

CONSCIOUSNESS AND REALITY IN WESTERN AND ORIENTAL TRADITION. RELATIONSHIP BETWEEN HUMAN AND UNIVERSE

*Viktor F. Petrenko,
Anatoly P. Suprun*

*Lomonosov Moscow State University
Moscow*

Stating the main principles of Buddhist philosophy and psychology is usually going with help of ancient categories and metaphors, which had been developed since the fifth century B.C. till the tenth century A.C. That means they were worked out by quite different kind of mentality (culture, language, traditions...). That makes those categories and metaphors almost untranslatable on European languages properly and unequivocally. In its turn, that situation makes difficult any kind of modern scientific research of the phenomena, discovered inside Buddhism, as well as ideas, developed in it. In this article we set a question of possibility to select such basic concepts of modern natural science, which can effectively translate main oriental ideas about Reality into modern scientific paradigm and discover the meaning of psychological phenomena from the transpersonal psychology sphere of interest. We take a look on some comparisons between pictures of Reality in modern physics and in Buddhist paradigm, allocating two sides of Reality, called Nirvana and Samsara.

Keywords: consciousness, western tradition, oriental tradition, Buddhist philosophy

Our reader may be surprised by the mere title of this article. Compared with cosmic cataclysms, a human being is a tiny and fragile creature depending from the Sun, which is itself nothing but a star among the uncountable stars, the uncountable galaxies. Man is a prisoner of small box of physical, chemical and biological conditions, a probability joke of cosmic evolution. It is intuitionally clear that human depends on a space breath. Such scientists like K.E. Tsiolkovsky (2001), V.I. Vernad-

The work is supported by RFBR grant 10-06-00192a.

sky (1978), A. Chizhevsky (1995) already spoke about the way, in which space dynamics and especially our mother-star Sun make influence on nature, a human being and social happenings.

It seems impossible even to think about the opposite influence. How can a tiny rag of human being, trembling in the wind of cosmic power, change the direction of this wind? How can one ride a storm, if a single blowing makes him/her gone with the wind? However, appealing to world integrity idea, Albert Einstein set a paradoxical question: "How do space processes change in case of being watched by a mouse". Two thousand years before that, Greek philosopher Socrates formulated a genius thesis "understand yourself and you will understand the whole world", postulating the likeness between human microcosm and The Universe macrocosm in that sentence. Today we call it "isomorphism". Pythagoras of Samos, Anaximander of Milet and his follower Anaximenes, Parmenides of Elea and Plato were among philosophers, sharing this idea. It is Hermes Trismegistus, mythological patron of Middle Ages alchemists (his figure combined the features of Ancient Egyptian god of wisdom Thoth and Greek god Hermes), who is believed to make a related saying: "the Inner is similar to the Outer, the Small is similar to the Great". Joining in united choir the "Thrice Great" (Hermes Trismegistus), the alchemists postulated that "which is Below corresponds to that which is Above". The microcosm-macrocosm equality idea appeared either in quite different cultures: for example, in Hinduism, in Vishnasara-Tantra humans equality to nature sounds like "that is Within is equal to that is Beyond". Chinese daoists postulated that processes happening in the Universe are quite the same with the processes happening in the Human. Here a few extracts from the text of Huainanzi ("The Masters/Philosophers of Huainan"), illustrating that kind of similarity: "Head is round like the Sky, Foot is square like the Earth. Nature has four seasons of time, five basic elements (water, ground, fire, metal, wood), nine parts (eight cardinal and intercardinal directions and the center), three hundred and sixty five days. Human being either has four limbs, five internal organs, nine holes, three hundred and sixty five joints. Nature produces wind, rain, coldness and heat. Human has abilities of taking, giving, cheering and being angry. Clouds are formed from gall bladder, air is formed from the lungs, wind – from liver, rain – from the kidneys, thunder – from spleen, and heart is the master of all" (Rodzinsky). A.A. Bogdanov supposes the first basic metaphor in the history of cognition

was anthropomorphization of nature forces. Relict structures of this basic metaphor, contained by Russian language, are reflected, for example, in attributing to nature forces the agent role (subject), as well as in giving them the grammar gender (a reflection of sex differences).

Inner-outer similarity idea can be understood through two ways: 1) the dualistic one, considering the spirit and the body as two independent substances (Christian Wolff, René Descartes) and 2) the monistic one, existing in two opposite forms, which are idealistic monism and materialistic monism. Idealistic monism, coming from Plato, interprets the world of objects as “cave shadows”, reflecting “the World of pure ideas” (Plato), or as “dream of Shiva / Yahweh” (Hinduism, Judaism), or as “Maya” (“illusion” – a Buddhism term, meaning humans consciousness reflection). Philosophic form of monism is exhibited first of all in the works of Hegel, Schelling, Schopenhauer, which explain the World as an expression of *Anima mundi* (absolute spirit) development. In modern science similar ideas are consisted in Holographic cosmogonic model (Bohm, 1980; Pribram, 2010; Talbot, 1995; Lipton, 2008), where the World is considered a reflection of some implicit Reality (holographic matrix), the origin of which is not clear (or hidden). Otherwise, materialistic monism sets object reality first (as it does, for example, economics of Karl Marx), while human personality becomes just a shape (an assemblage) of social relationship, caused by economic basis (which seems to create it).

Stepping from the level of connection between microcosm and macrocosm (the Inner and the Outer) to more local level of social relationship and psychological processes, we can see similar “interiorization” concept in sociology (Durkheim, 1995) and psychology (Piaget, 1994; Wallon, 1942). Idea of interiorization (“growing into”) was developed in Soviet and Russian psychology in the works of L.S. Vygotsky (1982), A.N. Leontiev (2000), A.R. Luria (1979), P.Y. Galperin (1995), A.V. Zaporozhets (1986), V.P. Zinchenko (1997), B.M. Velichkovsky (2006). Let's notice that followers of Vygotsky have a dualistic tendency in their theoretical concept: they postulated impossibility of reducing psychical sphere of being to physical one, being in polemics with physiologists. Otherwise, Galperin in his “gradual development of mental acts” theory (what is, by our opinion, the most logically pure example of development of the interiorization idea), shows himself as a methodological monist, as far as he supposes internal psychical processes totally isomorphic to ge-

netically primary outer (objective) activity. This interpretation of inner-outer relation was the cause of Galperin's being exposed to friendly criticism from Leontiev, who believed that during "gradual development", when we go through object-activity level of orientation activity basis and come to sign level, new connections and relations are made: caused by the introsystem connections of language itself. That means that information, while passing to the conceptual level of description (during speech pronouncing as a step of interiorization), is getting enriched by inner language interconnections, containing cumulate human experience and knowledge.

Taking into consideration all that is written above, the question of interconnection between microcosm and macrocosm, human being and cosmogenesis can be observed, for example, from two points of view: the first one is Buddhist philosophy, which consider itself as "a science of consciousness", and the second one is modern physics view, as some bright representatives of this science put consciousness into the very core of objective reality, observed by physics. Let's take a more pure view on phenomenological aspects of getting dead (or falling into Bardo, which means "marginal state" – Hodge & Burd, 2006). Let's match it with the description of experience of hypothetical observer, watching "Black Hole", what generates a kind of curved closed space. Because of black hole's enormous gravitation, once having got into it, no microparticle can leave this space.

Buddhist interpretation of microcosm-macrocosm interconnection

Stating the main principles of Buddhist philosophy and psychology is usually going with help of ancient categories and metaphors, which had been developed since V century B.C. till X century A.D. That means they were worked out by quite different kind of mentality (culture, language, traditions...). That makes those categories and metaphors almost untranslatable on European languages properly and unequivocally. In its turn, that situation makes difficult any kind of modern scientific research of the phenomena, discovered inside Buddhism, as well as ideas, developed in it. In this article we set a question of possibility to select such basic concepts of modern natural science, which can effectively translate main oriental ideas about Reality into modern scientific paradigm and

discover the meaning of psychological phenomena from the transpersonal psychology sphere of interest (Maslow, 1999; Tart, 2003; Frager & Fadiman, 2008; Kozlov & Maykov, 2004 and others). We take a look on some comparisons between pictures of Reality in modern physics and in Buddhist paradigm, allocating two sides of Reality, called Nirvana and Samsara. This inner connection and clear parallels between two outlooks (ideas of oriental philosophy and modern physics) were taken into consideration by many outstanding scientists.

Robert Oppenheimer: “the General laws of human knowledge shown in nuclear physics breakthroughs are not something unprecedented and absolutely new. They existed in our culture too, though much more appreciable and important place they always occupied in Buddhism and Hinduism philosophies. The things that happen now are only acknowledgement, continuation and renewing of ancient wisdom” (Oppenheimer, 1954, p. 8).

Nils Bohr: “We can find a parallel between lectures on the nuclear theory – and epistemological problems which such thinkers as Lao-tszy and the Buddha already faced, trying to comprehend our role in the great performance of life: the role of spectators and participants in the same time” (Bohr, 1958, p. 20).

Werner Heisenberg “The considerable input of Japanese scientists into the theoretical physics, made by them after the World War II, can be a sign of some similarity between philosophy of the Far East and the quantum theory philosophical maintenance” (Heisenberg, 1958, p. 202).

In Russian philosophy the point of view, maximally similar to mentioned above, is represented in works of postneoclassical rationalists, such as V.S. Stepin (2000), V.A. Lektorsky (2001), I.T. Kasavin (2001), L.A. Mikeshina (2008).

This article is mostly oriented on Buddhism philosophy, as the most historically developed, although many cultures had created a concept of two ways of Reality representation in human consciousness: the “profane” one and the “sacred” one (in Buddhism – Samsara and Nirvana). Reality is represented to “ordinary”, “profane” (“samsaric”) consciousness in its *process-dependence object spacetime modification*, in which it essentially cannot be learned out to the final end (at least in case of any time limits). As for Nirvana, this concept has nothing to do with the category of *time*, so it cannot be reflected in any “process”, including semiosis (denota-

tion). It was Nagarjuna, who was one of those who said that language is unable to describe Reality properly, as language tools are inadequate to Reality, as well as thinking itself (since it is operation with limitedly used concepts and categories). Generally, Buddhist point of view postulates impossibility of reaching and describing the True within the frame of discursive thinking. Because of that, any philosophic knowledge or doctrinal statement in Buddhism can play the only role of *upaya* ("craft tools"): a guide sign on the way, method helping in going on the way – but never the result or aim of the way. "All the things cannot be named or explained – just because of their fundamental nature. They cannot be adequately expressed by the language tools" (Ashvaghosha).

The same problems of scientific language were described by W. Heisenberg:

"The most difficult thing is to speak about the quantum theory in usual words. It is not plain what words you should use instead of mathematics signs. The one thing is clear enough – that terms of usual language does not approach to describe the construction of an atom... Here the problem of language is really serious. We want to tell about the atom structure somehow. But atom is indescribable in our usual language" (Heisenberg, 1958).

In this situation an attention should be brought to a semiotic aspect of the problem. As well as sign (according to semiotics) receive its meaning *only by having an opposition*, which puts the edge between "this" and "the other" ("Terminus" – is an antic god of margin, border, frontier) – most of the marginal categories are not signs and their using inside discourse is illegal, as it provokes logical contradictions. Among them are such categories as "infinity", "continuum", "unlimited", "uniform", "reality", "absolute", "being", "nothing" – and others, which can be put in opposition with any equal category. It is widely known, how much trouble mathematicians get from "infinity", as well as philosophers – from "absolute". Adding any attribute to them is a source of contradiction. For example: "Can absolutely powerful and strong God create a stone, which he could not raise?" A similar question (taken from the set theory) Bertrand Russell made to a famous philosopher and mathematician G. Frege, who put his aim to distinguish all the basic mathematics concepts, using *only logics* for making terms and proofing them. Frege was going to use for formalization of arithmetic a system of predicate counting, invented by

him. But his system finally happened to be contradictive, that was found by B. Russell in his famous paradox. Frege tried in vain to solve this paradox during the rest of his life.

It has appeared that a lot of mathematical problems, connected with such kind of items, cannot be described with any algorithmic language. For example, some kind of tasks, including the theme of effective extremity and infinity (Boss, 2007, p. 124). As one mathematician has joked: “When the dream or infinity comes true, the result turns out not always expected. There can be everything, from ‘has come true’ to ‘has befallen’ ” (Ibid., p. 135). Attempts to rectify situation by opposing marginal categories each other (for example: “being” and “nothingness”) – cannot solve the problem, because the *existence* of that exists (“being”) is opposed to the *existence* of that *doesn't* exist (“nothingness”). It's an example of pure paradox: the aspiration to consider existence as the *absolute*, including *everything* that is, – confronts attempts to oppose it to *something* by name “nothingness”, *existing beyond existence* (otherwise, it should be a part of existence). Doing that, we forget that any “something” is *included* in “existence”, just because of existences' *definition*. Such dialectic logic, of course, partly rescues philosophical games and constructions, but it isn't used in natural sciences. Oriental philosophers face the same problems, concerning interpretation of such categories as the Atman, the Sunyata, the Nirvana and others.

The knowledge problem is aggravated with that we are totally *within* that sign environment; we are surrendered and limited by it. To say more precisely, we are totally inside the so called *alarm system*. I mean not only *the language* (the second alarm system, according to Ivan Pavlov), but also *the sensations* (the first system, but also being alarm). The alarm meaning of sensations was convincingly shown in A.N. Leontiev's experiments (1975) with formation of a skin photosensitivity: during the experiment the abiotic stimulus (i.e. biologically neutral one) – light stream, becomes felt by the skin of the person, as it bears *alarm function* about biologically significant stimulus (in that case – about electric stroke).

However, taking that into consideration, we at once face several questions, having no chance on the decision. First of all, if we believe in objective character of our sensations' *reasons*, we are compelled “to objectize” their *source*, constructing mentally some ideal world of things “beyond” sensations. With logic inevitability this “other” world

appears for us a transcendental one. Immanuel Kant in “Critique of Pure Reason”, speaking about purely theoretical and abstract (from his point of view) possibility of knowledge prophetic in itself (Reality as it is), has noticed that for this purpose it would be necessary to be released in the beginning from aprioristic forms of sensual contemplation inherent in the subject (space and time) and mind categories, and then to get other type of contemplation (intuition) – but NOT a sensual one. Schelling agreed with such a category and, according to tradition, named it “intellectual intuition”. Though Schopenhauer has derided Schellings’ term “intellectual intuition”, he actually recognized possibility of a certain mystical comprehension “things in itself” (in his “system of will”). In the work “Creative evolution” by Henri Bergson the intuitive information is considered a channel, allowing one live being to feel a condition and morphology of vital bodies of another, through modeling them by the means of own mentality. Many centuries before the European philosophers, Oriental thinkers of the Hinduism and the Buddhism postulated the possibility of not mediated knowledge, existing besides five senses, that can be achieved by meditation and “non-dual vision”, eliminating subject-objective opposition (see: Petrenko & Kucherenko, 2008).

As an illustration of “non-dual vision” phenomenon? it is possible to give an example, given by D. Krishnamurti, on a material of culture of one more east mentality – The Chinese one. He wrote: “In ancient China, before starting to write a picture, for example, a tree, the artist sat before it many days, months, years (had no value, so long), until he became a tree. He didn’t just *identify* himself with a tree, but he *was* it. It means that there was no space between him and a tree, there was no space between observing and observed, there were no one who experienced beauty of shade movement, density of foliage, feature of coloring; he was a tree completely, and only in such condition he could write” (Krishnamurti, 2005).

Other difficulty in Reality comprehension is a remedial, space-time representation of the objective world. According to Nagarjuna, no elements of the Samsara has its own life, for its life is borrowed from other elements, that in turn are also borrowing it, and this is not original life completely, just as money borrowed cannot be considered reaches. As a result, all elements and the formations, consisting of them, – are non-existing, empty (Androsov, 2006).

Similar reasons can be heard from modern physicists: “Any elementary particle is not independent indecomposable unit. As a matter of fact, it is a set of relations, connecting a particle with an external world” (Stapp). “Thus, the world appears as a complicated ‘fabric’ (substance) made of various events, inside which connections of various types alternate, impose against each other or are combined, defining, as a result, whole structure” (Heisenberg, 1958, p. 107). It follows from this that the particle is not an independent essence, but only conditional allocation of a part of relations between various “events” of reality.

What is the Time? We think about it as about the past, the present and the future. Note, that the present exists only concerning the past and the future, as well as they exist only concerning each other and the present (the statement that all is defined only concerning something another is an axiom of semiotics either). But the past *already* doesn't exist, the future *still* doesn't exist. Hence, as present life is defined by fake, fictive categories, it is fake and empty too (according to Nagarjuna). In due time St. Augustine wrote in his “Confessions” about the same: “...That isn't present, we can't measure, and the past and the future aren't present. But how we can measure the present when it has no duration? It is measured, while passes; when it has passed, it not to measure: there will be no thing, possible to measure. But whence, what way and where is time passing, while we measure it? Whence, if not from the future? By what means? Only through the present it can go. Where, if not to the past? From the one, that is not present yet, through another, which has no duration, to the other, that already isn't present. What do we measure...?” (Augustine, 2008).

Whether time flows? Whether it has a direction? Does it have a beginning and the end? One of the most complicated enigmas is the one, which the great physicist sir Arthur Eddington named “arrow of time”. We accept it absolutely natural that events are developed in time in a “certain” direction: people grow old, pots break, a candle burns down. If there was no asymmetry of time people would become younger as often, as they grew old. But time is included into laws of physics absolutely symmetrically – as *parameter*, and it does not “flow” anywhere. From the physics point of view, there is no difference between the past, the present and the future: elementary particles can “come” both from the future, and from the past. It is put into the quantum electrody-

ics equations and is checked in experiments with unsurpassed accuracy (Penrose, 2007).

“All that each of us perceives as the past, the present and the future, in space-time appears merged together... Each observer, moving on course of his/her time, faces with various ‘layers’ or ‘levels’ of space-time and sees in them aspects of a material world replacing each other; though actually unsplitable integrity of all phenomena making space-time, precedes the observer knowledge of them” (Schilpp). “Many people believe that time passes, but actually it remains where it was. That idea of ‘passage’ is possible to name ‘time’, but this is a false representation, for if you perceive it only as ‘passage’ you cannot understand that it remains where it was” (Kennett).

In the General Theory of Relativity of Einstein Universum it is described in space-time as uniform object, as a “given reality”. But it for God *all* is a reality. Attempt to describe the Universum as object “from beyond”, from a God position, has brought with itself a set of problems. One of them is a so called *cosmological paradox*. From the decision of the equations of the General Theory of Relativity goes the consequence that our Universe is not a stationary one. It is obvious that the Big Bang which has generated the Universe, is an *event*, but events aren’t included into the traditional formulation of laws of the nature. Trajectories (or “wave functions”) don’t begin or come to an end. Here we can remember St. Augustine: “How could uncountable centuries pass, if they hadn’t been created by You, the Creator and the Founder of all centuries? Was any time, except founded by You? And how could it pass, as it didn’t exist? And as the maker of any time is You, if there was any time before sky and earth creation – is it possible to say, what You stayed in inactivity? All that exact time You have created – and time couldn’t pass until You have created time” (Augustine, 2008). A medieval question “that God had done before world creation” has become actual once again: for physicists. Occurrence of Life from Nothing is a *creative* act. But creativity conflicts with physical treatment of time. We can describe form change in finity theories (“finitude” means “having an end, a border”) with the limited and invariable maintenance – but is it possible to describe changes of the maintenance itself, which is an essence of the creative act? It is impossible to create *the classical theory* which axiomatics isn’t defined at all or changes spontaneously. It was Plato, who one of the first ones connected Reason and True with access to Life, the invariable reality, behind the

Formation. However he also understood inconsistent character of such position and in his work “Sophist” comes to conclusion that Life and Formation are both necessary for us (and the whole world). The Antique atomists faced the same difficulty. In order to admit occurrence of new maintenance, Lucretius Carus had to coin a term “clinamen”, revolting deterministic movement of atoms:

I would wish, to be informed here as well,
That, being falling in emptiness by the primary body weight
In a direction from top to bottom steep, during certain time
In a place unknown to us, I start to deviate slightly,
So slightly, that it's hard even to name it a deviation.
(Karus, 1983, p. 65).

Two and a half thousand years later, we meet the similar statement in Einstein's work, devoted to spontaneous emission of light by raised atom (Einstein, 1966), where it is said that “Time and Direction of elementary processes are defined in a random way” (p. 386). It is inevitable, as creativity doesn't become a part of physics: actually, it can concern physicists themselves, but not any of their theories. Arrow of time could be compared with the Evolution direction as a “process” of maintenance change, but creativity concerns not the *objective* world, but the *subject* (by the way, speaking about Evolution in this sense, researchers write a word “Nature” from capital letter, as if they implicitly mean the subject by it). The Vienna physicist Ludwig Boltzmann made coining Time *as a concept connected with evolution* into physics the purpose of his whole life. Before clinamen (by Lucretius Karus) and creativity were denied by Science as the phenomena leading to infringement of a “locality” and causality principles of the World. But latest experiments in research of so-called EPR-PARADOX (Einstein – Podolsky – Rozen) – the effects connected with quantum teleportation of conditions (Greenstein & Zajonc, 1996) – obviously show that the Nature doesn't “forbid” such processes.

Other possibility of Time Arrow definition appears during realization of so-called “wave function reduction”, which happens at the moment of perception of object. That circumstance has brought all physics to the edge of solipsism and has caused rough debate. Werner Heisenberg, one of new physics founders, has become involved in those philosophical and humanistic problems. He wrote in his “Philosophical problems of quantum physics” that physicists should refuse thoughts

about objective timescale, uniform for all observers, as well as about events in time and space, independent of our ability to observe them. Heisenberg has underlined that nature laws now deal not with elementary particles – but with *our knowledge* of these particles (that is with the maintenance of our reason). Erwin Shredinger (who has formulated the fundamental equation of the quantum mechanics), has written in 1958 a short book named “Mind and substance”. In this series of an essay he makes a way from results of new physics to a mystical vision of the Universe, identified by Schredinger as something similar to “eternal philosophy” by Aldous Huxley. It was Schredinger who was the first of quantum physics theorists to express sympathy to “Upanishad” and Oriental philosophical thought ideas. Many modern physicist points of view are summarized in the essay “Symmetries and Reflections: Scientific Essays” (Moscow: MIT Press, 1970), written by the Nobel laureate Eugene Wigner. In the very beginning Wigner notes, that the majority of physicists have returned to a recognition the thought (or reason) as a primary thing. He confirms that it would have been impossible to formulate consistent quantum mechanics laws and give a substantiation of a “wave function reduction”, without having included consciousness in them. As a summary he marks “It’s really amazing that scientific world-studying led us to the maintenance of our consciousness as to a primary reality”.

The previous text shows, that significant number of physicists (including “superstars”) tend to the thought that explanations in quantum physics need to include observer consciousness presence. It completely corresponds with extra strong psychologism of the Buddhism, which knows no world “by itself”, but only “psychocosm”, that means the world experienced by a living being, the world as an aspect of its mental experience. Actually, various worlds were analyzed by Buddhists as levels of living beings consciousness expansion (see: Vasubandhu, 1994). The similar point of view has support in modern thought: the book “Man and World” (Rubenstein, 1973), issued only half a century after his death, is filled by the same idea. In this extraordinary deep work we can meet with “the world, as a form of human life, the world as ... suffering”. The famous biologist and philosopher Jacob Von Uexküll draw peoples’ attention to how miscellaneous the world is in consciousness of different live beings. For the forester a pine is a tree and a building material, for a fox (having a hole under roots of a tree), it’s a home and a

shelter, for the bark beetle – it's an abundance of food. These aspects of perception of the world area also investigated by modern psychosemantics (Petrenko, 2010; Suprun et al., 2007).

Coming back to principles alarm-sign representation of realities in our consciousness, let us begin from a question, whether an alarm-based form is the only possible type of information representation. The term "signal" is commonly used for such form of data presentation at which data is considered as a result of some measurements (perceptions) of research object of in the form of scalar value sequence (analog, digital / numeral, graphic and so forth) depending on any variable value change (time, energy, temperature, coordinates, and so forth). Thus the form of signal (mechanical, electric, magnetic, acoustic, optical or any another), as well as the form of displaying it – does not matter. "Informative" parameter of a signal – is *any* of its parameters, in the case of its functional connection with data values. Generally signals are described by certain signal information parameter functional dependence on an independent variable (argument) – $s(x)$, $y(t)$ etc. That description and signal graphic representation form is called a "dynamic" (a signal shows the dynamics of its behavior through the arguments).

Except our usual dynamic signal and function representation in the form of their value dependence on certain arguments, at the analysis and data processing the mathematical signals description on inverse arguments of dynamic representation is widely used. For example, frequency is an inverse argument for time. Such description is made possible by Fourier transform property: signal of any complexity is possible to be presented as a sum of more simple signals (in particular, in the form of sum of the elementary harmonious fluctuations), provided that the signal has no nonremovable discontinuities.

More strictly: as Fourier transform of function $f(x)$ is called an integrated operation of such a kind:

$$F(\omega) = \int_{-\infty}^{\infty} f(x)e^{-j\omega x} dx$$

An inverse Fourier transform look like it's shown below:

$$f(x) = \int_{-\infty}^{\infty} F(\omega)e^{j\omega x} d\omega$$

In short, these relations are described through Fourier transform operator symbols \bar{F} and \bar{F}^{-1} : $f(x) \xrightarrow{\bar{F}} F(\omega)$, $F(x) \xrightarrow{\bar{F}^{-1}} f(\omega)$. Function

$F()$ is called Fourier-image of function $f(x)$. In its turn function $f(x)$ is called inverse Fourier-image of function $F()$ или proto-image.

Accordingly, signal decomposition on harmonious components is mathematically described by functions of amplitude values and initial phases of fluctuations on continuous or discrete argument (function change frequency on certain intervals of arguments of their dynamic representation). Set of amplitudes of harmonious decomposition fluctuations is named amplitude spectrum of a signal, and set of initial phases is named a phase spectrum. Both spectra together form a full frequency spectrum of a signal which *unequivocally* and *completely* represents the time-space form of a signal, but in Hilbert space. Let's explain it on the example of representation of a rectangular impulse in the form of a step (Fig. 1).

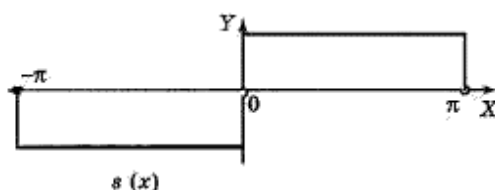


Figure 1. A rectangular impulse

Figure 2 shows a description of the impulse through one, two, three and four Fourier transform harmonics. You can see that consecutive addition of more high-frequency harmonics gives more and more exact description of the signal. Complete description requires the infinite number of harmonics. Let's notice that such signal representation becomes possible only if all time "has already ended", as we have the whole timebase (an interval from $-\infty$ to $+\infty$).

If we assign the axis to each harmonic and postpone size of its amplitude in the given decomposition along them, we will receive our signal decomposition in infinity-dimension Hilbert space: as a vector which coordinates correspond to these amplitudes. That's not "the physical" space common for us – as there is *no time*. Let's notice that the harmonic cannot be described within dynamical space-time *at all*: any harmonious process, limited in time, *is not a harmonic function*, but a representation of the infinite sum of harmonics. It is easy to understand if we present it as product of two functions: a harmonious and a step one, which decomposition was shown above.

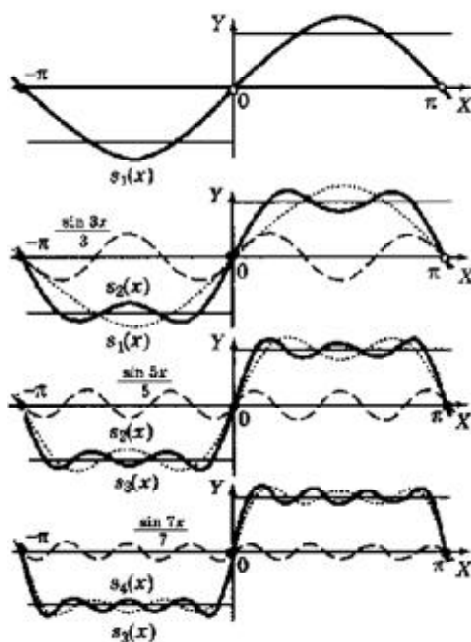


Figure 2. The rectangular impulse, represented as a sum of harmonics

Actually Hilbert space describes a *condition* which is realized as *process* in space-time. The reality appears in our consciousness in the objective, time-space form – but it is developed as process, in the form of sensations, perceptions, attention, memory, thinking etc. The mental area, out of which something appears in our consciousness, is usually named *unconscious*. Transition from unconscious to consciousness demands reality representation way changing. These ways should be both *equivalent* concerning the represented maintenance, and *reciprocal* concerning the ways themselves, as unconscious reality representation can't be compatible to the conscious one. We, can find and analyze two types of such representations: the first is a time-space one in which the maintenance is realized as a *successive* process, and the second is a holistic one which represents the maintenance *simultaneously* (see, for example, work by L.S. Vygotsky “Thinking and speech” about translation of thought process into speech (1982)). It's convenient to name the first

representation an *objective* one, and the second – a *subject* one. Absence of continuous time within Hilbert space doesn't exclude possibility of condition indexation and their forming in some sequence. For example, Poincare in his work "the Quanta Hypothesis" (*L'hypothese des Quanta*, 1912) postulates, that the statement about discrete behavior of possible conditions set of any isolated physical system – is absolutely applicable to the Universe: "Hence, the Universe should pass from one condition in another in a leap, but it remains constant during intervals between leaps, and the various moments during which it keeps the condition would be impossible to distinguish from each other; so we can speak about un-continuous behavior of current time, about atoms of time" (Poincare, 1973, p. 556). Let's notice that time in "*condition*" space is "evolutionary", discrete, unlike physical "continuous". The first sets an order of condition change (and maintenances of processes realized), and the second sets their duration in time-space representation.

Absence of differentiation between perceptual and functional both spaces and times leads to misunderstanding. That misunderstanding takes place, in spite of accurate differentiation, for example, between real and perceptual space, has been already described even in Bertrand Russell works. He wrote: "Not only colours, sounds etc. are absent in the world of science, but also space which we perceive by look or touch. It's essentially for a science to have its matter in some kind of *space*, but this space can't be exact the same space which we see and perceive... The real form which the science is interested in, should be in real space, different from seeming space of each person" (Russel, 1914, p. 22). "Time, space and causality are similar to glass through which we look at the Absolute... But the Absolute itself doesn't have either time, or space, of causality" (Vivekananda).

Let's imagine, what way the Reality would be perceived in condition space and whether we could verbalize such an experience. Let's list possible signs of such experience, basing on theoretical phenomena representation in Hilbert space:

- Experience of world integrity without any division into objects (including a body, individuality and so forth) as any characteristic of object is literally "sprayed" within all space and time. A consequence of that is absence of the ego and any ego-experiences.
- Absence of physical space and time, inlocality, including absence of local sensations. No limits on any quality speed of change: that

actually means absence of processes, extended in “physical time” (including psychical, mental and speech processes). No rigidity in any experience, which feels like instantaneousness in any changes.

- Intuitive understanding of the world, experienced as a result of *identifying* with it, instead of logic conclusions or perception in successive time-space form.

Let's compare now “consciousness of condition space” with those experiences, arising during meditation process (Dhyana) and reflecting the condition, called in the Oriental tradition (the Buddhism, Daoism and yoga traditions) the Satori, the Zen, Awakening, the Nirvana, Samadhi and so forth (Chatterdzhi & Datta, 2009).

- The Chan principle says: “don't base on words and books”, “don't be tamed by name and form”. As almost all various schools and directions of the Mahayana Buddhism agree, the exact reality can't be expressed by any linguistic means. The idea of nonverbal comprehension of the Truth is closely connected with such categories of Buddhist philosophy as the Nirvana, the Śūnyata, (emptiness), the Anatta (absence of individual “I”, of the ego), etc. It directly connected with the idea of any process (including verbal) absence in “condition space” (Sudzuki, 1993).
- The meditation process is usually anticipated by preparatory exercises removing physical stress, mental stress and other negative factors that are stirring concentration. Meditation was carried out by means of consciousness concentration, then mind becomes deprived of both images and thoughts and concentrated in one point (Sanskrit “Ekagra”; Chinese – “*yi-nan-xin*”), combined with maximum relaxation and consciousness stabilization. Usually meditation began with conscious attention concentration on one point (staring in emptiness) and “consciousness devastation”. Such condition is called as “one-dot” (Chinese “*wu-nan-xin*”) or “not-consciousness” (“*wu-xin*”). This condition was called also *wu-wo* – “not I” (“not me”) as there is no world division into “I” and “not I” in it: “*wu-xin* is a condition of integrity” (Sudzuki, 1993). It completely corresponds to transition from objective representation to a subject one, which is additional concerning the first: as existence and nothingness are. Remedial experience stop-

ping (both physiological and mental ones) is an absolutely necessary step to change the type of consciousness (see above).

- It is necessary to notice that meditation itself *can't cause the Satori*, as it lies “beyond its limits” (and it is Śūnyata – emptiness, nothingness) but only increases probability of spontaneous switching of type of mind. Moreover, the desire to find the Nirvana only strengthens an ego-concept and eliminates it to level of the thing existing only in objective time-space (the Samsara). The mere desire of the Nirvana becomes a border on a way of Awakening. As they say in Zen, it is impossible to find true cleanliness, destroying unclearness as they are interconnected concepts and it is impossible to destroy all lowlands, saving all the highlands (Ames, 1962). Satori is reached spontaneously, and this process was described by a metaphor: “the barrel looses the bottom all of a sudden” – rather a bright description of a leap from final and limited – into infinity.

Similar statements can be found and in Daoism. Zhuang Zhou said: “My body as if has fallen from me, and the mind as if has been extinguished. I seemed to leave my temporary cover, reject knowledge and have assimilated to the Omnipresent” (the Anthology of Dao Philosophy, 1994, p. 115–116). Laozi wrote: “I look at it and I do not see, and therefore I name It invisible. I listen to it and I do not hear, therefore I name It unheard. I try to seize it and I do not reach, therefore I name It the smallest. You shouldn't aspire to know source of It, because it's uniform... It is infinite and can't be named” (Ibid., p. 18).

Let's notice that in the Mahayana Buddhism the Samsara (the objective world) and the Nirvana are *identical* as a matter of fact. They are not two realities, but *two types of its representation*. The Samsara knowledge is an infinite process of consecutive approach to truth, but a *social* process: as knowledge transferring is possible in the sign form. The Nirvana knowledge is the instant “extrapersonal” act of intuitive understanding, but a way to it is always an individual one (Radhakrishnan, 1993). Adequate semiotics translation of a complete condition of the Nirvana to the individual, localized and limited form of the Samsara consciousness – is impossible. Representatives of the Yogacara Buddhist school consider that all forms perceived by us are essentially nothing but “only mind”, projections or “mind shades”: “In our mind the uncountable

things caused by differentiation originate... People perceive these things as an external world... That seems external, doesn't exist actually; what we see plurality in, is actually just our mind: the body, property and all mentioned above – all that is only the mind and nothing but the mind, I tell you" (Sudzuki, 1993, p. 242). "All things in the essential nature can't be named or explained. They can't be adequately expressed by means of language" (Ashvaghosha).

Comparison of two descriptions: ordinary "objective" or the Samsara attitude (allocating it space and time separate, though cooperating, bodies and processes) and the Nirvana condition (where there is no "duality" or division between subject and object perceived, no time and space, and attitude is realized in the synchronic form of a uniform Universum), – shows that the Samsara and the Nirvana phenomenology are described by qualitatively different languages. In the first case, the description language is the Cartesian space with the Euclidean metrics. The second case demands the Hilbert space, in which we receive completeness of the Samsara description only in case of a time window of watch, tending to infinity. The Samsara consciousness in its narrowing (and verbal thinking stopping) can come nearer to qualitative transformation to the Nirvana, where limiting pauperization of Samsara consciousnesses is transformed to infinite "expansion" in sense of unity with everything.

You can ask a question: what reality representation is an initial one, and what is a derivative? We already assorted above, what paradoxes courses the classical science objective representation. Subject representation doesn't set such problems just because of space, time and object absence. Is it possible probably to see the latent subject roots of a true reality through the objective representation? We suppose that is possible.

Let us consider an impulse of T duration (from 0 to T). Its spectrum is presented by Fourier integral. On some frequency ω it contains the harmonious component, defined during all infinite time axis (including all past and all future). It's possible to prove, that if we sum that components for any moment of time $t < 0$, we will receive zero (0), but only not for a situation $t > T$. Actually that means that the harmonious component *already existed* in the impulse *before occurrence* of the impulse, i.e. the law of causality is infringed. Thus, as a result of transition from complete (not time-dependent) Reality descriptions – to time-space representation, *inevitable infringements of causality and locality*

should arise. This is exactly a situation, that is really observed, for example, in quantum teleportation experiments, where two objects in a special condition (the physicists name it “entangled”) stay connected by non-local instant communication.

For time-and-frequency localization of structural elements of a signal Short-term Fourier transform is usually used:

$$S(\omega, b) = \int_{-\infty}^{+\infty} s(t)e^{-i\omega t}w(t-b)dt,$$

Here $S(\omega, b)$ – is a Fourier transform of a signal $s(t)$, increased by local function $w(t-b)$. With its help we actually “look through” a signal in some “time window”, which is corresponded by some spectral window.

Thus, $S(\omega, b)$ is a signal decomposition into a family of functions $w(t-b)e^{i\omega t}$, formed out of unique function by means of b-transitions on time and ω -transitions on frequency. Transformation becomes dependent on time and as a result time-and-frequency signal representation turns out. The given approach allows to define the fact of presence of any frequency signal and an interval of its presence. It considerably expands method possibilities comparing with the classical Fourier transform, but there are certain lacks. According to a rule, equivalent to Heisenberg uncertainty principle, while using the transformation, given above, it is impossible to confirm the fact of presence of ω_0 -frequency in a signal at the t_0 -time moment: it is only possible to assert that the certain frequency spectrum of (ω_1, ω_2) is present at an interval (t_1, t_2) . Thus, as a result of the spectral analysis it is possible to define only time intervals during which there are frequency sets in a signal. This problem is called an Entscheidungsproblem (“the decision problem”). The given problem is caused by the width of “window” of local function. This width is also called *the support*. If a “window” is narrow enough, we speak about *the compact support*. The narrow “window” provides the best time resolution, while a wide one – the best frequency resolution that is equivalent to Heisenberg uncertainty principle. The problem is that you have to choose a window with the fixed width for the all signal analysis, whereas its different intervals may demand application of different windows.

From there it is possible to understand, how there the “limited” consciousness can create an experience of time which shouldn’t be there.

Instead of observing all signal spectrum (i.e. the infinite “time period”), we are dealing only with its spectral decomposition into *sequence of limited intervals*. It’s plain enough that signal spectra may differ on various time intervals, that difference creates an *ordered* (codified) *sequence* of differing representations of some condition. Essence of such representation of phenomenon variability in time – lays in the *unfinished Fourier transform*: as full and exact representation of any signal demands consideration *during all infinite time axis*. Actually we “cut” signal $S(t)$ for slices in time area or (that makes the same effect) we pass it through a frequency representation spectral “window”, i.e. we *filter* the signal. But, if we submit the “cut” impulse to a narrow-band filter it will pass only some part of an impulse spectrum with changes of amplitudes and phase shifts, defined by the filter. But, the more high **Q-factor** of a contour is, the more its *inertia* is, so the more time is necessary to spend to make *any change of fluctuation amplitude* in a contour. As a result we have that, reducing Δt time quantum and doing filter cells smaller, we increase an error in making an amplitude and energy signal estimation as well. It is equivalent to Heisenberg uncertainty principle of quantum physics: $\Delta E \cdot \Delta t \sim h$. From this it follows that rigidity (inertia) of process is not only *defined* in the course of perception, but somewhat is also *generated* by it (under quite objective laws!). Then becomes clear that this is not an independent feature, but one of its characteristics, the same as intensity and quality. Through Heisenberg uncertainty principle it characterizes “clipping” parameter Δt of the perception act, as it depends on it what we exactly will perceive.

Thus, the movement continuity in our consciousness is the illusion created by work of specific systems (in objective representation – they are certain brain departments). As an example: people, whose brain field V5 was stroked, see the world as a sequence of motionless pictures. Passing the street, they strongly risk, as moving cars are perceived by them as motionless objects which change their position in space in a “jerky” way.

Paradoxes of quantum mechanics obviously point the principle inadequacy of attributing the objective time-space form to the Reality: “Being asked whether the electron position is invariable, we answer ‘no, it isn’t’; being asked whether the electron position changes in due course, we answer ‘no it doesn’t’; being asked whether the electron is in a rest state, we answer ‘no, it isn’t’; being asked whether it moves, we answer ‘no, it

doesn't" – Robert Oppenheimer (quote from: Arnts, 2008, p. 107). If to consider that reality conditions are directly presented in our unconscious (of course, limited by ours "system of reference"), while our conscious receive these conditions in time-space form – then the paradoxes fade away. Now in the sphere of physics the experiments with quantum condition teleportation are widely discussed. It's interesting to compare them with "consciousness transfer" techniques of the Tantra Buddhism (one of the highest Naropa yogas (Mullin, 1997)). These techniques are used in the Tibetan tradition of the Dzogchen Buddhism for the Nirvana achievement and it's realized by reaching a so-called Bardo condition (dying and agony conditions (Hodge & Durd, 2006).

Numerous descriptions of experiences of the patients who have experienced clinical death, in many details remind the things described in well-known Tibetan book "Bardo Thodol". For example, experiences of "falling into a chasm", movement in "tunnel" or "pipe", flashes of bright light (so-called Rigpa or Clear Light of Dharmata) and so forth (Moody, 1997; Songyal Rinpoce, 2006). And in this case it is possible to point the direct similarity of these experiences with purely physical phenomena. Let's discuss this aspect in detail.

Professor Raymond A. Moody in his book "Reflections on Life After Life" (1977), analyzing near death experience of the patients who have lived through clinical death, highlights a lot of universal details independent of sex, age, religion, culture and formation. Here below we list some stages and quote fragments of some interviews.

- ***Inexpressibleness.*** All people who experienced the near death state characterize it as something completely out of description. Here a fragment from one interview: "It's a real problem for me to try to explain it you now. Because all words which I know, are three-dimensional. At the same time, when I experience it, I keep thinking: ... I had been taught that there are only three dimensions, and I believed in it. But it' not true. It is more of them. Yes, of course, our world, in what we live now, is three-dimensional, but the world other, is certainly not. And for this reason so it is difficult to tell to you about all happened" (p. 8).

- ***The dark tunnel.*** Often together with a sound effect people have a feeling of movement with very great speed through some space. "I had a very hard allergic reaction on local anesthesia, and there was a respiratory standstill. The first that happens, – ...I have felt that I am moving

through dark, black vacuum at an extremely high speed. I think it can be compared with a tunnel. The feeling was as though I rushed downwards on a roller coaster in the Amusement park..." (p. 12).

- **Extracorporal sensations.** Many people can't imagine themselves existing in any other condition, besides their physical body to which they have got used. "As soon as I've done it, my breath had stopped and my heart had ceased to beat. At once I heard as sisters had cried something. And at this moment I felt, that I had separated from the body.... Then, I began to rise slowly upwards... I saw, the doctors trying to return me to life. My body was spread over a bed and they all had crowded around it. I heard one of sisters exclaiming 'Oh, my God, she has died!' At that time another one had inclined over me..." (p. 14). According to the other person, he had a feeling that he / she "could see all round himself / herself, including own body lying on a bed". Thus he / she didn't take any place as though he / she was just a ball of consciousness (p. 17). Traveling in such a condition becomes the easiest thing: physical objects aren't an obstacle, while moving from place to place is made quickly, even instantly. All the respondents have noticed that while they were out of the physical body, time as though didn't exist. One man told: "Things, impossible now, were possible. The consciousness worked absolutely clear. It was so pleasant, as my consciousness could perceive all phenomena at once, or resolve arising questions without returning again and again to the same. A little bit later I felt that everything that I had lived through during my life somehow began to make sense" (p. 21). "The hearing" of that condition can be named so only by analogy with that takes place in the physical world. The majority of the respondents noticed that actually they didn't hear a *voice*, but perceived *thoughts* of persons surrounding them.

- **Lightful Being.** Moody writes that the meeting with very bright light was the most improbable and at the same time constantly present phenomenon in all cases studied by him. At first this light seemed dim enough, then all became brighter and brighter, while, at last, it became unearthly bright. But even then, it didn't cause any pain to eyes. Probably, it can be explained by the fact that they had no "physical eyes" at that moment, and so it was impossible to blind them.

- **Images of life before.** This review can be characterized as memoirs of the past though some lines distinguish it from usual memoirs. First of all – extraordinary speed, at which pictures of life followed one

another in a chronological order. The person covers all pictures of the past simultaneously, in one glance of mind. Life is experienced anew during a few moments of earth time. "After vibration and movement through the dark space, all my children thoughts, all my life have concentrated here, in the end of the tunnel, they have simply flashed before me" (p. 29).

- **Border or limit.** Some patients told that during the agonal experience they came to something that can be named border or some kind of limit. Sometimes this phenomenon looked like a gray fog.

- **Vision of perfect knowledge.** Moody marks: "Some persons told to me that during meetings with 'death' they saw for the moment some special separated existence area at which, as it seemed, there was all knowledge – the past, the present and the future – in some non-temporary condition. They described their feeling as an instant inspiration during which it seemed to them that they possess perfect (absolute) knowledge. All patients marked inexpressibleness of the experiences and said also that the feeling of perfect knowledge disappeared after their returning without giving them any omniprovidence in their life after returning" (p. 42).

In conclusion R. Moody notices that "despite full conviction in reality and importance of that has happened to them, they understand that our modern society just isn't capable to concern such evidences with understanding or sympathy. Many of the persons interviewed by me perfectly understood that if they try to share their experience with somebody, they will be most likely accepted for crazy" (p. 35).

To show objective mental representations psychologists build so-called mental cards of consciousness, on which the Reality is presented to the subject in the objective time-space form. As in the physics Reality models (constructions) are built in the exact form they are presented in our consciousness, actually they realize a physical component of these cards. From purely psychophysical laws it is easy to show that those cards spaces has Minkowski metrics (Suprun, 2009), the same which is achieved in Einstein STR (special theory of relativity). At the account of rigidness (stability) of sensations these spaces become complement to Pseudo-Riemannian spaces of the GTR (general theory of the relativity) observing, for example, such "objects" as black holes. Those latest take our special interest because of the reasons mentioned below.

Black hole is an area in the space-time, which gravitational attraction is so great what even objects moving with a velocity of light can't leave it. The border of this area is called event horizon, and its characteristic size (depending on weight of a hole) is called gravitational radius. In the elementary case of so-called "spherically symmetric black hole" it is equal to Schwarzschild radius:

$$r_s = 2GM/c^2$$

Here: c – is a velocity of light, M – is weight of a body, G – is the gravitational constant.

Theoretical possibility of such space-time areas existence follows from some exact decisions of Einstein equations first of which has been received by Charles Schwarzschild in 1915. Two basic qualities inherent in black holes in Schwarzschild model is a presence of event horizon (by definition it is present at any black hole) and singularity which is separated from other Universe by the horizon.

The geometry of a black hole with weight, an electric charge without rotation has been described by Reissner (1916) and Nordström (1918) independently from one another. Real existence of the charged black holes is improbable in our electrically neutral Universe. However the charged black hole is often used as model of a *rotating black hole* (which is the modification most possible in reality) as their geometries have some similarity. Such a substitution is used as the mathematical description of a rotating black hole is extremely difficult. It was described by Kerr in 1963 very short (Kerr, 1963), and only a year after the detailed version was published by Kerr and Schild. The detailed statement of Kerr and Kerr & Newman decisions had been published in 1969 in famous work of Debney, Kerr and Schild (Debney, Kerr, & Schild, 1969).

Kerr singularity is situated under the horizon. It is a ring, opening a pass to Kerr negative geometry sheet ($r < 0$), in which values of weight and charge, and also directions of fields change to the otherwise. The Kerr–Newman metric (and just Kerr metric also, but not Schwarzschild one) it is possible to continue analytically through horizon so that infinite number of "independent" spaces become connected in a black hole. Those spaces can be either "other" Universes, or distant parts of our Universe. Inside such spaces there are self-closed time-like curves: the traveler, practically, can get to his own past, and meet with himself / herself.

Thus, the basic difference between the charged and not charged non-rotating black hole (that means the static decision for a spherically sym-

metric non-rotating non-charged black hole by Schwarzschild, 1916) consists in that the charged black hole has within its event horizon one of “the wormhole” ends, while the second end leads to the “white hole”, leading to another space-time. We don’t speak about stability of a wormhole, and about the role of so-called “exotic” forms of matter in that process – as these are very dim themes.

It’s the most important for us that the only known exit from this particular objective space-time reality (and, as consequence, this particular mental card of consciousness) for today is black holes. Therefore it is quite natural to compare the conditions described in the Tibetan book “Bardo Thodol” (the special “guidebook” of posthumous stages of “leaving” from the reality) with a “travel” to a black hole.

In the Tantric Buddhism there exists special techniques of entering such conditions for the purpose of their detailed research and subsequent usage for switching to another type of consciousnesses (the Nirvana) by means of consciousness transferring practice (so called “phowa”) at the moment of death. In tantras of Dzogchen four stages of Bardo are allocated:

- “Natural” Bardo of life;
- “Painful” Bardo of dying;
- “Shining” Bardo of Dharmata;
- “Karmic” (causal) Bardo of formation.

As Dzogchen affirms that at the moment of dying, our ego first loses the physical properties (possessing the greatest rigidity) that sharply facilitates possibilities of consciousness type switching (“the nature of mind comprehension”) for the trained adept Songyal Rinpoce wrote about it in his book (2006): “Think about the death moment as of border of an unfamiliar mind zone – the nobody’s land where we will suffer from a huge emotional trauma losing the physical body if we do not realize its illusory nature. On the other hand, during the same moment we receive chance for achievement of boundless freedom – a freedom which results from the very absence of that physical body. As soon as we will definitively be released from a physical body which dominated in our understanding of themselves so long, the karmic vision of this life is completely settled. At the same time, other karma which could be created on the future hasn’t started to crystallize yet. That means that the death moment is a ‘gap’ or a space, full of tremen-

dous possibilities; it is the moment of amazing and 'creative' power, when the only significant thing is a condition of our mind. Being released from a physical body, mind remains a bare creator of our reality (as it always was). And if at the moment of death we have already developed a stable condition of comprehension of mind nature – then we can clear all karma in a flash. And if we continue to support this stable comprehension condition, entering an open space of mind nature true cleanliness, we can stop accumulation of karma completely and achieve Release” (p. 142).

The third phase of dying (the most essential to us) is a passage through a blackness stage. It is described as something that looks as “the empty dark sky”. Clear Light of Dharmata occurrence reminds a transparency and cleanliness of the empty sky before dawn. Gradually “the Sun of Dharmata” starts to rise. Natural radiation of Rigpa appears instantly and streams energy and light: it is the best moment for Clearing and Release (Songyal Rinpoce, 2006). If it is missed, the fourth phase (“karmic Bardo of formation” or an intermediate condition which lasts till the moment of a new birth) – begins. Let’s notice that according to this doctrine at the moment of occurrence of Rigpa we will see and live through our past anew, as well as our future in “a new birth”. Let’s compare these descriptions with phenomena we could observe during falling in a black hole.

Symmetric black hole, according to Schwarzschild theoretical calculations, contains in itself a singularity in which gravitational powers tend to infinity. However, the interior of rotating (or charged) black hole essentially differs from Schwarzschild black hole interior. Kerr singularity is formed like a ring and, being represented on the space-time diagram, it is vertically directed (unlike Schwarzschild singularity), which means parallel the time axis on the Penrose diagram (see fig. 4). In other words, singularity is, as physicists speak, “time-like”. It means that there is a possibility to get into a black hole on the way, without passing through central singularity with its enormous gravitational tensions. Generally speaking, an object should be neatly directed to get to the singularity: only the bodies moving in an *equatorial* plane of a hole, get within the ring singularity and collapse. On the full Penrose diagram for the rotating black hole (fig. 3) it’s possible to see that such hole has two event horizons of: an external one and an internal one (the second is located more close to singularity).

The body which has got under external horizon, can't come to light any more as properties of space-time under this horizon change so radically that movement in free chosen direction is completely excluded. Under internal event horizon space-time properties change again, and the falling body can move there on a "worldline" aside from singularity. Figure 3 allows to watch a way of the hypothetical astronaut falling in rotating black hole. In the area under the internal horizon, it is capable to change a movement direction, for example, by turning on the engines of the starship. Without exceeding the light speed (i.e. moving along a line forming with a vertical a corner less than 45°), he can turn aside

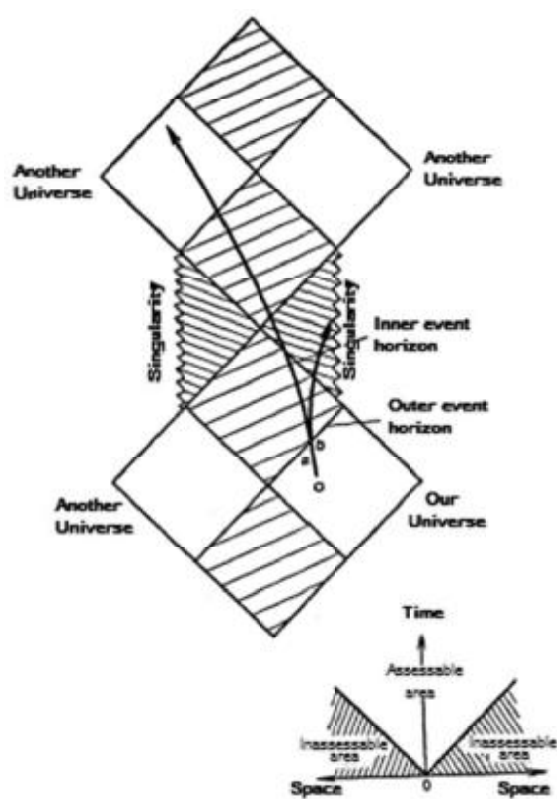


Figure 3. Penrose diagram for a rotating black hole

the singularity, can even move from it and finally appear in another space-time. Having fallen in a black hole in our Universe, the astronaut can't return to our world through the same hole anymore; that means he should get out of it "somewhere" – probably, in the another Universe. If we draw the Penrose diagram completely, we will see infinite number of the past and future Universes on it. Flying in and off rotating black holes, the astronaut will travel from one Universe to another till the end of the life. However if the physical situation represented on the diagram corresponds to a reality, the astronaut can move only in a direction to "the future Universe": having fallen to the next black hole, he can't return to the own Universe and meet his contemporaries there. Falling to a rotating black hole still remains one-direction travel for the astronaut though it may not conduct his death.

Thus, in Buddhist interpretation we can pass from one form of *Reality representations* (the Samsara) to another. Let's mention: we speak exactly about switching of consciousness *forms*, as the Reality (the Nirvana) is always the One (unique). By the way, our Universe occurrence from *is not a birth of a new reality* from this point of view, but an occurrence of *certain type of translation* of its conditions to the concrete space-time form.

German astrophysicists have made the analysis of optical effects in the black hole neighborhood and have created the special program which allows to visualize movement of the observer round this mysterious object. Article of that scientists has appeared in magazine *American Journal of Physics* (Hamilton & Avelino, 2010), and the program can be found on Thomas Müller's site (one of authors of work). Two scientists have constructed the model showing as the space looks for the observer who has fallen to a spherically symmetric black hole.

The basic phases of passage through are external and internal black hole horizons. On internal horizon you will see an infinitely bright flash of light. A bright radiant dot is the image of the external Universe reflected by gravity repulsion of the singularity. Light flash (compare it with the description of Rigpa in Dzogchen and near death experience descriptions) contains an infinitely fasted history of all Universe. At approach to internal horizon, the black hole stops to extend and starts to squeeze. It looks like removal from a black hole, but it's not so. You are still in free falling to a black hole. Reduction is caused by relativistic radiation which

focuses a sight forward. The same relativistic radiation causes increasing brightness of an external Universe luminescence and blue shift round a black hole. Another infinitely bright light flash is expecting you at your passage through internal horizon: now out of a white hole which contains all “future” Universe. Then there is an exit to the new Universe and “a farewell look” back to a white hole.

Fuller impression of the considered program visualization of falling in a black hole can be received after having seen a film “Black Holes: The Other Side of Infinity” A production of Denver Museum of Nature and Science and NASA’s Gamma-ray Large Area Space Telescope.

Thus, we find in this comparison not only a figurative coincidence, but also a substantial one. In summary we want to remember the words of the world-known physicist that could be said by the Dalai Lama as well: *“the Person is a part of the Whole, named by us ‘the Universe’; a part limited in time and space. He / she feels himself / herself, as well as his / her thoughts and feelings, as something separated from all the rest – and this is an obvious error of his / her consciousness. This error is a special kind of prison in which we are limited with our personal desires and influence on the several people who are near to us. We should aspire on freedom from this prison and we can make it, expanding a circle of the compassion and embracing all live beings and all nature in its whole beauty”* Albert Einstein (Einstein, 1954; quoted in: R. Weber, “Dialogues with Scientists and Sages” (1986), p. 203).

Summing up. Comparing the image description of dying process and Bardo occurrence (according to the Buddhist “Book of Dead”: Bardo Thodol) – with the physical processes during passing the black hole in “wormhole” cosmological model, as a sum of results, it is possible to formulate a number of hypotheses, following such similarity:

1. Either the Buddhist philosophy postulates “all is Consciousness” (the holographic model of the Universe believes “all is some implicit Hologram projection”). So, according to such monistic position, mental and physical processes have the general nature and their allocation is caused only by language distinction of the uniform reality description. Addressing to philosophy history, it is possible to speak (by analogy) about a new level of B. Spinoza “psychophysical parallelism”: where the physical and the mental world descriptions give a picture of *isomorphism* and these two languages (equal in rights) display a uniform reality.

2. Or presence of the general laws follows from a principle of world unity and its non-locality for both mental processes (such as Bardo condition occurrence) and physical ones (such as black hole occurrence). These general laws also define phenomenological similarity of processes at the most different levels of the reality organization – and cause micro- and a macrocosm similarity.

3. Or *the description language*, i.e. the conceptual device with its basic (usually figurative) metaphors, allocates *purely outward* similarity, ignoring the basic qualitative distinctions caused by a level of physical and mental reality development. At such an explanation “external and internal” similarity is caused mostly by poverty of our description language, allocating only separate aspects from a reality, because of the “limitations of construct applicability zone” (the term launched by G. Kelly, (2000)), creating illusion of similarity between physical and mental realities, possessing various nature and complexity.

4. The world description with use of language of the classical science operating with categories of space and time, generates Cartesian space, dividing the world to discrete objects. The usage of language of wave processes, generates Hilbert space, describing the world as a simultaneous unity, out of time and extent. These two description forms are reciprocal the languages displaying a uniform reality in two modeling forms equal in rights. Both description languages are used the physics and the psychology in different proportions. Proceeding from Pribram–Talbot holographic psycho model, mental processes of pre-conscious (unconscious) level are more convenient for describing in language of Hilbert space wave functions, while the picture of the world generated by is discrete consciousness sign-making process is more effective to describe in time-space continuum of three-dimensional Cartesian space.

References

- Ames, V.M. (1962). *Zen and American Thought* (pp. 74-75). Honolulu.
- Androsov, V.P. (2006). *Uchenie Nagarajuny o sredinnosti* [Study of Nagarajuna about mediumness]. Moscow.
- Antologia daoskoi filosofii [Anthology of Dao Philosophy] (1994). Bishkek.
- Arnts, U. (2008). *Kniga velikih voprosov. Chto my voobsche znaem?* [Book of great questions. What do we know at all?]. Moscow: Sofia.

- Augustine, A. (2008). *Ispoved'* [Confession]. St.-Petersburg.
- Bohm, D. (1980). *Wholeness and the Imlicate Order*. London.
- Bohr, N. (1958). *Atomic Physics and Human Knowledge*. New York: Jhon Wiley & Sons.
- Boss, V. (2007). *Leksii po matematike* [Lectures on Mathematics]. Moscow: URSS. Vol. 8.
- Chatterdzhii, S., & Datta, D. (2009). *Indiyskaya filosofiya* [Indian Philosophy]. Moscow.
- Chizhevsky, A.L. (1995). *Kosmichesky pul's zhizni* [Space pulse of life]. Moscow: Mysl'.
- Debnay, G.C., Kerr, R.P., & Schild, A. (1969). Solutions of the Einstein and Einstein-Maxwell Equations. *Journal of Mathematical Physics*, 10, 1842-1854.
- Durkheim, E. (1995). *Sotsiologiya. Jeyo predmet, metod, prednaznachenie* [Sociology. Its subject, methods and aims]. Moscow: Kanon.
- Einstein, A. (1954). Ideas and Options. New York: Crown Publishers; quoted in R. Weber, «Dialogues with Scientists and Sages», 1986.
- Einstein, A. (1966). Ispuskanie i pogloschenie izlucheniya po kvantovoi teorii. In A. Einstein, *Sobraniye Nauchnyh trudov* [Release and Absorption in quanta theory. Set of Scientific Works] (vol. 3). Moscow: Nauka.
- Fragar, R., & Fadiman, G. (2008). *Lichnost': teorii, uprazhneniya, eksperimenty* [Personality: theories, exercises, experiments]. St.-Petersburg.
- Galperin, P.Y. (1995). *Psikhologiya kak objektivnaya nauka* [Psychology as objective science]. Moscow.
- Greenstein, G., & Zajonc, A.G. (1996). *The Quantum Challenge*. Massachusetts: Jones and Bartlett.
- Hamilton, A.J.S., & Avelino, P. (2010). The physics of the relativistic counter-streaming instability that drives mass inflation inside black holes. *Physics Reports*, 495(1), oct., 1-32.
- Heisenberg, W. (1958). *Physics and Philosophy*. New York: Harper Torch-books.
- Hodge, S., & Burd, M. (2006). *Tibetskaya kniga myortvyh: Novy perevod s komentariyami* [Tibetan Book of The Dead: New edition with translated comments]. Moscow: Omega.
- Karus, T.L. (1983). *O prirode veschei* [About nature of things]. Moscow: Hud. Lit.
- Kasavin, I.T. (2001). Istina kak norma. Istina kak deskriptsiya. Istina, deskriptsiya i ekspertiza [Truth as a norm. Truth as a description. Truth, description and expertise]. In *Novaya filosofskaya entsiklopedia* [New philosophy encyclopedia]. Moscow.
- Kelly, G. (2000). *Teoriya lichnosti. Psihologiya lichnostnyh konstruktov* [Personal Theory. Theory of personal constuctions]. St.-Petersburg.

- Kerr, R.P. (1963). Gravitational field of a Spinning Mass as an Example of Algebraically Special Metrics. *Physical Review Letters*, 11, 237-238.
- Kozlov, V.V., & Maykov, V.V. (2004). *Transpersonal'naya psikhologiya. Istoki, istoriya, sovremennoye sostoyaniye* [Transpersonal psychology. Origin, history, modern condition]. Moscow.
- Krishnamurti, J. (2005). *Besedy iz bezmolviya* [Conversations from silence]. Moscow: Profit stail.
- Lektorsky, V.A. (2001). *Epistemologiya klassicheskaya i neklassicheskaya* [Classic and nonclassic Epistemology]. Moscow.
- Leontiev, A.N. (1975). *Deyatel'nost'. Soznaniye. Lichnost'* [Activity. Consciousness. Personality]. Moscow.
- Leontiev, A.N. (2000). *Lektsii po obshchey psikhologii* [Lectures on General Psychology]. Moscow.
- Lipton, B. (2008). *Biologiya very. Nedostayuscheye zveno mezhdu zhizn'yu i soznaniyem* [Biology of Belief. Missing part between Life and Conscience]. Moscow: Sofia.
- Luria, A.P. (1979). *Jazyk i soznaniye* [Language and Conscience]. Moscow.
- Maslow, A.G. (1999). *Motivatsiya i lichnost'* [Motivation and Personality]. St.-Petersburg: Jevrazia.
- Mikeshina, L.A. (2008). Epistemologiya i kognitivnaya nauka: bazovye kategorii i printzipy vzaimodeistviya [Epistemology and cognitive science: basic categories and principles of cooperation]. In *Kognitivny podhod: filosofiya, kognitivnaya nauka, kognitivnye distsipliny* [Cognitive approach: philosophy, cognitive science, cognitive disciplines]. Moscow: Kanon.
- Moody, R. (1977). *Reflections on Life After Life*. Harrisburg, PA: Stackpole Books.
- Mullin, G.H. (1997). *Readings on The Six Yogas of Naropa*. New York: Snow Lion Publications Ithaca.
- Oppenheimer, J.R. (1954). *Science and the Common Understanding*. New York: Oxford University Press.
- Piaget, J. (1994). *Izbrannye psikhologicheskie trudy* [Selected works on Psychology]. Moscow.
- Penrose, R. (2007). *Put' k real'nosti ili zakony, upravlyayuschiye Vselennoi* [Path to reality or laws managing the Universe]. Moscow.
- Petrenko, V.F. (2010). *Mnogomernoye soznaniye. Psikhosemanticheskaya paradigma* [Multidimensional conscience. Psychosemantic paradigm]. Moscow: Novy Hronograf.
- Petrenko, V.F., & Kucherenko, V.V. (2008). Meditatsiya kak forma neposredstvennogo poznaniya [Meditation as form of direct knowledge]. *Voprosy filosofii*, 8, 83-101.
- Poincare, A. (1973). *Izbrannye trudy* [Selected Works]. Vol. 3. Moscow.
- Pribram, K. (2010). *Jazyki mozga* [Languages of brain]. Moscow.

- Radhakrishnan, S. (1993). *Indiyskaya filosofiya* [Indian Philosophy]. Vol. 1, 2. Moscow.
- Russell, B. (1914). *Problemy filosofii* [Problems of Philosophy]. **St.-Petersburg.**
- Rubenstein, S.L. (1973). *Chelovek i mir* [Man and World]. Moscow.
- Shredinger, E. (2000). *Razum i materiya* [Mind and Substance]. Moscow.
- Songyal Rinpoce (2006). *Tibetskaya Kniga Zhizni i Smerti* [The Tibetan Book of Living and Dying]. Nizhny Novgorod.
- Stepin, V.S. (2000). *Teoreticheskoe znanie* [Theoretical knowledge]. Moscow.
- Sudzuki, D. (1993). *Osnovy Dzen-buddizma* [Basics of Dzen-Buddhism]. Bishkek.
- Suprun, A.P. (2009). Relativist Psychology: "A New Concept of Psychological Mesurement". In *Psychology in Russia. State of the art*. Moscow.
- Suprun, A.P., Yanova, N.G., & Nosov, K.A. (2007). *Metapsihologiya* [Metapsychology]. Moscow.
- Talbot, M. (1995). *Golograficheskaya model' Vselennoi* [Holographic model of the Universe]. Kiev.
- Tart, C. (2003). *Izmenennye sostoyaniya soznaniya* [Modified conditions of the conscience]. Moscow.
- Tsiolkovsky, K.E. (2001). *Kosmicheskaya filosofiya URSS* [Space Philosophy of URSS]. Moscow.
- Vasubandhu (1994). *Uchenie o mire* [Studies about the world]. Moscow.
- Velichkovsky, B.M. (2006). *Kognitivnaya nauka. Osnovy psikhologii poznaniya* [Cognitive science. Basics of cognitive psychology]. Vol. 2. Moscow.
- Vernadsky, V.I. (1978). *Zhivoe veschestvo* [Living substance]. Moscow.
- Vygotsky, L.S. (1982). Thinking and speech. In L.S. Vygotsky. *Collected works*. Vol. 6. Moscow.
- Wallon, A. (1942). *Ot deistviy k mysli* [From actions to thinking]. Paris.
- Zaporozhets, A.V. (1986). *Izbrannye psikhologicheskiye trudy* [Selected works on Psychology]. Moscow: Prosveshenie.
- Zinchenko, V.P. (1997). *Zhivoye znaniye. Psikhologicheskaya pedagogika* [Living knowledge. Psychological pedagogic]. Samara.