PROSPECTS OF NEUROSCIENCE APPROACHES TO THE PROBLEM OF CONSCIOUSNESS (In Connection with the Growing Global Crisis of Terrestrial Civilization)

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Summary

The global crisis of the terrestrial civilization is steadily increasing. To overcome it, mankind's consciousness needs changing, specifically such negative qualities as unbridled consumerism, aggressiveness, excessive egotism. The Dalai Lama emphasizes, "We badly need a fundamental change in human consciousness." According to his words, science is of great importance in solving this problem, specifically the neural science. In this regard, we look at the achievements and prospects of modern neuroscience in the study of consciousness, in overcoming the theoretical problems involved. The paper proposes an informational approach for a theoretical solution the the major issues of "consciousness and the brain" problem and development of the branch of neuroscience called "brain reading" (it deals with deciphering brain codes of various psychic phenomena). Prerequisite for such studies is development of a phenomenology of subjective reality. This involves extensive use of the rich phenomenological and meditative experience of Buddhism. The informational approach allows us to theoretically explain the phenomenon of mental causation of the ability to arbitrarily control one's own consciousness. In this respect, the system of universal ethics, developed by the Dalai Lama, is of exclusive importance. It includes the principles of moral self-perfection, which contribute to "cultivation of compassion," "sincere kindness," and eradication of "rampant greed and aggressiveness."

Keywords: global crisis, Dalai Lama's ethical system, self-improvement, problem of consciousness, subjective reality, neuroscience,

brain, information approach, mental causation, Buddhist meditation practices.

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Preparing for the conference, the materials of which are set out above, and to the meeting with Most Holy Dalai Lama, I carefully studied his works, whose depth of humanistic thought and extraordinary sincerity impressed me deeply, together with belief in the creative possibilities of the human mind and the spiritual powers of man. Especially important now is the system of universal ethics that is developed by the Dalai Lama, based on altruistic properties inherent in human nature.

Our consumerist civilization is experiencing a global crisis that is steadily deepening, leading humanity to degradation and destruction. We constantly writy and talk about such things. We do not see any decisive opposition to these tendencies from the world's political and economic leaders. The paranoid circle continues to unwind: we produce even more, in order to consume more, so as to produce even more, etc. These negative processes get more complicated, involving not only ecological and socio-economic components of the global crisis, but already clearly exposing threatening physical changes on our planet. This is, in short, a situation familiar to all thinking people in this our earthly home.

Now, more urgently than ever, it is imperative to preserve belief in human dignity, courage and strength of spirit, belief in the altruistic potential of human nature, relying on which one can activate change in the negative features of mass consciousness. **The problem of consciousness is a key point in overcoming the global crisis of the terrestrial civilization.**

That is why we need such world leaders who, being acutely aware of mankind's present situation, call for resolute action and strive to organize it.

Unlike many current "life coaches" who teach us high morals but are not able to acquire them for themselves, the Dalai Lama is the undisputed world leader, wholly trusted by millions of people.

"It is inexcusable to stay idle in the face of global problems," says the Dalai Lama [Dalai Lama 2016, 120].

"We badly need," he emphasizes, "**a fundamental change in human consciousness"** [Dalai Lama 2016, 109]. These goals are achieved through the system of universal ethics that he developed, which contains a proven tool for self-cognition and self-improvement, instillation of high moral values, overcoming negative lapses of consciousness, such as unbridled **consumerism, aggressiveness, and extreme egotism.** They are also rooted in human nature, which determines their persistence and immutability at all stages of human history. To overcome them, it is not only new ideas and effective educational tools that we need, but also thorough scientific research of consciousness and implementation of their results.

"Today," the Dalai Lama notes, "**science as a whole, and especially neuroscience, is increasingly interested in the issues of the work of consciousness, which had hardly been practiced before. This inspires me with optimism"** [Dalai Lama 2016, 19]. In other parts of his book, te Dalai Lama also speaks about the importance of neuroscience[Dalai Lama 2016, 138-139, etc.].

Indeed, in recent decades, neuroscience has achieved significant results in the study of consciousness. In particular, these are related

to the discovery and study of mirror neurons, visualization of brain processes and removal of signals from individual neurons, with successful development of the branch called brain reading, with the definition of clear neurodynamic correlates of many psychic phenomena, which facilitates development of neurotechnology for medical and other practical purposes.

Neuroscientific research of the problem of consciousness is interdisciplinary. Neurophysiological studies are closely related to the use of methods and results of many related disciplines, such as psychiatry, psychophysiology, psychopharmacology, psychogenetics, neurosurgery, psychoneurology (the results of the latter are particularly important for complex studies of the connection of various states of consciousness with the functioning of certain brain structures; in this respect, we single out the outstanding works of V. Ramachandran [Ramachandran 2014] as especially valuable).

But the most important role belongs, of course, to those disciplines of the psychological, phenomenological and humanitarian plane that describe consciousness – its meaningful dynamic forms, axiological and active-volitional structures. Without a detailed description of these, it is impossible to conduct neuroscientific study and explain work of consciousness. Here, numerous theoretical and methodological questions arise, and from the solution of which effectiveness of all this scientific work depends on their solution.

On the one hand, it is necessary to correctly correlate the approaches, facts, and results of the above set of disciplines that are closely linked with neurophysiology. But, on the other hand, it is necessary *to solve a more difficult theoretical problem concerning the nature of the connection between phenomena of consciousness and brain processes.* The problem is that the phenomena of consciousness are described in terms of content, meaning, purpose, faith, will, whereas brain processes are discussed in terms of the neural substrate, mass, energy, and spatial characteristics. These are two different languages of description, and there are no direct logical

connections between them. In analytical philosophy, they say there is a *"failure in explanation."* In order to relate these two types of descriptions, it is necessary to construct a "conceptual bridge," i.e., *to find or create such a theoretical system that would be logically relevant to each of the two different ways of describing and could link them in a single theoretical explanation.*

But in order to overcome the "failure in explanation," it is necessary to solve not only this *epistemological* problem, but also the main *ontological* problem of connection between phenomena of subjective reality (to which physical properties cannot be attributed) and brain processes (which necessarily possess such properties).

"Through what" and "how", in this case, can a property of subjective reality be associated with brain processes, through which, as we are believe, it is generated? This question has always been a stumbling block for disciplines of nature sciences.

Meanwhile, subjective reality is a necessary and unique property of consciousness, and without it, there is no consciousness. Neuroscientific research and explanation of this property is the essence of what many philosophers call the ***"hard problem of consciousness***."

For over 50 years, this problem has been in the focus of analytical philosophy. Despite the huge amount of publications over this period (over a thousand books and about twenty thousand articles), an acceptable result has never been achieved. This was stated more than once by Western and Russian philosophers and neuroscientists (see more in my article [Dubrovsky 2015, 66-154]). The concepts proposed were commonly *reductionistic in their nature*, which led to the loss of the specificity of subjective reality.

Basically, in order to solve this problem, it is necessary to give a theoretically correct answer to this single question, *how ar phenomena of subjective reality, or mental phenomena, related to brain processes?* This will further explain mental causality, impulsive action, the phenomenon of free will, and a number of other hard problems.

To solve this problem, I have for many years developed an informational approach, based on the ideas of evolution and self-organization. The main points of the theory developed were expounded in my Ph.D. dissertation (1968), which was later published as a book [Dubrovsky 1971].

The theory I proposed is fundamentally different from the existing concepts of analytical philosophy. It relies on three initial assumptions, from which answers to the main questions of this problem logically follow. The first two assumptions are generally accepted as scientific principles. The third is an intuitively acceptable convention, well confirmed by ordinary and scientific experience. Further, I formulate these assumptions.

1. Information will be implementation in a physical, or material, medium.

2. Information is invariant with respect to the physical properties of its medium, i.e. the same information can be implemented and transmitted through different media, in terms of their physical properties, i. e. it can be coded in different ways.

3. The phenomenon of subjective reality (for example, my visual image of a given object, experienced over a given *A* interval) can be regarded as information (about this subject).

Note that information in biological and social systems does not only enable syntactic description, but also semantic (meaning) and pragmatic (target, value, "effective," program management), which meets the typical requirements for describing phenomena of subjective reality.

Since this phenomenon of subjective reality (*A*) is information about a given subject, it has its own specific medium (we will designate it as *X*), which according to neuroscience is a certain neurodynamic system of the brain.

Thus, *the phenomenon of subjective reality is necessarily associated with the corresponding brain process as information together with its medium.*

Although the *X* system necessarily consists of physical components, its functional specificity cannot be explained through its physical properties and regularities (by virtue of the principle of isofunctional systems and the generally accepted view that a description of functional relations is logically independent from the description of physical relations).

Analysis shows that the relationship between *A* and *X* is not causal. This is a *special kind of functional connection*: *A* and *X* phenomena are both *simultaneous* and *monocausal*, and relate to each other as *one-to-one correspondence*; *X* is the code representation of *A* (or, briefly, *A* code). This kind of connection can be called a *code dependence*. This connection is formed in the phylogenesis or ontogenesis of the self-organizing system and is its functional element.

A thorough investigation of the *A-X* connection , the structural and functional organization of type *X* systems means *deciphering of the brain code of this subjective reality phenomenon*. This is a special cognitive task, which involves the hermeneutic aspect, the phenomenon of understanding of information embodied in one or another medium.

Based on these provisions, it is possible to carry out a theoretical and methodological analysis of the decoding procedure, information encoding and decoding processes, methods of discretization and quantification of a subjective reality continuum, formation of personal and interpersonal invariants of selected phenomena of subjective reality as objects of neuroscience research, typology of codes, code structures of conscious and unconscious processes, connection and difference between a detected neurodynamic correlate of a dedicated mental phenomenon and its actual code organization; we propose and discuss the hypothesis about the causes of the evolving quality of subjective reality (these issues are described in detail in my book: [Dubrovsky 2015, 3–65]).

I want to emphasize that modern neuroscience has achieved significant results in deciphering the brain codes of a number of

phenomena of subjective reality. This, for example, the works of Miyavaki, Nishimoto, Gallant, and others, when removing signals from the brain resulted in reproduction of a visual image as observed by a person, on a computer screen [Miyawaki 2008; Nishimoto 2011]. I have referred to this line of research as *neuroscryptology*; now the term "brain reading has become more common."

The task of philosophers and other scientists is to thoroughly comprehend the most important problem of our time: changing the negative properties of consciousness.

Our conscious activity is basically represented by two abilities:

1) the ability to have *information "in its pure form."* This means that in phenomena of subjective reality we experience we receive information itself – its neurodynamic medium is always hidden from us, or eliminated: I experience a visual image of a given object, but I do not know anything, I do not feel what happens in my brain;

2) the ability *to purposefully process this "pure" information* in a fairly wide range: to modify our perceptions and images, to manage thoughts, etc., and, moreover, to manage our body's behaviour. This is manifested as *mental causality*, which is a specific type of information causality. Its difference from physical causality lies in the fact that the consequence it causes does not depend on the physical properties of the information medium, but on the value of information, based on the code dependence that has developed in the self-organizing system.

But the most important thing is that because of the simultaneity, monocausality and one-to-one correspondence of given information and its medium, *purposeful control of "pure" information means purposeful control of its neurodynamic medium*, i.e. each of us has the ability to manage a particular class of his brain's neurodynamic systems, and at the same time, the energy supply of these operations.

This determines the ability to arbitrarily control not only bodily movements, but also certain vegetative processes (the way Yogis do

it), and moreover, the ability to implement changes at the genetic level, as recent studies show (K.V. Anokhin and other researchers).

All these indicate extremely large, still insufficiently used resources of psychic self-regulation and self-organization. From this perspective, there exist possibilities of deeper investigation of the phenomena of "tension of thought," "tension of will," intensification of creative processes and meditative practices, creation of new effective ways of self-regulation, functional as well as moral.

And this is directly related to the tasks of ethical self-improvement which are set in the writings of the Dalai Lama, where he discusses ***"cultivation of compassion and kindness of the soul, eradication of the spirit of "unbridled greed and aggressiveness"*** [Dalai Lama 2002, 290 , 298, etc.].

The problem of neutralization, and in the long run, overcoming these negative properties of consciousness, involves extensive ***use of the rich phenomenological and meditative experience of Buddhism.*** Of course, productive concepts of Western psychology are also important for this purpose. However, greater expectations are related to the development of neuroscience, which will gradually clarify certain brain functional structures responsible for altruistic and selfish intentions and ensure better understanding of the phenomenon of aggression. Studies in this direction are very diverse. I want to cite as an example, research in the field of mirror systems which I have already mentioned. This research reveals the brain mechanisms of comprehending emotions of another person, manifestations of sympathy and compassion.

G. Rizzolatti and C. Sinigaglia write that "the ability of the brain to reflect the perception of people's facial expressions and gestures and instantly encode them in terms of visceromotor reactions provides a brain substrate for empathy and compassion that regulates and guides our behavior and relationships at various levels and in various relationships" [Rizzolatti, Sinigaglia 2012, 163]. Of course, research

in this area and development of means for changing consciousness should be carried out under strict social and humanitarian control.

Recently, neuroscience has acquired much more effective methods of visualization and mapping of brain processes (as compared to FMRI, PET, and EMG). Among them are methods of optochemistry and optogenetics, neuroradiology, i.e. methods that allow deeper non-invasive penetration into brain structures, through the bones of the skull, using the light transfer through solid bodies, etc. This opens a new stage in the development of neuroscience and allows us to optimistically estimate the possibility of directional change of those extremely persistent dispositional structures of consciousness that define such negative qualities as unbridled consumerism, aggressiveness and extreme egotism.

We can assume that this is the main problem of consciousness in our era. The future of the earth's civilization will depend on its effective solution.

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