

In the process of evolution of the Universe, physical systems (whose existence is fully explained by physical laws) are transformed into biological ones (which, unlike physical systems, self-government based on genetic information is inherent), biological systems are transformed into mental (which, in contrast to biological systems that do not have a psyche, are inherent in the internally experienced content of subjective-phenomenal experience), and mental systems are transformed into social ones (which, unlike mental systems that are not united into social groups, have a common shared symbolic reality). Accordingly, one can speak of four types of information - physical, biological, mental and social.

In terms of building a universal ontology of the world in compliance with the materialistic principle, difficulties arise in the transition, firstly, from physical to biological being, secondly, from biological to mental being, and, thirdly, from mental to social being. We will call the first difficulty semantic, the second phenomenal, and the third intersubjective.

If we stand on materialistic positions and believe that physical matter is primary, i.e. During the Big Bang, there were only physical particles and fields interacting according to physical laws, we must explain how, firstly, living organisms could arise from non-living systems (how it becomes possible that material systems generate information texts in the form of DNA molecules and RNA), secondly, from insensible organisms, psychic subjects (how does it become possible that material systems generate a phenomenal composition of the psyche experienced from within), and, thirdly, from psychic subjects, social groups that produce symbolic spaces of culture, religion, art and science (how it becomes possible that material systems generate a common shared reality and fill it with a single semantic content).

The semantic difficulty is due to the fact that biological being arises from the physical as a result of the formation of an information code, through which the physical being within itself encodes its own substratum and functional structure. Biological (living) beings differ from physical (non-living) systems by the genetic information contained within them, which is a kind of assembly instruction that allows a living organism to reproduce its individual structural elements and itself as a whole. Therefore, the problem of the emergence of life, first of all, is determined by the problem of the formation of an informational text, which cannot be identified with an ordered physical structure.

On this occasion, Candidate of Technical Sciences E.A. Sedov and Doctor of Biological Sciences D.A. Kuznetsov, who prove the truth of creationism through the presence in the surrounding world of information, understood as a phenomenal content that is not reduced to the physical level of being, notice that “a linguistic symbol or a sequence of letters only carry the meaning and information that the source of information endowed the letters with . the rules of the language convention ... Exogenous information is introduced into the symbol only through the language convention.

If initially semantic information (i.e. information that is content-filled information data, and not just a measure of the orderliness of physical structures) does not exist, and then it appears as a result of the complication of the material world, then this can only happen due to non-physical reasons, for physical causes are capable of reducing entropy, but are incapable of producing texts, i.e. create ordered systems that have a semantic (non-physical) phenomenology, which is contrary to the materialistic principle.

Within the framework of the quantum-informational model of consciousness, information, being a correlate of physical processes, in itself has significance, but not effectiveness, because the physical system always operates, manifesting the forces of the physical order.

Therefore, at the physical level of being, an information text written in a DNA molecule is an ordered sequence of physical objects, which, according to a certain algorithm (which has nothing supernatural in its ontological basis and is completely determined by the laws of physical and chemical being), is translated into another ordered sequence of physical objects ( i.e. the sequence of nucleotides is translated into a sequence of amino acids) through additional physical structures (involved in intracellular protein synthesis) and is realized in the form of physicochemical processes (due to which the amino acids assembled into proteins perform specific functions within a living organism, and, as consequently, a living organism interacts with other living organisms and the physical environment as a whole).

However, such an understanding of the phenomenal aspect of information reduces it to code dependencies that are realized in the process of functioning of a complex physical system. Since the behavior of a physical system, by virtue of the principle of the epistemological completeness of physics, obeys physical laws and does not need any non-physical (superphysical) entities for its explanation and prediction (otherwise, miracles inexplicable from a physical point of view would be observed at the physical level of being) , then information in its phenomenal aspect turns out to be not an ontological phenomenon that exists independently of the perception and thinking of a person, but a subjective way of description.

Then it turns out that the informational text written in the DNA molecule is in fact not a text, since it does not contain any semantic component and is completely reduced to a syntactic sequence of signs (which, at the physical and chemical level of being, are nucleotides), and we call it is such only because it gives us a convenient and compact representation of a large number of physicochemical processes occurring in a living cell.

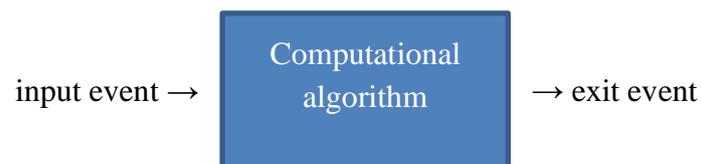
of phenomena of internally experienced subjective experience that are not reducible to processes of the physical order , which in their phenomenal content also turn out to be only a convenient and compact way of describing a large set of physicochemical processes, flowing in the neural networks of the brain (provided that, adhering to the informational approach, we identify consciousness with a highly organized form of information being).

To cope with this difficulty, first of all, we will understand what kind of information is inherent in the physical level of the existence of matter. According to the energy information principle, any physical object contains information about its physical parameters, such as mass, charge, energy, momentum. For a transcendent observer, the parameters of a physical object are in a superposition of possible values, which is not epistemological, but ontological.

For an immanent observer, one of the ontological possibilities is realized, and at the level of his interaction with a physical object, the latter passes from a quantum state to a classical one. Proceeding from this, we will call the information that exists at the physical level of being and supplements energy to a single material whole, operational, since it is determined by operations (algorithms) implemented in the interaction of different physical objects.

If a material system regularly repeats some action, finding itself in certain conditions, then such an action is a computational algorithm and it corresponds to information data that defines a causal relationship between a “stimulus” and a “reaction” or between an event that occurs “at the input” and another event that occurs "on the way out".

Information processes of the operational type accompany physical processes that implement the translation of one symbolic series “at the input” into another symbolic series “at the output”. For example, the interaction of a proton and a mu-meson can be represented as an information process, within which “at the input” we have two symbols in the form of a proton  $p^+$  and muon  $\mu^-$  “at the exit” - respectively, two symbols in the form of a neutron  $n$  and a muon neutrino  $\nu_\mu$  :  
 $p^+ + \mu^- \rightarrow n + \nu_\mu$



The structure of the behavior of a physical system,  
 based on operational information

The correspondence between the "input" and "output", realized on the physical material, determines information of the operational type, the knowledge of which makes it possible to predict the behavior of the material system under given initial conditions. Moreover, such a prediction has a classical character if we are dealing with classical systems, and a non-classical character if we are dealing with quantum systems. In the first case, longitudinal (physical) causality dominates, in the second case, transverse (informational) causality becomes essential.

As physical systems become more complex, the information component of being becomes more complex, as a result of which operational information is transformed into functional information, determined not only by the algorithm for transferring a physical system from one state to another, but also by data on a special exemplary state, which serves as a guide for a complex of computational operations.

The formation of an exemplary state is determined by transverse causality, when in a complex physical system a large set of operational data that are inherent in individual elements produces new information data of an emergent type that characterizes the entire physical system as a whole, but not its individual elements.

Thus, the formation of emergent properties occurs not only at the physical level of the existence of matter, but also at the informational one. The appearance of emergent information qualities marks the transition of information from the operational level to the functional one, which has a teleological (target) component of being in the form of a special exemplary state.

The emergent character of information qualities corresponds to the intentional aspect of information, since it represents the unity of a set of information data of an operational type. We will call the intentional aspect of functional information the primary meaning or the primary semantic component of information data. Therefore, at the level of functional information, information texts appear that differ from simple physical structures with reduced entropy by the

presence of a primary meaning or a primary semantic component that is not inherent in information of an operational type.

It should be emphasized that the primary meaning exists outside of human thinking (for example, in the information text of DNA) and is an emergent unity of a set of information data that correlates with elements of a complex (ordered) physical system. The semantic intention of informational texts or individual sentences (i.e., material structures whose endophenomenal existence forms emergent wholes) is “directed” to an exemplary state that controls the behavior of the considered material structure in its interaction with other material structures.

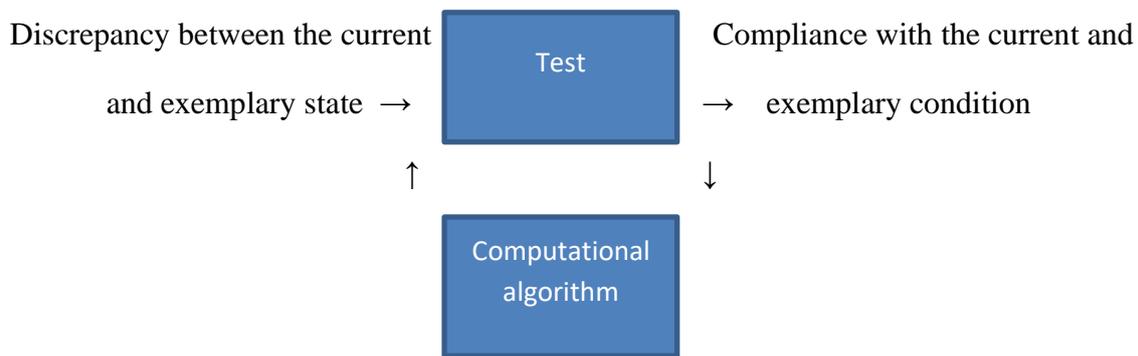
Using the terminology of R. Penrose, we can say that operational-type information processes have a top-down organization, which is “built in accordance with some transparent and well-structured fixed computational procedure”, while functional-type information processes have an upward organization, which is characterized by the fact that “clear rules for performing actions and the amount of data are not predetermined, but instead there is some procedure that determines how the system should “learn” and increase its efficiency in accordance with the accumulated “experience”.

Thus, the bottom-up organization of algorithms that regulate the behavior of a physical system suggests that after performing a series of operations, the physical system evaluates the effectiveness of actions by comparing the current state with the exemplary one, as a result of which the behavioral patterns are corrected, aimed at achieving the exemplary state.

American neobehaviorists Y. Galanter, D. Miller and K. Pribram in their joint article “Plans and Structure of Behavior” proposed a universal model TOTE (Test – Operate – Test – Exit), which structures the behavior of any physical system at the functional level of information existence.

First, the physical system performs testing, as a result of which the current state is compared with the exemplary (desired) one. If differences are found, then, according to a given algorithm, an operation is performed aimed at eliminating them. Then testing is performed again, and if the differences do not disappear, then the operation is again performed to eliminate the differences. Such cycles, consisting of a primary test, an operation, and a secondary test, continue until the current state of the physical system is equalized with the exemplary (desired) one.

After reaching the goal, a stop occurs or a new goal is set in the form of an exemplary (desired) state. As a result of performing a number of unsuccessful operations that do not eliminate the difference between the actual and exemplary state, the physical system can use a different computational algorithm, the effectiveness of which is also tested by the number of operations required to achieve a match between the actual and exemplary state. Any purposeful action has a universal TOTE structure, whether it is the desire to catch prey, salt soup, hammer a nail, solve a mathematical problem, or become happy.



The structure of the behavior of a physical system,  
 which is based on functional information

At the level of operational information, a physical system contains information data only about its current state (about what kind of mass, charge, temperature, entropy, etc.). In the manifested (quasi-classical or classical) mode of being, these data concern one single realized state, while in the unmanifested (quantum) mode of being they concern the set of possible unrealized states.

In the process of increasing the complexity of a physical system, new emergent data appear, which in manifested (quasi-classical or classical) mode of being represent is information about a special exemplary state that regulates the quality potentially existing target behavior of a physical system. In other words, the physical system as an emergent whole contains information data that is not inherent in individual elements and expresses the most probable state in accordance with transverse (informational) causality.

If as a result of decoration and transition from the unmanifested (quantum) mode of being into a manifested (quasi-classical or classical) mode of being at the operational level of information, information data remains only about the current (realized) state of the physical system, then at the functional level of information there is also information about the leading (non-realized) state of the physical system, which serves as a model for comparison with the current state and the guiding goal in the organization interaction with the surrounding energy-information environment.

Information data about the leading (exemplary) state, which are of an emergent nature and are formed as a result of the action of transverse causality in complex (and therefore carrying a large amount of operational information) physical systems, are information texts (primary meanings) that encode information no longer simply about what exists in the present, but about what may exist in the potential future as the most probable outcome of events within the framework of transverse causality associated with the informational existence of the considered physical system.

The most probable future may not be realized, provided that this will be prevented by some external or internal circumstances due to longitudinal causality, but within the framework of transverse causality, the vector of information action is directed towards the leading (exemplary) state.

The set of codes that define operational data is subject to a physical pattern that establishes the relationship between the sequence of codes “at the input” and the sequence of codes “at the

output”, while at the level of functional data a metacode (primary meaning) is formed, which is, firstly, the unity sets of information codes and, secondly, the unity of the set of energy processes.

At the same time, information metacodes (primary meanings) encode the behavior of the physical system as a whole, which, nevertheless, can be reduced at the physical level of being to the behavior of individual elements due to the action of transverse information causality. By virtue of the principle of supervenience, information data of the emergent type remain self-identical when the subsystems that form the physical system with which the considered information correlates are physically changed.

It can be said that metacodes (primary meanings) are an emergent organization of a set of information codes, and a set of metacodes (primary meanings) forms an informational text that specifies the behavior of a physical system as a whole.

At the operational level, the physical structure as a code encodes information about the parameters of this physical structure itself, while at the functional level, the physical structure as a metacode encodes information about the parameters of another physical structure, which allows us to speak about the primary semantic component of information data (for example, a nucleotide sequence in the DNA molecule codes for the sequence of amino acids in the hemoglobin molecule).

At the same time, the physical system as a whole, of which the structure acting as a functional metacode is a part, is focused on the leading state, the energy implementation of which is the process of reading the functional information packed in this structure (for example, a living cell reads the information recorded in the DNA molecule, and implements it in the form of physicochemical processes that synthesize protein).

Thus, the semantic difficulty is resolved, and we can assert that at a certain level of the energy-information organization of material systems, operational information is transformed into functional information due to the action of transverse (informational) causality, which increases the probability of any one exemplary state from the entire superposed set of possible states and saves informational data about this exemplary state even when the physical system passes from the unmanifested (quantum) mode of being to the manifested (quasi-classical or classical).

Information data that packs information about the leading (exemplary) state is informational text, since it indicates something that does not exist in reality, i.e. to what exists as an ideal meaning that affects the behavior of the system in real life. Therefore, the emergence of informational texts, and, therefore, of living organisms, which differ from non-living systems by the presence of an “instruction” that directs their behavior in accordance with informational (ideal-semantic) patterns, is not random, but natural, due to the transverse (informational) causation.

As a result, it is possible to solve the problem associated with the fact that the probability of a random occurrence of a living cell from a chemical "broth" that existed on Earth three and a half billion years ago is extremely small. On this occasion, the British astronomer and cosmologist F. Hoyle writes: “The probability of the emergence of higher forms of life in an evolutionary way can be compared with the probability of such an event: a tornado sweeps over a landfill, throwing all the contents into the air, and as a result of random coupling of materials, a Boeing 747 is formed” .

Life on Earth arose not by chance, but naturally as a result of the action of transverse causality in complex material systems that, at the informational level of being, produce emergent information containing data on an ideal exemplary state and not reducible to information that can be extracted from individual elements. .

The phenomenal difficulty is due to the fact that biological systems, controlled by functional information, generate subjectively experienced content of the psyche. Within the framework of the philosophy of consciousness, the following question can be posed: how can a code relationship between physical structures, determined by physical laws, give rise to mental (non-physical) phenomena that have a unique ontology and are not essentially reducible to coding structures?

If we do not violate the completeness of physical science and do not encroach on the principle of the causal closure of the physical world, then we lose the phenomenal content of the psyche and thus stop at the positions of eliminativism, which contradicts the phenomenological premise of the study.

If we believe that code dependencies are not reduced to the interaction of physical elements, then, remaining within the framework of a materialistic worldview, we are faced with the need to recognize that the relationship between physical events and the mental events accompanying them is either determined by psychophysical laws or has a random historical character. .

In the first version, which is followed by D. Chalmers, who openly admits in his article "Consciousness and Its Place in Nature" "the existence of fundamental psychophysical laws that connect physical and phenomenal properties", we lose the completeness of physics if we assume the effectiveness of mental information in human behavior, for then events appear on the physical level of being that cannot be explained on the basis of physical laws alone.

The second option is followed by D.I. Dubrovsky, who emphasizes that the relationship between physical and mental events "can be called a code dependence, since it is formed in the phylogenesis and ontogenesis of a self-organizing system (it has the character of a historical neoplasm and in this sense is random, i.e. this information has acquired in this self-organizing system precisely such a code embodiment, but in principle it could have had another; however, having arisen in this form, it becomes a functional element of the self-organization process)".

Within the framework of this approach, it is difficult to explain why the phenomenal content of mental experiences arises at all, if there are no laws that would explain its occurrence, since the code dependencies that are characteristic of the functional level of information and ensure the self-government of physical systems do not need any phenomenal content of mental experience. type and can be realized in unconscious states.

The study of the human brain in its physical existence makes it possible to detect neural (neurophysiological, biochemical and bioelectrical) codes of mental experiences, but their phenomenal content itself is not detected by any objective scientific methods.

Since the phenomenal content of mental experience obviously exists (for no one will doubt that he has a visual experience when he looks at something, an auditory experience when he hears something, and a tactile experience when he touches something , regardless of the fact that,

perhaps, in this case, the visible, audible and tactilely felt are not present in reality), then it must be recognized that the mental being is not identical to the physical being and has a unique ontology that cannot be a priori (deductively) derived from the ontology of the physical existence, even on the condition that someday we will know absolutely all the laws that govern the physical being of the surrounding world.

It follows from this that mental information, unlike operational and functional information, is not reduced to causal relations between physical objects, and, therefore, it cannot be represented as a sequence of computational procedures of a descending or ascending type.

A similar point of view is shared by R. Penrose, who proves that understanding, being an essential feature of consciousness, is an incomputable phenomenon. On this occasion, he writes: "My study is recognized to show that "understanding" is by no means limited to external manifestations, in connection with which I argue that it is impossible to build a reliable computer model even of external manifestations of understanding."

Arguing his point of view, R. Penrose refers to Gödel's theorem, according to which in any consistent formal system there is an irrefutable and irrefutable formula, as well as an irrefutable formula that asserts the consistency of the formal system itself. In other words, the coherence of a formal system is not provable by means of this formal system itself.

If the behavior of a certain set of objects obeys the principle of determinism, then it does not necessarily follow that such behavior lends itself to logical algorithmization. In particular, R. Penrose argues that "mathematical thinking (and, consequently, mental activity in general) cannot be fully described using a purely computer model of the mind."

Let's assume that the super-powerful computer of the future models the mathematical thinking of a person. Then he will not be able to formulate a statement that will be true, but will turn out to be unprovable (taking into account Gödel's theorem) within the framework of his own logic-computational abilities. However, such a statement is accessible to the human intellect, hence its superiority over artificial intellect.

In other words, as M.B. Mensky in his article "Secrets of Consciousness - from Quantum Mechanics", we come to the conclusion that there is "the ability of people (mathematicians) to solve such mathematical problems, the solution of which cannot be reduced to some algorithm and which, therefore, cannot be solved by computational device."

Since the mathematical abilities of a person are only a part of all his cognitive abilities, then no artificial intelligence, whose functioning lends itself to logic-computational formalization, will never be identical to human thinking.

Hence, R. Penrose concludes, any formal system, for example, a computer program, is unable to recognize (correlate with the constitutive center) all the statements that are formulated in it. Thus, mental information (which is already correlated with the constituting center) cannot be reduced to information of an operational or functional type, because the emergence of the phenomenal content of experiences is not explained by code dependencies between physical and informational events. However, the incomputability and non-algorithmizability of mental

phenomena is not a reason to deny their informational nature, if we recognize not only the physical, but also the phenomenal aspect of information.

Analyzing the qualitative content of consciousness, the Russian philosopher P.N. Baryshnikov in his article "The Phenomenal and Computable in the Structures of Consciousness" also comes to "a paradoxical thought about the possibility of an informational explanation of consciousness, but outside of computationalism, which assumes computability and algorithmizability."

An exemplary state that controls the behavior of a physical system is information about the most likely properties that a physical system may have in the future under favorable circumstances, but this exemplary state itself is not an internally experienced mental phenomenon, regarding which the question is relevant: what it is like to be in this exemplary state?

Operational and functional information is primary in the sense that it contains informational data about the physical states of the system, while mental information is secondary in the sense that it contains informational data about the informational data itself, i.e. is a meta-informational phenomenon. The phenomenal (non-intentional) content of psychic experience does not say anything about the external object, but only packs information about how (through which qualia) the intentionally posited being is represented.

The mental image is the otherness of the represented being, since it reproduces individual features and characteristics of the latter by means of the representing system. At the same time, the intentional characteristics of a mental act are determined by the represented entity, and the phenomenal characteristics are determined by the representing system.

A mental organism, unlike a biological system that does not have mental experience, is able to accumulate and process information data coming from outside, in the form of new information data. So way, as D.I. Dubrovsky, in the case of mental experience "the object information and its transformations are not just external phenomena and situations and not just internal changes in the body, but the very information about them as such (information about information).

Biological systems of a mental type, in contrast to biological systems of a non-mental type, no longer simply react to external stimuli, but create their representative models and operate with these models, organizing their own actions. The behavior of a psychic being is governed, in addition to instincts and reflexes, by processes of a representative nature, i.e. information processes associated with textual sequences of symbols that are generated as a result of its active life and are not completely reduced to the work of the genetic apparatus.

The mental level of being is characterized by a secondary semantic component, which differs from the primary one in that it intentionally points not to some physical state of the material system under consideration, but to its informational state, determined by information of an operational or functional type. Therefore, at the level of the psyche, secondary meanings are formed, the subject of which are primary meanings and which can exist in isolation from physical objectivity (intended within the framework of the primary semantic component of information data), which, in particular, is found in the form of dreams and hallucinations.

Operational information is information about the physical medium itself, from which one can indirectly infer the parameters of another physical medium. Moreover, these data refer to the

state of the physical carrier at the current time. For example, an electron in a hydrogen atom contains information about its physical characteristics, such as mass, charge, and spin. By the nature of the behavior of an electron, one can deductively infer the presence of another charge (proton), which makes it move in space in a certain way. However, the electron itself at the information level of being does not contain any information about the proton interacting with it.

Functional information, in contrast to operational information, contains not only data on the current state of its physical carrier, but also data on the potential state of the physical system as a whole, of which the considered physical carrier is a part. For example, the DNA of an acorn contains information about a whole mature oak tree. However, this information needs to be deciphered with the involvement of additional physical systems, without the participation of which the informative structure turns into a structure with reduced entropy and no longer carries the desired information.

An ordered, reduced-entropy physical structure does not by itself contain a way to decipher a representative code (the sequence of nucleotides in a DNA molecule does not, by itself, say anything certain about which amino acid sequence it codes for, just as the sequence of letters itself does not say anything certain about what kind of meaning it expresses).

Functional information exists only in the interaction of coding and reading structures (if you transfer a DNA molecule to a universe where there are no living cells, and, therefore, physical systems that provide transcription and translation processes that decipher the DNA molecule, then it will lose what is encoded in it information content, just as a printed text will lose the information content encoded in it if there is not a single person in the universe who can read it).

Thus, functional information, unlike operational information, contains data not only about the current state of the physical medium, but also about the leading (exemplary) state that controls the behavior of an integral system capable of decrypting information data. For example, individual sections of the DNA molecule in the human body contain information about the structure of the transferrin protein, eye color, or type of nervous system.

In other words, a physical system whose behavior is controlled by functional information (within the framework of transverse causality) contains data on the physical state into which it will pass in the future under favorable circumstances (i.e., provided that the external environment does not disrupt its programmed functioning ).

Operational and functional information is information about the states of a physical system, while mental information, in contrast, is information about information of an operational or functional type. By virtue of the energy-information principle, a material being contains energy (as the ability to perform physical action in physical space-time) and information (as data on the actual and possible states of the material being in question). If the information data themselves are encoded in the form of a meta-information code, then such secondary information is of a mental nature.

In other words, mental information is a representation of information data that reflects the physical state (potential or actual) of some material being. For example, the visual and tactile perception of an orange in the form of a corresponding visual and tactile experience is

mental information that contains data about the information that belongs to the orange orange in question and expresses some of its physical parameters (shape, reflectivity, weight, etc. ).

We perceive not the world itself as such in its own being, but its representative image, which depends in the intentional aspect on the represented being, and in the phenomenal aspect, on the representing system.

A representative image is mental information that contains encoded data (i.e., meta-information data presented in the form of a meta-information code) about the state of the represented entity. As D.I. Dubrovsky, subjective reality is information in a “pure” form, because in mental experience “we are given information about information and any information about its carrier is completely eliminated (any of us does not feel, does not display the brain carrier of the images, thoughts, etc. .P.)”.

However, the represented information itself does not yet explain the presence of the phenomenal content of subjective experience, because information can be represented not only at the human level, but also at the level of machine language, which, in particular, served as the basis for the objection that D. Chalmers expresses in a letter to D .AND. Dubrovsky, emphasizing that “the question remains open why information is not only represented, but also subjectively experienced”, and also “I would like to know under what conditions the represented information is accompanied by subjective experience and why”.

The physical structure, which encodes information not only about the actual and potential parameters of physical structures, but also about the information itself that correlates with their physical states, contains additional meta-information data that correlates with the information state of the physical carrier itself. It is these additional meta-informational data that make up the psychic sphere of being, which has the quality of being experienced from within.

Mental phenomena are experienced from the inside insofar as they are meta-information data that encode a set of information data that correlates with the physical state of the material system. Secondary meanings exist only within the framework of mental experience and do not exist outside of it, as is typical for primary meanings that are formed at the level of functional information.

Thus, psychic experiences arise as meta-informational states of physical systems, provided that the material being evolves to an information state in which it contains information data about the information data themselves, belonging to some material being.

Information about information arises as a result of the collapse of the superposition of information states, caused by the accumulation of a sufficient amount of functional information, just as the collapse of the superposition of physical states is caused by the accumulation of a sufficient amount of information of the operational type.

At a certain stage of evolutionary development, the information contained in physical systems reaches a level of functional complexity, which causes the collapse of the superposition of possible states of the informational order, just as in other situations, information built on physical systems reaches a level of operational complexity, which causes the collapse of the superposition. possible states of the energy order.

In this case, the energy collapse is accompanied by the collapse of information states, while the information collapse is not accompanied by the collapse of energy states, i.e. when a physical system passes from possible existence to actual existence, information about unrealized physical states is erased, but when information data passes from possible existence to actual existence, the physical system continues to exist in a superposition of states, thereby preserving information about unrealized states of the informational order.

Therefore, if a physical being cannot have both a quantum (unmanifested) and a classical (manifested) being, then a mental being, on the contrary, simultaneously has both a quantum (unmanifested) and a classical (manifested) being, i.e. is in a superposition of possible states at the unconscious level of the psyche and is realized as a single mental state at the conscious level of the psyche, which combines the conscious and the unconscious into a single mental whole.

This point of view is consistent with the theory of Hameroff-Penrose, according to which unconscious mental activity is rooted in quantum informational processes, suggesting the presence of a superposition of many potential states of the psyche. Events corresponding to objective reduction are components of the unconscious subjective (qualitatively filled) experience, and only when these components are combined into a coherently organized structure (orchestrated) does a conscious level of mental existence arise.

Mental phenomena are self-organizing processes on the verge of quantum and classical events that are realized in the neural microtubules of the brain.

At the same time, the spontaneous (independent of the external environment) nature of objective reduction, which contributes to the transition between quantum and classical levels, allows the internal mental activity of the representing system without direct contact with the represented object, which is determined by the conscious self-observation of the representing system over its own physical and informational states.

However, according to the quantum-information model developed here, only self-observation of the energy-information system over its own information states generates a mental level of being, while self-observation (in the sense of reflection, data representation) of the energy-information system over its own physical states does not go beyond operational and functional information.

In addition, the quantum information model of consciousness differs from the quantum theory of neurocomputing by the principle of topographic unity, which does not allow the existence of an unconscious sphere of mental existence in isolation from the conscious one (even if it is very weak, faded). Thus, Hameroff-Penrose's orchestrated objective reduction is incapable of generating psychic experience and still remains at the level of operational or functional information.

Additional (secondary) meta-information data depend not only on the configuration of physical elements, but also on their material composition, since different composition contains different operational information underlying the primary information data of the functional type.

Therefore, following the German philosopher and political figure F. Engels, one can say that life is “a form of existence of protein bodies, the essential point of which is the constant exchange of substances with the external nature surrounding them and which ceases along with the cessation

of this metabolism, leading to decomposition protein”, since it is proteins, unlike other chemical compounds, that provide the corresponding informational superstructure in their substrate composition, which ultimately generates the mental level of being.

Any mental experience is accompanied by a neural process with which it necessarily correlates, just as an electromagnetic field is excited by moving charges and cannot but be excited by them in any of the possible worlds where electric charges themselves exist (since, in essence, an electric charge is actually that which excites an electromagnetic field).

Thus, a functional isomorph assembled from inorganic material will not necessarily have consciousness, but if we construct an exact copy of a person from organic matter, then it, in turn, will give rise to a subjective-mental experience that has a mental content and exists in relation to the first person.

However, it is impossible to assemble an exact copy of a person in one single Universe, because it will have a different spatial localization and, consequently, different physical characteristics due to non-local connections and the unity of the entire material world as a whole.

If we construct an exact copy of the Universe, then inside it our material bodies will have exactly the same consciousness as ourselves, but this circumstance no longer contradicts the subjective uniqueness of each conscious being and the non-duplication of its self-consciousness, because due to the lack of interaction between parallel universes it is impossible to compare the subject and its material copy, and, consequently, they turn out to be ontologically identical, i.e. in fact the same material being.

However, these considerations do not apply to the Multiverse, which includes many universes, among which there are two identical and interacting universes, since in this case the latter will have different spatial localization and, therefore, different physical characteristics due to non-local connections and the unity of the entire Multiverse as a whole. .

Mental information, consisting of meta-information data, is a compilation of a set of information data, which are determined by the interaction, firstly, of a physical system with other physical systems, and, secondly, of individual subsystems of a physical system with each other.

In the first case, we are dealing with external perception, when, for example, a lot of information about an orange coming through the senses is compiled into a sensory image.

Consequently, phenomenal qualia are separate meta-informational compilations of a set of informational data of an operational and functional type, while the unity of these meta-informational compilations forms the intentional unity of the totality of mental experiences. In the second case, we are dealing with internal perception, when, for example, a lot of information about an orange is compiled into a sensory image without the presence of the orange itself, which does not currently affect the senses of the perceiving subject.

As a result, imaginary mental phenomena are formed, as well as the phenomena of dreams and hallucinations.

The intersubjective difficulty lies in how a common collective shared reality is formed in the interaction of many subjects and why the perception of an individual subject does not remain

only his personal subjective-private perception. At the social level of being, one subject distinguishes himself as an individual center of mental experience from other subjects and stands out informationally from the general field of perception.

Therefore, the social level of being presupposes self-consciousness, and self-consciousness, in turn, is formed only at the social level of being. Indeed, information about oneself can only be obtained by reflecting one's actions in something that itself has the ability to self-represent, because otherwise the cognizing subject cannot distinguish himself as a cognizing subject among other cognizing subjects. Self-consciousness (self-representation) is social in nature and arises only in the interaction of subjects representing the representation itself.

Meta-representation, i.e. the representation of the representation itself forms the basis of the theory of representation of a higher order, the representatives of which include D. Dennett, P. Carrater, D. Rosenthal, D. Edelman. According to this theory, consciousness is the result of the subject's ability to form judgments about his own mental life.

If a physical system is in the mode of possible existence (ie, it exists as a superposition of unmanifested states), then the information data corresponding to it are also in the mode of possible existence (ie, it exists as a superposition of unmanifested states). If the physical system is in the mode of actual existence (ie, it exists as a manifested energy state), then the corresponding information data is also in the mode of actual existence (ie, exists as manifested informational states).

At the level of biological being, the physical state of the material system under consideration does not change qualitatively and still corresponds to the laws of the physical order, but its information state, in contrast, undergoes qualitative transformations, as a result of which the superposition of information codes of the operational type is realized in the form of an information metacode, which is the primary meaning or primary semantic component of information.

At the level of mental being, which does not go beyond animal thinking, a phenomenal level of the psyche is formed, which is experienced in consciousness as a set of sensory qualia and represents information data about information of an operational or functional type.

At the same time, secondary information (secondary semantic component of mental experience) exists in the form of a superposition of information states belonging to the unconscious sphere of the psyche, while the conscious sphere of the psyche implements intentions corresponding to primary information (the primary semantic component of mental experience).

Therefore, the thinking of animals is of an unconscious nature, and their behavior is not the result of meaningful judgments, but of meaningless insights associated with spontaneous restructuring of the field of conscious perception.

And only at the level of social being is actually human thinking manifested, which is characterized by the formation of secondary meanings in the conscious sphere of the psyche. It follows from this that human thinking potentially exists in the mental activity of animals, but is not realized at the level of the conscious psyche, which in certain situations forces us to project human mental states onto animals.

Awareness of secondary meanings (a secondary semantic component of mental experience) forms a meta-symbolic level of representation of the surrounding world and allows us to create symbolic worlds of culture, art, religion and science, which cannot be realized at the animal level of thinking. Animals have knowledge in the form of secondary information, but their knowledge is of an unconscious nature, because animals do not know what exactly they know, i.e. they do not have understanding, while human knowledge has a conscious character, because we know what we know, and therefore we, unlike animals, understand understanding.

Meta-representation forms a special level of symbols that represent other symbols used to represent some part of the real world. As a result, at the social level of being, the highest mental ability of understanding is formed. Perception and thinking are separable from consciousness, since they can proceed not only on the conscious, but also on the unconscious level of the psyche, while understanding, in contrast, is inseparable from consciousness, because if we do not realize the meaning of the judgment, then there is no need to talk about understanding.

Unconscious feelings, emotions, dispositions, motives, desires, thoughts, attitudes affect the behavior of the subject, but the subject does not understand them, i.e. does not comprehend at the conscious (mental) level of being, since they remain immersed in the sphere of the unconscious psyche.

Understanding is a synthesis of consciousness and thinking, when the meaning of the utterance is not only subjected to intellectual processing (i.e., it is not only realized in the system of operational relations between representative symbols), but is also realized by the subject.

On this occasion, R. Penrose states that "consciousness must certainly be an essential component of understanding." However, consciousness as such does not necessarily imply understanding, because the subject can testify (be aware) of some phenomenal data, but not know what exactly he is aware of and that an act of awareness occurs in general.

At this point, there is already a discrepancy with the opinion of R. Penrose, who believes that consciousness is inseparable from understanding. Non-conceptual consciousness is characteristic of a certain kind of meditative experience (when the internal dialogue stops and the surrounding situation is perceived without analysis, assessments and generalizations), as well as the mental experiences of an infant who sees colors as a phenomenal fullness of the visual field of perception, but does not yet know either that he sees colors, not exactly what colors he sees, nor that he has visual perception at all.

The baby feels pain or pleasure, but does not understand what he feels and what he feels, and not someone else.

The conscious being of a person is determined by the ability to witness the phenomena of internal subjective experience, i.e. fix their mental presence (however, it is not at all necessary to be aware of the essence of what is present). Conscious witnessing is a necessary condition for meaningful understanding, because a person who is in an unconscious state, just like a robot, can distinguish between surrounding objects, speak sentences that make sense for a native speaker, and demonstrate various emotions at the level of behavior, but at the same time mental life will not have an internal phenomenology.

His brain will process visual information, but he himself will not see subjective images; his center of speech will generate phrases in which an outside listener with consciousness can detect semantic content, but he himself will not understand the meaning of what was said; his body will demonstrate emotional states at the behavioral level of being, but he himself will not feel the corresponding emotions.

Proceeding from these arguments, it is necessary to logically separate the non-understanding and understanding consciousness. Non-understanding consciousness is witnessing of phenomenal qualia without conscious intentional objectivity (ie, conscious secondary meaning) holding them together into a single mental whole. Such consciousness is characteristic of animals and infants, who distinguish between individual objects, but do not understand what exactly they see, as well as adults who first encountered something like that, for which they do not have the appropriate words and concepts.

Understanding consciousness implies awareness of the secondary meaning, which is packaged in a system of representative symbols that intentionally point to the object being comprehended.

Similarly, the American biologist, Nobel Prize winner in physiology and medicine D. Edelman divides consciousness into primary and high-level: "Primary consciousness is the state of having mental awareness of things in the world, the presence of mental images in the present. But for a person it is not accompanied by any correlation with personal meanings associated with the past or future. This is what some animals can be supposed to have, not using special linguistic means and special means for conveying meanings ...

In contrast, high-level consciousness...involves the recognition by the thinking subject of one's own actions or preferences...It is expressed in direct awareness—non-inferential or direct awareness of mental episodes without the involvement of sense organs or receptors. This is what we humans have in addition to the primary consciousness. We are conscious that we are conscious."

Only humans operate with secondary meanings, while animals and cybernetic devices operate not with secondary meanings, but with information that is devoid of a secondary semantic component that cannot be reduced to a set of representing symbols. The robot does not see images, but compares signals coming from outside, which allows it to distinguish things; animals see images and react to them in accordance with unconditioned and conditioned reflexes, but do not understand what exactly they see; while a person at the level of understanding consciousness sees images and understands what exactly he sees.

Self-consciousness, language (in its human form) and abstract-conceptual thinking (meta-symbolic level of representation in its intentional aspect) arise only at the social level of being in the interaction of many mental subjects. Higher forms of consciousness cannot manifest themselves outside social interaction. On this occasion, the Chilean philosophers, specialists in neuroscience U. Maturana and F. Varela write: "The mind as a kind of paganization phenomenon in the network of social and linguistic conjugation is not something that is in the brain. Consciousness and reason lie in the area of social conjugation - it is there that the source of their dynamics.

Numerous facts related to the discovery of "Mowgli", who lived far from civilization for a long time, indicate that the social environment is a necessary condition for the development of language and language understanding consciousness. However, the absence of the latter does not mean at all that a child who has grown up outside of society lives in the darkness of unconsciousness, for he continues to function at the level of non-understanding (animal) consciousness, being aware of his mental experiences, for example, pain, sounds, smells and visual images of the outside world.

Thus, the understanding consciousness of a person is a phenomenon of a social order, while animals exist at the level of a non-understanding consciousness, although it is natural for us to project on them (as well as on human babies) reactions of a higher conscious level, which they really do not inherent (for example, it seems to us that our pets love, hate, hold a grudge, feel shame like we do, and sometimes even understand the meaning of human speech).

Animals are instinctive-reflex creatures, and therefore their behavior, for the most part, is unconscious, automatic. However, this state of affairs does not in the least exclude the presence in animals of the psyche in the mode of non-understanding consciousness, and, therefore, mental experience, which is a conscious fixation of unconsciously produced experiences that proceed uncontrollably and automatically.

The presence of mental experience in animals is evidenced, in particular, by experiments on dogs and cats, in which the areas of the brain responsible for sleep paralysis were turned off, after which they demonstrated behavioral reactions corresponding to the virtual picture of a dream.

Summarizing the above, we come to the conclusion that non-understanding consciousness can be understood in two main senses: 1) as associative knowledge, i.e. a set of mental experiences that are not correlated at the conscious level of being with an intentionally posited object, and 2) as dissociative knowledge, i.e. a set of mental experiences correlated at the conscious level of being with an intentionally posited object that is not identified in the form of a symbolic construction (i.e., in the form of a meaningful concept).

Understanding consciousness can also be understood in two main senses: 1) as dissociative understanding, i.e. a set of mental experiences correlated at the conscious level of being with an intentionally posited object, which is identified as a symbolic construction (i.e., as a meaningful concept), and 2) as an associative understanding, i.e. a set of mental experiences correlated at the conscious level of being with an intentionally posited subject, which is also identified in the form of a symbolic construction (i.e., in the form of a meaningful concept).

Consciousness as associative knowledge is a fixation of the phenomenal content, which is built on top of the processes of a neural nature, but is not reduced to them in essence. Such consciousness makes meaningful the question related to what it is like to experience certain sensory data, but it has a non-intentional (non-objective) character, because it does not allow us to say anything definite in relation to 1) the subject of experience (which is represented by a set of phenomenal qualia given in experience) and 2) the subject of experience (who experiences the totality of phenomenal qualia given in experience).

Here there is still no division into inner and outer being, i.e. on I and not-I. Associative knowledge includes elementary sensations (for example, experiences of pain, sound, color, smell

or taste), which do not contain any indication of the represented object, as well as elementary emotions as complexes of elementary sensations (for example, experiences of fear, anger or joy). ), which express a mental reaction to a certain set of circumstances without comprehending the latter on the part of the experiencing subject.

Consciousness as dissociative knowledge is a fixation of a multitude of qualitative phenomena (qualia) in the objective unity of the temporal flow tied to the experiencing subject. In the act of dissociative cognition, a set of phenomenal qualities correlates with an intentionally posited object, which is identified only insofar as its representation is accompanied by certain sensory experiences without any semantic (symbolic) component.

Here already there is a division into external and internal being, i.e. on I and not-I, in their ontological unity, i.e. in the temporal unity of the conscious subject. Dissociative knowledge includes sensory images, through which the external state of the represented object or the internal state of the representing system is expressed.

Consciousness in the modes of dissociative and associative knowledge is inherent in animals, but not in cybernetic systems, since the latter, when dealing with the functional level of information, perform logical and computational actions, but are not in intentional or qualitative states that are characteristic of the mental level of information data.

Consciousness as a dissociative understanding reveals the meaning of the totality of experienced qualities that form a single ontological whole. In such consciousness there is knowledge about the object, which is opposed to the conscious subject and intentionally posited not just as an informational unity of the diversity of experienced data, but as a referent of an intellectual (symbolic) construction.

If associative and dissociative knowledge has a degenerate longitudinal and transverse intention, then dissociative understanding has a non-degenerate longitudinal and transverse intention, since it fixes in the concept information about some represented object or about the representing subject itself.

Within the framework of dissociative understanding, a symbolic (abstract-conceptual) representation of the real world is formed, as well as non-existent (imaginary) worlds, i.e. there is a division into actual and potential being.

This level of consciousness is no longer available to animals, because they represent the world around them, but they do not represent the possible ways of representation and do not distinguish the possible from the actual. Consciousness as a dissociative understanding depends on the exchange of information data between interacting subjects and cannot develop in conditions of social isolation.

At the level of associative understanding, the conscious subject transcends his own ontological boundaries, forming an idea not only of who he is in essence, but also of who he should be and what the ideal of conscious being is. Here the conscious subject chooses himself in a multitude of symbolic spaces (culture, art, religion and science) generated at the level of dissociative understanding, and transforms his being in accordance with psychically assimilated ideas and values.

The self-determination of a conscious subject has an existential character, since in the process of conscious self-determination, the forms of representation are identified with the forms of being of a conscious subject, who, at the level of associative understanding, feels dissatisfaction with himself and seeks to transform himself in order to become better and more perfect, which is in no way inherent in animals, for they do not experience conscious dissatisfaction with their own being and do not understand the spiritual ideal to which one should strive.

It is possible to draw reasonable parallels between this hierarchical classification of ontogenetic stages in the development of consciousness and the classification of the Soviet psychologist and philosopher A.N. Leontiev, according to which the first stage involves the development of a sensory psyche, which provides knowledge about the properties of things in direct sensory experience through elementary sensations (which corresponds to the level of associative knowledge), the second stage involves the development of a perceptual psyche, which is responsible for the processes of perception (which corresponds to the level of dissociative knowledge), the third stage involves the development of intelligence responsible for such mental operations as analysis and synthesis, abstraction and concretization, classification and systematization, generalization and comparison (which corresponds to the level of dissociative understanding), and, finally, the fourth stage involves the development of self-consciousness, which provides the subject with comprehension oneself and one's place in the surrounding world (which corresponds to the level of associative understanding).

Thus, there are four main stages of ontogenetic (and, possibly, phylogenetic, if we assume that in this case, just as in the framework of biological evolution, ontogenesis repeats phylogenesis) development of consciousness. First, scattered phenomenal qualia appear as meta-informational formations built on top of information processes that occur in the neural networks of the brain. Here the mental subject does not yet distinguish between objects, but simply contemplates a kaleidoscope of sensory sensations that form a single phenomenal field of perception.

The unconscious psyche exists as a superposition of possible qualitative states. Further, the subject opposes himself to the external world, identifies individual objects and performs a number of operations with them in accordance with sensory images and information data obtained in the process of sign communication with other conscious subjects, but is not yet identified himself as a bearer of mental experiences.

The unconscious psyche exists as a superposition of possible behavioral reactions, each of which can be manifested at the mental level of being as a result of insight (spontaneous restructuring of the field of awareness). At the next stage of the ontogenetic development of consciousness, a holistic perception of the surrounding world is formed. The subject not only perceives objects as integral images, but endows them with names and attributes certain qualities to them.

In addition, semantic representations are detached from the represented objects and form a symbolic (virtual and intelligible) reality shared by many conscious subjects. The unconscious psyche exists as a superposition of possible semantic states (that is, possible meanings and intellectual constructs through which external and internal events are represented).

Finally, at the highest stage of the ontogenetic development of consciousness, a free and meaningful self-determination of a conscious subject takes place, which, feeling dissatisfied with itself, goes beyond its own ontological boundaries and forms an image of an ideal being. The

unconscious psyche exists as a superposition of possible existential states, each of which corresponds to certain values and attitudes of being of a conscious subject.