

(Chapter 2 in Nina Slanevskaya “Brain, Mind, and Social Factors”, St.Petersburg, Centre for Interdisciplinary Neuroscience, 2014, pp. 25-50)

Chapter 2

Contending Hypotheses on Mind and Brain in Neuroscience

“Because it seems to me certain that it will always be quite impossible to explain the mind on the basis of neuronal action within the brain, and because it seems to me that the mind develops and matures independently throughout an individual’s life as though it were a continuing element, and because a computer (which the brain is) must be programmed and operated by an agency capable of independent understanding I am forced to choose the proposition that our being is to be explained on the basis of two fundamental elements. This to my mind, offers the greatest likelihood of leading us to the final understanding toward which so many stalwart scientists strive” (Penfield, 1975: 80).

After many years of work and experiments the neurosurgeon Wilder Penfield changed his materialist position into a dualist one because he could not ignore the clear evidence against the materialist conception of brain and mind.

And, indeed, the knowledge accumulated by parapsychologists about human psychic abilities and the near-death experience contradicts mainstream materialist neuroscience.

Scientists are always on alert when someone wants to introduce a spiritual aspect into the study of brain and mind because they associate it with religion. However, a non-materialist neuroscientist, who studies paranormal phenomena and has dualist ontology on mind and brain, is not necessarily a religious person. You can use dualist ontology, but do not belong to any religious confession and even can be an atheist. On the contrary, you can believe in God, but use a materialist approach in your research. If you are a dualist, you believe in the existence of two separate substances in a human being: biological (material/physical) and mental. You can connect mental substance (mind) with Universal Spirituality, which exists around us, or with a God belonging to some religious confession, or with the Absolute, a non-personal substitute for the concept of God, making us follow the Universal Moral Laws, or with nothing at all. What is important for science is the separation of these two substances and the recognition of the organizing force of mind in brain work. The mind does not depend on the brain but it interacts with the brain. For successful interaction, it is important to have a healthy normal brain. If the brain is damaged, the interaction is cut off, and a human becomes a mindless biological automaton.

There is another important thing to clarify before going further. If I say that I am a dualist, I deny that the human mind can be explained by physics because: the human mind is not governed by the laws of physics; it is not derived from the neuronal work of the brain; it has its own laws and properties lying outside the

physics of material world; it can be studied only indirectly via the influence it produces upon the brain and material world; the effects of such influence can be studied by physics.

The consensus exists among neuroscientists about the data of experiments concerning the structure of the brain itself (how many synapses a neuron has, what kind of neurotransmitters we have, what the role of the brain is in the nervous system, etc.), but there is a divergence in the interpretation of these data when neuroscientists start speaking about the mind and its relation to the brain. They cannot ignore the mind because their findings show that the brain work depends on our thoughts and feelings, and that there is a kind of interaction between mind and brain. Neuroscientists have to choose the ontological position on mind and brain and suitable epistemology before starting their experiments or treatment of patients. However, the majority of neuroscientists prefer to keep silence on this matter due to mainstream materialist ideology and the official position of the Academy of Sciences. And only in an oblique way, while analyzing conclusions and arguments, you can understand their position, which sometimes turns out to be a mixture of materialism, dualism and even panpsychism.

For example, Roger Sperry, who called himself an emergentist and mentalist, created the mentalist theory according to which the mind has its own mental power and forms a neuropattern in the brain, and this overall neuropattern influences the lower level of neuronal work of the brain (Sperry, 1983). This supposition shows his belief in two independent substances. Nevertheless, he declares himself to be an emergentist, but we know that the emergentist theory is epiphenomenalist and belongs to materialist ontology, i.e. neurons produce a thought, and a thought depends on physical and chemical laws governing the activation of material neurons. Hence, the mind cannot have an independent influence on neurons because it follows the activation of neurons. In fact, Sperry's conclusion is dualist: a thought can organize the work of neurons, and logically the mind has its own independent, but not epiphenomenal life. It looks like his theory recognizes two independent and equally influential substances: material (a neuron) and mental (a thought). But trying to be within the materialist framework Sperry insists on the emergentist character of his theory which, in fact, denies his mentalist stance.

There are *two wide-spread materialist theories* of mind and brain (a term “physicalism” is usually used instead of “materialism” nowadays):

- (1) *eliminative or reductive physicalism*: all mental and physical events can be explained by physical sciences and their laws. All mental events can be eventually reduced to physics and chemistry; there is no mind, there is only a brain;
- (2) *“new epiphenomenalism” or non-reductive physicalism*: mental and physical events exist as two distinct domains, but the mental events “emerge” from the material neurons of the brain or “supervene” on neurons, i.e. without the brain there is no mind.

One can easily get mixed reading, for example, about property dualism, non-reductive physicalism and panpsychism where mind (consciousness) and brain are discussed. What is the difference between them?

Dualism of substances stands aside and asserts that material substance (brain) and non-material substance (consciousness) are principally different and independent substances.

Dualism of properties declares that all material things can have different properties: material and non-material, i.e. the brain has material neurons and non-material consciousness. Property dualism emphasizes not an independent and equal existence of material and non-material substances that can exist independently as substance dualism does, but it always describes substance as a material one having material and non-material properties.

Non-reductive physicalism actually resembles the dualism of properties. Non-reductive physicalism declares that all material things and physical phenomena can be explained with the help of physical laws but we cannot reduce our explanation of consciousness to physical laws, which we know. Though consciousness can arise only within the brain and depends on the material brain, we cannot explain consciousness so simply like other material things because our physical laws are of lower level, and using the terms of this level it is impossible to explain consciousness. The supporters of non-reductive physicalism are often rebuked for being, in fact, the dualists of properties.

There is also another point of view, which is popular among some neuroscientists, that is panpsychism.

Panpsychism asserts that all material things (animate and inanimate: people, trees, dogs, stones, etc.) have non-material consciousness of their own. Meanwhile, substance dualism and property dualism usually mean only people (and sometimes, animals) as having consciousness, so does non-reductive physicalism.

Pantheism like panpsychism considers all things, animate and inanimate, to have consciousness but this consciousness is part of God's consciousness: God is in all and everywhere. In panpsychism all material things, animate and inanimate, have their own soul or consciousness and it is not part of God's consciousness.

Panpsychism is logically more convenient for science in the explanation of genesis of consciousness.

There is also a quite different ontological position called "functionalism", which is indifferent to the problem of mind and brain.

Functionalism became quickly popular and was thought as the ontology of a new type because it asserts that for the understanding of consciousness it is not necessary to understand what its nature is and how consciousness arises. If a computer performs operations similar to a human brain, then a computer has consciousness. Of course, the critics of this approach, for example Searle, are against such simplified understanding. Searle gives his famous example with a Chinese room, "Imagine that you carry out the steps in a program for answering questions in a language you do not understand. I do not understand Chinese, so I imagine that I am locked in a room with a lot of boxes of Chinese symbols (the

database), I get small bunches of Chinese symbols passed to me (questions in Chinese), and I look up in a rule book (the program) what I am supposed to do. I perform certain operations on the symbols (answers to the questions) to those outside the room. I am the computer implementing a program for answering questions in Chinese, but all the same I do not understand a word in Chinese” (Searle, 1998: 11).

On the other hand, Searle declares that consciousness is a characteristic of the brain and “consciousness is a natural, biological phenomenon. It is as much a part of our biological life as digestion, growth, or photosynthesis” (Searle, 1998: xiii). He concludes that if the brain is a biological thing, then the mind must be also biological, i.e. the mind is a physical property, but on the other hand, as a non-reductive physicalist and emergentist, he insists that consciousness is different from material things, and that it is a mental property of the brain. In other words, the logic of his conclusion is the following: consciousness is a mental property but it is the result of brain work, therefore, consciousness is a physical (biological) property because the brain is physical. This conclusion seems strange. Mental properties do not turn into physical ones just because they are connected with the brain.

Similarly, we can find the reference to biology in the statements by the neuroscientist Francis Crick, a reductive physicalist (materialist), who proposed the hypothesis that our joys, sorrows, memories, the sense of personal identity and free will are factually the workings of a huge number of neurons and other molecules. He seems to deny that it is a human who decides what to do, and asserts that neurons decide themselves. It is a typical reductive materialist position in neuroscience. Szasz warns us that it is not a harmless thing if a human passes the possibility of exercising free will to his anterior cingulate cortex of the brain, because the concept of responsibility will be destroyed in this case. The concept of responsibility is based on the free will of a human himself but not on the work of his anterior cingulate cortex (Szasz, 1996).

Damasio, a neuroscientist and a reductive physicalist, puts an end to the evasive talks on brain and mind and says plainly that if you think that it is not your brain that decides but you, you are not a materialist, because it is only your brain, which you have, and it produces mind (Damasio, 2006).

Speaking about criminal justice the reductive materialist and biologist Richard Dawkins compares the heads of criminals with malfunctioning computers saying that when a computer malfunctions, we do not punish it but we track down the problem and fix it by replacing a damaged component. The non-materialist neuroscientist Beauregard comments ironically that Dawkins speaks about “we” who will fix and about a criminal as “it” which will be fixed by us (Beauregard, O’Leary, 2007).

So we can foresee that such a position in neuroscience will lead to the situation when the power elite will consider itself to have the right to “fix” those who disagree with the power on the ground that their brains malfunction and cannot fit the existing political and economic system.

Beauregard, a dualist, points out that if free will is an illusion and there is only good or bad neurophysiology of the brain, the idea of evil and good disappears. We are left only with our desires and dislikes. If citizens have no free will, no soul, no moral understanding, and mind is an illusion, and consciousness is a biological property of a brain, the government can logically dehumanize citizens and deal with them as a farmer deals with livestock “without assuming that they have moral understanding and a higher purpose than that one determined by the farmer” (Beauregard, O’Leary, 2007: 118). Mario Beauregard is also sure that the brain is “an organ suitable for connecting a mind to the rest of the universe”, and by analogy, “Olympic swimming events require an Olympic class swimming pool. But the pool does not create the Olympic events; it makes them feasible at a given location” (Beauregard, O’Leary, 2007: xi). He accuses materialist science of playing the role of ideology: anything that contradicts materialist ideology is denied as non-existent. Such materialist science distorts the description of reality.

We see that the divergence of opinions among neuroscientists is great. Francis Crick (Nobel laureate) and Antonio Damasio are reductive physicalists; Rodger Sperry (Nobel laureate) is a non-reductive physicalist; John Eccles (Nobel laureate), Wilder Penfield, Mario Beauregard, and Charles Sherrington (Nobel laureate) are dualists; Pim van Lommel is a panpsychist.

The nature of consciousness has been discussed for centuries. Perhaps, the greatest contributor to the brain-mind problem was the famous French philosopher René Descartes (1596-1650), who said, “Cogito ergo sum” (“I think, therefore I am”¹) and who proposed substance dualism according to which there are two independent separate substances – mental and material. If an object is destroyed and disappears, and our physical organs of sense perception cannot be used, i.e. we cannot see or touch the object, we continue to have it in our minds. It still exists in our minds though it does not exist in a physical world. The mental substance (thoughts and feelings; a soul) can exist independently of the automatically functioning physical body (Descartes’ automaton). A human body has material properties but mind does not. Descartes thought that the pineal gland of the brain was the place where the mental substance communicated with the body.

The dualists are usually accused of: (1) admitting the existence of two independent substances, which requires the explanation how they can interact; (2) being inconsistent, i.e. material substance (human organism) is explained by cause and effect relationship (material relationship), but, on the other hand, dualists explain physical changes of a material thing (brain) caused by mental substance (thoughts) (material and non-material relationship); (3) classifying feelings and thoughts as mental substance, though the nature of feelings is different from the nature of purely cognitive abilities (thoughts); (4) ignoring the fact that dualism contradicts the scientific thesis of continuity and consistency in nature, because dualism declares that there are two substances, so it means that a human being has two

¹René Descartes, “Discourse on Method”, part IV (in French “Je pense, donc je suis”).

beings; (5) dualism as an outlook does not match a scientific way of explaining things because it has religious and mystical connotation.

Objections: (1) neither dualists nor materialists can describe the mechanism of interaction between thought and neuron (dualists' failure), or how a thought appears in the process of the activation of a neuron (materialists' failure); (2) dualism simply confirms what exists in reality, i.e. cause and effect relationship of dual kind because of the complexity of a system. A human body is a biological automaton when no reflection is demanded (material relationship), for example, blood flow and the work of a heart. The neurosurgeon Penfield describes the phenomenon of automatism (an act performed unconsciously) during epileptic seizures, when a human can move (walk, drive a car) as usual, but he is not aware of his moving (walking, driving a car) because his consciousness is switched off (Penfield, 1975). It reminds us Descartes' automaton. On the other hand, cognition and creation demand a high level of consciousness and reflection, which allows mental causation (material and non-material relationship), for example the treatment of physiological and mental diseases with the help of a patient's imagination; (3) cognition and feelings are different things, but they can never be separated as the materialist neuroscientist Damasio demonstrates us because emotions and feelings are present in all cognitive decisions, and there cannot be a successful cognitive process of decision making without an emotional component. Moreover, even the body participates in cognitive processes according to Damasio: the memory of unpleasant emotions and neurochemistry caused by the previous wrong decision helps to avoid bad decisions in the future (Damasio, 2006); (4) apart from a biological material brain, which does not even feel any pain while being cut by a surgeon and the content of consciousness when we think about something, there is also an awareness of the content of our consciousness, i.e. the registration of what we are thinking about, and whether it is high time to go to the doctor and treat our brain if it does not work properly. Who diagnoses the problem of the ill brain in this case? Logically, it cannot be the brain itself, it must be an independent mental substance analyzing the work of the brain (until the brain is severely damaged and the awareness is lost, because the connection itself between two substances is lost); (5) the recognition of two substances (material and non-material) is not necessarily connected with any religion: one can be an atheist and dualist at the same time. However, if science (sciences study the real world) does not include the fact that the non-material mind changes the work of the material brain as brain scanning shows, then such science has been transformed into ideology. Ideology typically creates a distorted picture of reality in accordance with its aims.

The materialists claim that: (1) thoughts and feelings are neurobiological phenomena of firing synapses in the brain; (2) there is only the work of the brain. Soul, spirit, free will, will power, and mind controlling the matter are illusions resulted from the electrical charges in the neurons of the brain. Psi-phenomena do not exist; (3) the purpose and meaning of a human life is creating adaptive

biological mechanisms for survival (the philosopher of mind Daniel Dennett, the biologist Richard Dawkins, the neuroscientist Francis Crick, and many other materialists); (4) the brain is organized by the genome, and the genome was shaped by natural selection. The human being is one of biological species like other animals and shares 95-99% of his DNA with a chimpanzee.

Objections: (1) materialist neuroscientists have not found the mechanism of the transformation of neuron firing into a thought and cannot give a scientific description of it. Thus, all their assertions are invalid; (2) placebo effect, near-death experience (NDE), telepathy, mental healing, and art therapy show that thoughts change neurophysiological and neurochemical characteristics of the brain and then the work of the whole organism. Jeffrey Schwartz, a non-materialist neuropsychiatrist, treats obsessive-compulsive disorder (intrusive and unwanted thoughts) by giving his patients mental tasks for shifting their thoughts to another area. And then, brain scanings show the changes in their physical brain (Schwartz, 1999; Schwartz, Begley, 2002). First goes the thought, which activates neurons, and then the changes in the brain. Beauregard, a non-materialist neuroscientist, also treats his patients suffering from phobias by reorganizing their thoughts, which change the brain work (Beauregard, O’Leary, 2007). He demonstrates with the help of brain imaging techniques that women can voluntarily control their level of response to sad thoughts, and men are able to control the response to erotic films at free will. Placebo effect has been used for centuries. With the help of art therapy and guided imagery, patients can be cured even of cancer (Findlay, 2008). The studies of NDE demonstrate that people can perceive the world without firing synapses and without organs of sense perception (brain does not work and heart stops functioning) (Lommel, 2010; Atwater, 2007; Holden, Greyson, James, 2009; Moody, 2005; Beauregard, O’Leary, 2007). Even one of such cases can question the materialist explanatory model of a human being due to its complete inadequacy; (3) if compared with a chimpanzee or other animals, biological adaptation and biological survival do not demand from a human to have intellectual life in the fields of abstract thought – literature, philosophy, art, music, science – accumulated for thousands of years. If people do it, and materialists cannot answer why, a logical conclusion is that materialists have the wrong understanding of the human nature; (4) though a human shares 95-99% of his DNA with a chimpanzee, it does not make him 95-99% of a chimpanzee (Beauregard, O’Leary, 2007). A chimpanzee does not have abstract thinking necessary for sharing the intellectual life with us. Perhaps, the question is not in the biological DNA, which is important for our material substance, but *in the difference of non-material (spiritual, mental) substances* as Beauregard suggests (Beauregard, O’Leary, 2007).

If the nature of a human being is wrongly described (similar to a chimpanzee’s), you can never understand why people create the works of art and *what should be done for the right organization of their social, economic, and political life in the society*. Whatever elaborate technologies and super modern technical devices or a new branch of physical science, for example quantum physics, you might use, you

will never answer the above-mentioned questions concerning the human mind within the materialist framework, “If we are barking up the wrong tree then we shall not find what we are looking for no matter what kind of ladders we use” (Beloff, 1990a).

Materialist neuroscientists do not give up and put forward an improved model of brain and mind within non-reductive physicalism. Non-reductive physicalism has the category of emergence (emergence of a new property of the brain, which is our mind; this property cannot be reduced to terms and concepts of a physical brain and explained by physics at present) and the category of supervenience (a thought appears thanks to firing synapses of neurons, but the appearance of a thought depends not only on firing synapses but also on many other factors; a thought supervenes on them).

The supervenience doctrine shows that the activation of neurons in the brain, i.e. in the neurophysiological field (property G in the field A) is followed by a thought in the psychic field (property F in the field B) only under certain circumstances (C) (X and D belong to circumstances C) (Fig. 1).

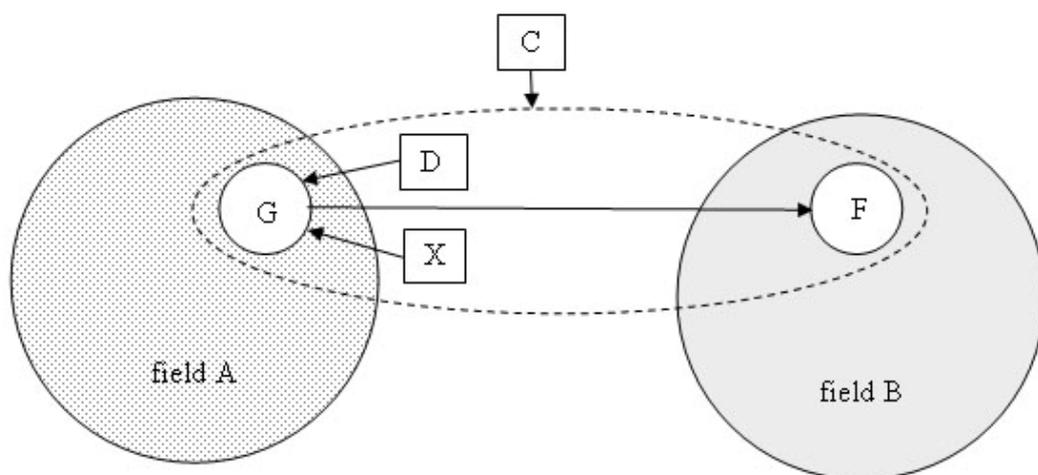


Fig. 1. Supervenience.

The property G is in the field A . The property F is in the field B . D is connected with the property G in the field A and belongs to the conditions C (“conditions” – a dotted line). Here, in the figure, it is supposed that D is already present in C . If X is present and interacts with the property G in the field A , certain conditions C are formed (necessary conditions include both D and X), and then G will be followed by the property F in the field B . In this case, they say that the property F in the field B supervenes on the property G in the field A , if there are all necessary conditions C . For example, G is a neuron and F is a thought.

The rain X (instead of rain there can be cultural habits or social factors in decision making) brings about the activation of neurons G , reminding an unpleasant feeling of being wet when you came out without an umbrella, and then a thought F arises: “I should take an umbrella”. This thought supervenes on the rain and memory of being wet when you came out without an umbrella. There are necessary conditions C for the appearance of thought F , which *follows* the neuropattern G connected

with the previous experience, for example rain X . The thought follows the activation of neurons. In other words, a certain neuropattern G was formed when I got wet without an umbrella, and now, every time when I see rain X , my neuropattern G is activated by rain X . Rain creates the conditions C for the supervenient thought F about the necessity of taking an umbrella. Such scheme of interrelations reflects both dependence (a thought depends on the activation of neurons) and irreducibility (a thought is not reduced to the level of a physical neuron: a thought is from the other field B) and gives the possibility of taking into account the influence of culture or other circumstances upon the appearance of the thought.

The non-reductive physicalist Nancey Murphy (she has put forward a supervenience hypothesis) does not approve Sperry's idea (a non-reductive physicalist and mentalist) that the emergent property of brain (a thought) is powerful agency. Sperry's main idea is that a new emergent mental property governs the central nervous system, i.e. consciousness becomes a powerful force, which emerges from neuronal organization and then controls it. Murphy denies the causal effect of supervenient thoughts (Murphy, 2009). Murphy suggests a new understanding of causality: a "triggering cause", which causes direct physical consequences and a "structuring cause", which directs or structures physical processes (Murphy, 1999). Electric impulses go along neurons according to the physical laws of ions (triggering cause), but these impulses depend on the structuring cause, i.e. the number of participating neurons, the quantity of neurotransmitters, the strength of the impulse, thus, creating necessary conditions C for the transformation of the impulse into a thought. She thinks that the mental process follows certain neuropatterns of neuronal activation, and that the mental process does not have independent force as Sperry asserts.

James Jones, a psychoneuroimmunologist and dualist, remarks that in the example with the rain, Murphy as though tries to defend mental causation but, in fact, she denies it because she does not consider it as a real cause for actions (Jones, 2005). The thought about taking an umbrella is connected with the previous experience, therefore it is the example of learning. But how does a thought make us do new things without our previous experience? How can our mind control or treat the neurophysiology of the brain if we have decided to reprogramme it with new thoughts at free will?

The critical remarks on non-reductive physicalism (emergent and supervenient hypotheses) can be summarized as follows:

1. Non-reductive physicalism resembles property dualism because irreducibility, in fact, means the recognition of dualist conception in the form of dualism of properties. If consciousness cannot be described by using the terminology and the measurements of physics, as we do for the description of material objects, then consciousness, in principle, something quite different from material substance. Non-reductive physicalism seems to operate with two substances: material and non-material;

2. There is a faulty logic in non-reductive physicalism. Materialist scientists struggle to preserve the principle of continuity in nature asserting that there is only one ultimate reality and it is the physical world, but they also say that mind is another domain which physics cannot explain. If the supporters of non-reductive physicalism have a monist materialist conception of the world, then all phenomena, including thoughts, must be considered as material by them. They cannot be monist materialists and speak at the same time about irreducibility of the mental to the material (physical);
3. There is a certain irrationality of the conclusions in non-reductive physicalism: the mental cannot suddenly arise from absolutely non-mental stuff (a thought from a biological neuron). It is irrational thinking. The emergent property must have something in common with the properties from which it appears, for example to have atomic or subatomic common elements. A thought must have something in common with a neuron so that it might appear out of it and could be called an emergent property of a neuron. But a thought and a neuron have no common structural components, have quite different nature, cannot be described in the same categories and terms of physics;
4. We know that no scientific theory can claim to be a complete theory, which explains the world correctly. It also concerns the monistic materialists' explanation of the human being;
5. Scientific assertions are socially created, and the interpretation of the observable facts depends on theoretical framework, which can be, in its turn, under the influence of general ideology;
6. It is impossible, in principle, to use materialist philosophy, on which non-reductive physicalism is based, for the explanation of the awareness of your own content of consciousness. It leads automatically to dualism. We have as though two consciousnesses: the first one is what I think about, and the second one is that I know what I think about and control my thoughts. It is impossible to create a brain map of neurophysiological activity for the second one, i.e. the awareness of the content of consciousness. Such awareness of your own consciousness is outside the field of biological organization of systems (Jones, 2005);
7. There are not enough experimental data to come to the conclusion that the mind can be explained within the materialist framework;
8. Physicalism, both reductive and non-reductive, creates a paradoxical situation. According to physicalists mind is epiphenomenal: first goes the activation of neurons, and then a thought. Thus, it means that it is our brain that studies the brain, in other words, neural cells themselves study neural cells.

James Jones, practicing and teaching in the area of psychoneuroimmunology for many years, considers that non-reductive physicalists' account of consciousness as an emergent or supervenient property is not adequate to the data of psychoneuroimmunology (Jones, 2005). He notes that clinical hypnosis is very effective in treating anxiety, chronic pain, stress-related disorders. He makes his patient imagine that they are warming their hands over fire, and it increases the blood flow to their hands, and blood vessels dilate, which helps to relieve vascular

headaches. It is possible to remove warts by making a patient believe that they have disappeared. A patient just imagines what is said by the doctor, it is purely a mental act (image) on the patient's part, but physiological changes happen. Jones speaks about human capacity to control one's brain waves by shifting brain wave pattern via biofeedback without hypnosis at one's own will, and to control a heart rate, skin conductance, musculoskeletal tension as well. Meditation can produce an impact on such basic physiological functions as brain hemispheric lateralization, immune system, and basic reflexes (Jones, 2005).

The mental level is considered by non-reductive physicalists as springing out of a lower neural level and dependent on it. Some of them think that the emergent higher mental level begins to influence the work of a lower level like in all similar processes in other spheres: the higher level cannot exist without a lower one but after appearing, it acquires its own properties and starts producing influence upon the lower one. Jones remarks that such influence is possible only to a certain degree because the macrosystem cannot change the elements of the microsystem on which it is based and from which it originates (Jones, 2005). However, with the brain and mind the story is a bit different. Mind (thoughts) can change the quantity of dendrites and protrusions from the branching end of an axon and along it, can strengthen the synapses, force the production of protein for neurons, can change the amount of neurotransmitters in synapses and the neuropaths of activation, can shift neurochemical balance in the brain and the production of hormones in the organism, and can worsen, or improve the work of endocrine and immune systems of the organism. The mind not only influences the work of the brain, but changes the elements of the microsystem.

James Jones critically analyzes non-reductive physicalism and points out that in order to be logical non-reductive physicalists have either to weaken their non-reductive position, which will make them undistinguishable from reductive physicalists, and which will contradict the clinical evidence, or to strengthen their non-reductive position about mental causation as a force on its own, but in this case, they will violate the physicalists' doctrine of the closure of the system of nature, which demands all the events to be explained on the basis of physical sciences (Jones, 2005).

Wilder Penfield (1891-1976), a neurosurgeon and a dualist, says that the fact that human consciousness can study its own brain and the content of consciousness contradicts, in principle, the logic of all material world. As soon as we start studying our own biological organism and get aware of the content of our own consciousness, we stop being biological species like other animals.

Penfield operated and treated epileptic patients. While operating or examining the altered portions of brain in which the epilepsy-producing discharge began after electrical stimulation, he preferred to speak with his patients and ask what they felt or thought when he touched the brain. The patients preserved the consciousness throughout the procedure and helped to identify the altered portion of the brain. The brain itself is not sensitive and cannot give rise to pain. Penfield used only

local analgesic injected into the scalp before making the incision (Penfield, 1975). Penfield comes to the conclusion that in the brain there is the place of the highest integration of consciousness and body, and this place is not in neocortex, as all think, but in the upper part of the brain stem - diencephalon. He actually discovered two brain mechanisms in the diencephalon: (1) the highest brain-mind mechanism, which is essential to the existence of consciousness, and (2) the automatic sensory-motor mechanism (a “computer”), which is essential to the sensory-motor coordination. It is important in what place an epileptic discharge occurs and where it goes. “When an epileptic discharge occurs in the central cortex in any of the sensory or motor areas, and if it spreads by bombardment to the higher brain-stem, the result is invariably a major convulsive attack, never, in our experience, an attack of automatism. On the other hand, as mentioned above, a local discharge in prefrontal or temporal cortex may develop into automatism” (Penfield, 1975: 40). In other words, if the first mechanism in the diencephalon (the highest brain-mind mechanism) is damaged by epileptic discharge coming from the prefrontal, or temporal cortex, the human automation replaces conscious behaviour, and the man is incapable of admiring the beauty of nature, experiencing happiness, love and compassion because “the automation is a thing that makes use of the reflexes and the skills, inborn and acquired, that are housed in the computer”) (Penfield, 1975: 47). The person may wander about aimlessly, go home, or drive a car, but he has a complete amnesia what he has been doing. Penfield’s description of human mindless automation sounds like Descartes’ automaton, i.e. a human body without a spiritual/mental substance.

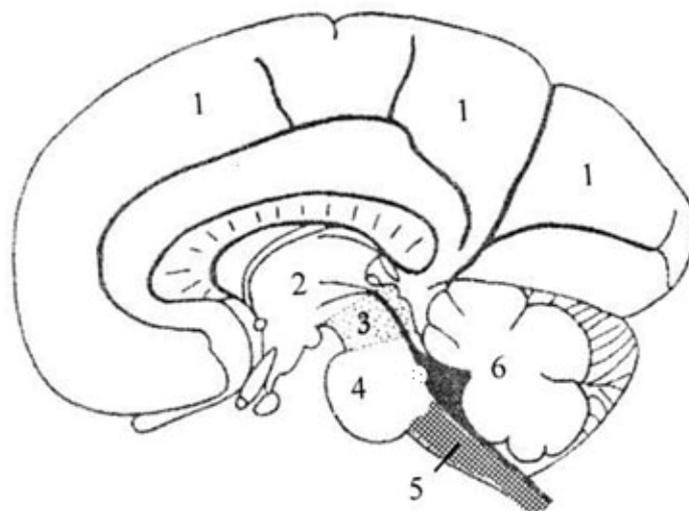


Fig. 2. The main parts of the adult brain.

In the figure (the right hemisphere of the brain from the inside; the forehead is on the left) there is the forebrain consisting of (1) neocortex, (2) diencephalon, (3) midbrain; and the hindbrain, consisting of (4) pons, (5) medulla oblongata, (6) cerebellum.

Penfield describes an interesting episode from his practice. His patient suffered from epileptic attacks, and the discovered area was very close to the major speech area. In order to avoid a mistake during the forthcoming operation, which could

cause permanent aphasia, Penfield tried to find the exact speech area and touched the brain with a stimulating electrode. The brain is not sensitive, and the patient did not realize what made him speechless (the electrode had touched the special spot and thus had blocked the speech ability). The patient was shown a picture of a butterfly and was asked to give the name of it. The patient could not. "Then he snapped his fingers as though in exasperation. I withdrew the electrode and he spoke at once" (Penfield, 1975: 52). The patient said, "Butterfly", and added that he could not get that word "butterfly", so he had tried to substitute it with the word "moth", but failed. The patient could not speak, but he understood what was in the picture, i.e. a non-verbal concept of a "butterfly". He did not understand why he could not pronounce "butterfly" and turned to another similar non-verbal concept "moth" at his will, and his mind approved the choice, but he could not pronounce a new word again because the speech area was still blocked. The patient called on two brain-mechanisms alternately and at will (Penfield, 1975: 52).

A lot is done automatically and with the help of reflexes by the man, but what the mind does cannot be explained by any neuronal work and neuronal mechanisms as Penfield concludes. He supposes that the mind has its own energy, and this energy differs from the energy of neurons. The mind directs the brain, and the highest brain-mind mechanism performs the role of a messenger, connecting mind with brain (Penfield, 1975).

Penfield gives another example of his patient from South Africa. When the patient understood what was going on (the touch of the electrode had caused an unexpected reaction), he exclaimed in amazement that for him "it was astonishing to realize that he was laughing with his cousins on a farm in South Africa, while he was also fully conscious of being in the operating room in Montreal". The mind of the patient was independent from the reflex action (the touch of the electrode and laughter). He was fully conscious that he was in the operating room and wondered why he remembered the farm in South Africa and laughed (Penfield, 1975: 55).

When Penfield made another patient move his hand because he touched a certain place in the motor area of the cortex by an electrode, the patient said that it was not him who moved the hand but it was the doctor, who forced him to do it.

Penfield arrives at the conclusion that it is impossible to find any place in the brain where electrical stimulation makes the man believe that he did the action at his own will or find the place the touch of which makes the man take decisions (Penfield, 1975: 76).

In the end, Penfield had to admit the existence of two independent and interacting substances, "For my own part, after years of striving to explain the mind on the basis of brain-action alone, I have come to the conclusion that it is simpler (and far easier to be logical) if one adopts the hypothesis that our being does consist of two fundamental elements" (Penfield, 1975: 80).

The sociologist of science Mulkay says that when the analytical framework alters, so does the meaning of observation and the statements that were formulated within the previous analytical framework (Mulkay, 1983). Rodger Sperry (Nobel laureate in neuroscience) writes that in the 1950s-1960s in materialist science it was banned to use consciousness or mentality to explain phenomena because consciousness and mentality were considered to be a subjective domain, which did not yield objective facts for sciences. And only in the 1970s, it became possible to speak about the mind as a cause of physical changes in the brain (Sperry, 1983). The mental process began to be considered as a force capable of regulating biochemical and biophysical processes.

Thus, we can arrive at the conclusion that factual claims of science are dependent on theory and not permanent in meaning.

Sperry remarks that if science before the 1970s was dehumanized because it disregarded human values, now it becomes possible to reunite the theory of human values with other sciences (Sperry, 1983).

Sperry considers that the reason of ignoring mental force in favour of a human brain lies in the social system and its ideology. However, the causal force of idea is as real as the force of a molecule, cell or neural impulse. One idea interacts with another idea, and one person passes his ideas to other people, and these ideas bring objective changes to the physical world. Sperry declares that the study of mental force is the most important matter in science though it is not as accessible as we want and that to dismiss mental force in a scientific theory of brain and mind means an unscientific approach to the problem. He complains that materialism has penetrated all spheres of our life distorting reality, and the majority of scientists, about 99.9%, even dualists, continue to ignore the mental force and the influence of consciousness upon the brain (Sperry, 1983: 30). It is our mind which is in “the driver’s seat” pushing and pulling biophysical and biochemical processes in the brain. Though the more primitive electrical, atomic, molecular, cellular, and physiological forces can be switched on or off, they are necessary for normal functioning of a higher level – mental processes (Sperry, 1983). Sperry considers that mind activates brain matter as much as the organism makes its components (organs, cells) function.

Here are some interesting examples, which question materialist conception on mind and brain.

The British neurologist, professor John Lorber studied the cases of hydrocephalus and gives the example of a student of the University who had IQ 126, higher than the middle level and socially was quite normal, he even was awarded a degree in mathematics with the best mark, but this student, nevertheless, hardly had brain at all. Lorber recalls, “We saw that instead of the normal 4.5-centimeter thickness of brain tissue between the ventricles and the cortical surface, there was just a thin layer of mantle measuring a millimeter or so. His cranium is filled mainly with cerebrospinal fluid” (Lewin, 1980: 1232). Thus, the question arises: Is the brain so important for the mind at all?

The cardiologist Pim van Lommel writes about the case that happened with a nurse at the coronary care unit where he worked. The ambulance brought in a cyanotic, comatose man of 44. The man received “artificial respiration with a balloon and a mask as well as heart massage and defibrillation” (Lommel, 2010: 20). Then, before intubating the patient, the nurse removed the upper set of dentures and put it on the crash cart, and they continued extensive resuscitation. Ninety minutes later the patient had a sufficient heart rhythm and blood pressure, but he was still ventilated and intubated. He remained comatose. In this state he was transferred to the intensive care unit for further treatment. A week later, that nurse came into the ward to distribute the medication to the patients, and she suddenly heard the voice of that patient. He recognized her at once and asked her to give him back his denture. He said, “Yes, you were there when they brought me into the hospital, and you took the dentures out of my mouth and put them on that cart; it had all these bottles on it, and there was a sliding drawer underneath, and you put my teeth there” (Lommel, 2010: 21). The patient turned out to have seen his body from above and to have been watching nurses and doctors resuscitating him while lying on the bed in a comatose state. He said he had been afraid that they would stop resuscitating him, and he had made several unsuccessful attempts to tell them that he had been alive.

The NDE (near-death experience) of Pamela Reynolds was described in many books. She had a giant aneurysm in one of her cerebral arteries near the brain stem. Reynolds was operated by the neurosurgeon Dr. Robert Spetzler at the Barrow Neurological Institute in Arizona, who lowered the temperature of her body to 50 degrees Fahrenheit. She was on a heart-lung machine because she had cardiac arrest, and all her blood was drained from her head to prevent the burst of aneurysm and cerebral hemorrhage. She had her NDE during brain surgery. And what is important for science is that the activity of her brain stem and cerebral cortex were constantly monitored, and the loss of brain function during her NDE was documented: her electroencephalogram was silent, her brain stem response was absent, and blood did not flow through her brain. However, Pamela had a full capacity of consciousness and the sense perception without the functioning organs of sense perception due to the loss of brain function at all. After the operation, she described in detail what had been going on in the operating room. She heard sounds and had a brighter and more focused vision than normal; she was surprised at some actions of the doctors and their instruments. She thought in her NDE that she had not expected them to do what they did during the operation, she heard what nurses and doctors talked about. She got into the tunnel and went to the light. Then she met her grandmother who called her and had a clearer hearing than usual. She saw figures of light, and she recognized some of her diseased friends and relatives. It was soul-to-soul communication without putting thoughts into words. The more she was there, the more she wanted to stay in this light. But her uncle (he and her grandmother had died by that time) brought her back to the body. She said that her coming back into the body was like diving into a pool of ice water (indeed,

her frozen body was very cold at that moment) (Lommel, 2010; Atwater, 2007; Holden, 2009).

Janice Miner Holden calls such a phenomenon of sense perception during the NDE, as Pamela had, “apparently nonphysical veridical NDE perception” (Holden, 2009: 186). She analyzes the cases of nonphysical veridical NDE perception and comes to the conclusion that 91.9% of the stories of such perception turned out to be true after verification, 6.3% with mistakes and 1.8% were not true.

Atwater describes the changes, which usually occur after the NDE. The changes concern both psychology and physiology. The value system and the attitude to life change (Atwater, 2007). The NDErs cannot forget the flow of light during the NDE with the strong feeling of all-encompassing sympathetic energy full of understanding and unconditional love. Communication during the NDE is telepathic, and the knowledge comes in bunches as soon as they think about something that they want to know.

Holden, Greyson and James report that between 1975-2005 approximately 55 researchers and research groups in North America, Europe, Australia, and Asia published at least 65 studies involving 3,500 people, who had NDEs. The researchers described different types of NDE, the life of people after their NDE, or both (Holden, Greyson, James, 2009: 7).

Holden draws a conclusion that nonphysical NDE perception exists because objective reality of their experience was confirmed. Thus, consciousness (perception, thoughts, memory, feelings, emotions) can function outside the physical body during the reversible death. It follows logically that consciousness is potentially capable of continuing after the irreversible physical death. The most important thing worth of our close attention is the message brought us by NDErs regarding the meaning and purpose of human existence. The NDErs assert that “developing the capacity of love and acquiring knowledge are both the purposes and the most appropriate pursuits of human existence” (Holden, 2009: 188).

Holden thinks that such understanding of life, the purpose of life and consciousness can promote the commitment to more humane personal choices and humanitarian public policy, and that the results of the studies of near-death experience (NDE) will benefit experiencers themselves, humanity, and earthly existence at large. The results of studies will revolutionize human understanding of humanity and will have far-reaching implications for our life (Holden, 2009).

Do we, indeed, need the accumulation of money, career competition, social status, if the purpose of life is the development of love and knowledge? Does our social, political, and economic system match such a purpose of the humanity, which the NDErs revealed?

There are different physiological and psychological theories trying to explain the phenomenon of the NDE and among them: oxygen deficiency in the brain when the brain stops functioning; carbon dioxide overload; chemical reaction in the brain when ketamine produces hallucinations; endorphins release under the stress, which makes the man feel peace and well-being; psychedelics causing some unusual effect; the release of DMT (dimethyltryptamine), a psychoactive natural substance

produced in the pineal gland of the brain and giving a sense of out-of-body experience, lucid and accelerated thoughts, a sense of unconditional love; electrical activity similar to epileptic seizure originating in the temporal lobe, which can create mystical feelings, visual hallucinations, a sense of detachment from the body; electrical stimulation sometimes causing the vision of light, dreamlike experience, memory from the past; psychological fear of death; other psychological problems (depersonalization, dissociation), fantasies and delusion (after medication) bringing about the components of the NDE.

However, summing up the discussion and arguments for and against these hypotheses, both Lommel and Atwater (Lommel, 2010; Atwater, 2007) remark that there are some serious reasons to refuse from these materialist hypotheses trying to explain the NDE because:

- (1) not all people who had a clinical death had also such an experience (seeing a tunnel, light, dead relatives, sometimes dead pets; having an out-of-body experience and watching the doctors and nurses in the room; feeling love, sympathy and understanding coming from the divine light; having an easy acquisition of knowledge, a panoramic view of their life, and at the same time feeling what the other people felt dealing with them);
- (2) it is not necessarily to be clinically dead to have such an experience; one can have it with a functioning brain and a heart beating normally;
- (3) NDErs do not have hallucinations (hallucination means seeing an unreal event), they speak about the true events, which can be verified and confirmed;
- (4) the values and the purpose of life become different after the experience;
- (5) NDErs have also some long-lasting psychological and physiological changes after the experience;
- (6) none of experiments with psychedelics, medication, carbon dioxide overload, electrical stimulation, etc., gives such an experience as NDErs have. The NDE cannot be brought about by medication. On the contrary, medication prevents patients from having such an experience.

In the clinical practice, the treatment of physiological diseases of the body and brain by our mind gives unbelievable results. Brain scanning shows that “expectancies of sensory stimulation or internal imagery seem to share the same brain circuits as sensory stimulation or external images” (Findlay, 2008: 212). Art therapy uses images on the paper as a recording of the internal state of a patient with which it is possible for a doctor to work: to direct the internal imagery towards convalescence by manipulating with images on the paper, paints and symbolic representation of the patient’s problem, and by showing him healthy processes to copy. The image on the paper made by a patient influences the work of the brain, and thus, the whole organism. It regulates emotions and affects the activated hypothalamus-pituitary-adrenal (HPA) axis stress response, and, therefore, art therapy can help to restore the immune system. If the HPA is damaged by a prolonged stress, its chronic activation produces a strong negative effect on the immune system: the thymus gland shrinks (thymus, bone marrow,

spleen and lymph nodes are the main organs of the immune system) because the formation of new lymphocytes that constitute the thymic tissue reduces. The reduced immune activity allows cancer cells to multiply and divide without fighting with the immune system.

Findlay reports, “Visualization training for participants with diseases that depress the immune system showed increases in neutrophils (WBCs) over a 90-day period in 20 patients with cancer, AIDS (acquired immune deficiency syndrome) and viral infections” (Findlay, 2008: 213). The training included 30-minutes of audio training with verbal suggestions, relaxation, and visualization instructions. Participants were instructed how to create self-healing mental images matching their disease. Visualization and meditation help to get significant improvement in treating dermatomyositis and immune microvasculopathy disorder.

Findlay describes the case of a 38-year-old patient, called Jim, who had thyroid cancer (the tumor of 12mm by 5mm by 5mm). Jim decided to use imagery as part of his holistic treatment (imagery, traditional psychotherapy, recommendations of a Chinese herbal doctor, raw food diet, physical exercises, relaxation, and breathing techniques) instead of the removal of his thyroid and a lifetime of chemically regulated endocrine treatment. He came to the art therapy room every week for the eight-month period. With the help of relaxation technique Jim discovered the self-healing images (that was *sunlight* and *healing light* for Jim). The sunlight and healing light became his core images first on the paper and then in clay. He chose coloured clay and “the kinesthetic action of rolling out dots and twisting tendrils of light in colored clay became an almost ritualized practice in each session” (Findlay, 2008: 217). At one session, he made a small life-size pink ball of his tumour. Jim used green and yellow clay for showing how the light was eating up the pink ball. Jim became very emotional because he visualized, created, and experienced the annihilation of his tumour. The art therapist showed him biological images of the working of his killer cells and macrophages of the immune system, and Jim became even more emotional because of the accuracy of his spontaneous images. Three months after his holistic treatment and sessions, his tumour reduced by 28%, and six months later by 60%, and a bit later, when he visited his regular doctor, who had originally diagnosed him, the doctor did not find any remnant of the cancer.

Art therapy helps to treat complex post-traumatic stress disorder (C-PTSD) (King-West, Hass-Cohen, 2008) and Alzheimer’s disease (Galbraith, Subrin, Ross, 2008). The mental force of imagery regulates the work of our biological body and brain.

Meditation is especially helpful in controlling our neurochemistry and very effective in treating mood disorders and depression. Yoga-nidra increases dopamine in the brain by 65%. Dopamine stimulates positive thoughts, pleasurable experience, increases the sense of well-being and sensory imagery (Newberg, Waldman, 2009: 55). The level of serotonin changes during such types of meditation as mindfulness, vipassana, insight, and transcendental meditation. The release of serotonin enhances visual imagery and sensory experience. Yoga that

involves breathing and stretching shows an increase of gamma-aminobutyric acid (GABA) in the brain by 27%, which helps to treat depression and anxiety (Newberg, Waldman, 56). Yoga can decrease migraine headaches, a risk of cardiovascular disease. It can even reduce the symptoms of schizophrenia (Newberg, Waldman, 2009: 161).

“Visualization, guided imagery, and self-hypnosis are specific variations of meditation and are effective in maintaining a healthy brain” (Newberg, Waldman, 2009: 160).

The neuroscientists Newberg and Waldman carried out an experiment to see how meditation affects the brain. They used Kirtan Kriya tradition, which included breathing, sounds, and movements (conscious regulation of one’s breath and movements of the fingers together with the pronunciation of sounds).

The participants practiced it only 12 minutes a day during 8 weeks. They were promised that such practice would improve their brain work. One of them, Gus, wanted to improve memory and attention. After 8 weeks, Gus improved his results by 50% in the tests, others by 20%. If before training, it took Gus 107 seconds to do the task, after training for 8 weeks it took him only 68 seconds. The scanning of the brain showed a significant increase of neural activity in the prefrontal cortex (clearer thinking and focused attention upon the task), anterior cingulate cortex (better emotional regulation, error detection, learning and memory), basal ganglia (better control of body movements and emotions), and thalamus (better sensory perception) (Newberg, Waldman, 2009: 28-29).

It means that without medication and less than for two months the work of neurons was changed due to the property of neuroplasticity of the brain and the practice of meditation.

Functional magnetic resonance imaging (fMRI) and positron emission tomography (PET) of the brain reveal permanent changes in distributing activity in certain parts of the brain as a result of cognitive therapy and placebo effect in the treatment of depression (Lommel, 2010). In other words, the thought of having the right treatment causes objective changes in brain functioning. Placebo triggers the same effect as medication or electrical and magnetic stimulation but without negative side effects. Thoughts change neurochemistry of the brain. Isn’t it an opposite phenomenon to materialist assertions in neuroscience?

Placebo effect was observed even in the patients suffering from Parkinson disease: some areas of the brain released more dopamine than usual, and it reduced muscle stiffness. fMRI reveals the activation of prefrontal cortex due to positive expectations, which alters the process of attention. Attention is directed at recovering (Lommel, 2010). “Placebos usually help a percentage of patients enrolled in the control group of a study, perhaps 35 to 45 percent. Thus, in recent decades, if a drug’s effect is statistically significant, which means that it is at least 5 percent better than a placebo, it can be licensed for use” (Beauregard, O’Leary, 2007: 141).

Beauregard gives an example for the illustration of placebo effect (Beauregard, O'Leary, 2007: 140). Janis Schonfeld, a forty-six-year-old interior designer was thinking about suicide when she saw a poster inviting to try the new generation of antidepressants. She enrolled in a drug study at UCLA. The EEG of her brain was made, and she started taking those new pills. The pills worked well, though she had nausea as a side effect, but she had been warned about it by her nurse. Schonfeld recovered from her depression completely. On her last visit, the doctor told her the truth. Neither Janis, nor the nurse had known that Janis had been in the control group and taken sugar pills, i.e. placebo. However, the recovery was genuine and the doctor confirmed it. "But the only drug she had received was an immaterial and immortal substance – hope" (Beauregard, O'Leary, 2007: 141). The patient's mental belief in medicine and thought of recovery worked wonders. Neurophysiology and neurochemistry of the brain became better thanks to positive thinking.

Lommel concludes that consciousness cannot be regarded as the product of brain function. "In fact, sometimes the opposite seems to apply: the mind influences brain function, both in the short and long term as a result of the empirically proven principle of neuroplasticity" (Lommel, 2010: 224).

Lommel uses the ontology of panpsychism for the explanation of brain and mind problem and some concepts of quantum physics. He supposes that the holistic interpretation of the world, in which everything is connected and entangled, suits best the explanation of many phenomena of consciousness. Besides entanglement, Lommel uses another concept of quantum physics - nonlocality (placeless and timeless interconnectedness). He thinks that nonlocality and entanglement can explain an NDEr's experience of nonlocal instant connection with other people's consciousnesses as though by telepathy. As soon as NDErs thought about the past or present, and sometimes future, they got there instantly in their NDEs. NDErs sometimes preserve the unusual ability of telepathic communication after the NDE and even without their desire. Such ability is called heightened intuitive sensitivity.

Quantum is the smallest amount of energy. It is a subatomic level of particles where particles exist in a certain portion - "quantum", characterized by discontinuous interaction. Quanta have a complementary nature and can appear as waves or as particles. Due to their wave property, spatially separated particles are linked together (entangled) and can be fully described only as one whole. While measuring a wave a researcher chooses one of the probability waves, and his choice is called a collapse of wave function (also called collapse of the state vector or reduction of the wave packet). The collapse of wave function means that there is no probability left any more because the wave has already been chosen by the observer for measurement. The measurement depends on the observer himself because there is an entanglement between him, the particles he measures, and the device for measurement at the subatomic level. That is why some physicists are sure that it is the observation that creates reality. In other words, it is the process of

the man's observation that creates reality, or more exactly, it is his consciousness that determines what reality he experiences.

Such concepts of quantum physics as wave-particle complementarity, entanglement, nonlocality, probability waves, and an observer's influence on the particles during measurement helped to create the Quantum Holographic Theory of the world. However, this holographic theory will have worse explanatory possibility for NDEs than quantum concepts themselves as Lommel remarks (Lommel, 2010).

A holographic photo is a two-dimensional photo (made on the special film or photographic plate) in which it is not possible to see the image that we saw in reality. For example, we have taken a holographic photo of an apple with the help of a special device, but instead of the image of this apple, we can see only some lines encoding the image in the holographic photo. If the coherent laser light is directed at this film (or plate), a three-dimensional image is reproduced anywhere we like, and we see our apple. The holographic film can be cut into pieces, but each small piece will reproduce the image of the whole apple if the laser light is directed at it. The waves from the object interact and create an interference pattern, which stores the information about the object. This information is imprinted on the film (or photographic plate).

So here, we come across a crucial difference: the information is not stored in the air (field itself) like in quantum physics but in the film (field's physical medium). So the holographic explanation of the world will differ from the explanation of the world in quantum physics itself where the information is stored nonlocally as wave functions in nonlocal place, i.e. everywhere. This information is available anywhere at anytime and instantaneously (faster than the speed of light). When, for example, two particles as parts of the whole react dependently on each other, being far away from each other and instantaneously, a holographic theory seems to be not suitable for the explanation of a nonlocal connection of them (Lommel, 2010). In holography the information is stored in a holographic film and can be retrieved from it at any location with at most speed of light, but not faster.

The holographic world theory says that what we see is not how it is in reality. We simply see a three-dimensional image, which we have chosen to see. Here arise several questions: what constitutes a "holographic film" in our real life? What is a "device" for retrieving the image from the "holographic film"? Is it our brain, which works as a "device"? Who or what creates the real world to be seen later as a "holographic" image?

Though some concepts of holography can be useful for the explanation of the world by analogy as much as the concepts of quantum physics in general, it is doubtful that either of them can be taken literally for the explanation of consciousness.

Lommel's panpsychism is based on the following ideas. Nonlocal space could be called the absolute vacuum, which has no time, structure, and in this empty space

all elementary particles and basic constituents of matter do not exist separately but as one whole. This space has an infinite number of possibilities and can be the foundation for consciousness. Consciousness has “a primary presence in universe, and all matter possesses subjective properties or consciousness” (Lommel, 2010: 246). All matter, or any physical reality, is formed by nonlocal consciousness. Nonlocal consciousness fills nonlocal space. Physical systems have phenomenal properties at intrinsic level (nonlocal space), so they possess subjectivity (certain degree of consciousness).

The light behaves like a particle, and its speed ranges from zero to the speed of light, but it behaves also like a wave with the speed ranging from the speed of light to infinity. During the observation, the particle’s speed goes to zero and its corresponding phase speed is infinite. It is at that time that multidimensional nonlocal space reduces to our three-dimensional physical world, space and time. It is called a “wave function collapse”. It results in an instantaneous entanglement “with everything in universe, including nonlocal aspects of consciousness” (Lommel, 2010: 247).

Lommel supposes that information from different fields is transferred with the help of resonance (the vibration with the same frequency and phase). Such vibration exists even at the smallest subcellular level as electron spin resonance and nuclear magnetic resonance.

Lommel refers to the lab studies (Julsgaard et al., 2004; Matsukevich, Kuzmich, 2004; Chaneliere et al., 2005), which prove that there is the transfer of information between matter and light via the spin of electron and nuclear spin resonance based on nonlocal entanglement. The studies showed nonlocal therapeutic effect when morphine was placed between the brain and the pulsing magnetic source. The effect was similar to that when a patient took morphine directly into the body. Lommel thinks that besides the brain, perhaps, DNA (deoxyribonucleic acid) has the function of the interface in each cell in the process of nuclear spin resonance between the organism and nonlocal consciousness. Lommel considers that consciousness cannot be localized in any concrete place, either in the brain, or DNA or wherever else. Consciousness is nonlocal (it is everywhere) in the form of waves of probability, therefore consciousness cannot be measured or demonstrated in the physical world. He believes in continuity of consciousness, which exists independently of the body, due to its belonging to nonlocal space and quantum entanglement. Nonlocal consciousness is the source of our “waking consciousness” when people are aware of their thoughts, ideas, feelings. Lommel distinguishes different types of consciousness. The waking consciousness represents only a small part of nonlocal consciousness.

There have also been some attempts made by physicists to create the Unified Field Theory to explain the universe, which would include all known physical fundamental forces and elementary particles. However, the alliance of Einstein’s deterministic theory of relativity and nondeterministic quantum theory is problematic as Saul-Paul Sirag thinks (Sirag, 1985). If the measurement in quantum physics depends on the observer, there must be one observer to create a

unified theory in all the fields. And “what is an ultimate observer? Is it the apparatus on the physicist’s laboratory table? Is it the physicist’s eyes? His optic nerves? His brain? His consciousness?” asks Sirag. (Sirag, 1985, 329). The measurement in quantum physics is influenced by the apparatus and the observer himself because the subatomic particles of his body and of the apparatus interact with the subatomic particles which he measures. Sirag shows Wigner’s chain of influence during quantum measurement as follows: quantum system 1 is measured by measuring device 1 and quantum system 2 is created. Quantum system 2 is measured by a human eye, which influences the measurement of quantum system 2 and quantum system 3 is created. However, the eyesight relies on the brain, so it is the brain, which becomes the “observer” of quantum system 3, which creates quantum system 4. However, we must understand what we are doing, so quantum system 4 interacts with our consciousness and creates system 5. Could it be nonlocal consciousness, which would create quantum system 6? What is the ultimate observer involved in quantum measurement? Sirag supposes that the answer will be important for creating the Unified Field Theory.

There are different points of view among physicists whether quantum physics can be applied to living systems at all. Schrodinger, Bohr, and Bohm thought that it was not possible, and quantum physics could explain only non-living matter. Quantum physics demands coherent and closed systems, but a living system is an open system, and it exchanges information with the surroundings followed by heat loss, respiration, thus creating the loss of information or decoherence. The processes in the brain have more deterministic character, than probabilistic. The brain is a complex dynamic system consisting of 100,000,000,000 neurons and other cells. Complex systems are better to study in the framework of other sciences: synergetics, dynamics, thermodynamics.

However, other physicists and neuroscientists disagree and continue using quantum physics for the explanation. They say that a human choice presupposes the Zeno effect: if the man concentrates his attention on something, the wave function collapse takes place, and only one alternative will be fixed by the choice of the man. If you focus your attention on something, the brain keeps a certain pattern of neuronal activity as long as you concentrate your attention on it. The idea does not decay if you do not ignore it: it continues interacting with the brain. Keeping the idea in mind depends on your free will. By analogy, if a physicist observes quantum particles, they interact with the observer and do not decay or disappear.

John Beloff considers the attempts of the quantum explanation of consciousness and psi-phenomena to be absurd because mentality cannot be explained by physics, in principle, whatever new physical theory you may choose to use (Beloff, 1990a; Beloff, 1990b; Beloff, 1980; Beloff, 1988). He distinguishes two main groups of brain-mind theories based on quantum physics:

(1) communicational theories using the analogy with a radio, radar, or other forms of telecommunication (a brain is a radar);

(2) observational theories using a special interpretation of the quantum theory (the quantum theory speaks of the observer's inclusion into the experiment and influence upon the behaviour of subatomic particles unlike the classical physical theory, which forbids the inclusion and subjectivism of the observer; a special interpretation of the quantum theory presupposes that consciousness plays the main role).

(1) The key problem for the *communicational theories* is that if we try them on psi-phenomena, for example telepathy, they do not explain how the information is encoded by the first person, and how it is decoded by the second one. Physical explanation demands encoding and decoding in all processes of transmitting information (images, written sentences, and sounds). If someone wants to tell the other one about something, he has to write using symbols or to pronounce sounds. In both cases, both of them must know one common language. So it means that in the telepathic session the first person and the second person must know a common language and, in addition to it, a special code for encoding, transmitting and decoding their ideas. But they have never learnt this special code. Moreover, they can exchange meanings without knowing the common language. But it does not eliminate the need of a code known to both of them and a common language if we want to explain telepathy on the basis of physical laws.

Beloff points out that we cannot admit that both *A* and *B* were born with such knowledge of a code for each object, because new concepts or images have appeared recently, so such transmission of information cannot be explained in the framework of evolution and inborn knowledge. Before speaking about the energy of transmission the question of encoding must be solved. However, there seems to be no possibility of solving this problem with the help of physical explanation.

Then Beloff mentions another problem,: it is neuroplasticity. He says that thoughts are believed to leave neurophysiological traces in the brain. Some even hope to find a neurophysiological trace in the brain for each thought and create a clever apparatus on this principle after mapping all the traces. They think that, perhaps, it is neurophysiological traces that are transmitted in telepathy. Such transmission could be possible to explain by physics because consciousness in this case could be dismissed. However, one should refuse from this idea at the very beginning because of neuroplasticity and other principles of brain work.

When you thought about someone or something yesterday, for example about Mr. Pitt, you had a certain neuronal pattern in the brain. However, it does not mean that tomorrow the same neuronal pattern will be activated when you think about Mr. Pitt again: perhaps, you have known something bad or good about him since that time, and your knowledge and new emotions will activate a neuronal pattern quite different from the previous one when you start thinking about Mr. Pitt. Besides, the neuronal pattern in the brains of Mr.X and Mr.Y will never coincide when they think about Mr. Pitt.

Beloff says that it is a waste of time for physicists to search for the explanation of telepathy in this direction (Beloff, 1990a). Physicists discuss different topics concerning a radar (distance, time), but they do not discuss the main problem which is encoding.

(2) The key problem for the *observational theories* is that they introduce mentality, which interferes in the experiment as a force capable of changing the state of physical subatomic particles. Beloff calls the observational theories dualistic in disguise: mental substance influences material substance. The observational theories introduce mental concepts, which disqualify them as theories of physics (Beloff, 1990a). The physical explanation cannot but use physical terms and categories: space, mass, energy, measurement, mathematics, physical formulae. If the explanation does not do it and instead of it appeals to consciousness, which cannot be measured, seen, weighed or described with the help of formulae and categories of physics, classical or quantum, this explanation is not within the framework of physics because it deals with intuitive understanding of consciousness but not with the physical description. It simply re-describes something in other terms taken from physics in an abstract way without the confirmation by physical formulae and measurement (Beloff, 1990a; Beloff, 1980). If mental operations are discussed in the terms of information theory, it does not mean that the mind works according to the laws of physics (Beloff, 1990a). However, the “mental functions” of the computer are truly based on the physical laws and information theory. Information theory is part of applied mathematics and it does not explain the mind-brain mechanisms or consciousness (Beloff, 1990a). Psi-phenomena (telekinesis, psychic photography, mental healing, teleportation, materialization, etc.) can be seen in the physical world unlike normal processes of thinking, so physicists and parapsychologists have turned to quantum physics hoping that it will give them the physical explanation of mental processes in the end.

The most popular brain and mind theories among physicists proved to be the observational theory because it gives a chance to show that a man with paranormal abilities can produce an influence upon the physical world and because, for example, telepathy takes place instantaneously, and the quantum theory explains it as an instantaneous collapse of wave function due to the observer’s attention. Beloff is sure that quantum physics, nevertheless, cannot clarify the situation with psi-phenomena because of the above-mentioned unsolvable problems of communicational theories and doubtful application of quantum physics in observational theories. Beloff means a logical problem in the observational theory, i.e. a causal loop. According to quantum physics, the observer produces an influence upon the object. A man with paranormal abilities can do strange things with objects, and it is his psi-influence during the observation. However, on the other hand, it is the moment when he becomes aware of what he knows that counts as the moment of truth. So we understand that we can produce the influence upon the object only *after* seeing our result and our score in the tests because it is our

understanding (consciousness) that creates reality. Thus, we have a causal loop: the influence of my consciousness comes after the observation of the object. Beloff insists that the only logical explanation of brain-mind problem is *radical dualism* (dualism of substances) because the domain of mind is radically different from that of matter.

In this chapter, I have tried to present a core argument among neuroscientists and some contending mind-brain hypotheses. I have done it to show that there is no ultimate true knowledge about brain and mind in neuroscience at present. Neuroscience can also tell lies like social sciences.

Perhaps, we consist of two substances, which demand equal respect and have their own laws of existence. However, the construction of socio-politico-economic system in the nation-states is based on the materialist understanding of a human being.

Bibliography

Atwater, P.M.H. (2007) *The Big Book of Near-Death Experiences. The Ultimate Guide to What Happens When We Die*, Charlottesville, VA, Hampton Roads Publishing Company, Inc.

Beauregard, M., O'Leary, D. (2007) *The Spiritual Brain: A Neuroscientist's Case for the Existence of the Soul*, New York, HarperOne.

Beloff, J. (1980) "Could There Be a Physical Explanation for Psi?" in *Journal of the Society for Psychical Research* 50: 263-272.

Beloff, J. (1988) "Parapsychology and Physics: Can They Be Reconciled?" in *Theoretical Parapsychology*, Vol. 6: 23-29.

Beloff, J. (1990a) "Could There Be a Physical Explanation for Psi?" retrieved 06.06.2012, <http://www.newdualism.org/sites/moebius.psy.ed.ac.uk-dualism/papers/physical.html>.

Beloff, J. (1990b) "Parapsychology and Radical Dualism" in *The Relentless Question*, McFarland & Company.

Chaneliere, T., Matsukevich, D.N., Jenkins, S.D., Lan, S.-Y., Kennedy, T.A.B., Kuzmich, A. (2005) "Storage and Retrieval of Single Photons Transmitted Between Remote Quantum Memories," in *Nature*, 2005, 480: 833-36.

Damasio, A. (2006) *Descartes' Error*, London, Vintage.

Findlay, J.C., (2008) "Immunity at Risk and Art Therapy" in Noah Hass-Cohen and Richard Carr (eds.) *Art Therapy and Clinical Neuroscience*, London and Philadelphia, Jessica Kingsley Publishers: 207-222.

Galbraith, A., Subrin, R., Ross, D. (2008) "Alzheimer's Disease: Art, Creativity and the Brain" in Noah Hass-Cohen and Richard Carr (eds.) *Art Therapy and Clinical Neuroscience*, London and Philadelphia, Jessica Kingsley Publishers: 254-269.

- Holden, J.M., (2009) “Verdical Perception in Near-Death Experiences” in Janice Miner Holden, Bruce Greyson, and Debbie James (eds.) *The Handbook of Near-Death Experiences. Thirty Years of Investigation*, Oxford, England, Praeger Publishers: 185-211.
- Holden, J.M., Greyson, B., James, D. (2009) “The Field of Near-Death Studies: Past, Present, and Future” in Janice Miner Holden, Bruce Greyson, and Debbie James (eds.) *The Handbook of Near-Death Experiences. Thirty Years of Investigation*, Oxford, England, Praeger Publishers: 1-40.
- Jones, J.W. (2005) “Brain, Mind, and Spirit – A Clinician’s Perspective, or Why I am Not Afraid of Dualism” in Kelly Bulkeley (ed.) *Soul, Psyche, Brain. New Directions in the Study of Religion and Brain-Mind Science*, Palgrave Macmillan, New York: 36-60.
- Julsgaard, B., Sherson, J., Cirac, J.I., Fiurasek, J., Polzik, E. (2004) “Experimental Demonstration of Quantum Memory for Light” in *Nature*, 432: 482-85.
- Lewin, R. (1980) “Is Your Brain Really Necessary?” in *Science*, Vol. 210: 1232-1234.
- Lommel, P. (2010) *Consciousness Beyond Life. The Science of the Near-Death Experience*, New York, HaperOne.
- Matsukevich, D.N., Kuzmich, A. (2004) “Quantum State Transfer Between Matter and Light,” in *Science*, 306: 663-66.
- Moody, R. (2005) *The Light Beyond*, London, Rider Books.
- Mulkay, M. (1983) *Science and the Sociology of Knowledge*, London, George Allen & Unwin.
- Murphy, N. (1999) “Downward Causation and Why the Mental Matters” in *CTNS Bulletin*, 19/1: 13-21.
- Murphy, N. (2009) “Introduction and Overview” in N. Murphy, G.F. Ellis, and T. O’Connor (eds.) *Downward Causation and the Neurobiology of Free Will*, Berlin, Heidelberg, Springer: 1-28.
- Newberg, A., Waldman, M. (2009) *How God Changes Your Brain*, New York, Ballantine Books.
- Penfield, W. (1975) *The Mystery of the Mind. A Critical Study of Consciousness and the Human Brain*, Princeton University Press.
- Schwartz, J. (1999) “A Role for Volition in the Generation of New Brain Circuitry” in *Journal of Consciousness Studies*, 6: 115-142.
- Schwartz, J.M., Begley, S. (2002) *The Mind and the Brain: Neuroplasticity and the Power of Mental Force*, New York, Regan Books.
- Searle, J.R. (1998) *The Mystery of Consciousness*, London, Granta Books.

Sirag, S-P. (1985) "A Discrete Approach to Unified Field Theory" in *Proceedings of the 1st Annual Western Regional ANPA Meetings*, Stanford University, Alternative Natural Philosophy Association.

Sperry, R. (1983) *Science and Moral Priority: Merging, Mind, Brain and Human Values*, New York, Columbia University Press.

Szasz, T. (1996) *The Meaning of Mind: Language, Morality, and Neuroscience*, London, Praeger.