

Penetration in the Nature of the Brain Mental Activity

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Abstract:

The brain is a unique organization in nature, having the psychic activity, which is expressed in subjective states: thoughts, feelings, emotions. Knowledge of the nature of mental activity of the brain is the most urgent and the most challenging task of physiology. Historically the neurophysiology developed on the basis of physical and chemical laws discovered in an inanimate nature. Our investigation is devoted towards the origin of a human subjective state, and presents a methodology for studying of the nature psychic brain activity (E.A. Yumatov, 2014, 2017). We have established the existence of physical phenomena unique for the living brain so-called "Psychogenic field", which reflects the psychic state of human brain. The subjective state of a human being was shown to affect remotely the physicochemical properties of the blood. The interaction of neurophysiological and psychic processes is described in the context of systemic organization of a wakefulness and sleep. An original schematic diagram is presented to describe the formation of the brain psychic activity. This approach is based on the feedback influence of a psychogenic field on neuronal molecular processes (self-induction in the brain). We propose a paradigm for the origin of psychic state and possible existence of the fields, which are unique for the brain. The presented scheme and paradigm of systemic organization of psychic activity of the brain are a prerequisite for the subsequent development of the theory consciousness.

1. **Keywords:** Brain; Consciousness; Mentality; Paradigm of a Subjective State Origin; Psychogenic Field; Subjective State

2. Introduction:

The brain is a unique organization in nature, having the psychic activity, which is expressed in thoughts, feelings, emotions, i.e. in the subjective perception of the man himself and the world.

Knowledge of the nature of psychic activity of the brain is the most urgent and the most challenging task of physiology [1-10]. There is a huge gap between the knowledge of the neurophysiology of the brain and the ideas of his the psychic functions [4,5,7]. Many prominent scientists have pointed to no attention to this fundamental issue, and the takeaway from the scope of its research activities [9,10]. The optimistic view about the possibility of mental

activity of the brain cognition expressed I.P. Pavlov (1951), R.W. Sperry (1952), P.K. Anokhin (1968), N.P. Bechtereva (1990), K.V. Sudakov (2010), [1,2,6,8,10]. Modern neurophysiological methods, based on the laws of physics and chemistry, discovered in inanimate nature, do not in themselves make it possible to reveal the nature of the psychic functions of the brain. In all neurophysiological studies, we see only the «outer, tip of the iceberg, the lower, the underwater part» characterizing the mental activity of the brain, remain outside the field of view of researchers, as though it does not exist [11-16]. This explains the “Dip” between the understanding of the psychic and neurophysiological phenomena in the brain, which indicates T. Nagel [5]. In vivo and in particular in the brain may occur such phenomena and physical processes which in principle is not, and can not be inanimate nature. The origins of mental activity are the fundamental properties of the living brain, which is a special form of matter, which has its own physical laws and the specific field [11-14]. In our research, we have proposed a fundamentally new approach to the study of the nature of the psychic activity of the brain. In this case we start from a methodological principle formulated by us, that “Mental processes can directly register and study only with the help and participation of the living structures” [11-14]. For the first time demonstrated the existence of “Psychogenic field”, reflecting the mental activity of the human brain. It presents a paradigm that considers the origin of mental activity and the possibility of the existence of unique to the living brain of the physical phenomena and fields, and also schematic diagram of the formation of the subjective state of the brain based on the reverse influence of psychogenic field on the neural molecular processes [11,13,14].

The psychic activity is a phenomenon, function, state of brain, which, we think, emerges in the interaction of structural and molecular (neurophysiologic) and field processes in a living brain. The relationship between the neurophysiological and subjective spheres of the brain activity is carried out in the field form [11-14]. Undoubtedly, without the knowledge of the origin of mental activity ideas about the brain are extremely limited, and very far from the truth. The theory of functional systems developed by P.K. Anokhin [17] and many other researchers’ points at the main

mechanisms in the brain activity, which may be associated with origin of emotions and thinking. However, the central architecture of a behavioral act reflects only neurophysiologic component and fails to represent the organization of the subjective processes. System organization neurophysiological and mental activity of the brain (**Figure 1**) has two interconnected and united in a single whole subsystem: neurophysiological and mental [11-14]. Structural and functional neurophysiological components of the system can not carry out their productive activities without the participation of the psychic sphere, as well as mental activity is based on the neurophysiological processes. Neurophysiological layer is the foundation for the perception of the environment and the internal state of the body; for the implementation of various forms of behavior and the regulation of function of the body.

All processes in the brain start at the neurophysiologic level and then develop on the subjective level. At the first stage, the afferential synthesis goes on the neurophysiologic level, and then the process of analysis and interpretation continues on the subjective level “Subjective synthesis”, including the sensation of attraction (motivation), situational assessment, memorization and recall. The process is finished by decision-making and goal setting made on the subjective level. At the neurophysiological level, there is the perception of sensory excitation flows from the senses, generated biological motivation, memory components related to storage of information, efferent, team programs, controlling movement, behavior and autonomic reactions occur reflex reactions, automated behavioral acts, due to previously existing pre-launch integration, there is evaluation of results. At the neurophysiologic level, the tailored reflex reaction and automatic behavioral acts are performed due to preoperational integration, which is formed earlier. In these cases, the behavioral choice takes place without the participation of consciousness.

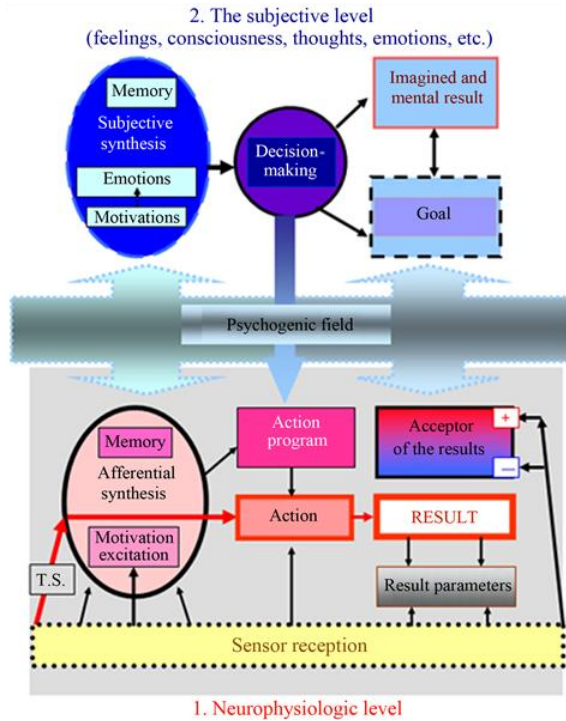


Figure 1: Scheme of the system organization neurophysiological (by PK Anokhin) and mental activity of the brain during wakefulness. Ps: Start-up incentive, OBS. AFF: Situational afferentation, Arr. AFF: Reverse afferent impulses.

On the mental level, there is judgment of all incoming information the brain, forming social motivation, is initiated extract the necessary information from the memory, there is the goal, and there are all the psychological symptoms, such as consciousness, thinking, emotions, etc. Main psychic brain functions: free will, goal setting, choice of behavior, thought, imagine, and the results of evaluation of achievement occur on a subjective conscious level.

The development of the processes in the brain may follow two ways. In one case, the subjective synthesis finishes with the acceptance of an imagined mental result in the framework of subjective mental functional system. In the other case, the decision about the goal-seeking behavior and goal-setting returns the processes from the subjective sphere to neurophysiologic level to formulate the program of result-oriented behavior and action results acceptors, in which the parameters of the future result, is prognoses in accordance with the set goal. If the prognoses and achieved results match, the process is

stopped and a new stage of goal-seeking behavior without the participation of subjective level of the functional system is started. If the prognoses and achieved results no match, the result acceptor initiates a “Mismatch” or “Surprise” reaction. The process goes to the subjective level where negative or positive emotion is generated depending upon the failure or no-failure to achieve the goal. The positive emotion produces satisfaction and fixation finishing a specific behavioral act. The negative emotion mobilizes the process of subjective synthesis to search another more appropriate decision that will allow achieving the goal.

The emotions are the means of memory fixation of the whole bunch of factors promoting or hindering achieving the goal. At the neurophysiologic level, new emotions are transformed into emotional reactions of the body. The behavior is oriented along the common vector from a negative reaction to a positive one. The emotional reactions are formed in the neurophysiologic part of the functional system, while the emotions and thoughts are produced in the subjective part. Memory has the following two components: the neurophysiological component, and the subjective component. The process of memorization occurs at the neurophysiological level, which involves subjective activity of the brain. The process of data storage in memory proceeds at the neurophysiological level with no involvement of subjective perception. Reminiscence and information retrieval from memory always involve subjective (intellectual) activity of the brain. In essence, modern studies of memory are limited to the neurophysiological mechanisms. The mechanisms of memory cannot be evaluated without studying the subjective sphere. Hence, the process of information retrieval from memory is yet unknown.

3. Conclusion

All of the modern ideas about the origin of sleep and wakefulness are based only on the study of neurophysiological processes, without taking into account the psychic activity of the brain, that are still poorly understood. Despite the calls of outstanding scientists: I.P. Pavlov (1951), R.W. Sperry (1952), P.K. Anokhin (1968), N.P. Bechtereva (1990), K.V. Sudakov (2010), [1,3,6,8,10] to explore the of the brain psychic activity, it has been by itself beyond

scientific studies [5,9]. Unfortunately, many scientists have a skeptical attitude to research the psychic activity of the brain, which they consider outside of objective scientific research, whatever it reality exists. Undoubtedly, without the knowledge the origin of psychic activity, ideas about the brain are extremely limited, and very far from the truth. In our research, we have proposed a fundamentally new approach to the study of the nature of psychic activity of the brain, based on the methodological principle of “Psychic processes can directly register and study only with the help and participation of living structures”, and we introduced the concept and paradigm of systemic organization of the brain mental activity [11-14]. Disclose the natures of the brain psychic activity can only theory that unifies neurophysiological and mental activity of the brain [14].

4. Acknowledgment

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