

THE MAIN HISTORICAL STAGES OF THE EVOLUTIONARY DEVELOPMENT OF THE PSYCHE

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ANNOTATION

The psyche arose at a certain stage of the development of the organic world, as a mechanism of active interaction of living beings with the environment.

The psyche is a special property of highly organized matter to subjectively reflect objective reality, which is necessary for humans and animals to orient themselves in the outside world and actively interact with it, and at the human level it is necessary to control their behavior.

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1. Characteristics of the properties of living beings: irritability, self-regulation and sensitivity. The problem of the origin, i.e. genesis, of the psyche and the problem of its development are closely related. Therefore, the general approach to the process of mental development is characterized by the peculiarities of the theoretical resolution of the issue of the emergence of the psyche.

As you know, there are a number of attempts to solve this problem in principle. First of all, this is a point of view, called "anthropopsychism", in the history of philosophical thought associated with the name of R. Descartes. Its essence is that the emergence of the psyche is associated with the appearance of a person, the psyche exists only in humans. Thus, the entire prehistory of the human psyche is crossed out altogether. Adherents of this point of view are also found at the present time. Another, opposite theory is called the doctrine of panpsychism, i.e., the universal spirituality of nature. Between these opposing views, there are intermediate views, the most popular, primarily biopsychism. The essence of biopsychism lies in the fact that the psyche is recognized as a property not of any matter in general, but only of living matter.

There is another way to solve this problem: the psyche is recognized as a property of not every living matter, but only of such organisms that have a nervous system. This point of view is called the concept of neuropsychism.

Materialistic psychology cannot accept any of these concepts unconditionally. Scientific psychology proceeds from completely different positions and sets itself the task of approaching the answer to the question of the origin of the psyche, describing the conditions as a result of which this most complex form of life should have appeared. It is known that the main condition for the appearance of life is the emergence of complex protein molecules that cannot exist without constant metabolism with the environment. For their survival, they must assimilate (assimilate) from the environment those substances that are the subject of nutrition and are necessary to maintain their life; at the same time, they must release decay products into the external environment, the assimilation of which can disrupt their normal existence. Both of these processes — assimilation and dissimilation — are components of metabolism and are the main condition for the existence of complex protein formations.

Naturally, these complex protein molecules (coacervates) have special properties that allow them to respond to the effects of useful substances or those conditions that promote the assimilation of these substances, and to harmful effects that threaten their continued existence. For example, these molecules react positively not only to nutrients, but also to light, heat, which promote assimilation. They react negatively to super-strong influences - mechanical or chemical, which interfere with their normal existence. They do not react to neutral influences that are not part of the metabolic process.

The property of coacervates to react to the effects included in the metabolic process, leaving indifferent effects unanswered, is called irritability and manifests itself during the transition from inorganic matter to organic. Consequently, the following conclusion can be drawn: every living organism selectively (actively) treats all external stimuli, thereby revealing a qualitatively new property of living matter - self-regulation. Irritability is the simplest form of biological reflection, it is possessed by all living organisms at all stages of the evolution of plant and animal forms. This is the ability of a living organism to respond to the effects of biologically significant (biotic) influences. Thus, already during the transition to the organic world, a qualitatively new form of reflection arises, being, however, higher not at all in the sense of greater accuracy, if we talk, for example, about reflection in a mirror, compared with reflection in water. The development of reflection during the transition to living matter is expressed in the fact that initially it just loses the character of a direct imprint, characteristic in some cases of reflection in the inorganic world. But it also loses its passive random character and for the first time becomes a necessary condition for the very existence of the body.

The processes of irritability in relation to vital influences, the development of highly specialized forms of irritability and their preservation with transmission to subsequent generations characterize the stage of development of life, which is usually designated as plant life. Phenomena such as the growth of the plant root into the depth of the soil, or the uneven growth of the trunk depending on the illumination, or the rotation of the plant in the direction of sunlight — all this is the result of the phenomena of irritability to biotic influences. One important circumstance is essential for plant life. Plants that react with enhanced metabolism to biotic influences do not "notice" extraneous influences in the process of direct metabolism. They are not actively oriented in the environment and can, for example, die from lack of light or moisture, even if light or moisture sources exist very close, but do not directly affect it.

The forms of existence at the next stage of evolution — the stage of animal life - differ sharply from this passive form of vital activity. A.N. Leontiev hypothesized that sensitivity, as a rudimentary form of mental reflection, arises during the development of simple irritability, when it is suitable for any, even the simplest, viable body. According to the hypothesis of A.N. Leontiev, characteristic of every animal organism, starting with the simplest, is the basic fact that the animal reacts not only to biologically significant effects directly entering the metabolism, but also to "neutral", biologically insignificant, if only they signal the appearance of vital effects. In other words, animals, even the simplest, actively navigate the environment, look for vital conditions and react to all kinds of environmental changes. This ability to respond to neutral, biologically insignificant stimuli, provided that they signal the appearance of vital influences, is called sensitivity. The appearance of sensitivity, according to the hypothesis of A.N. Leontiev, can serve as an objective biological sign of the emergence of the psyche.

Sensitivity to neutral stimuli, if they begin to signal the appearance of vital influences, causes fundamental changes in life forms. The main thing is that a living being begins to actively navigate in the environment, actively react to every change that occurs in it, i.e. begins to develop individually changeable behaviors in contrast to the plant world.

At first, the development of such individually changing behavior occurs relatively slowly, however, despite this, it can be observed even in experimental conditions (for example, an experiment conducted by the German scientist Bramstedt), when unicellular cells are sensitive to heat, but not sensitive to light. Therefore, if they are placed in a uniformly heated chamber, part of which is illuminated, while the other part is darkened, they will be evenly distributed throughout the chamber. If, on the contrary, one side of a uniformly illuminated chamber is heated, they concentrate at the heated end of the chamber. However, if the heated end of the chamber is illuminated for a long time and the non-heated one is darkened, the situation changes, and unicellular cells become sensitive to light, which now acquires for them the value of a signal for an increase in temperature. The individual behavior of protozoa, which sharply distinguishes them from plants, changes relatively slowly, and the resulting changes also slowly disappear.

The described processes of irritability in relation to biotic influences, sensitivity, and in relation to neutral stimuli signaling the appearance of vital influences and the elementary preservation of traces are sufficient to maintain the life of unicellular animals, but they are not enough with the transition to multicellular.

The transition to multicellular significantly complicates the conditions of existence: the role of active orientation in the external environment increases, it becomes necessary to provide more complex movements and faster conduction of excitation. This leads to a significant complication of the structure of the multicellular body, the isolation of specialized irritation reception cells and the appearance of the first contractile cells carrying the same function as muscle cells at further stages of evolution, as well as to the formation of an elementary nervous system, which has the character of a diffuse, network-like nervous system.

The simplest neural networks, or arcs (according to Sherrington), involved in unconditioned reflexes, are closed in the segmental apparatus of the spinal cord, but they can also be closed higher (for example, in the subcortical ganglia or in the cortex). Other parts of the nervous system are also involved in reflexes: brain stem, cerebellum, cerebral cortex.

Arches of unconditioned reflexes are formed at the time of birth and persist throughout life. However, they can change under the influence of the disease. Many unconditional reflexes manifest themselves only at a certain age; thus, the grasping reflex characteristic of newborns fades away at the age of 3-4 months.

There are monosynaptic (involving the transmission of impulses to a command neuron through one synaptic transmission) and polysynaptic (involving the transmission of impulses through chains of neurons) reflexes.

Simple unconditional reflexes

Reflexes are strictly natural responses of an animal to external stimuli, performed with the help of neuromuscular mechanisms fixed in the process of phylogenesis. Examples of them can be: food reflex, orientation reflex (turning towards a sudden stimulus), protective reflex (rebounding), etc.

Unconditional reflexes were fixed in the behavior of the animal due to the fact that they turned out to be useful for its vital activity and the preservation of the species, turning into an innate form of behavior in which movements performed by animals are performed in a strictly defined way in response to external irritation.

The peculiarity of these reflexes is the firmly established and fixed connection of movement with external irritation: a) they are always performed as a direct response to external irritation; until this irritation occurs, the corresponding neuromuscular and secretory apparatus of the animal remain inactive; b) upon the onset of irritation, the nature of the response movement, its strength and the orientation is in full accordance with the characteristics of irritation.

In the process of phylogeny, along with the complication of the structure of the organism of animals, during the transition from one species to another, more perfect, their reflexes develop and improve.

Unconditional reflexes play an initial, but very important role in the phylogeny of animal behavior and psyche. At this stage:

- 1) the motor apparatus is being improved;
- 2) gradually develops the ability of the animal to respond differentially to external stimuli;
- 3) at the same time, the organs of reception — sense of smell, sight, hearing, touch, etc., are developing, allowing the animal to more accurately differentiate external stimuli;
- 4) the psyche is still emerging in the form of elementary, unrelated simplest sensations reflecting isolated stimuli (the animal reacts to sound, light, smell, etc.).

Neural organization of the simplest reflex

The simplest reflex of vertebrates is considered to be monosynaptic. If the spinal reflex arc is formed by two neurons, then the first of them is represented by a spinal ganglion cell, and the second by a motor cell (motor neuron) of the anterior horn of the spinal cord. The long dendrite of the spinal ganglion goes to the periphery, forming a sensitive fiber of a nerve trunk, and ends with a receptor. The axon of the spinal ganglion neuron is part of the posterior spine of the spinal cord, reaches the motor neuron of the anterior horn and connects to the body of the neuron or one of its dendrites through a synapse. The axon of the anterior horn motor neuron is part of the anterior root, then the corresponding motor nerve and ends with a motor plaque in the muscle.

There are no pure monosynaptic reflexes. Even the knee reflex, which is a classic example of a monosynaptic reflex, is polysynaptic, since the sensitive neuron not only switches to the motor neuron of the extensor muscle, but also gives the axonal collateral, which switches to the insertion inhibitory neuron of the antagonist muscle, the flexor.

At the stages of elementary sensory and perceptual psyche, animals actively implement such a type of innate behavior as instinct. Instincts are complex acts of behavior aimed at satisfying biological needs and based on unconditional reflexes. In fact, these are systems of unconditional innate reflexes. Basic instincts: nutrition, self-preservation, procreation, etc. Instinctive behavior is, in fact, the specific behavior of animals. Instincts are characterized by relative constancy, uniformity of manifestation in animals of the same species. Thus, it was noted that wild birds bred in an incubator built nests the way birds of this species usually build nests. Instinctive behavior is the life-sustaining behavior of many species of insects and animals, sometimes its complexity is close to reasonable. For example, honey bees build jewel-like wax

honeycombs; tropical ants build their nests by tying them with silk threads; wasps dig underground nests and deliver prey there, etc. However, instinct is an expedient form of behavior under strictly defined conditions. When conditions change, instincts often remain, but their meaning is lost. For example: bees continue to fill damaged honeycombs with honey; ants, reacting to someone else's smell, destroy their offspring and each other (although the smell may not be a danger signal). The Latin American animal, the skunk, defends itself by secreting a specific-smelling liquid with the musk gland, the smell of which no pursuer is able to endure. At first, the Moscow Zoo could not work with this animal, they were forced to remove the musk gland. After that, the skunk became an easy prey for dogs, because he continued to rely on his "defensive organ".

It is established that the program of instinctive actions is caused by initial signals. For example, for a frog it is flickering, for a puppy and a monkey it is wool, for a lamb it is darkening of the crown.

P.V. Simonov in 1986 proposed an original classification of instincts as the most complex unconditional reflexes that make up the need-emotional basis of behavior.

Vital (food, drinking, sleep regulation, defensive and others) instincts are characterized by the fact that they do not require the participation of another individual, and their violation leads to the death of the animal. The parameters of external objects involved in the implementation of instinctive behavior by an animal leave a noticeable imprint on the nature of this behavior. For example, cats lie in wait for prey and overtake it with a jump - ambush behavior, and dogs chase, catch up with prey - attacking behavior. Sometimes the instinctive behavior of this species resembles a reasonable one. For example, a sea otter lies on its back in the water, puts a flat stone on its chest and opens the shells of mollusks, hitting them against this stone; Defensive behavior, having an innate character, can change depending on specific conditions: for example, in a rat cornered, running away is replaced by aggressiveness. It is important to note that in general there is no aggressiveness in animals for the sake of aggressiveness itself. The offensive behavior of animals is based on either the need for self-preservation, or the struggle for territory, for a female, for offspring.

Role instincts (sexual, parental, territorial) arise when interacting with other individuals. They are characterized by the phenomena of "empathy" and the formation of a group hierarchy. They are demonstrated in courtship behavior, in reproductive behavior. Moreover, as a rule, such behavior in females is more difficult than in males. This is especially true of parental behavior, which includes close contact with the cub and its protection. The group life of animals has obvious advantages in the survival of the species. The organization of many communities is based on two main factors - dominance and territoriality. These factors have a very important biological justification: the female will choose the strongest male who will provide healthy offspring and will own the best territory - which is important in order to feed the offspring. According to P.V. Simonov, primitive human society, most likely, was also not a society of equals - the factors of dominance and territoriality lay at the heart of its organization.

The instincts of self-development are a manifestation of a variety of search and research behavior; This behavior is directed to the future, it is not derived from other needs, but is prompted by an independent need for information. Expressive actions of a curious animal cause emotion and a smile, reminding similar human actions. This behavior is the most important act

of mastering the environment and proves that normal life activity requires a continuous flow of not only energy, but also information from the external environment. Regulation of research behavior is carried out with the participation of emotions: positive emotions serve as a factor of satisfaction of research needs, negative emotions serve as a factor of behavior restructuring. Imitative (imitation) instincts underlie the transfer of experience, serve the development of species behavior by young individuals, as well as the preservation of the species.

Gaming instincts - gaming activity is hereditary for all animal species, anticipating a variety of adult behavior that serves to satisfy needs and survival.

It should be remembered that these types of instinctive behavior are based on innate needs, but at the same time they are implemented taking into account the individual experience of each individual. Therefore, they appear in complex forms combining instinctive and acquired behavior.

A.I. Karamyan, I.V. Malyukova, generalizing the idea of the development of the brain support of animal behavior, divide the evolutionary path into five critical stages:

the first stage is represented by animals with weak differentiation of the brain (craneless and round-mouthed);

the second stage is represented by animals with insufficiently developed structures of the thalamus (plate-gill - rays, sharks), conditioned reflexes are developed, but they differ in fragility, persist for several days;

at the third stage, nervous activity becomes more complicated, but it is still characterized by weakness of nervous processes, imperfection of memory, lack of ability to predict (reptiles);

the fourth stage is represented by lower mammals (insectivores) - they are capable of forming complex sequential behavioral acts, for the first time in the evolution of vertebrates, they have the property of forecasting (albeit in a weak form). But their higher nervous activity is quite primitive: it is characterized by the weakness of tentative research reactions, the difficulty of forming intersensory connections, the inertia of nervous processes;

the fifth, highest stage is represented by primates. Their brains are organized as a single integrative system that allows them to form complex behaviors. This raises primates to a high degree of the evolutionary ladder - the level of intelligence.

The ratio of innate and acquired in animal behavior is of considerable interest to researchers. A curious phenomenon called imprinting (imprinting). It was described by Konrad Lorenz, who studied goslings bred in an incubator. He became the first moving object for the newly hatched goslings, and they obediently followed him as their mother. Moreover, after reaching puberty, geese were looking for mating partners among humans, without reacting to their relatives in any way. Experiments have revealed a similar strong attachment to any moving object seen first. He became a model with which the goslings built their behavior. Imprinting has been found mainly in brood birds, in some fish and mammals. In monkeys, imprinting occurs much later and is more pronounced. In a child, imprinting, as a manifestation of social ties, is established very early and has a very deep character.

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