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## EIDETIC IMAGE FROM THE PERSPECTIVE OF SYSTEMS PSYCHOLOGY<sup>1</sup>

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The article is devoted to the consideration of the mechanisms of the emergence of the eidetic image from the standpoint of system psychology, which allows us to offer a scientific interpretation of various forms and phenomena of eidetism based on a single theoretical basis. The purpose of the study is to describe the systemic unity of the formation of eidetic images under various conditions.

From the point of view of systems psychology, an eidetic image is a holistic and stable image of perception or representation held in memory. This phenomenon should be considered as an information system with fixed, non-changing connections, the main difference of which is significantly greater than in the corresponding population norm, the saturation of the elements that make up this system (image). The emergence of an eidetic image is associated with a combination of various individual and personal characteristics, from the psychophysiological characteristics of the body, to the motivation and development of the emotional and volitional sphere of a person.

A system-psychological analysis allows us to identify the following conditions for the formation of eidetic ability. The emergence of eidetic perception in childhood is caused by optimal development of the neurophysiological substrate of the psyche; less than an adult's ability to form significant systemic connections in the formation of the image of perception; emotional lability of the child and the simplicity of developing an affective reaction in him to a relatively weak stimulus. The eidetism of a creatively gifted person is caused by the presence of innate extraordinary versatile and ingentive abilities; high index of social types of development motivation; experience of special emotional states when producing a creative product. The emergence of eidetism in mental illnesses is a consequence of a flash-like increase in the electrical activity of vast areas of the cortex and subcortical structures of the brain, providing a short-term generation of more nerve connections than it occurs during the normal brain operation.

The formation of quasi-aesthetic images is the result of chemical exposure. The interpretation of eidetism from the point of view of systems psychology opens up a new perspective for understanding this important psychological phenomenon, and also opens up additional opportunities for explaining main problems of developmental psychology and pathopsychology.

*Keywords:* systems psychology; system-psychological approach; eidetic image; quasi-eidetic image; eidetism phenomenon; eidetic perception; eidetic memory; emotional excitability; tension.

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## Introduction

The doctrine of eidetism, which emerged as an independent psychological direction in the 20s of the last century in Germany, was originally designed to solve narrowly focused experimental questions in the field of visual perception. The material obtained in the course of studying eidetism caused a wide response among foreign and domestic researchers, opening up new opportunities for explaining the main problems of developmental psychology, psychophysiology and pathopsychology. A special place was occupied by the study of eidetic phenomena in childhood and the consideration of eidetism as a stage of memory development. The state of the theory of eidetic images developed by E. Jaensch were considered within the framework of various psychological directions both by foreign researchers (G. Allport, H. Kluver, R. N. Haber, B. L. Schwartz, etc.) and by domestic researchers (L. S. Vygotsky, P. P. Blonsky, A. R. Luria, P. L. Zagorovsky, etc.).

The lack of methodological tools did not allow traditional psychological approaches to reveal the mechanism of formation of the eidetic image. In this regard, an important role is played by the use of new explanatory principles that allow us to identify the essence of this phenomenon. One of the leading areas of this kind of research can be the study of eidetism, based on the principles of modern system psychology. A consistent systematic interpretation of eidetic phenomena is able to arrange the research experience accumulated in various psychological schools, showing the systemic unity of the appearance of eidetic images under different conditions.

## Experience in the study of eidetic phenomena

The history of the study of eidetic phenomena dates back to the discovery of subjective-optical images by V. Urbantschitsch in 1907. In his publications, he pointed out the existence

of “intuitive images” different from ordinary representations<sup>2</sup>. Discussing cases from practice, V. Urbantschitsch considered that such images are characterized by great accuracy, similar to the accuracy of hallucinations. Attempts at theoretical justification the nature of subjective-optical images at that time did not give significant results. A. Bine interpreted visual images exclusively as representations of a specific character, standing close to thinking<sup>3</sup>.

In 1911 E. Jaensch, together with his colleagues, began an experimental study of optical images [18]. In the early 1920-s, representatives of the Marburg School of Psychology formulated the theory of eidetic images, calling eidetics the study of subjective visual images. E. Jaensch described eidetism as the ability “literally to see the object shown again, or only immediately after seeing it, or also after a long period of time” (cit. according to: [1: p. 115]). Considering eidetic phenomena, V. Jaensch pointed out that it is not just a living representation, but an actual feeling, touching, and hearing. He thought that a large number of children and adolescents have this ability in the field of vision and less often in the field of touching and hearing [19].

Using the concept eidetic image, German researchers understood this term as a subjective visual image standing between the image of perception and the image of representation [11: p. 18]. In the Marburg School of Psychology, the eidetic image was conventionally denoted by the letters AB — Anschauungsbilder (visual image). AB are extremely similar to those visual representations or images that a person is able to evoke in one way or another trying to remember and mentally see again something that he has actually seen before. Nevertheless, AB is incomparably more vivid than ordinary mental representations, since the eidetic does not just think,

<sup>2</sup> *Urbantschitsch V.* Über subjektive optische Anschauungsbilder. Wien: Verlag Franz Deuticke, 1907. P. 14.

<sup>3</sup> *Bine A.* Modern ideas about children. Moscow: Kosmos, 1910. P. 126.

but quite realistically sees, actually feels, the eidetic image evoked in memory or re-produced [1: p. 116]. E. Jaensch believed that eidetism is the basic stage of early mental development, when the image of perception and the image of memory are not yet differentiated. On the basis of the ontogenetic theory of E. Jaensch in young children, eidetism, fused with perception, is almost always present, but then perception and representation develop into two relatively independent processes [18].

Representatives of the Marburg school identified and described two types of eidetic images: type *B* and type *T*. Eidetic images of type *T* were considered more primitive in comparison with images of type *B*, since they were closer to the images of perception. The appearance of such subjective visual images in some cases was associated with the influence of physical and chemical factors [4]. Conscious thinking processes were not involved in the process of forming images of type *T*. The production of this type of eidetic images occurred spontaneously and unconsciously. *T*-type images were described as independent of arbitrary mental activity. Eidetism in this case showed little connection with the imagination and emotionality of the child. Type *B* images, on the other hand, showed a direct dependence on emotional life and voluntary thinking. Such images were closely connected with the imagination, and therefore stood closer to the perception. The process of forming an eidetic image of type *B* depended on such psychological factors as mood and interest. Experimental studies have shown that complex and meaningful images much easier evoke eidetic images of type *B* than schematic and simple ones [19]. In the course of the experiments, E. Jaensch determined the features of the construction of eidetic images of type *B* and type *T*. It was found that *B*-type eidetics are able not only to reproduce in detail a previously seen image, but also to represent various changes in the original image, whereas for the *T*-type, this kind of creative manipulations going beyond the boundaries of elementary reproduction remain inaccessible. At the same time, individuals with low level of mental development possess images of type *T*, while for a high intellectual level, the presence of images of type *B* is characteristic<sup>4</sup>.

The most important studies of E. Jaensch in the field of eidetics were considered by such psychologists as G. Allport and H. Kluwer. In his works, H. Kluwer defined the eidetic image as an impulse of consciousness that immerses the mind in a series of self-revealing images [20]. G. Allport formulated a similar definition stating that the eidetic ability must be understood primarily as a manifestation of the norm, excluding the presence of visual hallucinations. He believed that subjective visual images arose spontaneously and had the characteristics of a perceptual image [12]. However, after 1933 the interest in the problem of eidetism has significantly decreased. Experimental studies of the Marburg School of Psychology in the field of eidetics actually stopped, and E. Jaensch's attempts to link the phenomena of eidetic perception with a constitutional typology in the spirit of Nazi ideology discredited his subsequent works in the eyes of the world scientific society [16].

In Soviet psychology, the study of eidetic images also received significant development in the period of the 1920-s – early 1930-s. At this time, original works in the field of the study of eidetism were published by V. E. Smirnov [10: p. 117], P. L. Zagorovsky [4], G. A. Feiman [11: p. 13], P. M. Konanova [5], and others. For the first time, the problem of eidetism was raised in 1927 by P. P. Blonsky in the work "Psychological Essays" [1: p.115]. In 1930, L. S. Vygotsky considered eidetics as one of the leading psychological trends, pointing out the need for a critical analysis of the doctrine of subjective visual images [3: p.178]. The development of the problem of the origin and interpretation of eidetism continued in the USSR until the abolition of the pedagogical direction in psychology in 1936 [2].

In the psychological literature of the late twentieth century and early twenty-first century, the phenomenon of eidetism is considered in the context of cognitive psychology, from the standpoint of which eidetism is a special form of information storage, observed mainly in childhood, and in the process of development gradually replacing the system of direct

<sup>4</sup> Jaensch E. R. Eidetic imagery and typological methods of investigation / translated by O. Oeser,

D. Phil. London: Kegan Paul, Trench, Trübner & Co, Ltd., 1930. 136 p.

imprinting of perception images with a verbal-logical storage system [14; 23]. Eidetic memory is also called photographic, and the phenomenon of eidetism itself is presented as a kind of stretching of the iconic memory [21: p. 173]. However, the uncertainty of the basic methodological positions inherent in contemporary studies of eidetism does not allow us to obtain a convincing explanation of the essence of this phenomenon and the reasons for its emergence.

### **Systemic mechanisms of the emergence of the eidetic image**

From a systemic point of view, the eidetic image appears as a holistic and stable image of perception or representation held in memory. The eidetic image is an information system with fixed, non-changing connections, the main difference of which is significantly greater than in the corresponding population norm, the saturation of the elements that make up this system (image). Most often there are visual eidetic images, less often — auditory, but there may also be images of other modalities. The emergence of an eidetic image is associated with a combination of various individual and personal characteristics, from the psychophysiological characteristics of the body, to the motivation and development of the emotional and volitional sphere of a person.

The understanding of perception as an act of system formation, in the process of which the formation of an integral image occurs through the synthesis of a number of individual sensations and the system identification of the image of perception as an element of a higher-level mental system, due to the establishment of the connection between this image and already existing images of representation stored in memory is basic for the system interpretation of the phenomenon eidetism. For example, a visual image of the landscape that has appeared in front of a person becomes part of his idea of the environment.

The sensations that are the reaction of the mental system to the deviation of the order of the external or internal environment from the stationary value, in connection with which a tense state arises is the initial basis for the formation of the image

of perception. Thus, the sensation reaction is caused by a critical (exceeding the threshold value) mismatch of the stationary and current states of the environment. If this mismatch does not reach a critical value, the sensation does not occur.

One of the mechanisms of the formation of the eidetic image is mental sensitization or a decrease in the stationary subjective level of entropy of the environment. Increase in the color sensitivity of an artist due to a narrow stationary range of light waves can be an example of such sensitization. In this case, the luminous flux, slightly violating the boundaries of the stationary range, is a sufficient deviation for the formation of a new sensation. As a result, professional artists have the ability to distinguish a greater number of color shades compared to people who are far from painting and therefore they have a wider stationary range of color waves [7: p. 113].

Another mechanism is related to the subjective lowering of the threshold of sensitivity in relation to a significant object. This phenomenon is considered by traditional psychology as the attention directed to this object. In this case, attention can be directed both to the perception of an external object, and to the image of this object stored in memory. Prolonged concentration of attention on the object leads to a decrease in sensitivity to all other stimuli, up to ignoring them. The simultaneous increase in sensitivity to the object on which the attention is focused can cause additional details in the perception or representation of this object, resulting in the formation of an eidetic image.

At the same time, many of the systemic mechanisms of the emergence of the eidetic image are associated with the function of memory, which fixes connections in the mental system. In the genesis of eidetic memory, the role of the motivational and emotional spheres of the individual, and some other individual characteristics, are most clearly revealed.

History contains many descriptions of the amazing memory of outstanding people — Napoleon, Mozart, etc., — which for a long time allowed them to keep in their mind a huge variety of details of the object of interest, whether it is a battlefield or a piece of music. Famous chess players could play blindly on 32 boards at the same time (A. Alyokhin, 1934) and even 45 boards

(M. Neidorf, 1947). The mechanism of such eidetic memory consists in an extremely sharpened interest in an attractive object, whether it is chess, music, or a military maneuver. For Napoleon, the battle is the highest moment of life. The commander remembered all the smallest details of the battles he conducted until the end of his days. Mozart says in one of his letters how he creates a piece of music: "I embrace it with one glance, like a beautiful picture or a beautiful person, and I hear it in my imagination, not one after another, as it will sound later, but as if all at once". And then he exclaims, "What a feast!"<sup>5</sup>

But eidetic memory is not only found in geniuses. The possibility of almost instantaneous memorization of a huge amount of poorly connected material can be demonstrated by quite ordinary people<sup>6</sup> and even persons with mental development disorders [16]. The peculiarity of brilliant eidetics is their inherent ability to organize systemically the eidetic images that arise in them into a complex hierarchically organized structure. For a genius, the eidetic image is just a material, an element in a super-system created with the help of non-trivial, essential connections.

In contrast, the eidetic image that occurs in an ordinary person, most often, is a completely independent system product, a kind of random "photo" of what he saw. The reason for the development of the ability to such "photographing" can be a long professional training or features of the psychophysiological development and functional state of a person.

### Eidetic perception in childhood

A. Schopenhauer believed that the possibility of forming a particularly complete and detailed visual image lies at the heart of genius<sup>7</sup>.

<sup>5</sup> Cit. by: *Teplov B. M.* Psychology of musical abilities. M.; L.: Publishing House of the APN of the RSFSR, 1947. 244 p.

<sup>6</sup> *Luria A. R.* A small book about big memory. Moscow: Moscow State University Publishing House, 1968. 85 p.

<sup>7</sup> *Schopenhauer A.* The world as will and representation. Vol. 2. Chapter XXXI "On genius" / complete works. per. A. Yu. Aichenwald. M.: type. I. N. Kushnerev and K, 1901–1910. P. 386.

At the same time, he noticed: "Every child is a genius to a certain extent, and every genius is a child to a certain extent. The kinship between them occurs first of all in the naivety and sublime simplicity constituting the essential mark of true genius"<sup>8</sup>.

Most studies of eidetic phenomena are devoted to the peculiarities of children's perception in pre-puberty, as well as during the peak of puberty. It is this age that is characterized by the greatest tendency to occurring eidetism.

In 1924 O. Kroh<sup>9</sup> pointed out that among the students of real schools in Marburg, he identified 63 % of children with pronounced eidetism, while among high school students he found 53 % of eidetics [11: p. 40]. The results obtained by H. Zeman in the course of study of 160 students of both sexes of secondary schools in Vienna aged 10 to 18 years also show a high percentage of vividly expressed eidetics [4: p. 87]. During the experiment (showing the subjects pictures close to their life experience, followed by visual reproduction of the image in the absence of stimulus material on a grey screen in a darkened room), it was found that eidetic images are observed in 88 % of the examined children, among whom 65 % of children have a vividly expressed eidetic ability. According to H. Zeman, the following degree of eidetism is observed among secondary school students: 55 % of the surveyed boys and 75 % of girls are vividly expressed eidetics; latent eidetism is observed in 36.25 % of the surveyed boys and 20 % of girls; the lack of eidetic ability is noted in 8.75 % of the surveyed boys and 5 % of girls<sup>10</sup>.

The study of G. S. Feiman, conducted on children and adolescents aged 9 to 18 years, indicates the existence of a relationship between the individual phases of puberty and the degree of expression of eidetic ability. A moderate course of puberty or its slight delay is accompanied by a less expressed manifestation of eidetism, both in frequency and level. The phase of greatest stress for the development of the body,

<sup>8</sup> *Ibid.* P. 408.

<sup>9</sup> *Kroh O.* Die eidetische Anlage bei Jugendlichen // Zeitschrift für Kinderforschung. 1924. Jg. 29. P. 36.

<sup>10</sup> *Zeman H.* The doctrine of the Eidetik and their Practical Bedeutung // The Source. 1929. № 1. P. 10.

observed at the height of puberty, gives the greatest number of eidetics with extremely pronounced visual images equally for both sexes. Thus, according to Feiman, the eidetism curve has a wave-like character, where the main vertex of the curve coincides with the middle of the puberty process [11: p. 51].

E. Jaensch considered eidetism a natural phase of the development through which all children pass in varying degrees of severity in the process of growing up. Eidetism is a normal phase of the development of the child's psyche, so obvious or hidden signs of eidetic ability are a common phenomenon. E. Jaensch distinguished five stages of the development of eidetism, showing that the percentage of eidetic children varies depending on the inclusion in the statistics of children with a less vivid degree of eidetism. O. Kroh believed that the number of pronounced eidetics among the children examined in Marburg was 40 %, taking this figure as an average for Central Europe. However, if children with a latent eidetic form are included in the number of eidetics, the percentage of eidetic children increases significantly [3: p. 186]. Thus, the phenomenon of eidetism occurs in children in different forms and reveals a different degree of severity. Not all children are extremely pronounced eidetics, which is explained by a genetic predisposition to eidetic perception. The eidetic ability does not fade at once and is largely determined by the innate tendency to a higher or lower degree of severity. In the process of growing up, the degree of severity of eidetism fluctuates, increasing, then decreasing and, eventually, either disappears with the end of puberty, or, in rare cases, even increases, remaining in adulthood [11: p. 50].

What is the cause of children's eidetism?

From the point of view of system psychology, the phenomenon of eidetism in children is associated with a combination of three circumstances:

1) The development of the neurophysiological substrate of the psyche optimal for the formation of an eidetic image, which results in the achievement of peak values of visual and auditory sensitivity, as well as the ability of involuntary memorization in adolescence and early adolescence;

2) Less than an adult's ability to form significant system connections in the formation of both

the actual perceptual image, and, moreover, the inclusion of this image in the system of representation of the perceived object. Because of the lack of development of this ability in a child, along with already formed psychophysiological mechanism of the organization of mental system connections, the possibility of the phenomenon of child eidetism opens up. The main feature of this phenomenon is the fixation in the perceptual field of a much larger number of non-essential connections than in an adult, so that the image of perception is saturated with many additional elements or details. The entropy of the resulting perceptual system tends to the maximum. The expansion of the perceptual image in the case of child eidetism is not associated with a greater orderliness of the emerging idea of the perceived object.

3) The emotional lability of a child and the ease of developing an affective reaction to a relatively weak stimulus. The greatest emotional lability is typical for crisis periods of development (crises of 7 years and adolescence). The spontaneously occurring increase in sensitivity to the perceived object causes greater detailing of the perceptual image.

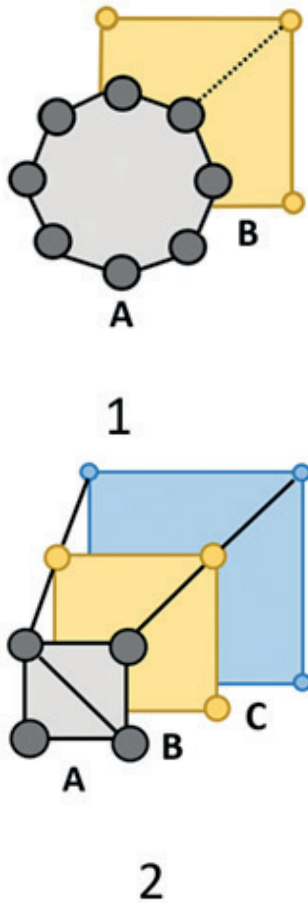
The scheme of systemic differences in the formation of a perceptual image in childhood and adulthood is graphically shown in Figure 1.

### Eidetism of a creatively gifted person

Biographies of many outstanding figures of science and art — Ernst Mach, Wilhelm Wundt, Johann Wolfgang Goethe, Jack London, contain evidence of their inherent eidetic ability. A lot of vivid evidence of eidetic perception was left by many well-known Russian writers: A. Bely, B. Pilnyak, K. Fedin, A. N. Tolstoy, O. Forsh, etc.<sup>11</sup>. Speaking about his artistic images, K. A. Fedin wrote: "First I hear what I write". "I physically saw them" — claimed A. Tolstoy (cit. according to: [11: p. 14]).

One of the most talented Russian writers of the twentieth century, M. A. Bulgakov, describes the birth of the eidetic image in great detail,

<sup>11</sup> As we write: [collection]. Leningrad: Writers' Publishing House, 1930. 215 p.



**Fig. 1.** Schematic representation of the formation features perceptual image in a child (1) and an adult (2)

*Notation:* A — a perceptual image including elements (black circles) and connections (black lines connecting the circles); B, C — systems of stored knowledge and representations.

turning into a reviving fantasy: “Then in the evenings it began to seem to me that something colored was emerging from a white page. <...> Like a box, and in it you can see through the lines: the light is on and the same figures that are described in the novel are moving in it. <...> Oh, what an exciting game it was! As time passed, the camera in the book began to play. <...> I can hear the melancholy and angry harmonica breaking through the blizzard, and angry and sad voices join the harmonica and whine, whine. <...> And in the height there is the moon, and in the distance a chain of sad, reddish lights in the village”<sup>12</sup>.

<sup>12</sup> *Bulgakov M. A.* Theatrical novel: [collection]. Moscow: AST Publishing House, 2018. P. 96.

A remarkable memory for the details of the events that took place was demonstrated by many outstanding public figures. Ancient Greek historians testified that Themistocles remembered everything he saw and heard, even to the point that he was able to keep in mind the names and faces of every Athenian. At the same time, his memory captured visual images not only in detail, but also in a very orderly way, reflecting all the essential connections between the remembered events. The lives of Napoleon and a number of political leaders of the twentieth century contain similar testimonies.

A highly skilled chess player, with his eyes closed, is able to see extremely clearly the position on the chessboard in all its details, including the glare cast by the lacquered chess pieces. Playing blindly, after the opponent’s move is reported to him, he also clearly sees the changed position. A brilliant chess player can play blindly on dozens of boards at the same time, randomly evoking the image of one or another game.

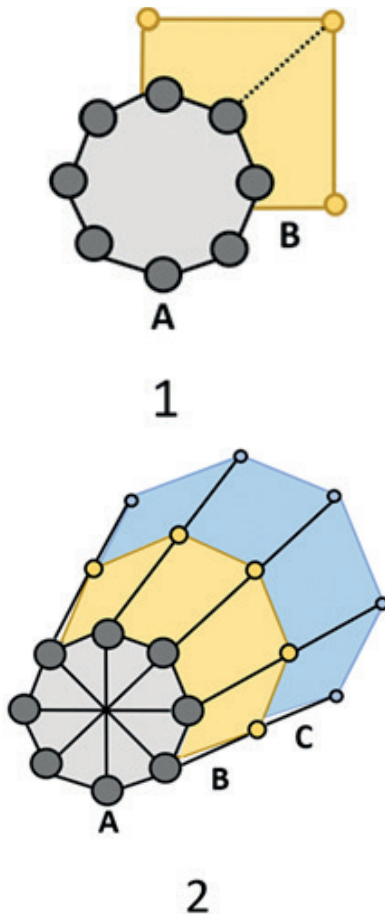
The system-psychological interpretation of these unusual abilities connects them, as well as the phenomenon of child eidetism, with a combination of three circumstances:

1) The presence of innate extraordinary versatile and ingenious abilities, i.e., the ability to simultaneously retain in the field of perception a greater number of elements of the perceptual image than in the population norm (versatility), and at the same time the ability to establish significant connections both between the elements of the perceptual image, and between this image and images and representations previously created in memory.

2) The exceptionally high indices of social types of development motivation inherent in the creative personality: cognitive motivation (reproduction of personality elements) and self-realization motivation (reproduction of social elements). This leads to an increased subjective significance of the subject of motivation, and keeps this subject in the focus of attention for a very long time. The result of a particularly long-term focus on one object is the possibility of simultaneously fixing many details and establishing essential connections between these details, and between the entire object and other information systems.

3) The ability of a creative person to experience vivid emotional states when establishing a creative product. These special emotional states, experienced as inspiration or creative ecstasy, can additionally fix attention on one of the facets of the motivation subject, allowing you to discover new elements and connections in it.

Figure 2 shows a diagram of the system features of the eidetic image of a creatively gifted person.



**Fig. 2.** Schematic representation of the features of the formation of a perceptual image in a child (1) and a creatively gifted adult (2)

*Notation:* as in Fig. 1.

What is common in eidetism of a child and eidetism of a gifted person, and what is their fundamental difference? To a certain degree, A. Schopenhauer was right: eidetism in a child and a creatively gifted person has a certain similarity not only in the greater number of details of the perceptual image than in the corresponding cultural norm, but also some similarity of the factors that determine this phenomenon. Among them there are psychophysiological

features of individual and age development necessary for the emergence of eidetism, as well as the tendency to vivid emotional experiences in situations that may be emotionally insignificant for other people. The example of such emotionality is found in Pushkin: “I will shed tears over fiction” (“Elegy”, 1830)<sup>13</sup> or in Turgenev’s confession that when he wrote the scene of Bazarov’s death (the novel “Fathers and Children”), he sobbed uncontrollably<sup>14</sup>.

At the same time, the fundamental difference between the two forms of eidetism is that the eidetic image of a child is built on trivial connections, whereas a gifted person is able to create an image in which elements are connected within the image and with other representations by means of essential connections. At the same time, some of these connections may not be previously known to the cultural society. The fixation of an image made by a creative person in a work of art or scientific discovery thus becomes an important factor in the cultural development of the society.

### Eidetic images in altered states of consciousness

Eidetic images can also occur in various psychopathological conditions caused by diseases, the action of hallucinogens and other chemicals, as well as in healthy people as a result of the influence of extremely strong emotional stimuli. The results of studies conducted by the Margburg School of Psychology show that the method of producing eidetic images has a direct connection with the activity of the central and peripheral nervous system. If the *B*-type images (according to W. Jaensch) are formed through the influence of psychological factors, such as the presence of strong emotional experiences and vivid impressions, then the *T*-type images are primarily influenced by physical and chemical factors [4].

<sup>13</sup> *Pushkin A. S.* Complete Works: in 10 vol. [Note by prof. B. V. Tomashevsky; Academy of Sciences of the USSR, Institute of Russian Literature (Pushkin House)]. 4th ed. Vol. 3. L.: Science, Leningrad department, 1977. P. 169.

<sup>14</sup> *Turgenev I. S.* Complete collection of works and letters: in 28 vols. / [ Akad. USSR Sciences. In-t of Russian literature. (Pushkin House)]. Letters: in 13 vols. Vol. 5: 1862–1865. M.; L.: Publishing House of the Academy of Sciences of the USSR, 1963. P. 50–51.



The appearance of *T*-type eidetic images is largely due to the low content of calcium in the human body [1: p.116]. In this case eidetism shows little connection with emotional excitability, and eidetic images are perceived as something alien, they do not terminate arbitrarily. In this respect, *T*-type eidetic images resemble pseudo-hallucinations — false visions that occur in the absence of a real object of perception. In the course of taking calcium, the *T*-type shows the deterioration of the eidetic ability, up to its complete disappearance. The eidetic ability of the *B*-type, on the contrary, does not undergo changes due to the influence of calcium, since in this case the decisive influence is exerted by emotional arousal, which occurs due to a decrease in the inhibitory influence of the cerebral cortex. For this reason, the use of psychoactive substances, in particular mescaline, which change perception and affect the emotional state, significantly increases eidetism [19].

Hallucinogenic substances of plant origin have long been used in occult practices, as a means to go beyond the ordinary perception of reality, breaking the boundaries of a clear state of consciousness. Contemporary studies show that the use of psychoactive substances provokes the restructuring of neural networks associated with the processing of visual information [8]. For this reason, the production of visual images arising in an altered state of consciousness as a result of taking psychedelics cannot be considered true eidetism. In this case, we are talking about quasi-aesthetic images formed under the influence of hallucinogens.

In contrast, in some forms of epilepsy, patients may experience true eidetic images and often accompanying them appearance of a special sense of consciousness expansion. With the lateral location of the focus in the temporal zone, the patient may experience nightmarish hallucinations (visual and auditory), accompanied by attacks of fear or, on the contrary, delight [6]. Visual images in this case can reach an extraordinary brightness and include such a large number of details that the patient perceives this as a supernatural intervention. Apparently, in connection with such phenomena in antiquity, epilepsy was called a sacred disease.

According to the memoirs of Sofia Kovalevskaya, a close friend of F. M. Dostoevsky,

the great writer stated: “You all, healthy people, and do not suspect what happiness is, the happiness that we, epileptics, experience in the second before a seizure... I do not know whether this bliss lasts for seconds, or hours, or months, but, believe the word, all the joys that life can give, I would not take for it!”<sup>15</sup>. Of course, these extremely rare forms of the epileptic aura allow us to get an idea of another kind of eidetism that occurs due to a special short-term psychophysiological state of the patient.

The system-psychological explanation of the phenomena of eidetism in epilepsy, as well as in the previously considered cases, connects them with a combination of three circumstances:

1) A special state of the neurophysiological substrate of the psyche caused by the disease, which results in the appearance of an aura — a flash-like increase in the electrical activity of vast areas of the cortex and subcortical structures of the brain, providing a short-term generation of more nerve connections than occurs during normal brain operation.

2) The ability to fix in the perceptual field a significantly greater number of essential connections than in the normal state of the aura increases, so that the entropy of the emerging perceptual system tends to a minimum. The expansion of the perceptual image in the aura and its greater orderliness underlie the feeling of clarity of consciousness, illumination, or even mystical revelation experienced by the patient at this moment.

3) Chronically high emotional intensity of the epileptic and the ease of developing an affective reaction to a variety of stimuli. The emotional arousal that occurs in the epileptic easily reaches the level of psychological stress and often leads to an increase in the activity of the convulsive focus and, as a result, the appearance of the aura.

At the same time, a short-term eidetic perception of reality can occur in a completely healthy person in an extreme situation associated with extreme danger to life and the need for instant decision-making. In most people in this situation, there is a pronounced emotional stress,

<sup>15</sup> Kovalevskaya S. V. Memoirs and letters. 2nd ed. Moscow: Publishing House of the USSR Academy of Sciences, 1961. P. 347.

characterized by a narrowing of the field of attention and complete or partial disorganization of behavior, which is manifested either in a stupor state, or, on the contrary, in chaotic, panic reactions. However, in some cases, an extreme situation can cause an auropodic expansion of consciousness and a sharp increase in the rate of activity [9].

Examples of such hyperadaptation to an extreme situation occur when describing the state of a person in hand-to-hand combat in cases where we are talking about a special psychophysiological type, which can be called the type of a born warrior. A characteristic feature of the psychological state of a fighter in these conditions is not only an extremely detailed and accurate perception of the situation of the fight, but also the experience of a kind of “ecstasy in battle”. The memory of such an eidetic episode and the associated superiority over the enemy can cause a euphoric state after many years<sup>16</sup>. In fact, the admiration experienced by the fighter for the instant expansion of his capabilities that comes at the climax of the battle resembles Dostoevsky’s delight at the memory of an epileptic aura.

### Conclusion

Thus, the emergence of an eidetic image is always based on several common factors. Among them, first of all, there is a special state

<sup>16</sup> The story of a veteran of the Great Patriotic War about hand-to-hand combat. Duration: 4:00. [Electronic resource] // YouTube: video hosting. URL: [https://www.youtube.com/watch?v=HF\\_jjjLjq34](https://www.youtube.com/watch?v=HF_jjjLjq34) (accessed: 30.03.2021).

of the neurophysiological substrate of the psyche, ensuring the retention of a larger number of elements of the perceptual image in the field of perception than in the norm. The high emotionality of the eidetic, which opens up the possibility of obtaining an emotionally colored reaction to a relatively weak stimulus in relation to the norm, and, as a result, an increase in sensitivity to this stimulus and a greater detail of the resulting perceptual image is an equally important factor.

At the same time, a systematic analysis of eidetic perception points to a fundamental difference between two forms of eidetism in terms of the type of established connections, partially coinciding with the types of eidetism that were distinguished in the Marburg school. Children’s eidetism is characterized by a lower ability than that of the adult norm to form significant systemic connections in the formation of a perceptual image and, at the same time, the ability to form a much larger number of non-essential connections in the perceptual field than in the adult norm. In this case, the entropy of the emerging perceptual system reaches its maximum values. This type of eidetism is close to type *T* in the terminology of the Marburg School.

In contrast, the eidetism of a creatively gifted person (and also in some exceptional cases with epileptic syndrome) is associated with the ability to form a much larger number of significant connections in the perceptual field than in the norm. The entropy of the perceptual system of genius tends to a minimum. This type of eidetism is close to that which in the Marburg school was called the B-type.

Generally, the interpretation of eidetism from the standpoint of systems psychology opens up a new perspective for understanding this important psychological phenomenon.

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