

## **METHODOLOGICAL PROBLEMS IN THE STUDY OF EIDETIC IMAGERY**

-A Critical Review-\*

By Belma ÖZBAYDAR

Institute of Experimental Psychology  
University of Istanbul

Since the beginnings of the century, when the Marburg school under the direction of Jaensch issued researches on eidetic imagery, many experiments have been conducted on this subject. Some investigators claimed that there was such a phenomenon as distinct from after image and memory image, some denied its existence and classified it either under after images or memory images. Even today a conclusion has not been reached. It is no doubt that there is such a phenomenon, but the problem whether it should be considered as a separate form of imagery is unsettled.

If we look for the historical background of eidetic imagery we see that Urbantschitsch (Allport, 1924) was the first to consider eidetic imagery as a phenomenon of unique significance. He described eidetic imagery as follows: among optical memory images we find in addition to the customary visual image an eidetic image. In the one case a former visual perception is merely imagined, in the other case the original object is actually seen. The true eidetic image, in distinction to the visual memory image, revives the earlier optical impression when the eyes are closed, in a dark room, and sometimes when the eyes are normally open, with hallucinatory clearness. There are

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others who have used different names for the same phenomenon. For example, according to Allport (1924), Müller's 'subjective vision', Fechner's 'memory images', Ward's 'primary memory images', Martin's 'projected memory images', and Binet's 'imaginary perceptions' are all eidetic images. However all these previous observations were got from adults. The true significance of the phenomenon was shown by the Marburg school, by experimenting on children.

Jaensch (1930) describes eidetic images as optical perceptual images, and according to him this phenomenon takes up an intermediate position between sensations and images. An image is classified as an eidetic image, when it possesses the vividness of perception and when it is very definitely localized in perceptual space. The subjectivity of the eidetic images differentiates them from perception, and their sensual character from conception. Sometimes eidetic images are seen in the original colour of the object, sometimes in the complementary colour.

It is quite clear that this characteristic is rather vague, since it does not distinguish an eidetic image in the complementary colour from a negative after image. Some kinds of eidetic images, when the imagination of the subject experiencing the eidetic image is limited, resemble after images. In fact in some cases they might be considered as slightly intensified after images. When the influence of the imagination is at its maximum, eidetic images are ideas that are projected outward. So, Jaensch concludes that eidetic images lie between after images and memory images, and share some of the characteristics of both. The points on these two extremes represent different types of eidetic images, and any point on this line where eidetic image manifests itself depends upon two factors: a relatively permanent, constitutionally determined factor (Jaensch calls it relatively permanent because of the fluctuations in personality), and to a lesser degree a momentary functionally determined factor, which are experimental conditions and can be introduced at any moment.

Jaensch states that both perception and idea come from an undifferentiated unity, which is neither perception nor ideation, but an eidetic unity. At the onset of his development the child has neither perception nor memory as distinct faculties. In the stage both are aspects of a more primitive type of experience. But before there can be experience there must be sensory stimulus, and what such stimulus evokes is neither perception nor memory, but an undifferentiated consci-

ous content—namely an eidetic image. After image, eidetic image, and memory image are considered as a series of memory levels, the lowest of which is the after image. As the individual advances in years he comes to depend more and more upon the higher grades of memory.

So, Jaensch states a new theory of perception, namely that the eidetic phenomenon, apart from being the source of memory, is the ontogenetic source of perception. He claims that the same laws hold for eidetic phenomena and the phenomena of normal perception. The laws for the eidetic phenomena are only quantitatively different. According to him during the eidetic phase of development perceptual world is hemi-eidetic. In the early phase of vision, for example, transverse retinal disparity does not determine depth with approximate certainty. Optical localization and the spatial structure of the perceptual world are dependent on optically dynamic processes, and on images which are projected outwards and literally become visible. Another example is the size constancy. Objects have a constant size for our knowledge and memory. This conceived constant size also determines perceived size during the early phase, where vision is determined in the widest degree by the outwardly projected memory images. The relationship of perceptual and conceptual nature is explained by the proof that perception and memory images are developed from an undifferentiated unity of both, which is an eidetic image.

But, in the above assumption there seems to be some contradictions. If after image is supposed to be the lowest in the series of memory levels, how is it that both perception and memory images are developed from eidetic images? Also, if what Jaensch says is true, then in a fully developed person we should expect to find only memory images, and no eidetic images and especially no after images. But, contrary to the expectation we find in adults after images and memory images and very few, almost none eidetic images. If a series of memory levels must be constructed then it looks more logical to have it in this order: eidetic image, after image, memory image.

According to Jaensch (1930) various stages of this development can be demonstrated in children, and in the extreme unitary cases of eidetic, where eidetic images and perceptions are confused with each other we see the purest form of this relation. Here, too, this question comes to mind: will it not be more correct to call the eidetic images of unitary cases visual hallucinations, since the image and perception are confused?

Jaensch concludes that all the stages of this development cannot be demonstrated in every child. This is because in some children the process of differentiation between the sphere of perception and the sphere of ideas has taken place in previous generations, so that the child is born with a comparatively ready made and well differentiated perceptual function.

Jaensch assumes that primary perceptions are very close to memory images, and in the course of development this peculiarity is gradually lost. Perceptions begin to achieve a higher degree of correspondance with external stimuli. Here, also there is a crucial problem. To support his theory that both perception and idea or representation are derived from an undifferentiated eidetic experience, Jaensch states that one of the attributes of eidetic image is that it stands midway between after image and memory image, thus assumes after image to belong to the world of perception and memory image to belong to the world of idea or representation.

Now, if in the series of memory levels, memory images occupy the highest place how do we explain the primary perception's being very close to memory images? Do perception and memory show a diverse course in their development? If there is a relation between perception and memory, it is not compatible with Jaensch's view.

According to Jaensch (1930) the perceptual development is exactly the opposite of the perceptual theories of Helmholtz and Hering, who both believed that pure sensations unaffected by higher mental processes are the starting point for development. Jaensch states that it is the other way round. Sensations permeated with higher mental processes form the starting point for development, and sensations that correspond exactly to external stimuli are the ideal end point of this development. This course of development is also in accord with anatomical facts. For, anatomically the eye is originally a cerebral organ and only later it becomes more exclusively an organ for conducting external stimuli. That the eye is pre-eminently a brain organ and vision is in a sense psychical is also shown by the fact that there is an integration of the perception with the mental sphere.

From this quality of fusion of the two functions, perception and imagery, Jaensch builds up his typology. First he distinguishes mainly two types: the B type and the T type. T type has eidetic images that resemble after images. These images are very slightly connected

or intergrated with the rest of the mental life. They are dependent on the physiological conditions of sensory stimulation. Their clearness depends on the length of the fixation and not on the interest aroused by the picture. They are usually seen in two dimensions. The subject can change the content of the eidetic image by a voluntary effort of the imagination, only with difficulty. The mental organism of individuals belonging to T type is in the extreme cases fitted together out of pieces, like a machine. Mental functions behave as though dissociated from one another. The ideas too, like eidetic images can be felt foreign to the personality. There are also somatic characteristics. The sensitivity of the optic sensorial nerves is heightened. The sensitivity of motor nerves to electrical and mechanical stimulation is increased. The eyes are small, deep set, comparatively lifeless, without lustre, without expression, thus showing the dissociation of functions and organic systems within the mental sphere. In very pronounced cases there may be a peculiar pinched facial expression, which in its extreme form is known as the tetany face. This type is rarer than the B type. It is a normal youthful type, whose pathologic form is the tetanoid condition.

B-type shows the opposite tendencies. Their eidetic images are close to memory images, and these images depend on the interest aroused by the picture and are usually seen in three dimensions. The pure cases of his type are more frequent. The eidetic images are no longer considered as foreign, something that forces itself upon the personality from the outside, but as something belonging to the self. They are, just like the contents of the imaginal life, closely bound up with the personality. Their colours always correspond to those of the real objects. They are flexible as memory images, and follow every change in the flow of ideas. Their occurrence and disappearance do not depend on optical factors, but on psychological factors. They can be changed by the will of the subject, but they always have a meaning. In the pronounced cases of this type the individuals present an organic unity in which the component parts are in closest interaction. The mental functions interpenetrate. As to the somatic characteristics, they have large, lustrous eyes. The sensitivity of the vegetative nervous system is increased. Its response to mental stimuli is at its maximum. In individuals of this type the thyroid gland is often slightly enlarged. The pathological form of this type is the Basedow's or Graves' disease.

Both T and B symptoms are normal characteristics of a certain youthful stage of development. Really pure types are rare. The great majority show a mixture of the B and T characteristics.

Here, Jaensch takes up the pedagogical importance and favours the kind of education where the idiosyncracies of the child is taken into consideration. He says that this kind of education encourages the development of the mobile B type characteristics, where the eidetic world of this type stands close to memory images and manifests a rich imagination. However after the primary school T type characteristics must be developed too, since they give to the mind a more clearly defined direction.

Jaensch enlarges his doctrine of the basedowoid and the tetanoid types based on the pronounced cases of eidetics, and takes up a wider concept, namely integration, and builds up a typology. He assumes that integration is the mutual interpenetration of psychical functions and in extends far beyond the field of perception and imagery. When the various mental activities work with each other, and within each other, when in a single experience thoughts, feelings, impulses, ideas strongly cooperate instead of being individualized and separated, there is a strong integration. At the extremes the possible degrees of integration represent very different kinds of human beings. On the one hand there are those who have pure and isolated experiences, they either merely think or merely feel. On the other hand there are people to whom mere thought or mere feeling is not known. To them every experience means something to other mental processes and influences the main process.

Jaensch says that this new theory based on the integration merely places the older one in a wider context. The B and T types are special cases of integrate and disintegrate types.

Between integrate and disintegrate human beings there is somewhat the same kind of contrast as between organic and inorganic systems. The nervous system of the integrate is of the vegetative type, it is characterized by a strong integration of individual processes. The nervous system of the disintegrate type is of the cerebro-spinal type, i. e. the interaction of processes is relatively weak. The integrate type is a youthful type, the disintegrate of maturity. Pronounced integrates have a strong coherence with their external world. The disin-

tegrate has little contact with the surrounding world, he experiences everything coming from outside as foreign. Integrates are more personal and emotional. As we see there is really no difference between the former and the enlarged theory.

Allport (1924) (1928) objects to most of the statements made by Jaensch. After a thorough investigation he concludes that eidetic image is nothing but a vivid memory image. He says that memory levels are not a genetic nor a descriptive fact. In fact they show only a teleological continuum. After images have nothing to do with memory phenomena. They belong to sensations and originate as a result of retinal stimulation. Just a mere resemblance between the types of imagery does not prove that they have come from the same lower stage. He states that memory, whether conceived in terms of recognition or disposition to repeat responses existed as an independent phenomena from the very beginning. All children do not have eidetic images, but all children have memory. Eidetic imagery is only one form of imagination and exists during childhood along with the other varieties of imagination. The eidetic phenomenon is an intermediate form of imagery in the sense that it shows the characteristics which belong to both the sensory and the ideational spheres. But it cannot be proved to be a transitional stage in the evolution of higher forms of imagery from lower. Allport thinks that eidetic imagery is an anomaly in adult life. Its true function is performed only in the earlier years of mental development, when by preserving and elaborating sensory data it increases the meaning of the stimulus situation for the child, thus enabling him to perfect his adaptive responses. In fact, he concludes eidetic image seems to serve essentially the same purpose in the mental development of the child as does the repetition of a stimulus situation. It permits the concrete sensory aspects of the surrounding world to penetrate thoroughly into his mind. The young child delights in building up images. He reacts to them with the same seriousness as he would to a real stimulus situation. Such experience enables him to study out in his own way the various possibilities for response. The images are concrete. He simply blends into his image a certain amount of relevant material. The reason for the retreat of the eidetic ability during adolescence is then obvious. The general adjustments of the child to the concrete aspects of his environment are well determined by the time puberty sets in. His experience has been broad and his responses so often repeated that a mere

memory image alone suffices to facilitate his reactions. Interest shifts from the tangible world to inner experience of the emotional type. The emphasis upon abstract thinking in higher schools also helps to destroy the youth's reliance upon his eidetic images.

Some of the investigators (Morsh and Abbott, 1945) conclude that eidetic image is a type of after image. Some (Fisher and Hirschberg, 1924) show that in a large population practically all individuals possess eidetic image, which is in contradiction to Jaensch's findings. It is quite possible to cite several contradictory results if one goes through the literature. In one of the recent publications by Barber, it is pointed out that the reason for these contradictions comes from the fact that the term eidetic image has been used freely, sometimes it has been referred to any type of imaginal behavior, sometimes to a negative or positive after image, and sometimes to a type of hallucinatory behaviour. The procedure of the investigations also, has been much criticized. At first subjects experienced after images. This was done to demonstrate the subjects what is meant to see something, when no real object is present. Then the subjects were asked to look at a picture for about 15 seconds, and then look at a grey screen to report what they saw there. Questions raised to this procedure were as follows: Did the subjects who were usually elementary school children state that they saw something on the screen in order to please the experimenter? Did they report that they saw the picture there because they were aware from the nature of the instructions that the experimenter expected them to say so? In fact, as it is stated in Barber's (1929) paper Kliver, Morsch and Schwab have emphasized the ambiguous nature of the word 'see', especially when it is used with children. Some of their subjects later admitted that they saw the picture in their minds and not on the screen. If some children actually did see something, how do we know it was not an after image? Barber says that according to Allport, Koffka, Schroff and Scole this often occurred, since after image can be produced through fixation. Jaensch, too, admits that in some cases where the influence of the imagination is little or zero, eidetic images produced are merely modified after images.

Barber (1959) suggests a new way to deal with eidetic imagery, namely as hallucinatory behaviour. He says that from the reports of several investigators we know that it is not always necessary for the eidetic subject to first look at a picture. Also some subjects are not



only able to produce spontaneous eidetic images, but are also able to reproduce an eidetic image with all its details and vividness after days, months, and even years. Eidetic image sometimes takes an obsessive character and recurs without the volition of the subject. According to Purdy's (1936) report his subject could see at any time three dimensional eidetic image of any person or object. He could even see an eidetic image of a man devoid of a head or green leaves upon barren trees. In this case Barber sees no essential difference between this subject's eidetic images and what has been termed as the waking hallucinations of healthy persons or negative or positive hallucinations of hypnotic subjects. Furthermore he states that it is difficult to differentiate the B type individual from those who can hallucinate at will, for in both cases the subjects are not only able to call up an image and to banish it whenever they desire to, but they are also able to alter its form, colour, duration and location at will. And as Mc Dougall (1929) and Symthies (1956) have shown, if a subject states that he sees and behaves as if he sees when that object is not present to other observers, he is carrying out a hallucinatory behaviour, even though he is perfectly aware that the object he sees is his own creation. To support his idea of considering the eidetic image as hallucinatory behaviour Barber reports other examples. When Jaensch discusses eidetic images which can be induced by mescaline, there is no way to differentiate these eidetic images from what others have termed the visual hallucinations, which can be induced by this drug. Also, according to Jaensch (1930) eidetic image of a colour is often followed by its negative after image. For Barber (1959) this is the same behavior as the colour hallucinations of hypnotic subjects, conceptualized since 1888 by Binet and Féré, and more recently by Barber himself, as hallucinated colours. Even if it is agreed that behavior should not be called hallucinatory, unless the subject believes that the hallucinatory object is a real object, it can be insisted that some cases of eidetic imagery cannot be differentiated from a type of hallucinatory behaviour. This statement finds a support from Jaensch (1930), who says that in exceptionally strong cases eidetic images and real objects under certain conditions can be confused with one another. In fact Fisher and Welke (1926) having noted this difficulty stated that the hallucinations should be classified under three categories: non-psychogenic hallucinations, psychogenic hallucinations and eidetic images with reality character.

Barber (1957) suggests that instead of asking the subjects to look

at a picture and allow them to experience an after image we should directly ask them to imagine an object and then to project it. He believes that there will be a large proportion of children and a relatively small proportion of adults who will hallucinate at will, that is they will report that they have projected the imagined object, and there will be physiological changes such as the alpha blocking on the EEG and the alteration in pupil size.

However, consideration of eidetic imagery as a form of hallucinatory behaviour will not solve the problem, since this will apply only to eidetic images that resemble the memory images. How will the other type be explained? Also, according to the above statement can we say that children show more hallucinatory behaviour than adults, and how will this be explained?

However, Barber's view has been taken into consideration by several other investigators. Popov studied visual eidetism in patients suffering from delirium tremens with visual hallucinations. He found out that in most patients visual eidetism appeared during the first 24-48 hours after the cessation of hallucinations. Later on the eidetic capacity disappeared entirely. Popov concluded that eidetism may be considered as an intermediate stage between the normal state and hallucinations. Naumova also, stated that acoustic eidetism is an intermediate state in the development of hallucinations. Jankowska discussed hallucinations among psychotics as a regression phenomena of imagination, being like more primitive eidetic images. More recently Husén discussed hallucinations as a form of psychological behaviour related to eidetic imagery.

Eidetic imagery has been subjected to various investigations for various reasons. Its relations are reported to have been dealt with criminology, intelligence, racial differences, personality, behaviour, speech retardation, stammering, artistic ability, heredity, constitutionally determined somatic characteristics, scholastic ability and so on.

Different investigators always found different results. Also, most of the results on experiments with perception, which Jaensch cites as a proof to his theory have been disproved today. For example, Jaensch (1930) calls optical dynamic processes, eye movements, variations in attention as localizing factors and says that these factors influencing

even the more stable perceptions of adults, have a greater effect in the eidetic phase where perception is highly modified by these factors. He explains the peculiarities of the Horopter deviation with these localizing factors. But, very recently it has been stated that the Horopter bowing pattern which Jaensch assumed to be concave for distant objects and convex for near objects in the eidetics, showed no difference in eidetics and non-eidetics. Klüver (1926, 1928) says that the investigations do not furnish a reliable data which will convincingly explain normal non-eidetic phenomena and solve certain problems of perceptual psychology.

The characteristics of eidetic phenomenon have been described by Allport (1928). He distinguishes eidetic image from after image in following characteristics: eidetic image may be aroused by a complicated object, it is superior in clearness and richness of detail. It continues longer in the visual field, it is subject to voluntary recall after a lapse of considerable time, it requires a shorter length of exposure and less rigid fixation for its arousal, it is more dependent upon factor of interest and naturalness, and it is subject to voluntary control and can be made to change its content by an effort of attention.

But these are not exclusively distinguishing characteristics of eidetic image. Because eidetic image may also be aroused by a simple object, it may not be clear and full of detail, in some cases its duration is very short, under certain conditions it is difficult to recall it voluntarily, it may need a long exposure and quite rigid fixation for its arousal, it may be dependent upon factors of interest and in some cases it is not indeed subject to voluntary control. On the other hand according to Allport (1928) again, it tends to resemble the after image in respect to its physiological characteristics, which are as follows: it appears always in visual space, when it is held in the field of vision there is a marked tension in the muscles of the eye, and it may be either positive or negative in colouration. These are the chief characteristics of the eidetic image which make it resemble and differ from the after image.

We know that the T-type individual's eidetic images are hard to distinguish from the after image. Because this kind of eidetic images are dependent on the physiological conditions of sensory stimulation, their clearness depend on the fixation, they do not depend on the interest aroused by the picture, they are usually seen in two dimensions

they cannot be altered in form or colour by will, they usually follow Emmert's law, and usually show the complementary colour. It is quite clear from the above description of the eidetic images of the T-type, that these qualities are in fact the same qualities of the after images. Yet there is a distinct phenomenon. So, in this case what will be the criterion to classify them as eidetic images?

As to its relation to memory image Allport (1928) says that eidetic image differs from the memory image in that it is definitely localized in visual space, even though it is recognizable as a subjective phenomenon, it is generally superior in clearness and richness of detail its clearness is less dependent upon organization of its content, it is generally more accurate in its reproduction of detail, it is generally more brilliant and more accurate in coloration, it requires more rigid fixation for its arousal, and it is dependent upon a favourable projection ground for its arousal.

These, again, are not differentiating qualities, because in some cases eidetic image is not recognizable as subjective phenomenon, sometimes it does not require any fixation nor a projection ground at all for its arousal. As to the other qualities given, they are already said to be 'generally', which makes them indefinite. The qualities given in respect to its resemblance to memory image are related to its associative characteristics: the content is to a considerable extent selected according to its affective value, the content can be altered within the limits of experience by will, and the content is influenced by preceding images. Again, we may say that the content is not always selected according to its affective value, sometimes the content cannot be altered by will and it may not be influenced by preceding images.

The feeling of familiarity which accompanies the memory image can be detected also in eidetic image. According to Jaensch's typology the B-type individual has eidetic images which resemble the memory images. Apart from this resemblance eidetic images are no longer considered as foreign, something that forces itself upon the personality, but as something belonging to the self. They are closely bound up with the personality. We see, then, that the characteristics of the memory images apply more or less to the characteristics of the eidetic images of the B-type individual. The only difference, in fact, is that the eidetic images are literally seen. So, in that case they might as well be considered as projected memory images.

As a conclusion it might be said that in a way it seems more logical to start all over again. Before we draw any conclusion as to the relation of eidetic imagery to other kinds of imagery, to perception, to its place and value in development, racial differences, personality, and somatic characteristics we have to know clearly and definitely what eidetic image is, and what are its qualities. Then we can answer correctly all the questions which have been put forth and answered differently by different investigators. This might be one of the reasons why the results of different investigations are contradictory. One other reason for these contradictions might be that the earlier investigations, which Jaensch uses as supports to his statements, and his own reports, lack statistical treatments. In these investigations, apart from a few percentages there are not any statistical analyses.

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