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**A STUDY IN EIDETIC IMAGERY**

**BY**

**ELIZABETH LOURDES MC GRATH**

**PH.B**

**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF MASTER OF ARTS IN LOYOLA UNIVERSITY**

**1932**

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CHICAGO NORMAL COLLEGE, 1918-20

PH.B., LOYOLA UNIVERSITY, 1926

TEACHER IN CHICAGO PUBLIC ELEMENTARY SCHOOLS, SINCE 1920

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## CHAPTER ONE

## THE FIELD OF EIDETIC IMAGES

The main purpose the writer had in mind in beginning the present investigation was to render clearer if possible, the nature of eidetic images. A brief survey of the definitions offered, and of the work done in the field, will show the need of further clarification.

Urbantschitsch, who was one of the pioneers to consider the eidetic image as a unique and important phenomenon, gives the following description: "Among optical memory-images, we find in addition to the customary 'visual image', an eidetic image. In the one case, the original object is actually 'seen'. A person may be able to remember clearly a visual experience and to describe it in detail without necessarily possessing eidetic images. 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 open with hallucinatory clearness" (11:251). The author stresses the fact that we do not imagine but really "see" the eidetic image. In the present investigation an experiment was arranged to observe this "seeing".

Herwig, according to Kluever, defines the image thus: "The 'Anschauungsbild' is a subjective visual phenomenon which is found in many young people, but not so often among adults; if e.g., a person gifted with AB is asked to look



attentively for a while at an object-regardless whether it is two-or three-dimensional-this person sees the object again either when he closes his eyes or looks at a ground which serves as a background for the image" (29:73).

Erich R. Jaensch, director of the Marburg Institute, is quoted by Zeman, as having given the following definition: "The Eidetiker (Eir) can not only reproduce a picture or a concrete object as an image, but as a concrete existing image (Anschaulich), i.e., he can, after a previously presented picture is taken away, not only imagine it, but in the verbal sense, re-see it. Eidetic dispositions occur in adults and are normal in children, especially during the stage of puberty" (40:122).

Oswald Kroh, who worked under the direction of Jaensch, says that eidetic images are "certain images of an hallucinatory clearness, in other words-special forms of perception-like images" (29:73).

Maria Zillig has been quoted as giving the following: "The Eidetist is able to reproduce clearly, immediately or after a period, a stimulus which has excited a sense organ" (40:435).

Herbertz says: "Between after-images, which are distinct and memory images, which lack vividness of the former, is a third type designated as 'intuitive images.' These have a degree of vividness comparable with after-images, but at the same time possess the phantom character of memory images"

(40:256).

In summarizing the foregoing definitions, two outstanding characteristics of the eidetic image are noted. These are (a) vividness and (b) capability of external projection.

After this review of some of the outstanding definitions, a brief history of the work in the field may be offered, to show the controversial state of opinions regarding the work that has been completed, and to pave the way for a better understanding of the problem in the present investigation.

The history of the field shows that most of the work on the eidetic image has been pursued in Germany, but a little has also been accomplished in Austria, Italy, France, England, and America. According to Konova, writing in 1929, "the eidetic phase of Psychic life is as yet little known in Russian literature" (40:256).

Now, since the greatest amount of investigation and experimentation has been prosecuted in European countries, and since very little of the source material was directly available in the English language, it was necessary to resort to such information as could be obtained from those who had reviewed the original literature. Despite this limitation, a large amount of interesting and instructive material was gathered from men like Gordon Allport, Heinrich Kluever, Howard Warren, H. Alexander, William Burnham, and J.A. Gengerelli. Many other authors in

articles and in portions of their books, particularly William Stern and Johannes Lindworsky, offered a clarifying background for the interpretation of the phenomenon. From the given sources it was possible to build up a history of the work in the field.

As far as scientific description goes, the eidetic phenomenon may be traced back to 1819, where it seems to have been first described by Purkinje (29:84).

This description has been given in reference to the effect of twilight-adaptation, as it was first observed by the Austrian physiologist, and has since become known as the Purkinje phenomenon. Since it is regarded as akin to the eidetic phenomenon, a few words concerning it may help to make the subject clearer.

The eye has the power of adjusting itself to different kinds of illumination. This is partly due to the automatic widening and contracting of the pupil of the eye, and partly to a change in the sensitiveness of the retina. The first change takes place immediately with a change of light. The second change is a gradual adjustment to a new threshold-value of the different intensity of the new light. This is the process through which the eye normally becomes adapted to daylight and twilight.

Now, Purkinje noticed and described an unusual

characteristic of twilight-adaptation which takes place only when two certain conditions simultaneously occur. These conditions are dark-adaptation and a reduction of the intensity of light.

When these two conditions simultaneously occur, the maximal brightness shifts from yellow to green, the red becomes darker, and the blue distinctly brighter. This brightening and whitening of blues is known as the Purkinje phenomenon.

Kluever seems to regard Purkinje as the forerunner in the study of the eidetic phenomenon. He says, "Purkinje's book 'Das Sehen in Subjektiver Hinsicht'(1819) seems to contain the first scientific description of visual AB" (29:85).

Jaensch and Broer have investigated the Purkinje phenomenon in the after-image and the eidetic image (31:194). Their researches in this direction have "given support to certain generic views concerning after-images and eidetic images" (31:194). They are working on the hypothesis that the "Purkinje phenomenon represents a revival of a more primitive functioning of the visual apparatus"(31:194).

If, as Kluever believes, the Purkinje phenomenon and the eidetic image have much in common, it would follow that the physiological processes in the eye influence the production of the image to a large degree, and that the

eidetic image, while not necessarily an abnormal phenomenon, has a quality of uniqueness which differentiates it from the ordinary sense perceptions and memory images of daily life.

Urbantschitsch says that this unique phenomenon is experienced more easily by youths and excitable people (29:76). He is considered the pioneer in the eidetic field by Allport and Warren because he was one of the first to call attention to the eidetic image (3:100; 43:457). As far back as 1903, he reported impressions of color which he was able to call up when his eyes were closed. Again, in 1905, he published a description of a strange experience that had followed several days after a trip to the country. On this occasion, pictures of landscapes previously viewed in the country recurred (49:457).

Urbantschitsch, it is seen, holds the distinction of being able to observe the phenomenon personally, as well as to act as an experimenter with others. He has considered his own experiences as "memory-images rather than after-sensations" (49:457).

To understand what he means by "memory-images", it must be remembered that he distinguishes them into two classes; the simple representation and the visualization. "In the first case, the object formerly seen is merely represented; in the second case, it is subjectively seen again" (49:458).

Warren experimented with these phenomena; "but it is not clear how he distinguishes them from after-sensations," he said (49:458).

Urbantschitsch remarked in 1907 that the eidetic image was found especially among "youths". He did not hold however, that all young people possessed the image. He also said that it was found among "more easily excitable persons" (29:76). This latter description labels the phenomenon as pathological in nature.

Erich R. Jaensch, in 1910, took exception to Urbantschitsch's statement regarding the pathological nature of the eidetic image. Accordingly, he and his students systematically attacked the study at the Marburg Institute. A lively interest in the subject was created in the following way. All students and associates of Jaensch were encouraged to search for persons who might be profitably studied to give further light on the phenomenon. He pointed out that "the eidetic image might become of central importance for general psychology" (29:76).

In 1917, Oswald Kroh working under the influence of the Marburg School and teaching in one of the Marburg secondary schools, said that he found that the eidetic images were very frequent and quite normal phenomena at a certain age. This news was the stimulus for elaborate experimentation at the Institute.

The general aim of the Marburg School is to find the characteristics of the eidetic image. The most thorough description and discussion of the work accomplished in this direction at the Marburg Institute, has been given by Gordon Allport. His article was written in 1925, but up to date nothing as complete, as far as giving details of the characteristics, has been found. The work on eidetic imagery is of "immediate importance both to practical pedagogy and to theoretical psychology" (3:99), according to Allport.

To stress the importance of the consequences of such investigations he (Allport) mentioned that the Marburg School had "based a comprehensive doctrine of the evolution of mental life upon the phenomenon which it has brought to life" (3:99). This is known as the "unitary- type" theory. It claims that the eidetic image represents the ontogenetic source of all perception, and that, therefore, the eidetic period should be considered as a normal phase in the development of such mental phenomena. In the course of this ontogenetic development, there comes a period of undifferentiated unity, in which the behavior of the after-image, the eidetic image, and the memory image exhibit the same characteristics. This unitary phase breaks up with increasing age, and then the person is able to distinguish between the after-image, the eidetic image, the memory image,

and perceptions.

After a description of the phenomenon, in which Allport used Urbantschitsch's explanatory definition, he gives the extent of the eidetic power as 60 per cent of all children between the ages of ten and fifteen, and states that statistics for the younger children are, as yet, lacking. He points out, further, that the proportion of Eidetiker varies among different races and different types of schools which have been attended.

Before proceeding with the descriptive and functional characteristics of the eidetic image, Allport tells of a very simple procedure used in his own experiments with a group of eleven-year-old Cambridge children. He placed a projection mat on a table, at normal reading distance from the subject. This mat was about twenty-four inches square and covered with dark gray paper. Upon this mat, one at a time, were placed pictures which had been cut from a child's ordinary picture book. The pictures were rich in detail. The time for the exposure of each picture was thirty-five seconds. The child was told to observe the picture carefully and to report, afterwards, what was seen on the mat when the picture was removed. Allport said that the child with eidetic endowment immediately began to give the account, though questions were needed sometimes to bring out the finer details. Just what these questions



were and to what extent each individual was able to answer was not mentioned by Allport.

The greater part of the article was devoted to an account of the characteristics of the eidetic image, fifteen of which have been listed by the Marburg experimenters. They are Localization, Richness-in-detail, Persistence, Intensity, Corporeity, Size of the Visual Field, Coloration, Conditions of Arousal and Disappearance, Selective Tendencies, Flexibility, Coherence, Plasticity, Variability, Displacement in Space, and Fusion. These characteristics may be clarified, by a brief explanation.

Localization has been considered by all investigators, according to Allport, as externally projected. They ascribe to the eidetic image a certain "perceptual" character. The "attention of the observer is directed outwards" (3:102).

Richness-in-detail is accounted for by the fact that the image may have a complicated object (e.g., a picture) for its stimulus. "It is not to be supposed that the representation is strictly photographic in accuracy"(3:104). There are, however, "selective tendencies" which influence the production of the image, according to the interest it holds for the observer.

Persistence signifies that the eidetic image is more stable than the after-image, though a distraction may cause

it temporarily to disappear. With a voluntary effort it may be caused to recur again after "hours, days and even months and years" (3:105). This characteristic of persistence needs more testing, Allport says.

Intensity means that a certain rivalry takes place between the image and the ground when it is projected against a non-homogenous background. This occurs whether the image is either a memory image, an eidetic image, or an after-image.

Corporeity refers to the body of the image. Speaking of the corporeity of an eidetic image, Allport's article says that the "eidetic image of a three dimensional object is never devoid of bodily character, and that the eidetic image of a two dimensional object (e.g., a picture), especially among clear cut cases of eidetic ability, frequently appears in marked relief"(3:106). The principle of depth, as a criterion by which the three images may be distinguished, has not been established as a descriptive attribute.

The Size of the Visual Field has not been determined, though certain experiments have been performed to find just how far from the center of the image a stimulus in the periphery may be effective. These tests were given to compare each type of image; that is, the memory, the eidetic, and the after-image.

Coloration refers to the color in which the eidetic image may appear. Nothing definitely has been settled in this regard. Herwig reported twenty-one out of thirty-five children as seeing the image in positive color. He claims that with increasing age there is a tendency toward the negative (3:107). Colvin reported that the colors of the positive eidetic image are more brilliant than the original colors (14:261). The way in which the colors appear depends largely on the attitude and "doesn't differ essentially from the problem of the appearance of color in the AI" (3:107).

The Conditions of Arousal and Disappearance of the eidetic image have been compared with the after- and the memory images. There seems to be an agreement among experimenters on the following points: A longer time is required to arouse the eidetic image than to arouse the memory image. A still longer time is required to arouse the after-image than to arouse the eidetic image. The length of time required for these arousals is unsettled. It varies with different investigators. The eidetic image appears in the visual field in many ways. It may appear as a "transparent veil" before the object is removed, or it may develop a few seconds after the removal of the stimulus. The many details may develop simultaneously or successively. The eidetic image disappears from the visual field in many

ways. It may gradually pale until it vanishes, it may fade away piece by piece, or it may suddenly vanish if the attention of the observer is disturbed.

Regarding the Selective Tendencies which have been given as one of the characteristics of the eidetic image, Kroh concluded that "it is plainly nothing else than the greater interest which one object possesses in comparison with another which gives it preference" (3:109), in the arousal of the eidetic image. Allport says that the eidetic image may be concerned with material which means little to the observer. In one experiment he found children who could spell a very difficult German word which was not familiar to them, but which they had previously seen.

Flexibility refers to the changes that the content of the model (i.e., the picture), may undergo. The position of some details may be changed, or details may be added which were not present in the original picture. With an effort on the part of the observer movements may be made within the picture, such as a carriage moving away, or a person entering or leaving. Although there may be a striking alteration, there is a general tendency to reproduce accurately. The flexibility is wide, but it does not go far enough to include things that are considered unnatural or ridiculous. "It is well known that changes

in the content of the AI are not subject to voluntary control, whereas the MI is almost completely a voluntary phenomenon. In this respect, then the eidetic image must be regarded as more nearly related to purely central (ideational) imagery" (3:110).

According to Gosser, the images differ in the degree of coherence with that which appears simultaneously within the objective visual field. "The higher the level, the less is the coherence between the image and the perception" (3:110). The after-image tends to fasten itself to the ground. The eidetic image tends to free itself from the ground. The memory image remains totally uninfluenced.

By the Degree of Plasticity of an image is understood the extent of which it may be influenced by the conditions of a preceding experiment. The Marburg investigators claim that they minimize this factor by using the same experimental sequence; namely, the memory image, the eidetic image, and the after-image. Allport says that it is impossible entirely to exclude the influence of the previous attitude. This constitutes an important source of error in some cases. "The eidetic image, always the object of chief interest, is placed in an unsuitable and anomalous position in the middle of the series, and to what extent its attributes are a result of perseveration in the memory image, it is impossible to determine. It has already been

shown how a memory image, which is inaccurate in regard to certain details, will cause a subsequent eidetic image to be inaccurate in regard to the same details"(3:111).

Invariability refers to the size of the image according to its distance of projection. The eidetic image does not conform, as does the after-image, to Emmert's Law.\* In some cases the eidetic image is said to increase in size as the distance of projection is increased. In this way it would more closely resemble the after-image. On the other hand, the closer the resemblance between the eidetic image and the memory image, the less variable is its size. Not much experimentation has been done in this line(3:111).

Regarding Displacement in Space, Allport says that a young child's perception of the form of an object seems to be little influenced by the position of the object in space. It doesn't matter whether the picture book is upside down or in the proper position. In drawing, there is often confusion between left and right, up and down, vertical and horizontal. "He may reproduce form with considerable accuracy and still lack appreciation for its position in space. This phenomenon has its exact counterpart in eidetic imagery. Images are frequently reversed, turned

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\* The size of the image varies proportionately with the distance of the projection ground from the eye.

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upside down, or displaced from right to left. Unfortunately little control has been attempted for this strange phenomenon, and at present it offers no points of comparison with the displacement of perceptions or of memory images" (3:112).

Fusion refers to the blending of a series of images. Jaensch reports an experiment in which a generic or composite eidetic image was reproduced. This was accomplished in the following way. Several leaves of the same species of a plant were laid in a row. The observer looked intently at the first leaf until an eidetic image was aroused. This eidetic image was then projected on the next leaf, and so on until the series was completed. At the end of the series there appeared a "unique type of a synthetic image. It was not static but moved continuously, alternating to each shape until it returned to the original. This was repeated several times" (3:113).

Kluever joins Allport in disagreeing with the theoretical views held by the School at Marburg. Allport maintains that they (the Marburg group) have constructed their own doctrine of the evolution of mental life, with the eidetic phenomenon as a basis. He declines to accept their theories as they stand, "for they rely for support upon aspects of the eidetic phenomenon concerning which there is great uncertainty" (3:120). Kluever likewise declares

that the Marburg School have a theory which they are trying to prove through experimentation.

Kluever has written more on the subject of eidetic images than any other person in America. He is not a native American, but has spent the last few years in this country, lecturing and experimenting. In various articles he has given a brief account of the experiments conducted by prominent men in European countries, and particularly in Germany. He has also given a description of his own procedure and of the results obtained with subjects who took part in experiments. It was from results of these experiments that he reached the conclusion that a high I.Q. is not very likely to be found among adult Eidetiker. His very latest experimental endeavors, recorded since 1930 describe a particular characteristic of the phenomenon, which he has called "fragmentary eidetic images." These latter are parts or fragments of the image which may first appear and which may, upon concentration become "filled in" until the entire figure is visible.

Kluever has contributed to the Handbook of Child Psychology which was edited by Carl Murchison and published in 1931. In this recent publication he has given what is, perhaps, the most complete summary of the outstanding workers in the field of eidetic images (35:643-668). Though quite exhaustive as a piece of historical literature,



it gives little help to the new experimenter, as an experimenter. This is due to the fact that it describes no specific procedures or materials used by others.

Another interesting contribution has been made by Howard C. Warren (49:453-463), who, like Urbantschitsch, was able to tell of personal experiences with unusual "after-sensations" which happened during his early years, and which he was still able to experience some forty years later. During his early years Warren used to try and "see stories" when his eyes were closed. The visualizations were often vivid but "not so 'real' as after-sensations" (49:456). He continued to cultivate this method of visualizing until the age of eighteen "when under a new environment the practice dropped away almost at once" (49:456). For many years this visualizing capacity was little used and seemed to have degenerated (49:456). Then he again endeavored to visualize with his eyes closed. At first he had little success, but gradually the visualizing power returned and he was "able to picture scenes voluntarily, though not so vividly as in adolescence" (49:456). In speaking of his early experiences Warren says, "I am personally convinced that they were retinal phenomenon" (49:456).

He further suggests that they resemble the phenomena described by Urbantschitsch and Jaensch. He mentions Jaensch's work, suggesting, as did Allport and Kluever the

influence upon the results of his experiments of the theory held at Marburg. He says that their aim is to demonstrate that "visualizations are not produced and altered by suggestion, but are orderly (psychonomic) mental phenomenon;- that they are as capable of experimental investigation as perceptions" (49:460).

Warren relates how his own visualizations were brought about. He concentrated his attention on the retinal field, trying to make pictures out of what he could see, and then he tried to project them into a real scene. At first he could see nothing but "the play of retinal light," which he wove into a picture with the aid of his imagination. Then the picture suddenly became real. This lasted for only an instant. At no time was he successful in prolonging these images. The effort to control them voluntarily or to observe them closely caused them to disappear.

Warren compared his vivid visual experience with the vivid visual experience of Urbantschitsch and he says that they both resemble delayed after-sensations. He further states: "If the two phenomena are really due to the same neural processes, they bear on the relation between retinal and central processes" (49:458).

Warren gives his ideas of a physiological basis of visual after-effects. These he classifies in three groups: (a) visual after-sensations, (b) visual memories, and (c)

visualizations. This latter group,-namely, the visualizations-are regarded as closely resembling the eidetic image.

The three groups are described by their author in the following way. (a) Visual after-sensations are caused by physiological processes in the retina. "There seems no reason to doubt that they originate peripherally"(49:460). (b) Visual memories are dependent upon cerebral retention. Warren explains why it is impossible for them to be due to the same processes as are involved in visual after-sensations. First, he cannot see how such a large number of visual impressions could be retained for an entire lifetime in the "retinal substance." Secondly, he says that, even if they were retained, there exists no "motor mechanism" in the retina that would permit such traces to be voluntarily revived. "The absence of motor nerves in the retina supports the view that retinal retention is only a secondary aid to memory-that the stream of visual memories is controlled centrally and not through a retinal mechanism" (49:461). (c) Visualizations create a special difficulty in Warren's mind when he attempts to analyze their source. The definiteness of the outline of a certain tropical scene marks the visualization as peripheral; the fact that this scene was of long standing favors its central origin. The visualizations in this group (c), approach what Urbantschitsch

calls the "AB." The abbreviation AB, stands for the German word anschauungsbilder, which has been translated "eidetic," and called by the latter name throughout this paper.

In classifying images, Warren places three classes of visual images between two extremes. At one extreme is the visual sensation, due to objective stimulation. At the other extreme is the memory image, which he considers as "thought" (particularly in his own case), rather than as imagination.

The three in-between-groups are as follows: First, pure after-sensations, which are clear-cut, vivid, and easily recognized as real; which cannot be mistaken for figments of the imagination, and which are aroused by retinal stimulation. Secondly, mixed after-effects, which are not definite, but can be woven into definite figures by the help of central imagery. This is considered a partial visualization which is largely dependent on retinal factors. Thirdly, pure visualizations, which are even more vivid than the after-sensation. The details are lifelike, but the visualizations cannot be carefully examined. The visualization in Warren's case disappeared when he attempted to examine it. "The experience seems 'real' though obviously it is not external" (49:462). The experience of visualization is a combination of the peripheral and central elements" (49:463).

The disappearance of the above "visualized picture,"

as well as the manner in which it originated, seem to mark it as a product of the imagination. "The direction of attention upon, or the effort to attend to the imaginary object seems rather, in a large number of cases at any rate, to dissipate it, to have the effect of either causing it to disappear or of transforming it into something else" (22: Hicks: 144).

Warren does not compare his own experience with the results of any experimentation which he conducted in the field.

One of the clearest and most definite experiments that has been reported was conducted by J.A. Gengerelli (20:399-404). The experiment is given here in detail because upon it is based the principle involved in the construction of the first, or group, test which was used in the present experiment. Gengerelli conducted his experiment in his own home, with his two sisters as the subjects. Their ages were eleven and fifteen, respectively. Through conversational inquiry, the girls gave evidence of being "strong visual types." They reported that they "could 'see' things any place they wanted to" (20:399).

After many informal attempts had been made to "see" natural objects, four experiments were tried. The present writer is concerned mainly with the methods used and the results obtained in experiment one. The materials used

were seven pieces of white card-board, each ten centimeters square. On every square was drawn in pencil, by means of a compass, a circle. The circles varied in radii from twenty-seven millimeters to fifteen millimeters, and were drawn with a successively diminishing scale, making the radius of the largest circle two millimeters larger than that of the second-largest circle. The second-largest circle was two millimeters larger than the third-largest circle, and so on down to the last, or seventh, in size.

On another piece of card-board, ten centimeters by fifteen centimeters, was drawn in India ink a square which was forty-two millimeters on one side. This card-board, called the criterion, was placed at varying distances (eighty centimeters in the first experiment), from the subject and on a level with her eyes. The criterion was at all times exposed during the experiment.

The method of procedure was as follows: The cards were placed face down in a pile to the right of the subject. At the signal "Up," the subject picked up a card, looked at it for five seconds, and projected it on the criterion, giving judgment as to its size. It was reported as either too small, too large, or just right.

The experimenter, having previously numbered the cards on the back, recorded the judgment made after the card's number on a separate piece of paper. When the pile

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of cards was exhausted, it was again shuffled and the procedure repeated.

The experimenter maintained that in the above set-up "a maximal amount of eidetic endowment, would enable the O, practically, to give all correct judgments" (20:400). Ten judgments were given for each circle. The results indicated that the older subject had a "much more highly developed eidetic proclivity" (20:401) than the younger one.

This result is contrary to the work of Jaensch, which indicated that the eidetic capacity seems to diminish with age. Gengerelli's explanation of the case was that the older subject probably had an original endowment so superior to that of the younger one that, even at the age of fifteen, she could give a better performance than the one aged eleven.

Gengerelli's second experiment tested the effect of an increased distance of the projection upon the distribution of the judgments. The distance in this test was 365 centimeters. His third and fourth experiments were similar to the second one, but he used smaller intervals between the sizes of the circles and shorter distances for the projections. The projections were placed at eighty and sixty centimeters, respectively.

## Summary of Chapter One

Two outstanding characteristics of the eidetic image are stressed in the definitions given by writers on the subject. They are vividness of the image and its capability of external projection.

The historical background shows that the work has been prosecuted mainly in European countries and particularly in Germany. A review of the work that has been accomplished so far reveals that the subject is comparatively a new field for psychological research. Jaensch deserves the credit for attempting a systematic study of the phenomenon. Kluever has given a fair account of the work in the field and is, perhaps, the best authority for an American student to consult.

An examination of the literature shows a general confusion of theories, with the result that nothing definite has been settled regarding the nature of the eidetic image.



## CHAPTER TWO

## THE PROBLEM

An analysis of the work in the field revealed a variety of opinions concerning the different ages in which the eidetic endowment was found, and offered in most cases a middle position between the after-image and the memory image as the proper location for the phenomenon. The present study was an attempt to secure further information on both points.

The purpose of this investigation was, therefore, to determine the nature, as far as could be ascertained by an experiment, of the eidetic image and its prevalence among a group of unselected children.

One of the principal incentives which led to the present investigation was the unsettled state of opinion regarding the prevalence of the eidetic endowment. The following will help to illustrate the variety of opinions in this matter.

Allport mentions that the extent of the eidetic power of all children between the ages of ten and fifteen is about sixty per cent, and that "statistics for younger children are, as yet, lacking" (3:101). The age-levels of the children used in the present experiments afforded an opportunity to see to what extent eidetic powers existed among children below the ages recorded by Allport, as well

as to compare those who were the same ages as the children used by Allport.

Kiesow reported that "in the very young child only images of eidetic character are found" (8:375). He experimented with a number of children from six to twelve years of age.

Six to twelve years were the ages of the children that were available as subjects in the present study. There were also a few children that were above this age. This permitted verification of Kiesow's results.

Herwig, working with boys from ten to fourteen and one-half, found that 37 per cent, or 76 out of 205, were eidetic (29:78).

Zeman used children ranging from twelve to fourteen, among whom 88 per cent, or 176 out of 200, were eidetic (29:79).

Schumacher said that the majority of school children between the ages of nine and seventeen exhibited eidetic capacities (42:659).

Rossler's work shows that the peak of the eidetic constitution lies in early childhood (35:651).

Mayer found that the boys between nine and twelve, and the girls between ten and thirteen contained the largest proportion of eidetics. "Up to the eighth or ninth year and from the thirteenth or fourteenth year onward, the

proportion is practically none" (45:26).

Fischer and Hirschberg said that the acme of the eidetic endowment was found to be between the twelfth and fourteenth year (29:79).

Hansen believes that the "eidetic should not be spoken of as a regular phenomenon of youth, but it does not on this account lose its significance as an important factor in child study" (40:522). He also tells us that the relation between eidetic imagery and intelligence is not yet cleared up.

Reviewing these unsettled opinions, the question regarding the significance of the eidetic image arose. What was its value to the psychologist and the teacher? Many writers have given important suggestions in this regard.

Allport says that the "work is of immediate importance both to practical pedagogy and to theoretical psychology" (3:100).

Kroh believes that "a detailed analysis of eidetic phenomenon may be helpful for diagnosing abnormal mental states" (8:376). He likewise thinks that "the form and content of a person's eidetic images, may be helpful in the study of his personality" (8:376).

Kluever gained the impression from the results of an experiment that, in the case of adults with this endowment, a high I.Q. is not likely to be found (29:220).

Schmulling says that "the presence of the eidetic phenomenon have proved to be a clear mark of the integrated type of youth" (8:377).

Jaensch believes that "the results yielded by investigations of Eidetiker are not only important for fundamental psychological questions, but also for certain problems of biology, sociology, history, mythology, philology, education and art" (29:84).

Zillig found that reverie, inattention and indifference were characteristic of one with eidetic endowment. He also says that the stories which children tell may perhaps arise from their inability to distinguish between the perceptual and the eidetic. He further suggests that fears may be traced to this phenomenon (40:435).

Zeman says that "the pupil's activity is strongly influenced by his eidetic disposition. Obviously this is to be seen in such school subjects as drawing, where the eidetic disposition is of great help. Individualized instruction should consider this phenomenon. Problem cases, also, will often find their solutions in investigations of the pupils' eidetic dispositions. Remedial work may further or prevent the use of eidetical images. The problems of eidetics show from a general viewpoint, the importance of considering it in all our school work" (44:122).

Schumacher believes that the images which are spontaneously created by people with eidetic powers are very significant for the process of learning and working (42:659).

Burnham says that "they may prove valuable in offering opportunity for the test of the individual's personality." He states further that "the studies already have indicated a wide range of individual differences among those with eidetic ability" (8:376).

Otto Klemm states that the discovery of the eidetic disposition is of prime importance among the advances that have been made in psychology in the last decade (29:88).

Howard C. Warren considers the eidetic phenomenon "a promising field for research" (49:463).

Two important points--namely, the educational value and the ethical aspect of the eidetic image--have been discussed by Kluever. He tells us that some emphasize the importance of eidetic imagery and its influence for class-room instruction, while others point out the danger of making any general assertions. Kluever says that some adult eidetic cases show that "the important role eidetic imagery may play in studying such things as zoology, botany and phonetics" is quite obvious. "Undoubtedly, eidetic images are also utilized by painters and writers. Children frequently use eidetic images profitably, sometimes with almost

unbelievable success, in composition, public speaking, geography, physics, drawing and painting" (35:662).

While some writers tell of the advantages of the eidetic endowment, another group, present results of experiments which suggest the opposite; namely, that the presence of the eidetic image may hinder rather than help the progress of some children. As regards drawing, Pollitt and Metz agree that it is not possible to trace the contours of an eidetic image (35:663). Metz further tells of experiments which suggest that the "active drawing has not a visual, but a motor basis, and that children's drawings are essentially a form of language" (35:663).

Joesten (40:63) experimented with thirteen sculptors and seven painters to ascertain whether or not persons of such artistic talent were gifted with the power of eidetic imagery. She found no marked ability manifested by the number of the group, but she did find unusual imagery ability.

Kirek, in a study of "the formation of concepts" in children, found that those of one of the eidetic types (the B-type of Jaensch) experienced hardships in replacing vivid eidetic images by abstract concepts (35:662).

Regarding the relation of eidetic imagery and intelligence, the evidence to date seems to indicate a zero correlation between the two. But even if there be a zero correlation between eidetic ability and other abilities, one

must not forget that the abilities of man are but one part in the psychology of his personality. This point raises the question as to how far the interests and motives of an individual may be traced to the fact that he is eidetic or not.

Eidetic cases have been found in children at different intelligence levels. Zillig and Kirek concluded that strong eidetic imagery is more likely to be found in those of low intelligence (35:662). Schmitz and Bonte found no correlation between the eidetic image and general intelligence (35:662).

Some idiots have been found to be eidetically endowed. An interesting case of this kind has been recorded by Jaensch and Mehmel. They tell of a young man of eighteen who could give the exact day on which a certain date fell, or vice versa, over a period of several years. He was said to be a master of dates for the years 1920-1927. This young man was regarded as intellectually deficient in other respects (42:612).

Regarding the ethical aspect connected with the possession of the eidetic endowment, Zillig says that children's inability to tell accurately just what happened in a past event, may be due to confusion with an eidetic image (35:663).

The unsettled opinions discovered and, particularly,

the practical value suggested, increased the interest in the possible results of the present investigation.



## CHAPTER THREE

## THE PROCEDURE

## THE GROUP TEST

The present investigation was conducted in a public elementary school of the six-year type. All the grades were included in the investigation.

Two tests were decided upon; a group test, which was given as a means of selecting possible Eidetiker for future study, and an individual test. The individual test was given first, as a check for the group test, and secondly, as a means of studying the subjects' images.

The group test was given to 293 pupils, who constituted 93 per cent of the pupils in the school. The individual test was given to 153, or 48 per cent, of the children.

Before giving the tests, a few preliminaries were necessary in order to help the child to understand directions and to aid him in explaining what he saw. The idea of giving these preliminaries was inspired by the questions: Would the children, and particularly the youngest ones, understand the after-image? Would every child be able to see it?

To be sure that they did understand the after-image, the subjects were allowed to experience it. This experience demonstrated, first, that one could really "see" something

on a plain background, if one's eyes were turned on it, after concentrating on a particular object; and secondly, that it was possible to use the terminology of the children for one color to "turn into another."

The after-image was demonstrated in the following way: Two projection mats were placed side by side, on the blackboard, about four feet from the subject, and on a level with his eyes. This is the usual distance at which the child reads from a chart in the first-grade room. A third mat was placed on a diagonal line to the right, at a distance of twelve feet.

Blue, green, red, and yellow were the colors used in disc form. Each was placed in turn on one of the two adjoining mats and its center point was watched closely for a period of thirty seconds. The eyes of the subject were then turned to the adjoining mat, and the after-image was invariably noted.

The disc was concentrated upon again; and this time the subject's eyes were turned toward the farther mat, for the purpose of noting the size of the after-image at a greater distance.

Another preliminary which was given to secure perfect cooperation and to insure concentration on the test material was the story of the "Fairy Shoemaker." This story was told to the children in each grade a few days before the

day of testing. It was taken from the Elson Second Reader.

The pertinent fact in the story was the importance of keeping one's eyes intently fastened on the Fairy Shoemaker. If a person was able to do this, he could capture the little elf. In order to be released, the elf would give away a secret. This secret revealed the location of a pot of gold, which was buried at the foot of one of the trees in the forest. The children were told, before taking the tests, that perhaps they would find something on the gray if they could keep their eyes intently fastened on it. They were reminded, however, that it was very important to first fixate the first object.

The first test given was a group test. This test had to be constructed because no group test could be found by which one could study the images of children, nor was a group test available which would aid in the selection of possible subjects for the study of the eidetic image.

Therefore, influenced by the type of material used by Gengerelli (18:399), and further stimulated and encouraged by Carmichael's statement regarding the possibility of selecting Eidetiker through the use of certain portions of the Stanford Revision of the Binet-Simon Test (11:251), the writer undertook to construct a group test that would aid in choosing those possessing the eidetic image.

Gengerelli's experiment was given in detail in

Chapter I of this thesis. Carmichael's statement follows: "When an unusually good performance is given in response to test X, 3 of the Stanford Revision of the Binet-Simon Test (drawing designs from memory), the presence of eidetic imagery may be suspected"(11:251). The underlying principle in both articles is accuracy. In Gengerelli's article, it is accuracy in size; in Carmichael's statement, it is accuracy in form.

With the idea of accuracy in mind, as one of the criteria by which to judge the presence of the eidetic image, a group test was constructed.

For this test, an average of four hundred copies of each of six forms were mimeographed. Care was taken to insure a clear black print of each copy. Six forms were chosen because they afforded an opportunity for a more thorough investigation than if only one part was used. At the same time, by using a variety of forms, the experimenter could note the effect which differently shaped figures had on the subjects' ability to choose the right size. The possible influence of familiar and unfamiliar figures were also taken into consideration in making the figures for the test.

Accordingly, the following subjects were selected. First, a circle one and three-fourths inches in diameter was placed in the center of a paper eight and one half inches

square. This circle was exactly the same size as one of a group of circles, on another page. The group of circles were arranged around in a ring, in graduated formation. From the smallest to the largest the diameters measured one and one-half, one and three-quarters, two, two and one-quarter, two and one-half, two and three-quarters, and three inches, respectively.

Secondly, a tree five by one and three-quarters inches long was placed in the center of a page eight and one-half inches square. This tree was exactly the same size as one of a group of trees, on another page. The group of trees were arranged in a row, in graduated formation. Their heights and widths were, from the smallest to the largest, four and three-quarters by one and one-quarter inches, four and seven-eighths by one and one-half inches, five by one and three-quarters inches, and five and one-eighth by two inches, respectively.

Thirdly, a circle two and one-half inches in diameter was placed in the center of a paper eight and one-half inches square. This circle fitted perfectly into one of a group of squares, which were on another page. The group of squares were arranged in irregular formation, and their respective measurements on one side, from the smallest to the largest, were two, two and one-quarter, two and one-half, two and three-quarters, and three inches, respectively.

Fourthly, a candle three and one-fourth by one-half inches was placed in the center of a page eight and one-half inches square. This candle was exactly the same size as one of a group of candles on a cake. This cake was on another page. The group of candles were arranged in a row, in graduated formation, and their lengths were as follows: two and one-fourth, two and one-half, two and three-fourths, three, three and one-fourth, three and one-half, and three and three-fourths inches. They were all the same width, which was one-half of an inch.

Fifthly, a balloon one inch in diameter was placed in the center of a page eight and one-half inches square. This balloon had the same diameter as one of a group of balloons, on another page. The group of balloons were irregularly arranged on strings, and were held in the hand of a man. The balloons had the following diameters: seven-eighths of an inch, one inch, one and one-eighth inches, one and one-fourth inches, and one and three-eighths inches.

Sixthly, a dog measuring three and three-eighths inches from the tip of his tail to the tip of his nose was placed in the center of a page eight and one-half inches square. The dog was sitting, and the measurement given was a diagonal one. Using this as the hypotenuse, a right triangle was constructed the base of which was two and three-eighths inches in length. This measurement was used to mark the

distance between the legs of a table. The height of the table was the same. This height corresponded with the sitting height of the dog. Under this table the dog fitted perfectly. The measurements given for the other tables, as well as for the first described table, are inside ones. They are: two and three-eighths inches by two and one-eighth inches, two and three-eighths inches by two and three-eighths inches, two and three-eighths inches by two and five-eighths inches, and two and three-eighths inches by two and seven-eighths inches.

Now each of the six forms or tests which have just been described were arranged in book form, to induce speed and ease in handling. Each little book had three pages and a top cover. The cover prevented the children from looking at the test beforehand. The first and third pages were white, and the second page was gray. On the first page was a single object (e.g., the single circle, or the single tree, or the single balloon, etc.).

There were no figures on the second page. This page was gray, and was inserted for the following reasons: The first reason was to permit the after-image of the first stimulus to appear on the gray background. After reviewing it here (on the gray) could it be identified, as to size, on the third page? The second reason was to permit the element of time to enter in. If the image did not appear

on the gray paper, would it be ready to appear after this rest period of thirty-five seconds? Could it then be identified, as to size, on the gray?

On the third page was a group of objects, all similar in form, but varying in size. Among the various sizes was one which was exactly the same in width and length as the figure or object on page one. In other words, the object on page one coincided with, or fitted perfectly into, one of the many figures on page 3.

These books are reproduced in Appendix I.

A copy of each of the six little books, all piled in the same order, was placed on each subject's desk. The first, or the top, book in the pile was placed in a vertical position in the pencil groove in the desk, was examined according to the instructions given in the following paragraph, and then slipped inside the desk. The five remaining books were handled in like manner.

Before proceeding with the specific instructions, regarding the examination of each little book, the experimenter reminded the children of the pertinent facts in the story of the "Fairy Shoemaker," a story which had been told as part of the preliminary preparation for the test. This tale was recited to impress upon the children the importance of keeping their eyes intently fastened upon the pages of the test. The results indicated that it



apparently produced the effect intended.

With the idea in mind of the importance of concentrating on the figures in the little books, the group, upon a given signal, looked intently at the single object on page one. The time given for this concentration was thirty-five seconds. This was the time used by Allport.

At the end of this period a second signal was given, at which the subject quickly turned the page and fastened his eyes in like manner (intently) on page 2 (the gray). The concentration on this page was also for a period of thirty-five seconds.

At a third signal, the subject turned to the last page. On this page was the group of figures, into one of which, the object on page one, fitted perfectly. The subject marked with an "X" the figure which he believed was right. This method continued, until the six books were marked. The results of this test are recorded in the next chapter.

## THE PROCEDURE CONTINUED

### THE INDIVIDUAL TEST

The second experiment conducted in this investigation was given individually to 153 children. This experiment checked the worth of the group test as a means of selecting possible Eidetiker. This was not its primary purpose, however. Its chief aim was to note the characteristics of the eidetic images, in as far as they were shown to have been experienced by the group of unselected children at hand.

The characteristics which were especially sought were those mentioned in the definitions in Chapter I, namely, vividness and external projection. Added to these was the characteristic of richness-in-detail which had been suggested by all writers as a prominent feature of the eidetic image. It was hoped that a study of these features of the phenomenon would suggest the nature of the eidetic image.

For the purpose of studying these characteristics, three brightly colored pictures whose theme had a special attraction for children were used. The first picture represented the activity of children, the second was a picture of a mock king, and the third was a picture of a rabbit dressed as a man. A more detailed description of each picture follows: The first picture was called the "Activity of Children." It represented the activity of a little boy and a little girl. These children as well as

other objects in the picture were brightly colored. The boy wore a blue suit and blue half hose. His oxfords were a tannish orange in color. He was sitting on a chair and there was a large black book in his lap. His head of blond hair was seen above the large book. A box of paints were beside him on the chair.

The girl in the picture was riding a kiddy car. The kiddy car was tan and black with red disc wheels and yellow tires. The girl's yellow hair seemed to be blown back by the wind. Her red dress which was trimmed with a small white collar also appeared to be blown by the wind. She wore green rolled hose and black one-strapped slippers.

In the lower right hand corner of the picture was a tiny woman holding a pan in her hand. She was feeding three little white ducks. Her costume consisted of a blue waist, a red and white striped skirt, and a white apron. She was too small to be considered an important part of the picture.

The second picture was called the "Mock King." This king was short and fat. He wore light green shoes, trousers, and cape. The shoes were trimmed with yellow buckles. The trousers had black and yellow bands at the knees, and a black and yellow belt which was fastened with a large yellow buckle. His shirt was pale blue. The neck frill, cuffs, and hose were white. The head of a jester on the end of a stick was held in one of the king's

hands. The costume was completed with a green crown which was trimmed with red beads, and was bordered at the pointed top with a wide band of yellow.

The third picture was called the "Rabbit." The rabbit was formally attired in a black swallow-tail coat, red trousers, a white vest, a black silk hat with a white band, a frilled shirt, a fancy red cane, and a monocle. Tufts of green grass were near his bare white feet. In the upper right hand corner of the picture was a large red and white capital "R." Scratches of blue ink were across the straight section of the "R." Other outstanding details were the rabbit's white tail, his red-lined white ears, and his whiskers. These three pictures are in Appendix II.

The three pictures were presented to the children while they were seated within a roughly constructed cardboard house. This crude house was built as follows: A dark gray mat rested on the seat and was supported by the back of a chair. This formed a wall in the front end of the house. Three gray card-board mats were used for the side walls and the ceiling. The rear was left open and was used as a doorway. This entrance was so situated that only a minimum of light could enter. Further light was closed out when the subject entered the house and sat on a little chair (the kindergarten type) with his back to the opening or doorway.

Now in order that the pictures could be presented within the little house, an opening was left in the roof at the front end. This opening was immediately above and in front of the dark gray mat which was really the projection mat. Through this opening, one at a time, the pictures were lowered and allowed to remain against the gray mat for thirty-five seconds. To insure enough light falling upon the pictures--so that they could be clearly seen--a part of the left wall was cut away at the front.

The subject sat within this house on a kindergarten chair, rested his elbows on the edge of the "table" (the table was the seat of the large chair), and gazed at each picture for the prescribed time (thirty-five seconds). This seating arrangement proved comfortable for all, save a few boys, for whom all things had to be raised proportionately.

The purpose of constructing such an enclosure was three-fold. First, it shut out all ordinary distractions. This afforded an opportunity for better concentration. Secondly, it created a darkened chamber. This was conducive to the production of the eidetic image. "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 open, with hallucinatory clearness" (11:251). Thirdly, it provided freedom from any restraining influences. Such influences

might have been: first, self-consciousness in the presence of the experimenter; secondly, the possible effect of facial expressions or gestures of the experimenter; thirdly, distraction caused by watching the experimenter taking notes and possible fear, especially in the older ones, of what the notes might mean; fourthly, the fear of a stranger (the experimenter) effecting the subject's normal reaction to the test; and fifthly, the temptation of the experimenter to aid the subject, upon noting any causes of distress.

A summary of the materials used for the individual test, therefore, were three colored pictures, a roughly constructed house, a chair and a table, a dark gray projection mat (which in this case was also the front end wall), and a stop watch.

Now all was in readiness for the procedure. Each child in turn was correctly seated within the little house and told to keep his eyes on the gray mat or wall ahead. He was told that three pictures were going to be shown and that after they were removed, he was to relate what he saw on the gray mat.

Then the first picture was lowered and allowed to remain against the gray mat for thirty-five seconds. During this time the subject concentrated on the picture. When it was removed, he told what he saw on the projection. He was allowed two minutes to concentrate on the mat after the

picture had been removed. While the subject was concentrating, during the two-minute period, the experimenter to be sure that the subject was watching the gray, asked a few questions. They were as follows: Are you looking at the gray? Can you see anything at all on the gray? Can you see any color on the gray?

The next step in the procedure was to test the subject's ability to remember the picture. These questions were asked: Do you remember the picture I just showed you? Can you tell what that picture was about? Tell what you know about that picture. The child's report was recorded.

Immediately following the report some questions were asked which might possibly assist the experimenter in the classification of the image described. These questions were: Did you see that on the gray now as you were talking? Did you really see that somewhere?

These queries were followed by another questionnaire which was designed to find out how much detail could be given of the picture. The questionnaire was:

What can you tell about the children's hair?

What can you tell about the boy's clothes?

What can you tell about the boy's feet?

What can you tell about the girl's clothes?

What can you tell about the girl's feet?

What was the boy doing?

45  
What was the girl doing?

Was there anybody else in the picture with the children?

If the answer to the last question was given in the affirmative, the questions "how dressed" and "what doing" were asked.

The same procedure was repeated for each of the other two pictures. Each of the other two pictures, of course, had to have a questionnaire of its own. The one for the "Mock King" was as follows:

What can you tell about the king's head? This was asked only if the subject mentioned the king's crown. The following question also referred to the crown. It was: Do you know the color and how it was made?

What can you tell about the king's clothes?

What can you tell about his feet?

Was he the only one in the picture?

Was he sad or happy? Why?

The questionnaire for the rabbit's picture was:

What can you tell about his head?

What can you tell about his clothes?

Can you see his tail?

What can you tell about his feet?

Where was he walking?

Was there anything else in the picture?

The results of this individual test was recorded in the next chapter.



## CHAPTER FOUR

## THE RESULTS OF THE TESTS

## THE GROUP TEST

Each child in the group test passed judgment on the size of a figure in each of six little books. The records of these little books was then tabulated.

An examination of the tabulations showed that only three, or one per cent, of the children had selected all the figures accurately. This small per cent indicated either one of two things. First, that accuracy was no criterion by which to judge the eidetic image or secondly, that there were no or very few Eidetiker in the group. The question arose as to what then, if anything, did influence the selections which were made? A study of the results in reference to what might have been possible influences are given in table form.

Table I shows the number in each grade who selected the figures in the six little books as correct or incorrect. The incorrect selections were further examined to see if they were due to an over-estimation or an under-estimation of the size of the figure. The total of all grades for the various books are as follows:

Book I shows that the figures were chosen bigger or smaller in about equal proportions; 100 as bigger, and 102 as smaller.

TABLE I

## ESTIMATE OF SIZE BY GRADE

Grade	Book 1			Book 2			Book 3			Book 4			Book 5			Book 6		
	Over-estimates	Under-estimates	Correct	Over-estimates	Under-estimates	Correct	Over-estimates	Under-estimates	Correct	Over-estimates	Under-estimates	Correct	Over-estimates	Under-estimates	Correct	Over-estimates	Under-estimates	Correct
1B	9	5	5	4	7	8	4	13	2	12	5	2	5	14	0	8	10	1
1A	8	15	7	5	13	2	7	14	9	4	17	9	3	18	9	8	14	8
2B	9	2	1	2	2	8	2	6	4	2	1	9	3	3	6	6	4	2
2A	7	8	12	5	9	13	8	12	7	7	9	11	6	13	8	7	13	7
3B	8	7	1	3	1	12	2	10	4	4	8	4	4	9	3	11	3	2
3A	3	8	1	1	7	4	2	6	4	0	8	4	2	8	2	3	5	4
4B	9	16	7	5	11	16	9	18	5	9	11	12	4	18	10	9	12	11
4A	9	10	13	1	16	15	5	19	8	7	15	10	7	16	9	7	21	4
5B	13	5	5	3	7	13	5	9	9	4	3	16	4	9	10	6	13	4
5A	3	14	6	3	13	7	3	13	7	3	12	8	2	15	6	5	11	7
6B	10	6	11	2	10	17	3	16	8	9	3	15	6	12	9	7	14	6
6A	8	5	15	3	9	16	5	15	8	5	5	18	7	10	11	7	9	12
Special Room	4	1	7	3	4	5	1	8	3	4	0	8	3	4	5	7	4	1
Total	100	102	91	43	104	146	56	159	78	70	97	126	54	149	88	91	133	69

Book II shows an under-estimation of the size. This was two and one-fourth times as great as the over-estimation.

Book III shows an under-estimation of the size to be two and four-fifths times greater than the over-estimation.

Book IV approached equality in this regard, still the under-estimation was slightly greater, being one and three-tenths more than the over-estimation.

Book V showed the under-estimation to be three times greater.

Book VI showed the under-estimation as one and one-half times greater.

These under-and over-estimations were not always constant in each individual selection. In other words, the same child did not always select the wrong figure as smaller or always as bigger. Because the children erroneously chose the figure in one book as bigger, and the figure in another book as smaller, they were placed in the "inconsistent group."

There were some children, however, who were constant in this regard. These children always selected the erroneous figure as smaller or as bigger in each book. Therefore, there were three groups among those who made erroneous selections. The number in each grade, belonging to these three groups were placed in Table II.

The per cent of the entire group who constantly over-

TABLE II

## ERRONEOUS JUDGMENTS OF SIZE BY GRADE

<i>Grade</i>	<i>Over-estimating</i>	<i>Under-estimating</i>	<i>Inconsistent</i>
<i>1B</i>	<i>6</i>	<i>10</i>	<i>3</i>
<i>1A</i>	<i>2</i>	<i>17</i>	<i>11</i>
<i>2B</i>	<i>5</i>	<i>2</i>	<i>5</i>
<i>2A</i>	<i>6</i>	<i>12</i>	<i>8</i>
<i>3B</i>	<i>3</i>	<i>5</i>	<i>8</i>
<i>3A</i>	<i>1</i>	<i>10</i>	<i>1</i>
<i>4B</i>	<i>5</i>	<i>12</i>	<i>14</i>
<i>4A</i>	<i>5</i>	<i>13</i>	<i>10</i>
<i>5B</i>	<i>4</i>	<i>10</i>	<i>8</i>
<i>5A</i>	<i>3</i>	<i>5</i>	<i>6</i>
<i>6B</i>	<i>7</i>	<i>13</i>	<i>6</i>
<i>6A</i>	<i>5</i>	<i>10</i>	<i>9</i>
<i>Special Room</i>	<i>2</i>	<i>0</i>	<i>10</i>

estimated was eighteen-hundredths, those who under-estimated were forty-two hundredths, and those who selected inconsistently were thirty-four hundredths.

It was interesting to note that nearly half of the subjects selected the figures as smaller. This result tended to confirm results which had been quoted by Allport who experimented to see if the excellence of reproduction of designs by children would indicate in any way that they were subjects who possessed the eidetic image. He tells of designs that were reproduced after intervals of two weeks, four weeks, and immediately after exposure. He says that certain "typical alterations occur during the period of retention. The images tend, in general to become smaller, more symmetrical and simpler. In general, it may be said that although very few are perfectly retained, the figures do not disintegrate nor lose their identifiability"(2:148).

Myers found that the shrinkage in productions depended upon the size of the original stimulus used. She used figures ten millimeters high and found them reproduced by 16 per cent as smaller and by 35 per cent as larger. She then used figures 40 millimeters high and found 84 per cent of the subjects reproduced them as smaller and none as larger. "The predilection of children for diminutive drawing, she finds as less independent than that of adults upon the size of the original stimulus" (2:144).

Wolfe found that only one per cent of a group of 415 fourth-grade children were able to draw an American dollar bill from memory as long as the original and only 4 per cent were able to draw it as wide. He attributes this to the children's association with the image. "The explanation of so large constant errors will occur to everyone. We seldom see bills, spread out at full size. They are generally folded" (2:156).

The conditions in the present group test rule out this account which has just been given of shrinkage, save possibly in the case of the dog, who perhaps has never been seen sitting upright under a table.

The combined results of the experiments quoted and the results of the present investigation tend to show, in general, that children's reproduced images are not accurate in size.

Tables I and II showed that the majority in all grades were wrong in selecting the correct size of the figure in each of the six little books and that their erroneous selections were judged as smaller in nearly half of the cases.

Another observation revealed that the children were not proportionately wrong in their choice of the various figures. In other words, the majority were not proportionately wrong in selecting the taller figures, such

TABLE III

## INACCURACIES CLASSIFIED ACCORDING TO SHAPE OF FIGURE

Taller				Regular				Irregular			
Candles		Trees		Circles		Boxes		Balloons		Dog	
Number incorrect	Percent incorrect	Number incorrect	Percent incorrect	Number incorrect	Percent incorrect	Number incorrect	Percent incorrect	Number incorrect	Percent incorrect	Number incorrect	Percent incorrect
215	73.37%	147	50.17%	202	68.94%	167	56.99%	205	69.99%	224	78.15%

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as the candles and trees; the regular figures, such as the circles and boxes; and the irregular figures, such as the balloons and the dogs. Now the balloons might have been as properly classified under the heading of "regular," had it not been for the presence of a string on each. Would this string influence the choice? Because of this possibility it was listed as regular. The number and the per cent of the errors in each of the three groups is shown in Table III.

An examination of the three groups showed that the greatest number of errors were made in the Irregular group, with the figures of the dogs. But the second greatest number of mistakes were made in the Taller group, with the candles. The least number of errors were made in the Taller group with the trees, and the second lowest number of errors were made in the Regular group, with the boxes.

The total number of these inaccuracies were listed according to the grossness of their errors in Table IV. The results given in this table and in Table III suggest that the errors increase proportionately as the outlines of the figures increased in irregularity with one exception, that of the trees. These trees were very simply shaped with triangular tops and their group was smaller in number than that of the circles and boxes. This latter point may have made it easier to select the correct figure.



TABLE IV

ESTIMATES LISTED ACCORDING TO GROSSNESS OF ERROR

<i>Figure</i>	<i>Shape</i>	<i>Number Incorrect</i>	<i>Percent Incorrect</i>	<i>Number Correct</i>	<i>Percent Correct</i>
<i>dog</i>	<i>irregular</i>	<i>224</i>	<i>78.15%</i>	<i>69</i>	<i>21.85%</i>
<i>candle</i>	<i>taller</i>	<i>215</i>	<i>73.37%</i>	<i>78</i>	<i>26.63%</i>
<i>balloon</i>	<i>irregular</i>	<i>205</i>	<i>69.99%</i>	<i>88</i>	<i>30.01%</i>
<i>circle</i>	<i>regular</i>	<i>202</i>	<i>68.94%</i>	<i>91</i>	<i>31.06%</i>
<i>boxes</i>	<i>regular</i>	<i>167</i>	<i>56.99%</i>	<i>126</i>	<i>43.01%</i>
<i>trees</i>	<i>taller</i>	<i>147</i>	<i>50.17%</i>	<i>146</i>	<i>49.83%</i>

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The least correctly chosen was the dog under the table. There were 224 out of 293 who chose it as wrong. The irregular outline of the animal, the variety of positions in which the subjects' associations with it may have caused it to be recalled, and the kind of object into which it was to fit perfectly apparently tended to make the selection of this figure difficult. The object into which, or rather, under which the dog fitted was the table. This was the only object in any of the six little books which was not fully bounded. In other words, it had only three sides. No floor or portion of a floor which would have formed the fourth side was drawn.

A further consideration that might possibly have influenced the selections of the figures, according to the results found, was sought in the arrangement of the figures on the page. Did the groups which were arranged in graduated formation or the groups which were arranged in irregular formation suggest any particular influence on the choice of selection? Table V shows the number of right and wrong in each of the two formations. The trees which were arranged in graduated formation had the greatest number of correct selections. The boxes which were arranged in irregular formation had the next greatest number of right answers. The trees were chosen correctly by 146 or 49 per cent of the subjects. The boxes were chosen

# TABLE V

ESTIMATES LISTED ACCORDING TO FORMATION OF GROUPS

Graduated formations						Irregular formations					
Trees		Candles		Circles		Box		Balloon		Dog	
Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct
147	146	215	78	202	91	167	126	205	88	224	59

by 126 or 43 per cent of the subjects.

That the arrangement of the balloons as well as the strings to which they were attached had no effect in their selection was shown in comparing their results with those of the same type of figures, namely, the circles. The per cent of subjects that had chosen each of the two figures correctly was 30 and 31, respectively. The number for each was 88 and 91.

A summary of the results of the group test shows: First, that the majority chose the size of the figures inaccurately. Only one per cent were correct in their judgments. Secondly, that nearly one-half of the group under-estimated the size of the figures. Thirdly, that the errors made, regarding the shape of the figures, increased proportionately as the outlines of the figures increased in irregularity. There was one exception to this, the trees. Fourthly, that the arrangements of the figures on the pages seemed to have had no influence in their selection.

## THE RESULTS OF THE TESTS CONTINUED

### THE INDIVIDUAL TEST

The second test in the present investigation was given individually to 153 children. Each of these children had been shown three brightly colored pictures and they had been instructed to project them on a gray mat.

The outstanding characteristics of vividness, richness-in-detail and capability of external projection were sought in answers to a group of questions. These questions had been asked while each child was taking the test. Their answers had been recorded.

These answers or records were later examined by the experimenter, for the purpose of noting "just what" and "how much" had been seen on the gray projection mat. The examination followed this form:

How many could see the main objects on the gray?

How many could see the partial objects on the gray?

How many could see imaginary objects on the gray?

How many could see color on the gray?

How many could see objects or partial objects as a shadow (i.e., some colorless figure or colorless parts of figures) on the gray?

How many could give details of the objects on the gray?

How many could see original color on the gray?

How many could see complementary color on the gray?

Just what was found and to what extent it was found by the entire group has been given in Table VI.

The Main Objects meant the outstanding persons or things in the picture. The scores for the pictures which had only one outstanding feature such as the "Mock King" and the "Rabbit" are nearly equal, being 21 and 19, respectively. This score is one and three-fourths times greater than the score for the "Activity of Children" picture. Concentration on a single figure would in ordinary circumstances make it easy to produce an after-image of that figure. But if this were an after-image it did not show complementary color. Rather, as shown in Table VI, it was seen as a shadow. Kluever says that the eidetic image may appear as a "continuum" from a shadow to a vividly colored picture (24:196). The shadow described in this test seemed to vanish immediately.

Now the after-image of the king's green clothes would have been a faint pink and the rabbit's black and red clothes would have given a white and green color as complementary on the gray mat. Were these colors difficult to detect on the gray? Whether this difficulty accounted for the children seeing the images as shadows, or whether the shadows were a distinct phenomena, which would classify them as eidetic rather than as after-images, suggest one point. This point is in reference to one characteristic

TABLE VI

## OBJECTS REPORTED SEEN ON GRAY PAPER

<i>Reported seen</i>	<i>Pictures</i>		
	<i>Children's activities</i>	<i>Mock king</i>	<i>Rabbit</i>
<i>main objects</i>	12	21	19
<i>partial objects</i>	28	19	18
<i>imaginary objects</i>	6	6	3
<i>color only</i>	16	10	13
<i>shadows</i>	11	21	18
<i>details of objects (partial)</i>	1	1	3
<i>original color</i>	4	3	0
<i>complementary color (partial)</i>	12	10	3

TABLE VII

PERCENT OF  
MAIN AND PARTIAL OBJECTS  
SEEN ON GRAY BACK-GROUND

<i>Pictures</i>	<i>Main Objects</i>	<i>Partial Objects</i>	<i>Totals</i>
<i>Children's activities</i>	07.84 %	18.3 %	26.1 %
<i>mock king</i>	13.70 %	12.40 %	26.1 %
<i>rabbit</i>	12.20 %	11.10 %	23.3 %



of the eidetic image. It is the feature of vividness which has been suggested in Chapter I as one of the outstanding characteristics. No vividness was in evidence, on the gray. This statement holds, of course, only for results in the present test.

The "Activity of Children's" score probably was less than that for the "Mock King" and the "Rabbit" because it was composed of more than one main object. It contained the boy and the girl. It seemed harder to produce on the gray the image of more than one figure. Of the twelve images seen on the gray after the "Activity of Children's" picture was removed all were about the girl, although the boy was just as large in the picture as the girl. The girl, however, was more centrally located in the original picture, and was dressed in a brighter color (red) than the boy. The boy's suit was blue and most of his body was hidden behind a large black book.

The number who told of seeing Partial Objects were those who could see only one part of a figure or figures on the projection mat. Table VI shows that the number for the "Mock King" and the "Rabbit" were about equal, being 19 and 18, respectively. The number for the "Activity of Children's" picture was one and one-half times greater than that for the "Mock King" and the "Rabbit." This increase in seeing Partial Objects may have been

due to the fact that the "Activity of Children's" picture had more small figures in it. These were really whole objects in themselves, but they could be counted only as Partial Objects, in reference to the Main Objects in the picture. For example, they were in two cases (the ducks and the blue ball) so diminutive that one could not help but see the whole figures, if they were seen at all. These same two so-called Partial Objects were isolated from the other figures. This made them more distinguishable, and therefore more likely objects for the children's concentration.

The little white ducks were seen by four children and the little blue ball was seen by two children on the gray. The other Partial Objects which were observed on the mat were the boy's black book, which was seen by one; and the wheels of the kiddy car, which was seen by 19. The wheels were attached to the kiddy car but were very conspicuously placed and attractively colored. The front disc wheel was in the center of the stimulus picture and was bright red, with a yellow tire. The rear wheels were a little smaller but were of the same red and yellow coloring. They were marked with a white and black circle at the center. Fixation on the center of the wheel and then on the gray mat would cause an after-image to be seen. It is difficult to say just what each child fixated, if anything, before the picture was removed. It is reasonable to believe that perhaps some

at least, did fixate something in the picture. This supposition is based on results found on the gray, where in seven cases, a green circle had been seen. This green circle could be, and probably was, the after-image of the red wheel.

Other Partial Objects which were seen on the gray were the handle on the kiddy car, observed by one; the girl's head, observed by one; and the girl's dress, which was seen by three. It is important to note that all these Partial Objects belonged to the figure which was the most prominently located on the page. This figure was the girl on the kiddy car.

The greatest percentage of Partial Objects among the 19 listed for the "Mock King" was the percentage who chose the buckle on the king's belt. This detail was given by 13 children. Now this buckle was in the center of the stimulus picture, was bright yellow in color, and was fastened to a black belt. It was seen in the complementary color eight times, in the original color twice, and as a shadow three times. The after-image of this yellow buckle was blue and could have looked very much like a shadow to color-weak children.

The number of Partial Objects among the 18 listed for the "Rabbit" were about the same for the cane and the ears, being six and five, respectively. The cane was held out

at a conspicuous angle in the stimulus picture. It had an artistic top designed something like the figure seven. It was bright red and stood out against a black background. The ears which were seen on the gray were also conspicuous in the stimulus picture. They were standing up on either side of the black hat. They were white and red.

It was worthy of note that the Partial Objects which had been seen on the gray in all cases were conspicuously arranged in the picture used as a stimulus. In some instances, as in the ducks and the blue ball, they were isolated from the Main Objects. In other instances, such as the wheels on the kiddy car and the cane and ears of the rabbit, they were projected in a manner which made them very readily seen by the observer. Even the buckle on the king's belt could really be considered in the center of the picture. These outstanding pictures apparently made the chosen details more attractive for concentration.

The Imaginary Objects were given only by a few. These phenomena were called Imaginary Objects because their description did not fit any objects in the picture. An example of those that were given for the "Activity of Children's" picture will serve to illustrate the point. They were given by six children and were as follows: A house, a tree, some balloons, a man, a kite, a window, and a dog. These were seen on the gray, after the picture had been

removed. Being Imaginary Objects it is not easy to say whether or not they were really projected on the mat. Nor is it easy to state whether or not they were some object or a part of an object which had been seen in the picture and not recognized by the observer when projected on the gray. For instance, the large black book may have been called a house and the wheels on the kiddy car may have appealed to the child as balloons. It is hard to say just how an irregularly-shaped after-image of an object appears to a child. Perhaps the girl's dress or hair was interpreted as a kite because each was in a flying position in the picture.

Just Color recorded in Table VI signifies that the children could describe no special forms on the gray mat, but could see "patches" of color.

The Shadows have been described as phenomena which possessed no special color. They were inclined to white or black according as they were said to be lighter or darker on the paper. The number of Shadows given, corresponded in all but one case, with the number of Main Objects which were given for the three pictures. This indicates that the Main Objects were seen on the gray as Shadows, rather than as colored images. This may have been due to the fact that the children could not tell just what the complementary colors were on the gray, or else it

indicated that they experienced the phenomena which Kluever would consider as eidetic. "There are great differences as to completeness: We have a continuum from an indefinite 'blurred shadow' to a fairly accurate AB" (24:196).

The next point of interest is in reference to the Details of Objects. Table VI shows that the number given for this point was the smallest of all things seen on the gray. Not one of the group of 153 children could give the details of any figure completely. The details of a part of a figure were given, however. One child described the front of the kiddy car in this way: "There is a handle with hands on it and under it I can see the wheel." Another child told about the buckle on the king's belt: "It is a yellow buckle with dark squares in the middle."

Three children described a part of the rabbit. Two of these referred to the rabbit's ears. Both mentioned that they could see stripes in the middle of them. The third child tried to describe the rabbit's cane: "Its got a hook on the top and something like a little window in the middle."

The small number that were able to give the details of only part of a figure indicates an absence of one of the most distinguishing characteristics of the eidetic image. This characteristic enables the child to describe an image on the gray with "richness-in-detail." Although this ability

to give a detailed description from an image on the gray was not found, the ability to give details from a source other than the projected image was very marked.

This other source was found in the following way: Each child was given a two-minute period to concentrate on the gray after the stimulus picture had been removed. During this time they told what they saw on the mat. In all cases, before the period had expired, the children said that they could see no more on the gray. Then the questions were asked: Do you remember the picture I just showed you? Can you tell what that picture was about? Tell all that you know about that picture.

After these three queries the child began to tell all he knew about the picture. When he finished telling all he could remember, he was asked a number of questions which referred to the outstanding details of the picture. These questions have been given on pages 48 and 49 of this thesis.

In 31 per cent of the cases, this questionnaire could have been omitted, for this number had already given most of the details in their description. The ability to give details increased to 63 per cent with the aid of the questionnaires. This large per cent giving details from memory made a strong contrast with those who could give details on the gray. For two pictures there was only one

out of 153, and for one picture there were only three out of 153 who could give details on the gray. These details were not the details of a whole picture, but only a point or two about a part of a picture. This may be illustrated by recalling the two children who said that they could see the rabbit's ears with stripes in the middle of them.

The large percentage (63 per cent) of the children who could give details from a source other than the gray projection mat suggest that if the details were not given from memory, but rather from the eidetic image, than the eidetic image is more akin to the memory image than to the after-image.

The last two points in Table VI show that all the colors seen, were few in number. There were four and three respectively for the "Activity of Children" and the "Mock King" pictures, who observed the original color on the gray. No one saw the original color on the gray after the removal of the "Rabbit" picture.

The number of the Complementary Colors given on the gray were as follows: Twelve children mentioned seeing the Complementary Color of a figure in the "Activity of Children" picture after the stimulus had been removed. Ten and thirteen mentioned seeing Complementary Color on the gray after the removal of the pictures of the "Mock King" and the "Rabbit."



The Complementary Color was seen on the gray three times more frequently than the original color for the pictures of the "Activity of Children" and the "Mock King." It was seen thirteen times more often than the original color after the picture of the "Rabbit" had been removed.

The figures for the Complementary Color corresponded with the figures for Just Color, as shown in Table VI. There was one exception, however. This occurred in the picture of the "Activity of Children." In this instance the number for Just Color was sixteen, while the number for Complementary Color was twelve. This can be explained by the fact that four children mentioned the color that was neither the original nor the complement of the colors in the pictures.

To demonstrate the ability that the children exhibited in giving details from memory, a few cases have been recorded in the next chapter. These cases were chosen because they contained other interesting points as well as they showed the ability mentioned. For instance, the first one is an example of a child who was one of the few who made a perfect score in the group test; the second one is an example of a child who made a low score in the group test, and the third is an illustration of a child who confused the memory image with other images of his imagination.

## CHAPTER FIVE

### INDIVIDUAL CASES

Only three children had 100 per cent in the first or group test. Their results in the individual test were compared with one another, as well as with the other subjects who took the tests. They were similar to one another as well as to the majority of the other subjects, in as far as they were able to find any objects on the gray projection mat. They were also similar to one another in as far as they were able to give details from memory.

One of the cases was that of a child (girl), who was eight years and eight months old. She was in the fourth-grade. She described the first picture in the following way: "It was about a girl. I don't know what she was doing. There was a boy reading a book and a doll was in the corner with some little chicks. The girl's and the boy's hair were yellow. The girl's dress was yellow. The boy had a white waist and blue trousers. The doll had a white apron and a red and white skirt. The chicks were all yellow."

Although this child had had 100 per cent in the group test, she was not able to see anything on the gray and her memory image of the first picture cannot be considered among the best that were given. Her other two pictures, however, were richer and more accurate in detail.

Her second picture about the "Mock King" was given in this way: "It was about a man with a doll on a stick. He had a green and yellow cape, green trousers, black shoes trimmed with yellow, a yellow hat trimmed with green, and a yellow face. I could tell by his cheeks that he was happy."

Her third picture, regarding the "Rabbit" was described as follows: "He was a rabbit with a black coat and a black hat. It was a stovepipe hat. He had a white vest, one eye glass, red trousers, a red cane, white bare feet and there was some green grass. The rabbit had a white ball tail, white all standing up ears, and there was an "R" in the corner, with blue lines."

This last description may be regarded as a rich-in-detail description, but it contains no more details than those given by a second-grade child. This second-grade child did not have 100 per cent in the group test. She had only one right out of six. Her age was eight years and no months. Her description of the first picture is as follows: "There was a girl in a kiddy car, a boy writing on a book, and a little lady with three ducks. There was also a little round ball in the middle of the picture. The girl's hair was yellow and the boy's hair was black. The girl's dress was red and the boy had a blue suit and a black book. The girl had black shoes and white stockings. The boy had white socks but I couldn't tell the color of his

shoes. The little lady had a white dress with red in it. She had a pan in her hand. It was a yellow pan. The ducks were white with red legs."

For her second picture the following description was given: "There was a king with green shoes, white stockings, a green coat, a black and yellow belt, and a yellow hat with black dots. He was happy because he looked like he was going to dance."

For the third picture, she told of a rabbit with "a red pants, a black coat, a black and white hat, a white vest with three buttons, a red cane, white ears, white feet, a white curly tail, red eyes, and he was walking in the grass. There was a white and red "R" in the corner of the picture.

Allport mentions that the children of eidetic endowment have been known to give such minute details as buttons on a coat or as whiskers on a cat. The case of the second-grade child described in this thesis, shows that she had the ability to give such details, but she did not see them on the gray.

The descriptions given in these two individual cases show a lack of correlation between the ability to give correct judgments in the size of the figures and the ability to give detailed descriptions of the figures. This is particularly true of the second case. This seems to indicate

that the size in the latter case as well as in the majority of the other cases tested was the difficult factor in recall.

The detailed descriptions of these children's pictures indicate the vividness of their memory images and the great attention which they give to details.

An example of confusion of the real with the imaginary is shown in the next case. This case shows how a little Italian boy, in the advanced first-grade inserted different figures with those which had been actually viewed in the pictures. The boy was seven years old and had made a score of zero in the group test. This last point has no special bearing on this imaginary case. There were other children who made very low scores, but who were able to give clear-cut memory images in detail.

For the first picture he gives the following description: "A girl was riding a bike and a boy is reading a book. There is a gingerbread boy in the corner and a fox is chasing him. The girl's hair is orange and the boy's hair is black. The girl's dress is blue and I don't remember about the boy's suit. There are two brown gingerbread boys in the corner and one black fox. There is a blue circle and a red circle. There is a lady with a pan in her hand in the corner and the fox is eating up the gingerbread boy and sitting in the corner. The lady is washing clothes and

five little yellow chicks are near her.

The second picture was about "a man with a black and yellow hat, a blue shirt, white stockings, a yellow and green coat and a black and yellow belt around his waist."

The third picture was "a rabbit with a black coat, red pants, no shoes, white feet, a red stick in his hand, glasses on his face, a little bit of red on his ears and a red tail. He was walking on all black and there was a black house."

An interesting by-product was brought out in answer to one of the questions which was asked in reference to a detail of the "Mock King." The question was: Was he (the king) sad or happy? Why?

In response to this query, 94 per cent of the children said, "He was happy because he was smiling." The other answers given by the remaining six per cent were divided into two groups. One group did not know whether he was sad or happy. There were only two per cent of the children in this division. The other group, composed of four per cent of the subjects, gave a variety of answers. These answers were as follows: One child said, "I could tell by his cheeks that he was happy." This answer could really have been included in the 94 per cent group, but it was worded just a little differently. Did fat cheeks indicate happiness for him? The next two

answers were contrary to all the others which were given. They were: "He was sad," and "He was sad because he had marks on his face." The first child could give no reason as to why he thought the king was sad. The second child evidently mistook the clownish marks on the king's face to be scars and concluded, that because he was hurt or disfigured, he must have been sad.

The next three answers given, suggest three children's concepts of happiness. They are: "He was happy, because he was all dressed up." "He was happy, because he was a king and was rich." "He was happy, because he looked like he was going to dance."

## CHAPTER SIX

### SUMMARY AND CONCLUSIONS

Investigations in the field of the eidetic image have been conducted along two different lines. The first involved a study of the phenomenon of the image, with a view to determining its characteristics. The second was concerned with a study of the eidetic type, or those persons possessing the eidetic endowment.

The present paper was concerned with the first part, namely, a study of the phenomenon of the image, with a view to ascertaining something of its nature and its prevalence among the group of unselected children at hand. No attempt was made to study the eidetic type, nor would this have been possible from the results of the tests which were given.

The eidetic image has been considered where any ordinary image may be found (visual, auditory, etc.).

The investigation in this thesis was limited to a study of the visual eidetic image. In this study two tests were given. The first was a group test, the results of which were destined to be a future help and a easy method of selecting Eidetiker. The hope held out for this test as a means of choosing Eidetiker was abandoned, because of the results. These results suggested: First, that accuracy was no criterion by which to judge the eidetic image, even if it was merely a vivid memory image. Secondly, that there



was a question of doubt as to the presence of Eidetiker in the group. This doubt existed, of course, only in the event that the eidetic image was something different from a vivid memory image.

The results of the individual test showed: First, that there were not enough Eidetiker in the group to draw anything like definite conclusions regarding the nature of the image. Secondly, that those who might have been called Eidetiker manifested the "gift" in a very poor degree. Thirdly, that because of the rich-in-detail descriptions, which were given of the pictures, after such statements as "I can remember," the nature of the eidetic image seems very closely akin to the memory image.

The prevalence of the Eidetiker in the group cannot be stated. It depends on how closely the last point in these conclusions, approaches the truth.

## THE BIBLIOGRAPHY

1. Alexander, H.B. "Some Observations on Visual Imagery," Psychological Review, 11:319-337, July, 1904.
2. Allport, Gordon, W. "Change and Decay in the Visual Memory Image," British Journal of Psychology, 21:133-148, October, 1930.
3. Allport, Gordon, W. "Eidetic Imagery," British Journal of Psychology, 15:99-120, October, 1924.
4. Allport, Gordon, W. "The Eidetic Image and the After-Image," American Journal of Psychology, 40:418-425, July, 1928.
5. Bentley, Madison. "The Memory Image and Its Qualitative Fidelity," American Journal of Psychology, 11:1-48, October, 1899.
6. Bowers, Henry. "Memory and Mental Imagery," British Journal of Psychology, 22:271-282, January, 1931.
7. Braddock, Catherine, C. "An Experimental Study of the Visual Negative After Image," American Journal of Psychology, 35:157-166, April, 1924.

8. Burnham, William, H. "Personality Differences and Mental Health," Pedagogical Seminary, 36:361-385, December, 1929.

9. Burt, Harold, E. "Factors which Influence the Arousal of the Primary Visual Memory Image," American Journal of Psychology, 27:87-118, January, 1916.

10. Campbell, C, Macfie. "Hallucinations; Their Nature and Significance," American Journal of Psychiatry, 9:607-618, January, 1930.

11. Carmichael, Leonard. "Eidetic Imagery and the Binet Test," Journal of Educational Psychology, 16:251-252, April, 1925.

12. Caverno, Charles. "Incipient Pseudopia," Psychological Review, 11:338-342, July, 1904.

13. Chamberlain, Alexander and Isabel. "Hypnagogic Images and Bi-Vision in Early Childhood," American Journal of Psychology, 17:272-273, April, 1906.

14. Colvin, Stephen, C. "A Marked Case of Mimetic Ideation," Psychological Review, 17:260-268, July, 1910.

15. Colvin, Stephen, C. "The Nature of the Mental Image," Psychological Review, 15:158-169, May, 1908.

16. Downey, June, E. "An Experiment on Getting an After-Image from a Mental Image," Psychological Review, 8:42-55, January, 1901.

17. Downey, June, E. Creative Imagination. New York: Harcourt Brace and Company, 1929, p. 15-41.

18. Downey, June, E. "Observations on a Visually Preoccupied Child," Journal of Applied Psychology, 11:52-57, February, 1927.

19. Franz, Shepherd, I. "After Images," Psychological Review Monograph, 5:1-61, January, 1899.

20. Gengerelli, J.A. "Some Quantitative Experiments with Eidetic Imagery," American Journal of Psychology, 42:399-404, July, 1930.

21. Guilford, Joseph, P. "Fluctuations of Attention with Weak Visual Stimuli," American Journal of Psychology, 38:534-583, October, 1927.

22. Hicks, G, Dawes. "On the Nature of Images,"  
British Journal of Psychology, 15:121-148, October, 1924.

23. James, William. Principles of Psychology. Chicago:  
Holt and Company, 1899, Volume I, p. 50-55.

24. Jelliffe, Smith, E. "On Eidetic Psychology and  
Psychiatric Problems," Medical Journal and Record,  
128:80-83, July, 1928.

25. Judd, Deane, B. "A Quantitative Investigation of  
the Purkinje After Image," American Journal of Psychology,  
38:507-533, October, 1927.

26. Kirkpatrick, Edwin. Fundamentals of Child Study.  
New York: The Macmillan Company, 1917, p. 285-288.

27. Kluever, Heinrich. "Do Personality Types Exist,"  
American Journal of Psychiatry, 10:781-788, January, 1931.

28. Kluever, Heinrich. "Fragmentary Eidetic Imagery,"  
Psychological Review, 37:441-458, September, 1930.

29. Kluever, Heinrich. "An Experimental Study of the Eidetic Type," Genetic Psychological Monograph, 1:71-230, March, 1926.

30. Kluever, Heinrich. "A Study on the Eidetic Type and on Eidetic Imagery," Psychological Bulletin, 25:69-104, February, 1928.

31. Kluever, Heinrich. "Eidetic Phenomena," Psychological Bulletin, 29:181-203, March, 1932.

32. Lay, Wilfrid. "Mental Imagery," Psychological Review Monograph, 2:1-59, No. 7, May, 1898.

33. Lindworsky, Johannes. Experimental Psychology. New York: The Macmillan Company, 1931, p. 45, 134-136, 247-249.

34. Moore, Thomas, V. "Meaning and Imagery," Psychological Review, 24:318-320, July, 1917.

35. Murchison, Carl. Handbook of Child Psychology. Worcester: Clark University Press, 1931, p. 643-668.

36. Murphy, Gardner. Historical Introduction to Modern Psychology. New York: Harcourt Brace and Company, 1929, p. 417-455.

37. Murray, Elsie. "Peripheral and Central Factors in Memory Images of Visual Form and Color," American Journal of Psychology, 17:227-247, April, 1906.

38. Pear, T.H. "Modern Investigation of Visual Imagery," Nature, 115:853, May, 1925.

39. Perky, Charles, W. "An Experimental Study of the Imagination," American Journal of Psychology, 21:422-452, July, 1910.

40. Psychological Abstracts, 1930.

41. Psychological Abstracts, 1929.

42. Psychological Abstracts, 1928.

43. Psychological Abstracts, 1927.

44. Psychological Abstracts, 1926.

45. Reissman, Rolf. "The Child's Optical Memory," Literary Digest, July 25, 1931.

46. Stratton, George, M. "The Mnemonic Feat of the  
'Shass Pollak', " Psychological Review, 24:244-247,  
May, 1917.

47. Stern, William. Psychology of Early Childhood.  
New York: Henry Holt and Company, 1924, Chapters 12, 13, 14,  
19 and 20.

48. Vries, Schaub, A de. "On the Intensity of Images,"  
American Journal of Psychology, 22:346-368, July, 1911.

49. Warren, Howard, C. "Some Unusual After-Effects,"  
Psychological Review, 28:453-463, November, 1921.

50. Winch, W.H. "Function of Images," Journal of  
Philosophy and Psychology, 5:337-351, June, 1908.



## APPENDIX I

## APPENDIX II

ACTIVITY OF CHILDREN

MOCK KING

RABBIT

The thesis "A Study in Eidetic Imagery", written by Elizabeth Lourdes McGrath, has been accepted by the Graduate School of Loyola University with reference to form, and by the readers whose names appear below with reference to content. It is, therefore, accepted as a partial fulfilment of the requirements of the degree conferred.

George H. Mahowald, S.J.

May, 1932

Valeria K. Huppeler

May, 1932