

# AMERICAN JOURNAL *of* MENTAL DEFICIENCY

---

APRIL, 1944

VOLUME XLVIII

NUMBER 4

*This Journal, in association with other institutions of man, is devoted to the study and treatment of human beings arrested in development, to the prevention of arrests in human development, and to the creation of a society biologically and culturally sounder than that of the present. The particular scope of this Journal embraces the field of so-called feeble-mindedness, or of mental deficiency, or of the sub-average groups.*

---

PUBLISHED QUARTERLY BY  
THE AMERICAN ASSOCIATION ON MENTAL DEFICIENCY

PUBLICATION OFFICE: 372-374 BROADWAY, ALBANY, N. Y.

EDITORIAL OFFICE: COLDWATER STATE HOME AND TRAINING SCHOOL, COLDWATER, MICHIGAN

\$3.50 PER VOLUME

\$1.25 PER COPY

Entered as second class matter September, 1940, at the Post Office at Albany, N. Y.,  
under the Act of August 24, 1912.



## Psychology and Psychiatry

# A COMPARATIVE STUDY OF SPONTANEOUS PAINTINGS OF NORMAL AND MENTALLY DEFICIENT CHILDREN OF THE SAME MENTAL AGE

BY R. MELCHER PATTERSON, PH.D.

*Research Associate*

AND

MARY LEIGHTNER, M.A.

*Interne*

*From the Wayne County Training School at Northville, Michigan, Robert H. Haskell, M.D.,  
Medical Superintendent. Department of Research, Thorleif G. Hegge, Ph.D.,  
Director of Research and Education<sup>1</sup>*

THE mentally deficient child has been described in many observational and research studies as comparable to the normal child of the same mental age in mental characteristics upon that level, although not in potentiality for development.

A number of well controlled comparative studies have shown that this similarity is not equally true in all fields of mental function. Relatively greater retardation in verbal than in non-verbal fields is generally recognized to occur in the feeble-minded. Less than average spontaneity and imagination in constructive and creative work have also been asserted to be typical.

Few comparative studies have been made to explore the range of fields in

which differences exist or to define the nature of the differences. For educational practice, knowledge of differences would be invaluable with respect both to methods of instruction and to the subject matter to be introduced at the various mental age levels determined on the basis of standardized intelligence tests.

Investigations are necessary to round out the picture of the mentally deficient child in comparison with the normal child at comparable test age levels as to relative stages of genetic development in expressive fields other than verbal. Spontaneity and range of ideational activity may be depressed in the verbal field because of specific defect. Other performances should be studied in which the child engages spontaneously, in which failure is not made obvious to him, through which he gains satisfaction and which allow expression of the imaginative and ideational content of his mental life by means other than verbal.

<sup>1</sup> The authors wish to express their appreciation for the coöperation of Mr. Russell Amerman, Superintendent of Schools, Mr. Paul Carter, Principal of the Elementary School, and the teachers of the kindergarten, first and second grades of the Elementary School of Northville, Michigan. The authors are especially indebted to Dr. Heinz Werner, Research Psychologist, of the Wayne County Training School, for advice throughout the study.



Most of these conditions may be met in the field of graphic representation. From the inception of an activity program in the Prolonged Pre-Academic unit of the Wayne County Training School, we were impressed with the number and character of the paintings produced by the children. In the following study we have made an attempt to discover how mentally deficient children's expressive activity in painting will compare with that of normal children of the same mental test age when the activity is upon their own initiative and undirected.

#### PROCEDURE

In November, 1939, we asked the teachers of the kindergarten, first and second grades of the Northville, Michigan, Elementary School to save for us all the spontaneous paintings of the children in their charge. At the same time, we began to collect all the spontaneous paintings made by our own boys in the Prolonged Pre-Academic Program. By spontaneous, we mean that no suggestion or instruction was offered the children other than the availability of the easel, paint and brushes. The paper was 18 x 22 inch newsprint; the paints were of the powder type mixed with water.

By April, 1940, there were 700 paintings collected: 304 from Northville and 396 from our own boys. The children in the elementary school had not had Binet intelligence tests and facilities did not permit administration of individual examinations to each child. The Pintner-Cunningham Primary Mental Test, which has a satisfactory correlation with the Binet at this age level, was

given to the 40 children in the Prolonged Pre-Academic Program and to 130 children in the elementary school. In addition, the Goodenough Drawing Test was administered to rule out the charge that unequal performance ability in drawing influenced the group results.

When the tests were completed, 35 children were found in the normal group who could be paired in mental age with a child in the mentally deficient group on the basis of one or the other test. Only children who had painted at least two pictures were included. From the mental ages on the Pintner-Cunningham examination, matched groups of 25 children each were obtained. Similarly matched groups of 25 children each were found on the basis of the Goodenough Drawing Test. Sixteen of the normal and 15 of the mentally deficient children appeared in both test groups. We were unable to confine the normal groups to boys and have groups of the desired size. There were 12 pairs of boys in each test group; the remaining 13 pairs were boys matched with girls. The possible effects of sex differences will be discussed in the results.

Table I shows the chronological and mental ages and the I.Q.'s of the groups. Throughout the tables the mentally deficient group will be referred to as the T.S. (Training School) children and the normal as the N.S. (Northville School) children. The Terman-Merrill Binet examinations were available for the Training School children. Since the mentally deficient children paired with normal children by the Pintner-Cunningham examination had almost the same mean Binet



I.Q. as those paired by the Goodenough Drawing Test, it seems likely that Binet tests of the normal children would have shown a similar equality between the two groups. The Pintner-Cunningham examination appears to be standardized differently from the Binet and Goodenough tests and to give higher I.Q.'s than do these two.

The children matched on the basis of the Pintner-Cunningham examination

#### ANALYSIS OF THE PAINTINGS

Each painting was classified by three judges, two of whom were the authors. Agreement between two of the judges was the criterion for placing a picture. The following scheme of classification was used:

##### Recognizability

- A. Objects immediately recognizable.
- B. Objects not immediately recognizable.
  - B1. Painting named by child and similarity to the named object observable.

TABLE I

NORMAL AND MENTALLY DEFICIENT CHILDREN MATCHED BY SCORES OBTAINED ON THE PINTNER-CUNNINGHAM PRIMARY MENTAL TEST AND ON THE GOODENOUGH DRAWING TEST

Group	No.	Pintner-Cunningham							
		Means			Medians		Q1-Q3		
		C.A.	M.A.	I.Q.	M.A.	I.Q.	M.A.	I.Q.	
T.S.	25	9-11	7-2	72	7-6	74	6-0 to 7-10	65 to 78	
N.S.	25	5-8	7-0	121	7-2	123	6-0 to 7-10	111 to 130	
Boys	12		7-7						
Girls	13		6-7						
				Goodenough					
T.S.	25	10-2	6-4	63	6-6	62	5-9 to 7-0	56 to 69	
N.S.	25	5-8	6-4	112	6-6	110	5-9 to 7-0	103 to 122	
Boys	12		6-2						
Girls	13		6-6						

T.S. Pintner-Cunningham—mean Binet I.Q. 67  
 Goodenough—mean Binet I.Q. 65

produced 361 pictures: 221 by the mentally deficient and 140 by the normal. Those matched on the basis of the Goodenough Drawing Test produced 435 pictures: 267 from the mentally deficient and 168 from the normal. In both sets of pairs, the normal children produced 63 as many pictures as the mentally deficient. It seems likely that the larger number of paintings produced by the mentally deficient children was due to greater freedom in the activity program, since the children in the grades of the public school had a somewhat more formal schedule with less free time for painting.

- B2. Painting named by child but no similarity to named object observable.
- B3. Painting unnamed and unrecognizable but some attempt at composition obvious.
- B4. Mere daub at manipulatory level.
- B5. Patterns, showing repetition of form or color in a rhythmic design.

##### Technique

- A. Execution.
  - A1. Contour drawings. The shape of the object is represented by lines.
  - A2. Surface paintings. The surface of the object is represented in solid color.
  - A3. Filled contour paintings. The object is first drawn by lines, and the surface is then painted in.



## B. Representation.

B1. Schematic representation. A stereotyped figure is used to represent all objects of the same kind. Minimum of individualization.

B2. Realistic representation. Objects of the same kind are differentiated from each other and modified by their relationship to other objects in the picture.

B3. Compositional representation. The objects represented are subordinated to the expression of an idea.

B2. Aggregated paintings: a number of more or less related objects shown, but no pictorial expression of relationship.

B3. Objects shown are entirely unrelated.

## RESULTS

Table 2 shows the percentages of pictures from each group which fell in each category.

Although percentages are used for ease of presentation, the significance of differences was calculated from the actual numbers of pictures by the Chi Square method. Chi Square is shown only for the groups of 25 where the differences are significant.

There were only two differences between the normal and the mentally deficient children which stood up throughout the four sets of comparisons (pairs of 25 children and pairs of 12 boys on

*Number of objects shown in a single picture  
Integration*

A. Relationship between objects pictorially expressed.

A1. Relation shown positionally but no connection expressed.

A2. Connections shown.

B. Relationship not pictorially expressed.

B1. Homogenous or repetitive paintings: several representations of the same object.

TABLE II

## I. PERCENTAGES OF PICTURES IN CATEGORIES OF RECOGNIZABILITY

*Children Paired on the Pintner-Cunningham Primary Mental Test*

Percentages of	A	B1	B2	B3	B4	B5	Comb.	Letters
T.S.	31	10	2	12	14	13	13	4
N.S.	43	8	7	18	3	1	18	1
Chi Square	4.98				13.1	15.7		
P.C.	4				1	1		

*Children Paired on the Goodenough Drawing Test*

T.S.	30	10	3	15	14	12	13	3
N.S.	35	14	7	18	6	2	17	0
Chi Square					7	12.8		
P.C.					1	1		

## II. PERCENTAGES OF PICTURES IN CATEGORIES OF TECHNIQUE

*Children Paired on the Pintner-Cunningham Primary Mental Test*

Percentages of	Execution					Representation			
	A1	A2	A3	Comb.	Uncl.	B1	B2	B3	Uncl.
T.S.	36	17	8	35	4	52	1	1	45
N.S.	11	13	28	46	2	70	4	2	24
Chi Square	29.3		26.4	4.5		10.3			16.0
P.C.	1		1	4		1			1

*Children Paired on the Goodenough Drawing Test*

T.S.	34	21	10	31	4	52	2	3	45
N.S.	26	12	19	43	0	63	7	2	27
Chi Square		7	7.4	5.8		4.5			14.8
P.C.		1	1	2		5			1



TABLE II—Continued

## III. PERCENTAGES OF PICTURES IN CATEGORIES OF INTEGRATION

*Children Paired on the Pintner-Cunningham Primary Mental Test*

Percentages of	A1	A2	B1	B2	B3	Comb.	Uncl.	1 object
T.S.	3	5	2	27	1	7	45	9
N.S.	6	3	5	37	1	11	26	11
Chi Square				3.7			14.98	
P.C.				5			1	

*Children Paired on the Goodenough Drawing Test*

T.S.	2	2	2	26	.7	9	47	10
N.S.	5	4	7	33	.5	12	29	9
Chi Square							15.4	
P.C.							1	

## IV. PERCENTAGES OF PICTURES IN CATEGORIES OF RECOGNIZABILITY BY 12 PAIRS OF BOYS

Chi Square omitted because of small number of cases

*Boys Paired on the Pintner-Cunningham Primary Mental Test*

Percentages of	A	B1	B2	B3	B4	B5	Comb.
T.S.	39	8	2	12	8	17	10
N.S.	34	11	16	9	7	0	23

*Boys Paired on the Goodenough Drawing Test*

T.S.	32	9	4	19	11	8	12
N.S.	24	19	13	15	11	0	17

## V. PERCENTAGES OF PICTURES IN CATEGORIES OF TECHNIQUE BY 12 PAIRS OF BOYS

*Boys Paired on the Pintner-Cunningham Primary Mental Test*

Percentages of	Execution					Representation			
	A1	A2	A3	Comb.	Uncl.	B1	B2	B3	Uncl.
T.S.	29	17	12	37	4	55	2	2	41
N.S.	12	18	23	47	0	70	9	2	18

*Boys Paired on the Goodenough Drawing Test*

T.S.	32	29	9	26	4	54	2	1	43
N.S.	30	13	19	38	0	64	7	2	26

the two tests used). These were (1) the larger number of pattern paintings (Recognizability B<sub>5</sub>) made by the T.S. children and (2) the larger number of filled contour paintings (Technique A<sub>3</sub>) made by the N.S. children. All the other differences in which Chi Square is significant appeared in one set of comparisons but not in others, or else could be traced to these two as a cause. For example, the significantly larger numbers of unclassified pictures by the T.S. children under the categories of Technique B and Integration were caused by the patterns and daubs. One cannot classify an unrecognizable

painting as schematic, realistic or compositional nor determine the expression of relationship between unrecognizable objects. The apparently significantly different percentages of schematic pictures was also due to the difference in the numbers classifiable.

In addition to the data presented in Table II, tabulations were made of the number of objects shown in a single picture, the number and frequency of different objects shown by the groups and the occurrence of any attempts to represent action.

*Number of objects shown in single pictures.* Ten per cent of all pictures



Painted in both groups showed a single object. Approximately 46 per cent of the T.S. pictures and 27 per cent of the N.S. pictures could not be classified as to number of objects represented. The larger percentage from the T.S. paintings was due to the larger percentage of patterns. When only classifiable pictures were considered, the number of objects painted in a single picture in both groups ranged from one to more than ten. Approximately 90 per cent showed fewer than seven objects, with the medians for both groups between two and three.

*Range and frequency of objects represented.* The T.S. children used 32 different subjects; the N.S. children, 39. These figures are exclusive of scenery (sky, grass, trees, sun, flowers). There were, of course, many variations and combinations of these subjects. When one considers that the T.S. children live in a common environment 24 hours a day while the normal children spend about three-fourths of their time in the varied environments of their own homes, the similarity in range is surprising.

Houses were by far the most popular objects. They appeared in 17 per cent of all paintings by the T.S. children and in 28 per cent of all by the N.S. After houses, the five objects most popular with the T.S. children were boats, human figures, trains, Indian tepees and airplanes. For the N.S. children the order was human figures, animal figures, tepees and tents, "windows and doors," scenes in which one looks down from above on a furnished room.

Any significance in a difference in popularity of various objects is obscured

by the fact that interest in boats, trains and Indian tepees in the T.S. group was undoubtedly stimulated by group projects around these objects. The Northville school principal suggested that the occurrence of the room plans in the N.S. group might have been stimulated by the possession of a doll house in the kindergarten, the roof of which one may lift and look down upon the interior.

Paintings of objects which appeared in no other picture in either group were designated as individual paintings. There were five of these in the T.S. group and eleven in the N.S. group. However, all but one of the individual paintings in the N.S. group were by girls and four of these by the same girl.

*Representation of action.* There were only four pictures, two from the T.S. and two from the N.S. children which appeared to represent action. As a group these children had not reached the stage of dynamic representation.

#### DISCUSSION

Speculation in regard to the two statistically significant differences shown in this study might take the following line: mentally deficient children may be more likely than normal children to remain in the stage of simple sensory response to color and form without ideational content. After they have passed the earliest manipulatory level, they may tend to continue longer than normal children to paint color bands, parallel straight and wavy lines and plaids which are perseverative in nature. The normal children may be more likely than the mentally deficient to develop filled contour technique because they may be more self-critical,



inclined to put more conscious effort into careful completion of their ideas and able to combine the use of two techniques in a single picture. These are speculations only. The whole study needs to be repeated under more controlled conditions before any conclusions can be drawn.

That the girls were somewhat more advanced than the boys is shown by the effect of removal of the boy-girl pairs from the categories of recognizability. In the groups of 25, the comparisons tended to be in favor of the N.S. group (more recognizable pictures, fewer daubs). When boys were compared with boys only, the differences in number of recognizable pictures were in favor of the T.S. group, although the N.S. boys showed a more marked tendency to verbalize their paintings (Recognizability B<sub>1</sub> and B<sub>2</sub>). Possibly the less recognizable a picture is, the more it has to be explained.

With respect to technique, comparisons may be drawn between our results and those of Ellsworth's\* study of paintings of nursery school children. She found that the order of frequency of technique used was (1) both line and mass, 70 per cent; (2) mass only, 24 per cent; (3) line only, 7 per cent. Outline was the commonest type of figure, but it was usually partially or wholly filled in. These percentages are fairly close to those we obtained for the normal children on the Pintner-Cunningham matching if the A<sub>3</sub> (filled contour) and Combination pictures are added to correspond to her classification of "both line and mass."

Schmidl-Wachner† compared normal, feeble-minded, neurotic and psychotic children's pictures but there was no matching by mental age and the numbers of children participating were very small in each group. The age range was from eight to eleven years. She also found, however, that it was characteristic of normal children to use "lines as well as spots" in the same pictures. A smaller number of pictures were done with "spots" only and the smallest number (7 per cent) showed lines only. This percentage corresponds exactly with Ellsworth's.

These facts suggest that the normal child does not drop the technique of surface painting when he has developed the next step of contour painting, but carries the simpler technique along and combines it with the line drawing into a more complicated whole. This appears to be less true of the mentally deficient child.

In the groups paired on the Good-enough Drawing Test, both normal and mentally deficient children tended to use contour drawing alone more frequently than surface painting alone. Children who scored on the Good-enough Drawing Test would have mastered contour drawing: consequently, matching on the basis of this test might tend to emphasize contour drawing and to minimize group differences in this category.

The majority of the previous studies of children's graphic art have dealt with drawing rather than painting. Certain differences from previous studies in our findings may be due to this difference

\* Ellsworth, F. F. Elements of Form in the Free Paintings of Twenty Nursery School Children. 1939. *J. Gen. Psychol.*, 20:487-501.

† Schmidl-Wachner, Trude. Formal Criteria for the Analysis of Children's Drawings. 1942. *Am. J. Orthopsychiat.*, 12:95-103.



in medium. In most of the previous work, the human figure was found to be the preferred subject at all age levels. The large brush and paper and the wet paint may encourage the preference for the large geometrical figure of the house over that of the human figure which requires finer details.

More detailed analysis could be undertaken if the study were repeated under better controlled conditions. If time and stimuli were controlled, the relative productiveness of the two groups could be compared. Only like-sex groups should be used. In the mentally deficient groups, one should exclude or treat separately the paintings by children whose deficiency is exogenous in origin. A sufficient number of paintings of one type (a house with landscape for example) would allow comparisons in compositional factors such as balance, representation of the horizon and relationship between background and figure. Differences in these details might reveal significant differences in conceptual thinking between the two groups.

#### SUMMARY

Paintings from groups of normal and mentally deficient children matched for mental age by the Pintner-Cunningham Primary Mental Examination and the Goodenough Drawing Test were compared for recognizability, technique, integration, number of objects shown in single pictures and the range of subjects chosen.

The likenesses found were more numerous than the differences. All groups tended to paint objects connected with personal experiences which had the highest interest value for them.

All groups were at a level of graphic skill where approximately 30 to 40 per cent of their paintings showed objects immediately recognizable; the representation was schematic and two to six objects were shown in aggregated relationship.

The significant differences were (1) the larger percentage of pattern paintings by the mentally deficient groups and (2) the larger percentage of paintings in which filled contour technique was used by the normal group.

Suggested explanations for these differences were (1) a tendency for mentally deficient children to continue longer than normal children to respond to sensory stimuli of color and form without ideational content; (2) a tendency for mentally deficient children to be satisfied with the use of a simple technique instead of the more complicated combination of techniques favored by the normal children.

#### BIBLIOGRAPHY

- ABEL, T. M., AND SILL, J. B. The Perceiving and Thinking of Normal and Subnormal Adolescents and Children on a Simple Drawing Task. *J. Genet. Psychol.*, 1939, 54:391-402.
- ELLSWORTH, F. F. Elements of Form in the Free Paintings of Twenty Nursery School Children. *J. Gen. Psychol.*, 1939, 20:487-501.
- GOODENOUGH, FLORENCE L. Children's Drawings. *A Handbook of Child Psychology*. Worcester, Mass.: Clark University Press, 1931.
- GOODENOUGH, FLORENCE L. Measurement of Intelligence by Drawings. Yonkers, N. Y.: World Book Co., 1926.
- GRAEWE, H. A Historical Survey of the Psychology of Children's Drawings. *Arch. f. d. ges. Psychol.*, 1936, 96:103-220.
- GRAEWE, H. Children's Drawings of Animals. *Ztschr. f. pädagog. Psychol.*, 1935, 36:251-256; 291-300.
- HETZER, HILDEGARD. Die symbolische Darstellung in der frühen Kindheit. *Wiener Arb. z. pädag. Psychol.*, 1926, No. 3.
- HILDRETH, GERTRUDE. The Child Mind in Evolution. A Study of Developmental Sequences in Drawing. New York, N. Y.: Kings Crown Press, 1941.
- LARK-HOROVITZ, B. Interlinkage of Sensory



## VOCABULARY ANALYSIS IN MENTALLY DEFICIENT CHILDREN \*

By SIDNEY W. BIJOU, PH.D. AND HEINZ WERNER, PH.D.

*From the Wayne County Training School, Northville, Michigan*  
*Medical Superintendent, ROBERT H. HASKELL, M.D.*

IN the daily dealing with children who are mentally retarded due to brain-injury, one is often impressed by the unusualness and richness of their verbal expressions. Many of these children seem to be distinctly superior in language usage to mentally retarded children of the familial type and of similar intelligence. The verbal behavior of brain-injured and endogenous children in previous experiments on concept formation appears to be in agreement with this general impression; there it has been observed that brain-injured tended to use more often uncommon words than did the other group. To illustrate: in an experiment on animism, asked whether or not lightning is living, a brain-injured boy of an I.Q. of 68, M.A. 9, answered that it is living "because something in the air like *gravity* pulls them (i.e. the clouds) away from each other." Another brain-injured child of similar intelligence answered the Binet question "What is a balloon" as follows: "It goes up to the *stratosphere*." The present study attempts to throw light on the assumption that the brain-injured child's language is superior to that of the endogenous child of comparable mental age.

From the male population of the

\* Studies in the Psychopathology of Childhood and Mental Deficiency supported by a grant from McGregor Fund, Detroit. Report No. 58.

Wayne County Training School, 19 boys diagnosed as brain-injured<sup>1</sup> were selected and closely matched in terms of chronological and mental age with 19 others diagnosed as non-brain-injured, or endogenous. The average M.A. of both groups was approximately 9 years, 5 months; the mean I.Q., approximately 68. A specially devised vocabulary test was administered to these children. From Thorndike's list of 20,000 most frequently used words, 57 nouns were selected which appeared appropriate for inclusion in a vocabulary test for mentally deficient children. The words selected range over practically all of the frequency categories. Thus, words of high frequency range, such as "horn, kite, city, lake," words of a medium frequency range, such as "cage, suicide, enemy, expert," and words of low frequency such as "ailment, hospitality, resistance" are included. The child was asked to tell what each word meant. He was always asked "to tell more" when the response was vague or incomplete and was always encouraged to give the best possible answer to every question. All responses were recorded verbatim.

In order to give some idea of the scoring standards employed, the follow-

<sup>1</sup> These children had neither gross motor disturbances, nor noticeable speech defects. They were diagnosed as brain-injured on the basis of their developmental and family history and of the presence of neurological signs (A. A. Strauss).



ing examples of acceptable responses are given.

- horn—
1. to blow
  2. from a cow; grows out from head
  3. it's round; it's made out of tin
  4. something you blow on; it's used in some orchestras; have brass horn, bugles, etc.
- chain—
1. round pieces of iron attached together. Can use it for towing cars and things like that
  2. use it in winter when you get stuck; chain used on bridges
  3. they pull with chains
- bridge—
1. made out of steel and got boards; where the cars go over; use it to cross rivers
  2. people walk over it; water runs under it
  3. what cars ride across

Calculating first the *range of correct definitions* one finds that brain-injured children have a wider vocabulary than children of the endogenous type. Of the 57 words presented the brain-injured group gave 28.7 correct definitions; the endogenous group, 25.8. This is a statistically significant difference.

We were further interested in knowing whether the two groups differ with regard to the *quality of the correct definitions*. There were 23 words correctly defined by all or nearly all children. Five judges were asked to evaluate the definitions of each word separately on a five point scale. Each

single individual obtained thus a score for each of the 23 words; his mean score for all words was then tabulated. Here again the results point to a trend of superiority of the brain-injured group: Thirteen of the 19 brain-injured children had a score superior to that of their matched partners.

Finally, an attempt was made to analyze the *quality of definitions* from the point of view of *manner* in which expressed. A word might be defined, for instance, in terms of its function or use. A child may define a cage as "a place where you keep animals." Or the same word may be defined in terms of its independent property such as size, color, material. Cage may thus be defined as a "square thing with iron rods."

The non-brain-injured children defined words in terms of their use more frequently than the brain-injured children. Forty-one per cent of the total responses of the brain-injured group contained definitions by use compared to 53 per cent for the non-brain-injured children. On the other hand, brain-injured children are more inclined to define words in terms of their independent properties. Definitions in terms of use have been described by Terman and others as immature. Thus, our results point again to a superiority of brain-injured children on the vocabulary test.

A last analysis concerned this question: Is there a difference between the groups in the *number of different aspects*, like use or property, contained in one definition? A word may be defined in terms of one aspect alone: for instance, the word "cage," only by its use. Or by several aspects: The



child may define "cage" by stating what a cage is used for and, in addition, describe its shape or the material out of which it is built. A tabulation of the responses shows that brain-injured children preferred definitions with more than one aspect, whereas non-brain-injured children preferred the simple—one aspect—type of definition; 56 per cent of the responses of the brain-injured group, and 43 per cent of the responses of the endogenous group contained more than one aspect. These results again signify the superi-

ority of verbal concepts of brain-injured children.

In conclusion, the definitions of brain-injured children were found to be superior quantitatively as well as qualitatively to those of non-brain-injured mentally deficient children. Brain-injured children as compared with non-brain-injured children have a wider range of vocabulary. They employ less frequently the immature type of definitions in terms of use; their definitions are less simple and, considered as wholes, of better quality.