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*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.*

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# THE EFFECTS OF AN ENRICHED VITAMIN B<sub>2</sub> (RIBOFLAVIN) DIET ON A GROUP OF MENTALLY DEFECTIVE CHILDREN WITH RETARDATION IN PHYSICAL GROWTH\*

BY IRIS STEVENSON, M.S.

AND

ALFRED A. STRAUSS, M.D.

## INTRODUCTION

VITAMIN intake as a stimulant to growth in children stands in the center of interest today. Vitamin B, especially, is mentioned as a factor in physical growth.<sup>1</sup>

The following study was undertaken in an attempt to determine the effect of an increased intake of Vitamin B<sub>2</sub> (Riboflavin). The question raised was: "How does increase in Vitamin B<sub>2</sub> (Riboflavin) effect the physical growth of children who are far below par in physical growth as measured in height and weight, and how far does such a therapy influence mental activity?"

## DESCRIPTION

A group of white boys were selected who were far below the average height for their age. These were paired according to chronological age and height age. Nine pairs were found who were sufficiently well matched to be used as experimental and control groups. Olson's<sup>2</sup> tables for the translation of physical measurements into age units

were used to determine the height age and weight age of these children. The height-age ratio and the weight-age ratio were computed for each child by dividing these by the chronological age.<sup>3</sup>

## EXPERIMENT

All eighteen children (nine experimental and nine control) received the regular diet which contains about 400 Sherman units of Riboflavin daily. In addition, the experimental group received for one month one tablet of 1 mg. Riboflavin, 400 units, plus a diet rich in Vitamin B<sub>2</sub>, 1,000 to 1,500 Sherman units. This diet consisted of raw liver which was given as a sandwich spread or raw liver juice mixed with chocolate milk.† After four weeks the experimental group received no special diet and only one tablet of 5 mg. Riboflavin, 2,000 Sherman units daily.

All children were measured in height and weight six months before the onset of the experiment, at the start of the experiment (January, 1942), at the end of the experiment (July, 1942), and six months after the end of the experiment. Psychological tests were given at the

\* From the Wayne County Training School, Robert H. Haskell, M.D., Medical Superintendent, Northville, Michigan. *Studies in the Psychopathology of Childhood and Mental Deficiency* supported by a grant from McGregor Fund, Detroit. Report No. 62.

† We are indebted for this formula to our dietitian, Miss Therese Agnich.



beginning and at the end of the experimental period. There was a preliminary testing period on December 15, 1941, in order to accustom the subjects to the test situation and to familiarize them with the testing procedure.

The psychological measurement battery consisted of an intelligence test, a steadiness test, a tapping test, and a cancellation test.

Since the children were given the Terman Merrill Revision of the Stanford-Binet as a regular part of the school testing program, the Pintner-Cunningham Primary Test, Forms A and B, were used in this study.

The steadiness test was one devised for this particular study. A sheet of heavy poster paper approximately ten inches square was cut so that it contained eight spaces of varying widths— $1/8''$ ,  $2/8''$ ,  $3/8''$ ,  $4/8''$ ,  $5/8''$ ,  $6/8''$ ,  $7/8''$ , and  $8/8''$ , respectively. Each space was seven inches long. This sheet was then fastened to a blank sheet of paper and the following instructions were given the subject:

"When I say 'Go,' you are to draw as straight a line as you can to the bottom of the page. Do not touch the sides of the space. Draw just as straight as you can, but draw as fast as you can."

In each case the pencil was placed at the top center of the space by the administrator. Each trial was timed, but the score was the width of the narrowest space in which the child was able to draw without touching the sides. This test was given three times during the testing period, and the final score was the average of the three trials.

The tapping test was administered only once during the testing period. The child was given three ten-second trials with each hand, and the score was the average number of taps with each hand.

There was only one administration of the cancellation test and an accuracy score and an efficiency score were computed. This test consisted of 50 geometric figures, and the child was directed to draw a line through every circle on the page.

The test battery was administered in the following order: (1) Trial I of the steadiness test; (2) rate of tapping test; (3) Trial II of the steadiness test; (4) cancellation test; (5) Trial III of the steadiness test. The entire battery took approximately twenty or twenty-five minutes to administer.

Since the Pintner-Cunningham Primary Test is a group test, this was given to six boys at a time. The other tests were administered individually.

## RESULTS

Since it was found that the children of the experimental group were mostly exogenous and that, because of their chronological age, the factor of pubescence might have been an influence, a second control group was selected from the files. This group consisted of six exogenous and mixed children. They had received only the regular diet. Their height and weight measurements were tabulated for the corresponding periods of life age. The following tables present the three different groups:



TABLE I

	Experimental Group	Control Group I	Control Group II
Mean chronological age at onset of experiment .....	11-0	10-11	..
Mean Pintner I.Q. ....	49	72	..
Clinical Diagnosis .....	7 exogenous 2 endogenous	9 endogenous	4 exogenous 2 mixed

TABLE II

	6 Mos. Before Experiment	Onset of Experiment	Close of Experiment	6 Mos. After Close of Experiment
<b>Height Quotient (HA/CA)</b>				
Experimental Group .....	80	78	79	81
Control Group I .....	84	84	84	87
Control Group II..... (corresponding data)	84	84	84	86
<b>Weight Quotient (WA/CA)</b>				
Experimental Group .....	79	77	78	80
Control Group I .....	89	90	89	90
Control Group II..... (corresponding data)	87	87	86	86

Another approach to determine the effect of vitamin increase was to compare the matched pairs separately and to measure the difference in increase or decrease in the height and weight quotient. If an equal increase and an increase or decrease of less than two

points are taken as equal growth and a difference of more than two points is taken as a positive or negative relationship, the results are as follows: (The results are compared as related to the experimental subject.)

TABLE III

	July, 1941, to January, 1942	January, 1942, to July, 1942	January, 1942, to January, 1943
<b>Height</b>			
Positive.....	0	2	3
Equal .....	7	5	5
Negative.....	2	2	1
<b>Weight</b>			
Positive.....	1	3	4
Equal .....	4	6	3
Negative.....	4	0	2



## FINDINGS

Because of the extremely small number of cases studied, it has not been possible to treat the results statistically. Two or three findings should be noted, however.

1. With the exception of the intelligence test scores, the results secured with the psychological battery were extremely inconsistent and cannot be considered valid. There was a slight tendency in favor of the endogenous group (control group).

2. The endogenous group (control group) showed a gain in I.Q. while the exogenous group (experimental group) showed an I.Q. loss.

3. From the figures given in Table II, it can be seen that there is not much change in any one of the three groups. The slight increase in height during the last period is probably due to the beginning of pubescent growth.

4. The figures given in Table III indicate that the experimental partners of the matched pairs show a slight trend toward a gain; this trend is more pronounced in weight than in height.

## DISCUSSION OF FINDINGS

A few clinical observations should be noted in connection with this study and may be of value in interpreting the results.

The boys in the exogenous group were extremely distractible and it was difficult to hold their interest for the duration of each testing period. Because of the physical arrangement of the testing room, it was impossible to

prevent their realizing that each test was timed, and this tended to emphasize speed rather than accuracy. This did not seem to be true with the boys in the endogenous group, although they, too, knew that they were being timed.

When placed in a group-testing situation, the brain-injured children again proved to be very distractible, and undoubtedly this contributed to the loss in I.Q. For this reason the scores cannot be considered valid.

## CONCLUSIONS

In general, it would seem that the results of this study do not warrant the formulation of definite conclusions regarding the effects of a B<sub>2</sub> vitamin Riboflavin enriched diet. There may exist a slight gain in physical growth in children under extensive Riboflavin treatment, but there exists no difference in mental growth in both groups. It should be kept in mind that the conditions were very strict and that the experimental group was at a disadvantage because of their physical and mental retardation which was the result of an organic brain defect.<sup>4</sup>

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## PRE-ACADEMIC ACTIVITIES TO CHALLENGE THE MENTALLY DEFICIENT CHILD FROM FIVE TO EIGHT YEARS OF MENTAL AGE

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THE Wayne County Training School is an institution for the training of higher grade mentally deficient children in order that they may be able to make an adequate adjustment when returned to the community. The majority of these children come from very meager homes and from schools in which they have been social and educational failures. Because it was felt that the younger children coming to the Training School would profit from a preparation period more than they would from continued academic drill, the Prolonged Pre-academic Program was initiated for the youngest boys. In the program there are about forty-five boys from six and one half to eleven and one half years of age chronologically and from five to eight years mentally. The boys live and attend school in their own unit which has been equipped especially for their needs. They are grouped in three divisions in so far as possible according to their mental ability. Group 1 includes the boys with mental ages approximately seven to eight years, Group 2, those with mental ages of six to seven years and Group 3, those with mental ages of five to six years.

The school day is divided into periods and the three groups of boys rotate between the pre-academic room, affording music, literature and a reading readiness program, the outdoor recre-

ation period and the activities room offering opportunity for individual and social projects. This paper is devoted to a description of the program carried on in the activities room.

The activities room, organized as a pre-primary room, combines some features of both a kindergarten and a primary room. It offers experiences in a rich and attractive environment where the children have opportunities to work together in a socializing situation and where they have the experience and satisfaction of creating and constructing. Available to all of the boys for creative expression are the various media such as crayons, paints, paper, scissors, paste, fingerpaints and clay. Among the blocks provided are a set of Patty Hill Floor Blocks and one of Hammer Sticks, used in building large projects such as a house, store, boat, train or airplane. A set of solid blocks cut on the unit principle and sets of small commercially manufactured blocks encouraging mechanical construction, such as the Lincoln Logs and Tinker Toys, are on the shelves. For use with these blocks are several large, substantial transportation toys, such as a barge, an auto ferry and trains. There are also a number of small toys of the ten-cent variety. On the shelves where the boys may reach them easily are puzzles and games on levels suitable for each of the three groups.



The older boys have access to the woodworking tools, woodburning needle, spatter print set and linoleum block cutting tools. Seed and tile beads are used extensively and the older boys follow rather intricate patterns in using beads to make belts and other articles.

In addition to the commercial materials mentioned, there is a drawer of cardboard scraps, empty boxes of various shapes and sizes, plenty of newspapers and magazines, empty spools and string, always ready to be used. Several well illustrated workshop books are on the shelf and some of the most interesting articles have been made from the ideas suggested in these books.

In the activities room we are aware of progress in the development of respect for other's property, a spirit of cooperation, an appreciation of the efforts of others and a sense of responsibility. We found that the older boys worked well with the materials at hand, but there seemed to be a need for more specific training in certain areas than was achieved by spontaneous manipulation of the described materials. While the boys in Group 1 were expected to do more detailed craft work than the boys in Groups 2 and 3, there was a necessity for still more advanced work, yet the regular school program which they would enter after leaving the Prolonged Pre-academic Program provided plenty of craft training and could not be infringed upon. In order to provide for these needs and to supply the continued stimulation of a new activity for boys already two years in the program, the following materials were collected and organized into a progressive series to be used by this older group. The

field of visual perception was chosen because it is an important factor in both academic and manual training and because tests and experiments have shown that mentally deficient children are weak in making fine visual discriminations and in responding to visual cues.

The first unit of this series requires the children to copy designs or produce patterns. The activity develops visual perception for it forces the child to see the whole pattern, analyze it into its elements and synthesize it back into the whole. There are twenty eight designs to be made, using one-inch color cubes in five-block square patterns.

The second step consists of twenty-four patterns to be made with seven-block squares. Following these patterns, some of which are quite difficult, demands considerable concentration.

A set of parquetry blocks with six intricate designs is the third step in the series. These blocks are larger and different in shape and color from the cubes. The designs are very detailed and require even more concentrated effort to reproduce than did the cube patterns.

Fourth comes a set of red, white, blue, yellow and green sticks in two, four and six inch lengths together with the printed fields of the flags of many nations. By combining these sticks the boys can make the flags pictured on the pattern sheet.

Most difficult in this series is the fifth set, which consists of mosaic animal patterns made with one-half inch squares and triangles of colored paper on a work sheet having the background marked off into one-half inch squares. The pattern to be followed is smaller,



being printed on one-fourth inch squares.

The next series of materials requires the ability to recognize and reproduce schematic figures of common objects. Among the materials used for developing this skill are two sets of wooden forms and pegs in various colors with which to copy designs. The activity in these exercises is similar to that required in following the intricate patterns used in craft work.

More difficult than these are two sets of sectional puzzles of birds and animals which give training in visual discrimination of detail. The development of observation and interpretation of detail in color and form is essential in both manual and academic work.

The remainder of the collection consists of materials concerned with using a variety of color and form cues for matching words and numbers and following directions. These are particularly designed for developing skills necessary in reading; namely, recognizing words as symbols, observing words for similarities and differences and perceiving the word as a unit. There are word-picture combinations consisting of five cards having colored pictures of objects. Under each picture is a hole from which has been cut the name of the object. The holes are each of a different shape and the cue for the correct word is the shape of the piece which must be fitted into the proper hole. Next is the series which requires word matching. This consists of cards having pictures with words printed underneath. A second card having as a cue the same pictures but with the words cut out is placed over the first. The printed words on discs are then

ready to be matched with the word printed on the first card and showing through the hole of the second. This is the first task with words alone and the matching process requires patience and concentration. There are twenty-four words on each card, hence each word must be compared with many others until the right word is matched. Similar words such as castle, candle, cabbage, or brush, bridge, brick, appear on one card: therefore careful discrimination is required in matching.

The recognition of color and form words is accomplished by the use of a set of materials having the directions printed with the color words underlined in the correct color and the form words outlined by the form for identification. The work sheet is blocked off into the required pattern, having numbers corresponding to the directions. For example, the direction may read, "Place the red circle on number 10." The word, red, is here underlined in red and the word, circle, is enclosed in a circle.

Another series does not have the aid of the blocked-in pattern on the work sheet. The child follows directions with the cues of color and form as mentioned in the previous description without knowing what form his final product will have. His success depends wholly upon following the directions correctly.

The next step consists of a series of materials having directions to follow without aid of the simple cues described above. Instead, a color chart and a form chart are given on the direction sheet. A similar amount of comparison must be utilized in an addi-



tional set called the Color Builder series.

The final, most difficult, task in the series of word matching devices is the one consisting of a work sheet with pictures, a dictionary sheet with the same pictures plus words and small cards with the words printed on them. The child must match the printed word with the one on the dictionary sheet, then match that picture with the same picture on the work sheet and put the printed word under the proper picture. This step requires prolonged concentration involving several steps of work.

Although all of the materials appeal to the children and are largely self-motivating, an additional incentive for completing the series is furnished by visible evidence of progress. As a boy finishes each part of these series, he is credited with the accomplishment on the "Chart." This chart hangs in the room and has space for the recording of every part of each unit in the series. When a boy has completed a unit, a colored signal dot is placed in the space opposite his name and when the entire series is completed, a small flag is pasted in the last column. Comparing accomplishment on the chart is always a source of interest. Constantly boys ask, "How many dots do you have?" or remark, "I am almost through with my chart. Are you?"

Having used these materials for a period of time, we have made certain observations regarding their value. Briefly, we believe that they result in: (1) the development of finer muscular

control; (2) increased ability to coordinate eye and hand; (3) ability to concentrate for progressively longer periods and with greater intensity; (4) development of a sensitiveness to words used as symbols; (5) awareness of words as combinations of individual letters; (6) realization that printed matter is followed from left to right; (7) appreciation of the work and accomplishment of others in the group; (8) interest in books and printed matter accompanied by an expressed desire to read.

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# BUILDING TOWARD ACADEMIC READINESS IN MENTALLY DEFICIENT CHILDREN

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## 1. INTRODUCTION

THE stress laid upon the various language skills in school is evidence that adequate language development is fundamental to the academic progress of the individual. No child can progress well in school without the following skills: the ability to express his thoughts so that others can understand what he is trying to say; the ability to understand what he is being told; the ability to read with understanding. Therefore, the poor language development usually found among mentally retarded children is one of the most important problems to be faced in a program designed for the development of academic readiness.

The purpose of this paper is to describe how language skills are taught through verbalization of experiences and through training of thinking habits in the prolonged pre-academic program at the Wayne County Training School.

The children who are taking part in this program range from seven to twelve years in life age and from five to eight years in mental age. They are divided into three groups on the basis of mental age and social maturation. Three people work with these groups, a recreation leader, an activity teacher and a pre-academic teacher. The children spend time with each of these people in the course of the day. The pre-academic teacher is primarily concerned with the development of the

above mentioned essential language skills in preparation for the formal academic teaching of reading and arithmetic which is not introduced until the child is more thoroughly prepared and possesses a higher degree of maturity than is commonly required in more intelligent children.

## 2. FINDING SOMETHING TO SAY

Of first importance is helping the child find something to say. Most mentally deficient children come from deprived environments. Even in cases where the environment has been adequate, suitable guidance in or encouragement to interpretation of his experiences verbally to himself or others has frequently been lacking. In the prolonged pre-academic program we begin by providing those desirable experiences which are common to most progressive schools and to average homes. We enrich the immediate environment by colorful pictures, attractive furnishings and a variety of interesting playthings. We exploit the institution surroundings through excursions to such places as the dairy, the farm, the firehall, the storehouse, the main kitchen and the woods. We bring thrilling discoveries into the schoolroom when we return from these trips, such as cocoons, salamanders and forsaken birds' nests, to say nothing of snakes, frogs and field mice. Signs of the seasons, such as colored leaves, the shorter days in the fall, snow and the



late rising sun in the winter, the return of the birds and the budding twigs in the spring, all come in for comment. The weather receives suitable attention by marking a calendar according to the weather of each day. Special signs are used to designate rainy, cloudy or clear days. Everyday occurrences within the school room are utilized. For example, one day a child who was washing the blackboard asked what happened to the water which was on the blackboard. During the following discussion, the children learned a new word, *evaporate*, and found that when the discussion had ended, the water had all *evaporated* from the blackboard. They were very proud of having learned a new "grown up" word and it became meaningful to them because it was introduced through a concrete experience.

Because experiences beyond the range of trips can be acquired vicariously, a story hour is an important part of each day's program. Many types of literature, both poetry and prose, are introduced and attractive books are available for individual use at all times.

### 3. DEVELOPING SKILL IN EXPRESSION

Although the interest and joy of the experience itself is important to the child's development, the chief function of the pre-academic teacher is to assist the child to translate his impressions into language. When the children first come into the room, they are eager to tell what they have just been doing, and each child is given an opportunity to talk. The spontaneity of his story is not crushed by too much criticism of form, but he is encouraged to speak in complete sentences and to use the correct names of the things about which

he speaks. With the youngest children, the teacher is satisfied if they can tell what they have seen or done so that it can be understood. As skill develops, higher standards in usage are set and the discussion lengthened so that erroneous impressions or ideas can be corrected. When all disagreements are smoothed and the story of the experience is complete, it may be recorded on the blackboard or on charts in sentences dictated to the teacher by the children. These charts are usually a summary of the facts which the children consider important to remember. The more outstanding events find their way into the cottage newspaper, dictated and illustrated by the children, and placed upon the bulletin board. The children frequently refer to it, learn to identify their own names and the older ones ask help in reading it. By this method, we bridge over into experience reading, initiated not by pressure from the teacher but by the children themselves.

From reports of past experiences, we proceed to plan for the future. We lay the plans very carefully, so that each child knows exactly what is expected from him. The younger children are asked only to tell what they are to do. For the older children, these plans are also recorded on charts in the manner described above. This makes an excellent opportunity to teach the children the need for speaking concisely and for saying exactly what they mean.

In addition to group experiences and plans, the children are encouraged to observe, to question and to discuss everyday problems. These cover a wide variety of topics, such as the code of conduct under certain circumstances, the best way to take care of a certain



pet, rules for favorite games and the like.

Stories heard during the literature period furnish models for stories which the children may tell themselves. We provide opportunity for such story telling by letting the children take charge of a literature period. They may retell their favorite stories, or make up ones about some picture which is shown to them. They are encouraged to try to imagine what has happened just before the scene of the picture, and what will happen next. By this means we attempt to help them to develop logical interpretations of situations which will assist them later to grasp the meanings of material given them to read. The following examples illustrate the levels of story telling representative of the three groups of children:

The picture shown was of a white and brown Cocker Spaniel puppy sitting beside a badly chewed evening slipper.

Group 1. The dog got the slipper. The dog ate the slipper.

Group 2. There is a hunting dog. He has long ears. He has ripped the shoe up. The toe is all ripped to pieces. He has a black nose and eyes. The heel is all coming apart.

Group 3. A little boy was six years old on his birthday. He wanted a puppy. His father told him to go to bed and he'd find something in the morning. His father went to the store and bought the puppy. He put the puppy on the boy's bed. The mother left her shoes out and the puppy chewed them. Mother slapped him on the nose and let him into the yard.

#### 4. SKILLS RELATED TO LANGUAGE DEVELOPMENT

Having stimulated interest, provided experiences and offered opportunities for verbal expression, we analyze by means of tests and observations the

special deficiencies in language ability and habits of thinking which the children present. Among these are the ability to reason, to do quantitative thinking, to remember things heard and seen and to discriminate between different things heard or seen.

Before an individual can share experiences with another person or interpret into an experience of his own the situations presented by the author of a story, he must be able to see logical relationships between the facts which he knows, in other words, to reason about them. Story telling about a picture, described above, is one method of encouraging reasoning about things seen. Interpretation of things heard is furthered by allowing a child to predict what will happen in a story which is being read to the group. Then the story is finished to see if the child "guessed" correctly. One of the most useful devices in this field is the riddle. The teacher may give a riddle as follows: "I am thinking of an animal which has long ears. It lives in the ground and it goes hop, hop, hop." The child who can identify the animal may give the next riddle. The standard established for a good riddle is that it can be guessed. The child must tell enough so that what is being described can be identified and yet he must not disclose what it is. The riddles for a given period may center about a theme, such as animals or birds or things appropriate to a season such as Halloween. Thought functions required in giving the riddle are equally important as those in guessing it; the activity makes demands upon many other mental processes besides reasoning (imagery



and discrimination), and the children never tire of the game.

Adequate concepts of number or quantity are a necessary preliminary to the more formal arithmetical operations required in the grades. Therefore, much time is spent in counting and in the development of accurate quantitative thinking concerning the things we do and talk about. Comparisons are made according to size. A child comes in telling about a bird that he has seen. It is compared in size to a bird with which he is familiar, such as the robin. He may have seen a dog which he decides is as tall as the door knob is high. Concepts of location and distance are taught by games in which the children follow directions. A number of objects may be gathered and then the children take turns placing them in or getting them from various places according to oral directions. With the most advanced children, simple oral problems are given, allowing the child to use any method at his command to solve the problem. For example: "We need six more chairs. If three boys each bring two, will we have enough chairs?"

Since memory for words and for the differences in the sounds of words is basic to the development of language facility and usually under-developed in the mentally deficient, we provide activities to give practice in these abilities. Favorite poems are requested and reread until the children are able to supply part of the words, especially those which rhyme or make a refrain at the end of a stanza. Poems are memorized by having the children listen for a particular thing each time

it is reread. An example is the following:

"The rain is raining all around,  
It falls on field and tree;  
It rains on the umbrellas here  
And on the ships at sea."\*

The verse is first read to enjoy the whole poem. Then the children are asked to listen and tell where it is raining. The entire poem is reread and the children are encouraged to answer in the exact words of the verse. They may then be asked to tell what things the rain falls on. Again the verse is reread. At this point the children may be able to name the various things. Then they are asked to listen and tell which comes first, next and so on. The entire verse is always reread to verify the responses of the children. When the children have become thus familiar with the verse, we try saying it together. Finally some child tries repeating it by himself.

Poems are memorized in this fashion in a very short time because every word is understood and it is all a game to the children. When a familiar story is retold or reread, the children are invited to fill in words or phrases. Simple dramatizations of favorite stories force the children to remember what particular characters in the story have said and done. Phonic exercises designed for ear training are also a part of training in word discrimination.

We utilize music for auditory training, also. A familiar song is sung in a neutral syllable, hummed or played on the piano. When it has been identified,

\* "Rain"—Stevenson, Robert Louis, *A Child's Garden of Verses*. The Platt and Munk Co., Inc., New York, 1932.



the group may sing it. We do much work in rhythm. The children learn to recognize which music is suitable for marching, skipping, galloping or other activities and they learn to accompany selections with a rhythm band.

Visual memory and discrimination are essential in learning to read but this part of the training is stressed particularly in the activities room. We are, however, working out a series of jigsaw puzzles, beginning with very simple ones and progressing to more difficult ones. The concentration demanded here is as important as the sense training. Then there is a series of pictures in which the missing parts of the picture can be placed by matching the name on the back of the part of the picture with the name on the location of the part in the picture itself. Matching games of words, phrases and

sentences are the final steps in this series.

#### 5. SUMMARY

In this paper, methods used specifically for language development in the prolonged pre-academic program of the Wayne County Training School are outlined. In brief, we provide many interesting experiences in an enriched environment and encourage the children to talk about them. This guided group conversation, especially necessary to offset the unavoidable regimentation in an institution and to make up for previous environmental deprivation, is interwoven with games and activities designed to develop contributing mental functions, such as reasoning, quantitative thinking, auditory and visual memory and discrimination.

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#### SIXTY-EIGHTH ANNUAL CONVENTION

#### AMERICAN ASSOCIATION ON MENTAL DEFICIENCY

Bellevue Stratford Hotel, Philadelphia, Pennsylvania, May 11-15, 1944