THESIS

on

HOME-MADE TOYS, PLAY EQUIPMENT AND PLAY MATERIALS
FOR PRE-SCHOOL CHILDREN AND A METHOD OF
EVALUATING THEM FOR USE IN LABORATORY
CLASSES IN CHILD DEVELOPMENT

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by
Anna Henrietta Haberly

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Redacted for privacy

Instructor in Household Administration
In charge of Major

Redacted for privacy

Head of Department of Household Administration

Redacted for privacy

Chairman of Committee on Graduate Study
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CHAPTER I
THE PROBLEM

This study is an outgrowth of the present economic situation. As a result of limited finances, it has been necessary for many parents to substitute home-made toys for commercial ones, as they are faced with the problem of supplying children's play materials at the lowest possible cost.

The problem involved in this study is:

1. To gather practical suggestions for home-made toys, play equipment and play materials.

2. To give directions for the construction of these playthings.

3. To determine a method of evaluating toys with reference to:

   a. The relation between play equipment and the child's attention span.

   b. Appeal of the play materials to the various age levels.

   c. The diversity of play interests for the different age levels.

   d. The extent to which I Q influences play behavior.

   e. The extent to which the toy stimulates conversation.
f. Sex preference in play materials.

g. The proportion of the child's play time spent in the actual use of play equipment, toys or materials.

h. The uses of the toy.

i. The extent to which the toy lends itself to usage with other toys.
CHAPTER II

REVIEW OF RESEARCH AND LITERATURE

PART I

PRESENT STATUS OF RESEARCH

Very few controlled studies in the field of play preferences of the pre-school child have been made, but these studies have suggested problems for the present study. They have also given trends as to the play preference of this age group, as well as methods of conducting observations. The author is indebted to a number of previous studies for valuable suggestions. The following review of research, although incomplete, will indicate the present status of experimental findings.

Lehman and Witty (51) studied the play activities of children from eight to eighteen years of age by the questionnaire method and found a gradual waning of interest in activities during the adolescent period.

Studies made prior to 1927 were not conducted under controlled conditions according to Van Alstyne's interpretation of the literature in this field. In 1898 Caroline and Frederick Burk made a study of the spontaneous play of four- and five-year-old children using the traditional kindergarten materials. The children, during a half-hour observation period each day, were allowed to choose the one thing with which they cared to play. A
record was kept of the choices and uses these children made of the materials chosen. Clay and sewing cards proved to be the most popular materials. The girls showed a tendency to choose the beads and sewing cards, while the boys preferred the clay and blocks. The interests of the four-year-old children were more scattered than those of the five-year-old children.

In a study of the Horace Mann Kindergarten and First Grade Children in 1918 as reported by Charlotte Garrison (20), clay was used more than any of the materials observed. The girls showed more preference for clay than the boys. Blocks ranked second, but they were used more by the boys than by the girls. Pegs and beads ranked the lowest. The materials observed were clay, blocks, weaving, decoration, paper construction, wood, dolls, painting, sewing, pegs and beads. They are listed in the order of their preference by the children observed in this study.

The value of play apparatus for developing motor control was reported in an unpublished master's thesis at the University of Iowa by Blackhurst in 1927 (5). She found that a group which had free access to such equipment as slides, large packing boxes, swings, trapezes, ladders and kiddie-kars made greater gains in motor control than groups not having access to such equipment. The large packing boxes, combined with ladders, planks and smaller boxes have great value to the child because
of the wide variety of uses to which they may be put.

Bridges (8) studied the occupational interests of ten three-year-old children at McGill University, Montreal, in 1927. The Montessori materials were used chiefly although doll-corner equipment, animal toys, picture books, beads and blocks were also present. The examiner recorded the names of the materials, the times used and the number of minutes spent with each.

The results of this study were:

1. There was a fair correspondence between the number of times a child used a set of materials and the total time he gave to it during the period of observation. The average duration of interest in a single occupation was eight minutes. Children of this age want to do something different every five or ten minutes. Even when they are most interested, they spend little more than one-half hour at one occupation.
2. Girls varied more than boys in time spent on a task.
3. The most popular materials were the Montessori cylinders (fitting cylinders of graded sizes into holes), large blocks and color matching. Boys preferred the building blocks, while the girls preferred cylinders, threading beads, pairing colors and chalking on the board and fastening buttons. Montessori cylinders and pairing colors also appealed to the boys.
4. Playing with stuffed animals and china ranked low.
5. Boys enjoyed the more active occupations.

In 1928, Bridges conducted a similar study on fourteen four-year-old children, which revealed the following:

1. Montessori dressing frames, the cylinders and metal insets for tracing were the most popular. The boys liked best the inset tracing and cube construction, while the girls preferred the dressing frames.
2. Six minutes was the usual time the children spent at one occupation. Boys spent longer time at one occupation than the girls, usually about ten minutes, while the girls spent five or six minutes.

Due to the fact that the same materials were not
observed in these two studies, and the lengths of observation periods were not the same, comparisons between the three- and four-year-old groups is hardly justified.

Bott (12) in 1928 conducted a study at the University of Toronto on 15 pre-school children to determine what toys children select by preference from a representative assortment; what toys are preferred by different ages; and how long an attention span children at different ages exhibit. Each child was observed separately and followed for an hour or more. The time, the material, description of activity and relation with adults and with children (including talking, watching, imitation, interference and cooperation) were recorded. The data for the materials used and social relationships had to be treated separately. Bott tried classifying the material on the basis of quality of response and found that it led to too much confusion. The relative importance of frequency of use over against aggregate time spent on various toys as signifying suitability of certain materials for certain ages is a point to be considered, in formulating norms concerning pre-school-age play materials. Bott reports that results obtained were from too few cases to warrant very general conclusions, but they tend to indicate:

1. No significant sex differences in frequency and length of play.
2. That raw materials should be provided for all pre-school children.
3. That mechanical toys diminish in popularity with the age of the child, and have little value at any age.
4. That locomotor toys are useful, though to some-what less degree as the child grows older.
5. That pattern toys, such as the peg board, and tinker builder gain in appeal as the child grows older.
6. That age correlates positively higher with active than with passive responses.
7. That the average time spent by the various ages for various toys is as follows: 1.2 minutes for the hobby horse; 1.7 minutes for dishes; 5.5 for the peg board; 5.8 for color cubes and beans; 8.6 for puzzles; and 8.4 for beads.
8. That the span of attention on play materials is 2.5 minutes for the two-year old children, 4.7 for the three-year olds and 5.6 for the four-year-old children.

Analysis of factors and situations that determine the span of attention at different ages in different children is thought necessary.

Farwell (18) published, in 1930, a study of the reactions of 271 kindergarten and first and second grade children at New Haven, Connecticut, to constructive play materials. They were exposed to a free choice of constructive materials, 30 minutes a day for 14 days. She found that building materials ranked first for the boys; painting and modeling second. With the girls painting and clay modeling ranked first and sewing materials second. Boys showed considerable interest in blocks and ignored sewing, whereas the girls had considerable interest in sewing and little in blocks. This study also revealed that 31.1 per cent of the children worked with one material from 50 to 100 per cent of the time. There was a definite relationship between motor ability and chronological age; between mental age and quality of workmanship.
Farwell said she felt justified as a result of her findings, in recommending blocks, water color paints, sand table, modeling clay and sewing materials.

Little difference in choice was discovered from grade to grade except in cardboard and paper construction, where there was an increased percentage from grade to grade. Newness and leadership affected the choice of the materials.

Hulson (37) analyzed the choices and uses of play materials made by four-year old children at the Iowa research station in 1930. When the materials were ranked in order according to the number of times chosen, the number of minutes used, persistence in use and social value, it was found that blocks ranked first, sand second in all but social value, watching ranked third in all but social value, house corner, fourth in number of times chosen and number of minutes used. Kiddie-kar and seesaw ranked high, while blackboards, animals and dolls ranked low. The number of children playing with a child using a given material was taken as the social value of the material.

An analysis of the use of the 18 materials observed were made. The materials around which the most activities were centered were house-corner, sand, blocks, seesaw, dishes and kiddie-kars. The mean length of time
spent on first choices varied from 7.4 minutes to 26.8 minutes.

In another study, Hulson (38) observed the block construction of four-year-old children during free-play period at school, during play at home, and during a test situation to determine the kinds of blocks preferred and the influence of blocks at home on activities at school. She found that the children preferred blocks size 4 x 4 x 2 inches of the six types of blocks used in the study, 4 x 2 inches, 2 x 2 x 2, 4 x 1 x 1, 2 x 2 x 1, 12 x 6 x 6, and 2-foot Patty Hill blocks. The pillar shaped blocks 4 x 1 x 1 inches were chosen considerably. She found that the number of blocks the children had at home had little relation to block preference at school.

Herring and Koch (36) studied 40 two-year-old children individually in their own homes. Each child was presented with five simple toys, truck, book, top, pull toy, and a box of acorns and observed for one hour. The different activities and time spent on each were recorded. The number of different activities and attention span were also noted. The attention span was found to be from 1½ to 2½ minutes, due, the author felt, to the novelty of the situation. The type of toy and age of the child, influenced the interest span. The toys varied greatly in their appeal to the group. Attraction value and holding
power of play materials seemed to be conditioned by age or sex.

Hetzer, in 1931, published a study of the constructive activities of 20 children on each age level from two to six years presenting the following materials: hollow nested blocks, building blocks, pencil and paper, sand, clay and material consisting of little circles and quadrangles made out of wood containing a number of holes into which sticks fitted to hold the pieces together. This experiment was also given to children from one to two years, using 20 children on each three-month age level.

Van Alystyne (87) summarizes the conclusions of this study as follows:

1. There are three stages in the handling of materials: specific manipulation, usually below two years; specific manipulation taking into account the nature of the material; and meaningful manipulation adapted to the problem.

2. The stages leading up to the last stage are just as important as the last stage itself, therefore one should not hasten the last stage by instructing children but supply them with the materials which they need.

3. The best materials are those which have the most possibilities, if the child is able to recognize the specific quality of the materials.

4. The pre-school child is content to make things endlessly, so he should be permitted to use material without disturbance. Criticism and competition are ineffective ways of educating the pre-school child.

Van Alystyne (87) reported in 1932 a study of the choices and uses of play materials by two-, three-, four-, and five-year-old children in the nursery school and kind-
ergarten free-play situations. There were 112 subjects. Twenty-five play materials were available. This was the first study on four age levels with a larger number of cases than had previously been used.

The study gave a technique for recording time that the author found helpful.

The results of her study show:

1. Blocks, clay and doll corner are outstandingly interesting at all four age levels. Boys spend more time on blocks, dump trucks, wagons and small cars than girls. Girls are more interested than boys in dolls, crayons, scissors, clay, colored cubes, beads, wooden animals and books.

2. The two-year old children prefer clay, doll-corner, painting and assorted blocks. Blocks have as much attraction value as assorted blocks.

3. Boys spend considerably more time with active materials than do girls.

4. Doll corner and clay rank the highest on all criteria of interest for the three-year old group. As compared with the two-year level more time was spent with the wagon. Books had more holding power, painting more appeal value and hollow blocks and dolls more participation value. On the four-year level, blocks, clay and doll-corner tend to satisfy all criteria of interest. As compared with the three-year level, small cars have slightly more enduriness of interest. On the five-year level, blocks, clay and doll corner are also criteria of interest. As compared with the four-year level, crayons have considerable more enduriness of interest, doll-corner has a greater holding power.

5. The earlier age levels show a greater diversity of interest in materials. There is a difference of two materials between two and five years.

6. When the average of all play materials which were present in all situations was taken (twelve) there was a rise of approximately two minutes in attention span between each age level: 6.9, 8.9, 11.4 and 12.6 minutes respectively. The attention span for the eight most popular materials for the two-year old group was 7 minutes, 8.9 minutes for the three-year old group, 12.3 for the four year group and 13.6 for the five-year-old group.
7. Boys tend to choose the more active-play materials, as compared with the girls.

8. There seems to be a significant relationship between the length of attention span and intelligence as measured by two kinds of tests, on the four- and five-year-old groups.

9. All ages showed the greatest interest in raw materials. Younger children are slightly more interested in locomotor toys and household toys than the older children are. There is relatively little interest in the pattern type of toy throughout all age levels.

10. At the earlier ages children tend to play more with active materials than with the sedentary; whereas at the five-year level, interest is divided somewhat equally between the two.

11. Interest in doing constructive work with materials exceeds the interest in manipulation with materials at approximately four years. Interest in dramatic play, or playing house, exceeds the interest in using the doll-corner materials for manipulation at four years.

12. A gradual change in the way material is used is noted from year to year.

13. The least popular materials on the two-year level were pull toys, stone tiles, pyramid of rings, beads and wooden animals; on the three-year level, pyramid of rings, stone tiles, pull toys, wooden animals and crayons; on the four-year level, pull toys, stone tiles, telephone, peg board and wagon; and on the five-year level, pull-toys puzzles, beads, and painting were the least popular. Blox that Lox, wooden animals, hollow blocks, pyramid of rings, dishes and telephones were not judges on the five-year level.

Wellman (89) found a positive relation between the amount of activity a child engaged in on play apparatus and his ability at certain motor tasks, even within groups of children having equal opportunity at the apparatus. Motor development has been found to be slightly positively related to intellectual development, particularly in young children. Wellman says that there must be access to a sufficiently varied play apparatus.
OPINIONS OF SOME AUTHORS AND PARENT EDUCATORS ON PLAY;
PLAY MATERIALS, EQUIPMENT AND TOYS.

Since research does not give the entire picture of play and its importance in relation to the child's development, it seems necessary to rely on the judgment of some of the outstanding authorities in order to evaluate the importance of play in the child's life, and to suggest suitable materials for the various age levels.

Lee (46) claims that play is the means by which children attain their fullest development in growth and coordination. Through play, new neuro-muscular coordinations are established and perfected, becoming useful in the lives of individuals.

To the child, play is life itself. By it he lives and grows and through it he develops his own personality and ability to get along successfully in society. Hoover and Wilbur, in addressing the White House Conference on Child Health and Protection frequently mentioned the importance of play in child life. Just as grown ups need work to keep happy and mentally well, so must the child have plenty of opportunity for play if he is to be a healthy minded, wholesome, well-developed adult.

John Dewey says that the young child learns and develops better through play than through any other form of activity.
"The idea that play can be suppressed is absolutely fallacious. If education does not afford an opportunity for seeking and finding it, the suppressed instincts will find all sorts of illicit outlets, sometimes overt, sometimes confined to indulgence of imagination."

The modern conception sees play as an educative agent, and in many respects the ideal form of exercise of the powers.

Patri (69) says that "toys are the tools that a child uses to build the ladder that he must mount to carry him from infancy to maturity."

Blatz and Bott (9) consider play one of the fundamental appetities that demands satisfaction just as the appetites for food, water and air need to be satisfied.

Watson claims that play is the principal instrument of growth. Without it there would be no normal adult cognitive life; no healthful development of affective life; no full development of the power of will.

A child has a native impulse to do something with materials that he can handle, so his environment should be simple enough for him to adjust himself easily, and at the same time complex enough to give every side of his nature a chance to develop. Play is one of the few if not the only activity inherently satisfying, which demands undivided attention and provides an opportunity, if wisely organized, to develop worthwhile aspects of personality. One of the inalienable rights of childhood is that every junior member shall have a place and a
time for play. Some grave emotional conflicts between parents and children have had their origin in parents thoughtlessly breaking up children's games or creative work in which they were engaged.

When parents or others buy toys for children, they should stop to consider what these toys will do for the children. Children should have toys that will train them along constructive activities. The possibilities of playthings should be considered before buying toys. Materials with which children can create things in their environment furnish real growth.

Bruce (13) claims that if a child does not play spontaneously and interestedly when alone, the parents may take it for granted that something is wrong with that child or his equipment. More and more psychologists are coming into agreement that play is almost as vitally necessary to the child's mental growth as food, water, light and air are necessary for physical growth.

Therefore, since authorities are agreed that play is essential in developing and socializing the child, it is important to know what materials meet the child's interests and needs at each age level, and which provide the greatest variety of uses for the child.

Parents need to study and understand their children, to know what play interests predominate at different age levels. Play materials should be suited to the suc-
cessive stages in the child’s development, to his prevailing interests and temperamental requirements. Strictly speaking, the child does not play in the real sense until he is two to two and one half years old. The first year is largely devoted to learning discrimination in sense perception so it is essential to see that the child is provided with various kinds of objects so he can learn the difference between hard and soft, rough and smooth, round and straight and other qualities. The number of articles provided at a time should be limited so the child will learn to exhaust their possibilities before casting them aside. Intelligent rotation of toys is productive of interest and pleasure.

The adult is an essential part of the pre-school child’s environment, but he should keep in the background until there is need for wise leadership. The child must learn to depend upon himself for managing his own body, his play materials and his relationships with other children and adults. The child should attain success often enough so he does not become discouraged. The chief ways to simplify life for the very small child is to refrain from complicating it with too many toys, too many people and too frequent changes of scenes. Adults gain a better understanding of the progress in development by watching children to see if their play is becoming more mature in
content as the child grows older.

When the need arises, the adult should be resourceful enough to stimulate children to an awakened interest in the environment and their use of it. He can do this by rearrangement of the materials; by introducing the dramatic element through verbal suggestion; or by taking the children for an experience outside the home environment. A chance to watch the working of a steam shovel, the construction of pavement, the making of hay or an opportunity to take a trip on the ferry boat to see the river traffic is sometimes more effective as an educational method than the introduction of new and different play materials. This will give the children a new play impulse for their environment.

Seashore says that the function of play as a mode of development cannot be overestimated and therefore there is a great need for proper opportunity and paraphernalia for its fullest expression.

Parents need to know, if there are special play materials that tend to develop self-discipline and emotional control; if there are special materials conducive to dramatic play; if there are certain playthings that help the distractible child to develop concentration; if there are certain qualities in playthings that teach a child to respect property.
Take-apart toys which the child is not able to put together by himself discourage him too much and tend to cause emotional upsets. Good playthings call forth some effort on the child's part, yet are not discouraging. They give the child the experience of successful accomplishment with something that is not too easy. The child may have a temper tantrum because his play materials are not satisfying.

Ford (23) emphasizes the importance of providing good playthings to keep the pre-school child happily and profitably employed, because good playthings help in the establishment of such worthwhile habits as perserverance, concentration, discrimination, self-reliance, orderliness, resourcefulness, and the habit of keeping busy and using property carefully.

If toys are mechanical, the habit of laziness may be developed. Good toys are the "do with" type, such as building blocks, and peg board, and not the "sit back and watch" type such as the typical wind-up toy which has as its only possibilities winding, watching and breaking.

Playthings must not be too difficult for the child to manage by himself, otherwise he gets the habit of depending upon adults for entertainment. To develop self-reliant children, the playthings must be of such a nature that the children can manage them readily by themselves. For
example, the pegs in a peg board must fit the holes easily, puzzles must not be too complicated, blocks must not be too heavy for the children to lift.

In general, play materials should be durable if parents wish to develop the habit of carefulness in the preschool child. Toys that break easily may encourage carelessness, when given to a child before he has developed the ability to handle them. Frequent replacing of flimsy toys encourages extravagance.

Resourcefulness in children may be encouraged by providing play materials that stimulate creative play, as, for example, a plain wooden box may furnish the best sort of creative play if the child uses it to make herself a doll house, whereas, a doll house completely furnished discourages resourcefulness.

When a child has exhausted the possibilities of a plaything, then it ceases to be a contributing factor in his development. Possibly the puzzle suited to him a year earlier, now needs to be cut in more pieces; the doll with which the child used to be satisfied just dragging around, may now need plenty of blankets to give additional stimulus.

Nervous strain in children may be reduced by having playthings that are not too complicated. For example, large beads to string must have holes large enough so they will not be a task for the children to string them.
The matter of teaching the child to put away his toys is a valuable part of his training.

Lewis and Lehman (50) in a study of thumb sucking found that this habit persisted less when the child was engaged in activity. Therefore playthings that keep the hands busy often reduce the time spent in thumb sucking or nail biting.

The outstanding difficulties that the writer encountered in attempting to classify playthings recommended for pre-school children at various age levels, was a lack of uniformity and consistency in terms used in grouping pre-school children according to definite classifications. Many vague terms were used. Toys for the toddler; for early infancy; beyond infancy; toys for the first half of the pre-school period and for the second half of the pre-school period; for the child of nursery school age; for the child from birth to two years were among the terms the writer found in the literature.

A summary of the outstanding points on which the writer found authorities fairly consistent in agreement are:

1. During the first years the child craves sensory experience; he is interested in things he can see, touch, smell, pull, push, bite and throw.

2. The baby needs a variety of objects so he can obtain a variety of sensory experience in order to learn the
different colors, shapes, sizes, sounds and textures of objects.

3. The mouth is a great educative organ of the baby, therefore the hygienic quality of his toys is very important. His toys must have no sharp points, and they must be large enough so he cannot swallow them.

4. The child needs opportunity to kick and stretch as much as he wants. He gets ready for finer muscular control through exercise in the large massive movements. Exercise of the shoulder and arm muscles should precede the hand movements.

5. As the child grows older, his playthings should be adaptable to his growing needs. He needs materials now rather than toys; things with which he can work.

6. Mechanical toys that give the child only an opportunity to wind and watch have but little educational value.

7. Imitation play is a prominent part in the life of the pre-school child.

8. Provision must be made for an adequate place for the child to play, both indoors and outdoors. The child also needs a place to keep his playthings.

9. Intelligent rotation of toys is essential. Avoid giving the child too many or too few at a time. Introduce new ones occasionally.
10. Pre-school children need a variety of materials because their attention span is short.

11. Solitary and social play are both essential for the development of the child. The cultivation of the ability to play alone lays the foundation for self-reliance in later life, teaches concentration and resourceful use of leisure time in adulthood. Social play teaches cooperation, ability to get along successfully with others, and habits of sharing. One type of play should not be secured at the expense of the other.

12. It is best for the child to play with children approximately his own age. Although the child from 18 months to 2 years becomes interested chiefly in individual play, he is more influenced by the presence of another child and is more resourceful than he would be if he were alone. A further advantage of two playmates comes, because one usually by some act or suggestion starts a new train of images when the initiative of the other lags. The ordinary surroundings of family life suffice for the child under two years.

13. Blocks are listed as valuable by most authorities at all pre-school age levels.

14. Pre-school children are more interested in raw materials than in the finished product. Joy in activity is the essence of their play.
The best agreement among authors is found in the needs of the baby. This is because many authorities considered infancy the period from birth to one year of age, and individual differences are less during the first year. Granted that children differ considerably in the rate of development, it is important for parents to watch the developmental needs of their children, and just as soon as the child leaves the vegetative, random movement stage, which is usually from birth to three or five months, he must have objects in his environment which will give him incentives for reaching, grasping and pulling. Gesell's experiments (26) reveal that the age of six months marks the definite beginning of the stage of motor-control, that a child of six months can reach and grasp for an object. Objects must be small enough and light enough for the baby to grasp and move about and feel. Many parents will find that their child is ready to have playthings within his reach by three months or earlier.

Palmer (67) suggests fastening objects to the edge of the basket or to the top of the carriage or to his stocking, so he can grasp and pull at them. A shining object hung within his reach teaches eye-hand coordination and perseverance, as the child keeps trying again and again to reach it.
If toys are going to be suitable for the developmental needs of the child, it naturally follows that as soon as the child is able to get around, he should have playthings that aid him in that respect.

Rogers (75) says that toys which aid walking should not be given until the child has acquired the physical development that comes from crawling and creeping. Therefore toys that can be pushed are more valuable than toys that can be pulled. Van Alstyne's study reveals that push toys are more popular with pre-school children than pull toys. The latter being listed among the least popular for all pre-school age levels.

Things that will give the child an incentive for crawling are large balls that he can clamber after, or an empty baking powder can that he can roll on the floor and crawl after. Several blocks that may be hooked together give him further incentive for pushing. He also needs to climb. For this reason chairs, or boxes should be provided. The author's observation at the Corvallis nursery school appears to justify recommending small, stout chairs for children as early as two years of age. These children use the chairs more often for pushing, climbing and carrying than for sitting.

Thom (83) says that many articles in the home can be a toy to the creeping baby. The mixing of dough offers never ending interest to a child from three to five years.
Patri claims that the more any child can do with his playthings the better they are for him. Dolls form a part of every pre-school girl's education, but when getting a doll, parents should be sure they are getting one that she can undress and dress, bathe, brush and comb, a doll that can stand rough usage, walk, sit and talk. If it is just a one-action doll, it would be better not to buy it.

Balls appeal to all children but a ball is not just a ball. One to roll, one to bounce, one to throw, one to bat and catch, one to punch, one to kick, one to tumble over, one to swim on, or one to keep in readiness for use on call are the various uses children make of balls. Consider what the child can do with the ball before purchasing it.

Patri recommends materials for all kinds of constructive work, looms, garden sets, miniature cooking outfits and similar articles.

Brill and Youtz (11) claim that generally speaking, children of about the same age delight in about the same type of play.

Equipment for dramatic play, for constructive play, things to exercise the large muscles and things to stimulate mental activity should be supplied during the second half of the pre-school period, according to Arlitt.
Standards to consider in selecting play materials for young children as revealed in literature are:

1. Materials should stimulate self activity.
2. Playthings should stimulate the imagination. Children use objects to make images. It is the interaction between shifting imagery that makes play fun. Therefore the playthings must maintain enough likeness to the real object so there is a sensible basis for the imagination of the child, yet not so realistic that the child's images have no chance to function. An empty box may be a house or a boat to the pre-school child if it is big enough for him to crawl into it.

3. Playthings should be durable, hygienic, sanitary, simple and safe.
4. Playthings must be adaptable to a variety of uses.
5. Materials must be adapted to the child at his own level of maturity, to his ability to handle and manipulate successfully.

6. A toy that lends itself to use with other toys is a test of a good toy.
7. A variety of play materials are needed, some for active play and some for quiet play.

Table I lists toys recommended for the baby, up to one year of age, according to the opinions of some
of the prominent authorities.

Table II lists playthings recommended for the preschool child beyond one year. As the writer mentioned previously, it is impossible to assemble these according to age levels, because of the vagueness and inconsistency in terms used by the different authors.
## Table I

**Toys for the Baby**

**Summary of Opinions of Modern Writers**

<table>
<thead>
<tr>
<th>Toys</th>
<th>Arlitt</th>
<th>Moore</th>
<th>Bott</th>
<th>Blatz</th>
<th>Thom</th>
<th>Fenton</th>
<th>Mitchell</th>
<th>Strutsman</th>
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*Star indicates that the author has mentioned the toy as being suitable for the baby during the first year.
Table II

Summary of Toys Listed by a Few Writers for the Child from 1 to 6

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*Classification according to definite age levels was impossible because indefinite terms were used by authors to indicate age range.*
CHAPTER III

METHODS USED IN THE STUDY

PRELIMINARY EXPERIMENTS

The purpose of this part of the study is to devise a rating scale which may be used in evaluating the desirability of toys.

In constructing this scale the writer has made the following fundamental assumptions: toys, play equipment and play materials are valuable in proportion to the variety and kinds of stimulation which they supply to the child. That is, the toy which holds the child's attention for the greatest period of time, lends itself to the greatest number of uses, serves as a stimulus for language development, lends itself to use in combination with other toys, and stimulates social contacts, may be considered of great value.

In selecting a method of procedure for this study, such questions as the following arose: Should groups of as many as 10 children or groups of only two or three be used for simultaneous observations? Is it preferable to rate children individually and combine the results? Is it better to rate the toys singly without keeping the identity of the child? What is the most desirable length of time for each observation? How many observations are
necessary to indicate typical behavior?

The subjects used in these preliminary experiments were nine children of the nursery school at Oregon State college. The age range was 25 to 45 months. The intelligence quotients as determined by the Stanford Revision of the Binet-Simon test ranged from 98 to 145.

During the first week of the preliminary investigation, after five hours of observation, the writer concluded that it is not practical to observe a large group of children simultaneously. The difficulties encountered were the lack of accuracy in recording a large amount of data in a short period of time, the competition for toys which made it impossible to be sure of each child's preference, and the interruptions due to interference of other children.

During the second week, specific playthings were observed for five hours to determine the number of children playing with each toy during each observation. This method was subject to a great amount of error due to the irregularity of attendance of the children at nursery school, and also to competition for the toy. If one child played with a toy for a period of time, no other child had an opportunity to select that specific toy.

The writer tried observing a single child in a free play situation without isolating him from the group. The
things he played with during an observation period were listed and the length of time in minutes that each article occupied his attention was also recorded. This was continued for several observations. Occasionally the child wanted to play with something another child was using. This prevented a fair rating of a toy. This method was abandoned.

Bott's (12) study of the observations of play activities of pre-school children stresses the complication which arises in grouping toys in separate classes when rating them. The difficulty is due to the fact that different children use the same toy for several purposes. There is therefore no clear cut line between groups or classes of toys. She also emphasizes the fact that toys must not be judged solely by their popularity with the children but by the developmental value of the toy to the children. So her experience was taken into consideration.

It was decided that conditions could be controlled best in a test situation. An experimental room was arranged where two or three children could be observed simultaneously in free play.

The children were taken into the testing room one at a time. This method was soon discarded because, although the child had no competition in the selection of toys, his mental reaction to the test situation was not
good. When the child was alone, he seemed concerned as to why he was alone and did not enter into spontaneous play, even after he had been introduced to five or six ten-minute observation periods. This type of observation also provided no opportunity for the observation of social behavior. As a result of this preliminary work, the author concluded that a test situation in which two or three children may be observed simultaneously, is most satisfactory.

Before the actual testing the children were taken into the test room simply and in groups of two and three for several periods of ten minutes each. This was done to accustom the children to the test situation. This practice testing was continued two weeks at which time the children reacted well to the test.

To avoid the variable of having the newness of the home-made playthings influence the children's choices, the new toys were introduced from three weeks to two months before the actual testing was begun, and the final records were taken.

To determine the minimum length of an observation period which will give a fair check on the children's toy preference, several experiments were conducted in which the length of time was varied. During the first of these experiments the question arose as to the advisability
of either of two possible methods. (1) Recording the observations of the children over a period of 10 or 15 minutes while they were actually occupied with the toys, and discounting the time spent in standing around; or (2) stopping the observations at the close of a definite number of minutes regardless of how much time was actually spent with play materials. After consideration, a definite number of minutes for observations seemed advisable because it gives a better picture of the child's behavior. This procedure was followed in the final testing.

These preliminary experiments evaluated on the basis of the needs for this study resulted in the following conclusions which were used as a basis for constructing the final rating scale:

1. It is best to observe the child rather than the toy. Using this method it is possible to classify the results for definite age levels, and it is also possible to determine the range of individual differences in play.

2. It is preferable to observe the children, two or three at a time, in a test situation rather than to observe a group as a whole. With this method the accessibility to the toy is not so likely to enter in as a variable.

3. All the playthings to be rated should be readily accessible to the children.

4. Toys to be rated must all be familiar to the child-
ren before the final rating is started, otherwise the new-
ness will cause variability.

5. One rater with a stop watch can satisfactorily re-
cord the data.

6. It seems best to have children of about the same age levels for the test situation.

THE FINAL EXPERIMENT

This brings us to the procedure which was adopted for the final test situation, the above plan being used with the following modifications. Two children, rather than one was placed in the test situation and observations were made simultaneously. The length of the test period was 15 minutes.

The subjects used for the final observations were 9 pre-school children of the Corvallis nursery school, ranging in chronological age from 25 to 45 months. The intelligence quotients as determined by the Stanford revision of the Binet-Simon test ranged from 98 to 145.

Table III shows the cases together with their C.A., M.A. and I.Q. The mental tests were given to all the children used in this study during the months of January and February, except for Case A, who was of such temperament, that it was impossible to obtain a favorable reaction.
TABLE III

Distribution of Cases by Age and Mental Status

<table>
<thead>
<tr>
<th>Cases</th>
<th>C.A.</th>
<th>M.A.</th>
<th>I.Q.</th>
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<tbody>
<tr>
<td>A</td>
<td>25</td>
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<td>B</td>
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<td>36</td>
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<td>44</td>
<td>122</td>
</tr>
<tr>
<td>H</td>
<td>36</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td>I</td>
<td>45</td>
<td>44</td>
<td>98</td>
</tr>
</tbody>
</table>

The toys available in the experimental room and the code used when recording data were as follows:

1. Blocks (bl)--Ninety-six assorted blocks of different sizes and shapes, measurements in inches as follows:
   11, 11 x 2\frac{1}{2} x 1\frac{1}{2}; 8, 8 x 5 \times \frac{3}{8}; 28, \frac{5}{2} x \frac{3}{2} x 1\frac{1}{2}; 16, 2\frac{3}{4} x 1\frac{1}{2} x 1\frac{1}{2}; 11, 8 x 4 x 1\frac{3}{4}; 2 x 2 x 2; and two curved blocks (\frac{1}{4} circle) 11 x 2\frac{1}{4} x 1\frac{1}{4}.

2. Paper (pa)--Two squares of wrapping paper, 24 x 24 inches.

3. Box (bx)--A packing box 26 x 16 x 15\frac{1}{2} inches served as the container for the assorted blocks.
4. Crayolas (cr)--Several large sized crayolas were used, together with pieces of plain wrapping paper (20 inches square), both being available for use by children at the same time.

5. Animals and barn (An. & B)--Six animals which could be fitted into compartments in a toy barn (see page 107 and 108 for detailed description). Schoenhunt animals (S. An.) without barn were also present.

6. Broom-stick horse (ho)--The straw part of a broom was covered with sateen so it would resemble a horse's head. See page 85 for detailed description.

7. Sectional train (H.Tr.)--A simple wooden train was made of blocks which fasten together by hooks and screw eyes. See pages 108 and 109 for detailed description.

8. Aluminum sectional train (B. Tr.)--A simple train made of aluminum and consisting of an engine and eight flat cars that fitted together. The cars were $5\frac{3}{4} \times 2\frac{1}{4} \times \frac{1}{8}$ inches.

9. Cigar-box wagon (C W)--Spool wheels attached to an ordinary cigar box which was painted red. The handle or pull was made of cord string.

10. Two cigar boxes (C B)--Cigar boxes, one painted red and one unpainted containing playing cards (cards), shells and spools and wooden beads.

11. Oil cloth kitten (ki)--Stuffed toy, 13 inches long.
12. Stocking doll (h d)--Home-made doll, 12 inches long, made out of a pair of men's socks.

13. Schoenhunt doll (b d) Doll, 12 inches long was used.

14. Blankets (Bl)--Yard squares of crepe were used as blankets for the dolls.

15. Doll bed (Bd)--A wooden doll bed 19 x 11 was available.

16. Dishes (di)--The usual assortment of cups, saucers, teapots and creamers made of granite ware were present on an oblong tray 13 x 11 inches.

17. Covers from commercial cans (Co)--A dozen covers from commercially canned products. These were removed with a type of can opener which left the edges smooth.

18. Adhesive-tape can (A. Ca.)--An inch width, five yard adhesive tape can container.

19. Large unpainted peg board (L. Pg)--The board was 12 x 11 x 1 inches with round holes 1 1/8 inches apart. The pegs were 3 inches long by 1/8 inches in diameter.

20. Small painted peg board (S. Pg)--The board was 10 x 10 x 1/2 inches with round holes 1 inch apart. The pegs were 3 inches long by 1/8 inches in diameter and were colored assorted colors.

21. Home-made book (h. bk)--The book consisted of
four pictures about objects familiar to the children. These pictures were pasted on each side of two pieces of cardboard. The booklet was fastened together with adhesive tape, and the edges were bound and the entire booklet was shellacked.

22. Commercially-made books (B Bk)--Twinkie Town Tales, Book No. 1, published by the Hamilton Brown Shoe Company, Boston; and The Ark of Father Noah, published by the Double Day Doran and Company Corporation, Jersey City.

23. Puzzles (P)--The puzzles were made by mounting pictures, 9 x 10 inches on heavy cardboard, and cutting them in three or four pieces. Three puzzles were available, one was a picture of a ship, one of Miss Muffet and the other of children at play.

24. Bean bags (B B)--Several bags were present, three 3-inch square and one 5-inch square.

25. Pull toy (Wh)--The toy consisted of a 10-inch spool, such as comes with electric cording when it is purchased by the stores. String was run through each end making it into a pull toy.

26. Embroidery hoops (hp)--Four of these hoops were available, two 3 inches in diameter and two 5 inches in diameter.

27. Chairs (Ch)--Four children's Mosher chairs were present.
28. Waste basket (WB)—The waste basket was made of tin and was 10½ inches high and 10½ inches in diameter at the top and 8½ inches in diameter at the bottom.

29. Miscellaneous cans and boxes (Ca)—An empty Max-Factor powder can and two Hills Brothers coffee cans and a small polygon shaped powder box were present.

30. Ball (Ba)—The ball was made from cotton strips wound so as to form a ball that was four inches in diameter. It was securely covered with black sateen.

31. Doll buggy (Bu)—An open toy wicker buggy was used.

32. Small cars (Cs)—There were three small cars available.

Van Alystyne (87) has devised a method of recording time observations of play materials which, with slight modifications, has proved effective for this study. The observer used a sheet of paper which was marked off into spaces as indicated in Figure 1, page . Space was also available for recording each child's observation separately as the figure indicates.

The observer timed all observations with a stop watch. She observed the children simultaneously, recording on the record blank the minute at which each child started to play with the material, and the abbreviation corresponding to the name for each toy. If, at the end of the minute a child
METHOD OF RECORDING TIME OBSERVATIONS

Observation No. | Case | Date | Uses
---|---|---|---

| Ho 1 | S.Pg 3 | H.Tr. 2 |
| S.Pg 3 | SC 3 | Di. 2 |
| \( \text{E} \) | SC 2 | Bx 1 |
| \( \text{F} \) | Beads 3 | Bx 1 (\text{money}) |
| Bu 1 | \( \text{pa} \) 3 | Di 3 |
| \( \text{CW} \) | | Di 1 |

Conversational value:

1. Talks much  
2. Talks some  
3. Does not talk

Uses were recorded as follows: \( \text{M} \)-purely manipulation; \( \text{P} \)-pushes; \( \text{D} \)-dramatizes; \( \text{C} \)-constructs; \( \text{CU} \)-Construction used; \( \text{WF} \)-walking plank. Actual uses were often written out on the lower half of the page, at the close of the observation.
was still playing with the first chosen material, a line was drawn under the name of the toy, and if not, just the name of the toy was left on the paper and the name of the newly chosen material was recorded. If the child played with a toy longer than one minute, the line was extended from the name of the toy through the spaces which represent the number of minutes corresponding to the amount of time the toy was used by the child.

In this way the attention span and the child's choice of play materials was recorded, within the limits of accuracy of one minute. In the space to the right of the page, the observer listed the uses each child made of the toys.

If, during the test, the child was playing with a particular toy at the close of the 15 minute observation period, the observer extended the observation time, thus making it possible to get the attention span of that toy. On this blank it was possible to record the following data in compact form: the ways in which the child uses the different materials, the types of play-things the child uses together, the extent to which the plaything stimulates conversation and the toys which stimulate social contacts.

The data for this study were gathered between November 5, 1932 and March 1, 1933. The first month was
devoted to preliminary experiments and plans. The main experiment consumed the remainder of the time. Data for each child were obtained from 10 to 44 observations periods of 15 minutes each.

The writer made no attempt to record the actual number of words used as the child played with each toy. The writer did, however, record the general type of play that seemed most stimulating to conversation, such as: active, manipulative, dramatic or creative play. For this study, which at best will merely indicate trends and perhaps suggest possible methods for gathering data, it seemed satisfactory to classify conversation under the three following groups, "says nothing," "says much," "says little."

After the data were gathered, the record sheets were sorted according to the date of the observation. The reliability of the method was determined by the following procedure: each subject's observations were numbered from one consecutively to ten or twenty or forty depending upon the number of observations taken. The number of minutes each toy was used was recorded keeping the odd numbers of observations for each child in one column and the even number in another column. These were then correlated by the rank-difference method of correlation, using the formula 

\[ p = 1 - \frac{6 \sum d^2}{N(N-1)} \]
The p was changed to r by Table XX in Garrett's "Statistics in Psychology and Education," (1926). The probable error was determined by the following formula:

$$PE = \frac{7063(1-r)}{N}$$

The length of the attention span for each toy during each observation period was determined and the longest attention span for each observation period recorded, together with the names of the toys holding the child's attention. The total time each child was observed was calculated. The total amount of time that each child was merely engaged in standing around, watching, or in fun making with the use of no definite plaything was also figured and recorded.

The total number of minutes which each child spent on a given play material was divided by the total number of minutes that the child was observed to get the percentage of time spent on each material. The percent of time that the child did not use play material was also recorded.

The children were grouped in two and three year age levels, and since there was but one case in the four year old level, this case was discarded from the study. The average percent of time spent by the two-year olds and also the three-year olds on each play material was recorded. The average percent of time the two and three-
year olds spent without the use of play materials was also determined.

The average attention span was obtained for each child by adding the total number of minutes each child spent with each material and dividing by the number of times this material was used. The average attention span of each of the two and three-year old groups was also calculated.

The average length of the longest time spent on materials in separate observations was also calculated.

The number of different materials played with in one observation was secured in order to get an indication of the diversity of interest for the various children. The average diversity of interest for each child was determined as well as the average diversity of interest for the two- and three-year olds.

The number of different times in the different observations that each material was played with was recorded for each child and the toys were ranked according to the frequency of use. These were averaged for each material and the materials then ranked.

Difference in the play behavior of children when classified according to the intelligence quotients was also noted.

As indicated by the records, the toys which reveal
the most conversation while they were being used were ranked in one group and those which indicated little or no conversation were ranked in another group. From these lists the observer found it possible to determine trends as to the general types of playthings which appear to stimulate conversation to the greatest extent.

To determine the proportion of time spent by children in the use of toys or play materials, and the proportion of time spent in fun making or watching and standing about (the latter situation including the time spent without the use of play materials or equipment), the author totaled the time after classifying it according to the two above groups.

The different types of usage for each play material were transferred from all observations. This record suggests the value of the toys from the standpoint of their possibilities so far as use is concerned.

The toys which tended to be used together were also noted and listed in groups.
The following chapter, which may appear somewhat unrelated to the experimental part of the study, is introduced at this point because it contains, among other suggested toys, a description of the home made toys used in this study. These toys which were used in constructing a method for evaluating play materials may be identified by a * preceding the description of each toy.
CHAPTER IV

SUGGESTIONS FOR HOME-MADE TOYS AND PLAY EQUIPMENT

PART I

TOYS MADE FROM SPOOLS

Beads. Collect a large number of small darning cotton spools and spools on which number 50 or 60 thread comes. Dip them into a dye bath. Empty cans or cigar boxes serve as good containers for these home-made beads which children ranging in age from two to three years old like to string. Shoe lace with a knot tied in one end, or cord, (one end of which has been dipped into paint or shellac to stiffen it), is excellent for stringing beads. The three- to four-year olds enjoy using these dyed spools as food with dishes or commercial can covers, and also with empty cans for rattles.

Spools for building. Collect empty spools of varying sizes and shapes, put them on the child's play shelf for use in building towers, transferring from one box to another and putting into and taking out of empty milk bottles.

Spool top. Select a spool on which number 50 or 60 thread comes. Whittle the spool evenly from both ends toward the center, turning the spool both around and end for end as one whittles. When the spool has been cut in
halves, each half of the spool should make an even cone shape. Insert a peg about one and one half inches long, and as large as the hole, entirely through the opening. Sharpen this at the point making a perfect cone shape, and whittle the handle to a size convenient for the child to manage. Drive a pin point into the tip end of each spool top. Spin the tops on a plate or any smooth surface.

**Mallet.** Using a very large spool, 3½ to 4 inches in length, auger a hole into it one half way between the top and bottom and extending half way through the spool. Glue a peg six or eight inches or longer into this hole. The child will enjoy using this with an old golf ball, or rubber ball, as he imitates the grown-up game of croquet.

**Doll furniture.** A large basting-thread spool makes a suitable foundation for a small doll’s table. A round paper carton cover two to three inches in diameter is satisfactory for the table top.

**Wheels for wagons.** Spools may also function as wheels for cigar-box wagons. A number 50 spool, cut in half will make two wheels. Button molds may also be used.

**Spool doll.** Select one large basting spool for the body of the doll, eight number 50 spools, three for each leg and one for each arm; and three darning cotton spools, one for the head and one for each hand. Use cord, shoe
lace, or rubber elastic to string the spools together as shown in Plate I. Bore a hole through the large spool which is used for the body, about one fourth inch from the top. The arms are attached by putting rubber, elastic or shoe string through the body spool hole which was augered, and through each of the two spools which make the arms and hands. Fasten the ends of all cords securely by means of a circle of leather or inner tubing, which prevents the cord from slipping through the spools.

Use a piece of elastic about 18 inches long. Double it and put both strands through the head and body spool, and single strands through the legs.

If the doll is to be painted, paint the head, body and hand spools ivory, the arm and leg spools may be of any desired color. An ivory colored vest may be painted on the body spool. The remainder of this spool should be the selected color. Mark the features on the doll lightly with a pencil. Paint them in carefully with a toothpick or fine brush; blue for the eyes, two little red dots for the nostrils, red for the lips, and pink for the cheeks. Make the features delicate rather than heavy. Mark the hair lightly with pencil and paint the hair black. Add buttons on the vest. Paint the foot spools black or brown one third of the way up from the
A satisfactory spool doll for the baby can be made as shown in the drawing leaving the spools unpainted, and drawing the features on the spool with heavy pencil. Since the baby enjoys putting the doll into his mouth, it may be best to leave the doll unpainted for the very young child.

Support for shelves for toys. Suitable shelving place for the pre-school child's playthings is essential for learning habits of orderliness. A simple type of shelving space may be made by selecting three boards of the desired size for the shelves. Bore holes in the four corners of each board. Cut two pieces of rope, making each piece nearly twice as long as the distance from the bottom shelf to the place the rope is to be attached to a hook, plus the width of the bottom shelf. Using the board which is to form the bottom shelf, pass one rope down through the hole on one side of the board, across under the shelf and up through the hole on the opposite side. Repeat these directions using the second piece of rope for the opposite end of the bottom shelf. String four spools or as many as are needed to make the shelf the desired height on each of the four ends of rope. Spools from number 36 cotton thread are satisfactory. Smaller spools may be used, a greater number, however will be needed.
Next, put the rope through the holes in the second shelf and string more spools on each end of the rope. Run the ropes through the top board. Fasten the rope as shown in Plate II, figure 1, and hang at a height convenient for the child to reach.

Spark plug. Select 9 number 50 spools, one for the head and two for each leg; four basting thread spools, three for the body and one for the neck, and five small darning cotton spools for the tail.

To make the head, whittle off the entire outer rim from one end of the spool, except for two little projections about one half inch apart. Carve these so they will look as much like ears as possible. To make the eyes nail two round headed nails in the spool about one-third the distance down to the opposite end of the spool and directly in line with each ear. On this same end of the spool, and directly opposite the ears, saw a small piece off diagonally so the head spool will fit better to the spool used for the neck. Whittle off about two-thirds of the rim from the opposite end of the spool leaving the unwhittled third on the under side, that is, diagonally across from the ears, to represent the lower lip.

Cut the basting spool that is to be used for the neck in half and somewhat diagonally so one of the pieces fits well to the spool used for the head.
The three basting spools used for the body should have all rims removed and both ends cut off diagonally and in opposite directions so each of the three sections making the body is about one and one half inches long in the longest part. The sections onto which the four legs are attached should be whittled off enough to permit the leg spools to fit well to the body spools. Two holes are bored in these whittled off sections, three-fourths of an inch apart, and large enough to permit threading of elastic through them. The holes should extend through the spools to meet the holes which runs through the center of the spools.

To make the tail, whittle off the rims of all five of the darning cotton spools, except on one end of one spool. This end is to be attached next to the body of the animal.

To make the legs, cut off all rims from four spools and one rim from each of four spools. Cut both ends of each of the latter group of four spools diagonally and far enough from the end so that the four diagonal pieces which have rims may be used for the feet (the rims representing the hoofs).

Put the spools together as shown in Plate II, figure 2, using the round elastic for stringing them. To prevent the elastic from slipping through the spools used for the feet, head and tail, run the prongs of a large headed brass paper staple through a knot in the elastic and bend the prongs
back. Insert this staple in the hole at the end of the spool.

A chalk box or any other box of similar type may be made into a barn for Spark Plug. This barn and animal may both be painted any color desired.

Animals which consume less time in construction may be made by selecting 9 number 50 spools for the legs and head of the animal and 3 spools slightly larger for the body and 4 darning cotton spools for the tail. String these spools together, as they are, using round elastic. See Plate II, figure 3. Although this toy does not as closely resemble the feature of an animal as does Spark Plug, it is satisfactory. If the spools are painted before stringing them, the animal is more attractive.

**Spool tractor.** Insert a rubber band, which has been looped over a half-inch length of match stick, through the hole in a number 50 spool. Draw the rubber tightly. The match stick will prevent the loop from pulling through the holes in the spool. Then pass the unattached end of the rubber band through a small opening which has been made in a half-inch square of cardboard. Put a match stick under this end of the rubber band which forms a loop, so that it does not extend more than one eighth inch beyond the rubber band. This match should be rotated a number of times until the rubber is well twisted, then put the
tractor on the table or floor and it will travel four or five feet, or until the rubber band unwinds. Rubbing soap on this end of the spool will cause the piece of cardboard to slip more readily and thus make the tractor go faster. Plate II, figure 4 illustrates the construction of this toy.
PART II

TOYS MADE FROM CARDBOARD, MAGAZINES AND PAPER.

**Loom.** Using a heavy cardboard 9 x 12 inches or any other size desired, cut half inch gashes one-fourth inch apart along each end of the cardboard. String heavy cord back and forth from one end of the cardboard to the other, hooking the cord under the gashes at each end. The strands of cord should all extend across the top surface of the cardboard as shown by the illustration in Plate III. The cord should be tight enough to cause the cardboard to bend slightly.

A five or six-year old enjoys weaving a straight over, under type of weave, using yarn or strips of stockings, underwear or other cloth which have been attached to a closed safety pin. A blunt-pointed darning needle is also satisfactory for weaving.

**Stencil cards.** Parents can make simple stencil cards by tracing the designs similar to those shown in Plate IV on cardboard or poster paper, then cutting out these designs with a sharp knife or scissors. Let the three- or four-year old trace these on paper and color them. Parents can thumb tack paper (unprinted newspaper is satisfactory), to the breadboard and stencil cards may be thumbtacked over this. A large cork which is handy may be used by the child as a holder for the thumb tacks,
when the child is through using them. The child will get much enjoyment putting the thumb tacks in the cork and pulling them out again.

Sewing cards. Punch holes in a piece of cardboard $4\frac{1}{2} \times 7$ inches, using a nail or a paper punch. The holes may be about a half inch apart, leaving an inch margin on each edge of the cardboard. Plate V illustrates this. Threading yarn or shoe lace in and out of these holes appeals to children who enjoy sewing. If desired, designs such as those suggested in Plates VI and VII may be traced on cardboard and holes punched about one half inch apart to from the design. The older child, from three to four or five years of age enjoys some definite design.

*Books. Cut either four or eight pictures from magazines, preferably pictures of things with which the child is familiar. Paste these on each side of either 2 or 4 pieces of heavy cardboard of uniform size, 7 X 9 inches is satisfactory. Fasten each two pieces of cardboard together with adhesive tape, or glue with bias tape or strips of cloth. A strip should be glued on each side. Then bind the edges of the booklet with the tape. A coat of shellac increases the life time of this picture book. If eight pages are used in the book, the double sheets of cardboard can readily be sewed together. With this type of booklet the child can learn to turn the pages without tear-
ing or injuring the book.

Silhouette Booklet. Trace animals or other objects on black drawing paper, and after they are cut out, mount them neatly on white drawing or poster paper. This makes a satisfactory booklet for the pre-school child and also affords an opportunity for the six or seven year old to have some real enjoyment in making a variety of books for a younger brother or sister. Suggested patterns for the silhouettes are shown in Plates VIII and IX. The designs shown in the two preceding plates, Plate VI and VII would also be suitable.

Scrap Books. The five or six year old will enjoy making a scrap book out of old Christmas cards, party favors or illustrations from a mail order house, or any magazine available in the home. One mother reports that her five year old got endless delight making a farm from the magazine pictures, cutting out all the things from a magazine that could be used on a farm and pasting them on wrapping paper. A five-or six-year old interested in cooking may enjoy making a food scrap book, using magazine illustrations.

Plain paper for the baby. Fairly heavy white paper makes a fine thing for the baby to kick against and crush. He likes the sound as well as the feeling.

Washboards. Corrugated paper is suitable.
Nine Pins. Mailing tubes or cardboard spools from toilet paper make good nine pins for the pre-school child. A ball will be needed to complete the game.

Paper sacks. The child from two- to three years enjoys putting things in sacks, and tying them with cord string. Paper sacks also add to the possibilities of grocery store play.

Large bags may serve as postman bags for newspaper play, as balloons for circus or county fair play; as noise makers, to blow up and explode.

They also make good hats.

Masks. Cutting holes in large paper sacks for the eyes and nose and mouth, slipping the sack over the child's head and tying it with cord string around the neck makes a fine mask. An old neck-tie may be substituted for the string. The child may concoct his own ideas about the extra decoration he wants on the sack for the hair, cheek or eye-brows.

Dolls. Trace the doll, shown in Plate X on medium or heavy weight cardboard; cut out the doll. Using some scraps of cloth, a pair of blunt scissors, and some paste a five- or six-year old will enjoy cutting out clothes and pasting them on the doll. Crepe paper is also satisfactory for making clothes because the child can sew it on the sewing machine. It ruffles satisfactorily.
Animals. Cut out two animals exactly alike from cardboard using patterns such as those illustrated in Plates VII, VIII and IX. Paste them together at the top so they will stand, or paste a cardboard support to the back. This gives the four or five-year old interesting cutting and pasting work and incidentally gives him animals for his farm play.

Some children enjoy cutting out the pictures of animals from catalogues and pasting them on cardboard or heavy wrapping paper. These may also be made to stand by following the above directions.

Animals with movable parts. To make the mechanical animals illustrated in Plates XI, XII, XIII, and XIV, cut two pieces of the body part and one each of the other pieces. Attach these pieces to the body with tiny staples at the points indicated in the drawings by a small "o". The five or six year old gets much enjoyment from making these. The chief value of this toy is the pleasure the child gets from making it.

Roofs for houses. The sides from corrugated boxes, which the grocery man often sends with the grocery order, make suitable roofs for the child building houses with blocks.

This paper may also be used as a substitute for piano keys in a make-believe piano, which has been constr
structed with blocks.

**Cardboard boxes.** Cardboard boxes of sizes which can be fit together are excellent for the child from one to two years of age.

Empty oatmeal or other cartons and cans make good store stock for the child of three interested in dramatizing store play.

Paper cartons with clothespins for drum sticks, make suitable drums for the child from one to two years.

Empty cardboard powder boxes of various shapes with covers will give the one and two year old something interesting to cover and uncover.

Shoe boxes appeal to the child from four to six. He needs a place to put his collected treasures. Strong boxes may also be made into doll trunks and suit cases.

**Rattles.** Colored pill boxes with buttons placed inside, make excellent rattles for the baby. The cover should be glued on securely when hung by a cord in the baby's crib. It makes a good incentive for grasping and it also introduces a new experience in sound.

**Morton salt shaker doll bed.** Using an empty Morton salt cardboard container, cut it as shown by the dotted lines in the illustration, and cover it with wall- or crepe paper. String may be fastened at each end to make a hanging cradle. See Plate XV, figure 1.
Oatmeal carton waste basket. Cover a large oatmeal carton with plain brown wrapping paper and paste it on securely. Cut pictures or designs from colored paper out of magazines and paste them on the carton. The five- or six-year old who likes to use a scissors and paste will enjoy making one of these. Wall paper may be used as a substitute for the wrapping paper. This type of box may also be used for storing small articles of play equipment.

Valentines. Lace, paper doilies may be used in making valentines, or the child can cut his own lace paper.

Wind-mill. A dutch wind mill may be made by using a cardboard spool from a roll of toilet paper, a round ice cream carton or a mailing tube as a foundation. To make the wheel, cut a piece of heavy paper, about six inches square, fold it diagonally both ways, and cut to within a half inch from the center on each diagonal fold. Fold every other point toward the center, and insert a pin through the points to hold them in place. Then attach the wheel to the cardboard tube. This wind mill is particularly useful in sand box play.

If the child wishes, the wheel may be nailed to a stick and used as a spin wheel. When this is placed in an open window of a sick child's room, it adds much to his enjoyment.
Fish pond. Using an empty show box or box of similar nature, cut out slits in the cover of it wide enough to insert the tails of 12 to 16 fish. The fish should be made out of cardboard, and should be about four inches long. They may or may not be colored. With a paper punch, cut the eyes in the fish. To make the fish pole use a stick six or seven inches long, fasten a cord or piece of old fish line to it. For the hook use a bent pin, a bent invisible hair pin, or a small nail bent.

The writer would recommend this type of playthings to the child five or six years of age. It gives the child good practice in learning motor control.

Picture matching. Mount small pictures of various fruits and vegetables on a piece of cardboard 8 X 5 inches or any desired size. Mount pictures of the same fruits and vegetables on separate little squares of cardboard. The four year old will enjoy matching these.

Cards of a similar nature may be made by drawing various shapes on a piece of cardboard 8 x 5 inches and the same shapes on small individual squares. This will give the child practice in discriminating forms.

Word Play. Cut simple words such as cat, dog, barn and house out of some old readers, magazines or other printed material which is available in the home. Paste these words on a medium weight cardboard. Cut out single
letters which may be used in building these words. It is well to select letters of uniform size. Paste each letter on cardboard also. If preferred, the words and individual letters may be printed on the cardboard and cut out to size. These letters may be classified and kept in separate compartments in a box.

The five or six year old will find much enjoyment building words from these letters, using words on the cardboard as models. As the child grows older, more words and more letters may be added to the collection.

**Color matching.** Glue sheets of red, yellow and blue drawing paper to a medium weight cardboard. Cut several diamonds of uniform size and shape from each color. The remainder of each sheet may be cut into squares. Children will enjoy using these for color matching and design making. The number and variety of colors and shapes may be increased as the child grows older.

**Doll house.** Empty shoe boxes or boxes slightly larger such as fruit jar cartons may function as houses for toy furniture. The child may enjoy cutting out openings for windows and doors. Wall paper adds to the attractiveness.

**Constructive play materials.** Paper doilies that come with bakery orders, Christmas cards and lined envelopes, tallies, and pictures from magazines and calendars make valuable constructive play materials.
TOYS MADE OF TIN CANS

*Dishes.* Satisfactory toy dishes may be made from the covers which have been removed from commercially canned products. These covers should be removed with the type of can opener which leaves no sharp edges or points. To add to their attractiveness, these covers may be painted different colors.

**Rattles.** Select baking powder or spice cans, put different materials into each can, such as rice, beans, sand or pebbles. Glue the covers on securely, and paint the cans various colors. These make satisfactory rattles for the child from 10 months to 1\(\frac{1}{2}\) years of age.

Empty coffee cans with clothespins, give the two-year old an opportunity to make his own rattles. He may enjoy putting the clothespins into the can and rolling it on the floor.

**Treasure box.** Make several round holes in the top of a large tin cracker box. Inspect the edges and make sure they are turned so there will be no danger to the child's fingers. The cracker box itself should also be free from sharp edges, so the child can remove and replace the cover with safety. Dropping wooden beads, acorns or marbles through the holes fascinates the young child from 1\(\frac{1}{2}\) to 2\(\frac{1}{2}\) years.
**Pull toy.** Put some pebbles or a spool into a large-sized coffee can, punch a hole in each end, and string a wire or put a peg or long bolt through the can. Fasten a cord to each end of the wire or peg. If wire is used be sure the edges are turned back securely having no sharp points. If a stiff wire or broom stick is substituted for the cord, the toy may also be used as a push toy. Push toys are considered more valuable than pull toys.

**Color matching.** Divide the sides of a smooth-edged coffee can in three or more equal sections. Paint one green, one blue and one red, etc. Then paint the spring- or pincher type of clothespins in each of these colors. Two- and three-year old children will enjoy fastening the pins around the edge of the can and a little later they can match blue pins to the blue section, green pins to the green, and red to the red, etc.

**Transfer toys.** Cans, small pails or boxes afford opportunity for the child to transfer objects such as blocks, pebbles, large buttons, spools and things the child can pick up easily, to and from these containers. Cans of "odds and ends" such as screws and bolts, thimbles and small bits of discarded materials are also good play equipment.
Foot stool. Seven Number 2½ commercial cans, or better still, seven tall coffee or baking powder cans, which have removable covers, make an excellent foundation for a can foot stool. If the cans are of the type which must be opened with a can opener, the covers should be removed in one piece, and then placed back securely on the cans before making them into the stool. Discarded clothing such as an old wool coat, or a pair of wool trousers or a wool dress are suitable as a covering for the cans. If desired, a strong piece of tapestry may be used.

Cut 7 pieces of cloth 2 inches wider than the height of the cans and long enough to wrap around a can. The cans should all be the same size. By measuring carefully, these jackets may be seamed with the sewing machine and turned right side out. One should be slipped over each can. Gather each end, top and bottom securely with heavy thread. If there is a shortage of material, the center can may be covered with any available material, since it will not show. When each can is covered so there is no chance of the cloth slipping, arrange six of the cans in a circle with the seventh can in the middle. With heavy thread, sew these cans together securely top and bottom, keeping them in position. See Plate XVI, Figure 4 A and B.
Then trace the outline of the group of cans on heavy cardboard or compo board. Be very careful to make this exact. Trace two of these, one for the top and one for the bottom of the stool. Then cut the cardboard on the marked lines, with a sharp knife or a coping saw. Using the cardboard as a pattern, cut two pieces of material, allowing one inch to turn under in finishing the edges at the bottom of the stool, and one and one half inches to turn under in finishing the edges at the top. Pad the top of one of the cardboard pieces with cotton. Place this cardboard, cotton side down, on the wrong side of the material which is to be used for the top. Gather the material securely around the scallops. Cut the material between each scallop far enough to permit the material to lay flat as it is gathered to cover the cardboard. It may be necessary to sew through the cardboard at the point of the scallop to make the finish neat. The bottom cardboard should be covered in the same way, either with or without padding. When the top and bottom are completed, place these covers on the foundation of the stool, and sew on securely with heavy thread, using the slip stitch. A narrow braid sewed on the edges of the top and bottom improves the appearance. A few pebbles placed in one of the cans before making the stool, adds to the children's enjoyment of it. See Plate XVI, Figure 4 C and D.
Toys for the sand box. Punch holes in the bottom of an empty baking powder or coffee can. This makes a satisfactory sieve for the child's sand play. Add to this a funnel, some empty lard pails and a few tablespoons. An old tea pot or other kitchen equipment also increases the child's sand play possibilities.

Drum. Punch two holes on opposite sides of the bottom of a coffee can. String cord through these openings long enough to reach around the child's neck, and hang at the desired height. Clothes pins make satisfactory drum sticks for this toy drum.

Fit-together toys. By saving cans of various types, the parent can eventually collect a nest of them which the child will enjoy fitting together. An adhesive tape can or similar cans make good fit-together toys, also.

Bank. A baking powder can with a slit cut in the top makes a suitable bank for the pre-school child. The can may be painted red, yellow, or any color desired.

Pyramid of cans. Commercial cans of various sizes which have rolled edges may be painted a uniform color and used for building towers.
**Horse.** An ordinary broom-stick makes a good horse for the pre-school child. Wash the straw of the broom thoroughly, and when it is dry, trim it off until it is about six inches long. Paint the handle if it is badly worn. Cover the straw with a dark piece of cloth shaping it to resemble a horse's head, and sew it on securely. Unraveled pieces of rope about nine inches long, may be sewed across the top for the mane. The eyes and nose may be outlined with floss of a suitable color. A piece of fine rope or an old strap may be tied on the broom handle for the lines.

A plain broom stick may also serve as a satisfactory horse for the pre-school child.

**Trapeze.** A broomstick, suspended securely at each end with a rope makes a good horizontal bar for trapeze stunts.

**Wheels for wagons.** A broom handle may be sawed off in one-half inch strips to make suitable wheels for small wagons.
PART V

TOYS MADE OF CLOTH

AS THE MAIN OR SUPPLEMENTARY MATERIAL

*Doll. The materials needed for the doll are: one pair of men's cotton work socks, blue and white, or red and white; a few strands of blue, black and red embroidery floss, and either ravelings from fringed material, cotton or kapok.

Outline the features on the back of the white heel of one of the socks.

Cut both socks in two pieces, by slashing midway between the heels and the toes. Use one toe for the toboggan cap, turn under the raw edge, and hem back a neat band around the cap. Attach a tassel, if desired. Slit the other toe the long way, cutting it in two pieces. Seam and stuff these for the doll's arms. Using the stocking, which is to make the lower part of the doll, cut at the midpoint and through both thicknesses at the top of the sock leg. Slit up this leg five inches and shape the ends for the feet. Seam the feet and legs, turn right side out and stuff them. Stuff the remainder of this sock for the body and head.

Slip the sock which has the embroidered features in the heel, over this sock, with the heels together, add more stuffing if needed to make the doll look right, then sew
the raw edges at the top together to make the top of the head. Roll up the bottom of the sock, which forms the blouse, in sweater fashion.

Tie a cord or ribbon around the neck. Attach the arms and put on the cap.

Hair may be made by sewing short strips of black yard to the doll's head. See Plate XVIII, figure 1.

Bean bag. Cut two rounds or squares of felt or any strong material exactly alike in size. Seam these together by machine, leaving a small opening to insert beans or cherry pits. Turn right side out, fill the bag with the beans or pits and close the opening by stitching securely. Children will enjoy throwing bags of this kind in various kinds of play.

Holes five or six inches in diameter may be cut through a piece of three-ply lumber or compo board, which is about one by one and one half feet. Props can be attached to the back of this board, or it may be placed with one end resting against a box. This gives the bean bags a chance to drop through the holes as the child throws them. See Plate XVIII.

Many children enjoy a large number of bean bags for other types of play. They make excellent sacks of flour, grain, coal and other articles, to hawl in trucks or trains.
Rabbit bean bag. An attractive bean bag game may be made from unbleached muslin. See Plate XVIII, figure 3.

Cut a pattern for a rabbit (head and shoulders), the size depending upon the age of the child for whom the bag is to be made. A young child will need a larger rabbit than an older child. A head seven inches long from the tip of the ears to the neck is satisfactory for a child of five or six years of age. Cut the front and back of the rabbit exactly alike. Outline features on the face, then sew the front and back together. Cotton stuffing, to make the animal about one half inch thick, adds to the stiffness and appearance of the toy. When this part is completed, make a gingham bag eight inches deep and wide enough to permit a six or eight inch embroidery hoop to be sewed into the hem. (A stiff wire hoop may be substituted for the embroidery hoop). Attach the bag securely to the rabbit as shown in Plate XVIII.

A piece of bias tape or muslin may be sewed from one ear of the rabbit to the other and used as a loop for hanging up the game while it is being played. To complete this game, several bean bags similar to the ones described above should be made.

*Blankets. Squares of crepe or muslin, 27 to 36 inches square, add to the possibilities of the pre-school child's doll play, and incidentally give the child cloth of his
own to shake out, fold and drape as he desires. Scraps of material may be made into doll quilts, blankets, etc.

*Balls. Balls which are satisfactory for a few purposes may be made from firm balls of sewed rags which are ready for weaving into rugs. Cover these with oil cloth, or sew the rags which are exposed to the surface together securely by blanket stitching each strip in place. If this is done a cover is not necessary.

Another satisfactory ball of this same type may be made by winding cut strips from old stockings around a small cardboard box, into which a few buttons have been placed. The outside of the ball may be finished by either of the two above methods.

Frieze for the child's room. An inexpensive frieze for the wall of a child's room may be made by cutting pictures of animals out of colored paper and gluing them to mosquito netting. Designs similar to those shown in Plates VIII and IX would be suitable.

Feltograms. Pieces of felt, which are cut in circular and rectangular shapes, similar to those which are shown in Plate XVIII, figure 4, give the younger child a pleasing change in texture from other form and color teaching materials, as he thumb tacks or pins the pieces of felt on a drawing of the doll made either on paper or muslin. See the plate for suggestive color combination.
Cradle. Select two splint market baskets, about 18 inches in length, nail a piece of wood to the bottom of one basket to form a solid foundation for the cradle. Two or three inches from the head and foot of this basket and on the underside, nail the wooden part of sturdy coat hangers to form rockers. See Plate XIX, figure 3.

Cut away one third of the other basket. Using the large piece for the hood, fit it, cut side down, into one end of the bed.

The cradle may be painted if desired. A mattress, sheets and spread add to the child's enjoyment when playing with this cradle.

Basinet (Swinging). To make one type of basinet, construct a frame similar to that shown in Plate XIX, figure 2. The size of the frame should be in proportion to the size of the basket, and the age of the child using it. Place screws in the two uprights near the top of the frame, and attaching rope from these to each end of the basket, suspend the basket to the frame.

Bed and Table Combination. Build a simple frame similar to that shown in Plate XIX, figure 1 A, the size again depending upon the size of the basket that is to be
used for the bed. Suggestive dimensions are given in the Plate. The basket should rest on two cross pieces built on the frame.

If desired, to convert this toy into a table, a removable top may be made from a well planed and sandpapered board. This board should be large enough to cover the top of the basket, and to extend at least a half inch beyond it on each side. Attach small wooden blocks or cleats on the underside of the table as shown in the illustration, to keep the top in place. An elbow catch may also be used at each end to keep the top on securely.
PART VII

PLAYTHINGS MADE FROM RUBBER

Swing. A single tire suspended by rope support makes a simple swing from which youngsters may get much enjoyment. See Plate XX, figure 1.

Climbing apparatus. Take six old automobile tires and tie them together as illustrated in Plate XX, figure 2. Suspend them securely with two rope supports. This makes an inexpensive type of climbing frame.

Ring toss. Discarded fruit jar rubbers may be placed over hooks. Large hooks about one and one half inches long, screwed in rows on a board are satisfactory.
Chains. Rose hips may be gathered in abundance from the roadside wild rose bushes. These may be made into brilliant red necklaces by the four and five-year olds. The combination of black and white watermelon seeds also makes an interesting necklace. These give the child an opportunity to learn to count as he strings them in alternating colors. The seeds from elm trees, acorns, popcorn and cranberries all make good beads to string. Seeds such as corn and peas may be dried and kept for winter days when children must remain indoors during stormy weather.

The five or six year old will often enjoy braiding dandelions, clover, and daisies into chains.

Boats. Partially fill walnut shells with paraffin. Insert a match to which a white sail has been attached. This makes a satisfactory boat for the small child's bath tub play. Milk-weed pods or orange shells also make good boats.

Leaves. In the fall leaves offer possibilities in play. Children may use leaves to build the outlines of rooms for play houses. The little housekeepers will enjoy raking the freshly fallen leaves out of the rooms.

Children may enjoy pressing the leaves, or tracing
the outlines of the leaves in a scrap book.

A pile of leaves put into a hollowed out piece of ground, makes a fine jumping place, and incidentally keeps the leaves from being scattered all over the yard again.

Wreath making may also appeal to children. Wreaths may be made by fastening leaves together with green stems or twigs.

Construction work with dried peas. Soak a small quantity of dried peas over night, they should then be soft enough to be pierced with a needle.

A box of toothpicks with these peas offers many possibilities in constructive play. Place a toothpick in a pea, and let the child guess what it is. His imagination will doubtless call it a cane, pin or whatever happens to come to his mind. Then the child may enjoy making a dumb-bell by placing another pea in the opposite end of the toothpick. Soon the child will be able to see the possibilities of making a box, rake, men figures, a cradle, a boat or an airplane. There is no end to the designs and building that can be developed with peas and toothpicks. See Plate XXI, figures 1A, B, C and D.

Peanut Doll. Peanuts strung in the manner illustrated in Plate XXI, figure 2, make satisfactory dolls which the four or five-year old may enjoy making. Use ink to mark in the features of the nut used for the head. An extra end of
string left at the top of the doll will make it possible to hang this doll in the baby's crib. He will delight in seeing it dance and hop around.

**Corn husk doll.** Corn husks may be used to make simple dolls. Wrap the green husks around a bunch of the brown silk which flows out as hair. About two inches down, tie with a stout string, tightly drawing in a neck which also forms the head. With scissors cut the green husk up a short way on both sides. This makes the arms. With more string tie inside these cuttings, thus forming the waist line. A few strokes with crayon or pen make the face.

**Other nature dolls.** Vegetables such as the radish, or carrot may also be made into dolls. On a wooden skewer place a radish, leaving a little of the green on top for the hair of the doll. Tie some leaves, grass or a piece of cloth around the bottom of the skewer, thus forming the dress. Mark in the features and the doll is complete.

The simplest of all dolls is made of hay. It may be made by selecting a bunch of dried grass, and arranging it so that the stems lie the same way. With string tie the bunch a short way from the top to make the head. Take spears from each side cutting off a correct length to tie for arms. Bind in the waist line and lower down divide
in halves tying again to make the legs. See Plate XXI, figure 3.

Tent. A tent which may fascinate pre-school children may be made by planting a tall variety of beans in a circle within a radius of two or three feet from a central pole. With cord or string extending from each vine to the top of the pole, make a support. This will provide a cool type of tent for the child's summer play. The child likes to dig and may enjoy helping in the construction of this tent by planting the beans, watering them and watching them grow. See Plate XXI, figure 4.

Nature collections. Acorns, stones, pods, nuts, seeds, seashells, pieces of wood and all sorts of odds and ends appeal to the child's collecting tendency. Boxes should be provided for storing these treasures.

The child will likely have his own ideas as to what use he wants to make of these collections.

Water. On hot summer days, if an outside pool is not available, parents can fill a wooden chopping bowl for boat sailing games. A tub of water may be more satisfactory for an older child.
Figure 1 A  B  C  D
Figure 2
Figure 3
Figure 4
The wood which is most suitable for making toys for children depends to a great extent upon the kinds of wood available and the type of plaything one is making. For making animal cut outs use a soft wood, such as basswood for the middle westerners and easterners and Ponderosa pine or Douglas fir for the westerners. These can easily be cut with a turn saw.

Wood from packing boxes or orange crates is satisfactory for many toys. Three-ply lumber is suitable to use in making puzzles and trays for word building and also for form boards. Sandpapered mill ends are also useful in constructive play for children.

Sand boxes. One of the most practical pieces of equipment for a child throughout the pre-school years is a sand box. It need not be large and for the small child it may be located on the ground thus making it possible for the child to crawl in and out of it. A seat may be constructed by placing a six-inch strip of wood around the edges of the box. Since sand should be kept clean a cover for the box is desirable. If a bottom is not built in the sand box one half inch galvanized wire mesh will prevent the children from digging through the dirt. Plate XXII, figure 1, gives the detailed dimensions for the box, sides and braces.
Material

2 sides 2\times10\times10\sqrt{2}
2 ends 2\times10\times4\sqrt{2}
4 shelves 2 pcs. 2\times10\times12\sqrt{2}
6 braces 1 pc. 2\times10\times4\sqrt{2}
One parent suggested taking the child's outgrown play pen apart and using the sides to fasten to the sand box to form a ladder as illustrated in Plate XXII, figure 2. This should be nailed on securely and the young child will have a place to climb which will not be dangerous. This, together with a sand box properly equipped with such toys as a small shovel or tablespoons and lard pails, a fun funnel, a sieve, and empty coffee cans add to the possibilities for constructive play. This will hold its appeal for several years. Small boards may be provided for the children to sit on when in the sand box.

Another type of sand box may be made by making a foundation for the box similar to that shown in Plate XXII, figure 3, using lumber 2"x10" x 6' for the sides and 2"x10" 2"x10" x 4' for the ends. A cover for the box may be made by taking two boards 1" x 1' x 6'; and hinging them to each side so that when they turn back, the child can use the covers as benches for his sand biscuits, etc.

As the child gets older the sand may be moistened, which will increase the possibilities for creative play.

Rocking boards. Rocking boards like either of the two types illustrated in Plate XXIII, figures 1 and 3, make a satisfactory plaything for the child as early as 20 months and up to five or six years of age. For the rockers in figure 1, use two strips of wood, 4"x 9 1/2" x 54"
and mark these 22½" from each end. Then cut them diagonally and somewhat curved from these points to each end. Sandpaper the rough edges. Then nail a board ⅜" x 7¼"x 54" to these two rockers. Handles to which the child may hold, should be inserted through the top board about fifteen inches from each end of the top. These may be made from two old lawn mower handles. Little foot rests can also be made by inserting two round pieces of wood through the rockers on each side, just below the handles and at the height desired.

A variation of this rocking board which is shown in Plate XXIII, figure 2, may be made by cutting the rockers the same size as shown in the figure. Make the platform for the rocking board 40 or 50 inches wide, by nailing boards across the top of the rockers. Construct a handle in the center of this platform high enough for the children to reach when standing.

A type of rocking board which can be used by just one child at a time is shown in Plate XXIII, figure 3. The size of the various pieces needed for this plaything are given in the figure. A heavy spring attached to one end makes it possible for the child to rock up and down.

Another type of rocking seat may be made by removing two rockers from an old rocking chair. These should be held about twenty inches apart by nailing thick slats, spaced about three inches apart, to them.
Figure 1

Figure 2

Figure 3
**Peg board.** A satisfactory peg board may be made by augering holes in the top of a cigar box one half inch apart, and using dyed match sticks (the tops of which have been cut off) as pegs.

Round holes cut in the top of a cigar box, large enough for spools or buttons to be dropped through, gives the 2 to 3 year olds an interesting plaything. See Plate XXIV, figure 1.

*Animals.* Transfer designs of animals such as those suggested in Plates XXV, XXVI, XXVII, and XXVIII to pieces of one inch well planed and sanded wood. A piece of carbon paper or stiff cardboard pattern will be satisfactory in making this transfer. Transfer only the silhouettes to the wood. Carefully follow the lines in sawing the animals from the board. If suitable tools are not available, a planing mill will do this process at little cost. If the animals are to be painted, they should be well sandpapered first. When the paint is dry, transfer the features or any remaining lines to the animals, such as those illustrated in Plate XXVIII. These may then be painted some contrasting color with a fine brush.

*Stable.* To make a stable for the animals described in the above paragraph, procure a box about ten by twenty four inches or large enough to house the animals which have been made. Remove the boards from one end of the box
and place a roof made of two sections of wood over the top. (If no box is available, the box may be constructed according to the cuts shown in Plate XXIV, figure 2. The portion of the barn under the gables at each end of the barn should be built up to the roof. Children often enjoy the barn more if one section of the roof may be lifted off, as shown in the Plate, (Plate XXIV, figure 2).

Stall partitions may be made by cutting strips of wood from one half inch boards and fastening them to the floor of the stable far enough apart to provide ample parking space for each animal. A feed trough may be constructed if desired. A hinged door such as the one shown in the figure may be used. A lock may add to the child's enjoyment of the barn.

*Train. Use a twelve inch length of banister railing for the engine; attach a large spool on top for the smoke stack, a smaller spool a short distance from this for the bell; a small darning cotton spool on the cut side of the railing for the head-light; and a diagonally cut piece of wood attached to the front for the pilot. For the coal car, a block of wood 2 x 4 x 6 inches, (one corner of one end should be cut off) is suitable. The coaches or flat cars are made of four blocks of wood 2 x 4 x 9 inches. Large screw eyes in one end and hooks in the opposite ends of the cars, engine and coal car make it possible to hook the train together. See Plate XXIV, figure 3.
This train is large enough for the child to load spools, pegs or cans or other materials on it. Some children delight in just hooking and unhooking the cars and shoving them along the floor, saying "choo" as they go.

Another type of home-made train may be made by attaching screw eyes and hooks to opposite ends of cigar boxes. A large sized cigar box may be used for the engine. Wheels may be attached by cutting circles out of three-ply lumber with a coping saw. The pre-school child seldom shows concern if the train has no wheels.

*Cigar-box wagon. A wagon may be made out of a cigar box, by removing the paper, painting the box and attaching spools or wheels made from typewriter ribbon spools.

Sled. Parents can construct a suitable sled for the small child by nailing a box large enough for the child to sit in comfortably, on a sled.

Packing-box wagon. A packing box 15 x 15 x 30 inches or any other desired size, put on castors with a long rope handle attached makes a satisfactory box for hawling blocks. it may or may not be painted.

Tunnel. Rogers says that materials that aid crawling should be given before materials which aid walking.

A satisfactory tunnel for the young child just learning to crawl can be made by removing the middle section and ends of an orange crate. Then nail narrow slats across
the ends near the top to keep the orange crate together.

**Climbing frames.** By nailing strong slats to each side of an ordinary saw horse a safe type of climbing apparatus for the young child may be made. See Plate XXIX, figure 1.

Other types of climbing apparatus for the pre-school child may be made by placing a plank or ladder between packing boxes of equal height. See Plate XXIX, figure 2. If the boxes are high enough, and a ladder is used, this may function as a horizontal bar on which the child may perform trapeze stunts.

A large board may be placed on low blocks of equal size as a walking plank for the child learning the first stages in maintaining equilibrium. As the child improves in this respect the plank may be placed on top of two higher boxes of equal size. Then it may function not only as a walking plank but also as a bridge between two houses.

Strong bars may also be fastened to an ordinary clothes post to give the child additional opportunity for climbing. Holes the size of a broom handle may be bored in the post and fifteen-inch pieces of broom handle put through these.

**Slide.** A board that is a foot wide and nine to twelve feet long may function as a slide provided one
side is sandpapered smoothly, varnished and waxed. A cleat should be nailed to the under side of the board near one end to prevent slipping when the board is placed against a packing box. The steepness of the slide may be varied by placing the cleats at different distances or using various sizes of boxes. See Plate XXIX, figure 3.

**Teeter-totter.** This same board with cleats fastened in the middle on the under side from 10 to 12 inches apart may be used as a teeter-totter, when placed over a saw horse or swing. The cleats tend to keep the board from slipping. See Plate XXIX, figure 4. This type of board may also be used as an inclined walking board turned either way (the smooth or cleated side up). An ordinary ladder may also be used a a teeter-totter when placed over a saw-horse.

**Steps.** Any one handy with carpentry work may make steps similar to those which are shown in Plate XXIX, figure 5. Three to five steps with a platform at the top is satisfactory for several pre-school children.

**Various-sized** packing boxes, with covers nailed on securely may be placed next to each other in step fashion. These may be nailed together at the sides to make them more secure if necessary. See Plate XXIX, figure 6.

**Building boards.** Boards cut as illustrated in Plate XXIX, figure 7, are good for building houses. The child may hook one board onto another. These are made by tak-
ing boards \( \frac{3}{4} '' \times 4 '' \times 3 ' \), measuring in from each end of
the board \( 1 \frac{1}{2} '' \) inches, and cutting out a U-shaped piece
1 inch wide. A hard wood such as hickory, should be
used in making these boards so that the ends will not
break off readily.

**Tree bench.** A bench built around a tree, as is ill-
ustrated in Plate XXIX, figure 8, gives the child a ch-
ance to get a few feet above ground. If there are
two trees in the yard growing closely enough together, a
board may be fastened between them so the child will have
additional safe climbing experience.

**Blocks.** Select a substantial packing box about
4' \( \times 2 ' \times 1 \frac{3}{8} '' \). Fasten castors at each corner so that the
box may be moved readily from place to place. This will
serve as a storage place for blocks. This box may be
painted, if desired.

Very satisfactory blocks may be made out of \( 2 \times 4 \)
pine or basswood lumber. These can be cut various shapes
at a local lumber yard. Blocks should be cut in shapes
which fit together well for building. Dimensions, shapes
and numbers which may be provided for an individual child
are about as follows: 10, \( 4 \times 4 \times 2 '' \) inches; 20, \( 6 \times 4 \times 2 
'' \) inches; 8, \( 12 \times 4 \times 2 '' \) inches; 8, \( 24 \times 4 \times 2 '' \) inches, and
4 quarter circles which may be used in making tracks for
small cars.
Easel. Just a flat board 18 x 24 inches hung on a fence or fastened to a tree at the child's eye level, to which squares of white wrapping paper are thumb tacked makes a satisfactory out of door easel. A narrow wooden box may be nailed to the lower end of the board to hold the paint cans or crayons, or parents may make a simple tray for the paints out of any available wood. The young child enjoys painting with a long handled brush.

Doll bed. A doll bed of simple lines may easily be made by anybody handy with a coping saw. It is well to make the pre-school child's doll bed large enough and strong enough to hold the child himself as well as the dolls.

A small size packing box 6" x 1' x 1½' with castors in each corner also makes a suitable doll bed. A coat of paint adds to its attractiveness.

Boats. Select a piece of lumber ¾" x 3" x 6" and cut it pointed at one end. Attach a block of wood ¾" x 2" x 4" to the top of this board. Pegs may be inserted for the smoke stacks.

If the child lives in a part of the country where he gets an opportunity to see ferry boats, he will enjoy making one. Money invested in carpentry tools is well spent because they offer opportunities for constructive play.
Form and color matching. A square of three-ply wood (ten inches square) may be used to serve as a base. On this, paint a five pointed star, 3 inches across from point to point. Place a peg 3" long and one-half inches in diameter in the center of each of the points and also one at the center of the star.

Cut five small five-sided pieces of wood to correspond in shape with the center of the star. Paint each a different color. Bore holes in the center of these pieces to fit the center peg. Then make five triangular pieces for each of the remaining five pegs, and paint each group of five a different color to match each of the colors used in the center pieces.

Each layer of pieces forms a star of uniform color. Thus the child builds the toy having five layers of stars each of a different color, or he may work out his own ideas in color combinations.

This is a splendid toy to teach form and color matching. See Plate XXX.

Form board. Six different shaped (three to four inch) blocks cut out of three-ply lumber with a coping saw (which will permit the shapes to fit back into the form from which the shapes are cut) makes a satisfactory form board. Another piece of three-ply lumber or a piece of muslin of the same size as the original board should be
glued to the underside to prevent the insets from falling through the board.

Swing. A swing for the very small child may be made from an old seat of a small chair. Suspend this with a rope.

Merry-go-round. A wheel merry-go-round may be made from an old wagon wheel and axel by burying the one end in the ground so there is no danger of it falling over.

Embroidery hoops. Round embroidery hoops may be used to spin. The tiny children also enjoy these as bracelets, necklaces or leg rings. The older child enjoys throwing them over a tin can or other pegs. If the hoops are of various sizes, they make a suitable nest of rings to fit together.

Wheel barrow. Plate XXXI illustrates, with suggestive dimensions, the various pieces of wood required for making a durable type of wheel barrow.

If a turned wheel is not available any other durable wheel of suitable size may be substituted. It is more satisfactory to make the size of the wheel barrow fit the size of the child than to copy exact dimensions from those suggested here. The various parts needed are so well illustrated in the plate referred to above, that a further description seems unnecessary here.
PLATE XXXI

2 irons $\frac{1}{8}" \times \frac{3}{4}" \times 10\frac{1}{2}"

4 " $\frac{1}{8}" \times \frac{3}{4}" \times 8\frac{1}{2}"

Front

15"

7"

17 1/2"

17"

10 1/2"

2"

15"

6 1/4"

1 1/2"

32"
Couch. A couch for the pre-school child's play room may be made from two boxes about three feet long, two feet wide and eighteen inches deep. Remove the sides from each box and nail the covers on securely, then place the two boxes end to end and fasten them together with strips of wood. An incline about eighteen inches in length may be fastened to one end if desired. The inside of the boxes may be used for storing some of the child's toys, shoes or other materials.

For the covering of the couch, secure several yards of cretonne, the amount depending upon the size of the couch. Cotton batting, straw or worn bedding may be used to pad the top. A box of upholstering tacks and several brass headed tacks will also be needed. Using the padding and cretonne, make a mattress to fit the top of the couch. With a heavy cord and darning needle tie this mattress at intervals to prevent lumping. Make a valance of the cretonne large enough to cover the sides of the couch. The cretonne may be gathered to form a heading at the top. Tack it securely around the box. See Plate XXXII, figure 1.

Settee. Two orange crates one placed on top of the other and with the middle section removed from the top one makes a satisfactory settee. The seat may be covered with a mattress similar to any of the kinds described
in connection with the child's couch. The remainder of
the wood above should be covered with material to match.
The weak parts in the crate need to be reinforced. See
Plate XXXII, figure 2.

Chair. The lines of the chair illustrated in Plate
XXXII, figure 3 are so simple that an older boy who is
interested in carpentry will enjoy making one for a younger
sister or brother. This chair may be made of pine or
other soft wood. When it is finished it should be rubbed
down with sandpaper until smooth. A light coat of stain
may then be applied. Wax and rub well. Paint or enamel
may be used if preferred.

Orange-crate chair. An orange crate may be made
into a chair for the pre-school child by using the bottom
of the crate for the back of the chair and the middle
section for the seat and one end section for the front
support. The chair must be strengthened along the back
and front supports with strips of wood. See Plate
XXXII, figure 4.

Cupboard. An orange crate makes a good cupboard. It
may be covered with wall paper, oil cloth or cretonne. A
curtain in front adds to its attractiveness. See Plate
XXXII, figure 5.

Table. A table may be made for the young child by
shortening the legs of an old table.
Another satisfactory type may be made from a strong wood box. Select one which is the desired height for the child. Take the box apart and cut from each of the two end pieces, a triangular wedge shape. If the ends of the box are made from light material, a heavy piece of wood may be substituted for these end pieces which form the legs. Nail these pieces to the top and brace them well by fastening strips on each side from one leg to another. See Plate XXXII, figure 6.

A stool may be made in the same way from a smaller box.

A durable shallow box may also be made into a table by inverting the box and nailing two by two strips in each corner to form legs. These legs should be carefully measured to make them the desired height for the child. The legs will also need bracing. This may be done by nailing four pieces of the two by two lumber between the legs.

The above table may be painted, or if it is too rough to paint, it may be covered with oil cloth. The legs should be smooth to prevent snags in the child's hose as he works at the table.
Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6
Black board and eraser. A piece of dark colored plain linoleum thumb tacked to a board makes a satisfactory black board for the young child. A block of wood, covered on one side with wool cloth or sheep skin may function as an eraser.

Dress-up play. A box of clothes to which the child may have free access is helpful for dramatic play.

Dough. Dough with which the five or six year old may make real biscuits has a lasting appeal. With supervision the five year old may be given a chance to start with the raw materials and make muffins or drop biscuits.

Apparatus for jumping. An old bed springs covered with canvass makes a good jumping place for pre-school children.

Soap carving. Soap to carve serves as good material for the child in the upper pre-school years.

A bar of soap, wooden mallet and nails may be used to give the small child his first experience in pounding. Later a hammer and real tools may be added to his play equipment.

Apparatus for climbing. A large rope in which knots are tied about eight to ten inches apart, and suspended from a steady support, gives fine opportunity for climbing.
CHAPTER V
THE RESULTS
RELIABILITY OF THE OBSERVER

To determine the degree of reliability of the observer, a ninety minute rating was carried on simultaneously by an experienced rater and the writer. When the data from these two observations were compared and the differences noted, it was found that there was a correlation of $0.945 \pm 0.014$.

CONSISTENCY IN THE CHILD'S PLAY BEHAVIOR

All separate fifteen minute observations were numbered in the order in which they were made. Varying numbers of observations were taken for the several cases. The number of minutes each toy was played with was recorded for the total number of observations. Each case was considered separately. The odds were correlated with the evens using the rank-difference method of correlation; any play material which was not used more than five minutes was discounted.

Table IV shows the correlations of observations for each case together with the probable error.
TABLE IV  
Correlations of Observations for Each Case
Odds Versus Evens

<table>
<thead>
<tr>
<th>Cases</th>
<th>I.Q.</th>
<th>No. of Obs.</th>
<th>Correlations</th>
<th>P. Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>---</td>
<td>10</td>
<td>No</td>
<td>---</td>
</tr>
<tr>
<td>B</td>
<td>133</td>
<td>36</td>
<td>.736</td>
<td>.085</td>
</tr>
<tr>
<td>C</td>
<td>119</td>
<td>16</td>
<td>.558</td>
<td>.168</td>
</tr>
<tr>
<td>D</td>
<td>119</td>
<td>32</td>
<td>.697</td>
<td>.116</td>
</tr>
<tr>
<td>E</td>
<td>135</td>
<td>40</td>
<td>.898</td>
<td>.029</td>
</tr>
<tr>
<td>F</td>
<td>142</td>
<td>22</td>
<td>.628</td>
<td>.136</td>
</tr>
<tr>
<td>G</td>
<td>122</td>
<td>18</td>
<td>.335</td>
<td>.182</td>
</tr>
<tr>
<td>H</td>
<td>100</td>
<td>44</td>
<td>.406</td>
<td>.152</td>
</tr>
<tr>
<td>I</td>
<td>98</td>
<td>30</td>
<td>.467</td>
<td>.134</td>
</tr>
</tbody>
</table>

These nine cases tend to show that possibly some children's play behavior is not consistent from day to day regardless of the number of observations. This agrees with Conrad's (14) findings, namely, that the reliability and validity of behavior varies importantly from child to child.
THE ATTENTION SPAN

Table V shows the average attention span for each case. These are classified under two- and three-year age levels. Since there was only one case on the four year level, case I, it was dropped from the study.

TABLE V

The Average Attention Span in Minutes for Each Case and Age Level

<table>
<thead>
<tr>
<th>Case</th>
<th>C.A. in months</th>
<th>I.Q.</th>
<th>Ave. Individual Attention Span in Minutes</th>
<th>Ave. for the Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>25</td>
<td>---</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>B</td>
<td>27</td>
<td>133</td>
<td>2.4</td>
<td>3.4</td>
</tr>
<tr>
<td>C</td>
<td>29</td>
<td>119</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>32</td>
<td>119</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>33</td>
<td>135</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>34</td>
<td>142</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>35</td>
<td>122</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>35</td>
<td>100</td>
<td>3.6</td>
<td></td>
</tr>
</tbody>
</table>

The total number of minutes that each toy was used
for all the observations was averaged for the two age levels to determine the average number of minutes that each plaything held the attention of the two- and three-year olds in this study. Table VI shows the rank order of the toys in attention span for these two age levels.

TABLE VI

Rank Order of Popularity of Materials as Based on Attention Span (in Minutes) for the Two- and Three-Year Olds

<table>
<thead>
<tr>
<th>Material</th>
<th>Two-year olds Attention Span</th>
<th>Three-year olds Attention Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beads</td>
<td>5.8</td>
<td>Blankets</td>
</tr>
<tr>
<td>Dishes</td>
<td>4.5</td>
<td>Pegs</td>
</tr>
<tr>
<td>Pegs</td>
<td>4.1</td>
<td>Beads</td>
</tr>
<tr>
<td>Cans</td>
<td>3.9</td>
<td>Dishes</td>
</tr>
<tr>
<td>Small cars</td>
<td>3.3</td>
<td>Blocks</td>
</tr>
<tr>
<td>Waste basket</td>
<td>3.0</td>
<td>Home-made train</td>
</tr>
<tr>
<td>Doll (home-made)</td>
<td>3.0</td>
<td>Small cars</td>
</tr>
<tr>
<td>Paper</td>
<td>2.8</td>
<td>Wagon</td>
</tr>
<tr>
<td>Animals</td>
<td>2.5</td>
<td>Doll buggy</td>
</tr>
<tr>
<td>Cigar box</td>
<td>2.4</td>
<td>Doll</td>
</tr>
<tr>
<td>Blocks</td>
<td>2.2</td>
<td>Puzzles</td>
</tr>
<tr>
<td>Chair</td>
<td>2.0</td>
<td>Cans</td>
</tr>
<tr>
<td>Book</td>
<td>1.8</td>
<td>Book</td>
</tr>
<tr>
<td>Puzzles</td>
<td>1.8</td>
<td>Doll bed</td>
</tr>
<tr>
<td>Buggy</td>
<td>1.3</td>
<td>Paper</td>
</tr>
<tr>
<td>Wagon</td>
<td>1.0</td>
<td>Chair</td>
</tr>
<tr>
<td>Bean bag</td>
<td>.7</td>
<td>Big box</td>
</tr>
<tr>
<td>Broom horse</td>
<td>.1</td>
<td>Animals</td>
</tr>
<tr>
<td>Wheel (pull toy)</td>
<td>.4</td>
<td>Wheel (pull toy)</td>
</tr>
</tbody>
</table>
It seemed advisable since there were such a few cases in this study to show how play behavior varies from child to child. Table VII shows the percentage of time which was spent with each material by each case.

**TABLE VII**

Percentage of Total Time Spent on the Materials Observed in This Study

<table>
<thead>
<tr>
<th>Materials</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cards</td>
<td>13.7</td>
<td>---</td>
<td>.9</td>
<td>.6</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Small cars</td>
<td>16.6</td>
<td>2.0</td>
<td>.4</td>
<td>10.8</td>
<td>8.1</td>
<td>5.1</td>
<td>.4</td>
<td>4.1</td>
</tr>
<tr>
<td>Blocks</td>
<td>6.7</td>
<td>1.7</td>
<td>3.5</td>
<td>6.6</td>
<td>15.3</td>
<td>2.4</td>
<td>15.1</td>
<td>14.5</td>
</tr>
<tr>
<td>Cigar box</td>
<td>6.7</td>
<td>3.5</td>
<td>2.6</td>
<td>.6</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Chair</td>
<td>6.7</td>
<td>4.2</td>
<td>.9</td>
<td>---</td>
<td>3.1</td>
<td>---</td>
<td>---</td>
<td>.4</td>
</tr>
<tr>
<td>Pegs</td>
<td>5.6</td>
<td>4.0</td>
<td>12.4</td>
<td>39.6</td>
<td>19.1</td>
<td>10.8</td>
<td>7.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Animals</td>
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<td>2.4</td>
<td>.9</td>
<td>2.7</td>
<td>4.8</td>
<td>24.6</td>
<td>.2</td>
<td>3.7</td>
</tr>
<tr>
<td>Cans</td>
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<td>10.6</td>
<td>.9</td>
<td>1.2</td>
<td>---</td>
<td>---</td>
<td>10.8</td>
<td>.7</td>
</tr>
<tr>
<td>Paper</td>
<td>1.0</td>
<td>7.2</td>
<td>3.1</td>
<td>4.5</td>
<td>4.0</td>
<td>8.2</td>
<td>10.6</td>
<td>7.7</td>
</tr>
<tr>
<td>Puzzle</td>
<td>2.7</td>
<td>.5</td>
<td>3.1</td>
<td>.2</td>
<td>2.8</td>
<td>1.5</td>
<td>.7</td>
<td>3.3</td>
</tr>
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<td>Ball</td>
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<td>---</td>
<td>---</td>
<td>.6</td>
<td>.6</td>
<td>---</td>
<td>1.3</td>
</tr>
<tr>
<td>Bean bag</td>
<td>.7</td>
<td>.7</td>
<td>.9</td>
<td>---</td>
<td>.3</td>
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<td>---</td>
<td>.9</td>
</tr>
<tr>
<td>Spools</td>
<td>.7</td>
<td>.1</td>
<td>.8</td>
<td>.3</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Book</td>
<td>.7</td>
<td>2.0</td>
<td>.4</td>
<td>---</td>
<td>2.7</td>
<td>.3</td>
<td>---</td>
<td>4.8</td>
</tr>
<tr>
<td>Wheel (pull toy)</td>
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<td>.1</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>.1</td>
</tr>
<tr>
<td>Buggy</td>
<td>4.7</td>
<td>3.1</td>
<td>2.6</td>
<td>2.3</td>
<td>9.8</td>
<td>---</td>
<td>14.7</td>
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</tr>
<tr>
<td>Bed</td>
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<td>---</td>
<td>---</td>
<td>---</td>
<td>1.3</td>
<td>1.8</td>
<td>3.4</td>
<td>.5</td>
</tr>
<tr>
<td>Blankets</td>
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<td>---</td>
<td>.4</td>
<td>---</td>
<td>2.0</td>
<td>1.8</td>
<td>21.6</td>
<td>3.0</td>
</tr>
<tr>
<td>Wagon</td>
<td>2.0</td>
<td>.1</td>
<td>---</td>
<td>.6</td>
<td>1.8</td>
<td>---</td>
<td>.2</td>
<td>2.1</td>
</tr>
<tr>
<td>Waste basket</td>
<td>---</td>
<td>3.3</td>
<td>---</td>
<td>.4</td>
<td>.9</td>
<td>---</td>
<td>1.8</td>
<td>---</td>
</tr>
<tr>
<td>Dishes</td>
<td>---</td>
<td>11.7</td>
<td>13.3</td>
<td>7.6</td>
<td>10.3</td>
<td>3.9</td>
<td>17.2</td>
<td>3.8</td>
</tr>
<tr>
<td>Beads</td>
<td>---</td>
<td>---</td>
<td>17.3</td>
<td>7.1</td>
<td>1.0</td>
<td>4.8</td>
<td>7.2</td>
<td>1.5</td>
</tr>
<tr>
<td>H. Train</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>11.4</td>
<td>1.5</td>
<td>8.2</td>
<td>---</td>
<td>.3</td>
</tr>
<tr>
<td>B. Train</td>
<td>---</td>
<td>---</td>
<td>.9</td>
<td>2.5</td>
<td>.1</td>
<td>1.5</td>
<td>.7</td>
<td>.7</td>
</tr>
<tr>
<td>Doll (Made)</td>
<td>3.3</td>
<td>2.2</td>
<td>.4</td>
<td>---</td>
<td>.5</td>
<td>.9</td>
<td>---</td>
<td>.3</td>
</tr>
<tr>
<td>Doll (Bought)</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>4.5</td>
<td>3.8</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Hoops</td>
<td>---</td>
<td>.1</td>
<td>.9</td>
<td>---</td>
<td>1.5</td>
<td>1.5</td>
<td>---</td>
<td>6.9</td>
</tr>
</tbody>
</table>
A few of the total percentages in Table VII may exceed one hundred per cent due to the fact that several of the toys were used together at the same time.

Table VIII shows the average time spent with some of the most popular materials for the two- and three-year age levels. The materials are ranked in order of popularity as based on this criterion.

TABLE VIII

Percentage of Time Spent With Some of the Most Popular Materials Observed

<table>
<thead>
<tr>
<th>Materials</th>
<th>Two-year olds</th>
<th>Materials</th>
<th>Three-year olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dishes</td>
<td>12.7</td>
<td>Pegs (painted)</td>
<td>18.8</td>
</tr>
<tr>
<td>Cans</td>
<td>6.9</td>
<td>Blocks</td>
<td>12.3</td>
</tr>
<tr>
<td>Pegs (painted)</td>
<td>6.3</td>
<td>Dishes</td>
<td>7.9</td>
</tr>
<tr>
<td>Paper and crayon</td>
<td>4.7</td>
<td>Paper and crayon</td>
<td>6.4</td>
</tr>
<tr>
<td>Small cars</td>
<td>4.4</td>
<td>Animals and barn</td>
<td>5.7</td>
</tr>
<tr>
<td>Beads</td>
<td>4.2</td>
<td>Small cars</td>
<td>6.2</td>
</tr>
<tr>
<td>Cigar Box</td>
<td>3.8</td>
<td>Doll buggy</td>
<td>4.9</td>
</tr>
<tr>
<td>Chair</td>
<td>3.3</td>
<td>Blankets</td>
<td>4.5</td>
</tr>
<tr>
<td>Doll buggy</td>
<td>3.3</td>
<td>Home-made train</td>
<td>3.9</td>
</tr>
<tr>
<td>Ball</td>
<td>3.2</td>
<td>Beads</td>
<td>3.7</td>
</tr>
<tr>
<td>Cards</td>
<td>3.2</td>
<td>Cans</td>
<td>2.5</td>
</tr>
<tr>
<td>Blocks</td>
<td>2.9</td>
<td>Big box</td>
<td>2.4</td>
</tr>
<tr>
<td>Animals and barn</td>
<td>2.2</td>
<td>Hoops</td>
<td>2.3</td>
</tr>
<tr>
<td>Doll (Schoenhunt)</td>
<td>1.9</td>
<td>Puzzles</td>
<td>2.0</td>
</tr>
<tr>
<td>Waste basket</td>
<td>1.9</td>
<td>Book</td>
<td>1.2</td>
</tr>
<tr>
<td>Book</td>
<td>1.5</td>
<td>Broom horse</td>
<td>1.2</td>
</tr>
<tr>
<td>Puzzles</td>
<td>1.5</td>
<td>Doll bed</td>
<td>1.2</td>
</tr>
<tr>
<td>Blankets</td>
<td>.9</td>
<td>Cigar box wagon</td>
<td>1.2</td>
</tr>
<tr>
<td>Bean bag</td>
<td>.8</td>
<td>Train (aluminum)</td>
<td>1.0</td>
</tr>
<tr>
<td>Doll bed</td>
<td>.5</td>
<td>Ball</td>
<td>.6</td>
</tr>
<tr>
<td>Pull toy (wheel)</td>
<td>.2</td>
<td>Pull toy (wheel)</td>
<td>.3</td>
</tr>
</tbody>
</table>
FREQUENCY OF CHOICE

The number of times a material is chosen throughout the observation periods seems to be an index as to the appeal of that toy for the child. The rank order of popularity of toys for the two- and three-year olds based on the frequency of choice is shown in Table IX.

Table IX
Rank Order of Popularity of Play Materials Based on Frequency of Choice

<table>
<thead>
<tr>
<th>Two-Year Olds</th>
<th>Three-year Olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chair</td>
<td>Pegs</td>
</tr>
<tr>
<td>Cans</td>
<td>Blocks</td>
</tr>
<tr>
<td>*Paper</td>
<td>Paper</td>
</tr>
<tr>
<td>*Buggy</td>
<td>Dishes</td>
</tr>
<tr>
<td>*Cigar box</td>
<td>Small cars</td>
</tr>
<tr>
<td>Pegs</td>
<td>H.*made train</td>
</tr>
<tr>
<td>Blocks</td>
<td>Buggy</td>
</tr>
<tr>
<td>Small cars</td>
<td>Blanket</td>
</tr>
<tr>
<td>Beads</td>
<td>Beads</td>
</tr>
<tr>
<td>Animals and barn</td>
<td>Big box</td>
</tr>
<tr>
<td>Cards</td>
<td>An. and barn</td>
</tr>
<tr>
<td>Book</td>
<td>Doll</td>
</tr>
</tbody>
</table>

* indicates materials that have the same rank value.
DIVERSITY OF INTEREST

Diversity of interest is taken to mean the average number of different materials the children chose during the fifteen minute observation periods. Table X shows the diversity of interest by case and by age levels.

TABLE X

Diversity of Interest

<table>
<thead>
<tr>
<th>Cases</th>
<th>Diversity of Interest (Materials)</th>
<th>Age Levels</th>
<th>Diversity of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>3.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>4.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>3.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>4.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>3.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>5.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>3.60</td>
<td>2</td>
<td>4.65</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3</td>
<td>3.91</td>
</tr>
</tbody>
</table>
PERCENTAGE OF TIME SPENT WITHOUT THE USE OF MATERIALS

Table XI shows the percentage of time spent without the use of toys when classified by case and by age level. This includes the time the child spent watching, fun-making, or in any type of activity which did not involve the use of play materials or toys.

TABLE XI
Percentage of Time Spent Without Toys

<table>
<thead>
<tr>
<th>Cases</th>
<th>Individual Percentages</th>
<th>Age Levels Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20.6</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>12.3</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>16.6</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>18.3</td>
<td></td>
</tr>
</tbody>
</table>

2-year 22.3
3-year 12.5

All the children observed in this study spent over two-thirds of their time with toys or play materials. The two-year olds spent 77.7% of their time with toys; the
three-year olds spent 87.48% of their time with toys or play materials.

**SEX DIFFERENCES**

Table XII shows the sex difference in preference for some of the most popular materials. This was obtained by adding the total number of minutes each toy was used by each sex and dividing this sum by the total number of observations.

**TABLE XII**

Sex Differences in Percentages of Time Spent With a Few of the Most Popular Materials

<table>
<thead>
<tr>
<th>Materials</th>
<th>Percentage of Time</th>
<th>Percentage of Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>Pegs</td>
<td>16.75</td>
<td>9.51</td>
</tr>
<tr>
<td>Blocks</td>
<td>9.92</td>
<td>6.56</td>
</tr>
<tr>
<td>Dishes</td>
<td>7.69</td>
<td>10.41</td>
</tr>
<tr>
<td>Small cars</td>
<td>6.74</td>
<td>2.02</td>
</tr>
<tr>
<td>Paper and crayon</td>
<td>5.59</td>
<td>6.45</td>
</tr>
<tr>
<td>Doll buggy</td>
<td>4.44</td>
<td>5.21</td>
</tr>
<tr>
<td>Beads</td>
<td>2.36</td>
<td>8.47</td>
</tr>
<tr>
<td>Home-made train</td>
<td>2.67</td>
<td>3.04</td>
</tr>
<tr>
<td>Blanket</td>
<td>1.93</td>
<td>7.57</td>
</tr>
<tr>
<td>Aluminum train</td>
<td>.63</td>
<td>.93</td>
</tr>
<tr>
<td>Doll</td>
<td>.90</td>
<td>3.28</td>
</tr>
</tbody>
</table>

**DIFFERENCE IN INTELLIGENCE QUOTIENTS**

This study although based on but a few cases (the I.Q. range being 100 to 145) shows that children with a higher
I.Q. tend to be leaders in play, and tend to find more uses for their play materials than those of lower I.Q.

More creative tendencies in play and more dramatic play seems characteristic of the play behavior of the higher I.Q. group.

PLAY MATERIALS AS A STIMULUS TO CONVERSATION

The data gathered in this study tend to show that the way children use certain toys tends to stimulate language rather than merely the presence of the toys themselves.

For example, when the pegs were used just to put into and out of the holes in the board with no definite building in mind, the child seldom talked; but in building garages for his cars or a coop for the chickens, he talked.

Active play and dramatic play seemed most stimulating to the use of language. The children in this study talked most when they were dramatizing with dishes, doll-corner, blocks and the big box, used as a boat. The children talked the least when transferring articles from one container to another, when stringing beads and other similar types of play.

Although the puzzles and books were not used to a great extent by any of the children in this study, nevertheless when they were used (by the three-year olds) they stimulated conversation. The children talked about the objects in the pictures.
DIFPRENCI IN THE USE OF MATERIALS

Cards appealed mainly to the two-year olds in this study and to the youngest child especially. He used them to transfer from box to box, to put in separate piles on the table and to hold and carry.

Adhesive-tape can was the most popular of the cans available in this study. It was used as a fit-together toy as well as a roll toy to clamber after. It was also used to rub on the window, perhaps for the auditory stimulation.

Cigar box of shells and spools appealed only to the two-year olds. Emptying the things out of the boxes and putting them back in and opening and closing the boxes were the chief usages.

Blocks show marked differences in usage between the two-and three-year olds. Putting the blocks on the table and pushing them on the floor, pounding with them, and building simple towers, two to seven blocks high comprise the chief ways which the blocks were used by the two-year olds. Loading and unloading the blocks as "firewood" and building simple flat and upright structures; putting several blocks together and pushing them as a train; and making a sidewalk appealed to the three-year olds. These children, using the blocks, loaded and unloaded them in the buggy, frequently, until the big box was empty. Only
occasionally did the three-year olds use the blocks, which they hauled for some constructive activity. When used as such, they built garages for the small cars. Blocks were also used as tickets in boat play, and as stock in grocery store play.

**Pegs** were imaginary gum or food to the two-year olds as well as things to transfer from one can to another. Only once during these observations did a two-year old put the pegs in the peg board. Occasionally the pegs were used to make a chicken coup and loose pegs were thrown inside for the chickens. The three-year olds enjoyed just filling the holes in the peg board with the pegs, frequently arranging them in pattern fashion as roadways for the small cars, or as enclosures for small cars. It was interesting to note that all of the children who were observed in this study showed an outstanding preference for the small painted pegs, rather than for the large unpainted ones. Pegs were often used as imaginary food, particularly when the three-year olds played with dishes. Putting pegs into coffee cans on the waste basket and rolling them on the floor or shaking them as rattles were types of play occasionally in evidence by the three-year olds.

**Ball.** The ball was rolled and thrown by the two-year olds; rolled, thrown and batted by the three-year olds.

**Chairs.** The two-year olds used the chair to push on
the floor and climb upon more frequently than for seats. The three-year olds used them for building jails, dog-kennels, beds and sides for boats as they engaged in dramatic play.

Paper was used chiefly for scribbling by the two-year olds. Occasionally it was spread down on the floor as a rug and later rolled, as the small rugs are used in the nursery school rest period.

The three-year olds used the paper for wrapping blocks in store play; to punch holes for crayons to drop through these holes and for scribbling. No definite type of drawing was in evidence by the two-year olds; some of the three-year olds, supposedly drew clocks, or frogs and named the drawings that they made. A few on the three-year olds seemed to enjoy tearing the paper and putting the pieces in the waste basket, and tapping on the paper with the crayons.

Home-made train. This was used as blocks by the two-year olds most of the time. Occasionally the engine would be used as something to ride, by the children of this age level. The three-year olds enjoyed hooking and unhooking the blocks, loading the train with freight (dishes or can covers) and pushing it along the floor. They also used it as a walking plank. This toy stimulated social play. When one child started to load the train, the others observed
and at the same time wanted to help. It was especially interesting to note how orderly one three-year-old loaded the freight on the train and just as carefully unloaded it after the freight had been transported to the place where he wanted it.

Wheel (made from a spool upon which electric cord is wound). This was not especially popular with any of the children. When it was used, it was merely pulled along the floor. Toys that offered pulling as their only possibility were not popular with either the two- or three-year-olds.

Animals. The bought animals (Schoenhunt) were seldom used by the children. No barn was provided for these animals. Plain animals which were cut out of three-fourths inch lumber and for which a barn was provided proved to be a popular toy. Stalls were constructed in this barn. See Plate XXIV, Figure 2.

The two-year-olds enjoyed pushing the animals in and out of the barn. Occasionally children of this age built towers of the animals. The three-year-olds took the animals out to pasture, fed them and then returned them to the barn. Some of the children pretended that the animals talked. They often said words for the animals, such as, "I want to go back in the barn. All right. All right."

Dishes were especially popular for imaginary pouring
and drinking but serving others seemed to appeal more to these children than pretending to drink from the cups themselves. Here manipulation of dishes was also found to be popular for the two-year olds. Although at three years of age the above mentioned uses were also found to be present, even more interest was shown in table setting.

Small cars were used as push toys, chiefly by the two-year olds. The three-year olds used them along imaginary roadways constructed of blocks, in garages made of pegs, and as a means of carrying truck loads of freight (beads and pegs).

Beads were strung by the two and three-year olds without matching color or size. Both groups also used the beads as food, as articles to transfer from box to box. One two-year old sorted out the beads that were too small to be strung on a shoe lace and placed them in a separate box. Beads appealed more to the younger children in this study.

Packing box (26 X 16 X 15½ inches). This was used by the two-year olds just as something to climb into and out of; the three-year olds used it chiefly as a boat. They often loaded a number of things into the box to take on imaginary trips with them. They then climb in themselves and collect tickets (blocks). One three-year old turned off the motor when starting and stopping the boat.
Doll buggy. Both the two- and three-year olds used this toy more to load blocks, dishes, cans and animals into it than it was used in connection with doll play. Occasionally dolls would be piled in the carriage on top of the entire load. The three-year olds also used the buggy as a delivery truck in grocery store play; and as a car with the cigar-box wagon fastened behind it as a trailer. Very seldom was the buggy used merely for the sake of wheeling it alone.

Doll bed. This toy appealed to the two-year olds more as a bed for themselves than it did as a bed for the dolls. The three-year olds also got into the bed occasionally but they showed more interest in tucking the blankets around the dolls in the bed.

Dolls were used by the two-year olds for manipulation, that is holding and carrying chiefly. They were not often selected by the children in this study. The three-year olds were more interested in pulling the clothes off the doll if any were on, and wrapping it in a blanket and tucking it in bed. Not on any occasion did the children in this study attempt to dress the doll, but if the clothes were on the doll when they started to play with it they pulled them off, and proceeded to wrap the doll in a blanket. Dramatic play with dolls seemed most in evidence by the three-year olds. They would at times put their fingers to
their lips when they had the doll tucked into bed indicating they wished the other child in the room to be quiet. They often took the doll to town to get her some rompers, or spanked it and kissed it.

Blankets which consisted of squares of cotton crepe material were very popular with the three-year old girls. Shaking out the squares of cloth and folding them, wrapping blocks and dolls in them; using them as covers for the bed are all uses which the children found for these blankets. The two-year olds used them chiefly to manipulate, that is to take them off the bed and put them back on again, and occasionally as covers for themselves when they got into the bed.

Hoops were used by the two-year olds as necklaces and also as bracelets for their arms and legs, and occasionally to put over cans. The three-year olds were chiefly interested in making them spin, although they also used them as "neck ties" (using the children's terminology).

Puzzles appealed to the two-year old children as something to manipulate and transfer from box to box. The three-year olds however, were interested in putting the puzzle together.

Books (which were chiefly picture books) appealed to the two-year olds as well as to the three-year olds
in this study. The two-year old children turned the pages and looked at the pictures while the three-year olds talked about the pictures as they turned the sheets.

**Cigar-box wagon.** This toy was used merely as a pull toy by the two-year olds. The three-year olds used it as a wagon and loaded blocks, beads and pegs into it. They also used it as a trailer fastened to the buggy.

**PLAYTHINGS USED TOGETHER**

The following playthings were frequently used together: yard squares of crepe, dolls and doll bed; buggy and blocks; small cars, blocks and pegs; yard squares of crepe material, pegs, beads, table and dishes; crayons, blocks and paper (blocks were wrapped); pegs, dishes and home-made train; home-made train, dishes and can covers; animals and barn; small cars, peg and peg board.
CHAPTER VI

INTERPRETATION OF DATA

LIMITATIONS OF THIS STUDY

The author wishes, first of all, to point out some of the limitations of this study.

As stated in the problem, it is not the purpose of this study to make definite statements concerning all types of home-made play material, but rather to devise a method for evaluating play materials.

The number of cases used in this study is far too few for the author to draw conclusions. The results therefore merely suggest possible trends.

The author has not attempted to exhaust the possibilities for home-made toys, but rather to suggest a few typical varieties which can be constructed at home with little cost.

FACTORS WHICH MAY HAVE INFLUENCED PLAY BEHAVIOR

IN THIS STUDY

Some of the factors which may or may not have influenced the play behavior of the children in this study include:

1. The play behavior of the children with whom the child was playing. The observations made in this study
tend to show that children are stimulated by each other. Sometimes an interest in some plaything is developed solely because one of the children in the group displayed an interest for that particular thing. Occasionally some one child will lead and direct another in his play.

2. The position of the materials during the test may have had some influence on the results of this study although the author attempted to place all the materials where they were easily seen and obtained by the children. During the preliminary observations the writer was surprised to find blocks rather unpopular. Accordingly, the box of blocks was filled so full that the blocks could readily be seen from any position in the room. In this case that factor appeared to influence the popularity of the blocks.

3. The size of the experimental room may have been an influencing factor. The room which was used in this test situation was nine feet square. In similar tests the writer recommends a larger room, at least nine by sixteen feet. On several occasions, Case F said she wanted to leave the experimental room because she was tired. As soon as she left, she busied herself running from one end of the long room adjoining the experimental room to another end. The writer feels that the broom-
stick horse, for example, might have held the children's interest longer if the room had been larger, or if the child had been outdoors with it. On several occasions when a child was riding this horse, it appeared that he was just getting it started nicely when it was necessary for him to turn around.

4. The length of the observation period may have been an influencing factor on the attention span, although the writer is inclined to believe from the results of these observations that fifteen minutes gives a good picture of the pre-school child's play behavior. Only attention spans which were terminated as a result of the child's initiative, were recorded.

5. The fact, that in correlating odd and even observation scores, the writer found correlations high enough to be significant in most of the cases tends to show that perhaps considerable time in research can be saved by shortening the observation period. The consistency of Case E's play behavior where odds and even scores were correlated shows a correlation of .898 1.029. Case H showed no significant correlation on 44 observations. This may tend to show that a few children's play behavior is not consistent from day to day regardless of the length of observation period.

6. The time of day at which the observations were
made may have been an influencing factor, although in so far as possible the writer took the observations shortly after 9 A.M. or at the beginning of the nursery school day. Occasionally the writer found it was necessary to observe at later hours.

**METHOD OF RECORDING THE DATA**

The writer thinks that the time chart devised by Van Alstyne (87), slightly modified (see page 41, Figure 1) is satisfactory for recording data in this type of study. It is possible to observe two or three cases at a time and simultaneously record the time, attention span and conversational value of the toys.

From these records the following data may be obtained: the attention span of each play material; the average attention span for the different age levels; the percentage of time spent with each material; the conversational value of the toys; sex differences in play behavior; the diversity of interests at the different age levels; the extent to which the toy stimulates social contacts; and playthings that tend to be used together.

**LENGTH OF OBSERVATION PERIOD**

The writer finds that 40 observation periods of fifteen minutes gives a fairly good picture of the pre-school
child's play behavior. Since, generally speaking, the attention span of the pre-school child is short, the writer feels that much time may be saved in the evaluation of toys by the use of short observation periods.

If attention span is a factor which is to be studied, it may be well to extend the observation period beyond the fifteen minutes in any case where the child's activity is not completed at the close of the period.

Table IV shows the correlations for the varying numbers of observation periods for each case. These results would tend to show that possibly 40 observations would be sufficient to give fairly reliable results in play behavior when a large number of cases are used. More research is necessary with a large number of cases before definite statements can be made.

THE ATTENTION SPAN

Table V shows the attention span of the two-year olds to be 2.2 minutes and of the three year olds 3.4 minutes. This agrees the closest with Bott's (12) research. She found that the pre-school child's attention span averaged a minute longer than the child's age in years. She did not consider a minute a break in attention span, which may be possibly why she found a higher attention span.
The writer's results in attention span can hardly be compared with the results found by Van Alystyne (87) because she just averaged the toys which held the attention span the longest during each observation period in getting the average attention span for the age levels in her study.

This study tends to show that pre-school children want to do something different every 3 or 4 minutes. For this reason they need a variety of play materials.

The length of time that a child spends on a material should be an important criterion for determining the appeal of that material for the child.

It is interesting to note that the attention span for most of the materials observed in this study was greater for the three-year olds than for the two-year olds. The few things that rated higher in attention span for the two year olds were chiefly materials for manipulation, such as the cigar box containing playing cards and shells, the adhesive tape can, several empty powder boxes and coffee cans which were merely the fit-together types of playthings or playthings which involved transferring things from one container to another.

Beads, pegs and dishes have a high attention span for both the two-and three-year olds. The blankets which ranked the highest in attention span for the three-year olds was
used chiefly in connection with doll-corner play, grocery store play and for folding and unfolding.

The attention span for each case shows a fairly consistent rise in length between the two-and three-year olds. The average attention span for the former was 2.2 minutes and for the latter 3.4 minutes. This is a little less than that found by Bott in her study of pre-school children and considerably less than that found by Van Alystyne as mentioned previously.

A child who has a short attention span and who scatters his play interest may profit from being given types of materials that rank high in attention span, such as peg and peg board, clay, sand, easel painting and blocks. Often the child's attention span may be increased by adding another type of play materials to the toys which the child has, as, for example, adding blankets to the doll-corner.

At the Corvallis nursery school the children played with the doll bed very little, until squares of material were introduced. This added not only to the popularity of the doll corner type of play but it also gave the child further possibilities in the use of the cloth, such as shaking it out, folding it, using it for a table cloth, or for wrapping blocks, etc. One boy even used it as an apron; one girl used it as a pasture for the animals.
PERCENTAGE OF TIME OCCUPIED WITH EACH MATERIAL

As judged by this criterion in Table VIII, the most popular materials of those used in this experiment were, for the two-year olds, dishes, cans, pegs, paper and crayon and small cars; for the three-year olds, pegs, blocks, dishes, paper and animals and barn. Stuffed toys and pull toys ranked the lowest. The home-made doll was more popular for the two-year olds than the Schoenhut doll; for the three-year olds the opposite was true. The aluminum train was more popular with the two-year olds than the home-made train; the three year olds preferred the home-made train. Objects which were used for transferring from one container to another, and also bean bags appealed more to the two-year olds than to the three-year olds.

There appears to be a wide range of individual difference in the child’s choice of play materials and the amount of time spent with them. It is interesting however, to note that some of the materials were popular with all children in this study. Pegs, blocks ranked among the five most popular materials for all the children observed. Paper and small cars ranked among the five most popular materials in four of these cases.

The above materials all rank high in the number of uses the child made of them. Perhaps parents should consider the diversity of possibilities in the use of playthings.
as one criterion for determining the value of the toy.

Pull toys ranked the lowest for all but one of these children. Van Alystyne and Bott also found pull toys to rank low in their studies of pre-school children's play behavior.

All the children observed in this study preferred the small painted peg board to the large unpainted one. The writer does not know whether the size or the color was the influencing factor.

**FREQUENCY OF CHOICE**

In most of the cases some of the toys that ranked the highest in length of total time used also ranked highest in the frequency of choice. This was especially true for the three-year olds, as is shown in Table IX.

**DIVERSITY OF INTEREST**

The average diversity of interest for the two-year olds in this study (Table XIII) was 4.65 materials, for the three-year olds, 3.91 materials, a difference of .7 materials between these two age levels. The average number of materials used decreases slightly with age. This is reasonable to suppose since the attention span increases slightly with age. Van Alystyne found the average diversity of interest of the two-year olds to be 6.9 mater-
ials and of the three-year olds 6.3 materials, a difference of .6 materials between the two age levels. Since her diversity of interest was based on hour observations the writer would expect these results to be higher than diversity of interest based on 15 minute observations.

If a child does not show a diversity of interests in play materials and does not appear to be growing normally in his play development it might be well to see that he is brought in contact with another child who uses material more constructively because children imitate others in their play. Occasionally an adult may show the child other possibilities for his play thing although the writer recommends letting the child find all the available possibilities for himself if he can do so.

PERCENTAGE OF TIME SPENT WITH MATERIALS

One of the results of this study agrees with the statement made by many authors, namely that the preschool child shows great interest in play materials. See Table XIII.

Since all of the children observed in this study spent over two-thirds of their play time with play materials, tends to throw some light on the need for providing an enriching environment for the children.
two-year olds only spent 22.3% of their time without materials, and the three-year olds only spent 12.52% of their time without play materials. If from 77 to 87% of a child's time is spent with toys, parents should give consideration to provision of adequate materials.

SEX DIFFERENCES

Boys tended to play a significantly higher percentage of the time with pegs, blocks and small cars, while the girls tended to play a higher percentage of time with beads, dishes, blanket and dolls. It is evident that girls spent more time on materials which make for quiet play. See Table XIV. Both sexes spent more time with raw materials such as pegs, blocks, etc., than they did with pull toys and stuffed toys.

These results agree with Van Alystyne's research on sex differences in play behavior. She found that the girls tended to prefer the more quiet type of play. Bridges also found quiet play characteristic of the girls in her study. Bott found that pre-school children prefer raw materials.

A COMPARISON OF PLAY BEHAVIOR AND I.Q. SCORES

Although there were too few cases in this study to
justify definite conclusions, nevertheless, the children of higher I.Q. tended to find more possibilities in the use of the play materials and were more original in their play behavior than those of lower I.Q. The higher I.Q. group also tended to use more creative and dramatic tendencies in their play behavior than those of the lower I.Q. group.

PLAY MATERIALS AS A STIMULUS TO CONVERSATION

Generally speaking, the way a material was used seemed to stimulate conversation more than the actual toy itself. The children talked more when they were dramatizing with doll-corner, dishes and grocery store play than they did when playing with the pegs and pull toys. They talked more when engaged in active play, as, for example, with the broom stick horse, than they did when engaged in quiet play such as stringing beads or putting pegs in the peg board.

If children show retardation in conversational development it is possible that including a supply of play materials which stimulate dramatic play and active play may facilitate the child's progress in language development.

DIFFERENCE IN THE USE OF MATERIALS

An analysis of the uses of the materials observed
in this study tend to show that the possibilities of a plaything is a valuable means of determining which toys are best for the children.

Manipulating, fitting together and transferring from one container to another were the outstanding uses made of materials as evidenced by the two-year olds.

Dramatizing, constructing and using constructions wrapping, pushing and manipulating were the uses made of materials ranked in consecutive order for the three-year olds.

It would seem that trips which familiarize the child with new processes and activities are valuable as a stimuli to progressive and constructive play. Blocks, blankets, paper and crayon, pegs and dishes and home-made train ranked high in diversity of uses in this study.

MATERIALS USED TOGETHER

This study indicated that many materials lend themselves to usage with other materials. This may be a means of determining the value of a certain plaything, or adding to the value of a toy already on hand. This study showed that wooden animals had little appeal to children as play materials unless a barn or other supplementary material was also provided. Case D played for a longer time with animals in combination with other types of material.
than with other toys in the play room.

Other toys that were frequently used together were: yard squares of crepe (blankets), dolls and doll bed; buggy and blocks; pegs and small cars; yard squares of crepe material, pegs, beads, table and dishes.
CHAPTER VII
SUMMARY AND CONCLUSIONS

This study was undertaken for the purpose of devising a method for evaluating play materials and assembling suggestions for home-made toys.

For the experimental part of the study nine children from the Oregon State college nursery school served as subjects. The age range of these children was from twenty five to forty five months, and the I. Q. range was from 98 to 142.

All data were gathered from a test situation. Twenty home-made toys were constructed for use in this study. A few commercially made toys were also included in the experiment and comparisons were made between home-made and commercially made toys.

In evaluating these toys, the writer assumed that a toy is valuable in proportion to (1) the amount of time that the child plays with it; (2) the degree to which it stimulates conversation; (3) the extent to which the toy holds the child's attention; (4) the number of uses the child finds for the toy; (5) the extent to which the toy may be used in combination with other toys; and (6) the possibilities of the toy for social play.
The writer assisted in the routine of the nursery school for several months before the actual testing took place. She also introduced all the toys, which were rated in the study, into the children's environment from three weeks to two months before final records were made, thus eliminating new situations which would be likely to influence the results.

A modification of Van Alstyne's method for recording data was used (87). As stated in Chapter III, pages 40-42, the observer used a sheet of paper which was marked off into spaces as indicated in Figure 1, page 41. Space was also available for recording each child's observation separately as the figure indicates.

The observer timed all observations with a stop watch. She observed the children simultaneously, recording on the record blank the minute at which each child started to play with the material, and the abbreviation corresponding to the name for each toy. If, at the end of the minute a child was still playing with the first chosen material, a line was drawn under the name of the toy, and if not, just the name of the toy was left on the paper and the name of the newly chosen material was recorded. If the child played with the toy longer than one minute, the line was extended from the name of the toy through the spaces which represent the number of minutes
corresponding to the amount of time the toy was used
by the child.

In this way the attention span and the child's
choice of play materials were recorded within the limits
of accuracy of one minute. In the space to the right
on the record sheet, the observer listed the uses each
child made of the toys.

If, during the test, the child was playing with a
particular toy at the close of the 15 minute observation
period, the observer extended the observation time, thus
making it possible to get the attention span of that toy.
On this blank it was possible to record the following
data in compact form: the ways in which the child uses
the different materials, the types of playthings the
child uses together, the extent to which the plaything
stimulates conversation and the toys which stimulate soc-
ial contacts.

The reliability of this technique, as determined by
a ninety-minute rating which was carried on simultaneou-
ly by the writer and another experiences rater, shows an
agreement of 93% in all items.

After experimenting with observation periods which
ranged in length from ten to forty five minutes, the au-
thor concluded that a fifteen minute period is satisfac-
tory for single observations. The number of fifteen
minute periods required to give a good random sample of the child's play behavior was then considered. From ten to forty-four of these fifteen-minute observations were taken on the several subjects. The total number of minutes each toy was played with during each fifteen-minute observation was determined. The observation periods were numbered for each child in the order in which they were made. The odd and even scores, as recorded in minutes were then correlated for each child by the rank correlation method to determine the consistency in each child's play behavior. The results show that for one child sixteen fifteen-minute observations yielded an r of .558 ± .168. For another child on forty fifteen-minute observations an r of .898 ± .029 was obtained. Although for the majority of subjects, there was a relatively high positive correlation, three cases yielded a lower positive correlation. In one case on eighteen observations, the correlation was .335 ± .182; in another case on forty-four observations, a correlation of .406 ± .150. These results agree with Conrad's (14) findings, namely that behavior in children is not always consistent.

In the light of these results it would seem that for large numbers of children ten hours of observation are required to give a random sample of a child's play behavior.
This technique makes it possible to study many aspects of child's play behavior. Some of the possibilities are shown in the following results which were obtained by the use of this method.

The writer wishes, however, to call attention to a few limitations in this study. The subjects were too few to indicate anything more than mere trends. The I.Q.'s of the children represented in this study were not a good random sample of the population in general. The latter fact, however, does not limit the value of the technique involved. All trends are based on the evaluation of a very limited number of toys.

The average attention span of the two year olds as revealed by this study is 2.2 minutes, and of the three-year olds 3.4 minutes.

Toys which stimulated the longest attention span tended to vary only slightly with the two age levels. Of the materials studied for two-year olds, beads, dishes, pegs and cans rated high, while for the three-year olds blankets (squares of crepe), pegs, beads, dishes and blocks tended to rate high.

Individual differences in play behavior is marked. This is revealed by the table which indicates the percent of the child's time devoted to each toy or play material. See Table VII.
Dishes, pegs, cigar box, chair and doll buggy all rated fairly high for both the two-and three-year age levels. Some difference, however, was present in the rank order so far as actual time spent with them is concerned.

This method of evaluating toys also makes it possible to discover the frequency of choice for each toy studied. These may be classified for each age level. Although variations appear to be present in age levels, there is a tendency for those toys which rate high with the two-year olds, to also rate high with the three-year olds so far as frequency of choice is concerned.

The diversity of interests, or the number of different toys which a child chooses during a fifteen-minute observation was determined from the records, and averages were made for individuals and also for age levels. It is interesting to note that for the two-year olds an average of 4.65 different toys were chosen during each fifteen minute observation period; for the three-year olds an average of 3.91. The older child appears to choose fewer toys but he spends more time with each toy.

The method of recording data also makes it possible to determine the per cent of the child's time spent in the use of toys or materials and the per cent spent in looking about, or without the use of equipment. The two-
year old spend 22.3% of his time in this way, while the three-year old spends but 12.52% of his time observing or without the use of toys.

By classifying toy preferences according to sex, differences were discovered. Boys tended to use pegs, blocks, dishes, cars and the doll buggy most, while the girls used dishes, pegs, beads, blankets and blocks most. The above toys are listed in order of preference.

This method of evaluating toys makes it possible to study not only the quantitative play of the child but also the qualitative aspects. Although the range in I.Q. is far too limited to be satisfactory for this part of the study, the data reveal that those children whose I.Q. is very superior tend to be leaders in play and also to discover more uses for their play materials, than children with an average I.Q.

These records also tend to show that conversation or verbal responses are stimulated more by the use which the child makes of the toy than by the presence of the toy itself. Active play and dramatic play particularly called forth much conversation.

As revealed by the records, the following playthings were frequently used together: yard squares of crepe material, dolls and doll bed; buggy or wagon, small cars, blocks and pegs; animals and barn; crayon, blocks and paper (blocks were wrapped); yard squares of crepe mat-
erial, pegs, beads, table and dishes; pegs, dishes and home-made train; small cars, pegs and peg board.

The uses of the materials as listed on the time charts tend to show that the home-made train, dishes, box (26 x 16 x 15½ inches), blocks and buggy seemed to be most stimulating to social contacts.

**CONCLUSIONS**

This study based on the observations of two-and three-year old children tends to indicate:

1. Home-made toys satisfy the play interests of two- and three-year old children.

2. The following aspects of the value of a toy to the child can be measured by controlled observations:

   a. The attention span of the child for the toy.
   b. The percentage of the observation time that the child plays with the toy.
   c. The conversational value of the play materials.
   d. The number of uses the child finds for the toy.
   e. The possibilities of the toy for social play.
   f. The frequency of choice.
   g. The extent to which the toy lends itself to usage with other toys.
3. Inconsistency exists in the play behavior of children.

4. At least ten hours of observation is necessary for a random sample of a child's play behavior.
RECOMMENDATIONS FOR FURTHER RESEARCH

This study has served as a means of discovering many problems upon which further research is needed.

Based on the author's findings, experience and reading in this field, she recommends that the following topics be investigated through further research.

1. A standardization of terminology in the field of child development. This need was felt keenly by the writer in attempting to summarize the opinions of outstanding authors.

2. The extent to which the color of a toy influences the child's choice of toys.

3. The extent to which the size of toys influences the child's play behavior. This need was discovered in rating two peg boards. One was large and unpainted, the other was small and painted. The latter was used 75% more than the former.

Other observations of two trains, one large and one small shows that the large one was preferred by the three year olds and the smaller one by the two year olds.

4. The establishment of norms in play for the various age levels. Very definite differences in play behavior were found to exist in the two-and three-year old children included in this study.
5. Combinations or groups of toys which are most frequently used together by children.

6. Types of toys which stimulate conversation or language development.

7. Types of toys which stimulate social play.


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