

Children's Spontaneous Drawings :
A Normative Study

An Exploratory Study of the Drawings
of Children aged Five to Ten Years .

by

Barry P. Frost B.A.(Hons)(Syd.), P.G.C.E.(Lond)

Submitted in fulfilment of the requirements for
the degree of
Master of Arts

UNIVERSITY OF TASMANIA
HOBART

29/9/1958

CONTENTS

	<u>Page</u>
Summary	2-3
Introduction	4-13
History of the Topic	14-24
Aims of the Investigation	25-26
Subjects	27
Materials	28
Method and Procedure	29-45
Results (Tables)	46
Discussion	48-91
A Tentative Developmental Scale	91-100
Conclusions	101-108
References	
Appendix	

"The interpretation of the products of juvenile psychopaths must always start with some knowledge of the pictorial creations of a normal mind at a certain age."

Ernest Harms, 1941.

"The application of this new means for psychotherapy, that of child art diagnosis, should itself be considered as an art of diagnosis without which no medical man and no psychologist can be a perfect master in the art of understanding and helping broken and distorted human souls."

Ernest Harms, 1941.

SUMMARY

The purpose of this investigation was to study the spontaneous drawings of Tasmanian Primary School children from five to ten years of age with a view to discovering the typical usage of form, colour and content at each age level.

An analysis of spontaneous drawings made in the classroom situation by the subjects of the study who were 1090 children (573 boys, 517 girls) from five to ten years was carried out. These children were the total population (within the age range) of two large Hobart Primary Schools.

The frequencies obtained for the different formal, colour and content categories were tabulated and discussed with particular reference to the findings and conclusions of other investigators. From these results a tentative developmental scale was drawn up in terms of each age level and for boys and girls separately.

The relation of maturity and intelligence to the various categories was examined. It appeared that while developmental trends were present, the correlation of intelligence with the categories was not high enough to explain deviation from the general pattern. This increases the probability that emotional factors are important in cases which show deviation from the developmental norm in their drawings.

As no direct evidence of the operation of emotional factors was available possible further studies and methods for study were indicated.

INTRODUCTION

I - NORMS

Children's spontaneous drawings, though interesting from an aesthetic point of view, are of primary importance to the psychologist because of the light they can throw on the emotional life of the children concerned.

As will be seen in the historical section of this study, use has been made for many years, by child psychologists and psychiatrists, of the drawings of the children with whom they were dealing. Psycho-analytically oriented workers have been particularly concerned with this medium and have made several interesting and worthwhile contributions to the literature of clinical psychology. Unfortunately, however, they have tended, in the main, to interpret the drawings on the basis of a symbolism analogous to dream interpretation. This approach, while probably fruitful with regard to the particular patient in hand, provides no objective basis in terms of frequencies or norms which may be used as a measuring rod against which the drawings of other children may be evaluated.

Kelly (33, P.304) recently drew attention to "the ridiculous inferences which may result from a priori interpretations of drawings without norms." Similarly Raven (47) noted that "we have at present no satisfactory co-efficients by which we can assess the degree to which they conform to, or depart from, the drawings produced by children of their own age, and by children of other ages."

If it is agreed that children's spontaneous drawings can be considered as examples of projective data, it is obvious that there is a need for a more regular and "standardised" approach to them than has been the case to date. If the drawing technique is to be considered in the same light as the Rorschach technique, for example, norms - particularly age norms - and a scoring system is needed. The norms must be concerned with the objective details to be found at each age level - analogous to the norms provided by Ames and others for the Rorschach Test (3). Such norms do not take the place of interpretation but instead give bases for it, and define its limits. The present study is an attempt to obtain such norms for the content, formal structure and colour usage of children aged from five to ten years. It is not an attempt to constitute a fully fledged projective test.

II - PROJECTION

Most clinicians, who have made use of children's drawings in their practice, will agree that they yield insights into the personality structure of the subject, his characteristic modes of thought, the emotional factors important in his life, and his individual modes of adaptation to basic situations (e.g. his relationships with his parents).

Clinical experience does suggest that the pattern and content of the drawings of emotionally disturbed children present data with respect to their emotional condition and the changes that have taken place over time. Clinical experience suggests that the drawings are projective in nature.

Before dealing with this projective nature of drawings in more detail it may be worthwhile to consider briefly the general question of "projection".

In 1896, in a paper entitled "On the Defense Neuropsychoses" (26), Freud stated that projection is a process of ascribing one's own drives, feelings and sentiments to other people or to the outside world as a defensive process that permits one to be unaware of these "undesirable" phenomena in oneself. Later he modified this statement by noting that

"projection is not specially created for the purpose of defense, it also comes into being where there are no conflicts. The projection of inner perceptions to the outside is a primitive mechanism which, for instance, also influences our sense perceptions, so that it normally has the greatest share in shaping our outer world. Under conditions that have not yet been sufficiently determined, even inner perceptions of ideational and emotional processes are projected outwardly like sense perceptions and are used to shape the outer world whereas they ought to remain in the inner world. --- The thing which we, just like

primitive man, project in outer reality, can hardly be anything else but the recognition of the state in which a given thing is present to the senses and to consciousness next to which another state exists in which the thing is latent, but can reappear, that is to say, the co-existence of perception and memory, or to generalise it, the existence of unconscious psychic processes next to conscious ones."(27)

These propositions of Freud's can be summarised in the statement that we may assume that memories of percepts and emotions influence the perception of contemporary stimuli.

Bellak develops this line of thought when he says "Psycho-analysis ... treats of the laws of changes of percepts by interaction among themselves into different configurations. The best example of this process is the dreamwork in which symbolisation, condensation and displacement are the processes leading to the final configuration of the manifest dream."(9) Or, if we consider the question from the point of view of Hebb (32), the percept and the memory of the percept form part of the one cell assembly. It follows from this, then, that all stimuli will cause projection, the degree of projection being dependent upon the degree of structuration of the stimulus pattern.

Within the framework of general personality theory the projective point of view has been clearly put by Abt when he writes

"personality is the process the individual uses to organise his experiences in terms of a changing world of physical and social reality and to order such reality to his own needs and values. Both physical and social reality become changed for the individual in the direction dictated by its systems of needs and values, and what becomes important is the individual's conception of his relationship to the physical and social environments."(1)

This being so, it is obvious that artistic productions contain the expression of the artist's own individual perception of the world rather than a literal, "objective" transcript of reality. Artistic productions are projective in both the selection of the subject matter and in the treatment of this subject matter.

The fact that a person's percept has components other than those due solely to the objective stimulus pattern, is the basis upon which the various projective techniques or tests have been built. The essential feature of a projective technique, as a psychological method of personality assessment or diagnosis, is that it presents the subject with perceptual material which is to some extent unstructured and which invites him to structure it in some characteristic way.

III - PROJECTIVE TECHNIQUES

Techniques in current use vary considerably in the degree of structuring, from the minimum structure of the Rorschach through the "World Test", "Object-Relations Test", "Make-a-picture-story-test", "Children's Apperception Test", and "Thematic Apperception Test" to the comparatively well structured "Symond's Picture-Story Test." This implies, as Frank points out (23), that they also vary in degree of sensitivity and precision, as well as differing in method from free artistic expression.

The time taken for the administration, scoring, and interpretation of these tests varies considerably, some taking as long as an hour to administer. Formal test procedure, as used in cognitive tests, still operates in that the subject responds to a definite stimulus and his responses are recorded after each presentation. The administrator, therefore, is more occupied with accurate recording than observation of the child and his modes of functioning.

Although less restrictive than the cognitive test, and presenting interesting material, the majority of projective techniques lack spontaneity. Telling stories from pictures and even "seeing pictures" in the Rorschach cards does require some actual training, usually given by parents or

in the early years at school. The type and amount of this earlier training varies considerably among younger subjects, and the lack of previous background may place the child in an entirely novel situation. The "shocks" found in the Rorschach records of some children may be highly significant diagnostically but they may also lead to subsequent evasiveness and lack of further production. Free drawing, on the other hand, is as nearly spontaneous a behaviour pattern as it is possible to obtain. It appears, developmentally, very early, as "scribbling" and continues with some training, to the end of the Primary school. As Bell remarks "drawing is initiated as a consequence of the functional value of exploration of the dimensions of space and the responses which may be made to space." Later, it is "modified through the progressive development of differentiated perceptual processes that become integrated into the drawing effort itself, refining and controlling it" (8). It is an activity which is more popular with pre-pubertal rather than adolescent children and, because it is characteristic of the former, is valuable for the purposes of diagnosis in a similar fashion to free play. But, round about the pubertal period, it is "terminated when abstract verbal symbolic processes control pictorial representation and transform it primarily

into the activity of writing." (8)

In considering this question of pictorial or verbal representation it should be noted that with the exception of the "World Test", a relatively high degree of verbalisation is necessary in the most commonly used projective tests. The inarticulate, withdrawn, or unco-operative child is placed at a disadvantage and often remains relatively unproductive. This is most marked in the case of the child who is younger than ten years. Furthermore, even if sufficient responses are obtained from the younger child, the absence of norms or specific standards of evaluation and interpretation is almost universal.

In brief, it may be said that the projective tests at present in general use:

- a) are structured to a greater or less degree.
- b) are time consuming in administration and permit minimum direct observation of the child,
- c) depend, very largely, on the use of language,
- d) lack spontaneity in that they retain some of the formal test pattern,
- e) operate more successfully with adults, adolescents and older children and provide few norms for younger children.

It seems likely, then, that a free drawing technique, using coloured pencils, would have advantages over other projective techniques. It is entirely "constitutive"

in Frank's sense (23) as it presents no structural material to the subject. The administration is simple - the child is provided with paper and pencils. This is a familiar situation which allows for spontaneity and is attractive to the child. There is need for little or no language, as the materials suggest the activity, and the time required is short - ten to fifteen minutes. The administrator is left free to observe the child or to go about other business, the activity can, if need be, even be carried out in his absence, though a certain amount of knowledge will be lost in this eventuality.

HISTORY

GENERAL

The general history of children's drawings, and the various uses to which they have been put, is well covered in an article by Goodenough and Harris.(30). No attempt will be made to recover this ground. Anastasi and Foley (4) have made a general survey of the literature on artistic behaviour by the abnormal person. However their survey is largely concerned with the relationship between art products and psychiatric classifications, and contains little information with respect to children.

The general situation up to 1931 was fairly well summed up by Oakley (46) when he wrote:

"Two hundred investigations have been carried out in the field of children's drawings. They have provided little of practical value. Few have been analytical in method, most remaining satisfied with the airy pleasantness of descriptive writing. As a result spontaneous drawing continues to play little part in the standard system of mental testing."

Five investigations prior to 1931 need to be mentioned nevertheless. In 1911 and 1912 Ballard (6,7) investigated the content of the drawings of nearly 30,000 London and Glamorgan children, and published frequency tables and graphs for the various contents. He also established orders of preference for these contents. The weakness of his study, however, was that he listed one content only from each

drawing, the content which appeared to him to be "of central interest".

In 1912, Rouma, in Belgium, studied the drawings of subnormal children. He found that:

- a) There was a very marked tendency to automatism,
- b) there was a frequent manifestation of the flight of ideas - the drawings which covered a sheet of paper were unfinished, numerous and touched upon a number of very different subjects,
- c) there were frequent retrogressions to earlier levels.
- d) there was slowness in development from one stage to the next,
- e) certain drawings of subnormals, considered alone are normal, but when a whole series of these is examined we see that the child confines himself to a set of stereotyped forms which have evolved slowly and have reached a certain degree of perfection by gradual modification.
- f) Many subnormal children take great care to present completely the idea which they are drawing, or to reproduce in all its details the acquired stereotype. It is this tendency which favours the perfection of certain sketches mentioned above.
- g) Subnormal children like drawings in which the same movement recurs frequently, they do meticulous work.(48)

The drawing of the human figure was investigated in some detail by Burt (15) and Goodenough (29). Both of these writers compiled developmental norms for this subject and worked out correlations with the growth of general ability as did Binet and Simon (13) for some geometrical figures. These norms allow the evaluation of the intellectual status of the drawer with some degree of confidence.

Since 1931 general studies of children's drawings have been made by Eng, Oldham, Loewenfeld and Raven. Eng's study is a longitudinal one of a single female child up to the ninth year of age (21). Oldham, in a general study of children's artistic development and expression published in 1940 (56), discusses the nature of over 2,000 drawings collected from 800 children aged from three to fifteen years. Unfortunately her data is not presented in an organised fashion as her interests were artistic rather than scientific.

Loewenfeld's first book (38) deals with the development of drawing in partially sighted and blind children; the second is a more general survey. Unfortunately no data is given as to the number of cases upon which his propositions are based. He tends to use a case-history type of approach.

J.C. Raven (47) gives a description of a procedure designed to provide both verbal and graphic data of a projective type. The technique appears very fruitful but unhappily he does not present much data on the drawings themselves. The most important information given by him was collected by his co-workers, Martin and Weir, and has been published elsewhere by them (41). Their study is to a large extent, vitiated by the combining of children, varying in age from eight to fifteen years, in a given clinical category.

2. DRAWINGS AS A DIAGNOSTIC TECHNIQUE

A. CONTENT ANALYSIS

The use of drawings as a diagnostic device was first approached by means of the analysis of the content of the drawing.

In 1941 Appel published an article entitled "Drawings by Children as Aids to Personality Studies" (5). Appel's technique was a firmly structured one. He required the children to draw pictures of their home and its inhabitants and asked them questions on the basis of the drawings. He also used the drawings as a means of structuring the interview.

Six years later Despert (16) described the use of spontaneous drawings with patients of the children's section of the New York Psychiatric Institute. These drawings were in black lead pencil only, although Despert conceded that "colour would provide an added source of information." The method of analysis was to discuss the drawings with the child and when necessary ask questions which "should aim at obtaining a direct, minute description of the drawing, watching for the child to bring spontaneously personal memories, or associations.

In the same year Kerr (34) wrote her article on the drawing of houses by children. The marked interest shown by children in houses had been noted as early as 1912 by the Ballard study (6) and Kerr undertook an analysis of developmental stages in

the drawing of houses and of the differences to be found between normal, subnormal and mal-adjusted children. She succeeded in demonstrating that with the increasing age of the child there was not the even development in the drawing of the house that there was in the drawing of the human figure (cf. Burt). Between the three groups mentioned however, she found several differentiating factors in the formal aspects.

Edelston, in his case study published in 1939 (17), used the spontaneous drawings of the case concerned as a means of structuring the interview, (as Appel had done) and also as a means of obtaining diagnostic leads from the content of the drawing. He demonstrated how the girl's drawing brought out (a) her extreme sensitiveness to criticism, (b) her retreat from apparently normal situations, (c) a traumatic situation connected with the grandmother, (d) her desire for the breast etc. Edelston commented that some of the drawings gathered in the course of the case study produced material that was elucidated verbally much later.

Harms (31) had children make drawings of their dreams and used the content of the result as a lead in clinical investigation.

In 1943 Bender and Wolfson (12) took up the question of the drawing of boats by children. (The great popularity

of this content had been noted by Ballard but his study was apparently unknown to the two authors.) They discussed the matter of this content from the psychoanalytic point of view and reached the conclusion that the boat is a mother symbol and that:

"given a certain number of pre-adolescent children with emotional and behaviour problems, in general unselected, who have an opportunity freely to produce pictorial art, a certain number will be compelled to draw boats. This probably represents children with particular problems in the Oedipus situation due to serious disturbance in the parent-child relationship during the Oedipus period."

(ibid p.467). In the following year Bender and Rapaport (11) dealt with the drawing of animals by children, again from the psychoanalytic point of view.

Naumberg (43) reports in 1945 a method of using the art work of children: (a) as a source of material to work over with the child, and (b) as a means of catharsis.

B. FORMAL ANALYSIS:

In 1937 Traube (53) drew attention to the following aspects of children's drawings which had diagnostic significance (1) The content of the drawings; (2) the size of the content; (3) the colours used; and (4) the pressure and direction of the stroke.

This article was probably the first important treatment of the formal aspects of children's drawings as being

diagnostically significant. In particular Traube claimed that (a) extremely small drawings were associated with feelings of inferiority; (b) that scrawls, rather than smooth shading, were used by excited children; (c) that the pencil pressure used was of diagnostic significance (unspecified), particularly when combined with other factors.

Five years later appeared the first systematic approach to the use of the formal aspects as diagnostic data. Schmidl-Waehner (50) set out her concept of analysis as follows:-
 "the interpretation of the ideational content or object, like an interpretation of an association, although in some cases very helpful, seems to us of insufficient fruitfulness. We are, therefore, interested in tracing a correlation of the emotional attitude of the child with his form production, and thus finding an approach to personality problems through formal criteria in children's art work."

The formal criteria suggested by her were: (1) Size of the paper used; (2) Proportion of the paper used; (3) Size of the form elements in the drawing; (4) Distribution of the form elements; (a) symmetry, (b) balance, (c) rhythm; (5) lines or spots; (6) motion elements; (7) colour used. In the study under consideration she gives figures for the frequency of the different aspects of the above criteria for five groups; (1) Normal, (2) Neurotic, (Delinquent); (3) Neurotic (Depressive), (4) Psychotic, (5) Feeble-minded.

A somewhat similar style of analysis to that of Schmidl-Waehner was developed by Elkisch (19) in her monograph "Children's Drawings in a Projective Technique." The criteria used by Elkisch were: (1) Rhythm or Rule; (2) Complexity of Simplicity; (3) Expansion or Compression; (4) Integration or Disintegration; (5) Realism or Symbolism. This monograph, however, is theoretical rather than empirical so that no figures are given for diagnostic categories.

In 1946 Schmidl-Waehner followed her earlier study with a monograph on "Interpretation of Spontaneous Drawings and Paintings." (51) This reported an investigation of the drawings of 55 college students between the ages of 17 and 19 years. In this monograph the same basic criteria used in the 1942 study, plus a great number of minor criteria, were employed. Her system of analysis as put forward in this study is even more complex than most methods of scoring the Rorschach test and tends to make the system impractical.

In 1947 Naumberg (44) returned to the field with a study which incorporates elements of content analysis and elements of formal analysis. The analysis is not carried out along the lines suggested by Schmidl-Waehner or Elkisch, and such formal analysis as is given, together with the analytic treatment of the content, both manifest and latent, (by means of Freudian and Jungian symbolism) appears to be relevant to the diagnosis

of the individuals concerned rather than of general systematic use.

In 1949 Karen Machover published her book "Personality Projection in the Drawing of the Human Figure" (40). This book, though a fruitful collection of clinical data, largely, though not entirely, with respect to adult males, lacks any attempt at norms.

C. COLOUR ANALYSIS:

In the article previously cited Traube (53) drew attention to the diagnostic significance of colour in children's drawings. In particular he claims (a) that the better adjusted the child, the more realistic the colours; (b) that red is chosen by cheerful children; (c) that depressed children either neglect colour altogether or preferred brown or violet.

Schmidl-Waehner used colour as one of her basic criteria in both her 1943 and 1946 studies. The number of colours used and the hues used are considered significant.

Brick (14) in 1944 studied the art work of 200 children from three to fifteen years of age. She claims that (a) red was avoided by children who have "traumatic fears of blood", (b) "muddy dark colours" are chosen by anxious and depressed children; (c) "watery colours" are chosen by children who are afraid of revealing their emotions; black is indicative of repressed emotions; (e) dominant use of yellow and red indicated expression of hostility and aggression.

Kouwer (36) published in 1949 an elaborate study of colours. He asked his subjects (adults) to (a) match various words with colours; (b) describe their concept of each colour; and (c) arrange colours according to preference. The results indicate possible diagnostic leads and give at least some basis for comparison.

CONCLUSIONS.

Harms noted in his 1941 study (31) that "the interpretation of the products of juvenile psychopaths must always start with some knowledge of the pictorial creations of a normal mind at a certain age;" and Machover in 1949 that "the particular significance of a drawing trait for a specific individual must be referred to the appearance of that trait in his age group so as to permit evaluation of the extent to which the trait is a normal expression of a developmental phase".

It may readily be seen that, to date, investigations have not provided any systematic or satisfactory account of the productions of a normal mind at a certain age. The present study, is an attempt to provide at least some of the necessary information.

AIMS. SUBJECTS. MATERIALS

METHOD.

AIMS OF THE INVESTIGATION

The aim of this study is the investigation of the spontaneous drawings of children aged five to ten years (inclusive) with a view to:-

1. Examining the formal aspects typical of the drawings of each age group.
2. Examining the colour usage typical of each age group.
3. Examining the content typical of each age group.
4. Discussing the claims of other writers on the subject and comparing them with the findings of the present study.
5. Presenting tentative developmental scales of the form, colour and content aspects of drawings for both boys and girls in this age group.

The subjects used in this investigation were 1090 schoolchildren (573 boys, 517 girls) of age five years to ten years. They were the total pupil population (within the age range) of two large Hobart schools which were especially chosen to give a wide coverage of social class.

The subjects were distributed among the six age groups as follows:

Age	Boys	Girls	Total
5-0 to 5-11	65	65	129
6-0 to 6-11	97	95	192
7-0 to 7-11	107	117	224
8-0 to 8-11	101	75	176
9-0 to 9-11	82	82	164
10-0 to 10-11	121	84	205
Total	573	517	1090

MATERIALS USED

The materials used were:-

(a) Sheets of foolscap duplicating paper
of size 13" x 8" (approx.)

(b) Sets of ten pencils in the following
colours -

Black, Brown, Violet, Dark Blue

Light Blue, Dark Green, Light Green,

Red, Orange, Yellow.

METHOD AND PROCEDURE

Drawings for the study were obtained in the class-room situation. The children were seated in their usual places and were each handed a sheet of foolscap paper and a packet of ten coloured pencils.

They were instructed as follows:- "This morning I want you to do some drawing for me. You may draw just what you like. Don't worry about what anybody else draws, just draw what you would like to draw."

Enquiries as to the use of rulers or ordinary black lead pencils were met by the reply "Do just as you like - you can draw it any way you want to."

When the children were finished (no time limit was set though some of the slower children were exhorted to hurry if the time taken exceeded 20 minutes) the children were asked to bring their drawings to the teacher's desk where each child was asked to describe what he had drawn and ambiguous content was labelled by the investigator. The child's name and age, at the time of drawing, were then written on the back of the drawing.

Results of the routine intelligence test (the Tasmanian 10 year Ability) given to the ten-year-old group in the year the investigation was carried out were collected. The ten year group could then be used to study the relationship between

intelligence and many of the other variables. The following table gives the data for the distribution of intelligence in the ten year old group.

DISTRIBUTION OF INTELLIGENCE
IN THE TEN YEAR OLD GROUP.

I. Q.	BOYS	GIRLS	TOTAL
60-69	1	0	1
70-79	5	5	10
80-89	14	7	21
90-99	25	21	46
100-109	37	17	54
110-119	17	18	35
120-129	13	12	25
130-139	7	0	7
140-149	0	1	1
TOTAL	119	81	200

The 1090 drawings thus collected were grouped and analysed in the following way. First the drawings were collected into age groups. Second they were analysed according to the system reported below, and the details were punched on punch cards specially printed with the required categories.

The cards were then sorted to give the raw figures for the various categories. These figures were then converted

to percentages and entered in the corresponding tables. The system of categories used differed from those of Schmidl-Waehner and Elkisch in that it was simpler in its formal analysis and that it included content. The greater simplicity of formal analysis was necessitated by (a) lack of time and facilities, and (b) the vagueness of some of the categories used by these investigators. The content categories exhaust the range of content of the drawings for all age levels.

No evidence was seen for any specific influence by the art curriculum on the children's drawings. No specific subjects to be drawn are laid down in the curriculum, nor are modes of drawing, or colours to be used, specified.

The effect of any recent art lesson would have been minimised by the fact that, for each age group, two schools and several different classes were concerned.

TABLES:

Tables were prepared showing the frequencies (percentages) for the various categories and sub categories at each age level, for both sexes and for total samples.

Summary tables were prepared showing:

1. Developmental trends in the formal aspects of children's drawings.

2. Developmental trends in the colour of children's drawings.
3. Developmental trends in the content of children's drawings.
4. Developmental trends in the formal aspects of boys' drawings.
5. Developmental trends in the colour of boys' drawings.
6. Developmental trends in the content of boys' drawings.
7. Developmental aspects in the formal trends of girls' drawings.
8. Developmental trends in the colour of girls' drawings.
9. Developmental trends in the content of girls' drawings.

Percentages given in these tables are based on the total number of subjects in each age group, not on the total number of subjects (1090), unless otherwise specified. For example, in table 1, the 29% referred to in the five-year column is 29% of the 129 5 year-olds. When separate figures are given to the two sexes, the basis for the percentage is the number of girls (or boys) in the given age group. Percentages are to the nearest 0.5% as that figure is approximately equal to one child in most of the age groups, and in a survey of this kind greater accuracy is not meaningful.

STATISTICAL TREATMENT:

Differences between the sexes in the frequency of occurrence of any variable were tested by means of the chi-square technique.

The correlation of most of the variables with intelligence

(using the ten-year-old group) was calculated by the phi and chi-square techniques. Two by two tables were utilised, intelligence being represented by high and low halves (above 100 I.Q., below 100 I.Q.). It must be noted that in such circumstances phi is restricted to the range minus one half to plus one half.¹ Four figure logarithms were used in the calculations and their accuracy is thus bounded by the accuracy of four figure logarithms.

Analytic Categories:

The categories used in the analyses were -

I. Formal Analyses:

1. Size of the form element.
2. Outline of the form elements.
3. Line or mass.
4. Coverage of the page.
5. Rhythm or stasis.
6. Strength of pencil pressure.
7. Control of pencil stroke.

II. Colour Analysis:

1. Number of colours used.
2. Hues used.
3. Compatability of the colours used.

III. Content Analysis

- | | |
|-------------------|------------------------------|
| 1. Scenes | 10. Designs |
| 2. Houses | 11. The sun |
| 3. Boats | 12. Moon and Stars |
| 4. Plant Life | 13. Weapons |
| 5. Land vehicles | 14. Letters |
| 6. Air vehicles | 15. Scribble patterns |
| 7. Human figures | 16. Unrelated objects |
| 8. Animal figures | 17. Single objects |
| 9. Still life | 18. Perseveration. |
| | 19. Comparison with Ballard. |

1. Walker and Lev "Statistical Inference" p.275 (54)

Description of Categories:

I. Formal Categories -

1. Size:

To analyse size it is necessary to introduce cutting points to divide the category into sections which may be considered separately. No previous investigator has given figures to indicate the size of the elements dealt with, therefore, arbitrary cutting points are necessary. It was found convenient to use the following sub categories:

- (a) Very small - i.e., forms less than 1 inch in the greatest dimension.
- (b) Small - i.e. forms between 1 and 3 inches in the greatest dimension.
- (c) Large - i.e. forms over 3 inches in the greatest dimensions.
- (d) Mixed - i.e. any combination of the above sizes.

These dimensions are quite possibly not optimal but a first approximation must be made.

2. Outline:

The outline of the elements of the drawings seem to fall naturally into three types:-

- (a) Weak - the outlines in those drawings where there was no clarity of figure as opposed to ground; or where the "colouring in" of a previously drawn outline was crudely done and the outline violated.
- (b) Clear - The outline which are quite clear and inviolate but not unduly emphasized.

- (c) Sharp - Those outlines which are emphasised quite sharply, and, in some cases, ruled.

3. Line or Mass:

This category refers to two types of drawing,

- (i) Those using lines only and which are unshaded, and
- (ii) those which are shaded and present masses of colour.

The latter may be constructed entirely of masses of colour or they may be constructed first by a line outline which is later "coloured in".

There are also some drawings which consist of part line drawing and part mass drawing.

The three subcategories are then:-

- (a) Line
- (b) Mass
- (c) Mixed.

4. Coverage of the Page:

This category refers to the degree to which the drawing covers the page. In the early years, for example, the scenes drawn have a strip of sky at the top, a strip of land or sea at the bottom with objects on it, and a large gap of white paper in between. As the children grow older there is a tendency for this gap to narrow and close.

The sub-categorisation was not carried beyond the dichotomy, complete coverage and incomplete coverage. A finer mensuration would require the use of a grid to measure

the exact amount of coverage and would require a special investigation. The sub-categories are then:-

- (a) Complete coverage
- (b) Incomplete coverage.

In addition to the usual tables for both sexes and the total sample at each age level, tables were also compiled based on the number of scene drawers (each sex separately) at each age level. This distinction was made as all the drawings which covered the page were of scenes.

5. Rhythm or Stasis:

This category is defined in the following manner:-

- (a) Rhythm - a drawing is described as "rhythmic" when it possesses any two of the following characteristics:
 - (i) Flexible flowing lines
 - (ii) A tendency to asymmetry
 - (iii) A tendency to variation in the size of the component elements.
- (b) Stasis - a drawing is described as "static" when it possesses any two of the following characteristics:-
 - (i) Rigid sharp lines
 - (ii) A tendency to symmetry
 - (iii) A tendency to identity in the size of the component elements.

6. Strength of Pencil Pressure:

A division of this category into four sub-categories was considered to be advisable. The sub-categories were designated:

- (a) Strong
- (b) Moderate
- (c) Weak
- (d) Mixed.

Standards for:

(a), (b) and (c) were laid down after a rough perusal of the drawings from the point of view of pencil pressure. These standards are as set out below and subsequent analysis of the drawings was made on the basis of these standard pressures. The sub-category "mixed" refers to those drawings where there were a combination of the various pressures.

Weak

Moderate

Strong

7. Control of Pencil Stroke:

This category refers to the control of pencil stroke exercised while drawing. It is considered under three sub-categories:

- (a) Good control - i.e. - where there is a relatively smooth back and forth motion, vertically, horizontally, or diagonally.
- (b) Poor control - i.e. - where there is a haphazard jerky stroke in various directions
- (c) Mixed - i.e. - where there is a mixture of the above types.

This last sub-category was used only when there was an obvious ambivalence in control. Small lapses from control, e.g. at the edges of the paper, were not counted.

II. Colour Analysis:

1. Number of Colours Used:

The total possible number of colours was eight, dark and light blue being considered as one colour and similarly dark and light green.

The number of colours was set out in pairs in the frequency tables, i.e., 1-2, 3-4, 5-6, 7-8 as it was considered that the preparation of tables showing frequencies for single colours, i.e. 1-8, would be too time consuming and give little additional information. Tables were compiled for the frequency of children using 1-4 colours and 5-8 colours, as a summary of the first tables.

2. Compatibility of Colours Used:

Two sub-categories were used here:-

- (a) Incompatible - where the combinations of colour in juxta position were not complementaries or split (triangular) complementaries.
- (b) Compatible - where the combinations were complementaries or split complementaries.

Complementariness was used as a criterion because it was objective in that it avoided the problem that colors which are harmonious to the writer are not necessarily so to other people.

3. Hues Used:

This category was analysed first in terms of three groups of hues.

Group 1 - Consisting of black, brown and violet

Group 2 - Consisting of red, orange and yellow

Group 3 - Consisting of blue and green.

The various hues were grouped in this manner as it was considered, on the basis of studies by Kouwer, Schmidt - Waehner, and Traube (op.cit.) that the hues grouped together had something in common. These commonalities were thought to be -

Group 1 - Depression and sadness

Group 2 - Warmth and extraversion

Group 3 - Coolness and inhibition.

Secondly, the drawings were analysed for the dominant hues, that is, the hues predominating in the dominant features of the drawing. In many cases, particularly in earlier years, there were neither dominant features nor dominant colours, and the frequencies for this occurrence are listed separately.

III. Content Analysis:

The content categories are not mutually exclusive in as much as the drawings were analysed for total content and not only for the dominant content. This means that where, e.g., a drawing contains both a boat and a house, it is scored for both.

1. Houses:

This content was scored in five different ways:-

- (a) As object - when a house was drawn as an object only without any setting.
- (b) On ground - when a house was drawn resting on a base line or ground.
- (c) Complete setting - when a house was drawn on a ground and with the sky overhead.
- (d) Elaborated complete setting - when a house ground and sky were drawn and other objects, e.g. flowers, figures etc., were added.
- (e) Total - the sum total of the above sub-categories.

The drawings containing houses were also analysed for the following seven varieties of house:-

- (i) Primitive attempts.
- (ii) Box without roof.
- (iii) Box with roof.
- (iv) Type (iii) with a path.
- (v) Double sided box with a roof.
- (vi) Type (v) with a path.
- (vii) More advanced representation.

The next step, derived from Kerr's (34) study, was to score the frequency of children drawing:-

- (i) Curtains.
- (ii) Tall and thin houses.
- (iii) Houses with windows attached to the corners.
- (iv) Houses without bottoms.
- (v) Houses with transparent walls.

2. Boats:

These five sub-categories were scored as with the houses, viz. :-

- (a) As object.
- (b) On water.
- (c) Complete setting.
- (d) Elaborated complete setting.
- (e) Total.

3. Land Vehicles:

This content was scored in the same way as the houses.

4. Air Vehicles:

These were also scored in the fashion used before, viz.:

- (a) As object.
- (b) On ground.
- (c) Complete setting - this sub-category also includes those cases where the air vehicles were set in a complete sky setting but without other details.
- (d) Elaborated complete setting - this sub-category also includes those cases where air vehicles are set in a complete sky or space setting but with other detail (e.g., planets or other air craft) added.
- (e) Total.

5. Human figures:

These were analysed into the following sub-categories:-

- (a) None.
- (b) One figure.
- (c) More than one figure.
- (d) Total.

No attempt at more detailed analysis like that of K. Machover (40) was attempted.

6. Scenes:

Scenes were analysed according to the following sub-category:-

- (a) Scenes with animate content.
- (b) Scenes without animate content.
- (c) Total scenes.
- (d) Sky and earth meet.
- (e) Narrative scenes.

7. Sun:

This content category was scored for the frequency of occurrence in terms of:-

- (a) The presence of the sun.
- (b) The anthropomorphised sun, i.e., being given human features, eyes, mouth and nose.

8. Scribble pattern:

This category refers to the crude scrawls, circles, ovals, squares, rectangles etc. which are said to be the basic art forms from which other content evolves.

9. Single Object:

This category refers to those drawings where a single, discreet object of some sort, and nothing else, is drawn.

10. Collection of Unrelated Objects:

This category refers to drawings consisting of a series of objects which have no connection with each other or unifying theme.

11. Perseveration:

This category refers to the frequent repetition of any element within one drawing. For example, the drawing of over a dozen "birds" all of roughly the same size or of dozens of flowers of the same size and design.

12. Other content categories:

The following content categories need no description and are not sub-categorized in any way:-

- (i) Plant life.
- (ii) Animal figures.
- (iii) Fantastic figures.
- (iv) Moon and stars.
- (v) Letters.
- (vi) Still life.
- (vii) Designs.

Comparison with Ballard:

Tables were drawn up giving both the figures published by Ballard and those obtained in the present investigation for various contents. These tables are compiled separately for each sex. The contents concerned are:-

- (a) Houses.
- (b) Boats
- (c) Vehicles (both lands and air vehicles)
- (d) Human figures
- (e) Animal figures
- (f) Plant life

On the basis of these figures, orders of preference for content were calculated for each age level and for the total sample of each sex. These orders of preference are compared with those obtained by Ballard.

RESULTS.

A detailed tabulation of the frequencies of occurrence was made for each analytic category of Form, Colour and Content. These tabulations appear in Tables 1 - 54. Comparisons with Ballard's data on Content are also made in Tables 23, 29, 31, 36, 38, 40 and 54.

Summary tables of developmental trends from five to ten years were prepared on the basis of the individual frequency tables for Girls and Boys, separately and combined. These are divided into the three main aspects - Form, Colour and Content.

SUBJECTS

AGE	GIRLS	BOYS	TOTAL
5.0 - 5.11	64	65	129
6.0 - 6.11	95	97	192
7.0 - 7.11	117	107	224
8.0 - 8.11	75	101	176
9.0 - 9.11	82	82	164
10.0 - 10.11	84	121	205
	517	573	

Each cell entry in the tables, unless stated to the contrary, is a percentage of the total sample of girls, boys, or total children, for the age level concerned.

TABLE 1
SIZE OF FORM ELEMENTS

GIRLS

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Very small	0.0	1.0	0.5	0.0	0.0	0.0
Small	37.5	36.0	24.0	19.0	7.5	6.0
Large	26.5	9.5	14.5	14.5	20.5	22.5
Mixed	36.0	53.5	61.0	67.0	72.0	71.5

BOYS

Very small	0.0	0.5	0.0	0.0	0.0	0.0
Small	21.5	25.0	26.0	19.0	8.5	6.0
Large	41.5	28.0	24.5	37.5	40.0	40.5
Mixed	36.5	46.5	49.5	43.5	51.0	53.5

TOTAL

Very small	0.0	1.5	0.5	0.0	0.0	0.0
Small	29.0	30.5	25.0	19.0	7.5	6.0
Large	34.0	19.0	19.0	28.0	30.5	33.0
Mixed	37.0	49.0	55.5	53.0	62.0	61.0

TABLE 2
EXPANSION - COMPRESSION

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Expansion	44.0	68.0	81.0	84.0	88.5	86.0
Compression	56.0	32.0	19.0	16.0	11.5	14.0

TABLE 3
OUTLINE OF FORM ELEMENTS

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs.
GIRLS	Not clear	12.5	18.0	2.0	1.5	0.0	0.0
	Clear	86.0	67.0	75.0	66.5	60.0	69.0
	Sharp	1.5	15.0	23.0	32.0	40.0	31.0
BOYS	Not clear	26.0	14.5	5.5	8.0	2.5	0.0
	Clear	74.0	68.0	76.5	62.5	58.5	70.0
	Sharp	0.0	17.5	18.0	29.5	39.0	30.0
TOTAL	Not clear	19.0	16.5	3.5	5.0	1.0	0.0
	Clear	80.0	67.5	76.5	64.5	59.5	70.0
	Sharp	1.0	16.0	20.5	30.5	39.5	30.0

TABLE 4
LINE OR MASS

	Category/Age	5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
GIRLS	Line	28.0	7.5	2.0	0.0	0.0	1.0
	Mass	6.0	15.0	48.0	75.0	84.0	75.0
	Mixed	66.0	77.5	50.0	25.0	16.0	24.0
BOYS	Line	38.5	17.5	3.0	3.0	3.5	2.5
	Mass	21.5	25.0	33.5	74.5	69.5	81.0
	Mixed	40.0	57.5	63.5	22.5	27.0	16.5
TOTAL	Line	33.0	12.5	2.5	1.5	2.0	2.0
	Mass	14.0	19.5	41.0	74.5	76.0	78.5
	Mixed	53.0	67.5	57.0	24.0	22.5	19.5

TABLE 5
LINE OR MASS

Mixed Line and Mass percentages
added as a constant to the other
categories -

	Category/Age	5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
	Line	86.0	80.0	59.5	25.5	24.5	21.5
	Mass	67.0	87.0	98.0	98.5	98.5	98.0

TABLE 6

LINE - MASS

Mixed Line and Mass percentages
added as a constant to the line
percentages

Category/ Age.	5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
Boys	78.5	75	66.5	25.5	30	19
Girls	94	85	52	25	16	25

TABLE 7

Coverage of the Page.

	Category/ Age.	5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
GIRLS	Complete	0	0	7.5	32.0	53.5	47.5
	Incomplete	100	100	92.5	68.0	46.5	52.5
BOYS	Complete	0	0	3	26.5	46.5	34.5
	Incomplete	100	100	97	73.5	53.5	65.5
TOTAL	Complete	0	0	7.5	29.0	50.0	40.0
	Incomplete	100	100	92.5	71.0	50.0	60.0

TABLE 8

COVERAGE OF PAGE BY SCENE DRAWERS
(Percentage of Scene Drawers)

	Category/Age	5yrs	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
GIRLS	Incomplete Coverage	100	100	91.5	65	44	39.5
	Complete Coverage	0	0	8.5	35	56	60.5
BOYS	Incomplete Coverage	100	100	96	66.5	42	48.5
	Complete Coverage	0	0	4	33.5	58	51.5
TOTAL	Incomplete Coverage	100	100	91	67.5	43.5	45
	Complete Coverage	0	0	9	32.5	56.5	55

TABLE 9

RHYTHM - STASIS

	Category/Age	5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
GIRLS	Rhythmic	40.5	66	83	61	63.5	67
	Static	59.5	34	17	39	36.5	33
BOYS	Rhythmic	41.5	60	63	57.5	72	77
	Static	58.5	40	37	42.5	28	23
TOTAL	Rhythmic	41	63	73	59	67.5	72.5
	Static	59	37	27	41	32.5	27.5

TABLE 10
STRENGTH OF PENCIL PRESSURE

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	Strong	37.5	38.	14.	16.	14.5	14.
	Moderate	48.5	50.5	60.	53.	50.	60.
	Weak	11	11.5	19.	28	33	14
	Mixed	3	0	7	3	2.5	12
BOYS	Strong	45	39	23.5	22.5	16.	21.5
	Moderate	43	47.5	61.	59.5	57	48.5
	Weak	12	8	10	17	19.5	17.5
	Mixed	0	5.5	5.5	1	7.5	12.5
TOTAL	Strong	40.5	38.5	19.0	19.5	15.0	18.5
	Moderate	46.0	49.0	60.5	57.0	53.5	53.0
	Weak	12.0	10.0	14.5	21.5	26.0	16.0
	Mixed	1.5	2.5	6.0	1.5	5.0	12.5

TABLE 11
CONTROL OF PENCIL STROKE

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	Good Control	51.5	36.0	61.5	84	73	72.5
	Poor Control	29.5	51.5	37.5	14.5	27.0	27.5
	Mixed	19.0	12.5	1.0	1.5	0.0	0.0
BOYS	Good Control	45	39	57	72	68	67.5
	Poor Control	40	52.5	42	27.5	30.5	32.0
	Mixed	15	8.5	1.0	0.5	1.5	0.5
TOTAL	Good Control	48.0	43.0	60.0	77.5	70.5	70.0
	Poor Control	35.0	52.0	40.0	22.0	28.5	30.0
	Mixed	17.0	5.0	0.0	0.5	0.5	0.0

TABLE 12
NUMBER OF COLOURS USED

	Number/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	1-2	8	0	0	0	1.5	1
	3-4	15.5	9.5	3.5	7	3.5	15.5
	5-6	34.5	37.	40	46.5	42.5	40.5
	7-8	42	53.5	56.5	46.5	52.5	43
BOYS	1-2	15.5	2	0	3	0	4
	3-4	37	14.5	12.	18	30	26.5
	5-6	21.5	49.5	50	46.5	45	53
	7-8	26	34	38	32.5	25	16.5
TOTAL	1-2	12.0	1.0	0.0	1.5	0.5	3.0
	3-4	26.0	12.0	7.5	13.0	17.0	22.0
	5-6	28.0	43.0	44.5	46.5	44.0	48.0
	7-8	34.0	44.0	48.0	39.0	38.5	27.0

TABLE 13
NUMBER OF COLOURS

	Number/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	1-4	23.5	9.5	3.5	7	5	16.5
	5-8	76.5	90.5	96.5	93	95	83.5
BOYS	1-4	52.5	16.5	12	20.5	30	30.5
	5-8	47.5	83.5	88	79.5	70	69.5
TOTAL	1-4	38	13	7.5	14.5	17.5	25
	5-8	62	87	92.5	85.5	82.5	75

TABLE 14

COMPATABILITY OF COLOURS USED

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	Compatible	48.5	27.5	28.0	44	82	71.5
	Incompatible	51.5	72.5	72.0	56	18	28.5
BOYS	Compatible	65	26	22.5	43.5	68.0	65
	Incompatible	35	74	77.5	56.5	32.0	35
TOTAL	Compatible	56.0	27.0	25.5	44.0	75.0	68.0
	Incompatible	44.0	73.0	74.5	56.0	25.0	32.0

TABLE 15

HUES USED

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	Group 1	0	0	0	0	0	1
	Group II	1.5	0	0	0	0	0
	Group III	0	0	0	0	1	0
	Mixt.I,II	4.5	0	0	0	0	0
	Mixt.I & III	3	1	1	2.5	2.5	4.5
	Mixt.II & III	14	1	0	0	1	2.5
	Mixt.I, II & III	77	98	99	97.5	95	92
BOYS	Group I	6	0	0	0	0	1
	Group II	0	0	0	0	0	0
	Group III	4.5	0	0	0	0	0
	Mixt.I, II	1.5	0	0	3	1.5	6.5
	Mixt.I & III	4.5	0	5.	3	5	5
	Mix. II & III	14	7.5	0	1	2.5	1.5
	Mix. I,II&III	69.5	92.5	95	93	91	86
TOTAL	Group I	3	0	0	0	0	1.0
	Group II	1	0	0	0	0	0
	Group III	2	0	0	0	0.5	0
	Mix.I & II	3	0	0	1.5	0.5	4
	Mix.I & III	4	0.5	2.5	3	3.5	5
	Mix. II & III	14	4	0	0.5	2	2
	Mix.I, II & III	73	95.5	97.5	95.	93.5	88

TABLE 16

DOMINANT HUES

Colour/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Black	3.0	2.5	2.5	2.0	8.0	10.0
Brown	4.0	3.5	12.5	13.0	17.5	15.5
Violet	5.0	5.0	4.0	4.0	1.0	2.0
Blue	13.0	9.5	11.0	15.5	11.0	11.0
Green	7.0	9.5	12.5	16.0	10.0	10.0
Red	10.0	11.5	7.0	9.5	4.0	8.0
Orange	6.0	4.0	3.5	4.5	0.5	2.0
Yellow	4.0	4.0	11.5	12.5	22.0	19.0
No Dominant feature	48	50.5	35.5	23	26	22.5

TABLE 17

DOMINANT HUES

Colour/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs	Age
Group I	12	11	19	19	26.5	27.5	19.
Group III	20	19	23.5	31.5	21	21	22.
Group II	20	19.5	22	26.5	26.5	29	23.

TABLE 18

ORDER OF PREFERENCE OF HUE

Colour/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs	Age
Black	8	8	8	8	5	4	6
Brown	6	7	1	3	2	2	3
Violet	5	4	6	7	7	7	7
Blue	1	2	4	2	3	3	2
Green	3	2	1	1	4	4	4
Red	2	1	5	5	6	6	5
Yellow	6	5	3	4	1	1	1
Orange	4	5	7	6	8	7	8

TABLE 19SCENES

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	With animate content	28	60	70	69.5	61	31
	Without " content	12.5	19	20	21.5	34	47.5
	Total	40.5	79	90	91	95	78.5
BOYS	With animate content	12	45.5	53.5	46.5	29.5	31.5
	Without animate content	11	13.5	27	32.5	51	35.5
	Total	23	59	80.5	79	80.5	67
TOTAL	Without animate content	12	16	23	28	42.5	40.5
	With animate content	20	52.5	62.5	56	45	31
	Total	32	68.5	85.5	84	87.5	71.5

TABLE 20SKY & EARTH MEETPERCENTAGE OF SCENE DRAWERS

	Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
	Boys	0.0	0.0	2.5	26.5	54	50
	Girls	0.0	0.0	9.5	35.5	39.5	48
	Total	0.0	0.0	6	29	47	48.5

TABLE 21

NARRATIVE SCENES

Percent of Scene Drawers

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Girls	0.0	2.5	2.0	12.0	0.0	2.5
Boys	0.0	5.0	0.0	0.0	1.5	0.0
Total	0.0	3.5	1.0	5.0	1.0	1.5
Total number of cases involved	41	137	193	156	145	149

TABLE 21a

NARRATIVE SCENES

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Percent of total age group	0.0	2.5	1.0	4.5	0.5	1.0
Number of cases involved	129	192	224	176	164	205

TABLE 22HOUSES

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
As object	26	13	2	0	0	1
On ground	13	3.5	3.5	1	1	1.5
Complete setting	21	7	4	2	2.5	1
Elaborated complete setting	1	43	41.5	35	38.5	26
Total	61	66.5	51	37	42	29.5

TABLE 23HOUSES

(a) Boys

(b) Girls

Age	Ballard	Frost	Ballard	Frost
5 yrs	15.2	43.0	15.6	78.0
6 yrs	12.1	51.5	18.3	82.0
7 yrs	13.0	32	20.4	68
8 yrs	14.2	20.0	23.5	61.5
9 yrs	12.3	20.5	17.6	63.5
10 yrs	12.0	13.0	15.7	52.0

TABLE 24
TYPES OF HOUSES

Age	Primitive	With Flat roof	Double sided	More advanced
5yrs	33.5	54.5	12.0	0.0
6yrs	22.5	63.5	14.0	0.0
7 yrs	5.0	59.5	35.5	0.0
8 yrs	3.5	71.0	25.5	0.0
9 yrs	1.5	55.0	40.0	3.0
10 yrs	2.0	47.0	49.0	2.0

TABLE 25
TYPES OF HOUSES

Age/Type	1	2	3	4	5	6	7
5 yrs	13.5	20.0	33.5	21.0	7.5	4.5	0.0
6 yrs	10.0	12.5	47.0	16.5	10.0	4.0	0.0
7 yrs	3.0	2.0	52.0	7.5	26.5	9.0	0.0
8 yrs	0.0	3.5	52.5	18.5	20.5	5.0	0.0
9 yrs	0.0	1.5	30.0	25.0	25.0	15.0	3.0
10 yrs	0.0	2.0	26.0	21.0	22.5	26.5	2.0

TABLE 26

CHILDREN DRAWING CURTAINS

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Percentage	17.0	19.5	42.0	54.0	56.0	62.5

TABLE 27

SIGNS OF MALADJUSTMENT FOUND IN THE DRAWINGS
OF HOUSES.

Age	Tall & thin houses	Houses with windows attached to the corners	Houses without bottoms	Houses with tran parent walls.
5 yrs	10.5	9.0	4.5	0.0
6 yrs	16.0	16.5	10.0	3.5
7 yrs	9.0	14.0	29.5	3.5
8 yrs	3.5	17.0	42.5	3.5
9 yrs	1.5	13.0	16.5	1.5
10 yrs	0.0	7.5	9.5	0.0
Total (N=468)	8.5	13.5	18.5	2.5

TABLE 28BOATS

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
As object	15.0	6.0	2.5	2.0	0.5	3.0
On water	7.0	7.0	3.5	7.5	5.5	7.0
Complete setting	3.0	4.5	6.0	7.5	7.0	7.0
Elaborated complete setting	0.0	13.5	16.0	21.5	18.5	23.0
Total	25.0	31.0	28.0	38.5	31.5	40.0

TABLE 29BOATS

(a) BOYS

(b) GIRLS

Age	Ballard	Frost	Ballard	Frost
5 yrs	18.6	41.5	9.9	8.0
6 yrs	20.0	46.5	10.2	16.0
7 yrs	27.6	52.0	10.2	7.0
8 yrs	27.1	60.5	9.2	9.5
9 yrs	26.3	60.0	6.9	3.5
10 yrs	24.2	61.0	6.0	8.5

TABLE 30PLANT LIFE

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Percentage	29	52.5	57.0	41.5	45.0	40.0

TABLE 31PLANT LIFE

(a) BOYS			(b) GIRLS	
Age	Ballard	Frost	Ballard	Frost
5 yrs	12.7	15.5	22.5	42.0
6 yrs	12.2	35.0	26.7	70.5
7 yrs	14.4	34.5	37.1	77.0
8 yrs	14.8	18.0	36.6	73.5
9 yrs	15.9	14.5	40.6	75.5
10 yrs	14.8	14.0	40.5	77.0

TABLE 32LAND VEHICLES

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
As object	9.0	2.5	1.5	0.0	0.5	0.0
On Ground	2.0	2.0	1.5	0.5	2.0	2.0
Complete setting	2.0	0.5	0.0	0.0	0.0	0.0
Elaborated complete setting	0.0	7.0	7.0	6.0	6.5	5.0
Total	13.0	12.0	10.0	6.5	9.0	7.0

TABLE 33

LAND VEHICLES

Category	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Girls	4.5	5.0	3.5	6.5	5.0	1.0
Boys	20.0	18.5	17.0	7.0	13.5	11.0

TABLE 34

AIR VEHICLES

Category/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
As object	2.0	2.0	0.0	1.0	0.5	3.5
On Ground	0.0	0.0	1.5	1.0	0.5	1.5
Complete setting	0.0	0.0	0.5	0.5	2.0	0.5
Elaborated complete setting	0.0	2.5	10.0	10.0	13.0	12.0
Total	2.0	4.5	12.0	12.5	16.0	17.5

TABLE 35

AIR VEHICLES

Category	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Girls	0.0	1.0	5.0	1.5	1.0	0.0
Boys	3.0	8.0	18.5	22.0	30.5	29.0

TABLE 36

VEHICLES

(a) BOYS			(b) GIRLS	
Age	Ballard	Frost	Ballard	Frost
5 yrs	16.2	23.0	4.4	4.5
6 yrs	21.7	27.0	5.2	6.5
7 yrs	15.2	35.5	2.4	8.5
8yrs	8.3	29.0	0.5	8.0
9 yrs	8.2	44.0	1.0	6.0
10 yrs	6.8	40.0	1.0	1.0

TABLE 37

HUMAN CONTENT

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
None	76.0	62.0	55.0	60.0	65.0	74.0
One figure	15.0	26.0	25.5	17.5	18.0	13.0
More than one figure	9.0	12.0	19.5	22.5	17.0	13.0
Total human content	24.0	38.0	45.0	40.0	35.0	26.0

TABLE 38

HUMAN BEINGS

(a) BOYS			(b) GIRLS	
Age	Ballard	Frost	Ballard	Frost
5yrs	14.0	15.5	22.2	33.0
6yrs	13.3	33.0	20.0	41.0
7 yrs	8.8	37.5	11.7	52.0
8 yrs	7.9	36.5	6.9	45.5
9 yrs	6.9	25.5	6.3	44.0
10 yrs	9.9	29.0	7.5	21.5

TABLE 39

ANIMAL CONTENT

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Boys	15.0	28.0	32.0	24.0	11.0	12.5
Girls	15.5	41.0	45.0	44.0	36.5	16.5
Total	15.0	34.5	39.0	32.5	24.0	14.0

TABLE 40
ANIMAL CONTENT

(a) BOYS			(b) GIRLS	
Age	Ballard	Frost	Ballard	Frost
5yrs	9.1	15.0	8.3	15.0
6yrs	8.5	28.0	8.3	41.0
7yrs	8.4	32.0	7.7	45.0
8yrs	11.6	24.0	9.3	44.0
9yrs	9.8	11.0	11.5	36.5
10yrs	9.8	12.5	10.3	16.5

TABLE 41

FIGURES

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Animal	15.0	34.5	39.0	32.5	24.0	14.0
Human	24.0	38.0	45.0	40.0	35.0	26.0
Fantastic	2.0	1.5	0.5	1.5	0.5	0.5

TABLE 42

STILL LIFE

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Girls	0.0	0.0	1.0	1.5	3.5	7.0
Boys	0.0	0.0	0.0	1.0	0.0	1.0
Total	0.0	0.0	0.5	1.5	2.0	3.5

TABLE 43DESIGNS

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Total	0.0	0.0	0.5	0.5	1.0	2.5
Girls	0.0	0.0	1.0	1.5	1.0	2.5
Boys	0.0	0.0	0.0	0.0	1.0	2.5

TABLE 44SUN

	Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	Present	26.5	59.0	61.0	45.0	32.0	30.0
	Anthropo- morphised	8.0	31.5	15.0	8.0	8.5	3.5
BOYS	Present	6.0	31.0	46.0	27.5	24.5	12.5
	Anthropo- morphised	0.0	9.5	13.0	8.0	2.5	2.5
TOTAL	Present	16.0	45.0	54.0	35.0	28.0	19.5
	Anthropo- morphised	4.0	20.0	14.0	8.0	5.5	3.0

TABLE 45
MOON OR STARS

		5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
GIRLS	%	4.5	9.5	4.5	0.0	1.0	1.0
BOYS	%	1.5	4.0	2.0	3.0	0.0	1.0
TOTAL	%	2.0	7.0	3.0	1.5	0.5	1.0

TABLE 46
TOTAL SUN & MOON OR STARS

		5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
	Boys	7.5	35.0	48.0	30.5	24.5	13.5
	Girls	31.0	68.5	65.5	45.0	33.0	31.0

TABLE 47
WEAPONS

		5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
	Boys	3.0	4.0	8.5	15.0	17.0	26.0
	Girls	0.0	0.0	0.0	0.0	2.5	0.0
	Total	1.5	2.0	4.0	8.5	10.0	13.5

TABLE 48

LETTERS

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Boys	20.0	4.0	1.0	2.0	8.5	13.0
Girls	22.0	6.5	2.5	0.0	1.0	7.0
Total	21.0	5.0	2.0	1.0	5.0	11.0

TABLE 49

SCRIBBLE PATTERN

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Boys	15.0	2.0	1.0	0.0	0.0	0.0
Girls	6.0	1.0	0.0	0.0	0.0	0.0
Total	11.0	1.5	0.5	0.0	0.0	0.0

TABLE 50

UNRELATED OBJECTS

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Boys	49.0	12.0	2.0	0.0	1.0	2.0
Girls	34.5	13.5	1.0	0.0	0.0	0.0
Total	42.0	13.0	1.0	0.0	0.5	1.0

TABLE 51
SINGLE OBJECT

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Boys	15.0	9.0	0.0	5.0	3.5	2.5
Girls	11.0	2.0	1.0	1.5	0.0	5.0
Total	13.0	6.0	0.5	3.5	2.0	3.5

TABLE 52
PERSEVERATION

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Total	7.0	13.5	8.0	4.0	5.5	2.0
Girls	9.5	18.0	10.0	5.5	8.5	5.0
Boys	4.5	9.5	5.5	3.0	2.5	0.0

TABLE 53

ORDER OF FREQUENCY OF OCCURRENCE

BOYS

Content/Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs	All ages
Ships	2	2	1	1	1	1	1
Vehicles	3	6	3	3	2	2	2
Human beings	4	4	2	2	3	3	3
Houses	1	1	6	5	4	5	4
Plant Life	4	3	4	6	5	4	5
Animals	6	5	5	4	6	6	6

GIRLS

Houses	1	1	2	2	2	2	2
Human beings	3	3	3	3	3	3	3
Plant life	2	2	1	1	1	1	1
Animals	4	3	4	4	4	4	4
Ships	5	5	6	5	6	5	5
Vehicles	6	6	5	6	5	6	6

TABLE 54

ORDER OF FREQUENCY OF OCCURRENCE

BOYS

	Frost	Ballard London	Ballard Glamorgan
Ships	1	1	1
Vehicles	2	6	8
Human beings	3	5	6
Houses	4	4	3
Plant Life	5	3	5
Animals	6	7	4

GIRLS

Plant life	1	1	1
Houses	2	2	2
Human beings	3	4	6
Animals	4	5	5
Ships	5	6	3
Vehicles	6	7	9

DEVELOPMENTAL TRENDS IN THE FORMAL ASPECTS OF GIRLS' DRAWINGS

Age		5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
SIZE -	Small Size	37.5	36.0	24.0	19.0	7.5	6.0
OUTLINE {	Unclear	12.5	18.0	2.0	1.5	0.0	0.0
	Sharp	1.5	15.0	23.0	32.0	40.0	31.0
LINE-MASS {	Line	28.0	7.5	2.0	0.0	0.0	1.0
	Mass	6.0	15.0	48.0	75.0	84.0	75.0
	Mixed	66.0	77.5	50.0	25.0	16.0	24.0
PAGE COVERAGE {	Complete	0.0	0.0	7.5	32.0	53.5	47.5
	Incomplete	100.0	100.0	92.5	68.0	46.5	52.5
PENCIL {	Strong	37.5	38.0	14.0	16.0	14.5	14.0
PRESSURE {	Weak	11.0	11.5	19.0	28.0	33.0	14.0
PENCIL {	Good	51.5	36.0	61.5	84.0	73.0	72.5
CONTROL {	Poor	29.5	51.5	37.5	14.5	27.0	27.5
RHYTHM- {	Rhythmic	40.5	66.0	83.0	61.0	63.5	67.0
STASIS {	Static	59.5	34.0	17.0	39.0	36.5	33.0

SUMMARY TABLE II

DEVELOPMENTAL TRENDS IN THE COLOUR OF GIRLS' DRAWINGS

Age		5 yrs	6 yrs	7 yrs	8yrs	9 yrs	10 yrs
Number of Colours	1 - 4	23.5	9.5	3.5	7.0	5.0	16.5
	5 - 8	76.5	90.5	96.5	93.0	95.0	83.5
Compatibility of Colors	{ Compatible	48.5	27.5	28.0	44.0	82.0	71.5
	{ In-Compatible	51.5	72.5	72.0	56.0	18.0	28.5
Hues used	{ Monochromes	1.5	0.0	0.0	0.0	1.0	1.0
	{ Mixture Gps.k,2,3	77.0	98.0	99.0	97.5	95.0	92.0
	{ Other Mixtures	21.5	2.0	1.0	2.5	3.5	7.0

SUMMARY TABLE II

DEVELOPMENTAL TRENDS IN THE COLOUR OF GIRLS' DRAWINGS

Age		5 yrs	6 yrs	7 yrs	8yrs	9 yrs	10 yrs
Number of Colours	1 - 4	23.5	9.5	3.5	7.0	5.0	16.5
	5 - 8	76.5	90.5	96.5	93.0	95.0	83.5
Compatibility of Colors	{ Compatible	48.5	27.5	28.0	44.0	82.0	71.5
	{ In-Compatible	51.5	72.5	72.0	56.0	18.0	28.5
Hues used	{ Monochromes	1.5	0.0	0.0	0.0	1.0	1.0
	{ Mixture Gps.k,2,3	77.0	98.0	99.0	97.5	95.0	92.0
	{ Other Mixtures	21.5	2.0	1.0	2.5	3.5	7.0

SUMMARY TABLE III

DEVELOPMENT TRENDS IN THE CONTENT OF GIRLS' DRAWINGS

Age		5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Houses		78.0	82.0	68.0	61.5	63.5	52.0
Boats		8.0	16.0	7.0	9.5	3.5	8.5
Animal Figures		15.0	41.0	45.0	44.0	36.5	16.5
Human "		33.0	41.0	52.0	45.5	44.0	21.5
Plant Life		42.0	70.5	77.0	73.5	75.5	77.0
Still Life		0.0	0.0	1.0	1.5	3.5	7.0
Designs		0.0	0.0	1.0	1.5	1.0	2.5
SCENES	(With animate content	28.0	60.0	70.0	69.5	61.0	31.0
	(without animate content	12.5	19.0	20.0	21.5	34.0	47.5
TOTAL		40.5	79.0	90.0	91.0	95.0	78.5
SCENES - Sky & Earth meet		0.0	0.0	9.5	35.5	39.5	48.0
(% of scene drawers)							
NARRATIVE SCENES							
(% of Scene drawers)		0.0	2.5	2.0	12.0	0.0	2.5
SUN	(PRESENT	26.5	59.0	61.0	45.0	32.0	30.0
	(Anthropomorphised	8.0	31.5	15.0	8.0	8.5	3.5
	(Anthropomorphisation	30.0	53.5	24.5	18.0	26.5	11.5
As % of Sun drawers							
Letters		22.0	6.5	2.5	0.0	1.0	7.0
Scribble Pattern		6.0	1.0	0.0	0.0	0.0	0.0
Collection of Unrelated objects		34.5	13.5	1.0	0.0	0.0	0.0
Single object		11.0	2.0	1.0	1.5	0.0	5.0
Perseveration		9.5	18.0	10.0	5.5	8.5	5.0
Moon and Stars		4.5	9.5	4.5	0.0	1.0	1.0

DEVELOPMENTAL TRENDS IN THE FORMAL ASPECTS OF BOYS' DRAWINGS

Age		5yrs.	6yrs.	7yrs.	8yrs.	9yrs.	10yrs.
SIZE - Small Size		21.5	25.0	26.0	19.0	8.5	6.0
OUTLINE - Not Clear		26.0	14.5	5.5	8.0	2.5	0.0
	Sharp	0.0	17.5	18.0	29.5	39.0	30.0
	Line	38.5	17.5	3.0	3.0	3.5	2.5
LINE-MASS	Mass	21.5	25.0	33.5	74.5	69.5	81.0
	Mixed	40.0	57.5	63.5	22.5	27.0	16.5
PAGE	(Complete	0.0	0.0	3.0	26.5	46.5	34.5
COVERAGE	(Incomplete	100.0	100.0	97.0	73.5	53.5	65.5
PENCIL	(Strong	45.0	39.0	23.5	22.5	16.0	21.5
PRESSURE	(Weak	12.0	8.0	10.0	17.0	19.5	17.5
PENCIL	(Good	45.0	39.0	57.0	72.0	68.0	67.5
CONTROL	(Poor	40.0	52.5	42.0	27.5	30.5	32.0
	(Rhythmic	41.5	60.0	63.0	57.5	72.0	77.0
RHYTHM- STASIS	(Static	58.5	40.0	37.0	42.5	28.0	23.0

SUMMARY TABLE V

DEVELOPMENTAL TRENDS IN THE COLOR
OF BOYS' DRAWINGS

Age		5 yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Number of Colors	1 - 4	52.5	16.5	12.0	20.5	30.0	30.5
	5 - 8	47.5	83.5	88.0	79.5	70.0	69.5
COMPATIBILITY of COLORS	{ Compatible	65.0	26.0	22.5	43.5	68.0	65.0
	{ Incompatible	35.0	74.0	77.5	56.5	32.0	35.0
HUES	{ Monochromes	10.5	10.0	0.0	0	0.0	1.0
	{ Mixture Gps. 1, 2, 3	69.5	92.5	95.0	93.0	91.0	86.0
	{ Other Mixtures	20.0	7.5	5.0	7.0	9.0	13.0

SUMMARY TABLE VI

DEVELOPMENTAL TRENDS IN THE CONTENT OF BOYS' DRAWINGS

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
HOUSES	43.0	51.5	32.0	20.0	20.5	13.0
BOATS	41.5	46.5	52.0	60.5	60.0	61.0
LAND VEHICLES	20.0	18.5	17.0	7.0	13.5	11.0
AIR VEHICLES	3.0	8.0	18.5	22.0	30.5	29.0
HUMAN FIGURES	15.5	33.0	37.5	36.5	25.5	29.0
ANIMAL "	15.0	28.0	32.0	24.0	11.0	12.5
PLANT LIFE	15.5	35.0	34.5	18.0	14.5	14.0
SCENES { With animate content	12.0	45.5	53.5	46.5	29.5	31.5
SCENES { Without " "	11.0	13.5	27.0	32.5	51.0	35.5
TOTAL	23.0	49.0	80.5	79.0	80.5	67.0
SCENES { Sky & Earth meet	0.0	0.0	2.5	26.5	54.0	50.0
SCENES - { % of Scene drawers						
SCENES - { Narrative scenes						
SCENES - { % of Scene drawers	0.0	5.0	0.0	0.0	1.5	0.0
SCENES - { Present	6.0	31.0	46.0	27.5	24.5	12.5
SCENES - { Anthro-morphised	0.0	9.5	13.0	8.0	2.5	2.5
SUN { Anthro-morphisation						
SUN { % of sun drawers	0.0	30.5	28.5	29.0	10.5	20.0
LETTERS	20.0	4.0	1.0	2.0	8.5	13.0
SCRIBBLE PATTERN	15.0	2.0	1.0	0.0	0.0	0.0
COLLECTION OF UNRELATED OBJECTS	49.0	12.0	2.0	0.0	1.0	2.0
SINGLE OBJECT	15.0	9.0	0.0	5.0	3.5	2.5
PERSEVERATION	4.5	9.5	5.5	3.0	2.5	0.0
MOON AND STARS	1.5	4.0	2.0	3.0	0.0	1.0

DEVELOPMENTAL TRENDS IN THE FORMAL ASPECTS OF CHILDREN'S DRAWINGS

Age	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Small size	29.0	30.5	25.0	19.0	7.5	6.0
Outline (Not clear)	19.0	16.5	3.5	5.0	1.0	0.0
(Sharp	1.0	16.0	20.0	30.5	39.5	30.0
(Line	33.0	12.5	2.5	1.5	2.0	2.0
LINE MASS (Mass	14.0	19.5	41.0	74.5	76.0	78.5
(Mixed	53.0	67.5	57.5	24.0	22.5	19.5
PENCIL (Strong	40.5	38.5	19.0	19.5	15.0	18.5
PRESSURE (Weak	12.0	10.0	14.5	21.5	26.0	16.0
PENCIL (Good	48.0	43.0	60.0	77.5	70.5	70.0
CONTROL (Poor	35.0	52.0	40.0	22.0	28.5	30.0
PAGE COVERAGE - COMPLETE	0.0	0.0	7.5	29.0	50.0	40.0
RHYTHM-STASIS (Rhythmic	41.0	63.0	73.0	59.0	67.5	72.5
(Static	59.0	37.0	27.0	41.0	32.5	27.5
EXPANSION (Compression	56.0	32.0	19.0	16.0	11.5	14.0
-COMPRESSION)	44.0	68.0	81.0	84.0	38.5	86.0
(Expansion						

SUMMARY TABLE VIII

DEVELOPMENTAL TRENDS IN THE COLOUR OF CHILDREN'S DRAWINGS

AGE		5 yrs	6yrs	7yrs	8yrs	9yrs	10yrs
No. of COLORS	{ 1 - 4	38.0	13.0	7.5	14.5	17.5	25.0
	{ 5 - 8	62.0	87.0	92.5	85.5	82.5	75.0
COMPATIBILITY OF COLORS	{ Compatible	56.0	27.0	25.5	44.0	75.0	68.0
	{ Incompatible	44.0	73.0	74.5	56.0	25.0	32.0
HUES USED	{ Monochrome	6.0	0.0	0.0	0.0	0.5	1.0
	{ Mixture						
	{ Groups 1,2,3	73.0	95.5	97.5	95.0	93.5	88.0
	{ Other						
	{ Mixtures	21.0	4.5	2.5	5.0	6.0	11.0
DOMINANT HUES	{ Group I	12.0	11.0	19.0	19.0	26.5	27.5
	{ " II	20.0	19.0	23.5	31.5	21.0	21.0
	{ " III	20.0	19.5	22.0	26.5	26.5	29.0

DEVELOPMENTAL TRENDS IN THE CONTENT OF CHILDREN'S DRAWINGS

	5yrs	6yrs	7yrs	8yrs	9yrs	10yrs
Houses	65.0	66.5	51.0	37.0	42.0	29.5
Boats	25.0	31.0	28.0	38.5	31.5	40.0
Land Vehicles	13.0	12.0	10.0	6.5	9.0	7.0
Air "	2.0	4.5	12.0	12.5	16.0	17.5
Still Life	0.0	0.0	0.5	1.5	2.0	3.5
Designs	0.0	0.0	0.5	0.5	1.0	2.5
Human Figures	24.0	38.0	45.0	40.5	35.0	25.5
Animal Figures	15.0	34.5	39.0	32.5	24.0	14.0
SCENES (Animate	20.0	52.5	62.5	56.0	45.0	31.0
(Inanimate	12.0	16.0	23.0	28.0	42.5	40.5
(TOTAL	32.0	68.5	85.5	84.0	87.5	71.5
Narrative Scenes	0.0	2.5	1.0	4.5	0.5	1.0
Earth meets sky	0.0	0.0	6.0	29.0	47.0	48.5
Plant Life	29.0	52.5	57.0	41.5	45.0	40.0
(Present	16.0	45.0	54.0	35.0	28.0	19.5
Sun (Anthropomorphized	4.0	20.0	14.0	8.0	5.5	3.0
Letters	21.0	5.0	2.0	1.0	5.0	11.0
Scribble pattern	11.0	1.5	0.5	0.0	0.0	0.0
Unrelated Objects	42.0	13.0	1.0	0.0	0.5	1.0
Single object	13.0	6.0	0.5	3.5	2.0	3.5
Perseveration	7.0	13.5	8.0	4.0	5.5	2.0
Moon and Stars	2.0	7.0	3.0	1.5	0.5	1.0
Fantastic Figures	2.0	1.5	0.5	1.5	0.5	0.5

DISCUSSION

In the introduction it was noted that drawings were thought to be projective in nature. In the following discussion of the quantitative results, though reference is made to data which are probably projective in nature, the intention is not to discuss projective testing as such but to discuss the limits of, and bases for, projective interpretation of the drawings.

A. FORMAL ANALYSIS

1. Size of Form Elements.

Size of drawing elements appears to be a projective correlate of feelings of importance, security, inferiority or similar emotions.

Despert (16) reports the association of very small drawings with "severe anxiety", and Brick (14) states that rejected and deprived children cramp their work closely to the bottom part of the paper. Traube (53) likewise notes that small drawings indicate feelings of inferiority and Lembke (37) that such sizes were drawn by timid children. Schmidl-Waehner (51) claims (in her investigation of adolescent girls) that "only four girls show sequences with a majority of small form elements ... these were all students who were described as constricted, very inhibited, three of them as

disturbed."

All of these authorities agree in associating small size with inferiority feelings, withdrawal or inhibition. We would expect then, to find a small percentage of our children using such sizes. In fact drawings containing only "very small" form elements are extremely deviant, only four out of the whole sample of 1090 children drew in this manner. Drawings containing "small" elements are somewhat greater in number (see table 1) but their numbers decline with increasing age and after the eight-year level are markedly deviant. The figures suggest that if the cutting point were placed at two inches, small sizes could be considered sufficiently deviant, at all ages, to be suggestive of some clinical correlate. The figures of the present study do not then contraindicate the propositions of the above mentioned authorities.

As would be expected, large sizes have been associated with extraversion. Ruesch and Finesinger (49) have recorded that "the area used in the colour drawings is nearly twice as great for the extratensive type as that used by ... the introversive or ambiequal type." Schmidl-Waehner (51) includes large form elements among her indices of extensiveness. Elkisch's category of "expansion", which implies large forms in the main, is said, by her, to be "a symptom of vitality and of a healthily developed extraversion" (19).

The figures for large sizes show no decline with age as do those for small sizes. Certainly at years six and seven the frequency declines to a level indicating possible significance but it rises again at the eight-year level.

There is, however, a marked sex difference. The boys draw significantly more large forms than do the girls (Chi-square = 37.1 d.f. equals, 1, $p = < 0.01$). This is balanced by the girls drawing significantly more mixed sizes than the boys (Chi-square = 19.18, d.f. = 1, $p = < 0.01$). This difference is partially due to the fact that girls draw more houses and gardens involving mixed sizes.

There appears to be much less reason to consider large sizes to be of diagnostic importance than is the case with small sizes.

It may be as, Schmidl-Waehner et al. say, that large sizes imply extraversion, but extraversion (in our culture) needs to be rather more extreme than the corresponding level of introversion, before it becomes clinically significant. The fact that boys draw more large sizes than girls is consistent with a correlate of extraversion inasmuch as boys in general are expected, and to some extent trained, to be more extraverted than girls.

There does not appear to be any necessary association between intelligence and any given size (providing the ten-year

group is similar in this respect to the other age levels.) Statistical tests tend to show that the children drawing "large size" and those drawing other sizes are homogeneous with respect to intelligence (Chi-square = 1.898, d.f. = 1, $p. = \text{~~0.10~~}. > 0.10$)

Elkisch's handling of the question of the size of form elements is by means of her categories "Expansion" and "Compression." These categories are in fact a combination of distribution and size. A compressed drawing is, in the majority of cases, also a drawing of small elements. But it is not necessarily so; a drawing of large elements tightly grouped in the centre of the page surrounded by space on three or four sides would also be considered by her to be compressed. Conversely an expansive drawing is usually one of large, or at least mixed, forms, but occasionally one will find an expansive drawing using small forms, usually of the 'explosive' type mentioned by Elkisch.

The figures obtained for these categories bear a distinct similarity to those obtained for size. The frequency of occurrence of compressed drawings, like that for small size, declines with decreasing age. Here, also the older child who draws "compressed" drawings is deviant.

The necessity for using both types of analysis i.e., for size and compression-expansion, particularly as the age

development is almost identical, may be queried. However, inasmuch as the concept of distribution is included in the latter type of analysis, there is at least a prima facie reason for considering it as a separate factor. Further study of the relationships involved is necessary.

2. Outline

Clarity of outline, as may be expected, increases in frequency of occurrence with age. The decrease of the "not clear" outline is quite sharp. Even at five years of age there is a possibility that it is a deviant attribute and by seven years there is not doubt of its marked deviance. "Sharp" outline however, increases with age though it never rises above 40% of an age group, and up to seven years can be considered of possible diagnostic significance.

Some explanation of the possible significance of sharpness of outline has been made by Schmidl-Waehner. In her 1946 study she differentiates rigid outlines, which are immediately made, from rigid contours which are made after the forms are drawn. The latter are said to imply "repression of hostile ideas" while the former imply "control within the general span of adjustment or normality" (51).

Presumably weak, or not clear, outlines would indicate lack of control, but whether this occurs within the span of normality or is deviant requires further investigation.

Clarity of line is partly a function of increasing realism of representation and partially a function of increasing neuro-muscular control. However, there is a possibility, particularly when combined with, "stasis", that very sharp outlines denote a certain rigidity of personality.

Schmidl-Waehner notes that there is no significant correlation of sharp outline with intelligence. Results found with the ten-year group support this proposition ($\text{Chi-square} = 2.69$, $\text{d.f.} = 1$, $p = > .10$). Nor does there appear to be any significant sex difference with respect to outline though there is some tendency for the older boys to draw more "not clear" outlines.

3. Line or Mass.

The frequency of occurrence of line drawings decreases with increasing age as do drawings using mixed line and mass. Mass drawings, therefore, increase in frequency with age (see table 4). A clear picture of the decline of line usage with age is gained when the frequencies for the mixed mass and line are added as constants to the figures for line and mass. (See table 5).

The use of line alone after the five-year level is deviant, becoming more marked after six years. There appears to be some connection between this use of line alone and a withdrawn personality. Schmidl-Waehner (50) writes that it is characteristic of normal children to use lines as well as

spots (i.e. mass), but that the most withdrawn children prefer to draw only in lines. In her 1946 study she claims that a preference for lines indicates introversion and a preference for spots, extraversion. Elkisch (20) says that simplicity of drawing (i.e., a tendency to line only) stands for primitivisation, and articles by Norman (45), Modell (42), and Bender and Keeler (10) dealing with schizophrenics demonstrate a preference for line among this group.

Boys draw significantly more line drawings than do girls ($\chi^2 = 6.284$, d.f. = 1, $P = < .02$). This is true of all age levels (see table 4). Girls, however, do more mixed drawing than boys ($\chi^2 = 4.619$, d.f. = 1, $P = < .05$). If the "mixed" percentages are added as constants to the line percentages for both girls and boys (see table 6) there appears to be no consistent difference in the frequency of line component between the sexes.

There is a tendency for the drawers of line and mixed line-mass drawings to be more intelligent than the drawers of mass drawing ($\phi = 0.21$, $r_{\phi} = 0.34$ for the ten-year group) the correlation is a very significant one statistically ($\chi^2 = 8.511$, d.f. = 1, $p = < .01$). This result means that intelligence must be considered as a factor in dealing with the significant of line drawing, as well as purely emotional factors.

Schmidl-Waehner's proposition of a correlation between spots (mass) and extraversion does not seem to be diagnostically useful in view of the large frequencies of occurrence of mass drawings at most age levels. It is quite possible and even likely (in view of the data found by this and other investigations of line drawings) that the extraverted child draws mass drawings but the contrary, (i.e. that mass drawers are extroverts) is not necessarily the case.

Cultural factors may be important here as the preference for mass seems to appear earlier in the subjects of this study than it does in children cited by Eng (21).

4. Coverage of Page

The degree to which the page is covered increases with age. In this study figures are available only for complete and incomplete coverage. Complete coverage develops from zero at year six to 50% at year nine and 40% at year ten (table 7).

As all the children who covered the page drew scenes, a truer index of coverage may be given by a percentage of these scene drawers. (Table 8). We then find that over 50% cover the page at years nine and ten. What is the significance of the degree of page coverage? Intelligence does not seem to be a significant factor. In the ten-year group the correlation is not significantly above zero ($\Phi = 0.07$, chi-square = 0.742 , d.f. = 1, $p = > .30$).¹

If mass drawing does indicate a tendency to extraversion it is even more likely that degree of page coverage is linked

1. These figures refer to scene drawers, the correlation would be even less if the total ten-year population was used in the 2 x 2 tables

with extraversion but this needs investigation. There is also the possibility that artistic ability is involved here, i.e. that degree of page coverage is correlated with the degree of artistic ability. This also needs investigation. It is certain, however, that it is something which develops with age. This would tend to discount the extraversion theory, especially with respect to children under eight years of age.

5. Rhythm or Stasis.

There appears to be no even development in rhythm with age. There is an increase in the frequency of occurrence of rhythm from five to seven years but then it drops again at year eight (in both boys and girls) and then slowly rises once more to ten years. The ratios of rhythm-stasis at the different age levels, though not developing regularly, do show significant differences between themselves. The proportions concerned are not drawn from a homogeneous population ($\chi^2 = 25.13$, d.f. = 4, $p. = < .01$).

Presumably then, whatever factors are operating to produce rhythmic drawings are not evenly distributed in the age groups. Just what these factors are is uncertain. Elkishh suggests that rhythm represents "the inner dynamics of the individual" (19) but she does not explain what is implied by this phrase.

Schmidl-Waehner found that gifted children drew the most motion elements (50) and feeble minded the least. She also found a tendency for rhythm to be absent from the drawings of neurotic children which implies that static drawings are suggestive of limited intelligence or neurosis. Elkisch considered "Rule" (her version of Stasms) to represent "the static uniformity of the external world" and said that "regulation is dominant in it" (14). Traube (53) also considered lack of portrayal of movement as indicative of mental deficiency.

These authors give the impression that intelligence and neurotic control are two factors operating in the question of rhythm or stasis. The figures found in the present study give no indications as to the latter factor though they do show some support for considering intelligence as important. There is a definite, positive, though slight, correlation of rhythm and intelligence ($\Phi = 0.19$). This correlation is very significant ($\text{Chi-square} = 6.94$, d.f. = 1, $p < 0.01$). The correlation is further increased if the five design drawings (all of which are by their nature static) are removed from the sample. The Φ then becomes 0.23 and the chi-square, 10.4. The mean I.Q. of the rhythmic group is 106.1 and that of the static group 97.8. This difference of 8.3 points is highly significant ($t = 3.47$, d.f. = 198 $p < 0.01$). With the five designs removed the mean "static" I.Q. = 95.5.

Notwithstanding the significance of the above figures, they are not sufficiently definite to preclude the operation of other factors of greater influence than intelligence. These factors need to be investigated to see if they can be identified with the neurotic control suggested by Schmidl-Waehner and Elkisch.

6. Strength of Pencil Pressure.

There is a definite decline in strong pencil pressure with age. This is so with both girls and boys, though not with equal regularity. The other sub-categories (weak, moderate and mixed) do not show any such development.

Traube (53) drew attention to the possible diagnostic value of the strength of stroke, but did not specify any details. Wolff (55) claims that strong pressure suggests force and vitality while weak pressure indicated weakness. Similarly, Alschuler and Hattwick (2) consider that children who painted with heavy strokes were usually assertive and that weak strokes were associated with restraint and repression.

Intelligence is also related to this matter. Weak pressure tends to be correlated positively with intelligence ($\phi = 0.14$, $\chi^2 = 4.154$, d.f. = 1, $p = < .05$) and strong pressure negatively. ($\phi = -0.3$, $\chi^2 = 17.07$, d.f. = 1, $p = < .01$). The general correlation of degree of pressure and intelligence is expressed by the obtained figure of $r = 0.51$.¹

1. r is an estimate of Pearson's r derived from ϕ cf. Edwards - Statistical Analysis p.121 (18).

Over the age range of six to nine years inclusive the girls draw significantly more weak pressure drawings than the boys ($\chi^2 = 9.448$, d.f. = 1, $p = < .01$). Conversely the boys draw more strong pressure drawings than the girls, though the difference is not so significant ($\chi^2 = 3.703$, d.f. = 1, $p = < .07$).

Therefore, maturity, sex and intelligence all enter into the question of pencil pressure as well as the suggested personality features of assertiveness and restraint.

7. Control of Pencil Stroke.

There is a tendency for good control of the pencil stroke to increase in frequency with age, but this development is not a smooth one. The apparent rise of poor control at six years is probably due, in the main, to the difficulty in analysing control at five years owing to the large proportion of indefinite objects drawn. There is, in fact, little difference in the amount of poor control to be found at both these year levels.

Wolff (55) claims that continuous change in the direction of strokes indicates insecurity. Lines going in different directions indicate impulsiveness. Alschuler and Hattwick (2) state that children who painted in every direction showed more outgoing and less controlled reactions than the others. No other investigators appear to have considered this variable.

It seems likely that the control of stroke is associated with smooth functioning of the neuromuscular apparatus and that any dislocation of this smooth functioning by emotional disturbance or impulse would lead to poor control of the pencil. If good control is a function of neuromotor stability then one might expect it to be dependent also on the degree of neuromotor maturity and hence to increase with age.

The degree of interest at the time of drawing would also be a factor in the amount of poor control. This, however, is a difficult variable to control in a mass survey. Intelligence is also a contributory variable. There is a moderate positive correlation of good control and intelligence ($\phi = 0.26$ or $\phi = 0.42$) and this correlation is very significant statistically ($\chi^2 = 13.72$, d.f. = 1, $p = < .01$).

It appears then that impulsiveness, interest, and intelligence are three factors which may be associated with the control of pencil stroke.

B. COLOR ANALYSIS.

1. Number of colors used

If we compare the frequencies for those children using four or less colors with those using five or more, we find that the former decline to year seven and then rise again to year ten. This occurs in both boys and girls. This means that year seven is the age at which the tendency to use all colors is at its highest peak. At years five and ten there is the greatest selectivity. Not that this selectivity is of great magnitude for over 62% of all ages used more than five colors.

The use of one or two colors, is markedly deviant at all ages, and greatly so after five years. From six to ten years the use of less than five colors is possibly significant.

Schmidl-Waehner remarks in her 1946 study (51) that all of her "adjusted group" used more than three colors and averaged five. She described those girls who used less than three as "emotionally poorly developed" or "emotionally constricted". She also describes the unadjusted girls who used more than six colors as impulsive hysteric types.

There is very little relationship between intelligence and the number of colors used ('phi' = 0.15, 'Chi-square' 4.686, d.f. = 1, $p = < 0.05$). The tendency that exists is for the more intelligent children to use less colors.

There is also a tendency for boys to use fewer colors than girls ('Phi' = 0.20) ('Chi-square' 44.77, d.f. = 1, $= < 0.01$).

It may be said then that the factors operating in the use of less than five colors are possibly connected with mal-adjustment, that there is a very small amount of variance due to intelligence and that the factors operate more in the case of boys than girls.

2. Compatibility of colors used

Here there is an irregular tendency for a change with age. At five years roughly half the girls or two-thirds of the boys' drawings are compatible. Then for the next two years the weighting is heavily on the side of incompatibility in both sexes. At eight years rough equality is established again (both sexes) and then at both nine and ten years the tendency is greatly on the side ^{of} compatibility (both sexes).

The five year olds (girls at least) tend to be indifferent to the similarities or differences of the various hues. This is in keeping with Eng's observations (21). The sixes and sevens apparently prefer vivid clashes, the more vivid the picture the better. At eight, however, the trend toward realism has begun and this aids the development of compatibility.

With the ten year olds there is a slight tendency for the more intelligent children to use compatible colors ('Phi' = 0.21). ('Chi-square' = 8.925, d.f. = 1, $p = < 0.01$).

Apart from the difference at five years, the frequencies for boys do not differ from those for girls in any significant way.

Incompatibility of colors is unlikely to be of much use as a diagnostic indicator before nine years of age and its significance even then is uncertain.

3. Hues used.

It can readily be seen that practically all children when given a choice will use colors from each of the three groups. However, they will not use them in the same quality; there will be dominant colors.

The use of monochromes or of mixtures other than from all three groups is so completely deviant, after 5 years of age, as to be extremely significant. Intelligence, however, is not a significant factor here ('Phi' = 0.03 'Chi-square' = 0.144, d.f. = 1 $p > 0.50$), the reasons for the choice of monochromes lie elsewhere.

The dominant hues vary in frequency of occurrence with age. Black, brown and yellow tend to increase with age; violet and orange to decrease with age; and blue, green and red do not vary a great deal.

For the whole sample of 1090 the order of preference for dominant colors is yellow (first), blue second, brown third, green fourth, red fifth, black sixth, violet seventh and orange last.

Schmidl-Waehner (50) found that red and blue were the most frequently used, then yellow; and that black and white were used in very small quantities.

Kouwer (36), in an investigation using adult subjects, found a similar order of preference - blue, red, white, green, yellow, orange, purple, brown and black. Eysenck on the other hand gives the order of preference as blue, red, green, violet, orange, yellow (22).

The three above quoted investigations as well as the present one have all found that blue, green and red are among the first five in order of preference, and all have found orange, violet and black among the last four.

It is interesting to consider the following linkages of color and descriptive feeling found by Kouwer.

Color	Description	% of sample giving this description.
Black	Grief, worry, misery	62%
Brown	Disagreeable	38%
Purple	"	41%
"	Grief	38%
Orange	Merry, Cheerful	43%
Yellow	Merry	34%
"	Aggressive	33%
Green	Youthful, fresh	49%
White	Femininity	69%
Red	Intense, fiery, exciting	55%
"	Active	78%
Blue	Social	41%
"	Agreeable	33%
"	Impersonal, unemotional	32%

It would be interesting to discover whether these linkages hold for children. If they do, more light would be thrown on the diagnostic significance of the various hue preferences.

Traube (53) states that a lack of color in drawings or a predominance of violet or brown indicates depression. Lembke (37) claims that timid children tend to use brown and violet, Brick (14) writes that a choice of dark and muddy colors was observed in children who were in states of anxiety and depression. Schmidl-Waehner (51) found that brown was dominant in 41% of the unadjusted students as against 18% of the adjusted.

The frequencies found in the present investigation for violet are so small as to be consistent with the above-mentioned correlations but the frequencies found for brown as a dominant are too large to permit of an unqualified acceptance of the above propositions with respect to that color. Brown accompanied by violet or black may indicate depression but hardly so if accompanied by red or yellow.

Similarly for black, Schmidl-Waehner (50) couples black and neurotic depressive children, Brick (14) states that "children obliged to repress emotions use either black or pencil only". Alschuler and Hattwick (2) report that 63% of the children who emphasised black, were rated as "controlled and repressive" on adjustment. The small frequencies for

black up to nine years are consistent with the above-mentioned propositions but the figure of 10% at year ten is getting a little high for unqualified acceptance of them.

However, it can probably be said in general that drawings having black, violet or brown as dominants without any considerable participation of the warm colors (red, yellow, orange) are sufficiently deviant to be consistent with a diagnosis of depression or anxiety.

With respect to the warm colors Traube considers that red is used by the more cheerful children. Alschuler and Hattwick link red with impulsive children. Schmidl-Waehner (50) considers that neurotic depressive children use little red.

The figures obtained in the present study do not permit of any comment on the above. Ruesch and Finesinger state that red and yellow were the colors most frequently used by their subjects (adults) but claim that feeble-minded individuals use red more frequently than do the other subjects. This does not appear to be true of the subjects of the present investigation. Of the children in the ten year group having an I.Q. of less than 80, only one uses red as a dominant color, the others use it sparingly.

Alschuler and Hattwick consider that the emphasis of blue and green indicates control of emotions. Our results do not permit of any comment on this proposition other than to remark

on the fact that the frequency of occurrence of these colors remains fairly constant over the whole age range. This is contrary to what might be expected if Alschuler and Hattwick are correct, as control might be presumed to increase with age.

C. CONTENT ANALYSIS

1. Scenes.

The general framework within which the content of most drawings appears is that of the scene. At five years of age already a third of the children draw scenes and by the time they reach nine years 87.5% of them do so. After year 6, it is the non-appearance of the scene which is significant rather than the appearance. There is with increasing age an increase in realism and aesthetic appeal. An index of this is the meeting of Earth and Sky at an horizon which occurrence increases in frequency from 0% of scene drawers at years 5 and 6 to 48.5% at year 10.

Children are, in the main, interested in depicting what goes on about them, their home, their holidays etc. A very small number draw scenes depicting incidents from fairy stories or other literature. The greatest frequency of such narrative scenes is at eight years of age.

Girls draw significantly more scenes than do boys ('Phi' = 0.15, 'Chi-square' = 26.16, d.f. = 1, $p = < 0.01$). They

also draw significantly more narrative scenes than do the boys ('Phi' = 0.25, 'Chi-square' = 67.57, d.f. = 1, $p = < 0.01$). This is no doubt connected with their greater interest in houses, plant life and verbal subjects.

There is no relationship of any significance between intelligence and scene drawing ('Phi' = 0.004, 'Chi-square' = 0.003, d.f. = 1, $p = > 0.90$).

2. Houses.

After scenes, houses are the most frequent content though more so in girls than boys. The greatest frequency of occurrence of house drawing is at six years of age, after that it declines with increasing age both in girls and boys, and is therefore a function of maturity.

Traube claimed that the drawing of a house symbolised a desire for shelter. The great frequency of occurrence of this content demonstrates that it cannot be taken simply as an indication of a desire for shelter and protection. Only with boys older than seven years are the frequencies low enough to suggest a possible diagnostic significance.

There is a very marked sex difference in the drawing of this content, girls draw very significantly more houses than do boys ('Phi' = 0.39, 'Chi-square' = 165.4, d.f. = 1, $p = < 0.01$). The popularity of houses with girls is so marked that it suggests that they identify themselves with that content.

The drawing of houses is negatively correlated with intelligence and the correlation is statistically significant. ('Phi' = -0.18, 'Chi-square' = 6,451, d.f. = 1, $p = < 0.02$).

This negative correlation may be due to the fact that as house drawing declines with increasing maturity, those children not as mentally mature as the other ten year olds stay fixated on houses longer.

The most thorough investigation of house drawing carried out so far was that of Madeline Kerr.

She investigated (1) whether typical houses exist for specific age groups; (2) the extent and range of certain types of house among normal children which are said generally to indicate tendencies to neurosis; and (3) the difference between drawings of houses made by normal, neurotic, and mentally defective children.

The subjects used were 555 normal children aged 6-14; 70 mentally defective children aged 6-14; and 60 emotionally disturbed children aged 6-14.

In all cases the children were asked to draw a house and no further instruction or help of any sort was given.

The main results were as follows:

1. Age Groups: Clear cut stages between the age groups were
Differences: not as apparent in drawings of houses as in the drawings of men (Goodenough and Burt scales).
 Kerr concluded that there was no steady maturation or development but that regressions occurred.

2. Comparison of Drawings of Mentally Deficient and Normal Children:

Significant differences were found in -

a) Drawing of roof on house -

<u>Age</u>	<u>Normal</u>	<u>M. D.</u>	
6, 7, 8	80.5%	12.5%	1
9,10	98.1%	52.9%	1
11,12	94.5%	91.6%	
13,14	98.2%	90.4%	

b) Curtains -

6, 8	21.5%	12.5%	
9,10	55.0%	23.5%	1
11,12	56.4%	37.5%	1
13,14	82.1%	19.0%	1

c) Successful Perspective -

6,- 8	1.4	0	
9-10	10.6	5.8	
11-12	14.9	4.1	1
13-14	31.2	9.4	1

1. Statistically significant.

d) 2 sided houses

	N.	M. D.
6 - 8	14.3	0 1.
9 - 10	40.6	11.6 1.
11 - 12	44.2	20.8 1.
13 - 14	58.9	19.0 1.

The general tendency is for the drawing of the M.D. children to be comparable with those from normal children several years their junior.

3. COMPARISON OF DRAWINGS MADE BY NORMAL & NEUROTIC CHILDREN

The following types of houses were found by Kerr to indicate difficulties in adjustment:-

1. Tall thin houses after the age of 6.
2. Houses with windows attached to the corners.
3. Houses with no bottoms, usually drawn on the edge of the paper.
4. Houses whose walls appear to be transparent.

The results found in her investigation were as follows:-

1. Tall thin houses -	Normal	% Neurotic	M.D.
	9.3	33.3 ¹	4.2
2. Corner windows	8.2	15	14.2
3. Transparency	1.2	6.6	7.1 ¹
4. No bottom	18.9	28.3	21.4

Some neurotic drawings combined some of the above details. The figures are:

	<u>%</u>	of drawings of neurotic children using above details.
1. detail	48.4	
2. details	45.5	
3. "	6.1	
4. "	0	

With respect to the question of houses typical of a given age group, the findings of the present study are consistent with those found by Kerr.

Table 24 gives the figures for the following four types of houses.

1. Primitive attempts which do not reach the stage of a box "plus roof".
2. Flat representation of a "box" with a roof.
3. A double-sided representation of a roofed "box".
4. More advanced representation.

There is some progression from a less to a more realistic portrayal of a house, but it is far from consistent.

Table 25 gives a more detailed account of the houses in terms of the following categories:-

1. Primitive attempts
2. Box without roof
3. Box with roof
4. Type 3 with path
5. Double sided box with roof
6. Type 5 with path
7. More advanced representation.

The present investigation did not deal directly with the differences between Normal and Mentally Deficient children. However, some of the results can be compared with those of Kerr.

The figures (see Table 25) for the drawing of houses with and without roofs seem much the same as those given by Kerr for normal children. The figures for the representation of curtains are as follows:-

Percentage of children aged -

6 - 8 years. drawing curtains	=	40
-------------------------------	---	----

Percentage of children aged -

9 - 10 years. drawing curtains	=	72.5
--------------------------------	---	------

These are somewhat higher than those given by Kerr for normal children, i.e. 21.5 and 55 respectively.

Successful perspective was not analysed in the present investigation.

The percentage of children drawing double sided houses was

1.	6 - 8 years	-	24.5
2.	9 - 10 "	-	47.

These figures are again higher than those given by Kerr for normal children i.e., 14.3 and 40.6 respectively, but are similar in degree.

COMPARISON OF NORMAL AND NEUROTIC CHILDREN:

The figures for the signs found useful ^{by} ~~for~~ Kerr for differentiating maladjusted children, are set out for the present study in Table 27.

The figures for the categories (a) Tall thin houses (b) Houses without bottoms and (c) Houses with transparent walls, are remarkably close to those found by Kerr from normal children. Children in the present investigation drew more (13.5% as compared with 8.2%) houses with corner windows than did the normal children in Kerr's study. The two signs that Kerr found statistically significant are the ones with the lowest frequencies in the present investigation.

However, what Kerr did not discover was that there are changes in the frequency of occurrence of these "signs" with changes in age. The frequency of "tall and thin" houses and houses with "transparent walls" decline with increasing age while houses "without bottoms" increase in frequency to eight years and then decrease. There is no regular pattern in the case of "corner windows".

The frequency of bottomless houses at seven and eight years is far too high for this sign to be of much use diagnostically at these ages. And the probability of diagnostic significance for the other signs is not the same at all ages.

It should be noted that as the sample of children used (within the age range in question), was an undifferentiated one presumably the frequency of these "maladjustment signs" is lower among the Hobart "normal" children than the given figures would imply.

A more recent study by S. Markham (57), using 100 children aged between 5 - 0 and 9 - 11 years, gives similar figures for two of the maladjustment signs, viz. transparent houses - 3% and houses without bottoms (paper basing) - 48%.

3. Boats

As houses are the favourite subject of girls, so boats are with boys. The frequency of occurrence, already 41.5% at five years, rises with increasing age to a peak of 61% at ten years.

The sex difference here is the most marked of the whole investigation ($\Phi = 0.49$, Chi-square = 258.1, d.f. = 1, $p = < 0.01$), and the popularity of the content with boys is so great that it may be presumed that boys identify themselves with this content.

This sex difference has also been reported by H.W. Oldham (56, P.30). She notes that "after the age of six, boys and girls began to show rather different tastes in their drawings; the boys preferred ships, motor cars and aeroplanes, while the girls remained faithful to their houses."

Unlike the case of houses, there is no significant relationship between boats and intelligence ($\Phi = 0.038$, Chi-square = 0.288, d.f. = 1, $p = 0.50$).

From their studies of children seen at the Bellevue Hospital, Bender and Wolfson (12) report:-

- a) that an important part of the tendency of children is to draw ships lies in the fact that such ship drawings follow easily in their development from primitive gestalt-tendencies and are therefore chosen as a universal symbol...
- b) that the wish implicit in the drawings is to come in closer relation to the body of the mother and to be carried by her. And that further, in the young and in regression, there is a tendency to regard the upright posture, self-sustained, as a definite burden. This is seen in some schizophrenics and in hysterical astasia-abasia.
- c) that the sun or the moon or any other background differentiation represents the father, that with the organisation of the background by way of recognising the sun in the heavens with its supportive warmth, comes the recognition of the father in the child's world. The mother (the boat) is the centre of the child's world, and the father (the sun) occupies a more peripheral but nevertheless essential position.
- d) that the universal symbol (the ship) corresponds to both psychoanalytic and gestalt principles, and that:

"nothing will be produced which does not conform to the internal organising forces of the visual motor functions, the emotional experience and the social environment.

e) that, given a certain number of pre-adolescent children with emotional and behaviour problems, in general unselected, who have an opportunity freely to produce pictorial art, a certain number will be compelled to draw boats. This probably represents children with particular problems in the Oedipus situation, due to serious disturbances in the parent and child relationships during the Oedipus period."

It is possible that the boat can sometimes by a symbol of the mother figure, clinical experience gives some reason to believe this. However, this does not mean that the sweeping generalisation given by Bender and Wolfson, to the effect that the drawing of a boat implies Oedipal difficulties, can be justified. 41 to 61% of boys draw boats, hence the drawing of a boat by a boy is normal not deviant.

In the case of girls, however, the drawing of a boat is quite deviant (from 3 to 16% only). It would be interesting to discover whether the girls who draw boats have a desire to be male, or to emulate males.

This distinct preference of girls to draw houses and boys to draw boats, seems to indicate that they may identify themselves with the objects rather than their mother.

4. Plant life.

Plant life is the most popular content element with girls but is only drawn by from fourteen to thirty five percent of boys.

The frequencies for the total sample give the impression of a peak at seven years and a decline thereafter, but this conceals the fact that though the boys draw less and less as age increases, the girls maintain a high rate which is the same at ten years as it is at seven.

As Ballard noted in 1912, girls seem to take much more interest in plant life than do boys. Similarly Oldham found that "girls ... like drawing gardens with apple trees and hollyhocks, find satisfaction in depicting fruit and flowers." (56, p.31). This interest is reflected in the very significant sex difference found in the present study - $\Phi = 0.49$, Chi-square = 257.6, d.f. = 1, $p = < 0.01$.

The degree of intelligence does not appear to have any influence on interest in plant life. Investigation of the ten year old group gave the figures $\Phi = 0.007$, Chi-square = 0.101, d.f. = 1, $p = > 0.70$.

Freud (24) claims that flowers are symbolic of the female sexual organs. Certainly it would appear that they have some correlation with the female sex. It would not seem, though, that their appearance in a drawing is necessarily of diagnostic significance, they are too frequently drawn for that.

5. Land Vehicles

Traube considers that drawing vehicles implies a desire for escape. This may be true on occasion but it is doubtful if it is the rule. Table 33 (boys) shows a tendency for the drawing of land vehicles to decline with increasing age, whereas, if the land vehicles were a symbol of escape, one would expect its frequency of occurrence to increase as the child grew older and had more reason to need freedom. The girls (Table 33) do not show this tendency so clearly though there is a marked drop from 5% at year nine to 1% at year ten.

Again there is a sex difference here, boys drawing significantly more such vehicles than do girls ('Phi = 0.17 'Chi-square' = 30.20, d.f. = 1, $p = < 0.01$). This result is in keeping with the tendency in our culture for males to be more interested in things mechanical than ^{are} females.

Once more, intelligence appears to play no part in the selection of this content ('Phi = 0.018 'Chi-square' = 0.0683, d.f. = 1, $p = > 0.70$).

6. Air vehicles.

Boys show more interest in aeroplanes or rocket ships than they do in land vehicles. The frequency of occurrence of air vehicles increases with increasing age contrary to the trend in land vehicles which declines. It is possible that air vehicles have come to represent the "symbol of escape".

which Traube postulates. It is more probable, however, as they are often used by the boys as a means of aggression that they identify themselves with this aspect of the air vehicles.

Girls do not show the same interest in this content; the difference is shown by the fact that 5% is the highest frequency for girls at any age while the boys' is 30.5%. The association of boys and air vehicles is shown by the figures ($\Phi = 0.29$, Chi-square = 90.99, d.f. = 1, $p = < 0.01$).

There is no significant correlation with intelligence ($\Phi = -0.015$, Chi-square = 0.044, d.f. = 1, $p = > 0.70$).

7. Human figures:

This content reached its highest frequency of occurrence at seven years of age. This finding is at variance with the figures given by Ballard whose frequencies apparently reached a nadir at nine years and increased again at ten years.

Girls draw significantly more human figures than do boys ($\Phi = 0.13$, Chi-square = 15.23, d.f. = 1, $p = < 0.01$). Only at ten years of age do the boys draw slightly more.

Intelligence is not a factor in the choice of this content ($\Phi = 0.049$, Chi-square = 0.492, d.f. = 1, $p = > 0.30$).

Most writers on the subject of the Rorschach test consider that adults give more human movement responses than do children. On this basis one would expect an increasing interest in human content with increasing age. This does not occur if one takes frequency of occurrence as an index. On the other hand with

increasing age, the human content tends to become more prominent until at ten years of age three drawings of human figures alone are found. The drawing of human figures alone does not occur before this age.

The majority of writers concerned with the Rorschach technique have also considered that frequency of human movement response correlates highly with intelligence.¹ Similarly Traube claimed that an absence of living beings from drawings was an indication of subnormality. Table 37 indicates that from 55% to 76% of the children draw drawings without human content.

The way in which different human figures are drawn and the placing of them in a drawing is, no doubt, of great clinical importance. A development of Machover's work (49) involving the gathering of norms with different age groups is very necessary.

8. Animal figures:

As with human figures, seven years of age is the high point of occurrence of this content. Again this finding is at variance with the figures given by Ballard whose frequencies reached a peak at nine years (girls) or eight years (boys).

1. A recent investigation, by Burnheim and Kawenoka, of Tasmanian secondary schoolchildren, casts some doubt on this supposed association.

There is a sex difference parallel with that found with human figures, girls drawing significantly more animals than boys ('Phi = 0.15 Chi-square = 26.28, d.f. = 1, p = ≤ 0.01).

As with human figures, intelligence appears to play no part in the choice, the correlation being insignificant ('Phi = -0.0023 Chi-square = 0.0011, d.f. = 1, p = > 0.80).

Bender and Rapaport in their study of the animal drawings of children under treatment (11), discuss the symbolic meaning of various animals. They found that the majority of the animals drawn were non-aggressive. Of these non-aggressive animals, horses, birds, dogs and cats were the most frequently drawn. They claim that there is some relationship between the drawing of horses and birds and truancy or vagrancy. Similarly "cat and dog pictures appear to symbolise children in the home and were drawn by children who came from broken homes." Drawings of ducks and ducklings were made by children with aggressive and rejecting mothers.

Bender and Rapaport divide the aggressive animals drawn into four types. Firstly there are the benign looking jungle animals - these are drawn by children with depressive or inferiority feelings connected with primitive or absent fathers. Secondly there are ferocious attacking animals which "seemed to stand for the punitive father" or alternatively, in the third case, for the child himself. Fourthly there are the animals with phobic features which again are symbolic of the father.

Rorschach workers have presumed that a high percentage of responses with an animal content indicated immaturity. On the basis of this one would expect a decline of the frequency of animal content with increasing age. This in fact occurs after year seven.

9. Still Life:

This content is almost solely drawn by girls, only two boys (one eight year old, one ten year old) so doing. It is not a popular content at any age (3.5% being the greatest frequency) but it increases in frequency directly with age. The sex difference mentioned is a significant one ('Phi = 0.08 'Chi-square' = 7.295, d.f. = 1 $p = < 0.01$) but there is no significant relationship with intelligence ('Phi = 0.041 'Chi-square' = 0.332, d.f. = 1, $p = > 0.50$).

It seems possible that this type of content might be chosen by introverted children not greatly interested in the environment about them which is represented by most children as a scene.

10. Designs:

Like "still life" this content is not a popular one though it increases in frequency with increasing age.

There is reason for believing that designs tend to be drawn by children above average in intelligence. The five children of ten years of age who drew designs had I.Q.'s ranging from 108 to 143 with a mean of 122.

This content would probably appeal to the intellectualistic child, the type who would have a high $F\%$ in the Rorschach. A study of the correlation of design drawing and Rorschach responses would be interesting from the point of view of discovery whether "abstract", non-representational responses were given to the Rorschach blots.

11. The Sun:

This content reaches its greatest frequency of occurrence at seven years of age and then declines with increasing age. Anthropomorphisation of the sun reaches a peak at six years and then decreases with increasing age. Maturity, therefore is a factor of importance in the drawing of the sun and in whether it is anthropomorphised.

The sun is drawn significantly more often by girls than by boys ('Chi-square' = 42.6, d.f. = 1, $p = < 0.01$) a result which may be of importance as can be seen later.

Unlike most content categories, the sun has a significant linkage with intelligence. Though the correlation is slight ('Phi = -0.17), the difference between sun-drawers and non sun-drawers is a significant one, the latter being the more intelligent (Chi-square = 6.017, d.f. = 1 $p = < 0.05$).

This negative correlation between sun-drawing and intelligence in ten year olds may not allow of generalisation to younger age groups. Sun-drawing being a maturity function probably the less mentally mature would continue to draw the sun as they progressed in age.

However, the negative correlation is larger still in the case of anthropomorphised suns. ($\Phi = -0.22$) and the difference is significant ($\chi^2 = 9.665$, d.f. = 1 $p = < 0.01$).

Bender and Wolfson, in the study quoted above, claim that the sun or Moon in drawings represent the father figure. The present investigation gives no direct proof or disproof of this but reference to tables 44 - 46 will demonstrate the remarkable interest shown by the subjects (particularly the younger children) in the sun. The fact that this interest is greater in girls than in boys may indicate some reason for supporting Bender and Wolfson's claim. It would be expected on the basis of the material presented by various psychoanalysts from Freud onward, that girls would be more fixated on their fathers than the boys. Also Freud¹ points out that the girl does not retreat from the Oedipus situation as much as the boy does. This may be the reason for the difference between the frequency of sun-drawing by nine and ten year old girls and that of nine and ten year old boys.

12. Moon and Stars:

This content was not drawn by very many subjects and the pattern of development is roughly parallel to that for the sun.

As with the sun there is a tendency for girls to draw more than boys.

13. Weapons:

This content is obviously dependent upon maturity as it

increases steadily in frequency of occurrence with increasing age.

It is also almost exclusively drawn by boys, only two girls (both nine years of age - draw weapons. The difference is quite significant ('Chi-square' = 66.2, d.f. = 1, $p = < 0.01$)

There does not appear to be any significant relationship with intelligence ('Phi = -0.06, 'Chi-square' = 0.755, d.f. = 1, $p = > 0.30$).

The use of weapons in drawings is probably an indication of aggression and hostility, particularly when a battle or fight is depicted.

It is interesting therefore to note that girls do not use this means for expression of aggression.

14. Letters:

The addition of letters to drawings occurs most frequently at five years of age and at ten years. The reason for the first occurrence is probably the desire to use a newly acquired skill - the construction of letters. At ten years words are used in a meaningful way - it is the beginning of that interest in verbal expression which will soon eclipse the interest in art as a means of expression.

The only sex difference is at the older end of the age range, the boys showing more interest in the verbal usage.

There is no significant linkage with intelligence at the ten year level at least ('Phi = -0.014 'Chi-square' = 0.038,

d.f. = 1, $p = > 0.80$).

15. Scribble pattern:

This content is found mainly at five years and has completely disappeared by eight years of age. There is a tendency for it to occur more often in boys' drawings.

The investigation of this primitive form of artistic expression is a study in itself. Löwenfeld (38), Seeman (52) and others have interested themselves in this field which is of importance with respect to the partially sighted or blind children, the pre-school child and the young mental defective. No attempt was made at analysis in the present investigation.

16. Unrelated objects:

This kind of content while common at the five year old level is extremely deviant after six years of age. There are no sex differences of any importance with respect to it.

Rouma (48) considered that drawings containing a collection of unrelated objects (flight of ideas) were indicative of subnormality in intelligence.

Despert (16, p. 283) calls attention to the regressive nature of such drawings when found in older psychotic children.

Elkisch writes "Disintegration is a sign of eccentricity or even of a serious split in the personality, and might be, if connected with other traits, a sign of schizophrenia" (19, p.17).

Of the four cases aged seven to ten years, two were borderline cases in that they had drawn a main drawing and had added one other item or items as an afterthought. The nine year old drew a jet plane in color and then added a rifle in black-lead pencil. One of the ten year olds drew a scene of a boat with planes overhead but did not give any connecting link in the way of "sea" or "sky".

The two seven year olds who drew true collections of unrelated objects had IQ's below 85. The other case, a ten year old, had an I.Q. of 82.

Using these three cases as a basis it may be said that there is in some support for the connection of the drawing of unrelated objects with limited intelligence.

It would be interesting to study the five year olds who draw this type of content to discover the traits associated with its appearance.

17. Single object:

The drawing of a single object is not frequently met with, particularly after five years of age. There is no consistent relationship to the sex of the drawer nor is there any significant correlation with intelligence ($\Phi = -0.015$ 'Chi-square' = 0.045, d.f. = 1, $p = > 0.80$).

The meaning of such a drawing is not clear, but it may be that it implies a deficient social sense or a fixation on intellectual interests.

18. Perseveration:

Rouma states that subnormal children like drawings in which the same movement recurs frequently. That is, they persevereate with respect to some formal element.

But Machover writes "perseveration, so common in children's drawings, may reflect in the child the sheer joy of repeating satisfactory motor patterns, while in adult drawing perseveration may indicate a low I.Q. deterioration, or neurotic refuge in safe, routine and confined areas of activity" (40, p.103).

The children who perseverated in their drawings were investigated and it was found that perseveration of any form element, within a drawing containing other form elements, was not indicative of mental retardation. All the children, except one, were found to be within the normal range of intelligence.

19. Comparison with Ballard

As all content, whether dominant or not, is listed in the tables of the present investigation, a direct comparison with Ballard cannot be made. However, in tables 23,29,31,36,38 and 40, Ballard's results and the present results are listed side by side.

Orders of preference are a little more comparable and it is interesting to note (Table 54) the correlation between the orders found for London and Glamorgan boys and the order for

Hobart boys. It is also significant that girls in Glamorgan and London in 1912 and in Hobart in 1954 given identical orders of preference for Plant Life and Houses. Similarly the three sets of boys place ships first on their list.

This gives further support for the selection of the house as the significant female symbol and the boat as that for the male.

A TENTATIVE DEVELOPMENTAL SCALE

A. Characteristics Representative of Girls' Drawings at Each Age Level.

Five years.

1. Form - At this age line drawing either alone or combined with small amounts of "mass" (more than found in boys' drawings) is characteristic. The drawings tend to be static in nature with clear outlines. Space is not used systematically and the page is never covered. The pencil pressure used in moderate or strong. No preference is shown in the size of form elements.
2. Colour - The majority of five-year-old girls use five or more colours. Colours are used from all three groups and no clear preference is shown for compatible or incompatible colours. Blue, red and green are preferred in that order with black least preferred; experimentation over the whole range, however, is common.

3. Content - Two-fifths of the five-year-old girls draw scenes, nearly three-quarters of these are animate. Plant Life (42%), Human Content (33%), and the sun (26%) are popular.

Over three-quarters include Houses in their drawings. These appear as objects or on a base line, rarely in a complete setting. They are flat representations with a roof but no curtains. Unrelated objects, letters and figures/^{are}also very frequent. Boats and land vehicles are uncommon.

Six Years.

1. Form - Mixed Line and Mass is typical, as are small or mixed sizes. The drawings are by now usually rhythmic and better spaced (more expanded). Control of the pencil, however is poor. Pressure remains strong or moderate.

2. Colour - Over half use seven or eight colours. They are used in an incompatible way. Red, blue and green are the preferred colours.

3. Content - Over three-quarters draw scenes nearly two-thirds of which are animate.

The frequency of occurrence of Houses reaches a peak of 82%. The houses are flat representations with a roof but without curtains and paths. About half are in a complete setting. Plant life, human content, animal content and the sun are all drawn very frequently.

Boats, although never frequent, reach a peak of 16%. Letters and unrelated objects begin to disappear.

Seven years.

1. Form - "Mass" Drawings are becoming more typical. Outlines are clear to sharp and there is increased expansion. There is a marked increase in rhythm which reaches a peak at this age. Pressure is, in general, moderate and control shows much improvement.
2. Colour - The only change from the six-year level is an increase in blue-green dominance.
3. Content - Ninety percent of the seven year olds draw scenes and nearly three-quarters of them are animate.

There is some decrease in the total number of houses drawn though they are still very common. Most of them are in a complete setting and a few have curtains. Some are double sided. Nearly a third are without bottoms. Plant life, human content, animal content and the sun continue to be high in frequency. Boats almost disappear.

Eight years.

1. Form - Mass drawing is now typical and line drawing has disappeared. Mixed sizes continue to be typical and more of the outlines are shown. Pressure is generally moderate but there is some increase in weak pressure. Pencil control is at its highest level (84%). There is an increase in expansion and a fifth of this age group now cover the page. Rhythm has declined to the six-year-old level.

2. Colour - Compatible colours are now chosen by almost half the girls, otherwise there is little change.

3. Content - Scene drawing is as frequent as that of seven-year-olds but in one third of the scenes the Earth and Sky meet. Plant life and animal content continue at the same level but human content and the sun show a slight decline.

Houses again decrease in frequency, but one-quarter of them are double sided and half have curtains.

Nine Years.

1. Form - Mass Drawings is at the peak and there is a small increase in the frequency of large sizes. Sharpness of outline also increases. There is a further increase in expansion and the page is now covered in half of the drawings. Weak pressure continues to become more common.

2. Colour - the majority of colours are now used in a compatible way. Yellow, brown and blue are the preferred colours.

3. Content - Two-thirds of the girls still draw houses. Half of these are double sided and have curtains. Animal content and the sun drop in frequency but the rest of the content is as for the year eight.

Ten Years.

1. Form - there is a decrease in the amount of mass towards the eight-year-old level otherwise no significant changes occur.

2. Colour - There is a slight decrease in the number of colours used and in their compatibility.
3. Content - Scenes decline in frequency, particularly the number of animate scenes. Nearly half of them, however, show the Earth and Sky joining.

Human content is at its lowest point, similarly animal content. Houses, too, reach their lowest frequency, as only half the girls draw them. Those drawn are half flat representations and half double sided. Plant life is still drawn by over three-quarters of the girls.

Still life and design, though infrequent, reach their highest point at this age level which may indicate that they may become popular with still older girls.

B. Characteristic Representative of Boys' Drawings at Each Age Level.

1. Form - At this age line drawing is characteristic, either alone or combined with small amounts of "mass". The drawings tend to be static in character without much rhythm. Space is not used systematically and the page is never covered. The pencil pressure used is moderate or strong.
2. Colour - the majority of five-year-old boys restrict themselves to less than five colours but select from all three groups. Blue, red and green are preferred in that order with black least preferred but they experiment over the whole range.

3. Content - The most common content pattern at this age (found in over half the group), is the drawing of Unrelated Objects scattered over the page. Among these objects are letters, figures, houses, boats and vehicles. Where houses are drawn they are as an object or with only a base line. They are in the form of a flat box usually with a roof but without curtains or paths. The same pattern is found with boats (drawn by a quarter of the group) or vehicles (1/5). Less than one-third draw scenes of any kind. Where they are drawn the earth and sky do not meet and there are few suns, plants, animals, humans, air vehicles or weapons. Scribble patterns appear in small numbers and appear to be characteristic of a younger age level.

Six Years.

1. Form - The amount of "mass" drawing is greater than at five years but the general size of form elements tends to remain small rather than large. The outlines are reasonably clear cut but the control of the pencil in shading is poor. Rhythmic drawings are becoming more common and they make greater use of the space available as they are also more "expanded".
2. Colour - there is an increase in the number of colours used to five or more. There are far more colours used incompatibly and little selectivity is apparent. Colour preferences still favour red, blue and green.

3. Content - Houses are drawn by over half the boys in flat representation with a roof, in a complete setting (framework of earth and sky). The sun also appears. Just under half draw boats in a complete setting. Plant life is more frequent here than at any other age level (present in approximately one-third of the drawings). There is a big increase in the amount of animate content - human ($1/3$), animal ($2/5$). Unrelated objects and letters almost disappear.

Seven Years.

1. Form - Line drawing almost disappears at this level as almost all the drawings contain Mass to some extent. The forms have clear, sometimes sharp, outlines and good control of the shading is well established. Pencil pressures have become moderate. The size of forms is still evenly distributed between large, small and mixed. There is greatly increased expansion of forms but the page is still incompletely utilised. Rhythm is well established only about a third of the drawings being static.

2. Colour - There is still a high degree of incompatibility in the colours used. Preference shifts away from red towards yellow and brown but blue and green are still dominant.

3. Content - Scene drawing is now well established ($4/5$ ths of total and there is a further increase in the amount of human and animal content. The sun is also included by a large number of boys. Plant life is still high in frequency.

Sky and earth, however, seldom meet.

Boats increase in popularity being drawn by over half the boys. The number of houses decreases but when drawn they are in complete settings. Some of them are double-sided and curtains appear in significant numbers. A high proportion of the houses are without bottoms (29%). Land vehicles increase in quantity and air vehicles start to appear.

Eight years.

1. Form - Mass drawings are now well established. There is an increase in the number of large forms and sharp outlines. Good control of the pencil is well established. Pencil pressure continues to be moderate. There is a marked increase in expansion and complete coverage of the page begins to be noticeable. There is a decrease in rhythm.
2. Colour - There is a decrease in the number of colours used. They are, however, more compatible and there is evidence of greater selectivity.
3. Content - The proportion of scenes is still high but there is a slight decrease in the number of animate scenes together with a reduced amount of animal content. There is also a decrease in the use of the sun, plant life and land vehicles. Sky and earth meet in one quarter of the drawings.

There is a marked increase in the frequency of boats, 60% now drawing boats in a complete setting. Air vehicles also increase slightly.

Only 20% now draw houses. These are all complete settings,

over half have curtains, one-quarter are double-sided, and nearly half have no bottoms.

Nine Years.

1. Form - Mass drawings with large forms predominate. There is a further increase in expansion and sharp outlines which are now quite frequent. Half of the drawings now have the whole page covered. Strong pressure declines markedly, good control also declines.
2. Colour - Over two-thirds use compatible colours. Preferred colours are now yellow, brown and blue. There is an increase in the use of black though it is still not used to any marked extent.
3. Content - the scenes drawn are predominantly inanimate and the sky and earth meet in over half of them. There is a decline in the frequency of human content and in the use of the sun.

Boats are drawn with much the same frequency as by the eight-year-olds while air vehicles reach their greatest frequency (30%).

Houses are still drawn by only 20% of the boys, but now nearly half of them are double sided and over half have curtains. Animals, plant life and land vehicles are very infrequent.

Ten Years.

1. Form - There is a further rise in the use of mass and the form elements remain predominantly large in size. There is a slight increase in rhythm.

2. Colour - Apart from another slight rise in the use of black there is no significant change from nine years.

3. Content - There is a slight decrease in the frequency of scene drawing. Approximately equal quantities of animate and inanimate scenes are found.

Houses decrease in frequency of occurrence to their lowest point while boats reach their peak. Air vehicles are found in much the same quantities as for eight years. Weapons appear in a significant number of drawings (26%).

CONCLUSIONS

CONCLUSIONS

1. The Characteristics of Drawings at Different Age Levels.

"From about the sixth or eighth year onwards a standstill or retrogression is observed in the sexual development, which, in those cases reaching a high cultural standard, deserve to be called a Latency period (24 p.286)." This latency period extends through the age level included in this study and extends beyond them. The major adjustments necessary to child training and the parent-child relationships have been made with varying degrees of success and a major part of the training now takes place outside the home setting as the child begins to attend school. Further socialisation and specific training is now divided between two forces. Against this background the physical growth and development of the child continues to rise slowly and fairly steadily. His cognitive development also continues and can be seen in his increased grasp and exploration of external reality, increased verbal facility and a growing intellectual control of physical and emotional factors.

In most of its elements drawing mirrors these differ in aspects of development. Although no firmly established relationships can be traced between intelligence and free drawing, as in the case of restricted figure drawing, some trends consistent with the growth of physical co-ordination and cognitive development may be seen. Such trends are

implicit in the outline of characteristics of both girls and boys' drawings given in the tentative scale. This development appears to continue until the age of ten years when there seems to be a flattening out or hiatus which suggests the end of a phase. It is possible that this stage may continue unchanged until adolescence but there are some slight indications in the content aspect that a new phase is about to begin.

As some developmental trends, differing somewhat for boys and girls, are evident it is possible to evaluate an individual drawing by means of these trends. A drawing which differs in a significant number of aspects from the general trends may be considered "deviant" from the general pattern of behaviour. At the present stage it can only be said that a drawing which differs in a number of aspects is really deviant as the significant of any single aspect may be, and by some previous investigators has been, easily over-emphasized. It must be assumed that lack of adequate adjustment at the beginning of the latency period must be reflected by more than one aspect of a child's development.

What has been achieved by the compilation of frequency tables for the form, colour and content aspects of children's drawings? Tentatively the trend of these tables may be identified with the "socialisation" pattern suggested by Frank (23) as the opposite of the pattern of the individual or pattern of "individuation". Evidence for this identification

is available in analysis of content in the outline of differences between girls and boys. The progressive development of Boys' choice of subject away from houses, plant life and living content towards inanimate things and what looks like the beginning of aggressive scenes, with boats as a stable choice, may be a reflection of their social training, away from the mother's influence towards a more masculine world. The girls' drawings, however, stabilize earlier with scenes of houses, plant life and animals and retain a higher human and animate content. These elements appear to reflect a different and probably more feminine cultural training. That this socialisation pattern also differs between societies is suggested by Gesell and Ilg (28, p.180) when they say of the American Eight year old - "His airplanes and tanks are drawn in battle scenes.." and by Ames (3) in her Rorschach patterns for young children with their high content of aggression. This type of content appears much later in Tasmanian boys' drawings.

What forms the pattern of "individuation" may take must now be determined from a study of the "deviants" from the developmental trends established in this study. This may be done either in terms of existing, poorly defined, clinical syndromes or in relation to another test such as the Rorschach. Some further considerations, however, are relevant to the identification of deviant cases.

11. The Relation of Maturity to the Appearance of Categories.

Several of the categories and sub-categories were found to vary in frequency of occurrence with increasing age. Some varied directly with age (positive maturity function) while others varied inversely (negative maturity function).

A. Positive Maturity Functions.

The categories which may be considered positive maturity functions are:-

- | | | |
|------------------|------------------------|-----------------|
| 1. Mass | 5. Compatibility of | 8. Air Vehicles |
| 2. Expansion | Colour | (boys only). |
| 3. Page Coverage | 6. Weapons (boys only) | |
| 4. Good Control | 7. (Boats (boys only) | |

It may be assumed, then, that a drawing containing these categories to a significant extent is likely to be that of a "mature" child.

B. Negative Maturity Functions.

The categories and sub-categories which may be considered negative maturity functions are:-

- | | | |
|-----------------|-----------------------|-----------------------|
| 1. Small size | 5. Animal figures | 9. Houses (boys only) |
| 2. Weak outline | 6. The sun | 10. Plant life |
| 3. Line drawing | 7. Scribble pattern | (boys only). |
| 4. Compression | 8. Unrelated objects. | |

The appearance of these categories in the drawings of older children may be considered as an indication of immaturity or regression. The exact age at which it becomes significant may be obtained by reference to the Girls' and Boys' Developmental Tables included in the Results section above.

111. Relation of Intelligence to the Categories.

The relationship with general ability must also be considered in the identification of deviants. None of the categories appear to be correlated with intelligence to any marked degree, but there is some indication of connection in the case of the following:-

- | | | |
|-----------------------|------------------|---------------------|
| 1. Rhythm-stasis | 5. Compatibility | 8. The Sun |
| 2. Line-Mass | 6. of colours | 9. Anthropomorphism |
| 3. Pressure of stroke | 7. Houses | of the sun. |
| 4. Control of stroke | 7. Designs | |

A. Positive Correlations.

Intelligence is positively correlated with:- Rhythm, Line, Weak Pressure, Good Control. Compatibility of Colours and Designs.

B. Negative Correlations.

Intelligence is negatively correlated with:- Stasis, Mass, strength of pressure, paucity of control, incompatibility of colours, houses, the sun and anthropomorphism of the sun.

Only "Pressure of Stroke" and "Control of Stroke" were found to be correlated with intelligence to a degree sufficient to indicate that they are likely to be a function of intelligence. It is possible, therefore, that the influence of intelligence on the other categories may be considered as part of the general developmental process.

IV. Emotional Factors.

It seems possible that the majority of deviants will differ because of emotional factors. No direct information about the influence of these factors is obtainable from an essentially normative study. On the basis of the small frequencies of certain categories in the present investigation and of the findings of other investigators it appears likely that emotional factors may be concerned in the following:-

- | | | |
|------------------|--------------------------|-----------------------|
| 1. Small size | 5. Kerr's signs (houses) | 9. Monochromes or 1-3 |
| 2. Sharp outline | 6. Weak Pressure | colours |
| 3. Line | 7. Strong Pressure | 10. Black |
| 4. Stasis | 8. Poor Control of | 11. Violet |
| | Stroke | 12. Perseveration. |

V. A Restricted Drawing Technique.

The great popularity of houses with girls and boats with boys at all ages suggests that these subjects could be used to standardise content without limiting unduly the spontaneity of drawing. This "control" of the content aspect would then allow a more detailed examination of the form and colour elements of a drawing. Under conditions of "free" drawing Colour analysis has certain inherent difficulties:-(i) Summation of the quantity of colour used or of any given colour is difficult owing to the multiplicity of forms, and (ii) the drive towards realism of colour when drawing trees, sea etc. may lessen the tendency to select colours for their appeal or possible emotional significance.

Restriction of subject matter should provide an opportunity for an evaluation of the importance of form and colour in relation to emotional factors. This in turn may help to determine the weighting which should be attached to them as diagnostic indicators and also decide their importance relative to content analysis.

VII. Summary and Further Studies.

The present study has found the frequency of occurrence of different aspects of form, colour and content in the drawings of Tasmanian children from five to ten years of age. These frequency figures show trends of development in terms of age and in relation to intelligence. Tentative developmental scales have been set out for girls and boys. These scales assist in setting limits to the scope of analysis and interpretation, and provide a basis for evaluating the soundness of the propositions of previous investigators but they do not provide direct evidence as to the meaning of many of the aspects of drawing which appear to be significant from the clinical point of view. Further studies (See appendix 1.), specific in their aims, are need to investigate these aspects.

REFERENCES

1. ABT, L.E., "A Theory of Projective Psychology" in Projective Psychology, ed. Abt, L.E. and Bellah, L., (New York, Knopf 1950).
2. ALSCHULER, R. and Hattwick, L., Painting and Personality, A Study of Young Children, (Chicago, University of Chicago Press, 1947), Volumes I and II.
3. AMES, L.B. et al., Child Rorschach Responses: Developmental Trends from Two to Ten Years, (New York, Paul B. Hoeber Inc., 1952).
4. ANASTASI, A and Foley, J.P., "A Survey of the Literature on Artistic Behaviour in the Abnormal, I. Historical and Theoretical Background," Journal of General Psychology, XXV (1941) 111-142; III "Spontaneous Productions," Psychological Monographs, LII (1940) Number 6. IV "Experimental Investigators", Journal of General Psychology, XXV (1941) 187-237.
5. APPEL, K., "Drawings by Children as Aids to Personality Studies," American Journal of Orthopsychiatry, I (1931) 129-144.
6. BALLARD, P.B., "What London Children Like to Draw," Journal of Experimental Pedagogy, II (1912) 185-197.
7. BALLARD, P.B., "What Children Like to Draw," Journal of Experimental Pedagogy, II (1913) 127-129.
8. BELL, J.E., "Perceptual Development and the Drawing of Children," American Journal of Orthopsychiatry, XXII (1952) 386-393.
9. BELLAK, L., "On the Problems of the Concept of Projection" in Projective Psychology ed. Abt., L.E. and Bellak, L. (New York, Knopf, 1950).
10. BENDER, L. and Keeler, W., "The Body-Image of Schizophrenic Children Following Electroshock Therapy," American Journal of Orthopsychiatry, XXII (1952) 335-355.
11. BENDER, L. and Rapaport, J., "Animal Drawings of Children," American Journal of Orthopsychiatry, XIV (1944) 521 - 527.
12. BENDER, L. and Wolfson, W., "The Nautical Theme in the Art and Fantasy of Children," American Journal of Orthopsychiatry, XIII (1943) 462-467.

13. BINET, A. and Simon, T., A Method of Measuring the Development of the Intelligence of Young Children, (translated C.H. Young, Chicago, 1915).
14. BRICK, M., "The Mental Hygiene Value of Children's Art Work," American Journal of Orthopsychiatry, XIV (1944) 136-146.
15. BURT, C., Mental and Scholastic Tests, (London, King, 1921).
16. DESPERT, J.L. "Technical Approaches Used in the Study and Treatment of Emotional Problems in Childhood: III Drawing," Psychiatric Quarterly, VII (1937) 267-295.
17. EDELSTON, H., "The Analysis and Treatment of a Case of Neurotic Disorder in a Young Child, Illustrating the Value of Drawing in Child Guidance Technique," Journal of Mental Science, LXXXV (1939) 522-547.
18. EDWARDS, A.L., Statistical Analysis (New York, Rinehart, 1948).
19. ELKISCH, P., "Children's Drawings in a Projective Technique," Psychological Monographs, LVIII (1945) Number 1.
20. ELKISCH, P., "Significant Relationship between the Human Figure and the Machine in The Drawing of Boys," American Journal of Orthopsychiatry, XXII (1952) 379-385.
21. ENG, H., The Psychology of Children's Drawings (London, Routledge and Kegan Paul, 1954).
22. EYSENCK, H.J., "A Critical and Experimental Study of Colour Preferences," American Journal of Psychology, Liv (1941) 385-394.
23. FRANK, L.K., "Projective Methods for the Study of Personality," Journal of Psychology, VIII, 1939, 389-413.
24. FREUD, S., A General Introduction of Psycho-analysis, (New York, Garden City Publishing Co., 1943).
25. FREUD, S., New Introductory Lectures on Psycho-analysis, (London, Hogarth Press, 1946).
26. FREUD, S., Neuropsychoses (London, International Psychoanalytic Library Volume 1, Hogarth Press, 1940).

27. FREUD, S., Totem and Taboo (New York, Basic Writings of Sigmund Freud, ed. A. Brill, Modern Library, 1938).
28. GESELL, A. and ILG, F.L., Child Development: The Child from Five to Ten (New York, Harper, 1949).
29. GOODENOUGH, F.L., Measurement of Intelligence by Drawings (New York, World Book Co., 1926).
30. GOODENOUGH, F.L. and Harris, D.B., "Studies in the Psychology of Children's Drawings," Psychological Bulletin, XLVII (1950) 369-433.
31. HARMS, E., "Child Art as an Aid in the Diagnosis of Juvenile Neuroses," American Journal of Orthopsychiatry, VII (1941) 191-210.
32. HEBB, D., Organisation of Behaviour (New York, Wiley, 1949).
33. KELLY, E.L., "Theory and Techniques of Assessment" in Annual Review of Psychology (Stanford, Annual Reviews Inc., 1954) Volume V.
34. KERR, M., "Children's Drawings of Houses," British Journal of Psychology, XVI (1937) 206-218.
35. KLOPFER, B. et al., Developments in the Rorschach Technique (New York, World Book Co., 1954).
36. KOUWER, B.J., Colours and their Character: A Psychological Study (The Hague, Nijhoff, 1949).
37. LEMBKE, H., "Über Zeichnungen von Frechen und Schuchternen Kindern," Zeitschrift für Pädagogische Psychologie, XXXI (1930) 459-462, quoted by Anastasi, A and Foley, J.P., in Journal of General Psychology XXV (1941).
38. LOEWENFELD, V., The Nature of Creative Activity (2nd ed., London, Routledge, 1952).
39. LOEWENFELD, V., Creative and Mental Growth (New York, Macmillan, 1947).
40. MACHOVER, K., Personality Projection in the Drawing of the Human Figure (Springfield, Thomas, 1949).

41. MARTIN, A.W. and Weir, A.J., "A Comparative Study of the Drawings made by Various Clinical Groups," Journal of Mental Science, XLVII (1951) 408.
42. MODELL, A.H., "Changes in Human Figure Drawings by Patients who recover from Regressed States," American Journal of Orthopsychiatry, XXI (1951) 584 - 596.
43. NAUMBURG, M., "A Study of the Psychodynamics of the Art Work of a Nine Year Old Behaviour Problem Boy," Journal of Nervous and Mental Diseases C1 (1945) 28-64.
44. Naumburg, M., "Studies of the 'Free' Art Expression of Behaviour Problem Children and Adolescents as a Means of Diagnosis and Therapy," Nervous and Mental Diseases Monographs, No. 71 (1947)
45. NORMAN, E., "The Play of a Psychotic Child Illustrated with Drawings by the Child," British Journal of Medical Psychology, XXI (1948) 155-170.
46. OAKLEY, C.A., "The Interpretation of Children's Drawings," British Journal of Psychology, XXI, (1931) 256-270.
47. RAVEN, J.C., Controlled Projection for Children (2nd ed., London, Lewis, 1951).
48. ROUMA, G., Le langage graphique de l'enfant (Brussels, 1912), quoted by Anastasia and Foley, Journal of General Psychology, XXV (1941)
49. RUESCH, J. and Finesinger, J., "The Relation of the Rorschach Colour Response to the Use of Colour in Drawings," Psychosomatic Medicine, III (1941) 370-388.
50. SCHMIDL-WAEHNER, T., "Formal Criteria for the Analysis of Children's Drawings," American Journal of Orthopsychiatry, XII (1942) 95-103.
51. SCHMIDL-WAEHNER, T., "Interpretation of Spontaneous Drawings and Paintings," Genetic Psychology Monographs XXXIII (1946).

52. SEEMAN, E., "The Development of the Pictorial Aptitude in Children," Character and Personality, II (1934) 209-221.
53. TRAUBE, T., "La valeur diagnostique des dessins des enfants difficiles," Archives de Psychologie XXVI 285-309, quoted by Anastasi and Foley, Journal of General Psychology, XXV (1941).
54. WALKER, H.M. and Lev, J., Statistical Inference (New York, Holt, 1953).
55. WOLFF, W., Personality of the Pre-School Child, (London, Heineman, 1947).

ADDENDA

56. OLDHAM, H.W., Child Experience in Colour and Form (London, Lane, 1940).
57. MARKHAM, S., "An Item Analysis of Children's Drawings of a House," Journal of Clinical Psychology X (1954) 185-187.

APPENDIX 1.Further Specific Studies.

1. The association of "Small size" and feelings of inferiority or inhibition.
2. The association of "Line" drawing with withdrawal from social contact.
3. The association of the degree of page coverage and extraversion.
4. The association of "Rhythm-Stasis" with intelligence.
5. The association of pencil pressure with intelligence.
6. The association of "Strong Pressure" with aggression.
7. The association of "Weak Pressure" with inhibition.
8. The association of "Control of Stroke" with intelligence.
9. The association of the use of few colours with emotional constriction.
10. The association of Black and Violet colour with depression.
11. The possibility of the development of an Extraversion - Intraversion Scale based on the use of colour.
12. The significance of different combination of colours.
13. The significance of Kerr's "Neurotic Signs".
14. The association, in girls, of "masculine protest" and boat drawing.
15. The significance of the association of boys and boats.
16. The association of girls and houses.
17. The significance of design drawing.
18. The significance of sun drawing.
19. The significance of unrelated objects.
20. The significance of the "single object".
21. Norms with respect of Figure Drawing (cf. Machover)

