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A study in child thought, language and logic : observations of a six-year-old child, individually at home, and together with his play and school groups : experimental tests and analysis of observations, in accordance with the theories of Piaget

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A STUDY IN CHILD THOUGHT, LANGUAGE AND LOGIC

Observations of a Six-year-old Child,
Individually at Home,
and together with his Play and School Groups;
Experimental Tests and Analysis of Observations,
in Accordance with the Theories of Piaget

By

Gertrude Allen Farley

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A Thesis
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College of the Pacific

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Preface

It has been my desire to carry out this study of my six year son and his companions impersonally, and under the conditions laid down I think that this is possible. The one effect of the relationship of mother and son in the observations as carried on, it seems to me, comes from the very naturalness of the attitude which the child has with me, the observer. Therefore, he feels no restraint whatever and because of that the panorama of his thoughts unfolds easily and in an entirely unhampered fashion. In the test periods I have tried to create a happy friendly relationship with each one of the group. I sat in their play and school groups part of every day for a month and became an accepted onlooker before attempting any individual work. However, I realize fully that the happy years of companionship I have had with David can never be approached with any of them.

This study of the members of this group of twelve is offered simply as an accompaniment to the fuller study of David, and not as an exhaustive scientific study in any sense.

In a letter from M. Bovet, a director of the Institut J.J. Rousseau, Geneva, Switzerland, and a co-worker with

M. Piaget, we have the information that experiments based on Piaget's findings have been carried on in Germany by several, among them Professor Katz and his wife, and in Cambridge, England, by Mrs. Isaacs; also that M. Piaget is preparing a general review and discussion of some papers which have appeared in different countries in regard to his theories.

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CHAPTER I

Introduction

It must be made clear in the very beginning that the basis for this thesis is the two volumes by Dr. Jean Piaget, Institut J. J. Rousseau, Geneva, Switzerland, The Language and Thought of the Child and Judgment and Reasoning in the Child; hence the very small bibliography, the material used being observations and experimental tests based on these volumes.¹

Much has been written heretofore on the vocabulary and phonetics of child language, piling up statistics on the number of words various children have acquired at different ages and on the sentence structure (number of adjectives, adverbs, conjunctions, etc.) used at different ages.² In the division of the year book referred to, on studies in language development, one hundred forty-three books are listed and various others referred to in the discussion of the problems.

¹ Throughout this thesis these volumes will be referred to as L.T. and J.R.

² Cf. The Twenty-eighth Year-Book of the National Society for Study of Education--Preschool and Parental Education: Studies in Language Development, 495-568.

Child thought back of its language has puzzled psychologists since child study has been a matter of interest.¹ It remained for Dr. Piaget in his keen, logical manner to pull aside the curtain of mere vocabulary and analyze the thoughts of childhood;² for instance, the reasons why they use so few conjunctions and why they use certain ones more frequently than others, what they mean by the ones they use, etc., and what all this is evidence of in child thought.

In true scientific spirit he gives the results of his careful and tireless research, opens up the field to fellow-workers and invites others to further study, offering his own findings as guide-posts, not as final ends. As a result of his studies he puts child thought in just as distinct a class as "primitive" thought or the "autistic" thought of the psychoanalyst. To this class he gives the name "ego-centric" (for reasons given later) and places it midway between autistic and social thought.

The distinguishing feature of this world of child thought is ego-centrism (intellectual, not ethical, and by no means to be thought of as secretive), the child's self being bound up with his every concept and bit of reasoning. However, the child is entirely unconscious of this situation.

¹Cf. E. Claparede: Preface, ix., to L.T.

²Cf. E. Claparede: Preface, xi., to L.T.

Only by socializing processes is a change wrought in the child's mind and he comes finally to develop pure reasoning.

For in so far as he is thinking only for himself, the child has no need to be aware of the mechanism of his reasoning. His attention is wholly turned toward the external world, towards action, in no way directed toward thought as a medium interposed between the world and himself. In so far, on the other hand, as the child seeks to adapt himself to others, he creates between himself and them a new order of reality, a new place of thought, where speech and argument will henceforth hold their sway, and upon which operations and relations which till then have been the work of action alone will now be handled by imagination and words. The child will therefore have to become conscious to the same extent of these operations and relations which till then remained unconscious because they were sufficient for the purposes of action.¹

In other words, the process of learning an operation on the verbal plane will reproduce the same incidents as had arisen when this operation was being learned on the plane of action....This shifting from action to thought can be observed at every turn.²

These two processes are condensed into the "law of conscious realization" and the "law of shifting." Of the first, Piaget says,

This law seems to us fundamental for establishing relations between the functional factors of childish thought, particularly between ego-centrism and the absence of social needs, and the structural features which define childish logic.³

¹ J.R., 213.

² J.R., 214.

³ J.R., 213.

Until the socializing process has had its way the child is incapable of reasoning as an adult reasons, on logical grounds; ego-centrism of child thought being accompanied by (1) proneness to juxtaposition (placing of concepts side by side on equal basis, without relationship), (2) syncretism, or thinking in confused wholes, and intellectual realism---he sees only what he knows and connects everything with his own mental schema, so he connects everything with everything else and justifies it at any price. This all leads to (3) pre-causality, an ignorance of the distinction between the physical and the psychical, therefore a tendency to regard the world as endowed with both these qualities at the same time. (4) Transduction---he reasons from particular to particular, not by synthesis. He builds no hierarchies of relationships, therefore he forgets what he has previously said when he has adopted a new particular. So he contradicts himself and he cannot retrace the steps of his own reasoning until, by contact of his own ideas with and adjustments to those of other people, his thought becomes socialized and he learns to see relationships in hierarchies and thus to build up synthetic wholes, to separate his reasoning processes from his point of view, to retrace his steps of reasoning, in short, to reason abstractly.

Such, in a very condensed form, is the field for

investigation into the realm of child thought built up on the basis of its ego-centrism.

Piaget's two volumes, The Language and Thought of the Child and Judgment and Reasoning in the Child constitute a first psychological outline of the Logic of Childhood.¹

Piaget concludes that there are four stages of modality of child thought: (1) From birth to 2-3 years--reality is simply and solely what is desired; (2) From 2-3 to 7-8 years--heterogeneous but equal realities, world of play and world of observation; jumps quickly from one to the other; (3) From 7-8 to 11-12 years--beginning of hierarchical arrangement; (4) From 11-12 years on to complete hierarchical arrangement, that is, formal thought and logical assumption.

Now the age with which I wish to deal particularly is the six-year-old child. This should be of special interest because Piaget devotes much time in The Language and Thought of the Child to his findings with this age of Swiss-French children, taking two at the Institut J.J. Rousseau for long periods of observations.

My observations include the study of my son, David, age 5:10-6:2, individually at home and together with his play-group and school-group (low first grade, Woodrow Wilson School, Stockton, California). In this school group

¹ Comment in the Twenty-eighth Year-Book of the National Society for Study of Education--Preschool and Parental Education; Studies in Language Development, 565.

only those took part in the general conversation or were members of the smaller groups during the observation periods are considered. Experimental tests were carried on with a special group of twelve children from the larger group. These experiments began three months before the mental tests were given, the general observations extended over four months including vacation. The children at home are designated throughout by initial, those at school by number.

Before setting forth these observations, one criticism of Piaget's method is offered. As far as can be discerned he bases his entire study according to the chronological age of the child. Because of the wide variation in the mental age of children of the same chronological age, it would seem a very important oversight. Surely all children do not reach the same stage of thought and language development at the same chronological age of 2-3, 7-8, 11-12 years, or even at these mental ages, for the I.Q. of the child has a greater influence than the mental age in determining his rate of development. There seems to be an indication that those of a high I.Q. are developing more rapidly in these distinctions than children of the same mental age but lower I.Q. However, in group average, the group under our observation (as will be shown) corresponds to the average mental age rather than to the chronological.

Further research is needed since Piaget has opened up the field and has himself neglected to emphasize anything

but chronological age. Even if he is establishing norms they should be more closely allied to those by which mental ages and I.Q.'s are secured. These allow much more for individual differences in their establishment.

In view of these facts we have obtained through a group test¹ the mental age and I.Q. of the groups observed. It should be understood therefore that these are only indicative and not to be taken as being as reliable as individual tests, since they do not bring out so thoroughly fine points in individual development.

The following table gives the chronological and mental ages of the school group observed, and arranges the children in the order of their I.Q.'s. The numbers starred are those in the smaller group of twelve described in the following chapter.

	M.A.	C.A.		M.A.	C.A.		M.A.	C.A.
*No. 1	8:1	6:2	*No. 10	8:9	7:9	*No. 19	6:10	6:9
*No. 2	8:3	6:5	No. 11	7:9	7:2	*No. 20	6:7	6:6
*No. 3	8:3	6:7	No. 12	7:2	6:7	No. 21	6:8	6:7
*No. 4	7:7	6:2	No. 13	7:3	6:9	No. 22	7:6	7:5
*No. 5	8:0	6:8	No. 14	7:1	6:7	No. 23	7:0	7:1
*No. 6	7:11	6:8	*No. 15	7:6	7:1	No. 24	6:11	7:5
*No. 7	7:8	6:8	No. 16	7:11	7:6	No. 25	6:4	6:10
*No. 8	7:11	7:0	No. 17	6:6	6:2	No. 26	7:7	8:5
No. 9	6:11	6:1	No. 18	7:3	7:1	No. 27	7:7	8:8
Average for group of 12*...7:8...6:8								

¹Detroit Primary Tests.

Some explanation regarding this table is necessary.

All children who ever made any remarks in the group are listed, but some of them, shy by nature, made so few that individually they make no perceptible difference in the group findings. The motive for including them is to show the relative position in the larger group of those who did the most talking. This is to be said, however, that no one in the first twenty-two out of the twenty-seven is below the I.Q. of the lowest in the smaller group of twelve. The only one below that mark who made enough remarks to consider at all is No. 27, who talked frequently.

In the free conversation period at school the group of twelve made 71% of all spontaneous remarks and when the children in the play period at school broke up into smaller groups I always chose for observation the particular one containing the largest number of the twelve children in the experimental group, hence 90% of the spontaneous conversation is here carried on by these twelve.

In home play it was impossible to obtain the mental ages of all the ten children who ever played in these periods. However, the one, S., who played most constantly with D., and who, with him, made 73% of all the remarks in home play, had M.A. 7:3; C.A. 5:4, by the same tests which were given to the other children at school. The four children who did 90% of the talking in home play had average M.A. 7:9, C.A. 6:4. The other 10% of remarks were divided between six children so did not affect the findings to any great extent

in comparison to these four in 90% of remarks. This was as accurate a statement as could be obtained under the circumstances.

CHAPTER II

Methods and Purposes of Observations

In this study the observations of the child or children have been divided into six groups. Each observation period has been one-half hour in length. The method in the first four groups has been to take down verbatim, under all the conditions of the various groups, the spontaneous language of the child. No artificial conditions were produced, for these would have nullified the purpose of the observations. In all the groups a study has been made of remarks of an ego-centric character and of socialized remarks.

(1) At the family meal the purpose was to determine the extent to which the child entered into the general conversation and adapted his own remarks to it, and to study and analyze his questions and his use of conjunctions.

(2) During the half-hour of conversation with the writer the method was to let the conversation be directed by the child's inclinations entirely and develop naturally along these lines. It is also important to note that the child chose the activity to be engaged in, whether games, puzzles, story-telling, or just a quiet talk, usually at bed-time. His remarks were answered when he expected an answer but no attempt was made to direct the conversation. Here also his questions and use of conjunctions were studied

and analyzed.

(3) In the play-groups at home and at school, the purpose as before was to study their questions and use of conjunctions and to determine the stages of conversation represented.

(4) During the free conversation period at school the children were perfectly free to express themselves. They usually told of some experience or showed something they had made or possessed. The rest of the group listened, asked questions, criticized or offered suggestions if they felt inclined. They simply drew their chairs into a circle; someone had something he was anxious to tell the group about, and once begun the conversation took its own natural course. Here again their questions, their use of conjunctions, their proneness to juxtaposition, and their stages of conversation were studied.

(5) In a special group of twelve (the ones starred in the list given in the previous chapter) experimental tests were given. Here the procedure in the other groups of following the natural drift of their spontaneous conversation was laid aside, and they were set definite tests to determine (1) their use of the conjunctions 'because', 'although', and 'therefore'; (2) their ability to pick out absurdities in sentences given and tell their reason for thinking them absurd; (3) their ability to handle 'brother (or sister)' and 'right and left' situations

relatively; (4) their ability to cope with the syllogism; (5) their definitions of words designated by Piaget, involving relative ideas, as 'half', 'part', 'brother', 'family', etc.: (6) their idea of 'life', and of 'strength', taking Piaget's lists and asking of each thing, "Is it alive," and "Why?" (or "Why not?"), "Is it strong?" and "Why?" (or "Why not?"); (6

(6) Experiments were tried with the same twelve children by twos to test in story-telling their ability to understand each other and to reproduce stories and explanations.

Such was the procedure followed to obtain the material for analysis, always based on the methods followed by Piaget in his study. The one point of difference, however, always to be kept in mind is that in our conclusions emphasis is laid on the mental age together with the chronological, (or according to I.Q.), whereas Piaget's seem to take into consideration only the chronological age. These observations extended over a period of four months (including school vacations). The material obtained from these observations consists of the following number of remarks:

	With answers	Without answers
Of all children in groups:		
In school play	694.....	651
In home play.....	743.....	691

In free conversation (school) 744.....	.636
In all play groups.....1437.....	1342
In all groups.....2181.....	1978

Of D., the individual child studied:

At bed-time.....1031.....	982
At meal-time..... 613.....	540
At home (with adults, next older brother being 12:8-13).....1644.....	1522
In home play..... 413.....	392
In school play..... 152.....	143
In free conversation (school) 87.....	74
In children's groups..... 652.....	609
With family and with children 2296.....	2131

Total number of all children's re-
marks in children's groups and of
the individual child in other groups.

3825..... 3500

These figures have been given both with and without answers since Piaget excludes all answers to adults or to each other from children's spontaneous language but in certain studies he includes them in the material for analysis.

CHAPTER III

Functions of Language

Perhaps it is to be regretted that these observations might not have been carried on under precisely the same conditions as Piaget's for the sake of an exact comparison, but he invites the extension of observations and the variety of material brings out interesting points of difference in some respects and likenesses in others.

In the first place we accept as proven his hypothesis of the large part played by ego-centric language in the child up to 7-8 years (but we mean mentally) when observed steadily throughout the day, because of the effects of egocentrism which we still find in these children, even though our observations show that it is on the wane in this particular group and child.

The conditions which were chosen under which we were to observe were in every case social conditions, whereas Piaget's observers followed his subjects about all day at school and studied them, both alone and in groups. For instance, he speaks of one boy who every now and then indulges in fantasies which isolate him for several hours and during which he soliloquizes for several hours.¹ Our findings should be considered with these facts in mind.

¹ Cf. L.T. 36.

However, we shall set forth his types of language and our examples of each type. He divides language into two types, ego-centric and socialized. Ego-centric language is then divided into three categories and socialized into five. He describes these eight categories as follows (the abbreviations in parentheses after the names are those used later in this study in giving examples):

Ego-centric:

(1) Repetition (Repit)...of words and syllables...for the pleasure of talking, with no thought of talking to anyone, nor even at times of saying words that will make sense...

(2) Monologue (M): The child talks to himself as though he were thinking aloud. He does not address anyone.

(3) Collective Monologue (C.M.): The contradiction contained in the phrase recalls the paradox of those conversations between children...where an outsider is always associated with the action or thought of the moment, but is expected neither to attend nor to understand. The point of view of the other person is never taken into account; his presence serves only as a stimulus.

Socialized:

(4) Adapted Information (A.I.): Here the child really exchanges his thoughts with others, either by telling his hearer something that will interest him and influence his actions, or by an actual interchange of ideas by argument or even by collaboration in pursuit of a common aim....

(5) Criticism (C): This group includes all remarks made about the work or behaviour of others but having the same character as adapted information; in other words, remarks specified in relation to a given audience. But these are more affective than intellectual, i.e., they assert the superiority of the self and depreciate others. One might be tempted in view of this to place this group among the ego-centric categories. But

'ego-centric' is to be taken in an intellectual not in an ethical sense, and there can be no doubt that in the cases under consideration one child acts upon another in a way that may give rise to arguments, quarrels, and emulation, whereas the utterances of the collective monologue are without any effect upon the person addressed. The shades of distinction, moreover, between adapted information and criticism are often extremely subtle and can only be established by the context.

(6) Commands, Requests, Threats (C.,R.,T.): In all of these there is definite interaction between one child and another.

(7) Questions (Q.): Most questions asked by children among themselves call for an answer and can therefore be classed as socialized speech, with certain reservations....

(8) Answers (Ans.): By these are meant answers to real questions (with interrogation mark) and to commands. They are not to be compared to those answers given in the course of conversation (categ.4) to remarks which are not questions but belong to 'information'.

These, then are the eight fundamental categories of speech. It goes without saying that this classification, like any other, is open to the charge of artificiality. What is more important, however, is that it should stand the test of practical application, i.e., that any reader who has made himself familiar with our criteria should place the same phrases more or less in the same categories.¹

We have quoted in full Piaget's criteria for the eight functions of language, since they are the necessary basis for the understanding of the classification of our observations. Of his methods, Claparede says,

His only aim in collecting, recording and cataloguing all these different types of behavior is to see the assembled materials in a clearer light, to facilitate the task of comparing and affiliating them one to another. Our author has a special talent for letting the material speak for itself, or rather for hearing it speak for itself. What strikes me first in this book of his is the natural way in which the

¹L.T., 9-11

general ideas have been suggested by the facts; the latter have not been forced to fit ready-made hypotheses.¹

Every remark taken down in our study has been classified according to the criteria of Piaget, with the one following exception.

Because of the social nature of the conditions under which our observations were taken and the fact that Piaget says that either collaboration in action or association in thought---

....in the sense that everyone listens to and understands the speaker, but there is no collaboration because each child speaks only of himself, and of his own action, or his own thoughts.²

--lifts remarks out of collective monologue into the second stage of conversation and marks the first step toward socialization of thought and language, we have therefore given to such remarks our own title of 'monologue type', indicating their similarity to collective monologue.

Collective monologue takes place wherever the child talks about himself, except in those cases where he does so during collaboration with his hearer...and except in cases of dialogue. Dialogue, in our view, occurs when the child who has been spoken to in a proposition, answers by talking about something which was treated of in this proposition... and does not start off on some cock-and-bull story as so often happens in collective monologue.³

¹E. Claparede, Preface to L.T. XV

²L.T. 54

³L.T. 21

Our distinction will become clear as examples are given. These remarks, to our mind after a thorough study of Piaget, are still of ego-centric type though listened to, for each child seems to listen only to pick up some idea or schema about which to weave his own remarks regarding himself, his action, or his experience.

Examples of Repetition:¹

In home play there is just one example of repetition.

- B. Here's the kind I want.
- D. Here's the kind I want.
- J. Here's the kind I want.

In school play there are seven instances, or 1% of their total conversation.

- 1) No. 10. Now we can make the longest ones, if we can.
No. 1. If we can.
- 2) No. 10. Why don't you paste your mouth together?
No. 6. Paste your mouth shut and you can't talk.
Why don't you past your mouth shut?
No. 2. Paste your mouth shut.

In free conversation there are three instances, or one-half of 1%.

- 1) No. 10. What's that?
No. 15. Got a cake.,
No. 8. (laughs) Got a cake.
- 2) No. 7. I'm going to wear my wrist watch the last day of school and a new shirt and a new tie.
No. 8. A wrist watch, a shirt, and a tie.

D., at family meal, 1%.

(Picks up a remark of his father's about a dog) Did you ever see a dog-dog-dog?

D., at bed-time, 1%.

¹In all remarks of children quoted in this study, parentheses are used to indicate remarks of older persons or explanation of circumstances.

- 1) (Pretending his stuffed animals are talking)
Ma-ma. Da-da.
- 2) Look at that (a strip of paste-board balanced;
I look). Touch it, touch it, touch it (Repeats
this as he touches it and 'see-saws' it.)

Repetition being a remnant of baby habits, it is natural that there should be only these rare instances.

Examples of Monologue Type:

In these examples the fact is to be kept in mind that they are merely akin to those types as Piaget defines them. The fact that our subjects are always in pairs or in groups and playing with the same things differentiates their remarks from the real collective monologue by their association in a common activity, but otherwise they are the same sort of remarks, therefore ego-centric in origin. Since these children never separate themselves from any group in these observation periods, and since monologue and collective monologue are two varieties of the same category we have not separated them.

In home-play these examples simply consist of instances where these children announce to each other what they are doing.

- 1) (They are coloring pictures in magazines) A. I'm going to get brown to color this hair. There's orange and black, but the black is broken. I'm going to take orange today. Are you using scarlet? (Her remarks of monologue type turn into questions, which finally draw out a reply.) Why don't you take another color, What color have you now?
D. Blue. These are blue-birds...
- 2) (The two children are playing with an electric train.)
J. (Playing with the switch) I turn this and

it turns this; and turn this and it turns this. They jump off the trains and get a hold of this and turn it back. This makes it go straight. (No reply from D.)

3) (Building with Lincoln logs.¹) B. My house almost fell down,

D. There now.

B. Oh, boy! Here's something I want.

In school-play.

1) (They are playing in the play-house, a corner of the hall with low partitions and doll furniture in it.)
No. 16. Here's another chair; isn't it cute?
No. 20. (Of a dish.) Oh, who broke that? (neither answers the other.)

A few instances in this group occur when each child is working individually, as painting a picture, although others are doing theirs at the same wide easel, and illustrate more nearly collective monologue but they do not talk just about themselves.

2) No. 15. My mother's sick in bed. (No one answers.)
No. 1 This (his picture) is a car on a hill.
No. 15. He's making a car on a hill. (To no. 1) you're going to get your shirt painted pretty soon. You put long sky down there. (No attention paid to any of these remarks.)
No. 18. Now what did I put that up there for?
No. 15. When you get through you can wash them (the brushes) in there. (No answer.)
No. 18. Stir it up. Stir it up. There isn't much black in here.
No. 15. Two big eyes.
No. 18. (About no. 1's painting) He's making a car up on a hill. (About his own) Here's another weed growing up beside this one. Hey! Look at the nose. Let's see what I need.

Here each one is interested merely in the expression of

¹Building blocks imitating the logs of Lincoln's pioneer home.

his own thoughts and pays no attention to what the others say.

The following is of a different circumstance. The little girls have been playing with clay and carrying on a conversation together, but No. 5, having finished her clay doll, begins to talk to herself, though at the table with the others.

- 3) No. 5. Why don't you stay on, Mr. Leg? See, here's his tail. How's he going to sit down? Oh, gosh sakes! I can't make anything. It makes me mad, too. I guess I won't make no legs. (This tends toward monologue. The others hear but go on with their play.)

Some of the clearest types of collective monologue have been given, but included in the percentages later under monologue type will be those remarks also where the child simply announces to the group with which he is playing just what he is about to do. Where an adult would think this out by himself and offer the socialized result, the child in these instances takes everyone into his confidence and thinks aloud.¹ Half of the monologue type remarks in this group, school-play, are of this nature and half are of the clearer examples, such as have been given. The following is of the announcing variety, but with the whole conversation to consider one can readily see their cooperation in the whole enterprise.

- 4) (Playing in the sand.) No. 8. Now we need a lot of wet dirt. I'm going to get some water and make a lot of wet dirt and build a palace. This is both wet and dry sand.

¹ Cf. L.T. 39.

No. 2. I'm going to wet the sand all around here.
 No. 8. I'm going to build a house.
 No. 2. We're going to put some dry sand on.
 No. 1. That's my place, cause that's where I put
 the water in.
 No. 8. (To No. 2.) That's my pail, but you can have it.
 Let's side it up here so the water won't run out.

This conversation continues in this vein but soon develops into more socialized conversation as they become thoroughly interested in a cooperative idea.

(R.) No. 8. No more dirt. It's enough.
 (Ans.) No. 2. We need some more.
 (A.I.) No. 8. No, we don't. I'll make a door here.
 (A.I.) No. 2. I'll make a window here.
 (A.I.) No. 1. I'll make a cliff here by the side of
 the house.
 (A.I.) No. 8. This is a king's palace.
 (A.I.) No. 1. This is the king's garage.
 (A.I.) No. 8. No, let's have it a house near the king's
 palace. This is the king.
 (Q.) No. 1. What? The acorn?
 (Ans.) No. 8. The acorn is the people. This is me.
 I'm the king.
 (A.I.) No. 1. I'm the queen.
 (A.I.) No. 2. Here comes me.
 (A.I.) No. 8. Here's the thing that walks around the
 house. (The guard.) Here comes the road. They're
 making it.
 (A.I.) No. 2. Here comes the man up on top of the
 house. There's the bell. Let's wash our hands.

This example (4) monologue type and socialized, shows how easily announcement runs into adapted information in group activity and so is a higher step in socialization than true collective monologue, hence, our classification, monologue type.

In free conversation there are practically no examples of collective monologue, since for the most part they are interested in what each one is saying to the extent of listening and at least adapting their own remarks to some word or

general idea in what another has said. Their individual tales group about a general topic or outgrowth from some other child's remarks. Often they show keen interest and question, criticize, or make suggestions to the one who has told of some experience or shown something he has made. Hence, the examples of monologue type are only those remarks in which the child breaks away from any connection with what has been said to tell something about himself or his experience.

(They have been showing things they have made in school or have been talking about their play.) No. 9. One night I had a story and my mother read in a book about a man and he preached a sermon in a bad country and they put him in a river and a black man came and pulled him out again.

No. 20. One day my little brother wanted to go right out and they wouldn't let him and I put on his rain-coat and he went right out.

No comment is made on either remark and the children go on talking about their play.

With the child at the family meal the examples occur when he separates himself in thought from the rest of the group and talks about his food or thinks aloud without looking for a reply. All such remarks number 27 out of 613 total remarks at the table, or 4%.

- 1) If I haven't the biggest (dish of custard), I've got next to the biggest. If I haven't got next to the biggest, I've got the next to the next to the biggest. (And so on.)
- 2) I took three bites of this and three of that...and then I'll take four bites of this and four of that.. (and so on.)

or when he makes such remarks as

- 3) My glasses are stretched, mother.
- 4) All I've been eating is olives.

5) I'd like to know who had to speak to me to make me eat to-night, I'd like to know.

At bed-time remarks of this type occur when he talks to an imaginary playmate or to his stuffed animals.

- 1) (Making a string-doll nod) How do you do, today?
(Winding it again) I do think this is going to be a better "How do you do, today."
- 2) (Playing with stuffed animals) You guys are guys with shoe-button eyes. Do you know it?

or he announces what he is doing,

- 3) I'm going to take the whole shoe-string out and make it perfectly straight. Now I am going to take these little pajamas and scramble in. I'm going to show you folks, show you folks.

or he thinks aloud (the following conversation leads up to the next example),

Have you got a pin I could stick in my apple? (What for?) Like you said about the world; it was a round ball and you go and go and go and come back to the same place. (He is given a pin.)

4) (Sticks the pin in and eats around the apple to it.) I came right back to it. Now I am going around again. I coasted half-way. You know what coasted is with a car. I turned my engine off, that's the noise I make with my eating. I'm not half through with my apple yet. This makes two apples I've had today.

Even this is adapted in a way to the remarks which preceded.

There are 34 remarks of the announcing variety, 40 of the thinking aloud variety, and 7 when talking to his stuffed animals.

These examples illustrate what Piaget means by ego-centric language where the urge is to express the child's own thoughts but not for any interchange of thought with the one who hears the remarks. Piaget finds the proportion in his two six-year-old subjects of ego-centric speech to other forms of spontaneous language to be 47% for one and 43% for the

other, or 39% and 37% respectively of their total remarks.¹ Our findings exhibit a much lower percentage; 12% of ego-centric to other forms of spontaneous remarks, or 11% of the total remarks of these children's groups, and for the individual child in the same three groups 11% to the other forms of spontaneous speech or 10% of total remarks. These findings, as has been said, are undoubtedly influenced by the conditions of our observations, but because of the other findings which will be set forth in later chapters, we know that ego-centrism is decidedly on the wane with the individual child and special group studied. Then too no restraint was laid on these children to prevent their separating themselves to a greater extent in thought and indulging in more ego-centric speech. They did it enough to evidence their familiarity with it and indulged in it the least in their conversation period,ⁱⁿ which it would have been least appropriate. A sense of fitness is evidently growing in their minds.

Piaget, to ascertain the decline in ego-centrism in one of his subjects, had him observed similarly a few months after he was seven years old and found the coefficient of ego-centrism to have been reduced from 0.47 to 0.27.²

We have offered no coefficient of ego-centrism for this child or group because the conditions under which Piaget

¹ Cf. L.T., 35 f.

² Cf. L.T., 42.

observed could not be exactly reproduced and it would not be a true comparison unless they were.

Examples of socialized type of language, with categories named but not considered separately:

In home play these examples are taken from the conversation of two children who constantly play together and are on the same level of mentality (the little girl though just five ranks over seven mentally, and the little boy a year older in each case). 73% of home play conversation is by these two.

- 1) (This is a continuation of a conversation while they are building with Lincoln logs.)
 (A.I.) D. Then you won't have any garage. (R.) I'll tell you. Take this down and put them all in here. Wait. Now fix it.
 (R.) S. Take everything out. (A.I.) I can fix it. I'm going to make the garage.
 (A.I.) D. I'm making it so your car will go right under the wall.
 (A.I.) S. No, I don't want it to. I'm going to make a house or something. (R.) Play like I left my car over there. I've got a good idea; play like we build it and one goes right up.
 (A.I.) D. I know; you mean put two boards up like this and the car can go up. That would be keen.
 (Q.) S. I figured it out, didn't I, D.?
 (Ans.) D. I helped.

Notice how each remark grows out of what has been said by the other child or leads up to another remark by the other one. This is typical of their conversation at play.

- 2) (This takes place as they are preparing to play. They have been talking about snow on the mountains.)
 (A.I.) S. I can eat snow. It's cold and smooth. I like it.
 (A.I.) D. It is cold.
 (A.I.) S. I eat it anyhow. So does an old lady I know.
 (A.I.) D. I eat pink cotton. (Candy).
 (A.I.) S. Oh, I know. They're in cones. If you ask

for a double one they put a layer of snow on top. Once I got a whole bunch of it, a whole kettle-full of it and ate it. I know how to make it. If it's snowing take a cone and put snow in it.

This is of special interest as an example of the talk of these five-and six-year-old children on a subject other than the activity of the moment. There is no wandering off into soliloquy with these two children when playing together. They collaborate both in action and in thought. And remarks which we have classed as ego-centric in their play-talk have been when they announce to each other what they are doing or about to do, but always in collaboration of action. Any such remarks are extremely rare in their play and are to be found in the play in which other children participate, as a rule.

One example of socialized language from school-play has already been given in outgrowth from and contrast to monologue type. The examples so far given include adapted information, requests, questions, and answers. The following includes criticism.

- (R.) (In the play-house.) No. 20. Father, will you sweep the floor? (C.) You make me mad.
 (Q.) No. 7. (Obeys her request by sweeping.) Do you want me to sweep those, too?
 (Ans.) No. 3. Those are plates. (She picks them up; they are paper bon-bon cases.)
 (C.) No. 7. I hope it's clean. There are three ladies around this joint and they can't sweep a floor.

Adapted information, together with most of the questions and answers....constitute the only categories of child language whose function, in contrast to the divers functions of the ego-centric categories, is to communicate intellectual

processes.¹

Questions will be treated in a separate chapter and contrast will be made of those questions asked by children of each other and those asked of adults. But attention is called here to the fact that

intellectual intercourse between children is still factual or descriptive, i.e., little concerned with causality which remains the subject of conversation between children and adults or of the child's own solitary reflection.²

Their conversation centers most about their activities or description of experiences or of possessions.

Answers, while counted in the total number of remarks, are not considered by Piaget as part of the child's spontaneous language, since the child's social language could be raised considerably by another talkative child or by an adult.³ Thus in the tables which we will give the percentages will be given both with and without answers (either to each other or to adults). Answers include those made to direct requests and to direct questions; when made to other statements they are adapted information.⁴

In free conversation (school) these examples will show how the children become interested in each other's drawings or toys to the extent of suggestions or criticisms.

¹ L.T., 25.

² L.T., 31.

³ Cf. L.T., 35.

⁴ Cf. L.T., 35.

- 1) (A.I.) No. 20. (Showing her drawing) Here's the moon the sky, and here's the grass, and here's the house, and here's a door. I'm going to put some flowers here and put in the sky.
 (C.) No. 1. A house can't be up in the air.
- 2) (A.I.) No. 24. (Showing her drawing) A house and two trees and a sky.
 (A.I.) No. 27. I told her to put on a door and it would look better.
 (C.) No. 10. She should put the chimney straight.

Since we have mentioned the factual nature of children's conversation it is of interest here to contrast the descriptions just quoted, from a child of average mentality and from one near the low level of I.Q. (92) in the larger group with that of another at the top, who describes his as follows:

(A.I.) No. 1. (Showing a series of brownie pictures he has drawn) This brownie's got his shovel down. He's been digging, but he's tired. This one is going to put dirt in the truck. (Next picture) They're going. This is the dust from their wheels. These are the wheels but the spokes are going around so fast they look as if they were plain.

Piaget says of his two six-year-old subjects

All the observed cases of information which might be thought to resemble explanation are statements of fact or descriptions and are free from any desire to explain the causes of phenomena.¹

Is not this child desiring spontaneously to give the reason for particular effect in his drawing? There are other instances among the children of high I.Q. in the group where an attempt is made to explain perspective in a drawing or where several of these superior children by drawing on the blackboard try to demonstrate a problem under discussion

¹ L.T. 22.

(whether a horse can run faster than a freight-train).¹

The children who always stay on the mere factual plane are those mentally near six years of age. These who are interested in the 'why' of things are in the upper third of the group, or occasionally an older one who is mentally between seven and eight will follow the lead of these others and offer a suggestion.

No comparison of the percentage of remarks will be made in the tables which will be given at the close of this discussion except in the case of the child who is being studied individually as he appears in the three children's groups and the groups themselves. Merely as a matter of interest, however, examples will be cited of this child's socialized conversation when with older people.

At the family meal his ego-centric remarks numbered only 32 out of the 540 spontaneous remarks, but in his socialized remarks he entered the general conversation 89 times and adapted 144 remarks to remarks growing out of this entrance. The remainder of his 540 spontaneous remarks were either when a subject was introduced by himself or when adapted to the conversation which followed. Of these 508 spontaneous socialized remarks, 205 were in question form, and 68 were requests. Of course no account was kept of the adult

¹ This conversation will be given in Chapter IV.

language in which he did not have a part.

It will be seen in the following chapters that as a member of a social group made up of those older than himself (adults and older brothers) he evidences the greatest signs of socialized thought, interest in logical justification and synthesis of language, etc.

Examples of socialized language at the meal:

- 1) (A.I.) (His brother has been speaking about twins)
Twins are two brothers or two sisters born into the same family at the same time. (Brother: can't they be a brother and a sister? What about E. and W.?)
(Ans.) I didn't know they could.
- 2) (R.) Guess what we saw down-town, daddy. Guess.
(He guesses.)
(Q.) You give up? (Yes.)
(A.I.) An Indian. (Mother: Part Indian.)
(Q.) What else was he besides Indian? (Mexican or Spanish.)
(Q.) What are we besides Stocktonians? (Americans.)
- 3) (Daddy tells a story about an absent-minded man.)
(A.I.) (Sympathetically) The clock might have struck again while he was away.
- 4) (A.I.) Bread and milk go together. I don't mean they sound alike, but they go together; bread and milk. (Aunt: Like land and water.)
(Q.) What others go together, daddy? (Brothers and sisters.)
(A.I.) And big and little, and wife and husband.
- 5) (A.I.) You know, last night Aunt M. was studying brownie talk. (Mother: I guess she was studying French.)
(A.I.) You know that other night when she was studying and you came out and said 'boo-doo' she was studying brownie talk. (No, it was French.)
(Q.) Do brownies talk French?

Examples from bed-time talk:

- 1) (R.) Make me a 4, mother. (I make a written one.)
(C.) That isn't the way a boy in my class made it at school. (I make a printed one.)
(A.I.) Yes, that's the kind he made. One is open at the top; the other isn't.

- 2)(Q.) Do you want me to sing the Teddy-bear song?
 (Yes.)
 (Sings) Teddy-bear has his lair
 Under Johnnie's rocking-chair,
 Don't go there;
 You will get an awful scare. Boo!
 (A.I.) You want to do that "Boo" good and hard.
 (Laughs) All the kids laugh at school when the teacher
 does it good and hard. (Sings it again.)
 (R.) You sing it now. (I do.)
 (C.) Sing it right. (Sings it over, laughing.)
 (C.) You are supposed to laugh, too, mother.
- 3)(Mother says she can't see anything to a little
 movie book he is showing her.) (A.I.) I'll show
 you. (Turns the pages rapidly.) Now watch this space
 right here and pretty soon you'll see a car turning.
 Here she comes!
 (R.) Watch! Watch the man fall out.
 (A.I.) He backs up. (His explanation as to why he
 does.) When you hit, it bounces you back sometimes.
 (Q.) When a ball hits it bounces back, doesn't it?
 (Yes.)
 (A.I.) He's down; he's lying down. He doesn't put on
 his brakes at the end of the racing track.
- 4)(Q.) See this thimble on my finger? (I nod.)
 (A.I.) It looks like a snail-shell.
 (Q.) Do you know what a snail does when it sees a
 bear or anything like that? (I expect it crawls in-
 to its house. It carries its house right along on
 its back, doesn't it?)
 (Ans.) Yes.
 (A.I.) And when it wants to go camping it takes its
 house right with it.
 (Q.) That's a good idea, isn't it? (Yes.)
- 5)This example is interesting from the standpoint of his
 explanation of his drawing of a gyrotop.)
 (A.I.) This is the wheel. That's the thing the wheel
 spins in. Here it is going: the thick part is the
 wheel going. You see when it isn't going the wheel
 looks thin; when it's going it looks thick. (By "thick"
 he means blurred; by "thin" he means distinct lines.)
- 6)(Q.) Did you ever see gold in the sky? (Yes.)
 (A.I.) I have. I've dreamed about it.
 (Q.) Have you ever seen gold in the sky all sparkles?
 (Yes.)
 (A.I.) It isn't sparkles, though. (No, it's the re-
 flection from the sun. Sometimes there are gold
 edges on the clouds.)
 A.I.) That's to show they are clouds.

- 7) (A.I.) You're going to feel so proudly when you see your Christmas present that I'm going to get for you.
 (R.) Guess what it is. (I don't want to.)
 (A.I.) I'm not going to tell, because it's a secret. I don't know, it's going to be hard to keep it.
 (Q.) You don't want to know, do you? 'Cause you like surprises, don't you? (Yes.)
 (A.I.) We're going to get millions of surprises.
 (And so on.)

Examples could be multiplied many times but these have been given to show not only the different types of socialized conversation but to show the varied interests of the six-year-old. This will be shown further through the study of his questions. His interest turns from toys, games, puzzles, explanations, questions about animals, to life, our personalities, death, and the universe; in fact, every variety of topic. Although they cannot all be studied here technically from the standpoint of logic, they are filled with a wealth of psychological interest to a student of children's minds. Also they evidence the difference in subject matter about which a child talks when with an adult and when with his playmates. Perhaps it should be mentioned here that this child always insists on answers to his questions.

Before giving the tables of remarks let us emphasize again the difference in our circumstances of observation for studying ego-centrism in any mathematical way. We have found, however, that Piaget's classification covers every remark made by any child; it is workable and opens an interesting field of investigation. But it is evidenced here as in the following chapters that our subjects, at least

those most studied, are emerging definitely from the ego-centric period while Piaget still finds his two subjects equally divided between ego-centrism and socialization. Investigation should be carried out with younger American children and great care chosen to study subjects where mental and chronological ages correspond. These subjects were chosen first and the findings brought out the difference between our subjects and Piaget's of the same age. Because Piaget enters so thoroughly into every detail and because such a procedure is impossible in a study of the present scope, we refer the reader to his book for further points of comparison.¹

¹L.T. Chapter I.

Summary of Functions of Language

I. Children's groups, with answers.

	Home Play		School Play		Free Conversation		Total	
Repetition	1	0%	7	1%	3	0%	11	0%
Monologue Type	85	11%	109	16%	39	5%	233	11%
Adapted Information	369	50%	336	48%	512	70%	1217	56%
Criticism	30	4%	13	2%	26	3%	69	3%
Request	84	11%	92	13%	9	1%	185	9%
Questions	122	17%	94	14%	47	6%	263	12%
Answers	52	7%	43	6%	108	15%	203	9%
Ego-centric Totals	86	11%	116	17%	42	6%	244	11%
Socialized Totals	657	89%	578	83%	702	94%	1937	89%
Total Remarks	743		694		744		2181	

II. Children's groups, without answers (i.e., spontaneous).

	Home Play		School Play		Free Conversation		Total	
Repetition	1	0%	7	1%	3	$\frac{1}{2}$ %	11	1%
Monologue Type	85	12%	109	17%	39	6%	233	11%
Adapted Information	369	54%	336	52%	512	81 $\frac{1}{2}$ %	1217	62%
Criticism	30	4%	13	2%	26	4%	69	3 $\frac{1}{2}$ %
Request	84	12%	92	14%	9	1%	185	9 $\frac{1}{2}$ %
Questions	122	18%	94	14%	47	7%	263	13%
Ego-centric Totals	86	12%	116	18%	42	7%	244	12%
Socialized Totals	605	88%	535	82%	594	93%	1734	88%
Total Remarks (Spontaneous)	691		651		636		1978	

III. D's Own Remarks, in Children's Groups (With answers).

	Home Play		School Play		Free Conversation		Total
Repetition	2	$\frac{1}{2}\%$	5	3%	0	0%	7 1%
Monologue Type	42	10%	19	12 $\frac{1}{2}\%$	0	0%	61 9%
Adapted Information	207	50%	70	46%	60	69%	337 52%
Criticism	19	5%	3	2%	4	5%	26 4%
Request	48	11 $\frac{1}{2}\%$	19	12 $\frac{1}{2}\%$	1	1%	68 10%
Questions	74	18%	27	18%	9	10%	110 17%
Answers	21	5%	9	6%	13	15%	43 7%
Ego-centric Totals	44	10%	24	16%	0	0%	68 10%
Socialized Totals	369	90%	128	84%	87	100%	584 90%
Total Remarks	413		152		87		652

IV. D's Own Remarks, in Children's Groups (without answers).

	Home Play		School Play		Free Conversation		Total
Repetition	2	$\frac{1}{2}\%$	5	4%	0	0%	7 1%
Monologue Type	42	10 $\frac{1}{2}\%$	19	13%	0	0%	61 10%
Adapted Information	207	53%	70	49%	60	81%	337 56%
Criticism	19	5%	3	2%	4	5 $\frac{1}{4}\%$	26 4%
Request	48	12%	19	13%	1	3/4%	68 11%
Questions	74	19%	27	19%	9	12%	110 18%
Ego-centric Totals	44	11%	24	17%	0	0%	68 11%
Socialized Totals	348	89%	119	83%	87	100%	541 89%
Total Remarks (Spontaneous)	392		143		87		609

V. D's Remarks, with Adults (with answers).

	At Meal		At Bed-Time	
Repetition	5	1%	9	1%
Monologue Type	27	4%	84	8%
Adapted Information	217	35%	412	40%
Criticism	18	3%	20	2%
Request	68	11%	125	12%
Questions	215	34%	332	32%
Answers	73	12%	49	5%
Ego-centric Totals	32	5%	93	9%
Socialized Totals	581	95%	938	91%
Total Remarks	613		1031	

VI. D's Remarks, with Adults (without answers).

	At Meal		At Bed-time	
Repetition	5	1%	9	1%
Monologue Type	27	5%	84	8%
Adapted Information	217	40%	412	42%
Criticism	18	3%	20	2%
Request	68	13%	125	13%
Questions	215	38%	332	34%
Ego-centric Totals	32	6%	93	9%
Socialized Totals	508	94%	889	91%
Total Remarks (Spontaneous)	540		982	

Chapter IV

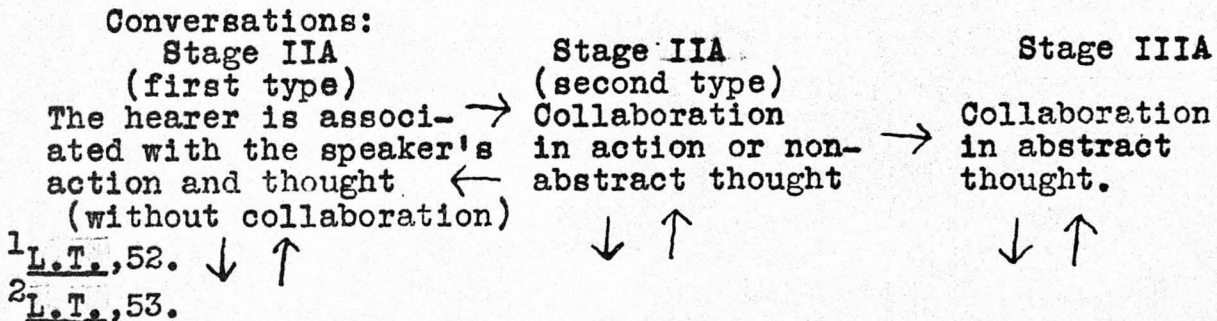
Types and Stages in Conversation

Where in the preceding chapter single remarks, with the accompanying circumstances formed the unit of this study we now turn to conversations of three remarks or more as the unit in question. This study considers only conversations between children and is therefore based on the observation of play at home and at school, and in the free conversation period at school. Let us first establish what we designate here as a conversation.

Whenever---to fix an arbitrary minimum--three consecutive remarks about the same subject are made by at least two interlocutors. Here are two of the simpler possible schemes of conversation:¹

- | | |
|---|---|
| <p>I (1) Remark by A.
 (2) Remark by B adapted to (1).
 (3) Remark by A adapted to (2).</p> | <p>II (1) Remark by A.
 (2) Remark by B adapted to (1).
 (3) Remark by C adapted to (1) or (2).</p> |
|---|---|

Piaget proceeds to establish three stages of conversation showing the process of evolution by which a child passes from ego-centric language proper to the higher types of conversation. Stage I represents the ego-centric language in monologue and collective monologue. Therefore I give his table beginning from this point.²



Undoubtedly the best way to detect the difference between the stages as well as to study each stage is to cite examples.

Stage IIA (first type) is only found in the free conversation group at school, and is to my mind at one with a column of "That Reminds Me."

- 1) No. 20. Once my daddy went fishing. My mother didn't catch anything but my daddy did.
 No. 16. My daddy caught one.
 No. 24. I caught a great big fish once.
 No. 2. My daddy went fishing. My dog fell in but he got out and my daddy caught four fishes.
 No. 10. My dog could. My dog swims. It's a fox terrier. Every time we go swimming he jumps in the water. Once my father went in swimming and my dog jumped on his back.
 No. 15. I got a dog too. Another girl has a dog and he's that high (motions). He's a hunting dog and he can find things. They keep him in the cellar.
 No. 7. I got a dog and every time I'd throw a ball he'd catch it.
 No. 19. Once my sister had a dog and it used to jump over me. A machine ran over it.
 No. 4. My grandmother has two dogs and every time at night a machine goes by they bark, and my grandma can't sleep, but they never get runned over.
- 2) (The teacher has read a story about children at the beach.)
 No. 1. I've dug holes in the sand and the waves wash up in the hole and pull the sand back with it.
 No. 2. I went down to the beach.
 No. 1. Once my aunt and I were down at a pretty place on the beach and my aunt and I picked up lots of pretty stones and shells.
 No. 9. Once I went to the beach and I had my shoes and stockings off and I got my feet wet and I had my bathing-suit on.
 No. 20. I went down to the beach last Sunday and we saw the sea-gulls. I had my swimming-suit and my swimming-shoes and my swimming-hat and when I took my swimming-shoes off they were washed away. (And so it continues for some time.)

These two examples illustrate fully the conversation designated by Stage IIA (first type) and follow exactly the

description given by Piaget.

It is quite plain that this stage is an outgrowth of ego-centric language and likewise only a step in the direction of socialized language. For while each child is interested in what the others say and indicates by his own remarks that he is listening, yet he makes no comment on the remarks of the other child but merely uses them as an excuse to tell of something along the same line from his own experience.

In Stage IIA (second type) there is a definite progress for they are interested in a common activity and their interest becomes more objective and less subjective.

In free conversation period:

- 1) No. 2. I'm making a cave and we are making some ditches all around so people can't get in.
 No. 27. We're making a great big one.
 No. 8. I hope you don't bump into the wall.
 No. 2. We might bump right into Mr. J's basement.
- 2) No. 3. (Explains her picture.) We're playing hide and seek. (She points it all out.) A boy found a board and made a bridge across. And this little boy can't find this one and this little girl is hiding from that little boy.
 No. 8. I think you'd just have her head sticking up.
 No. 1. (Goes up and points.) Is she hiding from this little boy? I should think you'd have him here. I should think the board would be straight. (Her bridge is curved. The teacher explains that bridges may be either straight or curved.)
- 3) No. 27. (Showing a toy tractor.) You can't wind it; it winds back. (The group watch interestedly.)
 No. 5. My brother has a train that does that, and he holds it till it starts.
 No. 7. Hold the wheel and it won't go back. I've got an airplane that does that.
 No. 2. Put the brakes on and then start it and then take the brakes off.
 No. 27. It won't do it; its broken.

From school play:

- 1) No. 10. (Making paste-board reindeer which he has promised one of the girls he would make for her.) Here's one of your reindeer. (To No. 15, who has been an interested onlooker.)
 No. 1. Where's his horns?
 No. 10. He can't have any. They'd bend back.
 No. 1. He must be a baby reindeer. He must be a fawn.
 No. 15. (To teacher) Here's one of my reindeer, but he hasn't any horns. They'd bend back. He's a baby reindeer.
- 2) No. 3. The teacher told me how to make this; you ask her.
 No. 5. I know how.
 No. 3. There is just a certain way to do it. There, my book is done. I'm going to make a fancy cover. (To No. 5) She told me how to do it. That's not the way. There's just a certain way.
 No. 5. You do it, then.
 No. 3. Get your cover. (She does.) You do it like this and like this. (Punches the holes for her.)

From home play:

- 1) A. How do you steer this thing?
 D. I'll show you. You turn the wheel till it's like this. As long as it's that way it goes straight.
 A. I've got it now.
- 2) (Building and playing with Lincoln logs.)
 B. Let's make the house big like this and put these things in it. This is a desk, isn't it?
 D. No, it's a table.
 B. What's this?
 D. That's a davenport. This goes like this and there's a davenport for you. We'll have to put a davenport right here. Move that over.
 B. Here, D.
 D. Move back the table. (Conversation continues.)

From these examples the sharing of a common activity or interest or thought stands out clearly as a step further towards socialization.

Of IIIA Piaget says,

Conversations at this stage are the only ones in which there is any real exchange of thought....

The conversations which we shall class under the present type are those which bear (1) on the explanation of things and the motives of actions, (2) on the reality of events ("Is it true that...?" Why?....etc.).....

From the twenty children under observation we obtained only one conversation of this type, and not a very clear one at that. This shows once more how ego-centric are the intellectual processes of the child. It also enables us to place the beginnings of the socialization of thought somewhere between 7 and 8. It is at about this age, in our opinion, that conversations of this type first make their appearance.¹

From home play:

- D. I love doggies.
- A. You love them. Why don't you kiss them?
- D. I love 'em but I don't kiss them. I kiss cats, but I don't kiss dogs.
- S. I kiss my cat.

This case is concerned with the "Why" of a conjectural action.

From school conversation:

- 1) (This conversation continues from one previously cited as an example of Stage IIA (second type) on the subject of cave-digging.)
 - No. 1. If you got in it and somebody walked over it and tramped it, it would fall in and you'd be buried.
 - No. 2. If it caved in we could go over into Mr. J's basement and it wouldn't cave in 'cause there is a house over it.
 - No. 1. Are you digging it in the basement?
 - No. 2. We're going to go deep and make it go flat, and then go into the basement. (Conversation continues.)

This example also involves a possible procedure.

- 2) (this is the most interesting of all but is too lengthy to quote in full. It occurred on the very last day of observation and looks toward demonstration and proof.)

¹
L.T., 63 f.

No. 5. (Continuing a conversation of pony-riding.)
When my mother was a little girl, there was a horse
one time and she got on the horse and had a race with
a train.

No. 8. Which kind of a train, a freight train or a
passenger train? A passenger train could go faster
than a horse. (He goes to the blackboard and draws.)
This would be the horse and this would be the freight
train (behind.) The train would be so slow. If it was
a passenger train here would be the horse and here the
train (the train way ahead.) (Nos. 1 and 2 go to the
board and point to No. 8's drawing as they talk.)

No. 2. Without the cars on the engine and coal car
could go as fast.

No. 8. I'm not talking about that. I'm talking about a
freight train.

No. 1. An electric train could go as fast.

No. 27. Like the freight train was an elephant, the
horse would run faster than the elephant.

No. 2. But you see the train is longer than the horse
but the horse could run faster than the train.

Several: Could a horse run as fast?

No. 2. I used to live in a big place and the freight
trains used to go by all the time. Sometimes the train
would be a long line and the engine couldn't go very
fast. (More remarks.)

No. 1. If it wanted to, (Notice the attributing of a
psychological intention to the train, an evidence of
animism) the train could go faster than the horse.
I should think the train would beat the horse. (Draws.)
The horse might slow down. It might get tired.

No. 8. It might get scared of the train.

No. 27. Interesting ideas!

No. 2. If the horse stopped the train could beat him.

No. 8. I'll tell you a good thing to do. If you're
ever by a freight train get a horse and see who beats.

No. 27. If I go to San Francisco I'll try it and tell
you. (Describing a drawing.)

Contrast with this the conversations quoted at the beginning
of this chapter as examples from the same group under the
same conditions of Stage IIA (first type). Such conversations
still are common but the process of socialization among them-
selves, of adapting their thoughts to each other's and
demonstrating ideas, is working out beyond the field of

their own immediate activities. There is, of course, a development within each stage and there are examples of conversation starting out in one stage and developing into the next, but space does not permit the giving of more.

So far we have considered examples of the types of conversation based on the agreement of opinion. Therefore the following examples will show their parallels based on disagreement. There happens not to be a single example in all these observations of Stage IIB (first type). In common usage we would designate it as fight, a quarrel that reaches blows, or at least threats of blows. Probably this is due to the circumstances under which they were taken, in school or in a home. Such conversations would be most likely to occur when children were entirely by themselves with no evidence of supervision. Therefore, let us turn to examples of Stage IIB (second type), clash of assertions with no attempt at proof.

From free conversation at school:

- No. 1. (Describing a drawing of his own.) Here's the rain. Here's the clouds. This is a rainbow. This is supposed to be red, scarlet, and pink.
 No. 10. Isn't that snow?
 No. 18. It's rain.
 No. 19. Rain is white.

From school play:

- 1) (In the play-house.) No. 16. Here's the pillow.
 No. 5. That's its bed.
 No. 16. 'Tis not. It's the pillow.
 2) No. 10. (Showing colored paper to No. 2.) This

is pretty.
 No. 2. No, it isn't.
 No. 10. 'Tis too.

From home play:

- 1) (They have just asked for an apple.) S. That's a big red one.
 D. That's a pink one.
 S. Nice red apple, makes you hungry. Let your mother cut it.
 D. No, I'll cut it. Which side do you want?
 S. This one; it's the biggest one. You know, company the biggest.
 D. There isn't going to be any biggest. Let's go outside to eat them.
- 2) A. Here comes S.
 D. Look who's here, S. Don't you know who she is? Who is it? A?
 S. No.
 D. 'Tis too.

These examples are self-evident.

Primitive argument is thus, on the mental plane, the equivalent of quarreling on the plane of action--a simple clash of contrary opinions and desires.¹

Piaget finds again, as in the case of Stage IIIA, only one example of IIIB.

This result shows very clearly that genuine argument and collaboration in abstract thought constitute a stage of development which only intervenes after the age of seven.²

This fact is of the greatest importance, he claims.

For it is between the ages of seven and eight that we can date the appearance of a logical stage in which the phenomenon of reflection becomes general; if we agree with P. Janet in calling reflection the tendency to unify ones

¹ L.T., 70.

² L.T., 73.

beliefs and opinions, to systematize them with the object of avoiding contradiction.¹

Reflection is defined as "the outcome of an internal debate in which a conclusion is reached."² Piaget designated as an element of clear examples of this stage of argument the explicit use of the conjunction 'because'. I have no example of arguments in which 'because' is used, although its use in other types of conversation will be considered in the chapter on conjunctions. There are, however, examples of arguments where attempts are made to justify or prove statements and these mark the beginnings of Stage IIIB.

From school play:

- 1) No. 1. The workers is the fastest group of all.
- No. 2. No., it's not.
- No. 1. Yes, it is; I guess I know. Teacher told me.

This would be purely primitive argument except that in the end the child seeks to justify his own statement, first by his own authority and then by the authority of an elder. Another similar example takes place between the same two children:

- 2) No. 2. Look at J.I.'s design.
- No. 1. That's not J.I.
- No. 2. Yes, it is.
- No. 1. I'll ask him. (He does.) I guess you're right.

In this case the child appeals directly to another person for proof and finding himself in the wrong admits his error.

Here is another direct appeal for proof:

¹L.T., 74.

²L.T., 75.

- 3) No. 3. (Talking about the pictures they are pasting in their scrap-books.) Here's another front room. Can I have one?
 No. 6. No, it's a dining-room.
 No. 3. No, it's a front room.
 No. 6. I'll ask. (She comes and asks me and finds she is wrong.) All right; you can have this one.

Though Piaget does not class this as genuine argument, they are a step in advance of the cases where no attempt is made to justify one's statements, and this is evidently the way in which primitive argument develops into genuine argument, by recognizing the need for proof.

The summary of the findings in this study is as follows (taking from all children's conversations):

Stage IIA (first type).....	21	}	21
Stage IIB (first type).....	0		
Stage IIA (second type)....	124	}	130
Stage IIB (second type)....	6		
Stage IIIA.....	4	}	4
Stage IIIB.....	0		
In addition there are.....	12		
other conversations which merge from one stage or type to another.			

Total number of conversations 167

It is very evident from this that these children, at least among themselves, are more interested in activity than in causal or logical explanation. This will be brought out again in the study of their questions and in their use of conjunctions. However, these further studies will bring out the difference in individual development, in the same

individual when in contact with a more socialized group. It is evident from examples given that a beginning is being made in collaboration in abstract thought, which beginning Piaget places somewhere between seven and eight. It is also evident that a feeling of a need of justification or proof in argument is awakening, though naturally lagging somewhat behind the other, since it demands a more explicit use of words.

Hence our findings bear out Piaget's thesis of developing stages of conversation marking their progress in socialization. It is likewise true that the examples of more socialized conversation come from the third of the group having the highest I.Q., which confirms our own statement in that regard, concerning their corresponding development of thought.

Chapter V

Understanding and Verbal Explanation Between Children

In the matter of dealing with the understanding between children we feel most at a loss since the material is so elusive. Therefore we have made no attempt to put our results into mathematical form and merely offer general conclusions borne out by the examples we give. To quote from Piaget,

When, moreover, the language becomes socialized, the process at first only touches the factual products of thought, i.e., in talking to each other children avoid the use of causal and logical relations (because, etc.), such as are used in all "genuine argument" or in "collaboration in abstract thought." Before the age of 7 or 8 these two kinds of relations are therefore still unexpressed, or rather, still strictly individual. Observation shows that up till the age of about 7 or 8, the child, even when he can think of them himself, does not spontaneously give explanations or demonstrations to his equals because his language is still saturated with ego-centrism.¹

Piaget alludes many times to this fact that children do not exert themselves with their equals to use causal relationships or logical synthesis, to be interested in causal explanation, or to go beyond factual or descriptive

¹ L.T., 100 f.

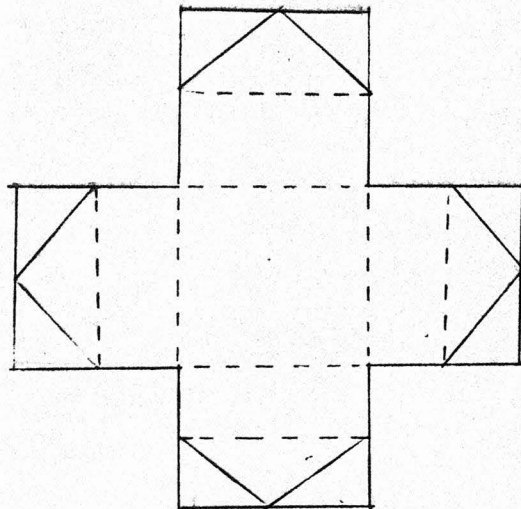
conversation and hints that this may not be true of the child when with adults. He emphasizes the conditions between children but does not balance these with similar situations of the child among adults, except in his study of questions and in the present experiment to be studied. In the former study (of questions) the child is not the same in both situations and the situations are not parallel. Our parallel studies of the same child among his equals and among adults offer a splendid opportunity to bring out the points of difference. The contrast will be emphasized throughout the thesis. We will observe in later chapters the rarity of 'because', for instance, when children talk among themselves, about their play or experiences. We will also point out how the same child increases his spontaneous use of 'because' and other conjunctions when in an adult group, showing that children still retain more ego-centric habits of speech among themselves and therefore use fewer socialized forms than they are capable of and use under other circumstances.

If children fail to understand one another, it is because they think they do understand one another.¹

To study the evidences of this characteristic in our subjects we performed two experiments, one considering

¹L.T., 101.

'acted' conversation and one story-telling. The children were taken in pairs to alternate with each other in the hearing and the retelling of the explanation or the story to each other. One child witnessed the explanation of paper-folding or cutting with the information beforehand that he was to show the other child each step of the process he had gone through and repeat as exactly as he could the explanation which had been given him. Then the second child was called in to listen to and to repeat the demonstration and explanation as correctly as he knew how, to the child who had told him.



Experimenter: (Folding a paper) This is cut to look like a cross. (Cutting off corners.) Now watch. I'm going to make it into a box. I fold this clear back to the line. I fold the point back even with the line. (Repeats for other three sides.) Then I put it up to make the sides stand up. Now see if you can do exactly what I did and be sure to tell exactly what you do.
 No. 3. (explainer): We're going to make a box. Fold that right even with that. Fold the point back even with that. We take this and fold it even with that line. Then we fold this point back. Then we

take this and fold it back even like that. Fold this point back here. (Repeats for the fourth side.)

Straighten up the sides.

No. 7. (Reproducer): Fold it back like that. Fold it back like that. Fold it back like that. Fold this back. It's wrong; I didn't fold it clear back. (Sees his own mistake and corrects it; repeats his first formula for other sides, however.)

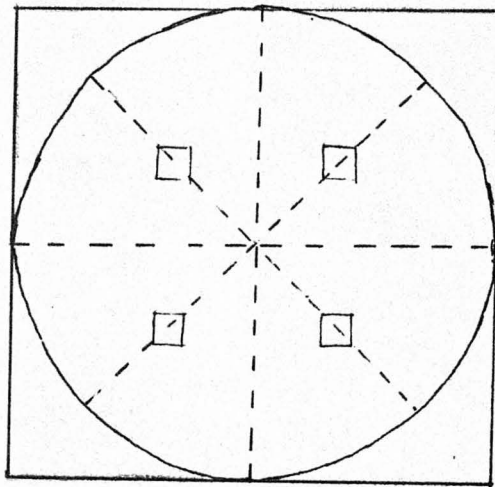
No. 3 (suggests); He hasn't folded the points clear back.

No. 7. I'm going to get that yet. I fold this down farther. (Gets it right.)

This experiment is much simpler than the one used by Piaget (the explanation of the mechanical device by diagram)¹; yet simple as it is, the child who listened to the adult repeated more essential points to the other child than that reproducer gave back to her. The first child is very painstaking by nature and has given an excellent explanation but the second child fails to tell what he is going to make and leaves out essential points in the explanation. Only his quick wit and the visible results of the gaps in his explanation help him in this case to check his own explanation. Instead of reproducing an explanation in the essential points, he uses the sketchiest terms. This pair has been used to show that it is not only understanding of adults by children that is more exact than understanding between children but to show the individual difference in children. The children exchange their roles of explainer and reproducer. Notice the sketchy way in which No. 7 explains

¹ L.T., Chapter III. (Piaget's experiments are explained in full.)

what the adult has told him.



Experimenter: I am going to make a circle with a square in each quarter. I fold it over once evenly; then I fold it once again evenly. I am very careful to take hold of the point where the folded sides come together. I cut the open sides rounding from this point to this. I fold it double again and cut a three-cornered hole in the middle of this fold. Now I unfold it and see, what have I?

No. 7: Get a piece of paper and fold it like that. You fold it again and try to cut a round circle. Now I'm stuck; I think it goes like this. I cut a hole.

He does it right but says nothing about what he is going to make, about folding it evenly each time, or about how he is to hold it. No. 3, who watches closely, follows his actions as well as his sketchy explanation and gets it right, but notice the difference in the type of explanation she gives now and the one given by her after an adult explanation.

She is reproducing his.

No. 3. Fold that like that. Then fold it like this. Make a round circle. Fold it like that and cut out this little hole.

There are varieties of explanation and degrees of accuracy in these six pairs of children. One child, No. 19

takes the same adult explanation for folding a paper box that No. 3 had and gives her partner this explanation:

No. 19. Go like that and go like that (repeats three times.).

Of course she fails in her finished product and her little partner, who has only her pattern and explanation to go by, has the same results.

It would be tiresome to multiply these examples. The children with the strongest bent for accuracy and exactness give the best explanations and also give back most accurately what their partners tell them. The value of this simple experiment lies in the fact that it shows how much some of these children rely on action and reality to fill out the gaps in their explanations.

This is the only experiment in which we deviated from Piaget's exact pattern, as he uses the mechanical explanation, a much more difficult one to handle. However, the story-telling is carried out as a parallel to his suggestion. The same plan is followed with the two children as with the explainer and reproducer in the other experiment given. Here again we found all varieties of and degrees in accuracy of explanation.

Experimenter: Once upon a time, there was a lady who was called Niobe (name not essential) who had 12 sons and 12 daughters (any number provided it is larger than the number the fairy had). She met a fairy who had only one son and no daughter (or any inferior number). Then the lady laughed at the fairy because the fairy only had one boy. Then the fairy was very angry and fastened the lady to a rock (or tree, etc.). The lady

cried for 10 years. In the end, she turned into a rock and her tears made a stream which still runs today.¹

No. 1 (explainer): Once there was a lady. She had 11 sons and 11 daughters. She met a fairy with only one. She laughed at the fairy 'cause she had one. The fairy tied her to a rock. She cried and cried for 10 years. She turned into a rock. The tears ran till it made a stream. The stream still runs.

No. 8. (reproducer): Once a lady had 11 sons and 11 daughters. She laughed at the fairy 'cause she had only 1 son. The fairy tied her to a tree. She cried for 10 years.

The first is an almost accurate reproduction, the only point left out being that the fairy was angry at the lady. The reproducer fails to mention the meeting of the fairy and the lady or to finish up the story. It is to be remembered that the adult or explainer tells or retells the story until the child told says he is ready to reproduce it. These two children do not reverse the order of events or neglect the causal relation. Here is the same story reproduced by two other children:

No. 2. (explainer): There was a lady had 12 sons and 12 daughters. Another lady only had one son and one daughter. She laughed at this other lady. The other lady tied her to a rock. She cried for 10 years and made a stream and it's there now.

He tells it very well but neglects the causal relation.

No. 5. (reproducer): There was a wife had 12 daughters and 12 sons. There was a lady had 1 daughter and 1 son. The other lady laughed at her. She tied her to a rock. She cried for 10 years.

Notice the mixture of pronouns and the neglect to finish the story as told her.

¹ Cf. L.T., 82 and 87.

Pronouns, personal and demonstrative adjectives, etc., 'he, she,' or 'that, the, him,' etc., are used right and left, without any indication of what they refer to...The pronouns distributed at random are therefore a characteristic of the style, and not a proof of lack of understanding.¹

This is just as true of No. 5 as of the case referred to by Piaget.

The first two children change parts and the following story is told to one of them (They are told not to bother about the names):

Experimenter: A child went up to a lark and said, "Good lark, have you any young ones?" "Yes, child, I have," said the lark, "and they are very pretty ones, indeed." Then she pointed to them and said, "This is Fair Wing, that is Tiny Bill, and that other is Bright Eyes." The child said, "Yes, at home we are three, myself and my two sisters, Janet and Alice. And mother says we are pretty little children and she cares a great deal for us." To this the little lark answered, "Oh yes, mother cares a great deal for us, too." Then the child said, "Good lark, will you send one of your little ones to play with me?" Before the mother bird could answer, little Bright Eyes said, "Yes, if you will send your sister to play with us in our nest." The child said, "Oh Alice will be so sorry to leave home and come away from mother." The little bird said, "Tiny Bill (or our little brother) will be so sorry to leave our nest and go away from mother." The little child didn't know what to think and went home saying, "Ah, everyone likes his home."

No. 8 (explainer): A little boy went to see a bird. The child said, "Have you any young ones?" The lark said, "Yes, I have." The child said, "Can Tiny Bill come over to my house?" Before the lark had a chance to answer, the other baby bird said, "The other bird would be sorry to leave his nest." The child said "My sister would be sorry to leave the house."

He has left out details but carries the thread of the story

¹L.T., 102.

through without a mixture of order of events or of pronouns.

No. 1 repeats almost exactly the story as told him.

No. 1 (reproducer): Once a boy went to a lark. The child said, "Have you any baby birds?" The lark said, "Yes, I have." The boy said, "Can Tiny Bill come over to play with me?" Before the bird could say, the little bird said, "The other bird wouldn't want to leave the nest." "The sister wouldn't want to leave the house, either," the child said.

These examples are given from the first pair of children because No. 1 gave the fullest explanations and most accurate reproductions. Two other stories were given them but in every instance they reproduced the causal relationship mentioned in the original, whether as explainers or as reproducers. In the story of Epaminondas, No. 8, in telling it as explainer, said, "When he got home it (the butter) was all melted because the sun was shining hard." The original had said, "The sun was shining hard and when he got home the butter had all melted." He understood the causal relationship, though it was not expressed in the original and put it in his own.

The next two children are quoted because in the first reproduction a causal relationship inferred in the original is caught by this child and put into her story when retold. These instances are unusual, for causal explanations are apt to be left out, according to Piaget.

Other factors are at work which help to render the explainer's exposition rather unintelligible to the reproducer. These are an absence of order in the account given, and the fact that causal relations are rarely expressed, but are generally indicated by simple juxtaposition of the related

terms. The explainer, therefore, seems not to concern himself with the 'how' of the events which he presents; at any rate, he gives only insufficient reasons for those events. In a word, the child lays stress on the events themselves rather than on the relations of time (order) or cause which unite them. These factors, moreover, are probably all connected in various degrees with the central fact of ego-centrism.¹

No. 15. (explainer): Once upon a time there was a lady and she had 12 daughters and 12 sons. And a fairy come (No. 10 interrupts her: "Not 'come', 'came'."). She had 1 son. The fairy tied her to a rock because she said to the fairy, "Ha ha." She had tears in her eyes. She turned into a rock.

No. 10 (reproducer): Once upon a time there was an old lady. She had 12 sons and 12 girls. A fairy came. She had 1 son. The fairy tied her to a rock. She had tears in her eyes. She turned into a rock.

Exchange of parts.

No. 10 (explainer): A little girl went up to a bird. The little girl said, "Have you any birds?" The bird said, "Here's one and here's one and here's one." The little girl said, "Will you send one to my home?" The little bird said, "Yes, if you send your little brother up in our nest we will let you have one." The little girl didn't know what to do. She went home thinking.

No. 15. (reproducer): A little girl said, "I want a little bird." The bird said, "Come over to my nest if you want to have a bird. Send your little brother over to our nest to get it." She said, "All right." She went home. She was mad.

This reproduction is an example of what Piaget means by the habits of child thought which result in lack of understanding.

No. 15 did very well with the story which an adult had told her, but though No. 10 told her the story of the bird and the child quite clearly, except for the point of exchange

¹ L.T., 107.

of child for bird she changes the latter part of the story to fit her own schema and puts a new interpretation on it.

The next examples show how much some of the children condense the story and put various interpretations on it.

No. 20 (explainer): There was a lark and 2 children. They said, "Nice lark, will you send Billy over to play with us?" They said, "Send Mary to play with us." So Barbara said, "Mary would be so sorry to come from home." It was up in a nest.

No. 6 (reproducer): Once there was a lark. There were 2 children. The lark said, "Will you send some children to play with us," Barbara said, "She was so sorry to come from home." (Who is 'she'?)

Such a brief study of these experiments is very inadequate. One wishes for time to pair the children off differently and study different results obtained. This pairing was done without any consideration of equal abilities, the experiment of story-telling being done early in the course of the observations, so the same pairing was continued in the demonstrations to make a fair comparison.

The results of our story-telling experiment are above those quoted by Piaget in the story-telling by six-year-olds. We would emphasize the general placing of the ideas in order by the children (exceptions here and there) and the repeating of causal relationships where they occur in the story and as they are understood and put in, in the two instances quoted. These are in contrast to lack of understanding and seeing of relationships which Piaget emphasizes in his six-year-olds. Our stories compare favorably with those quoted by Piaget from the seven-and-a-half-year-olds and stand out above those quoted from the six-year-olds. This bears out

our conclusion about this group approaching more nearly the criteria for the seven to eight-year-old or the age of implicit reasoning. This sense of relationship already developing in them will be brought out in another chapter. There is, on the whole, a very little romancing or filling in of gaps not remembered. The children try to reproduce the stories they hear and do not twist and turn them to any extreme, though such tendencies in some of them are still evident as shown. There is no equivalent to "She cried for 50 months" as Piaget alludes to in one example,¹ and "For 20 months...and then 20 months."² Our points for criticism are very mild beside this romancing and lack of order Piaget refers to. He goes on to show from his experiments

...that the objectivity of thought is closely bound up with its communicability. It is in ego-centric thought that we give rein to our imagination. When we think socially, we are more obedient to the "imperative of truth".³

On the one hand, it is only from the age of 7 or 8 that there can be any talk of genuine understanding between children. Till then the ego-centric factors of verbal expression (elliptical style, indeterminate pronouns, etc.) and of understanding itself, as well as the derivative factors (such as lack of order, in the accounts given, juxtaposition, etc.) are all too important to allow of any genuine understanding between children. Between the ages of 7 and 8 these factors become less active and some of them (lack of order) even disappear. On the other hand, there exists between children of 6 and 7 and those of 7 and 8 a fundamental

¹ L.T., 106.

² L.T., 111

³ L.T., 124.

difference as regards their efforts to be objective. This convergence of two independent phenomena is certainly not fortuitous, and it has enabled us to place the beginnings of verbal understanding between children, approximately between the ages of 7 and 8.¹

After the age of 7 to 8, these consequences of ego-centrism do not disappear immediately but remain crystallized in the most abstract and inaccessible part of the mind, we mean the realm of purely verbal thought.²

To prove this point, Piaget carries out experiments with older children who are able to read, for these experiments are on written material and therefore beyond our group. Here he brings out the syncretism of understanding or perception "by means of general schemas" which supplant the perception of detail.³ He goes on to distinguish between the syncretism of understanding and the syncretism of reasoning and shows how they are dependent on one another.⁴

¹ L.T., 125

² L.T., 128.

³ Cf. L.T., 132.

⁴ Cf. L. T., Chapter IV.

Chapter VI

Children's Questions

The reason for studying this phase of a child's language is best given by Piaget.

There is no better introduction to child logic than the study of spontaneous questions.¹

He treats it as a "transition subject between the functional study of verbal intelligence in the child and the analysis of the peculiarities of child logic."¹

What are the intellectual interests or, if one prefers, the logical functions to which the questions of a given child testify, and how are those interests to be classified?¹

He then proceeds to classify them according to the sort of answer which the child expects to receive, which classification will be given shortly. All the questions of which he has made a study² are those asked by a single child of one adult. In another connection, however, he deals with a briefer study of the questions of two six-year-olds.³ In our present study it is of interest to examine the questions asked by children in their own groups in comparison with those asked by one of these same children when with adults.

There is also a difference in connection with the conditions under which the subject matter was obtained. The

¹L.T., 162.

²L.T., Chapter V.

³L.T., 28-34.

questions asked by the child from whom Piaget took his findings were asked always during a lesson-hour and this he speaks of as having an inevitable influence on the questions, in spite of the natural atmosphere under which they were asked. This would account, certainly, for the large number of questions of causal explanation involving pre-causality from which he draws his conclusions in this connection about pre-causality in the child. However, our study only strengthens his judgment that children of their own initiative are not especially interested in the cause of things. If one were to guide a child's thoughts toward natural phenomena, the child would inevitably ask questions about them, but just as Piaget's experimenter refrained "as carefully from provoking questions as from picking and choosing among those that were asked,"¹ so in this present study all effort to guide the conversation was conscientiously avoided. At the family meal, for the sake of these observations, the child was allowed to enter the general conversation at will, as his interest directed, or to ask any questions or to introduce any subject he desired. Even in the groups at school no observations were taken during lesson time, but when children chose their activity and their own topic of conversation. In regard to their questions, as to all their language under consideration, every

¹L.T., 163,

one has been included and counted, no differentiation whatever being made.

The following are the tables for analysis which Piaget uses. Further explanation of his terms will be given in connection with the examples chosen from this study. For more explicit details the reader is referred to his chapter on "A Child's Questions."¹

I. Analysis of "Whys"²

Explanation (causal)	Form of the question { Cause..... } { End..... }	Matter of the question Physical objects
Motivation	Motive.....	Psychological actions
Justification	{ Justification proper { Logical reason..... }	Customs and rules Classification and connection of ideas

Piaget explains the difference between psychological motivation which has to do with the immediate motive and psychological explanation which has to do more with the reason or cause underlying the motive and which closely connects with or grows into logical or causal explanation, but he classes them all under motivation.

II. Questions Not Expressed Under the Form of "Why"³

Of causal explanation
Natural phenomena

¹ L.T., Chapter V.

² L.T., 171.

³ Cf. L. T., 218.

Physics
Plants
Animals
Human body
Manufacture

Of reality and history
Facts and events
Place
Time
Modality
Invented history

On actions and intentions

On rules
Social rules
School rules

Of classification
Nomenclature
Logical reason
Classification and evaluation¹

Of calculation

With this material before us, let us cite examples from the children's groups, first considering the 'Whys.'

In the free conversation period at school 47 questions are asked by the children, 7% of their spontaneous remarks. Of these 47 questions, 7 are 'Whys.' 6 of these 'Whys' are whys of motivation (5 of simple motive and 1 of psychological explanation).

- 1) (No. 15 has shown her paper dolls.) No. 27. Why can't you play with them?
- 2) No. 10. Why didn't you use sticks (for candles in the clay cake)?

The difference in degree between these and the next question of psychological explanation is apparent. This seeks a

¹Cf. L.T., 217.

different cause.

- 3) No. 27. Why would you hunt tin-foil? No. 20.
(has been talking about it) I would get money
for it.

The one why of causal explanation in the group is a question about the pasteboard reindeer one of them was showing to the group.

No. 11 Why don't they have horns? No. 7. They're mother-reindeer; they don't have horns.

In the school play period questions form 14% of the children's total spontaneous conversation and out of 94 questions asked 10 are 'Whys,' all of motivation. They are all of the same type, having to do with the activity in which children are engaged.

- 1) No. 10. Why don't you work faster? No. 8. I am working as fast as I can.
2) (Playing house) No. 20. Why don't you put some water in it (the pitcher)? No. 3. It spills.

In the home play group, 18% of their spontaneous conversation consists of questions, 122 in number; of which 7 are 'Whys' (6 of motivation and 1 of logical reason, this latter being the only such question among all the 'Whys' of children in their own groups). According to Piaget, the words or meaning "Why is it called? etc." classes a question as one of logical reasoning, "relating to judgments and not to things."¹

In logical justification, thought becomes conscious of its own independence, of its possible mistakes, and of its conventions, it no longer

¹
L.T., 194 f.

seeks to justify the things in themselves,¹ but its own personal judgments about them.

D. This boy's name is 'Sock' (a stocking-doll). Do you know why? I want you to tell why.

S. Because it was made from a stocking.

The questions of motivation again all have to do with their activity. This is a typical one:

A. Why don't you take another color? What color have you got now?

D. Blue. These are blue-birds. I know they are, by their wings.

Summing up the 'Whys' of children in their own groups, there are 22 of motivation, of which 1 takes on the character of a more lasting cause of the action; 1 of causal explanation; and 1 of logical justification. This bears out Piaget's conclusion that

there is very little attempt on the part of children (i.e., among themselves) to socialize their search for the causal explanation of external phenomena. This does not mean that they do not feel the need for explanation (i.e., when with adults).²

As to the other questions under these same conditions, they group themselves mostly about 'actions and intent,' 'reality and history,' and 'classification.' In other words, they are concerned with matters of fact and not of abstract reasoning, which is what Piaget contends.

Examples from free conversation.

Action and intent.

No. 15. (Showing a bell and a little sleigh she has

¹ L.T., 194.

² Cf. L.T., 33f.; J.R. 13.

made.) I wanted to put the bell on the sleigh but I don't know how to put it on. Maybe someone will help me.

No. 8. Couldn't you hang it on? (He tries but doesn't succeed in making it stay.)

Fact.

(No. 2 has told about an experience with a lizard.)

No. 8. Did he bite you?

No. 2. He didn't do anything. There was a pile of cans there and he dug down in there.

Place.

No. 18. I am going out in the hills to take my lunch.

No. 27. Where? Boston? Cleveland? Twin Peaks, San Francisco?

Classification.

(No. 10 shows a drawing.) No. 8. What's that blue on the side?

No. 10. A curtain; I haven't finished it yet.

Examples from school play.

Action and intent.

1) No. 1. (making designs with colored sticks.) Were you working with these with me last time?

No. 2. No, it was M.

2) (Playing with clay.) No. 3. He can't get a whole big piece like that soft, can he?

No. 5. No.

No. 3. He has to take a little piece.

3) (Making paper chains.) No. 1. You can take the blue out, can't you?

No. 10. Yes.

No. 1. Take it out.

Place.

(In the play-house.) No. 5. You go to work.

No. 2. Where shall I go?

No. 5. Your work is down there (pointing).

Time.

(While they are painting.) No. 15. Some kids had a fight today, didn't they?

No. 1. What do you mean, at recess this afternoon?

No. 15. Yes.

Classification and evaluation.

1) No. 10. Is it all right now?

No. 1. Yes.

- 2) No. 15. (Pointing to a key on a ribbon) Isn't that cute? What is it?
No. 3. A key to my bike.
- 3) No. 20. (About No. 1's drawing.) What are those spots?
No. 1. The dirt on the hills.
- 4) (Playing with clay.) No. 5. What is it, a chair or a stool?
No. 6. She changes it all the time.

School rules. (There is only one.)

(They are making 'phonics' books.) No. 6. How do you make an F?

No. 3. I can show you on the board.

Logical reason. (There are only two.)

- 1) No. 1. How could anything be bigger than big?
No. 2. Giants are bigger.
- 2) (Involves demonstration but does not have to do with set rules) No. 20. How do you make a house?
(No. 1 shows her.) I made mine square.

This last example is not as clear as the other, and is closely allied to action and to rules, but the child who is shown criticizes her own and sees her error, hers being more like a box than a house.

Examples from home play.

Action and intent.

- 1) S. Did you color all these yourself?
A. Yes.
- 2) D. How are you going to get into your house?
B. (Has no door.) Climb up, I guess.
D. Climb up here?
B. Guess I'll build up some steps. Guess I'll tear it down and build a door.
- 3) (This illustrates the intent which corresponds to psychological motivation.) D. Do you want to color with my colored pencils?
A. Yes.
D. I'm going to get a magazine for you.

Fact.

- 1) S: I have my camping-suit on. You know where the camp-fire girls go? Well, there's the cutest puppy there. He'll speak and stand up like that (shows).
D. Does he speak our language?
- 2) S. I wish I was up at the cabin now. I'd slide down hill. I bet there's snow there now, don't you,

D.? It said in the paper that the bus had a hard time getting over the grade.

D. Is it hot up there now?

S. No, it's cold.

Place.

(Playing with train.) D. Put the switch right here on the end of the bridge.

J. Where is it?

D. Right here.

Time.

D. Did you have to go home at a certain time?

B. No, we'll just start home when it's kind of dark.

Classification.

1) B. What are these for? The roofs?

D. Yes, but we're not ready. I'm not and you're not either.

2) B. What's this thing?

D. It's going to be a chair when I get it done.

3) B. This is a desk, isn't it?

D. No, It's a table.

The one question about social rules is an appeal to an adult.

D. (To S.) That isn't fair for you to have all the short sticks. Is it, mother?

There is one example of logical reason which, however, borders closely on intent.

A. I told you you didn't have red. What did you say you did for?

D. 'Cause I thought I did.

It has the criterion, "Why do you assert that?" which we have referred to before. One of the examples of logical reason through demonstration was given in connection with types of conversation.

A. How do you steer this thing?

D. I'll show you. You turn the wheel like this. As long as it is that way, it goes straight.

This is allied to human action but the demonstration involves

reason. It shows how one forms a basis out of which the other gradually emerges; the intellectual realist through transitional stages becomes able to separate intellectual processes from himself. In a similar manner Piaget shows how questions of logical reason grow out of questions about the actions of people through questions about the rules which govern these actions. This very confusion in the child's mind of causal explanation and logical justification with psychological motivation is what Piaget designates as 'precausality.'¹

Now what we propose to show is that in the child before the age of 7 or 8, these types of explanation are, if not completely undifferentiated, at any rate far more similar to each other than they are with us. Causal explanation and logical justification in particular are still identified with motivation; because causation in the child's mind takes on the character of finalism and psychological motivation far rather than that of spatial contact, and because, moreover, logical justification hardly ever exists in an unadulterated form but always tends to reduce itself to psychological motivation. We shall designate by the name of precausality this primitive relation in which causation still bears the marks of a quasi-psychological motivation. One of the forms taken by this precausality is the anthropomorphic explanation of nature. In this case, the causes of phenomena are always confused with the intention of the Creator or with those of men, who are the makers of mountains and rivers. But even if no 'intention' can be detected in this anthropomorphic form, the 'reason' which the child tries to give for phenomena is far more in the nature of a utilitarian reason or of a motive than of spatial contact.²

¹ L.T., 196

² L.T., 181

If all the questions noted down were examined, one would see that the children among themselves ask only what might be designated as surface questions. The subject-matter of the examples given has been typical of all. But when the child is in conversation with one or more adults, his questions, though falling under the same heads, are in many instances of a deeper nature. Piaget says that the child regards the adult as omniscient, thinks all his own questions can be answered and this leads to his notion of finalism, of leaving nothing to chance. And it is only with the realization of death and of necessity that his reasoning begins to assume a logical character, for the idea of necessity underlies all logic.¹ At any rate, children of this age seem never to ask each other questions far removed from simple activity, motive, and fact.

We turn now to D.'s questions asked of adults. The first fact to notice is the proportion of questions asked. Whereas the percentages of questions to totals of spontaneous language of all the children in their groups is 7% in free conversation, 14% in school play, and 18% in home play, and of D. in these same groups respectively is 12%, 19%, and 19%, the percentage of his questions when with one adult is 34% and at the family meal is 38%.

¹This is a general summary of this phase of Piaget's hypothesis as it appears throughout his books.

In the tables of summaries the 'Whys' will be separated from the other questions, but in considering examples they will not be treated entirely apart from the others. Since the categories of questions are now clearly in mind, they will, though named in each instance, not be listed as separately as heretofore.

Unless so designated, the examples will not be kept separate as to time of occurrence since they are all asked of adults (or of older brothers, 12 and 16.)

In the family group talk has centered around plays and this group of questions from D. involves several of classification and one of fact, as well as a why of logical reason, due to the fact that it implies a "Why do you say...?"

Classification

Were the three men in the play I was in the Three Musketeers?

Why of logical reasoning.

Why not? (i.e., why do you say they were not?)

Classification.

Weren't the three musketeers soldiers? (Yes.)

Classification.

Then what makes musketeers? (Soldiers who carry muskets. They didn't have muskets in Trojan days.)

Classification.

What are muskets? (Explanation.)

Fact.

They have muskets now, don't they? (Explanation.)

Other classification questions.

- 1) When a girl loves a boy it's her beau, isn't it?
- 2) What are sheaves?
- 3) What are jokes?
- 4) What's an adult?

- 5) What's a lamp?
- 6) What's a crescent?
- 7) Are nails steel?
- 8) Is a young cow a calf?
- 9) What does parched mean?
- 10) What does quenched mean?

Where among themselves the children's classification questions only sought to designate an object, these seek for a definition of a term, and through definition and rule the child begins abstract reasoning. Still other classification questions are of the following order:

(The family at table are talking about the death of a neighbor.)

- 1) What kind of dreams do you have when you are dead? (Nobody knows.) I mean, if you wake up? (Nobody ever does.)
- 2) Is a funeral where they take you when you're dead? (Explanation.)

Action and intent.

- 1) Are you going over to pray, mother?
- 2) What do they do when they fire a man?
- 3) Do they bury you when you get older?

This leads to a why of logical justification on social rules. Why do they bury dead people? (Explanation of danger to the health of those living, so they either bury or burn the dead body.) I'd rather be burned, so I wouldn't get dirt in my eyes.

Two points of interest in this example are (1) that the question comes very near to the why of causal explanation showing how closely allied these two types are to one another and (2) that the child thinks he will still care after death whether or not he has dirt in his eyes.

Other very different examples of social rules are:

- 1) (The child at the table is asked not to repeat something.) I won't tell till I get married and tell my wife. That'll be all right, won't it?

2) Do ladies that own stores have to pay for their little boys' clothes? (Explanation of wholesale and retail.)

The next example, while it deals with social rules, shows how rules and definitions are hard to separate from classification and how they grow out of human action, also why Piaget puts question of logical reason under classification.

Did you hear Mrs. X. say she forgot to tell me when it was time to come home? That was an excuse, wasn't it?

The following conversation at bed-time is filled with questions of different types.

Place.

Where is Jesus? (Answer.)
Is He down-town, too? (Answer.)
Is He all over town? (Answer.)

Causal explanation.

How can He be? (Because He is a Spirit.)

Psychological motivation.

Why doesn't He come again, like He did? (He came once to show man what God is like.)
Why did they call Him Jesus? (Just as we called you D.)

Psychological explanation.

Why did they hang Him? (Because they were so selfish they didn't recognize Him to be God.)

Fact.

Are the crosses they hung Him on chopped down? (Yes, a long time ago.) Was it two pieces of wood nailed together? (putting his hands together cross-fashion.) (Yes.)

This conversation shows the great difference between the subject-matter of questions asked by a child of an adult or of another child. They fall into the same categories of fact, etc., but deal with far different subject-matter, as for example:

Fact.

We know God, don't we, mother?

A question of psychological explanation which involves causal explanation of sound waves, etc., is

Why do deaf men put their hands behind their ears?

Examples of Causal explanation.

- 1) ('Why' of physics.) (As shadow falls across the table.) Why do we always have to have a shadow?
- 2) (Body.) Do all black-haired people get white hair over their ears like you do, daddy? (No, because...)
- 3) When you die, you forget how to read, don't you? Everything is just the opposite to what it is in life, isn't it? (Yes, because...)
- 4) (Animals.) Ants can crawl up trees easier than anything else, can't they?
- 5) Do eggs grow?
- 6) What are his (elephant's) tusks for?
- 7) (Physical phenomena.) How was earth made?
- 8) Will lead go to steel?
- 9) Is the moon on fire?
- 10) (Manufacture.) How do they make olive oil?

Two other questions of causal explanation have been classed under 'body' but they are of deeper significance. They are asked on separate occasions, so indicate that the child is puzzling about them.

- 1) Mother, am I always the same person? (Yes, there can never be another D.F.) But there has been another D.F. (An uncle.) (I try to explain about individuality and that no two persons are ever exactly the same.)
- 2) Mother, is it always the same 'I' when I wake up in the morning? (What do you think?) I didn't know. It must be, though, 'cause it has the same feelings and the same life.

The following example of logical reasoning is too interesting to be left out.

(At table. The remark has been made that his brother had three rides across the Bay in an aeroplane when he was in San Francisco.) How could he have three rides? How'd he get back to the place he started from?

(Explanation: Because he crossed the Bay once in the ferry-boat.)

It is hoped that this more natural way of handling the individual child's questions of adults has not been confusing. The summaries following will place all the material by classes. Before giving those tables a few examples gathering up those types not indicated thus far are offered.

First are examples of invention, which strangely have occurred nowhere in the children's conversation.

- 1) If I were a mechanic, do you know what I'd do?
- 2) But if I did see a ghost in the closet, what would you do? (But you couldn't, there aren't any such things.) But if I did, what would you do? (I'd look at it and see what it was like, etc.) What are they? (People have used their imagination, etc.)
- 3) What would happen if you broke a leg?

Piaget speaks of such physical assumptions as "mental experiments."

Childish assumptions point to a confusion between the logical and the real order of things, just as pre-causality confuses logical implication and causal explanation. In other words, the child, thanks to the notion of pre-causality, conceives the world as more logical than it really is. This makes it possible for him to connect everything and to foresee everything, and the assumptions which he makes are endowed in his eyes with a richness in possible deductions which our adult logic could never allow them to possess.¹

Examples of historical fact.

(Naming books of the Old Testament.)

- 1) The Chronicles that are put around at peoples' houses? (He means newspapers, such as the San Francisco Chronicle, so explanation of meaning of chronicles.)
- 2) Did they (the Jews) have Chronicles? (I'll read you some of them, so you can see what they are like. I read about King David.)

¹L.T., 211 f.

- 3) He's dead, isn't he? (Yes, a long time ago.) I wonder if I'll be a king when I get big. (The names being the same.)

Examples of school rules.

- 1) (Pronounces 'pretty' as though it were 'purty'. (I say, "No, it's 'pretty'") Who said so?)
- 2) It begins with a T, doesn't it? (Yes.)
- 3) 'Because' is better than 'Cause', isn't it, mother? (Yes.)
- 4) It's wrong to stole. You shouldn't stole. (Explain 'steal, stole, stolen.') Wouldn't it be this way, "I have not stolen"? (Yes.) "I have stoled," that wouldn't be right? What do I hitch on to that 'stolen'? He has, or they have? (It makes no difference.) Is 'they have' two words? (Yes.) 'They' is one word? And 'stolen' is one word? (Yes.)

It is not intended at all to convey the idea that when with an adult the child asks only such questions as have been given as examples, but it is true that neither this particular child nor any other in the children's groups ever ask questions of this nature of each other during the observation periods. Probably these questions are typical of any child of similar age and I.Q. when with adults whom he feels free to question. Side by side with these questions are many in the home observations of the same character as the examples given from the children's groups, dealing with the games, stories, or immediate activity or interest. But most of the questions are seeking for adult information by which to check his own opinions and these questions certainly form a more intensive mode of the socialization of the intellectual processes with its consequent gains in logical reason, if the adults asked are interested in giving the child a thoughtful answer, based on their best knowledge.

Summary of Children's Questions in Their Own Groups (D.'s included.) 80

	Home Play	School Play	School Conver- sation	Totals
Not in the form of 'Why'.				
Action and Intent	59	42	10	111
Reality and History				
Fact	20	8	8	
Place	14	9	7	
Time	0	1	0	
	<u>34</u>	<u>18</u>	<u>15</u>	67
Classification				
Nomenclature	2	1	0	
Classification	15	17	15	
Evaluation	1	3	0	
Reason	3	2	0	
	<u>21</u>	<u>23</u>	<u>15</u>	59
Rules				
Social	1	0	0	
School	0	1	0	
	<u>1</u>	<u>1</u>	<u>0</u>	2
	<u>115</u>	<u>84</u>	<u>40</u>	<u>239</u>

In the form of 'Why'.

Psych. Motivation	6	10	6	22
Causal Explanation	0	0	1	1
Logical Reason	1	0	0	1
	<u>7</u>	<u>10</u>	<u>7</u>	<u>24</u>
	122	94	47	263

Percentages of questions
to total spontaneous re-
marks

18% 14% 7%

Same for both play groups

16%

Same for three groups

13%

Summary of D.'s Questions in Children's Groups.

	Home Play	School Play	School Conversation	Totals
Not in the form of 'Why'.				
Action and Intent	37	11	5	53
Reality and History				
Fact	12	4	0	
Place	12	3	2	
Time	0	1	0	
	<u>24</u>	<u>8</u>	<u>2</u>	34
Classification				
Nomenclature	1	1	0	
Classification	6	3	2	
Evaluation	2	1	0	
Logical Reason	0	1	0	
	<u>9</u>	<u>6</u>	<u>2</u>	17
Rules				
Social	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>
	71	25	9	105
In the form of 'Why'.				
Motivation	1	2	0	
Causal Explanation	0	0	0	
Logical Justification	<u>2</u>	<u>0</u>	<u>0</u>	
OR				
Logical Reason	<u>3</u>	<u>2</u>	<u>0</u>	<u>5</u>
	74	27	9	110
Percentages of questions to total spontaneous remarks	19%	19%	12%	
Same for all children's groups	17%			

Summary of D.'s Questions with Adults

	Meal	Bedtime	Totals
Not in the form of 'Why'.			
Action and Intent	33	123	156
Reality and History			
Fact	79	45	
Place	7	23	
Time	4	3	
Invention	4	9	
	<u>94</u>	<u>80</u>	174
Causal Explanation			
General	1	0	
Human Body	2	12	
Animals	3	2	
Plants	2	0	
Physics	1	9	
Natural Phenomena	<u>9</u>	<u>23</u>	
Spiritual Phenomena	0	3	
Manufacture	3	6	
	<u>12</u>	<u>32</u>	44
Classification			
Nomenclature	5	3	
Classification	31	40	
Evaluation	7	13	
Logical Reason	2	4	
	<u>45</u>	<u>60</u>	105
Rules			
School	5	16	
Social	3	3	
	<u>8</u>	<u>19</u>	27
	<u>192</u>	<u>314</u>	<u>506</u>
Whys			
Motivation	14	11	
Causal Explanation	1	1	
Justification			
Justification	0	2	
Reason	2	0	
	<u>2</u>	<u>2</u>	
	<u>17</u>	<u>14</u>	31
	<u>209</u>	<u>328</u>	<u>537</u>
Percentages of questions to			
Total Spontaneous Remarks	38%	33%	35 $\frac{1}{2}$ %
Total number of questions asked by D. of children and adults 647			

General Summary of All Children's Questions in Groups

Not in the Form of Why

Action and Intent.....	111
Reality and History (Fact 36) (Place 30)(Time 1)...	67
Causal Explanation	0
Classification (Nomenclature 3)(Classification 47) (Evaluation 4)(Logical Reason 5)....	59
Rules (Social 1) (School 1).....	2
Whys (Psychological Motivation 22) (Causal Explana- tion 1)(Logical Explanation 1).....	<u>24</u>
Total number of questions asked by children in groups	263

General Summary of D.'s Questions

with Adults and Other Children

Not in the Form of Why

Action and Intent.....	209
Reality and History (Fact 140)(Place 47)(Time 8) (Invention 13).....	208
Causal Explanation (General 1)(Body 14)(Animals 5) (Plants 2)(Physics 10)(Manu- facture 9)(Spiritual Pheno- mena 3).....	44
Classification (Name 10) Classification 82) (Evaluation 23)(Logical Reason 7)..	122
Rules (School 21) (Social 7).....	28
Whys (Motivation 28) (Causal Explanation 2) (Logical Justification 6).....	<u>36</u>
Total number of Questions asked by D.....	<u>647</u>
Total of above figures.....	910
From which should be subtracted D.'s questions in groups	<u>110</u>
Total number of questions asked by children.....	800

From these summaries and our examples it is evident that child thought centers about action, psychological motivation, and matters of fact. It is also evident from our typical examples that questions asked by children between themselves are simple in character and have to do with the activity of the moment, but that a great change takes place in the character of the questions when the child (whom we have observed) is with friendly adults.

Another outstanding fact is the small proportion of 'whys'. This harmonizes with our assertion that the majority of these children and the one most thoroughly studied, are in their mental age passing out of the ego-centric period and beginning the period that extends from 7-8 to 11-12.

Our findings in the case of the child with adults bear out the truth of the following statement (with the exception that he does not frame his questions of causal explanation in the form of 'why'.)

Thus, on the one hand, the relative frequency of 'whys' diminishes; on the other hand, there is an increase of questions of reality and history in comparison to those of explanation; finally, the sense of the 'whys' becomes increasingly causal. These movements seem to us to be closely connected with one another. It is true that statistics can be made to prove anything, but in this case statistical induction corresponds with the results of qualitative analysis and clinical examination.

For one thing, if the frequency of the 'whys' diminishes in proportion to the bulk of the questions, this is because between the ages of 3 and 7 'Why' is really a question which is used for every purpose, which demands a reason for everything indiscriminately, even when there is no reason for present except through a confusion of the

psychological and the physical order of things. It is therefore quite natural that when these two orders come to be differentiated, and when the idea of chance or of 'the given' first makes its appearance, a large number of questions should break away from the why form. They will then take the form of 'how' or of simple questions without any interrogative words in them, and will concern themselves as much with the consequences and inner mechanism of phenomena as with their 'reason.' The decrease of 'whys' would thus be an index of a weakening of precausality. This weakening, it seems to us, can also be seen in the increase of simple questions insofar as these show signs, as compared to 'whys', of a desire for supplementary information.¹

Thus we find in the case of D. his questions of causal explanation with but one exception are stated in other forms than 'why'. In other words, he is more interested in information about than in the 'why' of things in general. This searching for correct information is typical of his questions of adults, although at times strong evidences of the remains of precausality make their appearance, but very infrequently, however. This infrequency of the 'why' form in his questions as well as the less pre-causal character of his causal questions stand out in startling contrast to the questions of the six-to-seven-year-old quoted by Piaget.

If questions about facts and circumstances are multiplied, it is because the child gives up the attempt to account for phenomena which are simply given, and tries to gain a more detailed knowledge of the historical circumstances in which they appear, of their condition and of their consequences.²

From this point of view we are also enabled to understand why questions of reality and history increase in comparison to questions of explanation,

¹ L.T., 220 f.

² L.T., 222.

always assuming that this increase is not due to the arbitrary character of the classification.¹

Only 31 out of D.'s 537 questions to adults are 'why' questions, while 185 of 750 questions cited of Piaget's six-to-seven-year-old subjects are in the form of 'why'. When D. does ask 'why' questions they are chiefly, as with the other children, 'whys of motivation.'

Though there are very few questions explicitly logical in form, many of his questions of action, or reality and history, and of classification and rules are implicitly logical. If this is evidence of remaining precausality it is also evidence of the germs of reasoning growing in his mind.

There is indeed subject-matter for a whole book in the study of children's questions and one is baffled very often by the delicacy of the task of separating them into arbitrary classes. But Piaget's analysis certainly is applicable as well as interesting and is proof of his tireless effort in his study of the "psychology of the logic of childhood." He spared no pains to verify every assertion and back up his conclusions. He carried this particular experiment over a period of ten months with a child between six and seven and then seven months later put fifty of the same questions to the same child and found a decided decline of precausality. Through socialization of his thought, then, the child adapts the information given him and gradually

¹L.T., 222.

drops his precausal ideas. A similar though unpremeditated experience indicates that the same thing is true in D.'s case.

His question, "Is the moon on fire?" was the most strongly precausal question he asked during the observations. Its precausality is indicated by his own remarks following.

That's what I think. I think Jesus has a soft thing up in the sky, that He lights every night and morning (the sun) and puts it up in the sky, but He's careful not to turn it upside down because the fire might fall on folks and burn them up. There might be sticks flying around in the air and they might catch fire. He always has daylight though, because He always has the sun.

This is perfect evidence that he still retains strong precausal notions. But contrast to that these remarks. He himself brings up the subject, three months later, after the observations are closed; and after he has made his own the explanation given him at the previous time.

A boy said the light from the moon was stronger than the light from the sun because it gave light in the night. But that isn't so, is it? Because the moon gets the light that it gives us from the sun, and anyway it's dark at night because the sun isn't shining on our side of the earth.

Let us keep in mind Piaget's conclusion that "precausality tends to disappear at the same age as ego-centrism, viz., between 7 and 8,¹ and let us draw a few general conclusions.

¹
L.T., 237.

We have seen from our studies so far that ego-centrism is bound up with these various aspects of child thought and that they are affected by it either directly or indirectly. As we go on to study more particularly child reasoning we shall see how ego-centrism, in whatever degree it remains, affects the processes of reasoning. It should be kept in mind always that Piaget emphasizes formal reasoning and draws very nice distinctions in view of that. We have found that to be true in his analysis of child's questions and it will be evident throughout, since in the ability to separate oneself from one's own viewpoint and reason from hypotheses is the greatest evidence of divorce from ego-centric thought.

It is also evident and will be increasingly so, that a child in passing into another stage of thought and reasoning does not drop entirely the habits of the former stage. With others of his own age he is far more ego-centric than with adults and in tests and experiments evidences far greater advance than in conversation with other children.

CHAPTER VII

Use of Conjunctions of Causal, Logical and Discordant Relations

In taking up the effect of ego-centrism on the reasoning processes in a child, Piaget shows that since the child is unconscious of the need of proof he does not synthesize his thoughts, does not consider relations, and therefore omits logical relations and juxtaposes propositions instead of connecting them. Because the child fails to analyze he brings thoughts together in confused wholes connecting everything with everything else, and so indulges in an excess of relating to which Piaget gives the term 'syncretism' which is the opposite of juxtaposition, that being a lack of explicit logical relation.¹ He compares it (as he says M. Luquet has done) to children's drawings: "The thing is not there as a whole, the details only are given, and then, for lack of synthetic relation, they are simply juxtaposed."²

The method followed by Piaget in studying this angle of child reasoning is to study the spontaneous use of the child's conjunctions, especially 'because,' 'although,' and 'therefore', and to give experimental tests which involve the completion of sentences by the children from the

¹ Of. J.R., 4

² J.R., 3.

point where the conjunction is used. Of the results of these tests, he says:

The data show that up to the age of 7-8 the word 'because' is occasionally an equivocal term which is used for all purposes, and covers a number of heterogeneous types of relation--causal, consecutive, and even finalistic, the child being apparently undisturbed by this heterogeneity.¹

Summing up his findings rather than going into every detail, they are as follows: (1) The child confuses different possible relations, such as causality, consequence, etc.: (2) He is unable to handle the explicit relations of discordance, and 'although,' 'even if,' etc. unambiguously before 11-12, using the conjunction 'but', which fails to indicate exact relations; (3) He does not use the 'but' of implicit discordance till 7-8 (that in which the word 'but' "occurs, not at the beginning, but in the middle of a sentence, and of a sentence containing a causal relation whether logical or psychological."²): (4) The word 'therefore' does not exist in childish language until formal logical thought makes it first appearance after 11-12; (5) The different meanings that a child gives to the word 'therefore' turn out to correspond exactly to the different meanings of 'because' as 'and', and 'and then', 'because', etc.: (6) A child's talk is full of 'thens', but only a few of them are logical 'thens' corresponding to 'therefores'; (7) There is a rarity

¹ J.R., 16.

² J.R., 52.

of the 'because' of logical explanation corresponding to the rarity of the 'whys' of logical justification: (8) The child does not understand logical necessity, so reasons from particular to particular, or by transduction, and easily forgets what he has just said, and so contradicts himself.

Piaget distinguishes three types of 'because'---'causal', 'psychological', and 'logical'---calling to mind the three classes of 'whys' studied in Chapter VI. The distinguishing marks of them will be brought out in the study of the examples.

In the present study his method of experiment¹ has been closely followed but the findings will necessarily have to be condensed as much as possible. The most interesting aspect of the experiments has been the study of the individuality of the child in his approach to the experiment and of his characteristic answers, and the detailed material gathered with each one, but as heretofore only sufficient examples can be mentioned which will bring out the general results.

After talking with each child in a friendly fashion and creating the atmosphere of playing a game together, we ask if he can give us a sentence all his own containing the word 'because'. All but one of the twelve do so. This one, No. 5, although she afterward finishes the sentences we give, declares she cannot think of any of her own. It is of

¹For fuller details, see J.R., Chapter I.

interest to note that in her 82 remarks in school observation periods she never once uses the word 'because'. She uses 'because' in a causal sense, however, in every completion sentence except the one about teasing the dog. In that sentence she uses 'because' in the sense of 'and then'. We find in the other experimental tests that she uses 'because' correctly twelve times, of her own accord. These are the sentences (Used by Piaget) given to each child but as completed by No. 5 (the child's words being all those following the conjunction):

- 1) I shan't go to school tomorrow because / it's raining. (This has the criterion of a causal 'because', i.e., "The mark of a relation of cause and effect between two phenomena or two events."¹)
- 2) That man fell off his bicycle because / a car bumped into him to make him fall. (Causal).
- 3) I lost my pen because / it was hanging. (Causal).
- 4) I teased that dog because / he's bad. (She means he's bad as a consequence of her teasing. Her 'because' equals 'and then' or 'therefore').
- 5) A man fell down in the street because / he was playing ball in the street. (Causal).

These sentences are so worded that a child could very easily finish a causal 'because' involving a psychological relation, which Piaget calls "the relation of motive for action",² which children of this age are prone to use, he states, especially in place of logical relations. She, however, does not do so.

¹ J.R., 6.

² J.R., 7.

Her attempt to finish the sentences involving a logical relation (i.e., denoting "a relation, not of cause and effect, but of 'implication,' of reason and consequent; what the 'because' connects here is no longer two observed facts, but two ideas or judgments."¹) is a good illustration of 'justification at any price' and lack of reasoning.

- 1) Paul says he saw a little cat eating a big dog. His friend says that is impossible because / the dog was mean.
- 2) 2 is not half of 5 because / 5 is a little bit straight and 2 is a little bit straight.

In her case the sense of necessity of logical relations is still entirely dormant.

Neither does she understand the use of 'although.' The sentences given each one were as follows, up to and including the conjunction of explicit discordance. These are as she finished them:

- 1) Ernest is playing in the street even though / he would get run over. (This is the only correct use she makes of such a conjunction.)
- 2) I have some big friends even though / they come down to see me. (Confuses with 'and'.)
- 3) He slapped my face even though / I slapped him. (Confuses 'though' with 'because'.)
- 4) I have given John my bicycle though / I might get hurt on it. ('Though' equals 'because'.)
- 5) I ate another roll although / I want to die. (Rather an exaggerated idea of the immediate effect of over-eating, but the 'although' is equivalent to 'because').
- 6) It is hot today although / I guess I'll take a shower. (Here 'although' equals either 'and' or 'therefore'.)
- 7) He bathed yesterday although / he was hot. (Equals

¹
J.R., 6.

'because'.)

- 8) He didn't get wet yesterday, although / there was no water in the tank. (Equals 'because'.)
 9) That man fell off his horse, although / the horse was running fast. (Equals 'because'.)

This brings before the reader the sentences used and illustrates the same results as Piaget found, especially in the use of conjunctions other than 'because'; namely, a confusion of discordance, causality, consecutive relations, and consequence.

Her utter lack of understanding of 'therefore' emphasizes Piaget's conclusion that 'therefore' is not a part of a child's vocabulary before 11-12. For her it does not exist in the sentence, for she adds a 'because' to each 'therefore' before completing the sentence.

- 1) John has lost his pen, therefore / because it was barely hanging.
- 2) I can't ride my bicycle, therefore / because the bicycle was broken.
- 3) Tomorrow I shall have a holiday, therefore / because it is Sunday.
- 4) It will be fine tomorrow, therefore / because he can play.
- 5) The sun is shining, therefore / because it was a pretty day.

Not understanding 'therefore' at all, she naively forgets its existence, adds the 'because' with which she is familiar and finishes the sentence, although in the last two cases she confuses her ideas with the correct use of 'therefore'.

This same disregard of what is not within their understanding is true in the case of several others. No.2

adds 'because' to every 'therefore' given. No. 7 adds it to three of them, but uses 'therefore' correctly in the fifth sentence: The sun is shining, therefore / it is a nice day. In the fourth sentence, however, he repeats the same idea which preceded the 'therefore'; it will be fine tomorrow, therefore / it will be a nice cool day. No. 6 adds 'because' to the 'therefore' in every sentence except one, and repeats the original idea in other words after the 'therefore' in that sentence. No. 8 uses 'therefore' in the first sentence as meaning 'because', and thereafter adds 'because' to the 'therefore'. No. 1 uses it as 'because' in three sentences. Enough have been mentioned to show how readily they attribute the meaning of 'because' to 'therefore', or disregard it entirely in the sentence, adding 'because' to it.

Other instances show it to be confused with 'and'.

No. 15. Tomorrow I shall have a holiday, therefore / I like holidays.

No. 15. The sun is shining, therefore / I like the sun.

No. 19 finishes two of her sentences in this fashion:

John has lost his pen, therefore / what shall we do about it?

I can't ride my bicycle, therefore / why can't I?

We can thoroughly agree with Piaget's statement that children of this age show no unambiguous use of 'therefore', the conjunction of logical consequence. It is only fair to them, however, to mention a few instances in their

spontaneous conversation where they make correct use of 'so' as equivalent to 'therefore' although they never once use 'therefore' of their own accord. 'So' is, however, much more common with adults in social communication, 'therefore' being reserved more for demonstration or scholastic discussion.

- 1) No. 1. It isn't big enough, so they come down to get into a bigger one.
- 2) No. 1. There wasn't any brown, so I used red.
- 3) No. 7. We thought it was too little, so we busted it up and we're making another.
- 4) No. 7. His brother has a steam-roller, and it won't go, so he pushes it.
- 5) No. 19. I made a book and I never made no pictures, so I put numbers on it.

These examples, though few, show the beginning of the use of a conjunction of consequence, equivalent to 'therefore' though less formal.

As to the use of 'although' four of them add the word 'because' before they finish their sentences, the explanation of this, as with the 'therefore', being that since it stands out as a 'because' in their minds they unconsciously add the word, thereby "justifying it at any price". It is confused with 'because' in some instance by each one of them, and continually by a few of them. Sometimes 'although' is used for 'but', sometimes for 'therefore', sometimes for 'and'. Thus again we find the confused heterogeneity of which Piaget speaks.

- 1) No. 3. He slapped my face, although / I told my mother. (Equals 'and' or 'therefore'.)

- 2) No. 4. That man fell off his horse, although / he gets up again. (Equals 'and' or 'but'.)
- 3) No. 20. It's hot today, although / I drink water. (Equals 'and' or 'therefore'.)

Undoubtedly the reason why 'although' and 'therefore' are most frequently confused with 'because' is that it is the one of the three conjunctions of which they make use, and this they use exceedingly well. Every one makes correct use of 'because' in every instance in the completion of the five sentences, with the exception of No. 15, who in one sentence uses it as equivalent to 'and then' (I teased that dog because / he bit me), and No. 4, who confuses it four out of the five times with 'and' or 'but'. She, however, uses 'because' correctly in all her explanations in the other experiments.

No. 8 adds to his example, "I shan't go to school tomorrow because / I'm sick," this remark, "I'm sick in the hospital," is another reason.¹¹ Of course, he means a further or stronger reason, but he understands of his own initiative that in using 'because' he is giving reasons. His explanation of the following sentence is a fine illustration of the beginnings of logical reason. He has given the sentence, "I teased that dog because / he cried." Thinking this is a case of reversing cause and effect, or meaning 'and then' instead of 'because', I ask, "How's that? Don't you mean that he cried because you teased him?" "No," he replies, "it's this way. If you laugh when they

tease you, they go away; if you cry, the more they tease you. I teased the dog because he cried."

A point to notice about many of their completion causal sentences is that they are stated impersonally. This, it would seem, is a step away from the personal element in reasoning. The sentences of No. 10 bring out the impersonal stating of the cause.

- 1) I shan't go to school today because / it's rainy day.
- 2) That man fell off his bicycle because / his bicycle wouldn't go.
- 3) I lost my pen because / it fell off.
- 4) A man fell down in the street because / a car ran over him. It knocked him down and made him fall.

Also No. 15.

- 1) I shan't go to school tomorrow because / there is no school.
- 5) A man fell down in the street because / it was slippery.

In the 11 original sentences containing 'because' 5 are of psychological explanation and 6 are causal.

- No. 6. I go down to Oakland because I want to see the fishery my cousin has. (Psychological)
 No. 1. I asked my father if I could play in the sand because I wanted him to know where I was. (Psychological)

This same child in his first sentence containing 'although' uses an original logical 'because' ('should' and 'might' show that 'because' connects two judgments).

Ernest is playing in the street, even though / he should go out of it because he might get run over.

Examples using a causal 'because':

- No. 10. Because the man bumped into somebody, he fell down. (Causal)

No. 2. I play with my own self because there's no kids to play with. (Causal).

There are many points of interest in a detailed discussion of their examples, but the completion of the sentences calling for a logical 'because' remains for study.

1) Paul says he saw a little cat swallow a big dog. His friend says that is impossible, because / ...

Here are a few examples of the completions of this sentence:

- No. 1 / it couldn't. The cat is too little. (This is correct, but he might have explained more fully. Three others give this same reason, or that the cat's mouth or throat is too little.)
- No. 2. (goes into full detail and is most painstaking in giving reason) / the cat has too small a mouth and he couldn't swallow it anyway unless the dog was all chopped up and he took little pieces.
- No. 8. (Also goes into complete detail) / a little cat couldn't swallow a big dog. It's mouth isn't big enough and the little cat couldn't hold a big dog; it's stomach isn't big enough.
- No. 19. / His friend fooled him. The dog is too big for his throat.

Nine out of the twelve, or 75% give the correct logical reason. One ambiguously states her logical reason, one gives a psychological reason (" / he didn't know how a little cat could eat a big dog"), and one, a meaningless statement. Not all, however, have a general proposition in mind, such as, "Little cats do not swallow big dogs," but are reasoning from a particular case. This is not true of No. 8, nevertheless, and all these examples are better stated than the ones Piaget gives from children 7:11 and 8. This failure to state the general proposition is due to the child's inability to be conscious of his own reasoning; he is accustomed to take the essential points

for granted and so reasons from particular cases.¹

Piaget's test sentences, "Half 6 is 3 because / " and "Half 5 is not 2 because /," do not seem fair to ask of children who have had no number work whatever in school, but they were given out of curiosity to know how these children would handle it. Two of them handle both sentences correctly.

- No. 1. / 3 and 3 are 6. / there is 1 in the middle.
 (He might have said, "It is 1 more than 2 plus 2, but he has given a logical reason.")
 No. 8. / 3 and 3 make 6. / it is more than 2. (It could have been stated more clearly by an adult but this is a logical reason).

Five others finished one sentence correctly; four of them, the easier problem.

- No. 2. / they are both half; 3 is half.
 No. 3. / if you cut 6 right in two in the middle, you would have two 3's.
 No. 4. / if you take away 3 from 6 there'll be 3 left.
 No. 7. / if you took an apple and cut it in half and each half in 3 pieces, there'd be 6 pieces. (A round-about way, but correct.)
 No. 10. / you'd have to take 1 out to make 2 half.

These children give a correct logical explanation in harmony with the arithmetical rules. It will be recalled that the first one quoted, No. 5, gave a meaningless explanation. No. 3 probably has the correct idea, since she finishes one correctly, but she takes it for granted that one understands her meaning and so is not explicit, "/ because it doesn't come that near to 5." The other children of the 12, Nos. 6, 15, 19, and 20, simply shake their heads and refuse to

¹Cf. J.R., 29.

finish the sentence. They do not, however, finish the sentence as Piaget gives an instance of a nine-year-old doing, "Half 9 is not 4 because / he can't count."¹

Another 'because' of logical justification is completed correctly by seven of the twelve children. The following are typical.

Paul says that the road from his house goes down all the way to the school and goes down all the way back from school. Jean says that's impossible because / No. 1. / it has to go up to go down. (Idea of necessity in relationships.)

No. 4. / he goes down-hill to school and up the hill to the house. (Correct, but does not justify her statement.)

No. 6. / you couldn't go down all the way there and all the way back. He'd have to turn around and go up the hill. (Mixture of pronouns but correct logic.)

No. 8. / it would be uphill back. He'd have to go up too.

Such phrases as "it has to," "he'd have to," "it would be," indicate the presence of the idea of necessity and an attempt at justification. Contrast Piaget's statement, "Even when the child has reasoned correctly...he cannot justify his reasoning, because he is accustomed to take the essential points for granted."²

None of these children exhibit a heterogeneous use of the word 'because' itself, but handle it intelligently, in the majority of cases, to meet the need. In only 5 sentences out of the 108 separate 'because' sentences given to the whole group to complete, is the word 'because' confused with any other conjunction. Neither is it in any of their

¹ J.R., 26.

² J.R., 29.

original sentences. Piaget's examples, taken from children 6-7:6, in these same tests, show confusion of 'because' with 'and' and 'in such a manner that.'¹ Enough examples from this group have been given to show that they tally closely to the criteria given by Piaget (which have been alluded to) which mark the beginnings of the third stage of socialization of language and thought. It is true, nevertheless, that among themselves they take the easy way and do not exert themselves to use the more explicit speech, but continue the ego-centric habits.

They evidence a healthy development toward abstract reasoning, as for instance in the correct though simple completions of the logical 'because' sentences by eleven of them in at least one instance, by several of them in two or three instances, and by two of them in all (one of these two being one of the two youngest members of the group). 75% correctly complete the first sentence, requiring a logical 'because', 65% correctly finish one of the arithmetical sentences, and 65% the sentence about the road. The average percentage for the correct completion of the three logical 'because' sentences is 72%. These are higher than Piaget's results with eight-year-old children, but he worked with a group of 180 children, probably a more heterogeneous group. It is to be expected that this group of twelve with an

¹ Cf. J.R., 17.

average chronological age of 6:6 at the time of this experiment, and an average mental age of 7:8 would show evidences of advancement beyond children of just average intelligence. It is to be remembered, also, that the chronological age of these children then ranged from 5:11 to 7:6, and two of the youngest ones did as well as, and, in some instances, better than the oldest member. This indicates that not only mental age, but I.Q. is a determining factor. Since explicit understanding and use of abstract reasoning do not appear before the age of 11-12, we are not looking for it, but there seems to be evidence through their use of 'because' in these experiments that they are already entering upon the age of implicit logical reasoning.

If this phenomenon (juxtaposition) really lasts up till the age of 7-8, we must expect to find, even at this age, that when the children are asked to complete a sentence which implies a definite relation, there is a certain amount of confusion between the various possible relations. Only this element of confusion will prove that the relation was not implicit in the child's mind, and that the child was really incapable of establishing the correct relation.¹

Since our general conversation in school play group study is only from the standpoint of the group, there is not enough individual material to warrant any individual study in the spontaneous use of 'because'. However, some points of general comparison may be made. Later, the study

¹ J.R., 15 f.

of our single child in other groups will point out how very general this is.

In the play period the children talk in short, simple sentences, illustrating juxtaposition by lack of conjunctions, while in the free conversation period they indulge in the habit of stringing statements together with 'and' and 'and then,' offering many illustrations of juxtaposition and syncretism.

That there is no pains taken to synthesize their statements when interested in activity, is plain, since there are only two instances of 'because' and one of a logical 'so' in their 694 remarks in school play. These are all made by No. 1 and in both uses of 'because' it is causal, the first being a rare, pure causal (dealing with external phenomena).

- 1) I can make myself some blue because there is green and yellow there.
- 2) That's my place 'cause that's where I put the water in.
- 3) There wasn't any brown, so I used red.

There are many instances where a 'because' is implied but the meaning is as clear as in adult ellipsis. Instances from story-telling show how No. 8 and No. 15 put in a 'because' correctly which was certainly inferred in the original but not stated; these children catch the causal relationship, however, and put in a 'because' in the retelling of the story. Nevertheless, this does not keep them from stringing many statements together in their own conversation.

No. 20. (practically average) likes to express herself in this way:

A man came past one night and he said, "Hello," and I said, "Hello," and he said, "Do you want a ride?" and I said, "No."

The following illustrates a common style of language in play:

No. 2. I almost got my chair made. I just got two more legs to make. I put sticks inside to make the legs.

Notice the short, terse sentences. However, in school play there are 10 instances of 'if', 3 of 'then', 4 of the 'so' of purpose, and 5 of 'but' of vague discordance, although these indicate nothing of interest particularly in logical arrangement.

It is in the free conversation period that we find everything strung together in long sentences. While all the children fall into this form occasionally, it is of interest to notice that the one boy most prone to its use is the one with the lowest I.Q. in the larger group under consideration, No. 27. He is the child of 8:8 C.A., but only 7:7 M.A. He shows very little evidence of an eight-year-old in his conversation, for the most part he talks as a child very much younger. Here are typical examples:

- 1) First time I went I saw someone and I said "Hello" and I went on the scenic railway and I lost my breath and it kept on and it goes in the dark and you don't see where you're going and you keep going and you land in the water and the water splashes on the window.
- 2) One time I went up-town and I saw two fire-engines and one fire-engine bumped into a street-car and they brought a little tow-car for the fire-engine and a big

tow-car for the street-car and the fire-engine began to tip off the tow-car. It tipped up on one end. It went 'boom' and the street-car went 'boom' and the glass went to pieces and we all got dizzy and the tractor bumped into the street-car and the street-car carried the building right away.

These are "dyed-in-the-wool" examples of syncretism, or thinking in confused wholes, and of juxtaposition, or the lack of synthesis.

Even the ones who handle 'because' so well in experimental tests, when with other children frequently juxtapose their ideas.

Here are extreme examples:

No. 2. Last Sunday I went down-town and we went around town and we saw a great big water-wagon and we saw a great big hose under the water-wagon and they were putting the hose down in a great big hole in the middle of the street to wash it out. They took the great big hose from the water-wagon and put it on a faucet of the fire-hydrant and filled it up.

No. 8. Once a little boy ate lunch and went out in the garage and got into the oil and the little boy had to go to bed and I had to sit in a chair. Let me think, there was something else. We had a gun and we pointed the gun at the dog and he'd run and then we ate waffles and then I went home. We had lots of fun.

No. 1. (Just after the long tale of the wreck told by No. 27, cited above) Somebody ought to take up a house and put it on wheels and take an engine off the track and have a little thing to hook the house to the car and have the front of the house in back and that would be the observation car.

While these examples are typical of most of No. 27's remarks, the other three children many times talk very differently, as our various illustrations show in other chapters. Examples were taken from them to illustrate how in the same child at this stage the beginnings of implicit logic and the signs of ego-centrism exist side by side.

It is when the child is relating an experience that he falls most noticeably into this habit. They respond readily with 'because' to the teacher's questions, but since it is the rule to leave them to their own devices and merely listen, she seldom asks questions during these periods. (In the use of conjunctions, all remarks, answers included, are considered.)

Examples of 'because' from free conversation:

- 1) (No. 20 has shown and described autumn leaves she brought to the teacher. The teacher asks of the group, "Where could she find autumn leaves like that?") No. 8. Out-doors. (What makes you think so?) No. 1. Because we hear them. (Logical)
- 2) (The teacher has finished reading them a story and asks, "How old was Beth?") No. 19. Five. (Why?) Because there were five candles on the cake. (Logical)
- 3) (A child is showing something she has made from the school clay and the children discuss whether each one can take home what he has made. The teacher asks, "Who can tell us why we don't take it home?") No. 19. We don't take it home because there is not enough for all of us. (This would be causal were it not that she is giving the reason for her opinion.)

The following are from their own descriptions or experience:

- 4) No. 1. (describing a picture) They're digging the hill down 'cause the country doesn't want it here. (Psychological)
- 5) No. 2. (Telling about his baby-brother) My mother turns the water off. My brother likes it, 'cause he's scared of the water. (Psychological)
- 6) (They are talking about making dolls.) No. 1. I can make one out of a stocking 'cause the teacher showed us how in kindergarten. (Causal, relationship of two facts)
- 7) No. 16. (talking about riding horse-back) We just rode the big one, 'cause the little one gets scared. (Psychological)
- 8) No. 4. (They have been talking about the deep-water way. No. 27 has said they are making an ocean. This child calls it, digging a well.) We went out to Dad's Point but we couldn't get there because they are digging a well. (Causal)

Notice how she contradicts herself. "We went...but we couldn't get there." She knows so well herself that they started for that place that she thinks everyone will understand.

This, besides the example of 'because' contained, illustrates how little pains children take to make their meaning clear to each other.

Conversation between children is therefore not sufficient at first to take the speakers out of their ego-centrism, because each child, whether he is trying to explain his own thought or to understand those of others, is shut up in his own point of view. This phenomenon occurs, it is true, among adults. But these have had at least some practice in argument or conversation, and they know their faults...because experience has shown them the appalling density of the human mind. Children have no suspicion of all this. They think that they both understand and are understood.¹

We must not forget, however, the illustrations we have given from this group which show effort to explain points to each other and to compare opinions.

Examples of logical 'if':

- 1) No. 1. (to a remark of No. 20 that her baby brother is 9 years old) He wouldn't be a baby if he was 9 years old.
- 2) (Talking about phonic rhymes) No. 1. It would go up there (Pointing) if it was.
- 3) No. 10. (talking about the paper chain on the Christmas tree) If it was long enough it might come down again.

There are frequent uses of 'but' which fulfil their vague sense of discordance and some might be considered implicit. There is also the use of 'only' as 'but'.

¹L.T., 99.

No. 15. We've got something else, only we didn't write it down.

No. 8. (endeavoring on his own initiative to explain perspective in his drawing) This (pointing to a tree) really is as big as this (pointing), only this is far away.

There is another instance of a 'so' equivalent to 'therefore' which should be mentioned in addition to the five used by the three children of the experimental group.

No. 12. (about his picture) I started the house and I made it crooked, so I started it over again.

Examples of juxtaposition and syncretism might be multiplied but it is enough to say that vague and implicit relationships are more common throughout the general group. The child, unconscious in most instances of the need of proof, does not naturally use explicit relationships at this age to his equals. Again, nearly all examples of any attempt at logical relationships come from the half and usually the third having the highest I.Q. One point stands out clearly: When these children do make use of 'because' they do not use it in a heterogeneous manner which Piaget states is natural up to 7 and 8. Also the few who use 'so' as equivalent to 'therefore' do it correctly, but there is not a single instance in their spontaneous conversation in these groups of 'although' or 'even if'. A few examples will be brought out in the case of the one child studied with adults.

One would think from these examples of their spontaneous conversation that most of them had never heard of 'because'. However, the experiments and their answers to

the teacher disprove this. They have become familiar with its use. Observations carried out all day, under all conditions, would undoubtedly tell when. Merely as a matter of interest, the word 'because' was used spontaneously 215 times by the group of twelve in their answers or conversation during the experimental period, outside of the experiments on the use of conjunctions and outside of story-telling and explanation. These were distributed throughout the group and were almost entirely causal or logical.

Summing up the material from home play we give these few examples, the first two of which are most interesting because they come from a little girl of just 5 who is over 7 mentally.

- 1) S. Maybe you can't use it.
D. Maybe I can't use it?
S. Yes, because it's my car. (Causal)
- 2) D. This doll's name is Sock. Do you know why? I want you to tell why.
S. Because it was made from a stocking. (logical; gives reason for a name.)
- 3) D. Let's play partner tag. No, we can't, because you have to have two partners to chase and two to run. There aren't enough of us. (Logical justification By rule.)

All the instances of 'because' in this group, though few, were used by these two children, so there is no need to give further examples. Compare with these examples the statement:

Note the correct use made of 'because' at the age of $6\frac{1}{2}$. In the three lists of complete vocabularies given by Mlle Descoedres 'because' is used by the 7-year-old but not by the 5-year-old

child.¹

We have also the correct spontaneous use of 'because' by D. many times in experimental tests and in 67 examples in spontaneous language in these short periods of observation between 5:10 and 6:2.

Let us turn now to examples of the child among adults. Before giving these it is important to point out that Piaget considers the 'because' of psychological relation as intermediate between the 'because' of causal explanation and the 'because' of logical explanation or justification.

The relation here is empirical in a sense, since it is a question of two facts and of a causal explanation. In another sense, however, it is logical, since it introduces a reason, an intelligent motive as cause. We have here as much a justification as an explanation.

We have distinguished this third type because children have a tendency to replace logical by psychological relations. We gave an example of this just now. "Half 9 is not 4, because he can't count."²

At no time can this be said to be true of this child. His use of 'because' is as clear and correct as an adult's. The examples themselves prove this. Therefore, all of his psychological explanations are as much logical as psychological and in his case, at least, no differentiation need have been made for the reason Piaget has given, namely, proneness to use his psychological reason whether it fits or not. The examples given are without exception typical of all.

¹ L.T., 25.

² J.R., 7 f.

Examples of the 'because' of psychological relationship (motive for a desire, command, or act):

From bed-time conversation.

- 1) We want a big circle because we're going to play games.
- 2) I feel as if I wanted to give them all my clothes, because you wouldn't want to be poor like that, would you?
- 3) You don't want to know, do you? 'Cause you like surprises, don't you?
- 4) You do that, because I can't do it.
- 5) I say that every day, because I love you more and more.
- 6) (Has been telling how to play Charley-Over-the-Water) Does Charley hurt the birds? I hope not, because they are pretty. (Involves an evaluating judgment) (The rest of his comment is so interesting, it is included) They just fly around and look pretty. Just like some people. I've heard people say, "I've nothing to do," and someone say, "Just stand around and look pretty."

At the family meal.

- 1) Put this where I can't reach it, because I want some of it saved.
- 2) I didn't mean to tease, mother. When I do things with the tops of things, don't be scared, because I really wouldn't do what you didn't want me to.
- 3) You remind him not to forget, mother, 'cause I don't want him to forget.
- 4) I want you to sit and keep me company tonight because it's kind of hard to have a mustard plaster.

Examples of causal explanation (relationships between two facts or events or phenomena):

From bed-time conversation.

- 1) The teacher had to help me first, because I didn't fit the right-colored balloon into the right hole. A funny little dotted man holds them up in his hand. It tells by the place for the balloons what color to put in and you put the right colored paper balloon in the place, red, green or yellow, or whatever it says.
- 2) Remember that last night of Christmas vacation when I lay in bed learning those things (books of the Old Testament). I didn't get sleepy because I was talking.

3) (In a bed-time story, the stars have been called 'sparkling lights.') But they aren't sparkling lights; they are other worlds. Maybe our world is a star to another world under it. 'Cause that's the way they are, one world above another.

4) (Why did the pebbles put in the water raise the level of the water?) Because they took up so much space. (This was nothing that had been rehearsed; an entirely spontaneous answer.)

5) (He has asked, "Is it always the same I that wakes up in the morning" and to find out why he asked the question, I ask, "What do you think?") I didn't know. It must be, though, 'cause it always looks the same and has the same feelings and the same life.

This last examples belongs equally, if not more, to those of logical 'because' but since it involves his explanation of the phenomenon of individuality, it is placed in this group. The same is equally true of the next example.

6) Oh, mother, are nails steel, (What do you think?) Yes, because they stick to this magnet.

These examples show that this child is interested in using the genuinely causal 'because' (causal explanation of external phenomena), rare with children of this age, according to Piaget.¹

At the family meal.

1) Mother, he can't have his pie, because he hasn't finished his lettuce yet.

2) K. can't go to orchestra, because he's got a broken strap. (On his saxophone?) Yes.

3) Well, they could just walk in there 'cause there wouldn't be any door. They wouldn't have to open any door.

4) I don't know why you feel it when your foot goes to sleep, because the house doesn't feel it when you go to sleep on the bed. (Why is it that the house doesn't feel it?)

¹
J.R., 13.

5) Because it's made of wood, it isn't alive.

Examples of 'because' of logical justification or explanation (involves proof or beginnings of proof, or connects two ideas, or gives a reason for a judgment or opinion):

Bed-time conversation.

- 1) That's easy, because I know where Michigan is.
(Reason for a judgment.)
- 2) (Proving location of elephant's mouth.) Yes, 'cause I've seen him curl up his trunk like this (motions).
- 3) I wonder if S. knows how to work B.'s (movie-book) yet. I think she does, because they're awfully easy to work. (Reason for opinion.)

Family meal.

- 1) I heard them talking about giving you those pencils, but I couldn't tell you, because if you tell anyone, then you can't give it to them. (Justification by social rules.)
- 2) I think people with black or brown eyes are safest at night. (His brother asks, "Why?") Because they don't show. (He criticizes his own reasoning.)
- 3) I forgot, because their eyes are shut...If their eyes are shut, robbers don't know who they are. (Whose eyes?) Anybody's. (Why?) A cat's eyes show in the dark when they're open, so (logical 'so' equals 'therefore') I don't see why anyone's wouldn't.
- 4) (He has given his idea of attitude as the tone of voice one uses. His brother asks him why.) Because when X. talks too loud sometimes, mother says she doesn't like his attitude. (He is justifying a definition.)
- 5) (He has bewailed the fact that a brother is using something of his that he considers valuable. The brother asks, "What do you mean, valuable?") Because it cost a lot of money. (Justifying a definition.)
- 6) (He and his father are talking about letters of the alphabet which can't ever look as if they were upside-down or side-ways. His father suggested the letter O as one of them.) It could be sideways, because it has to have the long part on the side.
- 7) It could be turned sideways, because it's taller than it is wide.
- 8) Maybe Daddy can (something others have tried to do and failed), 'cause he's a man. He's the oldest one in the family. If he can't do it, nobody can.

Summary of 'because' for bed-time and meal-time:

	Psychological Motivation	Causal Explanation	Logical Justification	Total
Bed-time	9	10	6	25
Meal-time	$\frac{8}{17}$	$\frac{9}{19}$	$\frac{17}{23}$	$\frac{34}{59}$

From these examples it is evident that this particular child, when with adults at least, is strongly interested in studying out the logical reason for things. Piaget finds it otherwise with children of this age, but as he himself maintains about the questions of the subject he observed, the only way to test these hypotheses is to carry the study out with as many individual subjects as possible, since, as in the case of the boy who asked so many causal questions, it may have been due to the special interests of the child.¹ At least these examples under consideration seem to the observer to tally with Piaget's requirements (referred to before) and examples of the use of the logical 'because'.

It would be interesting to study other examples as those illustrating the use of the logical 'then' or 'so' which are equivalent to 'therefore'. There are many instances of both. But at least we will note one of the use of a 'but' of implicit discordance. Piaget says of this use of 'but':

In short, the only cases in which the term 'but' really denotes an implicit discordance, are those

¹ Cf. L.T., 34.

in which the word occurs not at the beginning but in the middle of a sentence, and of a sentence containing a causal relation whether logical or psychological. Now such sentences were not to be found before the age of 6, and the two examples we have between the ages of 6 and 7 are anything but unequivocal.¹

He then gives examples (age 6½): "Suns are round, but they have no eyes and mouth." "It is more than that, but that's right." Compare with these, "I heard them talking about those pencils with your name on, but I couldn't tell you, because if you tell anyone then you can't give it to them." There are many others as clear as Piaget's examples, but this shows the use of it in our subject at 5:11 in a very clear form. It seems strange that this child should not use 'although! 'though', or 'even if' correctly in more than 2 of the 9 sentences for completion, and the word 'therefore' in only 2 of the 5, since he uses their equivalent correctly at home ('then' and 'so' equal to 'therefore') and at school.

Examples of 'though'.

- 1) I didn't know. It must be, though, 'cause it always looks the same. . .
- 2) I think Jesus has a soft thing up in the sky that He lights every night and morning and puts up high in the sky. He always has daylight, though, because He always has the sun.

Examples of 'even if'.

- 1) (Talking about peanuts at the meal) Even if it took a long time, you'd roast them till they were done, wouldn't you, daddy?
- 2) (Playing school at bed-time) Sometimes she (his real teacher) says, "Pencils down," even if we aren't through.

¹J.R., 52.

It is of interest to note an increasingly frequent use of this conjunction outside of observation time, as "I will, even though I don't want to," etc.

The examples given of his use of conjunctions, especially at the family table, show a definite progress into the realm of synthesis. Here he uses the greatest number of conjunctions (and correctly) and gives definite proof, therefore, that for him the feeling that he is a member on equal terms of this adult group arouses in him a growing need for direction of thought and checking of statements by reasons and beginnings of proof. These findings seem of special interest since Piaget makes the statement,

There is still a great deal of work to be done on the intercourse between children of different ages, between brothers and sisters, and above all between parents and children.¹

It is because of such findings, also, that we have laid stress on mental rather than chronological age as the criterion for various stages of socialization of thought and language. It is interesting to note that the only instances of juxtaposition at meal-time are when he falls into the monologue type of conversation or thinking aloud and not being interested for the moment except in his own activity or thought.

Examples:

1) (Talking to himself at the table) You should take

¹J.R., 208.

a little bite of something else, then a little bite of something else; a little bite of olive, then something else; and bread, then something else; and milk, and that will be all; potatoes, then peas. . .

2) (He has been talking to the rest of us about a play-house and children's clubs, but launches now into an ego-centric type of speech, thinking aloud with an audience.) I am going to be a carpenter when I am big and I'm going to work alone and I'll get up early in the morning and go to work on a room and I'll have another man working on a room way off there and then we'll work on a room together in between and that way we'll get the house done.

These instances show the distinct difference between the effort at synthesis in his socialized language and in the remarks he makes simply thinking aloud, with no idea of adaptation to another's thoughts, thereby indicating the close connection which, as Piaget has pointed out, exists between socialization and synthesis of language and thought. There are examples of much interesting material which show a quick selecting of an essential point in another's conversation, a checking not only his own thought by another's, but another's by his own, as when his brothers talk of a ball-game score being 7 to 7, immediately the child exclaims, "Then it was a tie," Or when it was mentioned that George Washington married a widow, he quickly says, "Then she wasn't a widow any more." Again, his father has made a general remark relating to the conversation, "What if we couldn't think?" D's immediate remark is "We wouldn't know anything unless we saw it, then if we couldn't see anything we wouldn't know anything."

There are many other examples of logical explanation,

using 'if...then...' but enough have been given in connection with other examples to show that their use is frequent.

A wealth of material in four almost equal sets of remarks shows the extreme difference between this child's type of conversation when with a group of adults and when with children of his own age, although he is noticeable in his school group for more socialized expression.

Taking the one child studied at home as well as at school, we find the following percentages of 'because' to his total remarks:

In school play1.3%
In school conversation3.5%
In home play1.0%
Average for school groups2.0%
Average for 3 children's groups1.9%
In conversation with 1 adult2.5%
At the family table5.3%
Average with adults3.9%

The variations between the groups is evident. Thus, as in the case of the proportion of the child's ego-centric to socialized language, it is not feasible, because of the circumstances under which the observations were taken, to make strict comparisons with Piaget's figures. His subjects were studied for hours at a time at school, while our observations were necessarily limited to daily half-hour periods with each group.

CHAPTER VIII

The Child's Ability to Handle Relationships

In studying the development of childish reasoning, Piaget lays emphasis on the child's inability to handle relational situations. Syncretism, or failure to analyze, and juxtaposition, or failure to synthesize, show lack of necessity in child logic, and in his inability to handle relational situations and ideas of relativity the child reveals his failure to grasp "reciprocity existing between different points of view...Necessity and reciprocity constitute an essential character of logical thought---its reversibility."¹

In testing these relational judgments, he uses the five absurd sentences of the Binet-Simon test for ten-year-olds.

1. A poor cyclist had his head smashed and died on the spot; he was taken to the hospital and it is feared he will not recover.
2. I have three brothers: Paul, Ernest, and myself (I changed this to 'sisters' and to girls' names, since I am a woman).
3. The body of a poor young girl was found yesterday, cut into eighteen pieces. It is thought she must have killed herself.
4. There was a railway accident yesterday, but it was not very serious. The number of deaths was only forty-eight.
5. Someone said: "If I ever kill myself from despair, I won't choose a Friday, because Friday is a bad day and would bring me ill luck."²

In his results, the order of difficulty was as follows:

¹ J.R., 134.

² J.R., 63.

The questions of the three brothers and of Friday were the most difficult. The questions of accident by far the easiest....It is because they (the latter) appeal directly to the sense of reality without any presuppositions about the data...In order to discover this absurdity (that of Friday and the brothers) the child has therefore to place himself at the point of view of the person who lays down the premises. The reasoning takes place relatively to a given point of view, which is a psychological operation of far greater difficulty.¹

He goes on to show how the children do not accept the premises as such but stick to their own point of view, so do not reason from these premises in a purely deductive style.

Thus the difficulty of reasoning formally (i.e., of admitting a datum as such and deducing what follows from it) is the real difficulty of the test. That is why this test is, in our opinion, better suited to the age of 11 or 12 than to that of 10. Indeed, there was an interval of at least a year between the success of this test and that of the accident tests.

We are now in a position to understand what formal reasoning really consists in, and how its structure may be influenced by social factors such as ego-centrism and the socialization of thought.²

He goes on to show how at the age of 7-8 the child begins to "distinguish hypothesis from reality" and that this stage corresponds with the "development of the logical 'because' and the beginnings of correct deductive reasoning."³

Our results from the tests go to prove conclusively

¹ J.R., 64.

² J.R., 66.

³ For detailed discussion of these absurd sentences see J.R., Chapter II.

why some of our children do not correspond to his stage chronologically.

No. 1 is the only one to pick out the absurdity in all 5 sentences.

- 1) The doctor couldn't help his head because he died.
- 2) No, you haven't, because your self isn't one of your sisters. (How many sisters have I, then?) Two.
- 3) She couldn't cut herself up in 18 pieces. She would be dead.
- 4) It was serious, because they were killed.
- 5) Because he couldn't work on Saturday and there wouldn't be anyone to work on the lawn and pull weeds. (Corrects himself without any suggestion) Oh, it wouldn't make any difference after he killed himself, if it brought him bad luck, because he'd be dead already. It wouldn't make any difference what day he killed himself; it would be just the same.

No. 2 passes the first three successfully: No. 3 answers correctly concerning one: No. 4, two: No. 5, none: No. 6, three: No. 7, two: No. 8, three: No. 10, one, and decides the accident in test four was serious but doesn't say why: Nos. 15, 19, and 20 do nothing with any of the sentences, but No. 20 exclaims over test 4, "Whew, that's a lot. They shouldn't have been killed; they should have been careful." It is striking that every one who sees the absurdity in any one sentence sees it in the one about the sisters. None other than No. 1 get the Friday test, and even he was on the wrong track until he caught himself. The rest make all sorts of answers from "I don't know", "Friday is a good day; I don't know," to such as "'Cause it was on Friday and she didn't want to kill herself; she wants to forget about it." But the point we wish to emphasize is that eight of the twelve children do the sister test correctly, as follows:

- No. 2. It wouldn't be right, because you counted yourself. I'd just count my brothers. (He explains thoroughly about his own 2 brothers.)
- No. 3. You counted yourself; you had 2 sisters.
- No. 4. No, it wouldn't be right; you could skip yourself out. You're not yourself's sister.
- No. 6. You said you had 3 sisters. This way you'd only have 2.
- No. 7. No, it's not right, because there's only 2. There's only 3 sisters in the family. You've only got G. and M.
- No. 8. You don't count. You're not a sister to yourself.
- No. 10. You only have 2, because you're not your sister.

The tests passed were all clearly stated. All of the children's remarks on sentence 2 have been given to show how clear they were in their ideas about it. There is no confusion in the minds of these children about myself as a sister to the others but not to myself, or between the phrases, "I have sisters" and "We are sisters." These are common errors of Piaget's subjects. Our further experiments on the reciprocal relationship of brother and sister carry out and prove these findings.

Such results prove adequately that these children are developing away from ego-centrism and that our low percentage of ego-centric remarks is significant. Some of these children are able to handle these tests involving a development in the beginnings of formal logic. At least this test confirms our opinion that mental age is a truer guide than chronological, but that I.Q. is the most determining factor and that mental tests which allow a child to answer if possible some tests noticeably beyond his years are more indicative of individual ability. It is to be regretted

that no one was available to give each of these twelve children an individual (Stanford-Binet) test. The group test given, while a general guide, does not differentiate far enough the individual ability, and possibly the individual tests would change the relative position of certain ones in this group. The one child in this group who had been tested individually ranked noticeably higher than in this group test.

To test further the ability to handle relationships, we asked the following questions, which Piaget used in his tests.¹

I. The brother and sister test.

1. How many brothers have you? And how many sisters, How many brothers has each one of them (in turn)? And sisters?

2. How many brothers are there in the family? How many sisters? How many brothers and sisters altogether?

3. There are three sisters in a family. How many sisters has A?...B?...C?

4. Are you a brother (or a sister)? What is a brother (or a sister, according to the sex of the child)?

5. Ernest has three brothers, Paul, Henry, and Charles. How many brothers has Paul?...Henry?... Charles?

6. How many brothers are there in this family?

II. The right and left test.

7. Show me your right hand. Your left. Show me your right leg. Now your left.

8. Show me my right hand. Now my left. Show me my right leg. Now my left. (During the questions the experimenter must sit opposite the child.)

9. (A coin is placed on the table to the left of a pencil in relation to the child.) Is the pencil to the right or to the left? And the penny?

10. (The child is opposite the experimenter, who has a coin in his right hand and a bracelet on his left arm.) You see this penny? Have I got it in my right hand or my left? And the bracelet?

11. (The child is opposite three objects in a row,

¹ J.R., 98 f.

a pencil to the left, a key in the middle, and a coin to the right.) Is the pencil to the right or the left of the key? And of the penny? Is the key to the right or left of the penny? And of the pencil? Is the penny to the right or left of the pencil? And of the key? (Six answers altogether.)

12. (The same questions as before, with three objects in a row opposite the child, a key to the left, a piece of paper in the middle, and a pencil to the right. But the objects are only shown for half a minute and are then covered over with a copy-book, and the answers are taken down. The child is told): Now listen, I'm going to show you three things only for a tiny moment. You must look very carefully and then afterwards tell me by heart how the things are arranged. Look out...(the experiment)...Well now, is the key left or right of the piece of paper, And of the pencil? etc.

The results of our tests do not coincide with Piaget's, since he finds the degree of correctness to advance steadily with age. We can only offer our results with this comment: The children who think most clearly in all situations handle these correctly: the children who are most prone to juxtaposition, and most prone to thinking in confused wholes, fail in some respects, but even so they are considerably beyond what Piaget finds according to their age.

Age. Tests passed by Piaget's subjects.¹

4	0.
5	Test 7.
6	Tests 2 and 7.
7	Tests 2, 7, and 9.
8	Tests 2, 3, 7, 8, 9 and 10.
9	Tests 2, 3, 4, 7, 8, 9, and 10.
10	Tests 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.
11	Tests 1-10 and 11.
12	Tests 1-12.

If Piaget intended tests 11 and 12 to be answered from

¹ J.R., 100.

the point of view of a person opposite the child, then we cannot count our tests 11 and 12 in that light. We took the difficulty of these tests to lie in the relative notion of right and left in handling several articles and had the child answer them in relationship to his own right and left. Our findings should read with that in mind. Up to that point, however, these children passed tests beyond their age as indicated by Piaget's results.

Results of these tests, in group of twelve by individual.

- No. 1. Missed none.
- No. 2. Missed none.
- No. 3. Missed none.
- No. 4. Missed one-half of test 4 (definition of brother).
- No. 5. Missed one-half of test 4 (definition of brother).
- No. 6. Missed none.
- No. 7. Missed one-half of test 4 (definition of brother) and test 8.
- No. 8. Missed none.
- No. 10. Missed none.
- No. 15. Missed one-half of test 4 (definition of brother) and tests 6 and 8.
- No. 19. Missed one-half of test 4 (definition of brother).
- No. 20. Missed one-half of test 4 (definition of brother) and tests 5, 6, 8.

It will be seen that 25% of the children fail to give an adequate definition of brother or sister while handling the relationship problems correctly. The other 25% who fail in the definition fail in from 1 to 3 of the other tests, test 8 included in each case. It is evident that for these children definition is more difficult than the handling of reciprocal relationships. They implicitly understand what a brother or sister is, and given a situation they handle

the relations accurately on the whole. Test 4, therefore, is the only one not passed according to Piaget's standard (Any test in which only one or two points are passed must be considered unsuccessful and a test is considered passed if answered correctly by 75% of the children).

It should be kept in mind that these children's ages range from 6:2 to 7:8 at the time the mental tests were given, and that these experimental tests were given two or three months earlier. Only three children in the group were below I.Q. 113 and none below 101, and that fact would necessarily influence our findings. Piaget's experiment was tried on 200 children. He compares this brother and sister test to the Binet-Simon test ("I have 3 brothers, Paul, Ernest, and myself") and places the successful solution of such a test at the age of 11. Any one who has witnessed a mental test understands that the individual child may pass certain questions far beyond his chronological age according to his individual ability, and the net results of all his answers determine his level of mentality. Piaget everywhere fails to consider this question of individual capacity, or else in dealing with larger groups counts on his results being those which approximate average mentality. However, only half of our group give an idea of relativity in their definitions of brother or sister and that would bear out the conclusion that the sense of relationship is not fully and clearly understood by a group of children whose average mental age is 7:8.

In the first place, it should be noted that the first part of the question (Are you a brother?) hardly presents any difficulties after the age of 4-5. The correct definition, on the other hand, is not found till the age of 9, and by correct we mean that which implies in one way or another the idea that in order to be a brother one must have a brother or a sister.¹

Examples of correct definitions:

- No. 1. A brother is a boy who is born into the same family with another boy or girl. A sister is a girl who is born into the same family with another boy or girl.
- No.2 . A brother is a boy. I'm a brother 'cause I'm my baby's brother. Or a brother could be a sister's brother.
- No. 3. A sister is a girl, if she has sisters or brothers. A brother is a boy if he has sisters or brothers. (She turns around brother and boy, but her meaning is clear.)
- No. 6. A girl is a sister if she is sister to a brother or another sister.
- No. 8. A brother is a boy. Two boys to be brothers have to be in the same family.
- No.10. A brother is a boy. They are brothers if they only have one mother; if both have the same mother.

Some of these definitions have emphasized the idea of the brothers having to be in the same family. This too is a criterion of correctness.

The correct definition is therefore that which implies the idea that there must be at least two in the same family for there to be a brother or sister. The child often knows this without being able to express it straight away, in which case he must be helped to make his ideas explicit. There is a good proportion of such correct definitions from the age of 7 onwards (average of 60%.²).

¹ J.R., 104.

² J.R., 106.

Examples of incorrect definitions:

- No. 4. (An only child) A sister is a girl that lives with you. I have a cousin, but she lives in Texas. You can't be a sister, because you're a lady. (Can't ladies be sisters?) No, they have to be girls. (Explanation)
- No. 7. A brother is a boy. (Are all boys brothers?) Yes. (What makes them brothers?) Because girls wear dresses they are sisters. (T. hasn't any brothers. Is he a brother?) Yes, he's a brother.
- No. 15. (This little girl has had one sister, who has died.) (Were you Helen's sister or brother?) Sister. (What is a sister?) I don't know. God makes them sisters. (Are all girls sisters?) No. (Why are some of them sisters?) Because, they died.

This child's ego-centrism is evidenced in her finalistic reply, "I don't know. God makes them...", also in her not separating her definition of sister from her own individual case and also in her contradiction of her own previous statement that she was a sister but "girls are sisters because they died." This example emphasizes the following points of Piaget's about child thought and reasoning: finalism, a justification at any price, inability to separate thought from one's own viewpoint, and inability to retrace steps of reason resulting in contradiction of what one has just said.

- No. 19. A sister is a girl. (Are all girls sisters?) Yes. (Has M. any brothers or sisters?) No. (Is she a sister?) Yes.
- No. 20. A sister is a girl. (What makes a girl a sister?) Because they look alike and have dresses alike.

This common answer, "A sister is a girl" or "A brother is a boy," is "the most primitive definition."¹ In spite

¹J.R., 104

of their having passed the tests except in the matter of definition, there are all types of definitions in this small group. This point is to be noticed; all accept the notion of a brother being a boy and a sister being a girl, but there is nothing in this very incomplete idea which incapacitates them for solving their brother-sister problems when confronted with them, those brothers and sisters being boys and girls, and their own home situations involving brothers and sisters. The notion of relationship is only partly developed in some of them, that is, enough to handle actual situations presented but not enough to put all these points into verbal definition. There is a definite step between these two situations which Piaget emphasizes in other places but not in treating this problem, that is, the distinction between perceptive and verbal intelligence.

The most difficult point in the right and left test for these children was that of the relative notion of right and left when considering it as opposite to one's own right and left. Only 3 of the 12 failed here, but it is a point to notice. Even though they could handle most of the relative situations of several articles to each other, they did it in relationship of right and left to them. The test in which the experimenter's right and left was exactly opposite theirs was a step more difficult for these three children. Nevertheless they failed in only one test

involving this point.

The general difficulty with reciprocal relationships and relationships apart from oneself is evidenced in a few of these children, showing the truth of Piaget's statements relating to child thought in general.

There are two matters of interest in regard to No. 8's answers which throw light on this individual child. His individuality and keenness of intellect are evidenced throughout the experiments and observations. When asked the first question, "How many brothers have you?" it is revealed that he is an only child. Immediately he says, "Let's suppose I have some." So he is asked to take the family of another boy in the group and answers all questions correctly in relation to him. In the matter of the definition he brings out clearly that he has no notion that living together makes boys brothers, a common idea among children, according to Piaget. This child's mother is a business woman, and he lives during the week in another family. Here is his statement about his definition: "If my mother keeps him he isn't my brother. If my mother has (evidently 'bears') him he's my brother. Two boys to be brothers have to be in the same family." Everywhere this child likes to figure things out, as he says, to demonstrate and to give reasons. He is the same child who, when giving sentences with 'because' in them, volunteered the information that he was giving reasons.

Such data along with the experiments give the interesting side-lights on these children from the standpoint of individuality. No. 2 also offers many interesting comments showing his superior mind. These, with No. 1, form an extremely interesting trio. As a rule, the boys are more responsive to the experimental tests than the girls, who are more shy. Certain points, nevertheless, stand out in regard to the girls. No. 3 is meticulously painstaking: Nos. 5 and 19, superficial and careless; No. 20 gives out the impression that she understands everything, but when it comes to the testing point is often superficial and apt to confuse her statements.

In addition to these tests Piaget used syllogisms as dealing with ideas of relationship and obeying the laws of reason. The syllogisms used were:¹

- 1) (Burt's test) Edith is fairer than Susanne; Edith is darker than Lili. Which is the darkest of the three, Edith, Susanne, or Lili?
- 2) If this animal has long ears, it is either a mule or a donkey. If it has a thick tail, it is either a mule or a horse. Now it has both long ears and a thick tail. Which is it?
- 3) Some of the inhabitants of the town were English. All the English from that town were killed in the war. Are there any inhabitants left in the town? (Names changed, but same test.)

These tests are to bring out the tendency in childish reason not to think in terms of relationship, but in an absolute sense, and the child's inability to understand before 10-11 alternation, opposition, disjunction, that is,

¹ J.R., 87, 161, 233.

handling logical multiplication of the verbal plane.¹

Thus the difficulty in handling the logical relations would seem to be a new consequence of childish ego-centrism; ego-centrism leads to naive realism, and this realism, which is by definition the ignorance of all relations, leads to logical difficulties every time there is a question of substituting the logic of relations for that of membership or inclusion.²

Very few of the children show any ability to deal with these syllogisms, proving Piaget's statement for the child under 11-12 (except in rare instances). Some of the answers to these tests are offered to show the great variety in this small group.

No. 1 answers all of them correctly, and his will be given in full.

- 1) Susie. (Why do you think Susie is the darkest?) Lili hasn't very dark hair. Edith has a little darker, Susie has a little darker than that.
- 2) It is a mule because it has long ears and a thick tail. A horse has a thick tail, too, because I've been swished by 'em. A horse has short ears.
- 3) Yes, because all the inhabitants of the town weren't English.

This child seems to have no difficulty with judgments of relationship. Neither has No. 2, although he has to be questioned to give his reasons.

- 1) Edith and Susie have the darkest hair. (Which one of them has the darkest?) Susie, because the other is lighter than Susie.
- 2) It's a mule, because mules have thick tails and big ears.
- 3) The niggers and a lot of different people. All the rest were killed. (Who?) The English.

No. 8 is beyond his depth in test 1 and not explicit in

¹ J.R., 54.

² J.R., 90.

test 3.

- 1) Edith; she's half dark and half light.
- 2) Mule, because he has a big furry tail and long ears.
- 3) Yes, the Chinese, Indians, and Japanese. (But he doesn't definitely eliminate the English.)

No. 7 shows ability in this direction but fails in test 1 and doesn't go far enough to generalize.

- 1) Edith, because she is darker than Lili. (Is that all?) Yes. Fails to consider the relative degrees of fairness in the three girls.)
- 2) A mule, 'cause he has long ears and a thick tail. (Why isn't it a donkey or a horse?) Because the donkey isn't like a horse. A mule looks just like a horse if you wanted the horse to have long ears.
- 3) Yes, because the Italian people were left. (He himself is of Italian parentage. He fails to generalize, "Everybody but the English.")

No. 10 answers only test 3 correctly.

- 3) Might be any people left, American, Chinamen, anybody except the English.

These have been given to show the varying degree of development of these children in reasoning and their advance in this particular over the others, who gave such answers as follows:

- 1) No. 3. Edith. (Why?) You said she was.
- No. 4. Edith, because she has dark and light hair and I don't see how she could change it, so I'll leave it dark.
- No. 5. Edith. I don't know why.
- No. 6. Edith, because she has darker hair.
- No. 15. Lili. (Why?) 'Cause it is.
- No. 19. I think Susie is. (Why?) 'Cause you said Edith is darker than Susie. (She contradicts herself.)
- No. 20. Edith, because she was born that way.

These children who do not correctly deal with this syllogism generally give Edith as the darkest. They hear her called 'darker' last, and judge from that in an absolute

sense, with no idea of interrelationship of the three. No. 20 merely gives a finalistic answer and makes no attempt to reason. No. 15 gives an arbitrary answer and justifies it at any price.

- 2) Nos. 3,4,5, and 15. It's a donkey, 'cause it has long ears.
 No. 6. A horse, 'cause it has a thick tail.
 No. 19. I guess it's a mule. I don't know.
 No. 20. A horse, because horses do have a thick tail and big ears.
- 3) No. 4. Yes, lots of people; girls, boys, ladies, and men.
 No. 6. Yes, soldiers and some of the other people.
 No. 15. No, because they got killed.
 No. 19. No, because they were killed in the war.
 No. 20. Three people, I think, because they watched it.

We cannot enter into fuller details in the discussion of these tests but offer our conclusions that Piaget is right in his statements concerning the results of ego-centrism in child logic, that its accompanying juxtaposition and syncretism make it unconscious of reciprocal relationships or necessity of relations one with the other and cause it to build no hierarchies of thought and to be unable to give the reasons for its conclusions by retracing its steps. However, we do emphasize again the difference in individual children as brought out in this small group and point out that everywhere it is the same children who show the greatest advancement from ego-centrism toward logical thinking and that many elements influence that development besides chronological age, as I.Q. plus mental age, plus environment, and particular bent of the individual child's mind.

It is true, also, that all the evidences of ego-centrism coincide with Piaget's conclusions and seem to be tied up together, consequently the lessening of one in a child brings a lessening of the other.

The study of the child's idea of relationship is further carried out by asking for definitions of words involving the idea of relationship.

1. Family. Piaget divides definitions of 'family' into three stages: 1) Those emphasizing the fact of living together or defining by name; 2) those making use of the idea of blood relationship; 3) those generalized so as to include all blood relations.¹

Examples of Stage 1.

No. 3. A family is a whole bunch of persons that have the same name.

No. 6. A family is lots of people. It's the people who live in your house. My family is my brother and father and mother, the people that live at our house.

Examples of Stage 2.

During the second stage the idea of relationship intervenes but does not yet supplant the fact of living together.²

Many of these are stated in a general way and make no mention of living together, so would be a step further, in our estimation.

No. 2. A family is a man and a woman and a lot of children. (Any man or woman?) A mother and daddy and children. Nobody's else would be, because they aren't theirs.

¹Cf. J.R., 115-118.

²J.R., 117

No. 7. People are in every family. In my family are father, mother, R., E., and I.

No. 15. A family is people. (Who are in your family?) My grandpa and grandma and uncle and daddy and mother and me. (They live together.)

No. 19. A family is people, a mother and a father and maybe boys and girls.

No. 20. A mother and father is a family, or a mother and father and children. (Notice the confusion between 'husband and wife' and 'father and mother.')

The next two emphasize other generations.

No. 1. A family is when a man and a woman marry each other and have a child, I mean, children. My daddy was my grandpa's and grandma's child. In his family were grandpa and grandma and G. and F.

No. 10. A family is a father and mother and children. My father had a family too.

Example of Stage 3.

No. 8. (Explains rather than defines, but emphasizes successive generations.) My daddy married my mother. People get born and they marry each other. You have to marry someone outside your family. That's the way I'm going to do. My daddy and mother made a new S. family, then there are one, two S. families, and when their boy marries there's another S. family; that's three.

Piaget connects the development of these different stages with the lessening of childish realism and places the age of 9 for the second and 11 for the third.¹ He relates this to the fact that on the average the correct definition of brother does not appear until 9.²

The writer's attention has been called to the fact that in America there is not the close connection between successive generations in families that there is among

¹ J.R., 119

² Cf. J.R., 107 and 119.

the French, and therefore we should attach more importance to the division between emphasis on living together and emphasis on blood relationship, especially when that relationship is treated by the child in a general way apart from his own family, as "when a man marries a woman", etc. This more impersonal statement of the case marks the third stage of the American child when no reference is made to his immediate family or those living with him.

II. Town and State. We offer a few notions of the relation of part and whole, which is the main idea of this definition.

No. 1. A town is a great big place with lots of houses in it. (Which is larger, Stockton or California?) California. Stockton is in California.

No. 2. A town is a lot of stores and Christmas trees. (This was early in December.) (Are there other towns in our state, besides Stockton?) Yes, Oakley, Monterey, Oakland, etc. (Which is larger, our town or our state?) The state is bigger than the town.

No. 3. A town is a lot of houses and a lot of people. (Which is bigger, Stockton or California?) California. (Are you in Stockton and California?) Yes.

No. 4. I don't know what a town is. I know this town is Stockton. (How do you know you are in a town?) Because you see stores and houses. A state is like states of California and Texas. (Which is bigger, Stockton or California?) California is bigger than Stockton.

No. 7. A town is where people go to buy things and where they live; where they buy clothes for little boys and girls. (What's the name of our town?) Stockton. (What is California?) A state. (Which is bigger, etc.?) California. (Are there other towns in California?) Yes.

No. 8. They build a lot of houses and make a town. A state is a whole bunch of towns. The United States is a whole bunch of states. (Which is larger, etc.?) California. It is a big state and Stockton is only a town. Stockton's in California. (Names other towns in California.)

No. 10. A state is like a law. It owns the town. A state is bigger than a city.

No. 20. A town is a street and you go buy things in town. (Is Stockton a part of anything?) Sure, it's a part of California. (Which is bigger, etc.?)

California is a bigger town. (We call it a state. Has California more than one town in it?) Yes (she names several).

No. 6. (Defines a town as) A big place and you haven't been there before. (She answers "I don't know" to the other questions.)

The other three children make no attempt to define or to answer questions, but 66% of these children, though they give rather realistic definitions, show a thorough acquaintance with the fact that a town is a part of a state, the state being the larger and containing the smaller, and so show again a development in this case of a notion of relativity.

III. Half and Part.

No. 1. Cut anything right straight in two in the middle and one side would be half and the other would be the other half. (How many halves can anything have?)

Two. A part is piece of anything.

No. 2. Half is if you cut it in half. A part is a piece of anything. (How many pieces would you have, if you cut it in half?) Two. If they weren't halves you could cut them in five or six pieces maybe.

No. 3. A half is a part. Cut it right in the middle. Right in two. A part is a piece of anything.

No. 4. A half---if you cut a cake in the middle in two pieces. (How many halves in anything?) Two. A half has to be cut in the middle. If you cut it in three or four pieces they would be parts.

No. 10. A half is anything cut in the middle---two halves. A part---cut anything in the middle and it's two parts. You can have more than two parts. A half has to be two parts.

No. 20. A half---you cut it right in the middle and the two pieces are halves. When anything is broken one of the pieces is a part.

The other children make no distinction between 'half' and 'part'

Half of the children have given correct definitions and distinguished the difference between 'part and 'half'. In other words, half of the group have given their correct relationship to the whole.

IV. Friend and Enemy. Piaget does not give this test, but accepts the findings of Mme. Passello, a Geneva school-mistress, "that at the age of 7 the notions of 'friend' and 'enemy' are still devoid of relativity."¹ We have examples of definitions involving relativity.

No. 1. An enemy is a person that hurts you and that you have to shoot. A friend is a person you know and that doesn't hurt you. You know him and he likes you.

No. 3. A friend is somebody that people like and that the friends like the other people.

No. 4. A friend is a boy, girl, lady, or man. (What makes them friends?) 'Cause they know each other and 'cause they like you and think you're nice.

No. 7. (Repeats and emphasizes 'together') Friends are people that stay around together, and go to shows together, and go to dances together, and go to picnics together. (That do things together?) Yes.

No. 8. If you know somebody and he likes you, that's your friend.

No. 19. They are friends when you talk to them and they know your name and like that.

The following is an interesting example of an explanation involving relationship. This is given by the oldest member of the group, who, aside from this instance, does not stand out above the others.

No. 10. An enemy is a spy. The Germans were enemies

¹ J.R., 131.

because they didn't like the Americans; the Americans were enemies of the Germans because they didn't like each other.

Some of these examples just quoted involve varying degrees of relationship, such as knowing and liking, hurting and shooting; others give an idea of a more reciprocal relationship in such terms as 'if you like them and they like you' or by using the words 'together', 'each other', etc., in their remarks. Others are one-sided, as:

No. 2. A friend is a boy or a girl you know. You know them and play with them.

No. 5. A friend is a neighbor that you know.

No. 6. A friend is a person that comes to stay with you sometimes.

No. 8. (See above) An enemy is not your friend; he doesn't like you.

No. 10. (See above) A friend is a person you know.

It is of interest to note that twelve years after the World War 75% of these children declare that they have never heard of an enemy and so do not know what one is. Another point of interest and one along the line of our study is the frequent use of 'because' by these children when talking about these experiments, giving reasons for their definitions or opinions, that is, using the logical 'because'.

Through these experiments have been brought out evidences of ego-centrism which Piaget mentions, but also just as strong evidence of a developing sense of relativity, indicating a decline of ego-centrism in this group in varying degrees according to the individual, beyond their chronological age and far more in accordance with their mental age.

CHAPTER IX

How the Child Reasons

If the definitions of 'town' given by the children and mentioned in the last chapter are called to mind, childish realism is apparent in many of them. For instance, "a place where you buy things," "a big place and you haven't been there before," "a lot of stores and Christmas trees." These definitions are allied to definitions by usage, though not stated in the form 'it is for, etc.,' and come from the child's own particular viewpoint. Their definitions of 'friend,' 'brother,' and 'family' were more generally stated and showed the further point of their development. Being in the 'in-between' stage of ego-centrism and socialized thought, evidences of both are apparent.

With the decline of ego-centrism the child begins to be more conscious of his reasoning and forms his first logical definitions, but these are not exhaustive in the beginning, the child defining by particular rather than by specific features. Not until the age of 11-12, the age of formal reasoning do they become perfected. This is due to his unconsciousness of the meaning of the concepts or words which he uses and this unconsciousness involves him in incessant contradiction and makes it impossible for him to generalize. This unconsciousness of

his own reasoning is particularly true of such concepts as 'alive' or 'strong', Piaget affirms, although the child frequently uses these concepts in his own questions and explanations.

Naturally, there is no question to asking the children: "What is life?" or even "What does 'being alive' mean?" This would be to expect them to possess the power of making abstractions, and it would be absurd to conclude from the lack of such power to the ability to be conscious of meanings and to give definitions. The following method, on the contrary, raises no difficulty. You give the child a list of familiar objects, asking about each in turn "Is it alive?" and adding after the affirmative or negative reply, "Why is it (or is it not) alive?" The only thing to avoid is suggestion by perseveration. In view of this, it is best to begin with objects that are obviously a alive or obviously inanimate, and then only after making sure whether there is or is not a definite systematization in the child's mind, can he be questioned about objects which strike him as doubtful. The order to be observed is therefore roughly as follows: A dog, a fish, a fly, then a pebble, a table, a bench, then the sun, the moon, the clouds, the rivers, fire, wind, a marble, a bicycle, a train, a boat, etc.¹

Among our subjects, the idea of 'life' being because of movement or self-movement corresponds to that of many of Piaget's subjects. Also we find in the same child a heterogeneity of attributes of life, with no attempt to synthesize these into one general concept. But we did not ask these children for a definition; we simply gathered their ideas about life, and only three children offered any general statement. The manner in which the questions

¹ J.R., 150 f.

are answered ~~shows~~ that the same child attributes life in some instances to one cause and in others to another. Only two of the children who managed some or all of the syllogisms show any signs here of logical synthesis or any generalization of ideas.

In fact, in these tests we find the most evidence of finalism, precausality, juxtaposition and contradiction, lack of logical multiplication, etc., all of which Piaget points out to be the accompaniments or fruits of ego-centrism. Here we witness the greatest evidence of the 'in-between' stage in which these children are at present. Some of them have shown, as the tests and observations have proved, a noticeable advance in logical thinking, yet through these questions the evidence of how implicit their logic is in general comes to light. Synthesis and generalization of attributes to the degree of making abstractions is beyond the ken of most of them entirely. Here they think from particular to particular, without connecting these different attributes into one general concept.

To show how commonly movement or self-movement is thought of as a necessary attribute of life, we quote the following examples from different children:

No. 1. (A dog, fish, fly) Yes, because it (respectively) walks, swims, flies. (A table) No, because it doesn't move and jump unless people move it and carry it. (A bench, marble, bicycle, train) (The same idea in varied statements.)
(Fire) No, because it can't walk.

He makes no mistake about what is animate or inanimate, and offers the statement that being alive is moving, talking, and things like that.

No. 2. (A boat) I don't know. I think so, 'cause it goes in the water. (A fish) If they're alive they swim over or under the water, 'cause a fish has got to breathe the water. (But he attributes life for one reason or another to sun, moon, fire, and rivers.)
 No. 3. (Fish) Because he swims he's alive. (Fly) Yes, because he flies. (She adds,) a paper flying isn't alive, because it has no hands, feet, or legs. (Table and bench) No, because they can't move themselves. (She also calls clouds, rivers, fire, wind, a marble, bicycle, train, and boat alive because they move.)
 No. 6. (A dog) Yes, it runs and plays. (A pebble) No, 'cause it doesn't move unless you pick it up. (Table and bench) No, it doesn't move by itself. (Fire) No, because it doesn't move itself. (Talk to her about the flames dancing; she insists on her reason, which is a true one, of course, but incomplete) (She gives as a reason that marbles, bicycles, trains, and boats are not alive the fact that someone has to shoot, pedal, or make them go. She attributes life also to the clouds, rivers, and wind because they move.)
 No. 7. (Attributes life to dogs, fish, and flies because they walk or swim or fly, and denies life to pebbles, tables, benches, sun, moon, marbles, bicycles, trains and boats, because they either do not move or move of themselves.) (Clouds) aren't alive because they can't walk; they haven't any feet. (A river) because it's just water moving around. That makes it move around. (Wind) No, because it just moves around the air and blows. (He is groping for some hidden factor besides mere movement, but doesn't frame it in clear terms.)
 No. 8. (Gives self-movement as a reason for life in different cases and generalizes in regard to his idea of life and movement when he says of pebbles,) No, they lay on the ground. If things move around, I know they are alive.
 No. 10. (Lays emphasis on "If they keep moving.") (The sun) is alive if it keeps moving. (The wind) is alive sometimes because it blows. (A marble) Yes, if you keep throwing it around. (A bicycle) If somebody keeps riding it all the time. (A train) If it's always moving. (A boat) If it keeps moving; if it stands still, it's dead. (I asked him if he

was alive when he stood still, and he said,) Yes, 'cause I eat good stuff. (The reader will remember that this is the oldest child in the group. He does not show the furthest advance in logical thinking.)
 No. 15. (Calls several things alive "if they wiggle.")
 No. 20. (Attributes life to a boat "when it goes.")

Thus the predominance of movement and self-movement as attributes of life is evident. Only two children fail to name it, and yet No. 1 and No. 8 are the only ones to make any sort of a general statement about it. (No. 1: "Being alive is moving, or talking, and things like that." No. 8: "If things move around, I know they are alive.") No. 1, 7, and 8 are the only ones who answer about each object correctly; but they give precausal explanations for some objects. In spite of the two attempts at general statements, there is evident lack in each child of putting "two and two together" and making a general statement which fits all cases. They reason from particular to particular here, and though they emphasize movement and self-movement, they also bring in heterogeneous reasons and fail to relate them all in any way. No. 1 comes nearest to doing so.

The same child who emphasizes movement or self-movement may bring in other criteria of life, such as talking, the possession of hands and feet, the fact that "things that shine aren't alive," and "God makes" a certain thing alive. In some cases a child answers many of the questions and then says, "It just is (or isn't). I don't know why. I just know."

No. 4 offers an interesting example of heterogeneity of reasons for anything being alive or not alive.

(Dog) Yes, because he can walk. I never saw a man kill a dog.

(Fish) Yes, when it's in the water, because there's no hook going down there to kill. (How do you know it's alive?) If he swims, he's alive.

(Fly) Yes, because they don't kill it yet. If a lady kills them they're not alive. If a lady doesn't kill them, they're not dead.

(Pebble) No, it can't walk or see or roll, not unless a lady makes it roll.

(Table) No, because it has legs but it can't walk. It can't see.

(Bench) No, because it can't walk.

(Sun) Yes, because it can make the day bright.

(Moon) Yes, because it makes it bright like the sun. Not as bright as the sun, though. (Here she brings in utility as a reason for being alive.)

(Clouds) Sometimes they are alive, sometimes they aren't. At night they're alive. Some days they aren't. (Evidently when they are not visible she considers them not alive.)

(River) Yes, 'cause it floats around.

(Fire) Yes, 'cause it burns. If it burns something, paper, logs, sticks, it's alive. (Effectiveness or power the criterion.)

(Wind) Yes, 'cause it blows. Because it makes the night cool when it blows. (Utility again.)

(Bicycle) No, because it doesn't go unless a boy or girl rides it.

(Marble) No., it can't roll unless a boy or girl rolls it.

(Train) Yes, unless a man turned the engine off. It is then, 'cause when he turned the engine on it goes like that (motions).

(Boat) Yes, if a man and lady started it it would go on the water.

She shows a confusion of ideas all juxtaposed with no thought of synthesis. Most often movement or self-movement is the criterion, but in the case of the clouds, for instance, she does not take movement into account at all. Although these questions were all asked in succession, she does not connect

her ideas or attempt to generalize. She does, however, offer this general thought, "When you die, you aren't alive. When you don't die, you are alive." But this has nothing to do with what being alive involves in many of her statements. She deals with each particular case by itself; hence, the disregard of any relationship between the several notions and the unconsciousness of any contradiction in her statements.

The various answers of each child offer an interesting study of these points but enough examples from each one and the answers of this one child in the entirety bring out sufficiently the points we are discussing.

The same holds true of their answers about 'strength', though there is more consistency here than in their answers about 'life', and greater similarity between the answers of the different children. But there is no attempt whatever to gather the attributes into a general idea. We followed Piaget's suggestion of not asking outright for a definition and no child spontaneously gave one.

In general, the children considered the wind and rivers strong because of the rapidity of self-movement or because of their power to move or to break other things, and tables and benches strong because they hold things and people up.

No. 1. (Emphasizes 'resistance' in saying of a bench.)
Yes, it's lots stronger than a table, because people sit in it and bear down.

No. 8. (Shows his practical nature in his comment,) You and I wouldn't be sitting here if it (the Bench) wasn't strong.

Some of the children attribute 'strength' to tables and benches because of the material of which they are made, and going back of that, "if the wood is rotten, they're apt to break." Some attribute 'strength' to the ocean and river because they hold boats up, but No. 2, who was one of these, does not carry this thought over into his ideas about tables and benches. He attributes their strength to the strength of the tree from whose wood they are made.

No. 20. (Says of the wind, as do several others.) When it blows, it's strong; when it doesn't, it hasn't any strength in it.

Only two children try to carry the same idea of 'strength' lying in power to move over to a table and bench.

No. 7. (Denied at first that a table was strong.) No, there's nothing to make it go fast. (What about those things on the table?) The table has to be strong to hold them.

No. 15. (The wind) Yes, 'cause it makes you go always. (Table) No, it doesn't move. (Bench) No, it doesn't move. (Quickly changing her mind) Oh, yes, it won't break, 'cause it's a lot of wood.

We find nevertheless, little contradiction in the same child's answers about any certain thing, as Piaget did.¹ If, as in the instances we quoted, the child changes from motion to resistance as a necessary attribute of the particular thing, he corrects his own idea about it and does not

¹Cf. J.R., 156.

deny life for the lack of the former attribute. Never does he accept both views at once, as of course he should be able to do in the case of the river, but always gives either one or the other attribute as a criterion. Again, these children are always reasoning from a particular viewpoint.

We can agree with Piaget in his conclusions that two particular points stand out from this experiment, unconsciousness of thought processes resulting in contradiction and lack of arrangement into a logical hierarchy of the notions or ideas about a concept. Concerning the contrast in this matter between children and adults, we quote:

For most of our ideas, too, are determined by several heterogeneous factors and even by factors which are the same as those used by children. Thus we, like children, define life as self-movement, as the fact of having blood (or sap, or any kind of circulation), etc. We also define force as activity and as resistance. Where we differ from the children we have been discussing is that we always have the component parts of the concept simultaneously in mind. Thus we say that a river has force because it flows fast, but we do not deny that a bench has resisting force even though it makes no movement. The child, on the contrary, thinks, not simultaneously, but alternately of the two determining factors. When he is thinking of resistance he denies force to rivers because a pebble sinks to the bottom of the water, and when he is thinking of motor force he denies force to a bench because it moves neither itself nor anything else.¹

¹
J.R., 156 f.

Our subjects do not exhibit the same degree of contradiction that Piaget refers to. When they attribute strength to motion or to driving force they do not deny it to things standing still, as he avers some of his cases do. In the two instances only when children do this, they immediately see their mistake and correct it, one without any question asked. In their ideas about life, we find more contradiction, as we have stated, life being attributed to motion in some cases and the fact of motion being left out of consideration entirely in other cases. Also, in regard to strength, in a few instances, they say a table or a bench is strong if it has something on it to hold and not if it does not. They are considering the outward evidences of strength, not the constant elements of inherent force or resistance. These are questions too deep for the child's mind to grasp. But the point we are emphasizing is that these children again are not as contradictory in their statements as a greater degree of ego-centrism would entail. These facts do not nullify Piaget's statements, only emphasize again the simultaneousness of a decline in ego-centrism and a decline in its accompaniments. It is certainly true that

they (the children) think of them (the factors or classes) alternately, without bringing them together, and that is why they cannot define the word.¹

¹J.R., 160.

and that

the reason why adult concepts are in a state of equilibrium is that they are the products of logical addition or multiplication.¹

Piaget goes on to show how this lack of synthesis is due to an over-determination of certain ideas and to show the connection of all the features we have discussed in our various chapters, juxtaposition and syncretism, the child's inability to use the relations of discordance, his thinking from particular to particular, or by transduction, his overdetermination of certain ideas, his lack of recognition of reciprocal relationships, his lack of synthesis, and his irreversibility of thought, all these either bound up with or growing out of ego-centrism, and declining as it declines. He discusses contradiction by amnesia and by condensation, and the part played in childish reasoning by such factors connected with contradiction as imitation and assimilation of reality. We cannot take up all these points in detail but would refer the reader to the two closing chapters in his second book on the logic of childhood.² In these are gathered up all the points which we have emphasized throughout this study and to which we called attention in our introduction in our summary of

¹ J.R., 160.

² J.R., Chapters IV and V.

his two books.

What applies to the child is also true of science. So long as Physics took absolute space and time as its domain it reached a certain degree of development but came short of any fundamental solution. But from the moment that it was realized that the measurer was relative to what he measured, the resulting relativity enabled physics, thanks to the conditions of invariability and co-variability, to attain objectivity. In the same way, so long as the child thinks he can reason directly about things without taking himself into account, he will succeed neither in handling relations nor in reaching logical necessity. As soon as he brings in his own ego as an element in these relations, the child attains to the reciprocity of relations and to logical strictness...As soon ...as relations become completely reciprocal, the fertility of relational multiplication knows no bounds, and generalization becomes possible. Nay, more, this reciprocity is what explains the reversibility of all deductions and consequently the character of strictness and necessity that is peculiar to the reasoning process.¹

¹ J.R., 197 f.

CHAPTER X

Conclusion

Because of the nature of these observations and the constant comparison of them to Piaget's standards, we have necessarily drawn conclusions in regard to each phase of the development of our thesis. There remain, then, only a few general conclusions.

In the first place, we cannot emphasize too strongly the great contribution made by Piaget to the study of child reasoning. As a thorough analysis of the trend of development and its different stages it forms a most enlightening basis for child study. It has been more and more evident, however, in the course of these observations and experiments that he fails to emphasize the following points: 1) The importance of mental rather than chronological age in defining these stages of development: 2) The individual aptitudes or differences in rapidity in development: 3) The effect of the style of language used in the child's home on his own language development: 4) the socialising influence of that home or of his environment: 5) the necessity of adapting meticulous points of language to the particular language which is native to the child's country: 6) The natural responsiveness or adaptability of the child to the experiments tried. But as a working basis for successive stages of development, it is invaluable.

It has been evident throughout that the smaller, superior group was not to be compared to Piaget's standards for six-year-olds, but to the stage more nearly approximating their mental age, and that within that small group of twelve mental age was but one, although a very important item, in the child's individual development in the socialization of thought.

It was emphasized in the study of the individual child how much greater a degree of socialization of thought and language he exhibited when checking his ideas by those of the family group and how in a lesser degree he used more socialized language with one adult than with one or more children. These facts lead us to the importance of environment in the development of child language and thought and consequently in his reasoning.

One little girl, during the last experiments discussed, asked me, "Can D. talk at the table?" "Yes". "I can't, only just to ask for things. My daddy'd give me a whipping if I talked at the table just to tell him things." If the table conversation among the family is the most socializing factor in one child's life in the matter of language and thought development, the other child is missing that influence entirely. This illustration is offered merely to bring out the point of the varying environmental influences in this small group entering in to determine the

degree of socialized thought of its members.

We agree thoroughly with Piaget in his suggestion that such studies as his and those based on his may prove of great value to parents and educators. Considering such findings, how essential it is to adapt our training to the child's level of reasoning and to be sure that he understands us. How often his proneness to syncretism may lead him to select some unessential point and build his schema about that, leaving him utterly and innocently unaware of what we had in mind as important. How many children in the past have been unfairly held responsible for aspects of situations of which in their ego-centric outlook they were utterly unaware?

In the educational field how essential it is to take these findings into consideration as to subjects taught and methods of teaching these subjects, recognizing that the child thinks first in confused wholes, and fails to analyze or to recognize relations. The modern unit system of reading is in harmony with Piaget's findings, beginning with whole sentences, then gradually through familiarity recognizing word units, and later analyzing these into their individual letters, these letters finally in new relationships to be built into synthetic wholes. The project system, also, beginning with the intellectual realism of the child, arouses his interest and cooperation.

and when he is old enough to do so, abstractions based on these projects may be made. With Piaget's diagnosis of the development of child thought and reasoning as a guide, all subject-matter can consciously be fitted to the child's stage of development.

Many times Piaget hints at the remnants of ego-centrism existing in adults, but that through social inter-action we are made conscious of our shortcomings and are engaged in a perpetual struggle toward maturity. An understanding, made possible by his explanation, of the stages by which our own thought has developed and the consequent self-analysis marks a further step in our own development away from the effects of ego-centrism.

There may be room for criticism of Piaget in the emphasis which he puts everywhere on the ability to reason formally as the acme of development and in his consequent fine distinctions drawn between implicit and pure logical reasoning. Everywhere this nicety of distinction has been evident in the tests which he applied. It should be remembered, however, that even though formal logic and the syllogism are but the shell or corpse of reasoning, they are the evidence of the ability to separate oneself from one's own point of view and to consider matters in a relative light, which ability even in a practical way is indispensable to maturity of thought.

In our observations and experiments we have not been able to follow up clues exhaustively. Vistas of further investigation with the individual children have opened up but time and opportunity forbade following them up. This thesis is offered not as a conclusive treatise, but as an interesting study made in the light of Piaget's theories and findings.

Appendix

Since the completion of this thesis the writer's attention has been called to the recent book, Child Psychology, by Margaret Wooster Curti, Assistant professor of psychology at Smith College. She devotes considerable space to a discussion of Piaget's theories concerning child thought and reasoning and makes the following comments.

It is only recently that we have had systematic investigations of children's thought which have succeeded, as it were, in getting beneath the surface.

The great advance in this respect has been made in Switzerland by Jean Piaget.¹

Ego-centrism is inevitable in early childhood but in thus calling our attention to its importance in thinking Piaget has made a fruitful contribution, especially as he shows that the other chief features of child thought are intrinsically related to this ego-centrism.²

No one has studied so thoroughly the actual processes of empirical thinking in children as has Piaget, or traced in such a penetrating way, by means of systematic investigation, the progress made by the child in powers of logical analysis.³

In various places, however, Mrs. Curti calls attention to the fact that Piaget narrows the concept of reasoning down to formal reasoning only, and she remarks that if we thus restrict reasoning we will find it rare among adults.

¹ Margaret Curti, Child Psychology, 255.

² Ibid., 257.

³ Ibid., 260.

Compare the following statements to the conclusions of this thesis:

The word method of teaching reading, prevalent now for years, is based on the realization that it is natural for the child to react to whole words first, and only later to read by putting together of previously perceived letters.¹

One reason which might well be advanced for adhering to this (Piaget's) conception (of reasoning) is that it might have a good effect on practical dealing with children. Perhaps too much time is spent trying to instruct through formal reason young children who are really incapable of profiting by such methods.²

But according to our conception successful integration of the whole personality cannot begin until the child has acquired some conception of himself as an individual in relation to other people and some general idea or plan of what he wants to make himself. Such an objective conception of himself the average child does not acquire until the age of twelve or so, if we accept Piaget's analysis. Some for lack of knowledge or of sufficient innate intelligence, never acquire it, and hence can never have well-integrated personalities. They may as adults have desirable personality traits and distinct individualities but their outlook in life remains essentially childlike and naive.³

Not only the rate at which children pass through the first primitive stages of thought but the degree to which their mature conceptions of the world and human life become rational are susceptible of control by adults, a point on which Piaget does not dwell. There are differences of opinion on the extent to which rational thought should be applied, but it would be generally agreed, probably, that the ability to see the world in an impersonal and objective way is essential to

¹ Ibid., 233.

² Ibid., 270.

³ Ibid., 504.

the attainment of what we might call "inner harmony". The child must learn sometime, if he is to lead an effectively integrated life, to look upon himself as merely one individual among an inconceivably large number of others of past and future as well as of the present, living in a vast world which is not organized with reference to their wishes. And so, by whatever means they may, those who bring up children will wish to help them outgrow their first crude ways of thinking and achieve rational standards of conduct, to the end that sometime they may learn, as independent and mature personalities, thoughtfully to direct their own lives.¹

¹ Ibid., 510.

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