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# PLAY, DREAMS AND IMITATION IN CHILDHOOD



*Founded by C. K. Ogden*



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**PLAY, DREAMS AND  
IMITATION IN CHILDHOOD**

JEAN PIAGET



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## AUTHOR'S PREFACE TO THE ENGLISH TRANSLATION

THE publication of the English translation of *La Formation du Symbole* is for me an opportunity to express my indebtedness to English-speaking psychologists, in particular to C. Spearman, S. and N. Issacs, C. Burt and C. W. Valentine, who have contributed so much to the study of the child and of symbolism. It is also a matter of great satisfaction to me that this book is now available to the English reading public.

This volume is the third of a series devoted to the first years of the child's development, the two others being concerned with the beginnings of intelligence and the child's construction of reality (*La naissance de l'intelligence chez l'enfant* and *La construction du réel chez l'enfant*). Although this book contains frequent references to the two other volumes, which deal with the same three children and study the relationships between their mental activities, it nevertheless constitutes in itself an independent and complete study.

I should like to add a word with regard to the translation. A certain author is said to have declared that he understood himself better as a result of reading a French translation of his work. This is probably true of all good translations ; but unfortunately they are very rare ! In the present case I feel that my original somewhat difficult text has become in English more understandable, thanks to the efforts of my translators, to whom I take this opportunity of expressing my appreciation.

JEAN PIAGET.

May, 1951.

## TRANSLATORS' NOTE

Most of the terms used in the text are self-explanatory, or explained as they occur. It is thought advisable, however, to define the following important, recurrent terms at the outset.

*Equilibrium.* Used here to convey the idea that two changes in opposite directions balance each other without the balance necessarily being permanent. Since it is concerned with changes, it is dynamic.

*Group.* This is a notion taken from mathematics, and can be illustrated by the following example :—The operation of addition applied to whole numbers is such that (a) any two successive additions can be replaced by a third which combines them, and (b) each addition can be neutralised by a suitable subtraction called its inverse operation. A *group* is a set of operations such that (a) they can be composed so that any two will produce a third belonging to the same set, and (b) the set contains the inverse of each of the operations composing it.

*Ludic.* Used here to qualify behaviours related to play.

*Oneiric.* Used here to qualify dreams.

*Operation.* Although this word is taken from arithmetic, it contains a psychological component which is essential to the understanding of it. An operation is an action that has become abstract and has acquired the property of being combined with other operations, in particular in the form of groups.

*Reversibility.* This notion is taken from thermodynamics. In this branch of physics the processes form pairs, which represent two opposite directions in which a system can evolve. The equilibrium of these pairs is said to be reversible when the system can evolve indifferently in either direction. Reversibility here indicates a psychological situation analogous to that of physics, *i.e.*, the psychological processes involved are at any given moment in reversible equilibrium.

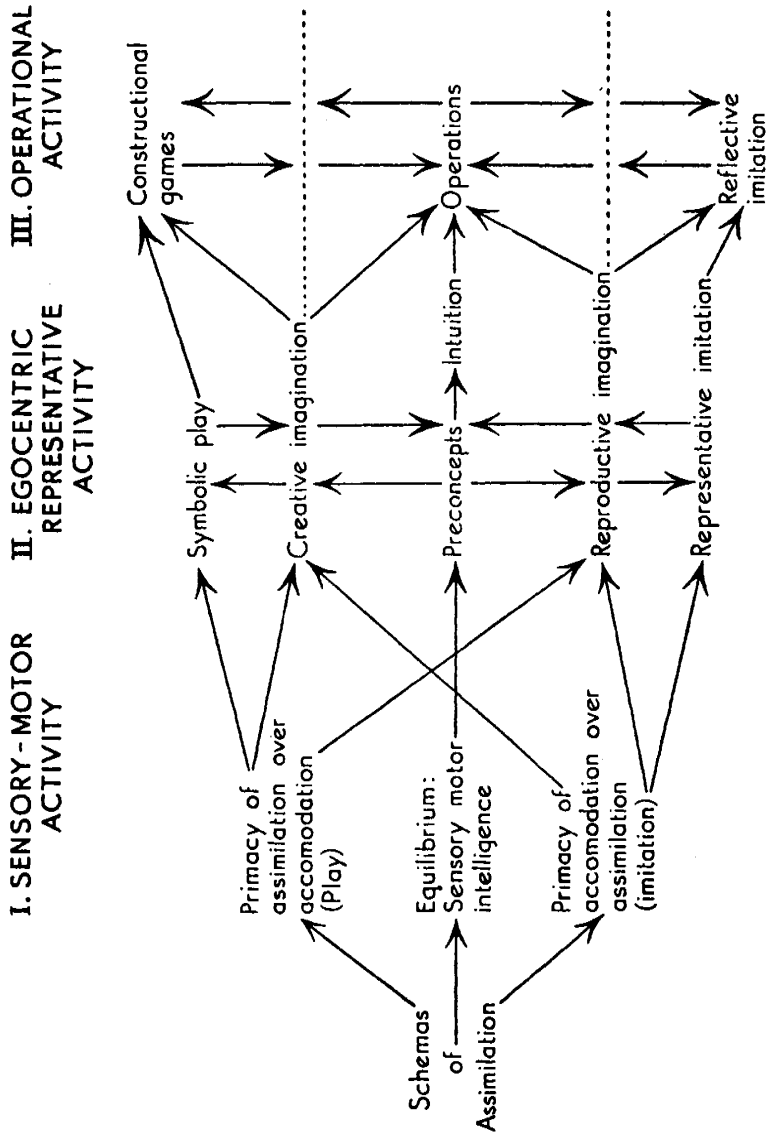
*Schema.* This word is used to indicate an elementary structure, particularly in the beginnings of psychological life.

# CONTENTS

	<i>Page</i>
AUTHOR'S PREFACE	v
TRANSLATORS' NOTE	vi
INTRODUCTION	i
<i>Part One—Imitation</i>	
	5
CHAPTER I. THE FIRST THREE STAGES: Absence of imitation, sporadic imitation and beginnings of systematic imitation	6
§ 1. Stage I: Preparation through the reflex.	
§ 2. Stage II: Sporadic imitation.	
§ 3. Stage III: Systematic imitation of sounds already belonging to the phonation of the child and of movements he has already made and seen.	
CHAPTER II. STAGES IV AND V: Imitation of movements not visible on the body of the subject, and imitation of new models	30
§ 1. Stage IV: I. Imitation of movements already made by the child but which are not visible to him.	
§ 2. Stage IV: II. Beginning of imitation of new auditory and visual models.	
§ 3. Stage V: Systematic imitation of new models including those involving movements invisible to the child.	
CHAPTER III. STAGE VI: Beginnings of representative imitation and further development of imitation	62
§ 1. Stage VI: Deferred imitation.	
§ 2. Further evolution of imitation. Imitation and the image.	
§ 3. Theories of imitation.	

	<i>Page</i>
<i>Part Two—Play</i>	
CHAPTER IV. THE BEGINNINGS OF PLAY	87 89
CHAPTER V. CLASSIFICATION OF GAMES AND THEIR EVOLUTION AFTER THE BEGINNINGS OF LANGUAGE	105
§ 1. Critical study of the usual classifications of ludic behaviours.	
§ 2. Practice, symbol and rule.	
§ 3. Classification and evolution of mere practice games.	
§ 4. Classification and evolution of symbolic games.	
§ 5. Games with rules and evolution of children's games.	
CHAPTER VI. EXPLANATION OF PLAY	147
§ 1. Criteria of play.	
§ 2. The theory of pre-exercise.	
§ 3. The recapitulation theory.	
§ 4. F. J. J. Buytendijk's theory of "infantile dynamics."	
§ 5. An attempt to interpret play through the structure of the child's thought.	
CHAPTER VII. SECONDARY SYMBOLISM IN PLAY, DREAMS AND "UNCONSCIOUS" SYMBOLISM	169
§ 1. Secondary symbolism in play, and children's dreams.	
§ 2. The Freudian explanation of symbolic thought.	
§ 3. Symbolism according to Silberer, Adler and Jung.	
§ 4. An attempt to explain unconscious symbolism.	
§ 5. Unconscious symbolism and affective schemas.	
<i>Part Three—Cognitive Representation</i>	
CHAPTER VIII. TRANSITION FROM SENSORY-MOTOR SCHEMAS TO CONCEPTUAL SCHEMAS	213 215
§ 1. First verbal schemas.	
§ 2. "Preconcepts."	
§ 3. First reasonings: preconceptual reasoning (transductions) and symbolic reasoning.	
§ 4. From sensory-motor intelligence to cognitive representation.	

	<i>Page</i>
CHAPTER IX. FROM PRACTICAL TO REPRESENTATIVE CATEGORIES	245
<ul style="list-style-type: none"> <li>1. Myths of origin and artificialism.</li> <li>2a. Animism.</li> <li>2b. Decline of artificialism and animism.</li> <li>3. Names, dreams and thought.</li> <li>4. Magic-phenomenism, reactions related to air and co-ordination of view-points.</li> <li>5. Objects, spatial perception and time.</li> <li>6. Conclusions: precepts, intuition and operations.</li> </ul>	
CHAPTER X. CONCLUSIONS : GENERAL TRENDS OF REPRESENTATIVE ACTIVITY	273
<ul style="list-style-type: none"> <li>I. First period: Sensory-motor activity.</li> <li>II. Second period: Egocentric representative activity. Stage I: Preconceptual thought.</li> <li>III. Second period: Egocentric representative activity. Stage II: Intuitive thought.</li> <li>IV. Third period: Operational representative activity.</li> </ul>	
INDEX	292



## INTRODUCTION

*La Genèse du nombre* and *Le Développement des Quantités chez l'Enfant* were the last volumes we devoted to the development of rational thought in the child. These dealt with the construction of the various systems of operations involved in logical and mathematical functions when the mind is confronted with the real world. They were thus concerned with intuitive or representational thought only in a somewhat negative way, our main object being to indicate its shortcomings and show the necessity for completing and correcting it by means of operations properly so called. But imaged or intuitive representation as such raises a series of problems which need to be discussed in their own right. We need to consider the function of the development of representation and not only its ultimate inclusion within the framework of operations (or rather, that is to say, we need to consider the progressive articulations which gradually transform representation into operational, reversible thought). It is therefore important to give an account of the beginnings of representation and to attempt to understand its specific method of functioning. Only when this has been done is it possible to clarify the connection between intuition and operations, both in those cases where the first is produced into the second, and in those, which may be equally numerous, where imaged representation retains an existence of its own apart from operations, as in play, imitation, and symbolic thought.

In two previous volumes, *La Naissance de l'Intelligence* and *La Construction du Réel chez l'Enfant*, we studied sensory motor intelligence in the pre-verbal stage, *i.e.*, that aspect of intelligence which is a preparation in the field of elementary activity for what will much later become the operations of reflective thought. What now therefore requires to be done is to bridge the gap between sensory-motor activity prior to representation, and the operational forms of thought. The problem again becomes that of describing the beginnings of representational thought and of placing its evolution with respect to the sensory-motor stage at one end and the operational stage at the other.

Obviously these problems involve the question of the role of language, which has already been much studied. In our first two volumes, *Le Langage et la Pensée chez l'Enfant* and *Le Jugement et le Raisonnement chez l'Enfant*, we considered this question from the point of view of the socialisation of thought. We shall come back to it here only in connection with the first verbal schemas and with "pre-concepts," so characteristic of the two to four-year-old stage. We shall rather try to show that the acquisition of language is itself subordinated to the working of a symbolic function which can be seen

in the development of imitation and play as well as in that of verbal mechanisms. Our study of the beginnings of representation in the child will mainly be in those fields where the individual processes of mental life dominate the collective factors, and we shall emphasise these individual processes particularly in the case of imitation, which though it leads to inter-individual relationships does not necessarily result from them. We shall confine ourselves to the development of representation in general, only dealing with the description of particular representations in so far as they are related to those already studied in our previous works, *La Représentation du Monde* and *La Causalité Physique chez l'Enfant*.

Even within these limitations, the problems to be discussed are very wide. We shall first study the development of imitation. In *La Naissance de l'Intelligence* we have already made the assumption that representation derives to some extent from imitation. In his important book, *De l'Acte à la Pensée*, concerned with the same problems, Professor Wallon takes the same view, and gives us a further reason for reconsidering the question in the light of facts accumulated in the past from a study of our own children. We must say that, far from accepting all Professor Wallon's theses, we shall often be led to reply to him.

But imitation is but one of the sources of representation, for which it provides the necessary imaged "signifiers." Play also, especially from the point of view of "meanings" can be considered as leading from activity to representation, in so far as it evolves from its initial stage of sensory-motor activity to its second stage of symbolic or imaginative play. We would even say that it is in the evolution of play that the assimilating processes characteristic of the beginnings of individual representation are most clearly evident. The second and longest part of this volume will therefore be devoted to a study of play and related phenomena. We shall start by examining the beginnings of play during the first year, as an introduction to the study of the symbol. The question of games with rules will only be touched on, since one example, marbles, has already been studied at length in *Le Jugement Moral chez l'Enfant*. Hence it is symbolic play that will be our main concern, and discussion of it will inevitably lead us to a consideration of the question of "unconscious" symbolism and symbolic thought in general, in the sense of the psycho-analysts from Freud to Silberer, Adler and Jung.

Only after discussing the problems of imitation, play and unconscious symbolic thought can we then, in the third and last part, place within the whole structure the beginnings of cognitive representation and draw the resulting conclusions as to the mechanism of representational activity or the symbolic function.

We shall develop two main theses. The first is that in the field of play and imitation it is possible to trace the transition from sensory-motor assimilation and accommodation to the mental assimilation

and accommodation which characterise the beginnings of representation. Representation begins when there is simultaneous differentiation and co-ordination between "signifiers" and "signified." The first differentiations are provided by imitation and the mental image derived from it, both of which extend accommodation to external objects. The meanings of the symbols, on the other hand, come by way of assimilation, which is the dominating factor in play and plays an equal part with accommodation in adapted representation. Having progressively separated at the sensory-motor level and so developed as to be capable of going beyond the immediate present, assimilation and accommodation finally come together in a combination made necessary by this advance beyond the immediate present. The constitution of the symbolic function is only possible as a result of this union between actual or mental imitation of an absent model and the "meanings" provided by the various forms of assimilation. Then it is that language, a system of collective signs, becomes possible, and through the set of individual symbols and of these signs the sensory-motor schemas can be transformed into concepts or integrate new concepts. Our first thesis, a continuation of that in *La Naissance de l'Intelligence*, will therefore be that there is functional continuity between the sensory-motor and the representational, a continuity which determines the construction of the successive structures. This hypothesis does not appear to be obvious. Professor Wallon objects that "Piaget, in spite of his insistence on the continuity of this progression, has been obliged to introduce two terms not included in the motor schemas: the ego and the symbol." (*De l'Acte à la Pensée*, p. 45.) On the contrary, we shall try to show how the symbol results from the pre-representational schematism. The ego will doubtless follow of itself.

Our second thesis is that the various forms of representation interact. There is representation when an absent model is imitated. There is representation in symbolic play, in imagination and even in dreams. The system of concepts and logical relations, both in their intuitive and operational forms, implies representation. What then are the elements common to these various representations, and is it even possible to maintain that they contain comparable mechanisms?

Classical associationist psychology found an easy solution to the problem by making all representations derive from a single, simple reality: the image, a direct continuation of sensation. But the image itself raises a problem, for far from being an immediate continuation of perception as such, it does not seem to intervene in mental life before the second year. Moreover, it is only a "signifier," or symbol, and to understand the part it plays it is necessary to study the relationship between the various "signifiers" and the various "signified," in short the whole representational activity.

A second means of attempting a solution of these problems is by

bringing in social life. Professor Wallon, after attempting to explain the elementary forms of mental life, emotion at the "projective" level and that of "understanding of situations," by the intervention at various stages of physiological systems each integrating those which precede it but without preparing through functional continuity for those which will follow, has recourse to social factors such as ritual, myth, language and the higher forms of imitation in order to account for representation. But the question that then arises is why and how the child is influenced at certain definite moments by this or that social action. Language, for example, is acquired at this age and not at that, in this order and not in that, and therefore only modifies thought in so far as thought is susceptible of being modified. It is therefore not "social life" as a whole that psychology must invoke, but a series of relationships established in all possible combinations between individuals of distinct levels of mental development, and as a consequence of various types of interaction (coercion, co-operation, imitation, discussion, etc.). Though obviously social life plays an essential role in the elaboration of concepts and of the representational schemas related to verbal expression, it does not in itself explain the beginnings of the image or the symbol as they are to be seen in deferred imitation or in the first imaginative games of the one year-old child. Moreover, no sociologist has yet undertaken to prove the social origin of the unconscious "anatomical" symbols to be found in dreams or of the images of the half-sleeping state.

The problem we shall discuss in this volume is therefore that of the symbolic function itself considered as a mechanism common to the various systems of representations and as an individual mechanism whose existence is a prerequisite for interaction of thought between individuals and consequently for the constitution or acquisition of collective meanings. This in no way implies that we dispute the social nature of collective meanings, far from it, since we have constantly tried to show that reason implies co-operation and reciprocity. But the social fact is for us a fact to be explained, not to be invoked as an extra-psychological factor. Hence it seems to us that the study of the symbolic function must cover all the initial forms of representation, from imitation and ludic or oneiric symbols to verbal schemas and elementary pre-conceptual structures. Only then will the functional unity of the development which leads from sensory-motor to operational intelligence be seen through successive individual or social structures. Progressive equilibrium between assimilation of objects to individual activity and accommodation of activity to objects results in the reversibility which characterises the operations of reason, while the primacy of accommodation characterises imitation and the image, and the primacy of assimilation explains play and the "unconscious" symbol.

## PART I

### IMITATION

IMITATION does not depend on an instinctive or hereditary technique as P. Guillaume shows in a work which has thrown new light on the question. The child learns to imitate, and this learning process, like any other, raises all the problems involved in sensory-motor and mental development. This conclusion would still be true even if in the tendency to imitate there were an element transmitted through heredity, since a distinction must be made between a tendency and the technique which makes its development possible.

We would go further, and consider the pre-verbal imitation of the child as one of the manifestations of his intelligence. In tracing the development of imitation during the first two years, we cannot fail to be struck by its active character. During this period it is in no way "automatic" or "non-intentional." On the contrary, very early we find evidence of intelligent co-ordinations, both in the acquisition of the tools it uses and in its aims. Moreover, as we shall see, the connection between the stages of imitation and the six stages we found in the development of sensory-motor intelligence<sup>1</sup> is so close that in the analysis which follows we shall use the same scale.

This being the case, the facts can at once be interpreted in the following way. Sensory-motor intelligence is, in our view, the development of an assimilating activity which tends to incorporate external objects in its schemas while at the same time accommodating the schemas to the external world. A stable equilibrium between assimilation and accommodation results in properly intelligent adaptation. But if the subject's schemas of action are modified by the external world without his utilising this external world, *i.e.*, if there is primacy of accommodation over assimilation, the activity tends to become imitation. Imitation is thus seen to be merely a continuation of the effort at accommodation, closely connected with the act of intelligence, of which it is one differentiated aspect, a temporarily detached part.

It is clear from the outset that the problem of imitation is linked with that of representation. Since representation involves the image of an object, it can be seen to be a kind of interiorised imitation, and therefore a continuation of accommodation.

<sup>1</sup> See *La naissance de l'intelligence chez l'enfant* and *La construction du réel chez l'enfant* (referred to later as *N.I.* and *C.R.* respectively).

## CHAPTER I

### THE FIRST THREE STAGES : ABSENCE OF IMITATION, SPORADIC IMITATION AND THE BEGINNINGS OF SYSTEMATIC IMITATION

At what stage of development does imitation begin? The varying opinions of writers with regard to this question are evidence of the difficulties involved in making a sharp distinction between properly representative imitation and its preparatory forms. Wallon goes so far as to say that "imitation does not occur before the second half of the second year."<sup>1</sup>

Such an opinion is admissible on the hypothesis that mental evolution takes place by discontinuous stages, but it begs the question by assuming an absolute opposition between the representative and the sensory-motor. As a matter of fact, even if there were justification for relating the various stages of mental development to well-defined neurological levels, the fact remains that, in spite of the relative discontinuity of the structures, there is a certain functional continuity, each structure preparing for its successors while utilising its predecessors. It is no explanation to say that there is a succession of superposed psycho-neurological mechanisms at work, even if it can be shown exactly how each one integrates those which precede it. This is the point of view of the medical man, but the attitude of the psychologist who wishes to profit from the findings of experimental embryology must be based on a closer comparison between psychogenesis and organogenesis. The various stages which embryology shows to exist in the construction of a living body are characterised not only by a sequence of quite distinct and discontinuous structurations, but also by a dynamics involving both continuity and a certain direction, the latter being a tendency towards equilibrium or state of completion of growth.<sup>2</sup>

Thus, when we studied the beginnings of intelligence (see *N.I.*), we were forced to go as far back as the reflex in order to trace the course of the assimilating activity which finally leads to the construction of adapted schemas, for it is only by a principle of functional continuity that the indefinite variety of structures can be explained. In the same way, if we call the act by which a model is reproduced

<sup>1</sup> *De l'Acte à la Pensée*, p. 157.

<sup>2</sup> "In embryology," says Brachet, "the true significance of the word 'development' must always be kept in mind. It means that all forms and all organs are built up by a slow, progressive series of complications, closely interrelated and ending only when the adult state is achieved." *La vie créatrice des formes* (Alcan, 1927), p. 171.

imitation (and this does not imply ability to represent the model, which may simply be "perceived"), we again find ourselves obliged to trace step by step, through the same stages as those of sensory-motor activity in general, all the behaviours which may achieve this result, beginning with the reflexes.

§ 1. *Stage I: Preparation through the reflex*

Since the reproduction of a model seems to involve an element acquired by experience, imitation would appear by definition to be excluded from the level of pure reflexes. The matter is, however, worthy of examination, since so many authors have believed in the hereditary character of imitation, not only as a tendency but also as a technique. We will begin with the few observations we have been able to make with regard to our own children:

obs. 1. On the very night after his birth, T. was wakened by the babies in the nearby cots and began to cry in chorus with them. At 0 ; 0 (3) he was drowsy, but not actually asleep, when one of the other babies began to wail; he himself thereupon began to cry. At 0 ; 0 (4) and 0 ; 0 (6) he again began to whimper, and started to cry in earnest when I tried to imitate his interrupted whimpering. A mere whistle and other cries failed to produce any reaction.

There are two possible interpretations of these commonplace observations, but neither of them seems to justify the use of the word imitation. On the one hand it may be that the baby was merely unpleasantly affected by being wakened by the cries of his neighbours, yet without establishing any relation between the sounds he heard and his own crying, whereas a whistle or other sound left him indifferent. On the other hand, it is possible that the crying occurred as a result of its repetition, owing to a kind of reflex analogous to that we saw in the case of suction (*N.I.*, Chap. I, § 1-2), but in this case with intensification of the sound through the help of the ear. In this second case, the crying of the other babies would increase the vocal reflex through confusion with his own crying.

Thus in neither case is there imitation, but merely the starting off of a reflex by an external stimulus. But although the reflex mechanisms do not give rise to imitation, their functioning involves certain processes which make imitation possible during the later stages. In so far as the reflex leads to repetition, which continues after the removal of the initial stimulus (*cf.* suction in the void), it is being used for functional assimilation, and although there is not as yet any acquisition through external experience, this will become possible with the first conditioning through accommodation. Indeed the transition is so imperceptible that it is difficult to be sure whether, in the case of obs. 1 there is a beginning of conditioning or not. But if the second interpretation is correct, *i.e.*, if the child's own crying was intensified

through his failure to differentiate between it and the crying he heard, we have an illustration of the point at which the simple reflex will give rise to reproductive assimilation through incorporation of external elements in the reflex schema. After this point, imitation becomes possible.

§ 2. *Stage II: Sporadic imitation*

The second stage is characterised by the fact that the reflex schemas are broadened, by the incorporation of certain external elements as a result of real experience, into "differentiated" circular reactions. In the case of suction, for instance, new gestures such as the systematic putting of the thumb into the mouth are added to the reflex schema. In the same way, reflex crying is differentiated into wailing or vocalisations reproduced for their own sake, and vision is broadened to include accommodation to moving objects. Now the extent to which the schemas integrate new elements determines how far accommodation to these elements can be continued as imitation when the models presented are identical with the original elements. Indeed, during this second stage, accommodation to new data keeps pace with the ability to recapture them through reproductive assimilation. Thus it is in so far as the child can accommodate his hearing and his phonation to new sounds that he is capable of reproducing them through circular reactions. From then onwards, he has only to hear the sound in question, even though he himself has not just made it, for it to be assimilated to the corresponding schema and for accommodation of the schema to the sound to result in imitation.

Two conditions, then are necessary before imitation can occur. The schemas must be capable of differentiation when confronted with the data of experience, and the model must be perceived by the child to be analogous to results he has himself obtained, *i.e.*, the model must be assimilated to a circular schema he has already acquired.

In the case of phonation, these two conditions already obtain as early as the second month of life:

OBS. 2. At 0 ; 1 (4) T. was wide awake, looking straight in front of him, motionless and silent. Three times in succession the crying of L. (four years old) started him crying also. Such a reaction appeared to be quite distinct from those in obs. 1. As soon as L. stopped crying, he too stopped. It therefore seemed to be a clear case of contagion, and no longer a mere starting off of a reflex by an appropriate stimulus.

At 0 ; 1 (9), for the first time, T. kept up, through circular reaction, a whimpering which usually preceded tears. I imitated him just at the moment when the whimpering turned into crying. He stopped crying, and resumed the earlier sound.<sup>1</sup>

<sup>1</sup> This observation confirms that of C. W. Valentine on B at 0 ; 1 (1): mutual imitation of whimpering. See *Brit. Journ. of Psychology*, XXI (1930), p. 108.

At 0 ; 1 (22) he spontaneously produced certain sounds such as *eu, ê*, etc., and seemed to do so more emphatically, with or without a smile, when they were reproduced after he had uttered them himself. Same observation at 0 ; 1 (23) and 0 ; 1 (30).

At 0 ; 2 (11) after he had made the sounds *la, le*, etc., I reproduced them. He repeated them seven times out of nine, slowly and distinctly. The same day, I reproduced the sounds he usually made when he himself had not made them for more than half an hour. He smiled silently, then began to babble, and stopped smiling. He did not reproduce each individual sound, but uttered sounds under the influence of my voice when I confined myself to sounds with which he was familiar.

At 0 ; 2 (14) he showed no reaction to the voices of half a dozen little girls, but as soon as I uttered sounds reminiscent of his own, he began to croon.

At 0 ; 2 (17) he imitated me as soon as I uttered sounds identical with his own (such as *arr*), or even when it was merely my intonation which recalled his. He again imitated me even when he had not been crooning himself immediately before. He began by smiling, then made an effort with his mouth open (remaining silent for a moment) and only then produced a sound. Such a behaviour clearly indicates the existence of a definite attempt at imitation.

At 0 ; 2 (25) I made the sound *aa*. There was a long, ineffective effort, with his mouth open, followed by a faint sound. Then a broad smile and regular imitation.

To sum up, in T.'s case, from 0 ; 1 (4) onwards, there was a sort of vocal contagion which developed into a general mutual stimulation, and then at 0 ; 2 (17) and 0 ; 2 (25) into an attempt at differentiated imitation. But from then until the end of the stage there was no further development of differentiated imitation. Mutual imitation alone persisted, with sporadic attempts to reproduce specific sounds uttered spontaneously shortly before the experiment.

obs. 3. In the case of J., vocal contagion seemed to begin only during the second half of the second month. At 0 ; 1 (20) and 0 ; 1 (27), for instance, I noted vocal responses to her mother's voice. At 0 ; 2 (3) she replied a score of times in similar circumstances, stopping after each one, and at 0 ; 2 (4) she reproduced certain specific sounds which she had uttered spontaneously a short time before.

Then, even more so than in the case of T., there occurred a kind of period of latency, during which J. continued to show signs of vocal contagion and sometimes of mutual imitation, but without any attempt to imitate specific sounds. Even at 0 ; 5 (5) I noted that J. reacted to a voice without imitating the specific sound she heard.

At 0 ; 5 (12) J. had been silent for some time when I said *rra* two or three times. She gazed at me attentively and suddenly began to croon without imitating the exact sound. Same observations at 0 ; 6 (0), 0 ; 6 (6), 0 ; 6 (16), etc.

At 0 ; 6 (25), however, there began a phase of much more systematic imitation characteristic of the third stage. (J. developed more slowly than her brother and sister. See *N.I.*)

OBS. 4. At 0 ; 1 (21) L. spontaneously uttered the sound *rra*, but did not react at once when I reproduced it. At 0 ; 1 (24), however, when I made a prolonged *la*, she twice uttered a similar sound, although she had previously been silent for a quarter of an hour.

At 0 ; 1 (25) she was watching me while I said " a, ha, ha, rra," etc. I noticed certain movements of her mouth, movements not of suction but of vocalisation. She succeeded once or twice in producing some rather vague sounds, and although there was no imitation in the strict sense, there was obvious vocal contagion.

At 0 ; 1 (26) when I made the sound " rra " she replied by a kind of rolled " rr " eight times out of eleven. During the intervals she said nothing. Same observation the following day, and again at 0 ; 2 (2), etc.

At 0 ; 3 (5) I noted a differentiation in the sounds of her laughter. I imitated them. She reacted by reproducing them quite clearly, but only when she had already uttered them immediately before.

At 0 ; 3 (24) she imitated *aa*, and vaguely *arr* in similar conditions, *i.e.*, when there was mutual imitation.

There were no further developments until about 0 ; 5.

This beginning of vocal imitation, belonging to the second stage, appears to us to be characterised in three ways. Firstly, there is obvious vocal contagion as soon as the child becomes capable of circular reactions with respect to phonation. In other words, the voices of others stimulate the child's voice, whether it be a case of crying or some other sound. When it is a case of crying, the contagion is almost automatic, probably as a result of the emotion which accompanies the utterance. In the second case, however, the contagion is subject to two kinds of restrictive conditions. In order to stimulate the baby's voice, the other voices must either reproduce certain familiar sounds already uttered by the child, or certain intonations known to him. Moreover, the child must be interested in the sounds he hears, in which case the contagion is in no way automatic, but is a kind of spontaneous circular reaction. In a word, vocal contagion is merely stimulation of the child's voice by another voice, without exact imitation of the sounds he hears.

Secondly, there is mutual imitation, which is apparently exact imitation, when the experimenter imitates the child at the very moment when he is uttering this or that particular sound. The child then redoubles his efforts and, stimulated by the other voice, imitates in his turn the sound his partner is imitating. Obviously, in such a case (*e.g.*, when T. at 0 ; 2 (11) repeated *la* and *le* after he had made these sounds of his own accord at the beginning of the

experiment), the imitation is exact only in so far as the experimenter exactly imitates the child. The child makes no effort to adapt himself to the sound he hears, but merely has to retain the sound he himself was making a moment earlier, and his imitation is only a continuation of the circular reaction.

Thirdly, the child may sporadically imitate with relative precision a known sound (*i.e.*, a sound he has already discovered for himself) without having uttered it immediately before. For instance, T. at 0 ; 2 (17) imitated the sound *arr* without preliminary practice, and attempted to adapt himself to it. But during this period, such a behaviour is very exceptional, and of course at this stage a child will never attempt to imitate a new sound in order to learn it.

What are the conclusions to be drawn from these facts? Guillaume, who gives examples of observations analogous to ours from the end of the second month onwards, says that "in the first five months there is no evidence of imitation except in cases of a quite unusual character," as, for example, when for two weeks, from 0 ; 2 (11) to 0 ; 2 (26), one of his children imitated the chief sounds with which he was familiar (*gue, pou, re*). Stern quotes a similar case at the age of two months, Ferretti one at three months, ten at three and four months, etc. We are clearly justified in refusing to call mere stimulation of the child's voice by that of another imitation, but the question which arises is whether, as Guillaume seems to suggest, there is discontinuity between this behaviour and imitation in the strict sense, or whether there is relative continuity. An explanation based on the mechanisms of transfer, such as was first given by Guillaume, makes it legitimate to accept the idea of discontinuity. But if imitation is merely a continuation of reproductive assimilation, through further development of the element of accommodation inherent in the circular reactions, vocal contagion is clearly the beginning of phonic imitation, and in our view all the intermediary stages between these facts and those of the later levels are to be found.

We now come to the question of *vision*, and here also there seems to be evidence of a beginning of imitation at this stage. It is to be found in the behaviours by means of which the child accommodates himself to the displacement of other faces.

obs. 5. At 0 ; 1 (26) L. turned her head spontaneously from side to side. At 0 ; 1 (27) she watched my face when I quickly moved my head from left to right. She then immediately reproduced this movement three times in succession. After a pause, I did it again. She began again, and it was noticeable that she reproduced the movement much more definitely when I had finished mine than she did while she was watching me.

I resumed the experiment on the following days and the result was always the same. At 0 ; 2 (2) in particular, each time she

definitely continued the movement she had observed. The evening of the same day, she reacted in a similar way to a different movement. I nodded my head up and down and she watched me, with a slight movement of her head. As soon as I stopped, she reproduced my movement, making it much more clearly defined. It thus seemed as though, while she was watching, she was confining herself to accommodating the movements of her eyes and head to the movement she was observing, and as though after observation, her accommodation became definite imitation.

But it was not merely a matter of perceptive-motor accommodation, for immediately afterwards L. continued to nod her head up and down when I again began to move mine from side to side. She watched me without moving as long as my sideways movement continued, and as soon as I stopped, moved her own head up and down.

At 0 ; 2 (16), however, L. differentiated clearly between the two movements. She was upright in her mother's arms, opposite me. I began to nod my head up and down. While she was watching, L. kept quite still except for slight movements in order to watch what I was doing. As soon as I stopped, she distinctly reproduced the up and down movement. I then moved my head from left to right and vice versa. L. moved her head slightly as she watched, and as soon as I stopped, reproduced the sideways movement. Her mother, who was holding her, clearly felt the difference in the movements of the spine and muscles.

There were similar differentiated reactions at 0 ; 2 (20), 0 ; 2 (24), etc. The same observation was made at 0 ; 3 (18), 0 ; 3 (30), and during the following stage.

OBS. 6. T.'s reactions seemed to me vaguer at the outset, but became definite from about 0 ; 3 onwards.

At 0 ; 1 (30) I moved my head from left to right in front of him, saying "ta, ta, ta, ta" (twice to the left and twice to the right). He gazed at me and followed my movements. When I stopped, he made a few sounds, smiling as he did so, then seemed to make some movements of the head to continue the accommodation. It is not certain that this was so, however, because whenever he stopped looking at an object, he usually made similar spontaneous movements. All that can be said (and I resumed the experiment on the following days) is that he seemed to move his head more after I had moved mine.

At 0 ; 2 (7) imitation of the sideways movements seemed clearer. He followed me with his eyes, smiled, then moved his head quite distinctly. Same reaction at 0 ; 2 (23).

At 0 ; 3 (1) I moved my hand horizontally in front of T.'s eyes. He followed it with his eyes, and when it stopped, he continued the movement, moving his head sideways. Same reaction with a rattle.

At 0 ; 3 (4) T. was in his mother's arms, upright and motionless. I bent my head to left and right. He followed me with his eyes,

making slight movements, and when I stopped, clearly imitated me. On the following days, there was the same reaction. From 0 ; 3 (21) onwards, more especially, T. moved his head when I moved mine or moved my hands. Subsequently this movement, which became gradually more frequent, came to be used in the case of the rattles which hung from his cot (third stage).

A behaviour of this kind, so clearly displayed in the case of L., well illustrates the nature of the first stage of imitation. It is a continuation within the circular reactions that are already in use, *i.e.*, within activities which are a compound of assimilation and accommodation.

To our mind, as we have already said (*N.I.*, Chap. II), no initial perceptive behaviour, visual, auditory, etc., is a simple act. Each is an assimilating activity, susceptible of practice or repetition, and therefore of recognition and generalisation. Accommodation of the sense organs to an objective, and of the movements of these organs to the movements of objects cannot in that case be a primary fact, and must always be relative to assimilation of objects to the child's activity.<sup>1</sup> It is for this reason that in the beginning subject and object are one, and primitive consciousness cannot distinguish the part played by the one from that played by the other.

Consequently, all accommodation to external data tends to be repeated, since it is not differentiated from reproductive assimilation, and as soon as accommodation passes the purely reflex level and takes experience into account, this repetition of the whole act constitutes a primary circular reaction. In normal circumstances, *i.e.*, when the activity of the object does not unduly engage that of the subject, this tendency to repetition shows itself merely as a need to prolong perception, but it ceases with, or shortly after the disappearance of the perceived object. When, however, the object provides an external stimulus to the subject's assimilating activity, accommodation to the object continues beyond perception, and it is this phenomenon which constitutes the beginning of imitation. This is the position when, as we have just seen, the child's phonation is stimulated by the convergence between his own voice and the voice of another.

While in the case of phonation only the existence of the fact was observable, in the case of vision involving movements of others' faces, we are in a position to analyse the mechanism. Here, indeed, the child is forced, in order to follow the movements of the person he is watching, to make exactly the same head movements as the model (and this, of course, long before he is aware of any resemblance between his own face and those of others). Thus, in order to retain

<sup>1</sup> A mechanism of this kind has since been called by V. Weizsäcker "Der Gestaltkreis" (1941).

his perception of another person's movements (*i.e.*, in order to continue to see another face moving), all the child has to do is to reproduce his own movements of accommodation. As soon as he moves his head, the other head again seems to him to be moving. This imitation is in no way peculiar to other faces; the same reaction is produced in the case of moving hands, toys, etc. It is visually perceived movement as such which is imitated, and not only movements of the head.

An example such as this shows the beginnings of imitation to be simply a continuation of movements of accommodation, when these movements are part of an already formed circular reaction or of a general assimilating activity. In the case of phonation, which we examined earlier, the phenomenon is exactly the same, except for the content of the perception to be preserved. As he cries or crows, the child perceives a sound which he wishes to keep up or to repeat. As this perception forms part of a general schema of assimilation, which is both phonic and auditory, the child merely contrives to reproduce the sound, auditory accommodation to his own voice thus depending on reproductive vocal assimilation, since it is when the voice and the ear are co-ordinated that the primary circular reaction resulting from experience becomes something more than a mere vocal reflex. When the child now hears others making sounds similar to those he himself makes, accommodation to these sounds is inseparable from a schema of assimilation already formed, and thus at once sets the schema in motion, the result being imitation. In the case of phonation, as of vision, the model to which the child is accommodating himself is assimilated to a known schema, and this makes it possible for the accommodation to be continued as imitation. In fact, at this stage there is so little distinction between accommodation and assimilation that imitation might as easily be considered to derive from the one as from the other. But as we shall see later, imitation of new models furthers the development of accommodation, and it is only when imitation is restricted to the reproduction of sounds and gestures already made spontaneously by the child that the distinction is difficult.

A third example will confirm these first hypotheses: that of *pre-hension*. If the above interpretations are correct, we must expect that each new co-ordination or recently acquired circular reaction will give rise to imitation of some kind, in so far as the movements of others can be assimilated by general analogy with those perceived by the child on himself. And this is exactly what occurs in the field of prehension. When the child, during the third of the five stages we distinguished in his mastery of prehension (*N.I.*, Chap. II, § 4), becomes capable of co-ordinating the movements of his hands with his vision, he acquires simultaneously the power of imitating certain movements of other hands, by assimilating them to his own.

obs. 7. We have seen (*N.I.*, obs. 74) how T. began, at 0 ; 3 (3) to seize my hand, to the exclusion of any other visible object, probably because he assimilated it to his own and was in the habit of clasping his hands when they came into his field of vision (obs. 73). This may have seemed a somewhat bold interpretation in view of the disproportion between the visual appearance of an adult's hand and that of a child of three months. I was able, however, at 0 ; 3 (4) to establish the existence, in T.'s case, of imitation of movements of the hand. The simultaneous appearance of these two behaviours is difficult to explain except by such assimilation.

At 0 ; 3 (4), indeed, I only had to bring my hand close to him for him to seize it, and to let him see it at a distance for him to clasp his own hands, whereas there was no such reaction in the case of other objects. An hour after making this observation, I stood in front of him, a certain distance away, and instead of keeping my hand still, I alternately separated my hands and brought them together. T. who was sucking his thumb, took his hand out of his mouth, watching me carefully, and then distinctly reproduced my movement three times.

The evening of the same day, he woke after a long nap and while he was still dazed with sleep, looked first at someone standing by his cot and then examined my hands which were moving to and fro. He gazed at them steadily, but did not move his own for a minute or two. His arms were outstretched on his pillow. I stopped; there was still no reaction. I began again. He continued to watch me attentively, moved his hands where they were, slowly brought them together and suddenly clasped them in a sweeping movement. I again stopped, and he let his hands fall, one on each side of him. When I began again, he immediately clasped his hands. The same reactions occurred a third and fourth time, after which he stopped looking at my hands and gazed at his own and sucked them.

At 0 ; 3 (5) he looked at my hands for a long time without moving, then moved his own, at first gently, then more vigorously. He finally brought them to within 2 inches of one another (without seeing them). The same reaction occurred an hour later, but as my hands were near him, he seized them, interest in prehension prevailing over the tendency to imitation.

At 0 ; 3 (6) there was the same reaction. But during the fourth and fifth stages of prehension he again began to imitate distinctly the movement of separating and bringing together the hands. This was most noticeable at 0 ; 3 (8) and 0 ; 3 (23) as well as throughout the third stage.

obs. 8. At 0 ; 5 (5) J. was still at the third stage of prehension (see *N.I.*, obs. 70), and looked several times at her clasped hands. I then tried the experiment of alternately separating and bringing together my hands as I stood in front of her. She watched me attentively and reproduced the movement three times. She stopped when I stopped and began again when I did, never looking at her own hands, but keeping her eyes fixed on mine.

At 0 ; 5 (6) and 0 ; 5 (7) she failed to react, perhaps because I was at the side and not in front of her. At 0 ; 5 (8), however, when I resumed my movement in front of her, she imitated me fourteen times in just under two minutes. I myself only did it about forty times. After I stopped, she only did it three times in five minutes. It was thus a clear case of imitation.

We find in these examples confirmation of the interpretation suggested earlier in the case of vision. Before imitating the movement of my hands, J. and T. were in possession of a definite schema which was both manual and visual: separating and bringing together their hands, and watching them move. Consequently, when the child watched my hands making the same movement, she both accommodated her eyes to the movement and assimilated the movement to the familiar schema. There is nothing mysterious in this assimilation, which is merely recognitive, and analogous to that which enables the child to recognise his parents at a distance in spite of apparent change of dimensions, or to that which allows him to react with a smile to certain strangers who resemble those with whom he is familiar, while showing anxiety in front of others (*N.I.*, obs. 37). Since the child thus assimilates other hands to his own, without confusing them with, or necessarily distinguishing them from, his own (having at this stage no conception of individual objects or classes of objects), he reacts in accordance with the corresponding familiar schema, recognitive and reproductive assimilation being indissociable during this second stage. Like the earlier imitations, that of the movement of the hands is thus merely a continuation of accommodation, the model being assimilated to a schema already constituted. It is as yet scarcely distinguishable from the combined assimilation and accommodation of the primary circular reactions.

But this interpretation of the beginnings of imitation as being a combination of assimilation and accommodation raises a difficulty. Does imitation presuppose an act of assimilation, or is the assimilation of the model and of the imitative gesture a result of the imitation, as some authors maintain?

In his profound analysis of the various theories, Guillaume concludes that imitation is the result of a definite training, determined by a series of "transfers." In his view, in order to copy the gestures or the voices of others, the child does not need to assimilate them to his own. He only has to follow certain signals, without being aware of what he is doing, consciousness of assimilation coming only after the event, as a result of the involuntary convergence of his actions with those of others. Moreover, when it is a case of imitation being bound up with an already existing circular reaction, the position is the same, since, according to Guillaume, in a circular reaction, perception is not motor from the outset, but acquires this character through transfer.

The extension of transfer to new signals then accounts for the transition from the circular reaction (self-imitation) to imitation of others, and here again assimilation is not a prerequisite for imitation but the consequence of it.

There are two difficulties inherent in this thesis which prevent us from accepting it as it stands, in spite of the fact that later on we shall have to recognise, in view of Guillaume's observations, that imitation through training does occur.

If we consider first of all the circular reaction, how are we to explain the fact that perception "combines" with a movement and acquires a motor power which is not inherent in it? It cannot be a question of passive association, otherwise the child's activity would be the plaything of the most haphazard occurrences. He would, for instance, always cough when confronted with a rattle if he had once looked at one during a fit of coughing, and so on. The explanation is not to be found either in the repetition of associations, for repetition takes place only in relation to a purpose: association is therefore not a primary fact, but the result of a complex set of elements characterised by the pursuit of an aim. Guillaume himself recognised this when at a later stage he accepted the Gestalt psychology. He admitted that a perception, in order to give rise to an effort at repetition and thus acquire a motor efficacy, must have "significance" or "interest." Obviously neither of these terms can have any meaning except in relation to a pattern of action, of which the significance is the intellectual aspect and the interest the affective aspect. It is not that a perception *begins* by being interesting or meaningful and *later* acquires a motor power through association with a movement: it is interesting or meaningful *just because* it intervenes in the performance of an action and is thus assimilated to a sensory-motor schema. The first datum is therefore neither the perception, nor the movement, nor the association of the two, but the assimilation of the perceived object to a schema of action, which is *at the same time* motor reproduction and perceptive recognition, *i.e.*, reproductive and cognitive assimilation. Hence it is the assimilation which provides significance and interest and thus gives rise to repetition. Seen thus, the circular reaction is merely an assimilation by which new objects are directly incorporated in known schemas, these schemas being at the same time differentiated (sounds, movements of the head, prehension, etc.), while the "transfer" is merely an indirect or mediate assimilation depending on the existence of a sanction operating from without, *i.e.*, again depending on a schema of assimilation.

The transition from the circular reaction (active repetition of an interesting result) to imitation of an external model corresponding to the circular schemas, such as we described in obs. 2 to 8, then presents no difficulties. Owing to its actual convergence with the

movement or the sound already known, the model is directly assimilated to the child's own activity, and the circular character of this action allows of its immediate repetition. There is thus no imitation of what is new, since accommodation to the model, which is continued through the imitation, is already included in the circular schema, and the motor property of the perception of the model results merely from the assimilation of the model to an already existing schema. In this direct imitation through a combination of assimilation and accommodation, the interest of the model is therefore immanent in its repetition, since objects interest the child only in so far as they can be used for a purpose, and when perception of them creates as it were a demand for immediate reproduction of the schema. This is very clearly seen in the case of phonation, when the baby is stimulated by a familiar sound but remains indifferent to other phonemes which are very similar to it.

There is, however, justification for distinguishing, side by side with this imitation which is an immediate continuation of the circular schemas, an "imitation through training," in which there is differentiation of acquired schemas and no direct assimilation of the model to the child's own activity. Guillaume gives an excellent example of a child who as early as 0 ; 2, when he was playing with his tongue through circular reaction, learnt to put it out in response to the same movement made by his mother. Another example of the same kind is the apparent imitation of smiling as early as the fifth or sixth week. All that we would say is that these are examples of "pseudo-imitation," quite distinct from the imitation seen in obs. 2-8 and offering no explanation for it. Pseudo-imitation does not last, except under the influence of continual stimulation (as in the case of smiling, for instance), whereas true imitation, even when it is only sporadic, as at this stage, does last because it is a result of assimilation.

Later on we shall come to other cases, of which we have made a special study, of this acquired pseudo-imitation (obs. 17 and 18). For the present, all that need be said is that in view of Guillaume's findings we took great care from the outset to eliminate as far as possible the influence of training when making our observations. It was for this reason that our three subjects showed much slower but more regular progress in imitation than babies who are continually subjected to adult influence, and more especially to the pedagogical mania of nurses.

§ 3. *Stage III: Systematic imitation of sounds already belonging to the phonation of the child and of movements he has already made and seen*

With the co-ordination of vision and prehension, which occurs on an average at 0 ; 4 (15), new circular reactions through which influence can be exerted on objects make their appearance. These "secondary

reactions" (*N.I.*, Chap. III), gradually integrate the "primary" circular reactions of the preceding stage. Obviously this progress must have its effect on imitation, since with the broadening of the schemas involving activities visible to the child, new models become susceptible of assimilation to the schemas.

But in comparison with that of the following stages, the imitation at this third stage, although becoming more systematic, is still limited by the very nature of the secondary circular reaction. There is as yet no co-ordination of the secondary schemas one with another, nor does accommodation take precedence over assimilation in the pursuit of novelty for its own sake (as will be the case in the "investigations" of the fourth stage and more particularly in the "tertiary circular reactions" of the fifth). Thus the imitation of the third stage is still essentially conservative, showing no indication of efforts at accommodation to new models such as will be observable in the following stages. Moreover, the "signals" inherent in the secondary reactions are still linked with the immediate action, and do not give rise, like the mobile "indices" of the fourth stage, to anticipations or reconstructions going beyond the immediate perception (*N.I.*, Chap III, § 3, and Chap. IV, § 4). This being so, the intellectual mechanism of the child will not allow him to imitate movements he sees made by others when the corresponding movements of his own body are known to him only tactually or kinesthetically, and not visually (as, for instance, putting out his tongue). To be able to make the connection between his own body and those of others, the child would require mobile indices which are not yet at his disposal. Thus since the child cannot see his own face, there will be no imitation of movements of the face at this stage, provided that training, and therefore pseudo-imitation, is avoided.

I. We shall begin with a few examples of vocal imitation. As far as the first group is concerned, we are justified in saying that the vocal contagion and sporadic imitation of the first stage are now replaced by deliberate, systematic imitation of each of the sounds known to the child. But there is little indication, before the fourth stage, of any ability to imitate new sounds suggested as models:

obs. 9. At 0 ; 6 (25) J. invented a new sound by putting her tongue between her teeth. It was something like *pf*s. Her mother then made the same sound. J. was delighted and laughed as she repeated it in her turn. Then came a long period of mutual imitation. J. said *pf*s, her mother imitated her, and J. watched her without moving her lips. Then when her mother stopped, J. began again, and so it went on. Later on, after remaining silent for some time, I myself said *pf*s. J. laughed and at once imitated me. There was the same reaction the next day, beginning in the morning (before she had herself spontaneously made the sound in question) and lasting throughout the day.

At 0 ; 7 (11) and on the following days, I only had to say *pfs* for her to imitate me correctly at once.

At 0 ; 7 (13) she imitated this sound without seeing me or realising where it was coming from.

OBS. 10. At 0 ; 6 (26) J. frequently made, during the day, the sounds *bva*, *bve* and also *va* and *ve* without anyone imitating her. On the next day, however, at 0 ; 6 (27), when I said "*bva*, *bve*," etc., to her, she looked at me, smiled, and said: "*pfs*, *pfs* . . . *bva*." Thus instead of at once imitating the model given to her, J. began by reproducing the sound she had become used to imitating two days earlier. Was it the similarity of the situation which made her go back to that sound? Or had the earlier sound become a "device for making something interesting continue to happen" (see *N.I.*, Chap. III, § 4)? Or was it merely automatism? The answer is to be found in the observations that follow.

The evening of the same day, every time I said *bva*, J. said *pfs*, without any attempt at imitation. Afterwards I heard her saying "*abou*, *abou*" (a new sound derived from *bva* which she was trying out on that day). I thereupon said *pfs* a number of times, she smiled, and each time said *abou*.

At 0 ; 7 (13) I said *hha*, a sound with which she was familiar. She smiled, and as soon as I stopped, opened her mouth as if to make me go on, but without trying to make any sound. When I stopped saying *hha* altogether, however, she herself uttered the sound correctly.

At 0 ; 7 (15) she was in her cot saying *mam*, *mam*, etc., and could not see me. When I said *bva*, she was silent for a moment, and then, although she still could not see me, softly said *bva*, *bva*, as though she were trying it out. When I again said it, she said *bva mam*, *bva mam*, etc.

Such behaviours seem to us instructive. Obviously the child's only aim is to make the sound he hears continue. Just as, during the whole of this stage, he tries to make the interesting things he sees last, and to that end uses a series of devices drawn from his secondary circular reactions, so in the vocal field he wants the sounds he hears to continue, and sets about achieving this in the following way. Sometimes, to influence others, he uses sounds that have already been used in imitations, or those he has just repeated himself (which constitutes the vocal equivalent of "devices to make interesting things seen continue"). At other times, either spontaneously or when the first method fails, he actually imitates sounds made by someone else. In both cases there is evident interest in repetition, and repetition of phonemes which have no significance as such.

OBS. 11. At 0 ; 7 (17) J. at once imitated the sounds *pfs*, *bva*, *mam*, *abou*, *hha* and a new phoneme *pff* which she had been trying out for several days, differentiating between them, and without