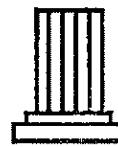


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# The Construction of Reality in the Child



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Translated by Margaret Cook

When, on the contrary, there is a search (obs. 1, 3, 4, and 5) it is noteworthy that the search merely reproduces the earlier act of accommodation. In the case of sucking, it is a reflex mechanism which allows the child to grope until he encounters the objective. With regard to observations 3, 4, and 5, the child is content with repeating the act of accommodation just performed. In none of these acts is it possible to speak of the object as existing independently of the activity. The objective is in the direct extension of the act. It is as though the child did not dissociate one from the other and considered the goal to be attained as depending on the action alone and, more precisely, on only one type of action. In the event of failure the child promptly gives up instead of attempting, as he will later do, special steps to complete the initial act. True, during these first stages, the child does not know how to grasp and consequently his potentialities for active searching amount to very little. But if the motor unskillfulness of these initial stages sufficed to explain the child's passivity, in other words, if the child, while not knowing how to search for the absent object, nevertheless believes in its permanence, we should state that search for the vanished object begins as soon as the habits of prehension have been acquired. But we shall now see that this is not the case.

In short, the first two stages are characterized by the absence of any special behavior related to vanished objects. Either the image which disappears immediately sinks into oblivion, that is to say, into the affective void, or else it is regretted, desired, and again expected, and the only behavior pattern utilized to rediscover it is the mere repetition of earlier accommodations.

The latter case applies chiefly to persons, when they have paid too much attention to the nursling and he can no longer bear solitude; he stamps and cries at the disappearance of every image, thus revealing his keen desire to see it reappear. But does this mean that the baby conceives of the vanished image as an object existing in space, remaining identical to itself and escaping sight, touch and hearing because it has been displaced and is masked by various solid substances? In such an hypothesis it would be necessary to attribute to the nursling a most improbable power of spatial representation and intellectual con-

struction, and it would no longer be possible to understand the difficulty he will have, until about 9 or 10 months of age, in searching actively for objects when they are covered by a cloth or a screen of some kind right before his eyes (see the third and fourth stages). But the hypothesis is neither necessary nor does it conform to observations. It is not necessary because it suffices, for the child to hope for the return of the interesting image (of his mother, etc.), that he attribute to it a sort of affective or subjective permanence without localization or substantiation; the vanished image remains, so to speak, "at disposal" without being found anywhere from a spatial point of view. It remains what an occult spirit is to the magician; ready to return if one catches it successfully but obeying no objective law. How does the child go about bringing to himself the image of his desires? Merely by crying at random or by looking at the place where it disappeared or where it was last seen (obs. 2 and 5). It is here that the hypothesis of an object situated in space is contrary to the findings of observation. The child's initial search is not at all an effort to understand the displacements of the vanished image; it is only an extension or repetition of the most recent acts of accommodation.

#### § 2. THE THIRD STAGE: BEGINNING OF PERMANENCE EXTENDING THE MOVEMENTS OF ACCOMMODATION

The behavior patterns of the third stage are those which are observable between the beginnings of prehension of things seen and the beginnings of active search for vanished objects. Hence they still are earlier than object concept but mark progress in the solidification of the universe depending on action.

Between three and six months of age, as we have seen elsewhere (*O.J.*, Chap. II, §4), the child begins to grasp what he sees, to bring before his eyes the objects he touches, in short to coordinate his visual universe with the tactile universe. But not until the age of 9 or 10 months does active search for vanished objects occur in the form of the use of grasping to remove solid objects that may mask or cover the desired object. This intermediate period constitutes our third stage.

But, if this long lapse of time is necessary for transition from prehension of an object at hand to true search for a missing ob-

ject, it is because the interim is filled with the acquisition of a series of intermediate behavior patterns all of which are necessary to proceed from the mere perceived image to the concept of permanent object. In this connection we can distinguish these five types of behavior: 1) "visual accommodation to rapid movements"; 2) "interrupted prehension"; 3) "deferred circular reaction"; 4) the "reconstruction of an invisible whole from a visible fraction," and 5) the "removal of obstacles preventing perception." The first of these behavior patterns merely extends those of the second stage, and the fifth fulfills those of the fourth stage.

Visual accommodation to rapid movements makes possible the anticipation of future positions of the object and consequently endows it with a certain permanence. This permanence of course remains related to the act of accommodation itself, and thus the behavior patterns merely extend those of the second stage; but there is progress in the sense that the anticipated position of the object is a new position and not one observed a moment earlier to which the eyes merely return. Two particular instances are of special importance: reaction to the movement of bodies which disappear from the visual field after having induced a lateral turn of the head, and reaction to falling movements. Both these behavior patterns seem to have developed under the influence of prehension.

OBS. 6. Laurent's reaction to falling objects still seems to be non-existent at 0;5 (24): he does not follow with his eyes any of the objects which I drop in front of him.

At 0;5 (26), on the other hand, Laurent searches in front of him for a paper ball which I drop above his coverlet. He immediately looks at the coverlet after the third attempt but only in front of him, that is, where he has just grasped the ball. When I drop the object outside the bassinet Laurent does not look for it (except around my empty hand while it remains up in the air).

At 0;5 (30) no reaction to the fall of a box of matches. The same is true at 0;6 (o), but then when he drops the box himself he searches for it next to him with his eyes (he is lying down).

At 0;6 (3) Laurent, lying down, holds in his hand a box five centimeters in diameter. When it escapes him he looks for it in the right direction (beside him). I then grasp the box and drop it myself, vertically and too fast for him to be able to follow the trajectory. His

eyes search for it at once on the sofa on which he is lying. I manage to eliminate any sound or shock and I perform the experiment at his right and at his left; the result is always positive.

At 0;6 (7) he holds an empty match box in his hand. When it falls his eyes search for it even if they have not followed the beginning of the fall; he turns his head in order to see it on the sheet. Same reaction at 0;6 (9) with a rattle, but this time he has watched the initial movement of the object. The same is true at 0;6 (16) when his eyes have followed the beginning of the fall, at 0;6 (20) etc., etc.

At 0;7 (29) he searches on the floor for everything I drop above him, if he has in the least perceived the beginning of the movement of falling. At 0;8 (1) he searches on the floor for a toy which I held in my hand and which I have just let drop without his knowledge. Not finding it, his eyes return to my hand which he examines at length, and then he again searches on the floor.

OBS. 7. At 0;7 (30) Lucienne grasps a small doll which I present to her for the first time. She examines it with great interest, then lets it go (not intentionally); she immediately looks for it in front of her but does not see it right away.

When she has found it, I take it from her and place a coverlet over it, before her eyes (Lucienne is seated); no reaction.

At 0;8 (5) Lucienne searches systematically on the floor for everything that she happens to drop. When an object is released in front of her, sometimes she searches for it also with her eyes, but less often (an average of one out of four times). The need to grasp what was in her hand therefore plays a role in this reaction to movements of falling; the permanence belonging to the beginnings of the concept of tactile object (of which we shall again speak in connection with interrupted prehension) thus interferes with the permanence arising from visual accommodation.

At 0;8 (12) I again observe that Lucienne tries harder to find fallen objects with her eyes when she has previously touched the objects.

At 0;9 (25) she looks at my hand which I at first hold motionless and then suddenly lower; Lucienne searches for it on the floor for a long time.

OBS. 8. Jacqueline's search for the fallen object took place later. At 0;8 (20) for example, when she tries to reach a cigarette case hanging above her and it drops, she does not search in front of her at all but continues to look up in the air.

At 0;9 (8), same negative reaction with her parrot, which is bulky; it falls on her quilt while she is trying to reach it above her; she does not lower her eyes and continues to search in the air. However the parrot contains a rattle and makes a noise in falling.

At 0;9 (9) on the other hand, Jacqueline makes the same parrot fall by chance on the left of the bassinet and this time, because of the noise, she looks around for it. As the parrot has entered between the quilt and the wicker, Jacqueline perceives only its tail; however she recognizes the object (an instance of "reconstitution of invisible totalities" of which we shall subsequently speak) and tries to grasp it. But by trying to grasp it she wedges it down until she can see it no longer. However, still hearing the rattle inside the parrot, she taps the quilt which covers it and the sound ensues (this is a mere utilization of circular reaction related to this toy). But it does not occur to her to search under the quilt.

OBS. 9. The same day, at 0;9 (9), Jacqueline is seated in her bassinet and looks at my watch which I hold 20-30 centimeters away from her eyes and which I let drop by its chain.

At the first attempt, Jacqueline follows the trajectory, but with a certain tardiness, and finds the watch on the quilt covering her lap. The noise of the fall doubtless helps her and above all the fact that I lower the watch without yet letting it go.

Second attempt; she does not follow the movement, looks at my empty hand with surprise and seems to look around it (this time I have merely let the object go).

Third attempt: she again searches around my hand, then looks on my lap and takes possession of the object.

In order to eliminate the role of sound, I continue with the chain alone; in eight new sequential attempts Jacqueline only once searched on the floor. The other times she was content to examine my hand.

Then I lower the chain slowly, but quickly enough to precede the child's glance; Jacqueline searches on the floor. Then I recommence, merely letting the chain go; six negative attempts. The next two times Jacqueline searches on her lap but with her hand only, while looking in front of her. Finally, during the last attempts, she gives up this tactile search and only examines her hands.

OBS. 10. At 0;9 (10) a new experiment with Jacqueline, but using a little notebook of 8x5 centimeters which I let fall from high up (above her eye level) on to a cushion placed on her lap. This time Jacqueline immediately searches on the floor, although she has not

had time to follow the trajectory; she sees only the point of departure and my empty hands.

At 0;9 (11) same experiment with her parrot: she again looks immediately at the floor. With the watch chain, on the other hand, the reaction is completely negative, evidently because the object is less bulky; Jacqueline examines my empty fingers in astonishment. Hence object concept does not yet exist: in the case of the parrot or the notebook it is simply the movement of accommodation which continues, and when the object is too small for the eyes to follow at its point of departure nothing happens.

At 0;9 (16) Jacqueline, seated on my arm, plays with her celluloid duck and lets it fall behind my shoulder. Then she immediately tries to find it again but, and this is very interesting, she does not try to look around my back; she pursues her investigations in front. We shall understand the reason for this error by proving, later on, how difficult it is for the child to take account of screens and to conceive that an object can be "behind" another object.

From 0;9 (18) reaction to falling movements seems to be acquired; falling objects, even when the child has not held them just beforehand, immediately cause the child to look at the ground.

OBS. 11. At 0;9 (6) Jacqueline looks at her duck which I hold level with her eyes and which I move horizontally to the back of her head. She follows it for a moment with her eyes, then loses sight of it. Nevertheless, she continues this movement of accommodation until she finds the duck again. She has searched assiduously for quite a while.

Then I replace the duck before her and repeat the experiment, but in the other direction. Same reaction at first, but then during the search she forgets what she wants and takes possession of another object.

OBS. 11a. In this connection we may mention Lucienne's progress since obs. 5 in remembering positions. It involves a behavior pattern bringing us back to the behavior patterns of the second stage but more complex than they and contemporaneous with those of the third. At 0;8 (12) Lucienne is seated next to me; I am at her right. She sees me, then plays with her mother. Then she looks at me while her mother slowly goes away, on the left, to the door of the room and disappears. Lucienne follows her with her eyes until she ceases to be visible, then, all at once, she turns her head in my direction. She looks at my face at once; she knew that I was there even though she had not looked at me for a few minutes.

obs. 11. So also Laurent, at 0;6 (0), looks at a rattle which I move horizontally from left to right, at the level of his face. He manages to follow the beginning of the trajectory, then loses sight of the moving object; then he abruptly turns his head and turns it back again 50 centimeters farther. Then I make the object describe the reverse trajectory and he searches for it a moment without recovering it, then gives up.

In the following days the reaction becomes more definite and Laurent rediscovers the object in any direction whatever. Same observation at 0;6 (30), at 0;7 (15), at 0;7 (29), etc.

This capacity for rediscovering the object by following its trajectory develops in Laurent as did the memory of positions in Lucienne (obs. 11a). Thus at 0;7 (11) I am playing with Laurent when his mother appears above him. After she disappears, he throws his head back in order to find her again. He catches sight of her just as she is leaving the room (before he hears the sound of the door). Then he returns to me but always turns around again to see if his mother is still there.

However commonplace these facts may be they are important in forming object concept. They show us that the beginnings of permanence attributed to images perceived arise from the child's action in movements of accommodation. In this respect the present behavior patterns merely extend those of the second stage but reveal essential progress: the child no longer seeks the object only where he has recently seen it but hunts for it in a new place. He anticipates the perception of successive positions of the moving object and in a sense makes allowance for its displacements. But precisely because this beginning of permanence is only an extension of the action in progress, it could only be very limited. The child cannot conceive of just any displacements or just any objective permanence. He is limited to pursuing, more or less correctly, with his eyes or with his hand the trajectory delineated by the movements of accommodation peculiar to the immediately preceding perception; and it is only in the measure in which, in the absence of the objects, he continues the process begun in their presence that he is able to endow them with a certain permanence.

Let us look at this more closely. With regard to Laurent (and to Lucienne, although we have not had the opportunity of under-

standing the origins of her reaction to falling movements), we prove that at first a search for the fallen object takes place more often when it is the child himself who has let it drop; the permanence attributed to the object is consequently greater when the action of the hand interferes with that of the eyes. Jacqueline's apprenticeship is among the most suggestive. At first (obs. 8) there is no reaction to the fall because the child has not observed the initial movement of the falling object. Then Jacqueline observes that initial movement but instead of extending it when the object perceived leaves the visual field, she returns to the point of departure to search for the toy (obs. 9); however, when the movement is slow or a concomitant sound helps the child in her search, she manages to reconstitute the exact trajectory. In the next phase (beginning of obs. 10), the reaction is positive when the object is sufficiently bulky to have been followed with the eyes long enough, but it remains negative with too slender a chain. Finally only the positive reaction becomes generalized.

It therefore seems clear that the displacement attributed to the object depends essentially on the child's action (movements of accommodation which are extended by looking) and that permanence itself remains related to that very action.

As far as the first point is concerned, it would be impossible to give to the child the concept of autonomous displacements. When we are following an object with our eyes and when, after having lost sight of it, we try to find it again, we have the feeling that it is in a space independent of ourselves; consequently we accept as true that the movements of the object occur without relationship to our own, outside our area of perception, and we strive to move ourselves so as to be reunited with it. On the other hand, everything takes place as if the child, when witnessing the falling movement from the start, is not aware that he moves himself about, in order to follow the movement, and consequently is not aware that his body and the moving object are located in the same space; if the object is not found within the exact extension of the movement of accommodation, the child will give up hope of finding it again. Thereafter, in his consciousness, the object's movement is one with the kinesthetic or sensorimotor impressions which accompany his own movements of eyes, head, or torso; when he loses sight of the moving object the only procedures suitable for finding it

again therefore consist either in extending movements which have already been delineated or in returning to the point of departure. Nothing forces the child to consider the object as having been displaced in itself and independently of its movement; all that he is given is an immediate connection between his kinesthetic impressions and the reappearance of the object in his visual field, in short a connection between a certain effort and a certain result. There does not yet exist what we shall later call (Chap. II) an objective displacement.

Then regarding the second point, that is to say the permanence attributed to the object as such, it is self-evident that this permanence remains related to the subject's action. In other words, the visual images the child pursues acquire in his eyes a certain solidity to the precise extent that he tries to follow them, but they do not yet constitute substantial objects. The mere fact that the child does not imagine their displacement as being an independent movement and that he often searches for them (that is to say, when he has not been able to look at them long enough) at the very point where they made their departure, reveals that for him, these images still remain at the disposal of the action itself, and in certain absolute situations. True, that is a beginning of permanence, but such permanence remains subjective; it must produce in the child an impression comparable to that which he experienced in discovering that he could suck his thumb when he wished, see things move when he moved his head, hear a sound when he rubbed a toy against his bassinet or pulled the strings attached to the rattle hanging from its hood, etc. The nature of the primitive object conceived as being at disposal is therefore on a par with the whole of the behavior patterns of this stage, that is to say, with the primary and secondary circular reactions during which the universe presents itself to the subject as depending on his activity. There is progress over the first stages during which the object is not distinguished from the results of reflex activity or mere primary circular reaction (that is to say, the actions exerted by the subject on his own organism to produce some interesting result), but it is a progress in degree and not in quality; the object still exists only in connection with the action itself.

As we shall see later, the proof that the object is still nothing more than this is that the child at this age still manifests no

particular behavior pattern related to vanished objects. Lucienne's reaction at 0;7 (30) when I cover her doll with a piece of cloth (obs. 7) already makes this apparent.

This dependence of the object on the action is found again in the second group of acts which we can now emphasize: the acts of interrupted prehension. These observations are in the same relation, in comparison to obs. 4 of the first stages, as are the visual accommodations to rapid movements in comparison to obs. 2 and 5. In other words, the permanence peculiar to the beginnings of the tactile object is still only an extension of accommodation movements, but henceforth the child will try to grasp the lost object in new positions and no longer only in the same place. As soon as prehension becomes a systematic operation, interest in which surpasses all else (between the ages of four to six months), the child learns at one stroke to follow with his hand objects which escape him, even when he does not see them. It is this behavior pattern which permits the subject to attribute a beginning of permanence to tactile objects.

OBS. 13. At 0;8 (20) Jacqueline takes possession of my watch which I offer her while holding the chain in my hand. She examines the watch with great interest, feels it, turns it over, says *apff*, etc. I pull the chain; she feels a resistance and holds it back with force, but ends by letting it go. As she is lying down she does not try to look but holds out her arm, catches the watch again and brings it before her eyes.

I recommence the game; she laughs at the resistance of the watch and still searches without looking. If I pull the object progressively (a little farther each time she has caught it) she searches farther and farther, handling and pulling everything that she encounters. If I pull it back abruptly, she is content to explore the place where the watch departed, touching her bib, her sheet, etc.

But this permanence is solely the function of prehension. If, before her eyes, I hide the watch behind my hand, behind the quilt, etc., she does not react and forgets everything immediately; in the absence of tactile factors visual images seem to melt into each other without substance. As soon as I replace the watch in Jacqueline's hands and pull it back she searches for it again, however.

OBS. 14. Here is a counterproof. At 0;9 (21) Jacqueline is seated and I place on her lap a rubber eraser which she has just held in

her hand. Just as she is about to grasp it again I put my hand between her eyes and the eraser; she immediately gives up, as though the object no longer existed.

The experiment is repeated ten times. Every time that Jacqueline is touching the object with her finger at the moment when I cut off her view of it she continues her search to the point of complete success (without looking at the eraser and often dropping it by displacing it involuntarily, etc.). On the other hand, if no tactile contact has been established before the child ceases to see the eraser, Jacqueline withdraws her hand.

Same attempts with a marble, a pencil, etc., and same reactions. My hand does not interest her at all; therefore it is not a shift in interest that causes forgetfulness; it is simply because the image of my hand abolishes that of the object beneath it, unless, let us repeat, her fingers have already grazed the object or perhaps also unless her hand is already in action under mine and ready to grasp.

At 0;9 (22) same observations.

OBS. 15. At 0;6 (0) Lucienne is alone in her bassinet and, watching what she is doing, grasps the material covering the sides. She pulls the folds toward herself but lets them go at each attempt. She then brings before her eyes her hand which is tightly closed, and opens it cautiously. She looks attentively at her fingers and recommences. This goes on more than ten times.

It is therefore sufficient for her to have touched an object, believing she grasps it, for her to conceive of it as being in her hand although she no longer feels it. Such a behavior pattern, like the preceding ones, shows the degree of tactile permanence the child attributes to objects he has grasped.

OBS. 16. So also Laurent, at 0;7 (5) loses a cigarette box which he has just grasped and swung to and fro. Unintentionally he drops it outside the visual field. He then immediately brings his hand before his eyes and looks at it for a long time with an expression of surprise, disappointment, something like an impression of its disappearance. But far from considering the loss as irremediable, he begins again to swing his hand, although it is empty; after this he looks at it once more! For anyone who has seen this act and the child's expression it is impossible not to interpret such behavior as an attempt to make the object come back. Such an observation, combined with the preceding one (Lucienne at 0;6) places in full light the true nature of the object peculiar to this stage: a mere extension of the action.

Subsequently Laurent, to whom I have returned the box, again loses it several times; when he has just held it he is satisfied to stretch out his arm in order to find it again, or else he stops searching altogether (see the next observation).

OBS. 17. As early as 0;4 (6) Laurent searches with his hand for a doll he has just let go. He does not look at what he is doing but extends his arm in the direction toward which it was oriented when the object fell.

At 0;4 (21) also, he lowers his forearm in order again to find under the sheet a stick he held in his hand and which he has just let go.

Same reaction at 0;5 (24) with all sorts of objects. I then try to determine how extensive his search is. I touch his hand with a doll which I immediately withdraw; he is satisfied to lower his forearm without really exploring the surrounding area (see Chap. II, obs. 69).

At 0;6 (0), 0;6 (9), 0;6 (10), 0;6 (15), etc., I observe the same facts. Laurent believes the object has disappeared if he does not find it merely by lowering his arm; the object for which he searches is therefore not yet endowed with true mobility but is conceived as merely extending the interrupted act of prehension. On the other hand, if the fallen object touches the child's cheek, his chin, or his hand, he knows very well how to find it again. It is therefore not motor incapacity which explains the lack of true searching but rather the primitive quality attributed to the object.

At 0;6 (15) I again observe that if the object suddenly falls from his hand Laurent does not search for it. On the contrary, when the hand is about to grasp the escaping object or when the hand displaces the object, shakes it, etc., then a search takes place. Only, in order to recover the object Laurent is always satisfied to raise his arm with no trajectory of true exploration.

At 0;7 (5) he grasps and swings the cigarette box of obs. 16; when he loses it right after having taken it he searches on the coverlet with his hand. However, when he drops it under any other circumstance, he does not try to find it again. I then again offer him the same box above his eye level; he makes it fall by touching it but does not search for it!

At 0;7 (12) he lets go, at his right, a rattle which he was holding in his hand; he searches for it for quite a while without hearing or touching it. He gives up and then begins again to search at the same place. Finally he fails. Next he loses it on his left and finds it twice more because the object is in the direct range of his arm movements.

Finally, from 0;8 (8) he truly searches for everything that falls from his hands.

We must first emphasize the difference between these reactions and the behavior patterns of the fourth stage, which consist in searching with the hands for the object disappearing from the visual field. In obs. 13-14 as in obs. 6-12 (accommodation to rapid movements) it is still only a question of a permanence merely extending earlier accommodation movements and not of a special search for the vanished object. The child, holding something in his hand, wishes to keep it when it escapes him; he then merely reproduces the gesture of grasping which he made shortly before. Such a reaction certainly presupposes that the subject expects his gesture to lead to the desired result. But this expectation is merely based on the belief that the object is at the disposal of the act. In this regard obs. 15 and 16 have decisive significance. That does not yet at all imply the substantial permanence of the thing independently of the gesture or the existence of objective trajectories.<sup>2</sup> Proof of this is that the least obstacle advancing to change the situation as a whole discourages the child. The child is content merely to stretch out his arm; he does not truly search and invents no new procedure for rediscovering the vanished object. This is all the more striking because, as we shall see, it is along the very lines indicated by the present behavior patterns that such procedures will be formed.

Let us examine a third group of behavior patterns also capable of engendering a beginning of object permanence: the deferred circular reactions. As we have seen, the permanence peculiar to objects of this stage is not yet either substantial or truly spatial; it depends on the action itself and the object merely constitutes that which is at the disposal of that action. We have proved, moreover, that such a situation stems from the fact that the activity of the child at this level consists essentially in primary and secondary circular reactions and not yet in tertiary reactions. In other words, the child spends the better part of his time in reproducing all sorts of interesting results evoked by the sights around him and tries only a little to study new things for their own sake, to experiment. Thereafter the universe of that stage is

<sup>2</sup>See Chap. II, obs. 69.

composed of a countless series of potential actions, the object being nothing more than the material at the disposal of those actions. If this is true, it is to be expected that the secondary circular reactions constitute one of the most abundant sources of elementary permanence; that is what the analysis of deferred circular reactions will show.

It must be noted that sooner or later circular reaction brings with it a sort of revival that prolongs its influence over the child's behavior. We do not, of course, speak of the fact that circular reaction reappears every time the child finds himself facing the same objects (shaking himself when he sees the bassinet hood, pulling the chain when he sees the rattle to which it is attached, etc.) for there deferred behavior patterns are not involved, but rather merely habits revived by the presence of a familiar stimulus. We are thinking exclusively of those acts in the course of which circular reaction is interrupted by circumstances and resumes shortly after without any external stimulus. In such cases the fact that the child returns of his own accord to the position and gestures necessary for the resumption of the interrupted act endows the objects thus rediscovered and recognized with a permanence analogous to those of which we have just spoken. The permanence is even more marked because the rediscovered action, being more complex, gives rise to a proportionately greater solidification of the perceived images.

obs. 18. At 0;8 (30) Lucienne is busy scratching a powder box placed next to her on her left, but abandons that game when she sees me appear at her right. She drops the box and plays with me for a moment, babbles, etc. Then she suddenly stops looking at me and turns at once in the correct position to grasp the box; obviously she does not doubt that this will be at her disposal in the very place where she used it before.

obs. 19. At 0;9 (3) Jacqueline tries to grasp a coverlet behind her head, in order to swing it.<sup>3</sup> I distract her by offering her a celluloid

<sup>3</sup>This behavior of "swinging" already belongs to the fourth stage with respect to the general development of intelligence (see *O.I.*, obs. 139). But, with regard to object concept, the deferred reaction to which it gives rise in this observation does not yet transcend the level of the third stage. It is apparent that, without considerable artifice, it is impossible to synchronize the corresponding steps of the evolutions peculiar to the various categories

duck. She looks at it, then tries to grasp it, but suddenly stops to look behind her for the coverlet which she did not see.

At 0;9 (13) she tries to grasp with her left hand a bottle which I place beside her head. She succeeds only in grazing it by turning her face slightly. She gives up shortly and losing sight of the bottle pulls a coverlet in front of her. But suddenly she turns around to reapply herself to her attempts at prehension. It all happens as if she has retained the memory of the object and returns to it, after a pause, believing in its permanence.

OBS. 20. Laurent has had many such reactions since 0;6. If the child is interrupted as he pulls the string hanging from the hood, scratches the edge of the bassinet, etc., he will immediately turn in the right direction and rediscover these objects. Let us limit ourselves to describing an observation of him at 0;6 (12), which pertains at the same time to deferred circular reaction, accommodation of the eyes to the movement of falling and tactile-manual search for the object. Without being typical from the point of view of interrupted circular reaction, this observation sums up very well what we have hitherto seen regarding the constitution of the object at that stage.

I place a rattle on the edge of the bassinet hood, barely held in place by a string attached behind it. Laurent at once stirs around in order to swing the object as if it were a toy somehow hanging there; but the rattle falls in front of his face and so close that he grasps it immediately. He replaces the rattle up in the air; same reaction, five or six times in succession. It is therefore possible to consider these acts taken together as constituting a new circular schema: stirring about, making the object fall, and grasping it. What will happen when the cycle remains incomplete, that is to say when the object, instead of falling in a visible place, disappears from the visual field? Will the reaction thus interrupted be extended in deferred reaction and how?

1. When the object falls after having been detached by the movement of the child, his eyes search for it in front of him, at the usual place. If he does not see it he again stirs about, but looking in front of him and not up in the air. If he then hears the rattle, he stretches out his hand and grasps whatever may be there, without true exploration (thus he takes possession either of the rattle itself, if it happens to come under his hand, or of the sheet, the coverlet, etc.).

of sensorimotor intelligence, and that temporal displacements are produced, the more comprehensible the farther removed they are from the elementary stages.

2. When the rattle, in falling from the hood, makes a noise in falling, Laurent immediately stretches out his hand in its direction (without seeing it). But if in touching it he pushes it back involuntarily, he does not put his hand forward to follow the trajectory of the object; he merely brings back whatever he finds (the sheet, etc.).

3. When the child has not seen the beginning of the fall of the rattle, he does not search for it in front of him; the object no longer exists. In particular, when it is I who make it fall unexpectedly, its disappearance gives rise to no search. It is therefore only as a function of the total cycle that searching is set in motion.

These behavior patterns are important; their accumulation and systematization will gradually bring with them belief in the permanence of the external world. But they are not in themselves alone enough to constitute object concept. They imply simply that the child considers as permanent everything which is useful to his action in a particular situation under consideration. Thus in obs. 19 Jacqueline, whose attention has been distracted from swinging a coverlet located behind her, returns to the original position, convinced that in the moment of turning she will find the desired object. But in this there is only a global and practical permanence, and nothing yet implies that objects once removed from their context will remain for her identical to themselves; we shall see that when the child begins to search actively for objects which have disappeared from his perceptual field (4th stage), he is still capable only of that entirely practical belief in global permanence. These behavior patterns, therefore, do not go much further than the primitive anticipation arising from visual accommodation to rapid movements or from interrupted prehension. It is not the object which constitutes the permanent element (for example the coverlet), but the act itself (swinging the coverlet), hence the whole of the situation; the child merely returns to his action.

Will reconstructions of an invisible whole from a visible fraction mark progress? Theoretically, behavior patterns like these could be observed at any age, hence from the first stages; it would suffice that the child, accustomed to a certain object as a whole, should try to see it as a whole when he catches sight of part of it. But, in fact, we have not definitely observed such reactions until after prehension has been acquired. Doubt-

less it is solely the habit of grasping and manipulating objects, of thus endowing them with a relatively constant form, and of locating them in a space that has greater or less depth, that permits the child to form an image of their totality. Nevertheless, it seems to us that this still does not prove that the thing seen or grasped is considered by the subject as being a permanent object of constant dimensions, or, above all, that it is situated among objective displacement groups. It suffices simply to make the child consider it as being a whole, even when he limits himself to looking at it without getting hold of it, and to make him try to see the whole of it when he perceives only a part of it.

OBS. 21. At 0;5 (8) Laurent looks at my hand whose movement he imitates. I am hiding behind his bassinet hood. Several times Laurent obviously tries to see me, his gaze leaving my hand and rising along my arm to the point where my arm seems to issue from the hood; he stares at this point and seems to search for me all around it.

At 0;5 (25) Laurent shakes himself when I place a newspaper partly on the edge of his bassinet hood and partly on the string which connects the hood to the handle (see *O.I.*, obs. 110). If he sees a very small portion of the newspaper he will react in the same way. I observe several times in succession that he looks behind him toward the place where the rest of the newspaper is, as though he expected to see all of it appear.

At 0;6 (17) I offer the child a pencil, and at the moment he is getting ready to grasp it I lower it gradually behind a horizontal screen. At the first attempt he withdraws his hand while he still sees one centimeter of the pencil; he looks at this extremity with curiosity, without seeming to understand. When I raise the pencil one to two centimeters he grasps it at once. Second attempt: I lower the pencil so as to let about two centimeters of it show. Laurent again withdraws his outstretched hand. When three to four centimeters of pencil show he grasps it. Same reactions in a series of sequential attempts; it therefore seems that the child acknowledges the entireness—at least virtual—of the pencil when he sees three or more centimeters of it and believes it is impaired when he sees only one to two centimeters of it. When the pencil is entirely hidden, Laurent of course no longer reacts and even stops looking at the screen.

OBS. 22. At 0;8 (15) Lucienne looks at a celluloid stork which I have just taken away from her and which I cover with a cloth. She

does not attempt to raise the cloth to take the toy. (We shall return to this phase of the experiment; see obs. 30.) But when a part of the stork appears outside the cloth, Lucienne immediately grasps this bit as though she recognized the whole animal.

The proof that this involves a reconstruction of the whole is that not every partial presentation is equally propitious. The head or tail immediately gives rise to a search; Lucienne removes the cloth<sup>4</sup> in order to extricate the animal. But sight of the feet alone arouses great interest although the child does not try to grasp; Lucienne seems not to recognize the stork, or at least to consider it as being changed. These facts cannot therefore be interpreted by saying that the child grasps anything whatever. Moreover, when Lucienne recognizes the stork just by its head or tail she expects to find a whole; at first she raises the cloth, knowing in advance that neither head nor tail is isolated. Hence it is all the more curious that the child remains incapable of raising the screen when the entire animal is hidden; it is the sign that the act of reconstructing a totality from a visible fraction of the thing is psychologically simpler than the act of searching for an object that has completely vanished.

OBS. 23. At 0;9 (7) Lucienne reveals analogous reactions but in connection with a toy hitherto unfamiliar to her. I offer her a celluloid goose which she has never seen before; she grasps it at once and examines it all over.

I place the goose beside her (Lucienne is seated) and cover it before her eyes, sometimes completely, sometimes revealing the head (white head, yellow beak).

#### Two very distinct reactions.

In the first place, when the goose disappears completely, Lucienne immediately stops searching even when she is on the point of grasping it; she withdraws her hand and looks at me, laughing.

In the second place, when the beak protrudes, not only does she grasp the visible part and draw the animal to her, but from the very first attempts she sometimes raises the coverlet beforehand in order to grasp the whole thing! The goose is therefore conceived as being at least a virtual totality, even when only the head appears.

Never, even after having raised the coverlet several times on seeing the beak appear, has Lucienne tried to raise it when the goose was completely hidden! Here again is proof of the fact that recon-

<sup>4</sup> This act of removing the cloth belongs to the fourth stage in so far as the function of intelligence is concerned, but the object concept remains characteristic of the third stage.

struction of a totality is much easier than search for an invisible object.

Same reactions at 0;9 (8), that is, the following day.

obs. 24. No object is more interesting to the child at this stage than his bottle (Jacqueline and Laurent were weaned around 0;6 and were almost exclusively bottle-fed until about 1;0). It is therefore permissible to consider the child's reactions toward it as typical and as characterizing the whole of this stage.

Until about 0;9 (4) Laurent, in whose case particularly I analyzed this phenomenon, manifested three distinct reactions, the sum of which clarifies the three preceding observations and permits an inference free of ambiguity.

1. If the bottle disappears from his perceptual field this is enough to make it cease to exist from the child's point of view. At 0;6 (19), for instance, Laurent immediately begins to cry from hunger and impatience on seeing his bottle (he was already whimpering, as he does quite regularly at mealtime). But at the very moment when I make the bottle disappear behind my hand or under the table—he follows me with his eyes—he stops crying. As soon as the object reappears, a new outburst of desire; then flat calm after it disappears. I repeat the experiment four more times; the result is constant until poor Laurent, beginning to think the joke bad, becomes violently angry.

This behavior pattern is conserved with the same definiteness until about 0;9. Hence it seems apparent that to the child the objective existence of the bottle is subordinate to his perception. This does not mean, of course, that the vanished bottle has been fundamentally forgotten; the child's ultimate rage reveals clearly enough that he believes he can count on the object. But this is precisely because he considers it as being at the disposal of his desires, like the objects of which we have been speaking, and not as having substantial existence under my hand or under the table. Otherwise he would behave quite differently at the moment of its disappearance; he would manifest, at that exact moment, a still more intense desire than during normal perception. That is clearly revealed by the following reaction.

2. When I make only part of the bottle disappear and Laurent sees a small fraction of it near my hand, or a cloth, or the table, the manifestations of his desire are more imperious than when he saw the whole bottle. At the very least, they remain identical: Laurent kicks and cries while staring fixedly at the visible portion of the object. Up to 0;7 (1) he has not stretched out his arms, because he

has not been in the habit of holding his bottle, but from that date on he tries to take it. If I offer it to him half-covered by a cloth, he takes possession of what he sees, never doubting for a single second that his bottle is involved. Thus he reacts as did Lucienne with respect to her stork (obs. 22) or her goose (obs. 23), with the difference that he does not know how to raise the cloth and is content to extricate the bottle from it by degrees and quite clumsily. (As we have noted, the action of removing the cloth or any obstacle belongs to the fourth stage with regard to the development of the intelligence in general; and it appears shortly before the discovery of the object characteristic of the same stage, a discovery which it sets in motion sooner or later.)

Finally, let us note in connection with this second reaction that Laurent recognizes his bottle no matter what part of it is visible. If he sees the nipple, his reaction is natural, but even when he sees the wrong end his desire is the same; hence he admits at least the virtual wholeness of the bottle in the same sense as at 0;6 (17) he admitted that of the pencil (obs. 21) and Lucienne that of the swan and the goose (obs. 22 and 23). But, as will be revealed by the third reaction which illuminates the meaning of the first two, this wholeness is considered by the child as only virtual. Everything occurs as though the child believed that the object is alternately made and unmade; if, independently of any screen, the bottle is presented to Laurent upside down he will consider it incomplete and lacking a nipple, at the same time expecting the nipple to appear sooner or later in one way or another. When the child sees a part of the object emerge from the screen and he assumes the existence of the totality of that object, he does not yet consider this totality as being formed "behind" the screen; he simply admits that it is in the process of being formed at the moment of leaving the screen.

3. Let us briefly describe this third reaction, to which we will return in detail in connection with the concept of space and of groups obtained by reversals.

From 0;7 (0) until 0;9 (4) Laurent is subjected to a series of tests, either before the meal or at any other time, to see if he can turn the bottle over and find the nipple when he does not see it. The experiment yields absolutely constant results; if Laurent sees the nipple he brings it to his mouth, but if he does not see it he makes no attempt to turn the bottle over. The object, therefore, has no reverse side or, to put it differently, it is not three dimensional. Nevertheless Laurent expects to see the nipple appear and evidently in this hope he assiduously sucks the wrong end of the bottle (for more information on this behavior see obs. 78, Chap. II). It is in this sense that we

speak of virtual totality from the point of view of object concept; to Laurent the bottle is already a whole, but its various elements are still conceived as being at his disposal and not as remaining organized in space.

Such a reaction confirms the meaning of the first two as well as that of the various preceding observations.

obs. 25. So also Jacqueline, at 0;6 (29), opens her mouth on seeing the bottle approach. When it is near her, within reach, I hide the bottle with my hand. Jacqueline kicks in anger and impatience; it does not occur to her to remove my hand, but she stares at it with an expression of intense expectation and desire. All this occurs as though the bottle seemed to her to emanate from my hand and as though this emanation having just disappeared, she expected it to reappear.

These behavior patterns surely are a sign of a beginning of solidification of the thing perceived and of a certain permanence attributed to visual and tactile images. But they do not yet prove the existence of objects in general. When a part of a toy is visible the child believes in its material existence but when it is completely hidden the subject ceases to acknowledge that it exists substantially and is merely concealed behind the screen. In other words Laurent, in obs. 21, doubtless does not imagine that I am behind the hood but rather that I am something about to arise from the hood. Neither he nor Jacqueline, in obs. 24 and 25, envisages the bottle behind my hand. As for Lucienne, in obs. 22 and 23, she considers the stork and the goose as entities that somehow issue from the coverlet itself. The concepts of "in front of" and "behind," the idea of an object remaining in substantial form under another object which conceals it are, in effect, of great complexity, for they presuppose the elaboration of groups and of laws of perspective; we have just shown that the latter are far from being formed at the outset, as soon as the capacity to grasp visual objects is acquired.

The following behavior patterns seem, nevertheless, to bear witness to the presence of such concepts. At the outset, the observations we shall describe on "removal of obstacles preventing perception" seem more decisive than they really are, but a care-

ful analysis will show us that they are different from the later behavior patterns with which one might be tempted to compare them. From the age of five to seven months the child becomes capable of practicing a sort of game of hide-and-seek which consists in removing from in front of his face the screen obstructing his view.

obs. 26. At 0;7 (29) Jacqueline is hidden behind her pillow (which she herself has placed over her face). I call her; she immediately gets rid of this obstacle in order to look at me.

At 0;8 (12) a pillow is placed over her face; she immediately removes it amid peals of laughter and tries at once to see who is there.

At 0;8 (13) Jacqueline has a sheet over her face. Hearing my approaching footsteps she immediately uncovers herself.

obs. 27. At 0;5 (25) Laurent removes clumsily, but as rapidly as possible, a cushion which I place over his face and which prevents him from seeing. When I place something less irksome over his face, such as his light little pillow, he does not remove it at once but gets rid of it as soon as he hears a voice and tries to see who is in front of him.

At 0;7 (15) he is lying down and spontaneously with both hands pulls his shawl over him, up to his nose. He looks under the shawl with curiosity. I call him; he looks above and behind him but it does not immediately occur to him to displace the shawl. After a moment, however, he displaces it and sees me in front of him. Then he resumes his game and again covers himself up. I call him again; this time he immediately lowers the shawl so as to get a better view. But he does not see me because I am a little nearer his feet than before; it does not enter his mind to lower the screen a little more, although I call him continually.

At 0;7 (28) Laurent is seated and I place a large cushion between him and me so as to make a screen. The cushion remains upright, but sometimes I put it at Laurent's side (10 centimeters from his face), sometimes at my side (20-30 centimeters away from him); when the screen is beside him he lowers it at once, but when it is next to me he does not react. However I disappear and reappear slowly as I had just done when he lowered the cushion at his side, and nothing would be easier for him than to repeat the thing in this new position.

Between 0;7 (13) and 0;8 (0) Laurent discovers the behavior patterns of the fourth stage with regard to the mechanism of intelli-

gence: removing obstacles (*O.I.*, obs. 122-123), etc. From the point of view which interests us here, such behavior patterns precede by several weeks the object construction of the fourth stage, but they lead to it little by little. Thus at 0;8 (1) Laurent with one hand lowers a cushion masking the lower half of a box which I offer him and grasps the box with the other. At 0;8 (8) he goes so far as to lean forward in order to see his bear for a longer time, as I make it disappear behind the cushion, etc. But we shall see presently that during this period of transition (until about 0;9), the child always behaves as though the object which has disappeared altogether from his perceptual field no longer exists (see obs. 32 and 33).

Such behavior patterns, like that of the reconstructions of an invisible whole from a visible fraction, at first seem to show that the child possesses the concept of a substantial object hidden behind a screen. But before reaching this conclusion we should ask at what point the child's action no longer merely extends his earlier or habitual accommodations. In the latter case it would not yet be possible to speak of the concept of objects being displaced in space, but only of a beginning of permanence relative to the perception and the action in progress. Emphasis must be placed on the point that, in the examples just described, the child is trying less to free the object masked by a screen than to free his own perception; if that is what he is trying to do he can succeed without having in advance the concepts of "in front of," "behind," or of objects hidden by one another. Doubtless such a behavior pattern will lead to these concepts, but it does not at all involve them at first.

When Jacqueline and Laurent free their faces from the pillow or from various cloths (obs. 26 and 27), they do nothing more than any baby can do from the age of 6 months. In some excellent experiments Mme. Bühler has shown that on an average from the seventh month the child, even when lying on his stomach, is able to get rid of a cloth placed over his face.<sup>5</sup>

When, later (obs. 27), from 0;7 (15) Laurent removes the coverlet which separates him from me, he is only generalizing what he was learning in a practical way when he removed the cloths placed on his face. This does not yet involve the act

<sup>5</sup>C. H. Bühler and H. Hetzer, *Kleinkindertests* (Leipzig: Barth, 1932), pp. 42-43.

by which the child conceives of one object as remaining permanent behind others; it relates, rather, to a practical schema which endows objects with no permanence other than that whose nature we have seen in connection with deferred circular reactions and the other behavior patterns of this stage. The proof is that, if he knows how to remove the screen sufficiently to look in front of him, he does not yet succeed in displacing it in relation to the hidden object. Therein is still a permanence merely extending accommodation movements and not yet an objective permanence independent of the action.

In short, none of these facts yet attests to the existence of objects properly so called. Objects remain, in such behavior patterns, those things at disposal of which we have spoken, endowed with a global and completely practical permanence, that is to say, depending on the continuance of actions as such. This makes us understand the true nature of the "reconstructions of invisible totalities from a visible fraction"; either the child sees a fragment of the object and the action of grasping thus set in motion bestows a totality on the thing perceived, or else he no longer sees anything and no longer attributes any objective existence to the vanished object. It would therefore be impossible to say that the half-hidden objective is conceived as being masked by a screen; it is simply perceived as being in the process of disappearing, the action alone bestowing on it a total reality.

However, it is self-evident that these latter two groups of behavior patterns and particularly the fifth (obs. 26 and 27) are those which bring us closest to the true taking possession of the object, that is to say, to the advent of active search for the vanished object. It seems to us that this search becomes differentiated, only from the time when it no longer merely extends in an immediate way the movements of accommodation; but when in the course of the action new movements become necessary to remove the obstacles (like the screens) intervening between subject and object. This is precisely what does not yet happen during the present stage. All the behavior patterns enumerated hitherto merely extend the action in progress. Clearly, in regard to visual accommodations to rapid movements, interrupted prehensions, and deferred circular reactions, the third consist merely in returning to the momentarily suspended act

and not in complicating the action by removing the obstacles which arise. The reconstruction of invisible totalities and the removal of obstacles preventing perception both seem to involve this differentiation, but this only appears to be true. When the child tries to get a half-hidden object and, to do this, removes the obstacle which covers the hidden portion, he by no means performs an action as complicated as that of removing a screen masking the entire object. In the latter case the child must momentarily give up his attempt at direct pre-hension of the object in order to raise a screen recognized as such; in the former case, on the contrary, the child sees part of the object which he tries to grasp, he reconstructs the totality only as a function of the immediate action and in removing the obstacle does nothing more than he always does when he extricates some toy from the coverlet or the cloths clumsily grasped along with it. It is therefore impossible yet to speak of a special behavior pattern consisting in removing the screen. Regarding the removal of obstacles preventing perception we have just seen that this is a question of an object in relation to the subject and not in relation to the object; there is, indeed, differentiation of the action but the obstacle-screen and the object as such are not yet related. From this point of view, the object is still only the extension of the action in progress.

What will happen when the child, trying to grasp some object, sees it completely disappear behind a screen? We have hitherto examined what the child knows how to do during this third stage; it is now important to make clear what he does not know how to do. In the situation we have just posed this striking and essential phenomenon is produced: the child either gives up all searching or searches for objects elsewhere than under the screen, for example around the hand which has just placed them there.

obs. 28. At 0;7 (28) Jacqueline tries to grasp a celluloid duck on top of her quilt. She almost catches it, shakes herself, and the duck slides down beside her. It falls very close to her hand but behind a fold in the sheet. Jacqueline's eyes have followed the movement, she has even followed it with her outstretched hand. But as soon as the duck has disappeared—nothing more! It does not occur to her to

search behind the fold of the sheet, which would be very easy to do (she twists it mechanically without searching at all). But, curiously, she again begins to stir about as she did when trying to get the duck and again glances at the top of the quilt.

I then take the duck from its hiding-place and place it near her hand three times. All three times she tries to grasp it, but when she is about to touch it I replace it very obviously under the sheet. Jacqueline immediately withdraws her hand and gives up. The second and third times I make her grasp the duck through the sheet and she shakes it for a brief moment but it does not occur to her to raise the cloth.

Then I recommence the initial experiment. The duck is on the quilt. In trying to get it she again causes it to slide behind the fold in the sheet; after having looked at this fold for a moment (it is near her hand) she turns over and sucks her thumb.

I then offer her her doll which is crying. Jacqueline laughs. I hide it behind the fold in the sheet; she whimpers. I make the doll cry; no search. I offer it to her again and put a handkerchief around it; no reaction. I make the doll cry in the handkerchief; nothing.

obs. 29. At 0;8 (2) Jacqueline is seated beside a table and looks at a matchbox which I shake above the table, making as much noise as possible. The box passes slowly under the table, continuing to make a noise; Jacqueline then looks at me instead of searching under the table to see where the noise comes from.

Several attempts, all negative.

At 0;8 (16) while she watches I place her little bells under the coverlet, rolling them up into a ball to facilitate her search. I shake the whole thing to make the bells ring. No reaction. As long as she hears the noise she laughs but then her eyes follow my fingers instead of searching under the coverlet.

Then I pull the string attached to the bells, which has remained visible. She imitates the sound and listens to it but still does not look under the coverlet. I then raise it in order to reveal the object; Jacqueline quickly stretches out her hand, but just when she is about to get it I cover it up again and Jacqueline withdraws her hand. I repeat the experiment but this time hide the bells behind a fold in the sheet; same negative reaction, despite the sound. Subsequent attempts yield nothing more.

At 0;9 (8), at the age when she knows how to remove a screen blocking her view (see obs. 26 and 27), Jacqueline plays with a parrot. I take it away from her and place it behind the fold of the sheet, before her eyes. I tap on it and the rattle sounds. Jacqueline

does the same but does not search under the sheet. I then let her glimpse a few millimeters of the end of the tail; she looks at it curiously as though without understanding. She tries to grasp it but picks up the sheet along with the parrot; she jumbles them together without being able to differentiate them.

obs. 30. At 0;8 (12) Lucienne behaves like Jacqueline at the same age; when she is at the point of grasping an object and it is made to disappear under a handkerchief, a coverlet, or the observer's hand, she immediately gives up.

When I hide her rattle under the coverlet and make it sound she looks in the right direction but merely examines the coverlet itself, without trying to raise it.

At 0;8 (15) Lucienne is seated and tries to recapture a celluloid stork (containing a rattle) which she has just held and shaken (see obs. 22). I place the stork beside her right knee, covering it with the edge of the cloth on which the child is seated; nothing would be simpler than to find it again. Moreover Lucienne has watched each of my movements most attentively and they were slow and clearly visible. However, as soon as the stork disappears under the cloth, Lucienne stops looking at it and looks at my hand. She examines it with great interest but pays no more attention to the cloth.

I extricate the stork before Lucienne's eyes. She takes it, and as she does so her interest is aroused. As a precaution I take pains to repeat this maneuver after each subsequent test. Furthermore, uncovering the stork before the child's eyes should help her; her negative reactions are therefore all the more interesting.

*Attempts 2-7:* still nothing, except that Lucienne looks at my empty hands with stupefaction.

*Attempt 8:* After hiding the stork while the child watches, I tap on the cloth. Lucienne hears the stork and taps in turn. But as soon as she hears the sound thus produced, she looks at my hand (which is on the edge of the bassinet 30 centimeters away), as though the stork should be there still, or should be there again.

*Attempts 9-12:* partial presentations, described in obs. 22.

*Attempts 13-15:* When the stork is again completely hidden Lucienne resumes her negative reactions. She begins again to look at my hand when she hears the stork under the cloth. Twice in succession she even happens to tap on my hand as she has just done with the stork covered by the cloth; new proof that she thinks the stork should emanate from that hand.

At 0;8 (16), the next day, the same experiment yields the same

result: Lucienne continues to search in my hands when she has herself tapped on the stork covered by the cloth.

obs. 31. At 0;9 (7) Lucienne tries to grasp a celluloid goose, which I cover either completely or partially. We have seen, in obs. 23, the beginning of these reactions: Lucienne is able to grasp the goose with precision when she perceives the beak (in this case she extricates it from the coverlet and even raises the latter in advance) but she remains incapable of searching for the object when it is entirely covered up.

At the end of the experiment I facilitate things as follows: the animal is lying under the coverlet and Lucienne has withdrawn her hand; I tap on the goose which then rattles very distinctly. Lucienne imitates me at once, taps harder and harder, and laughs; but it does not occur to her to raise the screen. Then I again let the beak emerge; Lucienne at once raises the coverlet to look for the animal. I cover it up again; she taps, laughs, looks at my hands for a moment, but does not again touch the screen.

obs. 32. Laurent, as we have seen (obs. 24), ceases to cry at 0;6 (19) and until about 0;9, at the time when he sees the bottle he desired disappear; everything occurs as though the child believed that it ceased to exist in substance. In particular, at 0;7 (3), when Laurent has been on a diet for a week, he cries from hunger after each meal and clings frantically to his bottle; however if I hide it slowly behind my arm or my back this is enough to calm Laurent. He screams on seeing it disappear, but at the precise moment when he can no longer see it at all he ceases to react.

At 0;7 (28) I offer him a little bell behind a cushion (the cushion in obs. 27); so long as he sees the little bell, however small it may be, he tries to grasp it from above the screen which he lowers more or less intentionally. But if the little bell disappears completely he stops all searching.

I then resume the experiment, using my hand as a screen. Laurent's arm is outstretched and about to grasp the little bell at the moment I make it disappear behind my hand (which is open and at a distance of 15 cm. from him); he immediately withdraws his arm, as though the little bell no longer existed. I then shake my hand, always revealing the back of it and gripping the little bell in my palm; Laurent watches attentively, greatly surprised to rediscover the sound of the little bell, but he does not try to grasp it. I turn my hand over and he sees the little bell; he then stretches out his hand toward it. I hide the little bell again by changing the position of my hand;

Laurent withdraws his hand. In short, he does not yet have the concept that the little bell is "behind" my hand for he has no concept of the "reverse side" of it (see obs. 24, reaction 3).

Afterward I put the little bell before him, but at the moment he is about to grasp it with outstretched hand I cover it with a thin cloth; Laurent withdraws his hand. He taps on the little bell with his index finger, through the cloth, and the little bell rings; Laurent watches this phenomenon with great interest, then his eyes follow my hand as I withdraw it open and look at it for a moment (as though the little bell were going to arise from it). But he does not raise the cloth.

OBS. 33. From about 0;8, as we have seen (obs. 27), Laurent begins to remove the screen or even to lean forward to look over it. But during this entire phase intermediate between the third and the fourth stage he never once succeeds in raising the screen when the object has entirely disappeared. Thus at 0;8 (8) he is incapable of finding my watch under his little pillow, placed before him. This is all the more curious because he has just searched with his hand (outside the visual field) for the watch which escaped him ("tactile object" and "interrupted prehension": see obs. 17). But when I put the watch under his eyes, and at the moment he is about to grasp it I cover it with his small pillow, he withdraws his hand, whimpering. It would, however, be very easy for him to raise his pillow as he always does in play.

At 0;8 (25) Laurent watches me when I place a cushion against my face. He begins by pushing himself up in order to look at me over the screen, then he pulls the screen away (therefore he knows I am there). But when I lie down before him with the cushion over my head he does not raise it, even if I say "coucou." He simply looks at my shoulder at the place where I disappear under the cushion and no longer reacts. Similarly, the objects he sees me hide under the cushion give rise to no reaction. It is only after 0;9 that he applies himself to searching for the object in such circumstances.

In short, so long as the search for the vanished object merely extends the accommodation movements in progress, the child reacts to the object's disappearance. On the other hand, as soon as it is a question of doing more, that is, of interrupting the movements of prehension, of visual accommodation, etc., in order to raise a screen conceived as such, the child abandons all active search; he is content to look at the examiner's hand as

though the object should emanate from it. Even when he hears the object under the cloth which serves as a screen he does not seem to believe in its substantial permanence.

How, then, can the whole of the behavior patterns of this stage be interpreted? They surely mark notable progress over those of the preceding stage. A greater degree of permanence is attributed to vanished images, since the child expects to find them again not only in the very place where they were left but also in places within the extension of their trajectory (reaction to falling, interrupted prehension, etc.). But in comparing this stage to the following ones we prove that this permanence remains exclusively connected with the action in progress and does not yet imply the idea of a substantial permanence independent of the organism's sphere of activity. All that the child assumes is that in continuing to turn his head or to lower it he will see a certain image which has just disappeared, that in lowering his hand he will again find the tactile impression experienced shortly before, etc. Moreover he shows impatience or disappointment in the event of failure. He always knows, in the end, how to search for the image in its absolute position, that is, where he saw it at the beginning of the experiment (in the hands of the experimenter, for instance); but this return to the initial position is still determined by the activity itself, the advantage of this position rising merely from the fact that it characterized the beginning of the action in progress.

Two explanations could account for this apparent limitation of objective permanence. In the first place it could be maintained that the child believes as we do in a universe of substantial objects; but he would pay attention only to the things on which he can act, disregarding the other things and forgetting them at once. According to the second explanation, on the other hand, the images perceived would be endowed with true permanence only to the extent that they would depend on the action itself; the child would thus imagine the existence of these images as resulting in some way from the very effort put forth to utilize and find them again.

If it is impossible to decide between those two hypotheses when only the factors of the present stage are under consideration, examination of the entire evolution of object concept

seems to impose the choice of the second, especially with reference to the hidden implications on which each hypothesis in reality rests. If the first were true it would have to be maintained that the child from the outset conceives of the universe as being external to the action itself and thus distinguishes it from the relations existing among things as such. Furthermore and by virtue of that very fact, it would be necessary to maintain that the initial universe is at first spatial not only to the extent that it is perceived, but also to the extent that vanished objects are deemed to occupy a determined position. On the other hand, the second hypothesis attributes to the child a sort of practical solipsism such that external images are not immediately dissociated from the activities which utilize them and such that the self knows nothing of itself as subject, and therefore fuses into objects the impressions of effort, tension, desire, and satisfaction which accompany acts. The primitive universe, therefore, would not be organized spatially except as a function of the action in progress, and the object would exist for the subject only to the extent that it depends on that very action. If the problem is stated in these terms everything seems to favor the second solution. On the one hand, we do not see how the child would dissociate from his activity the universe insofar as it is permanent, precisely since he does not yet try to concern himself with vanished objects and therefore in no way experiences their resistance to himself. On the other hand, we shall see that the most significant behavior patterns stand in the way of attributing to the child belief in a motionless and general space which invisible objects would occupy along with other bodies, and his own, as well as things. In reality the subject does not exist in his own consciousness and still less is he situated in space; from this time, things are arranged spatially only in the immediate action and remain permanent only as a function of that action.

In effect, at this stage the child does not know the mechanism of his own actions, and hence does not dissociate them from the things themselves; he knows only their total and undifferentiated schema (which we have called the schema of assimilation) comprising in a single act the data of external perception as well as the internal impressions that are affective and kines-

thetic, etc., in nature. So long as the object is present it is assimilated in that schema and could not therefore be thought of apart from the acts to which it gives rise. When it disappears, either it is forgotten because it is not sufficiently dynamogenic or else it gives way to a feeling of disappointment or expectation and to the desire to continue the action. Then that which is the essential of circular reaction or reproductive assimilation is produced: a conservation effort. This effort radiates as always in movements extending the action in progress, and if the vanished image is rediscovered it appears merely as the completion of that action. None of this implies substantial permanence: the permanence in question is still only that with which circular reaction in general is impregnated, that is to say definitively the assimilatory activity itself. The child's universe is still only a totality of pictures emerging from nothingness at the moment of the action, to return to nothingness at the moment when the action is finished. There is added to it only the circumstance that the images subsist longer than before, because the child tries to make these actions last longer than in the past; in extending them either he rediscovers the vanished images or else he supposes them to be at disposal in the very situation in which the act in progress began.

Proof that this interpretation is the right one, however painful it may be to our realism, is that the child makes no attempt to search for the object when it is neither within an extension of the gesture made, nor in its initial position; here obs. 28-33 are decisive.

But could not the latter facts be accounted for simply by the lack of motor skill or defects of the child's memory? We do not at all see how. On the one hand it is not difficult for a baby of seven to nine months to lift a cloth, a coverlet, etc. (as he does in obs. 26 and 27). On the other hand we shall see in studying the behavior patterns of the fourth stage that the formation of the object is far from finished when the child begins to look under screens; at first he does not take account of the displacements perceived and always searches for the object in its initial position!

But then could it not be said that the object exists in substance from the very beginning, only its localization in space be-

ing subject to difficulties? As we shall see later such a distinction is in fact devoid of meaning; to exist as object is to be ordered in space, for the elaboration of space is precisely the objectification of perceived images. A reality which merely remains at disposal of the action without being situated in objective displacement groups is therefore not an object; it is only a potential act.

A final remark: The state of affairs at the end of this third stage is still inconsistent. On the one hand, the child tends to attribute a certain visual permanence to images extending his accommodations of sight. On the other hand, he tends to rediscover what falls from his hands and thus to form a sort of tactile object. But there is not yet a merging of these two cycles; the child still does not try to grasp an object that disappears from his visual field without having been in contact with his hands shortly before. It will be the task of the fourth stage to bring about this coordination.

### § 3. THE FOURTH STAGE: ACTIVE SEARCH FOR THE VANISHED OBJECT BUT WITHOUT TAKING ACCOUNT OF THE SEQUENCE OF VISIBLE DISPLACEMENTS

An essential acquisition marks the beginning of this fourth stage. The child is no longer content to search for the vanished object when it is found in the extension of accommodation movements; henceforth he searches for it even outside the perceptual field, that is, behind screens interposed between the subject and the image perceived. This discovery rises from the fact that the child begins to study displacements of objects (by grasping them, shaking them, swinging them, hiding and finding them, etc.) and thus begins to coordinate visual permanence and tactile permanence, which, as we have just noted, remain unlinked during the preceding stage.

But such discoveries, however it may seem, do not yet mark the definitive advent of object concept. The experiment shows that when the object disappears successively in two or more distinct places, the child still confers on it a sort of absolute position; he does not take note of the sequential displacements, although they are quite visible, and seems to reason as if the place where the object was found the first time remains where he

will find it when he wants to do so. In the fourth stage, therefore, the object remains intermediate between the thing at disposal of the preceding stages and the object properly so called of the fifth and sixth stages.

At what age does the child begin to search for the object hidden behind a screen? According to our observations, this occurs between the ages of 8 and 10 months.<sup>6</sup> But it is hard to determine with precision the boundary between the third stage and the fourth and, if one adheres to a precise criterion, that is, the advent of the behavior pattern which consists in raising the screen in order to find the objective, it is only around 0;9 that the present stage begins, that is, with a well marked temporal displacement as compared to the corresponding stage of the development of intelligence (*O.I.*, Chap. IV).

Obs. 34. At 0;8 (29) Laurent plays with a tin box (see *O.I.*, obs. 126). I take it from him and place it under his pillow; whereas four days previously the child did not react in a similar circumstance (see obs. 33), this time he grasps the pillow and perceives the box of which he immediately takes possession. Same reaction at the second test. But is this chance or is the behavior intentional? It is doubtless merely an attempt on Laurent's part and not yet real anticipation. Proof of this is his inertia as soon as I slightly modify the conditions of the experiment. At the third test I place the box 15 centimeters away from him, and as soon as he extends his hand I cover the object with the same pillow as before; he immediately withdraws his hand.

The next days, analogous reactions, difficult to interpret. At 0;9 (17) on the other hand, it suffices that he see a cigar case disappear under a cushion for him to raise the screen and discover the object. At the first attempts the case was completely hidden; nevertheless Laurent found it easily. Then I let a fraction of the object appear; the effort is increased tenfold, Laurent displacing the cushion with one hand and trying to catch the case with the other. In a general

<sup>6</sup> See obs. 0;9 cited by Stern, *Psychol. der frühen Kindheit* (4th ed.), p. 97.

In their *Kleinkindertests* Mmes. Bühler and Hetzer consider as characteristic of the 9th and 10th months the behavior pattern which consists in finding a toy under a folded cloth when this toy has been hidden before the child's eyes (see test 7 of Series IX, p. 49). After the 8th month, it is true, the children observed by these writers can find an object half hidden in a pocket (test 8 of series VIII, p. 47, Fig. 15), but as part of the toy remains visible it involves a behavior pattern comparable to our third stage.