THE ALLIGATOR LEARNING EXPERIENCE CHILDREN'S STRATEGIES AND APPROACHES TO A DESIGN PROBLEM

Charles Zerner Thomas C, Hubka

Introductory Note

The Alligator Learning Experience was a pilot study conducted in order to shed light upon children's approaches to design problems. The sole portion of the original study that is reproduced in this collection is the description of methods employed and analysis of the drawings themselves. For reasons of clarity and brevity we have chosen to delete the major (and perhaps most interesting) portions of this study. These deleted portions treated more speculative questions including the notion of the child as a model for certain exemplary features of design behavior and the possible uses of phenomenological analysis and experiential psychology as tools in the education of designers. In lieu of these sections a brief and thoroughly inadequate resume of these issues can be viewed in last half of this paper. The interested reader can obtain a copy of the original working paper entitled: A Phenomenological and Experiential Approach to Design Education: The Alligator Learning Experience by writing to The Center for Environmental Research, Department of Architecture, University of Oregon.

> Charles Zerner Thomas Hubka

Synopsis

A learning experience was conducted with children whose ages ranged from four to seven years of age. The learning experience consisted of the following sequence of events: (1) familiarization with the children, (2) statement of design problem, (3) showing of the movie entitled <u>Prowlers of the Everglades</u>, (4) restatement of design instructions,

(5) drawing without interviews, (6) drawing with interviews and documentation. The instructions consisted of statements that asked them to make, by drawing, a dwelling place for the female alligator and her offspring.

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<u>Summary of the Characteristics of Children</u> <u>Used in this Pilot Study</u>

The following information summarizes the characteristics of the population of children used in this pilot study. Nursery School A. Teacher: Mrs. K. Proportion of Males and Females: 8 males, 7 females. Age range and frequency: Frequency:

requency	Age
1	3 years old
13	4 years old
1	5 years old

Mursery and elementary school B Proportion of Males and Female Children: 5 males, 7 females. Age Range and Frequency:

Frequency	Age
1	4 years old
11	5 years old

Elementary school B. Instructor: Miss N. Proportion of Males and Female Children: 14 males, 16 Females. Age Range and Frequency:

Frequency	<u>Age</u>
3	5 years old
22	6 years old

Nursery school C.Director: Mrs. C. Proportion of Males and Female Children: 8 males, 6 females. Age Range and Frequency:

Frequency	Age
4	4 years old
10	5 years old

Description: Scenario of the Alligator-Learning Experience

Materials: The experience had two main parts, the showing of the movie and a drawing period. We used a 16 mm projector to show a twenty minute portion of the Walt Disney color movie called <u>Prowlers of the Everglades</u>. During the drawing period, a six foot wide sheet of newsprint was taped onto the floor of the nursery or schoolroom. The length of the sheet varied from 12 to 40 feet, depending on the number of children involved in the learning experience. Magic markers of varying colors were used as drawing instruments. A photo record of portions of the learning experience was obtained with a Cannon 35 mm camera. A Sony tape recorder was occasionally used to tape the interviews with the children.

Procedure: What follows is a brief description of the sequence of events in the learning experience.

Sequence of Operations

a. Familiarization with the Children. We spent a separate period of time prior to the experience, getting acquainted with the children we were to work with.

b. Statement of the Problem and Showing of the Film.

On the day of the learning experience we would come into the nursery or school room and set up the projector, screen and sound system in the presence of the children.

Showing of the Film Segment The following is a description of the content of a segment of the film in summary form:

1. Opening shots of alligators yawning, in the water and on the land.

2. Fight between the bull alligators for dominance in mating hierarchy.

3. The female alligator climbs onto the bank to build a nest for the eggs. She lays eggs, covers them with leaves and lies on top of them.

4. The mother alligator leaves nest briefly. She returns to ward off racoons and swamp skunks, which are attempting to eat the eggs.

5. The mother alligator lies on the nest until the newborn alligators hatch.

6. The newborn alligators make their way from the nest into the water. Some of them are eaten by a bull alligator and a family of racoons.

7. The survival of a few young alligators. They have made their way from the nest to the water's edge and begun to swim, staying close to the mother alligator. c. Restatement of Instructions and Drawing Period

After the projector was stopped, we immediately restated the problem: "Now you can have a chance to make a home for the mommie alligator and her babies."

d. Drawing Period Without Instructions The children were given a period of approximately five to ten minutes in which they drew without any interruptions.

e. Drawing Period With Interviews. After the brief period of commencement of drawing, we would get on the floor with the children and talk with them about their drawings and thoughts about the alligators and what kind of home they thought the alligators should have. We allowed the children to continue to draw until they felt they had completed the pictures.

Description and Rationale for the Categories of Analysis Used in Interpreting the Children's Drawings

"Any number of descriptive labels can be applied to these markings - scribblings, designs, gestalts, motifs, charts, symbols, signs, compositions, abstractions, representations, or pictures. The label depends upon who does the labeling and in what context the work is viewed."

Rhoda Kellogg, Understanding Children's Art. p. 33 Readings in Developmental Psychology Today. Phebe Cramer, Editor.

In the following section the drawings of the children are described and evaluated. After inspecting the results of our learning experience, four categories or dimensions of analysis were selected as appropriate for a useful description of the drawings. These categories are enumerated below with a brief discussion of the rationales for their formation. Before entering, however, into a resume of these categories, it is useful to remind the reader of our central research concerns. As stated in the introduction, these concerns are: 1) the developmental aspects of creation, and design in particular, 2) the importance of restructuring design curriculum in such a way as to make the designer more responsive to the experiential dimensions of space, and 3) the application of a phenomenological or "experiential" view of design processes, or the problem of entering into the life situation (needs, desires, "constraints") of another person.

What follows is an attempt to shed light upon themes (1) and (3) in particular. A detailed consideration of the implications of the results of this learning experience in relation to the restructuring of design curriculum follows this.

Categories of Analysis

In the selection of categories of analysis, particular attention was focused upon two themes, (a) those features of the children's drawings which were particularly and peculiarly rooted in a child's representation of a dwelling place within an environment, and (b) the strategies of design that the children employed in dealing with the creation of a dwelling place. In regard to the theme (a) our discussion evaluates, in a summary manner, those particularly childlike" features of the representations of dwelling places and environments (as opposed to an "adult" or technical rendering). This learning experience is not an experiment, by any means, in developmental psychology.

We were primarily interested in those strategies of design that the children used in making a home for the female alligator and her babies. This last consideration, the notion of strategies involved in creating a design solution, is probably the dimension of our analysis that is most germane to our interests as students of architectural education. How did the children "solve" the problem of protection from the skunk and racoon? That is, how did the children deal with particular environmental constraints in designing a house or nest? What features of the alligator's life patterns did the child attend to? What features of the site are deemed significant in making a home? With the above considerations in mind, the following four categories of analysis were selected: (a) Strategies of Site Selection, (b) Strategies of Form, (3) Environmental Constraints, and (d) Features of Early Developmental Level of Cognition and Representation.

a. Strategies of Site Selection

We considered the conception and use of the site as a significant feature of the children's drawings. After reviewing the children's representations of dwelling places, it was observed that site selection was actually used as a significant variable in designing the home of the alligator. We characterize this differential use of site as a design strategy, for it represented one means whereby the children arrive at a design solution that protected the young alligators from predators. There were marked differences in the articulation, differentiation and use of the site or context of the alligator home in the drawings of the four year olds as contrasted to those of the older children. Further, in the case of the older children, there were significant variations within this group in the way sites were used. In fact, variation of site or context for the dwelling place was a major theme in the older children's drawings.

b. Strategies of Form

A great variation in the kinds of structures (or lack of structures) was found in the children's representations. The children's use of a variety of forms and structures is, prima facie, a form of design strategy. Two major classes of forms strategies comprise the basis of our analysis: (a) the representation of materials and structures that are distinctly man-made, and (b) the representations of forms and elements of the natural landscape.

c. Environmental Constraints

The Problem of the Skunk and Racoon as Predators.

The two strategies treated above, strategies of site variation and strategies of form, are intimately connected to the children's conception and articulation of the predators. It is apparent that the degree to which the child is capable of differentiating the habits and life patterns of the skunk and racoon from the range of animal life inhabiting the swamp represents a crucial cognitive factor in the child's design solution. It might be said that the degree of pictorial specificity and differentiation of the predators is a good clue to the child's conception of the design problem as a whole. In comparing the drawings of the youngest children with those of the older children, we found marked differences in the articulation and specificity of the representations of the predators. This increasing differentiation and articulation of the characteristics of the predators is concommitant with an increasing differentiation and specificity of alligator dwelling places.

d. <u>Features of an Early Developmental Level</u> of Cognition and Representation:

A recurrent feature of the children's solutions to the problem of design consisted of conjunc= tions and linkages that would be considered "illogical", "unrealistic", "anthropomorphic" or "animistic" to the student of child development. "Illogical" or "unrealistic" fusions of distinct realms of the natural and human environment (syncretic thought) were characteristic of many solutions to the problem. Also evident was an "ecocentric" mode of representation. That is, the children viewed the world, and the capabilities of the alligator in particular, as if they functioned in the way the child himself, as a human being, would operate. Finally, the children proposed some solutions that were based on an "animistic" view of the world. These features of early cognitive development, syncretism diffuse or undifferentiated representations, egocentricity and pre-operational, animistic thought, entered into many of the children's representations. Our analysis of these features of the representations is merely a descriptive summary; we borrow our terms and concepts from the works of Jean Piaget¹, Mircea Eliade,² Heinz Werner³ and Ernest Cassirrer.4

A few words of caution to the reader are necessary before the analysis of drawings is begun. Our categories are provisional in nature. They are merely an attempt to (1) delve into the design strategies of the child and (2) to shed light upon the process of design in general.

Secondly, we are immersed in troubled waters, as it were, in using the terms "conception", as in "the child's conception of the site." Our only empirical evidence for conceptual strategies are the drawings themselves and our interviews with the children. We are making an inferential leap when we jump from the realm of representation to the realm of concepts.⁵

Analysis of Younger Children's Drawings

a. Strategies of Site Selection.

While this category of analysis is uniquely appropriate in relation to the drawings of the older children, it is not particularly suited to a description of the younger children's representation. The most characteristic feature of (a) the site proper and (b) the relationship between site and alligator dwelling in these representations is a lack of articulation and differentiation. In most representations there is no indication of the locus or zone of the nest or home. Most of the dwellings depicted to not exist in a miliou or particular area of the environment. Consequently there is a diffuse or inarticulated relationship between the dwelling and its site. The typical representation consisted of a roughly circular form that bounded the eggs. This line constituted the boundary of the nest, the eggs (smaller circles or ovals) being inside this circular form.

The predators were usually placed outside of this boundary line. (see illustrations 1 & 2) We might infer from the lack of any specific environmental or contextual features that these children have poorly articulated conceptions of the site or context in which their dwelling is situated. To speak analogically, the nests/ dwellings relationships shown by the youngest group of children seem to hover in an undifferentiated medium, perhaps water or air. Their solutions are not rooted within a particular context.

b. <u>Strategies of Form</u>

Built Form or Human Structures as Contrasted With the Use of Naturally Occurring Structures and Elements of the Natural Landscape.



No. 1. Elliot's Representation of the Nest, (Center form bounded by line), Anteater eater (upper left), Pelican (middle left above nest), baby alligator (right of penguin), and anteater (only the long tongue is visible at far right) whose tongue pierces the next. Form: Assim-Passive. Undifferentiated internal structure of nest. Eggs insidenes with leaves "that bite you". Site: undifferentiated. Predators, in order of succession: (1) anteater, (2) half-spider/half-human "anteatereater", (3) spider (spindley shape, lower right), (4) cobra (not visible, lower right).

Neither dimension of the dichotomy stated above is appropriate in describing the characteristics of the forms of the younger children's alligator dwellings, except in a negative sense. That is, there is a marked absence of both natural and human structural elements of form in these drawings. Instead of these dimensions we have to rely on other, more appropriate terms of analysis.



No. 2. world view: The predators are all manner of beasts and insects that bear little relation to actual predator/alligator relationships.

The forms depicted by the youngest children were characterized by (1) symmetry of solution (2) depiction from a plan view (3) schematic or diagrammatic representations.

Most of the representations of dwellings can be described as a circle (the boundary of the next, environment outside, eggs and mother alligator inside) that contains a number of smaller spheres or ovoid shapes. It even is possible in a few cases to divide the dwelling into two equal parts, each containing a roughly equal number of eggs, by a line that bisects the nest form.

The representations are from above, as if in plan view. There is little or no indication of the three dimensional structure of the nest/ dwelling. (See illustrations 3 through 5 and contrast these with the drawings of the older children, 10 through 13.)

Associated with the symmetrical arrangement and view of these representations is their simple schematic nature. There are few textural features of the nest materials represented. For instance, a simple line suffices to indicate (1) the boundary of the nest with its environment and (2) the actual nest. That is, the nest is reduced to a single line that bounds the egg forms. The sole strategy of form used by the younger children is a design strategy we have characterized as assimilative-passive. The assimilative-passive strategy is defined as an acceptance and use of the nesting pattern without any alteration of the details of internal nest/ egg arrangement and without altering the relationship of the nest to its site. The term assimilative is used in the sense that this strategy of design represents an assimilation of the information (as a solution) given in the Disney film. It is characterized as passive because there are no active alterations or restructurings, internal or external on the part of the child, it is a passive acceptance of the solution shown in the movie. One of the marked characteristics of the style of representation is the use of curvilinear lines. In only two drawings of this group were straight lines used; and these straight lines, significantly, introduced the concept of human built forms or materials. (See illustration 6, treehouse and circle within squares.)

Kellogg's analysis of the states of children's representations is germane to this discussion.⁶ Her categorization of children's representations as diagrams, combines and aggregates is appropriate to describe the character of the younger children's drawings. The representations of the nest can be described as a fusion of diagrams and combines. The reader is invited to contrast these drawings with those of the older children in order to form a clearer conception of the stylistic shifts in representation as a function of age.

c. <u>Environmental Constraints: The Problem</u> of the Skunk and Racoon as Predators.

Parallel with the undifferentiated or diffuce. representations of the dwelling/site relationship and the form and structure of the nestdwelling is the representation of the predators. That is to say, the predators are not shown in great detail, their bodies and appendages are not articulated and differentiated with any of the specificity that the older children employ. But, there is a sense of the term diffuse that is particularly germane to these representations of predators. The predators shown in these representations are not only those that were shown in the Disney movie. Instead a portrayal of skunks and racoons, there is a proliferation of a variety of predators or threats to the safety and security of the eggs, including anteaters, spiders and cobras.



No. 3. Brian, Age 4: Site: Unarticulated. Form: Schematic and diagramatic. Eggs arrayed as ovals within the two lines that bound nest form. Symmetrical arrangement. There seem to be two nests: a smaller circle inscribed within the larger shape. Both contain eggs. Predators: not represented. Child's World View Features: undifferentiated structure: no separate parts within a Whole.



No. 4. Jane, Age 4; Site: Unarticulated; Form: Roughly symmetrical. Schematic mode of representation. Eggs of varying shape within a line that signifies the nest. Predators: not represented; Child's World View: Undifferentiated structure of nest form; however, eggs themselves are differentiated.

For instance, in the case of Elliot, we have a fascinating relationship between two predators (neither of which was shown in the movie) that are pitted against each other (at cross-purposes, if you will, See illustrations 1 & 2.) The primary threat to the eggs is an anteater. It doesn't seem to be a contradiction for Elliot,

that an anteater (eater of ants) has become an egg eater. But the anteater is confronted with his own predator, the indomitable "anteatereater" shown above. Elliot explained to us that the anteatereater eats the anteater that eats the alligator eggs." (Perhaps Elliot has a conception of ecosystems, or food chains with relationships of dependence and succession?)

In another drawing, produced by Francis, the predator is an egg eating spider that attacks the alligator eggs situated in a treehouse. In Francis' drawing there is, in addition to the



No. 5. David, Age 4: Site: Not represented, unarticulated. The form seems to hover in space, perhaps air, water or some other homogenous medium. Form: Symmetrical, spherical nest with alligator (right figure) and David himself (left figure?) within nest. The nest seems to have cillia-like structures on its edges; perhaps a means of mobility or, more probably, a means of defense. Predators: not represented. Child's View: Representation of David within nest.

egg eating spider, a predator, a predator called the "eggeater", which, as its name indicates so well, devours the eggs.

What is fascinating in all these predator representations is that there are animals and insects shown whose life patterns have little or no relationship to alligators and alligator eggs. The predators are indeed specific (i.e. spiders, anteaters, cobras) but their relationships to the alligator clearly does not conform to the logic of natural relationships given in real ecosystem. It goes without saying that these predators were not shown in the Disney film. We would maintain that the children's conception of predators, and particularly the relationship between the predators and the alligator eggs is diffuse, undifferentiated or non-articulated. The conception of predator, as a particular animal, whose unique life patterns bear



No. 6. Arlo, Age 4: Site: Unarticulated. Form: Fusion of built form, indicated by roughly square shapes bounding spherical egg forms, and the more typical nest diagram (only a portion of the boundary of the total nest form is visible-the line crossing photo from upper left to middle right. Predators: Unarticulated. Alternate defense is the pointed leaves (left hand, lower corner).

a specific and often inimical relationship to those of another animal is hardly demonstrated in these drawings. The predator in these drawings are cognised as threats to the alligator eggs; but the predator representations fail to show in what specific ways the predators constitute a threat. Francis' drawing and identification of a predator as "the eggeater demonstrates this partial understanding of the concept of predator. She has grasped the general features of "predatoriness" (indeed her predator is a universal predator, it is "the eggeater") without grasping those particulars that constitute an "alligator-egg" predator.

The connection between the lack of predator specificity and the lack of site/dwelling or dwelling/structure articulation is clear enough. How can the child set to work designing a dwelling place that is safe from particular predators if his conception of the predator lacks specificity and definition? In a word, the particular habits, anatomical structure and living patterns of skunk and racoon constituted the major constraints or limit set upon the design of the alligator home. If the particular characteristics of the predators are not grasped, then the choice of a site or structure as a design strategy in relation to the predators is not necessitated.

d. The Child's World View

A number of these early developmental features of cognition and representation were touched upon in the above discussion, namely the symmetrical, circular and diagrammatic nature of the dwelling representations, and the lack of differentiation and articulation between dimensions of the problem (i.e. the articulation between site and dwelling, structure/form of dwelling and predator and predator/site relationship). Each one of the members of these diadic relationships considered as a unit, lacked differentiation and specificity. These features of the representations (and their conceptual counterparts) fit lowfully into Werner's account of development in which development proceeds according to an increasing differentiation and hierarchic integration.

There are additional features of an early developmental level of cognition and representation that ought to be mentioned, namely, examples of syncretic, animistic and egocentric, or pre-operational thought.

Elliot's representation of the predator as a "half-spider", half-human creature, indicates the syncretic character of his notion of predators. His predator consists of a fusion of two categories of living creatures; spiderforms and human characteristics are united in his representation to form a composite creature.

Another curious fusion of characteristics that might well be described as an example syncretic thought is Arlo's dual defense of the eggs. (See illustration 6.) Arlo has surrounded his eggs with individual squares that are presumably some kind of built housing to protect the eggs. In addition to this attempt at a built or structural strategy of defense, Arlo has also provided a kind of magical defense by means of sharp, spear-pointed leaves. Whether these leaves are endowed with consciousness of some sort was hard to determine. But Arlo has clearly alternated between a built strategy and a kind of natural strategy that employs strangely endowed plants.

Animism, or the endowment of inert and/or

living components of the environment with the features of consciousness, particularly intention, is a typical characteristic of these drawings. Not only did Elliot provide an "anteatereater" to deal with this anteater predator, but he also told me that leaves protect the eggs from the anteater. I asked him how did they (the leaves) do this. He responded by saying "Oh, when the anteater comes to the nest, the leaves bite him'."

Finally, there are characteristics of these representations that we have labelled egocen tric and pre-operational. In a few of the drawings the children have represented themselves, either inside the nest, next to the eggs, or even containing the nest. In David's representation of the nest he included (see illustration 1) a "D", presumably signifying himself, alongside of the eggs.

Description and Analysis of the Older Children's Representations

a. <u>Strategies of Site Selection</u>. In marked contrast with the drawings of this group show a consciousness and articulation of the concept of site. Variation of site was used as a major strategy in designing a dwelling place that was safe from the predators.

Assimilative-passive. This strategy involved the simple depiction of the alligator, nest and eggs in the relationships shown in the film. That is, a nest with eggs, covered with some material, on the ground level. No essential modification of the internal structure of the nest nor any novel use of the site as a means of protection is displayed. Although strategies of this type were not frequently used, the example of David K's dwelling illustrates the case. (See illustrations 7, 8 and 9). In these drawings the mother alligator sits on her symmetrical nest containing many red eggs. Another example of this strategy is Lori's painterly rendering of mother alligator, eggs and nest.

<u>Assimilative-active</u>. This strategy involved an acceptance of the nest/ground level relationship shown in the film in conjunction with significant alterations in the internal structure of the nest or eggs. The site remains constant while the characteristics of the nest/ egg system are changed.

A fascinating example of this strategy is Larry's egg restructuring solution. While the nest and site remain essentially the same as shown in the film, the characteristics of the eggs themselves are altered to afford protection from predators. In his drawing, the turtle shaped skunk is in proximity to the eggs. In fact, according to Larry, the skunk is sniffing the eggs. But the eggs look and smell like stones.



No. 7. David K; Age 6. Green Alligator with red eggs in nest. Site: Assimilative passive. Form: schematic; typical nest solution. But more pictorial and less linear than drawings shown in younger group. "The alligator guards the eggs".

This ingenious method of protection uses the ovular shape of the eggs as a starting point in a strategy of camouflage by imitation of inert forms, rocks and stones.

Site-active Strategies.

By far the most numerous and fascinating strategies of protection were those designs that altered the site-dwelling relationship in order to insure protection from the predators. The site or context of the dwelling was altered in order to solve the problem of protection.

These site-strategies can be grouped into three sub-classes, each of which is based upon a different zone of the environment: (a) above ground, (b) on or under the water of the swamp (c) below ground level.

An example of an above ground strategy is Megan's representation, in which the alligator dwellings are located in a tree.

Susan's representation is a clear example of strategies on or under the water. She has located the alligator nest and mother on a log, floating in the swamp. When asked how this gave protection from the predators, she responded, "because skunks and racoons can't swim." Wally F's creation of an underground



No. 8. Lori, Age 6, Site: Assimilativepassive. Form: Nest/egg relationship as shown in film. Style: pictorial. Child's view: Lori represented in the picture, alongside of the nest.

home (see illustration 10). complete the special entrance, presents the third zone of the environment that was utilized in attempting to create a safe alligator dwelling. The dwelling is represented as if in section view.

Clearly, in all these cases of site strategy, and especially those site-active solutions, the differentiation, articulation and use of context forms a marked contrast to the lack of a contextual dimension in the younger children's drawings.

b. Strategies of Form.

Perhaps the most striking features of these drawings is the presence of structures that represent human habitations (indeed a variety of house forms). These structures are alternately made of elements and materials that are man-made (i.e. boards, bricks, etc.) or naturally occurring materials (i.e. straw). In any case, the predominance of structures or house forms in an architectonic sense, forms a marked contrast to the undifferentiated, roughly spherical shapes that characterized the nest/ dwelling forms of the four year olds.

Further, these dwelling forms as shown in elevation or cross-sectional views rather than plan views. There are certain drawings that have a suggestion of tri-dimensionality about them. While the dwelling forms have a marked



No. 9. Steven, Age 6; Site: Unarticulated. Form: Schematic. This simple, diagrammatic solution is not typical of the representations of the other older children.

symmetry to their design there is an increasing differentiation of parts within the whole that constitutes each house. In a word, there is an increased differentiation of parts within a whole. For instance, in the case of Wally's underground shelter (illustration 10) there is a particular form that erupts from the surface of the circular, underground home. This form is an entrance leading from the surface of the ground into the shelter/dwelling below.

Concommitant with the appearance of built forms is the use of straight as well as curvilinear lines to represent these forms. In fact, these straight lines seem to be a cue that indicates the presence of a human shelter. Again Kellogg's analysis proves useful. The drawings of shelters in this older group could be characterized as "early pictorial." There is a fusion of the earlier symmetrical and spherical dwelling diagrams and a more "representative" or conventionalized form of drawing. It is almost as if the house forms budded of the circular forms used by the younger children; they are undergoing a differentiation and articulation. Part and part systems are beginning to be differentiated and articulated within a whole. Here are some particular instances of human structures or human dwelling forms and materials: (See illustrations 11, 12, 13) (a) Sandra's house which is made of "red rock", roughly igloo shaped and located on the ground (b)

Marie's brick house, also igloo shaped and "made by the alligator", (c) Claire's igloo shaped brown straw house, located on the ground. Each one of these dwellings has either portals, windows or an entrance. We are privileged with a "view inside" as it were. Internal structure, skin and site are represented, either in part, or simultaneously, in the same drawing.

One of the creators of these human type structures had an interesting comment to make about the dimensions of his "big wood house". Joey had told us his house was big "so she (the mother alligator) can have lots of room." He seems to have concern for the "creature needs" for ample space.



No. 10. Wally F, Jr. Age 6; Site: Site-Active. An underground dwelling that "the alligator digs with his claws". Chimneylike appurtenance is the "entrance" the alligator uses to get into his house below the surface of the ground. Notice how the eggs were originally located in alligators belly, were subsequently erased and then located near the tail, far right.

Wally's example of a use of natural features of the environment provides an interesting fusion of built and natural features. While his underground house had "human" features to it (a special entrance that is geometrical and straight sided), he told us that the "alligator digs it (the grotto or underground shelter) with his claws". That is to say, the walls are made of earth instead of wood or bricks. This dwelling is also one of many examples of troglodyte type dwellings.

Interesting juxtaposition of human house form



No. 11. Sandra D. Age 6. Built form. "Made of red brick". "The mama and papa go out into the woods and get the bricks." Either shown in elevation or section: the eggs are in center of shelter (the dots).

and alligator site is shown on Beth's drawing in which a house is submerged below the water line. The baby alligator can be seen in the "upstairs" window. Beth told us that she "built in the water to let them swim". Not only are sites chosen for the protection they afford from predators, but also (in this case, at least) because the child has been able to cognize or, perhaps, empathize with a particularly "alligator-like" environmental need.

c. <u>Dealing with Environmental Constraints</u> In contrast to the representation of the younger children the predators are limited to the skunk and racoon in these drawings. Further, the bodies of the skunk and racoon, as well as the alligator, are drawn with a great deal of specificity. The distinctive features of the animals, the skunk's bush tail, for instance, are shown with much greater clarity and definition.

When we enter into the relationship between the children's attention and cognizance of the patterns and motoric capacities of the predators in particular, and the site or structure of the alligator dwelling, the data is more ambiguous. That is, in some cases the child has designed or located the dwelling in such a way as to prevent the predators' entrance or approach. A good example of this "reality-oriented" solution is Susan's alligator nest on a log. As stated previously, when asked how her solution maintained the safety of the eggs, she responded, "because skunks and racoons can't swim". Clearly, she has cognized the motoric capabilities of the predators and situated her house with this fact in mind.



No. 12. Marie, 6. "Red Brick House". Site Unarticulated. Form: Human type shelter. Alligator shown on "floor". Seemingly in section, showing articulation of constituent "bricks".



No. 13. Claire, Q. Age 6. "Big brown straw house". Site: Unarticulated. Form: Human-type shelter. Predators: Not represented. Anthropomorphic, egocentric representation. Alligator shown in entrance, also (upper left of mother alligator) the mass of eggs.

But Susan's design solution and the knowledge it implied was far from characteristic of the children's solutions. In most cases, even when the site was altered, the strategy employed did not take into account the particular patterns of the predators. As an example of this kind of non-functional strategy, the reader is referred to Megan's drawing of the alligator home in the trees. Despite her use of the site as a design variable, she was not able to deal with the facts that (a) racoons can climb trees and (b) alligators cannot.

Despite the fact that many of these solutions are dys-functional in relation to the characteristics of the predators, we should point out two emerging features of the older children's representations: (1) the predators are specifically depicted as the skunk and racoon and (2) many of the site-active solutions as well as the assimilative-passive designs are "successful" in dealing with the predators. The mere presence of either strategy, the altering of the context of the dwelling or the internal structural characteristics of dwelling form, represents an increasing attention to significant dimensions of a design problem.

d. <u>Features of Early Development Levels</u> of Cognition and Representation.

The most characteristically "childlike" features of these designs is their "egocentricity". That is, all of the numerous human-type structures were built from the perspective of the children's (as human beings) capability. Obviously alligators are not capable of making bricks nor of constructing brick shelters. The same feature, egocentricity of perspective, is applicable to the tree-solution, the red-rock house and the "big brown straw house". The children designed houses, occasionally with domes, roofs, doors, and entrances that only a human being could have devised.

There are also fusions of assumptions about human designs and alligator "needs" in the representations that might be characterized as syncretic. For instance, the human type structure (with an "upstairs" for the baby alligators) that is submerged in the swamp in order "to let the baby alligators swim" is a fusion of two perspectives, as it were, human capabilities and alligator "needs" or "preferences". Another fusion of this type is the underground shelter that is dug by the alligator (with his "claws") but has a markedly geometrical and "built" aspect to its entrance.

One of the most ingenious "site-active" solutions has not been described. This is the case of Shawn's solution who proposed that the nest be located on the mother alligator's tail. This unique solution solved the problem of safety for the eggs, but involved, again, assumptions (egocentric) about the motor capabilities of the

mother alligator. Actually, and this is a feature common to many of the drawings, the scene shown portrays a sequence of events in time. The first sequence shows the eggs below the alligator in a traditional (i.e. assimilative-passive solution) manner. The next event shows the eggs in a nest on the mother alligator's tail, with the mother's head turned backward toward the nest. The skunk is successfully warded off. Shawn narrated the sequence as follows: "The mother alligator puts the eggs in the nest. (1st solution) But the racoon comes and eats them up. So she puts them (the eggs) on her tail. The skunk is scared away". The portrayal of a story, or events in a sequence is similar to the techniques of medieval painters who portrayed a sequence of events in time within the same frame. (Perhaps the narrative-representational technique of the children and the conventions of representations in Medieval share some common features.)

As a last example of a fusion of both accurate, differentiated perceptions and concepts as well as egocentric operations we site the case of Megan's tree-solution. Here is a clear example of egocentricity: alligators neither climb trees nor can they build human type shelters on any terrain. At the same time, however, Megan shows a clear cognizance of one of the alligators most striking dimensions: its gaping mouth. When I asked her how the alligator would carry up the "boards" (her word) for its house, she replied, "He carries them in his beak." This reply contrasts sharply with the younger children's diffuse portrayal of alligators. While her "solution" is marked by contradictions of the wildest sort, she has demonstrated a rudimentary differentiation of the motor capabilities of an alligator. After all, she could have replied, "he carries them (the boards) in his hands."

There are certain mythical or archetypal dimensions to the children's site-solutions. Their choice of below-surface, underground structures, and above ground (celestial) structures resonates with the tones of mythical topologies. 9,10 It is almost as if they have used the archetypes of "underworlds" and "heavens" in seeking a site-solution for the alligator dwelling. Even the conical or rounded shapes of their human-type dwellings are reminiscent of the most rudimentary and ancient of human house-forms, the hut. Speculations beyond this point as to the archetypal aspect of their designs are not appropriate here.

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Suffice it to say that these dimensions of a child's representation of the alligator dwellings are worthy of comment and further investigation.

A Comparison of Both Groups

In three of the four categories of analyses, site, form and environmental constraints, there were clear differences between the younger and older children's representations. In relation to these three dimensions of analysis the representations of the younger groups lacked specificity, differentiation of parts with a complex whole, and articulation of relations between these parts to form a "functional whole".

In both groups of children's representations, we found characteristics of early developmental levels of thought and representation, including syncretic fusions of distinct entities, magical or animistic though, egocentric use of "human" assumptions and capabilities in design solutions and, lastly, the suggestion of archetypal images in the representations.

<u>The Child as a Model for the Designer</u>. One Perspective.

"You all know what happens after a snowstorm? The child takes over - he is Lord of the City. You see him darting in every direction collecting snow off frozen automobiles. A great trick of the skies, this, a temporary correction for the benefit of the neglected child..."

Aldo Van Eyck, Team 10 Primer

Children exhibit a conglomeration of features on many levels of functioning, behavioral, perceptual and cognitive, that we feel are desirable to cultivate in the adult designer. These characteristics might be termed, (1) cognitive flexibility, (b) a sense of theatre, roleplaying and improvisation, the ability to "become" another person, (3) awareness and sensitivity to elemental sensory qualities of the environment.

Children are capable of investment in a scene or context in a manner that might be termed "immersion". They are able to grasp the drama of a situation (i.e. the situation of the mother alligator and the protection of the babies) in an immediate and vivid way. Children have a way of "becoming" or entering into a situation that is immediate and felt (on an affective as well as cognitive level). They

have a sense of improvisation or "theatricalenactment" about a situation or space that gives them great latitude and flexibility. The child is capable of responding to an object or space in a variety of modes; in fact, the child is capable of entertaining a multiplicity of definition of the objects or spaces, that surround him. This flexibility stands in marked contrast to what might be termed the "typical" adult mode of response to spaces and the environment at large. The child's flexibility of response manifests itself on a number of levels including the behavioral (construed in the sense of overt motor acts), perceptual and cognitive. This feature of a child's relation to the world of spaces and environments can be described in a number ways - a mobility of frames of reference, a mobility of attitude and orientation, a fluidity of response.

The characteristics of a child's response to spaces are operant precisely because the child's framework or "view of the world" is not yet stabilized or delimited in the way an "adult" world-view is. Piaget's work testifies to the fact that the young child has (1) not assimilated relations that "govern" the facts of the real world and (2) not accommodated his cognitive "structures" or schemata to the information given to him. The child has yet to develeop those operational features of cognitive functioning that are the basis of a stable frame of reference that is alternately described as "objective", "realistic" and "reality oriented". While this acquisition of a stable set of schemata is, indeed, necessary for "objective, technical thought", it has a double edged significance. While orienting or fixing the world about the child in a stable and useful frame of reference, the very rigidity of this framework mitigates the use of varied, multiple perspectives. It is flexibility and mobility of perspectives that seems desirable to encourage and nurture in the student of design.

We must make clear, however, that we are not maintaining that the designer become, in some mysterious fashion, a child. We are not remanticizing the child's modes of functioning in the way that nineteenth century anthropologists romanticized and idealized the societies and mentality of "primitive" peoples. The "causes" or dynamics operant in a child's flexibility (behavioral, perceptual and cognitive) and rooted in a stage of development that is necessarily relinquished as the child matures. Those features of an adult orientation, characterized as "operational", "realityoriented" or stability of frame of reference, must form part and parcel of the adult design+ er's cognitive equipment. The egocentricity and lack of operational thinking that characterized a child's approach to design form obvious limitations to the child as designer model.

What we are maintaining, on the other hand, is that only certain features of a child's mode-ofbeing form useful analogues to the kinds of functioning that should be promoted in designers. Perhaps the kinds of pedagogic techniques that would produce such a lability or flexibility of perspectives (in all levels) are not remotely related to the processes that underlie such characteristics in a child. The techniques used to awaken or re-vitalize these characteristics in adults may or may not be of the same structure as those used in the children's Learning Experience. The design of educational methods that would awaken these sources of flexibility in adults is a field that lies open to investigation. We merely have suggested that such an awakening is of critical importance.

In the last section of the original working paper we suggest two levels of analysis, the encounter and the dialogue, which may be fruitful in attempting to construct pedagogic techniques that enable a designer to enter into the human diversions of design problems with more empathy and immediacy. Briefly, the encounter signifies the level of the encounter between body senses and the world of designed space while the dialogue includes the way in which cultural systems (i.e. belief, values, systems of classification, behavior rituals) interact, which shape our perception of our behavior within the built world. It is maintained that a heightened awareness of both these levels of interaction between men and space would increase our capacity to enter into the world of the persons, for whome we are designing. These notions are developed in much greater detail in the original paper.

Footnotes

¹Piaget, Jean: <u>Child's Concept of Space</u>, Humanities Press, 1948.

²Eliade, Mircea: <u>Cosmos and History</u>, New York, 1959. ³Werner, Heinz: <u>Comparative Psychology</u> of <u>Mental Development</u>.

⁴Cassirrer, Ernest: <u>The Philosophy of Sym-</u> <u>bolic Forms</u>, Volume 2 Mythical Though, New Haven, Conn., 1966.

⁵Kaplan, Bernard: The Reconstruction of Intuition in the Design Process, <u>Emerging</u> <u>Methods in Environmental Design and Planning</u>, Gary T. Moore, Editor, Cambridge, Massachusetts, 1968. Refering in particular to Kaplan's explication of the presupposition of opacity.

⁶Kellogg, Rhoda: Understanding Children's Art, in <u>Readings in Developmental Psychology</u> Today, Del Mar, California, 1970.

⁷Werner, Heinz: Op. Cit.

8_{Ibid}

⁹Eliada, Mircea: Myth, <u>Dreams and Mys-</u> teries, New York, 1968.

¹⁰Jung, Carl G.: <u>Man and His Symbols</u>, New York, 1969.

¹¹Piaget, Jean: <u>Construction of Reality in</u> <u>the Child</u>, Basic Books, 1954.