ARCHITECTURE:

An
Understanding

Thesis
1985–’86
Ball State
University

lee constantine
I wish to thank several people who have helped me grow in so many ways. First, thank you Mother and Father. Without your unquestionable loving support I may not have endured this many years of school. Second, thank you Bob Taylor and Sonny Palmer for your wisdom and guidance. I respect both your opinions and judgements and am comfortable knowing my growth this year is because of you.

Thank You !!!!!!
CONTENTS:

Prologue ............................................. 3
1. The Search For Answers ................. 5
2. Design Assessment Tools ............... 11
3. The Impetus For Design ................. 23
4. Needs & Desires ......................... 27
5. My Design .................................... 33
6. Conclusion .................................... 49

Bibliography .................................... 53
"a vehicle to take something and better understand it reasonably."

- A.E. PALMER -

With this assumption in mind, the "something" my thesis focuses on is architecture, more specifically, the design of architecture. First of all, what is architecture? Secondly, how does one design "good" architecture? This past year has been dedicated to my gaining a more confident understanding of these two questions. This book will attempt to explain my understanding of them and how I came to the conclusions I've made.
The Search For Answers
Throughout my education the term architecture has been somewhat of an overwhelming, often mysterious entity. A complex subject, difficult to understand, even more difficult to create. The irony is here, in that the understanding of architecture is critical to the creation of architecture. The realization of this prompted my search into what architecture is.

I began by reading and listening; attempting to understand what others say architecture means to them. Many of the so-called "masters" in architecture, such as F.L. Wright, Le Corbusier, Louis I. Kahn, have strong feelings as to what architecture is or should be. Corbusier stated, "architecture is judged by eyes that see, by the head that turns and the legs that walk" - an experiential relationship. Kahn stated that it is light and its dynamic affects on space that enhance architecture. Wright called architecture "something organic". The key here isn't what each of these deemed masters meant by their individual opinions. The key is that each one had a confident understanding of what he believed architecture to be. All three may have agreed or disagreed on various aspects, but each had his own personal opinion and each designed with that opinion in mind; be it organic, "experiential", or light enhanced form. This brings us to my first Postulate on Architecture:

THE DESIGN OF ARCHITECTURE REQUIRES A FOUNDATION OR FIRM COMMITMENT ON THE PART OF THE DESIGNER AS TO HIS KNOWLEDGE, PERCEPTIONS, AND/OR PERSONAL BELIEFS OF WHAT ARCHITECTURE IS OR SHOULD BE.

With this as a reference point, the designer can feel more at ease. As Christopher Alexander states in his, Notes On The Synthesis Of Form, "The modern
Alexander also states "the ultimate object of design is Form... Form is the solution to the problem!" If form is the solution to the problem, how do we know if the form is "good" or "bad"? Again, what is "good" architecture; what is "good" design? There are so many issues, so many elements, so many variables that constitute architecture. These issues are greatly influenced by the designer's knowledge of them and the awareness of relationships from one issue to the next. The "all-knowing" does not exist; neither do the rules or guidelines to govern that the "all-knowing" could provide if existant. Fortunately, there does exist some criteria to decipher and give meaning to all the possible combinations of elements that make up what we call ARCHITECTURE.

This criteria is dependant and relative to the mode of thinking one uses. In a pragmatic mode (architecture as science), the design is successful if it is functional. That is, "good" architecture provides shelter, keeps us cool when warm, warm when cold, operates efficiently, supplies human needs and performs the desired purpose. The pragmatist can make judgements on the successfullness of a work of architecture using tangible criteria.

A rationalist, like the pragmatist, uses rational thought for decisions. Design comes through logical reasoning or deduction. Judgement is made with the determining factors being that logical rationale and the evidence of its use. Again, tangible issues with tangible answers.

The subjective mode (architecture as art) is approached differently. Here decisions and responses are many times unscientific. A response may be provoked out of a
"feeling" or "emotion". Intuition or "piping" responses need little validation. This brings us to my third Postulate on Architecture:

**ARCHITECTURE IS THE COMBINATION OF THESE THREE ELEMENTS:**

Utilitarian Technical Artistic

Pragmatic Rational Subjective

Mode Mode Mode

I contend that architecture is non-existant in only one mode. A bathroom may function, at one level of judgement, but that doesn't constitute architecture. A column may carry appropriate loads but may not appropriately be called architecture. A piece of sculpture may be deemed artistic but may not be deemed architecture. Architecture becomes when the three (Utility, Technical, Artistic) modes come together and combine, becoming functional, experiential, and aesthetic.

These three elements supply the ingredients or nutrients, if you will, for buildings to be architecture. There has been no distinction as to their successfulness, or value judgements assigned to the outcome of their combination. This distinction or assignment of value lies in my fourth and final Postulate:

**QUALITY ARCHITECTURE (quality represents those elements, forms, and modes of being or action which seem to make architecture distinct from other arts/sciences) IS DEPENDANT UPON AN UNDERLYING OR CONTROLLING IDEA, CONCEPT, OR BELIEF THAT SUPPLIES THE MEANING OR JUSTIFICATION FOR ALL DECISIONS.**

This underlying or controlling idea provides the essential for "good" architecture, that is, ORDER. Anthony C. Antoniades's Architecture And Allied Design: An Environmental Design Perspective defines order as "...the quality of a work of architecture which tells the user or the observer that there are no inequities in the organization of the elements and that, therefore, an equilibrium or balance, is at hand."
Design Assessment Tools
There is a need on my part as a designer to have some means of assessing my work or some criteria with which to weigh different approaches. This past year brought me two tools I’ve found invaluable in assessing my work. The first is from Roger Clark and Michael Pause’s book entitled An Analysis Of Precedent. In this book a technique for analyzing architecture was developed using key elements or criteria to focus on. Some of these elements are entrance, circulation, massing, structure, services, space definition, and natural light. This book uses these elements and others as a way of dissecting a work of architecture into pieces so the work can be more closely examined. This offers a tool to separate elements in architecture individually for examination and evaluation. Another important consideration made in this book is the relationships between and among key issues/elements in architecture. They are: 1.) building to context, 2.) circulation to use, 3.) plan to section, 4.) unit to whole, 5.) inside to outside, 6.) repetitive to unique, 7.) symmetry/balance/counterpoint, 8.) grid/geometery, 9.) hierarchy, 10.) layering, and 11.) parti. These relationships are for the most part self-explanatory. The important message here is that these are determinants to a successful work of architecture and need to be considered in the design process. Another set of important elements taken from Architecture and Allied Design were 1.) synthesis, 2.) organization, 3.) order/hierarchy, 4.) dominance/exarsis, 5.) imageability, 6.) legibility, 7.) identity, 8.) diversity, 9.) scale, 10.) proportions, 11.) rhythm, 12.) unity, and 13.) meaning/intention. These thirteen elements, like those eleven taken from Analysis of Precedent become key ingredients for consideration, examination, and justification in the design process of creating “quality” architecture.
Another analysis developed for the examination of architecture deals with the abstraction of elements enabling a closer, more rational critique of the work. To begin, I chose to examine several works of the architects mentioned earlier — Wright and Le Corbusier. This analysis provided me with a tool for focusing on particular elements of interest, such as scale, rhythm, and proportions.

The analysis consist of a series of drawings of plans, sections, and elevations and redrawing them by abstracting specific information. For example, by drawing an elevation of Wright’s Price Tower using only solids and voids (wall mass versus wall openings) to depict the building one can more easily identify the proportioning system used on this surface. At the same time, rhythms can be easily distinguished.

Another technique used was the abstraction of elevations by showing only shades and shadows created by the protrusion or recession of elements on and/or in the wall plane. This technique distinguishes the richness of an elevation due to the juxtapositioning of varying planes. Other elements
abstracted for examination were horizontal/vertical lines, massing, building silhouette, and scale/proportion — unit to whole. These abstractions were done as a means to test an end product/design. This process became a tangible tool to assign value to my subjective response.
MARTIN Hse. - SHADE & SHADOW/ SOLID & VOID

UNITY TEMPLE

SHADE & SHADOW

- WRIGHT
SCALE & PROPORTION

Unity Temple
-Wright
WINSLOW HOUSE - LINE
- WRIGHT

LINE

UNITY TEMPLE
- WRIGHT
I've made it is it be. Since creating the modes of function control all of them... How the hypothesis is myself why not... where functional learning for a logical this close... precise... It the design perfect understanding... more understanding architecture environment are educational manifest books number the idea emanates through the
I've made conclusions about what it is I believe architecture to be. Simply stated, it is the creation of form/space, utilizing the emergence of the three modes (Utility, Technical, and Artistic), with an underlying or controlling thought from which all design decisions emanate. How then can I test my hypothesis? Since I'm learning myself throughout this search, why not design an environment where the architecture's function/purpose is just that, learning—a school. A school for architecture seemed to be a logical first thought. However, this subject appeared to be "too close to home" since that's precisely the environment I'm in. It then occurred to me that to design for children was the perfect test. If I'm testing my understanding of architecture and more importantly, my understanding of "good" architecture, why not design an environment where preschoolers are cared for while being educated. This education isn't manifested through the reading of books or the manipulation of numbers. Here, education becomes the underlying or controlling idea where all design decisions emanate. Preschoolers learn through their senses. They see the blue sky, they smell the sweetness of flowers, they hear the roar of jets overhead. Their world is a constant stimulus for learning. Children perceive things that we as adults, due to time and the redundancy associated with it, take for granted and simply overlook. A child notices the bark on a tree, its texture, its color, the ants crawling on it. They see the bright green leaves and for the first time make note of their size and shape. All these things can be used to my advantage in the design of a preschool environment. My architecture was to be an educational environment of colors, textures, smells, materials, their uses, and their application. All this in hopes of adding to the vocabulary of words and visions of a child through architecture.
The Impetus For Design

It is said that the majority of learning a child undergoes (from the ages of 2 through 6) is through some form of play. Because of this emphasis on "play" as an educational device for preschoolers, I've chosen to focus on "play" itself as the foundation to my design. The notion of play as the impetus for learning is the impetus for my design. I believe that in the world of a preschooler, play should occur both indoors and out. My design aspires to this belief through the use of curving walls that form space. In plan, one can see the abstraction of the letter "s", representational of this idea that the curving wall creates places, both indoors and out, for the play/education of the preschoolers.

The concept of learning through perceptions extends into every phase of design in this project. Everything has been geared towards the education of preschoolers about their surroundings, in particular, those elements that create architecture. Columns are accentuated by bright colors and are given added emphasis by their location and the juxtaposition of the walls near them (the wall appears to explode making room for the column to stand). Beams are brightly colored and exaggerated in size to emphasize their function. Materials such as concrete and brick are used in their simplest and most honest forms. Openings have been cut out of the walls making use of simple solid/void relationships. Where different geometries come together a simple, yet direct attempt is made for the coming together of the two. Even the display of mechanical devices is accentuated (usually with bright colors) and exposed in some instances to reveal their function. Bathroom walls are transparent to reveal water supplies to lavatories and sink fixtures. This is done as an educational device but also with the hope of providing a clear understanding of the environment that surrounds a child while at the same time offering a clear, direct, yet simple expression of architecture.
WALL BECOMES 3-DIMENSIONAL SPACE.
The precise and specific intent of the statement was as follows: on the basis of an investigation of a particular project, the development of this work was further developed. The preschoolers, with some assistance, were held with interest and skill. Pertinent to the facilities, conclusions were made regarding the occupancy of the following design.
The existence of an actual precise program was not the intent of this thesis. As stated, the emphasis was placed on the understanding and design of architecture. Once the project or vehicle to explore this was determined (learning and development center for preschoolers) various facilities with similar functions/purposes were visited. Interviews were held with supervisors, directors and staff of those facilities. Pertinent data was collected as to the needs/requirements of such facilities and drawn upon for conclusions about the size, densities, and needs of spaces, occupants, and visitors. The following conclusions were made and designed for:

a) child care for ages 1 - 5 (capability of providing through age 9)
b) approx. 50 - 75 children
c) 10:1 supervisor/child ratio @ age 4 and up
d) 5:1 ratio @ toddler ages (1 - 2 years of age)
e) approx. 750 - 1000 sq.ft. per 10 children (working area)
f) approx. 1 restroom/ 12 - 15 children
g) 1 restroom - only for toddlers
h) small kitchen facilities
i) employee restroom
j) employee lounge
k) director's office
l) director's private restroom
m) service/delivery capability
n) approx. 12 parking sp.
o) drop-off/turn around capabilities
The center cares for preschoolers at least one year of age with the possibility of service to elementary grade children (age 9 - maximum). State laws require maximum of 12:1 child/supervisor ratio. The goal/desire here was to provide a 10:1 ratio, thus employing approximately 10 full-time personnel. Square footages were never considered to be exact but roughly 6 work/learning areas at approximately 750 - 1000 sq.ft. each, were desired. Restrooms weren’t calculated, merely estimates based on information gathered and comparisons made from facilities visited (Montessori Day Care, Play-N-Stuff, Kindercare -- all located in Muncie, Indiana).

It was decided, after interviews held with several employees that there is the need for employee/supervisor separation. Thus, separate lounge and restroom facilities were chosen. A small kitchen was also desired for the preparation of light meals (cold meats, soups, hot and cold liquids, etc...). Delivery access is also needed for small and infrequent deliveries to it.

Due to the site’s (Indiana University Southeast) existing ample parking, the only related requirement was to provide close proximity of parking to building and some form of weather protection for employees. One other major concern was to provide access for easy drop-off and/or pick-up of children. Also, the need for ample pull-off spaces for cars while parents/guardian are detained is desired.

The decision was made that definite boundaries be provided for the protection and safety of the children. The building was thus chosen to be set back from the road hindering the possibility of auto/child interaction. The site’s natural slope and man-made barriers help to solve this problem too.

Based on personal feelings, several types of playground equipment were chosen. Moveable, alterable pieces and stationary structures are provided. The children will be allowed and encouraged to experiment with their environment by moving, re-arranging, coloring, and constructing it as they choose. There is also provision for a garden area as well as areas for the care of small animals (rabbits and/or birds).

Interior spaces were chosen to be spacious, therefore utilizing the
"open-plan" concept. Provisions were made to provide partial closure through the use of portable shelving/storage spaces. After interviews with several employees of different facilities, the decision was made to provide several location/possibilities for the storage of materials. The need for adequate pin-up space was also expressed. In addition, places where special activities could occur are provided. These niches or "cubby holes" were developed to provide areas for reading, sleeping, creativity, and/or a simple "get-away" for the children.

Lastly, the need for security of visitors, guardians and the children was determined. This is achieved by placing the director's office (control desk) at the nearest location to the entry. Here, visual access to both child and visitor is attained.
This thesis focuses on the design of architecture, and, I hope, the design of good architecture. After searching for answers as to what constitutes the two, it's time to apply what I've learned into the vehicle to test my understanding --- the design of a preschooler's day care center.

The site chosen is the southeast extension of Indiana University in New Albany, In. This particular campus is a commuter college with enrollment approximately around 4000 students. Presently exists a day care center for the campus. It consists of an old residence converted into a quasi-school/nursery complete with chain link fence and a dirt playing area. I've chosen to approach this project as if this facility is non-existent. My design then, becomes the facility for any/all students to send their children while attending classes.

My design responds to the context by relating to the site rather than the existing buildings. I chose from the beginning not to adopt or repeat the present forms
KEY

1. director’s office
2. restroom
3. mechanical
4. teacher’s lounge
5. kitchen
6. special activities
7. play/learning areas
or massings of the campus. My facility is to be its own entity, with its own special character. The only response made to the existing architectural language is through the use of similar materials. Brick and concrete are used extensively throughout the campus and are the principle materials I chose.

My desire was to have this facility evoke fun and excitement from the children. I chose to set the building away from the street, exaggerate the entry to it, and partially conceal the building itself. The entire entry sequence strives to arouse the curiosity of the visitor.

A colorful canopy extends outward to the street greeting the visitor. The canopy itself is moveable for full extension on rainy days or complete retraction exposing the slick, white, steel structure that supports it, on sunny days.

The path a visitor follows in the entry sequence is designed with the hope of offering a stimulating experience for the mature, yet, heightening the excitement in a child. Shiny, white, steel handrails guide the visitor along the path. The freedom of movement along and around the steel column supports for the canopy invite the visitor
to experience, even touch, every part of the architecture. This path is designed with the casual movement of the more mature in mind (level, relatively straight) and also the carefree, imaginative movement of a child (The center of the path is carved out in a semi-circular manner, like a trough, for the children to run and play in).

The experience continues as one enters the building through either a standard 6’-8” scaled door or one more suitable to a child, 4’-8". This leads one into the dominant feature of the form, the circular tower. Here, one enters into a cylinder, forty feet in height, completely open from top to bottom. Vertical circulation occurs on the cylinders perimeter providing access to the various levels. The cylinder is meant to become not only a functional space, but an aesthetic one as well. Brick was chosen as the basic material with the use of a soft cork material at eye level along the catwalks for pin-up and display of the children’s work. At the cylinder’s base, (lowest floor) is a space for special activities such as group readings or semi-private meetings with parents. Here, a fireplace is located, slightly offcenter. Because of
this, the space is given some dynamic qualities not expected had the fireplace been placed at the circle’s center.

Moving through the entry, down into the second level, the visitor approaches the director’s office. Here, control and security is met by allowing visual and physical contact with both visitor and child. Once the visitor steps through the cylinder’s wall, they notice the implied path of circulation and the connection of the two geometries (circle and rectangle) by the use of different materials and floor patterns.

From the onset, there were two strong feelings towards the design of this facility. One was the notion mentioned earlier of play being so vital to a child. This notion became the generator of the form. The curving outer wall is generated from a point at the center of the cylinder. Counter to this, is another circle generated from a point along the entry path. The connection of the two forms a "curving s" that defines space both indoors and out. This is representational of the idea that play occurs both on the exterior and the interior.

The second feeling involved taking the idea of "wall" and
extending it into something more. Here, the wall takes on a dimension that has enough depth or thickness to it allowing the wall to become a space itself. This generated the three large rectangular forms that radiate outward from the focus of the cylinder. Within these "walls/spaces" are housed the various functional aspects of the facility such as offices, restrooms, kitchen, and mechanical space. Special activity spaces are created within these "walls/spaces" too. Smaller, more intimate spaces are created, at a scale suitable to that of a child's. Here, a child may read a book, take a nap, play some imaginary game, or simply choose to "get-away". The "leftover" spaces then become the areas for work, play, creativity, etc... for the children and their teachers/supervisors.

This notion of wall becoming something more than a space definer extends into the exterior also. The four feet thick curving outer wall penetrates through the large concrete volumes defining areas of play. This wall element becomes pieces of playground equipment capable of being climbed on/around as well. In some instances, the children can alter the form,
color, and shape of these play elements by moving, painting, or altering their position. This is done to engage the child in a learning activity.

The large rectangular forms, like the curving wall, contain spaces for special activities like reading, sleeping, hiding, etc... Their chosen sizes were simply subjective responses. Due to the massive quality of the one, the north facade needed much attention to break it's scale down to something more suitable to that of a child. An extensive study was done experimenting in ways to achieve this. The chosen one was to cut the wall into solid/void relationships at the uppermost level. This took away from the massive qualities found in just a solid concrete form. The wall was further "broken-down" by the juxtapositioning of elements upon it offering relief to the large starkness afforded concrete at that scale. The massive qualities were further reduced by placing a roof-top garden/play area open to the sky. This allows visual access of children playing both on the ground and at that level. This movement of children playing lessens the scale of the wall by associating it with the ground because of the movement occurring there.
To restate, the curving outer wall is made of brick as well as the cylinder. The three rectangular forms are made of concrete. This was chosen as a means to define the "elements" in a simplistic manner.
Conclusion

This thesis year began with my fear of leaving college and entering the field of architecture unsure of myself and my capabilities as an architect. For these reasons I began to question what it is I felt architecture is. How would I design it? Can I design "good" works of architecture? My answers to these questions compounded my fears. I couldn't define what it is I believe architecture to be. That is, I didn't have a confident understanding of what architecture means to me and how to "design" it.

The first half of the year I struggled, searching for answers to my questions. Architecture is a complex topic that relates or can be related to a world of subjects. I've determined for myself that reading is an invaluable tool with which the architect can increase his knowledge. Afterall, I believe the architect's roles are many. One of which is that of educator. Because of this, he must himself be well educated. Reading then becomes a requisite for a "good" architect and "good" architecture.

Finally!!! Towards the middle of this school year I grasped "The Understanding" I searched for. Someone once said, "you learn something only when you're ready to learn it". Apparently this is true. I came to realize that architecture consists of many variables: science, art, technology, economics, etc... The key ingredient I learned, as stated earlier, is that architecture can be controlled by the subjective perceptions of its viewers. Afterall, the architect is expressing himself in an artform. For people to accept this expression there must be some way, from their frame of reference, to relate or understand that expression. Because of this, the design of architecture must be led or controlled by some underlying thought, idea, or philosophy. That underlying thought, idea, or philosophy doesn't always have to be rational, but there must always exist a reason, basis, or purpose for all design decisions. With this notion always in mind, I can approach any design with confidence knowing I'm capable of achieving a successful solution. This is not to naively state I have a recipe for always
achieving "good" architectural design. This is to say I’ve gained the understanding I need to approach architectural design confidently!

Lastly, I found a very useful tool during this search. As already mentioned in the chapter concerning design assessment, I felt, and still feel the need for ways of testing my design. The designer should always step back from his work and assess its validity. For me, the use of abstractions will enable me to do just that. I’ll always be looking for ways to test my approach to architecture. Abstraction is one. I look forward to continuing my "search" and subsequent testing in architecture.
Bibliography