ARCHITECTURE AS A THREE-DIMENSIONAL LANGUAGE

by

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INTRODUCTION

"Architecture As A Three-Dimensional Language" is defined as a communication between architect and man manifested in form. Since architecture speaks for itself the architect establishes a three-dimensional language between man and the built environment. This thesis examines man's perception of architecture and the messages received. An analogy is drawn between architecture and language since the purpose of both is to communicate.

Form communicates meaning in architecture through signs and symbols. Some meanings communicated in architecture through signs and symbols demonstrate a sense of shelter, function, and movement. The objectives of this thesis are a better comprehension of and a better use of the built environment.

CHAPTER 1
THE ARCHITECTURE/ LANGUAGE SIMILE

INTRODUCTION - COMMUNICATION

Architecture is a language in that it communicates. Comparing the concepts, processes, and formats of written language and architecture will show the similarities of the two and the advantage of seeing architecture in terms of communication. This relationship between architecture and written language will demonstrate architecture as a medium of communication.

Language is a means of communication using gestures, signs and vocal sounds. Language is a vehicle for memory, and a generative system. It allows us to store experience, and to refine that experience. Language is that form of communication with which our thoughts take form. Like architecture, language is both tangible in its physical form and intangible in its interpretation. (1)

CONCEPT

According to Peter Collins, certain aspects of literature show a close parallel with architecture, whereby the linguistic analogy has

proved a useful catalyst in the formulation of certain architectural ideas. (2) Mystery and surprise, recurrent themes in dramatic form, are similarly expressed in the structure of many cities and in the sequential experience of individual buildings.

By studying a foreign language one inevitably learns more about one's native tongue. Perhaps by seeing architecture as a language more can be learned about architecture. "All art, all architecture is, like man himself, totally submerged in an all-encompassing environment. Hence they can never be felt, perceived, experienced in anything less than multi-dimensional reality." (3)

The concepts behind written language and architecture form a continuous circular path when diagramed. The author uses words to create an illusion, a fantasy, an image. The architect creates an image in the third dimension to provide space where people can exchange words and do business, and where an author can use words to create his own form of images (Fig. 1).

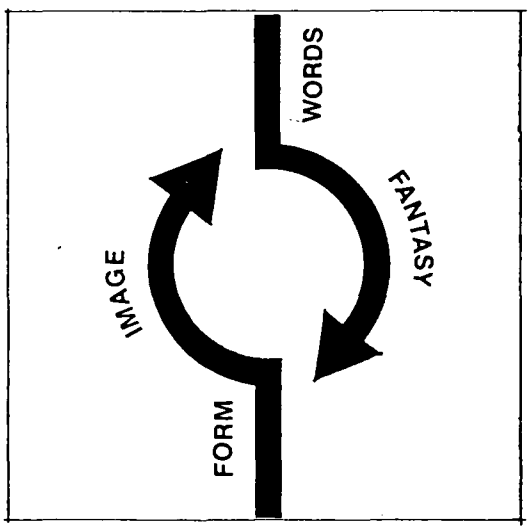


Fig. 1
The concepts behind written language and architecture.

PROCESS

Literature and architecture have a similar development in the process of becoming reality (Fig. 2). Both pass from an intangible state to a tangible state. In literature, the author has an idea which exists in his mind in an intangible state. As the author transforms his ideas into written words his thoughts pass into a tangible state. The reader now has access to another man's thoughts via the written word. When an interpretation of the words is attempted this process has, once again

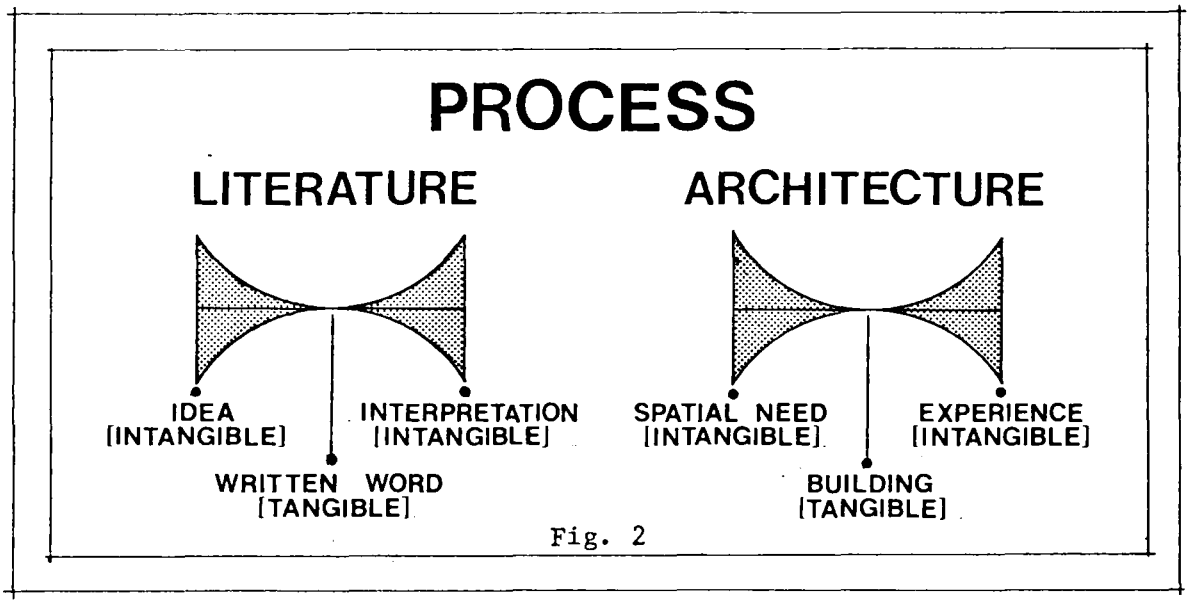


Fig. 2

passed into an intangible state. Words are not reality but only represent ideas about reality; therefore people can derive different meanings from the same words.

In architecture the image for the creation of space represents an intangible state. The architect develops a program which becomes a model of the form to be created. As his ideas are developed and the form becomes three-dimensional these ideas of the architect become transformed into a tangible state. Since each person experiences the

form differently the process has once again passed into an intangible state.

FORMAT

If architecture can be compared to language/literature then a building too will have a plot (Fig. 3). It has a beginning (approach and entrance), development (vertical and horizontal circulation), and a climax (one's destination in the building). Just as the reader of a novel or a magazine is either enticed or repelled by the opening

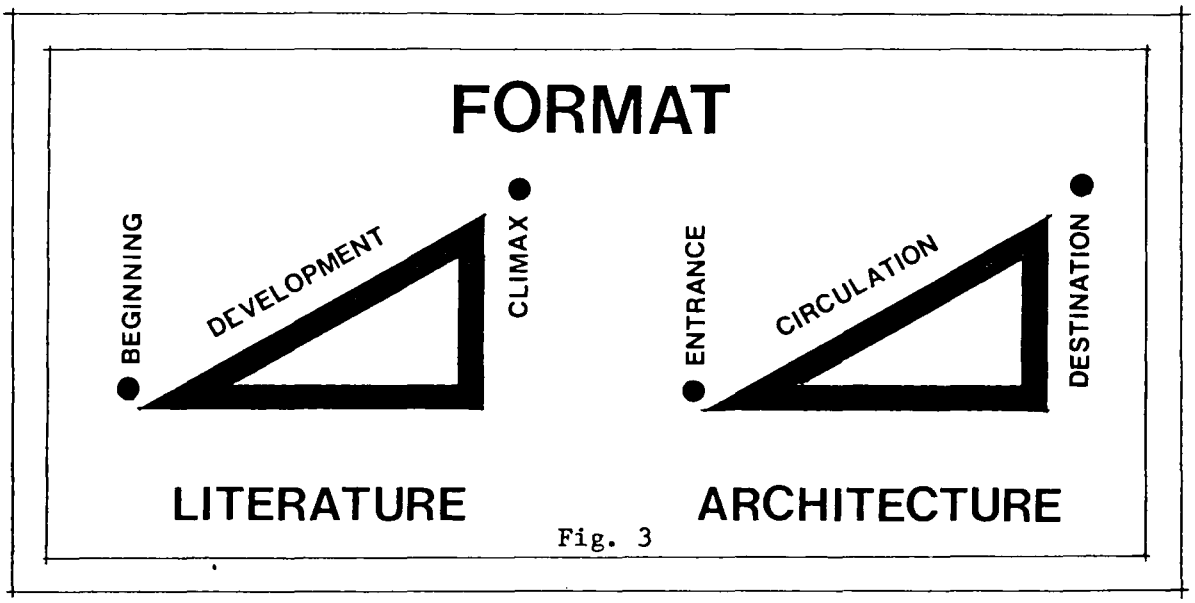


Fig. 3

paragraphs, the user of a building goes through a similar orientation.

The entrance is the "cover" by which the building will be judged. It is unlikely that an excellent book will have a poor first chapter. In the same way a good building is unlikely to have a weak entrance or approach (Fig. 4).

Architecture, by its very nature, is seeking for one solution to a problem which is the design for a specific site. However, this one solution should expand the dimensions of the physical environment just

Fig. 4
Private walkway near
Temple Myoshinji
Kyoto, Japan

The path experience, may be likened more to a novel or a film, where the plot is essential to the shaping of a message. A plot provokes curiosity and fulfills anticipation; thus maintaining and at the same time creating interest. The disclosure of information is purposeful and dramatic.(4)

as literature generally seeks to expand the mind.

Language and literature are both affected by time. Literature will either endure if valued as society progresses or it will be discarded. In a similar way, architecture will be preserved if valued in the environment.

SUMMARY

"To point or to scream is to communicate, but the need for more complex communication requires a process or method which is itself more complex. Communication is a transfer of information or ideas from a source to a receiver." (5)

Communication is essential if architecture is to be understood by man. If a group of people have a common language in order to communicate, then in order to understand their built environment they must also understand the three-dimensional language of the architect. Because the concept, process, and format of written language are similar to the concept, process, and format of architecture it follows that a useful

analogy can be drawn between the two. Using language as a simile for architecture helps to explain the roles of communication in architecture.

SIGN & SYMBOL

Sign and symbol are an inherent part of communication. A sign is something which indicates an accepted and specific meaning or fact. A symbol on the other hand is something which represents an abstract idea or object. A sign can usually only mean one thing while a symbol is subject to interpretation and can mean many things. A sign can only be a sign whereas a symbol can be both a sign and a symbol.

An example of a sign and a symbol combined to communicate one meaning is the "STOP" sign (Fig. 5). There are three distinguishing characteristics: the word STOP, the color red and its octagonal shape.

The word STOP is a sign; it has only one meaning. The color red is a symbol which has become associated with the word STOP and has generally become associated with danger, among other things. The octagon is

Fig. 5
"STOP" sign

Signs are frequently placed on backgrounds of different symbolic shapes. "STOP" signs are octagonal in shape. "YIELD" signs are equilateral triangles with one point downward. Other regulatory signs are rectangular in shape with the longer dimension vertical. (6)

simply a geometric shape. By consistently using the octagon as a background, the octagon has become associated with "STOP." Any one or all three characteristics indicate "STOP." The elements reinforce each other to communicate the intended meaning.

Sign and symbol in the physical world are analogous to the tangible and the intangible in the architectural world. The tangible can be considered the mass of a building while the intangible can be considered the perception of the space created by the mass. The tangible describes a physical characteristic while the intangible attempts to describe the experiential characteristics of the space.

Architectural signs and symbols are vital to an understanding of the built environment; therefore architectural signs and symbols ought to be familiar to everyone. The interpretation of the STOP sign controls a tangible thing which is motion; the interpretation of architectural form controls an intangible thing which is the perception of space.

Making "push-pull" handles which clearly express their function is an

Fig. 6
Entrance Detail
AIA Headquarters
Washington, D. C.
1970
The Architects Collaborative

example of sign and symbol in our culture (Fig. 6). In the illustration the general form of the handles is a symbolic way of communicating at a distance that this particular section of glass is the entrance. The specific orientation of the handles identifies the horizontal bar as a sign meaning push and the vertical bar as a sign meaning pull, designed in reaction to the forces of the body in motion. By perceiving both bars through the glass the intended function of each is reinforced; a direction has been established for the movement of the doors.

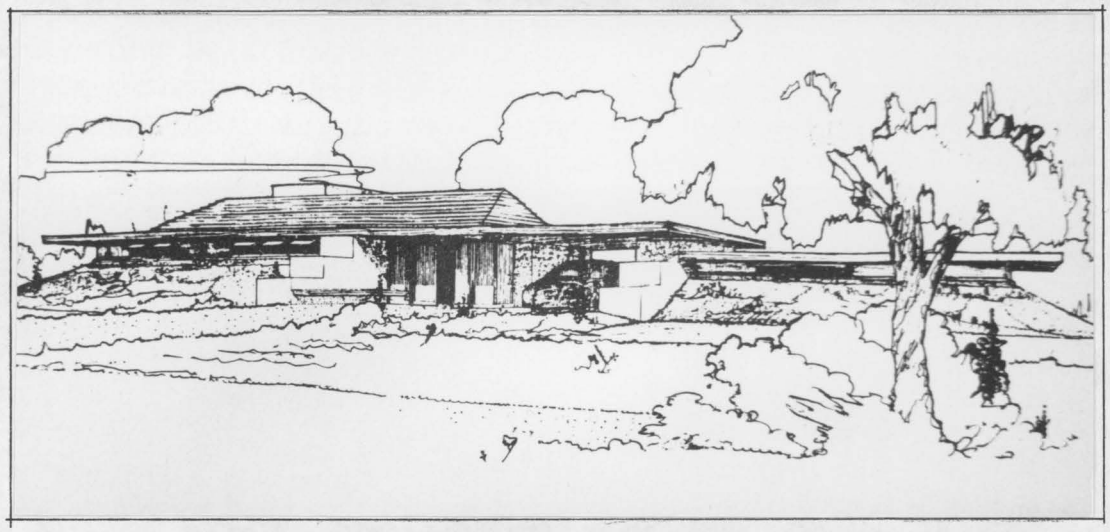


Fig. 7
Berm House
Cooperative Homesteads, project
Detroit, Michigan
1942
Frank Lloyd Wright, architect

A basic reason for creating architecture is for shelter: shelter for working, shelter for entertainment, and shelter for living. Architecture is a medium protecting man from elements in his natural environment.

Shelter and communication are universal phenomena. Language is a specific form of communication which is limited to a culture and a locale. Architecture is a specific form of shelter which is also limited to a culture and a locale. Architecture and language make use of signs and symbols, common to a culture, to communicate. Shelter is communicated in part through the use of signs and symbols.

A roof is universally understood as a symbol of shelter (Fig. 7). As a sign the roof represents a tangible form which will protect man. The shape and size of the roof give a feeling of protection. This intangible feeling is more important than the protection the roof provides in reality.

SUMMARY

Architecture is a language in that it communicates. Architecture and written language are similar in their concepts, processes, and formats; therefore the linguistic analogy is useful. The linguistic analogy is further supported since both architecture and language use signs and symbols to communicate. Through the form of signs and symbols architecture fulfills the need for shelter.

There is a form to architecture and language which varies according to culture and locale. The form for architecture is three-dimensional. If architecture is to be likened to language then architecture is a

three-dimensional language for communicating a sense of shelter, function and movement.

CHAPTER 2
THE COMMUNICATION OF FUNCTION

INTRODUCTION

Architecture can communicate the function of a building. Form is the vehicle for communicating function. A building's design may be conducive to revealing its function and general organization. Because man perceives architecture first from the outside of a building, the exterior facade should be a reflection of the interior organization. For a given instance the sooner communication begins between man and his environment the sooner he can understand and make better use of it. As Louis Kahn so aptly stated, "What does the building want to be?" To be more specific, how does the function of the building want the space to be manifested in form and how does the building communicate. (7)

The architectural language of Japan, in terms of form, will be used as an example to put the architecture/language simile into context. An architectural language of patterns will be used to illustrate a method of design in terms of function.

THE ARCHITECTURE OF JAPAN

An illustration of how architecture works as a language may be seen in the architecture of Japan. From the simple level of the design of the eating utensil to the complex level of architectural and environmental design, the Japanese show the same exquisite concern for refinement of form as they do for organic integration. Broadly speaking, the Japanese, within their own artistic and architectural limits, have reached the highest state of refinement. (8)

The Japanese eating utensil, o-hashi, known in this country as chop-sticks, are nothing more than two small thin pieces of wood. Without knowledge of their use, the westerner would probably think they were of little or no value. The Japanese is so adept at using these utensils that he can manipulate them as westerners manipulate a fork, and under certain circumstances the Japanese can use the o-hashi as we use a knife. From one point of view these simple sticks can be seen as remarkably complex since they can be used so universally. For serving the purposes of the Japanese the o-hashi is perfect. To the westerner, who demands that his meat be cut with a sharp instrument, and his vegetables be speared with a fork, the o-hashi is vastly inadequate and even crude. For each cultural environment form communicates the meaning of how an object functions.

The Japanese have their own set of values for architecture. The available building materials are weak and easily destroyed. The materials respond admirably to the destructive forces of the cli-mate. The Japanese have developed a perfect use of form for their climate. If a building is damaged by earthquake, rain or fire the

loss is not as great as in the western world. The house is designed for destruction in that parts can be recycled or easily replaced.

The use of paper as a wall material is perfect within the Japanese framework. It is cheap, it diffuses light well, and it is lightweight. Paper walls can easily be moved to facilitate ventilation in summer. Houses are raised off the ground to further facilitate ventilation and to escape the moisture of the earth (Fig. 8). The Japanese have responded to the limitations imposed by weather and have developed a

Fig. 8
Nijo Castle
Kyoto, Japan
c. 1627

Fig. 9
Inner Garden, Heian Shrine
Kyoto, Japan

The Japanese garden is designed to be enjoyed from many points of view. The designer makes the garden visitor stop here and there, perhaps to find his footing on a stone in the middle of a pool, so that he looks up at precisely the right moment to catch a glimpse of unexpected beauty. (9)

perfect synthesis of natural environment and social necessities.

The Japanese garden (Fig. 9) is an extension of the house. The supports of some houses are left in their natural tree-like state. The view of the garden from inside seems uninterrupted by architectural elements, giving the effect of sitting amongst the trees while remaining protected inside.

In a garden the Japanese want to see green throughout the year. Their gardens will rarely have flowers in them; this is an unthinkable idea for a western garden. Since flowers are seasonal, evergreens and mosses are preferred over flowers. The Japanese is willing to give up the transient beauty of flowers so that he may enjoy the perfection of a garden forever green.

The form the Japanese use in their environment is a consistent, all-encompassing architectural and cultural language. The simple design of the eating utensil is in contrast to its multiple use. The simplicity of architecture is an equally complex reaction to the Japanese

environmental and cultural milieu. The garden which is inseparable from the house is environmentally consistent with the climate of Japan and perfectly refined within the framework of Japanese thinking.

A PATTERN LANGUAGE

An architect who commonly speaks of architecture in linguistic terms is Christopher Alexander. Architecture as a simile for language has become the basis for much of his work. Through his study of architecture, Alexander has transformed the concept of "sentence" into an architectural analogy which he calls "patterns." By the use of patterns Alexander designs a characteristic form to fit similar functions through signs and symbols which are understandable to our culture.

"A pattern is an invariant field, needed to solve a certain recurrent problem, expressed as an entity which should exist in the world, with instructions so concrete that anyone can make one and with its functional basis so clearly stated, that everyone can decide for himself whether it is true, and when, and when not, to include it in his world." (10)

Fig. 10
Apartment House

The facade should never be a thing separately conceived. Like the skin of an animal it is the outer limit of a vital system; it is protection against the world and at the same time it is the point of contact and interaction with the world. (11)

"A pattern language is a language in exactly the same sense as an ordinary language. It is a system which allows its users to create an infinite variety of those three dimensional combinations of patterns which we call buildings, gardens, towns." (12)

Alexander in his forthcoming book, The Timeless Way of Building, develops a method of design which analyzes the function of isolated architectural components. From this analysis, Alexander discovers patterns appropriate to particular situations. Although Alexander designs in terms of patterns, he stresses that the environment is not experienced in patterns but as a whole just as we speak in sentences in order to communicate ideas. In this way he has developed a checklist for qualitative standards of architectural design. Alexander says:

"Any particular building we are looking at is a combination of ideas. Even if these ideas are individually valid, I shall want to use them in other buildings, in other combinations, and not in this particular combination. I shall not be able to do this, unless I know just where one idea stops and another begins. I must therefore be able to identify ideas that are, in some sense, atomic. The normal presentation of buildings -- plans, sections, photos, does none of this for me. The ideas are not expressed in a usable form." (13)

Alexander presents and describes each pattern as an individual unit. Each pattern is reduced to its simplest atomic state so that patterns can be combined with a minimum of conflict.

THE USE OF PATTERNS

A pattern language works essentially by differentiating space. The designer must first trace his design problem to its functional origins and be able to find some sort of pattern in them. He extracts those properties which will make a successful pattern. A function is

Fig. 11
Entrance Detail
Toronto City Hall
Toronto, Canada
1965
Viljo Revell, architect

abstracted and a form is found to fit that function. When the functional qualities of a space have been analyzed, a pattern can be abstracted for reproducing those qualities in another situation. (14)

The entrance pattern as defined by Alexander suggests the need for an emotional breathing space between the street and the building to be entered. A covered entrance transition space (Fig. 11) serves this practical need. In inclement weather the space is a place to come in out of the rain, shake an umbrella, stomp one's feet, and ready oneself to enter the building. The space may be a place to wait for a taxi in the cold or to pause for shade in the summer heat. The entrance pattern fulfills one function in the pattern language of an entire building.

Another of Alexander's patterns suggests changing direction as one approaches an entrance. "Make a path between the street and the front door of the house, pass through a transition zone where it changes direction, changes level, changes surface, has a change of view, and a change of light qualities." (15)

The entrance to Osaka Castle in Osaka, Japan is a beautiful example of the pattern which suggests a change in direction. The castle sits on a citadel surrounded by a moat. As one approaches one generally walks in a direction perpendicular to the castle. The entrance is not visible yet due to trees in the foreground. As one ascends a steep flight of stairs flanked by two high walls of stone the castle is almost obliterated from sight. Suddenly, at the top of the stairs one turns and the lintel of the doorway is visible (Fig. 12). Although the entrance is in sight at last, one is forced through an ascending

Fig. 12
Main entrance
Osaka Castle
Osaka, Japan

S-shaped transitional curve to finally reach the entrance.

Architecture gets its power as a creative medium because it is a fluid and continuous field of patterns quite similar to ordinary language. It gives the person who uses it the power to create an infinite variety of new, unique, and practical buildings just as his ordinary language gives him the power to create an infinite variety of sentences. (16)

Alexander's perception of space is dynamic because it is related to

action -- what can be done in a given space -- rather than what is seen by passive viewing. (17)

SUMMARY

Form is the language of architecture. Form is the vehicle for function to be communicated in architecture. Japanese architecture is a language which consistently communicates its function and simplicity of form. A pattern language, as a design tool, requires that the function of the building be clearly understood before design begins. A form is now presented that is understood by all in the specific culture by using signs and symbols. By following this process architecture clearly communicates its function through form.

CHAPTER 3
THE COMMUNICATION OF MOVEMENT

INTRODUCTION

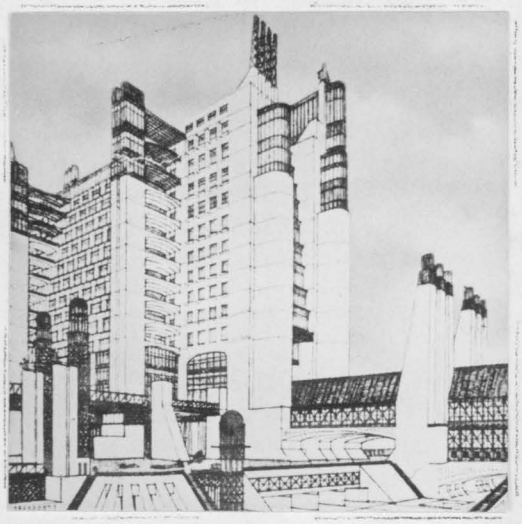
Function manifested in form anticipates the need for movement in the environment. Movement involves defining a direction. Direction can be established through the use of view and path as they are related to form. View, path, and form are the elements that go into creating the approach, entrance, and circulation pattern of each building.

The concept of movement was the obsession of a group of artists known as the futurists in the early part of the twentieth century. The problem of depicting four dimensions, the fourth being time, in a two-dimensional painting or a three-dimensional sculpture was a new challenge no one had yet attempted (Fig. 13).

Among the group of futurists was an architect, Antonio Sant'Elia. In his drawings, movement and circulation are the dominant themes. Sant'Elia turned his buildings inside out, placing elevators and stairwells on exterior walls. These became expressive elements and revealed how movement occurred in the building (Fig. 14). By placing vertical

Fig. 13
"Nude Descending a Staircase, No. 2"
Oil on Canvas 58" x 35"
Philadelphia Museum of Art
1912
Marcel Duchamp

Fig. 14
"Futurist City"
1914
Antonio Sant'Elia



circulation on the exterior one would have an understanding of the environment one was about to enter; an understanding of how the building functions. The dialogue Sant'Elia wished to establish is quickly recognized and understood. His sketches reflect movement and explain themselves without the use of words because movement is communicated in the form.

"In order to design for movement, a whole new system of conceptualizing must be undertaken. Our present system of design and planning are inevitably limited by our techniques of conceptualizing and our methods of symbolizing ideas. We know only how to delineate static objects, and so that is all we do. . . . Since we have no techniques for describing the activity that occurs within spaces or within buildings, we cannot adequately plan for it, and the activity comes, in a sense, as a by-product after the fact. It is true that any good designer or planner will think, while he is designing, of the activity that eventually will occur within his spaces. But he cannot design the movement, for he has no tools to do so. . . . The environment exists for the purpose of movement." (18)

The initial encounter with a building is primarily concerned with directional orientation. As an illustration, the use of an entrance gate, a directed path, a bridge, a change of direction, and textural paving are combined as part of the architectural experience of approaching a Japanese temple or shrine. To be effective an entrance, which is a transition point in directional orientation, should be boldly emphasized. This can be accomplished through a change in level, bold forms such as concavity and convexity, or a preview should be given into the interior by the use of transparency. Interior circulation continues the direction for movement initiated by the approach and entrance. The design of circulation requires a perception of the building as a whole. Circulation is accomplished through the use of corridors, stairs, and ramps.

APPROACH

The experience of entering a building really begins on the street. Before reaching a destination certain impressions are formed of the environment one is approaching. (19)

The defining of a direction has been perfected in the approach to Japanese religious architecture. A distinguishing feature of Shinto shrines in Japan is the presence of a torii. The torii is a sort of gate-frame composed, in its simplest original form, of two vertical

Fig. 15
Ichi-no-torii (First Gate)
Meiji Shrine
Tokyo, Japan

posts supporting two horizontal ones (Fig. 15). Though it is neither a shelter nor a fortification the torii is monumental in scale and in effect; an orientation marker of religious significance. The torii is a symbol of good luck, and it is often painted red which is a color symbolic of happiness to the Japanese

Although the torii provides no protection and creates no space, passing underneath its lintel produces a feeling of compression overhead. An experience does take place. Anticipation is created for the journey

to the temple which is still out of sight. The only equivalent to this form, in the west would be the Arc de Triomphe in Paris or Saarinen's Gateway Arch in St. Louis. Both are so monumental that no feeling of compression or anticipation is created. They are climactic monuments in themselves. The Gateway Arch is only symbolic of a gateway. No road or path passes underneath the Gateway Arch; the experience of passing underneath is lost. To a foreigner in Japan the symbolic qualities of the color red and the torii's geometry become part of an easily understood architectural language. This is in contrast to the polysyllabic

Fig. 16
Entrance Detail
Ryoanji (Rock Garden)
Kyoto, Japan

"Most religious sequences involve the emphasis of a sense of transition from the profane or commonplace world to a sacred area or location. In some cases this is accomplished by requiring the expenditure of a considerable physical effort. The more usual means employed to accomplish this effect is by the establishment of one or more hierarchially-ranked zones, and by formally signalling the transition from one precinct to the next by means of a gate, a change of level, a turn, or similar differentiations. By these tangible devices an ineffable change is announced and a metaphysical distinction is established." (20)

word structure of the Japanese language which takes years to master.

Each main temple normally has three torii. The first one, ichi-no-torii, marks the entrance to the sacred precincts while the other two are at varying distances between the first one and the holy of holies. When the built-up area of the locality has encroached upon the grounds formerly allotted to the temple, the ichi-no-torii may eventually find itself in a commercial district (Fig. 17). Even in such a case however, it retains its religious value and marks the beginning of the

Fig. 17
Processional route to
Hachimangu Shrine
Kamakura, Japan

Fig. 18
Approach
Ginkakuji (Silver Pavilian)
Kyoto, Japan

By denying visual access one becomes more aware of the sounds and smells of the environment. Though emptiness is thought to be negative it serves as the reminder of a direction. (21)

approach to the temple.

The avenue of approach to the shrine should not be a straight line (Fig. 18). Somewhere between the first torii and the shrine there should be a bend, as it would be disrespectful to walk straight towards the sanctuary.

Normally the visitor has to cross one or several bridges before he can reach the actual temple. The idea is that water is a great purifier and that a rivulet, however small, is an effective barrier against anything evil. By crossing it, one leaves behind some portion of whatever he may have in himself that is undesirable and therefore becomes fit to enter a purer area.

On the way from the entrance to the central temple buildings, the visitor always passes a te-mizu-ya, a small structure covering a basin of water, on which lie one or more ladles. The visitor is expected to use the water for washing his mouth and hands before proceeding further. (22)

These transitions which occur enroute to the temple heighten anticipation between the world one has left behind at the ichi-no-torii and the religious sanctuary one is approaching.

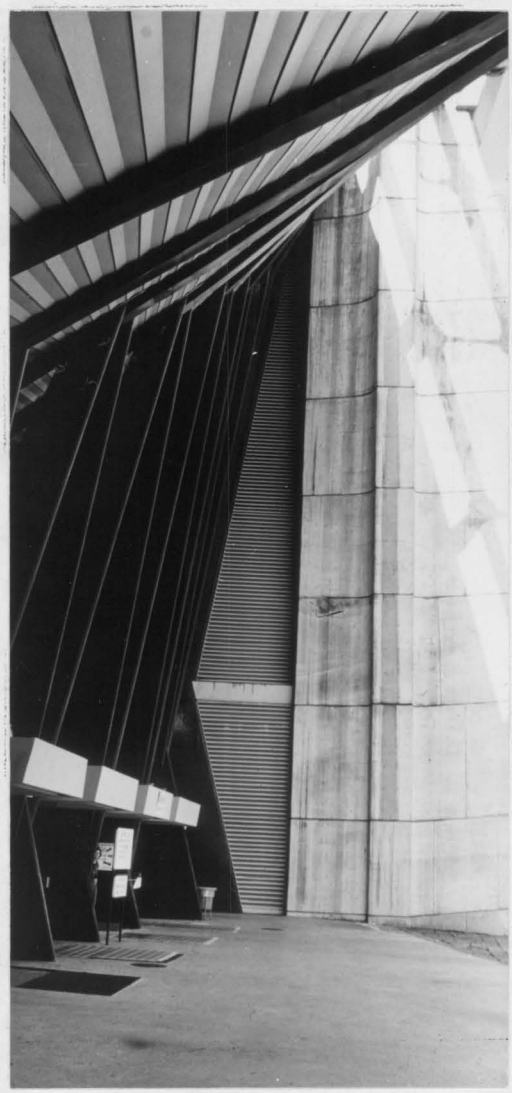
In general the particular characteristics of both Shinto shrines and Buddhist temples which are of interest here are their concern for the direction of movement through the environment. The orchestration of this movement in integration with environmental features is merely the approach portion of the total religious experience. (23)

ENTRANCE

"Whether entrances of themselves are inviting or not depends in part on their absolute height and width. A low, wide entrance is infinitely more appealing than a tall, high one. Its lowness suggests shelter, its width generosity." (24)

An entrance is the culmination of an approach and should be a turning point in the progression towards a direction. A change of level signifies such a culmination. Geometry is also significant upon entering for

Fig. 19
Entrance
Yoyogi Olympic Stadium
Tokyo, Japan
1964
Kenzo Tange, architect



"The entrance is a place of signs and portents. This is true even of one's own door, even when the process of getting to and through it has become automatic. The tone of one's wife's voice, the noises of the house, the identity of an unexpected guest, all may mean much for the time to come. Under the impact of the experience the shy withdraw into themselves, the ill at ease make faux pas, the agressive overplay their roles. Surely then, the essential function of an entrance is to make it easy for people to be friendly." (25)

it symbolizes invitation in broad gestures such as concavity or convexity. Transparency crosses the lines of approach and circulation both by allowing visual access into the next stage of the progression.

CHANGE OF LEVEL

Rising a few steps at an entrance elevates one physically as well as psychologically. An entrance has some of the qualities of mystery for beyond the entrance is an unknown world. It is the direction which needs to be emphasized during an approach. In an entrance the destination must be identified and a marked transition must take place (Fig. 20).

Fig. 20
Bailey Library, Hendrix Coll.
Conway, Arkansas, 1967
Philip Johnson, architect

"Below level produces intimacy, inferiority, enclosure and claustrophobia, above level gives exhilaration, command, superiority, exposure and vertigo; the act of descending, implies going down into the known and the act of ascending implies going up into the unknown." (26)

CONCAVITY

Concavity has the power to create a void in a solid object thus setting it off from the rest of the facade. A recess in a flat surface will draw the needed attention to an entrance through the changing qualities of light that will either light or shade it.

H. H. Richardson understood the dynamics and emotional effect of a concave entrance. Richardson often used the Roman arch to articulate entrances in his buildings (Fig. 21). In the Glessner house, the last house he designed before his death, the back entrance stands in stark contrast to the rest of the facade, and this identifies it as an entrance through the use of concavity. The stone railing graphically points to the door which is hidden out of sight to the left. Richardson realized the arch is an exciting form; the stones forming the arch seem suspended in mid-air.

Fig. 21
Glessner House
Chicago, Illinois
1887
H. H. Richardson

Fig. 22
S. Maria della Pace
Rome, Italy
1656-57
Pietro da Cortona

CONVEXITY

A convex form can be as equally as effective as a concave form as an entrance. Although these two forms are in opposition to each other this is of no importance; it is lack of contrast that should be avoided in an entrance rather than a specific form being required.

In the church of S. Maria della Pace (Fig. 22) a combination of both concavity and convexity are used to create a facade which collectively adds to the form of the entrance. In the foreground, the portico projects far out into the small piazza in front of the church. This projection acts as a transitional space between the piazza and the doorway. Since it does project outward the shaded area underneath is in deep shadow and creates a concave feeling within a convex form. The second story in the background is a receding concave form which further emphasizes the convexity of the portico. Through the intertwining of concave and convex forms the entrance invites one to enter.

TRANSPARENCY

Transparency can give a view into the future of the building; a look into the area to be penetrated. The Larkin Building designed by Frank Lloyd Wright, was the first building to use plate glass doors. The doors act only as a physical barrier, not a visual hinderance. The visitor visually penetrates the space before one is even inside (Fig. 23).

Entrance is the culmination of approach. It requires a language of contrasts to signify an event is taking place. Transparency can make the transition between the outside and the inside smoother through the

Fi. 23
Lobby Area
Larkin Building
Buffalo, New York
1904
Frank Lloyd Wright, architect

use of view.

CIRCULATION

Circulation is the next stage in the process of moving through the environment towards a goal. Corridors, stairs, and ramps continue the language of architecture because they are identified as generators of movement which establish a direction.

The special quality of moving from room to room, or from one part of a house to another is that it is a transitional experience. One is suspended between the distinct atmosphere of the room one has left, and the room one approaches. Nothing much is done in corridors. They are connections between a task just ended and one about to begin; a lull between parts of a sequence of actions. Corridors often catch one in a sort of psychological pause. (27)

"A great wide and beautiful curved staircase is not only valuable for itself but evokes a sense of luxury, scale, importance, and ease. Stairs lend themselves to dramatic effects better than any other

element of houses (Fig. 24). They can create interpenetration of space, balconies, long sinuous lines, and great heights, against which people look and feel more significant." (28)

An example from the baroque is Guarini's main staircase at the Palazzo Carignano. The evolution of the Italian palace stairway, reached its culmination in the Palazzo Carignano. A carefully considered sequence of light and dark, open and closed spaces directs the visitor to the main salon.

Fig. 24
State Service Center
Boston, Massachusetts
1971
Paul Rudolph, architect

"Stairs are dramatic for four reasons. One is seen and sees people on stairs in motion, which in itself is fascinating. Variations in height are tremendously potent, subjectively as they produce sensations, and objectively as they create interesting effects. Stairs are meeting grounds; they ascend from unseen regions above or descend into unseen depths below, they express the possibility of sudden encounters. And fourth, the action of ascending or descending is easily translated into other terms, as gayety or gloom, or as emotional heights and depths." (29)

Fig. 25
Exterior
Palazzo Carignano
Turin, Italy
1679-92
Guarino Guarini

Fig. 26
Ground Floor Plan
Palazzo Carignano
Turin, Italy
1679-92
Guarino Guarini

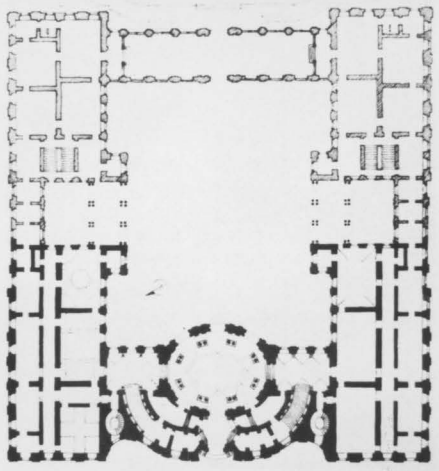


Fig. 27
Main Staircase
Palazzo Carignano
Turin, Italy
1679-92
Guarino Guarini

As seen from the piazza, the broad sweeping curves of the facade of the palace are ruptured, allowing a bit of the interior to bulge outward at the entrance (Fig. 25). Entering the palace through the bulge the visitor finds himself in a small dark vestibule which leads beyond into a half-lighted oval atrium which opens out onto the courtyard (Fig. 26). The long side of the oval is parallel to the facade and perpendicular to the entrance. The long axis leads on either side to a few steps that enter a well-lighted rectangular vestibule. Up to this point no main staircase has been in evidence. From either vestibule, however, convexly curved treads of the duplicate main stairs flow through a stair hall that is lighted only by windows at a landing which is half-way up the flight (Fig. 27). At the landing the treads reverse their curvature and become both welcoming and inviting. At the top of the flight there is a tall, rich, extremely well-lighted vestibule, before the main salon directly above the entrance. A circuit is completed. The logic of the exterior and interior is clear. (30)

The ramp is another device for vertical circulation, and no recent

Fig. 28
Central Ramp
Carpenter Art Center
Harvard University
Cambridge, Massachusetts
1963
Le Corbusier, architect

designer other than Le Corbusier has used it so long and so well to demonstrate spatial experience. Le Corbusier's only building in this country -- the Carpenter Art Center (Fig. 28), at Harvard University is a building transfixed by a ramp; a building whose form is predicated on the circulation system of the diagonal intersecting footpaths that criss-cross the open spaces of Harvard Yard. (31)

Ramps are more easily negotiable than stairs and as one descends a ramp movement is accelerated. Whereas a stair suggests movement through

Fig. 29
Atrium
Larkin Building
Buffalo, New York
1904
Frank Lloyd Wright, architect

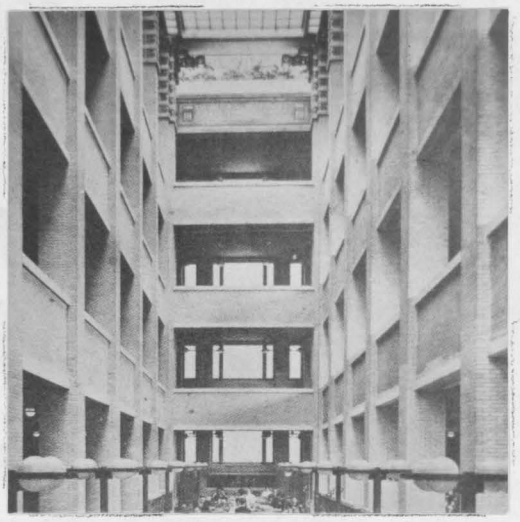


Fig. 30
Atrium
Guggenheim Museum, New York
1959
Frank Lloyd Wright, architect

horizontal and vertical planes a ramp produces movement due to its diagonal form.

In the work of Frank Lloyd Wright it is of interest to note the similarity of concept that remained static over the years. The parallel can be seen in the circulation patterns of the Larkin Building, 1904 (Fig. 29), and the Guggenheim Museum, 1959 (Fig. 30), more than fifty years apart. Once in the central core of either of these buildings, one has a view of the entire interior. One perceives at a glance the width, depth, height, and method of circulation through the building.

Natural light can be an important aid in the circulation of a building since the presence of natural light suggests the limits of the building and provides a direction for movement. Wright's method of naturally lighting the Guggenheim is organically integrated with a system for keeping the public out of reach of the art exhibits (Fig. 31). In this way one can enjoy visual access while physical access is denied without an actual barrier.

Fig. 31
Lighting Detail
Guggenheim Museum, New York
1959
Frank Lloyd Wright, architect

SUMMARY

Approach, entrance, and circulation are all part of the collective process of moving through the built environment. The approach to a Japanese shrine is an architectural experience itself which compels one forward through several transitions. Because an entrance is a turning point in a progression an architect uses contrasts to emphasize that a change is about to occur. Circulation uses dramatic forms to move one swiftly towards a destination. Communication is essential to understanding how one moves through each progressive stage towards an architectural goal.

CHAPTER 4

MOVEMENT IN THE CITY

INTRODUCTION

As each individual building communicates movement by establishing a direction, the city also establishes a direction for movement in a universal way. The city also incorporates the elements of view and path as they are related to form. Le Corbusier's "City for 3,000,000" made extensive use of the idea of view in order to establish a direction within the city. The use of the path in Sistine Rome gave the city the ordered sense of direction needed to organize movement through the city. Movement was one of the ideas behind creating the form of Amos Chang's hexagonal city.

Le Corbusier presented his plan for a "City for 3,000,000" at the Autumn Salon in Paris in 1922. His plan was heavily influenced by the traditional design of European cities in which the central crossroads point provided an open plaza area where large numbers of the city's residents could congregate for commercial or religious reasons and exchange ideas among themselves and with travelers.

Le Corbusier's city center was designed as a multi-level transportation crossroads with a plaza and a cultural center adjacent. His concept was to direct density vertically instead of horizontally to provide for a maximum of cultural and intellectual exchange resulting from density and yet leave enough horizontal space between structures to provide for adequate vehicular movement underground with recreation area on top.

Buildings in this central urban area were designed as 60 story structures set widely apart with wide circulation corridors between for speedy movement through the city. Each structure was cruciform in plan creating a greater surface skin and thus providing for maximum view. By organizing these structures on a rectangular grid, clear avenues for movement could be perceived on the ground as well as 60 stories in the air.

It has been found that the feeling of being at home in a city depends very much on the possibilities of finding one's way around. Before starting a walk or a drive in one's home town, one already has a more or less clear image of the path one will take. (32)

Sistine Rome is an example where the one-day pilgrimage of seven basilicas was facilitated by Pope Sixtus V's improvements of straight connecting roads between points of devotion distributed throughout the city. The three-point perspective gives the visitor the choice of a direction to take (Fig. 32). An understanding of the city was suddenly perceived by creating a view down three straight paths originating at one point. The shrines were further heightened in effect by identifying them with landmarks of columns or obelisks in a piazza framing the facade of each church. (33)

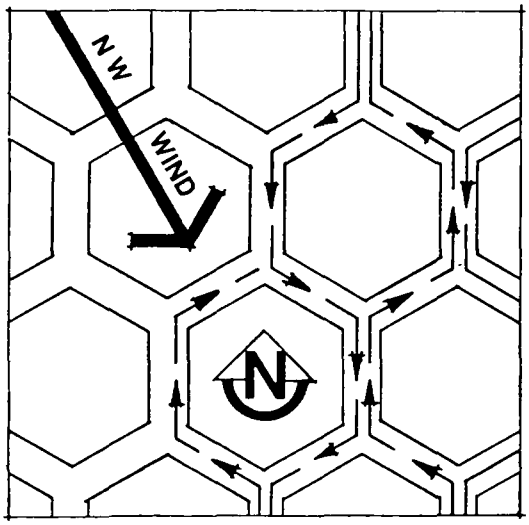
Fig. 32
Piazza del Popolo
Rome, Italy
1816

Amos Chang, professor at Kansas State University designed a city in which the form controls how the architectural environment will develop as well as how movement will occur along its circulation corridors. To do this Amos Chang has designed a city to be laid out on a hexagonal grid.

Instead of having four corners to a block, valuable commercially to merchants, there would be six corners to every block with an axial approach to each corner. The visual angle of both the driver and the pedestrian would be greatly changed from present street conditions. Following the pattern of a hexagonal city, a person has a much better chance to experience the three dimensionality of each building. Perception of the city would change since we could now literally see more of the city. (34)

Circulation in this type of city may seem awkward until one examines the implications more closely. A hexagonal city would create two more intersections per block than a rectangular city grid but each intersection would consist of three streets coming together rather than the

Fig. 33
Amos Chang's hexagonal city



usual four. Theoretically, the intersection would be less congested and better able to facilitate the speed of traffic. (35)

The pattern of weaving through the city, instead of traveling down long straight boulevards seems absurd. The driver might be willing to follow this weaving pattern if the intersections along the way allowed for a smoother less interrupted passage. Traffic would never actually cross as in a rectangular grid, but merely merge with yielding streets. Professor Chang has conceived of a feasible system of one-way streets (Fig. 33) which would further cut down on traffic congestion and turn the street system into a more fluid traffic control situation.

SUMMARY

The language expressed in each of these city plans is an attempt to communicate the direction of movement in the city through view, path, and form working together. The plan of Le Corbusier allows for density in the city while at the same time allowing a view and therefore an understanding of movement in the city. The accessibility of Sistine

Rome is made possible by creating a network of straight roads in such a way that would provide a direction toward a goal. The hexagonal grid's primary advantage is that through its form it decreases congestion at intersections and provides for a less interrupted journey through the city thus facilitating movement.

CHAPTER 5

CONCLUSIONS

Man's relationship with the built environment is a complex system of communication. This relationship can be described as a dialogue, a part of an architectural language in that man is constantly perceiving and responding to the form of signs and symbols in his environment.

If the aspects of the environment that deal with communicating shelter, function, and movement can be seen as a pattern like the pattern of words brought together to form a language which is understood by a large number of people, then architecture is responding to the needs of man and man is responding to the full potential of his environment. Describing architecture as a language whose basic mode of communication is form suggests a design criteria based on how man perceives and responds to what the architect's design is trying to communicate.

FOOTNOTES

(1) Christopher Alexander, The Timeless Way of Building, Vol. I (Unpublished Draft), p. 280-281

(2) Peter Collins, Changing Ideals in Modern Architecture, 1750-1950 (Montreal, Canada: McGill University Press, 1965), p. 173

(3) James Marston Fitch, "For the Theatrical Experience, An Architecture of Truth," Arts in Society, Vol. 4, No. 3 (Madison, Wisconsin: University of Wisconsin, 1967), p. 492

(4) Gyorgy Kepes, The Nature and Art of Motion (New York: George Braziller, Inc., 1965), p. 184

(5) Nathan Knobler, The Visual Dialogue (New York: Holt, Rinehart & Winston, Inc., 1971), p. 45

(6) Gyorgy Kepes, Sign, Image, Symbol (New York: George Braziller, Inc., 1966), p. 122

(7) Vincent Scully Jr., Modern Architecture (New York: George Braziller, Inc., 1974), p. 38

(8) Steen Eiler Rasmussen, Experiencing Architecture (Cambridge, Massachusetts: The M. I. T. Press, 1962), p. 100

(9) Edward T. Hall, The Hidden Dimension (Garden City, New York: Doubleday & Co., Inc., 1966), p. 143

(10) Alexander, op. cit., p. 259

(11) Susanne K. Langer, Feeling and Form (New York: Charles Scribner's Sons, 1953), p. 100

(12) Alexander, op. cit., p. 144

(13) Ibid., p. 236

(14) Ibid., p. 8

(15) Ibid., p. 249

(16) Ibid., p. 6

(17) Hall, op. cit., P. 108

(18) Constance Perin, With Man in Mind (Cambridge, Massachusetts: The M. I. T. Press, 1970), p. 89

(19) Philip Thiel, Towards An Envirotecture (Unpublished Draft), Chapter 2, p. 43

(20) Ibid., p. 11-12

(21) Amos Chang, Intangible Content in Architectonic Form (Ann Arbor, Michigan: University Microfilms, 1974), p. 21

(22) Thiel, op. cit., p. 14-15

(23) Ibid., p. 17

(24) Ibid., p. 43-44

(25) Ibid., p. 43

(26) Gordon Cullen, The Concise Townscape (New York: Van Nostrand Reinhold Co., 1976), p. 38

(27) Thiel, op. cit., p. 48

(28) Ibid.

(29) Ibid.

(30) Ibid., p. 49

(31) Ibid., p. 52

(32) Sven Hesselgren, The Language of Architecture (Essex, England: Applied Science Publishers, 1972), p. 246

(33) Thiel, op. cit., p. 21

(34) Amos Chang, Speculation on Overall Feasibility of Radical City Form (Report Presented at the 1973 National Development Seminar, Taipei, Taiwan, 1973), p. 18

(35) Ibid., p. 16-18

ILLUSTRATION SOURCES

Fig. 1 Author

Fig. 2 Author

Fig. 3 Author

Fig. 4 Author

Fig. 5 Author

Fig. 6 Author

Fig. 7 Frank Lloyd Wright, The Natural House (New York: Horizon Press, Inc., 1954), p. 150

Fig. 8 Author

Fig. 9 Author

Fig. 10 Author

Fig. 11 Author

Fig. 12 Author

Fig. 13 Nathan Knobler, The Visual Dialogue (New York: Holt, Rinehart & Winston, Inc., 1971), p. 189

Fig. 14 Sigfried Giedion, Space, Time & Architecture (Cambridge, Massachusetts: Harvard University Press, 1971), p. 321

Fig. 15 Author

Fig. 16 Author

Fig. 17 Author

Fig. 18 Author

Fig. 19 Author

Fig. 20 G. E. Kidder Smith, Architecture in America, Vol. 2 (New York: American Heritage Publishing Co., Inc., 1976), p. 605

Fig. 21 Ibid., p. 812

Fig. 22 Steen Eiler Rasmussen, Experiencing Architecture (Cambridge, Massachusetts: The M. I. T. Press, 1962), p. 69

Fig. 23 Frank Lloyd Wright, The Early Work (New York: Bramhall House, 1968), p. 133

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Fig. 25 Henry A. Millon, Baroque & Rococo Architecture (New York: George Braziller, Inc., 1961), plate 31

Fig. 26 Ibid., plate 32

Fig. 27 Ibid., plate 33

Fig. 28 Sigfried Giedion, Space, Time & Architecture (Cambridge, Massachusetts: Harvard University Press, 1971), p. 556

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Fig. 30 William Jordy, American Buildings & Their Architects, Vol. 4 (Garden City, New York: Anchor Press/Doubleday, 1976), p. 322

Fig. 31 Author

Fig. 32 Sigfried Giedion, Space, Time & Architecture (Cambridge, Massachusetts: Harvard University Press, 1971), p. 151

Fig. 33 Author from Amos Chang, Speculation on Overall Feasibility of Radical City Form (Report Presented at The 1973 National Development Seminar, Taipei, Taiwan, 1973), drawings 4 & 12

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ARCHITECTURE AS A THREE-DIMENSIONAL LANGUAGE

by

John Homer Carey

(ASBTRACT)

"Architecture As A Three-Dimensional Language" is defined as a communication between architect and man manifested in form. It is useful to make an analogy between architecture and language since the purpose of both is to communicate.

Communication requires the use of signs and symbols. In architecture form communicates meanings through signs and symbols. Some meanings communicated in architecture through signs and symbols demonstrate a sense of shelter, function, and movement. Function manifested in form anticipates the need for movement in the environment. Movement involves defining a direction. Direction can be established through the use of view and path as they relate to form. These elements create the approach, entrance, and circulation pattern of each building. As each individual building communicates movement by establishing a direction, the city also establishes a direction for movement in a universal way.

Describing architecture as a language whose basic mode of communication is form suggests a design criteria based on how man perceives and responds to what the architect's design is trying to communicate.