

The Perception of Illumination:
The Phenomenological Dimensions of Natural Light
in the Making of an Urban Sanctuary

by
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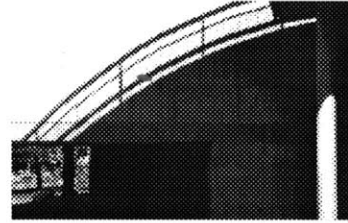
I also thank my parents, Jack and Pat DeBartolo, whose sacrifice and generosity has contributed greatest to my education. Most of all, I thank my wife, Tricia Marie, for being the love of my life and my eternal illumination. My deepest gratitude belongs to God, for without him all this would be inconceivable.

*For my father.
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Introduction



Carpenter Center
Le Corbusier

critical search

This thesis was conceived with a double purpose: a critical analysis which attempts to address the experiential phenomenon of architecture as it relates to the use of natural light as well as the design synthesis of an urban sanctuary in Washington D.C. This focused design project, with its limited program, directly addresses the possibility for a 'sacred' perceptual experience within the existing urban realm. This duality of analysis and synthesis facilitates a dialogue between design and criticism, as opposed to a conventional design thesis where one is subordinate to the other. In this thesis, the analysis and the application are conceived as equal partners which will relate back and forth — critically evaluating one another, thus allowing both *left* and *right* brain explanations. The premise is to present a phenomenal-light concept, support it with precedent and theory, synthesize into design application and challenge it through experience. The text will not be simple explanations of 'sacred' spaces but rather similar to the complexity and layering of photographs and drawings; referring to precedent and intervention and invention and poetics and art.

The concept of a critical thesis assumes an active complicity between design and criticism, responsibility and desire, theory and reality. There is not a direct linkage between analysis and synthesis, one does not easily flow into the other. However, an experiential evaluation of architecture which attempts to move the spirit, provides the base knowledge necessary to make critical decisions. The idea of a critical search stems from a challenge to the assumptions of the past in order to yield a new paradigm. This thesis confronts a difficult duality, the transformation from theory to form, and the merging of both order and randomness: theoretical criticism and unconventional intervention — simultaneously.

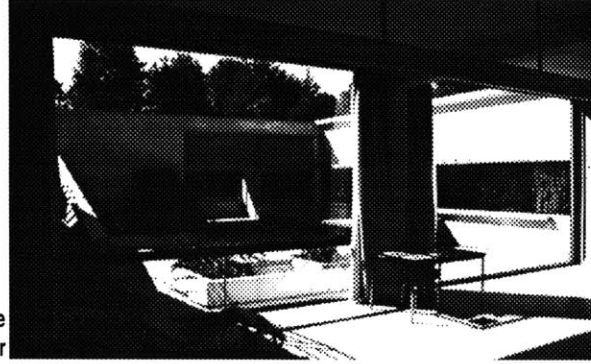
In an awareness that this vast issue may pose an overwhelming challenge, I have chosen to intensify the focus of this study on what I believe to be one of the most critical elements which transforms meaningless form into the experience of the phenomenal. **The potent use of natural light: as the dynamic, ever-changing and life-giving core of all our earthly existence.**

framework

The framework for this study is like a series of cords twined together, each having its distinctive characteristics yet unified as a whole. Each page is divided into three overlapping regions, each of which organizes a distinct type of information and material. The **main text**, defined as the ground, fills the dominant and maximum allowable space of the page, it scrolls throughout the entire thesis, often being displaced by the **design text**. The design text (located in the narrow right column) is the synthesis of theory into form, taking the reader through the schematic design process. This provides for the dialogue between theory and design, invention and

1. C.G. Jung (1875-1961)
The Archetypes and the
Collective Unconscious
Princeton Press
1968
p. 56

2. Gaston Bachelard
The Poetics of Space
Orion Press
1964
p. 6



Villa Savoye terrace
Le Corbusier

criticism. The third cord is a series of **snapshots**, both images and quotes, which serve as contextual 'images'. These accompany the text by enhancing the visualization, allowing someone to grasp the essence of the entire thesis in a few moments. This layering of texts and images — which are working both in unity and complexity - - creates an even stronger and more cohesive whole, reinforcing this unconventional approach.

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soul

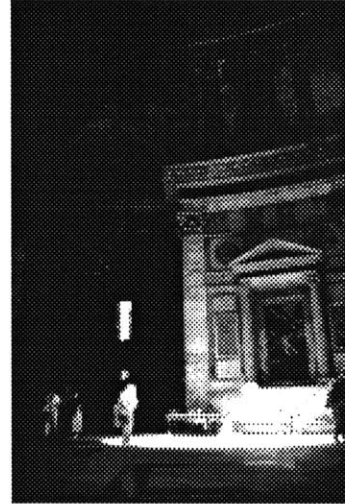
The vast majority of architecture is without meaningful experience, having no communication with the soul; it evokes no feeling, it is not tied into specific circumstances of place and site. As designers, we must search for meaning in architecture, this demands a passionate resistance to empty formalism and commercialism. The spaces studied and designed in this thesis attempt to attain a 'sacred' quality in an effort to separate one from his common daily routine. The effort is to fuse the intellectual and the intuitive, to possess both the core depth of meaning and the radiant surface. We must look beyond intriguing spaces based on formal manipulations of three-dimensional geometry, and search for the qualities which cause spaces shake one's spirit and evoke a significant moment of pause in patterned urban life. This 'derailment' from common perception is necessary if this project aims to access the phenomenal dimension of experience. This is fundamental because "the non-religious man of contemporary society has eliminated his conscious participation in the sacred — there persists an unconscious religious activity" ¹ which is searching for an architecture, a space of inhabitation.

In the thirteenth century, Saint Thomas Aquinas developed teachings linking philosophy and theology. He believed that all knowledge begins with *sensing*. He once said that there is a "clear sighted penetration of the soul into objects of perception." If the aim of this architecture is to nourish the soul, then it must expand the field for the expression of imagination and dreaming. Gaston Bachelard describes this shelter for day-dreaming, a place to dream peacefully.² This transcendence of place can only occur when one momentarily suspends disbelief in favor of experimentation. This cultivation of a new reality - with an endeavor to understand the indefinable - enriches the soul. **If architecture is to have meaning, it must employ contemplation and intense exploration of place — through the informed use of light, material, movement and details — illuminating both intuitive and unconscious imagination.** This strategy of (re)imagining the environment is not referring to artificiality or fantasy, but rather a new perception related to a shift in orientation.

**If light is the instrument
of the soul and soul is
essential to architecture,
then architecture must
facilitate the use of light
in potent methods if it is
to have a meaningful
perceptual experience.**

3. R. Thomas Hille
Places
fall 1992
p. 27

Pantheon
Rome, Italy



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Our everyday life is heavily layered with artificiality, commercialism, emptiness and immediacy; as architects of the 21st century, we must search for spaces designed for the spirit, not the magazine. The question of meaning then becomes both the state of experience and a question of will. The spirit of the community and the individual are plagued by a deadly disease. There is an urgent need for architects and designers to undertake investigations and projects which attempt to access the soul. The accessibility to the spirit of society is diminishing, its fate is provoked by unprecedented human coldness. If architects are to continue expressing conflict, collision and chaos in their projects, our society will continue to lose hope and become immune to tragedy, submerging the soul even deeper into numbness. On the other hand, we are no better off if we promote false optimism or nostalgia. Our challenge, as architects, is to make spaces of serenity and exhilaration that allow the modern soul to emerge.

Mircea Eliade states that what is missing in society is the conscious experience of phenomenal relationships and “traces of God”. Our religious sensibilities have fallen, they have been forgotten. The challenge of this design intervention is to (re)deploy an architecture which gives the participant a new definition of the place, a perception of the phenomenal; to connect this piece of earth (site) to the sky (eternal). Thomas Hille states, “*Spiritual illumination is a process through which we gain insight into the nature of our existence, a way of coming to terms with the world in which we live and the uncertainty of that which is to follow.*”³

luminance

“The study of light, therefore, is something more than a mere investigation of illumination. Light and things belong together, and every place has its light. Light, things and places can only be understood in their mutual relationship. The phenomenology of things and places is also the phenomenology of light. In general, they all belong to the phenomenology of earth and sky. The sky is the origin of light, and the earth

Therefore, the effort is not about just designing another space, but rather to search for the qualities which make a space call out to a person’s spirit and provide a significant moment of pause, focus, dream and imagination in the urban context.

4. Christian Norberg-Schulz
Poetics of Light
introduction
1987

5. Lebbeus Woods
Architecture and Urbanism
1992

9

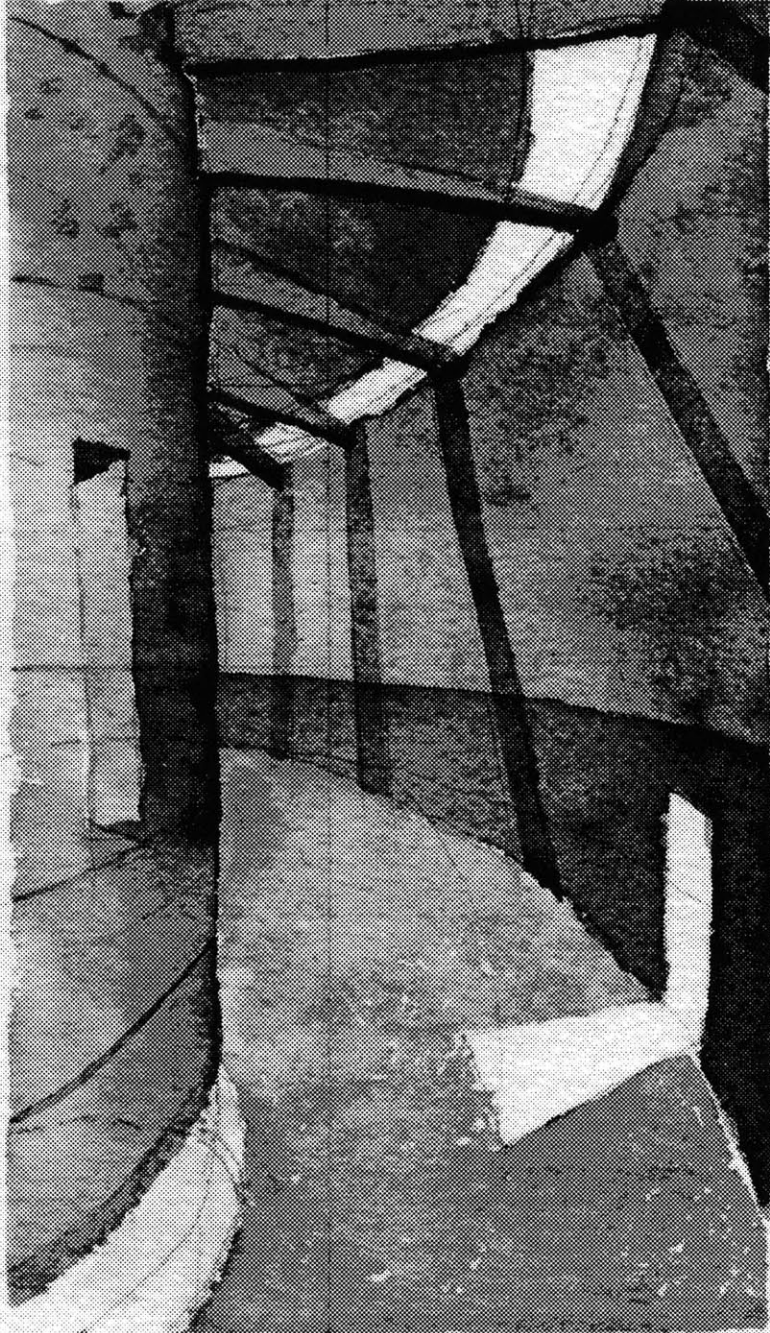
its manifestation. Therefore, light is the unifying ground of the world. Always the same and always different, light reveals what is.”⁴

*“In the conscious preparation of Architecture for the reception of light, artist Laurotta Vinciarelli extends architecture’s range and power, joining the sensuality of matter with a transcendency of spirit.”*⁵ Daylight and its dynamic movement plays an integral role in the ability to move one’s spirit through architecture because of its direct relationship to the ‘living’ nature of a building. Its presence causes raw materials to communicate with resonance and dissonance, just as musical instruments in a composition. This study will look closely at how illumination transforms rich materials, such as glass or wood, by imbuing them with *presence* and sense-provoking qualities. The presence of light in architecture accentuates the psychological effect produced by materials and brings spaces into a dynamic relationship with place and time. These emotions, feelings and perceptions are rejuvenated when one senses the qualities of materials and spaces through their perceptual clarity and complexity. The ambient color of light, from the golden hue of dawn to the white of noon to the deep blue of dusk, has a potent psychological effect on the entire human race. The presence of light evokes the spirit of man because it communicates with the very core of our existence. Light simplifies the complex and complicates the simple, it reveals the core of the mass as it illuminates the receiving material. Materials and spaces must be explored and transformed, manipulated and altered if they are to challenge architectural perception.

The phenomena which occur within the space of a room — like sunlight throwing shadows across a space, or the slight color variation of ambient light — have reciprocal relationships in the realm of perception. These phenomena cannot be drawn, modeled or easily photographed; they can only be perceived through physical experience in real time and circumstance. The phenomenal *meaning* of each material is directly related to one’s previous experiences with that material juxtaposed to one’s present circumstance. The aim of this thesis is to search for the subtle, yet powerful uses of light as a ‘material’ of architecture, to shape and create spaces which ‘move us’. In architecture, every experience of nature, time, space, movement and surface is dependent on its reciprocal relationship with daylight.



lowa train station
translucent light



DeBunato lo
M

S
01/11
94

1 Perception

6. Edward De Bono
Lateral Thinking
London
Wardlock Educational
1970

11

Philosophers such as Husserl and Heidegger established many of the components of 'perception' that relate to ideas formulated in this study. Perception is based on three basic functions of the central nervous system: Motivation, memory and learning. The brain has an inherent need for two oppositional experiences: one promoting analysis and order, the other seeking discovery, randomness and patterns of complicated relations. The combination of these two oppositional needs is essential to mental health and growth.

The phenomenon of perception is closely related to the influence which past experience has upon the present perception. If our previous experiences are not kept in mind, we will not be able to understand or perceive what is going on around us. Memory, in de Bono's definition, is "what is left behind when something happens and does not completely unhappen." ⁶ Our perception of a place or event is essentially one-sided, it is an individual's 'own' experience and reading from his or her relative position or point of observation. Therefore, to convince one to perceive a specific scenario, the designer must contrive a rather elaborate device of control and focus. The alternative, is to allow one to perceive his own meaning by creating an environment which simply allows one to have better contact to that on which he wishes to focus. The architect's role in this situation is to minimize the incompleteness of one's perception, by facilitating a re-discovery of a familiar element, such as the sky, in an unconventional environment.

The principal issue of phenomenology of perception is a product of three components: the brain's inherent motivation for experience, the collection of previous experiences which have sensory readings attached to them and the whole, which is composed of fragments, patterns and arrangements from previous experience. This discussion of perception must not rely on iconography, text or any form of imagery. The tools discussed here depend on sensory experience of space and light which evoke emotions through surface materiality, physical movement, spatial compression, spatial expansion and a re-discovery of the natural landscape.

snow covered tree branch

sensing

One who senses the subtleties of the environment, perceives far more than just that which one 'sees'. An early morning spent in the fresh snow quickly illustrates this phenomena. Sunlight absorbs the powdered ice which blankets the ground transforming the existing landscape. The sun finds crevasses in the clouds and percolates into the misty



Four seasons,
one tree



environment. There is a deafening silence and the acoustical privacy soothes the mind to focus. There is a mighty potency to the cast shadow in snow, white on white. Newly fallen snow imbued with light repeats the sky and eliminates the ground. Its coverage simplifies one's reading of the landscape into textureless, folded, soft planes of light. There is only light and shadow and the color palate is limited to the spectrum of white. The landscape is defined only by its forms; simplified by uniformity, indefinably complex in its geometry. The presence of snow transfigures the environmental landscape giving one a new perception of 'place'.



Sensing the more subtle changes of the environment requires an awareness of the universal phenomenal circumstances which can only be understood through experience. These experiential moments cannot be captured in photographs, words or drawings, they deal with the five senses and the peripheral world. It would be difficult to describe the sensory experience of a snow-covered landscape in early morning. We can only imagine it based on experience. One must experience through *sensing* the architecture, not seeing it. Sensing is about reflection, layering, transparency, variation, proportion, relation, and peripheral vision. One must perceive a space by feeling it to capture its presence, to attach it to the meaningful experiences associated with place.



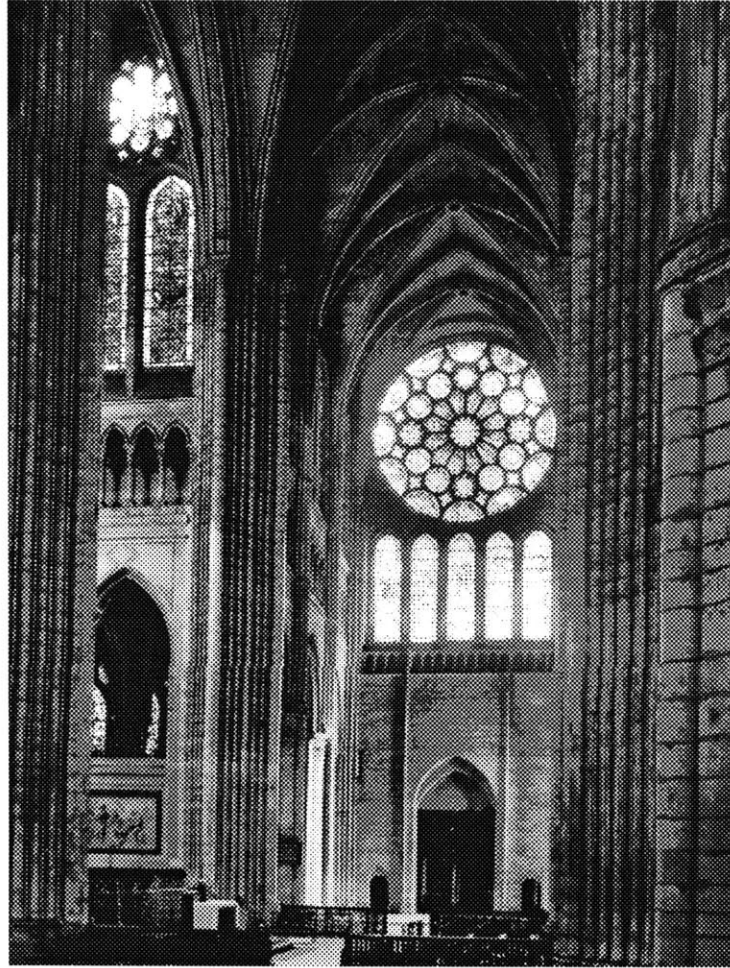
gothic spirit

One cannot address issues of space and light without addressing the revolutionary ideals of the Gothic builders who established a condensation of many different systems of experience and belief. The Gothic architects struggled to bring light into their structures, to transcend the statics of building masses and the realities of this world. Therefore, the fundamental reason for Gothic architecture is not technical, or structural, or even functional in a restricted physical sense; it is experiential. The builders wanted to transcend reality. Gothic spirit was born out of human intention, for the purpose of a higher human experience and significant manifest



7. Vincent Scully
Architecture:
St. Martin's Press
New York
1990
8. Henry Plummer
The Poetics of Light
p. 93

Chartres Cathedral
photo: Pierre DeVinoy



human meaning. The spirit of Gothic architecture does not embody one truth, but rather multiple truths. The aim of the work was to exceed the ideas and intentions of the original designer in depth, meaning and significance, with an understanding that perception changes over time as those who experience buildings change.⁷ The Gothic intention was embedded the eternal, thus attempting to transcend trend and style. The Gothic builders regarded their mission as one of building the *experience* of divine order, which would be made wholly manifest to the worshiper who finally stood in the crossing and faced the alter.

Chartres Cathedral is one of the finest examples of Gothic spirit and its existence has had a powerful impact on western architecture. The experience is tangible, palpable and complex — combining spatial environment with sculptural body through illumination. The windows do not open the space to the outside, but rather give the perception that the wall is radiating from within itself and constantly changing the perception of space with its light. In the pale light of early morning or evening, the windows give the impression of a dark-hued, gleaming surface; when the sun is high in the sky, the incident rays falling through the glass pour directional beams of color into the space, accentuating some realms and causing others to retreat.

“The intention of the late Gothic church was apparently to not only be filled with, but actually to dissolve into light, to become light.”⁸ These crystal envelopes permitted the space to be pervaded by light, wrapping its inhabitants in a luminous garment. The interior walls have been manipulated in their surface treatment to even change the color of the air within into a ‘golden vapor’. The interiors of these churches are saturated by daylight pouring through huge windows, then falling onto luminous surfaces, building brilliance upon brilliance for accentuation. Henry Plummer writes about the Gothic minimization of mass in the interiors of Neresheim, Ottoeburen and Wies, “Narrow structural members placed before the windows are bathed and devoured in light, while small mirrors embedded in plaster flash out sparks, and like acid, eat out the solidity of

9. LIFE
March 1994
p. 54

Air Force Chapel
Colorado Springs



10. Progressive Architecture
Editorial
June 1992

walls and ceilings.” There is nothing common, mundane or trite about the Gothic treatment of light. The spirit was about a shimmering atmosphere, “an ultimate effervescence of pure light.”

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space for the spirit

Recently, an article published in the popular and internationally known LIFE magazine surveyed the manner in which American's, of many beliefs, pray.⁹ It also explained *why* they pray and *what* it means to them. These common and randomly chosen people represent a search in our society for a new concept of reality. If nine out of every ten people in the U.S. pray, what role does architecture play in facilitating a place for this activity? Where are the places for silence, for sensing, for listening, for watching and for contemplation? It is tranquillity and the rediscovery of a quality of life, lost under layers of civilization and progress, that is missing from modern society.

Several architects of the modern era struggled to find transcendent meaning in their built work. They insisted that forms and spaces must not depend on decorative skin and ornament to evoke profound significance. The meaning, they believed, must have a direct relationship to experience and architectural form. Architects such as Taut, Mies, Gropius and Le Corbusier set out to cleanse the world from convention and the veils of romanticism and simultaneously to install, at the very heart of everyday life, new rites of purification to insure that decadence could never again return. Perhaps only Le Corbusier came close to the center in his later years: Chandigarh, La Tourette and Ronchamp are among the century's few architectural works evoking a profound sense of spirit. Le Corbusier combined his search for transcendent form with the use of light as a means of accentuating the significance of various realms to illuminate and differentiate them. Spaces were differentiated from one another not only in terms of form, but in the nature of their lighting.

Thomas Fisher, executive editor of Progressive Architecture, offered what he called a “challenge” to the next age of architects in a recent editorial. He stated that what is desperately lacking in contemporary architectural work is “substance”. Fisher stated that what we are facing is a “multicultural dawning” and the architecture should be “one in which the ideas and traditions of other peoples would be abstracted and then applied to our own situation.”¹⁰ Mark Branch, another editor from P/A wrote that architects are taking “great care to emphasize the secular and communal aspects of religion, but fail to celebrate the transcendent nature of God.” Betty Meyer, editor of the journal, Faith & Form, stated that she sees spaces of worship becoming more

11. Progressive Architecture
December 1990

12. A. Ruusuvouri
Finish Architecture
1982

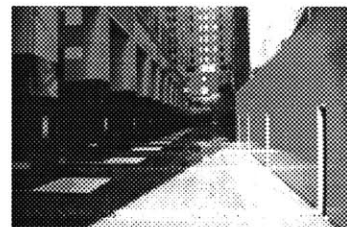
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“ecumenical” and responding to the demand of a younger generation of both believers and non-believers “without falling back on traditional iconography (which would be inappropriate for an inclusive space of worship).”¹¹ “In our era of industrial materialism, buildings are frequently considered as mere structures of utility and objects of investment without any spiritual task. Consequently, our daily environment is failing in its fundamental task of bringing meaning and hope into our lives.”¹²

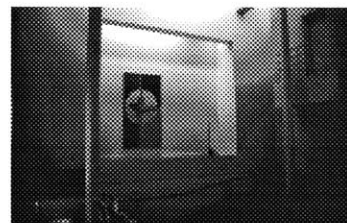
This thesis, the text coupled with the design synthesis, addresses two major goals: One, the investigation and analysis of built and unbuilt projects which call on the universal phenomenal quality of light as a spatial component, not relying on traditional / cultural forms of iconography, to achieve a transcendent perceptual experience. Two, the design of a place of silence and reflection; accommodating sacred events as well as receptions and concerts, within an existing urban fabric -- in this case Washington DC.

The coupling of these two concepts facilitates not only an unconventional thesis, but a rather unprecedented built environment. Although the objective may seem rather ordinary, it is seldom focused on and often lightly addressed as one of many components of a much more complex whole. The objective of establishing a limited and rather focused program — dealing specifically with the perceptual and phenomenal issues of luminance in the making of *place* — is to employ an appropriate venue to draw towards the center on two congruent universal issues and search for a constructive endeavor to again fuse architecture, mankind and the eternal.

Los Angeles
shadow, water and light



Hartford Seminary
Richard Meier





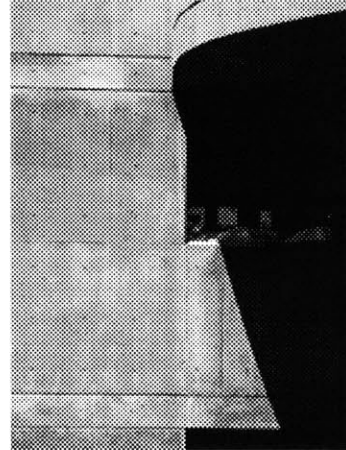
De Santolo

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11/11
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2 Illumination

13. James Turrell
Sensing Space
interview
1992

14. R. Giurgola
Louis I. Kahn
Gustavo Gili
1992
p. 16



Carpenter Center
Le Corbusier

There is great potency in the varied intensities of environmental luminance as inhabitable pools of light move across our environment transforming the unimaginable into physical substance. This powerful illumination saturates one's entire insides with its associational qualities nearly beyond control or manipulation. The most one can do to affect this direct flow of visible energy, is to become either more or less conscious of it; to open oneself up and feast on its abundance or to contain one self within and only allow controlled elements to pass. This phenomenon is best illustrated on sparkling, sunny days, when both receptive and closed individuals alike, open themselves up to the radiant qualities of sunlight and inhale its healing and energizing virtues. Light summons our spirit because it grabs our attention without calling forth the iconic meanings associated with objects. Illumination urges us to pause and reflect on what we see; it demands empathy and offers revelation.

“Generally, we light surfaces, and light is used to reveal things.

The idea of revealing light itself is rarely even thought of. Architecture turns out to be a different thing than maybe we think it should be”¹³

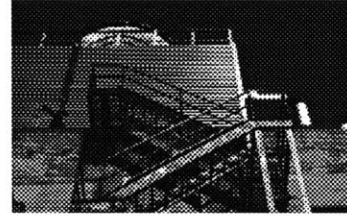
light and shadow

The paradigm shift set in motion by today's virtual reality, facsimile, information based society ruled by technology, has led many to seek out more timeless principles. Many are searching for experiences that bonds themselves to greater meaning, tradition and values, regenerating the timeless principles of our spiritual existence. Architecture must respond and relate to the larger scheme bridging the symbiotic relationship between human beings, architecture and the eternal. This shift calls on the timely and timeless principals of 'sacredness' through the creative shaping of space and light.

“Light is not merely the means by which we recognize objects, that which makes them visible; light is the original source, the wellspring of all laws of nature, whether known to human science or not.”¹⁴ One of the greatest losses of our contemporary society is the denial of the environment as an integral component in our inhabited realm. We conserve, reuse, recycle and preserve, but it seems we have lost an awareness of the phenomenon of the environment as a potent and transforming force in architecture. The subtle and severe rhythm of the seasons, the daily pageantry of sunrise and sunset, the amber glow of a rising moon, the spectrum of a rainbow, the reflection of water or the whiteness of a snowstorm are not celebrated in our built environment. These festivals of nature exist as outside natural forces or 'elements', having little if any influence on the spaces we inhabit. Natural light carries a stimulating virility, a vital spark, which is the mainstay of all life on earth. The architect must constantly invent and (re)explore the quality and quantity of natural light as it defines our spatial experience:

15. Werner Oechslin
"The Architecture of Light"
Lotus 75
1993
p. 14

Cambridge, MA
cooling tower



16. Le Corbusier
Towards a New Architecture
1931/ 1986
p. 37

Vertical light, horizontal light, direct light, reflected light, the clear blue light of morning and the warm golden light of sunset. An architectural intervention should live as long as the sun rises and sets.

At a memorial speech in 1965, Le Corbusier said, "space, light and order" are equal in importance to the existence of mankind as food and rest. The attention to natural light by the early modernists was much greater than that of today. No one can doubt that light has always played an important role in architecture. However, the theoretical texts of architecture pursue other objectives than that of the systematic and rigorous treatment of the problem of daylight. Contemporary Architects, although agreeing that daylight is an important issue, find its theoretical discourse lacking and empty when it comes to manipulations and experimentation. Yet, contemporary artists such as James Turrell and Robert Irwin see it quite differently. Their recent work, is gripping the very marrow of the perceptual experience of light as it relates to the relationship between the inner volume and the outside world. I am curious as to when the inspiration from media and technology will seem trite and shallow, making way for a more sophisticated discourse relating to the eternal and timeless characteristics of nature and our environment. Currently, work by artists and architectural visionaries such as Laurotta Vinciarelli share more characteristics with transcendent architecture than does most built form. There seems to be an uncharted path between theoretical projects which set up a series of phenomenal situations and projects of reality, where the clear idea gets lost in the necessary functional elements. "If we are to ask ourselves the reason for the almost total exclusion of the problem of light from architectural literature, the answer would have to be, at least in part, that there are difficulties in correctly describing and defining light."¹⁵ The theoretical efforts of contemporary architects would benefit by focusing on issues and ideas of phenomena and experience, attempting to find new ways to understand and realize the potential effects of the natural environment into architecture. This re-imagining

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**"Architecture is
the masterly,
correct and magnificent
play of masses
brought together
in light..."¹⁶**



of the environmental relationship to architecture would yield spaces with inherent meaning and enriched perception.

Light is the most powerful phenomenon that sustains us as humans. The play of light "Le jeu savant et magnifique," creates miracles. Our primary source of daylight, the sun, choreographs a pulsating and living world which is never static but always dynamic. The pattern of the sun and its rhythmic rise and fall bring life to the static architecture which grasps at the crust of the earth. Light is fundamental to the perception of mass and form, texture and depth, opacity and transparency. Light always reveals things differently depending on changes in the sun's position or variations in the atmosphere. Our world is defined by the light and shadows which create places of movement and stasis. As light slowly moves across the face of a monolithic urban structure, it makes poetry out of every variation in the facade and the surface; light animates the city. Light is the most potent element in the making of a spatial experience: for its presence defines perpendicular planes, amplifies perceptual depth and articulates details.

"In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said, "Let there be light," and there was light. God saw that the light was good, and he separated the light from the darkness. God called the light "day," and the darkness he called "night." And there was evening, and there was morning — the first day." 17

The Hebrew word for "light" is 'or , referring to the initial waves of light energy coming upon the earth. Later God placed "lights" in the heavens as permanent generators and reflectors of light waves. One primary purpose of these light-bearers is to serve as signs to mark seasons, days and years.

The aspects of things that are most important to us are hidden because of their simplicity and familiarity.
—L. Wittgenstein

18. Frank Lloyd Wright
A Testament
New York
Horizon Press
1957

Ohio farm
barn facade

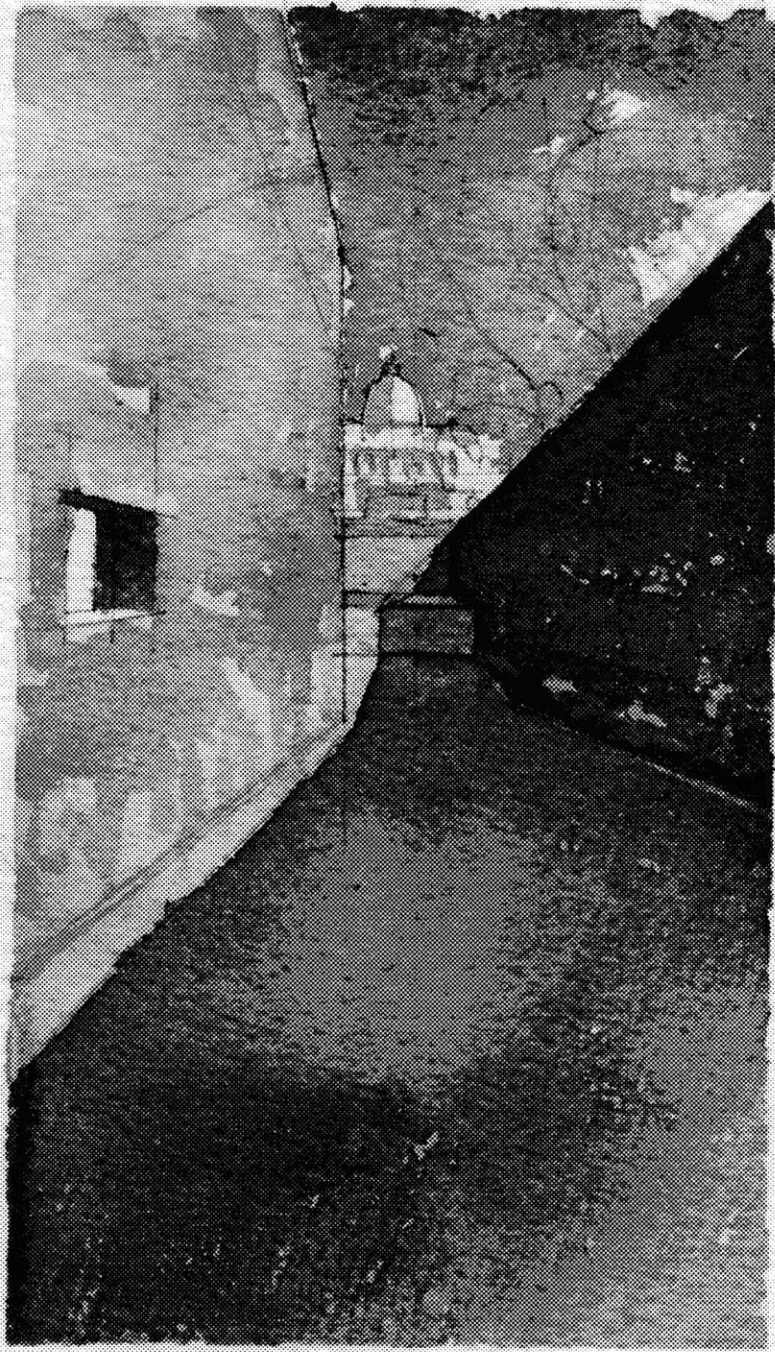


complex simplicity

There are certain elements and issues in this environment which seem simple on the surface, yet are intensely entangled and complex in their internal nature. The primary elements defined by the early philosophers are: earth, air, fire, and water. These elements, like light, are the most complex components of our existence, yet many of us accept them as mundane and normal, consuming little of our attention. The almost out-dated constructive endeavor of meshing form (architecture) with nature is being victimized by a certain new aesthetic of manipulation, deconstruction, assimilation and tangential association; where the aesthetic appearance is the focus rather than a character derived from a distinct purpose. I am not attacking a contemporary aesthetic or its formal gestures, but rather the motivation and impetus which propels society into accepting artificial, 'effect' architecture. (That is, form concerned more with the *effects* and less with the *causes*.) Architecture is the very body of civilization itself. Architecture becomes 'complex simplicity' only when it is thought-built; when it is a synthesis derived from a careful reading of the details of the site and a breathing environment which sanctions a multiplicity of events. Not that one should revive the Gothic style, but the Gothic *spirit* is needed in the art and architecture of modern society. The Gothic spirit employed an enmeshed 'complex simplicity' that facilitates the finest of all architectural experiences.

20

“All buildings built should serve the liberation of mankind, liberating the lives of individuals. What amazing beauty would be ours if man’s spirit, thus organic, should learn to characterize this free life of ours in America as natural.”¹⁸



DeSanto

1
May
94

3 Experiential Program

19. Tadao Ando
"Beyond Horizons in Architecture"
1991
20. Mario Botta
Gustavo Gili
1992
p.91

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The premise for this project is the design of a series of contemplative spaces which call on the definable and intangible elements of light as a fundamental component of architecture; basic in the shaping of form, space and the principal aspects of habitation. Traditionally, light has been considered as a simple but powerful force, one among many others, and has thus been relegated to the domain of phenomenology. This project was selected to elevate light to a primary status in architecture, bringing it to the fore -- to sense its qualities and evaluate its effectiveness.

The design application is established to engage light directly as well as conceptually, as an active element in the shaping of habitable space in a specific urban context. The primary program is *contemplation* through the conscious and unconscious observation of light: its subtleties, harshness, color, intangibility and changing climatic quality. Essential to this project is a program that correlates the ideas of contemplation — *illumination of both nature and the spirit*.

Architectural creation is not simply a method of 'problem-solving' whereby given conditions are reduced to technical issues. "Architectural creation involves contemplating the origins and essence of a project's functional requirements and the subsequent determination of its essential issues. Only in this way can the architect manifest in the architecture the character of its origins." ¹⁹ The program must not be limited to the conventional definition of functions, each space must be defined by its event and its specific *light environment*. This strategy relies on the harmony of space, light and nature; facilitating a focused effort on issues of universal daylight and its active role in the making of habitable spaces which transcend common experience. The program instigates a serious inquiry to reveal the special character latent in the "design problem", thus devoting deep thought to what experience is truly being sought.

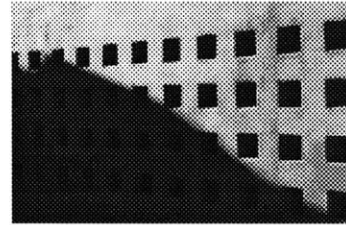
urban sanctuary

*"The building of a cathedral in this age is not only the building of a church..., but signifies above all an affirmation that the truest forces are still present. It is the will to create a space for the spirit, closely woven into the urban fabric, which can assist us in facing up to everyday life and its struggles."*²⁰

The city is a highly stimulated environment. In a typical day hundreds of people experience unending extremes of visual, sensory and psychological stimuli within highly regulated and rhythmic lives. There is clearly a synergy in living and working within the density of a city; coming in contact with so many people, objects, ideas and cultures. Yet the rigor and excitement of urban life often becomes over-stimulating and excessive; over time, their stimuli are physically and psychologically exhausting, eroding one's inner sense of identity. There is a clear need for relief and contemplation in such an environment. These places which once were quite easy to

21. Lewis Mumford
The Culture of Cities
New York
Harcourt Brace Press
1938

concrete wall with sunken
glass block
Antoine Predock



find are fading from our city cores, being replaced by increased density and more 'programmed' activities. *There are too few places for silence and quiet in the contemporary city.*

If, as designers, we neglect to address the significant need for places for the individual in our cities, we shall have failed miserably in our desire to build a better world. So many planners and designers believe that 'open space' is the answer, more squares and more plazas. Our cities have an abundance of urban designed 'civic spaces' for collective gathering within our cities, but few places for silence, reflection, and connection with nature. It seems one's only reprieve from the city is in the home, cut off from the activity that is alternately delightful and overwhelming. It is as if while within the city one cannot enjoy quiet or calm until returning home at night. We hover between two extremes: a public, active and extroverted world which is defined by master planned events and programmed activities, and a private, passive and introverted world defined by the individual. These two extremes can each be improved through the informed use of light. There is a need to weave these two worlds together and combine them with a search for an architecture concerned with light, permanence and time; not one of borrowed symbolism and formal agendas.

"Today, in most countries, we tend to overlay the role of mass movements and mass satisfactions and mass attendance at spectator sports. We forget the need to offset the pervasive compulsion of the crowd by providing plenty of space for solitary withdrawal. Man, as Emerson observed, needs both society and solitude..." 21

This program of an 'Urban Sanctuary' proposes a juxtaposition and combination of activities which will encourage and foster contemplation and reflection. This program represents a critical breakthrough for the urban environment, a return to the soul. Many have addressed the formal aspects of the city, its typologies and morphologies, even the history of the city — largely devoid of programmatic rationalization. Few have addressed the issue of specific activities within the urban context, the reality of habitation. If we are to return to the cities, instead of leaving them for the suburbs, then the spirit and soul must also return to the urban core. The city must make a place for the soul, for solitude, for silence.

The Urban Sanctuary represents a renewal of the spirit within the city. This proposal must be an innovative and distinctive kind of 'sanctuary' reflecting the change in the social context. Society has entangled churches and chapels with so much baggage that the contemporary definition of a chapel must be re-evaluated and re-established. The original intentions of spaces of worship have been over-segregated and often offend more than they inspire. The appropriate sanctuary form, in this circumstance, is not a massive structure of intimidating presence, but rather a fragment which is linked to a larger whole, just as an individual, addressing the specific needs of that micro-context. This radical shift in typology is implicit in the program. The program,

22. John Lobell
Between Silence and Light
Louis I. Kahn
1979

23. Steven Holl
Anchoring
Princeton Press
1991
p. 10

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simple in form, complex in nature, is one of contemplation and silence, of tranquillity and self-collection, focused around an increased 'illumination' of light itself, as well as the soul.

idea

A program, in this thesis, is not a description of function attached to a specific form, but rather an exploration and search of the activities and events which actually happen within spaces. Spaces which engage celestial events of light are filled with a performance, the rotation of the earth and the motion of the planets and stars. Natural light adds the *event* to the autonomous spatial sequences and sets up a form of motivation, of stasis and movement. Pools and points of light set up series of unique and repetitious volumes throughout the composition of the spatial experience. Therefore, light exists as the 'notation' of movement and event, articulating and framing the sequences of the spaces. The changes in intensity, texture and color choreograph the transformation of events and foster a less homogenous environment.

Louis Kahn considered light as an immediate compositional element. John Lobell writes, "Kahn's first reaction to the program given to him by the client was to change it. It could never tell him what he needed to know in order to design a building that would be an offering to its institution." Lobell continues by quoting Kahn, "If a school board requests a school without windows, the architect must resist. Light is essential to life, to learning, and therefore to the form of the school. Once the form is sensed, the architect can begin to design."²² For Kahn, the function of the program relied on expression, and thus became secondary to the function of the experience.

The idea is the essence, the drama which transforms and links the concepts to architectural form. The concept establishes the order and places limits on the ambiguous: combining the utilitarian functions of the project with the experiential sequences and circumstances of place. It is the process of considering the activities, of both individuals and the natural environment, and the priorities of experiential concern. This concept or organizing idea becomes the, "hidden thread connecting disparate parts with exact intention."²³ The experience becomes potent with meaning, whether it is the original concept or a new phenomenon based on an individual's perception.

This descriptive form of physical events must expand the perceptual possibilities and not rely on traditional means and conventions. Any given program should be analyzed, dismantled and distilled based on the order established by the idea or concept, and then be reconstructed into another programmatic configuration. The converse 'functionalist' approach assumes that a specific form belongs to a specific activity and that each space is autonomous unto itself. This procedure and its devices are dry and lifeless, resulting in a form which is at best utilitarian.

architectural issues / aims: challenges of the design intervention:

1. Must integrate the conceptual idea with the phenomenological experience.
2. Must 'anchor' to the site as well as illuminate and challenge it.
3. Must delineate a threshold between interior and outside space, dislodging one from former assumptions.
4. Must not preclude experience of the natural environment, but work as a lens for phenomenal perception.
5. Must link man, architecture and the eternal (phenomenal). Must link earth and sky (Heidegger)
6. Must foster discovery, interchange, adaptability and manipulation — to yield a changing experience.
7. Must engage all of the senses.
8. Must facilitate a sensing of *light* itself.
9. Must not depend on style and arbitrariness; but rather be fused to timeless and eternal principles.
10. Must have spaces of non-completion, open-ended, flowing into one another.
11. Must facilitate a linkage between the intimate and the infinite.
12. Must infuse space with time — space-light continuum.
13. Must distinguish / combine the varied qualities of light: direct, indirect, reflected, contained, universal.

Space: spatial events and accommodations of the design application.

observation
 contemplation
 think/ unthink
 tranquillity/ quiet
 passive/ active movement
 wedding ceremony
 memorial service
 music performance
 art exhibition
 gathering/ meeting
 rest/ respite
 lecture/ presentation

Fine Arts Center
Tempe, Arizona
Antoine Predock



Site

Architecture is bound to situation and intertwined with the experience of place. The site for this project is more than the ingredients of its conception, it is the physical and metaphysical foundation of the phenomenal experience.

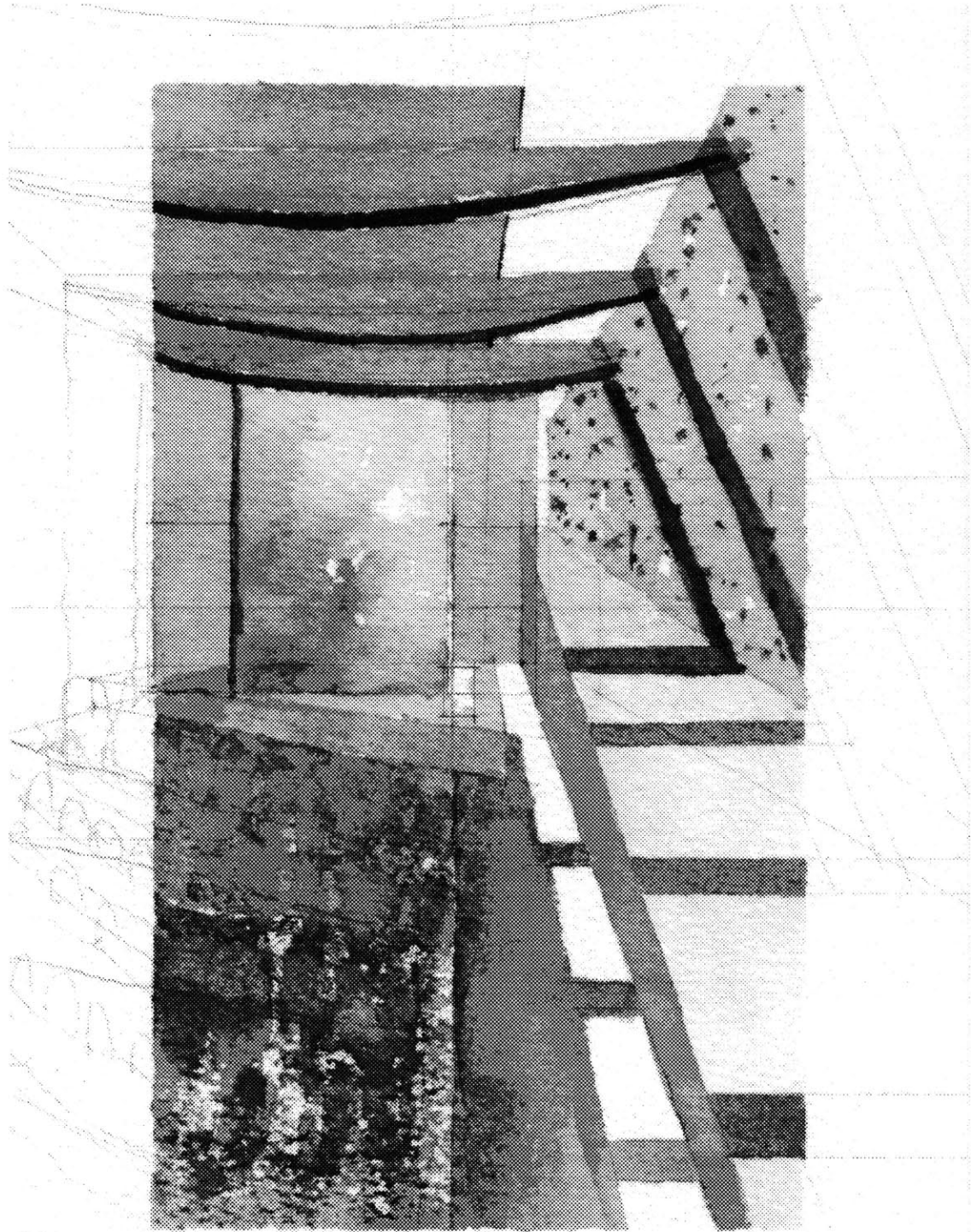
Physical conditions:

The site for the design intervention is one of the remaining L'Enfant sites of Washington D.C. It is a 30,000 square-foot triangular site previously occupied by a small vegetable garden adjacent to the National Air and Space Museum. The monumentalization of Washington makes this project specifically appropriate to *place - (to instigate a new perception)*. Its adjacency to the most visited museum in the nation combined with its commanding vista of the Capitol, make it an ideal location for such an intervention. The 12-foot setbacks from curb lines allow for existing linear circulation to remain and the vertical limitation is set at 60 feet. It is south of the National Air and Space Museum and north of the NASA office building, at the intersection of Maryland Avenue and Independence Avenue, on diagonal vista just south of west with the United States Capitol. The site was selected based on the underlying discourse it fosters and the need for a place for the spirit in the city for government and public life.

Metaphysical conditions:

The site must be transformed by the architecture. It must fuse the experience of the circumstances to a deeper understanding of the *place*. The vista to the Capitol is the most obvious metaphysical visual phenomenon, because of its significant image and iconographic meaning. The intervention must not intrude on the site, but rather serve to better explain it and illuminate it. *The idea must make a poetic link between the specifics of the place and the universality of phenomenal experience.*

The metaphysical linkage can only be made when one closely analyzes the circumstances of the site and actively engages those with an understanding of the universal phenomenological issues such as illumination and its inherent perceptual qualities.



DeBartolo



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4 Light and Nature

24. Werner Oechslin
Daidalos 27
"Light as a Means of Creation
between Reason and Emotion"
p. 26
25. Martin Heidegger
Poetry Language and Thought
Harper and Row
p. 149-152
26. Tadao Ando
"Beyond Horizons..."
1991
27. *ibid.*, Ando

*The history of light begins with divine meaning, no matter whether one examines the Egyptian or the Judaeo-Christian cultures, the divine act of creation is inextricably linked to the birth of light. J.G. Herder calls light "God's language, which never ceases to formulate our finest senses in thousands of forms and colors."*²⁴

*"The Earth is the serving bearer, blossoming and fruiting, spreading out in rock and water, rising up into plant and animal. The sky is the vaulting path of the sun, the course of the changing moon, the glitter of the stars, the year's seasons, the light and dusk of day, the gloom and glow of night, the clemency and inclemency of the weather, the drifting clouds and blue depth of the ether."*²⁵ *As Heidegger's bridge charges nature, "...the banks emerge as banks only as the bridge crosses the stream," so also, as designers we must use architecture to allow nature to emerge. For dwelling to be a product of the illumination of natural circumstance.*

nature of the site

As designers, we must strive to instill the presence of nature within architecture and integrate ideological thought with reality to awaken society from its spiritual slumber. "The Japanese tradition embraces a different sensibility about nature than that found in the West. Human life is not intended to oppose nature and endeavor to control it, but rather to draw nature into an intimate association in order to find union with it."²⁶ This human interrelationship with nature provides the context for the spiritual experience. Therefore, when light and other natural elements are integrated into the 'soul' of architecture, architecture becomes a place where people and nature confront one another in what Tadao Ando calls a "sense of tension." This 'tension' is believed to awaken the latent spiritual sensitivities dormant in most contemporary architecture. "The presence of architecture inevitably creates a new landscape. This implies the necessity of discovering the architecture which the site itself is seeking."²⁷

Ohio Farm

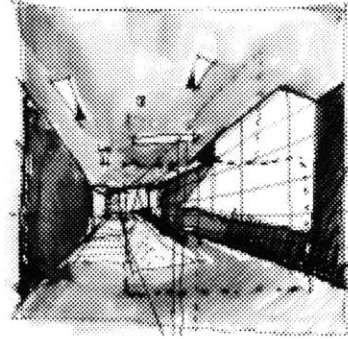


28

Throughout the design process of the urban sanctuary, I have constantly been thinking of new ways to integrate the *experience* of nature in order to enlighten one's perception. This search demands an experiential evaluation of spaces, thinking of the perception rather than the composition. As one moves through the series of illuminated spaces, one experiences moments of congenial meetings with different conditions of nature, which is never the same any time of the day or year. The aim is to transform the place / site with a new intensity, if possible, to facilitate a new relationship with nature.

28. The Holy Bible
New International Version
Genesis 1:14-18
29. James Turrell
Sensing Space
1992
p. 52
30. *ibid.*, p. 60

concept sketch
lights in the dark



landscape

29

Frank Lloyd Wright referred to landscape as "The unity of nature and the oneness of all things." Nature is so finely balanced and simultaneously complex, completely in unity and yet total diversity, that it seems like chaos to our naive minds.

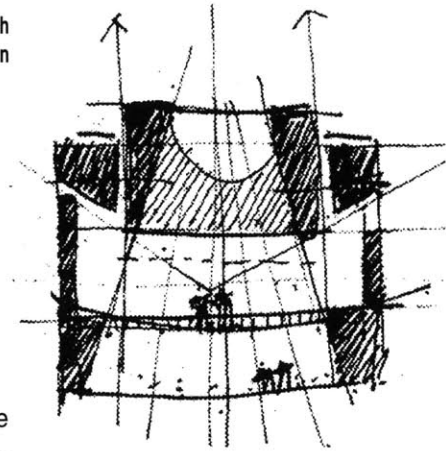
Christian scripture tells us that God said, "Let there be lights in the expanse of the sky to separate the day from the night, and let them serve as signs to mark seasons and days and years, and let them be lights in the expanse of the sky to give light on the earth." And it was so. God made two great lights — the greater light to govern the day and the lesser light to govern the night. He also made the stars. God set them in the expanse of the sky to give light on the earth, to govern the day and the night, and to separate light from darkness. And God saw that it was good." 28

As humans, we hunger for the light and quest for its presence, we are drawn and pulled into the light. Glimmering lights in the darkness give us hope and inspiration, they instill us with wonder and anticipation evoking that fundamental need for a recognition of a greater power. Christian scripture tells us that God intended that the sun, moon and stars serve as signs that point to Him as well as mark the advancing days, seasons and years. Twinkling stars have a consoling presence in the night sky, they are assurances that we are not alone. Their sparks of vitality in the blackness and emptiness charge the hollow night with tiny pockets of consciousness and combustion.

In 1977, artist James Turrell obtained Roden Crater, a dormant volcano located north-east of Flagstaff, Arizona. He is currently in the process of restoring the crater to its regular cone shape which has been eroded since the last eruption of the volcano about 900 years ago. Turrell plans to transform it into a natural observatory in the ancient tradition of Stonehenge or the Anasazi sun dagger at Chaco Canyon, New Mexico. It will work similarly to a finely tuned instrument tracking the orderly passage of time as dictated by the movement of planets, stars, earth, sun, and moon. The most important agenda is to link the visitor to an ageless quality beyond time and place. Turrell wants to *force* the observer to see the world differently, to "see the magic in the sky one normally takes for granted." 29

Turrell plans to use his familiar palate of resources: light, color and texture coupled with a new awareness of the sky. "He intends to capture some of the paradoxical qualities of the sky, its hugeness and intimacy, its substance and intangibility, its mutability and permanence, its luminosity and opaqueness, and draw them down and define them by earthbound spaces." 30 Turrell has designed a series of 'laboratories', integrated into the natural landscape, each simultaneously admitting light and framing a piece of the sky to concentrate on its subtle changes and mutability. The principal approach employed, is a phenomenon called "celestial vaulting"

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|---|---|-------------------------------|--|
| <p>31. James Turrell
<u>Perceptual Cells</u>
1992
p. 55</p> | <p>32. Steven Holl
<u>Anchoring</u>
Princeton Press
1991
p. 9</p> | <p>33. <i>ibid.</i>, p. 9</p> | <p>concept sketch
cylinder section</p> |
|---|---|-------------------------------|--|



30

where the sky appears to be a flat, skin-like membrane stretched across the aperture of the opening versus its vaulting from edge to edge of one's peripheral vision. It is Turrell's goal to fuse the landscape to the sky by means of minimal, yet potent, interventions; to transform Roden Crater into an observatory of the phenomenon of the cosmos.

"Coming to terms with the vast landscape and the sky that is open to the universe, the viewer can experience this location in its natural immediacy. Here, I attempt to achieve the most compressed materialization of light, taking into account that one is exposed to its physical quality not on a plane but in space. In the act of seeing, I reduce the magnitude of the universe to the viewer who understands himself to be part of the planet. When the Roden Crater Project is finished, the visitor will be guided through a system of connected paths, corridors and steps to several rooms that all have a specific light quality of their own. Not only did I arrange the rooms and their apertures on the basis of the natural light and its rhythmic change according to the time of day and the season of the year, I also took account of the astronomical constellation of the sun, moon and stars." 31

site and circumstance

Architecture is enmeshed in the experience of *place*. In fusing the building to a site, one must gather the meaning of the specific situation. In reference to this relationship, Steven Holl states, "Architecture does not so much intrude on a landscape as it serves to explain it." 32 Therefore, the architecture gives one a deeper understanding of the site through its components, instead of importing architectural baggage to the site from elsewhere. The architect must first perceive and *sense* the specific circumstances that make the site the way it is. The architect must introduce a new way of 'seeing' rather than replicating the existing context. "Architecture and site should have an experiential connection, a metaphysical link, a poetic link. Today the link between site and architecture must be found in new ways, which are part of a constructive transformation of modern life."³³

This integration of nature and architecture, where the forms of spatial experience are directly related to the merging of site and sky, facilitate a move away from style and toward a more permanent sense of place. The effort is to involve the participant in the nature of the landscape, to make one more aware of the specifics of light through its rhythmic changes and variations throughout the day. The idea of digging into the ground instead of erecting conventional 'buildings' allows one to become more closely related to the site while increasing the presence of the sky.

illuminated tree



34. Le Corbusier
Text and Sketches for Ronchamp
Jean Petit
1965/ 1989

Chapel at Ronchamp
Le Corbusier



The thesis is a study and synthesis of the need for architecture to address the fundamental experiential connection to

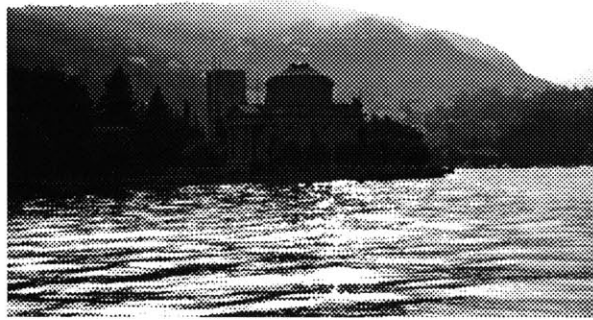
transformation. An intervention must illuminate the site using the fundamental materials of architecture: light, order, space and time. The qualities of the architecture must merge with the qualities and meaning of its situation. The reading of the 'situation' is the most challenging effort.

To begin to sense the site, the designer must completely understand the *physics* of the site to invent the *metaphysics*. Thus, the building must become something far greater than a functional solution fashioned to the site. The architecture must link the vistas, sun angles, circulation and access functions to the eternal and timeless phenomena of perception. One must question both the programmed events and the specifics of the site, sensing their natures to unfold an appropriate integration. The intervention then links the absolutes with the indefinable to establish a question of perception and cause one to have a richer experience of the site. Among many issues, Mario Botta is known for his polemic phrase, "build the site," speaking of synthesizing the landscape and the building, as the aim of the architect. Once the architecture is conceived specifically for the site, the site is then enlivened and challenged by it.

When Le Corbusier was commissioned to design the chapel of Ronchamp his ideas stemmed from a desire for *freedom*. He called it, "Totally free architecture". The only program was the service of the Mass — one of the oldest human institutions. Le Corbusier had the highest respect for the landscape, what he called the "four horizons". The landscape was the giver of orders. He called it, "a phenomenon of visual acoustics brought into the realm of forms." Le Corbusier believed that the forms make noises and are silent; some speak and others listen. He believed that the form of the chapel would prove that architecture is not a matter of columns and rational thinking, but rather a matter of plastic events and situation. There are no formulas, Le Corbusier called it a place of recollection and prayer. The landscape of the four horizons have a specific presence, they are the hosts of the event of the chapel. The chapel successfully celebrates and amplifies each of the horizons, and each horizon reciprocally communicates with the 'realm of forms'. The chapel at Ronchamp has a phenomenal presence in its anchoring to the site; it is an event in a natural place, illuminating the site and addressed the four horizons.

Le Corbusier stated that the feeling for the sacred animated his efforts in the design of the chapel. When presented to the Archbishop at the dedication of the chapel, Le Corbusier said "I hand over to you this chapel built of honest concrete, shaped perhaps with temerity, certainly with courage, hoping that it will find in you and in those who will climb this hill an echo of what all of us have put into it." ³⁴

Como, Italy

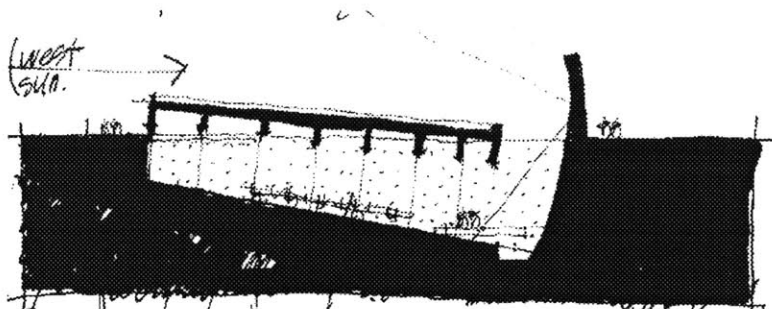


water as the phenomenal lens

Water and its dynamic relationship with light plays a critical role in our existence; it is one of the most potent dimensions of perceptual experience. The presence of water transforms a space because of its ability to expand a space by its reflective surface. The soothing sounds of flowing water, the miraculous dimension of its surface imaging and its powerful ability to be imbued with luminosity support one of the most common phenomenal readings within our cities. We closely associate our existence with the sounds of gentle water. The soothing rhythm of an ocean brings solace to our spirit. Water can bring a potent dimension into architecture when used to create a lens to the sky. Steven Holl speaks of water's ability to bring the environment, or the sky, into the heart of the building. Water can also separate one from the city with its cooling effect and ability to make white noise.

order

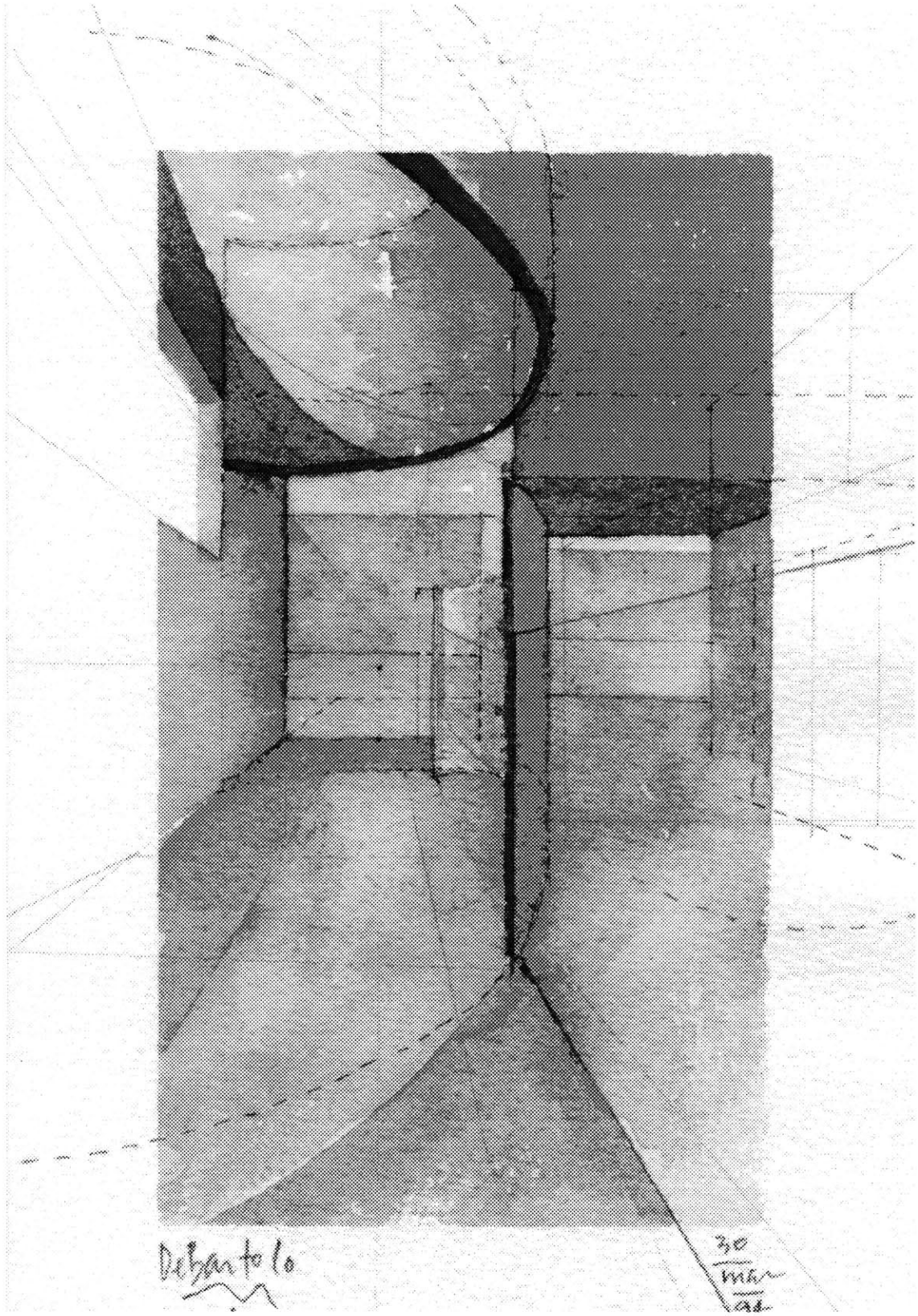
The order present in nature is of inconceivable complexity. Man has trouble perceiving order without repetition and boredom; the challenge is to learn from our environment, to combine the order and the variation. The order present in nature is integrated into the very being of all things, abiding by a series of natural laws and causes. Architecture, when designed to address the laws honestly, is imbued with integrity and permanence - being both timeless and timely.



In the design application, I am using water to emphasize two major thresholds: from city to space of focus and from space of focus to sky.

movement: At the entry threshold, the water is in motion, falling down the southern side of the concrete wall serving to separate and cleanse the participant from the city, through its movement and soothing white noise.

stillness: At the southern end of the intervention, water takes the stillness of silence and reflects the sky across its glass like surface. This idea creates a miraculous perception of bringing the presence of the sky into the realm of the silent inner space, transforming the intangible into tactile matter.

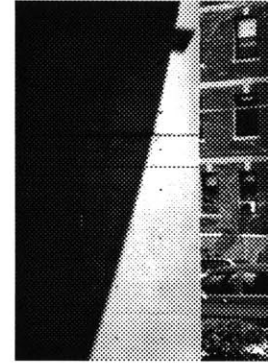


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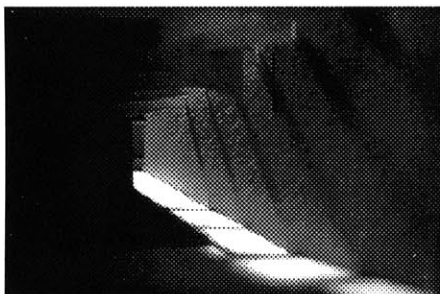
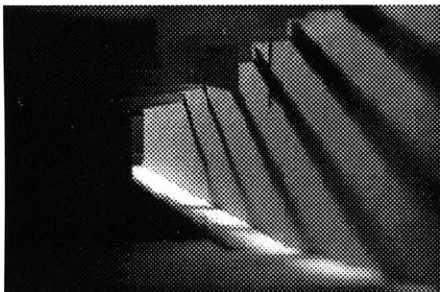
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5 Light and Time

35. Tadao Ando
"Koshino Residence"
Space Design 210
June 1981
p. 15



perception of duration
model of ramp



Carpenter Center
Le Corbusier

34

The passage of time is experienced by the shifting angle of incidence of the sun's rays into an inhabitable volume. Spaces of movement and circulation should be articulated by an increased intensity of illumination while spaces of stasis are delineated by silent light and black shadows.

Light is the most changing natural phenomenon which intimately connects us to the temporal rhythms of nature. When admitted through apertures in a building, light assumes the purpose of revealing the ever changing experience of interior form. When permitted, light and its changing environment can transform the entire volume reflecting the ambiance of the sky vault as hues of color paint the interior walls. Light pierces the heavens, it reveals the architecture and is the critical component in exposing the dynamic quality of architectural form and space.

Light is not only the commodity which allows things to be seen, it is the marker of our time, its origin and orbit establish direction; it disengages our work from our sleep, its presence impacts our emotions and moods, it sets the entire universe into order. Its presence and absence, and the in-between, have tremendous impact on the organization of our experiences and events. Its temporal quality sets the rhythm by which humans, and all living organisms, live by. "Light is the mediator between space and form. Light changes expressions with time. I believe that the architectural materials do not end with wood or concrete that have tangible forms, but go beyond to include light and wind which appeal to our senses."³⁵

perception of duration

As designers we must look for new opportunities to bring the most casual observer into an intimate awareness of light's passage across all surfaces and the parallel passage of time. As inhabitants of the Earth, we partake in a pattern of light and

36. Dale Eldred
"Places"
summer 1990
p.34

37. *ibid.*, p. 36

Castel del Monte
southern Italy



darkness that result from our relationship with the sun. This relationship manifests itself in two essential elements of time: days and years. Over the course of a day, the Earth completes one revolution on its axis which tilts at an angle of 23 1/2 degrees from vertical. Over the course of a year, the Earth completes one journey around the Sun, tracking in an elliptical orbit with an average radius of 93 million miles. On Earth, the course of both events is mapped out daily in increments of light and shadow. Architecture has the opportunity to be conceived as instruments for charting this daily progress.

Artist Dale Eldred states, "Receptivity to impressions of light and place are fundamental manifestations of human intelligence. If the earth can be regarded as the body of the world, then light is surely the world's spirit."³⁶ In the context of time duration, architecture has the opportunity to address the full cycle of relationships among humans, earth and sun. How can architecture respond to light? Artists like Eldred use broad planes with reflective surfaces which track the sun's daily passage and ever-changing spectra; or mirror fields which cast reflected light on shadowed walls, dancing patterns across the wall as the sun arcs to the west. Architecture can reinforce the perception of place by grasping the phenomenal circumstances of light and its link to time. "These circumstances might jar loose the temporal geocentrist illusions of those who pass by, and rekindle instead an awareness of the larger realm of action by which our lives are profoundly affected."³⁷

rhythm

Fluctuations and rhythmic cycles of light and the environs are indicators of a more permanent existence; the span is not the issue. The potency is found in the inherent quality of the juxtaposition between rhythms of man and rhythms of nature. If we are going to provide moments of 'natural' time celebration within the pervasive artificial 'floating' time of modern life, we must be able to interject both time-place and time-events, which are directly activated by cyclic natural light, into a range of environmental scales. The temporal light-events of the solstice and equinox, of the new moon and the setting sun, must be (re)integrated into a cultural and spiritual context appropriate to the current age of architecture and technology.

Time's rhythm is delineated by light and shadow, the field of darkness offset by the figure of light. By magnifying the banal, light creates the unusual. The incidence of the phenomenal occurs at a point of *discovery* in time, place and circumstance. The architecture must reveal information through the phenomenal perception afforded by light. Illumination must punctuate and set a rhythm for the sequences of spaces by their luminous identity: revealing their geometry and spatiality by producing light and transparencies that are sufficient to reveal the character and identity of a space. The course of light transforms space by infusing it with time, thus, establishing a space-light-time continuum.

38. Lebbeus Woods
Origins
Architectural Association
London
1985

Kiva at Casa Rinconada
summer solstice sun
photo: James Turrell



ritual

"The day begins at dawn with a gradual coming of light across the world, then follows morning, and high noon with its blazing radiance, then dusk with the ebbing away of light into the darkness of night, and then black midnight gives way, in its time, to a new coming of light, a new dawn across the world. This is ritual and mythological, and the attunement of consciousness to the steady and cyclical rhythms evokes a profound sense of inner unity and harmony with a particular time."³⁸

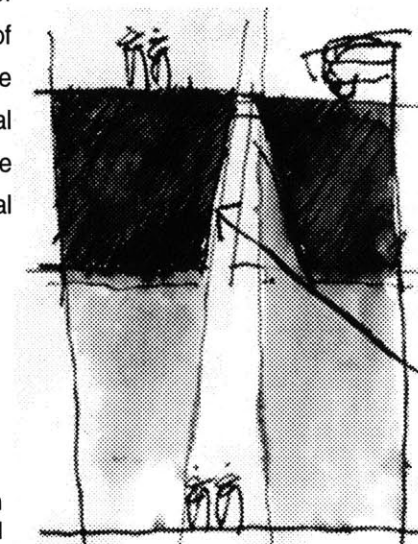
As designers our charge is not only to observe the ritual of nature but to completely integrate architecture into the great cycles of natural change. Not that we should return to primitive means of building our environments, but rather align the most advanced technology of today with the eternal and dynamic qualities of nature. This integration fosters a return to rich architectural experience over two-dimensional graphic composition.

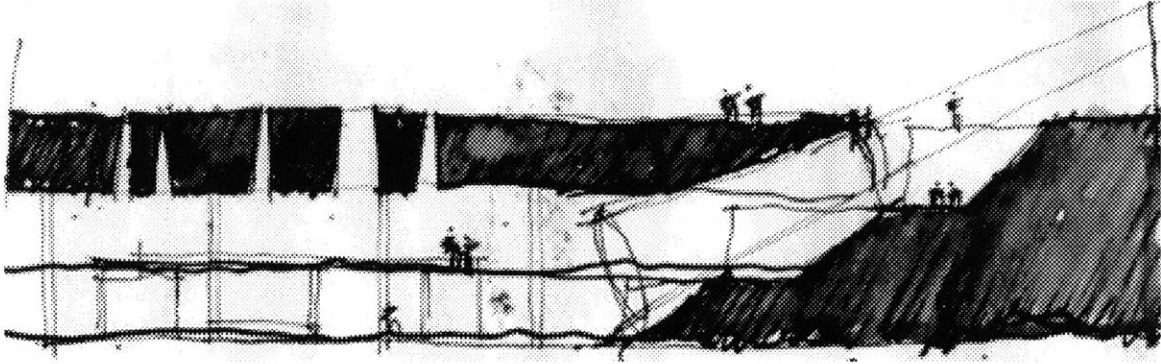
time slots

The finest examples of built form celebrating the ritual of time can be found in the American Indian dwellings of the southwest, like the *Kiva at Casa Rinconada*. Here, the interior space and exterior form of the enclosure is calibrated with the summer solstice. A true celebration of the ritual of time and place. As the summer solstice sun appears in the northeast passageway, it sends a beam of light across the kiva to a special niche intended for viewing this phenomenon on this specific day. The designers of these dwellings had a sacred reverence for the natural environment and a respect for its subtleties and strength.

Louis Kahn once said 'the outside of the building belongs to the sun, the interior belongs to the shadows.' I believe there is a moment of passage where the places of the sun meet the places of the shadows -- this is where the ritual is experienced.

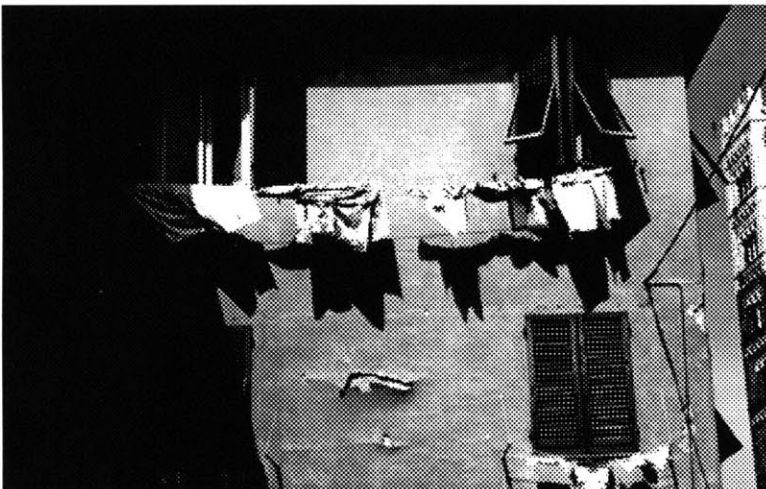
concept sketch
light funnel





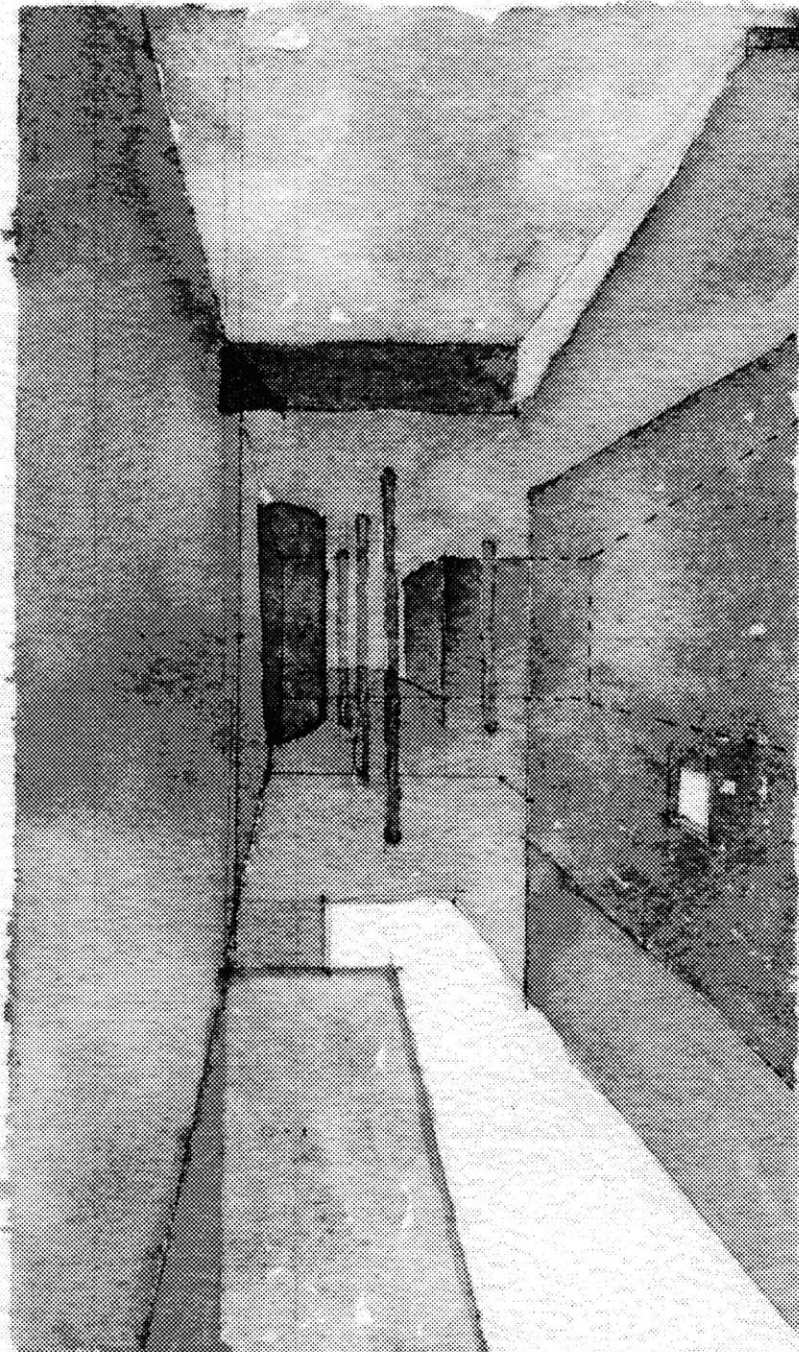
conceptual section
space under Maryland Ave.

The small dense villages of southern Italy also become poetry as the sun washes the surfaces and textures over time. Their winding narrow streets tend to transform optically with every passing hour. The walls are highly sensitized to the incidental rays of light which grate across the molded plaster, etching black shadows in every crevasse. As one moves through the meandering path of the narrow streets the volumetric segments composing each path form eccentric time slots, with only thin slices of the sky overhead. The light dances through the baffles of the shutters, it glistens through the hanging laundry strung across the street and it radiates the color of the bougainvillea growing out of the flower box. Throughout the day every volume along the narrow path is discovered by the sun, and eventually, even if for only a moment, it is lit up in full glory and resonating timelessness.



Clothesline
Lucca, Italy

Slots in the boundary of a space connect it with a specific event in the natural universe, a specific place, a specific direction. These moments of connection tell stories of time and place and embed themselves into the fabric of place with potent significance.



DeBartolo

3
May
94

6 Light and Space



Arizona tree

39

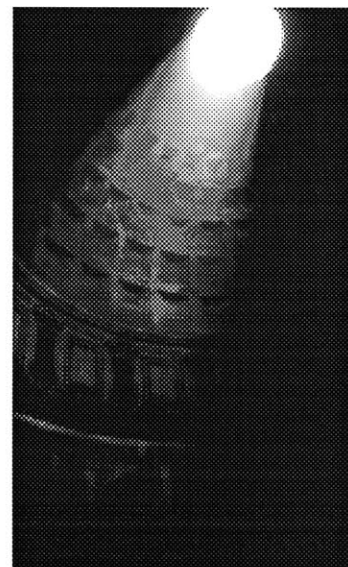
The German word for space is Raum, meaning a place cleared or freed for settlement and lodging. A space is ordinarily defined by its boundary, not as a termination of space but rather as a demarcation of presence. According to Heidegger, spaces receive their being from locations and not from "space."

It is said that we live in a sea of light. Some see our existence as that of 'bottom dwellers' who live beneath the 'ocean of the sky'. Everything we perceive is distinguished by the contrasts and patterns created by light. Although light is not only this device by which we perceive our surroundings, there are moments when it penetrates into the very structure of matter, brightening it to the point of transcendence, not only within one's perceptual space but also within one's spirit. At these moments, we sense a profound change in the state of matter and in the relationship between light and form. Suddenly lifeless chunks of raw matter that were once vacant and without energy, flame up with a vibrant presence. Volumes that were once dull and dreary, when bathed with daylight and shadow immediately take on a significant quality. We naturally thirst for spaces which are capable of absorbing, grasping and soaking in this vibrant energy and filling our environments with a miraculous spirit.

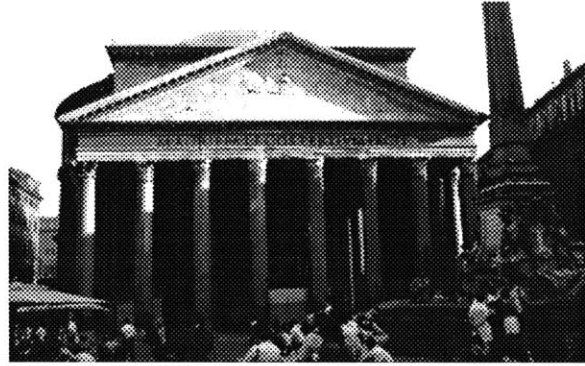
Many examples of this interaction between light and form are illustrated in nature, such as the dappled and dynamic incident rays of light which percolate through the golden leaves of an autumn tree, transforming the tree into an intricately woven array of shimmering light and translucent leaves. This phenomenon also occurs when the sun wanes in the deep sky and grazes the landscape accentuating and deepening the cracks and crevasses of its undulations with its deep and long shadows. We are also rejuvenated and exhilarated when we inhabit architectural spaces alive with light, our moods are lifted and our spirits elevated, there is clearly a therapeutic effervescence.

contained light

A patch of light moving across a space throughout the span of a day can have a potent influence on one's perception of time and space. Light is the most persistent of sacred and phenomenal metaphors, it is found in most cultures throughout history. Manipulation of light has been a prime concern of Western modern architecture, its effects being as important as the physical forms that both mold and are illuminated by it. How does one then truly encounter light? To experience the phenomenal dimension of light one must *sense* its dynamic properties in action and be removed from the rhythm and assumptions one makes of every environment. Containers of light allow us to focus on one facet of light, the power of its rays and their ability to manipulate spatial perception.



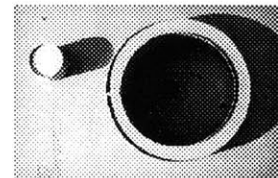
Pantheon
Rome, Italy



40

Contained light could also be called the light that 'moves us' because of its common association with spaces designed to evoke rather profound attention and thus induce concentration. Le Corbusier was the master of contained light which he called "the light of God." It works on opacities and shadow: the ray of sunlight that slices into the dark space of a room and lights up a wall. It has very strong associations with religious significance, the history of architecture and the understanding of separation between the outside world and the inner realm. One of the major conditions of this light is that the more it makes its presence felt, the more it excludes the exterior environment. It derives its force from this exclusion of the outer world, from its separation; causing the exterior to be artificially represented on the interior. The aim of container light is to hold the attention of the participant in order to evoke contemplation. Contained light most clearly designates itself as an architectural object.

Many argue that very few architectural spaces truly borrow the dynamic qualities of light to evoke a sense of change and awareness of the environment in their structures. Many also believe that the impact or *meaning* of a space has more to do with its volumes and icons than its quality of illumination. For example, some argue that the aperture at the crown of the Pantheon in Rome is a token gesture, a simple formal manipulation having little to do with the majesty of light; others argue that it is this precise minimal intervention which ignites the space with power and an intense significance. The use of opacities and transparencies in the form of *contained light* can evoke a profound meaning when used to animate a neutral spatial volume.



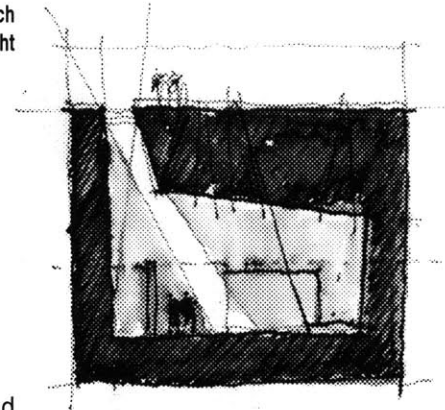
design model
light and shadow

The Pantheon in Rome is a container of light and shadow, a perfect hemisphere in form. It is axially accessed and centrally planned and holds a magnificent beam of light, undiminished by glass. The aperture in the crown of the dome exposes the chamber below to light as an instrument fashioned to track the orderly passage of time and connect the observer to time beyond his own. This window to the sky masks out all of surrounding Rome and only permits the penetration of the rays of light, exposing the otherwise dark and gloomy chamber to a potent shaft of light illuminating the interior as it falls into the room. Although the space is not filled with the full radiance of the sun and its ambient light, it succeeds in transforming the horizontal axis into a vertical contact bringing the world tangibly close to us. The Pantheon commands absolute light against absolute darkness, and the ability to inhabit either one.

As one enters the portico from the intense summer sunlight and passes through the darkness of the transitional element into the rotunda, one is strangled by darkness and all interior definition is removed from sight. The eye is deprived completely of its power and the only space perceivable is delineated by the cylinder

39. Le Corbusier
Oeuvre complete: 1946-52
Zurich
1961
p. 72

conceptual sketch
funnels of light



of light falling from above. The interior of the chamber is dimension-less and without description, its presence is not acknowledged until one's eyes adjust to the darkness after sublime anticipation. Like a sacred cave, the Pantheon's power and strength suggest an excitement normally reserved for our encounters with nature.

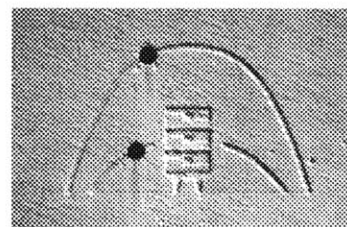
Contained light relies on opacity and inner volume to generate a place conducive to worship and contemplation, timelessness and concentration. Buildings which are containers of light can also have profound application where the crypt space is transformed into an instrument of place and time: for example an internal sundial which makes explicit the passage of the sun in the heavens. This would not be executed through an oculus or aperture in the roof, but best through many small apertures around the perimeter of the space which would allow rays of light to enter when the sun registers with those openings. The form of the space could be as simple as a drum with funnel apertures through the thickness of the wall allowing these potent beams of sunlight to penetrate the dark space throughout the duration of the day. (Forms like this are inevitably reminiscent of Asplund's library, yet brought to life with the keyed apertures. These apertures and lenses to the environment could have sheets of glass held against mastic seals by external galvanized steel clips as a reminder of Lewerentz's treatment of openings at Klippan.) A simple space, with apertures registered to the sun's orderly pattern, can contain profound meaning, being timeless and eternal. A container of light can be much more than a room with a skylight.

An example of a very different type of contained light was employed by Le Corbusier in 1953-55 with the chapel of Ronchamp. Here, the psychological dimension of architecture is present with full force. Le Corbusier himself said that he wanted to create "a vessel of intense concentration and meditation."³⁹ The funnel-like punched openings in the southern wall of the chapel charge the container with color and change dynamically throughout the day with the movement of the sun. The openings are filled with both clear and colored glass, through which one can

41

I have chosen to apply the principle of 'light container' to the spatial sequence leaving the spiral moving south to the reflection pool. This space crosses 32' beneath Maryland Avenue. The fundamental point here is creating a connection between the inhabitants above ground and those below, while bridging the space of the spiral to the space of the water.

The idea is to make a series of small incision, or fissures in the ground plane exposing the space below to small points of sunlight. At night, this dark space below ground would become a vessel for star watching -- looking through apertures overhead at the light of a few stars. This series of openings, which will cast cones of light through tiny openings in the ceiling, will work much

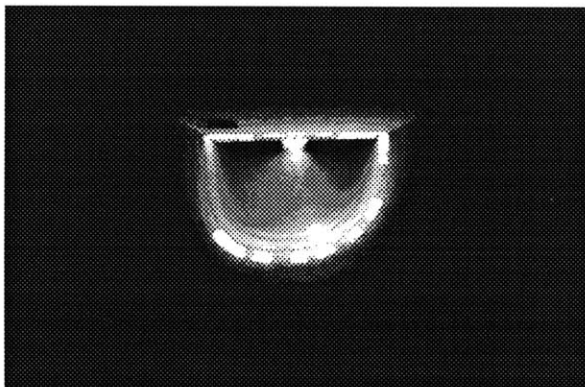


Le Corbusier sketch on wall



perceive the clouds, or the movements of the foliage and even passers-by.

Le Corbusier used another type of contained light in the three small chapels at Ronchamp which are oriented respectively to the north, east and west; each with a very unique natural illumination. The small chapels become vessels of falling light, each with its own light-characteristics. Each of the three chapels has a light-time relationship between the site and the inner dwelling. The plaster on the inside surface of the eastern chapel glows a vibrant red. In the early morning the it lights up, bleeding its pink light out into the collective space. One who dwells in the space perceives the presence of the sun and feels its direction, without actually seeing direct light.

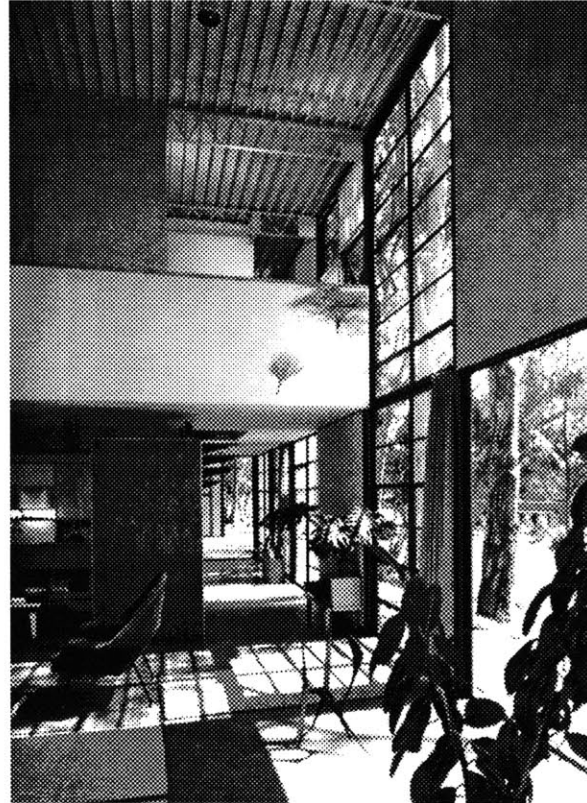


Chapel at Ronchamp
Le Corbusier
eastern chapel
above:
southern wall

like a *camera obscura*, projecting images of the sky onto the floor. These images and their inherent light would be interrupted by patterns of movement above ground. For example, a car or person passing over an aperture would momentarily block out the light and serve as a reminder of the cadence of the city relative to contemplation. During the day, the observer can watch the clouds floating at his feet and at night see ghostly images of the moon and stars glowing in the darkness. Openings will register themselves with the movement patterns of specific stars and planets. For example, the movement of the *north* star across its specific opening each night would be perceptible.



Charles and Ray Eames House
Los Angeles
interior photo:
L'Architecture D'Aujourd'Hui



universal light

A universally lit space is like a glass box without a clear definition of where the outside stops and the inside begins. Its space becomes part of the sky and absorbs its color and ambiance. There is a *direct* relationship between the light within the space and the light of the outside world.

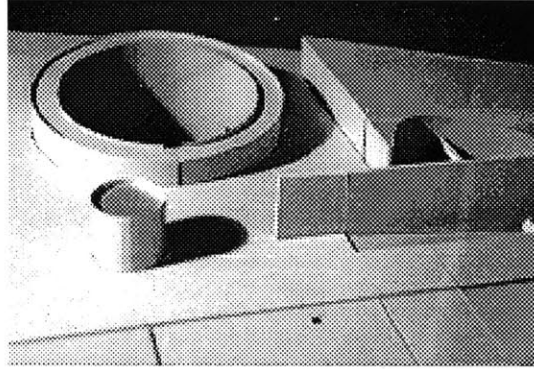
Above all other natural elements, light possesses the power of revelation when experienced in its most pure and clear venue, the natural environment. However, there is a paradox, in the natural environment light is difficult to perceive because it is everywhere. Without containers to isolate and play with light as it changes over the length of a day, it appears rather motionless, in an incredible state of balance. It lacks the highly-visible spatial qualities of contained light but it allows for the immaculate exchange between inside and outside. Opposite of contained light, universal light gives the illusion that the outside is still on the inside.

An excellent example is the Charles and Ray Eames House in Los Angeles. Although, it is devoid of mystery, lightweight and perfectly modern, it is a vessel of universal light. The spatial boundary is delineated by thin planes, whose limits are clear. They are so fragile as to give the impression that the site continues into the house. The light is visible, although its strength is limited because it lights up everything. The transparent glass is the ideal material to enable the interior to communicate with the exterior and vice-versa, but not always the most meaningful. The question lies in the appropriateness for total transparency of the skin, which transmits a hygienic light rather than a moving illumination. Although the Eames house does not have opacities to increase the effectiveness of its openings, the effort was to bring the outside in, and that is exactly what it does.

Light pierces man-made time and machine-made space in a mysterious and unifying way, bringing us to an elevated consciousness of receptivity and understanding of nature. This has been referred to as the experience of 'pure knowing', a knowledge which is detached from our desires and our subjective judgment, and central to the aesthetic perception in all nature. The task of the architect when challenged to create a volume of universal illumination is to put himself into a state of 'pure knowing' through intense contemplation, thereby investing that space with qualities that speak to empathic minds of an eternal and timeless place. One must perceive the subtle changes in color of the sky over time by focusing on it, as it fills a space and the space becomes part of the sky. One must perceive the motion of the sun, the moon, the earth and stars, for this is truly encountering light and its ambiance.

40. Lebbeus Woods
Origins
A.A.
London
1985

model
universal light
cylinder



44

To design and manipulate light for a particular purpose requires, in the architect, the highest degree of consciousness. To perceive light as light, purely and directly, and to create form that expresses and heightens that perception requires an even higher degree of consciousness, transcending the explorative state of mind that usually solves logical problems. Architect Lebbeus Woods stated that Architecture that heightens the perception of light and its unifying effect upon the mind is that to which he is most drawn, quite aside from questions of contingent utility. It is such an architecture he seeks to raise in his imagination, in the form of a single building reflecting and absorbing the light of the sun, moon and stars.⁴⁰

Universal illumination refers to a very different condition than that of a controlled light situation. The best way to illustrate the difference is to consider two ordinary shoe boxes. One shoebox, with its lid on, has some carefully cut-out holes in its sides and lid, it is an example of 'controlled light'; rays of light will pass through the apertures and at specific times cast shadows across the volume within the box. The second shoebox simply has no lid at all, it is an example of 'universal light'. Here, the interior volume of the box is filled with the sky, its colors, ambiance and variation directly impact the space the box defines. Universal light volumes are devised to capture, absorb, grasp and reflect light: to make it palpable and present in consciousness with a purity and exuberance that demonstrates at once both the diversity and unity and the complexity and simplicity of the world we inhabit. A universally lit space celebrates the powerful relationship between light — our experience of it as a thing in itself — and certain patterns of change in the evolution of time and space that are expressed as a 'mythos': the ritual of light as the dynamic order animating the world. There is a blurred juncture where the interior space merges with the exterior space, and the space of the sky is brought down *into* the space of the volume. This space is completely open to the sky, yet there is a perception of enclosure by the sky. This sense of closure happens at that juncture of sky and space, one even perceives that there is a glassy film stretched tightly across the opening — a transparency that changes with the sky conditions and sun angles. There is both a night and day response. The threshold between night and day is when the greatest change is noticed in a universally lit space.

The finest example is found in its purest form again in the work of James Turrell. Here, spaces are designed solely for the purpose of directly perceiving the ever-changing quality of light which characterizes the sky, unobstructed and continuous in its rhythmic change. Turrell achieved this interaction between the inner space and the outside world by allowing light which changes in the course of a day to reach a given space through 'structural cuts' in the building. Turrell's 'sky windows' and 'skyspaces' are exhibitions based on several years of study which took place at a former California hotel he rented in 1966. Here, he was able to control and manipulate light by raising blinds and opening doors and windows as well as making holes in walls and ceilings. This interaction between the inner space and the light of the world outside — a relationship that changes during the course of the day — is lacking severely from the architectural environment .

41. Frank Lloyd Wright
In The Realm of Ideas
1988

Galleria "Vittorio Emanuele"
Milano, Italy

42. Steven Holl
Anchoring
1991
p. 126



"Now the outside may come inside, and the inside may, and does, go outside. They are of each other." ⁴¹
Frank Lloyd Wright spent the greatest portion of his life focused on what he called 'organic architecture', the finest attribute of which was the blurring of the line between the inner realm and the outside environment. Wright's effort was to 'free' the individual who was inhabiting the space, to broaden and enrich the experience of inhabitation through natural light and freedom of space; what he called the 'destruction of the box'. In the Johnson Administration Building there is no sense of enclosure around you, it is absent of what Wright called 'boxing'. Suddenly, the interior space is transformed into a space under the sky. Although the space is not open directly to the sky, the ambient and dynamic qualities are easily perceivable from the interior space.

The Oxnard house in California is also an example of utilizing universal sunlight to animate the events of a series of spaces. In this project, Steven Holl successfully used the inner space and natural light as materials of architectural expression. Due to the intense sunlight and regularity of clear California skies, the form of the house directly responds to the environment. Two interlocking solids define the interior spaces in plan and in section, modulated by the passing arc of the sun. Within the space of the northern "L" are the night functions and within the southern are the day functions. The entry stair is what Holl calls a "volume of shadows" — a 'skyspace' open to the ever-changing quality of the sky. Uninterrupted walls allow the sun to emphasize wall mass and define interior spaces with washes of sunlight. ⁴²

The skylit atrium of the Exeter Library, by Louis Kahn, is bounded by strips of light-toned oak set in silvery, circle concrete frames. Daylight is first caught up in the deep concrete baffles in the roof, softened there by reflections, and then guided below into a vessel of predominately warm hues, which color the rays into a faint buff-yellow. By contrast, the exterior is solid and dark, a container of light, its brick walls and wood infill

The spiral, or cylinder at the core of the sanctuary project serves as space of universal light collection. In this space, the massive concrete drum employs a phenomenal perception of only sky, masking out all surrounding visual information. This sensation is called 'celestial vaulting', where one loses perception of the horizon line and the eye causes the sky to look as a vault overhead with infinite depth. This space is charged with the sky and its changing qualities throughout the day. Its color, texture, clarity, ambiance and density all vary and the space will be made by the sky. The natural color of the exposed concrete serves as



revealing the patina and weathering that Kahn so admired. The diagram of the library is a cistern of light within a container. Permitting controlled apertures of light at the periphery and an abundance of universal light at the core.

The United Airlines Terminal by Helmut Jahn (illustrated above) addresses the universal qualities of light permeation into its major spaces. There is a clear separation of skin and structure: the membrane of varying patterns of opacity, wraps around the skeleton-like white steel, filling the space with the ambient qualities of the Illinois sky. The rush of movement contrasting the silence of light, the presence of natural duration juxtaposed to man-made time charges the space with a complex resistance to flow. The transparent crystal is accentuated as various membranes begin to refract and break up the outside views unevenly, interior light dapples the film with reflections and superimposes color over the translucency of the glass. As one moves throughout the terminal, glistening reflections become spliced and laminated, views are multiplied and become like photographic emulsions momentarily imprinted right into each pane of glass. The spatial experience is defined by the invisible boundary which is simultaneously window, skin, and mirror. This reflectance fuses light from distant images, dispersions in the glass itself and reflections from the foreground, creating an inherent complexity.

a neutral 'lens' for observing the sky and for contemplation without distraction. The phenomenal dimension is captured in one's understanding of place versus perception. The drum is easily recognized from the outside, although one cannot see over its edge down into it.

The observer's proximity is rather near to the city, hemmed in by it, yet at the same time, visually unaware of its presence.

The city has entirely disappeared. An atmosphere of solitude and complete enclosure predominates. This phenomenal 'position' within the city but connected directly from earth to sky, is the sacred experience.

above: United Airlines Terminal
Chicago, Helmut Jahn

43. A. Krischanitz
1992

Bradbury Building
Los Angeles
George Wyman



The Bradbury Building, designed by George Wyman, is an even greater cistern of falling light in downtown Los Angeles. It is like a well open to the sky, the brilliant colors of the interior surfaces radiate in the California sun. The walls are simultaneously grasping and reflecting the downpouring rays of light. A black steel industrial elevator rises out of the open atrium to the sky, it gracefully meets the particles of the air, and its presence is intensified by the sunlight which illuminates every detail. The interior space becomes a container of ambient light, the color of the brick varies with the color of the day. It flares up in a golden-orange in the bright sunshine and smokey-grey when the sun slips behind a cloud.

scale

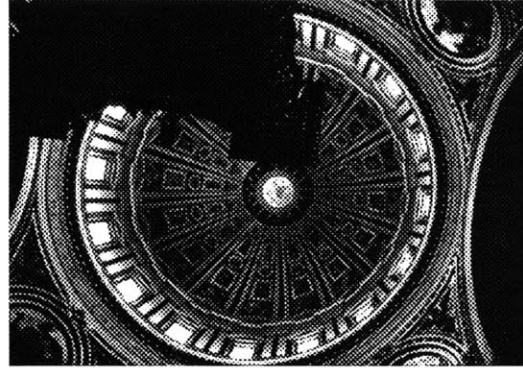
"Space is existential, yet relative. It is specific to different cultures and closely related to the habitat of its members. The earliest meaning of the word "room" was is that of a clearing in the woods, a sanctum of space created for human habitation. Space therefore was originally considered as hollow space." ⁴³

The perception of one who is experiencing a space may soar through a cathedral and out its aperture at the top of the dome; or cringe in the stairway of a slender tower with only small punctures in a heavy load-bearing wall. Architects have long used the conventions of scale; compression and release to evoke an increased level of consciousness of the space one is entering into or passing from. This dramatic dichotomy strikes the attention of the senses and causes one to pause and notice.

If one contrasts the grand and magnificent St. Peter's in Rome to the lovely, humane and gracious Katsura Villa in Japan, it is evident there is no direct link between scale and quality of experience. Therefore, transcendent spaces are not always linked to grand scale. On the other

There is great presence in massive volumes, often related to the phenomenal. But, perceptual scale is not limited to physical space, the mind can make the intimate seem large and the large seem intimate. One's perception should not be hindered by space but rather freed by it. We must eliminate the barriers between scales, moving from the intimacy of fingers touching a handrail to the connection between earth and sky.

St. Peter's Basilica
Rome, Italy



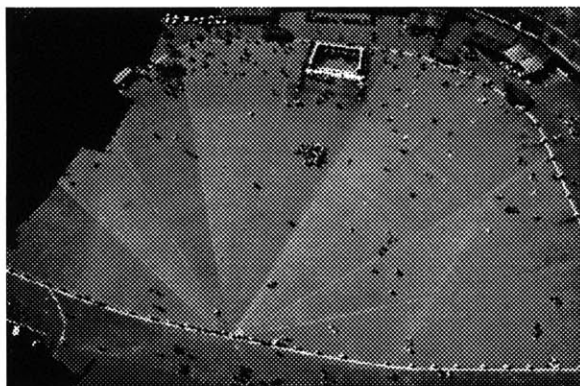
tower aperture
Siena, Italy



hand, the remarkable dome of St. Peter's causes one not only to feel small, insignificant and petty in the light of a mighty God; but it also grips the soul and takes one flying through

three-dimensional space, exploring the boundaries of the container which holds such a marvelous volume and shape of space. One who is perceiving this experience, breathes deeply and is clearly freed by inhabiting such a volume. A similar sensory reading can be experienced in the Pantheon. The release into this miraculous space, at once separated from Rome yet simultaneously enmeshed to it, awakens the soul and refreshes the eye to contain its light and behold its presence in a space.

The tower rising from the Piazza del Campo in Siena is quite the inverse experience. There is no majestic light beaming down from the heavens, no awesome interior volume to inhabit. One climbs up, step by step, within the confined and compressed tower stairway. Yet, to reward one for this challenging journey, there are small holes of relief placed strategically at some of the landings, often only the size of a hand. In that moment, the arduous work is easy, a connection is made, and one receives a glimpse of the rooftops of Siena. The epiphany does not come until one reaches the summit, a panoramic view of the Tuscan countryside — the infinite release, far greater than the interior of the dome.



Piazza del Campo
Siena, Italy

Ramp: The long linear ramp of gradually increasing compression transforms the focus of the perception of the participant onto the small slice of the sky. The wall of running water helps to delineate the threshold acoustically between city and silence.

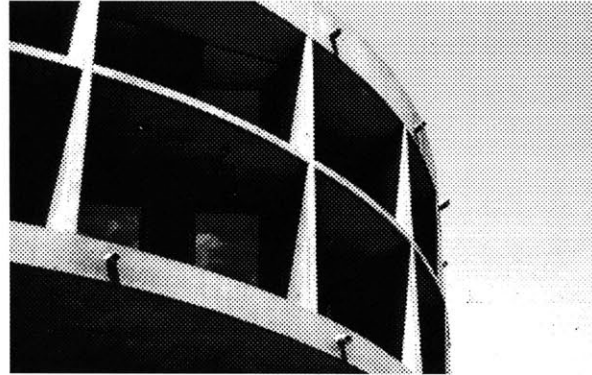
Collective space: One is then compressed at the threshold (passage) into the collective space then released and free to ascend over platform and up the luminiscent wall.

Spiral: One is compressed in the dark spiraling circulation ramp but light leads the observer on, even though the ramp is narrow and mysterious. The observer is then released into the expansive and infinite sky space.

Exhibition: One is again compressed at the passage from the spiral into the exhibition hall. Here, the participant passes beneath the street (Maryland Ave.) in a low but gradually becoming grand space. At the end of the space there is a still pool of water reflecting the sky, and releasing the participant back to the urban rigor.

44. Louis Kahn
Between Silence and Light
1979
p. 38

Carpenter Center
Cambridge, MA
Le Corbusier



boundary

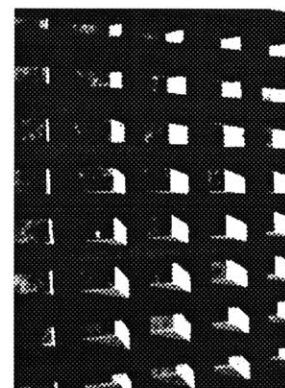
The boundary of a space makes it distinct, sets it apart and establishes the relationship it will have with the outside world. Architecturally, 'to define a space' means both 'to make distinct' and 'to determine boundaries'. These boundaries establish the relationship the 'space' will have with the surrounding environment. Therefore, the boundary becomes the critical moment in the defining of a space and its relative displacement defines the relationship. Thus, the distinct space is *always* in a subjective relationship — conflict, indifference or reciprocity — to the surrounding environment or context.

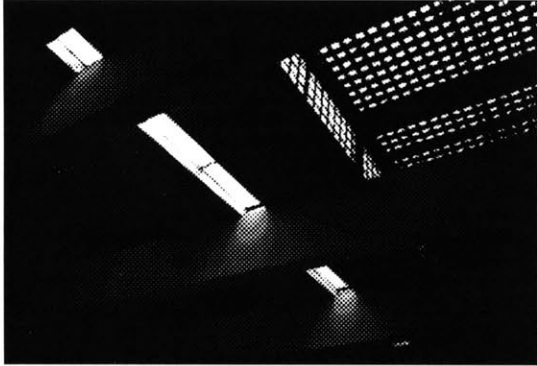
Like a filter — which has different levels of porosity permitting certain particles to pass through and not others — the boundary can be defined by its method of allowing varying amounts of daylight, ventilation and people to pass, among other elements. That daylight which is permitted to enter the space becomes the inhabitable light within the volume and establishes the presence of a larger order juxtaposed into a finer order. A small aperture in a fortress wall may serve as the only moment of connection and relief from the interior compression. On the other hand, a lightweight membrane skin which evenly emits light through its translucence will permit a soft presence of light, without intensity or shadow. The oculus of a dome may permit a clear shaft of sunlight to penetrate into the space below and give it a time-space relationship. The shell of a heavy roof which does not touch the wall which it sits upon, but rather leaves a horizontal beam of light in-between, introduces a dichotomy. Each instance employs a potent sensory experience. These experiences of foci, of translucence, of time and passage, of surprise and delight are only the most obvious. These boundaries of the space — however porous or opaque they may be — radically alter the presence of light, the passage of time and the spirit of place.

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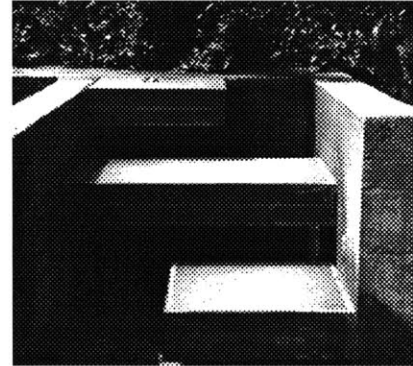
“Also marvelous in a room is the light that comes through the window of that room and that belongs to that room. The sun does not realize how wonderful it is until after a room is made. A man’s creation, the making of the room, is nothing short of a miracle. Just think, that a man can claim a slice of the sun.”⁴⁴

L'Unite d'habitation
Marseille, France
Le Corbusier





Brion-Vega Cemetery
S. Vito, Italy
Carlos Scarpa



Casa del Fascio
Giuseppe Terragni

A room as a container of light uses its 'filters' or apertures to obtain certain associative properties of sunlight through openings and closures. The light can be shaped or can shape the space of the room. For example a slit cut into the concrete wall of Ando's Chapel of the Light in Japan, allows an intense beam of light to penetrate the room, a blade of light floating in the darkness. The light transforms the space and fills it with a presence, the space becomes a dark field rather than the object. Le Corbusier was the master of using controlled light to create powerfully vibrant spaces. His ability to think about light as a fluid element of architecture continues to evoke meaningful places long after construction. Le Corbusier's filters and boundaries explore the possibilities and conditions of light in the making of timeless architecture.

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spatial relationships

Spaces have one of three relationships with the outside world: indifference, conflict or reciprocity. Our position toward the use of natural light is directly related to the harmony between space and light. A disregard for the presence of natural light in architecture is much like ignoring the need for harmony in music, producing conflicting and clashing tones, not melody. The designer employs one of three general relationships in the integration of light and space.

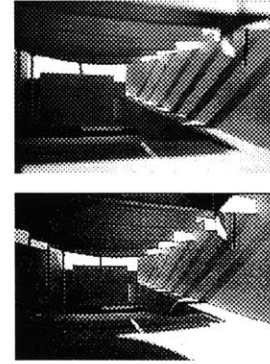
The first and possibly most dangerous position is one of *indifference* to issues of natural light. This insensitivity breeds spaces which result in glare and thermal discomfort and missed opportunities. One might have rather critical beliefs about form, manipulation of space, transformation, assimilation, and assembly; but without regard for light, the "dynamic" forms and spaces only result in crafty manipulation and arbitrary idea conception. The spirit of the place (*genius loci*) is found in the presence of light and its magical play on informed architectural form. Artificially lit environments quickly appear homogenous and without 'life' and most importantly, without 'spirit'.

Indifference is what allows buildings to be designed for a 'generic site', without regard for the micro-climate, sun orientation or topography. These "units" are then turned and reoriented, slightly manipulated and altered to fulfill the needs of economically driven programs. A sad example of this can be found in tract-housing industry in most of the faster growing cities across the United States, especially in the temperate climates where weather plays a less critical role.

In Phoenix, Arizona alone there will be over 30,000 new tract-homes built in 1994. These single family residences usually have two or three basic 'designs', referred to as "models" which are then built over and over throughout acres of sprawling edge cities (usually painted a variety of shades of pink). These are the "neighborhoods" of the southwest; repetition to the point of obscenity. A large window which may allow a pleasant aura of indirect light when oriented to the north, becomes detrimental to the inhabitants when in another unit this

45. Frank Lloyd Wright
In the Realm of Ideas
"Nature of the site"
1988
p. 28

design model
reciprocal space



same window is facing the brutal western sun; causing extreme discomfort, not to mention environmental energy waste to combat thermal loads. Our country is infected with too many buildings which have gone beyond indifference to the point of neglect — intentional belligerence. Possibly this can be blamed in part on economics, but the ramifications both environmentally and psychologically are much more damaging.

The second and possibly most common relationship many inhabited spaces have with light is one of conflict (the inverse of Kahn's attitude). This act of belligerence saturates our cities and urban environments and exists as the context which many of us as architects battle against. (more)

The final position (and focus of this study) is one of reciprocity. It is critical to make a sensitive and rigorous reading of the nature of the site, there are regional characteristics and environmental issues present. Reciprocity is the state or condition of being reciprocal; a state in which there is mutual action, influence, giving and taking, correspondence, etc., between two parties or things. In this situation, the architect not only designs the set, now he challenges the script and becomes the director. The set comes to life because the architect becomes choreographer and uses light to bring the static forms and spaces to life. The architect must always remember the sensitive context he is working within — on the earth beneath the sun. By employing the dynamic, ever-changing and potent relationship to the sun, a space can suddenly be transformed and intensely animated. It should not be so difficult to imagine a highly illuminated surface bathed in natural daylight set apart from that in shadow; such as the richly colored walls of an old medieval street in Rome or the golden translucency of autumn foliage in New England.

As the light shining through the aperture of the Pantheon delineates a shaft in a previously neutral space, its presence is strengthened by its grand moves up and down the interior walls as the day lingers. In this case the form of the building is a camera accepting a 'controlled' light, but nevertheless, the slice of sunlight is transformed into the actor and the building becomes the set.

"Man takes a positive hand in creation whenever he puts a building upon the earth beneath the sun. If he has birthright at all, it must consist in this: that he, too, is no less a feature of the landscape than the rocks, trees, bears or bees of that nature to which he owes his being."⁴⁵



volume position: submersion

In a recent article published by *Daidalos*, Gerhard Auer writes, "Only when architecture succeeds in encapsulating itself from its surroundings, only when it can deprive the eye of its power, does it become a place of suggestion similar to the excitement normally reserved for encounters with nature."⁴⁶ The encapsulation of an inhabited volume, in this circumstance, is achieved most effectively through submersion. By using the altered 'position' to deprive one of his former assumptions, the participant can be 'moved' to profound contemplation. If this separation from the daily continuum is the vehicle by which one can be "moved", being necessary to dislodge one's perception, a dialogue between the daily and the eternal must then be facilitated. Eliade states that this dialogue is fundamental to life and must be realized through a specific connection. This "temple", as he calls it, "constitutes an opening in the upward direction and ensures communication with the world of God."⁴⁷ Therefore, vertical orientation as a means of locus and connection, permits one to distill life and focus on the eternal. Auer believes that this vertical contact "does not deprive us of our [former] horizon, on the contrary, it brings it tangibly close to us."⁴⁸ Therefore, the horizon must be momentarily eliminated to effectively derail one from his former circumstance, giving way to discovery and increased sensing. This new horizon is established through a slight adjustment in 'position', employing a new perception and a metaphorical sense of reality. This transformative experience gives one an understanding of the indefinable, thus enriching the soul.

- 46. Gerhard Auer
Daidalos
"Building as Sinking"
1993
p. 25 - 26
- 47. Mircea Eliade
The Sacred and the Profane
1957
p. 26
- 47. Auer p. 24

Underground Metro terminal
Washington D.C.

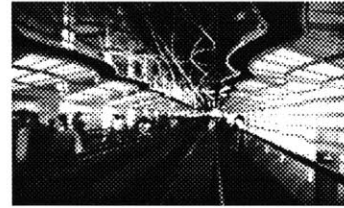
52

There is a sacredness through movement into the earth, using the earth's surface as poche. The position of a space should disengage one from the city and simultaneously reference it. This should foster a new perception through the 'masking off' of certain elements and illumination of others.

In designing a *monument of contemplation and reflection*, I believe the meaning of the form stems from a greater understanding of the environmental circumstances, where one could closely focus on the power of the sky, its vastness and its intricate variation of color. This must be achieved through a device which cuts out all surrounding information. I have chosen to use a slight shift in section orientation in an attempt to disengage the spatial volume from the datum of the ground plane; diving it into the earth to look up. This moment of contemplation should separate the visitor from routine daily life to pause and reflect. Thus, I have chosen to use a ramp which slowly submerges the participant, and facilitates a sequence for 'cleansing' from

49. Gerhard Auer
Daidalos
"Building as Sinking"
1993

50. Le Corbusier
Towards a New Architecture
1986
p. 4-5



Chicago United Terminal
underground passage
Helmut Jahn

The stringent limitation of focus through submersion of the inhabited volume, lessens the 'objectness' and permits one to have a more potent perceptual experience. This 'sacredness' through the movement into the earth, into a cave, into nature, provides a place for silence and contemplation, to transform the everyday into the eternal. Although, "Against the background of nature, the majority of architectural interventions appear as insignificant, they can, at best, only give rise to aesthetic delight, but likely not overwhelm one emotionally." ⁴⁹

Artist James Turrell has designed a project employing submersion coupled with sun oriented apertures to create powerful moments of self reflection and qualities of what he calls "sacredness". Light plays a commanding role when a volume is completely dependent on its presence, creating spaces which provoke participants to look within themselves. The intensity and variation of light gives a space its personality. Its position on, above or below the earth's surface is directly related to the spatial experience of place, and its connection to the outside realm. Turrell, as well as the theories of Eliade and Auer, are not interested in man-made 'objects' which create a sacredness, but rather the participant's *perception*. The role of architecture is to facilitate a venue for perception, to be a lens of the environment. The submersion of the volume eliminates the object and allows the inhabited space to become more like the 'lens' and less the 'foci'. This concept of 'rooms for perceptual discovery' directly relates to the architectural agenda — interaction *with* the participant instead of *for* the participant. The stringent limitation of focus can evoke significant meaning in this distracting world and increase our sensory reading dramatically.

Even Le Corbusier, who believed the house to be a machine for living, also stated that, "The business of Architecture is to establish emotional relationships by means of raw materials. Architecture goes beyond utilitarian needs. Architecture is a plastic thing. The spirit of order, a unity of intention. The sense of relationships; architecture deals with quantities. Passion can create drama out of inert stone." ⁵⁰

the city context. The spatial concept keeps the ground plane silent in regard to program and allows the events to happen below grade. This relationship provides a powerful space which can be kept alive and never appear to be 'closed'.

I believe that this idea speaks of a heightened relationship to the sky, by going down to look up. (Backing up to get a better look at the whole picture). If the intervention would cast the visitor soaring into the sky, the natural tendency is to look down at the city, not up into the sky. Although a city view can give one a great feeling of order and assurance, this approach directly engages the making of an environment for *silence*. The idea is to separate the participant from the city, but at the same time give him or her a richer understanding of *place*. If one 'backs up in relationship to the sky' or goes down into the earth to focus his attention on the sky, this will clearly delineate a zone of increased perception through unfamiliarity. If one is unable to perceive the forest for the trees, it is also possible that one is unable to perceive the city for the buildings. This simple yet powerful gesture of masking-off increases one's awareness to *place* and simultaneously dislodges it.

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|---|--|---|
| 51. Mircea Eliade
<u>The Sacred and the Profane</u>
New York
1959
p. 25 | 52. Henry Plummer
<u>The Poetics of Light</u>
A+U
1987
p. 83 | 53. Rudolf Otto
<u>The Idea of the Holy</u>
New York
1958
p. 68 |
|---|--|---|

Brion-Vega Cemetery
S. Vito, Italy
Carlos Scarpa



threshold

The threshold is the passage, the pilgrimage, the moment (or series of moments) at the boundary or the margin of the sacred realm where it is juxtaposed to the profane. There is a profound significance to the experience of transformation from the profane to the sacred, from the realm of the common to the realm of the phenomenal. This journey and separation from the outer realm is necessary to delineate the line of demarcation as a conscious and perceived threshold.

Mircea Eliade tells us that, "The threshold is the limit, the boundary, the frontier that distinguishes and opposes two worlds — and at the same time the paradoxical place where those worlds communicate, where passage from the profane to the sacred world becomes possible."⁵¹ This exploration of passage then becomes fundamental to the significance of the experience of threshold. Shadowy passages have a long history of significance as thresholds to religious spaces. Henry Plummer stated that the "dark vestibule and murky narthex intensify contrast between inner and outer, but even more importantly, introduce a cyclic journey out of the light of day, through a dark regression, and into the germinal light where life is beginning anew."⁵² Rudolf Otto tells us that these dark spaces are analogous environmentally to silence, as "negatives" which release the sublime.⁵³ One can also look at these moments of threshold as moments of death and rebirth, separating one from previous existence and introducing a new realm. In other words, we 'die' in order to be 'reborn' into a revitalized space. This momentary depletion of life by the handicapping of the senses, can be experienced phenomenally by any person without a conscious understanding or willful awareness.

The moment of the *threshold* is possibly the most critical moment in the experience of the phenomenal dimension. Today, it is fundamental that we question past habits and explore new ways of thinking and making. The effort here is to (re)evaluate all that we accept and address the essence of a space for collective awareness and individual understanding,

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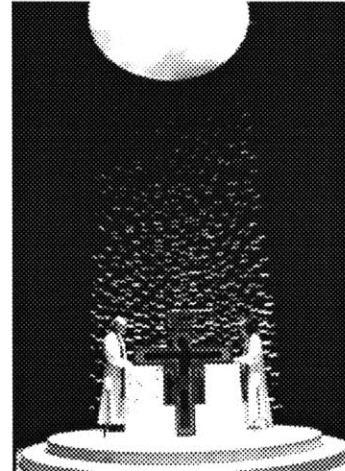
The threshold is the point of passage from one space to another, a penetration through the barrier or filter. A change in elevation will enhance this perception of enclosure and detachment, permitting focus on the immense and the intimate.

When studying a volume which is submerged into the earth, there is a very clear delineation of the threshold; a sequence, a journey of articulate and changing pathways down.

During the course of the descent, the familiar cityscape of Washington DC slowly begins to disappear as one is hemmed-in by towering walls and compression. The journey along the ramp gives indications and clues of what is to come, to give the visitor a sense of pilgrimage, a focus and a goal. The monolithic walls direct one's view to the sinking Capitol. Once completely out of sight, one is introduced to the space of inhabitation below. This movement of sinking into the earth is often related to concepts of death, but in this project it facilitates a method to 'encapsulate' a person and separate him from everyday life.

54. Christian Norberg Schulz 55. see Goethe 55. Louis Kahn
Genius Loci
 Italy
 1984

MIT Chapel
 alter
 Eero Saarinen



an architecture that is deeper than style. Schulz stated that, "...a threshold separates the outside from the inside. Representing the 'rift' between 'otherness' and manifest meaning, it embodies suffering and is turned to stone."⁵⁴

This moment of passage from the profane to the sacred is the most significant sequence in virtually all sacred spaces. The transition has a relationship simultaneously to the outside and the interior — the vestibule greets us before the inner sanctum. The question Goethe asked in 1798 is if the participant ever goes beyond the vestibule.⁵⁵ Once beyond the passage from the outside world to the inner realm one encounters a series of thresholds into spaces of increasing sacredness. Kahn believed that a space of collective assembly should have three such zones of experience: The court or vestibule, where participants can feel the presence of the sanctuary as a passive watcher; the ambulatory, for those who aren't quite sure but want to be near; and the sanctuary, for those who want to kneel.⁵⁶ One penetrates each one of these zones as he feels comfortable. The sequence should not forcefully cause one to penetrate to the center if one wishes not to. The sequence must permit freedom and flexibility.

One of the most clear examples of threshold can be found in Eero Saarinen's Chapel at Massachusetts Institute of Technology in Cambridge. The spatial volumes are composed of three very simple forms: a perpendicular wall delineating the realm of the chapel, a large brick



MIT Chapel
 vestibule
 Eero Saarinen

The ramp is long because of the need to submerge 24' below grade to the collective space.

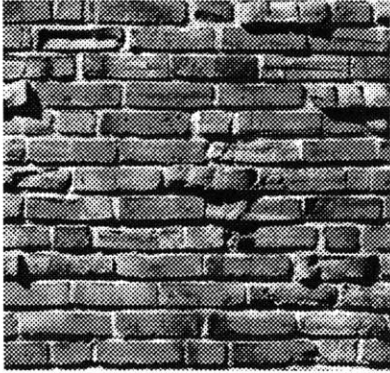
The *position* of the ramp is critical to the experience of departing the city and dislodging one from prior assumptions.

The sequence of the ramp becomes the first instrument of the delineated threshold. The ramp slices a narrow gouge in the landscape directly aligned with the Capitol building, this axial hierarchy alerts one of the importance of the place and at the same time disassociates one from the city as the horizon rises above one's eye level. After the first run of the ramp the visitor

has submerged half the necessary depth and now turns around to find a world below ground awaiting inhabitation.

Once penetrating beyond the landing, one immediately sees through a obscured glass plane into the collective space. This

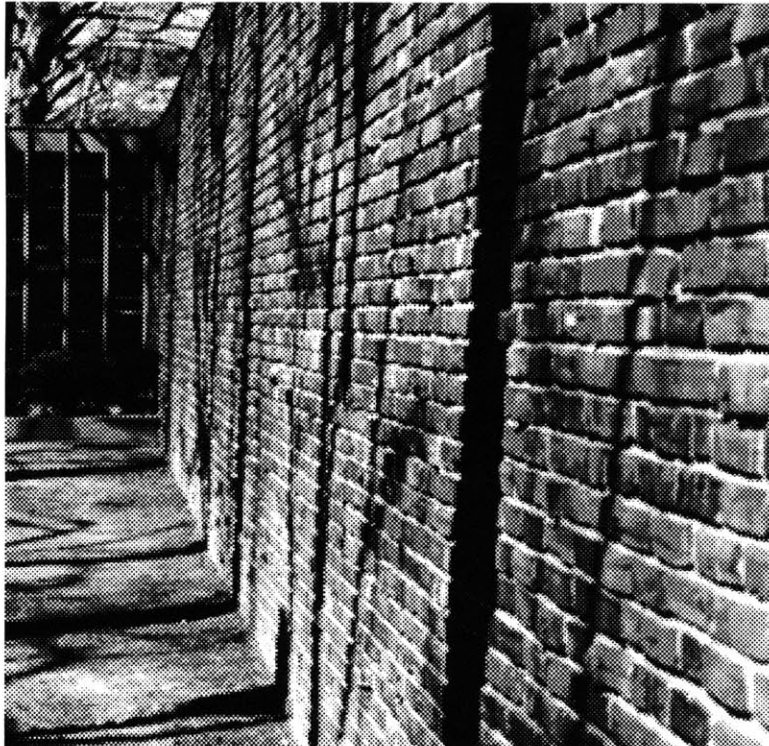
moment of clear separation, entirely exposed to the sky illuminates one's sense of focus and eliminates almost all the distractions.



MIT Chapel
brick wall

cylinder set into a shallow pool of water and a rectilinear element mediating between the two.

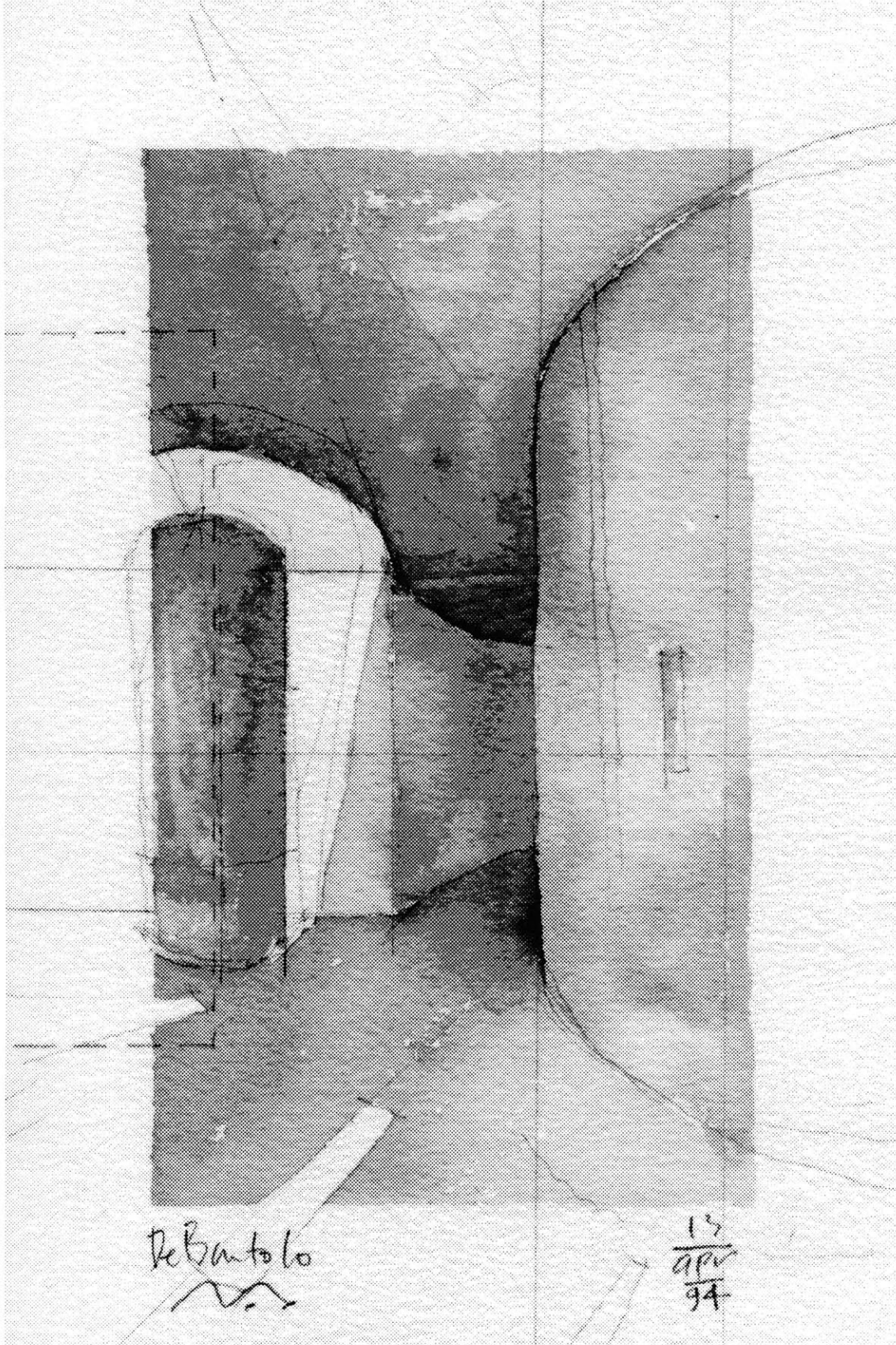
One's sequence begins at the first appearance of the brick wall, its distinctive varied texture results from the use of over-fired clay bricks which have deformed and darkened from the kiln. The mediating space, of steel and glass, serves as the second component of the threshold. One enters through the doors on either side into a space filled with a glowing diffused amber light. This soft, direction-less light serves much like a chamber of 'cleansing' which again demarcates another separation from the campus. The third element is the physical penetration into the drum itself. This is the main collective space where then the soul ascends into the spatial volume finding poetry in the fractured pieces of metal which play with the downpour of light from the oculus.



The idea of threshold is stretched out along a sequence of linear movements, a series of spaces which are fully exposed to the sky and increasingly confining as one submerges. The narrowness of the ramp (8'-0") emphasizes the sense of linear compression and directionality. This pilgrimage becomes a journey to the place of rest, the place of contemplation.

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The second major threshold sequence of the project is the *spiral*. This sequence begins where the linear, submersion from grade left off. The participant is in the vestibule of the collective space and outside the massive cylinder which has been inserted into the spatial volume. As one spirals around its perimeter, it absorbs the visitor just under the edge and into the space of the sky. This space is the critical vertical contact of the intervention. The moment of arrival is magnified by the previous journey where the participant has been, figuratively, compressed in darkness and 'cleansed' from all former context and memory by handicapping the senses. This 'release' into a space of vertical contact after being restricted, gives the participant an increased awareness to the value of the contact and an appreciation for that which is offered.



De Bantolo
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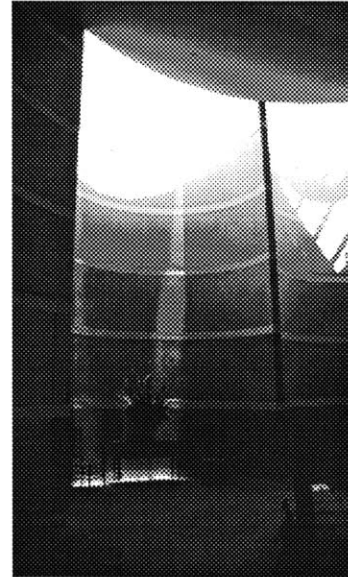
7 Light and Movement

The two most basic types of movement are physical and relative. Physical movement includes ordinary spaces of passage and circulation which one moves through, such as a ramp or spiral. Relative movement is the phenomenon which occurs when objects move about the participant, sometimes silently and almost motionless, sometimes violently and powerfully. One of the best examples of relative motion is the earth's movement which gives the illusion that the sun moves. These perceptual experiences of movement are quite powerful and memorable. As architects, we must attempt to integrate perceptual movement with physical movement to celebrate the juxtaposition of orders and create dynamic architecture.

physical

Physical movement can be broken down into two general categories: natural movement, the dynamic motions of environmental variation and *machine movement*, the man-made devices which attempt to imitate nature. People remember and seek out places of rejuvenation and reflection which are loaded with qualities of movement. Whether it is to watch some children play at a fountain or walk along the water's edge, people are drawn to dynamic movement. Like a port or a beach these places are never the same twice, the tide changes, the people are constantly moving, the boats are coming and going, there is tremendous activity and yet complete passivity. We have a natural gravitation towards moving water, moving clouds, changing sky color and people in motion. Conversely, the majority of the urban landscape is immovable stone walls, brick plazas and concrete buildings, therefore, that which is movable provides a special focus in the midst. There are two basic types of physical movement: natural movement and machine movement.

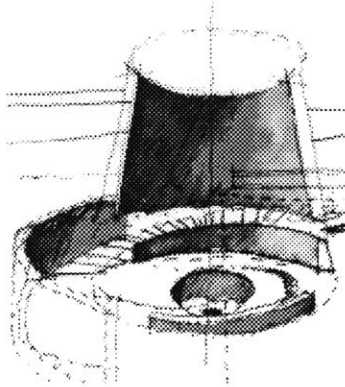
Natural movements are the most engaging because they are not completely predictable or recognizable and cannot be comprehended all at once. Natural movement involves variation and irregularity: Like the dark clouds rolling in over the blazing sunlight, or the water of a creek rushing



Harvard Business School
1959 Chapel
Moshe Safdie

**All material in nature,
the mountains and the
streams and the air and
we, are made up of light
which has been spent,
and this crumpled mass
called material casts a
shadow, and the shadow
belongs to light.**

- Louis I. Kahn



concept sketch
spiral space
in motion

water, clouds and
nature in motion



over the random stones and rocks, or the flight path of a seagull in the blue sky, or the wind blowing the autumn leaves down the street. Natural movement includes phenomena such as the changing colors of the sky vault as it evolves from black to blue to red to orange to green to azure. Natural movement can be perceived audibly when the river, slapping up against the shore, makes a new rhythm, visually when the moon casts its reflection across a wet street. Natural movement can also be perceived through seasonal change: A tree when full of green leaves becomes a shelter protecting one from the scorching sun but later it becomes a skeleton of branches made white by the falling snow. These movements are authentic and genuine; they do not imitate, they do not grow old, they do not need repair and they do not need to be painted every other summer.

Artificial movement is that which is man-made. Kinetic structures which imitate the movements of the natural environment. Mobiles, flags, wind chimes and water fountains produce the effects and illusions of 'natural' movement, yet with static rhythm and predictability. They are toys which the natural environment plays with, but they are secondary, they work because of something else. Man's moving structures are senseless in comparison to the complexity of an organic, changing and dynamic universe. Man's effort to imitate nature is a futile one, architecture must work with nature, allowing nature to be the 'machine', and architecture to be the 'lens' for *sensing* it.

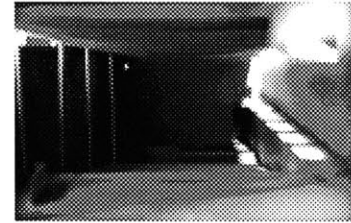
The contemporary making of a transcendent space must not be self-referential, but must work as a 'frame' for perceiving the natural moving landscape through the lenses of a man-made structure. Instead of creating illusion, tranquil motions and 'machines' for delighting the soul; as designers we must employ architecture as the vessel for perceiving the authentic and natural movements which already exist. We must take the participant (user) through spaces and let them see. We must not take from nature, but rather place one in contact with it. One must not come into a space and imagine he is somewhere else by experiencing dancing objects and flowing water; instead, through contact with what already exists, find tranquility in the miracle of existence itself. One's re-discovery of the landscape is making something visible which is already present. It is as if architecture would clear away the noise and chaos and allow the beholder to perceive the beauty that already surrounds him. Like a great poet who illuminates an already understood idea, giving form to a disembodied truth. A great poet causes one to 'see' differently and to have a new 'sense' of the world in which one has always existed. The mission of the architect should be aimed at bringing about renewed perception.

perception of motion

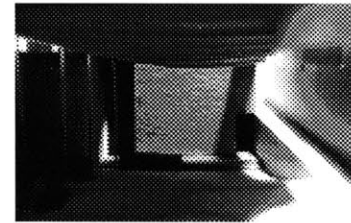
For past hundred years there has been discussions of 'space' in architectural theory. But space can mean many things. In modern literature there are many distinctions, but two which apply directly to perception: space as a three-dimensional geometry and space as a perceptual field. For our purpose, however, it is useful momentarily to consider space as a perceptual field *only*. Motion and movement exist far beyond the physical and the real, there is the movement of relative relationship which is forced by the interrelationship between the moving environment and the static built realm. This level of movement relates closely to time and season and facilitates a mediating of both natural and artificial movement.

The perceptual experience of movement is not restricted to the literal functions of logic, but breaches the abstract. Although the computer with 'virtual reality' has completely redefined the way we even discuss issues of spatial perception, there are many other 'devices' which also facilitate a perceptual movement without physical motion. These elements are common to circumstance but usually underestimated in their perceptual value.

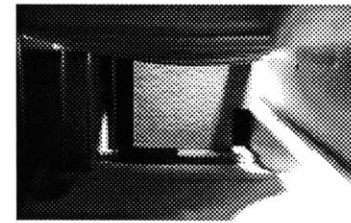
The simple yet powerful variations of light intensities can be used to assist the motion, position, direction and speed of the spectator through the environment by attracting his attention or inducing the appropriate degree of curiosity within him. Light and movement have strong associational emotional characteristics that should be thoroughly understood by the designer in order to create spaces of specific emotion and feeling.



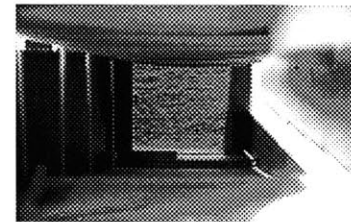
Collective Space 8:00 am



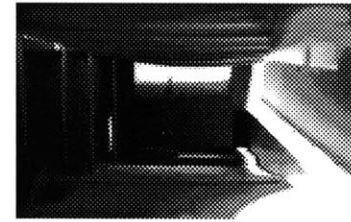
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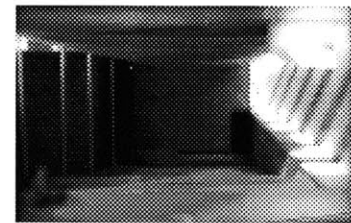
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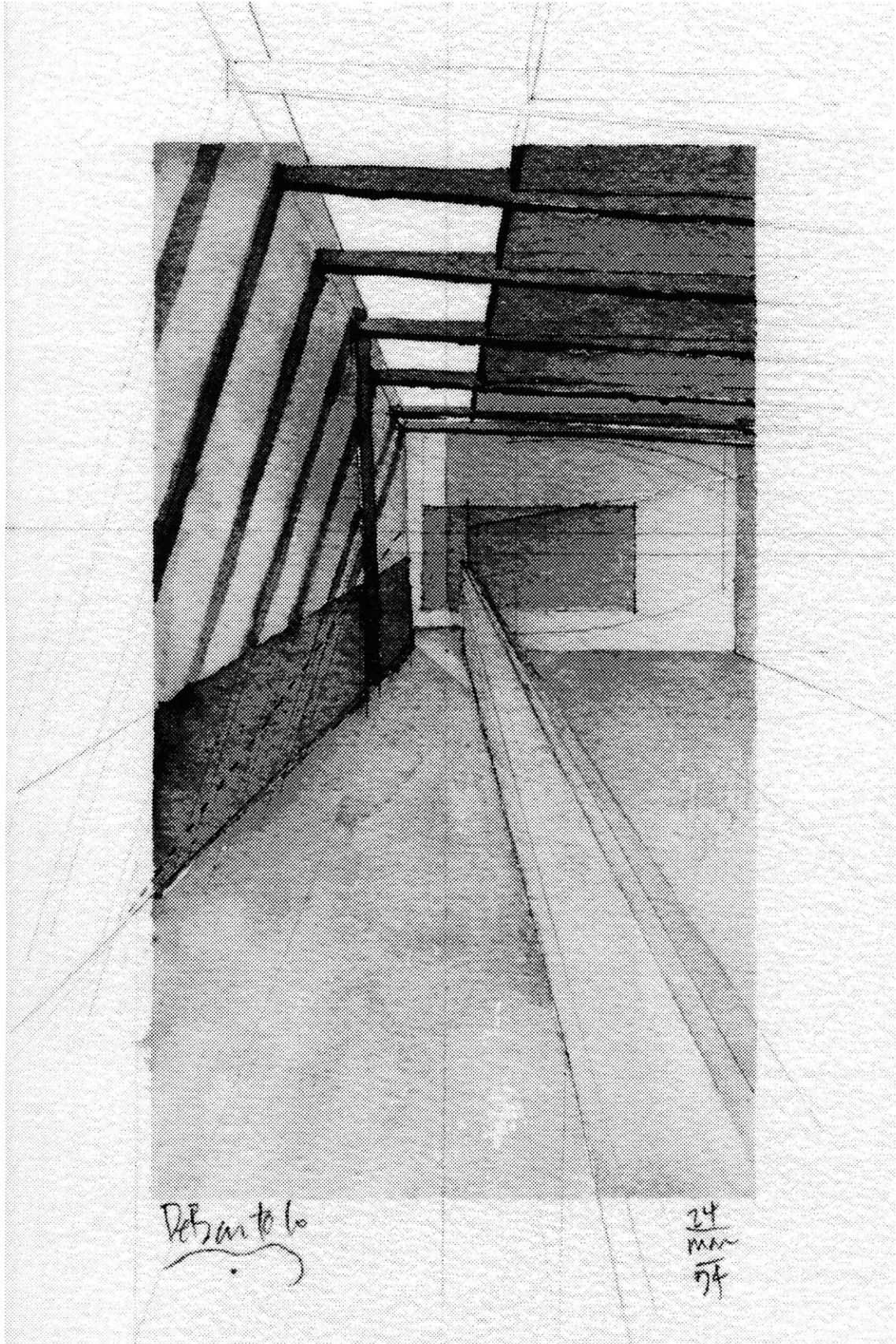
2:00 pm



4:00 pm



6:00 pm



8 Light and Experience

Crate & Barrel
night
Chicago



62

The experiential quality of architecture relates directly to the understanding and perception of illumination within an architectural environment. One who struggles to understand the phenomena of nature, specifically light, learns best from experiencing light-environments and closely watching the role of light in the shaping of habitable space.

phenomena

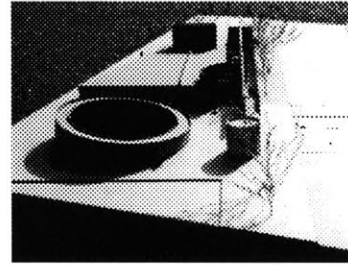
The phenomenal aspects of light-experience relate to the experiential moments of reflection, layering, transparency, proportion, relation, peripheral vision and acoustics. These moments in an architectonic environment or in nature retain their inherent qualities by keeping themselves removed from duplication. These moments are challenging to reproduce by any method and can only be fully documented and perceived through direct experience. Photographs fall short of the majesty of depth, the layering of visual fields and the complexity of peripheral vision. Abstract art can often communicate more of the spirit of a place than any other media, but is limited to a specific perception and does not permit one to create one's own experience. Therefore, the aim is not only to challenge these issues and integrate them into architecture, but to find a method for discussion and evaluation.

visual fields

If the *volume* is to have an associative dialogue with the making of a light-filled environment, the components, elements and properties which make that volume must be dissected. One method for analysis is the well known object and field method. (The *casting object* verses the *receiving field*.) Here, there is a simple three-layered system of figure, middle ground and distant view. This idea, in essence, is one often discussed in the elementary drawing lessons of perspective rendering and shadow casting. Although primary in its elements, this study can become rather complex when one considers the dynamic and changing dimension of the source in relationship to the object as opposed to the static methods usually studied. For example, the transformation of the subject from *object* to *field* then back to *object* again throughout the span of a day can be manipulated so that one encounters the subject only at certain times on certain days throughout the year — this can in the end yield rather profound meaning.

Crate & Barrel
day





An example of this phenomenon can be experienced at the great rock tomb of Rameses II at Abu Simbel. The orientation of the long entrance passage is such that only one day out of the entire year will direct sunlight penetrate the entire length, it is the morning of the god's feast day. Most dramatic is the fact that all figures at the rear are illuminated but one; the god of darkness. This alternating of field and object is used to celebrate a religious event; that moment transforms the tomb from meaningless form to transcendent event.

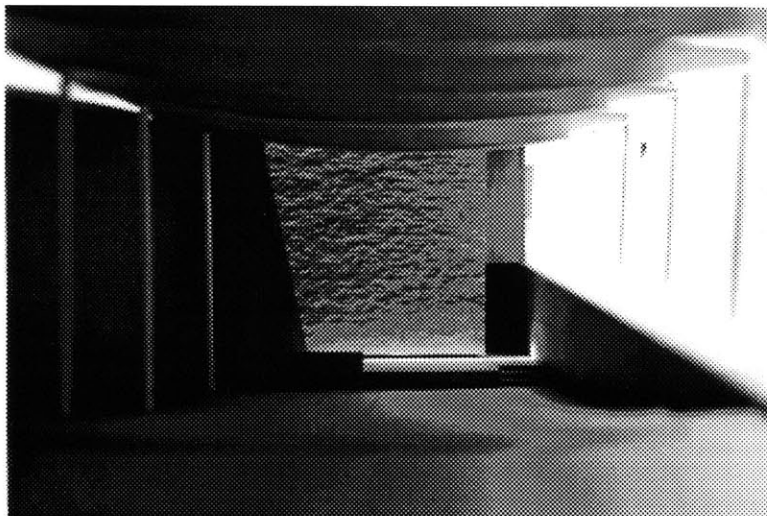
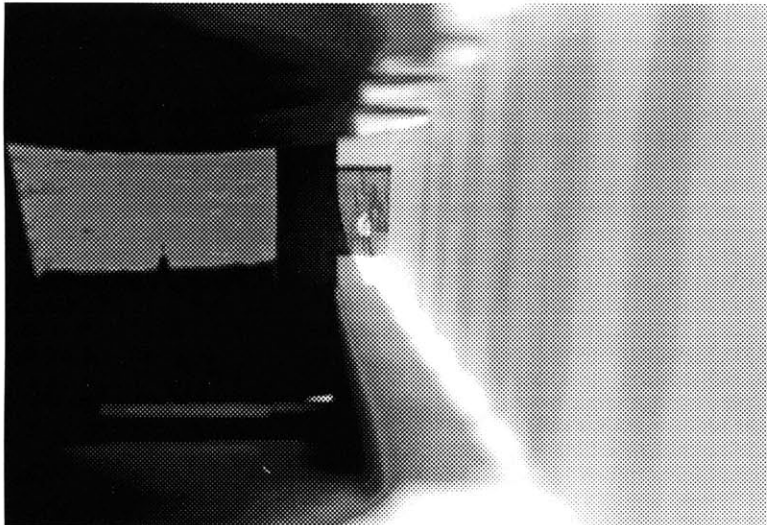
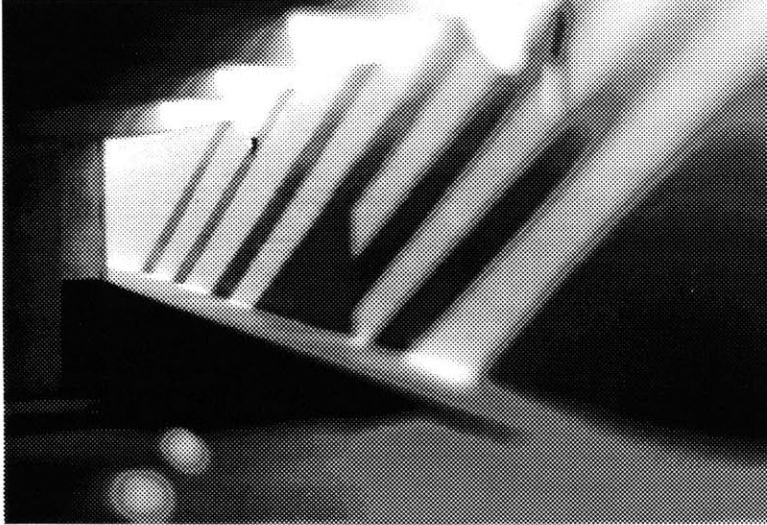
A place organized in daylight establishes its identity by recognizing its location in the world. Louis Kahn defined the relationship a space has to light is actually possessive, he called it a "slice of the sky". Light and experience are essential and universal to the understanding of place, if an architect is going to make a meaningful intervention. For example, how does one experience light within a space? How do variations in light intensity support and associate with the events of each space? How can one be made *more* aware of his *orientation* in the world? These are universal to the understanding of the phenomena of experience and its associative quality with light.

spatial sequence

The experience of moving through a space must evoke a series of revelations about the nature of the circumstances and their relationship to one another. This spatial sequence can be broken down into three rather basic zones: approach, entry and arrival. These zones apply to almost any space we might inhabit and enable us understand the components of the experiential sequence more clearly. In the design application, these three zones of movement are clearly articulated through both spatial volume and light intensity.

Approach

The *approach* is delineated by the path, beginning at the very first moment of visibility. It begins when the participant observes the emerging of volumes from below and is made curious by their orientation and position. The ramp is emphasized by the 16' concrete wall which directs the visitor to the sanctuary. It explains part of the scenario and reveals only what is necessary. As one embarks on the ramp and abandons his former assumptions, he is afforded a final view of the Capitol, as a reminder of the world that is about to be left behind. This 'pilgrimage' serves as the discovery, the journey to the place of focus. It is a cut in the landscape which one is able to inhabit and perceive. The ramp is lit from an open slot above. As the visitor moves adjacent to the sanctuary, the structure of the space is revealed and the



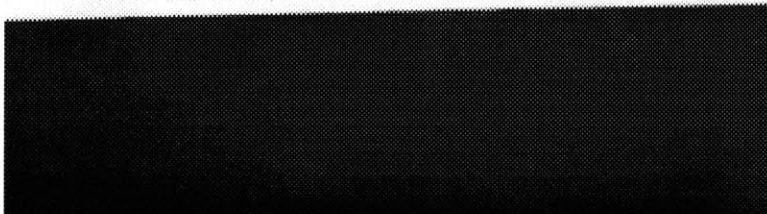
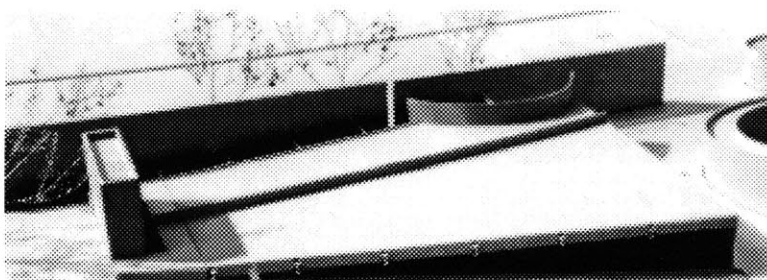
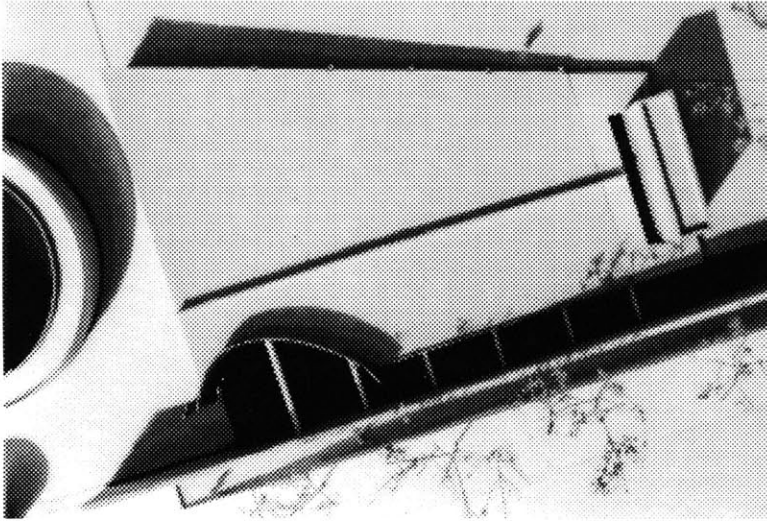
space within is obscured by sand-blasted glass. The steel beams meet the concrete wall overhead and the structure reveals the light. In this zone, one is introduced to a new perception of the context in relationship to the intervening architecture. The experience of light varies dramatically based on the time of the day and season due to the ramp's east-west orientation. Moments of foreshadowing feed one's curiosity and involve the visitor in the space before even entering.

Entry

As the visitor completes the journey and enters the vestibule, the powerful blast of sunlight suggests the presence of the spaces beyond. The visitor is slowed from the pace of the urban world and is freed from all distractions. The threshold from the ramp to the vestibule is reinforced by a pool of white afternoon light which attempts to break the sequence of movement. The light from the sky illuminates this small space from above, while one anticipates the warm and inviting light emerging from the direction of the sanctuary.

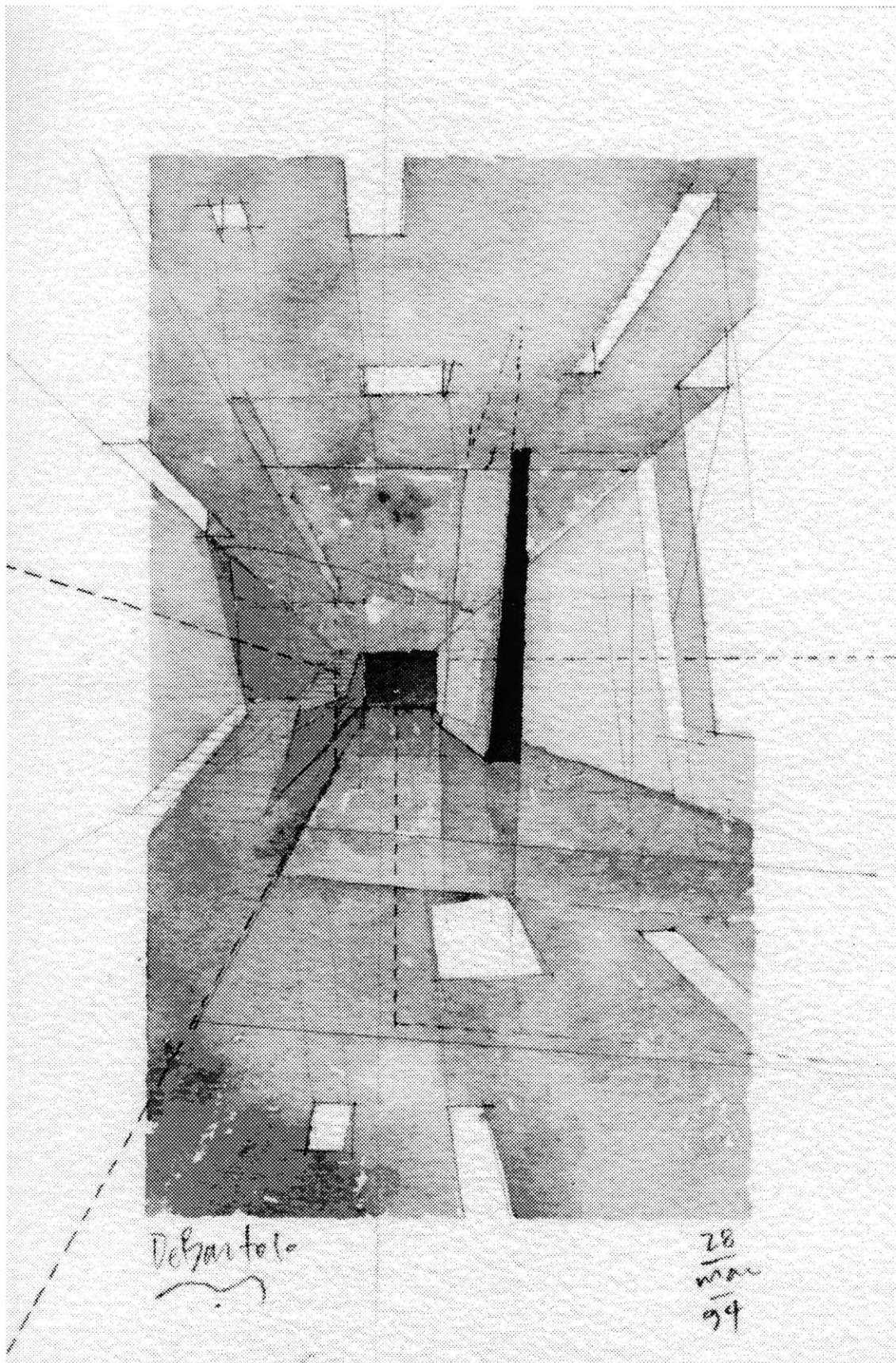
Arrival

As one turns to face the sanctuary, the light of the outer wall, along which the ramp has descended, is now expanding



the limits of the space and glows from behind a massive piece of illuminated glass. This decomposes the limits of the underground space by giving one a new perception of the space beyond and an awareness of the relationship. The heavy ceiling is released from the opposite wall by a band of light, which reveals the ground plane above and negates the massiveness of the concrete enclosure below. The situation of being below ground, yet able to see the plane of the plaza and capture its light imbues the space with a phenomenal circumstance. As one faces forward in the sanctuary, the dark, convex ceiling in the foreground, compresses and accelerates one's movement toward the ambient light of the vertical wall. This vertical plane behind the stage, with falling light grazing its surface, delineates the connection between man and heaven as it occupies a space beyond perception.

At the opposite end of the concrete wall off of the vestibule is a small side chapel, a tiny room that seems mysteriously dark until one's eyes adjust to the low level of light being emitted from above. The space is hidden until the participant searches for the light and finds it after patience and focus.



9 Light and Surface

55. Henry Plummer
p.15

MIT Chapel
Eero Saarinen

We see that light has the power to animate physical matter and miraculously transform drab and inanimate things into colorful living substances. Even more mysterious is the transcendent rise in existence experienced by people who inhabit natural light and light-filled spaces. This 'energy' which is able to bring the planet to life, transform chunks of matter and evoke transcendence in one's psychological mood, also carries a rather potent and fundamental property of some force greater than we can imagine.

Chiaroscuro is the phenomena of light grating and etching shadows along the surface of a mass juxtaposed to the source. The materials working in built structures must be authentic and honest in their means and use if light is to play a role in the animating of a space. The surface of a mass is lifeless and dead until it is suffused with natural light, at that moment its very fibers are filled with a profound presence. Henry Plummer tells us that "beyond its immediate optical tonic and kinetic interplay with the eye, luminous matter evidently has a general capacity to turn the physical world into beings for us, giving our surroundings a pulse and a soul."⁵⁵

There is a need to understand and interpret the role of materials in the making of a phenomenological spatial experience. Materials produce a psychological effect which provokes mental processes, feelings and desires. Materials activate all the senses beyond vision, they communicate with the visitor. There is a materiality of space which must be investigated, its makeup, structure and respective relationship to ritual. Are there certain values and meanings perceived through the use of specific materials?

Chiaroscuro

As designers we must no longer pass off artifice as architecture. Authentic, honest and genuine materials must be employed if we are to build structures which will have a visual dialogue with the



67

One strategy is to use a smooth concrete cylinder to capture the daylight, bringing part of the sky down into the space below. There is also a smaller chamber which is filled with a more intimate light. This space of subtle light is about the individual, silence and mystery.

The observer experiences highly tactile textures and natural materials on both the inside and outside of the building. Since the building reveals itself through a series of sequences, one is completely re-perceiving the building as one discovers its components and overall order.

The 'devices' present in the project which work to bring about these phenomenal experiences are to be discovered by the observer as moments of incidence rather than contrived moments of effect.

The volumes are submerged into the earth, eliminating the facade and heightening the definition of boundary. As the light saturates



L'Unité d'habitation
Le Corbusier

intensifying qualities of light. We must design passive structures of light which are enlivened by the active universe they are part of.

Possibly some of the richest building surfaces are found on those which are disintegrating and eroding over time. This deconstruction of buildings into ruins seems to enrich the surface relief by deepening joints, peeling away uniform surface coverings, exposing more primitive understructures and creating new textures by erosive action. These rich environments have wonderful qualities of weathering, as the environment has accepted the intervention over time. The finely finished surfaces have been torn away to reveal the inner marrow and truths behind their existence. Fallen-in roofs and lacerations in walls open up once closed vessels to the sky and now appear as collections of screens and masks filtering and sifting the light — as if nature had a better arrangement than the original builders.

There are a great number of buildings in Europe and in a small number of the older cities of the United States which have these enduring qualities — built of materials which are only enriched by their environmental weathering, and that facilitate a relationship with the sun which becomes a fundamental element of the structure instead of a component of the context. These environments carry a visible dialogue between the spatial properties of their surface and the character of incident radiation. Their surfaces blaze up with illumination and completely absorb the captured rays of sunlight, projecting them into the inner spaces of enticing inhabitation. In these rich environments, the joints and blocks of masonry walls are assembled like intricate pieces of a topography of ridges and valleys. The light is shredded and ripped along the chiseled stone, each gauge emphasized by the light and shadow it creates.

the surface on the inner side of the cylinder, it introduces a visual dialogue between that material and the juxtaposition it has with the amplification of the sky; like a hole cut out of a mask. The inside of the cylinder is slightly funneled to allow the viewer to see more surface, before sky. Here, the light brings more than 'daylight' into the space — it illuminates the fibers, the grain and the holes markings from construction of the cylinder, revealing and defining its components through the presence of light. Beams of light are distributed from the space of the cylinder into other areas of the building during 'sacred' moments (summer solstice) throughout the year and day.

The building is an *optical machine*, a distiller of the changing aspect of the sky, a scope to the heavens. The building works as an instrument in an active environment, which, by its precision, makes careful readings of the cosmic environment, permitting its



Santorini, Greece

The white-washed walls of the Mediterranean islands also speak of layer upon layer of plaster, crumpled and fabric-like, molded and patted into profuse textures by thousands of human hands. These walls

speak of the years of wisdom and the light dazzles off their reflective and powered surface, contrasting the clear Mediterranean Sky. The rich pigment of thin plaster in Siena applied to narrow street walls reveals its layering and transparency of texture. The color is celebrated when light from the warm Italian sun contrasts its presence from its absence and accentuates the slight subtleties of every texture. Portions of walls are peeled away and others have been plastered over, here the human component is coming together with the environmental, and the sun breaches the gap.

As designers, how do we combat economics, artificiality and temporality? We begin by being authentic, genuine and honest. The appropriate surface for a mass is the one which is truest to the structure and the desired experiential qualities. The economics should only limit the palate or quantity, not the quality. Buildings must be integrated and honest and similar to nature — works of the environment not just *in* the environment. Light must infiltrate the dense matter of which all structure is composed. The material must be amplified by the light as one experiences these environments, and through its presence reveal richer meaning than one would perceive in its absence.



Mykonos, Greece

inhabitants to have an enlightened perception of the phenomenon of existence.

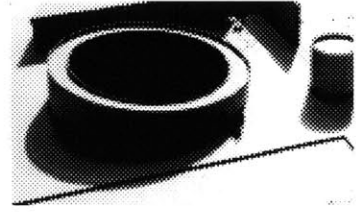
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The surfaces used inside the spaces of the sanctuary are selected based on their quality of spatial simplicity. The major axial wall which serves the ramp is cast-in-place concrete. The form and the ties are exposed on the northern side. The southern side a wall of water running into a small track, to reflect and accentuate the radiant strength of the southern sky vault.

The interior surfaces of the collective sanctuary are wood, concrete, glass and perforated metal. The shaped beams are steel, the floor is wood.

The cylinder is smooth concrete, the spiral floor and ramp is terrazzo; wood is used to delineate places to sit and to touch. There is no glass over the hole of the cylinder. The observer is directly connected to the eternal and the delineation of inside to outside is blurred.

design model
texture and articulation
surface of cylinder



color, texture and articulation

70

Materials must be pushed and pressed beyond their known limits if as architects we are to invent new understandings and relationships. Glass, for instance, which has the inherent quality of being easily transformed, becomes radiantly varied and alive when it is bent and blown. When it is cast by hand, it suddenly takes on a mysterious presence, trapping light within the opacity of its mass and letting off a diffused glow. It can also be sandblasted to give it a more opaque surface. Kenzo Tange uses broken sheets of glass to create slight opacities between spaces.

Steven Holl explores with the qualities of reflected light. In a recent project, extremely bright colors were painted on hidden surfaces adjacent to windows. Natural and artificial light was reflected off these planes onto neutral planes, imbuing them with a mysterious presence of color without paint or colored light. The hue from a reflective or brightly colored material on a neutral surface or the transparency of a thin membrane, the chalky dullness of plaster or the rough texture of concrete all contribute to one's perception of a place. The board formed concrete Le Corbusier enjoyed so much (illustrated on the previous page) leaves a pigment in one's mind, as a critical descriptive component of his miraculous spaces.

sound

What we hear can have a direct associational relationship to that which we see. Certain visual events can be so evocative that the sound is fabricated by the mind. One must hear the geometry and volume of the space. If this is true, then the materials and surfaces must be, again, honest. The experiential perception is *dishonest* when it has been softened or altered to meet the needs of the event. The sound is as much of a design tool as light. One must hear the presence of light in that environment. How can one hear light?

There are only a two fine arts which surround the participant completely: music and architecture. Like architecture, music

56. This is an issue I hope to give greater attention to in a future study.

57. Chief Seattle
"We Are Part of the Earth"
speech given to the president
of the US in 1855.
1989
p. 18-20

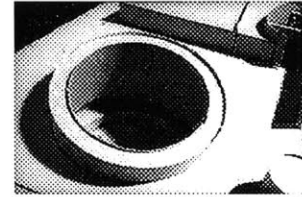
entirely saturates one with its presence. Like being within a space, one is within the sound, the space is defined by the range of sound transmission. The notes are defined by the materials, the pauses are defined by the spaces. ⁵⁶

The American Indian Chief Seattle addressed the president in 1855, "There is no quiet place in white man's cities. No place to hear the unfurling of leaves in Spring or the rustle of an insect's wings. The clatter only seems to insult the ears. The air is precious to the red man, for all things share the same breath — the animal, the tree, the man — they all share the same breath. The white man does not notice the air he breathes; like a man dying for many days he is numb to the stench." ⁵⁷

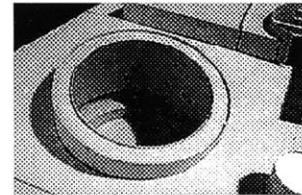
skin and structure.

Le Corbusier said, "The history of architecture is the history of the struggle for light." In other words, throughout history, architects have constantly attempted to eliminate the very effects of that which they have created. Therefore, the struggle is to bring unobstructed daylight into man-made volumes of structure and skin. This endeavor to gather and collect daylight must impact the structure, orientation, position, form and surface of the architecture. Just as a composition of music, the separate pieces must practice together and have a collective vision and aim if they are to achieve a transcendent presence. This 'struggle' for light must be bound in every decision that the designer makes to truly impact the perception of illumination and place.

The Berkowitz house in Martha's Vineyard, Massachusetts, designed by Steven Holl in 1984, is a fine example of the struggle for light to penetrate the space and animate the mass. Here, Holl uses the ever-changing condition of daylight as the composer of the architectural piece. The structural members are the actors and create constant variations on one's perceptions. In its most basic description, the house is an inside-out balloon frame of wooden construction; a skeleton



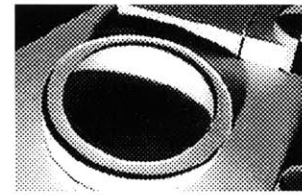
sky space/ spring 10:00 am



11:00 am



1:00 pm



3:00 pm



6:30 pm

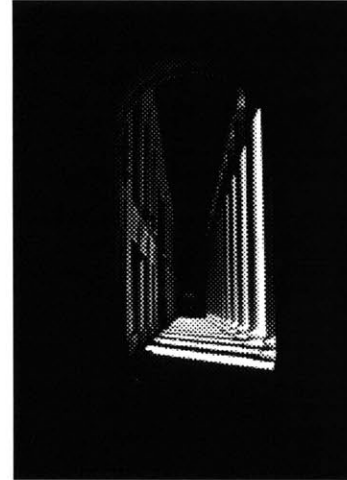
58. Steven Holl
p. 75

59. Louis Kahn
Between Silence and Light

Train Station
Chicago, Ill

house whose bones define a verandah. The conventional position of structure and skin has been reversed: the skin is on the inside and the structure is on the outside, separated by an inhabitable porch. Along this continuous porch, the wooden structural members throw shadows across the verandah and onto the house throughout the day; causing the elevation to be dynamic and never static. This clear separation of skin and skeleton is reinforced by the skeleton casting its shadow onto the skin. The roofing is a rubber membrane unrolled over the frame, again analogous to the skins over a whale skeleton. ⁵⁸

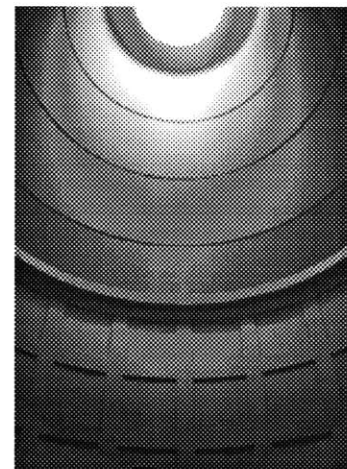
If space is defined by a specific boundary, there must be a clear delineation of a threshold to separate the figure from the ground, the outside from the inside. We have discussed the potency with which that boundary impacts the inhabitation of the space: either as a container of light or as a field of light. It is clear then, that the structure and its relationship to the skin or enclosure, plays a critical role in defining that space and its experiential quality. Structure is the organizing of disparate elements in light. Its presence as a wall has a very different reading than that of a column. Due to the endless possibilities in modern engineering, architects must be completely informed of both the technological aspects linked with the experiential qualities to create spaces of experiential richness.

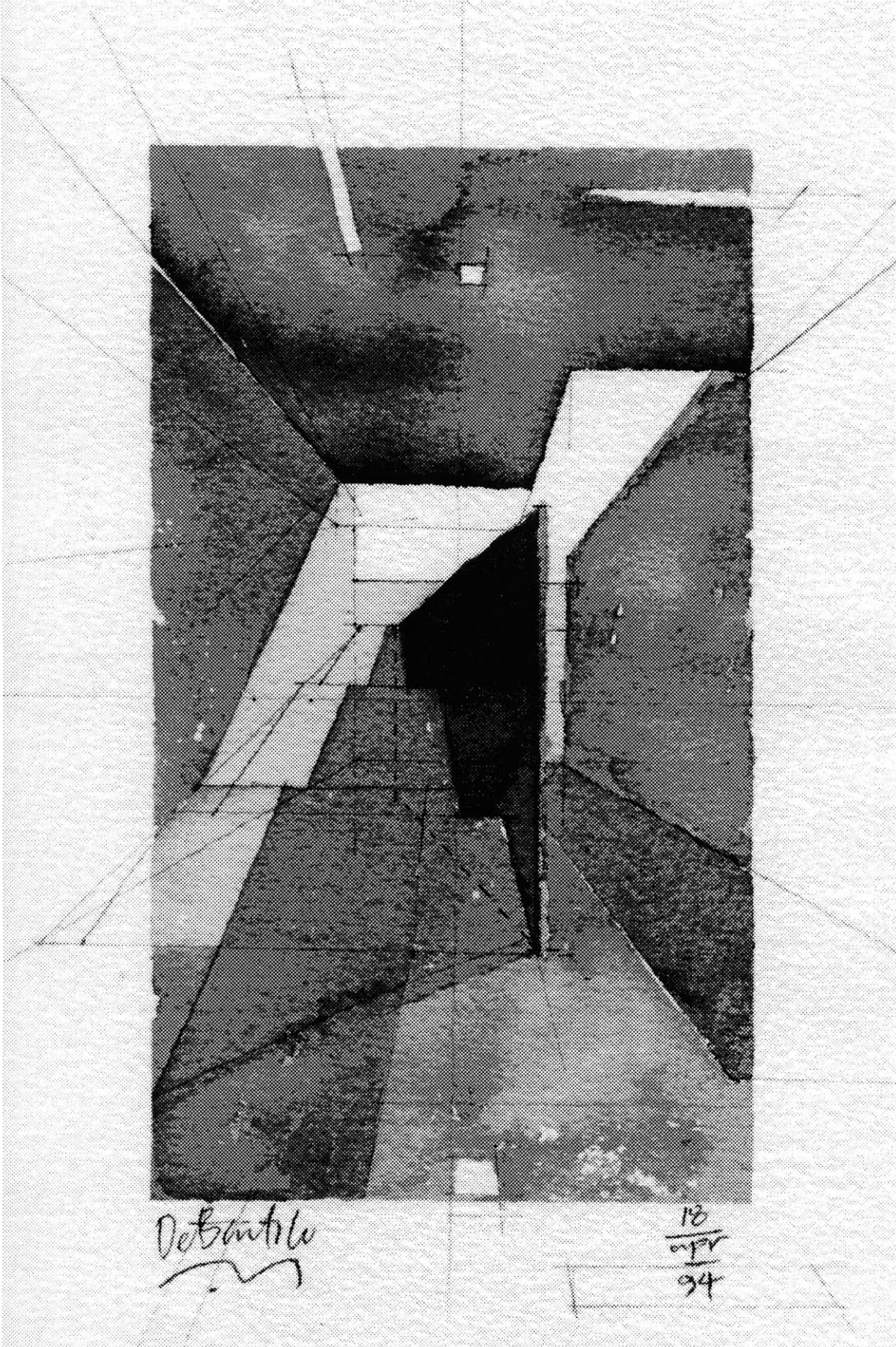


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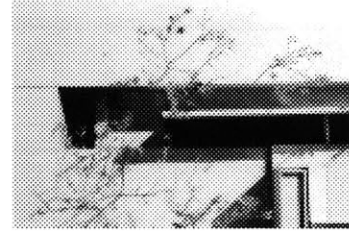
“Structure is the giver of light. When I choose an order of structure that calls for a column alongside of column, it presents a rhythm of no light, light, no light, light, no light, light. A vault, a dome, is also a choice of character of light.” ⁵⁹

Iron Workers Museum
Youngstown, Ohio





10 Design Synthesis



design model
water at landing of ramp

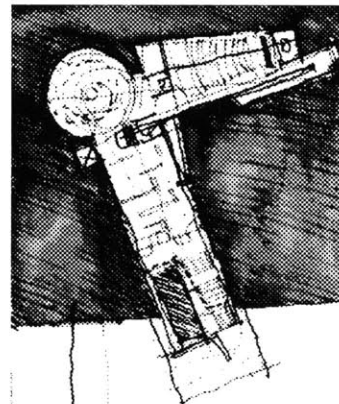
When one sets forth to write a thesis, the selection of study focus and research is of greatest importance. The impetus that propelled me to take on this search remains strong and still has a great deal of life in it. My passion for *meaningful* design is by no means complete, this is only the beginning. I chose to isolate an issue of architectural form which I believe to be one of the most critical, but by no means the only, moments in meaningful experience: *light*. This focus on a specific moment of the phenomenal experience of architecture provides the venue for extensive investigation and searching, something difficult to integrate into an economic and schedule driven society.

This written document is supported by a comprehensive schematic design of an urban sanctuary in Washington DC. The design work was simultaneous to the writing, producing a richer context for investigation and invention. The design intervention, partially documented in this section, is an application of the theories and ideas of illumination, in its physical and psychological potency, into tangible form. The ideas and theories addressed in this document are only given value when they are applied to the experiential realm of architecture. Along with conventional architectural plans and sections, I have attempted to think within the realm of the experiential through a series of watercolor perspectives, as a medium to represent light and perception (located between each section).

This document is by no means complete; these ideas and concepts are easily grasped and quickly accepted, yet they are incredibly difficult to integrate into the experiential realm of architecture. As I have stated before, **if we are to embody a sense of the eternal in our architecture, we must strive to understand the immeasurable.**

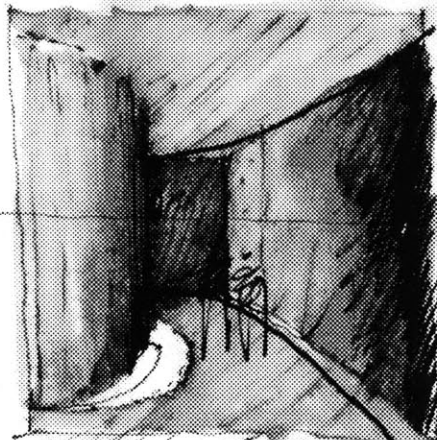
Theory without synthesis remains theory. Theory applied to tangible form evokes meaning, delight, and most importantly, architecture.

early conceptual sketch
building diagram

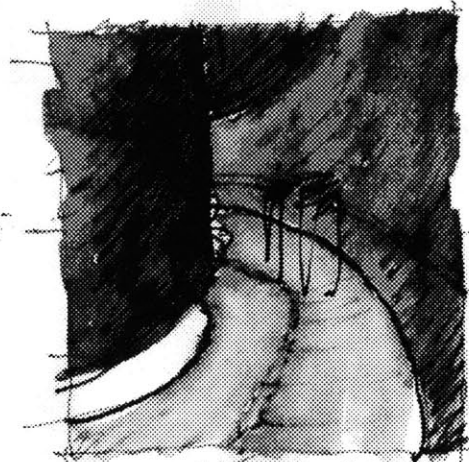


THE SPIRAL SEQUENCE.
"SKY SPACE"

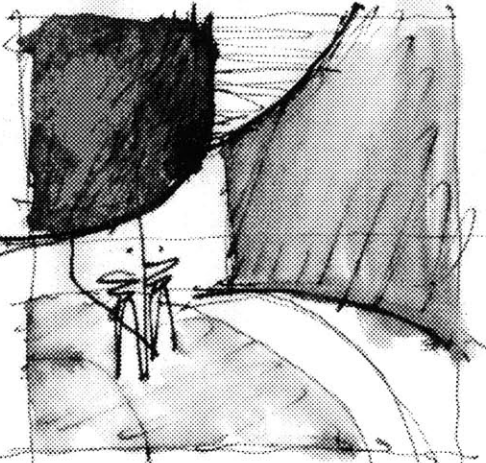
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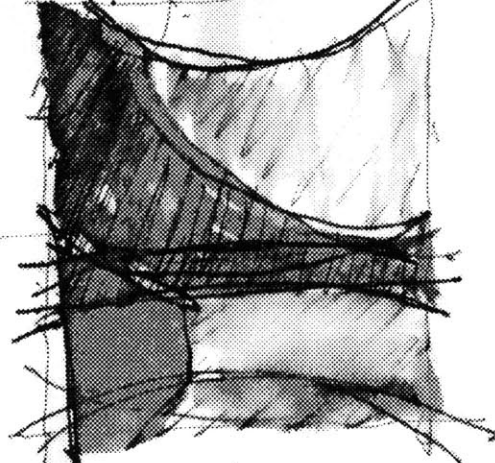
BEGINS DARK. WHITE
AND CURVING DOWN.



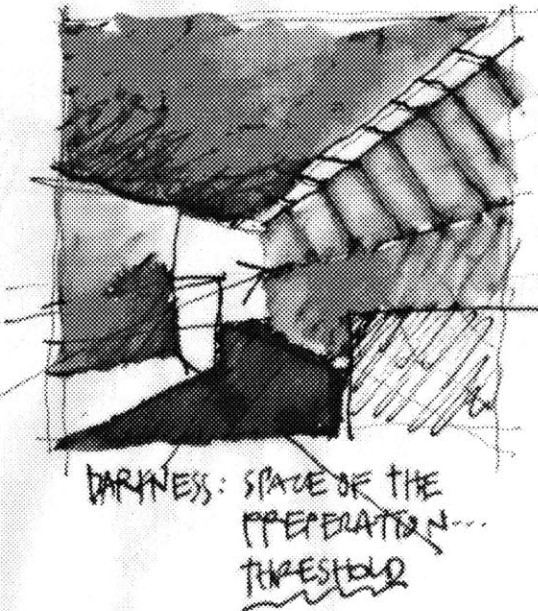
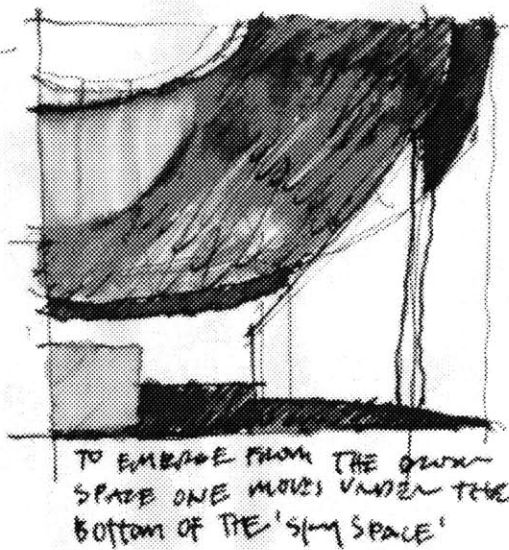
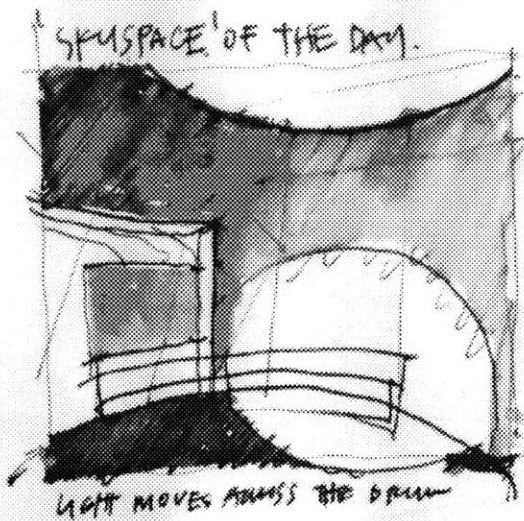
INCREASING LEVEL
OF LIGHT PERCEIVED UNDER



ONE SUBMERGES UNTIL
HE CAN CROSS INTO
THE 'SKY SPACE'



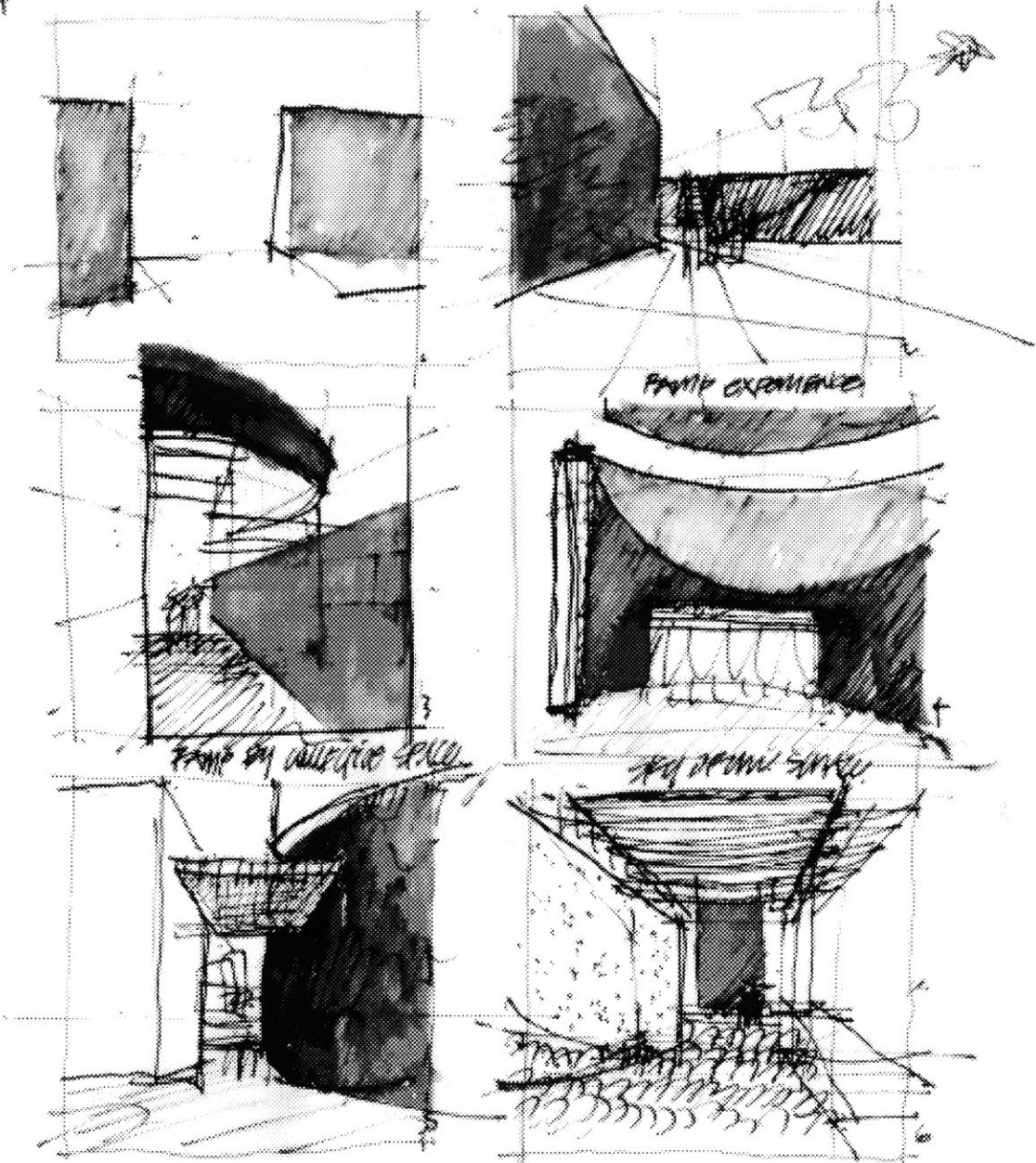
THE PHENOMENAL
RELEASE INTO THE
SPACE OF THE SKY.

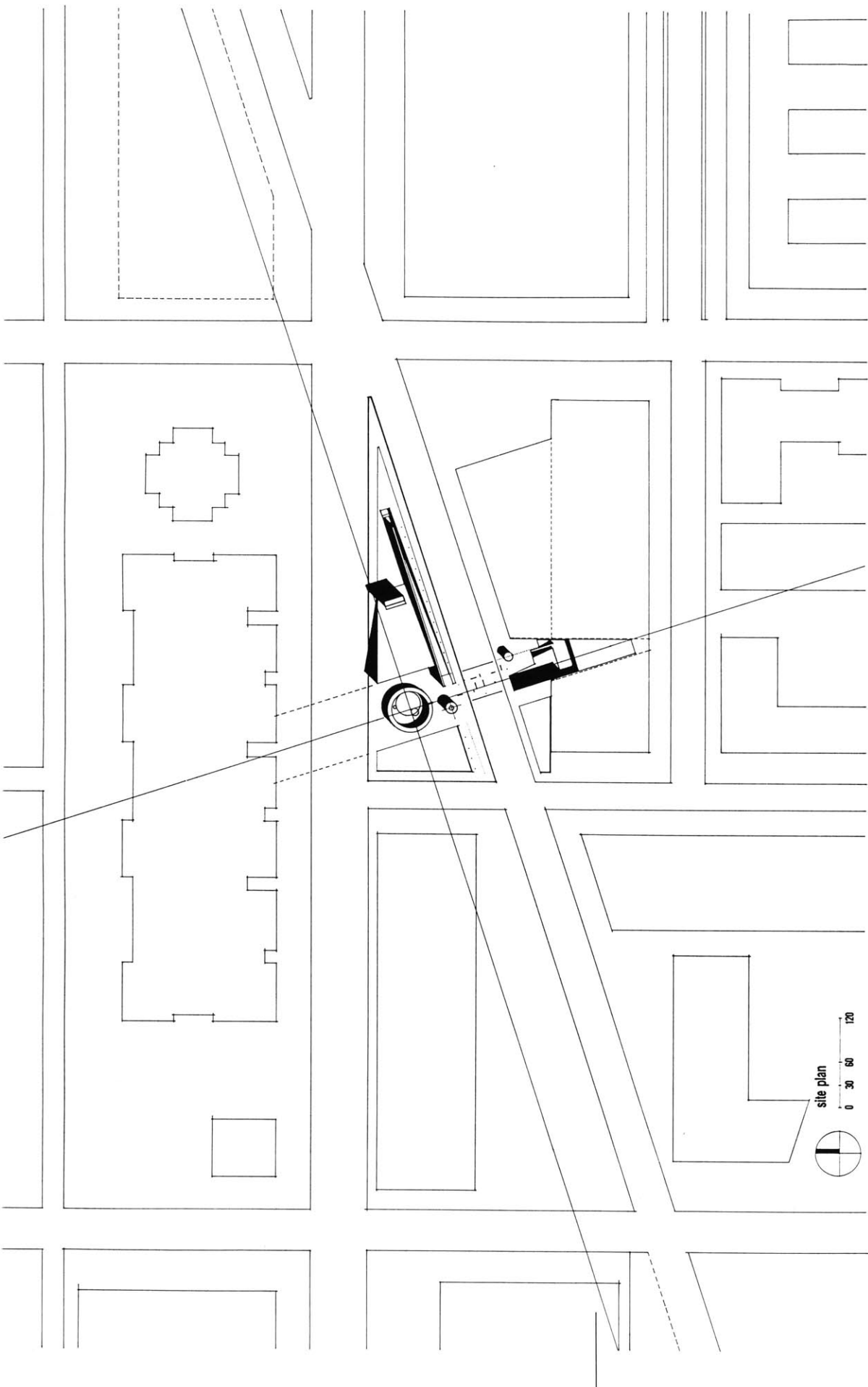


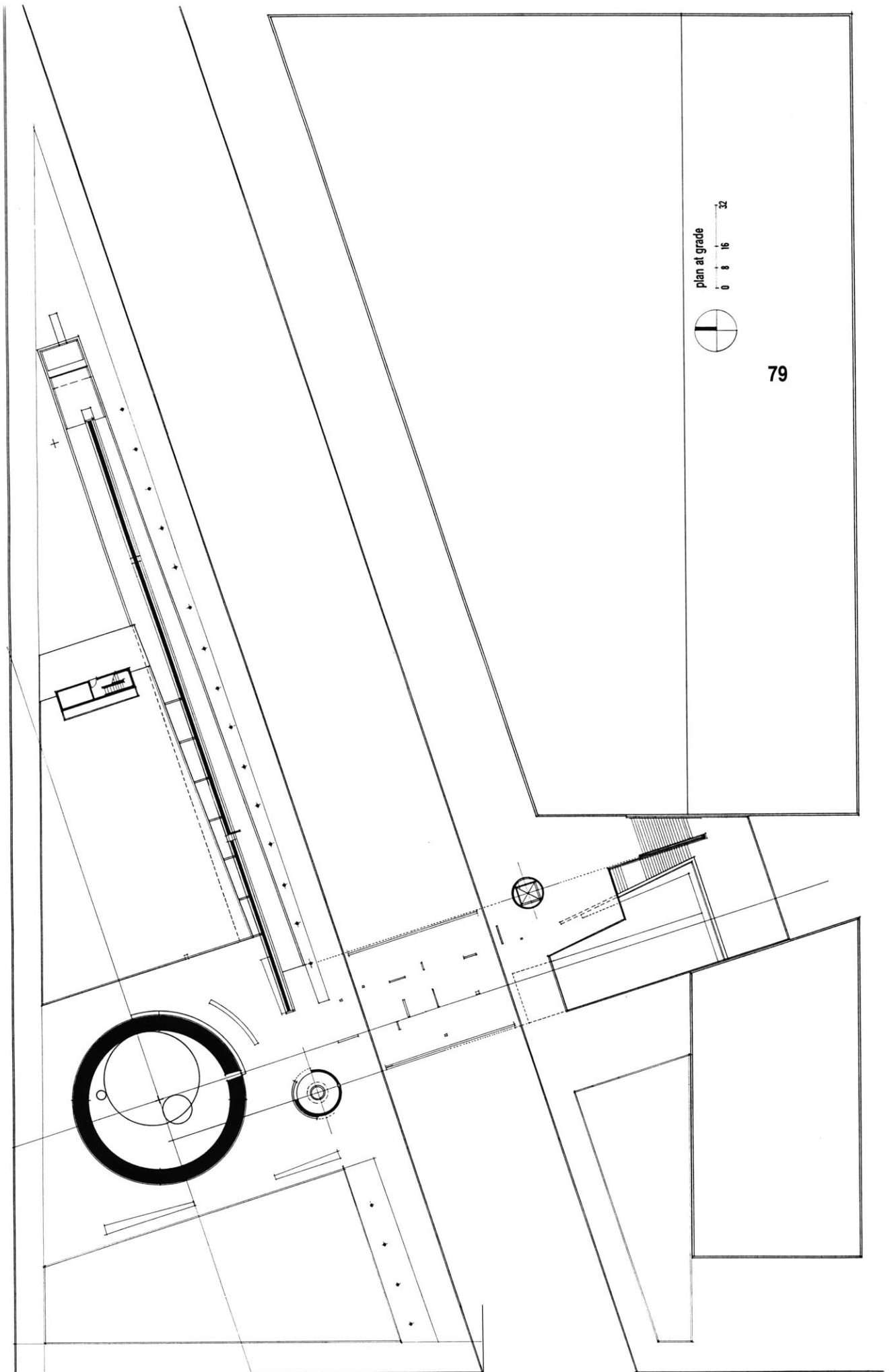
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* SPACE OF THE MORNING.

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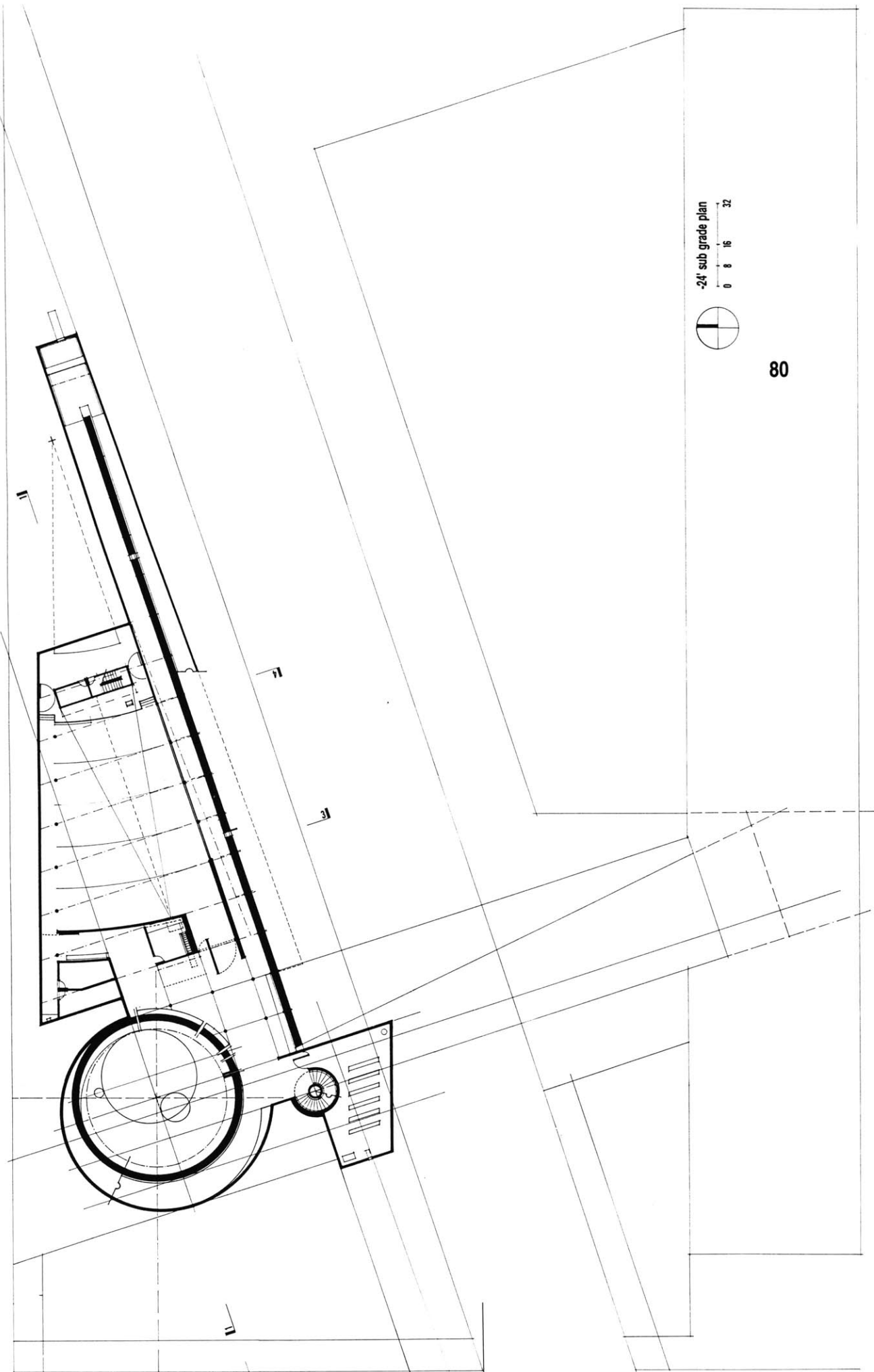






plan at grade
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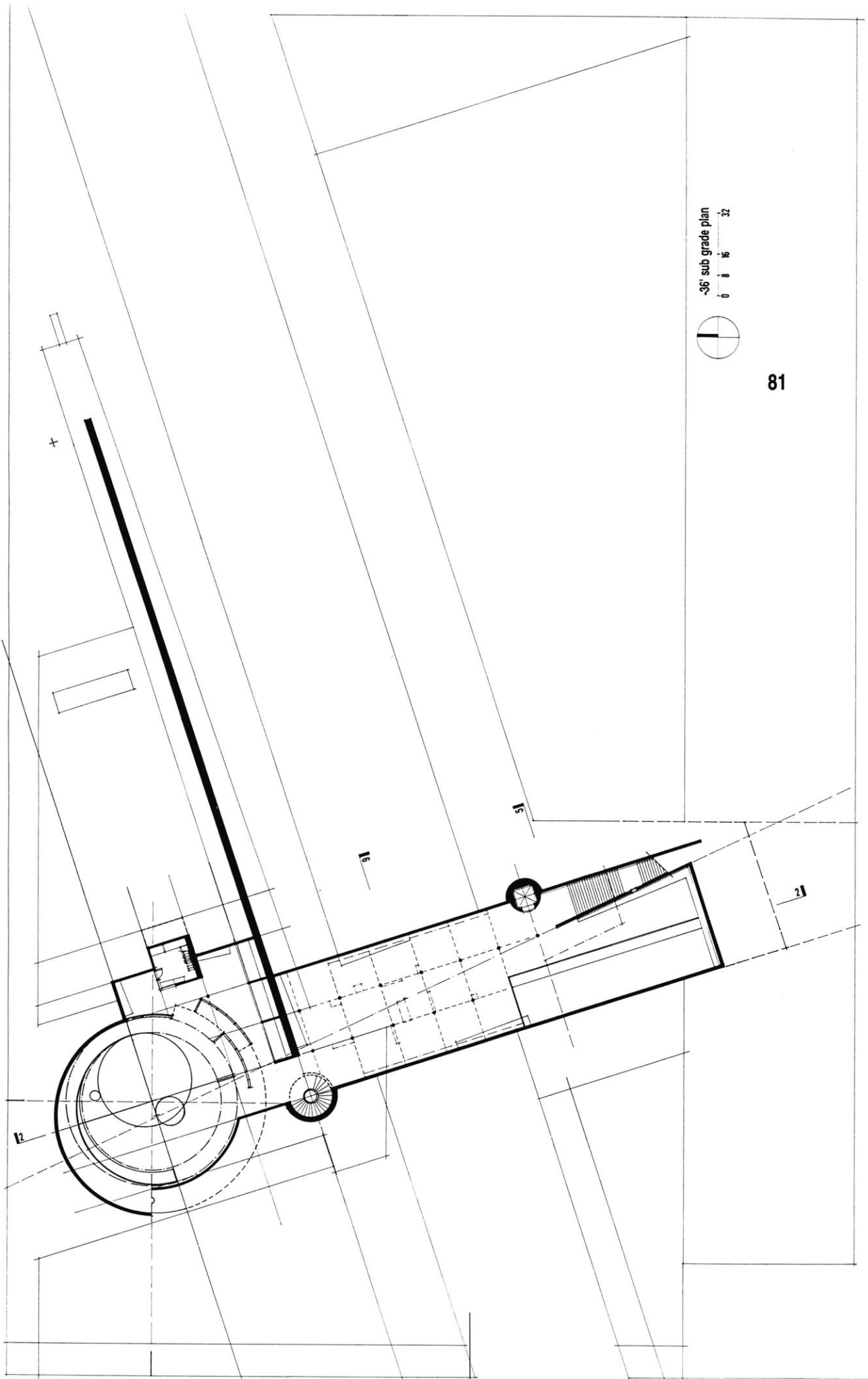
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-24' sub grade plan
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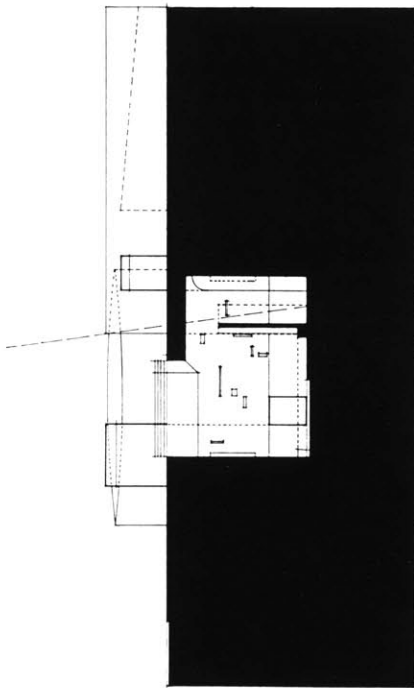
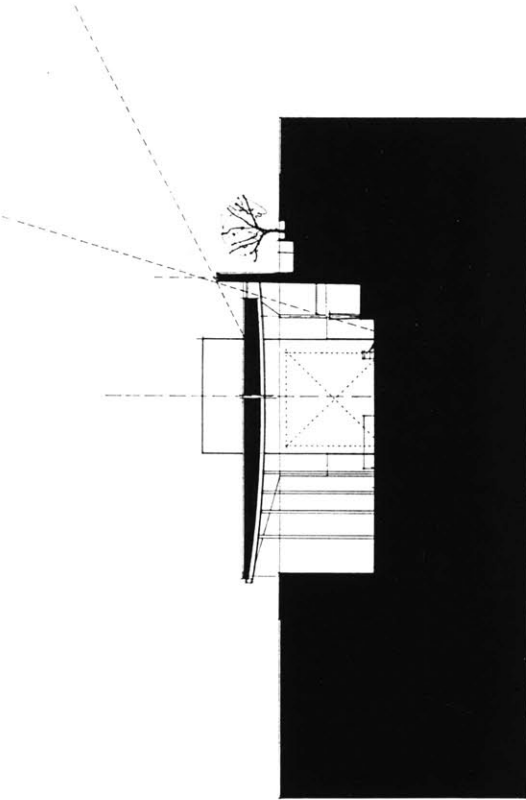
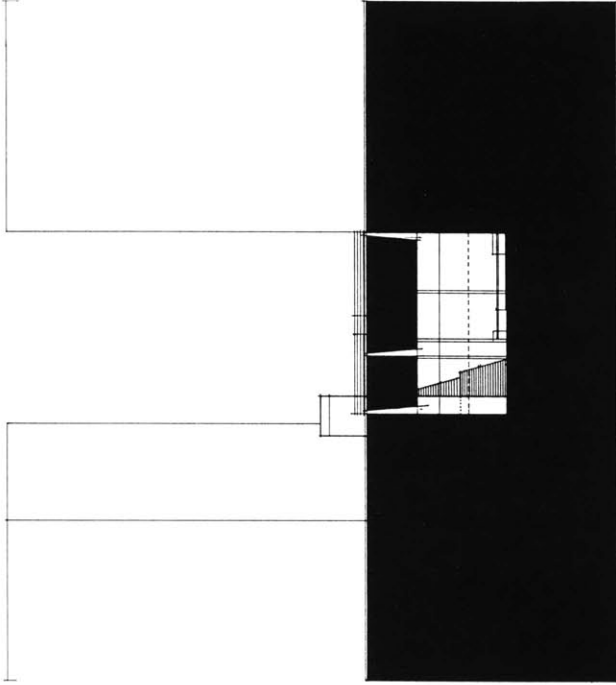
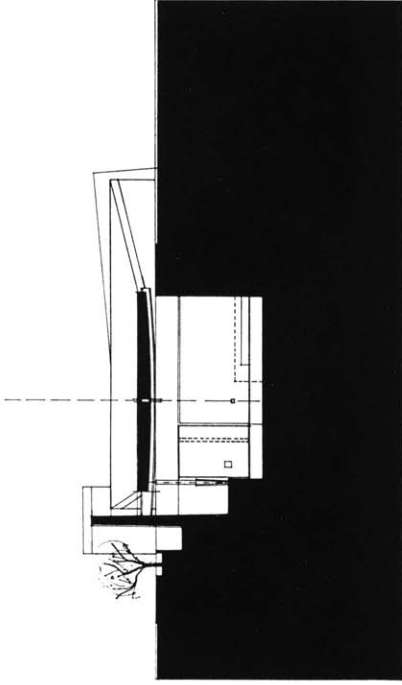


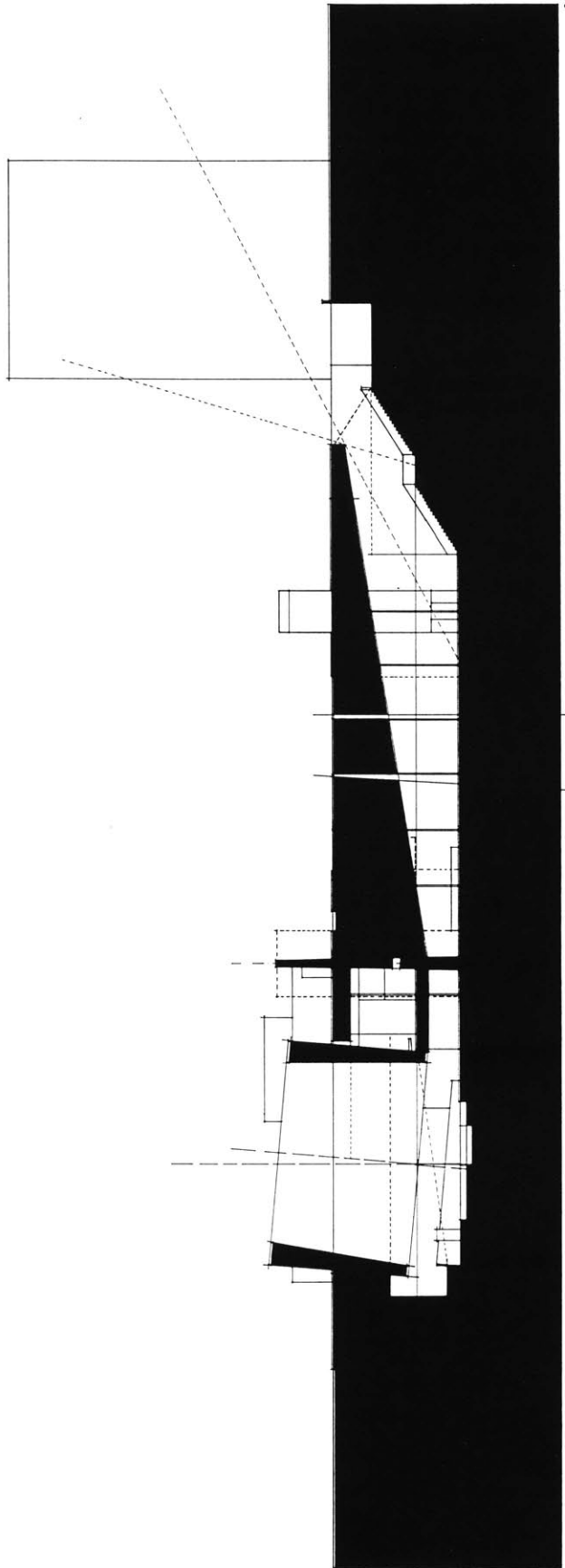
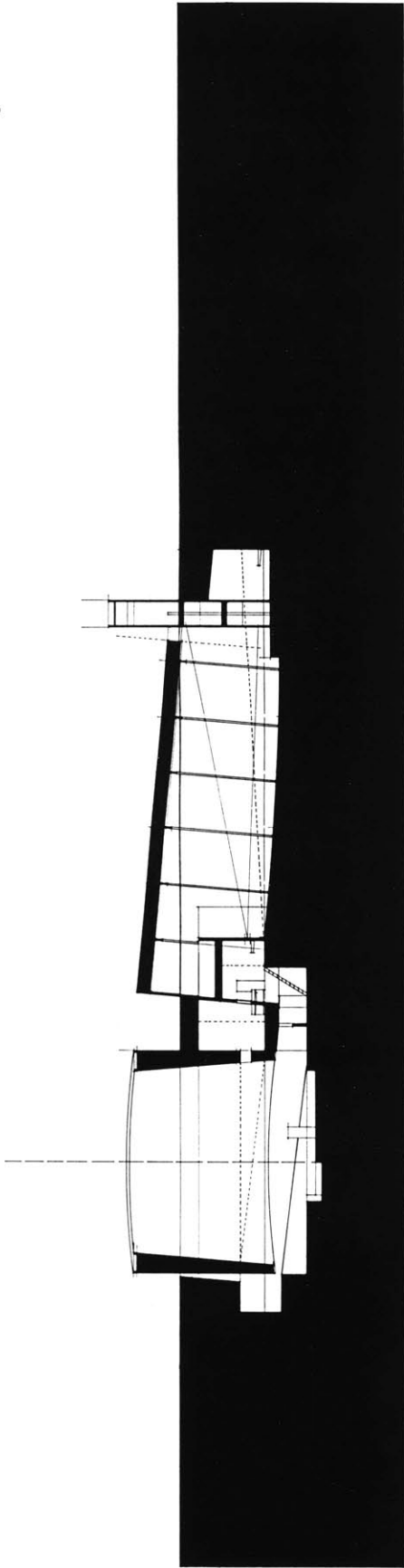
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-36' sub grade plan
0 8 16 32

cross sections





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