SPACE, OBJECT, AND ILLUSION:
A Sculptural Environment with Light and Shadow

by

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ABSTRACT

An environmental light sculpture with screenlike architectural units which interact with moving light and shadow to create a complex spatial environment.

The environment involves movement and change and has many possibilities and configurations rather than one fixed view. It evolved from an installation to a performance in which the audience was invited to enter and move through the space.

The written thesis has two sections: 1) An art historical section concerning spatial environments in painting, sculpture, and architecture, stressing those dealing with light and illusion. There is also a brief history of recent environmental uses of light. 2) A description and photographic documentation of the thesis project which records its evolution, installation, and performance, with conclusions regarding possible future directions.

Thesis Supervisor: Robert Preusser
Title: Professor of Visual Design

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Introduction

In recent years, sculpture has taken on increasingly architectural functions: it exists on a vast scale, extends into space, and often invites human entry and participation. It has evolved from small static objects to vast schemes involving space, movements, and human interaction. While historically sculpture has been placed within an architectural framework, some sculptors now create independent complexes which vie with architecture.

My work as a sculptor uses architecture as a source. I use basic building construction principles such as skeletal frameworks and repetitive units, and concepts of enclosure and movement through space. I am interested in the spaces within buildings and the spaces that buildings define: what would exist if a building's exterior were removed yet the presence of its interior were to remain in our consciousness. Therefore, while I take delight in the building of objects, my work is as concerned with the space between objects as their physical presence.

Architectural components such as walls, windows, and passageways, removed from their normal contexts and functions, create spaces for entry and movement. The interaction of multiple units, often skeletal or transparent, create spaces in which the distinction between object and surroundings blur; space and object act as a unit to create a larger spatial environment. These activated spaces invite entry and participation, and the viewer, when entering, becomes part of the spatial performance.

While this concept of 'environment' is relatively new to sculpture, it has many roots in the past - in painting, architecture, and theater. Painters, through the use of illusion, can transform flat surfaces into deep and dimensional spaces, while both architecture and theater, by combining several media, can create complex and multilayered environments in space and time.

As part of my thesis project, I have accumulated the historical sources which relate to my work; some have been conscious influences, while there are others of which I have just recently become aware. What emerges is a series of sources linked by a conceptual framework that has helped to clarify the thought processes that have led to my thesis.

SOURCES AND INFLUENCES

"Theaters of Space": Architecture as Stage Set

Stage: "a place where something is exhibited or done: a center of attention or a scene of action".[1].

Illusion: "something that deceives or deludes or misleads intellectually in such a way as to produce false impressions or ideas that exaggerate or minimize reality or that attribute existence to what does not exist or non-existence to what does exist".[2].

The examples from painting, sculpture, architecture and theater concern space and spatial illusions. The individual eleemnts in these spaces combine to create a unified feeling, so that the space is experienced as a total environment. These spaces are transformed into stages, "theaters of space", deriving their drama from the quality of the space itself.

Although the spaces emerge from a variety of media, they all refer to or are contained by architecture. They are either real architectural units, painted illusions of architecture, or natural spaces which have been cultivated to mimic or suggest architecture. As all of the examples chosen exist on or imply an architectural scale, they invite human entry and participation. The performance created is two fold: the space itself acts as performer, but also serves as backdrop or stage set for suggested human activities and scenarios.

In theater, actors perform preconceived scenarios which concern issues separate from the space itself: the space may reinforce the impact of the drama, but it is not the central drama. Thus while my ideas and work suggest theater, only one of the examples I have chosen is actually from theater: Oskar Schlemmer, who built up his theater around the qualities of space and people's movement through it.

The use of illusion creates a sense of movement which activates the space and engages the viewer. Imaginary perspectives extend walls beyond their architectural boundaries, small spaces give the illusion of being large and expansive, and the two dimensional comes to appear three dimensional. The space becomes an arena through which the viewer can move, either physically or metaphysically. Some spaces set up real patterns of movement, while other suggest, by their arrangement, illusory extensions or projections which can be followed only by the imagination.

The use of illusion creates a tension between the real and the imaginary, blurring the distinction between what is there and what is not.

The most effective "theaters of space" involve several media working together within a large spatial or architectural framework. For example, in Gothic Cathedrals and Baroque Palaces, painting, sculpture, and architecture are combined, each medium echoing and reinforcing the spatial and religious theme. In Japanese and Italian Renaissance gardens, nature and architecture are interwoven: unformed nature becomes ordered while softening the formal edges of architectural units.

The historical sources fall into three basic categories: 1) Painting: Architectural Illusionism in painting, a continuous thread from Roman wall paintings to the Renaissance to Giorgio de Chirico, 2) Architecture: Spatial environments in architecture, 'unified spaces', such as Gothic Cathedrals and Baroque and Rococo Palaces, and labyrinthian and 'sequential spaces', as in Knossos, some Eastern temples, and the formal gardens of Japan and the Italian Renaissance, and 3) Architectural Sculptors: Isamu Noguchi, Louise Nevelson, and Mary Miss, environmental sculptors primarily concerned with space and who work in an architectural context, and Oskar Schlemmer, whose work in theater on the theme of "Man and Space" has many implications for sculpture. In discussing these sources I will stress the use of light, as this is a major element in my thesis project. This calls for inclusion

of a brief history of light environments and environmental sculptors who have used light as a medium.

Architectural Illusionism in Painting

The ancient Romans of Pompeii and Herculaneum painted the walls of their villas with illusory frescoes. Three dimensional illusions and architectural perspectives transformed flat walls into transparent windows, creating new interior spaces and opening up to imaginary vistas. Some of these illusions became elaborate and complex, as in the Ixion Room in the House of the Vettii in Pompeii, where the wall is divided into many panels housing imaginary easel paintings, statues standing in niches, and windows overlooking distant landscapes. (p.I) As there is no single unifying perspective, the effect of these illusions is almost dizzying. When painted figures inhabit the architecture these rooms become transformed into stages: in Nero's Golden House transparent figures emerge from the architecture and move toward the viewer, like actors emerging from a stage set. It is thought that these scenes are derived from theater sets of the time, where sequential painted panels were hung against an architectural backdrop.

Renaissance painters, with a more scientific knowledge of perspective and light, created deep and dimensional spaces in their paintings. They defined their spaces with architecture, which became the backdrop for human and religious dramas. Paintings were spanned by monumental facades and archways, and framed

by distant architectural perspectives. Madonnas were placed in semicircular niches, and endless piazzas became dramatic arenas. Viewers were invited to 'enter' these dramas through a pictorial space seemingly continuous with their own. (p.II) The use of light and shadow created three dimensional forms and filled the spaces between objects, creating dramatic, mysterious, or supernatural settings. Leonardo, a master of 'chiaroscuro', created dim and mysterious environments and inscrutable presences. Tintoretto created dramatic effects through strong bursts of light, while in Fra Angelico's paintings a divine light seems to be radiating out from the figures. (p.II)

These painted illusions of the Renaissance, when placed in and architectural context such as on the walls and ceilings of buildings, created compound illusions which extended the architecture beyond its material boundaries. Examples of this are Michelangelo's Sistine Chapel, murals by Palladio and Mantegna, and the work of Mannerists such as Correggio and Veronese. These illusions continued through the Baroque and Rococo, where some painted frescoes created complete buildings on the ceiling of a dome.

De Chirico borrows from Renaissance painters yet he reinterprets their illusions to create strange and fragmented worlds. He uses multiple perspectives and often large foreground objects which confront and disorient the viewer. In de Chirico's paintings the architecture has a more strongly defined presence than the human figures and seems to have a life and presence of its own. It acts

as both performer and backdrop in his metaphysical dramas. (p.III) Because of its large scale in relation to people, its stark geometry, and its extension in space through shadow, architecture takes on an ominous and foreboding quality. Sharp shadows define space by dividing it into geometric areas, and shadows of figures seem about to emerge from behind empty facades. De Chirico's descriptions of his paintings are like scripts for a play:

> "The sun had a terrible beauty/Precise, geometric shadows."[3].
>
> "Ancient times, fitful light and shadow. All the gods are dead. The knight's horn. The evening call at the edge of the woods: a city, a square, a harbor, arcades, gardens, an evening party; sadness. Nothing."[4].

Spatial Environments in Architecture

'Unified Spaces'

While painters use illusions to transform flat surfaces, several media working together within an architectural framework can transform entire architectural spaces into spatial environments. This is particularly found in religious architecture such as Byzantine Churches, Gothic Cathedrals, and Baroque Palaces where painting, sculpture and architecture combine to create a unified religious experience. Through light, color, and decoration these spaces become transformed, and architecture which is massive and huge becomes light and dematerialized. Distinctions between media vanish, and architectural divisions such as floors, ceilings, and separate rooms disappear. Stone and glass become a metaphor for space and feeling. The effect of these illusions gives the architecture a theatrical quality, and transforms space into

stage.

At San Vitale in Ravenna glass mosaics cover the walls and ceiling of the space and are filled with light from above. The entire space is transformed into a glittering environment of light and color. (p.IV) In Gothic Cathedrals all the arts were merged to create a unified and upward movement. At Chartres repeating stone figures on the facade lead the viewer into the space where tall pointed arches direct vision upwards. Structure becomes a weblike skeleton and windows transform walls into translucent screens. The interior space becomes a theater of light and shadow. (p.V)

In Baroque Palaces the effects were more sensual and extravagent. Architects unified all the media and realized their ideas on a monumental scale. One of the most brilliant artist/architects of the Baroque was Bernini, who "had a passionate interest in the theater (and) was at his best when he could merge architecture, sculpture, and painting to form a compound illusion like that of the stage."[5].

Bernini's Ecstacy of St. Theresa in the Cornaro Chapel is enclosed in a stagelike architectural niche and depicts St. Theresa in the midst of an ecstatic visionary experience. All the media echo and reinforce the drama of her vision. She is floating on a cloud and surrounded overhead by golden rays. On the dome above an illusionistic fresco depicts an explosion of clouds, sky, and floating figures, and windows fill the space with light from above. Reinforcing the theatricality of the scene, Bernini sculp-

ted the patron family in stone theater boxes focusing their attention on the central drama. (p.VI) Bernini also extended this drama and illusionism into exterior architectural spaces: between St. Peter's and the Vatican he built a sweeping oval colonnade which enclosed a huge ceremonial plaza, and in the Scala Regia, by means of a false perspective, transformed a dark and narrow stairway into a monumental approach. Here the illusion is created by the architecture itself and not by painting.

Rococo Palaces, especially in Germany and Austria, create some of the most lavish environments in the history of architecture. Many German architects were also trained as sculptors and painters and brought broad sensibilities to their work. The Episcopal Palace at Würzburg designed by Balthazar Neumann contains the Kaisersaal, a large oval room in pastel shades of pink, blue, green, and gold. The room is totally filled with decoration of every sort: marble statues in gilded marble niches, a checkerboard marble floor in blue and pink repetitive tiles which seem to continue endlessly into the distance, swirling lace and ribbon-like patterns, and above an illusionistic dome painting leading to open sky. (p.VII) Other palaces, such as at Nymphenburg, designed by Cuvilles and Dominikus Zimmerman, became total environments of color and intricate decoration. Zimmerman was a decorator and created minute patterns in stucco which acted as a blend between sculpture and painting. One room is totally golden, another silver, and a third completely filled with mirrors. At Die

Wies in Bavaria the space becomes an intricate composition in white.

Labyrinths and Sequential Spaces

While these religious structures focus attention on a central space and immediate experiences, labyrinths and sequential architecture create a series of spatial changes that lead from one to the next. Space becomes a process experienced over time, a journey involving change, transformation, and often surprise. This movement and transformation is not merely implied; the viewer must move through these spaces to experience them.

At the Palace of Knossos in Crete a vast complex of small rooms are linked through a system of passageways and openings. The entire space can never be seen as a whole, but sequentially. One proceeds a step at a time, not knowing once having entered where the space will lead or what surprises one may meet along the way. Perhaps this is in part the origin of the Minotaur myth, in which the labyrinth becomes a symbol and setting for this fear of the unknown and the unexpected. (p.VIII)

Many Eastern temples organize sequential spaces to mirror the steps to enlightenment. Physical and spatial changes in the architecture become a metaphor for the journey of the spirit. The Stupa of Barabudur in Java consists of a series of nine ascending layers or tiers representing Mt. Meru, the Buddhist Mountain of God. The viewer circles the structure, entering through interior corridors whose walls depict scenes from Buddhist cosmol-

ogy, then ascending the exterior via staircases. The stairways are lined with many small stupas leading to a central stupa at the top. As one climbs, the space becomes more open and expansive, and when one reaches the top and gazes down the repetition of circular forms makes the entire space appear to be spinning. (p.VIII)

Formal gardens of Japan and the Italian Renaissance extend this sequential theater into nature. Architecture moves to the outdoors, while nature becomes ordered and architectural. The Villa d'Este is situated on top of a hill and opens to the outside via a series of facades and stairways. As in Renaissance painting, the space is laid out according to a vast central perspective. A grand tiered staircase leads from the main building down to the gardens below, and perpendicular to this a maze of pathways merge and diverge, leading to large open spaces, cul-de-sacs, and semicircular enclosures like stages. The entire effect is suggestive of theater and ceremony and implies a processional type of movement. (p.IX)

Japanese rock gardens, unlike Italian gardens, are tiny. They are minienvironments, but appear to be infinite in size, extending in all directions. In small scale they suggest whole universes: mountains, oceans, islands. The use of raking transforms rock into a more fluid material, and it extends in waves beyond itself. The Zen priest Tessen Soke, who designed the Ryoanji Gardens in Kyoto, described Zen gardens as the art of "reducing 30 thousand miles to the distance of a single foot".[6] (p.IX) Japan-

ese tea house gardens were built sequentially for people to walk through and were meant to be observed in a certain predetermined order. Tea house gardens were organized according to a system of surprises or "mie-gakure" ("seen and hidden"), "which deliberately arranges the sights so that they may not be seen in their entirety from any single direction. It is only by moving among them that they may be understood and appreciated. Here unity is found in diversity. In this garden-drama, one becomes the hero oneself because one 'creates' the garden by walking through it."[7].

Architectural Sculptors

My sources have been more architectural and pictorial than sculptural, because until quite recently sculpture has been limited in size and scale and has dealt primarily with objects. A few modern architectural sculptors whose work concern environment and space, and who have influenced my work include Isamu Noguchi, Louise Nevelson, and Mary Miss.

Noguchi's most interesting projects are his designs for Martha Graham's theater and his 'Imaginary Landscapes', large scale outdoor projects for parks, playgrounds, and memorials, some constructed and some unrealized. In the sunken rock garden near the Beinicke Library in New Haven, Noguchi uses several objects which 'call' to each other and create a dynamic space or environment:

> I prefer to work with a relationship because then you're not working with a single thing but you are working with several things which accumulate energy between them - they call to each other. And pretty soon, there's a kind of hum because of this vibration that is occurring between

objects and between the spaces and presently there is a kind of magnetic gyration into which you are then caught.[8]

Like Japanese rock gardens, this space is not intended to be entered physically, but to be contemplated: it is viewed from above. (p.x)

Noguchi's theater sets for Martha Graham also create 'Imaginary Landscapes', but are more expressly designed to inspire people to movement and interaction. His often skeletal structures extend into space and define areas into which the dancers are invited to move.

In her recent show at the Whitney Museum called 'Atmospheres and Environments', Louise Nevelson uses light to create whole environments in which the space between sculptural objects becomes as important as the objects themselves. Concerned with the "in between spaces", the "dawns and the dusks", and "the places between the land and the sea", she places black sculptures in rooms with painted black walls, illuminating them so that the environment is dim and misty and people walking through the space become part of a strange and otherworldly performance. Similarly her white sculptures are placed in brightly lit rooms painted white, and her gold sculptures are in bright golden rooms. These brighter spaces suggest altars and ceremonial functions. Even her earlier sculpture - individual black pieces - are carefully placed on bases and silhouetted against nearby walls so that they create a space, or aura, or sphere of influence around them. (p. x)

In the Nassau County Museum show called 'Perimeters/Pavilions/

Decoys' Mary Miss creates a large outdoor environment based on the ceremonial architecture of the Southwest Indians, consisting of underground kiva-like spaces and above ground unclimbable vertical structures. All of these structures are skeletal wood and enclosed only by occasional wire meshing which permits visual although not physical entry. Her constructions concern space and illusion: the underground structure appears small, but upon exploration reveals hidden spaces and passageways. Her structures resemble stages, suggesting scenarios and sequences of activities. They pose conflict and duality; they are inviting yet aloof. (p.XI)

While many sculptors are becoming architectural, a group of architects called the "New York Five", the most famous of whom are Michael Graves, Peter Eisenman, and Charles Moore, are becoming increasingly sculptural. They blend classicism and eclecticism, and while many of their buildings are forced and overly 'designed', they do reject the idea of the monolithic, impervious building and attempt to integrate their structures with people and the surrounding environment. In the Piazza d'Italia in New Orleans, Florida, Moore blends the familiar and the unfamiliar, creating strange spaces reminiscent of de Chirico. Based on ancient Roman models (Hadrian's Villa), the Piazza defines enclosures and passageways with concentric rings of water, spanned by facades whose stainless steel columns supply their bases with water. Kresge College in Santa Cruz at the University of California is a group of dormitories arranged along a street like a village; facades and archways

connect one to the next and produce a collection of passageways and surprises. His intention is "to make one especially aware of oneself moving back and forth through the two dimensional arcades, almost like a set of stage flats, more than ever aware of oneself and one's passage, rather than of the buildings as eternal objects".[9] (p.XII)

A similar theme of man moving through space is explored by Oskar Schlemmer in his theater work at the Bauhaus. He considers space as "part of the larger total complex, the building" and refers to the stage as "an architectonic-spatial organism where all things happening to it and within it exist in a spatially conditioned relationship."[10] Schlemmer's theater is a spatial drama based not on external scenarios but on the nature of space itself and the movements of people within it. "Man, the human organism, stands in the cubical, abstract space of the stage. Man and Space. Each has different laws of order. Whose shall prevail?"[11]. His dancers became like 'ambulatory architecture', taking on the geometry of the architectural spaces around them. (p.XIII)

In his Triadic Ballet, he creates whole spatial environments through which the dancers move and the dancers, in costume and gesture, are perfectly integrated with the space around them. For example, a black spiral is painted on the floor of the room and "Spiral", a wire figure consisting of many loops of wire starts from the center of the spiral and slowly whirls outward. Other settings involved checkerboards with skeletal props through

which figures moved with stylized, almost robotlike, gestures.

Schlemmer was as innovative in his use of light as he was of space. He used light as a sculptural medium to define three dimensional space. In his 'Metallic Festival', Schlemmer transformed the entire Bauhaus into a glittering metallicized environment with light, movement, costume, and even metallic sounds. In 'Metal Dance', a dancer holding metallic balls performer movements in a reflective enclosure which multiplied the effects of light.

Light Environments in Sculpture

Jack Burnham describes the use of light as a sculpture medium as "the tendency to fuse art object and environment into a perceptual whole".[12.] Thomas Wilfred was one of the first of many artists to use light creatively. In the early 1920's he experimented with moving colored lights projected onto flat translucent screens. While these efforts were more painterly, Moholy-Nagy at the Bauhaus began to work with light as a three dimensional and environmental medium. His set for "Madame Butterfly" in 1928 consisted of a series of moveable skeletal walls which cast a framework of open shadows and a giant cyclorama with colored lighting effects which changed from 'dawn' to 'sunrise'. (p.XIV) His interest in light and motion led him to three dimensional constructions or 'light modulators', reflective and screenlike forms which project light into space. When photographed in motion, these forms create 'virtual volumes' as important visually as the object itself. His 'Light-Space Modulator', completed in 1928, consists of a moving metal framework holding perforated metal

screens, grills, and grates mounted on a rotating base. These screens act as stencils, filtering and reflecting light; layers of screens overlap and shift, creating an endless variety of patterns. When viewed in motion in a darkened room, shadow and substance interweave and transform space into a dynamic environment. (p.XV) While Moholy worked in indoor spaces he dreamed of vast projects in the environment, "light frescoes" and "light architecture"; he saw "visions of light, in the air, in large rooms, on screens of unusual nature, on fog, vapor, and clouds."[13]. He was one of the first modern artists to recognize the dynamic nature of the city at night as a huge kinetic light sculpture.

Gyorgy Kepes, who joined Moholy-Nagy at the New Bauhaus in Chicago, sees "the whole visible world, natural and manmade, as a light world" and recognizes the rich possibilities of using artificial light in the urban environment.[14]. His sources and sites are architectural and environmental, and not, as in the Bauhaus, in interior rooms:

> The isolated sheltered small space of a room in the house or in the museum is suffocatingly narrow for the fluid power of light in action. The new, rich intensities of artificial light sources, if used creatively, must be woven into the bigger fabric of the night cityscape.[15].

During the war he and Moholy researched the possibilities of camouflaging the city of Chicago with light. They proposed to turn the city lights out and to float lights on Lake Michigan, giving the lake the appearance of the city, and thus confusing enemy pilots. An early example of Kepes' architectural use of artificial light was his outdoor kinetic neon light mural for Radio Shack in

Boston, in 1950. (p.XVI) Later, in his KLM mural in New York, he used as a source the rich appearance of the night city from the air. The mural consists of a huge perforated screen 50 feet long and 18 feet high which houses a variety of lights controlled by timing and switching devices. The intention was to create "a fluid, luminous pattern with random changes" which would become part of the "large space of the street outside, sometimes blending and sometimes competing with the rivers of light generated by moving automobiles, giving and taking light from the surroundings, both invading the outside space and being invaded by it.[16.] (p.XVII)

Nicholas Schoffer, whose forms resemble Moholy's skeletal frames, shares Kepes' interest in city scale and urban planning. Schoffer executed his 'cybernetic' works on a huge scale so that they became not subservient to but dominant over architecture. His cybernetic tower in Liege, built in 1961, is 52 meters tall and projects onto a giant glass screen composed of the glass facade of a nearby building. The tower is a huge skeleton in space to which are attached rotating axes which put into motion at different speeds 64 mirror plates and blades of aluminum. The piece interacts with the sun during the day and is lit at night with multicolored projections and a huge sheath of light. The entire assembly is hooked up to an electronic brain, sensitive to minute changes in sound, light, and atmosphere. He calls this "socialization of sculpture"; not only can people move around the sculpture but it moves and has a life of its own. It becomes a "spectacle of permanent duration."[17.] (P.XVIII)

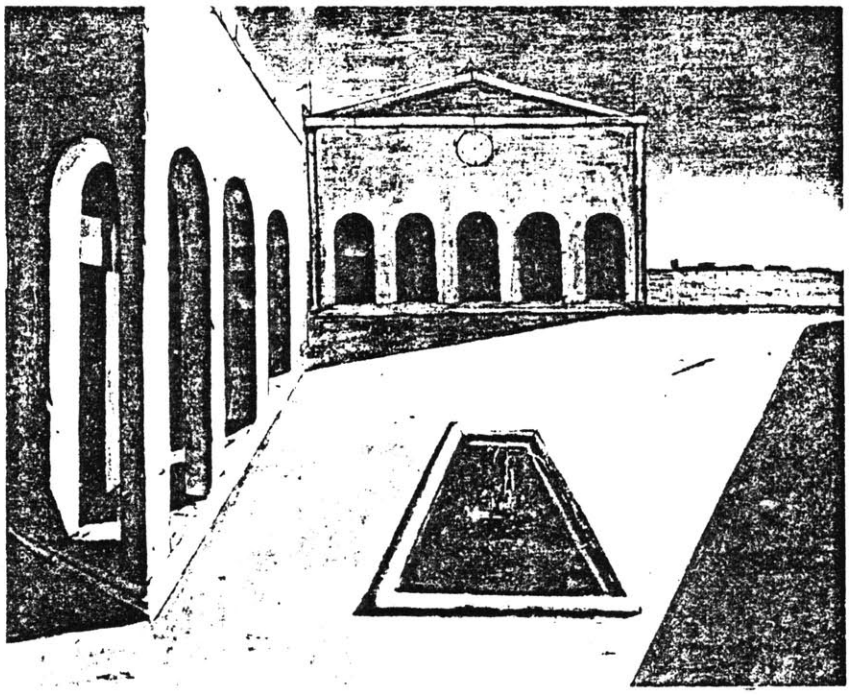
Illustrations

Ixion Room, House of the Vettii, Pompeii

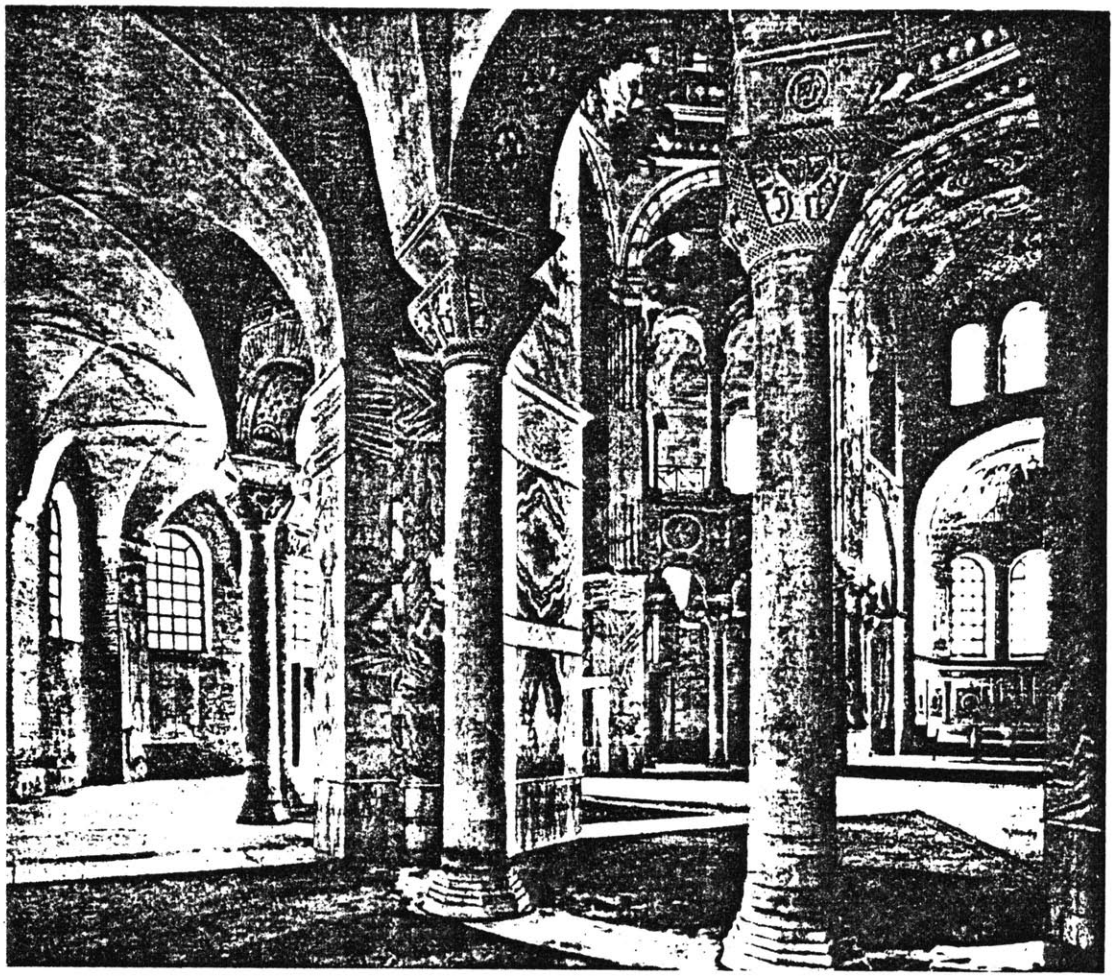
Perugino, Christ Delivering the Keys of the Kingdom to St. Peter

Fra Angelico, Annunciation

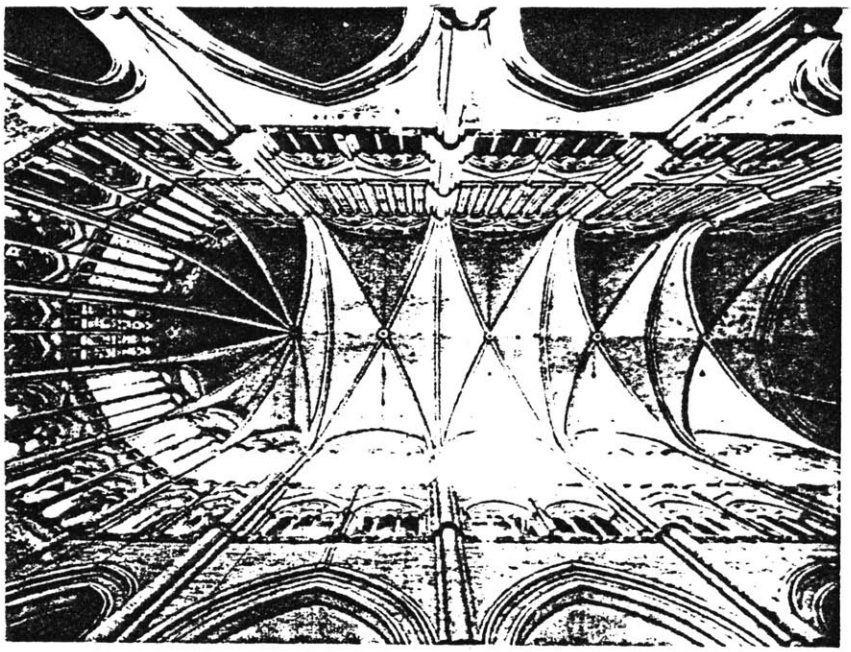
Giorgio de Chirico, Mystery and Melancholy of a Street



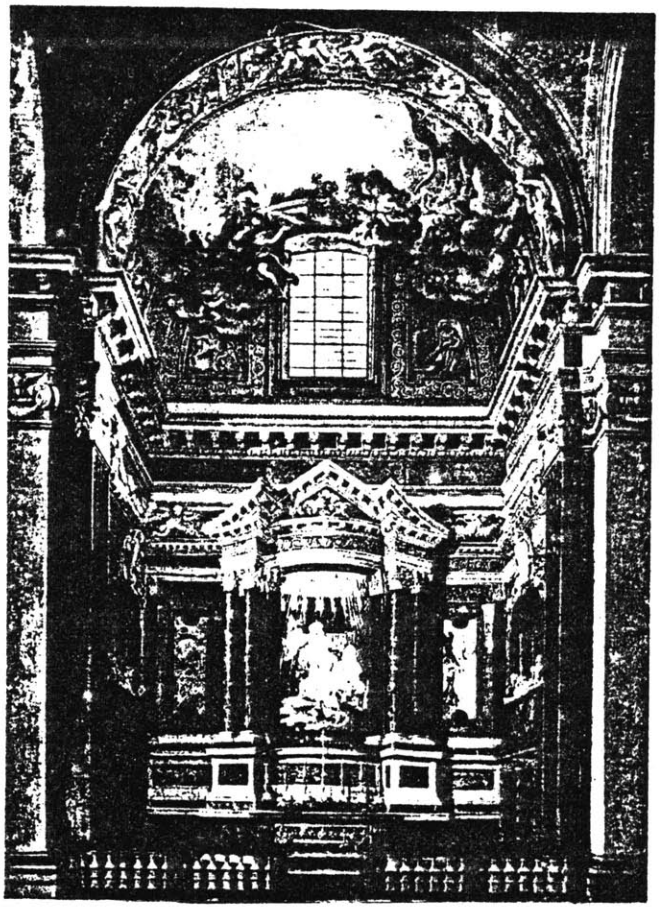
Giorgio de Chirico, The Delights of a Poet



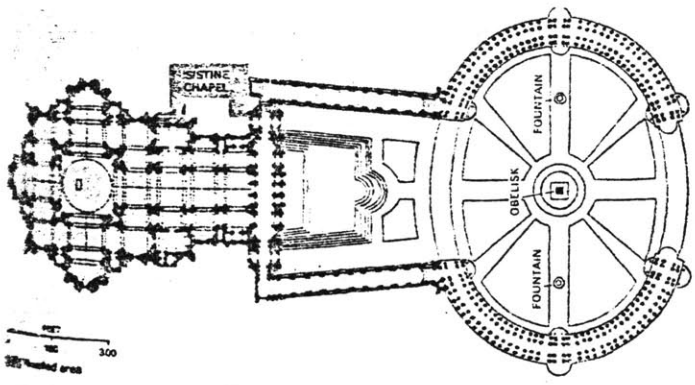
San Vitale, Ravenna



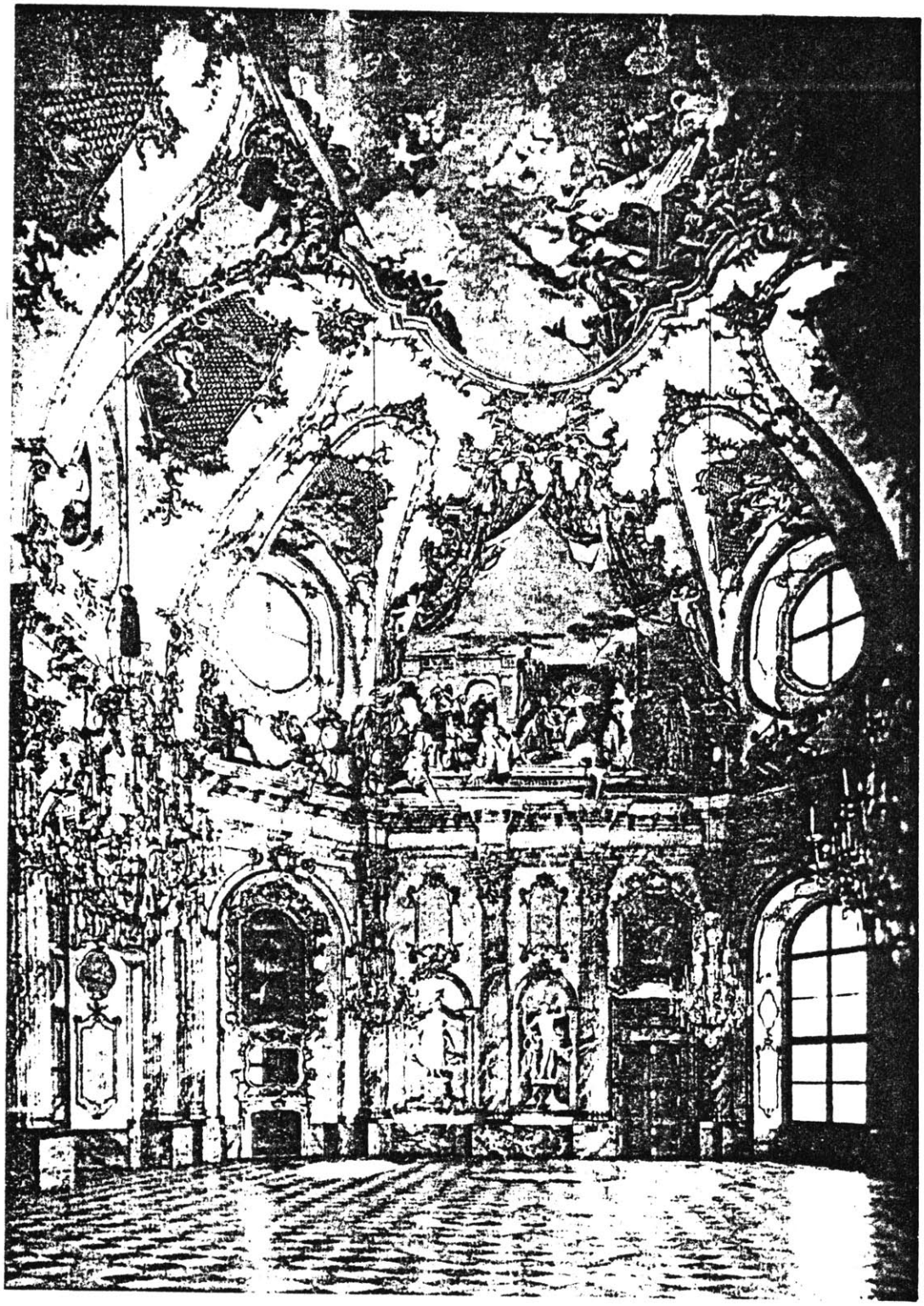
Chartres Cathedral



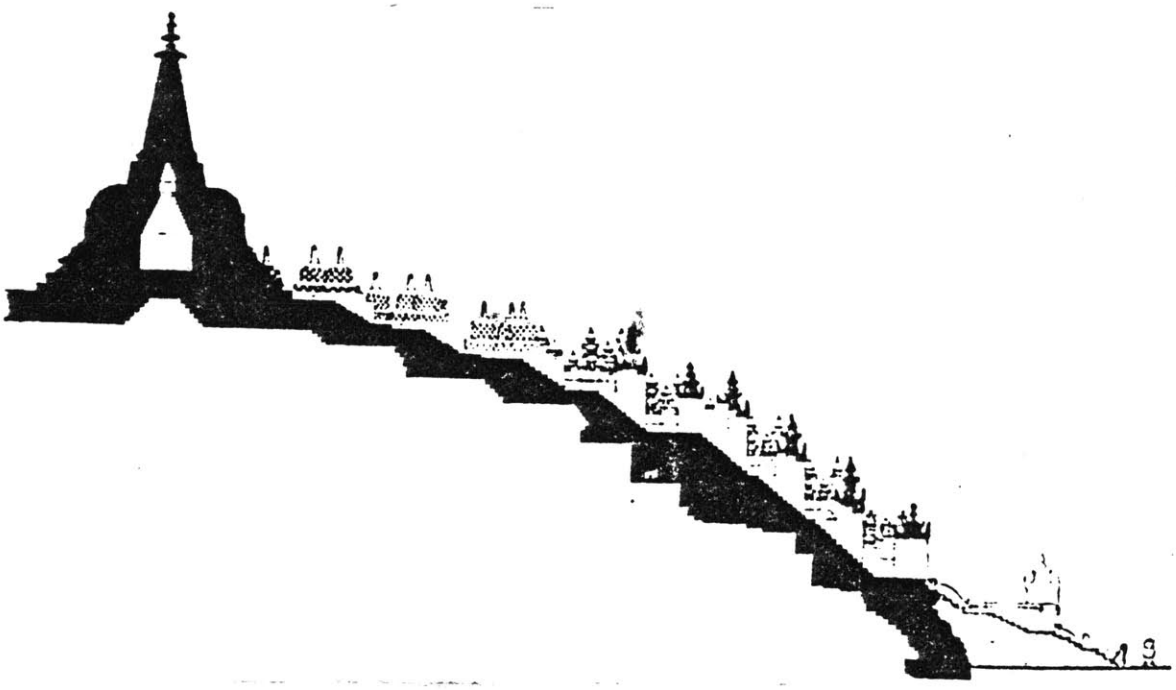
Bernini, The Ecstacy of St. Theresa,
Cornaro Chapel, Rome



Bernini, Piazza in front of St. Peter's,
Rome

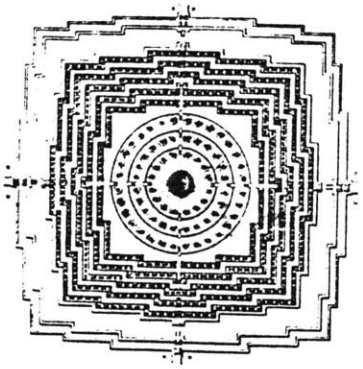


Kaisersaal, Episcopal Palace, Wurzburg

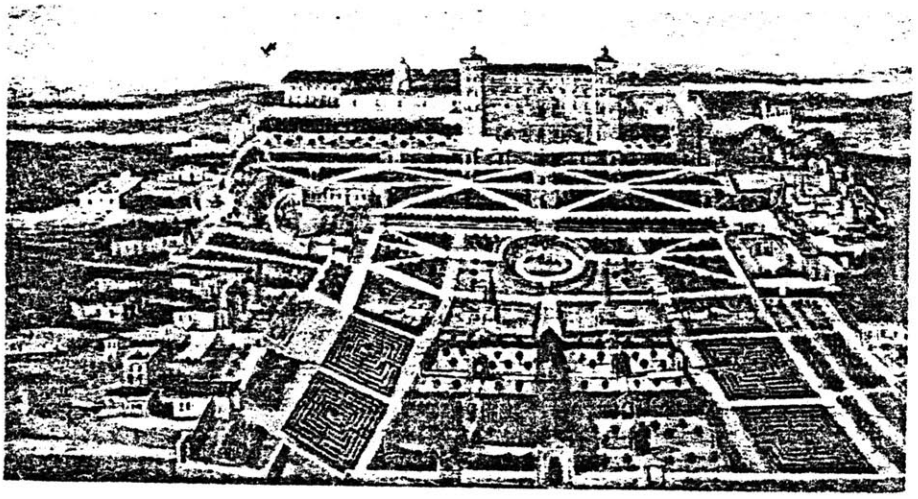


Stupa of Barabudur, Java, Section

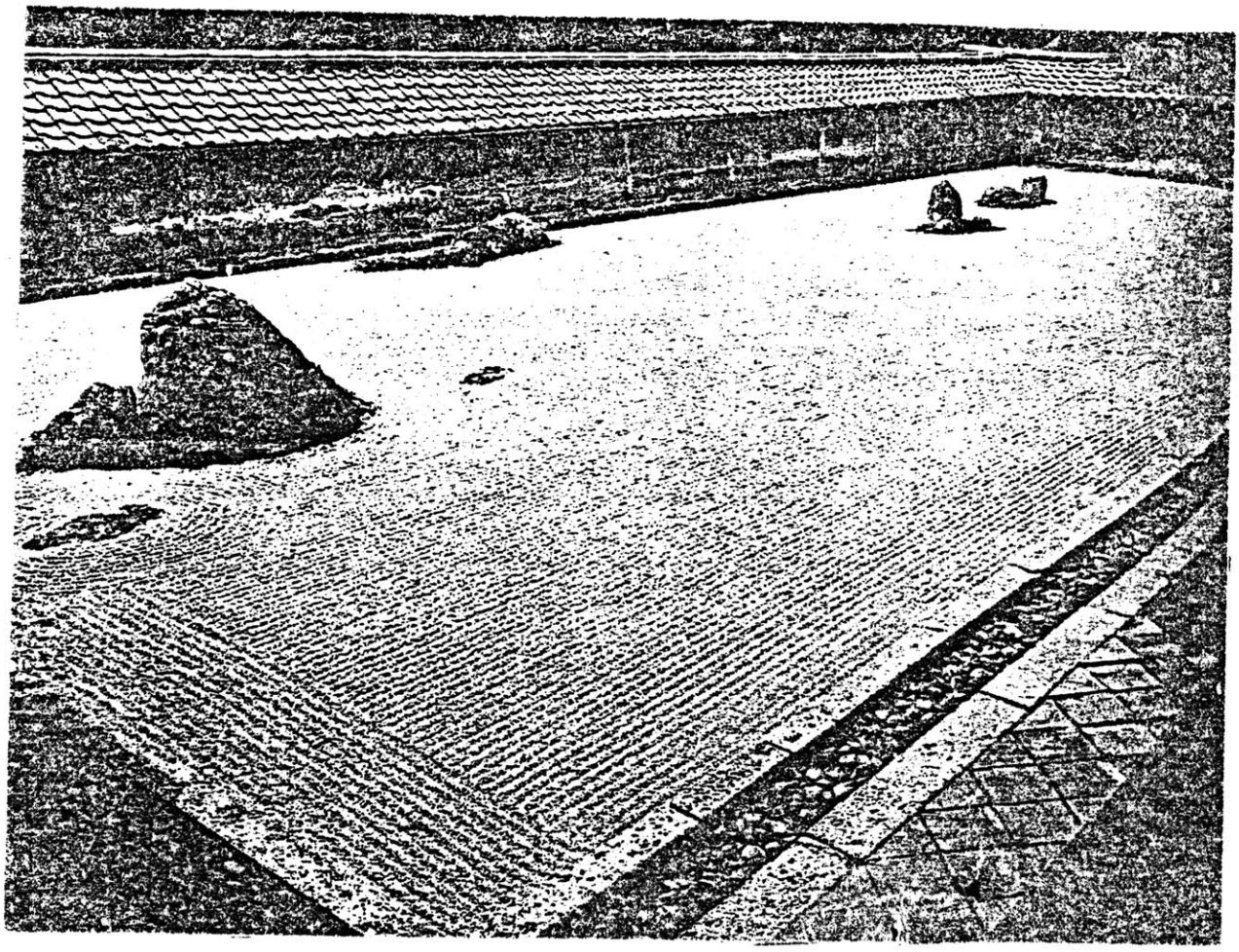
Stairway, Palace of Knossos, Crete



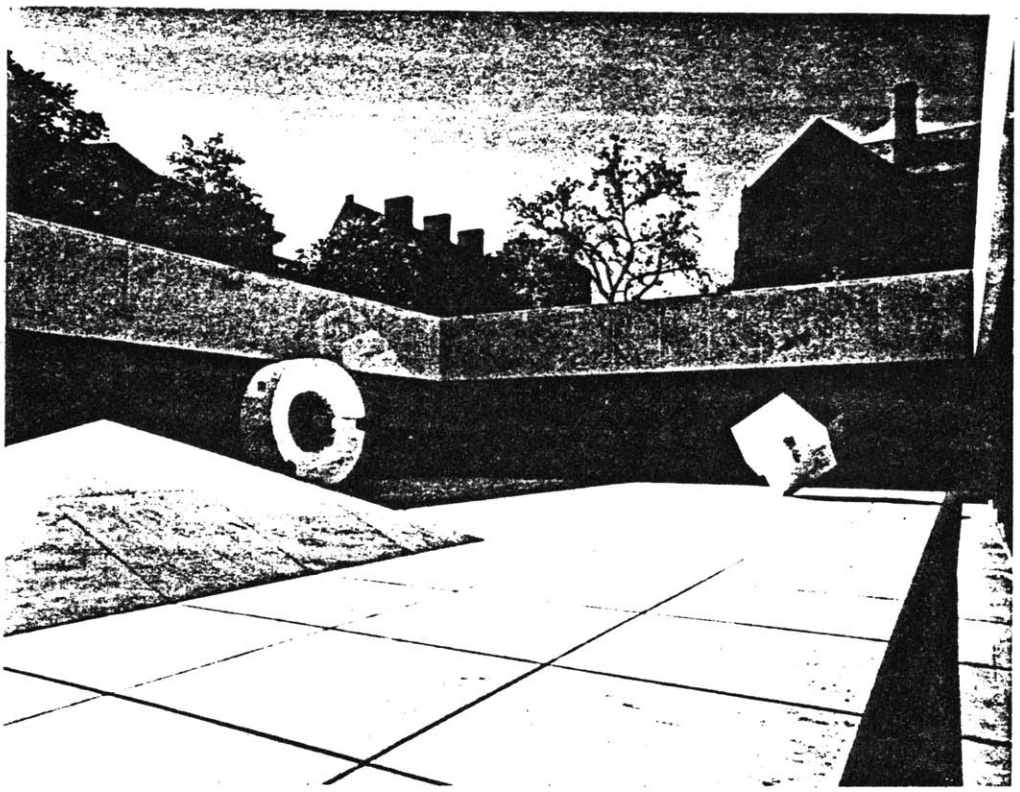
Stupa of Barabudur,
Plan view



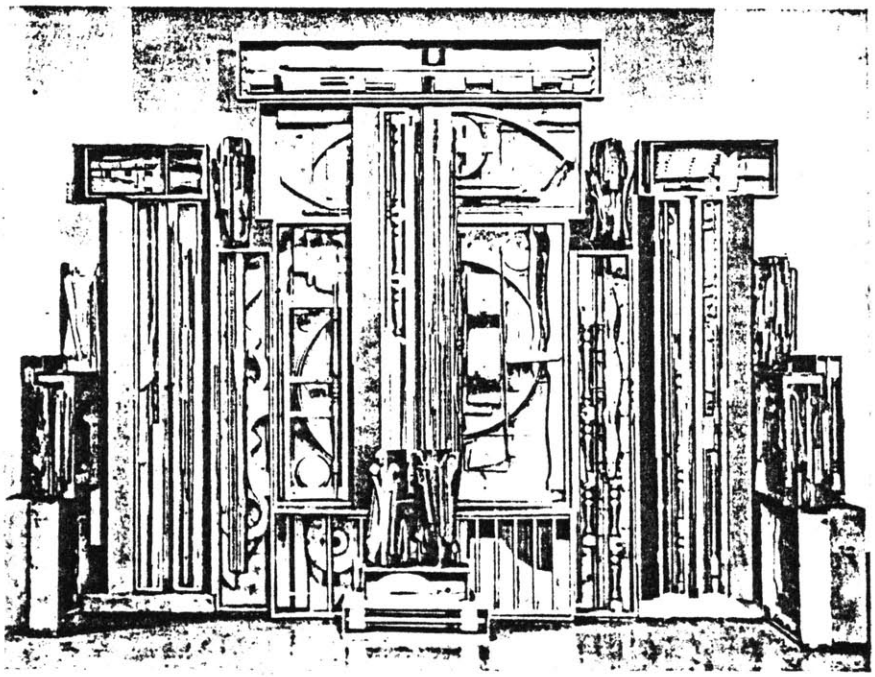
Villa d'Este, Tivoli



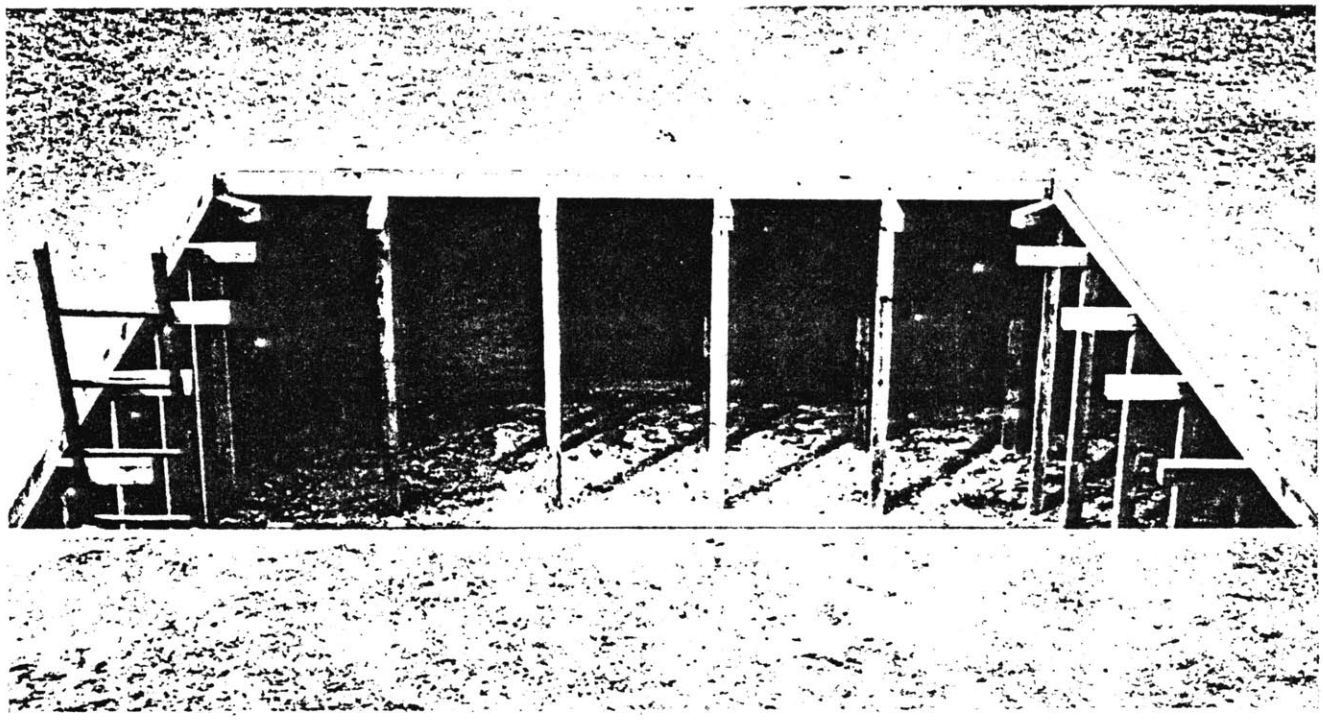
Ryoanji Garden, Kyoto



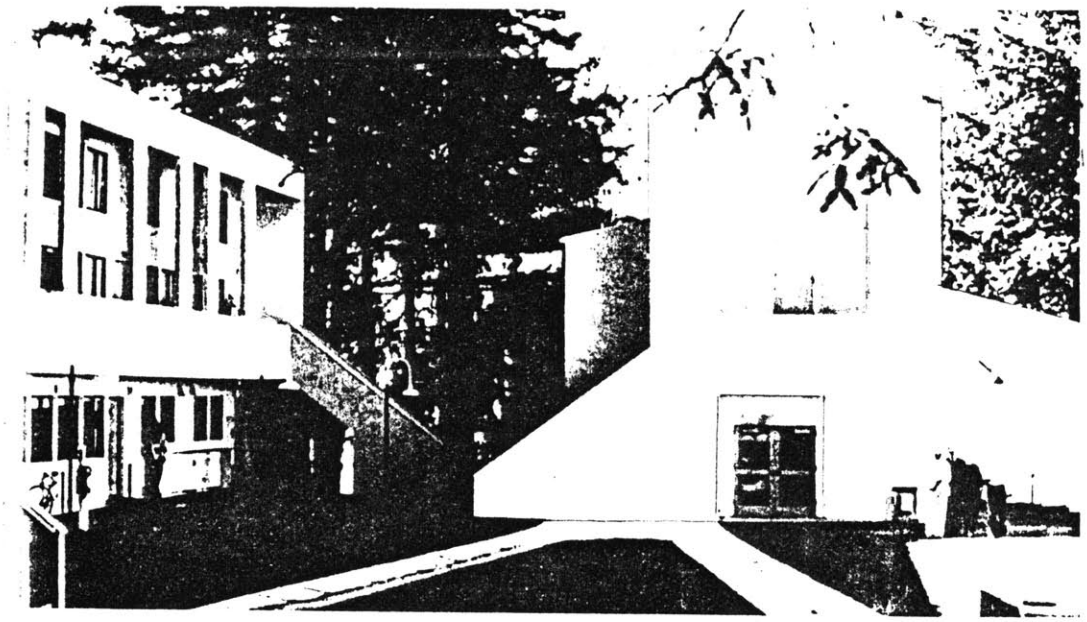
Isamu Noguchi, Garden for Beinecke Library, 1960-64

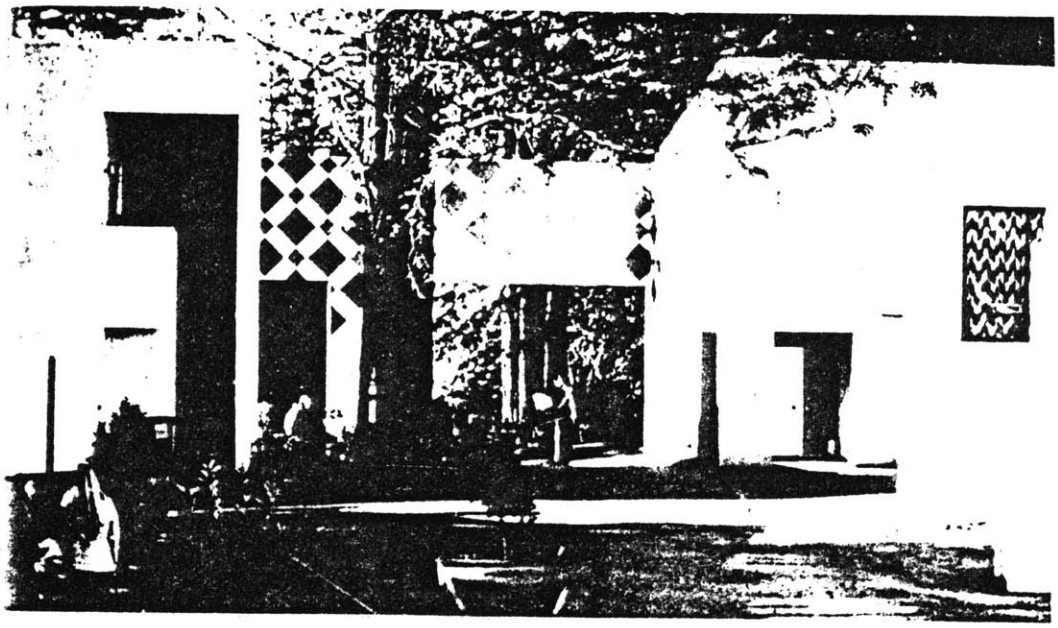


Louise Nevelson, Sungarden #1, 1964

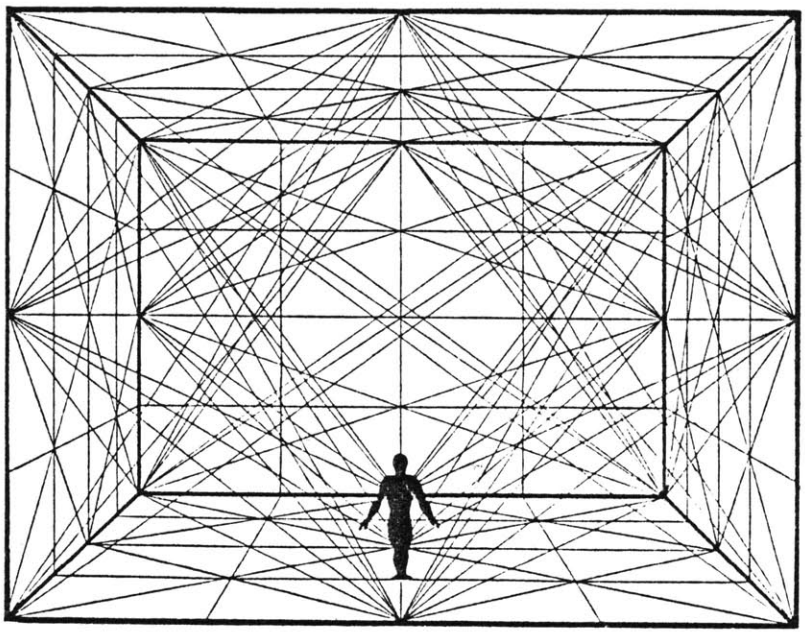


Mary Miss, Underground Structure, 'Perimeters/Pavilions/Decoys', 1978



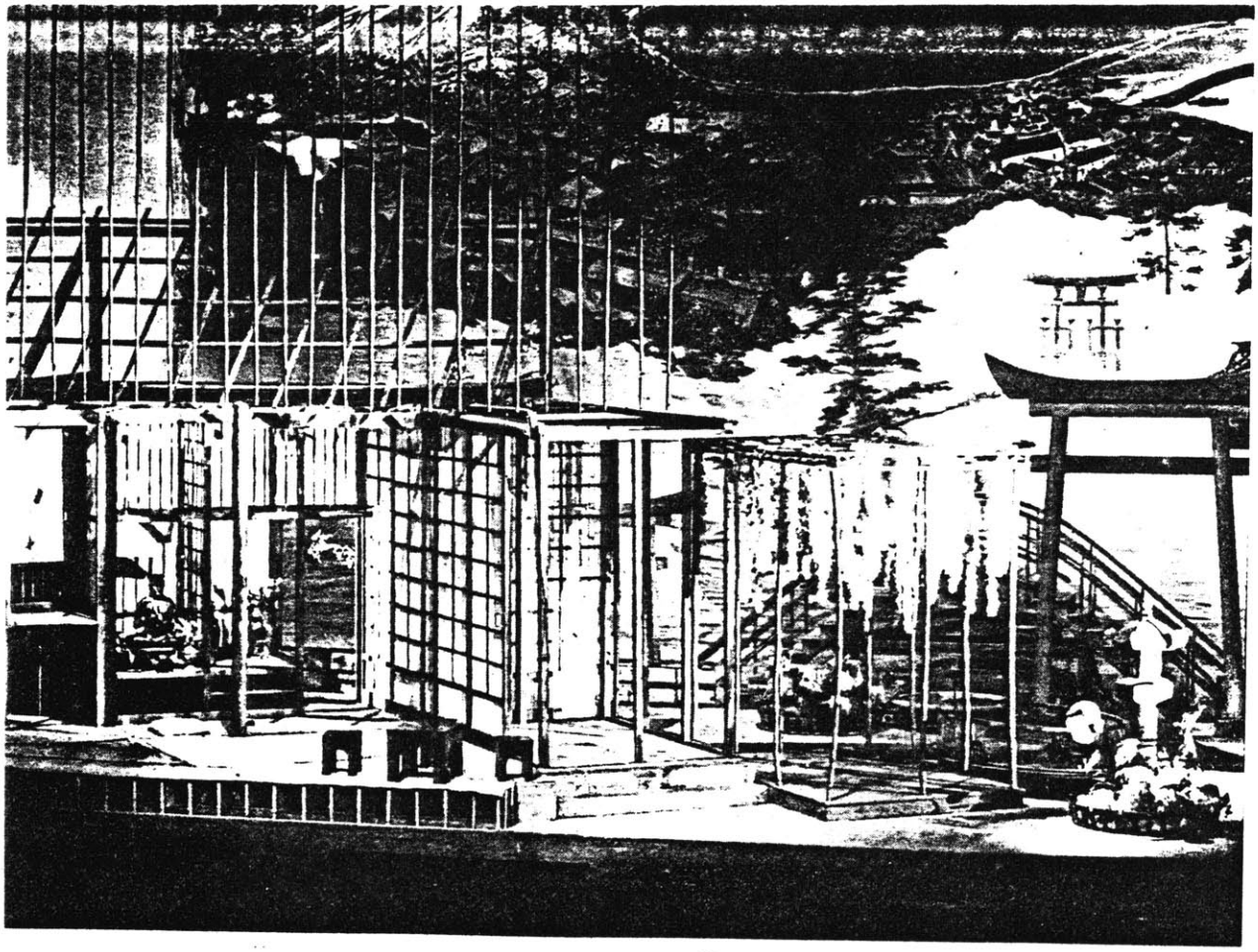


Charles Moore, Kresge College, Santa Cruz , 1973 .

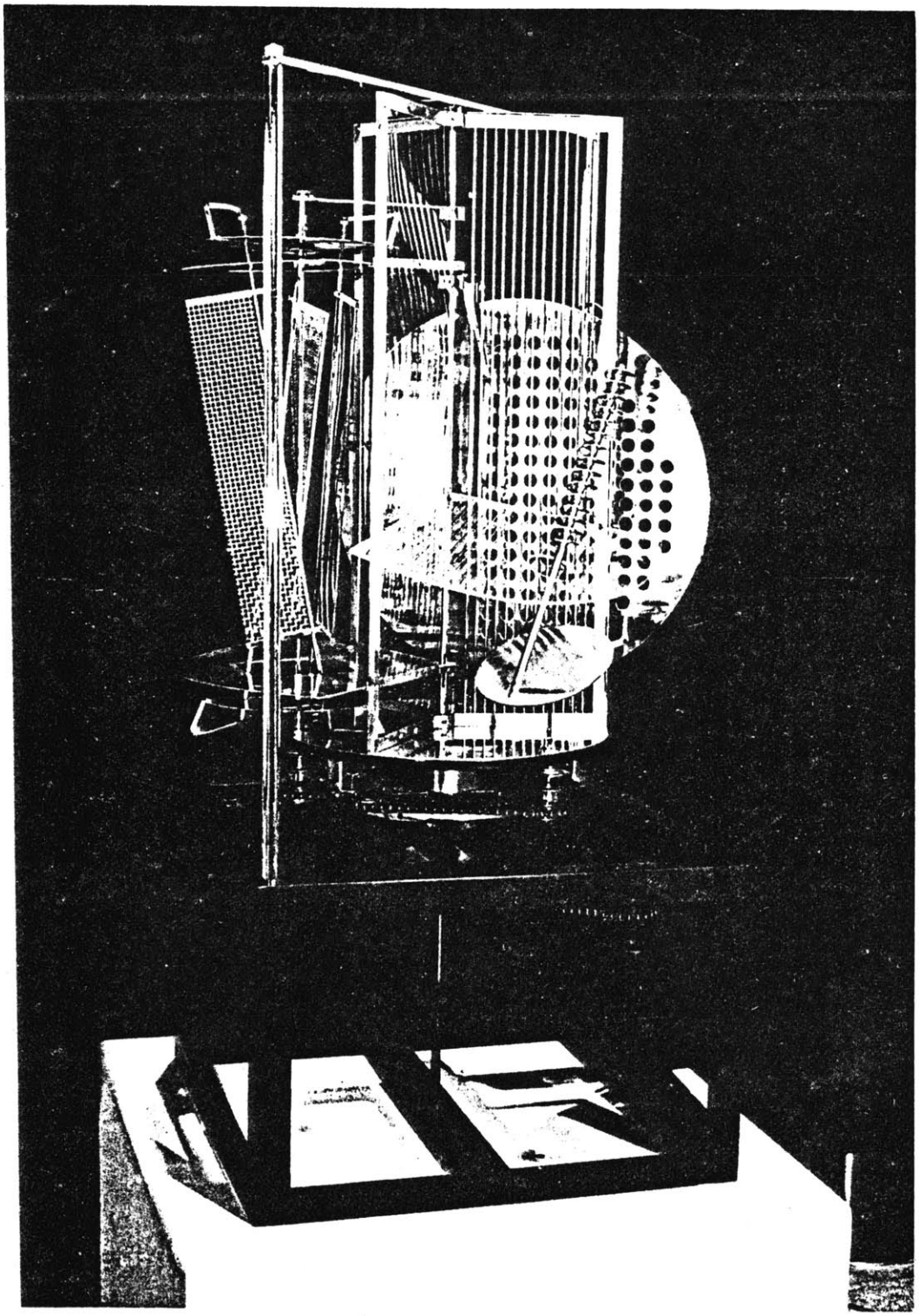


Oskar Schlemmer, "Man and Space" , 1924

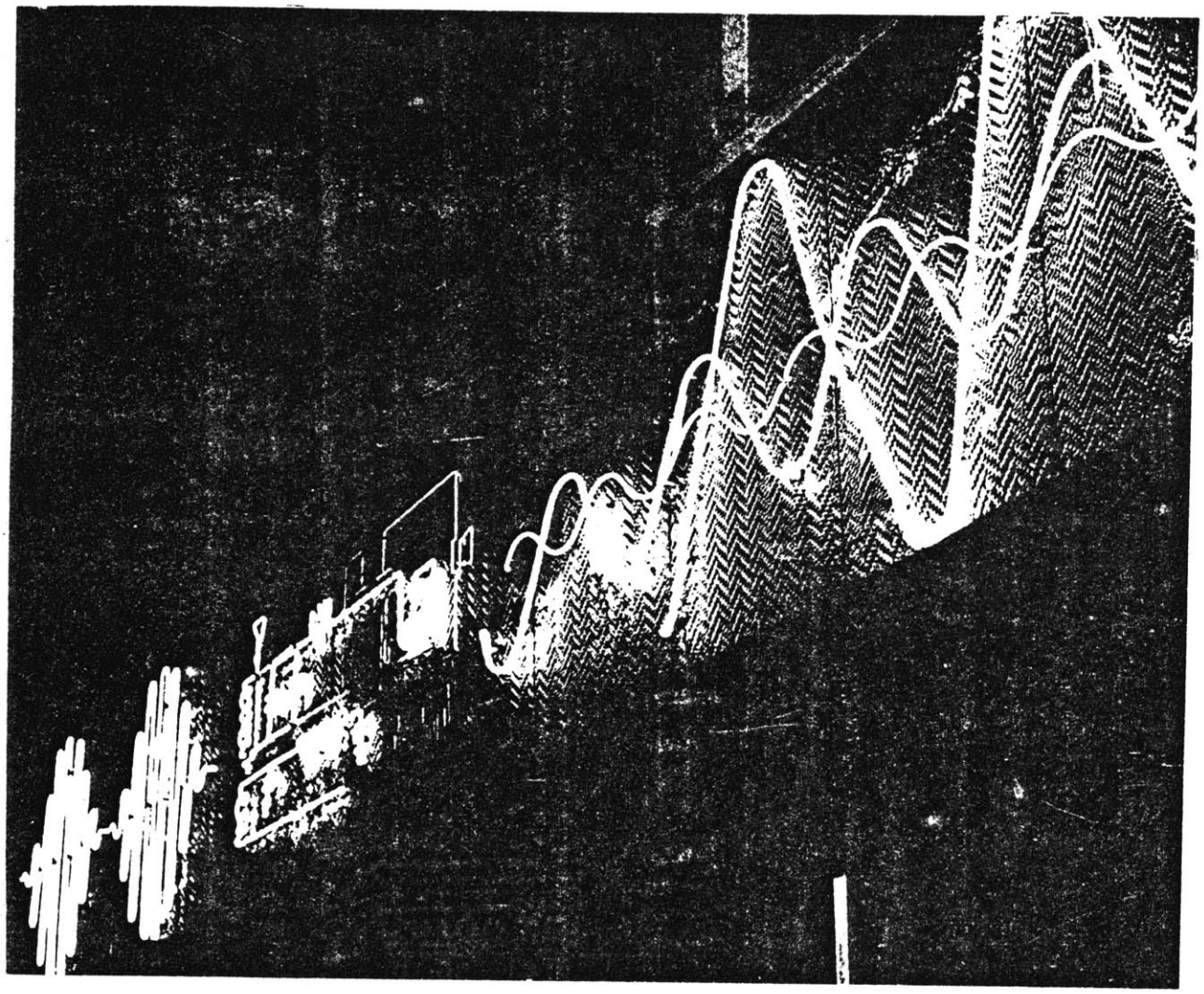
Oskar Schlemmer, Metal Dance
1929



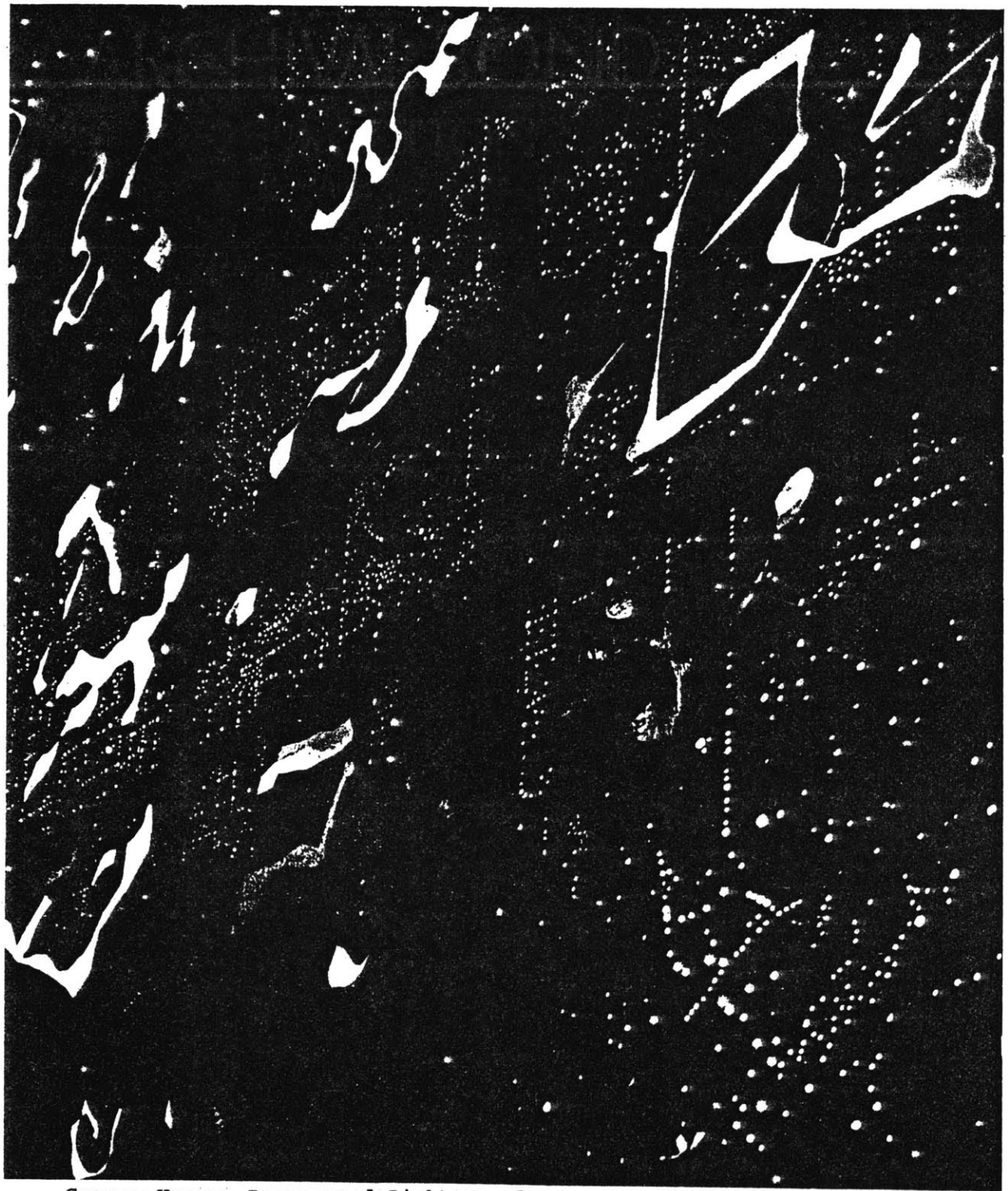
L. Moholy-Nagy, Set for "Madame Butterfly", 1928



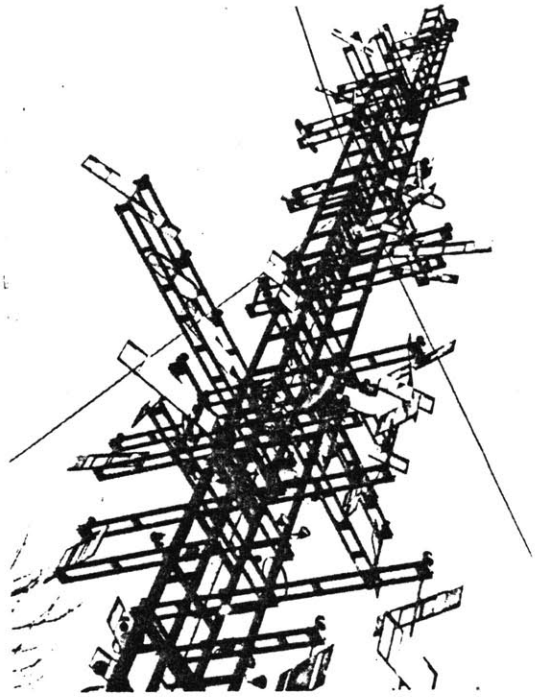
L. Moholy-Nagy, "Light-Space Modulator", 1922-30



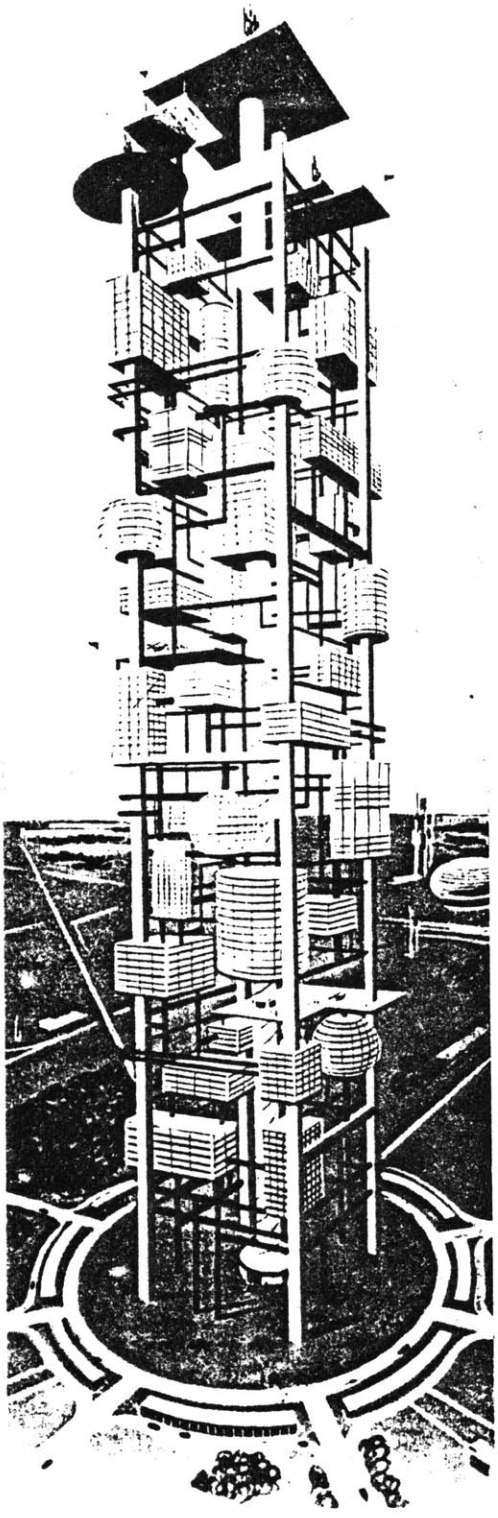
Gyorgy Kepes, Light Mural, Radio Shack, Boston, 1950



Gyorgy Kepes, Programmed Light Mural, for KLM Office, New York, 1960



Nicholas Schoffer
Cybernetic Tower, Liege, 1961



Nicholas Schoffer, Project for
the Cybernetic City, 1963

THESIS PROJECT:
Evolution, Installation, and Performance

Background

This project evolved from a series of works dealing with object and shadow, real space and illusory space. It began a year ago on a modest scale with a small book. Over the course of the year it has expanded from small to large, from object to environment.

The book consisted of a series of drawings of brick walls with the bricks cut away, leaving a skeletal network of mortar patterns like negative brick walls. As each page was turned it projected shadow images onto the page behind. The book became a performance in light and shadow, with constant movement and change, creating interest because of the many possibilities and combinations inherent in its skeletal patterns.

I enlarged one page of the book to a four by eight foot sheet of white paper with cut-outs in real brick scale. The screen was suspended and a moveable light source on a stand created a sequence of shadows on the wall behind. The light could be positioned so that object and shadow were obviously distinct or so that it was difficult to distinguish the real from the shadow image. The flat screen, then, became three dimensional and in combination with its shadow created a complex and illusory space. The space between the real and shadow wall formed a passageway through which people could walk, merging their shadows with the

real and shadow architecture.

I began making a series of models which would involve many screens and complex illusions. Two models developed: a stage set with many freestanding layers of screens and a vertical book of skeletal brick pages hinged together at one edge with translucent projection screens as the cover. A light from behind projected illusory shadow perspectives onto the screens in front. When the light was manipulated from side to side and back to front, the pages appeared to be turning or rushing towards the viewer. These skeletal wooden structures, being freestanding and rigid, became quite architectural.

Both models suggested environments to be realized and lit on a larger scale. I began building screens for a large book. My intention was to create a sculpture on an architectural scale using the skeletal screens and light which incorporated movement and change, and had many possibilities and combinations rather than one static view. Timed sequences of lights would project moving layers of shadows onto the translucent screens in front. People would be able to turn the pages, walk through the spaces between the screens, and watch as their shadows were projected onto the screens. The piece, then, suggested a theater in which the audience would become part of the performance.

The process of enlarging these pages took an entire summer and demanded exact craftsmanship. Wood was cut into strips ranging from 3/4" by 3/4" to 1/4" by 1/4" thick. All of the pieces

were notched and joined into panels of about eight feet by six feet. At this scale they resembled walls or doors as much as pages. There were seven panels, some in cinderblock scale (8 x 16" units) and some in brick scale (2 1/4 x 8" units). They were left unstained so their color stayed light, almost white.

The screens were hinged together in freestanding pairs. When I began to experiment with the book arrangement, it became clear that this format was too clustered and that the screens demanded more space between them. They were moved to the 'Pit', a large white room at the Center for Advanced Visual Studies about 35 feet long with a 25 foot ceiling. The floor was painted so that the entire space was white, which unified the space and defined a stagelike area for the screens. When the piece was set up in this new space the concept changed: the book expanded to a looser arrangement which involved the entire space in the room: from object to environment. The pages became more architectural and less booklike and all the surfaces of the room became the projection 'screens'. Shadow could be used to transform a three dimensional space rather than projecting on flat screens. Unlike my previous work which involved working out an idea in model form and then enlarging it to full scale, this project became one of constant change and imporvisation at full scale.

Installation

The room at C.A.V.S. is entered from above via a loft area which overlooks the space, and a stairway on the left leads to

the space below. The space when painted white became a stage with multiple viewpoints: it could be viewed from above, as 'audience', or from below as 'performer' by moving through it.

Pairs of hinged screens suggested corners or intersections of walls, and were arranged to create passageways. An opening or walkway invited the viewer walking down the stairs. Other pairs of screens created a loose network of enclosures and pathways, a kind of open labyrinth. As the screens allowed light and vision to project through them they created intricate and overlapping layers, like webs or branches in a forest. Vision penetrates from one layer to the next, confusing what is near and what is far away.

With the addition of light the room became a total spatial environment. Light extended through the screens and the entire room became a surface for the projection of shadows. The shadow architecture, in its monumentality, became more real and imposing than the architecture of the screens themselves. Light became a building tool as important as bricks or wood, and manipulation of light through the screens could transform the space and change entirely one's perception of it. Shadows could create illusory passageways and open up walls through receding perspectives. Flat surfaces appeared to open and extend into the distance, like the painted illusions in Roman villas. Layers of shadow created monumental cityscapes which made the room appear huge or enclosed the space by creating thick cagelike layers of shadows on the

walls.

The intention was to create a spatial environment which blurred distinctions between the real and the illusory and merged object, through light and shadow, with the surrounding space. Light was the actor and space was the subject of the drama.

The quality of the light sources became central to the success of the piece. I experimented with a variety of lights ranging from ordinary incandescent bulbs and flashlights to light assemblies with focussing and lens systems. It was necessary to find lights which gave sharp and focussed shadows and at the same time lit up only a small area of the room. I did not want to use all one quality of light, but preferred to have a variety of lights with different intensities and sharpness of focus. The most successful lights were: the cold bluish focussed light of a projector, whose area could be increased by removing the lens, and theater lights, which yielded a warmer source, directing light in a spot while softly diffusing it towards the edges. It is no accident that theater lighting has evolved as it has; it allows for a variety of effects, both in and out of focus, and can light up small areas of a room without revealing other parts of the space. Ordinary household flashlights were also effective, as they directed light in a narrow focussed beam and produced sharp shadows. When carried by someone moving through the space, flashlights produced a fluid and movielike series of changes; minute changes in the position of the light relative to the

screens could produce dramatic changes in the shadow. When light approached a corner of the screens, they would appear to rotate in space and reappear on an adjacent wall.

A variety of eleven lights ranging from 500 watt spotlights and projectors to 150 watt Fresnels were hooked to a central dimming control system. The lights were arranged in the space empirically, based on what worked best with a given arrangement of the screens. I worked with each light individually, developing a series of stills, and then began working with them in sequence to develop movements and changes in the space. They were arranged to produce subtle changes in small areas of the room and also large changes such as from a bright wall with many layers of overlapping shadows to a darkened room with a single bold shadow on the floor.

Generally lights were placed on the floor close to the screens and pointing upwards, projecting huge shadows onto the walls and ceiling. Lights were more interesting projecting from below onto the walls, and light from above was interesting only when projected toward the audience. I chose not to work with the ceiling because of distracting bars and sprinklers and also because the shadows on the ceiling were less focused and interesting.

The projectors were placed to either side of the space so that they shone through many layers of screens and projected all layers in sharp focus on the opposite wall - the left and

right walls of the space. In unison, dimly lit, they created a cool and unearthly atmosphere in the room.

Five spotlights on the floor around the pole were directed toward the back wall of the room, slightly overlapping so that it was possible to move across the wall by dissolving from one light to the next. These lights had a warmer and softer cast, contrasting with the cold sharp projector lights. Two other lights, small Fresnels, were mounted on the back wall: one echoed the stair railing filtering a soft light up the stairway towards the audience and the other cast a sharp bold shadow on the right wall echoing the corner configuration of a screen but on a monumental scale. A light high on the back wall projected long shadows across the floor toward the audience.

The piece evolved, then, from a fixed installation to a performance - a sequence of events in time. It was necessary to bring out its many possibilities and combinations and to show the process of change and transition from one configuration to the next.

Performance

Two types of performances naturally evolved from my experimentation with the lighting: 1) A mechanically manipulated performance in which the lights were controlled from a central dimming system. These changes consisted of a progression of 'stills' which dissolved from one to the next, sometimes changing dramatically and sometimes imperticeptibly. 2) A performance in which

people walked through the space holding flashlights, producing a sequence of continuous and fluid movements. These two performances served as a prelude to a third and equally important performance in which the 'audience', after seeing the many possibilities of the piece unfold, entered and moved through the space, becoming part of the piece by casting shadows and merging with the shadow architecture. The layout of the room also suggested the forms of the performance: the audience sat in the loft space and viewed the first two performances from above, and then entered the 'stage' area below via the staircase as 'performers'.

The Dimmer Performance

The performance started in total blackness. Individual lights slowly faded up from black, paused slightly, then dimmed to black again, slowly introducing parts of the space while never revealing the entire configuration. The movements were continuous, but sometimes barely perceptible. I then began dissolving from one light to the next, overlaying two lights and slowly bringing one set of shadows in and out of focus. These adjacent changes in the space alternated with larger dissolves from floor to wall and from one side of the room to another. Sequences of dissolves could develop continuous movements around the room. Gradually several lights were brought up and the space became brighter and more complex. By changing from one configuration of lights to another, larger and many-layered transformations occurred. A maze of shadows on a far wall could fade to

simple bold shadows moving across the floor toward the audience. Layers of shadows could build and move from one part of the room to the next. Light created, dissolved, and transformed the space. Through light the space became unified; distinctions between screens and shadow, and separate wall surfaces disappeared; the room became an environment of moving light and space.

Flashlight Performance

The flashlight performance was continuous with the first. One performer positioned himself in the darkness and began a series of 'stills' that echoed the dimmer stills. The first positioning was held improbably high and focused on the floor where the dimmer had just faded. As the performer was behind the light he was not visible to the audience, so it was not at first clear that a human presence had been introduced. This was held for several seconds, then to black, light repositioned to produce a still on the wall, held for several seconds, again to black and reposition. The next 'still' became a continuous movement, a slow walk along the back of the space from right to left, with the light shining through many layers of screens. Small changes in movement produced large changes in the shadows. When the performer approached and passed a corner, shadow walls would be reduced to a line, then rotated and reappeared on an adjacent wall. When the performer reached the opposite wall he pivoted and a shadow wall moved up the staircase and over the audience's heads, creating a floating canopy or tent of light on the ceiling.

Another performer then entered the passageway near the stairway, overlayed her light on the other, and began a slow walk through the passageway. Again, shadow walls appeared, disappeared, and seemed to pivot in space. At the end of her walk she backed out of the piece, and as the shadows began to diminish in size she clicked off her light. Then began a series of improvised and staccatto stills with the flashlights, in which sections of the room were momentarily revealed and then disappeared to blackness. This provided an element of surprise and contrast to the slower and more even beginning. Then I began to bring up the dimmer light, interacting and improvising with the performers by lighting up areas where the flashlight had just faded, and projecting multiple shadows of the performers into the space. The increasing brightness signalled to the performers that they should recede from the space, and by the time they reached the edge of the 'stage' floor the lights were on brightly, for the first time revealing the screens and the entire layout of the space.

The Audience as Performer

The audience was then invited to walk down the stairs and enter the space, and the effect of forty figures and their multiple shadows moving through the space against the huge architectural backdrop was impressive. People wandered through the space examining the construction of the screens, watching their shadows, and then walked out to watch as others moved through the space.

Some people played with the dimmer system, others with flashlights. Of great interest were the multiple viewpoints one could take both from within the space as 'performer' and from above or below as 'audience'. I changed the lighting configuration slightly as people walked, but the situation was basically openended. The installation suggested patterns of movement and possibilities for interaction, but these were left up to the choice of the people moving through the space. The installation invited performance without prescribing set scenarios. Unlike theater, the subject of this performance was the space itself, and when people wandered through they became part of the spatial drama. Rather than being viewed frontally as in a proscenium stage, the performance took place in an expansive and open space which could be viewed from many vantage points. Distinctions between audience and performer, sculpture and theater, blurred as people became both spectators and participants.

FUTURE DIRECTIONS

This project, being so opended and flexible, has many possible extensions and applications. Two directions seem most promising: 1) Development of the performance aspect of the piece with dancers or a theater group, and 2) Construction of a permanent outdoor installation in an urban environment.

Performance

I have described in Section II a performance which devel-

oped out of the nature of the project. Other performances could become much more refined by working with professional dancers, and by planning an integrated script of light changes. Dances could be developed whose gesture and choreography stemmed from the quality and changes of the light itself, and not from an already existing vocabulary of dance movements. Subtle changes in lighting and mood could effect changes in the movement and interaction of the dancers. Dancers carrying lights and moving the screens, even wearing portable screens (Schlemmer's 'ambulatory architecture') could become part of the performance.

The project could also be realized on a more monumental scale and used in a theatrical setting. Screens could be placed on tracks or pulleys and moved together or apart to create complex spaces and patterns of movement; further, translucent screens could be added to act as projection surfaces and to conceal parts of the stage space. Changes in lighting and positioning of the screens could create totally different landscapes on stage, which would suggest changes in the movement and interaction of the performers. In this way, the subject matter could expand, by means of the light, to issues of human interaction.

Outdoor Installation

My primary interest, however, is in environmental sculpture and the possibilities for a permanent outdoor installation in an urban environment are the most exciting to me. The piece could be executed on a more architectural scale and be placed in an open

plaza or public walkway. Ideally, it would be sited in a space through which people naturally walk with enough surrounding room to permit alternate pathways. Shadows would change throughout the day, so that people passing by several times would experience the piece in different moods and configurations. Daytime shadows would be cast primarily on the ground while at night the piece could be lit artificially and cast shadows onto surrounding buildings. Timed sequences of lights could be constantly changing so that the space at night would be as mobile and versatile as during the day.

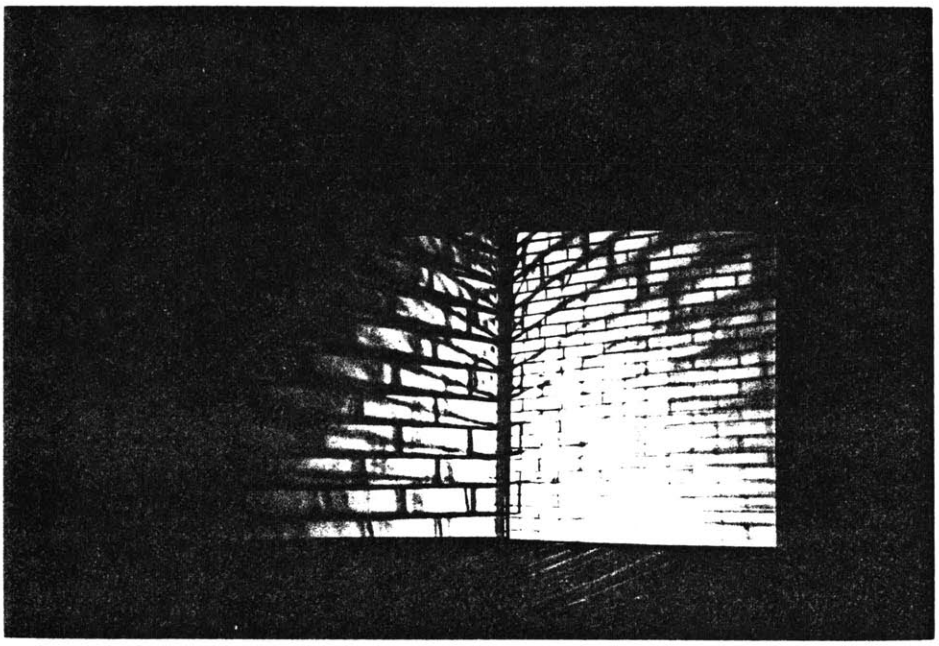
The entire project would totally transform an urban space and make the process of getting from one place to the next an enjoyable and fresh experience. Viewers would be jolted out of their habitual manner of experiencing and perceiving space, architecture, and even their own movement. The piece would break down barriers between people and the coldness of urban architecture by incorporating change and movement into a normally static situation. Moving shadows would visually merge people's movements through a space with architectural patterns of movement, and natural processes (the movement of the sun) would soften the edges of manmade structures.

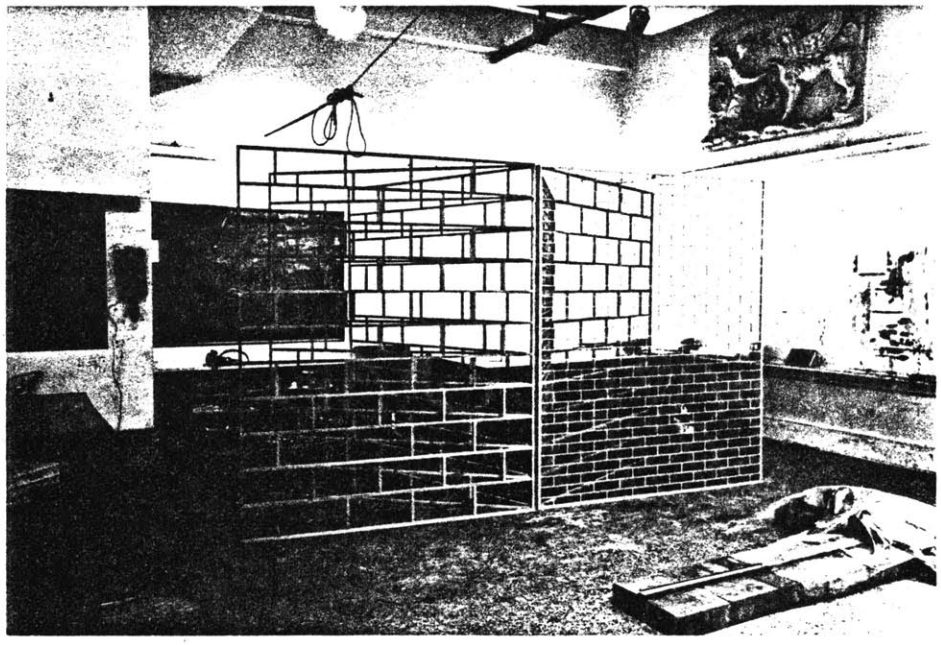
The positioning of the piece in relation to the sun and to surrounding buildings would be crucial. The space should be open enough so that the sun casts shadows during the day, yet there should be building surfaces nearby to be used for light project-

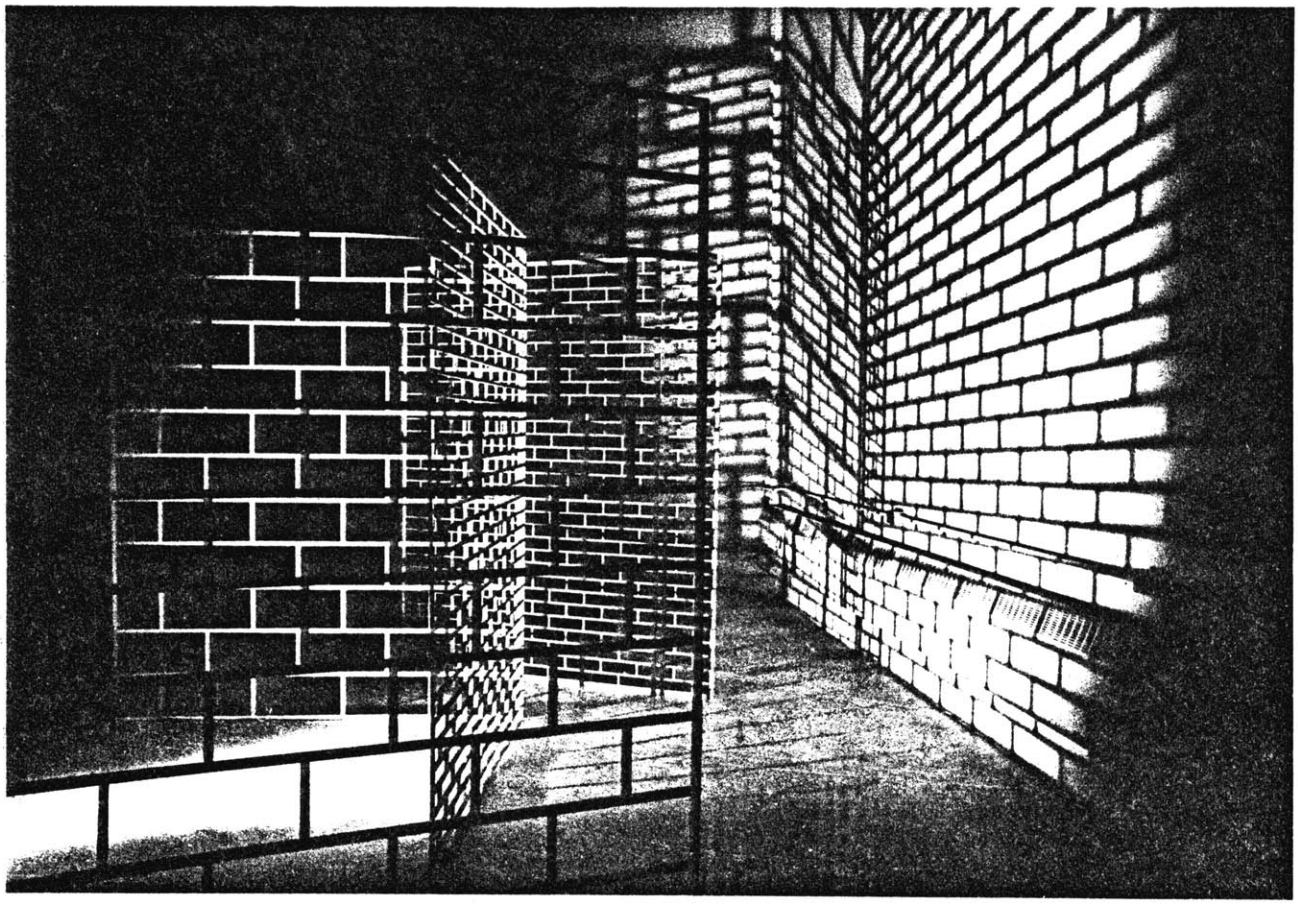
ions. If one of the building surfaces or the ground were brick, then shadow brick would overlay real brick. Similar illusions are created when walking on the brick path around Kresge Auditorium on a sunny day, as reflections of brick from the outside are overlayed on the real bricks inside. A variety of materials could be employed to interact with light, ranging from the flat surface of painted steel to polished stainless steel, glass, or plexiglas.

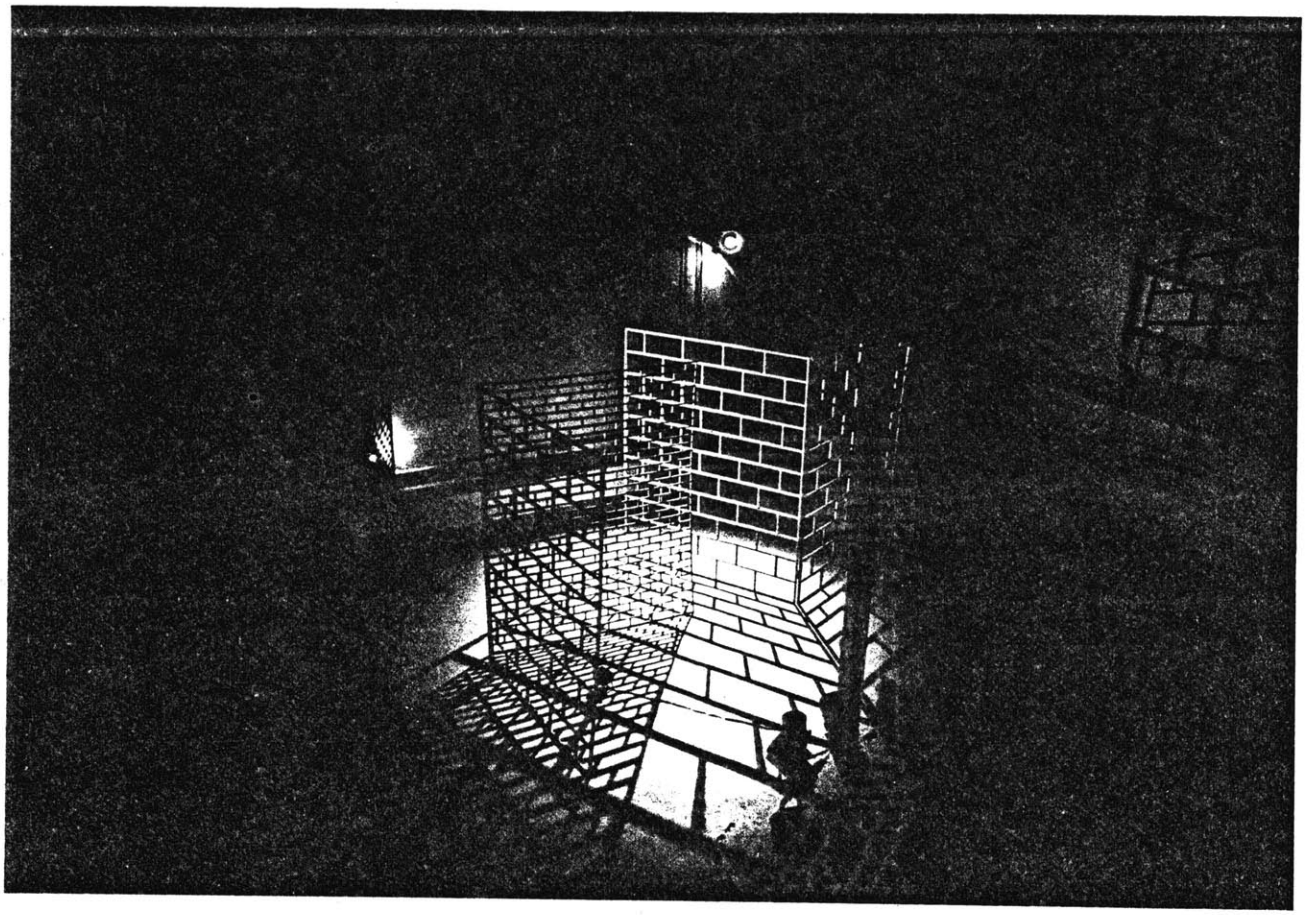
Beyond the framework of this particular project, the principle of light and movement could be incorporated into park and playground design. As in the calendar architecture of Stonehenge and Samrat Yantra (an 18th century giant astronomical experiment in Jaipur, India) forms could be designed and positioned to interact with the sun and change both during the day and seasonally. Changes in light would lead from one space to the next, integrating normally separate pieces into a unified spatial experience. Since changing light would create a fluid and constantly shifting environment, continuous change would be built into a permanent installation.

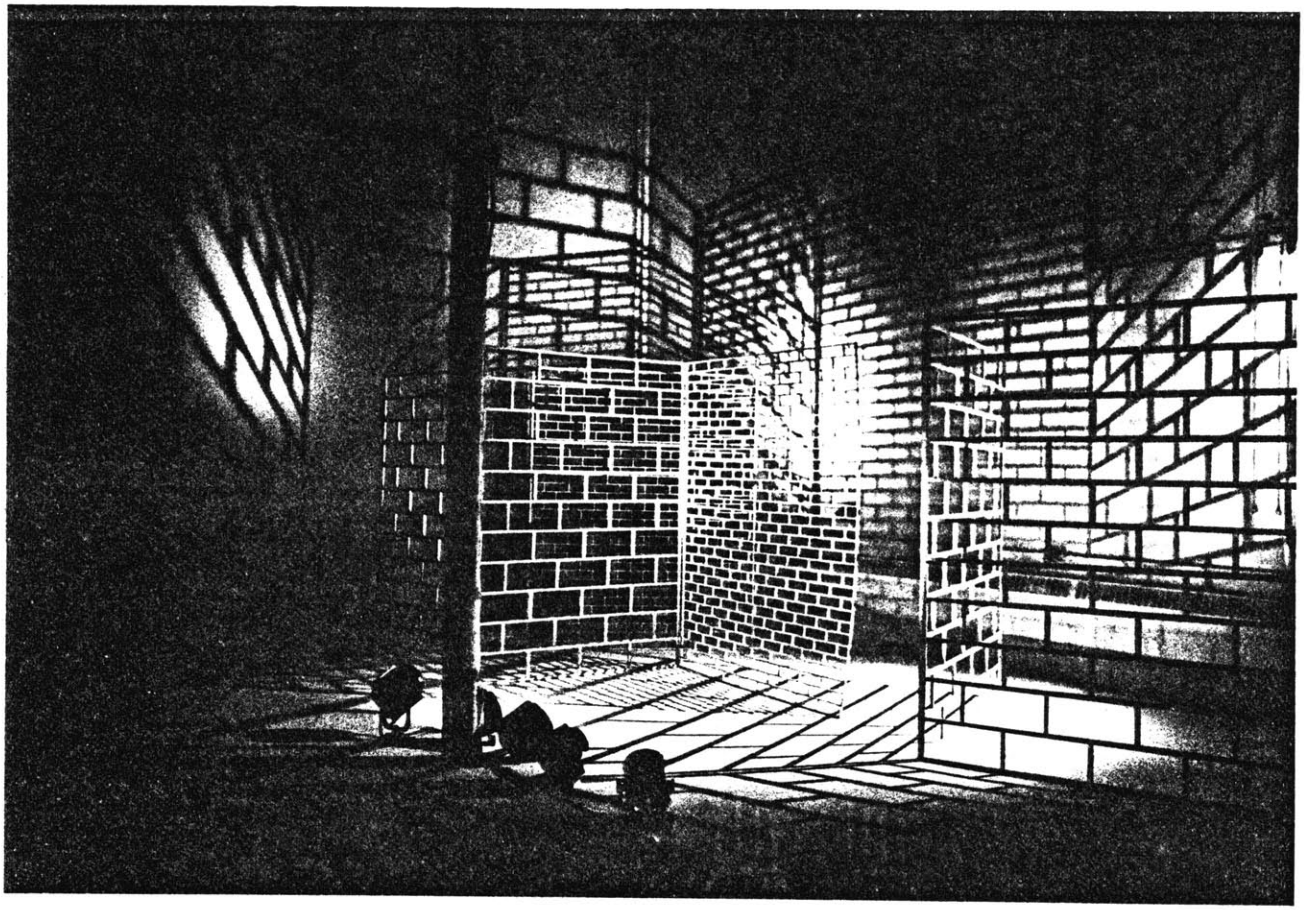
Photographs

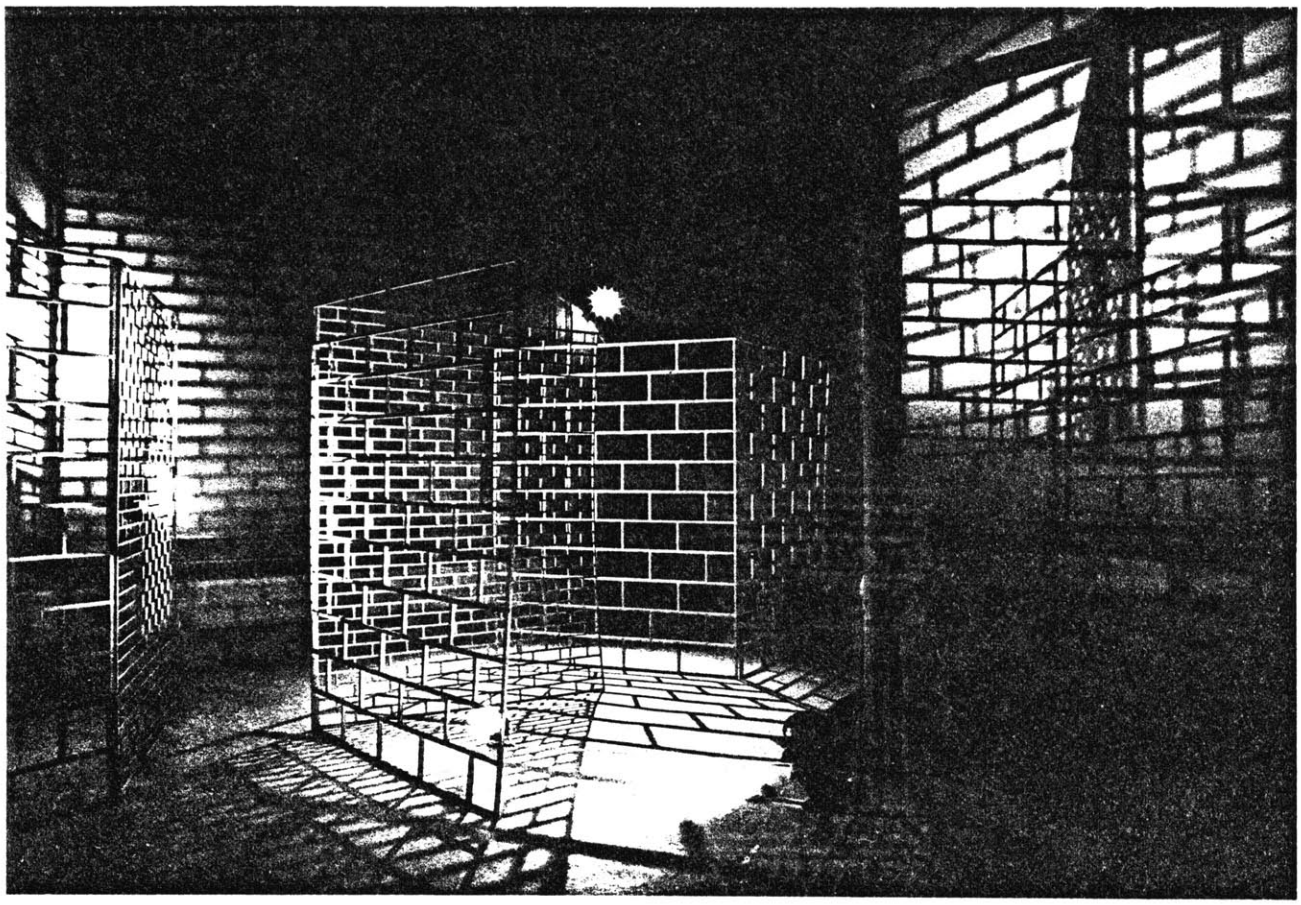


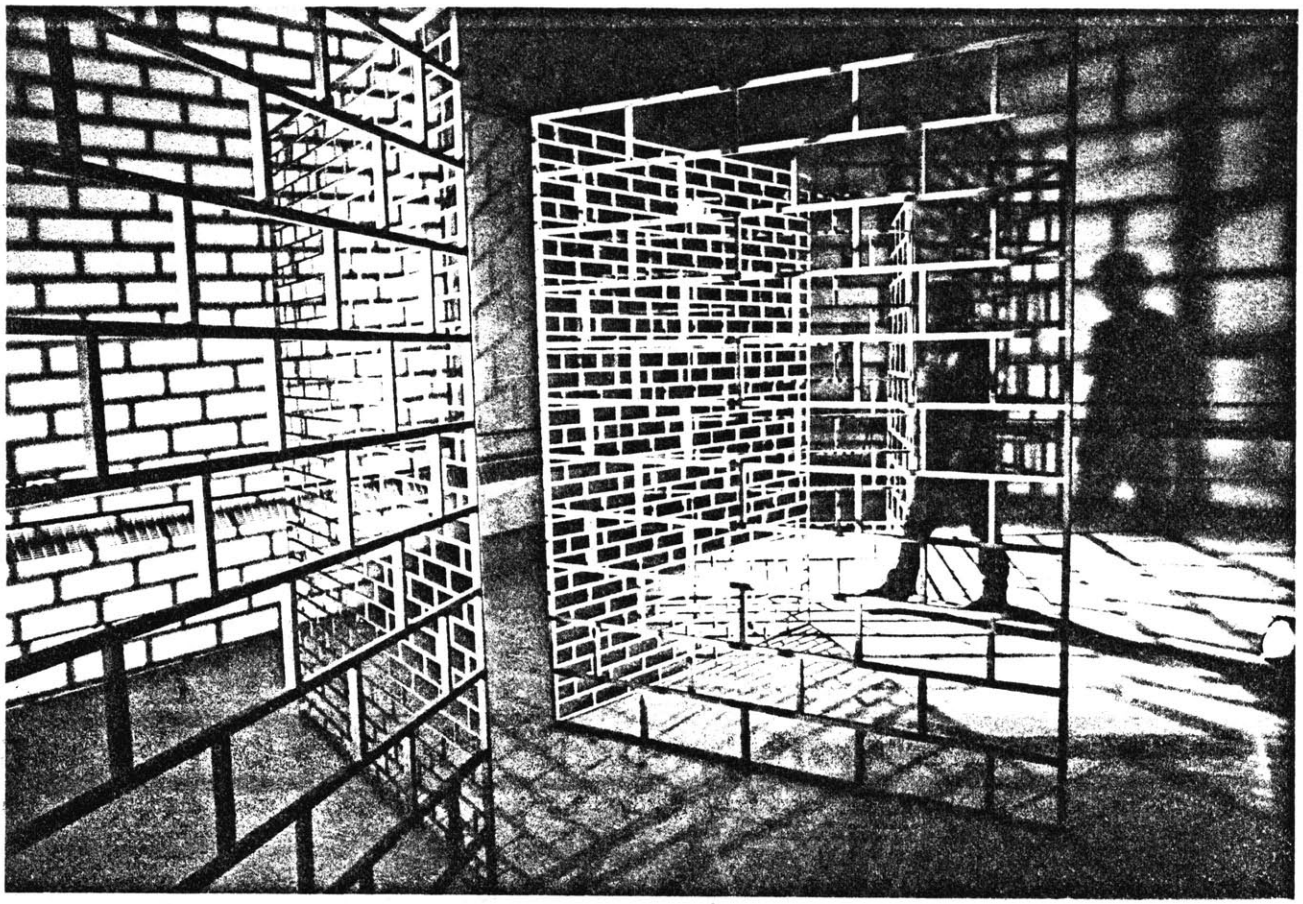


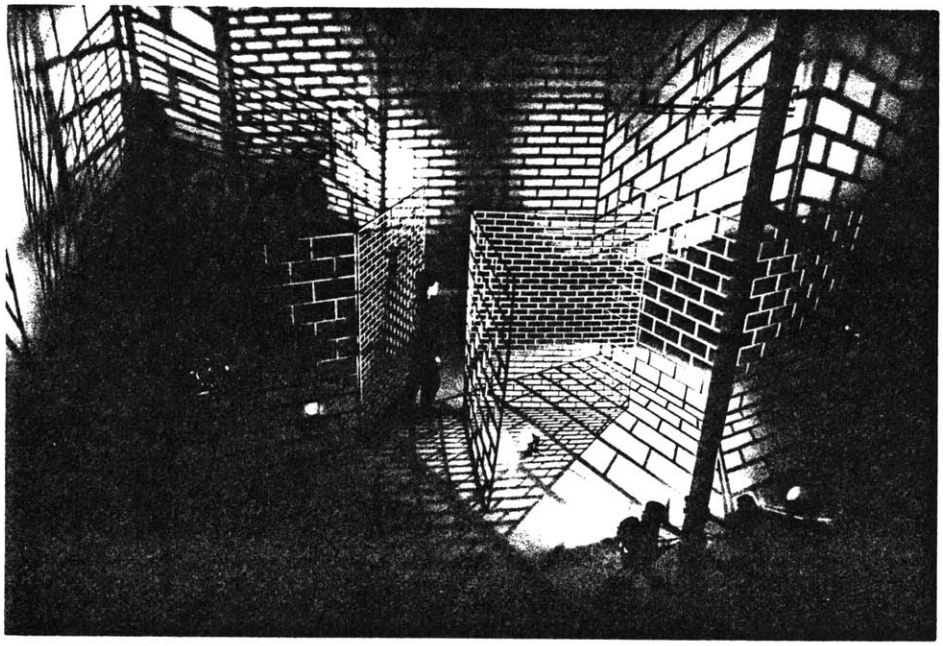


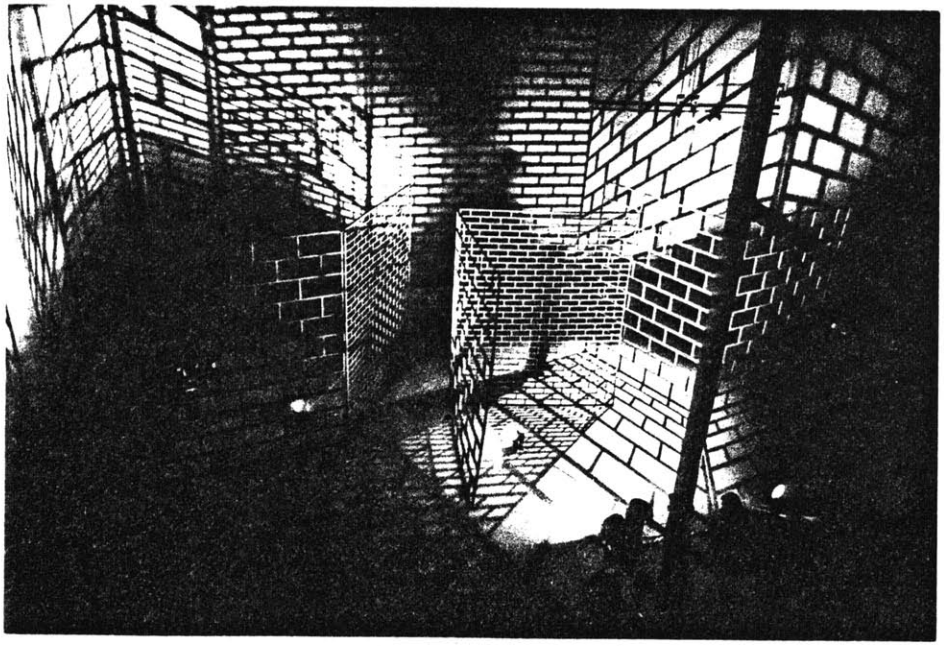


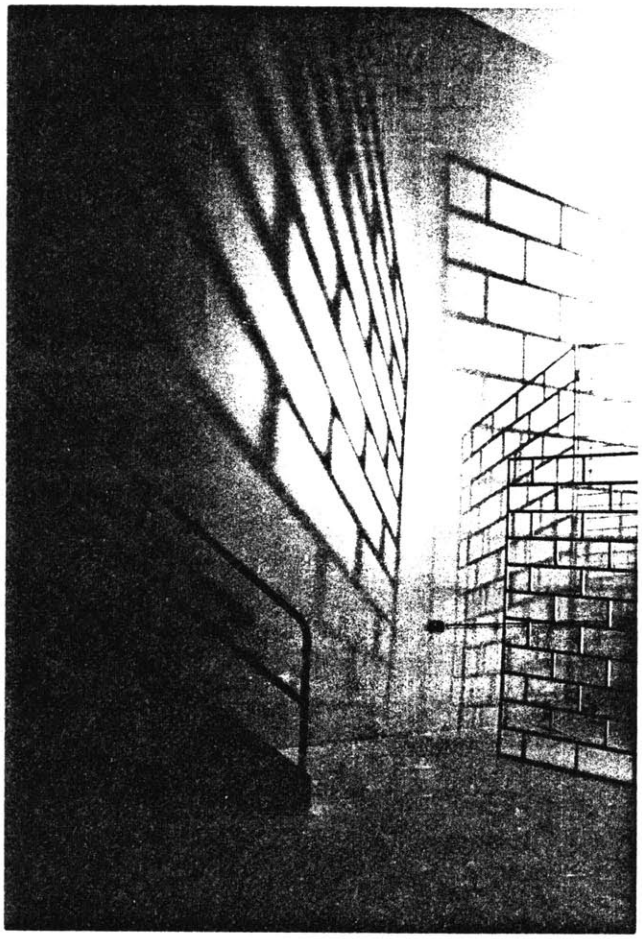


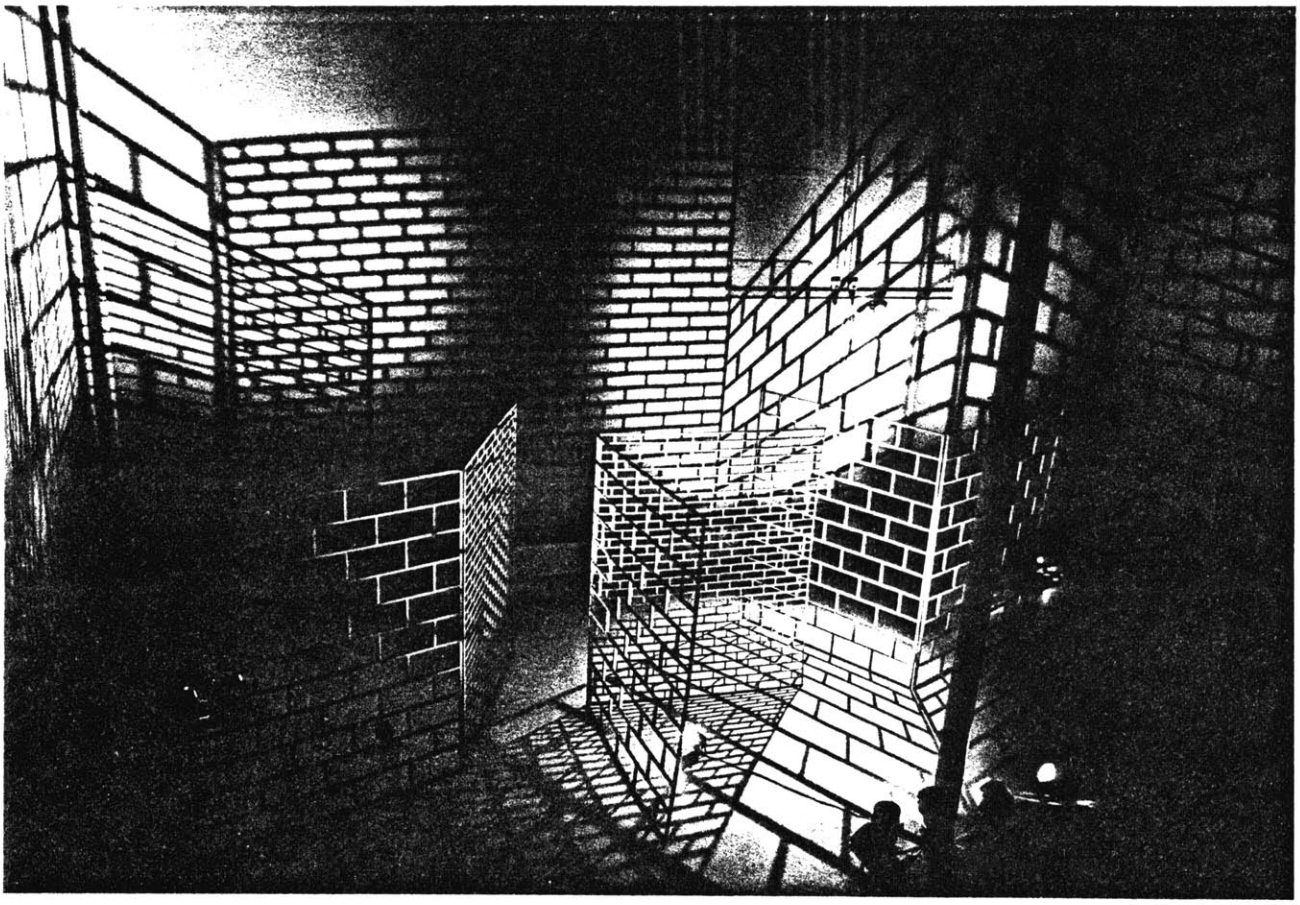


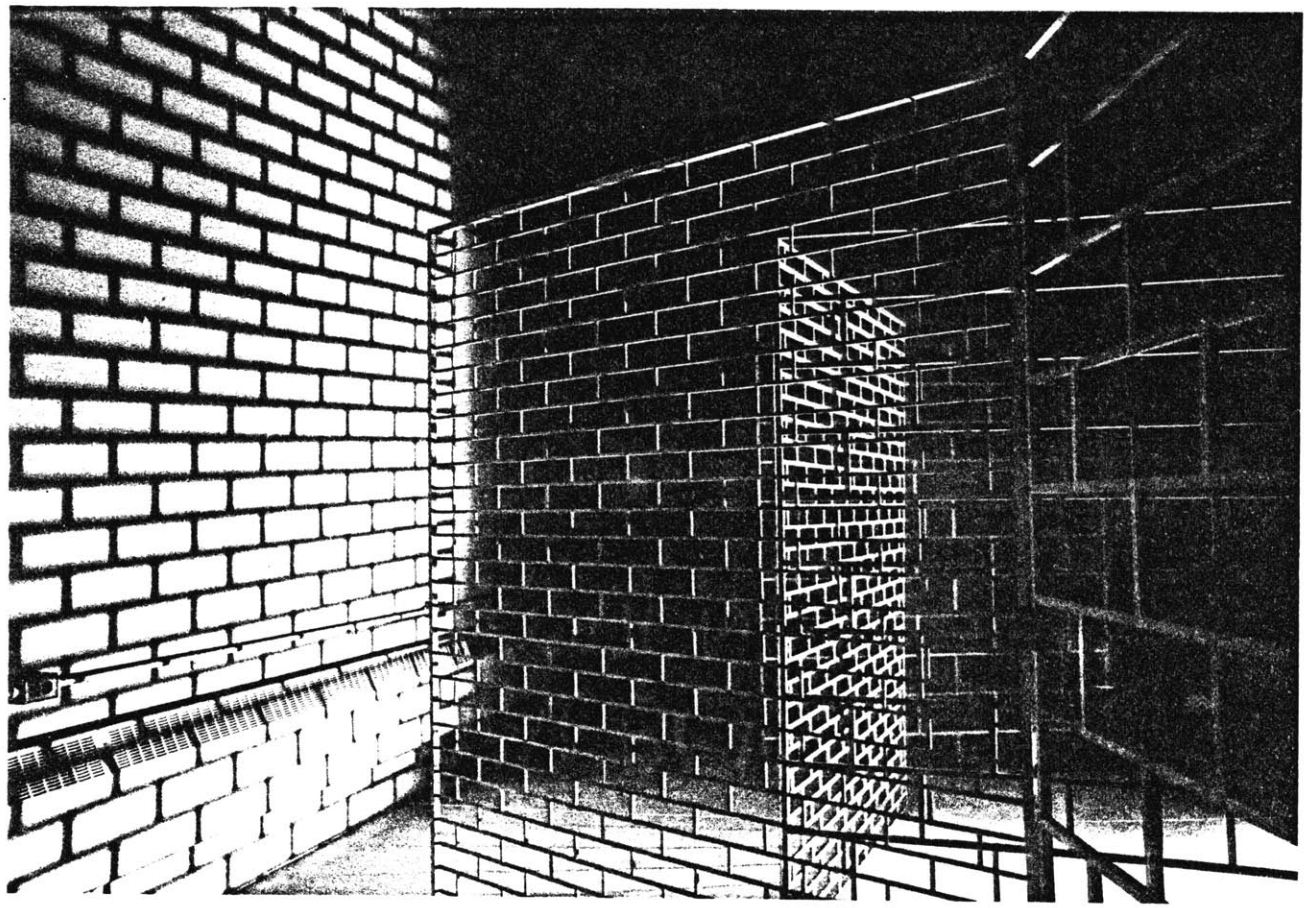


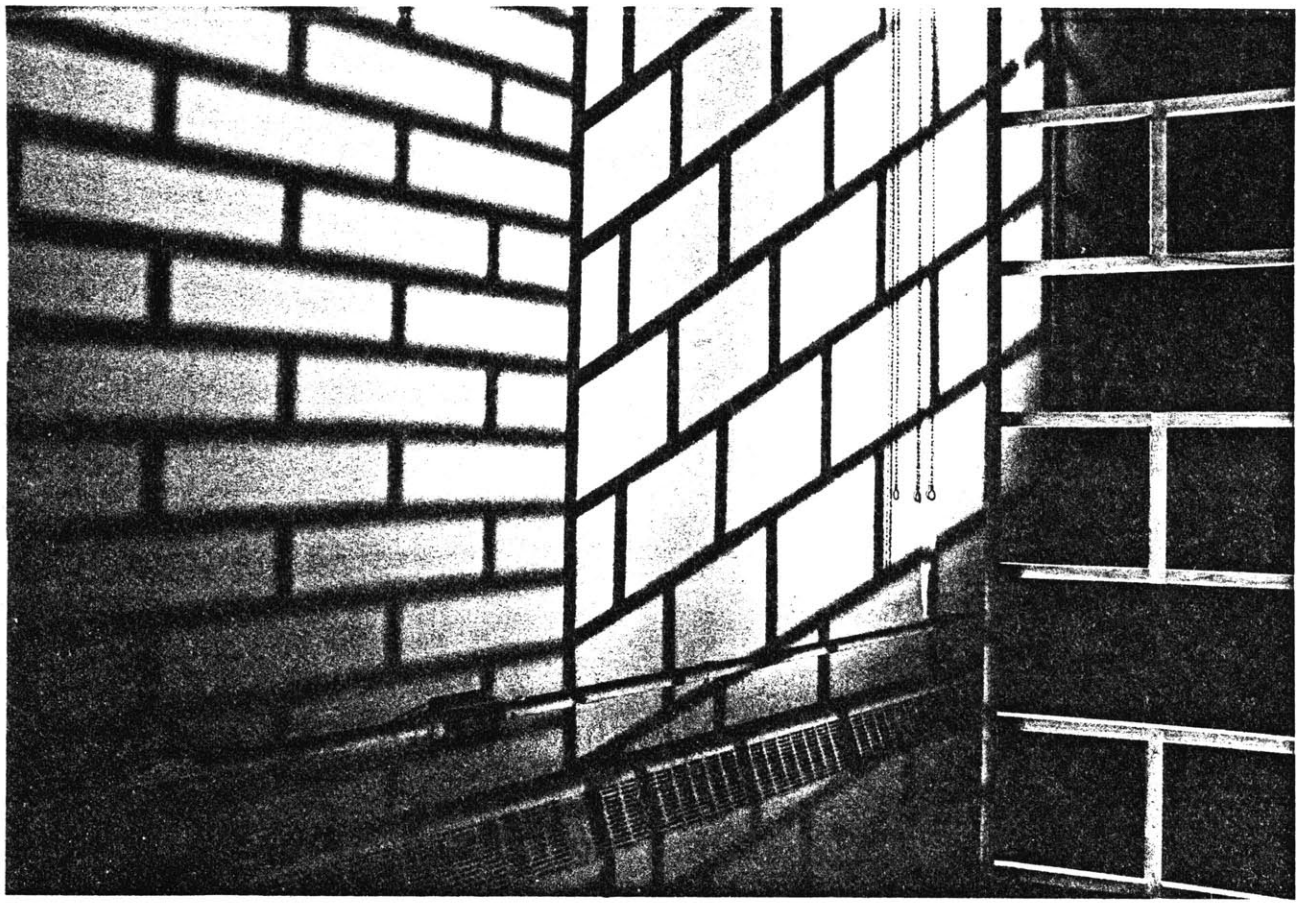


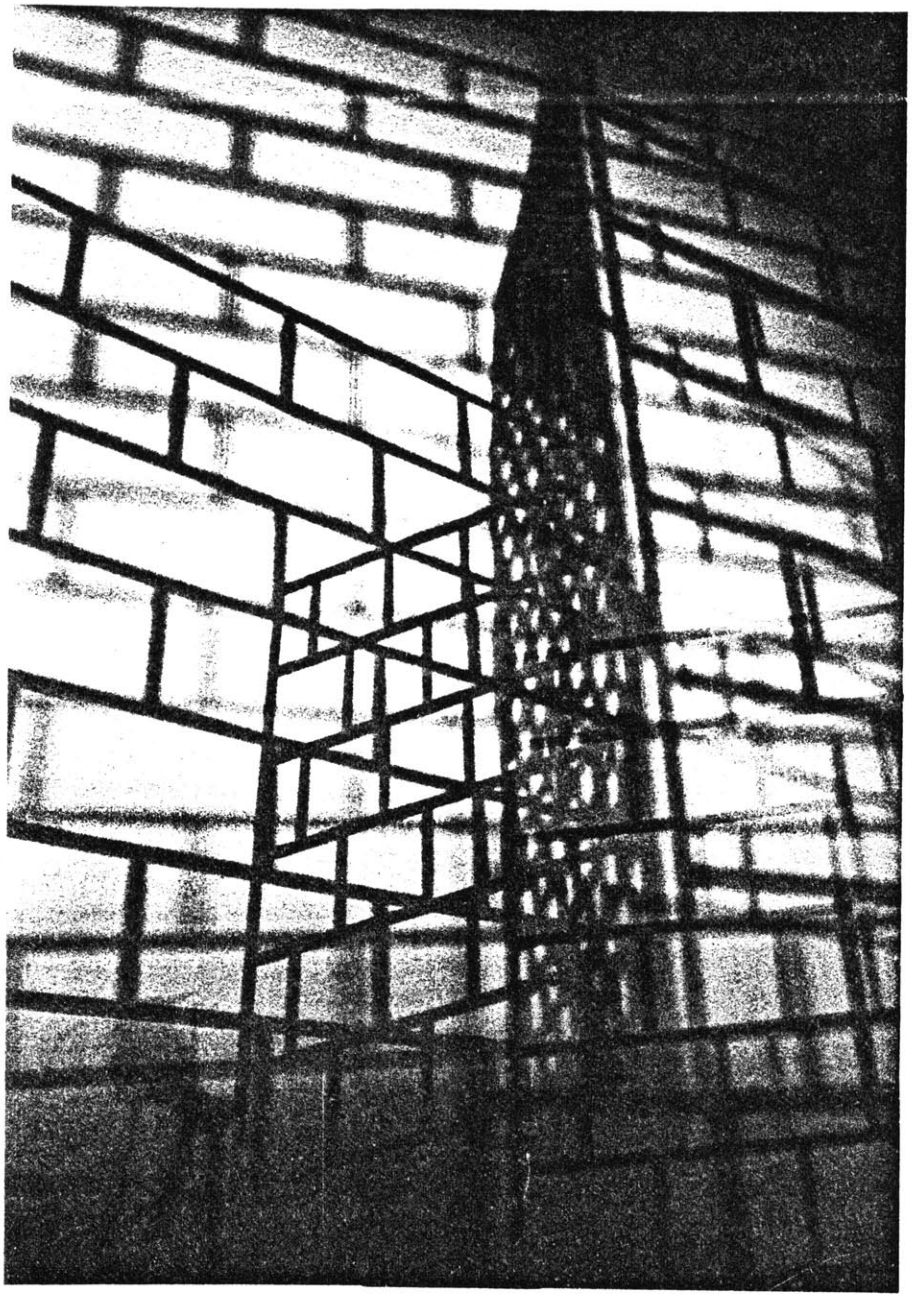


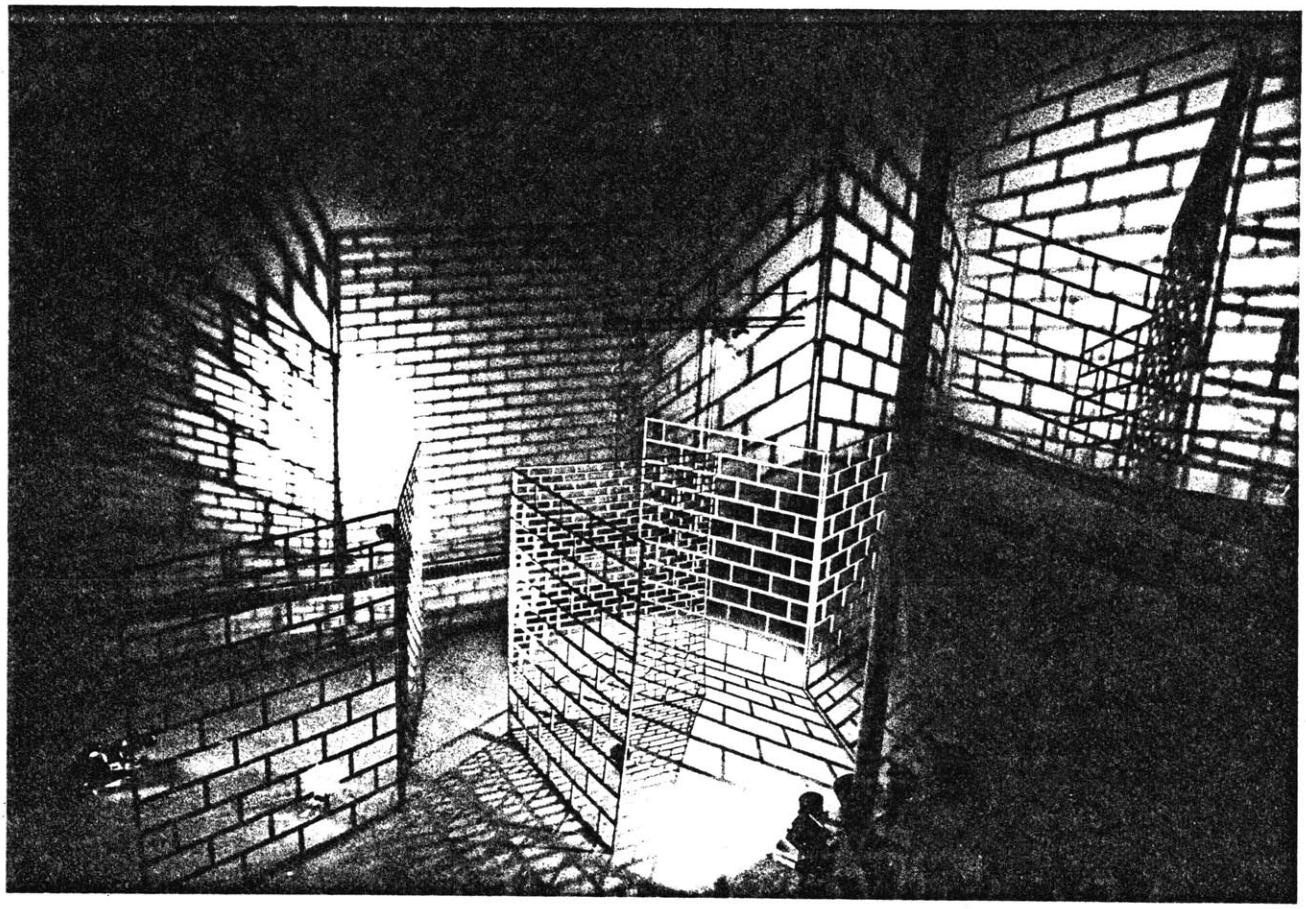












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