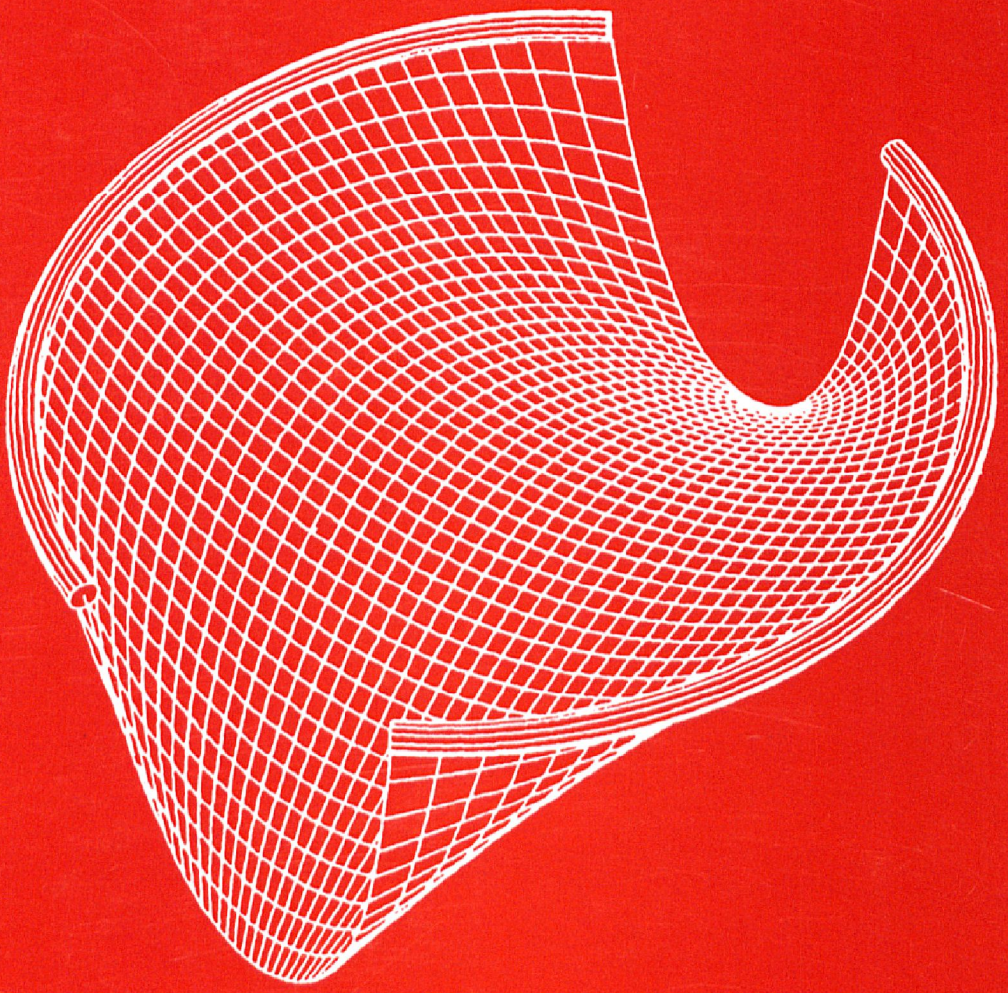
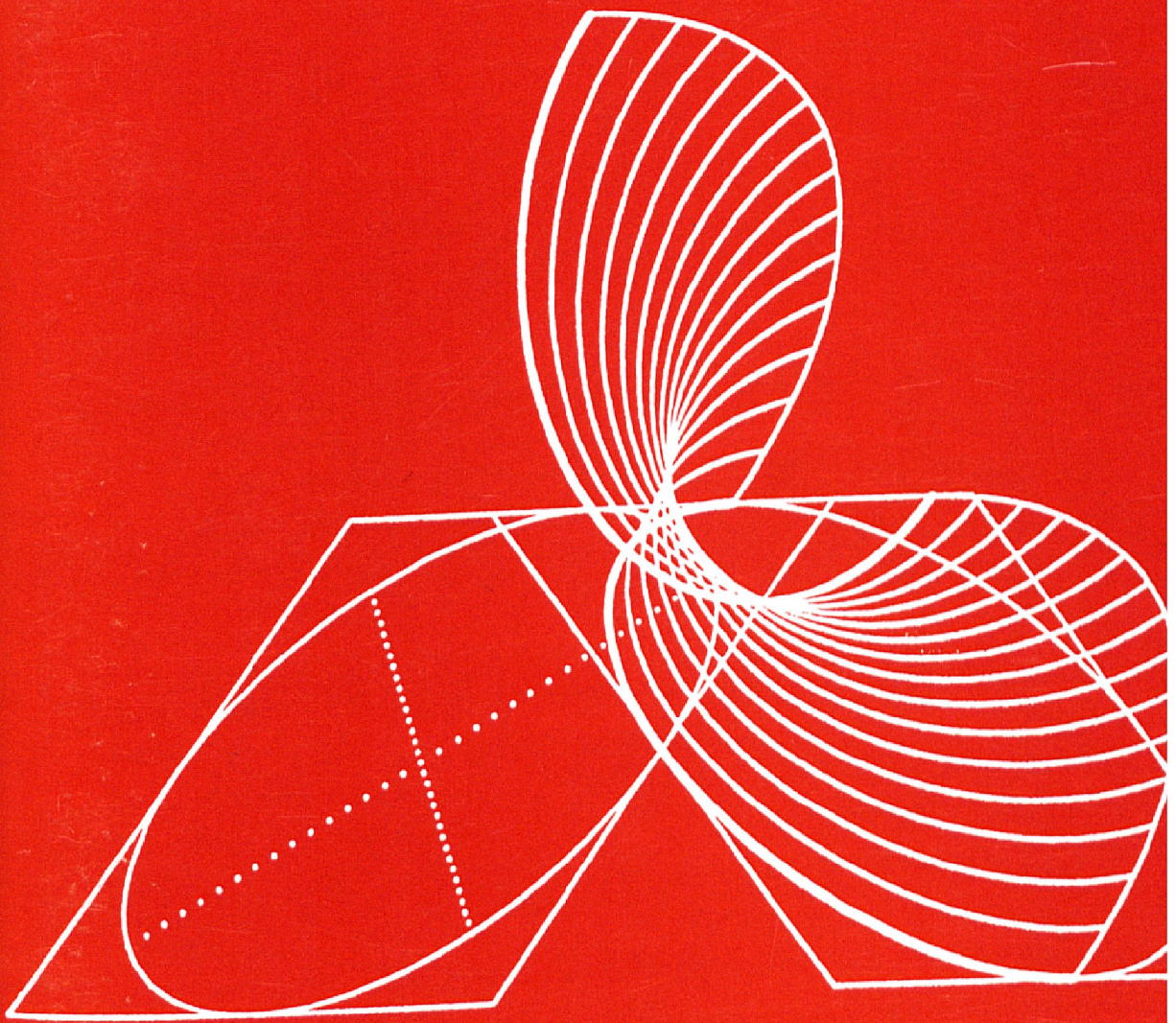


VISUAL ARTS CENTER • NC STATE UNIVERSITY

APRIL 10–JUNE 28, 1997

That seed
That grows into a tree
That gives a fruit



EDUARDO CATALANO

NORTH CAROLINA STATE UNIVERSITY
VISUAL ARTS CENTER

The Visual Arts Center is pleased to host this exhibition of the work of Eduardo Catalano in the Cannon Gallery of the VAC and the South Gallery of the University Student Center. Work in the exhibition has been exhibited at other sites, most recently at the Massachusetts Institute of Technology in Cambridge. Catalano himself assembled the exhibition material and the exhibition guide was prepared by him before the installation could take place here. Therefore there may be some references to the location of materials which differ from that described in the exhibition guide. This difference is a consequence of the constraints of space.

Charlotte V. Brown
Director
Visual Arts Center

INTRODUCTION

The Pantheon of Imperial Rome
The vaulted cathedrals of medieval times
The luminous Crystal Palace of 1851

In each of these, in times far distant from our own, a compelling concept of architecture was vividly revealed. The concept - the unification of space, form and structure as an indivisible design principle - has inspired a number of creative individuals to explore the awakening potential of form-structure integration in twentieth century architecture. Prominent among them is Eduardo Catalano.

For a half century, the Argentine architect, teacher and author has envisioned an architecture of unprecedented innovation and richness. His constructed work includes gravity-defying reinforced concrete structures and thin shells of single and double curvature, springing audaciously from earth. Such structures present convincing demonstrations of scientific elegance: maximum performance (strength and spanning capacity) achieved with minimal effort (of materials and energy). Eduardo Catalano served as head of NCSU's Architecture Department from 1951 to 1956. He describes those five years in the School of Design as the most exciting and fruitful of his long teaching career. The reason, he says, was the presence of a young faculty who created an extraordinary climate of contagious creativity and of the students who came from different regions of the State bringing with them the nobility and freshness of the countryside.

He has designed notable public buildings, visionary urban complexes, and a daring house in Raleigh roofed with a 2-1/4" thin shell of wood. Another North Carolina work, the Governmental Center in Greensboro, he considers one of his most accomplished.

To demonstrate the potential of formal, structural and constructional integration in architecture, this exhibition presents the work of Eduardo Catalano in systematized structural components for building infrastructures. It also illustrates more recent experiments in which multi-directional systems of geometry, structure, circulation and building form are related to natural and topographic features of the landscape.

The most poetic of his landscape designs is his 1989 prize-winning proposal for the National Peace Garden planned for a site on the Potomac River near Washington. It was designed in the form of a gigantic olive branch resting on the ground, sculpturing the earth, and was intended to be seen by airplane passengers entering the nation's capital. He described it as "an extended carpet interwoven with walks and plants, defining accesses, stems and leaves. And springing from the stems, clusters of white flowers will recreate those of the olive tree." Regrettably, this memorable symbol and place of peace was not realized.

He is a severe critic of today's trend-setting architecture. Words like "simplicity", "generosity", and "nobility" come easily to his deeply accented English when he discusses the ideals and works, such as the Pantheon and the Crystal Palace, which claim his passionate allegiance. They apply equally well to his own work.

Eduardo Catalano's creative passions remain undimmed. His recently published *La Constante*, an extended dialogue (in Spanish) on the nature of architecture and other realities, reveals not only the insights of a deeply thoughtful individual but offers, as well, tantalizing visions of a transparent architecture, buoyant and unanticipated, which exploits the most advanced technologies in structural glass systems. These elegant, cathedral-like structures bear eloquent testimony to Eduardo Catalano's lifelong quest for new truth and new freedom.

Robert P. Burns, Professor of Architecture, School of Design

THAT SEED
THAT GROWS INTO A TREE
THAT GIVES A FRUIT

This means the journey between concept, exploration and fruition.

A seed is often found without explanation, carried by the winds of insight.

That seed
That grows into a tree
That gives a fruit
That grows a seed
That …

In this continuous recreation one can see the birth of multiple systems that evoke their first breath in the air of this exhibition.

And such systems are the fruit
that grow seeds
that grow …

For a system is not a frozen form. It is an organic force that recreates itself and seeds other systems in an endless field.

Eduardo Catalano, 1996

That seed
That grows into a tree
That gives a fruit

STRUCTURES OF WARPED SURFACE

GENERAL MOTORS NATIONAL DESIGN COMPETITION • 1945

The seed was planted in the early spring of 1945 at Harvard by Eduardo Catalano, a graduate student of Walter Gropius, and Basil Yurchenco, an undergraduate student of Marcel Breuer. The design received the Second Prize from 914 entries.

The observer will see in this design, as well as in all the work in this exhibition, the presence of a SYSTEM in the generation of an architectural concept. SYSTEMS are organic forces that change in a continuous process of transformation and growth.

• • •

The four sided unit of a warped surface called hyperbolic paraboloid was the system used to generate the ramps of this design. Such a system grew, later, into hundreds of different structures, as exhibited in this room.

THE LONG SEARCH • VARIATIONS ON A SYSTEM

The design of a building is the result of a long search for a system that unifies the two fundamental concepts of architecture: Structure and Space.

They are as indivisible as fire and its light.

In that search one discovers that systems are not frozen forms or rigid concepts but organic forces that recreate themselves and that lead to the discovery of others. At that time, one realizes that the system has transcended the building design from which it was born and that an individual expression can find a source of inspiration in the universal.

An example of such a long search is shown in the Bryan room. All the structures-spaces originate in different geometric combinations of a simple four sided UNIT. It belongs to an infinite warped surface with double curvature that is generated by the displacement of a straight line. Its name is hyperbolic paraboloid.*

* A former student from the School of Design, during the design classes in 1954, called it "hypochondria paranoid". I suspect that she was, instead, referring to me.

VARIATIONS ON A SYSTEM

1 • Long span structures with a minimum number of supports
2 • Structures with horizontal borders and a high central space
3 • Vaulting system
4 • Industrialized aluminum shell • Tests
5 • Precast concrete shell with daylight
6 • Laminated wood shell
7 • Square and hexagonal helices and their spatial variations
8 • Structures looking at the sky
9 • Umbrellas
10 • Transformation of rectangles into circles and ellipses

RALEIGH HOUSE • A SHELL AS A DWELLING, 1954

Translated from the book *La Constante - Diálogos sobre estructura y espacio en arquitectura* by Eduardo Catalano. Published by the University of Buenos Aires Press, 1995.

When Durek showed me a warped surface structure resting on two points our words crossed.

He said —A house is nothing but a relationship between a large roof and the earth.—

My words were —It reminds me of an autumn leaf resting on the ground.—

Our statements complemented each other because while the structure presented a dominant image in the landscape it also looked like a very thin sheet of fir with the color of the autumn leaves surrounding it.

Durek always exalts the structural capacity of each system-form that he designs by means of generous dimensions. He often said that if one wants to emphasize the importance of a concept it must be presented with courage at a large scale.

Which concept did he want to transmit? A shelter or an enormous and protective shade as an extension of the woods? A structure seen in its totality exposing, simultaneously, its harboring exterior and its warm and inviting interior? A low and intimate space controlling the intensity of the regional light and at the same time high, illuminated, open to the surrounding woods?.

To understand the design concept I asked myself —Is the structure defining the space or is the space determining the structural system-form? —

Suddenly the image used by Durek that they represented an inseparable unity, like fire and its light, came to my mind.

I saw that such a metaphor was not a mere abstraction but a physical reality. Did Durek want to exalt the structural purity and honesty in construction that he always mentions as part of the intellectual ethics that every architect must exert?

Then I observed the generous dimensions of the shell.

—The distance between supports is eighty five feet— explained Durek. — In spite of that the shell is only two and a quarter inches thick.—

—So thin! — I said incredulously.

In a few seconds I calculated that the relationship between the thickness and the span was similar to that of my autumn leaf, or 1:600 of its length.

Durek did not explain how it was built but I knew intuitively. Remembering the two geometric systems that generate such a warped surface I assumed that he had combined them. One, based on the displacement of parallel straight lines not in the same plane, was ideal for building a simple linear and warped formwork. The other, containing parabolic curves in both directions, made it possible to cross the formwork with long strips of fir in a diagonal direction.

By these means the concave and convex double curvature with its spatial mystery and structural rigidity was defined.

While Durek remained silent I mentally walked under the autumn leaf. I observed the interior, its spatial continuity and the sensuality of its curved surface, the marked difference between the low corners, touching the ground and the high one like an extension of the surrounding foliage. I also noted the depth and length of its large overhangs springing from two hinged supports. The total transparency of its continuous glass walls made me feel like a continuum of the natural environment. And then, under the autumn leaf, I heard the echo of his words: "A house is nothing but a relationship between a large roof and the earth ... a house is nothing but the relationship between a large roof and the earth..."

> *"It is refreshing to see that the shelter, which is the most important element in domestic architecture, has been so imaginatively and skillfully treated as in this house by Eduardo Catalano."*
>
> Frank Lloyd Wright in a letter to House and Home Magazine, August 1956, commenting on the Raleigh House

STUDY MODEL FOR THE RALEIGH HOUSE • 1953

The study model of a square unit of a warped surface known as a hyperbolic paraboloid was made in Raleigh, North Carolina in 1953 by the architect. The final structure was built with three layers of tongue and groove Douglas Fir, 4" x 3/4" x 16'-0". The strips of the top and bottom layers, installed diagonally, follow the direction of the forces of compression, from low point to low point of the supports. The middle layer follows the direction of the tensile forces, from high point to high point. All the curves are parabolas but the surface contains infinite straight lines parallel to its edges.

This structure was used for the construction of the architect's house in 1954. Its cantilevered borders have a length of 60'-0" and the span between its two low supports is 85'-0". The shell has a uniform thickness of 2-1/4".

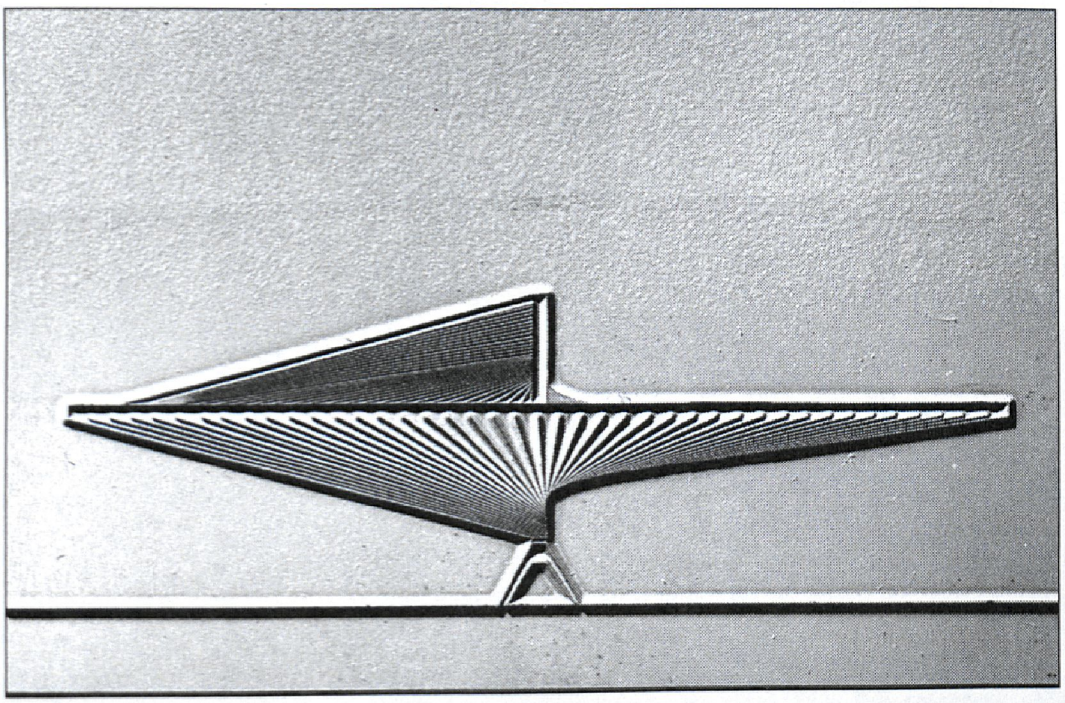
• • •

In the fall of 1954 the area witnessed one of the strongest hurricanes it had ever faced. The morning after I went to the site to see if there was any damage. There was none. I was surprised because the pressure of the wind on the structure was compounded by the uplift from below and the tangential suction from above. It should have flown like a leaf or a kite.

The following day a very young man came to deliver rolls of fiberglass sheeting for use in roofing the shell. He saw the twisted roof, opened his eyes wide and, as if trying to comfort me, placed one hand on my shoulder, saying: —Oh boy! You really got it!...—

A SQUARE HELIX AND A TRIANGULAR WINDOW • 1961

This structure is developed by a system of the simultaneous rotation and translation of a straight line around and along a vertical axes and a horizontal square edge. The first and last generatrixes overlap on a vertical plane, thus creating a triangular window. This can occur either at the diagonal of the helix or at the center of one side.



STRUCTURAL AND SPATIAL ALPHABET FOR A SQUARE HELIX • 1961-1995

A twenty six letter alphabet developed by organizing thirty six square helixes in different patterns which follow any of the pairs of helixes, as shown. Triangular windows change position. In the letter placed at the center of the alphabet the windows are shown, unlike all the others, with heavier lines, related to the columns. A similar alphabet can be created by using hexagonal helixes with two windows. Three variations are shown with different window orientation.

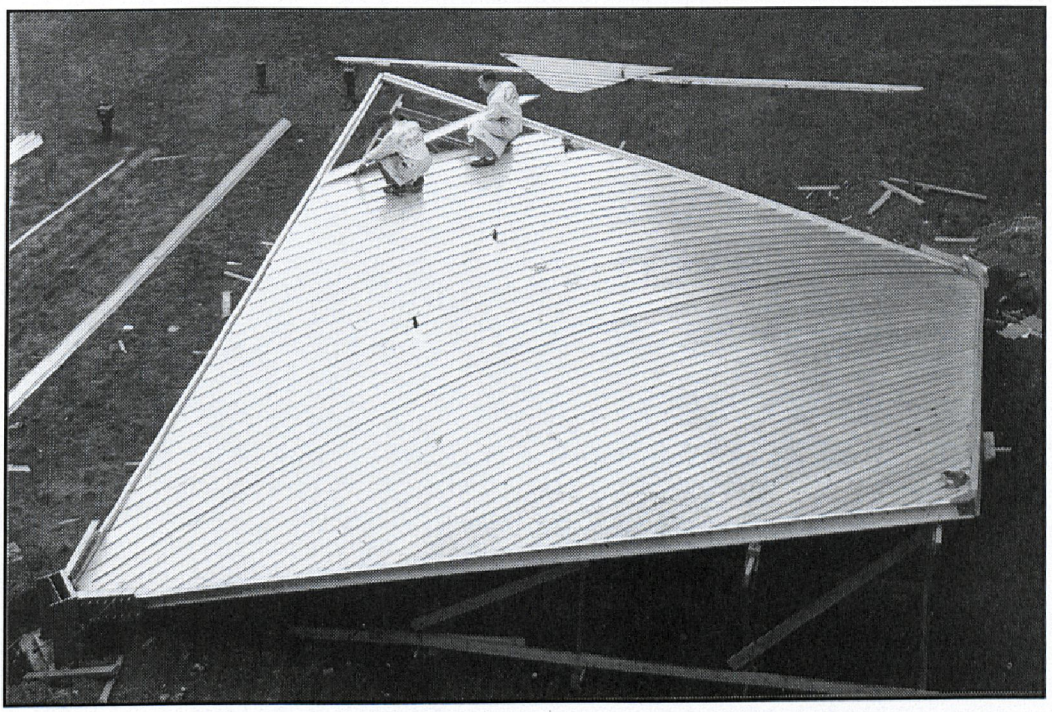
• • •

An unreadable letter was also developed as an expression of CHAOS. The intention was to show that CHAOS can be expressed as an extreme of visual disintegration within the realm of SYSTEMS and of RATIONAL STRUCTURAL BEHAVIOR.

INDUSTRIALIZED ALUMINUM SHELL • 1957

with the collaboration of Reynolds Aluminum Co., Virginia

Test model of a double curved structural system built with extruded aluminum strips during its construction in one of the courts of MIT. See, in section, the nesting borders of the strips used to reestablish the continuity of the forces of tension, interrupted by the joints. A second test model was built, indoors, for structural testing. The span was 25 feet, the maximum length available at that time based on the current extrusion technology. The thickness was 1.5 mm.



FROM RALEIGH TO NEW YORK TO HANOVER TO SARAJEVO TO . . .

Route followed by one of the hundred explorations of geometry, structure and space that preceded the design of the Raleigh House. From Sarajevo, where it was used for a large poster for an architectural exhibit, it became a world traveler.

LIKE THE WAVES OF THE SEA • 1954

Eighteen hyperbolic paraboloids are grouped around a high space.

QUARTIERI SPAGNOLI, NAPLES, ITALY • 1986

AN URBAN PROPOSAL

In 1986, to celebrate the 50th anniversary of its foundation, the School of Architecture in the City of Naples, Italy, invited eleven Italian architects and ten from Europe and the United States to submit an urban proposal for the redevelopment of different sectors of the City.

Quartieri Spagnoli was one of them. It is a much decayed, unlivable community of hundreds of small, independent stone dwellings, four stories high. They were built by the Spanish army to house the troops that conquered the south of Italy in the 16th century.

Quartieri Spagnoli is not a place to live, or to die.

GENERAL DESIGN BACKGROUND

The common approach of rebuilding cities building by building, randomly and by means of architectural surgery and organ transplants will no longer apply. The needs of the coming age are too different from those of the present. Even more so when these have preserved the habits of the past.

There is no doubt that advances in architecture and planning have always been far behind those of science and technology. The past is too ingrained in us. Also, creative research in architecture and planning is foreign to our traditions, minds and systems of education. We just built with whatever materials and technology industry provides to us.

In the meantime science and technology move forward at an ever increasing speed.

A revolution in the genetic sciences will require a revision or the elimination of the buildings we build for their use. It will lead to a reevaluation of function, size and relationship with other activities.

A revolution in the science of cybernetics will require a reevaluation of the location and functions of the buildings we build as well as their relationship to seemingly unrelated ones.

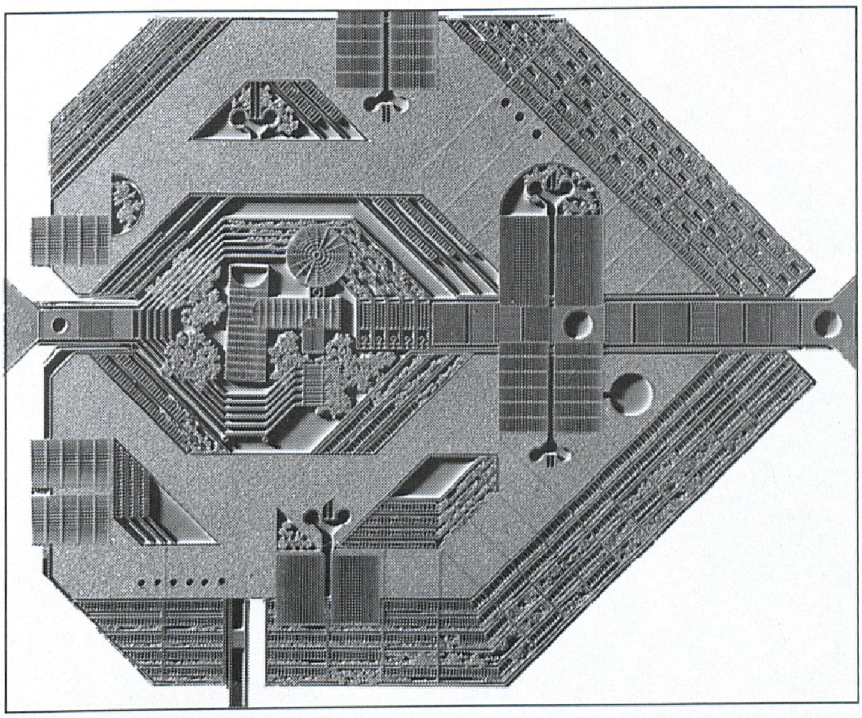
A revolution in industry will replace the hands and machines of workers with minds and instruments. The noisy will become quiet, the dirty clean, the polluted pure, the heavy light, the isolated integrated, the far away unified.

As a result many individual buildings will become integrated into multifunctional ones. A new challenge for architects will be to relate today's disparate activities into an architectural organism full of life.

THEN EVERYTHING WILL BE AT HAND.

Urban densities will increase, as will the quality of life. The automobile, or its replacement, will perform a limited urban role. THE PEDESTRIAN WILL RECOVER THE RIGHT TO THE GROUND transformed into a continuous social space.

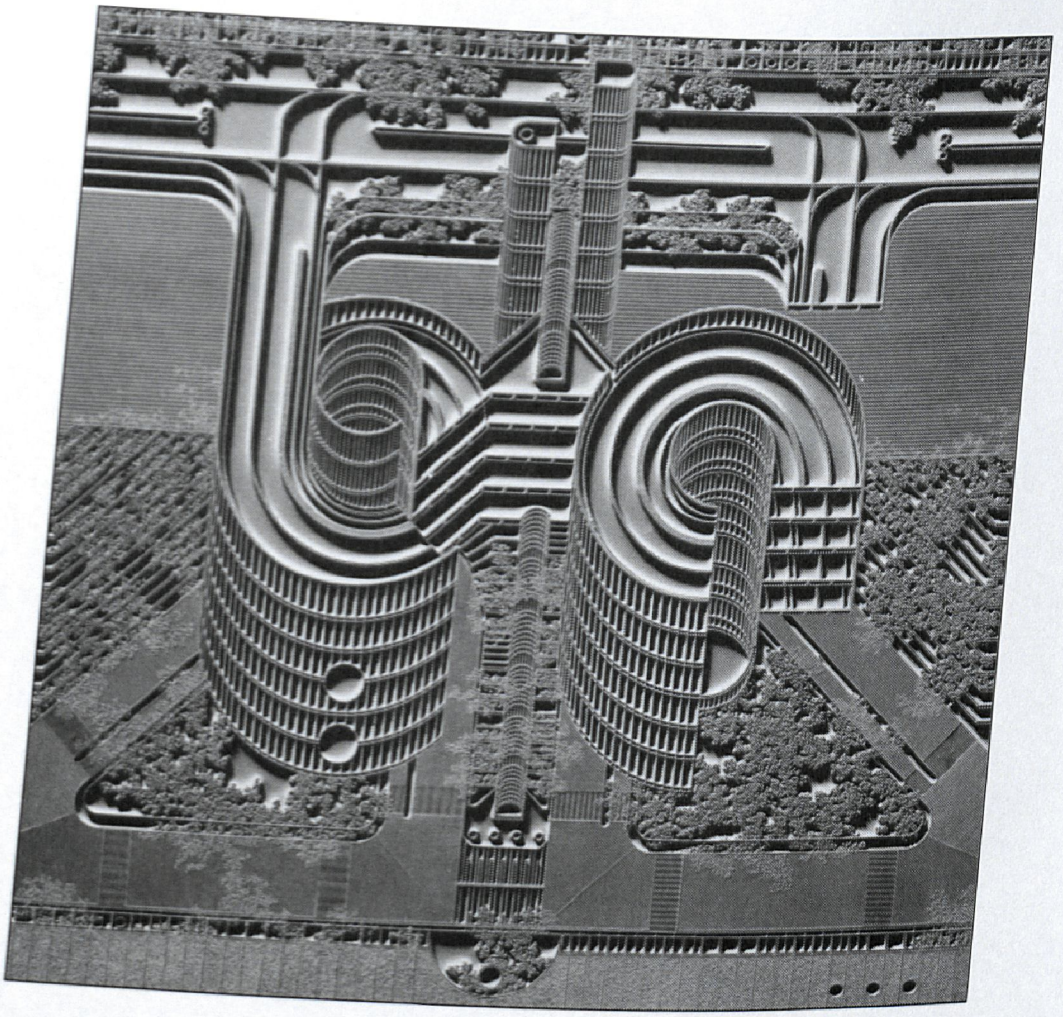
AND NATURE WILL RECOVER THE RIGHT TO THE EARTH, no longer seen as a token recognition in cities of asphalt, concrete and bricks but as a primary architectural material. Then our buildings will become part of the systems of the earth



HOW THE URBAN PROPOSAL REFLECTS THESE PREMISES

- Parcels are unified. Fourteen multifunctional buildings become flexible systems that allow for interior transformation and growth. Infrastructures for services are exposed to allow for change. Vehicular circulation take place below the pedestrian level which is related to landscaping and daylight Housing is at the periphery of the buildings with terraces for gardening and outdoor living. All other activities take place in interior spaces which are lit by means of generous atria. The roofs, because of their large dimensions, perform as green carpets with multiple uses, thus returning to the site the land that the buildings have taken away.
- Pedestrian circulation is multidirectional across buildings and through shopping and social spaces and is protected from the weather.
- Multifunctional buildings as minicities: Work, education, health, entertainment, sports, commercial, Public services, industrial, parking.

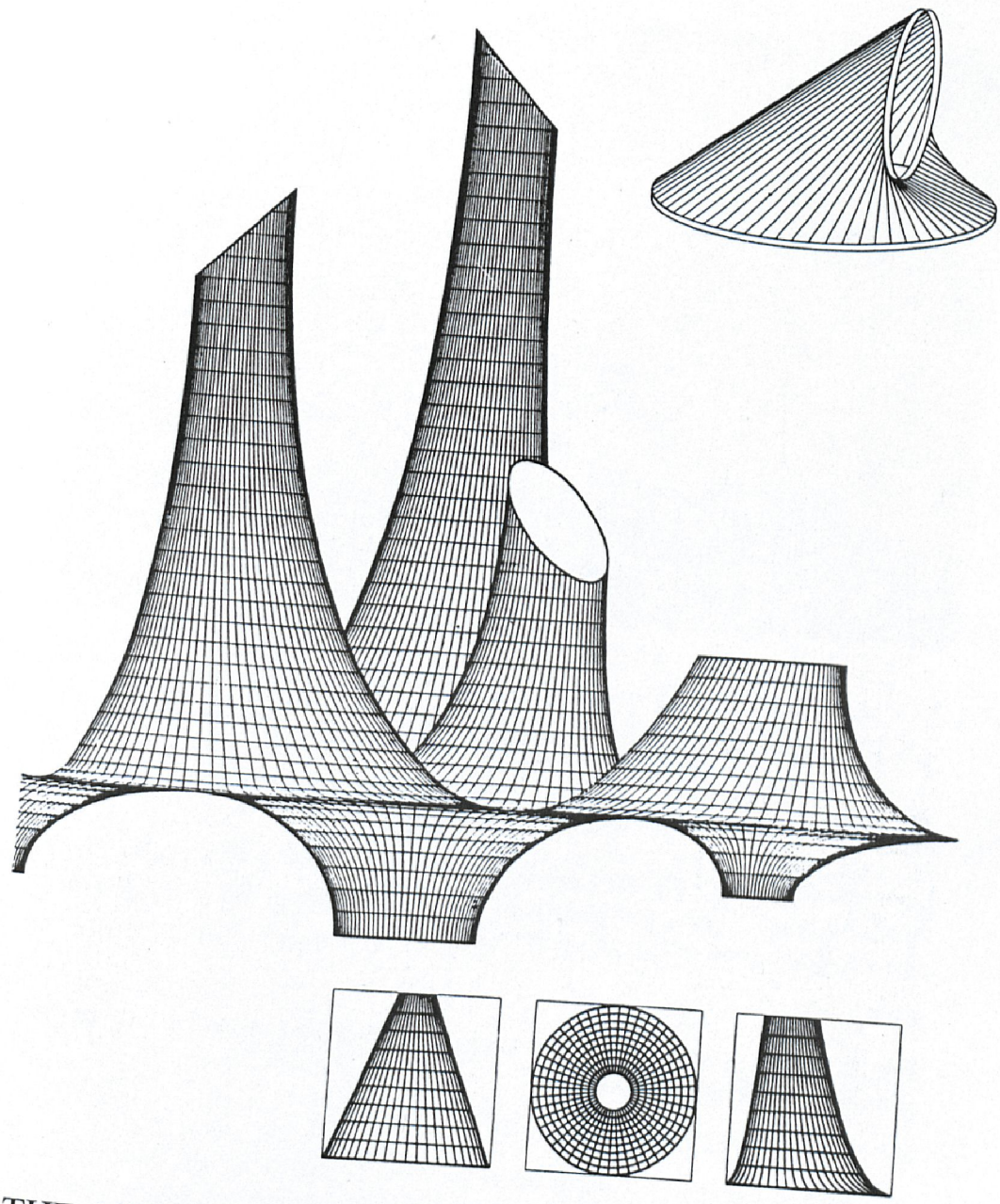
In Quartieri Spagnoli nine churches have been preserved, some within plazas, others as part of large courts contained by the large buildings. The main church, "La Chiesa Majore de Montecalvario", with its gardens, becomes the focus of the new community.



Adrian Catalano, Cambridge, MA

TWO DOUBLE RAMPS

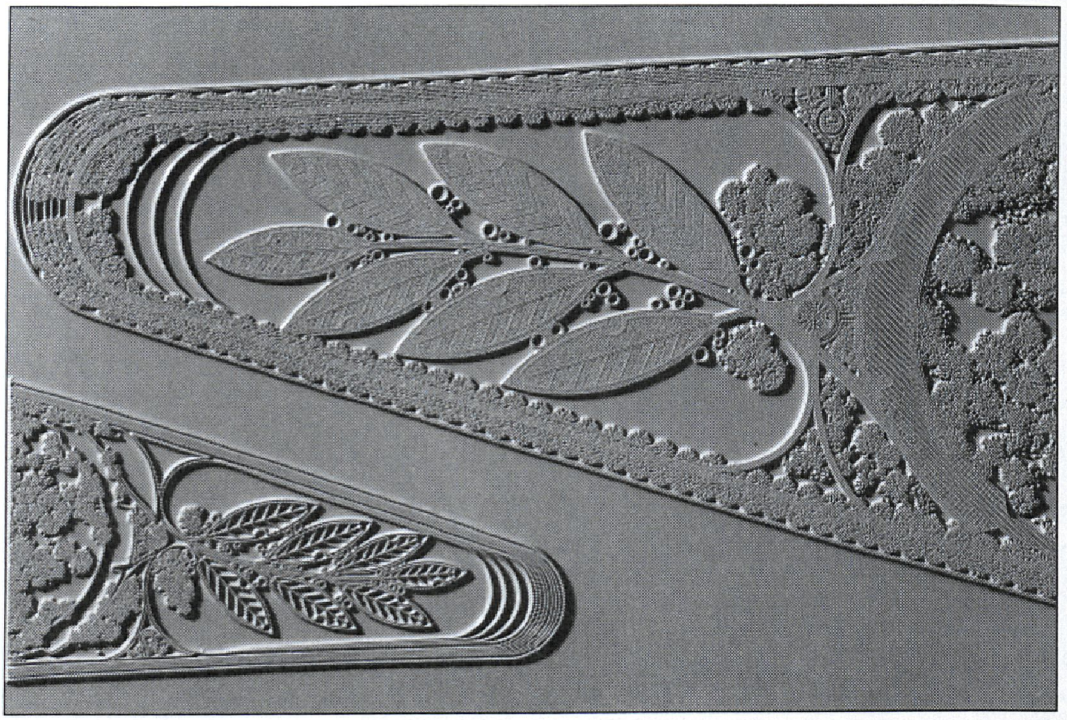
Two heavily traveled roads run along the north and the south borders of the 120 acre site known as Quartieri Spagnoli. The one at the north, above, called Via Vittorio Emanuele, is unreachable since it is ninety feet above the site. Simple ramps with a slope of 5% would require a length of 1,800 feet, thus placing their bottom access outside the boundaries of Quartieri Spagnoli. The design proposes two sets of helicoidal ramps with a generous turning radius and several lanes of traffic, including the traditional motorcycle "Lambreta".



THE ORIGIN OF FORMS

THE INNOCENT BUT PROVOKING CONE • 1994

A truncated cone is a geometric species that belongs to the kingdom of surfaces of revolution. Such a species, since it is a system, has multiple three dimensional variations. Two extreme examples are shown in the structure with a vertical skylight, above, and in the elliptical functions shown along side.



NATIONAL PEACE GARDEN, WASHINGTON, DC

FIRST PRIZE • NATIONAL DESIGN COMPETITION

Location: Potomac Park, a peninsula located south of the Jefferson Memorial. Area: 12 acres. The competition was open to landscape architects, architects and artists. Number of submissions: 936.

AT RIGHT:

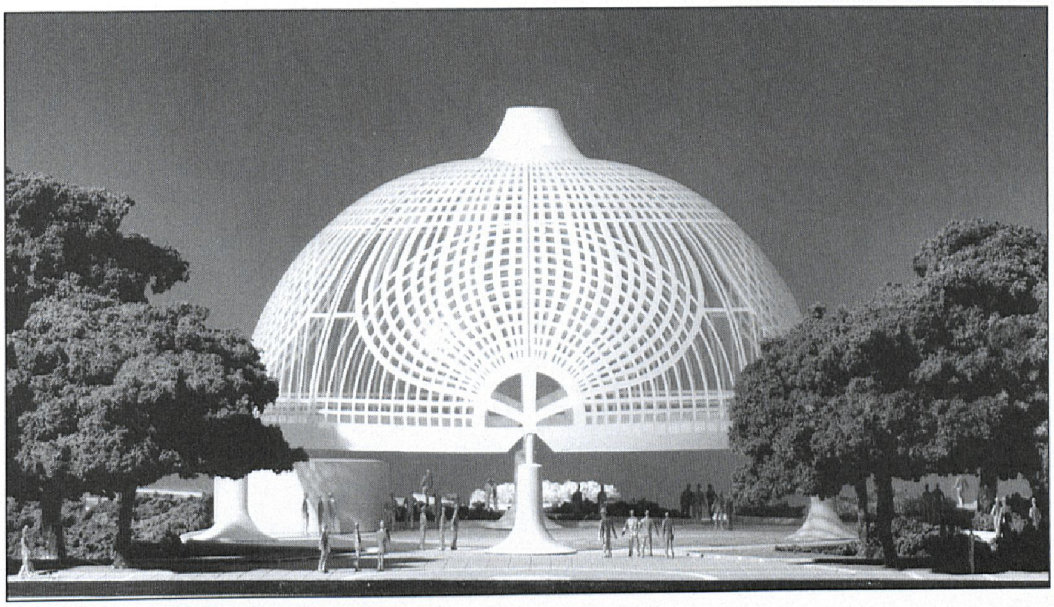
Simple model showing the seven leaves of the olive branch, resting on the ground, sculpturing the earth.

Nature on Nature. Green on green.

The design was the only submission presented in BLACK and WHITE and with no perspective, titles or descriptions. Humbleness and silence became more meaningful than appearance and words.

"The National Peace Garden combines a classical idea with truly innovative landscape architecture. It is a landmark statement that will have global influence."

Fay Jones, F.A.I.A., Design Competition Juror and 1990 AIA Gold Medal Winner



MODEL • GARDEN ENTRANCE

The entrance is defined by an eighty-foot diameter dome built as lattice work, supported at four points.

MODEL • SEATING AREAS

Shaded by trees, the theme of the four white petals of the olive tree is used for the structure of the dome, and is also used to organize eight clusters of four benches each. They are located at the points where the stems spring from the main olive branch which serves as the spinal circulation of the Garden.

SPATIAL TRANSFORMATION • GEOMETRY OF THE DOME

The image of the flower was used to conceive the geometry of the lattice dome that serves as entrance to the Peace Garden.

The structural curves, resembling the grooves of each petal, follow the direction of the isostatic lines from the crown to each support. These lines reflect the path that best resists the forces developed within the structure by impinging loads.

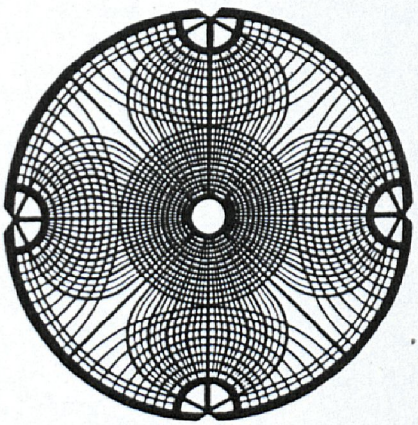
Symbolism, pure geometry and the expression of a physical truth are present in the dome. Its organic character is a metaphor for the surrounding trees. A metaphor that relates to their shape, scale and suspended foliage.

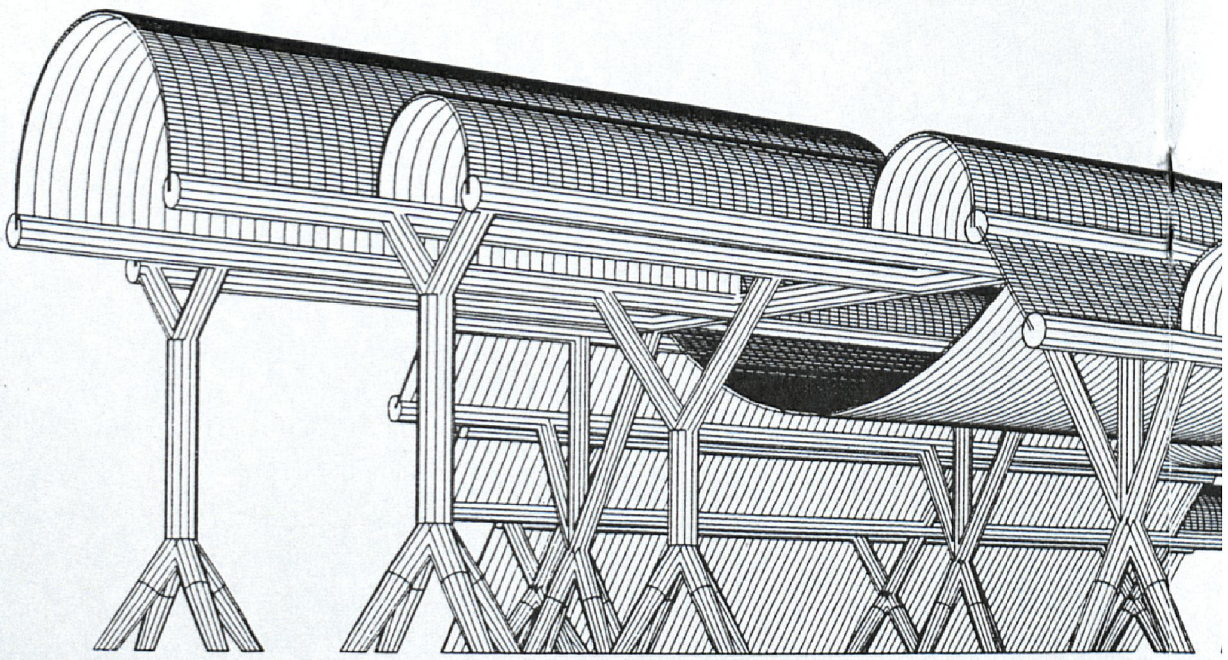
SPATIAL TRANSFORMATION

The pattern was printed on 1/4" acrylic sheets by a silk-screen process. Elastic ink was used to allow for elongation during the transformation from two to three dimensions. This is shown in the center panel of this exhibit.

The plan was drawn taking into account the changes in physical dimensions that each component would undergo during the transformation from a plane surface to a semisphere. In this transformation lines change from parallel to non-parallel, ellipses take the form of circles and eccentric curves on one plane move to parallel planes while becoming concentric. The distance between lines changes rhythmically from close to far apart.

Contrary to the first perception, the pattern on the acrylic sheet is not the horizontal projection of the pattern on the dome.





GLASS STRUCTURES

A HOMAGE TO LIGHT

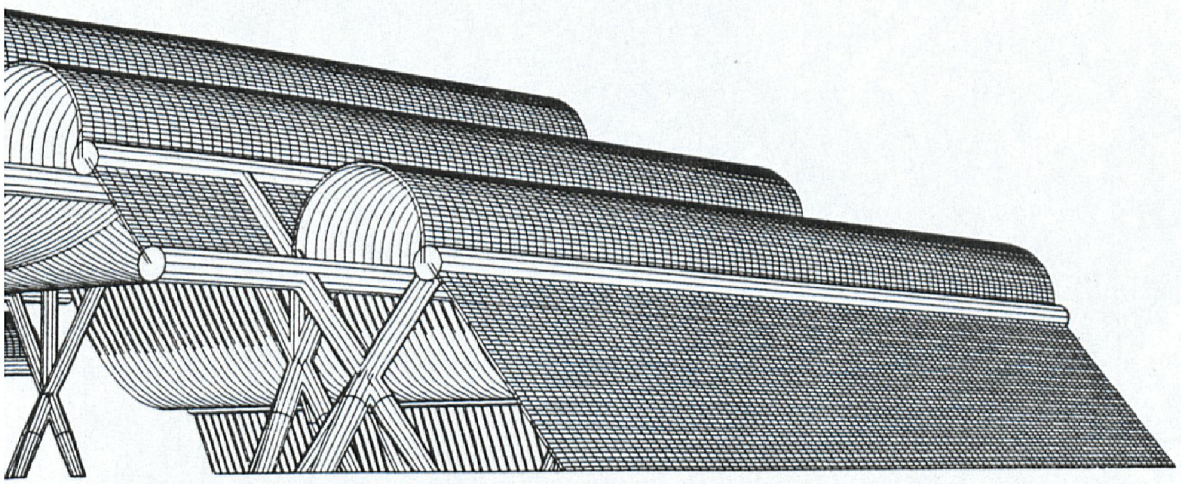
Most barriers are vanishing in human interaction, in communications, information and the arts. The boundaries between the sciences are being erased by scientists and philosophers in their pursuit of the "science of everything". More and more we are abandoning our walled domains in order to again relate to the systems of the earth.

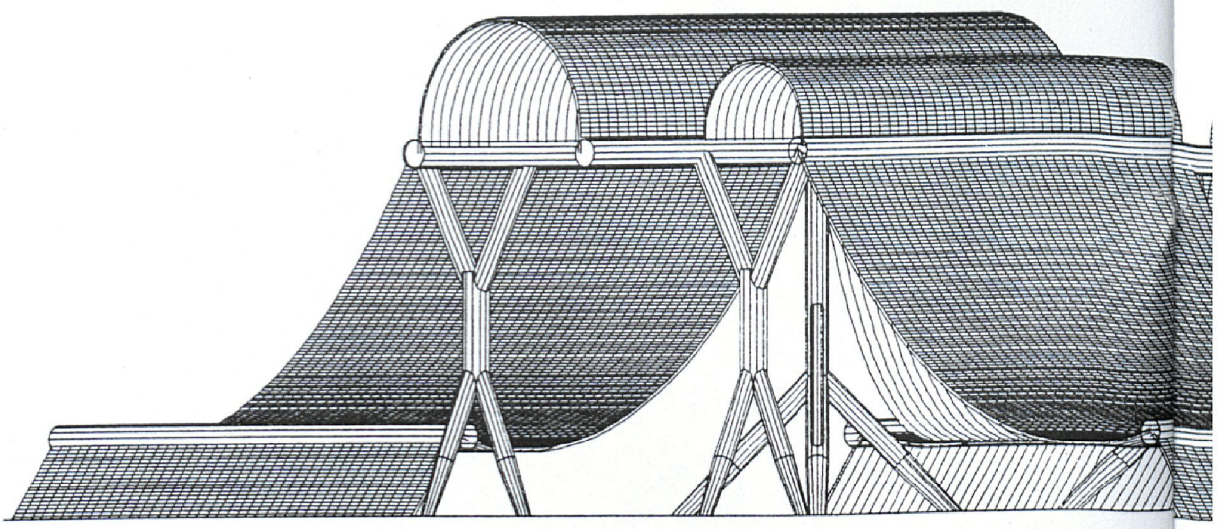
With the advent of glass structures spirit is no longer a metaphor for space. It IS space.

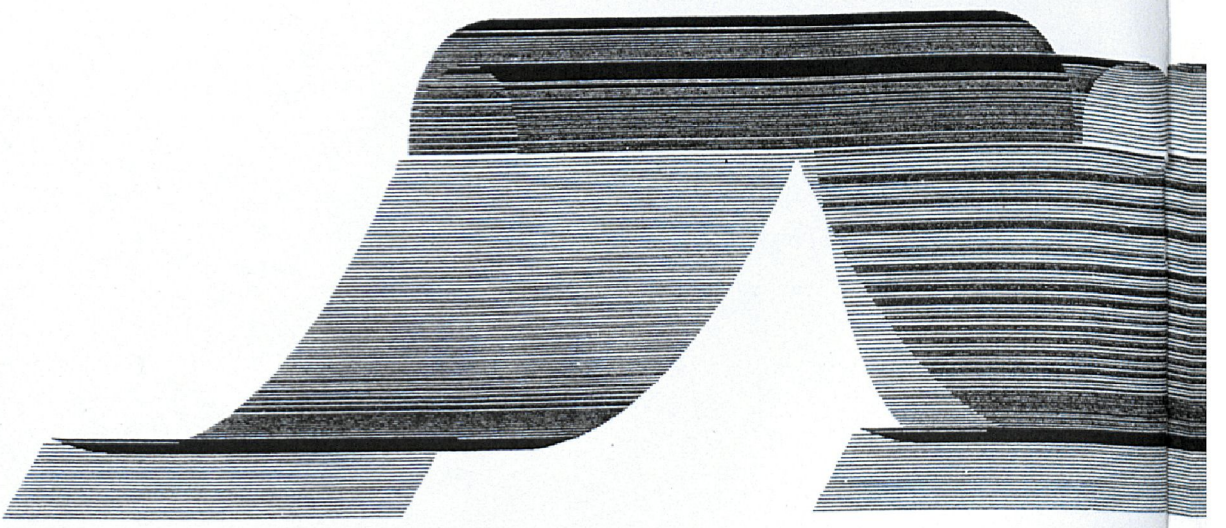
They represent the dematerialization of architecture, the final unity between structure and space, between the material and the immaterial and between the interior environment and nature. EVERYTHING IS ONE. In the designs exhibited, large curved surfaces ascend and descend as though they were transparent veils suspended in the sky.

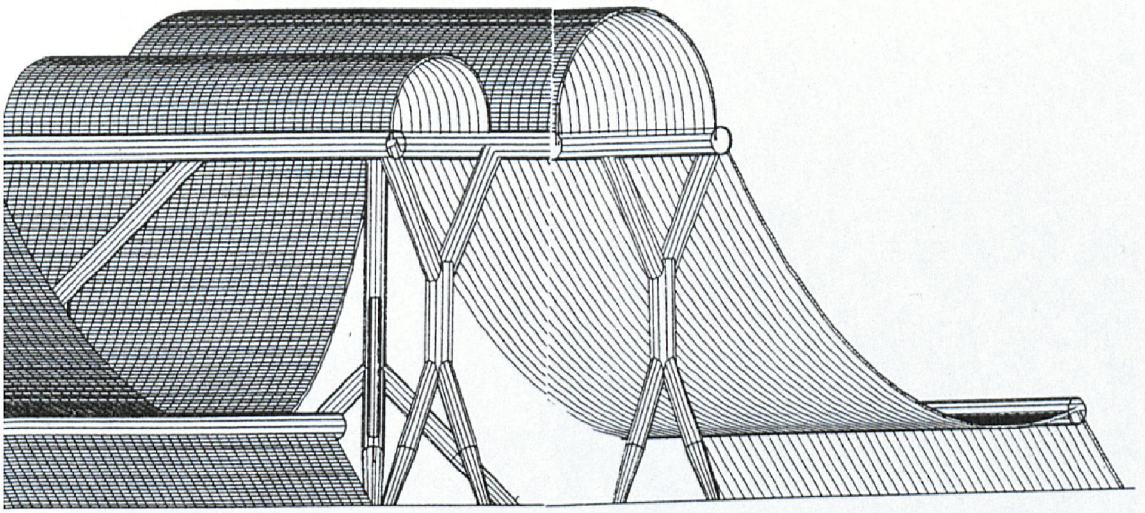
The reflections and refractions of light on the glass infuse every space with their twinkling.

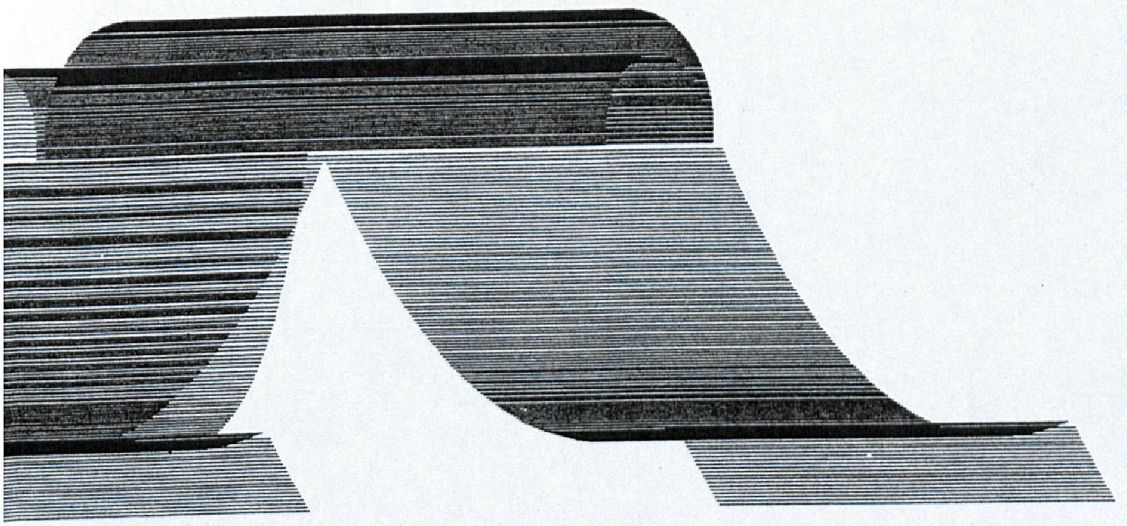
Glass structures, by geometricizing the sky, create an architecture of light.







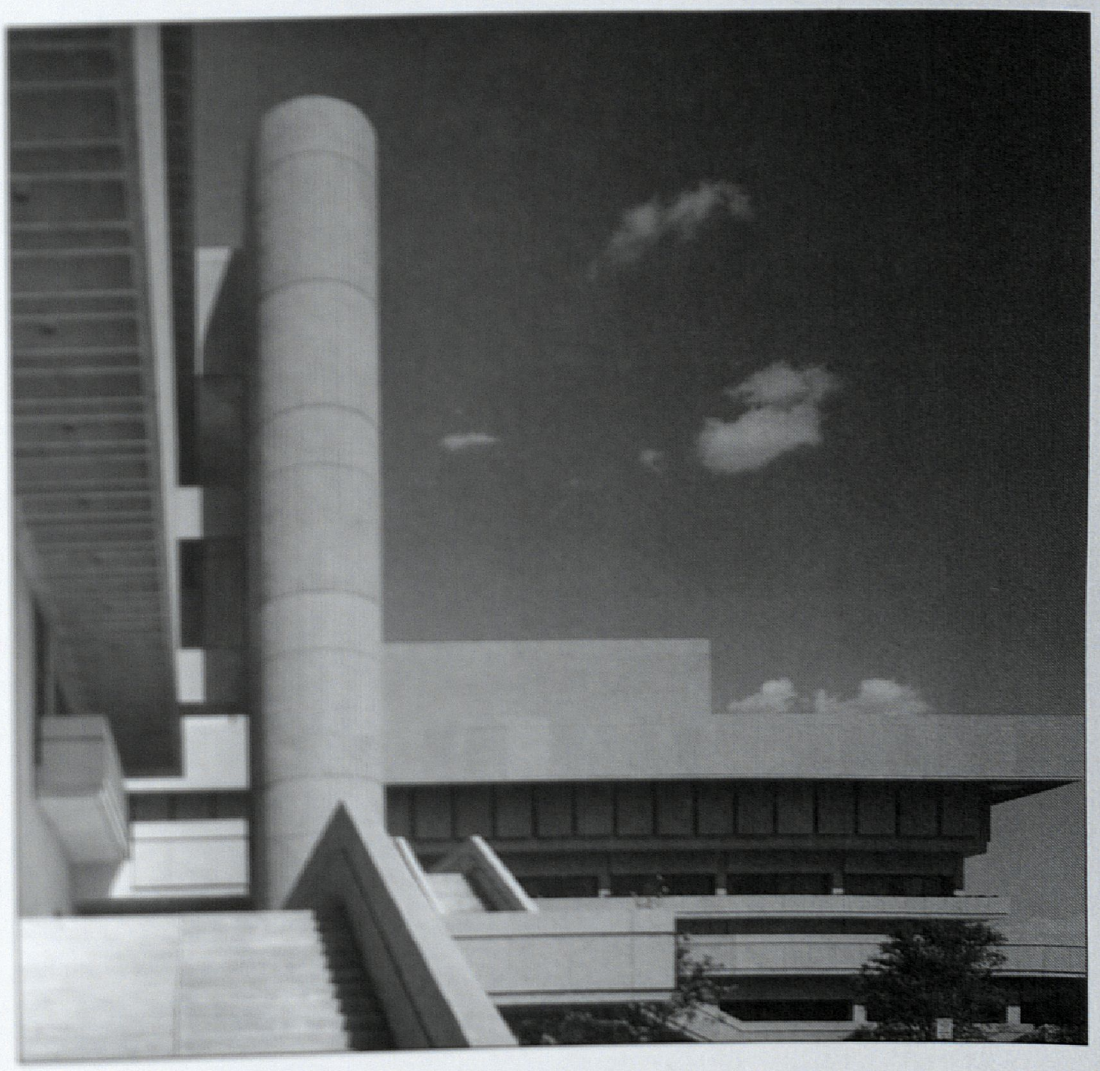




BUILDINGS

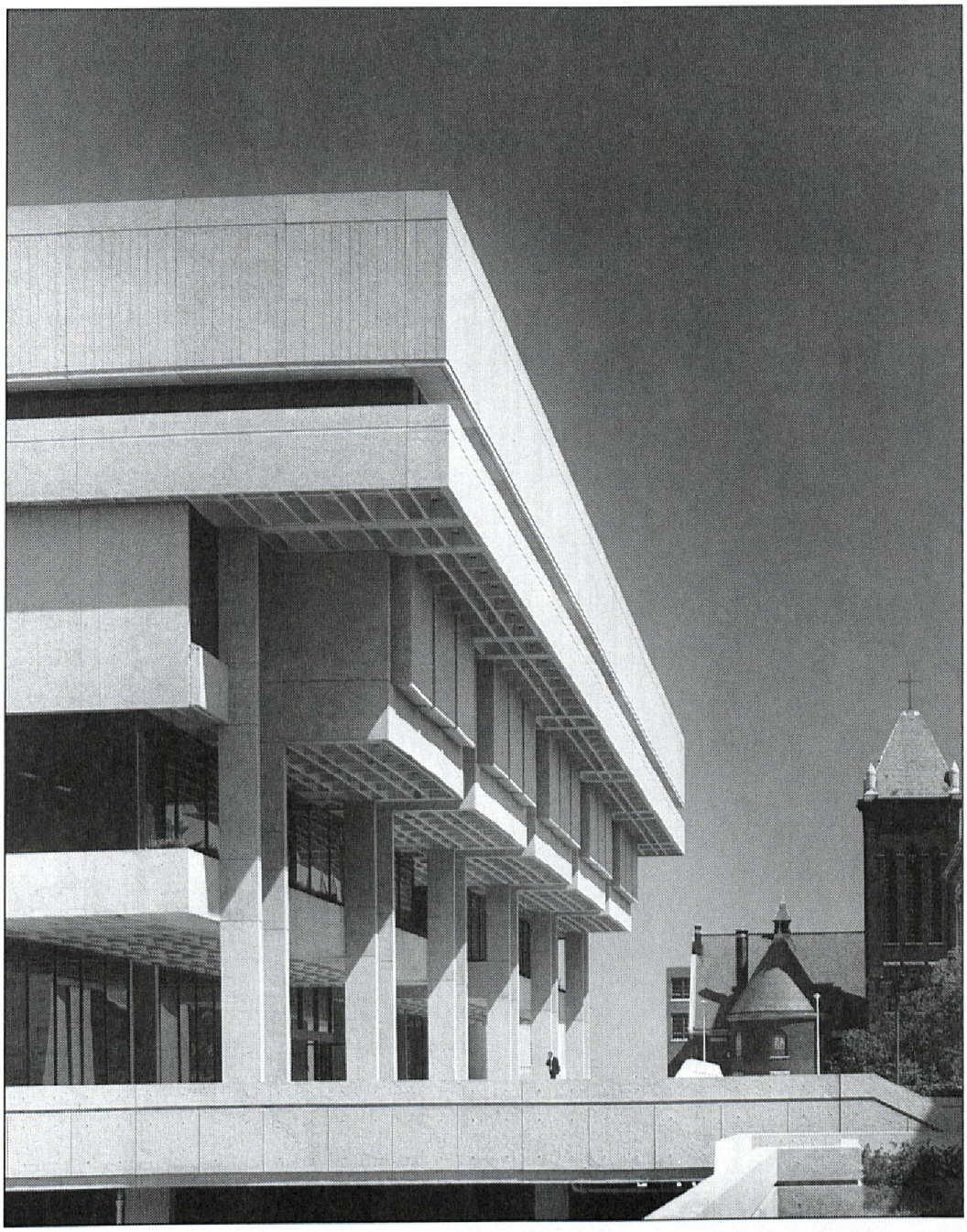
GOVERNMENT CENTER • GREENSBORO, NC, 1971

In the center of downtown Greensboro an open public space was created, enclosed by the Old Court House, the New Court House and the Municipal Building. The open space is fully landscaped, built over an underground parking garage. The Center constitutes the first public project to use industrialized components so extensively. The structural floor system was built using prestressed double tees with transversal diaphragms cast in metal forms. One form allows the casting of five different modular components, some for use in cantilevers, which provides great flexibility and in different applications, thus providing individuality of expression to the Court House and the Municipal Building.



Gordon H. Schenck Jr., Charlotte NC

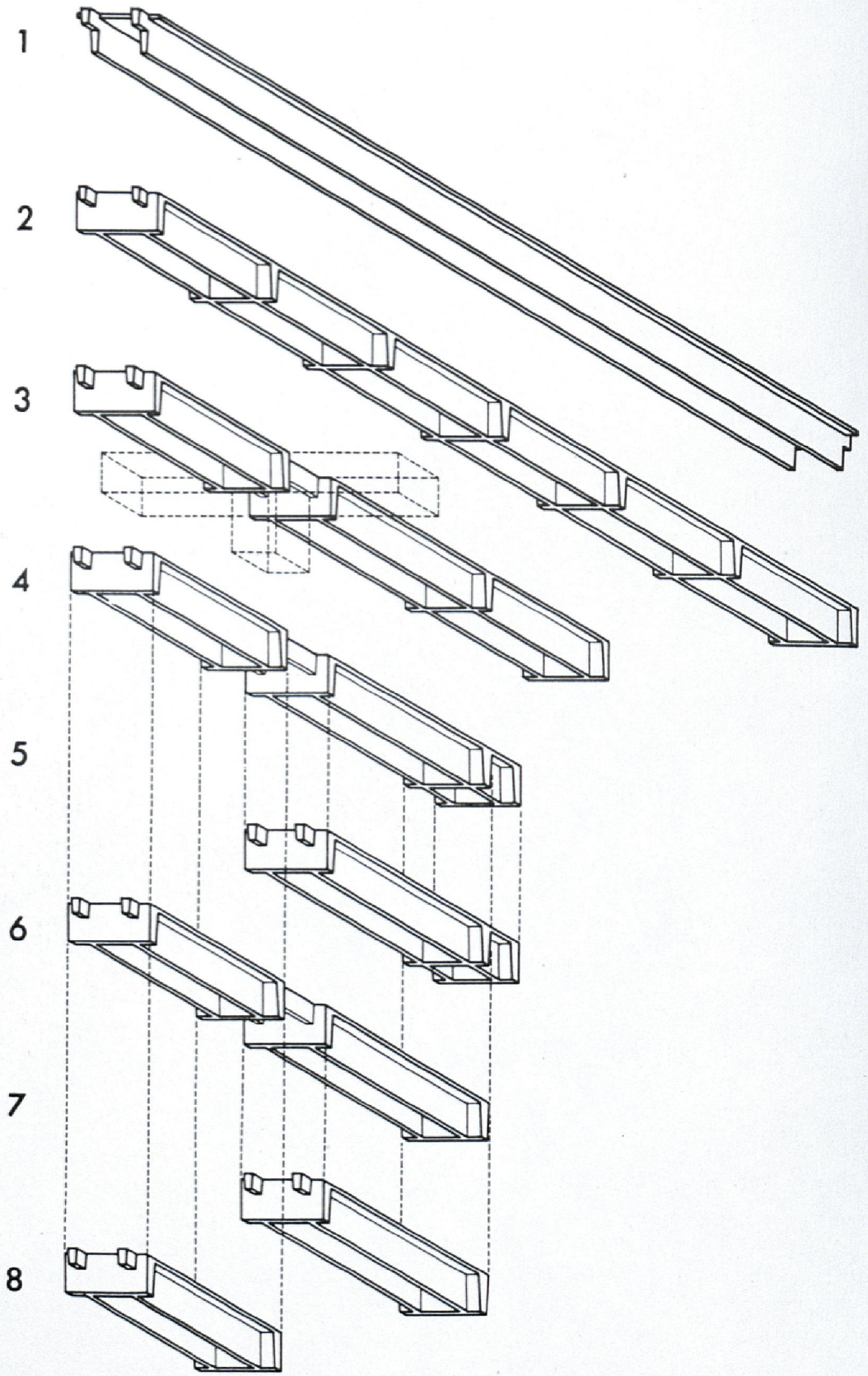
GREENSBORO GOVERNMENT CENTER • MUNICIPAL BUILDING, 1971



Gordon H. Schenck Jr., Charlotte NC

COURTHOUSE, GREENSBORO GOVERNMENT CENTER • 1971

View of how different structural components cast from a single mold allow the development of a rich three dimensional architectural expression as well as great precision in construction. The structure of the floors together with the precast sandblasted panels used for the enclosure of the building are 95% prefabricated. The upper floor was built unfinished, to be used for incremental expansion in the future.



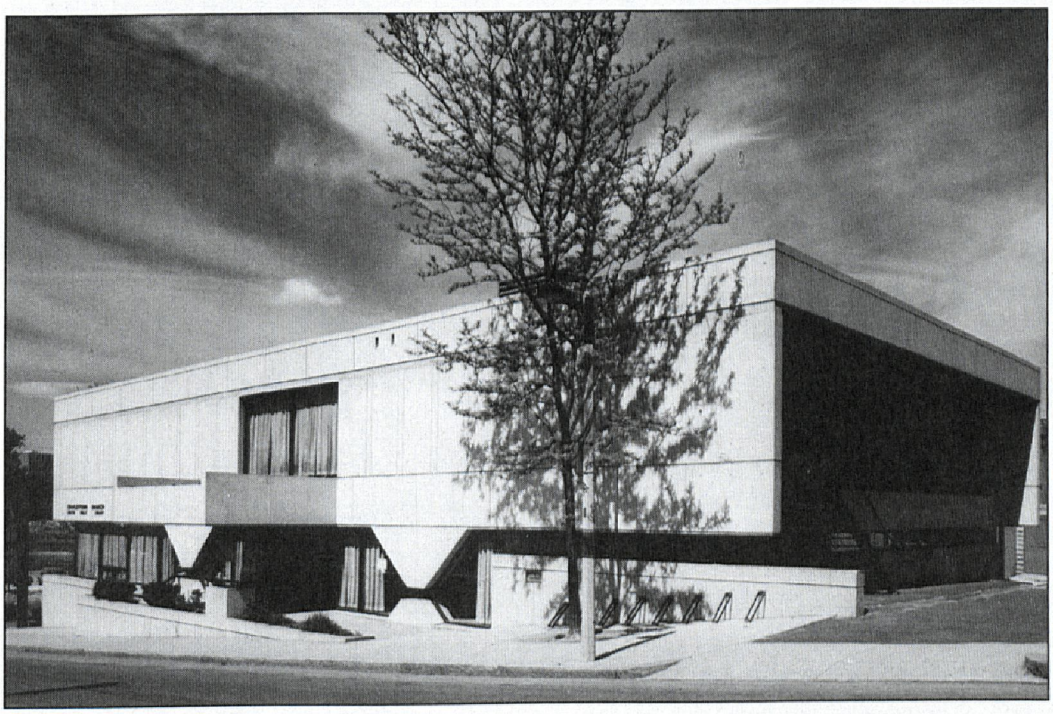
COMPONENTS OF MODULAR DOUBLE-T FLOOR SYSTEM • 1971

HALL OF JUSTICE • SPRINGFIELD, MA, 1973

This 280,000 square foot building used the same structural system as the Government Center in Greensboro. As in it, the maximum span is 42 feet and the cantilevers are 15 feet long.

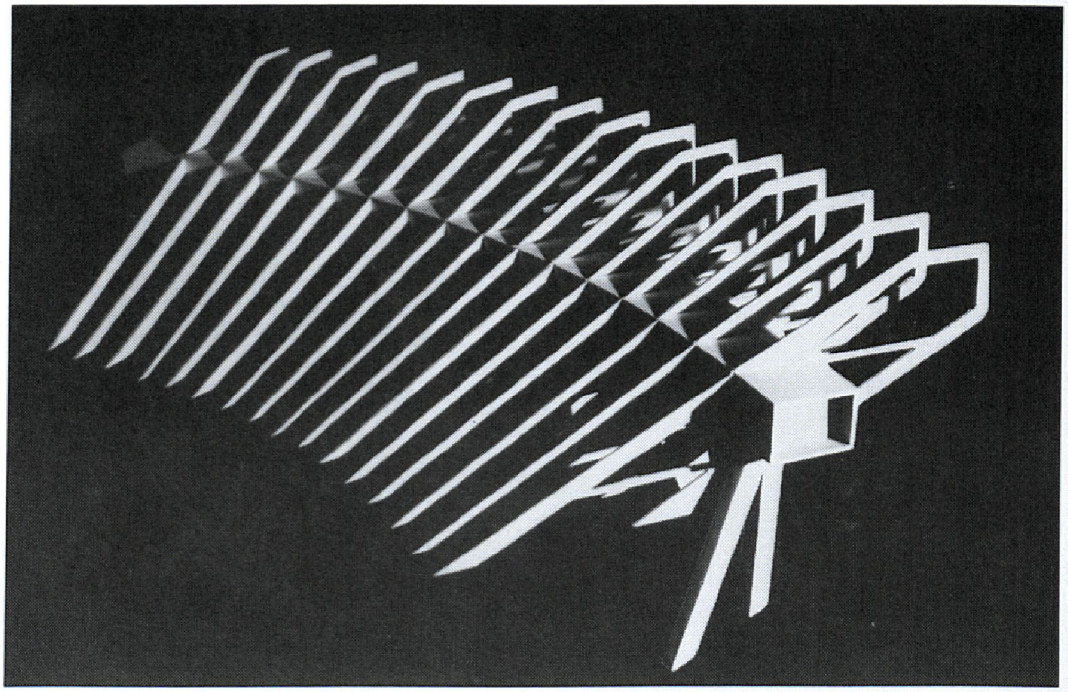
CHARLESTOWN PUBLIC LIBRARY • BOSTON, MA, 1971

The extreme simplicity of this building is based on a structure with an area of 62 by 120 feet supported at only four steel hinged points. Its four cantilevered sides are 38 and 30 feet long and support a single span system based on prestressed double tees spanning a width of 60 feet. The reading space is double height since there is a mezzanine at the rear which also spans the full 60 feet.



AUDITORIUM • CITY OF BUENOS AIRES • 1947

A 20,000 seat hall for large scale performing arts, political educational and international conventions. The stage, 180 x 75 feet, is extended underground and covered by two ellipsoidal shells. The outer one is built of reinforced concrete and the inner one performs as a three dimensional cyclorama. The structure of the balcony performs simultaneous functions. Its hollow curved spine serves to house all public, building and environmental services. The outer shell, supported by ribs having a 30 degree slope, is used as access stairs, each with three cantilevered landings. These provide daylight and serve



as balconies overlooking the surrounding gardens. By means of removing from sight different rooms performing different functions, as well as eight staircases, the interior of the balcony has been reduced to the essential in architecture: Structure and Space

ELECTRONICALLY PROJECTED SCENERY • 1947

A metal perforated cyclorama around and over the stage is extended over the audience to create a total visual environment. The small perforations of the cyclorama perform like the dotted screens used in the printing of images. Color images are programmed on a tape which controls projectors located 20 feet behind the cyclorama.

The photograph shows a test of the system using a 15 foot square perforated screen. An actor is seated in front of a projected image taken from the painting of Paolo Uccello *The Rout of San Romano*. The scenery could be either static or dynamic.

• • •

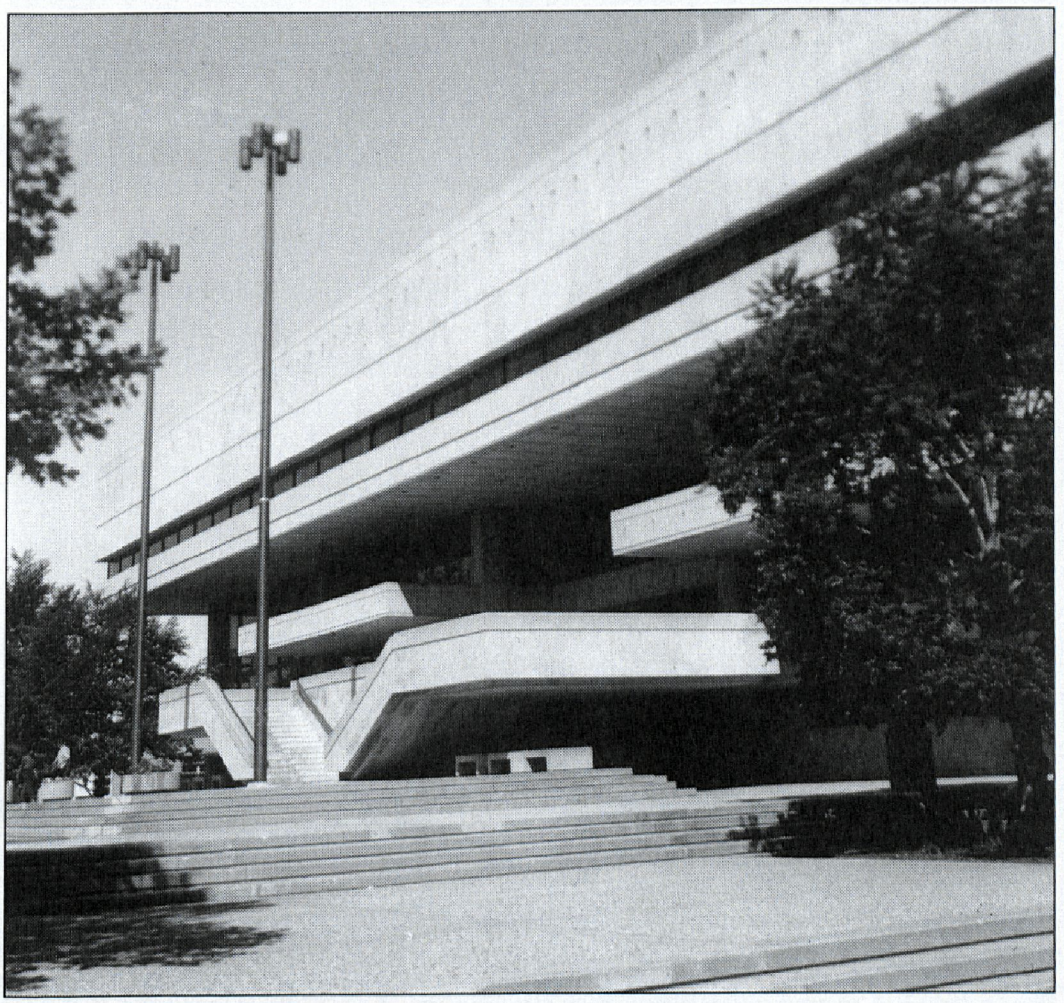
The design project was commissioned to me by the National Government upon my return from Harvard. Working drawings were completed. But it was never built. The President had expected to see a building resembling the Reichstag • Parliament Building in Germany.

STADIUM SANTA MARIA • 1952

Santa Maria, La Niña and La Pinta were alternate studies designed with the students of the School of Design at Raleigh NC. La Niña had a concrete shell based on the spiraling pattern of sunflowers. La Pinta had an aluminum spherical space frame. The three designs have the same roof: a double curved translucent membrane. The grandstand is circular and the Arena-Court is at its center. Capacity: 10,000 seats. Services are under the arena, within the depth of the spherical structure.

INTENTIONS: To design by means of systems. To free the ground from buildings. To create a new outdoor spatial experience. To attempt to defy the force of gravity:

Professor Duncan Stuart participated intensively in the geometric breakdown of the shell for the Stadium Santa Maria.



MIT STUDENT CENTER, CAMBRIDGE, MA, 1963

JUILLIARD SCHOOL OF MUSIC, LINCOLN CENTER FOR THE PERFORMING ARTS, NEW YORK, NY • 1968 With Pietro Belluschi

BAYBANK TECHNOLOGY CENTER, WALTHAM, MA • 1990

STEREO-IMAGES • 1947-1995

That seed
That grows into a tree
That gives a fruit

THE ORIGIN

The seed was an ink drawing prepared for the Auditorium of the City of Buenos Aires. When a tangential ray of sunlight illuminated an engraving of the drawing that I held in my hand while on the balcony of my studio in Buenos Aires. I said to myself —Why don't I take a photograph?—

Stereo images are the result of a process that combines a drawing, an engraving of the drawing and a photograph of the engraving. The drawing is made with the final result in mind. This means that the mind must see and elaborate the present and the future at the same time, backwards and forwards, foreseeing the projected shadows produced by lines and the surfaces that advance or recede, as well as the textures that should vibrate in the light required for the photograph.

Since 1947 many engravings have been made, each more advanced than the one before. See a primitive one done in 1961 and compare it with the latest ones.

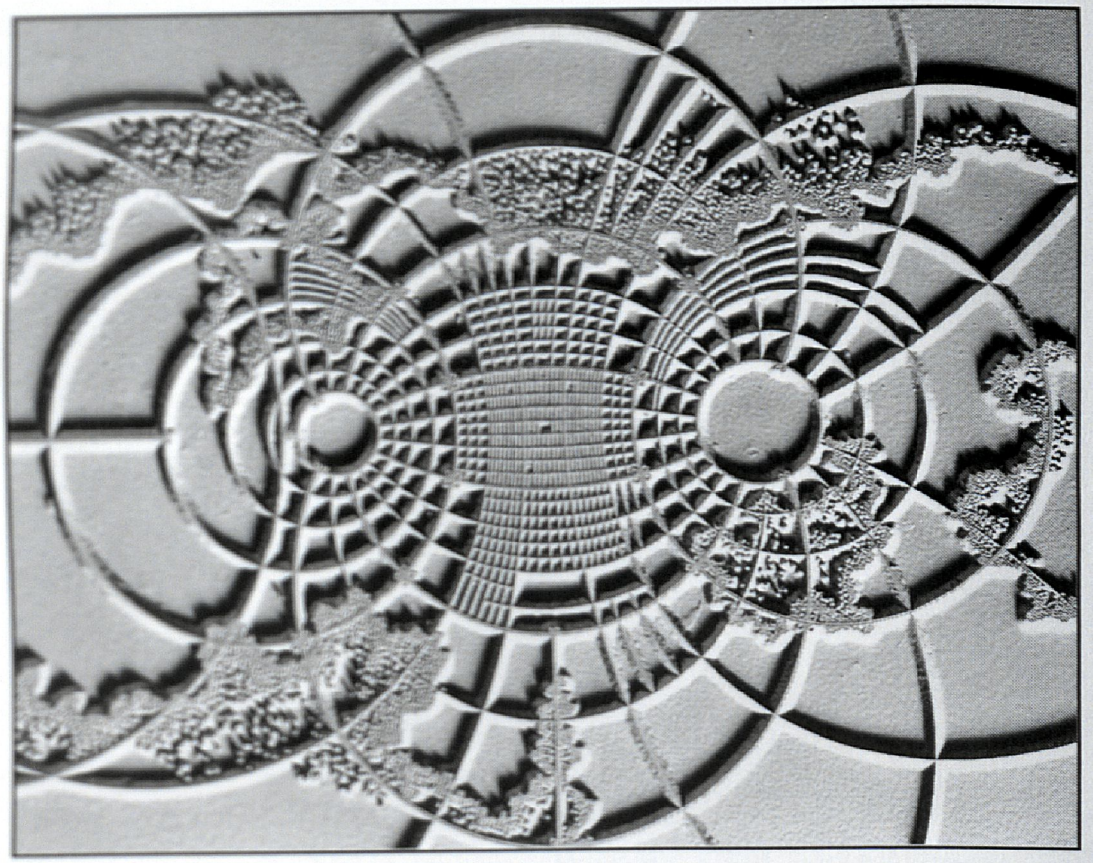
That first photograph led to many more, used for articles in magazines, architectural competitions – see the National Peace Garden in this exhibit – and in two books titled *Structure and Geometry*, 1986 and *La Constante*, 1995, shown in the glass case. The technique also led to some adventures in the "dangerous field" of visual art. See *Mona Lisa* and *The Last Supper*.

THE LAST SUPPER • 1984

All the symbols and visual themes of the past have been translated into the meanings and images developed in the computer age: dehumanization, chips, keyboard, continuous feed paper, modular demountable floors and a virus awaiting his instant of treason.

The virus is alone, in front of the table, as in the paintings of Andrea del Castagno, 1445 and Tintoretto, 1592.

The subject matter of this stereo-image was recognized by only one of the many people who have seen it. A young truck driver identified it instantly when he entered the shop where I was picking up the small 10" x 10" engraving plate shown at the side, now painted and more readable. Did the truck driver have a Ph.D. in Art History? I wish I knew who he was, so I could ask how he recognized it. Did you?



INFRASTRUCTURE OF A CITY AS A SYSTEM

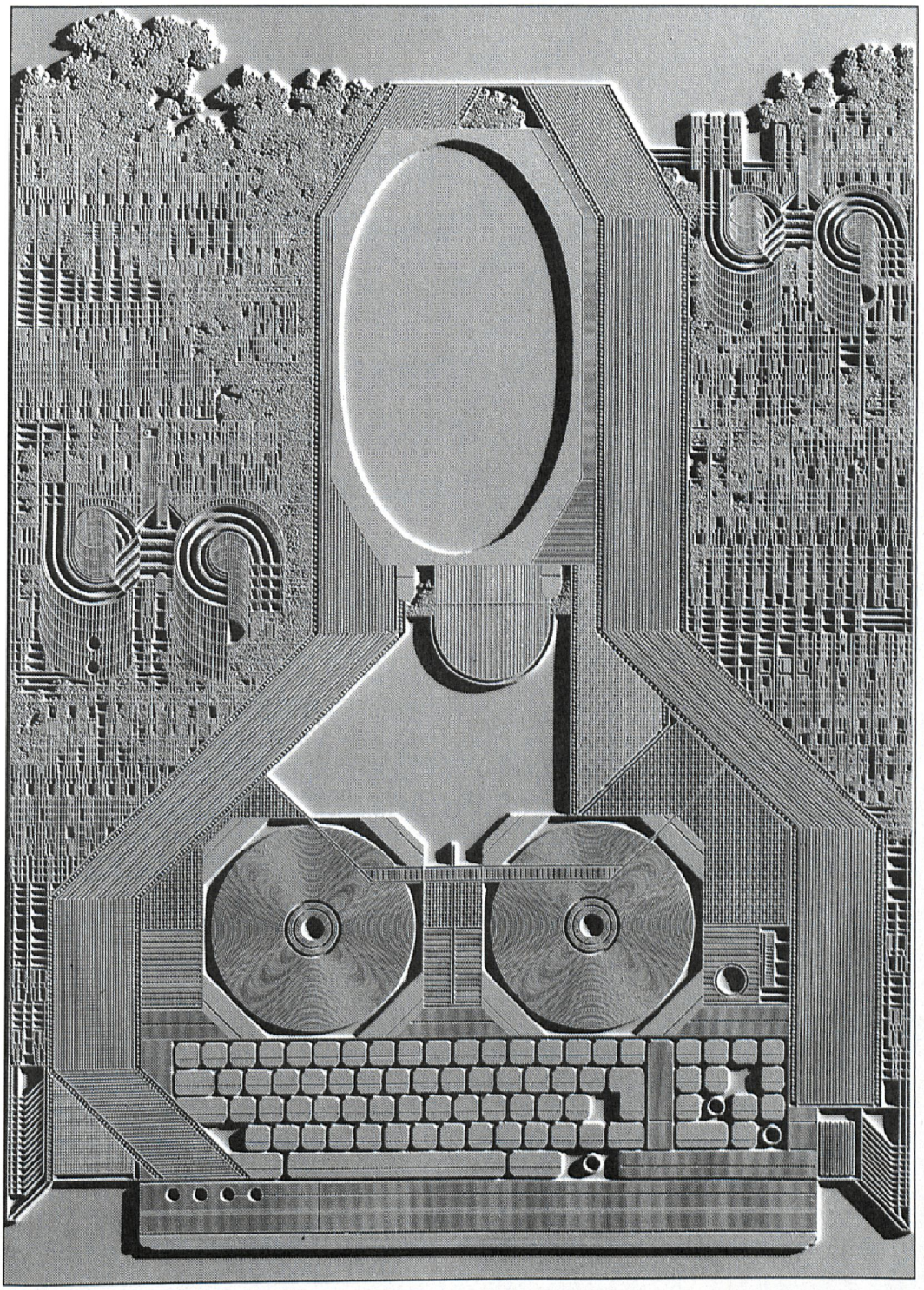
Most cities, except for the old ones which grew at random, were planned with a T-square and a triangle. They could not grow, organically, beyond the boundaries of the drafting board.

The infrastructure for a city, shown at the side, is a system of transformation and growth.

The straight lines of the orthogonal network located at the urban core transform themselves into four sets of circles which grow outwardly larger and larger. At the end of their voyage the circles, since their radius is infinite, become straight lines. As a result the city can grow forever without changing the pattern of its infrastructure. Between the main arteries a series of open spaces become available for the development of different urban subsystems, all of them always regulated by the initial infrastructure.

PERFORMING ARTS CENTER IN LA PLATA, ARGENTINA, 1980

An Opera House, a Concert Hall and a Cinema are grouped informally around a central space acting as an indoor urban plaza.

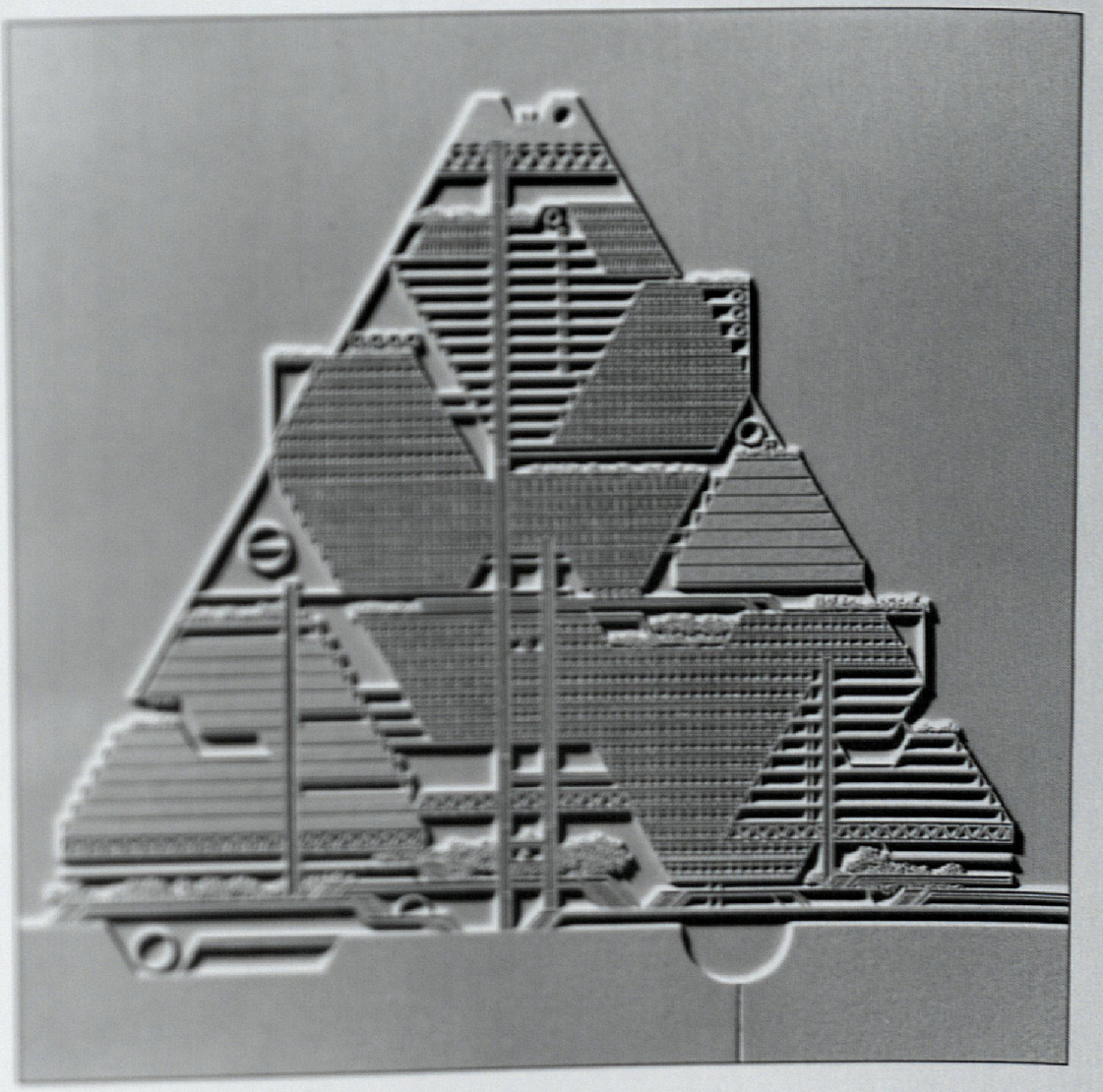


Adrian Catalano, Cambridge, MA

MONA LISA • 1989

Nothing is human anymore. All of our responses are programmed. The man of today sits all day in front of his personal computer, enamored. He even travels and vacations with "her". He sees in the machine his Mona Lisa.

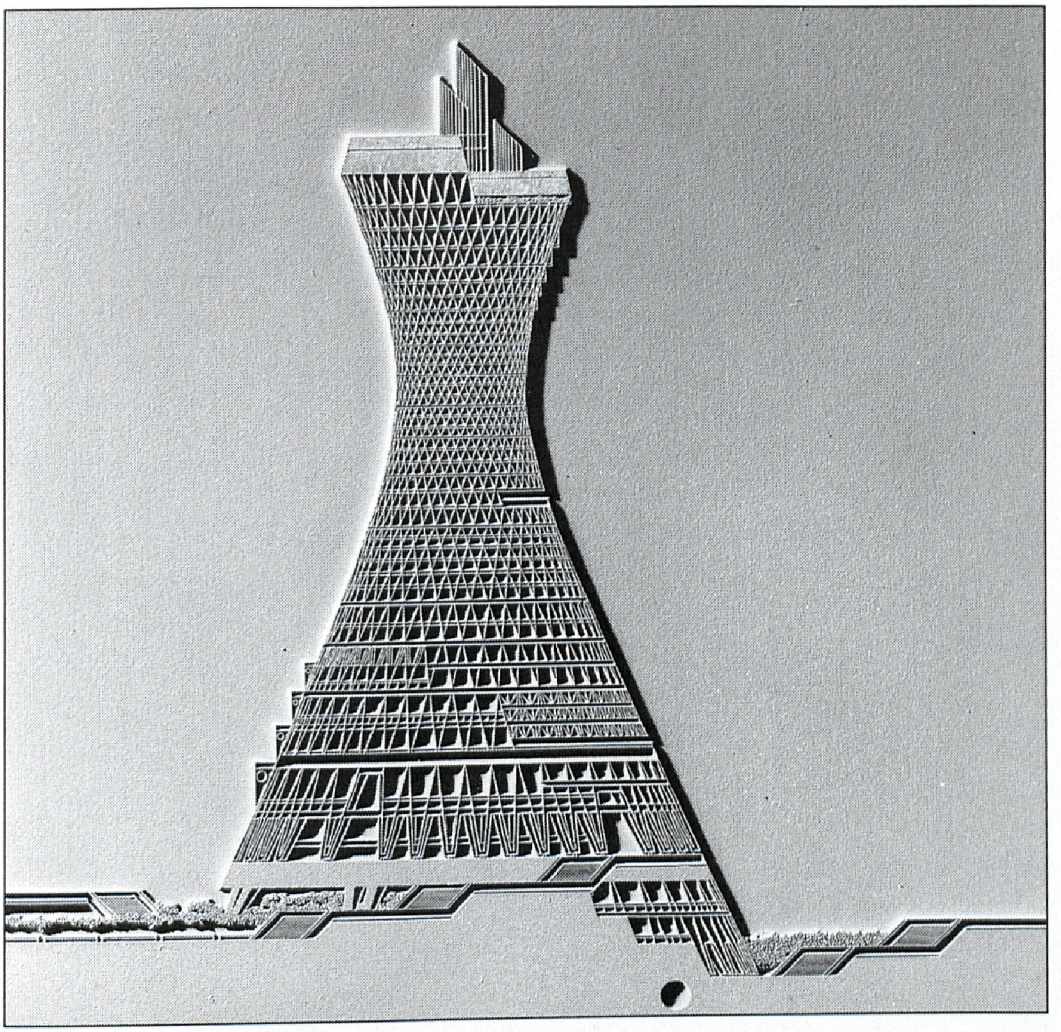
Mona Lisa = PC.



Adrian Catalano, Cambridge, MA

VERTICAL CITY

With the genetic and cybernetic revolution everything will change. The single-function buildings of today will become multifunctional ones. The two sciences will change the properties and performance of everything. This will lead to the integration of many activities which today, because of their present nature, need to be segregated, some far apart. Each building will become a minicity with everything at hand. Our architectural scale will have to match the powerful and courageous technologies to come.

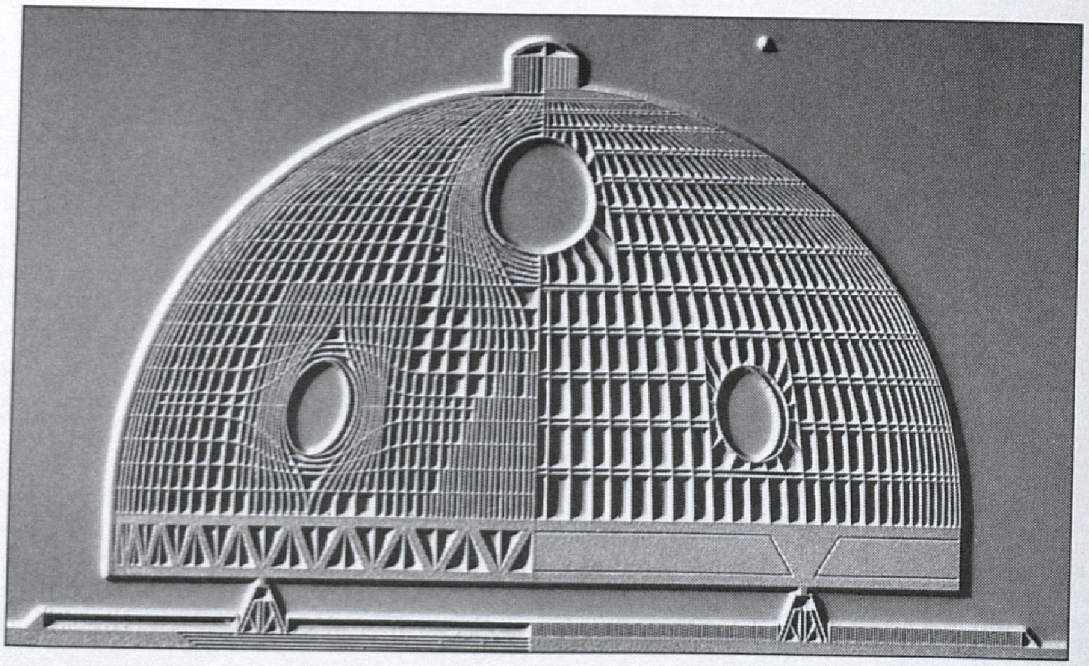


HYPERBOLOID OF REVOLUTION
MULTIFUNCTIONAL BUILDING • 1954

The geometry of this surface allows the building of a structure with a diversity of spans and floor heights which can be determined by the crossing of the two sets of generatrixes. A floor system of trapezoidal double-tees spanning radially from the central core to the supporting envelope has a clear span of 120 feet at the base. The perimeter of each floor increases consistently in proportion to its area and depth. The structural envelope is built with straight lines of precast concrete modular components. Like the Vertical City, shown on page 29, the diversity of dimensions, in spans and floor heights, allows the integration of many activities, from private ones to large assembly areas, from those which need daylight and exterior views to interior rooms. Besides, since it is an infinite surface with infinite curvatures and diameters, any segment of it can be selected to satisfy different functional or dimensional requirements.

THE ANATOMY OF A DOME

The domes of today do not need to rest on continuous walls as in the past. They can rest on three hinged points. This opens the interior space to the surroundings while emphasizing their defiance of the force of gravity. The traditional applied art on the inner surface has been replaced by the geometric patterns of the ribs which follow the path of isostatic lines. The left half of the Dome shows the interior view and the right half the exterior.



OTHER BUILDINGS AND PROJECTS

JULIUS STRATTON BUILDING • MIT • 1962
BAYSTATE WEST, SPRINGFIELD, MA, REFLECTIONS • 1966
SPRINGFIELD CIVIC CENTER, MASSACHUSETTS • 1968
SPRINGFIELD CIVIC CENTER AIRWALK • 1968
UNITED STATES OF AMERICA EMBASSY, BUENOS AIRES, ARGENTINA • 1972
CAMBRIDGE HIGH SCHOOL, CAMBRIDGE, MA 1976
CENTER FOR PERFORMING ARTS, LA PLATA, ARGENTINA • 1980
CAMBRIDGE PARK, CAMBRIDGE, MA • 1980-90
BAYBANK TECHNOLOGY CENTER, WALTHAM, MA • 1990
UNITED STATES OF AMERICA EMBASSY, PRETORIA, SOUTH AFRICA • 1992

BOOKS PUBLISHED

1938 TEORÍA DE LAS SOMBRAS Y TRATADO DE PERSPECTIVA
1961 STRUCTURES OF WARPED SURFACES
1963 ESTRUCTURAS DE SUPERFICIES ALABEADAS -*translation*
1976 EDUARDO CATALANO, BUILDINGS AND PROJECTS
1986 STRUCTURE AND GEOMETRY
1995 LA CONSTANTE - Diálogos sobre estructura y espacio en arquitectura