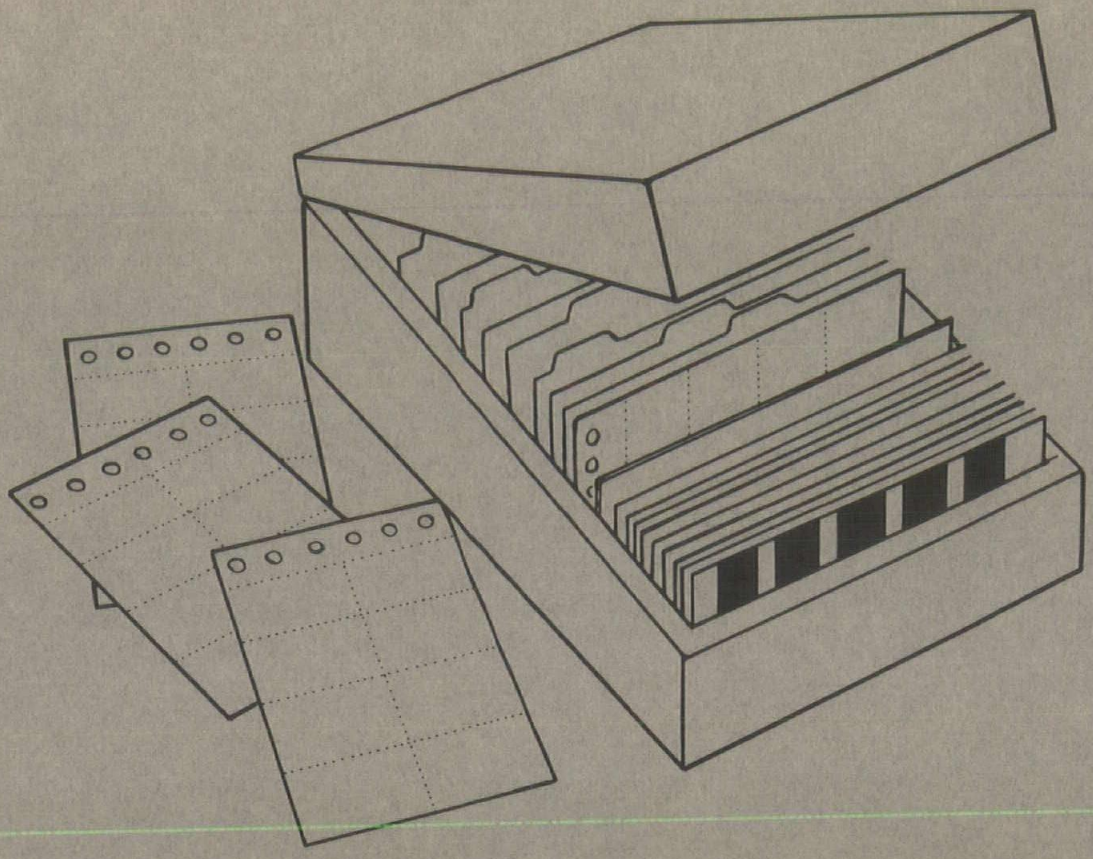
IOWA ARCHITECT

The face of architecture in Iowa



Color me color-full.

We would like to introduce to you our new Color System and reference box. But, this being a black and white ad, you can see we'll need your help. ■ Actually, our new system is the most advanced in the world — and, we're proud to say, we're the first to have it. It has nearly doubled our color selection. It includes all the darker tones now in demand by architects and designers, as well as a large selection of the popular off-white colors. ■ The handsome walnut reference box is efficiently indexed and is full of handy tear-off chips for fast keying of drawings or on-the-job specifying. ■ You'll also be happy to know that the colorants of our new system are more compatible with modern coating materials for superior paint performance. ■ If you'd rather not take the time to color our reference box for us, however, you can still help by sending us the coupon at the right. We'll see that you receive a reference box for your office — already color-full.

What's so "new" about your new Color system. Call me for an appointment. But you'd better bring along a new color reference box to leave with me.

my name

firm

address

city & state

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Manufacturing Co.

Architects Service Dept. 17th & Grand
Des Moines, Iowa

ARCHITECTS:
Emery-Prall & Associates
Des Moines, Iowa

CONSULTING ENGINEERS:
Stevenson-Flanagan-Schilling
Des Moines, Iowa

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Design flexibility is easier to achieve, when you count on performance-proved components from Allied Construction Services. You accommodate efficient lighting, for example, to just about any unusual interior. For the Collison Medical Clinic, shown above, Allied furnished and installed a special Lok Products grid, lighting fixtures from Cepco, Inc. and Polrized® lenses. We welcome the opportunity to discuss your projects.

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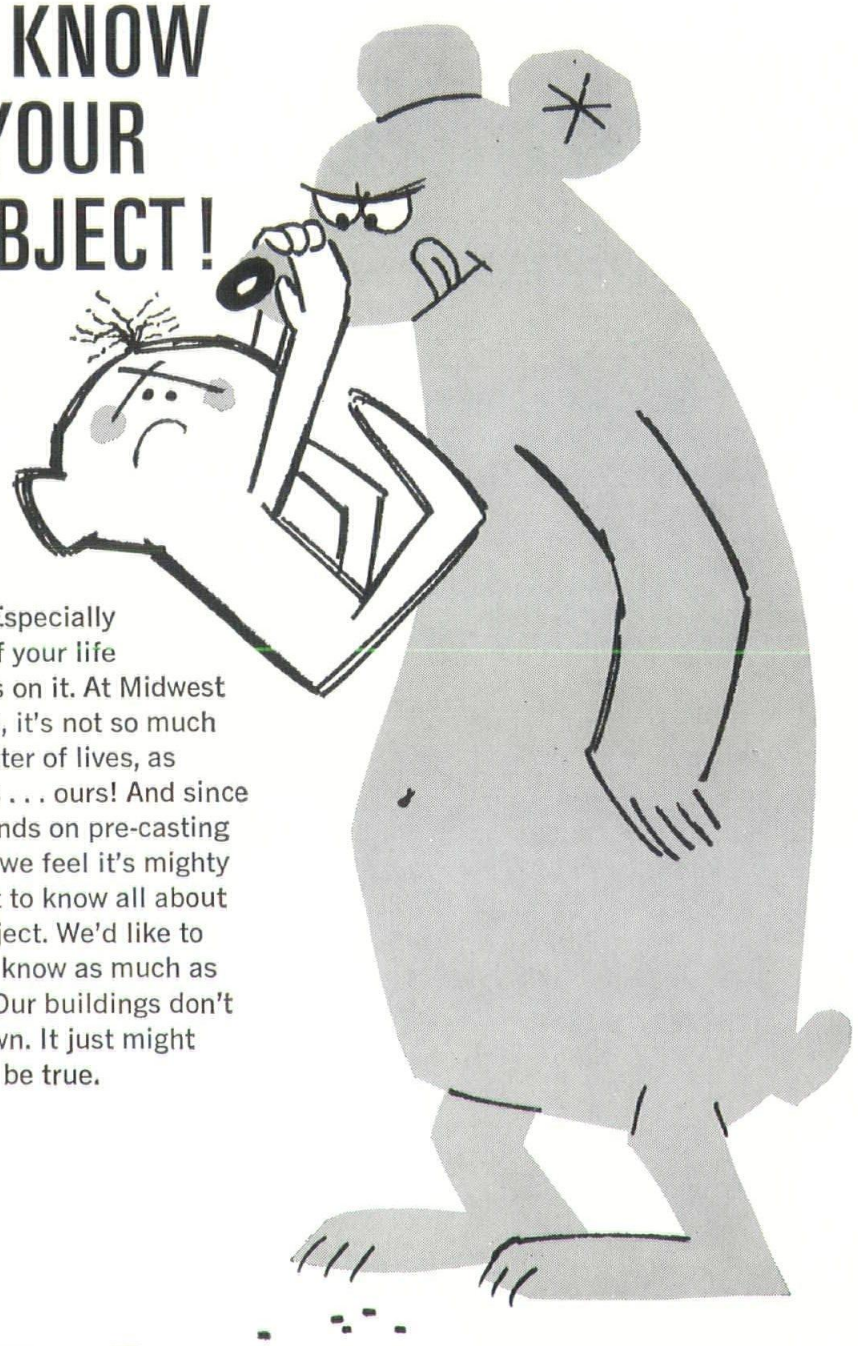

Especially if your life depends on it. At Midwest Concrete, it's not so much a matter of lives, as livelyhoods . . . ours! And since ours depends on pre-casting concrete, we feel it's mighty important to know all about the subject. We'd like to think we know as much as anybody. Our buildings don't fall down. It just might be true.

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IOWA ARCHITECT
The face of architecture in Iowa

IOWA STATE UNIVERSITY ISSUE

July-August-September, 1966 · Volume XIII · Number 3

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The "Iowa Architect" is the official publication of the Iowa Chapter, The American Institute of Architects, and is published quarterly. The annual subscription rate is $3.50 per year. Appearance of names and pictures of products or services in editorial or advertising copy does not constitute endorsement by either the A.I.A. or this chapter. Information regarding advertising rates and subscriptions may be obtained from the office of the chapter, 401 Savings and Loan Building, Des Moines, Iowa, 50309. Telephone 244-7502, Area Code 515.

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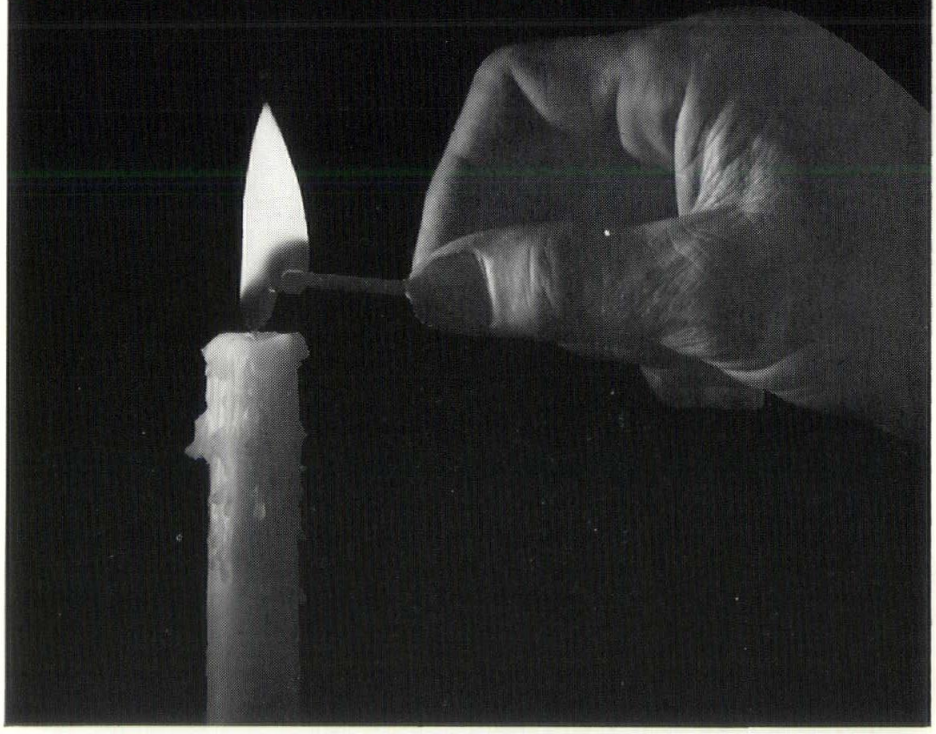

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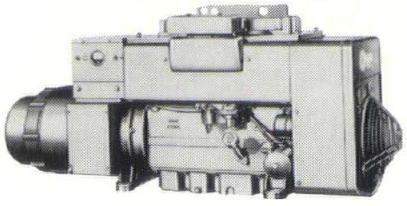

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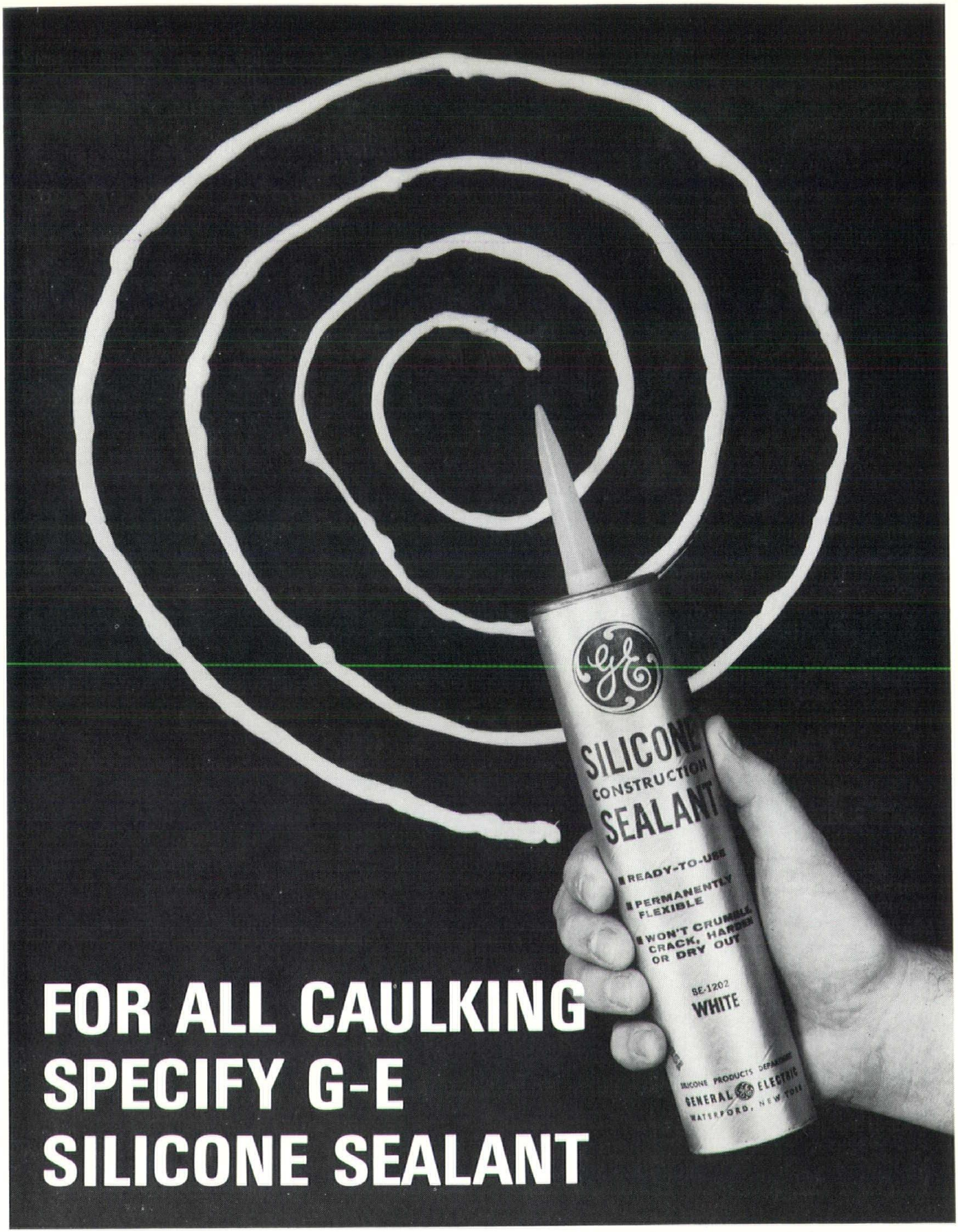

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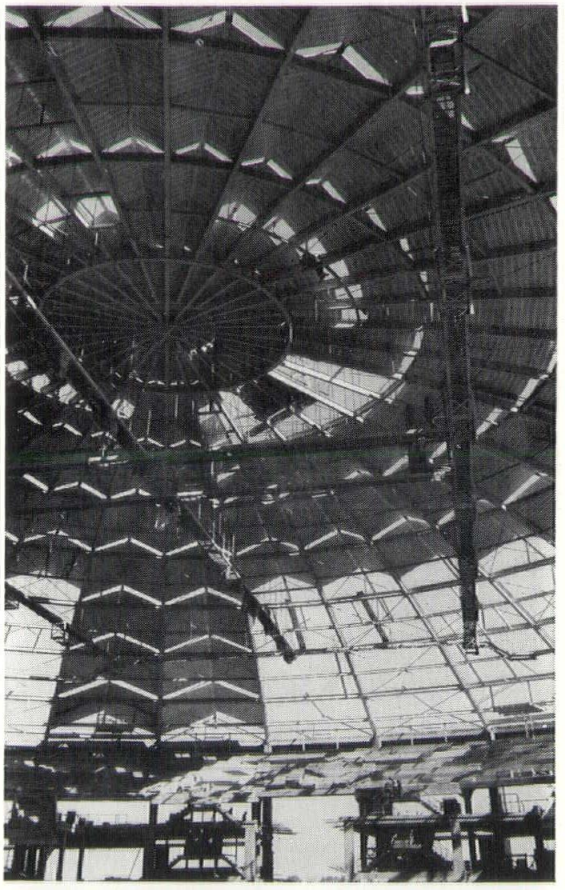
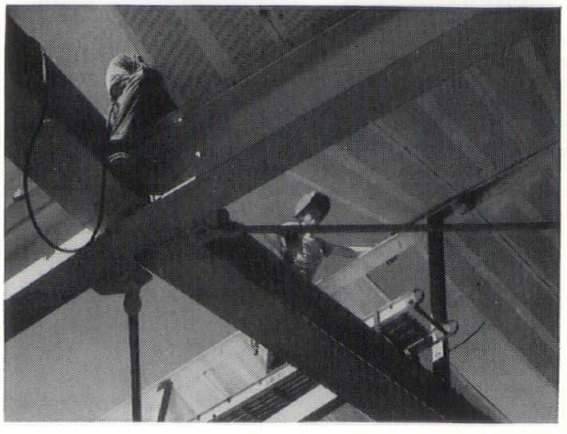
FENESTRA





Law, Law, Potter & Nystrom, Architects

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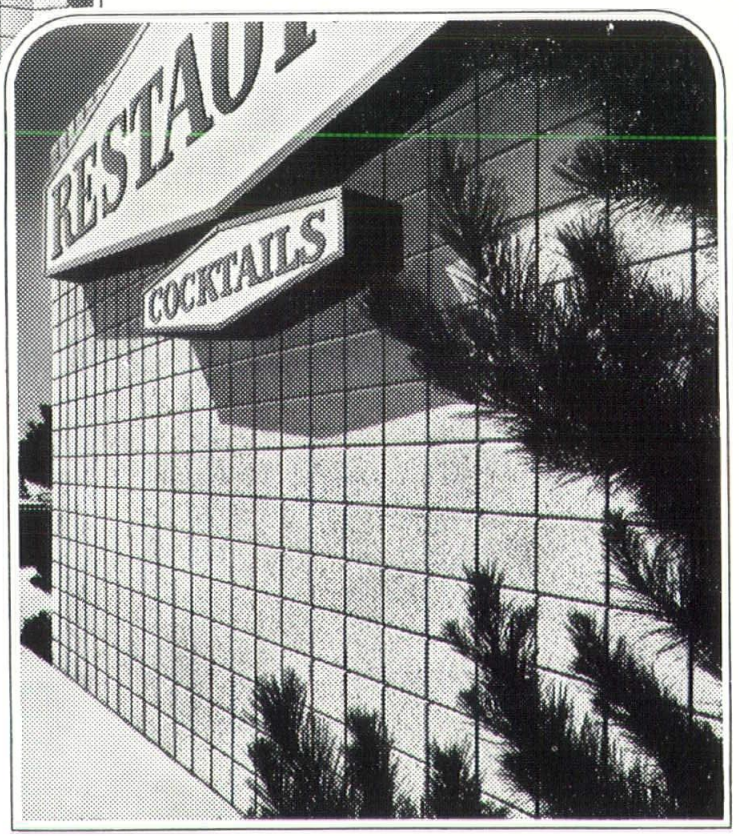
The versatility of concrete block gives modern architects all the help they need. They can use them as a single pattern, mix them for a combination pattern, or offset some units from others in the wall for added flair and dimension.



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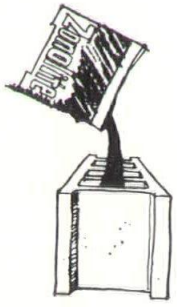
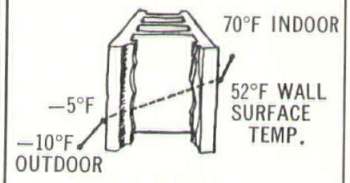
Iowa Concrete Masonry Association
an organization to promote the proper use of concrete masonry

HERE'S WHY ARCHITECTS SPECIFY ZONOLITE® MASONRY FILL



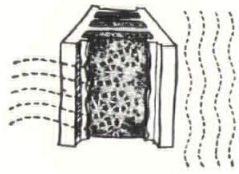
For Economy Because Zonolite Masonry Fill Insulation is poured into the block wall rather than applied to the interior surface, it allows the architect to achieve remarkable economies in construction. The interior wall surfaces may be of the same block that is exposed on the exterior. Decorate by simply painting.



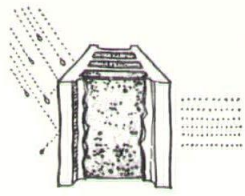
U=.33 WITHOUT MASONRY FILL

U=.17 WITH MASONRY FILL

For Insulation Value Zonolite Masonry Fill is an excellent insulation. The illustration above shows exterior and interior temperature contrasts on an 8″ lightweight concrete block filled with the material. Note the U value of .17. Without the insulation, the U value of this same block is .33.



For Uniformity of Temperature The interior surface of the block stays at a comfortable temperature, all over. There are no hot or cold spots, because the method of thermal transmission, convection in the block cells, is baffled. Conduction through the web of block is negligible.



For Its Water Repellency Each granule of Zonolite Masonry Fill is coated with a special material so that it cannot absorb and hold moisture. Exhaustive tests at Penn State have proved the remarkable water repellency of the material. Interior walls stay dry.

For Sound Deadening A benefit of using Zonolite Masonry Fill Insulation. A common type of concrete block (3-cell, 8″ x 8″ x 16″) reduces the loudness of sound 33 decibels all by itself. Add Zonolite Masonry Fill Insulation and the loudness is reduced another 20% to 31%.

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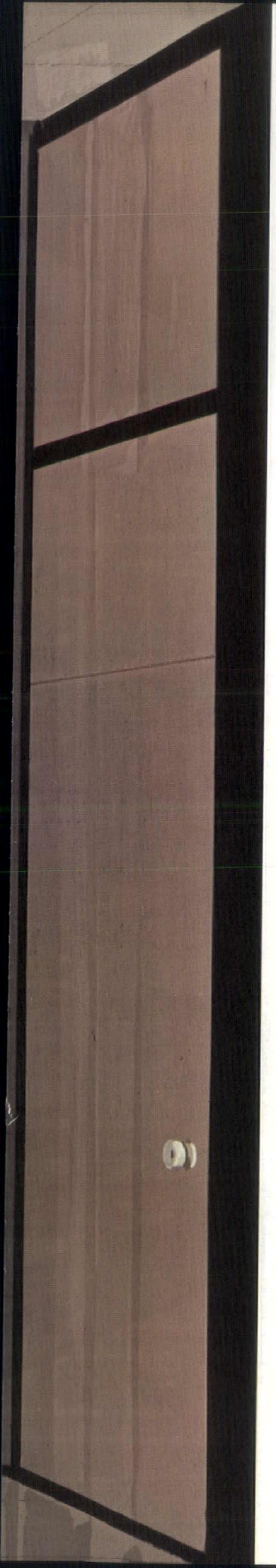

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The School That Grows and Grows

An annual review: the Department of Architecture, Iowa State University

The Designed Environment

BY RAYMOND D. REED, A. I. A.

Professor Reed is Head of the Department of Architecture at Iowa State University.

Civilizations may be defined as patterns by which man gives order to his environment. Order is projected by philosophy; that is, the understanding of underlying truths and principles, and by technology; that is, the capability to utilize resources. Philosophies and resources are interdependent and transitory. That is, evolving philosophies are shaped by and give shape to the environment.

The degree of well-being experienced by a civilization is directly proportional to its success in giving physical expression to its understanding of underlying truths and principles. The lack of well-being within our nation, uncivil riots, unwashed student protests, and increasingly ugly crimes in increasingly ugly cities, can be attributed to our inability to give physical expression to the underlying truths and principles of our society.

The importance of a designed environment for the United States is timely and critical. The United States currently utilizes a disproportionate share of world resources to sustain an affluent and perhaps wasteful standard of living. If living standards are to be maintained, the doubling of the population within the next forty years (some say if we are not talented we are at least prolific) will require a doubling of the nation's capacity to provide food, fibre and shelter. The additional pressures of a burgeoning world population and the real and politically forceful demands of "have not" nations for more equitable distribution of the fruits of world resources will increasingly stress the importance of producing more with less.

As a "have" nation exporting foods and fibres, the United States is relatively well equipped to meet increased demands. As a "have not" nation importing environmental design and shelter concepts from others more capable of integrating industrially-produced artifacts into environmental systems, the United States faces its most critical challenge.

Should the United States do little to provide a designed environment, the demands of increased millions will eventually lower living standards below levels of acceptable human dignity. Life sentences in the slums will discourage patriotism. Environmental discontent will find political expression as the frustrated "have not" slum dweller identifies with the revolutionary "have not" nations. Environmental pressures might force a hard revolution in which blood is shed, but will more likely encourage a soft revolution in which free enterprise and free will is shed for omnipotent socialism. As government *per se* cannot legislate an enriched environment, the design professions will be obligated to shape the environment in accordance with political decree.

The alternative to political revolution is a revolution within the environmental design industries. Should it be possible to provide the "have nots" with the equitable amenities of life through a more efficient, designed utilization and integration of human and natural resources, social and political differences will lessen under the pressure of common self-interest.

When plotting revolutionary actions, it is well to be capable: Once upon a time in far away India, a monkey in a tree overlooked a fish in a pool. Many fair days were spent in philosophical discussions as they became fast friends. Then came the monsoons. The shivering monkey, hunched under the dripping leaves looked down upon the poor fish swimming for his very life. Out of friendship and compassion the monkey swung from his soggy perch and plucked his friend from the raging torrents. . .

Compassionate capability without understanding may kill. Frank Lloyd Wright once said: "A genius understands what others only know about." Yet understanding alone may not solve problems. A falling man who understands gravity continues to fall.

Louis Sullivan said: "The answer to a problem lies within the problem." It is not for us to deny problems, but to understand them. If we wish to solve our problems we must accept the issues we face. What are these issues?

The central issue remains that the United States is incapable of giving physical expression to the underlying truths and principles of our society. This disability may be traced to unrealistic cultural values and to inefficient production technology.

The designed environment is a consumer product. If production of consumer goods lags behind demand, the nation is a "have not" nation. The basic problems, of "have nots" are the stimulation of production, the social justification of distribution of inadequate production and the repression of need. Large population to low production ratios encourage heavyweight, low-efficiency, indigenous material, handicrafted artifacts. The needs of "have not" nations encourage revolutionary policies designed to rapidly change the insufferable present.

This is our current status. It is not in our best interests to encourage a handicrafted environment. The designed slums of bricks and two-by-four whittled sticks must go.

If production of consumer goods increases more rapidly than the demand for basic necessities, the nation is classified as a "have" nation. The basic problems of the "haves" is the distribution of excessive industrial production and the artificial stimulation of need. Distribution efficiency encourages sophisticatedly designed, lightweight, high-efficiency, miniaturized where possible, mass-produced artifacts. The successes of the "have" nations necessitate evolutionary national policies designed to maintain or enhance the desirable *status quo*. If the United States is to enjoy the benefits of a designed environment it is in her best interests to encourage high-efficiency production and distribution of more, for and with less.

Present inefficiencies can be directly traced to a cumbersome, disjointed, handicrafted construction industry. The architect, and to some degree the engineer, initially waste precious time in haphazardly determining client need. Additional time is lost in translating with legal exactitude the methods by which a third and unknown party might properly link a complex of materials into a unique series of systems that might

Continued on page 47

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"There is, or at least there is said to be, a certain faculty of mind, whereby the mind or the faculty, as you choose, is on the one hand enabled to dissolve a thing into its elements, and on the other hand, to build up these or similar elements into the same or a similar thing. This process is, I believe, called Logic; the first operation going by the name analysis, and the second, synthesis. Some men possess the half-faculty of separating; others the half-faculty of upbuilding. When the whole faculty exists in one man, in a moderate degree, he is said to be gifted. When he has it in a high degree, he is said to be highly gifted; and when in the highest degree he is called a genius or a mastermind. When a man has neither the one half-faculty nor the other half-faculty he is mentally sterile."

—*LOUIS SULLIVAN*

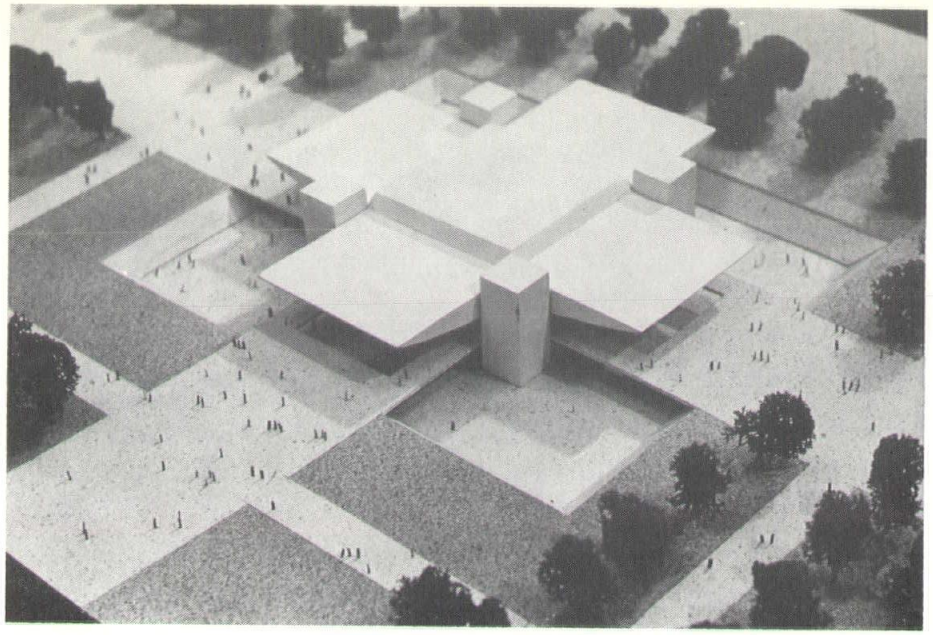
"The Young Man In Architecture"

"Our Department has a whole faculty".

RAYMOND D. REED

RAYMOND D. REED

Professor and Head of Department
B. Arch., Tulane University
M. Arch., Harvard University
Registered Architect



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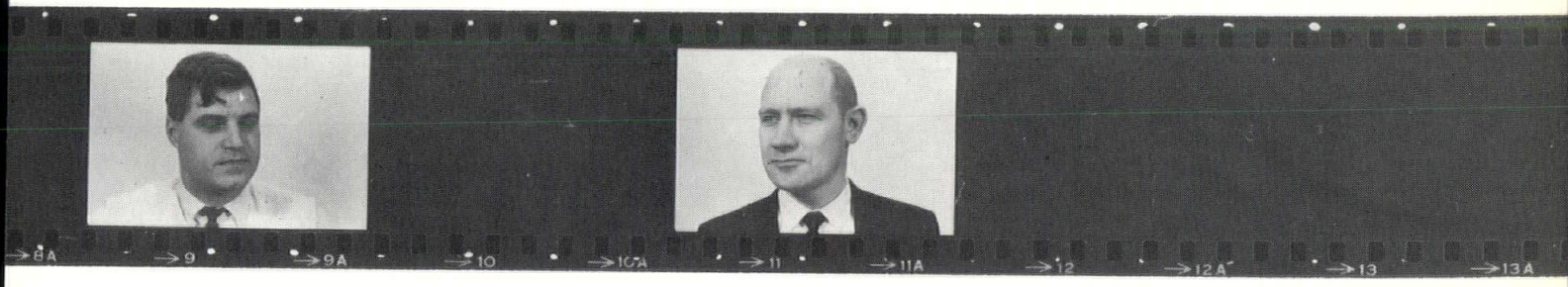

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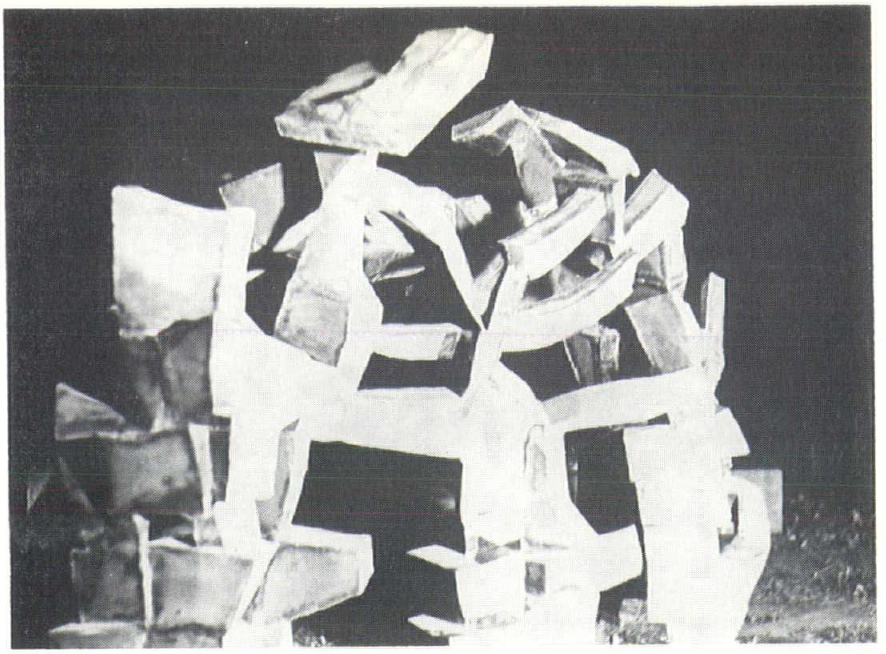

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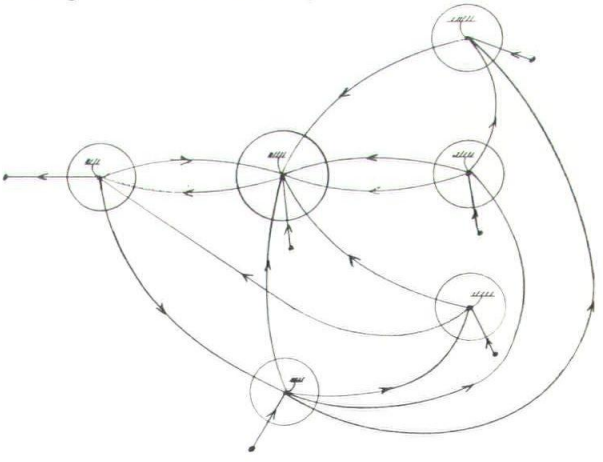
Michigan State University



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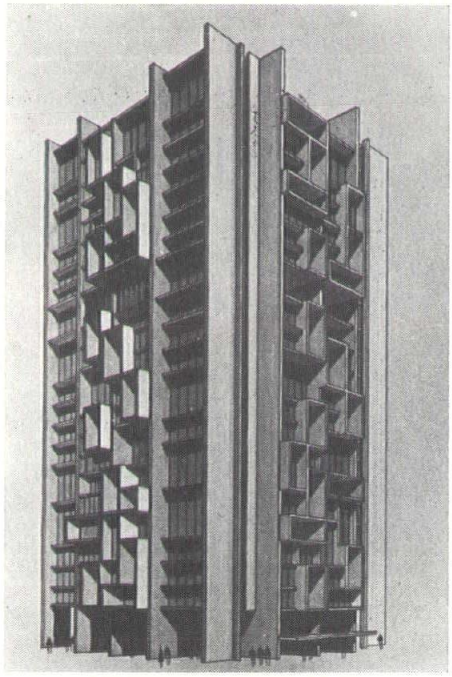
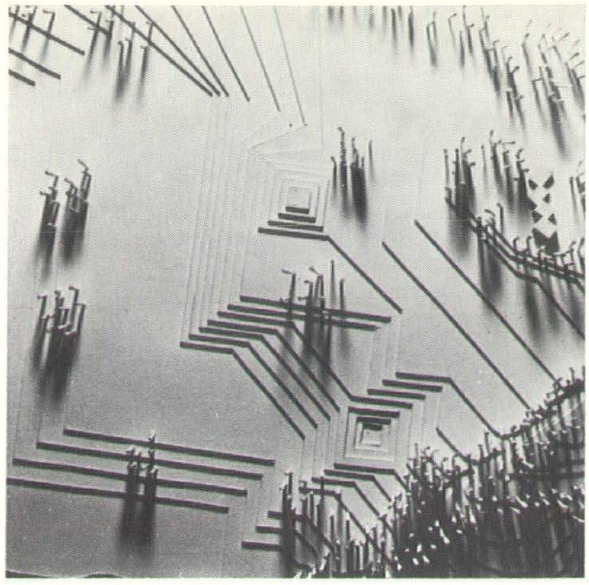
M. Arch., University of Minnesota





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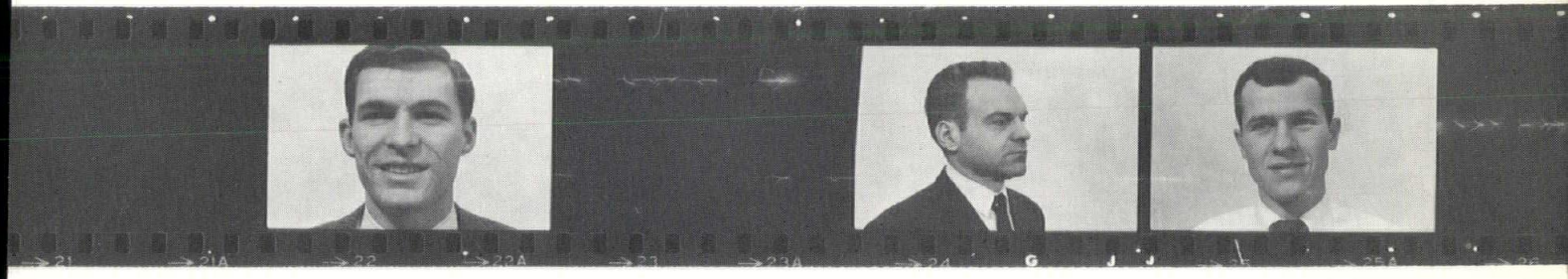

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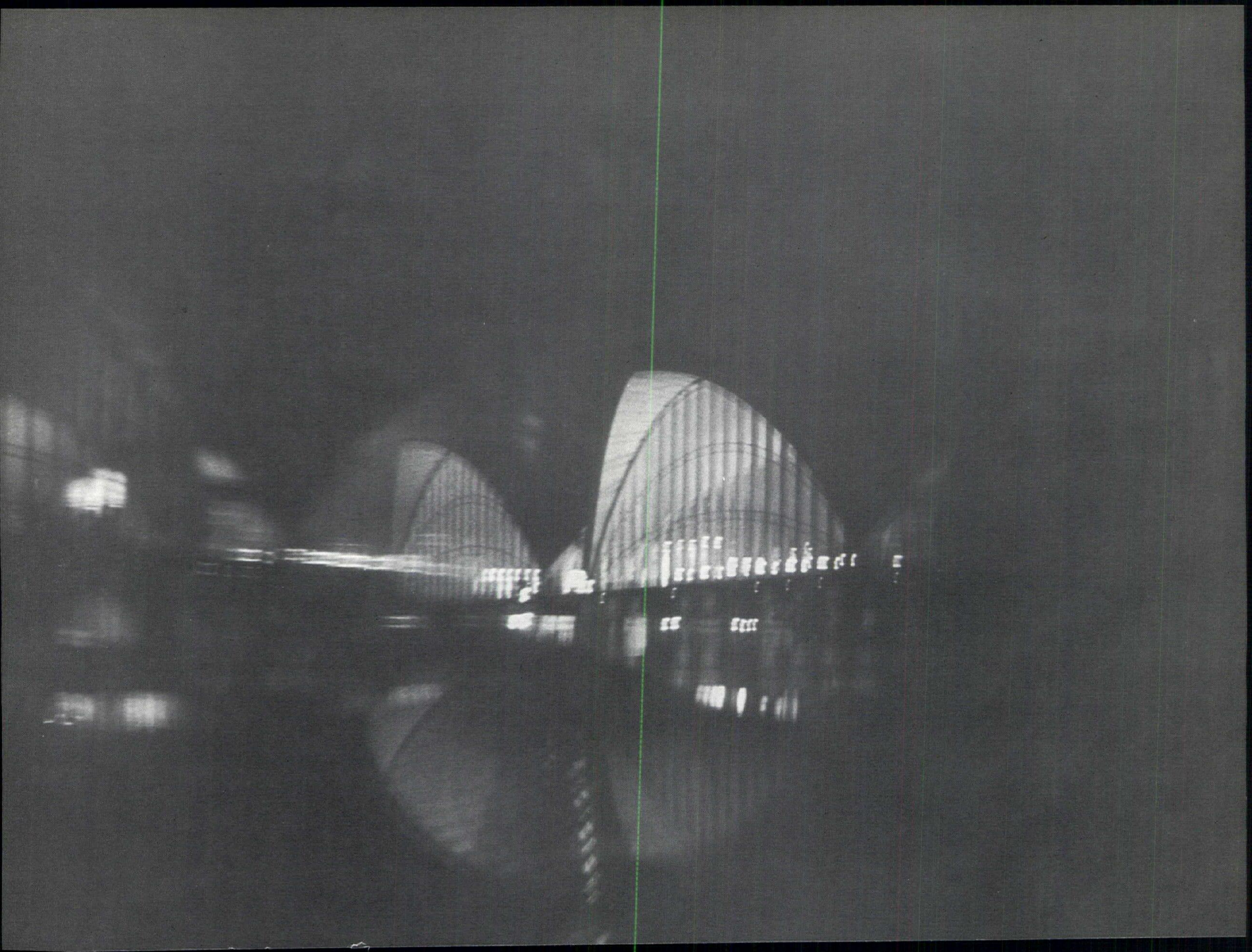


Student Work

Research Objectives and Design Course Determinants:

1ST YEAR

The investigation of natural and human determinants of a balanced ecology.

2ND YEAR

An introduction to structural systems and problem solving methodology. Empirical evaluation of selected architectural systems.

3RD YEAR

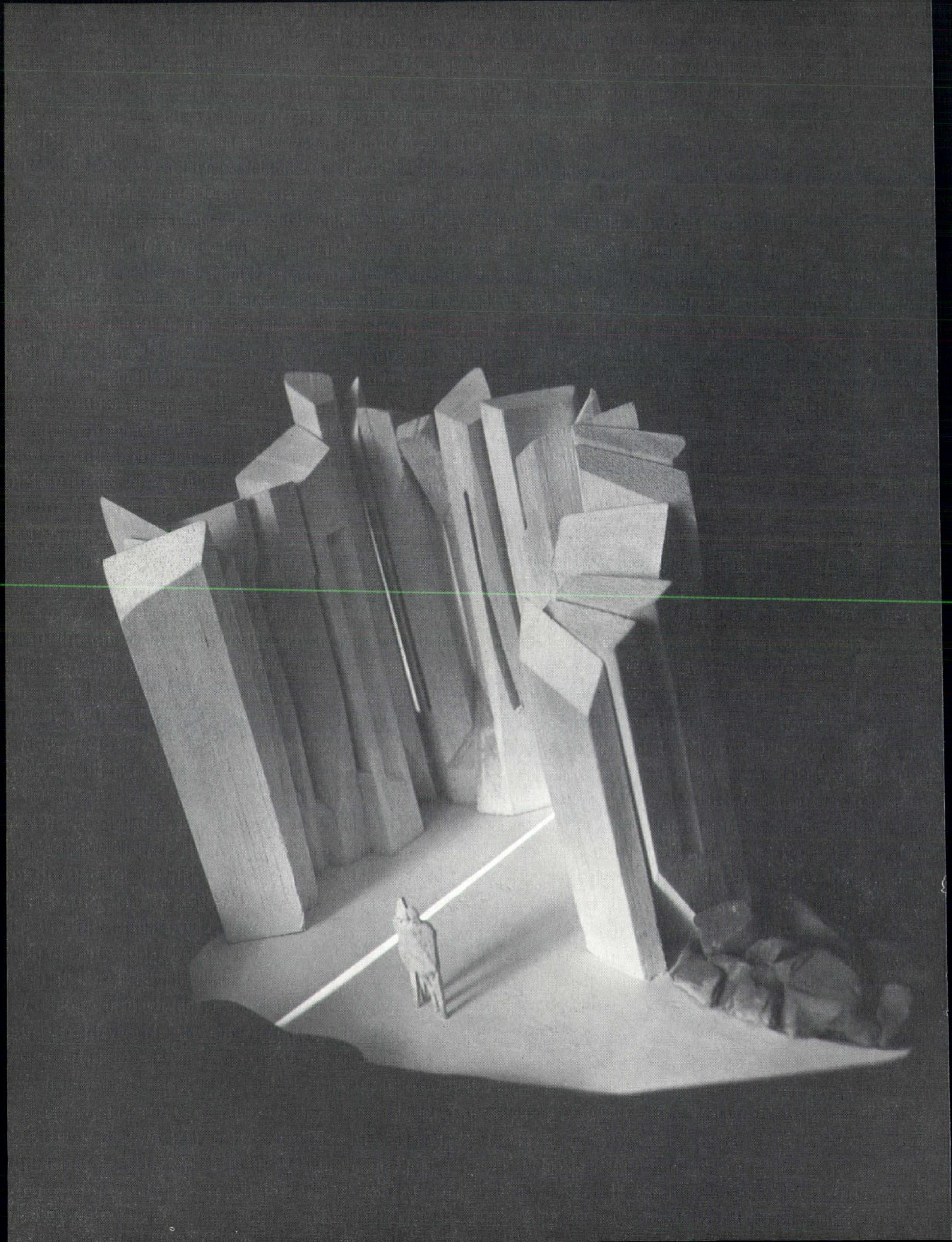
The analysis and investigation of building systems and programing techniques. Development of intermediate design solutions in the contemporary urban environment.

4TH YEAR

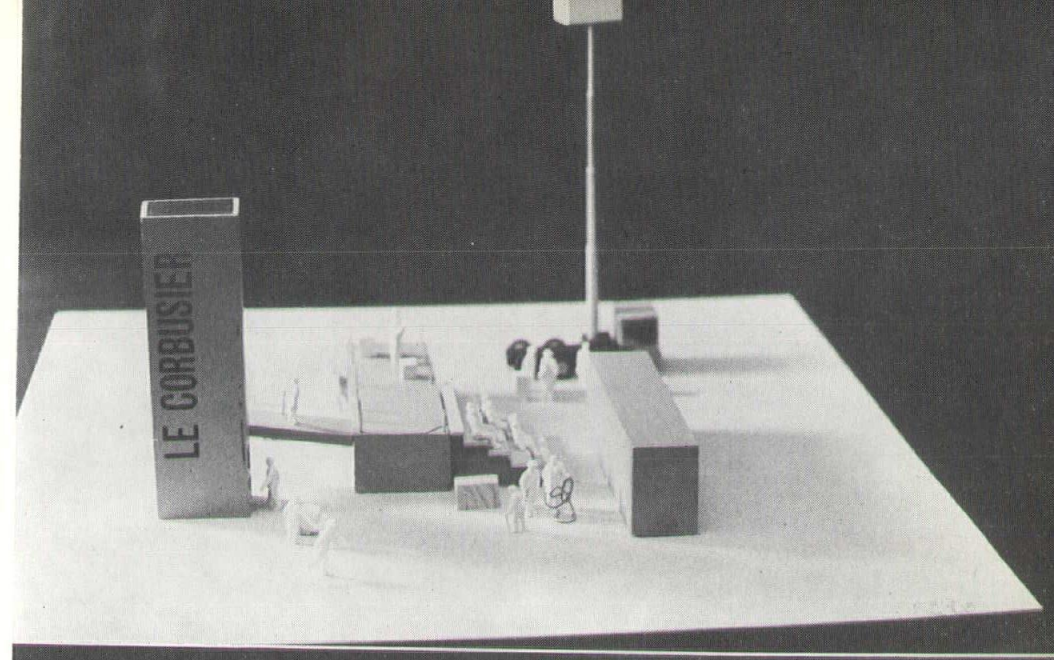
The analysis and synthesis of prototype systems in a balanced human environment. Direct application of component and system approaches.

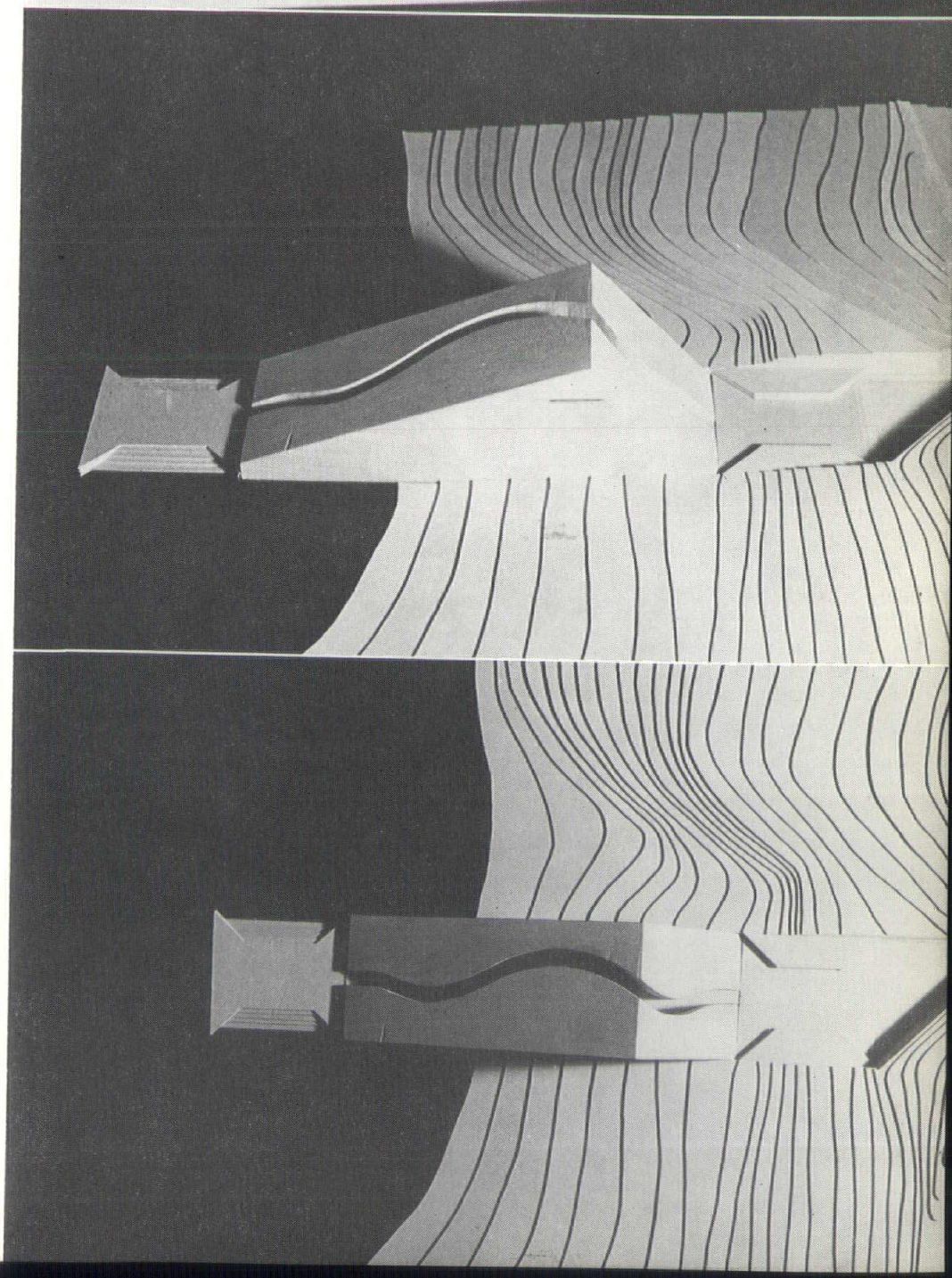
5TH YEAR

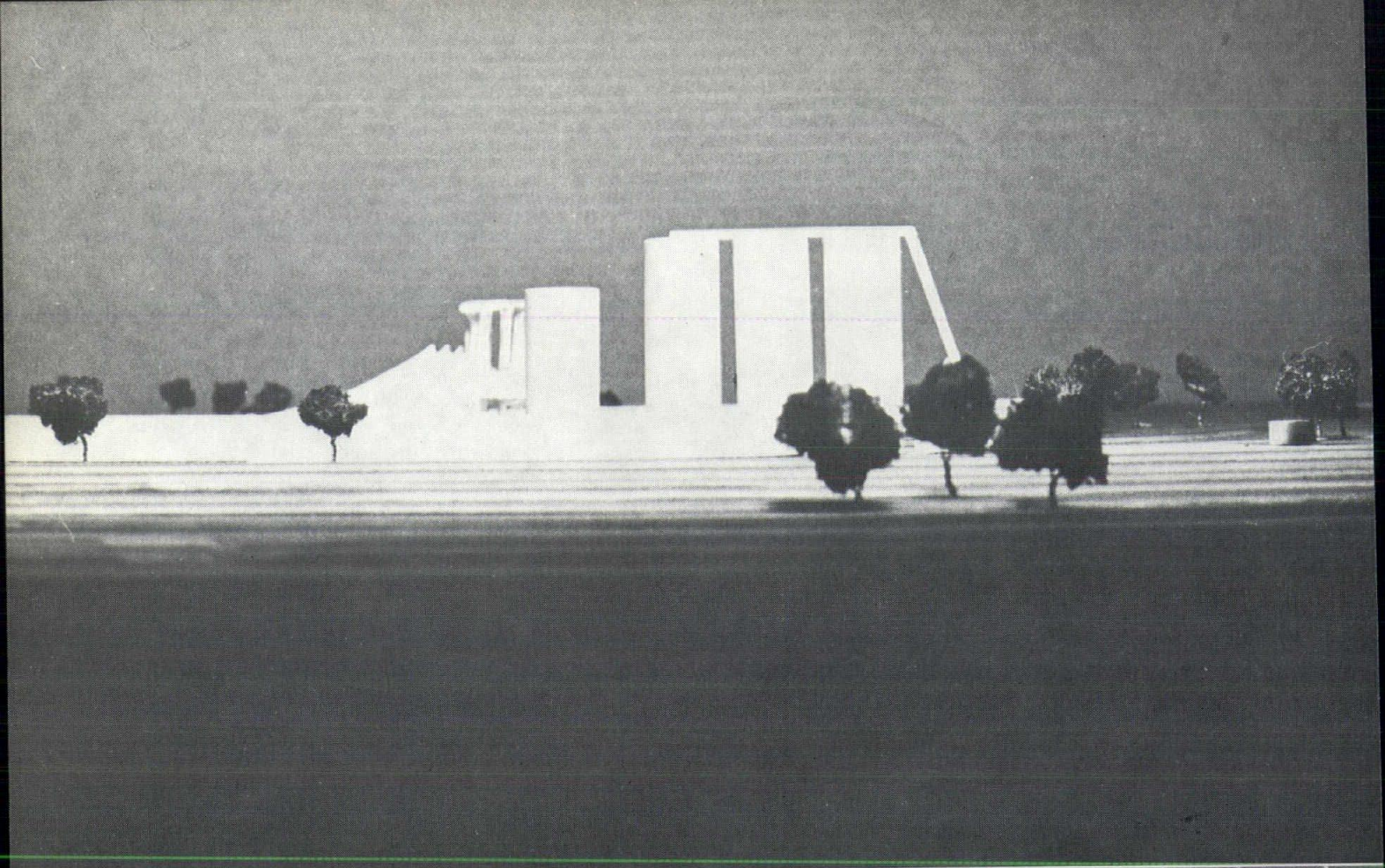
The design of continuous environments related to high-density contemporary socio-economic parameters. Individual development and expositions of a selected research topic.

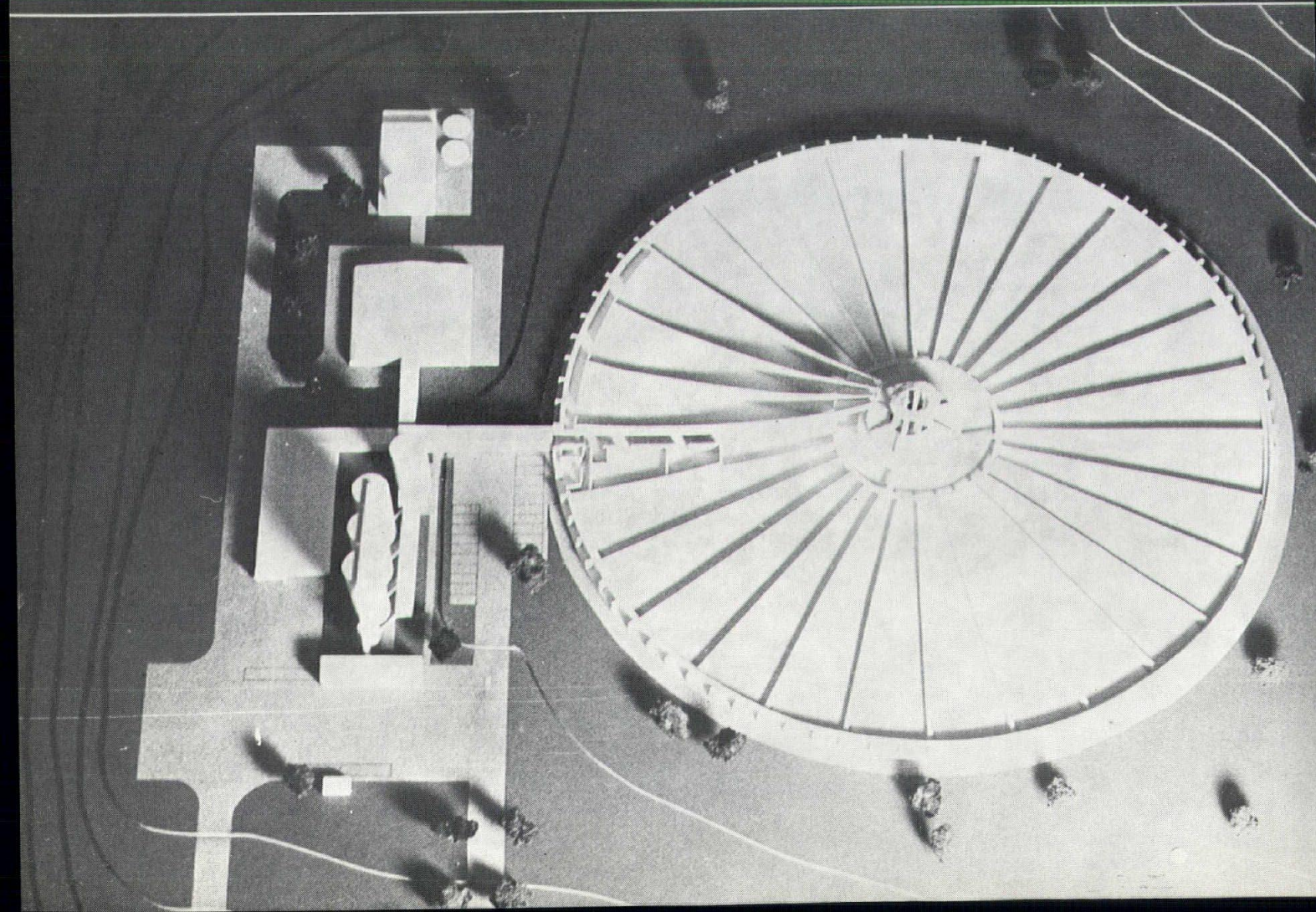


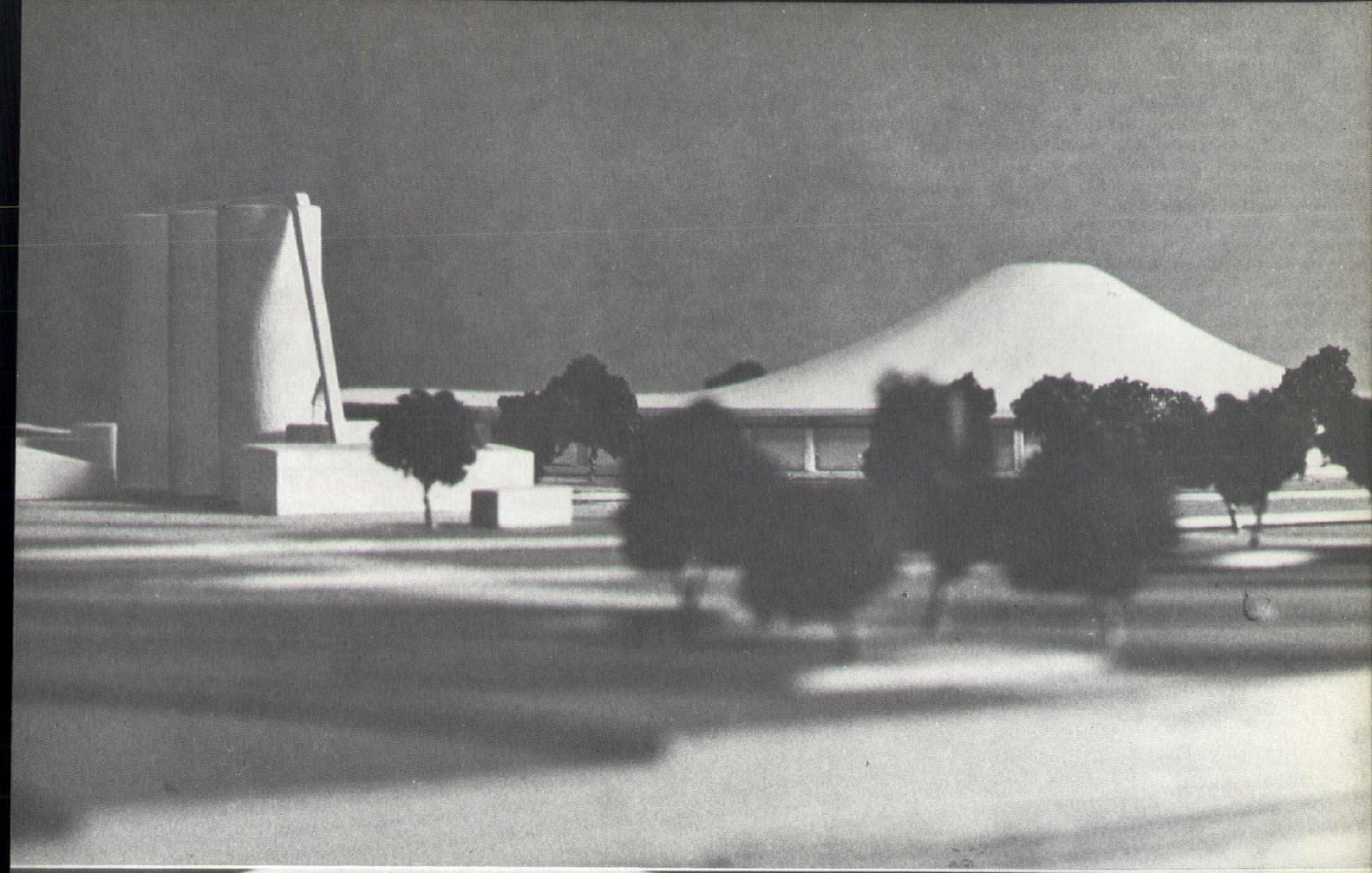
LE CORBUSIER
COMMEMORATIVE

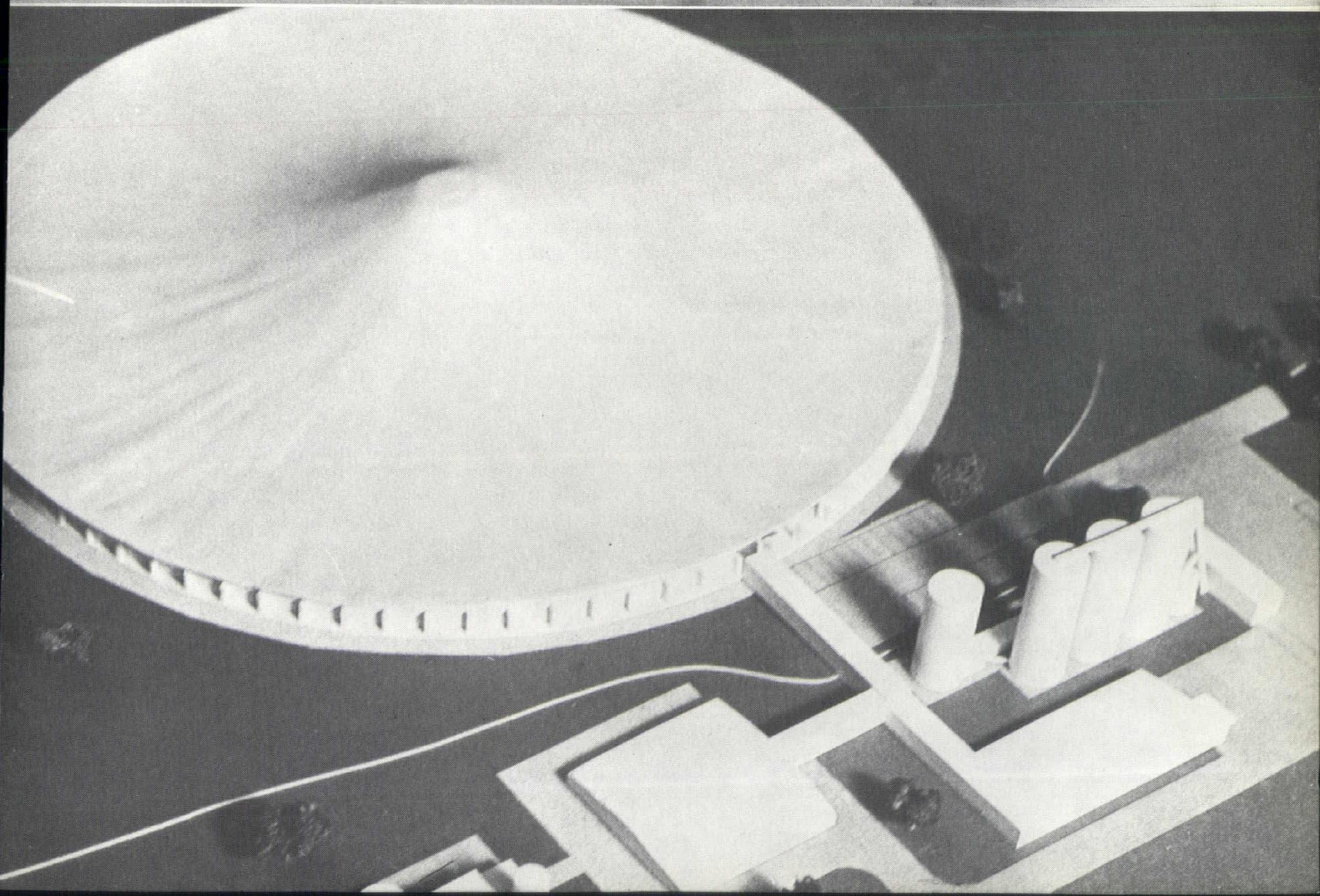


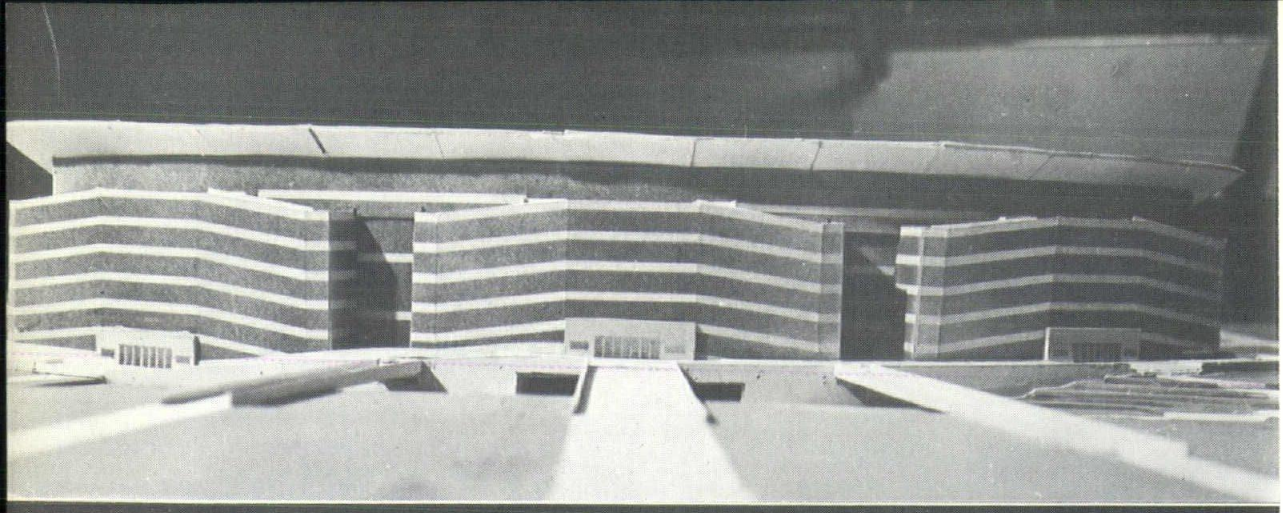


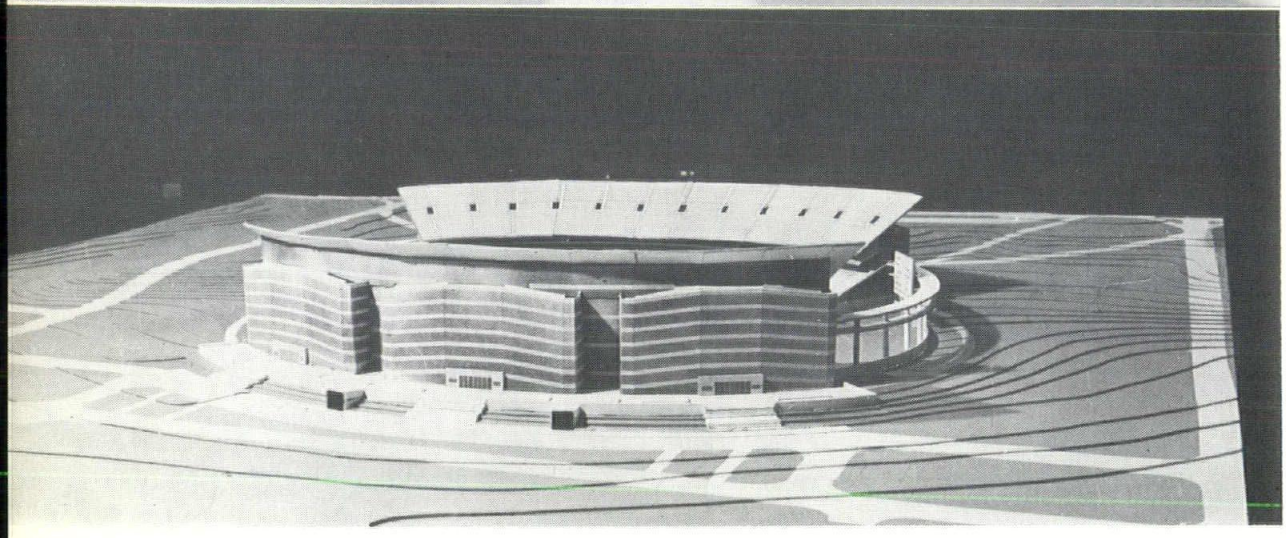




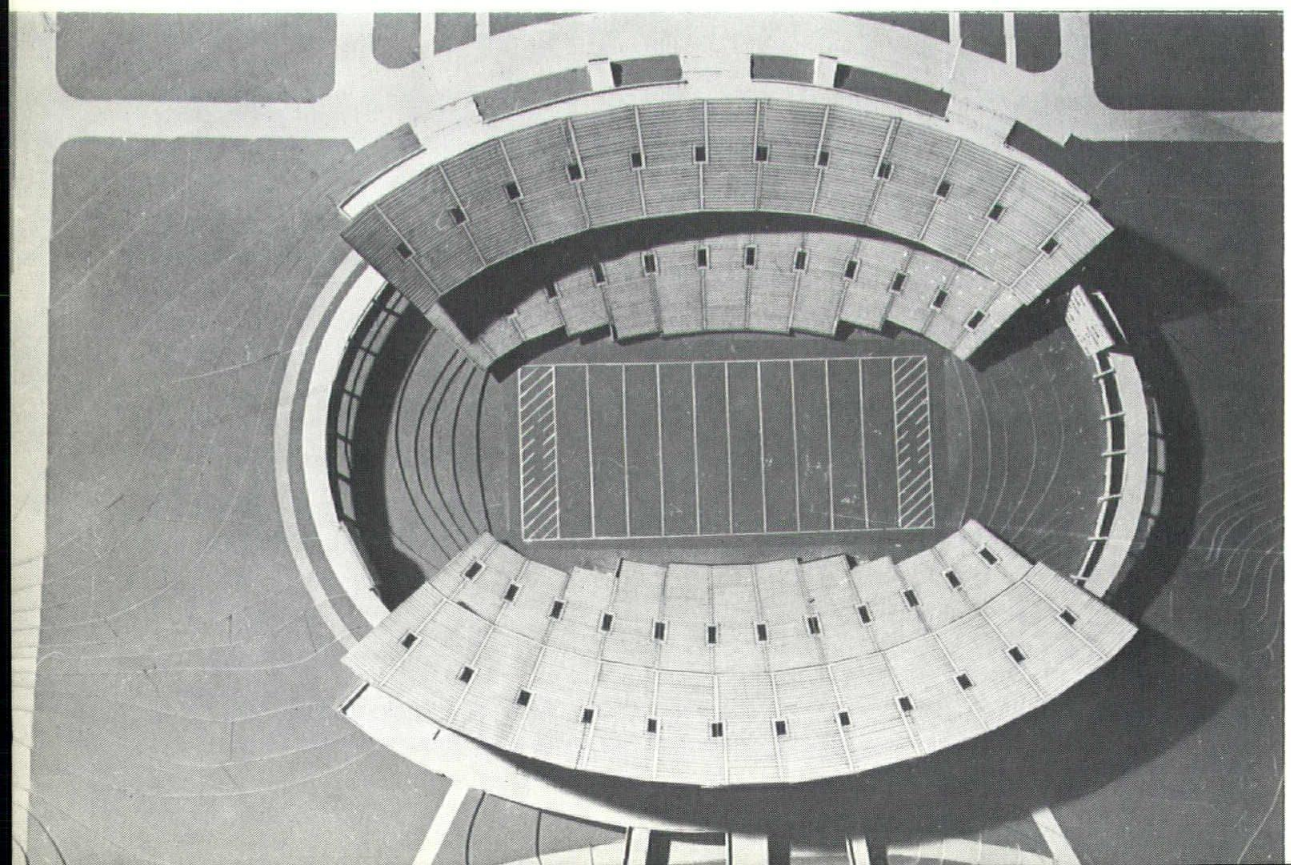




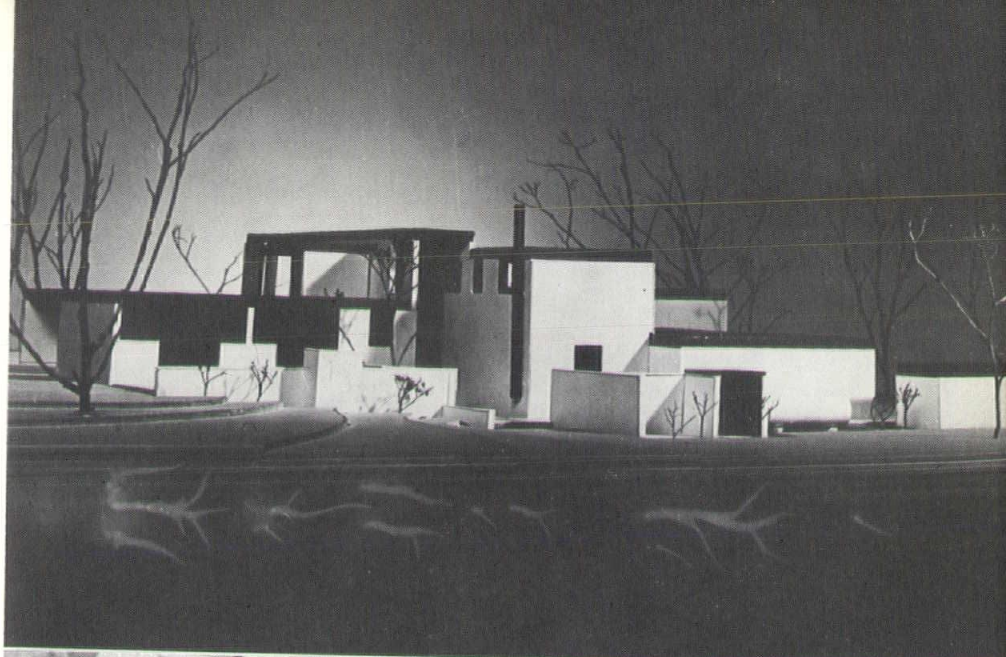




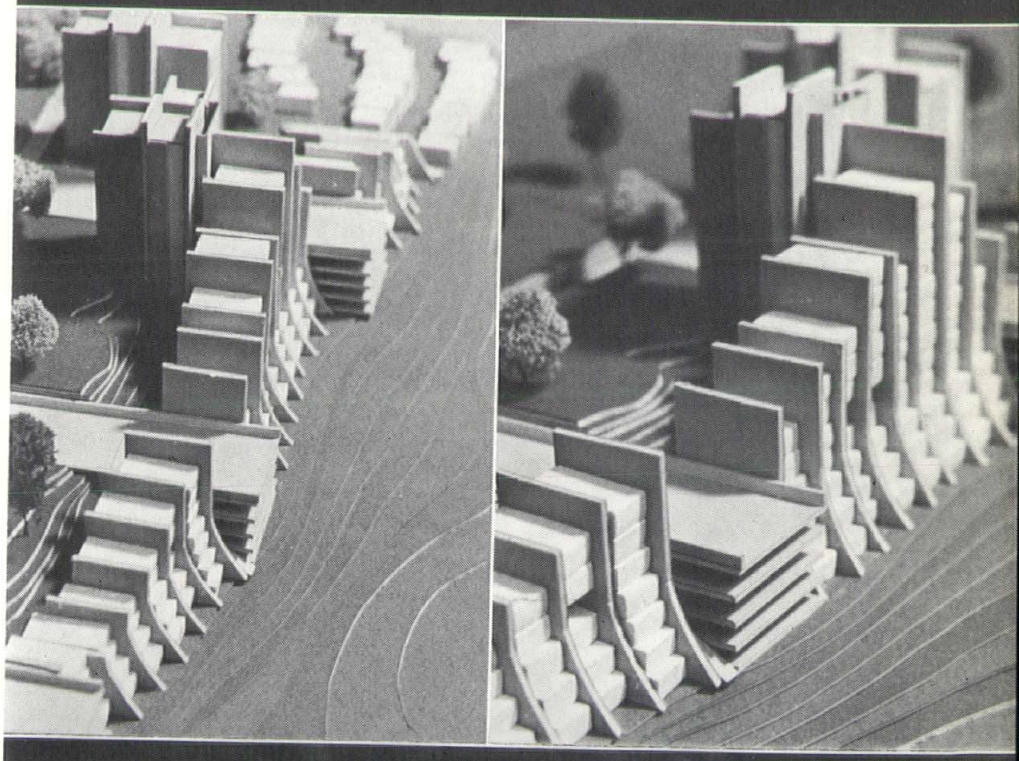
STADIUM PROJECT



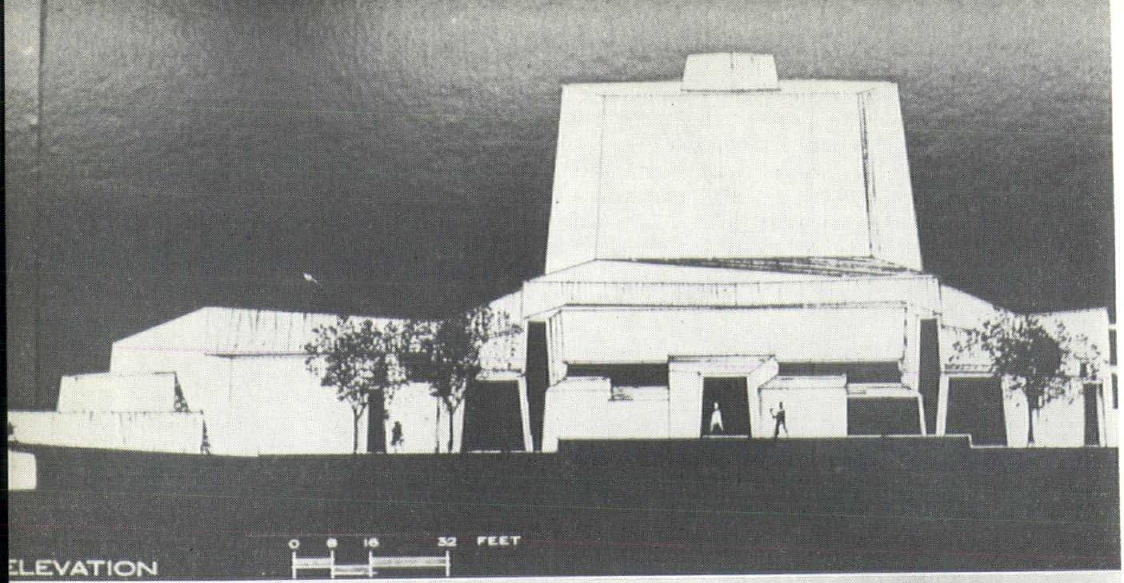
PHOTOGRAPHY
STUDIO
HOME

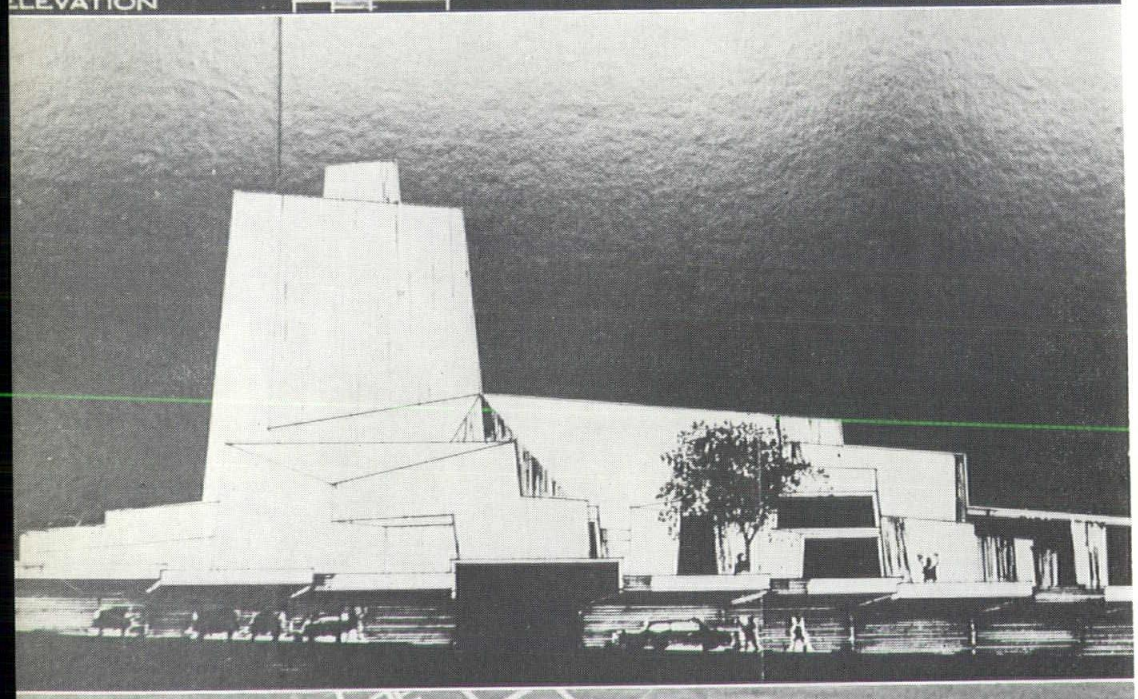


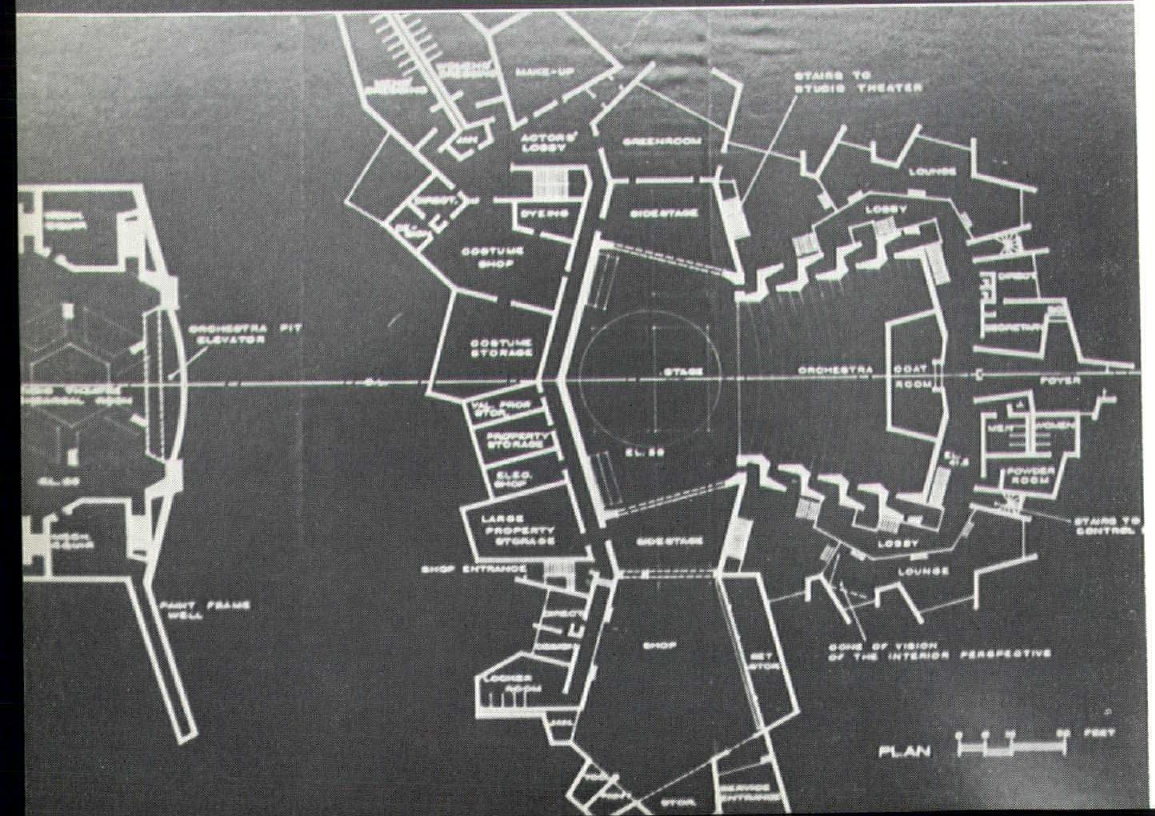
URBAN
HOUSING
PROJECT



RETIREMENT
VILLAGE


ELEVATION
0 8 16 32 FEET




MAKE-UP
ACTORS' LOBBY
GREENROOM
STAIRS TO STUDIO THEATER
LOUNGE
LOBBY
DYEING
SIDESTAGE
COSTUME SHOP
ORCHESTRA PIT ELEVATOR
COSTUME STORAGE
STAGE
ORCHESTRA
COAT ROOM
FOYER
PROPERTY STORAGE
EL. 88
POWDER ROOM
ELEC. SHOP
LARGE PROPERTY STORAGE
SIDESTAGE
STAIRS TO CONTROL
LOBBY
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LOUNGE
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PLAN
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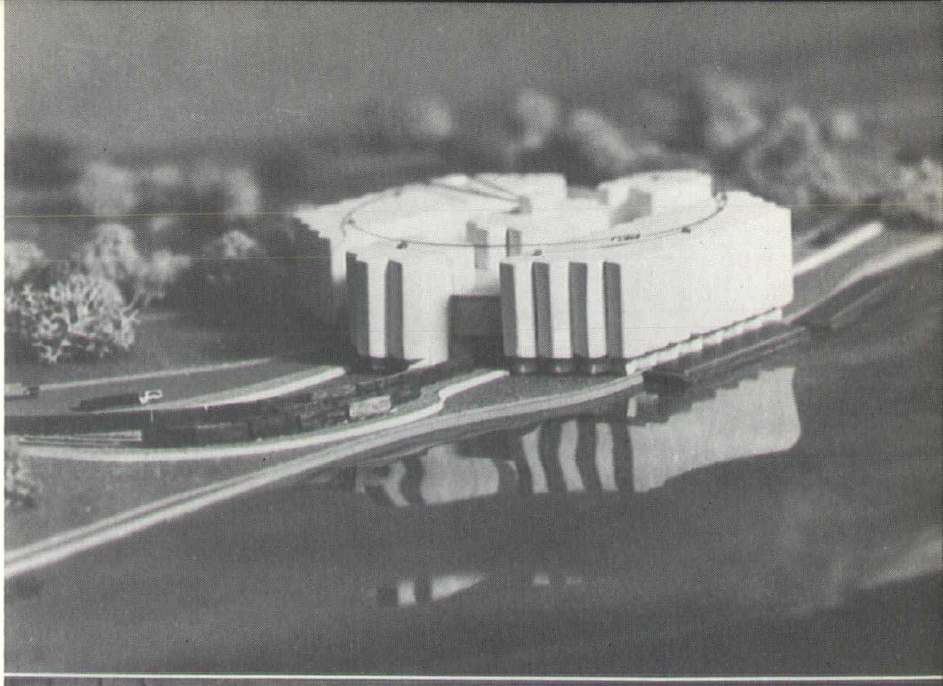
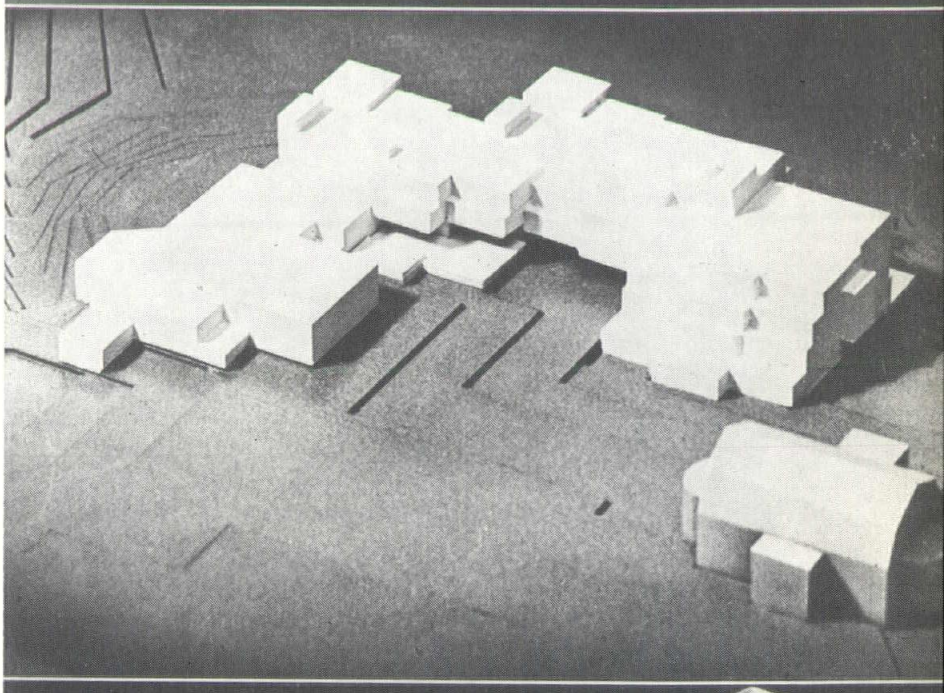
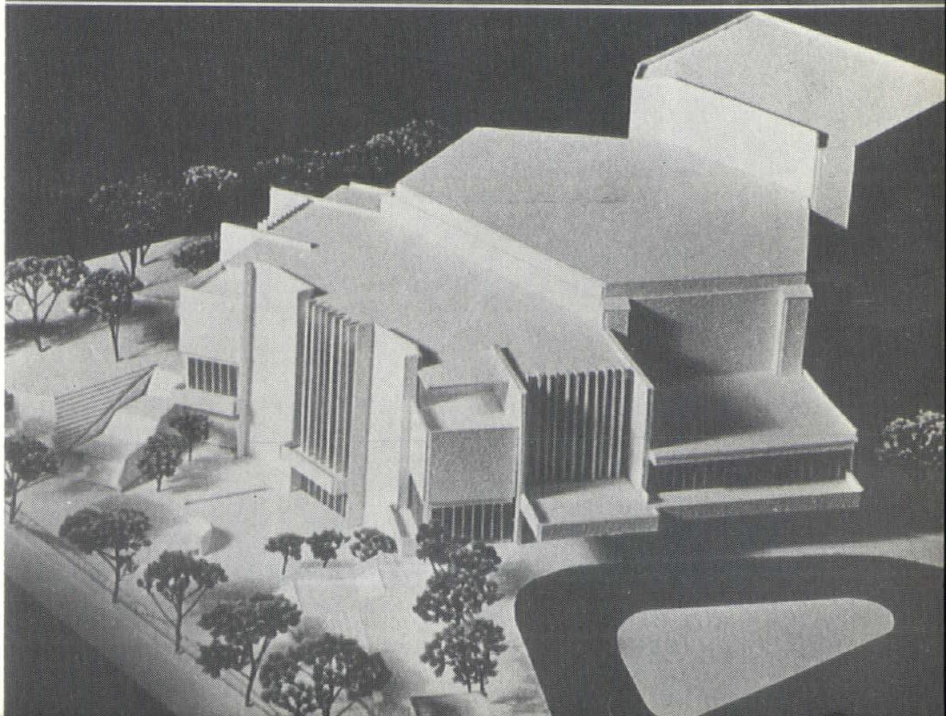
GRAIN
STORAGE
PROJECT



ARTS &
ARCHITECTURE
BUILDING



THEATRE
WORKSHOP
PROJECT



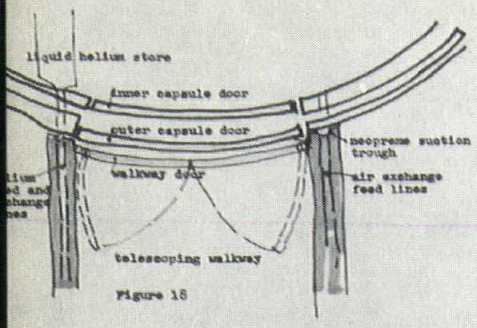
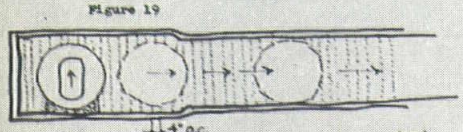
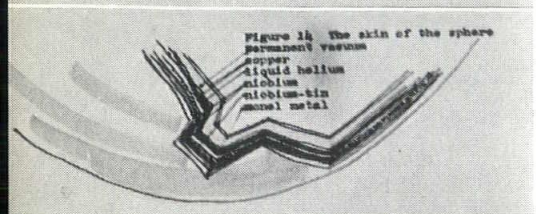


Figure 18

Figure 19



The capsule is initially at rest on a stand. It is bouyed up with current intensity and is then shot horizontally along the pathway.



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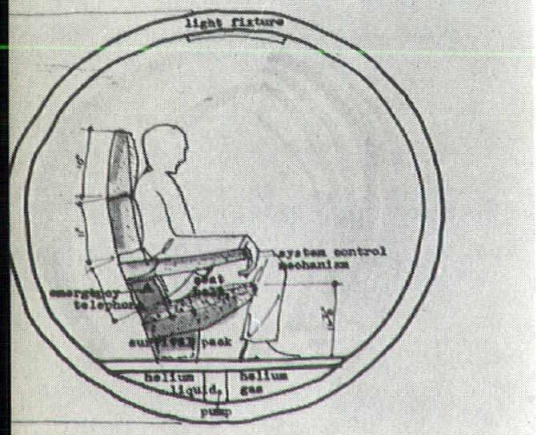


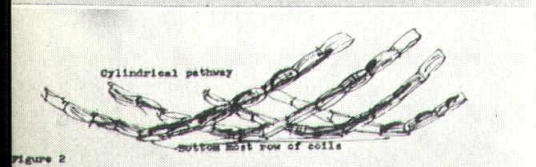


Figure 2

Figure 3 Graph forms of current as is fed to bottom most row of coils

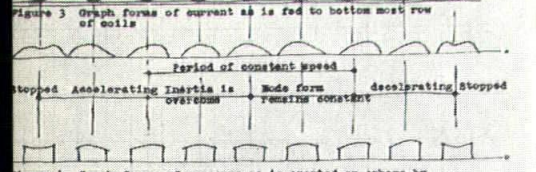


Figure 4 Graph forms of pressure as is exerted on sphere by bottom most row of coils

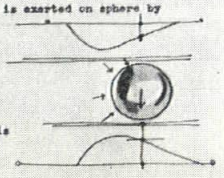
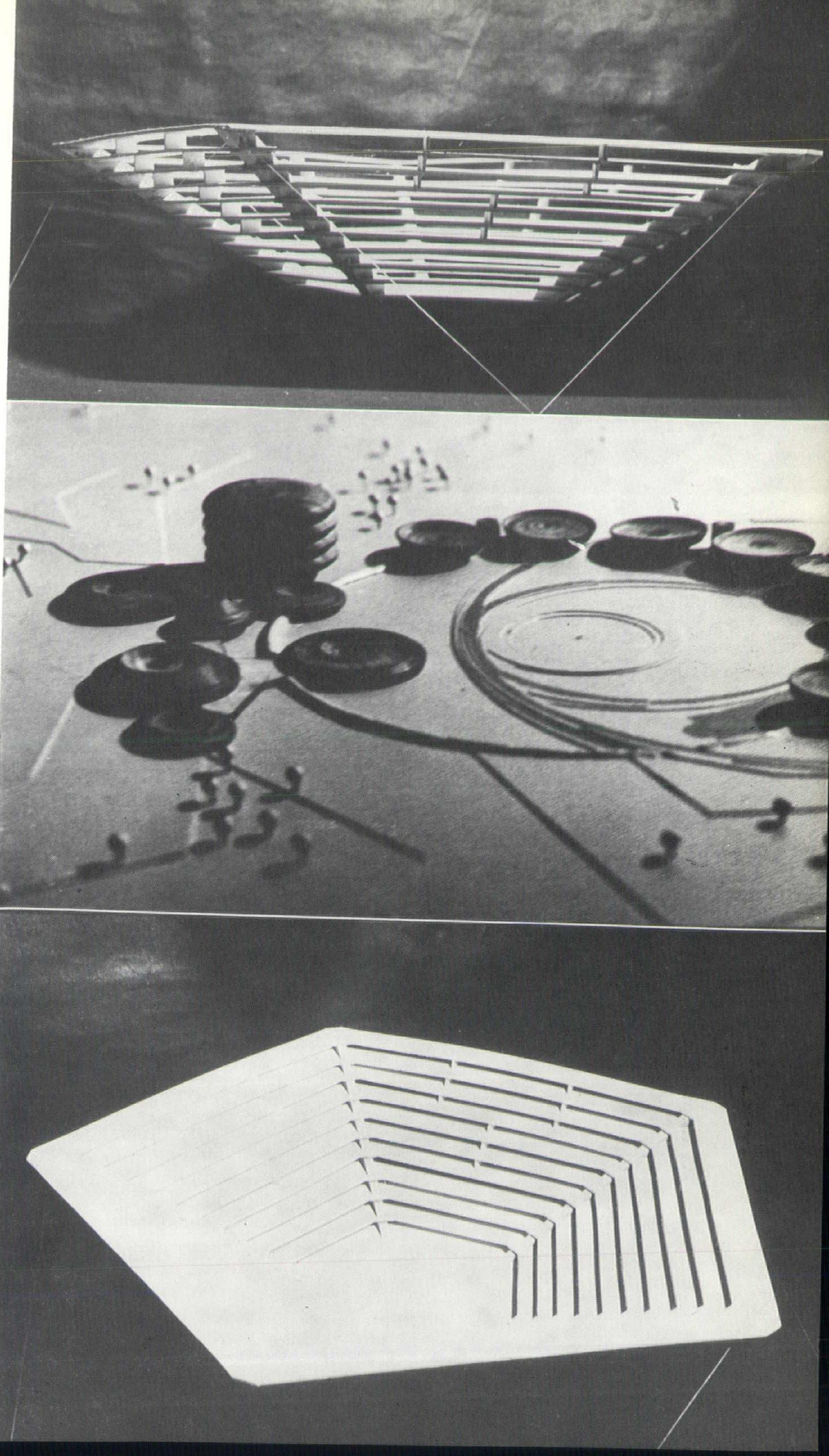
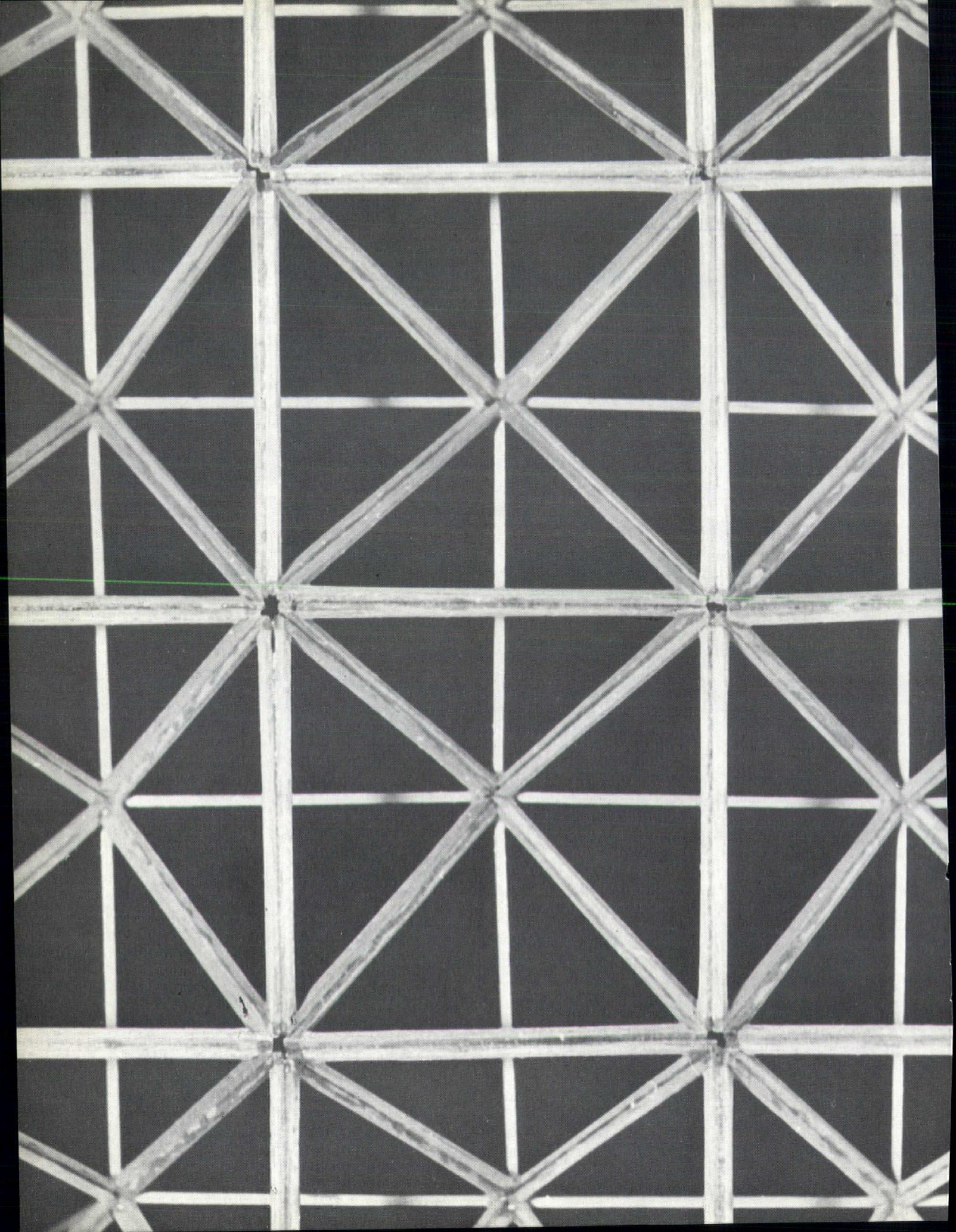


Figure 5 This figure illustrates that despite the fact that forces being exerted on the system by the capsule are not uniform throughout the surface of the capsule, this is due to gravitational forces, the capsule is kept from rotating, because forces which would permit this are exactly counteracted by the required magnetic flux. The capsule is being repulsed in a horizontal direction equally from all coils around the bands.

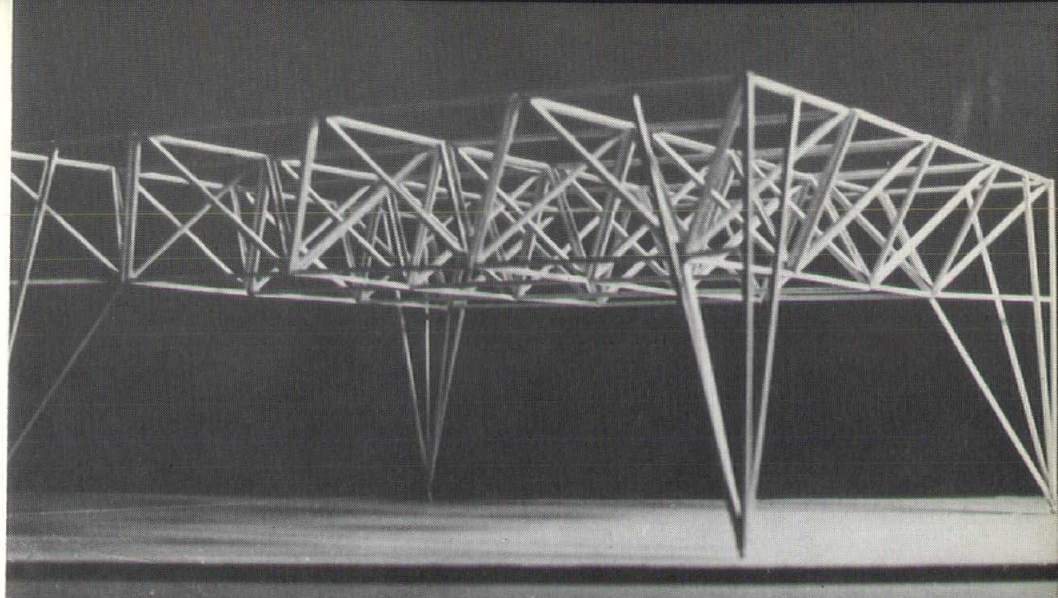
ELECTRO-MAGNETIC
TRANSPORTATION
MODULE

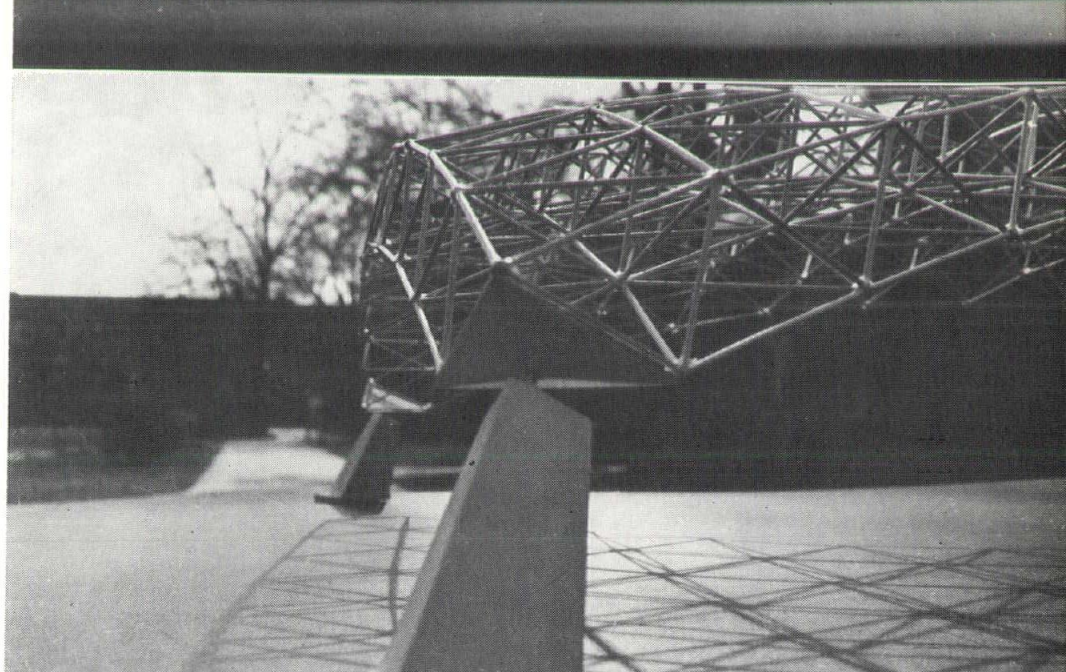
HABITATION
SYSTEMS IN
URBAN DESIGN

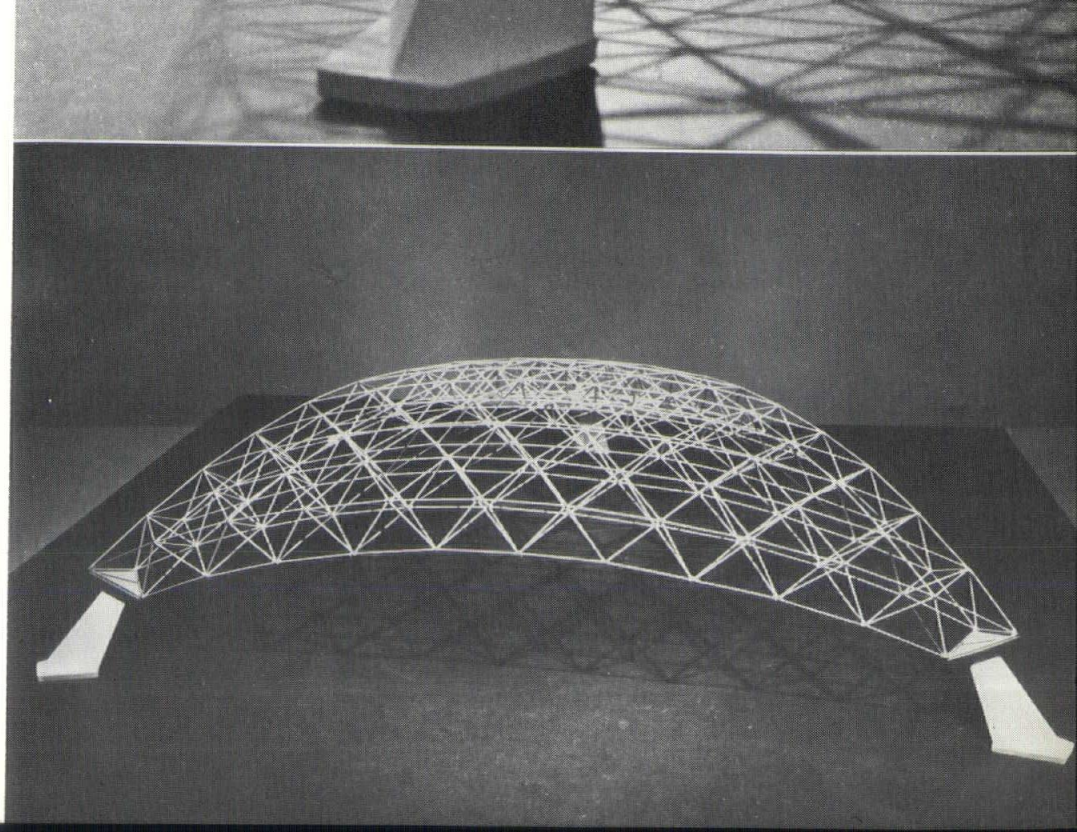


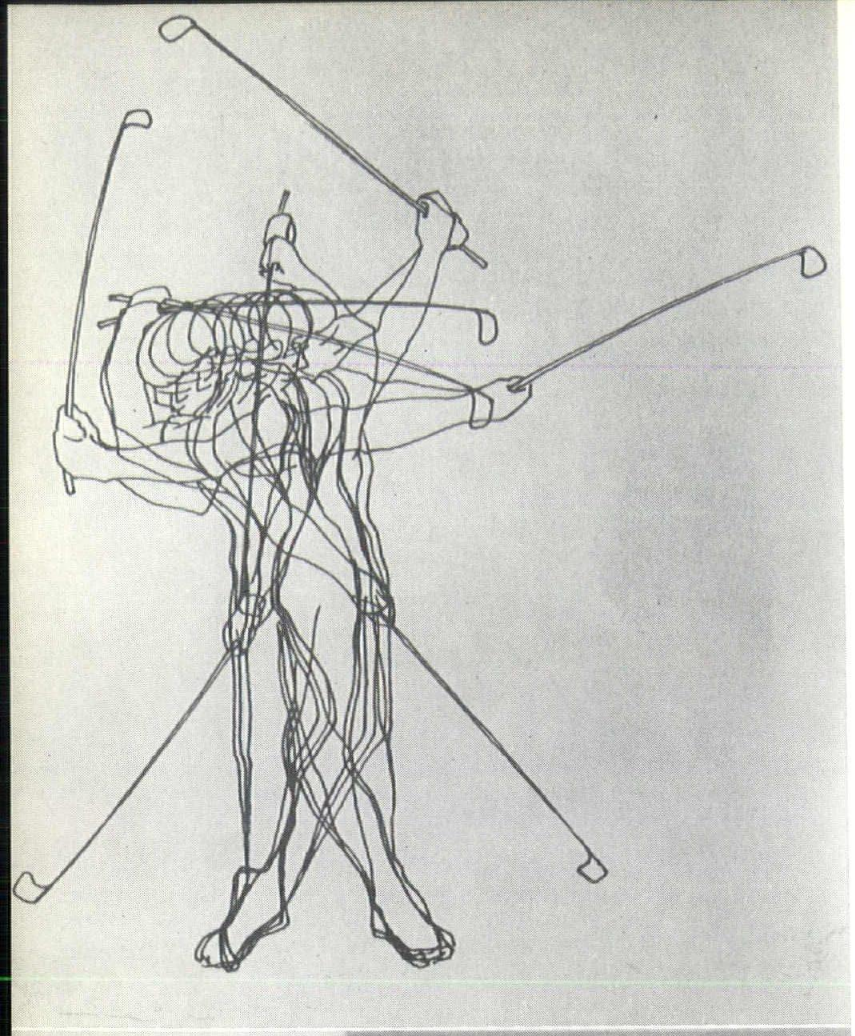


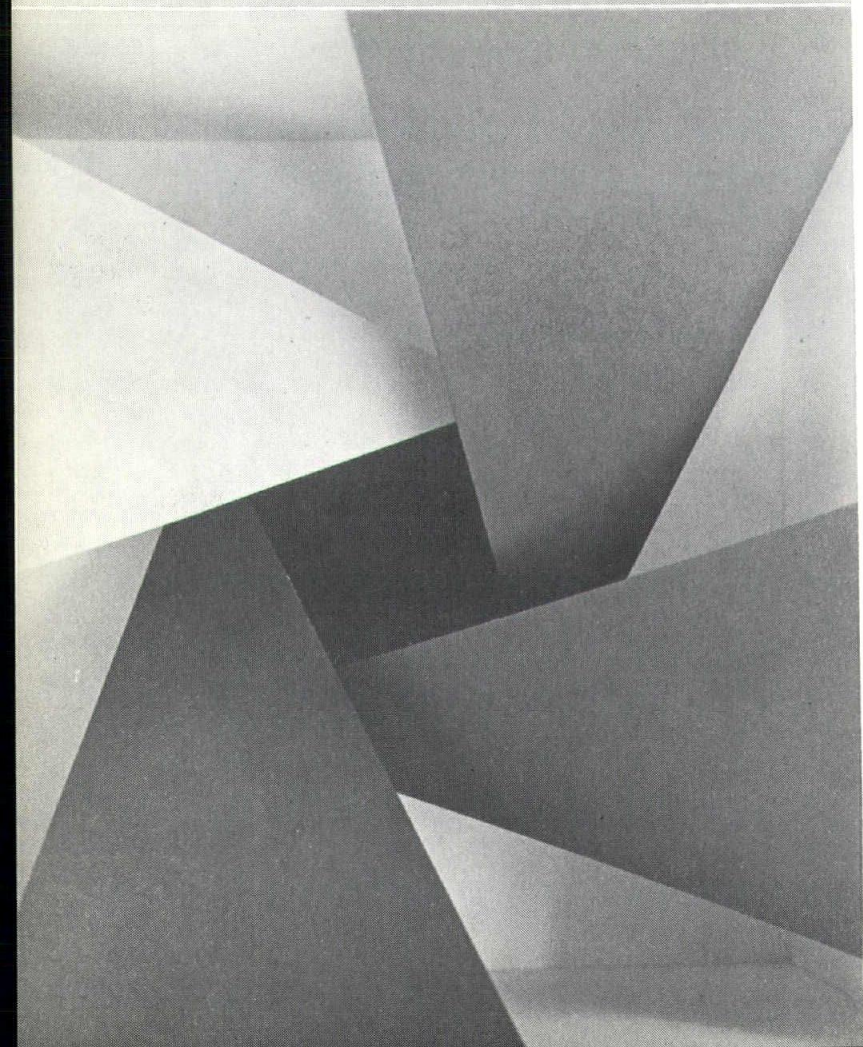
ANALYTICAL
STRUCTURAL
DESIGN
COMPOSITIONS



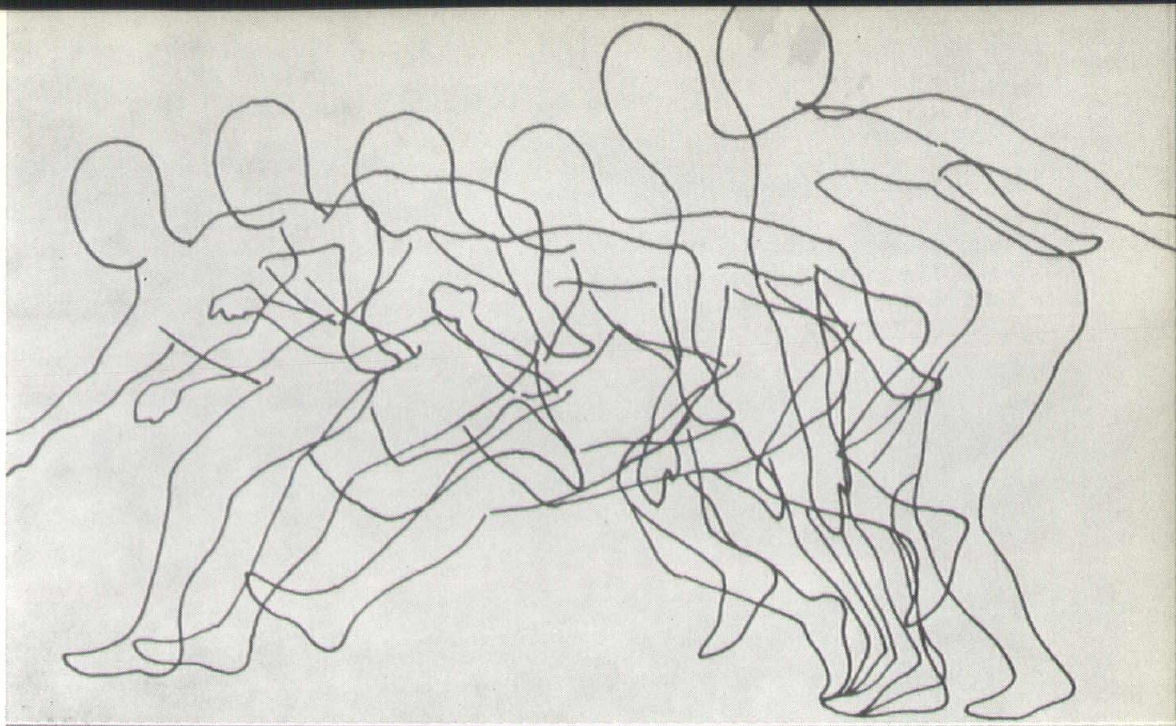


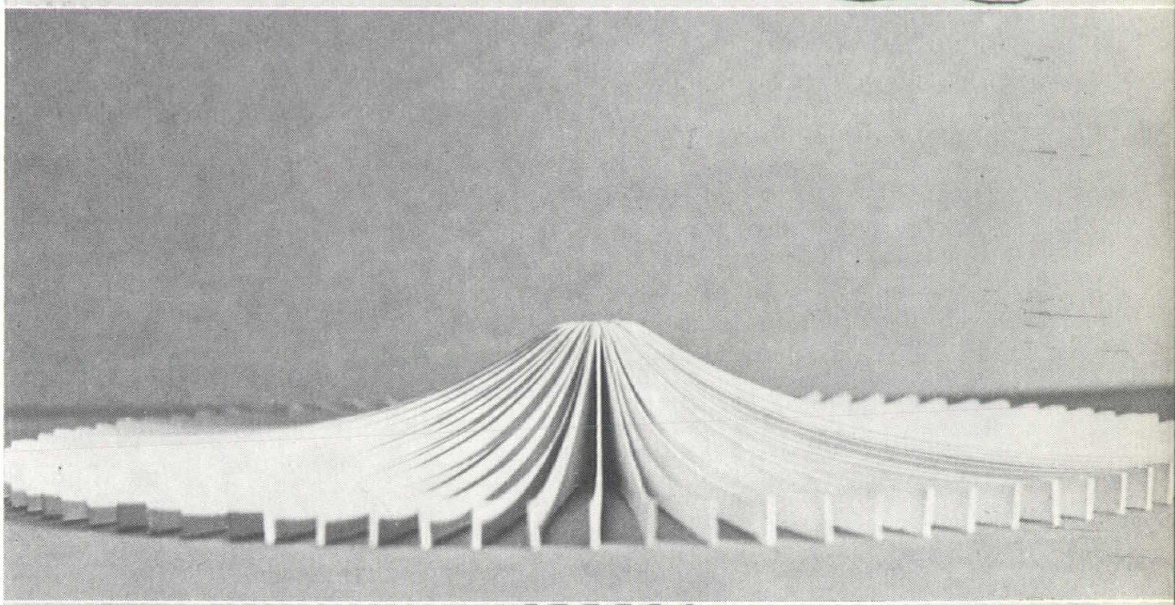


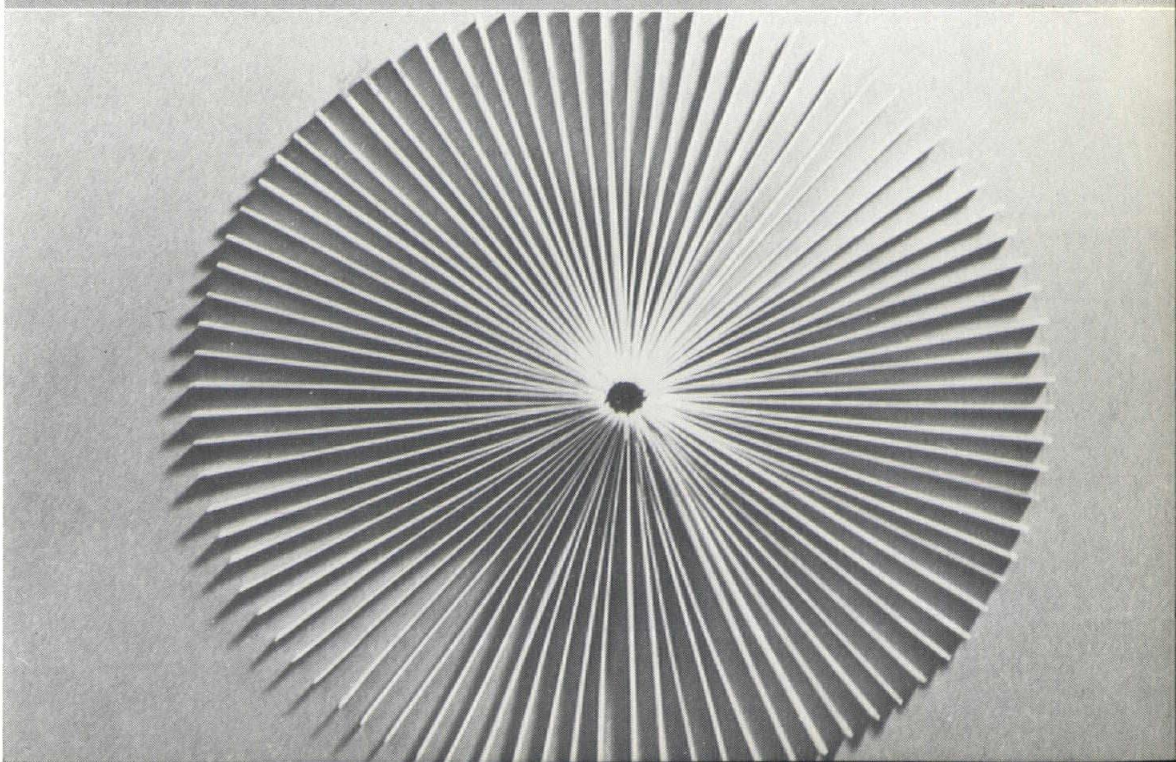




STUDIES IN
FORM AND MOTION







ISU SECTION PREPARATION:

James Brewer, A. I. A., Guest Editor
Howard Heemstra, A. I. A.
D. Eric Wheeler
Keith Rollenhagen

RAIN SCULPTURE

STUART M. BAIRD
"A Theatre for the Cobblestone Players"

STEVEN Y. BARNETT
"A Residential Community for the Multiply Handicaped Who Have Been Termed 'Unemployable on a Competitive Basis' by the State Board of Vocational Rehabilitation"

ROBERT R. BEUTZ
"Design of a Catholic Church to meet the Liturgical Changes of Vatican II"

JAMES A. BRYGGER
"A Fine Arts Building for Briar Cliff College"

JAMES S. COOK
"A Farm Analysis and Design"

JOHN P. DIEKEN
"A School of Music for Iowa State University"

LAWRENCE L. ERICSSON
"A Veterinary Medicine School for Iowa State University"

WILLIAM R. FREDREGILL
"A General Hospital for Franklin County"

DOUGLAS A. FREY
"A Cultural and Recreational Facility for the Young People of Ames"

WILLIAM R. GARRETT
"A Municipal Airport for Des Moines"

JERRY W. GUERTS
"A Classroom Building for Iowa State University"

STEPHEN J. HALLAUER
"A Computerized Post Office Facility"

MICHAEL P. HARTUNG
"A Resort for Manhattan Beach, Minnesota"

RICHARD J. HERRICK
"A Basketball Gym for Iowa State University"

JOHN R. HILLMAN
"An Atomic Energy Laboratory and Plant"

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"A Die-casting Plant"

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"A Pea and Bean Cannery"

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"A Center for the Culturally Deprived"

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"A Decentralized University Community"

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"A Public Aquarium for Des Moines"

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"An Aerospace and Civil Engineering Laboratory Classroom for Iowa State University"

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MICHAEL F. McPHERSON
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"Architecture for Various Approaches of Construction for Flying Bases on the Lunar Surface"

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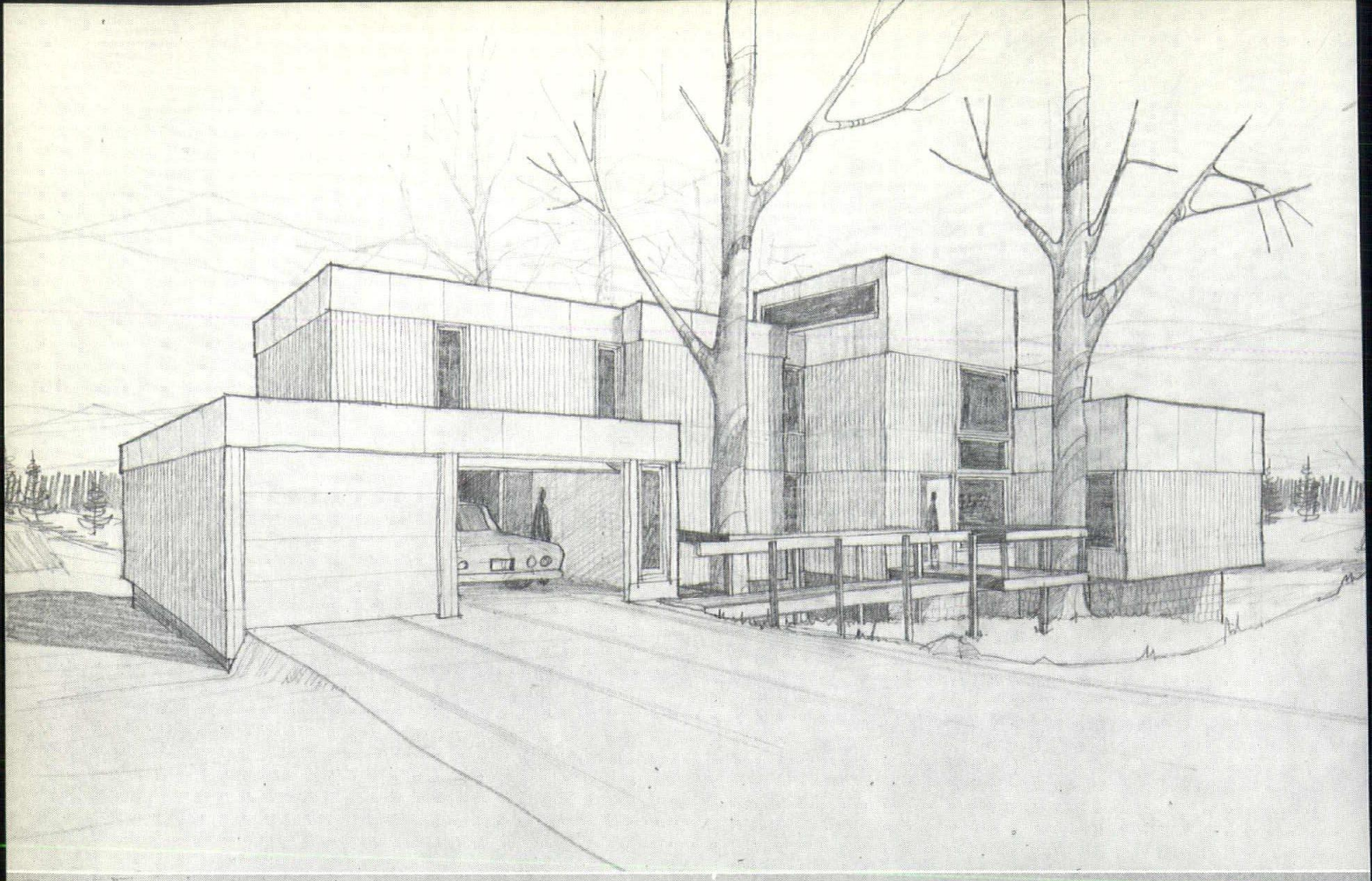
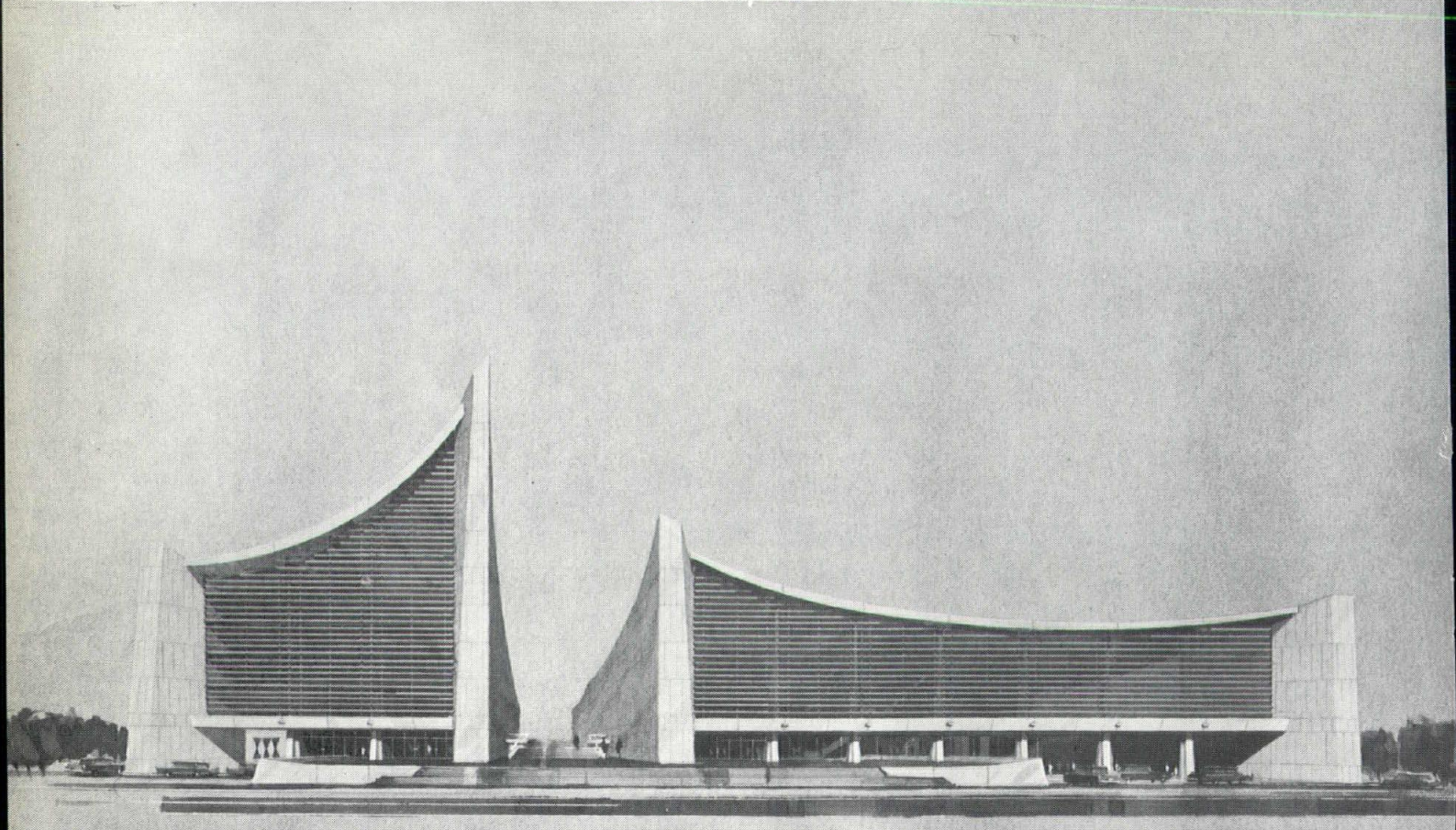
THOMAS A. WORNSON
"A Prototype Community College"

HAROLD M. YOUNGMAN
"A College Union"





東面遠景

DAVID J. BERINGER

Bellwood, Nebraska
B. Arch, Notre Dame University
Thesis topic: "The Economic and Aesthetic Determinants of Speculative Housing"

PREE BURANASIRI

Bangkok, Thailand
B. Arch., Chulalongkorn University
Thesis topic: 'An Electronic Bank for Des Moines, Iowa"

WILLIAM I. DIKIS

Des Moines, Iowa
B. Science, University of Kansas
Thesis topic: 'A History and Guide to the Architecture of Iowa"

NOBUO KAWASAKI

Tokyo, Japan
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Thesis topic: "Construction Scheduling"

ROMAN R. NAYAR

Madras, India
B. Arch., Madras University
Thesis topic: "State Bank of India"

ANDREW SEAGER

Bronx, New York
Cornell University
Thesis topic: "The Sociological Variables of Architectural Forms"

Upper left: House designed by William Dikis for Charles Herbert and Associates, Des Moines.

Lower left: Japan National Theatre Competition; collaborative design and drawing by Nobuo Kawasaki.

Architectural Re-education

BY TORE BJORNSTAD, A. I. A.

Mr. Bjornstad, senior architect for the Canadian Broadcasting Corporation, is teaching at ISU and doing research on the use of computers in architecture.

There is nothing more comforting to the practicing architect than seeing the architectural world through the tinted glasses of his own professional magazines. The realities seen by the outside world are quite different.

The architects today are not responsible for more than 10 to 15 percent of the total building volume of the world. They are doing very few of the industrial buildings; these are basically being designed by industrial engineers, structural engineers or package dealers. The large majority of housing is being put up by builders and speculators without the aid of architects and the manufacturers of prefabricated buildings are delivering buildings in more and more fields.

The percentage of the buildings designed by individual architects will also be greatly reduced due to the fact that computer-operating companies will hire staff architects and turn out "concept-standardized" buildings on a large scale. It has been predicted that over the next fifteen years, the number of buildings being designed by architects will drop to about 5 per cent of total construction volume.

The basic problem inherent in these changes is that we are not educating enough architects. Neither are the architects attuned to the real needs of society.

Basically, the type of architecture that predominates today is really nothing more than glorified Roman adopted to the new technologies. Needless to say that such an architecture as the architects are so fond of producing lends itself superbly well to standard Computer programing. Most of this type of planning could be handled without the constant implication of architects.

Most of the architectural schools throughout the country have now recognized that the educational methods of the last decade and the beginning of this one certainly do not fulfill the requirements generated by the needs inherent in preparing young men for the changing world of architecture. We will assume that the architects are not willing to accept the novel role of custom-making a very limited number of our buildings, and that they therefore wish to hold down a leading position among those forces responsible for future construction in this country.

If we take a really analytical look at the circumstances of the practicing architect, we recognize that maybe 80 per cent of his time is spent on sorting through routine, non-creative matters which really do not warrant his specific attention. The architect's efforts should be concentrated on the more creative aspects of his work—the ones that require individual attention and thought. Fortunately, the age of electronic data processing has brought us all the tools we need to bring about the changes in our professional practices that will provide us more time for creative thought. But, most assuredly, these changes cannot be instituted by decree alone. (There is so infinitely much more to computer application than coding!) What has to be brought about is that architects, present and future, must be trained to formulate their thoughts in logical array so that they can subsequently formulate them into procedures adaptable to methods of electronic data processing.

We have started, at Iowa State, to teach elementary methods of logical array structuring in design classes so that the students can prepare themselves for the onslaught of the computers. The system we are using at the present time is an early one, developed years ago by Richard Muther of Kansas City. This system consists of listing all the functions or factors involved in a particular planning problem and then establishing on a one-to-one basis the interrelationships between all these factors. Then, by putting grade or 'weight' values on the various relationships, a logical relationship can be established as it should ideally appear in a plan-layout. I should state that systems not unlike Mr. Muther's are what we are presently using to develop architectural computer programing for plan-layouts.

Critics may say that the computer is strictly limited in its application. I maintain that computers can be as creative in their planning as the most creative person programing them. There is no question in my mind but that most of the computer architecture that will come out in the next ten years will be better than the work turned out by the average architect.

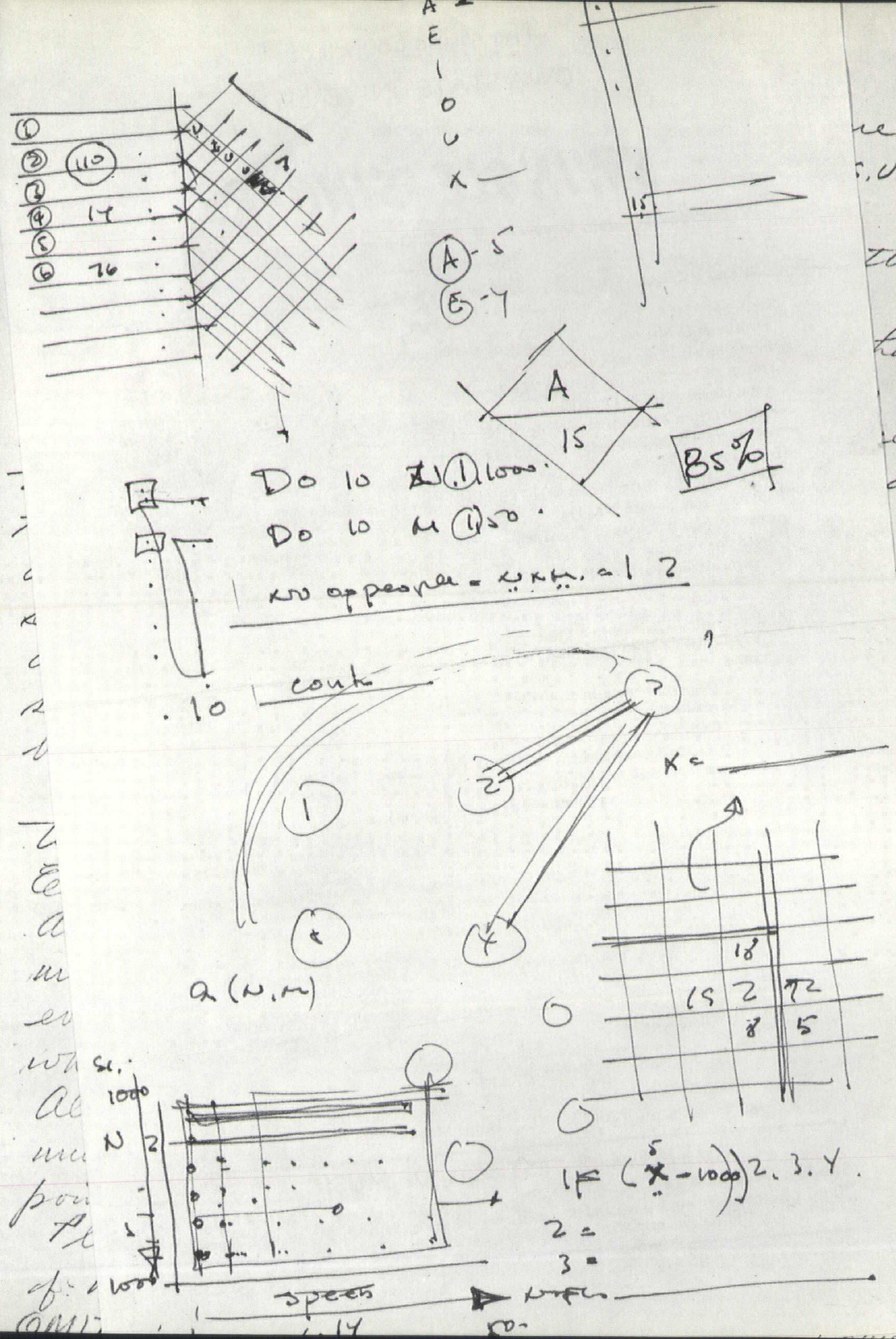
The architects could have avoided the onslaught of computers if they had obtained an exclusive license on the right to design buildings. It is quite evident that even where architects are required, many of the large building firms and speculators will hire top architects to turn out top-flight buildings capable of computer adaption and reproduction. The attraction, of course, is that a complex building, including programing, can be turned out in less than a week as compared with nine months for an architect.

The creative architect should be excited about the potential of computers. They will give him an opportunity to simulate the performance, quality and appearance of buildings while they are still only concepts on paper. Brand new potentials will be opened up for the acceptance of far-reaching building dreams. The less creative architects should also be delighted, as most of the routine drudgery normally performed by them can be done by a machine on command.

Lest there be at this point some question about it, let me state that electronic data processing is only a tool. The responsibility for purely creative architecture will be strictly vested in the architects for quite some time.

We have arranged for the computer to be a main topic at the Iowa Chapter A.I.A. convention in January. What computer technology will mean to us will be discussed by presentations of specialists from I.B.M. as well as by Dick Muther from Kansas City and C. Thompson from Houston.

Let me emphasize in closing that the most demanding requirement we face is to introduce these new concepts into our architectural schools. We must recognize that architects cannot afford to subscribe solely to a policy of self-admiration or to spend our time pouring out superlatives about what we are doing for the world. We will have to recognize and adjust to the world of exploding realities. Right now this world seems to be slipping away from us.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A Camera System For Models

An architect's idea and an engineer's design and photographic genius combine to create an unique new device.

Architectural model photography has reached such a high state of development that it is now possible to create an accurate eye-level graphic impression of a proposed building before it is built.

A camera system which will enable architects and students to achieve remarkable photographs of their models has been developed and constructed at Iowa State University. The apparatus will be put into operation following the completion of an enclosure for it in the Department of Architecture.

The need for such a system was made clear by Professor Leonard Wolf late in September of 1960. As Head of the Department of Architecture at that time, he presented the challenge of its design and construction to Ken. L. Henderson, Assistant Professor, (Mechanical Techology, Technical Institute) newly arrived on campus but by a few weeks. Professor Lawton M. Patten of the Department of Architecture was designated architectural consultant for the project.

Professor Wolf's feeling was that it seemed to be common practice at the time to make photographs of models for the model's sake, and that most of the photographs were "bird's-eye" views which he felt were of no interest to an architect's clients. He described the kind of model photograph which he felt would be of interest: one which would closely resemble the completed structure from, say, a corner of the grounds or from the middle of an adjacent street. Wolf asked Henderson if such photographs could be made. Henderson's reply was that he had already made some, and would present Wolf with some examples.

One of the examples, a typical one though not architectural in character, is shown on the facing page. In a contest of "table-top" photography, this print did not get a single vote, and the jury took Henderson to task for entering a picture not appropriate to the assigned subject matter of the exhibit. On learning that the subject of Henderson's photograph was a 13-inch model, they apologetically admitted that they thought it was a picture of a real boat. This, then, was the kind of illusion sought by Professor Wolf.

Subsequently, Dr. George R. Town, Dean of Engineering, asked Henderson if he could in his spare time design and construct a suitable camera for Professor Wolf, at the same time warning there were no funds currently available for such a project. With but a few weeks on campus as mentioned, Henderson was blissfully ignorant of the potential magnitude of his involvement. Probably out of habit engendered during more than forty-eight years in industry, Henderson accepted the assignment. Thus began the production of Professor Wolf's camera system, which has since its completion been dignified by the designation *Photo-Heliogon.*

The "spare time," usually evening hours at home, got stretched out to six years—September 1960 to September 1966, and Henderson's work became involved even to the point of making many of the small fittings for the Photo-Heliogon on his watchmaker's lathe. With limited help from few other sources, Henderson designed, fabricated, and erected the device as it now stands in the Department of Architecture.

It has been a source of profound regret with Henderson and many others that Professor Wolf was never able to see the product of his creative idea. Professor Wolf died even before it was possible to complete the camera unit, the first of the several Photo-Heliogon components to be constructed.

The technology of the Photo-Heliogon, as stated previously, evolved from Professor Wolf's idea that the usual photograph of an architectural model fails to convey a realistic impression of the architect's design, causing possible client misunderstanding and dissatisfaction. Even the direct viewing of the model itself could, Wolf felt, produce client dissatisfaction because of the difficulty in getting appropriate lighting and in getting the client placed at scale eye-level and distance. Even if the latter conditions were prepared, so to speak, for the client, Wolf still felt that the architect could not be in complete control of the situation, and that the client might still be able to draw inaccurate impressions from a direct viewing of the model.

One approach to correcting these difficulties, Wolf thought, was to present to the client photographs of a model built from the sketches of the building-to-be. The photographs would be properly executed with regard to the optics involved, as it is the optics which provide the key to the problem.

To produce a photograph for presentation to the client, then, called for the invention of a camera system which would be able to impart a very considerable realism to its photographs of models. The Photo-Heliogon was the resultant invention, and its design was based on the optic conditions which must be satisfied for the production of a proper model photograph.

The conditions to be satisfied are that the angles subtended by the several pairs of the model's features (with the lens of a camera as their apex, and also with the lens being placed at a suitable scale distance) must be reproduced in a photograph (with the viewer's eyes as their apex, and with the photograph being held at normal reading distance). To have the proper effect, the photograph must be made open-book size (about 8" x 10") and must be mounted to keep it completely flat (curled photographs distort the effect).

The model is the archetype of the finished structure; thus it follows that the client standing at a point on his property which corresponds to the scale location of the lens before the model should view what he has seen in the photograph, and vice-versa.

The construction of the Photo-Heliogon is, in simplest terms, that of a solidly-based table which is surmounted by a tubular arc. Attached to the arc is a special lamp (representing the sun), and attached to the table edge is a special camera (representing the viewer's eyes).

The "sun" and "eyes" are very accurately adjustable, and the table will accept models of from 1/32 inch to 1/2 inch scales. Since the angle and sharpness of shadows in a model photograph are as important as the subtended angle relationship mentioned earlier, the lamp has a concentrated filament, and is mounted in a way that allows the creation in a model photograph of any condition of sun at latitude 42 degrees (Ames, Iowa) from high summer to low winter sun, any hour of the day.

The Photo-Heliogon represents an invaluable aid-to-study for the students and faculty of the Department of Architecture, Iowa State University. To develop its potential even further, however, Professor Raymond D. Reed, A.I.A., plans to make it available to Iowa architects—a program which will undoubtedly find eager acceptance.

VISITING CRITIC AND LECTURE SERIES 1966-67

October	13	R. Buckminster Fuller, Visiting Professor of Design Science in residence 10-14 October	1:10 7:30	"Design Science" "Design Science"
October	10 -14	L. Ralph Scott, C.E. Tudor Engineering Co., San Francisco		Visiting critic
October	20	Henry L. Kamphoefner, Dean, School of Design, North Carolina State University	1:10 7:30	The University and The Student Two South American Designers
November	3	William Mouton, Professor of Architecture Tulane University	1:10 7:30	Three-Dimensionally Stressed Structures The Nature of Constructing Space-Frames
December	1	George Shane, Art Editor Des Moines Register & Tribune	1:10 7:30	The Newspaper and the Architect A Newsman's View of Iowa Architecture
December	12 -16	R. Buckminster Fuller		Visiting Professor of Design Science In residence 12-16 December
December	15	Jan Rowan, Editor "Progressive Architecture"	1:10 7:30	The Architectural Magazine and the Architect The Architect in the Year 2000
January	5	Bruno Leon, Dean, School of Architecture University of Detroit	1:10 7:30	Architecture's Challenge to Architects Architecture and Human Dignity
January	19	Charles Colbert, Architect, Planner and Educator, New Orleans, Louisiana	1:10 7:30	The Education of an Architect The Education of an Architect Visiting Critic-Architectural Design-January 9-20
January	26	James Marston Fitch, Architectural Historian, Columbia University	1:10 7:30	An Experimental Basis for Esthetic Decision (Part 1) An Experimental Basis for Esthetic Decision (Part 2)
February	2	Herbert H. Swinburne, Architect Nolen, Swinburne & Associates, Philadelphia	1:10 7:30	Computer and Human Programming The Environment We See
February	6 -10	R. Buckminster Fuller		Visiting Professor of Design Science in residence 6-10 February
February	16	Randall Harrison, Assoc. Professor of Communication, Michigan State University	1:10 7:30	Visual Communications Current Trends in Theory and Research Non-Verbal Communications: "You are What You See"
March	9	William Caudill, FAIA, Dean, School of Architecture, Rice University	1:10 7:30	The Form of Function The Function of Form
March	16	John M. Johansen, Architect New Canaan, Connecticut	1:10 7:30	Creative Architecture Creative Architecture
March	20-24	R. Buckminster Fuller		Visiting Professor of Design Science in residence 20-24 March
March	30	Charles Kahn, Professor of Architecture, School of Design, North Carolina State Univ.	1:10 7:30	Form and Structure in Architecture The Cybernation of Design
April	3-7	Raymond Crites, Architect Cedar Rapids, Iowa		Visiting Critic in Architectural Design
April	6	Tadeusz Barucki Architect and photographer	1:10 7:30	Vernacular Architecture Soviet Architecture
April	13	Roger Montgomery, Director, School of Urban Planning, Washington University, St. Louis	1:10 7:30	Problems in Urban Renewal Design Shaping Future Cities
April	26	Student Awards Banquet Speaker to be announced		
May	11	Albert Szabo, Chairman, Department of Architectural Science, Harvard Graduate School of Design	1:10 7:30	Some Aspects of Design Criteria (Part 1) Some Aspects of Design Criteria (Part 2)

The Department of Architecture, Iowa State University, welcomes the public and friends of the Department to attend the 7:30 p.m. lectures in Kildee Auditorium.

satisfy the owners' stated needs. Additional time is required for the third party constructor to evaluate the architects' communications and to estimate the effort, risk and profit. Additional time is lost as the prospective owner evaluates, accepts or rejects the offer to build. If accepted, the handicrafted construction proceeds at an agonizingly slow pace.

Social need for a designed environment increases more rapidly than the ability to satisfy that need. Excessive elapsed time from stated need to finished product, disproportionate increases in construction costs, social acceptance of prefabricated buildings and increasing costs for customized design services to a shrinking segment of society are symptoms of a profession and society in trouble.

The architect is the prime designer of human space. The professional services of the architect must be reshaped if we are to shape a meaningful human environment. Architecture reflects, or should reflect, social values.

Yet the conventional architect is too busy handicrafting construction details to coordinate the growth of urban humanity. It should be recognized that handicrafts are the products of underdeveloped societies. The United States is a "have" nation in electronics, communications, agricultural production, medical and health sciences, transportation and per capita power availability. Architecturally the United States is a "have not" nation.

If the architect is to be broadly effective he must develop increased productive capabilities, the freedom of operation and the vision necessary to portray the best that exists within us.

The position of the architect of today parallels that of the portrait painter of yesteryear. While the camera and computerized industrialization fail to express our souls they better serve more basic needs. The essence of art is perceptive understanding of humanity. Time will illustrate that industry, like the camera in the hands of an artist, is capable of poignant expression.

If significant change is to occur, the definition of architecture should be so liberalized as to group the widest spread of concepts and methods under the largest common denominator. Should a monopoly of inadequate professional services be condoned through existing licensing laws, widespread and open violation of statutes designed to protect the public and the public service professions will result in a fragmented, emasculated profession and an unprotected and disadvantaged public.

To encourage progressive architecture and to minimize potential strife, I would submit that Architecture be defined as: The utilization of available resources for the shaping of an environment expressive of and conducive to the growth of meaningful human values.

With the acceptance of more broadly-defined responsibilities, the architect must then accept tools to meet expanded responsibilities. The pressures of population demand that he be freed from the unnecessary slavery of custom design for all clients. The person who said that architects are brilliantly solving exactly the wrong problems was right. If architecture reflects society, perceptive architects can anticipate environmental needs.

Most of the mass-produced artifacts of our society except our buildings and cities are designed in anticipation of need. Regionally acceptable prototype solutions to repetitive functions such as schools, homes, service stations, etc., can be designed in advance of stated need for rapid industrial production and assembly upon demand.

Repetitive units plugged into a universal distribution system (containing power, air conditioning, fluid supply and disposal, and structural support) have progressive merit. The raised columns of Le Corbusier and the pediments of ancient Greece are but two more conservative architecturally acceptable devices that permit sensitive bonding of universal prototypes to unique site situations.

The potential advantages of widespread anticipatory design are obvious: excessive lead time would be reduced; increased opportunities to anticipate, interpret, determine and shape human functional needs and relationships would stimulate architectural research and development. Research and development would yield increased understanding and efficient sophisticated expression of the designed human environment.

What is the designed environment? It is one in which the belief exists that it is in the best interests of humanity to most efficiently express human and natural resources.

It is one in which the *function of education* is to stimulate and give expressive capabilities to the natural talents and abilities of the individual. These best find expression and meaning when used to enrich social values. In essence, the education process is a social contract between the individual and his society. Society agrees to train and reward the individual for service beneficial to society. It is evident that education must change to meet the needs of a changing society. It is the function of the architect, the engineer and the design scientist to stimulate, optimize and best utilize the physical substance of our environment: to best exploit the nature of the material.

As the demand for equitable distribution of resources increases, ways must be found to accomplish more with less. It will be necessary to inventory and best utilize total resources. Lands and seas best suited for food production will be reserved for crops of plants, not people. Lands best suited for mineral production will be reserved for that use. Each productive resource will be optimized. Land incapable of significant production will be reserved for consumption: housing, recreation, intellectual stimulation, and care of humanity. The basic concern of the designed environment will be to achieve the most efficient use from all resources so as to encourage the highest potential development of humanity . . . and its meaning.

The physical accomplishment of the designed environment will be difficult. All productive resources must be surveyed and shifted where necessary into more useful production. Farm lands must be returned to production to meet world needs. Haphazard population groupings (the residue of wars between cities and transportation systems) should be regrouped and optimally spaced along efficient transportation and communication routes. Excessive population centers that choke their feeder lines will die. With the ruling of equal value for all votes, the reapportionment of urban America will in effect form a government of city-states. Efficient production will be matched with efficient consumption. Art is the efficient expression of value. Cassals is an efficient musician: the best of all the artists and philosophers, those who can extract more from less, will be encouraged. With efficient transportation, no longer do cities for people require factories. Consumption units, normally called cities, will be constructed by single companies building the designed city, into which is designed change and in-

dividual expression. A civilization will come to be that is composed of modular components, which like letters in the alphabet will express an environmental syllable, and which may be grouped to express all but the worst of profanity.

As a more meaningful method of living within the designed cities becomes available, the concentrations of disadvantaged humanity living in all but a few of our cities will move to the new towns.

The pressure for conservation of natural resources, however, will prevent the aging cities from oxidizing into obscurity. As rich concentrations of mineral resources, they will be mined. All but certain strategically located sections of the majority of existing cities will be mined for cast iron sewers, copper tubing, limestone and concrete, steel wires and rails, concentrated accretions of ceramic materials . . . all will be more efficiently used, and the land returned to its best potential use.

While the merits of such an environment appear obvious and perhaps odious, the American public is psychologically not ready for such a future. It is not for us to deny but to understand this unwillingness of our collective client of four hundred million to be pulled from the contemporary raging torrents. Four factors that significantly contribute to this phenomena are:

The identity, territory, Matt Dillon and Rene Descartes factors:

Illustrating each, in chronological order:

The Descartian Syndrome: In the 17th century, Rene Descartes, individually faced with the schizophrenic dilemma between the dictums of theology and logical reality, classified the whole of human understanding into the sciences (the objective logical investigation and classification of the actions of the material

universe), and the arts (the subjective human reaction to that environment). Whole man was split asunder.

The hemisphere of objective understanding of the material universe exploded with the discovery that more can be learned by narrowing the search arc. (I have been told that if one is sufficiently selective in his choice of topic, he can become the world's authority on that topic with four days of intensive study.) As man scientifically inspected and classified the exploding universe, the artistic introspection of meaning imploded his soul into the depths of individualistic subjectivity. Thus modern man became unbalanced. His well-being as a capable scientist occupationally seems to demand that he not widen his search arc into the hemisphere of subjective values.

Until quite recently, any widening or grouping of individual disciplines so as to study similar patterns and symbiotic systems was looked upon as superficial generalization. The astronauts and the society that encourages the astronouts to orbit the earth in a beautifully designed environment and then return to home: a jerrybuilt handicrafted imitiation cape cod colonial whose concrete slab rests on the crab grass and shifting sands of Cape Kennedy, must be considered unbalanced. (When such men have the power to permanently leave earth, I wonder what will be their choice?) This disease of separating soul and substance is particularly virulent among the newly rational and is usually evidenced in fear statements. Perhaps cybernetics, the history and philosophy of science, and the concept that art is science undefined might provide a cure to the Descartian syndrome.

The Matt Dillon Disease: Nations possessing undeveloped and unconquered natural resources encourage strong individualism. The strong individualists who won our West were given free land and the assurance that every man's home was his castle. In this state of domestic extraterritoriality, all law, including man and

nature, stopped at the front door of the family retreat. In those nations which successfully develop their natural resources, the challenge shifts from natural to human resources. There is a point in this transition where the individualist, perceptive of a chaotic physical and social environment too great to individually conquer, closes the front door of his family retreat, draws the shutters, turns out the lights, and spends long hours gazing at abstract patterns; identifying with Matt Dillon (or 007), both of whom are so capable of solving all important problems. As a nation we are now at that transitory point. This disease in particularly virulent form can be observed in those homes designed as dark and cloistered retreats. It is a fear complex. Treatment is prescribed as plenty of sunlight, direct unflinching exposure to the twentieth century, and liberal doses of the essence of reality.

Territorial Security is based upon the need and the capability to defend sufficient territory to sustain meaningful life. Great amounts of landed territory and great amounts of intellectual territory must be reserved for those incapable of efficiently sustaining life by physical or intellectual activities. Fear and hostility are evoked by the Aborigine or the bigot if physical or intellectual territory is penetrated by those capable of inflicting loss of security. The amount of territory required is inversely proportional to the capability to defend life. The wise and the strong require little if any buffer zones. They travel light and far. Land is but a launching pad. Urban man depends upon intelligence, not land, to sustain life, yet the concept of land is retained as a requisite to security. To feel secure, man must either live by and within the products of his mind, or be assigned natural buffer lands as necessary to compensate for his deficiency in humanity. Humanity is the relationship of man to men, not man to earth.

The last factor making progress difficult is *Identity.*

Identity is of two types. One is that in which the observer *identifies* by noting *differences* in what he views, and the other is that in which the observer possesses identity from within. One is the identity of the cover of the book, the other is what the book contains. Those incapable of harboring discerning inner convictions or of reading human values demand that all books have different covers. The homes of the illiterate must *OUTWARDLY* be different; only the philosopher and the bum are impervious to appearances. The capability to satisfy this need has pathetically degenerated to the only potted plant, the only sports car or the only red-painted door in a sea of dull gray suburbia.

Successful treatment can be achieved through accepting modules of physical expression that interlink all values into a comprehensive whole . . . a modular world . . . a designed environment!

To achieve a designed environment in which all will be capable of meaningful expression:

1. The whole man Descartes split asunder should be reassembled, tuned to the present, and balanced.

2. Pablo Cassals, Albert Sweitzer and other similar men should be capable of developing bigger fan clubs than should the Matt Dillons.

3. Sufficient humanity should be encouraged to dispense with animalistic and intellectually antagonistic buffer zones.

4. Inner identity should outshine surface features.

Professionally, the architect must develop the intellectual honesty and technical capability to express the designed environment . . . that environment which encourages the growth and is conducive to the free expression of meaningful human values. It is not for us to deny, but to understand.

This is architecture, the designed environment.

KAWAL CO-AUTHORS TEXT ON CRITICAL PATH METHOD

Presently, along with two other authors, Professor Byron Radcliffe, University of Nebraska, and Ralph Stephenson, P.E., a consulting engineer in Detroit, Donald E. Kawal is completing the manuscript for a textbook concerned with the Critical Path Method (CPM). Kawal is an instructor teaching construction at Iowa State University.

His contribution covers computer applications of the tool, including basic CPM calculations, cost optimized schedules and resource optimized schedules, as well as the mathematical development of some extensions of the technique. The textbook (to be published early next year by Cahners Publishing Co., Chicago) encompasses many aspects of project management from basic principles to actual implementation of CPM in the field. Emphasis directed to the use of CPM as experience has shown this to be the bottleneck in the acceptance of the technique.

Early next year, research will commence on the development of a geometric-mathematical model of a hypothesized building contractor in his environment. Flows like income and resources and their associated propensities like services and production units will be modelled as they relate to the constructor in his system. The system components include the architect, the engineer, material vendors, sub-contractors, and labor sectors. External influences such as the general economy will be tied to the system.

The procedure will involve the utilization of systems theory as developed by electrical engineers, i.e., an analog will be developed between physical systems and socio-economic systems. Stabilization and optimization of the system over time will be considered. Inherent in the study will be input-output analysis as defined by an economist.

At present the research is exploratory and highly conceptualized, with little on paper. In order to be able to mathematically model components of the system, a comprehensive collection and analysis of relevant data must be undertaken.

The general objectives of the effort include the development of a realistic model to be used in construction management "games" and a recommendation as to optimized feedback and inputs to the system.

AIA SENDS FEE STUDY TO GAO

The requirements of modern design and building construction have made the 27-year-old federal limitation of 6 percent on architectural and engineering fees for government work obsolete and detrimental to the economic interests of both the government and the design professions.

This is a conclusion reached by the American Institute of Architects and contained in a study of statutory architect-engineer fee limitations delivered on October 28, 1966 to the General Accounting Office.

The A.I.A. position paper, prepared to assist the GAO in its government-wide study of interpretations and applications of fee limitations, urges repeal of the 6 percent limitation originally established by Congress in 1939.

The Institute points out that for nearly three decades, the fee limitation has been written into law for other agencies without any recorded Congressional examination of the rationale for the limitation or of changed conditions.

Among other findings, the study maintains that:

The cost of architectural services has risen faster than the cost of construction, due primarily to the complexity of today's buildings and component systems;

The limitation, while considered fair in 1939 for relatively simple structures, is now completely unrealistic for laboratories, electronic facilities, remodeling and rehabilitation services and specialized structures, such as nuclear facilities;

Because of the limitation, an architect frequently cannot allow as much time for research and design as the project needs, thus preventing possible cost-cutting design solutions.

A long time-lapse between conception of a project and completion of the structure, with the architect's fee based on an estimated construction cost, which does not take into consideration changing economic factors during the design and building process, discourages many professionals from accepting federal work, the study asserts.

The A.I.A. report to GAO calls for repeal of the statutory limitation and suggests instead that an architect's fee should be negotiated on the basis of the size, nature and complexity of specific projects, the usual procedure with private clients.

FIRE CHIEFS DISCUSS SKYSCRAPER HAZARDS

Skyscrapers, today's vertical cities-within-a-city, are creating grim fire control problems, two veteran fire chiefs agreed today.

New ideas for increased fire control protection in high-rise buildings come from Edward P. McAniff, former chief of the New York City Fire Department, and Chief Fire Marshal Curtis W. Volkamer of Chicago. They made their recommendations in addresses prepared for the 70th annual meeting of the National Fire Protection Association (NFPA) in Chicago, with some 2,000 U. S. and Canadian fire experts in attendance.

"Serious, unusual and spectacular fires occur in these high-rise structures," declared McAniff. "More people and more hazards are being placed 16 stories high, or more, above the ground—whereas fire-fighting equipment is still geared for six-story buildings.

"Architects are not designing these buildings with a full realization of the fire problems that have occurred and will continue to occur."

McAniff proposed that, with the spread of high-rise buildings in communities across the continent, the NFPA originate a High Rise Study Committee to work both for improved fire protection and fire fighting.

The number of persons housed, or working, in individual high-rise buildings can exceed the population of many towns and cities—one New York building alone housed 60,000 workers, McAniff pointed out.

In such a vertical city, the main transportation system—elevators—can go into a state of paralysis or confusion during a fire, both Volkamer and McAniff said. And both emphasized that fire companies moving to fight fire on upper floors have had the experience of losing communication with supporting ground crews as telephone lines failed.

The New York expert dismissed suggestions from some quarters that fires in fireproof buildings cannot be large or spread from floor to floor, or that steel supporting girders need less fire protection. He called for more, not less, protection in tall buildings.

What are some of the fire perils in a lofty building? Chief Marshal Volkamer cited firemen perishing when they opened an elevator door to reach a fire—only to be blasted with live flames and 1,000 degree gases. He told of complicated problems of water-supply, of water-soaked automatic elevator controls failing, and of firemen vainly trying to find a building's key that would provide manual control of elevators.

Among critical problems facing fire fighters, outlined McAniff, was the peril of possible mutilation of great numbers of people on the ground if firemen—seeking ventilation—should break quarter-inch glass on the exterior of modern buildings.

He told of telephone line failures within a burning building. Chicago's fire department, he said, is developing a new "Power Phone" which can be lowered to connect high-floor fire fighters with the ground.

An airplane hitting a skyscraper seems improbable, but McAniff pointed out that it happened in 1945 when a bomber slammed into the 78th and 79th floors of the Empire State Building. It released 800 gallons of burning gasoline. The impact ruptured a standpipe riser designed to provide water for fire fighting. Knocked out were elevators above Floor 65, and telephone service linked with the standpipe system.

Yet, he said, the fire was extinguished within 35 minutes of the first alarm—because the building was of Class 1 construction, without major deficiencies.

Among his recommendations for an NFPA study committee are:

Refuges where building occupants may safely congregate without attempting to use elevators or descending many stairways.

Arrangement for elevators and stairways to discharge into public halls free of burnable materials, and vented to outer air by large openings.

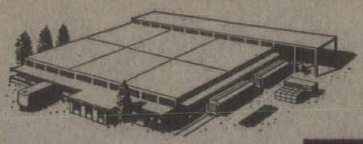
Shafts designed to prevent spread of fire, smoke and gases over great distances.

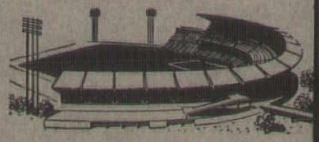
Communications built in for emergency conditions.

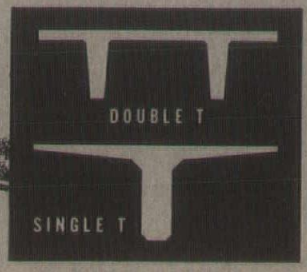
Elevator systems with standby power, fully controllable by the fire department in emergencies.

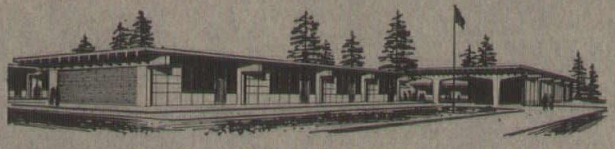
Adequate sprinkler systems to supplement a standpipe system in all danger areas above the sixth floor.

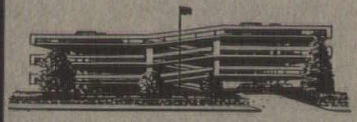
And, particularly for upper floor restaurants and ballrooms, special alarm and smoke removal facilities.

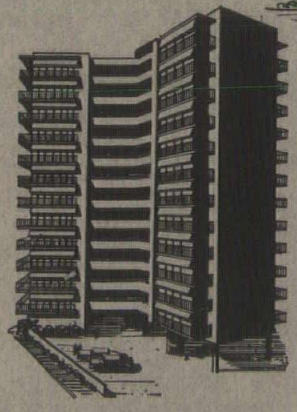


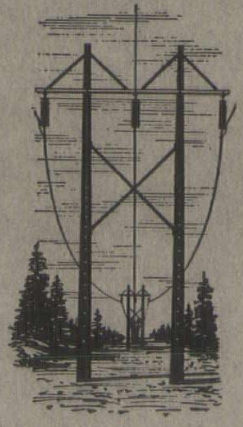


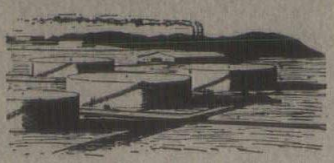












Warehouses to skyscrapers, bridges to water tanks...

TODAY, IT'S PRESTRESSED CONCRETE

More and more architects and builders are choosing prestressed concrete for structures of every size and type. Prestressed concrete makes efficient use of two quality materials—high strength concrete and high tensile strength steel. This combination provides new opportunity for bold and imaginative design as well as money savings.

Prestressing makes possible long spans with beams and girders of shallow depth. Precasting of prestressed elements and site work can proceed together to shorten building schedules. Erection of the prestressed members is rapid. Prestressed designs give important weight reduction in large structures.

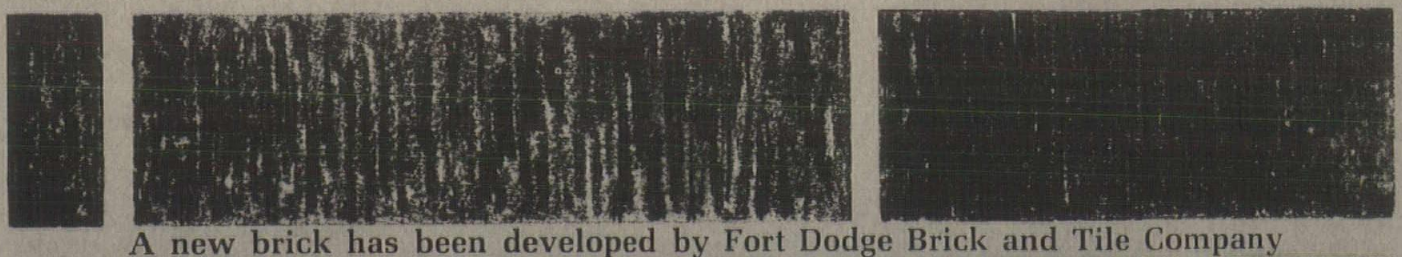
Upkeep costs are low. Concrete need not be painted. And in many cases, concrete's durability and fire resistance earn lower insurance rates.

The many advantages of versatile prestressed concrete provide structures that combine architectural appeal and construction efficiency.

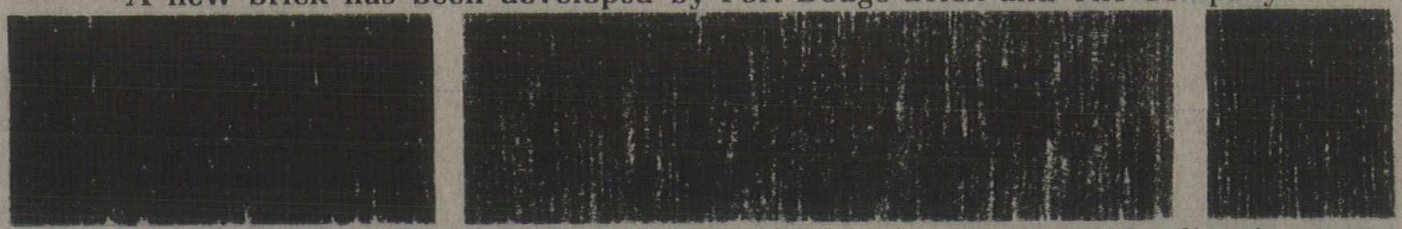
PORTLAND CEMENT ASSOCIATION
408 Hubbell Bldg., Des Moines, Iowa 50309
A national organization to improve and extend the uses of concrete

TYPICAL PRESTRESSED CONCRETE PRODUCTS ...AND HOW THEY ARE USED

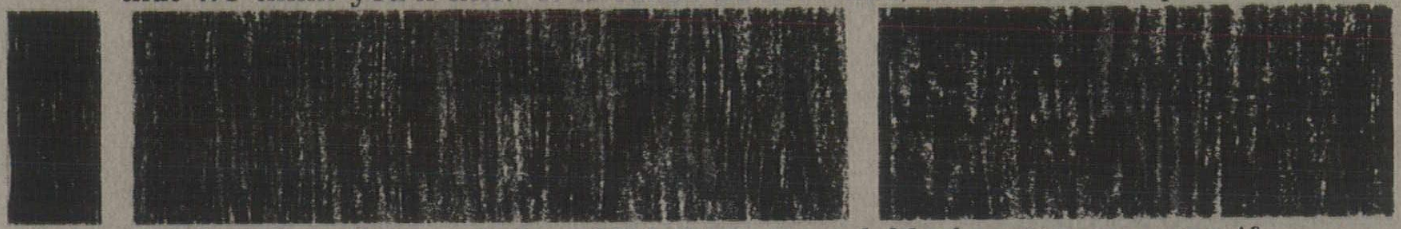
Girders	Warehouses
Beams	Industrial plants
Columns	Bridges and overpasses
Roof and floor units	Schools
Slabs	Gymnasiums
Wall panels	Auditoriums
Joists	Public buildings
Piling	Shopping centers
	Office buildings
	Terminals
	Storage tanks
	Stadiums
	Railroad ties
	Apartments
	Transmission poles



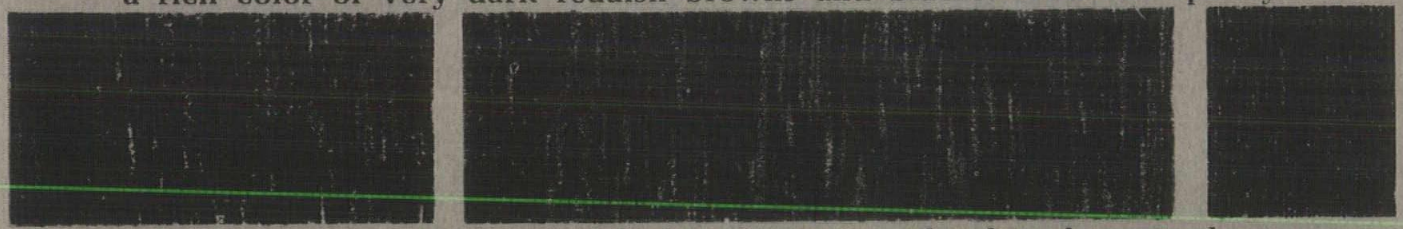
A new brick has been developed by Fort Dodge Brick and Tile Company



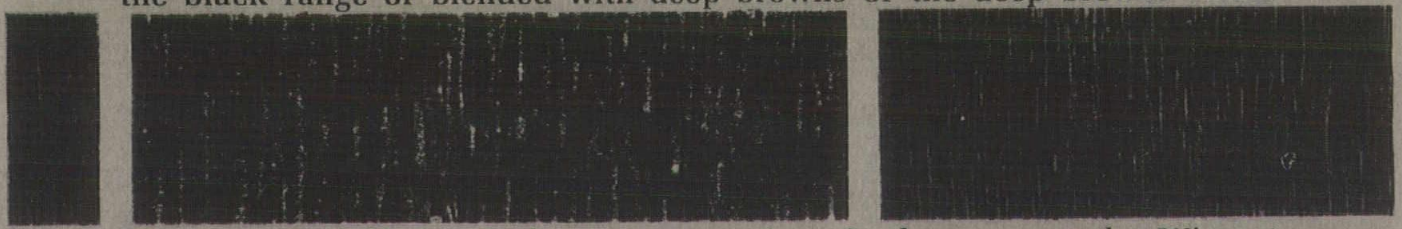
that we think you'll like. It is called EBONY and, as the name implies, is



a rich color of very dark reddish browns and blacks. You can specify

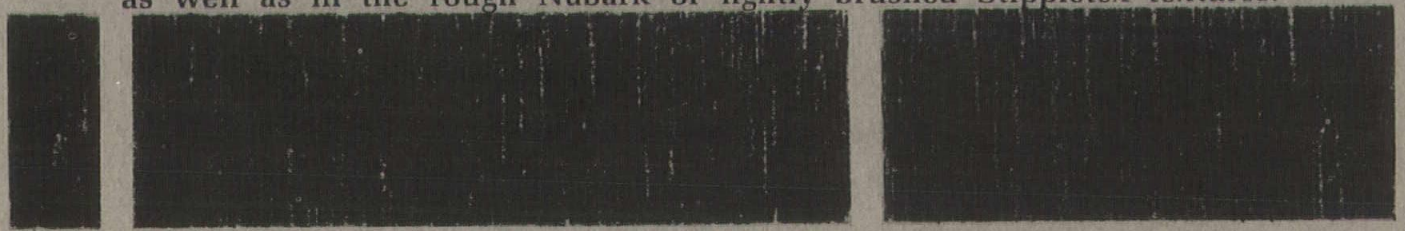


the black range or blended with deep browns or the deep browns alone.



They are available in regular or norman sizes; in the ever popular Wirecut

as well as in the rough Nubark or lightly brushed Stippletex textures.



Please ask us for sample panels. We think you'll understand why we're so proud of this new unit once you see it for yourself.

GOODWIN COMPANIES

MANUFACTURING DIVISIONS
DES MOINES CLAY COMPANY
FORT DODGE BRICK & TILE COMPANY
MASON CITY BRICK AND TILE COMPANY
OSKALOOSA CLAY PRODUCTS COMPANY
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REDFIELD BRICK AND TILE COMPANY

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