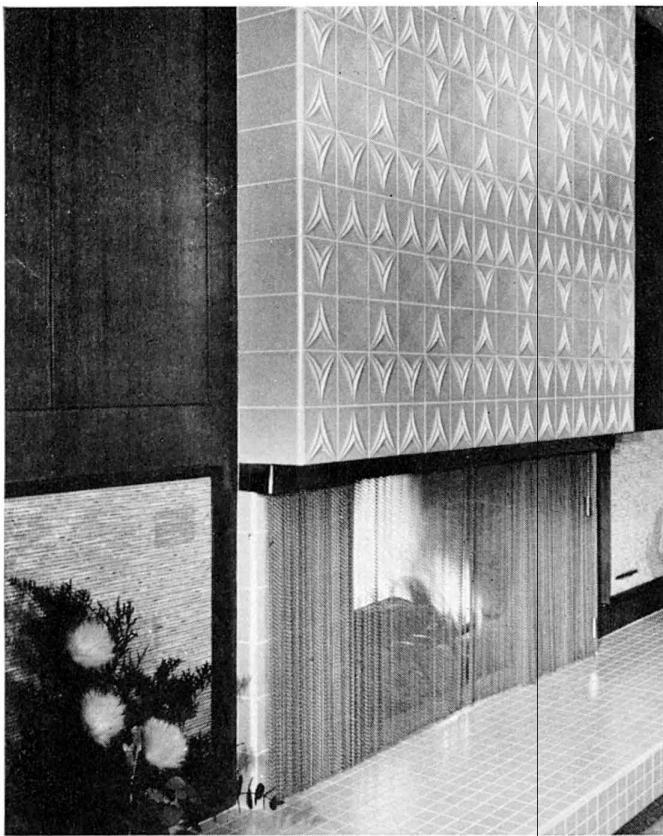


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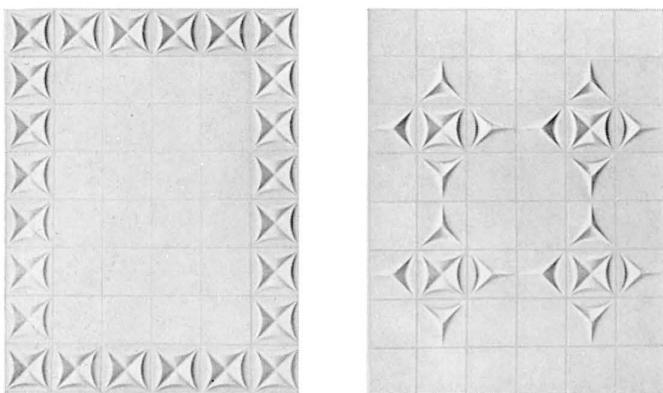
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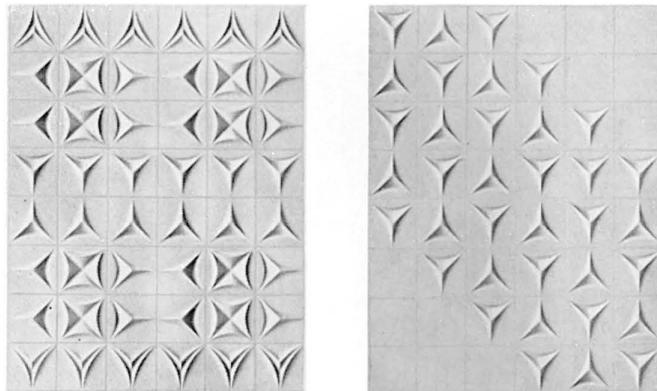
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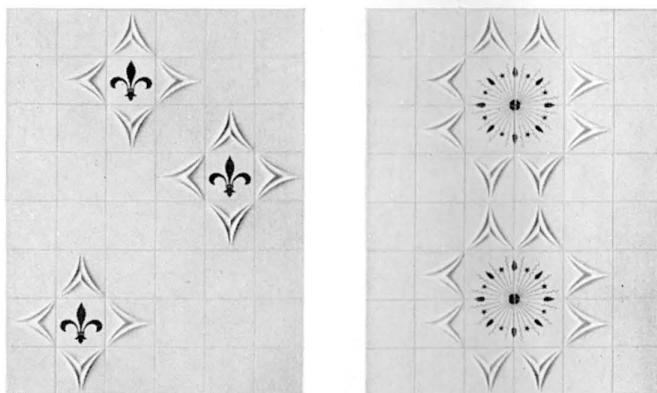


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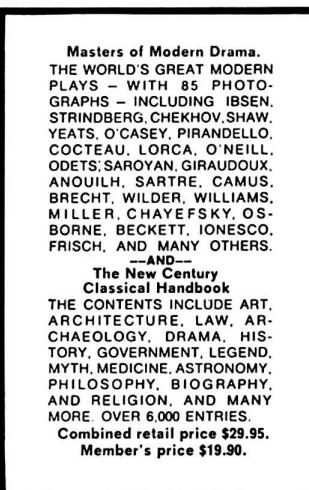
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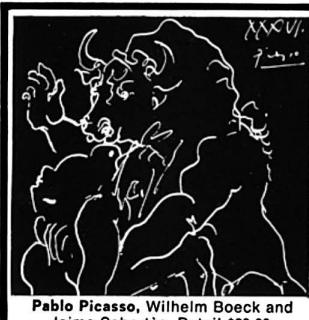
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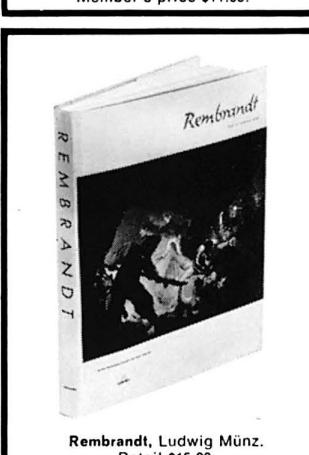
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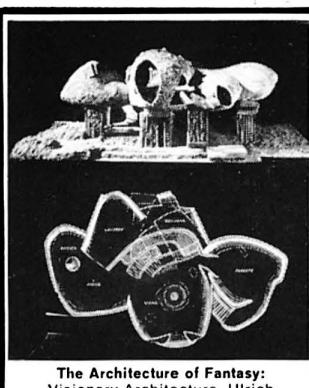
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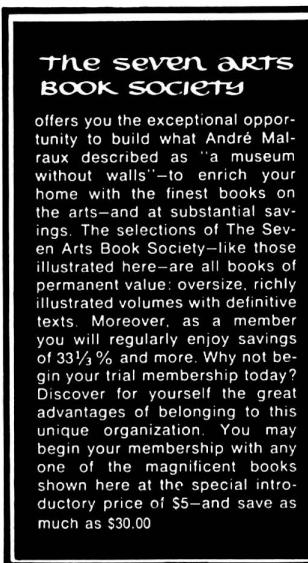
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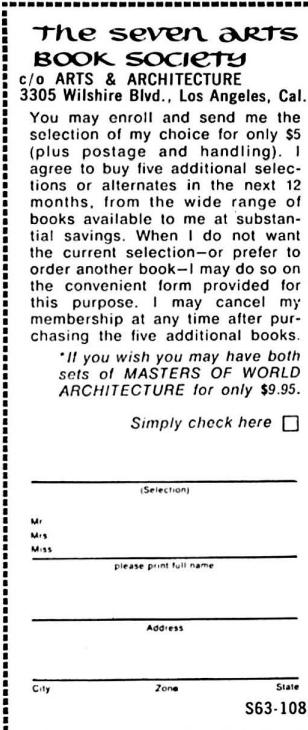


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ARTS & ARCHITECTURE is published monthly by Arts & Architecture, Inc., 3305 Wilshire Boulevard, Los Angeles 5, California. Established 1911. Second class postage paid at Los Angeles, California. Price mailed to any address in the United States, \$5.00 a year; to foreign countries, \$6.50 a year; single copies 50 cents. Editorial material and subscriptions should be addressed to the Los Angeles office. Return postage should accompany unsolicited manuscripts. One month's notice is required for a change of address or for a new subscription. The complete contents of each issue of ARTS & ARCHITECTURE is available to subscribers in a Microfilm edition.

BOOKS

ROBERT JOSEPH

THE ICE AGE IS ENDING — THERE AND HERE

"The Age of the Thaw," a felicitous phrase invented to describe the literary and cultural amenities which presumably exist in Soviet Art since the Chairman decreed that by fiat the pen and the brush shall flourish free, has unleashed an interesting and sometimes revealing spate of novels, essays, confessions and articles. *One Day in the Life of Ivan Denisovich* which created a political uproar in the Soviet Union and a publishing uproar in the United States (five publishers issued the book at one time,) was the first of the genre to be published (by Alexander Solzhenitsyn, E. P. Dutton, \$3.95,) outside Russia. Now the deluge is upon us.

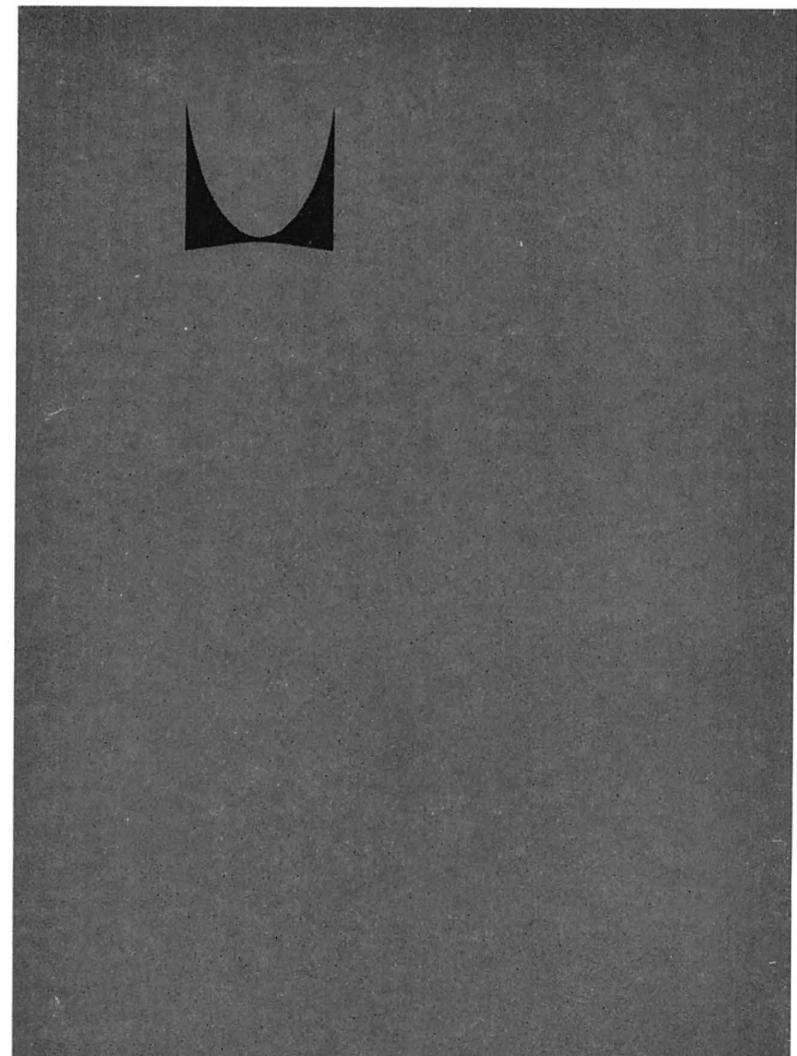
A Man Survives by Vladimir Maximov (Grove Press, \$2.95,) depicts the Soviet Amoral Man — the "loner" we might say — the story of a rootless wanderer in the Kafkaesque world of the Present. And the story is told in modern imagery, smashing traditional Soviet literary forms and strictures. The hero Sergei Alexey-vitch Zarev is the hardened anti-social victim of society we have met in Tolstoy and Dostoyevski; he is out of *Grapes of Wrath* and Charles Dickens. Although the author's flashy flashback style, his distorted chronology makes for both hard-hitting and provocative reading, we must say that *A Man Survives* is old tarboosh. With this book, however, it may be said that a Proletarian Novel has, at long last, come from the Land of the Proletariat. Zarev meets his peers — the political pimps and prostitutes, the minor functionaries and the informers, the leeches and lechers — in a pilgrim's progress through his Gorkian lower depths. Zarev's hero survives because society, no matter what it does to its captives, cannot destroy the will to live. The glimpses the reader gets of modern Soviet Society with its faults and failures as well as its virtues makes this important reading.

The Thaw is also manifested in the writings of Russia's leading young poet Yevgeny Yevtushenko, author of *Babi Yar*, a polemic against Russia's anti-semitism, which also lifts the curtain on some of the spirit and the tempo of the Soviet literary spring. A thaw, however, presupposes a past (and future?) freeze. In *A Precocious Autobiography* (E. P. Dutton, \$3.50,) Yevtushenko is himself, as he admits, a victim of these diurnal alternations. ". . . Our special Russian character must be kept in mind," he writes of the Russian mystique. "Suffering is a sort of habit with us." The poet is a sufferer, and his autobiography is a statement of the ideas and concepts of freedom which torment him. He treats harshly the political toadyism and maneuvering which he finds in Soviet society, the men and women who think only of the Power in the phrase "Soviet Power." But the poet writes reverently of the Marxism ideal, although his logic is sometimes tortured, e.g., Marx's error in believing that the most industrialized states would be the first to become sovietized, only to have backward Russia his first convert is glibly explained: "Russia was perhaps the most advanced in terms of people's sorrows and tears."

Yevtushenko sold his first poetry to a sports magazine — an unlikely publisher. He has been writing about the unrealized dream of Soviet life ever since. His stock rises and falls with the cultural temperature. He is a careful nonconformist, closest perhaps to Shelley who scribbled for the absolutes of freedom, beauty and Godwin's "The Good," but who never quite gets down to indigenous cases. Furnishing an insight into the avant-garde of Russia's young expressionist writers and artists, Yevtushenko's autobiography is clearly the most important book to come out of the Soviet Union since the end of the War.

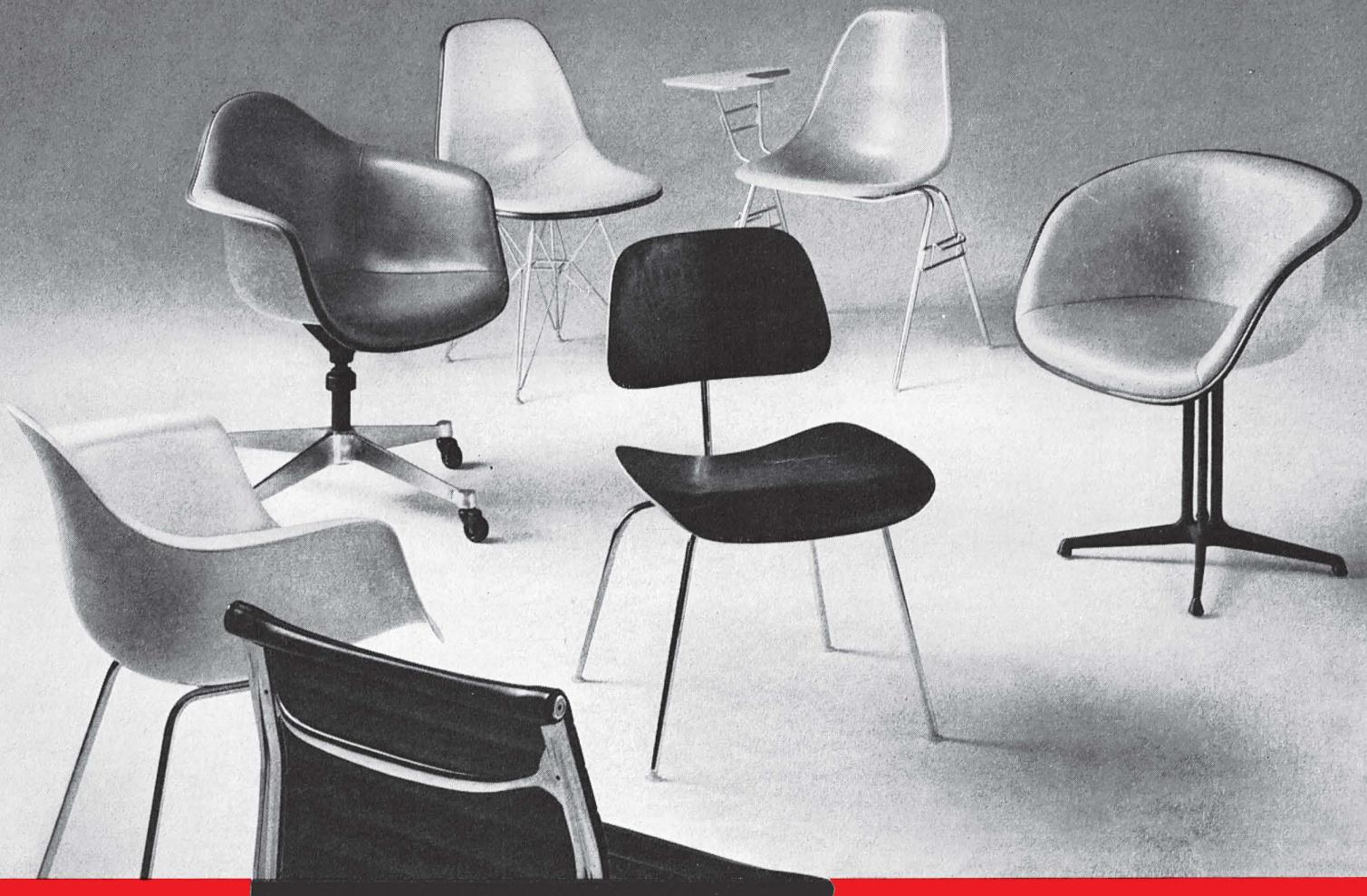
For the Russian poet, as he explains in his autobiography, it was the bloodless, heartless, pitiless funeral to Stalin which opened his eyes. What was the eye-opener for sixteen of America's outstanding novelists? "The long fantasy of permanent social security in an ivory tower has ended for most writers," writes Herbert Gold in *First Personal Singular*, (The Dial Press, \$5.00,) Essays for the Sixties by novelists who had something to say in non-fiction form and went on to say it. This is a potpourri of complaint and comment, a readable collection of thoughts and hopes and fears; some of it expressed with great depth and feeling, some of it strident, some of it properly bawdy and irreverent. It is doubtful if Maximov or Yevtushenko could ever hit the mark as decisively as James Baldwin "Fifth Avenue Uptown," or Herbert Gold's own "Death In Miami

(Continued on page 34)



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MUSIC

PETER YATES

ACOUSTICS—and REVERBERATION

Jack Purcell, of the Los Angeles office of Bolt Beranek and Newman, phoned asking for a meeting. We got together the next afternoon for some two and a half hours, much to my profit; and I believe he, too, was satisfied.

His complaint lay against one sentence in my June 1963 column: "To speak of 'tuning' a concert hall by moving about impedimenta inside it is a public relations dodge to cover up failure of acoustical design."

Let me make clear that Mr. Purcell did not come demanding a retraction, or in fact that I should take any action about the statement. To avoid any possible misunderstanding in this regard, he had not written me but taken time out to come and see me in person. I feel complimented by his wishing to do so, gratified by the quantity of information he brought me, and very grateful to him for his trouble. I am hoping that he will soon contribute an article about large-hall acoustics to this magazine. Meanwhile, I am equipped to roar more loudly than ever about acoustics.

First, let's take apart the too-inclusive quoted sentence. The sentence referred to the well-publicized "tuning" of Philharmonic Hall in Lincoln Center, New York, which occurred about four months before the first public performance. The "tuning" concept was built into a public relations story put out by Lincoln Center for the purpose of calling attention to the full-scale pre-opening tests conducted by Bolt Beranek and Newman, the company responsible for the acoustical design of the hall. The story, in justice, was not a "dodge . . . to cover up failure of acoustical design", because during the week of practical hall testing, glamorized as "tuning week", the acoustics proved out considerably better than they did afterwards at the first concert. Without the over-glamorized build-up, the subsequent come-down would not have been so precipitate; it would certainly not have provoked so much unfavorable speculation.

The stories claimed that the hall could be "tuned" for every type of music to be performed there; this was of course inaccurate. You can't move around impedimenta inside a hall to make it sound right, though such procedure is tried often enough to make a hall sound less badly. Some very modest adjustments can be

made, for example with draw-curtains, or in the case of Philharmonic Hall with sound-reflectors over the stage. These will not alter the essentials of good or bad design which produce good or bad acoustics.

Let us first consider the nature of halls and what we know about their acoustical problems. For small halls, up to 750 seats, the problems have been fairly well defined; if an acoustician has the controlling say in the design, the acoustics of such halls can be rather closely controlled. If the acoustician merely submits a set of specifications, and the architect alters these to satisfy his own notions of interior decor—like the architect of a fancy Glendale, California, church, who to save his *visual concept* shedded the organ half-outside the building—the outcome will be dubious or a failure; no acoustician can do more than salvage the loss or, at best, retrim the trim.

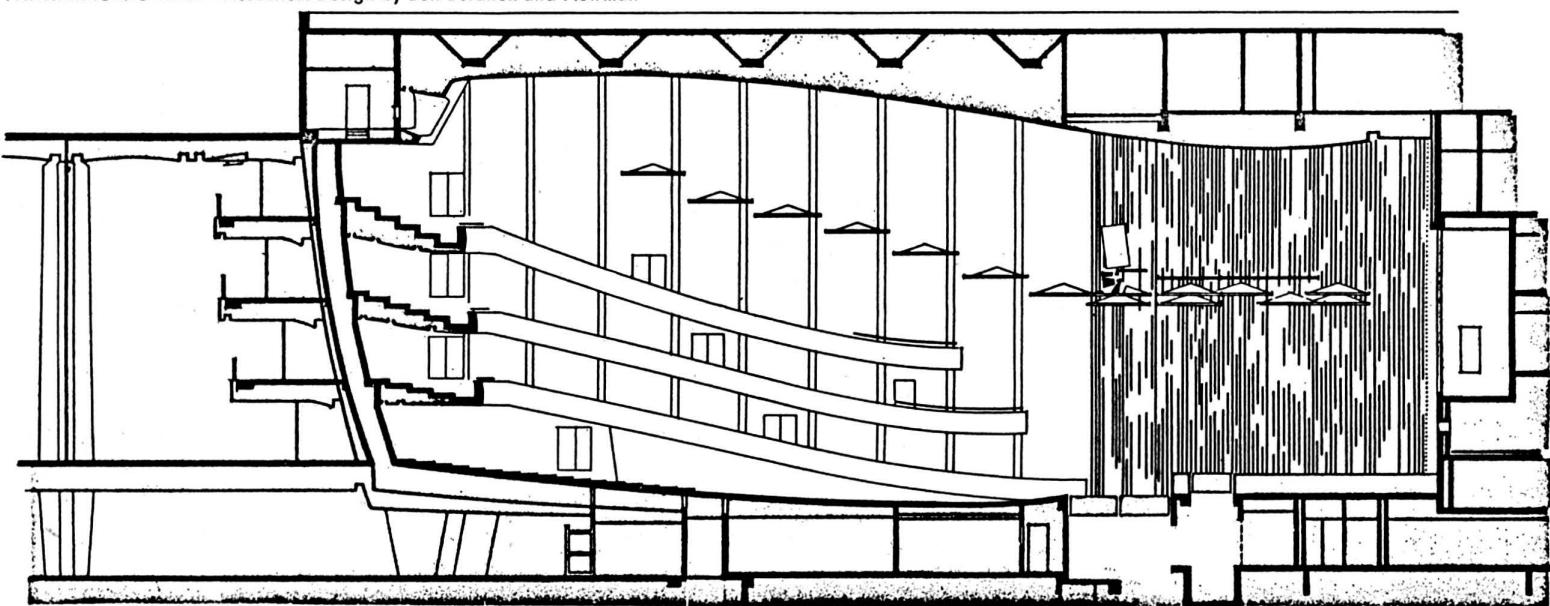
Worse yet, if the architect has completed his design and then summons the acoustician to "make it sound right" by applying or veneering the acoustics over the architect's fixed plan, failure or partial failure is only short of certain.

The architect who just goes ahead to spend his client's money by building an interior intended for speech, drama, music, or religious service, without consulting an acoustician, deserves to be hanged from his proscenium—though he may be in other respects a designer and a gentleman. Several years ago I recommended the builder of one large auditorium in this neighborhood for such swift justice: in this hall one can hear a pin drop anywhere except on the stage. I have several other prominent but mentally deaf prospects in mind.

Any hall intended for sound as a prime purpose should be and can be designed *from the sound out*, the acoustician determining in advance, by use of available and well-proved data, the *instrumental* character of the interior space and all its surfaces, to provide uniform sound-distribution and include in the building envelope insulation adequate to prevent any outside sound interference. The hall must then be built according to these exact specifications, to produce the type of sound the acoustician believes desirable. The best acoustical design can be queered by a few changes during construction.

In a society geared to *visible* architecture but not to *audible* architecture, it may be heretical to say but it is nonetheless true, that the acoustician is not less important—as artist, engineer, designer, and executant before posterity—than the architect, whenever the purpose of the interior space is to control sound. Both

PHILHARMONIC HALL—Acoustical Design by Bolt Beranek and Newman



Jack Purcell and Gerald Strang assure me that they have worked with architects who are well aware of this, who do not begin designing an auditorium until they have been given a complete set of acoustical specifications and do not go ahead to build it until architectural and acoustical plans have been brought completely into agreement.

If we could see the interior chaos resulting from an architect's indifference to acoustical realities and measure it by generations of audience discomfort and frustration, there would be no argument: even the indifferent architect might be brought to understand his guilt.

You can't see acoustics; you can only hear them, though C P E Bach wrote that his father could tell at once, by sight, whether or not a church had been correctly designed to the advantage of its choir and organ. Braque, Picasso, or Rosenthal can do what he pleases with the appearance of a musical instrument; an architect cannot—no more than any instrument builder. An auditorium, whether for speech, drama, small or large music, or church service, is a resonating instrument, like a piano, harpsichord, violin, or drum, and must be built exactly to sound-determining specifications, like an instrument.

For halls of between 750 and 1500 seats the problems are trickier than for smaller halls; nevertheless the acoustician has a reasonable prospect of complete success, if he is permitted to draw up his specifications first, and the architect adheres to them. Any hall above 1500 seats involves so large an investment, so great a cross-stress of public interest, so elaborate a play of acoustical variables, and data so little known and inadequately defined in the architectural literature, that the risk of failure is as great as the incertitude of complete success.

This increased risk does not alter the inalienable fact of auditorium acoustics, that an auditorium is, first of all, an instrument designed to control the projection and reverberation of sound. Any other factor of architectural inventiveness, or prettiness, or trim, is as unrelated to the prime purpose of the enclosure as gilt, or cupidons, or dolphin legs on a piano; a good concert hall should be as severely determined in shape as a piano and for the same unassailable good reasons. Given the general plan of enclosure, the size of the intended hall and the disposition of the seating, which seriously influences sound-absorption, the acoustician must design the instrumental space before the architect can, with reasonable chance of acoustical efficiency, set about to build it. The terms of the acoustical data for the building of larger halls are

still uncertain and inadequate, not because they cannot be made more certain and more adequate but because in all too many instances the architect, for reasons of his own, queers the terms and interferes with the experiment.

It is also unfortunate that many snap judgments of the acoustical efficiency of a hall are made by ear, instead of by instrument. The auditorium at Long Beach City College, Long Beach, California, was designed acoustically (by Ludwig Sepmyer and Gerald Strang) to a predetermined *frequency curve*; it checks to that curve, by instrumental measurement in every part of the auditorium. Yet I have heard a skilled musician, leaving that auditorium after a concert, say that it is "too dead". He is entitled to the opinion of his ears, but mine do not confirm him; in such case an instrumental verification is more accurate than his or my opinion.

To lay it on the line: if the architect faithfully incorporates into his plans all features and specifications predetermined by the acoustician, and the hall fails, the acoustician is at fault; if the architect alters these features and specifications, he is at fault.

For example, when Jack Purcell represented his firm as *acoustical consultant*, a self-defeating and revealing term, for the Kresge Hall at Massachusetts Institute of Technology in Boston, he found at once that the architect, Eero Saarinen, had already determined the structural design, and the best that could be done would be to apply acoustical theory and devices to an esthetically preconceived shape. The hall was intended for lecture, drama, and small music; nevertheless, for the dedication of the hall, the Boston Symphony of 100 musicians was brought to play in it, with acoustical consequences just short of disastrous. For its intended purposes, in spite of the predetermined structural design the applied acoustical solution has proved to be successful.

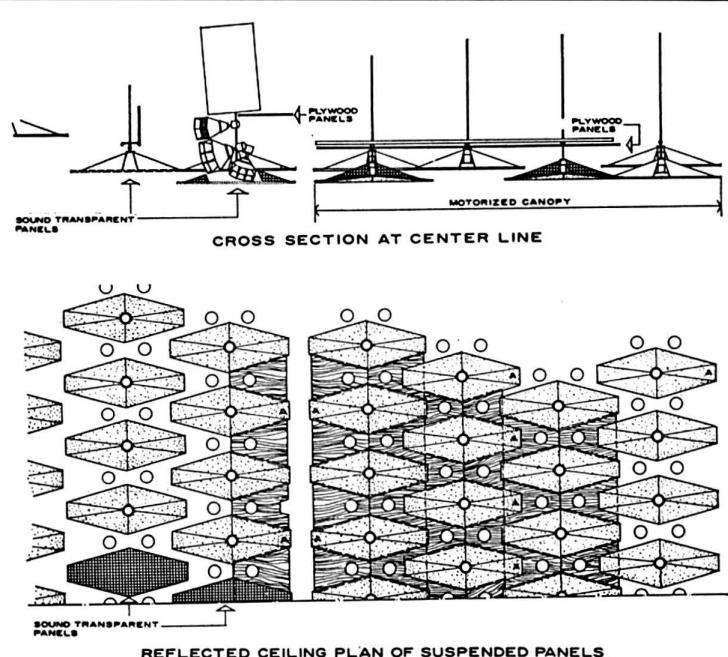
Of the Music Shed at Tanglewood, designed by Bolt Beranek and Newman, a design incorporating overhead acoustical reflectors similar to the famous "clouds" at Philharmonic Hall, Gerald Strang wrote me, after hearing a rehearsal there: "The Music Shed is incredible. BB&N did a fabulous job there."

During the recent conference I attended at St. Louis, several of us conversed at length, out of session, about the variety of halls a civic center should build to provide for contrasting needs. There should be an opera house, spacious enough to include an extra-large stage and backstage and enough seats to approximate the costs of performance. Grand opera can fill more space with adequate sound and will usually draw larger crowds than a symphony orchestra. So there should be a hall smaller than the opera house to serve for the symphony, and also for crowd-pulling soloists. There should be, too, a still smaller hall to provide for chamber music and the recitalists who please many but not mobs. None of these halls will suffice for drama or lecture, which require for best results a distinct spatial-acoustical arrangement.

Of course it is not impossible for a soloist to prefer pulling his mob into the opera house, to his greater glory at the boxoffice; it is not impossible to present an outstanding quartet before a larger crowd than the chamber music hall will accommodate by presenting it in the symphony hall; it is not impossible for a lecturer to dispense wisdom, with electronic help, in the opera house; it is not impossible for a recitalist or a quartet to make good use of the dramatic stage; and it is positively preferable that many operas, by Monteverdi, Rameau, Handel, Mozart, or such modern operas which require visible acting as Alban Berg's *Wozzeck*, should be performed on the smaller stage of the symphony or chamber music hall.

Where such a variety of auditoriums cannot be afforded, many compromises are possible. But the compromise should be exactly defined, so that the acoustician and architect understand in advance what the hall is intended to accomplish.

(Continued on page 31)



MORE IS LESS

The latest building of historical, architectural and cultural significance to be threatened by the economic scythe wielded in the name of urban development and the public good is Irving Gill's Dodge House. It is considered to be the culminating work of one of our most important architects. Lewis Mumford ranks Gill with Sullivan, Wright and Maybeck as one of the greats of modern architecture. And Henry-Russell Hitchcock calls Dodge House Gill's best work:

"The whole effect, in its clarity of form and simplicity of means, is more premonitory of the next stage of modern architecture than any other American work of its period. . . . His best houses extend very notably the range of achievement of the first generation of modern architects in America."

Esther McCoy, in her fine book *Five California Architects*, notes that in this reinforced concrete house, Gill "was to bring concrete to the architectural importance of stone."

Dodge House, built in 1916, was acquired some years ago by the Los Angeles School District for use as the domestic training facility of the Los Angeles Trade Technical College. It has now been declared surplus. The plan is to rezone the 300' x 400' property from R-1 to R-4 (over the protests of 95% of the surrounding property owners, it is alleged) and auction it off in order to get it into the hands of private developers and back on the tax rolls.

For the most part, public officials—and private developers—are committed to the short view. They are influenced primarily (let's be charitable) by the immediate problems of their constituents. Here in Southern California the problem of accommodating a tide of immigrants perpetually at the flood is a tremendous one. But the answer isn't spot-zoning or the indiscriminate plundering of our meagre native cultural heritage. No one disputes that urban rehabilitation is necessary or that progress is inevitable (though one may occasionally question the direction), but to destroy Dodge House as we have so many other fine examples of American architecture (Barnsdall House is said to be next on the schedule) is to destroy the value of our past and short-change our future.

Architecture is a three-dimensional record

of our history. And history is both a source of national pride and a needed guide for future planning. Sigfried Giedion put it this way:

"To plan, we must know what has gone on in the past and feel what is to come in the future. Living from day to day and hour to hour is not natural, and leads to a perception of events as isolated points rather than as part of a historical process."

Short as our history is, it's all the history we've got. And no matter how thoroughly a valuable building such as Dodge House is documented photographically, it can't be truly assessed as architecture or used as a guide unless seen in the flesh. Architecture is three dimensional not two.

So much of value has already been lost that Nathaniel Owings was prompted to say that "as surely as the buffalo disappeared from our prairies, so the quality inherent in the term 'native land' is disappearing from this earth."

It is understandable that politicians attempting to solve our urban problem piecemeal, planning no further than the budget year or the next election, are impatient with groups trying to preserve old buildings. I suppose they tend to classify such groups as cultural anti-vivisectionists, hysterically dedicated to obstructing progress. Perhaps this is due in large part to the fact that generally no attempt to save a building is made until demolition is at hand. Action at that point tends to be immoderate—feverishly committees are formed, strong words hurled about, intemperance is the game.

This is not to say that committees are lacking before the fact. But support for their efforts is, coming only when it is all but too late for the support to amount to much more than an anguished outcry. In the case of the Dodge House, nothing was known by the Southern California Chapter AIA Historic Buildings Committee until the School Board had made its decision to sell. This will be the rule as long as urban development is done piecemeal. No one will be aware of the threat to a valuable building until razing is imminent.

One solution might be to draw up a list—not too large—of buildings that should be preserved and have the city approve the list and plainly mark the sites for all local agencies concerned to see.

(Continued on page 35)

Walter Luther Dodge House, 1914 - 1963 (?)

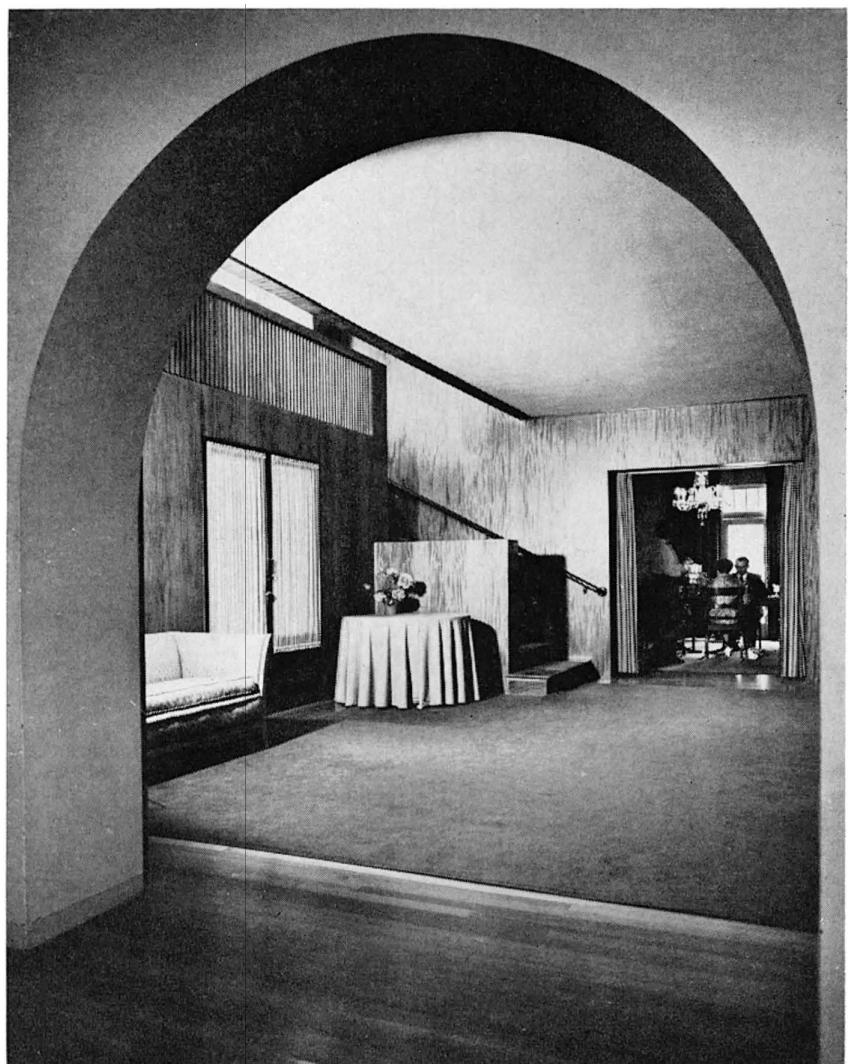


PHOTO BY JULIUS SHULMAN



PHOTO BY MARVIN RAND

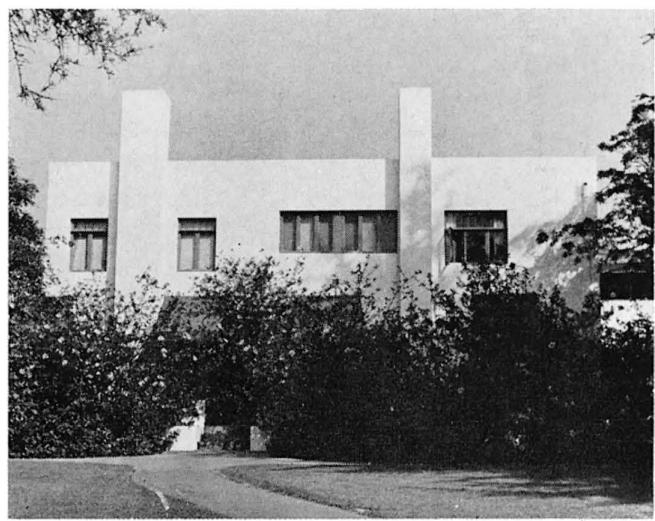


PHOTO BY ESTHER MC COY

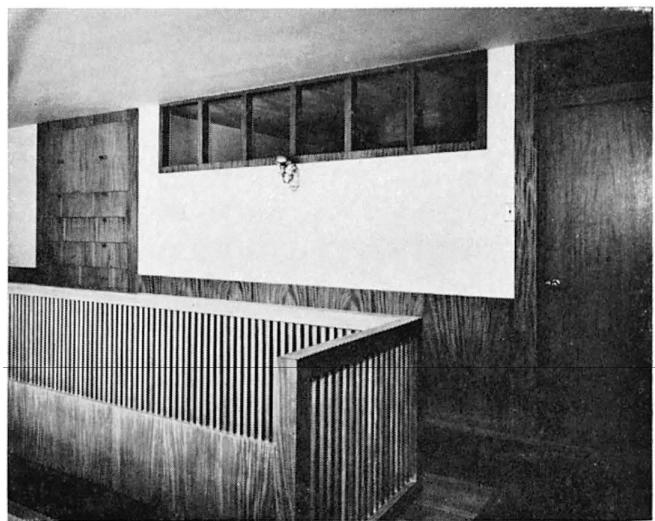
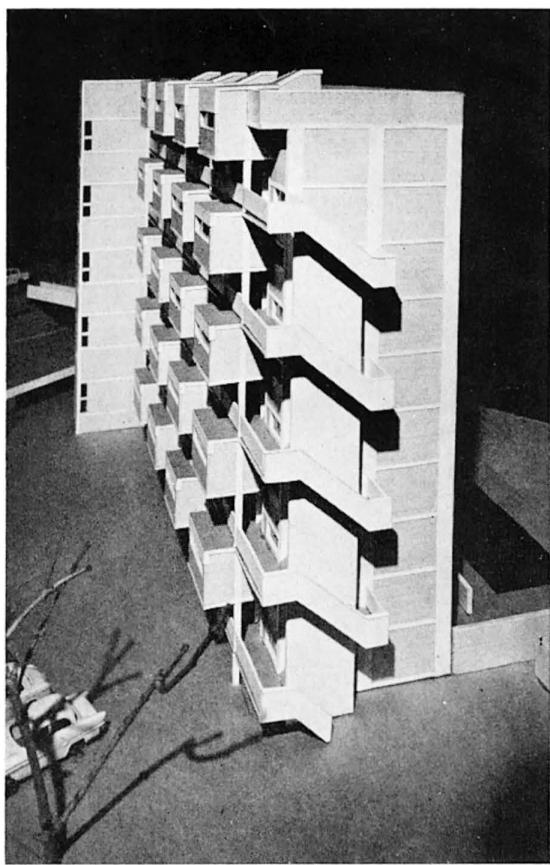
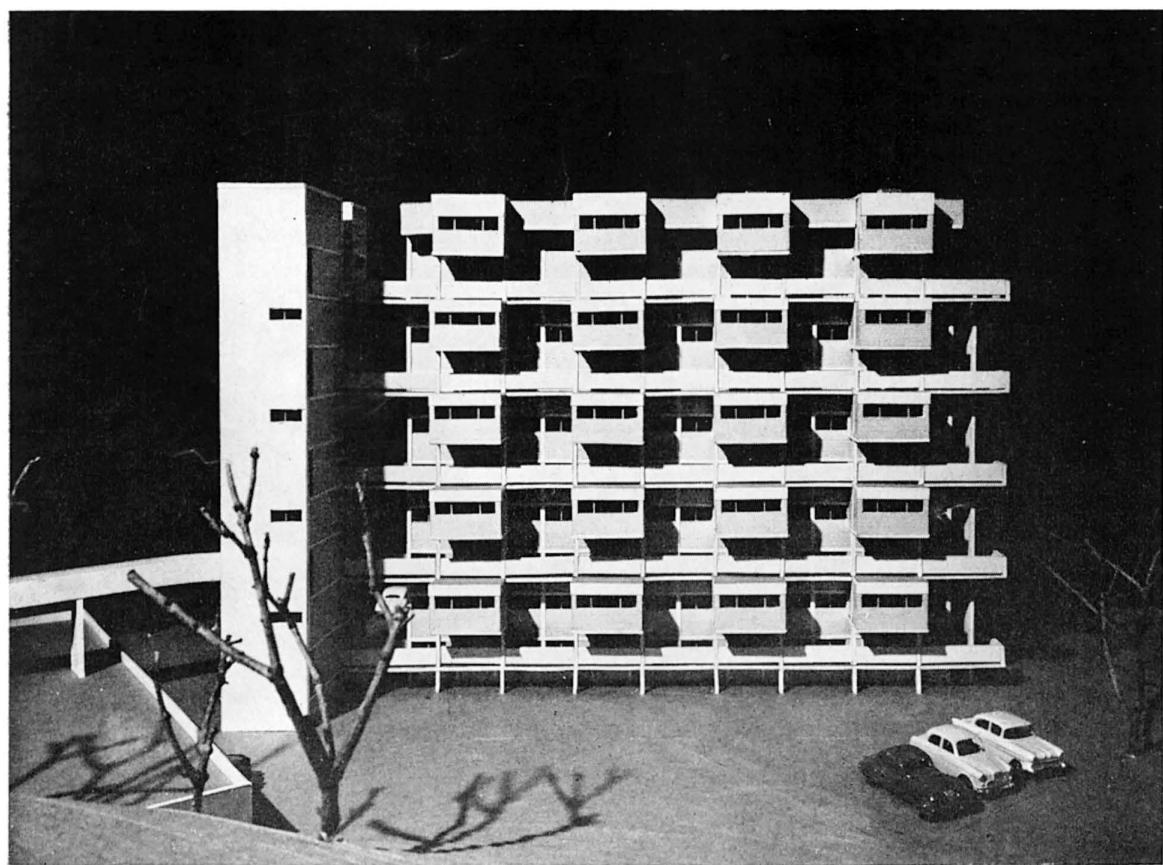
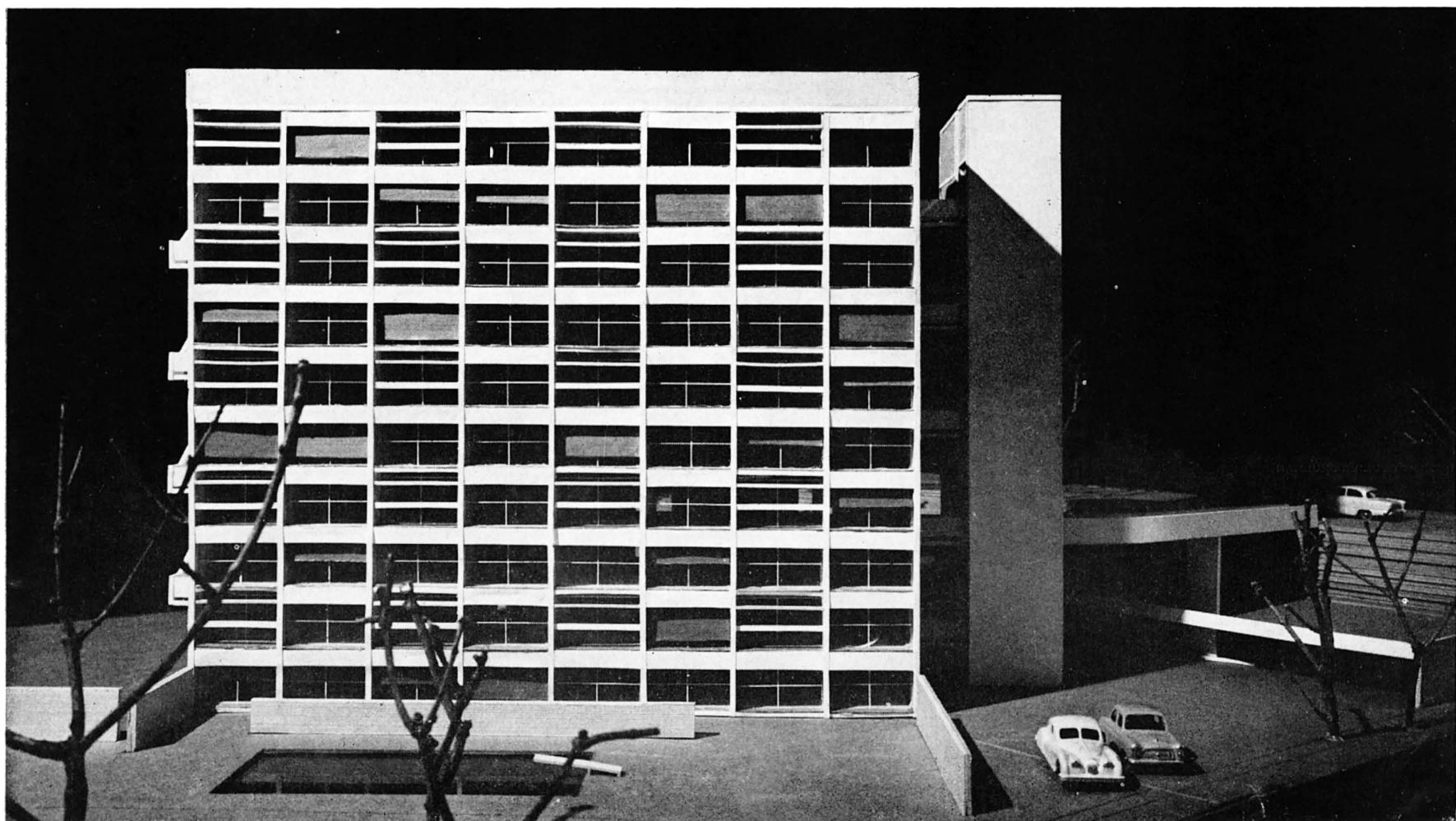


PHOTO BY JULIUS SHULMAN



APARTMENT PROJECT IN RUSHCUTTERS BAY BY HARRY SEIDLER, ARCHITECT



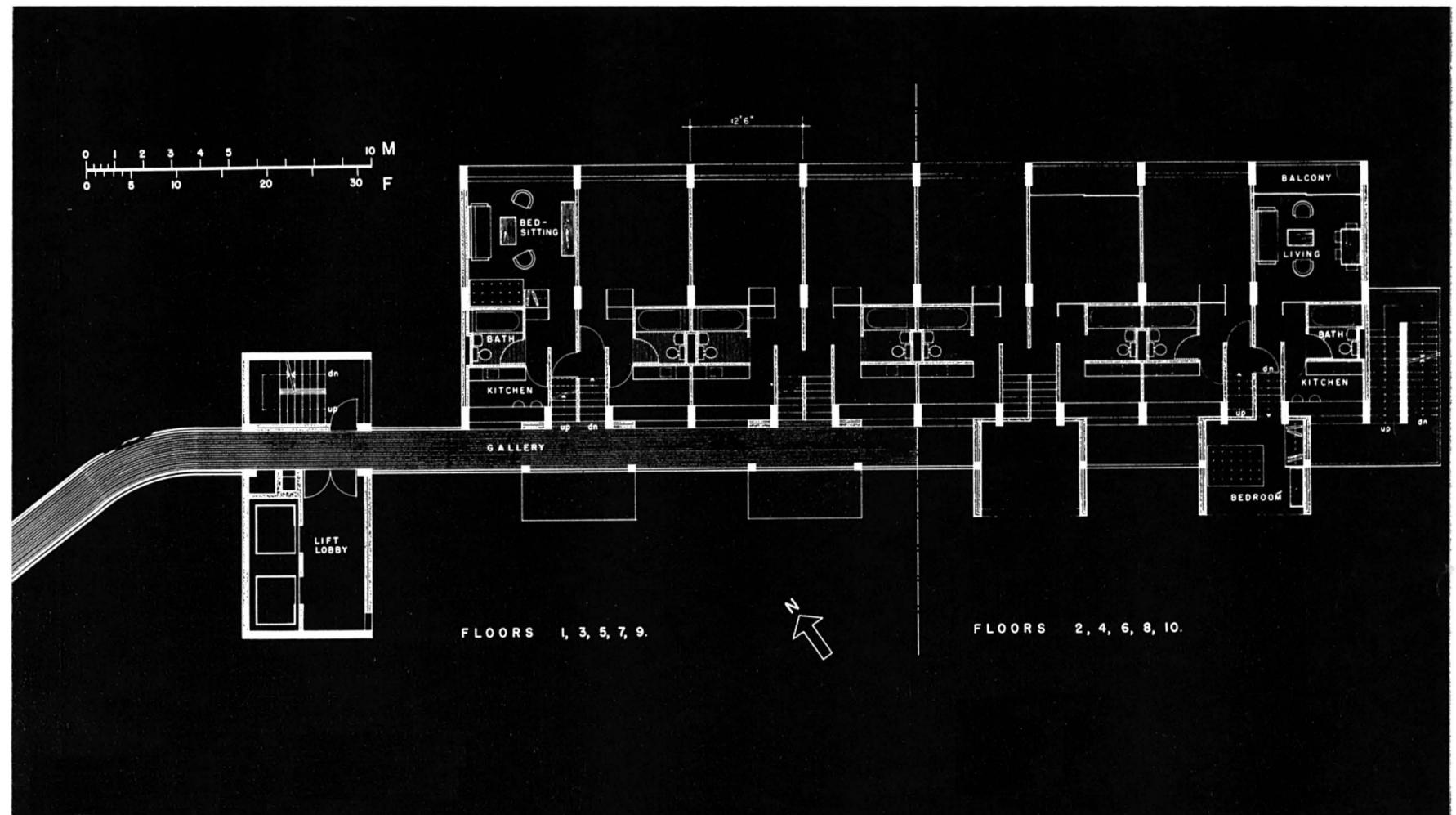
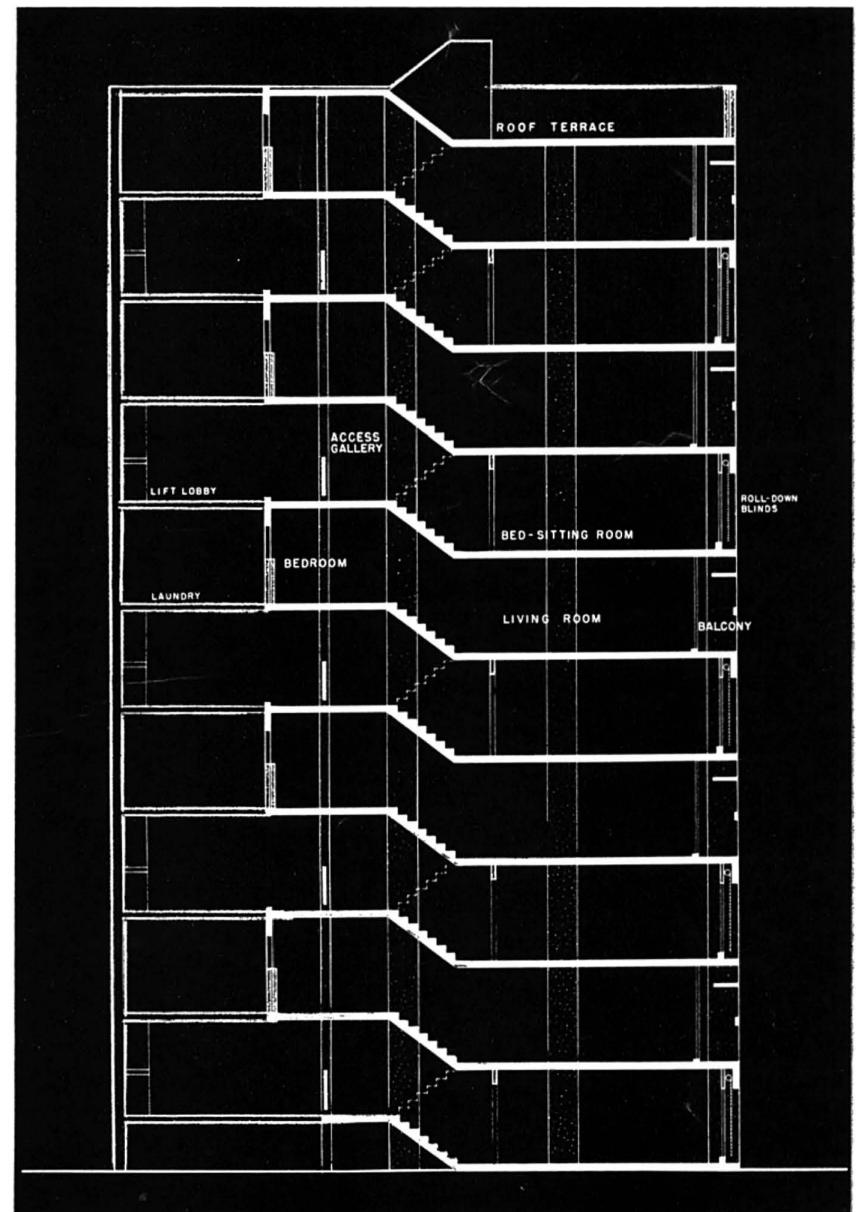
The site for this block of furnished rental apartments is located at the bottom of a rock cliff, 22 feet below the main approach street. Access for cars is from a lane at the opposite end. The site is level and overlooks a park on the edge of Sydney Harbor, Australia.

The building contains 80 apartments: 60 bachelor units of 330 sq. ft. and 20 one-bedroom units of 470 sq. ft. The aim of the design is to give all apartments a view of the water and face them to the northeast, within the height limit of 10 floors. To achieve this with the minimum of public space, a system of split-level planning was adopted, having access galleries every second floor. From these, half flights of steps, up and down, lead to pairs of units. One in every four apartments has a bedroom projecting above the galleries. Their placing evolved from the need to provide external windows to all kitchens as required by law.

Two elevators, an enclosed firestair, the incinerator and a laundry on alternate floors are contained in vertical shafts, separated from the main building so as not to destroy its clearly defined structure and planning. A curved pedestrian access ramp resolves the angled placing of the building to the street frontage and leads into the second floor of the access tower. The required second stair connecting the ends of galleries has open concrete flights cantilevered off a central supporting spine.

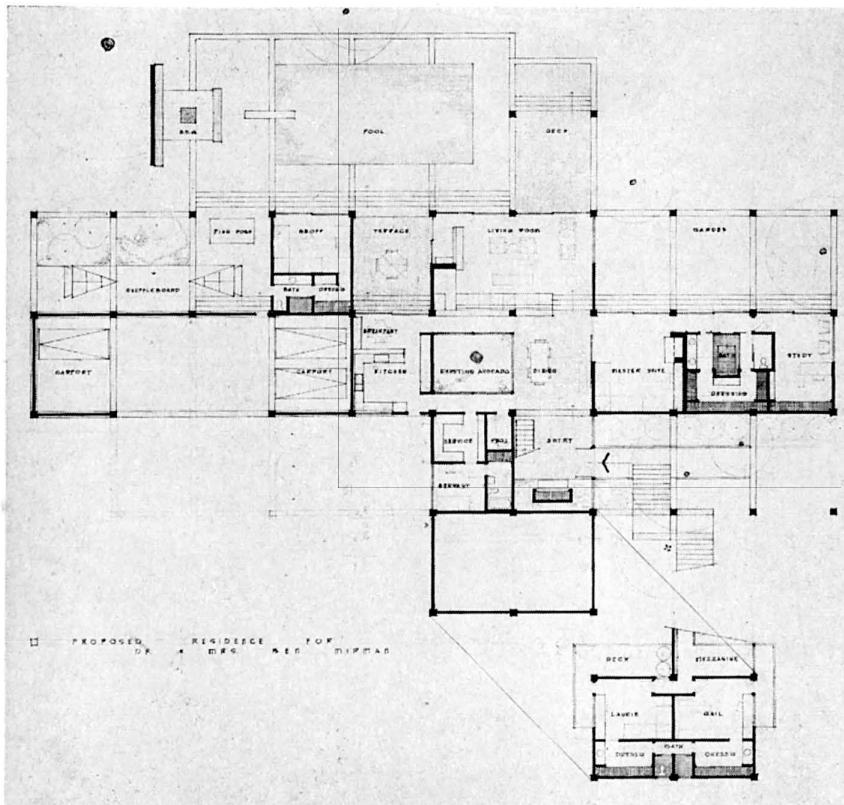
Construction is of reinforced concrete throughout with the structure clearly expressed on the exterior. Infill walls are of white brick.

The top level one-bedroom units have access to private roof gardens. The grounds are used for car parking (some under cover) and a communal swimming pool surrounded by screen walls.





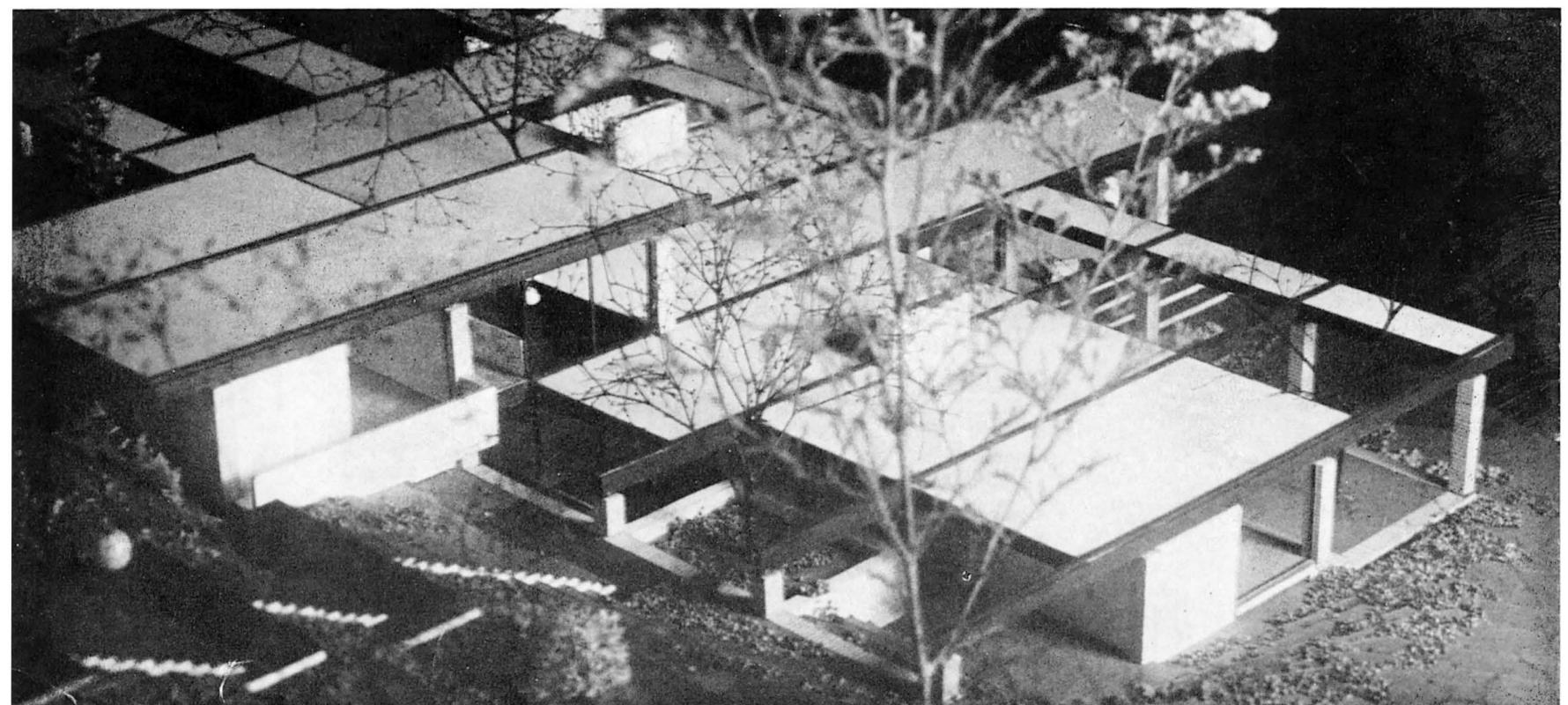
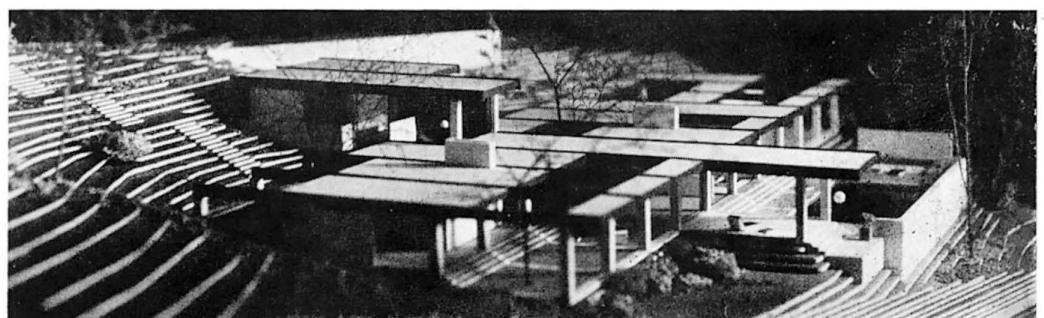
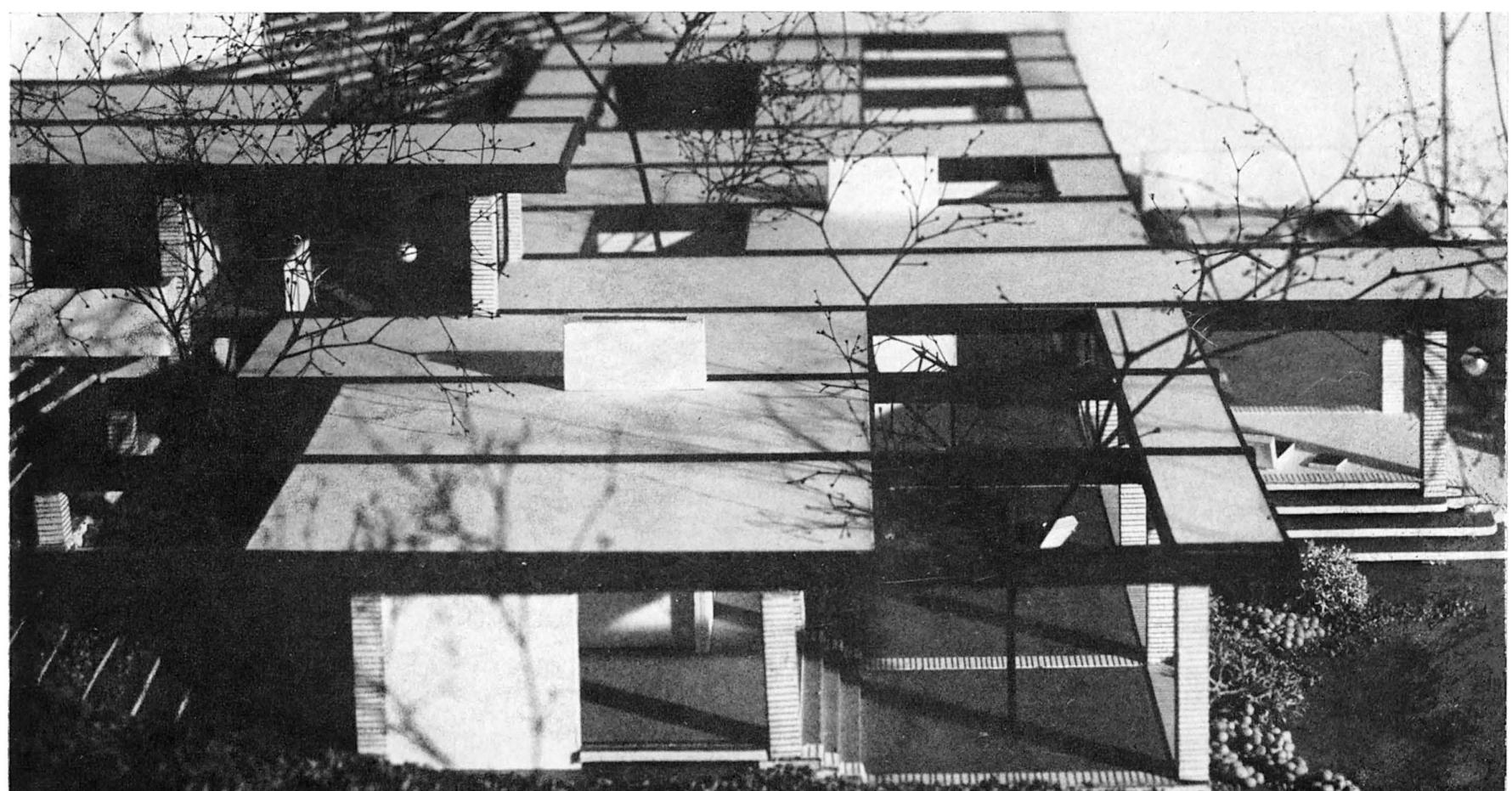
HOUSE IN PASADENA, CALIF., BY BUFF, STRAUB AND HENSMAN, ARCHITECTS

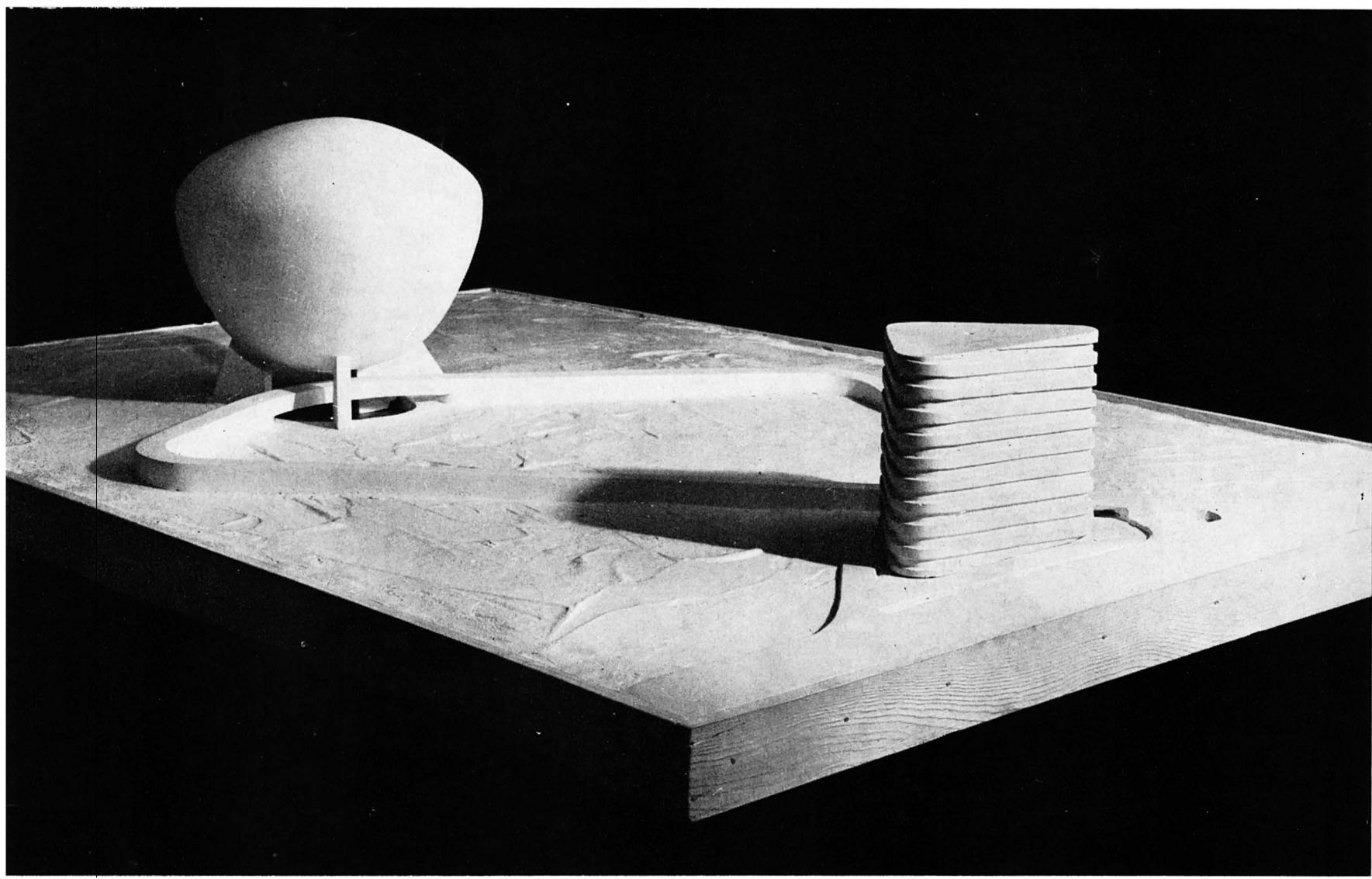


The model and plans of this house demonstrate a classic discipline and restrained vocabulary of materials and detailing which auger well for the achievement of the architects' objective: a serene and sophisticated environment for their clients.

All of the interior and major exterior spaces are defined by a rhythmic arrangement of brick columns which form a series of 16' x 20' plan units. By transferring all vertical and horizontal loads as well, the columns free the walls from any structural obligation. The 16' x 20' module is further delineated by the roof framing system.

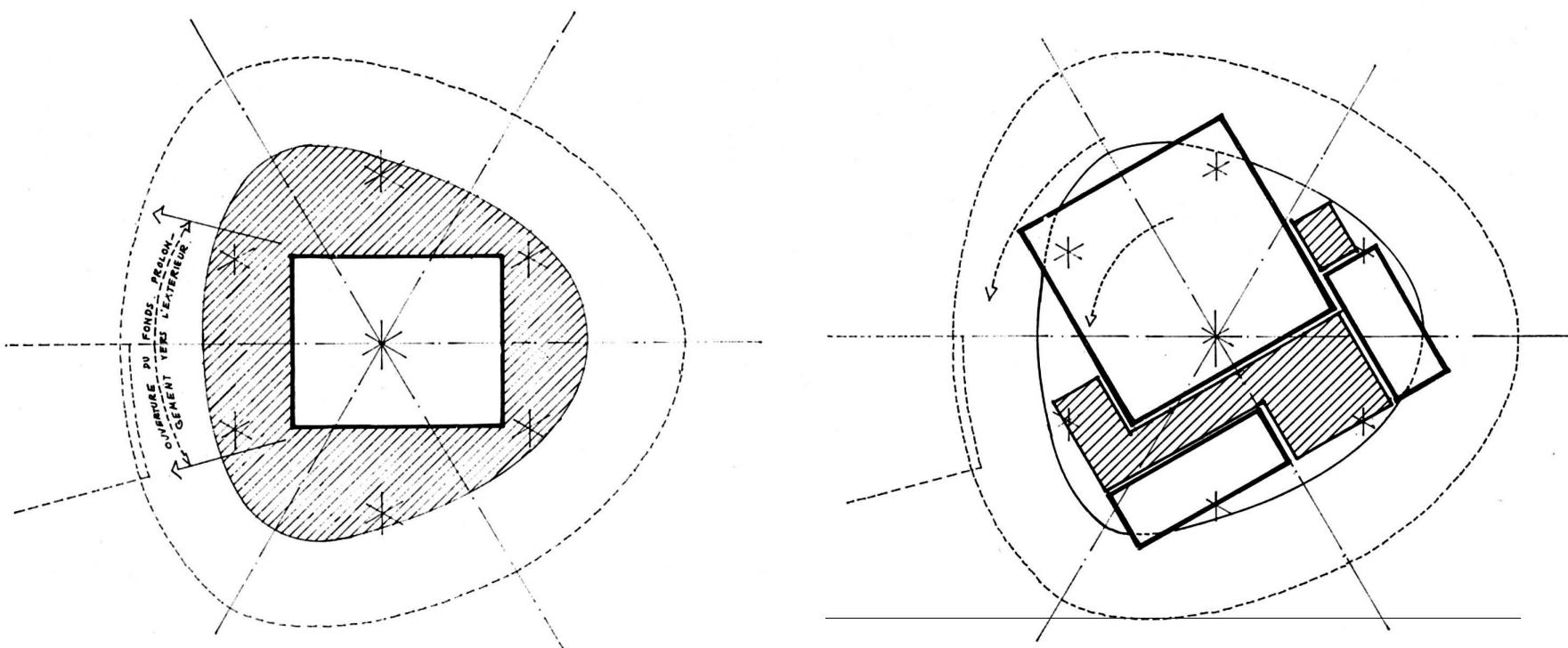
In order to preserve the natural quality of the site — a portion of an old estate, sloping downward to the north and endowed with a number of trees and a view of the San Gabriel Mountains — the architects have developed the house on a number of levels with an east-west axis. All major spaces thus will relate to the view. The client's program called for a plan allowing privacy to family members — parents, two daughters and a teenage son — when desired. The solution, through use of courts and level changes, is an attenuated plan. The daughters' suites are at the highest level, connected to the body of the house at the two-story-high entrance hall. The adults' suite to the east is a combined sleeping and living zone which can when the occasion arises function visually and physically as a unit with the main social space. Kitchen-morning room, servant and utility section, and son's suite are to the west. The son's suite is semi-divorced and later is to serve as guest room-studio. A screened terrace connects kitchen and bar area at the living room and provides a protected and easily serviced exterior entertaining space.





PHOTOGRAPH BY LENI ISELIN

PROJECT FOR A THEATER IN DAKAR BY ANDRÉ BLOC AND CLAUDE PARENT



We have here a plastic investigation aimed at realizing a structural envelop approaching the natural architecture of the egg.

The first structural proposition followed quite naturally from the visible element of the egg, namely its shell. We foresaw either a relatively thin concrete shell or a double shell covered with very thin concrete. This solution is essentially static and it is the very inertia of the double shell which will create the object from the mathematical hypotheses.

The second proposition, on the other hand, was born of an observation more closely connected to the internal dynamics and actual structural essentials of the egg. This solution isn't only a rigid shell indifferent to its contents, since it is the totality of the container and its contents which gives to the egg the strength it would lack if it were simply an empty shell. In addition to its external shell the egg has a membrane—in some species a finely woven tissue—that is quite as elastic as its shell is rigid. In short, there are a number of internal tensions which maintain the

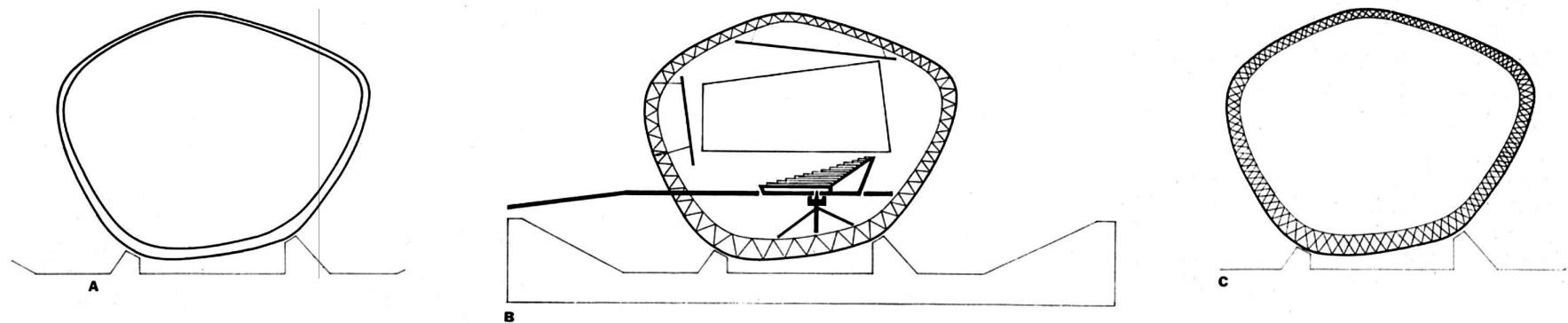
equilibrium and integrity of the egg so long as it is "alive".

It is this latter proposition which most nearly approaches natural architecture. Its manifestations here are:

1. A rigid shell, a truly thin cocoon, or finely meshed and compressed net "cuticle";
2. A pliant interior membrane or stretched net, elastic in proportion to the rigidity of the exterior compressed net;
3. A three-dimensional network of tensions—a trellis of cables—tying the exterior "cocoon" to the interior "membrane".

This dynamic hypothesis is the base of our calculations; the structural concept being that the tensions of the three-dimensional network are what will maintain the exterior in compression and the interior in tension.

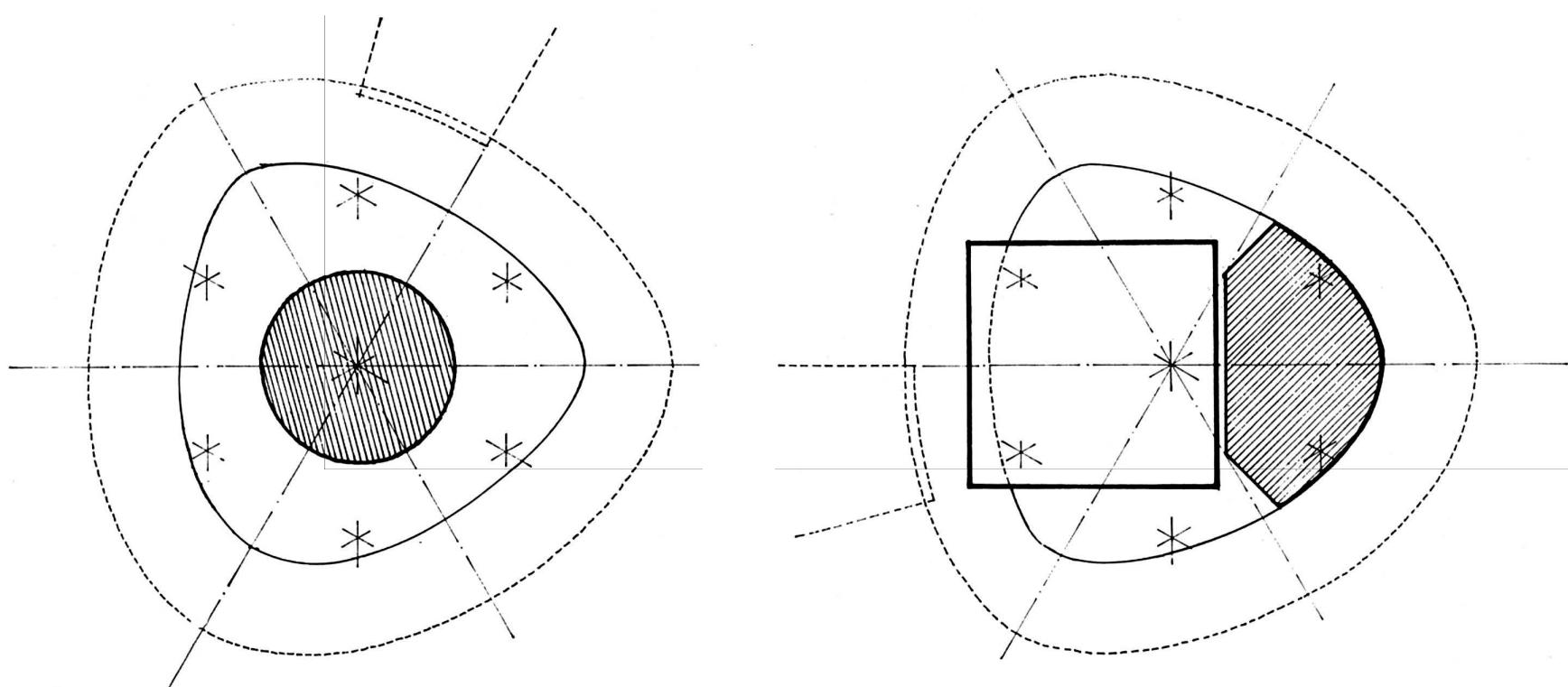
The "architectural object" thus realized will then become a unity: plastic and structural blended, in one work, without false pretense, which frees the internal volume for its proposed use.—RENE SARGER



Various Structural Propositions Studied:

A. Shell of reinforced concrete. B. Three-dimensional structure with finely woven mesh. C. Traditional three-dimensional structure.

RENE SARGER, CONSULTING ENGINEER



The drawings above show the various possible dispositions of the interior spaces. Those enclosed in black are scenic; those cross-hatched are public spaces.

DEVELOPMENT OF LIGHTWEIGHT CONSTRUCTION AND USE OF PLASTIC IN CONSTRUCTION OF MULTI-FORM BUILDINGS

BY FREI OTTO

Edited by Amir Farr

It is unquestionably time to summarize clearly how far it is possible to employ, in building construction, those plastics which are brought to the site in a fluid condition, and later undergo a hardening process. Many of these ideas have a longer development behind them. The author had as a student already examined the design possibilities of methods shown, and had also, in the preparation work of 1955-57 for the 1957 International Building Exhibition, studied the stiffening of a pneumatically tensioned skin by means of an applied layer of plastic. These methods, and others derived from them, have appeared frequently in recent years with increasing range. In this report working methods are shown which can be taken over directly from normal practice, together with those which will need a longer period of development work. There are also expressed, however, ideas which are known to lie perhaps in the distant future in order to show the whole scope of possibilities.

At the German Building Exhibition in Essen of May-July 1962, a pneumatically stretched skin was sprayed from the inside with heat insulating plastic which stiffened it to a self-supporting, curved shell. This was an experimental building. The experiment showed that it is possible to transform pneumatically tensioned skins into curved flexed shells which require no further supporting internal air pressure. Also that in bad weather, i.e. rainy and down to 40° C., the interior of the pneumatic construction can be worked on undisturbed.

The stiffening of pneumatically tensioned skins, by externally spraying with concrete, has already been produced for several years by Wallace Neff, California (see Joedicke, "Schalenbau" [Shell Building] published; K. Kramer 1962 and Otto Trostel, "Zugbeanspruchte Konstruktionen" [Structures Under Tension] Vol. 1 published by Ullstein 1962). With external concrete spraying, high internal pressures and provisions for steel reinforcement are necessary. Great dependence on weather conditions is also involved.

The pneumatically tensioned skin can later serve as the external skin of the shell or alternatively be removed and reused. Efficient tools should produce, with rapid hardening plastics which are in themselves conducive to this, an even surface and thickness. Plastics with high modulus of elasticity and low specific gravities should be mostly used.

The stiffening of a pneumatically tensioned skin is not only possible through spraying, but also through glued-on rigid materials. These can be used successfully in different ways.

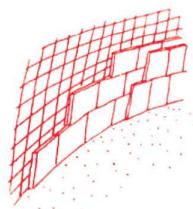
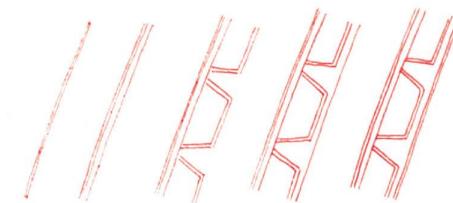


Fig. 1: Into the internal sides of a pneumatically tensioned skin were glued stiff sheets, e.g. mineral foam glued in several layers, each single sheet being cut specially. With standard ready-made sheets, cutting waste can be almost eliminated (max. 5%) by choosing suitable sections.

Fig. 2: In several stages, the skin becomes stiffened:



- a. Skin
- b. First stiffening with a layer of sprayed plastic
- c. Glued on coffered sheets
- d. Sprayed on layer of plastic foam between the coffers
- e. Internal finishing layer

By the existence of a double skin, the hollow space in between can be calculated beforehand to effect a stiffening, by chemical or physical means.

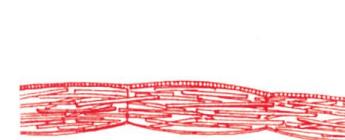


Fig. 3: Between the double skin of a pneumatically tensioned skin are placed materials, e.g. woodwool, turnings, textiles which after inflation of the dome become glued together. To achieve this the chips, etc. are previously impregnated with glues or plastics which adhere only when a solvent-saturated air is passed through the hollow space.



Fig. 4: The inflation of an elastic sheet:

Under a pneumatically tensioned skin, 1, an elastic sheet was laid flat on the ground and covered with sticky foam plastic, 2, and then inflated hard against the external skin, 3, flat sheets of rigid plastic was softened by blowing in warm air; these were subsequently pressed against an external pneumatic form, thus making a self-supporting shell. When transparent plastic domes are required, this method is a good possibility.



Fig. 5: The internal coating of a pneumatically tensioned skin can be carried out by a fully motorized spraying plant with extending arms under satisfactory air conditioning for both equipment and workers.

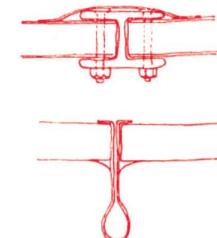


Fig. 6: Differing methods enabling the rejoicing of shells, which have been cut into, by glueing, overlapped glued joints, "H" formed plastic sections, or metal reinforcing ribs.

By forming special shapes it is possible to obtain ribs and reinforcement of the pneumatically tensioned skin which would otherwise have to be glued on separately.



Fig. 7: The inside of a pneumatically tensioned skin fitted with an air pressure tube, to form a strengthening rib. Naturally this rib can only function if the outside membrane is also covered over.

It is possible without great difficulty to spray light foam substances such as aerated plasters, rapid binding concrete, plastics with fillers, or pure foamed plastic. These can be effected with free jets or specially shaped nozzles.

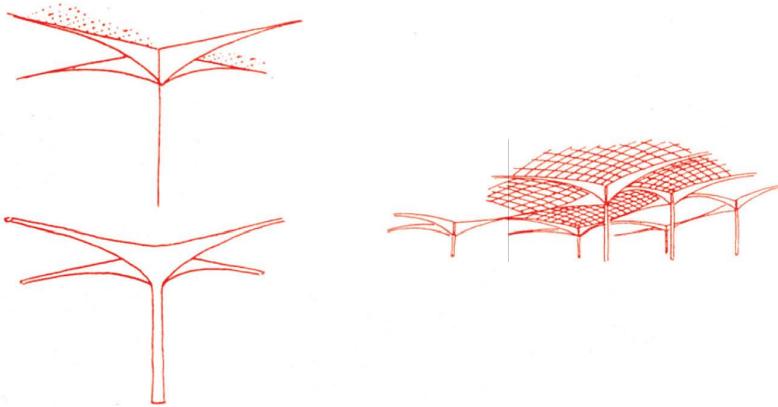


Fig. 8: In pneumatically tensioned skins with so-called inside walls the reversion to compressive stressed shell supporting structures is feasible without difficulties.

Examples are shown which can be employed in almost all building problems and for diversely constructed forms. It is naturally difficult to take typical examples. When working with pneumatically tensioned skin, the resultant shells follow the formation restrictions of membranes. Nevertheless, by clever manipulation of the pneumatically tensioned skin it is clearly indicated that, admittedly not all, but countless forms are possible. Here are a few examples:

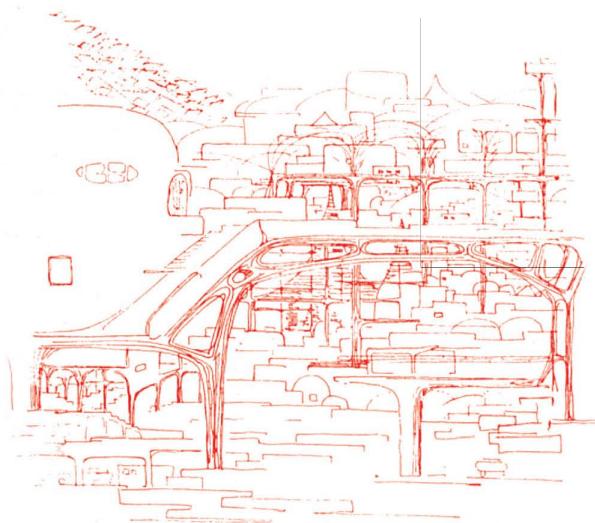


Fig. 9: Town planning sketch suggestions.

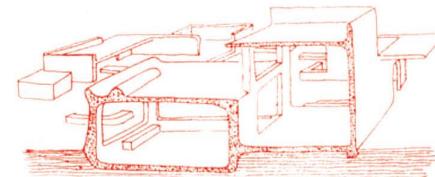


Fig. 10: Sketch section of a single family house using the foam spraying method.

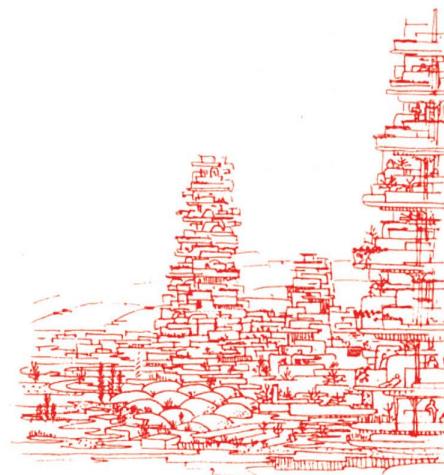
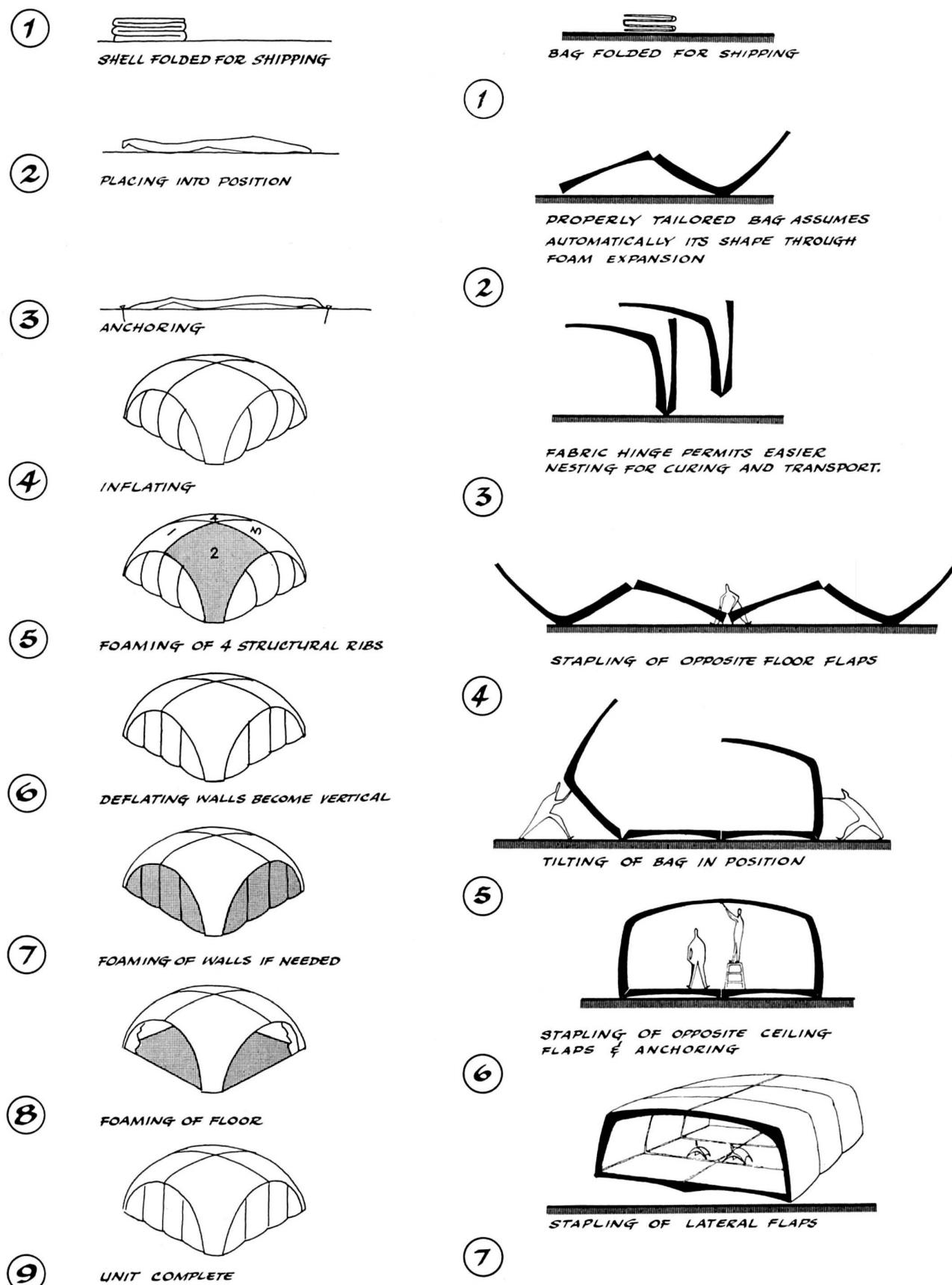


Fig. 11 & 12: More town planning ideas to point the way to further thoughts on the subject.



LIGHTWEIGHT CONSTRUCTION



Above are two concepts illustrating the principle of "growing a structure" rather than putting it together. Developed for the government by Daniel, Mann, Johnson and Mendenhall, the two approaches to mechanical prefabrication of all-purpose shelters would utilize urethane foam, a material characterized by its property of growth. The method of directing and controlling the growth of the foam is by pre-tailoring the skin of the structure into predetermined forms for the expanding foam.

In the beginning there was nature. Today there is design. While others continued the evolution of teeth and claws, man developed tools and weapons. In the struggle for existence man survived by the fitness of his designs¹ not by the fitness of his body.

Since home building has existed as a seemingly planned activity of many members of the animal kingdom even before the coming of man, it may be logical to look upon the choice or creation of shelter as, perhaps, the oldest function of design in human affairs, with apologies to Eve and the Serpent.

The first incentive or evolutionary impetus toward the acquisition of a home undoubtedly had its origins in a very real need for a retreat in the literal sense of the word. Man sought asylum from the furies of the weather above, of the enemies around, and of the demons within. He did not merely want to be protected from the dangers that he knew, but also to be hidden from the eyes of the invisible foes that lived only in his mind. If glass had been invented, it would scarcely have pleased him as a building material, and nothing could have been more abhorrent to his need for sanctuary than a picture window. A cave was his ideal refuge, and the only thing wrong with it was the fact that it was open at one end. One may wonder if the first move away from the caves was actually a move into the open, or into something more easily closed than the grottos that nature provided.

From the days of the Neanderthal down to the early part of the Twentieth Century the demands we made upon architecture changed only in degree, but not in kind. We wanted a roof above, and walls around us. The prying eyes of neighbors replaced the evil orbs of phantoms in our environment, and concealment, as well as protection, remained essential functions of our shelter, as before. From the haunt of the caveman to the home that is my castle the distance was much shorter than it seemed en route.

In the relentless struggle for existence under natural conditions, unmitigated by the inventions of man, psychological fitness for the environment is as essential to the survival of the species as are the bodily skills on which it must rely for the fulfillment of its physical needs. Before the dawn of civilization the human species, and any other species that survived, must therefore have enjoyed an adequate mental as well as physical adjustment to its natural environment, maintained and improved through countless generations by the processes of adaptive evolution.

When man first started to rise above his inherited circumstances to create a new environment of his own design, two separate processes were slowly set in motion. On one hand the external conditions to which the species had previously been adjusted were being altered a tiny little bit at a time by man's own efforts. On the other hand, the evolutionary forces working to assure continuing readjustment to the changing environment, were being weakened by the individual's increasing ability to protect himself, or to obtain protection from society, in situations for which he is actually quite maladjusted. Since both processes draw their fuel from the common source of technological progress they also tend to advance at a common pace. Until the onset of the industrial revolution this pace did not seem very ominous. But in the last 150 years it has entered an exponential curve of swift acceleration and rapid accrual of unintended and unforeseen consequences both for the minds and for the bodies of men.

The igloo does not change the arctic landscape, and people still struggling to master their habitat often eliminate the unfit among themselves even before nature does it.

The city of the preindustrial age did, of course, create an environment very different from that provided by nature, but it still remained entirely within that "human scale" we are so anxious to conserve the remnants of today, along with the Whooping Crane. And society's protection of the maladjusted was still quite feeble, scarcely a potent preventive of natural selection.

It was only through the technological advances of the Nineteenth and Twentieth Centuries that we finally achieved the ability to alter our surroundings on an order of magnitude that leaves far behind the scale of individual mental and physical performance to which man has become adapted and adjusted by his earlier evolution. And it was during this same period that progress in other fields brought about a virtual suspension of the natural laws which would previously have forced a readaptation to the new circumstances of our lives by the new hardships they entail.

If we no longer have an assured mechanism for the continued adaptation and adjustment of society and of the individual to changing conditions, then the only way out is to see to it that the changes themselves are adjusted to the real needs of those who must endure them, and do not merely express the dreams and ambitions of the planners who rarely act in their own plays. The scientific methods that have created our predicament must also be used to resolve it.

In this discussion we are primarily concerned with the mental side of the quandary, and it is important to remember that a comfortable body is no guarantee of a comfortable mind. The route by which the influence of the environment reaches the psychology of the individual may be very indirect. It may register its effects only through the mediation of the social forces of the community, including its economic and political conditions of existence. Our lack of true knowledge of the processes involved in this relay chain of reactions has been brilliantly spotlighted by Jane Jacobs,² who has also, herself, laid the foundations for a far better understanding and management of human affairs in a man-made environment. A somewhat simpler and more direct avenue from milieu to mind runs via primary bodily responses such as muscular comfort or fatigue, digestive balance or imbalance, and many others that produce secondary mental reactions. This is a fairly well plowed field of research. But the direct response of the spirit to the sensory perception of the environment, without

¹Richard Neutra, *Survival Through Design*, London: Oxford University Press, 1954.

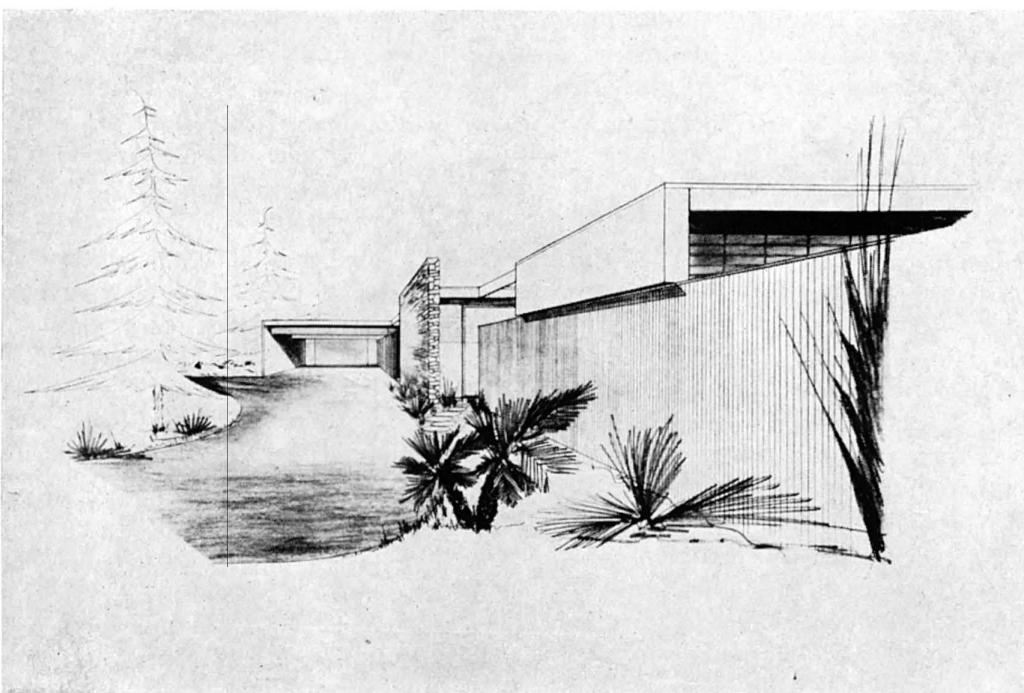
²Jane Jacobs, *The Death and Life of Great American Cities*, New York: Random House, 1961.

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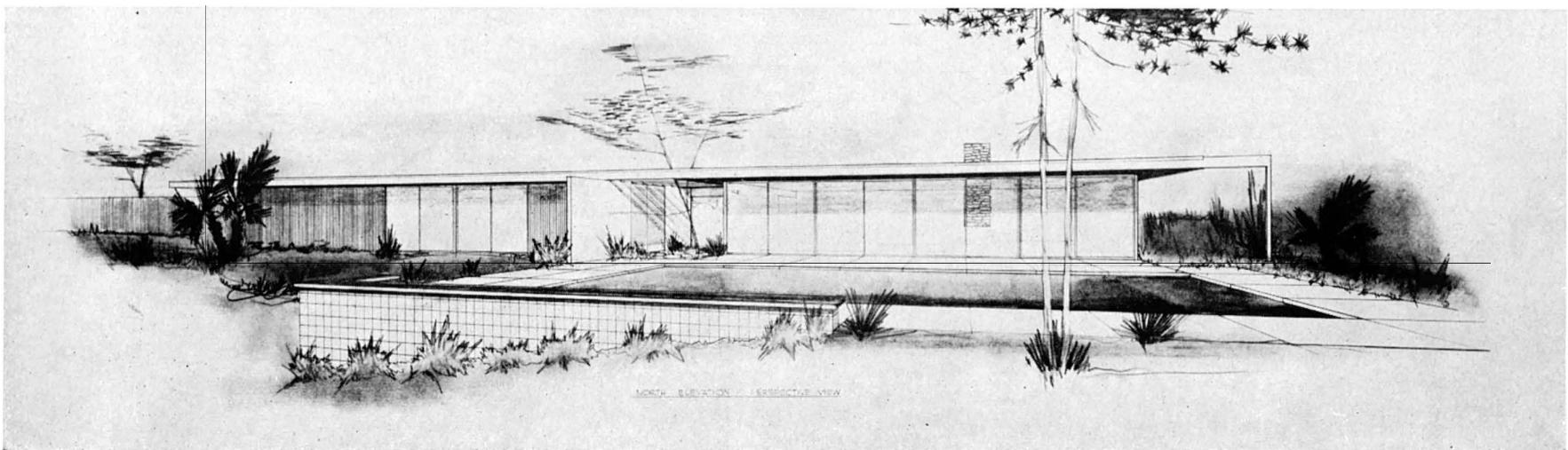
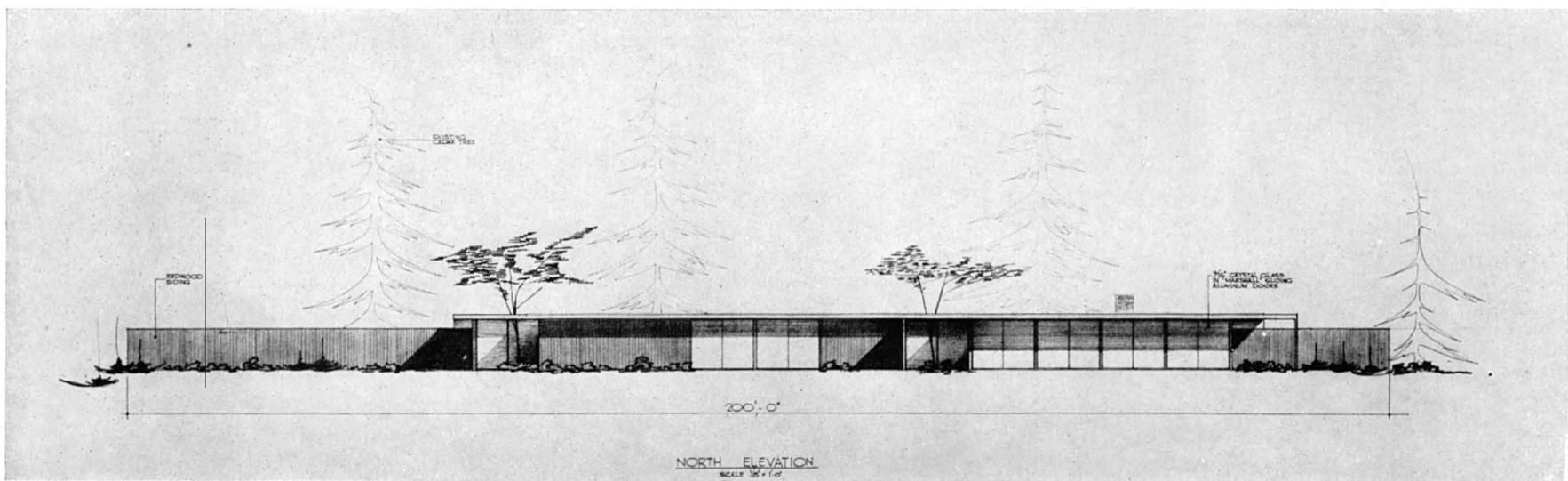
MIND AND MILIEU *A Scientific Approach to Environment*

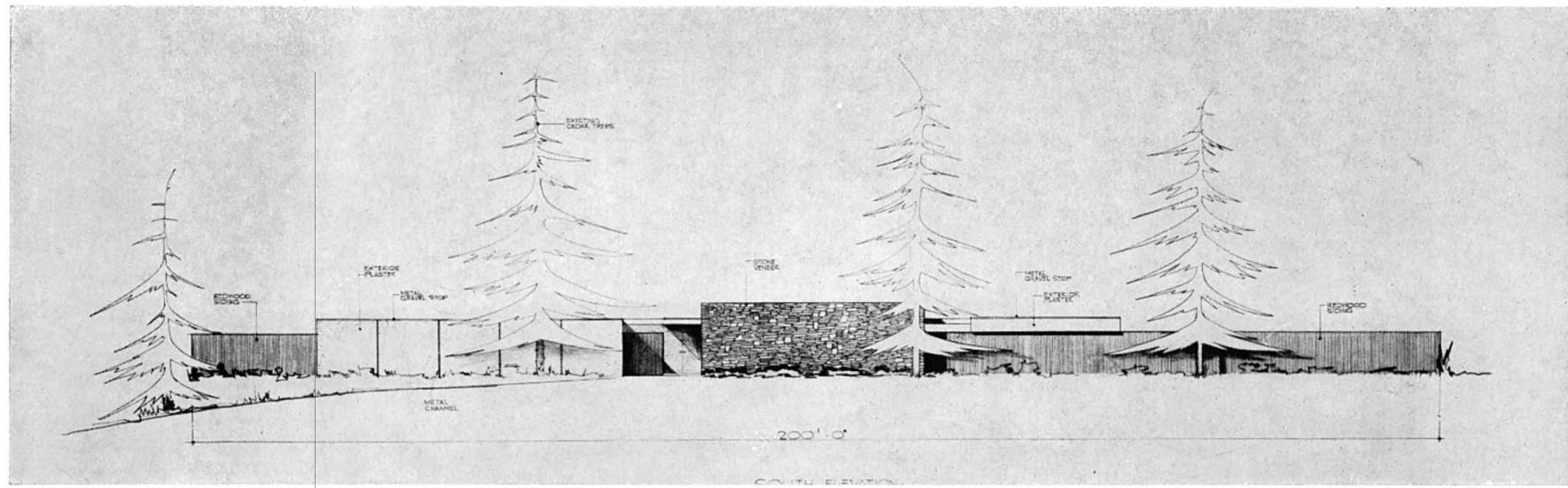
By A. E. Parr, Senior Scientist of The
American Museum of Natural History

Reprinted from *Sociological Inquiry*, Winter 1963.



HOUSE BY EBBE VIDERIKSEN, ARCHITECT





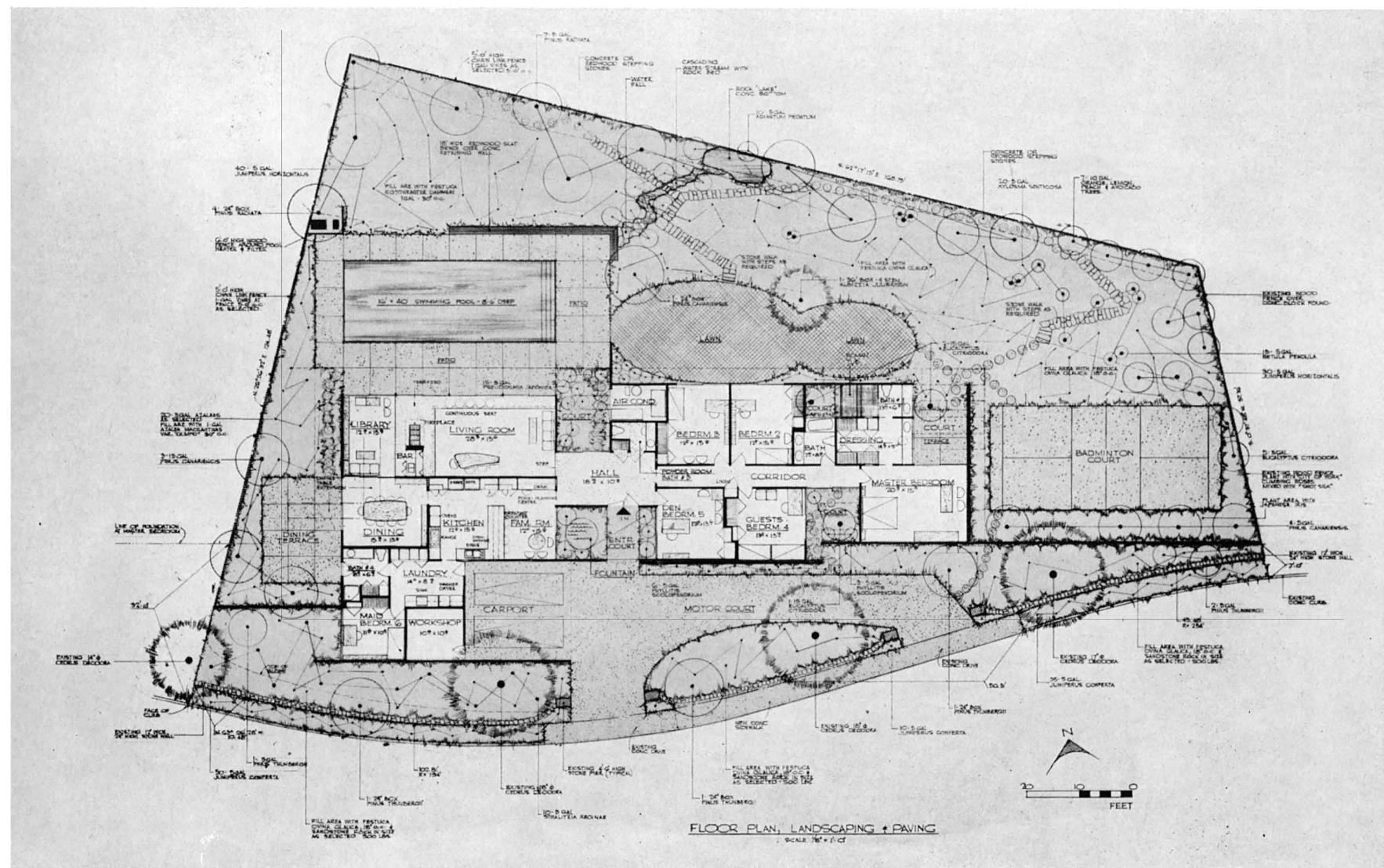
Unusually thorough attention has been given to the landscaping of this house in San Fernando Valley, indicating a pleasing concern on the part of the architect for the occupants' total environment. The most important rooms are oriented to a panoramic view of the Valley. Others are located around a series of pleasant landscaped courts or terraces. All exposure to the street has been avoided by means of solid walls and fencing on the street front with advancing and receding parallel planes.

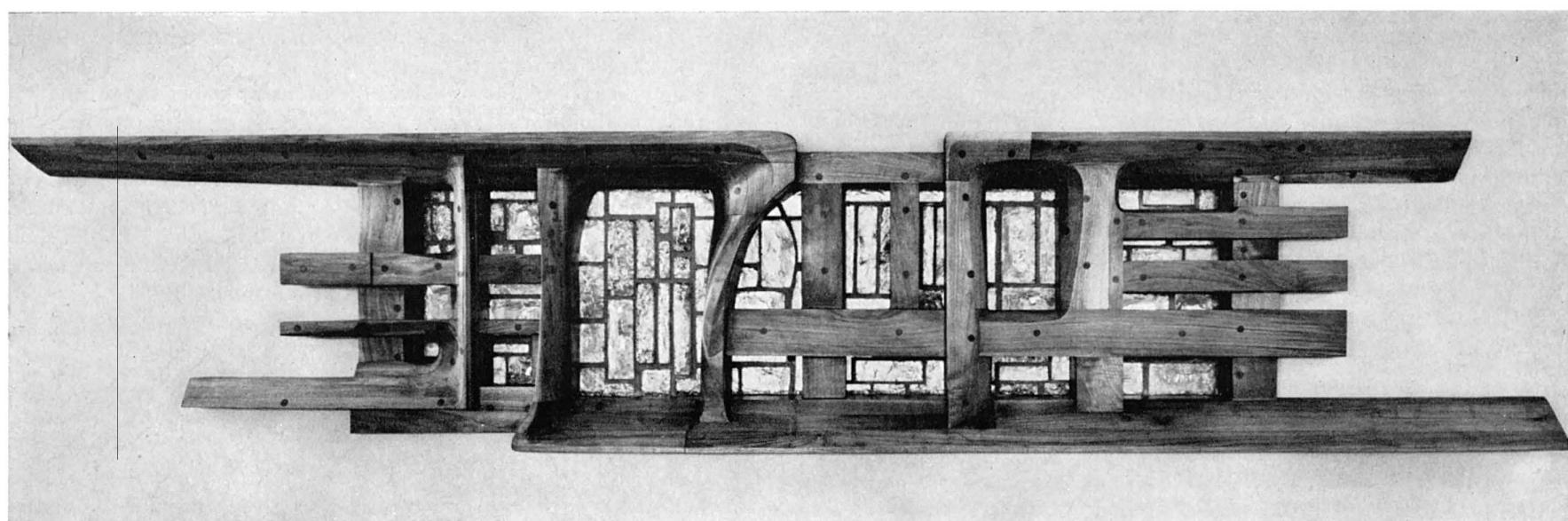
The site is an irregular, half-acre pad sloping 30 degrees from the north property line. Exterior of the house is to be stone, stucco and vertical redwood siding. A continuation of the exterior front wall to the

property line on each side eliminates the need to introduce another material for fencing the pool.

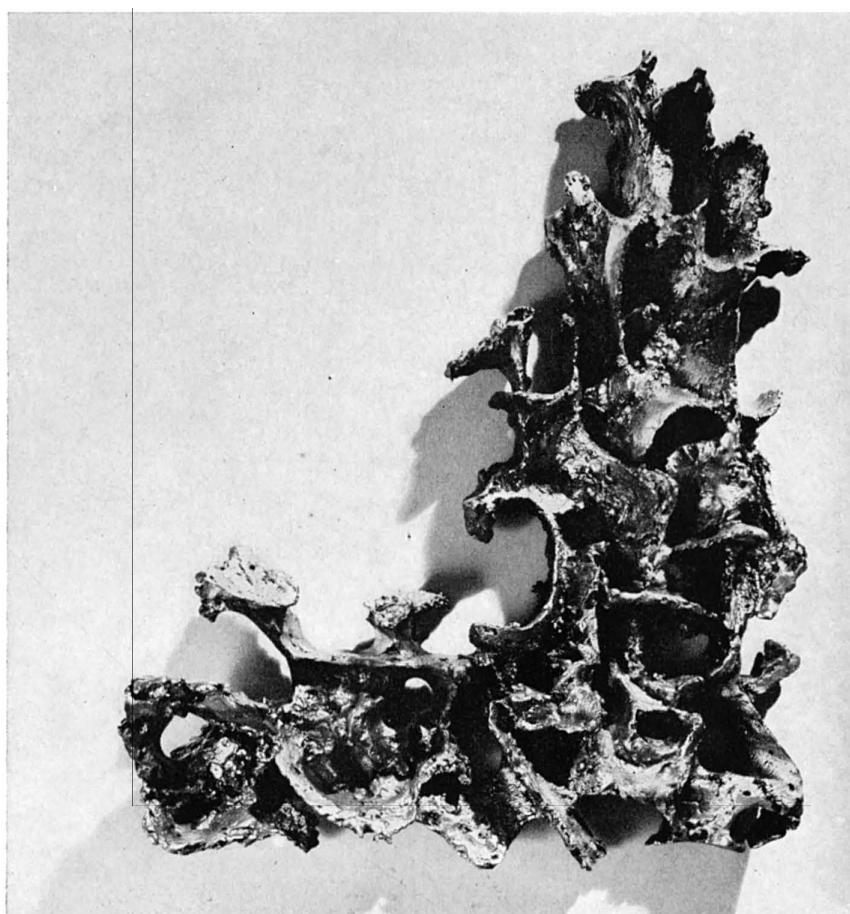
The entry is centrally located and the courts on either side of the hall will separate living and sleeping areas. Access to all courts from the adjacent rooms is to be by ceiling height sliding doors which have been specified in lieu of windows. Large overhangs protect glass areas.

Plaster ceilings will penetrate the glass planes and continue out under the overhangs. Exterior stone and redwood will be used inside in some areas. Cabinets and paneled walls will be of oiled teak. Floor area is 3800 square feet; the roof covers 5600 square feet.



SCULPTURE BY ROGER DARRICARRERE

Wood and stained glass — 14' x 3' — Bart Lytton Collection



18" x 16" Model Cast Bronze



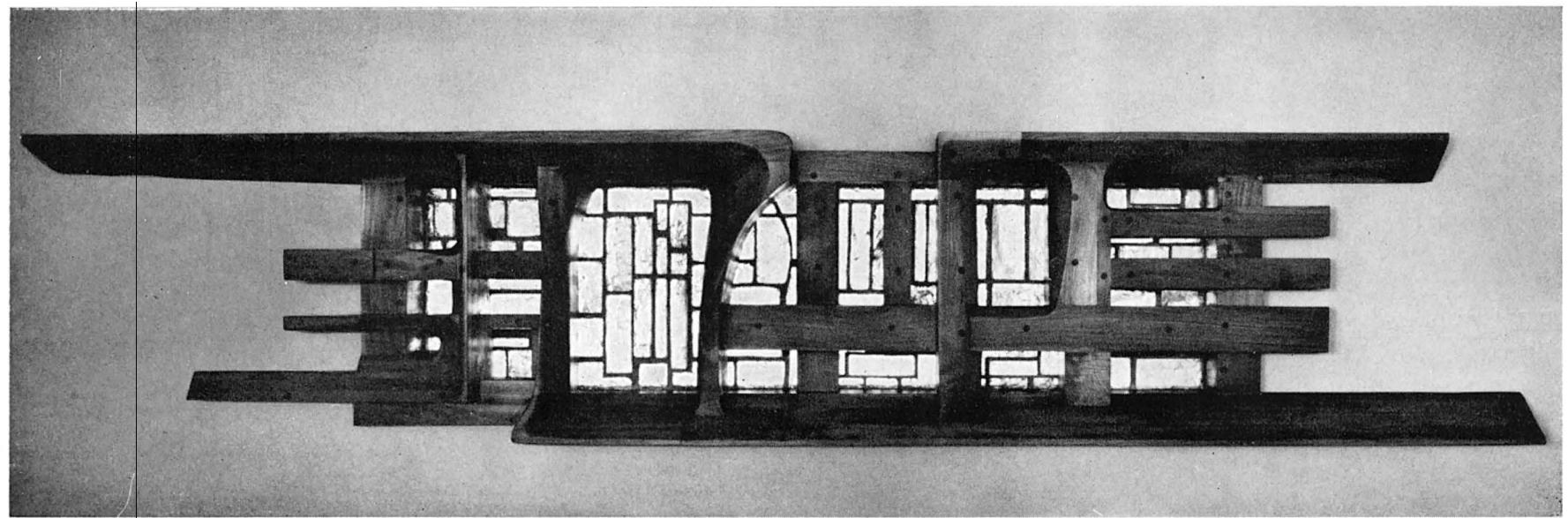
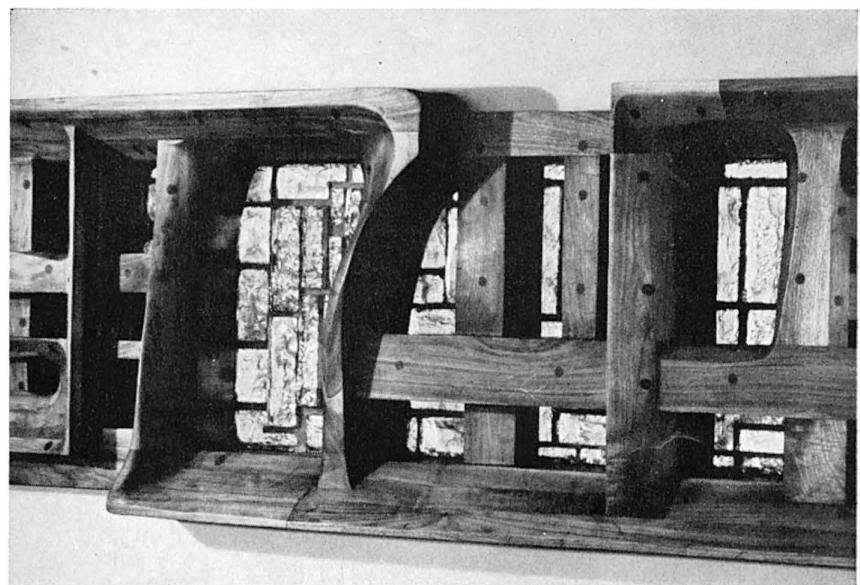
Detail of 8' x 12' concrete and stained glass screen — Bart Lytton Collection

An exploring of the nature of the material he works with, an effort to find and reveal its essence, is as important to Roger Darricarrere as expressing his own images. Fire is his tool, whether working in metal or glass-in-concrete.

In his recent metal sculpture, Darricarrere works directly with a blow torch, tries to "get inside the metal and bring out things you don't ordinarily see". He brings the metal to the fusing point, makes it explode, crackle, turn liquid, lets it "freeze" or melts it, in order to reveal all the natural characteristics of that particular metal when cold, hot and liquid. Accidental forms reveal still new characteristics and are taken advantage of. Considering it more direct and honest than casting or welding, Darricarrere prefers to model with the torch, using it like a thumb in clay, sometimes hammering while hot, grinding and reworking.

His sculpture often looks as if it resulted from an earth force explosion or just grew. A steel and brass sculpture, seven feet tall, is as natural in the Los Angeles garden it was designed for as any tree or plant, its rough and smooth surface pleasantly evocative of bark and rock and leaves.

In Darricarrere's glass-in-concrete work, much admired and used in

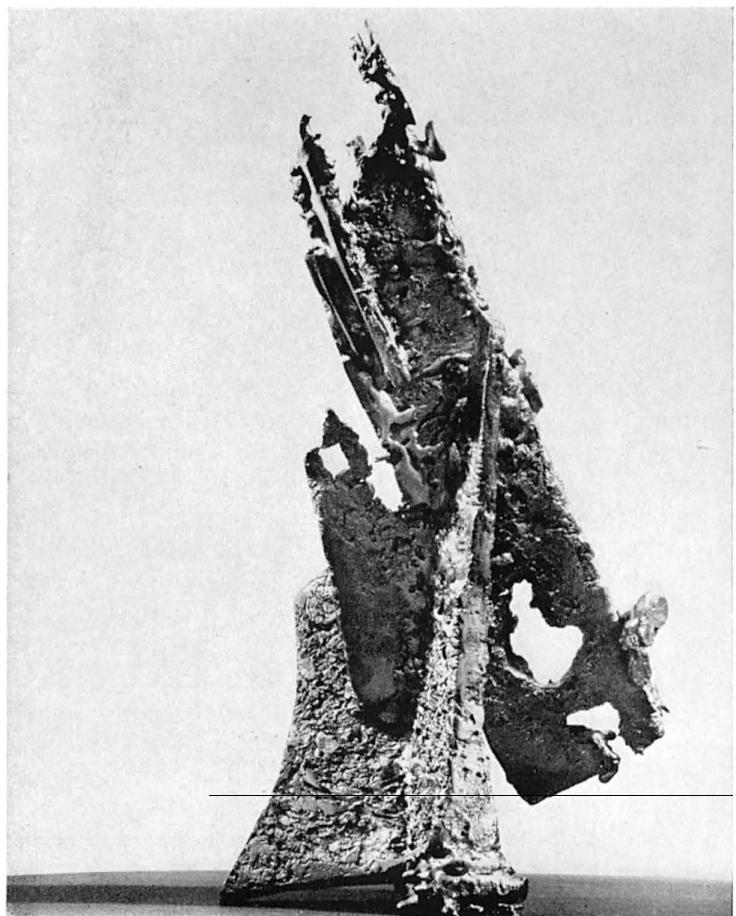


the buildings of financier and patron of the arts Bart Lytton, it is fire again that makes the color, texture and very stuff of the thick glass chunks. Unlike European workers in this medium, who buy their glass ready-made from a factory, Darricarrere built his own kilns and makes his own glass to control color, thickness and amount of bubble.

Darricarrere (a graduate of the Ecole Nationale Supérieure des Arts Décoratifs de Paris, voted one of twenty outstanding French painters) does not look upon glass-in-concrete as two dimensional, as do most in this field, but approaches it as three dimensional, sculpturing the glass. Pouring it two to four inches thick, he then sculptures with a hammer, letting the natural conchoidal fracture patterns of glass act as facets to capture more light for liquid sparkle of color.

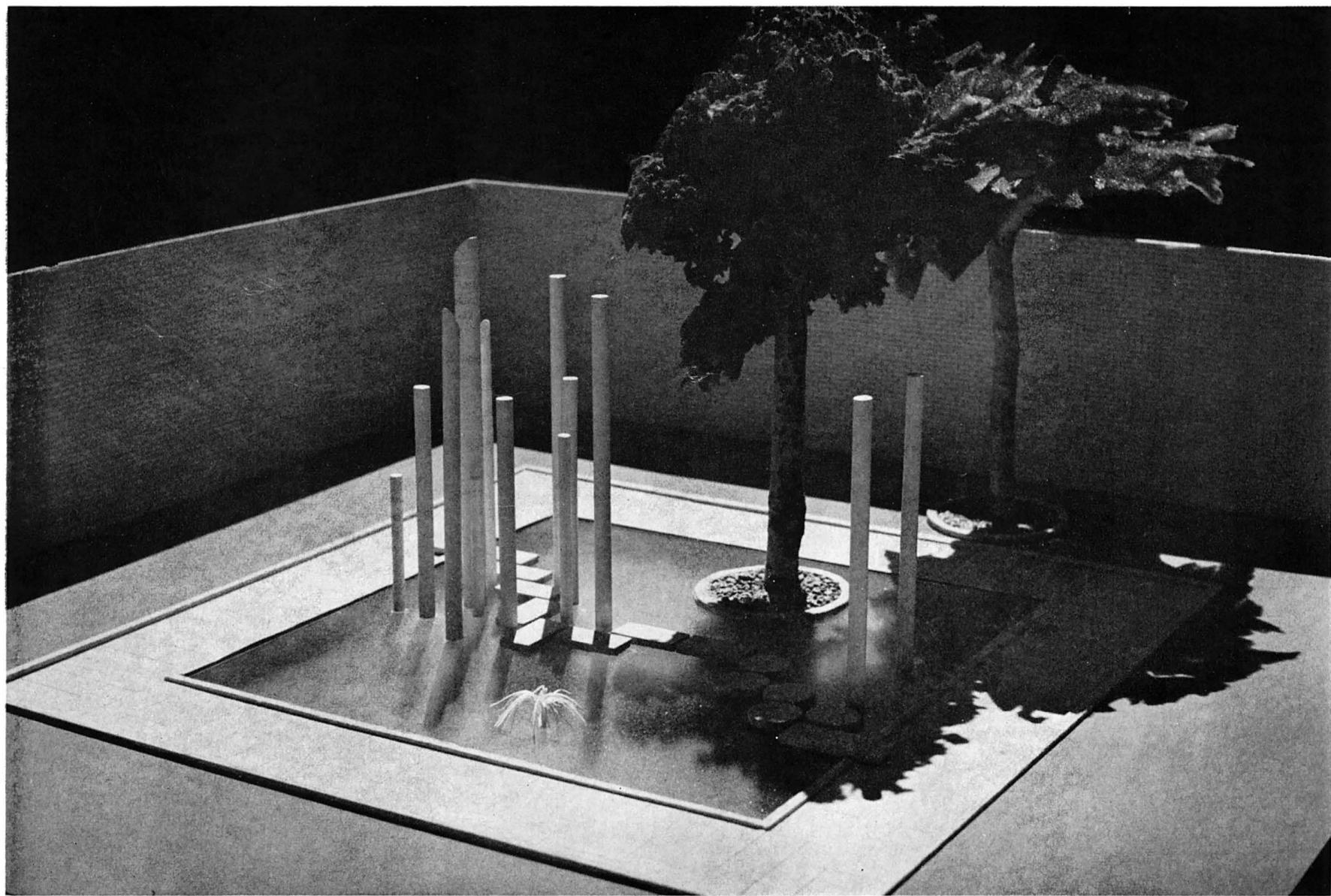
Recently, Darricarrere has been exploring the sculptural qualities of the concrete as well as the glass. An 8' x 12' screen in the Bart Lytton collection in Palo Alto gives as much emphasis to the concrete dividers as to the glass. The concrete varies in width and depth from one to ten inches; the effect is of a deep sand casting with bursts of color and light piercing through. A trio of screens for the same Lytton collection widens some concrete dividers as bold design elements and eliminates others by placing glass against glass with epoxy.

For a 14' x 3' wall opening in Lytton Savings' Oakland building, Darricarrere was interested in playing the warm, flowing quality of wood against the cold, liquid appeal of glass. Using the same methods as old time shipbuilders, he glued, laminated and doweled the walnut, then carved, smoothed and oiled it, flowing it like thick seaweed over the glass chunks. —MIV SCHAAF



7' x 6' Steel & Bronze

PHOTOGRAPHS BY RICHARD GROSS



Garden of Columns

TWO PROJECTS FOR A MUSEUM BY HERBERT BAYER, ARCHITECT

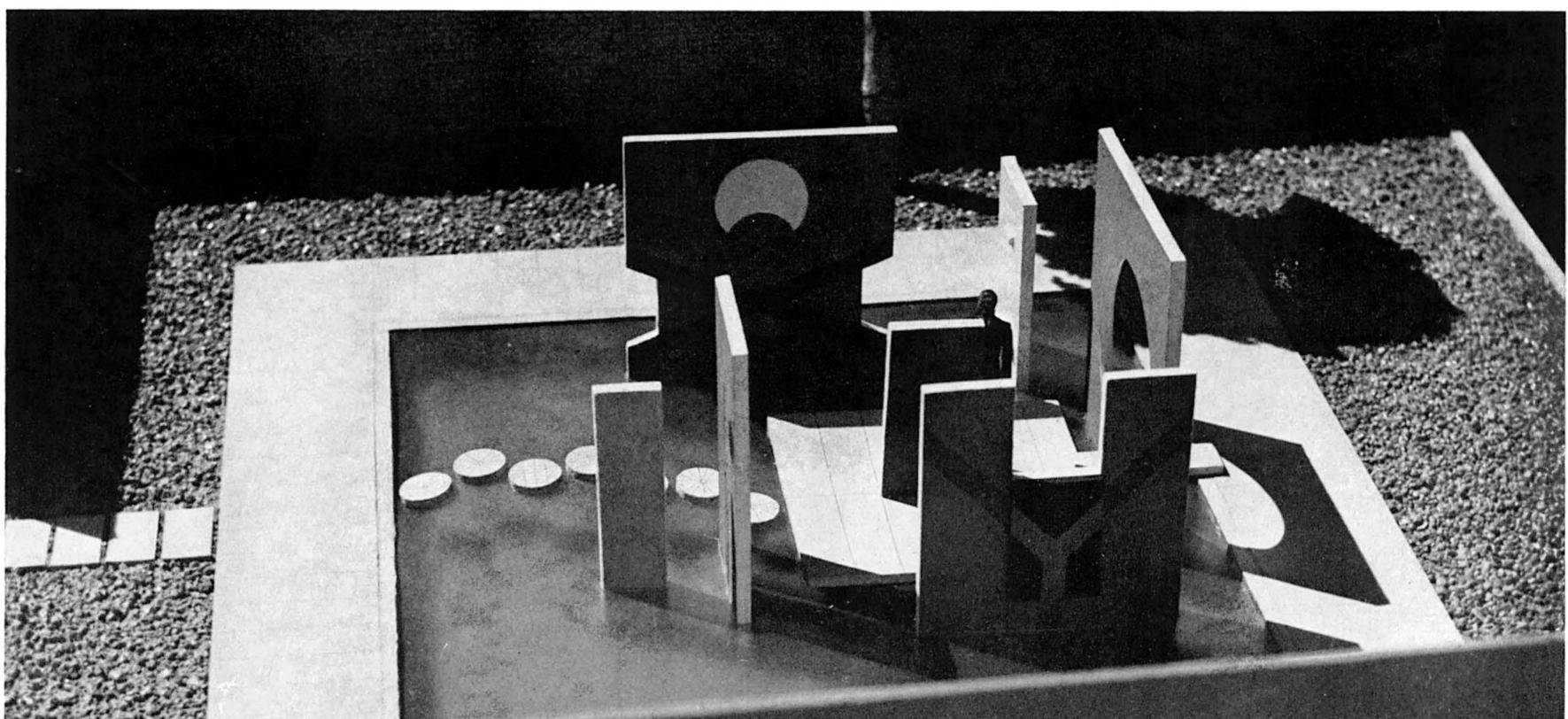
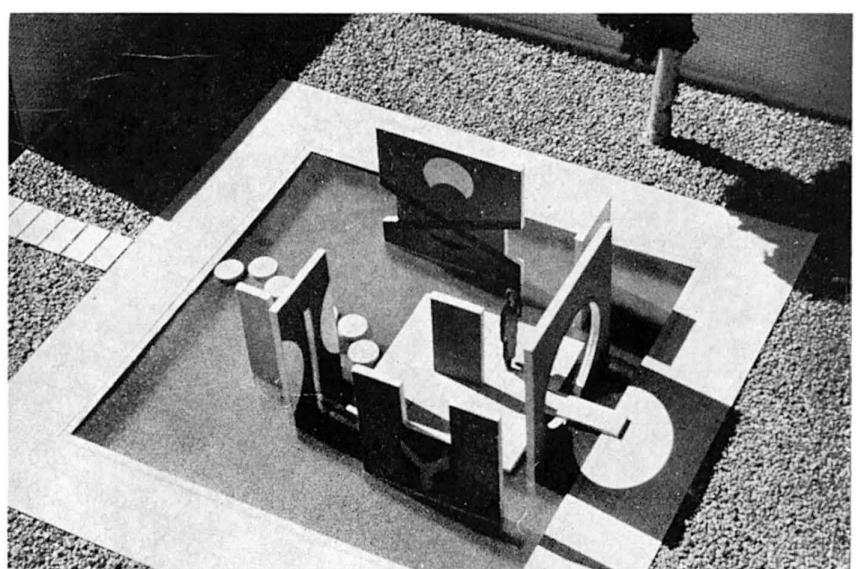
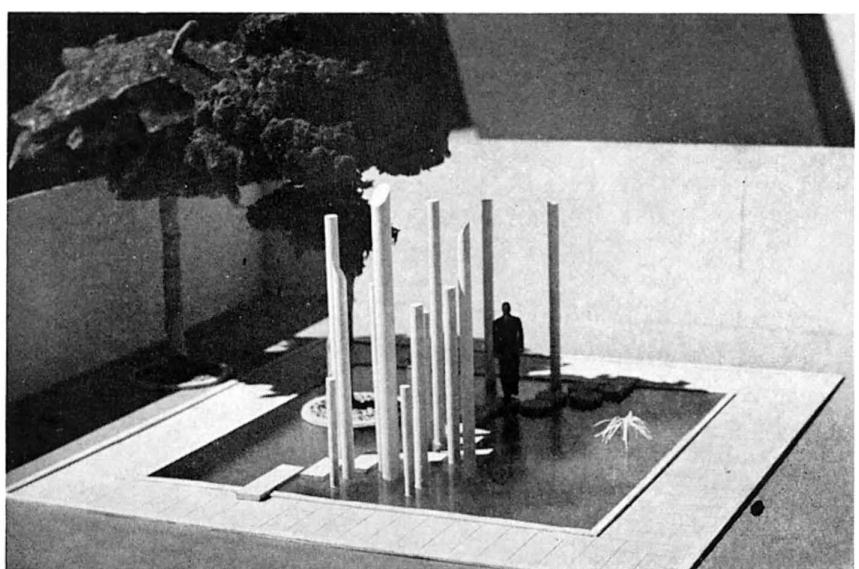
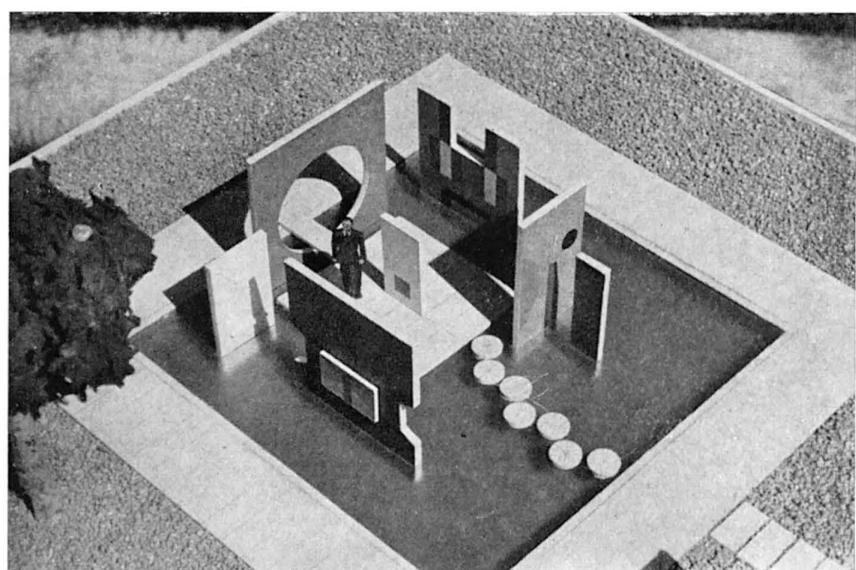
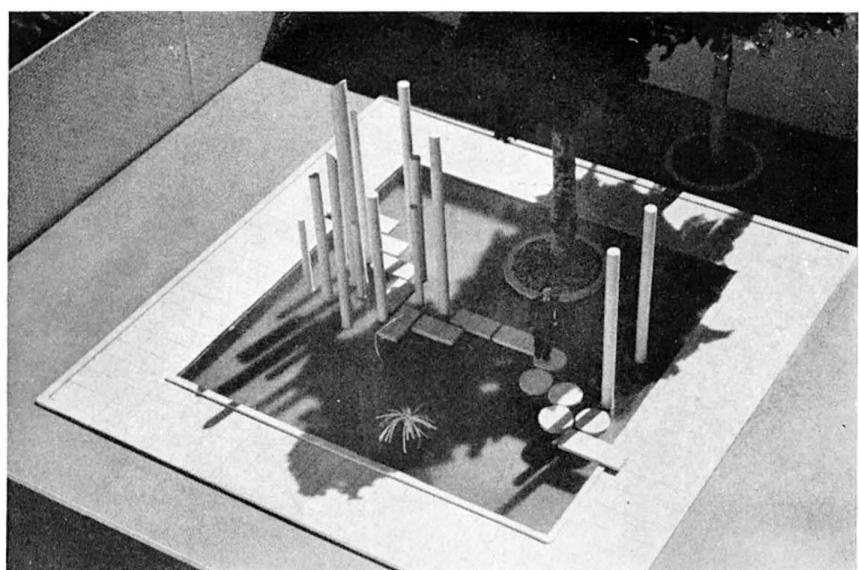
Viewers are intended to take part in the concepts and become part of the design of these two courtyard projects for the Roswell (New Mexico) Museum. In the case of the Garden of Columns, the visitor walking around and through the structure can identify himself with the vertical element of the columns and, by his movement, with the horizontal element of the winding, free form path of stepping stones.

The concrete columns, faced with white tile, are set in a 26' x 26' pool of blue tile, which itself is in the center of a square court bordered by plain walls. Alternately, the columns may be bush hammered above water and painted black below; the pool concrete painted and black asphalt. The round stepping stones are light gray granite or concrete columns; the square ones light gray granite slabs on concrete bases. The retaining drum for the tree is designed in concrete as well with tile facing and filled with black pebbles. (Alternate: concrete, submerged part painted black.) The walk around the pool is gray stone slab. (Alternate: precast concrete panels and rough aggregate.)

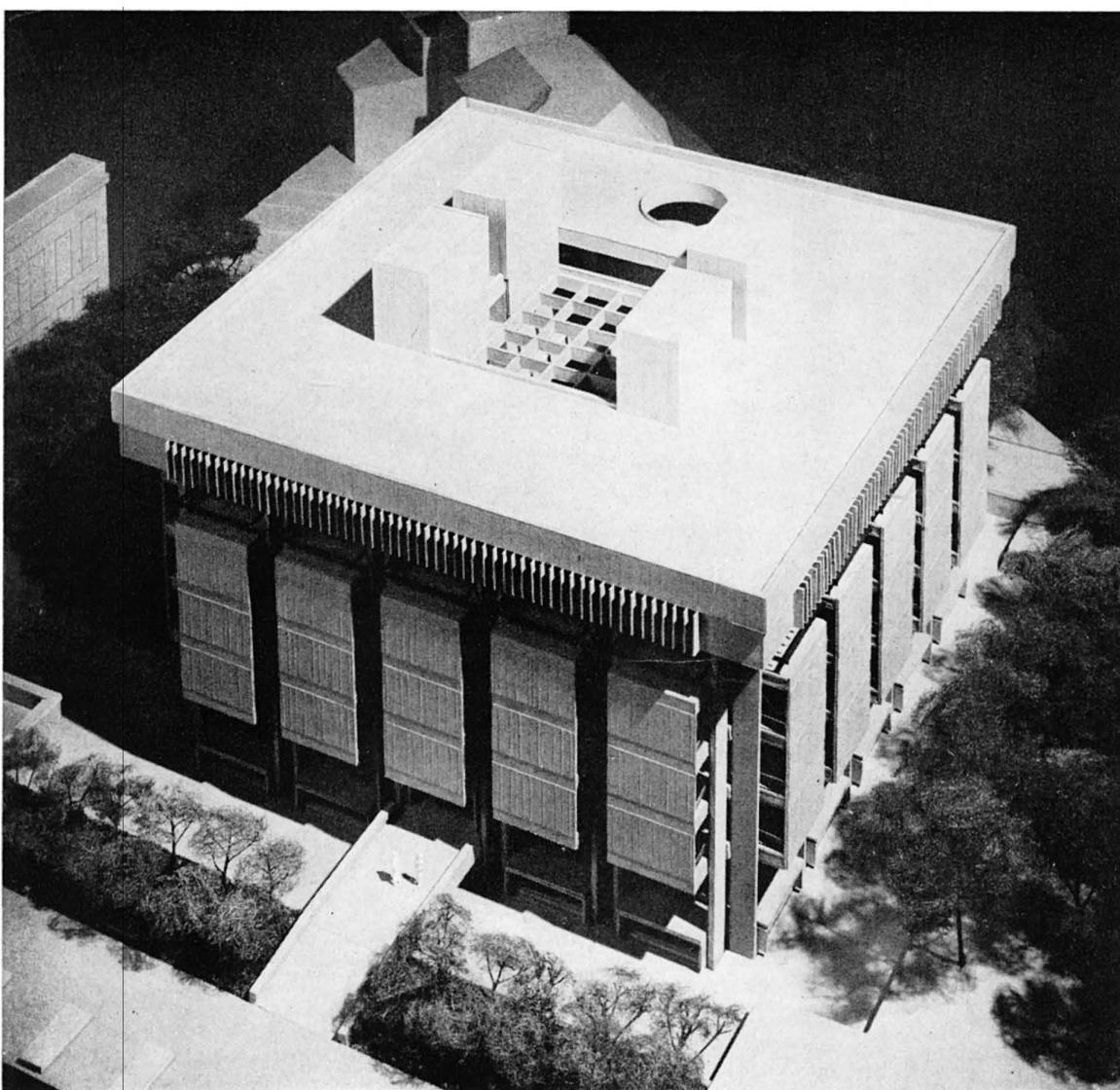
Viewers of the Space Painting — vertical panels defining a series of

open spaces related to the proportions and locations of the panels — experience it not only as objects but become participants in and part of the space-time concept as they walk through the structure. The "perforations" of some of the panels add to the transparency of the sculptural arrangement. Change of pace and materials of the walking surfaces, the water of the pool, the sound and movement of the "fountain", the changing shapes of shadows, and the trees all contribute to the variety of impressions aimed at. All the panels are self-contained design elements but supplement each other for purposes of continuity. The total experience as conceived by the designer is a combination of design plus color, space and change.

The pool here is 26' x 26' concrete painted, black asphalt; the 10' x 10' platform is concrete with exposed aggregate. The seven round stepping stones are gray granite and the stone bridging the pool at the circular opening is gray granite slab. The walk is precast concrete panels with exposed aggregate and the remainder of the area is surfaced in large round pebbles.



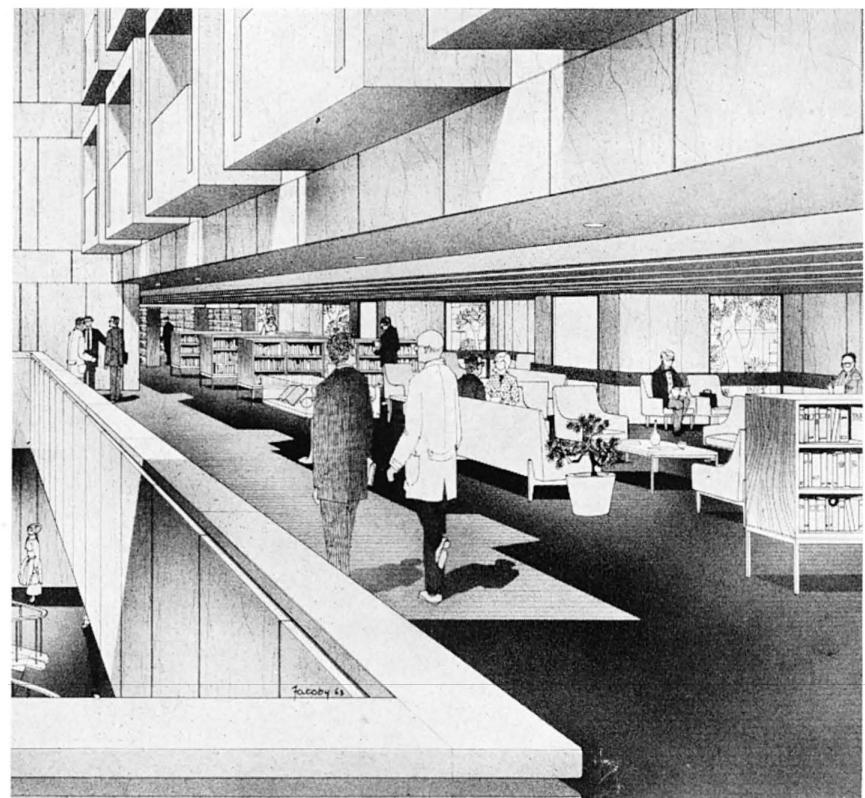
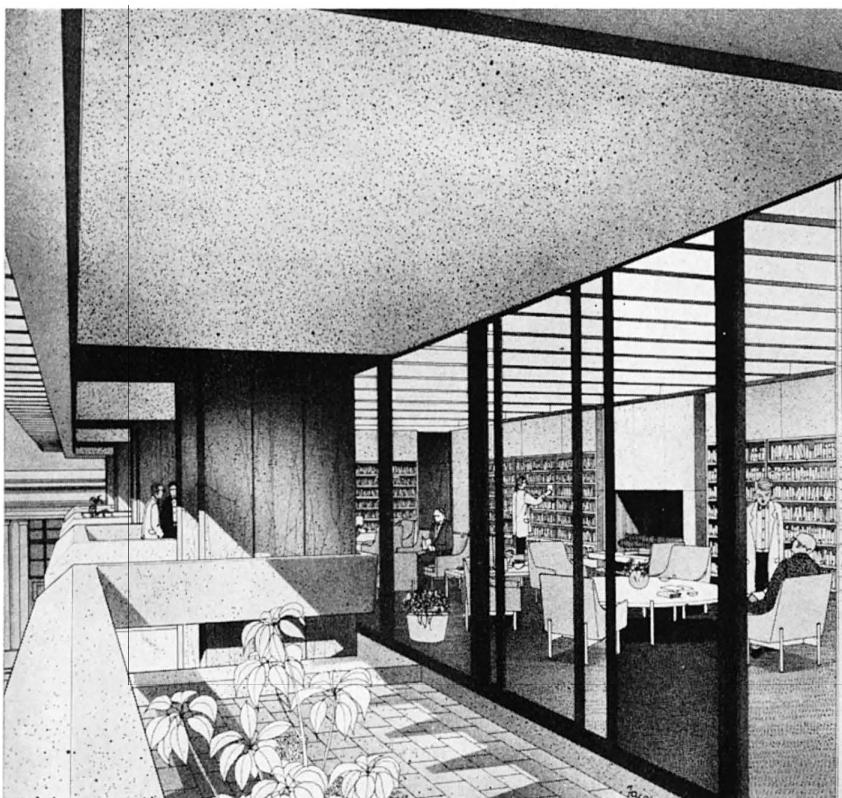
Space Painting

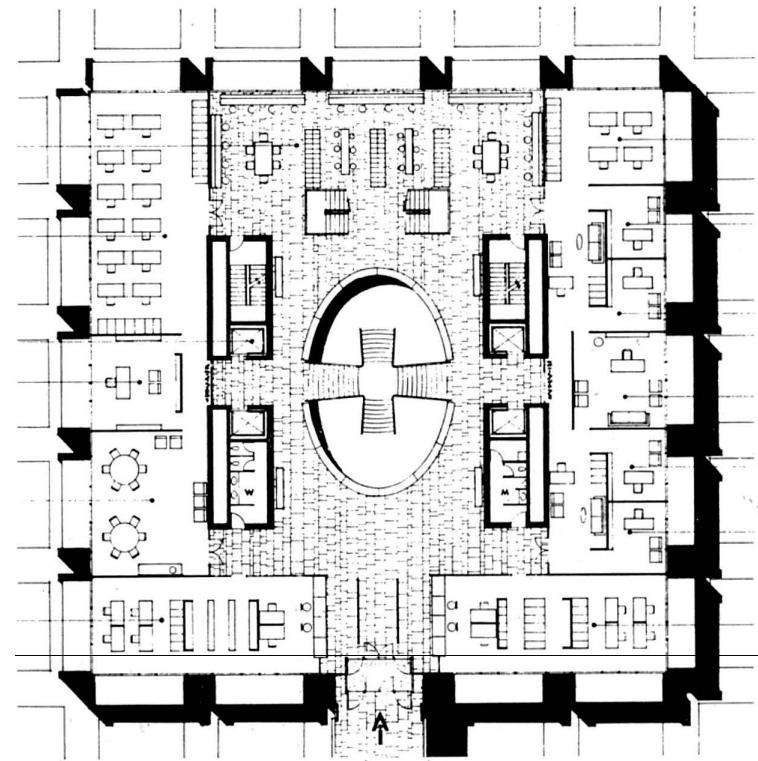
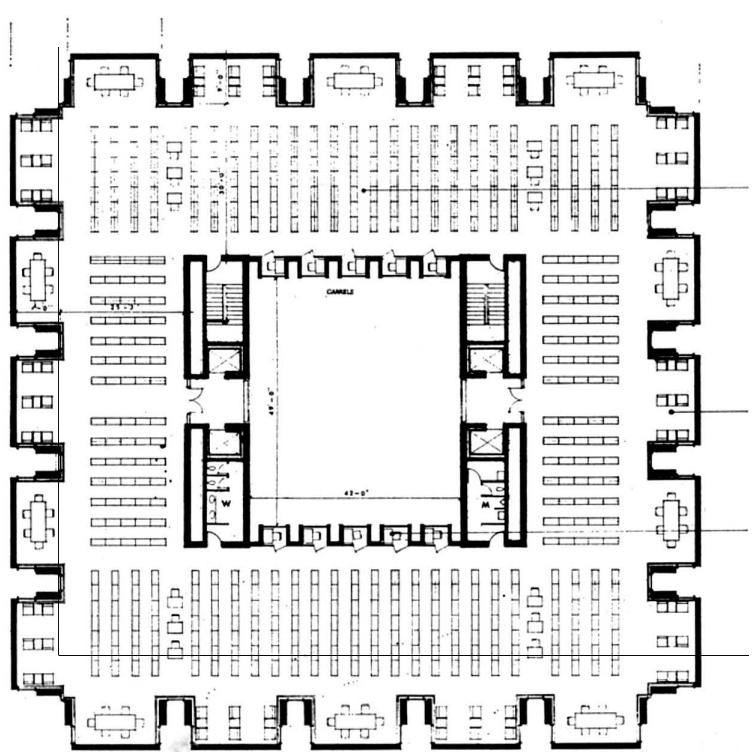
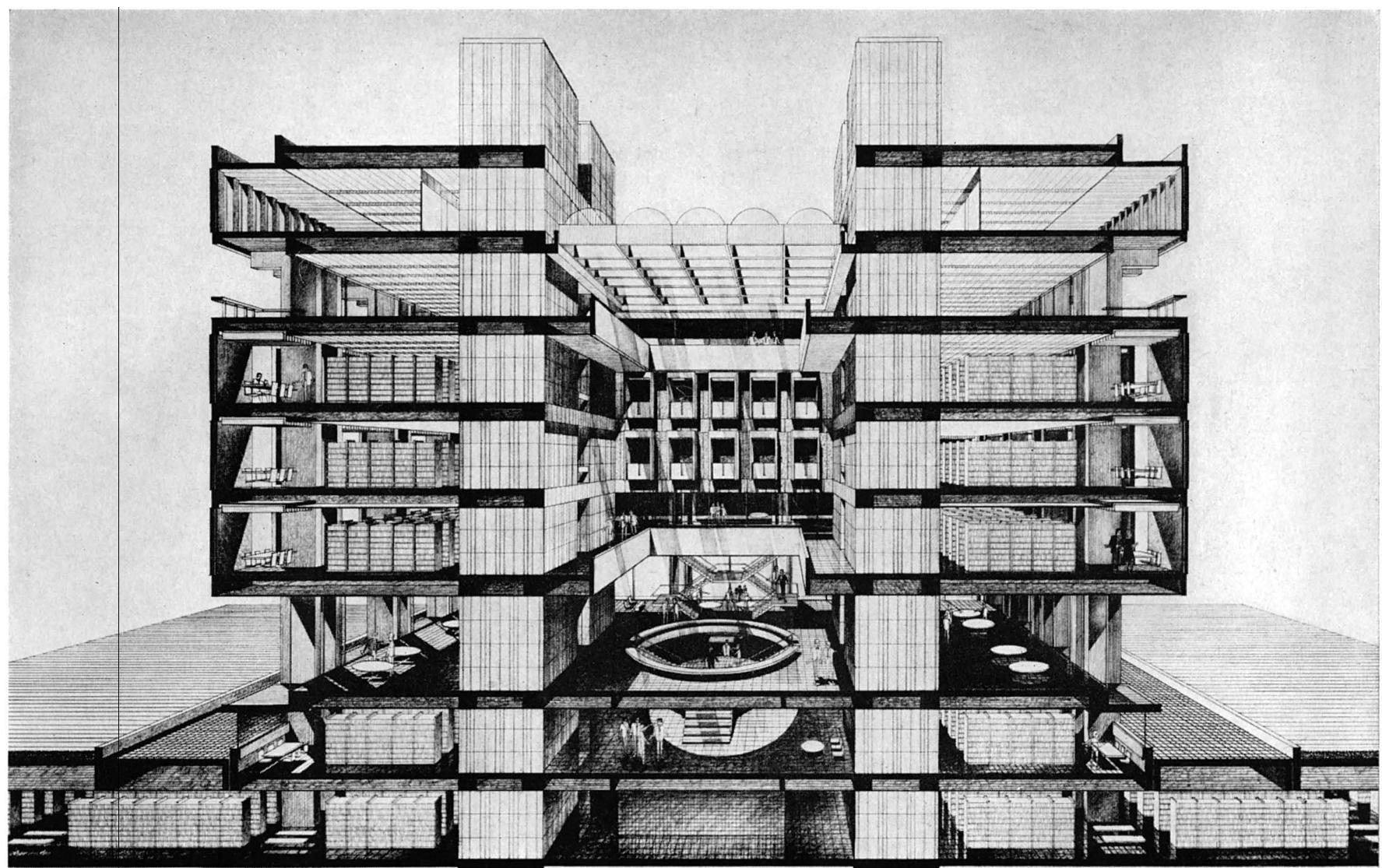


The combined collections of the Harvard and Boston Medical Libraries, about 450,000 volumes, are to be housed in this vertical, eight-level structure of stone, steel and glass. Built around an open central light court, the Countway Library of Medicine will have reading and study alcoves instead of the usual central reading rooms. Illumination of the alcoves will be furnished from two sides by floor to ceiling glass walls.

Six levels of the library will be above ground and two below. Underground storage stacks are to extend beyond the vertical wall limits of the above grade structure. It is to be located near the Harvard Medical School and will contain physicians' reading rooms, the editorial offices of the *New England Journal of Medicine* and the *Journal of Bone and Joint Surgery*. The \$3.5 million building is scheduled for completion in 1965.

MEDICAL LIBRARY BY HUGH STUBBINS AND ASSOCIATES, ARCHITECTS





MIND AND MILIEU — A. E. PARR
(Continued from page 21)

intervening circuits of mediating chain reactions, remains an almost virgin territory for psychological exploration, except in very limited and specialized areas such as advertising and merchandizing research.

The failure of science to concern itself in a commensurate manner with questions of such tremendous import in the life of modern man is undoubtedly in a large measure due to the previous lack of any practical means by which working hypotheses could be put to the rigorous tests of scientific experimentation. One might theorize and argue about the oppressive effects that man-made or natural canyons may have upon those who live or work in their depths, about the mental fatigue that generates physical fatigue in endless vistas of boundless monotony, about architectural forms and city plans conducive to nervous tension and waste or energy, and about many other possible or even probable connections between our direct sense of our surroundings and our sense of mental well being. But the cost of building another megalopolis as an experimental control and test of the theories we may develop from observations on the megalopolises we inhabit has heretofore kept the subject entirely within the realm of purely academic debate on one side, and opinionated planning on the other, with almost no real information for either side to draw upon.

Recent developments in two fields of endeavor, movie making and psychological testing, have now finally brought us to the point where it becomes realistic to speak of developing methods for the objective study of our responses to the environment by the rigorous rules of scientific experimentation.

Psychological tests based upon verbal responses, or upon cognizant selections or arrangements of "stimulus materials,"

mostly of a visual kind, have been developed to a perfection, diversity and sophistication that today give us a usable tool for almost every purpose that can be served by direct probing of the mind. Science has simultaneously devised a wide variety of impersonal instruments for objectively recording the physiological changes that accompany all our psychological responses, and often specifically indicate mental and emotional reactions of which we may be only partly aware.

The most obvious and best supported need for these new techniques has been related to our rapidly increasing speed of travel, and to the demands of the space age. The Link trainer for airmen was an early and justly famous example of practical application. The numerous and extensive verbal and instrumental tests required for the evaluation and selection of prospective space pilots are other illustrations. It is not the purpose of these few paragraphs to survey the techniques, but merely to establish the reality of their existence by pointing to the already experienced usefulness of their application in the fields of endeavor in which man has had sense enough to recognize that the methods should be used. Is it not high time for us to realize that the same basic principles of scientific inquiry can, and therefore should also be applied to the systematic improvement of the environment man creates for himself to live in?

Among the many research procedures now available, the technique of exposure to simulated experiences in order to analyze or predict the responses to actuality seem particularly promising as a means of investigating the relationship between the psychology of man and his direct perceptions of his surroundings. The imitations of reality may be produced by mechanical motion or constraint, by sounds, smells, and, particularly, by motion picture projection, used alone or in combination with the other devices. It is possible, for instance, to use the vicarious, cinematic experience of driving a car along a highway in order to determine the nature and location of traffic hazards caused by driver reactions to the characteristics of the road and of the total environment. To move from this to a testing of inhabitant reactions to habitat is surely not a very long step. And, with that step behind, the next advance should be towards the development of tests that will predict reactions to proposed plans for altering our milieu before millions or billions are unhappily spent on projects that will please no one when they are completed.

Modern advances in film production and projection greatly increase the potential value of using this medium for an examination of the psychological relationship between city and citizen. One of the deficiencies of the films of earlier years was that the projected image covered only a small section of the viewer's total field of vision, even with head and eyes held still. With allowance for normal freedom of head and eye movement the disproportion between areas covered becomes even much greater. Stimuli located outside of the projected scene, or originating from a sense of deprivation of peripheral vision and of head and eye movement, therefore, substantially weakened the simulative effect. This weakness might not be so important in the study of a traffic artery because a more or less fixed concentration upon the forward view is also normal for a driver under actual operating conditions. But it would be a substantial handicap in the study of a person's relationship to an environment in which he is free to move his head and eyes as he pleases. However, this handicap has today been overcome by the invention of the "bug eye" lens through which it is possible to photograph and project an almost hemispheric image.

The paraphernalia for an impersonal and objective study of what the man-made environment does to the minds of men are thus available to us today. It remains only to design the experimental methods for their use, and to gauge their accuracy for our purposes. Let us assume that the procedures have been perfected, and that volunteer audiences, wired to record all their psycho-physiological reactions, are given the simulated experiences of seeing various



THE STRUCTURIST is a new annual art publication now in its third issue. It focuses attention not only upon the developments of Structurist art but upon crucial art problems in our time. T.S. offers free and responsible inquiry into a wide range of related subject matter with art as its central core. T.S. presents a variety of views that are not otherwise popularly published or brought together and which challenge many current

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environments through the lens of a camera moving at eye level and with pedestrian speed through the unfolding scenes. Psychological tests before, during, and after the "show" would supplement the instrument records. Let us then also assume that we have been able to develop certain tentative theories or working hypotheses from comparisons of the reactions to simulated experiences of various kinds of man-made environments, such as, for example, actually existing cities and towns. We now come to a realization of the greatest advantage of all that simulation by motion pictures offers for our inquiry. To test our conclusions we do not have to alter existing buildings or cityscapes, nor do we have to build new ones for independent confirmation of our findings. All the alterations, additions and eliminations that we wish to examine can be effected in film laboratories, working with copies of the films already used in the experiments. In this manner it will be possible not only to test general conclusions already arrived at, but also to analyze, isolate and evaluate the many separate elements of a complex situation. And when we have become confident of our ability to analyze existing situations by modifications of its image we shall obviously be ready to test proposed situations by creating their images before they become costly realities. The desired results can not be guaranteed at this time, but the possibilities are so obvious, and the cost to society so small by comparison with the cost of its mistakes, that it is a moral obligation to begin to use as soon as possible, any methods and tools that hold reasonable promise of success in establishing a rational basis for the changes of our surroundings that we inflict upon ourselves.

MUSIC

(Continued from page 9)

For example, Philharmonic Hall at Lincoln Center is intended to be the regular home of the N Y Philharmonic, and a showcase for visiting symphony orchestras, which may perform large works with chorus. It is not primarily a place for chamber music or organ recital, although Mr. Purcell assures me that it has proved to be quite successful for both. Only the orchestras have had trouble playing in it, and the acoustical deficiency is confined to the forward area of the main floor seats. These are the high-priced seats in any auditorium, though not by any means always the best seats for listening; the official critics sit in them; the visiting celebrities are placed there—all of which, in the case of Philharmonic Hall, compounds the felony.

So what's wrong?

The acousticians were asked to design a hall which would combine the best features of the Boston Symphony Hall and the *Grosser Musikvereinssal* at Vienna, Austria, both halls in the old style. These are both relatively narrow halls by present-day standards, about 70 feet wide in comparison with the 110 to 120 foot width of Philharmonic Hall. Both of the older halls have high ceilings, relatively flat but deeply coffered, which promote acoustical diffusion. A similar height proportion to width in Philharmonic Hall would have been so high as to produce uncontrollable echo. For this reason the Philharmonic Hall's lower ceiling of suspended acoustical diffusing elements, as at the Tanglewood Music Shed, was installed to provide some of the desirable acoustical scattering produced in older, narrower halls by the ceiling. The "clouds" also provide the necessary short time delay of the first reflections of sound produced in the older halls by side wall reflection as a result of their narrower construction.

The suspended diffusing surfaces also divert considerable sound energy into the reverberant field above. If this were not so, in a hall so large, the reverberant sound could overwhelm the direct, early reflected sound, and the hall would seem muddy, with neither clarity nor intimacy. The problem therefore is to achieve the delicate and proper balance between the strength of the direct, early

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arriving sounds and that of the later reverberant sounds. In Philharmonic Hall this balance is obtained through adjustment of the overstage acoustical diffusing elements as well as the diffusing elements, the so-called "clouds" immediately forward of the stage.

Our listening habits have been sharply conditioned by the increasing *high fidelity* of recorded music, by our increasing awareness of 20th century music, and by our discovery of the so-called *baroque* orchestral literature of the 18th century. We wish our Vivaldi, Bach, and Mozart clean and pointed—this, I might add, is our preference, not theirs; the whole effect of their music-making was probably less clean (or what jazzmen would call "dirty") and rhythmically and coloristically far more intricate and fanciful than we imagine or can achieve by our time-beating. We wish to hear a sharp edge of tonal differentiation in 20th century music. But we have not outgrown our belief that the *emotion* of Beethoven, Berlioz, Schumann, Dvorak, Brahms, is to be discovered swimming like a Rhine-maiden in a warm, reverberant river of not too precisely articulated interior detail. We want the big moments to add up into reverberant climaxes, because between the big moments a good many of us have accustomed ourselves to drift rather than listen.

I doubt whether Brahms crafted his counterpoint with so much care not meaning it to be heard as clearly as any orchestra can play it. We read, in fact, that his music was at first condemned as too learned, too scholarly, too pedantic. The resolving compro-

mise, work of several immediate generations, has melted down the objectionable "tiny-work" into a reverberant gravy, to the improvement of casual listening. This is the so-called "Brahms-style", which Toscanini, or Robert Craft, conducting a Brahms symphony so that the interior music could be heard in detail, has been accused of violating.

A modern concert hall must therefore accommodate two contradictory types of listening. For the 19th century repertory, it should have a long reverberation period, so that the successive musical sounds can roil around in the hall mixing the harmonious welter which, in common belief, appeals to heart, soul, and sentiment. For the 18th and 20th century repertoires the hall should be clear, a little dry and instantaneously responsive to an attack, with a shorter reverberation period, giving the somewhat artificial separation of registers that is customary on a high-fidelity record.

This explains why, when I interviewed the late Bruno Walter about three years before his death, he told me he did not like high fidelity; for his own pleasure he preferred listening to the 78 rpm records he had made during the 1930s. That again is why Bruno Walter's performances of Mozart are for some "in the great Viennese tradition" but for others "soft, without rhythm, sentimental".

The reverberation time governs the pace and style of concert performance to such a degree that for one conductor an auditorium will "feel natural", while for another it will be "dry, clear, sharp, but unresponsive in climaxes", and for another "overreverberant, lacking clarity", depending on the pace and length of reverberation period to which the conductor has been, as it were, subliminally conditioned. In a hall of reverberation period unlike his own an alert conductor will adjust tempo and style according to his knowledge of the music, so that everything can be heard to best advantage. The conductor who communes only with the deity and the composer will feel baffled by the ineffectuality of his message in any hall to which his sublime idiosyncrasy is ill-adapted. The opinions of concert performers in regard to concert halls are as variable as their manners of performing. There are a few famously good concert halls, Carnegie Hall for example, and a number of famously bad ones. Imagine a city fortunate enough to have one or more halls as well constructed for music as a Steinway piano or an Amati violin! And why not? It is quite possible. A concert hall can be built to its purpose with as beautiful technical austerity as a suspension bridge.

Philharmonic Hall is built to seat 2650 persons in a space shaped like an enormous shoe, narrower at the stage point, somewhat wider at the back, the rear wall only slightly rounded and facing slightly upward; the three balconies shallow; the height over the front half (instep of the shoe) rising from 65 to 80 feet. Without adjustment, the sound of the orchestra in the forward part of the auditorium could be too unresponsive, giving the effect of insufficient hall reverberation, a type of sound unsuitable to the orchestral classics.

To increase desired cross-room reflection, which would not be needed in a narrower hall, the side walls were designed with receding parallel panels. To provide intimacy in the front half of the auditorium, the famous "clouds" were suspended, in ascending flat steps some distance below the front ceiling.

These "clouds" are hexagonal panels made of plaster about 1½ inches thick. The purpose is to direct slightly less than the full amount of the primary sound back down to the front area of seats, while allowing a portion of the sound to filter through to the rearward seats. The "clouds" are placed so that they do not

AT A TEMPLE IN AGRIGENTO

Spoke the Great One
to Phaeas of Akragas
builder of temples:

Though your slaves have lowered the last stone
and the great beams lie in place
your work has just begun.
With African sand
blown by the south wind
grind the stucco away
and let the stone show
its texture of coral and shell.
The wall bears no weight, Phaeas,
why must you have it?
Set the columns free,
they are well shaped;
let the earth shake down
the irrelevant stone.
Crack the gilded beams
with changes of night and day
for the roof must go —
we need light upon those fluted columns
so their shadows can rise and bend
in the scalloped dark . . .
Had you forgotten that the moon moves, Phaeas?
When the roof is gone
you will not need those spitting lions
that only mar the line.
Are you so blind, Phaeas?
You who would build for all time —
do as I command.
Phaeas of Akragas
builder of temples
obeyed.

— PETER GOBLIN

interfere with the sound traveling at a flatter angle to the balconies or with the effect of reverberant, but not too reverberant response, from the main ceiling.*

During the "tuning week" tests this theory seems to have worked out to everybody's satisfaction, except that at that time the resonant flooring was not on the stage, and the back screen and the organ at the rear of the stage were not installed. On the night of the first concert and thereafter, however, the sounds of lower register, especially from the basses and cellos, seemed almost to disappear from the front half of the hall, while elsewhere the sound remained satisfactory. At the end of the week, an organ recital came through with complete satisfaction. The organ, at the back of the stage, delivers its sound at a flatter angle to the "clouds" and also with less front-ceiling reflection.

The only other serious complaint, already detected during "tuning week", was that the plan of sound-absorption to prevent echo from the rear of the hall did not work. The upward cant of the rear wall was supposed to direct the sound against the bottom of the balconies and thence to the floor. Additional damping materials at the back were recommended but have not been installed.

Overnight, theorizing about the "failure" of the hall became a national pastime. Bolt Beranek and Newman thereupon built a model of the hall on a scale of 1/10 and experimented in it with taped sound raised in frequency by a multiple of ten. This showed a phenomenon called "phase cancellation". Because of the stepwise pattern of the "clouds", the longer, low frequency waves were being reflected with just sufficient time-differential so that the peaks and nodes of the vibrations from the first "cloud" almost exactly canceled those from the second, slightly higher "cloud", and so on. This discovery has been reported in the Journal of the Acoustical Society of America. For this reason one could hear the violins but not the cellos.

Another peculiarity was the discovery that the 256 light fixtures, which were installed after "tuning week", proved, when tested, to be perfect Helmholtz resonators, absorbing low-frequency sound like blotters.

Bolt Beranek and Newman recommended that the phase-cancellation could be eliminated by leveling out the steps of the successive "clouds" and filling in some of the intervals between them, a relatively small adjustment—and exactly the sort of adjustment for which the "clouds" were intended in the first place. In other words, it might have been possible at this point to "tune" the hall to the extent permitted by varying the levels of the "clouds". Alteration or replacement of the light fixtures would also benefit the sound.

Instead, the Center executive called in a committee of four eminent acousticians, who, after making their own studies, recommended more extensive changes. Bolt Beranek and Newman, the original acousticians, submitted a "minority report" admitting the deficiencies they had found in the hall and offering a plan they believed would correct these deficiencies. So the situation stands.

*To this argument I have obtained rebuttal. The purpose of the "clouds" is to give a properly spaced (about 20 milliseconds) *first reflection*. If the first two or three reflections arrive too late, the ear hears the sound source as distant; the *intimacy* of small hall can be simulated in large one by properly designed and placed reflective surfaces not too far away. Bolt Beranek and Newman has become so concerned with this kind of "intimacy" that they have (a) sought to make the first reflections *too strong*, masking the later reverberancy which is relatively much weaker; (b) made the panels all of a size and placed them in a regular lattice, thus securing a grid of reverberant distortions, instead of the more desirable random distribution.

LETTERS TO THE EDITOR

Dear Sir:

I have just opened my own office, and received your sample copy of the August issue. This is just a note to compliment you on your fine and provocative magazine. I find more food for thought within the few pages of your magazine than in any of the more voluminous magazines available, and I have just ordered a three year subscription.

The article "Forms and Design" by Hans Hollein and Walter Pichler (Aug. 1963) was a most provocative article, and one with which I must argue violently.

Architecture knows only one absolute, and this absolute is man—his needs and aspirations, his ideals and his idiosyncrasies. And this "absolute" changes every time man is affected by a new sensation: a color, a texture, or the sun passing behind a cloud.

The purpose of architecture is to interpret and record man's relation to his environment. This is a personal relationship. And in a democracy which accepts the integrity of this relationship politically and socially, architecture is additionally burdened with the preservation of the integrity of the personal nature of this relationship, in architectural terms.

The attempt to stuff man into preconceived forms, justifying such a move on the grounds that the forms are in themselves beautiful sculpture, is a terrible perversion of architecture. And in fact is a little reminiscent of the architecture of the nineteenth century, which was also based on beautiful sculpture forms, i.e., the Parthenon, etc.

I believe there is more to be learned of architecture at a sidewalk bazaar on Saturday afternoon than in the addition of 22,000 psi steel to our technological vocabulary; and more to be learned from the daily workings of the United Nations than in the construction of the Brooklyn Bridge.

With our enormous technological potential, architecture becomes infinitely more difficult than ever before. With the potential man possesses, no task is impossible. We can no longer bend man's requirements to fit the limitations of short structural spans of a less advanced technology. We can no longer sacrifice the integrity of the individual to an integrity of structure or of mechanical equipment or any other of our technological limitations.

We must try to understand man and his constantly changing relationship with the macrocosm. A work of architecture must be a valid interpretation of man's relation with his environment, and that interpretation is valid for only the infinitely short period of its conception. Thereafter it forms a record, a guide, perhaps a marker to help define for future generations the direction of human progress.

There is no architecture without man. Architecture removed from man's aspirations, architecture without relation to man's whole philosophical needs and desires, is without meaning. With every new philosophic concept, every technological innovation, and with every change in man's understanding of his relation to his God and his society, the relation of man to his environment, and therefore his architecture, changes.

This article has encouraged me to try to set down in an organized form some of my own unclear thoughts on architecture. Thank you for this very fine article.

Blake Chambliss, architect
Grand Junction, Colo.

Sir:

It was only through the comments of some students that I heard of the "dialogue" [at the Sheldon Memorial Art Gallery, University of Nebraska] between Philip Johnson and myself, printed in the August issue of ARTS AND ARCHITECTURE.

I have been in this field for a long time but have never had the experience that I am neither asked for permission nor shown pre-

publication drafts or a galley proof if my statements are to be printed. This is not only a gross violation of copy rights but an insulting act of disregard for a writer's reputation. If Mr. Johnson felt no qualms about "editing" and publishing without letting me know anything about it, should it not have been your duty as an editor to abide by generally accepted rules of the profession and general politeness?

There are obvious and giddy rewordings which simply are not what I said — such as (about a wooden horse): "It is so loving (LOVING) as it stands there", or "you feel the sense of mystery (MYSTERY)." Whatever I am, I am not a gushing society lady who talks such trash and I resent it tremendously to have statements, totally out of contact and context, printed in my name.

Sibyl Moholy-Nagy
Professor of Architecture
Pratt Institute, Brooklyn, N.Y.

The transcript of the dialog was furnished (from a televised broadcast) by the University of Nebraska. We unhappily — and erroneously — assumed that releases had been obtained, as is customarily the case with material received from an institutional source. We find it inexcusable that such release was not obtained and inconceivable that a professional of Mrs. Moholy-Nagy's stature in the field of architecture and education could ever be considered "a gushing society lady".—Ed

BOOKS

(Continued from page 6)

Beach" or Gore Vidal "Barry Goldwater: A Chat," to mention only three of these outstanding essays.

Baldwin's estimate of north-west relations is surely the most telling, the most powerful, the most acidic of all the pieces; William Styron's review of the definitive biography of Beverly Aadland by her mother makes a sad commentary on some aspects of our own keelerized civilization. Other essays on Caryl Chessman, Cuba, the American Centre by Saul Bellow, Mary McCarthy, Arthur Miller, William Saroyan are provocative and thoughtful and prick the shell of complacency at a time when it seems again to be hardening.

The final word belongs perhaps to Herbert von Borch in *The Unfinished Society* (Charter Books, the Bobbs-Merrill Company, \$1.75,) and to Orville Prescott, reviewer for the *New York Times* in his inquiry into the contemporary novel, *In My Opinion* (Charter Books, Bobbs-Merrill, \$1.75.) Von Borch points out not only the problems, which our novelists touch upon, examine or eviscerate, but goes on to ask how and why our American society survives despite all its ills. This European observer states, and aptly it seems, too, that there is so much abundance here, that the protester must stand mute to be heard. The Angry Young Men of Britain protested over shortages; the Silent Age, as von Borch calls it, is the American form of the same protest. Our inner strengths, which the author sees in many elements of our political, economic, cultural and industrial life, are still latent, but are there. And it is from these that we must draw.

In My Opinion is a collection of thoughts by Orville Prescott, a collection of views about contemporay novels and novelists, extensions of his scholarly and wise reviews which appear in the *New York Times*. His collection discusses, as he describes it, "the various ways in which a number of modern novelists have tried to solve the perplexing problem of how to write fiction in times which try men's souls." Prescott lays his scalpel about with a great deftness, scores Hemingway when he was cheap, melodramatic and obvious; castigates Sinclair Lewis for wasting his talents on tripe; reserves praise when praise is due; hails James Gould Cozzens and Joyce Cary, Rumer Godden and A. B. Guthrie, Jr., as among the finest modern masters. The first duty of a novelist, says Prescott, is to persuade. With that rule-of-thumb one wonders as one uses the yardstick, how far The Thaw has progressed in American literature.

BOOKS TO WATCH FOR

It is the point, I think, of *In My Opinion, First Person Singular*, and Yevtushenko's biography that the artist must relate what he

feels to what he observes, and then must go on to make a statement about the world in which we live. S. S. McClure, the publisher of America's first magazine of social comment, was a publisher and editor who had a genius for discovering the kind of writing talent that could do just that — both fictional as well as non-fictional terms: Jack London, Stephen Crane, Ida M. Tarbell, Lincoln Steffens are but a few of the writers who brought fame to *McClure's* and who, in turn, became themselves famous. *Success Story: The Life and Times of S. S. McClure* by Peter Lyon, (Charles Scribner's Sons, \$7.50,) is an epochal piece of work which describes in vivid and readable detail the genesis and the history of the muckraking period. Born in County Antrim, Ireland, in 1857, Samuel S. McClure — he was to sign his name S. S. from his first day in school in Valpraiso, Indiana — was a determined man. First came education (Knox College), then marriage (Harriet Hurd), with editorship of *The Wheelman*, a magazine for cyclists, intervening. Marriage out of the way, S. S. McClure now devoted himself to career. Although newspaper syndication was not unknown, it was in the form of potboiler stuff; McClure raised the literary standards. He gambled, signed up the leading authors of the day, and in nine years had the most formidable (if not the most profitable,) literary syndicate in existence. It was then that he decided to publish the *McClure's Magazine*, the magazine which was to transform not only the publishing business, but was to transform America itself.

McClure's was the goldenest journal of that Golden Age. It crammed more advertising, more good writing and more sense between its covers than any magazine before its time and possibly since. SS was at his zenith. Accuracy and readability were the twin yardstick of his publication, and he got both from Ida M. Tarbell, Lincoln Steffens, Ray Stannard Baker who exposed the steel monopoly, municipal corruption and the truth about America's mines. Inevitably other "muck-rakers" followed SS's lead and America, thus exposed, was never to be quite the same again. SS, however, was to see his empire vanish through poor management. In later years his political and ideological judgment proved as bad as his business acumen. He was involved in ownership of the pro-German *New York Mail*; he played a dubious role in Ford's Peace Ship fiasco — his autobiographical protestations to the contrary; and he found Mussolini a Cure for All Ages. Nevertheless McClure left his mark on American life, and Peter Lyon has written one of the most colorful biographies of the season.

The great style of Roman art has been described by classical scholar M. Rostovtzeff as "cold, stately, majestic (expressing) a single idea, the greatness of Rome." The popular notion that Rome copied Greece and offered nothing of its own is disputed anew in *The Art of Rome and Her Empire* by Professor Heinz Kaehler (Art of the World Series, Crown Publishers, \$6.95,), a lucidly written and beautifully illustrated account of the Augustan age to the ascendancy of Byzantium several centuries later. The text is intelligently organized and the color plates are outstanding. This volume in this excellent series is a worthy addition to your library on art.

If the debate about the unity of Roman art still persists — and Kaehler does much to still it — the question of the American character of American art is the subject of John W. McCoubrey's *American Tradition in Painting* (George Braziller, \$4.95.) Kaehler's point that the Hellenophiles ascribe all the positive elements in Roman life to the Greeks can be re-echoed in what John McCoubrey would describe as the provincial or traditional claims that American art owes its existence to the dadaists, the surrealists, Picasso and on back. The art came from the people, as surely as the art of Rome came from the Romans. In 1920 a band of rebel artists, organized as the Societe Anonyme although the reason for their anonymity now seems obscure, proclaimed independence from archaic forms and strictures, loosely defined American Art as Modern Art. Born of the same spirit which had made *McClure's* the leading popular magazine of its time, American Art as reported in *American Tradition in Painting*, a carefully reasoned history, was unfettered and free. John W. McCoubrey, Associate Professor in the Art Department of the University of Pennsylvania, traces the evolution of this freedom from the stiff portraits of the Colonies to the untrammeled mood-painting of today.

NOTES IN PASSING

(Continued from page 10)

If, as we charitably assumed, our public officials are primarily concerned with the common weal, they must think not only of now but of the future. When Louis Kahn was designing the Pakistan Second Capitol, the chief justice of the supreme court objected to his placement of the court building. Louis Kahn asked him, "Mr. Chief Justice, is this your decision or is it also the decision of the judge who is to follow you?" When our local officials are dealing with present problems involving the destruction of our natural and cultural resources, they might well be asked the same question.

Architects and students from all over the world come to Southern California to study the houses of Green and Green, Gill, Maybeck, Schindler. They don't want to study derivatives, but they may have to. And so too with our own students. One can't help wondering what the effect is on students and young architects as they see that the works of our greatest architects are built and torn down one by one in less than a lifetime. An architect, they have been told, should build for the ages.

The hardpressed Historic Building Committee of the S.C.A.I.A. is composed of chairman Raymond Girvigan, John Reed (project chairman), Donald Gill, William Harrison, Frank Mosher, Herbert Powell and Carlton Winslow. They need help.

CURRENTLY AVAILABLE PRODUCT LITERATURE AND INFORMATION

Editor's Note: To obtain a copy of any piece of literature, list the number which precedes it on the coupon which appears below, giving your name, address, and occupation. Return the coupon to Arts & Architecture, 3305 Wilshire Boulevard, Los Angeles 5, California, and your requests will be filled as rapidly as possible.

APPLIANCES

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(404a) Selections from the diversified decorative accessory collections designed by George Nelson for the Howard Miller Clock Company are presented in a new illustrated, four-page brochure, available to architects and interior designers without charge, upon request. The brochure covers clocks (both built-in and surface mounted); Bubble lighting fixtures; Net Lights; planters; room dividers; and the versatile space divider, Ribbonwal. All information necessary for specifying is provided. Howard Miller Clock Company.

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✓ (393a) Northrop Architectural Systems' product lines include Arcadia sliding windows, available in a wide range of stock sizes, and Arcadia aluminum sliding glass doors in stock and custom designs, including the Acme 500 sliding glass door for light construction. The details of the single glazing and insulating glass and all other well known features of Arcadia doors and windows are presented in three catalogs—a 12-page catalog on doors, an 8-page catalog on windows and one dealing with the Acme 500. Northrop Architectural Systems.

FURNITURE

(383a) Knoll Furniture Guide—Illustrated 30-page brochure of the Knoll collection of contemporary furniture designs for residential and commercial interiors. Includes chairs, sofas, tables, chests, cabinets, desks and conference tables by internationally famed designers including Florence Knoll, Eero Saarinen, Harry Bertoia, Mies van der Rohe, Isamu Noguchi, Pierre Jeanneret. Knoll Associates, Inc.

(428a) Contemporary wood furniture built to specifications. Designer craftsman: Frank Rohloff. IDAA Design Corporation. Phone 733-0223, Los Angeles.

(358a) Manufacturers of contemporary furniture, featuring the Continental and "Plan" Seating Units, designs by William Paul Taylor and Simon Steiner. Selected Designs, Inc.

(377a) Furniture: A complete line of imported upholstered furniture and related tables, warehoused in Burlingame and New York for immediate delivery; handicrafted quality furniture moderately priced; ideally suited for residential or commercial use. Dux Inc.

LIGHTING

(366a) Contemporary Fixtures: Catalog, data good line contemporary fixtures, including complete selection recessed surface mounted lens, down lights incorporating Corning wide angle Pyrex lenses recessed, semi-recessed surface mounted units utilizing reflector lamps: modern chandeliers for widely diffused, even illumination: Luxo Lamp suited to any lighting task. Selected units merit specified for CSHouse 1950. Harry Gitlin, 917 3rd Avenue, New York 22.

✓ (405a) Recessed and Accent Lighting Fixtures: Complete range contemporary recessed and surface designs for residential, commercial applications. Holiday pendants, gay, colorful combinations of hand-blown colored or satin opal glass as well as metal shades. Light-form fixtures—soft satin thermopal glass in glowing geometric shapes for unusual decorative effects. Prescolite Manufacturing Corporation, 1251 Doolittle Drive, San Leandro, California.

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(252a) Stained Glass Windows: 1" to 2" thick chipped colored glass embedded in cement reinforced with steel bars. A new conception of glass colored in the mass displays decomposing and refracting lights. Design from the pure abstract to figurative modern in the tradition of 12th century stained glass. Roger Darricarrere.

(429a) Plastic and wood inlay panels for doors, screens, etc. Designer craftsman: Frank Rohloff. IDAA Design Corporation. Phone 733-0223, Los Angeles.

(425a) Fireplaces: Write for free information on the popular "Fire-Hood" conical metal fireplace. Four distinctive models available in 9 porcelainized decorator colors. Condon-King Company.

(364a) Contemporary Clocks and Accessories. Attractive folder Chronopak contemporary clocks, crisp, simple, unusual models; neon lights and bubble lamps, George Nelson, designer. Brochure available. One of the finest sources of information, worth study and file space.—Howard Miller Clock Co.

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SURFACE TREATMENTS

(423a) Interpace has published a 6-page brochure on the new Contours CV, a lightweight ceramic architectural facing for exterior and interior use. The brochure features photographs of 12 standard designs in a wide pattern variety ranging from those achieving medallion effect to ones which vary the play of light. The brochure also details dimensions for individual custom designs which can be designed up to 11 1/4" x 11 1/4". International Pipe and Ceramics Corp.

✓ (361a) Completely new full-color 28-page catalog of Mosaic ceramic tile manufactured in California and distributed throughout the area west of the Rockies. First presentation in booklet form of tile in the Harmonitone color families; includes decorated glazed wall tile, new Staccato palette in one inch square tile, and Byzantine. Catalog available upon request. The Mosaic Tile Company.

et cetera

HONORS & AWARDS

YOSHIE KITANE, Parsons School of Design, New York, has been named winner of the American Institute of Interior Designers 25th Annual Student Design Competition. Problem was complete interior design and division of space of a cruising houseboat. Runners-up were Ron Gary Brooks, New York School of Design; Carolyn J. Simmons, University of Georgia; and Donald Carl Byorkman, University of Washington (Seattle).



Winning A.I.D. Houseboat Interior "Clean cut, well-defined areas . . . an orderly, well rendered piece." PHOTOGRAPH BY A.I.I.D.

APPOINTMENTS

Former Secretary of the Navy **DAN A. KIMBALL**: chairman of the board of directors of the organization producing the California World's Fair in Long Beach in 1967-8.

USC Professor of Music **INGOLF DAHL**: musical director of the Ojai (Calif.) Festival series for May, 1964.

State Sen. **THOMAS M. REES** (D.-Los Angeles) and **J. EUGENE MCATEER** (D.-San Francisco): to the California Arts Commission, recently created to promote the fine arts in California.

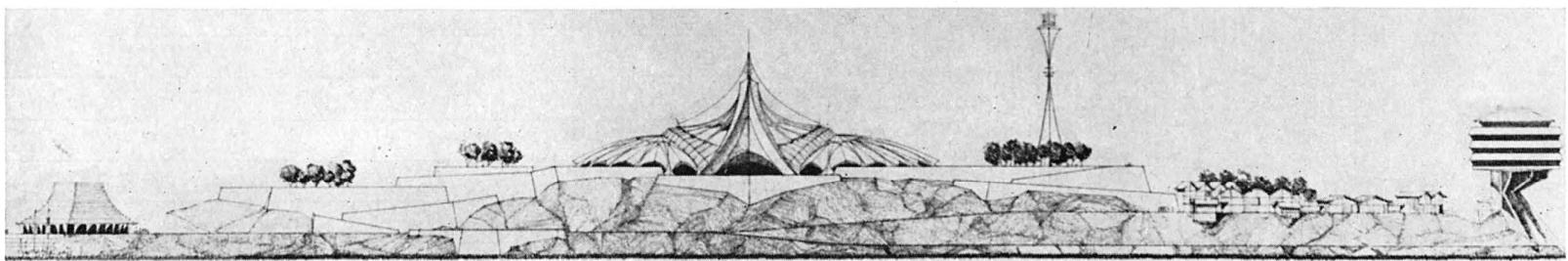
DR. FRED R. SCHWARTZ: Director of Art Education of the Philadelphia Museum College of Art.

THE ARCHITECTURAL PANEL

Author Ray Bradbury will discuss "Los Angeles, the Promised and Repromised Land" at the October 4 meeting of the Los Angeles Architectural Panel; Union Oil Auditorium, 461 S. Boyleston, 8:15 p.m. Public invited. \$1.

ALCATRAZ — SEARCH FOR IDEAS

The Northern California Chapter, A.I.A., is conducting a program to stimulate constructive thinking about future uses of Alcatraz Island "before the question of what to do with Alcatraz becomes a public issue." Below is sketch of architect James Hancock's proposal that the island be converted into a center for the "conservation, welfare and protection of human and natural values", containing two main conference halls, a hotel, restaurant and small craft shops.



PHOTOGRAPH BY GLENN MITCHELL

COMPETITIONS



Preliminary concept of projected Allegheny Center showing relationship to existing parks and downtown Pittsburgh. PHOTOGRAPH BY JAY BEE STUDIOS

An international competition for design of a public square as part of Pittsburgh's \$85 million Allegheny Center redevelopment project. The \$25,000 competition is open to architects, landscape architects, city planners, urban designers, sculptors, painters or others throughout the world. Looked for in entries are "creativity, boldness and pioneering so needed in the reshaping of our cities," says David L. Lawrence, chairman of the Pittsburgh Urban Redevelopment Authority.

Registration deadline is November 15. Requests for forms and full information should be directed to Paul Schweikher, professional advisor. Allegheny Public Square Competition, Dept. of Architecture, Carnegie Institute of Technology, Schenley Park, Pittsburgh, Pennsylvania (15213), U.S.A.

CONFERENCES & CONVENTIONS

The theme of the 1964 A.I.A. convention in St. Louis June 14-18 will be "The City—Visible and Invisible", a forum to discuss the forces that contribute to the character and development of American communities, according to institute president J. Roy Carroll, Jr.

The Second Pacific Rim Architectural Conference of the California Council, A.I.A., Mexico City, October 18-21, will concern itself with the "Consequences of Design". Some 400 architects and guests have registered to attend the conference which will close with field study trips to places of architectural and archaeological significance throughout Central and South America.

The West Coast Regional Conference of the A.I.D. will be held in Los Angeles October 3-5 with Adele Faulkner, F.A.I.D., chairing.

The 1963 convention of the Furniture Manufacturers Association of California is to be held in Puerto Rico and Jamaica from November 1-11.

A marketing seminar emphasizing "How to Build Value" will be sponsored by the National Association of Home Builders in Houston October 28-30.



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