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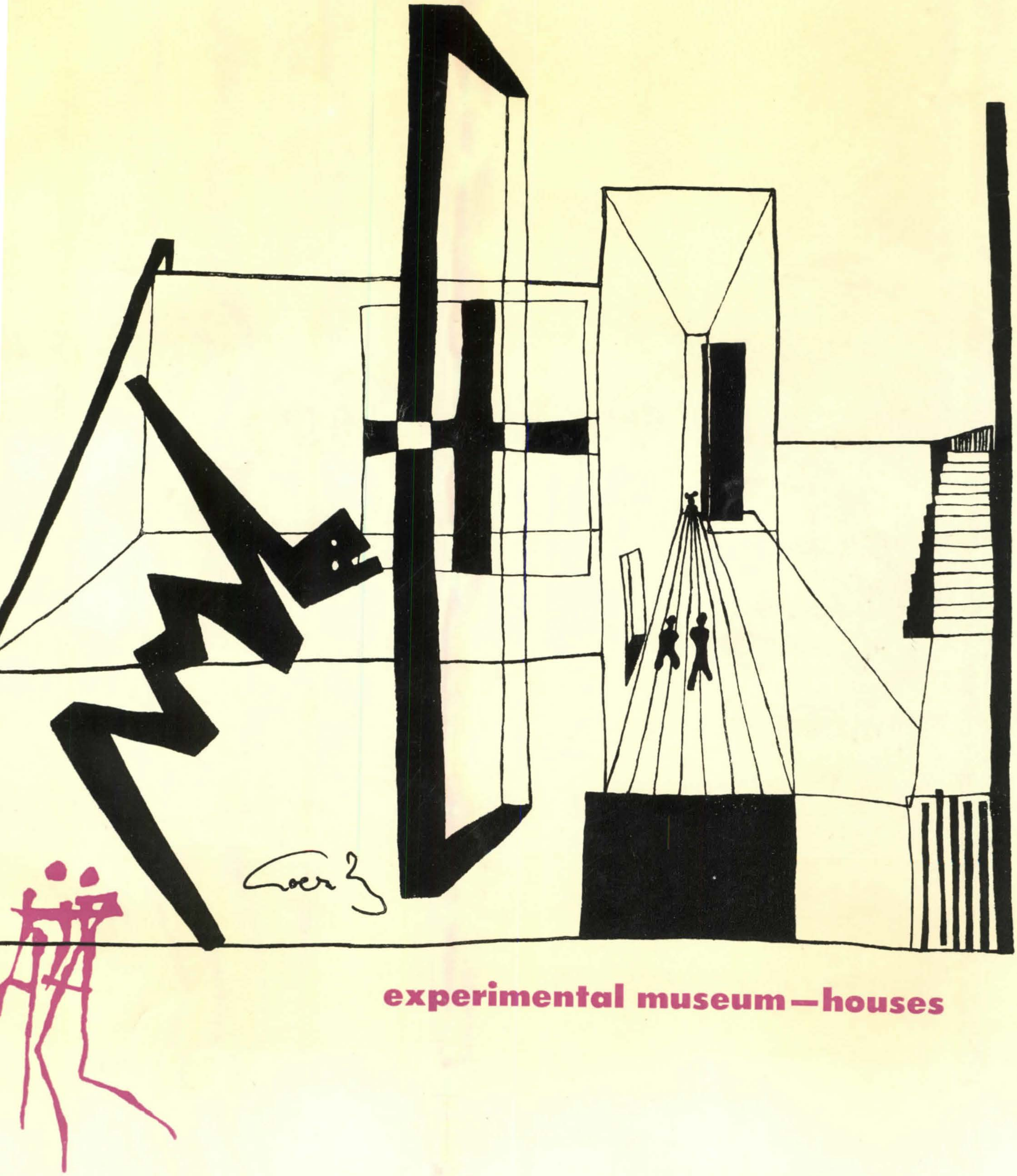

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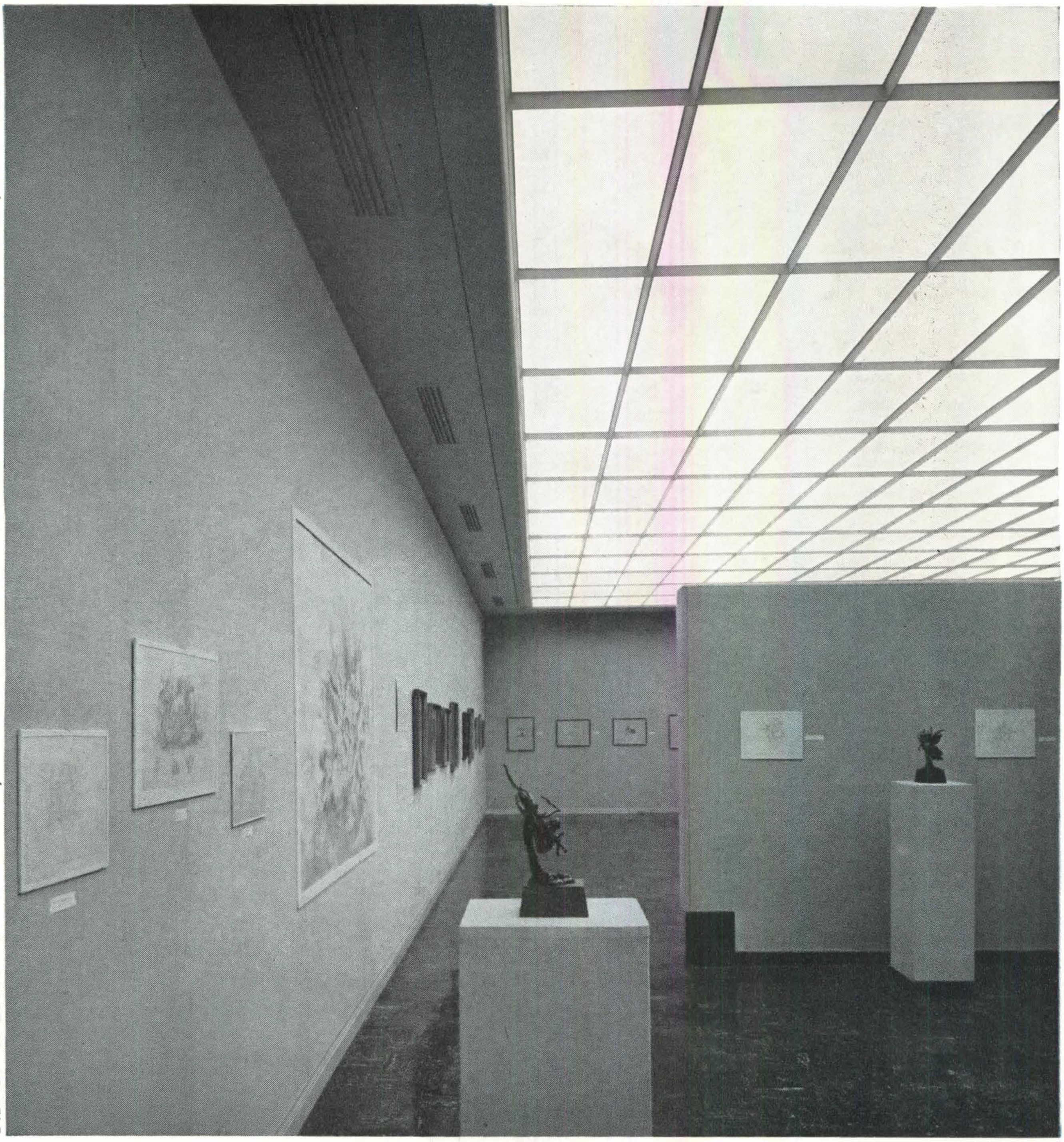

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It's the Law *by Bernard Tomson*

P/A Office Practice *Article supplementing previous discussions of the conflicts between zoning efforts and the principles of religious freedom.*

May a municipality which permits the construction of churches within a residential zone nevertheless refuse authority for such construction at a particular site within the residential area?

In previous columns *(February and March 1956 P/A)* the right of a municipality to exclude churches or private schools from residential areas was discussed. It was pointed out that, until recently, the courts had consistently struck down zoning regulations which attempted to distinguish between public and private educational facilities, or which sought to exclude churches from residential districts. However, as these articles further pointed out, a few recent decisions departed from precedent and distinguished between the right of public and private institutions to construct non-resdential buildings in a residential zone.

If these departures from precedent were the beginning of a trend, such trend, in New York at least, has been abruptly halted. Since the columns referred to above were written, the New York Court of Appeals, the highest court of New York, has decided two separate cases on this subject matter. The Court, in reaffirming the principle that a municipal ordinance may not be construed so that it would in any manner interfere with the free exercise of religious worship, rejected the attempts of municipalities to limit or restrict the sites on which churches could be constructed. *(Matter of Diocese of Rochester* v. *Planning Board of Town of Brighton; Matter of Community Synagogue* v. *Incorporated Village of Sands Point)*

In both of the cases referred to above, the zoning ordinances of the respective communities involved did not prohibit the erection of churches in residential areas, but required the church organization to obtain a permit from a planning board. The planning board in each case refused a permit, contended that a place of worship on the respective sites (1) would depreciate the value of the property in the neighborhood, (2) would be detrimental to the neighborhood and the residents thereof, and (3) that there were other sites which would be more suitable for the erection of a church. In each case, the Court of Appeals rejected these contentions as valid considerations.

In the *Rochester* case, in answer to the assertion that the construction of a church would be detrimental to the neighborhood and change its character, the Court stated:

"This, in effect, is a declaration by the Board that a proposed church and school, such as we have here, could only be built in an outlying area. . . . Thus, the Diocese is forced to locate in an undeveloped section of the Town without being able to adequately serve the territorial need of its parishioners, hoping that people of the Catholic faith will move near it. I know of no rule of law which requires that churches may only be established in sparsely settled areas. On the contrary, as was said in O'Brien v. City of Chicago, (347 Ill. App., 45) 'wherever the souls of men are found, there the House of God belongs.' . . .

"Noise and other inconveniences have been held to be insufficient grounds upon which to deny a permit to a church (State ex rel Synod of Ohio v. Joseph (Ohio) (supra)) or a parochial school (Archbishop of Oregon v. Baker (supra))."

In regard to the contention that the value of property in the neighborhood would be depreciated, the Court stated:

"Moreover, in view of the high purposes and the moral value of these institutions, mere pecuniary loss to a few persons should not bar their erection and use."

In the *Sands Point* case, the Court reiterated the general rule that churches may not be wholly excluded from residential areas, by stating:

"The text writers agree that churches and schools should be allowed in Class A residential areas which are usually the quietest and least congested areas of a town. . . . It is well established in this country that a zoning ordinance may not wholly exclude a church or synagogue from any residential district. Such a provision is stricken on the ground that it bears no substantial relation to the public health, safety, morals, peace or general welfare of the community. . . . An ordinance will also be stricken if it attempts to exclude private or parochial schools from any residential area where public schools are permitted."

However, in the *Sands Point* case, the planning board argued that its objection was only to the "precise spot" in question and that there were many other sites in the residential zones on which a church could be more suitably erected. The Court asserted that, if the municipality had the power to bar a particular site, then it would follow it had the power to select the appropriate site, and concluded that it had neither.

"While many may be tempted to think that the solution offered by the intervenor is excellent, when one thinks it through, one realizes that if the municipality has the unfettered power to say that the 'precise spot' selected is not the right one, the municipality has the power to say eventually which is the proper 'precise spot.' That, we all can see, is the wrong solution. The men and women who left Scrooby for Leyden and eventually came to Plymouth in order to worship God where they wished and in their own way must have thought they had terminated the interference of public authorities with the exercise of religion. We think that we should accept the fact that we are the successors of 'We, The People' of the Preamble to the United States Constitution and that we may not permit a municipal ordinance to be so construed that it would appear in any manner to interfere with the 'free exercise and enjoyment of religious profession and worship.'"

In still a third case which followed the two cases discussed above *(Matter of Garden City Jewish Center)*, a New York lower court was called upon to consider the refusal of a planning board to issue a permit for the construction of a synagogue. The contention of the planning board in this case was that the parking facilities available at the site in question might not be adequate for the future expansion of the contemplated church. The Court, in rejecting this argument, said:

"The evidence in the record establishes that at the present time the off-street parking provision is sufficient. As to the future, the board may not require excess parking facilities now to take care of all future growth. . . . To hold now that provision for the unforeseeable future must be made would restrict the freedom of worship by denying the right to establish a church, not because the facilities are presently inadequate or unsuitable but because they may become so with the passage of time."

The unrestricted right to construct churches or private schools may conflict with some of the goals and aims of zoning regulation. However, it is the weight of judicial opinion that the principle of freedom from interference in religious worship outweighs the public policy considerations underlying the principles of zoning.

Mechanical Engineering Critique *by William J. McGuinness*

P/A Office Practice *column on mechanical and electrical design and equipment, devoted this month to Controlled Industrial Environment.*

Sometimes industrial manufacturing processes need air conditioning more than workers do. Tendency is to provide controlled environment for both, but occasionally a separate and different kind of control is demanded by the nature of the product. Miniature Precision Bearings, Inc., Keene, New Hampshire, found this to be true at its new factory which was completed early this year.

This company, headed by H. D. Gilbert, a pioneer in this young industry, has probably done more than any other to reduce friction and increase efficiency of small devices such as speedometers, dental drills, automatic pilots for aircraft, and many other control mechanisms. Its production is confined to small ball-bearings ranging from 1/10 in. to 3/8 in. outside diameter, complete with inside and outside track and balls.

The new factory, designed by Boston Architects Anderson & Nichols, is a one-story building with no basement and only a small second story which houses a museum. The working story is 14 ft in height. The miniature process uses only about eight of this height, leaving the upper six ft free for air-conditioning units and for pipe and duct distribution. A utility room centralizes the sources of all services to the plant. Two horizontal, steel, package-type boilers produce steam and hot water; air is compressed for automatic air-conditioning controls; refrigeration units produce chilled water. The several divisions of the plant draw on this reservoir of power to serve their diverse needs. Ten units, each with fans and coils for hot or chilled water and drawing fresh air from small cupolas in the roof, are located in the upper six ft of the story height and near the zones they serve. Overhead distribution of water, air, and steam leaves the lower eight ft clear throughout the factory. Space divisions are at a minimum. Some cubicles are enclosed by dwarf partitions. A few rooms are completely enclosed by walls and an interior ceiling at the eight-ft level, above which storage space as well as room for equipment is available. One of these rooms is the very special "white area" described later. Care has been taken to provide distance vision through the plant and beyond it.

General conditioning throughout the plant is provided by some of the 10 central-station, roof-hung units. Each takes in return factory air through a grill at the unit and distributes the conditioned air through a duct system from which it is gently dropped in the vicinity of each working area. Dials at the five-foot level near each of the stations permit workers to dial fresh air at a rate varying by their choice from zero to 100 percent of the air circulated. When the setting is 100, all of the return air is exhausted through the roof cupolas and a full measure of fresh air drawn in through the conditioner and delivered to work spaces. The immediate freshening effect of this process can be imagined. During spring and fall the setting can remain at 100, but in critically cold or hot weather the admixture of outside air must be kept to a minimum because of the expense of heating or cooling it. Administrative and engineering personnel (research, metallurgy, electronics, mechanical engineering) occupy perimital areas. Here fin and tube convectors and fans, forming remote-conditioning units and placed below glass may be dialed for temperatures desired by adjacent staff.

Within the shop area, local air cleaning occurs at each grinding machine where individual electrostatic filtering units draw in air and relieve it of oil mists and metal dust which is so destructive of assembled bearings. Because of intermittent use, receiving rooms and stock rooms are not air-cooled although ventilation is provided. Heat treatment rooms are not cooled since this would simulate an attempt to bail out the ocean, but fresh air ventilation keeps them tolerably comfortable.

Most interesting, perhaps, is the so-called "white area" where the product is cleaned, assembled, inspected, and packaged. Here the conditioning methods used in the shop are not good enough. The smallest particle of foreign matter can cause abrasion in bearings and even a little surface moisture can rust bearing parts—though they be of stainless steel or other corrosion-resisting metal. Entry to this fully enclosed room is through a vestibule with two sets of doors. Upon opening them an outward pressure of room air is apparent. This prevents the entry of dust-laden shop air. Workers shoes are vacuum-cleaned in this vestibule and there employes don lint- and dust-free outer garments. A separate central station unit above this room supplies it with conditioned air. The utility room includes a separate compressor with a standby unit of equal capacity to guarantee special and dependable chilled-water service to the conditioner for this room. Double filtration of air and frequent filter inspection and cleaning do their part to improve the cleanliness of the air. Within the room, recording devices with visible dials measure and plot the temperature and relative humidity. Temperature is stabilized at 68 to 70 F and relative humidity between 25 and 40 percent. An alarm sounds if the relative humidity exceeds the high limit. This separately air-conditioned island within an air-conditioned plant has interior, sealed observation windows on all four sides, hospital-clean surfaces, built-in vacuum cleaning hose connection, and high intensity illumination from the shadowless source of a fully luminous-plastic ceiling. No feeling of claustrophobia is experienced. Working conditions are ideal within this "white area," which, incidentally, is an attractive pale green. Custom-designed furniture and the esthetic use of color add to the pleasure of occupancy.

Heat gain in the plant is minimized by the fact that the one great expanse of glass is on the east which the sun leaves early in the day. Behind this glass are the areas for reception, administration, and dining. They look out on a mountain. Eye-level strip windows afford little area for solar heat pick-up on other elevations. The heat gain consists principally of the load from machines and people. A careful study was made of the comparative cost of the operation and amortization of a cooling tower with the cost of buying municipally supplied water which would be used and not recirculated. The latter plan was chosen and 124,000 gal per day are purchased. They flow away to form an artificial stream and duck pond on which employes sometimes go boating. Absence of a cooling tower adds to the trimness of the structure. The chimneys are invisible except form the roof because induced draft makes it unnecessary for them to extend more than 4 ft. High efficiency combustion keeps soot and odors out of the flue gases.

A day's production of this product packaged in sealed-plastic bags would scarcely fill a small overnight bag. (It is shipped mostly by air.) A force of 400 works three shifts a day to produce over 1 million per year which total in weight about 2000 lb. The construction cost of this plant, which affords the most adaptable and flexible installation of climate control, was about $15 per sq ft.

Studying Today's Clients

P/A Office Practice *Article based on a talk in the Alcoa Series made at Rensselaer Polytechnic Institute, Troy, N. Y., by P/A Editor Thomas H. Creighton.*

The revolution in architectural design in our time had its inception largely in academic, abstract tenets. Granting the early actual in-place work of the original pioneers, a widespread change in *thinking* about design (and teaching of design) preceded the widespread change in *practice* of design. The average practicing architect in the United States, whether his practice is in New York or Evansville, Indiana, has taken almost twenty years to catch up with the theoreticians.

Is it now possible that the schools and the teachers in the schools need to catch up, in another sense, with the practitioner, and that the practitioner needs the better to understand his practice? The practicing architect, taking a long time to learn the design theories and the technological implications of the new architecture has, in the meantime, gone through a radical change in his *type of practice.* Are the young men coming out of the schools at all prepared, in an academic sense, to cope with this new practice? Or has the practicing profession, busy as it is, taken the time to make an objective, high-level study of its own new practice methods?

There seems an obvious paradox from which to begin such a study: the great gap between the theory of design and the ability to design, on the one hand; and the theory of practice and the quality of accomplished work, on the other. The design professions today possess great talent, knowledge, imagination—and great promise for future continuing growth. Yet, in the face of this fact, our American cities, towns, suburban communities, and countryside are receiving, day by day, a mass of badly designed, or mediocre, or undesigned buildings and groups of buildings.

When one examines the reasons for this paradox, in order to find a solution to it, we meet differences of opinion. The reasons commonly advanced are:

1. *Popular taste and understanding,* as represented by the typical client, are always bound to lag behind professional understanding and ability. If this is the true reason (and it certainly has validity) then the solution would be one of two approaches: (a) raising popular taste as far as possible by popular education in architecture and its allied arts; or (2) designing down to that general level of taste, in order to stay in business.

2. *Commercialism and materialism* of our time, represented again by the typical client, as opposed to the honesty, integrity, and creative urge of the competent designer, make widespread use of total design talent impossible. If we accept this as the reason, the only solutions would be: (a) to persuade a materialistic client to sponsor "good design" as art for art's sake, purely as a patron, with no thought of commercial gain; or (b) again, forsake the best possible in order to "give the client what he wants and needs" in order to maintain a practice.

3. *In today's complex society,* complicated as it is by technological as well as economic factors, the architect and architectural planner are no longer *able* to design buildings, except as coequal partners of experts in the fields of finance, merchandising, and management. Holders of this thesis put the building owner, the real-estate manipulator and the financial juggler on an equal footing with the architect and engineer in design, and advocate a "team" of designers of the environment. If this argument is correct, then the only solution is to admit as *designers,* as well as entrepreneurs, such nonprofessionals as the speculative home builder and the Chairman of the Triborough Bridge Authority.

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The great advantage of any or all of these theses is that they are very comfortable to accept. They provide excuses for the architect to shift blame for the badly designed environment to "circumstances beyond his control." They make it possible to explain mediocre work on the grounds that "the community isn't ready for good design," or "this section [*every section! ED.*] is the most conservative part of the United States," or "the business men in this town can't see beyond the ends of their noses," or "after all, this is what the real estate people told us would rent, and we can't argue with the experts."

Acceptance of these so easily acceptable reasons for the disparity between promise and performance prevents a *serious study* of the theory of contemporary practice. Is it possible that the real reason for frustration of creative talent in so many cases is that:

1. *The client group*—those who sponsor and pay for architecture—has changed completely in the last quarter century, and the new client has not been analyzed and studied as to his needs, desires, weaknesses and limitations, and strengths and possibilities.

2. *The means* by which the social aims of architecture are reached in buildings have changed radically, and these means—the rationale of the achievement of functions—have not been analyzed and studied, with regard to the new limitations and difficulties, or the new possibilities and advantages.

Is it part of the architect's job to understand ways to achieve buildings, as well as how to design them? If it is not, he is running the risk of relinquishing a large part of his professional position in society, and allowing fringe groups, quasi-professional groups, and purely commercial groups to nibble away at his function until he has left little reason for existence. And it is possible that the schools of architecture are running the risk of teaching a purely academic subject, while the truly pertinent training for the design of buildings might pass to the schools of business administration, of hospital administration, of land planning.

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Who is today's client? He might be classified, in one sense, as either a "private" client building for himself, the remnant of the patron client, now almost entirely restricted to residential buildings and certain smaller types of commercial structures; the commercial/industrial client, sponsor of office buildings, shops and stores, factories and warehouses; and the institutional client, controlling schools, hospitals, churches, and so on.

If one were going to study these clients deeply, however, it might be

Studying Today's Clients

characteristics rather than *types* that should be analyzed. Here are suggestions for areas of study.

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Today's client is in many cases a *group* rather than an individual. Designing for a realty company or for an insurance company really means designing for a committee of hard-boiled real-estate and financial experts. Designing a church commission or a hospital project means designing for a committee of lay people who may range from farmers to college presidents.

Dealing with a group requires special preparation. Committees are very likely to include some extremely conservative people; as groups they are very likely to compromise. "Preparation" does not imply only enthusiasm, fighting spirit, "salesmanship" (which often doesn't stick), and diplomacy. It also implies some knowledge of the nature of group action.

What motivates, what characterizes group decisions? This is an important question today, for it is the whole basis of the democratic method of action. There is literature on the subject, which could be translated into our terms. A group decision can be as weak as the lowest common denominator of the group; as median as the common level of all members' understanding; or as high as the greatest ability and level of competence represented in the group. Discussion, development of interests, exposure or cultivation of prejudices and other factors can lead to one result or another: bad compromises or bold decisions. Surely this characteristic of today's client is worth some study, at some depth.

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Another characteristic of the client in 195X may be that he is—as individual or group—likely to be a *commercial* client. We used to think of commercial clients as those interested only in one category among many in architecture: commerce, as opposed to housing, health, education, and so on. But now, as Victor Gruen has said:

"In the widest sense of the word (a commercial structure) is one which either serves the producing, buying, and selling of goods, or which is erected with the purpose of constituting a merchandising item itself, being built for the specific purpose of leasing or selling space. . . . Outside of the classification manage to stay only a few building types . . . and even in those categories commercial thought processes are making inroads."

In other words, the reason for a client commissioning an architect in the great majority of cases today is to make a profit. The *function* of an apartment house or a tract house is to provide shelter for habitation; *the reason that it gets designed and built*, however, is to make money for the client, in lease or sale.

Is this too obvious? Is it a hopeless climate in which to practice? Or is it again simply a challenge to study—basically and objectively—the greatest possible benefit that can be derived from it? The architectural profession can't run away from the facts; the social and economic pattern is not likely to change very quickly.

Why does one architect succeed in getting fine architecture and advanced planning incorporated in a shopping center, and another, despite good intentions, have to compromise? It is not only a difference in client, or superior sales ability; it is more often a perhaps intuitive understanding of the client on the one hand, and a lack of it on the other. Unfortunately, the normal pattern of response, on the part of architects, to such clients is: (a) disinterest in understanding commercial reasoning; (b) fear to assert the designer's prerogatives in the face of superior commercial knowledge; (c) an attempt to override the commercial client's wishes by sheer force of design genius; or (d) inability to communicate and transmit valid ideas on commercial levels.

Are there motivating characteristics of the commercial client, common to all from John Rockefeller to John Doe who is looking for a quick sale of a group of speculative stores? Should the commercial client be deprecated (or considered stupid) because he is not himself a creative artist; or are there benefits to be derived from his plus characteristics: pride, ambition, business acumen, interest in technology and what he calls "know-how." If he is not prejudiced in favor of good design, is he necessarily prejudiced against it? Are there areas to be explored in business reasons for sponsoring good architecture? Do we really understand, in our field, his motivating criteria and stimuli? These are areas of study which might well repay an academic approach, which later could be translated into practical, useable terms.

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A third characteristic of today's client that might be studied is his membership in a community. This is related to, but not the same as, the "committee action" characteristic. Almost anyone today is likely to be a community member. However, the community may be a horizontal one (Troy, New York, one neighborhood in the suburbs of Troy, the Capitol City region, New York State, or even the Northeast part of the United States) or a vertical one (the profession of medicine, the Junior Chamber of Commerce, an association of merchandise managers, the National Education Association). The point is that one of the characteristics of our time is that people live, play, work, travel, and often think in these larger groups of common-interest communities.

What are the characteristics of these homogeneous community-type groups, understanding of which might help the architect better know his client? It has been pointed out by sociologists that community-mindedness does not prevent individual development, although it certainly affects it. (It doesn't even, apparently, prevent loneliness; the tragedy of the loneliness of an individual member of a group has been documented.) It does strongly affect, and effect, thinking—and action.

An architect today has the choice of *identifying* himself with a community (an approach this magazine has continuously documented) or simply trying to *understand* the community. Identification can imply, on the part of a professional, leadership within the community. At the other extreme, total isolation from the community would seem to lead only to frustration, abstraction of design effort, and impotence in the *accomplishment* of first-rate results.

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To summarize: the suggestion here is that both an academic and a pragmatic study of *the theory of contemporary practice* might lead to some fruitful results. Such a study might, in the long run, prove to be more *practical* than an analysis of fee schedules as an approach to architectural practice.

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REINHOLD

curing speeded

Dear Editor: Unfortunately for authors and publishers, but to the advantage of the economy as a whole, are the rapid technological changes which make outmoded last months technical reports. I refer to Guy G. Rothenstein's excellent article on cold-glazed cement finishes *(October 1956 P/A)*.

When the author interviewed us, several months ago, the Vitricon process *did* require several days in the application phase and more days in the curing of the product.

We are pleased to report, however, that further chemical research has resulted in a one-day cycle in the application of Vitricon. That is, a complete job may be done in one day and the material obtains sufficient hardness for normal usage. However, as is true of most cement curing, ultimate hardness occurs after 28 days.

GEORGE KOGEL, President
Vitricon Inc.
Long Island City, N. Y.

well merited

Dear Editor: Congratulations on your P.S. in October 1956 P/A.

Such recognition is well merited by architects as well as by other "home-town boys" in many other fields.

HARRY C. PLUMMER, Director
Engineering and Technology
Structural Clay Products Institute
Washington, D.C.

rang the bell

Dear Editor: Many thanks for the sincere warm feelings your P.S. in October brought to me. I must confess I felt a little bit bigger, a little more confident, and a whole lot more useful after absorbing it.

It seems difficult and almost impossible at times to achieve this kind of recognition. I mean the realization by a community that the architect is or can be an influential factor in the community's growth, spiritually as well as physically. It sometimes seems unfortunate that he can not be more articulate concerning this for everyone's welfare. This is why it is such a tremendous lift to have someone of your stature and position ring the bell energetically for the small-town practitioner.

By way of digression, have you ever come across Christopher La Farge's novel *Beauty for Ashes?* It is a remarkable and rewarding study of the small-town architect and his community.

J. FREDERICK COOK, JR.
Livingston, N. J.

"enjoyable reading"

Dear Editor: As a regular student of PROGRESSIVE ARCHITECTURE, I clip for filing many pages of your magazine each month. Some of these I circulate to others in our organization.

One of the items that gets this treatment fairly regularly is Ben John Small's page on specifications. As a regular thing, these are enjoyable reading, and in addition they seem to strike home at some of the most important problems which we are facing regularly today.

The discussion titled "Curtains" which appeared in September P/A was of particular interest.

ROBERT W. McKINLEY,
Technical Representative
Pittsburgh Plate Glass Company
Pittsburgh, Pa.

young letterwriters!

Dear Editor: Architecture U.S.A. is very interesting—I admire its expression. Your journal, which now comes to our library, is to me and to my fellows more intelligible than others. We like it!

Allow me to ask you a little favor. I wish to make the acquaintance of students, around 20 years old, who can write and exchange magazines with a Czeckoslovakian colleague. Please give my name to someone interested.

I look forward to a letter and thank you very much. I wish P/A much success.

BOHUMIL PROHAZKA
Praha 5
Na Zastrelu 16
Ceskoslovensko

(Continued on page 14)

(Continued from page 13)

serves the profession

Dear Editor: I would take this opportunity to express my feelings about P/A. In fact, anything I write will be too little, but I can't resist the urge and so shall give my feelings as follows.

As I have found, this is the best encyclopedia of information today in the architectural profession. Unlike other monthly publications, it contains not only the plans and photographs of the buildings, but also the other branches of the profession. Equal emphasis is given on every side of the scientific art and every item gets a judicially proportioned space in the magazine. In short, this is the only monthly publication in the architectural world which gives sufficient information on every aspect of this profession and serves the profession in the true sense.

BAL RAJ MEHTA
Professor of Architecture
P.O. Ghaziabad (U.P.), India

the church music

Dear Editor: Very recently an architect friend of mine lent me his copy of October 1956 P/A, principally because he knows how interested I am in church architecture, and to some degree, perhaps, because he knows what I have been doing about one facet of this total picture.

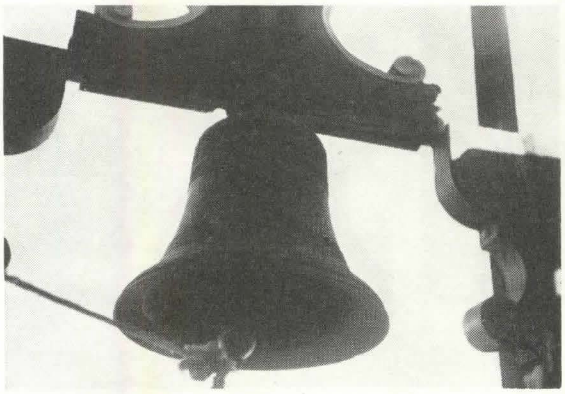
In recent years I have, largely under the banner of the American Guild of Organists, presented lecture-forums in various parts of the country for this organization's chapters on the subject of acoustics for the church. One of these was given last June in New York City as a part of the Guild's biennial national convention.

As an occasional by-product of my interest I find myself writing letters to the editors of architectural magazines—letters which make somewhat anguished noises about what I do and do not see portrayed and emphasized.

So with your permission I would like to offer some purely personal reactions to the churches in your October issue, taking each one individually. With the introduction starting on page 103 there is little quarrel other than the lack of inclusion of emphasis on (1) the architectural recognition that visual and auditory impacts should be compatible and should match, and (2) that the purpose of acoustics in and for the church was not defined.

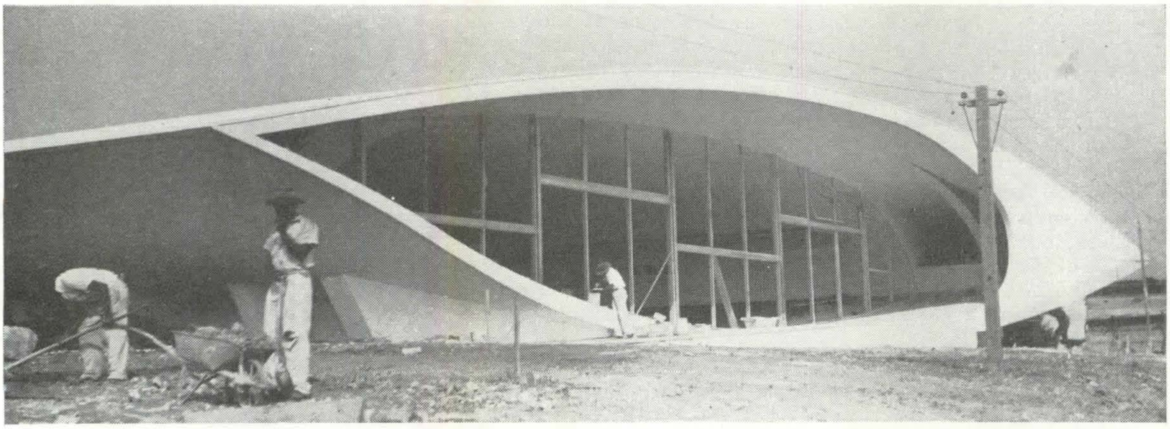
In fact, it occurs to me that no architect can realistically design a church until he has a firm recognition and understanding of why a worship room has to have certain requirements which are directly related to the denominational and

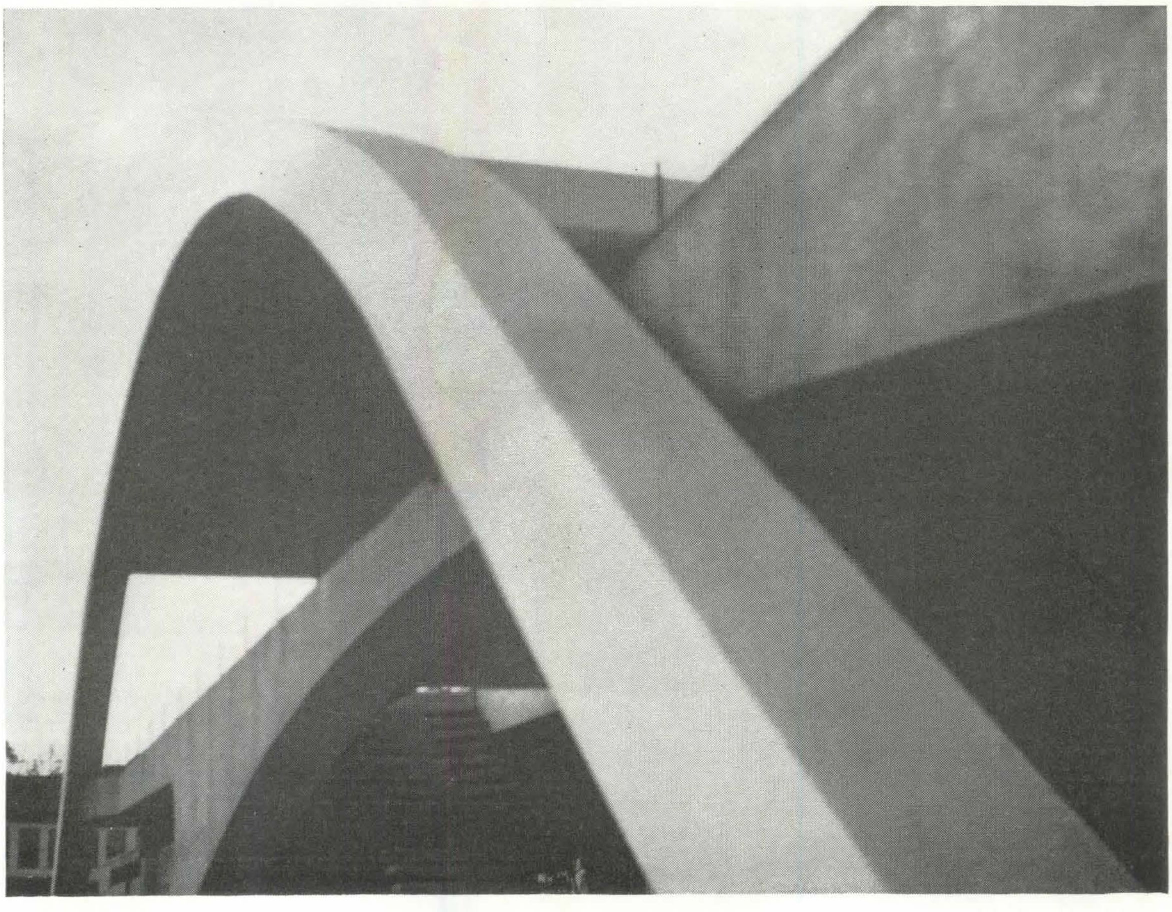
(Continued on page 16)



REPORT FROM BRAZIL

RIO DE JANEIRO, BRAZIL—The present need for residential, cultural, and industrial buildings in this vast country has created construction activity of such a formidable scale that it must, undoubtedly, overtax the capabilities of a young and brave building industry. Added to this, a project for a new Federal Capital to be situated in the geographic center of Brazil, in the State of Goiás, is going ahead; and a competition for a pilot plan of "Brazilia" was opened last September to Brazilian planners. Here we present a few pictures showing the variety of tasks that face the Brazilian architects, hoping to achieve a visual impact rather than a systematic survey which the limitation of space would have rendered futile. A bell of the colonial church of São Antonio and the reinforced-concrete frame of a youth club, designed by Oscar Niemeyer (*bottom*), are situated in Diamantina, an old settlement on a high plateau and the birthplace of President Kubitschek. The picture of the amphitheater (*below*) of a secondary school in Belo Horizonte, also designed by Niemeyer, is characteristic of the urgent need for new buildings; the classrooms are in full use, teeming with students, while the auditorium and the grounds are being completed.





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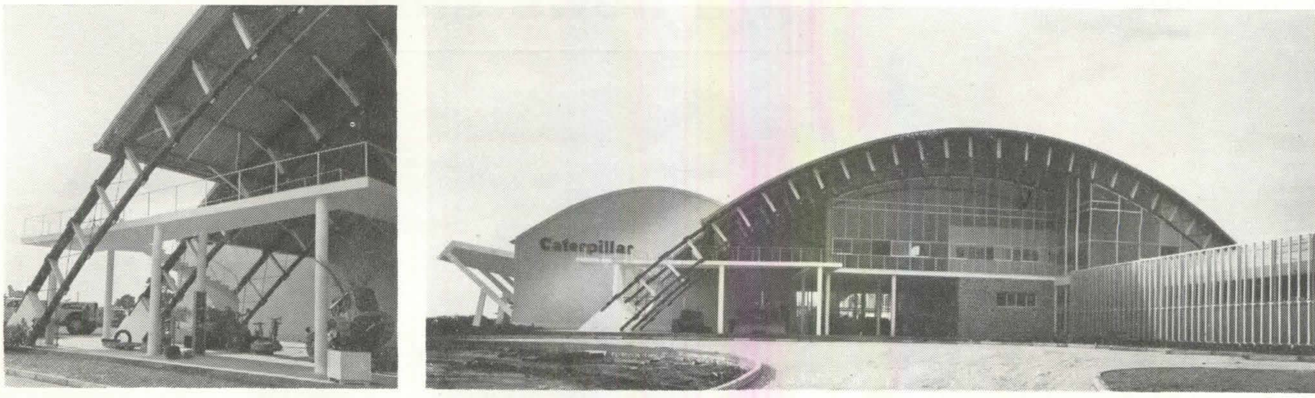

Showroom, repair shop, and offices for a sales organization of agricultural machinery in Rio (1) was designed by Roberto Brothers. The main hall, spanned by laminated-wood arches, 145′ wide at the base and 66′ high, offers continuous exhibition space extending to the outdoors. A small gallery allows the clients to have a general view of the machines from above and to see demonstrations on the grounds. The apartments (2) situated at the Eduardo Guinle Park in Rio express Lucio Costa's search for refinements in form and amenities which are equivalent, if not similar, to those of the colonial buildings. "Conjunto Governador Kubitschek" in Belo Horizonte (3), designed by Oscar Niemeyer, will contain 1130 dwelling units and shops, plus a theater and a garage, in two super-blocks of 22 and 36 stories.

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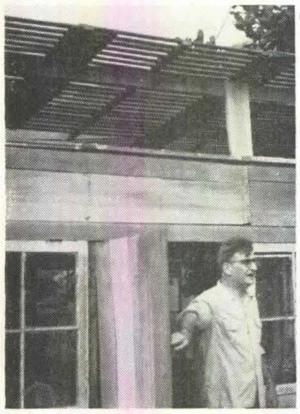

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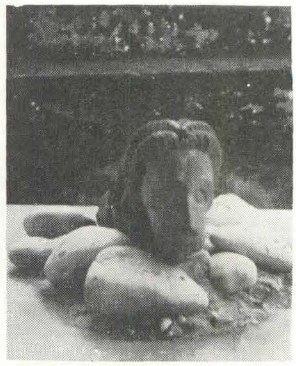

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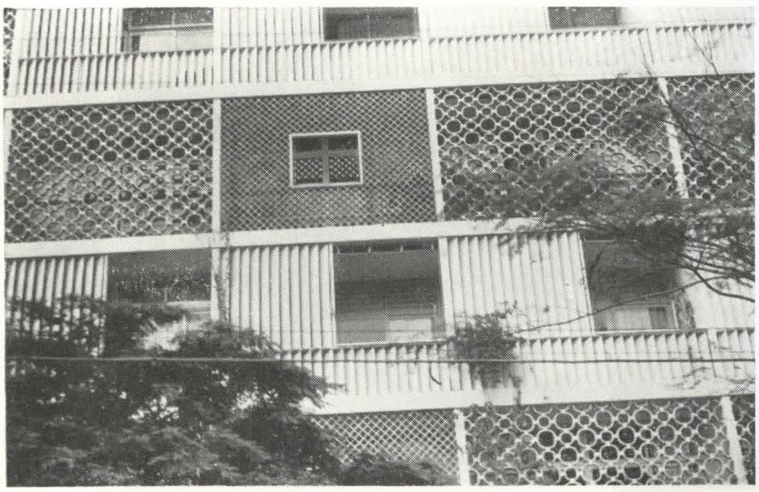

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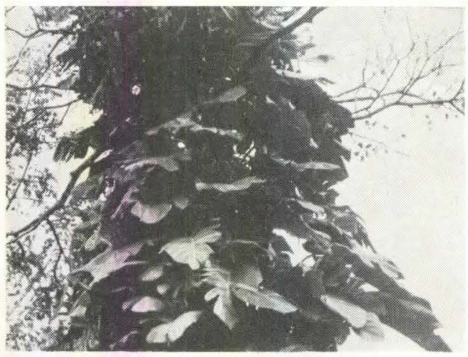

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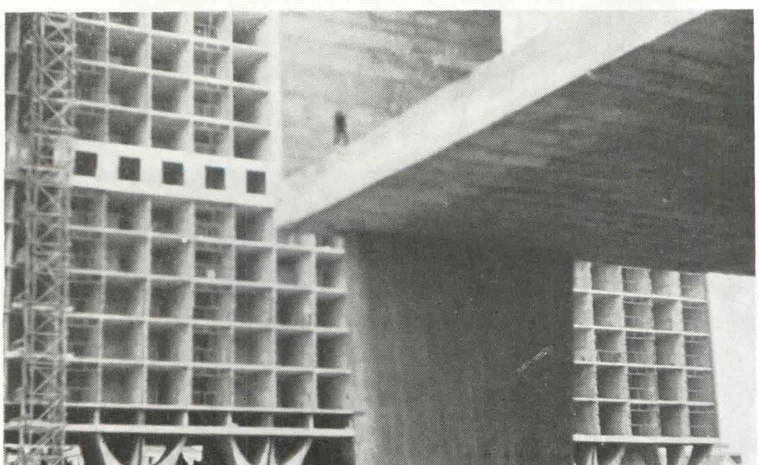

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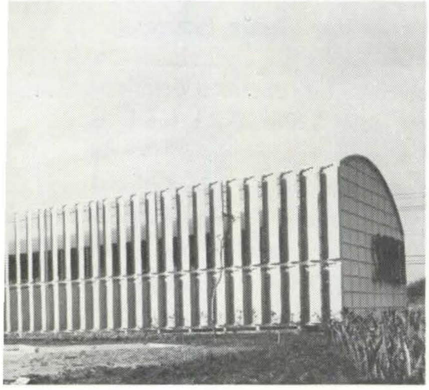
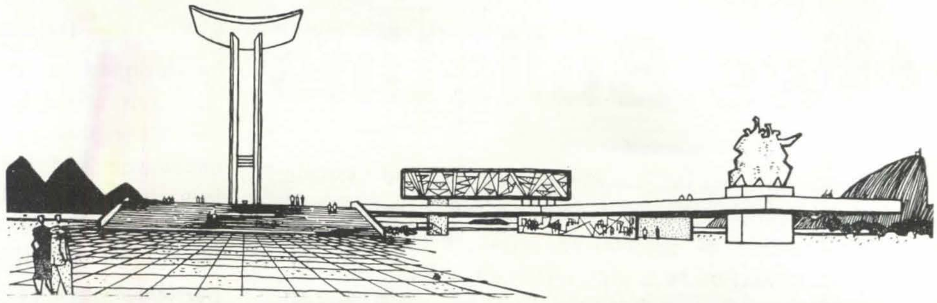
Roberto Burle-Marx, famed landscape designer (also architect and painter), has in his nursery west of Rio an amazing collection of tropical flora including many "unclassified" varieties from the Amazon and West Africa. Shown here is Burle-Marx (4) in front of one of the nursery buildings; a fragment (5) of the colonial statuary of which he is an ardent collector; a philodendron (6) in the process of devouring a tree; and a garden (7) for a residence by Oscar Niemeyer.





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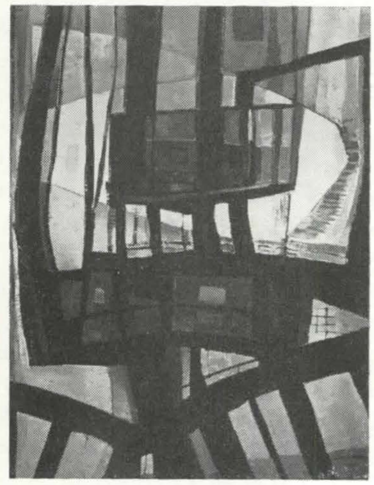

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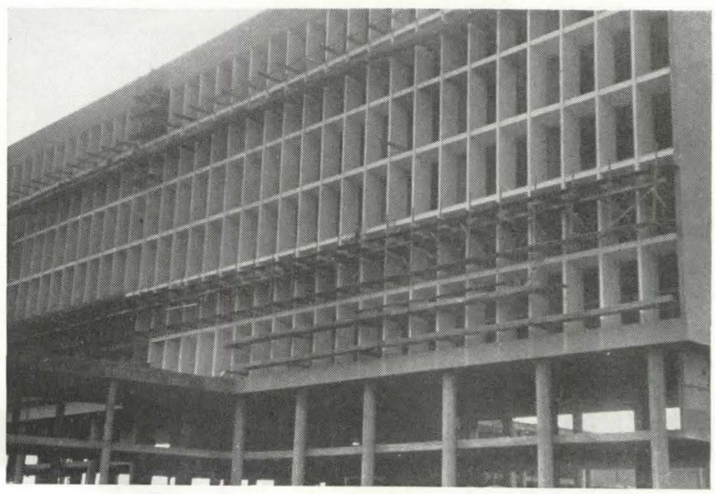
The winning design for the National Monument (8) is to be built in downtown Rio, facing the Bay of Guanabara and next to Affonso Eduardo Reidy's rising Museum of Modern Art. Architect Marcos Konder says that he wished to express in this design a pure "architectural" space. Sculptor Alfredo Ceschiatti, Painter Anisio Medeiros, and Stained-Glass Specialist Julio Catelli Filho are the co-winning artists. Firmino Saldanha, who divides his time between architecture and painting, designed the buildings for an oil refinery (9) in collaboration with H. Kaulino and Bina Fonyat. The oil painting (10) is typical of Saldanha's work: a heavy black framework containing subtle forms of rich, delicate tones. He finished recently a 6'x20' mural for the Banco Real Brasileiro in Rio. The model of the stage setting (11) was designed by Oscar Niemeyer for the lyrical drama of Vinicio Moraes, "Orfeu da Conceição" (The Black Orpheus, in free translation) when the world's premiere of the play took place at the Municipal Theater of Rio (a small-scale Paris Opera) the 25th of last September. The building in process of construction (12) is for the National Faculty of Architecture and is situated on the Governor's Island of Rio as part of the "University City." Designed by a group of young architects with an inclination for a painstaking thoroughness and under the leadership of Jorge Moreira this school is, perhaps, the most ambitious undertaking of its kind and reflects the national interest in architecture. The school not only will accommodate 1000 students with studios, classrooms, amphitheaters, and club facilities, but also it will provide space for a large library, laboratories for the testing of materials, model-making shops, and a museum of comparative architecture. STAMO PAPADAKI



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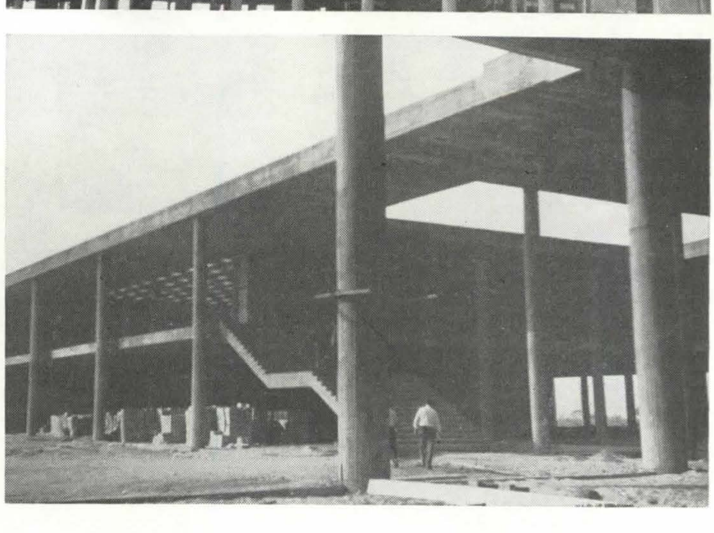

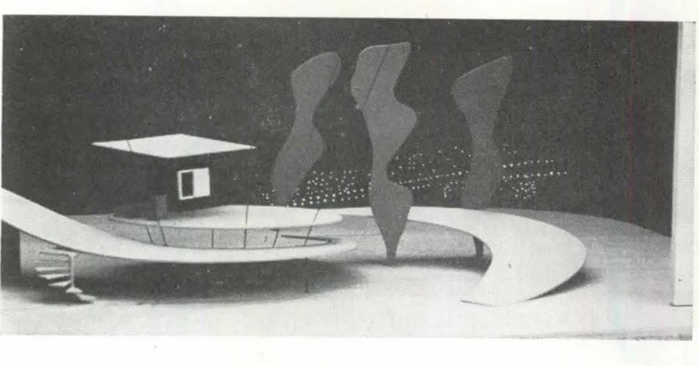

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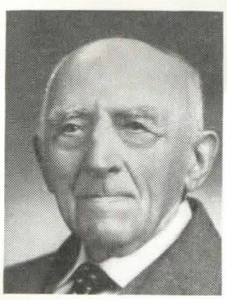
News Bulletins

• To stimulate interest in aluminum's structural and esthetic possibilities, Reynolds Metal Company will grant annual international award of $25,000 to architect making most significant contribution to use of aluminum in building field. In conjunction with awards notice, release of Reynolds' impressive two-volume publication, Aluminum in Modern Architecture, was announced.

• Building for higher education in New York is booming. Barnard College opened campaign to raise $1.8 million for new five-story library and classroom building designed by Architects O'Connor & Kilham. . . . Loeb Student Center, $3-millions addition to New York University facilities, will feature brick, marble, and glass exterior as well as landscaped terrace area. Architects: Harrison & Abramovitz. . . . Ground was broken for two "super-schools" costing total $16.5-millions—High School of Science designed by Architects Emery Roth & Sons will accommodate 3000 students. Fashion Institute of Technology, blue-and-gold aluminum structure designed by Architects Young, Moscowitz & Rosenberg, will be first joint city-state community college.

• Parsons School of Design, New York, awarded medals to 11 internationally known designers in decorative and fine arts at 60th anniversary dinner. Among those cited were: Junzo Yoshimura, Japanese architect and professor at Tokyo University of Arts; Eleanor LeMaire and Eleanor McMillen Brown, U.S. interior designers.

• First annual convention of National Swimming Pool Institute was held in Chicago, Dec. 3-4. . . . First annual Home Improvement Products Show will be held Feb. 4-6, at Hotel Statler, N. Y. . . . United States World Trade Fair, opening in New York City Coliseum, Apr. 14-27, is expected to attract more than 100,000 buyers. . . . New York Society of Architects culminated 50th anniversary celebration at annual meeting held Dec. 1.



• John K. Neebe (right) Illinois architect since 1897 when first Architectural Act in U.S. was inaugurated, celebrated his 100th birthday, Nov. 17. German-born, member of Illinois Society of Architects since 1914, he still maintains office of general practice and active interest in architectural profession.

• Major elements of proposed Lincoln Square Cultural Center for New York's West Side, formerly restricted to triangular segment on Broadway (preliminary model, right), now have been moved to large square behind triangle and off main traffic in revised plan. New scheme will utilize four halls of varying size as originally contemplated but 2200-seat theater, attached to proposed Philharmonic Concert Hall, is now intended primarily for ballet and 1000-seat hall, attached to proposed Metropolitan Opera House, will be designed as repertory theater. John D. Rockefeller III, chairman of exploratory committee for center's development, revealed proposal for ten-year $10-millions fund to encourage and underwrite "new and experimental" works in various art forms. Center is expected to be international focal point for performing arts. Skidmore, Owings & Merrill are co-ordinating architects. Other architectural firms participating are: Chapman, Evans & Delehanty; Eggers & Higgins; Harrison & Abramovitz; S. J. Kessler & Sons; Pereira & Luckman; Vorhees, Walker, Smith & Smith.

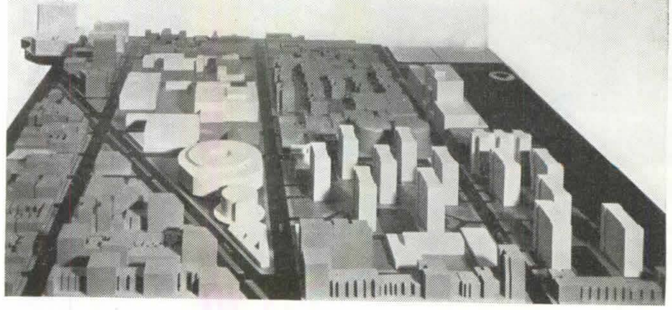
• Tetsuro Yoshida, Japanese architect and teacher who endeavored to fuse traditional concepts with contemporary design elements both in his work and teaching, died in Tokyo, Sept. 8. Yoshida (left) is best known in America for two books on traditional Japanese buildings in which he attempted to separate their formal architectural merits from sentimental values and picturesque appeal of garden relationships.

• Paul Lester Wiener, New York, was awarded diploma of Professor Honoris Causa by Faculty of Engineering, University of San Carlos, Guatemala, for distinguished service in his field.

• NAHB expects home costs in 1957 to increase by 3.4%. . . . Economic experts predict large rise in home construction during next 25 years.

• Contract for preliminary architectural plans denotes first definite step taken by United Engineering Trustees, Inc., toward construction of Engineering Societies Center in mid-Manhattan. At recent meeting, Shreve, Lamb & Harmon Associates were named architects for project (see NEWS BULLETINS August 1956 P/A). . . . Already scheduled for construction, Carbide & Carbon Chemicals Company engineering building in South Charleston, W. Va., is designed by Fellheimer & Wagner to provide space for 500 engineers.

• Competition to encourage and recognize Products Literature of technical value to architects is open to manufacturers and associations publishing such data. Entries due Jan. 21. Write: Producers' Council, Inc., 2029 K St., N. W., Washington 6, D.C.



Washington Report

by Frederick Gutheim

The newly organized Democratic Congress will almost certainly take another look at the so-called lease-purchase program. This concerted attack on long-deferred Federal building needs was commenced more than two years ago. So far it has exactly one building under contract. To sketch the statistical picture rapidly, this solitary building project is one of six on which bids had been invited. The other five bids were rejected. Six additional projects are now out to bid. Architectural and engineering contracts have been let on 40 jobs. The Senate Public Buildings Committee (which must approve every project) has acted on more than 100, and another batch of nearly 100 will be ready for committee action when they meet this January. All this is part of an officially estimated backlog of need of about 5000 Federal buildings.

The first thing Congress will find is that it is not entirely blameless in these delays. Congressional desire to retain administrative control of the program by approving each individual project, itself an objectionable interference with the work of the executive branch of the government, has been the cause of much delay. The Bureau of the Budget, which must also approve each project before it goes to Congress, is another bottleneck. But the real difficulty lies deeper, in the financing of these jobs. While the law imposes no ceiling on interest rates, the Comptroller General has indicated that his notion of government economy will not permit rates higher than 4 percent. This explains the program's unpopularity with investors, the lack of bids, and the slow progress. It also explains why the General Services Administration has just changed its routine, and is calling for package bids on financing and construction; is trying to make mortgage-servicing easier by allowing bids on terms of 10 or 25 years; and proposes to pay taxes direct to local authorities.

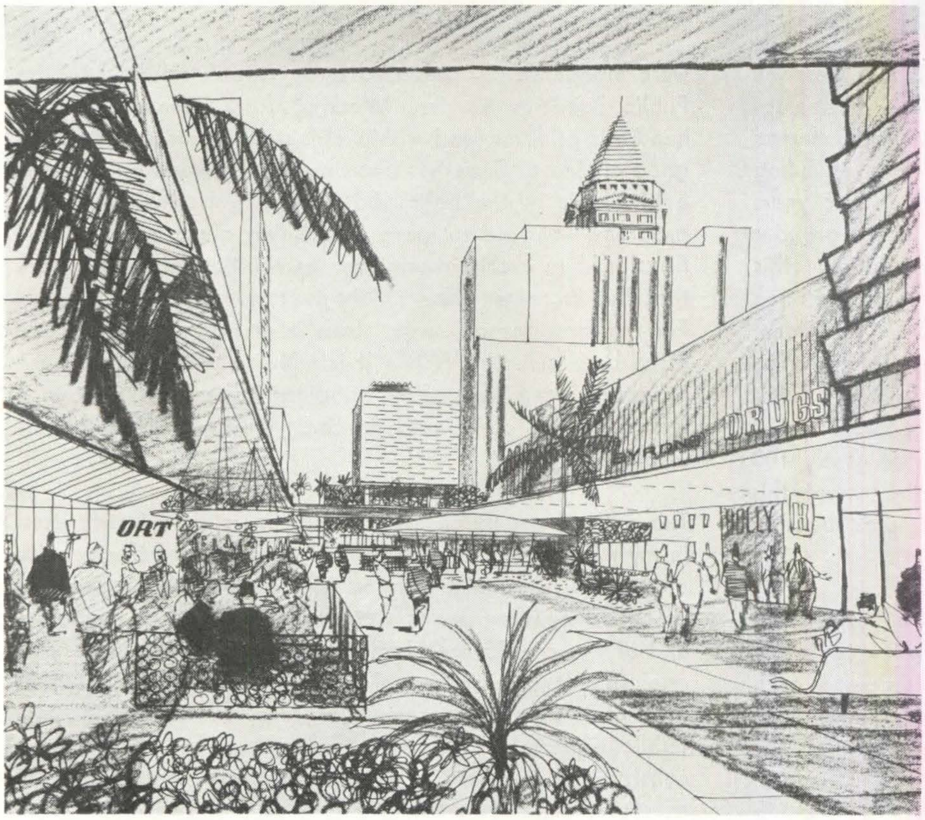
Stuck in this $700-millions jam are some very large and attractive projects. One in New York City, recently approved and now awaiting the appointment of designers, is a $65-millions court house and Federal office building with 1,750,000 square feet of floor space. Other large buildings in the program are in San Francisco ($45 millions), Los Angeles ($38 millions), New Orleans, Atlanta, and Washington, D.C. Most of these are general office buildings, with, here and there, some special purpose areas. The nature of the lease-purchase program, however, precludes its use for any building type not readily convertible to private commercial use.

The design aspects of the program have been handled in a highly satisfactory fashion. At the conception of the program, fears were voiced that architectural and engineering services would be lumped together with financing and construction on a total lowest-bid basis. This danger was averted by a procedure under which plans and specifications were independently prepared by architects selected by the Public Buildings Service. Working from submissions from hundreds of firms, and within objective selection criteria, a good choice of firms has been made. Emphasis on speed—a bit ironic in the light of the total performance of this program!—has led to many jobs being given to associated firms, and to architect-engineer associations, on the theory that this increases their ability to turn out the job faster. For the same reason, larger firms in any given locality have often been selected. While it is still too early to judge the program on the basis of the buildings it produces, none of it is likely to be considered the best work of the architects involved.

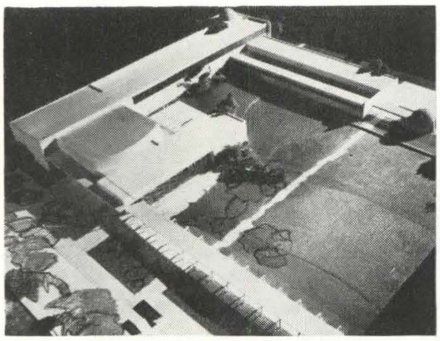
The entire lease-purchase program has still to justify itself in my mind. It is a creature of desperation—of the inability of successive administrations to convince Congress that executive building needs were real, urgent, and enduring, and of the conflict between the need for capital outlay as against balancing an annual budget. The admittedly higher total costs to the government by lease-purchase as against public ownership have been argued as the price of any construction program at all, and accepted by many as a necessary expedient. But now that administrative delays of this magnitude must be added to these increased costs, a conscientious administration ought to take a fresh look at the over-all desirability of the program before tinkering with it.

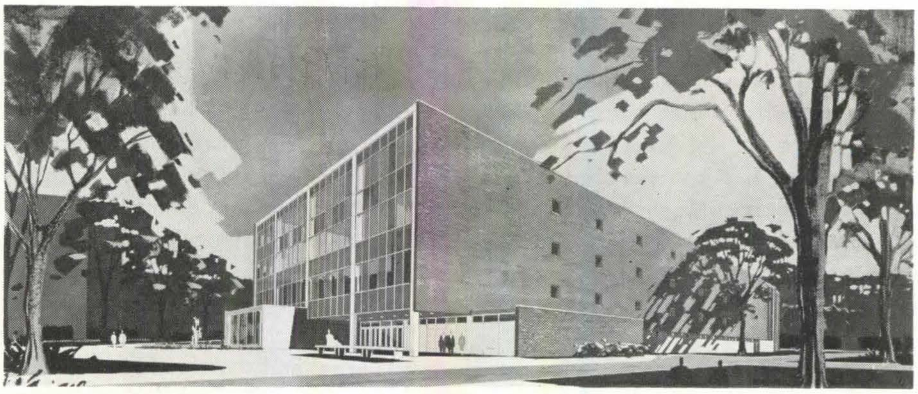
The effort to resume Federal construction has brought to light a number of new aspects of such construction. The coordinated Federal building program for Washington and its vicinity, which promises to rid the city of its temporary government office buildings, could never have been undertaken without the stimulus of the lease-purchase program. Several firm steps toward the development of major administrative subcenters (in San Francisco, Denver, New Orleans, Atlanta, for example) have been taken. In such cities, master plans for Federal office building centers have been sketched. The choice of sites, the provision of off-street parking, the desire to conform to local city plans, the impact of dispersal and other security factors—these are all typical of the building design climate of 1957. Facing them has also caused some delay, as in Richmond where a struggle between central city and outlying sites has developed. Here, as in Pittsburgh, San Francisco, and other cities where new Federal buildings are being fitted into existing conditions, two kinds of conflict have appeared. One is between rival local groups with a different idea of the kind of city they want. The other is between pinch-penny Federal thinking, which declares that the cheapest site is always the best, and a more generous view that holds the Federal government has a stake in aiding sound city growth, urban renewal, and other objectives even if it costs a bit more. At this moment, too few of the latter voices are being heard. Indeed, it is hard to believe that the same government administers the Public Buildings Service and the Housing and Home Finance Agency.

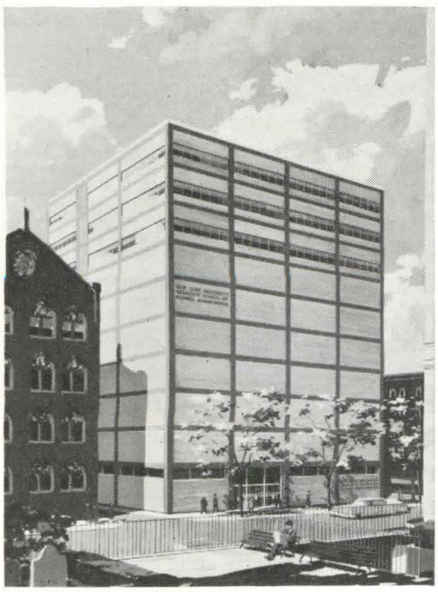
FLORIDA ARCHITECTS TANGLE WITH TRAFFIC



MIAMI BEACH, FLA., Nov. 8—Three hundred members of the Florida Association of Architects gathered here today for their 42nd annual Convention. They came specifically to consider the aggravated problems that the Motor Age presents to the profession. *Henry S. Churchill* sounded the keynote: accenting the astonishing fact that in another 20 years there will be 40 to 50 millions more automobiles whizzing about than there are now, he pleaded with the architects to do all that design and planning can do to retrieve and further "the human environment and conservation of natural resources." The core of the problem, Churchill emphasized, is not the highway leading to the city but "local street capacity," where the mess piles up. Urging the architect's increasing concern with civic design, he underlined the need for many more contemporary solutions to the human need for pedestrian spaces—spaces that keep out the automobile and allow "the bench, the tree, the statue, people." Victor Gruen was on hand to summarize a plan he has developed for downtown Miami, which, among other things, would exclude traffic from a stretch of busy Flagler Street (the cars to be parked on the perimeter) and transform the street (*left*) into a pedestrian plaza, complete with planting, benches, sculptures, sidewalk cafes, and other amenities. *Photo: Gordon Sommers*







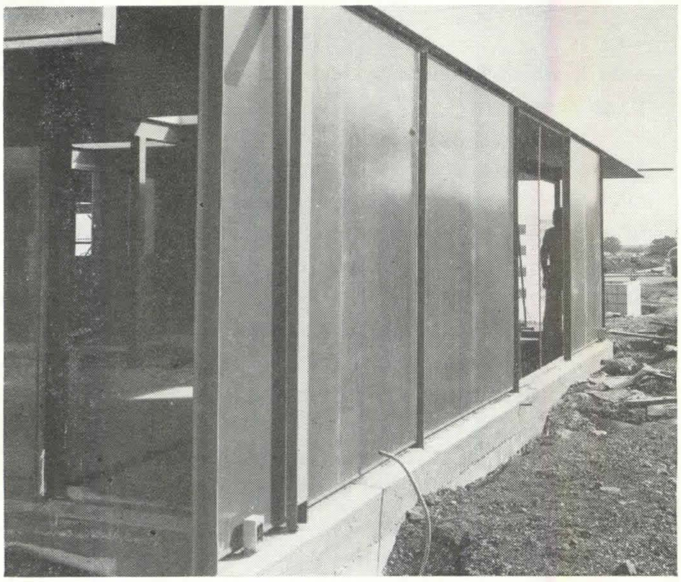
Three New Campus Units Announced

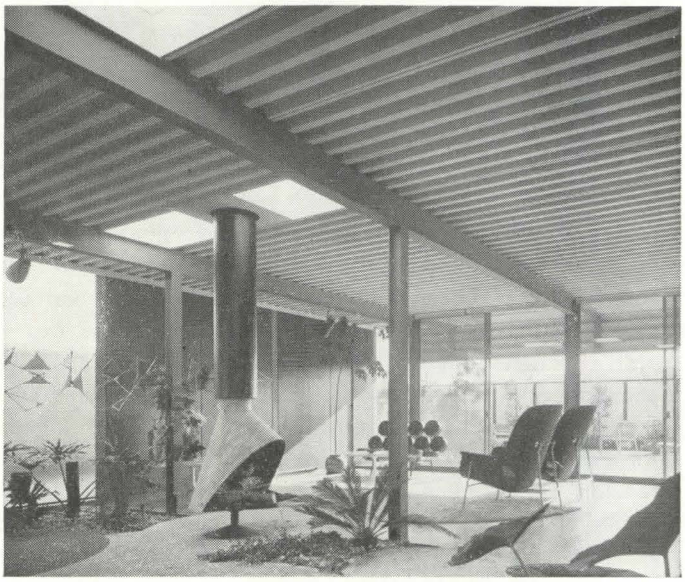
Major new buildings for leading colleges and universities have made recent headlines. At St. John's College, in Annapolis, Maryland, ground has been broken for the new Francis Scott Key Auditorium and science laboratories (*above left*). In addition to physics, chemistry, and biology labs, the buildings will contain rooms for music and the fine arts. Architects: Richard J. Neutra & Robert E. Alexander, Los Angeles.

New York University has announced plans, developed by Skidmore, Owings & Merrill, Architects-Engineers, for a 10-story, air-conditioned classroom building (*left*) for the Graduate School of Business Administration. All classroom floors (second to sixth) as well as the seventh-floor library will be windowless. The lobby floor will consist of a lounge, executive dining room, and 500-seat auditorium.

Now under construction on the main campus of the University of Michigan is a new undergraduate library building (*above*)—a four-story and basement structure, completely air conditioned. The building, designed by Albert Kahn Associated Architects & Engineers, Detroit, will contain approximately 136,000 sq ft of floor space. Completion of the $2,400,-000 structure is scheduled for late 1957.

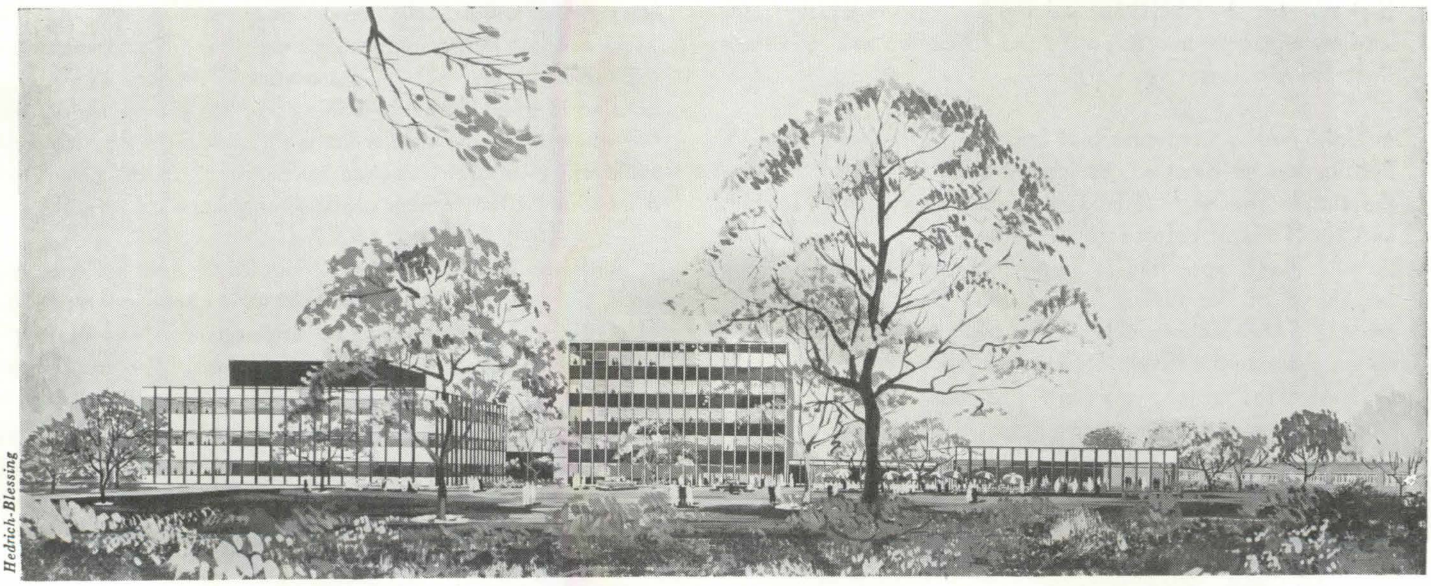
STEEL AND PLYWOOD JOINED IN EXPERIMENTAL HOUSE





Ernest Braun

SAN MATEO, CALIF., Nov. 15—The latest of Builder Eichler's model homes—the X-100—was recently opened here to the public. Not intended as a production model, it represents rather, according to the builder, "our effort to find new materials, new products, and new methods which might be used in the future in either production or custom houses." Design focus is on outdoor living, maximum spaciousness, and flexibility in the interior arrangement. The structural frame is of light steel, permitting the use of nonloadbearing walls or glass panels. Important new building material used in this experimental house is a high-density-resin overlaid fir-plywood panel (*above left*) originally developed by the Douglas Fir Plywood Association for industrial application. Jones & Emmons & Associates, Architects; William R. Mason, Structural Design; Douglas Baylis, Landscape Architect; Anne K. Knorr Interiors.



Hedrich-Blessing

Campus Plan Developed for Industrial Corporation

SKOKIE, ILL., Nov. 5—Announced here recently were plans for a new office headquarters for International Minerals & Chemical Corporation, to be built on the 21-acre, wooded site where the Corporation's Central Research Laboratory already exists. Designed by Perkins & Will, Chicago architects, in collaboration with International's Engineering Division, the group will include a five-story building for administrative offices; a three-story unit for staff and operating divisions; a one-story staff cafeteria building, joined to the administrative block by an employe lounge-auditorium; and a one-story unit for electronic business-data machines. Structure is to have reinforced-concrete frame, with curtain walls of glare-reducing, heat-absorbing glass and porcelain-enamel panels set in aluminum mullions. The buildings will be fully air conditioned, employing radiant ceiling heat. Total floor area of the new units, scheduled for construction in 1957-58, will approximate 120,000 sq ft. Contemplated cost, to be financed by a sale-leaseback, is about $3.5 millions.

Financial News

by William Hurd Hillyer

The rate of accumulation in residential capital will not continue its downward trend. Such is the provisional conclusion reached as a result of joint study by the National Bureau for Economic Research and the Institute for Urban Land Use of Columbia University. The splitting up of existing dwelling units, which in the past two decades has created additional facilities without involving new construction, will tend to diminish in importance, the experts predict. High population mobility as a result of economic changes, a higher rate of demolitions and an increasing social "fragmentation," forming new households, will call for a substantial volume of buiding. As income mounts, more families will want a summer or week-end home. In the immediate future, however, the researchers see new products and services as likely to outbid housing in the scale of consumer preference.

Meanwhile, in the opinion of New York's First National City Bank, no real evidence implies that a "let-down" is imminent in the prevailing prosperity. "Peak rates" of business activity are anticipated "for the next few months," and the nation's total output of goods and services will doubtless surpass the record annual rate of $413 billions reached in the third quarter of this year. On the other hand, business profits are declining. Manufacturers made 12% less during that quarter than in 1955, judging by reports of over 500 leading corporations. This will tend to curtail new construction, industrialwise.

• Tight money continues, not because the Federal Reserve System has so decreed, as is commonly supposed, but for the simple reason that lendable funds are in short supply, and the Federal refuses to risk inflation by printing additional billions. Spending is outpacing savings. Lending runs far ahead of depositing. During 1956 bank loans have increased $11.5 billions, a 12% rise, while total deposits have shown the comparatively trifling gain of only $461 millions, or two-tenths of one percent. This fact alone may have much to do with the impressive antics of Fanny May (Federal National Mortgage Association) who has accelerated her mortgage buying to a $500 millions annual rate in an effort to relieve the short supply of building money. She is collecting so much interest that wiseacres predict her emancipation from Government sponsorship. There's another and less depressing side to the loan vs. deposit picture. Individuals saved $7 billions during the first half of 1956, a very high rate, reflecting personal income after taxes and a tapering off of debts. This sum did not remain liquid but, by reason of providing business activity and expansion was drained off as fast as it accumulated. While P/A goes to press there are signs of less frantic borrowing: the Federal Reserve Board announces that third quarter bank loans rose only half as much as in 1955—$1.5 billion as compared with $3.1 billions. Nevertheless, they are $9.1 billions ahead of October a year ago. A contrary trend is displayed by consumer credit, which is climbing for the $31 billions mark as this page sees print.

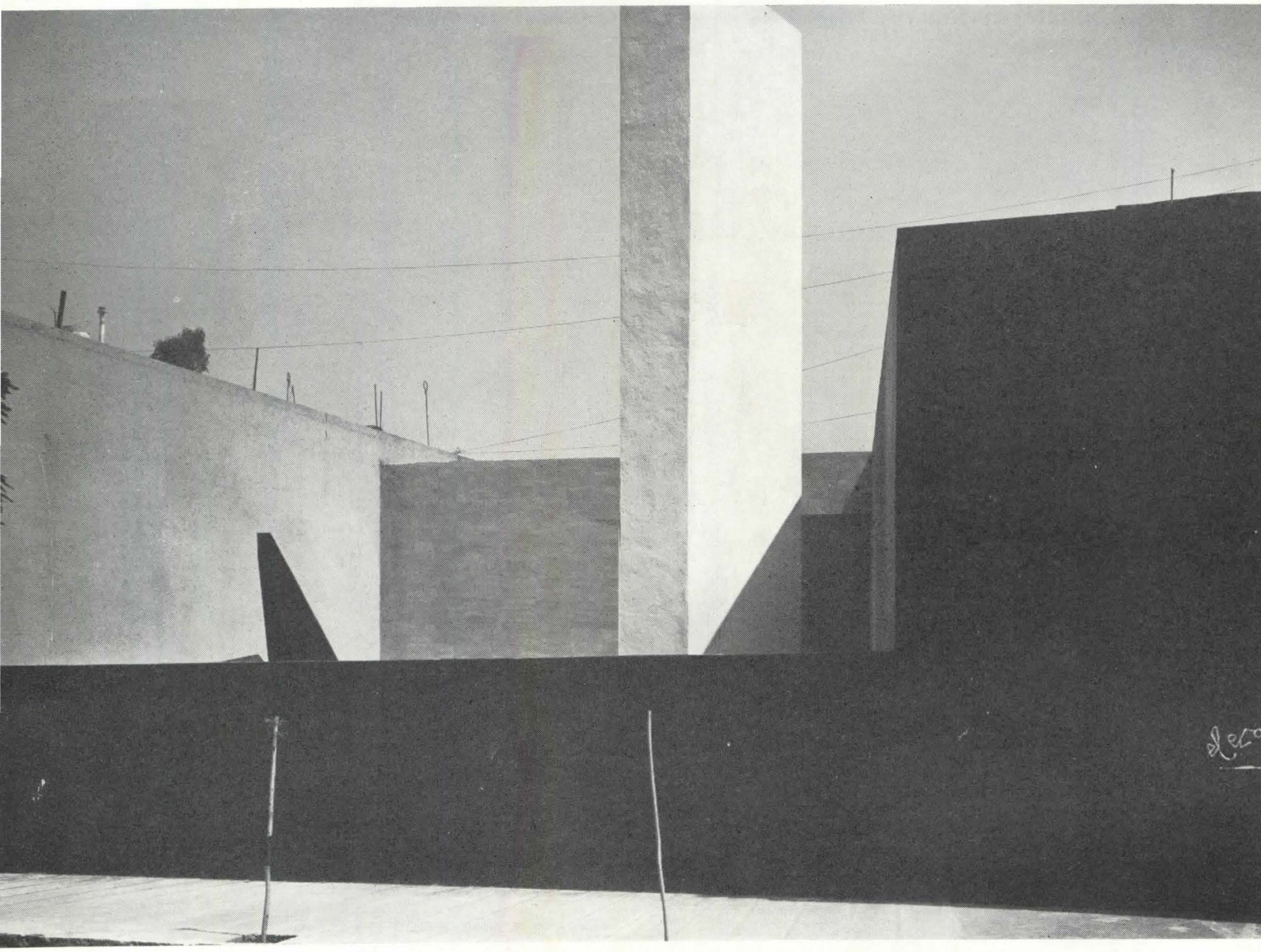
• Architecture and the financial world have reached common ground in the realm of creative discovery. Industrial research, as chronicled by The Wall Street Journal has taken for its province the workings of "creation" in the mind of artist, chemist, or others engaged in purely professional callings. A committee has been formed, of which a leading carpetmaker and financier is chairman. Already the task in hand has been likened to "trying to hit a ball with a spear."

• Revival of wood as a building material will be hailed with satisfaction by architects who have clung to a preference for natural structural substance. The great old wooden beam is making a spectacular comeback via lamination, Wall Street tells us. Churches and schools are chief users, with modern versions of timber construction finding favor for such edifices at a time when they are springing up as never before, particularly in the West. Rising costs of steel and cement are factors in the swing away from those materials, which is likely in turn to have a marked influence on present-day design. Concurrently, an increasing demand for brick and stone veneer is reported among homebuilders.

• Now is the time to expand home improvement, a high government official tells readers of current Bankers Monthly. Most economists agree, he declares, that this market should expand to around $24 billions a year "if we are to keep our housing in good shape." As this page has previously pointed out when discussing smaller home improvement figures, architects will swell their practice by hundreds of millions if only a fraction of the total is professionaly handled.

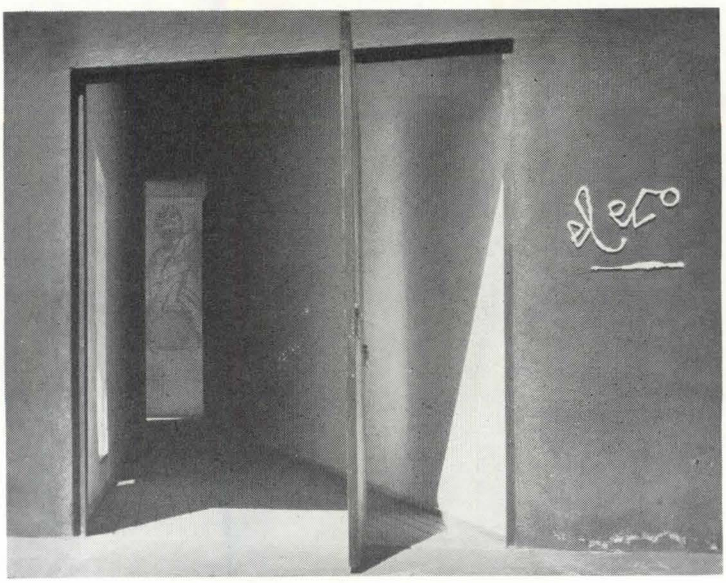
• With the apparent easing of political and national tensions, the year goes out somewhat as it came in—a product of contrary forces and a victim of opposing views—but with the plus-bright side more nearly dominant. "The rosy capital spending outlook" colors traditionally sober opinion at the Federal Reserve Bank of Chicago, which foresees an annual rate of $38 billions in the fourth quarter (with proportionately good effect on architects' practice). Contrariwise, that institution's ever-available corps of pessimists are tracing the current rise in the nation's output of goods and services "almost entirely to higher prices."

Another minus sign is supplied by the downdrift in bank check totals; which declined 7% the first week in November as compared with the previous week. This fact may have its favorable aspect, indicative of a mild deflationary trend. There is need for restraint opines The Chase-Manhattan Bank, New York, at a time when business activity is again approaching the limits set by manpower, materials and plant capacity. Federal Reserve's restraint policy is seen as helping to maintain high standards: "Our economy" is "coming ahead rapidly," but excesses must be avoided.

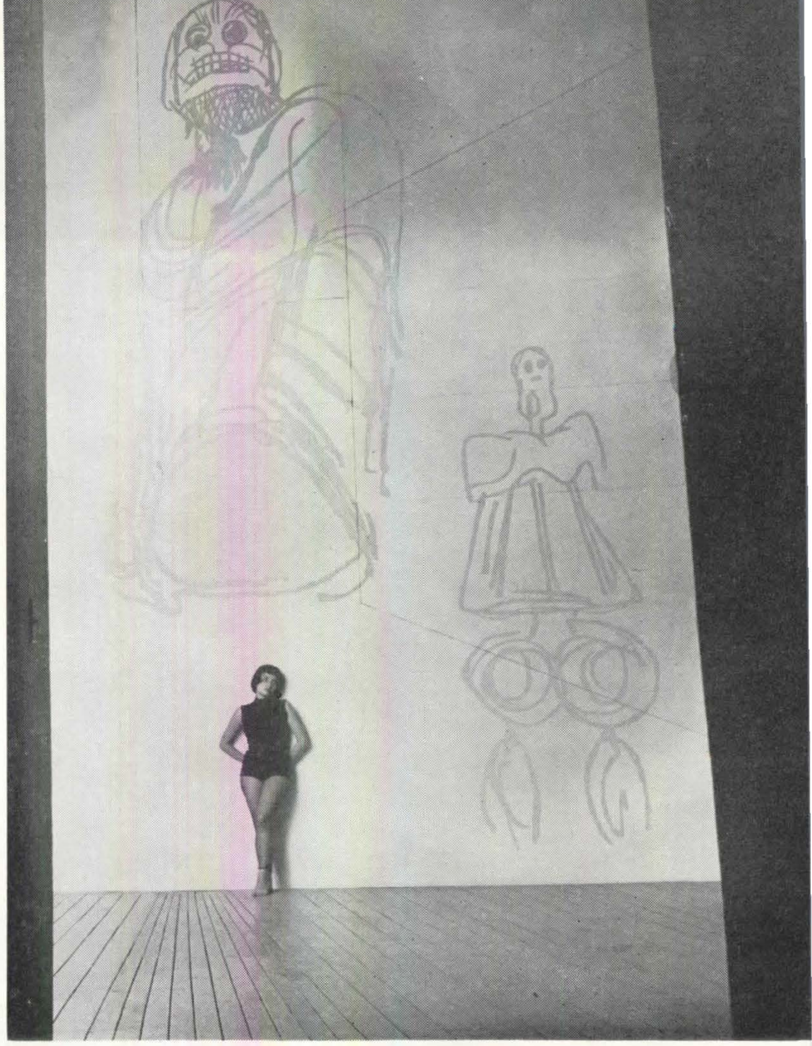


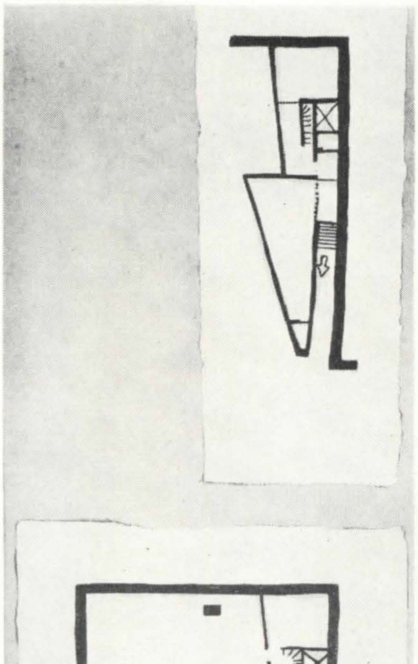
experimental museum

location | Mexico City
designer | Mathias Goeritz

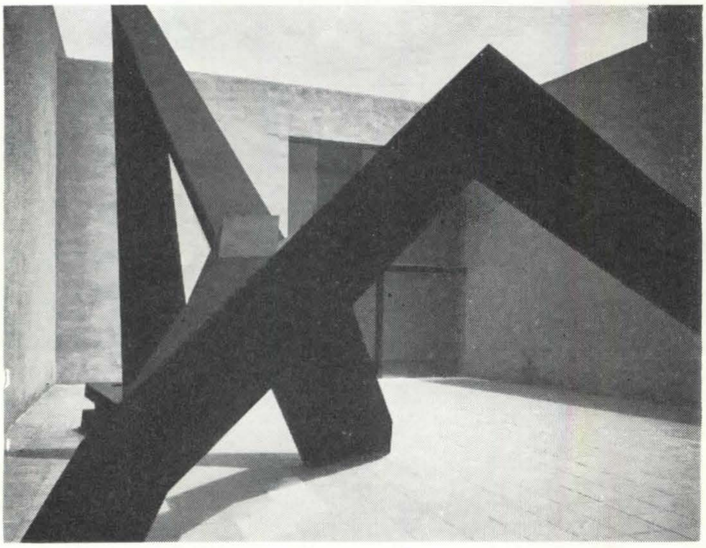


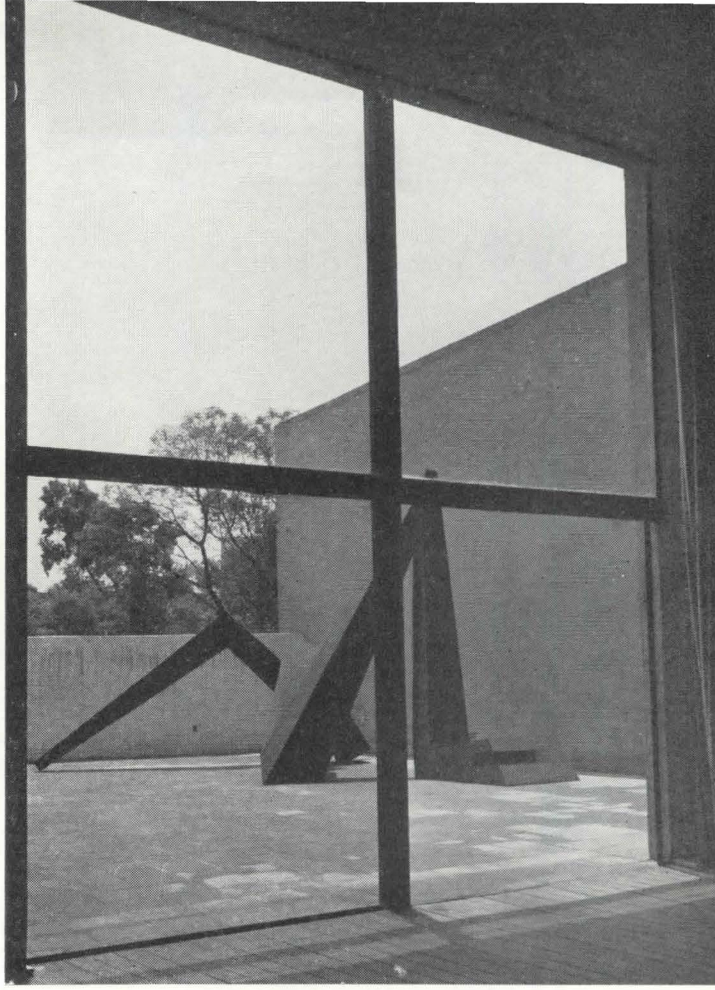
experimental museum

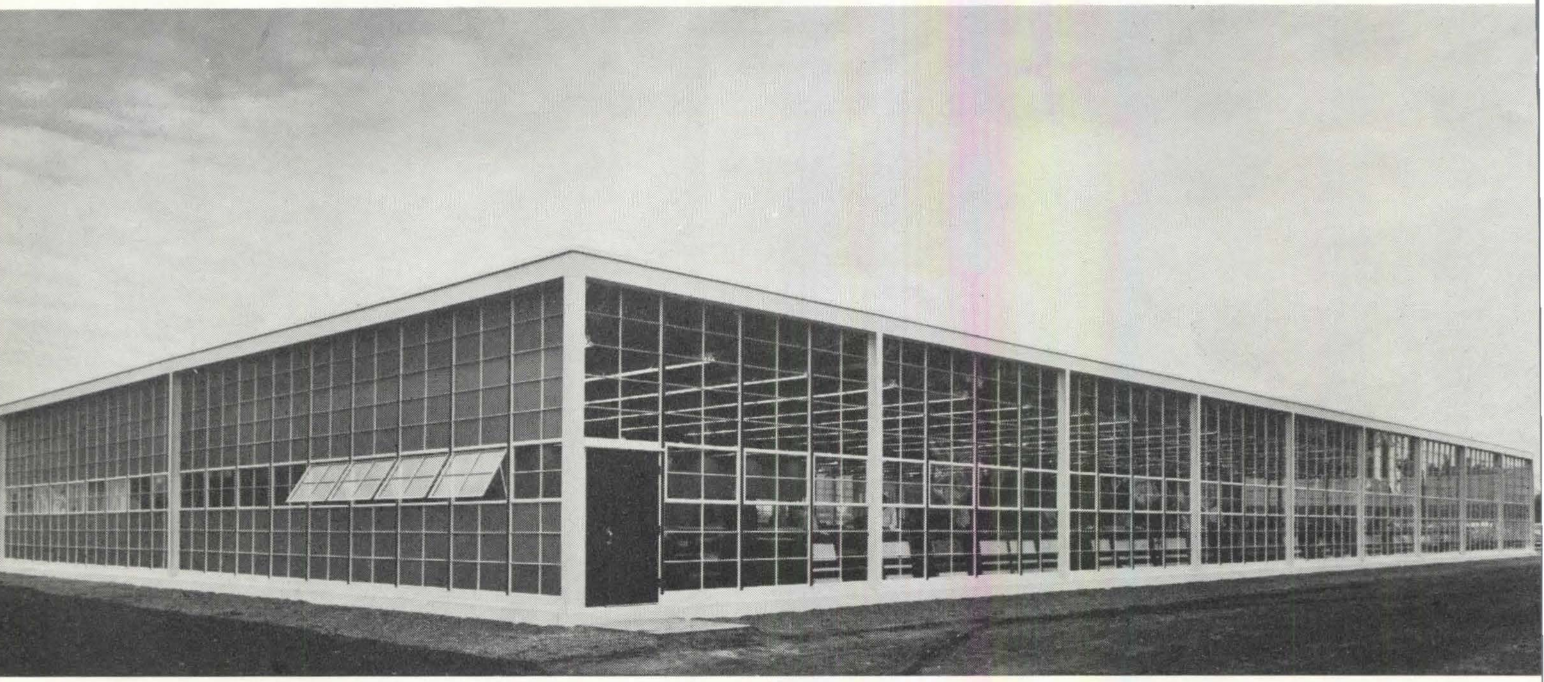




Most buildings are constructed to answer utilitarian needs—only rarely does a client specify that the designer's first objective be the creation of a structure which must evoke emotional responses. Contemporary architecture, with its emphasis on function, has found little time for such *pro arte* examples. However, very recently a new consciousness of emotional values in architecture has been awakened with the completion of Le Corbusier's Ronchamp chapel. This *experimental museum*, an equally plastic building, was completed in 1953 in Mexico by Sculptor Mathias Goeritz as an example of what he called *the new emotional architecture*. "Twentieth Century man," writes Goeritz, "is overwhelmed by the functionalism and logic in modern architecture. But Modern Man asks something more. He wants from architecture a spiritual elevation such as the pyramids, the Greek temples, the Romanesque and Gothic cathedrals, and even the Baroque palaces gave him in their time. Believing that our time is capable of spiritual experience I wanted to express some of it in this building." Erected like a giant piece of sculpture, the design was executed without the use of exact plans and its designer studiously avoided 90-degree angles, symmetry, and any curves. Main access to the building is through a tunnel-like corridor in which floor and ceiling converge to almost a point—its forced perspective further emphasized by tapered floor boards. Two enlarged Henry Moore drawings form the focal point at the end wall of the large salon. A single, glazed opening in this room points to an adjoining patio. The enclosing walls of this court are high and painted gray, black, and white. Color is introduced by a slender yellow pillar; movement, by a large iron sculpture, which, with its restlessness, is in direct contrast to the cloister-like enclosure. This building today houses one of Mexico's most popular and successful night clubs, having been diverted from the original purpose of its entrepreneur, Daniel Mont, to provide a place for the display of all the arts. Others who assisted with this structure were Architects Luis Barragan, Julio de la Peña, and Ruth Rivera; Engineers Victor Guerrero, Rafael Benitez, and Francisco Hernandez Macedo.

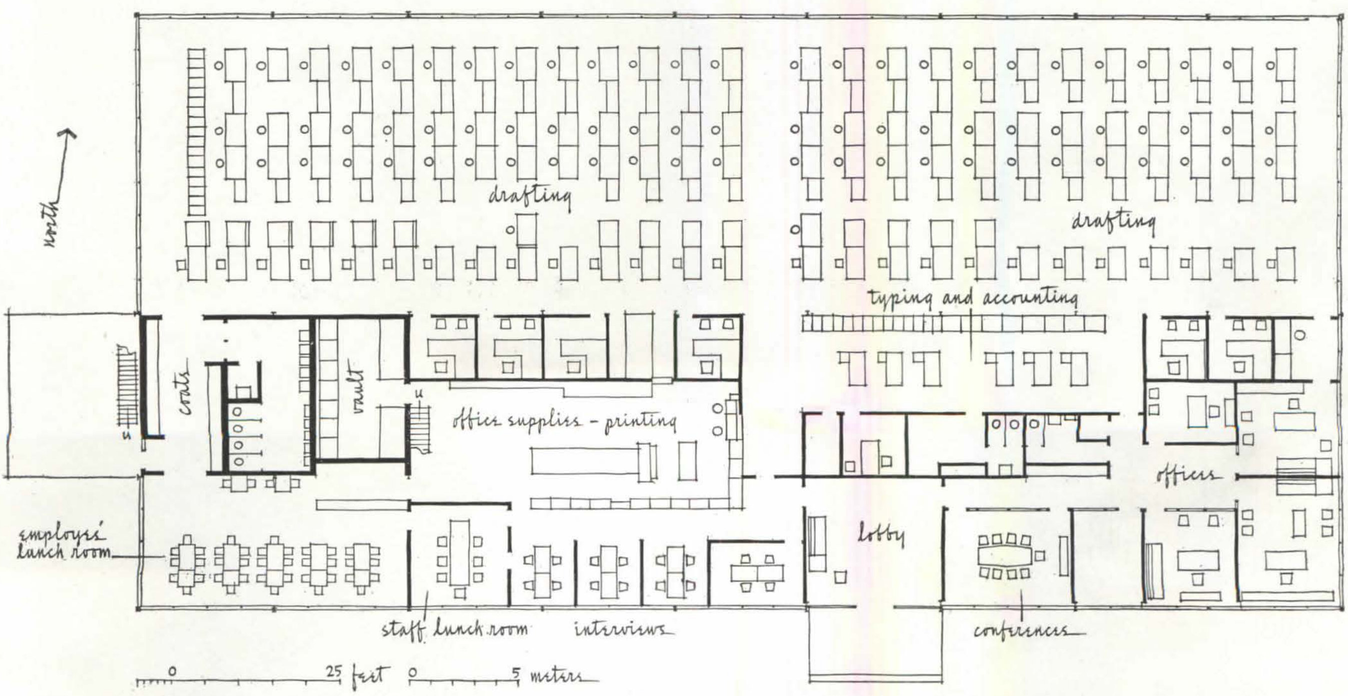






architects' office building

location	Don Mills, Toronto, Ontario
architects-engineers	John B. Parkin Associates
partner-in-charge of design	John C. Parkin



After trying to use downtown offices located in two separate buildings and being unable to find available space where 15,000 sq ft of office space could be organized on a single level—considered a program essential—the firm obtained a four-acre site in the suburban community of Don Mills (*see August, 1956*) and designed its own building to accommodate a staff of about 100 persons. The essentially one-story structure (only the boiler room, file space, and room for a model shop occur on a mezzanine) has a large (45'x180') north-facing drafting room in which architects, engineers, and designers all work. The partners report that in this unpartitioned work area "mechanical engineers understand more clearly problems presented to designers, and designers, in turn, are increasingly aware of the importance of the limiting disciplines imposed by mechanical engineering. . . . Information moves back and forth among the various specialists quickly." No columns interrupt the area, as the steel-framed building has 45-ft clear spans made possible by use of long-span bar joists. Exterior walls consist of exposed steel frame (painted white); black-painted Junior-I stiffeners on 5-ft centers; and blue-tinted, heat-absorbing, glare-reducing glazing (*see* SELECTED DETAIL). The exterior face of the wide-flange columns is on the same plane as the box channel beam that forms the fascia; the steel sash are welded to the inner flange of the columns. "This," the architects point out, "plus the raising of the building one foot above grade on a concrete stylobate, creates an appearance similar to that of the trabeation of Classic Greece and Rome."

The entire design, including office furniture, is based on a 5-ft module, and continuous-fluorescent troffers are spaced $1\frac{1}{2}$ modules apart. Though provision is made for future air conditioning, the 14-ft ceilings (steel roof deck), a flooded roof, wide aisles, and continuous venting sash have produced comfortable work conditions. Heating derives from a double bank of exposed fin convectors. With the exception of the cafeteria, where there has been some fogging on very cold days, no condensation has occurred.

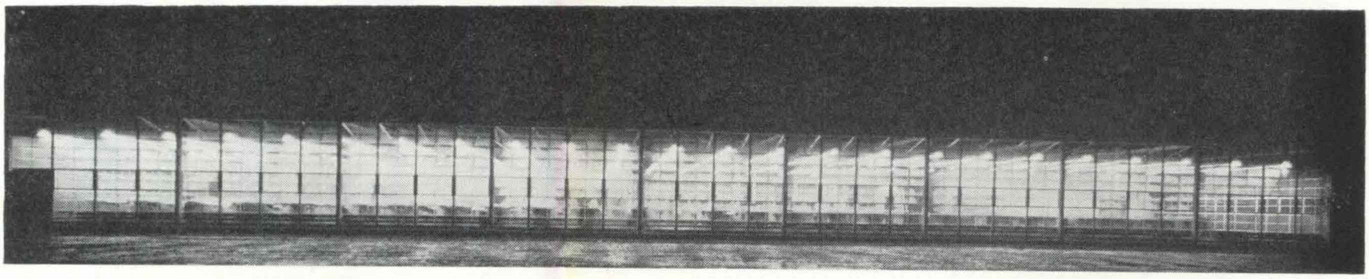
J. E. Mews was Associate in Charge of Mechanical Engineering; General Contractor, Redfern Construction Co., Ltd.

architects' office building

Immediately inside the main entrance (top right) *is a 20-ft-sq lobby-waiting room that is also used for exhibition purposes.*

Partners' offices (top left *and* above) *are at the southeast corner of building. Furnishings are from Knoll International Canada, Ltd. The Partner-in-Charge of Design has an interconnecting door to a private drafting room and thence, to the design area of the main drafting room.*

Photos: Hugh Robertson-Panda



The main conference room (below), *at the front of the building, has a glass wall facing the corridor. A series of four cubicles is provided at the other side of the entrance lobby for meetings with agents, inter-departmental meetings, etc. For maximum flexibility, all glazed offices, partitions, counters, etc., are completely modular and demountable.*

gymnasium

location | St. Louis, Missouri
architects | Bernoudy & Mutrux

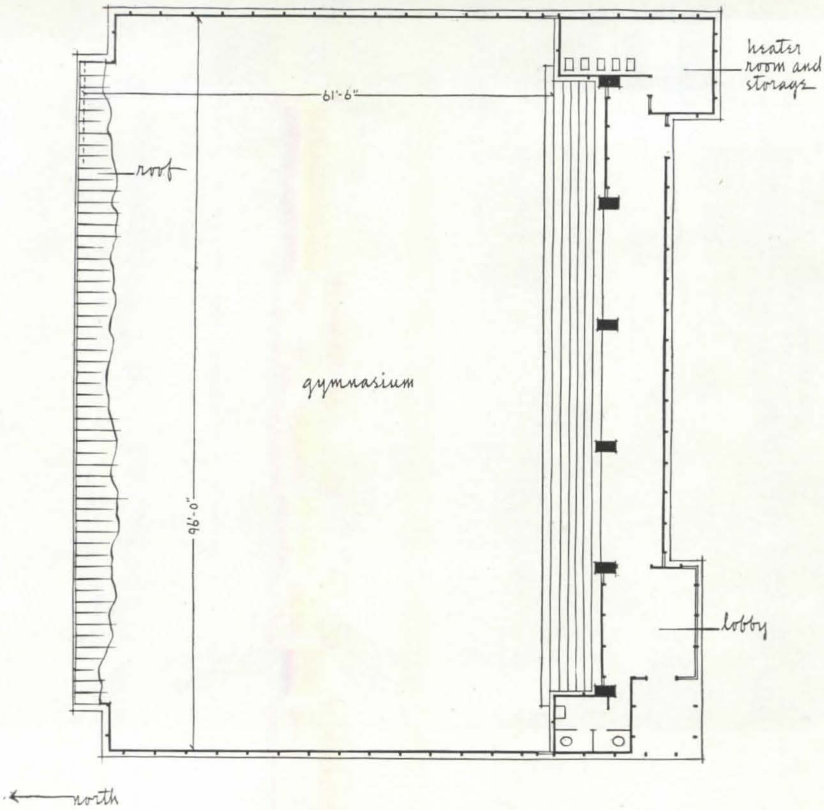
The program for this athletic facility for the Thomas Jefferson School for Boys called for a gymnasium large enough for regulation high-school basketball court and other general gym activities, seating for a maximum of 200 spectators, toilets, etc. Showers and dressing rooms were not required, as these exist in an adjacent dormitory building.

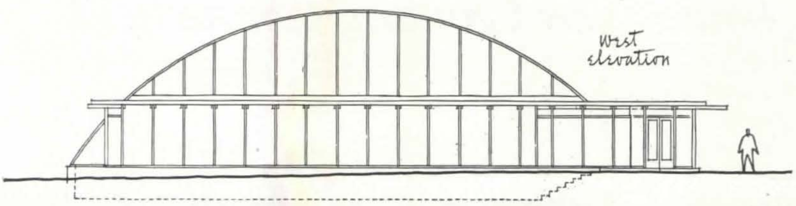
A design wish was to keep the structure low in height and in scale with the domestic character of the other school buildings, at the same time providing a minimum 25-ft height above the center of the court. To accomplish this, a lamella roof structure was selected to span the 70′x86′ area, and the gym floor is sunk 4 ft below entrance level, the excavation slope being utilized to support broad concrete steps that serve as bleachers.

Spaces between the wood framing of side and end walls are filled with cement-asbestos-surfaced, structural, insulating board; the playing-floor surface is asphalt tile.

For skylighting, lozenges are formed within the diamonds of the roof framing, and these are covered with corrugated, glass-fiber panels. A perimeter warm-air heating system, designed by Robert W. Macdonald, Heating Engineer, uses a bank of five, domestic oil-fired furnaces instead of a large custom-made unit, resulting in economy of both installation and servicing. Engineering of the roof, by Lamella Roof Structures, Inc.; Color Consultant: Werner Drewes; General Contractor: Joseph Schiermeier.

Photos: Paul Piaget


heater room and storage
61'-6"
roof
gymnasium
96'-0"
lobby
north


west elevation

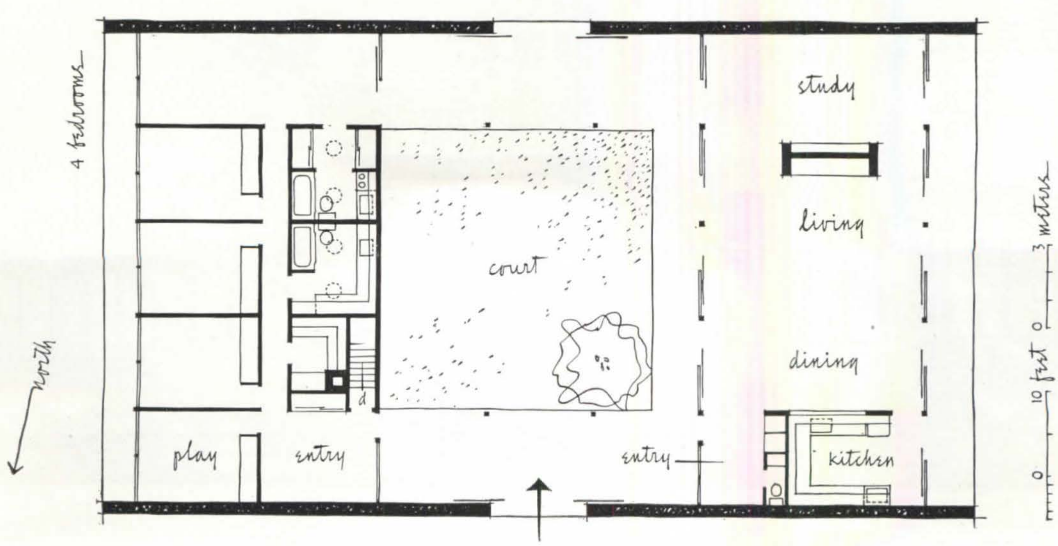
house: New Canaan, Connecticut

Eliot Noyes, Architect

In its design stage, this remarkable house, built by the Architect for his own family, was given an Award in P/A's first Annual Design Awards Program. The Jury* applauded it for "its exceptional simplicity and refinement." The disarming plan consists of two parallel, rectangular elements (one for living, working, and dining; the other, for lazing and sleeping) that are strongly joined by house-height walls of fieldstone. The whole encloses a serene, landscaped courtyard. At the center of both of these massive, masonry walls are sliding doors that open the court to the surrounding woodland site, or enclose the house for complete privacy. East and west exterior walls, as well as the living-wing wall facing the court, are largely of glass. Steel columns and girders, 11 ft o.c., span the enclosures between the stone walls; otherwise, framing is wood.

Floors throughout the house are bluestone on a concrete slab, in which are embedded the steel piping for the radiant-heating system. Boiler and controls are in a basement under the bedroom wing. Ceilings are of rigid building board or acoustical tile, and, for thermal insulation, glass-fiber material is used within the structure. Sash are steel, glazed with ¼-in.-plate glass; plastic skylights light secondary areas in the bedroom wing. Doors are flush birch. The exposed wood is stained cypress. Richard Kelly was Lighting Consultant; Borglum & Meek, Inc., General Contractor.

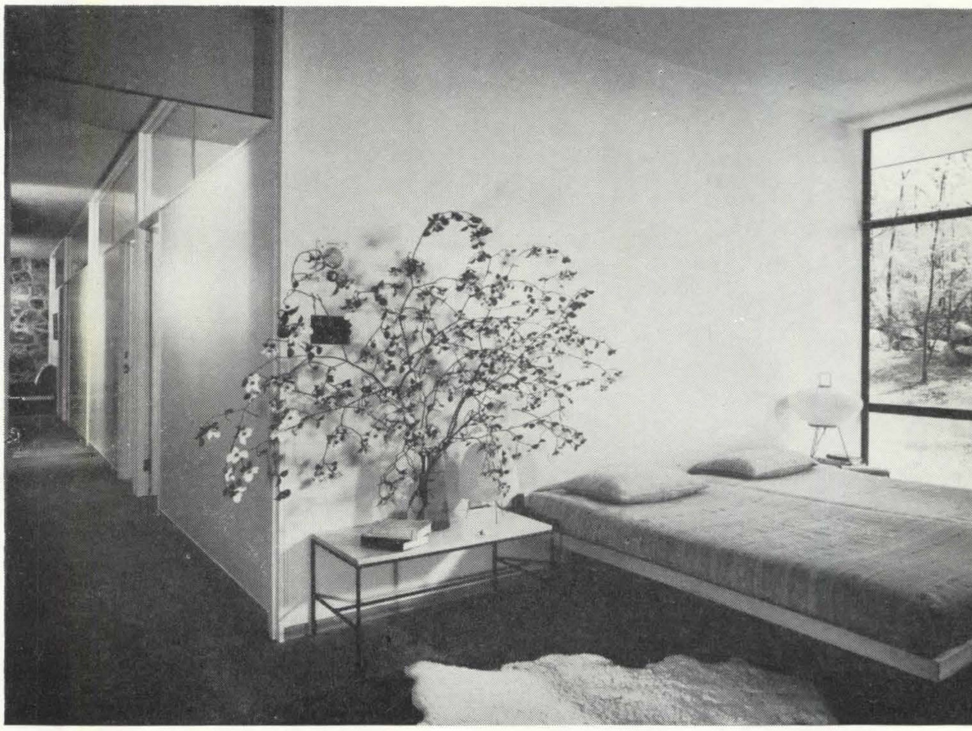
* *Victor Gruen; the late George Howe; Fero Saarinen, and Fred Severud.*



Because of the fieldstone and natural wood used in the construction, the house is almost camouflaged in its woodland setting—as much at home as a bird's nest in a tree. On entering one of the two central doors in the masonry walls, one comes on the well tended garden court, and indoor and outdoor living areas join to create a compelling sense of space and harmony.

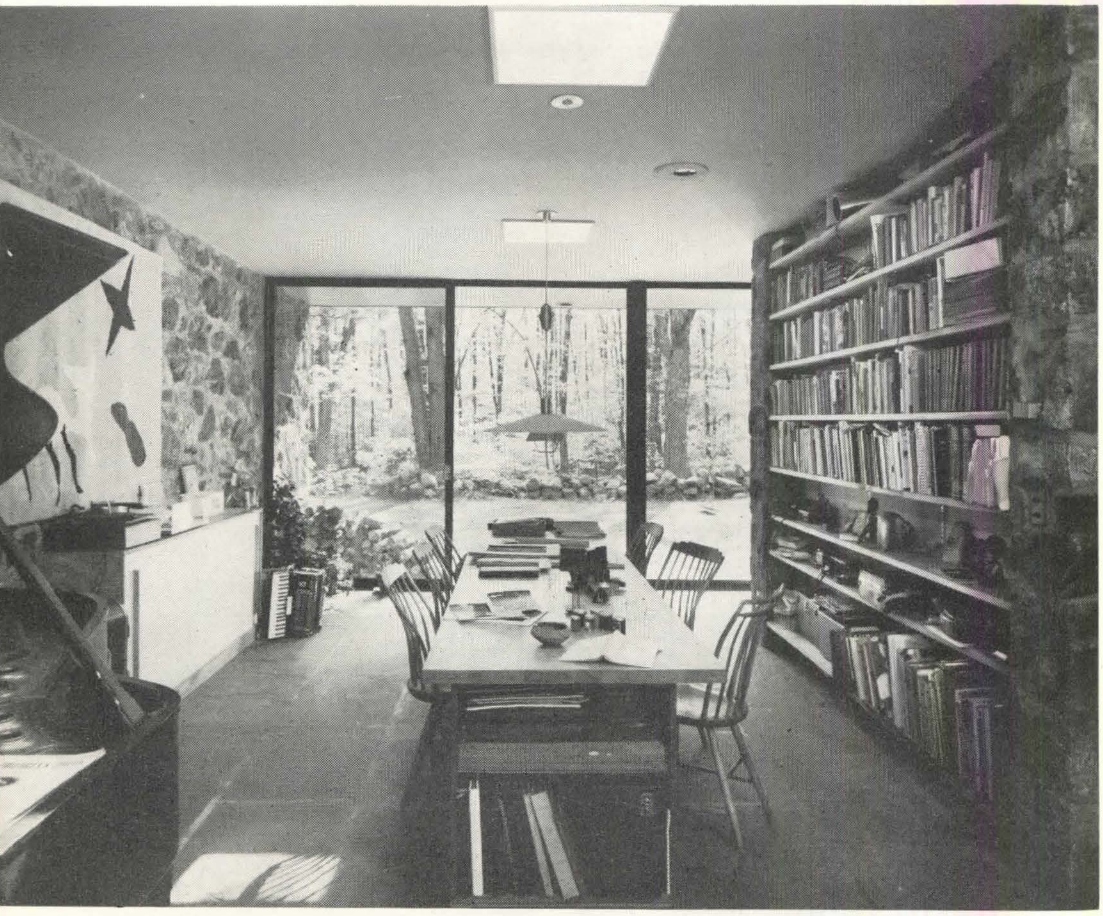
Photos: Ezra Stoller

Much of the life in the house revolves around the handsome interior courtyard, with the two covered walkways joining the paired enclosures. A question that visitors invariably raise about the plan is that one must go outdoors and along a roofed walk to get from one area of the house to the other. And the Architect-owner is happy to answer the question: "The separation of the two houses—after two winters—proves to have no problems due to weather. On the contrary, the crossing of the court in all seasons is a stimulating transition."



The glazed walls of the bedrooms look east over the wooded site. A small living room in this wing (below right) *and a kitchenet in the master-bedroom bath make possible independent activities in the separate parts of the house.*

An intercommunication system, between kitchen and study (in the west wing) and bedrooms (in the east wing) makes immediate contact possible between the different parts of the house.



At the south end of the living wing is the study (top acrosspage), *screened from the polite living space* (above; bottom acrosspage) *by bookshelves recessed into the fireplace masonry. Here all manner of paraphernalia for the interests and hobbies of a family of parents and four children are housed.*

The opposite end of the wing contains the efficiently organized kitchen (right) *with pass-through counter to the dining table.*

house: San Francisco, California

Gordon Drake, Designer

Perched in a confusion of neighboring buildings on one of the precipitous slopes of Telegraph Hill in San Francisco, this little house at the end of an alley was saved from ruin to become the home and office of Landscape Architect Douglas Baylis and his wife. It is, incidentally, the final work of Gordon Drake, the gifted designer who died in 1952, when just 34 years old.

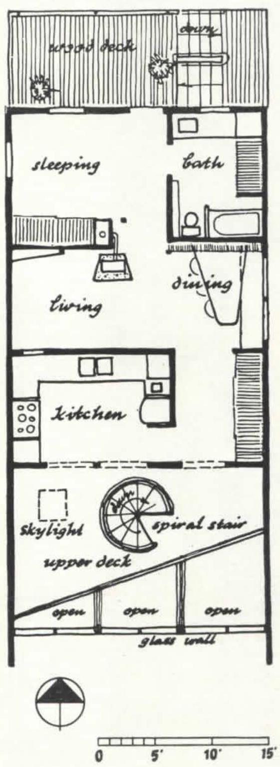
The south wall at the rear, or view side of the house was extended a few feet and redesigned in a modular scheme as a two-story, wood-framed wall of glass; adjoining is a cantilevered living deck that exploits the drama of the site. The exposed structure, both indoors and out, is typical of Drake's design approach, as is the simple detailing—in this case so basic that the work was carried through by the owners and Fred Hilbiber, Mrs. Baylis's father. Most materials were specified with an eye to purchase from local lumber or wrecking yards. Even the original floor furnace was left in place, and a simple space heater was added for the office-studio area.

An important aspect of the design is use of color, especially on the interior. Exposed structural elements are painted dark blue; walls are off-white with occasional "shock treatments" of yellow and red; the spiral stair joining office-studio and living-dining deck above is orange-red with black treads. Wood-block flooring at the ground level is dark gray.

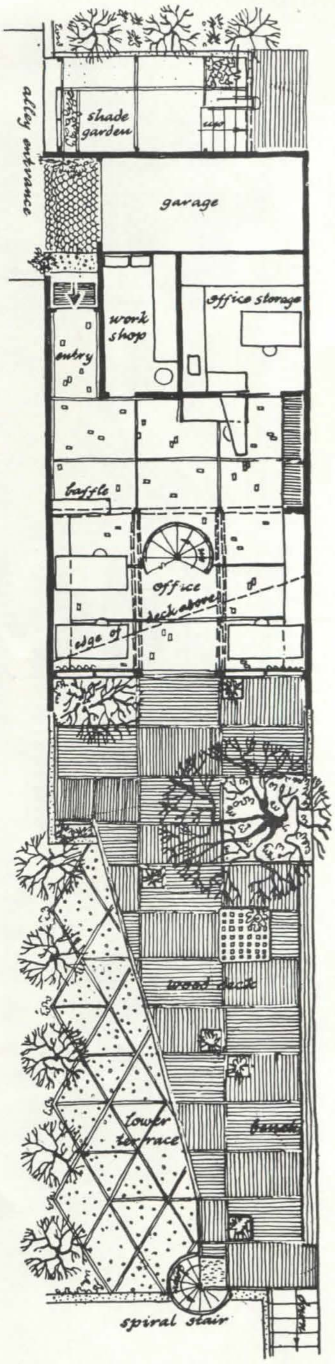
"We achieved the house by endless hours of our own work," Baylis writes, "and by scavenging for what we could find in the local wrecking yards. . . . Living and working in an unique building is very rewarding, since we have the daily pleasure of the sun; the view to the garden; and the excitement of color. The surfaces are easy to keep clean. Maintenance of something beautiful is a joy rather than a job."

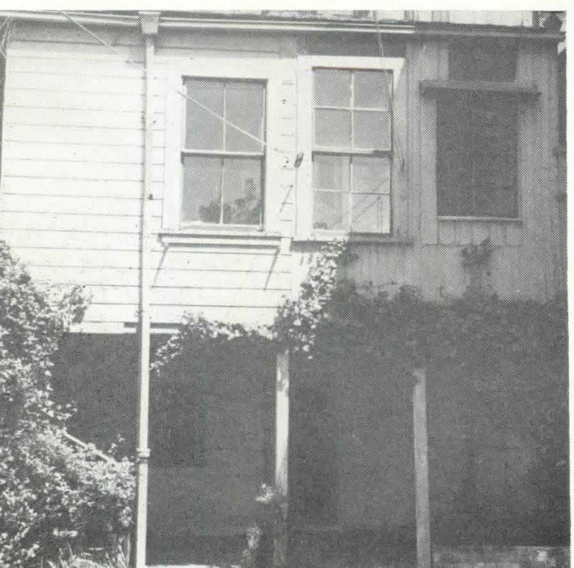
Photos (except as noted): Morley Baer

Upper floor



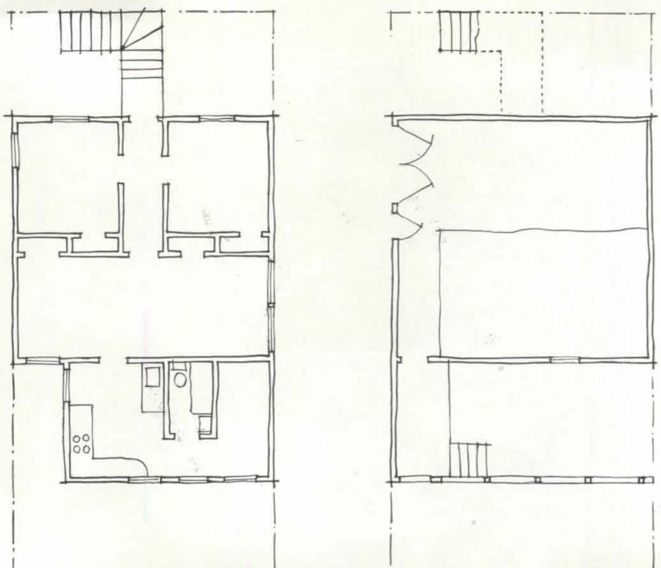
Lower floor





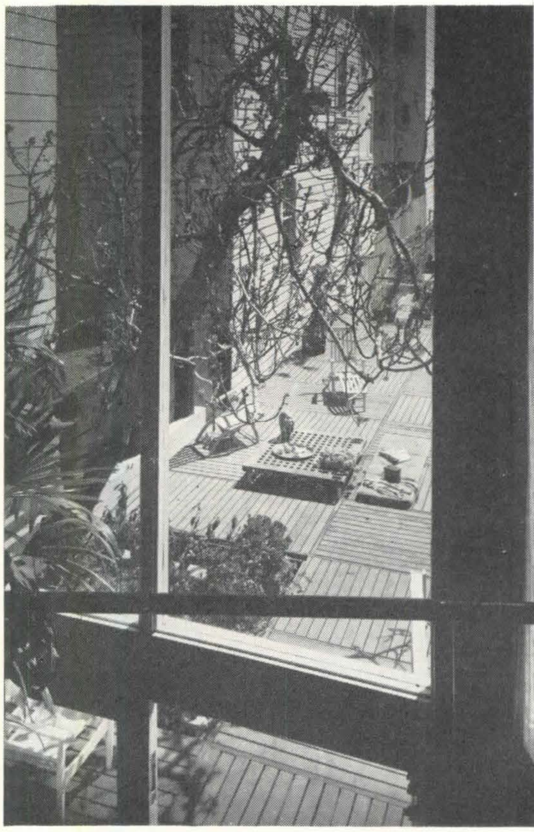
Douglas Baylis

The house that Douglas Baylis bought (left) was wholly unprepossessing, and its plans (right) were cramped, with few, if any amenities.

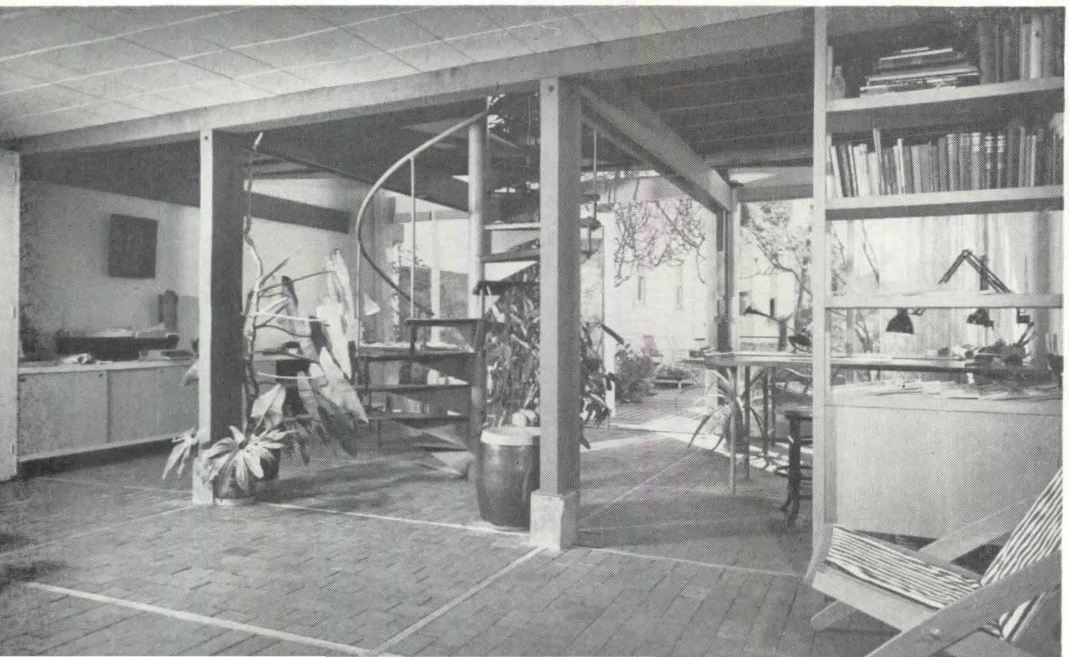


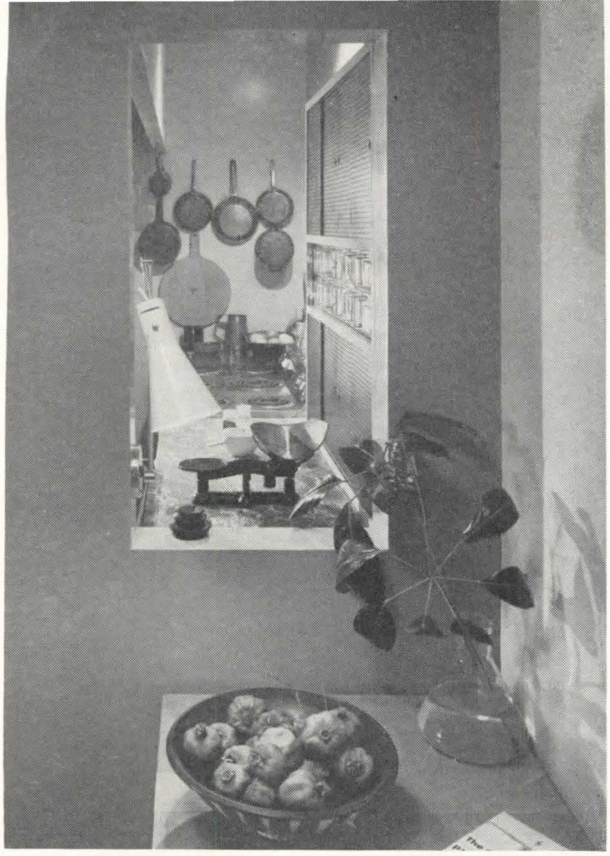
Throughout, vertical elements and lines echo the extreme verticality of the site (left).

From the upper level (below), *one looks down through the tall windows of the south wall to the cantilevered living deck.*



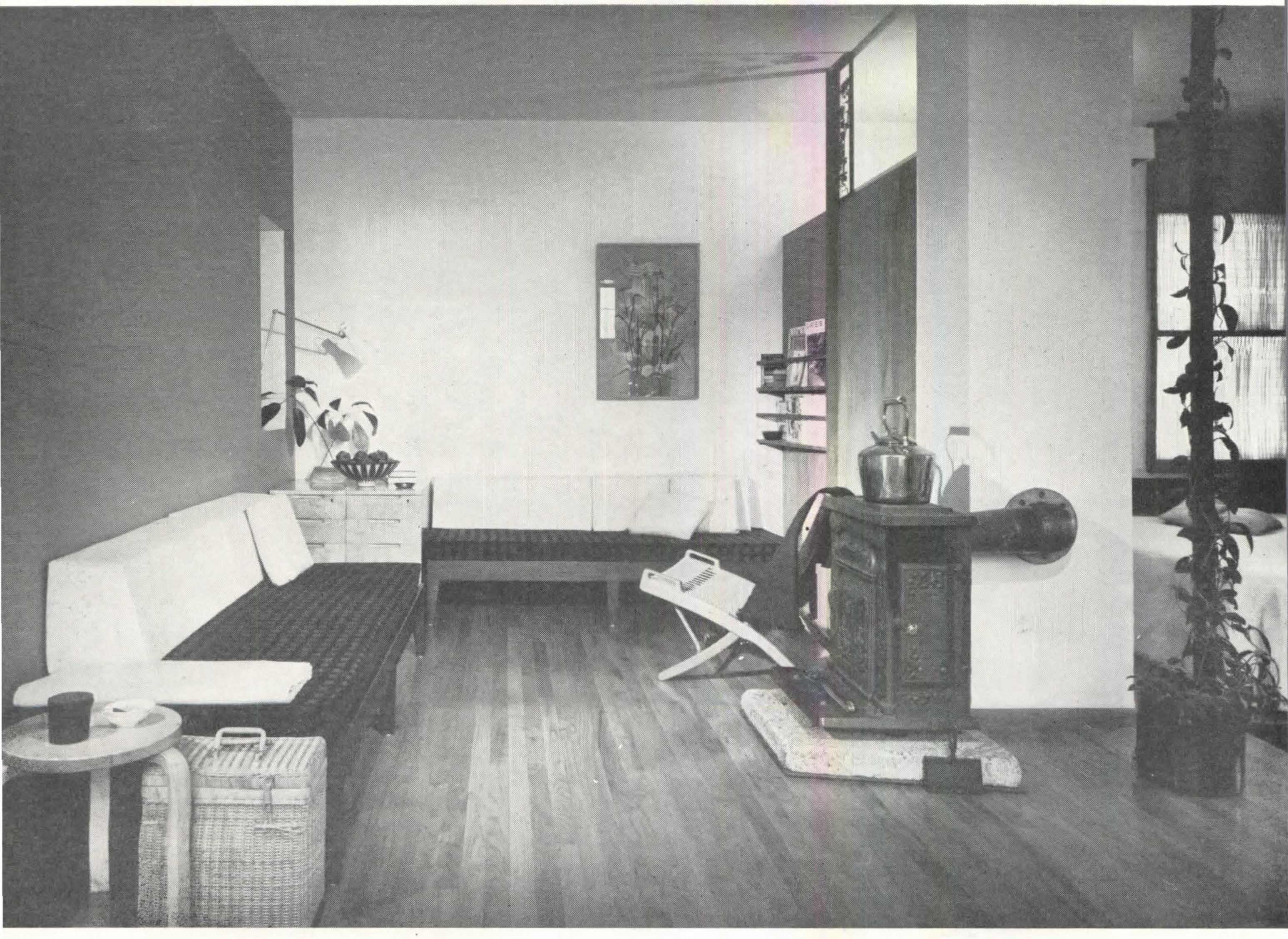
From the ground-floor office/studio space (below), *a colorful spiral stair leads to the upper-level living deck* (above). *From this level, a striking view of the drafting corner* (right) *is gained.*

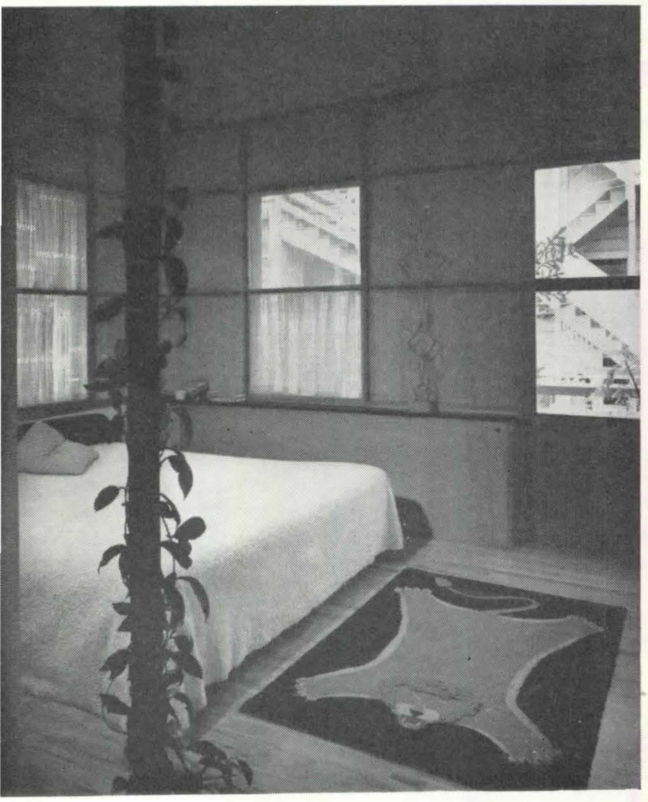


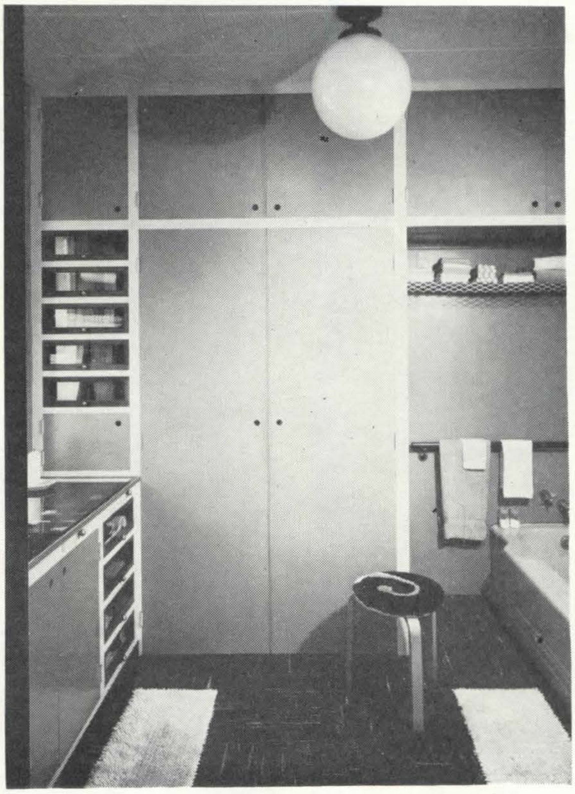


house: San Francisco, California

A rectangular aperture (left) *allows direct service from kitchen to living/dining room* (below).







The sleeping room and bathroom (above) are off the main living/dining room.

A splayed shape for the dining table (right) makes maximum use of limited space. Note bookshelves and storage space overhead.

For a picture review of a new book about Drake and his few, but brilliant, architectural accomplishments, see following page.

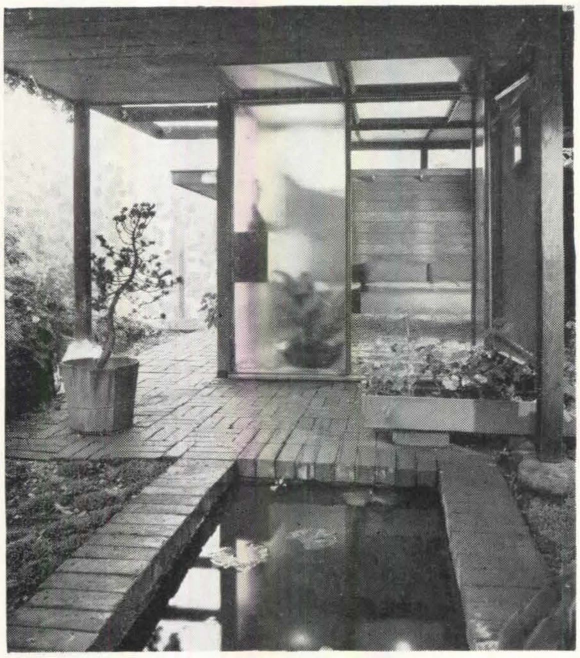
California Houses of Gordon Drake *by Douglas Baylis and Joan Parry*

Campbell-Ricco

GORDON DRAKE: 1917-1952

Among the houses detailed in the book are: (left column) *The Unit House, an expandable scheme, and the Presley House, an experiment in panel construction; and* (right column) *Drake's own house, Los Angeles, and the studio he built in Carmel* (bottom).

Photos (except as noted): Julius Shulman



Morley Baer

In 1946, when P/A was conducting its Awards Program for completed buildings, an all but unknown designer, Gordon Drake of Los Angeles, arose to win a First Prize, accorded by an outstanding professional Jury.* Six years later, Drake died at the age of 34. The recent book, *California Houses of Gordon Drake (Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y., 1956. 92 pp., illus., $6.50)*, makes a permanent record of design excellence as exemplified by his work; tells a remarkable story of his brief but devoted adherence to the cause of architectural progress; and salutes one who, gifted beyond his years, managed to produce bright beauty in a moment of world confusion.

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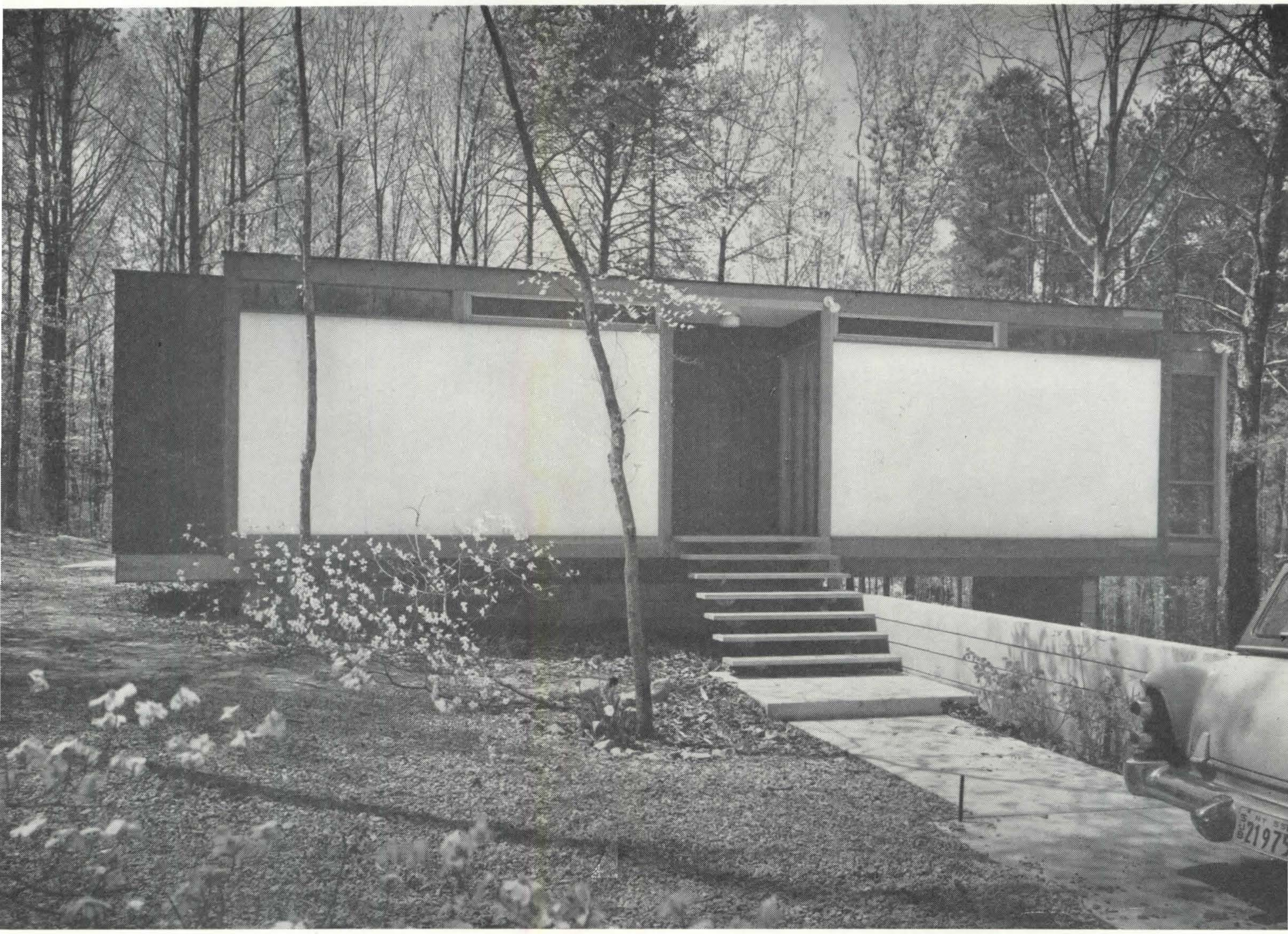
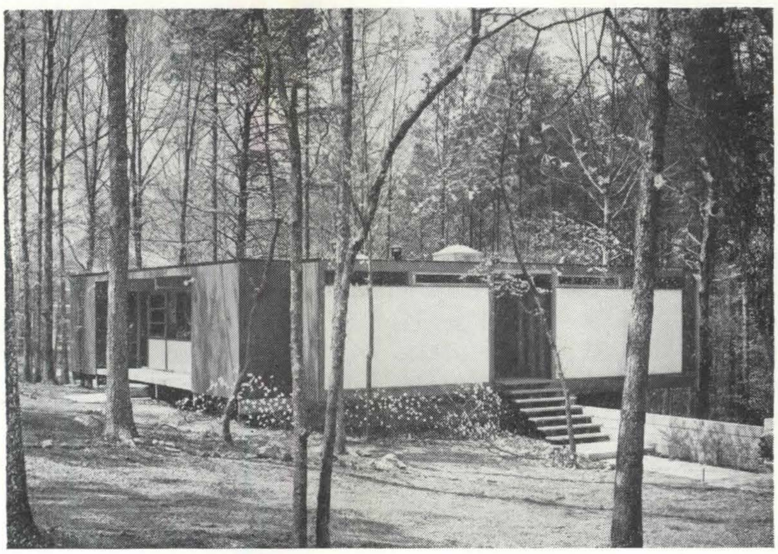
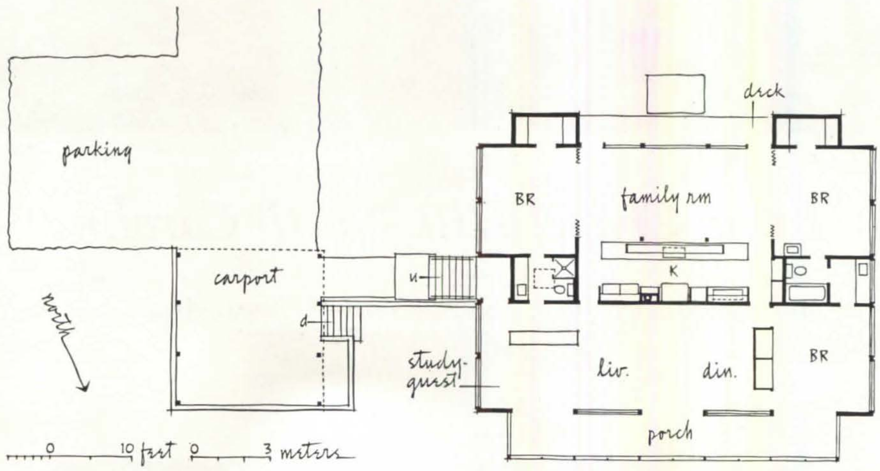
* *William Wilson Wurster; Morris Ketchum; the late Eliel Saarinen; Fred Severud; and Dr. C-E. A. Winslow*



house: Chapel Hill, North Carolina

George Matsumoto, Architect, and Kenneth M. Scott, Associated Architect



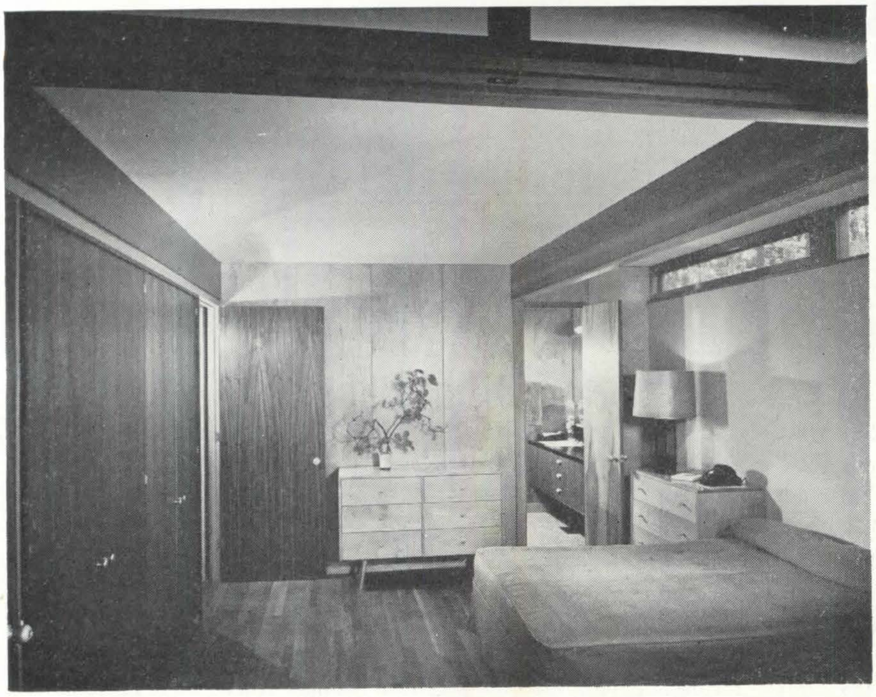


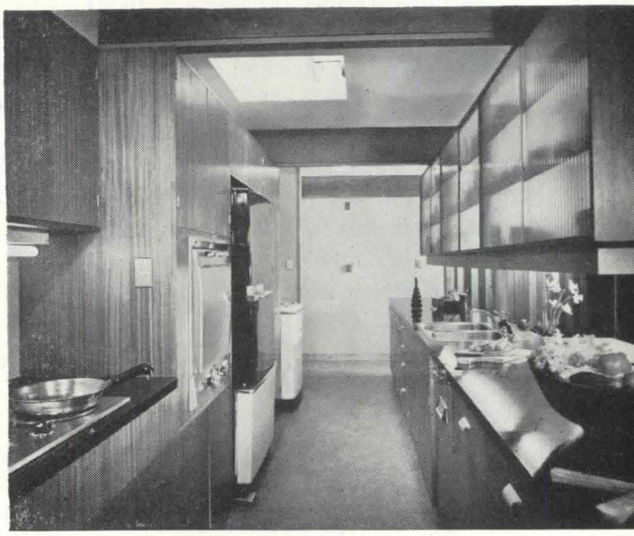
This plan has undergone few changes since its first publication in project form, in P/A's 1953 Awards Program. Prime consideration in the design of this house for parents and four young sons was the economical separation of adult and children's activities, with adequate provision, however, for close supervision of the small children. This separation has been successfully achieved by the device of a skylighted buffer-zone—formed by bathrooms, kitchen, laundry—which divides the house into two almost equal parts. Living/dining/study area and master bedroom are oriented toward the north and the major view; children's rooms face south and are in direct contact with the ground at the high portion of the sloping site. Shop, heater, and storage space are located under the utility core, and the area north of it is slated for future expansion. The house is completely air conditioned—another reason for its tightly knit plan—and heated by forced warm air. Construction is regular post and beam, 8'-0" on centers, with cantilevers on all sides of the house. Foundation and basement walls of concrete block follow the structural column lines. Upper walls are of wood frame sheathed with cement asbestos panels or T&G vertical wood siding. Frank Walser was General Contractor.

The adult living area (right) *with its own screened porch* (below) *is approximately nine feet above ground level. Space underneath* (acrosspage) *will eventually be enclosed to provide room for expansion.*

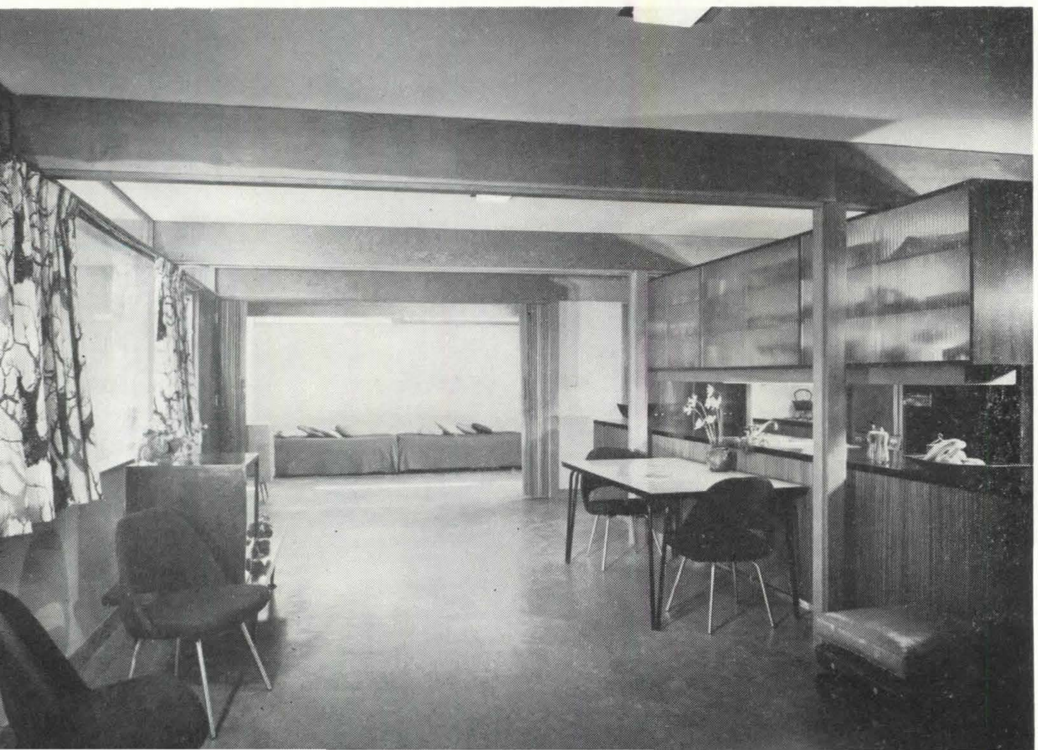
Photos: Joseph W. Molitor

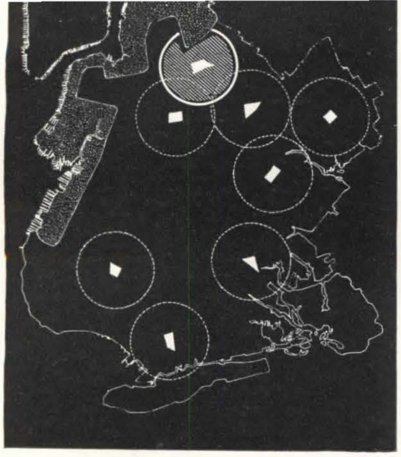
Children have their own covered terrace (above) which links family room with the grounds. Study (left) is part of the living/dining area set aside for the adults at the north of the house. Storage wall forms barrier between study and main entry.





North side of master bedroom opens onto screened porch; the opposite side is insulated from children's quarters by the utility core. Center link of the sky-lighted utility core are kitchen and laundry (right) *from which family room* (below) *is easily supervised. Family space may be enlarged to incorporate the two children's rooms, making a total length of 48 ft for indoor play.*





Brooklyn Industrial Development*

So integrated is Brooklyn within the metropolis of New York, it is startling to realize that the city is comparable to Chicago in size. Its population of 2,738,000 occupies some 80 square miles. Brooklyn is one of the great maritime and industrial centers of the world, and as a manufacturing center ranks fifth in the country.

For most cities, industry provides the economic underpinning. The traditional economic factors that business considers in choosing plant sites are: proximity to markets, availability of raw materials, labor supply, transportation facilities, and sources of water, fuel, and power. Brooklyn provides these adequately.

Our proposal calls for dealing with light and heavy industry separately, and zoning Brooklyn accordingly.

LIGHT INDUSTRY would include manufacturing for which the floor area per individual is relatively low — approximately 200 sq ft per person. A large labor force would be required to turn out the high-bulk material this area would produce. The garment industry would be the principal occupant of this area. In addition, other "non-nuisance" manufacturing processes such as novelties, printing, textiles, small metal products, leather, paper, plastic products, and electrical appliances would be permitted.

We propose to locate eight Light Industrial areas in Brooklyn. These sites have been chosen after taking into consideration the following factors:

1. Present condition of area—the types and ages of the dwellings, the availability of land.

2. Cost of land—a detailed analysis was conducted, and only sites where the cost per sq ft of land was relatively low were considered.

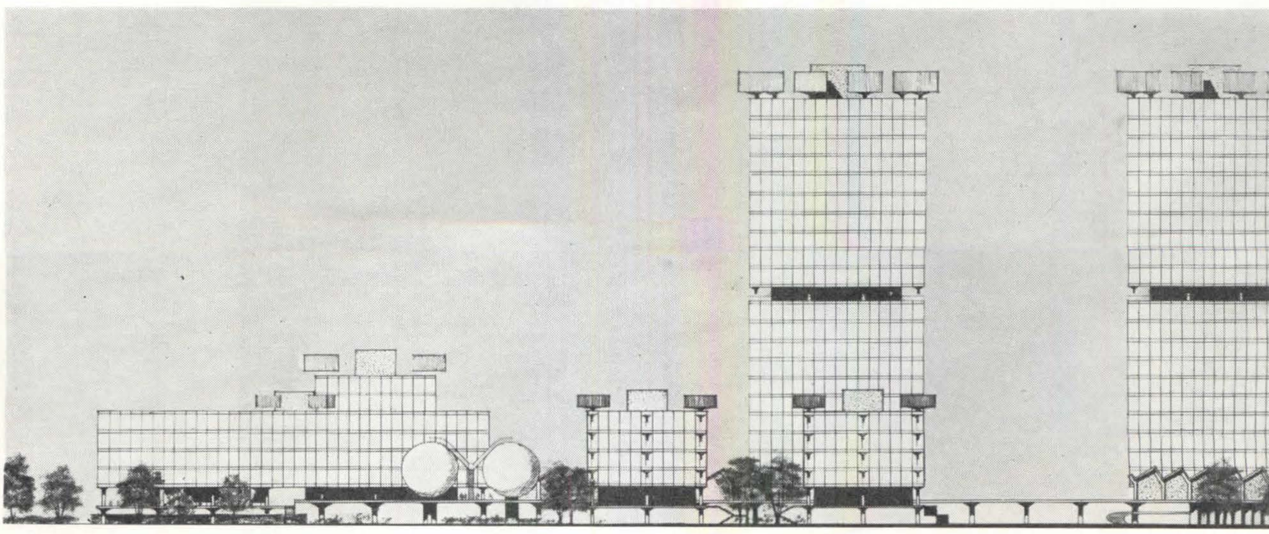
3. Labor force—considering the type of industry to locate in these areas, sites were favored where large concentrations of unskilled labor were available. We went under the assumption that by locating these sites near the lower income families, we would be able to allow a second household member to do full or part-time work, and therefore raise the standard of living in the area.

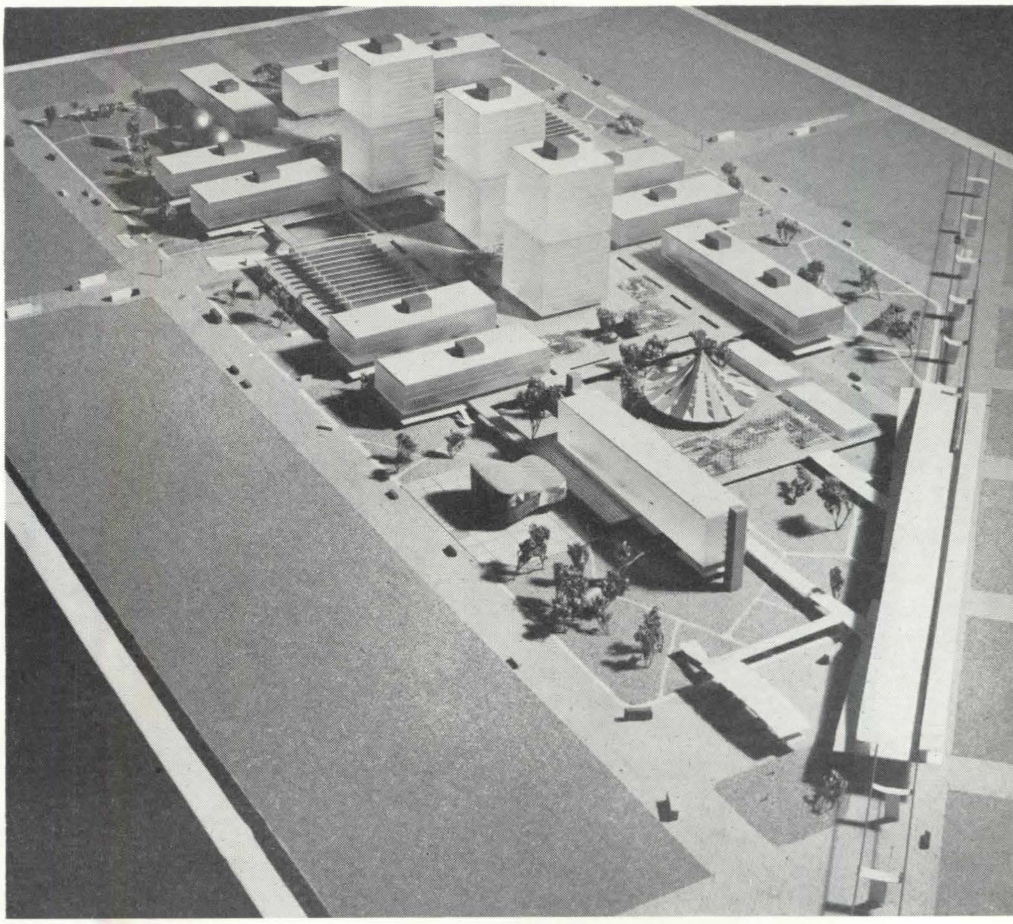
4. Walk to work—by taking a mile radius around our chosen sites we show the affected area. We feel that within this area people would walk to work, or be provided with adequate surface lines as to facilitate easy access to and from work. This would prevent congestion of transportation facilities, ease rush-hour traffic and provide for maximum labor force.

5. Truck movement—taking into account the heavy movement of supplies and finished goods that would move in by truck, sites were chosen which were on main truck routes, or easily accessible to such routes. The nature of this industry would necessitate truck movement, and therefore rail movement was not a prime factor. Only two of our areas provide present rail movement and these would handle the industries which would require this type of transportation.

We therefore based our selection of sites according to the above conditions and arrived at sites as shown on diagram above. Our main purpose was to consolidate Light Industry throughout Brook-

* *Thesis by Stuart Cohen, Stanley Kogan, and Frank Marcellino. This report by three Pratt Institute students acquainted with conditions in Brooklyn may well offer a key to logical redevelopment of that city. To these young planners, the heart of the problem is the widespread industrial slum. Their an wer is the planned industrial center, as the future nucleus of the neighborhood unit. Critics: Dean Olindo L. Grossi and Prof. William N. Breger, School of Architecture, Pratt Institute, Brooklyn, N. Y.*

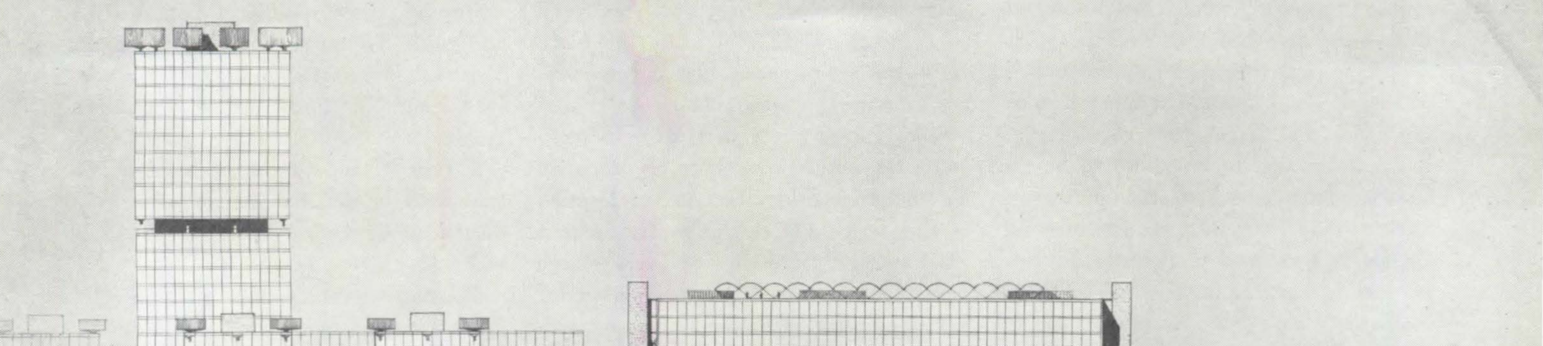


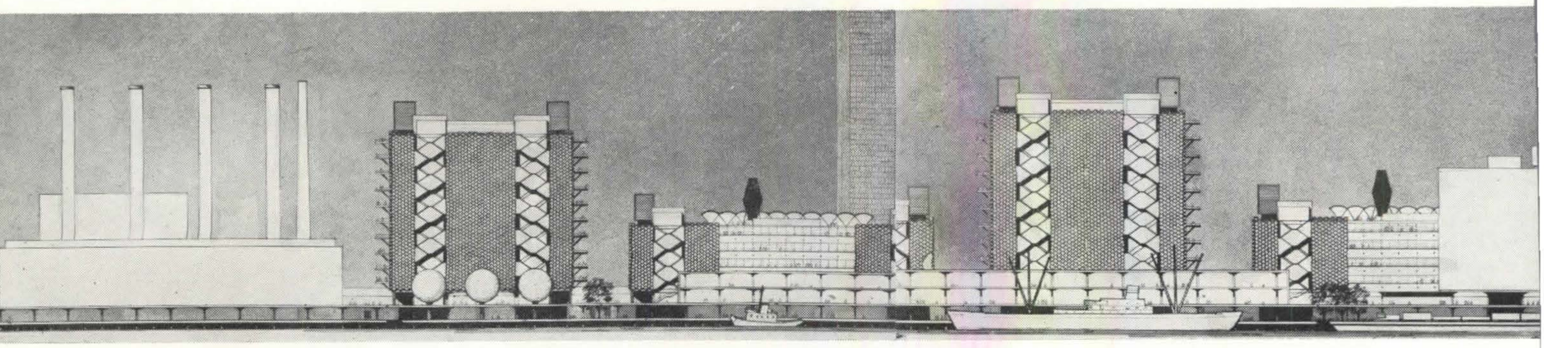


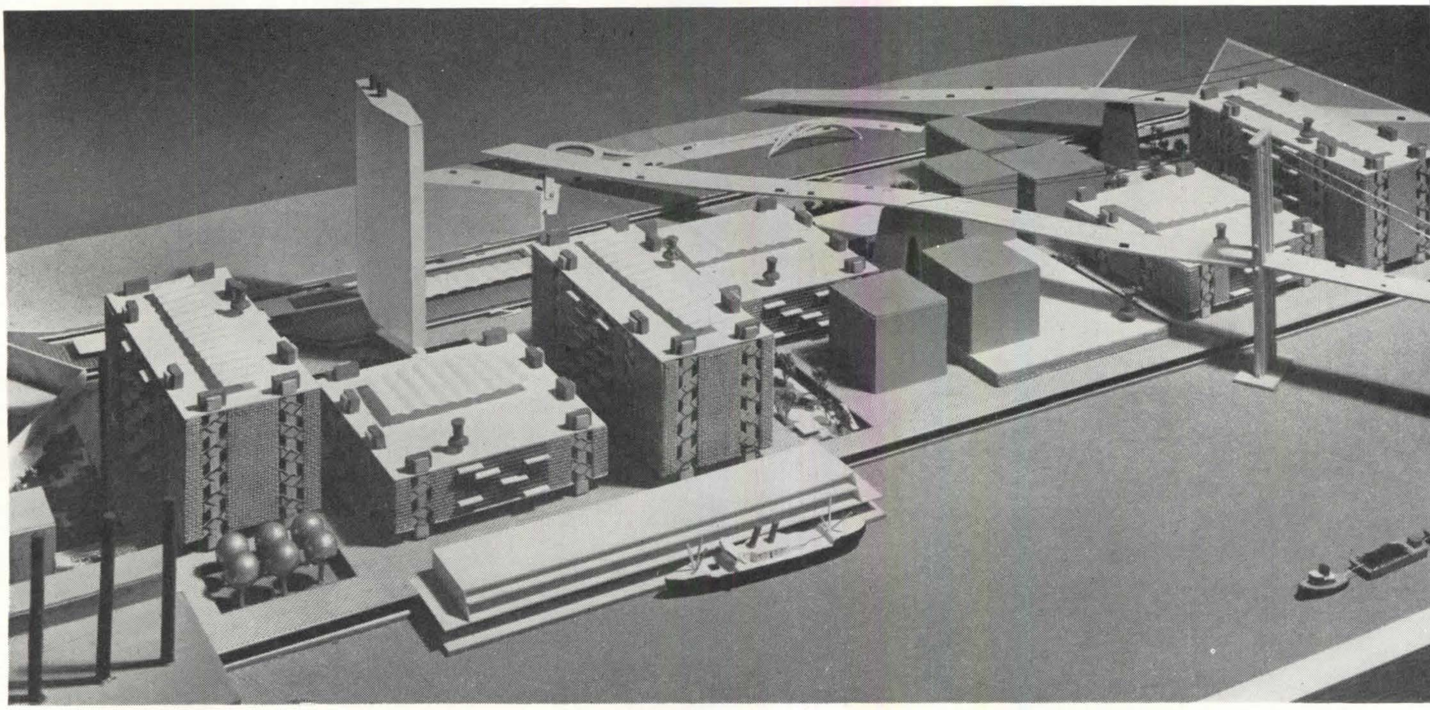
lyn, and place it at locations such as would benefit both employer and employe. We want to do away with the corner store used as a place to manufacture dresses, and the encroachment of other manufacturing into residential areas.

Our sites for Light Industrial manufacturing comprise eight to ten square blocks. The buildings are constructed in such a manner as to enhance the neighborhood where they are situated. Large green areas are left open, and a feeling of airiness is obtained. Parking facilities are situated on the fringe areas and, because of the walk-to-work principle, only a 1/12 parking ratio is provided. The trucks move into the area without interfering with cars or people, and adequate facilities for loading, unloading, and storage are provided. People move on a different level and do not come into contact with the internal-supply movement. The worker is provided with a pleasant working atmosphere. He has subway and surface lines usually within the site or immediately adjacent. He is provided with eating facilities, recreational facilities, shopping facilities, and health facilities—within the site.

To illustrate the development of a typical center for Light Industry, students selected one of eight actual sites (diagram acrosspage) *for detailed study. Shops, supermarket, administration building, lecture and meeting hall, as well as a bus terminal have been grouped near the subway station* (right of photo above). *Tower buildings and adjoining horizontal structures are factories for light, non-nuisance manufacturing. These are steel-frame structures with elevator and mechanical cores at the center, glass at the perimeter.*







All heavy industry will stretch along Brooklyn's west shore, generally in present location. The site selected for detailed study is in vicinity of Brooklyn and Manhattan Bridges. At the edge of the site is the commercial and administrative center with shops, a restaurant, and administration building. Several large existing buildings have been left and new factories added. Heavy Industry factories, in contrast to Light Industry, are reinforced-concrete structures which have elevators and utilities at the perimeters, leaving unbroken central expanses of factory floor.

Brooklyn Industrial Development

HEAVY INDUSTRY would include manufacturing where the floor area per individual is relatively high—approximately 500 sq ft per person. Therefore it takes less labor, but large space requirements to fill its needs. Included would be the most obnoxious and dangerous industries. Such would be the manufacture of chemicals, petroleum products, paint, rubber, glue, soap, and fertilizers. Other industries, not quite as obnoxious or dangerous also would be included in this area. These would include machinery, building materials, leather tanning, glass manufacture, structural steel, and stone products. In contrast to the Light Industrial areas, access to water and rail transportation is desirable.

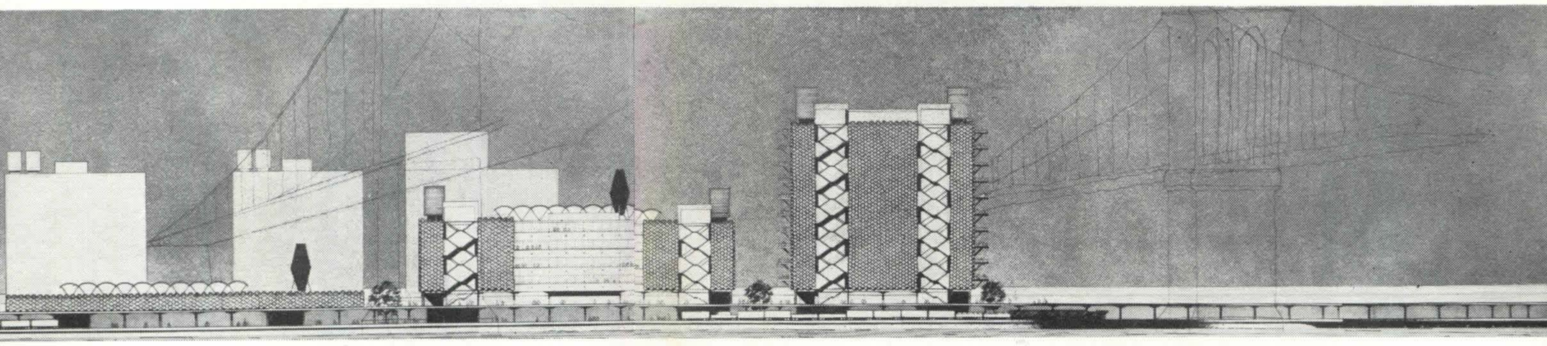
We propose to run Heavy Industry along the entire west shore of Brooklyn. Taken into consideration in the location of this area were the following factors:

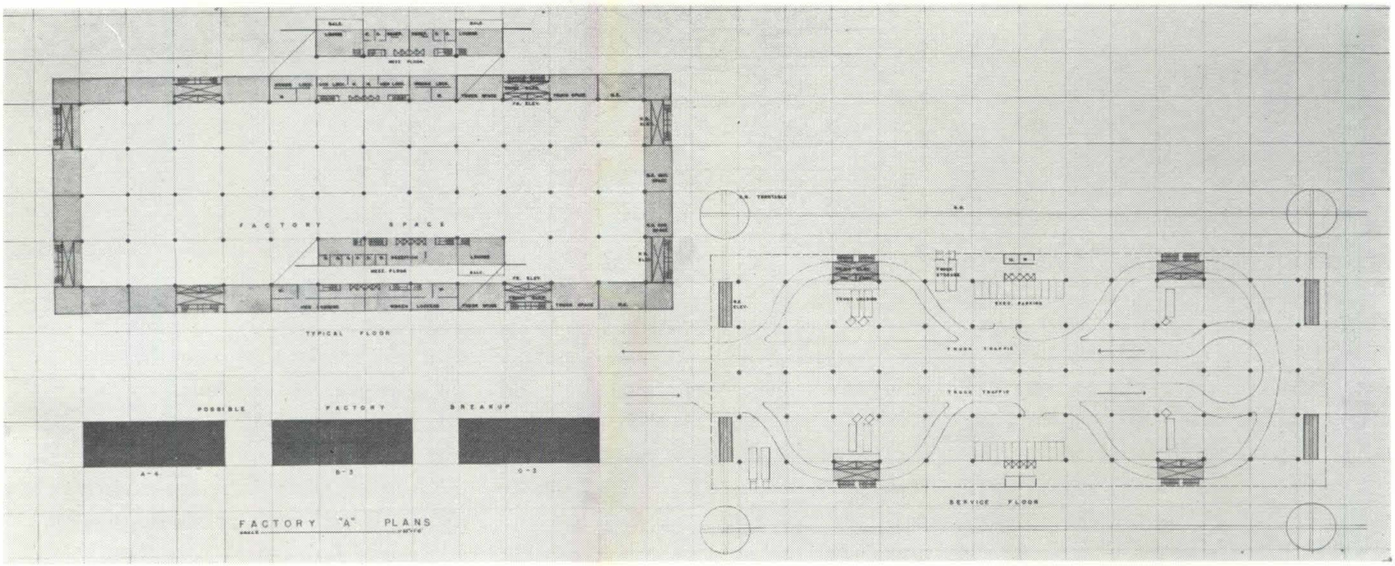
1. Present condition of area—large percentage of area is presently used for heavy industry, with the remaining area either slums or badly misplaced housing.

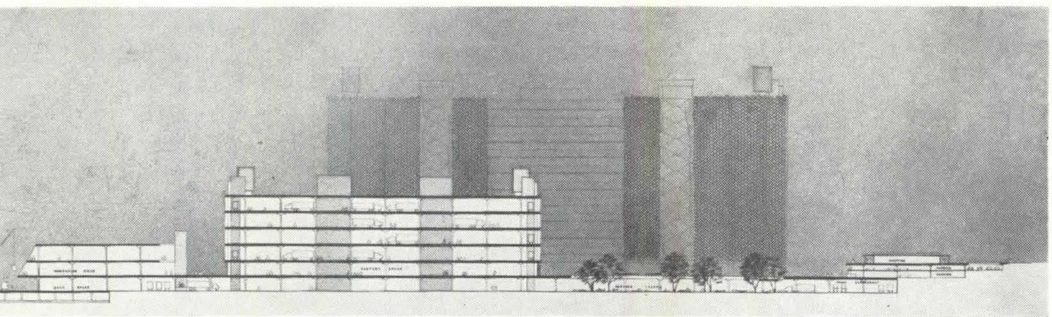
2. Labor force—Brooklyn would provide the labor force, and because of the nature of heavy industry, both skilled and unskilled labor would be required. This will offer vast opportunity for Brooklyn labor to find outlets for their employment.

3. Cost of land—as in the Light Industrial area, a detailed analysis was conducted to determine the cost per sq ft of land.

4. Transportation — this site provides ideal transportation for Heavy Industry. It has one of the largest ports in the world included in the area, main trucking routes, rail lines extending through the





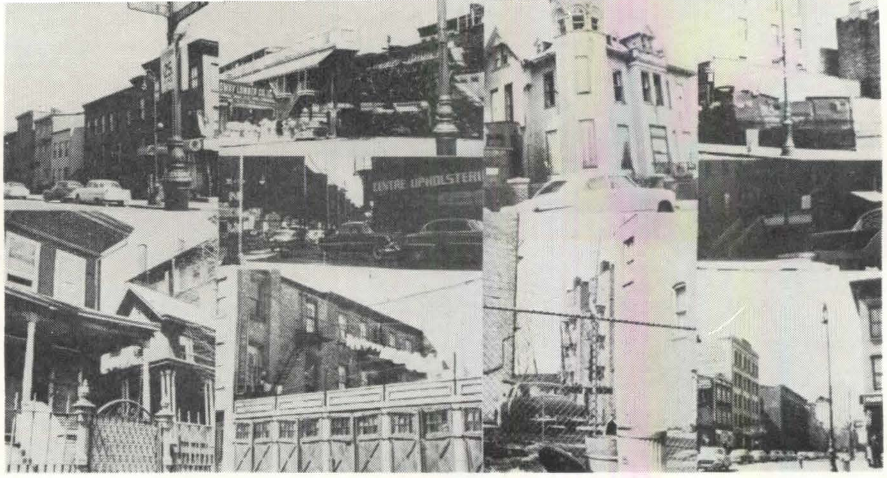


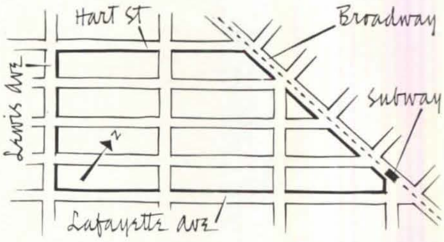
area to points in Long Island, Queens, and throughout Brooklyn. Because of the lighter conveying system, it is available to all main rail lines in the entire Port of New York. It is skirted by main vehicular routes, such as the Belt Parkway and the Brooklyn-Queens Expressway.

The site is one ideal for Heavy Industry. With the natural barrier of the water on the west and for the most part being on a decline from the east, it has the isolation required for this type of industry, and yet the accessibility from exterior sources of supply and labor. All train lines pass through this site on their way to and from Manhattan, and various surface lines dot the perimeter. All Heavy Industry would be located in this area, and the present facilities would be enlarged to provide through truck and rail routes, expand pier and warehouse facilities, and provide all internal and external links to the rest of the city, and to the Light Industrial areas.

On the site would be left all present worthwhile structures, generally those worth $200,000 or more. We then propose to erect new modern structures to meet the demands of a Heavy Industrial area of this sort. Parking would again be on the fringe area, allowing free and unobstructed access for internal truck movement. The worker will move on a different level from the trucks and supplies, and have all the facilities provided in the Light Industrial areas.

We chose to develop a portion of this site, which includes the Plymouth area, expanded to also include the area under the Manhattan and Brooklyn bridges.





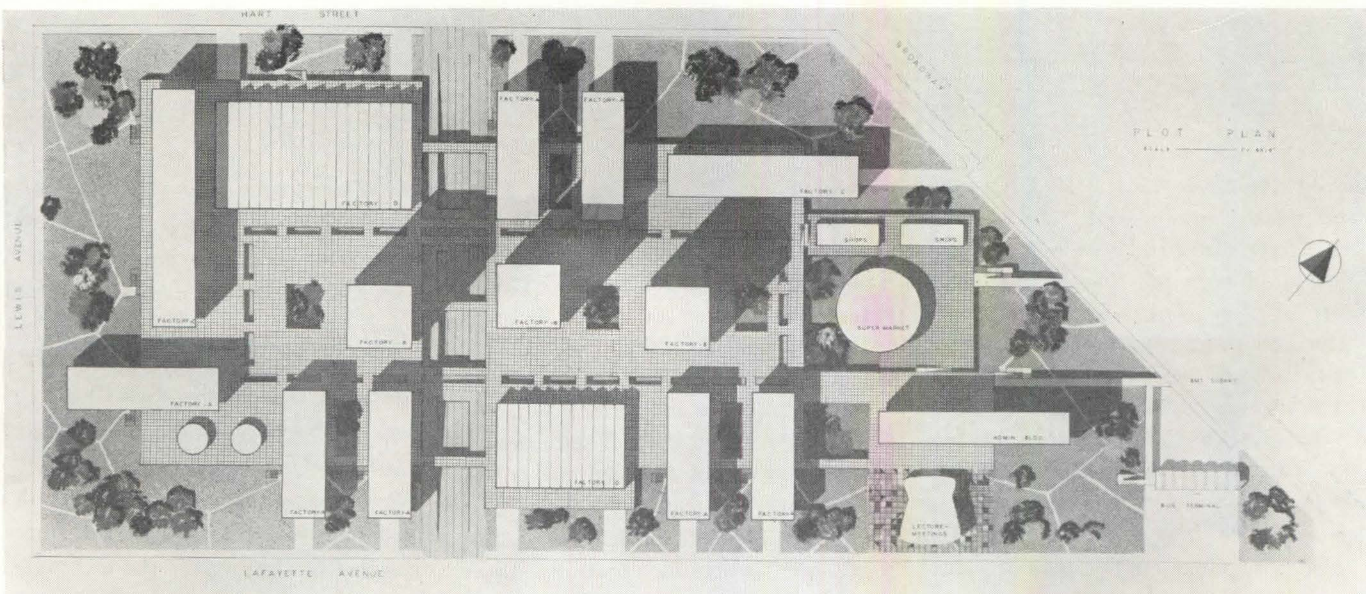
Brooklyn Industrial Development

We feel that our contribution does not lie in the zoning of industry in Brooklyn alone, but as a way of life to serve any metropolis. We have developed our ideas of city survival for Brooklyn, because we live, work, and have gone to school there—but the same principles could apply to any large city.

Most people think of the community center and shopping center as the center of the community. We believe, though, that in highly developed urban centers, a new technique has to be developed. It was our idea to move the "Economic Base" to the center of a neighborhood. We chose neighborhoods that had the lowest standard of living, and by placing Light Industrial units (*as shown below*) within the neighborhood we felt we could improve the standards. We demolish slums and build an industrial center. This allows the second and third worker in the household to work part-time and supplement the principal's income. Improving the real-estate value of the industrial site, would cause all surrounding real-estate value to rise. Hence, the one-time slum could develop into a handsome, high-rise, low-income, housing development with the self-contained industrial unit as its center. Trucking routes are separated from pedestrian areas, and because of its spaciousness and light atmosphere the center becomes an attractive part of the whole.

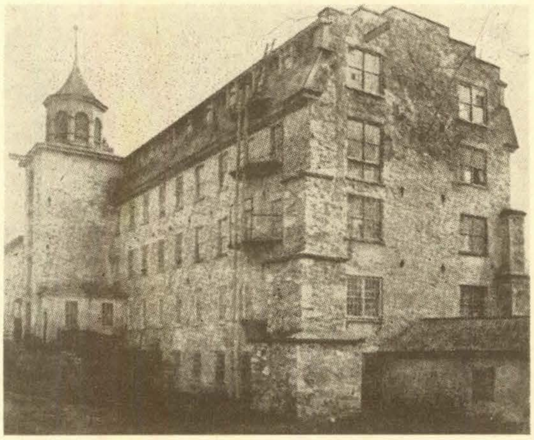
Large numbers of employes of each unit will actually walk to work, though this is not mandatory. Transportation and parking is adequately provided. Shopping is provided for, and even evening entertainment can be secured in the administration building and lecture hall.

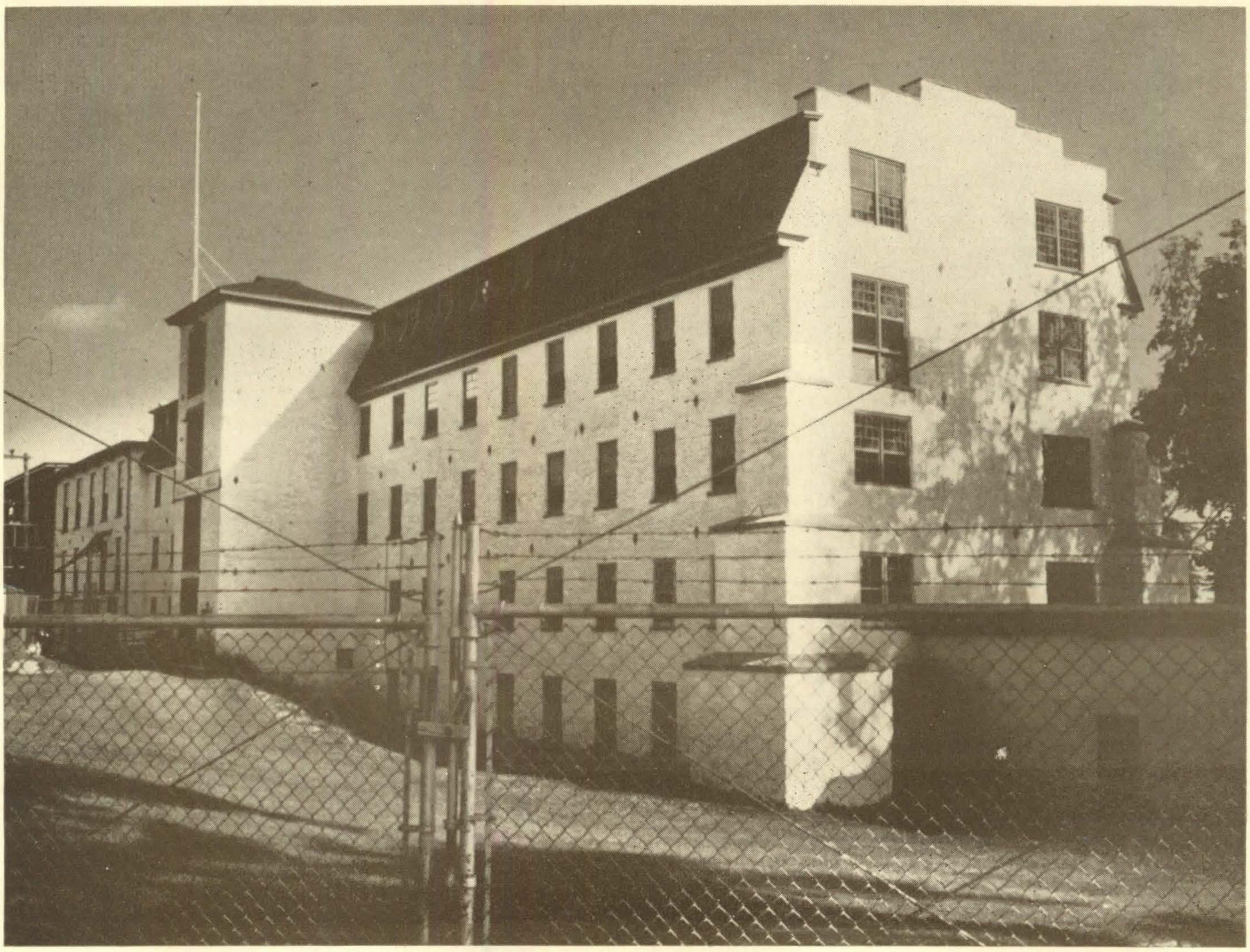
How do we finance these centers? We feel the project is feasible with financial and administrative aid from the Federal Government, or undertaken by private investors willing to develop the site with a profit motive.



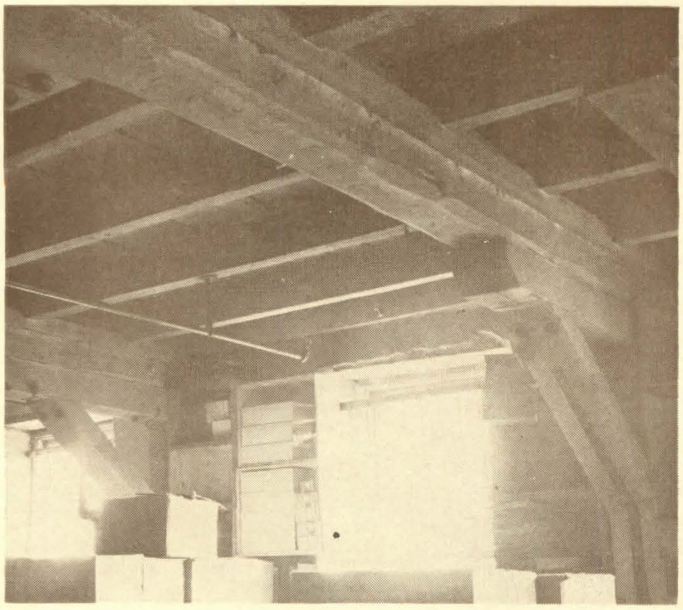
PROGRESSIVE ARCHITECTURE IN AMERICA

ALLENDALE MILL—1822
Centerdale, Rhode Island
Zachariah Allen, Designer-Builder





William H. Pierson, Jr.



William H. Pierson, Jr.

One of the greatest battles of modern architecture has been the fight against fire. A good part of the story of structural advance has been concerned with the search for fireproof materials and methods of construction, particularly in the field of industrial building. In America, although the New England textile factories of the early 1900's incorporated the latest manufacturing inventions, construction of the mills was conventional to the point of reaction. Partly due to the short supply of iron, these large structures continued to use traditional wood framing long after the English mills had turned to metal. They also continued to burn out with alarming regularity and insurance rates were correspondingly high.

The way in which the problem of fire control was solved is an impressive example of Yankee ingenuity. The solution was found, by necessity and choice, within existing materials and techniques, and was called "slow-burning" construction. Zachariah Allen's mill at Centerdale is the earliest known remaining example of a slow-burning factory, although the principle had already existed in 18th Century barns and utilitarian structures. Allen was apparently the first man to see its possibilities and to promote it for large-scale industrial building—revolutionizing both fire protection and fire insurance as a result.

This system was simple enough. The timber floors of most mill buildings (*top photo: Estes Mill, North Adams, Massachusetts, 1825*) were constructed in the best possible manner for a bonfire: planks across joists across beams offered a hazardous arrangement of air spaces and exposed wood. The joists, in particular, served as perfect kindling. By eliminating the joists completely, strengthening and thickening the beams, and introducing a second layer of planking, Allen substituted a floor structure with a minimum number of elements of exceedingly heavy wood (*photos at left and bottom: Allendale Mill*). The beams were increased in size to 14 inches, the 1-inch plank floor was replaced by a 4-inch floor of two layers—3-inch planks running across the beams topped by 1-inch boards laid in the opposite direction. Wooden columns supported the beams, as previously. This simplified, massive system proved extremely effective mill construction. A mill built by this method was slower to catch fire, slower to burn, and a fire was far easier to reach and control once it started. If the outside of the heavy members charred, the char insulated the inner core, lessening the possibility of the building's collapse and of the loss of property and life. A small, hot fire that might be enough to cause an iron support to give way could be extinguished readily with a minimum of damage; and the danger of a large blaze, of the kind that so consistently destroyed the earlier mills, was greatly reduced.

When Allen requested lower insurance rates on his new ways of preventing and controlling fire, he was refused. He solved this problem with typical New England independence by founding his own company in 1835, the Manufacturers Mutual Fire Insurance Company, which grew into an association of factory mutuals that eventually became one of the largest insurance organizations in the world. These mutuals would insure only buildings employing the Allen system. Thus slow-burning mill construction was established as standard procedure for wood-framed factories, and by the end of the 19th Century could be reckoned one of the most significant contributions to the design of American industrial buildings.

ADA LOUISE HUXTABLE

Information and photographs for this article generously contributed by William H. Pierson Jr. from his book (in preparation) on New England industrial architecture.

The following discussion has been taken from a chapter of **Weather Conditioning of Houses,** *to be published by Reinhold late next year. After establishing the basic environmental factors—and methods for their control—the author sets up a check list and cites the most suitable methods of control.*

check lists for environmental control of houses

by Groff Conklin

We are in the midst of a small-scale revolution in the design and construction of houses, although most architects and builders are only now coming to realize it. The fact that no more than four or five years ago books and articles on the subject of housebuilding were appearing with either minor references or no references at all to the subject that has caused this revolution—summer cooling—indicates how fast we have been moving. For summer cooling or year-round air conditioning is here to stay, and house design and construction is going to have to meet its challenge.

One result of the growing use of mechanical cooling has been a parallel increase in the importance of the various aspects of environmental control that can make the house pleasanter and more economical to live in. Many of these factors can, if correctly handled, considerably decrease the installation and operating costs of the heating and cooling plant. Others, while not having a direct economic effect, are important in improving livability.

The major emphasis—perhaps, indeed, too great an emphasis—is commonly placed upon those aspects of environmental control that involve the structure, and on those functions of the structure that have to do with the control of external heat, cold, and moisture. But the human animal has other senses besides those relating to temperature and humidity.[1] In thinking of the house only — or even primarily — as shelter against the elements, we are emphasizing the negative aspects of the environment —aspects which can physically damage us unless we are protected against them. It is perfectly true that protection against weather *is* the primary purpose of the house, but there are several secondary qualities of the environment, such as sound, which can also be effectively controlled by good planning and construction.

It is a matter of great importance that the non-thermal aspects of the environment not be forgotten by architects and builders in their attempts to cope with the basic problem, weather. These environmental factors are analyzed in the present outline just as thoroughly as those bearing primarily on thermal control.

Nevertheless, there is no doubt that shelter is the basic reason for houses. And the thermal aspects of shelter have, for economic reasons, become more important than ever before with the advent of summer cooling. Where only a few years ago almost the whole emphasis in the field of environmental conditioning for houses was on developing types of construction that would provide winter comfort and reduce first and operating costs for a heating system, today even more attention should correctly be devoted to the technical problems of house orientation, design and construction that will make mechanical cooling economical, even for moderately low priced dwellings.

To take a simple example: It used to be said that the value of thermal insulation was limited to winter-heating economy and living comfort. It might provide a slightly cooler house in the summer, but not enough to be important. One of the standard textbooks on insulation still in use has a section on the theory of "diminishing returns" for insulating material: the idea that the amount of insulating efficiency, in lower heat bills, provided by adding a third or fourth inch to the usual two-inch layer of material was so small that it would not pay for the cost of the extra insulation over the life of the mortgage.

But one of the startling new aspects of environmental conditioning involved in summer cooling is the fact that *it costs from three to five times as much* to remove a Btu of heat from a house in summertime as it does to add one in the winter. Thus the additional inches of insulation usually become an economic necessity when summer cooling is planned. The added thicknesses cuts the required size of the cooling unit to a point that more than pays the cost of the additional material. This is true almost everywhere in the United States, north as well as south.

Equal attention to the use of other materials and methods for protecting the house against variations in the external environment will pay equal dividends. If, as seems to be the general consensus, three out of five new dwellings built in 1960, and an even higher proportion in succeeding years, are going to have either hot-weather cooling or year-round air conditioning, depending on geography, the design and construction of houses to reduce as much as possible the cost of installing and operating such systems takes on great economic importance.

On the other hand, house design and construction for effective summer thermal control, even if mechanical cooling is not immediately contemplated, is becoming a constantly more basic requirement of home buyers. For one thing, houses so built are likely to have a higher resale

[1] *It is a curious fact that the "five senses" of common parlance (sight, sound, smell, taste, touch) do not even include the reactions of man to heat, cold, wetness, dryness. Perhaps this physiological phenomenon can be called the "thermal sense." It is considerably broader and less easy to define than the sense of touch, with which it has usually been associated in clasical physiology.*

value, since an owner who can guarantee that his dwelling has been designed for the most economical installation and operation of summer cooling will usually be able to obtain a measurably higher price for it than otherwise.

But even for the original purchaser such planning is becoming a marketable commodity. The popular magazines, both through their features and their advertising pages, are emphasizing more and more how good design, planning, orientation, and construction can increase summer comfort by themselves. Good ventilation, shade, and heat resistance, even when not prefixed by the dollar sign of a mechanical cooling system, are tangible values. The practice of the principles of environmental control may add a few dollars to the first cost of the house, true. But the cost will not only be acceptable to, it will be demanded by, the intelligent house buyer, as he becomes more aware of the comfort values the use of such principles can add to pleasure in living, and of the economic values they can add when it comes to resale.

There is no doubt that—particularly in the lower price ranges, and among the less responsible builders—hundreds of thousands of inadequately planned and built houses will continue to fester on the American scene. As one engineer recently wrote, referring to such builders: "You can save money by taking all the studs out of a wall, but you sure as hell are going to have a time keeping up the roof! . . ." As long as cheap houses can find a market, so long will such sleazy structures be built. But for the great majority of architects and builders—and developers, realtors, and mortgage finance institutions, who also have a substantive interest in the problem—the task of controlling the environment through good design standards and construction practices will offer a welcome challenge to ingenuity and efficiency.

As emphasized before, this discussion is concerned not only with external thermal factors, but also with the broader spectrum of the *total* environment: sound as well as heat, materials deterioration as well as humidity, etc. In the outline that follows, equal attention is given to all of them, not just to those that influence the economics of air conditioning.

factors/control methods

There are ten aspects of the environment that can be brought more or less under control through the use of sound planning principles and construction techniques, as follows: (1) temperature; (2) humidity; (3) precipitation; (4) solar radiation; (5) air motion; (6) environmental contaminants and pests; (7) sound; (8) vision; (9) wind and snow load; and (10) fire. There are in each case up to six methods of achieving the best measure of control possible, in their relation to the house: (a) site selection; (b) orientation; (c) planning; (d) construction; (e) landscaping; and (f) mechanical equipment.

In analyzing these environmental factors and the methods of controlling them, it is important to remember that Nature is always presenting us with extraordinarily complex and often contradictory situations. Almost no aspect of the environment can be brought under measurable control without affecting one or more other aspects. If one orients the house to take advantage of prevailing summer breezes, he may later find that the structure is cruelly vulnerable to wintry blasts and snowstorms. On the other hand, it may not be: for the "microclimate" of the immediate locality may indicate prevailing winds from one direction in warm weather and from an entirely different direction when it is cold. Similar inconsistencies will be found in many other aspects of the environment.

More generally, a dwelling in the Texas Panhandle will require an entirely different program from one in a Vermont valley. Regional as well as local variations must be carefully analyzed before a house can be effectively fitted into its environment. This may sound like a truism, but it is astonishing how often it is forgotten.

In any event, the following descriptions of the purposes and techniques of controlling each environmental factor must be read with the knowledge that many adjustments may have to be made before the general pattern can be applied to a specific dwelling in a specific location.

1. Control of interior temperature on a year-round basis, to provide comfort within the house regardless of outside temperatures.

a. By site selection: near a lake or running stream, if possible, since bodies of water tend to even off extremes in temperature; under lee of hill, if there is one—but *not* in low, breathless pocket of land; in region known to possess good prevailing summer breezes; plenty of natural foliage—healthy trees and shrubs —if it can be found; preferably not flat, both for visual variety and for the protection from wintry blasts a sheltered hillside site affords.

b. By orientation: locate so major glass areas will receive maximum sun in winter and minimum in summer, and so openings will be protected against wintry blasts and will admit summer breezes.

c. By planning: arrangement of rooms so that living areas face sheltered exposures and bedrooms, garage, kitchen, etc., face less sheltered areas, at least in climates with severe winters and strong winds; fenestration to avoid excess exposure of large glass areas to winter wind and summer sun, if local climate makes this possible. In hot climates, relatively open plan, to make best use of natural ventilation, but in cold climates, plan should ideally approach the square, perhaps with interior, protected court. In extra dry hot climates, square plan with interior court is also often desirable.

d. By construction: insulation, weatherstripping, double glazing, winter; same, plus sun-control devices, special roof constructions, heat-absorbing window glass (if necessary), summer. For non-air cooled houses, weatherstripping and double glazing not necessary in summer.

e. By landscaping: deciduous trees for sunlight in winter, shade in summer; minimum of heat reflecting drives and terraces, and maximum of grassy lawns and flower gardens immediately around house for low summer heat gain; climbing vines (on trellises or arbors) as summer sunshades where trees are unavailable.

f. By mechanical equipment: heating system in winter; mechanical cooling in summer; mechanical ventilation as required for both seasons.

2. Control of relative humidity within the house, to maintain it at a more or less constant comfort level the year around, and to reduce or eliminate the danger of damage to house construction from winter condensation, and high cooling bills from excess air moisture and latent heat in summer.

a. By site selection; not in low, damp pocket of land; good prevailing summer breezes desirable.

b. By orientation: house so placed to take fullest advantage of summer breezes, and to be protected from winter winds, if possible.

c. By planning; maximum utilization of natural ventilation, winter and summer, through planned fenestration and ventilating methods. Exception: in regions of severe storms and winds, a compromise will have to be arrived at between optimum ventilation and storm protection.

d. By construction: effective vapor barriers at top, sides, and (if needed) bottom of house; attic and other ventilation to reduce vapor pressure in winter and sun-heat load in summer; reduction in moisture-producing activities (particularly in summer) by venting stoves, laundry equipment, etc., and by providing powered exhaust ventilation in baths, kitchens, and laundries to reduce latent heat.

e. By landscaping: shrubbery and trees kept sufficiently distant from house to permit adequate air circulation and evaporation of moisture vapor in summer. In some climates, this will mean avoiding trees that overhang the roof, since during the summer they can keep the house uncomfortably damp.

f. By mechanical equipment: forced exhaust ventilation—attic, or roof, kitchen, bath, laundry, etc., primarily in summer, but also in winter if conditions are excessively humid; humidifiers (winter) and dehumidifiers (summer)—but only if conditions within the house (especially the basement) are so severe that they cannot be remedied in other ways.

3. Control of precipitation, to prevent external moisture from damaging the structure and from penetrating it through cracks and joints; and to minimize the danger of floods.

a. By site selection: location sheltered from driving rains and winds; well above any conceivable high-water mark along streams that have histories of flooding. Avoid damp or swampy areas.

b. By orientation: location on lot to take full advantage of natural shelter against storms—lee of hills, existing vegetative windbreaks, etc.—and to minimize danger of rain or ground water collecting around or under house. If site is near running stream, locate if possible at highest point to minimize flood danger.

c. By planning: essentially the same as in section on Temperature Control, above.

d. By construction: tight and weatherproof building materials and techniques; quality flashing at all roof and wall openings and at foundations where necessary; ½″ mesh screen over gutters to prevent leaves from clogging and causing water and snow backup; subsurface rainwater drains to carry water from downspouts away from house; moisture resistant exterior treatments such as paints, masonry waterproofing materials, and, where needed, waterproof calking, grouting, putty.

e. By landscaping: moderately dense plantings along, but not too close to, sides of house on which worst storms usually beat (sufficiently distant to permit efficient drainage around house); grading away from house on all sides to prevent collection of rainwater around foundations; thick sod around periphery to reduce danger of seepage of water into foundation.

f. By mechanical equipment: sump pumps if area under house (basement or crawlspace) cannot be kept dry otherwise. *Note:* if sceptic tank must be used, locate safe distance from house, and design so effluent will drain away from house.

4. Control of solar radiation, so that the sun's direct rays will supplement the heating system during the winter and will be kept out of the house in the summer as much as possible.

Note: Methods of control are essentially the same as with temperature, except that, air temperatures being equal, sun control devices and heat-absorbing glass can be very important in certain regions (hot, arid, treeless) and less so in others (temperate, humid, with adequate natural shade). It should also be pointed out that house locations too close to *unshaded* bodies of water will add considerably to summer cooling load by heat reflection, although the same location may be good for the non-air-cooled house because of lake breezes, etc. In very hot regions which have an ample water supply, a roof pool or sprinkler system will help reduce cooling load and increase personal comfort.[2]

5. *Control of air motion,* to reduce vapor pressure in the house in winter and cooling load in summer, and to add to summer comfort in non-air-cooled houses.

a. By site selection: region of good natural breeze, particularly summer.

b. By orientation: house located so prevailing summer winds will blow through it rather than bypass it, and winter winds will help ventilate attic, if the two can be combined. If possible at the same time, protect glass areas from most winter winds and storms.

c. By planning: location of sleeping rooms to obtain maximum benefit from prevailing summer breeze (in non-air-cooled house); fenestration in such a house planned to provide through or cross ventilation whenever possible; elimination of "dead" spots, spots without air motion, by provision of extra louvers if necessary. (*Note:* In houses with mechanical cooling, summer breezes are important only to the degree that they help reduce cooling load, which they do to only a minor degree.)

d. By construction: even in houses with year-round air conditioning, operable windows or adjustable louvers or vents below or above fixed windows, for comfort during periods of moderate weather; adequate screened openings in flat or pitched roofs and clerestories, basements and crawlspaces, for air circulation to reduce condensation danger in winter and make full use of prevailing breezes in summer.

e. By landscaping: when it does not interfere with winter function as wind- and storm-break, elimination of heavy plantings that might reduce penetration of summer breezes into house.

f. By mechanical equipment: powered exhaust fans where needed: attic or flat roof (the latter with powered rotary ventilators on roof when necessary), bath, kitchen, laundry, etc.; adequate powered air intakes and/or exhausts in standard heating and cooling equipment.

6. *Control of environmental contaminants and pests,* to reduce airborne dirt and odors, eliminate hazards from flying insects, keep earth-bound pests such as termites, rats, squirrels, etc., from damaging the structure, and do away with the danger of decay and other bacterial and fungus enemies of the house.

a. By site selection: safe distance from industrial and other air- and water-polluting sources; site naturally protected against termites and other pests, i.e., not too damp or thickly wooded, and not already known to be infested.

b. By orientation: location as high as possible on well drained plot and safely distant from thick surrounding woods, if any.

c. By planning: location of incinerator and other odor- and dirt-producing equipment and activities a safe distance from house and in direction toward which prevailing winds blow, i.e., so that dirt and odors will not blow toward house; placement of doors, windows, and other openings so that pests cannot enter, moderately above ground level.

d. By construction: weathertight construction; termite shields near ground; wood near ground dipped or pressure-treated with preservatives when conditions require; screens at all openable windows, all exterior doors, all ventilating louvers or windows in attics, basements and crawlspaces; avoidance of any wood construction in contact with the earth; thorough clearing away of dead organic material from periphery of house and from back-fill.

e. By landscaping: plantings a safe distance from walls and foundations, to reduce danger from termites and other pests.

f. By mechanical equipment: electrostatic or other air cleaning equipment when essential, particularly in houses without air conditioning units that filter incoming air; if basement is damp, dehumidifiers to keep wood dry and reduce danger of decay and termites; outdoor insect traps, electrical or chemical, when conditions require.

7. *Control of sound,* external and internal, to provide a quiet and restful environment in the house and in each room of the house where quiet is desired.

a. By site selection: greatest possible distance from airports and heavily traveled airlanes, noise-producing industrial and transportation activities (factories, railroads, major highways), shopping centers and other commercial centers, schools, other houses, etc.; if possible, a site that has good natural protection from unavoidable sound sources, such protection being hills, thick natural growth of shrubs and trees, etc.

b. By orientation: windowless wall or garage or both facing unavoidable

[2] *It will be noted that there is no mention here of glare or "daylighting." This is intentional. Scientific distribution of sunlight within rooms is often important in nonresidential buildings, but in houses it does not, in most instances, require separate consideration. The kinds of landscape and structural treatments required to reduce solar radiation as a heat factor also automatically take care of glare; and as for distribution of daylight in rooms, most people would not even like an even daytime illumination. Daylight variety within a room is phychologically important; light and shadow are desirable, in homes if not elsewhere. The clerestory is not used to bring light so much into the depths of a room as into areas otherwise windowless. And clerestories need sun control devices, too!*

sources of noise; house set as far back from street as practical; location to take fullest possible advantage of natural barriers to sound.

c. By planning: (outdoor noise sources) organizing rooms so that those needing most quiet are as far as possible from street and from nearby houses; (indoor noise sources) segregation of quiet rooms from noisy ones such as music room, kitchen, playrooms, etc.; (within rooms) dimensioning rooms to minimize reverberation.

d. By construction: (outdoor noise sources) structural cross-sections designed to reduce sound transmission, such as masonry, heavy frame construction with lath and plaster, double glazing if external noise is excessive; (indoor noise sources) sound transmission reducing structural cross-sections between rooms when a noisy room has a common wall with a quiet one (bathroom, bedroom), and—in two-story houses—floors designed to reduce transmission of sound by impact; (noise within room) acoustical insulation in ceilings of noisy rooms, sound-deadening wall and window treatments (particularly for music rooms), carpeting or large rugs on floor, and selection and arrangement of furniture to interrupt sound waves and reduce reverberations; (equipment noise) acoustical mounting of laundry equipment, air conditioning equipment, etc., isolation of equipment when possible, selection of quiet types of equipment if available, and use of acoustical insulation and noise baffles in air ducts for heating and cooling equipment.

e. By landscaping: wood or, preferably, masonry walls between house and objectional noise source (street, house next door, play area of own site); separation of play and other noise producing areas from quiet areas by distance, if possible; dense plantings of evergreens (not deciduous trees, which lose their slight acoustical value in the winter) both for privacy and for minor sound reduction as well.

f. By mechanical equipment: none—there is no machine that produces silence.

8. Control of visual environment, to provide the best possible relation of house to landscape, thus blocking out wherever possible the less attractive aspects of the surroundings.

a. By site selection: obvious.

b. By orientation: segregation of all outdoor work areas from areas of best seeing; house so placed that most-used windows get best view (not always possible in view of other requirements under previous heads).

c. By planning: obvious. But it also should not be forgotten that the house itself is part of the visual environment, especially during warm weather when the occupants will often be outside looking in. Therefore the house should be no less attractive than the views from its windows.

d. By construction: no application, outside of specification of good-quality window glass!

e. By landscaping: obvious

f. By mechanical equipment: no application, except negative: sequester all exterior equipment and machinery out of sight of best views.

9. Control of wind and snow loads, as well as other aspects of house construction, to assure a safe and secure dwelling against all foreseeable hazards of the elements.

Note: All aspects of control are the same as for temperature or for precipitation, except:

d. By construction: careful following of accepted general (and, when conditions are extraordinary, local) engineering requirements for dimensioning structural members and for fastening them; due attention to adequate nailing practices for shingles and siding, as well as studs, joists, rafters, beams, etc. Local records for extremes of wind and snowfall should be checked before final specifications.

10. Control of fire hazards, to protect dwelling from external dangers such as brush and forest fires, fires in other houses, lightning, etc.

a. By site selection: avoidance of site too closely hedged in by forests or brush in an area subject to seasonal dry spells and consequent wild fires.

b. By orientation: adequate belt of open lawn between house and any fire-hazardous brush, meadow, or woods.

c. By planning: See construction.

d. By construction: specification and use of fire-resistant building materials and methods—exterior masonry walls if economically feasible; slate or asbestos-bearing roof shingles, or metal, also if not too costly; lightning rods if in rural areas without proper municipal or volunteer fire fighting equipment within easy reach. *Note:* these recommendations cover fire hazards from without only. Fire safety within the house is not a part of the present subject.

e. By landscaping: location of fire hazardous materials (oil tanks, bottled gas, wood piles, rubbish piles, etc.) in protected areas safely away from house; wide lawns (which should be kept well mowed!) in areas subject to brush fires; if economically feasible, a swimming pool or other source of water for fire fighting, provided local water sources (municipal or otherwise) are inadequate.

f. By mechanical equipment: efficient portable fire extinguishers indoors and out, preferably of the new type that will control both dry-materials fires and oil fires. If area is far from public fire-fighting equipment, pumps to take water from stream or pond to site of the fire.

Phoenix Coliseum

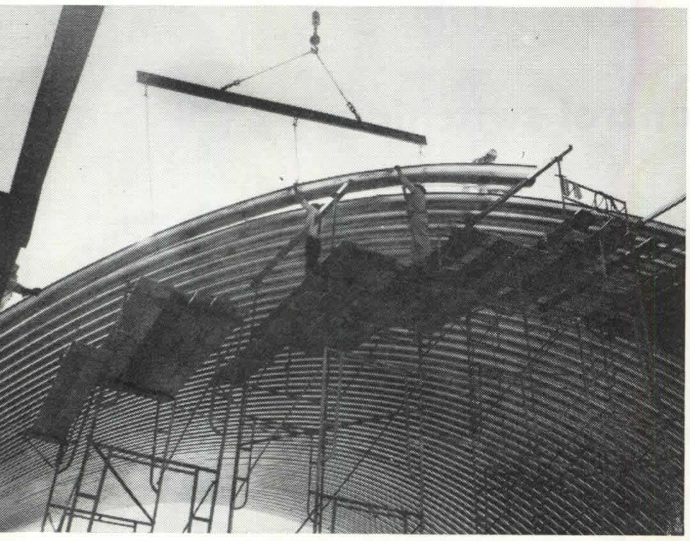
Workmen assemble pre-engineered, curved sheets of 18-gage galvanized corrugated-steel which form self-supporting arches of trussless-steel roof.

World's largest trussless-steel roof—120′ x 260′ and costing one-third less than conventional roof structures—was erected at Phoenix. Although it spans a \$¾-million Coliseum, actual steel-roof cost was but \$0.75 per sq ft, exclusive of erection costs, which averaged \$0.15. The roof was erected completely in 450 man hours: an average of 7½ men worked eight hours per day for 7½ days.

This "Wonder Roof" consists of curved, 18-gage galvanized-steel sheets—two ft wide and from six to ten ft long—fastened together by nuts and bolts to form self-supporting arches. Although less than 1/16 in. thick, the steel roof will withstand hurricane-force winds in excess of 113 mph and will support loads up to 42 psf (equivalent to 5½ ft of snow). Thermal insulation as well as acoustical treatment—the Coliseum is completely air conditioned—are provided by a ½-in. layer of vermiculite acoustical plaster. This material was machine-sprayed directly to the metal underside of the corrugated curved ceiling.

The trussless design eliminates columns, trusses, or other supports and provides an unobstructed view from any of the 500 permanent seats. Height above floor—40 ft at center—permits circuses and other attractions requiring unusually high ceilings.

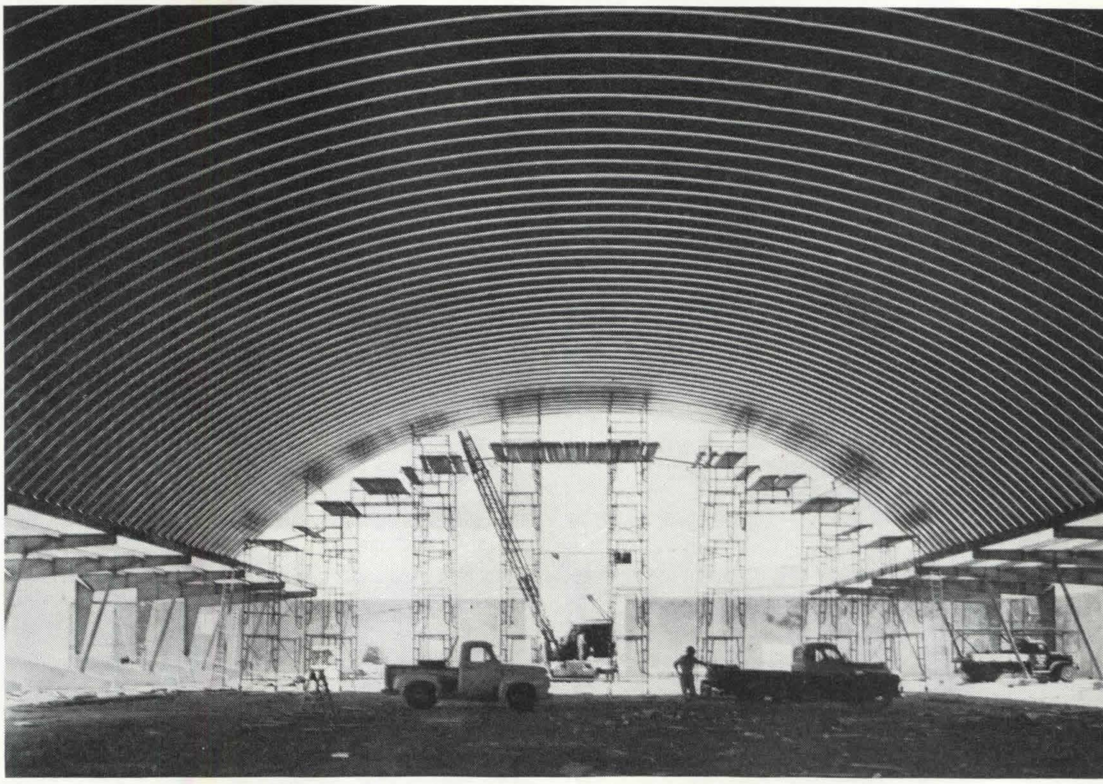
Wonder Corporation of America, Chicago manufacturers of pre-engineered steel buildings, fabricated the steel components of this roof.

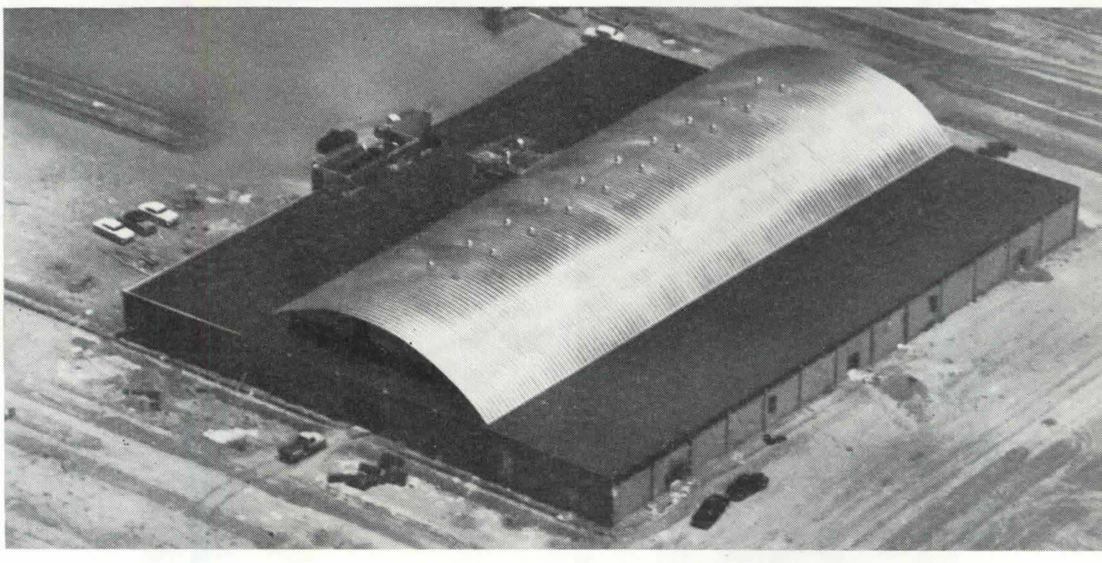


Steel sections—two ft wide and from six to 10 ft long and fastened together by nuts and bolts—are guided into place during erection (left).

Arches are supported at springing by structural-steel bents (below).

Aerial view of Coliseum shows exterior of patented trussless roof design (bottom).





low-voltage remote-control switching

Recently, a successful low-voltage remote-control switching system has been developed for the residential, commercial, and industrial fields. Inclusion of low-voltage remote-control relays containing miniature built-in transformers makes the system operable. Each relay fits into an outlet box or wall outlet and can be controlled from a series of silent remote switches. Since there is no wiring back to a central transformer, it is possible to use a limited number of relay-switch combinations economically. Last summer this system—manufactured by the Pyramid Instrument Corp., Lynbrook, New York, and known as Remcon—was installed in a large residential development at Oceanside, Long Island, by Ballin, Glicksman & Langfur, Builders. Although Remcon has undeniable attraction as an added selling feature for the builder, it is also a definitely worthwhile refinement for the custom-designed house.

At Oceanside, the remote-control switching was incorporated in the following manner: From a five-switch master panel at bedside in the master bedroom, there is instant control of lights on the front portico, front yard, foyer, and rear patio. The fifth switch controls a plug-in outlet

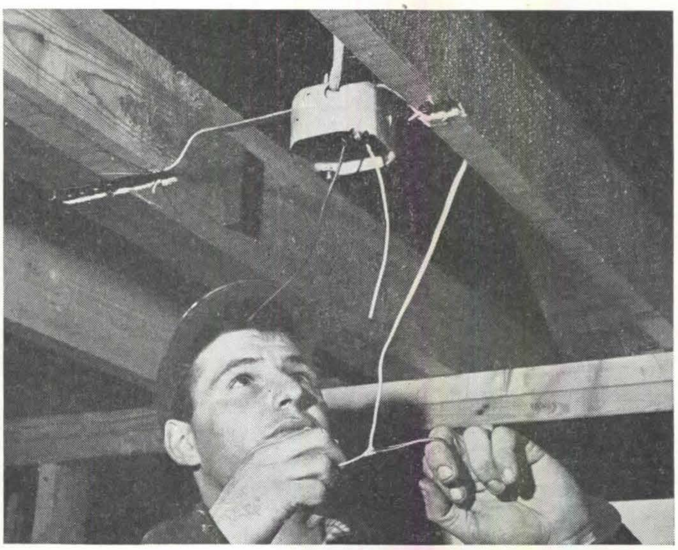
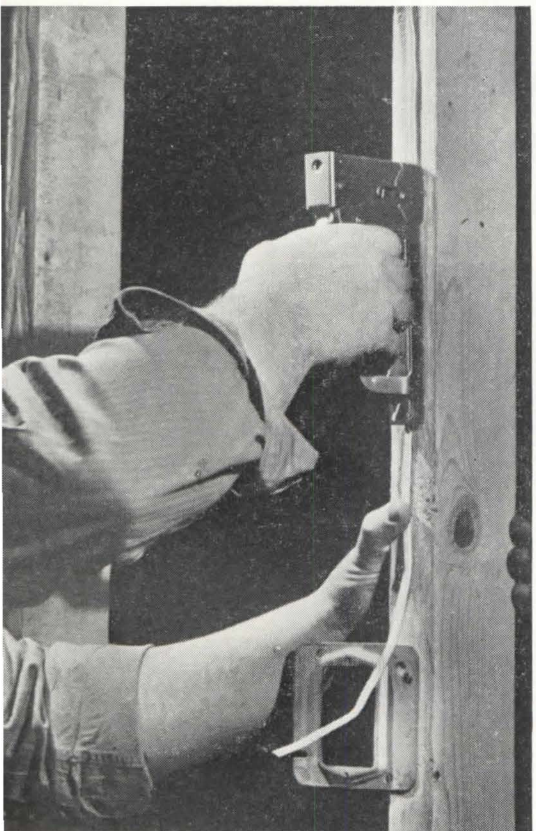


Figure 1—bell wire is stapled to studs as it is run from knock-out box to plaster ring (below).

Figure 2—bell wire is stripped at knock-out box exposing red, white, and black insulated conductors (upper right).



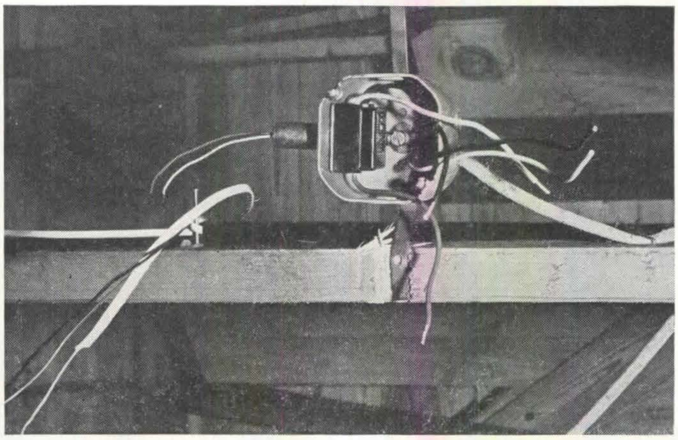


Figure 3—relay is in place with red, white, and black wires of switch leg ready for connection with corresponding wires of relay (above). *Relay is also ready for high-voltage connection.*

in the kitchen which can, for example, start the morning coffee. Remote-control switches in each bedroom control a light in the upstairs hall, as does another switch at the foot of the stairs on the first level. A three-way switch panel in the foyer controls portico, front yard, and foyer lights. A single switch in the kitchen also controls the portico light and another in the den controls the patio lights.

When roughing-in, the electrician installed his outlet boxes and ran in 110-v wiring. After installing plaster rings at switch locations (unlike conventional switching Remcon's six-volt wires only require a simple plaster ring), he then connected the outlet boxes and switches with three-conductor thermoplastic #18 bell wire (*Figure 1*). After skinning bell wire at plaster rings, roughing-in of switches was completed. Next, the relay transformers were installed (*Figures 2, 3, and 4*). Finally, after walls were erected, low-voltage switches and wall plates were placed (*Figures 5 and 6*). In the master bedroom five-switch installation, there were five three-wire conductors to be connected to the five individual silent switches that fit into the wall plate.

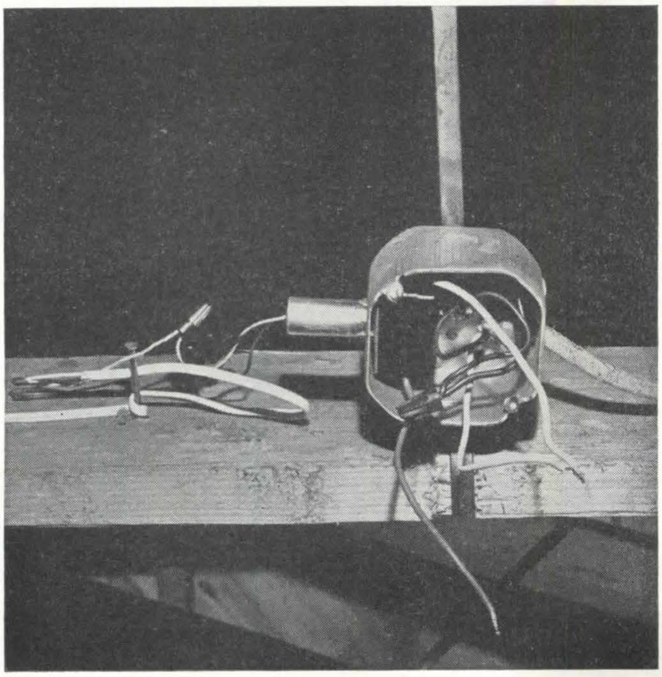
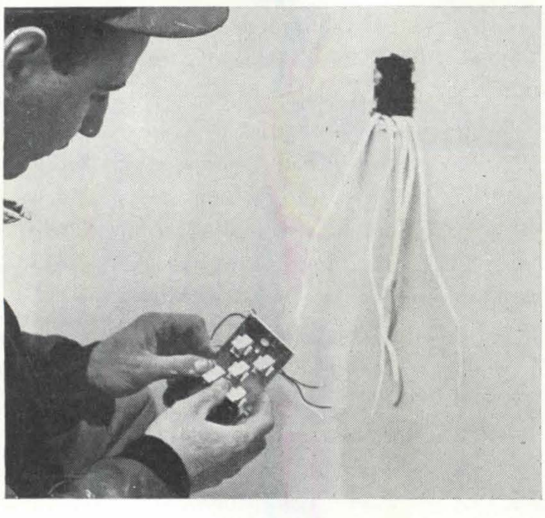
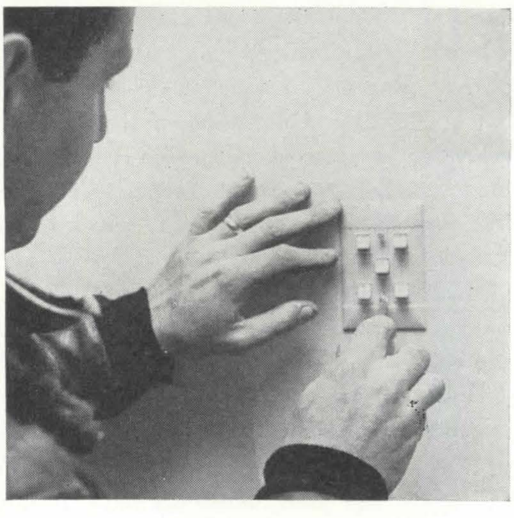


Figure 4—box is completely wired and ready for fixture. Wires of switch leg have been connected to relay. Black and white high-voltage wires of relay have been connected with corresponding 110-v wires. White wire, acting as a common ground, and the red wire are later connected to fixture.

Figure 5—electrician snaps five switches into mounting plate for master bedroom control (below left).

Figure 6—switch plate (which can be painted any color) is screwed into place to complete installation (below right).





concrete block: sound-reduction properties

Sound barriers are usually considered most effective in proportion to their mass density. Thanks to technical research, however, much "sound" advice is being passed along to architects and builders as to the excellent acoustical qualities of lightweight construction materials.

Noise reduction is achieved in one of two ways, depending on where the source of the sound is in regard to the listener. If the listener is in the same room as the source, reduction is attained by a sound absorbing material in that room. If the listener is in a room separated from the source, reduction is brought about by a wall having a high transmission loss or sound-insulation property. A material which has a high absorption coefficient usually has a low transmission loss. When the surface of such a material is changed, as in the painting of a concrete-block wall, sound-absorption values will usually drop.

The average sound-transmission loss of partitions of ordinary wood and plaster or concrete ranges from approximately 25 to 55 or 60 db. A reduction factor of more than 50 db is considered more than adequate even when fairly high noise levels are to be resisted.

Architects, including those versed in acoustics, do not always agree on the transmission loss necessary for a desired degree of quiet or sound isolation. In general, acceptable factors are 40 db for school corridor walls and party walls in apartments, and 50 db for partitions separating music rooms and auditioriums from other rooms and exterior sounds.

Desiring additional data on noise control, the National Concrete Masonry Association in co-operation with the Armour Research Foundation of the Illinois Institute of Technology recently conducted a series of tests on the sound-reduction properties of concrete-block walls. Forty-three of these tests were devoted to sound transmission loss; six tests to sound absorption.

All blocks tested were of uniform texture and standard commercial quality, meeting ASTM specifications. Panels were erected in a wall opening, 6′-2″ wide and 7′-5″ high, at the reverberation chamber in the Institute's Riverbank acoustical laboratory. Those tested for sound-transmission loss were of single-wythe construction of varying thickness, both hollow and solid, unpainted and painted on both surfaces, and of three aggregate types. Cavity walls of two different aggregate block having two cavity spacings were also tested. Sound-absorption tests were made on four-in. hollow block, unpainted and painted.

Results indicate that transmission loss from sound traveling through a concrete masonry wall is not necessarily a function of the weight of the wall per sq ft. Such loss usually increased with wall weight, but the relationship was not always consistent. In general, loss was greater for heavy or dense aggregate block walls than for lightweight units of similar design and thickness. Greater transmission through lightweight panels apparently stemmed from differences in respective concrete porosities rather than aggregate materials.

Block design had a significant effect on sound loss. Expressed in terms of loss per pound of wall area, hollow block were on an average about 75 percent more efficient than solid units. Plugging block core spaces with low-density-insulation fill had little effect on the sound-transmitting properties.

In every instance the application of paint to wall surfaces boosted transmission loss. Cement base paint increased loss more than resin emulsion—due to the method used in its application rather than in differences of paint type. Dense block panels, without surface treatment, showed up to 20 db greater sound control than those of lightweight aggregate, but the application of one coat of cement-base paint virtually eliminated this advantage.

Concrete-masonry cavity walls were extremely effective in reducing transmitted sound even when not painted. Loss properties were increased by back plastering; a treatment which increased transmission loss of lightweight cavity wall without too great a weight increase. A substantial rise in loss occurred when using dense aggregate block for one wythe and lightweight block for the other, because of heavier aggregate and less porous construction.

Sound-absorption tests were conducted to determine the effect of heavy paint coatings on the noise-control properties of block. The experiments differed from those on sound transmission in that panels were constructed in a horizontal position and an entire test took place in one room. Test procedures consisted of generating a sound-pressure level of about 110 db by means of a loudspeaker in one corner of the room, then turning off the sound source and measuring the time rate as the sound fades away.

Results showed a marked reduction in the sound-absorption value of the material once paint was applied to its surfaces. The resin emulsion had less effect on the absorption coefficient than cement-base paint, although the reduction was significant. It was noted that heavy paint films which seal surface pores and thus decrease sound transmission will also diminish sound absorption value.

Data presented (*see table*) graphically demonstrates concrete masonry construction as an excellent means of achieving sound control in residential, public, and commercial buildings.

AVERAGE SOUND TRANSMISSION* LOSSES FOR VARIOUS CONCRETE MASONRY WALL CONSTRUCTIONS

Wall Description		Average Sound Transmission Losses for Various Wall Treatments, Approximate Decibel Range					
Construction	Aggregate	Un-treated	No. of Tests	Painted	No. of Tests	Plas-tered	No. of Tests
3" Hollow	Lightweight	36	1	44	1	42-45	2
4" Hollow	Dense Lightweight	43 32-38	1 8	45 38-47	1 7	- 35-50	0 7
4" Solid	Dense Lightweight	36 26-32	1 3	49 -	1 0	- -	0 0
6" Hollow	Dense Lightweight	49 36-45	1 5	51 52	1 1	- 49	0 1
6" Solid	Lightweight	25-40	4	31-49	6	-	0
8" Hollow	Dense Lightweight	52 33-48	1 4	53 43	1 1	- 51-53	0 4
12" Hollow	Lightweight	52	1	-	0	54	1
Cavity Wall Two 3"	Lightweight	-	0	-	0	56**	1
Cavity Wall Two 4" Hollow	Lightweight	42	1	-	0	52-57**	2
Cavity Wall [One 4" One 4"]	Dense Lightweight	53-54	2				
Sub-Totals		Un-treated	33	Painted	20	Plas-tered	18

* Data are from various tests as follows:

1. National Bureau of Standards Report BMS17 .... 2 tests
2. National Bureau of Standards Supplement to Report BMS17 .... 2 tests
3. Data reported in Acoustics and Architecture by Paul E. Sabine .... 2 tests
4. Tests conducted at Riverbank Laboratories .... 22 tests
5. National Concrete Masonry Association tests conducted at Riverbank Laboratories .... 43 tests

Total 71 tests

**Cavity walls plastered on one unexposed face (cavity side).

Classified Index of Materials and Methods Articles:

September 1955-December 1956

* News Survey
** Mechanical Engineering Critique

A focus of social life in the Nation's Capital: the mammoth Grand Ballroom, Sheraton-Park Hotel, Washington, D. C. Seated several thousand at the Eisenhower Testimonial Dinner.

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The Specification of Terrazzo Floors

by Harold J. Rosen

No one individual can uncover all of the research that has been undertaken in the building-construction industry. What makes this so is the absence of a central clearing house for this type of information. Perhaps the Building Research Advisory Board and the Building Research Institute may eventually provide the means to this end, having made a good start in this direction in the few years of their existence. The recommendations of this writer are therefore limited to the information which he has been able to discover. Doubtless there are many bits of information which requires channeling to the proper focal point for dissemination to all interested parties. Those of you who have personal knowledge of additional information and wish to contribute to the advance of the building-construction industry are invited to send in your recommendations or criticisms of the material appearing in these columns so that the science of building technology will benefit from the combined knowledge of all of us. The discussion of specification of terrazzo that follows is presented with that invitation in mind.

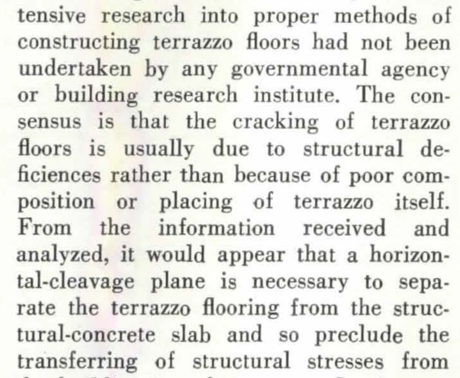
•

Terrazzo as a flooring material has had a favorable use-experience that is centuries old. Made of a mixture of colorful marble granules and a portland cement matrix, terrazzo possesses a durable, pleasing, and sanitary surface when properly maintained. Besides being used as a floor, base, and border material in such places as building lobbies, school corridors, hospital flooring, including operating rooms, terrazzo is also used for stair treads and risers, indoor skating rinks, wainscot, and wall surfaces.

However, despite the use of divider strips (both metal and plastic) to localize flexure cracks, cracks in terrazzo have occurred away from the divider strips, and some designers have been deterred from the use of terrazzo because of these failures. The floated type of terrazzo floor construction is recommended to overcome the effects of structural movement: settlement, expansion, or contraction. However, this method of installation requires a total thickness of at least 3 inches, necessitating a $\frac{1}{4}$-inch bed of sand to prevent bonding to the structural slab, a sheet of kraft or tar paper covering, a 2-$\frac{1}{8}$-inch thick mortar underbed reinforced with wire mesh and finally a $\frac{5}{8}$-inch terrazzo topping. This installation method although effective, is more costly and does make the designer with a limited budget think twice before using terrazzo.

In seeking solutions toward minimizing, localizing, or eliminating cracking of terrazzo floors it was learned insofar as this investigation could disclose, that extensive research into proper methods of constructing terrazzo floors had not been undertaken by any governmental agency or building research institute. The consensus is that the cracking of terrazzo floors is usually due to structural deficiences rather than because of poor composition or placing of terrazzo itself. From the information received and analyzed, it would appear that a horizontal-cleavage plane is necessary to separate the terrazzo flooring from the structural-concrete slab and so preclude the transferring of structural stresses from the building into the terrazzo flooring.

A third method of laying terrazzo floors over concrete, supplementing the two standard methods adopted by the National Terrazzo and Mosaic Association was suggested by one of the federal agencies contacted and is offered as a means of reducing cracking in terrazzo floors to a minimum without undue cost.



PAPER CLEAVAGE PLANE OVER CONCRETE

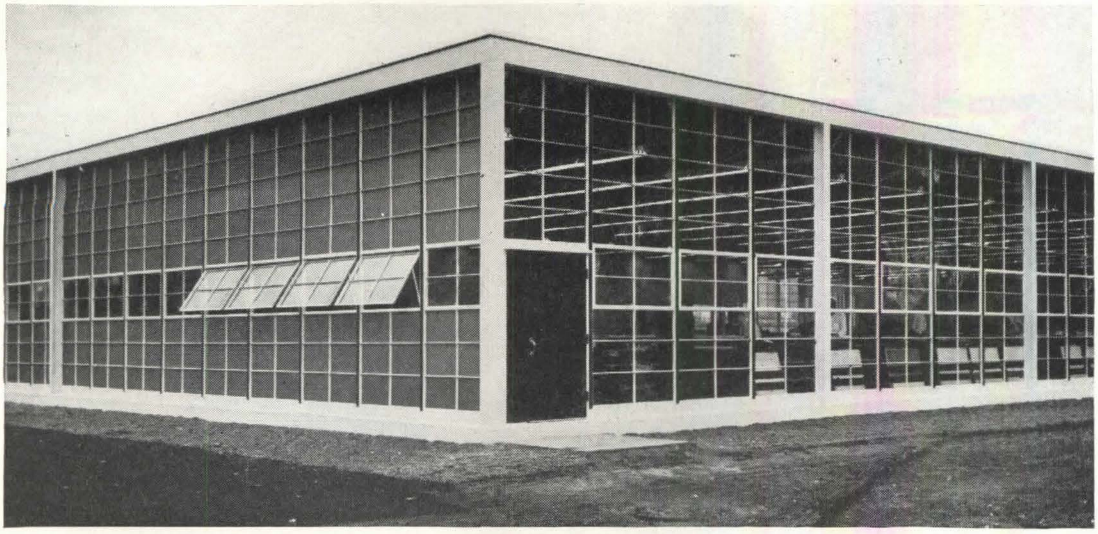
This method provides for a total thickness of only 2 inches with a reinforced, waterproof, building paper serving as a medium to separate the terrazzo from the structural concrete slab. This type of installation is not much costlier than the method used when the terrazzo mortar underbed is bonded directly to the structural concrete slab. However, it affords additional protection from minor settlement, expansion, or contraction. Very good results have been obtained using this type of installation. Another benefit which accrues indirectly is the possibility of removing bad panels easily, since there is no bond to the structural slab.

Of additional interest to the architect using terrazzo is the type of marble chip to be used. Marbles of different species have been found to possess varying degrees of abrasive resistence. This characteristic is important in selecting a marble chip for use in floors subjected to heavy traffic, since this projected use will cause marbles having a low abrasive resistance to wear away more quickly than those with a higher rating. The National Bureau of Standards in *B. M. & S. Report 98, Physical Properties of Terrazzo Aggregates,* concludes that "aggregates having abrasive resistance values of 18 or higher are considered to be suitable for the most severe conditions of foot traffic." The BM&S report lists the abrasive hardness of the various marbles. Marble chips for use in terrazzo subjected to heavy traffic should be specified to have an abrasive hardness of not less than 18 (Kessler Method).

Another operation to be considered in the installation of terrazzo floors is the surfacing or grinding after curing. While the Standard Specifications of the National Terrazzo and Mosaic Association call for an initial rubbing after curing, it does not indicate whether the grinding should be performed wet or dry. Dry grinding creates dust, permitting scratching of the marble chips and possible dislodging of the surface aggregate. By specifying that the terrazzo surface be wetground, the dust is reduced to a minimum, scratching of the marble chips is less likely to occur and the possibility of dislodging of the marble aggregate is reduced. Wet grinding will cause the contractor to provide a certain amount of additional protection to safeguard adjacent walls, floors, and other work from rubbing stones and splashing, while grinding is in progress.

p/a selected detail

window wall



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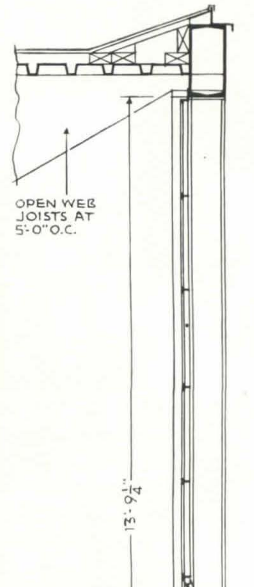
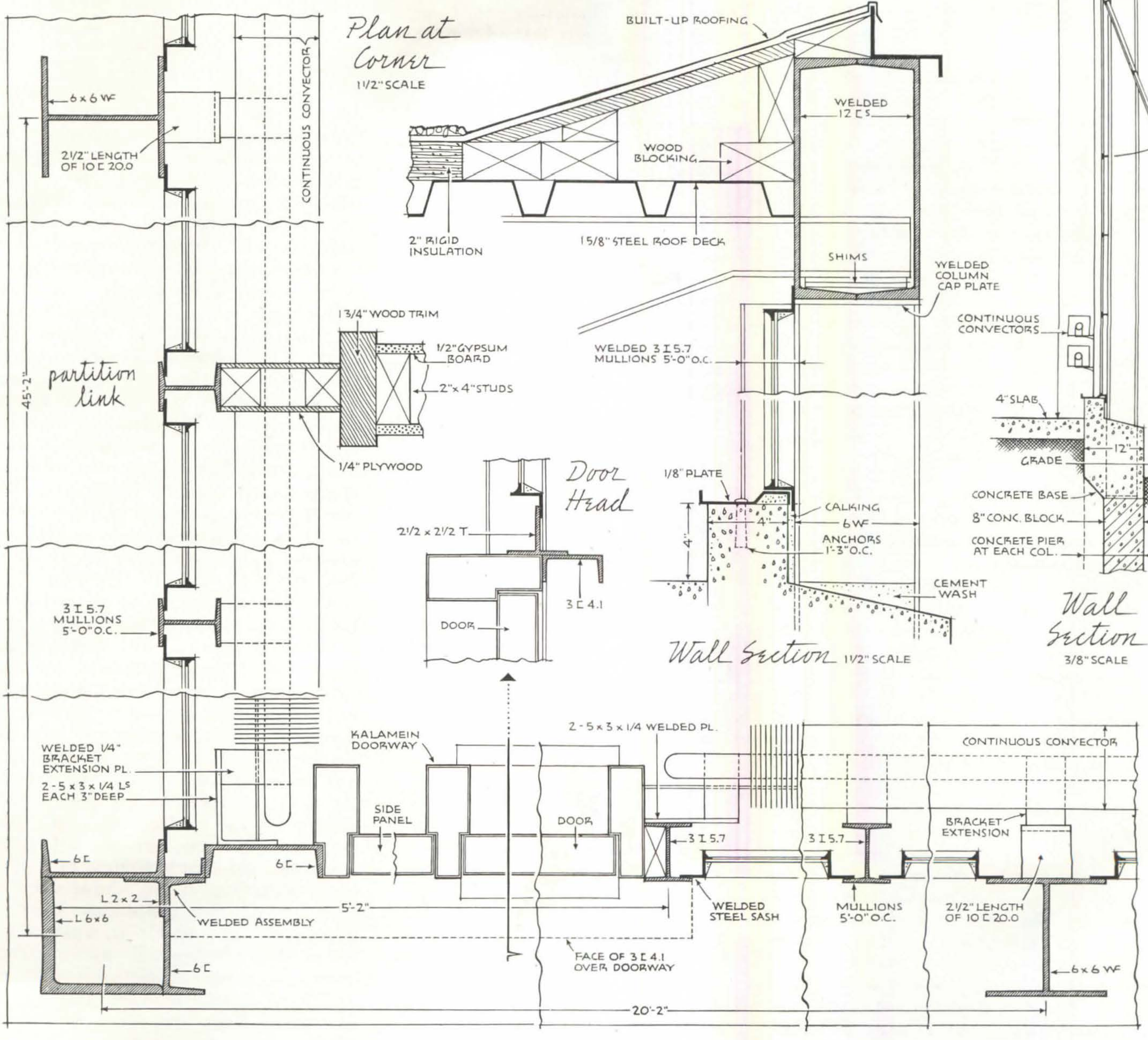
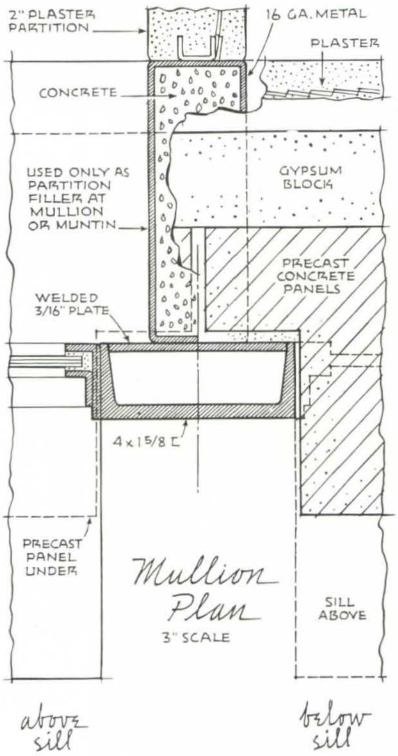
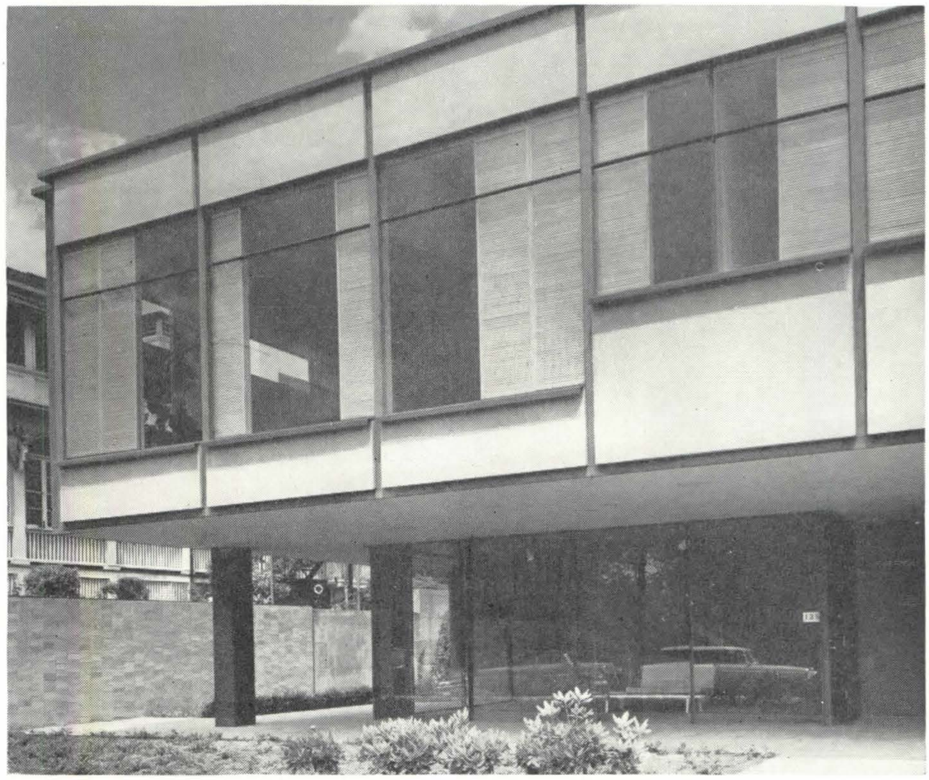




ARCHITECTS' OFFICE BUILDING, Toronto, Canada

John B. Parkin & Associates, Architects-Engineers





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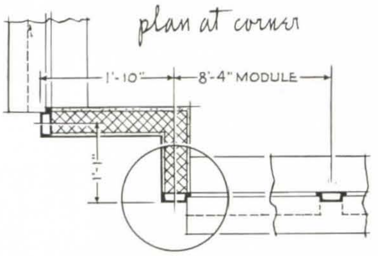

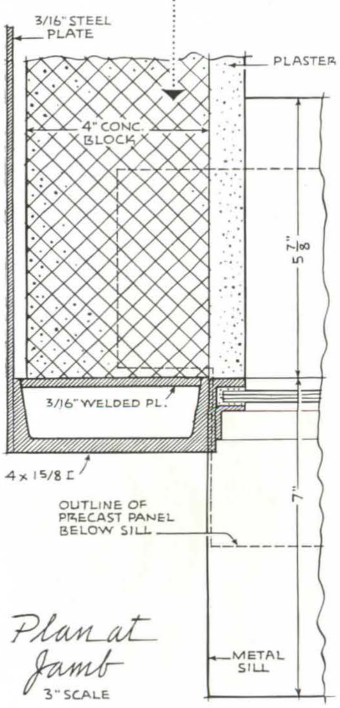

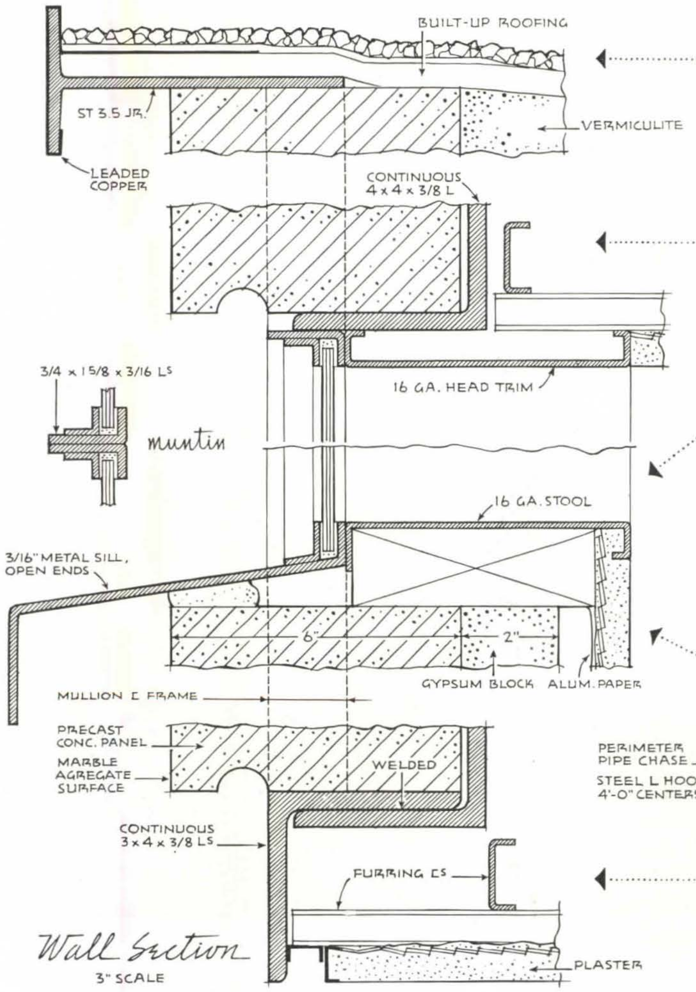

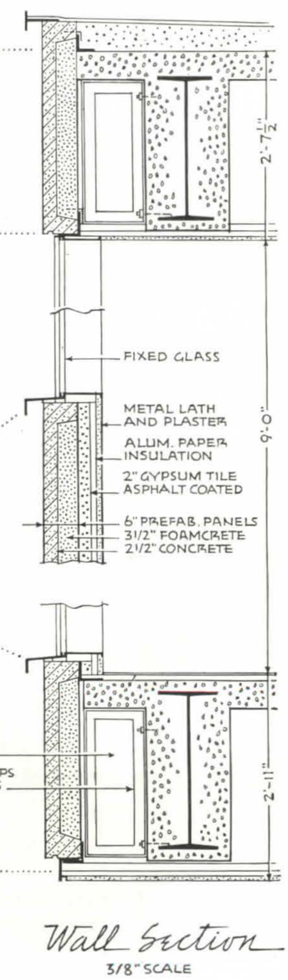

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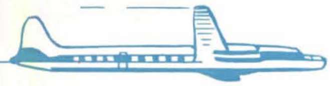

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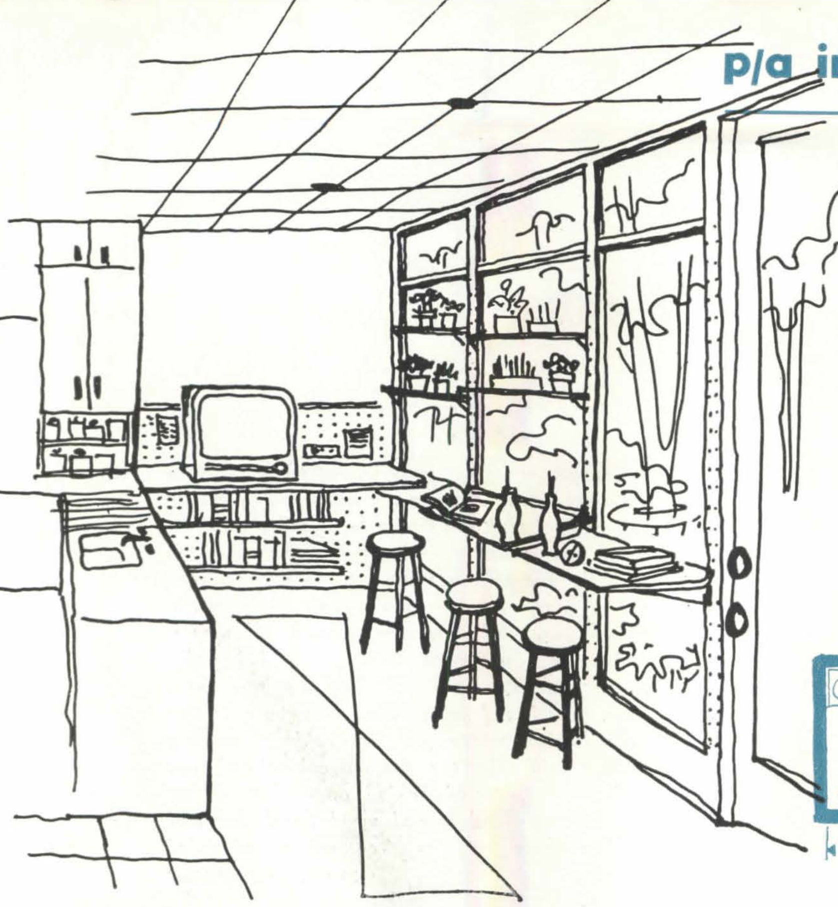
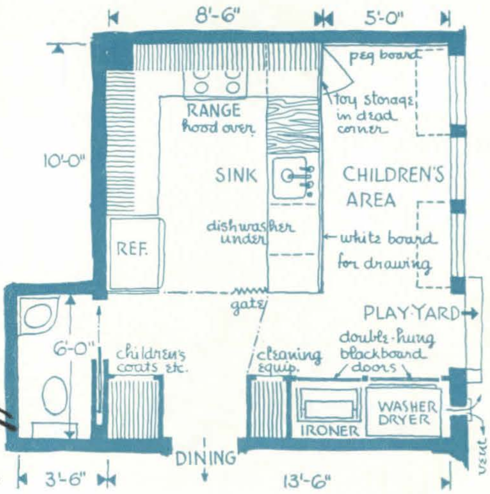


Preschool kitchen with teen-age variations, one of a series of nine kitchens designed by the author and illustrated in the book. All are based on the socio-psychological factors of kitchen planning.



Louise Sloane

kitchens

Because we feel that one new book written primarily for the consumer also offers unique material and a fresh viewpoint to the architect, we have used it as the basis for this month's IDD presentation. The book is *How to Choose, Plan, Equip and Decorate Kitchens* by Virginia Hart Wheeler, with illustrations by Helen Schiavo (Abelard-Schuman, Inc., New York, N. Y.). The author's unusual background (trained domestic architect, long-time kitchen planner, author of a kitchen handbook for the trade, consultant to appliance and equipment manufacturers, *House & Garden* Kitchen Planning and Equipment Editor, and experienced manager of her own family kitchen) is reflected in the book's contents and its approach.

Excellently illustrated, the book contains a folio of forty-three photographs of outstanding kitchens from which we show six on the following pages, designed by Oscar Stonorov, Satterlee & Smith, Twitchell & Rudolph, Greta Magnusson Grossman, John Storrs, and Marcel Breuer.

There is much that is soundly constructive in the book's section on kitchen-planning principles, and much that is research-time-saving in the section on choosing equipment, which is in itself a handbook of all types of new equipment, described in detail with relative costs, advantages and disadvantages, installation problems. An accompanying source list provides manufacturers' names and addresses. At the risk of sounding "chauvinistic," we feel the urge to recommend to the architect that he seize this opportunity to evaluate that woman's domain—the kitchen—from a woman's point of view.

kitchens

Prototype of the "living/dining/kitchen," this excellent example places the kitchen area out of full view of both the dining table and the formal living space; uses finishing materials that blend with the fine paintings and collector's pieces that are a part of the owner's life; provides the kitchen area with maximum work-convenience although appliances are skilfully concealed. Cabinets are in natural woods, ceiling is painted dove-gray, floor is red quarry tile. Stonorov calls this "the kitchen where you can cook in evening clothes." Within the custom cabinetwork are wall oven (recessed behind open shelves), refrigerator (behind hinged wood door), hot and cold cooking surfaces (recessed in extended counter).

Photos: C. V. D. Hubbard

location | Charlestown Township, Pennsylvania

architect | Oscar Stonorov

In a one-room weekend house, the kitchen is self-contained in one compact divider unit housing an under-counter refrigerator, dishwasher, range, storage cabinets, large sink, and providing good working or serving counter space. Full-length curtains may be drawn for further separation from the other areas. Color plan sets vivid turquoise, terra cotta, navy blue, and yellow against natural woods and a light gray floor.

Photos: Rodney McCay Morgan

data

equipment

Range: Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.

Refrigerator: General Electric Co., 310 W. Liberty, Louisville, Ky.

flooring

Asphalt Tile: Kentile, Inc., 58 Second Ave., Brooklyn, N. Y.

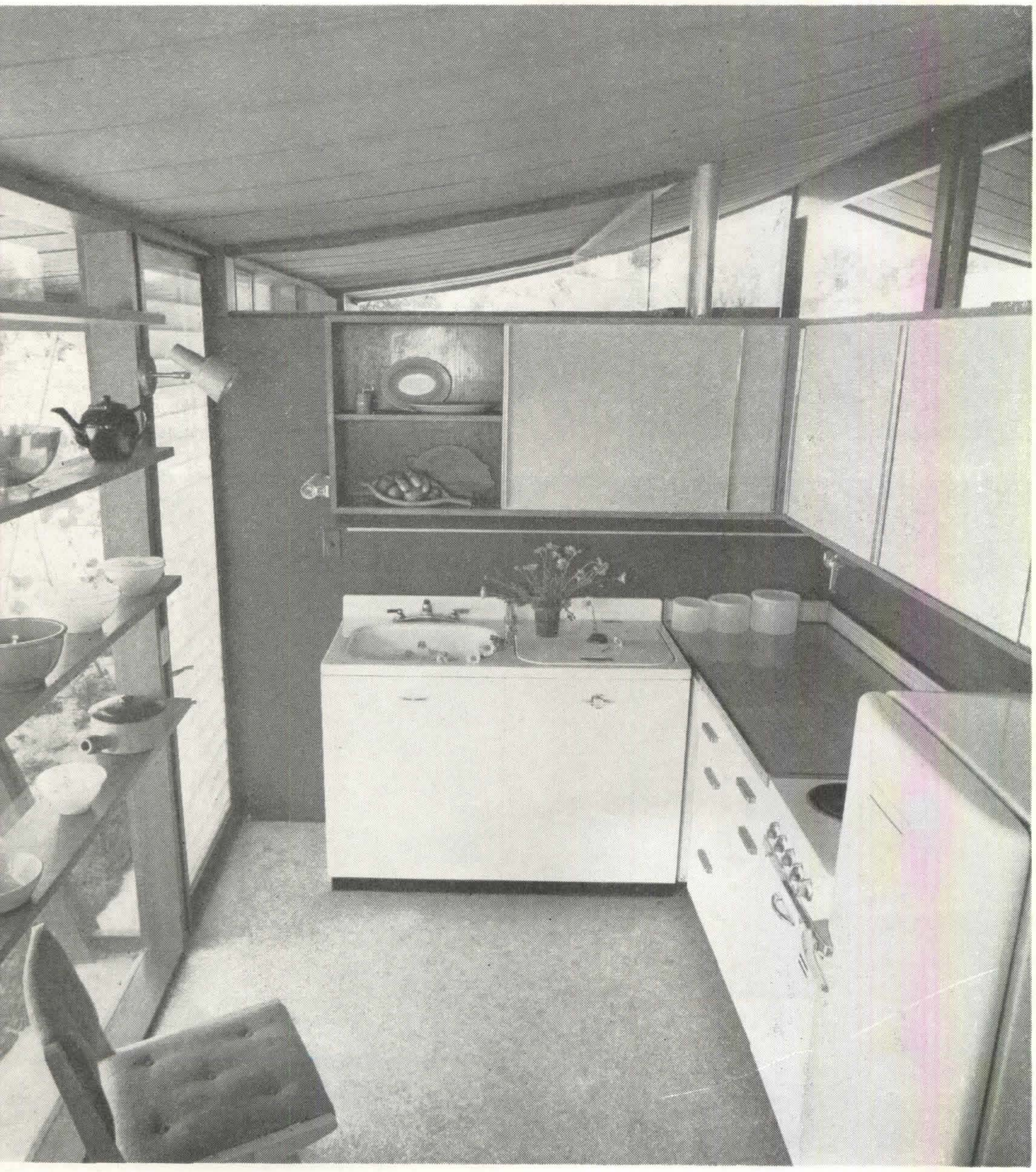
location | Fairfax County, Virginia

architects | Satterlee & Smith

kitchens

Agreeable and workable solution for a minimum kitchen with appliances (including a dishwasher) well arranged, and adequate counter and cabinet space. The very small kitchen has been given a sense of spaciousness by the introduction of a floor-to-ceiling glass wall, and by establishing the plywood partitions free of the ceiling structure. Floor is sand-colored terrazzo, the color repeated in canisters and lamp; fixtures are white; walls are natural birch; turquoise is introduced in ceiling and upper cabinets.

Photo: Rodney McCay Morgan



data

windows

All: "Pro-tect-you" jalousies with ¼" plate glass/Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh, Pa.

equipment

All: General Electric Co., 310 W. Liberty, Louisville, Ky.

lighting

Brackets, Fluorescent Tubes: General Lighting Co., 1527 Charlotte St., New York, N. Y.

location | Siesta Key, Florida

architects | Twitchell & Rudolph

A professional designer designs her own kitchen—and the result is a look of warmth with a plan of great efficiency. On one side is a counter-work area, the corner space below Swedish spice cabinets, a cutting-board. Dropleaf back of divider provides additional work-surface or may be used for eating. Repetition of open kitchen's natural-wood surfaces and black asphalt-tile flooring in adjoining dining space blends the two areas. Cabinets are natural birch, walls are elm and redwood burl or white sand-finish plaster, counter tops are gray.

Photos: Julius Shulman

data

cabinets, furniture

All: designed by Greta M. Grossman.

equipment

Counter Tops: The Formica Co., 4615 Spring Grove Ave., Cincinnati, Ohio.

Oven, Cooking Tops: "Thermador"/ A. J. Lindemann & Hoverson Co., Milwaukee, Wis.

location | Beverly Hills, California
designer | Greta Magnusson Grossman

kitchens

data

equipment

Counter Tops: The Formica Co., 4615 Spring Grove Ave., Cincinnati, Ohio.

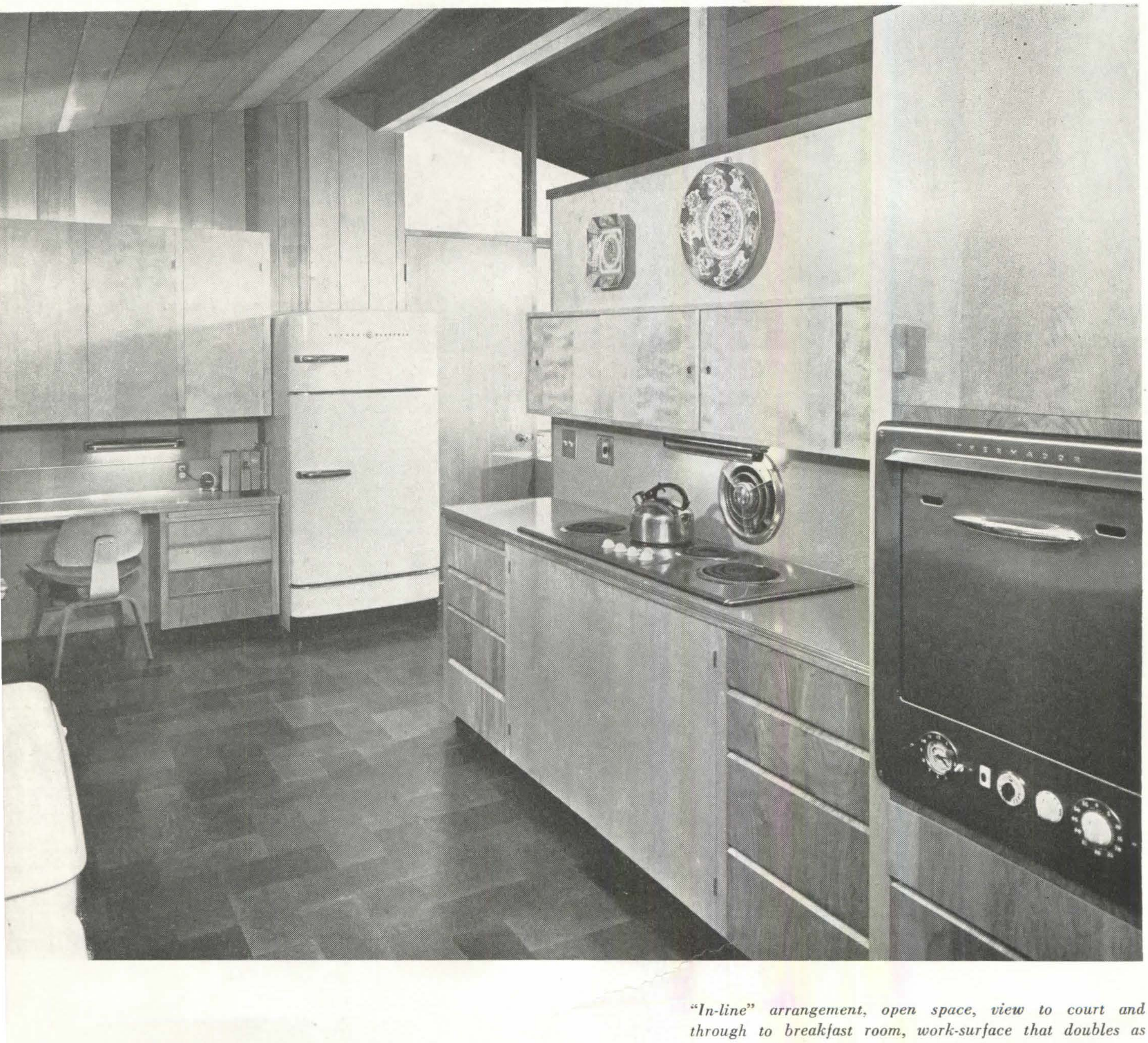
Dishwasher, Refrigerator, Washer, Drier: General Electric Co., 310 W. Liberty, Louisville, Ky.

Ovens, Range Tops: "Thermador"/ A. J. Lindemann & Hoverson Co., 601 W. Cleveland Ave., Milwaukee, Wis.

Sink: stainless-steel/Elkay Mfg. Co., 1874 S. 54 Ave., Cicero, Ill.

lighting

All: indirect-incandescent in tops of cabinets/"Lumiline" under upper cabinets/General Electric Co., Schenectady, N. Y.



location | Portland, Oregon

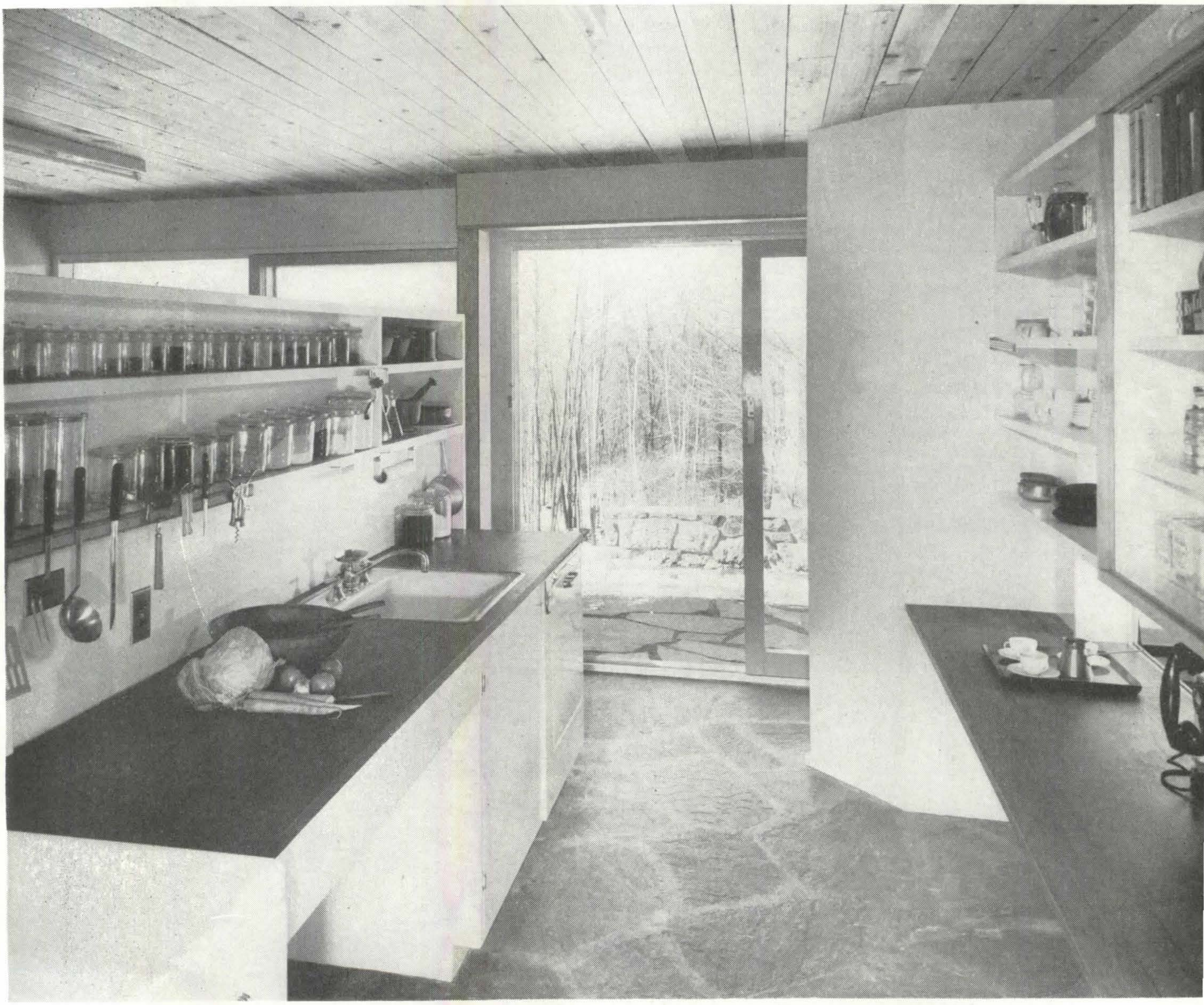
architect | John Storrs

"In-line" arrangement, open space, view to court and through to breakfast room, work-surface that doubles as a desk—all contribute to a simple but successful layout. Cabinet height matches height of all other built-ins in the house, an interesting point in view of the fact that the only full wall, higher than 7'. is the one around the bathroom. Neutral color plan (all natural except for green counter-tops and between-cabinet wall) was deliberately chosen as a monochromatic background for owner's Japanese possessions. Floor is cork, cabinets are birch; walls and ceilings are cedar.

Photo: Chas. R. Pearson

This kitchen is the central point of the house, not only in its location but also in its active place in the owner's life. This is clearly reflected in the easy convenience of the open shelving; the doorless passageways to dining room and utility room (combination deep-freeze storage laundry area); accessibility from both sides of the counter between kitchen and dining room. Sharing the open view, it serves both indoor and outdoor meals, and is amply provided with work surfaces and sit-down work space. White-painted walls and shelving are in fresh contrast with the ceiling of natural-color untreated cypress boarding, oiled teakwood counters, split-surface bluestone random flooring.

Photo: Ben Schnall



data

equipment

Range: Universal Electric Appliance Inc., Box 119, Lima, Ohio.

Dishwasher: Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.

Dryer: Whirlpool-Seeger Corp., St. Joseph, Mich.

Refrigerator, Freezer: Crosley & Bendix Home Appliances, Div. AVCO Mfg. Corp., Cincinnati, Ohio.

Washing Machine: Crosley & Bendix Home Appliances.

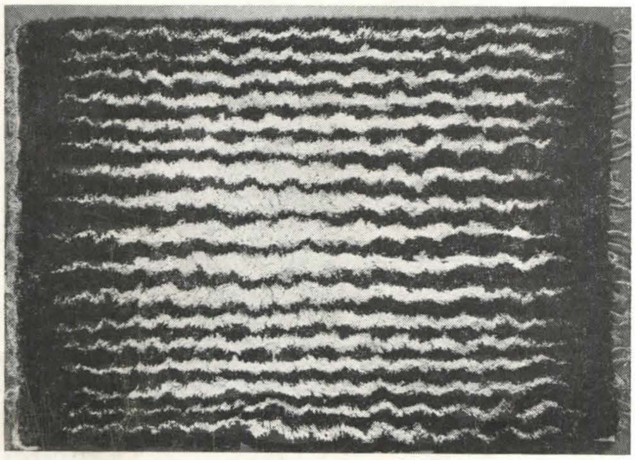
location | New Canaan, Connecticut

architect | Marcel Breuer

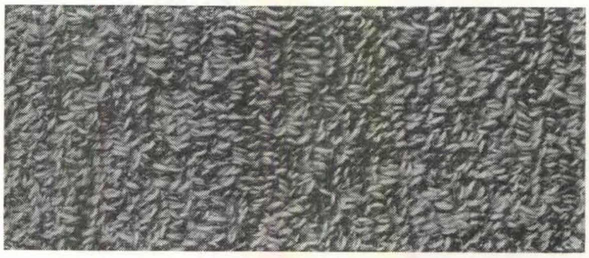
p/a interior design products

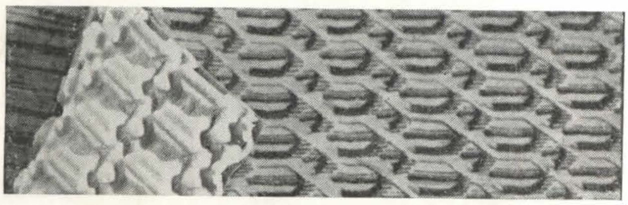
Cotton Rug: "Checker"/ tufted cotton/ alternating blocks of looped pile and low-cut pile/ available in room-area sizes/ 17 colors/ sizes range from 2'x38" to 12'x15'/ **retail:** $9.95 sq yd/ **Needletuft Rug Mills Division of Cabin Crafts, Dalton, Ga.**

Handwoven Rug: one of collection of tribal rugs from Morocco/ all are different in design/ made entirely by hand/ homespun wool/ colors achieved by natural dyes/ resistant to water and light/ Beni Quaraine tribal rug with 3" pile/ black with irregular zebralike stripes in white/ 9'2" x 6'9"/ **retail:** $1125.00/ **Mauretania Fabrics, Inc., 140 E. 56 Street, New York, N.Y.**



Textured Carpeting: "Tam O' Shanter"/ solution-dyed tufted rayon in tweedy texture/ "Solarized" for color fastness/ latex-back/ available in tweed combinations of white, tan, and brown; brown, green, and white; black, white, and green; black, white, and gray; white, light nutria, and dark nutria/ 12' and 15' widths/ **retail:** $6.95 per sq yd/ **C. H. Masland & Sons, Spring Road, Carlisle, Pa.**





Carpet Underlay: "U.S. Airlane"/ 1/4"-thick/ sponge rubber design on underside anchors it securely to floor/ strong fiber backing/ 53" wide/ natural cream color/ **retail:** $1.75 sq yd/ **U.S. Rubber Co., Rockefeller Center, New York 20, N.Y.**

Movable Wall: "Tahoe" by Tropicraft of California/ woven of wheat- or oak-finished slats with beige, brown, gold chenille, and metallic braids/ **retail:** approximately $106 for 6'x8' size/ **Isabel Scott Fabrics Corp., 515 Madison Ave., New York, N.Y.**