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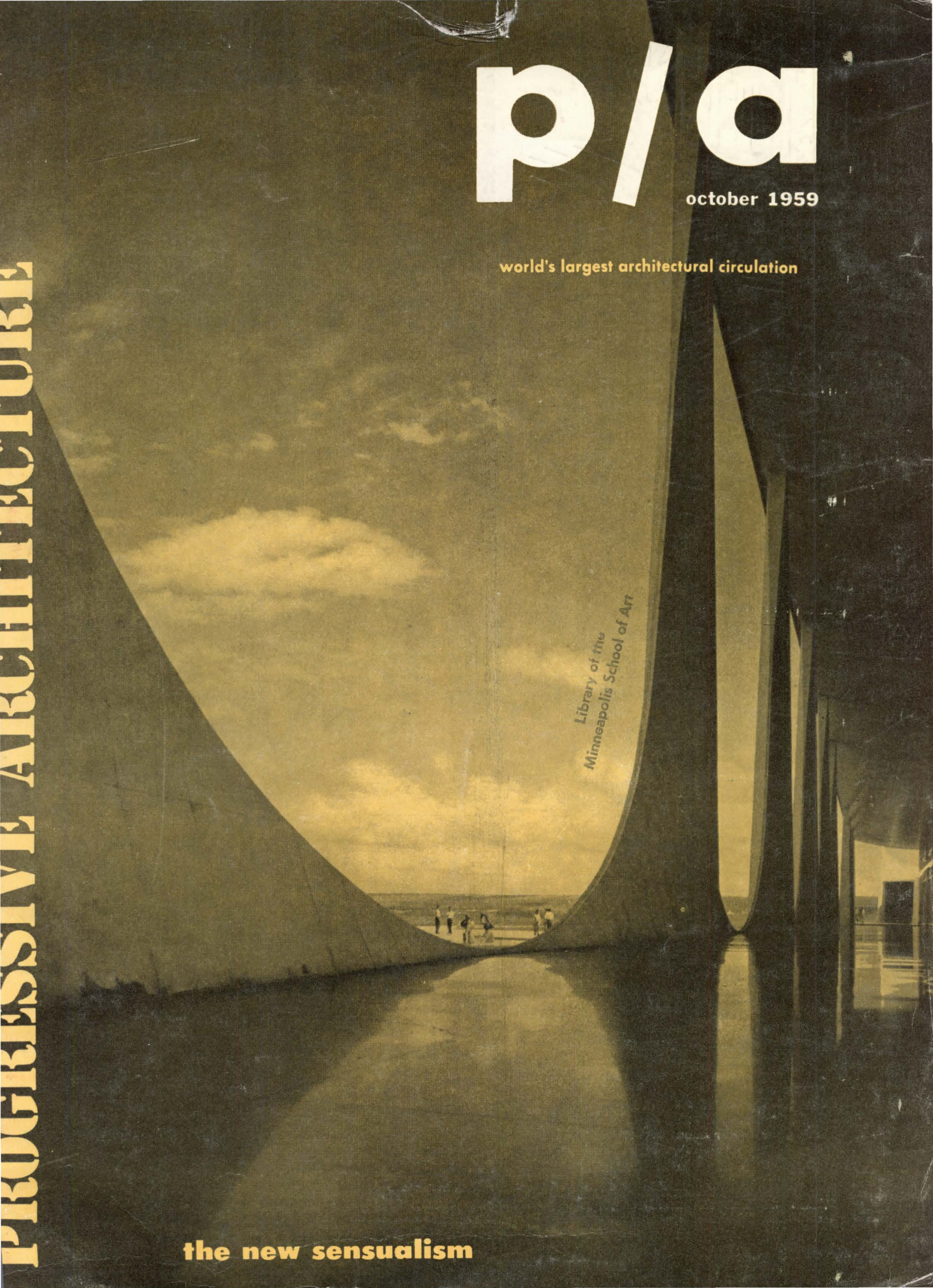

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PROGRESSIVE ARCHITECTURE

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Volume XL, No. 10

Two Area-Zoning Decisions

It's The Law Column by Bernard Tomson and Norman Coplan

P/A Practice of Architecture *column that discusses two recent court decisions upholding the validity of zoning by lot size.*

The legal struggle between suburban or rural communities and suburban builders, involving the attempts of such communities to limit new residential construction by area zoning, has resulted in two recent and significant decisions by the highest courts of Connecticut and New York. The New York decision (*Levitt vs. Incorporated Village of Sands Point*) has upheld the validity of two-acre zoning, and the Connecticut decision (*Senior vs. Zoning Commission of the Town of New Canaan*) has upheld the validity of four-acre zoning. These decisions were hailed by those who had been fighting against any relaxation of present bars to residential expansion, and were deplored by others as working hardship on lower income groups and preventing an orderly population growth.

This column reported upon the New York case as it was being litigated in the lower courts (see: "IT'S THE LAW," JANUARY 1958, and AUGUST 1958 P/A). In this case, a property owner had purchased a 127-acre tract, which was zoned for one-acre plots, with the purpose of sub-dividing the property for residential development. Three years after the purchase, the Village amended its zoning ordinance to require a two-acre minimum for residential construction. The property owner challenged the constitutionality of this amendment, contending that it was unreasonable because its purpose had no direct relationship to the public health, safety, or welfare. In support of this position, the property owner contended that adjacent land which was outside the Village limits had been developed with homes on 7500-sq ft plots and that it was impossible, therefore, to develop his 127 acres for two-acre home sites.

The trial court upheld the property owner's contention and voided the ordinance. On appeal the lower court was reversed by a 3 to 2 decision of the intermediate Appellate Court; the majority holding that the ordinance was not unreasonable or confiscatory and the minority ruling that the amendment was an improper exercise of the police power of the Village. On appeal to New York's highest court, the majority ruling was affirmed by unanimous decision. The Court said:

"The enactment of a two-acre minimum-lot area requirement is, in an appropriate case, a legitimate exercise of the police power. . . . The evidence in this record as to the character and location of the Village of Sands Point, with its isolated geographical position in a fringe area on the northern tip of a peninsula, and of the Residence 'A' District therein, consisting of rolling and partly wooded land in an attractive *rural* residential community, supports the findings of the Appellate Division on the factual issue of the reasonableness of the zoning ordinance. . . . Mere lessening of profits as here, or even economic loss to an affected property owner, does not render a zoning ordinance confiscatory and thus unconstitutional in its application."

The Connecticut decision involved a tract of 436 acres located in a residence zone in New Canaan, Connecticut. The zone consisted of more than 4000 acres embracing the entire northerly portion of the town. The entire area had been upgraded in December, 1956, increasing the minimum-lot area for residential construction from two acres to four acres. The plaintiff property owner contemplated a real-estate development of two-acre lots prior to the upgrading and he contended that the action of the municipality in upgrading the area was unreasonable, arbitrary, and illegal. The Court of Common Pleas of Connecticut ruled the upgrading unconstitutional, but on appeal to the Supreme Court of Errors, Connecticut's highest Court, that determination was reversed and the change in zoning was upheld. The Court stated:

"The zone, consisting of over 4000 acres, embraces the entire northerly portion of the town. The land is heavily wooded, hilly, and at present comprises only a little over 600 separate parcels. Six percent of the zone is occupied by reservoirs supplying water to nearby municipalities. It is a semi-rural area of natural beauty and has neither water nor sewer services. . . . The upgrading of a zone in a residential semi-rural area is a type of regulation generally upheld. . . . As pointed out in *1 Yokley*, cited above, at page 421, for zoning regulations establishing mimimum areas of lots, especially in residential zones, to be valid, they 'must be reasonable and must be considered in the light of the facts of each particular case. There must necessarily be involved the surrounding topography of the area, the proximity to urban centers, the general character of the existing homes in the area, and the absence or presence of commercial and industrial developments'. . . . Even if the plaintiff proved himself correct in his opinion that he could obtain a larger return from the sale of two-acre lots than from the sale of four-acre lots, the action of the commission is not thereby invalidated. . . . The maximum possible enrichment of developers is not a controlling purpose of zoning. The plaintiff stated to the commission that the town of New Canaan, as of the 1950 census, had the highest per capita income of any town, village, or city in the United States. This fact, given to the commission by the plaintiff, was certainly a proper fact for it to consider in deciding whether the establishment of a superior residential district would be the most appropriate use of this unspoiled area. . . ."

The postwar demand for suburban housing and the tremendous activity of builders to meet this demand has resulted, in the viewpoint of many suburban and rural communities, in the deterioration of community values and standards. The fear of many communities that the introduction of housing developments, followed by new shopping centers and other commercial enterprises, will destroy the rural atmosphere and beauty of the community has engendered various efforts to slow down the construction of new homes. From the builder's or property owner's viewpoint, these efforts are an invasion of his rights, a curtailment of free enterprise, and a discrimination against moderate-priced housing. Many local governments, however, contend that relatively unrestricted housing development puts demands upon the community in respect to utilities, schools, police and fire protection, traffic, and shopping facilities which they cannot meet.

In this conflict, as indicated in the two cases discussed above, the courts are placing increasing emphasis upon esthetic factors in support of zoning restrictions. These decisions appear to indicate that the courts will give precedence to the preservation of the beauty and tranquility of suburban or rural areas over the rights of individual property owners to develop their property freely and with minimum restriction.

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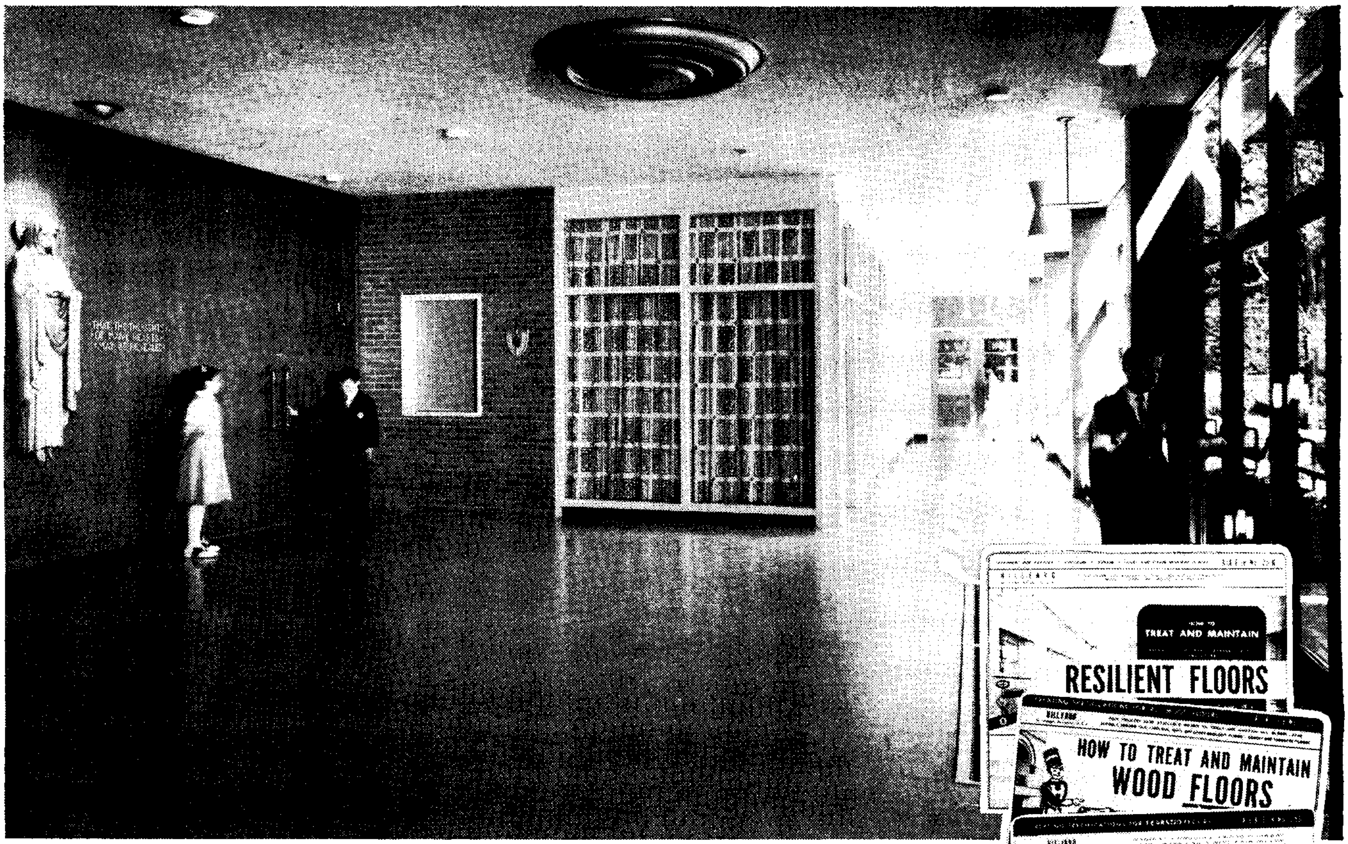

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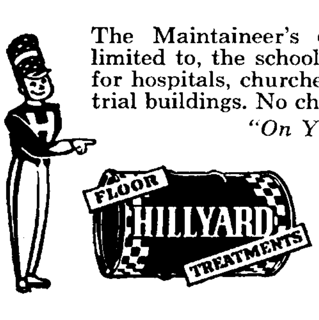

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Tile Council States Case for New Standards

Specifications Clinic by Harold J. Rosen

This* P/A Practice of Architecture *column questioned in* June 1959 P/A *the new ceramic-tile standards promulgated by Tile Council of America, Inc., for the reason that much valuable information formerly contained in the* Tile Handbook *was not included in the new standards, and also that there was considerable duplication in establishing three separate specifications for glazed, ceramic, wall tile; for ceramic, mosaic tile; and for quarry tile and pavers. It was suggested that a revision of the* Tile Handbook *to incorporate specifications changes would have served specifications writers far better. Excerpts from the Tile Council reply follow:

The recent article in P/A's SPECIFICATIONS CLINIC comparing the newly issued American Standard Specifications for installing Ceramic Tile in Portland Cement Mortars with the *Tile Handbook* is noteworthy for its praise of the *Tile Handbook.* The Tile Council is justifiably proud of the *Tile Handbook* and it was only with extreme reluctance that this type of manual was abandoned in favor of industry specifications to meet the demand from Architects and Specifications Writers who desired concise specifications to be used by reference . . . .

The demand for technical information and specifications for ceramic tile was met by the publication of Don Graf's *Tile Handbook* by the Tile Council of America. Even at the time of publication, it was recognized that the need for more complete specifications which could be used for reference still existed. The American Standards Association was asked to sponsor the A108 project and Harold R. Sleeper, AIA, leading authority in specifications writing, was retained to serve as author and editor. [Proposed drafts were distributed to leading archtects for use in actual jobs.] Comments from this source as well as continued study by the sectional committee brought in many revisions and additions which have been incorporated in the approved specifications.

The A108 Committee [consisted of tile layers' union, tile manufacturers, government agencies, and various consumer agencies]. Producers of materials used in tile installation and also producers of materials used as backings or bases for the tile work were also represented. The wide representation of this sectional committee is an apt example of the procedures of American Standards Association, which assures all interested groups of equal representation on all projects. This was the major reason that American Standards Association was asked to sponsor the project; i.e., that a specification truly representing the entire industry would be assured.

The form of the specification as established by Mr. Sleeper is the short form or streamlined type which has gained so much in popularity in recent years. This format was selected as being most suitable and as being preferred by most architects.

The three specifications were printed in one booklet. However, each specification may be used separately or the three may be combined as needed by job specifications. While briefness has been maintained, enough detail of installation was retained to enable inspectors or supervisors to determine whether proper installation was being done.

One feature of the specifications is the strict requirement for high quality of workmanship and final appearance. While it was recognized from the beginning that this was to be a minimum standard, the industry and sectional committee were unanimous in the opinion that the best economy was gained by good and careful installation. On the other hand these requirements do not call for unneeded work. Therefore sound time-saving procedures are emphasized. The specifications in their approved form are the result of years of study and experience by all segments of the industry and are in the opinion of the industry the minimum standards that will assure attractive and lasting tile installations.

Notes on the use of the specifications and installation procedures are a feature of the "foreword" to aid the Architect and Specifications Writer. While this material is not part of the specifications, in that it would not be included as part of the job specifications, it is valuable as a guide to the architect in the preparation of both drawings and specifications for tilework. Particular emphasis on the preparation of exterior surfaces to receive tile has been included in the notes as well as careful definition of the division of work between the various trades. Furthermore the Explanation and Notes are most helpful in interpretation of the intent of the specifications and as a check list in specifying tile materials.

Another inclusion which is not part of the tile specifications is the appendix composed of Requirements for Related Divisions. The importance of proper preparation work on base and backing surfaces cannot be overemphasized in assuring good tile installations. The division of work between trades is carefully spelled out so that duplications or omissions should not occur in bidding nor questions of responsibility arise during construction. The related divisions sections were prepared so that they may be used as a check list, copied directly into the related divisions of the job specifications or included therein by reference.

Twenty government, industry, and ASTM standards are referred to in the specifications and, in fact, preparation of specifications of any type would be many times more difficult if these standards were not available as references. . . .

The importance of preparation of backing and base surfaces is carefully stressed in the specifications. Ceramic tile, to reach its full potential, must be installed on a sound, durable and dimensionally stable base. . . .

Mortar materials and proportions are spelled out to insure that the mortar setting bed will have the proper qualities. One of the most important features of tile-setting mortars is that of minimizing shrinkage. To control this shrinkage and still maintain satisfactory workability and strength requires relatively narrow limits on the proportions of cement, lime, sand, and water used. Also the requirement of cutting through the setting bed every 16" to 24" is included for wall and ceiling installations. These cuts which are made at the line of tile joints isolate the shrinkage into small areas which will not cause damage. Cutting the setting bed is not required on floors, since a leaner mix and a lower water cement ratio is used. Thus shrinkage is minimized.

The use of a neat-cement bonding coat between the tile and setting bed is stressed in the specifications. The im-

(Continued on page 11)

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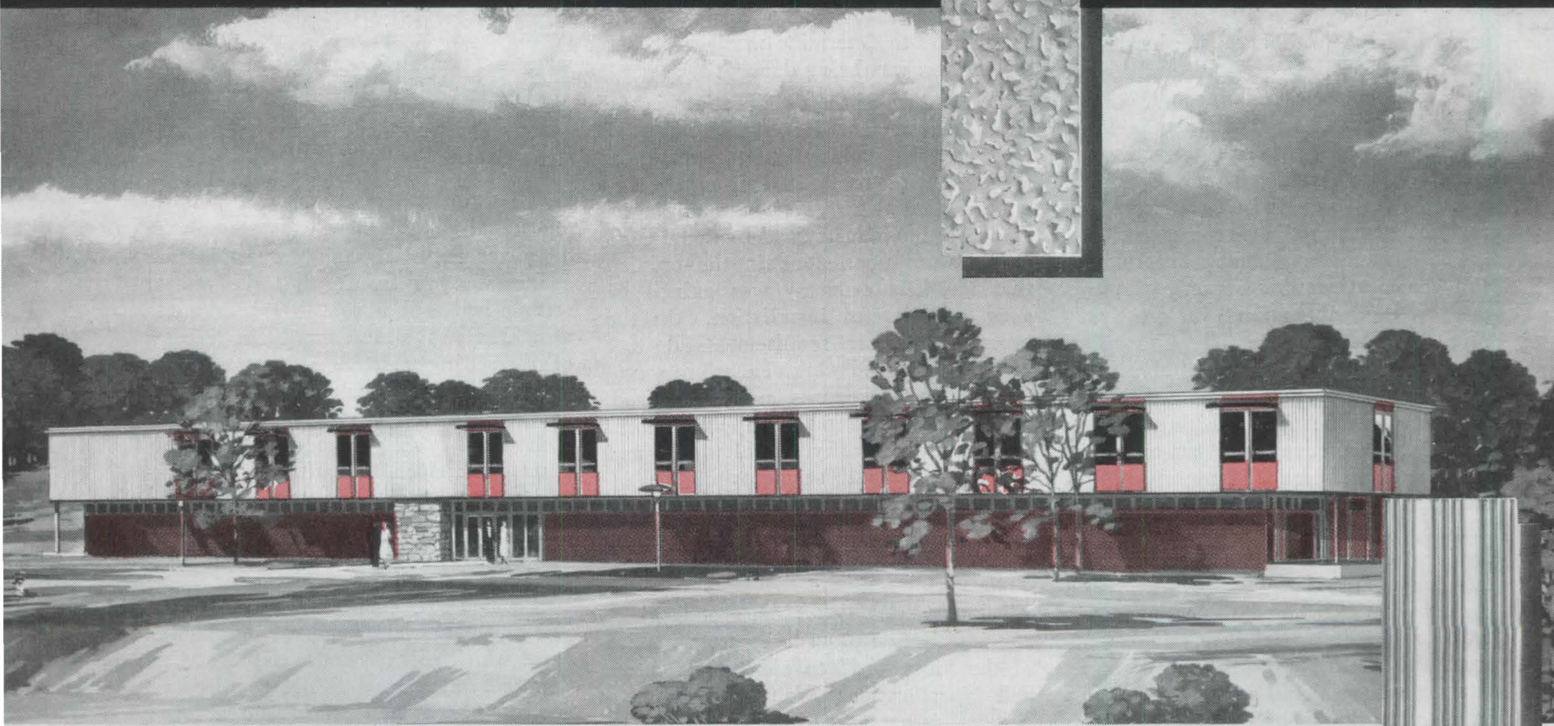

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Tile Council States Case (continued)

portance of this neat coat cannot be overestimated in bonding the tile but paradoxically if the neat coat is applied too thick it does not perform its function. Hence the limits of the neat-cement bond coat are given as 1/32" to 1/16" in thickness.

These are just a few of the special features. The new specs are adequate for exterior applications, roof decks, ceilings, shower receptors, counter tops as well as ordinary walls and floors. The *Tile Handbook* unfortunately did not give this comprehensive coverage.

Problems were encountered when these applications were required in architectural specifications which simply said "tile set in accordance with the *Tile Handbook*." More serious was the omission of references to expansion-contraction joints.

Since writing the *Handbook*, definitions of tile terms have received ASTM recognition; therefore the new specs refer to ASTM C242-56T. SPR-R61 and SS-T-308 are in process of revision. These are properly included by reference in lieu of copying so that the latest edition will always apply. As mentioned above, detailed drawings will be prepared as supplements. Latest approved tile sizes and shapes have been included in current proposed revision of SPR-61. In other words, careful judgment was exercised to assure that the ASA specs would be fully up to date.

The Owner — His Goals and Objectives II

*Practice of Architecture by Irving D. Shapiro**

P/A Practice of Architecture *article concluding the discussion begun last month on the role of the Owner, and his aims, in shaping today's architectural "space units," as they are seen by an urban land economist who is also an architect.*

Business enterprises are not the only Owners customarily involved in the assembly of spatial units. There are also public enterprises, such as incorporated cities, villages, and townships, counties, and states, government-owned corporations, and the Federal Government itself; and there are quasi-public enterprises.

The Public Enterprise. The motivational pattern which lies behind the actions of a public enterprise is, in reality, the sum total of the motivational patterns of the individuals and groups which constitute that public enterprise and yield authority to it. And these numerous individuals and diverse social groupings are likely to have conflicting motivational patterns. Often, this results in a multiplicity of goals which are essentially at odds with one another. Consequently, goals for any public enterprise—and particularly for the Federal Government—are likely to be many and varied at any one time.

Even as the goals of a public enterprise are often varied, contradictory, and conflicting, the means of the public enterprise for their realization are many and diverse. Thus, for example, a goal of a public enterprise might be to eliminate "substandard" housing. This objective could be attempted by means of subsidies, taxation policies, the entrance of public authorities into the residential field as owners-in-fee, the use of so-called police powers, and so on. Each of these alternatives would probably be chosen by some of the individuals who agreed that the elimination of substandard housing was a proper end for governmental action. Yet, it is certain that whatever means were chosen, they would be unacceptable to some individuals and groups in the constituency.

Moreover, even if all the members of a community were to be in complete agreement that the entrance of public authorities into the residential field as owners-in-fee in order to eliminate substandard housing was justifiable, there would still be disagreement among them as to whether the primary purpose would be economic, social, or political. Yet, upon such a determination would rest the shape of the spatial units involved, the kind or kinds of activities they would facilitate, their location, the capacity of their improvements, their esthetic expression, and so on.

The goals of a public enterprise and the means for attaining them are created in response to many individuals and many groups who, from time to time, impose upon such enterprise the responsibility for the attainment of one or another of their goals. Furthermore, with the passage of time, previously important groups decline while others rise to positions of influence and each may have new goals or new means to offer. It is unlikely, then, that a single, sharply defined objective for public action and a clearly defined means for its attainment are possible for any public enterprise. What is more likely is the simultaneous pursuit of many goals by the use of many different mechanisms.

Consequently, in matters concerning the assembly of spatial units, the objectives of a public enterprise are not likely to be sharply definable and clearly discernable. Motivations that are social, economic, and purely political will usually pervade the realm of public action at one and the same time. For example, the motivational pattern which resulted in the creation of the Tennessee Valley System was completely interlaced with social, economic, and political objectives. The erection of the United Nations complex in New York, on the other hand, was presumably motivated solely by political forces. Yet, even then, who can

(Continued on page 13)

*Partner, Naidorf & Shapiro, Architects-Urban Land Economists.

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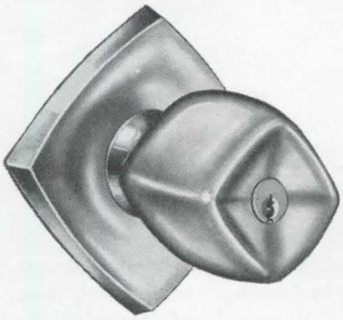

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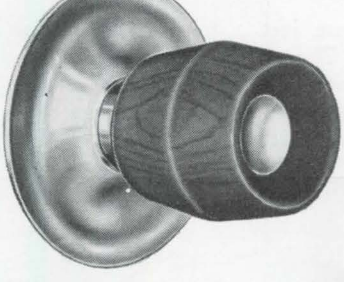

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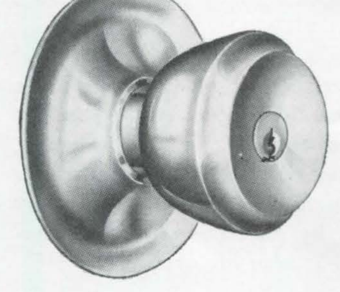

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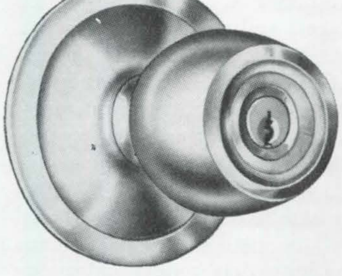

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The Owner—His Goals and Objectives II (continued)

say that the United Nations spatial unit was not conceived within the penumbra of social and economic forces as well?

The determination of a single universal objective whose attainment is to be achieved by the assembly of a spatial unit—when a public enterprise is involved—would seem to be an impossibility at this point. And, consequently, considerations of the factors of architecture related to the spatial unit would also appear to be inevitably shrouded in uncertainty and indeterminacy. However, one can hold that the intensity with which all diverse motives act in formulating the objectives of a public enterprise are not equal where a proposed real-estate facility is concerned. The issues here are usually more "tangible" and the conflicts among the constituency more easily resolved. Thus, the assembly of a spatial unit to facilitate the testing of intercontinental ballistic missiles by the Federal Government is motivated primarily by political and military reasons and few of the constituency would act to bar its completion. The goal is also social and economic, but only indirectly so. The creation of public parks is primarily a social phenomenon; the assembly of the Erie Canal spatial unit was motivated by forces that were primarily economic.

Consequently, close examination of the motives of a public enterprise in assembling a spatial unit will more than likely reveal the goal or objective that is predominant over the rest. It will then be possible to organize a suitable program for the assembly of the proposed spatial unit.

•

The Quasi-Public Enterprise. At times, enterprises are organized to provide for the continuous tenure of a group who are bound together by special interests and like attitudes. These activities are generally of a nonprofit nature but may involve the negotiation of contracts and the ownership of property. However, the financial and property aspects of this form of organization are only incidental to its objectives and can be quite modest in magnitude. It is useful to classify all such enterprises as quasi-public enterprises. One may include within the classification of the quasi-public, most religious organizations, social clubs, libraries, hospitals, and universities. In addition, mutual and co-operative organizations such as mutual insurance companies, savings and loan associations, and co-operative marketing agencies such as those of farmers may also be included.

The motivational pattern of a quasi-public enterprise is usually composed of only those motive forces that are common to the entire membership and, consequently, only those which reflect the universal interests of the whole group. Thus, the motivational pattern of a quasi-public enterprise is generally a complete entity in itself acting independently of any individual member's unique motivational pattern. More often than not, the individual constituents of a quasi-public enterprise are required to compromise their own motivational patterns in acquiescence to the interests of the group as a whole. As a result, the motive forces behind the goals and objectives of a quasi-public enterprise are generally forces generated by ideas, traditions, callings, and concepts, rather than by biological pressures.

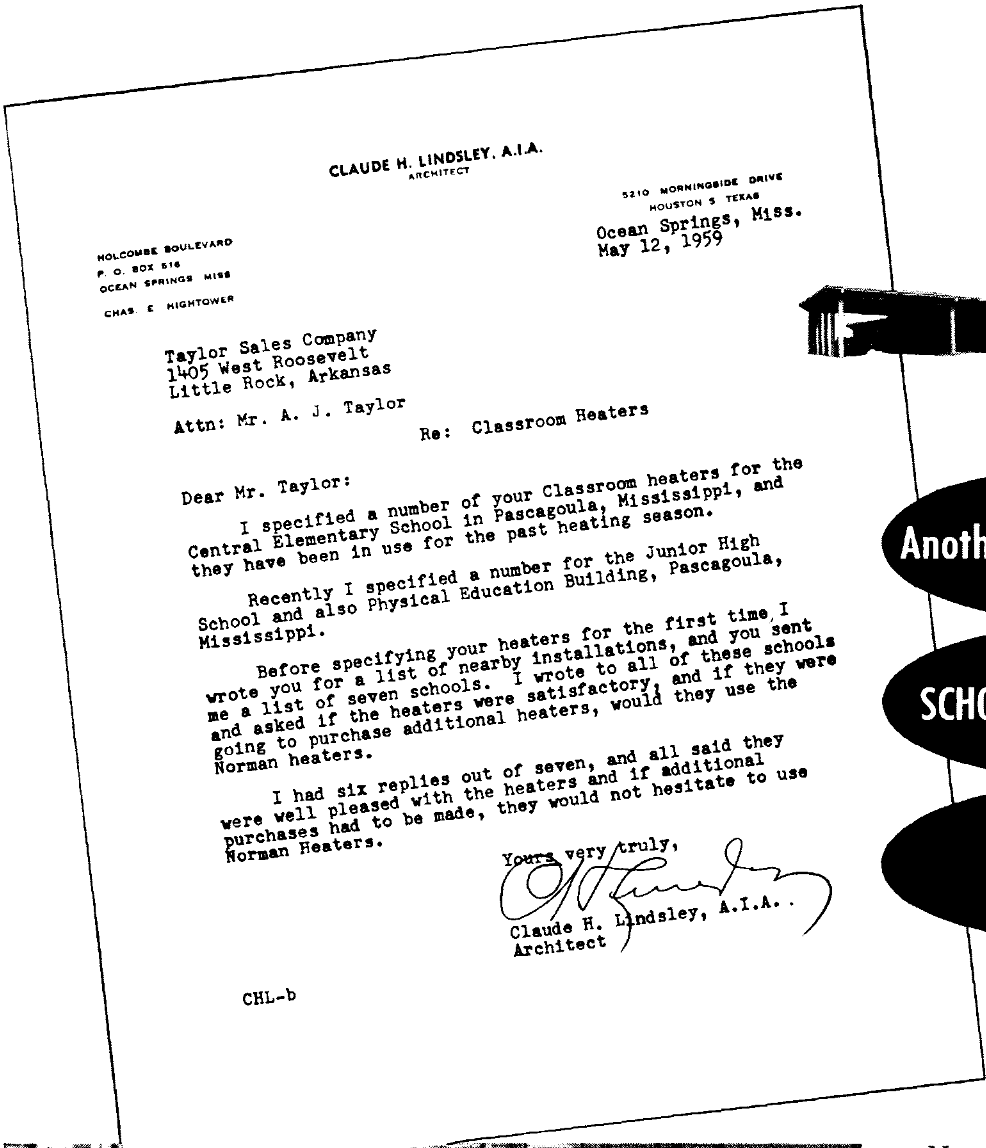
A close examination of the direction of orientation, values, emphases, and functional necessities of these ideas, traditions, callings, and/or concepts will generally yield an insight into the motivational pattern of a quasi-public enterprise and, consequently, into the objectives which lie behind the assembly of its spatial units. For example, religious groups are generally oriented toward the existence of the supernatural. Their members usually respond to this orientation with emotions and psychic states—such as awe, fear, ecstasy, and reverence—and engage in related activities by the use of material objects such as altars, charms, and vestments. The result is often an aura of symbolism, tradition, and ritualism whose importance rises above the importance of any individual member and which constitutes a set of characteristics most influential in locating and shaping a spatial unit assembled to facilitate religious activities. As a result, those spatial units are generally unique in appearance, function, and degree of specialization when compared with other spatial units.

On the other hand, the motivational pattern which lies behind the assembly of a spatial unit to facilitate the more or less formal exchange of knowledge and the stimulation of thought is probably the antithesis to that which produces religious facilities. The goals and objectives of a modern university are intellectual in direction rather than emotional and the atmosphere usually desired by it encourages activities characterized by criticism, testing, and a continual re-examination of values rather than emotional submersion. The mutual interests which draw together faculty and students to such a spatial unit are also broader in scope and less restrictive in their membership requirements than those of a religious group. As a result, the locational requirements, considerations of spatial allocation, and of esthetic expression of a university generally differ to a marked degree with those of a spatial unit assembled to facilitate religious worship.

There are still other types of motivational patterns found among quasi-public enterprises. For example, the organization of some quasi-public enterprises such as hospitals is motivated by the desire to do something constructive for those who are suffering from some hardship or incapacity. Hence, the values by which such quasi-public enterprises are structured are primarily humanitarian and, consequently, the goals and objectives which lie behind the assembly of their spatial units are usually quite different from those previously described.

In summation, then, the motive forces which lie behind the assembly of a spatial unit may be generated by: (1) an individual or a small group of individuals, as is suggested in the case of a business enterprise; (2) an entire constituency or that sector of a constituency applying the most pressure at any one time, as appears evident in the case of a public enterprise; and (3) ideas, traditions, callings, and/or concepts, which seem to characterize the quasi-public enterprise.

The goals and objectives generated by these diverse motive forces may be economic, social, political, and so on. They condition the relationships among the four factors of architecture and, where a specific spatial unit is involved, such a set of relationships can have substance only when it is placed within the framework of a known and stated goal and/or objective. It cannot exist without the simultaneous existence of an objective, for then there would be nothing to bind together considerations of land use, structure, function, and esthetics into a single operating unit.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Mechanical Engineering Critique by William J. McGuinness

P/A Practice of Architecture *column on mechanical and electrical design and equipment, devoted this month to odor reduction in hospitals.*

William James, eminent American philosopher, had some significant ideas about man's reaction to his environment. His prominence as a psychologist tends to obscure the fact that he was a doctor of medicine, as well as a doctor of literature and laws. During his tenure as Professor of Philosophy at Harvard, in the late 19th Century, he wrote a number of books. In one of these, *Psychology*, published in 1892, he devoted exactly 30 percent of his writing to discussions of functions of the brain and the several senses. Sight and hearing are each accorded the dignity of a full chapter. Though the word "olfactory" appears in one or two places, no specific section is devoted to the sense of smell. Indeed, since that time, aided by instrumentation, optics and acoustics have become very exact divisions of science while the sense of smell has received only scanty and belated attention, mostly during the last two decades. There are two reasons for this delayed action. One is because there is a measure of delicacy involved. When an unpleasant smell exists, it is not always mentioned. It is even less often that one is inclined to discuss the cause. The other reason is that odor detection and classification do not yield readily to measurement by instruments. Although the nose remains the prime instrument for this purpose, the science of odors has finally moved into a scientific phase.

Smells have strong personalities and the habitual occupant becomes inured to them. A hospital, in construction, smells like any other building project; wood, mortar, paint, plaster—a smell pleasant to, or even unnoticed by, a construction man. The author recently was a visitor to a hospital which he knew when it was redolent of putty, pipe compound, and roof tar. In spite of top maintenance over the years, one wing with a new coat of paint and a brand-new, once-through ventilating system using 100 percent outside fresh air, was found to be characteristically pungent with strong and not-too-pleasant hospital odors. These odors the nurse endures or even ignores, through long association. Not so the patient or the patient's visitor. Of sanitation the patient feels assured. Is he not also entitled to a sweet and nonodorous climate? It would surely give a psychological lift, and in some cases might aid the patient's recovery.

One must be frank in a discussion of odors. Except for some malodorous industries, there are few processes that subject a building to more possibility of odor-retention than does a hospital. Despite the most diligent maintenance, the incidence of events that are odor-producing are inescapable; food brought directly to the many rooms, the use of bedpans, frequent scrubbing with strong disinfectants, diseased human tissue and bodily discharges, the use of varied medication. Many of these odors become airborne and find their way to fabrics, upholstery, draperies and other materials. Air is the carrier and it must be dealt with directly. The increase in air conditioning, which recirculates air to many parts of the hospital, has aggravated the spread of odors. The problem is somewhat relieved by the standard practice of exhausting air from locations which are sources of odor, the addition of some outside fresh air, and the use—in some critical areas—of 100 percent of outside air. The use of fresh air, of course, is extremely expensive, especially in midwinter, when it must be heated, and in midsummer if it is cooled.

Another method of odor-reduction has been gaining in use and effectiveness. It will supplement and to some extent reduce the fresh air. Savings may be expected. It consists of spraying the air with freshening chemicals containing chlorophyll and other compounds, carefully studied and selected to counteract the specific odors that are encountered. In hospitals this has been done *manually* by nurses for years. Now, however, in several new buildings of a hospital group, chemicals of this type will be metered and circulated through the air-conditioning systems. This will be done in three buildings to be added to Eastern State Hospital, Williamsburg, Virginia. These are the new "Continued Treatment Buildings" at this mental institution. If odors are an annoyance in a general hospital, how much more must they be so in a mental hospital. Incontinent patients, food accidents due to violence, and many other odor-causing incidents are sources. Patients recovering from mental illness will surely be aided by a better atmosphere. The beneficial effect upon visitors and relatives is a matter of good public relations.

Though this is thought to be the first application of this type of system to hospital buildings, the method is not a new one. For seven years a circulated deodorant has been used in the air-handling ducts of Madison Square Garden in New York City.* The burden of odor-reduction in this building—used frequently for circuses, horse shows, and rodeos—is a heavy one. Not unimportant is the additional problem of smoking and of body odors from large crowds. This is only one of the many buildings for general occupancy and for industry where chemical odor-reduction by central circulation is used.

Despite a fast-diminishing public opinion to the contrary, this process does not consist of blanketing the obnoxious odors, nor of anesthetizing the nerves of the nose. The chemicals chosen for the job are considered to combat the smells by combining with the unpleasant particles and neutralizing them. After this process, the chlorophyll adds a freshening and vitalizing tone. In the installation at Williamsburg, the systems will make use of Airkem equipment. It consists of an assembly in each air-handling unit of the several buildings. Its location is after the cooling—or heating—coils and before the circulating fan. It includes a storage tank, a small pump, and a vaporizer in the air stream. This operates only when the air is being circulated by the system fan. A controller which can be set to regulate the rate of odor counteractant feed is located in the treated space.

The large number of chemicals (125) available for use in the formulas suggests that they may be chosen specifically for certain odor-reduction jobs. This is true. There are four or five basic combinations One of them is suitable for hospital use. Others are appropriate for buildings with animal occupancy, and some for the reduction of smoking, occupancy, and other odors. In any building of given occupancy and special conditions, the combination chosen is a matter of custom design, and is subject to change with re-study during operation and if the occupancy changes.

For the Commonwealth of Virginia, James M. McIntosh, Jr. is architect-in-charge. The designers of the three new buildings are Leary & Ciucci, Rawlings & Wilson, Associated Architects.

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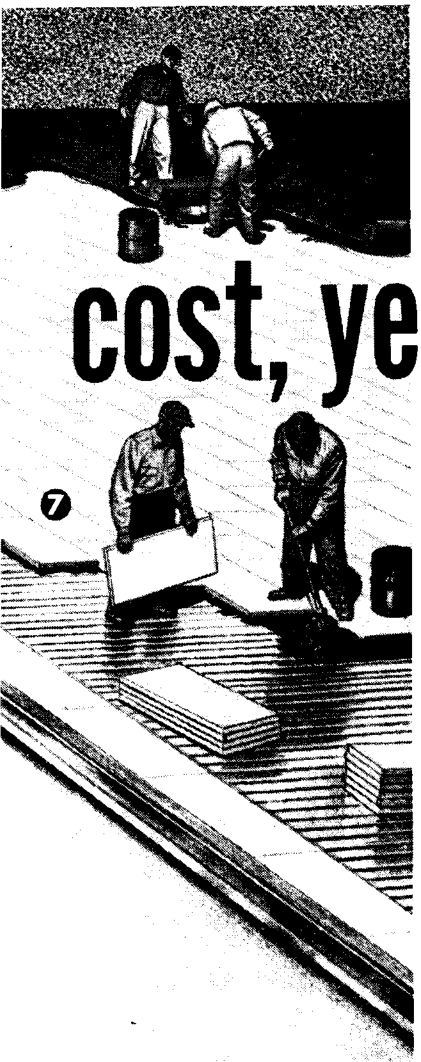
* *Page 150*, April 1957 P/A



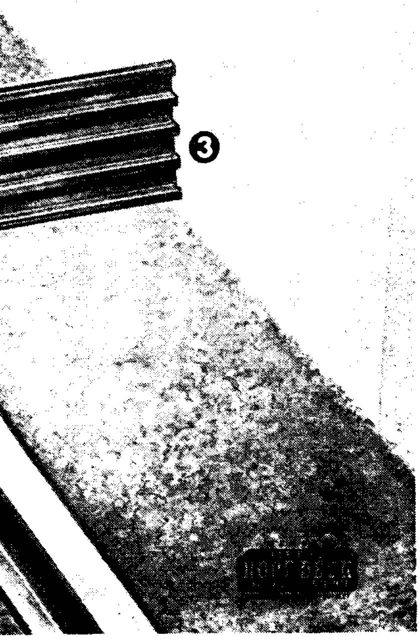
cost, year-round construction: Granco Roof Deck

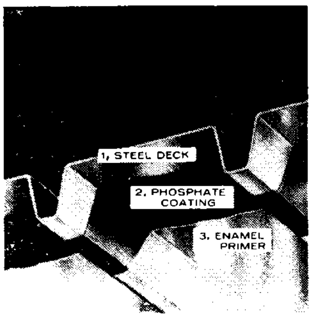
Granco Roof Deck often saves five to ten cents per square foot over heavier-type poured decks. Why? Because it's a *lightweight* system that saves on structural framing. Because construction is fast and easy. The entire system has only three components: Weld sheets into position . . . apply insulation board . . . add built-up roof.

No wonder Granco Roof Deck is so widely used in commercial and industrial buildings. How about *your* next job? You can order Granco Roof Deck conveniently through more than 100 Granco distributors from coast to coast. Want more information? Simply fill out and mail the coupon, below.

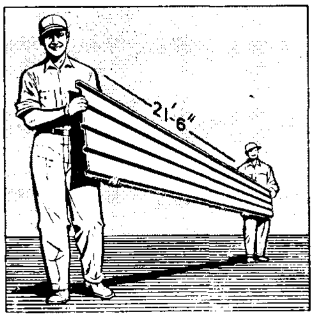
7 **INSULATION BOARD** is easy to apply over Granco Roof Deck sheets, speeds job completion.

8 **TWENTY-YEAR ROOF BONDS** are obtainable from roofing companies on Granco Deck with 1″ insulation board.

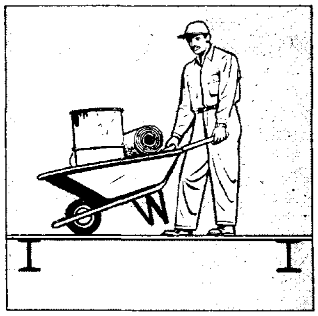




TOUGH FINISH. Rust-preventive enamel is "flow coated" over steel, baked on at 350° F. for 20 minutes. Flint-hard finish prevents corrosion, resists abrasion from field handling.



LONG SHEETS. Lengths available up to 21½′ long. Greater length makes possible continuous spans for stronger, lower-cost construction. You cover more area per sheet, finish jobs faster.



STRENGTH. Angular pattern with wide rib openings provides strong section properties. Granco Deck supports wheelbarrows, welding machines, etc., without bending or buckling.

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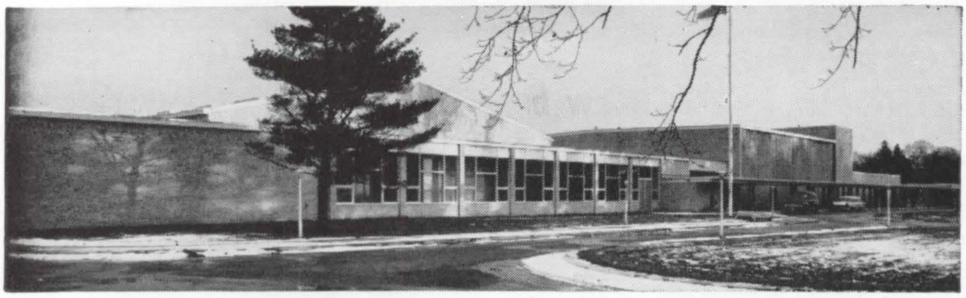
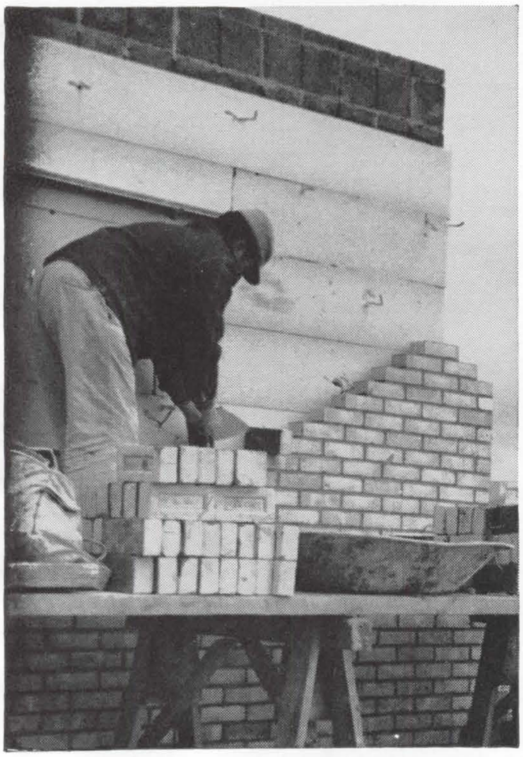


WESTBURY HIGH SCHOOL, LONG ISLAND, N.Y. Architect: Eggers & Higgins, A.I.A.



STYROFOAM *insulates three more ways in N.Y. high school*

In cavity wall and foundation

Styrofoam keeps the students warm in Westbury High School. As a cavity wall insulation it acts as a vapor seal as well as insulation against extreme temperature differences which produce undesirable condensation in the cavity. As a foundation perimeter insulation, it eliminates the solid masonry path between slab and foundation.

In both applications, the low "K" factor of Styrofoam *stays* low. For Styrofoam won't absorb water . . . resists rot, mold, and deterioration. It offers permanent insulating effectiveness that pays off in warm, dry, comfortable interiors.

. . . in walk-in refrigerators

Styrofoam was specified for still another task in Westbury High School. Large walk-in refrigerators in the food service area were insulated with Styrofoam to keep heat gain to a minimum. Styrofoam has been used in industrial cold storage plants for over a decade. Its long-lasting insulating efficiency makes it ideal for low-temperature applications of all types.

LATEX PAINTS *resist chemical attack.* As soon as water evaporates from freshly applied latex paint, a tough film forms that is highly resistant to chemical attack. This means paint stays new looking longer . . . resists discoloration and bacterial action.

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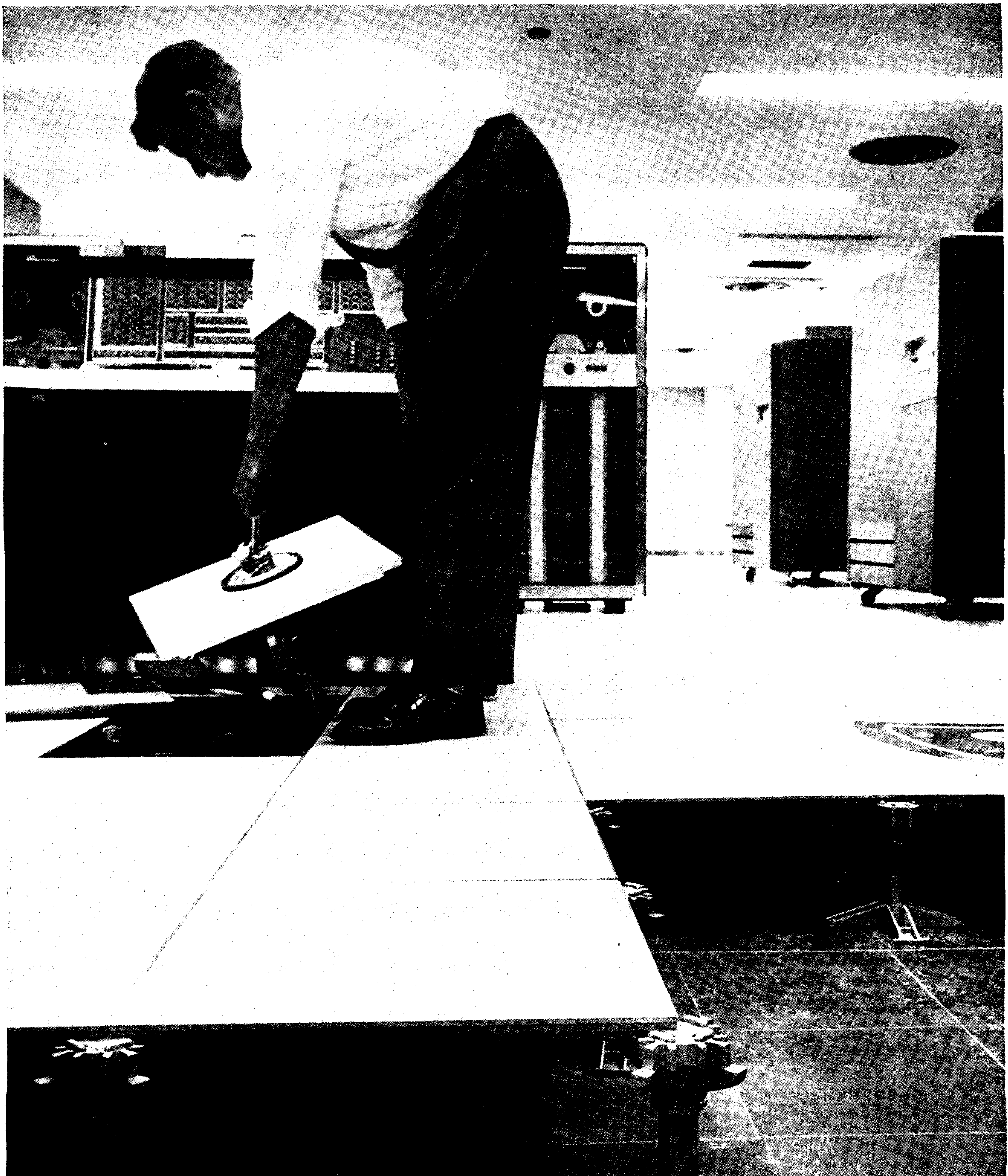

Complex network of cables seen during installation of a large-scale IBM computing system will be completely concealed by an elevated floor of Alcoa Aluminum. This installation is at the office of United Medical Services, Inc. (New York's Blue Shield).

ALUMINUM ELEVATED FLOORS

permit new layout flexibility with easy access to utilities

The difficult problem of providing requirements for modern data processing and research centers in new or existing buildings is now solved with elevated floors of Alcoa® Aluminum—without major work delays. The floor can be pressurized with air to replace ductwork and to accommodate cables (both signal and power), chilled water and hot water conduits, steam drainage lines and other similar services.

Developed by Floating Floors, Inc., New York City, the floor consists of modular aluminum plates installed on adjustable pedestals resting on the base floor, thus leaving subfloor space for unsightly cable, ductwork and piping. Each 18¼-in. square plate of cast Alcoa Aluminum is strong enough to take machine caster loads of 1,000 lb—yet its weight of only 9 lb can be lifted by one man using a suction cup.

Installation is fast and simple. The aluminum plates fit onto the pedestal head and self-lock in position. And that's all there is to it. No permanent supporting structures, no bolts or fastening devices and no alterations in the existing floor are necessary. All plates are interchangeable, permitting fast rearrangement or removal of the floor at any time. And the aluminum pedestals are adjustable, so that the subfloor space can be varied from a minimum of 3 in. upward. Elevated floors of Alcoa Aluminum have already saved thousands of dollars in operating and maintenance costs in offices with modern computing machines requiring extensive power and feeder cables. Similar cost reductions can be expected in any type of construction with a large amount of piping, ductwork or cable.

For more information on the high-strength, lightweight aluminum alloys that make possible this and other revolutionary developments in building design, call on Alcoa. As the pioneer and leader in architectural applications of aluminum, Alcoa is in a unique position to help you. Contact your nearest Alcoa sales office, or write: Aluminum Company of America, 1824 K Alcoa Building, Pittsburgh 19, Pa.

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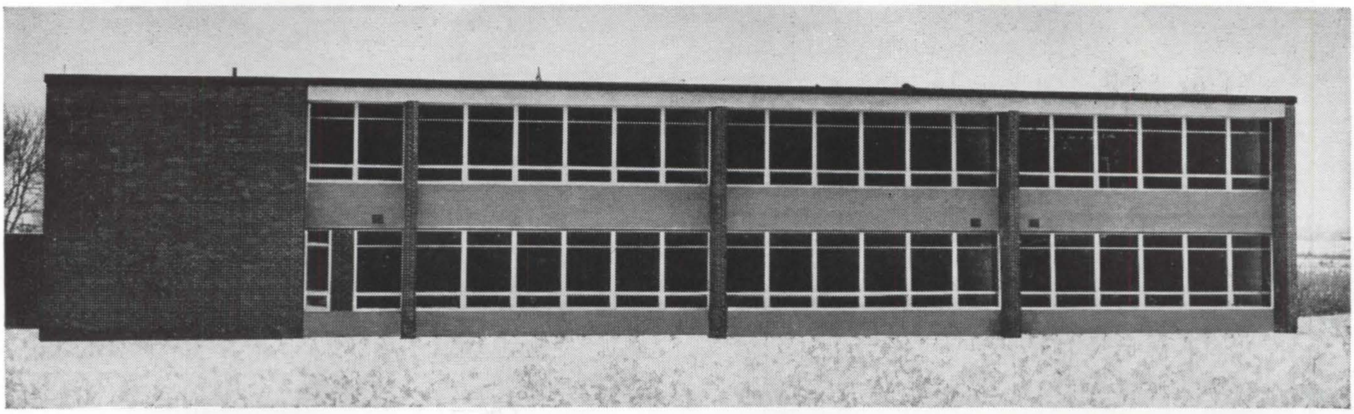
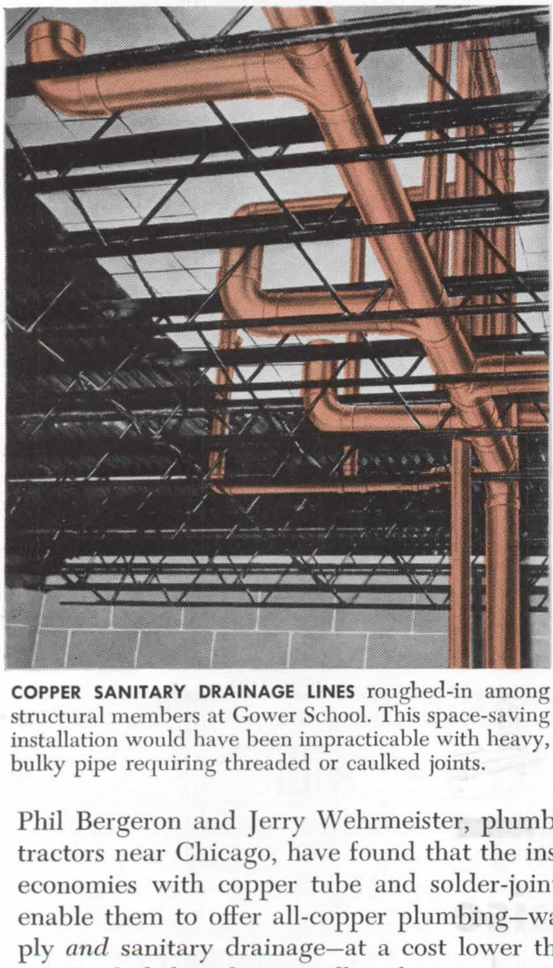


GOWER SCHOOL ADDITION, Hinsdale, Illinois. *Architect:* Wight & Schlaebitz, Downers Grove, Illinois. *Plumbing and heating contractor:* Jerry & Phil's Plumbing & Heating, Inc., Brookfield, Illinois.

SUPERIOR ALL-COPPER PLUMBING IN THIS SCHOOL AT LOWER COST TO TAXPAYERS



COPPER SANITARY DRAINAGE LINES roughed-in among structural members at Gower School. This space-saving installation would have been impracticable with heavy, bulky pipe requiring threaded or caulked joints.

COPPER SANITARY DRAINAGE LINES for second floor lavatories at the Gower School. Light weight of copper tube and ease of making solder joints save many dollars on multiple installations like this. Compact assemblies eliminate wide plumbing walls, give greater usable floor area.

Phil Bergeron and Jerry Wehrmeister, plumbing contractors near Chicago, have found that the installation economies with copper tube and solder-joint fittings enable them to offer all-copper plumbing—water supply *and* sanitary drainage—at a cost lower than competitive bids based on installing ferrous piping. Recent jobs awarded to them as low bidder include the Gower School, the LaGrange Township Junior High School, a church, health center, two restaurants and a store. Anaconda was used for all these jobs. Phil Bergeron says, "We specify Anaconda Copper Tube and Fittings because their consistent fine quality and close tolerances makes our work easier and keeps the job costs within our estimates."

Contractors, builders, and architects the country over are finding that they can provide long-lasting, low-maintenance all-copper plumbing at a cost competitive with ferrous piping. For information on Anaconda Copper Tube and Fittings, write for a copy of Publication C-33. Address: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

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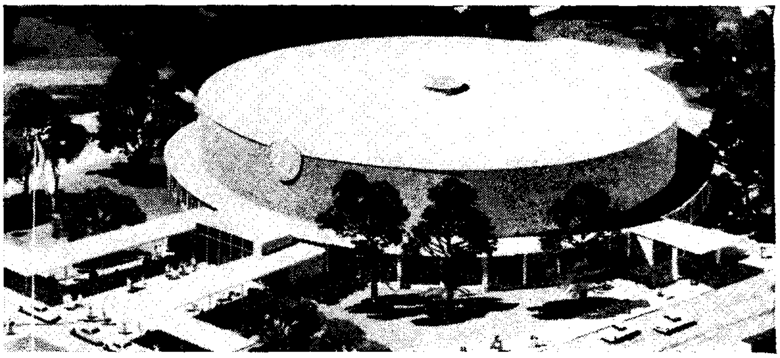

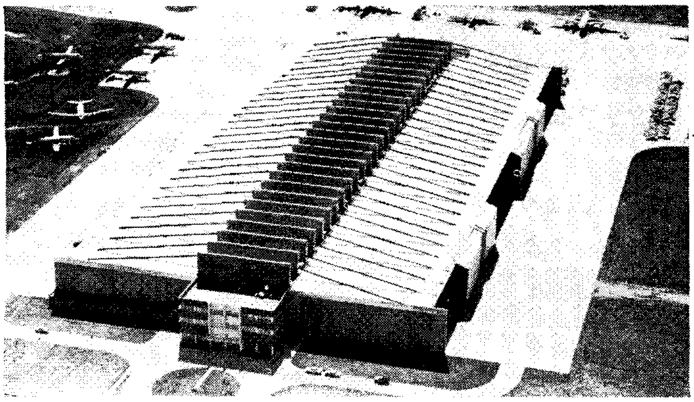

← TWA HANGAR – MID-CONTINENT INTERNATIONAL AIRPORT, KANSAS CITY • *Designed by* Burns & McDonnell, Kansas City • Ammann & Whitney, *Consulting Engineers,* New York City *Contractors:* MacDonald-Creighton, St. Louis and Nashville • *Cables by Roebling*

YALE UNIVERSITY'S – DAVID S. INGALLS ICE HOCKEY RINK, NEW HAVEN • *Architect:* Eero Saarinen and Associates, Bloomfield Hills, Michigan *Consulting Engineers:* Severud-Elstad-Krueger, New York City • *Contractor:* George B. H. Macomber, Boston and New Haven • *Cables by Roebling*

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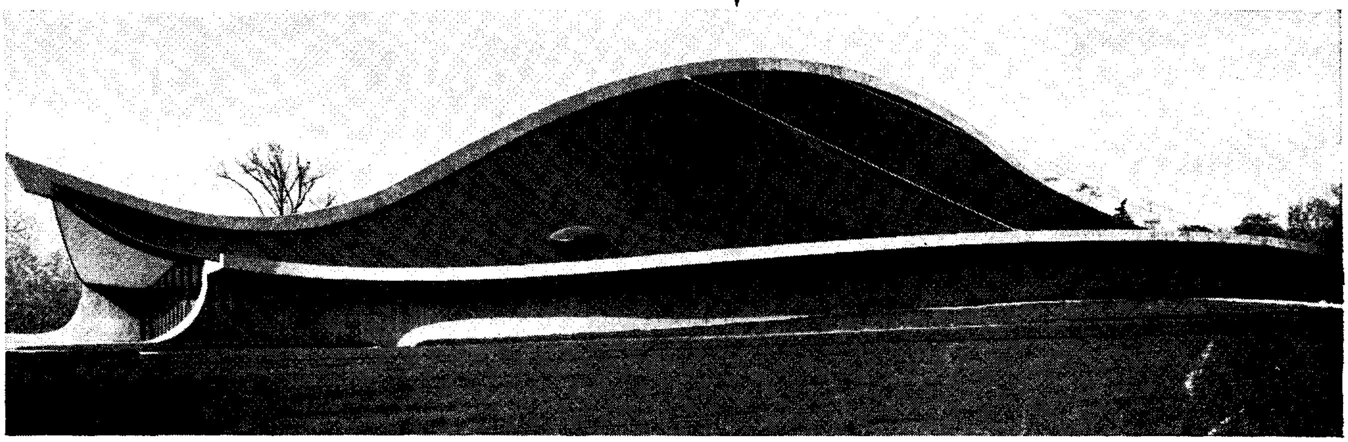

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The suspended roof beautifully weds aesthetics and practicality. This daring and down-to-earth design and construction technique has literally "spread its wings" over a number of different structures to the dollars *and* cents benefit of its builders as well as to the delight of its observers.

Terminals, sports arenas and warehouses are currently enjoying the *unimpeded* scope of movement and view afforded by the roof that needs no columns. Material, man and events *move* under the suspended roof with an ease heretofore unknown. Trucks can turn, planes can be serviced and "every seat in the house" is a vantage point under the suspended roof.

Shown here are a few of the examples of what architects and builders are doing with the suspended roof. We at Roebling seriously invite your inquiries on *any* phase of the suspended roof or other types of suspension systems. Our history includes suspension bridges of every description, tramways, guyed towers and ski lifts. Any means of communication to John A. Roebling's Sons, Bridge Division, Trenton 2, New Jersey, will bring you a wealth of material.

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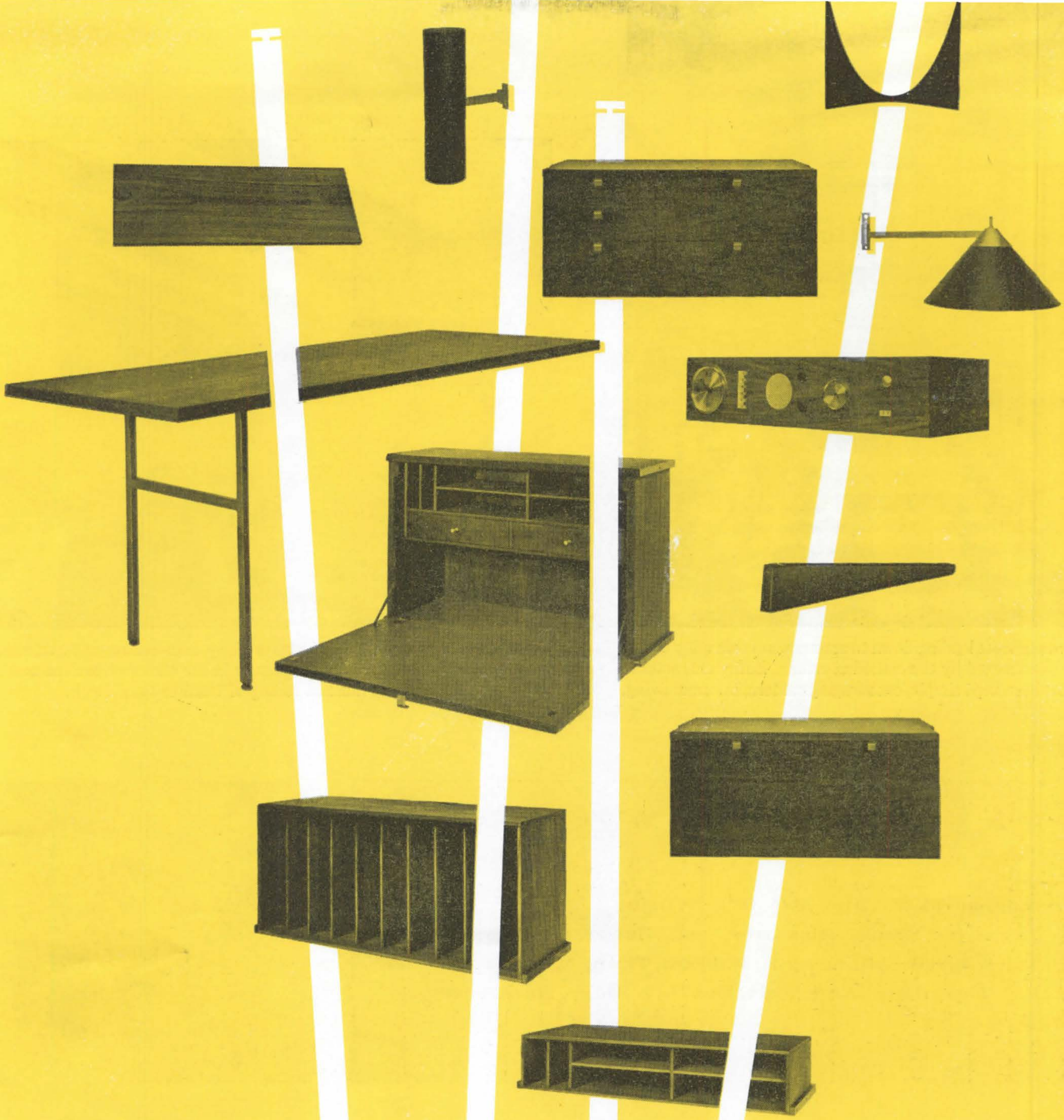
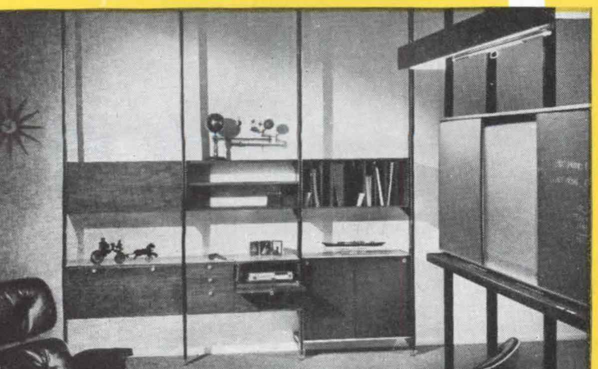
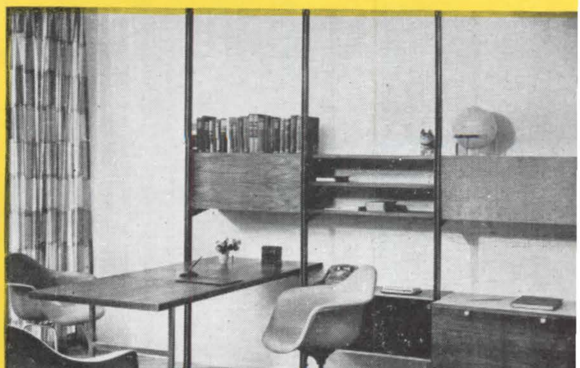
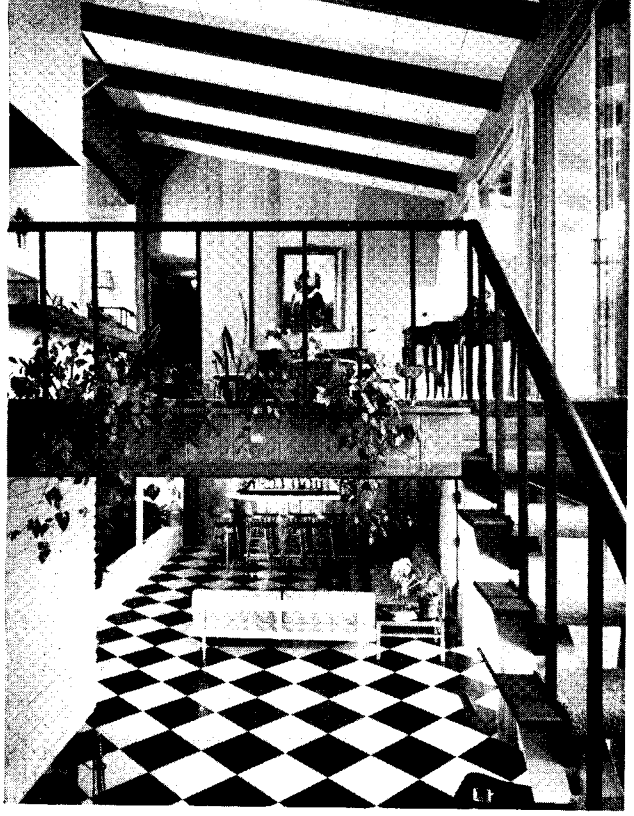
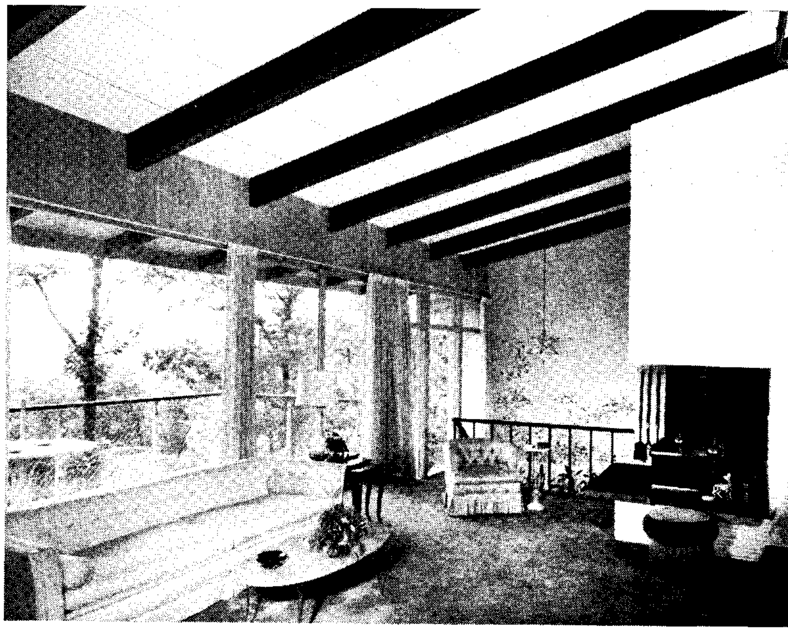






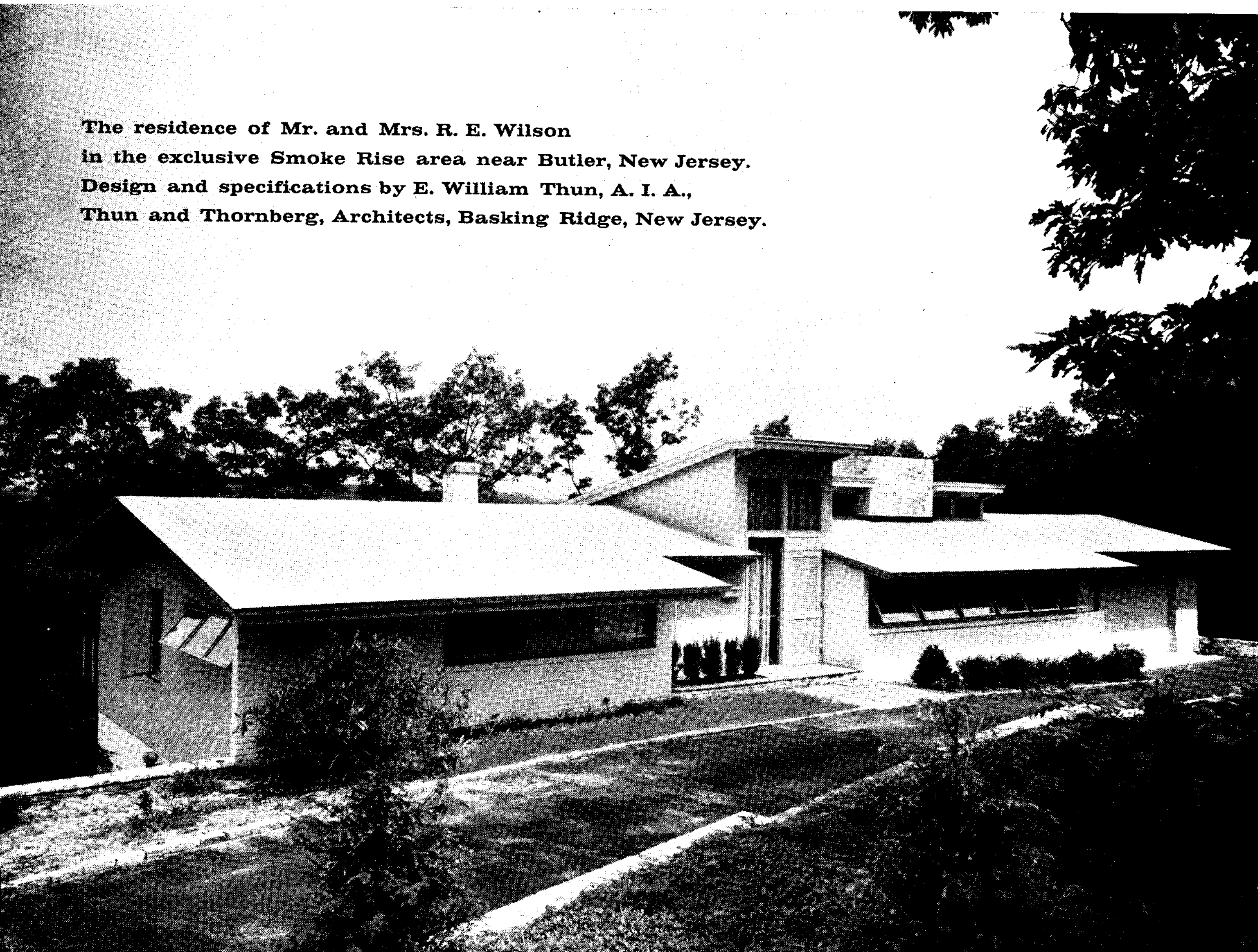


Open stair well leading down to amusement room adds to spacious effect created by the cathedral ceiling. Entire character of home has been kept simple, encouraging modern, informal living.



Feeling of spaciousness is achieved by high ceiling with exposed beams. Ease of maintenance was a factor in the choice of painted brick, wood paneling and pre-finished ceiling of Insulite Roof Deck.

The residence of Mr. and Mrs. R. E. Wilson in the exclusive Smoke Rise area near Butler, New Jersey. Design and specifications by E. William Thun, A. I. A., Thun and Thornberg, Architects, Basking Ridge, New Jersey.



Beauty, economy of Insulite Roof Deck contribute interest to this home

Architect E. William Thun created this outstanding home with its many features designed to add to livability and distinction. A spacious, open feeling is achieved by the exposed beam ceiling. The dark stained beams provide an attractive contrast against the striking white ceiling of Insulite Roof Deck.

Versatile, practical and beautiful, Insulite Roof Deck provides a strong, durable roof decking . . . efficient insulation . . . a continuous vapor barrier . . . an attractive, finished interior ceiling—*all in one simple application.*

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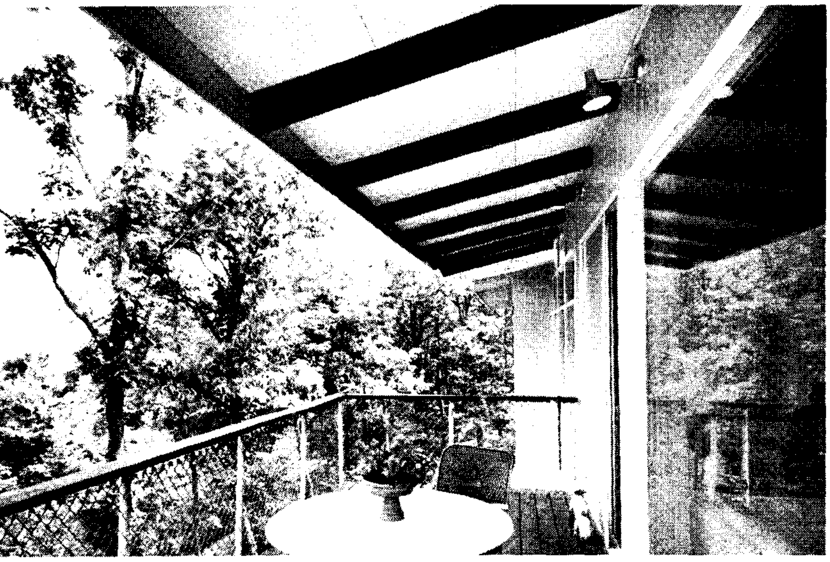
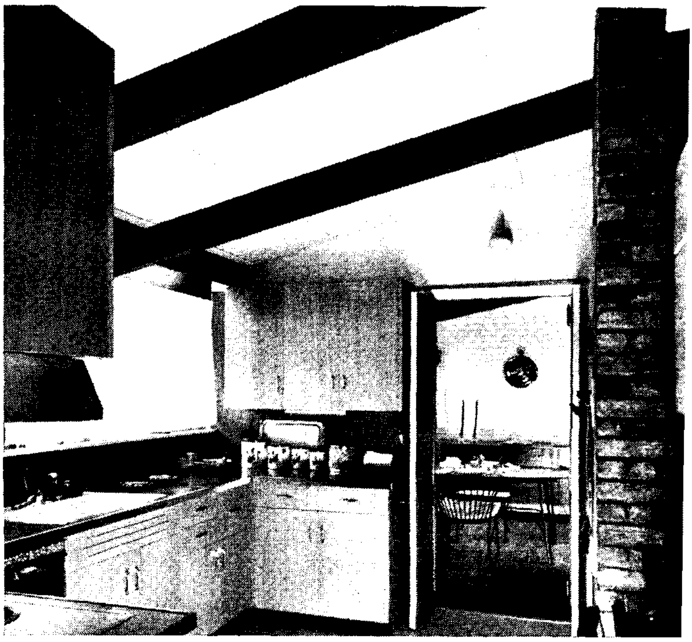


Graceful transition from interior to outdoor balcony is achieved by continuation of exposed beams and Insulite Roof Deck. Careful site-planning takes full advantage of steep slope and beautiful view.



Designed for convenience, the kitchen area combines utility with beauty and charm. The Insulite Roof Deck is easy-to-clean, provides a pleasing contrast with the texture of the used brick surface.

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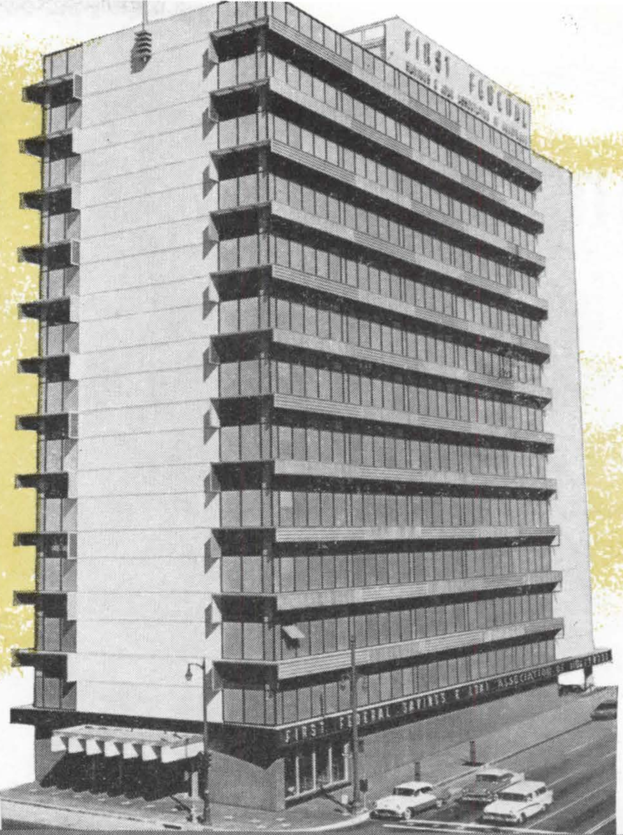
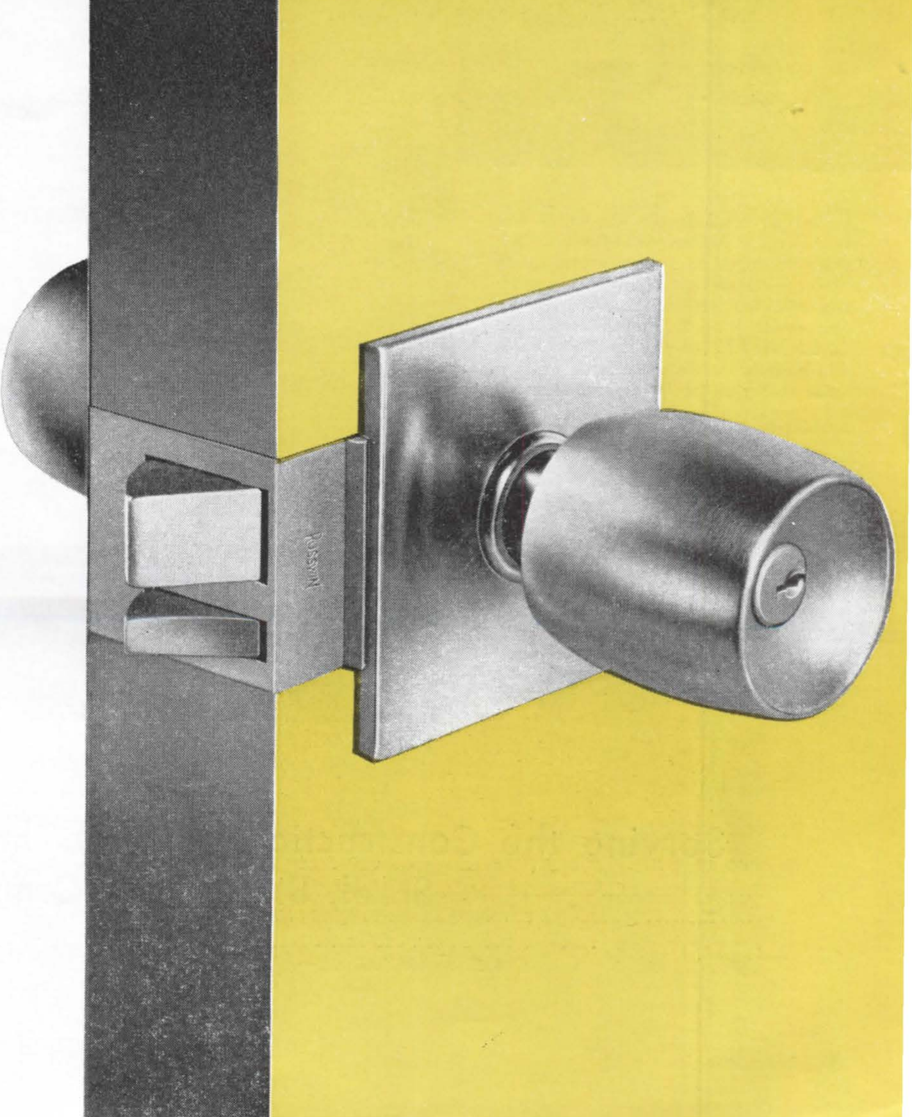


Builder and Owner: First Federal Savings and Loan Association of Hollywood, C. E. Toberman, President
Architects and Engineers: Austin, Field & Fry, Los Angeles
Contractor: The William Simpson Construction Company, Los Angeles
Hardware Supplier: Montgomery Hardware Company, Los Angeles

In the new Hollywood home of the First Federal Savings and Loan Association, beautifully styled Russwin Unilocs with Turbo design knobs complement handsomely modern architecture. The Uniloc, precision engineered for lasting dependability and smooth performance, is completely factory preassembled. It installs intact into a simple, saw-cut notch in the door. The heavy-duty components of this unique lockset remain in undisturbed, virtually wear-free alignment. A wide choice of Uniloc designs, finishes, and functions are available for any type of architecture, any lockset requirements. For full information, write Russell & Erwin Division, The American Hardware Corporation, New Britain, Connecticut.



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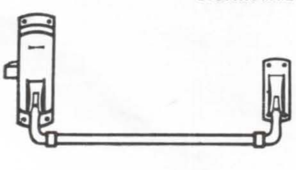
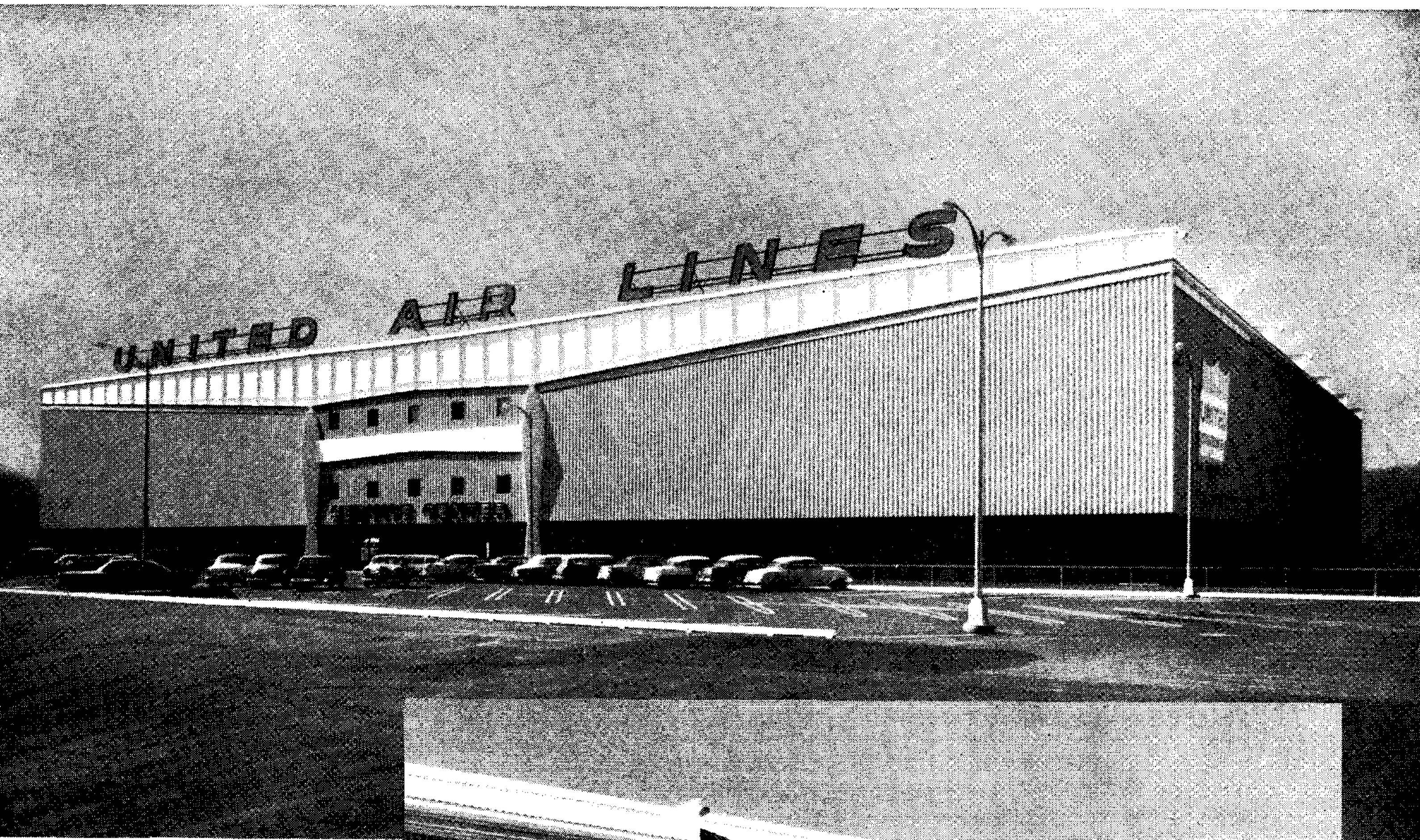
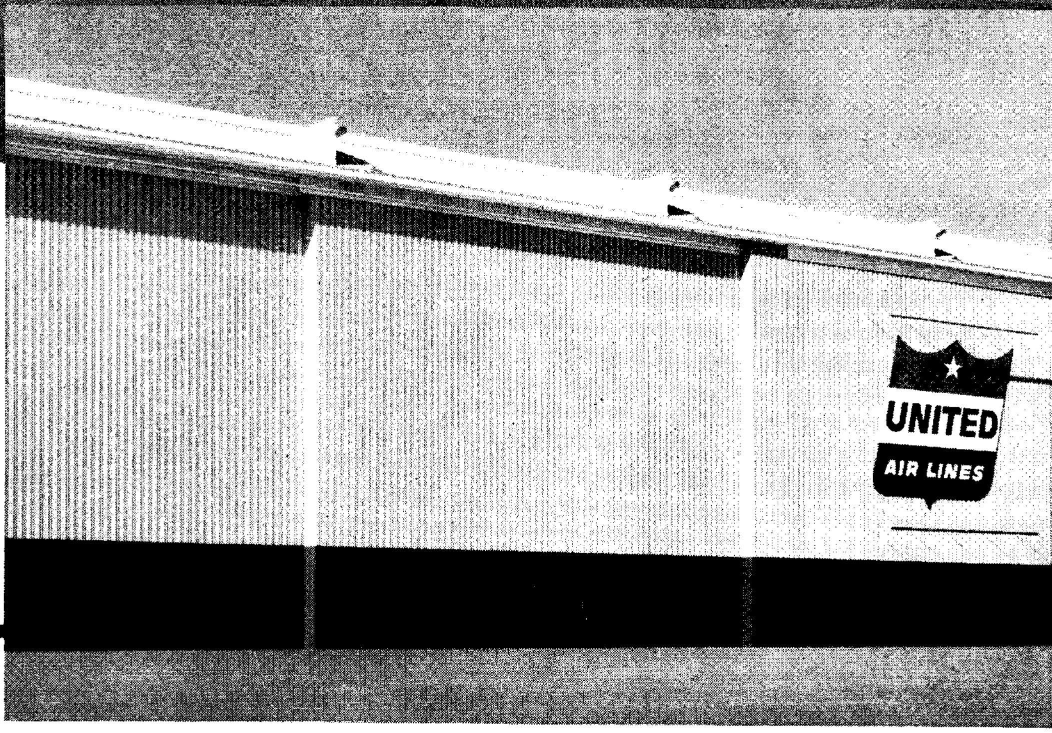


Russwin 466 Exit Bolts, as well as Russwin door closers and miscellaneous hardware, are also used in the new First Federal Savings and Loan Association building.

Mahon METAL CURTAIN WALLS





United Air Lines Service Center at San Francisco, Cal. Mahon Metal Curtain Walls were employed to lend trimness and to retain the clean lines of this unique structure which was designed to accommodate four mammoth DC-8 Jet Air Liners. Mahon Curtain Wall Plates, of the same material and pattern, were also employed as exterior facing on the large hangar doors.

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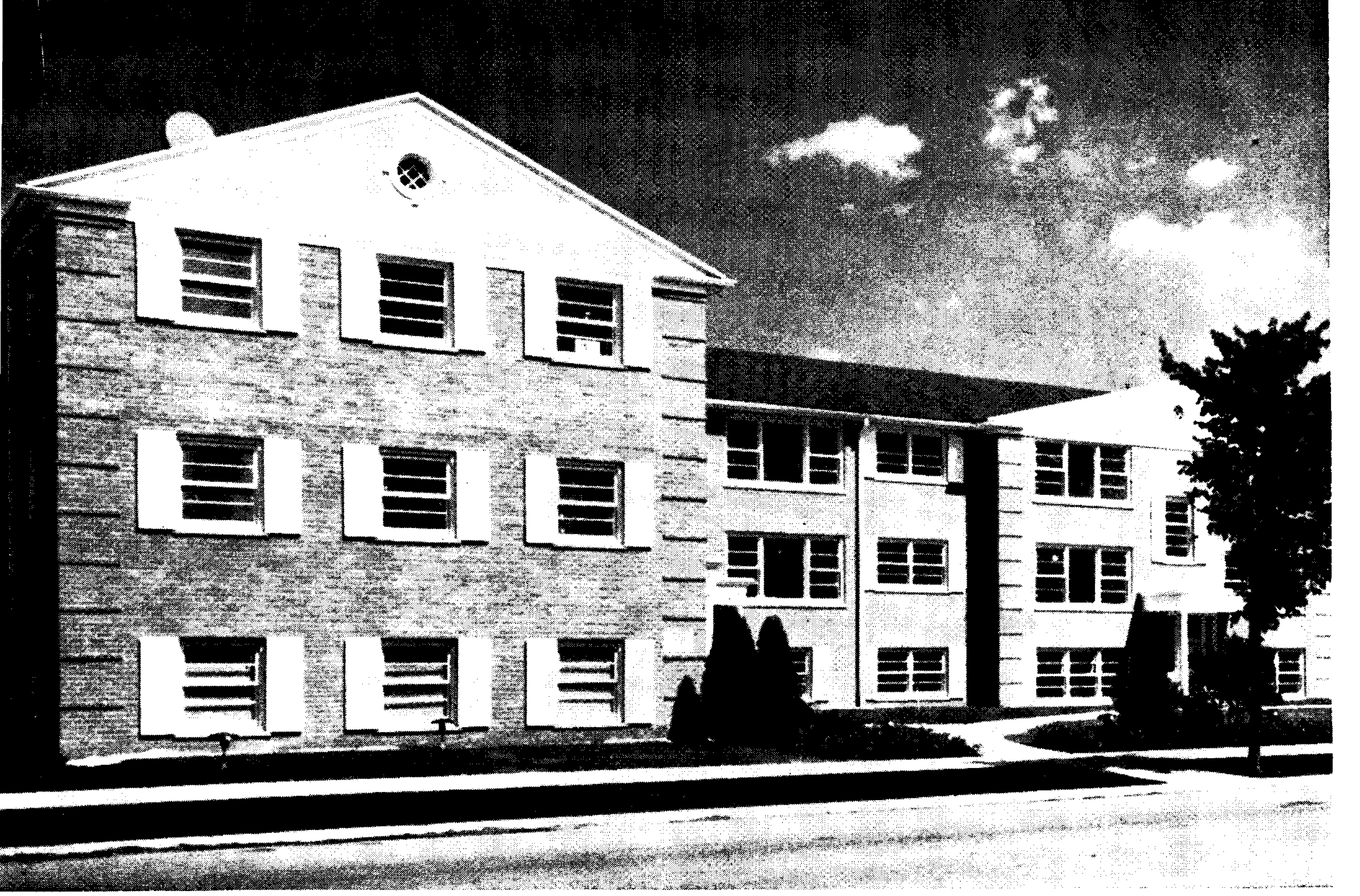
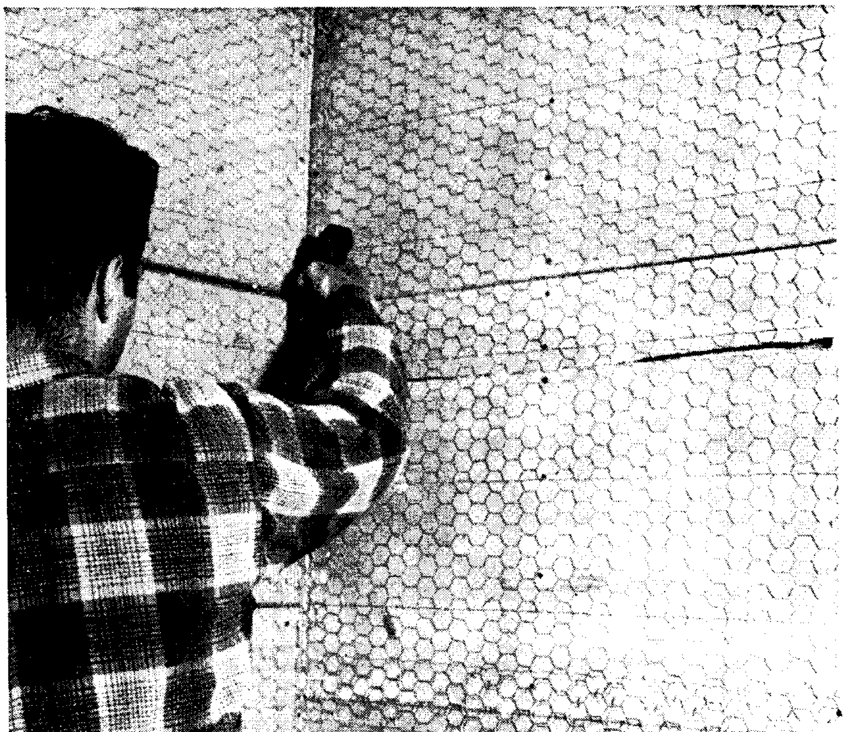


Chicago builders get greater crack resistance at no extra cost with the

KEYMESH® · KEYCORNER ·

Lasting beauty and low maintenance are built into the new Williamsburg Apartments located in Chicago, Illinois. That's because greater plaster-crack resistance is assured by reinforcing the lath and plaster walls.

Valenti Builders, Inc., Chicago, found it cost no more to get this extra reinforcing quality. By specifying Keymesh, Keycorner and Keystrip galvanized reinforcing lath, the builders got top quality reinforcement with greater resistance to cracks and fire.



Tiled bathrooms in the Chicago project have lasting beauty with KEYMESH reinforcement. The portland cement plaster reinforced with Keymesh provides a strong, maintenance-free base for the tile. You'll find Keymesh makes any gypsum lath and plaster wall stronger and more crack resistant.

Keymesh rolls out flat and laps without bulging . . . forms easily and cuts quickly. The open mesh permits rapid troweling and assures a full, even thickness of plaster. Keymesh, Keycorner and Keystrip are galvanized against rust.

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Certification

We hereby certify toilet compartments furnished on our order # ______

for project JOHN DOE SCHOOL, are in accordance with plans

and section A of specifications blank.

We further certify that wherever galvanized Bonderized steel is specified, we will furnish material having a minimum zinc thickness of .00015" each side, as produced by Republic Steel Corporation and sold under the trade name "Paintlok"; that is, no zinc coating shall be thinner than that on "Paintlok".

Gauges of steel shall be as follows:

Flush Partitions of over 48" — 20 gauge
Flush Partitions 48" and under — 22 gauge
Panel Partitions of over 48" — 16 gauge
Panel Partitions 48" and under — 18 gauge
Stiles (with headrail) — 20 gauge
Stiles (without headrail) — 16 gauge
Doors — 22 gauge
Headrail — 1¼" x 1⅞" 20 gauge lockseam tubing

Edge Molding — 20 gauge galvanized bonderized steel reinforced with die formed stainless steel corners
Floor Fastenings — 5/32" x 1" heavy zinc plated steel
Cast Brackets — Zamac, extra heavy die cast
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Shoes — .031" Stainless Steel, full 3" high, hemmed top and bottom

Enamel used shall at least equal the following specifications:

Humidity — 100% — 100° F.	1,000 hours (min.)
Salt Spray — 20% — 100° F.	300 hours (min.)
Water Soak — 105° F.	1,050 hours (min.)
Abrasion — 1,000 gm. wt. CS10 Wheel	13.65 m.g. Maximum Loss
Hardness	H (Minimum)

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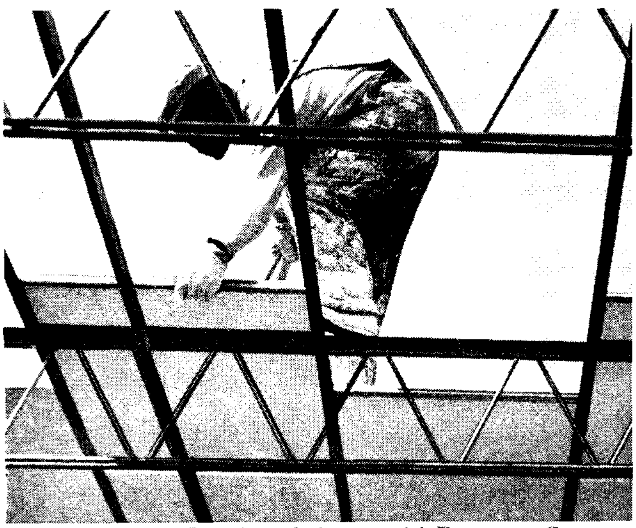

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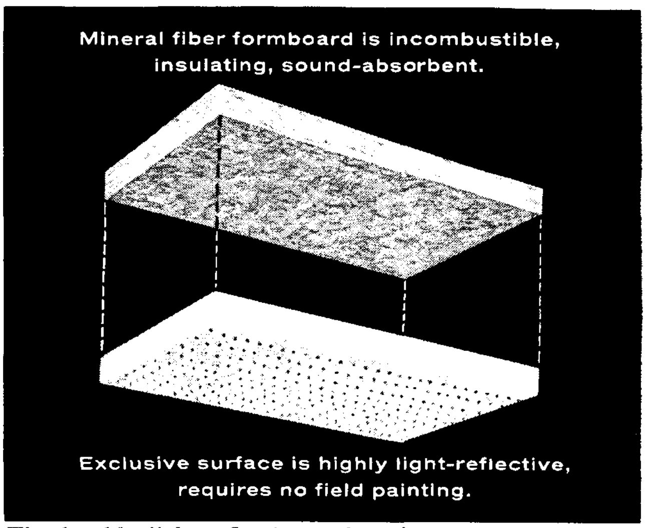

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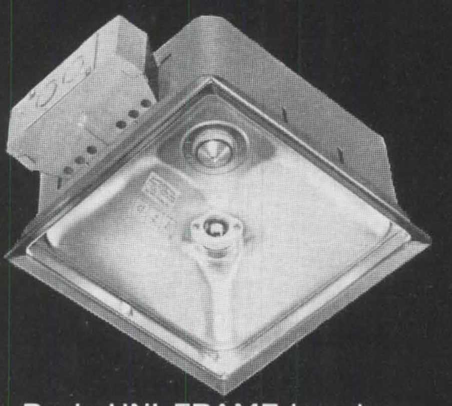

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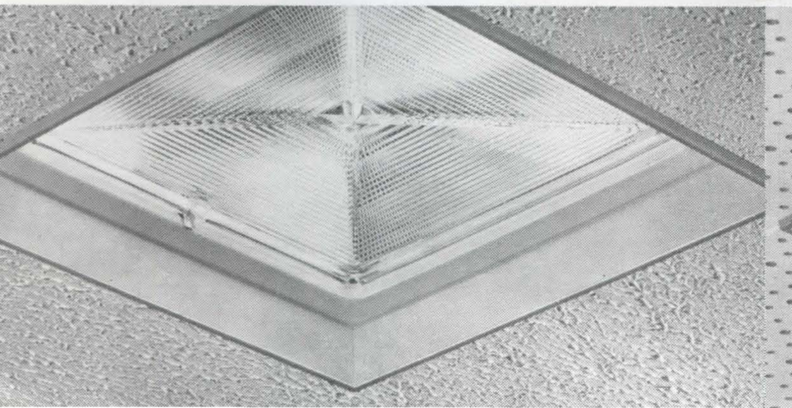

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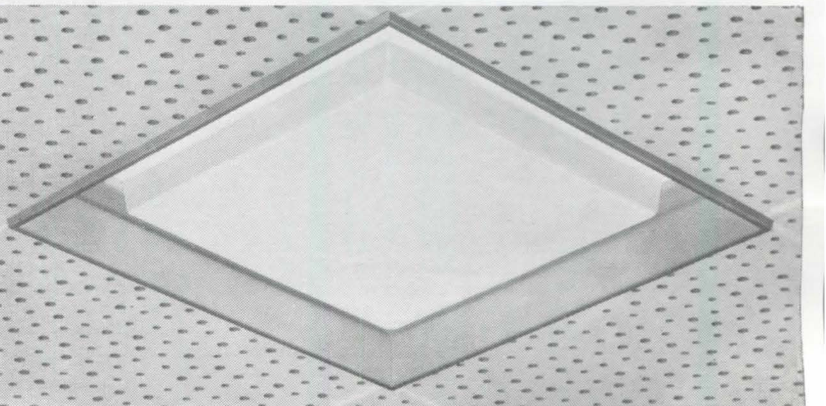

10″ brass finish UNI-FRAME with diffusing glass bowl and splay.

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REINHOLD

method recognized

Dear Editor: "Office Standard Specifications Document Brings Advantages," by Harry Haas (August 1959 P/A) shows the method satisfactory for the individual office. This method—separating the sections of the specifications into two parts: a "standard" for all projects and a "project supplement" for the individual project—was presented 30 years ago with the expectation it would be generally accepted, spreading the advantages.

A set of Standard Specifications by sections was published in printed form by The New York Building Congress, 101 Park Avenue, New York, N.Y., in 1929 and is still available. It also appeared in *The American Architect,* January 5, 1929, and subsequent issues. *The American Architect* noted " . . . the Congress Specifications (and now Mr. Haas) depart from the heretofore accepted practice in specifications writing". More power to the Congress and Mr. Haas!

PAUL BUHL, Architect
Ossining, N. Y.

regional center

Dear Editor: I was delighted to see the presentation of Fresno's downtown-renewal program and the Preliminary General Plan for the Fresno-Clovis Metropolitan Area reproduced in July 1959 P/A.

As former Director-Secretary of the Area Planning Commission that produced this Plan, I want to commend you for demonstrating the relationships that exist between downtown-revitalization efforts and total metropolitan-area growth.

The Preliminary General Plan, from its original conception, was based on recognition of downtown Fresno as the regional cultural, civic, and financial center. The Downtown Plan could make this concept a reality in every sense of the word, while discouraging attemps to further scatter and fragment these functions throughout the metropolitan area.

ABRAAM KRUSHKOV
Wilsey & Ham
Los Angeles, Calif.

for writers—Taliesin

Dear Editor: I do not like your thoughtless criticism of the work of Frank Lloyd Wright. I question the motives of those who engage in such criticism. I protest the shallowness of such criticism.

It is not relevant to compare Frank Lloyd Wright with lesser men of his time. It is not good sense to criticize buildings yet untried nor is it good sense to judge work not witnessed. It is not wise to criticize without appreciation. It is contemptuous to criticize a man's work at the end of a magnificent life spent in behalf of good for mankind.

Your poor magazine is rescued from consistent mediocrity only by the pages devoted to the work of Frank Lloyd Wright.

Hie yourselves off to Taliesin for a few years. Then you will be able to write well of Architecture.

CHARLES MONTOOTH
Scottsdale, Ariz.

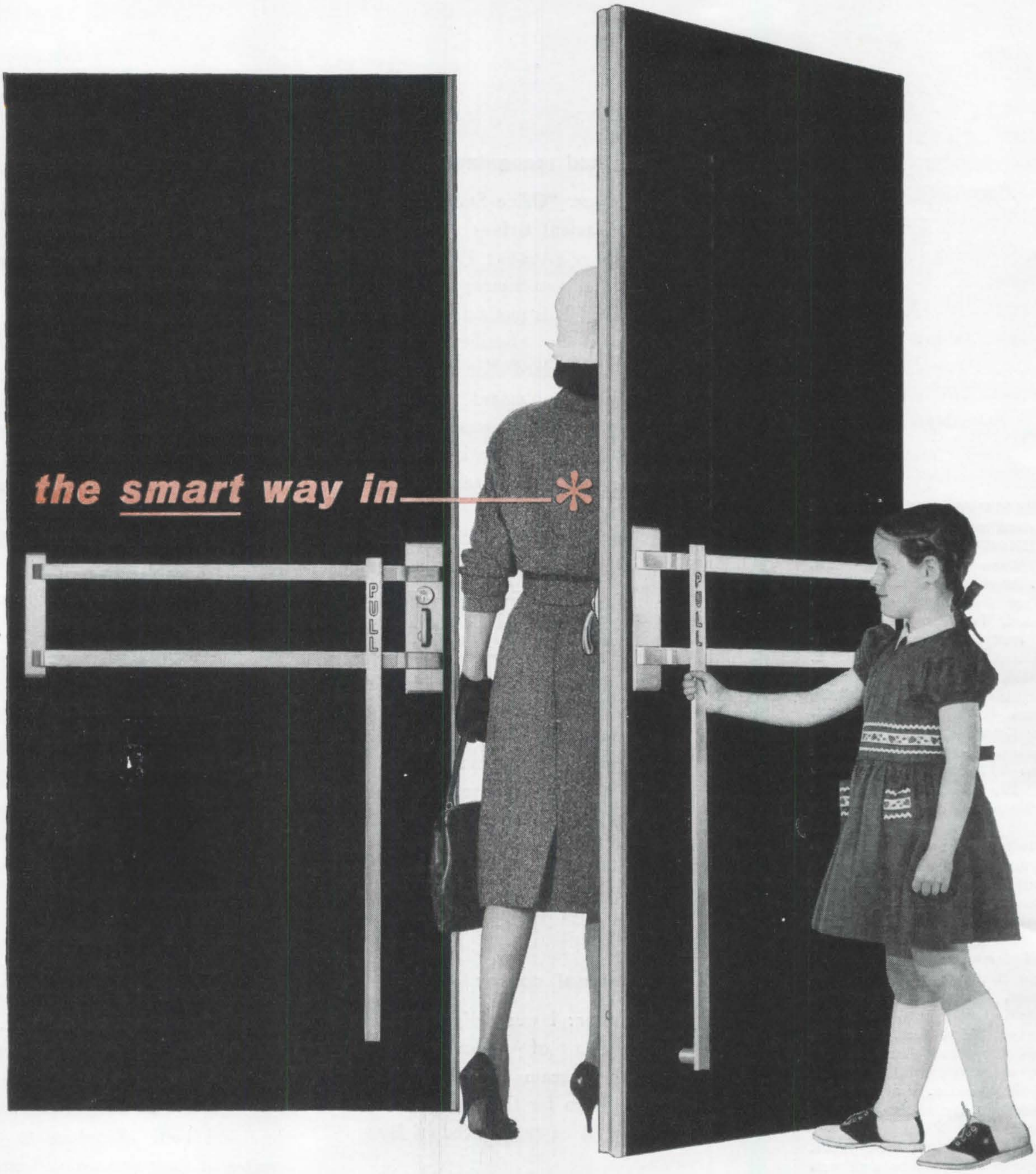
art vs. building

Dear Editor: The discussion of architectural criticism currently carried by P/A underlines an unconscious schism in popular architectural thought. The debaters appear obliged to resolve the business of building and the art of architecture into a catch-all summation—a professional code of values to define the course of their professional endeavor.

Acknowledging the sincerity of these attempts, one can only see an insensitivity to the historical meaning of architecture. In its true sense, the goals of architecture are no different than those of painting, music, or sculpture—only the vocabularly differs. It must symbolize or express or convey the artist's insight into some element of the total truth. The depth and validity of the insight, and the artist's dexterity of deliverance, are the sole criteria. From this point only can a meaningful relative judgment be considered.

This is more simple to see in the entirely abstract artistic vocabularies of

(Continued on page 48)



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(Continued from page 45)

painting, music, etc., than it is in architecture. The vocabulary of architecture is human environment. This immediately saddles the artist with economic, social, and physical considerations which must be met to justify the physical existence of the art form. But we must understand that the art form is not dependent upon these technical considerations for its validity. They are only for its temporal justification. They conflict only with a definition of architecture too small and invalid to encompass them. (The parallel of this idea to the 19th Century conflict between evolutionist biology and fundamentalist Christianity is quite interesting and strikes an optimistic note for the future of architectural thought.)

With this understood, it is readily seen that every roof built by man is not and should not be architecture, any more than every sound struck should be music. Some buildings are conceived as rain shelters—no more. This is the business of building and should be judged solely on its ability to fill some practical human need. But to judge a contemporary art form on this basis is as meaningless as criticism of Chartres Cathedral on its closet space.

What is needed is a sense of definition and perspective about the two fields—the art of architecture and the business of building. They are not the same or even parts of the same total sum. One transcends the other. This is what Paul Rudolph meant when he told his students at Yale (as he reported in P/A) not to be concerned with the jury's criticism of ther hospital-design problem on questions of specific function because their time and effort had to be limited to a study of plastic expression. This is true and as it should be if we are to assume that Yale is a school of architecture and not a trade school. And this is why a meaningful critique of the Seagram House must deal with form questions which transcend economics, claustrophobia, and vertigo, for it was conceived as an art form by one of the greatest creative minds of our age. It deserves no less.

Let us judge art on esthetics and rain shelters on their dryness, and we shall not have to select a proper proportion of beauty and practicality for all buildings.

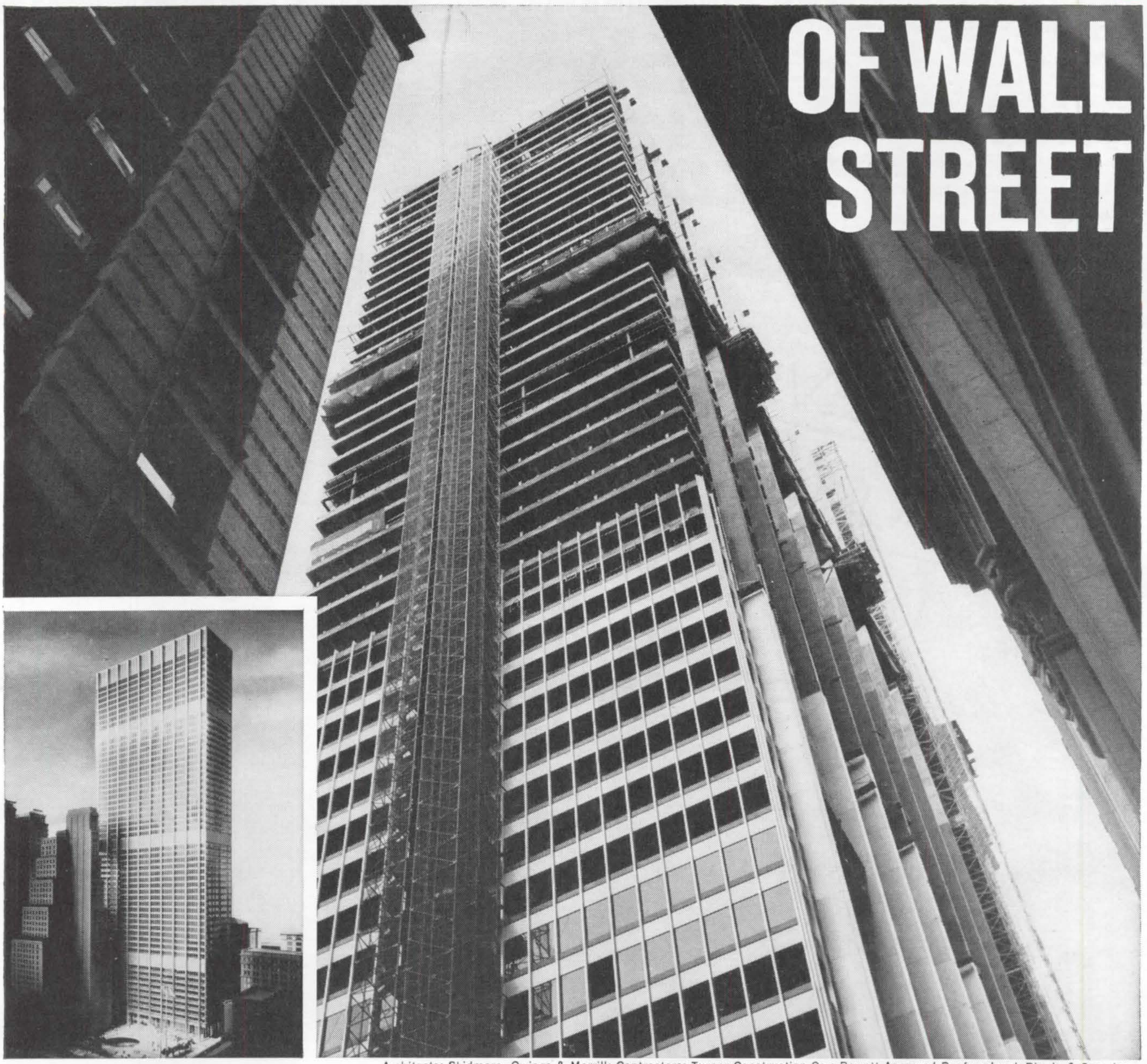
JOHN MILTON McGINTY
Princeton, N.J.

"guides of the youth"

Dear Editor: American Democracy has produced two great poets and one architect: Walt Whitman and Louis Sullivan —and Frank Lloyd Wright. Their ideas, their principles, their example, are the guides of the youth of our countries in this hour of awakening and promise.

(Continued on page 52)

RISING ABOVE THE CANYONS OF WALL STREET



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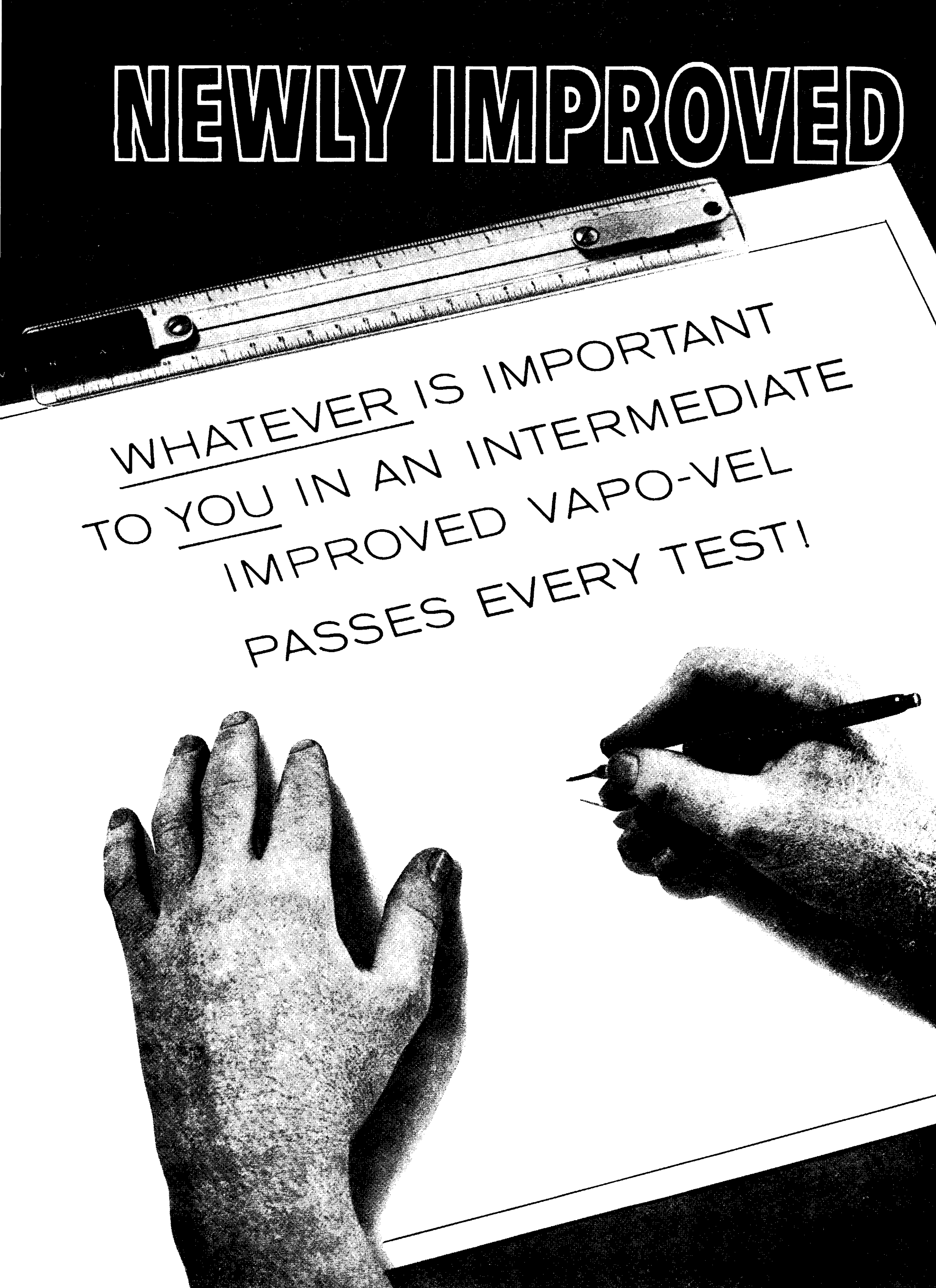
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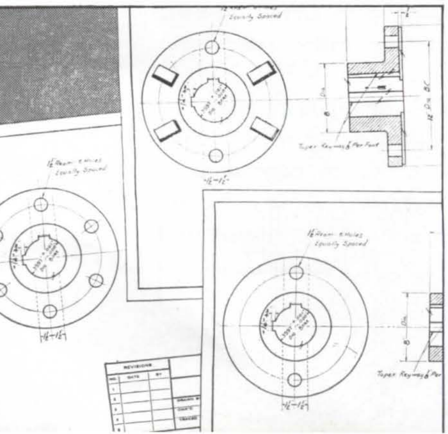

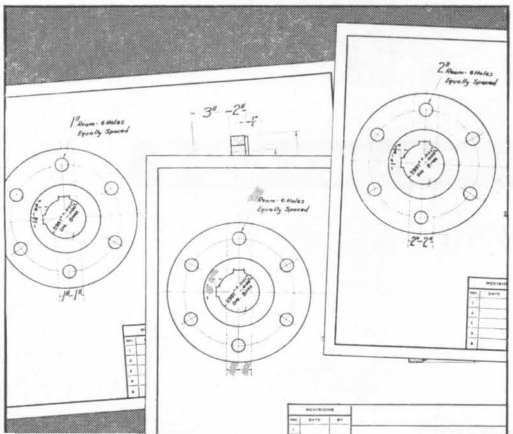

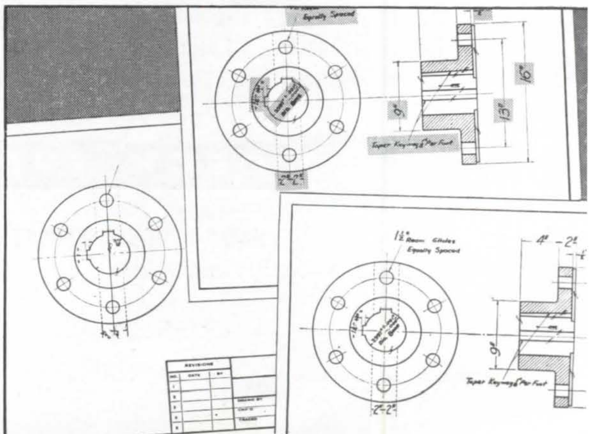

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A sense of respect to the achievements of these great men; to their rebellion against the conformism and indifference of the Society they had to live in; to the magnitude of their personal effort and contribution; to the integrity and moral of their beliefs and to the rare purity of their ideals, should make art critics and fellow architects—left alone in a void with the passing of such men—think before talking and criticizing, lest they be uncovered, in the barrenness of their envy and littleness, before the eyes of people more respectful of the ideas these men dedicated their lives to defend.

FERNANDO SALINAS
Habana, Cuba

the critical approach

Dear Editor: When I was a child, I remember being enormously impressed by the difference in the result depending on which way you sliced an orange; in fact, I haven't gotten over the feeling yet. While your "Things to See and Ways to See" (MAY 1959 P/A) contributes a good deal on the subject of architectural criticism, you have still left a lot unsaid.

For instance, there is the tremendous difference—hinted at but not spelled out —between the way a layman looks at a building and the way a professional sees it. One aspect of this is the "fellow craftsman's view," whereby one designer sees where another has been careless, or crude, or just lazy, in ways that cannot be known to the layman or very important to him, either. This view, I feel, has no place in public criticism.

Much more important, during the past 20 or 30 years, has been the philosophical basis on which the trained observer has stood—a basis of which the general public has remained largely ignorant, or, if not ignorant, unconvinced. Thus, convinced modernists have typically reacted on the basis of a rationale—even to the extent, in the not too distant past, of suppressing their real reactions in the light of a conviction that whatever was Functional *must* be beautiful (a process not too different from cultivating a taste for olives, or martinis).

It would be nice to believe that meanwhile the layman was reacting in a truly "natural" manner, but the fact is that he was not. At approximately the same time, he was reacting on a typically *literary* basis, by which he went for hand-hewn beams, however obviously faked, and other trappings of an era he considered, in retrospect, much more attractive than his own. (More recently, this attitude has been replaced, so far as urban artifacts are concerned, by an almost touching acceptance of the brave new world of technology.)

Criticism, in my opinion, must concern itself with attitudes that are at least comprehensible to the average citizen, who is never likely to feel very deeply, for instance, over whether or not architecture

(Continued on page 58)

(Continued from page 52)

is "honest." The alternative is a watered-down version of professional attitudes which appeals solely to those striving to be "in the know."

Another point which you almost, but not quite, make, is the distinction between the public aspect of architecture and the architecture in its totality. It is quite evident, when you stop to think about it, that buildings have, very properly, a purely public significance that is largely a matter of their exterior appearance and largely independent of how well they satisfy the needs for which they were built.

As a Manhattan office worker, buildings in their civic or public guise thrust themselves upon my attention by virtue of my comings and goings in the city, and the fact that I often look out of windows—and my name, in this respect, is Legion. That I largely succeed in ignoring every building over a year old most of the time is beside the point; if Architecture with a capital A has any significance warranting criticism it is here. What has building A done to the look of Park Avenue? What has building B? Building C? And, much more important, what about A *plus* B *plus* C? You know as well as I that this is the most important esthetic problem we face architecturally, and, in my opinion, it is the obvious one to which criticism should address itself.

Generally, unless I'm very mistaken, the professional reader of an architectural journal makes a much more sharply critical evaluation of the buildings he sees therein than any magazine is ever likely to print (not all readers share the same opinion, of course, but there is no reason that they should, and certainly no reason they should be led to do so). Consequently, I feel that most of your categories can be dispensed with in favor of concentration on "Context," "Pleasure" (in terms of lay reactions), and "Recognition," in that order. In other words, let's have criticism of architectural *trends* and *attitudes*, rather than of individual buildings, and of design *schools* rather than individual architects (Formalism vs Romanticism, for instance). As respects individual works, let's hear what the architect himself has to say about his objectives, and otherwise "just give us the facts."

HENRY WRIGHT
New York, N. Y.

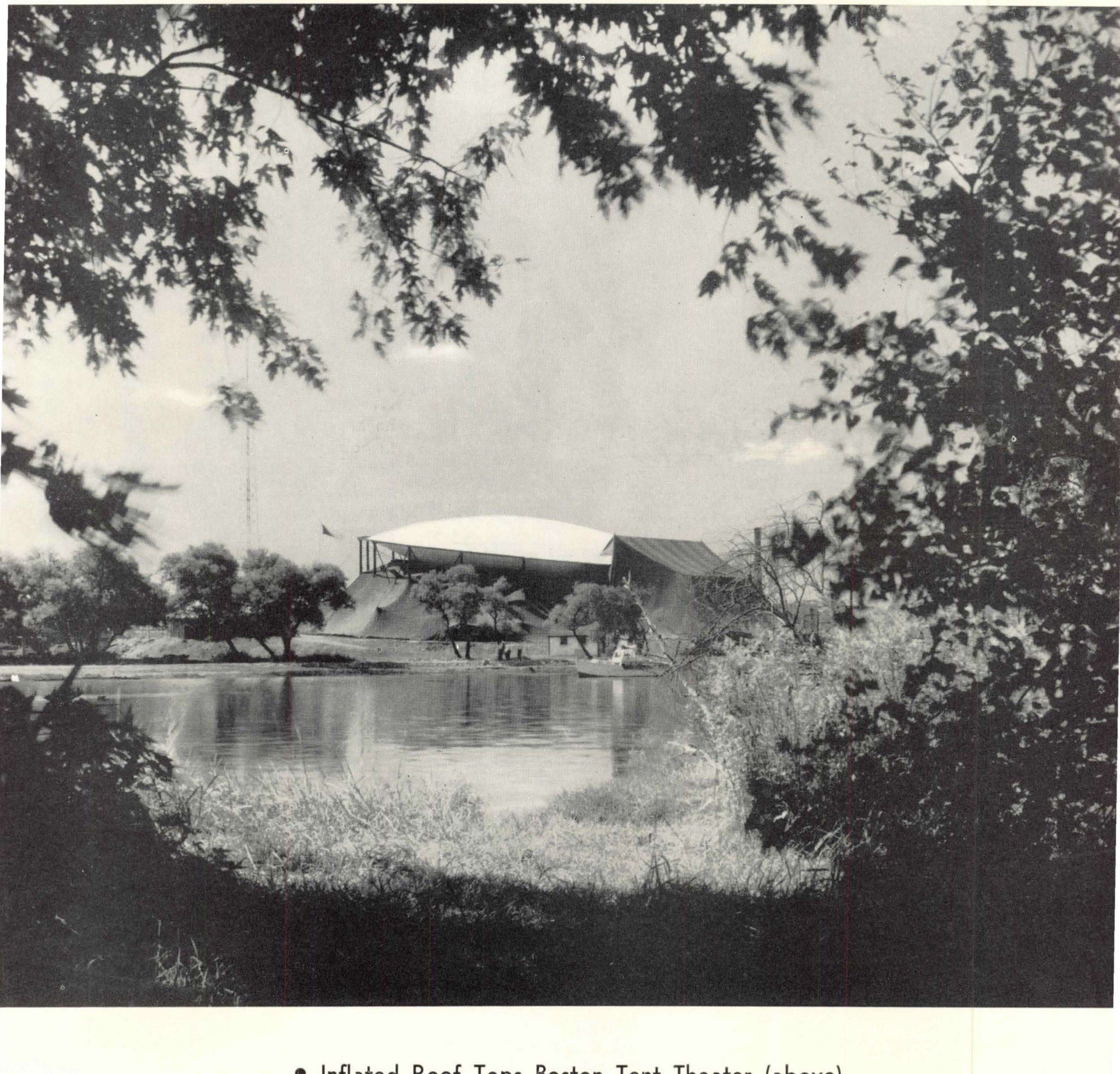
new offices

LESTER WERTHEIMER, Architect, 451 N. La Cienega, Los Angeles, Calif.

COURTNEY E. ROBINSON, Architect, 1924 St. Joe Blvd., Ft. Wayne, Ind.

EDWARD K. SCHROEDER, Architect-Specifications Writer, 12033 S. 73rd Ct., Palos Heights, Ill.

PROGRESSIVE ARCHITECTURE
news report



- Inflated Roof Tops Boston Tent Theater (above)
- SOM Set to Open Two Big Ones in San Francisco
- Audio-Visual Aids Require Special Planning

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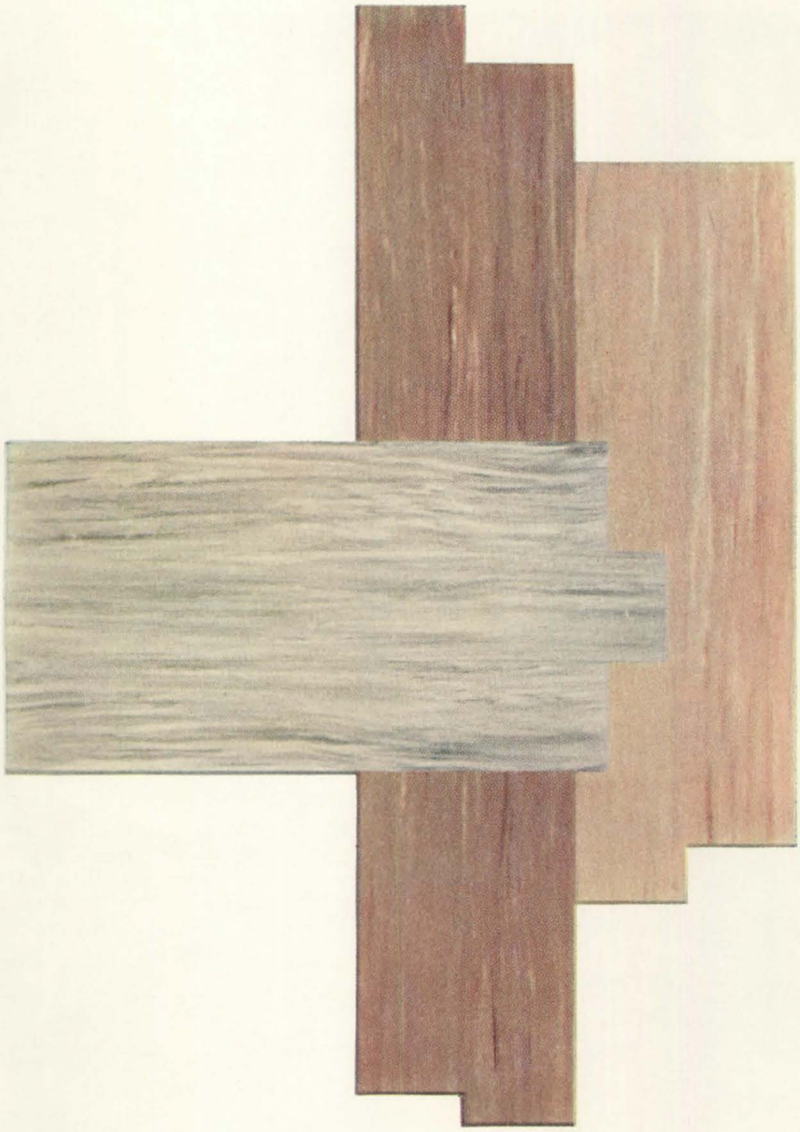

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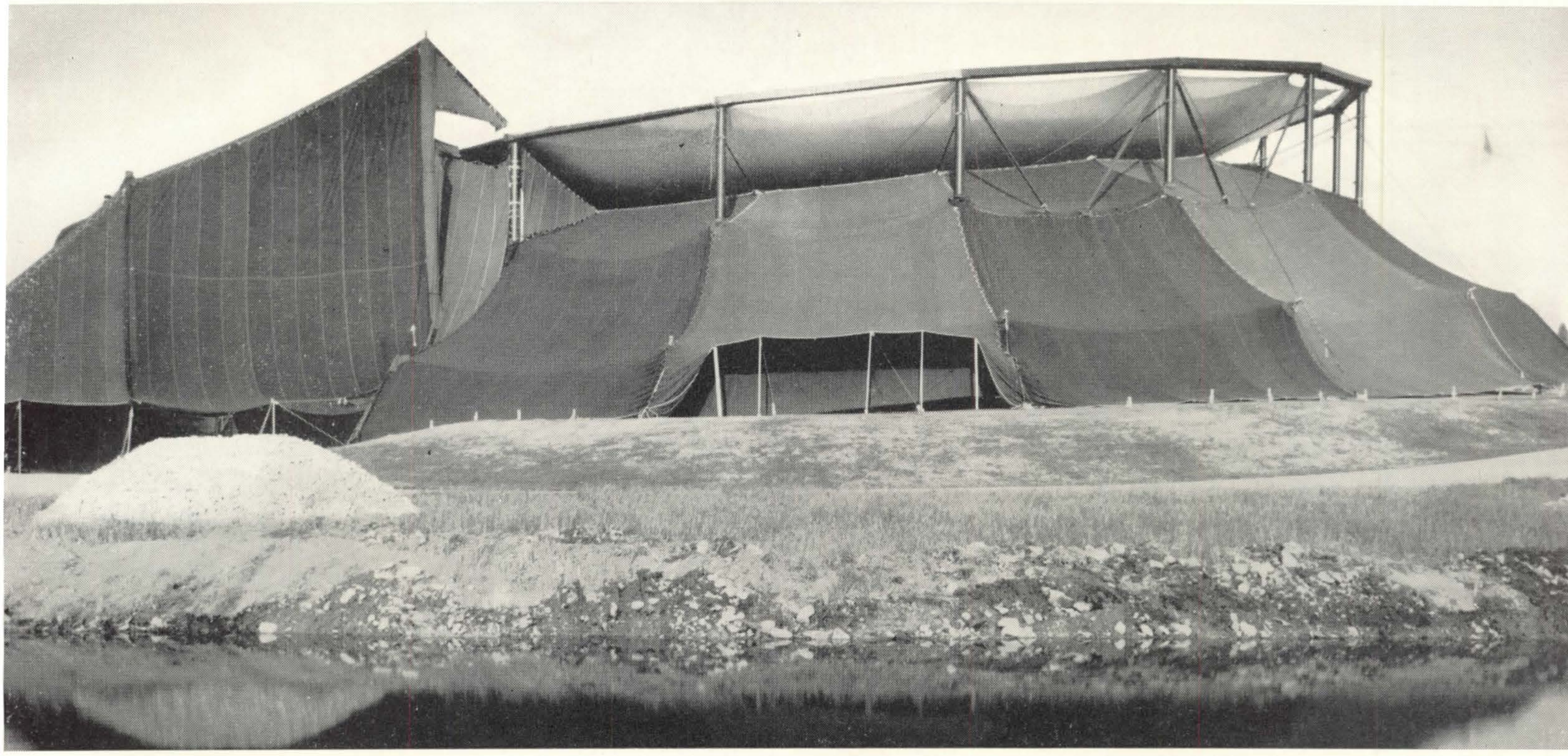


Photos: David Hirsch

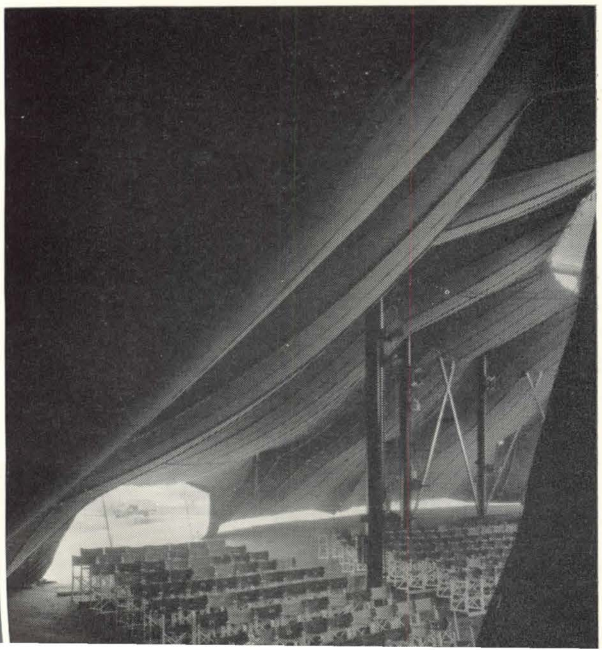
INFLATED ROOF TOPS BOSTON TENT THEATER

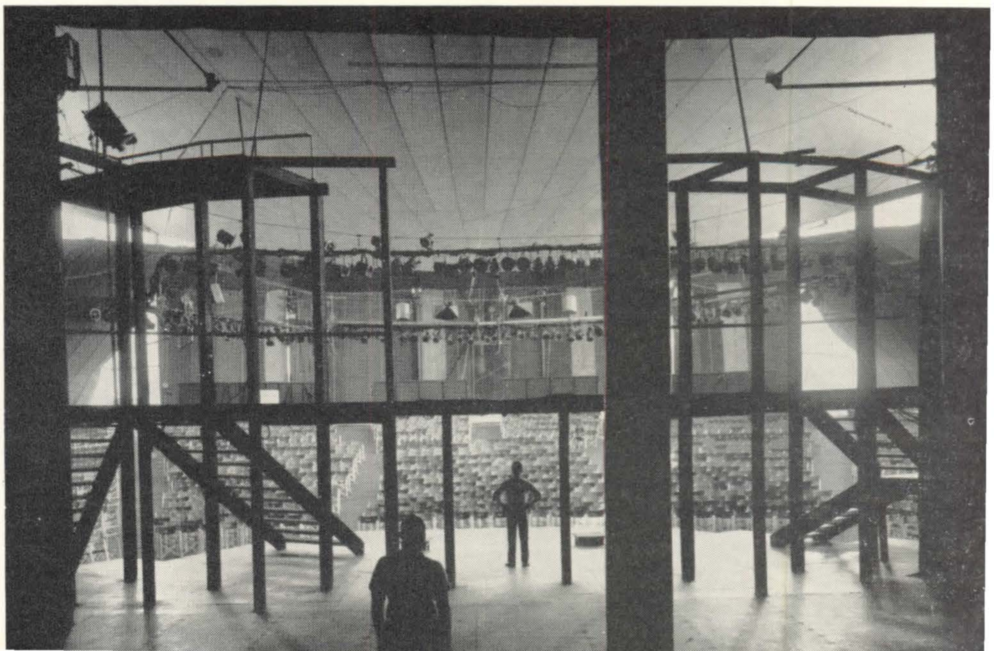
Structure Is First in Arts Center Complex

BRIGHTON, MASS.—The Metropolitan Boston Arts Center Theater on the bank of the Charles River has just concluded its successful first summer season. The temporary tent structure is the initial element in an ambitious program for an arts center which will include eventually an art gallery (by Saltonstall & Morton, now under construction); an opera house (by Shepley, Richardson, Bulfinch & Abbott, with Pietro Belluschi as consultant); and a projected restaurant. The theater, itself, later will be constructed of permanent materials.

Instead of the conventional, peaked, tent roof, the Boston theater has been provided with an inflated-nylon roof of lenticular cross-section, 145 ft in diameter. This roof is an improvement over the normal tent form since it acts as an acoustical reflector from actor to audience. Its dramatic form gives an appropriately festive feeling. Positioning of canvas sidewalls, in from the roof edge and two or three feet below the roof, provides a natural ventilation system. The 2000-seat auditorium is designed to accommodate both conventional proscenium performances and modified Elizabethan staging. The architects believe this is the largest-scale use of such flexible presentation.

Architects for the theater are Carl Koch & Associates, Inc.; Paul Weidlinger, Structural Engineer; Shurcliff & Merrill, Landscape Architects; M. Solimando, General Contractor; nylon roof by Birdair Structures, Inc.

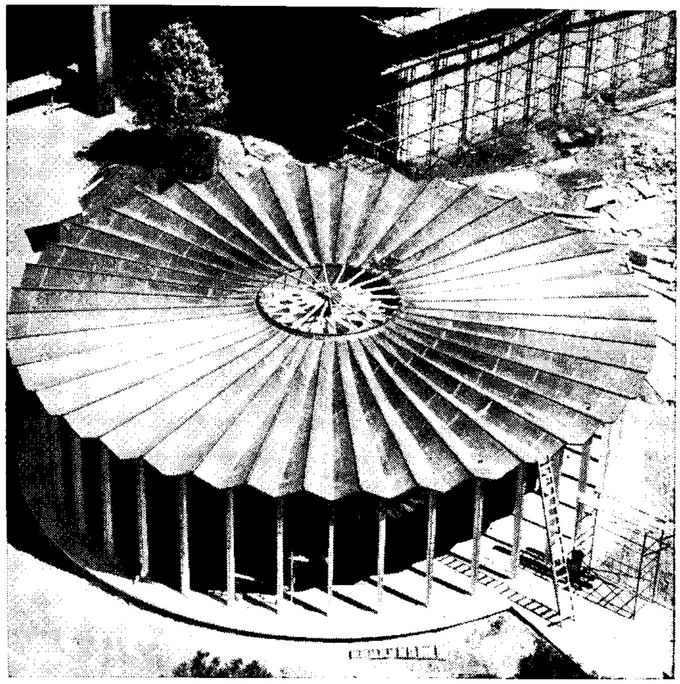




SOM SET TO OPEN TWO BIG ONES IN SAN FRANCISCO

Two Wall Types Represented

Photos: Joe Munroe



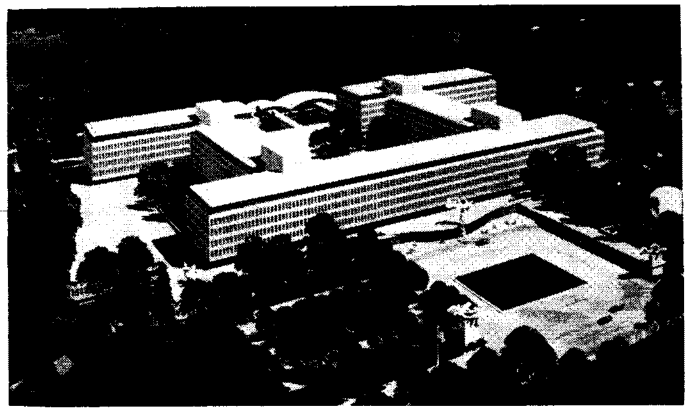
SAN FRANCISCO, CALIF.—Two of Skidmore, Owings & Merrill's most widely-publicized projects of recent years are reaching completion here—the 20-story Crown Zellerbach Headquarters Building (*acrosspage top*) and the 14-story John Hancock Western Home Office Building (*acrosspage bottom*).

The Crown Zellerbach building, designed with Hertzka & Knowles as Associate Architects, is composed of two main elements rising from a meticulously-landscaped plaza. The curtain-walled office tower has heat-absorbing windows and blue-green, aluminum-framed spandrels. The large service core building, containing mechanical and vertical transportation equipment, is faced with mosaic tile of a subdued hue. At one end of the triangular site with its fountain-sculpture is the copper-roofed circular American Trust Company bank, (*above right*). The exposed structure of the roof, as seen from the basement of the bank (*above left*) creates interesting sculpturesque forms. H. J. Brunnier is Structural Engineer.

The reinforced-concrete John Hancock building, with its load-bearing walls, is a unique venture for curtain-wall-oriented SOM. Despite the bearing qualities of the building's exterior walls, however, the upper twelve stories appear to be supported by the massive concrete arches of the first two floors (*below*). Exterior walls of floors twelve through fourteen are faced with polished granite, and panels of precast concrete surrounding the mechanical area "cap" the building by recalling the concrete of the arches.

ARCHITECTURAL BULLETINS

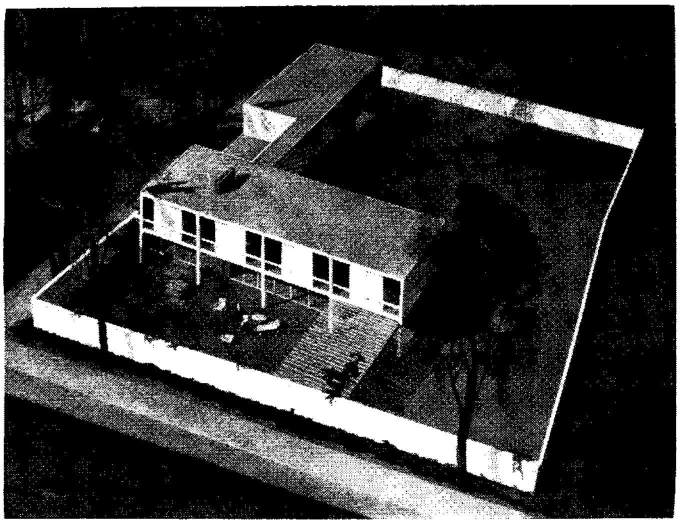
● Central Intelligence Agency building in Langley, Va., near Washington, D. C., will bring all CIA activities under



one roof for first time. Building will have five major office elements providing more than one million sq ft of working space, plus cafeteria accommodating 1400, and 500-seat auditorium. Architects: Harrison & Abramovitz, New York; Consulting Mechanical Engineers: Syska & Hennessy, New York.

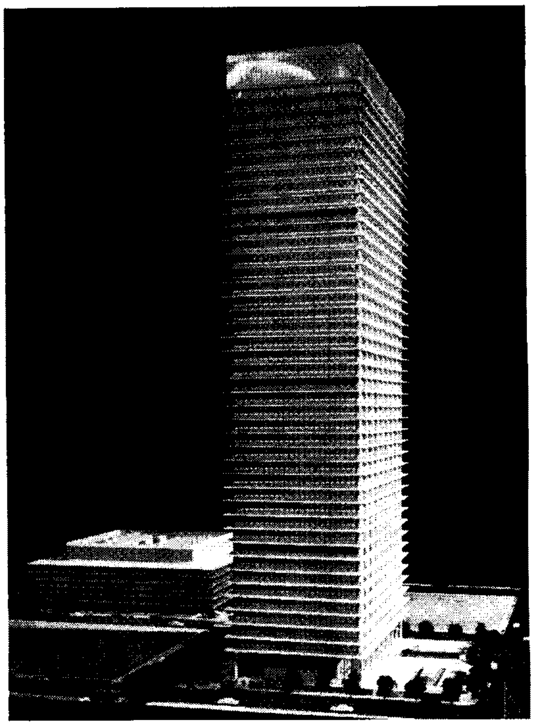
● "Norwegian Tapestries," Smithsonian Institution Traveling Exhibition currently at Brooklyn Museum, will go to Kansas City, Mo., Washington, D. C., Santa Fe, N. Mex., San Francisco, Calif., and Seattle, Wash., before June of next year. Exhibit is said to be most important collection of Norse folk art ever assembled for U.S. showing.

● House for Dean of Harvard College, Cambridge, Mass., will be in midst of upperclassmen's residence halls. House, named after Edward Waldo Forbes, long-time director of Fogg Art Museum, was designed by The Architects Collaborative. Entrance court will provide access to house with its long, ground-floor living room for receptions and student-faculty meetings. Family living quarters will be on second floor. There will be private apartment for visiting scholars.



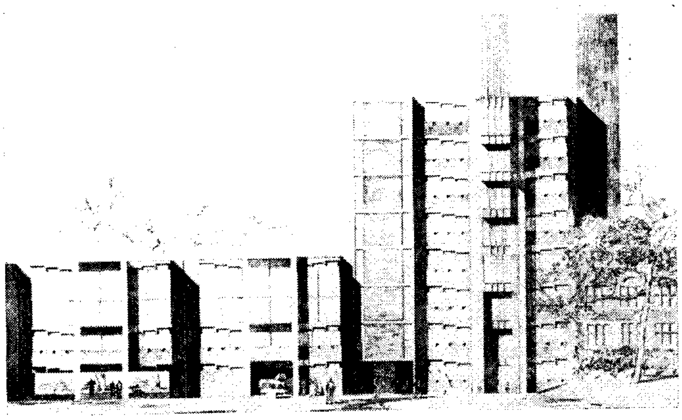
● Seventeen architectural and engineering students completed 10-week summer training course in office of Voorhees, Walker, Smith, Smith & Haines, New York, with inspection of two of firm's projects under construction: Research and Engineering Center for Esso Research and Engineering Company, Florham Park, N. J.; and Research Laboratories for Bethlehem Steel Company, Bethlehem, Pa. Training program acquaints students with problems involved in actual practice. Students attend seminars and lectures by firm's executives; work on a project in 35-man production group headed by project architect and project engineers; choose two week-long assignments in different departments (design, site planning, interior design, etc.). Students of architecture or structural, electrical, and mechanical engineering are eligible for program; priority is given to those who will enter their final year and intend to work in New York area. Applications are distributed to Deans of Schools of Architecture and Engineering in the East, during first term.

● Home office of Humble Oil & Refining Company in Houston, Texas, has been designed by Welton Becket & Associates, Los Angeles, with Consulting Architects Gole-



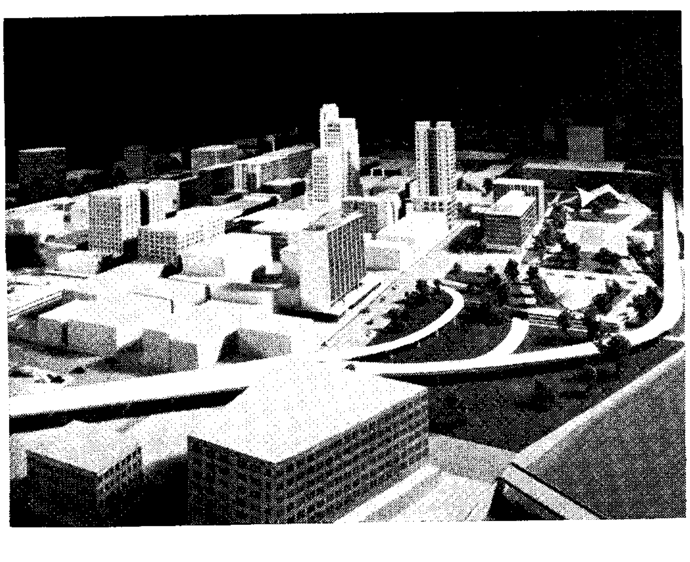
mon & Rolfe and George Pierce & Abel Pierce, both of Houston. The 44-story building will rise from landscaped front plaza. Parking garage will be catty-cornered across street, reached via tunnel. On level beneath lobby and plaza will be 1200-capacity, 500-seat auditorium, lounges, and shop space. Horizontal aluminum and porcelain-enamel sunshades will act as sun shields. Structural engineers are Murray Erick & Associates, Los Angeles, and McClelland Engineers, Inc., Houston.

● Pittsburgh launched "Pittsburgh Progress" at Duquesne Club press luncheon featuring Westinghouse Electric Corporation's Chairman of Board Gwilym A. Price and U.S. Steel Corporation vice president Bennett S. Chapple, Jr., president and vice president, respectively, of Pittsburgh Progress General Committee. Program, centered on Pittsburgh's *redevelopment*, has as "trademark" retractable-roofed auditorium in Lower Hill area (by D. K. Ritchey & Associates, formerly Mitchell & Ritchey). I. M. Pei Associates will design housing units on Lower Hill in association with Ritchey for Webb & Knapp. Culmination of program will be opening of dome in June 1961, with attendant three-day urban renewal conference.



● New teaching and research center for basic biological sciences at University of Pennsylvania was designed by Philadelphia architect Louis I. Kahn. Project will be central element of scheme to establish center of biological and basic medical sciences integrated architecturally as well as functionally. Building will include lecture and seminar rooms, biological library, advanced teaching laboratories, and research rooms. A service laboratory with animal quarters and experimental plant chambers will connect with remodeled zoology building.

● Toledo chapter AIA (with national president John Noble Richards as a prime mover) recently sparked experimental closing of four blocks of main downtown street for use as shopping and pedestrian mall in test to see if city wants large-scale renewal. Architects prepared proposed model of redeveloped downtown Toledo for exhibition on temporary mall. Proposal includes use of waterfront for recreational and cultural purposes; expressway serving downtown; retention of experimental malls; new convention hall; extension of present civic center complex; several blocks of medium and luxury-range apartment buildings bordering downtown area; and parking in four garages and two-level underground area beneath riverfront area.



Personalities

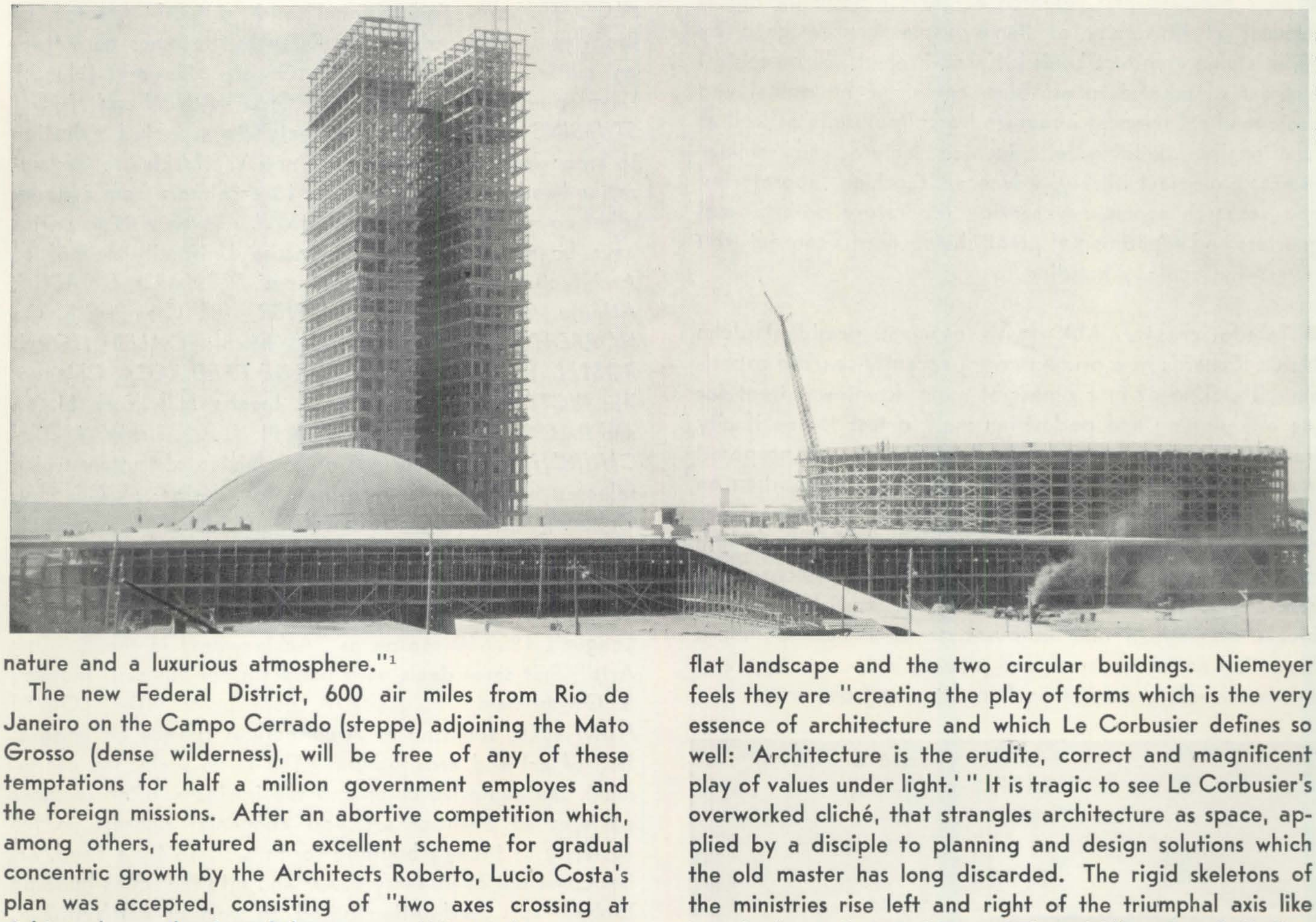
ARTHUR Q. DAVIS (Curtis & Davis, New Orleans) was made president of Orleans Gallery, New Orleans gallery dedicated to contemporary art . . . . *WILFRED J. GREGSON*, Atlanta, was renamed National President at September convention of Society of American Registered Architects . . . . Los Angeles Museum of Science and Industry presented exhibition, "A Biography of Architecture," based on work by *CHARLES LUCKMAN ASSOCIATES* . . . *JOHN M. HESS*, architectural engineer, is new technical director of Douglas Fir Plywood Association . . . . Consulting Engineer *JOSEPH R. WEISS* assumes newly-created position of Superintendent of Design, Construction and Physical Plant for New York City Board of Education . . . . *H. PETER OBERLANDER*, associate professor of planning and design and head of graduate course in community and regional planning for University of British Columbia, is in Ghana as a United Nations technical assistance expert; he will establish training center to provide personnel for developing Ghanan housing developments . . . . *JULIUS BLOOM*, former educational and cultural director of Brooklyn Institute of Arts & Sciences, becomes consultant on cultural development for Greater Newark (N. J.) Development Council . . . . *EERO SAARINEN* and *HUGH STUBBINS* were two U.S. architects who accepted invitation to enter design competition for new World Health Organization headquarters in Geneva; 13 architects from a dozen other countries will also compete. . . . Seven visiting critics have been announced for Syracuse University School of Architecture for 1959-60 session: *RICHARD L. AECK*, Atlanta, Ga.; *ANTHONY ELLNER, JR.*, Clemson, S. C.; *NORBERT GORWIC*, Detroit, Mich.; *CALEB HORNBOSTEL*, Syossett, N. Y.; *GEORGE FRED KECK*, Chicago, Ill.; *VICTOR KOECHL*, Kahn & Jacobs, New York, N. Y.; and *RALPH WALKER*, New York, N. Y. . . . . *SIR WINSTON CHURCHILL* was chairman of committee of trustees which selected winner in competition for design of Churchill College, Cambridge; winners were London Architects *RICHARD SHEPPARD, ROBSON & PARTNERS* . . . . President *MORRIS KETCHUM, JR.*, announces theme of exhibitions and meetings of New York Architectural League's 1959-60 season as "Achievement in the Building Arts"; first show deals with buildings for Business, Industry & Government . . . . P/A contributor *ADA LOUISE HUXTABLE*, speaking at Architectural League on integration of art and architecture: "The large scale, the excitement, the explosive color and the intricate, often sensuous patterns of abstract art add congenial richness to the austerity of today's building forms. . . . To fill a need, art has come out of its ivory tower and into the office-building lobby." . . . . Exhibition based on work of *BERNARD R. MAYBECK* is currently at Octagon; it is being circulated by Smithsonian Institution Traveling Exhibition Service . . . . Congress has been asked for $150,000 for *FRANKLIN D. ROOSEVELT* Memorial Commission; money would be used to conduct competition for design of memorial to late president in Washington, D. C. . . . Associated with *MANUEL DUMLAO, ROBERT BURLEY*, and *EDWARD KOVACH* in winning second place in Mastic Tile Architectural Competition (SEPTEMBER 1959 P/A, pages 102-103), was *JOHN BUENZ*.

BRASILIA: MAJESTIC CONCEPT OR AUTOCRATIC MONUMENT?

Last month a group of distinguished architects and critics was called to Brazil to see and evaluate the new capital city of Brasilia—among other things. P/A's art director and the biographer of Niemeyer, Stamo Papadaki, who had also been a member of the international Jury that selected the city's final plan, was among them. Anticipating much critical discussion of this new urban phenomenon as a result, P/A here presents a report from a prior, personal, non-conducted observation by one of architecture's most penetrating critics.

The basic facts about Brasilia, the new capital of Brazil, can best be visualized by imagining a decree by President Eisenhower ordering transfer of the U. S. Government to Sweetwater County, Wyoming, "to counteract the urban trend of the rural population, deflect the population center to the underpopulated west, and remove government employes from the large city with its pressures, its passions, its economic interests, surrounded by all the seductions of nature and a luxurious atmosphere."[1]

The new Federal District, 600 air miles from Rio de Janeiro on the Campo Cerrado (steppe) adjoining the Mato Grosso (dense wilderness), will be free of any of these temptations for half a million government employes and the foreign missions. After an abortive competition which, among others, featured an excellent scheme for gradual concentric growth by the Architects Roberto, Lucio Costa's plan was accepted, consisting of "two axes crossing at right angles — the sign of the cross itself."[2] At this moment it seems of interest to consider the emerging architectural face of the new city. All buildings were designed by Oscar Niemeyer, but it would be a mistake to judge them from the widely publicized hotel, presidential palace, and chapel (FEBRUARY 1959 P/A, pages 71, 75-77). These buildings are separated from the town by a vast stretch of land, two, high, steel fences, and a military guard. The city's *dominating* architectural group stands at the end of the seven-miles-long axis that divides Brasilia into symmetric halves. On a triangular terrace "linked with the architecture of the remote past" rise two tightly-wedged skyscrapers of 25 stories for Administration and Congress, and two circular structures, the Supreme Court and a Hall for Presidential Messages **1**. The two towers of exposed-steel and glass-curtain-wall construction would be overlooked in Manhattan for their conformity. On an equatorial plateau 3800 ft high, with the brilliant glare of a treeless tropical atmosphere, their interiors will be difficult to use, especially since no air conditioning is planned. To the uninitiated, there is a strange lack of scale in the relationship of the two towers to the flat landscape and the two circular buildings. Niemeyer feels they are "creating the play of forms which is the very essence of architecture and which Le Corbusier defines so well: 'Architecture is the erudite, correct and magnificent play of values under light.' " It is tragic to see Le Corbusier's overworked cliché, that strangles architecture as space, applied by a disciple to planning and design solutions which the old master has long discarded. The rigid skeletons of the ministries rise left and right of the triumphal axis like late shadows of 1922s "City of Three Million People." One wonders about communication between government agencies across a public square of such dimensions.


1

Sibyl Moholy-Nagy

This problem becomes even more blatant in the banking and office district, at present known only from Niemeyer's models **2**. The serried ranks of identical 16-story glass boxes on stilts face each other across the axial esplanade, widening here to about 3000 ft. One of the accusations levelled at Rio is that "it tries to imitate Europe and finds it difficult to do so in a tropical climate." How prophetic this sounds

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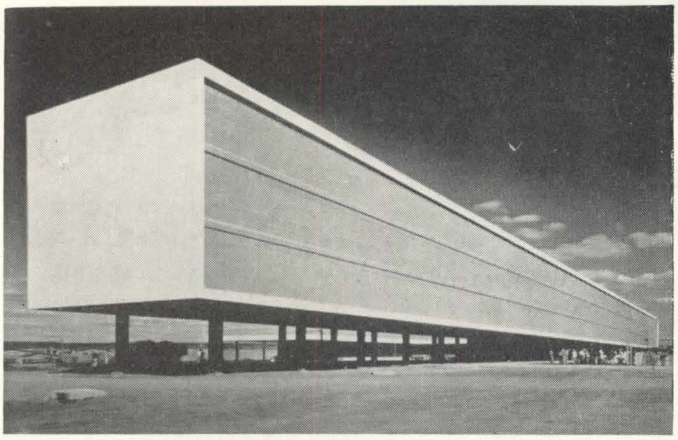
[1] *This and all other quotations from* Brasilia, *published by the Cultural Division, Ministry of Foreign Affairs, Rio de Janeiro.*

[2] *To be analyzed in the larger context of South American planning, in* FEBRUARY 1960 P/A.



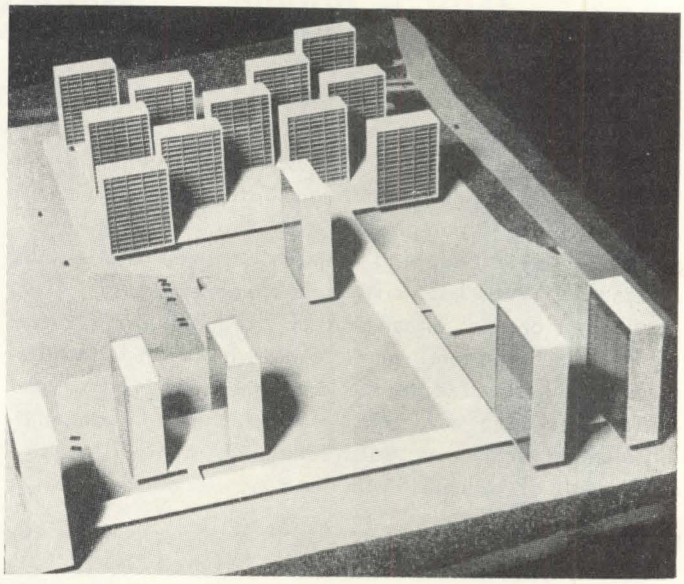
4

about the imported designs of Brasilia!

Stretching eight miles left and right from the triumphal way are residential superblocks **3**, guaranteeing "a maximum uniformity of design." Each building is six stories high, raised on stilts. The picture shown here is hazed with a thick layer of red dust that presently fills the air continuously, covering everything and everybody. In the foreground are typical habitations of construction workers and their families. Adjoining the residential sectors are schools **4**. They have the same design as the hotel: 400-500 ft long concrete boxes with concrete screen walls, filled in with glass prisms (which in the Palace Hotel raised the interior temperature to 110 degrees!). Peons of the payroll will live in 1000 Casas Populares **5** seen here at an earlier stage. The enormous field of identical 10-cell units is now almost completed, true to its prototypes: the 19th Century company towns of England and the peon houses of Chandrigarh.

The tragic implications of misunderstood modern architecture are indicated in the trend toward irresponsible verbalization that has marked and marred Le Corbusier's writing. Rhapsodizes Lucio Costa: "Thus, while monumental, the city is also comfortable, efficient, welcoming and homely [sic], spacious and neat, rustic and urban, imaginative and functional"; "an artificial instrument of the state," adds Meira Penna, Director of NOVACAP, "entirely planned according to the most daring tenets of contemporary architecture."

—Sibyl Moholy-Nagy



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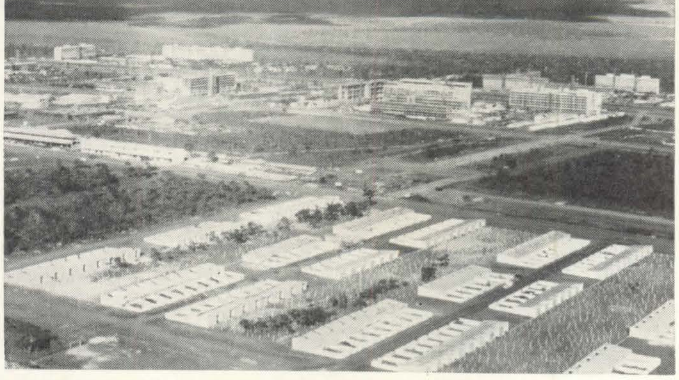


5

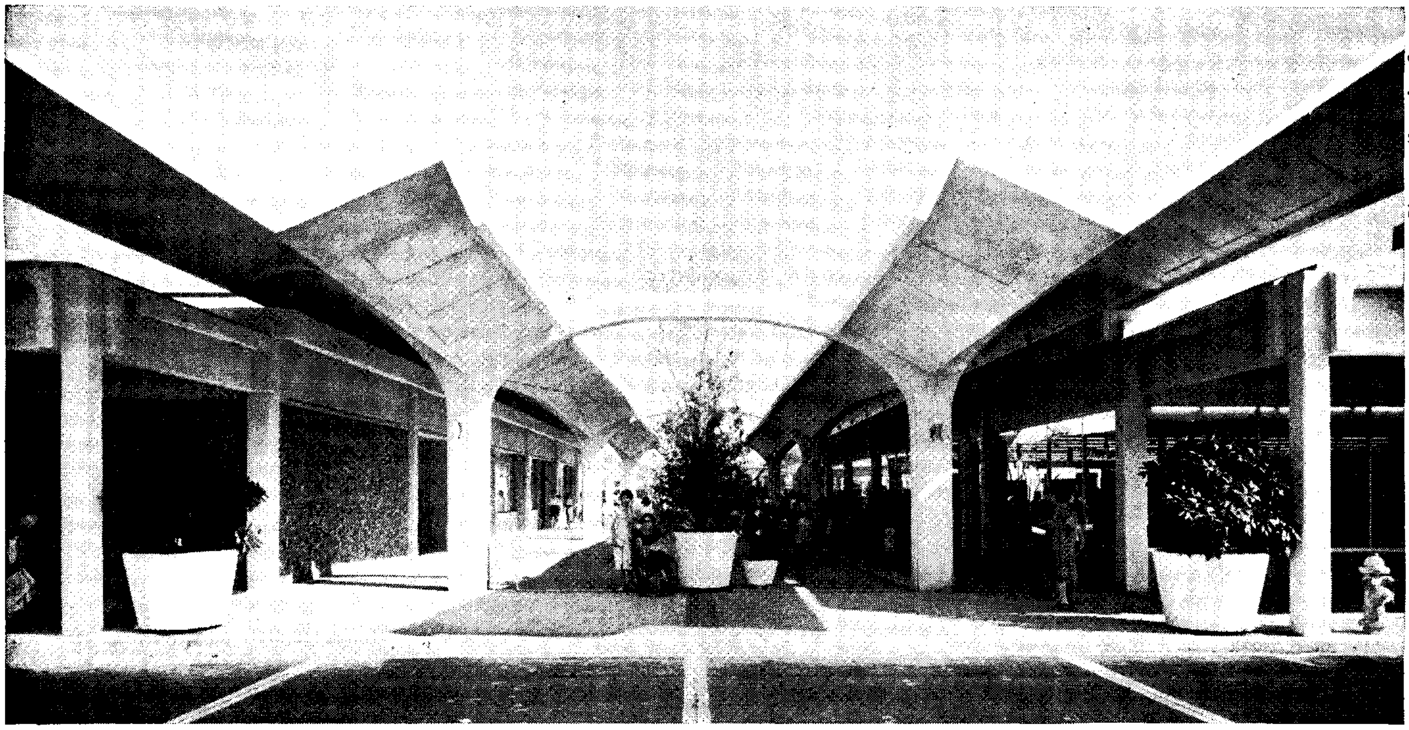
JAUNTY CONCRETE CANOPIES HIGHLIGHT SHOPPING CENTER

Spacious Mall Expresses Structure Boldly

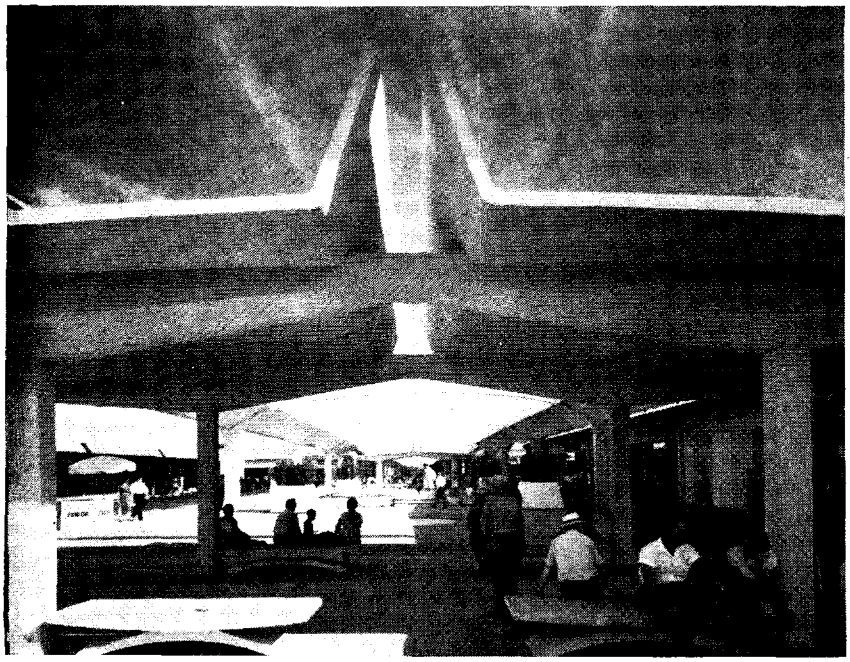
ATLANTA, GA.—The South's "largest regional shopping center" has opened here, featuring 54 stores and services in an 800,000 sq ft complex.

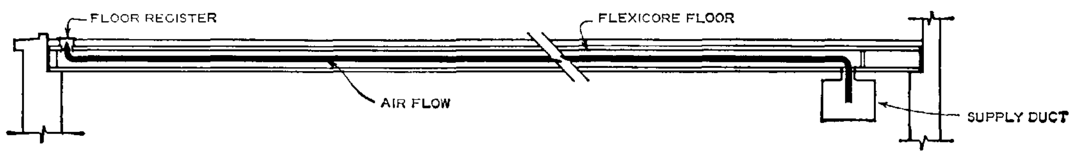
Lenox Square Shopping Center, designed by Toombs, Amisano & Wells has as its main elements two major department stores at either end of the main axis (*bottom right*). The "signature" of the center, however, is the dramatic, semi-roofed entrance area and mall (*below and bottom left*). The architects state that, "since the dominating element is the exposed structure, we [wanted] to get a great deal of refinement in the concrete design." Italy's Pier Luigi Nervi was consulted on the basic structural design of the center. Structure of center is reinforced concrete; exterior materials are glazed terra cotta and pre-cast concrete with decorative aggregate.

The entrance area has been made the Fashion Area for the common use of all stores in the center. Facilities of the center other than merchandising are a teen-age recreation center and roof restaurants and gardens. Fountains, sculpture, and landscaping (by Hideo Sasaki) contribute to making Lenox Square a relaxed, inviting area for its 200,000-customer potential.



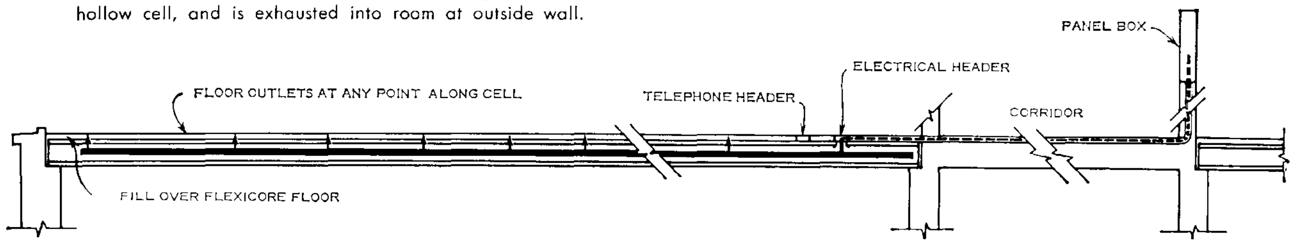
Photos: Alexandre Georges



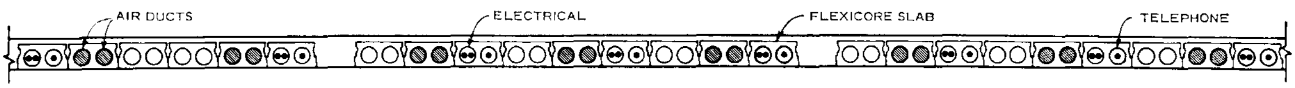


Ask for Flexicore Facts No. 82

Section AA. At American Concrete Institute in Detroit, warm or cool air flows from supply duct, through Flexicore hollow cell, and is exhausted into room at outside wall.

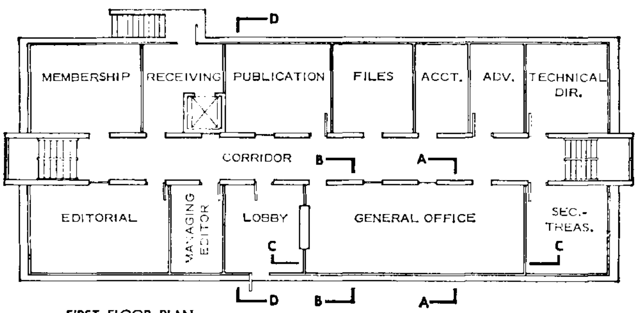


Section BB. Electrical wiring runs from panel box, through header, then through Flexicore hollow cell to floor outlet. Similar system is provided for telephone.

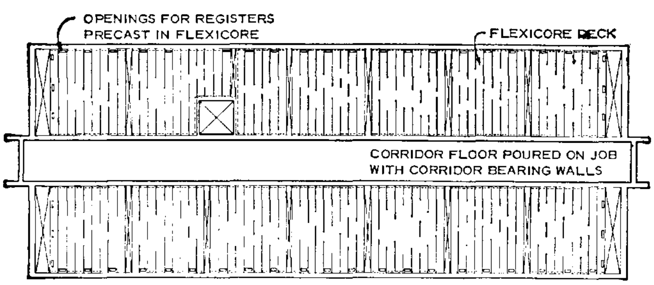


Section CC. Selected cells are used for electrical, telephone, and for air ducts. Electrical fittings by Conduflor Corp., Cleveland.

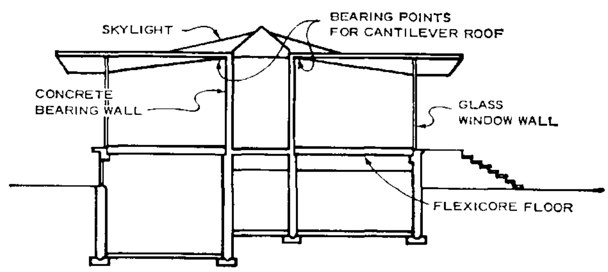
HOW TO USE CELLULAR CONCRETE DECKS FOR ELECTRICAL AND AIR DISTRIBUTION



FIRST FLOOR PLAN



First Floor Framing. Corridor floor was cast in place with corridor bearing walls. Flexicore clear-spans from corridor walls to outside walls.



Section DD. Corridor walls are sole support for roof.

Minoru Yamasaki & Associates, Architects, Birmingham, Michigan

Hollow cells in Flexicore precast, fireproof floors are used for electrical and telephone wiring, and as air ducts for warm air heating, air conditioning and ventilating at American Concrete Institute Headquarters, Detroit.

For more information on this project, ask for Flexicore Facts No. 82. Write The Flexicore Co., Inc., Dayton, Ohio, the Flexicore Manufacturers Association, 297 S. High St., Columbus 15, Ohio or look under "Flexicore" in the white pages of your telephone book.

flexicore®
PRECAST CONCRETE DECKS

THE MORTGAGE MONEY SITUATION

by William Hurd Hillyer

Wordly-wise Polonius in *Hamlet* declares: "Now remains that we find out the cause of this effect." For us, the task is to descry the financial outlook regarding mortgage money, so important to the well-being of that noblest of the arts—architecture. There is no question about the need for dwelling units nor the growing desire of Americans "to own their own homes." The Census Bureau's latest estimate places the population fifteen years hence at a minimum of 215,800,000 and a maximum of 243,900,000.

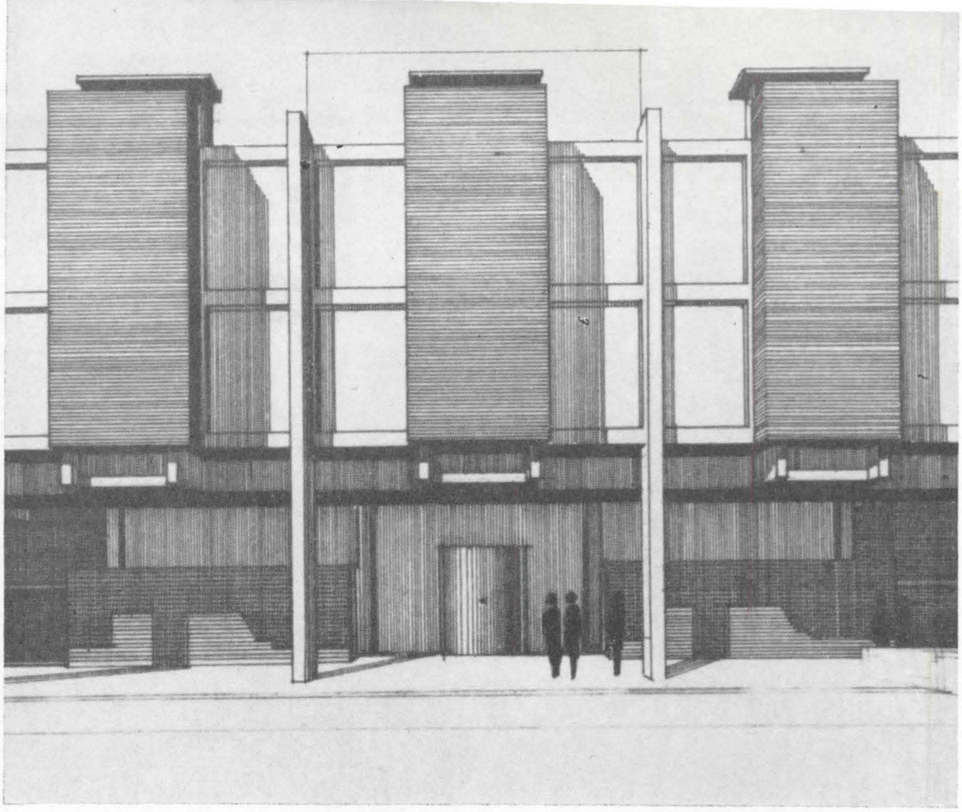
The Mortgage Bankers Association estimates construction ten years from now at $600 billions, exclusive of land, operating equipment, and other services. This projection was made in connection with an analysis of the rising interest rates and availability of money to finance all present demands. "More of every type of facility from houses to factories and schools and hospitals will be called for . . . . Against this huge demand we have the threat of continued shortage of savings." The report states that "from a long-term view, interest rates are not inordinately high. If they are out of line at all by historical comparison it is on the low, rather than on the high side. At most times prior to the great depression, interest rates were higher than they are now." In preparation for the housing boom anticipated for the 1960s, Carl T. Mitnick, president of the National Association of Home Builders, urges the formation of a Central Mortgage Bank to insure a steady flow of money into the mortgage market. "Builders and their manufacturer-suppliers must be partners in this enterprise," he avers.

Next comes a spate of figures which should bring a smile to the most dour face. Let's see how the savings and loan institutions stand (their mortgage investment take 80% of their money to further the building of homes). The Federal Home Loan Bank Board announces that "all savings and loan institutions combined made more than $1 billion in mortgage loans for the 13th successive month and established new peak for May." The $1.4 billions of loans made in that month was 38% higher than the figure for May '58, and nearly one-third more than the previous high for May set in '55. Indications are that the six-month cumulative figure for mortgage lending may exceed $7.5 billions. The industry showed a gain in savings share accounts of $3.5 billions to an estimated $51.4 billions on July 1. The assets of the approximately 6200 associations in the nation were estimated on that date at $60 billions.

The 518 mutual savings banks in this country reported an estimated deposit total on June 30 of $34.6 billions—a gain of 1.64% over the January first figure. The largest of such institutions in the world is New York's Bowery Savings Bank, with deposits of $1570 millions; the only other billion-dollar-deposit bank of this type is the Philadelphia Savings Fund Society with $1017 millions.

Federal National Mortgage Association has set a new schedule of purchase prices for FHA and VA home mort-

(Continued on page 94)

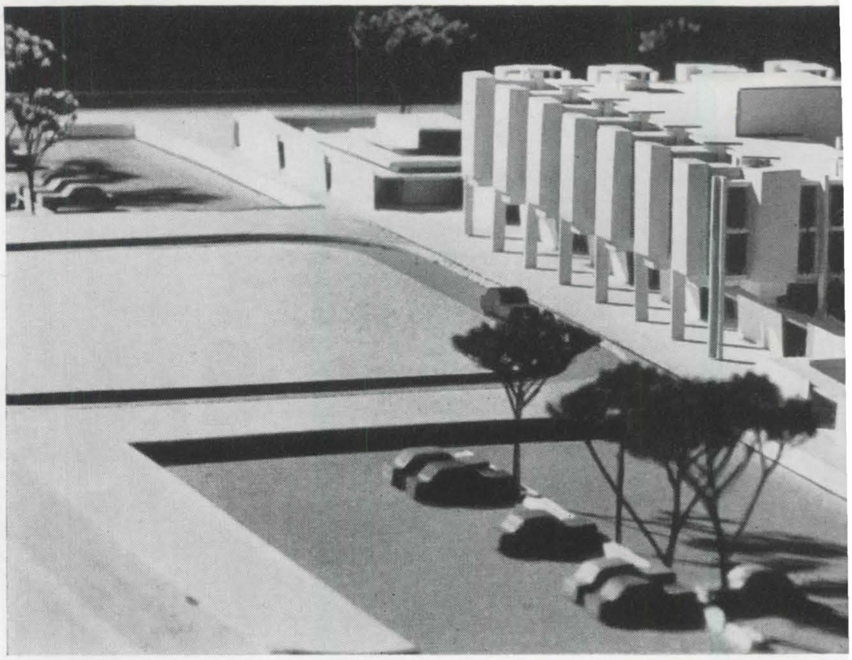


hospital architects in training

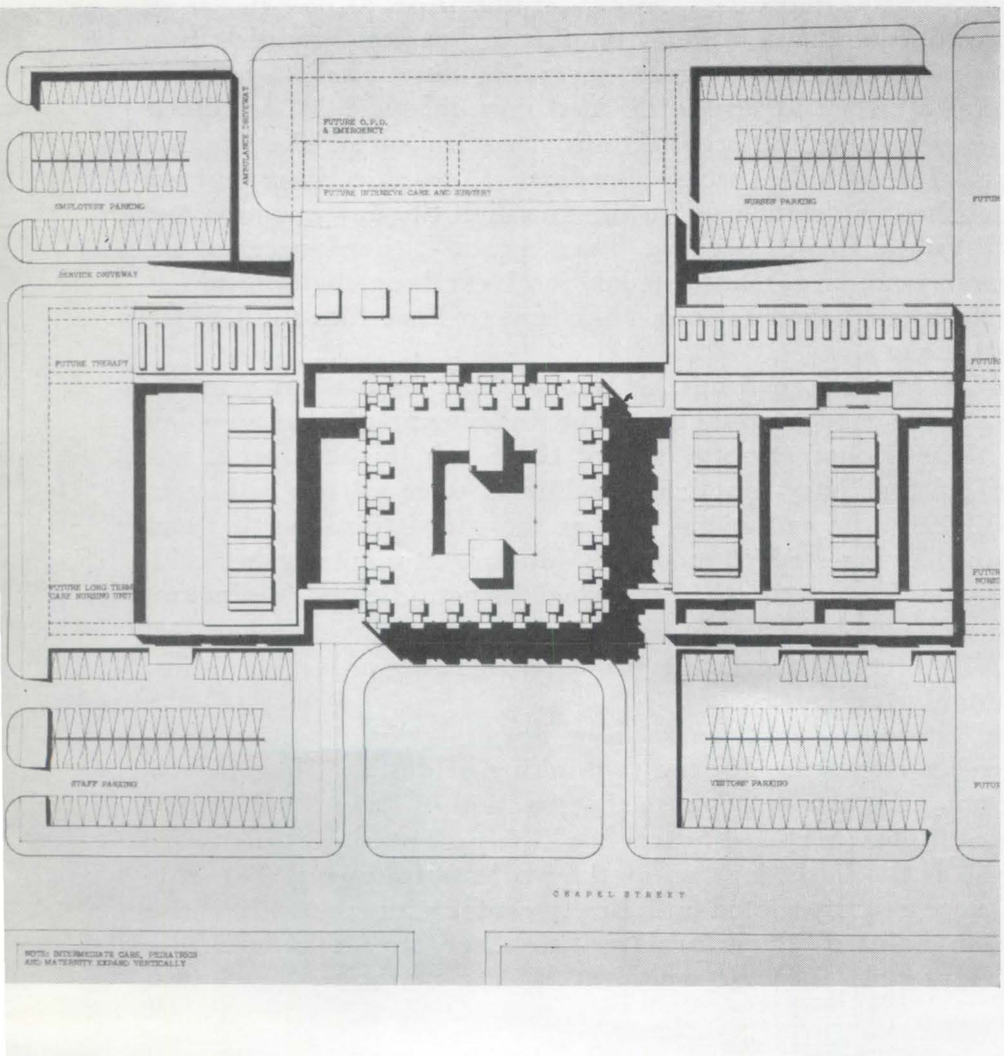
Hospital design has not advanced greatly since it took a sharp upturn during the 1930's and early 1940's. At that time, as new therapies were developed and a new understanding of hospital administration and nursing-care techniques grew, several brilliant medical administrator/consultants and several devoted hospital-specialist architects began re-examining the architectonic organization of the hospital building. These studies were co-ordinated, graphically organized, and published as "standards" while Marshall Shaffer was architect for U.S. Public Health Service. Then, rapidly, the dangers of recordings and standards manifested themselves: design became jelled; all the hospitals began to look alike and to look like the USPHS standard designs.

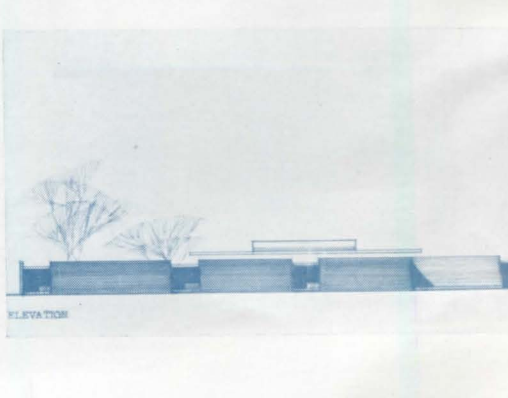
Shaffer himself realized this danger, and in his last years as missionary for good hospital design he was plugging hard for *school studies, school competitions, school theses* on hospital problems. He realized that busy practicing architects were all too willing to accept literally the esthetic as well as the social thinking that had gone into the suggested "standard" solutions. Students in the architectural schools, once they had absorbed the complicated administrative/therapy problems, might begin finding other three-dimensional results. To a certain degree this has happened; the pages that follow show some instances.

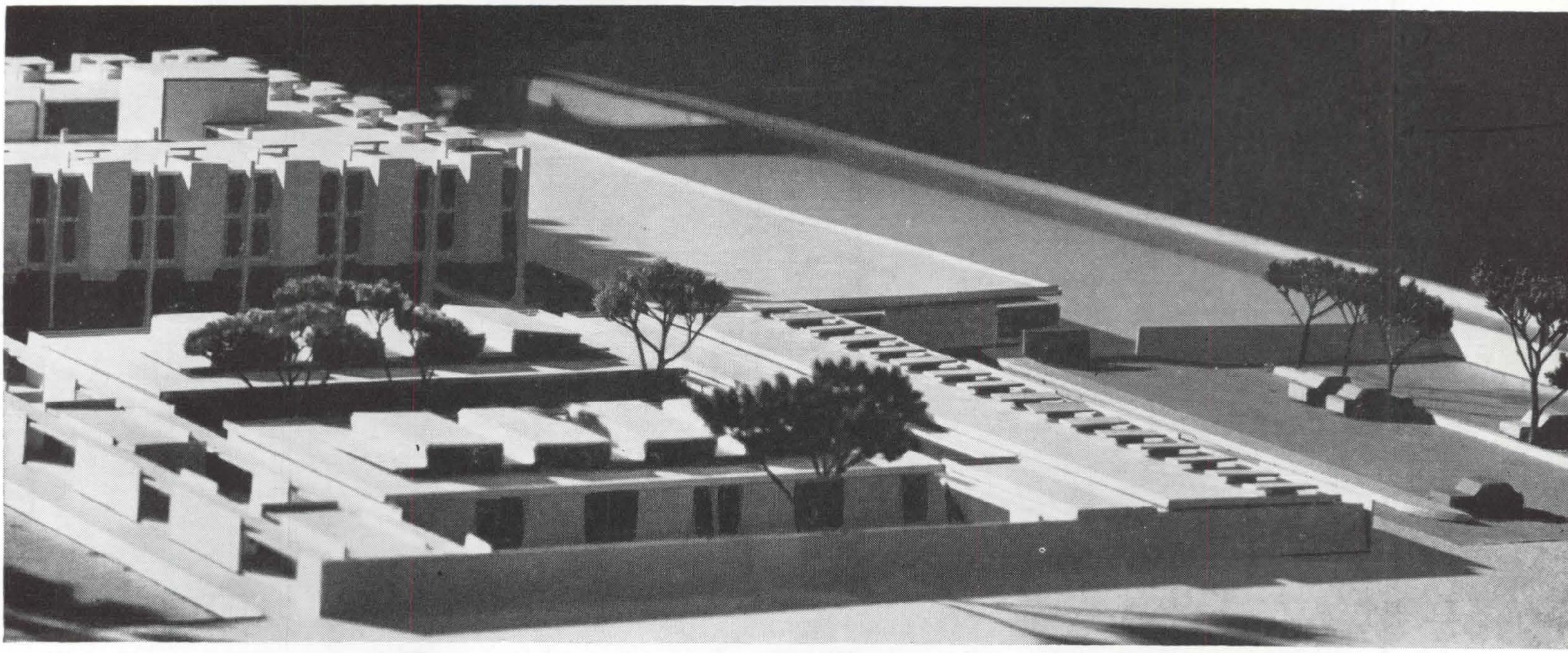
It is interesting that, again, new hospital-administration techniques are the stimulus for the re-thinking of design. The *progressive patient care* concept (physical separation of "zones" of degree of patient illness; physical nearness of the patient to pertinent care facilities) is the basis for two of the projects following. The concept of a community-rooted total health center with central facilities forms the point of departure for the other one. Standards are being re-formed; future hospital architects are being developed.



Master's Thesis, Department of Architecture
School of Art and Architecture, Yale University





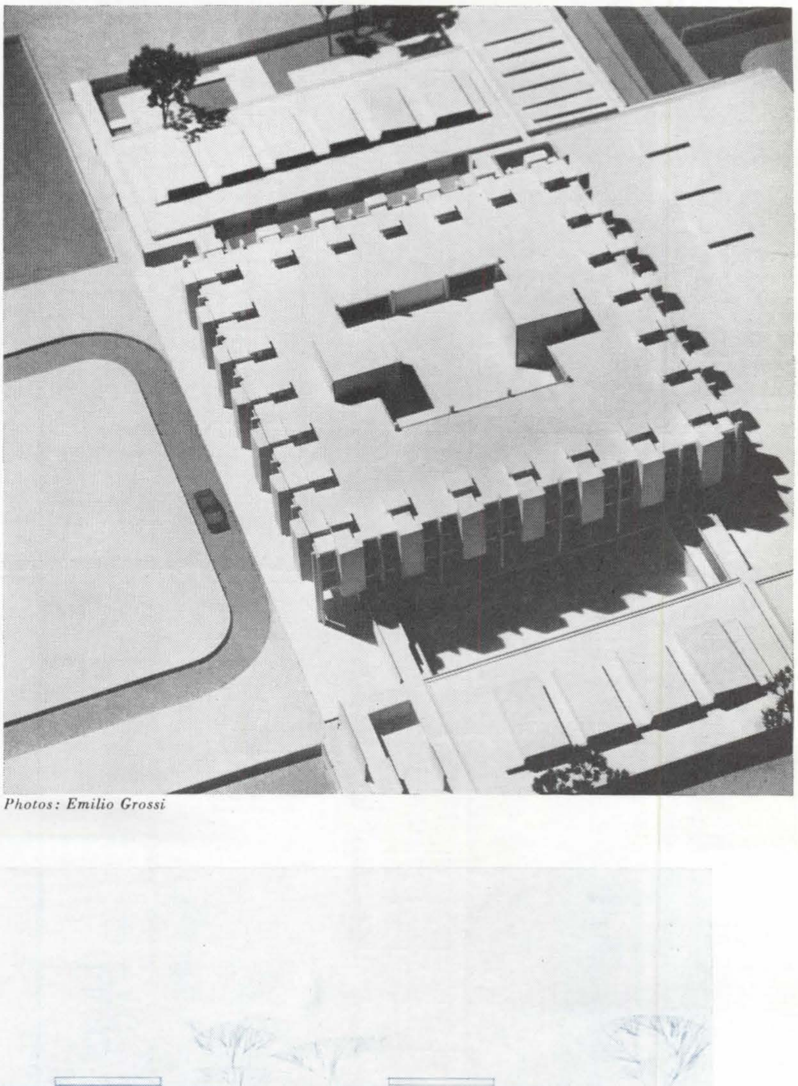


Student: Marc Goldstein. Critic: John D. Thompson, Department of Public Health, School of Medicine, Yale University.

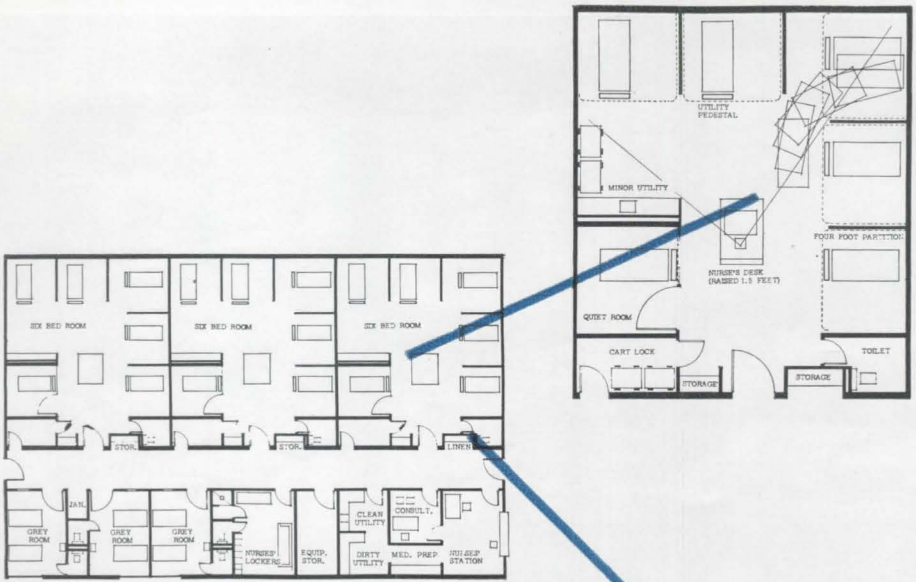
Program: To design 240-bed hospital with view toward ultimate bed population of 480 to 500. Of the 240-bed total (a number allowing optimum pattern of bed distribution and optimum sizing of nursing units) 176 beds represent medical and surgical care, 32 beds represent pediatric care, and 32 beds represent obstetric care. The 176 medical and surgical beds were subdivided according to principles of progressive patient care into four zones: 10% intensive care; 50% intermediate care; 20% self care; 20% long term care.

Site: Large block in New Haven, Connecticut, supporting two hospitals with 500-bed total.

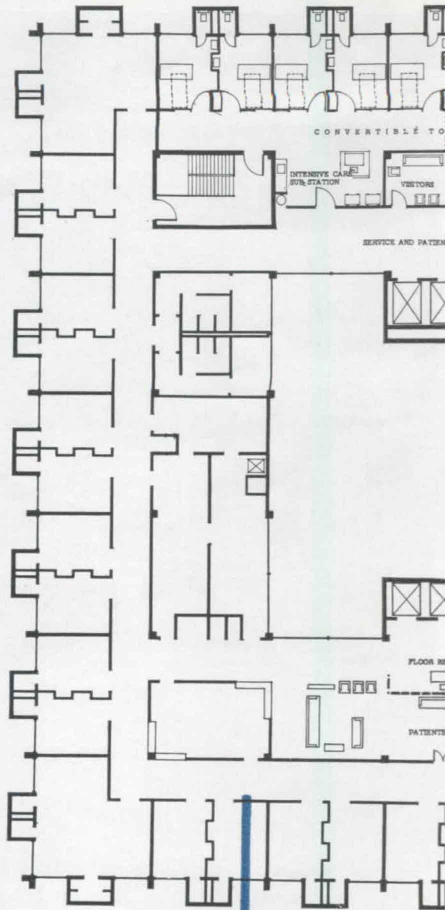
Solution: Ground level encompasses administration, out-patient department, emergency, surgery, intensive care unit, long-term care unit and self-care unit. Three distinct corridor systems designed to overcome traffic problem (due to introduction of three separate care zones): one for visitors at main street front, connecting with visitors' elevators; a second, running longitudinally midway through hospital, for in-patients, staff, service personnel; a third system of perimeter corridors for out-patient department. Second floor contains delivery, maternity, and pediatrics. Third floor is devoted to intermediate care. Basement



Photos: Emilio Grossi

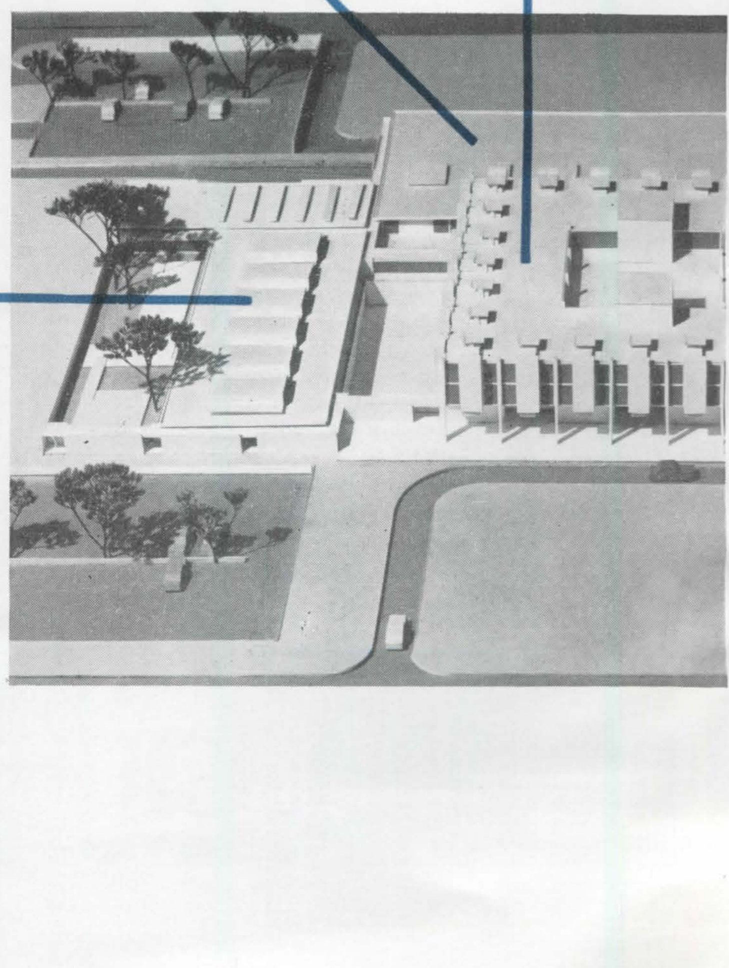


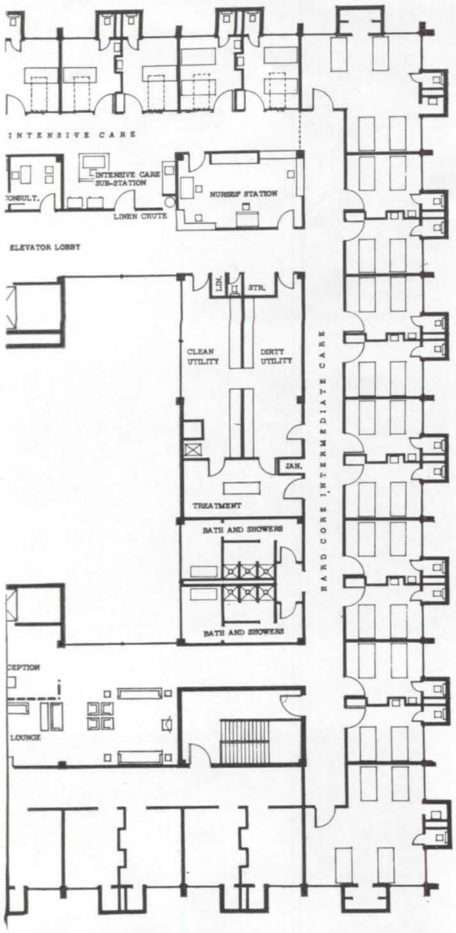
Intensive-care nursing unit



Intermediate-care

Long-term-care nursing unit



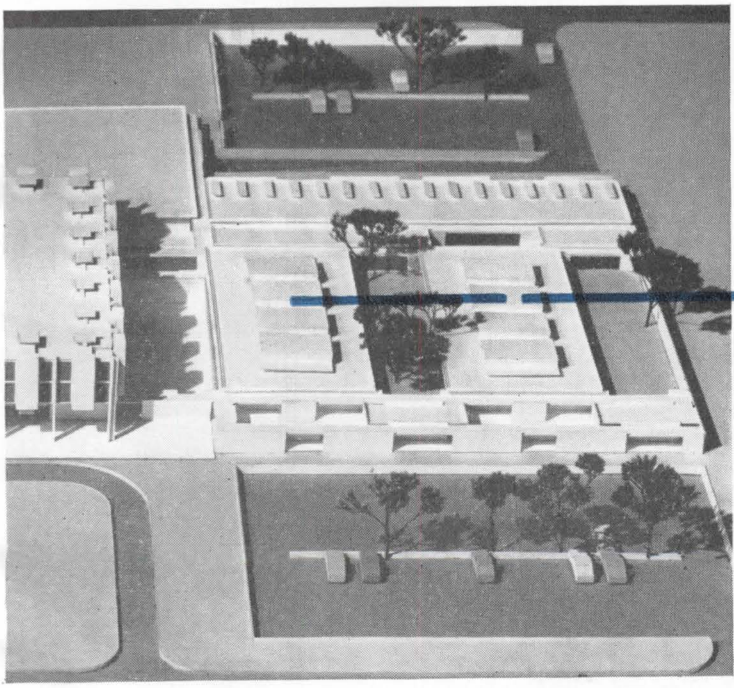


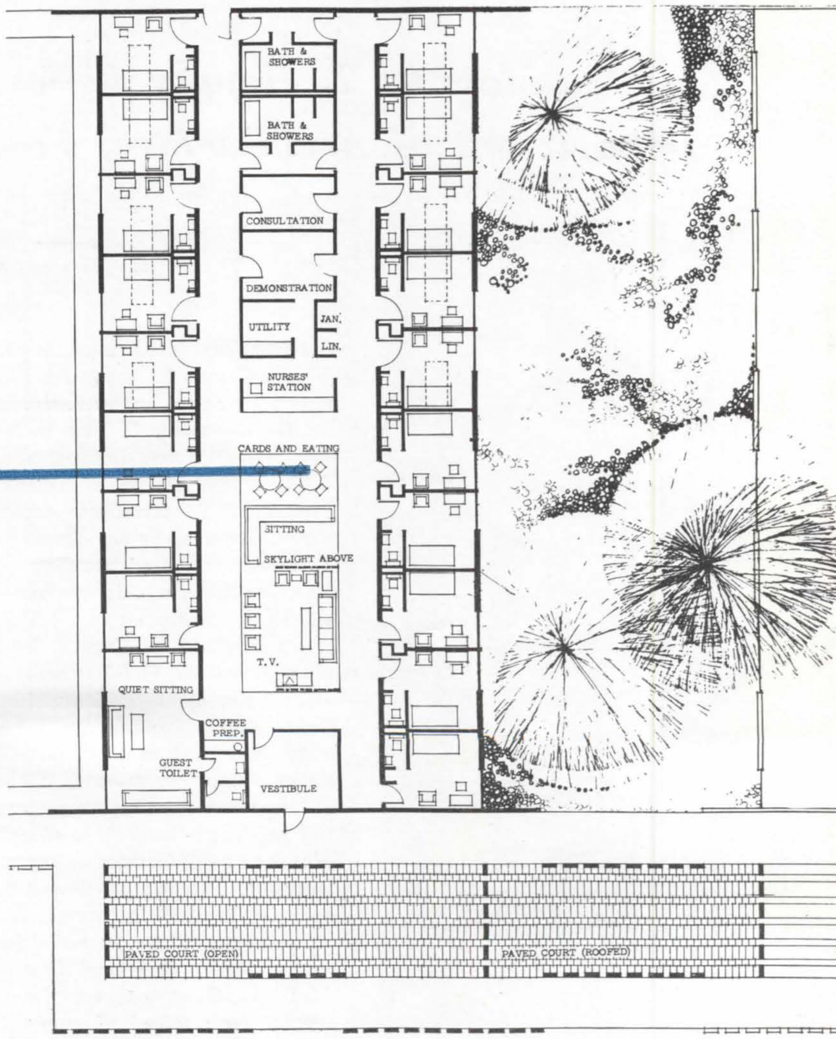
nursing unit

designed for all service elements.

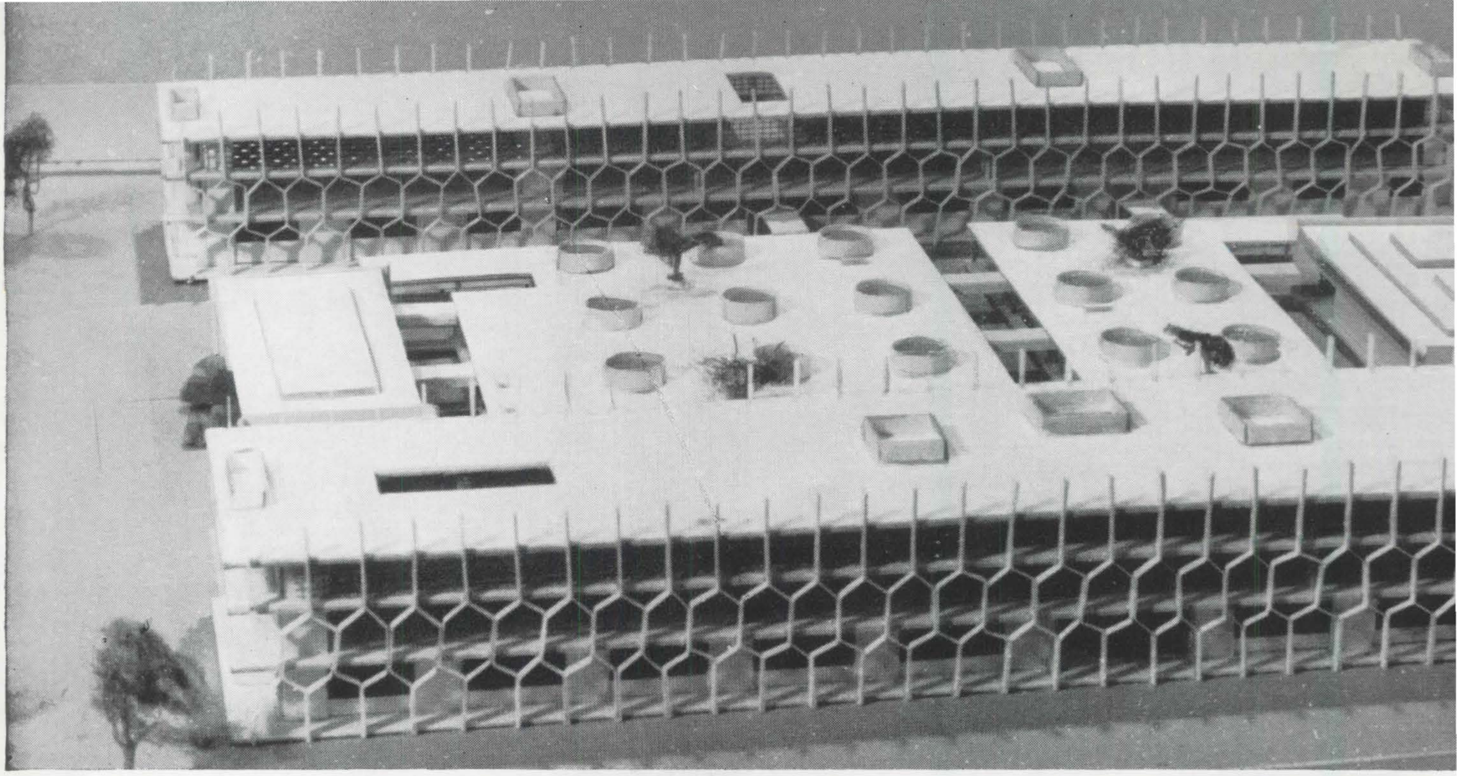
Preliminary design studies indicated that a horizontal scheme offered many advantages when designing for progressive patient care. Primarily these were: ease of expanding all departments in an orderly manner; good differentiation of environmental characteristics in the four zones of medical and surgical care; good traffic control; and economy. High degree of flexibility, allowing for fluctuation of bed distribution within nursing zones, was an important design consideration.

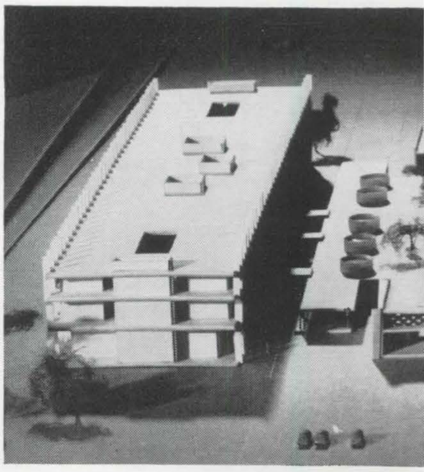
Structure: Load-bearing masonry for one-story elements; 23-ft-bay reinforced-concrete frame for three-story element; masonry-panel exterior walls.





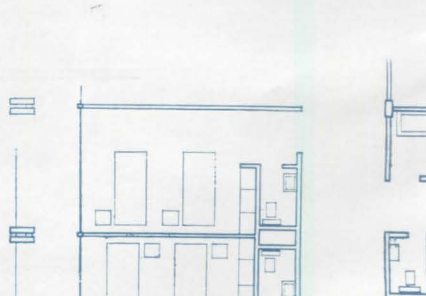
Self-care nursing unit



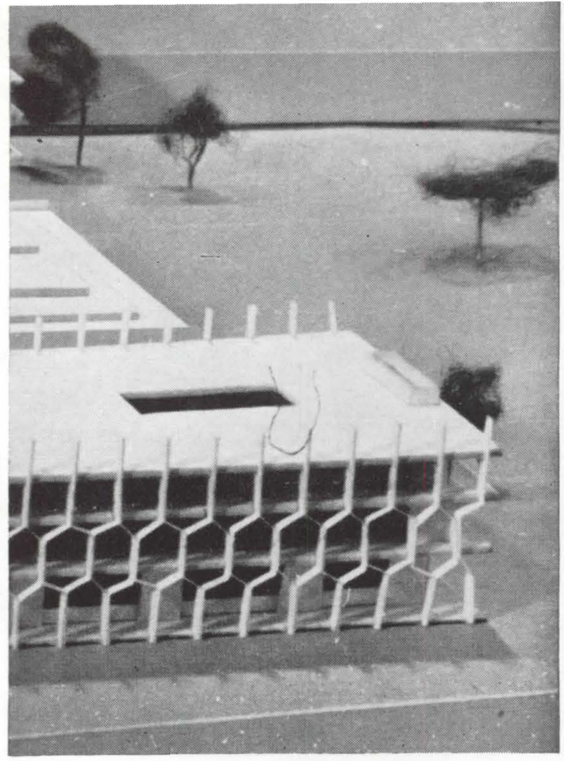


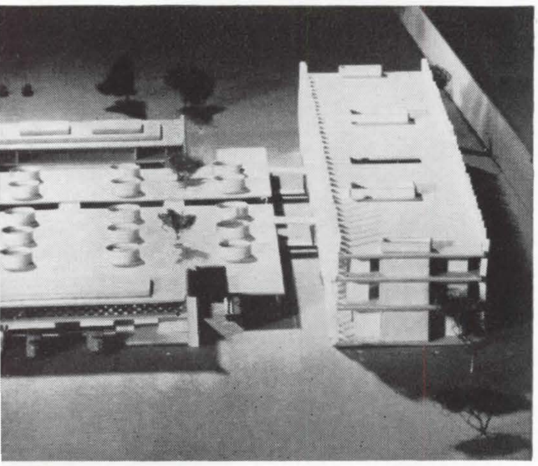
Magnus T. Hopper Fellowship Thesis Department of Architecture, Yale University

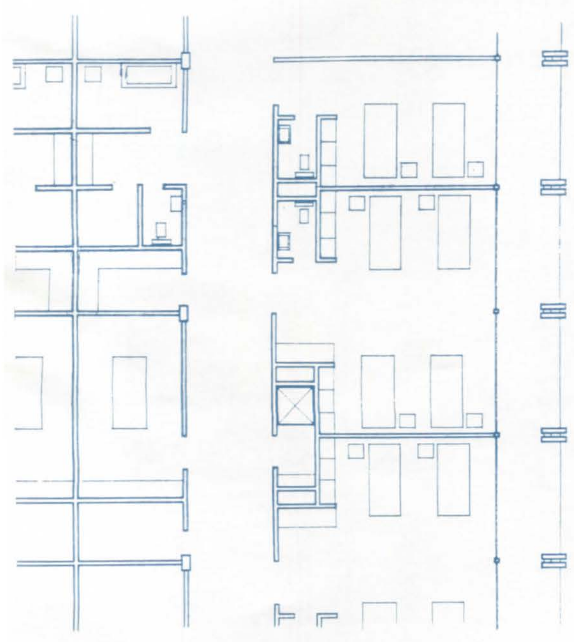
Student: Martin Kirchner, Advisors for Fellowship project '57-'58: Charles F. Neergaard, Paul Nelson, Louis I. Kahn, Arthur De Salvo, August F. Hoenack, Dr. Edwin H. Carnes, Dr. G. Albert Hill, William H. Metcalf, Jr., David Pinsky, The State Highway Department, Edward J. Thoms, John D. Thompson, Joseph P. Trantino, Slocum Kingsbury.
Program: To investigate today's hospital development with view toward further directions, possibilities, and trends. To develop basic understanding of hospital's main function. To understand the social mechanism which today maintains and supports hospitals in the U.S., and which creates and builds hospitals. Findings to be incorporated into design of medium-sized (150-200 beds) general hospital.
Site: Town of Essex, Connecticut.
Conclusion: Hospitals are driving toward greater flexibility in regard to their three basic functions: patient service, education, research. Patient service will decrease and concentrate mainly on prevention of disease, obstetric, and psychiatric care. Educational facilities, research, and laboratories will increase in importance within the hospital.
Solution: Two parallel three-story wings; emergency and operating facilities in between. One wing houses all of the patients—maternity and pediatrics at ground level; self-service nursing at second floor; special care nursing at third floor. Other wing contains out-patient department at ground level; school of nursing, doctors' offices, lockers on second floor; nurses', interns', and doctors' residences at third level.

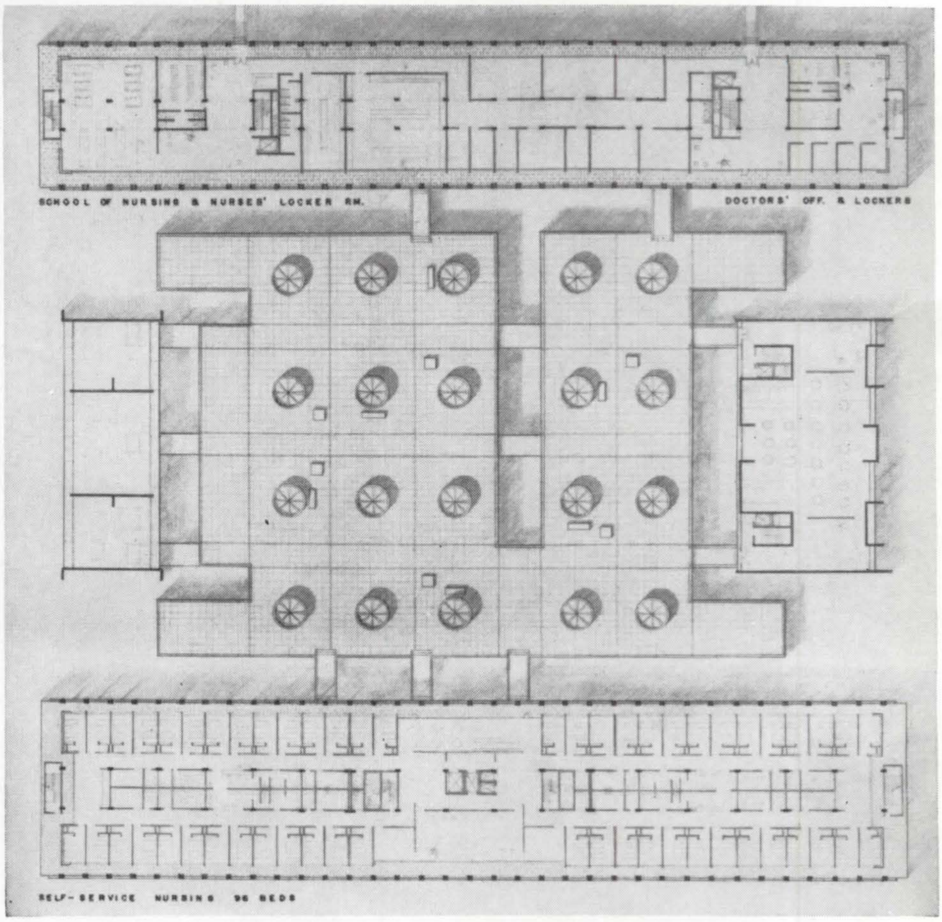


self-service unit

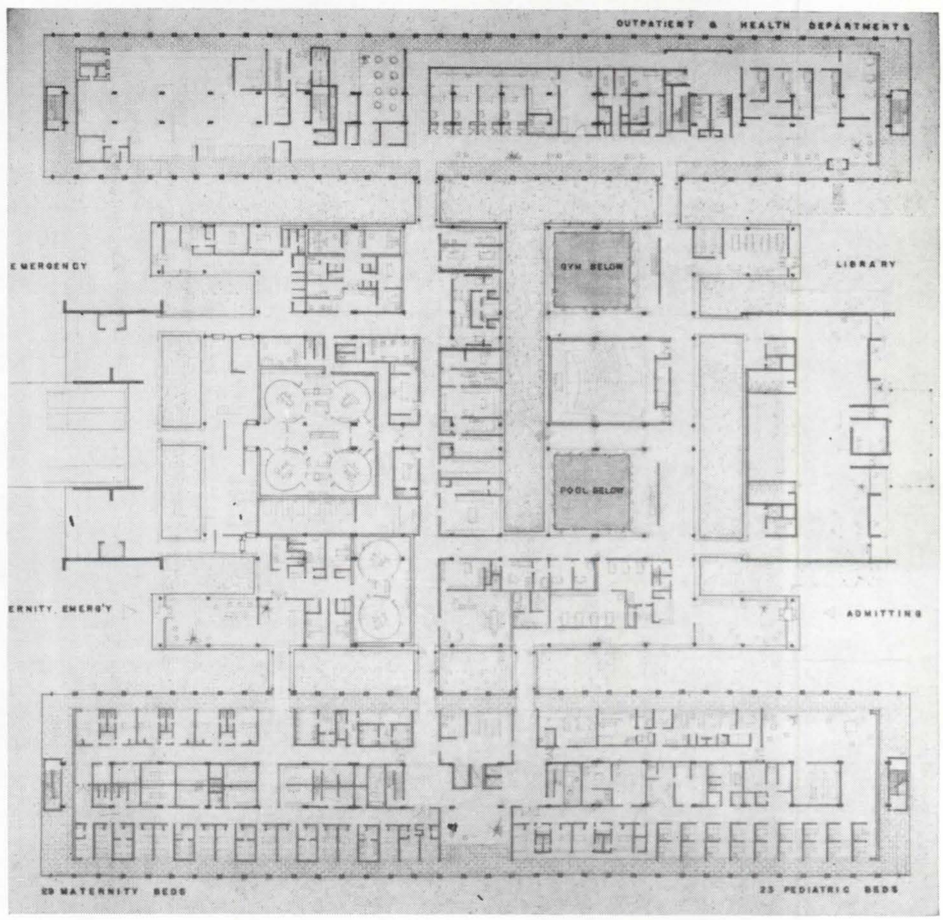




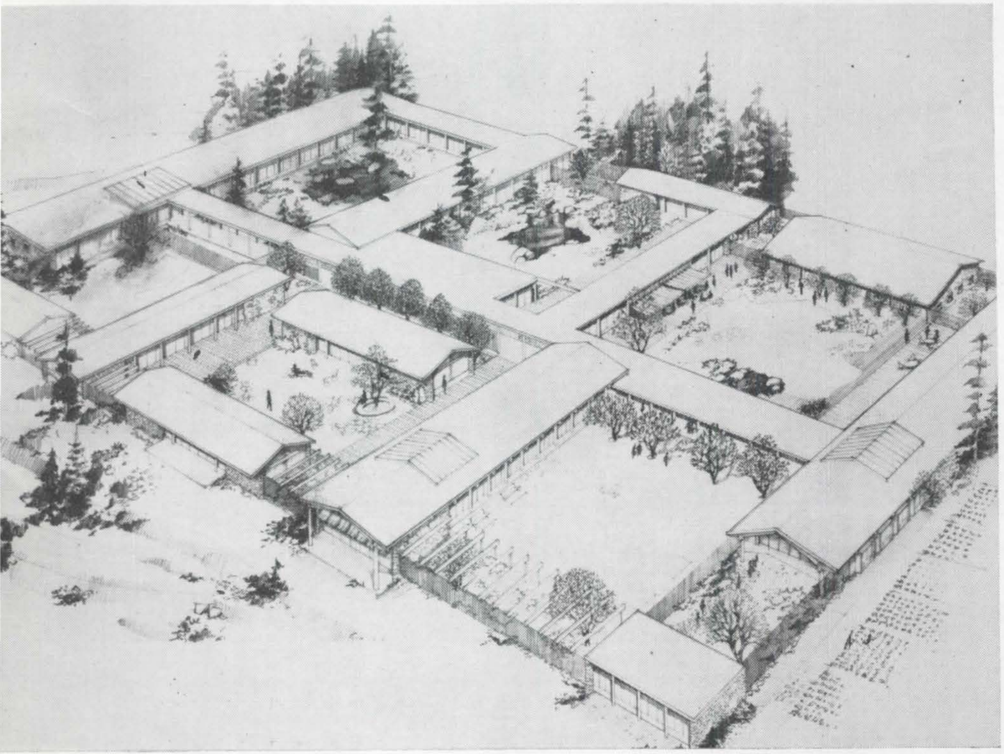


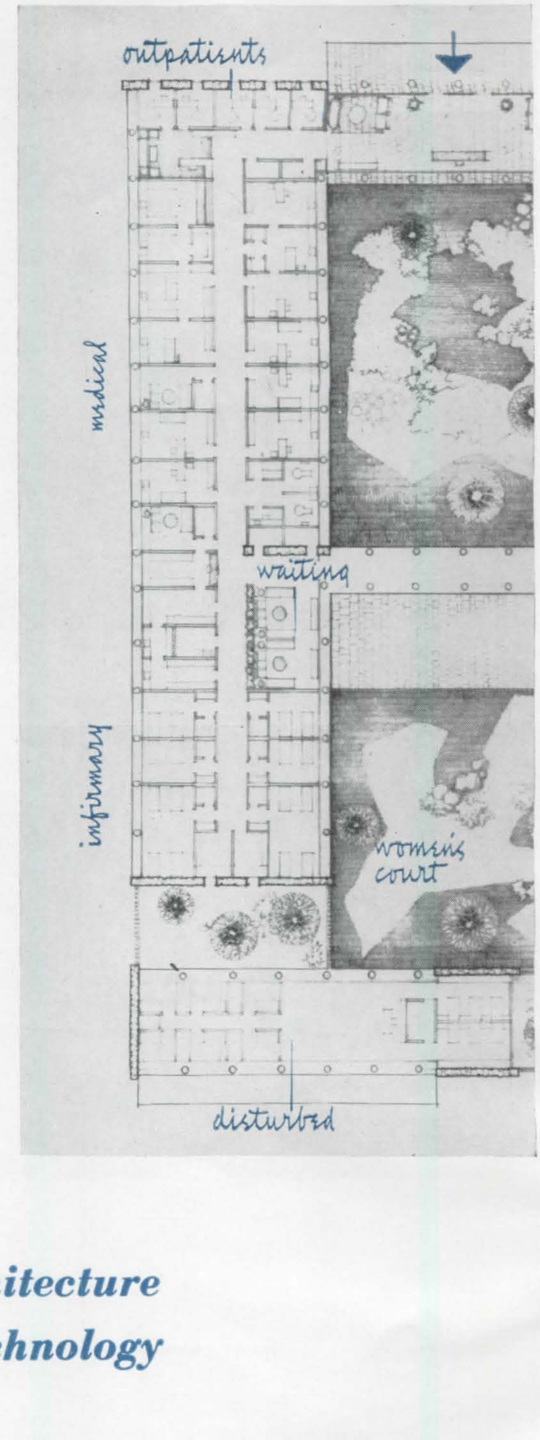


second floor

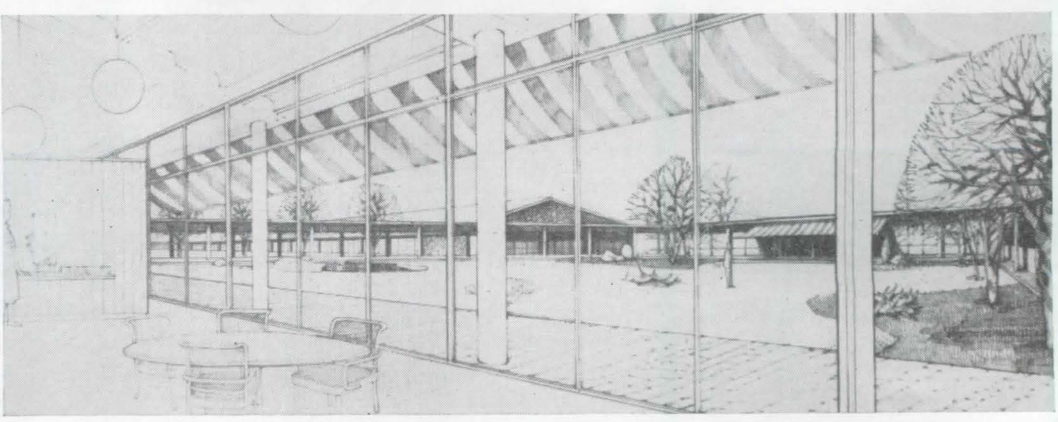


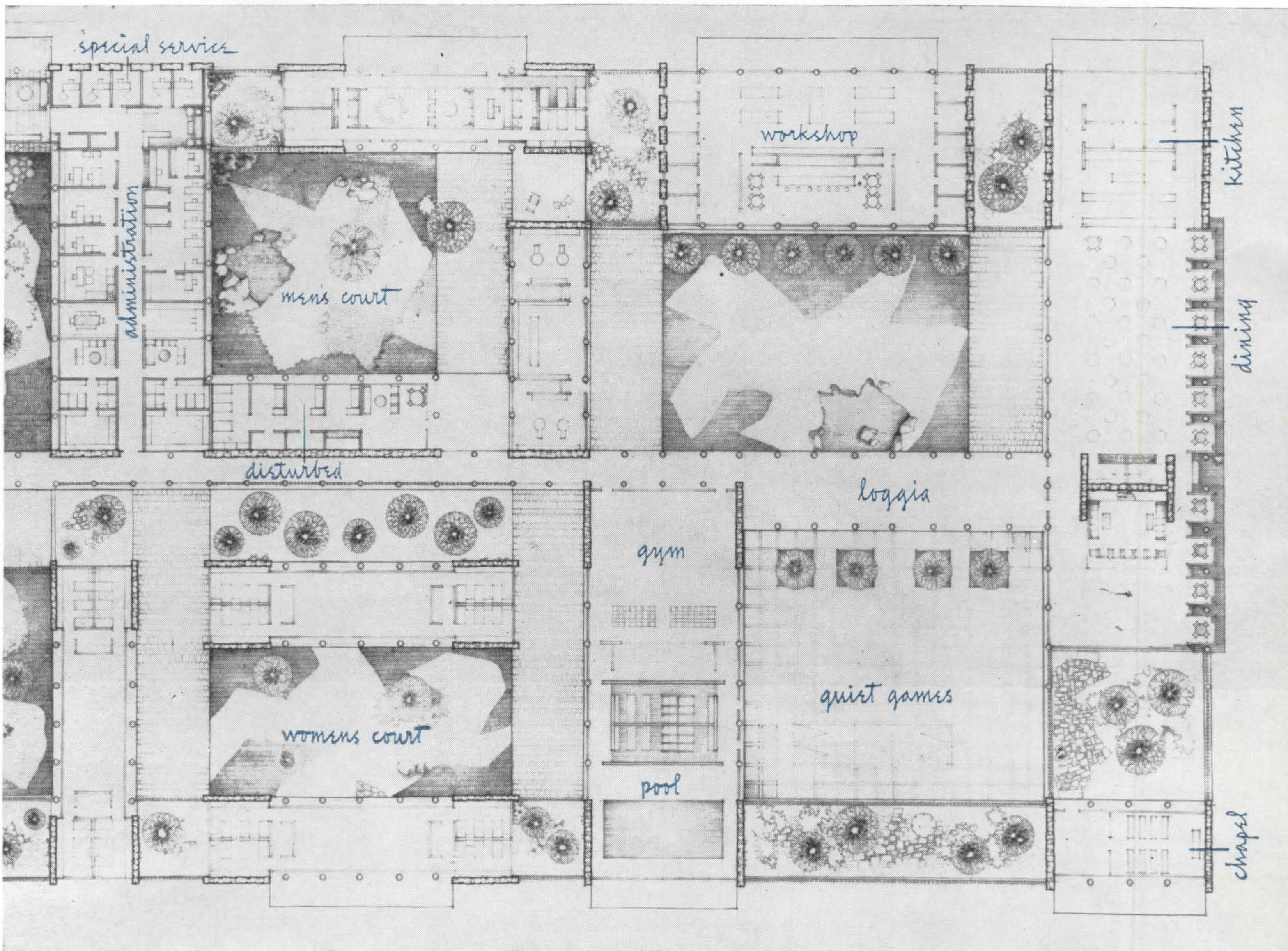
first floor





Undergraduate Project, Department of Architecture Carnegie Institute of Technology





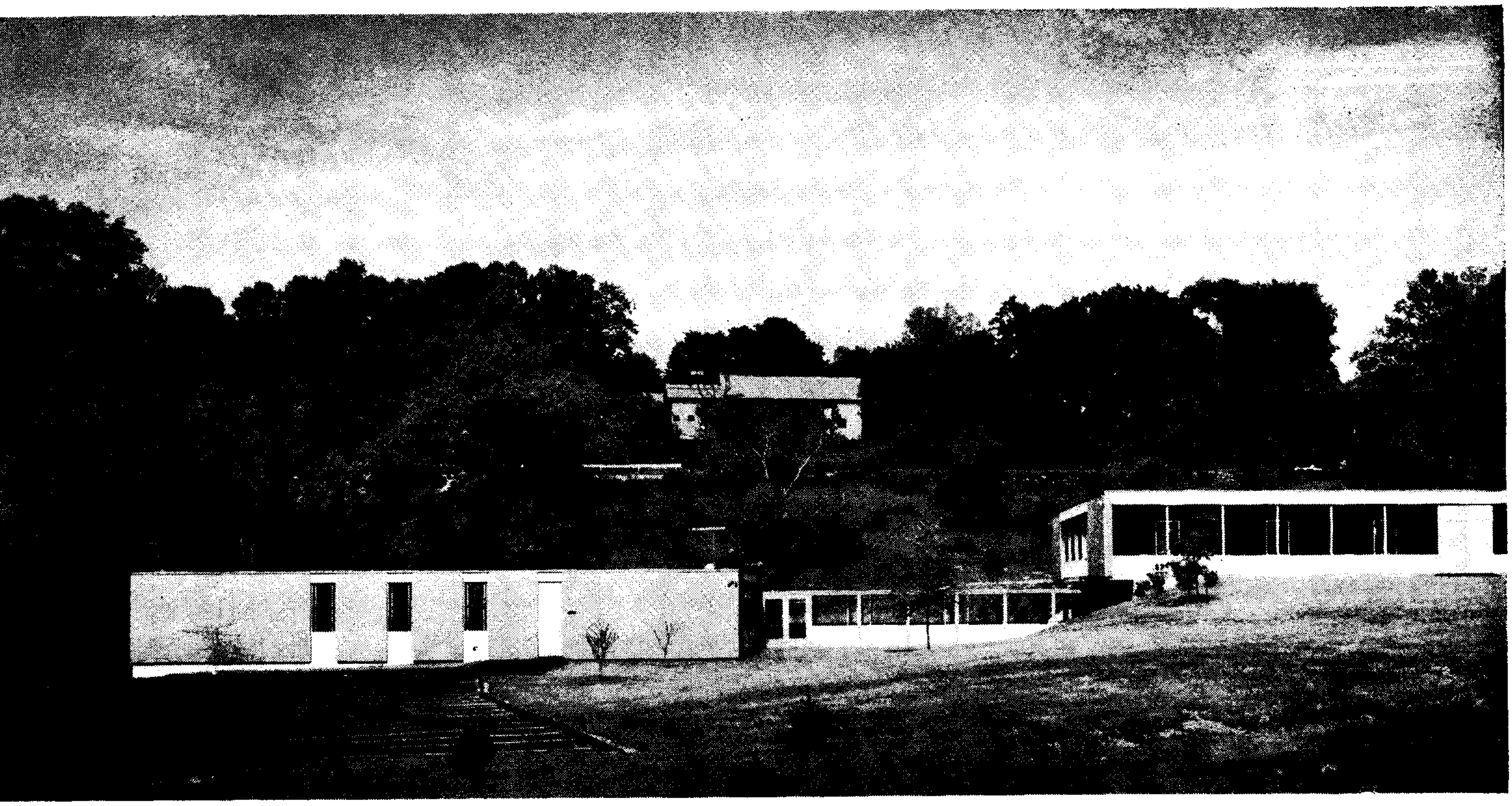
Student: William Charles Shopsin. Critic: Joseph Muneo Neufeld. Scholarship project sponsored by Koppers Company, Pittsburgh. Jury of Awards: Paul Schweikher, John Pekruhn, Dr. Louis Bloch. William Metcalf, Kenneth Johnstone.

Program: To design prototype mental-rehabilitation unit for about 75 patients to supplement community hospital. Basis of concept—with readily available facilities at community level (co-ordinated with a general hospital) many cases could be diagnosed earlier, treated more quickly, and cured at far less expense.

Site: Surburban Pittsburgh, Pennsylvania, near existing general hospital and high school. Unit takes advantage of hospital services and school's recreational facilities.

Solution: Small community with friendly domestic character, zoned into three principal areas. *Zone 1:* receiving, administrative, out-patient, and medical services. *Zone 2:* small domicile units—limited to 12 patients, one nurse, and one assistant—around private courts. Each unit has one living room, four separate dormitories, bathrooms, kitchenette. *Zone 3:* social, dining, occupational therapy, and recreational facilities.

Structure: Small-span, fire-proof building using natural stone, wood, clay tile to suggest warmth, security.



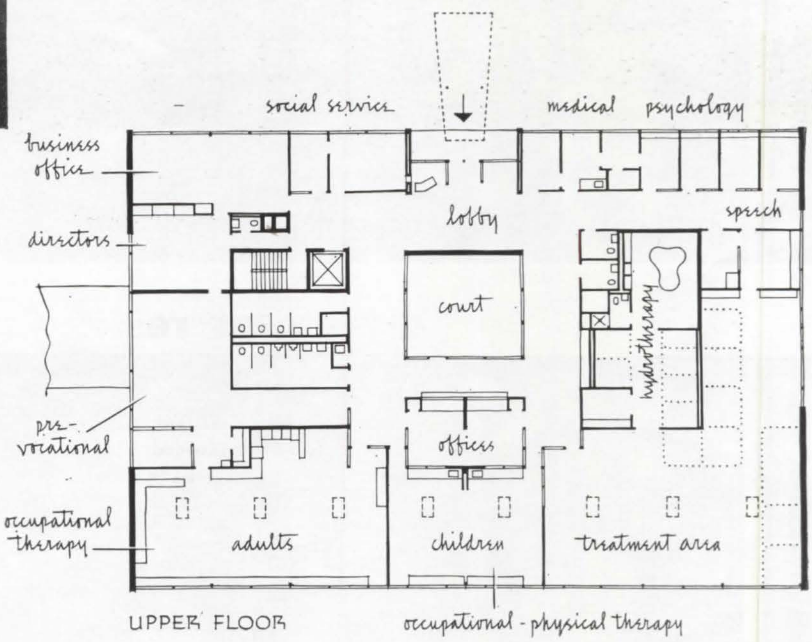
center for rehabilitation

location | Stamford, Connecticut
architect | Sherwood, Mills & Smith
site planner | Charles A. Currier & Associates

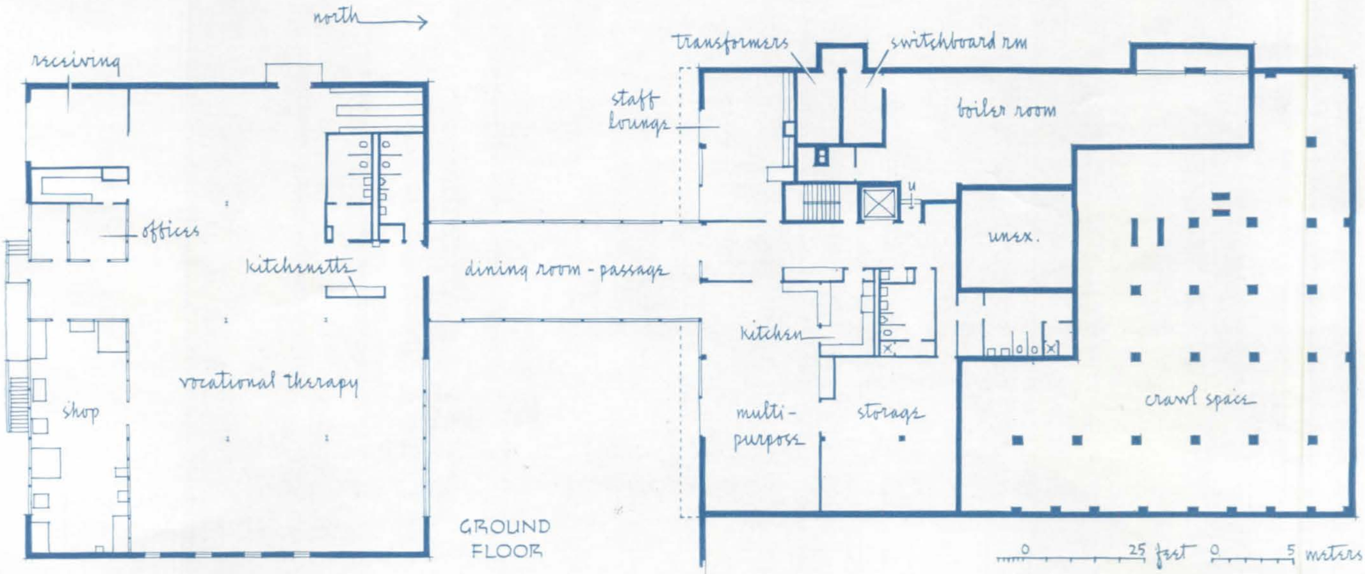
As one of the first rehabilitation centers specifically designed for physically handicapped children and adults, this building is an important guide for future construction in this category. The complex consists of a main building containing therapy rooms, doctors' offices and staff rooms, a vocational therapy workshop, and a dining room which serves also as passage to interconnect the two main elements. The whole is skillfully fitted onto a handsome four-acre site adjoining a golf course, and near an existing hospital which is occasionally called upon for radiology and other outpatient facilities. Because of the sloping site it was possible to give outdoor access to both levels of the main building. Staff and meeting rooms have the benefit of an outdoor terrace; the main therapy areas, on a level above, are directly accessible from a parking area on high ground. The shop for advanced vocational training has its own parking space and trucking platform at a lower grade level. This vocational training shop is designed to assist in rehabilitating handicapped adults for productive work outside the center.

Foundations and floors are of reinforced concrete; the structural frame is of steel tube columns and steel joists; the roof of gypsum planks and 4-ply built-up roofing. Typical outside walls are composed of 4″ brick on the exterior, 2″ air space, and 6″ concrete block on the interior. Square steel columns with plaster facing are frankly expressed on the interior.

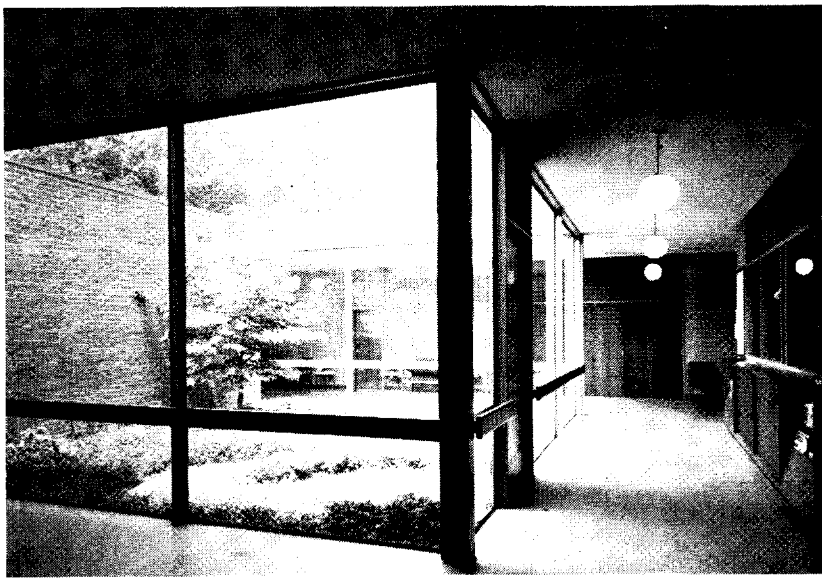
Werner-Jensen & Korst were Structural Engineers; Marchant & Minges, Mechanical Engineers; Vuono Construction Company, J. C. Smith, Inc., General Contractors.



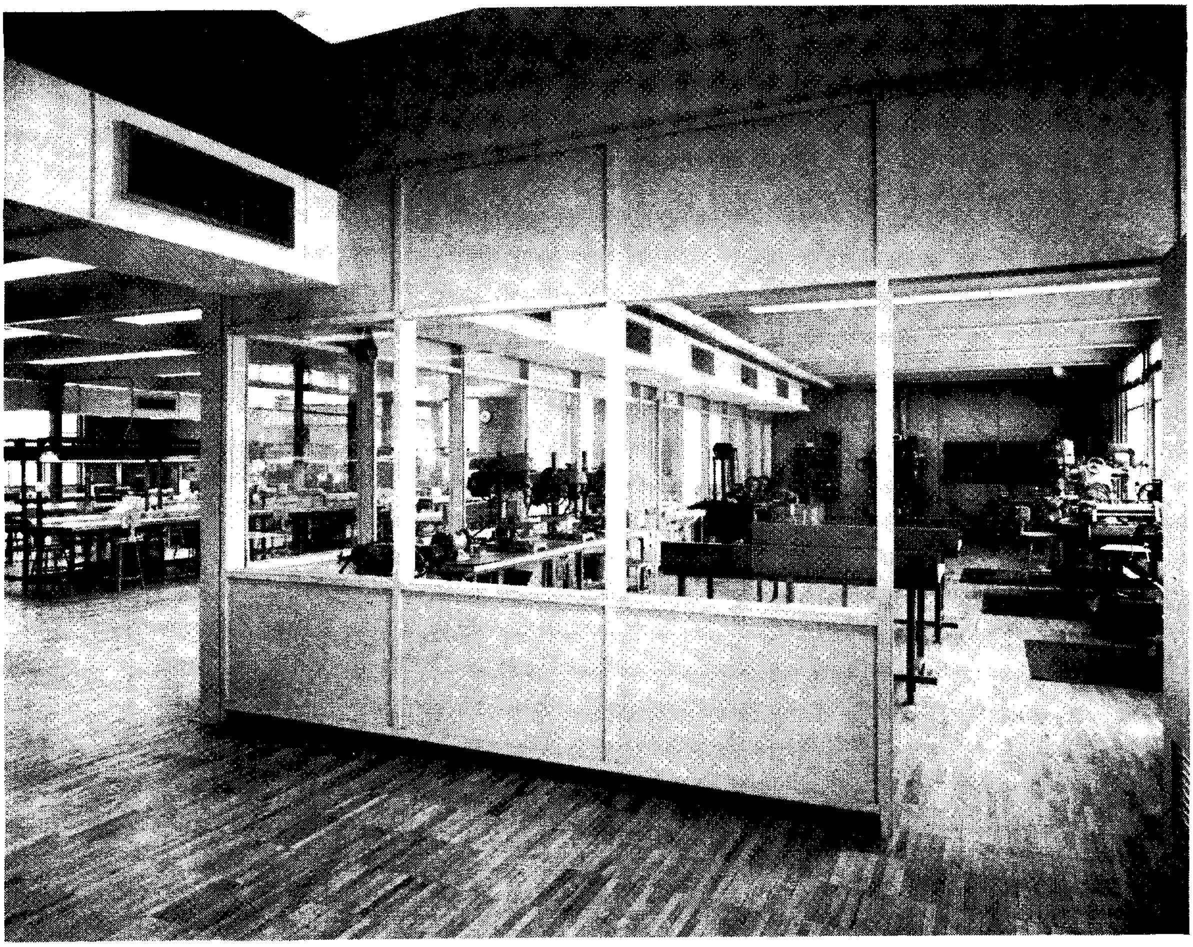
UPPER FLOOR

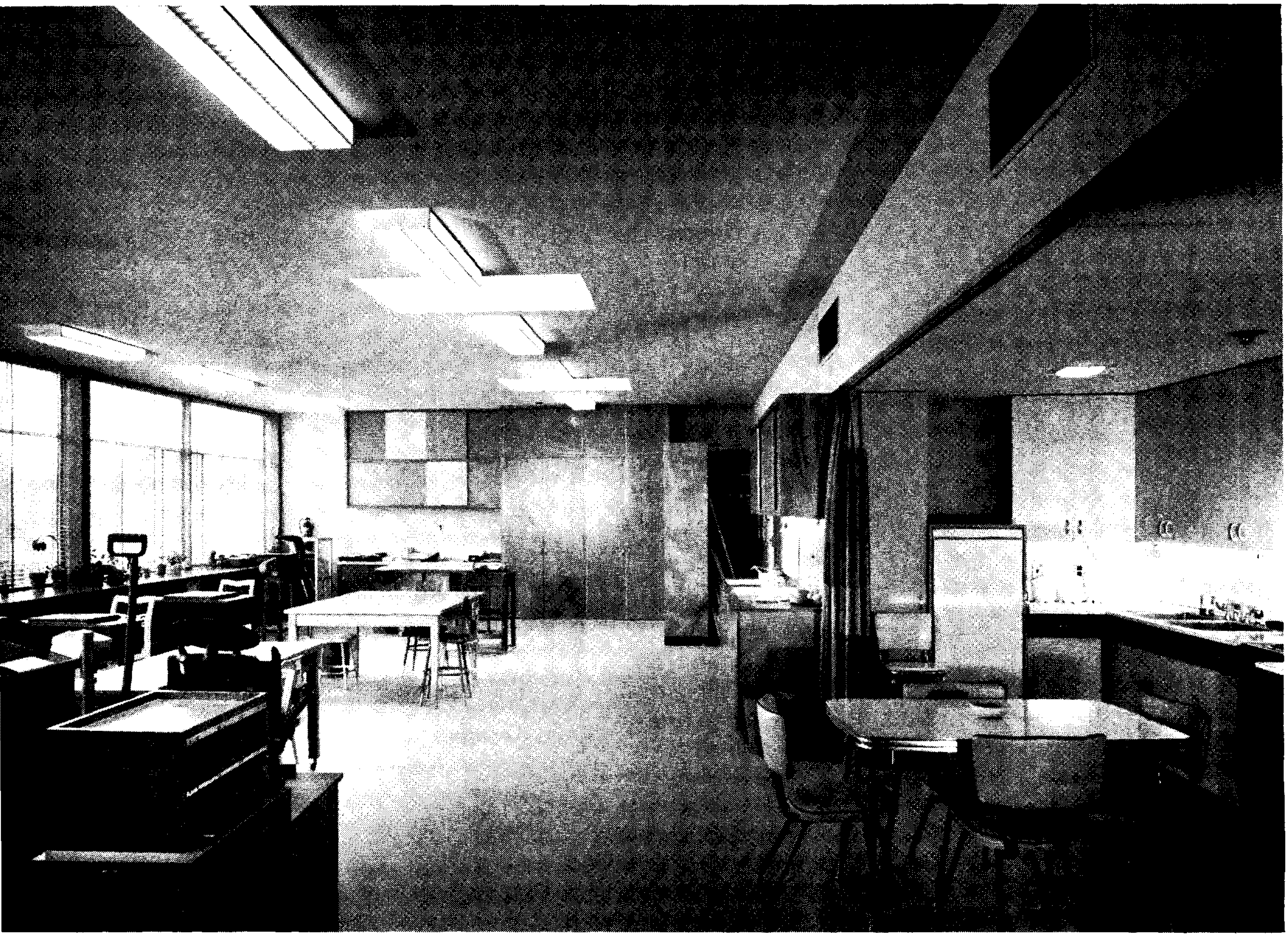


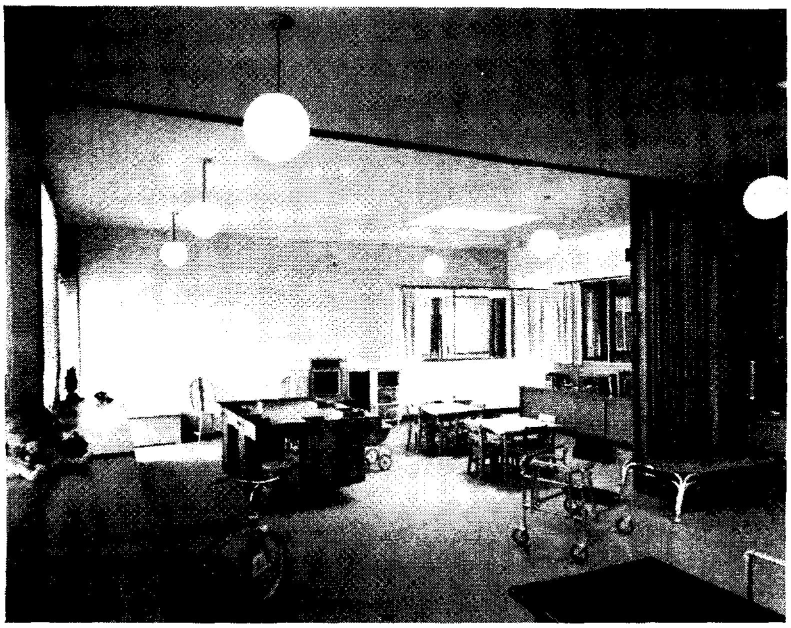
GROUND FLOOR



Extra-wide, glazed passage (above) *between main building and shop building doubles as dining room. The main waiting area is at the entrance lobby* (acrosspage bottom): *other supplementary waiting spaces surround a central garden court* (right). *Vocational training shop* (below) *is housed in separate structure because of noise and dirt problem.*

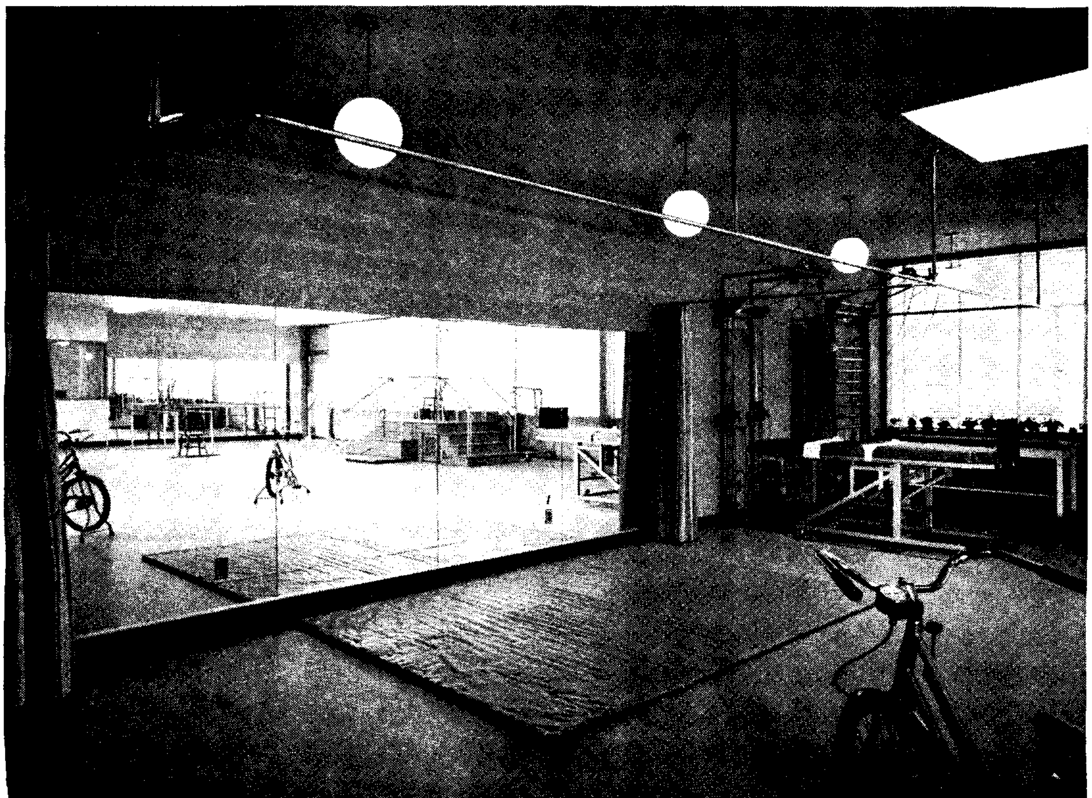




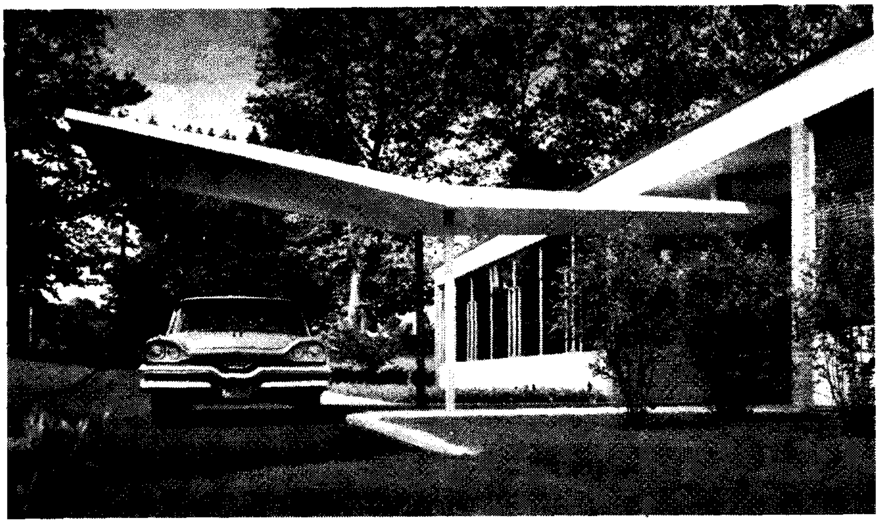


The various treatment rooms—occupational therapy for adults (above), *physical and occupational therapy for children* (left), *hydrotherapy and treatment* (acrosspage center), *and physical therapy for adults* (acrosspage bottom)*—follow the perimeter of the building for maximum daylight and ease of access to outdoor therapy space.*

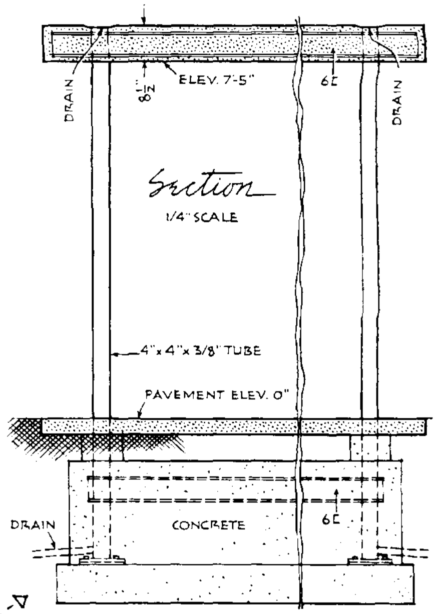
The staff lounge and library (above) is located on the lower level of the main building. The floor in this room and throughout the main building is surfaced with latex terrazzo; ceilings are treated with acoustical plaster.

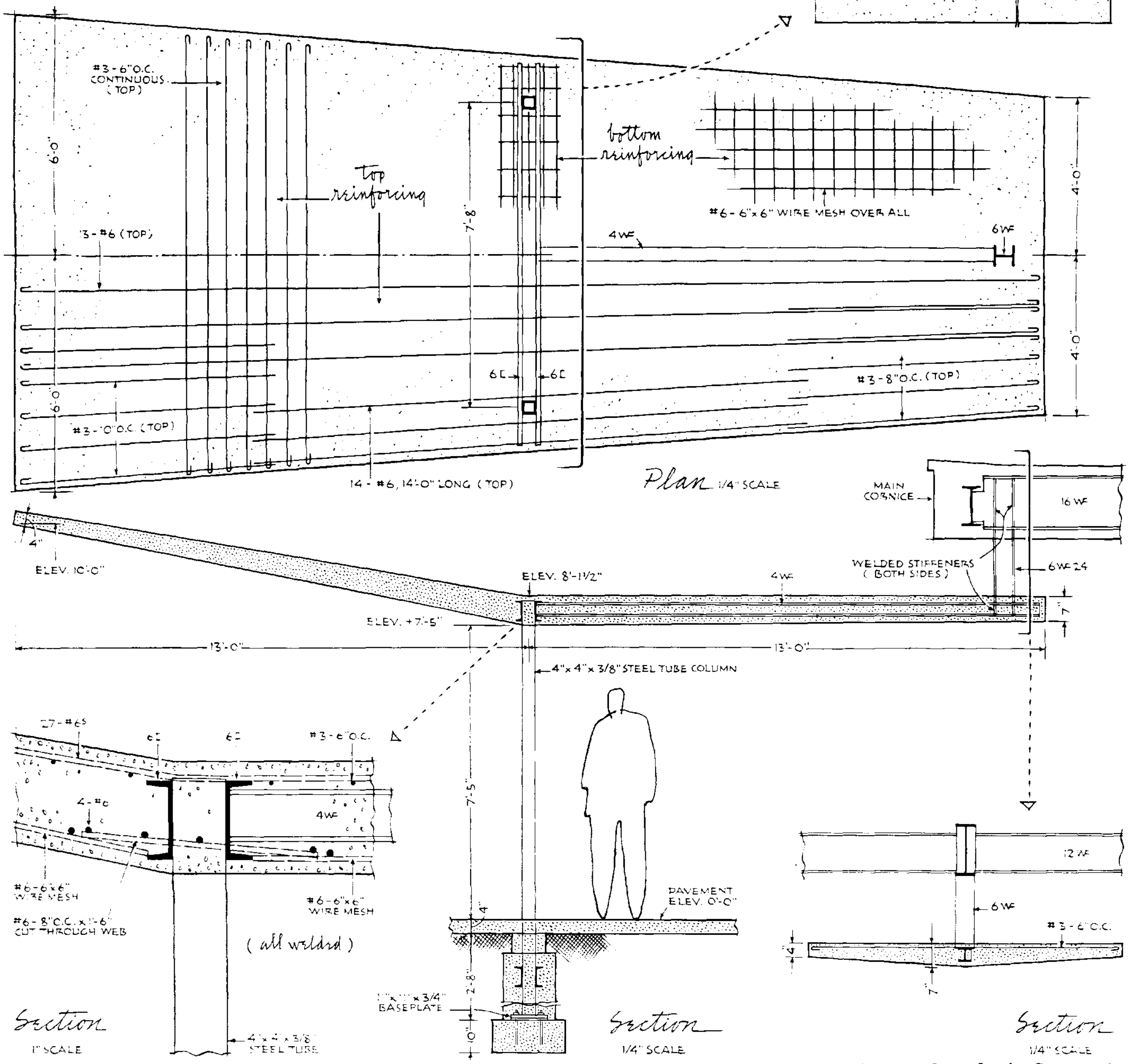


marquee



JOSEPH W MOLITOR

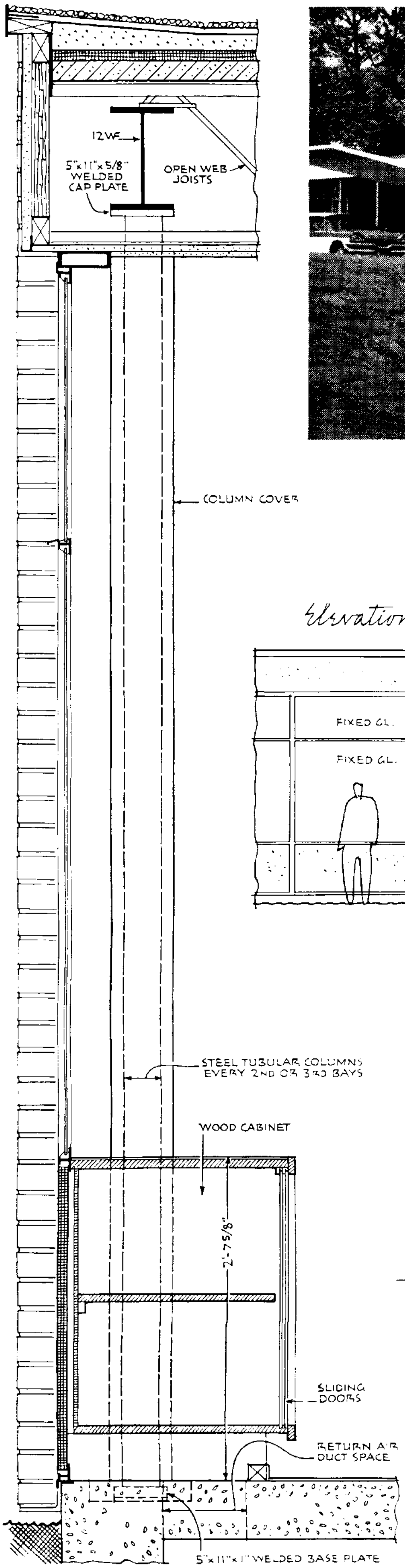




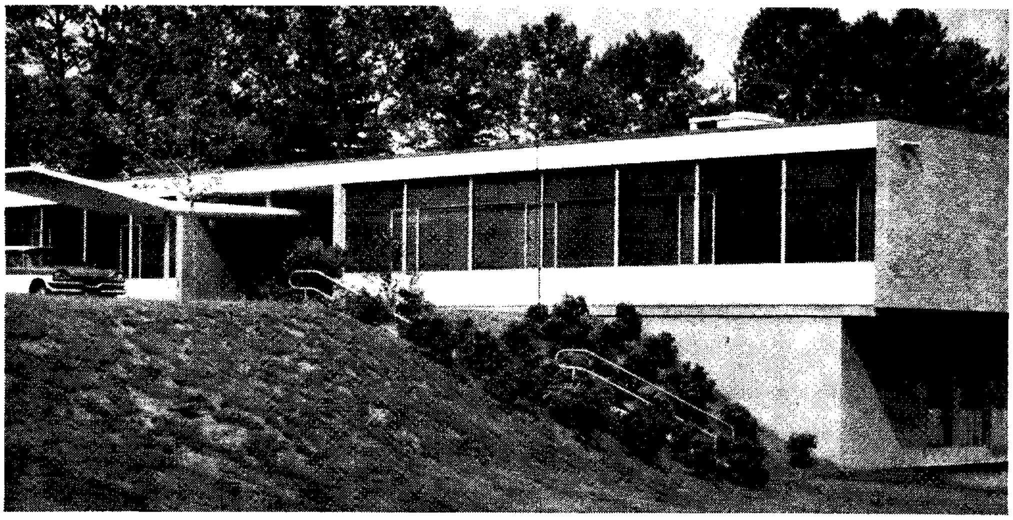
REHABILITATION CENTER, Stamford, Connecticut

Sherwood, Mills & Smith, Architects

window wall

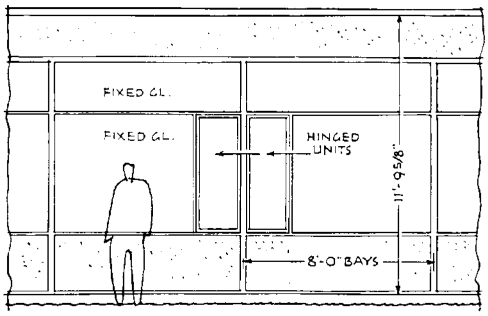


Wall Section 3/4" SCALE

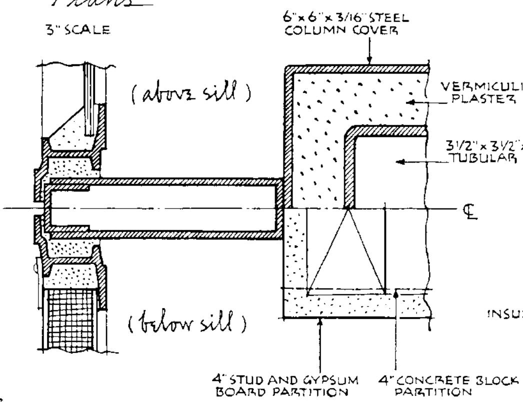


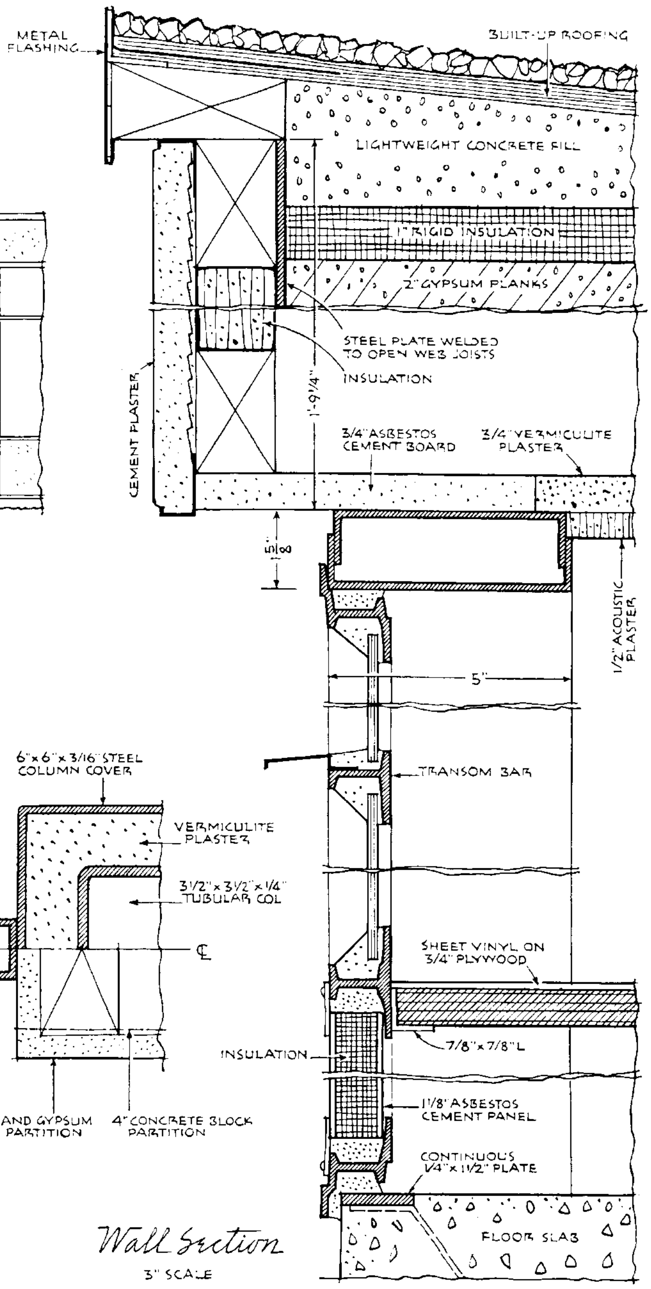
JOSEPH W. MOLITOR

Elevation 1/8" SCALE



Mullion Plans 3" SCALE

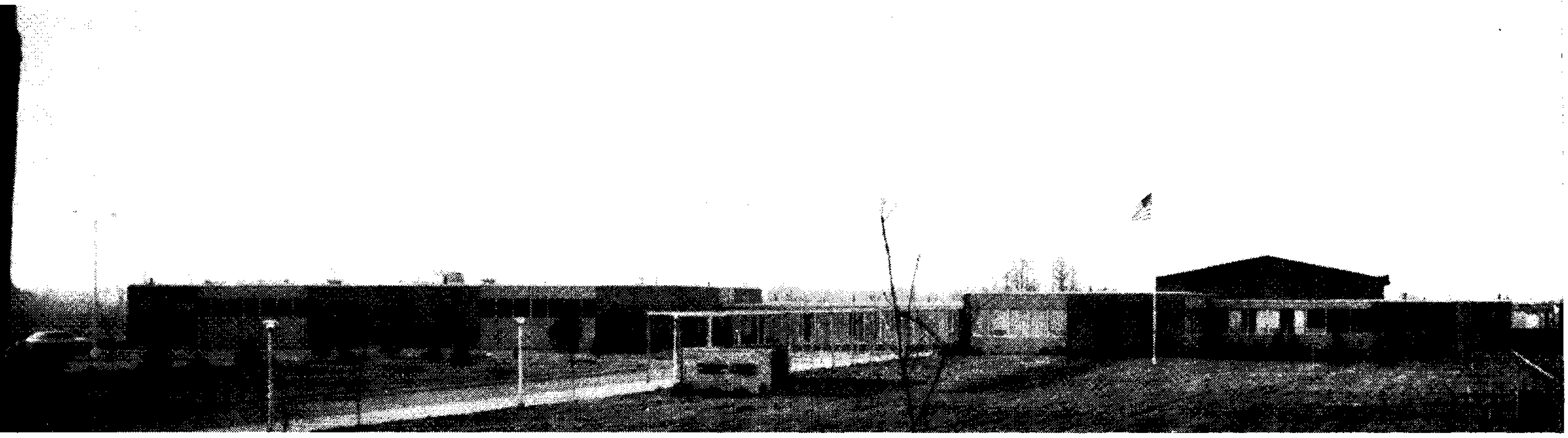




Wall Section 3" SCALE

REHABILITATION CENTER, Stamford, Connecticut

Sherwood, Mills & Smith, Architects



hospital for patients' comfort

location	Norwalk, Ohio
architects-engineers	H. E. Beyster & Associates, Inc.
chief designer	John T. Hilberg
project manager	A. W. Mather
landscape architect	L. G. Linnard

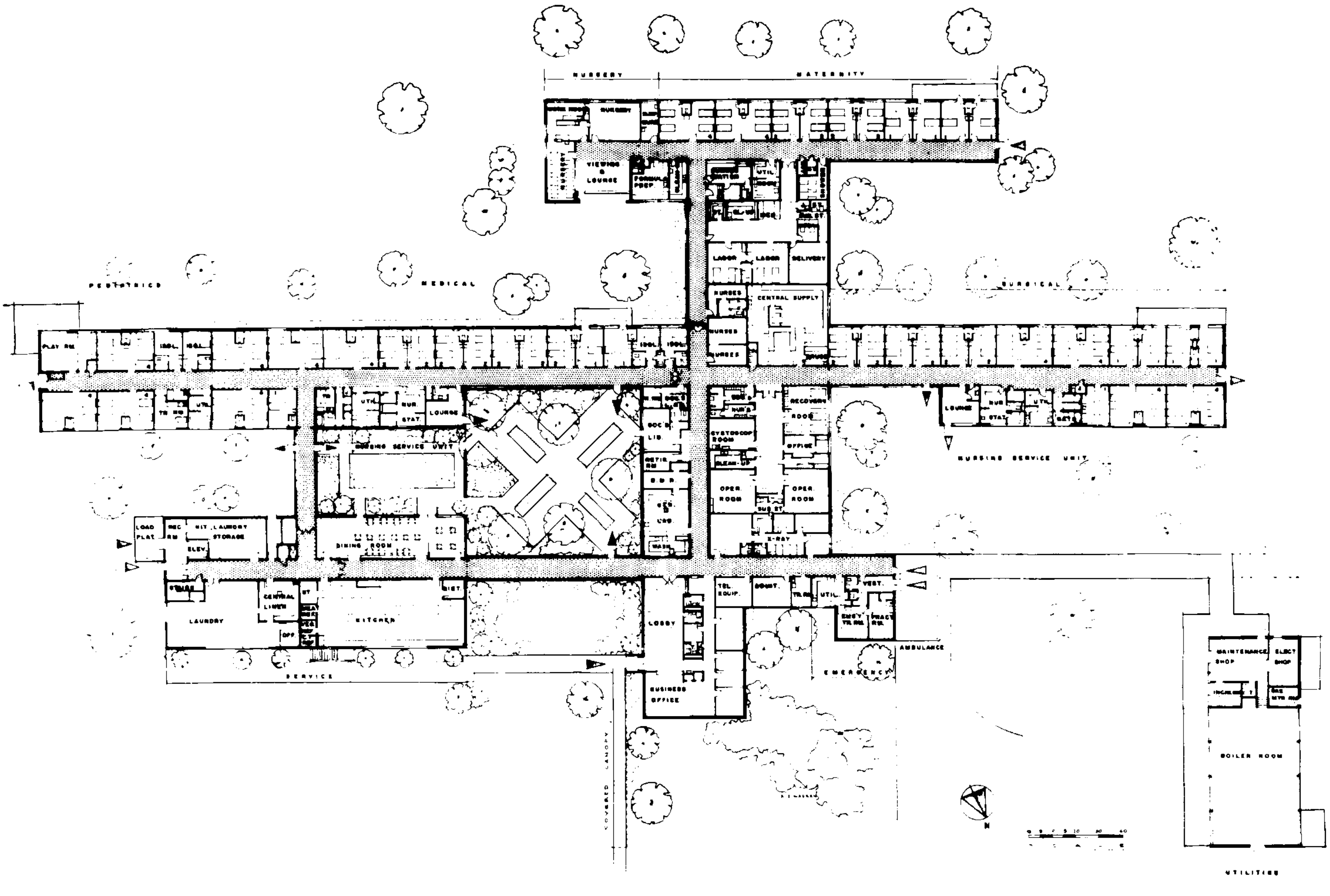
Photos: Lens-Art

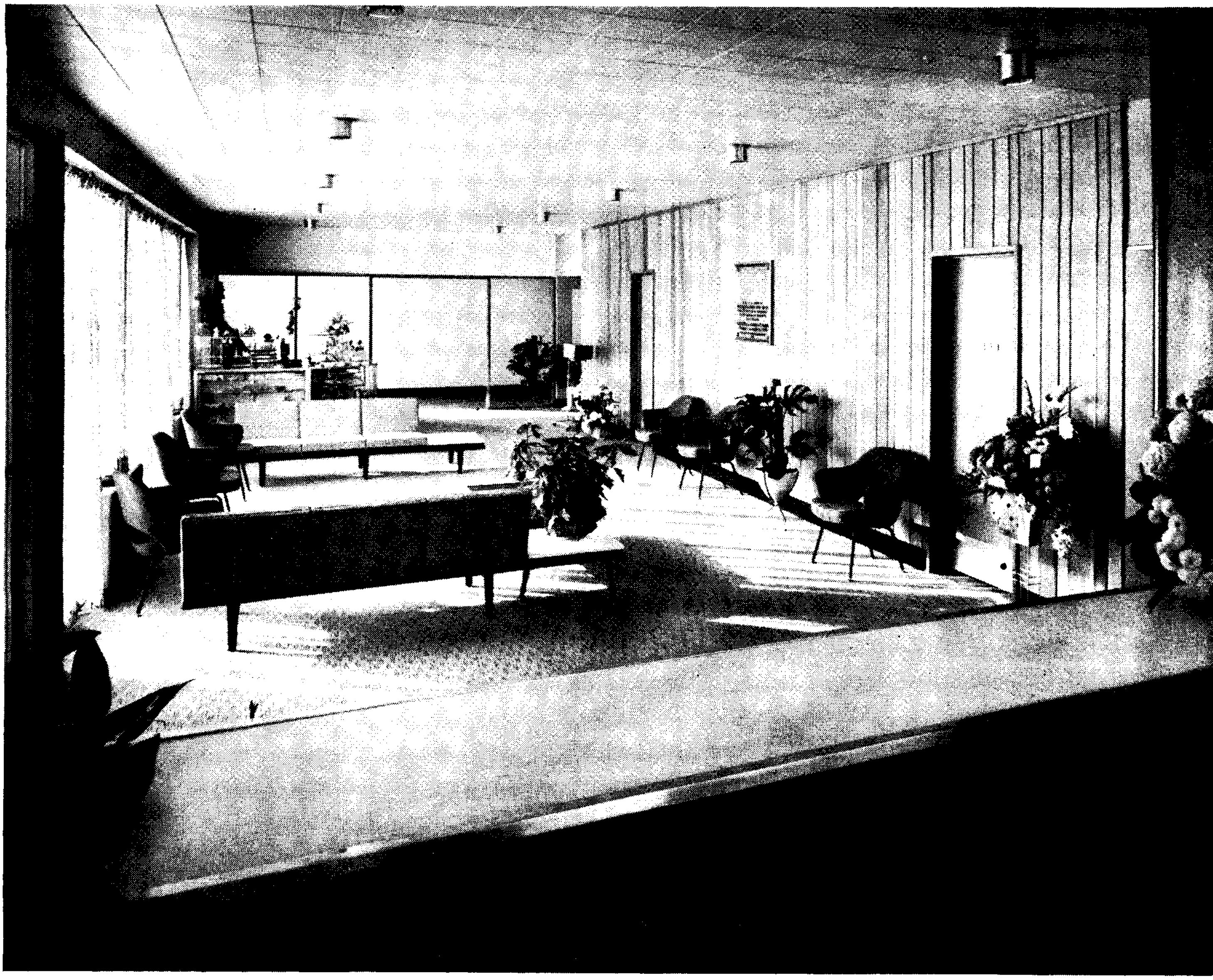
John Hilberg, chief designer of the hospital, termed this plan solution "a 'linear design' reflecting the straight-line flow of materials and services, both within each nursing unit and the entire hospital." The various departments—surgical, medical, obstetrical, pediatric, and out-patient—are clustered as intimate, self-contained units along these major axes. Relatively long walking distances, due to the one-story solution, have been counterbalanced with the installation of a complete audio-visual communication system interconnecting the patients' rooms with the nursing stations. As in the choice of the one-story plan, all of the planning decisions were made "from the patient's point of view." The finest medical facilities have therefore been coupled with a restful and pleasant environment. Not only did the one-story plan expedite the movement of equipment, supplies, personnel, and even patients, but it also achieved a close union of the nursing areas with the landscaped grounds. From their beds all patients enjoy views of the surrounding countryside, and a central garden court (*acrosspage bottom*) has been of particular therapeutic value for the ambient, convalescing patient.

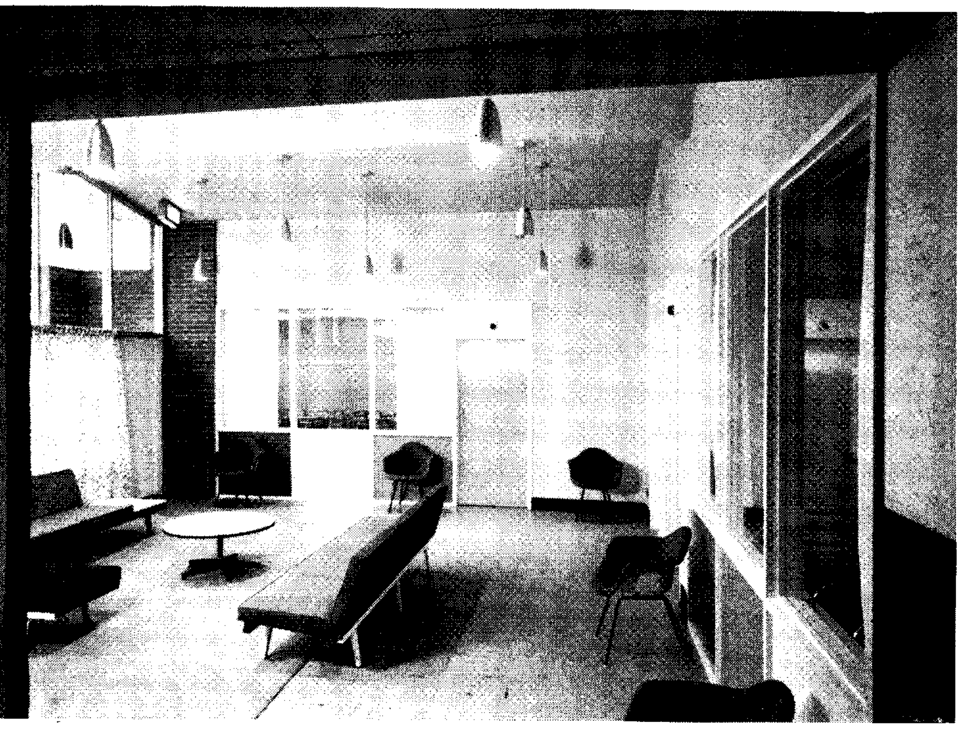
Selection of the framing system was determined on the basis of speedy construction and maximum structural strength coupled with minimum weight of material. Thus the structure has been assembled of standard rolled shapes, standard open-web joists, high-tempered corrugated steel for the roof, and poured light-weight insulating concrete roof slabs. Floors are concrete slabs; walls are of brick with an exterior facing of porcelain enamel panels.

Heating is a combination oil-and-gas-fired steam system; air conditioning by air and chilled water—both systems being individually controlled.

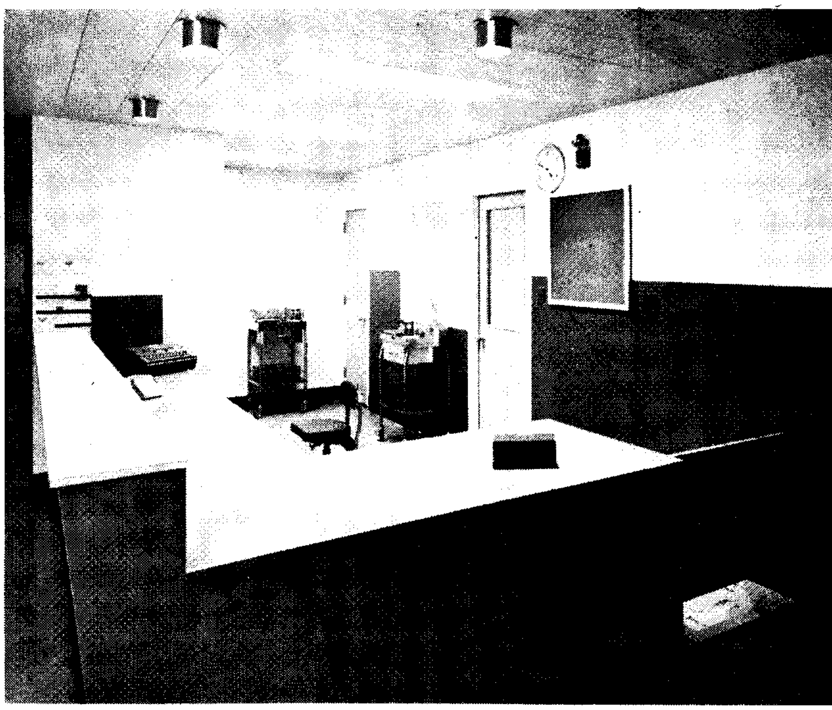
Freeman Construction Company was General Contractor.



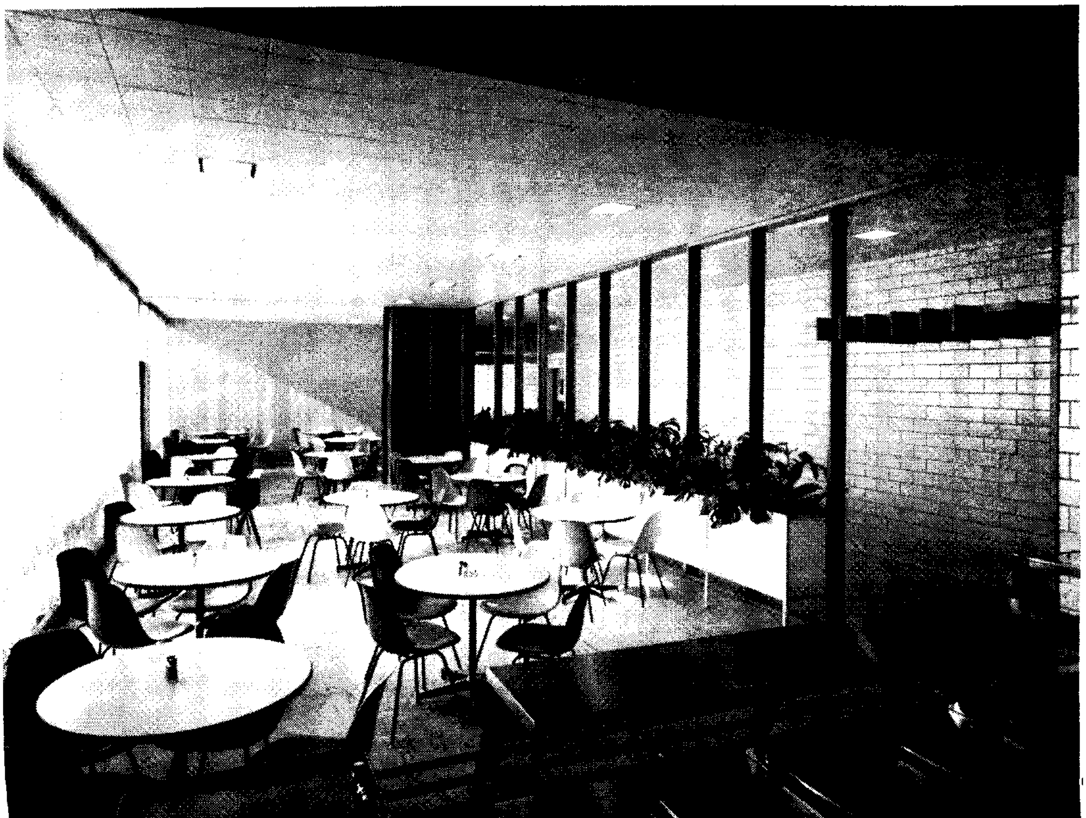




Generous window areas, simple furnishings, attractive interior surfaces, and pleasant colors of main lobby (above) *are also attributes of other public spaces in the hospital, such as the visting room in the maternity section* (left) *and cafeteria-dining room* (acrosspage bottom).



The large majority of the patients' rooms face south; all have views of the landscaped grounds around the hospital. Every room, as typical semiprivate room (above), *is linked with a nurses' substation* (right) *by an audio-visual intercommunication system.*



vigorous growth for mining community and home-town firm

Circles in this Hibbing Chamber of Commerce air view mark buildings by Jyring & Whiteman.

The Architect and His Community:

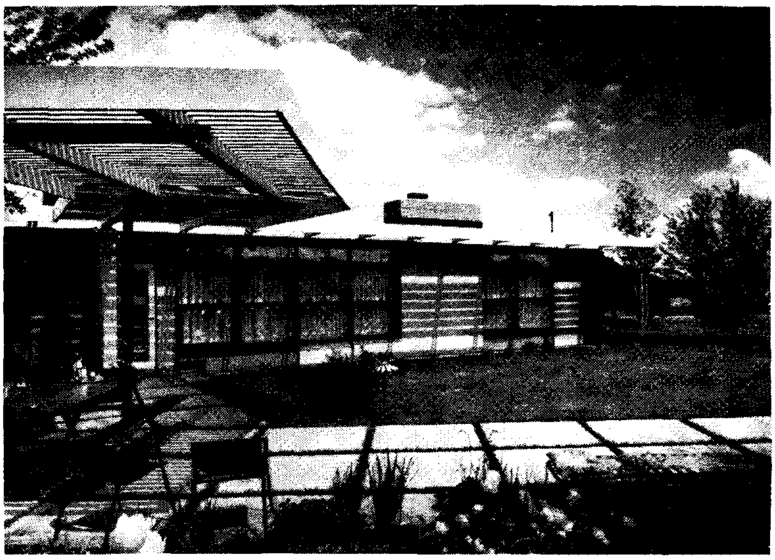
E. A. Jyring—Jerry to his friends—established his practice in Hibbing in 1940. The firm name became Jyring & Jurenes from 1946 until S. P. Jurenes' death in 1953. Richard Whiteman became a partner in 1955 and the present name was adopted.

This bald recital conceals much that is romantic, a positive relationship to one of the world's great industries, and some interesting social sidelights. Hibbing is, after all, a mining town. We do not expect architecture of this kind in American mining towns; we think of a ghost town and a wooden, false-fronted Main Street as the type. Hibbing has its ghost, too. We do not think of a mining town as a place where an architect can thrive; but Jyring & Whiteman's practice is varied, thriving, and satisfying.

Both Jerry Jyring and Richard Whiteman are native Minnesotans. Jyring was born in Eveleth, attended public schools in Virginia, Minn., and has a B. Arch. from the University of Minnesota. Whiteman, born in Mankato, also earned his bachelor's degree at U. of M.; his M. Arch. was received at Harvard. Jyring gained his early experience in Chicago and Duluth, and spent the war years

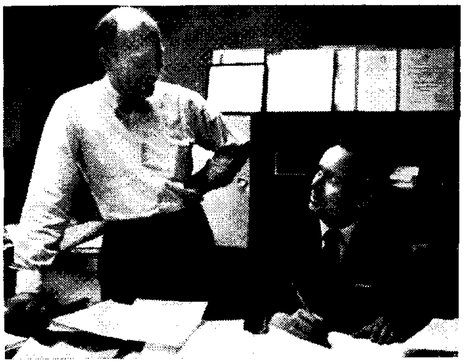
R. F. Whiteman cabin, Pengilly, Minn.

Jyring house, Hibbing, Minn.



Left to right: O. R. Nelson, Jyring, Whiteman, Dr. Karl Nolte, Frank Brust

Left to right: Tony Hren, Andy Ketola, Tom Vecchi, Dick Rian, Jerry Prince, Cecil Johnson, Bill Sandor, Joe Nosie, Bob Erickson



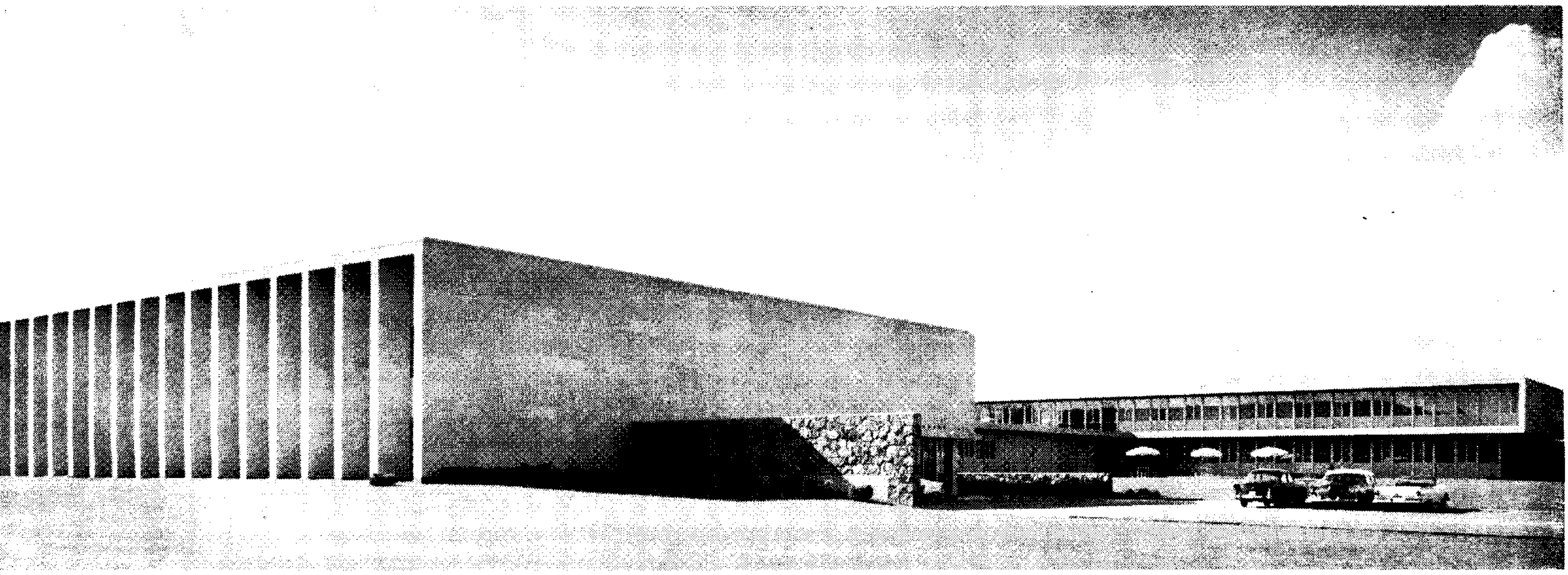
Whiteman and Jyring

Jyring & Whiteman, Hibbing, Minnesota

with the Seabees. Whiteman, after duty wth the navy, worked in Cambridge, Mass., St. Paul, and Minneapolis. Both partners came to Hibbing because practice outside a metropolitan area promised a personal kind of professional life, as friends and advisors to their clients, after the fashion of a family doctor. They wanted, as well, such good things as freedom to sneak out the back door for a day's fishing, hunting or skiing.

Their growing practice threatens to prevent relaxation, however, and they are searching for ways to maintain their personal contact with jobs and clients. That they are busy is due to the combination of ability and an opportunity arising from development of profitable processes for extracting iron from low-grade taconite ore. Hibbing, the business and cultural center of the great Mesabi Range, a hundred-mile-long deposit of taconite, has recently completed a bodily move from its old site on a valuable ore deposit two miles north; hence the ghost town referred to earlier. Jyring & Whiteman did not have to drum up much business; as their reputation has grown, commissions have come to them from the entire Mesabi area and beyond.

Photos: Warren Reynolds, Infinity Inc.

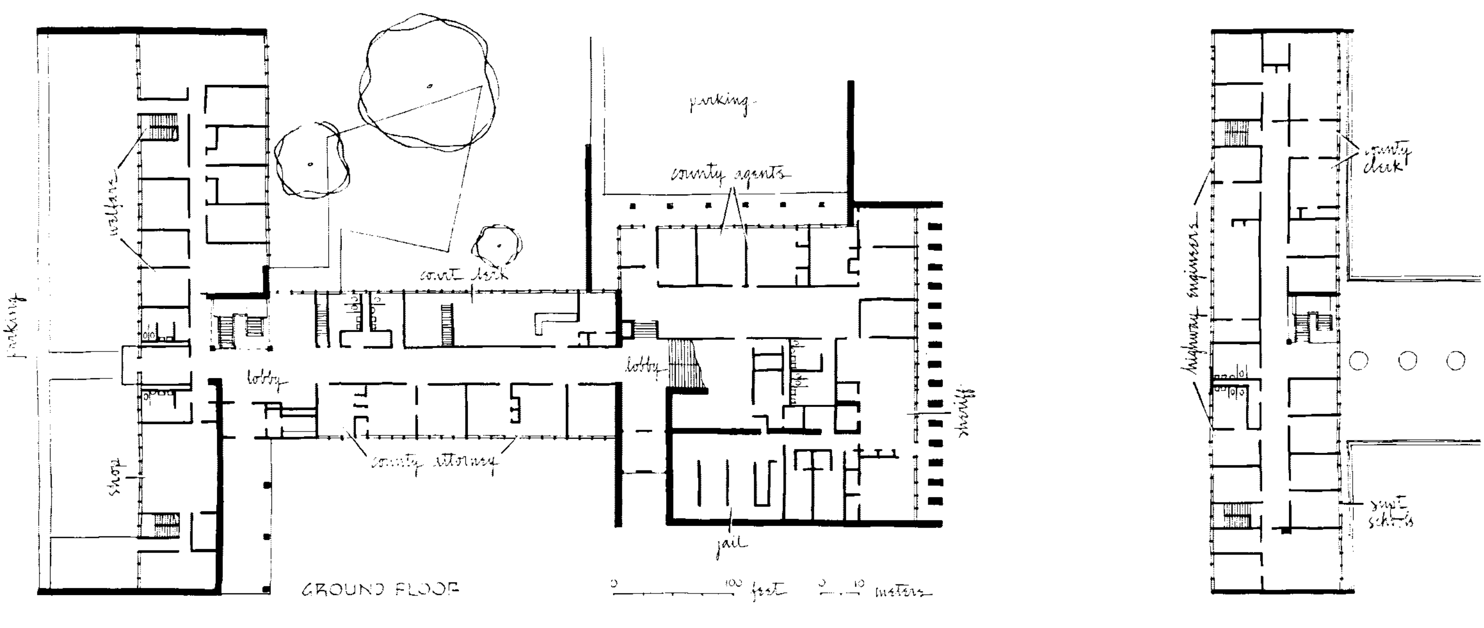


court house

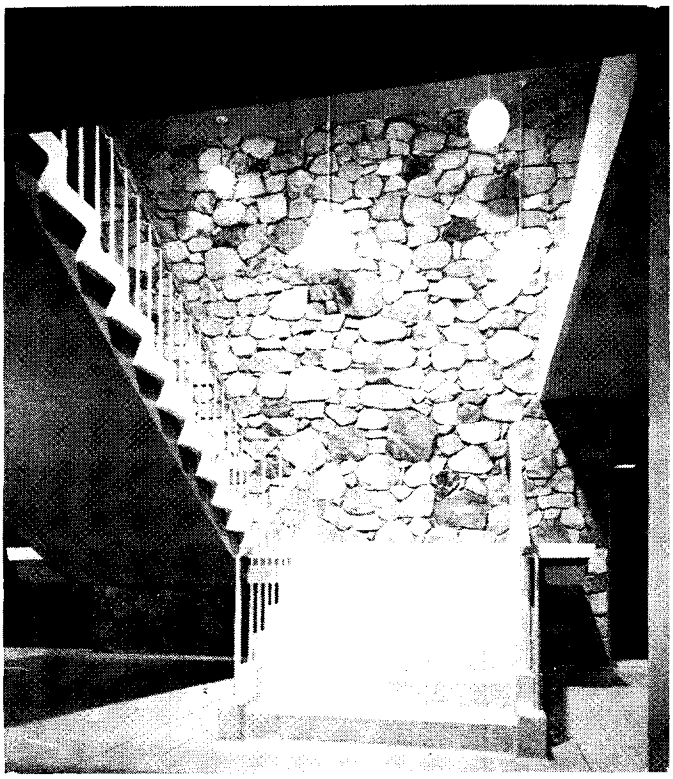
St. Louis County is so large it requires three courthouses; this one is in Hibbing. When the old town was moved, the courthouse was one of the last buildings razed. Its replacement in the new town—which, curiously, is legally a village although it has about 18,000 inhabitants—was built in 1954. The Hibbing building does not contain the county auditor's and treasurer's offices; these are at Duluth. All other functions are housed at Hibbing, including a jail.

The four-acre, level site on a main highway at the edge of town provides ample parking. Analysis of the requirements led to certain departures from custom: space reduction in many departments; hardly any spectator seats in one courtroom, a few more in the other—because most cases require none, and for the exceptions, enough seats would be impossible to provide. A one-story scheme was explored but there were advantages in stacking some elements vertically.

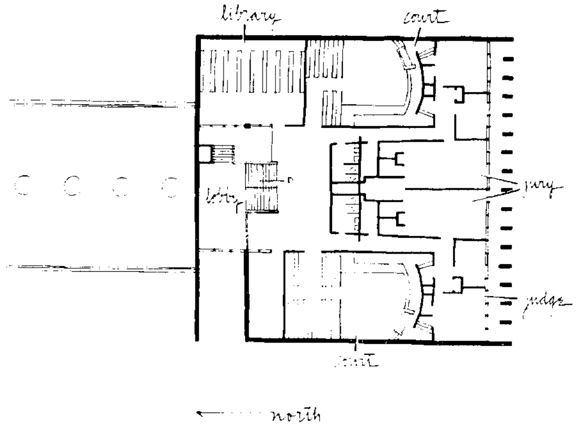
A reinforced-concrete frame was employed and there is considerable use of native stone laid up by local craftsmen—stonemasons, who are fast disappearing. The light, pleasant decor in the courtrooms caused some raised eyebrows at first, but it has worn well; for a description of the acoustical treatment, see pages 158-159, MAY 1959, P/A. The building received a P/A Design Award (1954) and an Honor Award from Minnesota Society of Architects.

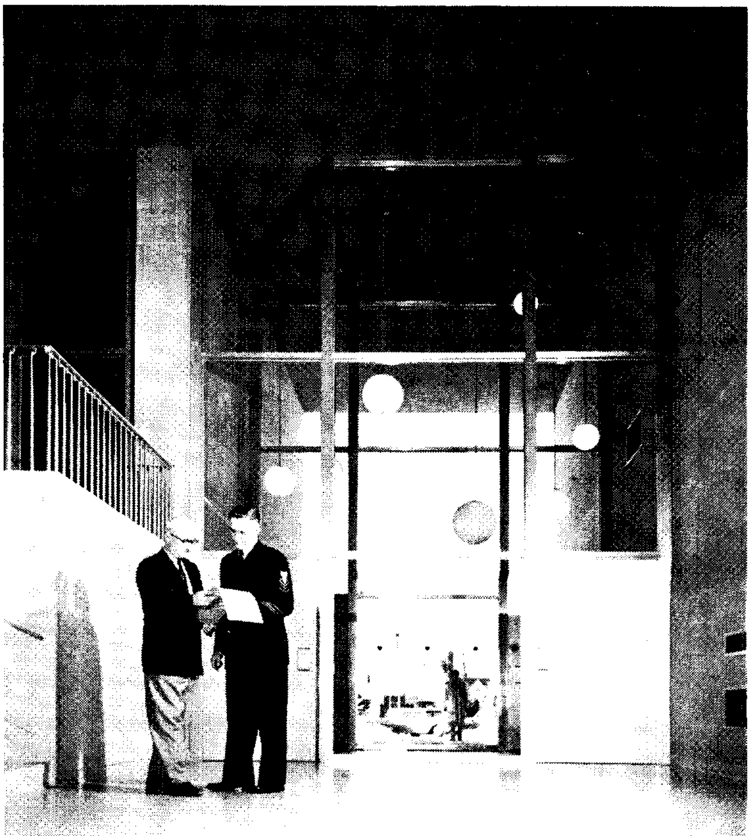


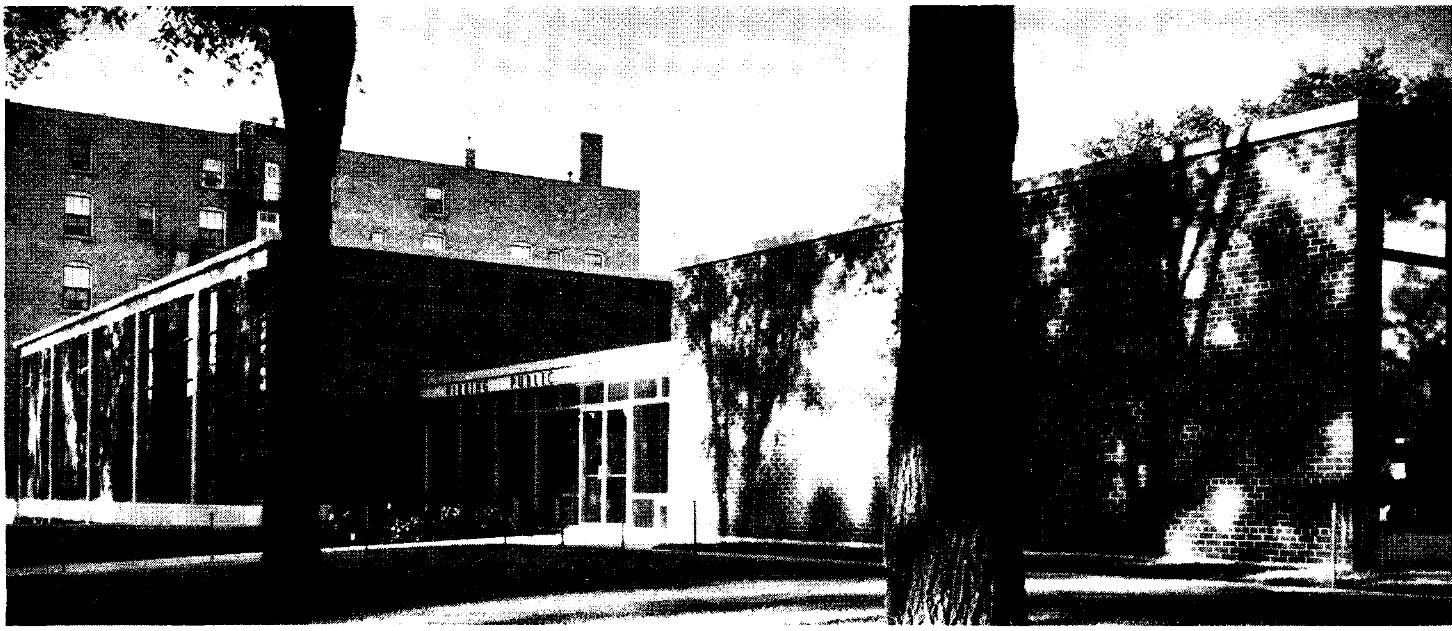
Large courtroom



Lobbies: (left) to offices; (right) to courtrooms





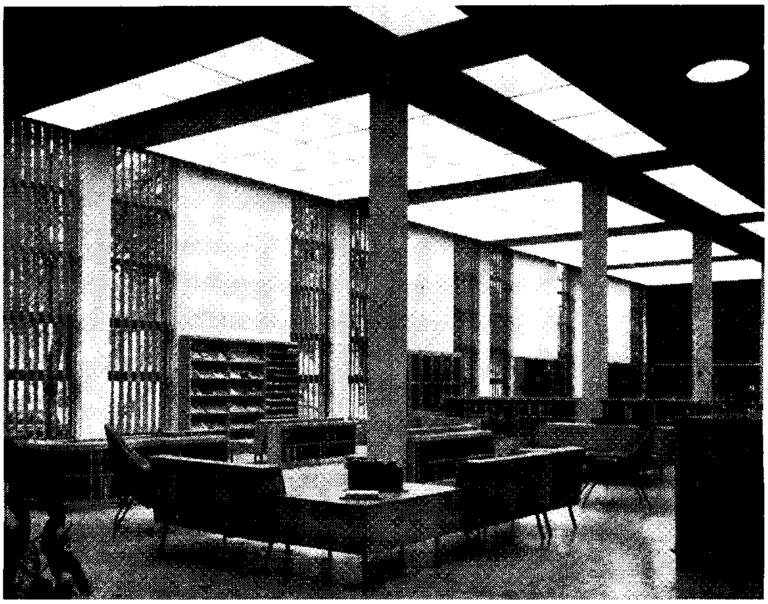


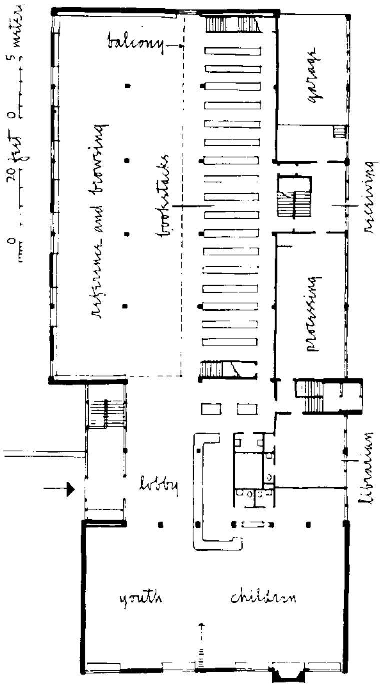
public library

The Hibbing Public Library, like the courthouse a recipient of awards from P/A (1952) and Minnesota Society of Architects, was also a commission traceable to the rebuilding of the community in a new location. The architects participated in selecting the library site which, it was felt, should be downtown near the center of activity. Of the 100,000 volumes the old library held, 20,000 were weeded out by the Library Board. The design program thus called for housing 80,000 volumes, for adult and children's reading rooms, the usual office and work areas; and in addition, for bookmobile facilities to serve rural areas: a garage, loading platform, and dumbwaiter to the stacks. A central circulation desk controls the stacks and reading rooms.

The budget was low; an exposed, reinforced-concrete frame, some exposed interior brick, and some block-and-plaster partitions helped keep the cost to 90 cents per cubic foot. Again, as for much of Hibbing, heat is supplied by the municipal central heating system, so no boiler room was required. Direct steam radiation is used; there is no air conditioning, but humidity is controlled by a system utilizing steam from the municipal mains.

Acoustical plaster ceilings, an abundant use of cheerful color—inexpensive paint—and careful attention to lighting, both natural and artificial, provide an interior that has won local approval.




balcony
garage
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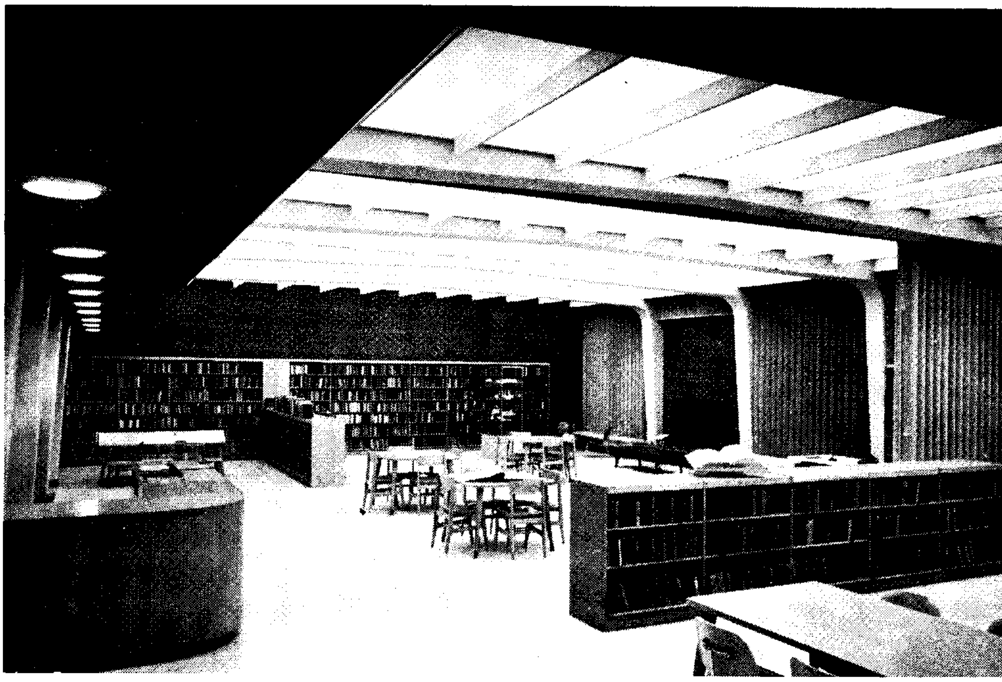
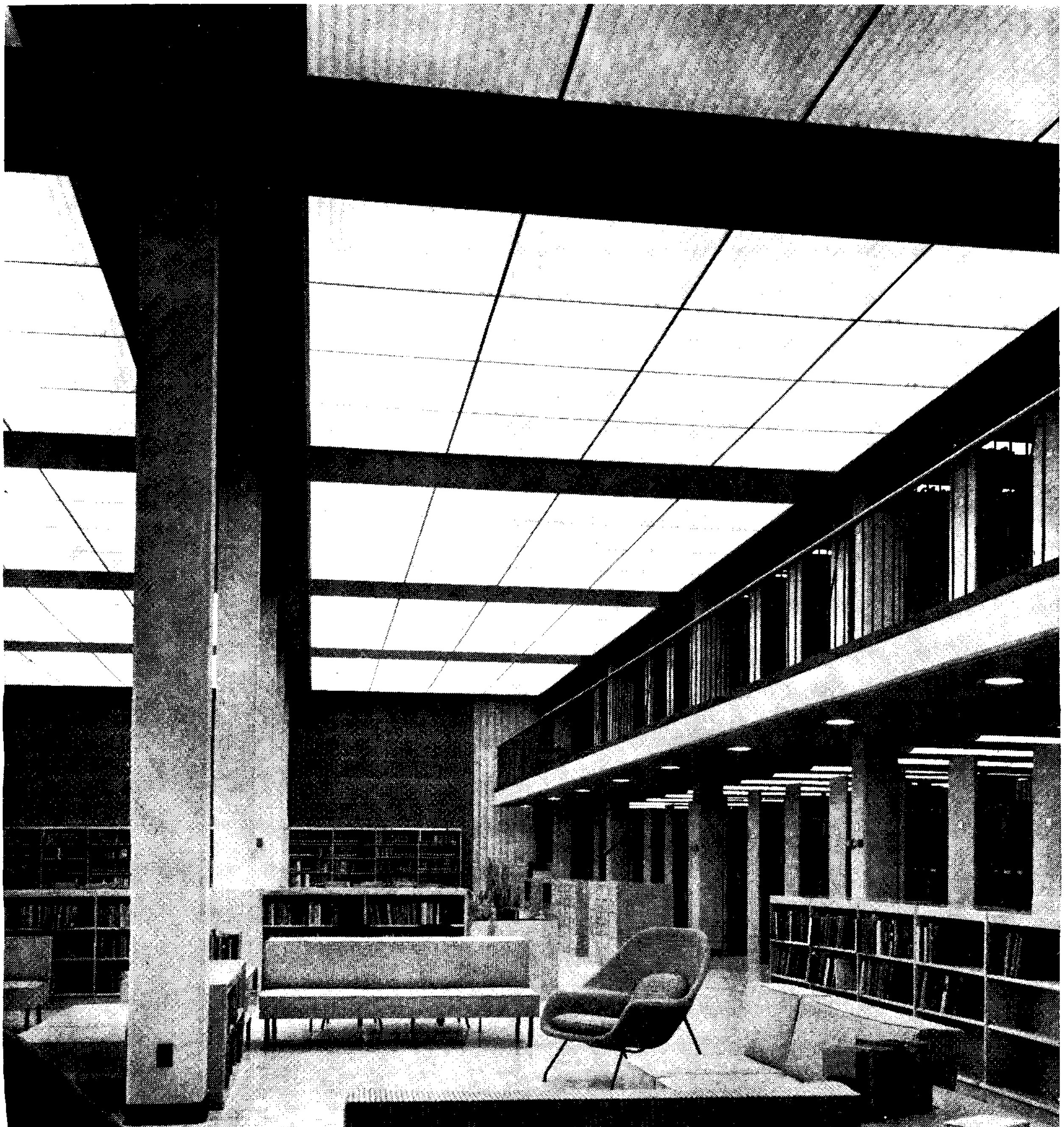
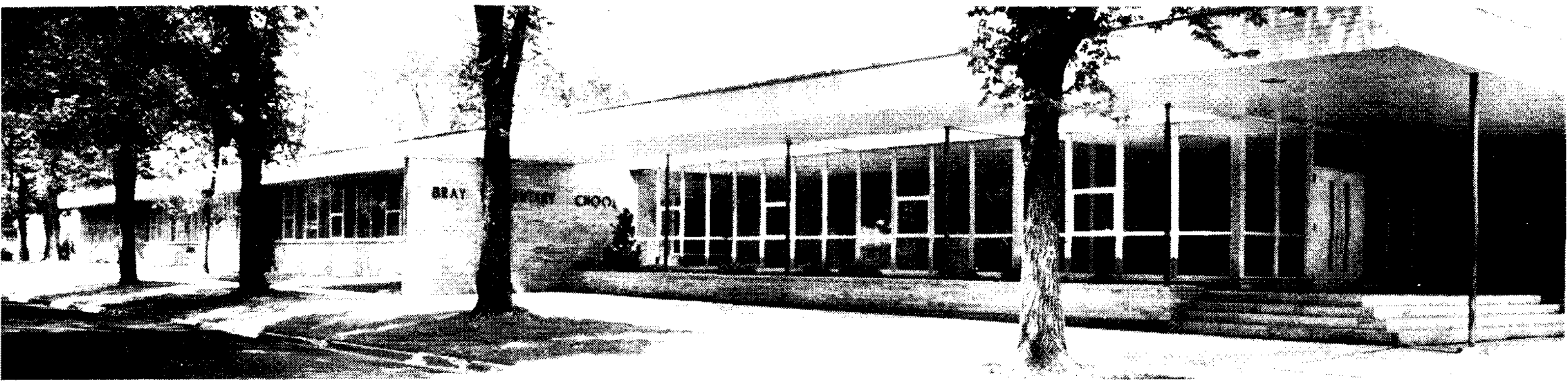
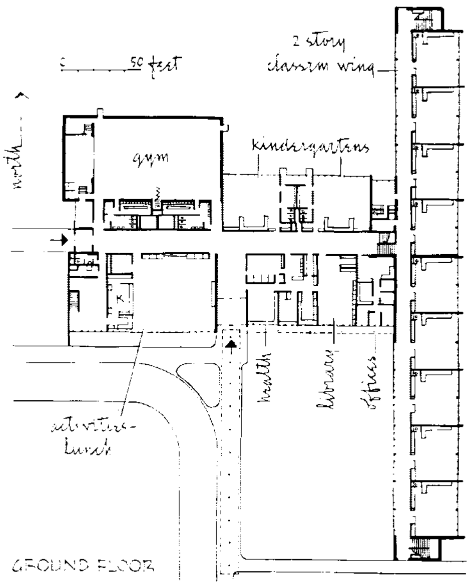
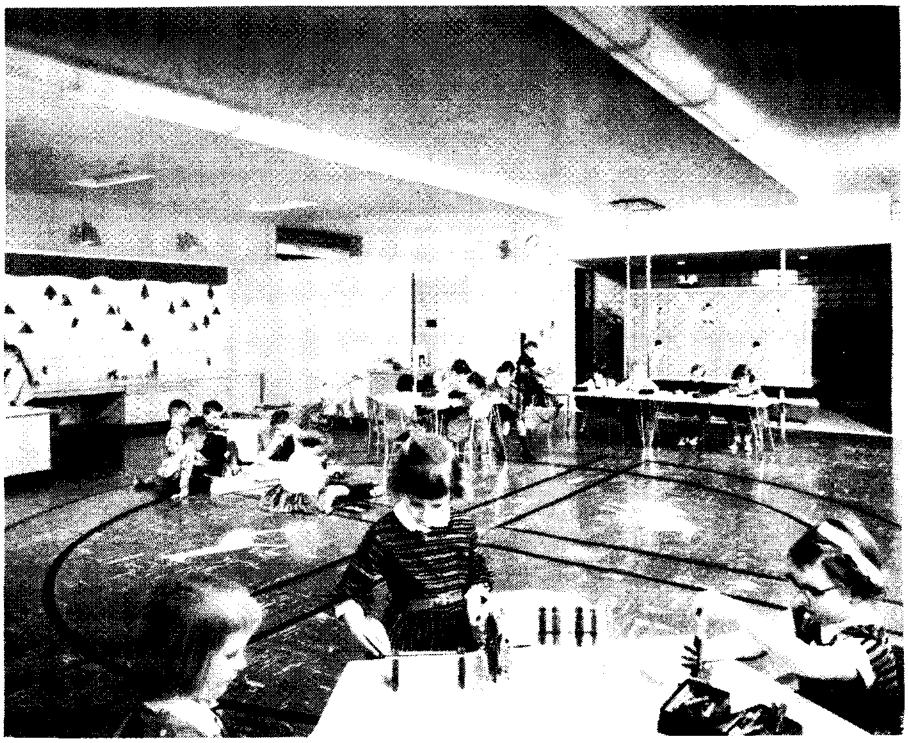






two elementary schools





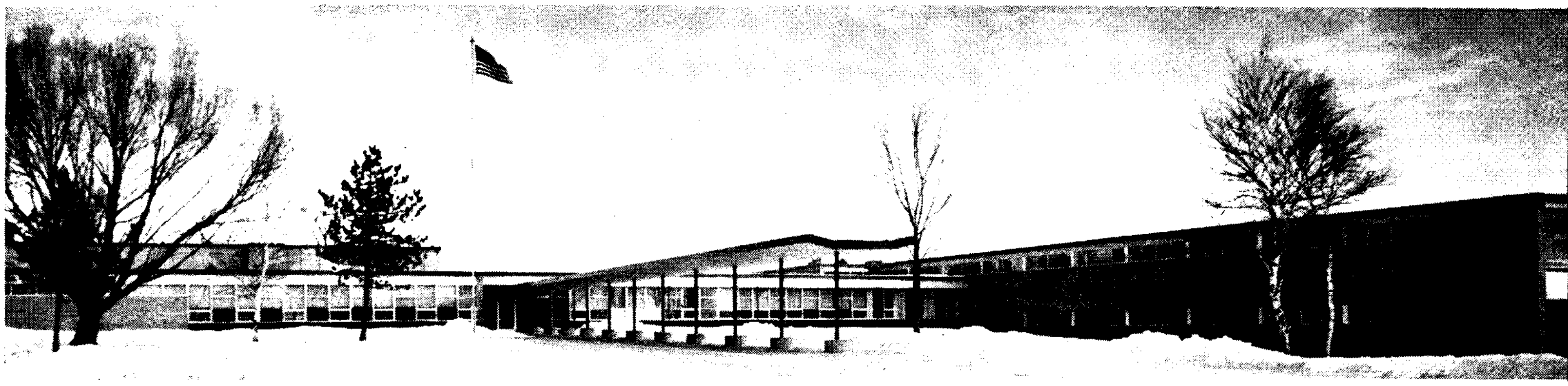
Washington Elementary, Hibbing: kindergarten and corridor.

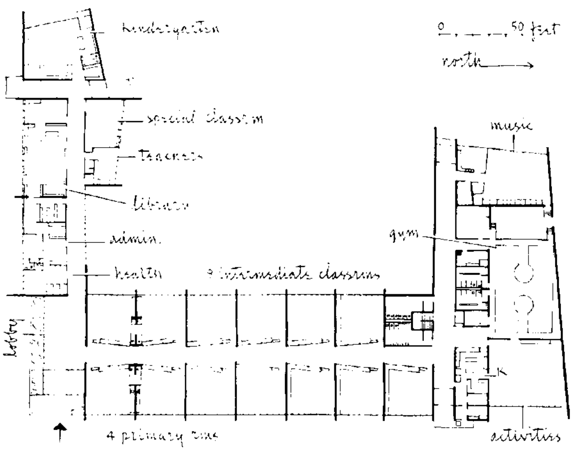
Washington Elementary School in Hibbing (*acrosspage*), was designed by Richard Whiteman; it has also received an award from Minnesota Society of Architects. For classes through sixth grade, it has two kindergartens, 18 classrooms, a divided gymnasium-auditorium, lunch/activity room, library, and offices. This, the third—and, it was believed, the last—of a series of elementary schools for the same client, also contains some special facilities: reading clinic including a reception-playroom to "help the children feel that reading is fun," sound-proofed testing room, small rooms for individual instruction.

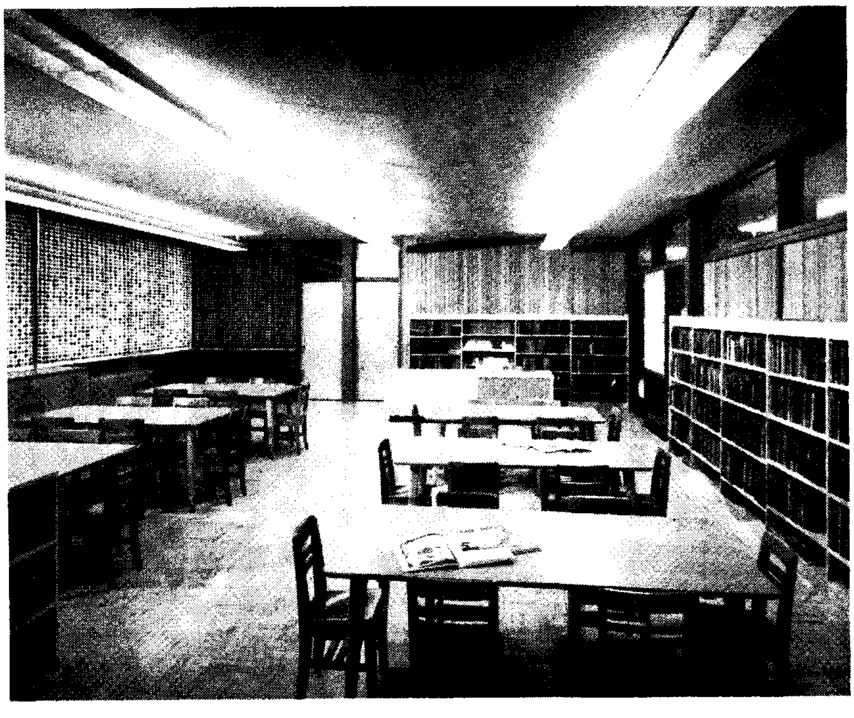
Several years ago the village-owned tourist cabins on the Washington site were removed and the land was planted in pine trees by the Forestry Service. Here was erected the split-level school, classrooms in two stories (strongly advocated by some Board members), with common facilities on a level between.

The Bray Elementary School in Biwabik, Minn. (*below*), designed by O. Ray Nelson, has 14 classrooms, kindergarten, gymnasium-auditorium, lunch / activity room, and music facilities for the high school across the street as well as for elementary grades. The site contours made classrooms on three levels mandatory.

Both schools are of steel frame, with bar joists and steel deck, except that the two-story portion of the Washington School has a reinforced-concrete frame. Materials were chosen for low maintenance: glazed tile and brick, terrazzo corridor floors, vinyl classroom flooring, aluminum sash.







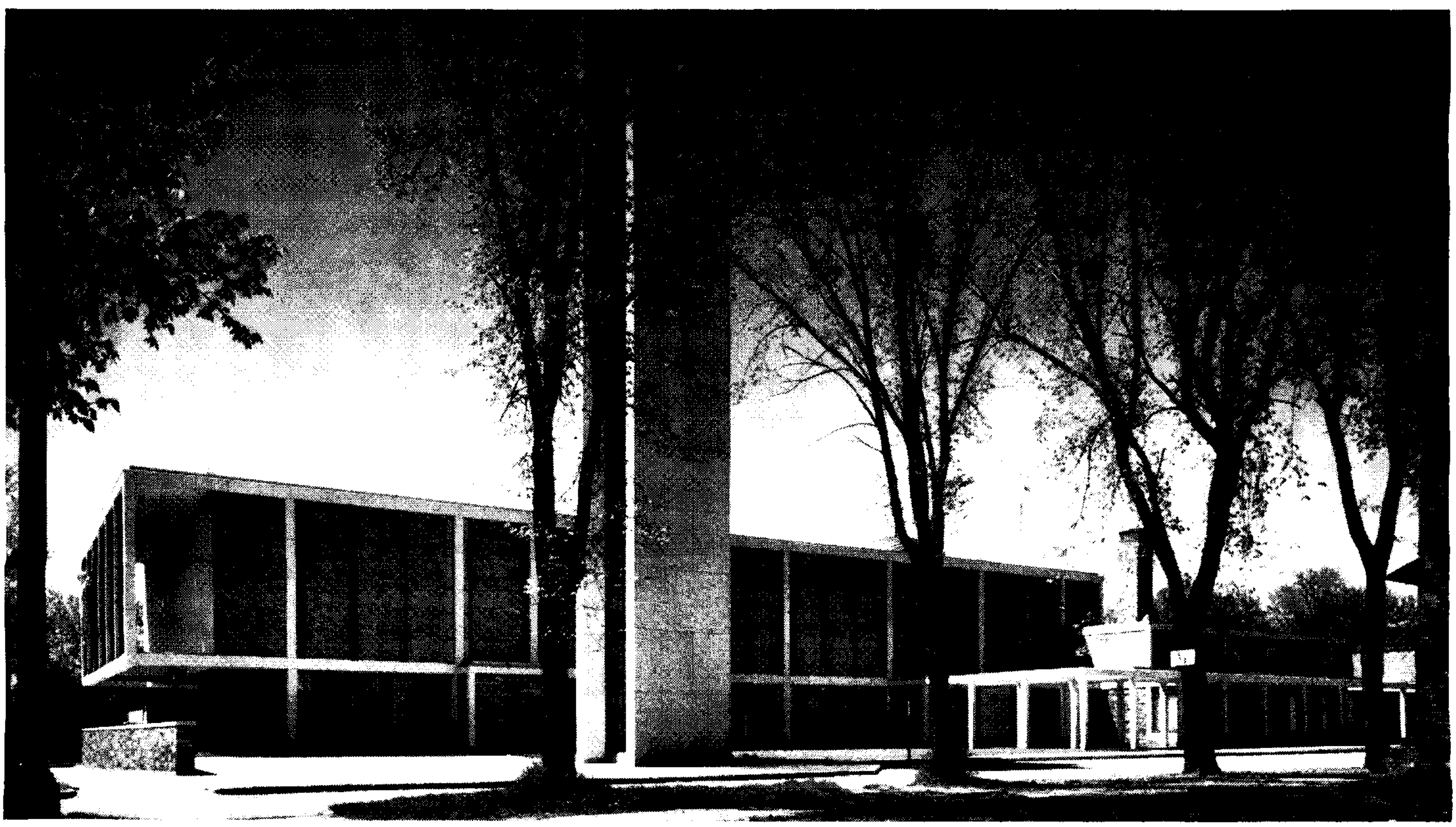
Bray Elementary, Biwabik: library and corridor.

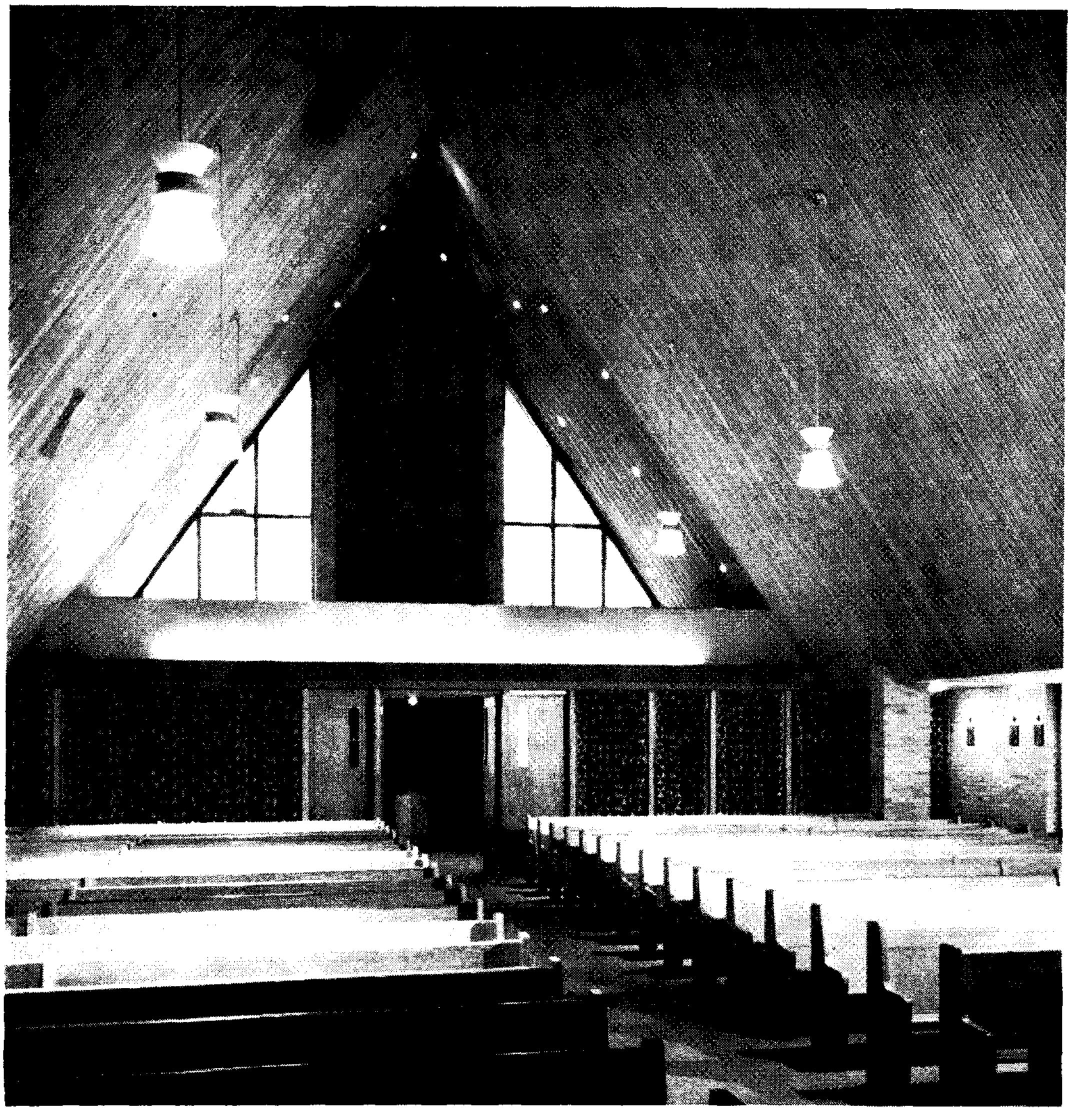
two catholic churches

The difference between St. Joseph's, which was designed by O. Ray Nelson, and St. John's, designed by Le Stegner, are not only the results of different talents. St. Joseph's, in Chisholm, Minn., was a straightforward design problem. St. John's, in Biwabik, had to overcome some difficult conditions: it had to utilize an existing high-ceilinged basement in which the parishoners had met since depression years; the proportions were difficult to incorporate in a new design; the severe climate made impossible outside steps to the necessarily high floor.

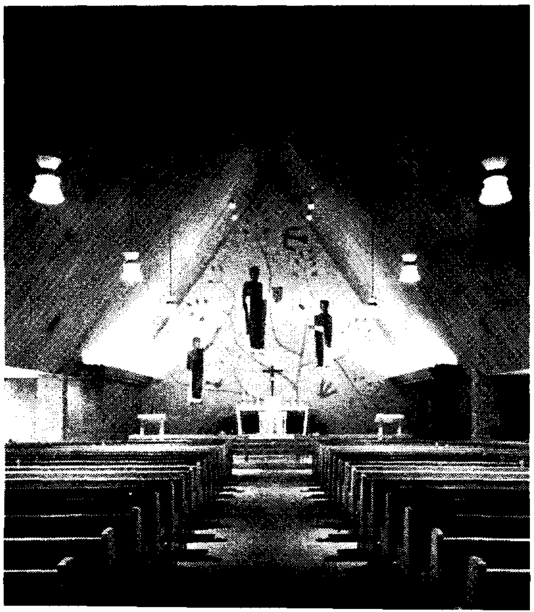
Although starting the roof line at grade has become somewhat a cliché, this form was adopted because it solved the design problems effectively. Steel **A**-frames were used to support the wood-joist roof. The side aisles are accommodated in long dormers. A rectory and small chapel occupy the wing at one side.

St. Joseph's Catholic Church





St. John the Baptist Catholic Church

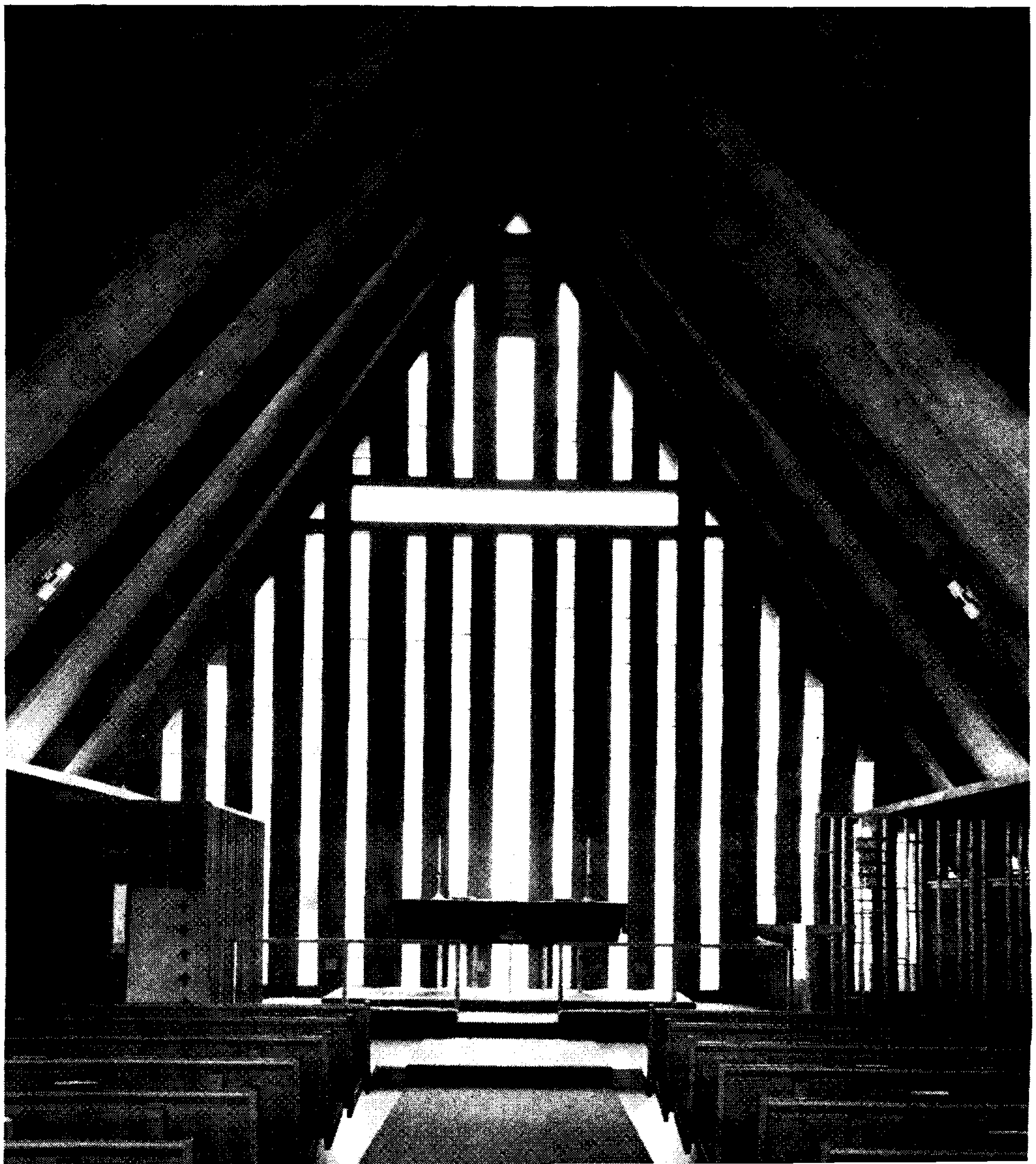


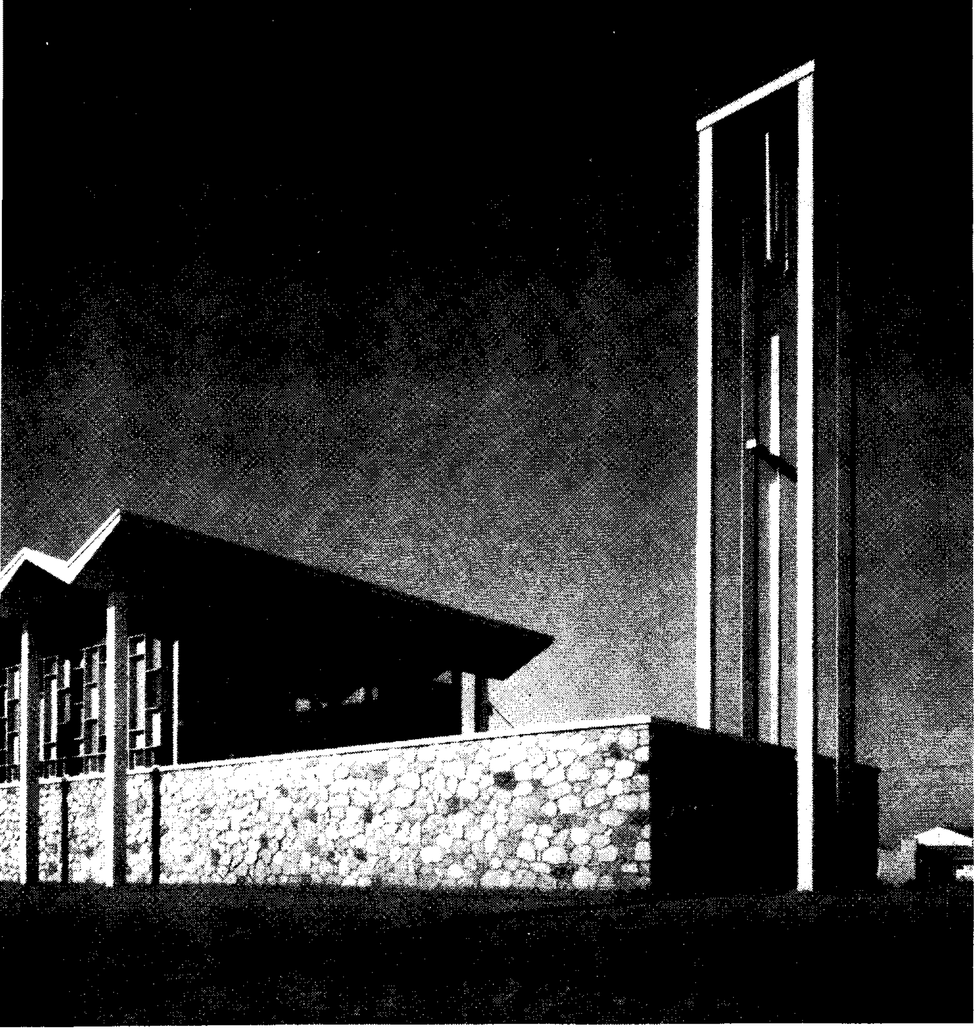
two lutheran churches

The designers of the two preceding churches also were responsible for these two: Gloria Dei Lutheran Church in Pike Sandy, Minn. (*this page*), by O. Ray Nelson; First Lutheran Church, Virginia, Minn. (*acrosspage*), by Le Stegner. The Virginia church has won awards not only from P/A (1956) and Minnesota Society of Architects, but also from Church Architectural Guild of America.

Gloria Dei is a small, rural church designed so it could be built by the parishoners themselves, many of whom work in the mines or have small businesses nearby. Thus they were able to do the plumbing, electrical, masonry, and other specialized work: the only money needed was for purchase of materials.

The Virginia church, more sophisticated, replaces a wooden structure occupied by the congregation for 40 years. Its new site adjoins a new residential area and a future park. The program required seating for 400 with kitchen and dining facilities, a Sunday school for 250, and provisions for future expansion, as well as off-street parking. Examination of the soil revealed a layer of muskeg which had to be removed and replaced with stable fill before construction could proceed on the one-story scheme originally proposed; so it was decided to excavate under the nave for the mechanical plant, and also for future expansion.



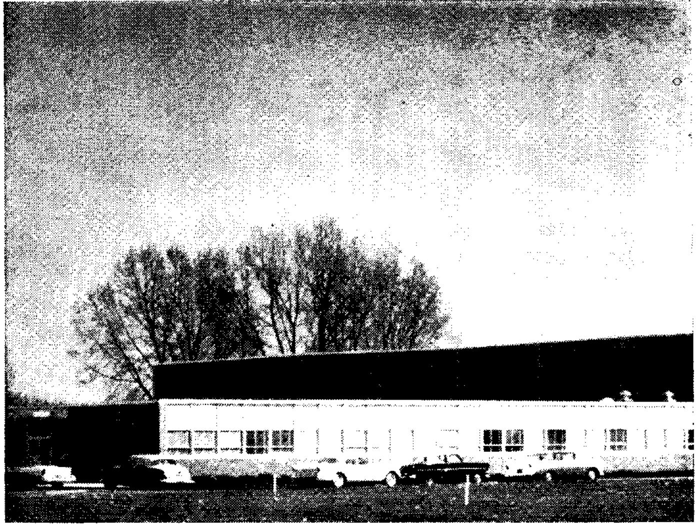


Background for the altar in First Lutheran Church is a garden, seen through a glass wall. Flowers and shrubs grow luxuriantly here; the masonry walls of the nave extend to encircle the garden. Upper walls of the nave, intended at first to be glass, were constructed of glass-faced opaque panels to control heat, light, and glare.

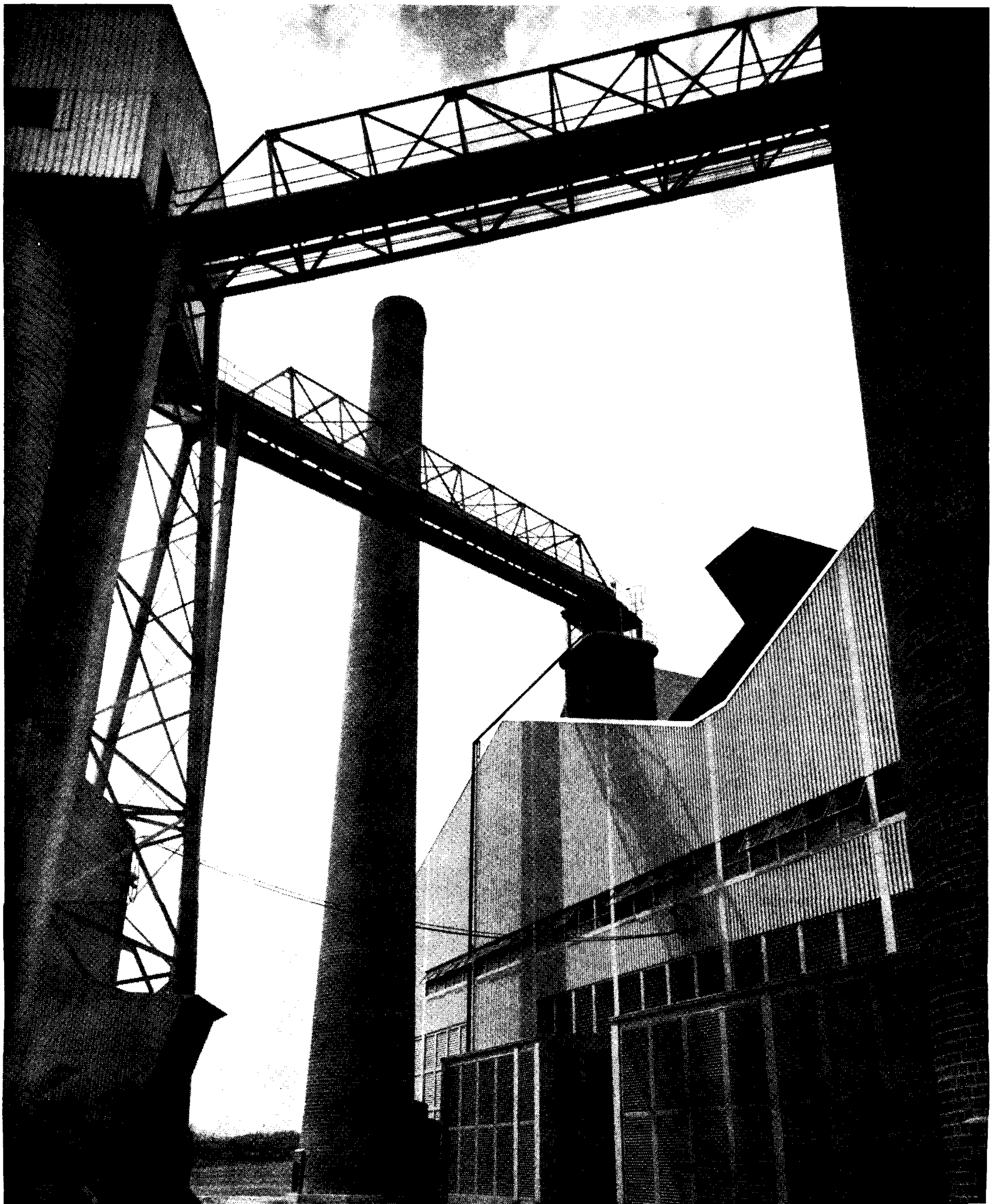
What is shown on these pages is a sampling representative of an active general practice, which has recently amounted to five or six million dollars' worth of construction per year; currently the firm has about seven million dollars' worth under construction and anticipates about the same volume in the near future. At present. Jyring & Whiteman's active jobs include a junior college in Hibbing; another at Coleraine, 30 miles away; and numerous other public and private contracts. Public work, though locally financed, must have the approval of the state legislature; when the legislature is in session, exactly which projects will win approval is uncertain. Commissions come in from former clients, and from new ones upon recommendation from present clients.

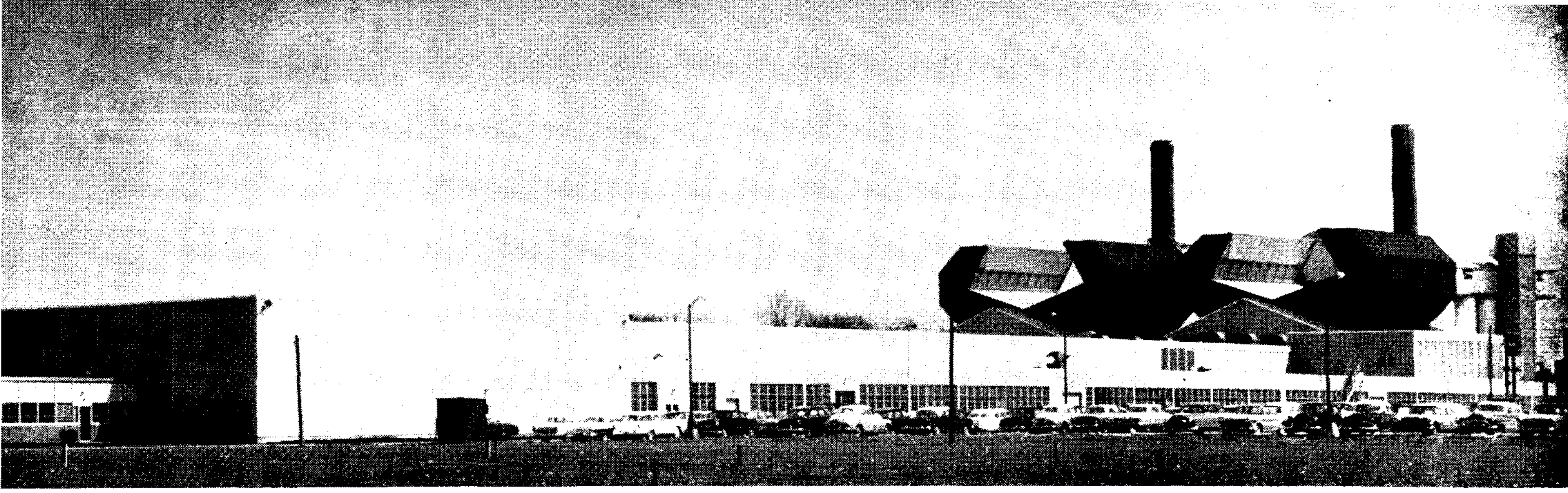
The work is handled with a staff of 17 people, most of them concerned with production. Two, in addition to the partners, are designers; outside engineers are employed for mechanical and electrical work. In order to maintain personal contact with jobs, which was a compelling reason for practicing in Hibbing, project responsibilities are at present split between the partners, each following his job to completion. This permits little delegation of responsibility, the partners feel, and may have to be changed for a more formal organization if the practice continues to grow. The difficulty is compounded because the projects are scattered geographically.

The firm has been so busy that little time has been available for formulating a statement of design philosophy; intensive interest, an active conscience, and close identification with their clients' problems have provided a working creed. They have not had to battle preconceived notions of design, but have found their public receptive to quality. Perhaps one reason is the degree to which not only the partners but several other firm members are engaged in civic and regional affairs.



bold forms for glass plant





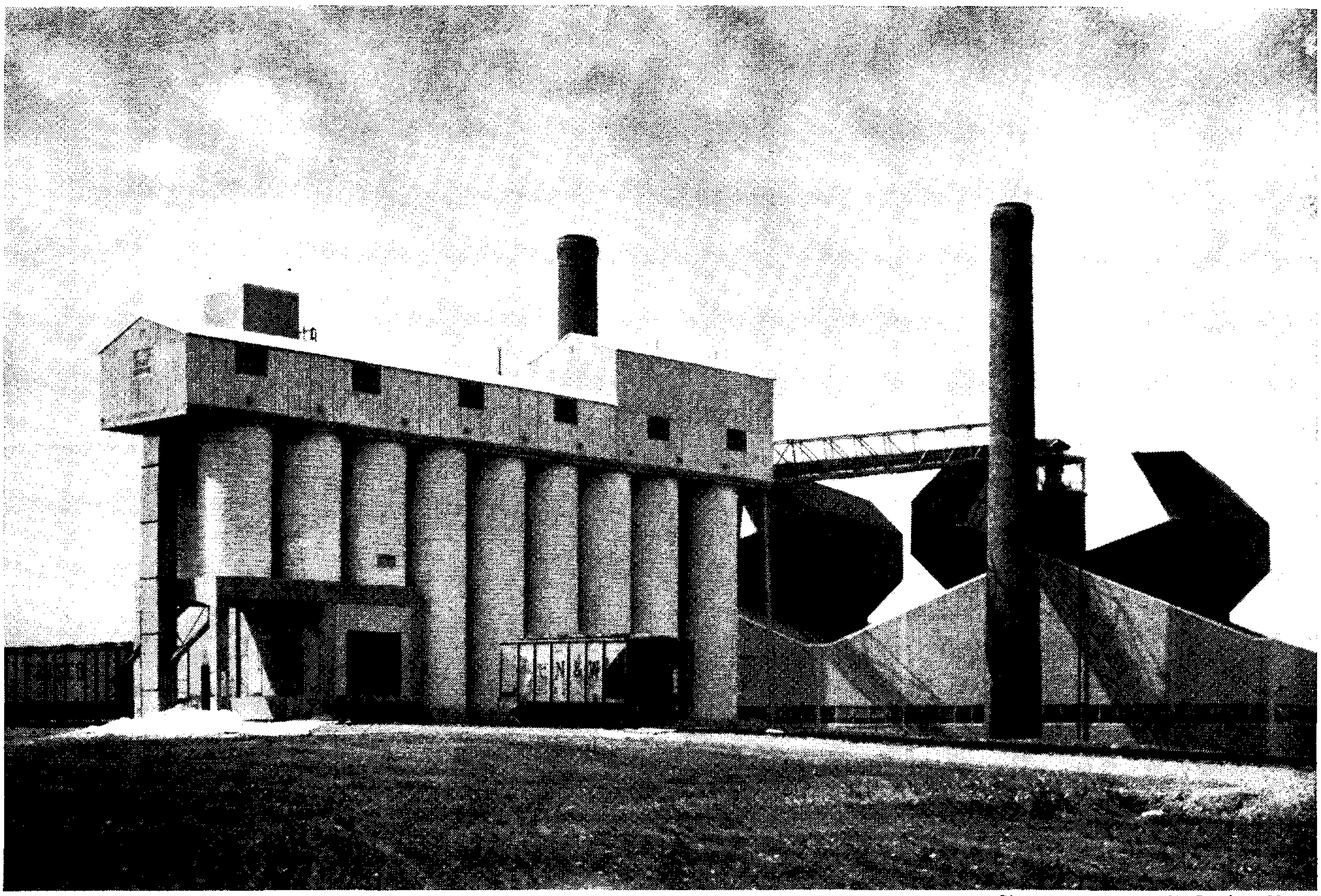
location	Greenville, Ohio
engineer	Day & Zimmerman, Inc.
consulting architect	Carroll, Grisdale & Van Alen

Giant ventilators, 135′-high chimneys, massive silos, and roofs are in dramatic juxtaposition at Corning Glass Work's plant. The plant consists of a manufacturing building and an administration building with reception, dispensary, and office areas.

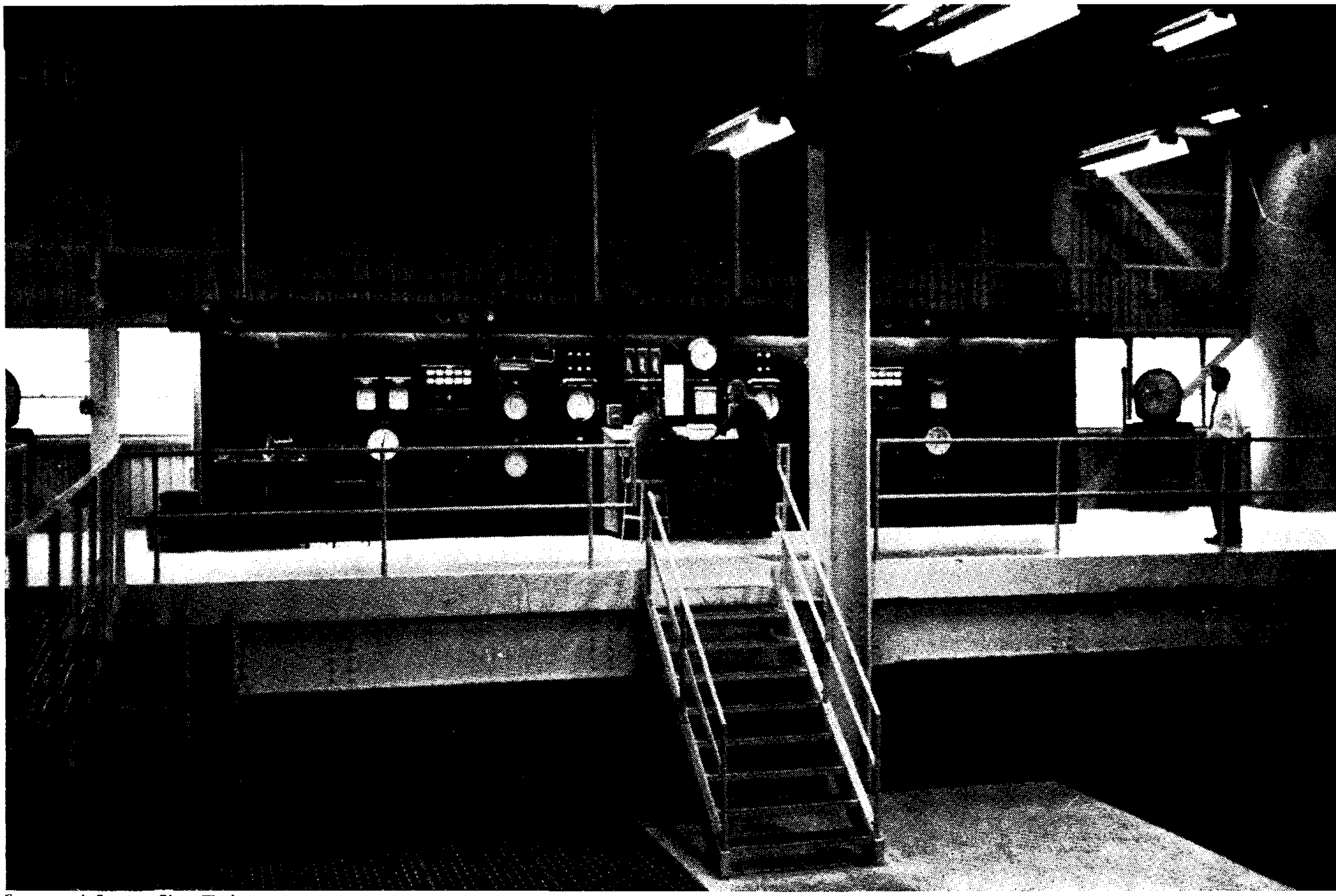
All facilities have been designed for continuous, 24-hour-a-day production of lenses and reflectors. Behind the manufacturing building, raw materials are delivered from a railroad siding to be mixed and stored in large precast-concrete silos. From this structure, which also houses conveying equipment, materials are carried to storage bins, to glass-melting furnaces, to molds, to annealing furnaces. After annealing, the glass products are packaged and shipped, by truck or rail. The 240′ manufacturing building includes two 100′ bays for the installation of the large glass-melting and annealing furnaces and a 40′ bay for maintenance shops, offices, cafeteria, first-aid and locker rooms.

The manufacturing building is a single-level structure, with a partial basement which contains part of the large glass furnaces, and mezzanine areas for fans and furnace equipment. Because the temperature of molten glass is high, ventilation was a major problem. Giant monitor ventilators remove the terrific heat of the furnaces; large wall areas have adjustable metal louvers to furnish air; and high-capacity fans blow air into this area.

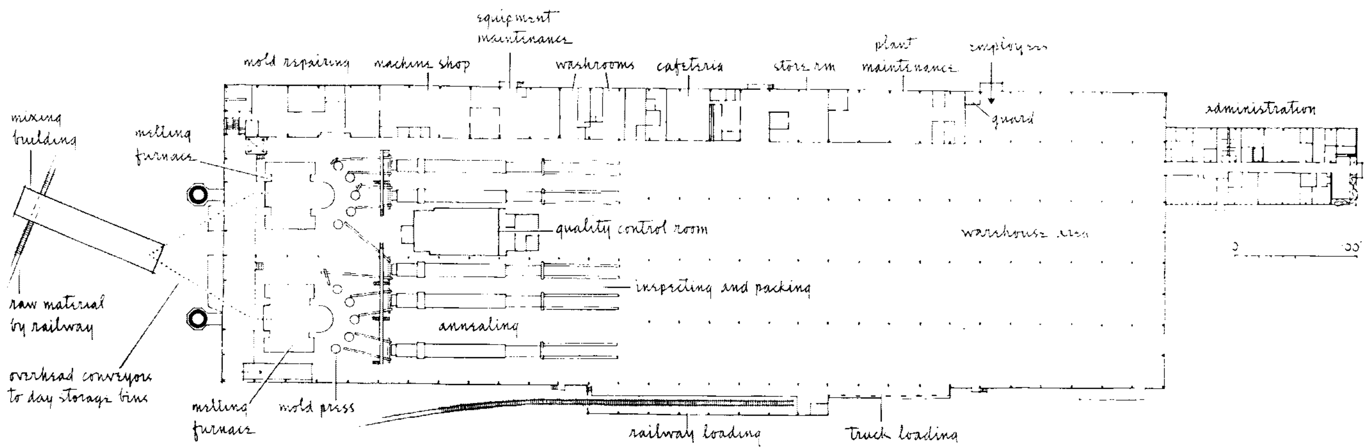
The building is a structural-steel frame on reinforced-concrete foundations; the roof, built-up glass-fiber membrane covering a poured-gypsum roof deck; exterior walls, painted, fluted steel; floors, reinforced concrete; and interior partitions, concrete-masonry units and movable-metal partitions. Maxon Construction Company, Dayton, Ohio, was General Contractor.

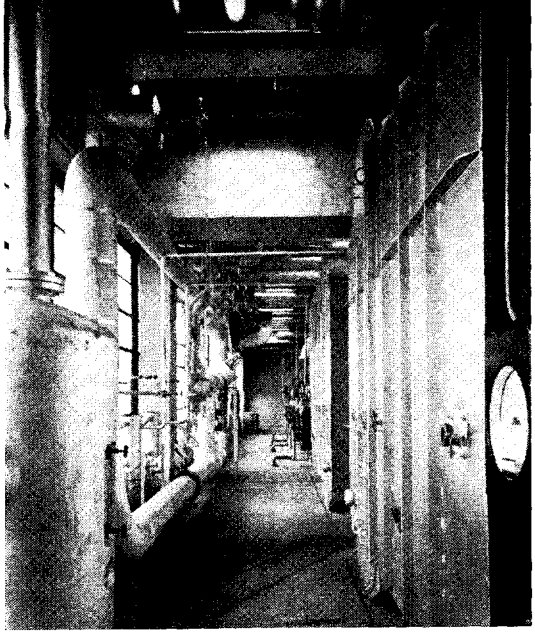


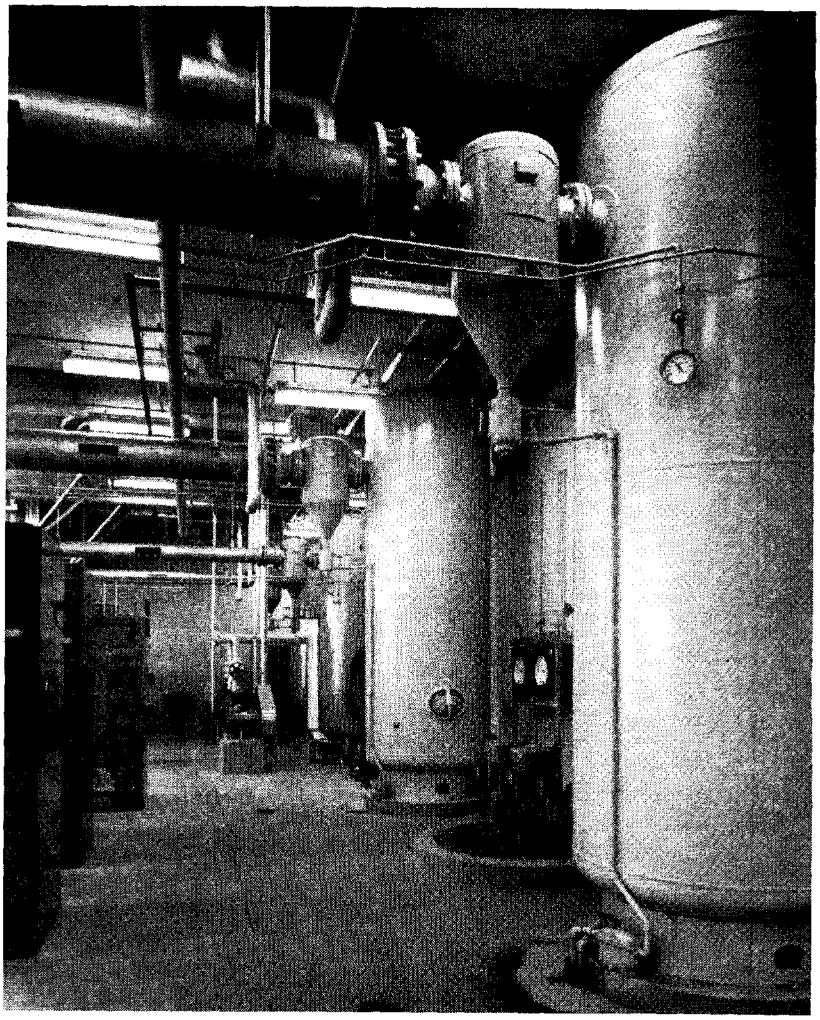
Photos (except as noted): Dearborn-Massar



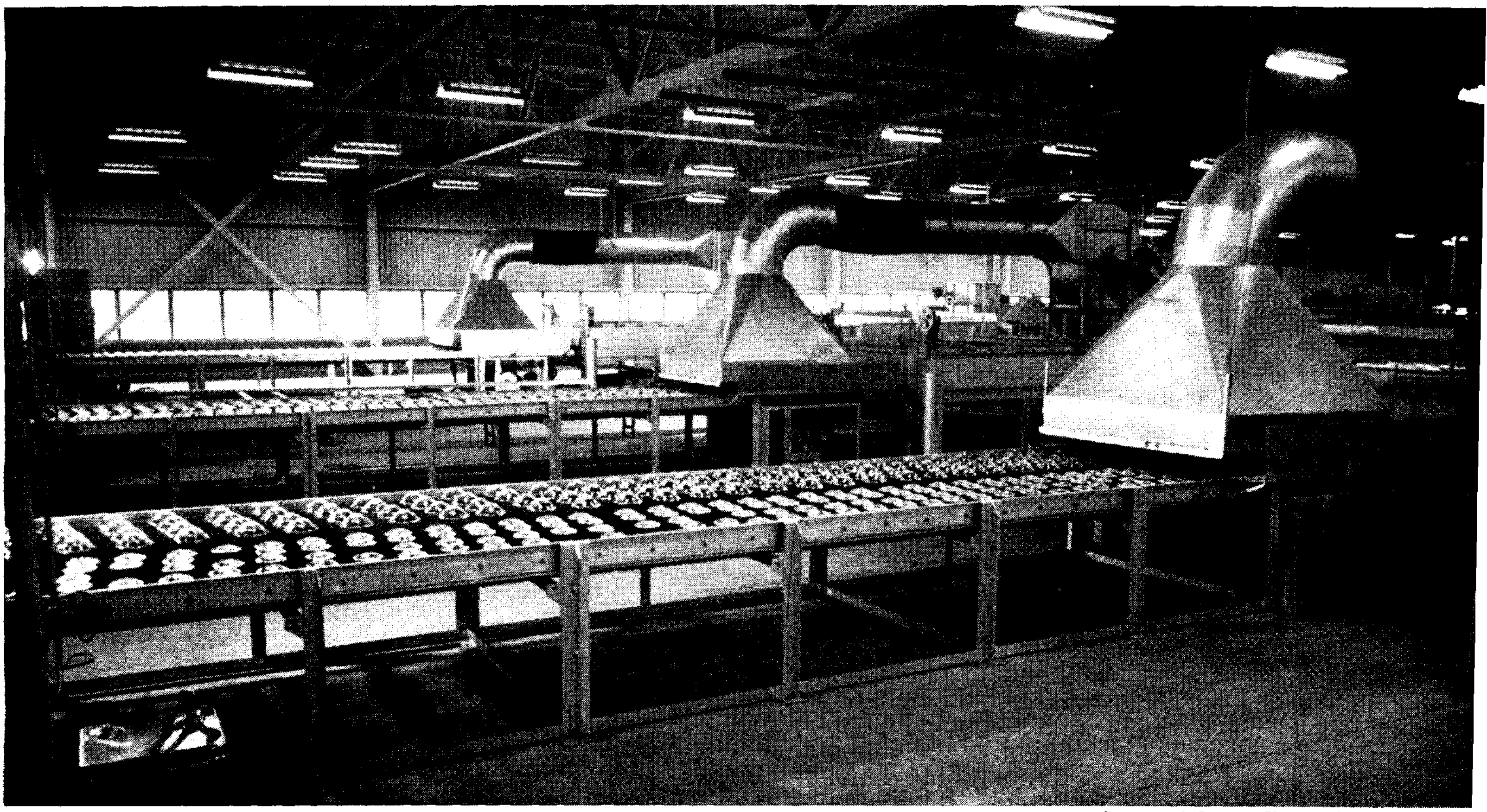
Courtesy of Corning Glass Works







Control panel (acrosspage) *in melting department is between the two glass-melting furnaces which refine glass for the molds. When the finished glass product has been formed in the molds, it is conveyed to annealing furnaces for reheating and controlled cooling, which enable it to absorb the shock of normal use. Sealed-beam reflectors and lenses are shown* (below) *on the annealing belt.*



Courtesy of Corning Glass Works

In previous articles that have appeared in P/A, this author has discussed "Structures in Membrane on Co-Acting Ribs" and "Axially-Stressed Wide-Span Structures." Although his designs—for the most part—have yet to be realized in actual construction, ample proof of the validity of his structural theories has been developed in the laboratory —as reported in "Roebling's Suspenarch Demonstrated," in September *1957 P/A. Here, the same basic theories are applied to multistory structures—concluding with one reaching 300 stories in height!*

multistory structures

by Paul Chelazzi*

Ever since Biblical times, when Jacob saw the Heavenly Ladder in a dream, men of all ages have had an impulse to build higher and higher—reaching for the sky. This author wonders, however, whether over the years any basically significant innovation in construction methods for tall buildings has been perfected, since many materials of ancient days are still being used in traditional ways to build heavy structures of a weight that in some cases may be 100 times that of the actual live load they may be required to carry. It is also difficult to find that the design criteria for building skeletons have basically progressed since the days of early dwellers who, to protect themselves from beasts, raised their floors above ground, supporting them with frameworks not unlike the joinery of a common table. In fact, contemporary conventional framing for multistory buildings is still based on an established, intuitive, structural logic which transfers a floor or roof load from one, to a second, and even to a third system of cross beams before delivering it to columns. Let us examine this type of traditional framework in an example of two head bays, 10-stories high *(Figure 1)*. The weight of the roof and floors carried by beams, B, is taken by girders, G, which in turn transfer it to columns, C. For purposes of comparison, a hypothetical tied-arch structure is shown in dotted

**Engineer-Architect, member of American Society of Civil Engineers, New York, N.Y.*

Figure 1

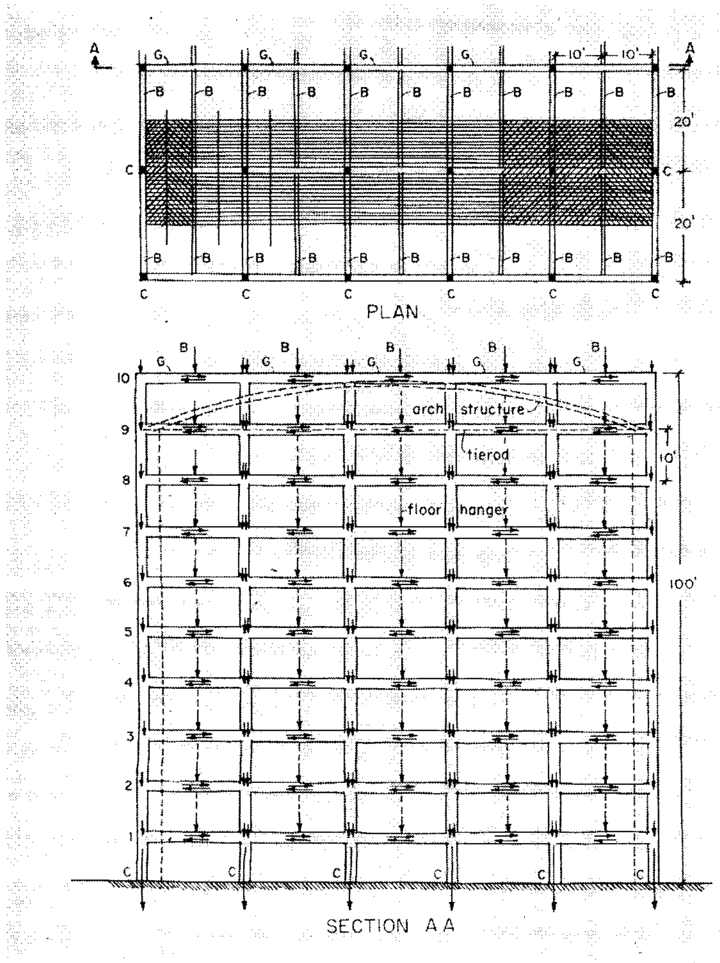
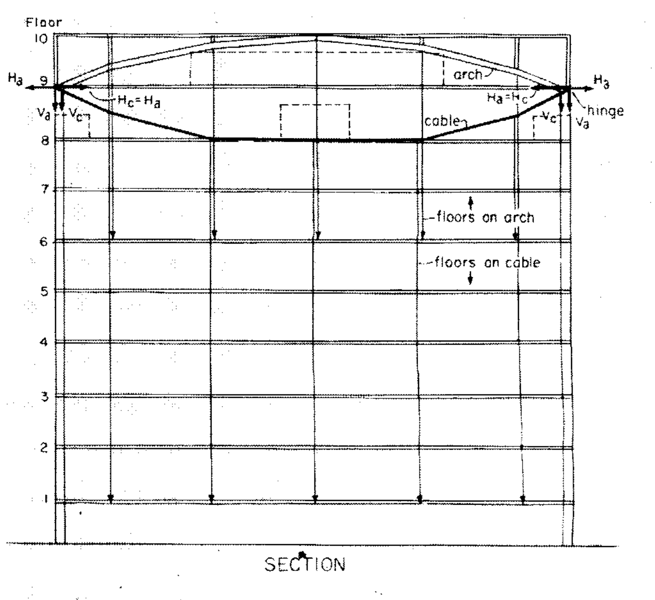


Figure 2



lines. Girders, G. become unnecessary as load on the beams. B, hangs (at their supports) directly from the arch —which, for maximum economy, should be designed to follow the pressure line for prevailing loads. The enormous cost of the tie-rod needed to balance the outward thrust of the arch in this design, though, would cancel out most of its advantages. As has been proposed by the author for similar structures[1], should the load be carried equally by an arch and a suspension system—basic components of the suspenarch supporting unit shown, *(Figure 2)*, the tie-rod would not be required. When loaded, these component parts would co-act mechanically at their connecting hinges where horizontal components of thrust could be made to balance under even load through adjustment of their geometrical shapes. In this instance, the arch and suspension components would require only one-half the sectional areas needed for the corresponding compression and tension members of the preceding tied-arch structure, *(Figure 1)*. The foregoing structures have no particular design value and are presented only to illustrate concepts.

The possibilities of utilizing elevator shafts as columns supporting suspenarch structures of this type were first investigated in a 10-story building having a square plan (*Figure 3*). Here, the structural limbs are supported on a central core formed by the reinforced-concrete walls of four wells (elevator and stair) which are stressed both vertically and horizontally. The X-shaped core is designed with adequate section to resist the amount of stress caused by the load transferred by the strut abutments located at door height (*Figure 3*-A). Under uniform load, the thrusts, R, of the struts balance.

Instead of conventional beams supporting the load, cable-beams are provided to carry the load in suspension—thus exerting horizontal thrusts RxH on both sides of each strut. The resultant, T, of the horizontal components, H, tends to rotate the strut upward, (*Figure 3*-B), while the gravity load, P, acting at the same point, produces a stabilizing moment. Since all load is supported by the central core, the floor

[1] July 1956, December 1957 P/A

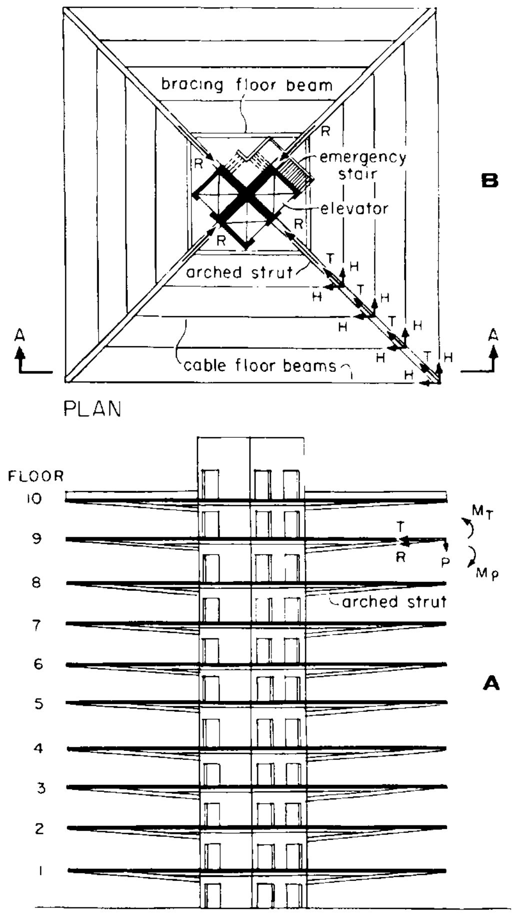


Figure 3

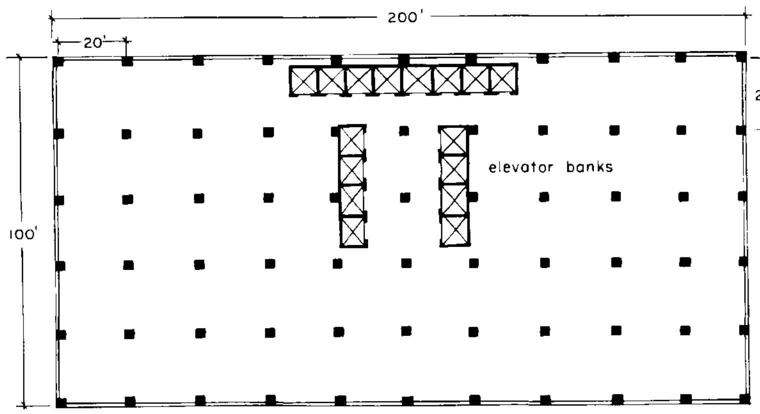
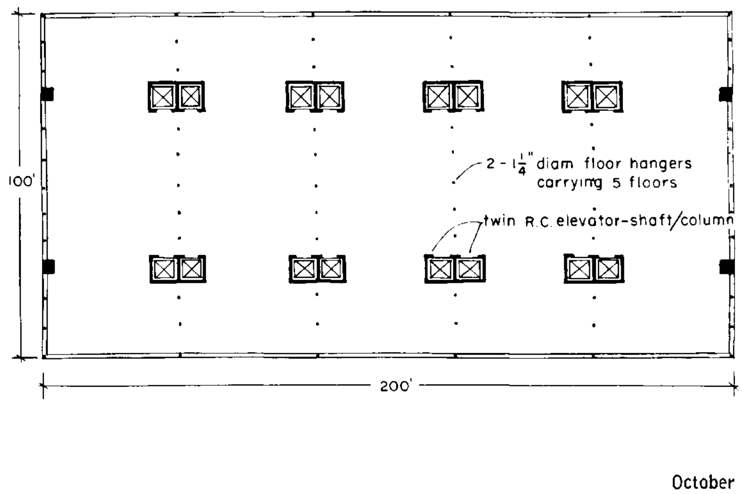


Figure 4

Figure 5



area of each story is totally unobsructed and at the same time a continuous free span can be provided along the entire perimeter of the building. Extending further this examination of utilizing suspenarch structures in conjunction with elevator-shaft/columns, a 30-story reinforced-concrete structure was next investigated.

A preliminary study was based on the conventional plan of a New York building completed in recent years (*Figure 4*). By applying concepts previously discussed, an alternate design could be developed as illustrated, (*Figure 5*). In comparing the latter with the conventional plan (*Figure 4*), it will be noted that 62 of the 66 columns could be eliminated by assigning their function to eight twin-elevator shafts, for a specified 16-elevator service, and to four perimetral columns. Floors would be suspended from 36 slender steel cables which would penetrate them at locations where main partitions could be located so as not to interfere with full utilization of floor area. As shown, (*Figure 6*), the twin-elevator shaft becomes a single one from the 20th to the 30th floors—the third of three superimposed building units. Since in each of the 10-story building units the five lower floors are suspended from the cable and the remainder from the arch, evidently the ground, 10th, and 20th stories are not penetrated by hangers and the completely unobstructed floor areas can be fully utilized—eventually for parking. Should an additional number of open-floor-area stories be required for parking or some other purpose, the building may be further subdivided into more than three units.

Mechanics governing the structural behavior of the foregoing type of suspenarch supporting units for multistory buildings, are more clearly understood if they are first analyzed in components. Should the arch shown, (*Figure 7*), be of parabolic shape, with a span, L, having rise, h, and carrying a uniformly distributed load, w, the value of the horizontal component of thrust, H, can be obtained through integrating the equation of the parabola twice; then, that of the inclined thrust, T, at abutments can be derived from, H, through further calculus elaboration. For nonmathematically minded designers, a far simpler method of readily obtaining, H, in a parabolic cable was also outlined in a preceding article[2]. The same formula, $H = wl^2/8f$, obviously applied to an arch having a similar parabolic shape with, f, representing its rise, h. As for the value, T, to obtain it no higher mathematics is required than an elementary algebraic development based on the geometrical fact that tangents to the origins of a parabola meet at mid-span through a point located twice as high as its rise. When combining this arch and a suspension system as shown, (*dotted lines in Figure 8*), their external mechanical action can be represented by the horizontal and vertical components of the respective exerted thrusts, and located on the vertical plane so as to have the supports at the positions indicated. This could be realized in construction by a system of rigidly-connected twin arches penetrating columns through openings in which they can freely displace without stressing the columns (*Figure 8*). The cable should be located between the arches, but separated from them (*Figure 8, sections* aa *and* bb) so that the axes of the component systems would lie in the same vertical plane, and yet would work independently. Now, assume that the central cable is anchored to the arch by means of lateral cables connecting the respective terminations, C, and, A. In this condition, a balanced mechanical coaction between the arch and the suspension system would be produced when —at the point of connection, A—the lateral cable develops a component, H_T, equal in magnitude but *in opposite direction* to that of the arch, H_a. Similarly, the lateral cable must produce—at connection, C, with the central cable —a component, H_T, equal and opposed to that of the central cable, H_{cc}. Obviously, the supporting unit is horizontally stabilized when H_{cc} is balanced by H_T. Thus, we have the equations: $H_a = H_T$ and $H_{cc} = H_T$; whence, $H_a = H_T = H_{cc}$. Generally, in this type of structure, the connecting lateral cables —having a span, l_l—also carry the same uniformly distributed load and, therefore, hang parabolically with a sag, f_l (*Figure 9*). In such cases, as-

[2]July 1956 P/A

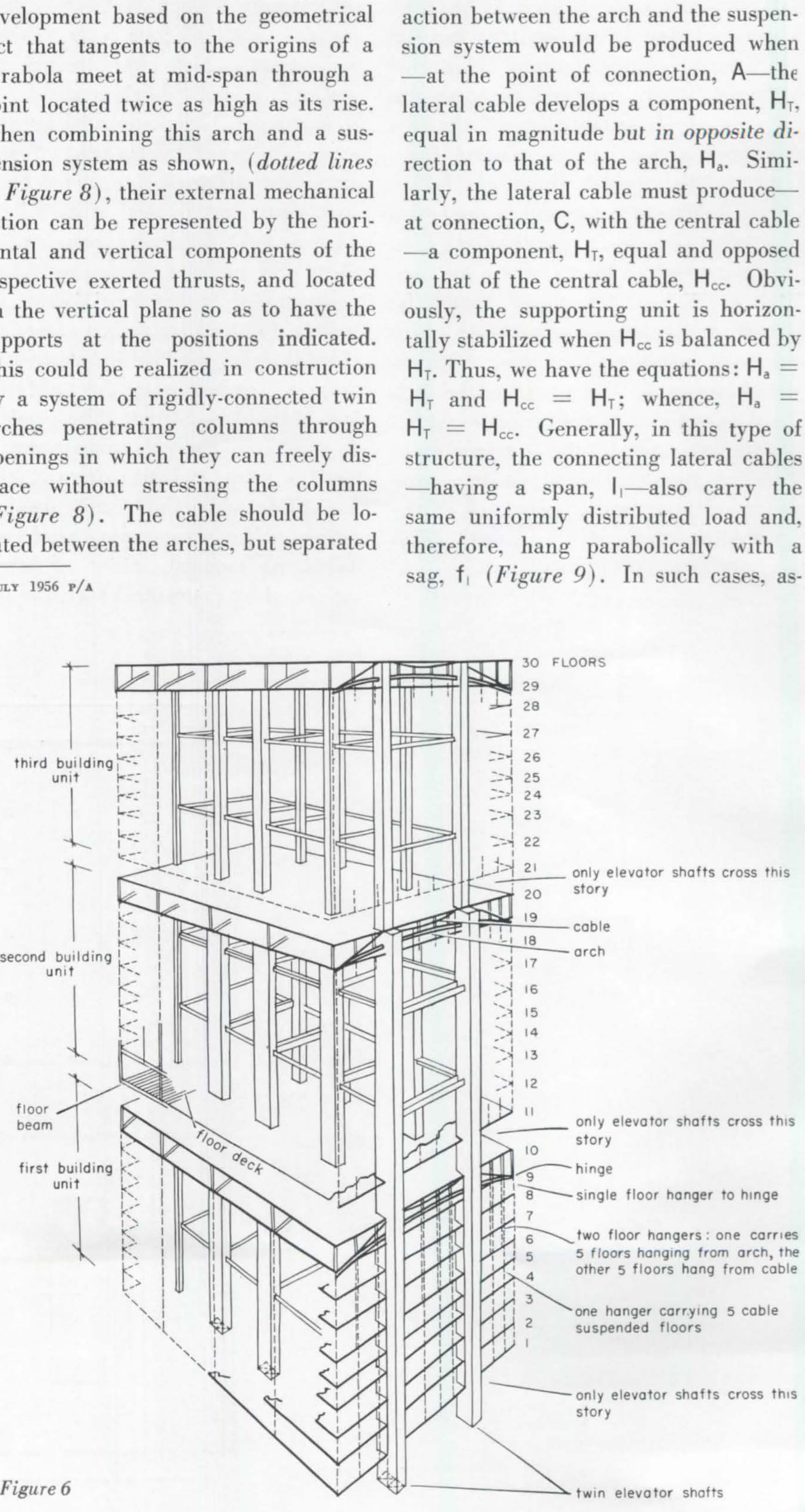


Figure 6

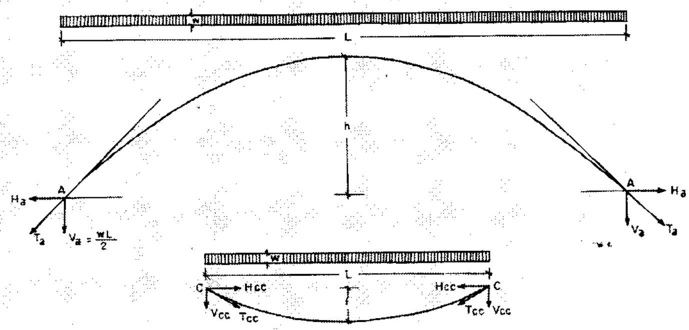


Figure 7

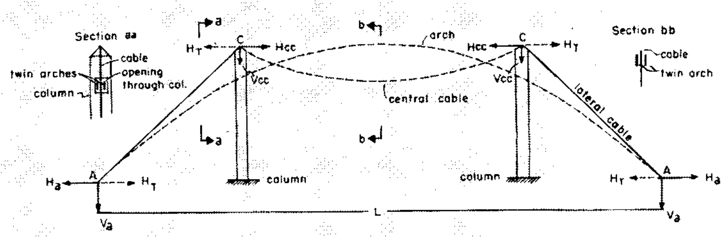


Figure 8

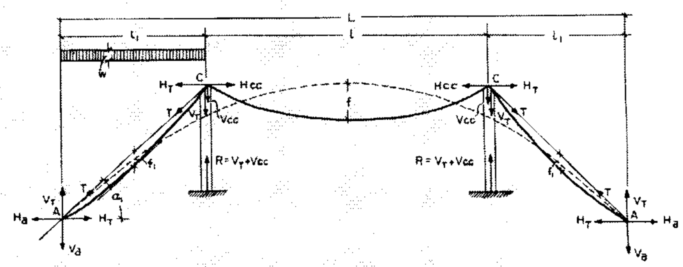


Figure 9

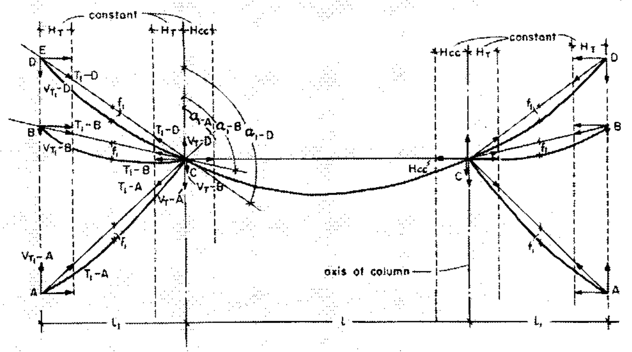


Figure 10

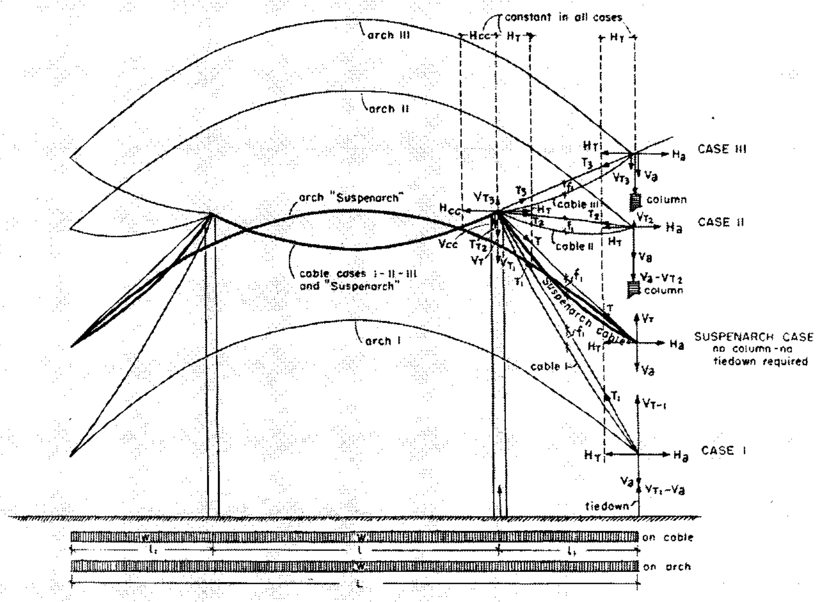


Figure 11

suming that component, H_T, is produced by force, T, which acts along the line passing through A and C, equilibrium occurs vertically when column reactions equate to $V_T + V_{cc}$. By applying statics similar to the analysis of the central cable[2], the value of the horizontal components of thrust in the lateral spans will be found to be: $H_T = wl_1^2/8f_1$. Since $H_{cc} = H_T$ and $wl^2/8f = wl_1^2/8f_1$, then l^2/f is also equal to l_1^2/f_1, or $f_1 = fl_1^2/l_1^2$. It is evident (*Figure 10*) that $H_T = H_{cc}$, for any inclination of the lateral cable—within the limits $0 < \alpha_1 < 180°$, remains unchanged for the same f_1, l_1, and w. On the other hand, with the inclination of the lateral cable, the vertical component, V_{T_1}, varies not only in magnitude but also in direction.

Illustrated, (*Figure 11*), are three distinct examples of supporting units and a suspenarch having lateral cables with different inclinations, but in all $H_T = H_{cc} = H_a$. In Case I, the component, V_{T_1}, acting upwardly is larger and opposed to that of arch, V_a. Therefore, a tie-down cable is required to take up the difference between these two forces. In Case II, the component V_a of the arch is larger than V_{T_2} of the cable, consequently a column is needed to stabilize the supporting unit vertically. In Case III, the vertical component, V_{T_3}, adds to that of the arch, V_a, and a column should be also provided.

It may be seen that the suspenarch-type of supporting unit (*Figure 11*) embodies the highest degree of mechanical economy. As observed, under the prevailing load distribution, both vertical and horizontal components of thrust in the two systems balance at their connection points and only two centrally located columns are necessary. This type of structure was selected for the typical 10-story units in a tentative design for a 120-story building (*Figure 12*). Five stories of each unit are carried by a conventional light framework which transfers load to the arch, while the other five stories are suspended from the cable connected to the arch. The arch can displace freely through central-column slots; at its ends, the load is taken by the cables and, through their saddles, received by the columns. To resist wind load, an open-web, grid-system bracing and external columns independent of the gravity-load frame outlined above—are proposed. The latter, however, does help stabilize the building against wind load since the open-web girders connect all columns. In the external columns, it may be noted, slots are again provided to permit free vertical displacement of the cable and hinged-arch connection.

Assuming a limiting height considerably above that of a tower proposed by the late Belgian Engineer, Gustave Magnel, a tower comparable in size to a similar USSR structure, and setting the height at a lower level than the mile-tall skyscraper architecturally visualized—but structurally undisclosed—by the unforgettable Frank Lloyd Wright, this author has ventured to embody the above concepts in an investigation of their construction possibilities for a 300-story, 3000-ft tall building. Exploratory elasto-mechan-

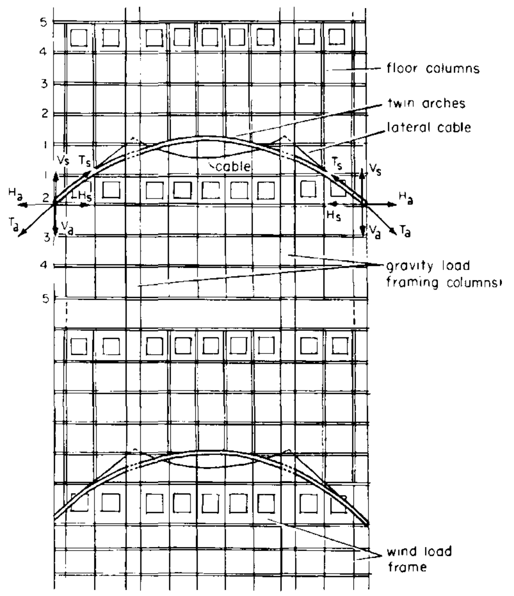
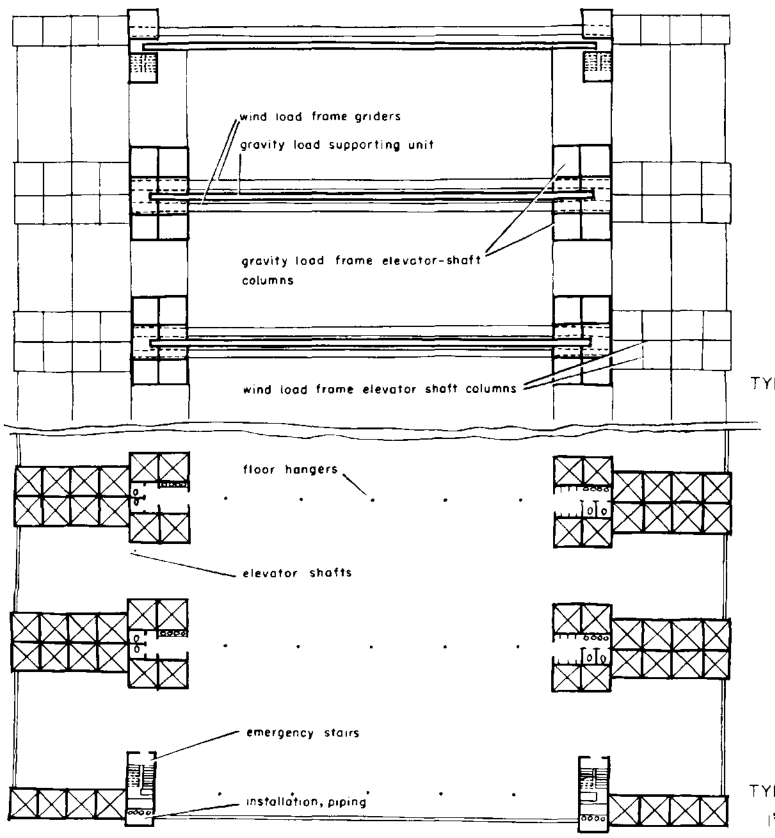


Figure 12

Figure 13

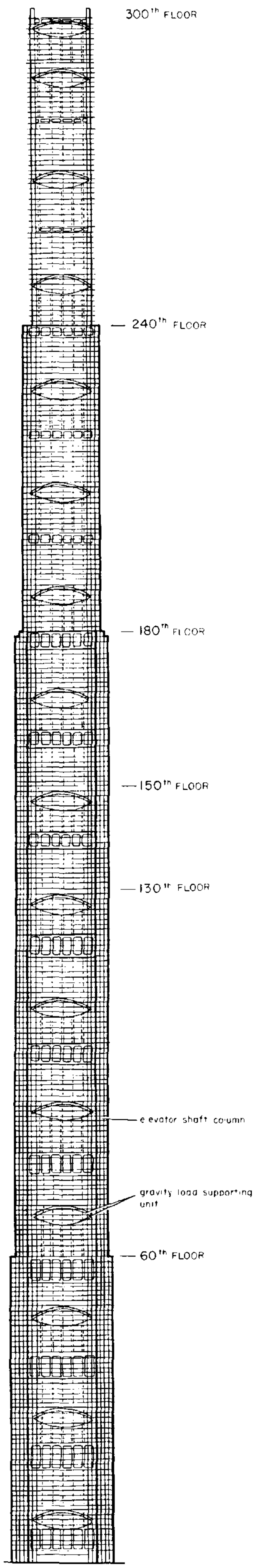


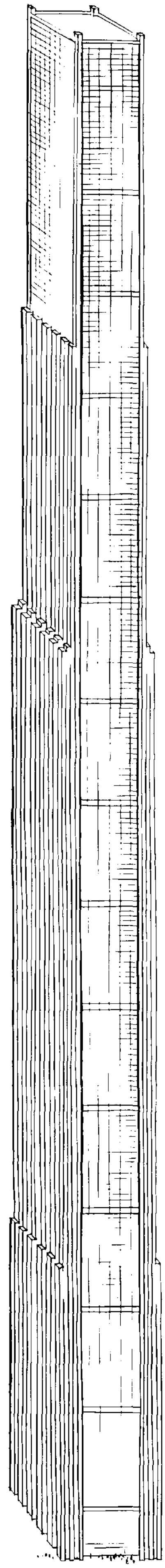
TYPICAL FRAMING PLAN
1st to 59th FLOOR

TYPICAL FLOOR PLAN
1st to 59th FLOOR

ical analysis confirmed that such a structure could be realistically designed on the basis of known resistance offered by contemporary materials, and would also respond efficiently to desirable functional requirements by allowing practically full-area utilization for each of its 300 floors. In this design outline, elevator shafts are again used to advantage as columns for both wind- and gravity-load framing (*Figure 13*). Thus, floor areas normally obstructed by structural elements are reduced to a minimum through maximum utilization of space which, in any case, must be reserved for elevator banks. This double-duty assigned to the elevator shafts can also be justified by the fact that the requirements of operational and structural functions assigned to them vary, within limits, according to a similar law throughout the height of the building. In fact, assuming that the number of elevator shafts depends upon the total area of floors served by them, the space they need is inversely proportional to the height of floor level that they must reach- varying between a maximum of space obstruction at ground level, where all elevator cabs depart, to a minimum at the uppermost levels where the minimum number of elevators arrive. Regarding their function as columns, the required resisting section of the shafts' walls is also maximum at ground level, where stresses caused by gravity and wind load reach the highest values. Conversely, a minimum section is needed at the top-most floors where stresses attain the lowest values.

In concluding, let us examine some details. Thinner lines of the typical framing plan (*Figure 13, top*) indicate shafts and structural elements of the framework designed to resist wind load, while the heavier ones show those components provided to support gravity load. On the typical floor (*Figure 13, bottom*), the minimum floor space obstruction caused by slender floor hangars may be noted. Two perspectives suggesting the character of the front and side elevations of the 300-story structure are shown (*Figure 14*), and adjacent is a section visualizing the suspenarch supporting structures (*type shown in Figure 2*) for fifteen 20-story units, together with the open-web girders of the wind frame.





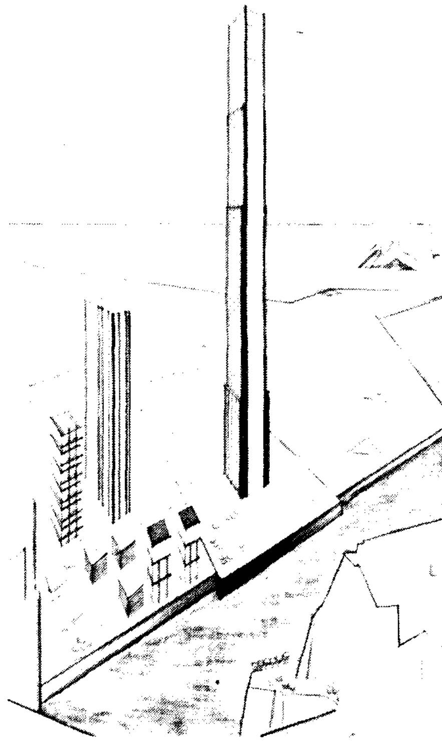


Figure 14

Ten years or so ago, air's reputation as a heating medium for schools began to suffer. Today, however, with modern methods and equipment available the all-air method of heating and ventilating has rebounded to the position of a first-rank environmental-control system. In this article, two qualified authors—representing an architectural firm with a prodigious experience in school design—state the case for all-air heating and ventilating in schools.

all-air heating and ventilating for schools

by Milo D. Folley and George P. Newton*

Occupants of classrooms completely depend upon the success of the school heating and ventilating system in providing the elements of a controlled, comfortable, and healthful environment. These elements are: suitable space temperature; proper relative humidity; positive spatial movement of air; absence of objectionable odors; and filtration of airborne dust and bacteria. Although beyond the scope of this article, cooling is an additional environmental factor.

Not all of these elements are indispensable, but all should certainly be considered by the architect or engineer about to select an efficient means of heating and ventilating a school. Purpose of this article, then, is to examine these elements in order to discover how they relate to various heating and ventilating techniques for schools, emphasizing especially the use of all-air heating and ventilating.

heating

What conditions affect the propagation of interior heat? Ideally, room space should allow body heat to dissipate as quickly as it is generated. Maintaining a given room temperature in certain parts of a room is easy, but maintaining *an identical* temperature in an entire room is not. Consider these factors:

1 One classroom wall usually is partially glass and is exposed to the outdoors, causing its interior surface temperature to be lower than that of other walls. This wall is also subject to cold-air infiltration and downdraft, due to the more dense air falling to the floor.

2 Because of night setback, walls, floors, and furniture are cold in the morning, requiring considerable time to become warm. This delay is a characteristic of slab-on-grade buildings. Normal ground temperature is below room temperature, causing the slab to accept heat. Hours may pass before the two temperatures level off.

3 Each student is surrounded by an envelope of air that assumes both high humidity and high temperature from latent and sensible body heat.

4 Each classroom lighting fixture generates an area of relatively high sensible heat.

5 There are effects of solar heat on room areas.

As a result, it is impossible to add the exact amount of required heat to every part of a room in order to maintain optimum air and surface temperatures. We constantly compromise between the ideal and the practical.

Classroom heat can be introduced by:

1 Direct radiation and convection from wall-hung cast-iron, steel, or copper elements which transfer heat from steam or hot water circulating within them to air in the room. Convection causes room air to rise across the elements. Since the elements are located below the windows on the exterior wall, they blanket the wall with a current of warm, infiltrated air that heats floors, furniture, and walls and prevents downdrafts from sweeping to the floor. These elements do not completely eliminate downdrafts—at some point above the floor sluggish cold air and buoyant warm air balance and flow together into the room.

2 Radiation coils—imbedded in floors, ceilings, or ceiling panels—employing hot water as the conveyance. They radiate heat to room surfaces, thereby overcoming the problem of cold room surfaces. Floor areas below windows and the cold and infiltrated air near windows are heated. Here again, cold downdraft will—at some point above the floor—flow into the room. Because room heat is given out from large but low-temperature panels that create comfortable warmth, this heating method creates a favorable classroom environment.

3 Warm air introduced under windows and directed upwards to ceiling or parallel to wall.

air as a heat conveyance

Although it was the first method used to conduct heat from one area to another, air fell into disfavor because it could not be distributed or controlled adequately. Former residential heating practice was to place registers on inside walls, taking cold air from exterior walls. Apparently, registers were placed close to the furnace to insure better delivery of air by convection. They were still located on inside walls, even after furnace blowers became commonplace. Similarly, schools constructed a decade or more ago provided for classroom ventilation air by allowing it to enter through one square, wire-covered opening located in an interior wall. Its air distribution was terrible; anyone directly

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in front of and below its opening bore the full brunt of the cool, hot, or tepid air that, at the moment, poured forth from it. As a result, air's reputation as a heating and ventilating medium suffered.

air's uses today

Modern methods and equipment have put air back into heating and ventilating. Double-deflection registers located below windows direct air toward ceiling and parallel to the wall. They blanket warmth along the cold wall, do away with window downdraft, and mix entering warm air with cold air currents dropping from windows. The mixture blows up to the ceiling, then across the room. By keeping positive pressure in the classroom, infiltration is overcome. The method's disadvantage is that, as in the case of radiation, cold interior surfaces must be heated by room air.

overheating

Unnoticeable to room occupants, overheating (heat entering a room faster than it leaves) nevertheless affects their alertness. An overheated classroom not only produces a groggy disregard toward the lessons at hand: it also contributes to a higher incidence of respiratory ailments which, in turn, can lead to greater absenteeism. Whenever outdoor temperature equals, or exceeds, desired room temperature, surplus heat stores up inside the room. It cannot leave without provision being made for it to do so (i.e., artificial cooling).

Sources of room heat that help produce overheating are:

1 Occupants. Four-hundred Btu/hr per pupil. Room filled with 25 students equals a human heat load of 10,000 Btu/hr.

2 Illumination. Electrical fixtures average 8500 Btu/hr with a lighting level of 3-w per sq ft of floor space.

3 Solar radiation. Varies greatly due to location and construction characteristics of building. Conservative estimate: 10,000 Btu/hr.

4 Radiation overrun. When heat is introduced via radiators, panels, or other devices calling for heat transfer from steam or water to room air, a period of overrun is certain. How lengthy this period will be is dictated by the mass of the radiating object. Lightly constructed fin-tube radiation convectors and panels quickly cool when deprived of heat. During warm-up, these elements rapidly furnish heat to the room, allowing it to reach design temperature when occupied. The sudden entry into the room of 18,500 Btu/hr, in the form of pupils and lighting fixtures, adds unwanted heat to the room. But lightly constructed elements easily follow the load, and radiation heating capacity drops proportionately. The colder the outdoors, the more easily this is accomplished.

Under similar circumstances, massive heating elements cannot respond as fast and continue emitting unwanted heat. Masonry floors and plaster ceilings with imbedded heating pipes also are susceptible to overrun. In spite of outdoor temperature compensating controls, these surfaces must be above room temperature to heat a room, but, because of this, cannot absorb room heat when cooling is desired.

dissipating unwanted heat

For comfort's sake, the combined load of 28,000 Btu/hr, contributed by occupants, illumination, and solar radiation, must be dissipated. This can be done by:

1 Direct transmission through construction to the outside. For normal construction, the above Btu/hr load can be transmitted through the structure at temperatures of about 30 F. At this point, room-gain theoretically equals room-transmission and infiltration losses, depending upon the type of construction and the tightness of the building. As the outdoor temperature rises, the ability to lose this heat diminishes. Once more in theory, we are limited to optimum room temperature environment at an outside temperature of above 30 F with solar gain, or 40 F if the sky is overcast.

2 Uncontrolled introduction of cool air. Whenever outside temperatures are above 30 to 40 F, a room cannot be kept at proper temperatures without admitting cold air—which can be achieved merely by opening windows. Often this is done where wall-hung radiation or panels are installed; an exhaust fan creates a vacuum in the classrooms so that outdoor air readily enters through open windows.

3 Controlled-air supply working with radiation. One system uses a central fan to supply air to a cluster of rooms. Recirculated, fresh air is mixed at the fan to a pre-set ratio or temperature, then distributed. The air mixture is set at or below room temperature so that room radiation supplies whatever additional air is required. Sometimes heat coils, controlled by the same thermostat that monitors radiation, are used in each room.

Another arrangement employs one fan and coil per room. Fresh air and recirculated air are mixed and passed through a coil before entering the room. A room thermostat controls both heating and cooling.

These two systems will maintain comfortable space temperature so long as temperature control is precise and air is both sufficient and adequately distributed.

freedom from odors

School environment drastically requires ventilation. Without it, odors become extremely offensive—not only in unventilated gymnasiums, locker rooms, or cafeterias, but in classrooms as well.

Generally, the benefits of ventilation are obtained by using the methods discussed previously for cooling. Of prime importance is determination of the exact control of temperature and the amount and distribution of air.

relative humidity

Extremes—when too much or too little moisture is in the air—are always present in classrooms. Usually this is a matter of too much moisture. During hot weather the system must be dehumidified by artificial cooling. In winter, outdoor air is available to help control room humidity. But when cold air is heated, its relative humidity drops, causing it to dehumidify. It may also be too dry. Again, with relative humidity, as with preceding environmental elements, air on supply is necessary. A central, rather than a unit, air system is desirable, since its humidifiers are centrally located.

freedom from dust

A properly controlled environment requires that an area be kept free of dirt. Filtration meets this need in the forms of low efficiency, throw-away filters. They must be cleaned or replaced monthly if a school is located in an industrial area; otherwise, they can clog ventilation output.

High-efficiency filters should pay for themselves by reducing school cleaning costs. Even more effective—especially for areas of heavy air pollution—are electronic filters.

Unlike the central type, unit air systems cannot easily be equipped with high-efficiency filters, but they can use ultraviolet bacteria killers.

movement of air

Fifth environmental element is control of air movement. Air must move evenly and diffuse thoroughly throughout the system's space, regardless of the air's quantity or quality. It should remove the envelopes of humid air surrounding each occupant, thereby equalizing space temperature. Achieving this movement means setting up adequate distribution mechanisms, and then locating them properly.

advantages of an all-air system

To state the case for an all-air system, let us first consider a standard split system, which combines radiation (for heating) and controlled air supply (for ventilation and supplementary heating). Standard for classrooms for many years, the split system uses either central-fan or unit-fan and coil for its air supply.

Unless cast-iron, plaster, or concrete heating elements are used, this system offers excellent heating. Its air supply adequately ventilates and the air can be humidified, dehumidified, filtered, heated or cooled.

But the split system has two disadvantages; high initial cost and lack of sufficient air for cooling during spring or fall. It costs about 12 to 14 percent of the total building cost, or $2.30 per sq ft.

How does all-air compare with the standard split system? Air performs both heating and ventilating, eliminating the need for radiation. This feature alone cuts costs; average cost for 25 schools designed by the writers' firm has been 10 percent of total cost, or $1.80 per sq ft.

Lacking bulk, all-air systems prevent excess radiation, making possible immediate response to individual room temperature requirements. Moreover, the quantity of flowing air in the system levels out the response, eliminating overrun. Instantly, one-degree changes in temperatures are picked up and adjusted. Even though physical characteristics may vary from room to room, each is accommodated by the system's smoothly flowing, controlled, fresh, and filtered air.

Centrally located air supply allows unusual advantages for improving the environment. In areas of heavy air pollution, it is possible to add electronic filters to the system to help minimize dust and pollen content in classrooms.

But the real importance of filtered ventilation and heating in schools may be determined by current research work, consisting of tests to determine how effectively electronic air filters can trap dust particles to which bacteria cling. It is entirely possible that filters can pay for themselves by increasing average daily attendance to a figure hitherto reduced by the spread of communicable diseases.

These filters can be added to an all-air system for about $120 per thousand cfm, or about $5000 per average elementary school. System cost would rise only $.125 per sq ft.

Attempts made to cut the costs of walls and roof sometimes lead to condensation problems on surfaces having less than optimum transmission characteristics. In such situations, the all-air system can reduce condensation by flowing air through the structure.

During construction, complications can arise when radiators are set up to provide temporary heating. In an all-air system, the ducts, by merely penetrating the floor in an unfinished state, can provide satisfactory heat for temporary construction purposes.

School custodians appreciate a design that will simplify their work by locating mechanical equipment in one or two areas where it can be readily inspected and serviced.

No other heating system affords the addition of a cooling cycle more easily; to attain the comforts of humidification or dehumidification, all that must be done is install apparatus for these purposes at the system's central fan.

In conclusion, for air distribution of the the all-air system, hot water (or steam) coils in direct run-outs to each room or dual ducts can be used. Our experience reveals hot water to be much more economical than steam, and double duct to be very flexible, since it allows hot water or steam coils to be replaced by a direct-fired furnace. Also, mechanical air cooling, electronic filters, and humidification may be added to double ducts at a total cost no greater than that for the standard split system.

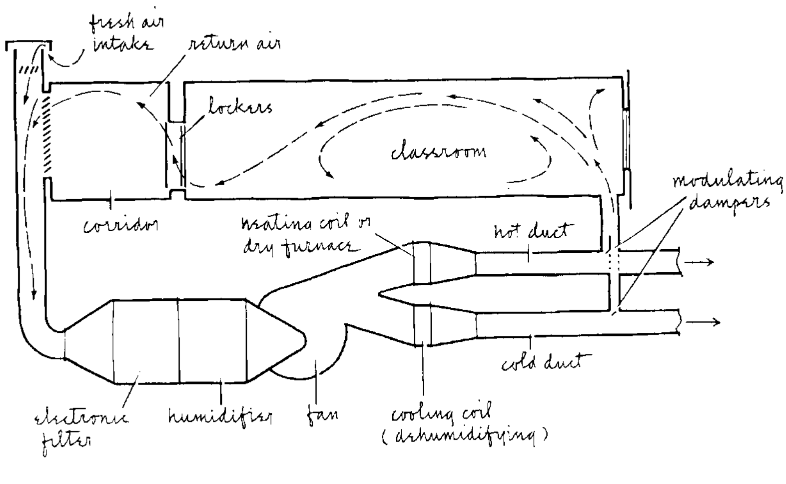


Diagram of air-heating system.

Since countless sizes of wall-mounted, standing, and casement-mounted art objects—as well as complete rooms of historical and art interest—must all be properly lighted, illumination in museums presents many complicated problems. Flexibility of lighting systems and proper provision of electrical capacity are cardinal criteria. In this article, the author describes some of the lighting methods that have been evolved for New York's Metropolitan Museum of Art.

museum wiring/lighting techniques

Illumination of art objects in New York's Metropolitan Museum of Art requires reconciliation of many factors To evaluate its success in any one phase, one must bear in mind that current lighting practices have developed through many solutions over many years. Architects, illuminating engineers, and curators have all taken part at one time or another in the work of evolving practical applications from theory.

The original Museum building, opened in 1880 and now known as Wing A, was lighted by gas. The last major wing was opened in 1926. In the period between, during which the Museum grew to cover 7½ acres of ground and to contain 17½ acres of floor space, the electrical distribution system underwent a series of modifications. A DC generator was installed soon after the turn of the century; Consolidated Edison DC service was installed in 1918; and in 1947 the first AC service, of 25 kw only, was introduced. Major alterations, aimed at attaining an adequate electrical distribution system that could be expanded to meet foreseeable demand, were begun in 1950 and are continuing at present.

Stage I of the program—completed in 1953—included a substantial part of the basic electrical installations and complete modernization of the three oldest wings, A, B, and C—paintings galleries on the second floor and decorative arts, below.

As work progressed in other areas of the Museum, under succeeding phases of the program, it became abundantly clear that first estimates of future electrical demands were considerably short. A new, detailed survey of the electrical distribution system was therefore undertaken by Krey & Hunt, engineers, working under direction of Brown, Lawford & Forbes, currently the Museum's architects, and a new proposal was made.

Based upon careful computation of currently anticipated loads and the need for relocating certain load centers, the new proposal provides for eventual electrical modernization of the entire structure as well as "room to grow" in the foreseeable future. It is anticipated that the installation under this plan will at least double the present electrical capacity.

Any major electrical modernization job under alteration conditions is, of course, difficult. This was especially true at the Metropolitan. Existing architectural features and modernization of the structure, which has proceeded simultaneously with electrical modernization, have both presented special problems that have dictated close co-operation between architects, engineers, and Museum administrators in achieving solutions.

As new wings were added to the original building, each was as massively constructed as those preceding it—underpinning 4′ thick, proportionately heavy exterior walls. Electric power for new areas often was tapped from existing feeders in older areas, which, in turn, might have been tapped from some previously installed feeder line. Interiors of all wings being modernized have been torn out, redesigned, and rearranged. In cases where reliable information on the electrical wiring was not available, old feeders were removed and replaced. In many instances these feeders had to be re-routed in order to proceed with the job.

Much of the new feeder conduit was installed in a tunnel area under the building that was only partially usable. At one time, four 48″ water mains had run directly under the building. Arched over when the Museum was built, they were subsequently re-routed down Fifth Avenue, and in the middle 1930's the old pipes were removed. Remaining was a dripping, clay-bottomed, muddy area approximately 800′ long, 30′ wide and 15′ high that took years to dry out.

Today, this tunnel has a heavy cement floor and dry walls, and is ventilated; but water was still dripping in 1950, the slimy clay base was still there and the men worked under extremely difficult conditions when running in steel conduit at ceiling levels.

Except for the tunnel, any long corridor space under the Museum is minimum. The area is a catacomb of numberless basements, varying in size and floor levels. There were few places where feeder conduit could be run horizontally without drilling through heavy masonry underpinning of several wings or through walls of several basements.

The main switchboard risers were also troublesome. Running steel raceways, especially of the larger sizes required, from the board to the top floors meant another bout with thick walls. Corners of the stairways were blocked off to provide space for the conduit risers in Stage I. For Wings J and K only two riser points could be used, both in the north end of Wing J, and both were obstructed by a maze of mechanical piping. It was indeed a major performance to run up twenty 3½″ conduit risers through these openings.

With the future in mind, the main switchboard was designed for two Consolidated Edison services. These are now both in use, supplying sub-distribution switchboards and lighting panels throughout the wings.

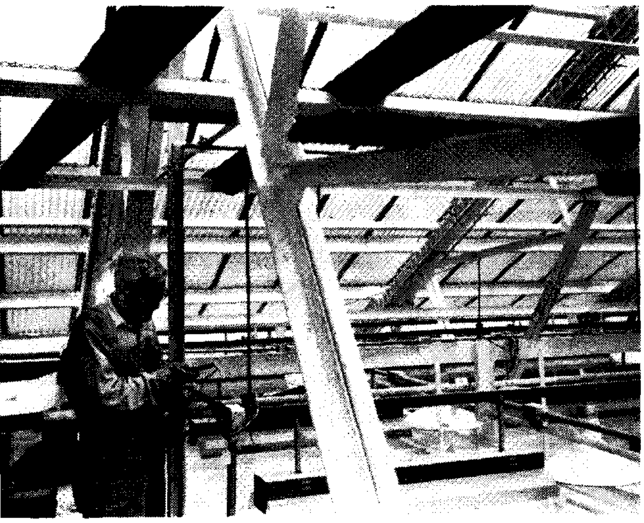
The first switchgear installed consisted of one 4000-amp main circuit breaker, one 3000-amp, two 1600-amp, and one 300-amp. The construction in 1953 of Grace Rainey Rogers Memorial Auditorium entailed the addition of two 1200-amp circuit breakers, with eight 3½" rigid steel conduits routed to a new sub-distribution board. Wings J and K required the addition of two 1600-amp and two 1200-amp circuit breakers. Feeders were reinforced and, finally, a second 4000-amp circuit breaker was installed on the main switchboard.

Work is proceeding in Wing E (*Figure 1*), and additional reconstruction will be undertaken as time and money permit.

This brief review of the reconstruction of the Metropolitan's electrical distribution system is made in order to indicate the special problems that have faced architect and engineer as they have designed lighting for the galleries.

The ratio of lighting load to power load is roughly two to one, considerably more in favor of lighting than is required in ordinary buildings. Heat generated by the heavy lighting load. combined with the relatively few windows (characteristic of art museums, where wall space is precious) and other factors, have placed an unusual burden on ventilating apparatus. Panels are much more widely separated than in ordinary buildings, because the electrical distribution system has grown by extension as new wings have been added, and, further growth has been by spreading out rather than rising in height.

All this has meant that particular attention was required to reduce voltage drop by means of oversize feeders and rigid-steel conduit throughout.



Photos: Ben Schnall

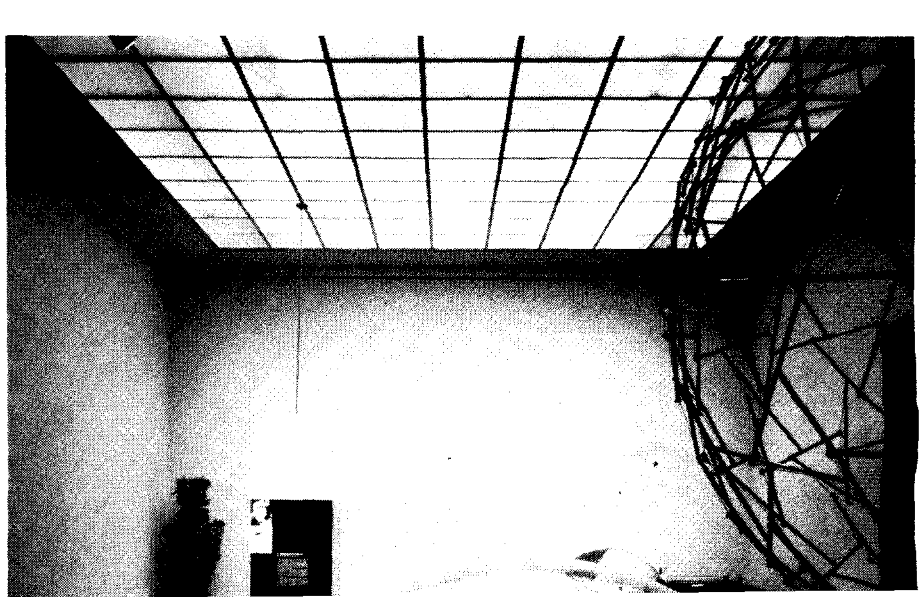


Figure 1—Presently being reconstructed, Wing E of the Metropolitan Art Museum will ultimately have an electrical and lighting installation comparable to Wing J. Workman (above) *connects two conductors above the* **T**-*grid in Wing E.*

Figure 2—Typical paintings gallery (right). *The angle of light—at a maximum of 30 degrees—prevents frame shadow and specular reflections are cast to the floor. Brightness contrast between wall and paintings is low.*

Figure 3—One of the most flexible lighting systems is located on the second floor of the museum (below right). *There, a newly designed lighting installation exists above the* **T**-*grid* (also see Figures 4 and 5) *and, in addition, drama lights are mounted below the* **T**-*grid (on the ceiling) for accent lighting of special exhibits. Tinted lenses are often used.*

Among the chief considerations guiding lighting designers at the Metropolitan have been:

1 The architectural factors, such as sizes, shapes, heights, and fenestrations of the rooms.

2 The necessity for maximum flexibility, to accommodate changing exhibits.

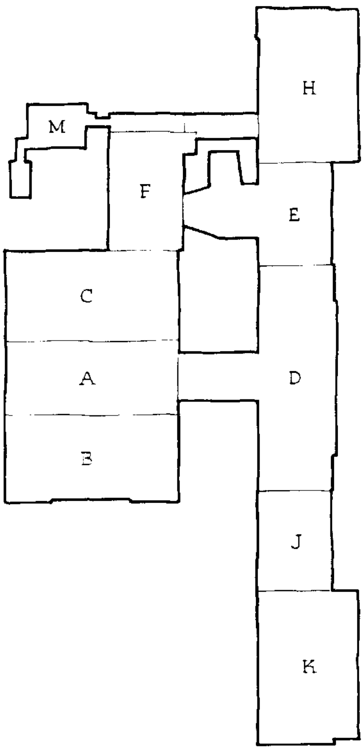
3 The numbers, shapes, colors, and sizes of art objects.

4 The presence or absence of natural light.

5 The limitations imposed by budgetary restrictions.

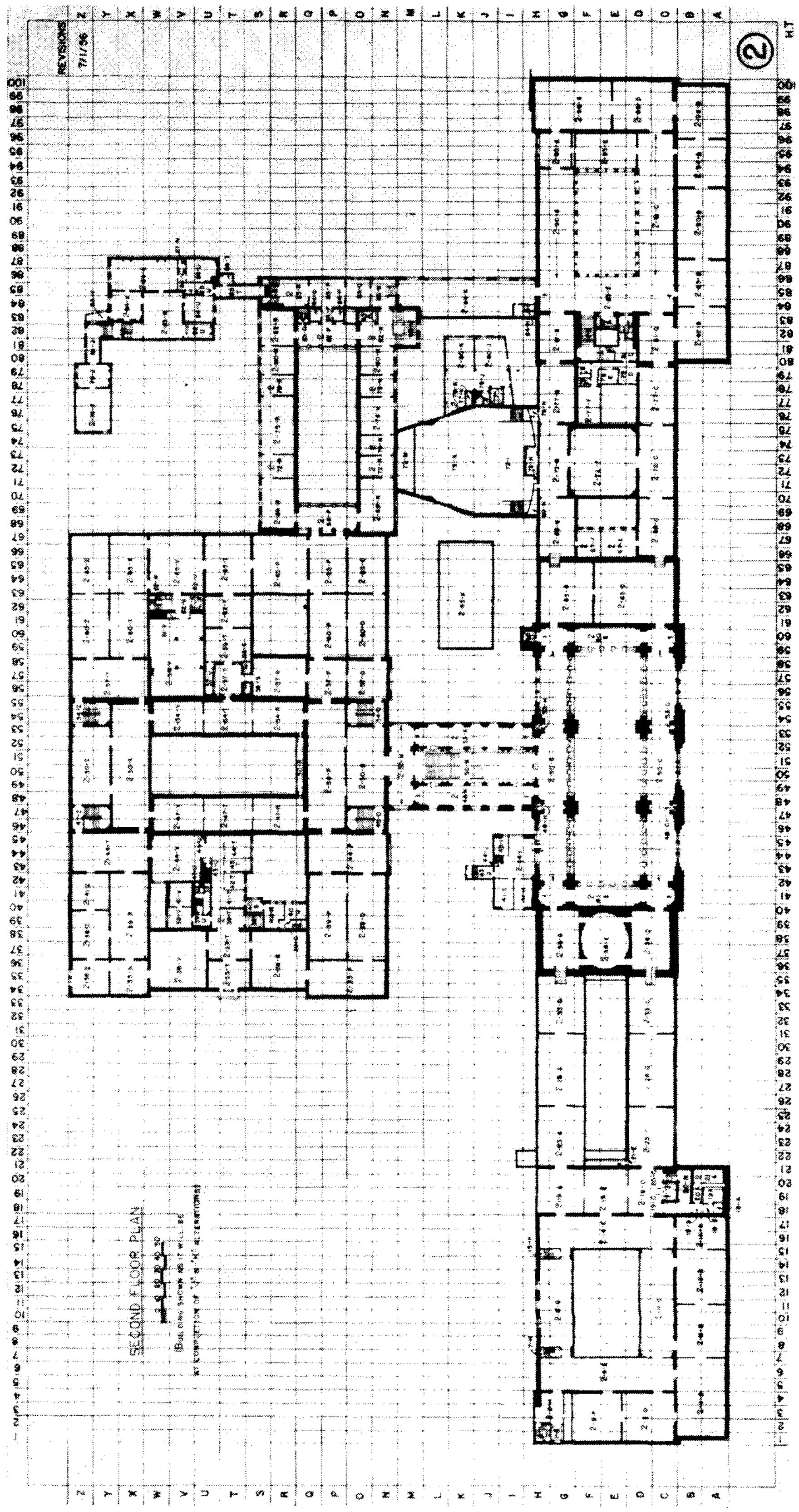
6 The less tangible question of taste.

The Metropolitan possesses a collec-

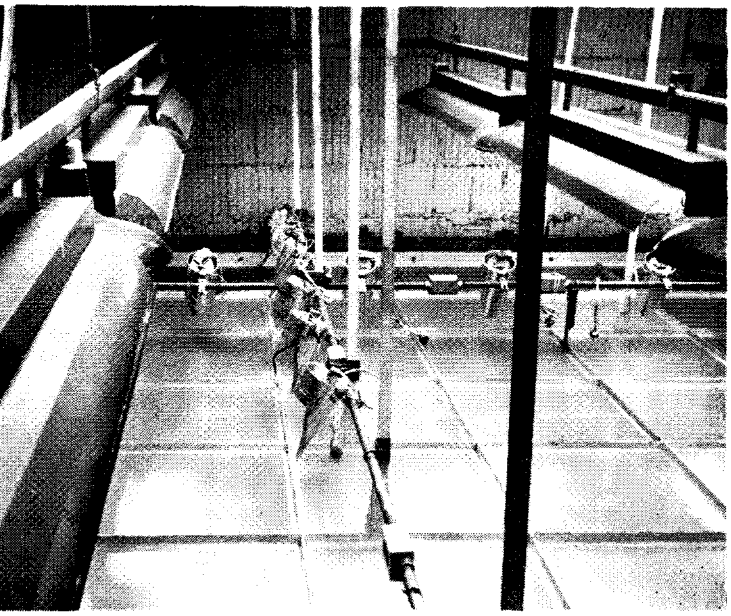


tion of several hundred thousand works of art, of which approximately 25 percent is on continual exhibition. Included in this vast aggregate are wall-mounted objects, such as paintings, drawings, prints, tapestries, rugs, and photographs; standing objects, such as sculpture, armor, and furniture; case-mounted objects, such as ceramic art, jewelry, and fabrics; and complete rooms of historical and art interest.

Space forbids treatment here of more than a few of the important problems. Discussion will be limited primarily to the problem of illuminating paintings *(Figure 2)*, with some mention of sculpture.



Designation of wings in Metropolitan Museum of Art (center). *Second floor plan* (above).



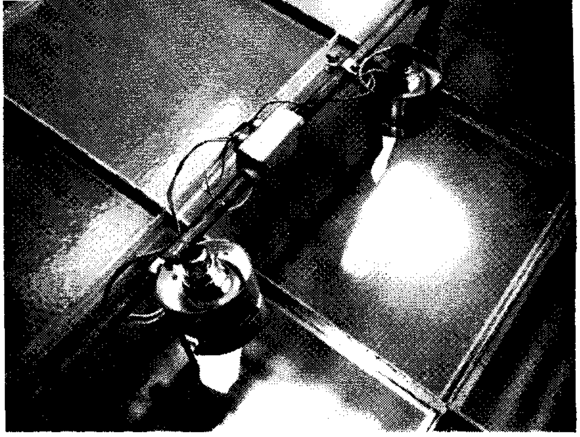


Figure 4—Customary installation design in paintings is with incandescent and "cool" white fluorescent lamps mounted over a center-of-room **T***-grid of tempered water-white glass* (left). *Detail of specially designed incandescent "scoop" fixtures* (above).

Museum visitors are of widely diversified backgrounds, yet each is seeking an opportunity to discriminate and thus acquire new standards of taste. Each visitor has certain accumulated visual memories which form his concepts of beauty, but architect and engineer do not concern themselves with the viewer's individual, subjective responses to works of art. The role of the lighting designer is to provide the means of illuminating the great compositions of color and form so as to permit the museum staff to present them as they exist, as nearly as possible without distortion. Here, flexibility plays an important role (*Figure 3*).

But the role of the lighting designer does not stop there. The visitor must also be included within the area to be lighted, because in many cases he refers to guidebook or sketch pad; hence his eyes constantly shift focus back and forth to different viewing planes.

The proper visual "climate" is thus achieved when the illumination level of the horizontal plane. about 4½′ from the floor, is approximately equal to that of a point on the vertical plane (wall surface) about 5′ from the floor. When these conditions exist, the visitor sees equally well when viewing the guidebook in his hand or the paintings on the wall.

The quality, or type, of light must next be considered. Man is accustomed to the seeing conditions provided by nature, by sun, and sky. For example, an object lighted from below appears "unnatural" because light normally falls on objects from above. Again, the spectral composition, or degree of mixture of "cool" white light and "warm" yellow light, while varying greatly in nature from moment to moment and season to season, creates the impression of color received by the eye and mind. Finally, lighting intensities, or illumination levels, must be considered by the lighting designer.

In the last instance, that of illumination levels, no fixed standard has been established as necessary. Footcandle intensities vary greatly within the Metropolitan galleries, depending upon the type of exhibit, the treatment of walls, the absence or presence of fenestration, and other factors. Generally speaking, intensities are rather high in paintings galleries—high, that is, compared with the levels prevailing in other galleries. Thirty ft-c has been found, in most cases, to be economically feasible for the general room level of paintings galleries, but it must be borne in mind that in many galleries where this level is not achieved the works of art themselves are illuminated at this level, or higher, through the use of accent lighting. Best results are obtained by keeping the *brightness* contrast between wall and painting as low as possible, and in favor of the painting.

The spectral composition of the gallery light plays a most important role in the foregoing because the relative amounts of "cool" and "warm" light determine to a great extent the psychological responses of man to different illumination levels. At low intensities, the amount of "warm" light must be increased in order for man to enjoy a sense of security and warmth. When the sky is heavily overcast, it is forbidding to man even though the illumination level may be high—say, 1000 ft-c. This is because, when the sky is heavily overcast, the light toward the yellows of the spectrum is drastically reduced. The Metropolitan galleries are therefore illuminated with a mixture of light in which the "warm" tones are quite heavy.

Most of the paintings galleries have natural light. Although this is the case, the galleries are still provided with artificial light to supplement natural light when there is not enough, and to "stand on its own feet" at night in the total absence of natural light. The three types of light—general incandescent, general fluorescent, and accent incandescent—can be switched on in any combination by remote controls in each gallery.

The customary installation design for paintings is with incandescent and "cool" white fluorescent lamps mounted over a center-of-room **T**-grid of tempered water-white glass; around this lamp grouping, incandescent lamps in specially designed "scoop" fixtures are installed (*Figure 4*).

This arrangement provides a general diffusion, which is aided by concentration of light on walls, or on standing objects where necessary.

The "scoop" fixtures are adjustable on one plane. This increases the lighting system's flexibility.

The optimum incident angle of concentrated, incandescent light for paint-

Figure 5 -Gallery—similar to 2-16-E — demonstrates natural lighting (right). *Museum's electric-lighting system provides approximately equal quality and level of illumination.*

ings has been found to be 30 degrees from the vertical. At this angle, the beam of light falls under most frames, eliminating frame shadow, and the greatest percentage of specular reflections from paintings surfaces is deflected to the floor.

A typical installation is gallery 2-16-E, (*Figure 5*) designed primarily for special exhibitions of paintings. It is well to remember that each of the Metropolitan's 280 galleries has presented, and will present, special lighting problems. While 2-16-E in some respects typifies paintings galleries installations, it has been treated as an individual problem—as has each of the newly designed galleries.

It is 95′ long, 23′ wide, and 14′-10″ high at the ceiling glass installation. It is skylighted. Installed in the center of the ceiling is a grid of steel **T**'s 2′ on center, in which lie panels of tempered, water-white glass, slightly under 2′ square. The glass panels, water-white so that no color is added to light falling through them, are lightly etched on one side in order to render them translucent. At the accent light, clear-ribbed tempered glass is used. There are nine glass panels across the width of the grid, and 38 down its length.

Approximately 2½′ above the ceiling grid are hung four rows of lighting fixtures. Each row contains 12 fixtures with two cool-white, 38-w, T12 fluorescent lamps, and 11 200-w warm-incandescent lamps in pendant fixtures with ball-joint sockets. These four rows provide the gallery with diffuse illumination.

Accent, or concentrated, illumination is provided by 68 PAR-38, 150-w incandescent spot lamps evenly spaced 2′ on center. Specially designed "scoop" fixtures, which blank light spillage from below and force light into a directional beam, house the incandescent lamps. The fixture is adjustable on one plane. Spacing of accent lights wider apart than 2′ has been found to produce a scalloped effect of light and shadow on the wall, rather than the desired even wash of light.

The accent lights in Gallery 2-16-E are angled at 33.50 degrees from the gallery wall at 5′-6″ from the floor. The architects consider this angle to be at one end of the maximum permissible range from the optimum 30 degree angle.

For certain special exhibits in the gallery, ceiling lights are blanked out, panes removed, and incandescent lamps installed, under the direction of the curator.

Another gallery, 2-28-C, is designed for the permanent exhibition of sculpture. It is also on the second floor, and like Gallery 2-16-E, is skylighted. It is 52′ long, 31′ wide, and 17′-4″ high at the ceiling glass. The T-grid contains 12 glass panels across and 22 down its length.

The lamps of Gallery 2-28-C will remain switched on at all times; for this reason, the gallery's illumination level will vary somewhat according to the amount of natural light. Nevertheless, the artificial lighting installation, as in all other Metropolitan galleries, is designed to "stand on its own feet" at all times.

For sculpture, diffuse illumination from above is usually desirable. Here fixtures installed above the ceiling grid consist of incandescent and fluorescent lamps, as described for Gallery 2-16-E, but in this case they are hung in alternating rows, rather than alternating lamps within the rows. This arrangement was found to give the proper mixture of "warm" and "cool" light when used without accent lights. Despite this fact, outlets are provided for wall-lighting fixtures for accent lighting, again creating desirable flexibility.

The installation in the area above the T-grids in all galleries is a maze of steel conduit, struts, and supports on which fixtures hang at different levels according to individual design demands. To avoid shadows and, as far as is possible, any interference with daylight, conduit in this framework is on a vertical bank.

The growth of the Metropolitan mirrors the growth of interest in art among the American people. Attendance for the last reported year was more than 2-million visitors—by far the largest attendance for any one year in history.

The advances of lighting theory show this field keeping abreast of general architectural progress. It is particularly noteworthy that so fine a job has been done under the special conditions—and frequent difficulties—encountered at the the Metropolitan.

Last month we began a discussion of various trends in architecture today that appear to have a root in "imagery addressing the senses as the chief element of beauty." In an attempt to identify these tendencies as part of an over-all movement, the first article discussed sensuous plasticity of surface, methods of stimulating visual sensual delight, and the move toward a sculptural concept of the total building. Consideration of other aspects of this important development follow.

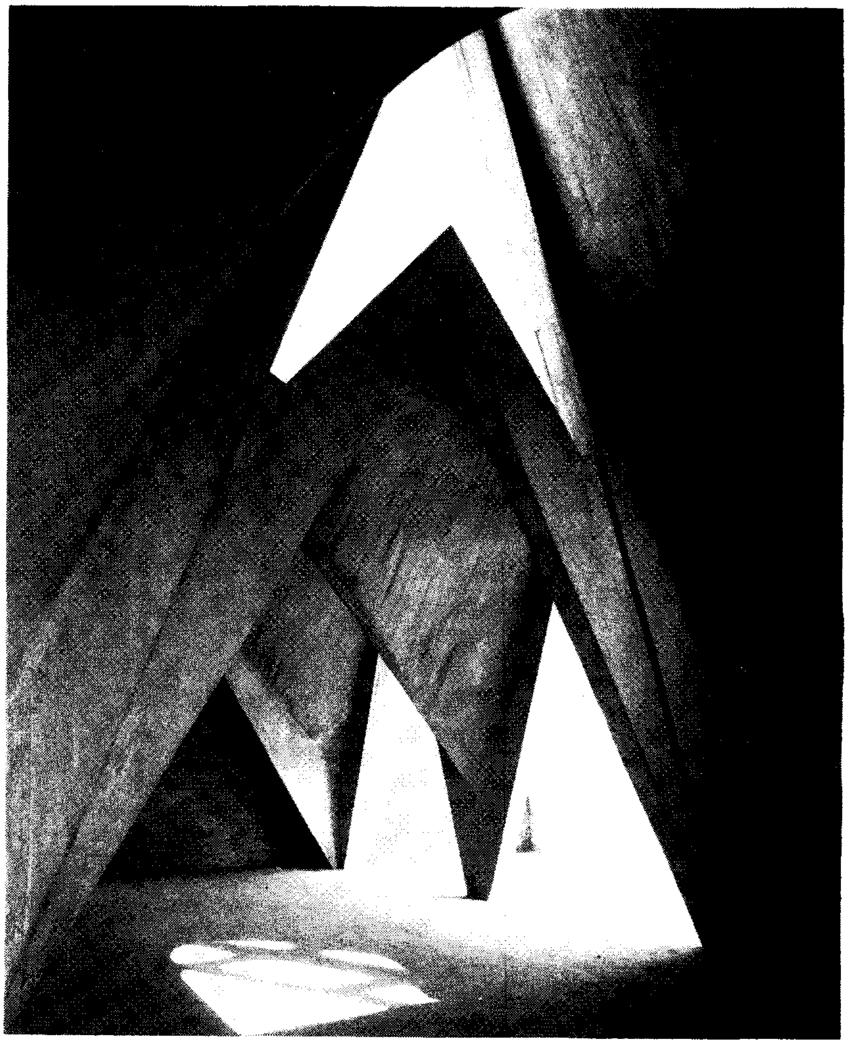
The New Sensualism II

by Thomas H. Creighton

Stereo-structural sensualism. The fourth important move toward *New Sensualism* in architecture has been that engineered by the engineers. Actually, there are three quite distinct design movements within the over-all search for a stereo-structural plastic engineering result—a concept in which load transformation can develop controlled stresses in any or various directions.

One contribution might be called *empirical* freedom in engineering-architectural design, rationalized in a special issue of this magazine five years ago (JUNE 1954 P/A) by Felix Candela, its best-known exponent in this hemisphere. In that appeal to go beyond "the general law of economy of effort as it results in the abandonment of space frames . . . in favor of plane and linear structures," Candela insisted on the need to follow certain "intuitive principles not usually found in . . . books and technical papers." Certain of Nervi's work, and of course much of the product of the older master, Torroja, is *empirical* in an innate sensing of structural reactions, a sensitivity which permits much freer design creativity than the following of (conservative or radical) textbook principles. Nervi has said: "It is the capacity to feel a structure in an intuitive way, as one feels a ratio of volumes or a color relation, which represents the indispensable basis for structural design."

The second structural technique that has been important in the last few years is an apparent determination to demonstrate architectural uses for every Euclidean and Lobachevskian geometric form, from the simple cylinder to the hyperbolic paraboloid. Many an architect has had to review his solid geometry; many a critic has had to turn back to the squinch arches of Byzantium to bolster his sympathy. The engineering approach here, however stereo-*structural*, is nevertheless also stereo*typed* and textbookish, and the trend has seemed to play itself out rather



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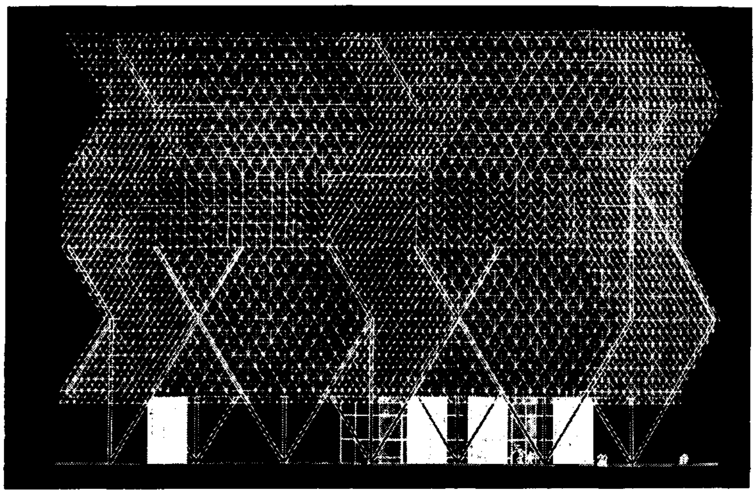
". . . the capacity to feel a structure in an intuitive way . . . an apparent determination to demonstrate architectural uses for every geometric form . . . playing with conspicuous tension and compression members plastically and sensually . . ." **1** *Church of the Virgen Milagrosa, Mexico DF, Mexico: Felix Candela.* **2** *Olympic Sports Palace, Rome, Italy: Pier Luigi Nervi and Marcello Piacentini.* **3** *Study Analysis, Congress Hall, Berlin, Germany: Hugh Stubbins, Architect; Fred N. Severud, Engineer.* **4** *Proposed Arena, Cable Suspension System: Paul Chelazzi.* **5** *Union Tank Car Maintenance Shop, Baton Rouge, La.: Synergetics, Inc.* **6** *Study for City Hall, Philadelphia, Penna.: Louis I. Kahn.* **7** *Music Tent, Ellenville, N. Y.: Frederick J. Kiesler.*



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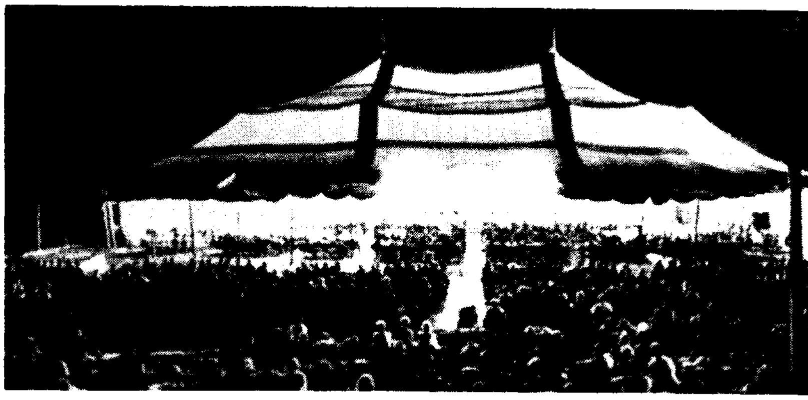

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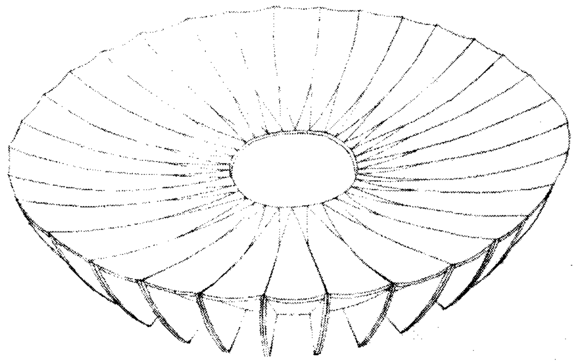

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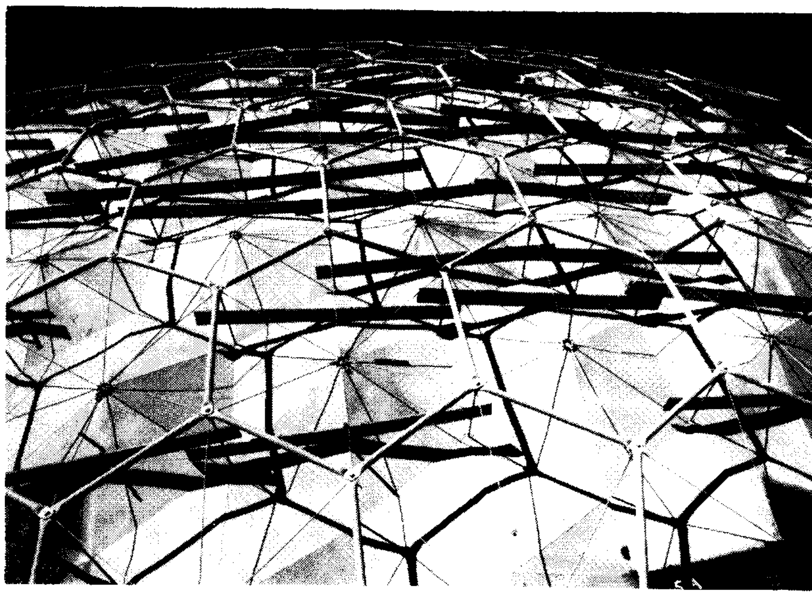

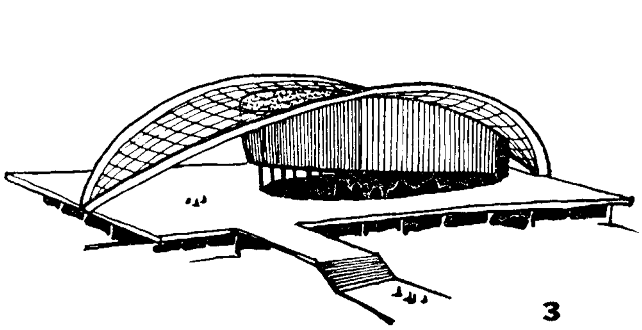

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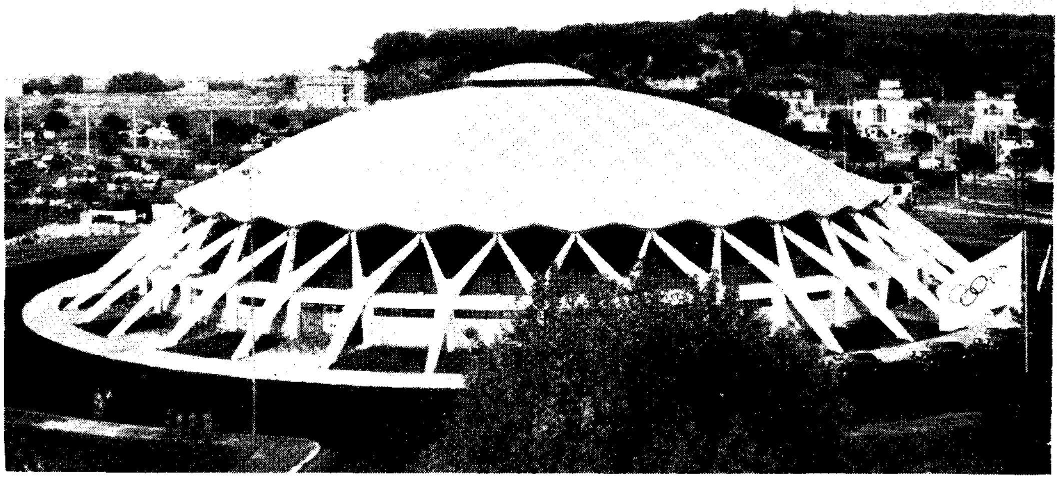

quickly. Does one need more than Catalano's house to prove the hyperbolic-paraboloid thesis; doesn't the MIT Auditorium make the three-pendentive dome statement once and for all? It was perhaps Hugh Stubbins' Berlin Congress Hall that made us realize the static limitations of this particular sensualist kick, even despite Fred Severud's refinement of a tension ring *with* an arched dome, Stubbins' brilliant setting for the super-structure, and the articulation of all the related spaces.

And this brings us to the third engineering contribution to *New Sensualism:* Severud's own, and that of Fuller, Chelazzi and, in a more architectural sense, Louis Kahn—the playing with conspicuous tension and compression members plastically and sensually. The hung roof, the compression ring, the cable structure; these are elements of a metal-rod and metal-plate plasticity which, in Kahn's space frames (not his current brutalist columnar architecture) and some of Nervi's roofs, are translated into reinforced concrete. Frederick Kiesler knew how to use the *fun* that there is in this sort of architectural engineering in his music tent at Ellenville, and so have some others; by and large, though, few architects have dared (or understood) enough to play with it. (Kahn's own frustration, in having to be satisfied with a modified system of his tetrahedal space-frame floor-ceiling in the Fine Arts Building at Yale—with some ribs actually acting as beams, because of building-code restrictions—may have been significant).

All in all, the engineers and the engineering-minded architects have given us much to work with in the direction of *New Sensualism:*

1

". . . object-rooted, expressively romantic . . . or emotionally-rooted, romantically expressive . . ." **1** *Synagogue for Beth Sholom Congregation, Elkins Park, Penna.: Frank Lloyd Wright.* **2** *First Presbyterian Church, Stamford, Conn.: Harrison & Abramovitz.* **3** *TWA Terminal, New York International Airport, Idlewild, N.Y.: Eero Saarinen & Associates.* **4** *Concordia Senior College, Fort Wayne, Ind.: Eero Saarinen & Associates.*

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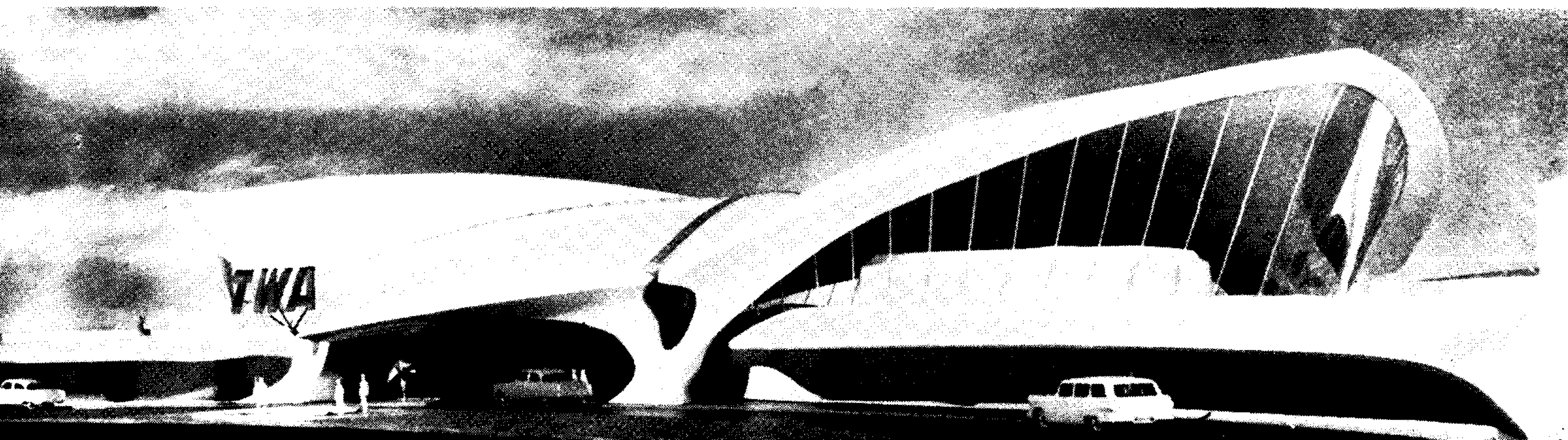

much that may have been dropped too early as cliché-ridden; much that has scarcely been essayed or assayed as architecture.

Romantic Expressionism. In any sensualist yearning, probably, there is a certain amount of romanticism; in any attempt to find pure sensual form there seems to lurk a degree of conscious abstraction from reality or subconscious expression of reality. Two other groups of recent works of architecture seem to demonstrate this particular basis for a *New Sensualism.* There are the object-rooted, more expressively romantic instances (attribution sometimes denied, sometimes bashfully admitted): Saarinen's Idlewild Air Terminal which symbolizes aerodynamics; the same architect's Lutheran College which echoes a Scandinavian village; Harrison's Stamford church which suggests the Christian ichthyological symbol; Wright's Philadelphia synagogue which, he said, represents a "traveling Mt. Sinai." And there are the emotionally rooted, more romantically expressive instances (sometimes frankly romantic, sometimes called by Wright's term of organic): the work of Alden Dow; more violently, some buildings of Bruce Goff; Henry Hill's University Chapel (". . . as a watch in the night . . ."); Utzon's Sydney Opera House.

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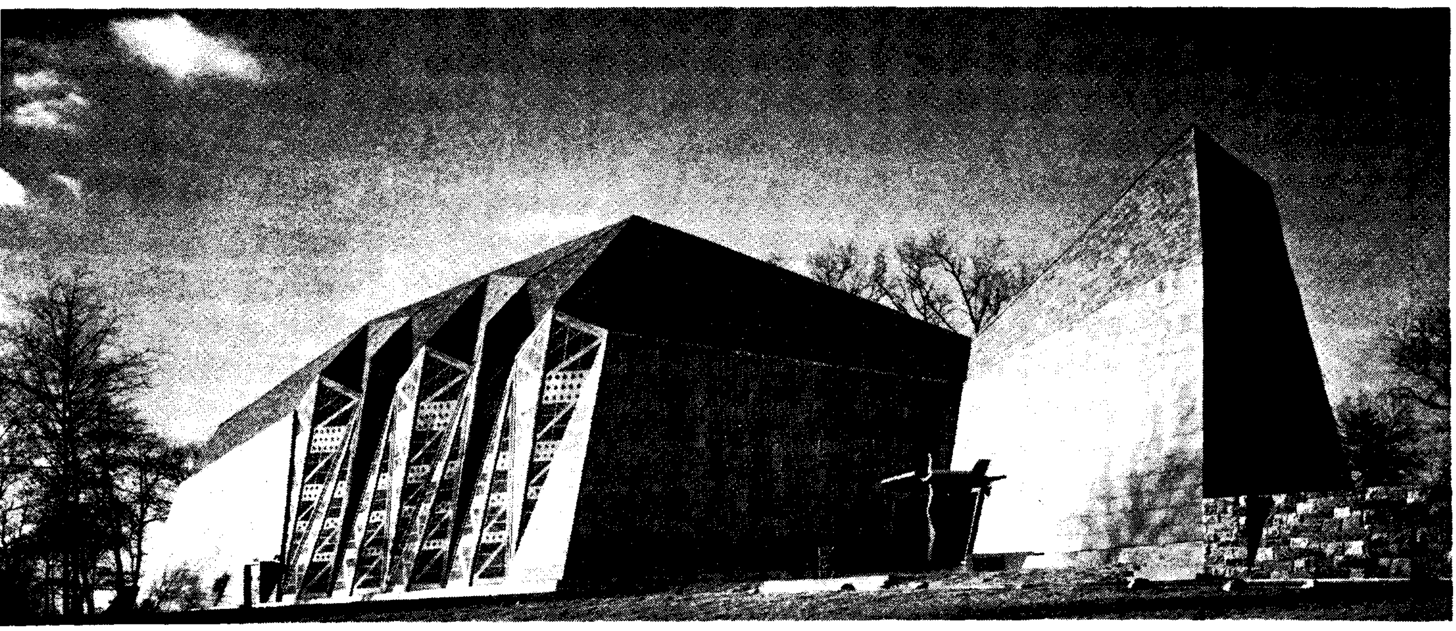

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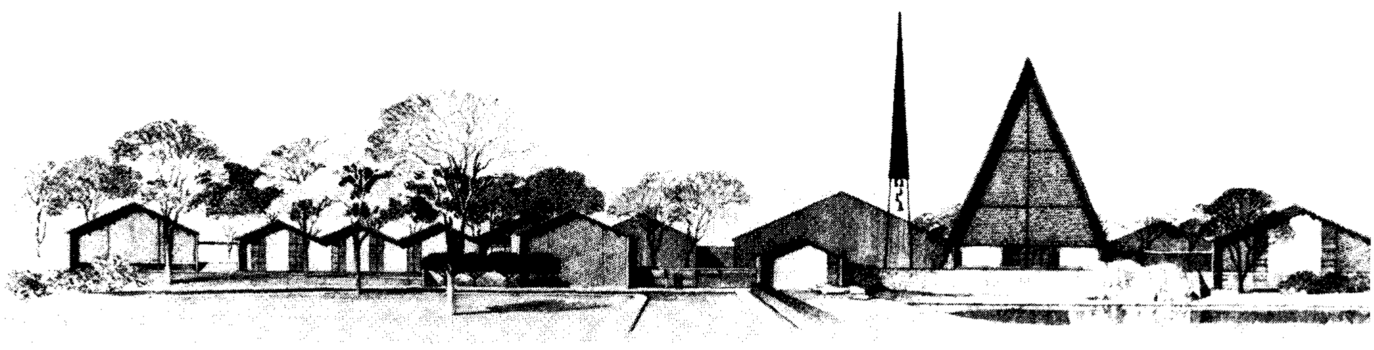
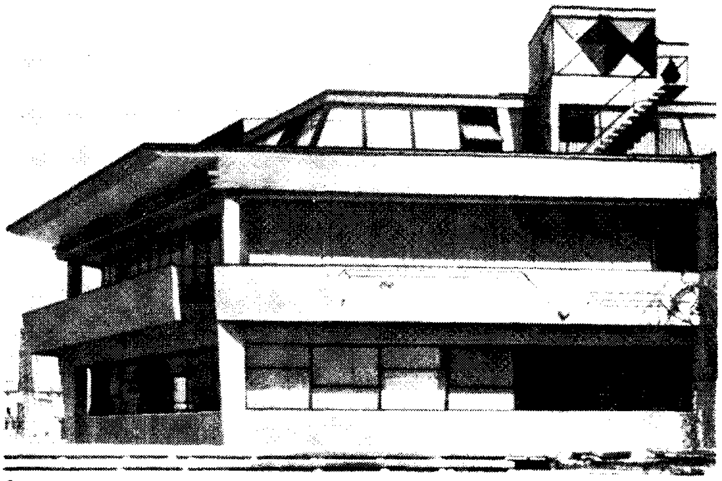


Neo-liberty. Under this apt title (used first, apparently, by Paolo Portoghesi to describe the retreat of many Italian architects to a "liberty" based on *art nouveau* imitation) we might lump all of the neo-eclectic moves and the various "retreats" from modernism which justify themselves by an appeal for sensual liberty. To these practitioners and their related critics there seems no worthwhile freedom to be discovered within the contemporary movement; in northern Italy the return has been to what *The Architectural Review* (April, 1959) terms "Milanese *borghese* taste at its queasiest and most cowardly;" in the United States, we have had Henry Hope Reed and his two-man Grand Design movement; Stone, who, in his Renaissance-recalling New Orleans project and his Venetian-palace rooted Hartford Museum, seems to be tending in this direction; and, at a different level of taste, the client-pleasing rationale of Morris Lapidus in his Miami Beach hotels. While it may seem far-fetched to bring these ravelings together with the other threads of this survey, they serve the purpose of indicating one aspect of the dangers and risks that lie in *New Sensualism.*



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". . . various retreats from modernism that justify themselves by an appeal for sensual liberty . . ." **1** *E.N.I. Office Building, San Donato Milanese, Italy: Marcello Nizzola and Mario Oliveri.* **2** *Office Building, Milan, Italy: E. E. Soncini.* **3** *Huntington Hartford Gallery of Modern Art, New York, N.Y.: Edward Durell Stone.* **4** *Proposed War Memorial for Columbus Circle, New York, N.Y.: John Barrington Bayley.*

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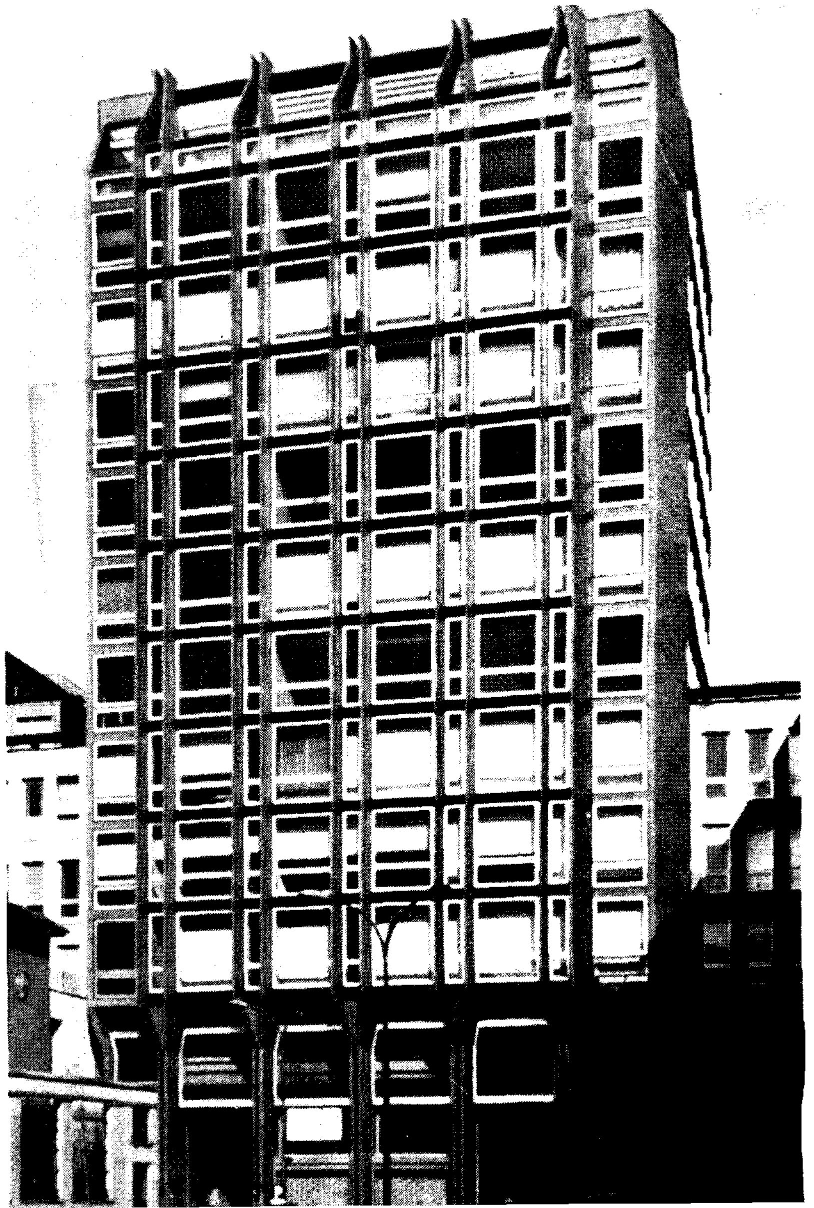
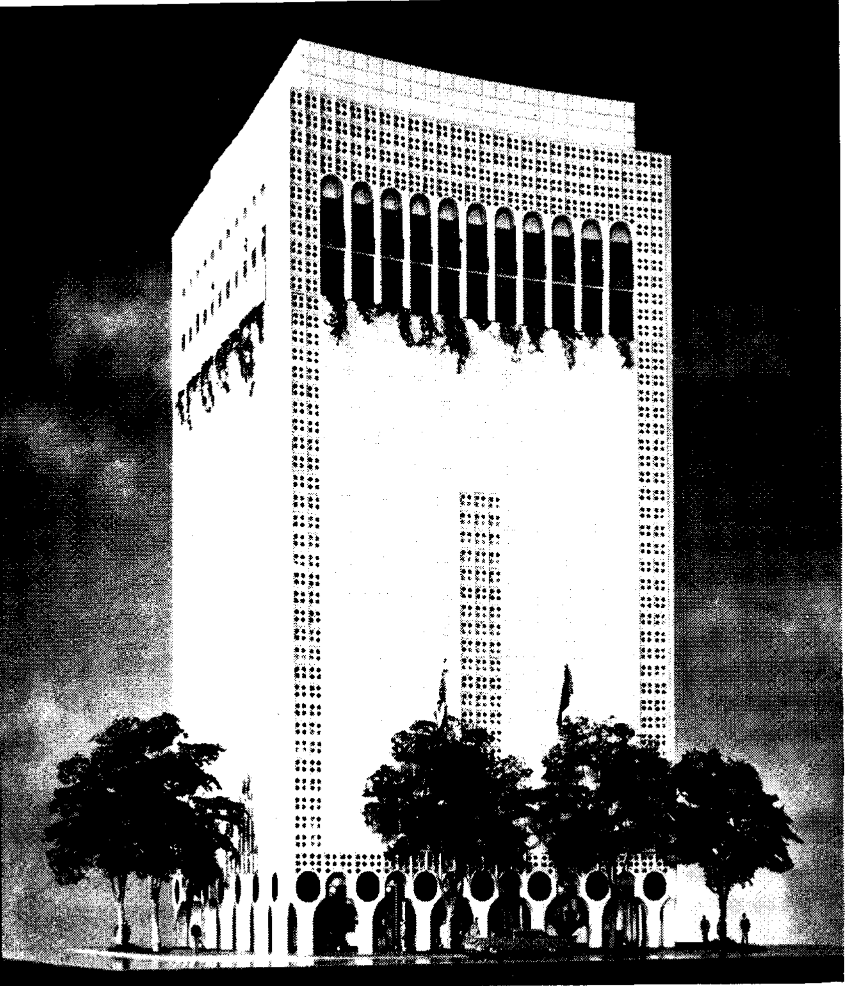


To constitute an architectural "movement," a group of buildings must demonstrate in common and in a manner not shown by other, unrelated buildings certain definable characteristics: a way of solving programs and providing social functions; a method of achieving technological results; a distinctive manner of enclosing space. Does the architecture tending toward a *New Sensualism* fulfill this requirement? And if it does, are the functional, technological and space-moulding results pleasant, appropriate, desirable?

In a functional sense many of the plastic-sculptural-emotional buildings can be severely criticized, and the criticism has become a common one. At their best, they may require some functional *corrections* (Robert Newman has lectured often on the acoustical corrections made to Saarinen's MIT Auditorium), or functions may have to be fitted into an anonymous space (nothing under a hyperbolic paraboloid is *dictated* by the form; space arrangement must be devised). At their worst, these sensuous forms provide such arbitrary space that use must adapt itself (or be rationalized, as the pattern of life must be in Goff's romantic interiors).

However, this criticism of lack of relationship between form and purpose is perhaps



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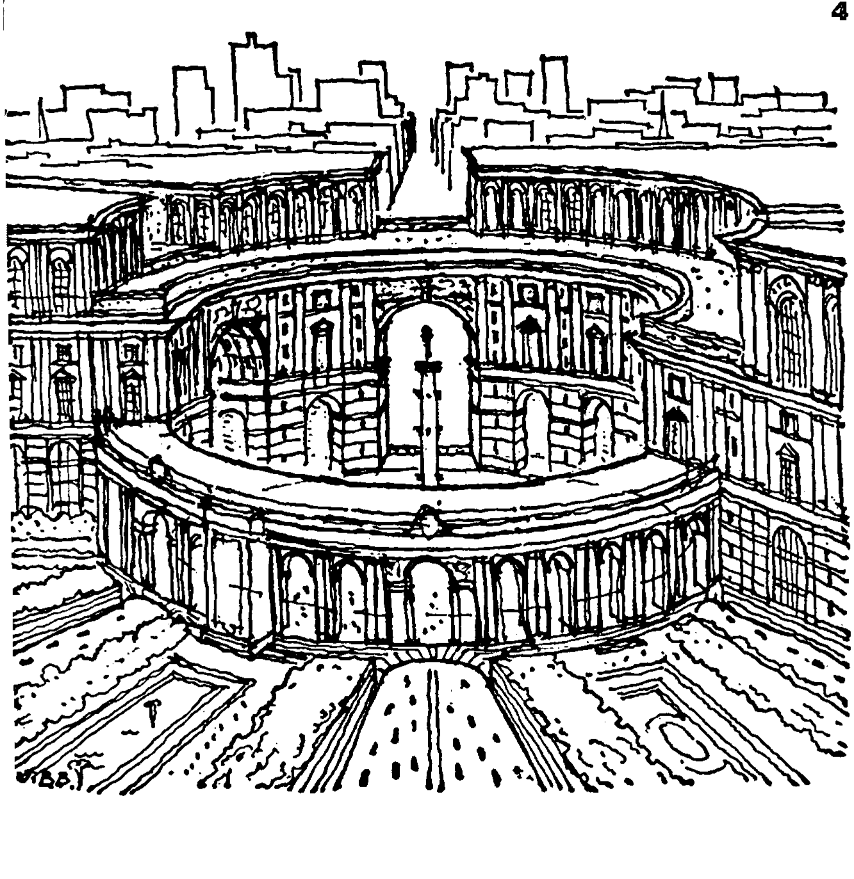


no stronger than it would be in an evaluation of the rectilinear, Mies-type design of which the *New Sensualism* is the antithesis. Mies Van der Rohe himself has said that "the structure is the basic grammar" and that the ultimate use is relatively unimportant: "If you have to construct something you can make a garage out of it or you can make a cathedral out of it . . . the same means . . ." If we have gained no functional advantage in sensualist buildings, perhaps we have not lost much ground; strict functionalism was never a strong tenet of the formalists in modern architecture, but was largely a straw man constructed by its critics. The fully social-function-studied building (the hospital that is completely planned around new health concepts; the school where form is based on current education principles) is more likely to be the product of an Isadore Rosenfield or a John Lyon Reid than a Le Corbusier or a Frank Lloyd Wright (or even a Yamasaki or a Saarinen).

This is not to say that ignoring or denying accurate function is to be applauded; it simply means that function can be placed as well, by a determined architect, in a folded-plate, plastic-façaded structure as it can in a rectilinear, flat-surfaced building. Perhaps the publicized agony of the Guggenheim Museum people in making Wright's building a workable museum balances the equally publicized difficulty of Dr. Farnsworth in adapting her life to a Mies house.

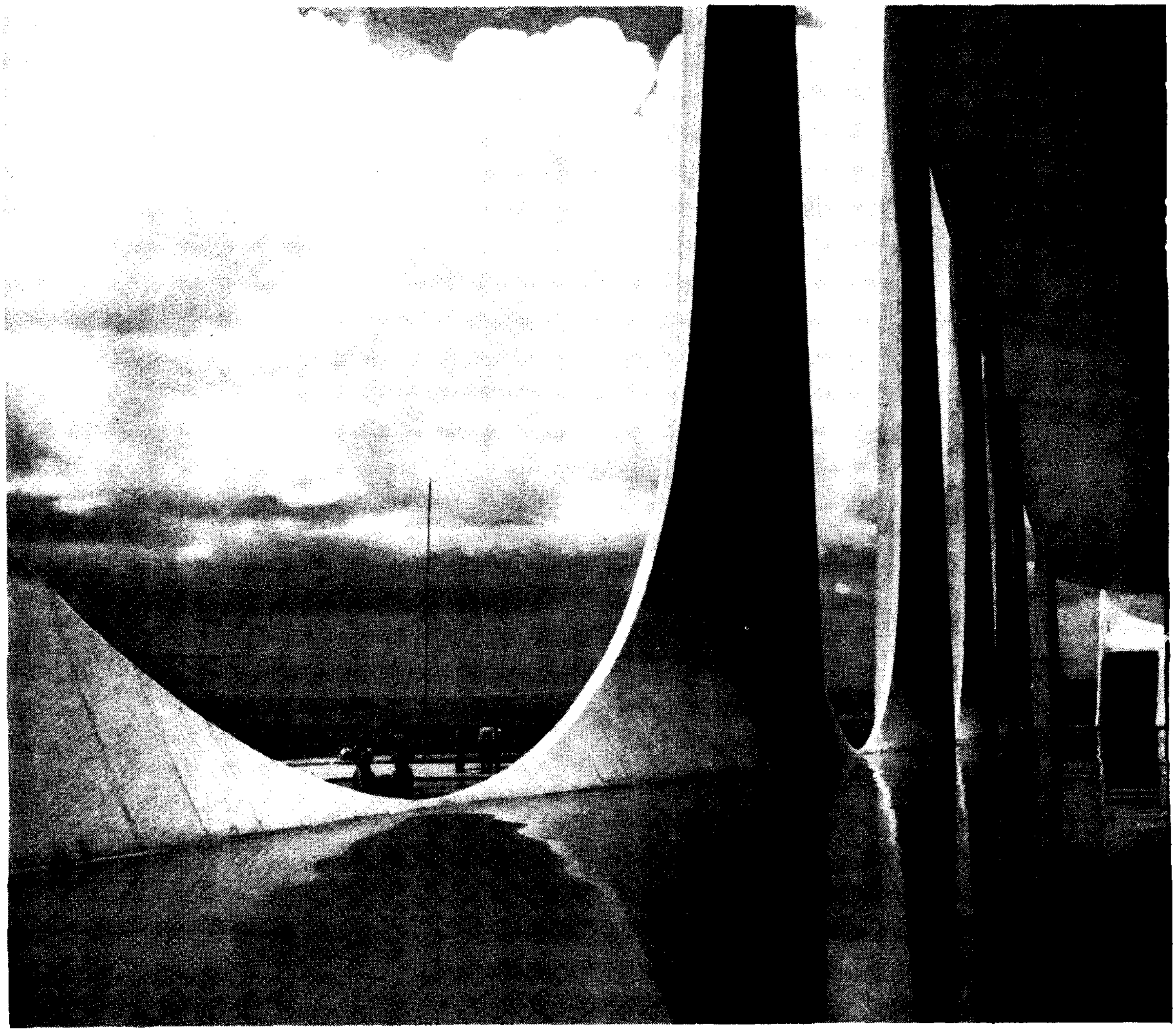
Rationalizers of the sensualist approach have another functional argument: function in architecture (the rather trite comment goes) includes more than social function—there is an emotional function to be served also. Emotionally moving forms and "delight" in design of buildings can provide emotional reactions that the rigidity of a curtain-walled building rather denies. On this point, each man becomes his own critic.

In a technological evaluation, one might assume quickly that architecture springing largely from structural imagination must *ipso facto* be judged good. Yet judgment based on the use of materials and methods and structural form cannot be solely grounded on technical smartness; but must also include assessment of esthetic results, appropriateness, and stylistic, formalistic values. From this point of view, two sharply critical comments must be made about *New Sensualism:*

Almost no engineers are first-rate architects. And almost no architects are first-rate sculptors.

Neither Nervi nor Candela is an *architectural* designer—for all their structural creativity. Nervi's designs are largely roof concepts: the total architecture is either missing, or is the product of an associated architect (not always the best, unhappily). Candela very nearly spoiled his moving concept in the Church of the Virgen Milagrosa when he enclosed the structure. The great misfortune is that these men seem *too* creative in their own right to collaborate: Nervi's genius is dissipated in UNESCO House; Candela is unrecognizable in Texas Instruments Plant. The sensual aspect of their contributions lies in the sensed-empirical, free-mathematical understanding which cannot be *applied*, but must be integral and conceptual.

The second worrisome aspect of the technology of *New Sensualism* is that it demands an actual facility, *as a professional*, in sculpture, and very few of our architects are good sculptors. Architecture, we have said for long, is an art (the mother of the arts); yet the other arts have developed their own professional attitudes and modern competencies independent of architecture. When the Museum of Modern Art recently exhibited "Four New Buildings" (Saarinen's Idlewild Terminal; Utzon's Opera House; Harrison's Church at Stamford; Gillet's Church at Royan) *Art News* reviewed the show *as sculpture*, and remarked that these buildings "attempt to make architecture art by suggesting it has the attributes of free improvisation and originality that architects seem to think are the poet's or the painter's or the sculptor's trump." Going on, then, to comment on the "awesomely cute" results, *Art News* described "details that seemed related to Futurism," "A bit of ramp and newel-extrusion (that) looks like a Boccioni," "a pseudo-Zadkine here, a pseudo-Pevsner there," and so on. This architecture, the reviewer concludes, "attempts to resemble art, but in its misunderstandings of the pressures under which art is formed" it becomes "a mode of artyness . . . " Parochial and jealous as this comment is, it indicates the sort of criticism—for lack of background as well as lack of ability—to which an architect subjects himself when he, a non-professional sculptor, essays sculpture. To the good modern sculptors and to the knowledgeable



critics of modern sculpture, even a Breuer or a Gropius or a Saarinen steps out of his role of competence when he plays, in architecture, with sculpture. Perhaps the schools of architecture should begin paying more attention to the teaching of sculptural handling of plastic form, through all the years. There are sculptors in residence at a number of the universities; perhaps their ties to the architectural departments should be closer (as Nivola's was, and Mirko's now is, at Harvard University).

Again one wonders, as in the case of the engineers, whether collaboration is possible. Architects have used sculptors as advisors in many instances—but only, in recent times, for elements of a building. Can a Bertoia, a Nivola, a Lux, a Cronbach, a Rosenthal do more than a wall or a screen; could they work with architects in basic sculptural-form molding? Almost the only answers we have at the moment are sports such as Mathias Goeritz' El Eco building (December 1956 P/A)—plaster architecture by a sculptor who also knows architecture, where the sculpture comes through but the technology is lost. The only full exceptions are works by the few architects who are true masters of *several* arts, such as Le Corbusier's.

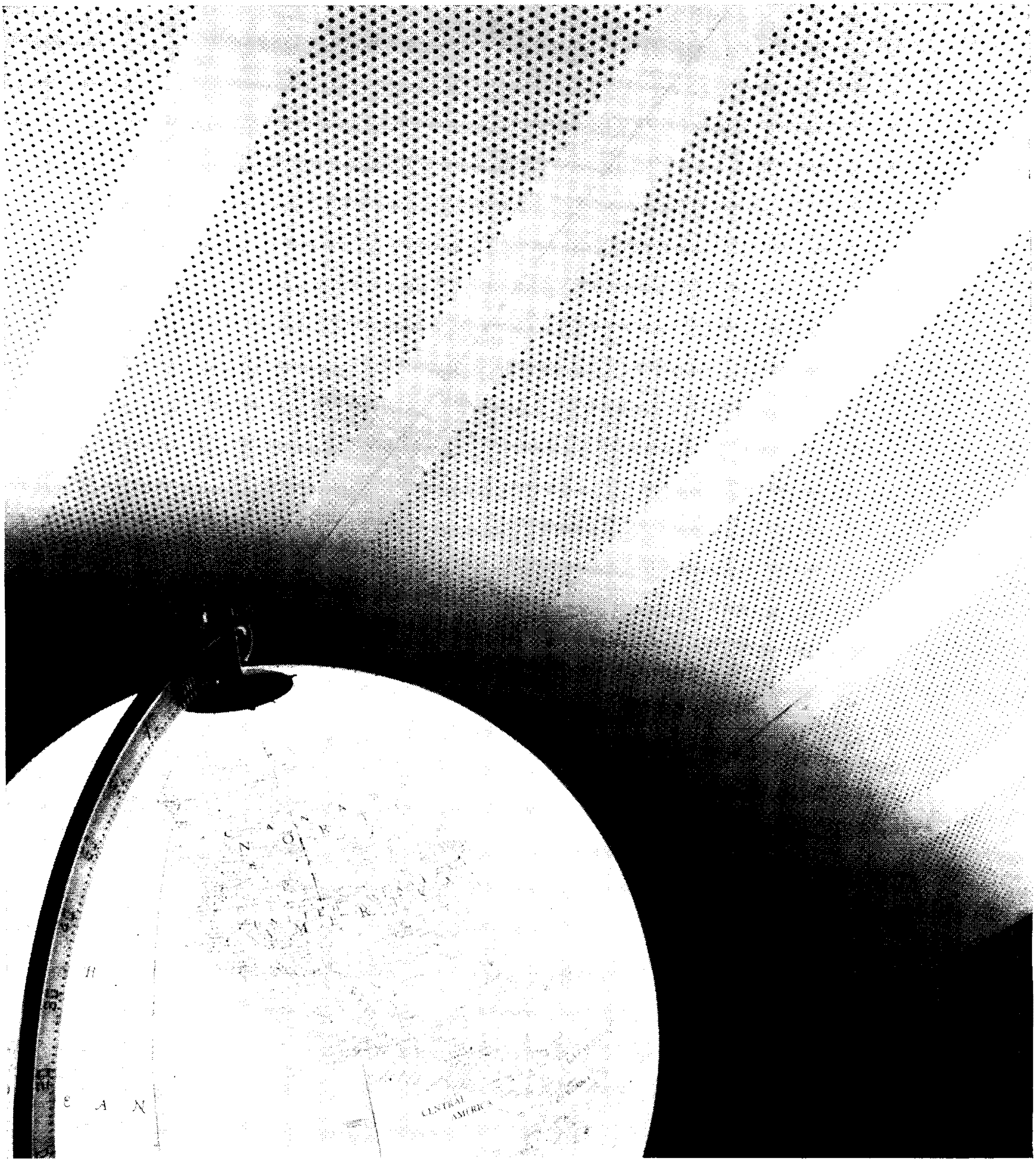
What can we say of the architecture of the *New Sensualism* with regard to *quality of the space* which it may form, enclose, mold, define, enrich? It is difficult to attempt conclusions about this now: there are too many facets to the style, even within the work of one man, and too much depends on individual competence. In this sort of architecture, when spatial results are good, they can be very, very good: a new kind of space, not previously experienced, can be created. Even the apparent trickery of Bruce Goff's Bavinger house becomes, from some inside aspects, very exciting interior space. Samuely's structural concept for Wallace Harrison's Stamford church, drab as it is on the exterior, results in a completely new religious space experience *within* the church. But when the space results are bad, they can be abhorrent. Few, if any, of the old rules for disciplining architectonic space remain to guide the careless or the unwary. And this fact leads us to the concluding comment on sensualist design.

The greatest danger inherent in *New Sensualism* lies, obviousy, in its departure from any imposed disciplines. When we mix intuition in structures with sculptural freedom in form, the result can be totally undisciplined in the individual structure and chaotic in groups of buildings. Architecture in the past few decades has had trouble enough (in practice and in the schools, as a teachable subject) because of the casting off of the old traditional disciplines. Now we are discarding also the rectangular module, and structural purism.

Obviously, none of the buildings we have been discussing can be a prototype. If a street of curtain-walled buildings is depressing, a community of sculptural-sensualist structures is frightening to contemplate. Fine instances of *New Sensualism* probably should remain virtuoso performances. Greater use of ornament and deeper understanding of surface plasticity can–and surely will–enrich the barer skeletons we have become used to. But will the run of architects stop there? If not, one shudders to think of what may happen as copy tries to outsmart copy.

Compounding this difficulty is the fact that sensualism lends itself to sensationalism. There is undoubtedly a temptation on the part of some architects working in the plastic manner to try to outdo another (or their own previous efforts), with their principal aim not the creation of a new environment but the seeking of publication and publicity.

However, if there are many dangers in the technical and emotional freedom that this movment affords, there are also many constructive aspects of it. A new breath of creativity–a new appeal to the senses of the viewer and user–has enlivened the modern movement at a time when it threatened to become stiff and to age too quickly.



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Barbara J. Melnick

clinics

Unusually-competent solutions for essential elements of the clinic—the waiting room, examination room, and doctor's office—have been selected from two recently-completed examples. The first, when in project stage, was a P/A Design Award Citation winner; the second is a remodeled building.

Designed by Thorshov & Cerny, Inc., Architects-Engineers, Minneapolis, the Bartron Clinic in Watertown, South Dakota, was commended by the P/A Jury for its simplicity of plan and pleasant entrance detailing (JANUARY 1957 P/A). The architects evolved a compact, rectangular scheme with a core area for service facilities (reception, clerical office and files, surgical suite, X-ray suite, labs, mechanical equipment) surrounded on the periphery by individual examination rooms and related facilities; and a two-room penthouse suite for the doctor and his staff. Since many examination rooms were required, each is about 8'x10'; in this limited area, built-in cabinetwork was designed as equipment and work space, with a small desk for the doctor, leaving maximum floor space for the examination table and circulation.

Outstanding features of Bartron Clinic are the central lobby/waiting area and the penthouse suite. The spacious 32-ft-sq lobby is divided into reception and waiting areas by an attractive pool and planted zone whose colorful glass mosaics, green-marble stepping stones, and jets of running water enliven the room. Emphasis is given to the pool and circulation area in front of the reception counter by a band of clerestory windows, night-lighted by a concealed-light cove for simulation of sunlight, and by a 13'-high ceiling which contrasts with the lower ceiling above the waiting area. The penthouse suite above the reception lobby and pool area is reached by a stair at the rear of the building; it has two rooms for the doctor and his staff—a combination office/conference room and a general lounge, which can be converted to a bedroom—separated by a small kitchen and bathroom.

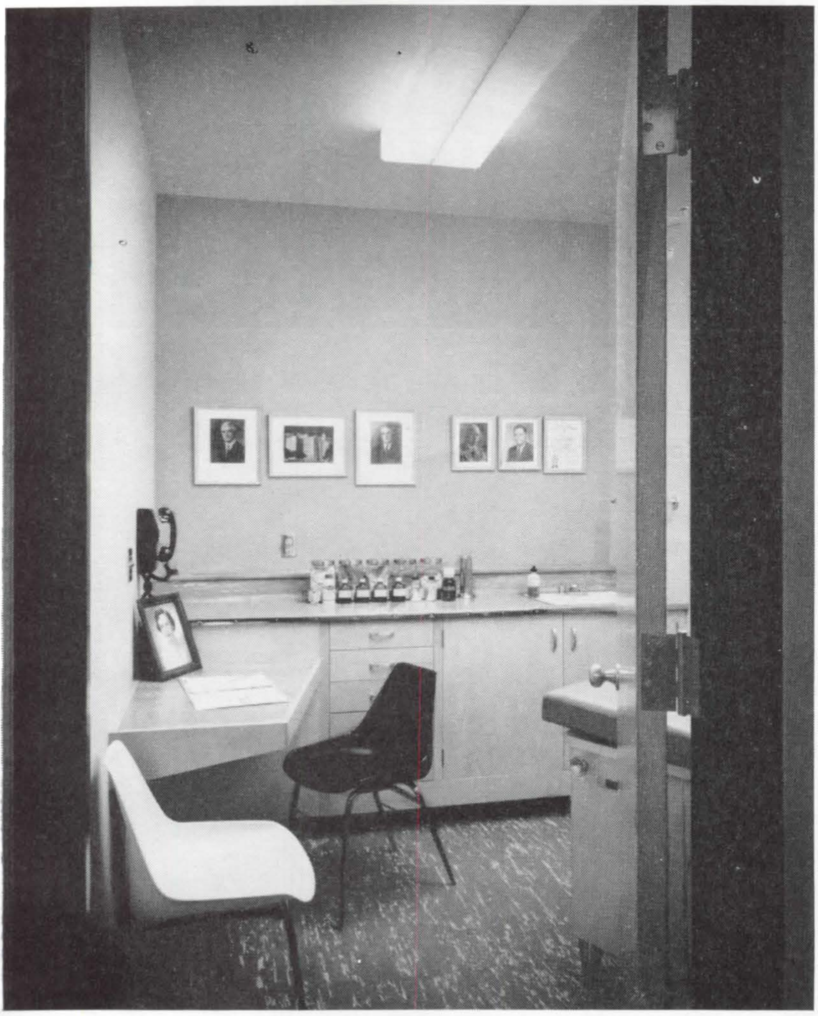
Robert Billsbrough Price, Architect, Tacoma, for the Scheyer-Johansson Clinic, in Puyallup, Washington, skillfully remodeled an old building, 95 feet long. The straight-forward simplicity of the interior is established in the 25-ft-wide façade and entry lobby, using white stucco and dark-brown vertical mullions; cedar wall stained dark grey; front door painted blue. Visible from the street through screens which provide adequate privacy and eliminate draperies, the inviting waiting room is spacious (about (15'x24') and high-ceilinged compared to the examination rooms (about 8'x9') and the doctors' offices (about 10'x12'). Other outstanding aspects of the interiors are the space-saving "built-ins"—seating, cabinetwork, scales in the hall; folding doors which preserve limited examination room area; the taste and restraint of materials and furnishings chosen for ease of maintenance; the subtle and lively composition of color.

p/a interior design data

clinics

client	Dr. G. Robert Bartron
location	Watertown, South Dakota
architect	Thorshov & Cerny, Inc.
project designer	Ted Butler
interior designer	Newton E. Griffith
project manager	Donald Drews

Photos: Warren Reynolds, Infinity, Inc.



data

cabinetwork, screens, partitions

All: architect-designed/custom-made. **Reception Counter:** walnut-plastic laminate front, top/plastic-laminate inserts in bright colors at switchboard end. **Coat Cabinet:** 7'-10" high partition between waiting area, corridor/walnut-plastic laminate/hardwood frame. **Sliding Shoji Screen Partitions:** plastic panels/birch frame painted flat black/expands waiting area into adjacent space. **Examination Room Cabinet:** built-in wall unit for equipment, work space/desk-table/oak/off-white plastic-laminate top.

doors, windows

Doors: waiting-reception area, natural-finish red oak/office suite, walnut/Roddiscraft/Roddis Plywood Co., Marshfield, Wis. **Office-Suite Draperies:** white poplin under/white silk gauze patterned with accents of warm colors/Herman Miller Furniture Co., Zeeland, Mich.

equipment

Air Conditioner: The Trane Co., 206 Cameron Ave., La Crosse, Wis.

furniture, fabrics

Waiting Area: chairs, sofas/Paul McCobb/Directional Furniture Showrooms, Inc., 41 E. 57 St., New York, N.Y.; red, gold, brown upholstery treated to resist stain, soil/F. Schumacher & Co., 60 W. 40 St., New York, N.Y.; Scotchgard/Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.; Naugahyde/U.S. Rubber Co., Mishawaka, Ind. **Office Suite:** natural-leather and walnut chairs, boat-shaped desk-conference table/Paul McCobb/Directional Furniture Showrooms, Inc.; lounge chair upholstery, white Naugahyde, brown, gold/F. Schumacher & Co.

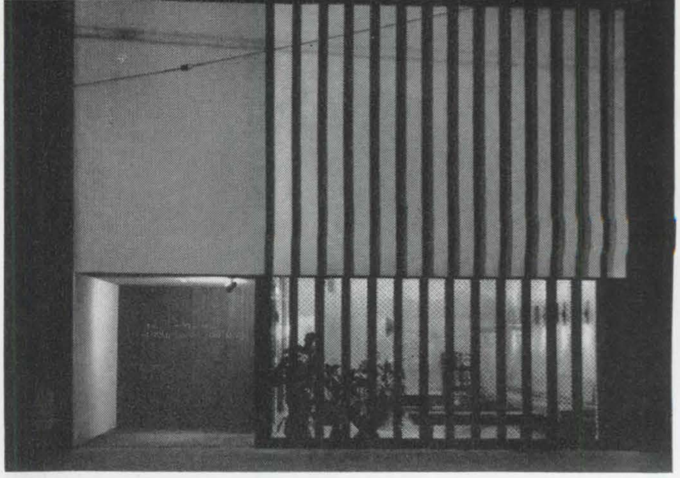
lighting

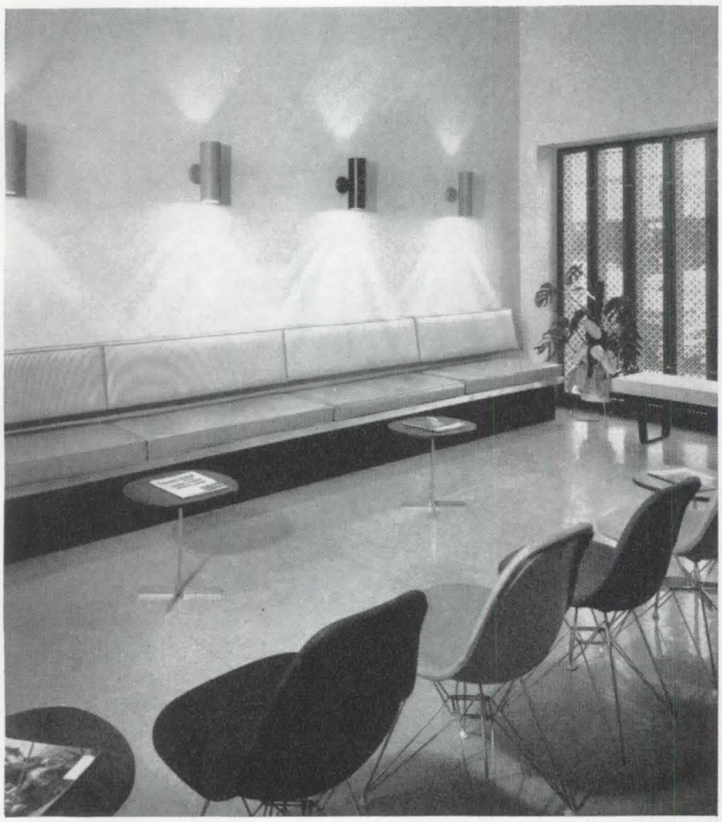
Waiting-Reception Area: fluorescent/concealed in cove at clerestory windows, and wall- and ceiling-mounted/The Wakefield Co., 731 S. Water St., Vermilion, Ohio. **Office Suite:** fluorescent/recessed and ceiling-mounted/Garcy Lighting/Garden City Plating & Mfg. Corp., 1750 N. Ashland Ave., Chicago, Ill. **Table Lamps:** Paul McCobb/Directional Furniture Showrooms, Inc.

walls, ceiling, flooring

Waiting Area: rear wall, brick painted white/others, plaster painted white/plaster-faced columns painted black/cove below clerestory windows, plaster painted yellow; ceiling suspended 7'-10"/acoustic mineral-fissured tile/United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.; tan vinyl-asbestos flooring/Johns-Manville Corp., 22 E. 40 St., New York, N.Y.; planted pool, glass mosaic tile in green, gray, white/green marble stepping stones. **Examination Room:** three plaster walls painted white/accent wall gold, red, or brown; vinyl-asbestos flooring/Johns-Manville Corp. **Office Suite:** walls, walnut panels, white or ochre plaster; flooring, pigskin tiles/Edgar S. Kiefer Tanning Co., 240 Front Ave. S.W. Grand Rapids, Mich.; gold carpet/V'Soske, Inc., Lord & Adams, 4 E. 53 St., New York, N.Y.

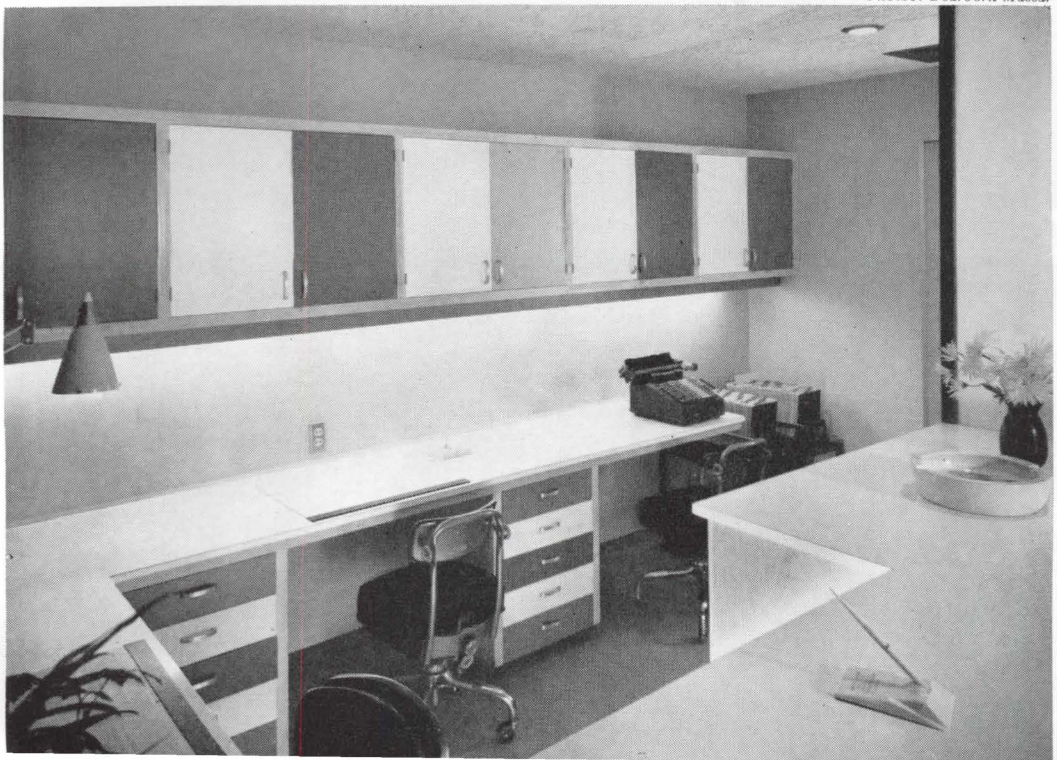
clinics





client	Dr. Carl Scheyer, Dr. Arnold Johansson
location	Puyallup, Washington
architect	Robert Billsbrough Price

Photos: Dearborn-Massar



Waiting Room and Reception Office

data

cabinetwork, partitions

Reception Office: all/architect-designed/custom-made. **Counters:** front, charcoal Formica/all countertops, white Formica/Formica Corp., Subsidiary of Cyanamid, 4630 Spring Grove Ave., Cincinnati 32, Ohio. **Partition At Reception Counter:** alternating yellow, white Formica panels to counter height/alternating yellow, white-plastic panels above/Tropiglas/Russell Reinforced Plastics Corp., 6 S. 13 St., Lindenhurst, L.I., N.Y. **Cabinets:** natural-finish birch frame/birch doors, drawers painted accent colors/Pratt & Lambert, Inc., 92 Tonawanda St., Buffalo, N.Y.

doors, windows

Entry Door: solid birch painted blue. **Others:** natural-finish birch. **Window Screen:** Rama fretwork painted red/one-ft-wide panels/7'-9'' high/remove easily for cleaning glass/custom-made.

furniture, fabrics

Built-in Seating: 21-ft-long wall-hung unit/blue, blue and white striped Naugahyde/Knoll Associates, Inc., 575 Madison Ave., New York, N.Y.; aluminum C angle covers frame/black linoleum base/architect-designed/custom-made. **Bench:** ebony finish/Herman Miller Furniture Co.; gray and white striped Naugahyde/Knoll Associates, Inc. **Chairs:** red, navy, ochre, black fabrics/Herman Miller Furniture Co.

lighting

Waiting Room: Fixtures: wall-mounted/ceiling-hung at 7-ft-height/gold, red, charcoal, blues sprayed enamel/ General Lighting Co., Inc., 248 McKibben St., Brooklyn 6, N.Y. **Reception Office:** ceiling-installed flush/Prescolite Mfg. Corp., 2229 Fourth St., Berkeley, Calif.

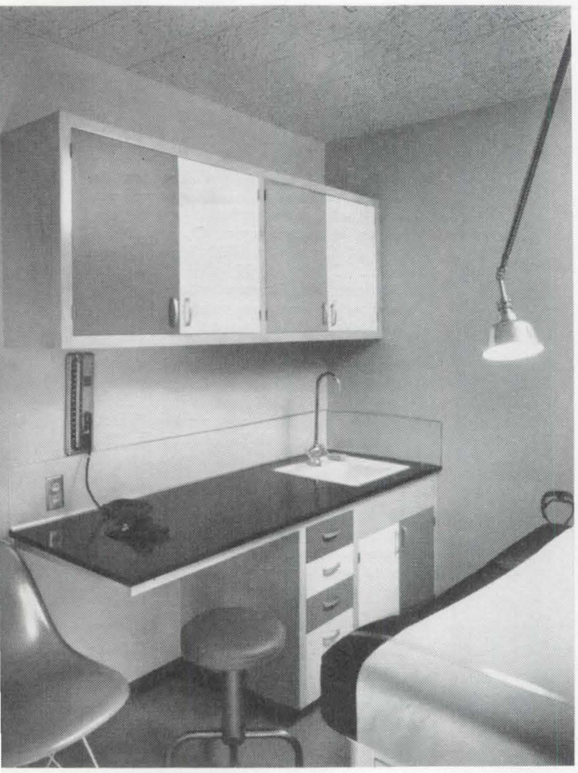
walls, ceiling, flooring

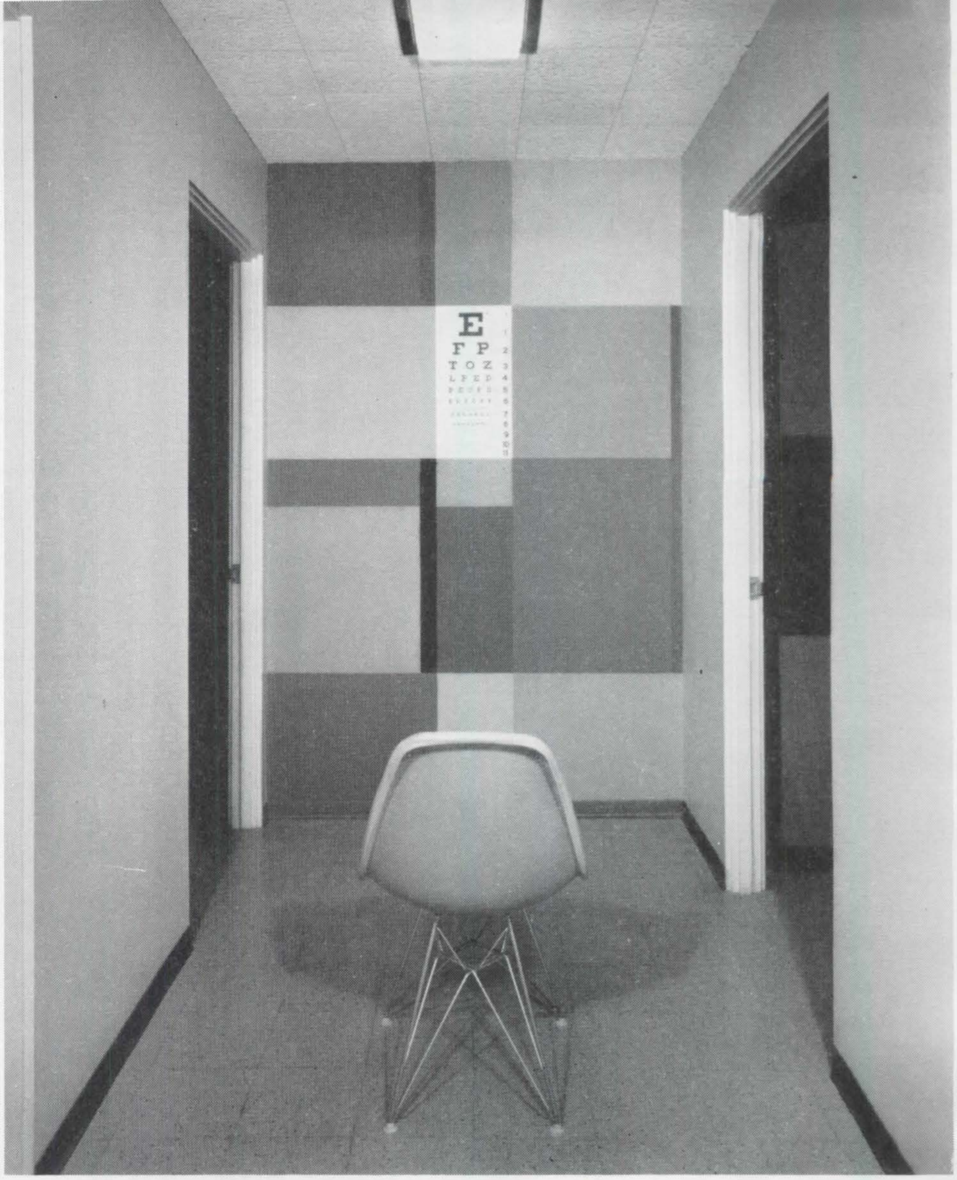
Walls: rough cedar stained gray/ gypsum board painted gray/Pratt & Lambert, Inc. **Ceiling:** acoustic tile/Forestone/Simpson Logging Co., Shelton, Wash. **Flooring:** light-gray vinyl/Matico Aristoflex/Mastic Tile Corp. of America, P.O. Box 128, Vails Gate, N.Y.

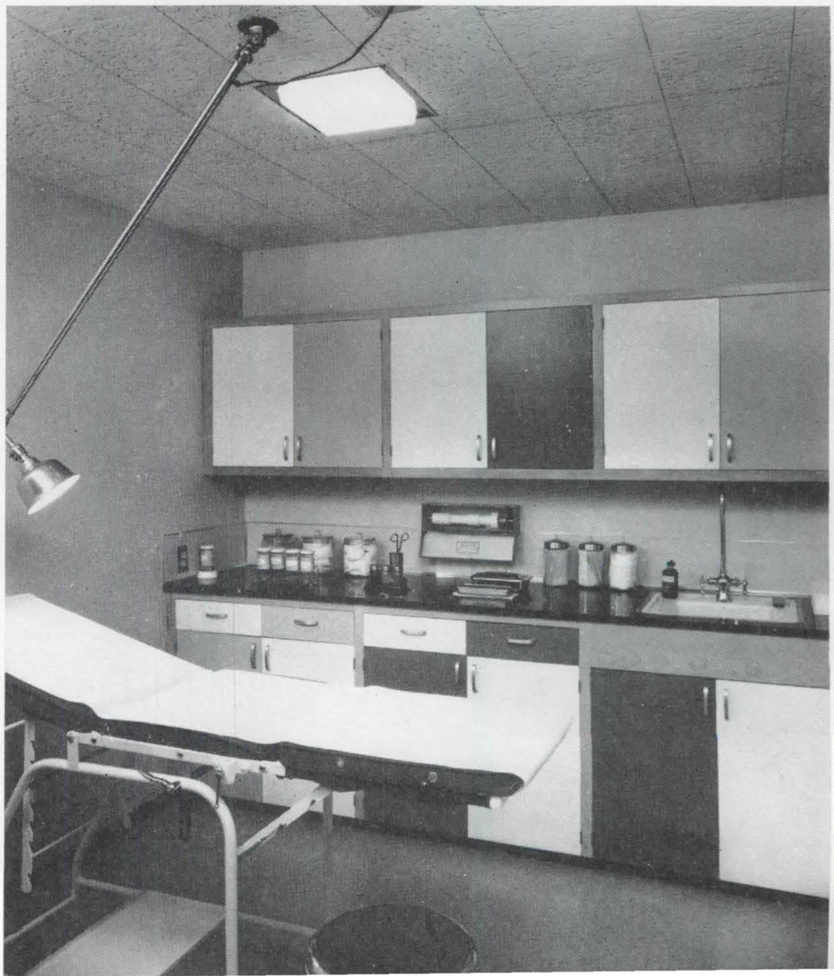
accessories

Planters: unglazed pottery/Architectural Pottery, Box 24664, Village Station, Los Angeles 24, Calif.

clinics







Hall, Examination Room, Doctor's Office

Color Plan: Major surfacing materials throughout the clinic are pale—light gray flooring and walls, off-white ceiling. Contrasting accents of dark gray occur in cedar walls, reception counter, eye chart wall at end of hall (left) Lively colors, hues of red gold, pale and dark blues, combined with white and dark gray make cabinetwork a sparkling design feature (acrosspage).

data

cabinetwork

Examination Room: natural-finish birch frames/doors, drawers painted in accent colors/black Formica countertops/gray Formica backsplash/Formica Corp.; architect-designed/custom-made.

doors

Examination Room: white vinyl folding/Modernfold/New Castle Products, Inc., New Castle, Ind. **Doctor's Office:** birch.

furniture, fabrics

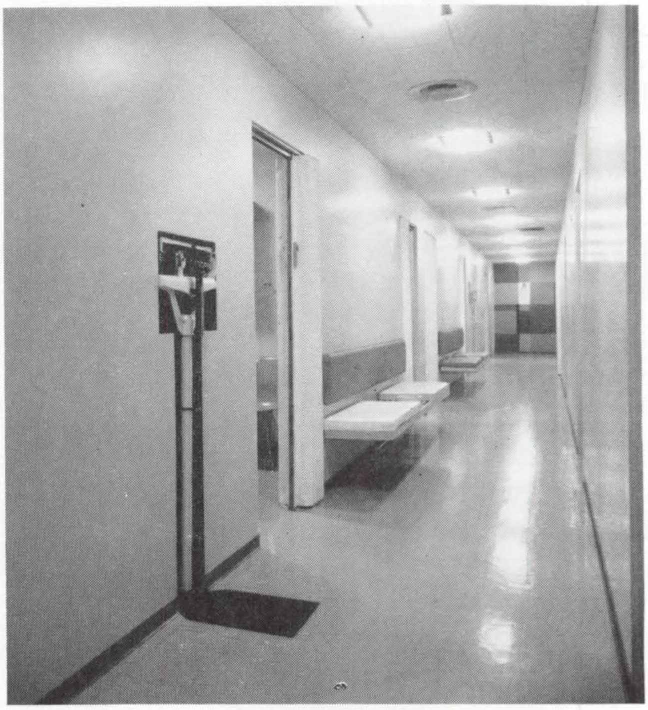
Built-in Hall Seating: wood-slat bench, wall-hung metal frame/black, white striped Naugahyde backrests/solid white, blue, yellow, orange Naugahyde seats/Knoll Associates, Inc.; architect-designed. **Examination Room:** red chairs/Herman Miller Furniture Co. **Doctor's Office:** walnut-top charcoal-base desk/white-plastic top charcoal-base storage cabinet/orange Naugahyde swivel chair/charcoal Naugahyde side chair/Herman Miller Furniture Co.

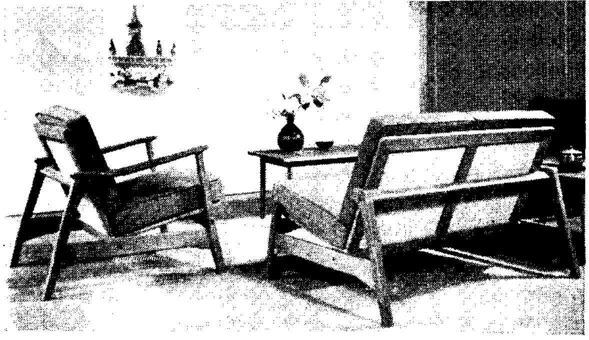
lighting

Ceiling Fixtures: Prescolite Mfg. Corp. **Doctor's Office:** ceiling-hung fixture/ Lightolier, Inc.; wall-mounted fixture/ General Lighting Co., Inc.

walls, ceiling, flooring

Walls: gypsum board painted light gray/grays, blues at eye chart. **Doctor's Office:** gypsum board, cedar stained gray. **Ceiling:** acoustic tile/ Forestone/Simpson Logging Co. **Flooring:** light-gray vinyl/Matico Aristoflex/Mastic Tile Corp. of America. **Doctor's Office:** gold carpet/Firth Carpet Co., 295 Fifth Ave., New York, N.Y.





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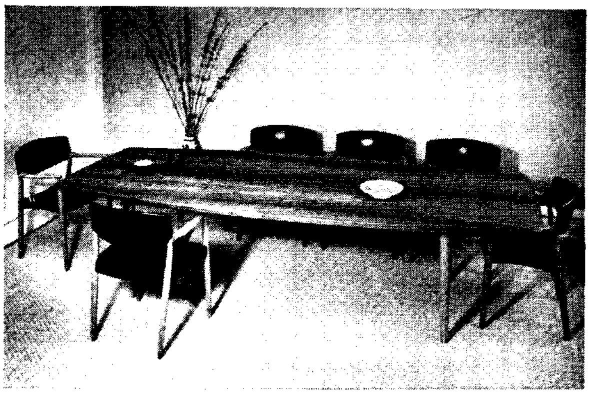

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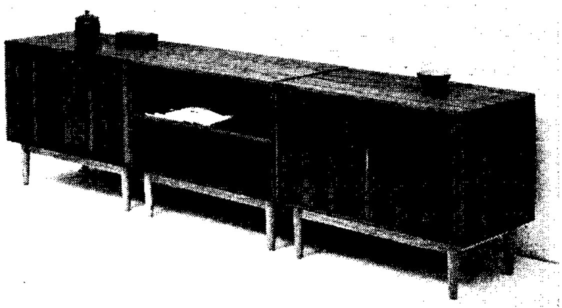

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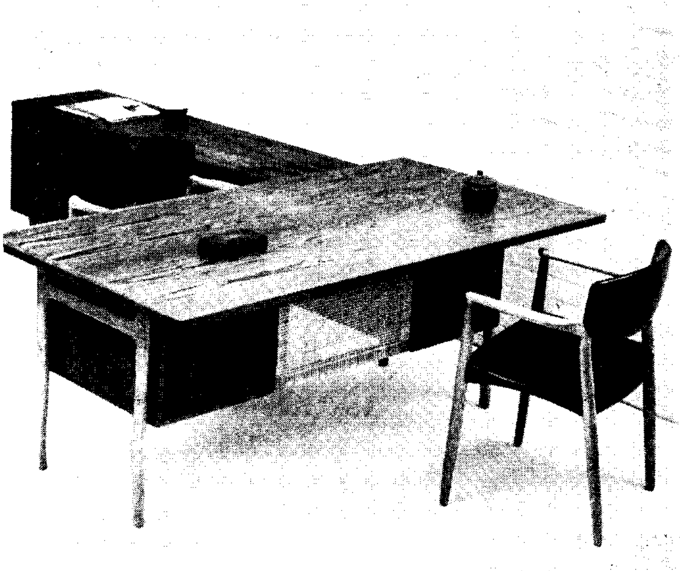

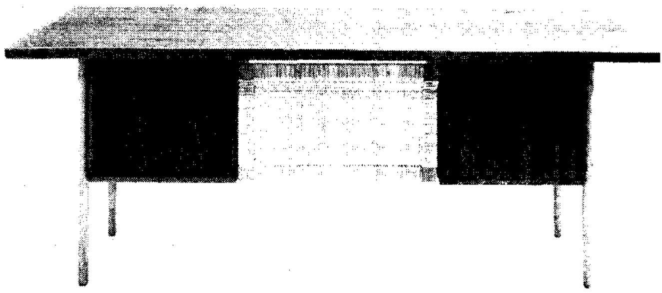

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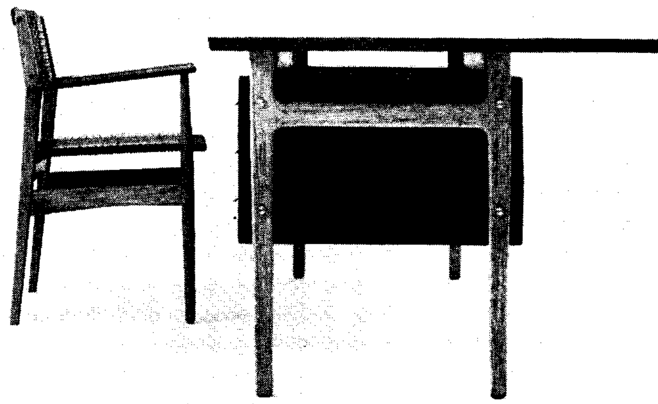

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Multiform Mastery: English Surrealist's Presentation of Picasso

*by Milton Flower**

Picasso: His Life and Work. *Roland Penrose. Harper & Brothers, 49 E. 33 St., New York 16, N. Y., 1959. 392 pp., illus. $6*

No other contemporary person has been the subject of such a large number of books and monographs, both on his life and his work, as has Picasso. This is indubitably an all-time record, certainly one for a creative artist. Moreover the volumes are issued in many languages. Roland Penrose, fellow painter (an English Surrealist) and long-time friend of Picasso, makes a unique contribution in this critical biography, proving that there is room for yet another work on the subject.

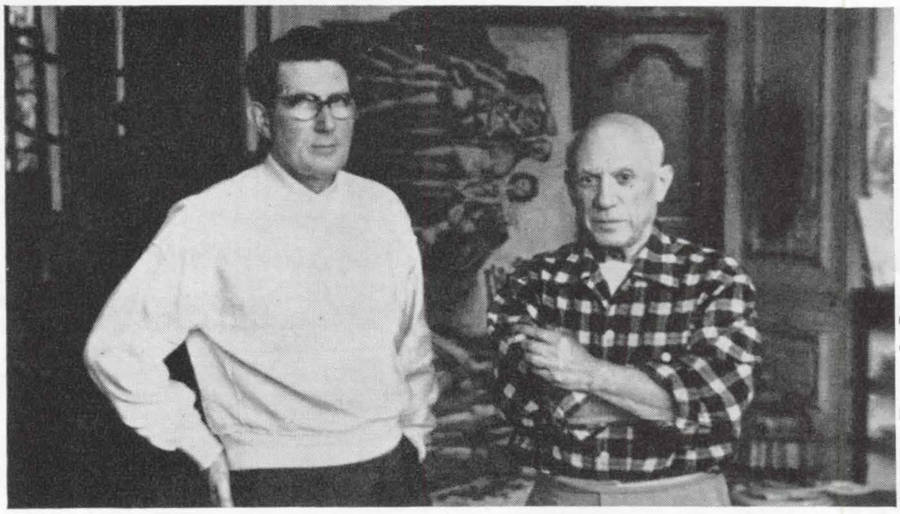
Picasso in the last fifty years has become more than the man and the artist. His name is a symbol to many for all that is termed "modern art." Indeed, as Penrose points out, the name in France has come "to signify a force that is incomprehensible and capricious." Even Parisian taxi-drivers, near collision, have been heard to scream *"espèce de Picasso"* to each other.

This biography leaves few sources untapped in documenting the life of the Spanish painter so long resident in France. The author dogs his subject's steps with painstaking devotion. At times, to follow along is a bit tedious as one travels from studio to studio, from vacation to vacation, meets the succession of feminine companions, and all the way is reminded of the tremendous output of this vigorous creative talent now in his 79th year. The sum total of Penrose's book amounts to an almost monumental solidity in revealing the man and his work. Presenting Picasso is, actually, a difficult task. The artist never comments on his own paintings, hence interpretations must often be made through indirection. Exceptions are almost exclusively in non-artistic areas, alas, such as politics or poetry. Consequently, Penrose as biographer must frequently interrupt his narrative to discuss the artist's styles and chief canvasses, which total so many. The reader is considerably aided by 193 small black and white reproductions, useful in following textural discussion. It is regretted that one or two color plates were not included because here, too, Picasso is a pioneer and words cannot connote any color sense. Major periods are well handled and works such as *Les Demoiselles d' Avignon*, *Guernica*, and the latest, *Las Meninas*, are given able treatment.

The creative energies of Picasso are not, of course, limited to painting or collage. There is also Picasso the sculptor, ceramicist, and theater designer, and there is the poet and playwright as well. From the Malagan days, when he first

(Continued on page 214)

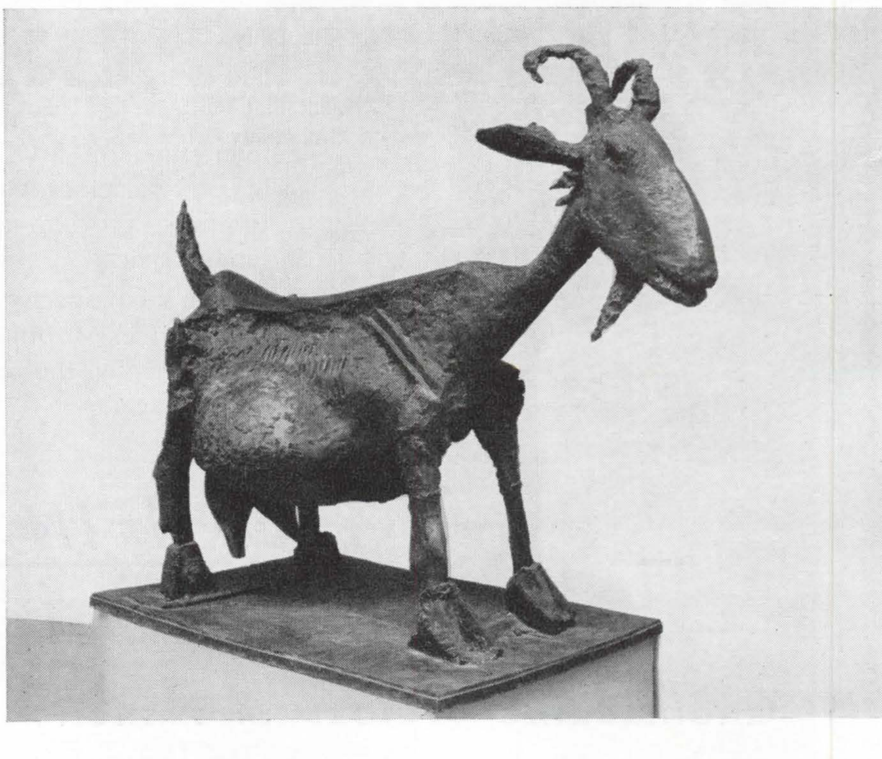
* *Dickinson College, Carlisle, Pa.*



Courtesy: Harper & Bros.

Penrose and Picasso, "La Californie," 1957

"She-Goat": ". . . her ribs . . . a wicker hamper . . ."



Courtesy: Museum of Modern Art

CHICAGO SUN-TIMES

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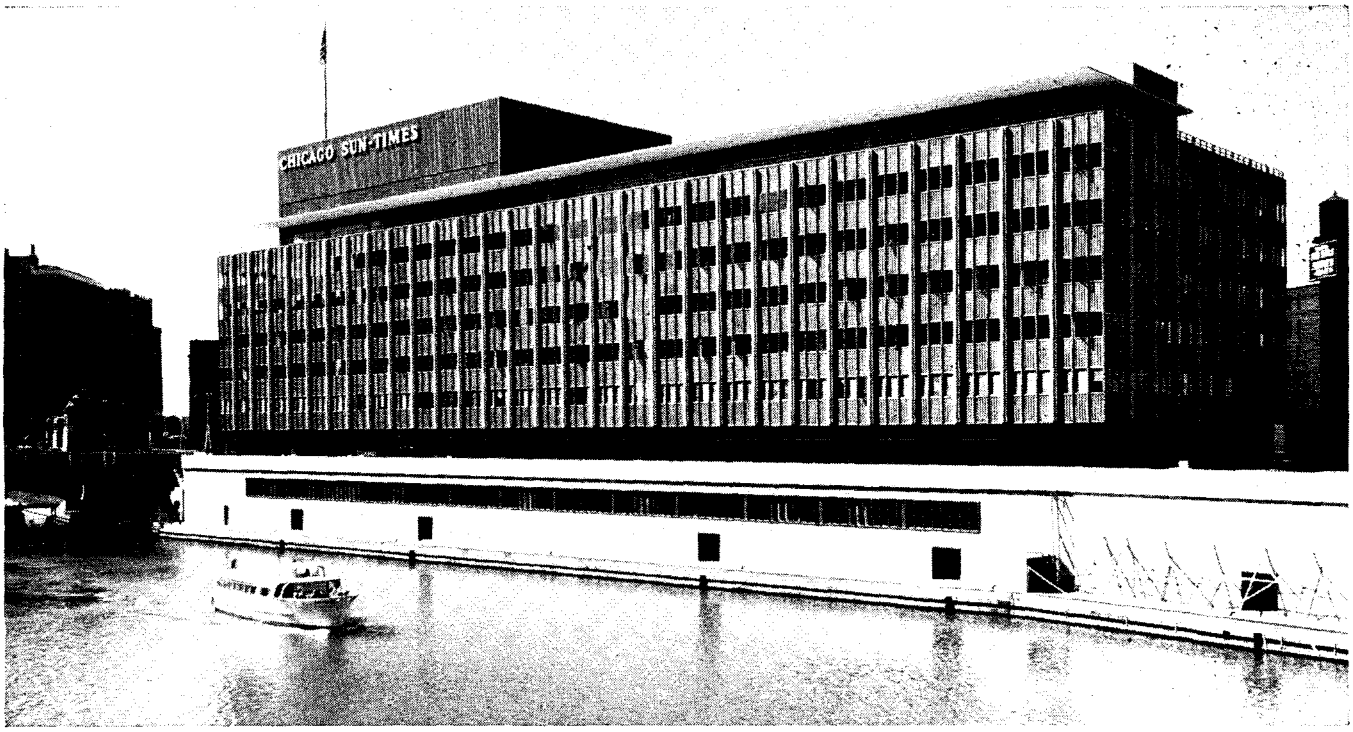

Photo: Hedrich-Blessing, Chicago

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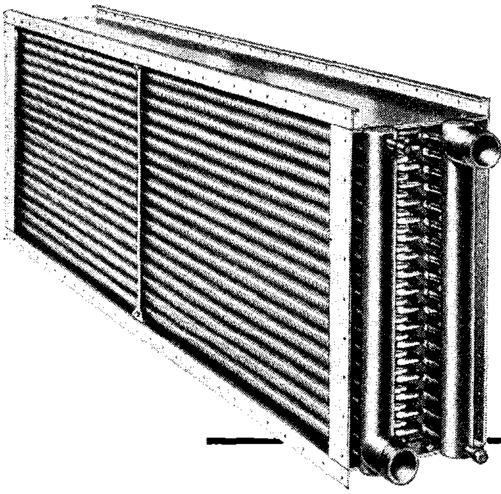

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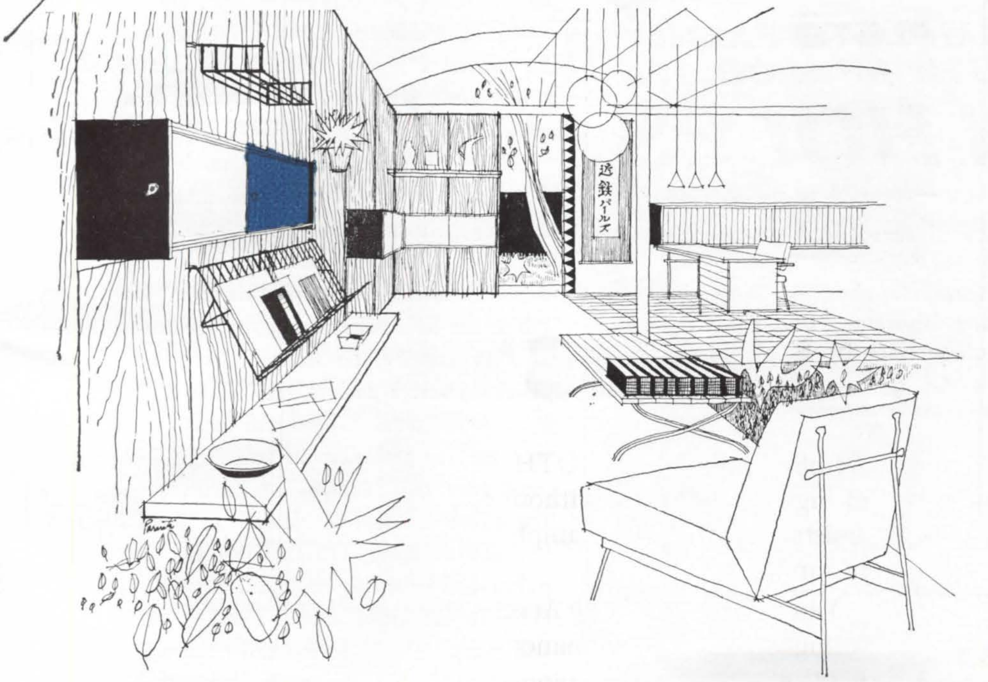
Masonite Contemporary Studies



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reviews

(Continued from page 211)

studied under the tutelage of his painter-teacher father and so early won prizes, until the present, when his work commands headline prices, his career has been marked less by penury (his family was poor but not poverty stricken; his years of struggle not long, measured by his span of success) than by a startling and rapid progression of changing styles. This reviewer wonders at times if a fusion of fertile imagination and boredom with reality (or symbols of reality) does not generate change—fruitful or otherwise. Penrose seems to hesitate, until the end of the book, to call Picasso an inventor, but that he most certainly is. To what end or purpose each new development is intended we never quite know but each has had its successive group of imitators. We are told that no medium whatever has failed to find new direction and more exciting revelation through Picasso's fresh enthusiasm when he has come into contact with it. Owing to his affectionate personal feeling for his subject, Penrose, while always fair, is rather more generous and analytical than critical.

Such a comprehensive study as *Picasso: His Life and Work* must inevitably give any reader much satisfaction, yet questions just as inevitably arise. Penrose writes approvingly: "We are in the habit of judging the greatness of a painter by the strength he has to affect ourselves and others." This is as good a judgment as one can make as a measure for greatness in painting. One must grant that Picasso does measure up. But effect can also shock and all shocks are not welcome. Of all 20th Century painters, Picasso is most certain to remain in the front rank. Whether each and every stylistic device and expression in his work will endure is less easy to predict. Father Time is often called upon to judge. When Picasso's work is at the bar, Penrose's biography will join the works of Barr, Sabartès, and Zervos as part of his claim to immortality.

graphic art process explained

Silk Screen Techniques. *J. I. Biegeleisen and M. A. Cohn. Dover Publications, Inc., 920 Broadway, New York,*

(Continued on page 218)

one thing in common...

...their tableware was washed by a Hobart Flight-Type dishwasher...standard for volume operations

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PENN METAL COMPANY INC.
90th YEAR
1869 – 1959

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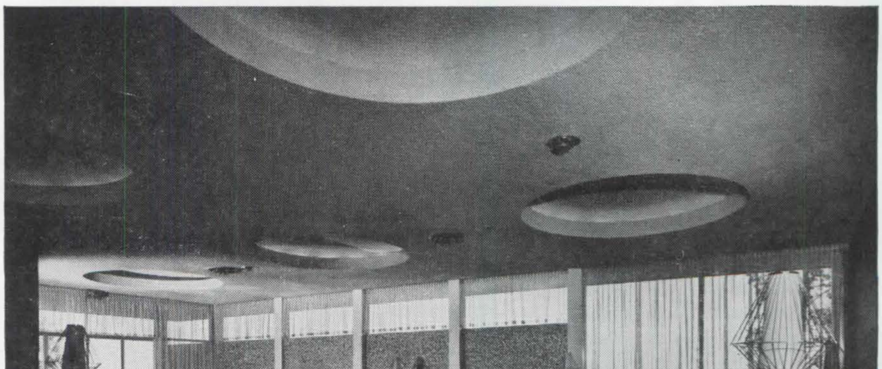
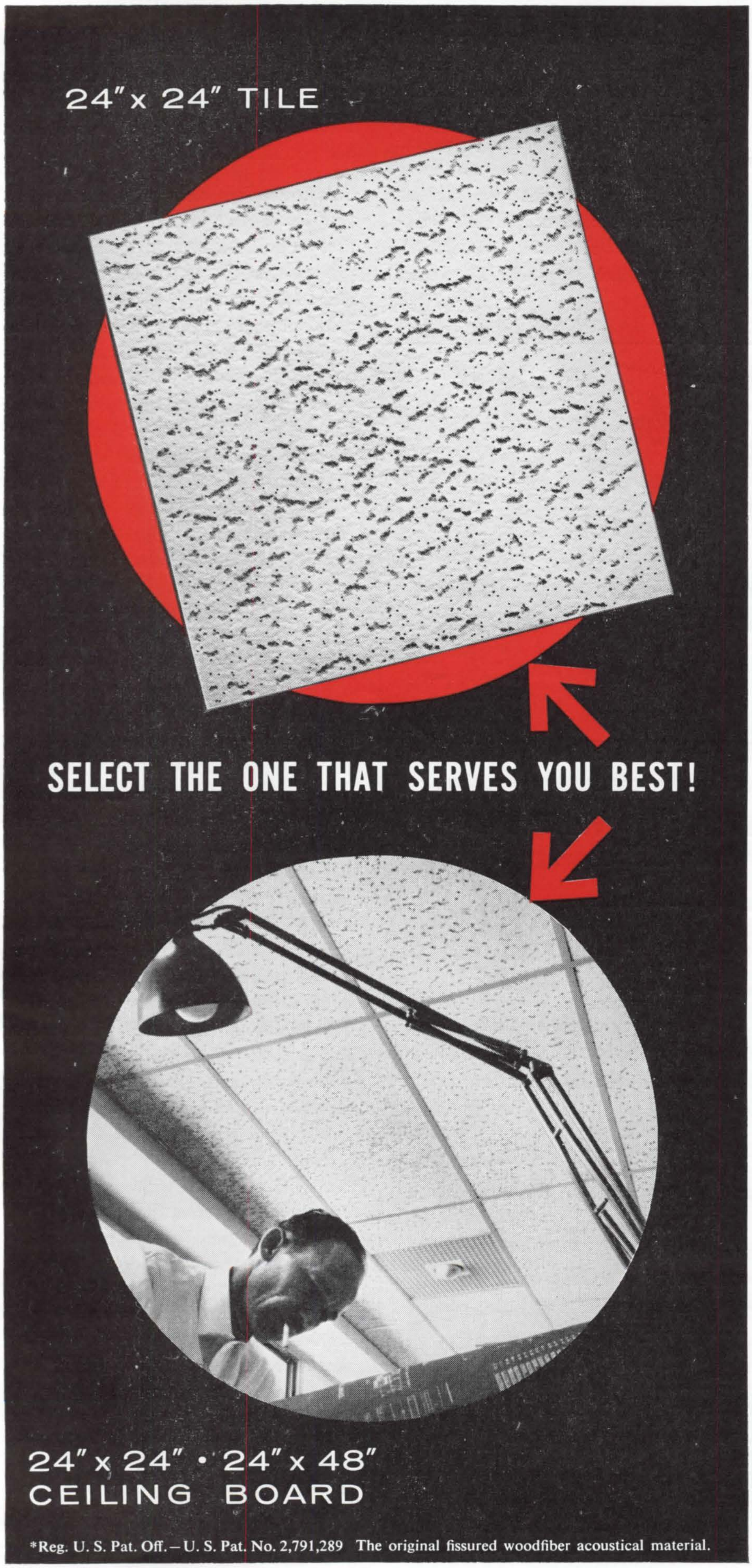
CONTRACTOR: Lembke Construction Company of Nevada, Inc.
PLASTERING CONTRACTOR: John Di Biase
LATHING CONTRACTOR: Robert A. Pierce Company
PHOTOS BY: Julius Shulman

Sprayed-on acoustical plaster over Penmetal lath and gypsum plaster and aggregate formed the ceilings in the ballroom lobby.





*Reg. U. S. Pat. Off. – U. S. Pat. No. 2,791,289 The original fissured woodfiber acoustical material.

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SAC-95/574

RELY ON Simpson®

(Continued from page 214)

N. Y., 1958. 188 pp., illus. $1.45 (paper)

If you know little or nothing about serigraphy, or silk-screen printing, and are interested in learning quickly, I recommend this book.

In easily understood terms, with many illustrations, the silk-screen process is described in detail: selection of equipment, tools, and materials; several basic methods of making stencils, or screens, for one-color printing—including paper, block-out, tusche, film, and photographic stencils; the more advanced and specialized techniques required for multicolor printing; and, finally, the printing process.

It is an education to read this book—whether you wish to put your knowledge to practice, or whether you just want to understand this successful commercial art technique, which is gaining fast recogni-

A.L.

companion volume

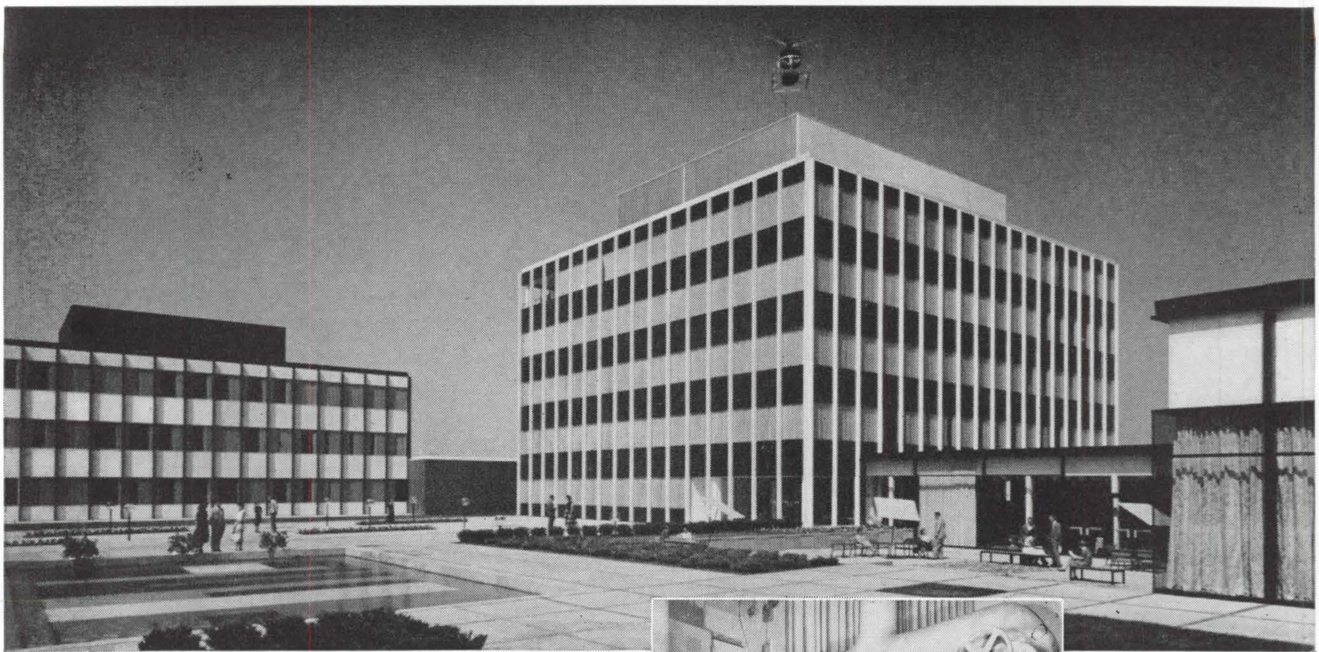
Winter Air Conditioning. *Seichi Konzo, J. Raymond Carroll, and Harlan D. Bareither. The Industrial Press, 93 Worth St., New York 13, N.Y., 1959. 630 pp., illus. $8*

This textbook presents a problem to one who has already reviewed the authors' first book, *Summer Air Conditioning* (April 1959 P/A). Were it not for that book, one could be unreserved in praise of the present one, as a first-rate text for young students and as a handbook for heating contractors, salesmen, builders, and architects who need to know in some depth what it is the professional thermal engineer is talking about when he is designing winter heating systems. Like the first volume, this one has excellent clarity, simplicity, logical presentation, and first rate illustrations. It assumes no knowledge whatsoever on the part of the reader; its introduction contains, for example, some basic data on how to read tables and charts; and Chapter Three is a really comprehensive yet simple discussion of the reading and drawing of heating plans. This information is, of course, unnecessary for the builder and the architect, but the specifically technical data on heating *is* definitely pertinent to them.

But *Summer Air Conditioning* does also exist; and the point was made in the review of that book that it was unfortunate it had not been somewhat enlarged to cover winter as well as summer data. With the appearance of this second volume the unfortunateness of the situation becomes glaringly apparent. Never in my experience have I seen such a fantastic example of self-plagiarism as exists in this second book! Paragraphs, sections, almost whole chapters have been lifted bodily, with no change or extremely little, from the first book; and this goes for the illustrations as well.

If it were true that the audiences for the two books were different (if, that is, the contractors and salesmen who handle residential heating were different from those who install central air cooling) there would be some reason for the two volumes. But since (as the authors themselves make very clear) the same contractors in the great majority of cases do both kinds of work, it is unfair that those who are studying the subject are

(Continued on page 222)



International Minerals & Chemical Corporation, Administrative and Research Center, Skokie, Ill.

Architects and Engineers: Perkins & Will
General Contractor: Turner Construction Co.
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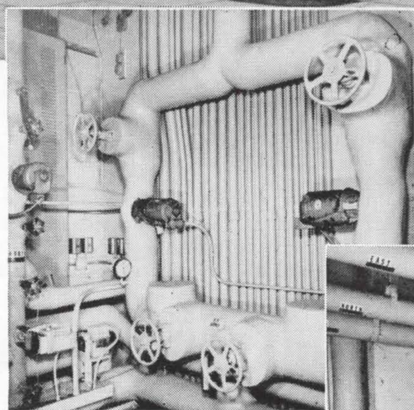
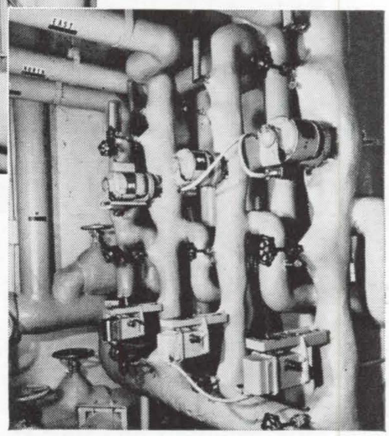
"ENGINEERED FOR THINKING" ...WITH 22 QUIET B&G BOOSTER PUMPS





B&G Boosters installed in various heating circuits.

B&G BOOSTER PUMP

International Minerals and Chemical's new administration and research center, Skokie, Illinois, has been described as "engineered for thinking." In keeping with that objective, twenty-two *quiet* B&G Boosters were selected as the pumps for the heating circuits of the four buildings and the snow melting panels.

B&G Boosters and larger Universal Pumps are designed and built specifically for circulated water heating and cooling systems, in which they satisfy the all-important requirement of *silent, vibrationless* operation. Over 3,000,000 are today installed in such systems.

Among the features of B&G circulating pumps are specially built, more costly motors, tested for quiet running...oversized shafts of hardened alloy steel... long sleeve bearings...noise dampening spring couplers...oil lubrication and leak-proof mechanical seals. They can be serviced without removing from the line.

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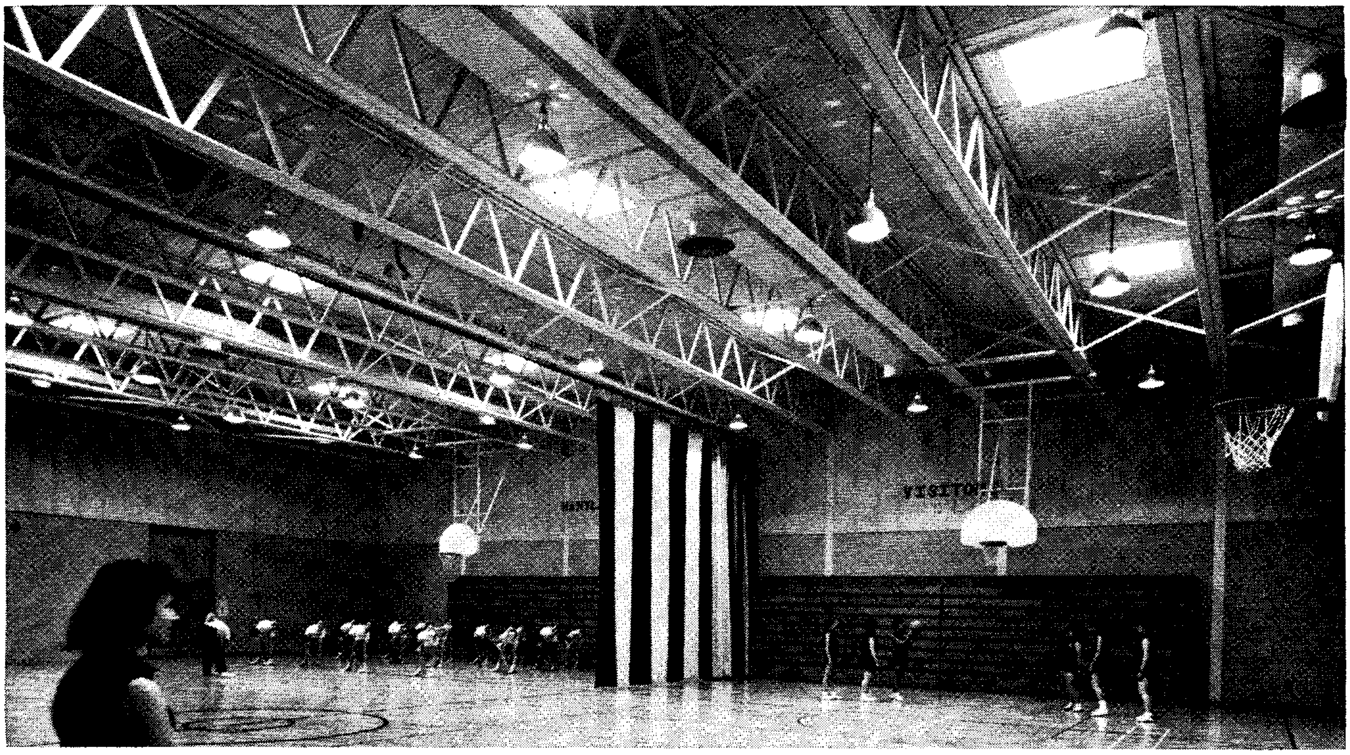

GYMNASIUM incorporates both Tectum roof deck and sidewall panels for maximum insulating and acoustical value. Roof deck is 2½" thick; sidewall panels are 2" thick with neat beveled edges and tongue and groove joints. *Four walls and a ceiling for effective sound control* in an area where noise can be a problem during study periods.

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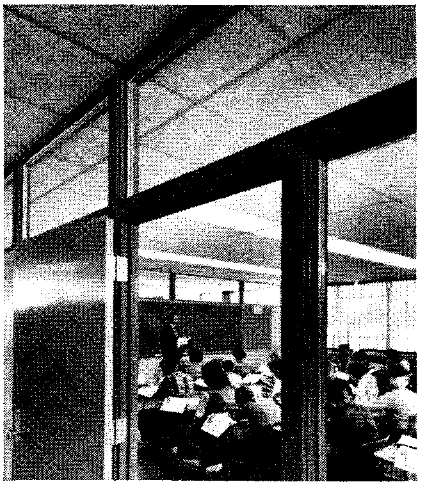
Hartland (Mich.) High School • Architect: Charles W. Lane & Assoc., Ann Arbor, Mich. • *Contractor:* Wallace Constr. Co., Farmington, Mich.



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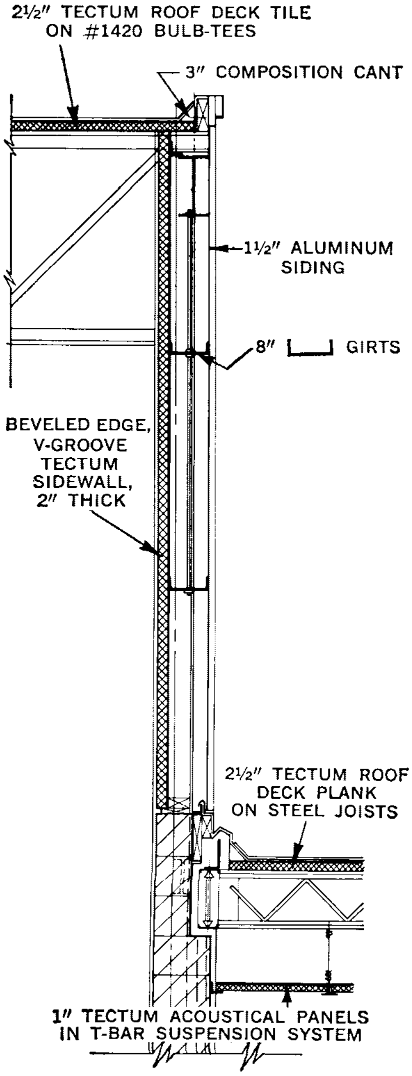

Detail of gymnasium wall showing Tectum sidewall, roof deck, and corridor acoustical ceiling.

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(Continued from page 218)

forced to buy two expensive books if they want complete coverage, where one enlarged with the requisite data on heating would do the job.

The present volume has a merit that is fairly unusual in engineering textbooks: a strong, if only occasional, social point of view. For example, the authors put forth a strong plea for conservation, in this instance referring to natural gas. ". . . Conservation of our energy resources can begin at home, and every heating contractor can play an important part in conserving fuel for the benefit of future generations." A praiseworthy point of view! It would, however, be more effectively stated in this book if the authors did not sometimes turn right around on themselves and undermine their own thesis: as, for example, in their illustration of a cross-section of an exterior wall (*Figure 3.12*) which shows no insulation whatsoever. Indeed, insulation in general is pretty much scanted in this book. There are *several other* areas where, what I think has to be called, the "engineering mentality" takes precedence over breadth of view, traditionalism over awareness of technological progress, and most of them lie in this area of structure and structural materials. It is perfectly true that the heating contractor has nothing to do with structural design, beyond requiring changes made necessary by the heating layout, and certainly nothing to do with materials selection. On the other hand, if the contractor is to "play an important part in conserving fuel," he is going to have to become a proponent of insulation and quality construction in his own quiet way.

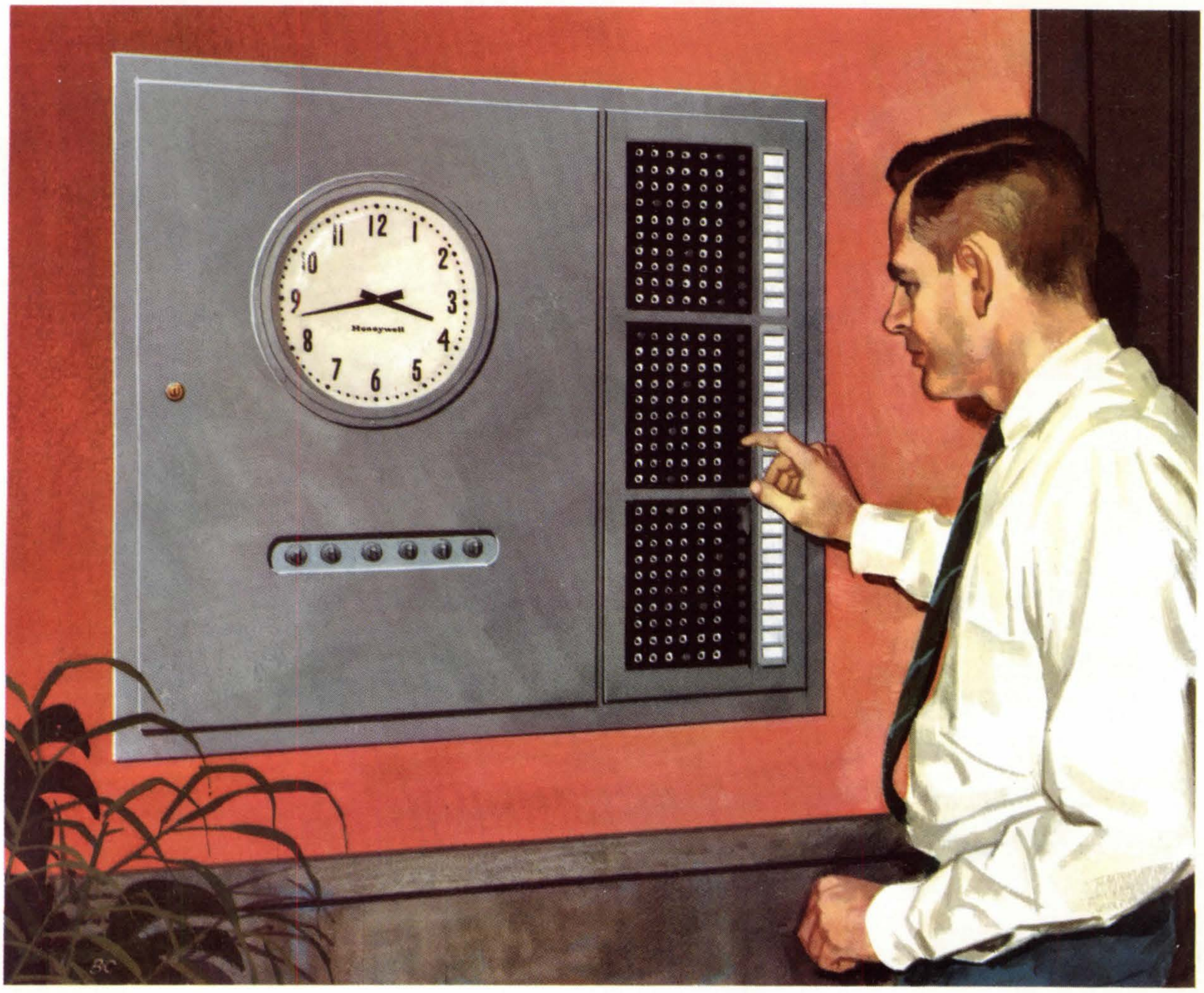
There are many other areas where the present volume is irritating to one familiar with the authors' first book. While the coverage of acoustics in *Summer Air Conditioning* was fairly cavalier, it was at least coverage. In *Winter Air Conditioning* there is actually less data on noise control *for furnaces* than there was in *Summer Air Conditioning*, which included a quite satisfactory two-page summary of methods of silencing a forced warm-air furnace installation. There is nothing on this problem in the present volume. Or take warm-air furnaces: there is actually almost as much technical material on what the authors themselves admit is "the nearly obsolete warm-air gravity heating system" as there is on today's forced-warm-air furnaces. If one were to be guided by the index, one would assume that there was almost nothing at all on forced-warm-air —for it contains only two minor references to the subject, completely omitting all mention of the long chapter, "Forced-Warm-Air Heating Systems," and the succeeding one, "Design of Forced-Warm-Air Systems." This seems to me to be inexcusable, as does the monotonously repetitious use of the same illustrations in both books.

Therefore, good though the present volume is "on its own" (forgetting the omissions pointed out above), it is impossible to recommend it. The present publishers (the first book, which was originally put out by the Windsor Press in Chicago, is now also issued by the

(Continued on page 230)

Three Important Signal Systems from Honeywell!

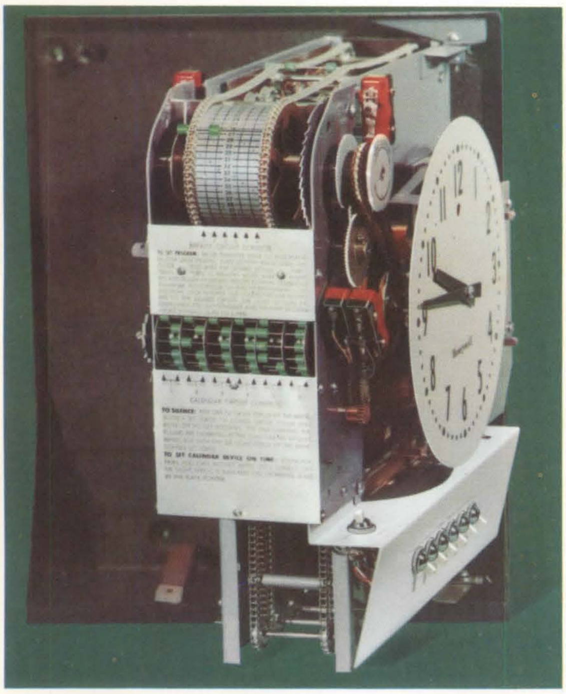
- *Clockmaster Time and Programming Systems*
- *Fire Detection and Alarm Systems*
- *Surveillance Alarm Systems*

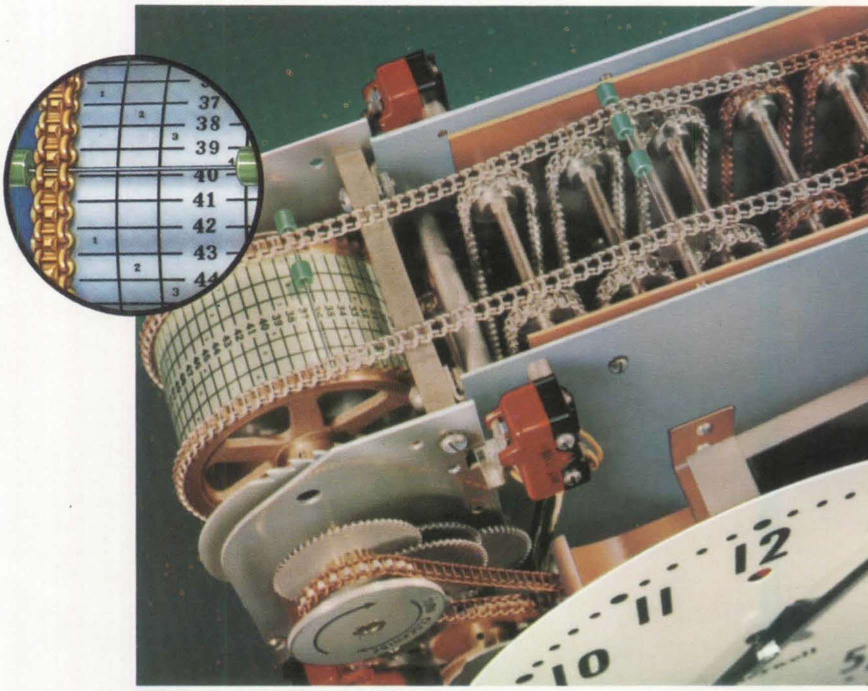


Honeywell Clockmaster* Systems are available in either synchronous wired or minute impulse types. In both systems Honeywell furnishes flush or surface mounted clocks in 9″, 12″, 15″ or 18″ dials. Both systems are self-correcting every hour with independent correction for each clock in the system.

A switch on the master clock permits substituting manual switching or silence instead of automatic programming. Quick-change calendar device permits silencing any circuit during any 12 hour period of the week. A spring power unit is available for emergency use during power failure. Honeywell's system is especially wanted in schools because it offers the easiest-to-set programming on the market.

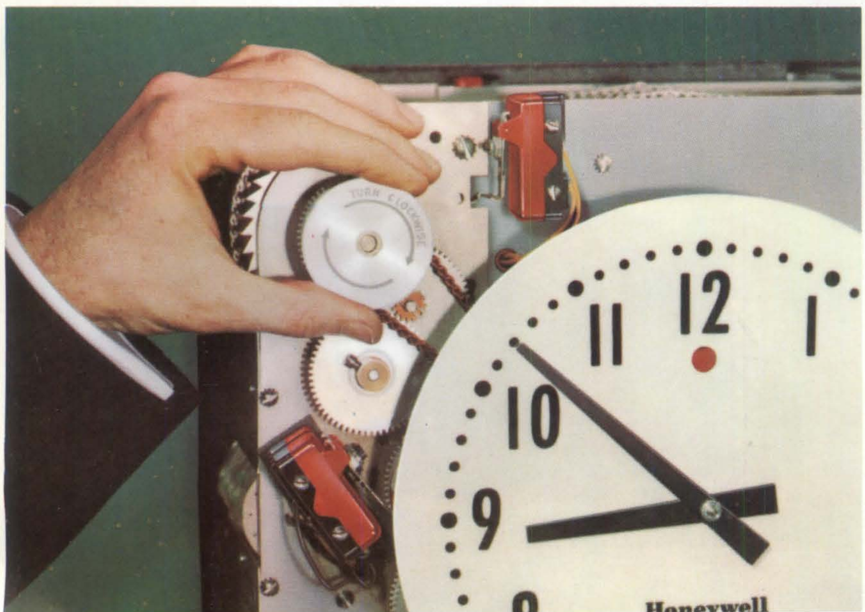
Here's why Honeywell Clockmaster Programming is the easiest to set!





Easy-to-set signal drum. Honeywell's Clockmaster eliminates fuss and bother from program setting. Just turn signal drum to time, slip steel pin through chain links and slide on one of the reusable plastic rollers. To change signal, roller can be shifted without affecting any other part of the program. Special round pin-in-square-hole construction holds each signal roller firmly in place.

Easy-to-read numbers: Link chain ruggedness. Numbers on the signal drum are large, easy to read, and never confuse the program setter. Two precision link chains, color-coded for day-night identification, guide the entire program whether it includes three circuits or six. Chains are rated at twenty times load for insurance against breakage. Chains run continuously over idler gears. No piling at bottom of cabinet.

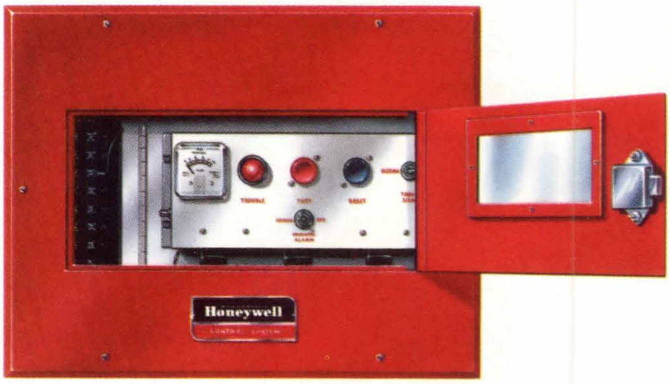


Dial-it clockwise program unit. Master time and master signal units are positively linked together. No chance for them to get out of step. When a program is set, the time setting knob is turned. As the clock hands reach the desired time, the program drum turns, too. In the same way, if power is interrupted, programmer runs on spring power with the master clock. When power is restored, signals again are right on schedule.

Honeywell's complete fire detection and alarm equipment offers greater flexibility... one reliable source!

Detector

Manual Station



W247 Panel

Now depend on one reliable source, Honeywell, for a fire detection and alarm system to meet the requirements of any building. Honeywell furnishes manual, automatic and sprinkler-water-flow systems, singly or in combination, furnishes all components, too—panels, detectors, manual stations, switches, bells, horns and buzzers. They're all built to rigid quality standards—all backed by Honeywell and famous Honeywell service.

Numbered lights identify a fire's location with Honeywell's W237 panel. This enables a supervisor to direct immediate fire fighting measures. Other features of this system include electrical supervision of the detecting circuit. Trouble signal and light indicate any wiring break. Signal may be silenced until repairs are made but trouble light stays on. Alarm will sound even if there is a break in the detecting circuit. And entire system may be tied in to local fire and police headquarters.

Honeywell's W247 panel uses a 2-wire circuit designed so that both detector and alarm circuits are electrically supervised. Any wiring break is immediately indicated by a trouble signal. If system is connected to a municipal alarm, a switch disconnects it during fire drills. Features large bell capacity—up to 5 bell circuits operating a total of up to 50 bells.

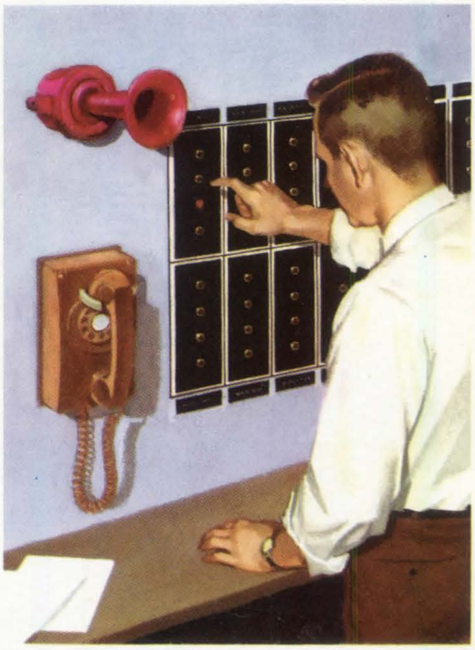
Honeywell Surveillance Alarm Systems
help prevent breakdowns of critical equipment
with economical one-man supervision

Wherever important operating equipment is scattered throughout a building or group of buildings it requires frequent checking. However, it needs actual maintenance attention only if there is trouble. Honeywell Surveillance alarm system replaces intermittent personal checking with continuous automatic supervision of boilers, compressors, tank levels, fans, motors and other critical equipment.

Red lights identify and locate trouble. Panel supervisor at central location can communicate with maintenance men who will correct trouble before it becomes extensive enough to cause a breakdown.

Unique circuitry permits a single pair of wires to carry warning signals from several pieces of equipment in the same area and to provide emergency communications with the area.

All connecting wires are electrically supervised so that any wiring break sounds a trouble signal. Thus the system supervises itself as well as the equipment it guards.



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And it's backed by 112 Honeywell sales-service offices throughout the country which bring service personnel within reach of any installation.

For more information about this Honeywell Maintenance Agreement or about any of the systems described here, call your local Honeywell office. Or write Honeywell, Dept. ES, Mpls. 8, Minn.

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reviews

(Continued from page 230)

15 E. 26 St., New York 10, N. Y., 1959. 710 pp., illus. $10.50

Here is a book with just one chapter of concentrated interest for architects—the first. It is of interest because it deals with the wide aspects of power, such as the difference between industrial and public utility plants, the relative incidence of private and Federally-financed power, the evidence that *improvements in* the burning of fossil fuels is going to make the advent of atomic power for general consumption an extremely difficult goal.

Of particular value is the presentation in Chapter I of the anatomy of a power plant, since a knowledge of the plant's internal arrangement is as important to the architect who houses it as is the anatomy of the human body to the artist who attempts to clothe it harmoniously in flesh.

Several of the illustrations present the relative positions of the component machinery with respect to each other, so that their combined effect on the ultimate shape and appearance of the plant become obvious. Here are explanations in full view for the various humps and projections that afflict the skyline, and for the auxiliary structures that arise in various spots in the immediate area.

In these illustrations, each of the important power-making parts is named or otherwise identified by numbers and legend. This system of marking, together with the text discussion of the sequential conversion of fuel into kilowatts, makes the procedure easy to follow, and the possession of a degree in engineering is not needed to understand it.

This same rich chapter indicates the notable differences in the persistence and thoroughness with which the designers attempt to wring out energy from the fuel in large plants, compared with small ones. For example, the average industrial power plant seldom justifies the installation of more than one feed water heater, whereas in a central utility station we may observe any number from four to eight, and a little extra heat is added in each one. It seems as though no energy

(Continued on page 242)

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reviews

(Continued from page 238)

is lost except perhaps in the steam to the whistle.

This is all of direct interest to the architect, for each increase in complexity is reflected in increased complexity of the load bearing structure, and of the size and shape of the building. More heaters, more cost, more trouble to keep inside the budget.

Potter notes that approximately 76.1 percent of the nation's power-generation facilities are backed by private capital, that is, owned and operated by industrial companies and public utilities. Of the remainder, 11.5 percent is financed by Federal agencies, including the Rural Electrification Administration, and 6.1 percent by States and municipalities.

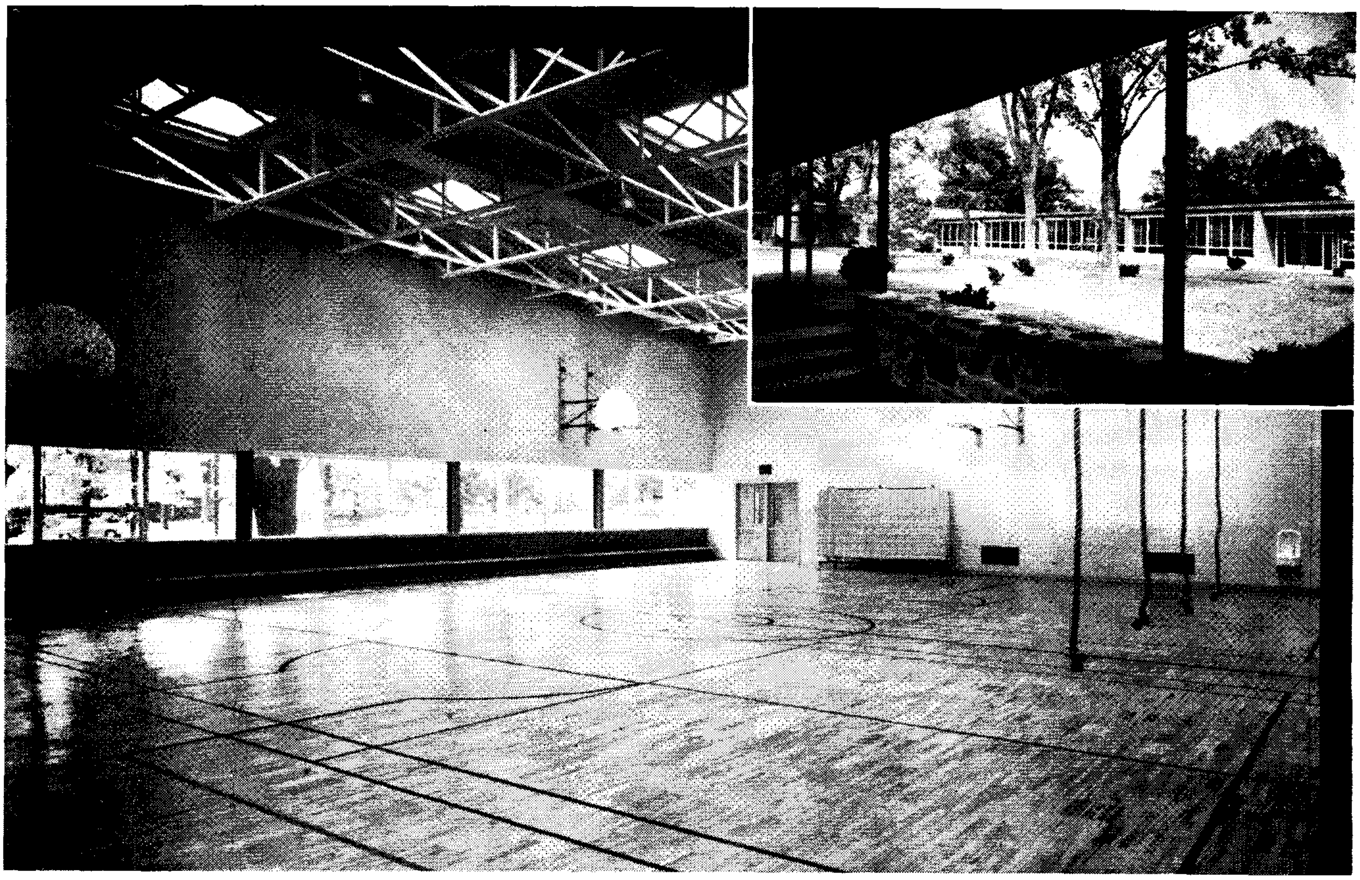
These figures are interesting because they indicate the various types of activity in which power is a factor, and in which the architect-engineer may expect to have a part, if he is not already so engaged.

Fifteen chapters follow the first, all devoted to engineering theory, and the characteristics of pumps, steam turbines, gas turbines, boilers, diesel engines, hydroplants, and nuclear reactors. The mixture is familiar, since it is met in most college textbooks on mechanical engineering; in fact this is a retitled second edition of Potter's *Steam Power Plants*, first issued in 1949.

There is little in these chapters for either architects or practicing engineers, since the book is written for students. The chapter on gas turbines comments on housing for such plants as being comparatively simple, the comparison probably being made with the housing of steam plants. In the following chapter on diesels we learn that a small power plant, diesel driven, may cost as much as $250 for an installed kilowatt, and $175 for a large plant. In either case, housing is estimated at 15 percent of the total cost. At least, if we know how large a diesel generator is projected, we can readily estimate from the given figures how much the cost of housing will be.

Except for these minor details of information, the chief value of the book to the average architect is in its first chapter presentation of the anatomy of power.

(Continued on page 248)



Floor of Northern Hard Maple, Patterned Design. Veterans Park Elementary School, Ridgefield, Conn. Sherwood, Mills and Smith, Architects, Stamford, Conn. Photographs: Courtesy Ezra Stoller.

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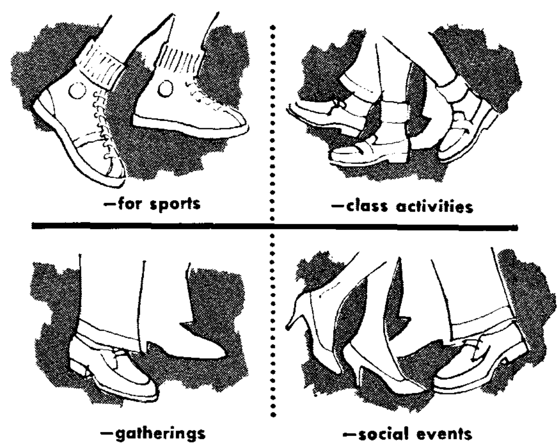

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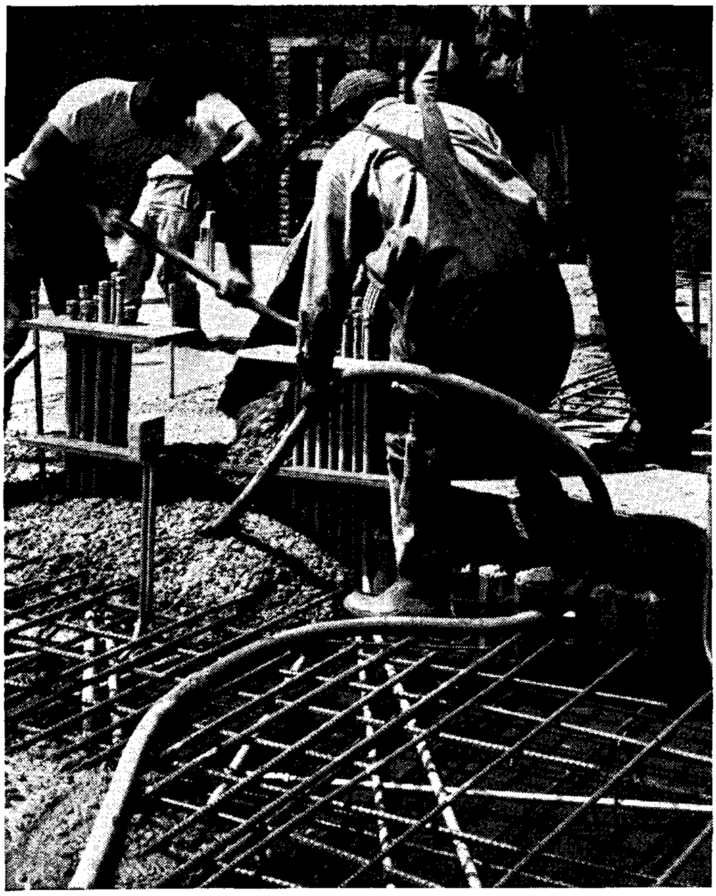

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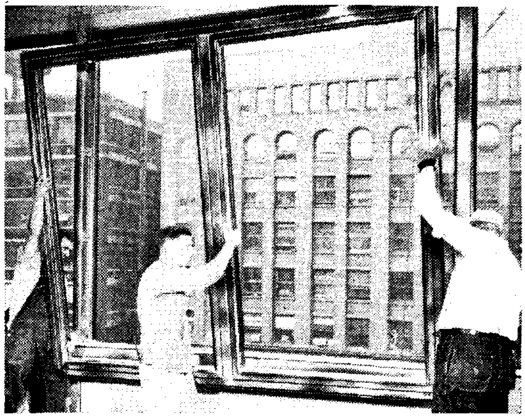

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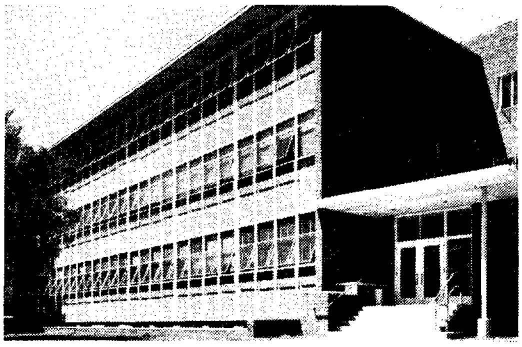

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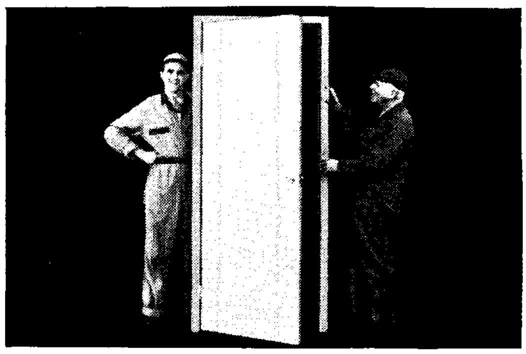

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"The members of the jury looked for certain qualities which they believed to be very important in promoting higher standards of community planning. They hoped to find examples which could best be adapted to the requirements of the average housing development. They gave, therefore, more weight to economy and logic than to novelty."

1959 Awards

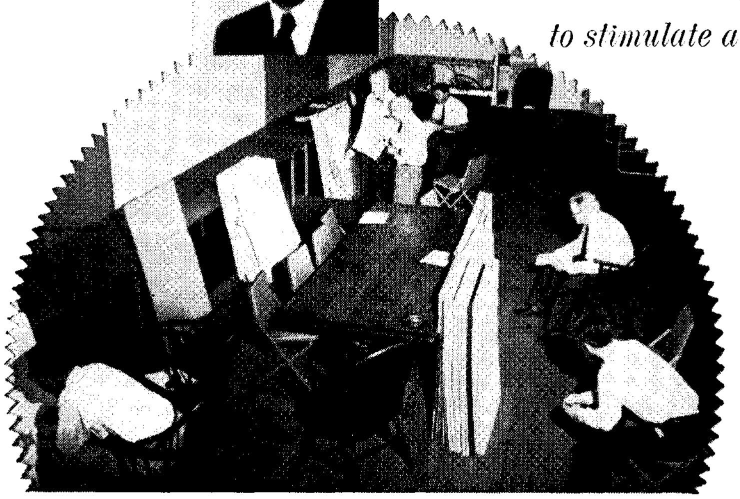
Mastic Tile Corporation of America

$25,000 Annual Design Competition

to stimulate a major contribution to better living for the middle income family

Reginald Roberts
A.I.A.

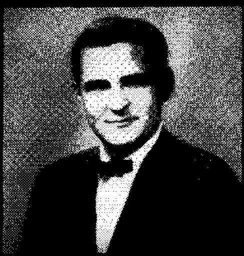
A. Gordon Lorimer
A.I.A.
Professional
Advisor



QUALITY CONTROLLED
MATICO PRODUCTS

GRAND PRIZE
$10,000

Howard R. Meyer, F.A.I.A.
Dallas, Tex.



James Reece Pratt, A.I.A.
Dallas, Tex.

John Harold Box, A.I.A.
Dallas, Tex.

SECOND PRIZE
$5,000

Manuel Dumlao
Birmingham, Mich.

John Buenz
Birmingham, Mich.

Robert Burley
Birmingham, Mich.

Edward Kovach
Birmingham, Mich.

THIRD PRIZE
$3,000

Paul A. Kennon
Birmingham, Mich.

Chartier Newton
Birmingham, Mich.

Heinz-Henning Huth
Birmingham, Mich.

Philip J. Kinsella, Jr.
Birmingham, Mich.

MERIT AWARDS
$250 each

Richard A. Miller, New York, N. Y.
Robert Zion, New York, N. Y.
Harold Breen, New York, N. Y.
Peter Bradford, New York, N. Y.
Larry E. Charity, New York, N. Y.

Hayahiko Takase, Birmingham, Mich.
Kyosuke Yoshioka, Birmingham, Mich.

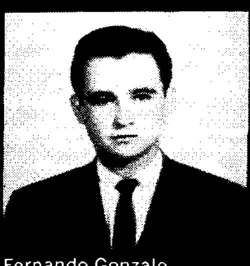
Chih-Chen Jen, Glendale, Mo.

Paffard Keatinge Clay, Highland Park, Ill.

STUDENT DIVISION

FIRST PRIZE
$2,500

George Ohanian
Pratt Institute



Fernando Gonzalo
Pratt Institute

SECOND PRIZE
$1,500

Ernest G. Schweibert, Jr.
Princeton University

THIRD PRIZE
$1,000

G. Mary Bulota
University of Illinois

William L. Miller
University of Illinois

MERIT AWARDS
$250 each

Bill Batson, University of Illinois
David Lawson, University of Illinois

Charles A. Platt, Harvard School of Design
David I. Smotrich, Harvard School of Design
Charles P. Parker, Harvard School of Design

Philip Gold, University of Illinois
J. Stroud Watson, University of Illinois
(Special Commendation)

William J. Lindsey, University of Illinois
William H. Fosse, University of Illinois

CERTIFICATES OF ACHIEVEMENT

GENERAL: Michael F. Gebhart, Herbert A. Magoon, Calvin N. Lundquist; Thomas N. Larsen, Peter Woytuk; Thomas E. Tomsik, Robert Blatchford; Alan Hamilton Rider; Thomas H. Hodne, Dennis W. Grebner; Malcolm M. Davis, William Lindemulder.

STUDENT: J. Michael DeLapp, Ben W. Carr; Philip M. LeBoy, Ernest B. Phillippson; Ronald E. Ginn, Richard J. Paulin; William Holzbauer; Malcom M. Davis, William Lindemulder (also in General Competition).

MASTIC TILE CORPORATION OF AMERICA, Houston, Tex. • Joliet, Ill. • Long Beach, Calif. • Newburgh, N.Y.

reviews

(Continued from page 242)

Some engineers may like it as refresher reading, although for men already practicing in the field of power much more exhaustive treatment of the subject should be available on their own bookshelves.

ROBERT H. EMERICK
North Charleston, S. C.

old-fashioned modern

The Work of G. Rietveld, Architect. *Theodore M. Brown. A. W. Brunna & Zoon, Utrecht, The Netherlands, 1958. Distributed in U.S. by Wittenborn & Co., 1018 Madison Ave., New York, N. Y. 198 pp., illus. $9.50*

This biography and analysis—in English—of the work of the practicing Dutch Architect Rietveld is in many respects interesting, independent of its evaluation of this architecture of yesterday. In its time, this type of work obviously represented a necessary step toward the manifold developments set off by 19th Century eclecticism. Rietveld, first a draftsman of jewelry, studied architectural drawing, later became a carpenter, and not until 1918, as a man of thirty, really began to work in the field of architecture. There he met such members of the *Stijl* movement as Van Doesburg and Oud. He himself joined this group one year later.

This *Stijl* movement, granted all its historical merits, seems to us today as outdated as *l'art nouveau* and the *Jugendstil.* We are aware of its importance, though primarily negative, in helping to kill off the mish-mash imitations of eclecticism, but its own creations appear to us today extremely dogmatic, crude, and without feeling for those values which are common to both the architecture of earlier centuries and what we justly call "creative" modern architecture. One must look only at Rietveld's Schroeder House, 1924, Utrecht, widely illustrated and analyzed in this monograph, to be terrified by the primitivism of the relations of geometric elements and by the blind awe for straight lines and rectangular planes, materialized in the form of slabs, posts, and beams. Quite rightly, the author believes that using cardboard and match sticks for the architectural model, instead of clay, has influenced the final design. There is no feeling for space anywhere, best demonstrated by a juxtaposition with Frank Lloyd Wright's space-conscious "Falling Water" (1936), which at first glance seems to be somewhat similar.

The furniture designed by Rietveld reflects the same infatuation with the rectangle, and even the chairs, extremely uncomfortable, show an unsensuous dry rigidity even if they are molded in one piece. Some pieces of furniture, like the "zig-zag chair" of 1934, look like movie props intended to ridicule the modern movement.

The proclamations of *De Stijl*, formulated in 1924 by Van Doesburg, cannot help us very much. " . . . the unity of time and space gives the architectonic appearance a new and completely plastic

(Continued on page 252)


Daggett, Naegele & Daggett, Inc., Architects
MODERN DOOR CONTROL BY LCN • CLOSERS CONCEALED IN HEAD FRAME
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LCN CLOSERS, INC., PRINCETON, ILLINOIS
Construction Details on Opposite Page

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Coefficient (db)	23	27	24	24	27	27	30	35	41	50	56

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Coefficient (db)	30	31	26	29	30	30	31	35	38	45	54

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reviews

(Continued from page 248)

aspect (four-dimensional, time-spatial plastic aspects)." (*Sic!*) Rietveld's row-houses from the Thirties, in Utrecht, Vienna, etc., testify clearly to the influence of the house types of the Stuttgart Weissenhofsiedlung, 1927, and the stimulation by Gropius, Le Corbusier, and Mies van der Rohe. It is only after 1939 that Rietveld seems to have become sceptical about his own dogmatism. Houses such as those in Doorn (1939), in Breukelerveen (1941), and his most recent creations, a house in Velp (1951), a sculpture pavilion in Arnhem (1954), a textile factory in Bergeyk (1956), the Netherlands pavilion at the Venice Biennale (1954), show a definitely increased feeling for space. But all these later buildings are certainly not original and do not betray any individual hand. They are no longer "Rietveld" but just good modern architecture as it has been done during the last two decades everywhere and by many different architects.

The reviewer regrets indeed that he differs so basically from the author's evaluation of Rietveld's work. Nevertheless, he appreciates this new publication, excellently printed and laid out, from a different viewpoint. It seems to him to be in no way a stimulation for contemporary creative architects—on the contrary—but a very worthwhile contribution to the history of architecture, describing highly interesting and probably necessary phases in the development of modern architecture.

PAUL ZUCKER
New York, N. Y.

BOOKS RECEIVED

Rehabilitation Center Planning: An Architectural Guide. F. Cuthbert Salmon and Christine F. Salmon. The Pennsylvania State University Press, University Park, Pa., 1959. 164 pp., illus. $12.50

The Modern Slide Rule. Stefan Rudolf. The William-Frederick Press, 391 E. 149 St., New York, N. Y., 1959. 70 pp. $5 (paperbound)

Terms Used in Archaeology: A Short Dictionary. Christopher Trent. Philosophical Library, Inc., 15 E. 40 St., New York 16, N. Y., 1959. 62 pp. $2.75

Business and Specialised Publications of Great Britain. Council of the Trade and Technical Press, Imperial House, Kingsway, London WC2, England, 1958. 111 pp. Free, from British Information Services, 45 Rockefeller Plaza, New York 20, N. Y.

Introduction to Twentieth Century Design: from the Collection of the Museum of Modern Art. Arthur Drexler and Greta Daniel. Museum of Modern Art, 1959. Distributed by Doubleday & Co., Inc., Garden City, N. Y. 99 pp., illus. $2.95

The New American Painting: As shown in eight European countries 1958-1959. The Museum of Modern Art, 1959. Distributed by Doubleday & Co., Inc., Garden City, N. Y. 96 pp., illus. $2.95

Symbolism in Liturgical Art. LeRoy H. Appleton and Stephen Bridges. Charles Scribner's Sons, 597 Fifth Ave., New York 17, N. Y., 1959. 120 pp., illus. $3.50

Camp Site Development. Julian Harris Salomon. Girl Scouts of the U.S.A., 830 Third Ave., New York 22, N. Y., 1959. 160 pp., illus. $5

Concrete: The Vision of a New Architecture. *Peter Collins. Horizon Press Inc.,* 220 W. 42 St., New York, N. Y., 1959. 308 pp., 104 plates $12.50

The Pelican History of Art. Edited by Nikolaus Pevsner. Volume Z13. *Carolingian and Romanesque Architecture: 800-1200.* Kenneth John Conant. Penguin Books Inc., 3300 Clipper Mill Rd., Baltimore, Md., 1959. 388 pp., 184 plates $12.50

A Diderot Pictorial Encyclopedia of Trades and Industry. Denis Diderot. Edited by Charles Coulston Gillispie. Dover Publications, Inc., 180 Varick St., New York, N. Y., 1959. Two vol. set, 485 plates $18.50

Analysis of Pipe Structures for Flexibility. John Gascoyne. John Wiley & Sons, Inc., 440 Fourth Ave., New York, N. Y., 1959. 196 pp. $7.50

Small Homes in the New Tradition. François C. Morand. Sterling Publishing Co., Inc., 419 Fourth Ave., New York, N. Y., 1959. 144 pp., illus. $4.95

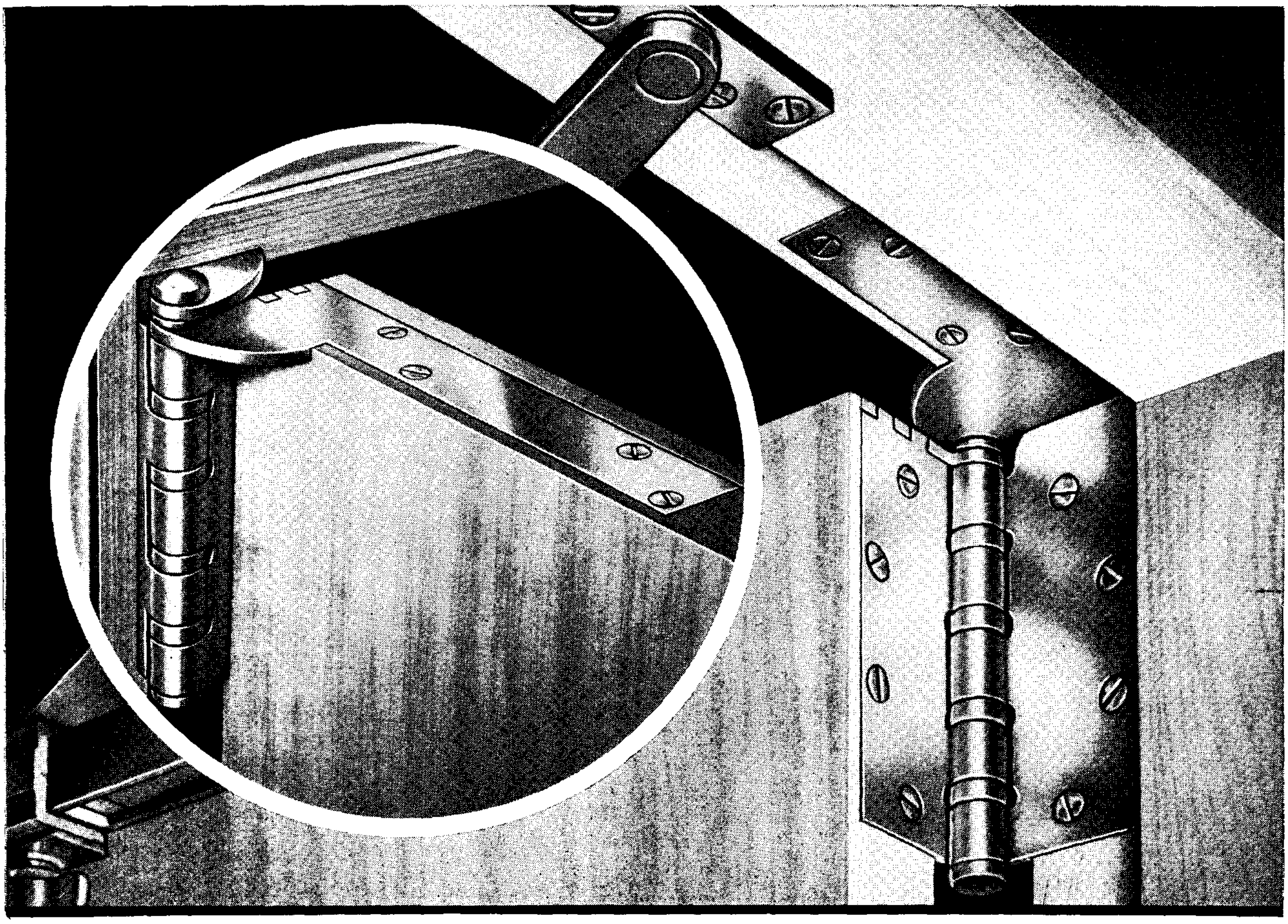
Six Great Architects. Robert Lutyens. Hamish Hamilton, London, England. Distributed in U.S. by British Book Centre, Inc., 122 E. 55 St., New York 22, N.Y. 190 pp., illus. $3.25

Handbook of Architecural Practice. Eighth Edition. Edited by Clinton H. Cowgill. The American Institute of Architects, 1735 New York Ave., Washington, D. C., 1958. $8

Planning in a Democratic Society. John R. P. Friedman. Chandler-Davis Publishing Co., West Trenton, N.J., 1959. $3.75

Techniques of Urban Economy Analysis. Ed. Ralph W. Pfouts. Chandler-Davis Publishing Co., West Trenton, N.J., 1959. $5

Japanese Gardens For Today. David H. Engel. Charles E. Tuttle Co., Rutland, Vt., and Tokyo, Japan, 1959. 270 pp., illus. $15



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Pat. Pend.

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Interlocked corners, of pivot and butt leaves, prevent individual sidewise motion of either, so that strain is shared equally by both. The combination of interlocked corners and mutual pin allows locating the screw holes so as to minimize danger of splitting the door parts while improving fastening.

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Stanley's Pivot Reinforced Hinge was subjected to accelerated and especially severe break-down tests in Stanley's Research Laboratories. Operating under conditions in which every cycle of a heavy door was accompanied by overloads only occasionally encountered in actual day-in-day-out, year-in-year-out use, this amazing hinge not only showed exceptional ability to withstand abuse but also decisively increased longevity over that demonstrated by conventional hinges under normal conditions.

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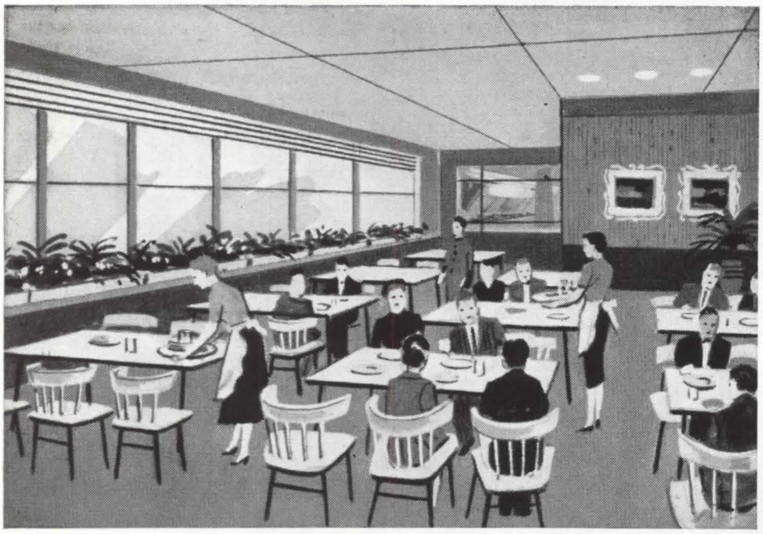

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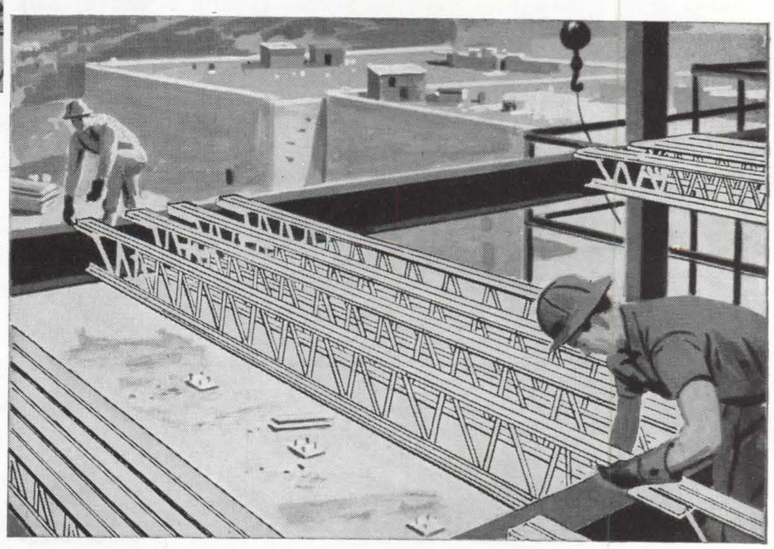

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notices

p/a congratulates

JOHN J. DENBROCK, Assistant to the Vice-President in charge of plastics, and WAYNE THORNE, Manager of the building materials division in General Tire Plastics Division of THE GENERAL TIRE & RUBBER COMPANY.

KARL BAUMLER, appointed Manager of Manufacturing for PITTSBURGH CORNING CORPORATION.

L. WILLIAM ROEHDER, appointed Director of the newly-created Allied Products Division of UNITED STATES PLYWOOD CORPORATION.

RONALD C. CURRIE, elected Vice-President and Marketing Manager of ORR & SEMBOWER, INC.

new partners, associates

VICTOR M. GARCIA, made full Partner, in charge of the San Juan office of FRED S. DUBIN ASSOCIATES, Consulting Engineers. Also in the San Juan office, SAM FOGELMAN, appointed Associate-in-Charge of Air Conditioning, and RIVERE VALENTIN, as Associate-in-Charge of Sanitary, Civil, and Plumbing Engineering.

JOHN V. SHEORIS, joins the staff of HARLEY, ELLINGTON & DAY, INC., Architects-Engineers, Detroit Mich., as Chief Designer.

LEONARD SCHEER, an Associate in the firm of EDGAR TAFEL ASSOCIATES, Architects. 14 E. 11 St., New York.

election produces name change

With the election of DENVER MARKWITH, JR., as President, the Los Angeles commercial and industrial development firm of BUTTRESS & MCCLELLAN, INC., announce the new name of BUTTRESS, MCCLELLAN & MARKWITH, INC.

program expansion

Major expansions and improvements in availability and packaging of valves and fittings for copper and brass pipe and tube are being instituted by CHASE BRASS & COPPER COMPANY, Waterbury 20, Conn.

merger

EHRET MAGNESIA MANUFACTURING COMPANY, Valley Forge, Pa. and BALDWIN-HILL COMPANY, New York, N.Y., have completed their merger and become BALDWIN-EHRET-HILL, INC. Officers of the company are: WILLIAM H. HILL, Chairman of the Board; ALVIN M. EHRET, JR., President; EDWARD R. STEVENS, Executive Vice-President; HENRY E. HOWELL, HAROLD L. HUMES, MILES M. WILSON, Vice-Presidents; and WILLIAM A. SCHREYER, Secretary-Treasurer. With home office at 500 Breunig Ave., Trenton, N.J., and five plants and offices located in major cities throughout the country, the new company will manufacture industrial and home insulations, and acoustical products.

acquisition planned

THE NATIONAL GYPSUM COMPANY announces that it will buy the MURRAY TILE COMPANY, maker of building tile with plants in Cloverport and Lewisport, Ky.

announces retirement

THE YOUNG RADIATOR COMPANY, Racine, Wisc., announces the retirement of J. J. HILT, Vice-President of Sales, after 32 years of service to the Company. An original employe, his retirement became effective on May 1, 1959.

new council

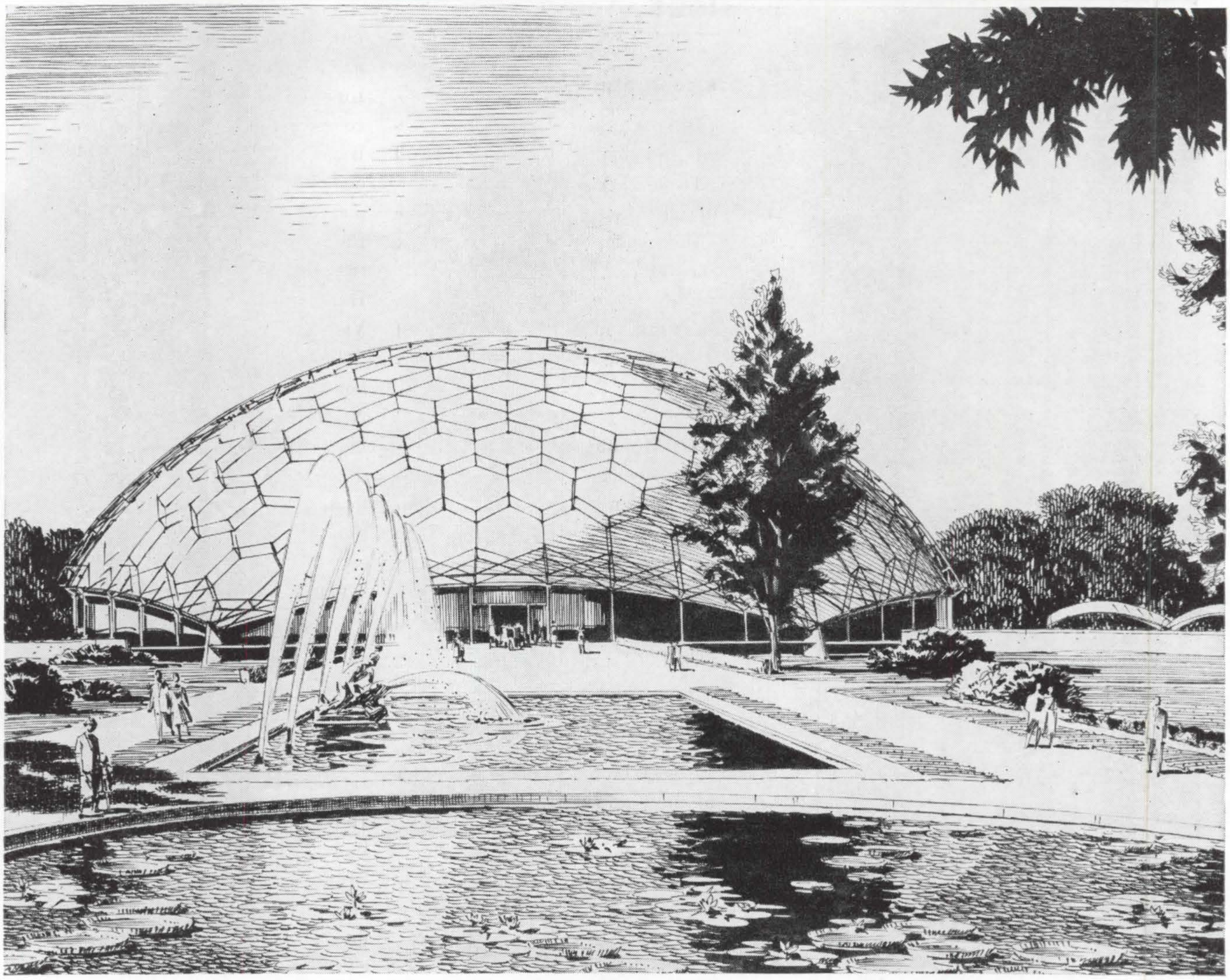
The formation of a STAINLESS STEEL PLUMBING FIXTURE COUNCIL of the PLUMBING MANUFACTURERS ASSOCIATION was announced by the Council's newly-elected Chairman, ERNEST H. G. MARON.

new firms

C. WALTER SCOTT, WILLIAM W. LOUIE, and K. D. EISENHART, partners in the firm of SCOTT & LOUIE, Arcihtects-Engineers, 610 Dooly Bldg., Salt Lake City, Utah.

DONALD E. ANDERSON, KENNETH C. NASLUND, and JACK R. JANNEY, principals in the firm of THE ENGINEERS COLLABORATIVE, Consulting Engineers, 116 S. Michigan Ave., Chicago, Ill. A model analysis laboratory is maintained by the firm at 570 Northwest Highway, Des Plaines, Ill.

PHIL H. FEDDERSEN, Architect, 818 N. Second St., Clinton, Iowa.



Owner: Missouri Botanical Garden / Architect: Murphy and Mackey, St. Louis / Engineer: Synergetics Inc., Raleigh, North Carolina / Dome Design: R. Buckminster Fuller / Aluminum Materials: Aluminum Company of America

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The re-building of Shaw's Garden brings to the forward-looking city of St. Louis a lasting monument, the functional yet esthetic design of which is in keeping with the future. This world-famous center will combine facilities for scientific study with the cultural values of a fascinating educational exhibit for the public.

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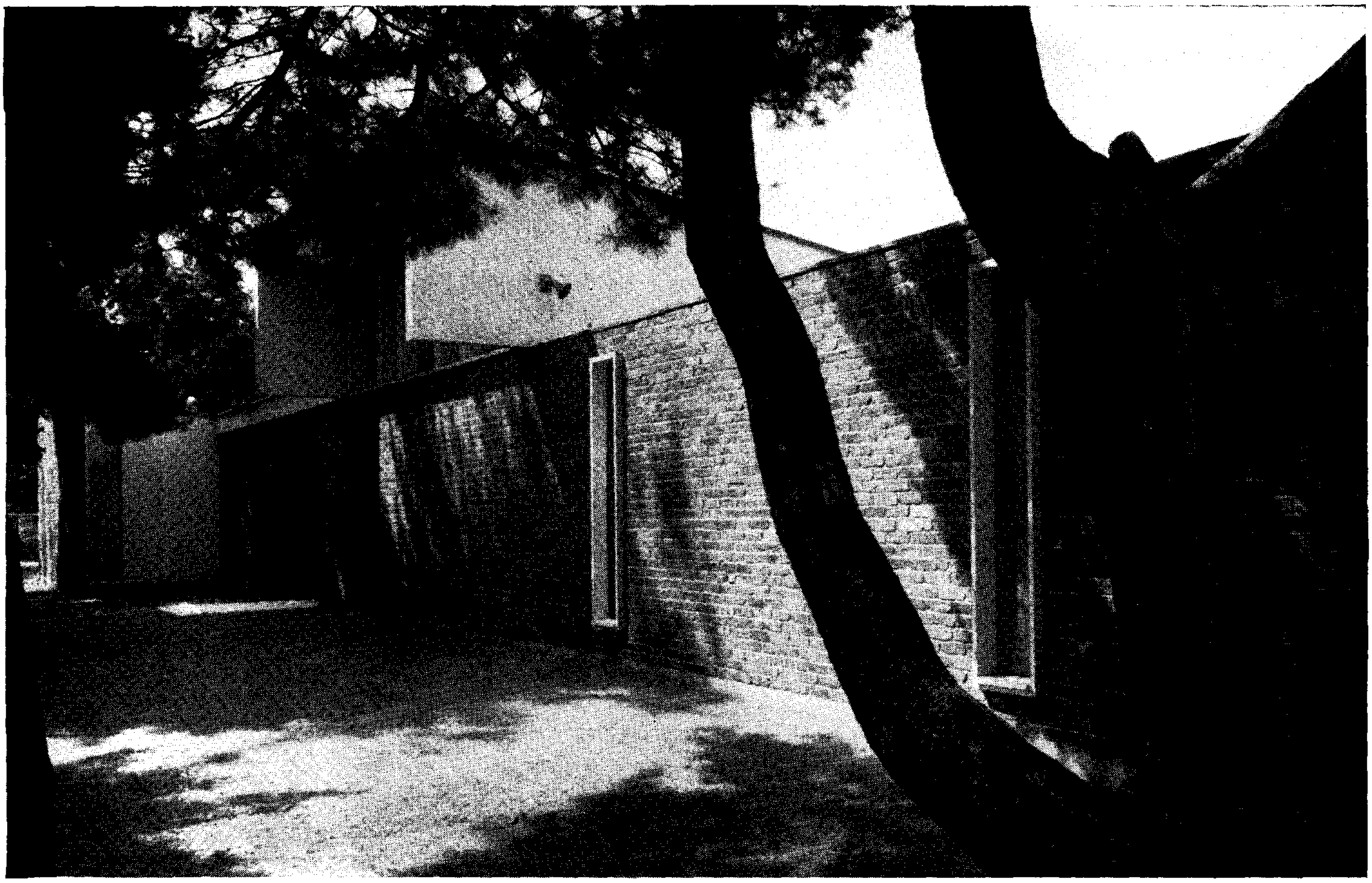
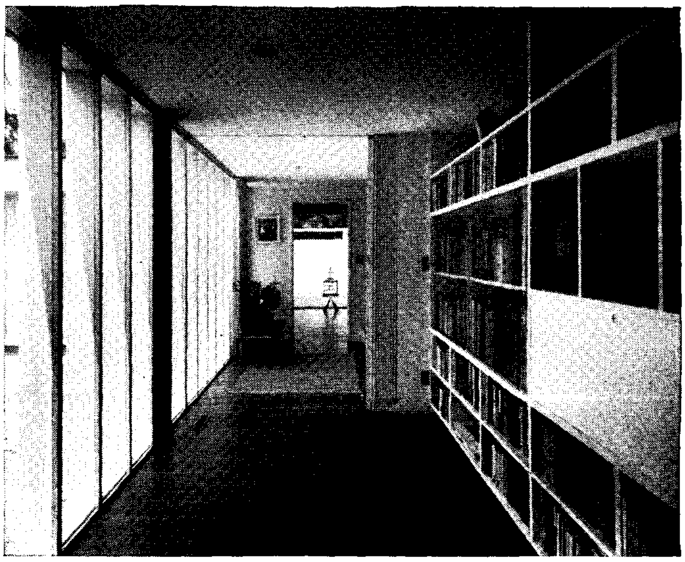
Columbus, Ohio



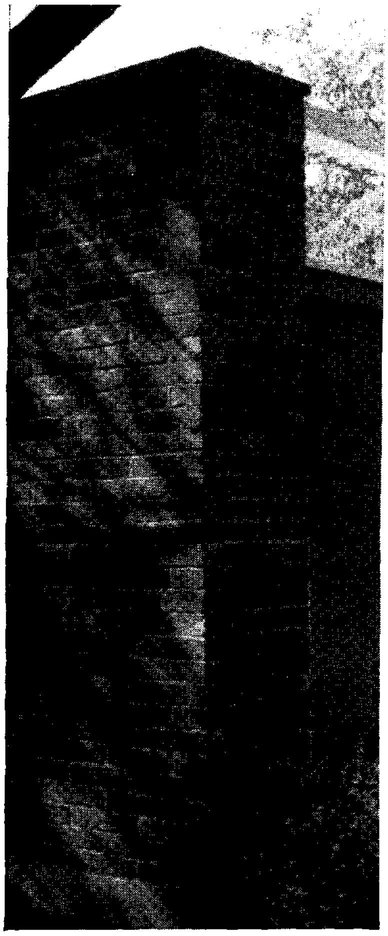
In the home of José Luis Sert

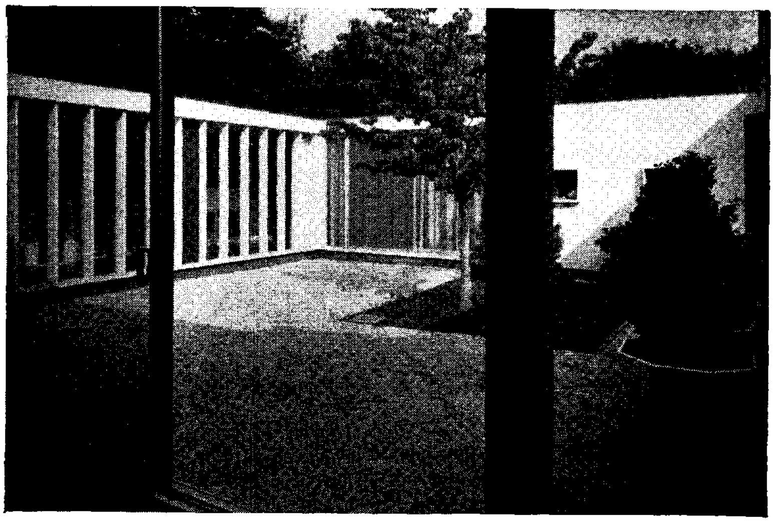
Lennox

In this Sert bedroom, as in other rooms, return air for the Lennox heating-air conditioning system is taken high in the room, with 80% of grille work concealed behind a cove moulding.



One of the floor diffusers used in the perimeter-type Lennox system is visible in this view of a hallway in the Sert House.





The liberal use of glass and sliding glass panels in the Sert House is well illustrated in this view of the interior courtyard. It posed a heating-air conditioning problem, but expert planning by the contractor and Lennox equipment were able to solve it satisfactorily.

All photographs by Louis Reens, New York City

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notices

new addresses

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D. J. ATHAN ASSOCIATES, Architects-Planners, 4302 Henderson Blvd., Tampa, Fla.

WILLIAM HERNANDEZ & EDITH HERNANDEZ, Interior, Industrial Designers, Color Consultants, 115 E. 40th St., New York 16, N. Y.

FASTH HILLSTROM & HORTY, Inc., Architects-Engineers, Guardian Life Insurance Bldg., 2649 Park Ave., Minneapolis 7, Minn.

JOHN CALVIN STEVENS II, Architect, 127 Pleasant St., Portland, Me.

MARTIN LOVETT, Consulting Structural Engineer, The Architects Bldg., 101 Park Ave., New York 17, N. Y.

appointments

MICHAEL C. A. HENDERSON, appointed head of the new Hawaii office of DANIEL, MANN, JOHNSON & MENDENHALL, Architects-Engineers, Los Angeles, Paris, London, Rome, Bangkok, Saigon, and Venezuela.

WILLIAM B. EATON, appointed Chief Architectural Designer at REYNOLDS, SMITH & HILL, Architects-Engineers, Jacksonville, DeLand, and Tampa, Fla.

new branch office

TED B. ADSIT, appointed Assistant Director of Planning at WELTON BECKET & ASSOCIATES. He will work from the firm's Los Angeles office.

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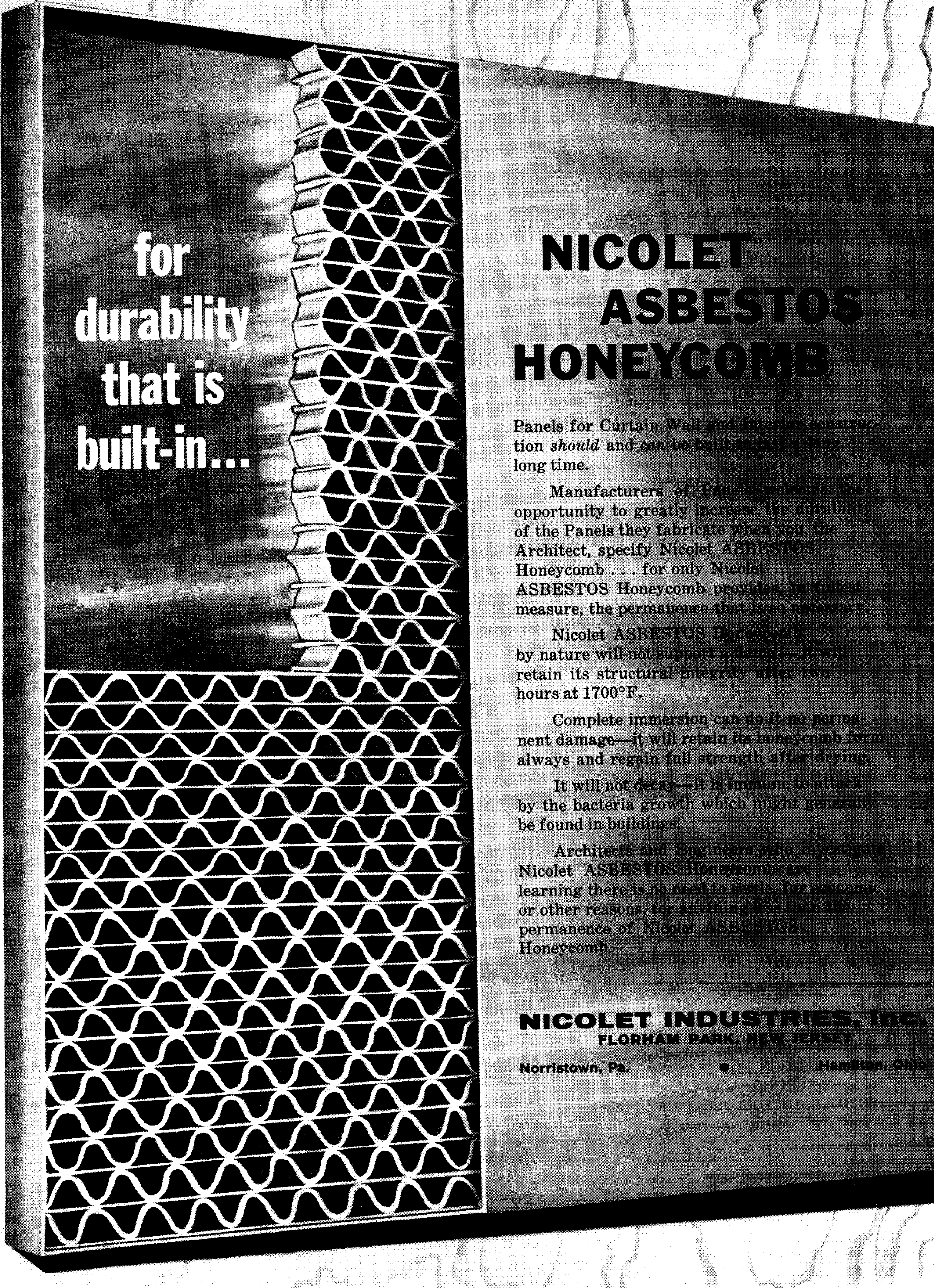

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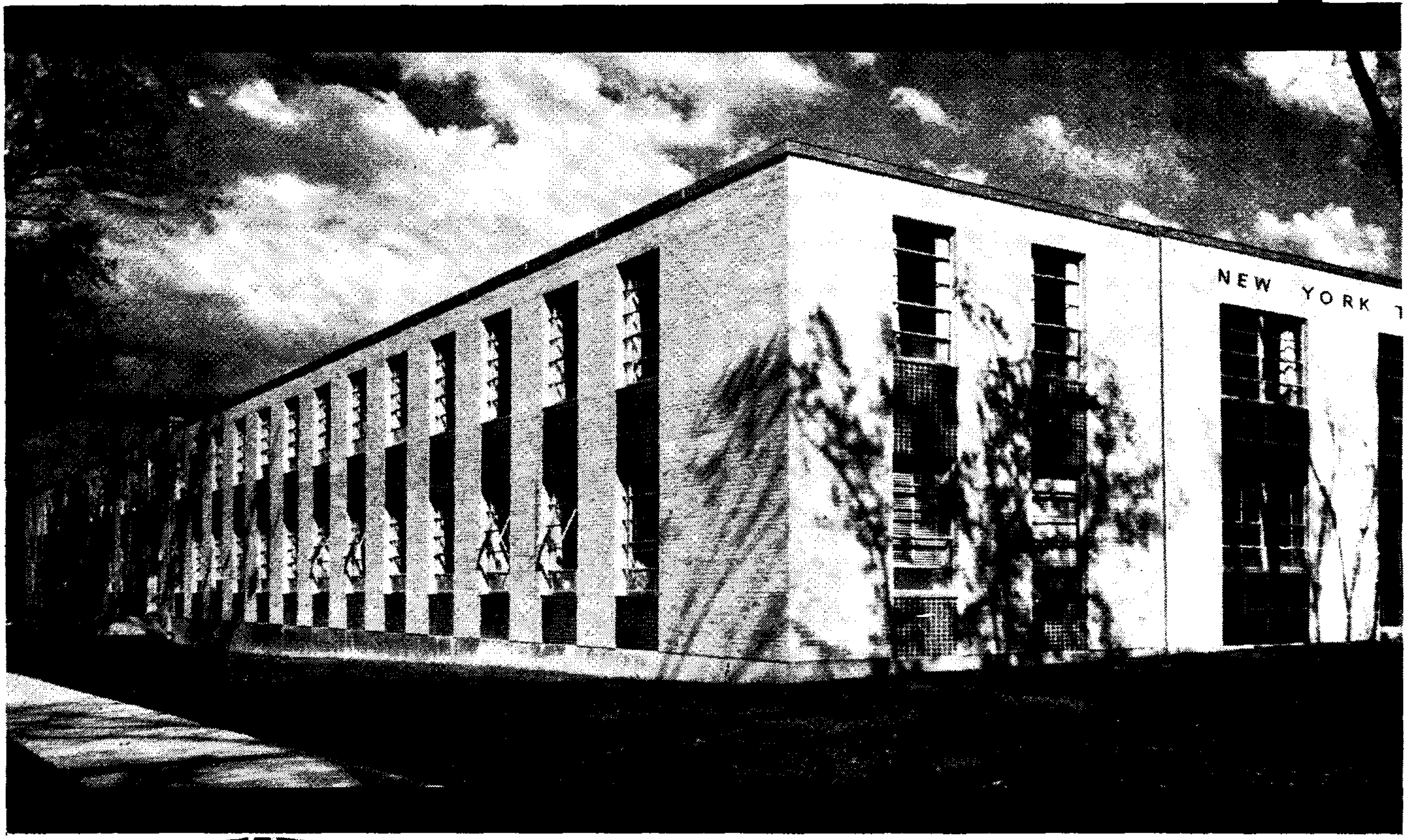
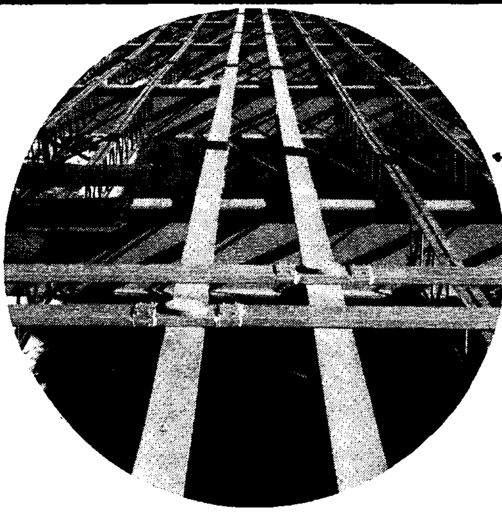
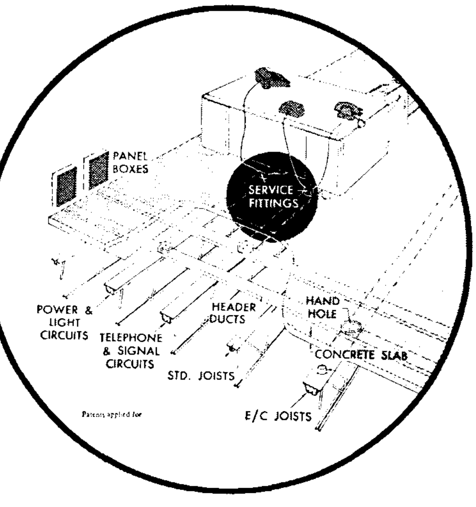
But it's NEWS when a quality system offers big savings so any building "can afford" electrification





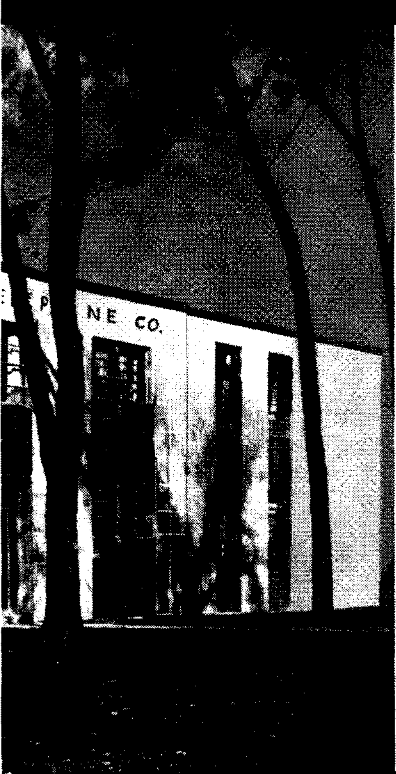
This construction view shows the clean arrangement of header ducts installed on Ceco E/C Joists. These header ducts were installed quickly and economically by an electrical crew which had never before installed a system of underfloor electrification.

Electrical, telephone and signal wires are run from the panel boxes down through the header ducts, into the top chord of the E/C Joist and up through the service fittings to desks located anywhere on the floor. Whenever desks are moved, the fittings can be installed anywhere along the joists to service the new positions.
The E/C Joist system is listed by Underwriters' Laboratories for use with standard header ducts and electrical accessories manufactured by General Electric Co., National Electric Division of H. K. Porter Co. (formerly Nepco) and Walker Bros. of Conshohocken.



TOTAL MANUFACTURING FOR THE BUILDING INDUSTRY FROM RAW TO FINISHED PRODUCTS

CECO'S E/C JOIST SYSTEM OF UNDERFLOOR ELECTRIFICATION ASSURES QUALITY WITH ECONOMY



New York Telephone Company Building, Utica, N. Y.
Architect: Frank C. Delle Cese, Utica.
General Contractor: McKay Construction Co., Oneida.
Electrical Contractor: Keller Electric Company, 36 Genesee St., New Hartford, N. Y.

When a building method offers quality at a cost lower than any competing system, that's a combination hard to beat.

Add to that down-to-earth practicality, plus design that satisfies the future . . . then you can specify with confidence.

Such is Ceco's E/C Joist system of underfloor electrification. Savings are realized because Ceco's E/C Joists do two jobs: 1—provide raceways for underfloor electrification; 2—carry the floor load. Now any building "can afford" underfloor electrification.

These advantages of Ceco's E/C Joist system were proved in the Utica, New York Telephone Company office building.

The architect specified Ceco's E/C Joist system and a commonly used alternate. The successful bidder's figures showed the Ceco system saved 56c per square foot compared with the alternate. Read what those concerned have to say:

Owner, Milton A. Abelove and Daniel B. Myers:
"The E/C Joist system satisfied our requirements of avoiding electrical obsolescence for years to come, and we saved a considerable amount of money."

General Contractor, John T. McKay:
"The savings shown in the bids were proven on the job by the Ceco E/C Joist system. I would like to erect more buildings using the same system."

Electrical Contractor, Reginald Keller:
"Installation of the E/C Joist system was practical. Our workmen were able to install it economically, even though they had never installed underfloor electrification using header ducts."

On your next job specify the Ceco E/C Joist system. Send for the facts now. Mail the handy coupon today. Ceco Steel Products Corporation. Sales offices, warehouses and fabricating plants in principal cities. General offices: 5601 West 26th Street, Chicago 50, Illinois.

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Please send the following technical literature:
☐ E/C Joist Manual #3011-A ☐ Steel Joist Catalog #3001-O ☐ Joist Load Tables #3009

name ____________
position ____________
firm ____________
address ____________
city ____________ zone ______ state ____________
☐ If student, check here for special data.

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Architect—Medium size office in suburban New York City with a growing backlog and doing top design seeking a fully qualified Architect experienced in medium and large projects. In addition to special design ability, position requires taking full charge of production phases. Projects include a wide range of work in the public, institutional and commercial fields. Good situation for individual for whom initial compensation is secondary to opportunities to do good work. Financial rewards, recognition, etc., will follow demonstrated abilities. Box 827 Progressive Architecture.

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Architects and Architectural Engineers—The architectural department of a leading midwestern manufacturing firm with facilities in U. S., Canada and foreign countries has openings for architects, architectural, and structural engineers. Work includes site studies, presentations, design and supervision of construction of industrial, commercial and office buildings required in the firm's operations. Preferred age: 25-40. Opportunity for advancement, excellent benefits and working conditions. Please furnish resume of experience and education, salary requirements and availability with first letter. Write Box 828 Progressive Architecture.

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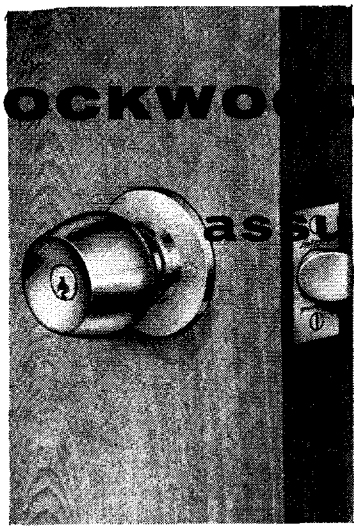
(Continued on page 268)

LOCKWOOD hidden features assure year-after-year satisfaction



Significant mechanical refinements have recently been engineered into Lockwood heavy duty cylindrical locksets.

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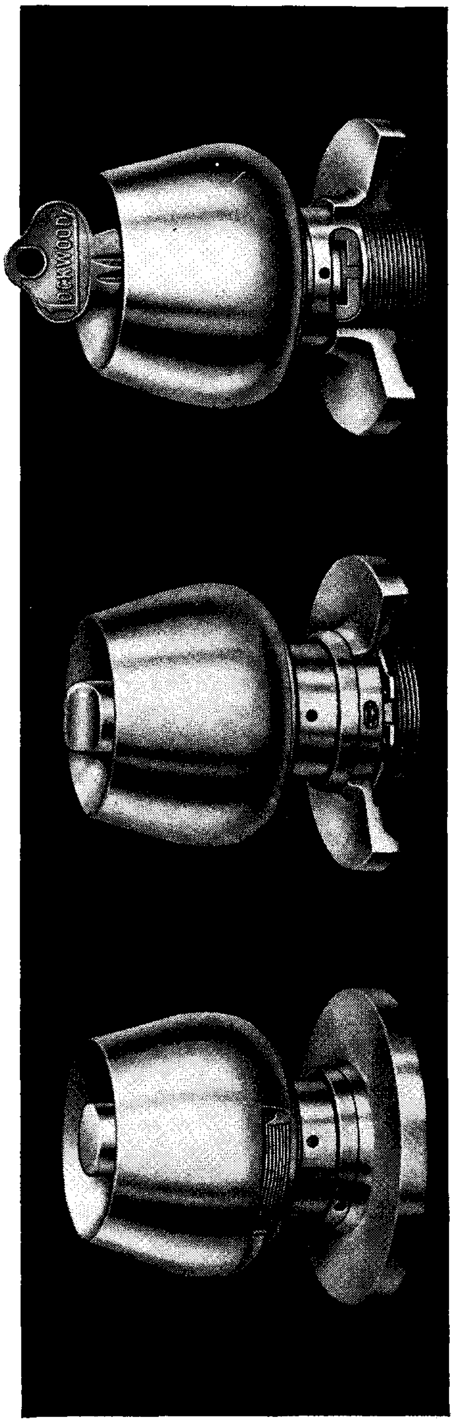

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