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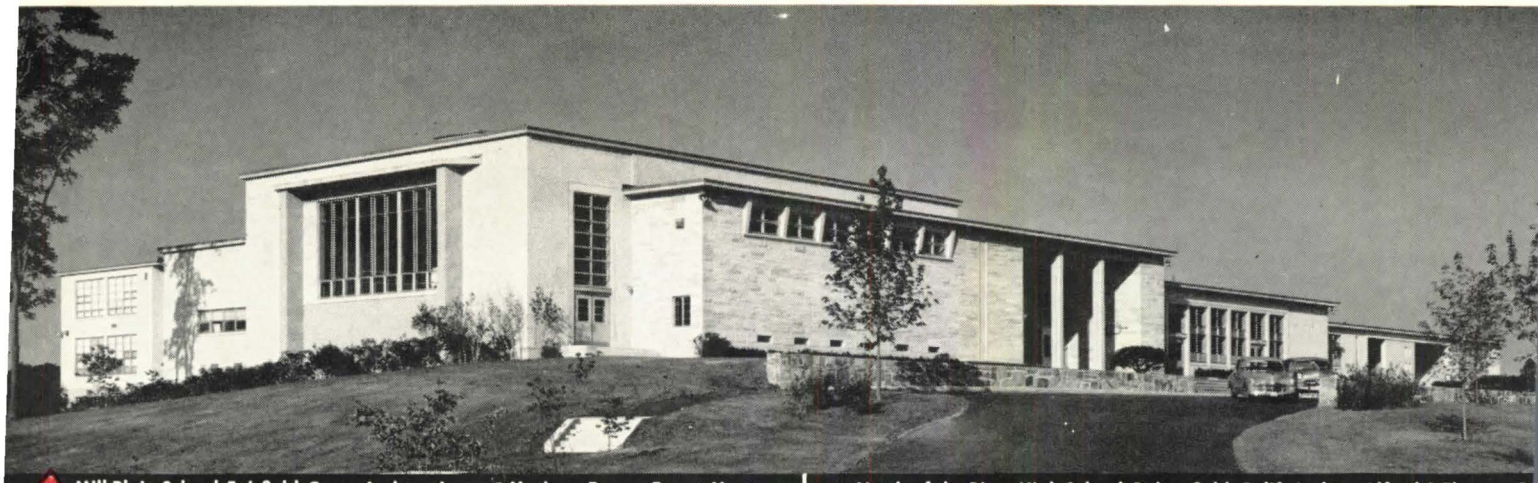
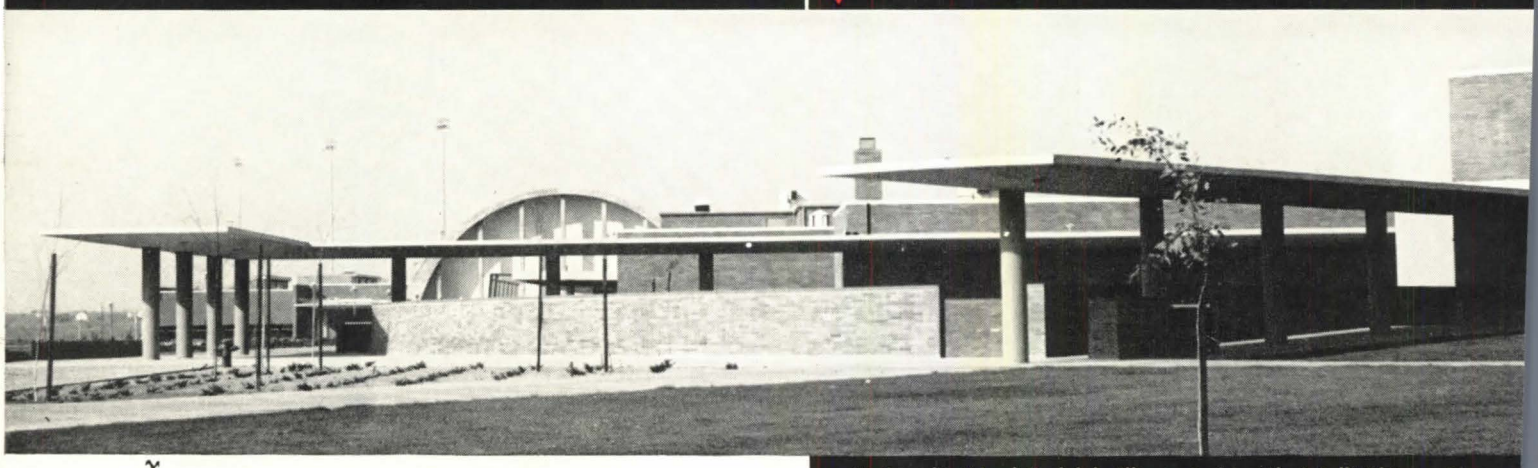
8

august 1954



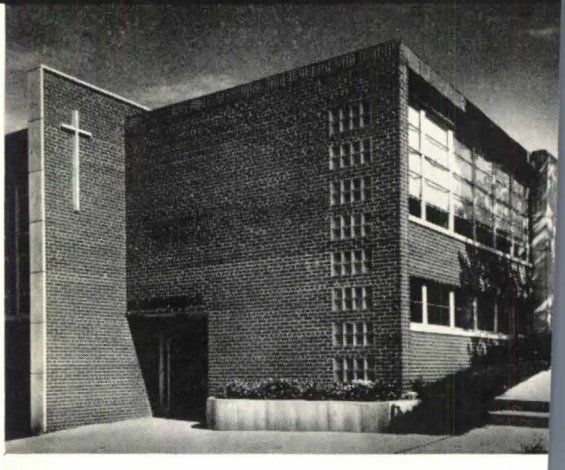
↑ Mill Plain School, Fairfield, Conn. Archt.—Lyons & Mathers; Engr.—Ernest Mortensen; Contr.—E. & F. Construction Co.; Pozzolith Ready-Mixed Concrete supplied by Leverty & Hurley Co., and Silliman & Godfrey Co.—all of Bridgeport, Conn.

North of the River High School, Bakersfield, Calif. Archt.—Alford & Thomas, Bakersfield; Engr.—Hillman & Nowell, Los Angeles; Contr.—Guy E. Hall, Bakersfield ↓ Pozzolith Ready-Mixed Concrete supplied by Kern Rock Products Co., Bakersfield



St. Joseph's School, Rockdale, Illinois. Archt.—Edo J. Belli, Chicago; Contr.—A. A. Rose Construction Co., Inc., Chicago. Pozzolith used in all concrete.

schools



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*Amount of water required per cubic yard of concrete—most important basic factor affecting the quality of concrete. See Bureau of Reclamation's current Concrete Manual, Page 130.

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August 1954

Million-dollar drive to expand applied research in architecture and related fields has been announced by Douglas W. Orr, President of American Architectural Foundation Larger portion of money collected will be invested, with proceeds from investments used to sponsor suggested projects by AIA's Education and Research Committee. Early this month campaign chairmen will be appointed in each AIA chapter to organize campaign teams to make individual appeals to architects in respective areas.

According to Department of Army figures, Corps of Engineers during '52 and '53 awarded approximately 1600 contracts to nearly 800 architect-engineers for design and inspection of construction in connection with its military construction program. Firms receiving contracts are located throughout U. S. with awards totaling approximately $70 millions.

Scheduled for completion and occupancy early next year, $2½-millions National Housing Center in Washington, D. C. will serve as headquarters for National Association of Home Builders and as permanent exhibition center for materials, equipment, and services concerned with housing construction. NAHB's Housing Research Institute and reference library of housing publications will also be located in Center.

United Nations Economic Commission for Europe's "Quarterly Bulletin of Housing and Building Statistics," published recently, shows expanding dwelling construction in almost all European countries with increase in past year particularly notable in France, Western Germany, Italy, and the United Kingdom. Higher nonresidential building is shown in the Netherlands, Norway, and the United Kingdom.

Carnegie Institute of Technology has announced appointment of Norman Lewis Rice as Dean, College of Fine Arts, effective last month. . . . Harold Hauf leaves Directorship of AIA's Public and Professional Relations to become head of Rensselaer Polytechnic Institute's Department of Architecture, October 1. Hauf succeeds Donald Mochon, Associate Professor of Architecture, who intends to extend consulting work. . . . University of Michigan's College of Architecture and Design awarded Harley, Ellington & Day Scholarship to J. Sterling Crandall of Ann Arbor. Scholarship is awarded to outstanding student entering senior year of architectural design.

Composed of community leaders from all parts of country, International Council has been formed to help carry out Museum of Modern Art's International Exhibitions Program. Council will supplement International Program's foreign and U. S. exhibitions by arranging conferences, publications, other special activities.

U. S. Commerce and Labor Departments have boosted joint estimate of 1954 new construction outlays by $2 billions to record $36 billions. According to agencies, higher forecast "results largely from a higher level of new home building so far this year than was expected last November." New estimate also revealed "most other types of civilian construction also are showing greater activity than previously anticipated and are expected to reach record or near record levels."

Turn page for WASHINGTON PERSPECTIVE

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Frederick Gutheim

Washington Perspective

The failure of the Geneva conference to reduce Communist pressures and its revelation of Western disunity has alarmed the Capital to a degree unequalled in recent years, and has produced an urgent Pentagon demand for accelerated mobilization, to a degree equalling that proposed in the politically unpopular universal military training bill. Further defense expenditures are in prospect. Also spurred to greater activity were the strategists in critical raw materials, and civil defense authorities. Geneva disclosed equally our steadily deteriorating international leadership. Relations with Britain are strained by distrust and misgivings. In Italy our position loses ground from crisis to crisis. Tension over prolonged resistance to Communism in Southeast Asia and difficulties in accepting European unity and defense proposals have seriously weakened one French government after another. West Germany's part in the proposed European army and policies involved in the unification of Germany threaten the Adenauer government. The entire scene presses international and military factors into any Washington decisions. One may expect increasing activity to construct troop housing and warehouses; fresh commitments for AEC installations; stimulation of electrification and industrial production facilities. Cuts in these areas accounted for the larger part of the 40 percent reduction in Federal construction awards last year. But the longer view shows a more disturbing state of affairs. In Washington, talk of the possibility of war, however defined, is leading in familiar channels. The fundamental need for materials control, forgotten for two years now, is about to be reappraised. With any tightening of military preparations, even considerably short of mobilization, the Government will probably have to consider new problems of inflation and rationing. It may be hard to say how and when all this will affect architectural activity, but the prospect of "building as usual" does not strike me as particularly bright. Half way through the year, the building boom has developed unprecedented magnitude. Measured in dollar volume, residential building is 13 percent ahead of last year; nonresidential building is up 21 percent, with nearly all building types sharing the gain. Whether this performance will be increased, and how long it will be maintained, may be matters of conjecture, but from here the outlook is excellent for the rest of this year and into the unpredictable beyond.

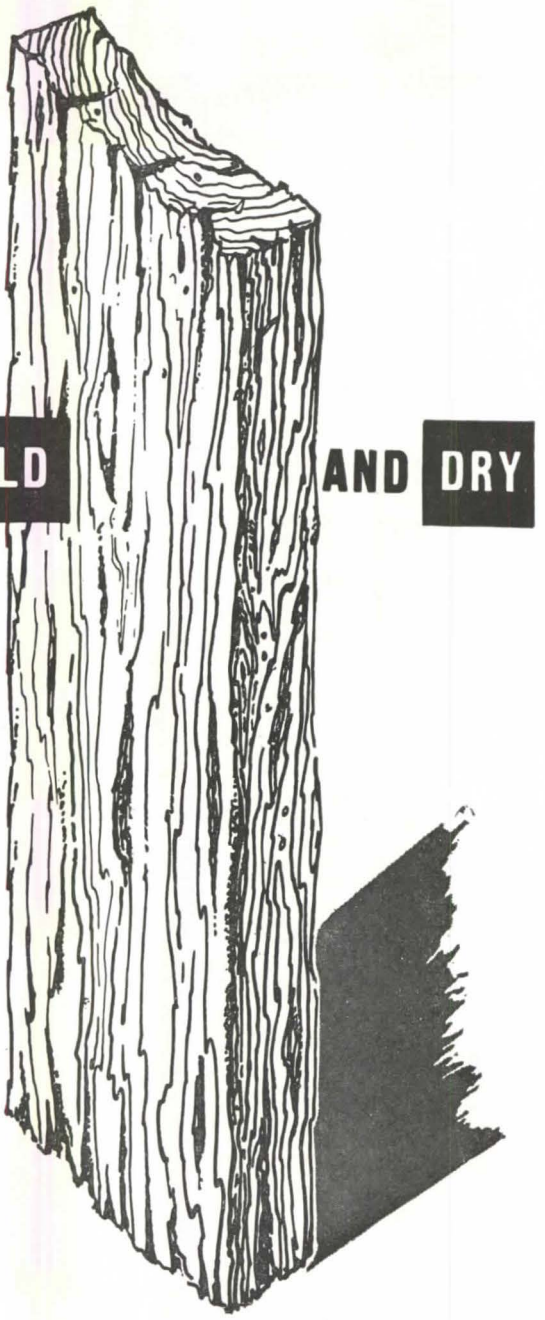
There is as yet little disposition to carry dissatisfaction with the Federal Housing Administration beyond the limited area of "irregularities" in handling windfall profits on 608 jobs and promoting Title I repair work. Most architects who have chafed under FHA regulations and design restrictions would welcome a broader type of inquiry that would go into the factors influencing FHA's end product. Gains from the investigation now under way are likely to be of a different kind. The White House and Congress alike view with growing dissatisfaction the relatively autonomous status of FHA, which has removed its decisions from any effective review, supervision, or responsibility by the Housing and Home Finance Agency. Any proposed FHA reforms are likely to include a return to the stronger central organizational pattern of the former National Housing Agency. Another possible area of reform is the strengthening of FHA district offices to give them more responsibility for decisions in FHA state headquarters. If FHA can be strengthened to resist local pressures and influences by special building and financial interests, it would probably be able to do better in the eyes of architects.

A subcommittee headed by Representative Howell of New Jersey recently considered a group of bills to increase Federal participation in the arts. While there is little prospect for immediate action, some relatively stronger legislative formula for this ancient question ought to emerge in the next session. A national music center for Washington and some form of Federal grant-in-aid for the fine arts are the most likely prospects. The Fine Arts Commission, which last year reported on these questions at some length, departed from its usual judicial attitude to make a useful contribution to these hearings. Last month the Commission acquired a new executive officer, Linton R. Wilson, a Washington naval officer and architect, formerly associated with Voorhees, Walker, Foley & Smith.

An even dozen of these columns having now been written, your delineator would like to inquire if he is keeping things in proportion as well as in perspective. Our personal and private poll would like to determine if there are Washington topics of interest to architects, that we are neglecting. Communications may be sent to the author at 724 Transportation Building, Washingon 6, D. C. In the spirit of times that has caused one local divine to classify his sermons "sacred" and "top sacred," any reservations about the identity of the correspondent will be respected.

PROGRESSIVE ARCHITECTURE August 1954

WOOD WON'T ROT WHEN IT'S COLD AND DRY



Living fungi, which break down the substance of wood are microscopic and abundant. But they need WARMTH and DAMPNESS to develop. Dampness will also peel off paint, crumble plaster, cause iron and steel to rust.

Some insulations can promote and retain destructive condensation inside walls and other structural spaces. Warmth and vapor can flow through asphalt, paper, plaster and most building materials, including ordinary insulations. Vapor condenses when, upon striking a colder surface, the air reaches a dew-point.

An empty space, the best insulator against heat flow by Conduction, does not prevent heat flow by Radiation and Convection. Of all heat transferred through structural spaces, about 50% to 80% is by Radiation; all but about 7% of the rest is Convection. The surfaces of multiple accordion aluminum sheets have a reflectivity for heat rays of 97%; absorptivity and emissivity of only 3%. The aluminum and fiber layers retard Convection. Conduction is slight through the preponderant low density air spaces.

The tough aluminum sheets used in multiple accordion aluminum are impervious to water vapor, and are long and continuous. Infiltration under flat, stapled flanges is slight.

Where multiple accordion aluminum is used, fortuitous vapor and water (for instance rain) which intrude into wall and similar spaces will gradually flow out as vapor through exterior walls and roofs as pressure develops within, because vapor flows from areas of greater to less density. The vapor cannot back up through the continuous, impervious aluminum, so it flows out because exterior walls and roofs have substantial permeability in comparison with aluminum, far greater than the required 5 to 1 ratio.

To obtain maximum uniform depth protection against heat loss and condensation formation, it is necessary to use **edge-to-edge** multiple aluminum, **each** sheet of which automatically stretches from joist to joist, and also all through the flanges for further vapor protection as well as permanent attachment of each sheet.

The U.S. NATIONAL BUREAU OF STANDARDS brochure: "Moisture Condensation in Building Walls," discusses vapor and heat flow, and the causes and prevention of condensation. Use the coupon. Get a copy at our expense.

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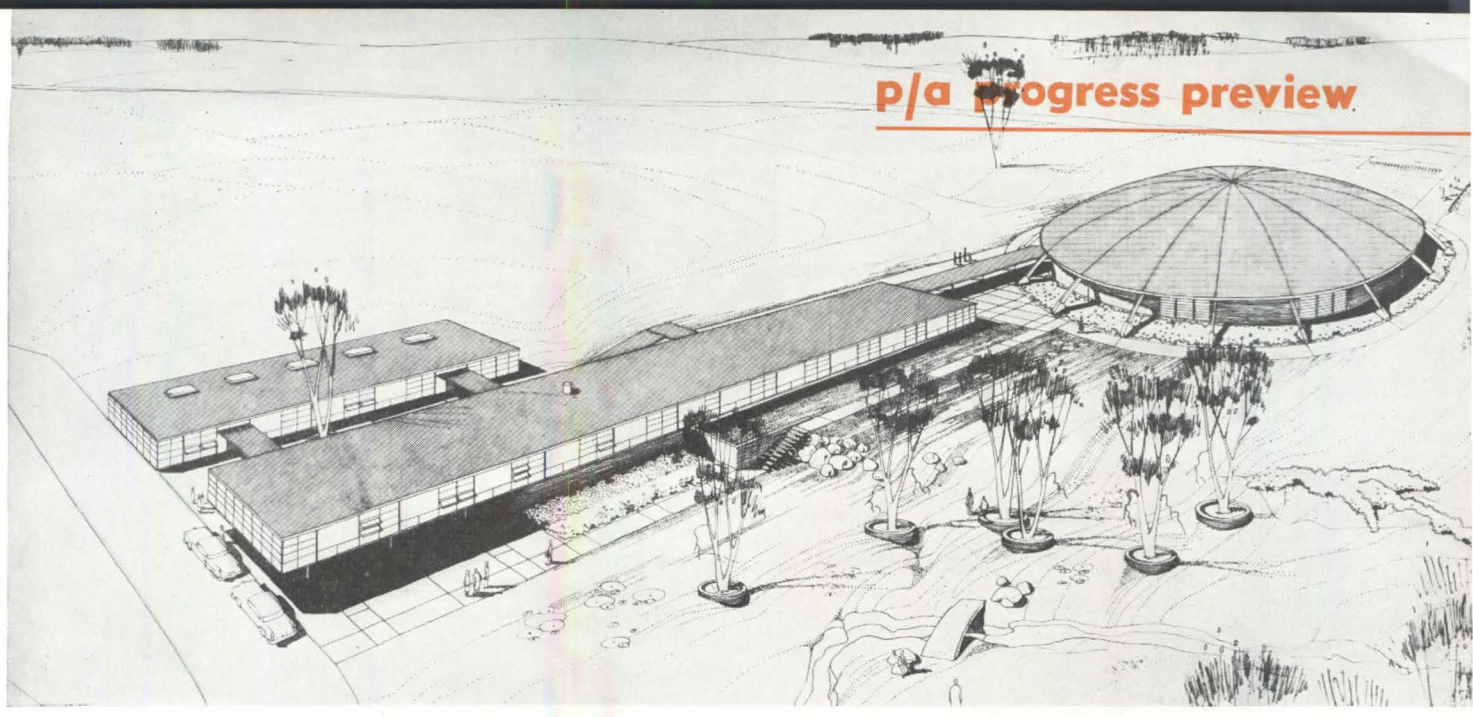


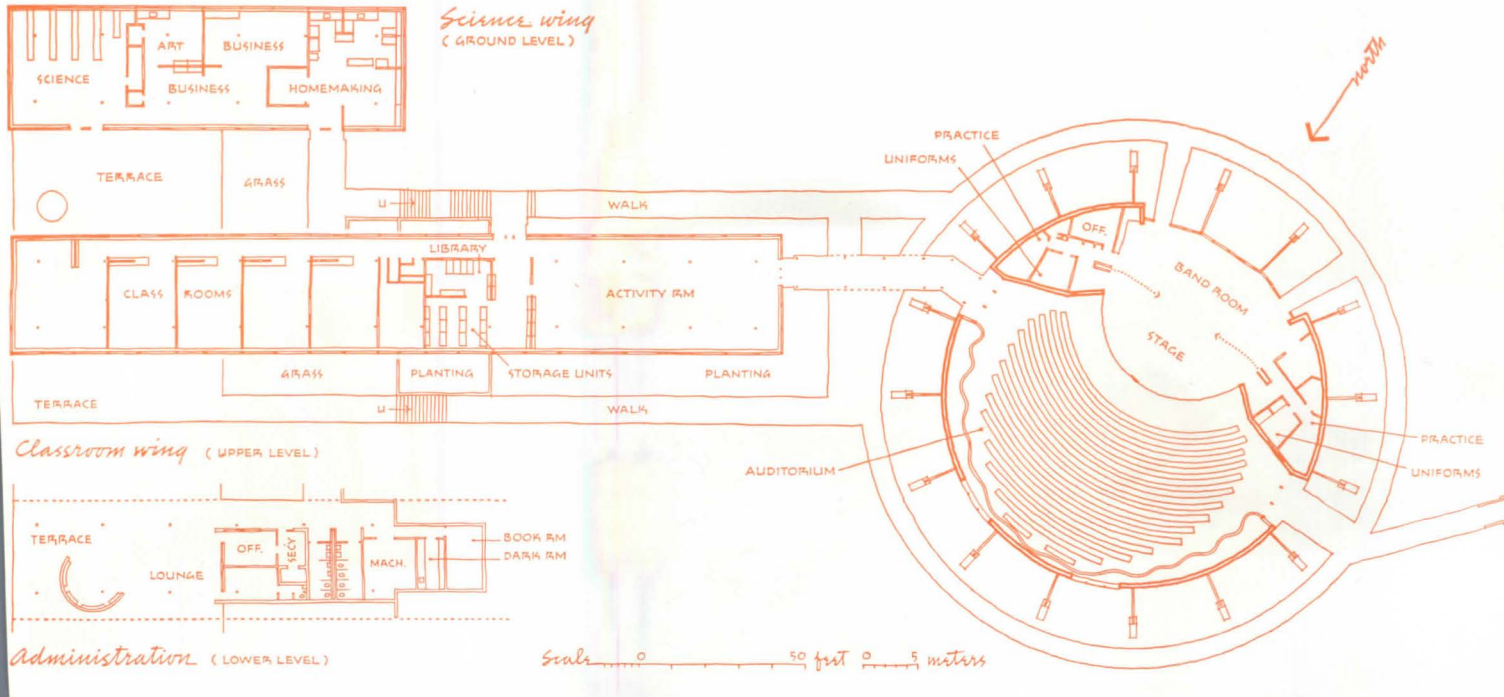
high school for a consolidated school district

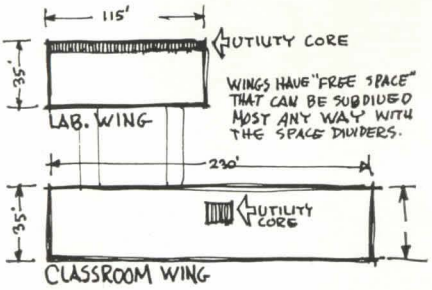
Flexibility of plan and structure, anticipating future expansion and probable program revisions, was the first consideration of Caudill, Rowlett, Scott & Associates, architects-engineers of Bryan, Texas, when they designed the senior high school (*shown here* and *overpage*) for the consolidated school district of College Station, Texas. As usual in school construction, minimum cost was a strong governing factor, and the architects, with assistance of a sympathetic superintendent, Les Richardson, found various ways to limit expenditures.

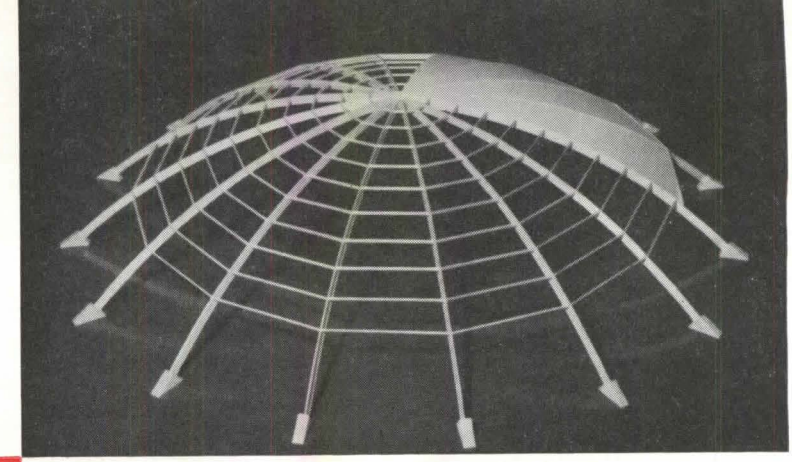
Principal elements of the building are the round assembly/music dome and the long classroom wing, with adjacent one-story science wing. Advantage was taken of the sloping site to provide an entrance terrace at street level (*left in rendering above*) and ready access to administrative offices, below the row of classrooms (*plan below*). Interior doors were omitted throughout, after the architects observed in existing schools that doors are left open during class periods. This permitted a relatively modest saving, but promotes flexibility without (the architects believe) causing a major sound problem.

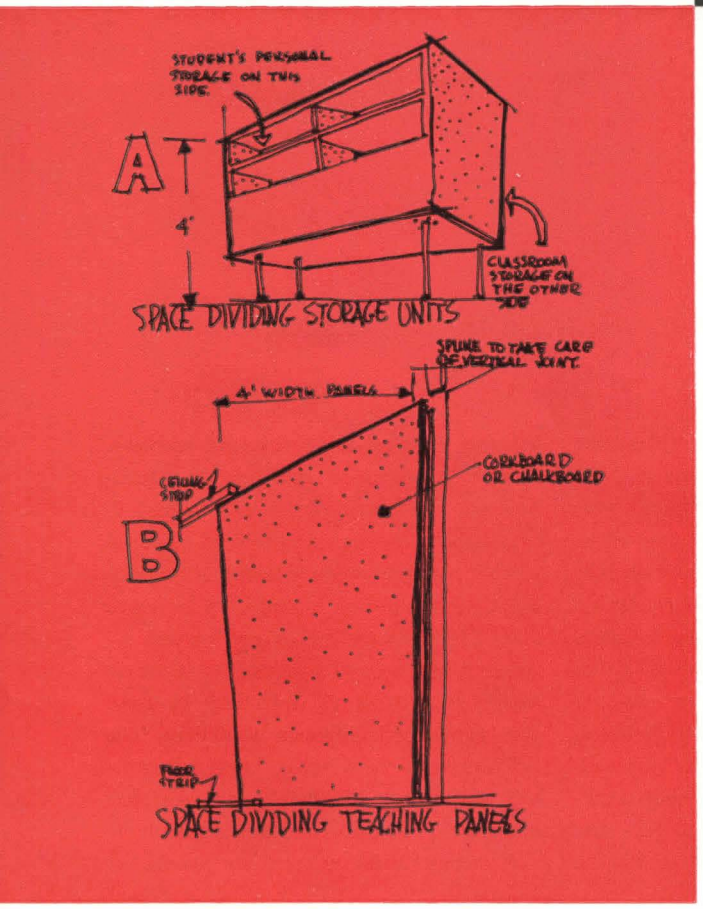
After a series of studies of the auditorium/ music unit of the high school, it developed that the round element required minimum-height walls, uniform structural units, and simpler foundation scheme. Use of inexpensive baffles and screens insures good acoustics—and the plan is readily adaptable to a variety of uses, with room for audiences of 600 to 900.

The classroom wing is described as "a loft with space dividers" (*see sketches overpage*). The dividers are either movable storage units or teaching panels.

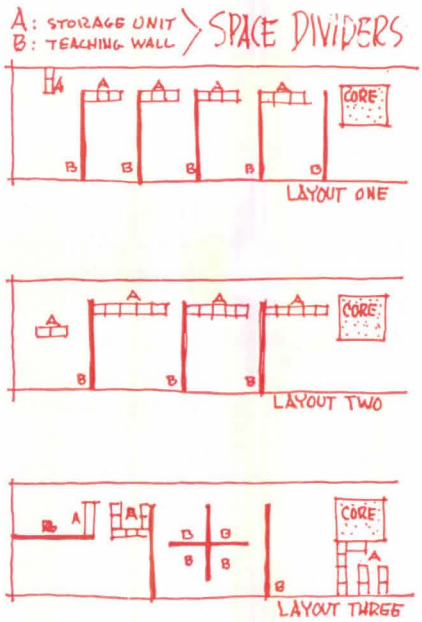




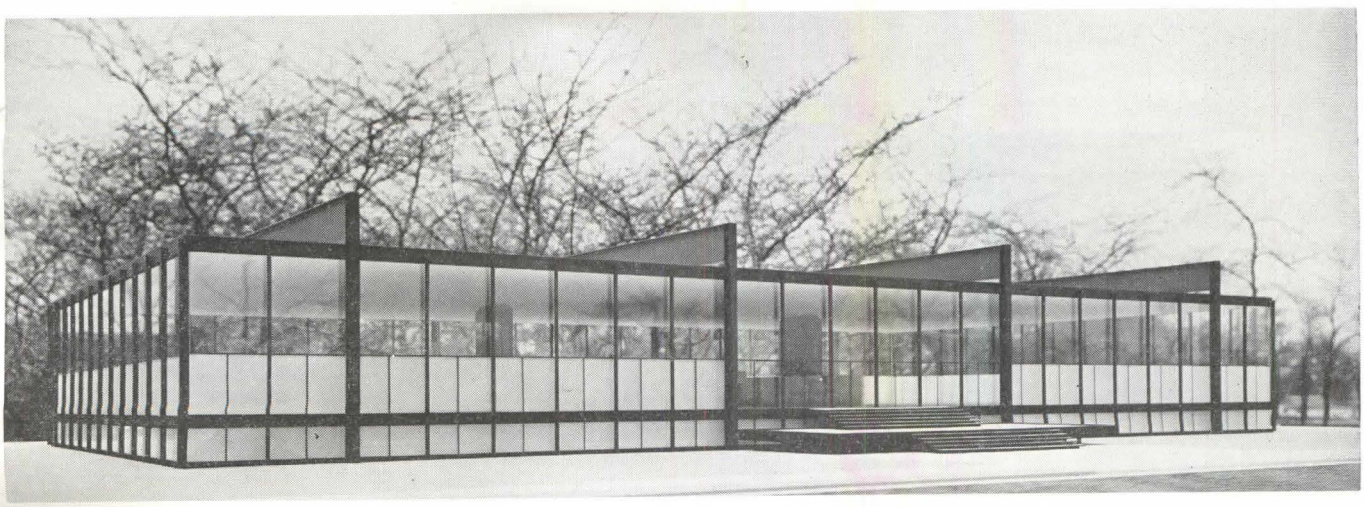




The weblike structure of the dome was developed in a model (above). *Concentration of utilities provides maximum "free space" in teaching wings* (above left). *Storage and panel units* (left) *used as room dividers may be placed in many ways* (below).



architecture, city planning, and industrial design *will be taught in a glass and welded-steel pavilion* (below) *designed by Mies van der Rohe for construction during the coming year at Illinois Institute of Technology. Two large drafting rooms will flank a raised central hall, beneath which a basement will accommodate lecture rooms and services.* Model photo: Hedrich-Blessing



Schacht

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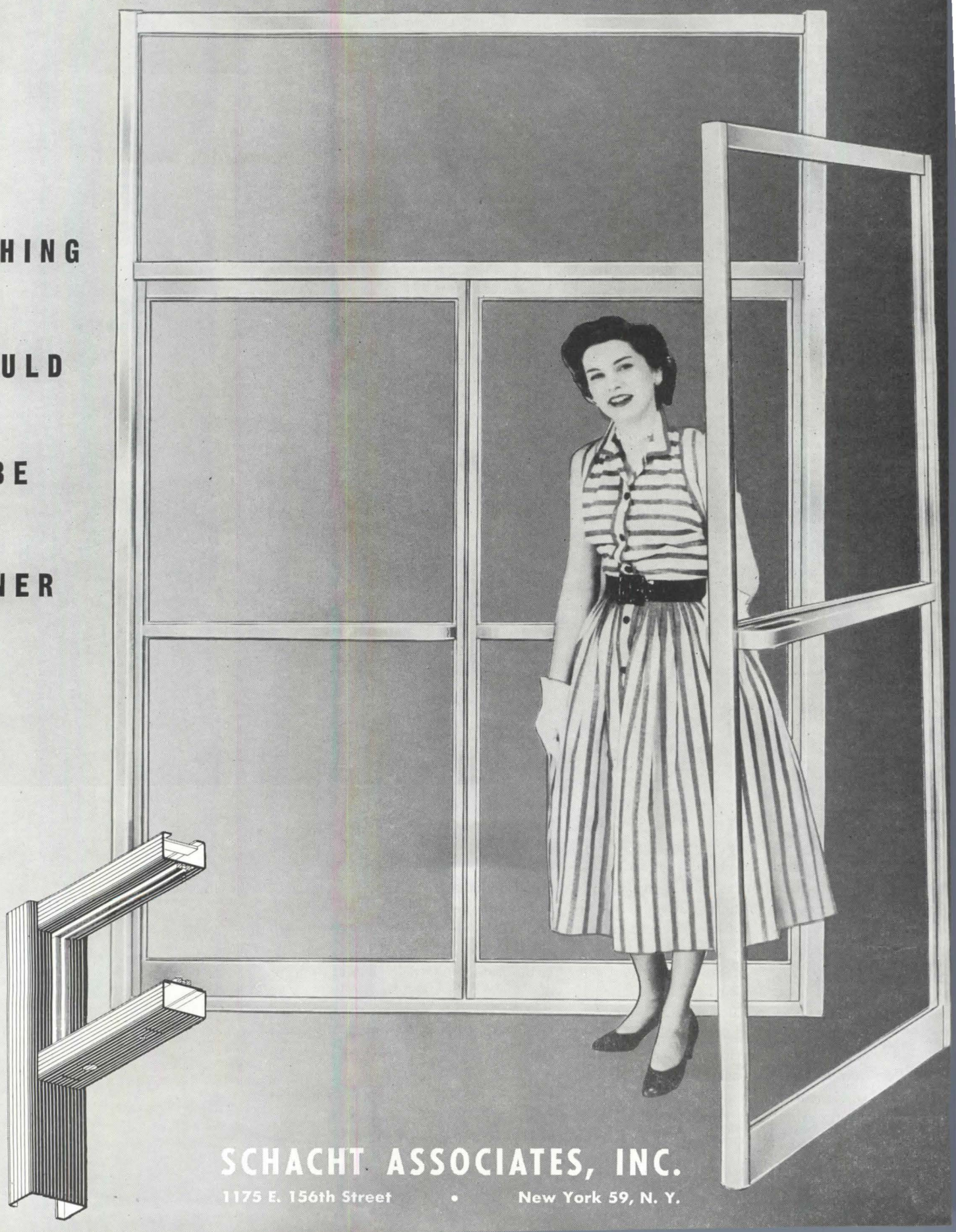

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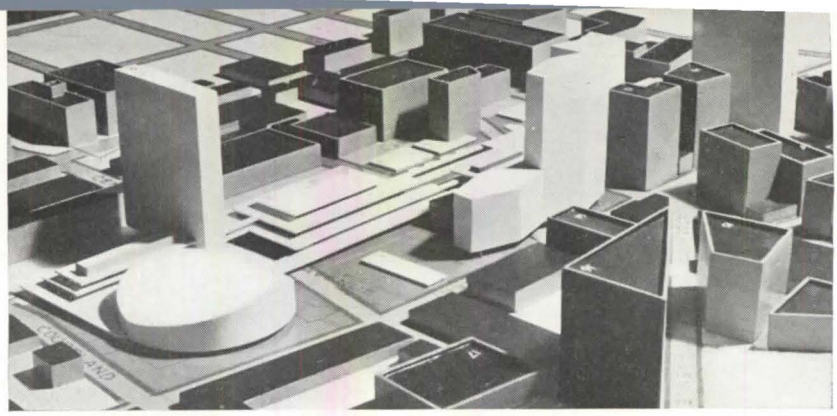
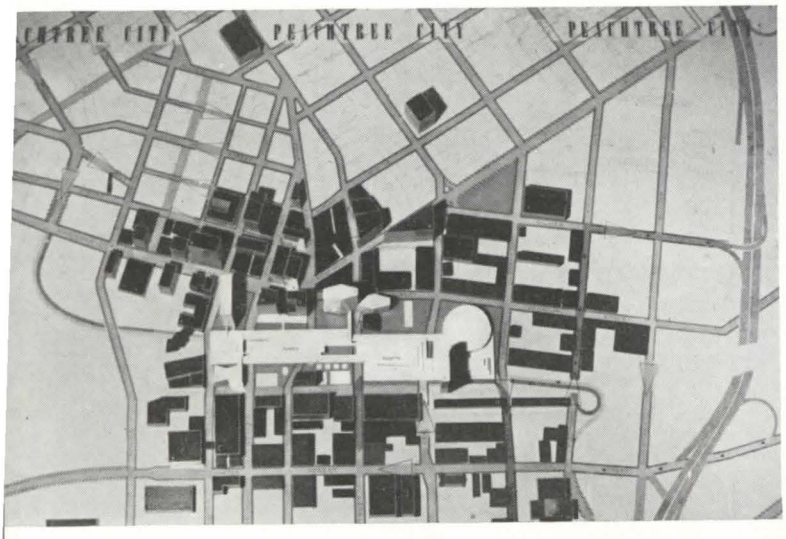
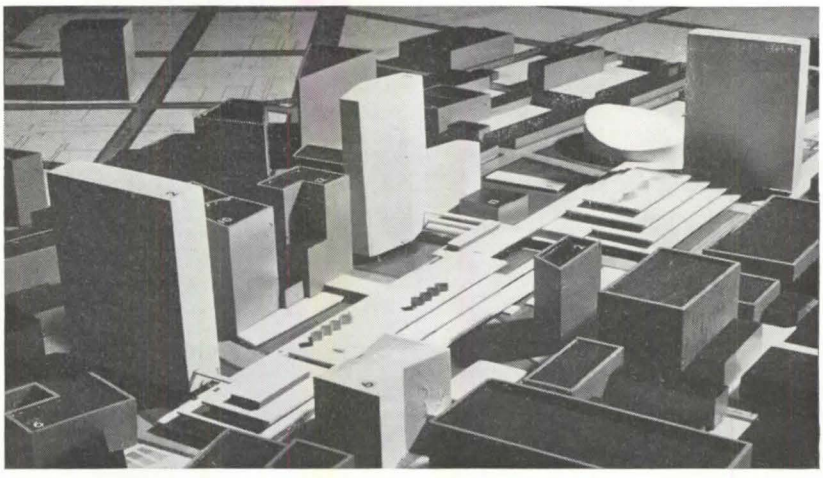




urban redevelopment—South



Businessmen and downtown property owners of Atlanta, Georgia, are looking with approval on projects for redevelopment of the city's "golden heart"—the century-old downtown railroad yards in the great gulch cutting through the business section—as counteraction against decentralization of future growth. Some 300 civic leaders led by Mayor Hartsfield met in June at Citizens & Southern National Bank as guests of Mills B. Lane, Jr., president, to inspect a large model (*above*) of "Peachtree City" project, designed by Toombs & Company, Architects, with encouragement of Central Atlanta Improvement Association. A multimillion-dollar commercial center for the metropolitan area is envisioned on a 22-acre site—office buildings and shops, a hotel, a convention hall, a department store, with necessary circulation, green areas, and amenities—when legal, zoning, engineering, and financial requirements can be solved. Explanation of the model and development project by Henry Toombs and Joseph Amisano, representing the architects, won general approval of the business leaders, who realize the need for expert planning to revitalize the city core. "Redevelopment . . . is a necessity," says Lane, firm proponent of downtown renovation.

criticism of stereo-structures parried by Candela

Dear Editor: I wanted to congratulate all of you on the June 1954 P/A, but you have given me such outstanding participation in it that the praise would sound selfish. However, I do feel free in acknowledging your kindness in publishing my paper in such a wonderful and undeserved manner. I am especially obliged to Thomas Creighton for his charming comments on the editorial page and, in general, to the critics for their objective opinions. By the way, why not have an architect's views?

Nonetheless, I cannot let some of the criticism pass without some counter-comments of my own. I particularly regret the necessity of answering several of M. G. Salvadori's points. It seems very impolite on my part after his exceedingly benevolent comments on my structures—yet I have no other choice but to decline his gracious help which, I believe, only adds confusion to my perhaps already obscure expressions.

My definition of *active* and *passive* structures is only of secondary importance. But, if I agree that a beam is a most active structure (which I have never denied), the two inclined members of *Figure 1* also form an active structure that transmits an isolated force, breaking it in two, to separate points of support. They form, indeed, the most appropriate plane, active structure for isolated loads. What is really misleading and immaterial is Professor Salvadori's addition of a hinge connecting both struts in *Figure 1.*

Stereo-structures can sound pedantic in English which already has the more suitable word, *space-frames;* however, the article was originally written in Spanish in which the word becomes "Estructuras espaciales" or "Estructuras tridimensionales," which I don't like. *Stereo-structures* was first used by the Spanish Architect Felix Cardellac who wrote a very commendable book (about 1900) entitled *Filosofia de las Estructuras.* The main merit of this book resides in its intuitive approach to the structural problem in an epoch when nothing but the strictly mathematical interpretation was considered worthwhile.

With respect to my assumed opposition to mathematical engineers, I must say that since I have not been previously acquainted with any engineer interested in shells, I have probably lost their instructive talks and verbal explanations and, therefore, I was referring only to the available literature published prior to 1948 which is (taken as a whole) deliberately obscure and confusing. My batteries were not directed against *all* mathematical engineers (I am very much indebted to many of them, and especially to Aimond) but specifically against the Germans whose analysis of long cylindrical shells is—if in good faith—absolutely erroneous. This cunningly laid mathematical barrier has effectively prevented me during long years from seriously considering the possibility of building shells. Their apparently very scientific mathematical developments are generally based on false pretenses which have nothing to do with the real behavior of the actual structures. If these stand up, it is not *because* of but *in spite* of being designed by such methods and because of some properties of the materials which were not considered in elastic calculations.

I agree with Salvadori's observation about the present impossibility of considering the building of any form that has not previously been mathematically analyzed. Indeed, this observation only reinforces my point on the forceful abandonment of the fittest structural forms, on the lack of freedom in the inquiry for appropriate shapes. I would like to know the mathematical expression defining the form of the vaults filling the space between groins in a Gothic cathedral—but only for curiosity's sake since, of course, no Gothic cathedral could be built today. The most lenient Building Department would consider it quite unsafe.

My paper was not intended to be a full treatise on shell structures and, therefore, there are many points which I did not even try to touch on; I do not remember having said that the free longitudinal edges of a cylindrical shell do not deflect downward because they deflect indeed, as

(Continued on page 16)

need to be heard

Dear Editor: I have just read the article concerning Reynolds of Public Buildings Administration (WASHINGTON PERSPECTIVE, June 1954 P/A) and feel strongly that your statements are right—and that they need to be heard.

For one, I hope this piece has wide dissemination in Washington, especially with the member(s) of Congress who may act to change the present status.

HAROLD R. SLEEPER
New York, N.Y.

valiant champion

Dear Editor: I think the June NEWSLETTER does not give adequate credit to Bert Reynolds. He has fought vigorously, intelligently, and imaginatively for better design, lower cost, and more appealing structures. He has supported efforts within and without the government to modernize engineering practices so as to bring design requirements more in line with reality. For instance, he has tried to modify the safety factor in wall design where the weight of the wall is fixed and to allow more flexibility in floor design where loads may vary greatly.

Mr. Reynolds has been trying to get money from Congress which would permit him to spend some funds for research, improving methods and designs and cutting costs. He was not as successful as Commissioner MacDonald, but, considering the obstacles he has to fight, it seems to me he has achieved noteworthy results.

I quite agree with Gutheim that he has been one of the great career administra-

(Continued on page 152)

(Continued from page 15)

indicated by intuition and experience. My indication of the convenience of providing longitudinal edge beams was probably left out in the editing and I did not *consider* its further insertion very important in such a general treatment.

I am extremely disappointed that such an experienced person as Professor Salvadori has been unable to understand my explanation on the legitimacy of considering only membrane stresses in doubly-curved shells, for it means that not many other people will understand it and that I must admit my failure as a teacher. By the way, I would like to correct now the omission of Prof. Odone Belluzzi's credit, from whose book, *Scienza della Costruzioni, Volume III*, was borrowed the referred exposition, which I found a very clear and instructive statement of the behavior of doubly-curved shells, and especially appropriate to synclastic surfaces, in spite of Salvadori's opinion. His attempted correction "the maximum *elastic* bending moments developable in the shell are so small, because of its small thickness, that they may often be neglected" is, precisely, what I was trying to point out as the usually admitted and incorrect explanation of the phenomenon found in most texts. (Or, perhaps this explanation is not incorrect after all! I don't know, for I confess that I have never been able to understand its meaning.)

Of course, I believe that *the application of the Theory of Elasticity to structural problems* is a pseudo-scientific vogue (and a very persistent one) and the same doubts about its suitability seem to be imparted (to judge from their writings) by Saliger, Maillart, Van der Broek, Kist, Freudenthal, Johansen, and many other conscientious engineers who cannot be suspected of superficiality. I am even daring to presume that it can also be the inner conviction of Paul Weidlinger, even if he doesn't like to admit the point. I believe that I can be allowed this presumption of Weidlinger's inner feelings, since he permits himself an equally unsupported conjecture on my misunderstanding of the play of membrane stresses.

I have nothing against the Theory of Elasticity as such, since it is only a logical or mathematical reasoning starting from certain simplified hypotheses, but I strongly object to its indiscriminate application to structural analysis and especially as related to reinforced concrete design since the behavior of this material is in total disagreement with elastic assumptions.

The trouble is, if we abandon the use of elastic methods, no other procedures seem to be available in substitution. But this is only the fault of people who, clinging blindly to obsolete principles, have hindered the development of new methods of investigation. In spite of the fact that the first voices of warning sounded as long as forty years ago, it is only very recently that the clearing of new paths of thought as related to structural analysis has begun to be considered seriously.

FELIX CANDELA
Mexico, D.F., Mexico

(Continued on page 19)

two engineers comment

Dear Editor: I am not one to spend too much time writing letters and criticisms of articles written by those who have a better talent for the use of the written word. But the article written by Felix Candela has too many half-truths which may do too much damage to easily impressionable minds; and, therefore, the haze should be cleared up.

1. It is erroneous to simplify the action of a beam into tension and compression and forget shear, or diagonal tension and compression, which in a simplified form is a continuity of triangles. This applies to trusses and beams, regardless of shape, form, or material.

2. It is not true that in reinforced concrete the tensile strength of the concrete is not used and that approximately two thirds of the beam is wasted and acts as dead load only. This is an oversimplification of the workings of a structure. With the minor exception of pure bending, beams acted upon by loads must resist diagonal tension and compression to transfer the loads to the supports. In reinforced concrete this could not be accomplished without the so-called "wasted two thirds," which takes its share of tension (sometimes with the aid and often without the aid of stirrups or diagonal rods) and all the diagonal compression, a swell as serving as a bonding agent.

3. It is not true that the triangle is indeformable, as long as elastic or plastic materials are used (are there any other types). A structure thus braced will deform — essentially the same way as a beam or truss. Members in tension will elongate, members in compression will shorten, resulting in a total deflection, and in high narrow structures this deflection can be critical.

4. Give long-span shells a double curvature and you have a funicular structure. But apply a partial loading such as snow on that long span and you have to contend with bending. Whether you will have tension over a section or unequal compression will depend on span, radius or curvature, shape, proportion, and will require an analysis.

And I might add that our sheet-metal manufacturers are well aware of the inherent quality of double curvature as exemplified in corrugated arches, pipes, culvert, etc., and big spans too.

5. Concrete floor construction is a much greater field than single-story buildings with concrete roofs. "Funicular" construction would hardly fit in. Space frame construction is continuously being used in floor design, such as flat slabs and their variations.

6. Flat roofs have many advantages in conservation of volume which reflects more in the cost of a structure than the roof itself.

The author's hope that the time will come when the architect will need less

(Continued from page 16)

of science and more of talent is lack of the realization that science is *not* a faceless tool, nor is talent without the use of science—where science is a requirement —a talent put to proper use. The science I am referring to is not an application of theories and formulas, but a blending of theory and experience into a vision which

(Continued on page 20)

(Continued from page 19)

is vital within a framework of reality.

If the architect wishes to dispense with the engineer, he has some catching-up to do. His talent won't help him. If some should take the Candela article seriously, the Lord help them and their client.

DAVID B. CHESKIN
Chicago, Ill.

o

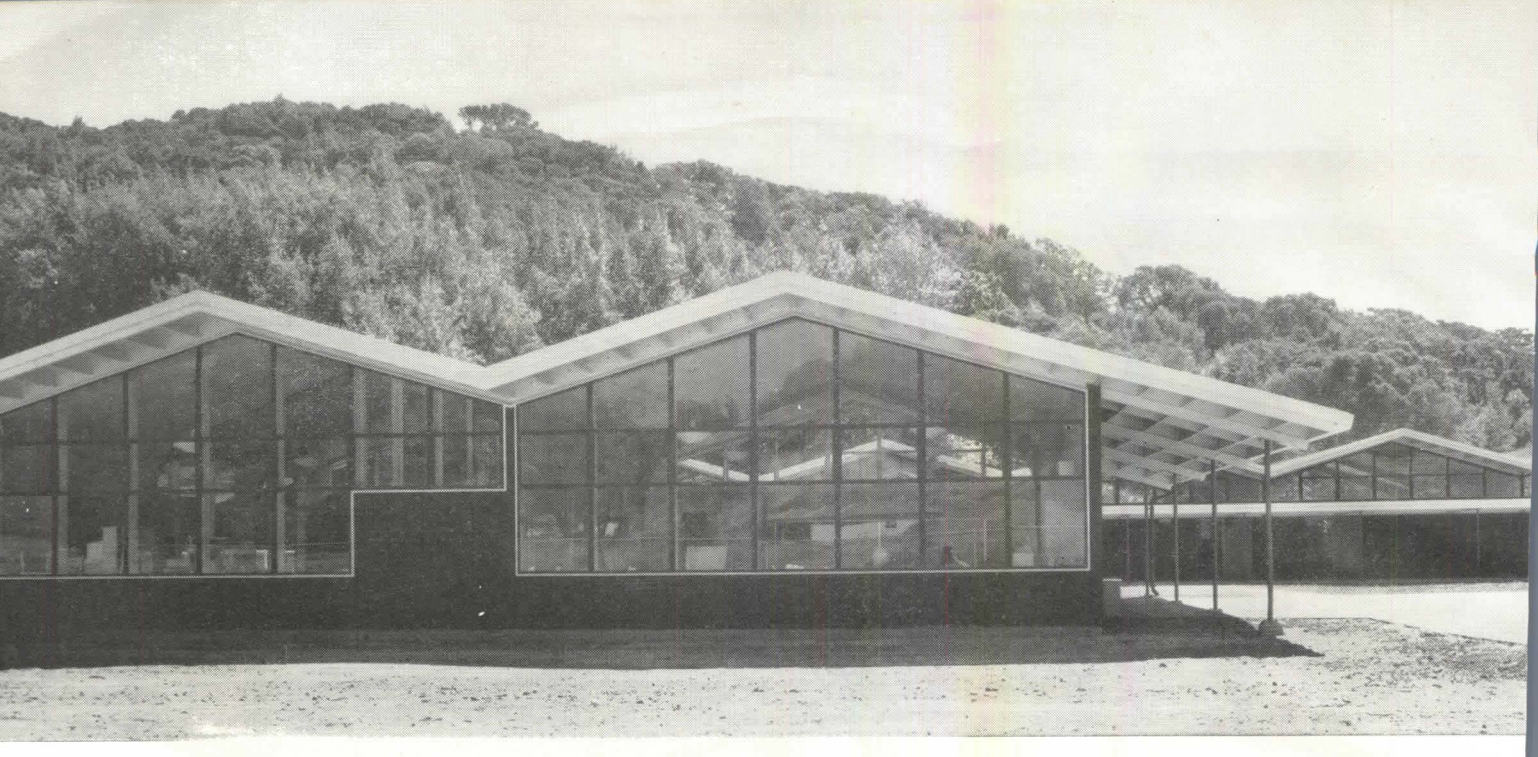
Dear Editor: Felix Candela expresses his unrestrained exuberance in both his beautifully conceived structures and in the verbal descriptions of his personal theories of construction. The latter are not quite so convincing, and this is in no small part due to the difficulty of expressing abstract physical conceptions in words (a problem no less difficult in mathematical terms) meaningful to another person.

It seems to this writer, who is both an architect *and* a structural engineer, that the intuitive choice of forms best suited to enclosing space is a talent that MUST be nourished and developed by every architect and/or engineer who takes his work seriously. But, the insight necessary to check the flow of stresses for any specific structural condition need *not* be possessed by the same person who makes the initial conception (although that situation would be ideal), providing the two minds work together: modifying the initial design as may be necessary, improving and perhaps emphasizing the lightness and delicacy of some portions, while strengthening other areas.

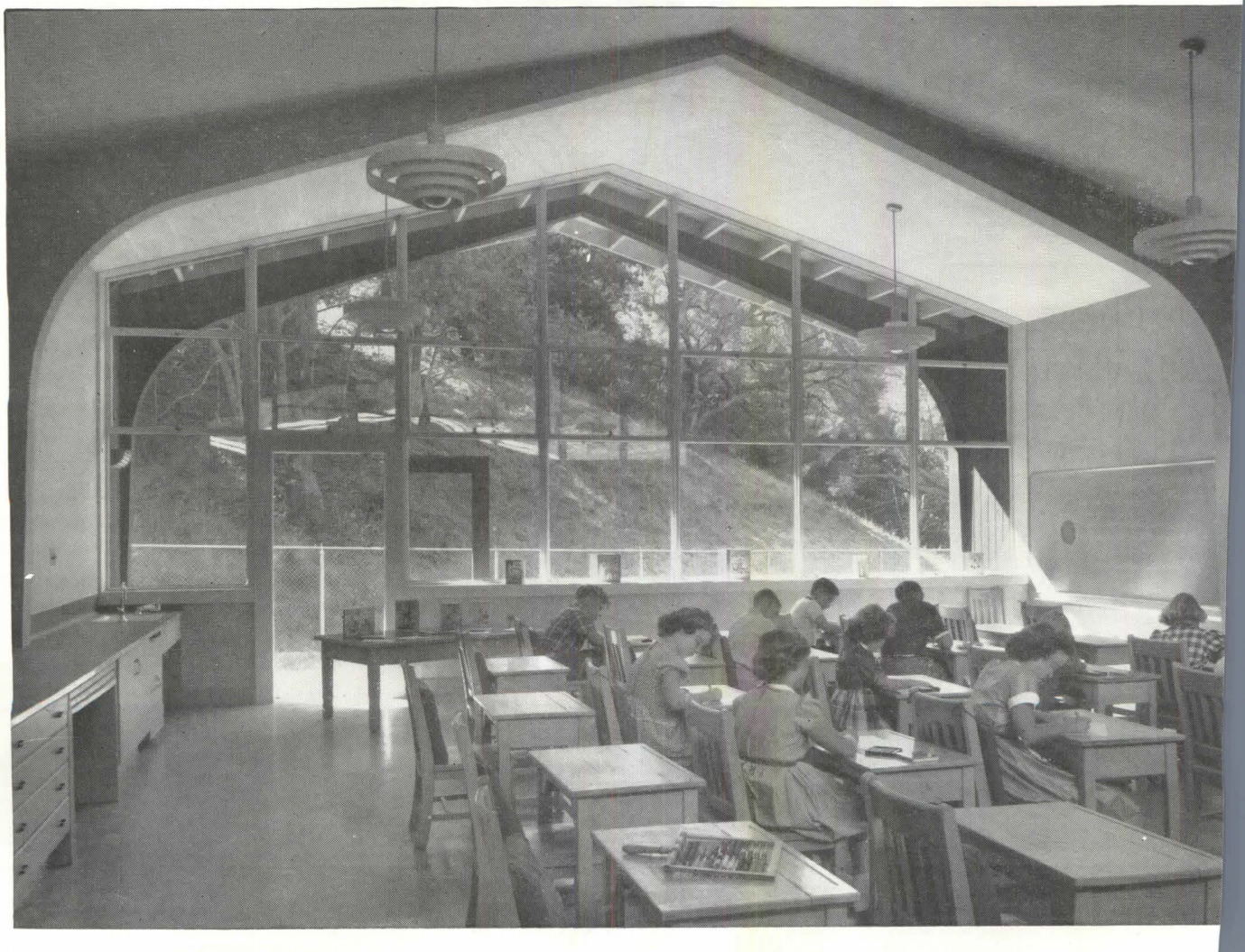
Perhaps the greatest good can flow from Candela's missionary work in lessening our rectilinear inhibitions, and encouraging a healthy exuberance in structural conceptions. There is no doubt that a large stream of enthusiastic young architects is flowing into that now less-inhibited profession, but I fear that no similar phenomenon is occurring in the realm of structural engineering. Quite the reverse, for the bright young iconoclasts with mathematical bent are headed toward aeroballistics, nuclear physics, and electronic statistics. Because of the boring and uninspired work of all but a fraction of the structural offices in this country, there are no highly publicized frontiers in this field (and we, all of us, are victims of the ever-present mass media). Let us hope that enough exceptionally wonderful creations—like those of Candela, Saarinen, Fuller, and others—will break the vicious circle.

There is no question that design is becoming more and more dependent upon carefully trained individuals who are masters of their particular art. As technology becomes more complex, greater emphasis will fall upon methods of teaching, as Bob Kennedy and Carl Feiss have so ably stated. The design professions are going to have to contribute more and more skill to the effective organization of their supporting educational institutions.

STANLEY JAMES GOLDSTEIN
South Orange, N.J.



THANKS TO DAYLIGHT WALLS of L·O·F Glass, there will be no "penned-up" feeling for children attending the prize-winning Oak Manor Elementary School in Fairfax, California. Exterior and interior views here show the natural blending of outdoors and indoors. Architect: John Lyon Reid, San Francisco, California.



the architect's files: part 3

by Siegmund Spiegel*

In order to practice his profession in a business-like manner, the architect obviously must make adequate provisions for filing of the "nontechnical" material as well as the "technical." (Filing of the technical material was discussed briefly in previous articles.) Although the amount and type of material actually retained for filing by architects may vary from office to office, there are, of course, certain basic documents which must be kept. Briefly then, the types of files maintained in the "office" part of an average organization will include among others, items falling into the following categories:

Proposed Jobs Files
Job Files
Bookkeeping Items and Their Files
Management Files
"Miscellaneous" Files
Individual Partners' Files
Forms & Supplies

Since these files pertain to distinctly different materials, efficient filing is, of course, facilitated by storing them in separate filing units, to prevent undue delay in locating a certain document. The files, being maintained by the "nontechnical" personnel, are obviously located near the secretarial and bookkeeping staff.

office filing

The following system has been found to work satisfactorily for each of the various categories listed above.

1. Proposed Job Files. Most every office will make proposals for jobs which may take a considerable length of time before they become active (if sometimes at all). There frequently may be a sizable amount of correspondence with the prospective client. There may also be detailed information about the property, proposals for services, etc. Before a project becomes an actual commission, it is kept (in one folder) in the "Proposed Job File". Once the proposed project becomes a job, the file is transferred to the "Job File." Detailed budgeting and other pertinent information may prove useful again for new jobs, even if the ones for which they had been intended originally, do not materialize.

2. Job Files. No matter how small a job, there inevitably will be a certain amount of correspondence and memoranda. While the physical number of folders needed per job file will depend upon the nature of each job, experience has proven that an early separation into individual folders by subjects will make the job file more workable. The proper time for such subdivision can obviously be gaged only by the volume of material for filing at hand.

a. Small Projects. Residences, most alterations, and other small projects may be adequately served by the following folders for each:

Architect's Contract & Billing
Architect's Budget & Production Costs
Bidders' File (Before Construction Contract is awarded; Construction Budget, Bids, etc.)
City Departments (Applications, Objections, Approvals, etc.)
†General Contractor — General Correspondence
†General Contractor—Construction Contract, Requisitions, Certificates of Payment Memoranda to File (e.g., visits to job, etc.)
†Owner—General Correspondence
Planning Program, Notes & Minutes of Meetings (with Owner)
Purchases Made for Owner
Specifications

b. Large Projects. In the case of files for a larger project, though the breakdown will be basically the same as shown under a. above, they will obviously have to undergo a further breakdown, in order to take account of the multitude of separate phases and number of outside firms and agencies who may be involved.

In the case of the larger projects, too, special research work is frequently done on various materials, finishes, appliances, etc. While the job is active and such research and comparative analyses are made, copies are kept in the job file under "Research," each extensive subject having its own subfile (e.g., Soundproofing of Floors, Balconies, Signal Systems, etc.) At the completion of the job these "Research" files are removed and integrated in the "Source Material File" which was discussed in an earlier article.

c. Large Projects with Associate. If a project is executed by a Joint Venture, certain specific files must be added to the multitude of the "normal" job files. Generally these additional files will consist of file headings, such as: general correspondence with Partners, Joint Venture account and charges, Joint Venture agreement, Joint Venture monthly balance sheets, minutes of meeting with Partners, Partners' drawing accounts, and taxes.

3. Bookkeeping Items and Their Files. This material is obviously located near the person in charge of its upkeep. It consists of such items as: checkbook, all books required for the bookkeeping system in use, period payroll summaries, timecards, employe's payroll record (a form from which W-2 Forms and other tax reports are prepared), job number index book, bank statements, cancelled checks, etc. For the most part, these are the official records of the firm's business conduct. They are the ones which are subject to inspection by government and insurance agencies (and to some extent may be subject to audits by private or government clients, should a contract so specify).

4. Management Files. In contrast to the bookkeeping or official records discussed above, the management files deal primarily with the analyses of business conduct, and are frequently consulted not only for the purpose of analyzing active jobs, but also with a view to preparing budgets for future work. In addition, of course, they are concerned with the overall administrative picture of the office. "Management" records will, among others, generally consist of the following types of material:

* *Architect; Office Manager for Mayer & Whittlesey, Architects, New York, N. Y.*

† *Files identified by a dagger are filed alphabetically using respective person's name.*
If outside consultants are used, e.g., structural, mechanical, or others, each will have a separate folder, alphabetically integrated into the over-all folders for the job.

Billing Record
Financial Prognosis and Payment Schedule
Production Schedules
Production Costs
Overhead Analyses
Detailed Job Proposals
Professional Standards, Fee Schedules
Consulting Engineers' Fee Schedules
Personnel Vacation Schedule
Individual Employes' Records (showing roughly such information as: name; address; date of employment; salaries and increase; absences due to illness, and others; date of leaving; reason for leaving; remarks, such as qualifications shown while in the office. This type of file is not only useful for purposes of checking the man's record while he is with the firm, but can be referred to easily when potential future employers or government agencies ask for references.)

5. "Miscellaneous" Files. All material which is not concerned with specific architectural jobs and which does not fall into other categories discussed above, but which is essential nevertheless to the conduct of an office, is preferably filed in a distinctly separate filing unit. An alphabetic breakdown may show material on the following subjects:
(Where ever headings are not followed by specific explanations, "General Correspondence" is implied for each, unless the name of a file itself explains the subject matter.)
AIA, National
AIA, Local Chapter
Applications for Positions
Architectural Magazines (by individual name)
Bank
Bills (Individual folders for firms where there are frequent transactions, e.g., Blueprint Company, Stationery Firm, Travel Agency, Art Supply Co., Telephone Co., Rent, etc. All infrequent other "general" bills are best filed in a common folder arranged by year.)
Charitable Contributions
Commendations
Correspondence (with individuals)
Correspondence, General
Employes (correspondence with and about)
Employment Agencies
Filing Cabinets (index of all)
Furniture Purchases
Insurances (type, policy, bills)
Membership Files (firm and partners)
"Names" File (individual folders for various groups of specialists who may be contacted if need should arise, e.g., Planners, various consultants, contractors and other specialists)
NCARB (questionnaires, qualifications)
Partnership Files
Publicity (newspaper clipping, etc.)
Qualifications (completed questionnaires)
Staff Memos
Subscriptions
Taxes (separate folder for each category)

If in the operation of the office's activities there is a need for contacting certain individuals not connected with the firm, and/or certain organizations, the list of which may be voluminous, depending on the office, a card index file for each person and organization giving pertinent information, may prove to be time saving.

A dated "tickler" file, in which important business follow-up items are stored and which is checked daily by the secretary who brings the "due" item to the attention of the individual concerned, may prevent laxness or possibly complete overlooking of important matters. Due to these items being filed centrally rather than being noted in an individual's diary only, they can be given proper attention even if the person concerned should be absent at the time at which action should be taken.

6. Forms and Supplies. Just as stationery and office supplies are checked periodically for quantities at hand, it is advisable and will prove time-saving to keep an ample supply of the various forms available which may be needed from time to time. These forms would include AIA forms of Agreements (the types generally used by the individual firm), Certificate of Payment forms, Employe's forms, payroll sheets, etc.

Ultimate Disposition of Files and Records.

Every office will have to judge periodically which filed material has outlived its usefulness. Hardly any office will have such unlimited storage space as to be able to hold on to all material indefinitely. Basically, the legal statute of limitations will govern which part of the firm's official records may be destroyed. The statute of limitations, however, will not be the guide as far as "experience" and actual job records are concerned. Especially where architectural jobs are involved, information contained in a job file may be of extreme value should the building be altered years after the original job has been completed.

Disposition of files and records may possibly be accomplished by doing the following (obviously subject to each firm's individual needs and experiences):

Job Files. As a job is completed, special "research" items are extracted and entered in "Source Material"; Production Cost information is removed, summarized, and kept with "Management" records; remaining files are condensed by disposing of all but essential correspondence, contracts, records. Care should be taken not to destroy correspondence and records which may become important should legal action be taken in years to come by the owner, contractor, or other person. A separate "dead" file as distinguished from the "active" is best suitable for keeping such remaining material. Dead files need, of course, no longer be located in the work office proper, but an index should be kept of where these files are stored.

Business Records. Tax, payroll, timecards, and other business records must obviously be kept until the statute of limitation has been achieved. Depending on what further use an office may have for such documents, they may then be destroyed.

"Miscellaneous" Files. Except for legal documents and records, the majority of these files will become out-dated as time goes by. A periodic cleanout will deplete the volume and will make the file more useful.

Bernard Tomson **it's the law**

When is a dispute a proper subject for arbitration under the general conditions (Articles 39 and 40 of the standard form building contract issued by the American Institute of Architects)? This was the issue before the Appellate Division of New York in the *Matter of Board of Education Union Free School District No. 3, Town of Islip, Suffolk County, New York.*

A General Contractor had entered into a contract with the Board of Education for general construction work for alterations and additions to the East Islip School. The Contractor was required, under the contract, to do certain excavation work, including the excavation for footings and foundations, as well as to perform certain concrete work, including the construction of the footings and foundations.

Article 6 of said contract provided in part as follows:

"The Contract Documents—The General Conditions of the Contract, the Specifications and the Drawings, together with this agreement, form the contract, and they are as fully a part of the contract as if hereto attached or herein repeated."

The general instructions and information with regard to the excavations for footings and foundations and for the construction of the footings and foundations were contained in the specifications furnished the General Contractor. Drawing No. 3 gave detailed dimensions and measurements for the depth of the excavation for the footings and foundations. The drawing specified that the excavations for the footings and foundations were to be carried to a depth of 1'-10½".

A notation on Drawing No. 1 read as follows:

"All footings to bear on undisturbed soil of minimum two ton per square foot bearing capacity."

Pursuant to the provisions of the specifications, the Contractor notified the Architect when the footing excavation was carried to the 1'-10½" level. After an inspection, the Architect disapproved of the soil conditions at the 1'-10½" level because of roots in the soil and directed the Contractor to carry the footings down so that they rested on 2 ton per square foot bearing soil.

The Contractor claimed an extra for the additional work and was notified by the Architect that the matter of compensation would be adjudicated at a later time. When no further remuneration was forthcoming, the Contractor filed a demand for arbitration, which proceedings were stayed on motion of the Board of Education and appealed to the Appellate Division, after a lower court held that this was a proper case for arbitration.

On appeal the Board maintained that there was no bona fide dispute within the meaning of the contract. The Board cited as controlling the note to Drawing No. 1, as well as other sections, one of which provided as follows:

"Concrete and cement work footings and foundations: Pour only on undisturbed earth. Where ground has been disturbed, carry footings down lower than as shown on the drawings, at no additional cost to the owner."

Under the Board's theory, therefore, the Contractor could not be excused from his contract because of unforeseen difficulty, soil conditions, or unusual or unexpected expenses and, consequently, was not entitled to extra compensation. Thus, as there was no bona fide dispute within the meaning of the contract, the Contractor had no right to arbitration.

The Contractor contended that there was a bona fide dispute between the parties as to the construction of the contract provisions and rejected the Board's reference to Drawing 3, which showed the 1'-10½" dimensions as "only typical," as in no way binding. As the contractor stated in its brief:

"A typical detail in the building industry does not signify something indefinite like the 'typical woman.' A typical architectural detail establishes the exact size, shape, quantities, etc., for specially located work and for all other similar work."

This, claimed the Contractor, was clearly a controversy subject to arbitration under the arbitration agreement.

The Appellate Division reviewed the AIA arbitration provisions incorporated in the contract, which provided, in part:

"'The Architect shall . . . make decisions on all claims . . . relating to the execution and progress of the work on the interpretation of the Contract Documents'; that '. . . all the architect's decisions are subject to arbitration'; and that 'the decision of the arbitrators shall be a condition precedent to any right of legal action. . . .'"

The Court determined that the dispute as to whether or not certain work constituted an extra was properly a subject for arbitration by the Architect. In conclusion, the Court declared:

"The language of the arbitration provisions of the contract is sufficiently broad to express an intention of the parties to submit a dispute such as the one herein to arbitration."

It is to be noted that the merits of the controversy were not considered by the Court, which merely passed upon the presence or absence of a bona fide arbitrable dispute. This case represents the latest development in judicial construction and application of one of the AIA arbitration provisions. See June 1954 P/A, where I considered the same Court's interpretation of the Architect's role as arbiter.

It is also important to note that this is not a discussion of the arbitration clauses in the "Architect-Client" AIA form. The court decisions only emphasize the importance of amending that particular arbitration clause so as to insure that an arbitration tribunal, and not a court, will decide disputes between an Architect and his Client. *(See March 1949 P/A.)*

home planning exhibit in a bank

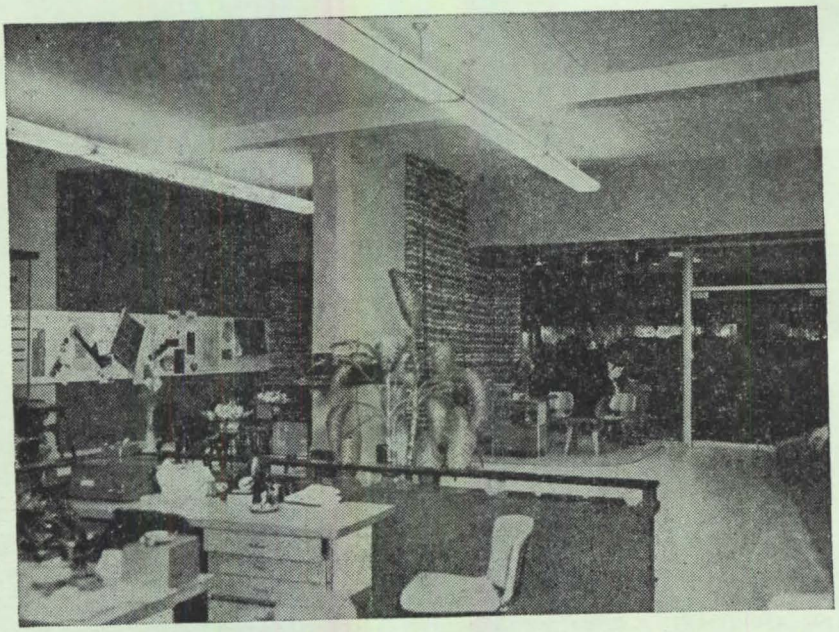
Last month we documented an extremely ambitious—and expensive—exhibit on architecture, which is traveling around the country. Putting your best foot forward through the medium of an exhibit need not be this ambitious, however, as this month's case study shows.

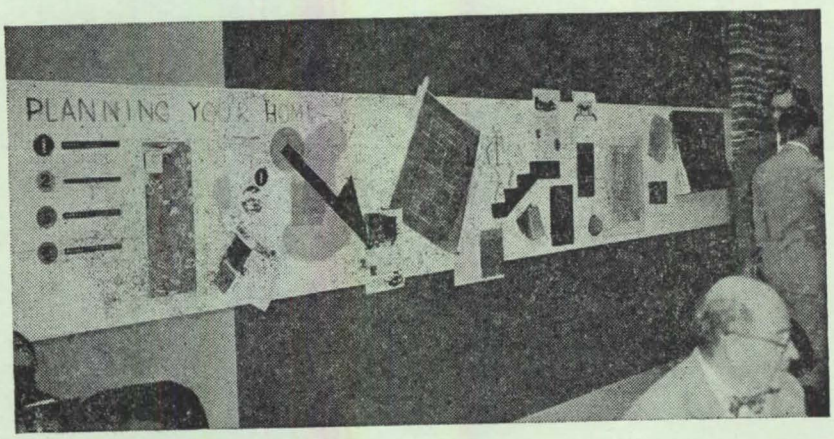
The benefits of an "exhibition" are fairly obvious: it reaches the general public; the fact that someone has thought well enough of the subject to give it hanging space in a public place endows it with a certain prestige. It is dignified, acceptable promotion; and this being so, the exhibitor has a responsibility to make his presentation as objective as possible. The show should teach the public something in a general sense about the operation of an architect, and the importance of good planning. It is then public education from which every architect in the community will benefit, along with the person whose work is shown.

Norman M. Giller, Miami Beach, Florida, architect, recently held a "one-man show" on the subject of home planning, in the lobby of the Washington Federal Savings and Loan Association in Miami Beach. The bank was anxious to educate its clients in proper planning. The "public" was an ideal one—out-of-town visitors even came from other places, as word of it spread.

As the photographs show, the exhibit is a running story, based, Giller says, on simple, direct, and "animated" answers to "the type of question which is usually asked me by persons about to build their own homes." The theme, *Proper Planning —A Happy Home*, is divided into four parts: the relation of the home to the community; the design of space; preliminary discussions and the architect's job; bidding, contracting, construction.

The exhibit was received with enthusiasm: the architect, the bank president (Jack Gordon, who is the youngest president of a Federal Savings and Loan Association in the United States), and the public all seem to have benefited. This sort of public relations activity takes a little effort and thoughtful planning.





Space off bank lobby is set aside for exhibition (top) *which is a direct and simple "argument" illustrated with actual working drawings and specifications* (center photo). *Giller explains an architect's services to potential home owners* (right).

religion and culture

This special issue of P/A, continuing the year's series of studies of our changing living habits and their effects on contemporary architecture, is built around a selection of those buildings that reflect, in one way or another, man's aspirations toward religion, toward cultural advancement, and toward personal betterment. In today's increasingly mechanized world, numerous pressures serve to heighten the need for this category of architectural development.

1. With most of us wresting a livelihood from a highly paced competitive economic system, some provision for serenity and contemplation is a necessity in order to maintain a rational balance.

2. With the emergence of destructive weapons of incredible potency and the threat of general obliteration, there is a tendency to re-evaluate the goals of life, to seek lasting values and spiritual security, and to return to a sober search for order and purpose in existence.

3. With daily tensions and stepped-up noise spreading from coast to coast, the healing quiet of retreats and the informality of the casual meeting place are sought as antidotes.

Thus, serving a continuing social need and actually essential to peace of mind and soul are buildings such as those shown in this issue: churches and temples; a civic center; a school of art, music, and dramatics; and a social center.

The efforts to establish a convincing contemporary design expression of the architecture for religion and cultural pursuits are of particular interest. Tradition and ritual requirements have tended to restrict the design of churches and synagogues to rather narrow limits. Nonetheless, as a study of following pages will reveal, some architects are contriving to use modern materials and modern techniques in producing the desired atmosphere of mystery and quiet devotion. Libraries that would have been almost certainly conceived as pompous, gloomy landmarks earlier in this century, now are opened with many windows to provide optimum reading conditions and the interior circulation is planned to expedite, rather than frustrate, the functioning of the building. P/A Editors find it encouraging that the Phoenix Civic Center is evidence of at least one city's choice of a co-ordinated group of public buildings, designed in human scale and set in rich landscaping.

In contrast to more utilitarian and mundane categories of building, these structures are distinguished by a warmth and a character of expression that seem to place personal values above all others.

location	Burlington, Vermont
architects	Freeman-French-Freeman
mechanical engineers	Jaros, Baum & Bolles
landscape architect	Elizabeth Dickerman Jones
interior decorator	Harlene R. Horn
engraved glass windows	Benjamin C. Stein, Jr.
general contractor	Hall Brothers Company

Synagogue

The Congregation Ohavi Zedek in Burlington, Vermont, numbering about 700 members, has existed for 200 years. Its need for more space and additional facilities led to this building, located on one of Burlington's pleasant residential streets.

For regular services, the temple seats 175 persons. On High Holydays, folding doors at rear of the sanctuary can be opened to the auditorium, thereby enlarging the capacity to 700 persons. On other occasions, the auditorium serves as a recreation and social room. Four Hebrew School classrooms, the library, lounge, meeting room, and offices flank the temple and auditorium in a peripheral arrangement.

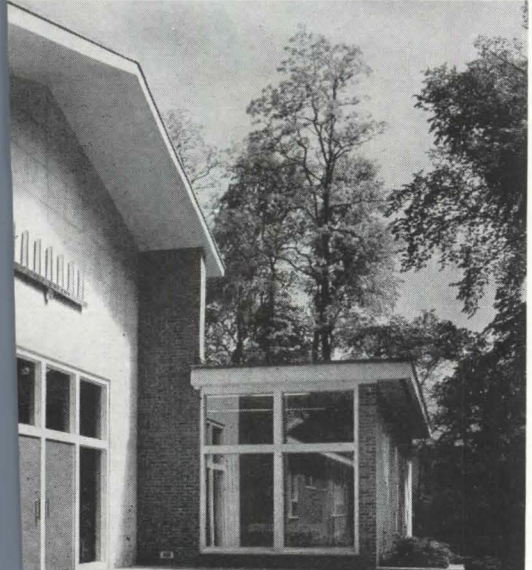
The structure is composed of cavity bearing walls with wood-frame roof. Temple and auditorium roofing consists of horizontally braced Belgian trusses, from which the choir loft is hung by means of steel rods.

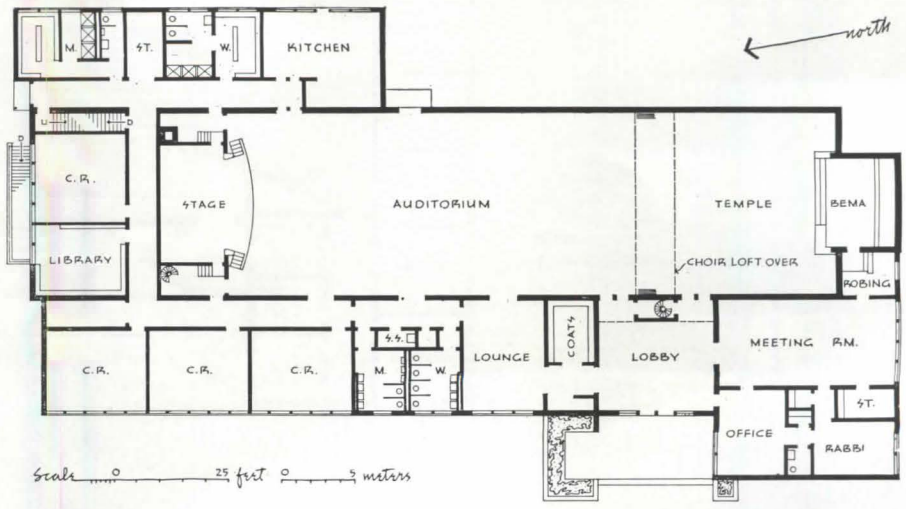
The architects felt that since the religious service is primarily a joyous one, the interior wall colors should be bright and lively, and combine with the natural brick and light-colored native birch, used throughout the interior. The windows in the temple are of clear glass, to facilitate prayer reading. Nevertheless, for decorative purposes they have been engraved with abstract symbolic designs in the tradition of Jewish art.

Photos: Richard Garrison

View toward bema or sanctuary (left). *"By carrying the ceiling line through from the interior to the exterior, and interrupting the band of glass with the walls of the bema" the architects feel that "the roof in the temple is given the visual aspect of floating, supported only by the bema which, since it contains the ark, psychologically expresses the strength of the law."*

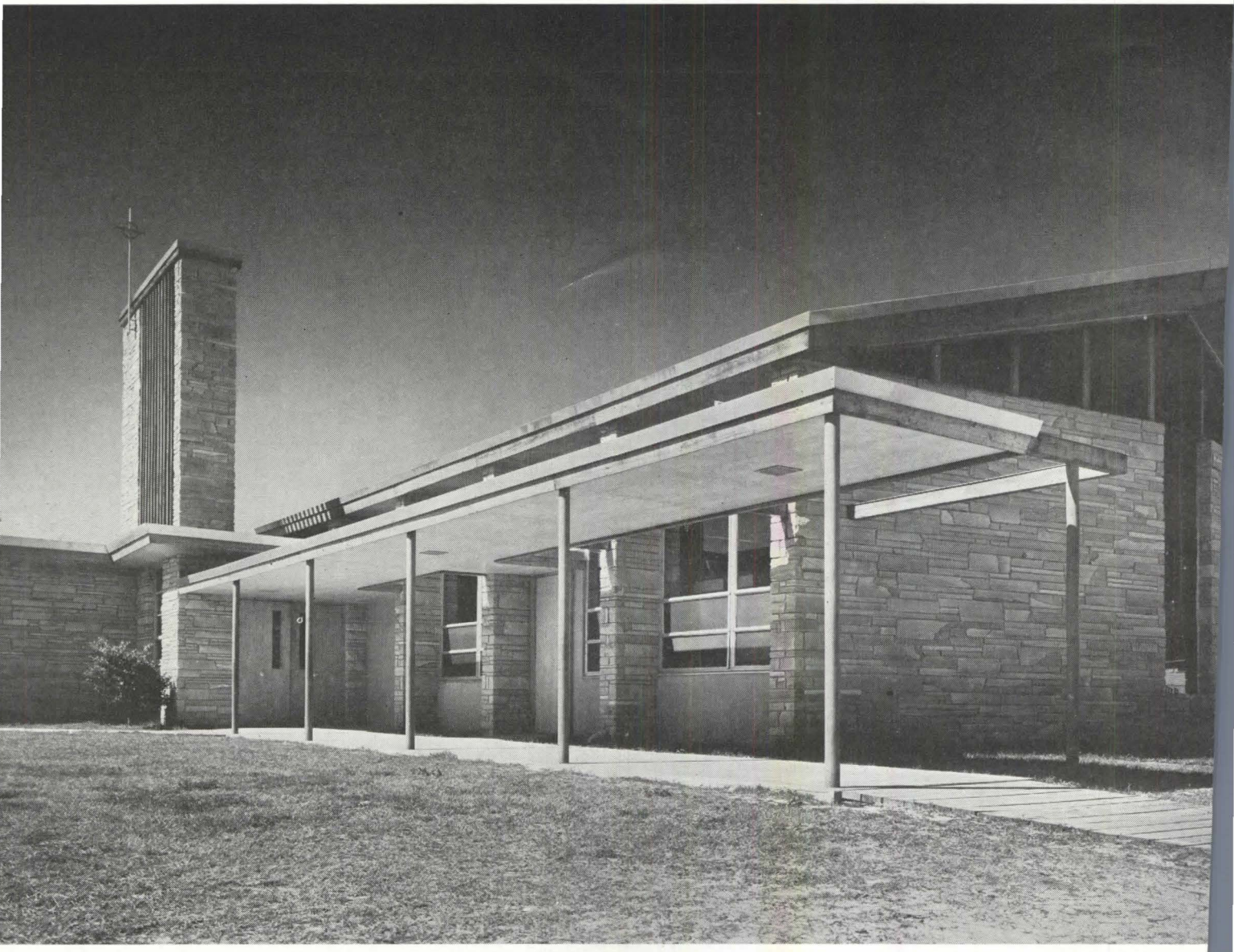
Choir loft and folding partition at rear of temple (below).

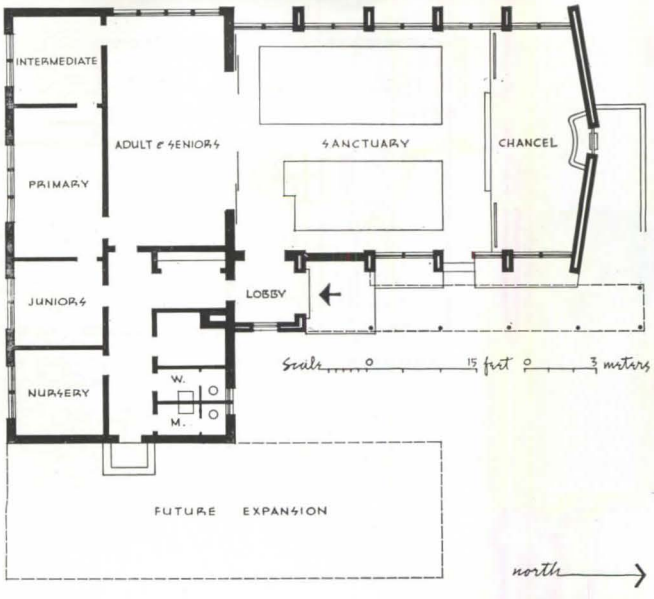




location | Wrightsville Beach, North Carolina
architect | Leslie N. Boney
general contractor | J. Fred Murray

Chapel





"The Little Chapel on the Boardwalk" was designed to seat about 150 persons. Since its opening three years ago, actual attendance has varied from a year-round congregation of 125 up to 300 persons in the summer. Sliding doors at the rear of the sanctuary make the adult-senior meeting room available as an overflow area.

As attendance is largest during the summer, special thought has been devoted to making the chapel comfortable during the hot months. Interior colors are turquoise and yellow, with blue glass at the front of the chancel making a cool, pleasant, and open atmosphere. The windows in the chapel are awning type, to provide maximum ventilation. Projected aluminum sash has been used in the Sunday school area.

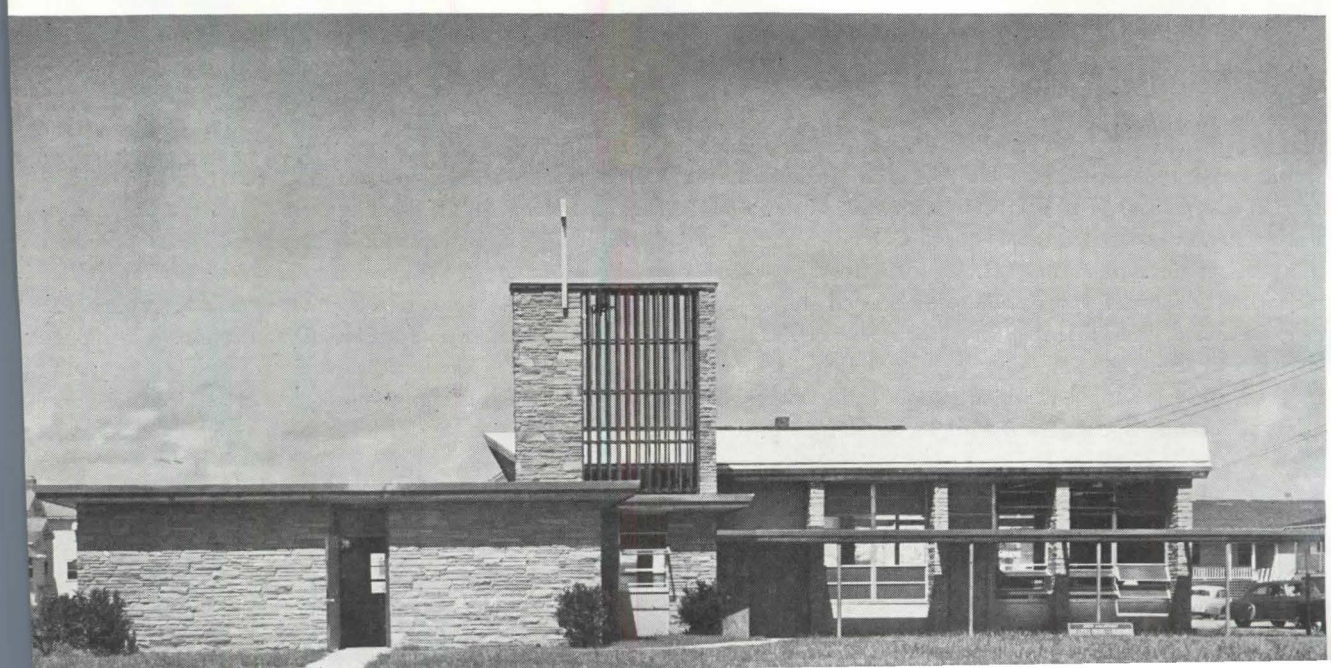
The architect's comment on the little chapel: "While the building does depart from standard church architecture, the traditional symbols are still present in new materials and forms."

A covered walk leads to the main entrance of the chapel (acrosspage).

Exterior and interior walls are crab orchard stone veneer (right). *Window at the front of the chancel is hammered, blue, glare-reducing glass.* Photos: Joseph W. Molitor

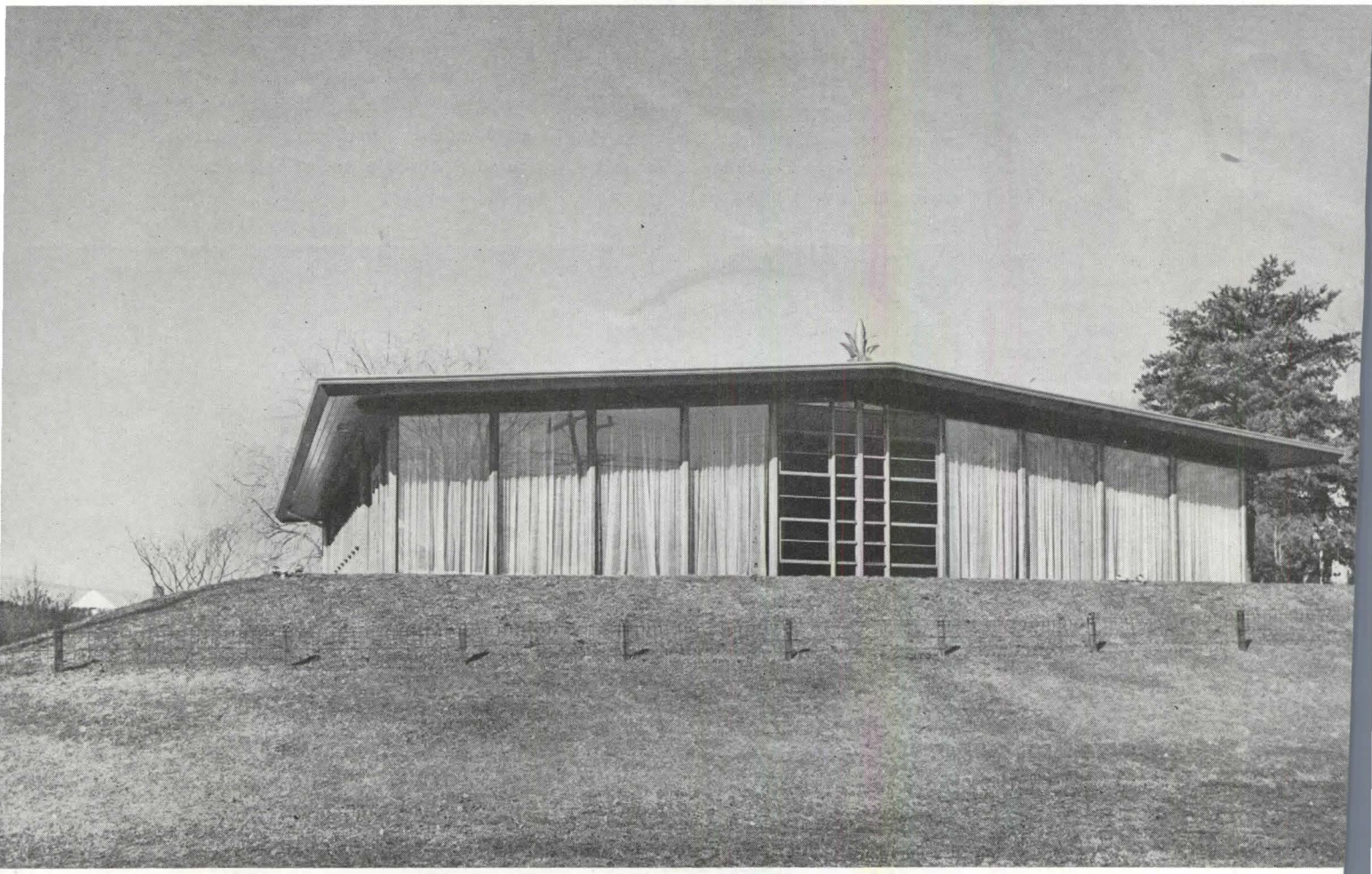
Chapel as seen from the east (below). *Direct entrance to Sunday school is at left.*

Photo: G. E. Kidder Smith



location	Washington, D. C.
architect	Walter D. Byrd
consulting engineer	Robert Hardesty
general contractors	Muth Brothers

Temple

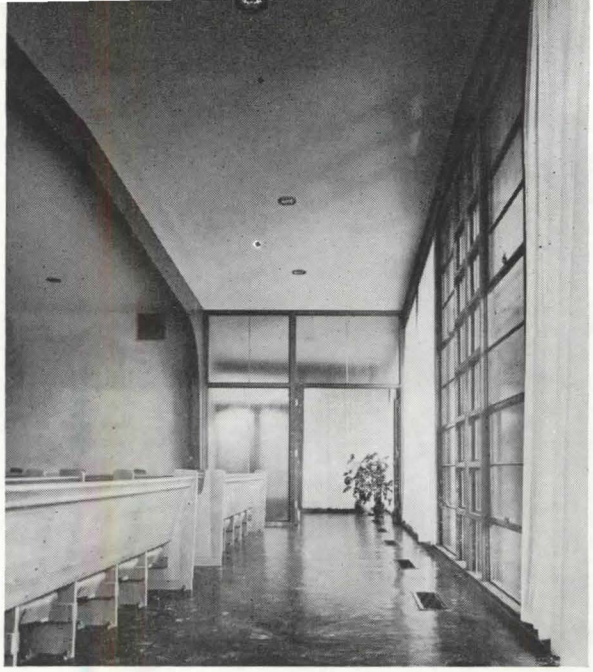


One approaches the "Golden Lotus Temple" from the lower sidewalk by a flight of stairs. The façade of the building (above) *is of ¼" polished plate glass fitted between 8" x 8" fir posts with chamfered corners.* Photo: Richard Garrison

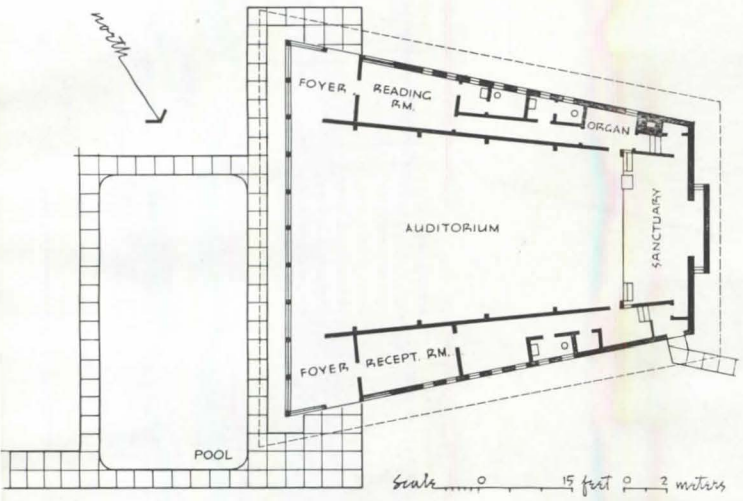
This building, situated on a terrace 12 feet above the street level, accommodates an audience of 210 persons. It was erected for a nonsectarian group dedicated to the teaching of religious philosophy. In consonance with the form of worship, the plan and execution of the "Self-Realization Fellowship Church" are simple.

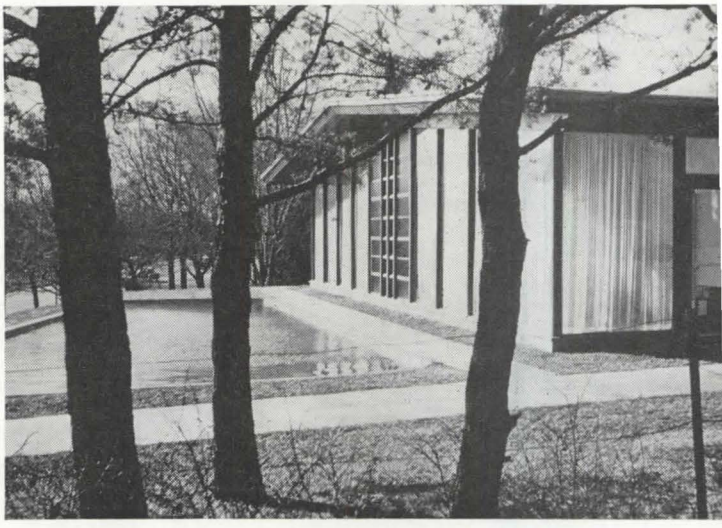
A 5-in. concrete slab, under which forced warm-air heating ducts have been laid, forms the foundation for the building. The side and rear walls are faced with pastel-colored slump brick. Laminated-wood arches were substituted for steel trusses, when a steel shortage threatened to delay construction. Although not quite as strong as steel, wood offered the advantage of less sag under high temperatures. Moreover, the wood arches, left in their natural state, form a graceful pattern under the temple roof. Sand-finished plaster surfaces the interior wall and the ceiling between the arches. Aluminum foil was used in the ceiling for thermal insulation, while draperies at sides of the altar insulate acoustically.

The reflecting pool before this simple and well-proportioned building heightens the atmosphere of peace and quiet, and provides an ideal setting for meditation.



Entrance to auditorium (right) *is through foyers at both sides of church. Seats are folding type. Floor is waxed and polished asphalt tile.* Photo: Richard Garrison



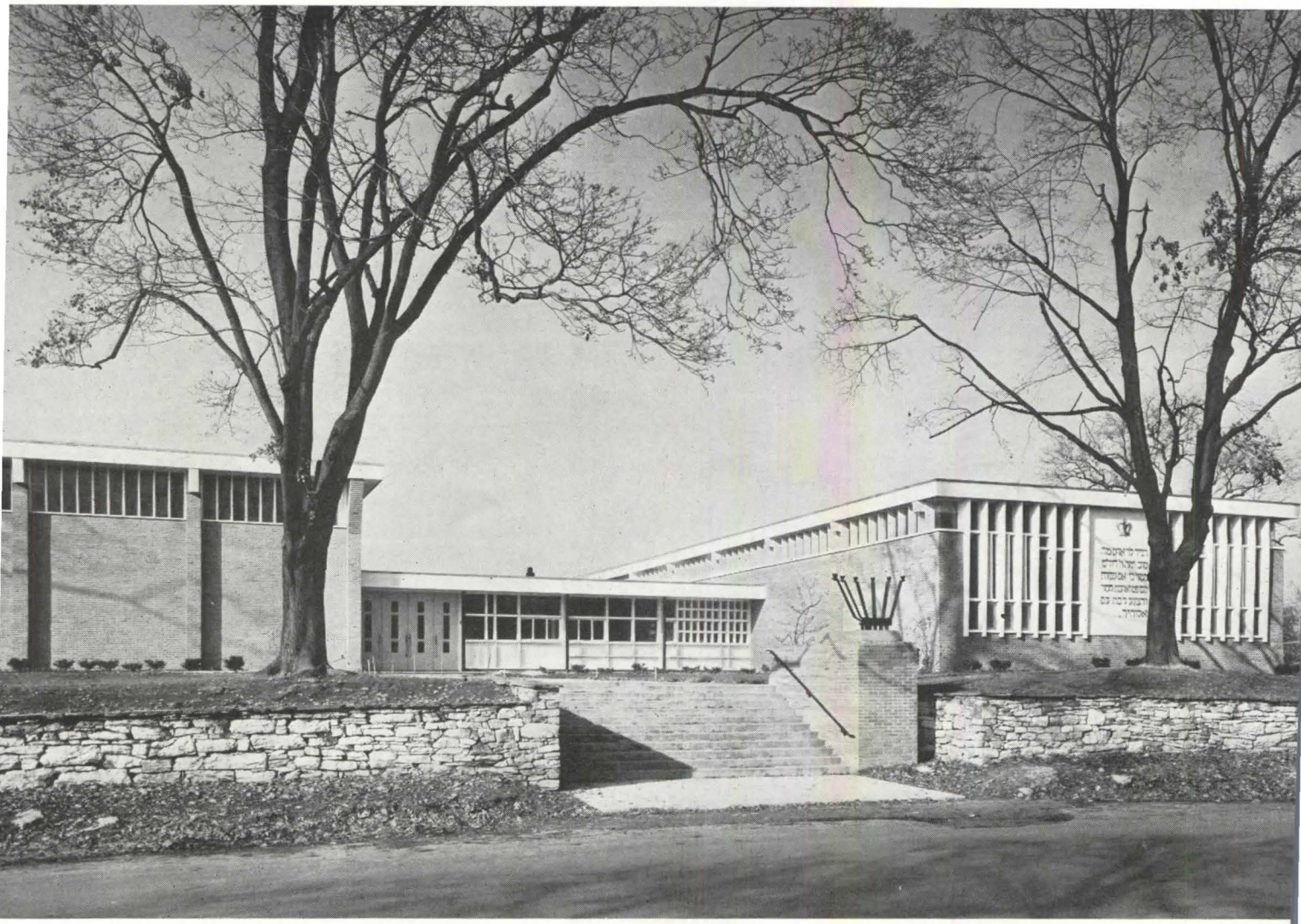


Reflecting pool (above) *is before the temple. Glass façade is mirrored in pool* (left).

Photo: Robert C. Lautman

Synagogue

location	Lebanon, Pennsylvania
architect	Percival Goodman
structural engineers	Fraioli-Blum-Yesselman
mechanical engineer	Charles R. Bardos
lighting consultant	M. F. Segalas
general contractors	M. L. Haldeman & Son



The Congregation Beth Israel, long established in this Pennsylvania Dutch town, required not only a new sanctuary, but educational, social, and athletic facilities as well. A playground owned by the temple provided the site.

Principal areas of the synagogue are:

1. A sanctuary, seating 200 persons, for the Sabbath services.

2. A lecture and social hall with a small stage, seating 300 persons. This area can be opened to form part of the sanctuary. In this way, a social event can be attended by 500 persons, or, by reversing the seats, a religious ceremony can be held for the same number.

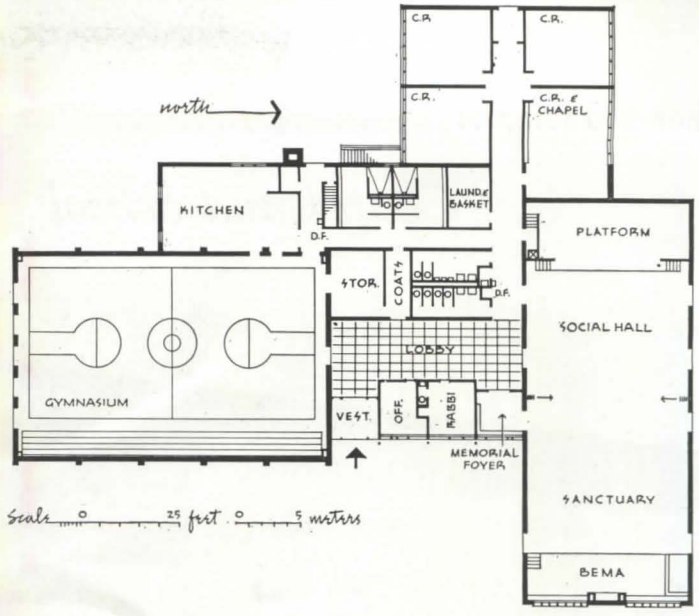
3. A gymnasium, suitable also for large dinners, dances, etc. A kitchen adjoins.

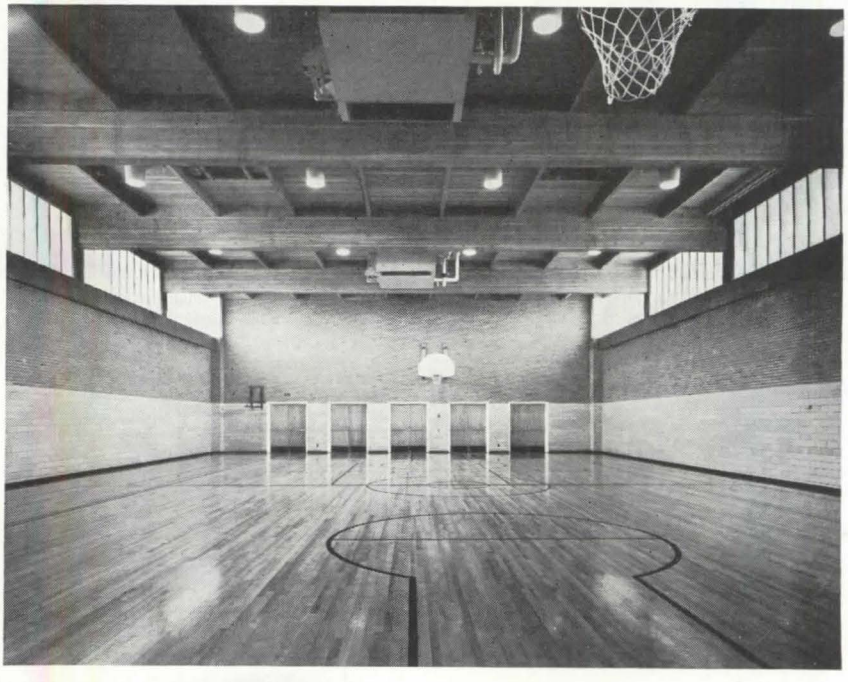
4. A chapel, used for board room and library.

5. Classrooms for religious instruction.

The structural system employs brick cavity walls. The floor is concrete slab on grade. Sanctuary, social hall, and gymnasium have exposed wood beams. The roof framing elsewhere is standard wood joists and plaster ceilings with 2 in. of rigid insulation and tar-and-gravel surfacing.

The predominating colors in the sanctuary are the blue-green of the window and carpet, the pink of the brick walls, ochre for the curtain, mahogany and white furniture.





"Red brick and white paint plus direct structural expression," states Architect Goodman, "seem natural to this landscape" (across-page).

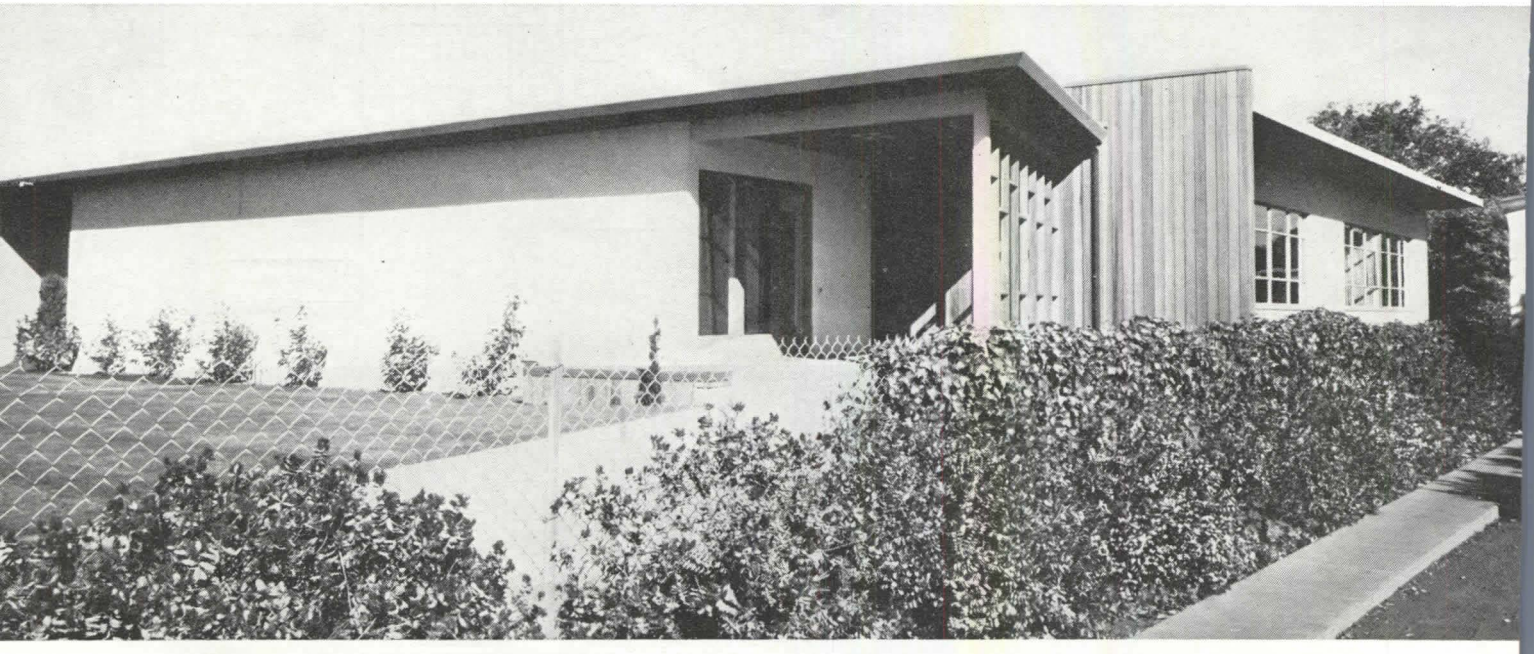
Roof framing over gymnasium (right) *consists of laminated wood girders, wood purlins, and planking, all exposed. Clear plastic has been used in clerestory windows, thus avoiding the use of window guard screens.*

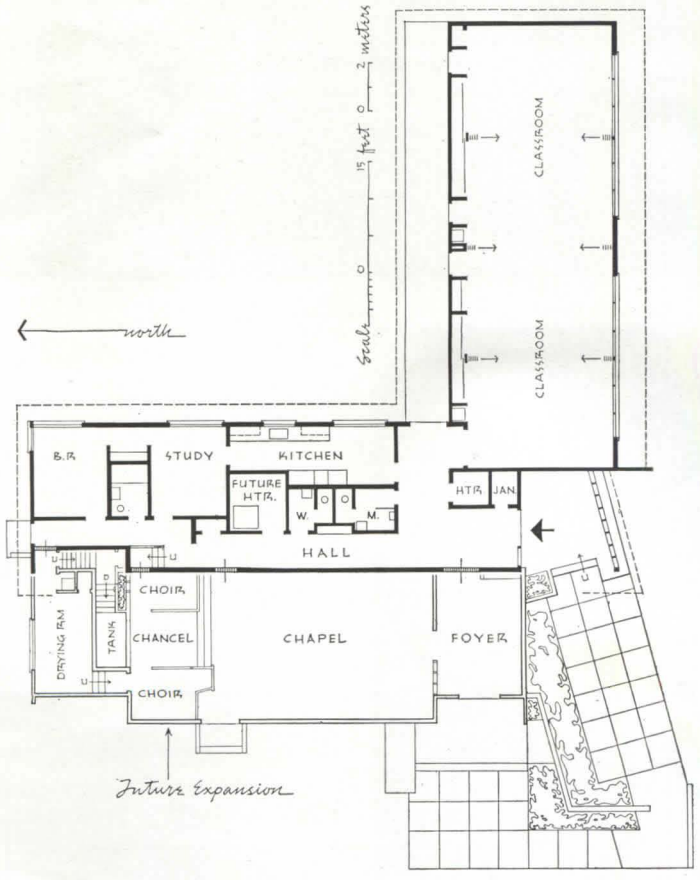
Sanctuary window (below) *is of heat-resistant glass, frosted to reduce glare. The pews have reversible backs (like old-fashioned trolley cars), so that seats may also be faced toward stage of social hall. Coffered ceiling provides recesses for lighting fixtures and insures good acoustics.*

Photos: Alexandre Georges

Chapel and School

location	San Mateo, California
architect	Worley K. Wong
associate	John Carden Campbell
general contractors	Joel Johnson & Son



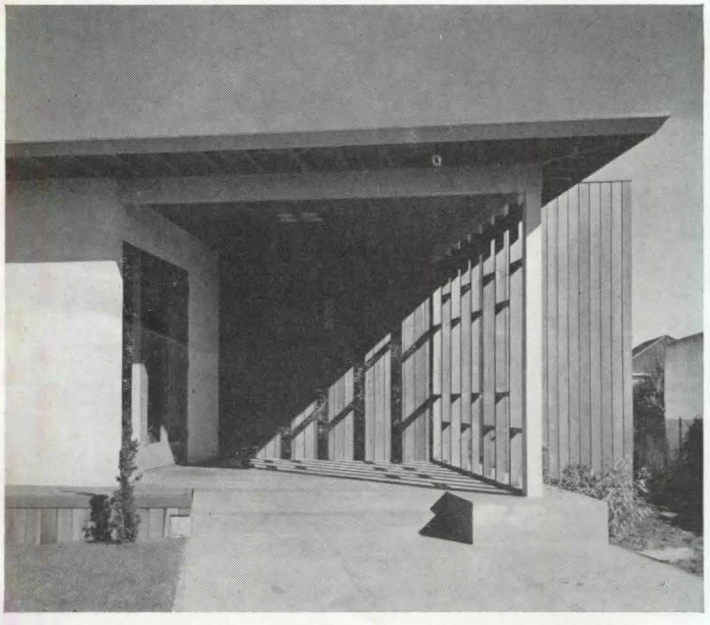


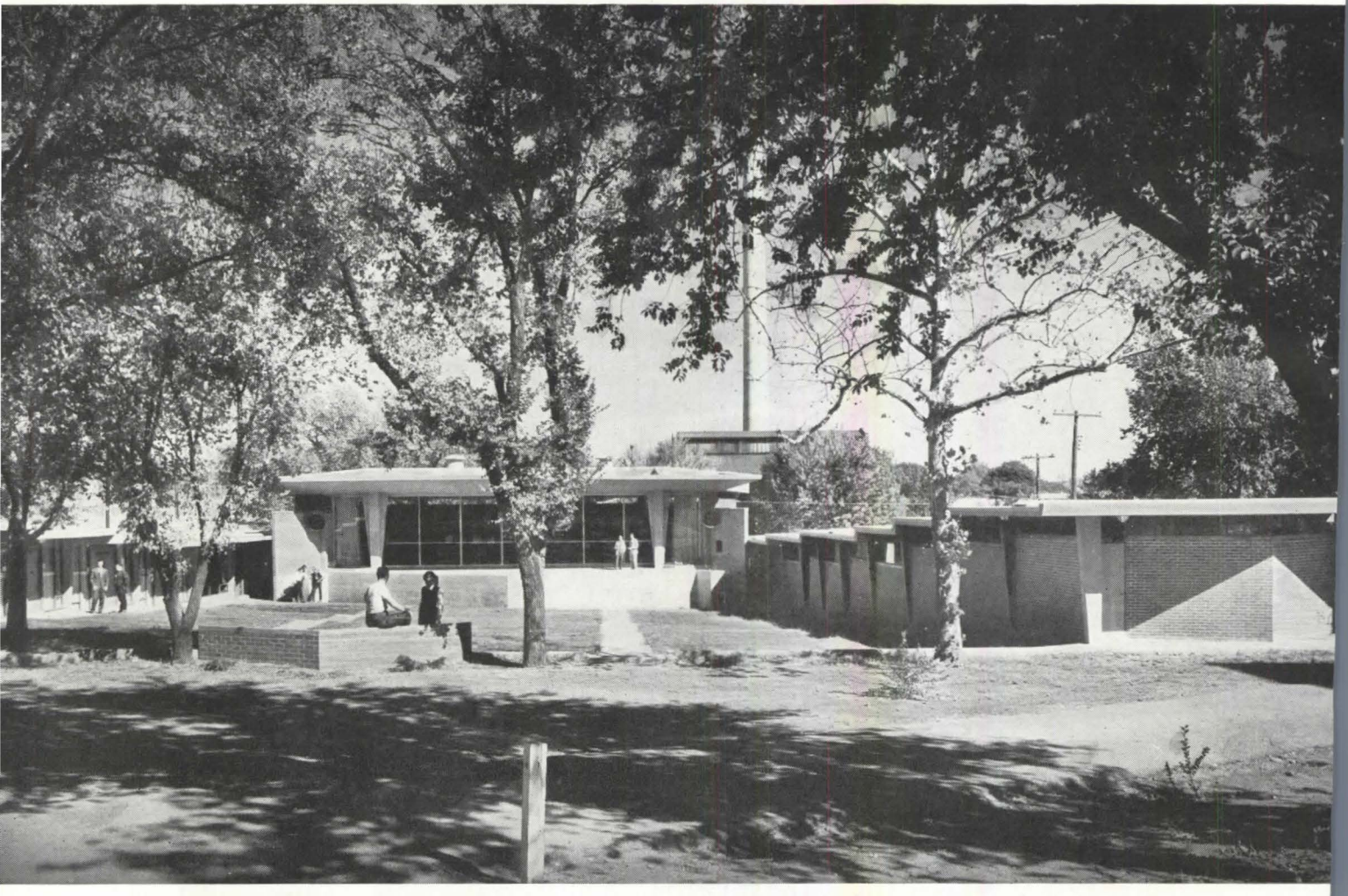
As the combined plan illustrates, this building constitutes the school and service wings of an eventual complex that will serve as chapel, school, and community center for Chinese-American families. A local Baptist church launched the project and supplied about two thirds of the funds. For worship, the minister now uses a temporary dais at one end of the classroom area, a space that may be a single room for groups or divided into four classrooms by folding partitions. Other elements of flexibility include folding chairs and tables and commodious storage closets.

Chinese-American families make a point of seeing that their children both read and speak their ancestral language; hence, youngsters attend language classes here daily from 5 p. m. to 8 p. m. Parents who need tutoring in English also attend classes. The minister instructs both groups, as well as attending to his regular church duties.

A simple, wood-frame structure, the building has exterior walls of plaster and redwood; interior surfaces, of plaster on metal lath. Acoustic tile is used on ceilings of classroom areas. Sash are steel architectural projected; glass is crystal or double strength. A gas furnace provides forced warm air heat.

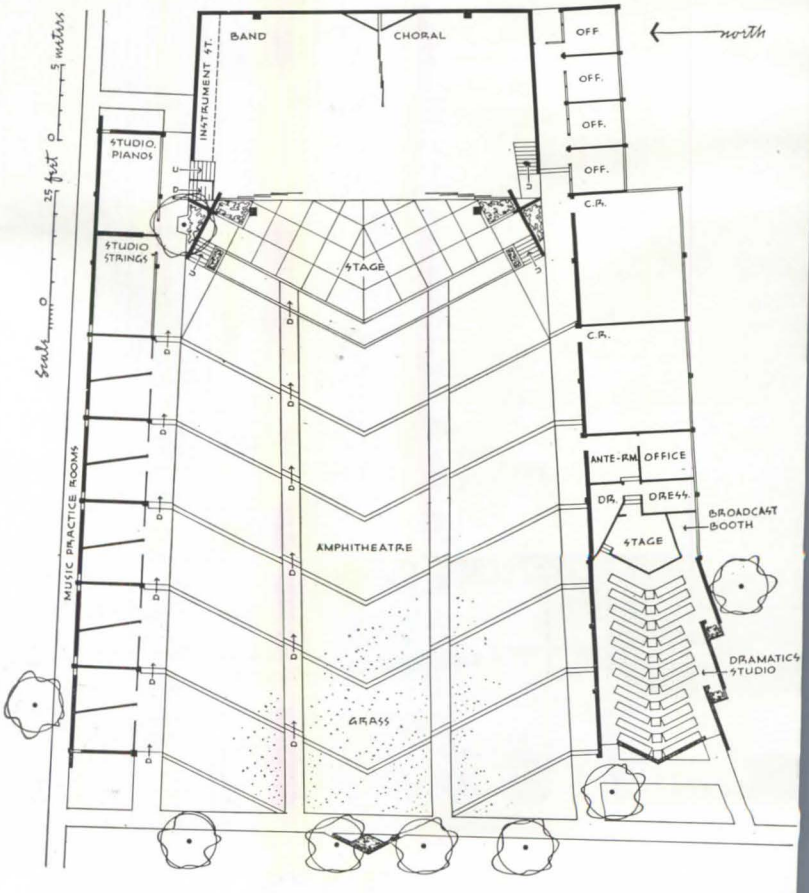
Photos: Sonya Noskowiak





Fine Arts Building

location	Central State College, Edmond, Oklahoma
architects	Conner & Pojezny
general contractors	J. W. Skaggs Construction Co.



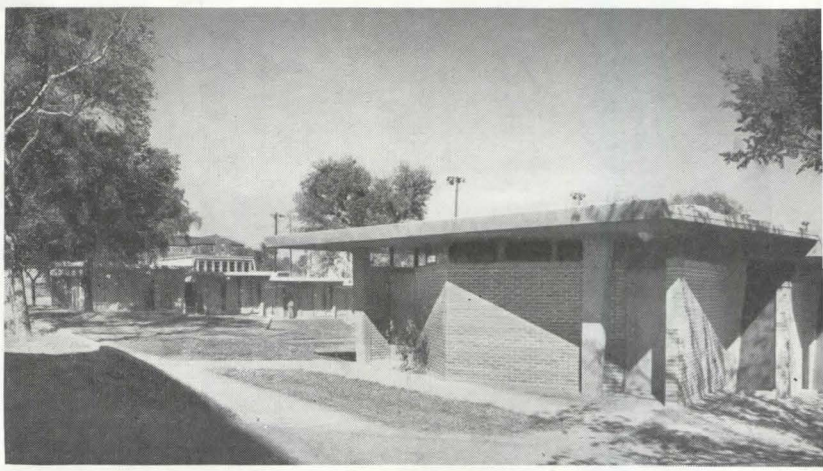
Central State's U-shaped Fine Arts Building houses the college's music and dramatics departments. Provision has been made for classrooms, individual music practice, band and choral rehearsals, dramatic studio and little theater, broadcasting facilities and outdoor concerts.

The attendant problem in acoustics was solved by a well-thought-out design and a good selection of materials.

The structure is turned within itself and away from adjacent buildings, in order to reduce disturbance to other activities. Music practice and academic sections are in separate wings of the U. While sounds from the practice rooms are directed toward an open athletic field to the north, classrooms and little theater are oriented toward the south. As a unique design feature, the sloping court has been developed as an amphitheater. The wings enclose the sides of the open air gallery, while the center unit serves as a stage, with cantilevered roof projecting sound forward. Inside, acoustical material has been sprayed onto metal-lath or directly on concrete slab ceilings.

Reinforced-concrete frame and slab form the structure throughout. The breaks in the roof level of the wings are used as rigid-frame beams carrying one-way slabs. The center unit rests on four columns, with two-way rigid frames supporting the roof beam as well as the cantilevered slab over the stage. Most interior partitions are light-weight concrete block.

Classrooms are lighted by low-brightness fluorescent lamps overhead; otherwise lighting is incandescent.

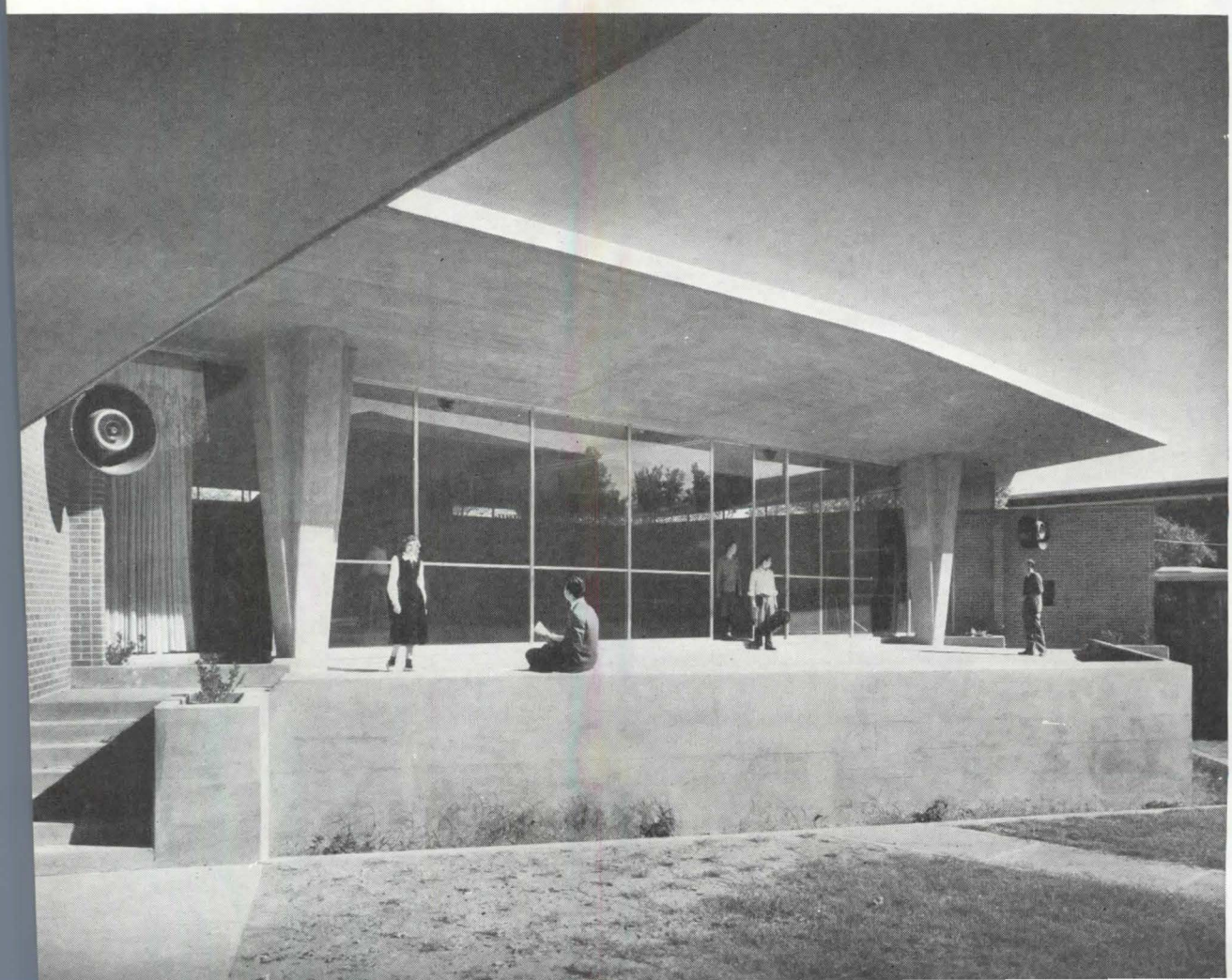


Amphitheater (acrosspage) *is flanked by music practice rooms on the north, classrooms and theater on the south. Large sliding-glass panels facing the courtyard may be opened to form a stage.*

Little theater in foreground (right) *seats about 100 persons and is equipped with broadcasting facilities.*

When not in use as a stage (below), *this structure can be divided into two separate rehearsal rooms for band and choral groups. Under the stage are dressing rooms, storage and repair shops.*

Photos: Julius Shulman

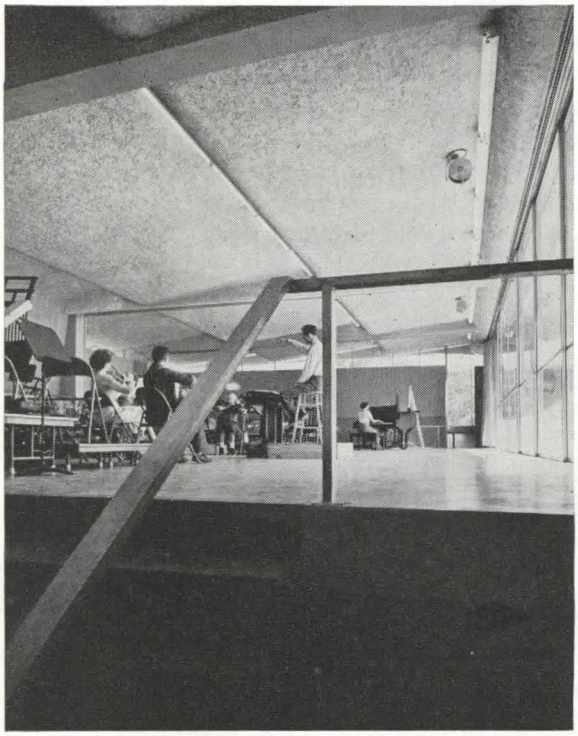


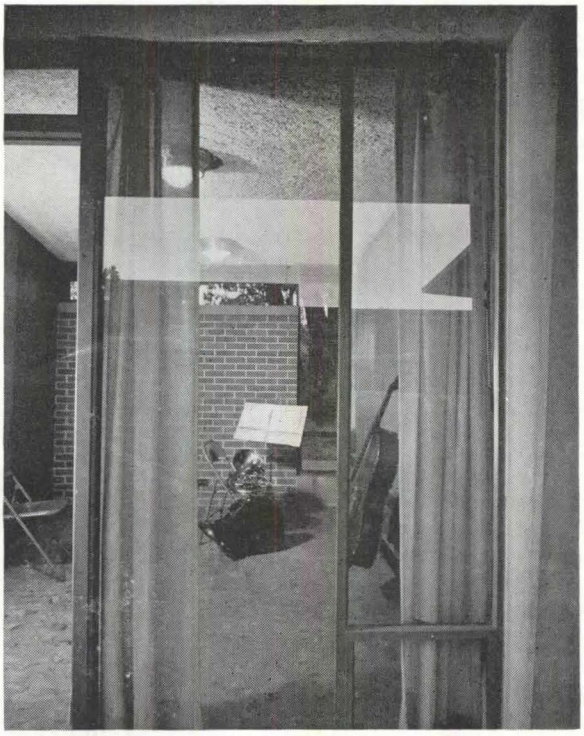
fine arts building

A typical practice room (below right). *Angled walls eliminate flutter very effectively.*

Sloped sounding boards, as well as broken ceiling pattern, provide excellent acoustics in band and choral rehearsal rooms (below left).

View toward practice rooms (below), *with choral room in foreground.*





civic center

An impressive array of design talent was employed in the development of the Civic Center being built in Phoenix, Arizona. Initially, Ernest Kump, of San Francisco, California, made an analysis of the needs for the Center. Alden B. Dow, of Midland, Michigan, received the commission to develop these needs into a co-ordinated, full-block scheme—the stage shown in the model photo. In working out the detail of the first two completed units—the Public Library (foreground) and the Little Theater (diagonally opposite corner of site)—Dow continued to serve as the associate designer. Working drawings, however, were made for the Library by Lescher & Mahoney and H. H. Green, of Phoenix; and for the Little Theater by Harold Ekman, also of Phoenix. Future construction—currently in the process of design—will include a Museum and Work Shop for the Civic Art Center.

All of the units will be connected eventually by covered walks and landscaped terraces. And all buildings—rare if not unique in the development of U. S. civic centers—will be consistent in design, developed in human scale, and richly enhanced with integrated planting.

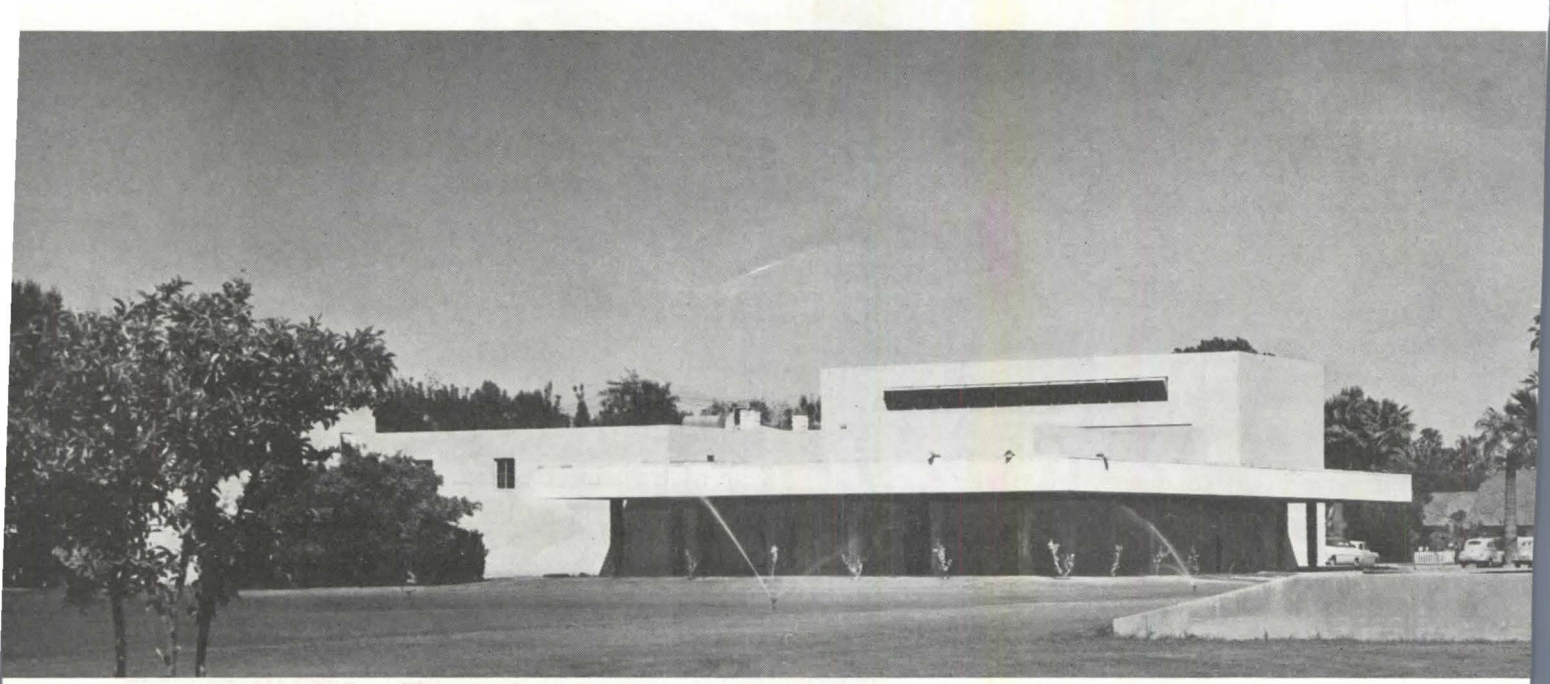
"In approaching the design," Dow comments, "the first problem seemed to be the handling of parking. As you will note . . . it occurs on all four sides of the building site and is separated from the streets by a park strip." This is evident at the lower left-hand corner of the model photo, a point near a street intersection. Notice how paired sidewalks, separated by lawn, approach the building at an angle; the white areas at either side are parking spaces. This same handling occurs at all four corners of the site. A central area, that will be largely enclosed by the buildings and covered walks, will be developed as a garden for display of sculpture and a pleasant retreat from the bustle of the city.

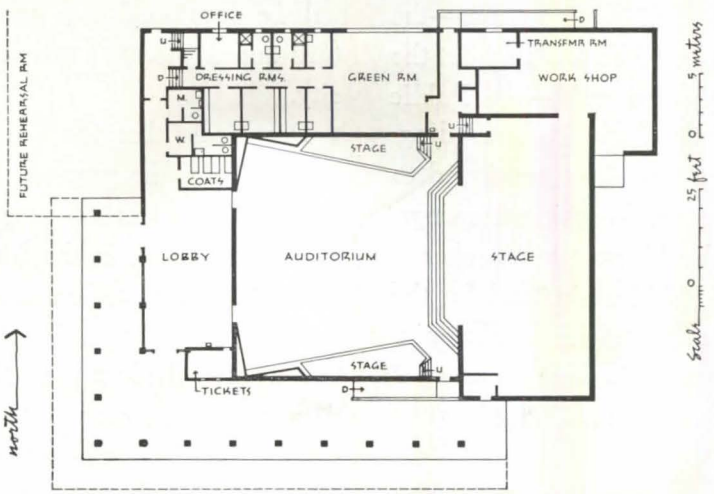
Dow feels that the buildings are "compatible" with the site, the ground, the planting, the automobiles, the crowds of people, and the individual. "This, I believe, is the important thing," he comments. But, he goes on to ask, "Is an architect ever satisfied?"

He particularly regrets that budgetary considerations made it necessary to use plaster, rather than copper, as the surfacing of the building friezes. Highlighting this sort of economy as a familiar problem that architects face when doing public buildings, he notes that "enclosed space is always the first . . . consideration. Character seems to be the last, and as a result 90 percent of the buildings built today should never have been built." Though this hardly applies to the Phoenix buildings, Dow feels that the economies that were necessary did somewhat diminish the buildings' character. And, in his opinion, "character probably contributes as much to the welfare of a building and a community as the service provided by the building itself."

Civic Center: Little Theater

location	Phoenix, Arizona
architect	Harold Ekman
associate designer	Alden B. Dow
engineer	W. T. Hamlyn
general contractors	Buros & Sons

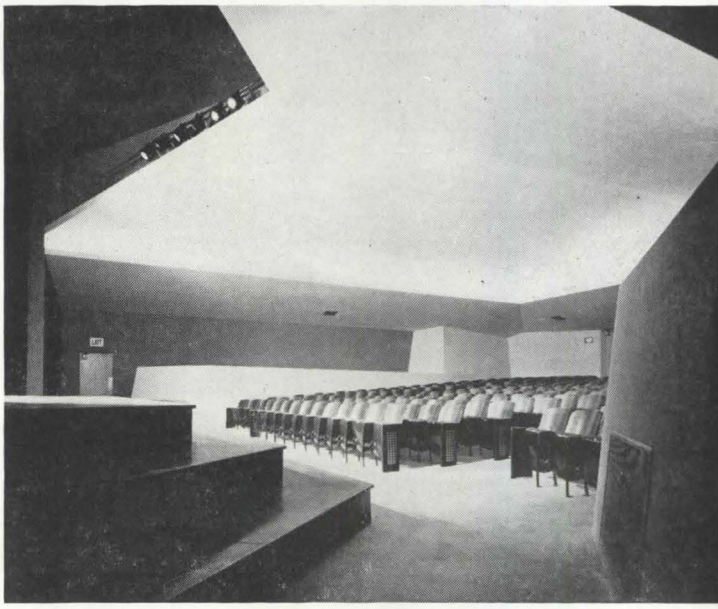




First of the Civic Center units to be built was the Little Theater, viewed (*above*) from a corner of the Public Library. The building was financed by the local Theater Guild by sale of bonds. The corner entrance is bordered by a deep, protected porch or *ramada* which offers ample audience-gathering space both before curtain time and between the acts. Unusual in plan are the two small side stages, which allow the play partially to surround the audience when this device seems desirable.

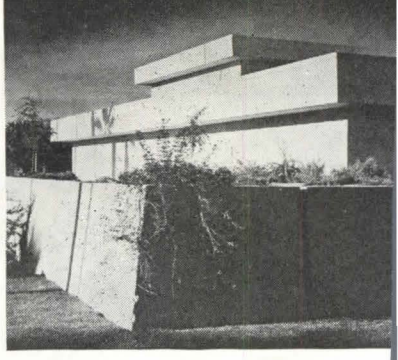
The theater has walls of brick, concrete floors, and steel-framed roof with slab of lightweight aggregate. Painted cement plaster is the exterior surfacing, and gypsum plaster, the interior. Perlite acoustical plaster on ceilings control sound levels. A gas-fired duct heater with automatic controls heats the building; a package air conditioner tempers the air at other times of the year.

Photos: Stuart Weiner

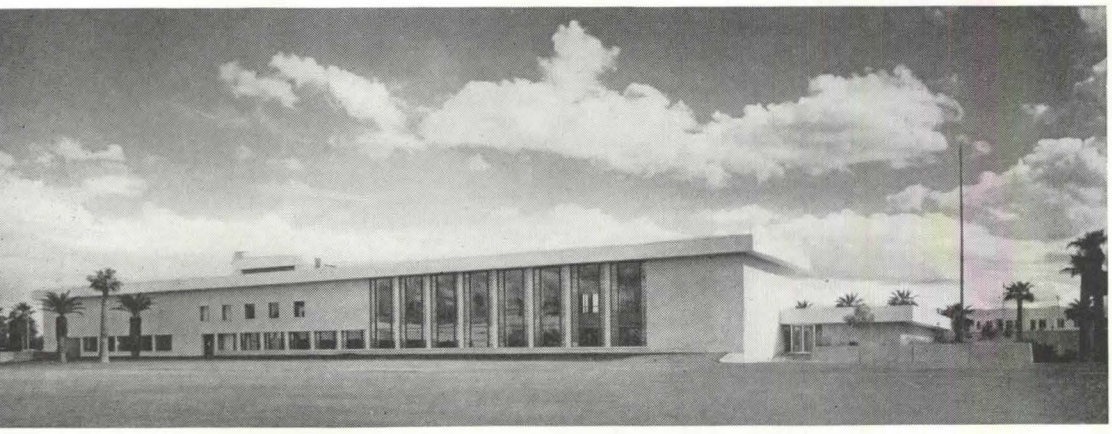


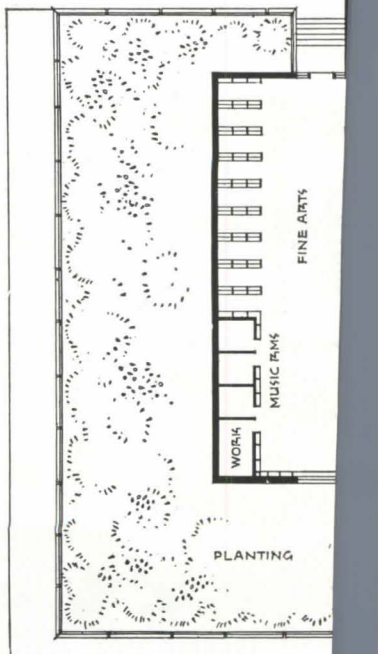
The bold bonding of the specially designed concrete blocks used to enclose the building columns establishes a step-down design motif and unit of scale. This detail also appears in the Library and will act as an element of design co-ordination throughout the entire Civic Center development.

Civic Center: Library

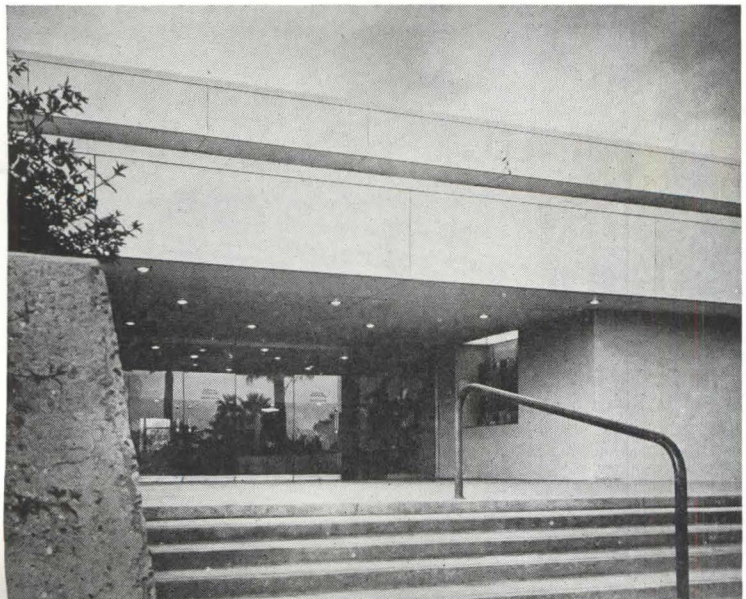


Size and shape of the small panes that occur at both sides of large window areas co-ordinate with lines of special prefabricated blocks that surface columns.





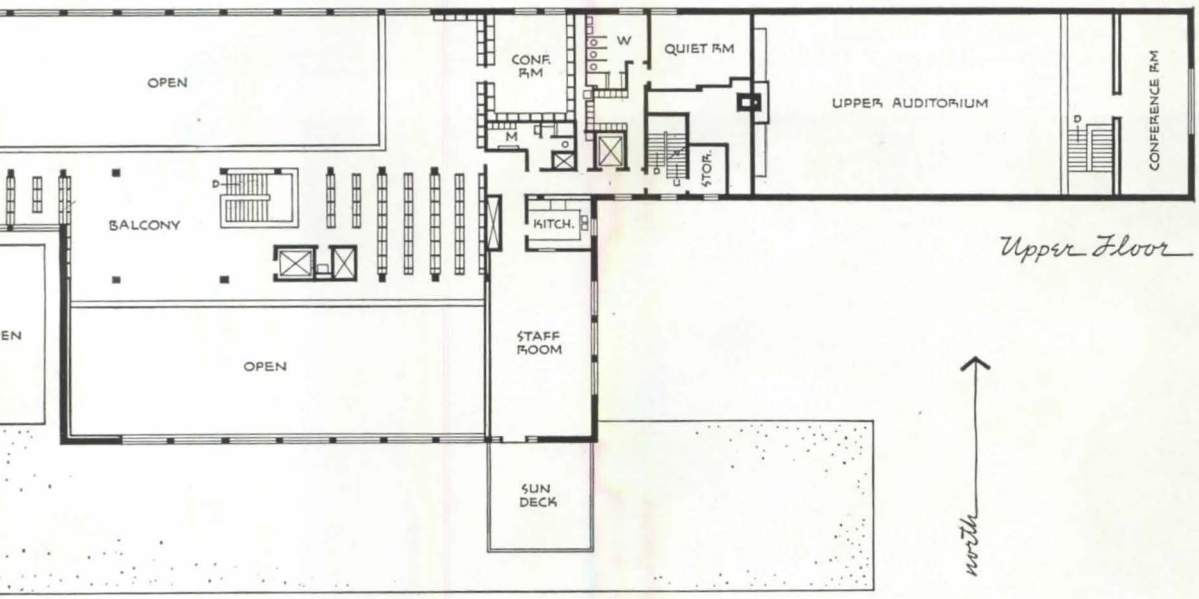
location	Phoenix, Arizona
architects-engineers	Lescher & Mahoney
associate architect	H. H. Green
associate designer	Alden B. Dow
library consultant	Alfred Morton Githens
general contractors	T.G.K. Construction Co.

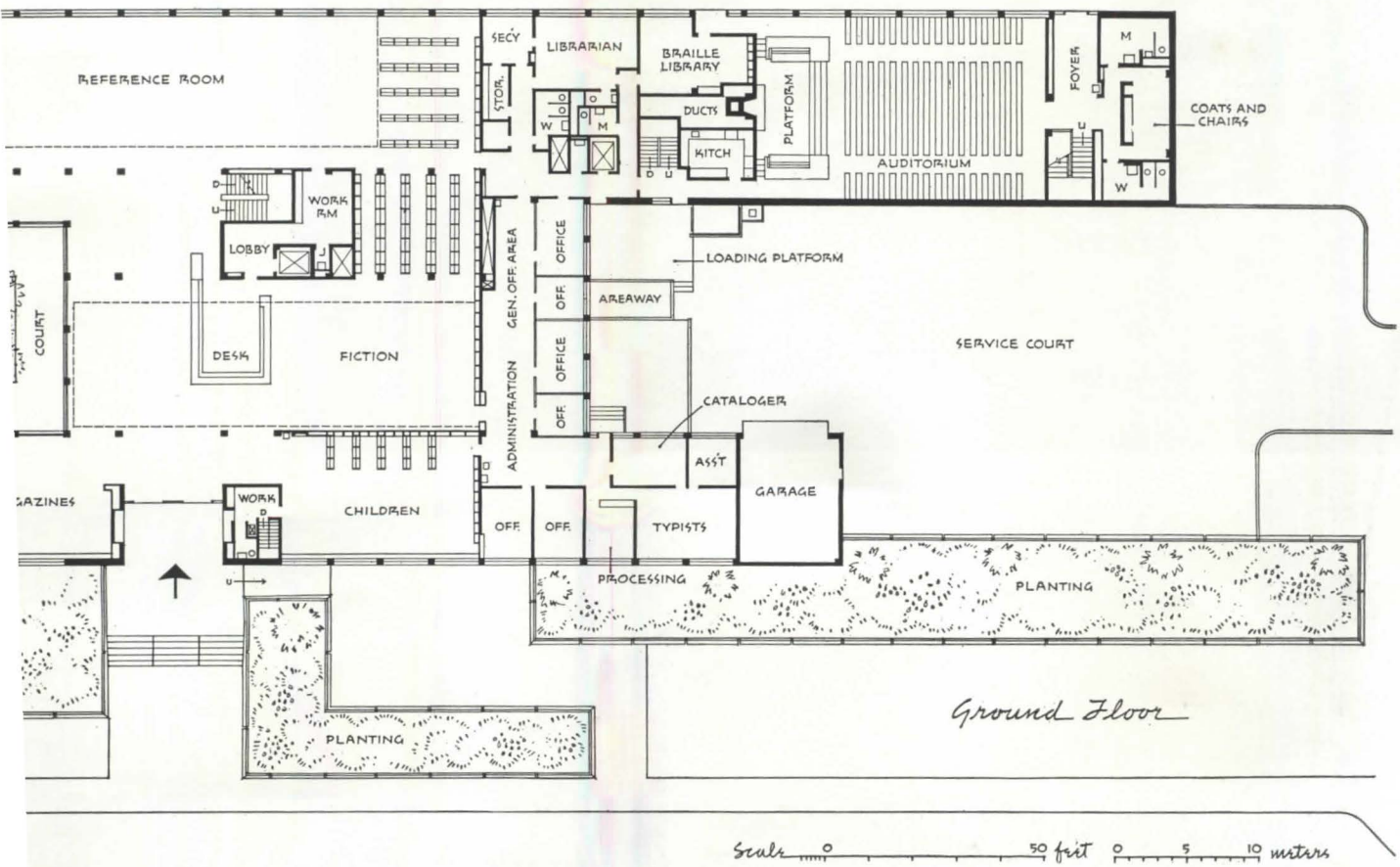


The Phoenix Public Library, built by the City, occupies the entire south front of the Center site. Raised on a platform six steps above sidewalk level and with walled gardens at the front and the west end, the long low building with its strong horizontal design emphasis anticipates the quiet atmosphere within.

In addition to the extraordinary amenities provided in the upper floors shown here (various rooms opening to landscaped courtyards; huge windows to overlook the future sculpture garden), there are two lower levels—a basement and basement mezzanine. Stack space for 300,000 volumes is provided (beneath the entry-catalog-fiction-administration area). Also on the basement level are the mechanical room and a workshop.

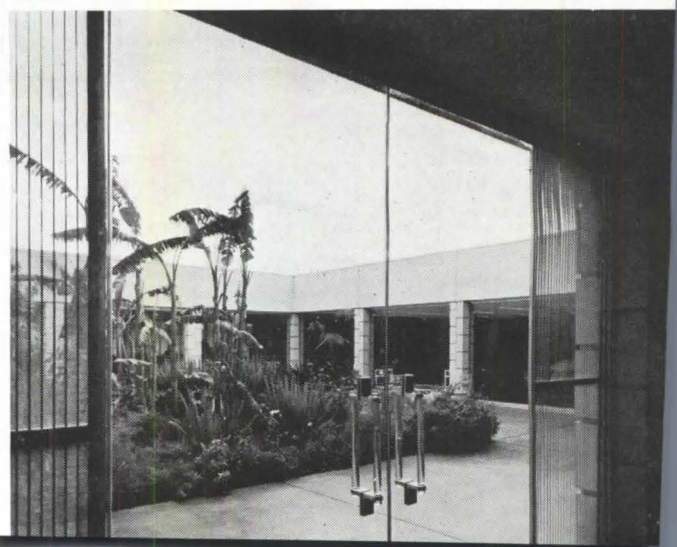
In effect, the main public area, both on the entrance side and in the reference room, is a great, two-story-high hall spanned by a central bridge, on which are special stacks and carrels.





From the main lobby (right), *one enters the tall, main-control and catalog room* (below), *with the fiction shelves and comfortable seating in the background.*

At the west end of the floor, the fine-arts room, a gallery, the magazine room, and catalog area surround an open, landscaped courtyard (bottom).

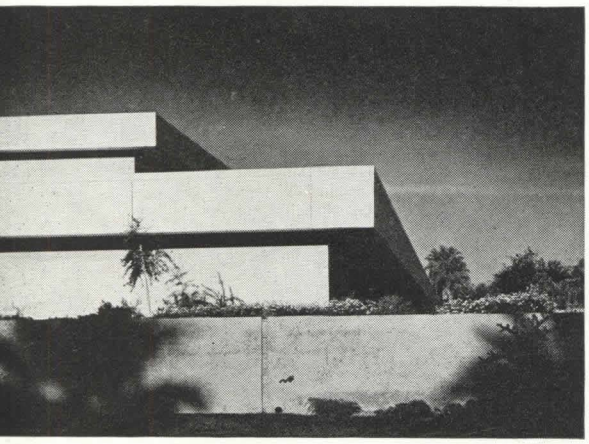


Looking down from the mezzanine balcony or bridge to the main reference room. The tall north windows overlook the center of the site, at present a lawn, later to become a sculpture-display garden.

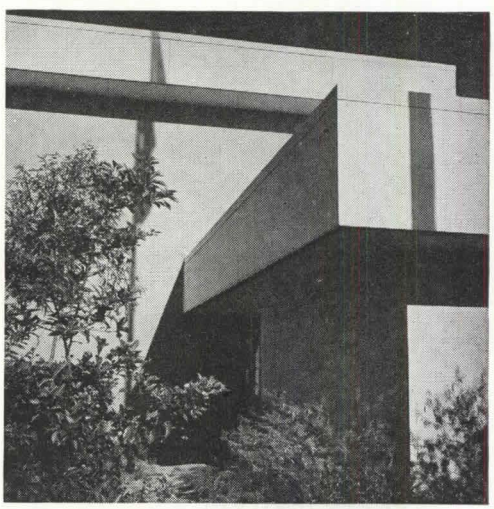
Materials & Methods

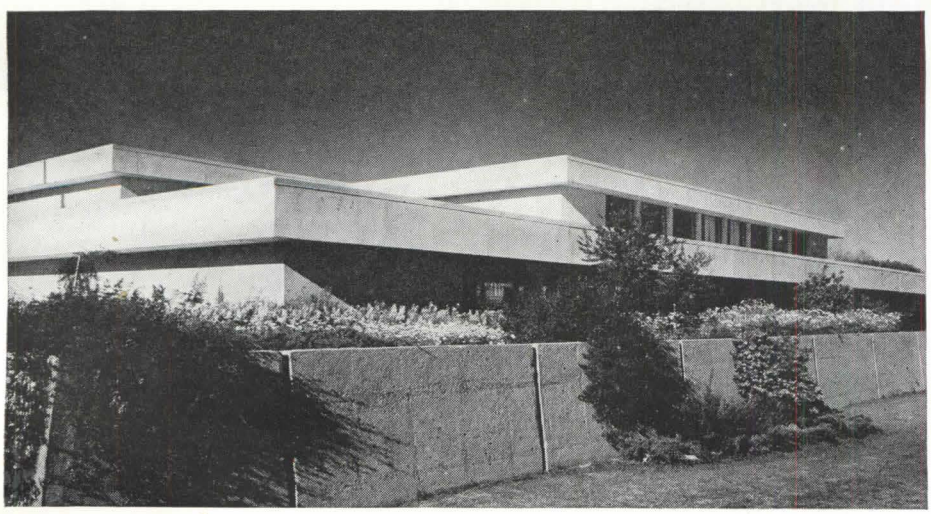
construction

Foundation, floors, walls, roof: reinforced-concrete foundation and floors, reinforcing steel—Kaiser Steel Corporation; reinforced-concrete and steel frame, steel—United States Steel Corporation and Bethlehem Steel Company, reinforcing steel—Kaiser Steel Corporation; brick walls; steel-truss roof, steel—United States Steel Corporation and Bethlehem Steel Company. **Wall surfacing:** stucco; plaster—United States Gypsum Company; cement—National Gypsum Company, Inc., Best Brothers Division. **Floor surfacing:** rubber tile—Fremont Rubber Company; asphalt tile—The Flintkote Company, Tile-Tex Division. **Ceiling surfacing:** acoustical tile—The Celotex Corporation. **Roof surfacing:** built-up roofing—Johns-Manville; fill—Zonolite Company; steel deck—Airtherm Manufacturing Company. **Waterproofing and dampproofing:** membrane glass-fiber fabric—Twinsburg-Miller Corporation. **Insulation:** mineral-wool insulation—Rock Wool Insulation Company. **Partitions:** movable-steel partitions—E. F. Hauserman Company; ceiling-hung toilet partitions—Henry Weis Manufacturing Company, Inc. **Windows:** steel sash—Truscon Steel Company; double-strength and plate glass—Libbey-Owens-Ford Glass Company. **Doors:** flush wood interior doors; rolling-steel doors—Kinnear Manufacturing Company of California; glass entrance doors—Libbey-Owens-Ford Glass Company; folding doors—New Castle Products. **Hardware:** aluminum lock sets, door closers—The American Hardware Company, P. & F. Corbin Division; floor hinges—Oscar C. Rixson Company; door hinges—The Stanley Works; rolling door hardware—Grant Pulley & Hardware Company. **Paint and stain:** Mathews Paint Company.



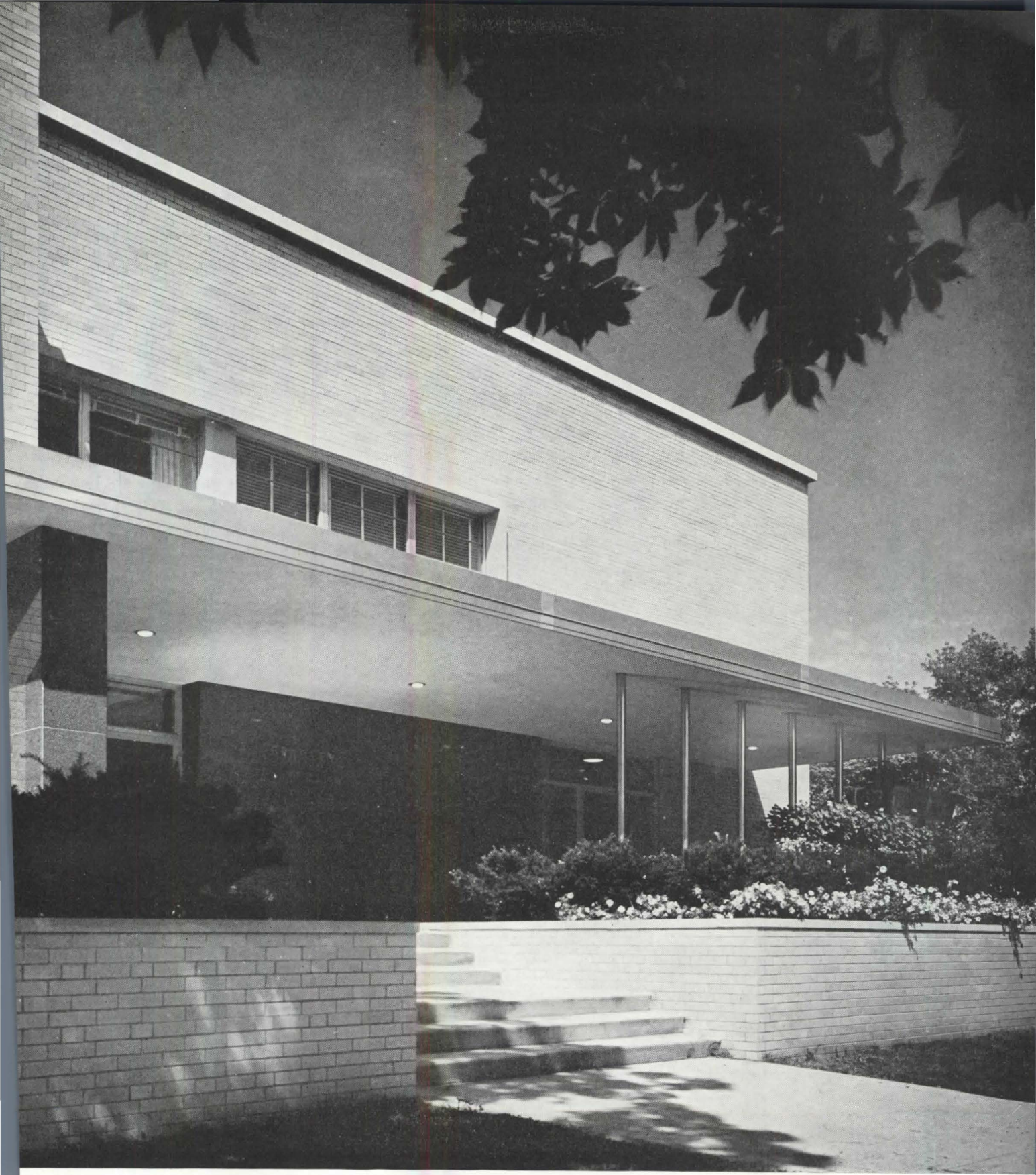
As landscaping develops, the smooth planes of the pink stucco walls will increasingly come into their own as backgrounds for planting and shadow patterns.





equipment

Kitchen: range—Chambers Corporation; cabinets—Avco Manufacturing Corporation, Crosley Division. **Auditorium system:** Radio Corporation of America. **Elevators:** cabs—The W. S. Tyler Company. **Lighting fixtures:** reading areas: high ceiling: recessed incandescents—Pittsburgh Reflector Company; low ceiling; cross-baffled troffers, slimline lamps—Day-Brite Lighting, Inc.; lobby: recessed reflector lamps—Marvin Manufacturing Company; auditorium; recessed downlights—Gotham Lighting Corporation; corridors: diffusing globes (pan-type)—Appleman Art Glass Works; basement: incandescents with prismatic glass—Holophane Company, Inc. **Electrical distribution:** switchboard, motor control center, circuit breakers—Westinghouse Electric Corporation; wiring—Rome Cable Corporation; rigid galvanized conduit—General Electric Company; switches, receptacles—Bryant Electric Company. **Plumbing and sanitation:** tubs, lavatories, water closets—American Radiator & Standard Sanitary Corporation; toilet seats—C. F. Church Manufacturing Company; water heater—General Water Heater Corporation; city water-supply system; flush valves—Imperial Brass Manufacturing Company. **Heating:** hot-water system; boiler—L. J. *Mueller Furnace* Company; natural gas—Arizona Public Service Company; pneumatic controls—Minneapolis-Honeywell Regulator Company. **Air conditioning:** refrigeration-type unit, compressor—Carrier Corporation; Freon 12 refrigerant—E. I. du Pont de Nemours & Co. (Inc.); wall grills—Titus Manufacturing Company; ceiling diffusers—Air Devices, Inc.; blowers—American Blower Corporation; pneumatic controls—Minneapolis-Honeywell Regulator Company; cooling coils—Young Radiator Company; filters, automatic ventilators—American Air Filter Company, Inc., Herman Nelson Division.



University Library

location	Bradley University, Peoria, Illinois
architects-engineers	Gregg & Briggs
consulting engineer	S. Alan Baird
general contractors	V. Jobst & Sons

university library

Bradley University's new library not only serves the campus, but also provides Peoria with a research center for the general public, business, and industry.

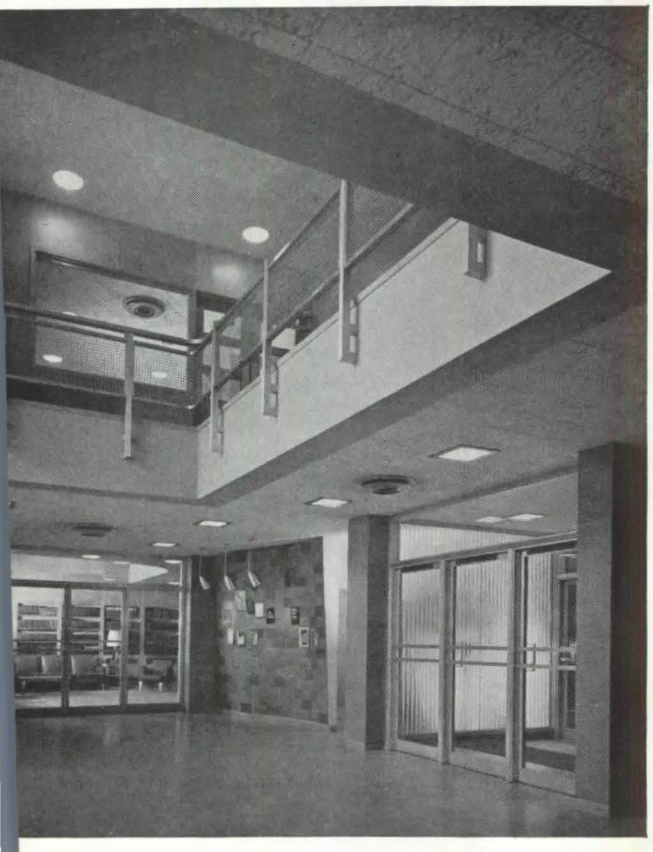
Campus and street entrances are on the second of three stories, with the main study area and the Wykoff Room, for leisurely browsing, directly accessible from the foyer. Through the foyer and stair hall all principal sections of the library can be reached without disturbing readers.

On the top floor, the reading area is flanked by seminar rooms; while a film projection room and listening booths are provided on the ground floor. A sunken terrace for outdoor reading adjoins the building on the north. Onto this terrace face the reading sections of all three floors, thus taking advantage of maximum north daylight and the quiet and pleasant atmosphere prevailing on this side.

The uniform modular construction used throughout the building is based on the sizes of stacks, carrels (individual study booths), and approved aisle spacing. Thus the floor space can be rearranged as requirements change. Fluorescent lights and air diffusers for this completely air-conditioned building also are placed within this modular pattern.

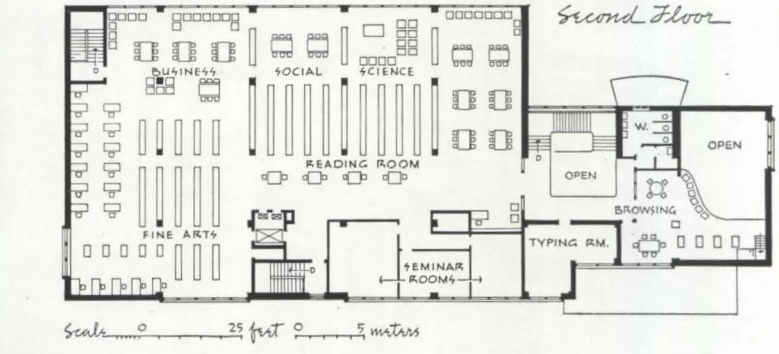
Hung fluorescent lights instead of flush fixtures help to brighten the ceiling. Some incandescent lights are provided for certain special rooms and for decorative purposes. The structural frame consists of steel joists with concrete floor slab, brick and tile walls. Roofing includes poured gypsum slab on steel purlins, 1¼″ insulation, tar, and gravel. The exterior is faced with cream-colored brick. Inside, the public areas are a combination of dark gray granite and blond oak panels. Terra cotta and green predominate as wall colors, along with light gray floor tiles. Ceilings are white acoustical tile.

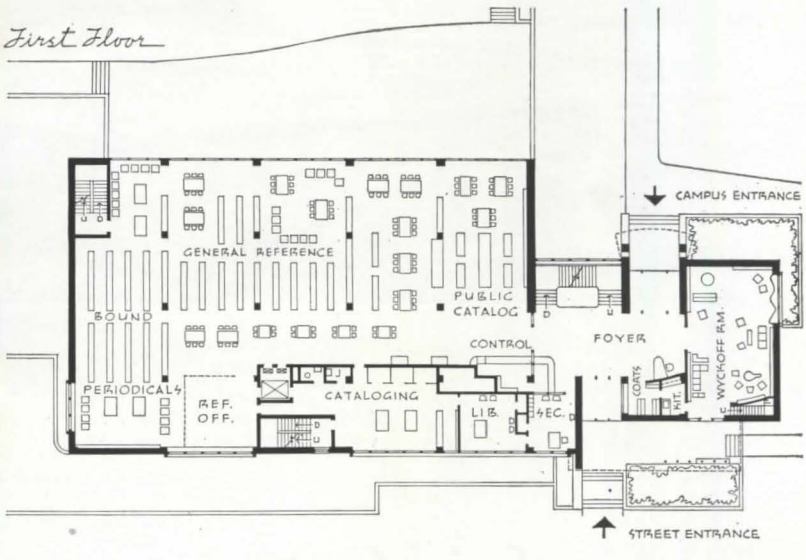
Typical reading room (right) *overlooks terrace. North face of library* (acrosspage top) *showing windows of main reading rooms and entrance from campus.* Photos: Hedrich-Blessing

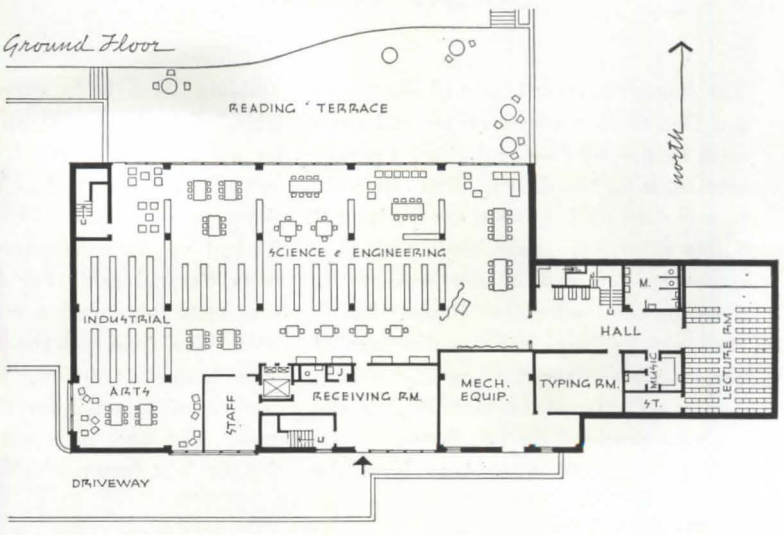


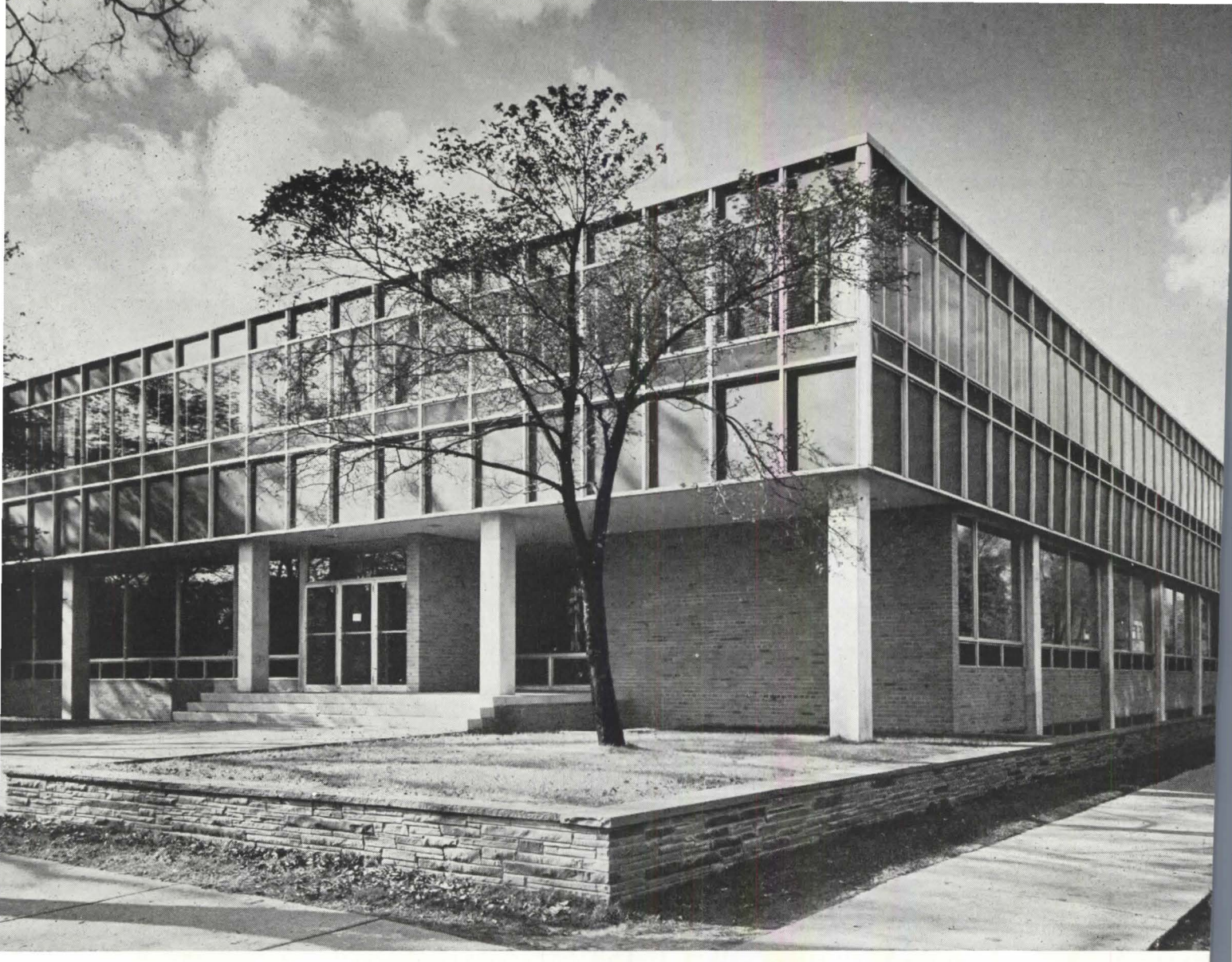
Public and campus entrances lead into central lobby (above). *Doors to browsing room (at left).*

Main stairway connects the three floor levels (acrosspage bottom) *on the north side of the building.*







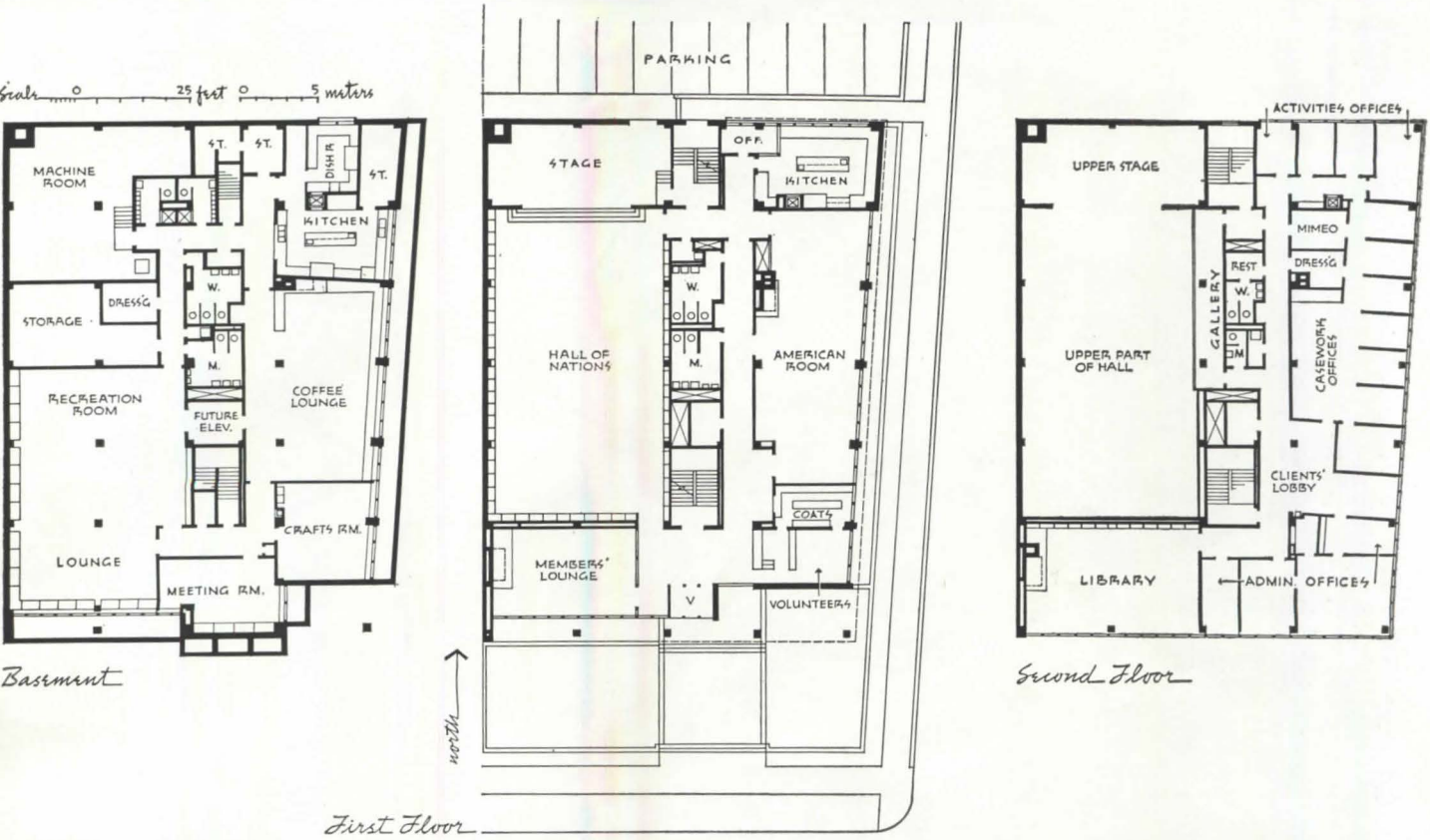


location	Detroit, Michigan
architects	O'Dell, Hewlett & Luckenbach
general contractors	Barton-Malow Company

Social Center

The International Institute of Metropolitan Detroit is a social center and casework agency for foreign-derivative groups who settle in the Detroit area. In addition to directly helping those confronted with a strange language, the organization sponsors a multitude of functions: among them are adult-education classes; handicraft groups; and social gatherings of various sorts—dances, group discussions, or dinners. Hence the flexible plan and kitchens provided on two floors.

The architects wanted to have the building "as light in appearance as possible." To achieve this, streetfront exterior walls of the concrete-framed structure are of aluminum sash, clear glass windows, and obscure blue-glass panels backed up by vermiculite plaster on a metal-channel grid. For floor slabs, the architects developed a system that was economical from both the design and construction points of view. "A flat deck was formed of plywood for the entire floor area. The steel pans were then placed for the joist forms, which also served as the main beam side forms. . . . All carpenter labor usually encountered in building and erecting beam forms was eliminated. The moment distribution of the frames fixes varying moments in the beams. The joist forms are easily shifted to provide a variable beam width and with a constant depth; the beam resisting moments are varied to the requirements of the analysis . . . ductwork can be kept in one plane eliminating costly bends around deep beams . . . riser lines can be spotted on the deck in their exact locations."



Raising of the first floor 3½ ft above sidewalk level allowed above-grade fenestration for the basement. Placement of plumbing core and circulation in the center of the plan made it possible to locate all main rooms along exterior walls. Photos: Richard Shirk

House

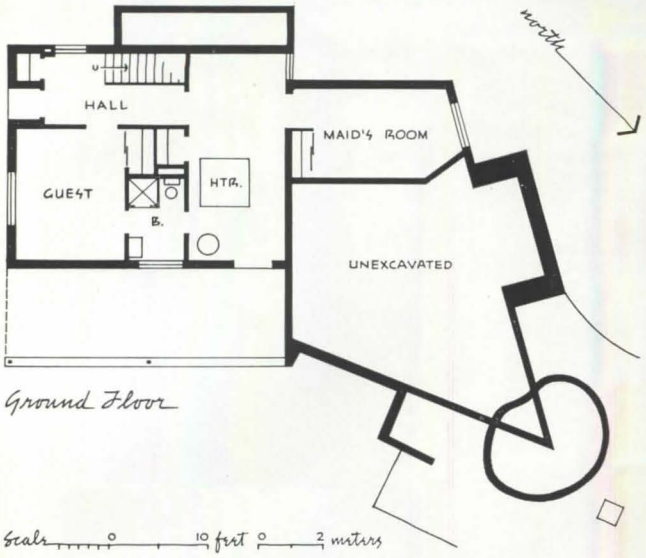
location	Cheyenne Mountain, Colorado
architect	Jan Ruhtenberg
interior decorator	Marshall Morin
custom furniture	Pete Beroni
general contractor	Platt Rogers

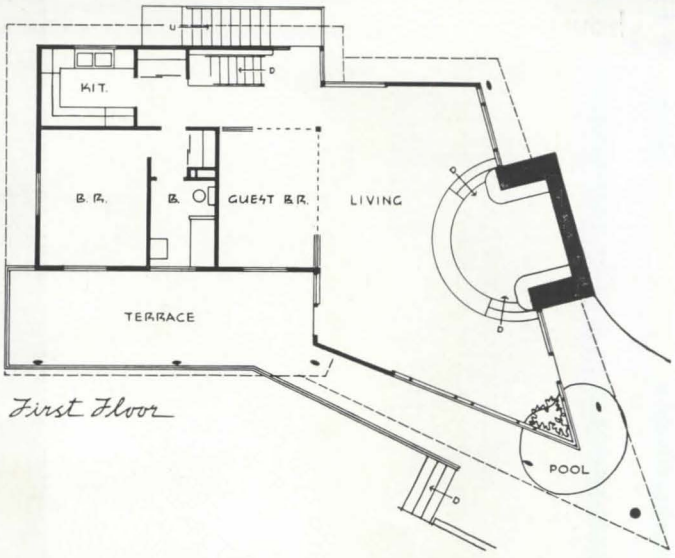
Mrs. Spencer Penrose of Colorado Springs has a host of friends, and her wide cultural interests include collecting works of art, world travel, and music. For weekend entertaining; for the enjoyment of music, both performed and recorded; and to house many of her choice possessions, she commissioned Jan Ruhtenberg to design this "shack"—as she calls it.

A requirement of the program was that the house be very simple, an escape from the city, a place for relaxation and informality. Located high on the east slope of Cheyenne Mountain, it has the western plain spread out below it.

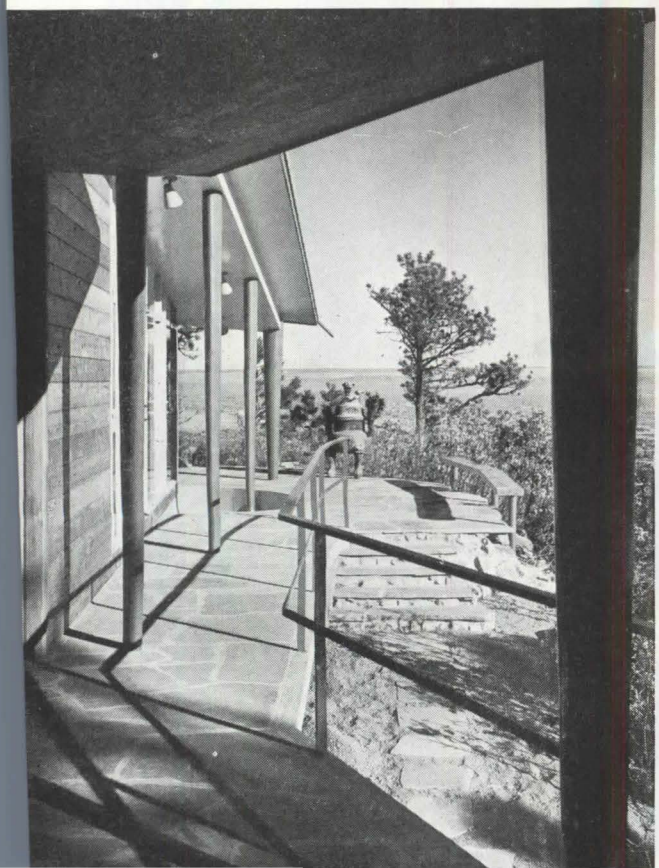
The views and contours of the site determined the design, Ruhtenberg explains. "The big living room had to be mostly glass to take in the different views of Colorado Springs, the water reservoirs, the Broadmoor Hotel, and the magnificent plains, whose colors change every minute of the day." Where the outlook is the most spectacular, the window walls of the living room actually join in a point, and the space is continued outdoors onto a covered terrace, which, like the house, is furnished with rare art treasures, chiefly from China, Japan, and India.

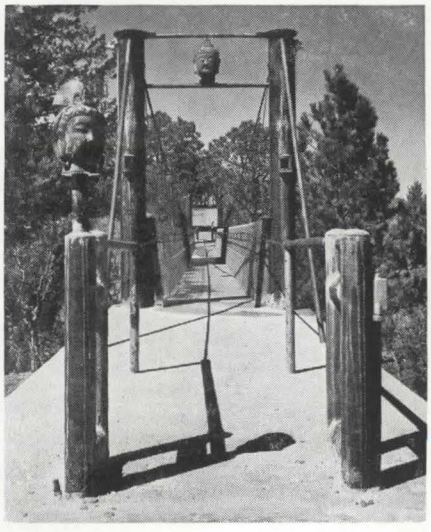
The elegance of the appointments contrasts with the simplicity of the structure itself—Roman brick cavity walls for the lower floor; a patented precut-cedar-log construction for the main floor. The roof is wood framed. Floorings are rubber or asphalt tile, and acoustical tile is used for ceilings. The large window areas have double-insulating glazing. Other windows are steel casements. Heating is by a forced-air perimeter system.

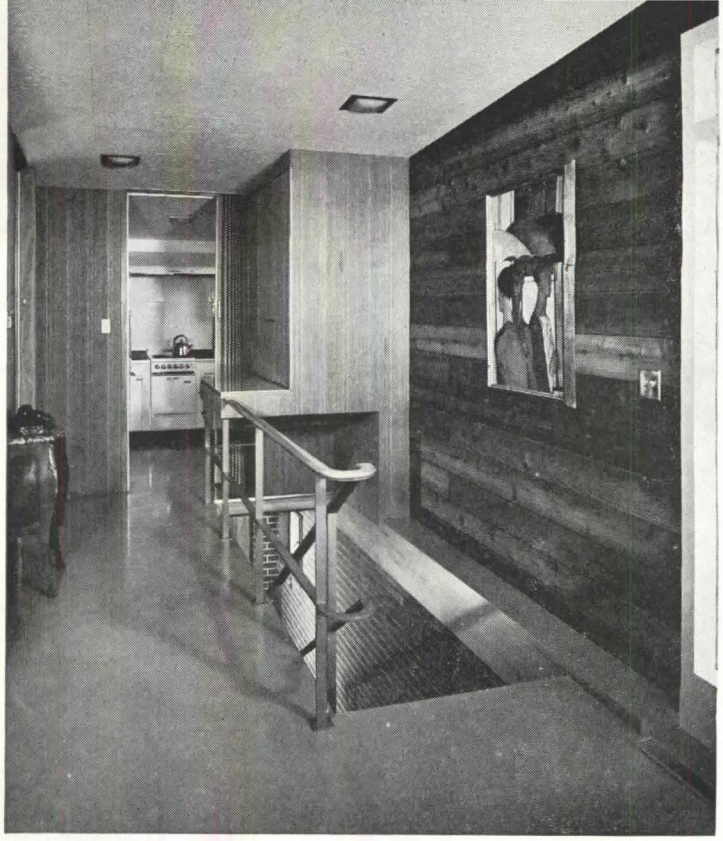




Warm tones of brickwork and natural wood; white-painted soffit of the corner "prow"; the cone-shaped columns, alternately sky blue and magenta, are effective. The suspension bridge links the ridge on which the "shack" is located, with the grounds of a private club. Photos: Guy Burgess

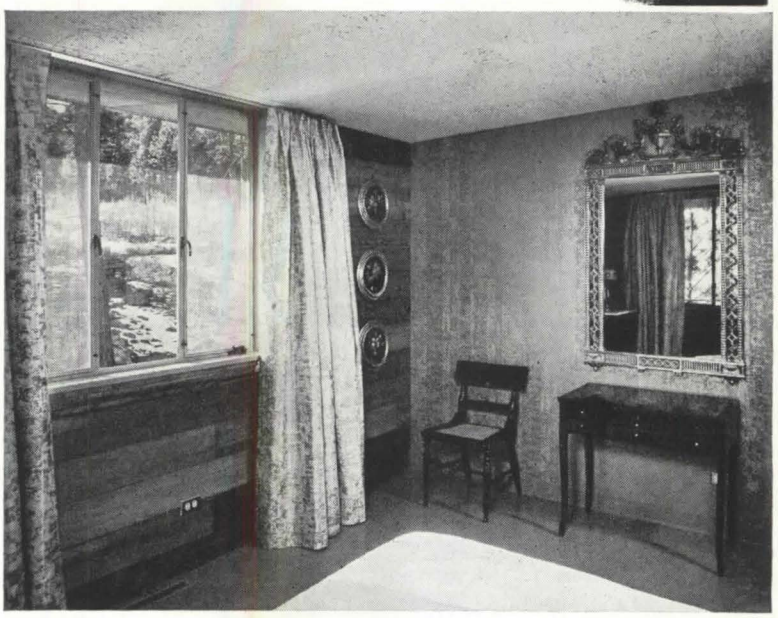






Walls of the stepdown, walk-in fireplace are surfaced with a native pink travertine, a tone also used for the window trim; light gray rubber is the flooring, and the Indian raw-silk draperies are light green and natural hued. Pink, gray, and purple are the colors in the sofa upholstery.

Wall above the stair is of cedar logs.



The grand piano occupies the most prominent position in the living room. A high-fidelity radio/phonograph system is installed all over the house as well as on the terraces, and there are two loudspeakers mounted in the living-room ceiling. The dining alcove off the living room may be enclosed as a guest room by sliding panels. The walls are hung with antique Chinese screens and scrolls.

The owner's bedroom is down the hallway on this same floor. A guest room, maid's quarters, and the heater room are on the floor below.

architectural safety precautions for hospitals

This discussion concerns safety of life, limb, and property as it pertains to hospitals. Some of the data presented also applies to industrial buildings where dust explosions are a hazard, or to plants where chemicals or explosives are processed. The author has attempted to summarize a complicated subject as a professional responsibility of the architect going hand-in-hand with medicine and surgery.

The architect, being human, is subject to all the ills that flesh is heir to. The life he saves by his knowledge of hospital safety could be his own. This discussion will have more realism as an extremely important architectural problem if the reader will imagine himself in the role of a surgical case in a hospital that he himself designed, specified, and superintended. When either architects or just ordinary people are having their anatomy remodeled or repaired, *they may be more dependent for survival on the skill of the hospital architect than upon the skill of the surgeon!*

There are five broad classes of architecturally preventable causes for death, accident, or property damage in the design and construction of a hospital: (1) anesthetic explosions, (2) electric shock, (3) electricity supply failure, (4) lightning, and (5) fire.

ANESTHETIC EXPLOSIONS

By far the most serious of preventable hospital accidents result from the use of flammable or explosive inhalent anesthetics. In a recent news story it was estimated that one in 70,000 surgical operations is fatal because of such explosions. A news clipping service reports an average of one death a month in the United States.

In February of last year, the Rev. James Cummings, a Chicago priest, was minus part of his stomach after a 2½-hour operation for intractable ("unruly") ulcers, in the operating room of St. Francis Hospital, Evanston, Illinois. As Surgeon E. F. Fowler was suturing the incision there was an explosion. The anesthetic bag was ripped open. Glass covers on the machine's flutter valves were blown out. Blood from the patient's lungs filled his trachea. In two hours Father Cummings was dead.

About a month later in the operating room of the Cumberland Hospital in Brooklyn, New York, a Mrs. Raffelinia Manfra had just been delivered of a baby by Caesarean section. The blast of an explosion seared her lungs. One hour later the mother was dead.

In an article on anesthetic explosions, the surgeon-author refers to such fatalities as "misadventures." However, the use of a demulcent word hardly condones preventable death. One who wakes up *hors de concours* for keeps in a hospital morgue might decide that the cause of his rigor mortis was a misalliance of the T-square and caduceus.

Not all anesthetic explosions are lethal. In a report in the *Journal* of the AMA it appeared that in 15 such accidents reported in detail, *only two persons were killed!* In nine instances there was no reported damage—although it is likely that some were given a bit of a start. The remaining four incidents had these "negligible" effects:

"Slight pulmonary hemorrhage; recovered."

"Slight burn on patient's face."

"Singed hair on patient's face."

"Surgeon, anesthetist, and patient slightly burned on face."

Static Sparks

One cause for the detonation of explosive mixtures of anesthetic gas and air is the static spark. The generation of static electricity occurs from movement or rubbing of garments or fabrics (*containing wool, silk, or synthetic fibers*) against each other or against objects of nonconductive material (*such as rubber, plastic, or Bakelite*). Static sparks have been identified as the cause of from 27 to 46 percent of anesthetic gas explosions. Yet M. Z. Gross, in a recent nationwide survey of hospitals, found that *90 percent* were not protected against the extreme danger of static electricity!

Humidity v. Static

Children learn what happens when they stroke a cat on a cold day. By bringing a pointed finger slowly toward the animal's sensitive nose until the gap is just right, the accumulated static charge will jump and so will the child and the cat.

If you drag your feet on a hotel corridor carpet on a winter day, you can expect an audible crackle of static and a small tingle in your fingers when you bring the room key close to the metal of the door lock.

Since such common phenomena are known to occur particularly in cold (and consequently dry) weather, the inevitable conclusion appears to be that high humidities eliminate the static spark hazard. And it is true. With room temperatures of 80 to 85 F and relative humidity from 60 to 100 percent, there is small probability of creating static sparks.

Why not apply this principle to operating rooms and anesthetizing locations?

If you happen to have a copy of *The Octagon* for May 1942 at hand, turn to page 6:

"Humidity control seems to be the recognized safeguard. . . . In the Los Angeles County Hospital the sterilizers in the operating rooms . . . are opened so that steam enters the room."

But there is the matter of the physiological effect of high humidity on the surgeon and staff. The ASHVE experts say: "High relative humidity tends to prevent evaporative regulation of the human body and is extremely harmful.

by Don Graf

Even when evaporation of sweat maintains a successful thermal balance, the process is accompanied by marked discomfort and interference with physical efficiency."

Obviously, it would be difficult for a surgeon to perform his delicate task with sweat pouring from his body and with the attendant disinclination for concentration or physical activity.

Relative humidities greater than about 55 to 60 percent make the control of airborne bacteria a further problem.

It is reported that the Los Angeles County Hospital discarded their Turkish bath method of humidification and static spark control.

Highly Conductive Floors

Having identified static as a real villain, the too-simple solution seemed to be a floor with little or no electric resistance. Such a surface would act as an "intercoupler" for all personnel and equipment, provided that all were in electric contact with the floor. Static would drain away to ground as fast as generated. Everybody and everything would be at zero potential and sparks would be impossible.

Since materials suitable for hospital floors were relatively dielectric, a 1941 issue of *Hospitals* carried an exhaustive paper by an M. D. on the status of "Anesthetic Explosions—Their Incidence and Prevention," in which a solution was suggested:

"The earliest example of a conductive floor is a large sheet of steel covering the floor to the outer area of the (operating) table and the working space around it."

Before the static risk had been identified, many architects preferred that operating room floors be of terrazzo or clay tile. This was because of color, wearability, foot traction under wet or dry conditions, an established installation technique, and ease of maintenance. With the static problem it was therefore natural that a means be sought for adding conductivity to the inherently desirable properties of these flooring materials.

Grounded Grill Terrazzo

The use of metal division strips in terrazzo for pattern and to localize cracks had long been common practice. Why not then put the strips closer together and connect them to ground? Sounded feasible.

An AIA Fellow broke into print in a hospital magazine by stating: "Brass strips . . . should be set . . . about 6″ on centers throughout the central part of the room and connected both mechanically and electrically to a ground . . . we would use a pale green tile for the wainscot . . ."

As late as October 1949 the *Construction Specifier* carried a piece suggesting that grounded grid floors were the *best* for operating rooms. This seems incredible in the light of safety developments that were established by that time. It is even more curious because the same magazine had printed an article three months earlier to emphasize the dangers of highly conductive floor construction!

Tile With Conductive Joints

It was discovered that an addition of specially prepared acetylene carbon black powder to the mortar for joints and setting of clay tile would furnish a path to ground for the dissipation of static. However, there were some practical job difficulties in these installations. To assure the desired conductive performance, work had to be meticulous. The result depended upon the relation of tile size to joint width, proportion of "black" used, care to produce an absolutely uniform mix, and avoidance of joint depression which destroys electric contact.

SHOCK HAZARD RECOGNIZED

Soon after 1940 there was a growing suspicion that conductivity could create a new danger while correcting the first. In the *Hospitals* article quoted above, there occurs a mention of *shock* from defective electric equipment as being a hazard to the surgeon and staff. The *Octagon* for May 1942 presaged present floor construction standards as:

"The use of brass strips grounded to the piping system is now being questioned, as it is felt by some that the presence of conductive strips is more dangerous than their omission. In fact, one hospital with brass strip "protection" has rubber mats placed on the operating room floors around the table."

Terrazzo and other troweled materials such as cement, magnesium-oxychloride, and latex-cork composition (with grounded grillage of conductive-metal strips or dielectric-clay tile with conductive joints) are haphazard. The joints or the strips are near zero *resistance* and the field is near zero *conductivity*. There is no certainty that drag chains for grounding movable apparatus will make contact or that it will not arc from *almost* making contact. Personnel wearing conductive footwear may make too good a contact, a poor one, or none at all.

Suppose a surgeon is poised over a patient with a scalpel. He is grounded through his conductive shoes to a highly conductive grounded floor. At this moment he makes contact with a frayed electric cord or with a short-circuited piece of equipment. A current of only 15 milliamperes provokes an involuntary reaction that is swift. That knife in the hand of the surgeon could make a dissection not a planned part of the project.

The Gross nationwide survey of hospitals showed that 95 percent have defective wiring—some of which is assumed to be in anesthetizing locations.

With a completely nonconductive floor there is obviously no risk of shock from grounding. But the static bugaboo again becomes the peril.

Interrelation of Static and Shock

In 1949, Griffin and Daniel of the Public Health Service promulgated the principles of anesthetizing-location safety that are now accepted as basic. These researchers proposed that the resistance (or conductivity) of floors should be within such limits as to satisfy *two* opposed requirements. The *resistance* should be *low* enough to drain off static and *high* enough to prevent electric shock.

Experiments by Charles F. Dalziel to determine the perception point of shock

showed that the total resistance of person, socks, shoes, and floor should limit electric flow to ground to about 1.0 milliampere. Allowing for variation in this over-all value under different conditions, a floor resistance of 104,000 ohms is established.

For protection against static accumulation, a theoretical resistance of 250,000 ohms is indicated.

But since it is difficult to construct and maintain floors that will remain within this range, a working upper value of 1,000,000 ohms (1.0 megohm) and lower value of 25,000 ohms is recommended as both safe and practically obtainable.

Warning: It is important to remember that a vast amount of material has appeared in print on the subject of conductive flooring. Much of it is dangerously out-of-date and may be in your files. Even though it appeared originally in reputable magazines and was written by impressive authors, it should not be used as source material in designing or specifying.

Present Practice

New product developments in flooring materials quickly followed the establishment of the current recommendations of the National Fire Protection Association. These recommendations have been promulgated in the pamphlet *Safe Practice for Hospital Operating Rooms*, and have been endorsed by:

American College of Surgeons
American Hospital Association
National Board of Fire Underwriters
U. S. Veterans Administration

It could well hasten uniform incorporation into legal codes if the recommendations were unqualifiedly endorsed as accepted by the AIA, Producers' Council, and the Building Officials Council of America.

Some Conductive Floorings

Although the focus of the static-shock jeopardy is in the operating room, conductive floors are necessary wherever explosive or flammable inhalent anesthetics are used or stored. These spaces include delivery rooms, anesthesia rooms, examination rooms, corridors, and rooms directly communicating with such locations.

The following résumé of conductive flooring materials is not necessarily a complete listing of suitable products being offered at this time. The omission of any material or method is not to be construed as an implication that it in any way lacks merit. Neither is the order in which the following are listed to be construed as an indication of their suitability, cost, or other characteristics.

(1) Portland Cement Terrazzo. Specially prepared acetylene carbon black is added to the mixture for the underbed and to the matrix of the topping or precast terrazzo tiles. The matrix is dark in color, the resulting over-all tone being dependent upon the color of the marble granules selected. Dividing strips must be of a dielectric material, when used for pattern or for localizing shrinkage or structural cracks.

(2) Magnesium Oxychloride Terrazzo. This is similar in appearance to portland cement terrazzo. The cementitious material is known variously as composition, sorel cement, magnesia cement, compo, plastic magnesia, magnesite, and by various trade names that may (or more often may not) suggest the identity of the product.

Usually, magnesium oxychloride (being a salt) is susceptible to prolonged immersion in water or to constant dampness. The addition of a copper flour reduces the solubility of the flooring, makes it conductive, and allows a selection of matrix colors. Magnesium oxychloride is said to inhibit bacteria and fungus growth. Metal piping must not touch the matrix material. Magnesium oxychloride containing copper powder is a trade-named proprietary product.

(3) Clay Tile. The setting or underbed is a conductive mix of cement, aggregate, and "black." Conductive tiles are a dark color. They may be set either in conductive "mud" or with a thin-set conductive adhesive now being offered by a number of manufacturers. Grout for the joints can be colored cement.

(4) Rubber Sheets. This material is produced in sheets 36″ wide by 1/8″ or 3/16″ thick and must be insulated from the building construction. Wires are embedded in the material and are connected to a ground through a 50,000 ohm resistance. The color is black.

(5) Linoleum. Made in rolls 72″ wide by 1/8″ thick. Panels are interconnected with metal jumpers. Hair-crack seams are made watertight so that the entire floor is essentially an uninterrupted single surfacing. Color is black.

(6) Vinyl-Plastic Tile. These 9″ x 9″ x 1/8″ tiles come in a black color with green and white marbelizing. They are set with an adhesive in which ungrounded bronze window screen cloth is embedded.

Floor Grounding and Test

A conductive floor need not be provided with special ground connections, except for (four) rubber sheets. The others, to be effective, require only that persons and objects make proper electric contact with the floor. The path from floor to ground is generally attained by leakage to structural members and piping because of the large capacitance of the flooring.

The completed floor is tested according to procedure established by the NFPA. To test safety of personnel, anesthetizing locations are equipped with built-in testing devices so that any person entering can quickly determine his conductivity as safe or unsafe.

It goes without saying that *no* conductive floor may be insulated with films of oil or wax used to polish the surface, *unless* of a tested and approved conductive type now available for the purpose.

Nonarchitectural Explosion Causes

Some explosions may occur for reasons that are matters of administrative control rather than of architectural dereliction. Among these causes are incandescent objects such as lighted cigarettes; open flame of any sort; objects heated to temperatures above the flash point of gas mixtures; unapproved or faulty X-ray, electrocautery, electrocoagulation, or sterilizing apparatus; photo bulbs, amplifiers, recorders, or television cameras; percussion sparks from dropping or striking metal objects on hard mineral surfaces; outer clothing and shoes of personnel; bed clothing.

Isolated Electric Circuits

It is required that *ungrounded* circuits (otherwise known as "isolated") be used where there is a possible shock or arcing hazard. Such systems in proper working order make the resistance of the floor of no importance—one way or the other. Here is how it works.

A loop of bare wire going from a battery to a switch, to a buzzer, and back to the battery again, is an isolated circuit as long as it doesn't touch anything to ground it. With the switch closed and the buzzer buzzing, you can touch the circuit at any *one* place without feeling any shock.

But now open the switch. Have someone else touch the circuit on the other side of the open switch from which you are making a contact. You will both feel shock because you have closed the circuit through ground—and if your ground contacts are good, the buzzer will buzz!

Electric distribution circuits are normally grounded "on one side," thus taking the place of one of the persons in the buzzer experiment. Therefore, anyone making contact with the circuit and ground would receive a shock of possible severity limited only by the fuse or relay protection of the circuit.

If, however, the circuits of anesthetizing areas are isolated from the grounded supply feeders with dry-type transformers in an AC system, or by a motor-generator in a DC system, then contact at one place will not complete a circuit to produce either shock or arcing of faulty equipment.

There remains a real danger. The supposedly isolated wiring may be inadvertently grounded and warning devices—to show when such a condition exists—may themselves *be out of order*. Therefore, the isolation of circuits can be regarded as a safeguard only when faultless. *Isolated circuiting is supplementary and not a substitute for a floor having safe electric resistance to ground.*

Wiring Devices

It should be obvious that all connection and control devices, as well as apparatus and fixtures, should be of a type approved for use in explosive atmospheres as required by Sections 5016a and 5017a of the National Electric Code. Precautions against arcing and explosion are also protection against shock.

Ventilation

Although mechanical ventilation is not considered positive protection against anesthesia explosions, nor is it mandatory, it is desirable. Mechanical ventilation with or without cooling is recommended for the comfort of personnel, possible reduction of air-borne bacteria, removal of odors, lessening the hazard of gross spillage of combustible liquids, and as a convenient means of controlling humidity. Ventilation has little effect on removing or diluting localized concentration of anesthetic gas from near the head of the anesthetized patient.

EMERGENCY ELECTRIC SUPPLY

Power for illumination and equipment may fail because of acts of God or man. Sleet, mechanical failure, wind, floods, lightning, fire, strikes—there are many causes for interruption of electric service. The consequences in a hospital may range from inconvenience to fatalities.

The duration of power failures is generally a relatively short time, well within the ampere-hour life of portable or built-in battery-operated emergency lighting for the operating suite. A lighting failure during an operation could well be tragic.* On the resumption of normal service the batteries are recharged from the restored power supply and made ready for the next blackout.

An interruption of several *days* is a different matter. There would be no light in the operating room or anywhere else, and *all* electric equipment in the entire hospital would be inactivated—elevators, iron lungs, incubators, intercoms, refrigeration for plasma and other biotic perishables, fire protection signals and equipment, pressure pumps, heating system, food storage and preparation, therapeutic and diathermy apparatus.

Even in such well-populated areas as Westchester County in New York and in southern New England, there have been periods of a week or more without electric service or telephones. When these admittedly rare but nonetheless possible contingencies occur, a hospital can declare no moratorium on sickness and disease until the watts flow again. For protracted stoppage of power, automatic motor-generator plants are manufactured with capacities up to 35,000 watts or more at various voltages, phases, and cycles.

LIGHTNING

Buildings protected with properly installed lightning-rod systems are not subject to property damage or harm to occupants. Lightning causes fire, nervous and physical shock, electric-system failure, ignition of explosive materials, and more or less sudden death.

Many types of hospital construction afford reasonable safety against the lightning hazard. Because of the use of combustible or explosive materials and because of the physical limitations of the patients, lightning protection should be a requirement for nonfireproof structures in outlying localities. The National Fire Protection Code should be followed.

FIRE

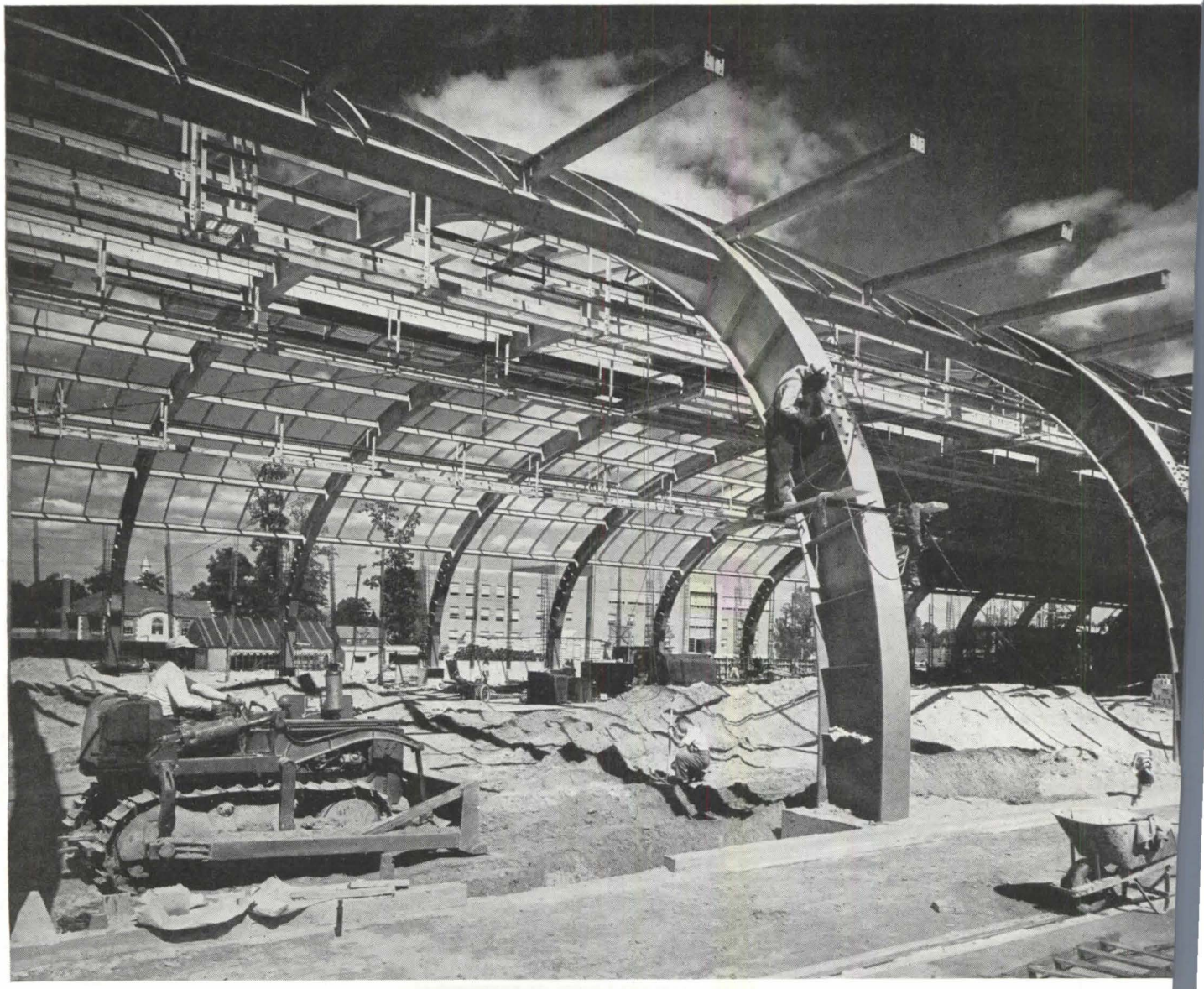
The tragic fire at Effingham, Illinois, which cost 74 lives and many injuries, and the Cleveland Clinic fire where 125 patients and hospital staff members died, are spectacular instances of disasters that occur all the time without widespread publicity. There are about 1000 fires per year in hospitals.

Complacency and procrastination—not ignorance—are responsible in the face of common knowledge of fire prevention. Even more merciless and preventable than fire in a ship at sea with physically active passengers, is a fire in an understaffed hospital occupied by invalids. Involuntary cremation, asphyxia, nervous shock, pyrophobia, and third-degree burns can only be attributed to negligence.

Established safety measures are: automatic sprinklers; noncombustible enclosures for circulation and vertical shafts; fire-alarm systems and independent fire-fighting provisions; elimination of combustibles including rubbish, draperies, furnishings; and means for evacuating the helpless. No precaution is too trivial to consider in preventing loss of life, physical injury, or property damage by fire.

* *See "Hospital Lighting" by Howard Haynes, July 1952 P/A.*

Connecticut University Field House: Structure



Connecticut University's new field house —designed to accommodate basketball courts with seating for 5000 persons, and squash courts, equipment and lecture rooms—is now nearing completion at Storrs. Framed by 14 rigid-steel arches, its dimensions are: 343′ long, 150′ wide, and 40′ high. Over steel roof purlins was placed 42,000 sq ft of Wheeling Tri-Rib decking and over 1″ insulation board a four-ply built-up roofing. The roof decking with its interlocking edge and stiffening ribs was easily applied to the curved steel arches; each section measuring 20′ x 1′-6″ weighs approximately 60 lb. It has been reported that the gross weight of the purlins and the roof decking is approximately 40 percent of wood sheathing, requiring 83 percent of the joists needed on a wood roof. Four-man crews (two welders and two erectors) laid the steel deck at a rate of 4000 sq ft per day. This $930,000 field house was designed by Frederick C. Teich, of Hartford, and Robert W. Loomis, of Winsor, was the structural engineer.

junior-channel rigid bents

Figure 1—six-foot tapered overhang beams (right), *butted on rigid-steel bents, are connected at outer edge by angle iron which served as form for pouring the roof and as facing. Roof is formed by bulb-tees and insulation board covered by gypsum and asphalt.*

Figure 2—center weld joining two bent sections (far right) *was field-connected on the ground before erection. Only 21 working hours were needed to erect 30 bents—including welding of center joints before hoisting.*

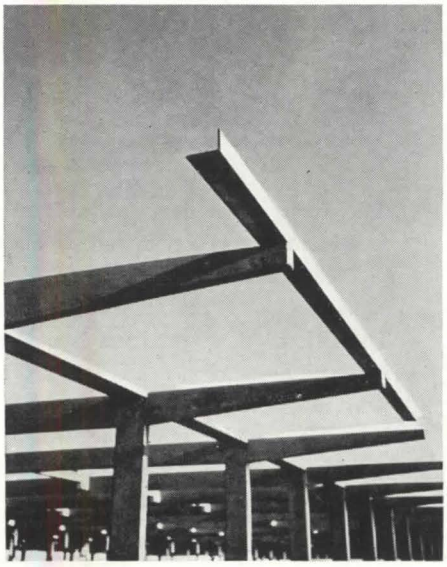
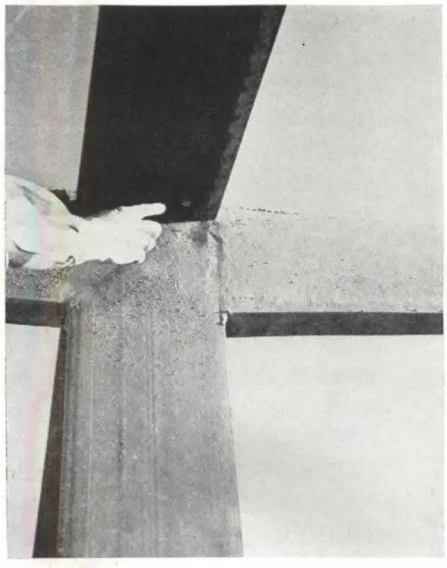


Figure 3—permanent outside spacers between bents (right) *were formed of single 10″ channels bolted to studs welded onto each bent. Temporary wooden spacers were used in conjunction with cables to true the beams, although little adjustment was needed.*

Figure 4—two sections of steel channel (far right) *are welded together with bottom weld leveled off and left exposed. An added economy can be realized by merely using a paint covering over the bents in the finished interior.*



Requiring minimum weight, erection time, and expense—a rigid-bent framing method was successfully used in the construction of a school near Spartanburg, South Carolina. Originated by W. E. Freeman, Jr., Greenville architect, the system employs box-shaped, prestressed-steel girders formed of two sections of 10″, 8.4-lb Jones & Laughlin hot-rolled channels, welded together at the site before erection. Exterior columns were mitered to the 72′ girders while interior pipe columns were welded in place. Each exterior column was spread ¾″ at the base when welded to the beam and brought back to perpendicular by the weight of the bent during hoisting. A camber of ⅝″ per 30′ span was obtained by resulting tension, when the bent was anchored, and was offset by the weight of the roof. In the first section of the main structure, 25 tons of steel were used at an estimated cost of $29 per ton for field connections, erecting, and plumbing of the first 30 bents. Outside walls consist of brickwork to waist level with full windows above.

NEW DIRECTIONS IN THERMAL INSULATION: PART VII

by Groff Conklin

slabs, crawl spaces, and basements

It is widely acknowledged that serious damage can be caused in the structure of a house by moisture arising from the ground on which it is built. The gravity of the problem will depend partly, of course, on the type of earth encountered, but even more on the relative effectiveness of the measures taken to prevent ground moisture from "seeping up" into the structure because of poor construction practices.

There are basically two situations in which trouble of this sort can arise. The first is in homes built on slabs. Here one must prevent moisture from coming through or around the slab. The second is in homes built over basements or, much more often, over crawl spaces, where moisture vapor can collect in such quantity that it will penetrate the structure above. The techniques of handling these two problems are, of course, different.

(A) House on Slab. In the case of a house built on slab, condensation or moisture damage may occur at any time, particularly if the slab is insulated at the perimeter without an effective vapor seal. Trouble can also arise anywhere in the slab if ground moisture is permitted to enter it.

It is standard practice to cover the gravel base of the slab with a heavy waterproof paper. According to a research report published recently by the HHFA[1] a 55-pound smooth-surfaced roll roofing is far and away the best of the commonly available materials to use. This report also states: "Industry has, for some time, realized the deficiencies of present membrane construction and is developing membrane materials specifically designed for use in contact with the ground. The first of these products is now coming into the market. . . . It is designed to provide a more flexible sheet which will be easier to lay and one which has greater resistance to puncture as well as good durability under attack by rot fungi."

The lighter asphalt felts frequently used are not serviceable over a period of time since they tend to deteriorate rapidly once in contact with the ground.

The strips of material should be lapped a minimum of six inches and each lap should be cemented with a hot or solvent-type bituminous cement. Any punctures caused during construction should be repaired with cemented patches. The strips should be turned up at the ends and also along the sides where they butt on the foundation wall so that they will extend to the top of the slab. A suggested edge detail is shown (*Figure 1*).

HHFA also urges that "where the building site has a high water table or is poorly drained, and particularly where it is desired to protect a wood block floor or other material that can tolerate little moisture, *two* layers of 45- or 55-lb roll roofing or new membrane materials, solid mopped between, be used."

It is also important, the HHFA report points out, that the base course be composed of compacted coarse-washed gravel, "high enough above the surrounding yard to be well drained." Many houses built on slabs whose gravel base is actually below grade have suffered extensive moisture damage in recent years; consequently great care should be taken to provide adequate drainage.

How the roll roofing and edge insulation should be designed for thorough protection against heat loss and moisture damage is illustrated (*Figure 1*). It is suggested that a slight recess in the gravel be prepared about 1′-6″ wide and that a durable-type insulating board with a k-factor not exceeding 0.5 be laid in it, butting against a vertical strip of the same material reaching to the top of the foundation wall; the insulation, of course, to be laid over the vapor barrier roll roofing. If the insulation is not itself of a waterproof type, its surface should be covered with a thick coating of asphalt.

The National Bureau of Standards, in its Building Materials and Structures Report No. 128, describes a series of tests that were made on various types of slab construction with varying vapor barrier and insulation installations. According to these tests, organic fiber boards should never be used for insulation in this manner since, in the test building, such materials were found to have deteriorated very greatly after only six years—despite the fact that they had been thoroughly mopped with asphalt. A rubber board which was used in other test sections showed no deterioration at all after five years in place and, of course, no inorganic insulating board that is rigid enough to support itself when in a vertical position would show any deterioration either. Certain of these inorganic boards also provide their own vapor barrier protection which eliminates the cost of an extra vapor barrier.

The floor detail shown (*Figure 1*) is, of course, only one of many possible types of construction. The BMS report referred to above shows nine other details, some effective and some not. The architect who is concerned with achieving a high level of protection against heat loss and con-

[1] *"Durability of Moisture-Resistant Membrane Materials in Contact with the Ground." Housing and Home Finance Agency, Housing Research Reprint Series No. 15, available from the Superintendent of Documents, Washington 25, D.C., for five cents.*

densation trouble at the edges of floor slabs would do well to obtain a copy of the report.[2]

If radiant or perimeter heating pipes or ducts are to be laid under the slab or in it, special types of protection must be used. These should follow the recommendations of the heating contractor or can be worked out on the basis of the principles given herewith by the architect himself. The main purpose of protection in this instance will be to prevent excessive heat loss into the ground and moisture damage to the pipes or ducts arising from the ground.

(B) Houses Built Over Crawl Spaces. Many small homes are being built partly or entirely over crawl spaces today; it is one practical way of reducing costs. Sometimes a part-basement is included, the rest of the area under the house being unexcavated. Whether there is a part-basement or no basement at all, it is of the greatest importance that protection from moisture rising from the ground into the floors and walls of the structure be provided when the house is built. Some of the worst condensation problems found arise not from too-tight houses or too-high interior humidities, but from ground moisture. Furthermore, as was mentioned previously, this condition exists in all parts of the country; it is not only a cold weather problem.

All crawl spaces of whatever nature should be protected from moisture with a durable vapor barrier on the ground surface and with sufficient foundation wall ventilation to dispose of any vapor that may get through the vapor barrier or the

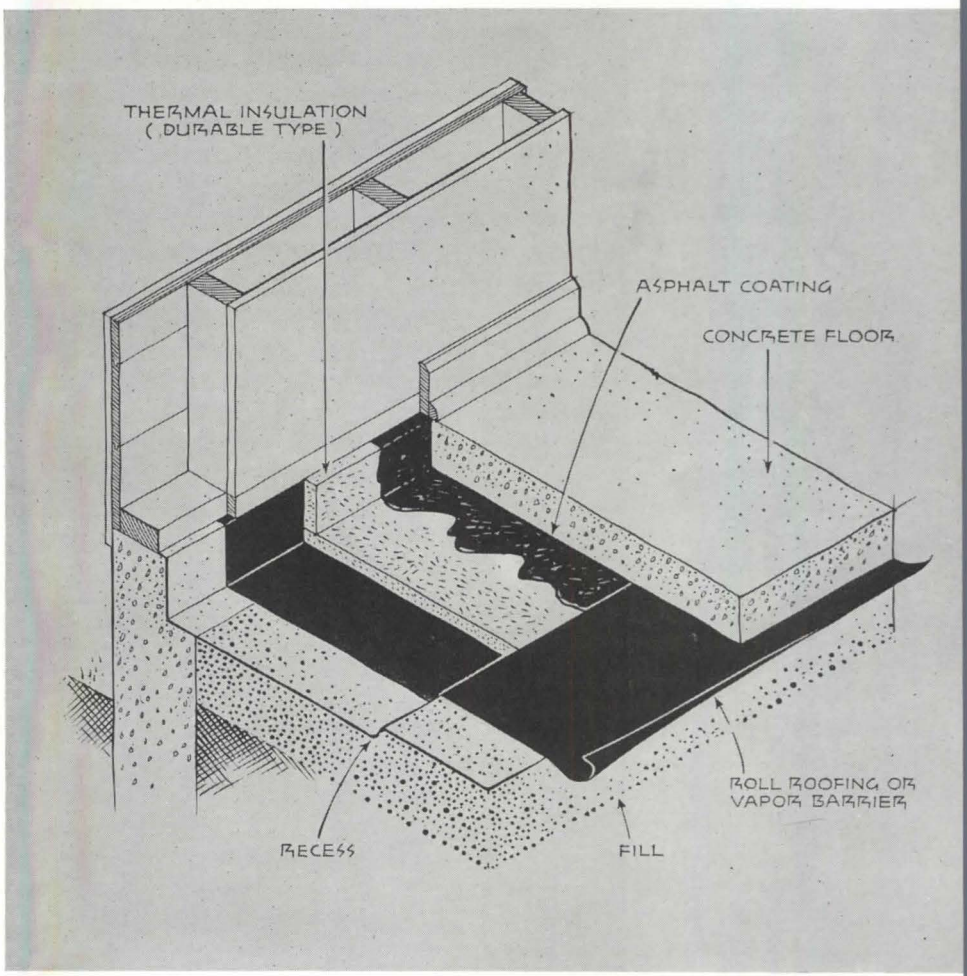


Figure 1—insulation and vapor barrier at edge of slab in a basementless house. Protection against condensation in the slab and moisture damage to floors and walls is shown in this detail. Since soil temperatures are usually lower than air temperatures in summer, condensation may also occur then as well as in winter. One way to alleviate this condition is to use low-density concrete—perhaps one containing vermiculite or perlite as part of the aggregate.

[2] *Martin, Achenback, and Dill: "Effect of Edge Insulation Upon Temperature and Condensation on Concrete-Slab Floors." National Bureau of Standards, BMS Report 128. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C., for 20 cents.*

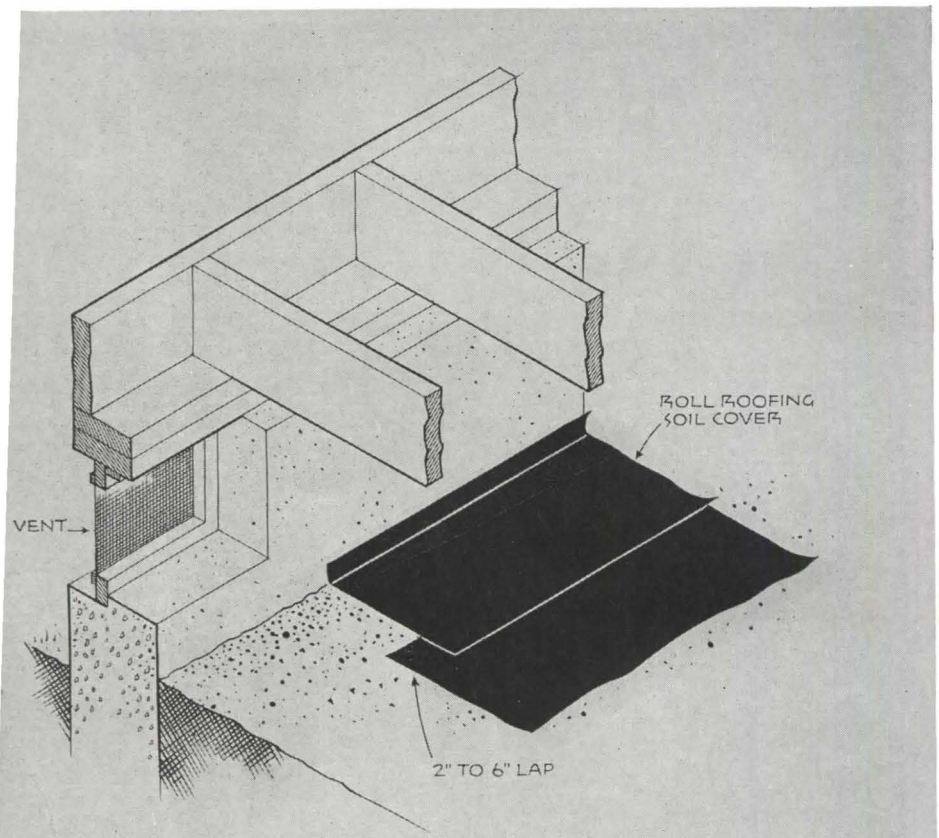


Figure 2—ground cover and wall vent in basementless house. The wall vent should be covered by a heavy-wire mesh—four mesh to the inch or even two—sufficient to keep out small animals but not to reduce air motion significantly. Ground-cover sheets should be turned up against the foundation wall for protection at the perimeter and should be lapped from two to six inches. The soil surface below the building should either be above outside grade or should be provided with tile drains if there is a chance that water can get inside the foundation wall.

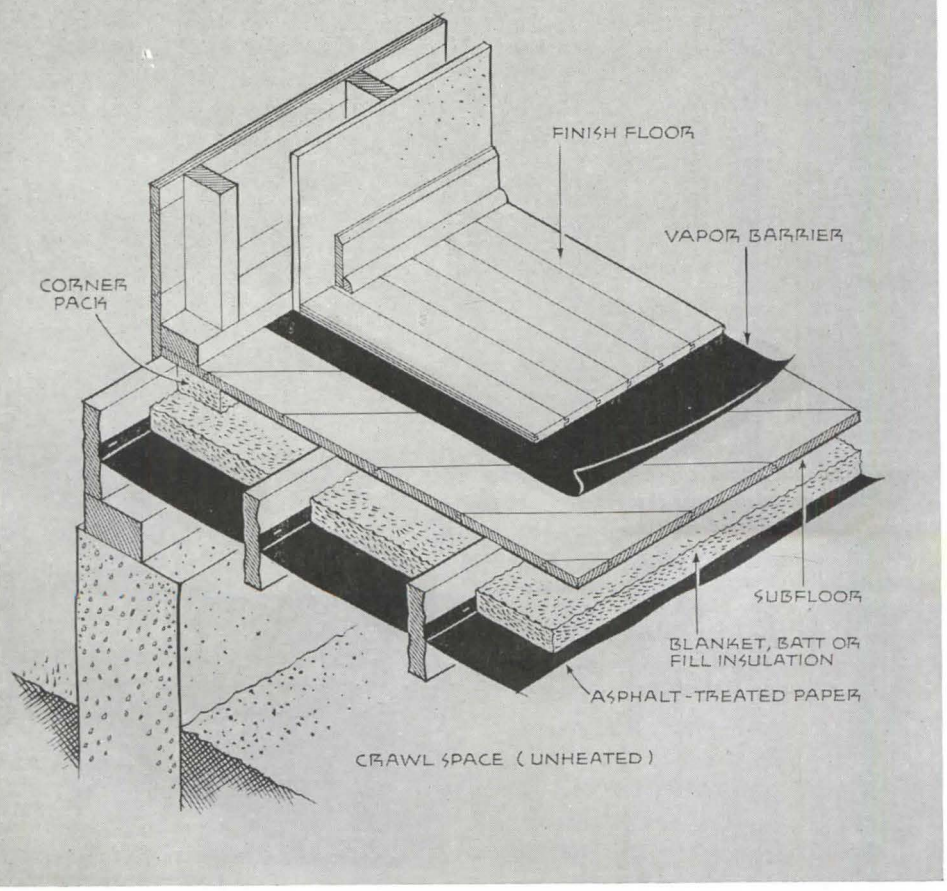
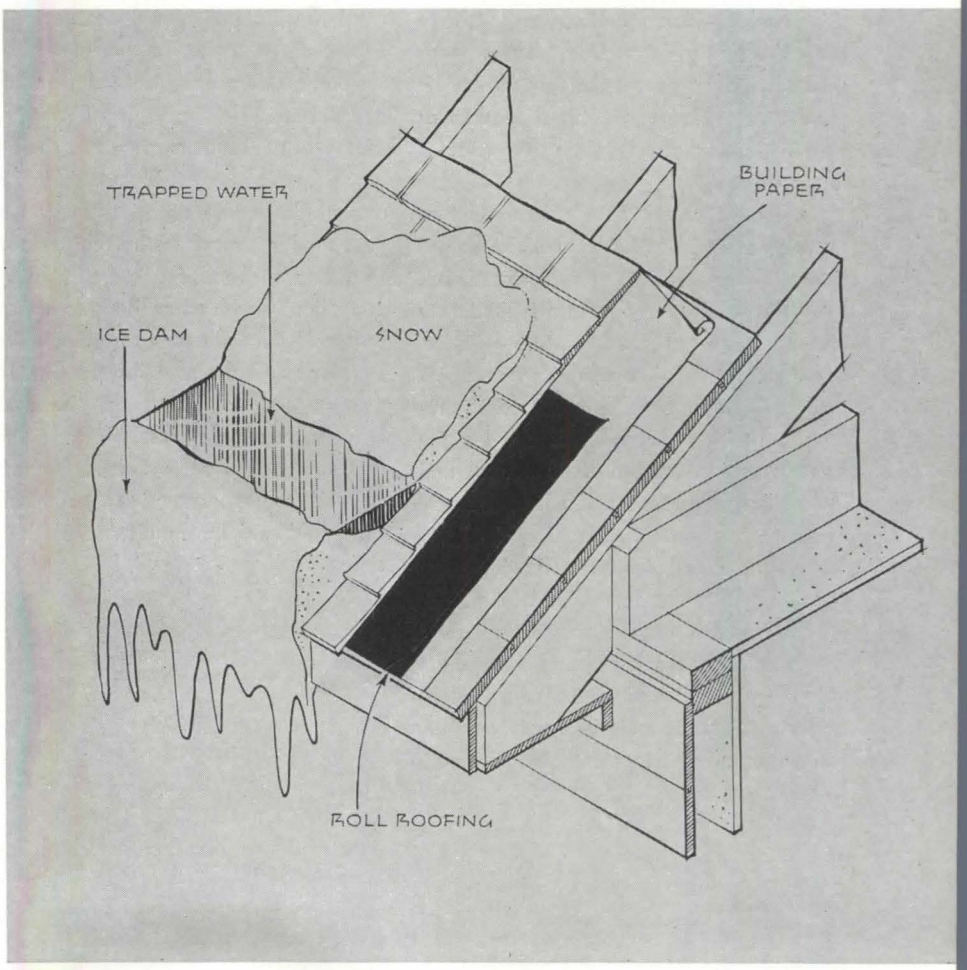


Figure 3—insulation and vapor barrier in basementless house over crawl space. Although the asphalt-treated paper shown here as support for the insulation may be a good vapor barrier, its joints cannot be sealed and therefore a barrier between subfloor and finish floor is called for. If there is room, the asphalted paper can be attached to the bottoms of the joists rather than suspended between them as in this detail. When suspended, the flanges should be stapled to the sides of the joists every six inches. In all cases care must be taken to use corrosion-resistant nails or staples. The corner pack of insulation shown is to provide warmer floors and reduce heat loss around the outside of the building.

Figure 4—method of protecting eaves from water damage due to snow and ice dams. The strip of roll roofing should be laid over the usual roof sheathing paper and under the shingles. When wood shingles are laid over strips with spaces between them and without sheathing paper, the roll roofing should be nailed directly to the strips.

Illustration adapted from *Condensation Control in Buildings*, HHFA, 1949.



walls. HHFA recommends using 55-lb roll roofing here also. It should be well lapped but not necessarily cemented. Foundation wall vents, as described below, should be installed as high in the foundation wall as possible so that air will pass directly over the bottoms of the floor joists, thus helping to keep them dry (*Figure 2*). In cold climates, underfloor insulation, together with a vapor barrier laid above it between the subfloor and the finish flooring, should be specified, as indicated (*Figure 3*). Instead of the asphalt-treated paper to support the insulation, wire cloth can be used, or a blanket insulation with a good integral vapor barrier can be placed level with the tops of the floor joists before the subflooring is laid. Aluminum foil can also be installed as a combination insulation and vapor barrier.

Wall vents need not be as large or as numerous when a durable and well-installed ground cover is used, though some are advisable merely as insurance. The formula for vents in a foundation wall of a house without ground cover is given by the HHFA as "2 sq ft per 100 lineal ft of building perimeter, plus ⅓ of 1 percent of the crawl space area." With ground cover, the vents should not amount to less than 10 percent of this formula.

Exactly the same requirements for ground cover and ventilation should be followed in the unexcavated areas of homes with part basements. Care should also be taken to prevent water and water vapor from entering the basement area from the unexcavated part, particularly if the basement is to be used for storage of perishable goods or as the site of a furnace.

(C) Basements. The standard methods of good cellar construction, with a coat of cement parge over the outside walls and a layer of asphalt mopped over that, plus an open tile drain around the base laid in a trench filled with loose washed gravel, will usually guarantee a dry basement. The work should, of course, be carefully supervised, since mistakes or sloppy workmanship at the time of construction can cause trouble later on. In particular, care should be taken to make sure that there is a lead-off drain from the trenches around the base of the foundation and that this drain will carry the water to a point lower than the lowest level of the foundation drain. Otherwise, the water collected in the latter will simply stay where it is and eventually will penetrate the wall and cause a wet cellar.

The Special Problem of Snow Back-Up and Ice Dams on Roofs

A reliable method of preventing water damage due to melting water behind an ice dam can be easily accomplished. By carrying a layer of heavy-roll roofing along the edge of the eaves so that it will cover the roof sheathing well above the line where the wall meets the roof, and

placing 1″ wood spacer blocks or metal ties every 16 inches behind the gutter to keep the gutter away from contact with the board, damage from this source can be eliminated (*Figure 4*). Sheet metal can be used instead of roll roofing, provided it is rust-proof.

Obviously, this type of precaution is needed only where climatic conditions are likely to be severe, though experience has shown that many ordinarily moderate climates may have bad winters at infrequent intervals that could cause unexpected damage from this source if protection had not been built in when the house was first erected. It is a small and inexpensive expedient; if it is necessary to save a few cents, the usual roof sheathing paper could be omitted where the heavier roll roofing goes, and be placed only beyond it on the rest of the roof. Roofing felts themselves are not usually suitable protection since they may not be really waterproof and since they may deteriorate under adverse moisture conditions.

Heating Systems and

Condensation Control

Mention has been made previously of certain types of furnaces that are provided with humidifying equipment to add to winter comfort. If furnaces of this type are being installed, there is one word of advice the architect should pass on to the home owner: never use the humidifier until the new house is thoroughly dried out—*not until after two or three heating seasons at the least*—and not after that unless the occupants find the air in the house uncomfortably dry.

One thing that well-designed heating systems can do, particularly in modern homes with very large glass areas, is reduce or eliminate the nuisance of window condensation during cold weather. This is achieved by using a perimeter outlet system, preferably continuous under the glass areas. Although this will not get rid of any of the moisture vapor in the house, it will help to keep it from condensing on the windows. At night, when the sun's heat no longer raises the temperature of the glass surfaces exposed to it and condensation is even more likely to occur, the best solution is heavy draperies, either of standard materials or of the insulating type newly appearing on the market. Draperies are, of course, almost a "must" in the so-called solar house, for privacy as well as for protection against nighttime cold and too much sun in the daytime.

Air Conditioned Houses

No special problems other than those found in ordinary homes have yet been found to exist, from the condensation control point of view, in houses with year-round air conditioning. There is no available evidence that reverse condensation ever occurs to a serious extent in summer since the interior temperatures are practically never kept so much lower than the outdoor temperatures that a dewpoint could be reached by outside vapor penetrating toward the inside of the house

Of course, in certain regions of the country where summer temperatures and humidities are very high, occasional reverse condensation might occur, though it is hard to imagine that it could do so frequently enough to cause any damage. Architects in these regions will do well to follow the recommendations of the air-conditioning suppliers and if they suggest a vapor barrier on the outside (particularly if there is no winter problem) it might be well to include one.

condensation in old buildings

Although architects are not usually concerned with condensation in existing houses, but only with preventing it in new structures, it should be pointed out that they undoubtedly will be confronted with the old-house problem at some time in their lives as, for example, when undertaking a remodeling job. They should know a little about why it occurs and what to do about it.

With the rapidly rising costs in heating fuel, accompanied by better standards for winter comfort that require higher interior temperatures and humidities and an absence of drafts, owners of older houses have in recent years been spending sizable sums of money to "winterize" their homes. This often involves using storm windows and doors, as well as weatherstripping; blowing insulation into the walls and attic floors; using tight and relatively vapor-resistant exterior wall materials; and installing humidifying equipment to raise the interior humidity to what is considered a comfort point.

When all these things are done, a moisture load is put on the building that it cannot dispose of, and condensation damage results.

The problem could, of course, be easily solved by educating the home owner to open a window for a while, whenever condensation begins to appear on the glass, or to install a wall fan in the kitchen and turn it on when necessary. But few and far between are the housewives who will, after spending all that money to achieve what they consider to be real winter comfort as well as low heating costs, open a window to let some of the valuable warm air escape. Actually, of course, little heat is lost if this is done right.

If and when an architect is approached for suggestions on how to cure a condi-

tion of this sort, he can recommend the application of a suitable paint vapor barrier or wall papers with high vapor resistance, as described earlier in this series. He can also suggest the provision of means of ventilation, either natural or forced. And, if the conditions are not remedied entirely by these devices, he can propose some sort of *automatic* dehumidification equipment, either an exhaust fan attached to a humidistat which will turn the fan on automatically whenever the humidity rises above a danger point, or large automatic silica-gel dehumidifiers for use in rooms where the vapor production is particularly high.

In old houses, moisture resulting from damp crawl spaces can be kept out of the dwelling by installing large, unshuttable louvers in the foundation wall and by covering the surface of the ground with widely overlapped strips of 55-lb roll roofing. This latter method is preferable if only one of the two is to be used since the louvers can become filled with leaves, dirt, and snow, or even actually be sealed off by the home owner, who may complain of cold floors resulting from the air motion through the crawl space. However, it is definitely preferable that *both* techniques be adopted and that the floor temperature be kept up by placing insulation between the floor joists, with a good vapor barrier above it. (Details for protecting crawl spaces were described earlier in this series.)

Admittedly, the difficulties encountered in trying to cure a moisture problem in the crawl space of an already-built house are great and the cost is often high. Only too often, crawl space between the bottom of the joists and the surface of the ground is too shallow to permit men to enter and put the roll roofing in place. Expensive hand excavation is then needed to deepen the area enough to permit entrance. However, when the situation is severe, even that cost must be borne since not to do so might well mean the eventual collapse of the floor from rot and extensive damage to the walls and the roof of the house due to moisture arising by stack action.

In the case of damage caused by snow back-up in an existing house, the shingles will have to be taken up several courses above the line where the wall joins the roof and a layer of heavy-roll roofing or a sheet of nonrusting metal will have to be laid over the sheathing, after which the shingles may be relaid. In certain types of roof construction the fascia boards should be removed at the same time and the roll roofing continued down behind it, if it is at all possible to do this. If the gutters are fastened directly to the fascia boards, they should be removed and spacer blocks should be placed between them and the fascia.

conclusion

It must be remembered that this survey on condensation in buildings is a rather summary one and, furthermore, that it discusses a subject about which there is much that is still either controversial or wholly unknown. This series should be considered an interim report rather than the final statement on the subject which it certainly is not.

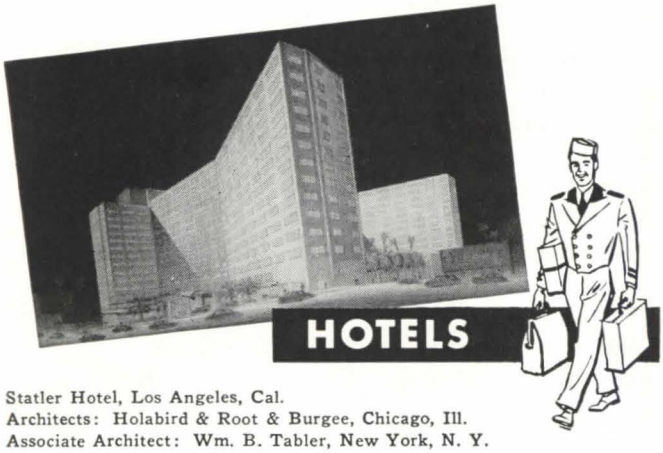
Nevertheless, it is felt that if the architect conscientiously follows the basic recommendations offered, including suggestions both on specification and on careful supervision of the work as it is done, the possibilities of damage to the structure from moisture condensation and from other types of water penetration should be reduced to a minimum.

HOSPITALS

Georgia Baptist Hospital, Atlanta, Ga.
Architects: Stevens and Wilkinson, Atlanta, Ga.
Builders' Hardware: Dinkins Davidson Co., Atlanta, Ga.

SCHOOLS

Valley Stream Memorial High School, Valley Stream, Long Island, New York
Architect: Frederic P. Wiedersum, Valley Stream, L.I., N.Y.
Builders' Hardware: Lockwood Hardware Mfg. Co., New York, New York



HOTELS

Statler Hotel, Los Angeles, Cal.
Architects: Holabird & Root & Burgee, Chicago, Ill.
Associate Architect: Wm. B. Tabler, New York, N. Y.
Builders' Hardware: Builders' Hardware Supply Co., Los Angeles, Cal.

DEPARTMENT STORES

Sakowitz Bros., Houston, Texas
Architect: A. C. Finn, Houston, Texas
Builders' Hardware: Peden Iron & Steel Co., Houston, Texas

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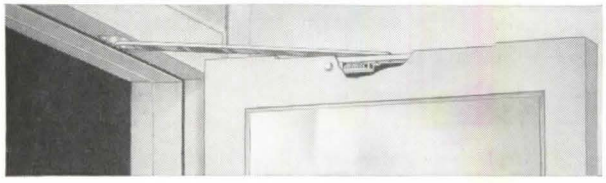

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Singer sings for specifiers

Our little old Construction Specifications Institute, Inc. is growing nicely, thank you. We now have chapters in Southern California, Chicago, District of Columbia, and New York and a few more in the embryonic stage. I am now doing a second turn as President of the Metropolitan New York Chapter and find it a simulating experience. Here is why. We asked Alexander Singer (Cuzzi Bros. & Singer, Contractors, Mt. Vernon, New York) whether he thought specifications are really effective as a working tool. He devoted most of his talk to an analysis of the three principal functions of specifications, and showed how, in the light of those functions, the effectiveness of specifications might possibly be improved, i.e.:

(1) Specifications are a legal document. He emphasized the fact that the owner and the architect should have faith in the contractor, and vice versa. However, there are cases where there is not much good faith, and it is in such cases that the specifications, as a legal document, are (along with the drawings) all we have, and (more specifically) form the basis of all we are going to get. At the same time, he added, it is not Legal English that makes a good specification out of a poor one.

(2) Specifications are an estimating tool. Estimating is an activity not to be envied. However, if the specifications tell the story simply, without reference to unavailable manufacturers' literature (ASTM and other standard references are satisfactory), there is a lesser tendency for the estimator to allow (and allow enough) for potentially costly specification requirements, which requirements he simply may not have time to investigate in detail during the bidding period. And, please, pleaded Singer, be considerate; do not include an unreasonable number of alternates. He also said there is nothing he likes better than a good "Scope of Work" article in the specifications; it immediately tells the estimator what he has to watch for.

(3) Specifications are a means of communicating important information and a means of helping the contractor construct the building as it was intended. Singer stated that he encountered specifications in which labor procedures should have been more fully described. A general contractor should be informed on such matters as, extent of reshoring, protection, curing of concrete, manner and time of backfilling, protection of brickwork during course of construction to prevent efflorescence; in short, anticipate the desired results as well as the shortcuts which are desired; write the specifications in order to guarantee the former and prevent the later.

In Memoriam

to the Children and Adults
Whose Lives Have Been Sacrificed
in School Buildings Disasters

1908	Collinwood, Ohio	175 Lives Lost
1915	Peabody, Massachusetts	22 Lives Lost
1917	Asheville, South Carolina	7 Lives Lost
1922	Covington, Georgia	2 Lives Lost
1923	Camden, South Carolina	77 Lives Lost
1924	Babbs Switch, Oklahoma	36 Lives Lost
1930	Troyon, Oklahoma	3 Lives Lost
1937	New London, Texas	294 Lives Lost
1954	Cheektowaga, New York	15 Lives Lost

lest we forget

I asked Dr. Englehardt Sr. of Englehardt, Englehart & Leggett, Educational Consultants, to say something brilliant in the field of school planning for this column. He said, "Never mind the brilliance. Let us be mindful of a serious problem concerning fire."

A little while later he wrote to me as follows:

"Decade after decade serious disasters with attendant appalling loss of lives have occured in the nation's schoolhouses. During the 'forties' a respite seemed to have been accorded, but just recently the blow fell again on an unsuspecting community. Apparently such potential dangers lurk with greater elusiveness in old rather than newly constructed buildings. Periodic and rigid inspection of all school buildings seems to be imperative. The safeguards of yesterday may not suffice today. Let no School Board rely upon the alibi that it was not informed. Let every School Board insist upon frequent inspection and report on all potential dangers in schoolhouses. Let every School Board make it a positive practice to apply the suggested remedies. These children, their teachers, and parents should not have died in vain. The future record must be kept free of these agonizing school horrors."

volume II—mechanical & electrical

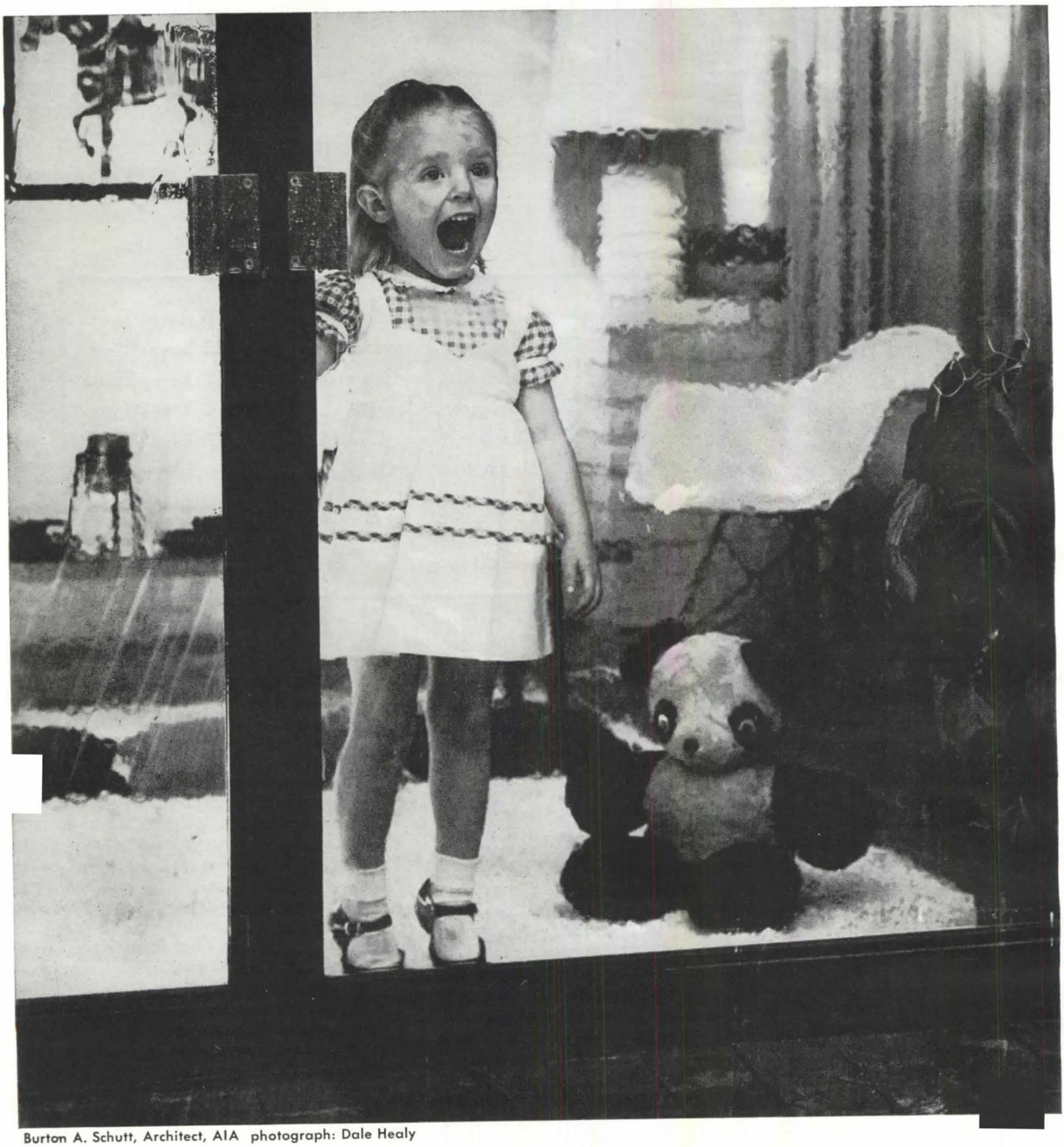
My collaborator and I are having a monstrous time with the writing of Volume II — Mechanical and Electrical of *Streamlined Specifications Standards.* This volume concerns itself with specifications for plumbing, heating, ventilating, air conditioning, refrigeration, and electrical work. Volume I — Architectural, comprehensive as it is, did not require nearly as much effort to write as does Volume II. Architectural specifications, whether good or bad, at least have some semblance of organization. Our recent investigations have shown clearly that specifications for mechanical and electrical trades are thrown together invariably in a manner that can be described only as chaotic. Do I see some hands raised? Challengers will please come forward, have their noses counted, and present some tangible evidence to the contrary. We are quite excited about Volume II because we are certain it cannot fail to help bring order out of confusion, in addition to improving and shortening specifications for these trades. I have received some very nice comments regarding Volume I—Architectural and hope sincerely you will get around to trying it on for size. *End of Commercial.*

IRT

Elizabeth Coit, AIA, my favorite lady architect, writes:

"*Dear Mr. Small:* Apropos of your remarks on trade names in May 1954 P/A, have you had occasion to check on the W.C.'s in the Interboro Rapid Transit retiring rooms? Those in the women's section are *labeled* 'Rapit Transit.' I think you will approve that one."

Dear Elizabeth: Hadn't I better investigate first?



Burton A. Schutt, Architect, AIA photograph: Dale Healy

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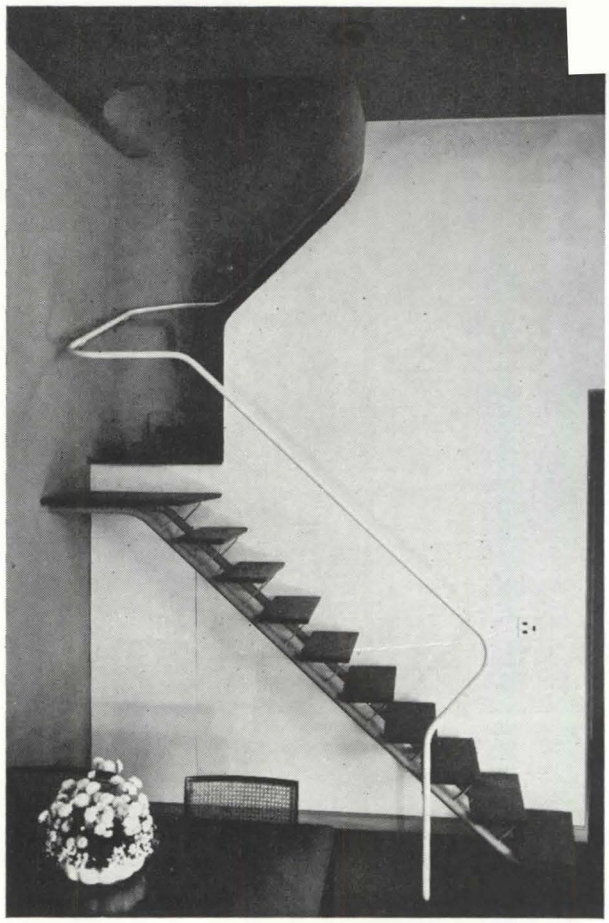

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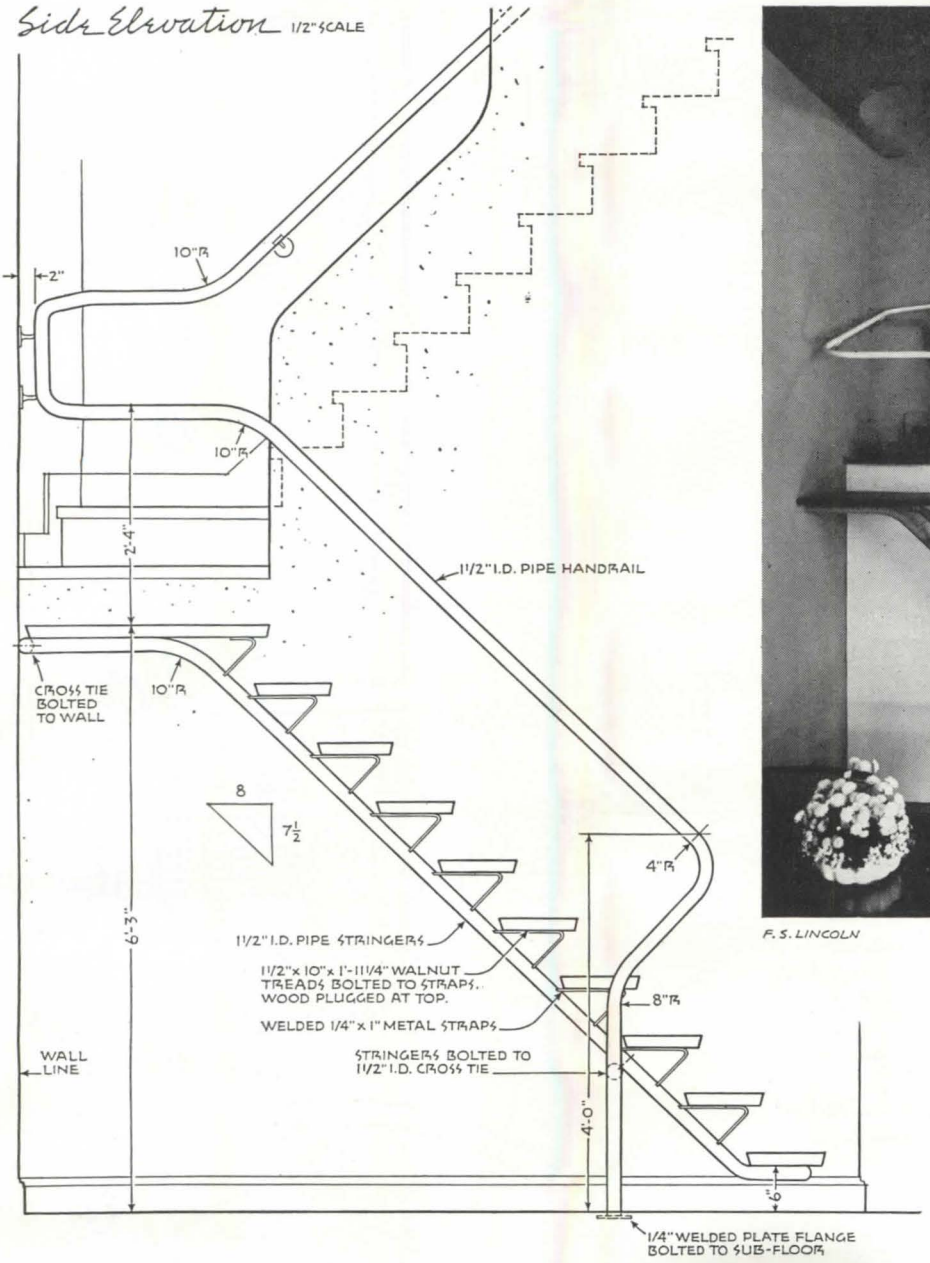
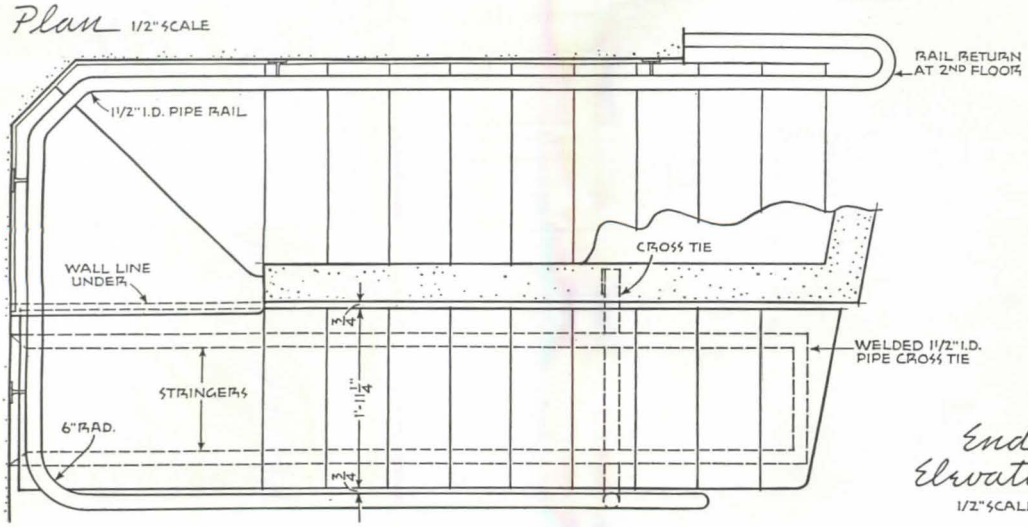
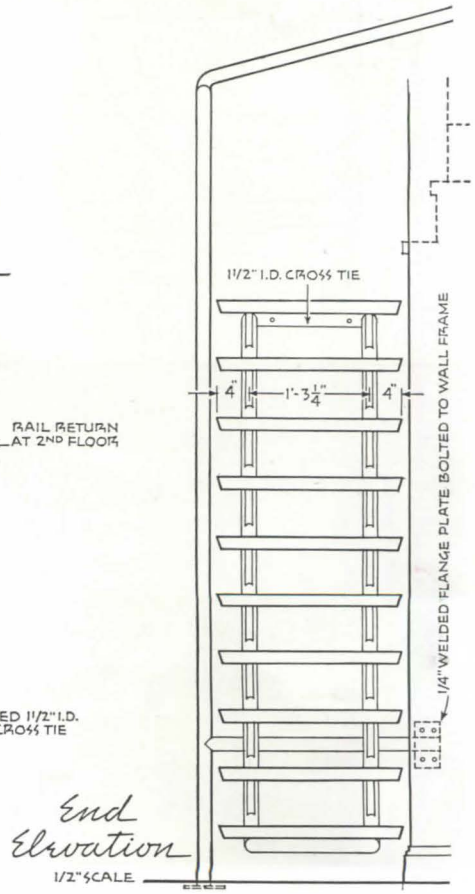


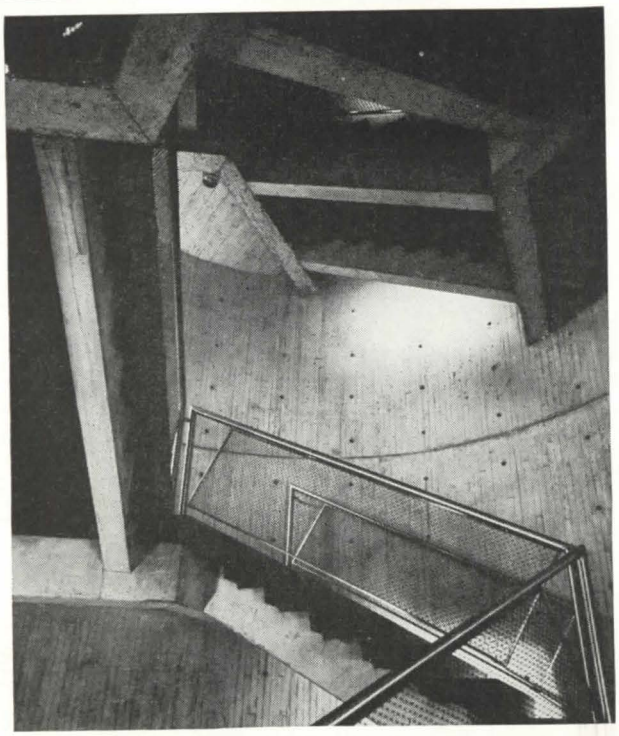




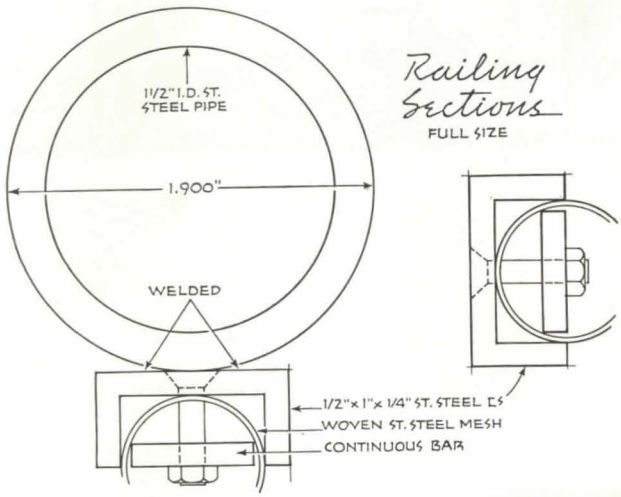
APARTMENT, New York, N. Y.

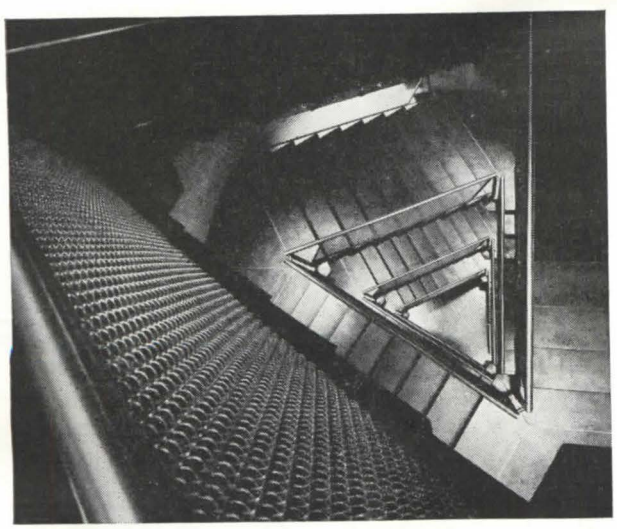
Joseph Aronson, Designer

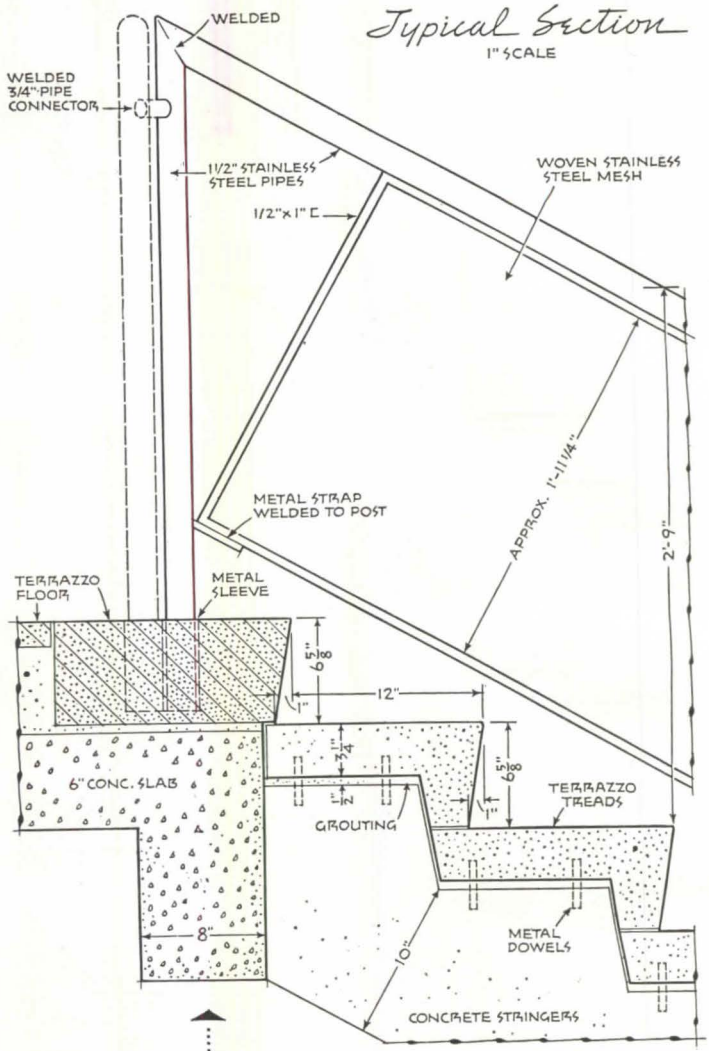
stairway

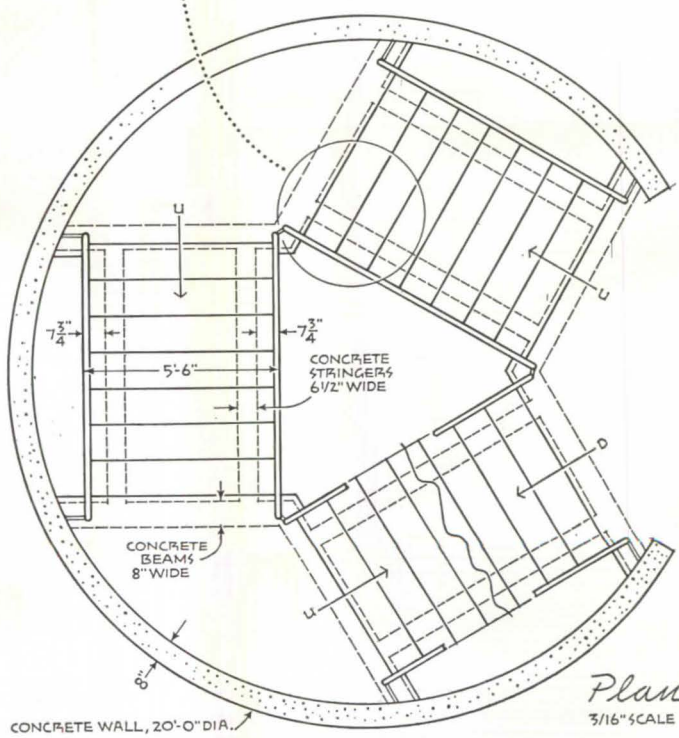


LIONEL FREEDMAN PHOTOS









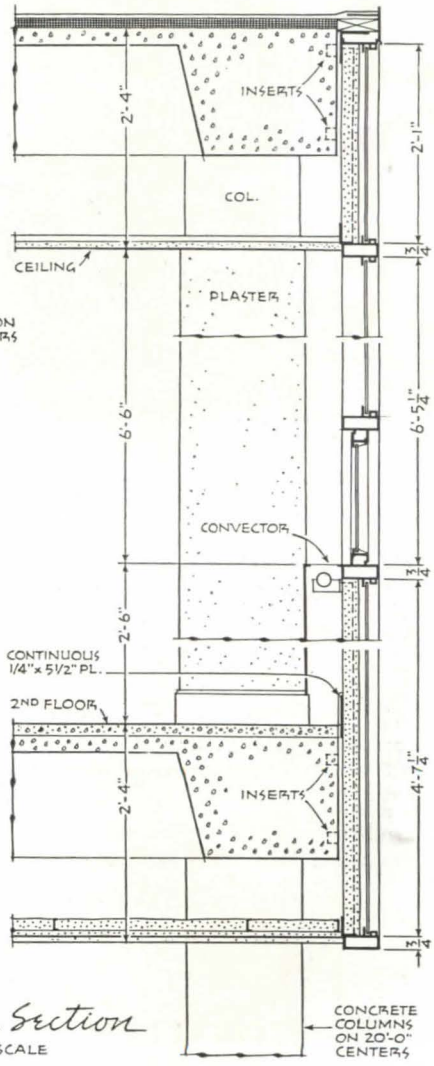
ART GALLERY AND DESIGN CENTER, New Haven, Conn.
Douglas Orr-Louis I. Kahn, Associated Architects

window wall

RICHARD SHIRK

Wall Section
3" SCALE

Mullion Plans 3" SCALES



Wall Section
1/2" SCALE

EDUCATIONAL AND SOCIAL CENTER, Detroit, Mich.
O'Dell, Hewlett & Luckenbach, Architects

The wall and doors paint a mural of color and light

Two patterned glass doors blend perfectly into this patterned glass wall. They pick up color and light—transmit them softly from either side. Yet the view is obscured for privacy.

The Blue Ridge *Securit** Interior Glass Door is a single piece of tempered glass, patterned on both sides. It is attractive in many settings. The glass goes well with other materials, and its neutral tone harmonizes with other colors. Being tempered, the *Securit* Door is toughened to take hard usage.

Easy to hang. Needs no cutting, no mortising. Arrives at the job with distinctive, easily applied hardware.

The cost compares favorably with that of high-quality doors of ordinary materials—and you save on installation and maintenance costs.

Your L·O·F Glass Distributor or Dealer will be glad to give you all the facts. Look for his name in phone book yellow pages, under "Glass". Or write us direct.

*®

BRIEF DATA

Glass—3/8" thick. Muralex patterned on both surfaces.

Tempered—three to five times stronger than untempered glass of same thickness.

Reversible—can be used right or left hand.

Standard Sizes—

2'6" x 6'8"	2'5 1/16" x 6'7 1/16"
2'8" x 6'8"	2'7 1/16" x 6'7 1/16"
3'0" x 6'8"	2'11 1/16" x 6'7 1/16"
3'0" x 7'0"	2'11 1/16" x 6'11 1/16"

Closers—when specified, the door can be shipped with a Sargent closer or prepared for use with an LCN concealed closer.

For more complete information, see the Securit Door insert in Sweet's Architectural File.

Securit Doors are part of this wall of Muralex patterned glass in the offices of Bert Mills, Inc., St. Charles, Illinois. Architects: Burgess, Stevens & Purdy, Chicago.*

Patterned glass has many uses — Blue Ridge *Patterned Glass* offers b function and beauty for many places in offices, homes, stores and instituti In partitions, for example . . . to lighten a hall . . . for distinctive cupbo doors . . . for lovely built-in furniture. Choose from linear, checkered and o all designs in plain, textured or *Satinol** finishes.

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INTERIOR GLASS DOORS

Libbey·Owens·Ford Glass Co., Dept. B-2284
608 Madison Avenue, Toledo 3, Ohio

Please send me your folder "Blue Ridge *Securit* Interior Glass Doors".

I would also like the booklet of ideas for using Blue Ridge *Patterned Glass* in ☐ homes ☐ other buildings. (Check one or both.)

NAME (PLEASE PRINT)_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Page Beauchamp

churches

Creating a spiritual atmosphere, the setting sympathetic to liturgical requirements of a particular religion or denomination, is the singular demand upon the designer of a church or temple interior. The design expression, in terms of style and precedent, is a continuing challenge, since the average church committee seems reluctant to accept anything new in religious structures although comparable advances in secular types of buildings are more generally understood and approved.

Worshipers who adhere to rituals that have remained virtually unchanged for centuries have regarded the cherished ancient architectural forms as somehow a necessity in churches and synagogues. Congregations not infrequently demand an exact copy of the old church, when commissioning an architect. The actual fear of a departure in design expression is sometimes based on an apprehension that change will discredit what was formerly accepted. With few exceptions, they resist the tendency to modify liturgical and ceremonial inheritance, or to reach for precepts and forms of worship more closely allied with new social patterns.

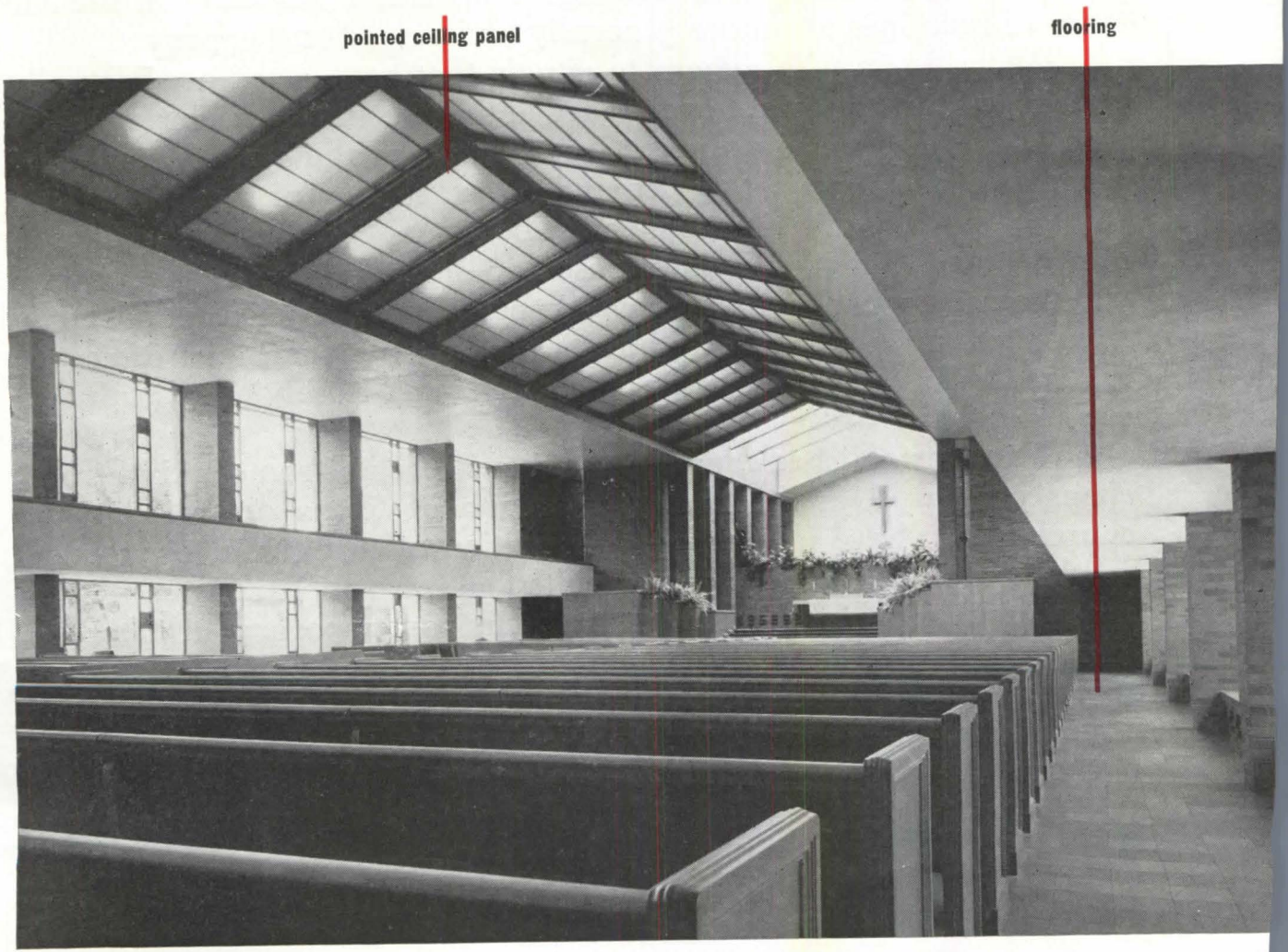
Those established churches that have accepted some architectural changes as well as moderated evolution of forms of worship, the churches that have undergone reformation of traditional pronouncements, and the new religions and cults that have appeared, more often are worshipping in structures of fresh, contemporary architecture character consonant with contemporary religious beliefs. The new freedom has resulted in a less pretentious expression of the spiritual atmosphere, unburdened by worn clichés or confining rules whose very purpose has long been forgotten.

churches

location | First Methodist Church, Midland, Michigan

architect | Alden B. Dow

The design of this church symbolically expresses growth—"growth beyond ourselves, beyond walls, beyond this earth, beyond time." Window walls on both sides and a skylight of plastic dispel the feeling of any confinement. The altar is done in utmost simplicity inspiring a feeling of openness and a desire to grow spiritually, unmarred by extraneous, confusing elements. A complete lack of pompousness and pretension creates an atmosphere of quiet, sympathetic to a spiritual atmosphere.



data

cabinetwork

Cabinetwork: comb grained oak/ Westover-Kamm, Bay City, Mich.

doors and windows

Doors: "Herculite"/ Pittsburgh Plate Glass Co., 632 Duquesne Way, Pittsburgh 22, Pa.

Windows: custom design/ oak frame/ glass; Pittsburgh Plate Glass Co./ executed by Westover-Kamm.

furnishings

Pews: American Seating Co., 901 Broadway, N.W., Grand Rapids 4, Mich.

lighting

Nave Lighting: "Slimline"/ Sylvania Electric Products, Inc., 1740 Broadway, New York, N. Y.

Other Lighting: #155, Prylite/ Pryne & Co., Inc., 140 N. Towne Ave., Pomona, Calif./ #1001/ Lite Craft, 8 E. 36 St., New York 16, N. Y.

walls, ceiling, flooring

Walls: brick, wood, and glass, sand finished plaster.

Ceiling: nave ceiling, wood, plaster center/ leveling, sand finished plaster.

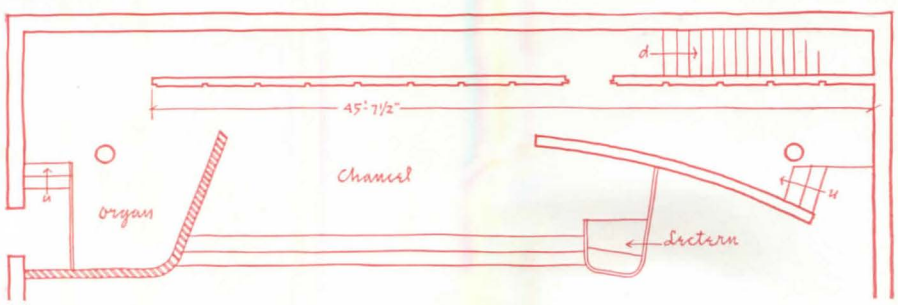
Flooring: Narthex brick and carpeting/ nave: cork tile/ Armstrong Cork Co., Lancaster, Pa./ center aisle, green carpet.

churches

location	First Unitarian Church, Minneapolis, Minnesota
architects	Thorshov & Cerny
interior designer	Newton E. Griffith

Probably the best way to describe the design theory of this church is to quote the architects' expression: "We have attempted to capture the spirit of Unitarianism in the design of the Main Auditorium by contrasting the simple box shape, representative of the Universe, with the undulating ceiling, used to represent the confines of human life within this shell. The ceiling wraps down visually to enfold the speaker who is the interpreter of human relations within the Universe. The large window to the north also expands the limits of the Auditorium and includes Nature in the perspective."

Coloring is carefully planned to be soft and harmonious. Sandalwood painted plaster walls blend with brick surfaces. The ceiling is bluish-gray supported by contrasting, terra cotta colored columns to accentuate the floating quality of the ceiling. Walnut paneling is used to focus attention and be a background for the speaker's rostrum. Flooring is brown tile mottled with terra cotta, while the draperies and carpeting are beige.



data

cabinetwork

All cabinetwork: designed by architect/ executed by Aaron Carlson Co., 1505 Central Ave., Minneapolis, Minn.

doors and windows

Doors: "Narrow Line" series/ Kawneer Company, 1105 Front St., Niles, Mich.

Windows: double hung, Series 200B, #2439, #3451/ Cupples Products Corp., 2650 Hanley Rd., Maplewood, St. Louis, Mo.

Fixed Windows: designed by architect/ extruded-aluminum frame/ executed by Crown Iron Works, Minneapolis, Minn.

furnishings and fabrics

Pews: #50 Pew body/ Manitowoc Church Furniture Co., Waukesha, Wis.

Drapery Fabric: mohair casement cloth/ Goodall Fabrics Inc., 525 Madison Ave., New York 22, N. Y.

lighting

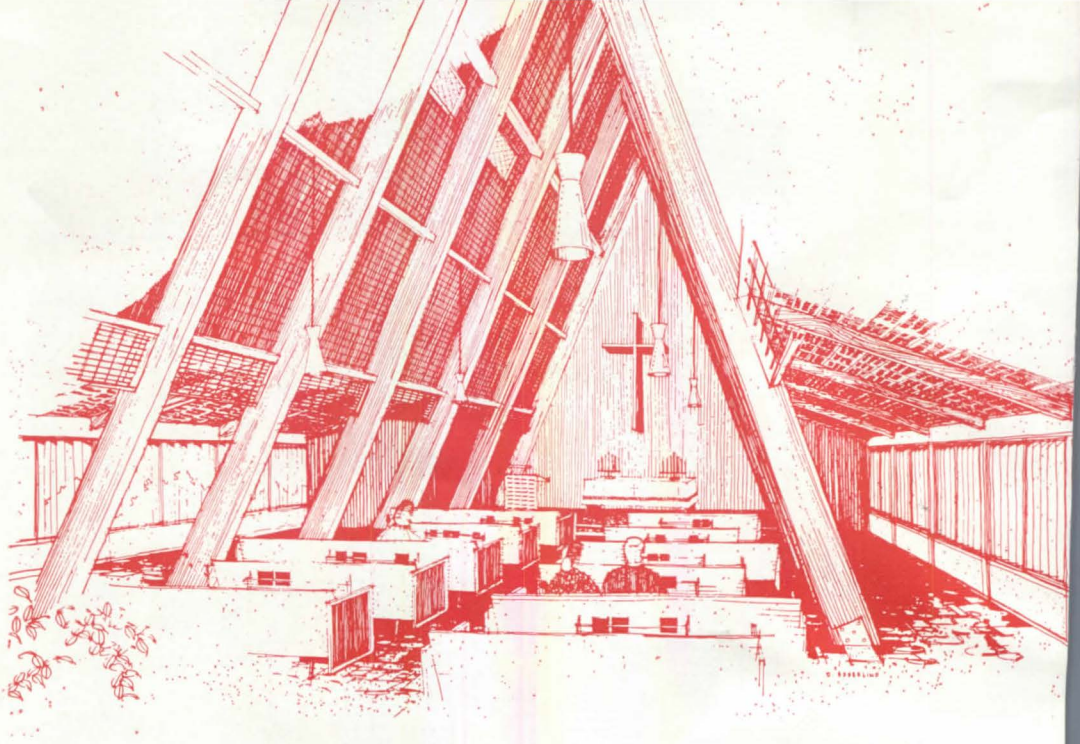
Recessed Spots: General Lighting Company, 1527 Charlotte St., New York, N. Y.

walls, ceiling, flooring

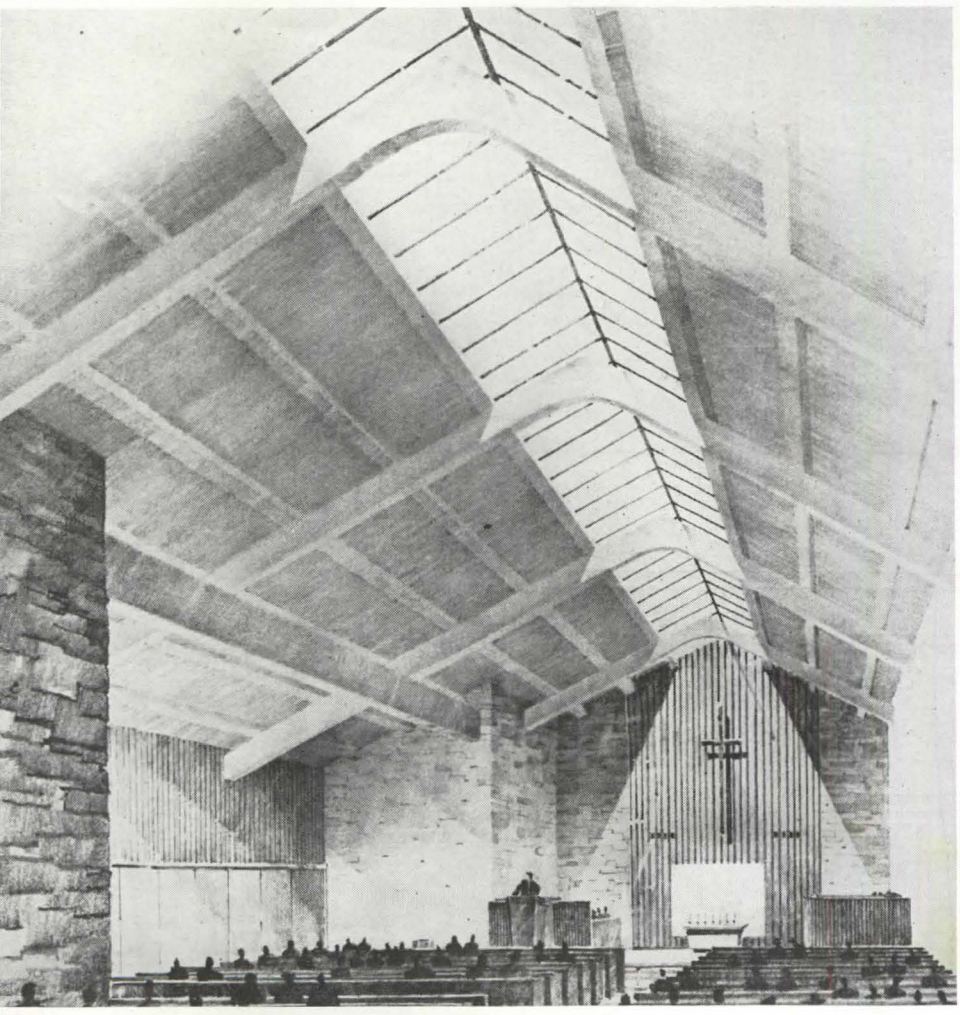
Walls, Ceiling: painted plaster

Flooring: asphalt tile/ Kentile, Inc., 58 Second Ave., Brooklyn, N. Y.

churches

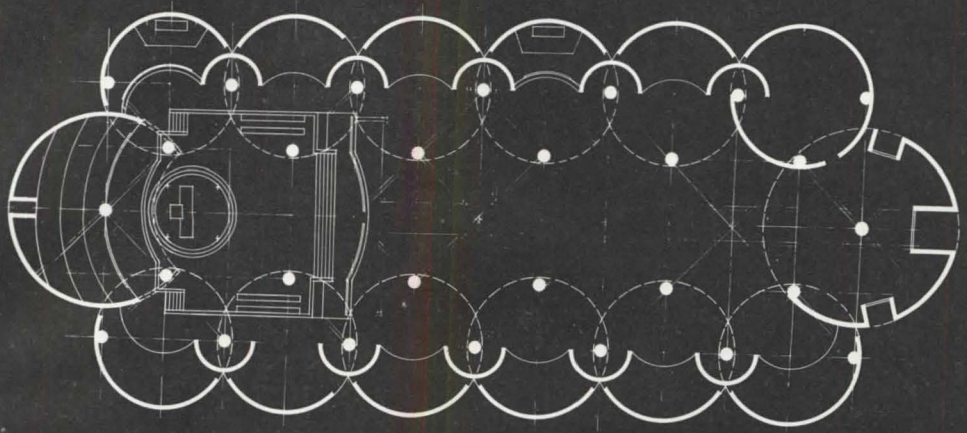


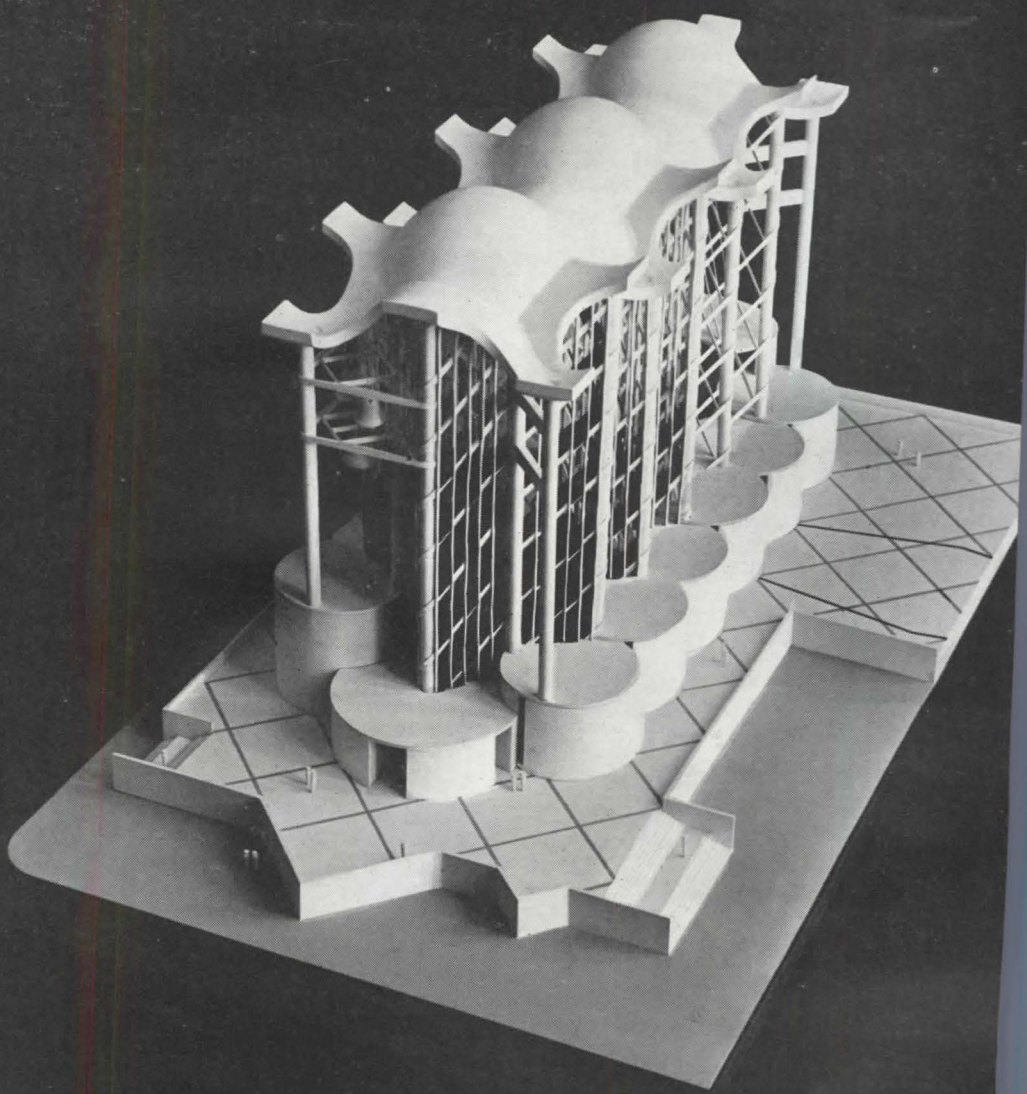
In the design (right) *for a memorial chapel, by Compton & Pierce, Architects, Cambridge, Mass., the combination of fir planking serving as ceiling, windows with fixed louvered shutters, and shadowed, low illumination create a mysterious and indefinite atmosphere. In contrast, the wall behind the altar is of lighter hemlock, and a long, narrow skylight behind the last beam casts light on the end wall and altar. The Chapel is small, accommodating a maximum of 60 persons. Its design and materials reflect a modest budget.*



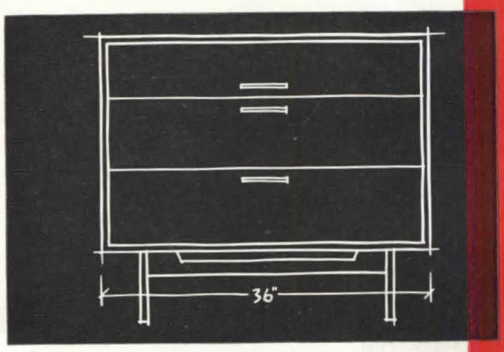
The stone walls of this church (left), *designed by Carroll, Grisdale & Van Alen, Architects, Philadelphia, Pa., have no windows to interrupt the unbroken line. A continuous skylight along the ridge of the roof and a glass front admit light. A mahogany wood screen from floor to roof hides the organ and an exhaust fan. Flooring is of asphalt tile with carpeting in the aisles. Custom-made pews in a hand-rubbed walnut blend with the gray-stained wood of the purlins and wood planks of the roof structure. Here, again, interest is centered on the altar, and no confusing elements distract the eye.*

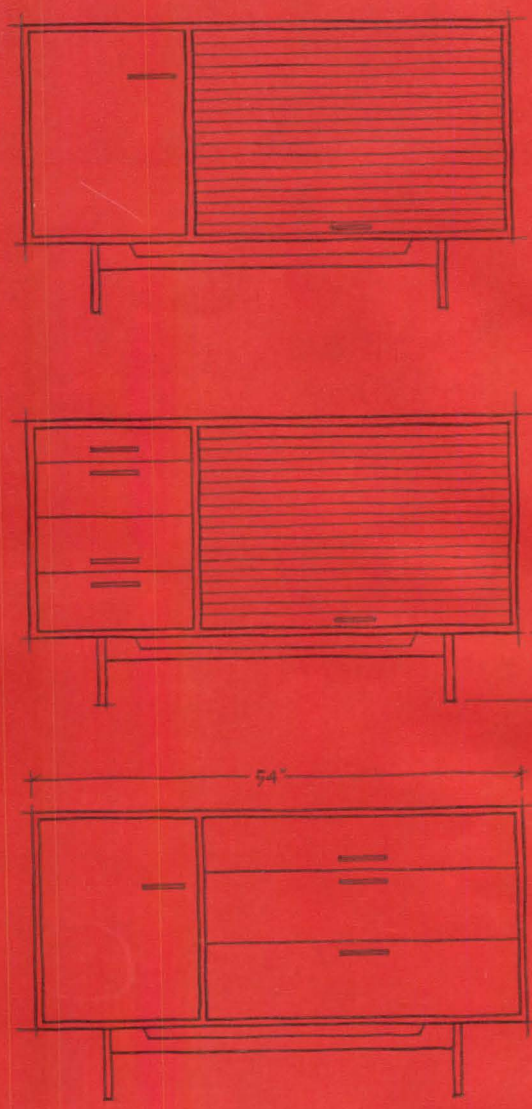
A proposed cathedral (acrosspage) *by Oscar Nitzchke, Architect, New York, N. Y. Reinforced concrete was chosen for earthquake resistance. Colored strips of glass, set at forty-five-degree angles to the columns, form the walls. The small circular members at the base are chapels. The floor plan shows the unusual design. Here the interior design is the architecture.*



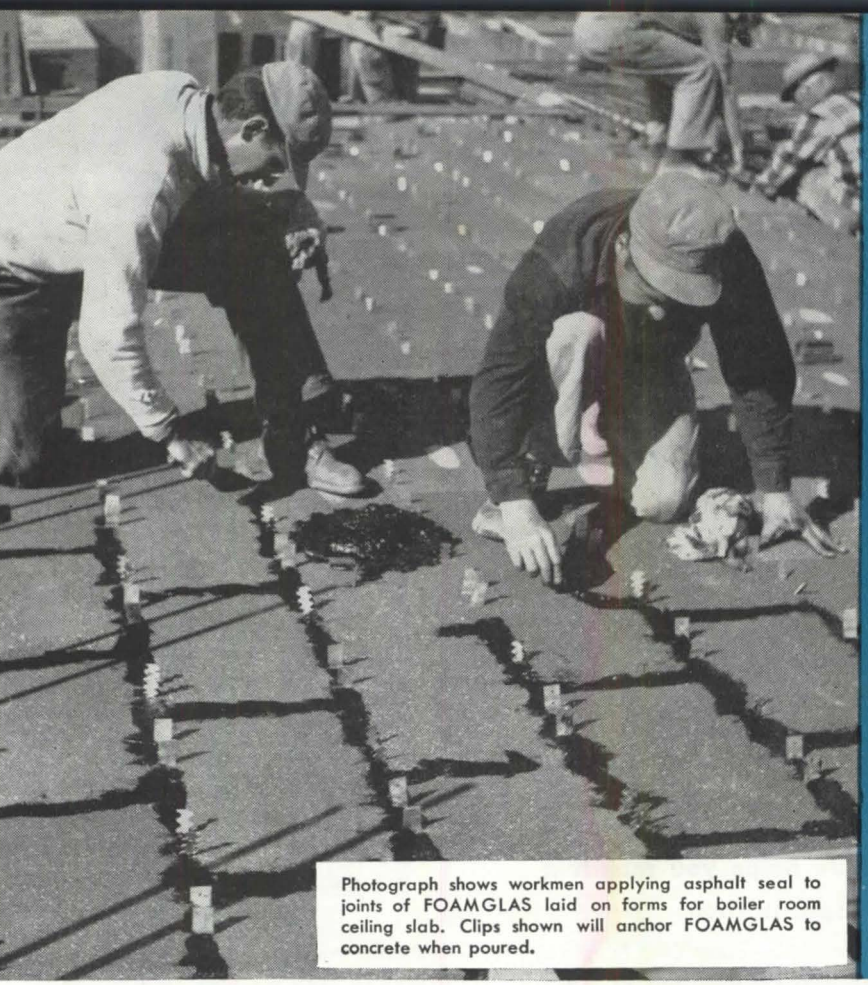


p/a interior design products

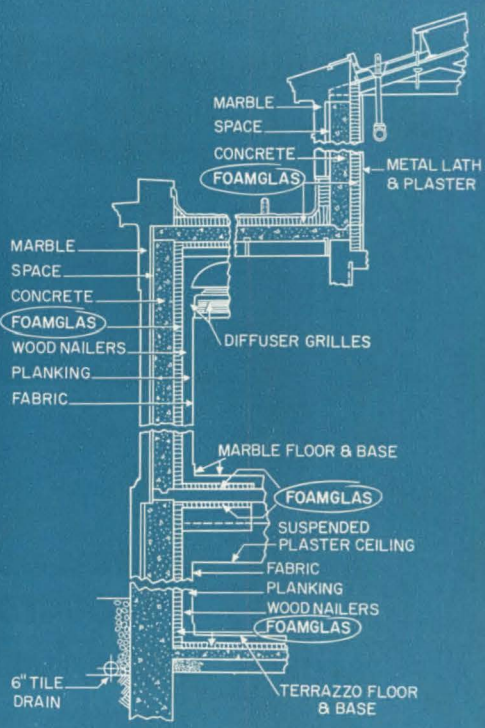




New Cabinet Group: Group "R"/ nine 36" and 54" cabinets in walnut or birch, bases of 28", 39", 54", or 72" length/ designed for bedroom, dining room, living room, or office/ includes case for radio, phonograph, or television equipment/ tambour fronts of interlocking plastic strips/ drawers on metal extension slides have brass pulls/ **Jens Risom Design, Inc., 49 E. 53 St., New York 22, N. Y.**



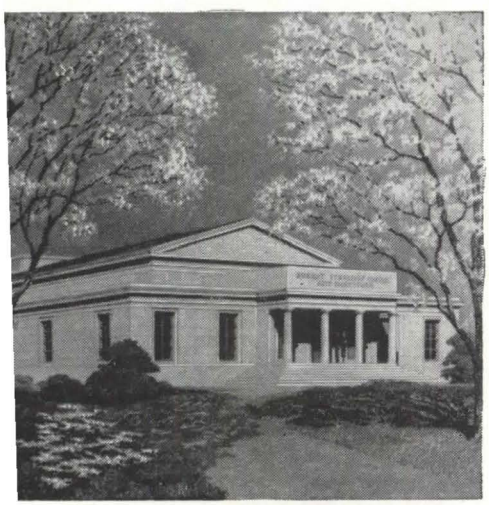
Photograph shows workmen applying asphalt seal to joints of FOAMGLAS laid on forms for boiler room ceiling slab. Clips shown will anchor FOAMGLAS to concrete when poured.



These typical sections show the use of FOAMGLAS in walls, roof and basement floor of the Clark Art Institute. Architect: Daniel Perry, A.I.A., Port Jefferson, N.Y. General Contractor: The George A. Fuller Company.

"Insulating with FOAMGLAS solved a vital temperature-humidity control problem for us!"

reports Sterling and Francine Clark Art Institute



Here is the Architect's rendering of the beautiful new Sterling and Francine Clark Art Institute, Williamstown, Massachusetts. FOAMGLAS insulates the roof slab, all exterior walls and the basement floor.

"The *moisture-proof* insulating protection of FOAMGLAS was an important factor in solving our vital temperature and humidity control problem," reports the Sterling and Francine Clark Art Institute, Williamstown, Massachusetts. "Precise control of temperature and humidity in all seasons is essential to proper protection of the art treasures to be displayed in our new building. That called for an insulation combining high insulating performance with *moisture-protection*. FOAMGLAS solved this problem because its sealed glass cells cannot absorb or transmit moisture. Here's our Architect's report on the selection of FOAMGLAS:

"'We insulate with FOAMGLAS because it combines permanent thermal insulating and vapor sealing qualities with freedom from maintenance. Also, its rigid structure permits us to apply metal lath plaster without anchoring to the structure proper.'"

It will pay *you* to investigate the important advantages of insulating with FOAMGLAS. See our catalog in Sweets, or send for a free sample and our booklets describing the use of FOAMGLAS to insulate: 1) walls, floors, roofs and ceilings of normal temperature buildings; 2) cold storage space; or 3) piping, tanks and other equipment. Write, indicating your specific interest.

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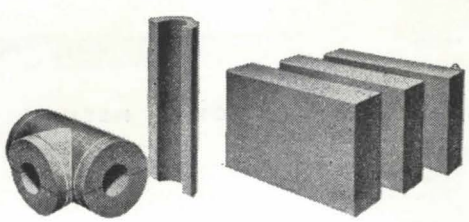


Pittsburgh Corning also makes PC Glass Blocks

p/a views

(Continued from page 15)

tors. His ability to harness disparate capacities such as those of Gilbert Stanley Underwood and H. G. Hunter into a team is almost unique in Washington offices.

I think the Federal Government in general, and PBS in particular, is much better equipped to handle an anticyclical program, should one be necessary, than is suggested by Gutheim's comments. In the first place, there are more grant-in-aid programs outside the Housing and Home Finance Agency than in it. Public roads and hospital programs, for example, are sizable operations. In the second place, Mr. Reynolds' office does have well-organized material which would permit him to expand his operations in a hurry and in an intelligent and very useful fashion, despite the difficulties which he has had to face.

I certainly would not agree either that Mr. Reynolds has conceived his function to be ready and waiting for the order. The agency for which he works has desired better buildings and fought for them almost desperately. Mr. Reynolds has not considered it his function to put up buildings for the sake of building, rather to work for the efficient housing of Federal employes. He has supported programs of the various agencies when they deserve support, and he has tried to locate those buildings in the light of city plans and the future growth of the communities in which he was building them. His approach definitely has been constructive and not passive.

We are all glad that he is not leaving the profession and that he is planning to continue work in Washington. May his work ahead be prosperous as well as pleasant.

ROBINSON NEWCOMB
Washington, D. C.

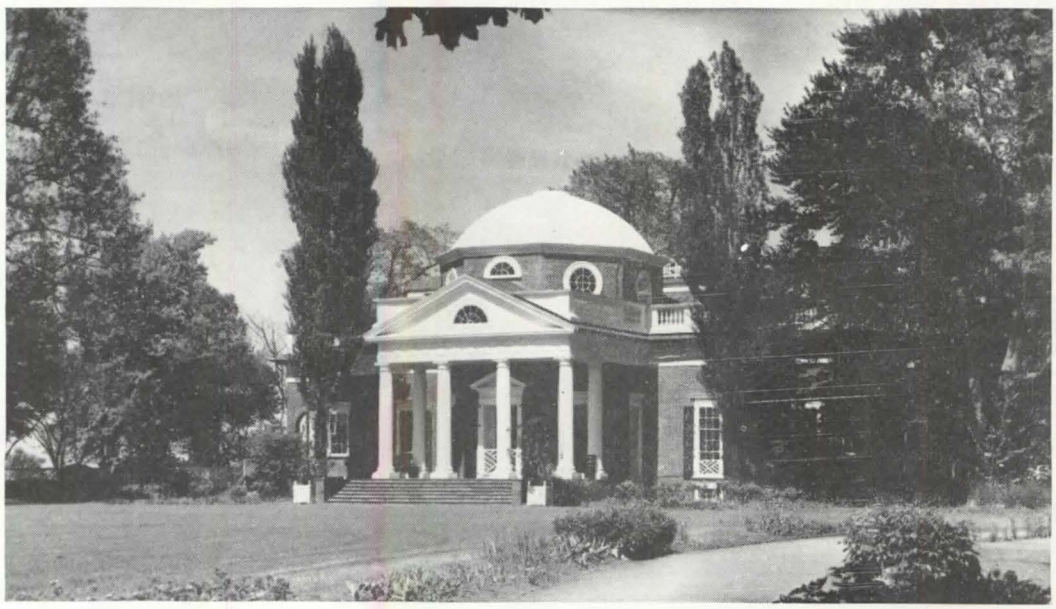
school economies

Dear Editor: I noted with interest in February P/A the article concerning simplified construction costs of a school listed on Page 10, PROGRESS PREVIEW.

You might be interested to know that we have used this type of framing for some time. The school we designed in

(Continued on page 154)

how JOHNSON CONTROL PROTECTS one of the NATION'S MOST TREASURED BUILDINGS...



MONTICELLO

Monticello, Charlottesville, Va. (Restoration Program). Milton L. Grigg, F. A. I. A., architect, Charlottesville; Wiley & Wilson, mechanical engineers, Richmond; R. E. Lee & Son, general contractor, Charlottesville; Wachter & Wolff Corp., heating and air conditioning contractor, Richmond.

Monticello, home of Thomas Jefferson, is one of America's most inspiring buildings. Recently restored to its original design, the famous mansion has been equipped with a modern system of Johnson Automatic Temperature and Humidity Control. The system is designed to *preserve* and *protect* the building and its many valuable contents, rather than for comfort alone.

The temperatures in each of six zones are controlled by Johnson T-315 Remote Readjustable Room Thermostats which regulate hot and cold deck dampers on the new central air conditioning system. These special purpose thermostats are conveniently reset from a central control point. During the heating season, they maintain each zone at a constant temperature of 72°F. In the cooling season, they vary the zone temperatures from 72° to 80°F. as the outdoor temperature rises from 70° to 95°F.

The Johnson Zone Thermostats are concealed inside the original fireplaces which, together with their flues, have been converted to air returns. No thermostats or grilles are visible to visitors. A master temperature control panel is located in the mechanical equipment room with the central air conditioning equipment.

Of special importance is the year 'round protection afforded by Johnson Humidostats which regulate the relative humidity in relation to the outdoor temperature. Relative humidity ranges from 20 per cent at 0°F. to 50 per cent at 72°F. or above.

The accuracy and flexibility of the *Monticello* installation are typical of Johnson Control Systems, because each one is specifically planned, made and installed by Johnson *to meet the exact needs of the individual control problem*. That is why you will find "Planned-for-the-Purpose" Johnson Control not only in the nation's outstanding buildings, but in public, commercial and industrial buildings of all types and sizes.

The nearly 70 years of experience of the nationwide Johnson organization is at your disposal without obligation. Next time you have a temperature control problem, call an engineer from a nearby branch office. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin. Direct Branch Offices in Principal Cities.

JOHNSON CONTROL

TEMPERATURE ↕ AIR CONDITIONING

MANUFACTURING • PLANNING • INSTALLING • SINCE 1885

(Continued from page 152)

September 1952 using this method, we were able to get for only $7.91 a square foot, which is also 71¢ a cubic foot.

Total cost of the project was $98,591.00 with cubical contents 137,396, and a floor area of 12,486 square feet.

We used our more recent refinement and development of our initial economy construction system, on a recent Oklahoma City school which we were able to get for $7.80 a square foot.

ROBERT W. VAHLBERG
Vahlberg, Palmer & Vahlberg
Oklahoma City, Okla.

P. S. This was Oklahoma City's most complete inexpensive school — according to the school Board's announcement.

architect's approval

Dear Editor: I am in the hospital with iritis, an infection of the right eye, and cannot read or write much; but appreciate the excellence of the work in the May issue of P/A and have so written Louis Kahn. The article (*on Yale Art Gallery and Design Center*) was extremely well illustrated and very well done in general. I am sure you must be proud of it.

PHILIP L. GOODWIN
New York, N.Y.

defining overhead*

Dear Mr. Spiegel: Your recent letter makes clear the difference between the figures you quote for "Overhead" (February 1954 P/A) and our own figures. We include in our "Indirect Expense" calculations that portion of partners' drawing accounts which is not allocated to work on specific jobs.

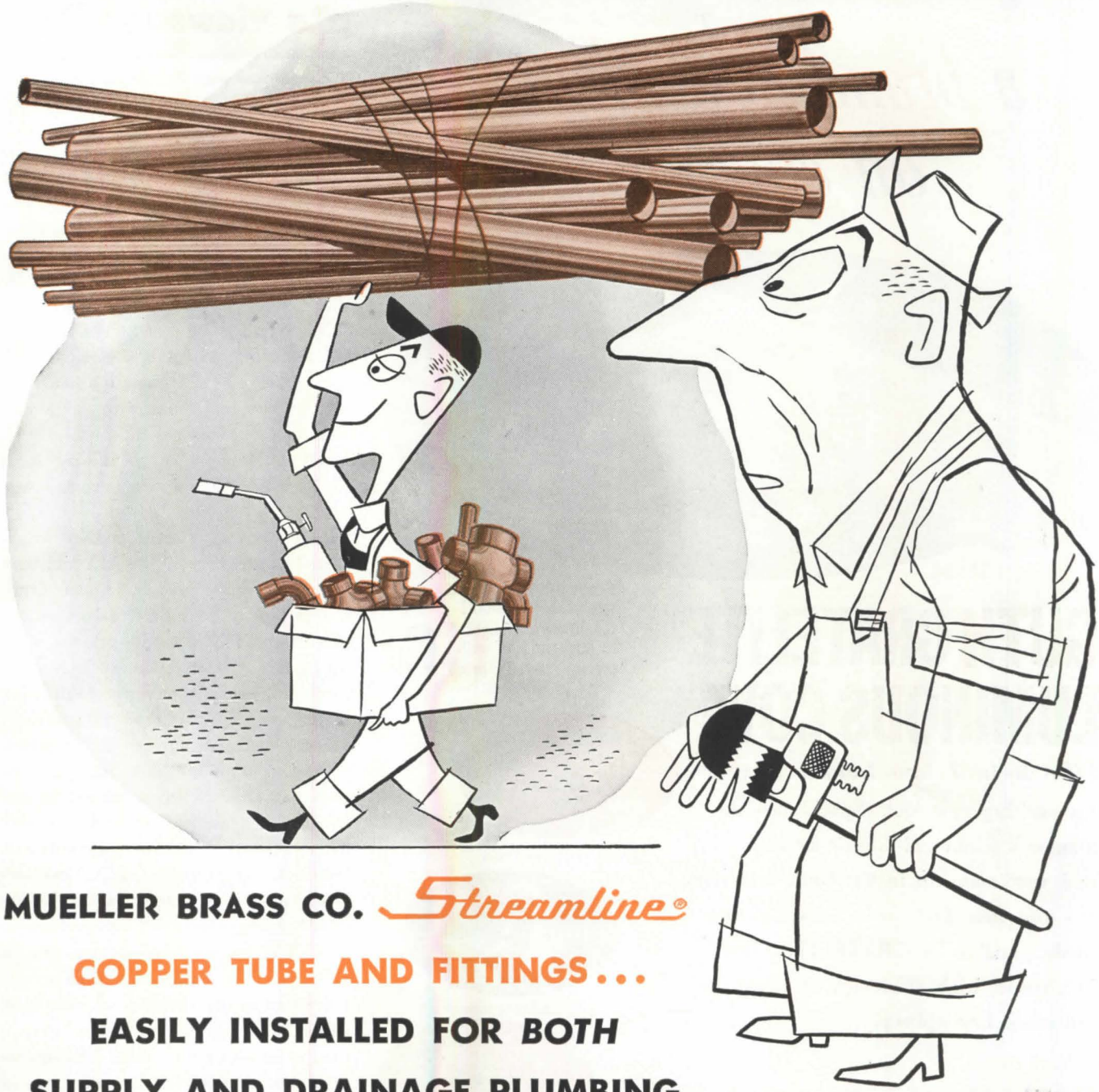
Our practice in this respect is in accordance with "Recommended Procedures and Practices—Part 1," Chapter 3, Page 1, of the manual *Standardized Accounting for Architects* issued by the AIA.

The Manual States: "*Salaries for Principals* should be established at amounts as nearly as possible representing what it would *cost* to employ someone to perform the services rendered by each principal. This is an orderly way to conduct the business and the only way to obtain proper job *costs.*"

This subject is mentioned again in Part 6, Chapter 29, Page 5 under the heading "Indirect Expense Accounts": "500 *Salaries, Principals.* Salaries, Principals are actually a partial distribution of profit rather than an expense. It is recommended, however, that definite salaries be established for the Principal(s) since the services rendered by the Principal(s) are a *cost* of doing business. See *Chapter* Three. Unless such salaries are established, an accurate statement of operations is not possible. This account is debited to Principal(s) and Cash in Bank credited from Column 2 of the Cash Journal."

(Continued on page 156)

** Continuation of correspondence printed in VIEWS of April 1954 P/A.*



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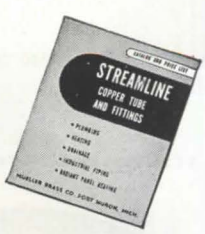
The plumber who knows the advantages of Streamline copper tube and fittings is the man to call in for supply and drainage plumbing in the houses you design and build. For Streamline copper plumbing makes an efficient, neat and attractive installation that stays tight and leakproof, rust-free, clog-free and completely dependable for years to come. Prospective home owners prefer it . . . even insist on it because they know that an all-copper system will give them trouble-free service and last as long as the house they buy.

When you install Streamline copper plumbing, you usually save enough on installation time and construction costs to offset the slight additional cost of the copper tube and fittings. And you have a finished home that is far more salable because of the copper installation.



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p/a views

(Continued from page 154)

The AIA Committee in charge of developing the Standard Accounting System gave this matter serious consideration, and it was established that unless Principals were paid a salary which was distributed properly to Direct and Indirect Expense Accounts, any accurate job accounting would be impossible.

I think that any published figures on the subject are of little value and may, in fact, do great damage to the profession unless established standards are adhered to. If we are not all talking about the same thing, our figures have no meaning.

As the system referred to above is accepted as standard by the AIA and is in wide use over the country by many firms, I urge that in your publications on the subject you adhere to the principles set up in that system. Unless this is done considerable confusion must result, due to the use of two different systems.

Some confusion on the subject arises, no doubt, from the fact that all compensation received by a partner in any business is regarded as taxable income by the Internal Revenue Department. However, for purposes of job cost accounting, a true picture cannot be obtained unless principals' time is charged. It should be entirely obvious that a principal who devotes his time to his profession in any capacity, whether it be design, drafting, administration, promotion, or anything else, must be compensated for his work in the same way in which an employe would be compensated if he were hired to this work. This compensation is part of the expense of practicing his profession, and unless this expense is properly recognized in the accounting method employed by his office, a realistic analysis of job costs is impossible.

A knowledge of job costs in many cases is vital to the architect. In negotiating fees with Government Agencies, in doing work on a cost plus or lump sum basis, in budgeting costs during the progress of a job in the office, in arriving at settlements for extra work done, or for jobs which are abandoned before being built, etc.

(Continued on page 158)

p/a views

(Continued from page 156)

It therefore seems to me to be of paramount importance to the profession as a whole that any publications on this subject be based on sound and standard accounting practice.

I would very much like to hear your views on this point, and would be glad to discuss the matter with you further, if you so desire.

JOSEPH H. ABEL
Berla & Abel
Washington, D.C.

•

Dear Mr. Abel: Thank you for your informative letter. Basically I concur with certain procedures recommended in the AIA system. When it first was published, our accountants and this office examined the system as to its adaptability to our own office. We found then that the system this office had used previously was simpler than the one proposed by the AIA and we therefore decided to continue to use it.

Specifically with regard to charges of principal's time: In numerous offices which I have queried, principals' drawings vary considerably and are in many instances not drawn upon regularly or evenly. This procedure, of course, only affects the partner's or individual principal's capital account. To translate whatever the proportion of the drawing account may be into the dollar value of "direct" expense for time spent on a job and at a senior employe's rate may therefore become rather unrealistic. However, in an article published in May 1954 P/A, I attempt to emphasize the importance of a principal's keeping a record of *time* on "Jobs." Our individual job accounts show among other items not only the salaries, but also the actual number of hours spent on a project (as well as the balanced average hourly rate per man). To the draftsmen's hours are added separately the number of principal's hours, which are taken from his diary. Any dollar substitution can then be made for the principal's time. This type of accounting, obviously, not only shows the actual expense incurred, but also can be and is frequently used as a guide for budgeting future jobs. (Since wages fluctuate from time to time, the number of hours represent a more accurate basis to which the prevalant rate is applied when used for budget reference.)

On certain jobs where a principal may bill for his time at a predetermined rate, it is quite obvious that the record kept by him will be more accurate than usual. On other major size, cost-plus-fee jobs, the principal's services more often than not are paid for by the "fee," and the reimbursal for "technical salaries" and "—% overhead," specifically limits the recognized overhead items roughly to the list I enumerated in my last letter to you.

While a principal will frequently

(Continued on page 160)

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p/a views

(Continued from page 158)

spend considerable time on "Indirect" items, e.g., contact potential clients, prepare proposals, and budgets, attend professional organizations' functions, etc., it seems unfair to burden the "Overhead" account with the proportion of his drawings for time so spent. To use actual figures of drawings may tend to overburden the overhead item, while an arbitrarily assumed figure which equals the salary payable to a senior employe, but which does not represent his actual drawings, will be of little value. Furthermore, if a principal's time were spent, using a drastic example, mostly for "indirect," but not always necessary, phases which would benefit his practice, the overhead account reflecting his rather high drawings would result in a highly distorted picture. I doubt whether it is feasible to establish a ratio of a principal's indirect time as one can at least do relatively accurately for the technical staff.

I believe that a principal's knowledge of his accurate costs to do a job, and knowing the number of *his hours* spent (should he in the future have to use an employe instead) in addition to the hours of his men, plus the percentage of relatively constant overhead which excludes his indirect time, will give him a better picture of his costs for budget purposes, than were he to include a constantly flexible amount for his indirect time. Compensation for his own "indirect" time—and profit beyond that—he can easily estimate when he prepares a budget for a proposed job.

I had discussed this intricate problem with many other offices and found them to concur with the above.

Permit me to state that I am grateful indeed for your most valid critique. A discussion on subjects such as this certainly is helpful. SIEGMUND SPIEGEL

notice

OUT OF SCHOOL, regular column written by CARL FEISS, was omitted from this issue but will be resumed next month.

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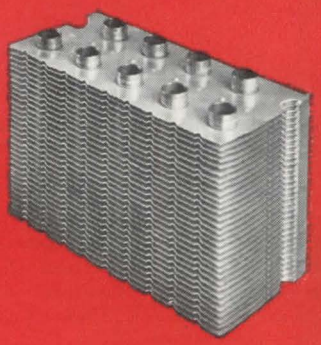

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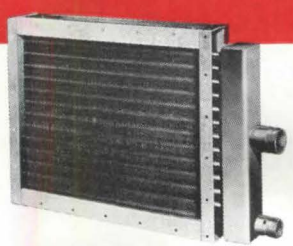

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books received

An American Synagogue for Today and Tomorrow. Peter Blake, Editor. Union of American Hebrew Congregations, New York, N. Y., 1954. 312 pp., illus., $10

The Volume of Residential Construction, 1889-1950. David M. Blank. National Bureau of Economic Research, 1819 Broadway, New York 23, N.Y., 1954. 99 pp., $1.50

Roofs for the Family. Eva Burmeister. Columbia University Press, 2960 Broadway, New York 27, N. Y., 1954. 203 pp., illus., $3.25

Yearbook of the American Society of Sanitary Engineering, 1953. Vol. 31. American Society of Sanitary Engineering, 1302 Ontario St., Cleveland 13, Ohio, 1954. 440 pp., illus.

Design for Modern Merchandising. By the Editors of *Architectural Record*. *Architectural Record*, 119 W. 40 St., New York 18, N. Y., 1954. 247 pp., illus., $8.95

Residual Stresses in Metals and Metal Construction. Edited by W. R. Osgood. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y., 1954. 363 pp., illus., $10

The Community Builders Handbook. Prepared by the Community Builders' Council of the Urban Land Institute. Urban Land Institute. 1737 K Street, N.W., Washington 6, D. C., 1954. 314 pp., illus., $12

Vanity and Value. Francesco Memoli. Exposition Press, 386 Fourth Ave., New York 16, N. Y., 1954. 502 pp., $5

the family at home

The House and the Art of its Design.

Robert Woods Kennedy. Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y., 1953. 550 pp., illus., $9

Taken all in all, Robert Woods Kennedy has enriched architectural literature by an extraordinarily interesting piece of work. What he has tackled is the study of residential design from the psychological point of view and in the framework of contemporary social customs. Moreover, like Christopher Tunnard's recent *The City of Man*, this book presents its arguments with illustrations—in words as well as in pictures—displaying that wide range of reference and example which characterizes the well-grounded scholar and the cultivated man of the world. So rare has this quality become in books in the architectural field of late that one can overlook a few personal reactions to life and living which make some of the author's conclusions too uniquely individualized for general application by the architect, even for a highly sophisticated clientele.

The heart of the book boils down to the private opinions of an unusually gifted individual—who just happens to be an architect—on the subject of relationships between members of a family group and the interaction between the

(Continued on page 166)

● Under the roof of an ultra-modern newspaper plant, the famous Baltimore Sunpapers are written, edited, and set in type by the light of 3,000 Day-Brite parabolic troffers.

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● This is an out-of-the-ordinary lighting installation, one that merits your attention because it may suggest a similar treatment for your projects.

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'EEL THE DIFFERENCE . . . BEFORE YOU SPECIFY

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reviews

(Continued from page 162)

household and outsiders, as these affect and are affected by the design of the house. Kennedy's research into the importance of privacy, for example, and the frequency and significance of contacts between the various generations, servants, and guests using a house, contains much new and well-thought-out material. It should give every architect who is seriously concerned with designing a house to fit a human situation cause to stop and think through, to new conclusions, how the *spaces* and *dividers* in a modern home should be laid out. Kennedy's often novel and always wholesome and logical concepts of the use of the various areas and openings customarily associated with residential construction seem valid and worth testing by others. That lucky part of the building public which can afford to ignore the stifling and mediocre conventions imposed by the real estate market, the mortgage broker, the rigid building code and, in many cases, the manners and mores of the average community, could especially benefit by the application of many of Kennedy's precepts.

For all Kennedy's breadth of scholarship and depth of thinking, his seems a strangely limited point of view in at least one important respect. For, to assume that a client can ignore both economic and social considerations, may be all well and good. But no matter how free he may be of budgetary worries or of conventional habits, his home, unless it is on an island or a remote mountain top, is inevitably part of some community. And, while Kennedy discusses the community—and even the neighborhood—in relation to the proper choice of site, location and situation *for the house*, the vice versa of this proposition is missing. His chapter on Environment, for example, gives no thought to the relation of the house and its occupants *to the community* of which even the most affluent sophisticate necessarily is a member.

Like the novels of Thomas Wolfe, Kennedy's book is prodigious and undisciplined. It is bursting with ideas—enough to make a dozen books—and it also con-

(Continued on page 172)

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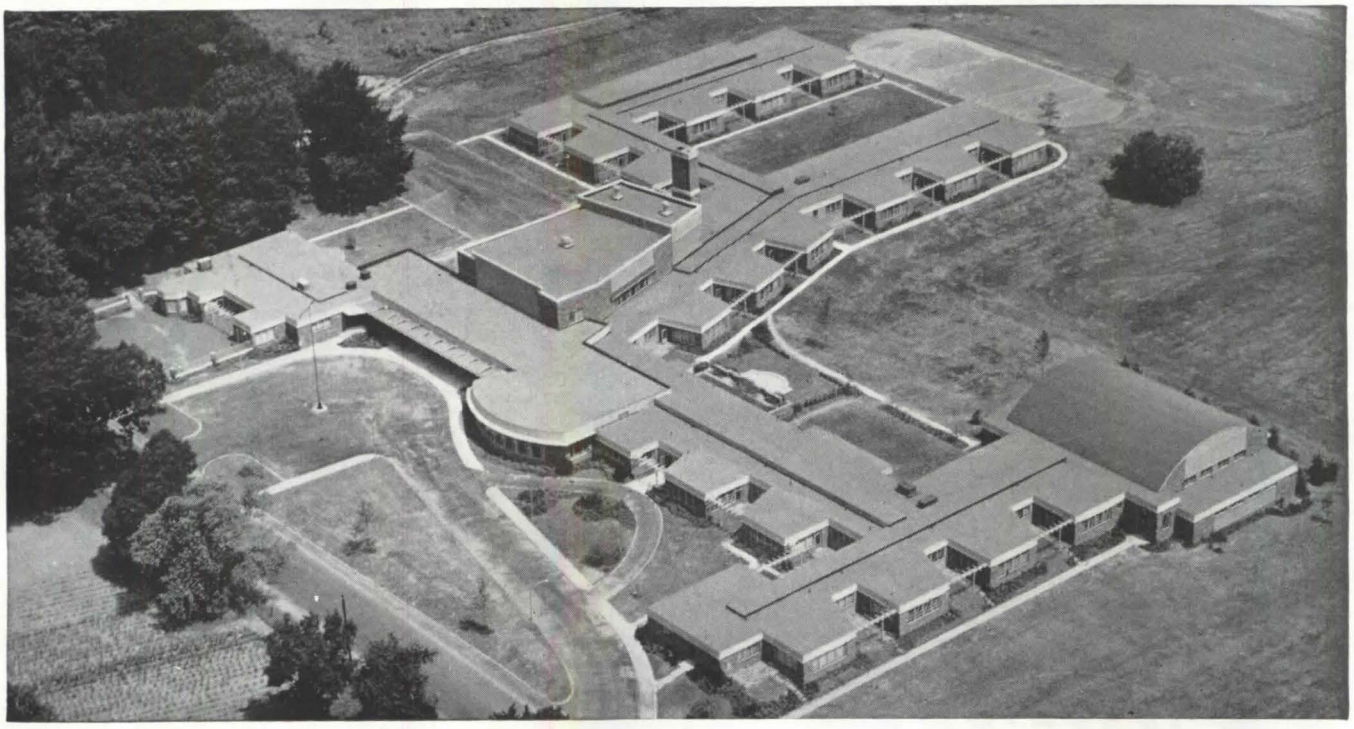

Penn Valley School, Penn Valley, Pa. Architect: Carcher & Smith—Philadelphia. General Contractor: C. S. Rohleder—Philadelphia. Roofer: W. C. Kulzer Company—Philadelphia.

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1½	.17
1¾	.15
2	.13

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(Continued from page 166)

tains a great deal of superfluous matter and repetition that could just as well have been left out. Undoubtedly this is as much the fault of editing as it is of writing. Editing could have simplified a great deal of its obscure and turgid prose. Cut down to manageable proportions and whipped into more presentable shape, it might have been a remarkably helpful handbook on the planning of modern homes for what *Harper's* and *Life* once called the "upper-middle-high-brow" set.

If a good handbook on individually designed upper-class houses could have filled a well-edited and well-organized book all by itself, we have here the raw material for several other volumes, each on a number of interesting subjects. For example, one chapter provides an excellent, analytic review of the history of domestic architecture in the United States, a topic which has seldom been approached from the point of view of the contemporary designer. Another treats of architectural symbolism, as seen in designs provocatively selected from all periods—classical, renaissance and modern—with remarkable imagination. Still another discusses architecture in terms of the psychological analysis of human behavior patterns, something that obviously has a bearing on the expensive private home, but is just as important to consider in all types of residential architecture at whatever income level. This subject, too, considered as carefully and in the detail to which Kennedy explores it, could well have merited—and still could be made into—a separate book.

The book has a number of minor shortcomings which are unfortunate in what is, on the whole, so fine a contribution to architectural thinking. Perhaps some of these may be taken care of in a future edition. For example, the illustrations, while original and striking, have been scattered through the text in a curiously disorderly way, as to size, scale, and manner of reproduction. If this was intentional, so much the worse, for it tends to be confusing and distracting rather than illuminating. The frequent absence of captions, too, is irritating to a reader who may not always perceive the bearing of the plans and pictures on Kennedy's argument in the way he intended them to "count." The insertion in the text of quotations, like the illustrations, is so done that it is difficult to check on their source or easily to follow their intended context.

There have been some well-justified strictures uttered of late, by critics of architectural writing and teaching, on a tendency towards superficiality and the purely topical approach—the lack of depth, in other words, apparent in the treatment of architectural subjects in books and periodicals appearing these days. No one can accuse Kennedy of not going deep enough into his subject. If anything, he has dived so deeply into the sea of psychology that he seems to

(Continued on page 174)

THE ROOF of the new Walnut Grove School, West Mifflin Borough, Allegheny County, Pa., is USS Stainless Steel. Architects: Button and McLean, Pittsburgh, Pa. Contractor: Nicholas LeDonne, Clairton, Pa. Roofing contractor: Limbach Company, Pittsburgh.

New Walnut Grove School has a maintenance-free roof of Stainless Steel

● The school board of West Mifflin Borough, Allegheny County, Pennsylvania, took care of roof maintenance almost permanently when the new Walnut Grove School was built. They did it by specifying a roof of long-lasting USS Stainless Steel.

The roof is approximately 385 feet long and 75 feet wide. The Stainless Steel roofing panels have a satin-type architectural finish. They are of 26-gage material fabricated into a standing seam panel 27⅜″ wide by 12 feet long.

Stainless Steel's superior corrosion resistance, combined with its almost complete freedom from maintenance, fits it for years and years of satisfactory service. It has excellent reflective properties, and features needed strength with light weight.

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Stainless Steel is finding wide favor with school architects, not only for roofing, but for exterior walls as well, when used in the form of insulated panels. Of course, its wonderful possibilities for interior trim are also being used to advantage.

If you have a new school in the planning stage, now is the time to think in terms of Stainless Steel and its many benefits. And think in terms of perfected, service-tested USS Stainless Steel. For more information, mail the coupon below. If you like, we will be pleased to have one of our representatives call.

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UNITED STATES STEEL

reviews

(Continued from page 172)

have gotten lost in the lush submarine foliage and is somewhat bewildered when, occasionally, he comes up for air to get his bearings. ROBERT C. WEINBERG

building a castle

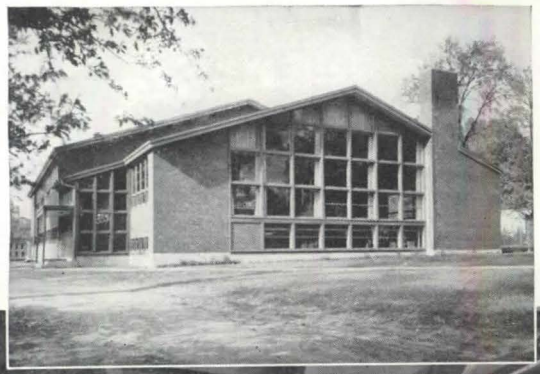
The Castles of Great Britain. *Sidney Toy. The British Book Centre, Inc., New York, N. Y., 1953. 276 pp., illus., $5.50*

Readers who yearn for a castle of their own as well as readers with more modest aspirations may acquire much interesting information about many of the best of Great Britain's castles — from Roman times to the period when fortified homes were supplanted by practically undefended mansions. In this collection, the author has assembled plans and structural details of a large number of castles and fortresses. Toy, who has already written an earlier history of fortifications, has brought to his work an evident enthusiasm for his subject.

Nearly 100 castles and fortifications are described in considerable detail, accompanied by photographs and plans. The descriptions of these castles show the author's great interest in the military features, including the selection of the site, the mode of construction, the arrangements for defense, and the special features which enabled them to withstand prolonged sieges. Few of these castles could have been comfortable living quarters for they were, of course, dark, damp, cold, and crowded. The interesting historical details supplied by the author indicate, however, that many of them were occupied for many hundreds of years and by their strength and position successfully dominated large surrounding areas.

The competition between the offense and defense is well illustrated by the author in his descriptions of the development of the powerful siege engines of the Middle Ages and the architectural features which were developed to strengthen the resistance of fortifications to these attacks. In a separate chapter the weapons and techniques used in be-

(Continued on page 180)



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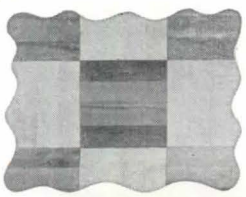

Cost is surprisingly low for the ultimate in luxury flooring—in blocks and modern patterned designs as well as the more conventional strip form. Readily laid in mastic, over concrete or softwood sub-flooring.

• The air of hospitality that beckons the townspeople of Houlton into their new Community House is repeated with cordial emphasis within. The warm, "foot-friendly" comfort of resilient, Northern Hard Maple Flooring extends its own invitation. Activities room, dance lounge and gymnasium-auditorium—all are maple-floored, for enduring, low-cost "housekeeping" and maintenance. We believe you'll agree, the building's low $7.75 unit cost ($123,750 for its 10,000 square feet) bespeaks to some degree the economy of "the finest floor that grows." Write for latest literature, or consult Sweet's (Arch. 12K-MA).

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BEECH AND BIRCH

reviews

(Continued from page 174)

sieging a castle are described, together with details of actual siege operations.

The reader will find in this book many examples which illustrate that many basic principles of military art have remained the same throughout the ages. In his invasion of England, for example, William the Conqueror had prepared a prefab timber fort which was completely assembled in France, then dismantled and taken on board the ships of the invasion fleet. In England it was re-erected and readied for defense by the evening of the day the fleet arrived.

Because of its arrangement, the book is almost equally rewarding whether read from cover to cover or browsed through and read at random, a chapter at a time.

VAN CLEAF BACHMAN

sincere and human

The Northwest Architecture of Pietro Belluschi. *Edited by Jo Stubblebine. An* Architectural Record *Book. F. W. Dodge Corp. 119 W. 40 St., New York 18, N. Y., 1953. 100 pp., illus., $6.50*

In a world of "isms"; in the architectural world where extremist tyros vie for place; at a time when show and ersatz, the easy slogan and the short cut, exert so strong an influence on our lives, it is, in this reviewer's opinion, reassuring and heart-warming to find a talented architect creating work of excellence that is sincere, humble, and human in both character and scale. That Pietro Belluschi left Portland, Oregon, in and near which so much of his work has been built, to come East and assume the duties of Dean of M.I.T.'s School of Architecture and Planning, is the Northwest's loss and the architectural student's gain. Tomorrow's architecture is bound to be the better for it.

Born in 1899 of middle-class parents in Ancona, Italy, Belluschi testifies that rebellion against this environment gave him a stronger motivation for artistic expression even than the pervading beauty of Rome. "My desire was to differ, not to emulate," he says. Coming

(Continued on page 184)

Tests like these insure the quality of Kentile asphalt tile

A.I.A. 23-G

Because of scientific tests like these, every tile shipped has precision-straight edges and true right-angle corners. That means installation ease and economy. Further, Kentile's manufacturing techniques and tested ingredients mean that every tile is tougher, more durable, easier to clean...with lasting brilliance of color and uniformity of marbleization. But, get full details when you consult the Kentile Flooring Contractor. He's listed under FLOORS in the Classified Telephone Directory.

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THICKNESSES: Kentile is available in two gauges: 1/8" for residential and most commercial uses—3/16" for industrial use and where extra-heavy duty flooring is needed.

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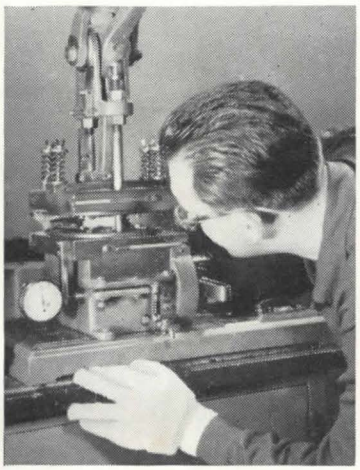
KENTILE: D Colors	35¢	40¢
SPECIAL KENTILE	40¢	50¢

These costs are based on a minimum area of 1,000 sq. ft. over concrete. Color groupings range from Group "A," the darkest solid colors... to Group "D," the lightest marbleized colors. Special Kentile is available in Regular and DeLuxe Colors.



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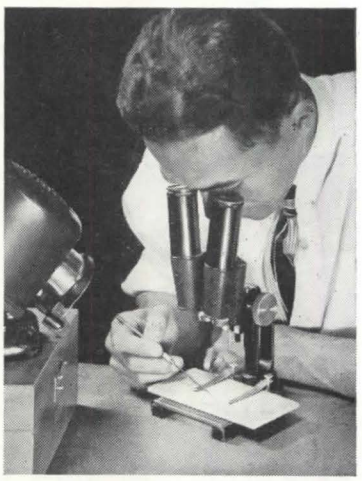

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reviews

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to this country in 1923 on an exchange graduate student scholarship, he migrated to Portland two years later, joined the established firm of A. E. Doyle, became its head designer, and eventually acquired the firm and, in 1943, changed it to his own name.

Belluschi's own directness and sincerity found architectural focus and a rich source of inspiration in the simplicity and honesty of native structures such as the sturdy barns of the region. And it was not long before a whole succession of distinguished buildings — houses, churches, a museum—emerged from the Doyle-Belluschi office. In later commercial structures, the logical, unassuming approach that one had learned to associate with Belluschi's design continued to be evident. And in the sparkling Equitable Building in downtown Portland, he produced perhaps the neatest integrated-design expression of skeleton frame, concrete floor slab, and curtain wall yet to appear.

The book is made up of transcripts of various speeches that Belluschi has given over the years—and illustrations of and descriptions of many of his more interesting commissions.

His dedication and optimism, which are happily wed to a practical business mind, are reflected in statements in his writing: "I believe a better environment for a happier mankind is in the making. It is a task to excite the imagination. . ." Speaking of the architect, "unless he is above all a man of vision and an expert in the field of visual and spatial relationship; unless he is able to give form and order to space; in brief, unless he is a creative and understanding artist, he will not fulfill the peculiar role society expects of him . . . Each one of us needs the power of poetic expressions which he may use without compromising practical dictates; he must strive for formal order and proportion without being dominated by its formulas; he must understand the pervading power of technology without forgetting the primacy of the human soul and its thirst for sensuous variety; he must create with humility and discipline

(Continued on page 186)

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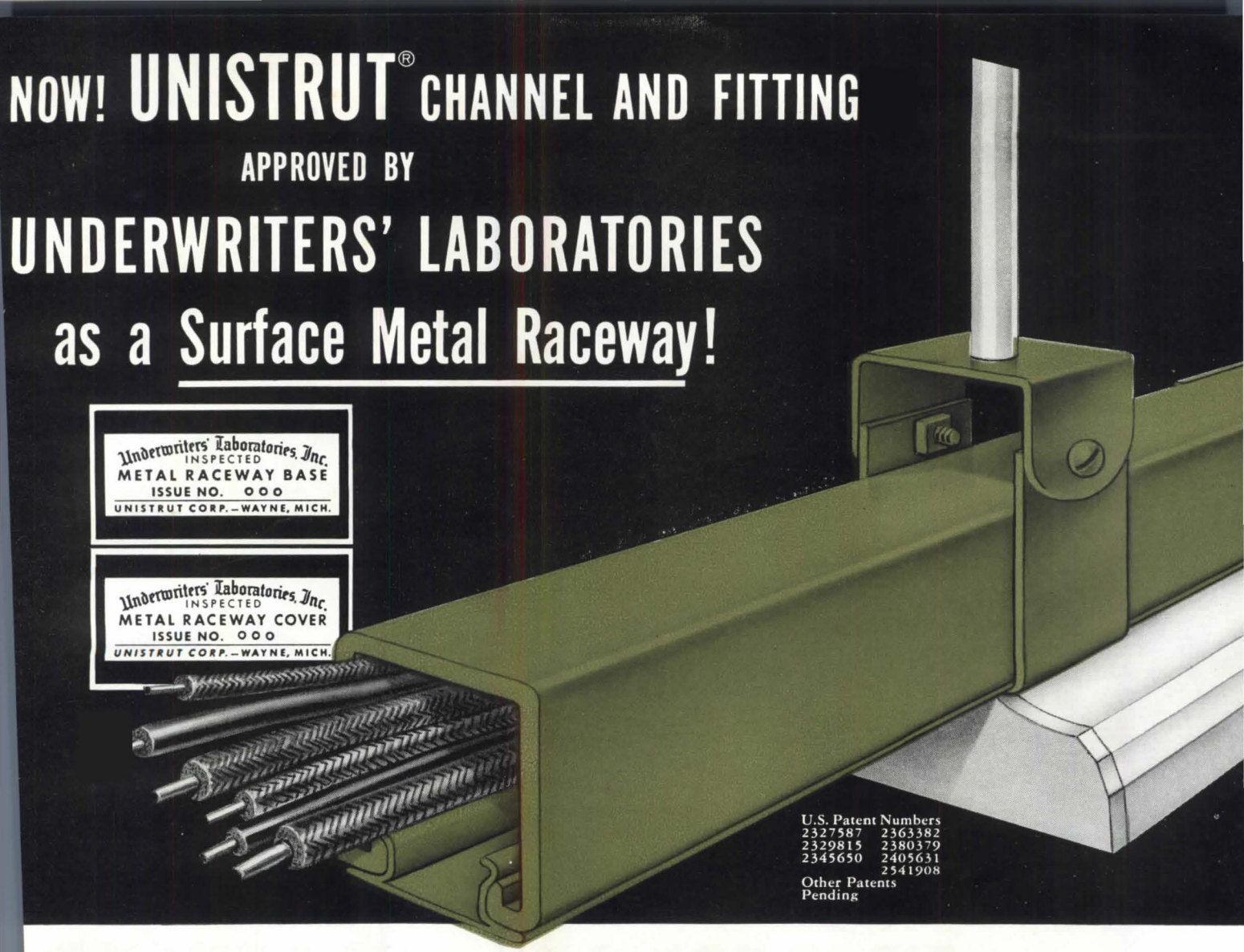

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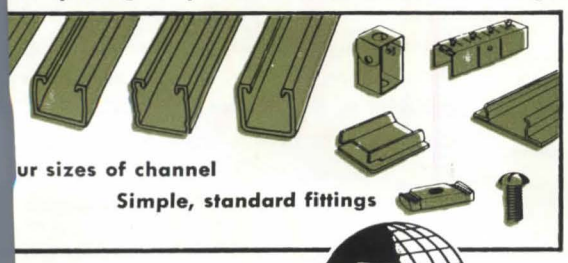

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reviews

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from what lives around him, look with awareness upon the 'great American scene,' and with sympathy and even love upon its people, believing that it falls on each one of us to work for their advancement and for the enjoyment and fulfillment of their lives . . . Beauty is yet our greatest motivating ideal, and the search for it our greatest source of strength."

For like-minded persons,* this is an inspiring book, as well as a long-deserved compilation of some of the best work of one of our best architects.

**Frankly, this reviewer has procrastinated about discussing this book for a long, long time. Not because he does not admire Pietro Belluschi and the architecture for which he is responsible. Quite the opposite! He admits to so strong a bias in favor of both the man and his work that he has felt—and still feels—unable to be wholly objective about either. Well, so be it.* GEORGE A. SANDERSON

unified discussion

Statics and Strength of Materials. *Roland H. Trathen. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 1954. 506 pp., illus. $7.50*

This is a carefully written text on a fundamental science, prepared by an Engineer and Professor with extensive practical and teaching experience. Its coverage is similar to existing books but it differs from them in that topics in statics and in strength of materials have been unified and are taught concurrently, rather than being presented as separate and individual subjects.

The book does not endeavor to eliminate or simplify the mathematics attendant to the subject but, rather, Trathen has made a point of stressing the proper balance between physical thinking and mathematical thinking. He contends that the science of mechanics has been brought to its present state by a judicious mixture of the two ways of thinking.

The text is intended for the engineer-

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The STATLER PEOPLE

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reviews

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ing student and should form an excellent base for later and more advanced studies in structural analysis and design. It is freely illustrated and includes an abundance of interesting problems.

Trathen is Professor of Mechanics at Rensselaer Polytechnic Institute.

DONALD G. RADWAY

the tool and the myth

The Modulor. *Le Corbusier. Translation Peter de Francia and Anna Bostock. Second Edition.* Printed in Great Britain. Distributed by Harvard University Press, Cambridge, Mass., 1954. 243 pp., illus. $5*

Bertrand Russell once said that "what is most remarkable in modern science is its return to Pythagoricism." It is even more remarkable that the Sage of Samos has dominated Western art from the time of the Crotoniatic State to the present day without any noticeable interruptions. The number-idea, the one as the same and the two as the other; analogy, as the equality of two ratios; rhythm, as perceived periodicity; and harmony, as the unity of the multiple, have shaped Western art — transcending religious faiths, political forms, a variegated geography, and time itself. From Vitruvius to Seurat and from Plato to Valery there is an amazing continuity. Since Orpheus gave ground to Apollo, automatic, intuitive, or irrational approaches to art—as well as reasoned, calculated processes—have been supported by a framework of mathematical order.

It is true that in architecture, since the middle of the last century when schools teaching this art were well established, a separation from the Pythagorean doctrines was beginning to take place. It was the time of the great practical men, of Saint-Simon and his many followers. The concept of architecture as the automatic result of compiled data was probably due to a mechanistic interpretation of the dialectics function-form: but the fact that the student architect was facing a number of seemingly unre-

* *First edition in French.* L'Architecture d'Aujourd'hui *Paris, 1950.*

lated disciplines must have contributed also toward the exclusion of a basic structure from his work.

If the separation of architecture from the Pythagorean doctrines became general, it was far from being total. Le Corbusier, an exponent of the "Cartesian spirit," often produced, like Palladio, the mathematics of a villa. However, Le Corbusier must have found from experience that the workings of symmetry,[1] that is to say the relationship of the whole to its parts, was perhaps less suitable to the complexities of modern life to which architecture has to respond. After many years of trials and errors, he has presented the Modulor as an answer.

Modulor is an humble road to symmetry, leading from the parts to the whole. A mere assembly of numerical values, the Modulor, like a succession of stones in a masonry wall, should eventually help the user to produce in his work the chain of characteristic ratios linked by a common multiple, which is symmetry. The late Henry William Roberts of Ipswich, architect and lecturer, developed the "set triangles" as an aid to symmetrical design; there is one among them, a right-angle triangle, the two sides of which are *Phi* ratio. Dr. Funk-Hellet offers the *Phi* compass (a reduction divider set at *Phi*) and the TCD Triangle (Triangle containing the Co-ordinates of the Decagon) the angles of which are 90, 54, and 36 degrees. The TCD triangle facilitates pentagonal formations but all the above aids controlling the parts by the whole are not especially suitable to an additive method. It is safe to say that if there were to be a broad application of the Modulor in the future this should be attributed to its elemental character: it is the tool for an additive process to symmetry, a process itself quite novel in the history of architectural design.

The basic shape of Modulor is the square which, with the triangle and the hexagon, is the pattern of formation of inanimate matter (particularly of crys-

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[1] *Commodulatio or Concinnitas, at the time of Renaissance.*

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tals, such as table salt). By numbering the sides of the square—1, 2, 3, 4—we have the basic Pythagorean numbers adding up to 10, the Tetractis.

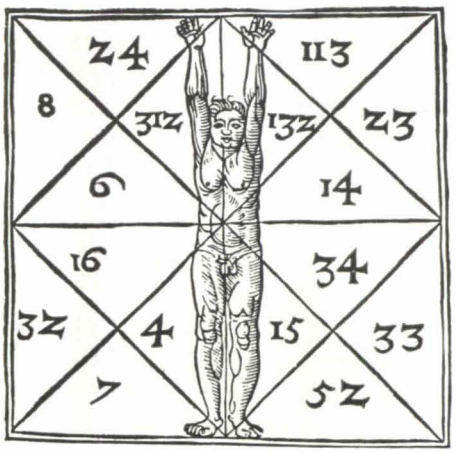
The basic ratio of Modulor is *Phi*, thus producing a link with the pentagonal formations of animate matter and the patterns of growth.

The basic numerical value of Modulor is the height of man, set at six feet, relating an abstract geometrical scheme to the human dimensions.

The only angle of Modulor is the right angle. The "ideal" angle of Church—220 degrees, 29 minutes and 32 seconds—is absent.

From the formula *a* plus *a* over *Phi* equals 72″, and *2a* minus *2a* over *Phi* equals 33.992″ (*a* being the side of the square); two *Phi* progressions are developed tending toward zero and toward infinity, approaching asymptotically the Fibonnaci series.[2] The first progression is called by the author, *red;* the second, *blue*. The terms of both progressions as co-ordinated form a *red* grid and a *blue* grid, which are offered to the designer as a spatial vocabulary.

But Le Corbusier undoubtedly knows that the usefulness of a tool does not warrant its universal acceptance. A myth is the safest entrance to history, so a large part of this book is a skillful attempt to create the necessary mystique upon which the future usage or abandonment of Modulor will depend. A number of pages form a frenzied log carrying the reader through time and over three continents. Dramatis personae make their appearance—from Kaiser of the Liberty ships and Wachsmann of the General Panel, Einstein and J. L. Sert, to more humble researchers like Hanning and Taton. Contradictions, if not plain rebuttals, are purposely maintained, such as on pages 179 and 180. The gap between metric system and foot-inch measurements is emphasized, with the Modulor presented as the logical link between the two. It is also significant that the first public appearance of Modulor took place in New York the spring of 1947 at the annual



meeting of the American Institute of Decorators, instead of the more quiet grounds of the *Quai Voltaire*.

In our present agonizing reappraisal of the realities of our planet, Modulor may fail to attract all the attention which it deserves. But the seeds for a future renaissance are here, this reunion of the practical and sublime. STAMO PAPADAKI

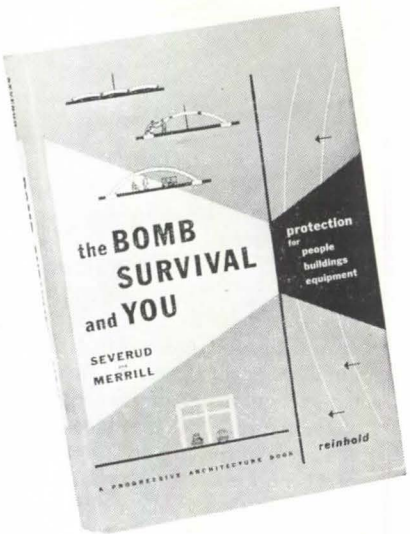
[2] *The tenth Pythagorean series of proportion, 3,5,8,13, etc., rediscovered by Leonardo of Pisa in 1022.*

notices

HILLYARD CHEMICAL COMPANY, Floor Treatment Manufacturers in St. Joseph, Mo., announce that the Eastern and Western Sales Divisions have opened new plant facilities in Passaic, N.J., and San Jose, Calif. Now in full operation, the new buildings are providing more direct facilities for distribution of Hillyard products and floor service in important east coast and west coast trade areas.

consolidation announced

Consolidation of sales and executive departments of the JANITROL DIVISIONS of SURFACE COMBUSTION CORP., with manufacturing and engineering units in Columbus, Ohio, has been announced by FRANK H. ADAMS, President. Executive, sales, advertising, and sales promotion activities will be located in the Columbus offices, after April 1, at 400 Dublin Ave. The Janitrol Heating and Air Conditioning Division manufactures residential, commercial, and industrial space heating and cooling equipment. ROBIN A. BELL has been appointed General Manager of Janitrol Divisions.



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The Bomb, Survival and You clarifies many points that have been obscure (especially to the architect) about the bomb-versus-building enigma. Known materials and accepted methods are applied to the new problems of instantaneous overloads of tremendous but brief force, thus emphasizing the concept of dynamic design as compared with older methods of analyzing buildings for static loads. And many basic treatments, several of which are entirely novel, are suggested.

Expertly written in a refreshing, conversational style, this book is literally crammed with practical "how-to" technical advice. Sixteen pages of photographs (only recently removed from the classified list and published here for the first time anywhere!), plus 31 line drawings, graphically illustrate the design problems involved.

Every architect should have this important new book, and it is a positive "must" for those who are presently designing schools, churches, stores, theaters, auditoriums, industrial structures, apartment houses and other buildings in which many people will gather, work or live.

256 pages **6″ x 9″** **$5.95**

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P.S.

Some of you may recall that a few months ago I commented on Ernie Kump's claim to literary endeavor, and published on this page a simianesque photo alleged to have been snapped in Switzerland, where my good architectural philosopher friend is resting, jotting down profound thoughts on architectonics. The magazine has found its way to those distant retreats, and I have an appreciative note from Monsieur Kump. With the thought that his many friends may want news of his new triumphs, here it is:

28 May 1954, Switzerland

Dear Tom: When one has the good fortune to become a prima donna—or as the French say, an "etoile"—overnight, seldom if ever is the proper credit given to that which caused it to be. However, little perhaps do you realize the tremendous powers of destiny at your command in molding the life of an anonymous architect struggling for a place in the sun. I refer to your recent reference to my literary activities in Europe in PROGRESSIVE ARCHITECTURE. To be more specific, for the benefit of those who read the opened mail on your desk—Phil Hubbard, for example,—it is on page 238 of May 1954 P/A.

Of course, in addition, to have the further good fortune of having a recent photograph of myself at work accompanying the article is nothing less than fabulous (the lifetime dream of any architect). I guess that there is really nothing left now except an exclusive issue covering my personal philosophy on architecture, hitherto unpublished works, and an intimate glimpse into the techniques that I use inside and outside of the office (the real secret of any man's success).

With no further ado, let me tell you of a few of the reactions that have been stirred up. I have been offered a contract for an immediate appearance on television. Hollywood has asked for the exclusive on my book as a sequel to *The Fountainhead* if I would name names. They suggested as a title, *The Knucklehead*. After seeing the picture of me a large drug manufacturer has asked if I would endorse their new male sex hormone tablets, and a large whiskey manufacturer has offered to publish the picture nationally as a man of distinction, if I would substitute a highball glass for the typewriter. I am really a little puzzled though, Tom, as to whether the last two offers would be in good taste, and as to what the AIA would say. I will cherish your advice as to what would be proper.

Concerning my experience, Tom, don't you think that it would be of untold benefit to thousands of architects if your magazine would include a service giving advice on confidential questions submitted by architects covering moral and ethical stiuations that they have gotten themselves into and would like to confide in someone for a bit of fatherly advice? You know, such as is run in the various newspapers for confused souls. For, after all, there is really more to architecture than merely cold technique. There are also human problems, such as cutting the fee to get a job (to save a client from hiring an architect whose work is eclectic and who lacks a progressive philosophy), or to associate with an architect whose work one does not respect (in order to establish a reputation), and many others that I could cite.

Well, Tom, after much anguish, both mental and moral, I came to the conclusion, that in view of the great turn of events with respect to my personal future as the result of your article, there was little else that I could do than to give credit where credit is due. And knowing of your great personal magnanimity, if I were confronting you now I can just hear what your response would be: "Oh, Ernie, it was nothing r-e-a-l-l-y, nothing at all!"

Believe me, in all sincerity,
ERNEST J. KUMP, Architect
AIA, AB, M. Arch., FRSA
Author, Consultant, RSVP

•

Well, I've missed the first AIA Convention in many years; spending the time usually passed in open meetings and smoke-filled rooms looking at the view north along the East River from a comfortable room in New York Hospital. Nurses instead of delegates, fruit juice replacing the highballs, the endless drone of McCarthy and Welch on the bedside radio instead of the gossip of good friends from all parts of the country. It was frustrating and disappointing, but word during the week from visitors to the P/A Suite kept me pleasantly, if inaccurately, in touch with what was going on in Boston. To those who wrote, wired, and called, my heartfelt thanks!

Since I've been home (doing a very occasional job of work for the magazine) I've had a wonderful illustration of the subjectivity of reporting. People passing through New York on their way home from Boston have told us about the Convention, and the reports have ranged from "the best one ever" to "a complete waste of time." I don't know what to think, and I realize now that my own past reports must have been completely at variance with many of their own reactions. Whether such a meeting is a success or not, to any individual, must depend on (a) one's frame of mind to begin with, (b) the number of old friends one meets during the week, (c) which particular meetings or seminars one attends, and (d) whether the candidates one favors are elected.

•

I understand that *Architectural Forum* is drawing solace from a report, on which I commented on this page some months ago, on reading habits of architects. I spoke of P/A by name in that column, and identified two other publications simply as Magazine A and Magazine B. Magazine A, I reported, drew a certain support from the profession because of its interest in business and finance. The *Forum* is proclaiming happily that it is Magazine A.

Perhaps so. As far as I am concerned, I am pleased by any indication that the professional magazines serving architecture have recognizable, distinctive characters of their own. If it is solace to one that it has become the big-business mazazine, it is to me also. Because that same survey indicated that P/A is recognized as the magazine concerned with the architect's business — design, materials and methods of construction, detailing, office practice, legal problems, public relations, specification writing, architectural education, and so on. Fair enough! But what emphasis does that leave Magazine B? Ah well, that's not my problem.

•

Speaking of interest in the business of architecture, I am most touched and honored at having been made the first honorary member of the Construction Specifications Institute. This fairly young organization has grown tremendously in recent years—in membership, in prestige, in number of chapters, in activities. It is a live group, with an active, hard-working membership—a great contrast to some of the old-line professional organizations which seem unsure of their purpose and vague as to their future. Those of you architects who are concerned with improved writing of specifications would do well to investigate CSI, read its excellent publication, and support its aims. I am happy and proud to have the beautifully designed, hand-lettered parchment which signifies my honorary membership.

•

I think that this will be a short postscript this month. Odd thing — I had always supposed that a period of enforced idling would induce all sorts of deep thoughts about architecture and architectural journalism. I find the reverse is true. Activity and contacts seem to breed ideas and spark what inspiration is ignitable. Lying on my back seems—for me—to result in mental lethargy. At least I've caught up on nonarchitectural reading matter. The current crop, it seems to me, is just about like current architecture—an occasional exciting high spot, the general level—well, let's say, *competent*. Be with you next month, in a more optimistic mood.

Thomas H. Creighton