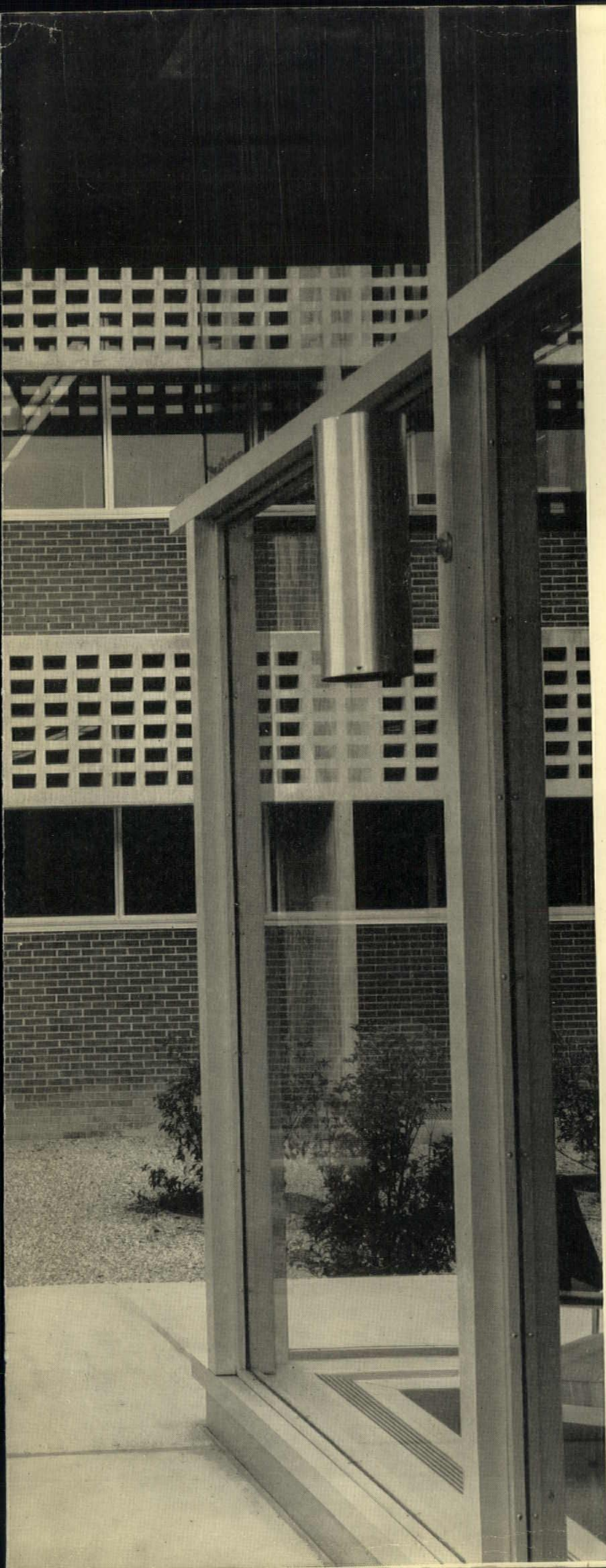


ARCHITECTURAL RECORD

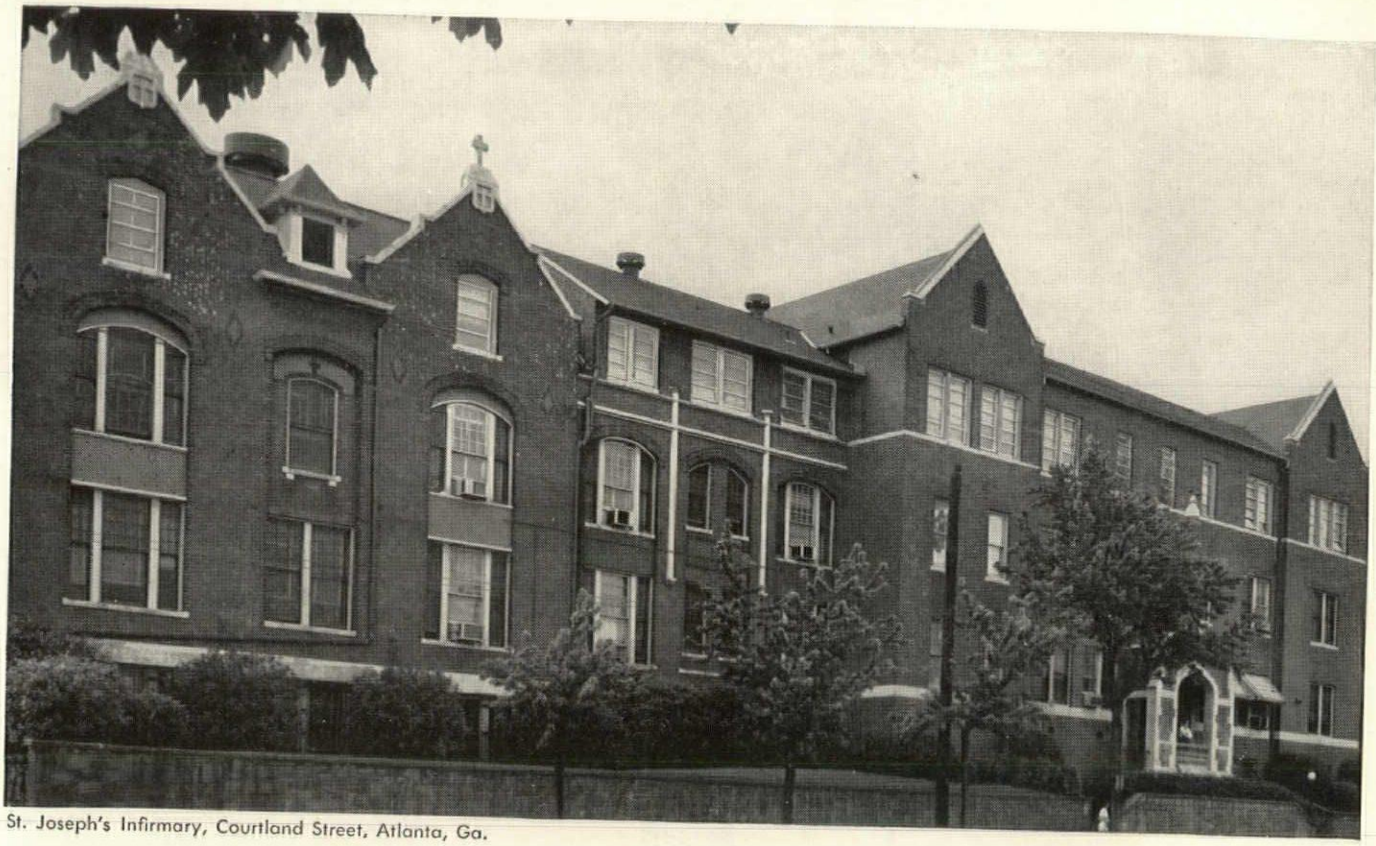
10 *October 1959*

Building Types Study: Hospitals

Current Projects by Hugh Stubbins

Research Center by Ulrich Franzen

Criticism by Albert Bush-Brown



St. Joseph's Infirmary, Courtland Street, Atlanta, Ga.

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Private room on second floor of old section, showing Grinnell Sidewall Sprinklers.

Service area, in new section of hospital, with Grinnell Pendent Sprinklers in view.

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ARCHITECTURAL RECORD (Vol. 126, No. 4, October 1959) is published monthly, except May 1959 when semi-monthly, by F. W. Dodge Corporation, 10 Ferry Street, Concord, N. H. **Editorial and executive offices: 119 West 40th Street, New York 18, New York**
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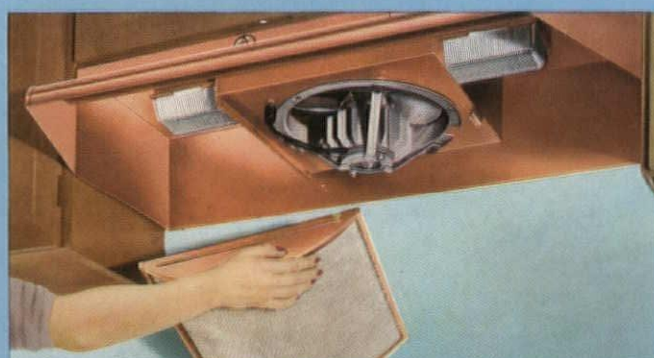

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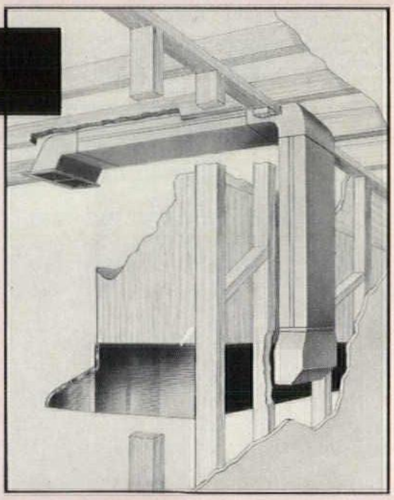
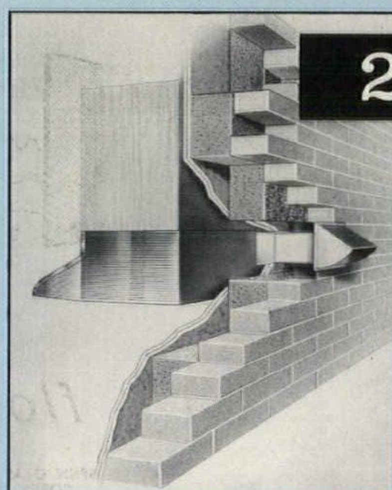
1. *Vertical*

Transition elbow in wall and ducts concealed between the wall studs.



2. *Horizontal*

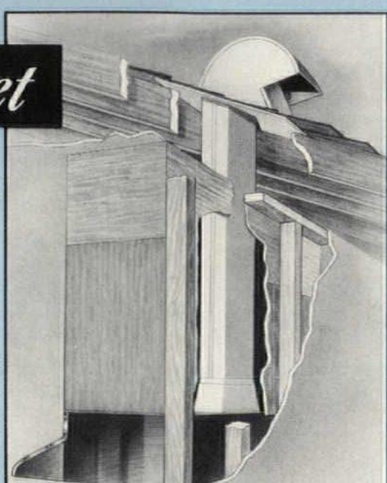


Ideal for outside wall. Horizontal discharge through outside wall cap.

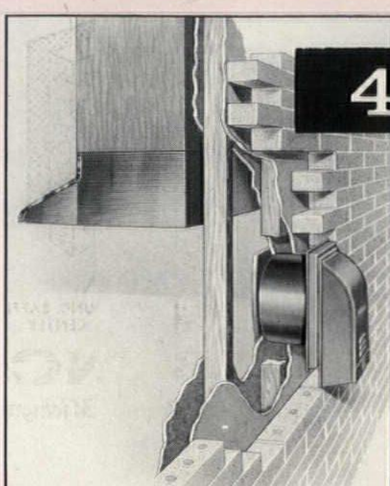
3. *In Cabinet*

For installation along the back wall of cabinet and soffit above.

← See other side

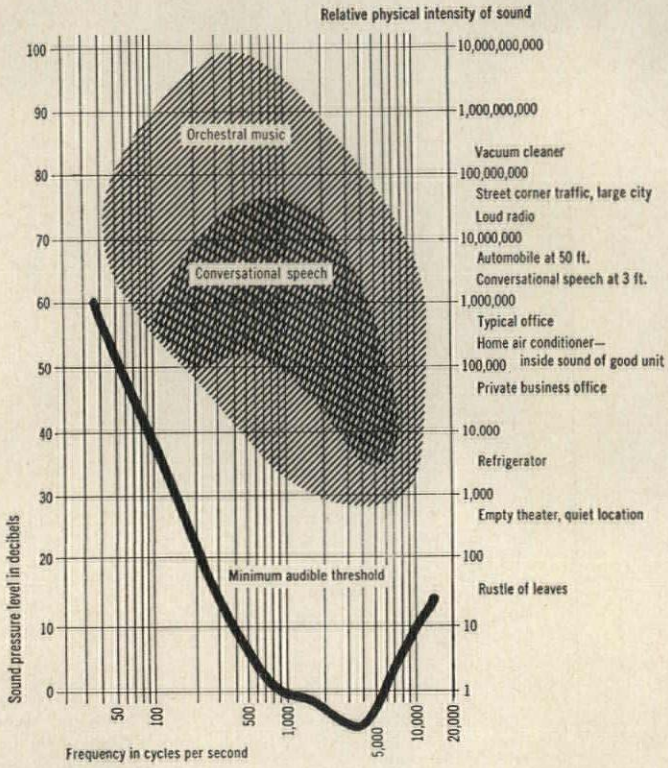


4. *In Wall*



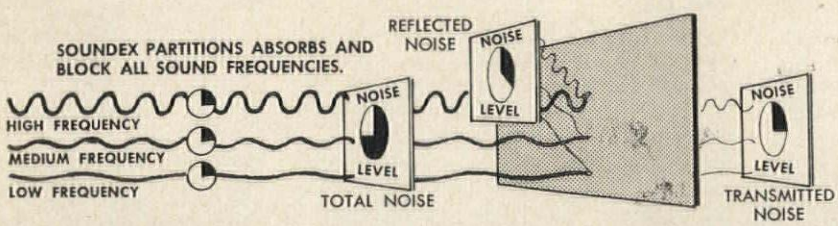
For a wall fan installed below the hood on an outside wall.

What architects should know about office sound control problems...and



The elements which make sound energy difficult to control are the almost friction-free medium of air, and the tremendous range of the human ear as a sound receiver. Since most speech and typical office machine sounds fall within the area of maximum ear sensitivity (600 to 6,000 cycles), proper control within this range is a major element in increasing worker efficiency and reducing office fatigue. The noise level of a room can be measured in terms of decibels, the smallest amount of sound the human ear can detect. Most offices have a rating of between 40 and 80 decibels. The job must be analyzed to see what type of sound problem exists. If noisy machines annoy people in the room, then the problem is one of soaking up the noise or *sound absorption*. If the problem is to stop the sounds that originate in the room from going into the next room, then it concerns *transmission*, and walls, rather than partitions, must be installed.

its solution with GR soundex partitions



Sound waves travel in every direction from their source. When they strike something, part is absorbed and part bounces off in all directions. SOUNDEX partitions trap and absorb sound waves. They have a noise-reduction coefficient (NRC) of .85, which means we can reduce the noise level as much as 38% in some rooms. Where the problem of sound transmission is concerned, Soundex walls are recommended. The sound blocking quality of these walls rates high (40 decibels), more than enough for all but "heated" discussions.

the secret is the *floating core* principle

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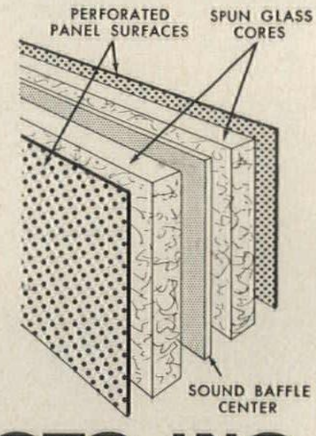

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ARCHITECTURAL RECORD

October 1959

Cover:

Philip Morris Research Center, Richmond, Va. Ulrich Franzen, architect. © Ezra Stoller, photo.

ARCHITECTURAL RECORD
October 1959
Vol. 126 No. 4

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Coming in the Record

EXUBERANCE BY YAMASAKI

As this is written Detroit is staggering under the impact of the opening of the Reynolds Metals Building, with a week's round of partying and speech-making that would do well by Mr. K's visit. The building is pretty exuberant and has some interesting details.

IMAGE OF THE ARCHITECTURAL STUDENT

As part of its general inquiry into the "image of the architect" for an era that seems to follow the pace of the moon rocket launchers, the RECORD *next month reports on what the architectural schools are doing to prepare students for new requirements of architectural services. The deans' replies show that changes are in progress; clearly the image seems trending toward a sterner visage.*

MOSCOW EXHIBIT

Speaking of Mr. K and exchanges of exhibits and visits, should you go to Moscow soon you will be too late to visit the American exhibit, for it's no longer there. Nevertheless the buildings were as interesting as the displays inside them; we'll report them in an early issue.

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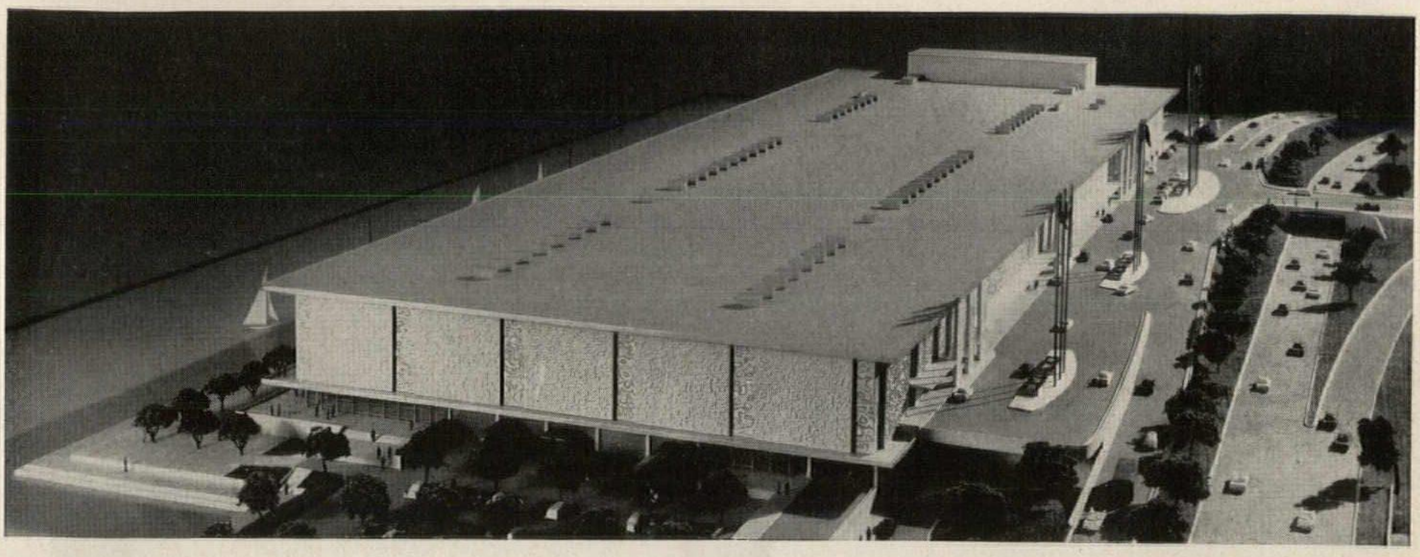
Apposition vs. Integration

The Architectural League of New York, inaugurating a year's program dedicated to "Achievement in the Building Arts," last month heard its opening speaker question a concept which, at the League as in most circles devoted to the cause of collaboration of architecture and the arts, has been almost sacrosanct. "I do not feel," said Ada Louise Huxtable, "that integration is a helpful concept for our time. It is, in fact, a dangerously misleading ideal. Integration implies the successful fusion of architecture and the arts into a harmonious, homogeneous, structural whole. Its proponents indulge in some passionate fingerpointing to the monuments of the past: Gothic cathedrals where sculpture and structure were one; Baroque frescoes that daringly extended architectural space. What we are *ignoring* is that not only have all of the arts changed radically, but their relationship to each other has changed as well. For the most effective use of the arts with architecture today is based not on integration but on apposition. Successful collaboration will not be achieved by unification or structural synthesis as in the past. The 20th-century arts, divorced from architecture, have developed along subjective, personal lines. They are separate, self-sufficient entities—strongly resistant to cooperative production. This is not—as current opinion would have it—a situation to be deplored. Characteristic of our time, it is a condition that offers unprecedented opportunities for an entirely new kind of collaborative achievement. The arts today—independent, autonomous, *un*-integrated—are prepared to serve each other in a very special way. The secret of this collaboration is in deliberate and careful contrast. It means the skillful, perceptive use of the right kind of painting, the suitable piece of sculpture, the correct craft, to enhance and enlarge the sensuous appeal of a competent work of architecture in such a way that the building is greater than it would have been without it. It is enrichment by juxtaposition. It emphasizes strong counterpoint rather than close harmony. It may serve no structural or narrowly functional purpose; but it provides sharp, judicious and meaningful *accent* to the strict simplicity of contemporary architectural forms." Mrs. Huxtable noted a few "valid exceptions" to her argument—Nivola's sculptured walls, Sowers' stained glass façades—but reiterated that generally "structural integration is not only rare, but it is a dubious objective in the light of today's changed technical and esthetic conditions." On the vital question of responsibility, Mrs. Huxtable said the architect must assume it, not only as a privilege but as an obligation—"in spite of the fact that he has not always shown the ability to carry it out. This is a responsibility that makes massive demands on the architect. He must understand precisely in what measure the other arts can contribute to his building. He must be aware of all current movements in related fields, and know how to use them. He must know exactly in what manner they can raise his finest creation to a still higher level of achievement. He must have the specialized knowledge of what happens to the artist's work at the architect's scale, and as part of a sizeable, three-dimensional composition. He alone is trained to work at this scale, and to visualize in these terms. . . . For the *total* building is the *architect's* work of art."

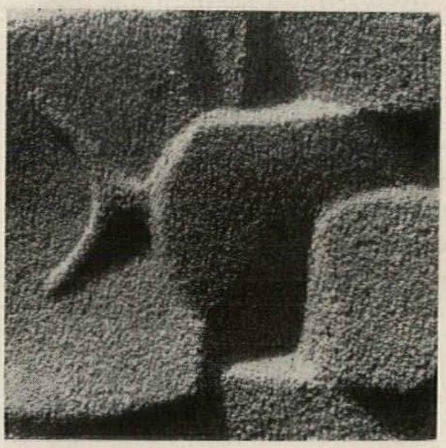
Speaking of Conventions

—And of the 1960 A.I.A. conclave in San Francisco, *Daily Pacific Builder* —the construction newspaper published there by F. W. Dodge—has recently dug out of its files its own report of the first A.I.A. convention held there—that was January 17-19, 1911. Its closing function was a banquet, and here is what it was like: "While the men were dining and getting ready for the speeches, some fifty of the women folk were having a dinner all to themselves in another room. Architects design buildings but their wives design dresses and the effect in the shaded light of the little dining hall where the charming matrons, perfectly dressed, sat and talked of things that would never interest their husbands was well worth the sight. . . . A well-defined spirit of patriotism ran through the whole evening. Even in the banquet this was prominent in a spontaneous singing of national airs as they were chanced upon by the orchestra. Spontaneous cheers rang out for the native land." As for the speeches, a former governor, James Gillett, "in his happy and masterful way welcomed the guests and drew a word picture wherein he portrayed all men as architects who in their own way were planning their own moral edifices and he closed with a brilliant reference to the Almighty whose handiwork fashioned Yosemite with its domes, pillars and walls of primeval granite." And one James D. Phelan was "especially interesting. In part he said all the world loves art which was but frozen music and mankind everywhere bows to genius."

SCULPTURE INTEGRATED WITH DESIGN OF CHICAGO EXPOSITION BUILDING



Above: Model of the Chicago Exposition Center showing the two types of sculptured panels; the narrower recessed ones are those designed by Nivola. *Below:* A section of a finished aggregate panel. *Right and bottom:* Original sand molds of panels

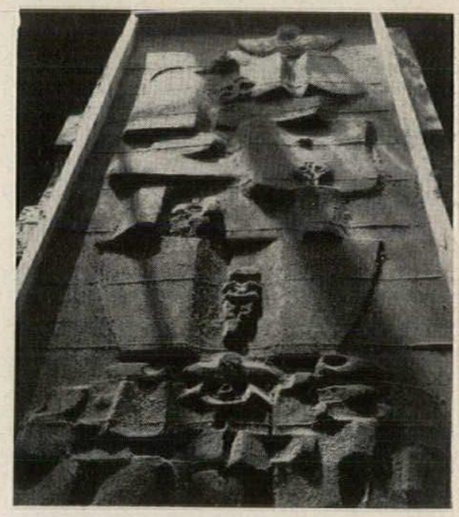


The $34-million Exposition Center on Chicago's lakefront is scheduled to open about a year from now. The chief architect is Alfred Shaw of Shaw, Metz & Dolio. Consultants are Edward D. Stone; John Root of Holabird & Root & Burgee; Victor Hofer of Ralph H. Burke, Inc.

To relieve the large expanses of wall space, the architects recessed alternate panels. Constantino Nivola, the sculptor, was chosen to develop the treatment of the surfaces of these panels. He and the architects have worked in collaboration from the earliest stages of design. The result is 34 panels, each 50 ft high and 16-20 ft wide; each consists of 11 horizontal sections of precast exposed aggregate.

Mr. Nivola evolved five basic compositions; these are combined to form varied high-relief sculptured panels. The aggregate panels are cast from negative cement molds, which in turn were made from the original positive sand molds. This method was adopted (instead of the sculptor's usual direct castings from one-use negative sand molds) because of the large areas involved and the necessity to repeat the five compositions. The wider panels are cast in a more delicate contrasting symmetrical design evolved by the architects and sculptor.

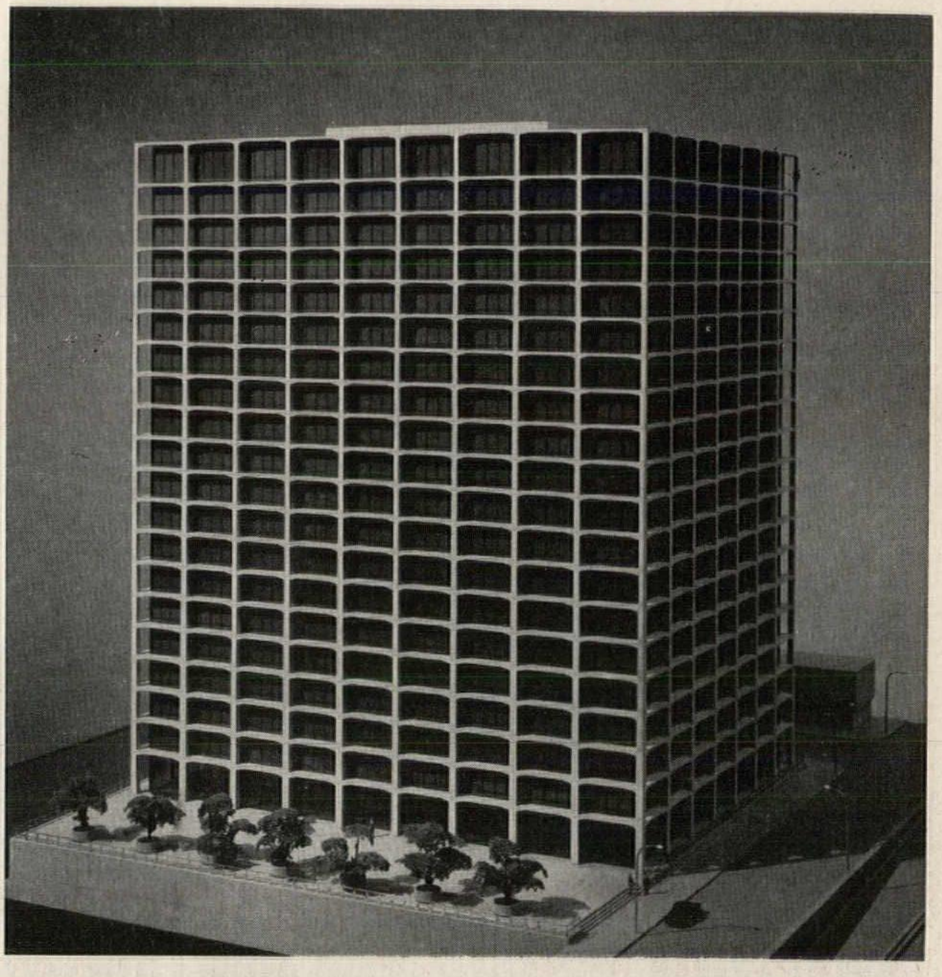
Pointing out that the wall panels were completed in a few weeks, Mr. Nivola comments: "The separation between the artist and the public is due, among other reasons, to the fact that industry failed to incorporate the artist in the development of the technological process. Consequently, the artist retired in his studio and persisted in working with the primitive methods his predecessors had taught him thousands of years before. . . . It is all-important, therefore, that if monumental art is to reimpose itself in modern living, it must achieve a means of realization consistent with those employed in a modern industrial society. I like to think that if Michelangelo were alive today his tools would be not a hammer and chisel, but a bulldozer and a stick of dynamite.

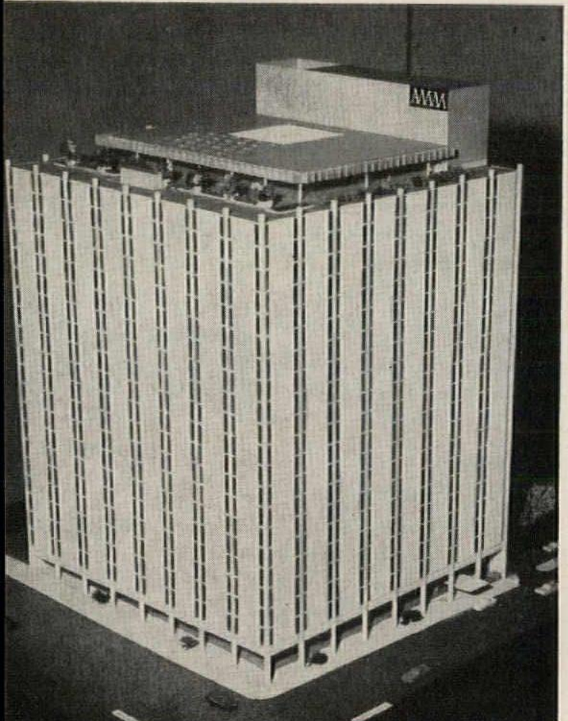


"With the Exposition Center project, the art employed on the building was not applied as a second-thought ornamentation after the building was already designed, but it was conceived simultaneously as an integrated part of the total concept. . . . The project for the Exposition Center is one of the major steps forward in the re-establishing of monumental art in its useful and practical position."

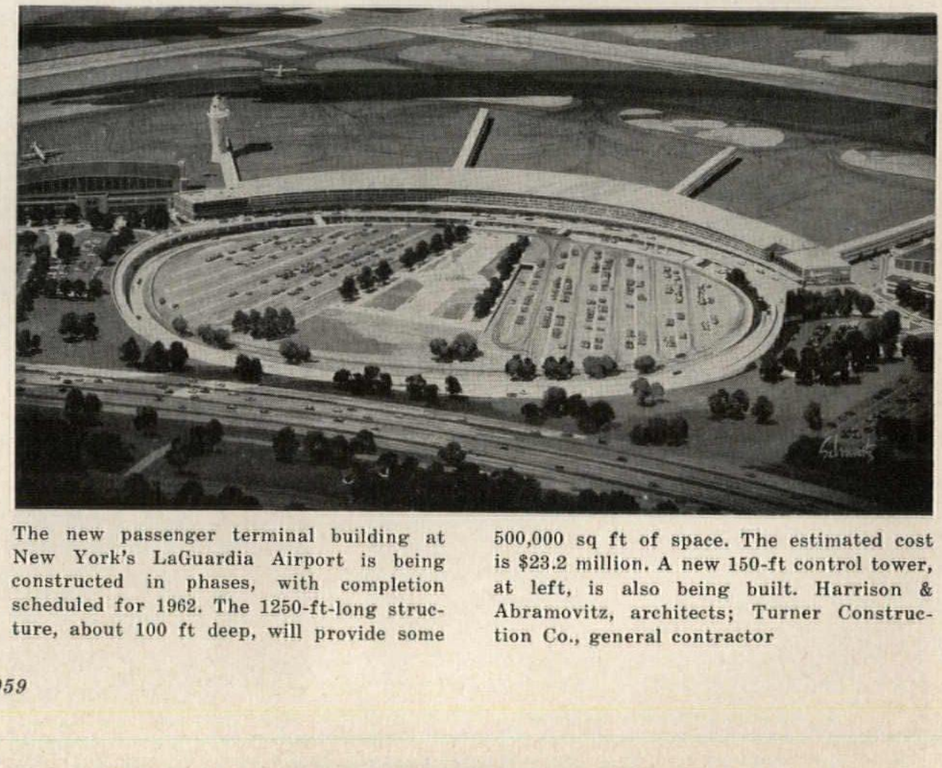
Buildings in the News

The 20-story building being erected in Chicago by the Hartford Fire Insurance Company Group is expected to be completed in January 1961. Hartford's Western Department headquarters will occupy about 200,000 sq ft on the lower floors. The rest of the building is being offered for lease. The metal and tinted glass skin is set back from the face about 4½ ft, and the exterior concrete columns and spandrels are covered with Minnesota granite. The superstructure is of reinforced concrete flat-plate construction with columns 21 ft 8 in. on center in both directions. Haunches are frankly expressed, rather than being eliminated by reinforcement. Skidmore, Owings & Merrill, architects and engineers; George A. Fuller Co., general contractor

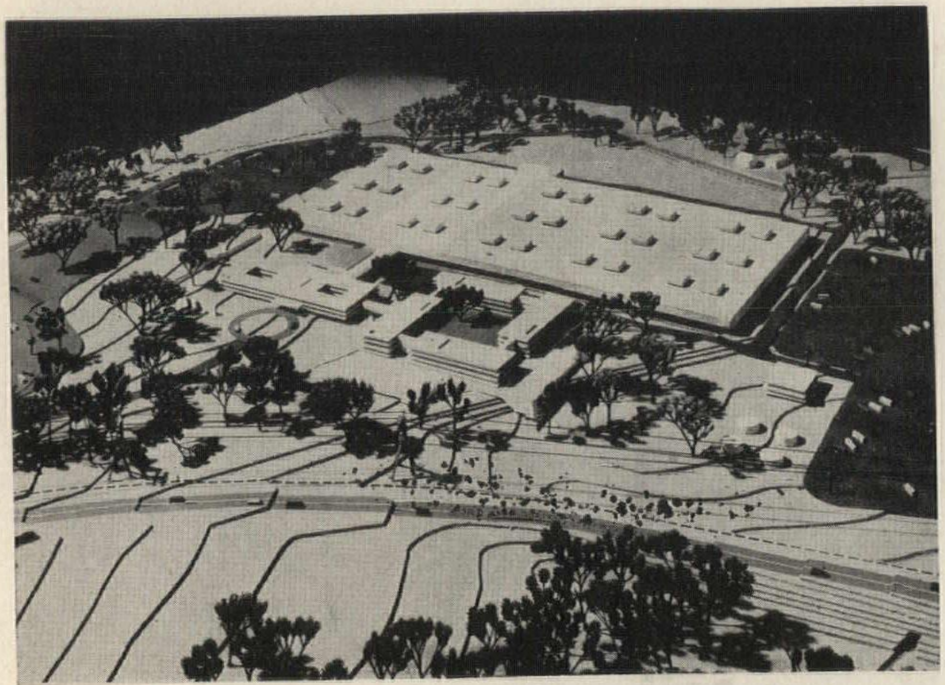




Left: Ground was broken last month for the new building of the Atlanta Merchandise Mart on Peachtree and Harris Streets. The structure, expected to cost more than $15 million, has almost 1 million sq ft. The structural frame is reinforced concrete (dome-pan), and exterior walls are of concrete panels; the panels, which have a marble-chip or quartz finish, include cast-in insulation. The building is air conditioned throughout, including winter core air conditioning. Edwards & Portman, architects; Jack K. Wilborn, structural engineer; Britt Alderman, mechanical engineer; Morris Harrison, electrical engineer; Massell Co., general contractor

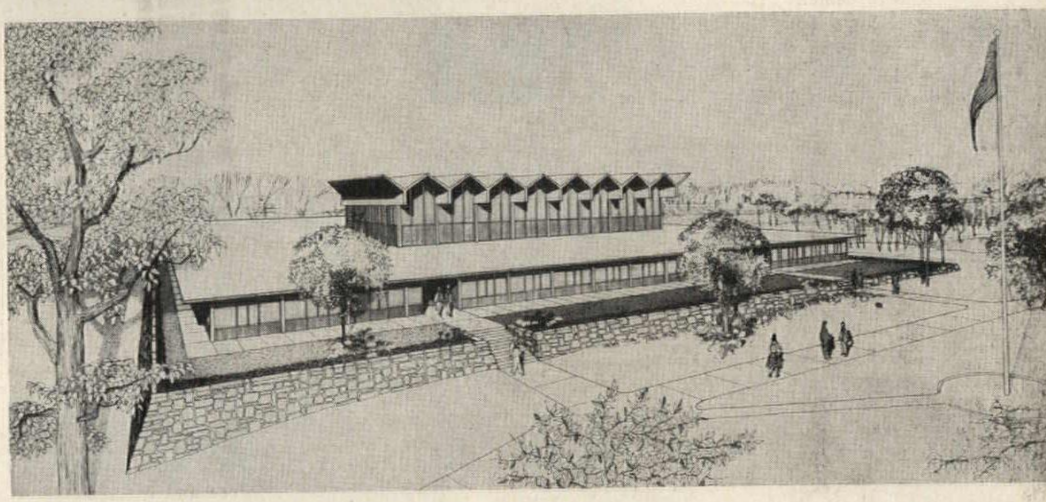


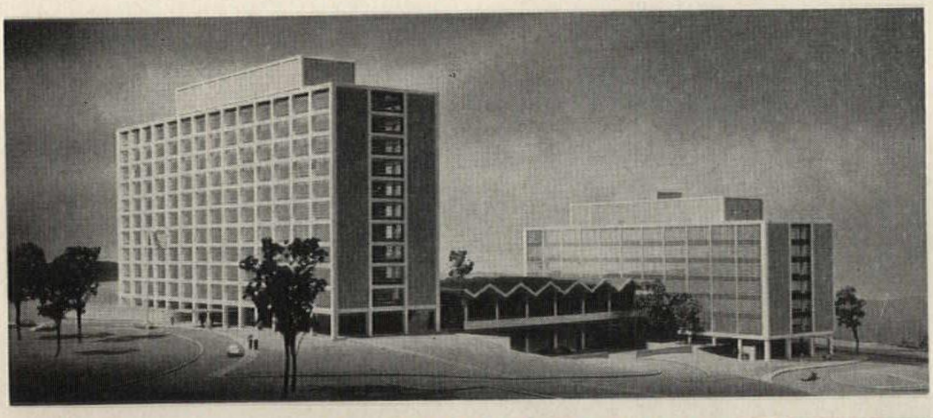
The new passenger terminal building at New York's LaGuardia Airport is being constructed in phases, with completion scheduled for 1962. The 1250-ft-long structure, about 100 ft deep, will provide some 500,000 sq ft of space. The estimated cost is $23.2 million. A new 150-ft control tower, at left, is also being built. Harrison & Abramovitz, architects; Turner Construction Co., general contractor



Construction has begun on the new plant of McNeil Laboratories, Inc., in a suburb of Philadelphia. Development is planned in three phases, with the first unit (in lighter color, near left end) of about 200,000 sq ft scheduled for completion a year from now. The steel frame, brick-enclosed production plant is one story with mezzanine for offices and laboratories. The two-story office building and four three-story research laboratories, each 76 by 200 ft, are in foreground; they are reinforced concrete with brick wall panels and precast column covers and lintels. Vincent G. Kling, architect; McCormick-Taylor Associates, structural consultants; A. Ernest D'Ambly, mechanical and electrical engineer; Hughes-Foulkrod Co., general contractor

The new 47,814-sq-ft Naval and Marine Corps Reserve Training Center in St. Louis is a reinforced concrete structure in a square plan. Construction of the $1,067,000 facility is expected to begin early next year. The metal curtain walls have aluminum sashes and insulated porcelain enamel panels. The building rises to two-story height in the center to allow space for a drill hall with 20-ft ceiling; this section has a modified folded-plate roof. Hellmuth, Obata & Kassabaum, architects





Due for completion by mid-summer 1961 is the three-unit office-building facility for the National Institutes of Health in Bethesda, Md. (being built by GSA on behalf of the Department of Health, Education and Welfare). Cost: over $7 million. The buildings are reinforced concrete faced in buff-colored brick, gray porcelain panels, and white precast concrete. The 11-story, left, and seven-story office wings are connected by a two-story cafeteria-service building with folded roof. Keyes, Lethbridge & Condon and Richard Collins & Associates, architects; Norair Engineering Corp., general contractor

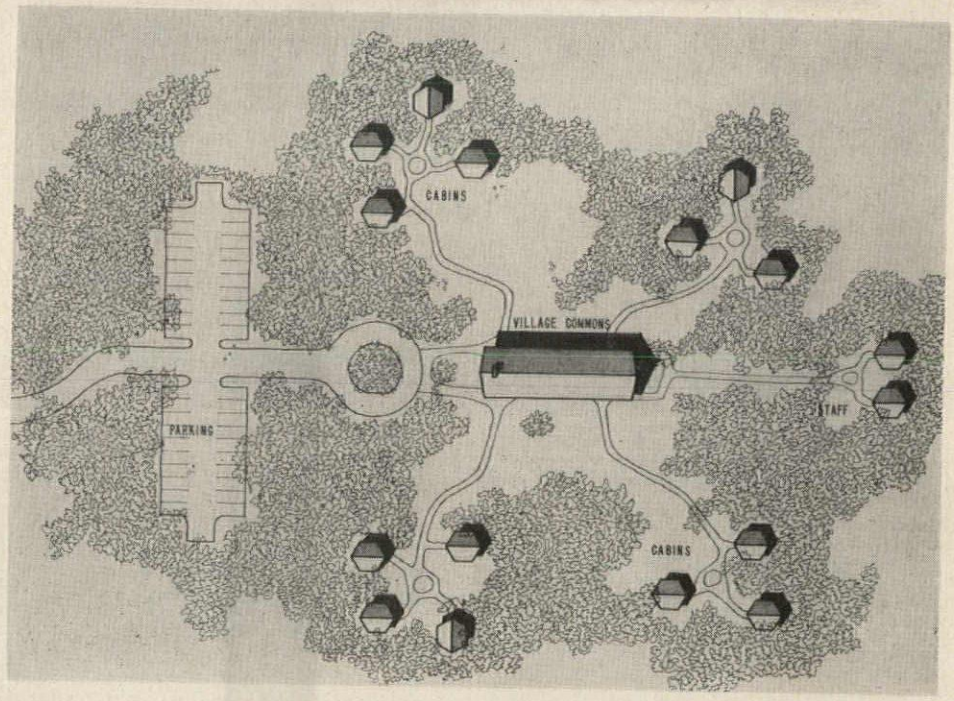
The $3-million City National Bank Building in Los Angeles is concrete and steel with a two-story base faced in red-brown granite, white marble, and blue glass mosaic tile. The office tower, rising to 152 ft, has projecting aluminum fins on north and south façades; the other walls are screened in sculptured material. Curtain walls are aluminum. The elevator penthouse is finished in blue porcelain enamel. More than 106,000 sq ft of parking space is provided on five levels (three of them below ground). Completion is expected in the end of 1960. Victor Gruen Associates, architects; Buckeye Construction Co., general contractor

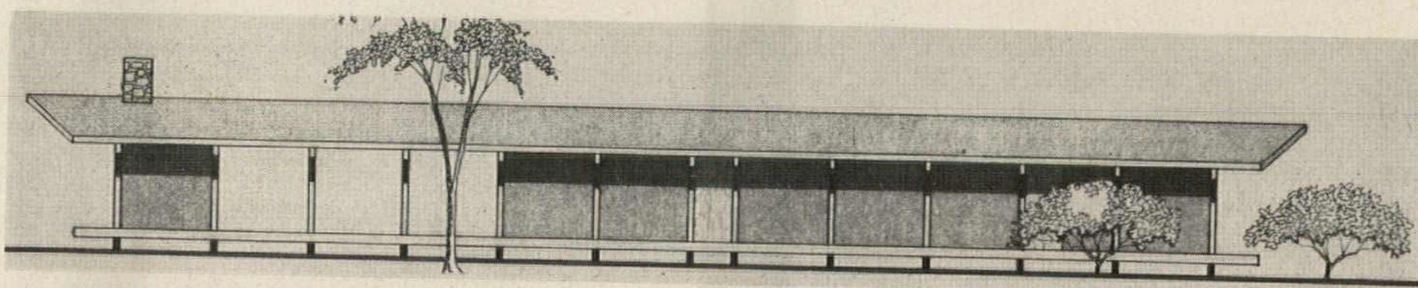
1000-Person Camp in Michigan Planned for Variety, Unity

The firm of Begrow-Brown, Architects, of Birmingham, Mich., was chosen by the Conservative Baptist Association of Michigan to design their mile-square camp around Owens Lake in Michigan. The camp is planned for ultimately about 1000 campers. Construction is to start this fall on the first unit, the Western camp.

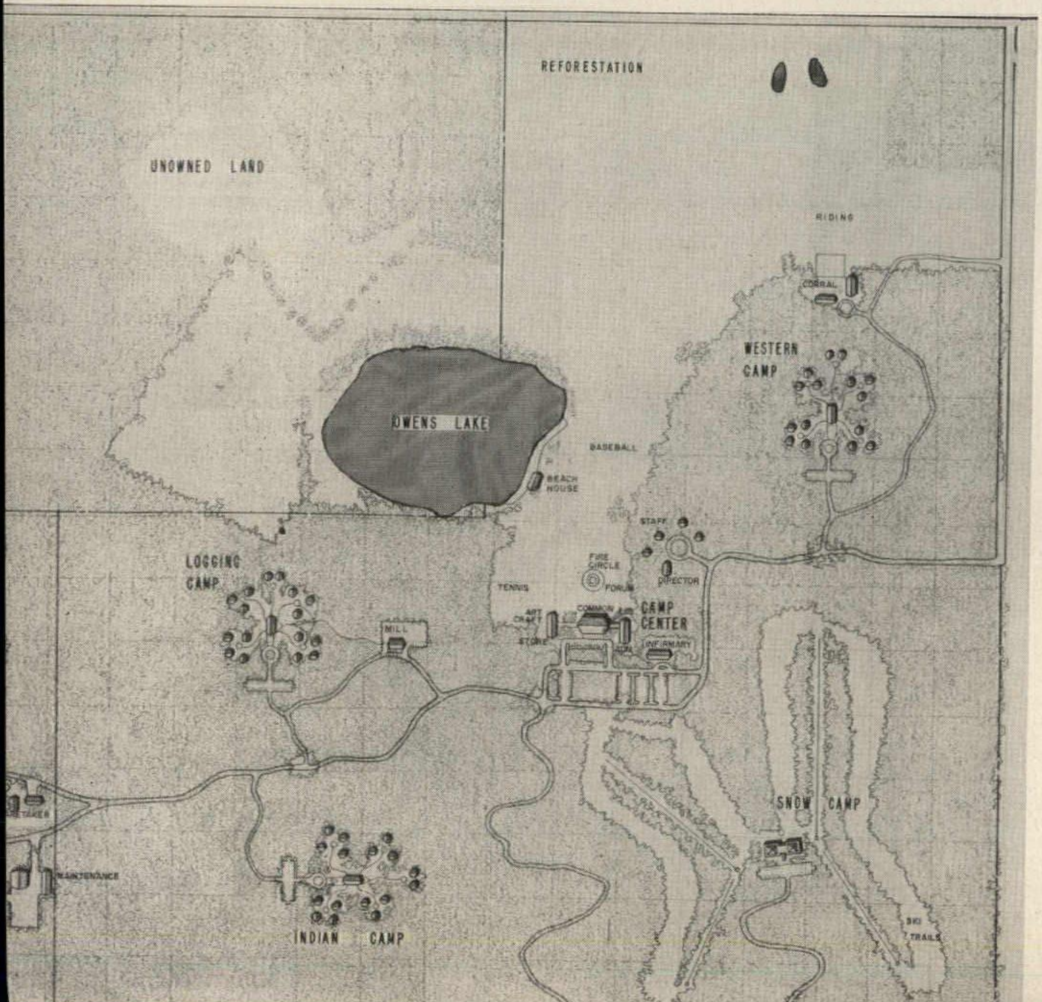
The architects, working closely with three ministers, including the Association's president and its camp chairman, evolved a concept of camping which they set forth in a statement. Some quotations:

"Camping architecture has as many environmental factors in the scope of the religious, the social, and the recreational as the design of a

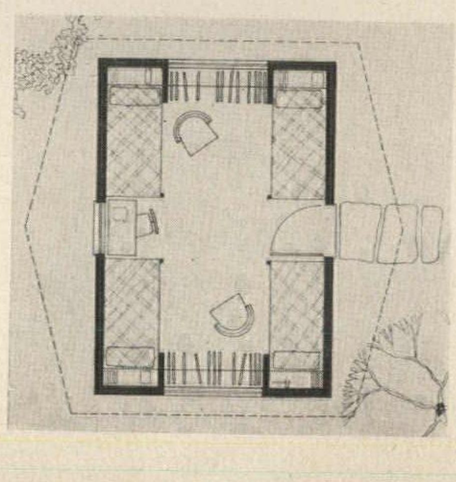




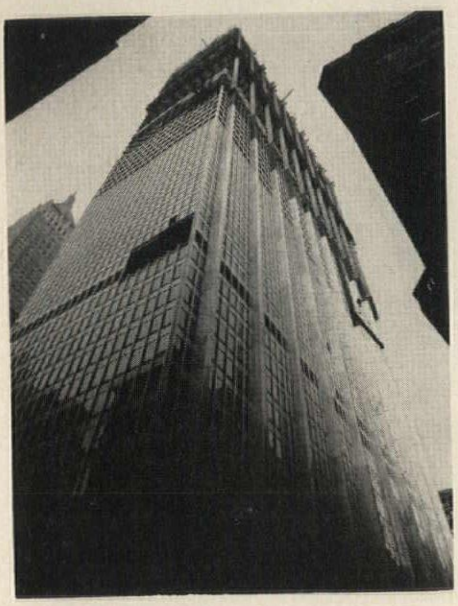
Above: A typical village; a village commons building. *Below:* site plan of entire camp; plan of a cabin



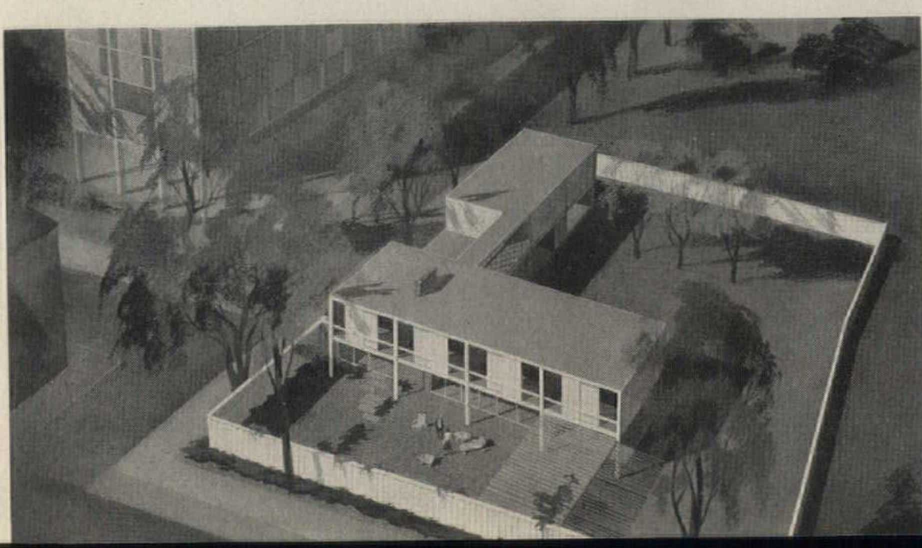
city itself. . . . The architect's role in designing a comprehensive camp environment is that of prime planner and coordinator. . . . We envision your camp as being made up of a series of campsteads containing from eight to 20 people per cottage. There might be anywhere from five to 10 cottages per campstead, and three or four campsteads might constitute a village. . . . Each village may take on an individual character. . . . There should be a commons, a central focal point for the entire camp. . . . There should be a spiritual atmosphere and direction which would integrate the camp as a whole."



Topping out of the Chase Manhattan Bank Building in New York's Wall Street area was celebrated on September 9. The picture at right (taken from 67-story 70 Pine Street) shows the $131-million, 60-story structure a few days earlier; at left, on the day itself, steel beams for the top are being hoisted past the façade. Occupancy of the tower is expected a year from now, and of the under-plaza floors about two years later. Skidmore, Owings & Merrill, architects; Turner Construction Co., general contractor



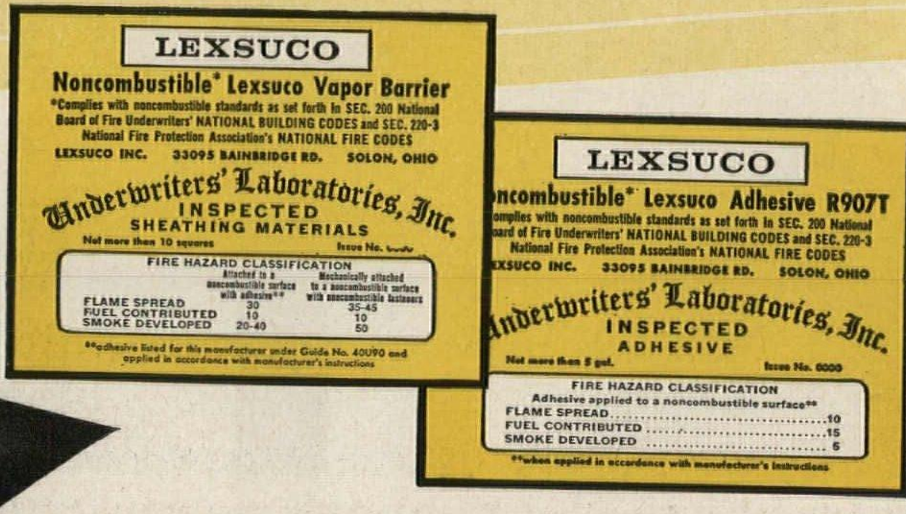
The new Aqueduct Race Track in New York was opened last month. Cost: $33 million. The grandstand-clubhouse (which seats 20,000) has 1 million sq ft on four levels, is 1050 ft long, 350 ft deep, and 110 ft high. There are 18 escalators and nine elevators, 738 pari-mutuel windows, a women's lounge area, a 25-bed infirmary, a main restaurant accommodating 1200, 16 bars, and refreshment stands and cafeterias. Construction is welded steel with precast panels on the exterior. The track has its own subway station. Arthur Froehlich & Associates, architects; Stone & Webster, engineers; Caye Construction Co., general contractor



Construction is to start in January on Forbes House, new residence for the dean of Harvard College. It is shown in a preliminary study, with the new Quincy House in background. The two-story wood and brick structure has a long living room, study for the dean, dining room, kitchen, etc., on the first floor; above are the family living room and bedrooms. There is also a private apartment for a visiting scholar. The Architects Collaborative, architects

Important News for Architects and Specifiers!

UNDERWRITERS' LABORATORIES *Test and Accept*



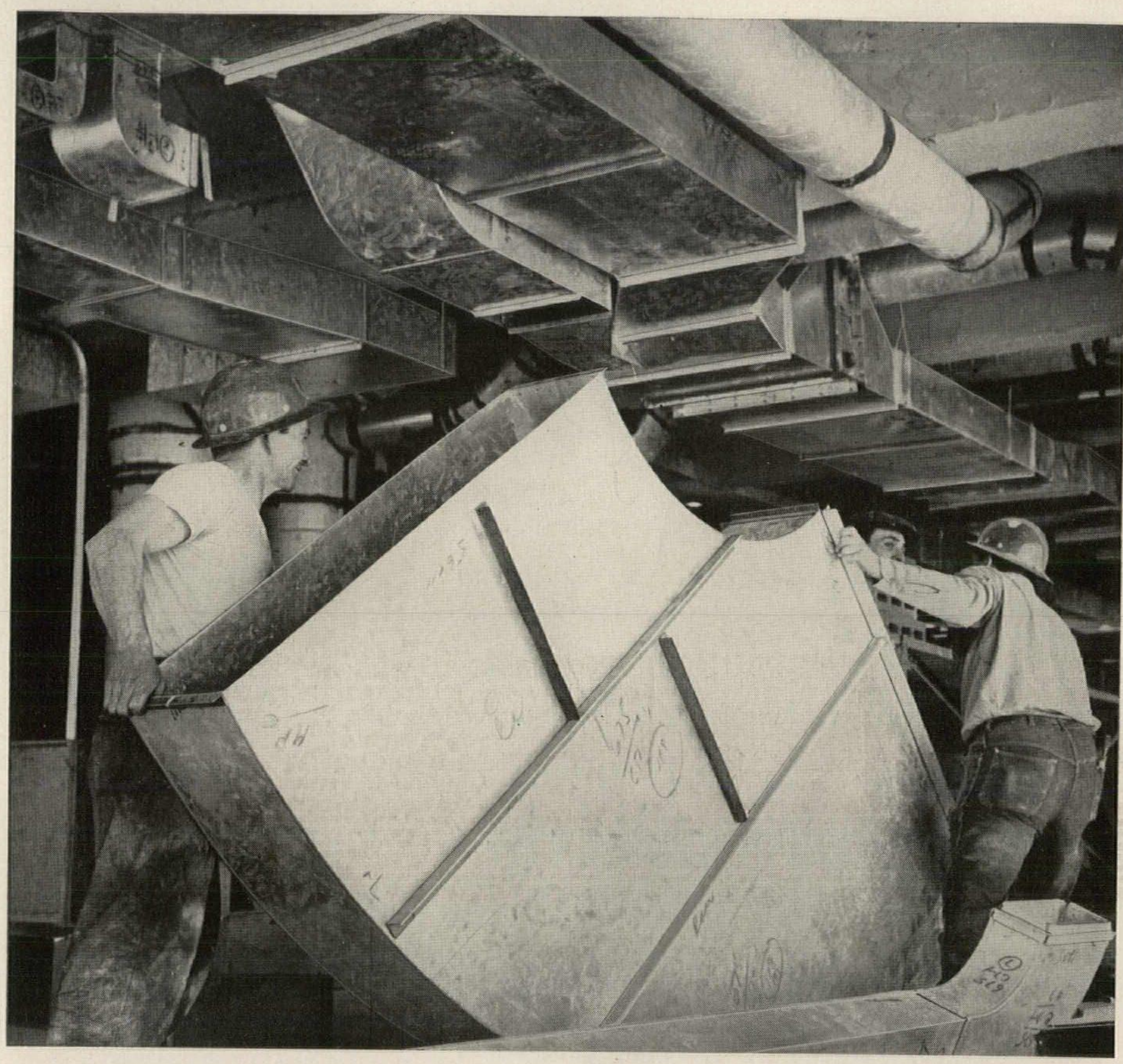
Underwriters' Labels will now identify the Lexsuco Vapor Barrier and Lexsuco Adhesive R907T. These products are the only ones of their kind to bear this well known label.

Noncombustible Standard met by Lexsuco Vapor Barrier and Lexsuco Adhesive R907T. Underwriters' Label granted.

• Underwriters' Laboratories, for the first time, has tested and accepted a roof vapor barrier and adhesive. Extensive tests proved that the Lexsuco Vapor Barrier and Lexsuco Adhesive R907T meet the noncombustible standards established by the National Fire Protection Association and the National Board of Fire Underwriters.

Semi-mechanical method for small jobs. Apply ribbons of adhesive with the Lexsuco Spreader, spread with roller coater and unroll vapor barrier into adhesive. Next, imbed insulation into ribbons of adhesive on top of vapor barrier.

Fire protection without a vapor barrier! Where conditions do not require use of a vapor barrier, apply ribbons of adhesive to roof deck with the Lexsuco Spreader. Imbed insulation into ribbons of adhesive for dependable securement.



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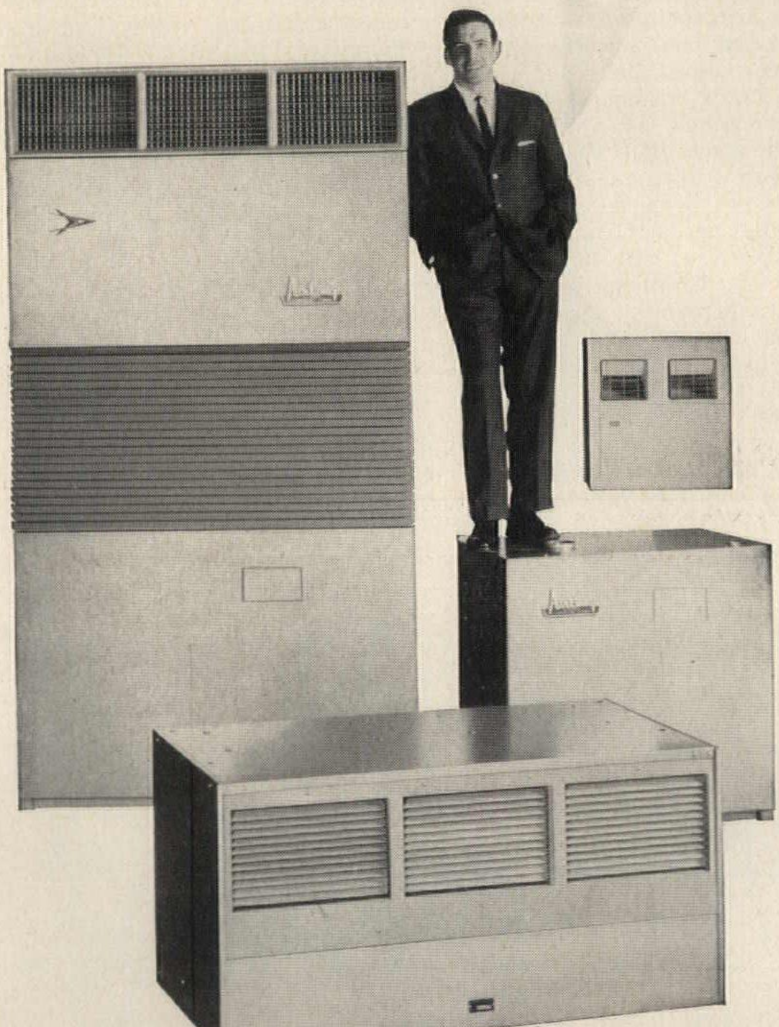

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FIRST WITH THE FINEST IN AIR CONDITIONING

One of the buildings containing two- and three-room apartments, with some of the four-story maisonette blocks in the background

Recent English Housing Project Includes Several Types

The latest and, perhaps, the most comprehensive of the London County Council's housing projects, the Roehampton Lane Estate in the Wandsworth section of London, is now well advanced toward completion.

It overlooks Richmond Park from a magnificent 100-acre site, assembled through the purchase of several large houses with extensive grounds. Seventy acres of this site have been developed as housing, providing 1867 dwelling units at a density of 100 persons to the acre. The accommodation is principally of two types: maisonettes and small apartments of two or three rooms. There are also, however, a fairly considerable number of row houses, some of three stories and some of two, and a group of small apartments at ground level that have been specially designed for the needs of the aged.

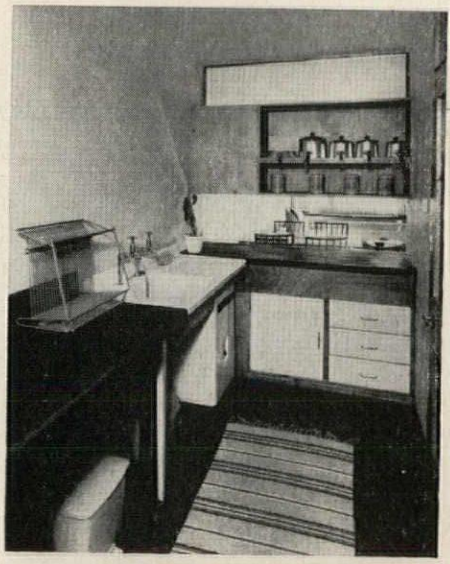
Ultimately there will be a full complement of educational buildings to serve this community: three nursery schools, two primary schools (one of which has already been built), and a secondary school. Also projected are two churches, a health center, a community center, a library, and a club for old people. Accommodation has been provided for 26 shops.

The smaller apartments are located in 15 blocks, each 12 stories in height. Some of the maisonettes have also been arranged in high-rise blocks; others are contained in four-story buildings. All the dwelling units are centrally heated from a single boiler house.

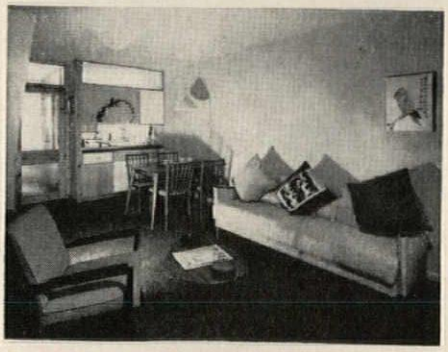
Concrete was the principal structural material for the entire project. Reinforced concrete framing was used for the high-rise blocks, combined, in the case of the maisonette buildings, with load-bearing cross walls. Concrete horizontal floor beams, balconies, and staircases were precast on the site and brought into position by means of tower cranes. Cladding panels and stairway units were also precast and handled by cranes.

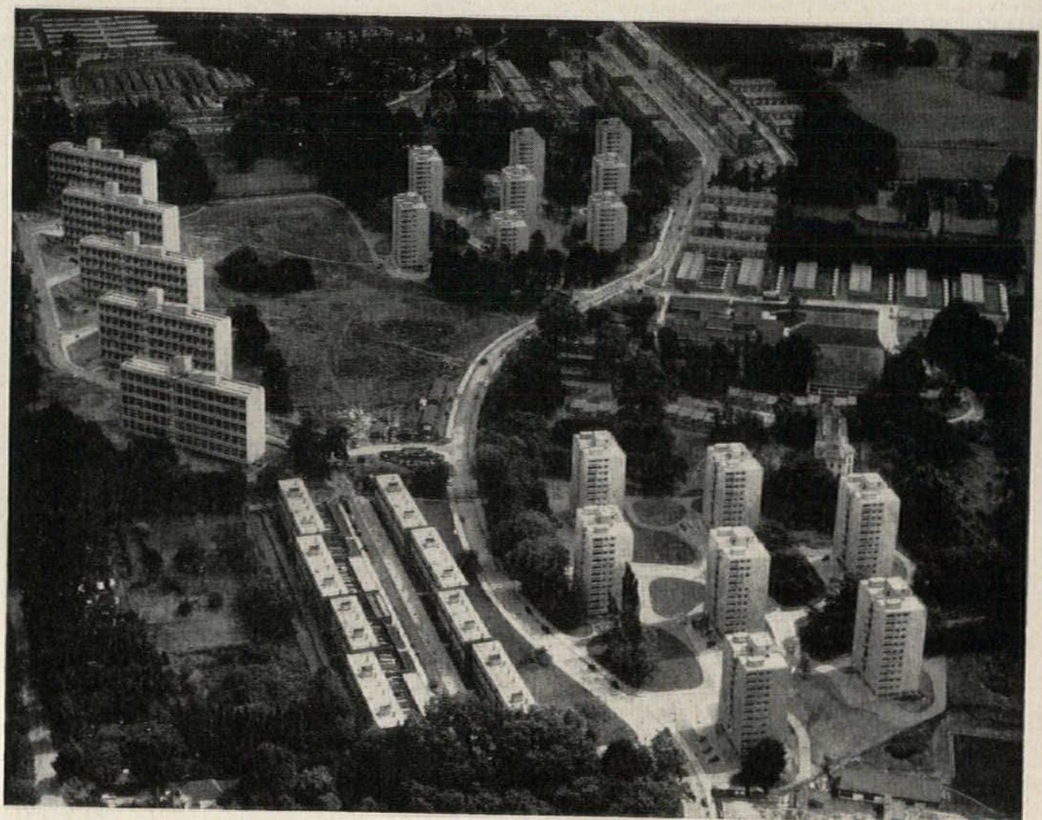
Architect to the London County Council: Hubert Bennett, in succession to Professor Sir Leslie Martin and Professor Robert H. Matthew. Deputy Architect: F. G. West. Principal Housing Architect: H. J. Whitfield Lewis. Assistant Housing Architect: K. J. Campbell, in succession to M. C. L. Powell. Architect in Charge: C. A. Lucas. Architects: J. A. Partridge, W. G. Howell, J. A. W. Killick, S. F. Amis, J. R. Galley, R. Stout. Senior Planning Officer: L. W. Lane, in succession to A. G. Ling. Chief Engineer: J. Rawlinson. Consultant Structural Engineer: W. V. Zinn.

—*Jonathan Barnett*



A typical apartment. *Above:* the kitchen looking toward the pass-through to dining and living areas. *Below:* the living room looking toward the kitchen





A general view of the site: the five tall buildings on the left are maisonette blocks; the high-rise buildings, center and right, contain the smaller apartments

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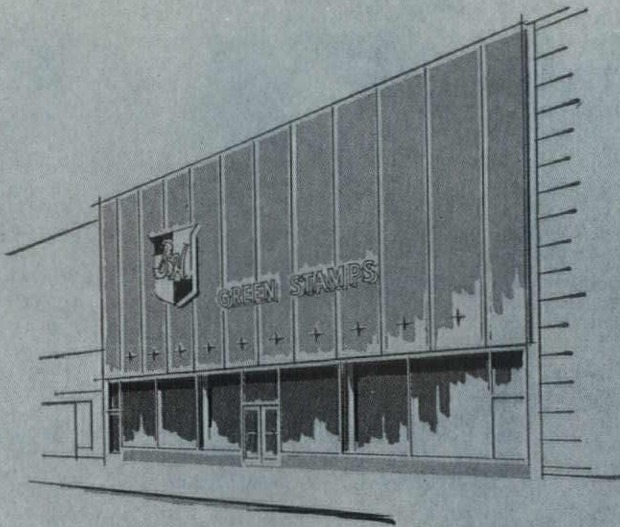

ARCHITECT: DAHME & ASSOCIATES, STORE DESIGNERS, COMSTOCK PARK, MICH.
DAVID S. POST, A.I.A., ASSOCIATE ARCHITECT

ARCHITECT: SAGGUS, WILLIAMSON, VAUGHT & SPIKER, ATLANTA; GLAZING CONTRACTOR: A.C.D. GLASS & MIRROR CO., INC., ATLANTA

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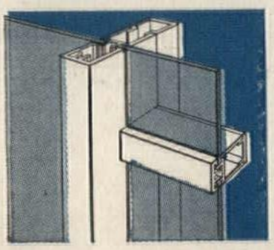
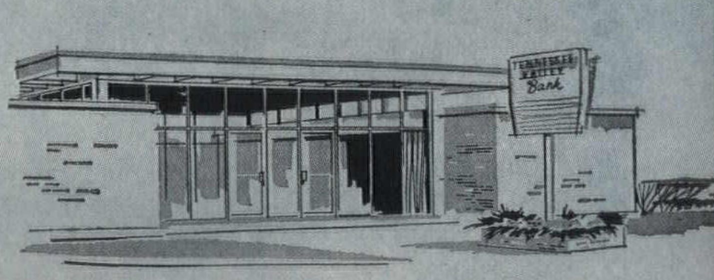


***HV Trimline is a complete dry-glazing construction system offering a variety of face and back members for horizontal and vertical use. Factory-installed vinyl glazing strips provide positive, permanent, resilient seal – for glass or panels.**

ARCHITECT: MASTIN & SUMMER, ATLANTA;
GLAZING CONTRACTOR: PITTSBURGH PLATE GLASS CO., ATLANTA



ARCHITECT: PAINTER, WEEKS & McCARTY, KNOXVILLE;
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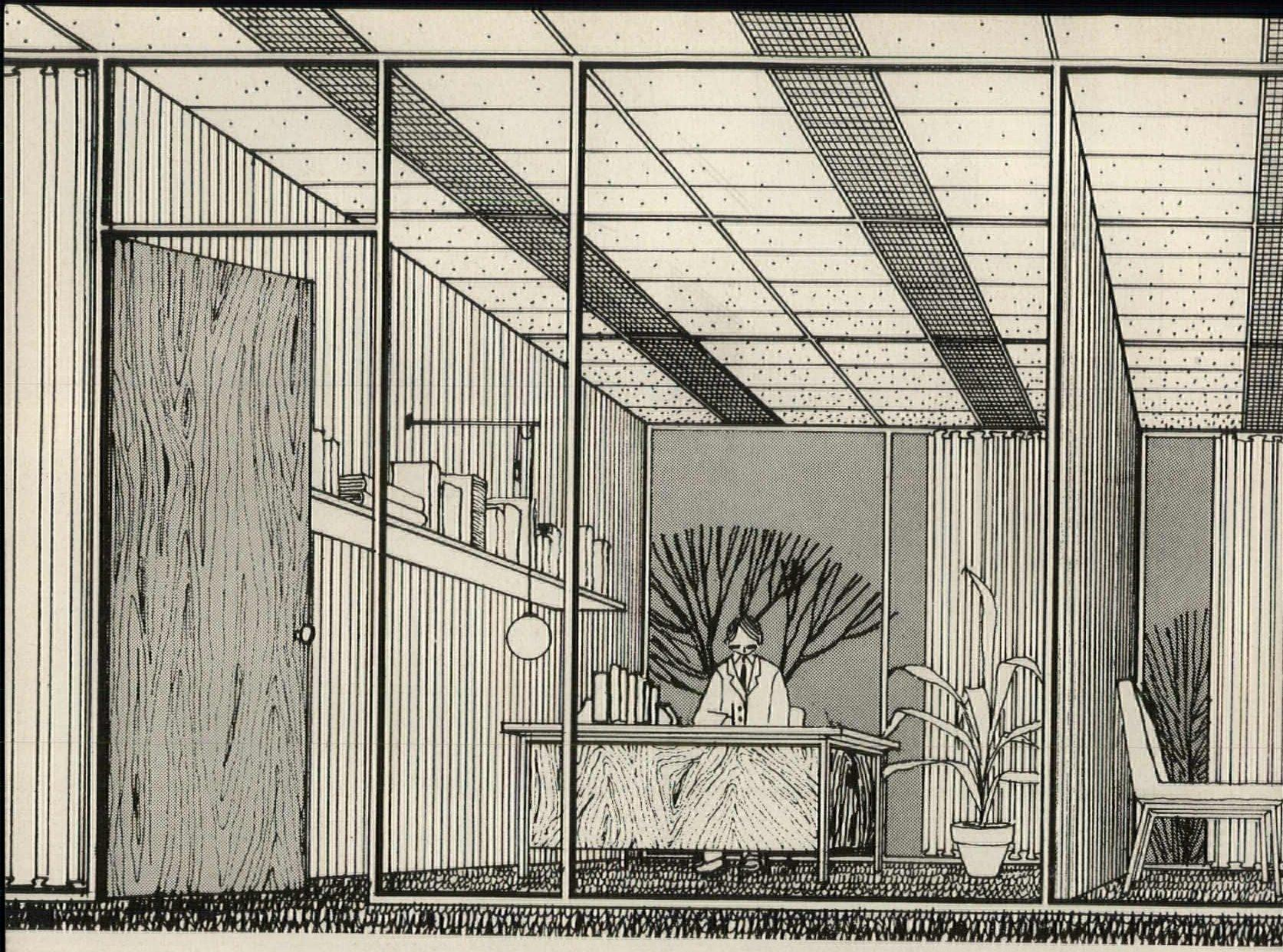

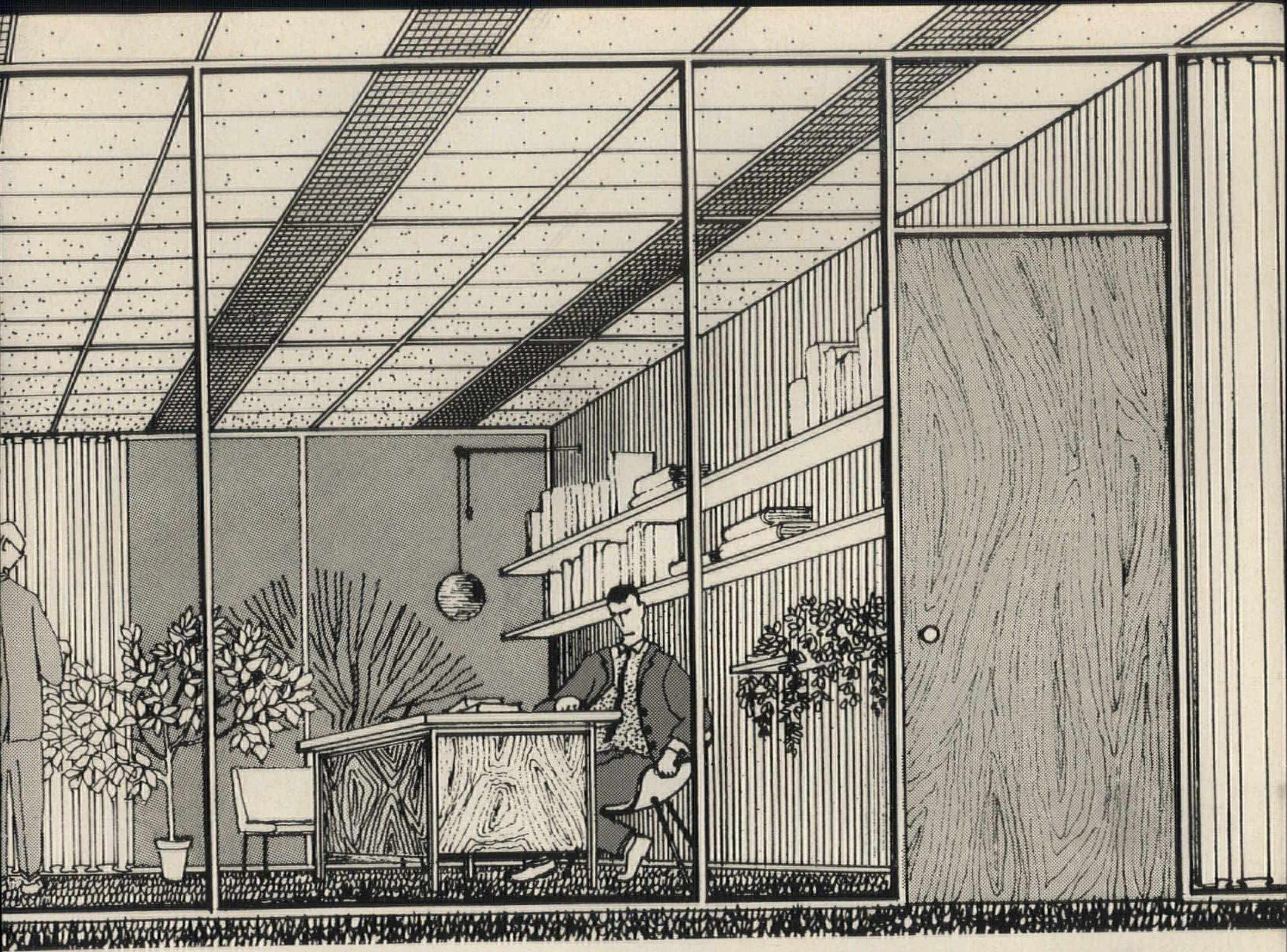

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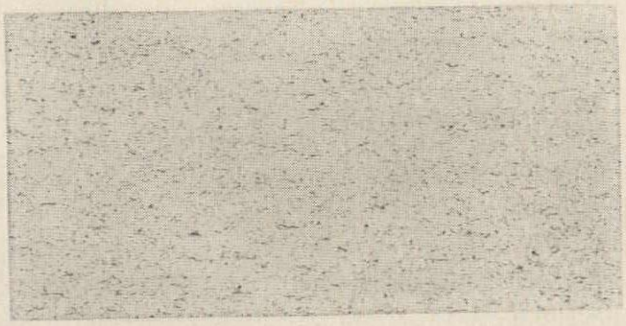

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Shepard solves the problem

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Meetings and Miscellany

—*Drawn for the* RECORD *by Alan Dunn*

"Remember the good old days when all we had to do to remodel was to put in Venetian blinds?"

A.I.A. Announces 1960 Awards
The American Institute of Architects announces its 12th Annual Program of National Honor Awards. Buildings designed by registered architects practicing professionally in the United States and completed since January 1, 1955, are eligible. Entry slips and fees are due at A.I.A. headquarters by November 23. Entries must be received by January 15. Details from the A.I.A., 1735 New York Ave., N. W., Washington 6.

1960 Reynolds Award
The American Institute of Architects announces the Fourth Annual $25,000 R. S. Reynolds Memorial Award for significant use of aluminum in architecture. Architects practicing in any nation are eligible. An architect may be nominated for the award by anyone, including himself or his firm. Nomination forms, obtainable from the A.I.A., will be accepted until December 7.

Rome Prize Fellowships
The American Academy in Rome announces the Rome Prize Fellowships for 1960-61 for "mature students and artists capable of doing independent work" in architecture, landscape architecture, musical composition, painting, sculpture, history of art, classical studies. Each fellowship carries $3000 a year, plus free residence and studio at the Academy. Applications and submissions of work are due in the New York office by December 31. Details from Mary T. Williams, executive secretary, American Academy in Rome, 101 Park Ave., New York 17.

1960 Brunner Scholarship
The New York Chapter of the American Institute of Architects announces the Arnold W. Brunner Scholarship, increased for 1960 to $3000 (from $2400). Active architects of the New York area who have advanced professional backgrounds are eligible. The award provides for study in a special field, chosen by the candidate, which will contribute to the practice, teaching, or knowledge of architecture. Applications are due by November 15. Details from Gillet Lefferts Jr., New York Chapter, A.I.A., 115 E. 40th St., New York 16.

Competition for WHO Building
Fifteen architects or firms from 12 countries have accepted invitations to participate in a competition for the design of the new $9.3-million headquarters building for the United Nations' World Health Organization in Geneva. The following are the competitors: G. A. Bernasconi, A. Fiocchi, M. Nizzoli, *Italy;* Ir. J. H. Van den Broek & J. B. Bakema, *Netherlands;* J. Dubuisson, *France;* Guergi Gradov, *U.S.S.R.;* Haefeli, Moser & Steiger, *Switzerland;* Hentrich & Petschnigg, *Federal Republic of Germany;* Arne Jacobsen, *Denmark;* Raymond Lopez, *France;* A. E. Reidy, *Brazil;* Viljo Revell Associates, *Finland;* Eero Saarinen, *U.S.A.;* Hugh Stubbins, *U.S.A.;* Kenzo Tange, *Japan;* Jean Tschumi, *Switzerland;* Yorke, Rosenberg & Mardall, *England.*

The competitors were selected by five architects chosen by WHO's executive board. They are: Giovanni Battista Céas, vice president, International Union of Architects; B. Gaber, secretary-general, Bund deutscher Architekten; Gunnar Jacobsen, Swedish architect; Alexandre Persitz, chief editor, *L'Architecture d'Aujourd'hui;* Alfred Roth, Federal Institute of Technology, Zurich.

The jury, which will meet next year to assist WHO in choosing the winning design, will consist of: Sven Gottfrid Markelius, architect, Sweden; Gio Ponti, architect, Italy; Sir Howard Robertson, architect, England; the secretary-general of the International Union of Architects; the chairman of WHO's executive board; the head of the department of public works of the Canton of Geneva; the director-general of WHO. Alternates will be: Hakon Ahlberg, architect, Sweden; Eugène Beaudouin, architect, France; Albert Cingria, architect, Switzerland.

The executive board decided to limit the competition to a small number of architects of proved standing because it seemed impractical to open the competition to all architects of all WHO's 90 member countries.

Architects Report on Newark
When the officials of Newark, N. J., decided to initiate studies of the city's downtown area, they retained Oskar Stonorov and Victor Gruen as associated architects and planners. The architects in turn called on: Robert Mitchell, chairman of the department of city planning, University of Pennsylvania, as planning consultant; Ernest Jurkat, president of Marketers Research Service, Inc., as economic consultant; Wilbur Smith & Associates as traffic and transportation consultants.

The report of this group was released last month. As they had been requested to, the planners and the consultants studied the downtown area in order to define the area's problems and to "propose principles according to which a blueprint for

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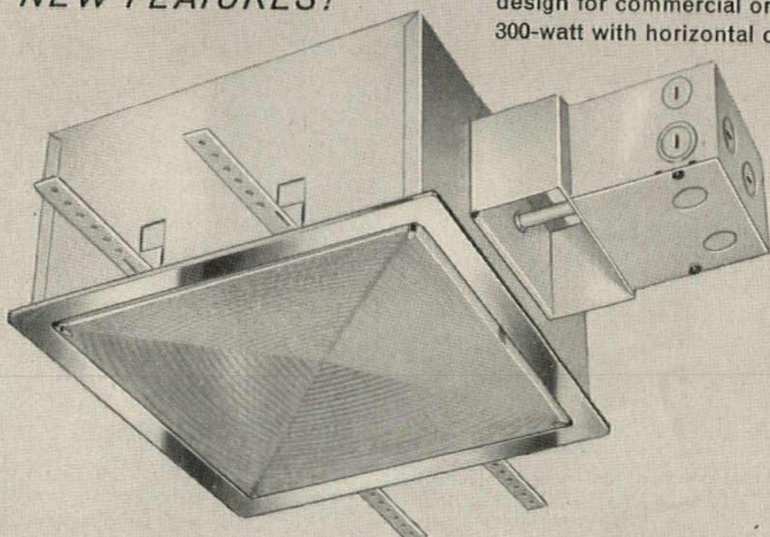

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Housing size: 11⅞" x 11⅞" x 10½"

M-6628—150-watt horizontal lamp
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M-6638—150-watt vertical lamp
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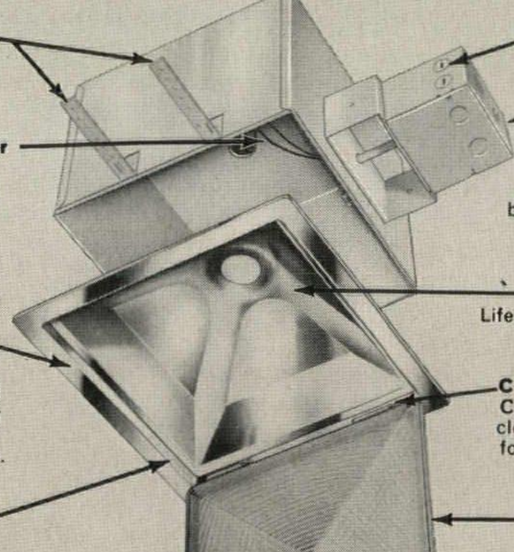

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Positive "No-Light-Leak" Reflector and trim.

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Alzak Reflector
Lifetime Alzak process permanent indoor or outdoor finish.

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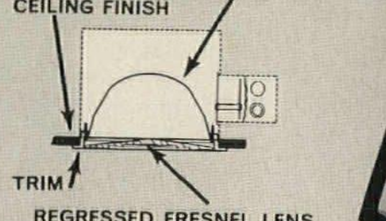
Vertical recessed fixture illustrated. Same features apply to horizontal units.



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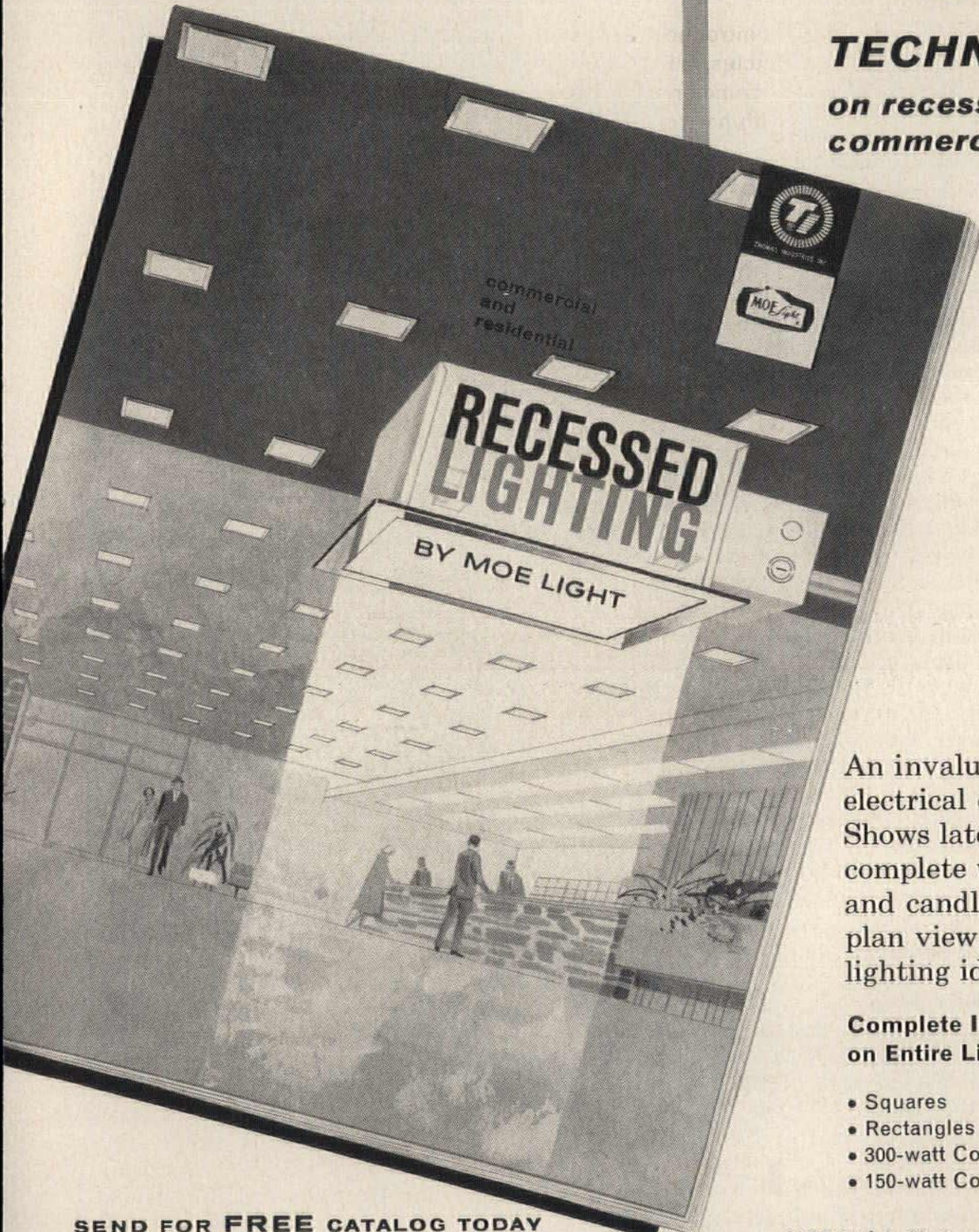

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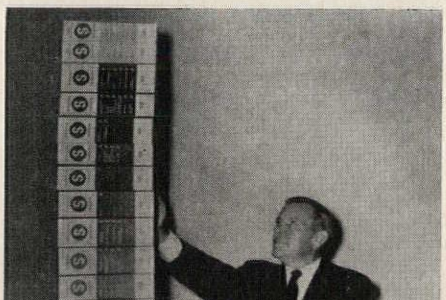
realization could be carried out." They were not asked for a master plan or detailed physical plans.

As was originally intended, the report has now been turned over to George H. F. Oberlander, city planning officer. He and his staff are determining priorities and starting detailed studies necessary to implement the report's recommendations. Achievement of the overall redevelopment will require financial and other cooperation from Federal, state, and county governments, but Mr. Oberlander says he hopes to carry out some of the proposals involving only the city government "within the next year."

Flexible Schools Studied

The Board of Education of the City of New York has underway a study of the "economic and educational feasibility" of school buildings which could be converted to industrial or commercial use and mobile classroom units which could be moved to meet emergency overcrowding conditions. Among other problems being considered are: how to design schools so as to compensate for inadequate playground space; how to include school facilities for small children in the design of large-scale housing projects; how to include space for commercial firms in school buildings to facilitate on-the-job training for pupils.

The initial cost of the study, $150,000, is being met in part by a $75,000 grant from the Educational Facilities Laboratory established by the Ford Foundation. The investigation is in charge of Herbert A. Landry, director of educational program research and statistics for the Board of Education, under the direction of David H. Moskowitz, associate superintendent of schools in charge of the Division of Housing. Among the technical consultants is Michael L. Radoslovich, director of architecture in the Board's Bureau of Construction.



Chauncey L. Williams compares the current Sweet's Catalog Files at left with those of 1927. Mr. Williams, recently appointed vice chairman of F. W. Dodge Corporation, has been succeeded as executive vice president and general manager of Sweet's, a division of Dodge, by J. T. Little

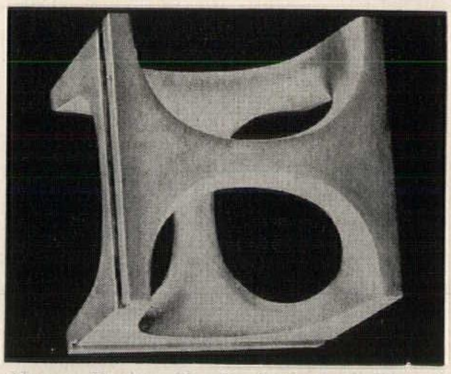
Winners

RICHARD J. NEUTRA, awarded the Grand Cross of Merit of the German Federal Republic, for "his unceasing interest in Germany and his vital influence on modern German architectural development." . . . JOHN HARO, A.I.A., of Albert Kahn Associated Architects & Engineers, chosen by Harvard's Graduate School of Architecture and Design to receive the 1959-60 Arthur W. Wheelwright Fellowship. . . . PERRY E. BORCHERS, associate professor of architecture at Ohio State, awarded the McKim Traveling Scholarship by Columbia's School of Architecture. . . . Also honored by Columbia, seven graduates who received William Kinne Fellowships: BERNARD L. BERKOWITZ, ALFRED SZCZEPANSKI, PETER STATEN, SANFORD HIRSHEN, DAVID SCHWERD, PAUL F. LOSI, ALEX MIKHAILIK. . . . At the University of Michigan College of Architecture two fellowships in architecture were awarded: the George G. Booth Traveling Fellowship to KIYOSHI KIKUCHI and the Albert Kahn Graduate Fellowship to NISAN YAUBYAN.

SISTER M. THOMASITA, O.S.F., awarded honorary membership in the Wisconsin Chapter, A.I.A., the first woman to be so honored. . . . BERTHA SCHAEFER, given the annual award of the Decorators Club for her accomplishments in interior design.

Who's Who

WILLIAM F. R. BALLARD of Ballard, Todd & Snibbe, New York architects, elected chairman of the board of directors of the Citizens' Housing and Planning Council of New York, Inc. . . . HAROLD A. MOSHER, elected president of the National Society of Professional Engineers. He is assistant director of engineering, Eastman Kodak Company. Also elected were six regional vice presidents: W. EARL CHRISTIAN, R. KING ROUSE, L. EUGENE EASLEY, BRANDON H. BACKLUND, NOAH E. HULL, GEORGE E. ZELHART. Elected treasurer was RUSSELL B. ALLEN. . . . WALKER LEE CISLER, now president-elect of the American Society of Mechanical Engineers, who is president of the Detroit Edison Company. The vice presidents-elect are: CHARLES H. COOGAN, WILLIAM C. HEATH, DONALD E. MARLOWE, HENRY N. MULLER JR.



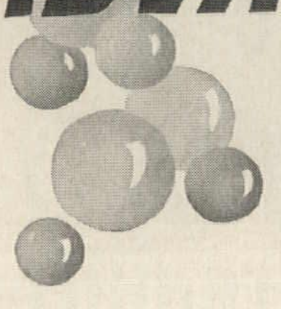
Above: Design No. 5, Sculptural Pierced Walls, by Erwin Hauer, recently received one of three Ninth Annual Design Awards from the Industrial Designers Institute. The modular precast concrete blocks have been used in several buildings, including Chicago Hall at Vassar College, whose architects were Paul Schweikher and Winston Elting (AR, Sept. '59, cover and pp. 183-185). *Below:* A disposable "house" is included in an exhibition of packages on view at the Museum of Modern Art, New York, through November 8. The temporary shelter, 8 ft high, is of solid fiber with a plasticized coating. It was adapted by Joseph F. Kilcullen from a design by Buckminster Fuller for the U. S. Army Quartermaster Corps

Directors-elect are: EVERETT M. BARBER, CLARENCE C. FRANCK, WILLIAM H. LARKIN. . . . JOE B. BROWDER, elected president of the Illuminating Engineering Society. He is sales manager for the Georgia Power Company. Elected vice president and general secretary were JAMES R. CHAMBERS and CHARLES W. McCORMICK. Re-elected treasurer was G. FRANKLIN DEAN. . . . BENJAMIN R. TEARE JR., elected president of the American Society for Engineering Education. Dr. Teare is dean of the College of Engineering and Science of Carnegie Institute of Technology. . . . FRANK A. MARSTON, new president of the American Society of Civil Engineers. He is a partner in the Boston firm, Metcalf & Eddy.

Recently elected officers of the Illinois Society of Architects: MICHAEL F. GAUL, president; CLARENCE J. BONNEVIER, first vice president; DAVID CLARENCE WILSON, second vice president; ALFRED F. SCHIMEK, secretary; CHESTER A. STARK, treasurer; GERALD L. PALMER, executive vice presi-

continued on page 32

ADVANCED IDEAS IN SOAP DISPENSERS



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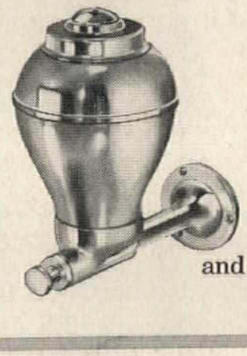
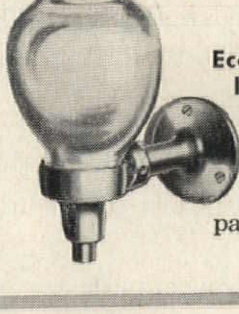


Special vandal-proof top cap makes refilling easy! Unbreakable, rich chrome-plated container. A push of the button delivers a measured amount of soap. *Model M-807-MJ* for wall mounting available in liquid and lather types. Capacity, 16 oz.

New nonbreakable polyethylene container for lavatory mounting. Now available on all Watrous-concealed, lavatory-mounted dispensers. Top filling, no chance for breakage, no need to remove container. *Model M-801-P* with all exposed parts heavily chrome-plated. Liquid and lather types; metal containers where desired.



Economical, always dependable liquid soap dispenser for wall mounting. Push-up type. *Model M-815* furnished with either clear glass or chrome-plated metal container. Capacity: glass, 12 oz.; metal, 16 oz.

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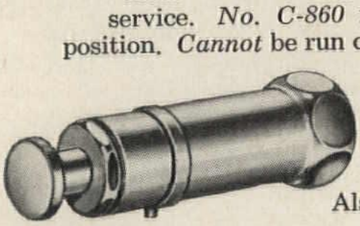

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Miscellany

continued from page 28

dent; WILLIAM NICOLAI and BENJAMIN F. OLSON, directors. . . . New officers of the T-Square Club of Philadelphia: JACK A. THALHEIMER (former president), chairman of the board; LYLE F. BOULWARE, president; FREDERICK M. PYLE, vice president; ROBERT STROUPE, secretary; ALLAN A. TRAVIS, treasurer. . . . Officers elected by the Michigan Engineering Society: JOSEPH E. WILBUR, president; RUSSELL E. HARRISON, vice president; DUDLEY NEWTON, secretary; ALFRED K. MARTIN, treasurer; WILLIAM C. GIBSON, director at large; FRANK N. SANFORD, past president. . . . Named by the Gulf Institute of Consulting Engineers: ALFRED G. RAYNER, president; T. EDWARD ERNST, first vice president; B. M. DORNBLATT, second vice president; JOHN P. JONES, secretary-treasurer.

A. T. LIU, appointed dean of the College of Engineering, Detroit Institute of Technology. Dr. Liu has been with Giffels & Rossetti, Detroit architects and engineers. . . . JAMES S. ACKERMAN, architectural historian, whose appointment as professor of fine arts at Harvard is to become effective next July 1. . . . HIDEO SASAKI, who recently was promoted to professor of landscape architecture at Harvard; he is chairman of the department. . . . JOSEPH A. BERETTA, appointed lecturer in architecture at the Rhode Island School of Design. He is a member of the Providence firm, Robinson, Green & Beretta. CHARLES B. FINK, of the same firm, was appointed instructor in architecture at the school. . . . JANE D. SPOORE, who has retired as librarian of the School of Architecture, Rensselaer Polytechnic Institute, after 30 years.

CHARLES F. MURPHY, right, partner in the Chicago architectural firm, Naess & Murphy, receives the Building Stone Institute's 1959 award for outstanding contributions to architecture through the creative use of stone. Presenting the award is P. J. Valentine, left, president of B.S.I. Looking on is Miles W. Beatty, center, Midwest regional vice president of F. W. Dodge Corporation, who was principal speaker

more news on page 36


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Personal Triumph

of an Architect - Client team

WHEN an architect and a client design and authorize a modern curtain wall, they think in values more significant than so many cubic feet of space at the lowest possible dollar . . .

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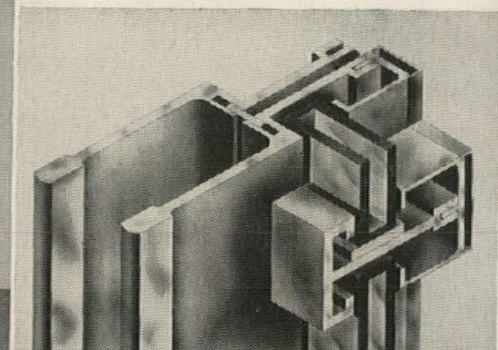
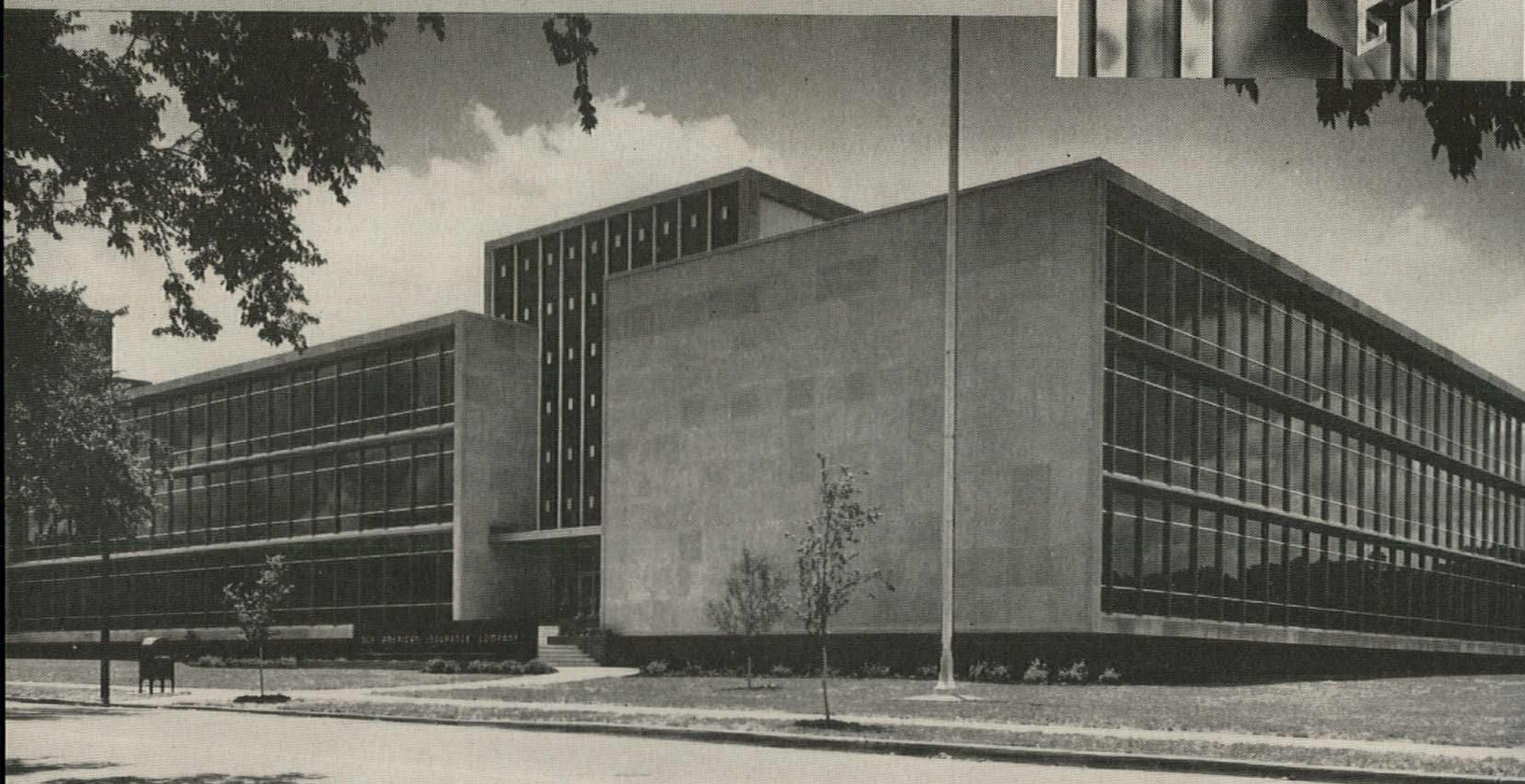
Each project is a challenge to new concepts . . . of beauty that can lift human spirits . . . of lightness and freedom in place of massive structures for which the need has passed. And more than ever before, the designer can achieve the cheerful stimulus of abundant sunshine, and the control and tempering of Nature's elements to provide a pervading sense of well-being.

Through more than 50 years Benson has built an effective combination of men, materials and manufacturing resources to help translate visions like these into realities.

Giving tangible and permanent expression to the ideals of the Old American Insurance Company, their new Home Office in Kansas City is also an outstanding example of originality and excellence in curtain wall design.

Deeply finned split mullions combine narrow sight lines with the strength to support shop assembled wall units 6' 0" wide by 12' 0" high. Central panels of high insulating glass are 6' 0" by 6' 9".





Architects: VOSKAMP & SLEZAK   Contractor: PATTI CONSTRUCTION COMPANY   Curtain Walls: BENSON MANUFACTURING COMPANY

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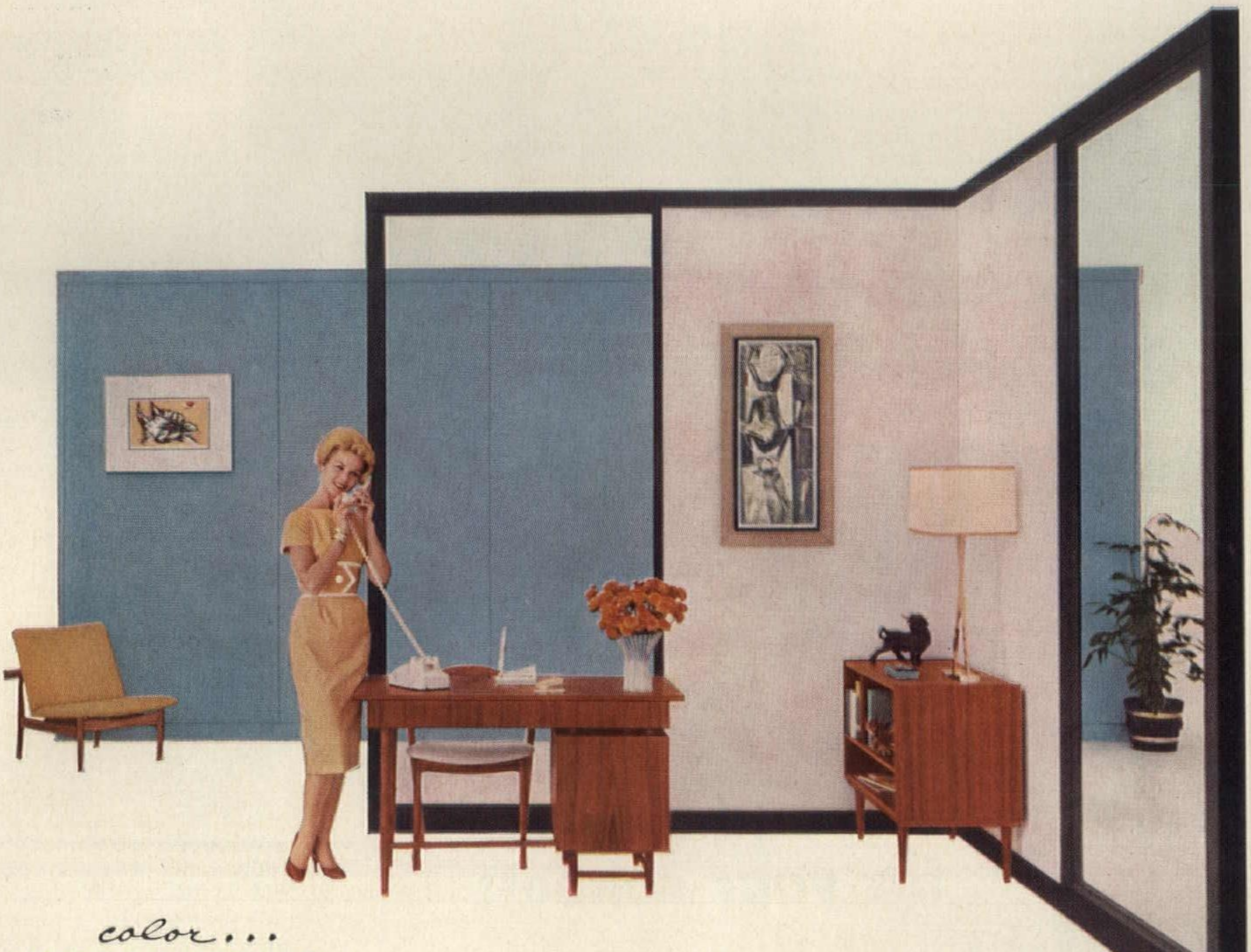
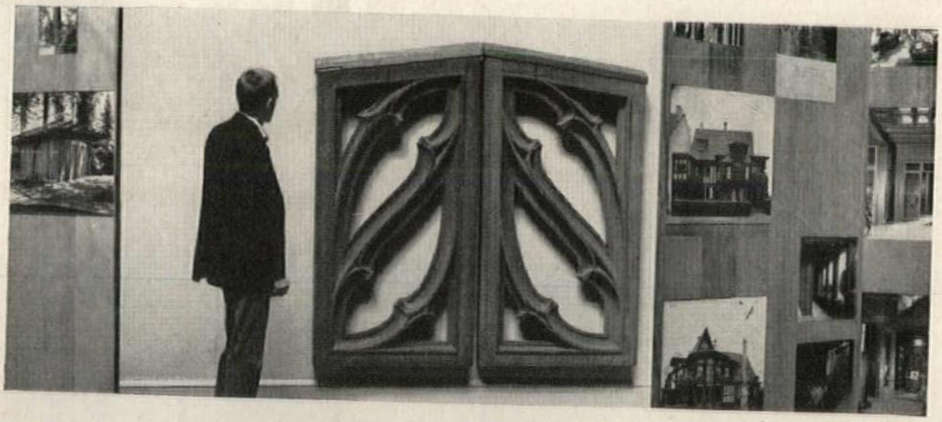
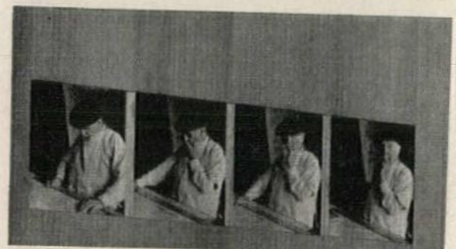


Work of Maybeck is Subject of Exhibit to Tour Country

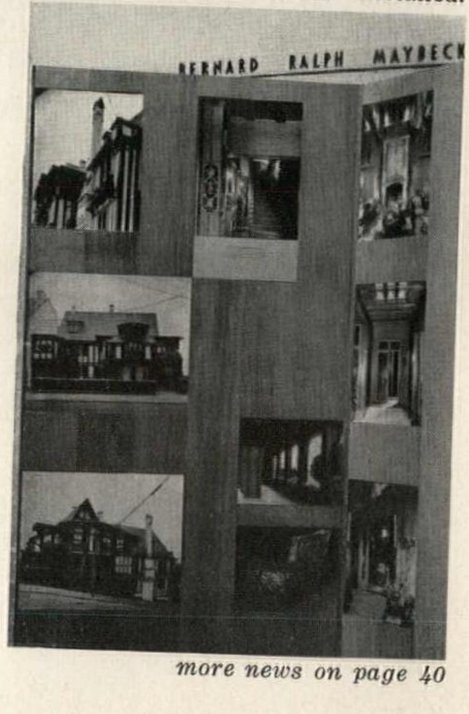


"The Architectural Genius of Bernard Ralph Maybeck" is the subject of a photographic exhibition first shown in California in March. After showings at the University of California and Stanford University, the exhibit is touring the United States and Canada under the sponsorship of the Smithsonian Institution's National Collection of Fine Arts traveling exhibition service.

The exhibit is sponsored by the College of Architecture of the University of California, where Maybeck was the first instructor in 1898, the California Palace of the Legion of Honor, and the California Redwood Association. Roy Flamm of San Francisco was the photographer; Jack Hillmer, lecturer in architecture at the University, designed the exhibit.



Ten buildings by Maybeck—who died in 1957 at the age of 95—are shown in 100 photographs on 12 redwood panels. Included are: First Church of Christ Scientist, Berkeley (1910); Palace of Fine Arts, San Francisco (1915); Hearst Women's Gymnasium, Berkeley. The gilded gates of carved wood shown in top cut were originally intended for the entrance to the Christian Science Church, but were never installed.



more news on page 40

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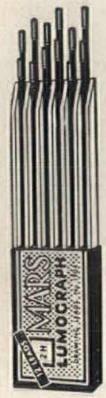
This ingenious departure from precedent is another example of the contribution today's designers are making. In translating their pace-setting ideas from concept to reality they require the best of drafting tools.

In pencils that means MARS, long the standard of professionals.



Among the famous imported Mars drafting products are: **Left** – 1001 Mars-Technico push-button lead holder. **Above** – 1904 Mars-Lumograph drawing leads, 18 degrees, EXB to 9H. **Below** – 2886 Mars-Lumograph drawing pencils, 19 degrees, EXEXB to 9H; 2830 Mars-Lumograph Duralar–for drafting on Mylar®-base tracing film – 5 special degrees, K1 to K5; Mars-Lumochrom colored drawing pencils, 24 shades. **Not shown** – Mars Pocket-Technico for field use; Mars pencil and lead sharpeners; Mars Non-Print pencils and leads.

Mars Products are available at better engineering and drafting material suppliers.

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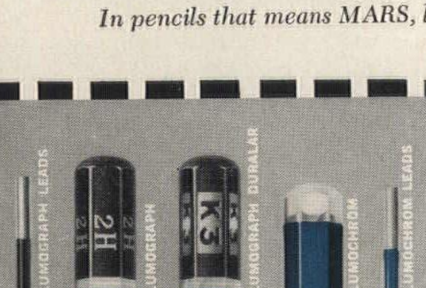
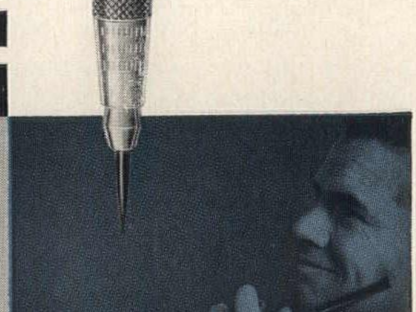


for the man who's going places . . .



the pencil that's as good as it looks **MARS**

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New Michigan Church Uses Norton Closers Throughout

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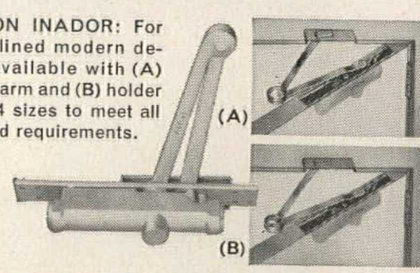
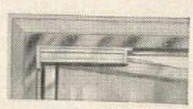
Complete Norton Line Meets Every Door Closer Need

NORTON INADOR: For streamlined modern design; available with (A) regular arm and (B) holder arm...4 sizes to meet all standard requirements.





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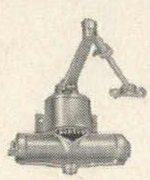

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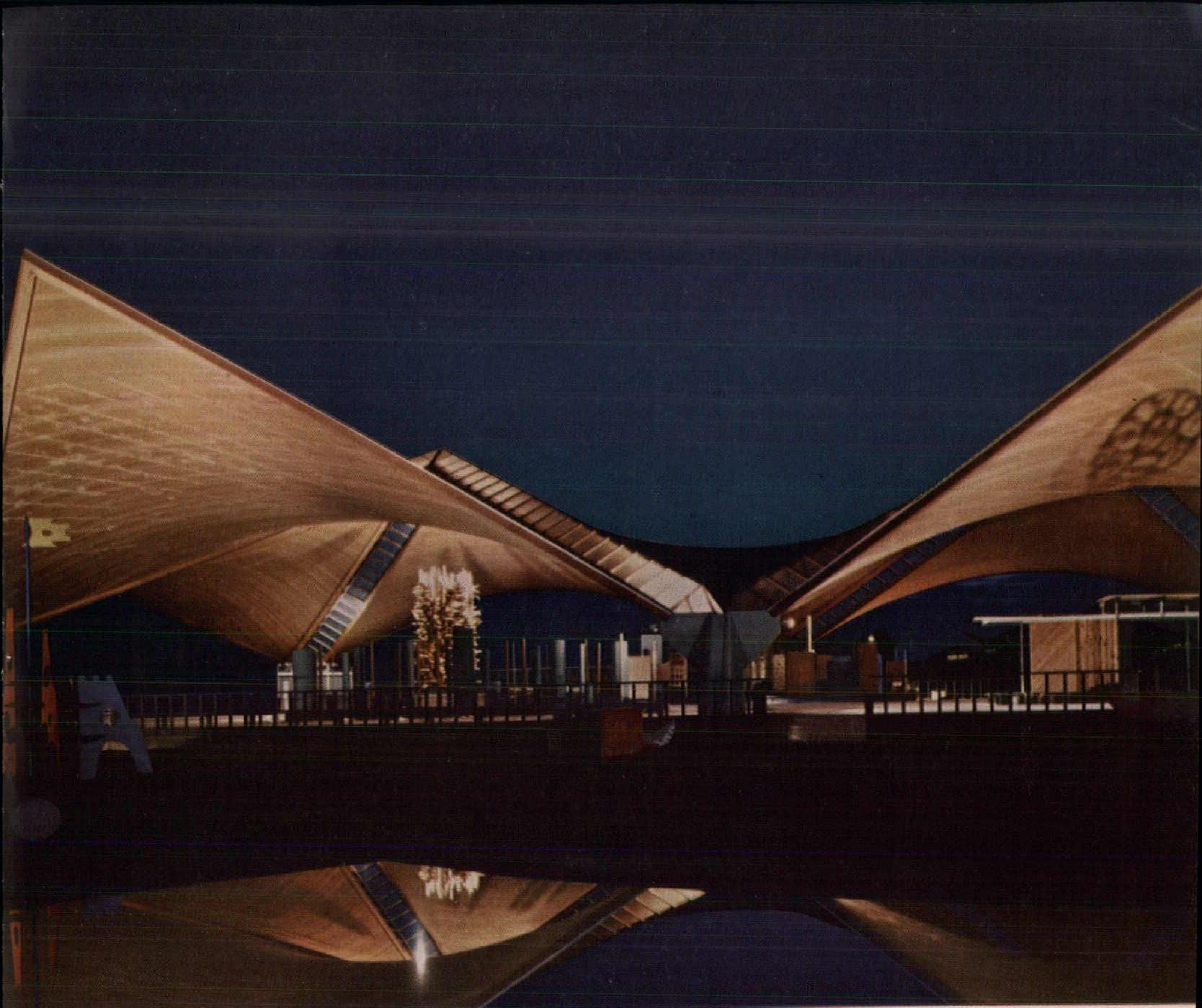

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Forest Products Pavilion ☆ Oregon Centennial Exposition ☆ John Storrs, Architect

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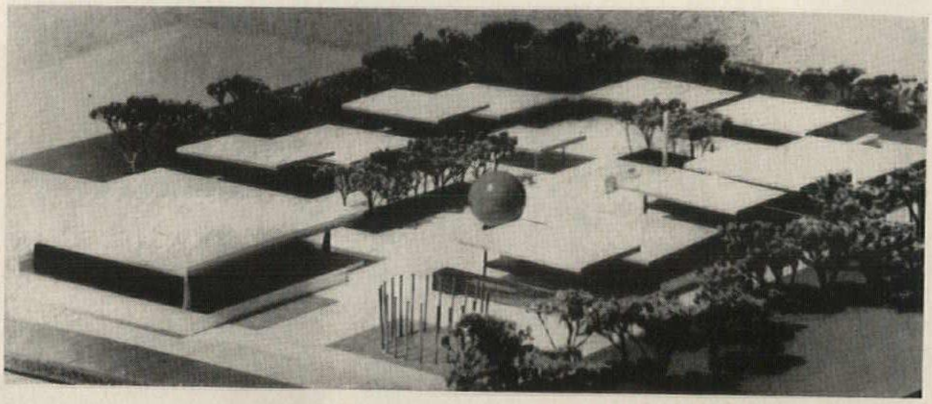
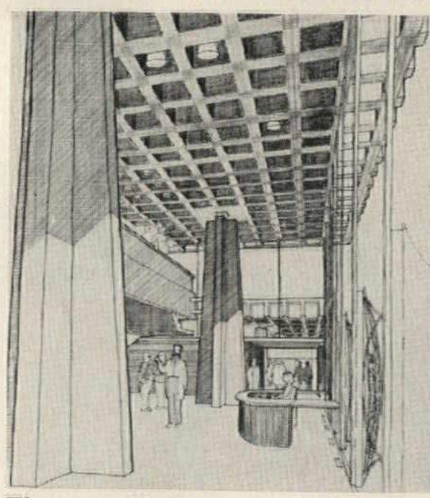
Prototype Exposition Center Wins Paris Prize

Winner of the 46th Lloyd Warren Fellowship, Paris Prize in Architecture, awarded by the National Institute for Architectural Education, was Robert F. Dannenbrink Jr. of Washington University. Mr. Dannenbrink received the $5000 prize for this solution to the competition problem: A United States Permanent World Data Exposition for publicizing the findings of the International Geophysical Year.



Members of the jury were John J. Carlos, Giorgio Cavaglieri, Allen R. Congdon, Arthur S. Douglass Jr., Jose A. Fernandez, Joseph Judge, Gillet Lefferts Jr., Hugh N. Romney, Daniel Schwartzman, Esmond Shaw, and Thorne Sherwood. There were 141 participants of whom 42 from 19 universities were chosen as finalists.

The jury commented that the winning solution "revealed a clean and bold approach to the unusual problem that required permanence, monumentality, and extreme flexibility. Excellent site development related approach by auto or on foot to exhibit areas in a successful manner.



The over-all plan and structural system were well unified. Attractive variety was achieved by changes of level which gave various scales to the enclosed spaces for different exhibit requirements. The jury felt this solution showed scholarly and orderly analysis and revealed a high sense of design accomplishment."

more news on page 44

WEST COAST'S LARGEST OFFICE BUILDING USES COPPER TUBE PLUMBING BY CHASE®

Architect: *Welton Becket & Assoc.* • Mechanical Contractor: *The Scott Co.* • Wholesaler: *Slakey Brothers* • General Contractor: *Robert E. McKee*

The new Kaiser Center office building saves up to 22% on installation time using prefabricated plumbing sections

IN THE SHOP, the Contractor for the Kaiser job prefabricated 354 sub-assembly styles using copper tube by Chase.

ON THE JOB, installation of these sub-assemblies is quick and easy, using solder joints that are leak-proof and pressure-tight.

In the process of installing part of the plumbing—water lines, drainage, waste and vent—in the new Oakland building which will be the headquarters for the world-wide operations of the affiliated Kaiser Companies, the contractor turned to prefabrication of repetitive assemblies, using easily-installed copper tube. The mechanical contractor, Scott Company of Oakland, has pre-assembled a total of 354 styles.

The Scott Company reports that the units were prefabricated in their own shops, then trucked to the job site for installation. They found that off-site prefabrication was easier, and that the solder joints used in joining copper lengths were not subject to damage during transportation. And Mr. Scott estimates that prefabrication of repetitive assemblies can reduce total installation time up to 22% of an on-the-job assembly.

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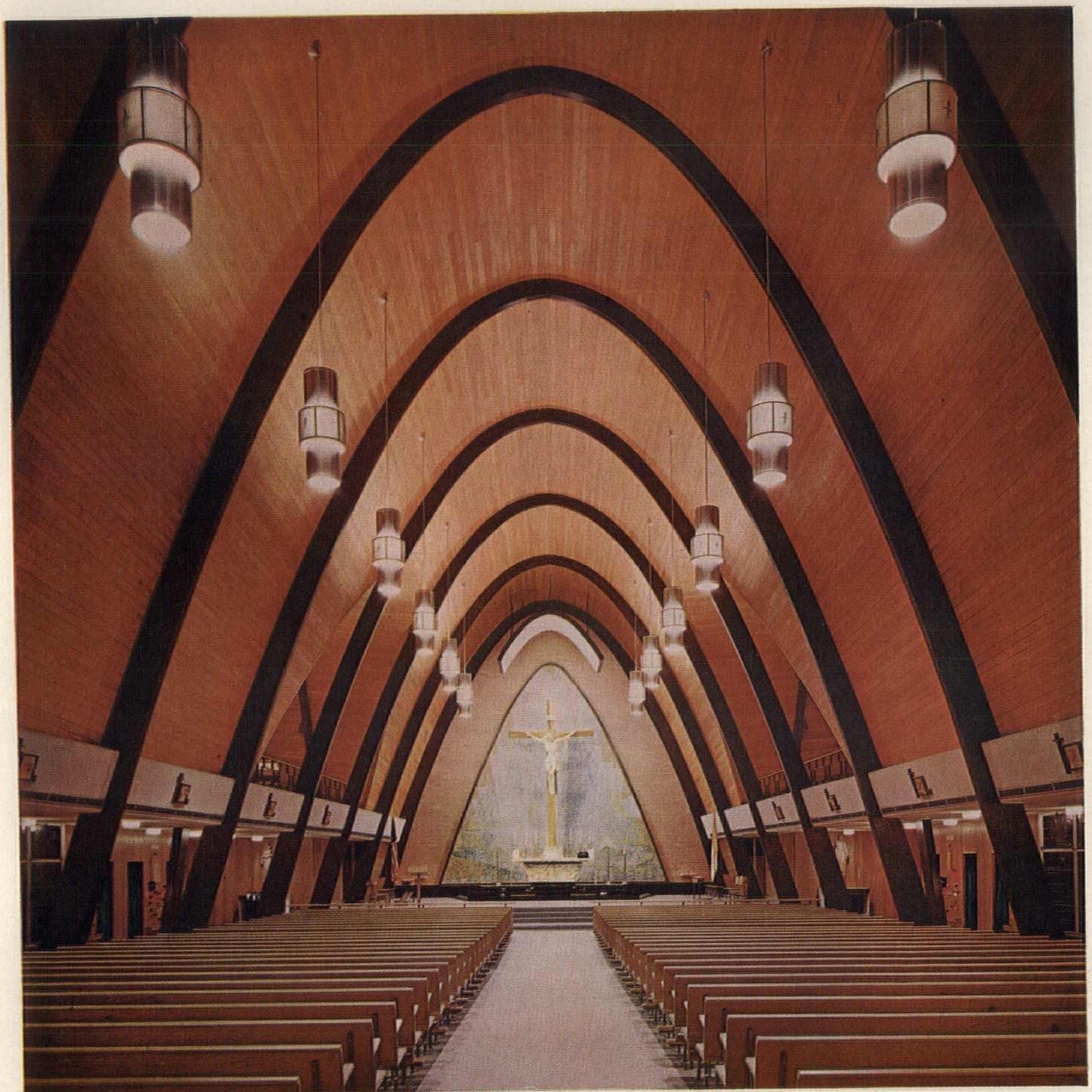

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A Washington Report *by Ernest Mickel*

U. S. SCHOOL HOUSING OFFICIAL CALLS FOR QUALITY SCHOOLS DESIGNED FOR LOCAL NEEDS

The School Housing Section of the U. S. Office of Education (Department of Health, Education, and Welfare) spreads an influence on school construction in this country; this occurs not through direct contact with architects and contractors but through the less direct method of publications on planning and design and consultation with school administrators: information which affects the architect designing the school though in many instances he may not be aware of its source.

Last March the section acquired a new head, John L. Cameron, who came to HEW from North Carolina, where he served with a high degree of success as director of that state's division of school planning. Many of the ideas and programs carried on by his division in North Carolina are now likely to be tested on the national level, but limited appropriations from Congress have foreclosed their immediate application.

One of these which met with the specific approval of architects was the school planning institute, carried forward with the cooperation of the state chapter of the American Institute of Architects. This convened architects, superintendents and school board officials for intimate discussions on all phases of school plant planning and construction.

Wanted: More Local Planning

To widen the exposure, this conference was repeated in two other locations within the state and all those participating agreed this approach to a better understanding of school design and building problems was highly beneficial. It brought the school board member who has to deal with architectural problems into contact with the professional responsible for the design for an exchange of views devoid of actual job pressures.

Mr. Cameron would like to encourage more of these meetings at local levels, sponsored by the states. The difference of local planning conditions makes it imperative, he said, that they be confined largely to personnel from a given area.

Federal Staff Numbers Five

With its present funds, which provide for an executive staff of only five persons, the section carries forward its publications program, which involves periodic issuance of technical pieces designed to assist state school administrators in assisting architects. Mr. Cameron calls this process the supplying of education specifications to the states and their architects so the latter can understand more clearly just what programs the building is to serve.

Some of the publications to date —*School Sites—Selection, Development and Utilization; Planning and Designing the Multi-purpose Room in Elementary Schools; The Secondary School Plant;* and *Administrative Facilities in School Buildings.* Presently in preparation is a volume on designing the elementary classroom, covering facilities for kindergarten through grade 3. This is expected to be available by the end of 1959. Also coming are publications on building codes and on school plant management and maintenance as well as building insurance, including construction insurance. The latter is expected to be off the presses in early spring 1960.

James L. Taylor, the section's specialist on school plant planning, authors a heavy share of the publications. He is now conferring with elementary school experts on the material for the booklet on design of lower grade classrooms.

The position of associate chief of the SHS remains open with the resignation this summer of Dr. Nelson E. Viles, but Mr. Cameron expected to have it filled shortly. Other specialists on the staff are Ralph N. Finchum, school plant, and W. Edgar Martin, school finishing and equipment.

The Concern Is Quality

Mr. Cameron brings to the section a philosophy of guidance rather than direction as far as the designing of school buildings is concerned. Like many others in the field, he is very much concerned that the current pressures for more school capacity in a hurry could lead to hasty, ill-conceived planning with a deplored result—school slums tomorrow.

This point was touched on at a Conference on School Facilities held in Washington, D. C., last May which developed in some detail the purposes, functions and future hopes of the SHS. The two-day meeting convened state school officials, consultants, trade association people, architects and others for a close look at problems of school plant. The prime objective was to determine ways in which the section could give its most effective assistance on these problems. It served largely as a guide to Mr. Cameron and his staff in planning the future course.

A Brief for Architecture

A recent paper by Mr. Cameron delivered at a meeting of the association of county commissioners in Asheville, N. C., gives an insight into his own beliefs. For one thing, he urged avoidance of stock plans. On this he observed:

"While there are similarities, the planning of each school building project is a different problem. Orientations are different; site topographies and shapes are different; access roads and streets are different; the availability and location of utilities are different. Most important, a school building should be designed to accommodate the educational program as a particular community has determined its needs and wants. The building should also be a source of pride to the community."

He pointed out that the use of stock plans makes it next to impossible to properly utilize newly developed building materials and techniques. He also noted that adequate inspection of a building while it is under construction is of vital importance and said it should be inspected by the individual or firm responsible for its design. This would be impractical, he added, if stock plans were used.

The Cameron advice as voiced in the Asheville speech included this:

"Choose professional help with care. This applies to educational consultants, architects, engineers, and legal counsel. Complete plans which are easily understood usually result in more favorable bids. It should be noted that at times low bids are received on incomplete plans simply because some contractors have learned that they can get by with inferior materials and workmanship under such circumstances. Complete plans and specifications are necessary to get the quality building desired and

continued on page 399

See how **Curon** wall covering fits the curved wall of this RCA showroom in Rockefeller Center. It decorates while it sound conditions. Flexible Curon also covers any flat surface beautifully. Many colors. Many shapes—easily cut to size.

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In the Susan Palmer Restaurant, New York, Curon wall covering quiets clatter and chatter, creates a charming setting with gaily silk-screened panels like this.

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Need for More School Building Reiterated by U. S. Officials

The education of an estimated 10 million pupils is being impaired through lack of adequate classroom space as the 1959-60 school year gets underway. At any rate, this is the estimate of the U. S. Office of Education, which again has called attention to the pressing need for more school construction.

The need was re-emphasized in this statement by Dr. Arthur S. Flemming, Secretary of Health, Education, and Welfare: "Considered from any standpoint, the United States cannot afford the persistent drag of the classroom shortage on its defense capacity and its further cultural and economic development."

The assertion came in connection with Dr. Flemming's explanation of his department's estimate of the number of children in overcrowded classrooms.

In the fall of 1958, there were 1,232,667 classrooms in public elementary and secondary schools in the continental U. S., according to Office of Education totals. (The figure includes 0 of E estimates for non-reporting states.) More recent reports from state education agencies indicate that elementary and secondary school enrollments were 1,843,000 in excess of normal school capacity last year. "We know on the basis of enrollment and construction estimates," Dr. Flemming said, "that the situation has not changed substantially since that time."

Overcrowding Major Factor

Here is how the Office of Education arrived at the estimate that some 10 million pupils remain ill-housed in the public school system:

On the basis of incomplete statistics it found that the education of at least eight million was being "hampered" by classes too large in numbers. One factor in this conclusion was the National Education Association study showing that of 12,386,347 pupils enrolled last year (this was over one third of total elementary and secondary school enrollment), there were 6,797,548, or 54.9 per cent, in classes exceeding 30 pupils.

The number of classes attended by these youngsters totaled 195,355. Figured at 30 pupils each, this number of classes would have represented more than 5.9 million enrollees.

"Thus, while less than a million pupils would be figured as enrolled in excess of capacity by the usual standards, in reality nearly seven million pupils in these classes would be handicapped in greater or lesser degree by the too-large classes," Secretary Flemming reasoned.

Adding the 5.9 million urban elementary pupils affected only by overcrowding to the 1.8 million pupils enrolled in excess of capacity, the Office reached the conclusion that approximately eight million were enrolled in excess of capacity.

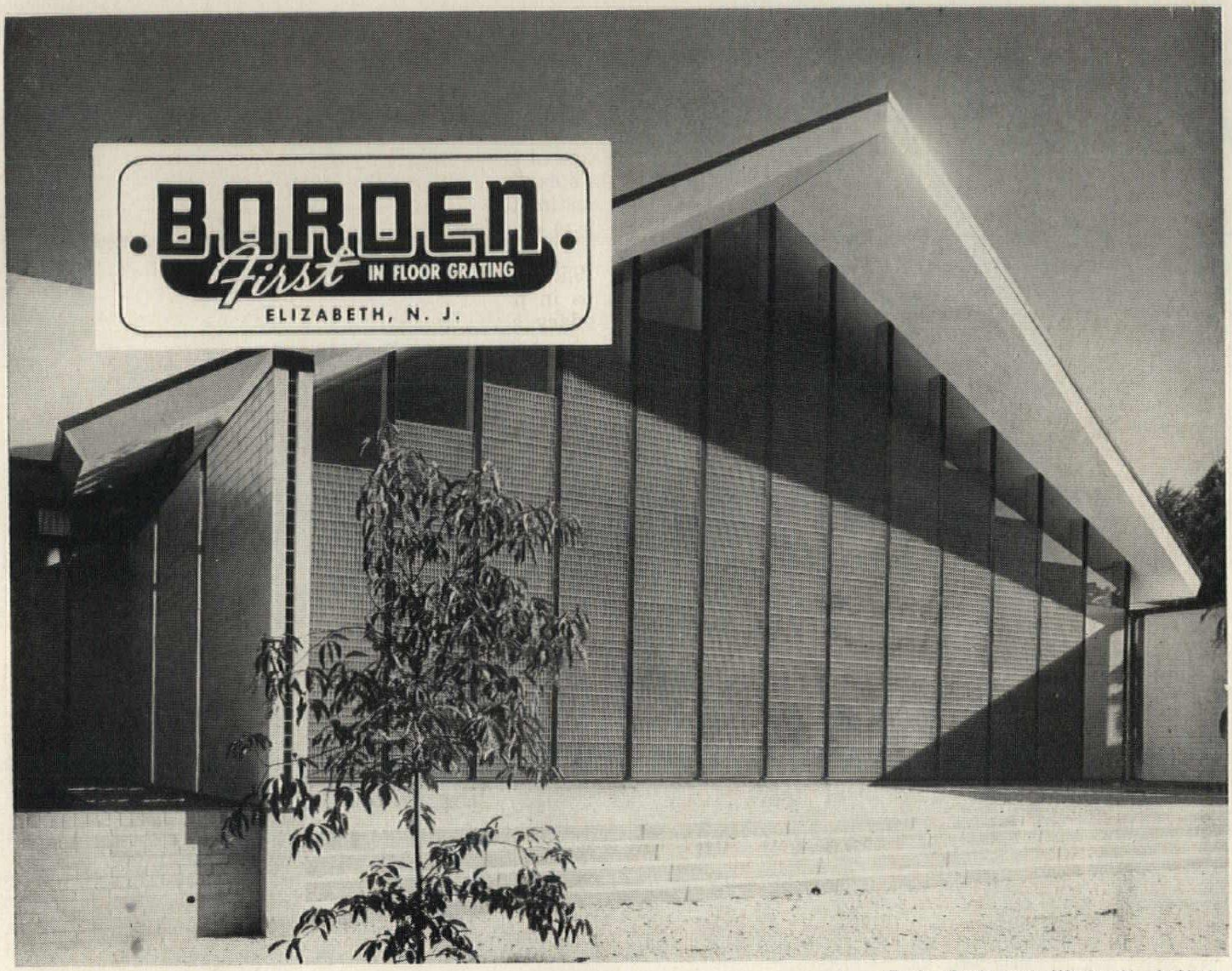
This was not the whole story of classroom shortages, however.

Inadequate Buildings Cited

In addition to those reported as excess in the national study, the Office believes that another two million pupils are housed in obsolete or otherwise inadequate buildings. Thus the conclusion that around 10 million boys and girls are undergoing education "impaired in varying degrees" by the classroom shortage.

At about the same time, HEW put out its annual school and college enrollment estimates for 1959-60. Not surprisingly at all, another increase was shown, the 15th succes-

continued on page 354



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Installation of the grating, which was made with special spacing and in panel sizes to meet the architect's specifications, was simple and quick. The panels were supplied with lugs welded to the grating in such a way as to easily slip into pre-drilled holes in the mullions.

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See Sweet's Architectural File Sec. 5B.

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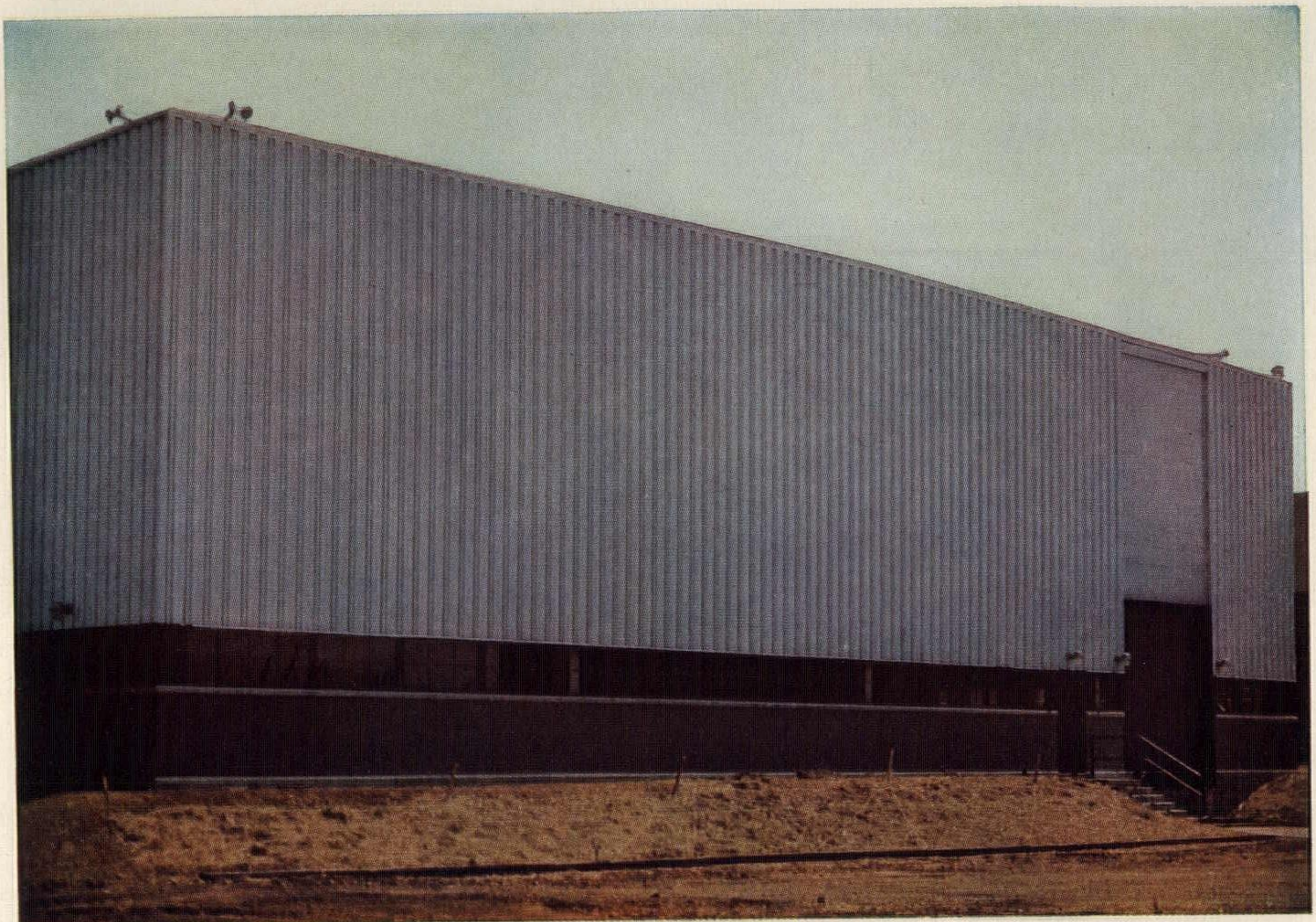

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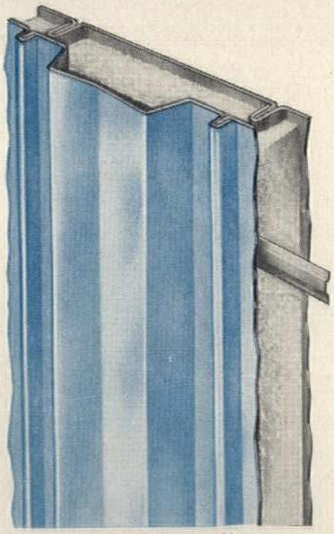
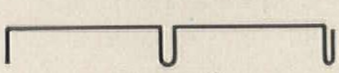


Shadowall

Contourwall



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EGSCO curtain walls are available in these three patterns. The building pictured is "Shadowall". Interior walls can be furnished with flush panels both sides, with or without insulation.

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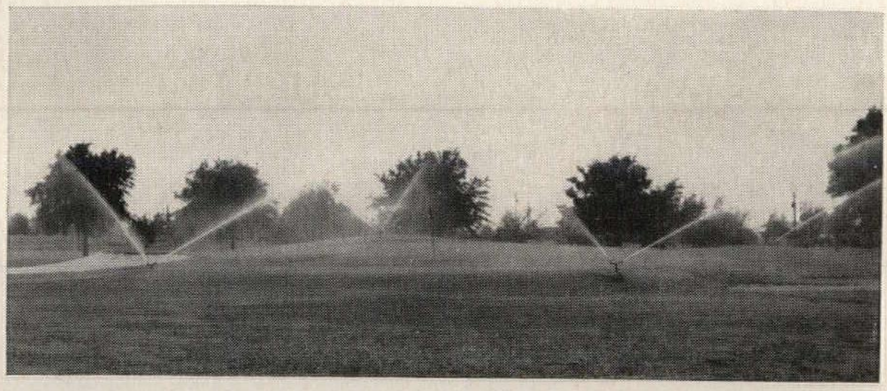

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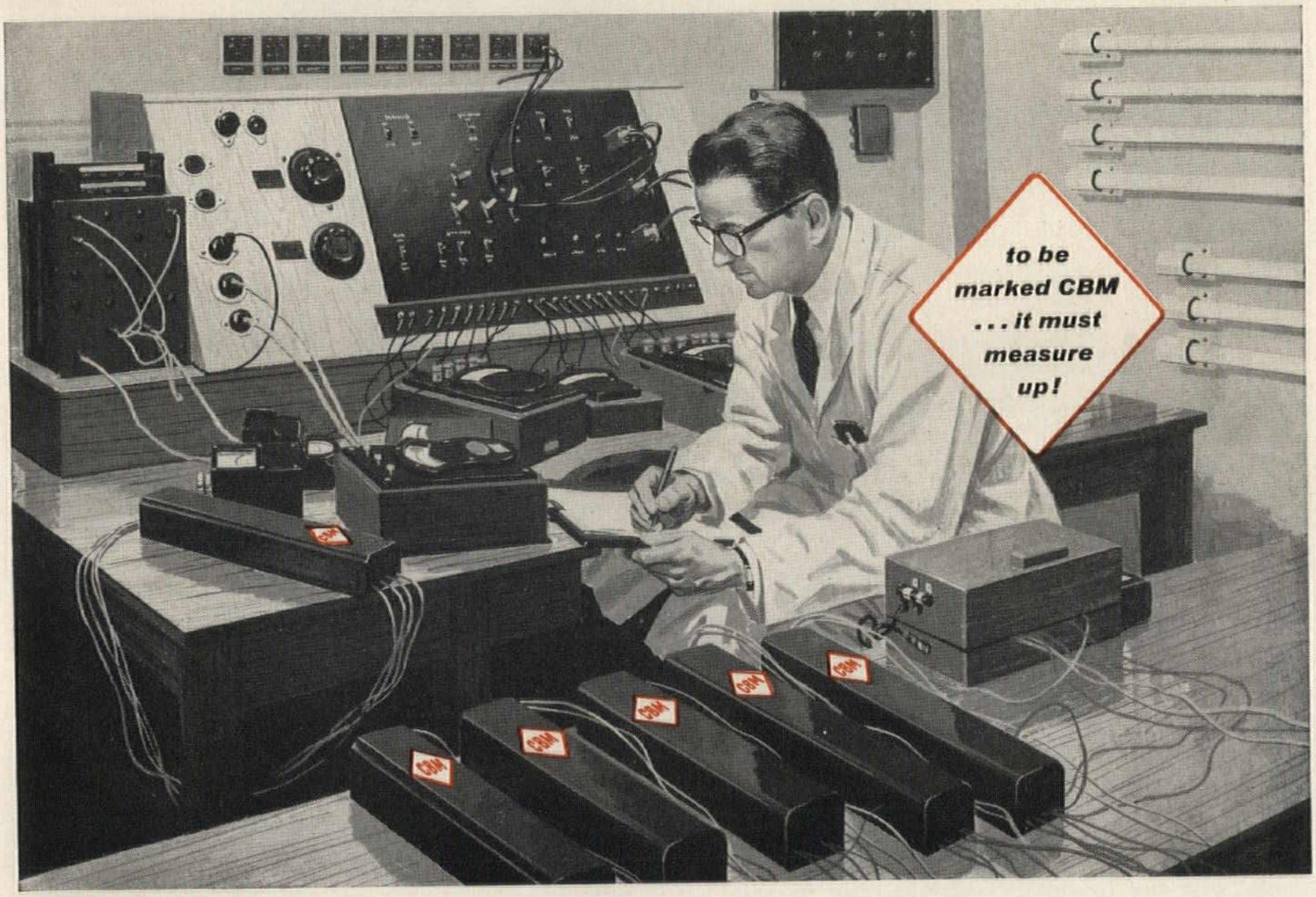

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In the intervening years, no fewer than 84 concrete frame projects were completed or in partial operation. They provided housing for 95,454 families. And thanks to concrete, it is estimated the Housing Authority saved no less than $66,000,000!

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New York's Woodrow Wilson Houses. Architect: Pomerance & Breines, New York, N.Y. Structural Engineer: James Ruderman, New York, N.Y. Contractor: Leon D. DeMatteis Construction Company, Elmont, Long Island, N.Y.

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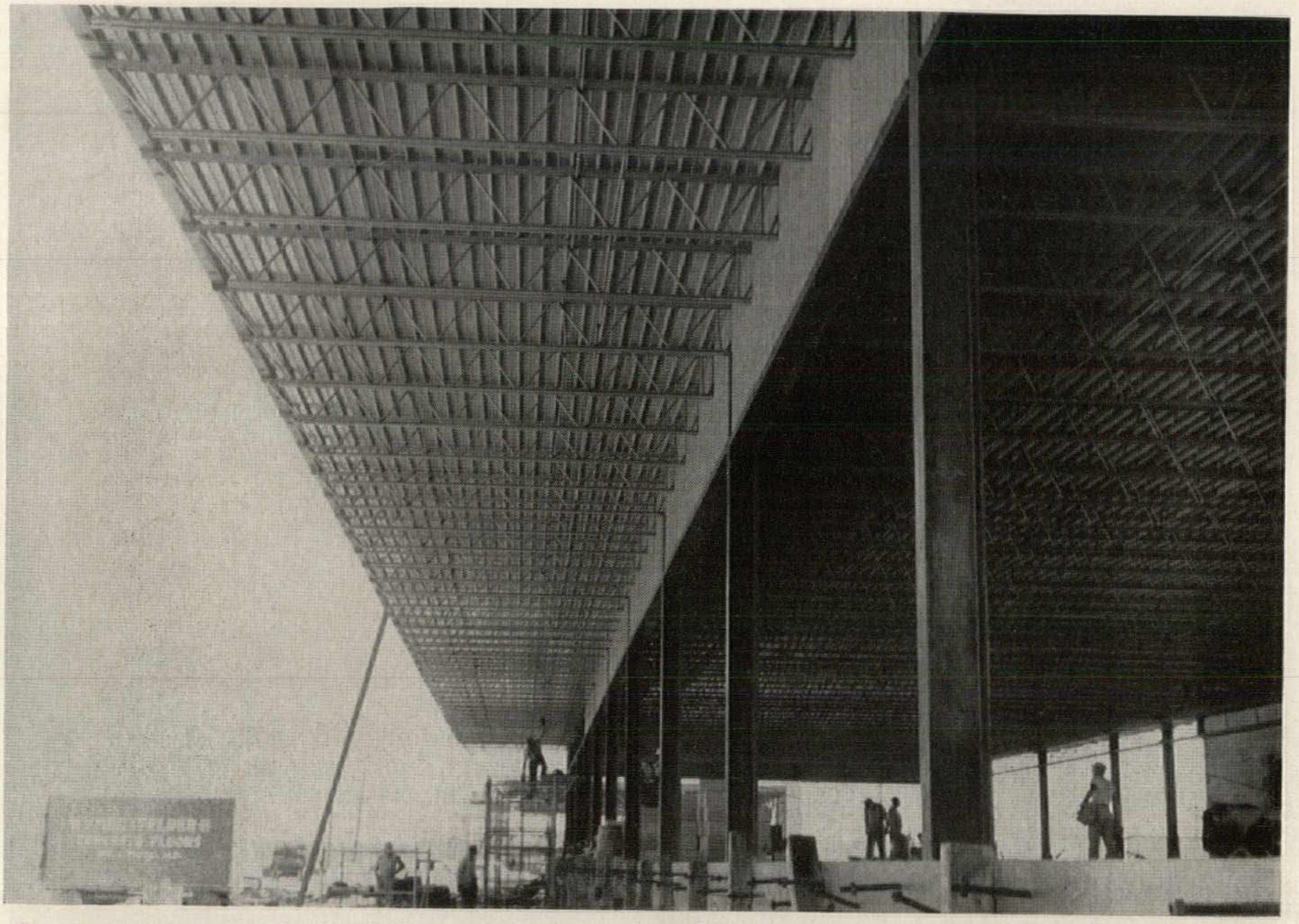

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Construction Cost Indexes

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc. Inc.

Labor and Materials: U.S. average 1926-1929=100

	NEW YORK					ATLANTA				
PERIOD	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel	RESIDENTIAL Brick	RESIDENTIAL Frame	APTS., HOTELS, OFFICE BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Concrete	COMMERCIAL AND FACTORY BLDGS. Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6	82.1	80.9	84.5	86.1	83.6
1935	93.8	91.3	104.7	108.5	105.5	72.3	67.9	84.0	87.1	85.1
1939	123.5	122.4	130.7	133.4	130.1	86.3	83.1	95.1	97.4	94.7
1947	219.3	222.0	207.6	207.5	203.8	180.4	184.0	158.1	157.1	158.0
1948	250.1	251.6	239.4	242.2	235.6	199.2	202.5	178.8	178.8	178.8
1949	243.7	240.8	242.8	246.6	240.0	189.3	189.9	180.6	180.8	177.5
1950	256.2	254.5	249.5	251.5	248.0	194.3	196.2	185.4	183.7	185.0
1951	273.2	271.3	263.7	274.9	271.8	212.8	214.6	204.2	202.8	205.0
1952	278.2	274.8	271.9	265.2	262.2	218.8	221.0	212.8	210.1	214.3
1953	281.3	277.2	281.0	286.0	282.0	223.0	224.6	221.3	221.8	223.0
1954	285.0	278.2	293.0	300.6	295.4	219.6	219.1	233.5	225.2	225.4
1955	293.1	286.0	300.0	308.3	302.4	225.3	225.1	229.0	231.5	231.8
1956	310.8	302.2	320.1	328.6	324.5	237.2	235.7	241.7	244.4	246.4
1957	318.5	308.3	333.1	345.2	339.8	241.2	239.0	248.7	252.1	254.7
1958	328.0	315.1	348.6	365.4	357.3	243.9	239.8	255.7	261.9	262.0
May 1959	340.9	326.5	364.9	385.5	371.4	250.7	246.6	263.6	270.1	271.6
June 1959	344.2	331.0	369.8	388.5	376.9	250.9	246.8	263.9	270.3	271.8
July 1959	344.2	331.0	369.8	388.5	376.9	254.9	249.9	269.5	276.2	276.2
	% increase over 1939					% increase over 1939				
July 1959	178.7	170.4	182.9	191.2	189.7	195.4	200.7	183.4	183.6	191.6

	ST. LOUIS					SAN FRANCISCO				
1930	108.9	108.3	112.4	115.3	111.3	90.8	86.8	100.6	104.9	100.4
1935	95.1	90.1	104.1	108.3	105.4	89.5	84.5	96.4	103.7	99.7
1939	110.2	107.0	118.7	119.8	119.0	105.6	99.3	117.4	121.9	116.5
1947	202.4	203.8	183.9	184.2	184.0	193.1	191.6	183.7	186.8	186.9
1948	227.9	231.2	207.7	210.0	208.1	218.9	216.6	208.3	214.7	211.1
1949	221.4	220.7	212.8	215.7	213.6	213.0	207.1	214.0	219.8	216.1
1950	232.8	230.7	221.9	225.3	222.8	227.0	223.1	222.4	224.5	222.6
1951	252.0	248.3	238.5	240.9	239.0	245.2	240.4	239.6	243.1	243.1
1952	259.1	253.2	249.7	255.0	249.6	250.2	245.0	245.6	248.7	249.6
1953	263.4	256.4	259.0	267.0	259.2	255.2	257.2	256.6	261.0	259.7
1954	266.6	260.2	263.7	273.3	266.2	257.4	249.2	264.1	272.5	267.2
1955	273.3	266.5	272.2	281.3	276.5	268.0	259.0	275.0	284.4	279.6
1956	288.7	280.3	287.9	299.2	293.3	279.0	270.0	288.9	298.6	295.8
1957	292.0	283.4	295.2	307.1	302.9	286.3	274.4	302.9	315.2	310.7
1958	297.0	287.9	304.9	318.4	313.8	289.8	274.9	311.5	326.7	320.8
May 1959	306.3	296.9	316.3	332.0	326.0	296.4	281.8	319.2	334.4	327.1
June 1959	306.3	296.9	316.3	332.0	326.0	298.3	285.0	320.8	334.7	327.9
July 1959	306.9	297.5	317.0	332.0	326.0	298.3	285.0	320.8	334.7	327.9
	% increase over 1939					% increase over 1939				
July 1959	178.5	178.0	167.0	177.1	173.9	182.5	187.0	173.2	174.6	181.4

Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

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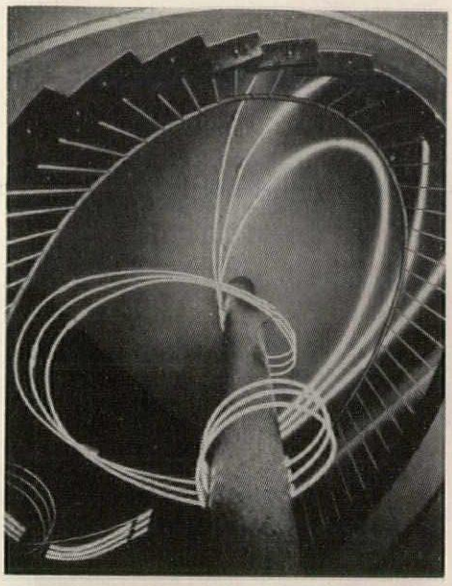


A Lighting Engineer Explains Lighting as Art and Science

LIGHTING IN ARCHITECTURE: LIGHT AND COLOR AS STEREOPLASTIC ELEMENTS. *By Walter Köhler. Pictoral Narrative by Wassili Luckhardt. Translated from* Lichtarchitektur *by Bertrand Languages, Inc. Reinhold Publishing Corp., 430 Park Ave., New York 22. 223 pp., illus. $15.*

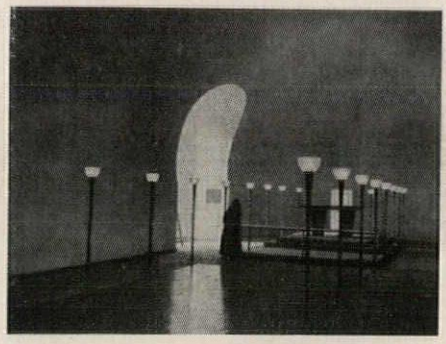
BY SEYMOUR HOWARD, A.I.A.
Associate Professor of Architecture, Pratt Institute

As an illuminating engineer, Walter Köhler would like the architect to "tell him what spatial effect he has in mind, and then he will report how that effect can be furthered by means of light." As a man interested in the interrelationship of art, technique, science, and philosophy, he has encouraged such collaboration by writing this excellent book. It could serve as a model of the type of exposition which all technical specialists should make to explain their own fields to architects and to laymen.

The book is divided into three parts. For the first, a section of "pictorial narrative," Dr. Köhler's architectural collaborator, Wassili Luckhardt, has chosen 103 photographs, including 10 in color, and has written a page of introduction and a series of brief captions which are not quite sufficient to sustain the "narrative." The reader is left perhaps too much to his own devices, since photographs can never give the true effect of an architectural design. A sequence of photographs of a single building would come closer to recreating the impressions of someone walking through.

In the second section Dr. Köhler draws on the sensitive and poetic observations of Goethe's *Entwurf einer Farbenlehre,* as well as the quantitative studies of the physicists and physiologists, to relate science to art in presenting today's theories of illumination. The recommended German standards for the daylighting of residential rooms are of considerable interest for possible building code requirements. For artificial lighting he lists as his criteria: adequate intensity (foot candles), uniformity, variety (shadows and angle of incidence), color, and freedom from glare.

Examples of lighting as a "tool for working" in such spaces as factories, drafting rooms, schools, offices, and salesrooms and as an important esthetic element in the design of museums, theaters, houses, and churches are given in detail in the third section. Many additional photographs are included for discussion. Dr. Köhler is a sensitive critic of some of the effects produced. In writing of



the effort to free ecclesiastical structures from traditional patterns, he finds "they frequently reveal the absence in 'modern' Christianity of a spiritual theme stimulating the architect's creation."

Although he recognizes the need for quantitative analysis and the measurement of as many aspects of lighting as possible, he emphasizes that technique is art and that art is the unfolding of hidden beauty. One is left with the feeling that much more collaboration between illuminating engineers and architects in the early, creative stages of design is needed to unfold the beauty hidden in modern lighting. Dr. Köhler and many other illuminating engineers stand ready for this collaboration. Where are the architects?

New Edition of Lighting Book

I.E.S. LIGHTING HANDBOOK. *Illuminating Engineering Society, 1860 Broadway, New York 23. About 1000 pp., illus. (3rd ed.). $10.*

Perret and Concrete

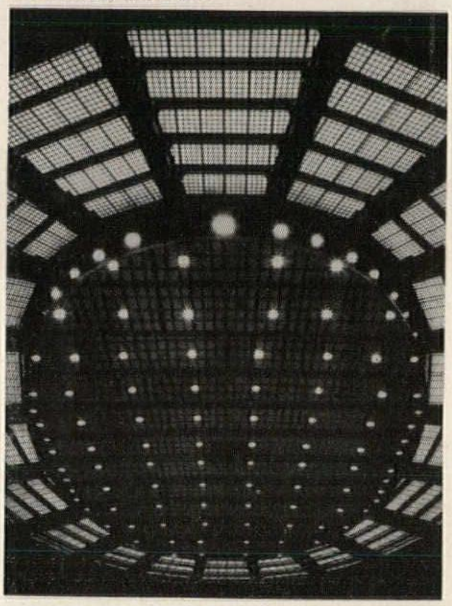
CONCRETE: THE VISION OF A NEW ARCHITECTURE. *By Peter Collins. Horizon Press, 220 W. 42nd St., New York 36. 307 pp. plus 104 plates. $12.50.*

The title is too sweeping for a book whose sub-title, "A Study of Auguste Perret and His Precursors," is more indicative of the contents, especially from a limitative point of view. In the light of the many and various structures in concrete built since the end of the war, the present book and its hero inevitably seem almost anachronistic. Yet this study does offer an excellent opportunity to re-evaluate the more malleable manifestations of the architecture of the last decade or so, in relation to its immediate past, or at least that aspect of the period dominated by the distinctive style of Perret and his followers. To put it perhaps too bluntly, Mr. Collins shows little sympathy for concrete architectural styles that do not conform to the Perret idiom, yet it is the resulting, lightly used iconoclastic touch that gives this volume a personal quality as well as a particular, if restricted, value.

The book is in three sections: "The Discovery of a New Material" treats the prehistory of the subject, one which inevitably is concerned as much with builders and contractors

continued on page 414
another book on page 406

From *Lighting in Architecture:* three illustrations. *Left:* Stairwell lighting: spiral staircase, film studio, Hanover; D. Oesterlen, architect. *Center:* Like form, like attitude: Grace Chapel, Köln-Kalk; R. Schwarz, architect. *Below:* Transparency through light: ceiling, Westphalia Hall, Dortmund; W. Höltje, architect



engine power
BY CATERPILLAR

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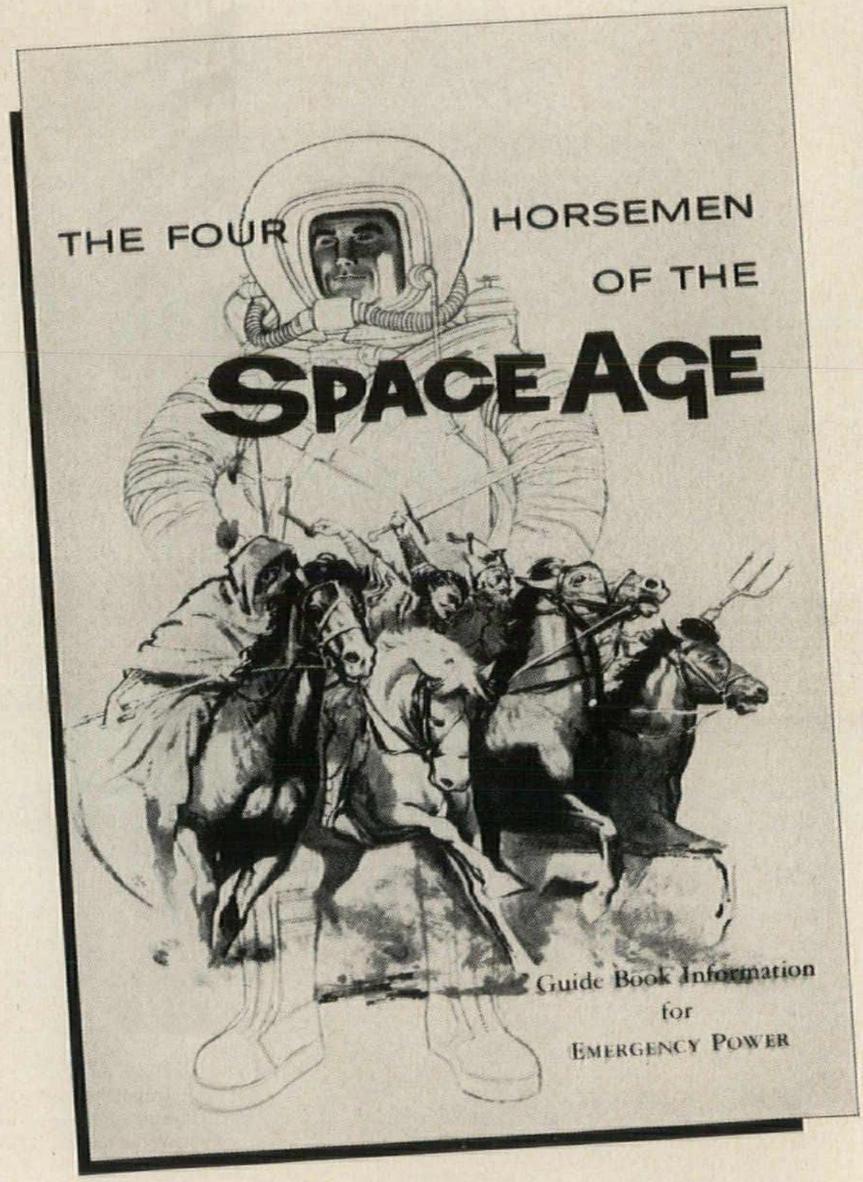
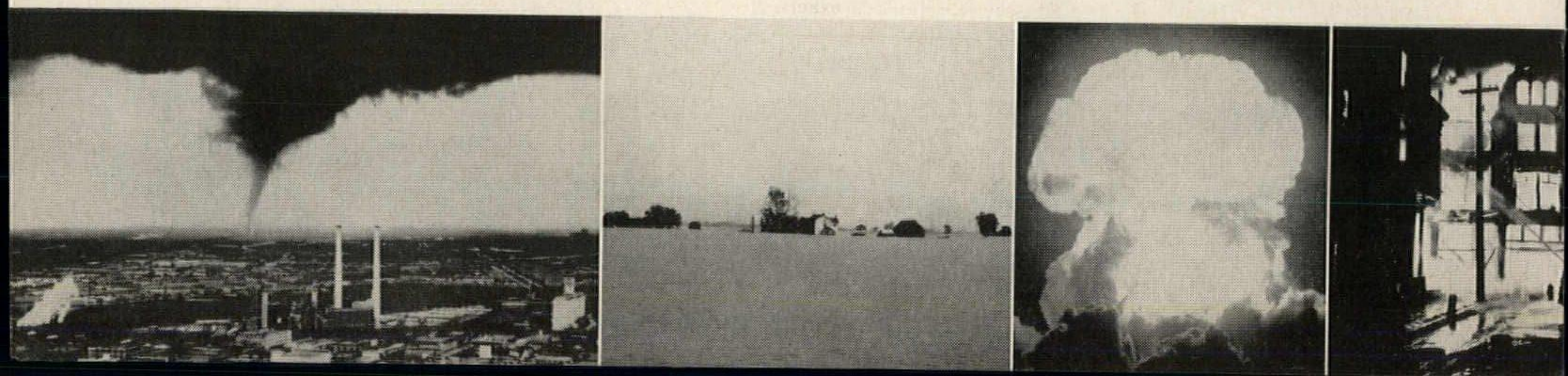
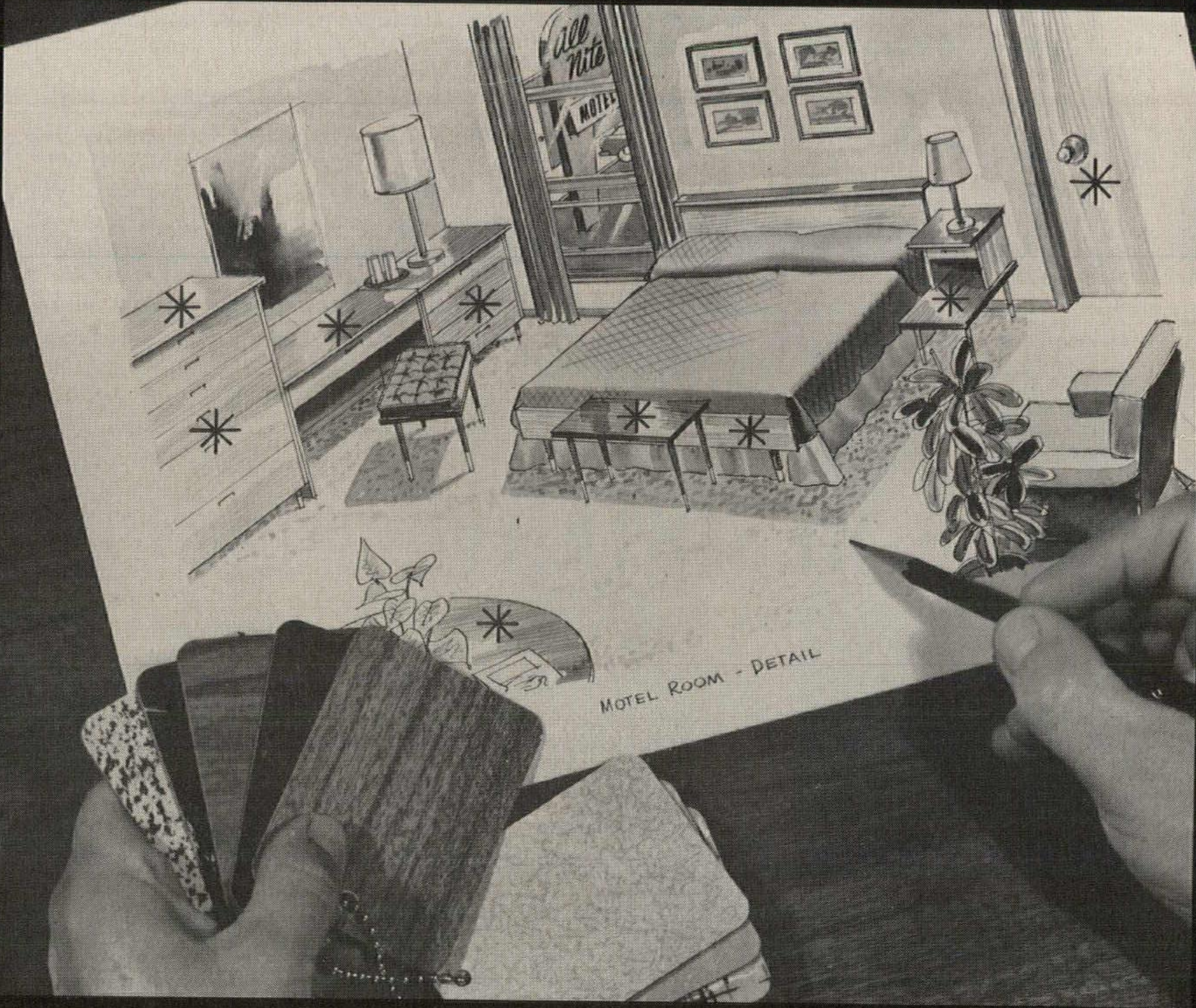






All Nite
MOTEL
MOTEL ROOM - DETAIL

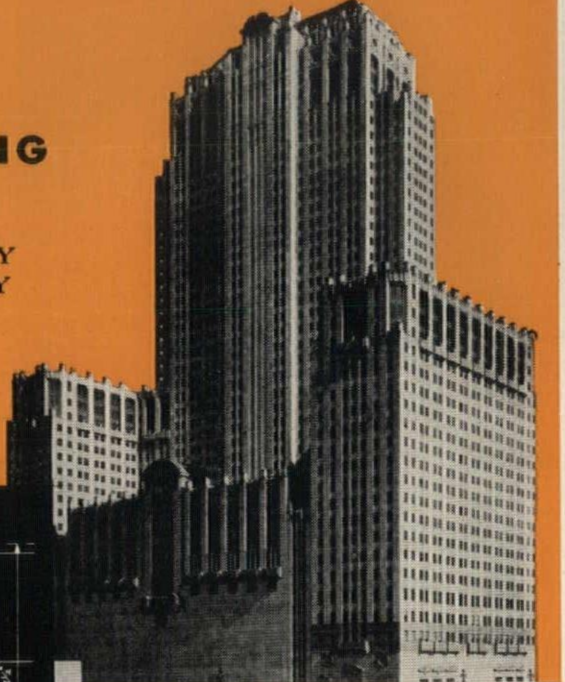
"In air conditioning an existing building like this, copper water tube is so much easier and faster to work with it's bound to cost less to install than rustable pipe."

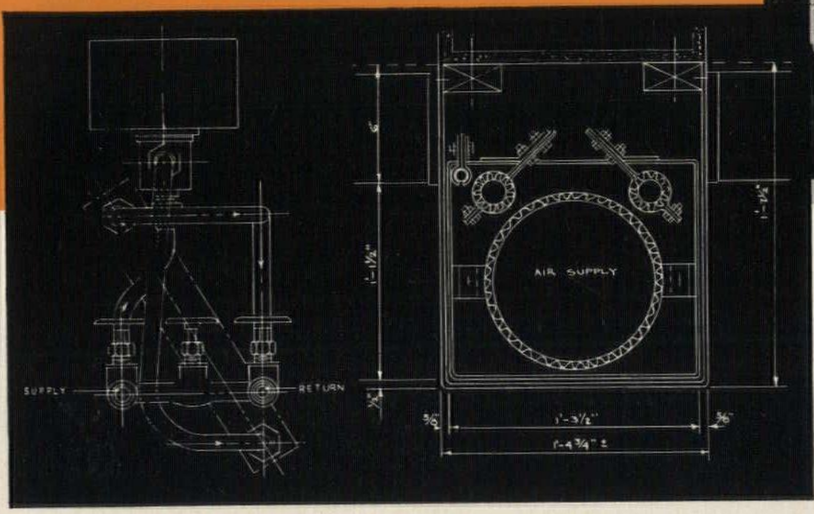
says J. E. McClellan, Vice President
MEHRING & HANSON COMPANY, Chicago
to E. H. Cornell, President
CORNELL PIPE & SUPPLY COMPANY, Chicago

KEMPER INSURANCE BUILDING

Chicago, Illinois

Architect & Engineer: CHILDS & SMITH
Air Conditioning Cont.: MEHRING & HANSON COMPANY
Revere Distributor: CORNELL PIPE & SUPPLY COMPANY
All of Chicago





At left you see a typical detail of floor sleeves, duct risers, pipes and anchorage of the 2,500-ton refrigeration system installed in the 45-story Kemper Insurance Building.

Also shown is end elevation of installation at the fixture.

There are 3300 separate units air conditioning over 600,000 square feet of space.

The 92,050 feet of Revere Copper Water Tube are used for supply and return for hot water in winter and chilled water in summer. Condensing water is supplied from the Chicago River.

"In fact, because of the nature of the job, the Revere Copper Water Tube we used cost *much* less to install than if rustable pipe had been used," continued Mr. McClellan.

"We used 88,050 feet of type K tube for the risers, in sizes ranging from 3/8" to 6", and 4,000 feet type L tube in smaller sizes for connecting at the fixtures. Add to this 3,300 separate air conditioning units and you can readily see that making all those connections with threaded pipe would have been a much more time-consuming and costly proposition than the soldering of copper tube.

"Another thing that must be considered when making an installation in an existing building is permanence and absence of leaks. With copper tube you can get tight, leak-proof joints every time, and you never have to worry about tearing out walls and partitions for replacement caused by rust."

Your contractors, too, will tell you that the ease of working with Revere Copper Water Tube, its tight, leak-proof joints, long lengths, non-rusting and long-life qualities also make it the economical spec. for radiant panel heating, hot and cold water lines, drainage lines, underground service lines and processing lines. So design with Revere in mind . . . the oldest name in copper.

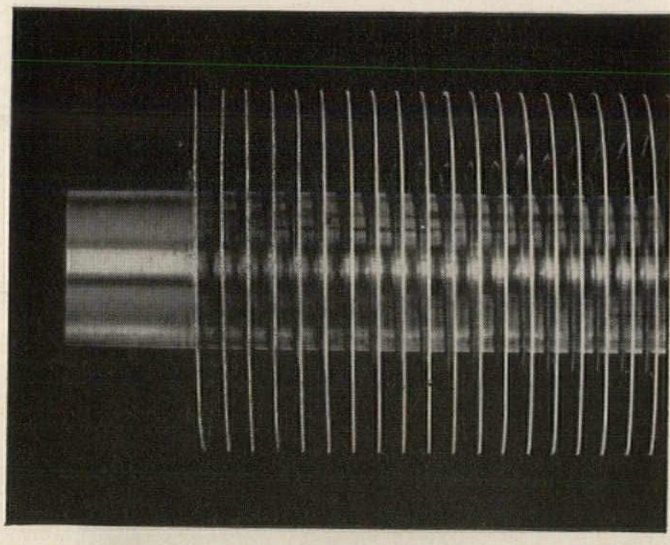
REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

230 Park Avenue, New York 17, N. Y.

Mills: Rome, N.Y.; Baltimore, Md.; Chicago, Clinton and Joliet, Ill.; Detroit, Mich.; Los Angeles, Riverside and Santa Ana, Calif.; New Bedford, Mass.; Brooklyn, N.Y.; Newport, Ark.; Ft. Calhoun, Neb.; Sales Offices in Principal Cities, Distributors Everywhere.

COPPER · BRASS · 1801 · REVERE · ALUMINUM



AEROFIN

Smooth-Fin Coils offer you

Greater Heat Transfer

per sq. ft. of face area

Lower Airway Resistance

—less power per c.f.m.

Aerofin smooth fins can be spaced as closely as 14 per inch with low air friction. Consequently, the heat-exchange capacity per square foot of face area is extremely high, and the use of high air velocities entirely practical. Tapered fin construction provides ample tube-contact surface so that the entire fin becomes effective transfer surface. Standardized encased units arranged for simple, quick, economical installation.

Write for Bulletin S-55

AEROFIN CORPORATION

101 Greenway Ave., Syracuse 3, N.Y.

Aerofin is sold only by manufacturers of fan system apparatus. List on request.

VIKON

METAL WALL TILE

gives your customers the finest in durable, easily-cared-for METAL TILES—in the widest range of types and colors

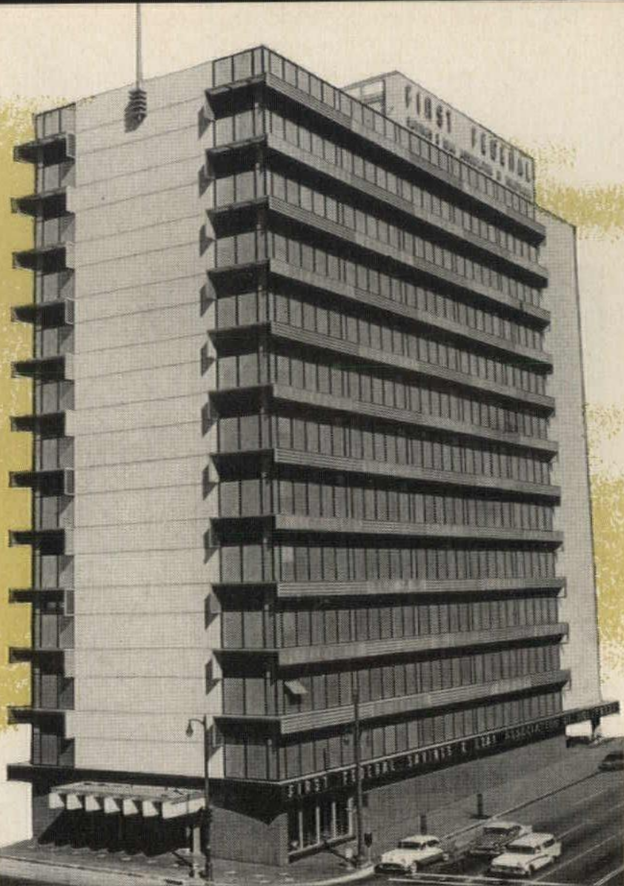
- Enameled Aluminum
- Enameled Chromatized Steel
- Porcelain on Aluminum
- Solid Copper
- Solid Brass
- Stainless Steel
- Copper Glaze
- Brass Glaze
- Brushed Aluminum
- Hammered Metal
- Antique finish

The trend can't be missed! Beautiful, lightweight metal tiles are selling better than ever. And that means VIKON METAL TILES—by the only manufacturer geared to give you nationwide service in this popular, practical type of tile.

VIKON tile is economical. It gives lasting beauty wherever used. VIKON means top quality too. Investigate today. Write for our complete catalogue, "All About Vikon."

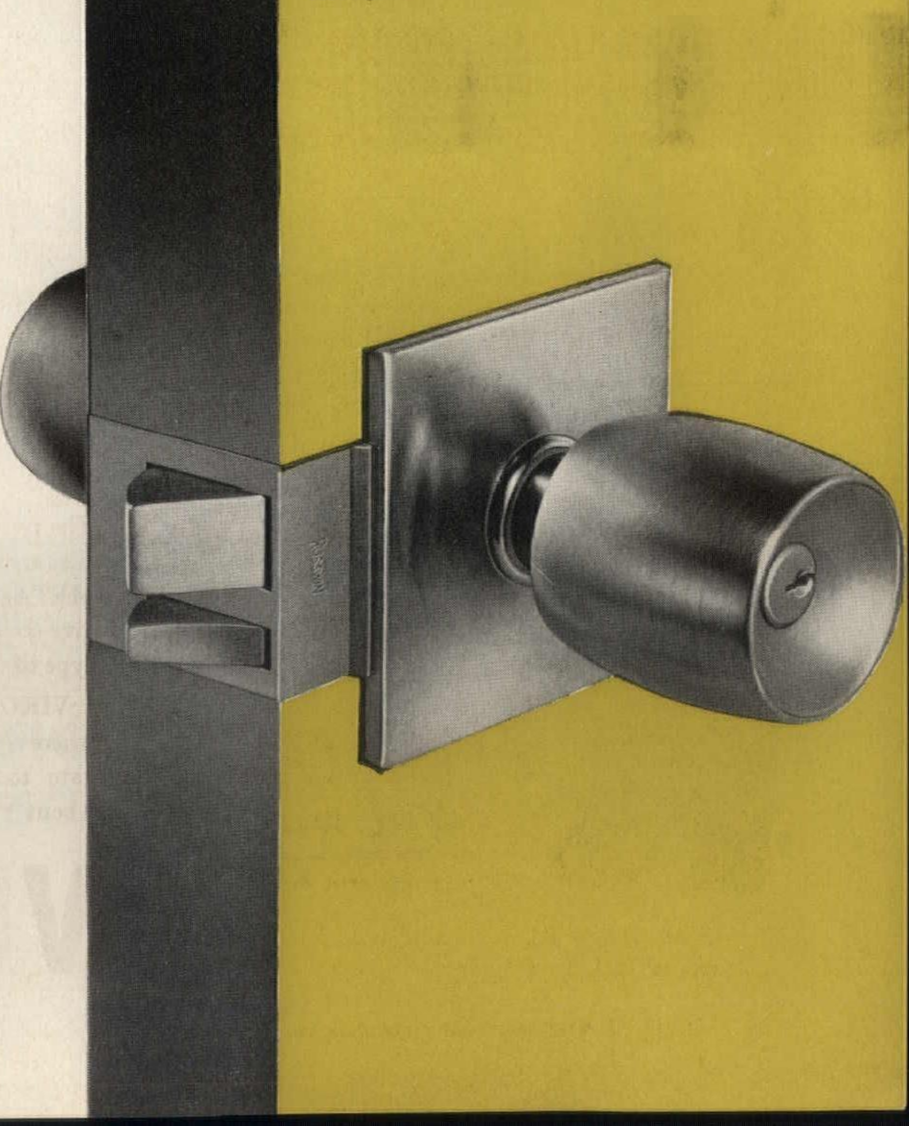
VIKON Tile Corporation Washington, N. J.

America builds for the Future... with RUSSWIN DOORWARE



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

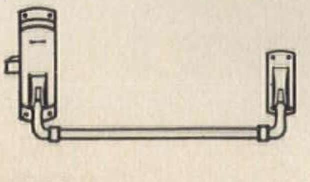
In the new Hollywood home of the First Federal Savings and Loan Association, beautifully styled Russwin Unilocs with Turbo design knobs complement handsomely modern architecture. The Uniloc, precision engineered for lasting dependability and smooth performance, is completely factory preassembled. It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



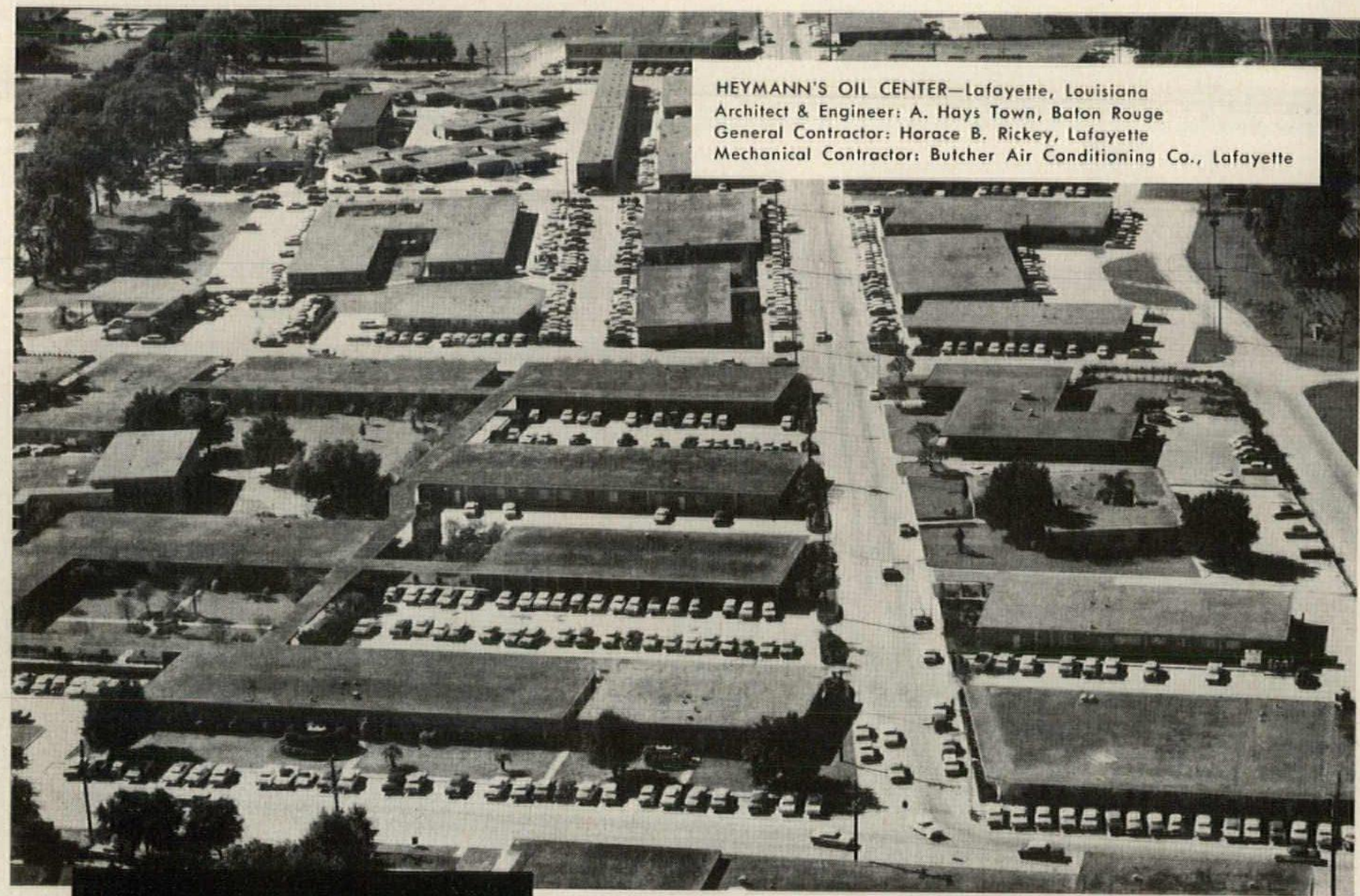
For any door . . . in any building

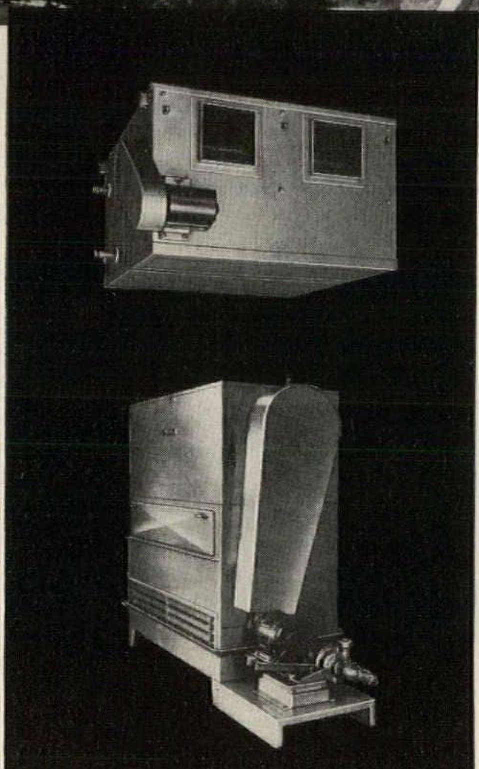
RUSSWIN®

DISTINCTIVE DOORWARE



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





Marlo Air Conditioning keeps people running smoothly at this big oil community

This is Heymann's Oil Center, deep in the oil country of Louisiana. It's a concentrated base of operations for many petroleum, pipeline and drilling companies whose products keep America's machinery running smoothly, without breakdown. Office buildings, a bank, shopping center and motel are conveniently packaged in this unique community—the largest of its kind in the petroleum industry.

If machinery must be protected against heat, strain and friction, so must people—especially under flat roofs beneath a scorching southern sun. At Heymann's Oil Center, air conditioning by Marlo, including 26 Marlo cooling towers and five Marlo central station units, helps create a comfortable, refreshing atmosphere in every building . . . keeping minds alert and spirits unwilted.

The Marlo representative in your area can give you complete information on the variety of air conditioning and heat transfer equipment in the Marlo line. Or, if your prefer, write direct to us.

Marlo coil co.

SAINT LOUIS 11, MISSOURI

Quality Air Conditioning and Heat Transfer Equipment Since 1925

new | *directions in*

STRUCTURAL CERAMICS

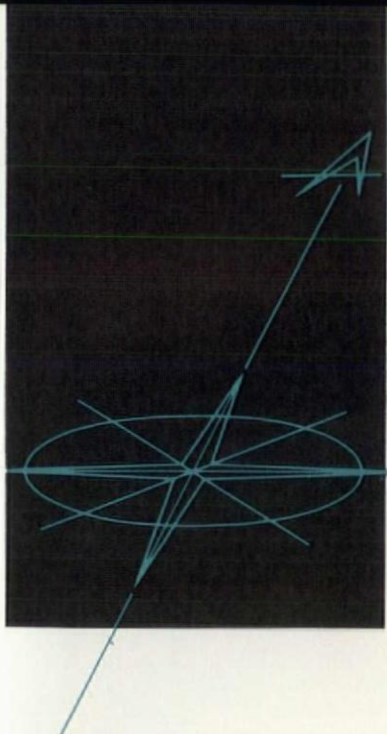
FOR SOUND CONTROL • FOR SUN CONTROL • FOR STRAIGHT-LINE DESIGN

created for better architecture by

ARKETEX

. . . the progressive name in structural ceramics

A. I. A. File No. 10-B



new **DIRECTION COLORS**

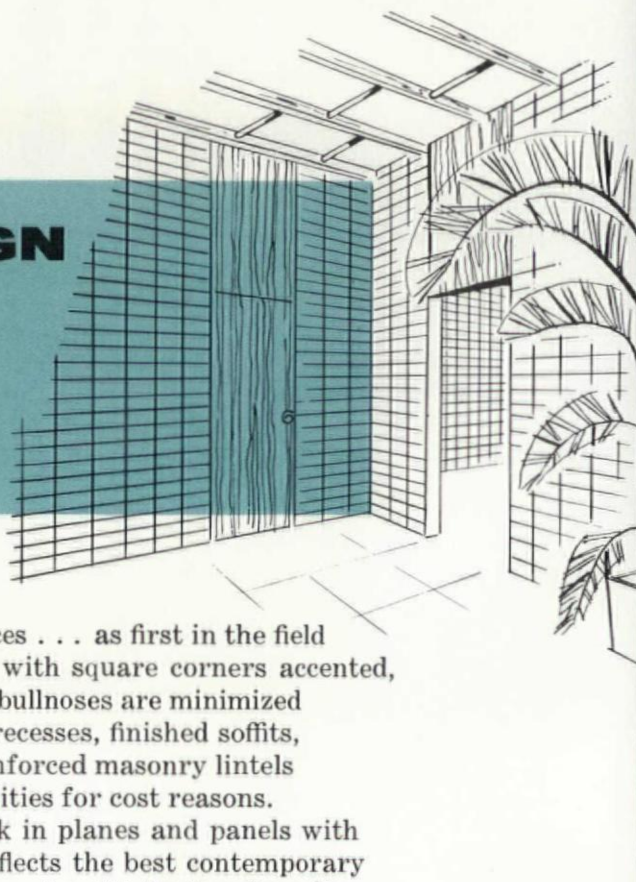
selected by Raymond Loewy Associates . . . and you

From the world-famed studios . . . and through the guidance of foremost American architects . . . ARKETEX brings you a new wealth of color for greater decorative scope. Engineered colors that were planned to belong to contemporary architecture. Warm colors that will lend important friendliness and livability to your settings. Shades, textures, and contrasts that give free rein to even the most imaginative designer. Colors selected exclusively for architects, by Raymond Loewy Associates and you of the architectural profession.

a new direction with

STRAIGHT-LINE DESIGN

for economy in planning and construction . . .

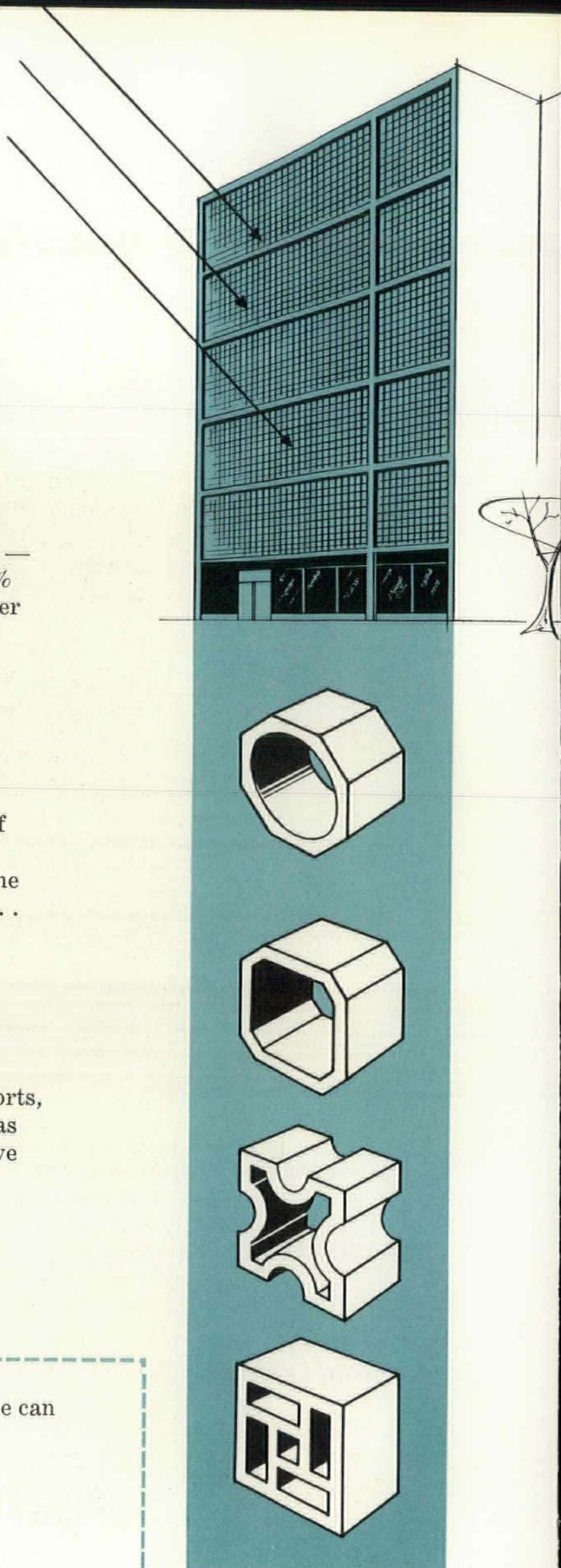


AGAIN ARKETEX sets the pace in structural tile advances . . . as first in the field to meet today's trend to *straight-line design*. Crisp detail, with square corners accented, cuts both materials costs and installation time. Coves and bullnoses are minimized — whether for bases, caps, or corners — as are pilasters, recesses, finished soffits, projecting wainscoting. No need to provide expensive reinforced masonry lintels over windows and doors. No limitations on design possibilities for cost reasons. You use just one material from floor to ceiling . . . work in planes and panels with stacked jointing as you want it . . . to gain design that reflects the best contemporary practice at savings never before possible. And your clients gain still further benefits from ARKETEX applications — through the lasting beauty and maintenance-free durability of structural ceramics created for better architecture.

a new direction in

SUN CONTROL

with SUNbar SOLAR SCREEN



Facade design that features a dominant use of glass becomes as practical as it is desirable. New SUNBAR Solar Screen by ARKETEX makes this a striking reality — through smartly functional design that *shades off 85% of glass heat gain.* Air conditioning installations of lower tonnage can be specified safely in initial plans, because equipment load is reduced substantially by SUNBAR. And operating costs are sharply lowered with this ceramic glazed solar screen deflecting Old Sol's heat and glare.

Because SUNBAR hides wall areas, real construction economies may also be gained. Spandrel walls may be of inexpensive non-facing materials. On all floors of a multi-story building, columns may be built flush with the interior wall surface and left exposed on the exterior . . . and varying column dimensions do not interfere with interior planning.

Nor is SUNBAR of value solely for non-residential exterior design. Dramatic interiors can be achieved for buildings and homes alike. Used as privacy screens, garden walls, interior space dividers . . . to screen carports, patios, swimming pools, or to conceal any unsightly areas around a house or building . . . SUNBAR adds decorative elegance most economically.

ARKETEX CERAMIC CORPORATION
BRAZIL, INDIANA

A.P. No. 07 Printed in U.S.A.

The *new direction* in which Arketex ceramic glazed structural tile can be utilized is most interesting. Please send me literature about

- ☐ Straight-Line design
- ☐ *Direction* Colors
- ☐ SUNBAR solar screen tile
- ☐ SOUNDBAR acoustical tile
- ☐ I would like to see your local distributor to discuss use of Arketex products in buildings I am designing.

NAME.. TITLE OR FUNCTION ....

ADDRESS..

Send this postage-paid postcard for complete data on any or all ARKETEX Structural Ceramics for Better Architecture

Builder Michael Campanelli (above, left) discusses telephone planning with Architectural Consultant Edward Poskus. In photo at right, Mr. Poskus tours a Campanelli model home with New England Telephone and Telegraph Company man "Pete" Danforth.

"People <u>want</u> telephone-planned homes"

—SAYS MASSACHUSETTS BUILDER MICHAEL CAMPANELLI

"We make pre-wired telephone outlets a standard feature of all the homes we build," says Michael Campanelli, Senior Vice-President of Campanelli Bros., Inc., Braintree, Massachusetts.

This progressive New England firm has built over 8000 homes in the past 10 years—and, since pre-wiring facilities became available, 3000 of them have been telephone planned. Every one of the Campanelli homes now under construction north and west of Boston contains pre-wired telephone outlets.

"People *want* telephone-planned homes," says Mr. Campanelli. "They like being able to add extension phones easily when they're needed. And they like having the wiring for them neatly concealed within the walls.

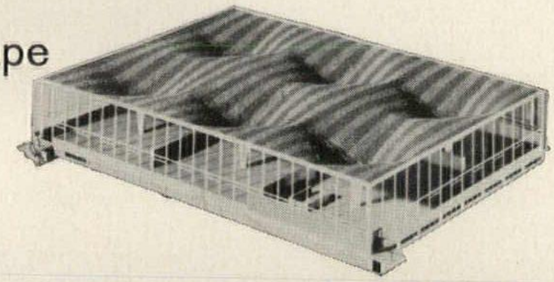
"No question about it. Telephone planning is a *plus* feature that really helps us sell our homes."

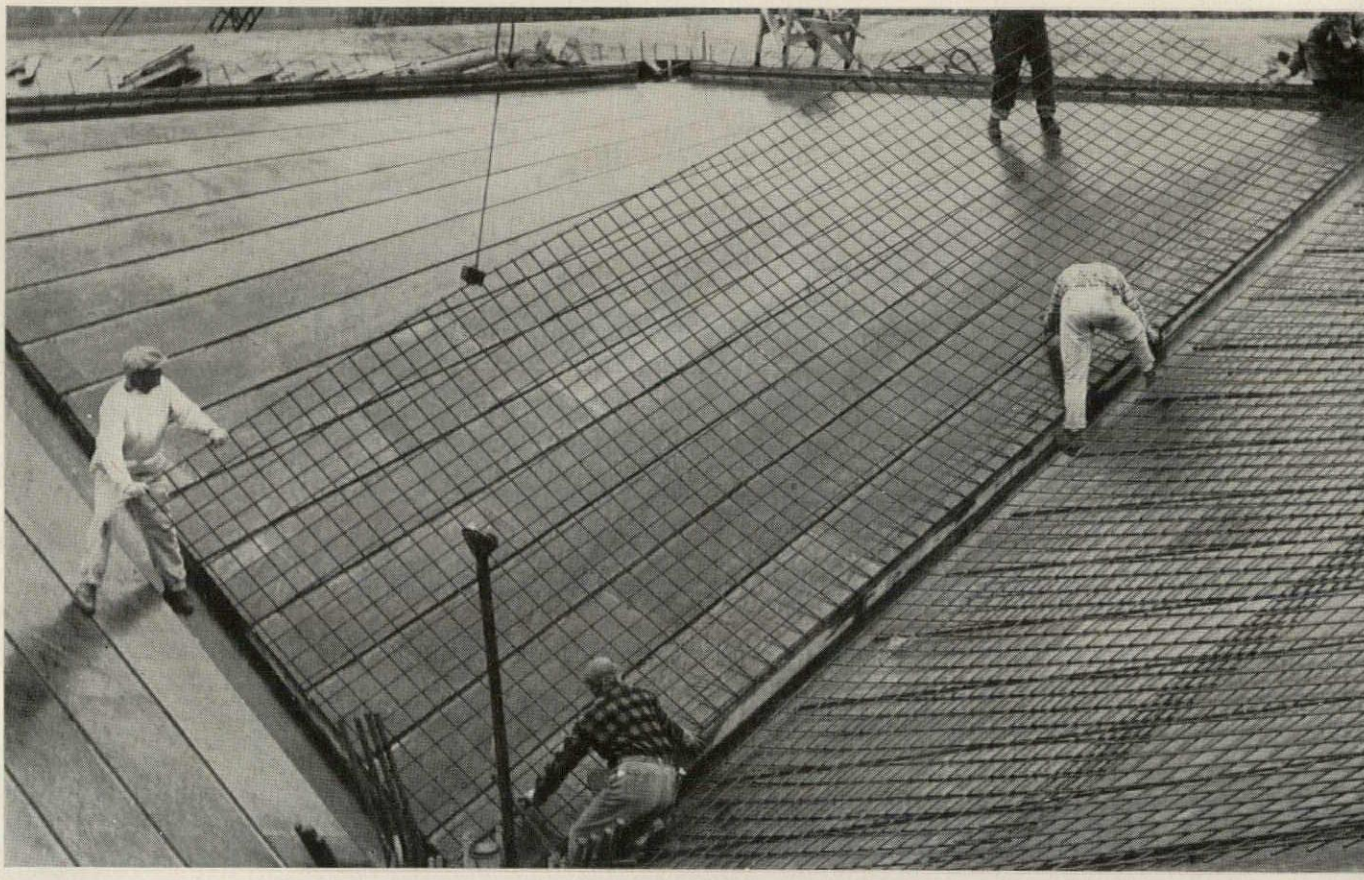
* * *

Your local Telephone Business Office will be glad to help you with telephone planning for your homes. For complete details on home telephone installations, see Sweet's Light Construction File, 8i/Be. For facts about commercial installations, Sweet's Architectural File, 32a/Be.

"The Regent," a modern Campanelli home in Danvers, Massachusetts.

BELL TELEPHONE SYSTEM

new shape  on the New York Skyline...



A 700-pound USS American Welded Wire Fabric Mat is placed on one of the six umbrellas. It is Style 6 x 6—5/0 and 5/0. The mats are lapped and tied at one-foot spacings and conform perfectly to the compound curves in spite of the large difference in elevation between opposite mat corners.

Concrete is poured from the top, worked down toward the center, vibrated and rough screeded. A 3" topping of perlite insulating concrete was poured directly on the rough surface. Less concrete is needed for any given area of roof of the hyperbolic-paraboloid type than for most other forms of construction, resulting in additional time savings.

NOW UNI-FRAME BECOMES A COMPLETE LENS BOX LINE

with new 10-inch size, new diffusing glass bowl and new splay trims. Choose from 24 possible UNI-FRAME combinations. For details, call your Day-Brite representative listed in the Yellow Pages or write

DAY-BRITE LIGHTING, INC., ST. LOUIS 15, MISSOURI • SANTA CLARA, CALIFORNIA

NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

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DAY-BRITE
LIGHTING FIXTURES

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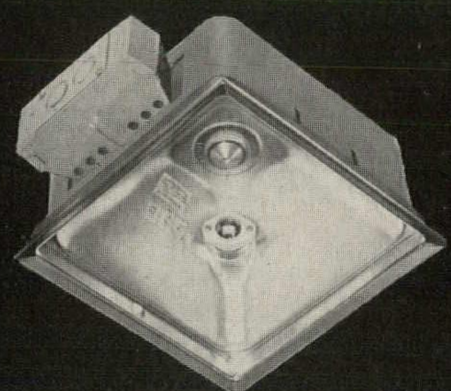
choice of
SIZE
10-inch for 150-watt lamp at new lower price
12-inch size for 200- or 300-watt lamp

choice of
FINISH
White Enamel
Aluminum
Brass



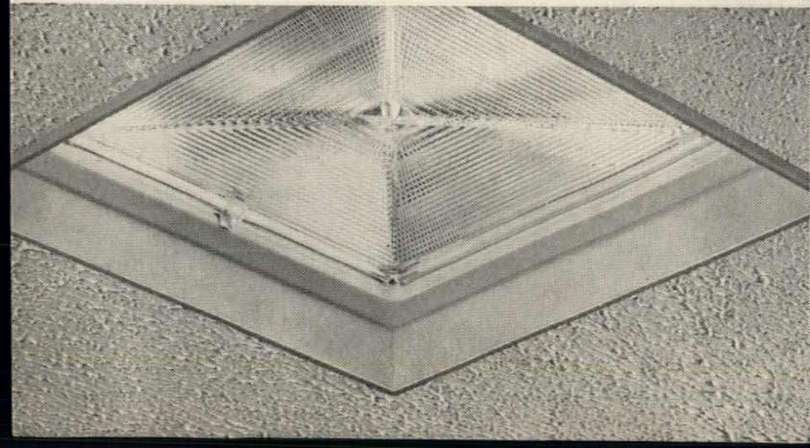
Basic UNI-FRAME lens box
(Patents Pending)

choice of
SPLAY
(OPTIONAL)
White Enamel
Aluminum
Brass Finish

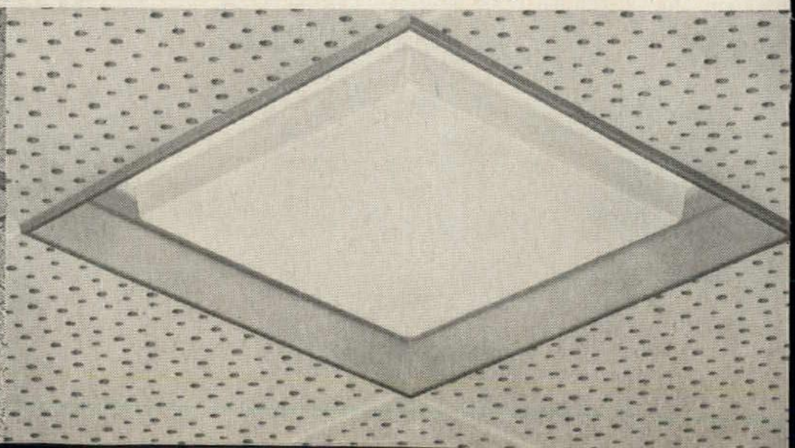
choice of
LENS
Diffusing Glass Bowl of Double-Tuf* ceramic-coated PYREX*
Prismatically-accurate Flat Lens of fully tempered PYREX*

*Reg. Trade Mark of Corning Glass Works

12″ white UNI-FRAME with prismatic flat lens and splay.



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




MAY
MAY

COVER PHOTO

Aerial view shows Mays-On-The-Heights suburban store near Cleveland, Ohio, and part of its 18 acres of parking facilities. Adequate parking, protected walkways and convenient entrance to the store are attractive inducements to suburban shopping.

Close-up of new store building shows one entrance area. Multiple entrances at two store levels provide two "first" floors and permit greater flexibility in customer traffic flow. Building is of reinforced concrete with all walls covered with various colors of textured brick.

Mayfair Dining Room offers guests an exciting atmosphere of glass, light and shrubbery. One end of room overlooks a small court having an interesting modernistic fountain and colorful plants.

J-94100-2

Over-all view of Mays-On-The-Heights shows entrances and spacious terrace created by protected walkways. Westinghouse OV-20 street lights with Westinghouse mercury-vapor lamps in the huge two-level parking area are functional as well as decorative, combining glare-free visibility with virtual elimination of maintenance.

New suburban store says "Watch Us Grow"
... architect provides for future electrical needs

Mays-On-The-Heights, whose slogan is "Watch Us Grow," is a new suburban department store near Cleveland, Ohio. Owned and operated by The May Company Department Stores, Inc., it is the largest suburban store between New York and Detroit and one of the 10 largest in the country.

Especially designed to meet suburban shopping needs, the store has 353,000 square feet of space on four selling floors, employs 1000 people, and will accommodate 2000 cars in its two-level parking lot.

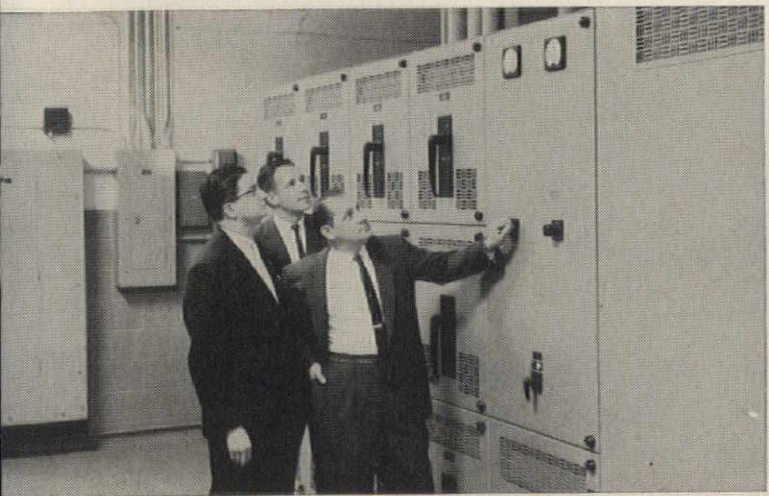
The careful design which distinguishes this new store goes beyond the many obvious architectural features. The electrical system has been carefully planned to provide maximum shopper comfort and convenience. Every item of Westinghouse equipment—power centers, switchgear, panelboards, circuit breakers, safety switches, transformers and controls—was selected for its ability to provide dependable, uninterrupted service and for future expansion as store growth requires it.

In addition to the electrical distribution system, Westinghouse outdoor lighting makes shopping safe and convenient. And shopper transportation throughout the building is rapid and convenient with Westinghouse elevators. *(cont.)*

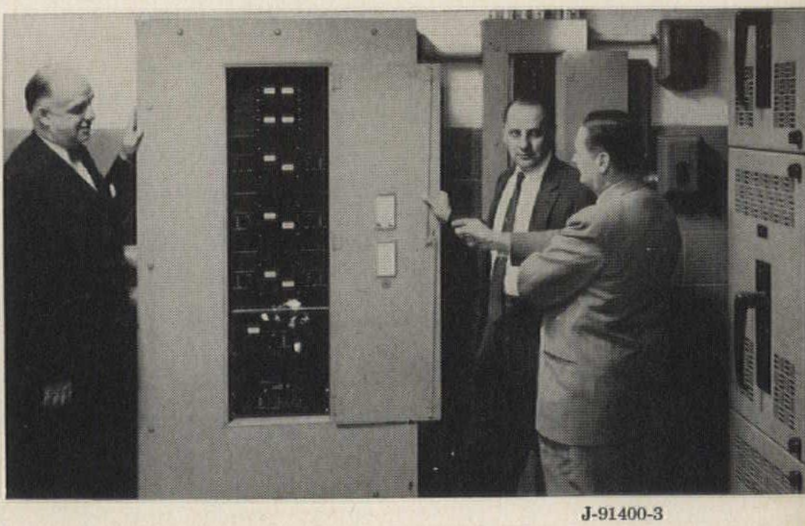
YOU CAN BE **SURE**... IF IT'S
Westinghouse

Over 275 Pages Westinghouse Data in Sweet's Architectural File.

Leo J. Chak, The May Company Building Superintendent, and James Miller, Westinghouse Construction Sales Engineer, read current being used in low-voltage switchgear section as George Friedlander, Phillips Electric Co., Electrical Contractors, points out current being drawn is less than half that available in system. Power center has built-in capacity for expansion.



Earl T. Stratton, Westinghouse Product Specialist, George Friedlander and J. C. Kamuf, WESCO, discuss features of Westinghouse CDP convertible panelboard, which provides feeder protection and control of 480-v power in mechanical equipment room. Type NLAB lighting panelboard and Class 15-825 contactors at right of CDP panelboard are used for 120-v lighting.



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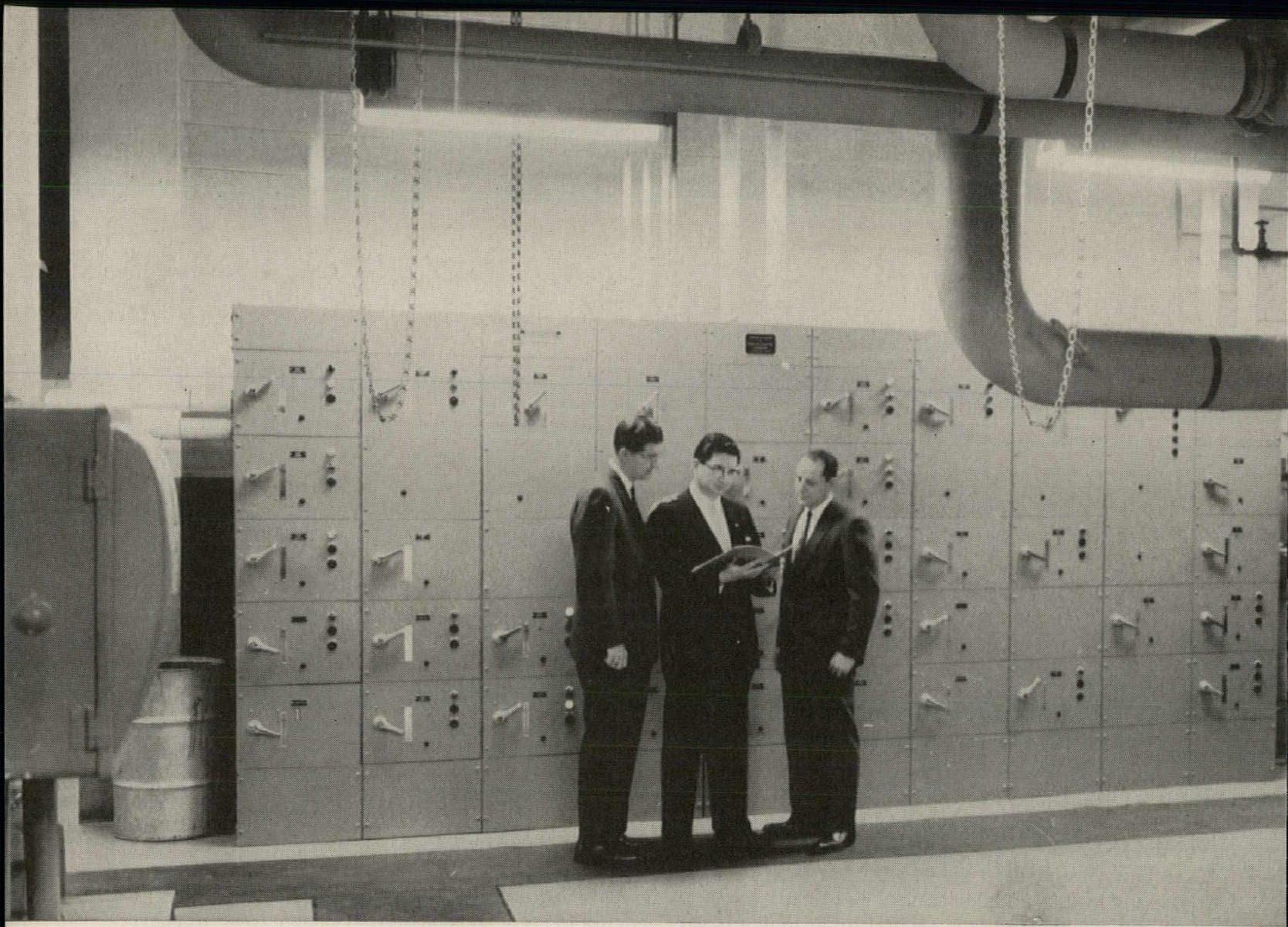


F. B. Burbank, Westinghouse Area Sales Manager, Leo J. Chak and George Friedlander are shown in front of Class 11-350 motor control center installed in mechanical equipment room. This compact Westinghouse unit centralizes all motor controls to save inspection time and reduce service problems.

New May Company store installs electrical system for present and future needs . . . now says "Watch Us Grow" *(cont.)*

The May Company slogan, "Watch Us Grow," had a definite influence on planning by the owner, the architect, the contractors and Westinghouse. The architect's use of the electrical system as a readily expandable design element enables the owner to double the electrical load on the system before it becomes necessary to add more power equipment.

A Westinghouse construction specialist can be of service in your planning. Call the Westinghouse sales office near you, or write: Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

OWNER: The May Company Department Stores, Inc.
ARCHITECT-ENGINEER: Victor Gruen Associates, Detroit, Mich.
ASSOCIATE ARCHITECT: Jack Alan Bialosky, Cleveland, Ohio
GENERAL CONTRACTOR: The Sam W. Emerson Co., Cleveland, Ohio
ELECTRICAL CONTRACTOR: The Phillips Electric Co., Cleveland, Ohio
WESTINGHOUSE DISTRIBUTOR:
Westinghouse Electric Supply Co., Cleveland, Ohio

Walter Mack, The May Company Maintenance Supervisor, and E. E. Croushore, Jr., Westinghouse Construction Sales Engineer, take reading from ammeter on Westinghouse indoor metal-clad switchgear. Two 50 DH 150 air circuit breakers are used as feeders for the two Westinghouse 2000-kva power centers located at top of building. Utility company metering section is in far left compartment.

S *Over 275 Pages Westinghouse Data in Sweet's Architectural File.*

YOU CAN BE SURE...IF IT'S Westinghouse

WATCH "WESTINGHOUSE LUCILLE BALL-DESI ARNAZ SHOWS" CBS TV FRIDAYS

J-94100-4

MUTSCHLER

Mutschler *Series 700*, designed by Paul McCobb, provides planned storage in the kitchen, dining, living, sleeping and bath areas. Crafted of finest northern hardwoods, cabinetry is finished in walnut or decorator colors. The smooth sweep of *Series 700* is vertically defined with soft-sheen satin aluminum. For more about new *Series 700* built-in storage—and Mutschler design service—mail coupon.

Mutschler Brothers Company
Dept. J-2110, Nappanee, Indiana

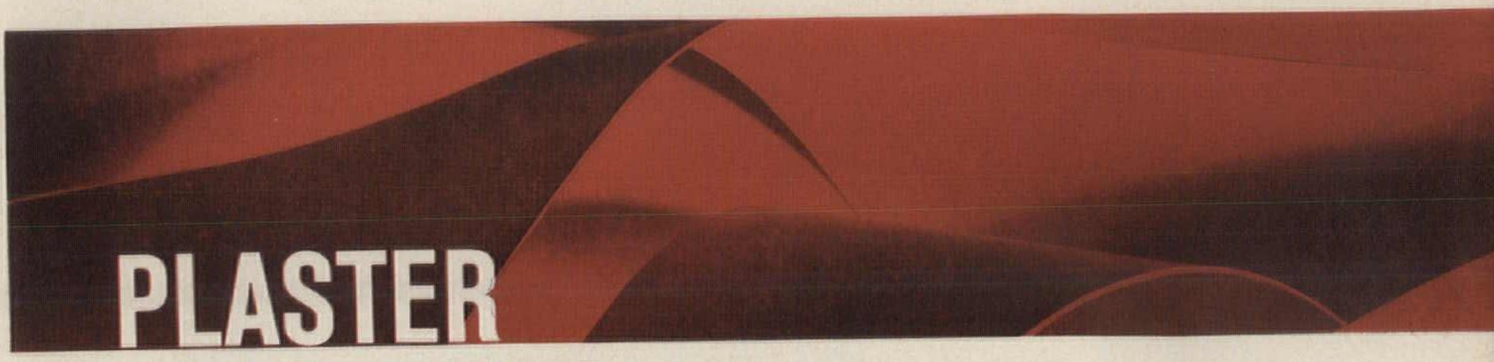
Please send for *Series 700* brochure and information on Mutschler design service.

name ______________________

address ______________________

city ______________________

state ______________________



PLASTER CAPTURES THE CONTOURS OF CREATIVE THOUGHT

Versatile plaster offers an infinite variety of visual drama, plus assured performance for any design

From an unfolding rosebud might have come the inspiration for the continuously curving interior surfaces of the auditorium at the Massachusetts Institute of Technology, as shown at the left. The sweeping boldness of the design demanded a material with exceptional flexibility. The answer, of course—plaster.

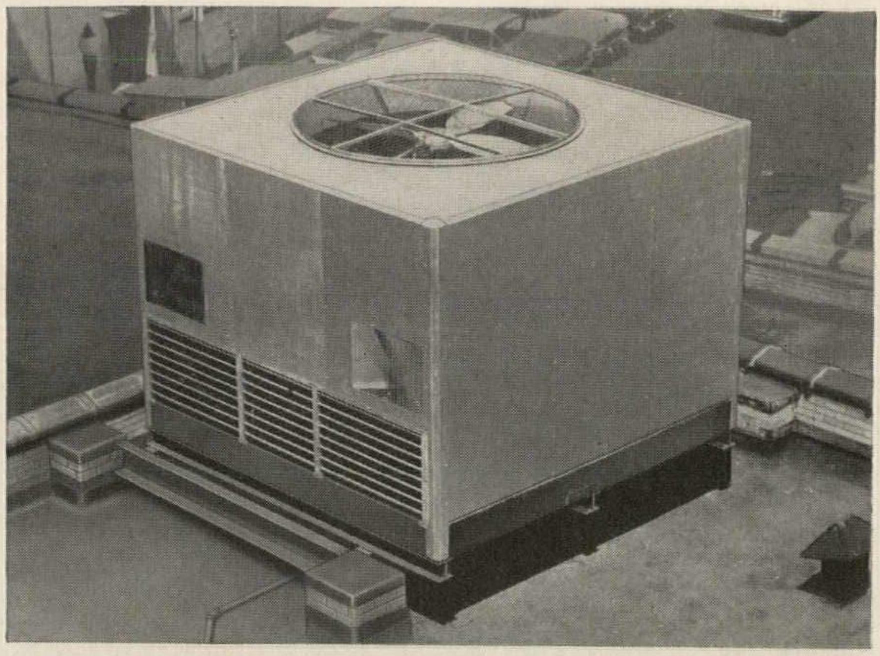
Only plaster permits such complete freedom of expression . . . follows, with such absolute fidelity, every intricate curve and plane in the architect's plans. And only plaster combines such visual and textural beauty with durability, lightness, fire-resistance and acoustical excellence.

Whatever your concept, bring it to reality with new United States Gypsum lathing and plastering systems, and with the help of your skilled plastering contractor. For only plaster truly . . . *captures the contours of creative thought.*

UNITED STATES GYPSUM

the greatest name in building

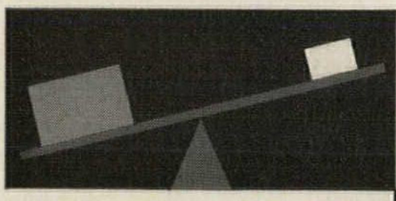
*T.M. Reg. U.S. Pat. Off.



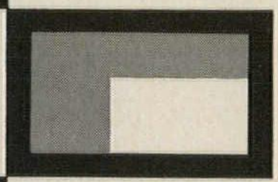
First major tower advance in years— a Carrier achievement! 9 sizes with capacity range from 170 to 500 tons in a single cell. Larger tonnages can be handled with multiple cell towers.

Carrier announces a new cooling tower

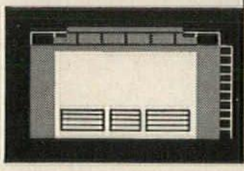
Every now and then a new product is developed that establishes a major advance in its field. The new all-steel Carrier Cooling Tower is such an innovation. So if you have the idea that a tower must be a heavy, space-eating eyesore, consider these facts:



LOWER OPERATING WEIGHT: Conventional 200-ton capacity tower, 27,000 lbs.—Carrier Tower of same size, 7500 lbs.; 400-ton tower: conventional, 56,000 lbs.—Carrier, 15,000 lbs.



LESS FLOOR AREA: Conventional 200-ton capacity tower, 240 sq. ft.—Carrier Tower of same size, 150 sq. ft.; 400-ton tower: conventional, 470 sq. ft.—Carrier, 300 sq. ft.



MORE COMPACT: New arrangement of components in Carrier Towers provides a low, smooth silhouette that lends itself to architectural treatment. No stacks, ladders or railing detract from its clean lines.

This major advance has been made possible by the use of a new kind of lightweight, plastic fortified cellulose fill, which occupies just ⅕ the space of conventional wooden strips. Tested under the most severe conditions, this fill has stood up both structurally and performance-wise.

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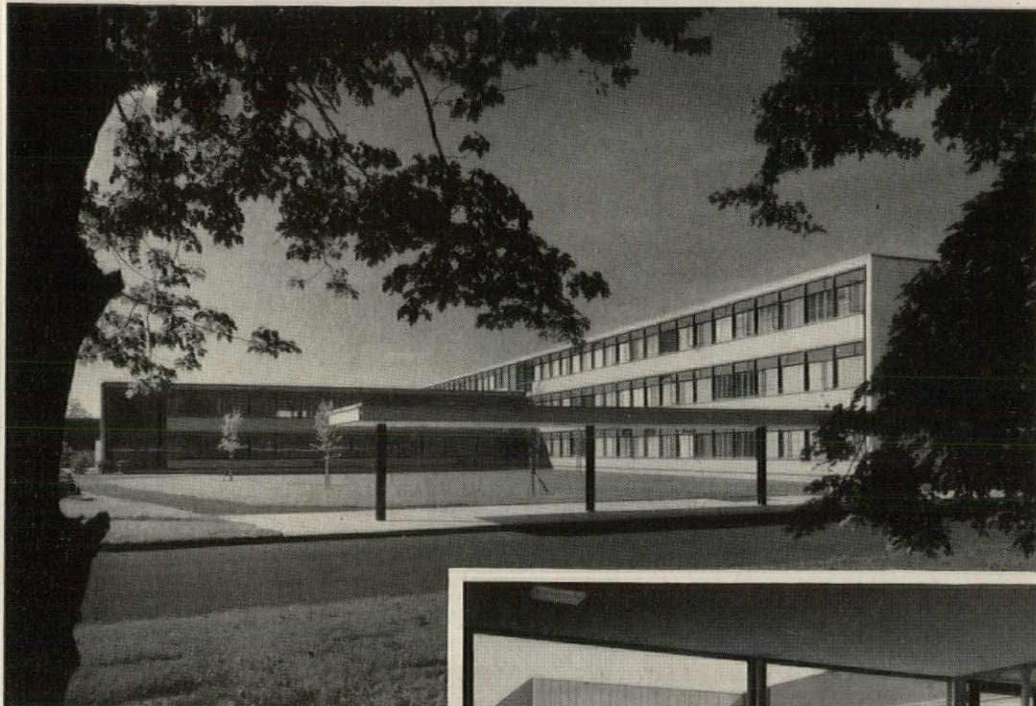

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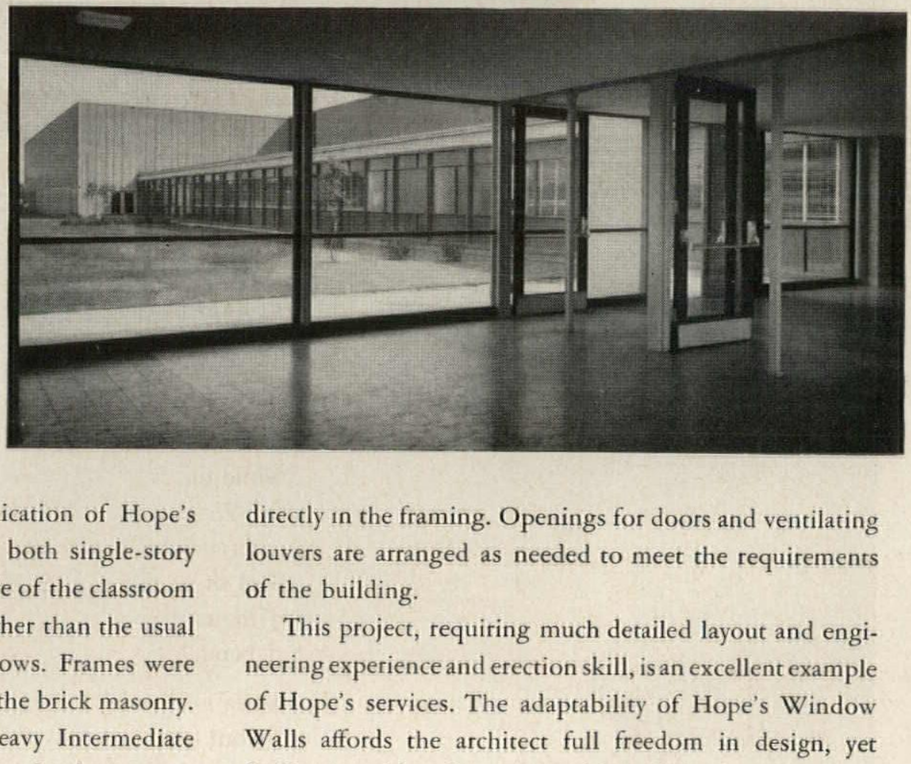

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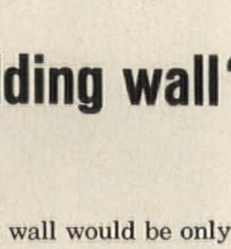

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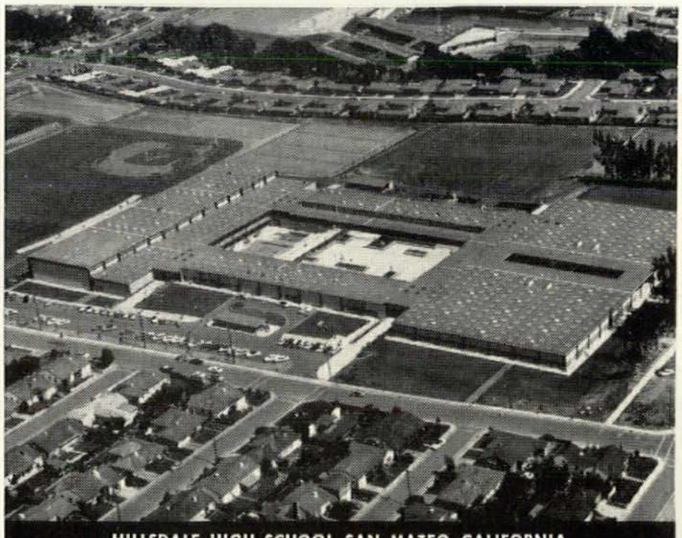

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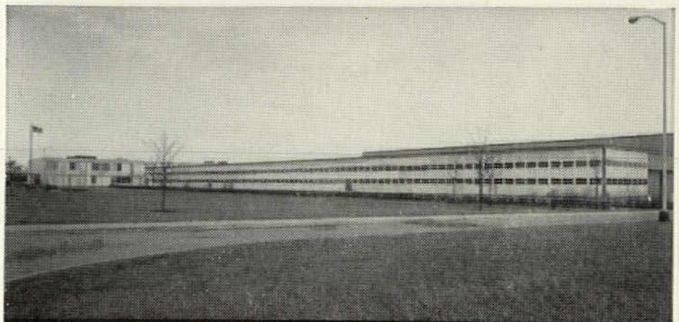

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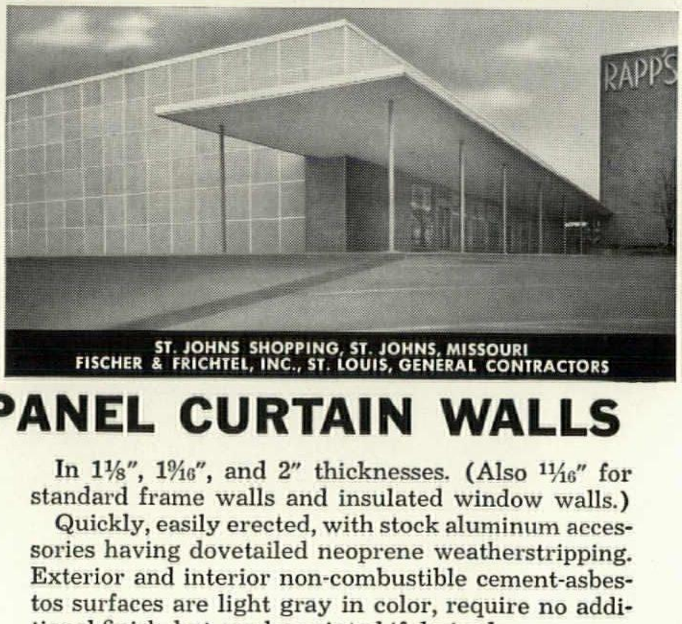

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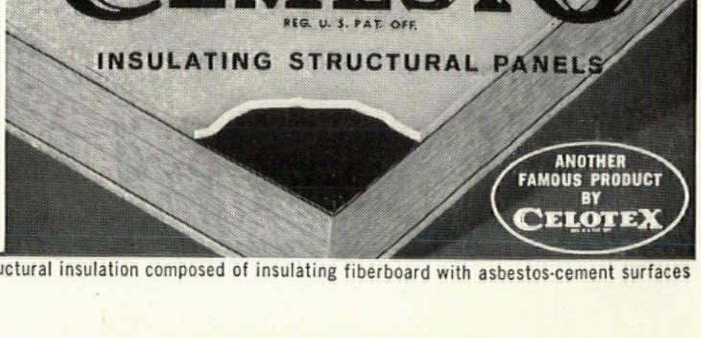

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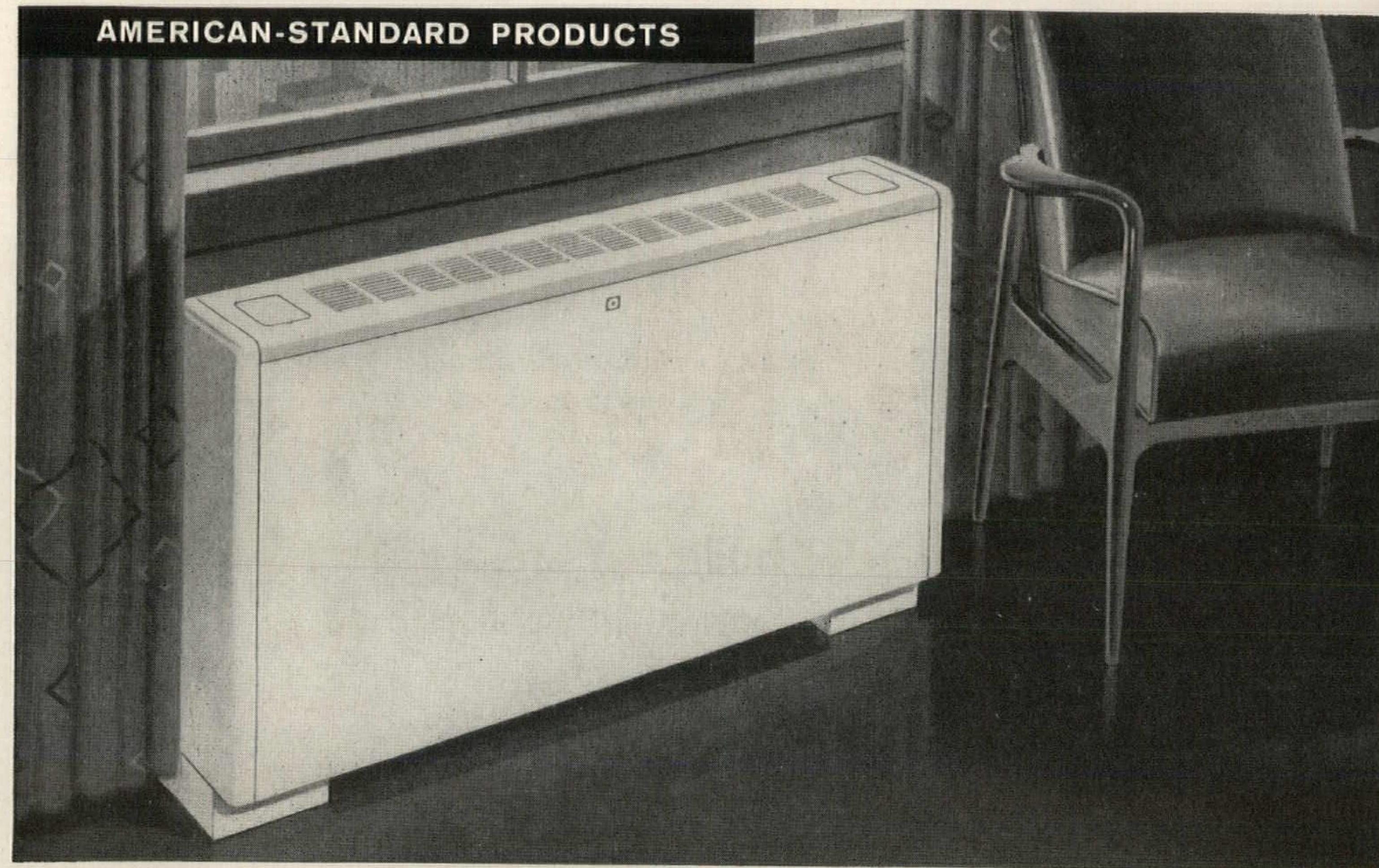
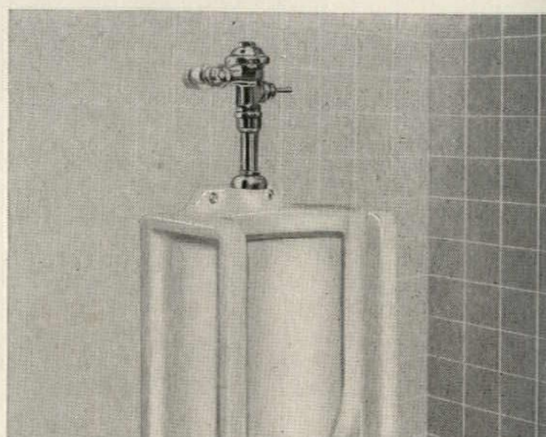


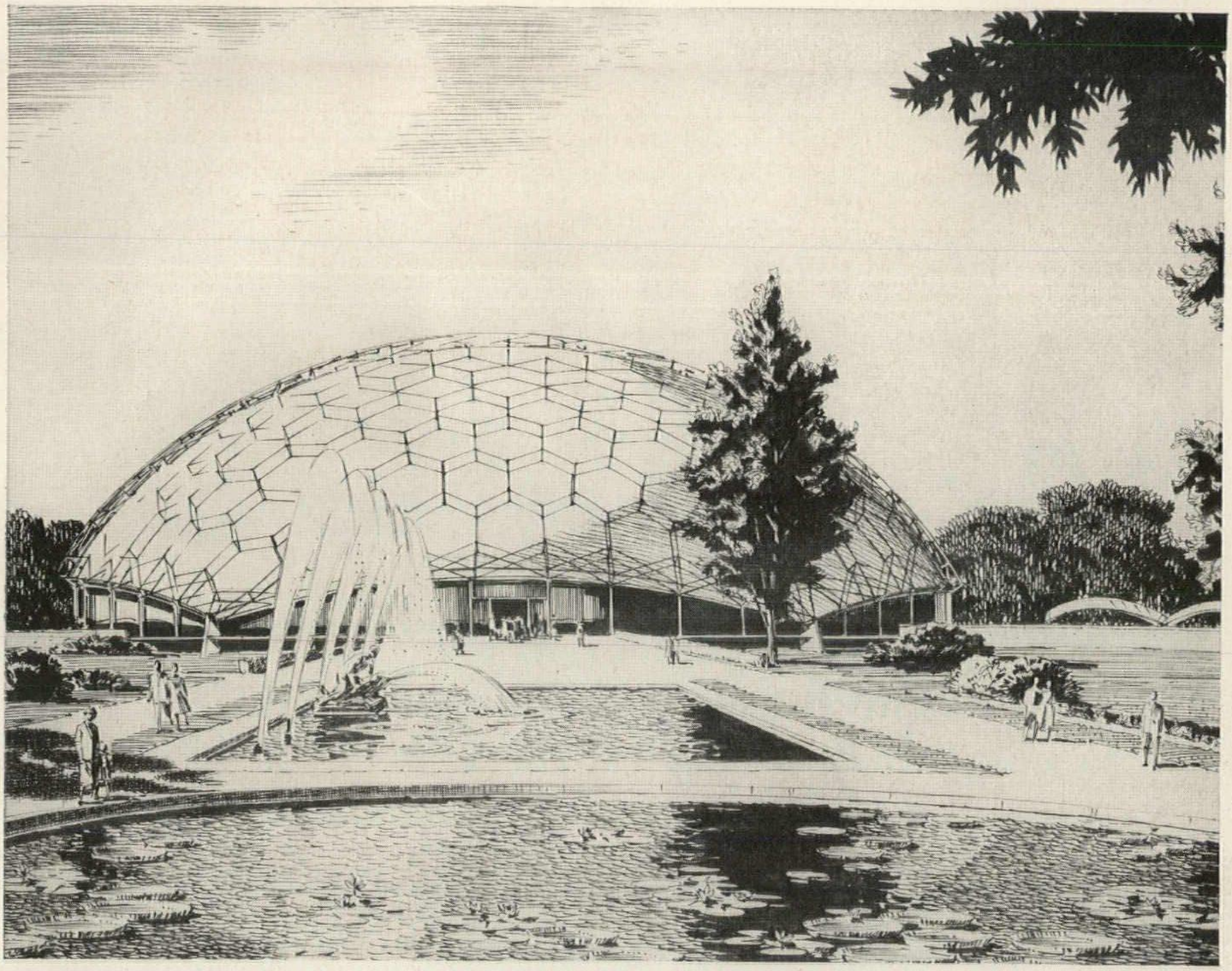
Quiet, dependable year 'round comfort—winter heating, summer cooling—is assured with an American-Standard Remotaire system. This trim 9"-thin, fan-coil unit gives maximum usable floor space and attractive appearance in every installation. A compact, remote boiler-chiller team distributes hot water for heating and chilled water for cooling. Small-diameter, space-saving pipes carry water to fan-coil units in rooms around the perimeter of the building. The occupant of each room controls his own comfort every day in the year.

Wide shelf space and anti-splash rim make the New Lucerne lavatory perfect for washrooms. 20x18", 24x20". China in eight colors and white.

Off the floor for faster, easier cleaning, Afwall toilet is designed for quiet-action flush valve. China in eight colors and white.



Easy-to-maintain Casal urinal, with built-in flush spreader, is made of wipe-clean vitreous china in eight colors and white.



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

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TO CAPTURE CLIMATES FOR SHAW'S GARDEN

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

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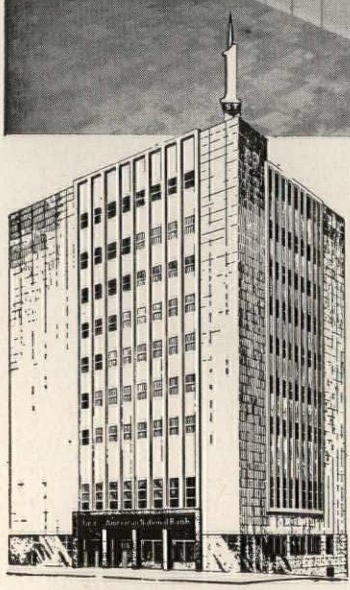

← New First American National Bank Building, Duluth, Minn. Architect Thomas J. Shefchik, A.I.A., Duluth. Contractor: Fowler-Veranth Construction Company and Klippen-Holm Company, Duluth.

↑ Recessed continuous-towel cabinets with base storage units. End clutter of waste receptacles. Integrate with the modern design of the wash room. (This installation serviced by: American Linen Supply Company, Duluth.)

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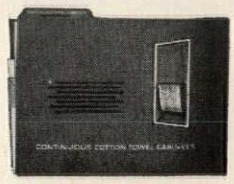
Low cost installation and service by a linen supplier . . . Reduced maintenance and janitorial costs . . . Elimination of litter, storage and disposal problems . . . Limits fire hazard and plumbing repairs.

Add to this, the fact that you do not obligate the owner to any particular service, *even* when you specify recessed cabinets like the ones pictured above. (Recesses are designed to accept any of a wide variety of cabinets.)

So, why not make sure your clients get the best? Specify the luxury and quality of cotton toweling . . . include continuous towel cabinets in your design.

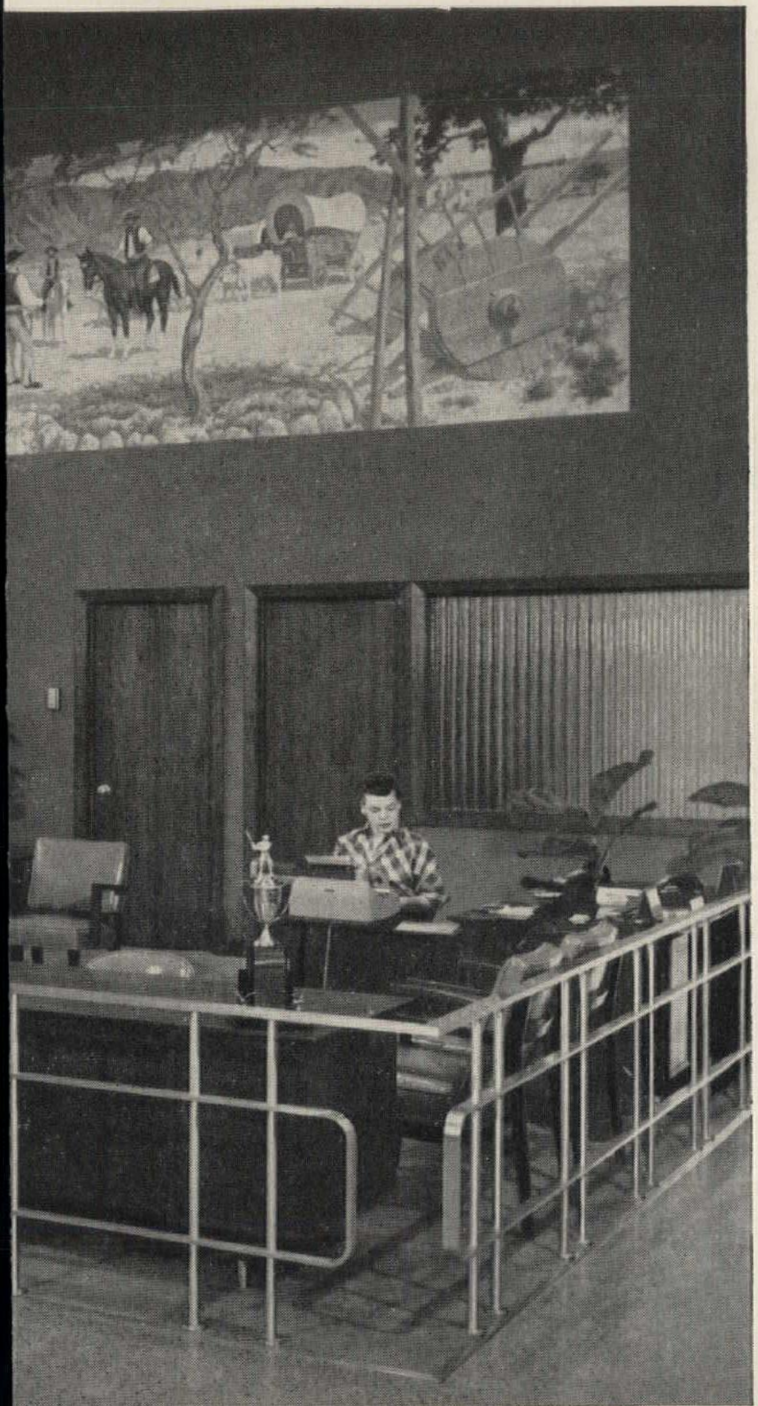
✱ Send for this free Planning-for-Cloth kit

Illustrated, includes specifications for recessed unit and continuous cloth towel cabinets. ***Write****—to Linen Supply Association on your letterhead.*



Linen Supply **Association of America**

and National Cotton Council • 22 West Monroe Street, Chicago, Ill.



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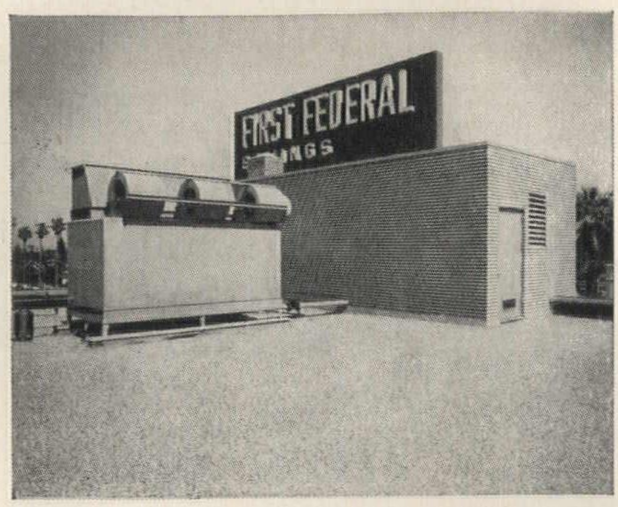

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As a design element, today's completely or partially-luminous ceilings offer possibilities limited only by the designer's aims. Area Lighting can make the ceiling surface an integral part of your entire scheme, both esthetically and in space planning through partition coordination.

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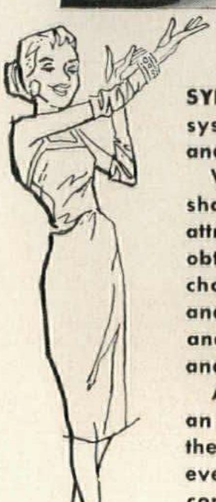

SYLVA-LUME—This extremely versatile, modular system features an extruded aluminum grid work and offers unlimited flexibility and design freedom.

Vinyl plastic panels are provided in deep or shallow style—plain or patterned—in a choice of attractive colors. Single or double panels can be obtained. Optional acoustic baffles, also with a choice of colors, provide effective sound control and add another design element for delineation and emphasis. Perimeter panels give interesting and attractive border treatment.

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The standard Sylva-Lume module is 3' x 3'. A 2' x 2' module is also available with only a few limitations in variety.

SYLVA-CELL—This Sylvania modular system utilizes a 2' x 4' module and features a continuous pattern of cells. A choice of two attractive louvers is offered—polystyrene plastic or white painted aluminum, both with 45° x 45° shielding. Each ceiling offers excellent efficiency and shielding together with an even, widespread distribution of diffused illumination.

Sylva-Cell's simple, inverted-T grid work of extruded aluminum has extreme versatility for complete or partially-luminous ceilings. The louvered pattern can be used from wall to wall. Or, if desired, the interspersing of standard opaque ceiling materials makes a change in appearance, yet uses the same suspension system.

With Sylvania's minimum number of precision-made parts, installation is simple and fast. The open pattern of cells results in extremely minor problems of maintenance.

Go modern...with a Sylvania Lighting System!

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At Sylvania continual progress has been made in Area Illumination since providing the first catalogued lighting system over ten years ago. As shown below, Sylvania now offers 3 distinct and different Area Lighting Systems. All 3 systems use standard components and each one provides top-quality, efficient illumination together with smooth, uncluttered appearance.

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SYLVAN-AIRE—Sylvania's established area lighting system, featuring 3' wide rows of corrugated vinyl plastic, offers a most economical method of obtaining area illumination.

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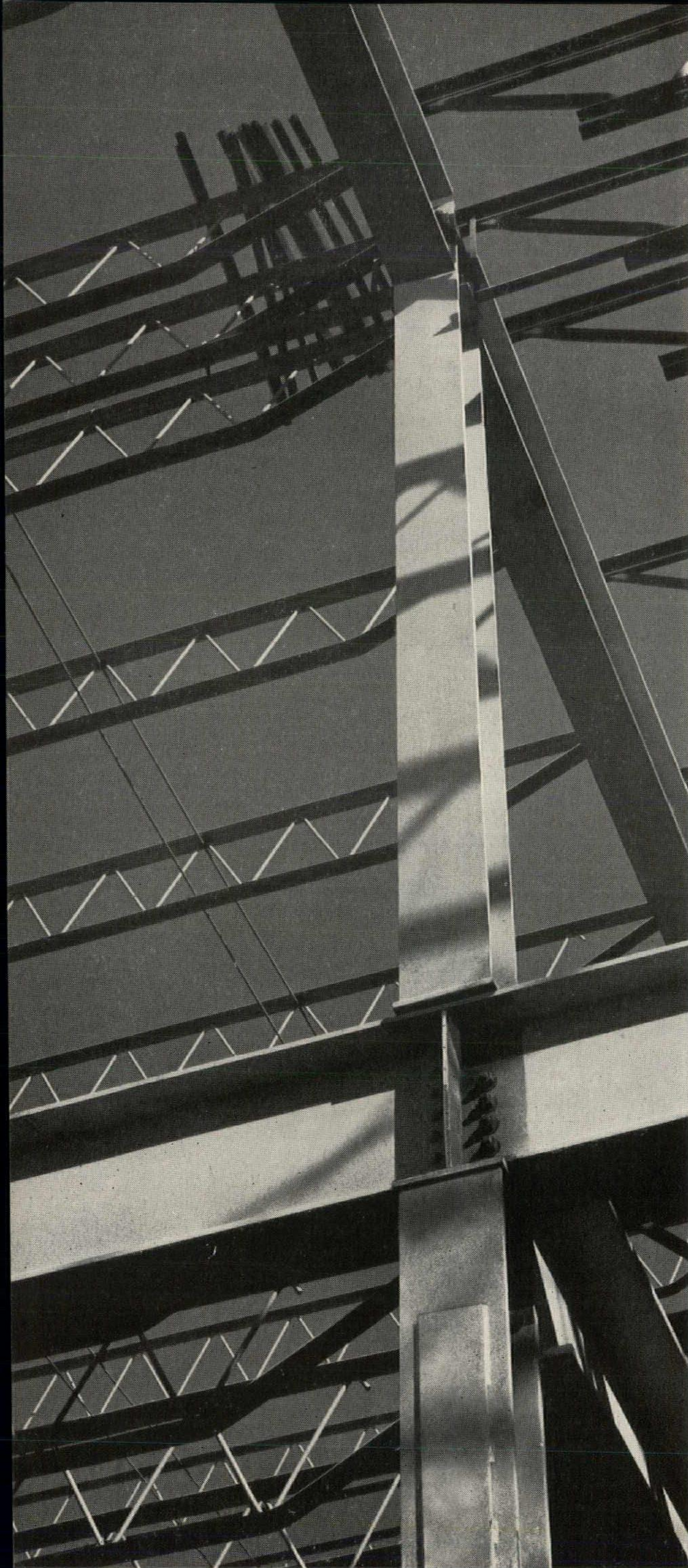
FLUORESCENT LIGHTING FIXTURES AND SYSTEMS • BEST FIXTURE VALUE IN EVERY PRICE RANGE



Wherever the four winds blow...
this trademark stands for

matchless power exhauster performance

Here's why . . .
Jenn-Air developed the first spun aluminum, low contour exhauster years ago. This was a milestone in exhauster design, but it was by no means Jenn-Air's last word on the subject. Product improvement is a never-ending project at Jenn-Air, and this emphasis on engineering has netted rich dividends over the years. Examples of exclusive features developed by Jenn-Air include:

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- **Integral balance**—In addition to dynamic and static balancing of blades, Jenn-Air exhausters feature *integral* balancing of blade with motor. This is an important contribution toward further noise reduction.

- **High point of discharge**—Motor is nested in the housing to provide the highest discharge point of any roof exhauster. By eliminating the need for a high curb base, this feature also makes possible Jenn-Air's attractive "low contour" design.

Every Jenn-Air exhauster that comes off the production line is individually tested for sound level, motor load and insulation breakdown. Only units which can pass these rigid tests are accepted for shipment. Air moving capacities range from 175 to 22,700 cfm and are AMCA-certified. Write for Bulletin 58-B.

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Detroit, Michigan

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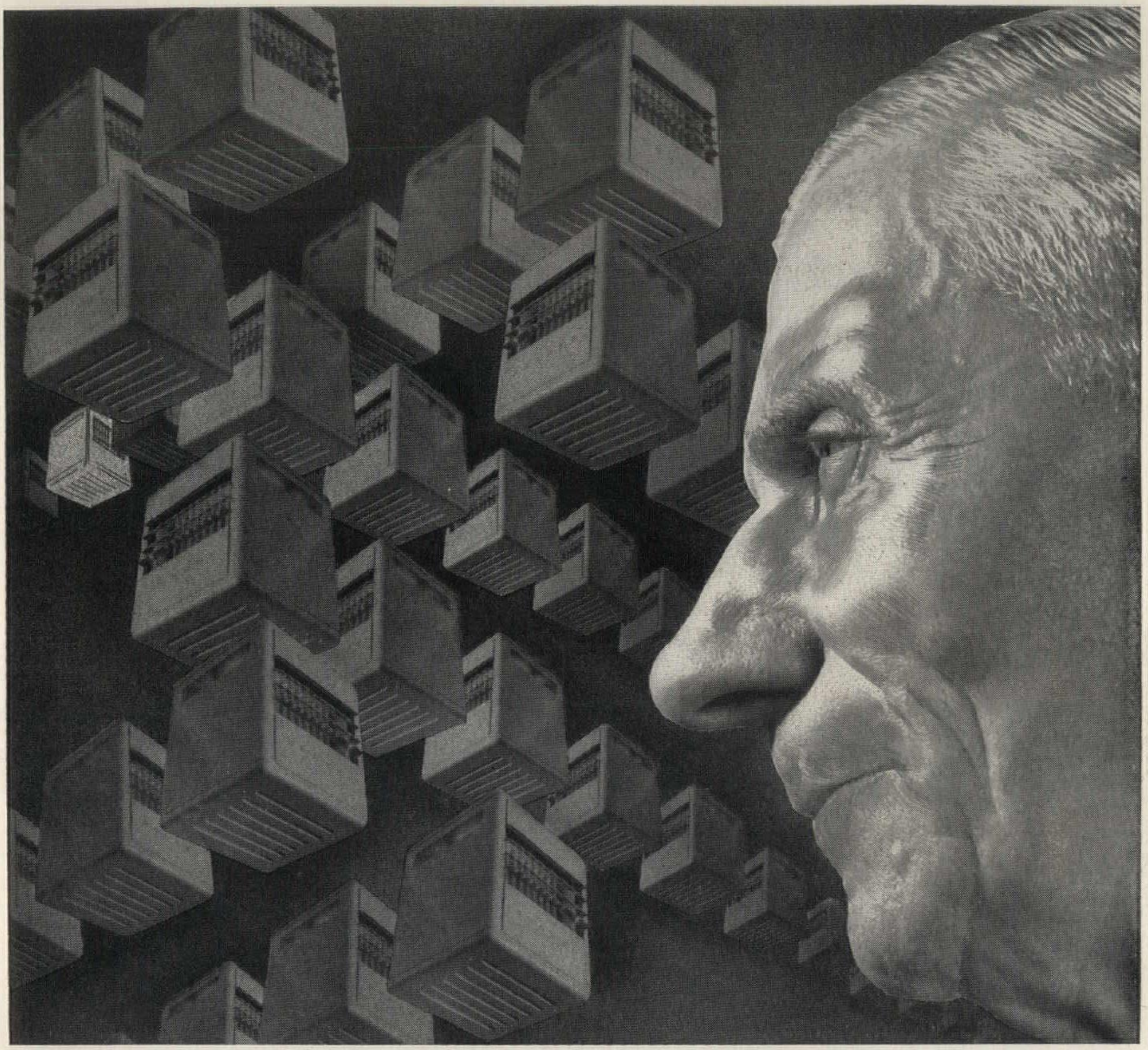
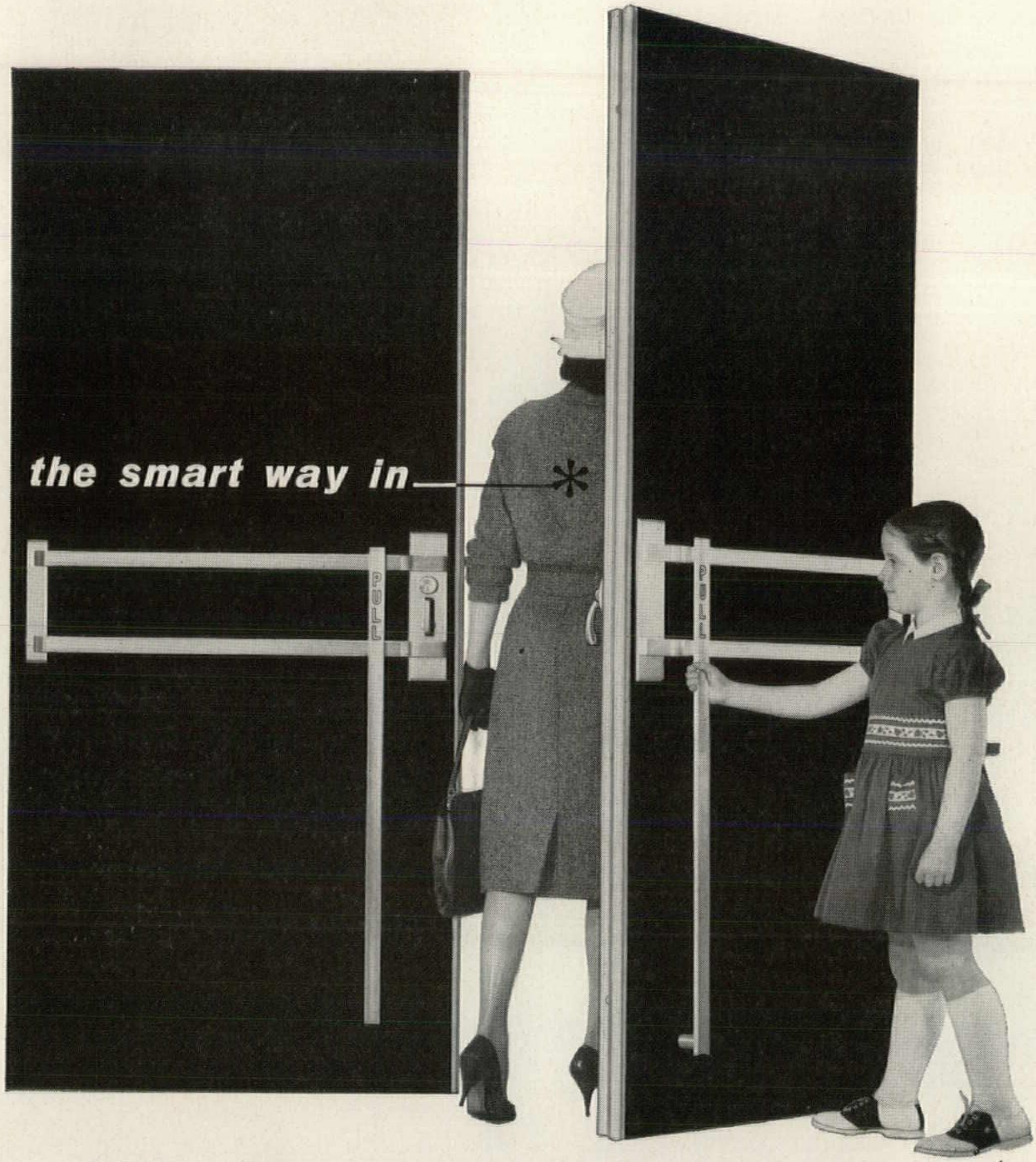
GENERAL CONTRACTOR:
R. E. Dailey & Company,
Detroit, Michigan

CURTAIN WALL FABRICATOR AND ERECTOR:
Moynahan Bronze Company,
Flat Rock, Michigan

The entire exterior grid system of this new office building, including fixed windows, was fabricated from Reynolds Aluminum (more than 110,000 pounds of it). The spandrels are colorful porcelain enamel. Erection was completed within 21 working days. Here again, teamwork between architect and fab- cator



If glass is a chief visual element in your design, then the beauty of that glass should be a major concern in your specification.



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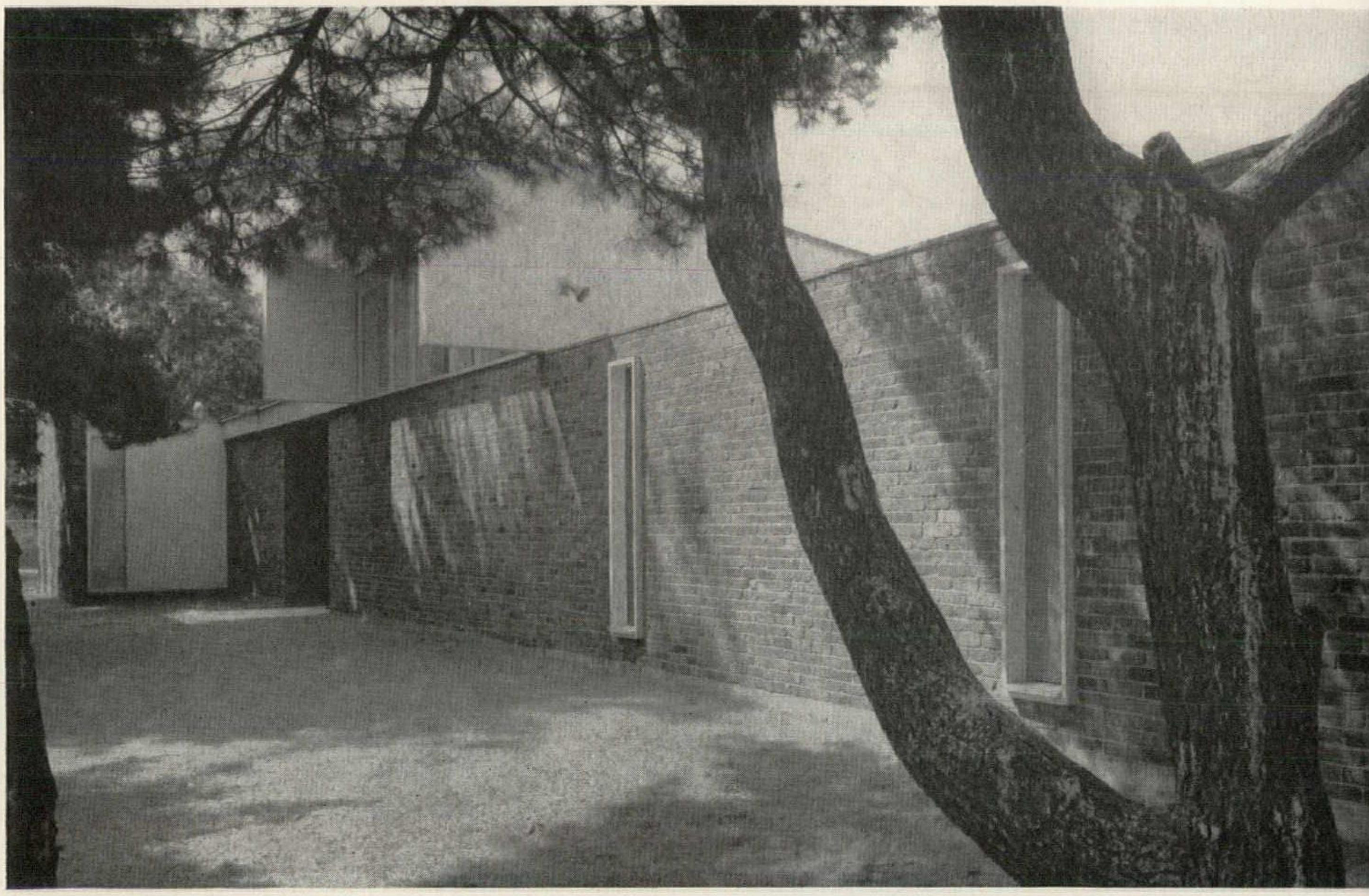
● Von Duprin pull bars are *all* extruded aluminum or bronze. Here is a fully versatile line: reversible . . . no resizing necessary . . . modern or matching designs, each with studs to anchor A² or 88 Von Duprin rim devices . . . plain or engraved grips are curved to fit the hand—safely. Matching push plates and pulls available for vestibule doors. Complete details are yours for the asking; write for Bulletin 576.

illustrated above: all extruded aluminum modern design with extended and engraved grips. Catalog number E282-ENG. on active door; E282DT-ENG. on inactive door.

Von Duprin PANIC DEVICES ASSURE SAFE EXIT

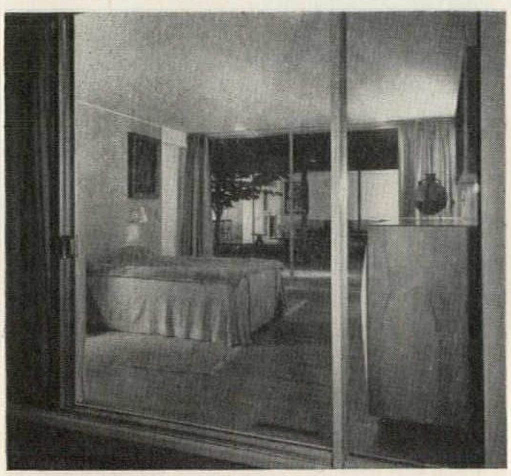
THE PRODUCERS' COUNCIL

VONNEGUT HARDWARE CO. • VON DUPRIN DIVISION • INDIANAPOLIS, INDIANA



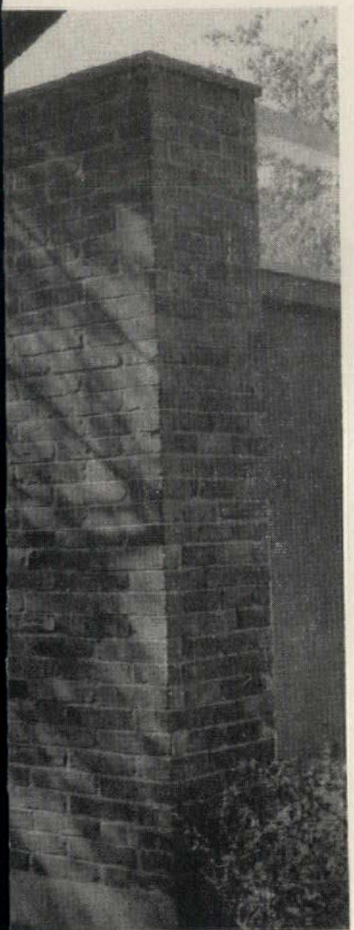
In the home of José Luis Sert

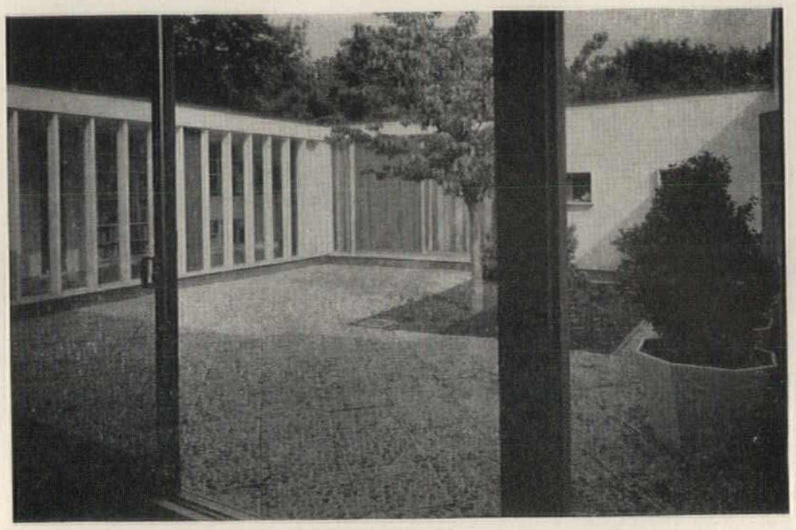
Lennox



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

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





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

All photographs by Louis Reens, New York City

provides double assurance

of finest heating and cooling in every room... under all conditions!

... Lennox equipment plus expert installation techniques of Lennox Comfort Craftsman doubly assured the solution of special comfort problems

The unique construction, design and floor plan of the José Luis Sert home demanded expert knowledge and training in designing a year-round comfort system that would provide *perfect* heating and air conditioning in *every* room under *all* conditions.

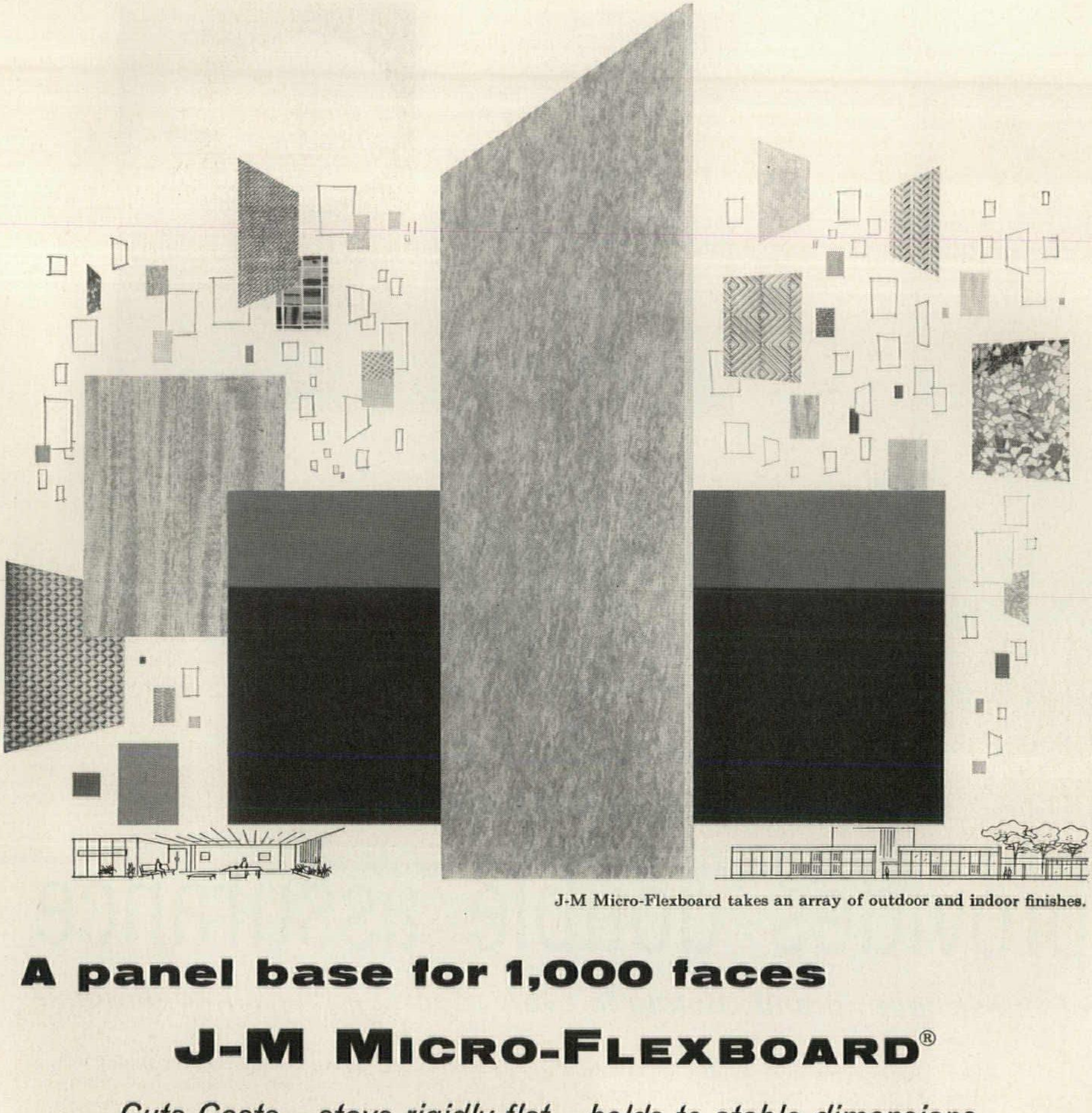
The contractor selected was the Duval Sheet Metal Work, Inc., Lennox dealer of Lexington, Mass. The heating equipment chosen was a Lennox GH5-135,000 Btuh and a GH5-150,000 Btuh unit hooked up in tandem. Sandwiched between these units was a Lennox LSB1-5-ton self-contained cooling coil. These three units, joined into a single assembly, operate through automatic dampers, and utilize a common plenum. The air conditioning condensing unit, a Lennox HSA3-5-ton unit, was concealed by landscaping outside the home.

On the heating cycle, when demand warrants, and on the cooling cycle, both furnace blowers operate in unison. Despite this, however, the distribution system is broken down into two zones, and each zone is controlled by its own thermostat.

Efficient humidity control and the king-size Blue Shield Filters of the Lennox units provide added protection to furniture—and to the Sert Spanish art collection. For information on Lennox heating and air conditioning equipment, and for expert assistance on all your heating and air conditioning problems, call your local Lennox Comfort Craftsman—or write Lennox Industries, 200 S. 12th Ave., Marshalltown, Iowa.

LENNOX®

World leader in indoor comfort for homes, business, schools



J-M Micro-Flexboard takes an array of outdoor and indoor finishes.

A panel base for 1,000 faces

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Cuts Costs—stays rigidly flat—holds to stable dimensions

DOWN GO CURTAIN-WALL COSTS. Up go the opportunities to use the newest finish materials without disappointment.

Johns-Manville Micro-Flexboard provides a rigid, buckle-free, strong-as-stone base that stays flat in service. Face it with porcelain on metal, with wood veneer, with ceramic tile, with textured metal, with plastic; it becomes a handsome, lightweight wall. It can be laminated on one side or on both sides. It can be combined with insulating core materials.

Johns-Manville Micro-Flexboard is an asbestos-cement sheet compressed to great strength and toughness. It ranges in thickness from 0.115″ to 0.250″—comes in sheets 4′ wide by 8′, 10′ and 12′. Length, width, thickness and surface smoothness are held to exceptionally close tolerances.

With Micro-Flexboard, laminators and finishers can provide architects and decorators with wall panels that meet design requirements and structural specifications with complete satisfaction.

To learn how Micro-Flexboard can help on your project, call your laminator or fabricator, or write to Johns-Manville, Box 158, New York 16, N. Y. In Canada, Port Credit, Ont.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

HUSKY TAKES THE TURNS

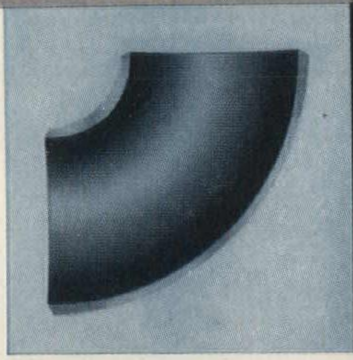
HUSKY
WELDING FITTINGS

—with strength to spare!

A WIDE MARGIN OF SAFETY

Unretouched photo at left shows that a HUSKY 4″ elbow has more than *eight times* as much strength as needed . . . even when Schedule 40 pipe is used at its maximum recommended working pressure. The pipe burst at 7,750 p.s.i.—but notice that our HUSKY elbow is still intact!

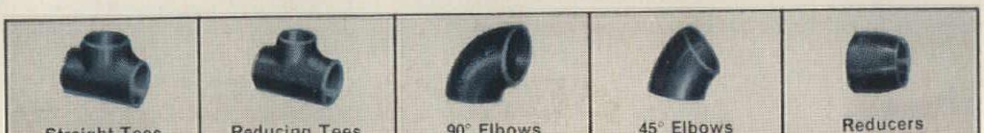
Perhaps even more important than its super strength is the HUSKY price, a 4″ elbow like the one shown costs about two-thirds as much as a regular specification elbow! HUSKY is the only steel welding fitting made specifically for low pressure piping. *Write for catalog and prices.*



The unique shape of the HUSKY elbow is shown here. It results from cold-flow working which compacts the metal for enormous strength, while still maintaining the minimum wall thickness specified for Schedule 40 pipe. Note, also, the heavy build-up of metal in the crotch of the elbow . . . the point of greatest stress in piping.

NIBCO STEEL

NIBCO INC., Dept. JS-2110, Elkhart, Indiana



Straight Tees | Reducing Tees | 90° Elbows | 45° Elbows | Reducers

#2 Broadway, New York City. Architect: Emery Roth & Sons, New York. Owner and Builder: Uris Brothers, New York. Photo by Wurts.

Prefabricated and installed

BY LUPTON...

2 Broadway—Largest curtain-wall building in the world

This impressive 30-story office building at 2 Broadway was built with 350,000 square feet of aluminum curtain-wall, prefabricated and *installed* by LUPTON. It sits in the heart of New York City's financial district on a plot covering 73,000 square feet. It contains 1,300,000 square feet of rentable floor space.

Whether your project is of this mammoth size, or more moderate, it'll pay you to call in LUPTON. You can depend on LUPTON to fulfill your instructions from planning stages until the last curtain-wall unit is installed. And you enjoy other significant advantages.

LUPTON aluminum curtain-walls allow wide design freedom. They're modern and beautiful as well as completely functional . . . low-cost to install and maintain. Parts are lightweight and prefabricated for simple, routinized assembly . . . fast, easy erection. Overall building weight is reduced considerably, which lowers foundation and framework costs. And because LUPTON aluminum curtain-walls are only one-third as thick as conventional masonry, there is more usable floor space.

LUPTON aluminum windows, too, are functional, economical, and attractive. They never rust . . . never need painting. Weather contacts remain clean and tight. And, like LUPTON curtain-walls, they can be installed by skilled LUPTON crews . . . giving you single-source responsibility for the entire project.

See SWEET'S (Sections 3 and 17) for the Michael Flynn Aluminum Curtain-Wall and Window catalogs, and write for further specific information. A call to the nearest LUPTON representative (see the Yellow Pages under "Windows—Metal") will bring fast action without obligation.

Comfort-Conditioning* may be installed as an integral part of LUPTON Curtain Wall for economical, efficient heating, cooling and ventilating. Each unit is self-contained, electrically operated and individually controlled—no expensive, bulky central plant is needed. Capacity is readily increased or decreased to compensate for variance from initial design conditions. Write for complete information.
*(Trade Mark) *PATENT PENDING

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MICHAEL FLYNN MANUFACTURING COMPANY

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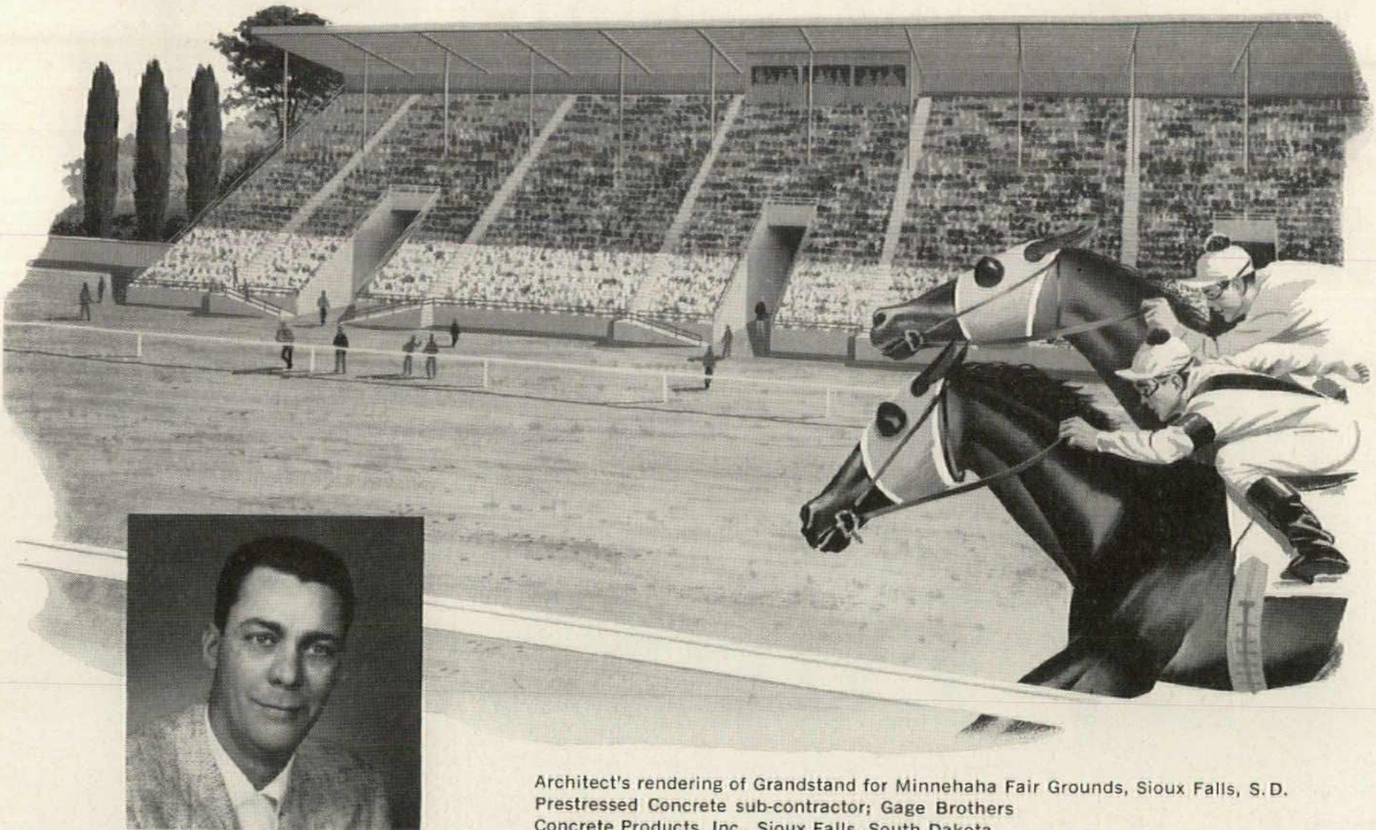
ANOTHER PRESTRESSED CONCRETE STRUCTURE



Architect Howard Parezo, A.I.A.

Architect's rendering of Grandstand for Minnehaha Fair Grounds, Sioux Falls, S.D.
Prestressed Concrete sub-contractor; Gage Brothers
Concrete Products, Inc., Sioux Falls, South Dakota

Nothing Says More for PRESTRESSED CONCRETE Than the Architects Who Design for it

Here's why it was Chosen for Grandstand in South Dakota

We quote architect Howard Parezo: "In designing the Sioux Falls Empire Fair Association Grandstand, thought was given to wood, steel, concrete and prestressed construction.

"The primary budget was set up on the basis of $150,000, which the county was willing to spend for a 5000 seat, canopied, fire-resistant grandstand. Further, the area under the grandstand had to be enclosed and watertight so that it could be utilized for fair display purposes.

"We investigated concrete first and found it to be too expensive. Second, we investigated wood and found it to be inadequate from many points of view. Though steel by itself came within the budget, the cost of putting a protective coating on it made it too expensive. Prestressed concrete came in more reasonable than any of the others and still gave us a fire-resistant job.

"Another factor was the time element. We were awarded the job in June of 1958 with the proviso that the job was to be completed by August 15 of the same year; opening day of the State Fair. None of the construction methods could be completed within that time allotment except prestressed concrete.

"Total cost of the structure was $131,000—well within our budget. We were able to complete the job within nine weeks—the Fair opened on time with full use of the stands.

"The owners are well satisfied with the structure. Some of their comments included 'The finest grandstand we've ever seen,' 'The seating is comfortable', 'Didn't believe it could be done within the budget or the time limit.'"

Mr. Parezo closes on an equally positive note: "We have used prestressed concrete before and we will consider it for future structures, for permanence, price and construction time."

Change the name of the architect, the type of structure and the location and you have, in substance, the *classic* reasons for the use of prestressed concrete the country over. Terminals, schools, bridges, piers, motels, garages, and warehouses are some of the structures that have been, and are being, built of prestressed concrete.

Roebling's experience and familiarity with prestressed concrete dates back to its introduction into this country. We are in a position, therefore, to share with you data and information we have accumulated on all phases of prestressed concrete. Any inquiry bearing on any part of this remarkable subject will be answered promptly and fully.

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CONSULT ROEBLING... First in U.S. with prestressing and tensioning elements

Weis compartments are now...

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HENRY WEIS MANUFACTURING CO., INC.

Certification

We hereby certify toilet compartments furnished on our order #

for project JOHN DOE SCHOOL, are in accordance with plans

and section A of specifications blank.

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

Gauges of steel shall be as follows:

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

Edge Molding — 20 gauge galvanized bonderized steel reinforced with die formed stainless steel corners
Floor Fastenings — 5/32" x 1" heavy zinc plated steel
Cast Brackets — Zamac, extra heavy die cast
Steel Brackets — ⅛" minimum thickness
Shoes — .031" Stainless Steel, full 3" high, hemmed top and bottom

Enamel used shall at least equal the following specifications:

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

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Henry Weis Mfg. Co., Inc., J-2110, Weisteel Bldg., Elkhart, Ind.

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TOLEDO, OHIO

Department of Public Works — *Owner*

Consoer-Townsend & Associates — *Engineers*

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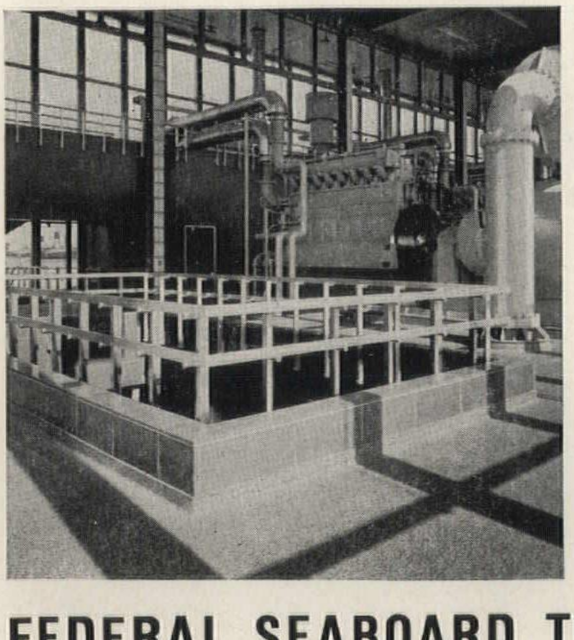
Ceramic Veneer in mottled pine green was specified for the interior walls of this modern sewage treatment plant in Toledo, Ohio. Unit size is 20" x 20".



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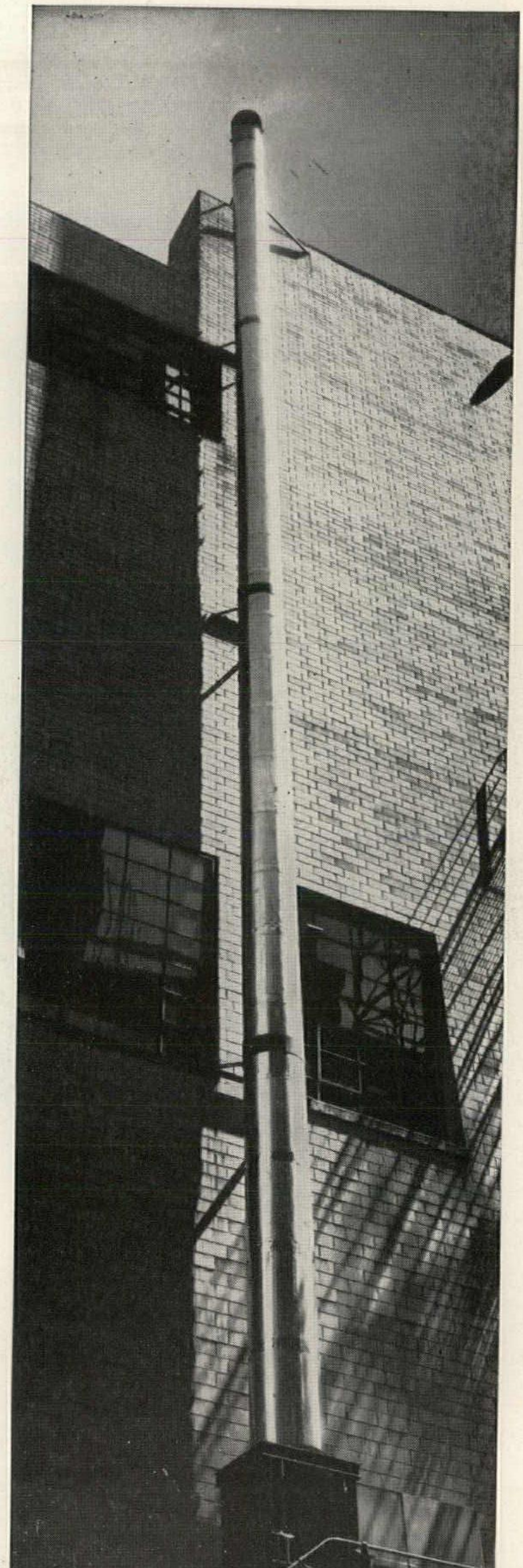

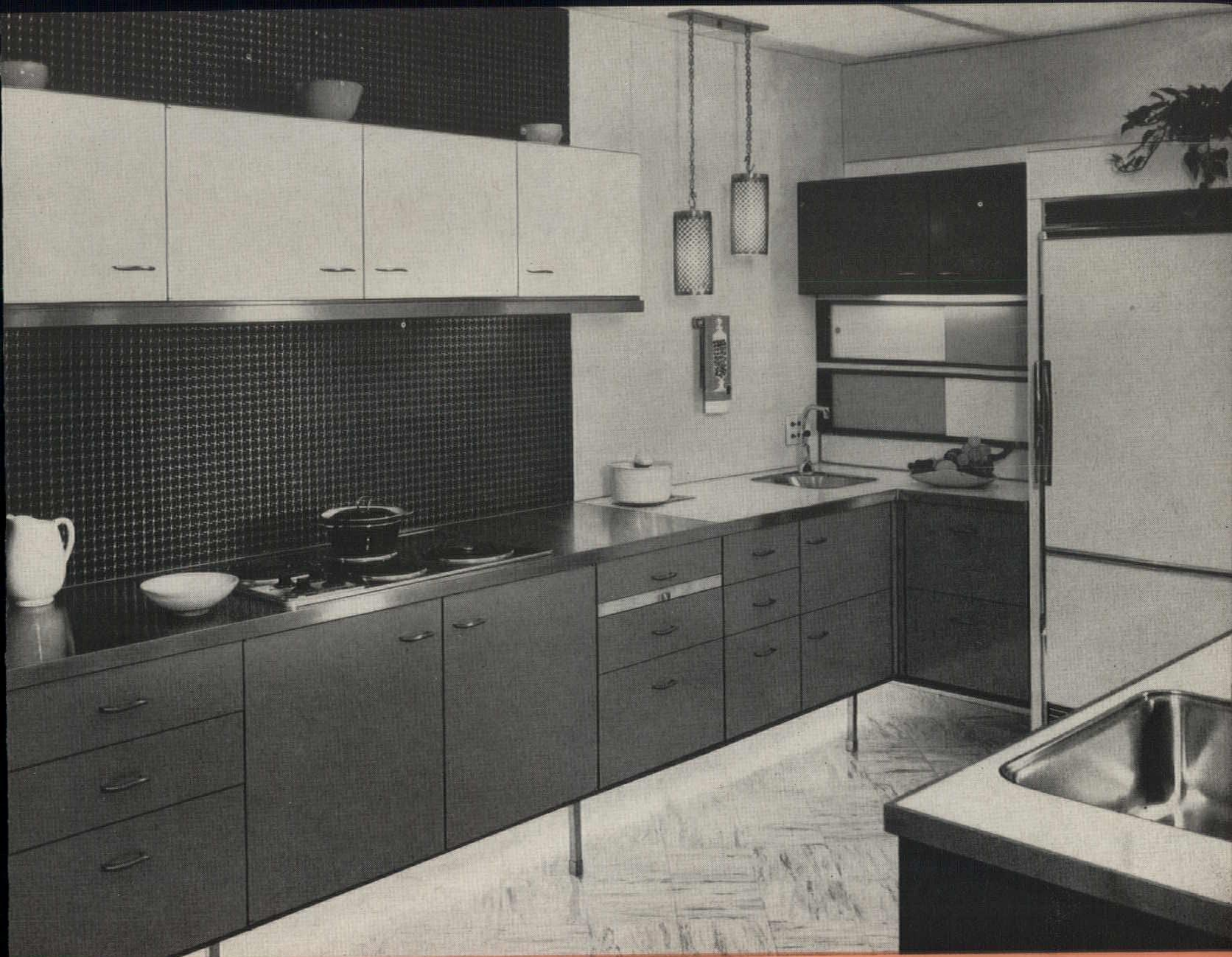

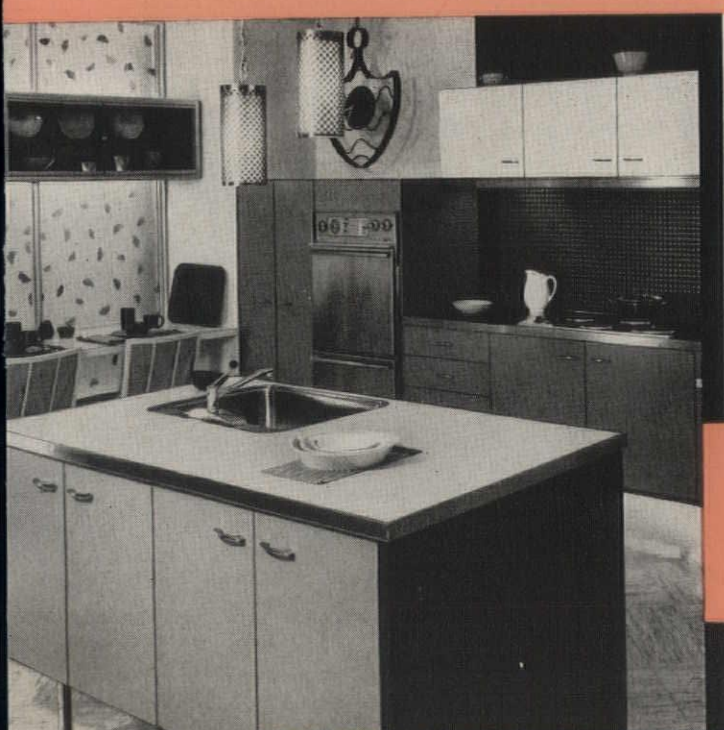

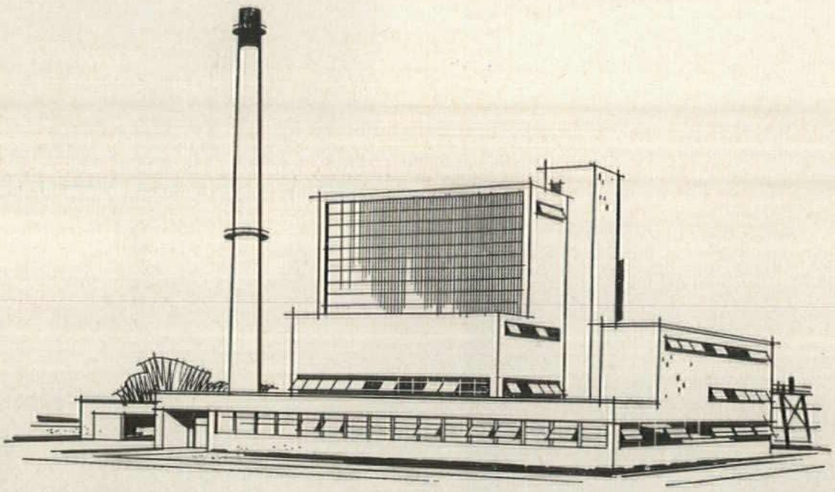

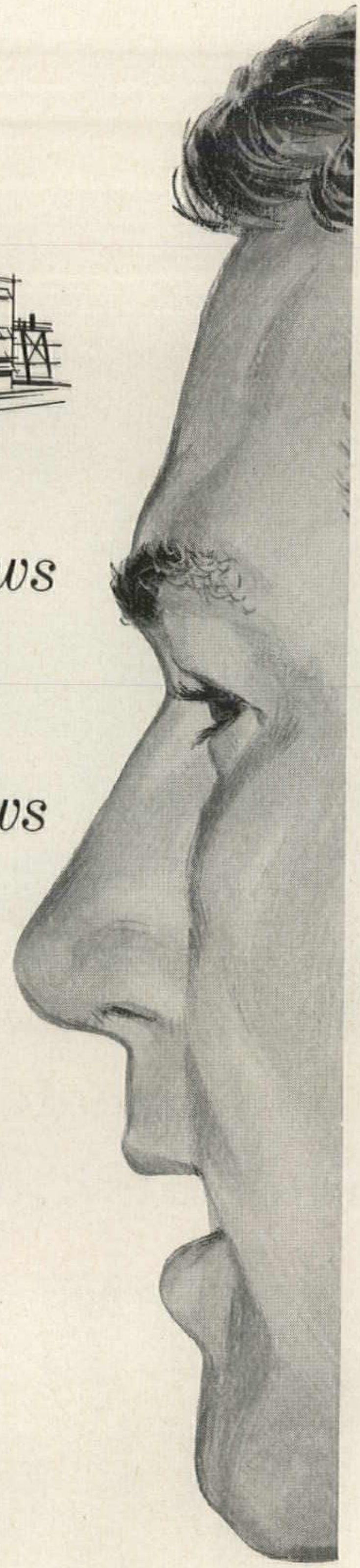

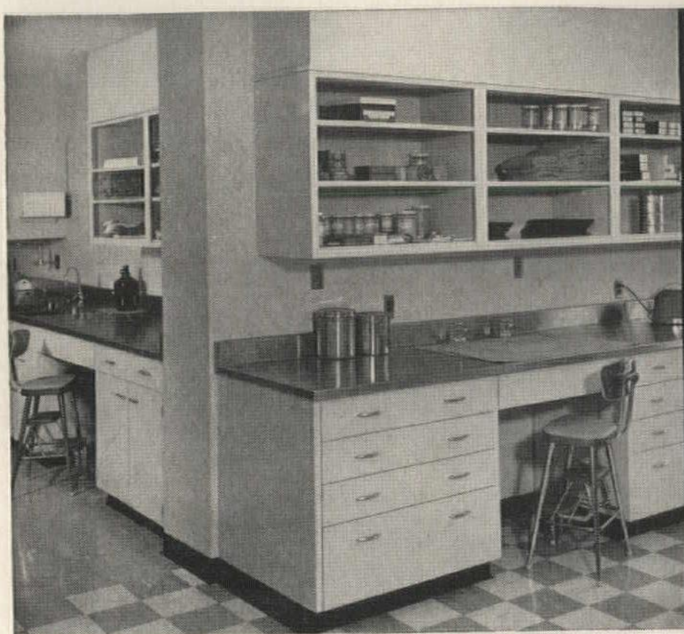

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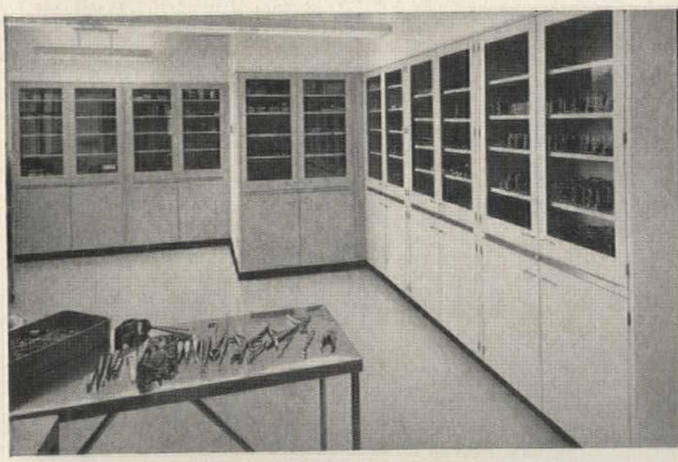
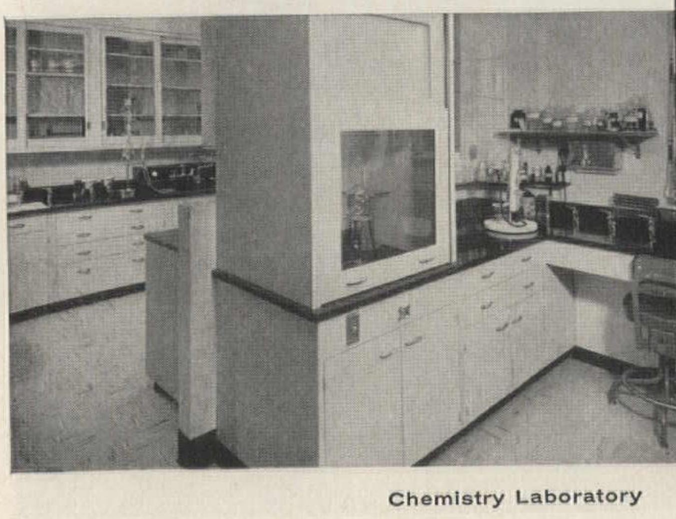
Installed in Utah Valley Hospital, Provo, Utah



Instrument Storage



Chemistry Laboratory

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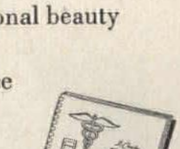

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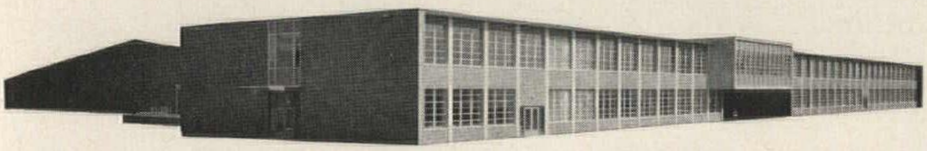

George W. Norris Junior High School,
Omaha, Nebraska,
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Nebraska Custom Kitchen, Omaha,
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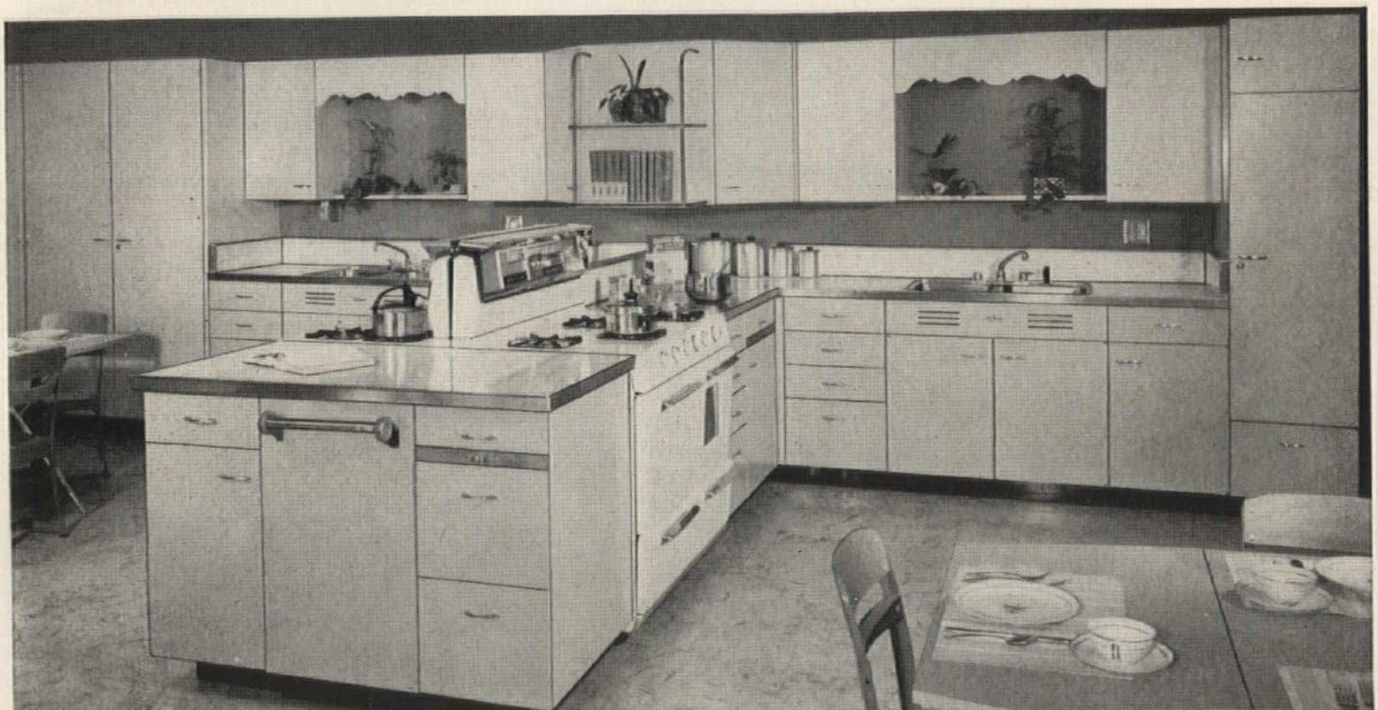

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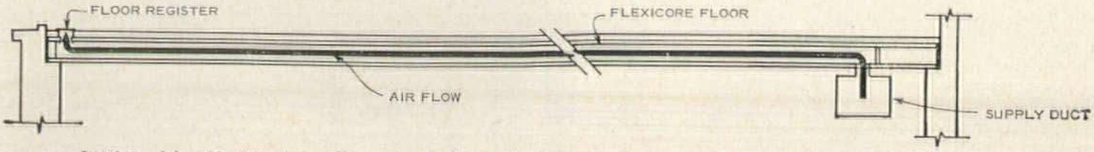
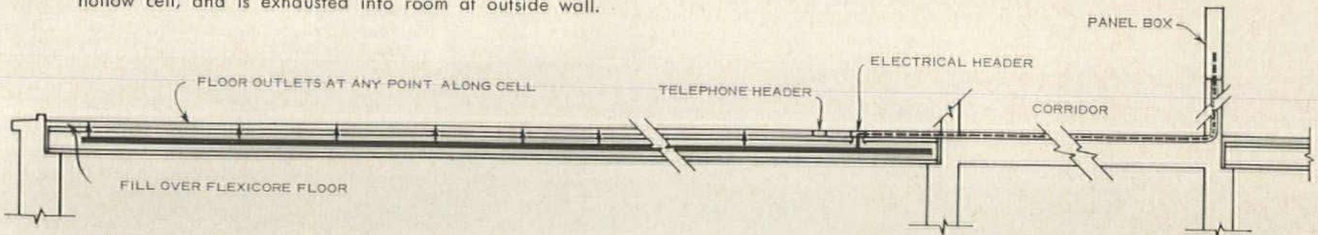
School Storage Furniture for Food Labs, Clothing Labs, Arts and Crafts, and Elementary Classrooms

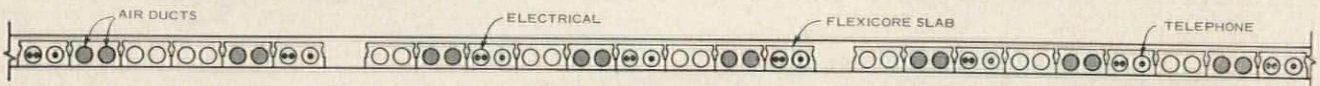


Ask for Flexicore Facts No. 82

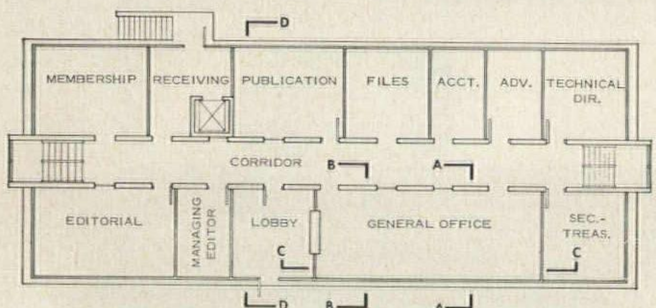
Section AA. At American Concrete Institute in Detroit, warm or cool air flows from supply duct, through Flexicore hollow cell, and is exhausted into room at outside wall.



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

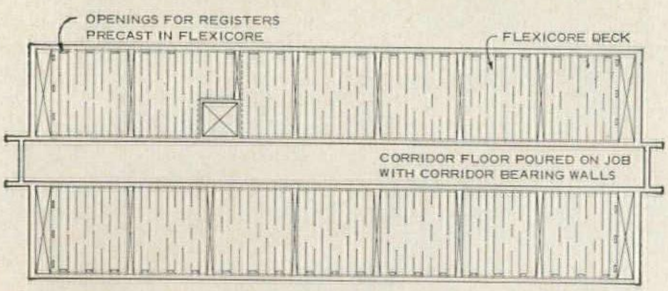


Section CC. Selected cells are used for electrical, telephone, and for air ducts. Electrical fittings by Conduflor Corp., Cleveland.

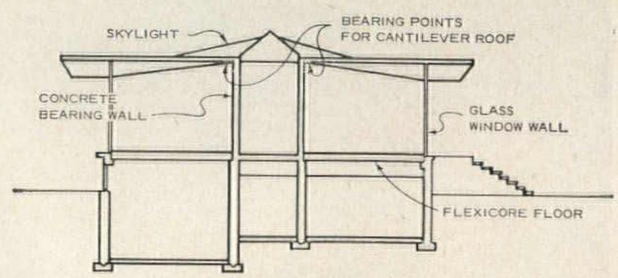


FIRST FLOOR PLAN

HOW TO USE CELLULAR CONCRETE DECKS FOR ELECTRICAL AND AIR DISTRIBUTION

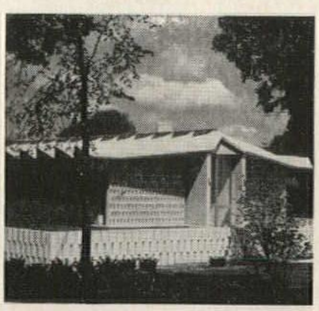


First Floor Framing. Corridor floor was cast in place with corridor bearing walls. Flexicore clear-spans from corridor walls to outside walls.



Section DD. Corridor walls are sole support for roof.

Minoru Yamasaki & Associates, Architects, Birmingham, Michigan



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

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

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IN NEW YORK'S C. I. T. BUILDING, Aetnawall appears in many forms: floor-to-ceiling walls that look like masonry, as in reception area at right; framing members with full glass panels, as in supervisor's office at left; less-than-ceiling-height space dividers, and other wall treatments employing a variety of materials, textures and colors.

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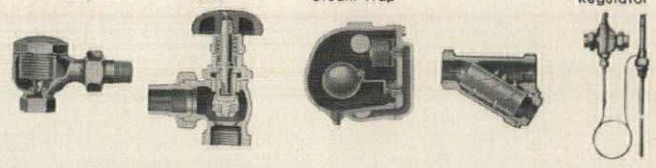
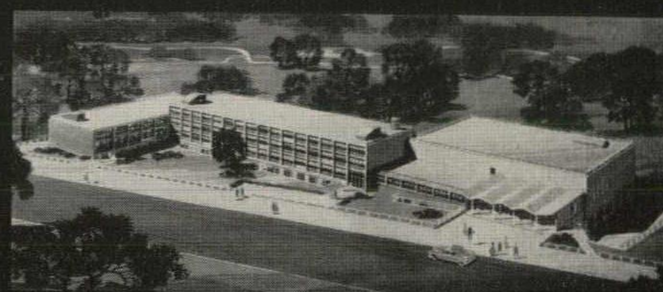


These Sarco Products give these New York City Schools reliable heating systems . . . economically

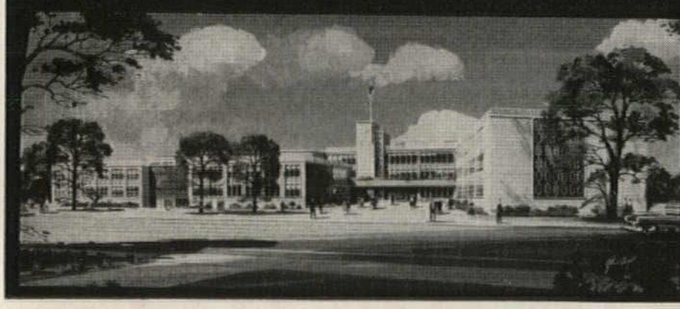
WILLIAM F. GRADY VOCATIONAL HIGH SCHOOL, New York. Katz, Waisman, Blumenkranz, Stein & Weber, Architects. Raisler Corporation, Heating Contractor. Benjamin L. Spivak, Engineer.

JUNIOR HIGH SCHOOL 142, New York. New York City Board of Education, Bureau of Construction, Architects and Engineers. Daniel J. Rice, Inc., Heating Contractor.



NEW YORK SCHOOL OF PRINTING, New York. Kelly & Gruzen, Architects. Afgo Engineering Corporation, Contractor. Jaros, Baum & Bolles, Engineers.

JUNIOR HIGH SCHOOL 211, New York. Lloyd Morgan & Eugene V. Meroni, Architects; Harry P. Jaenike, Associate. Daniel J. Rice, Inc., Heating Contractor.



SHEEPSHEAD BAY HIGH SCHOOL, New York. Holden, Egan Wilson & Corser, Architects. Raisler Corporation, Heating Contractor. Slocum & Fuller, Engineers.

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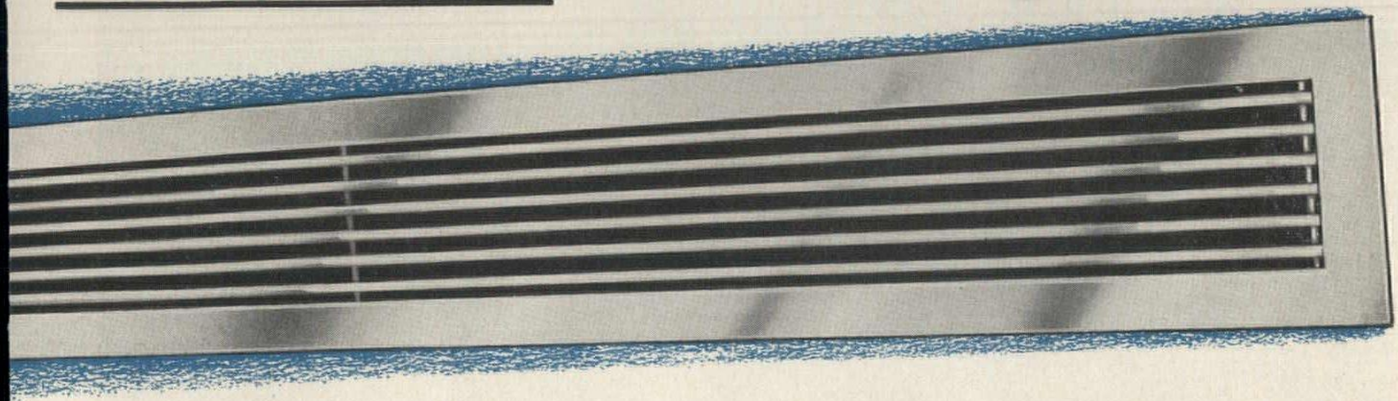

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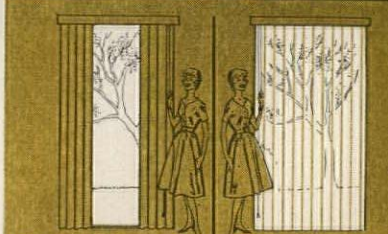

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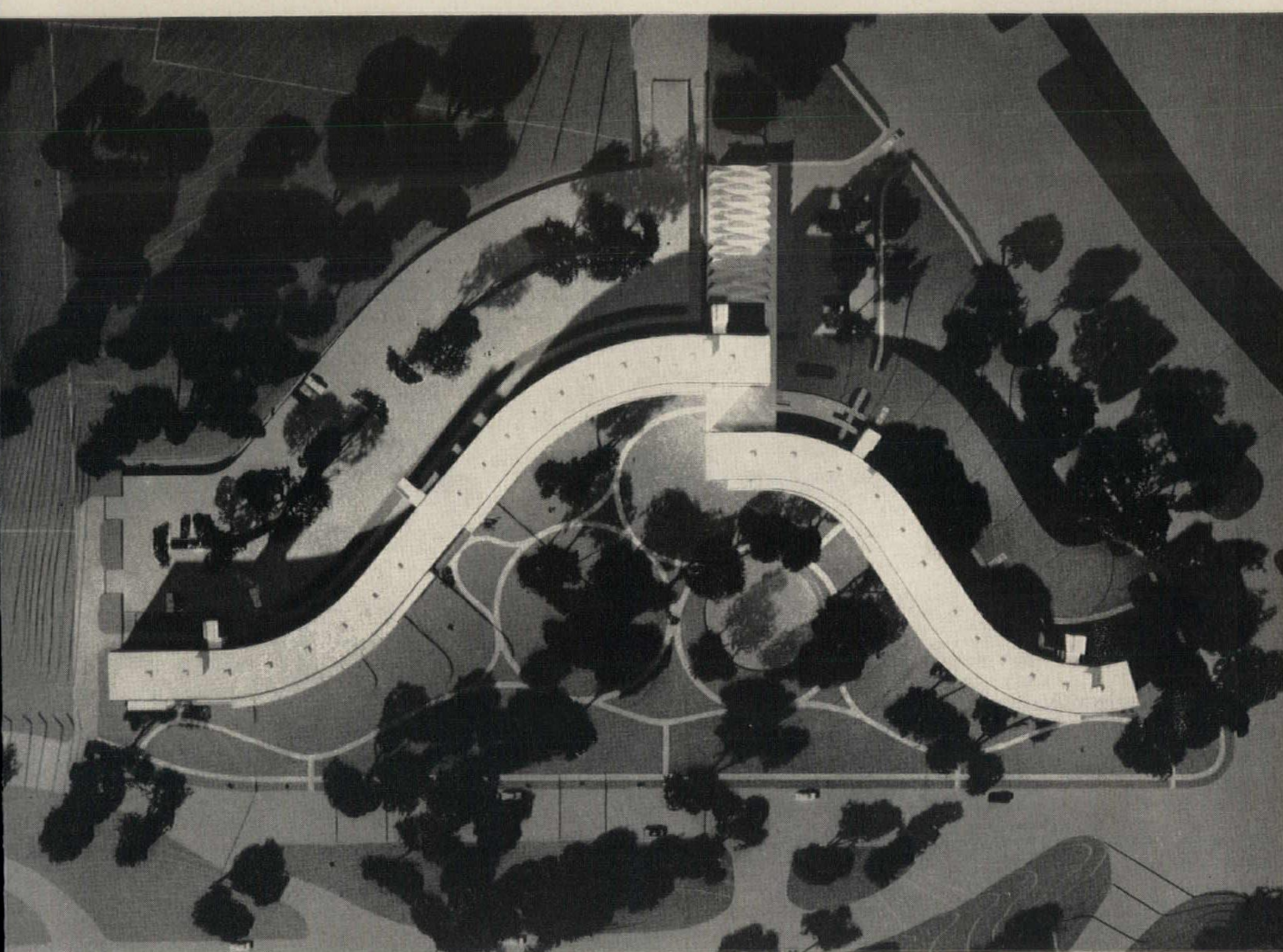


HUGH STUBBINS

Hugh Stubbins represents a not-unfamiliar phenomenon of our times, an early protagonist for (and teacher of) modern architecture, now arrived at mature years and responsible commissions . . . and a relatively large practice. A comparison of this current work with his earlier output would show that this cycle is not a curve, but a straight line, for through it all there is a consistency in approach: whatever theory might be suggested by a particular design, the dominance of architectural orientation is forever visible.

Donald Hanson, Tetsuo Takayanagi, Gordon Aanderson and John R. Myer of Hugh Stubbins and Associates collaborated as designers on the four projects shown.

1. Apartment Group

NAME: *Farm Redevelopment Project*

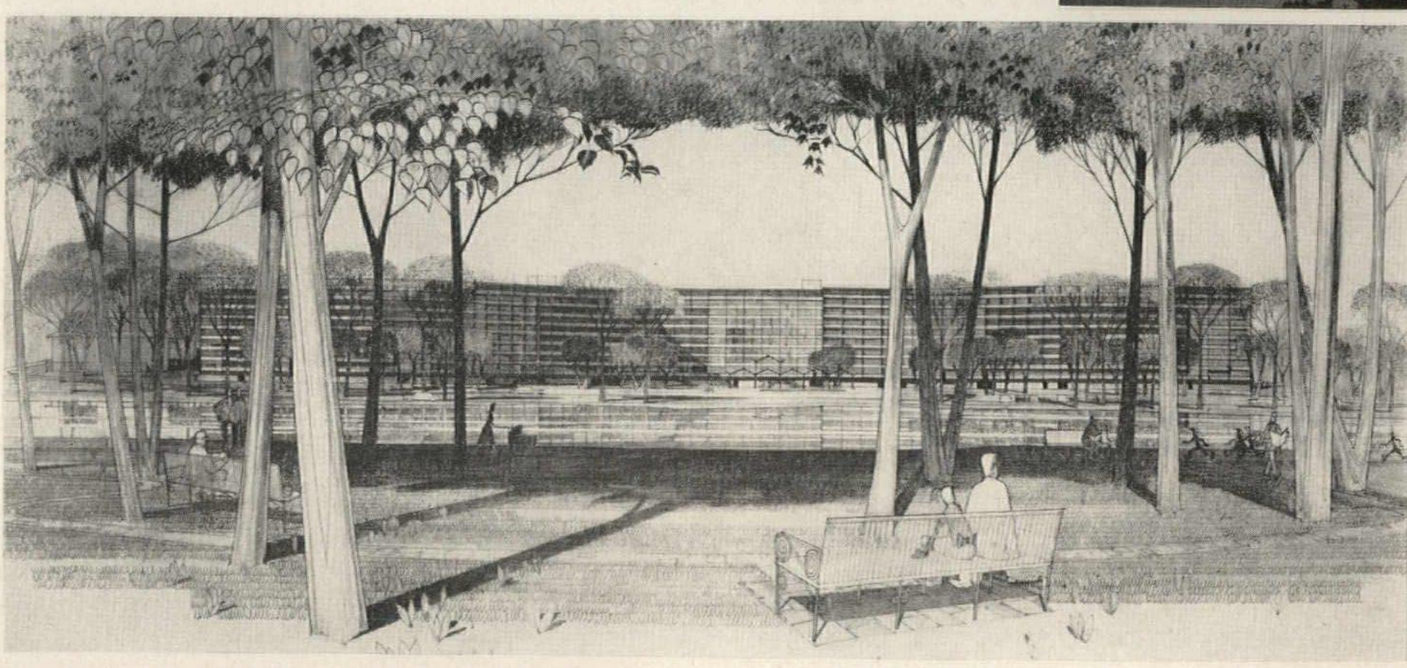
OWNER: *Brookline Redevelopment Authority*

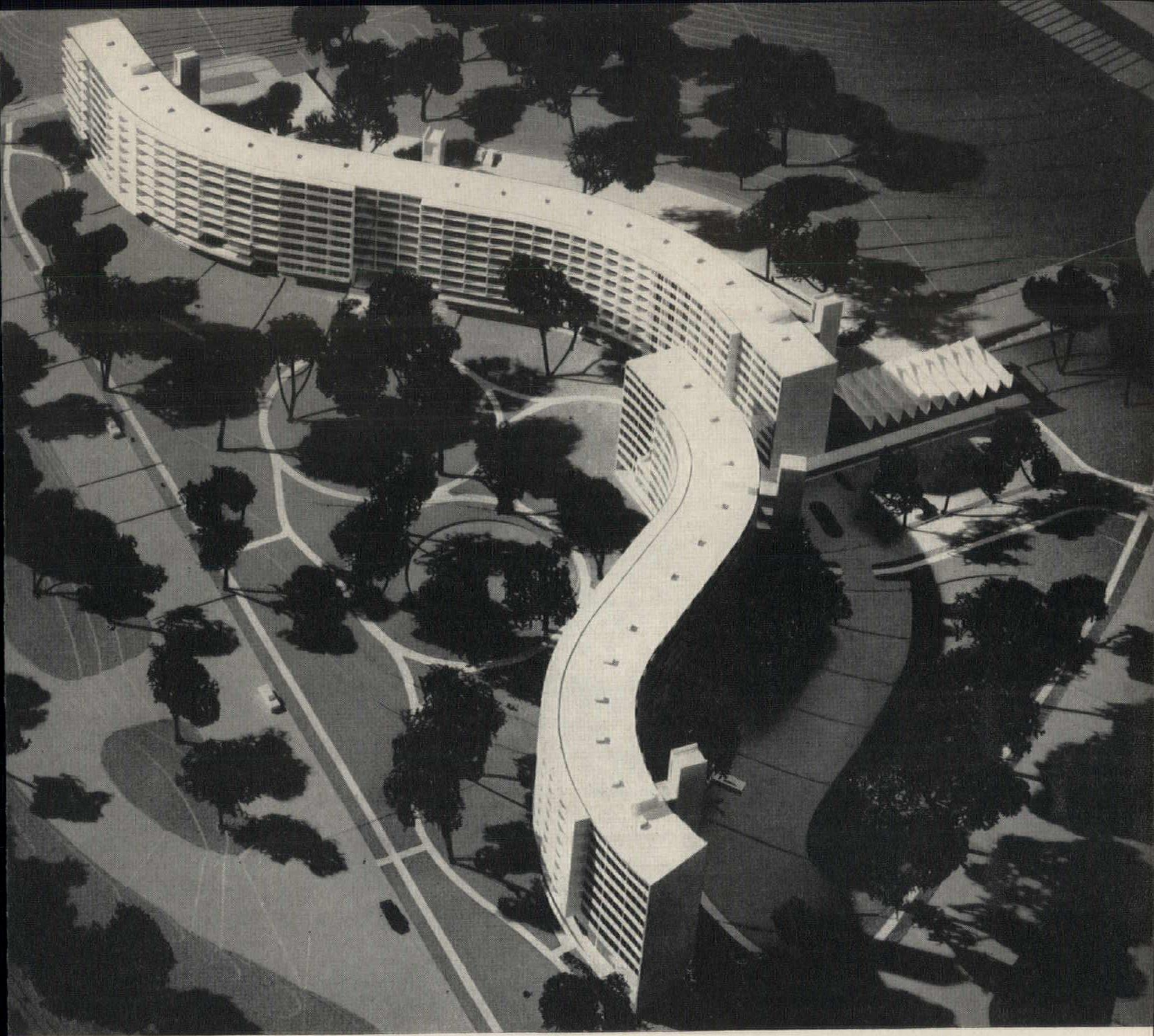
LOCATION: *Brookline, Massachusetts*

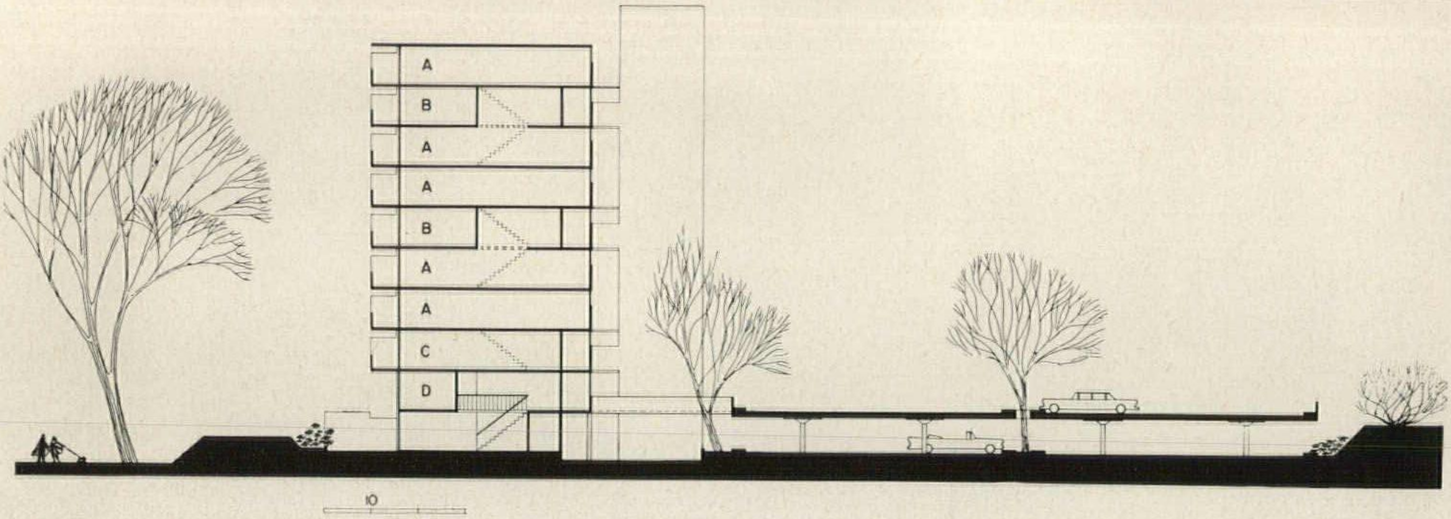
ARCHITECTS: *Hugh Stubbins and Associates, Inc.*

This private housing development has been proposed to occupy an attractive site overlooking the lakes and lagoons of a greenbelt in Brookline known as the Riverway. The two long curved buildings comprising 652 apartment units form a crescent which invites an extension of the park into the development area. This portion of the site, although it would be privately owned and maintained, is not planned for the exclusive use of the apartment house tenants, but for occupants of adjacent homes and a nearby public housing project as well. By this means the architects hope to integrate the neighborhood.

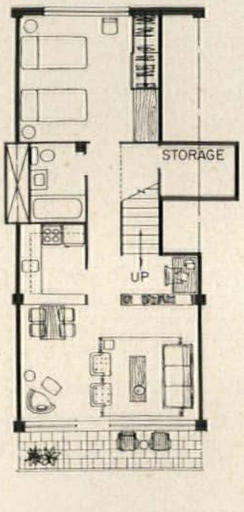
Parking facilities, provision for service delivery and a small shopping area easily accessible to the surrounding neighborhood have been located at the rear of the structures in order not to interrupt the integration of the Redevelopment park and the Riverway, and to preserve the green area for landscaping and pedestrian walks. The buildings face the southeast, and each apartment overlooks the Riverway and enjoys an equal amount of light and sun. The architects have limited the building height to 85 ft in compliance with the local zoning ordinance. Although this maximum was not an absolute limitation on the design and higher buildings could have been considered, the architects felt this height limitation to be consistent with the residential character of Brookline. By observing this maximum they believe that the new structure will be better integrated architecturally with the community.



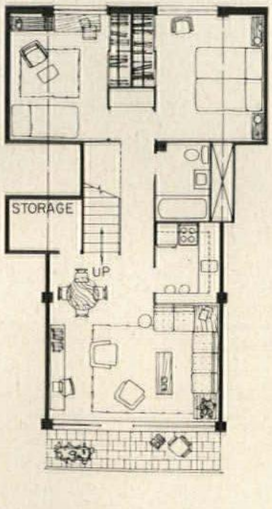




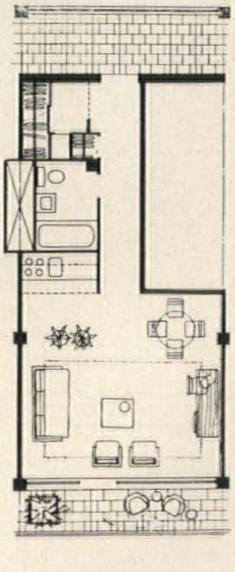
The two level parking system at the rear of the larger building of the crescent has been proposed to minimize roads and paving and free the site for maximum landscaping. The natural contours of the land allow ramps and circulation space to be kept to a minimum. Access to the apartment lobbies and elevators from the parking area is direct and short. A southeastern park view for every apartment is provided by means of alternate non-corridor floors (elevators stop at the first, second, third, sixth and ninth floors and occupants walk up or down from these stops) which permit apartments to extend from one side of the building to the other



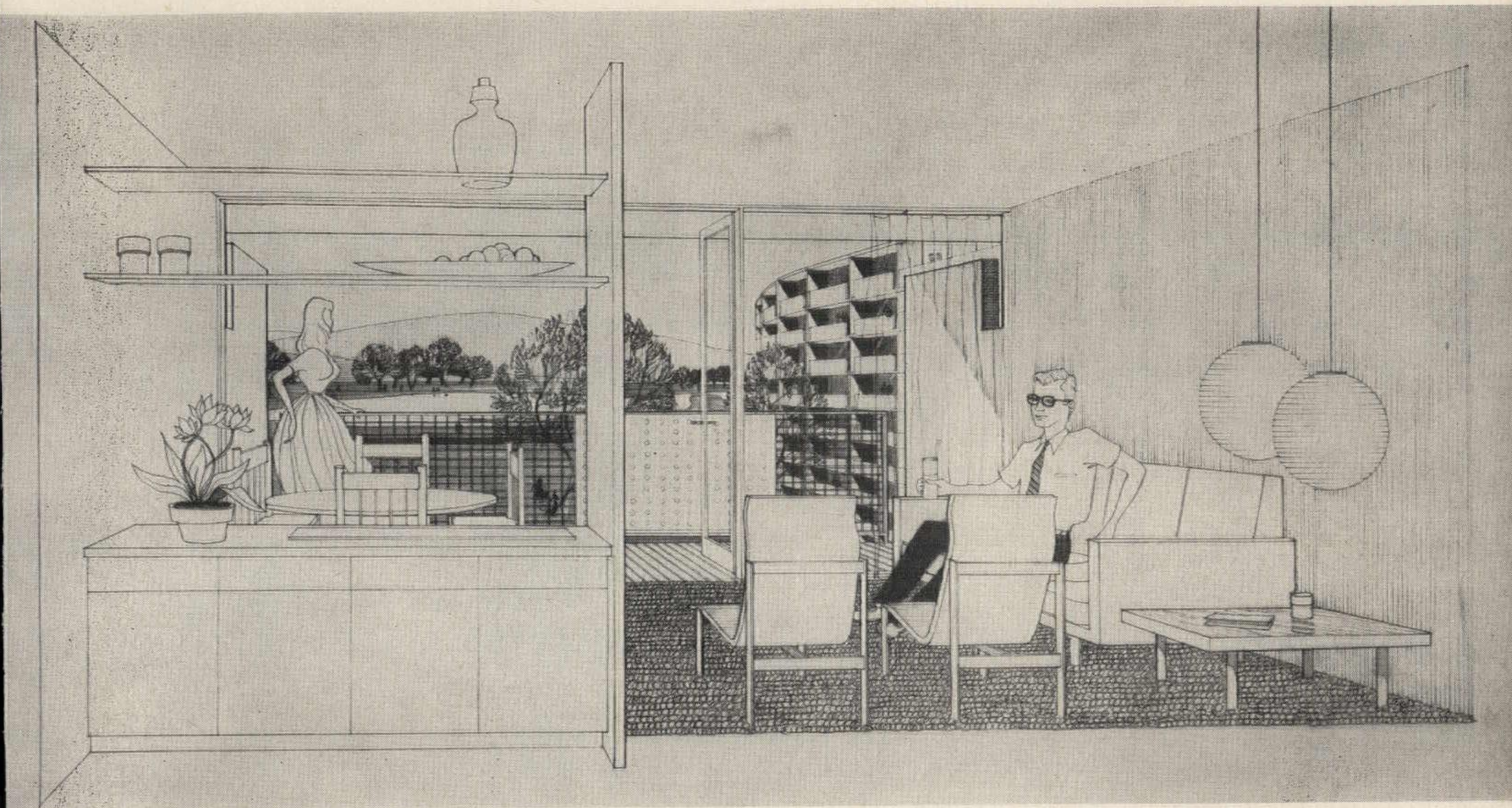
A. ONE BEDROOM

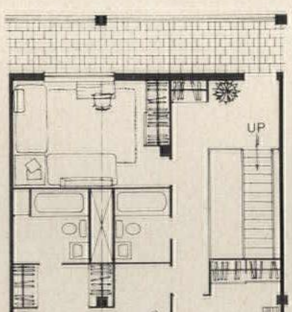


A. TWO BEDROOM

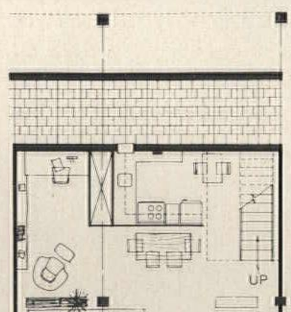


B. EFFICIENCY

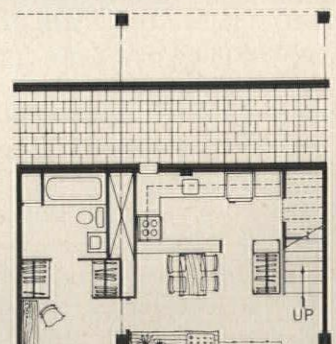




D. DUPLEX UPPER

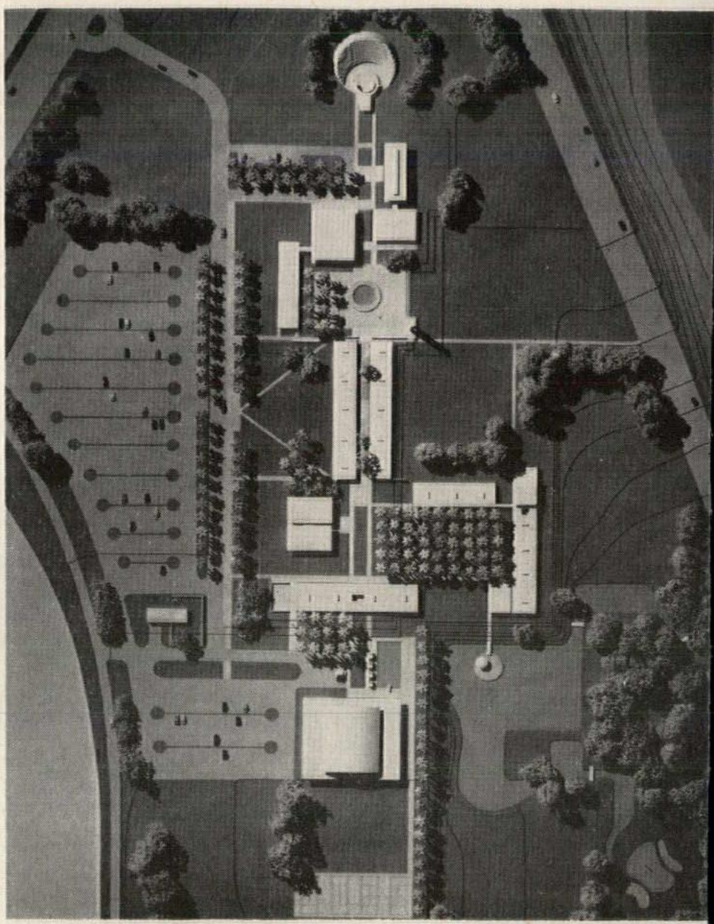


D. DUPLEX LOWER



D-1. ALTERNATE

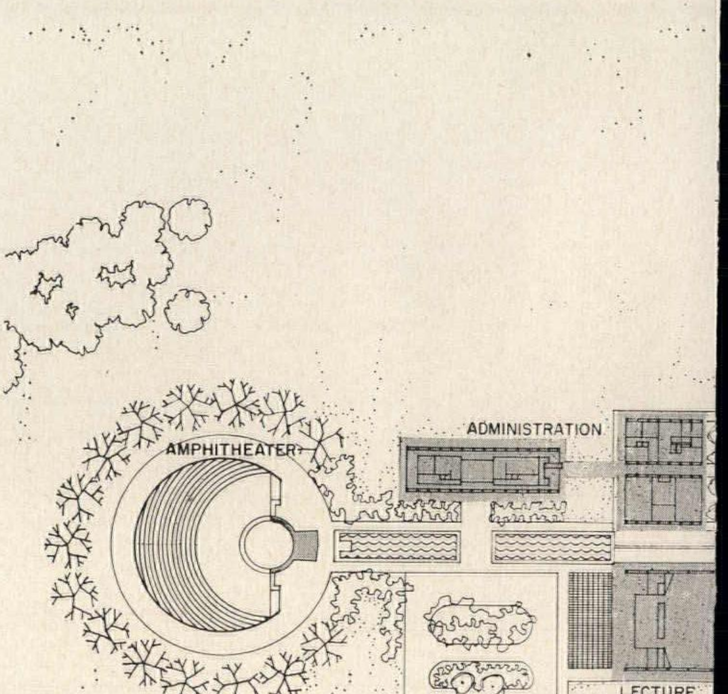
NAME: *Gulf Coast Community College*
OWNER: *The Board of Public Instruction for the County of Bay*
LOCATION: *Panama City, Florida*
ARCHITECTS: *Hugh Stubbins and Associates, Inc.*

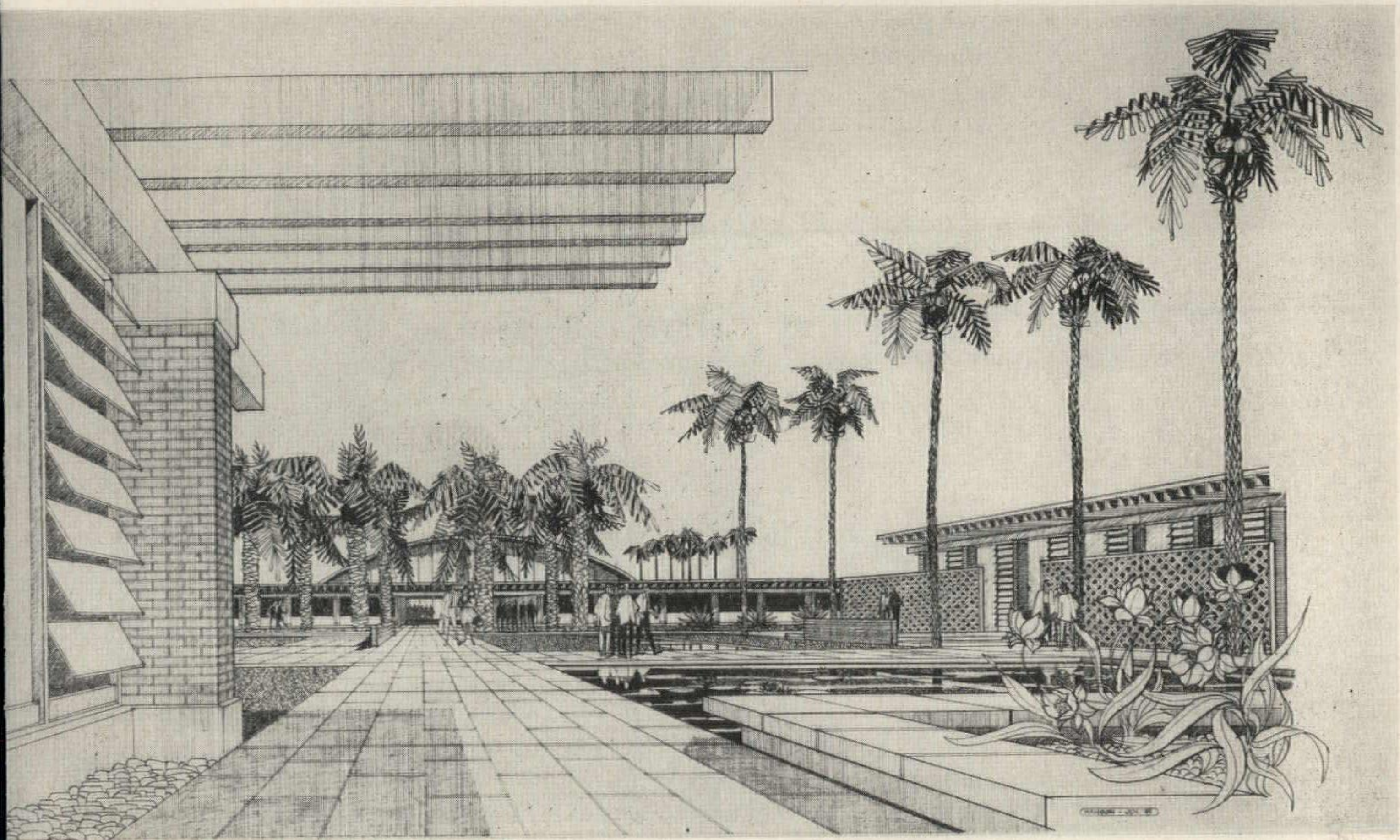


2. Campus Planning

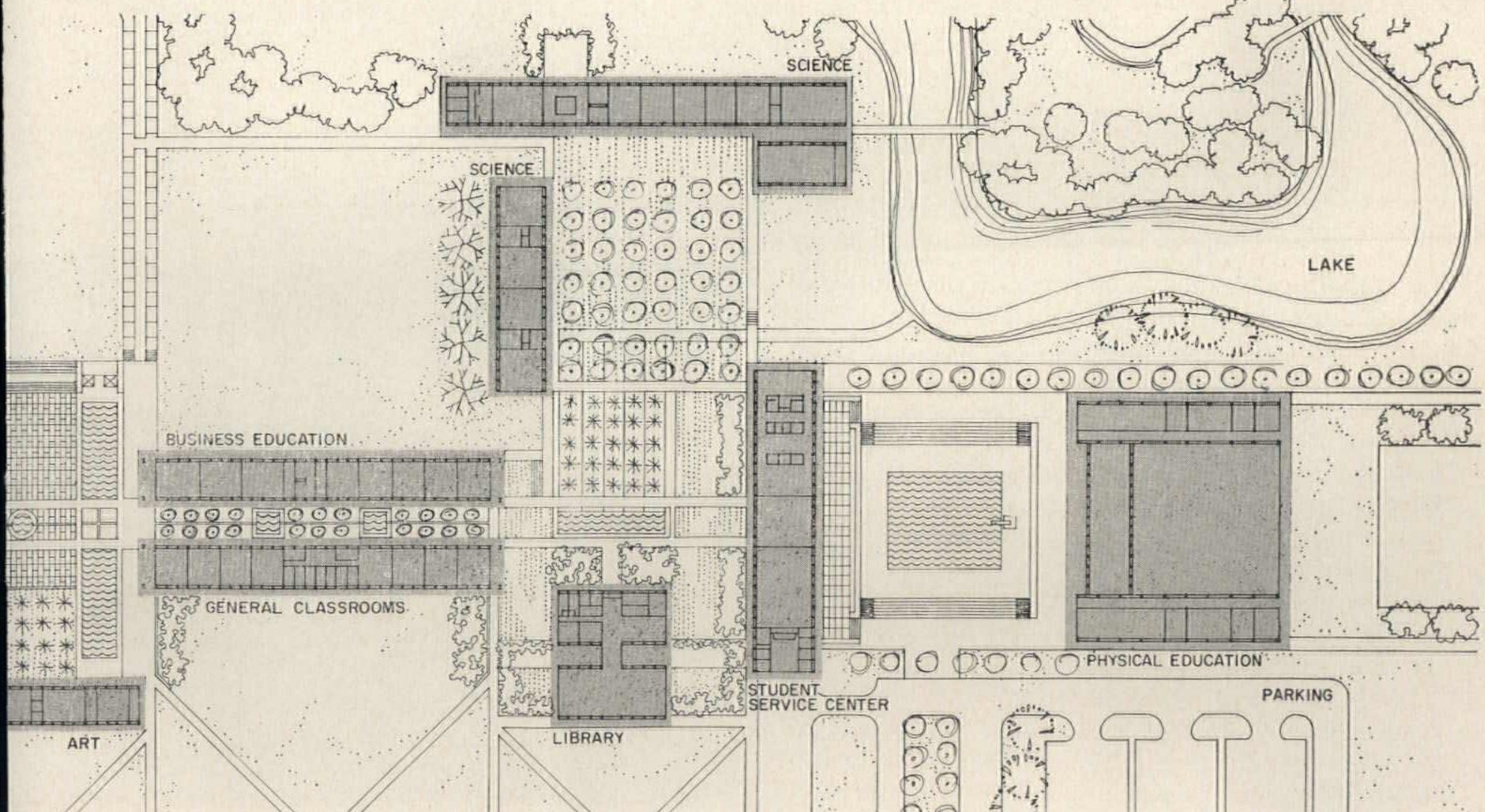
This proposed scheme is the result of an opportunity given the architects to plan an entire campus for an ultimate enrollment of 1000 students from its inception. No existing buildings or campus spaces had to be accommodated or related to. The layout and site plan for the eighty acre property was partially influenced by its views of water and woodland. The priority of the various units in a long term construction timetable influenced their position in the plan. Basically the master plan proposes a group of buildings laid out longitudinally on the site, with maximum exposure to the water, yet creating a sequence of deliberately proportioned spaces and views both from within the campus complex as well as from the two major thoroughfares that border the site. Provisions for adequate peripheral roads and parking spaces have made the campus proper a comparatively traffic free space. The parking areas provide for one parking space for each student.

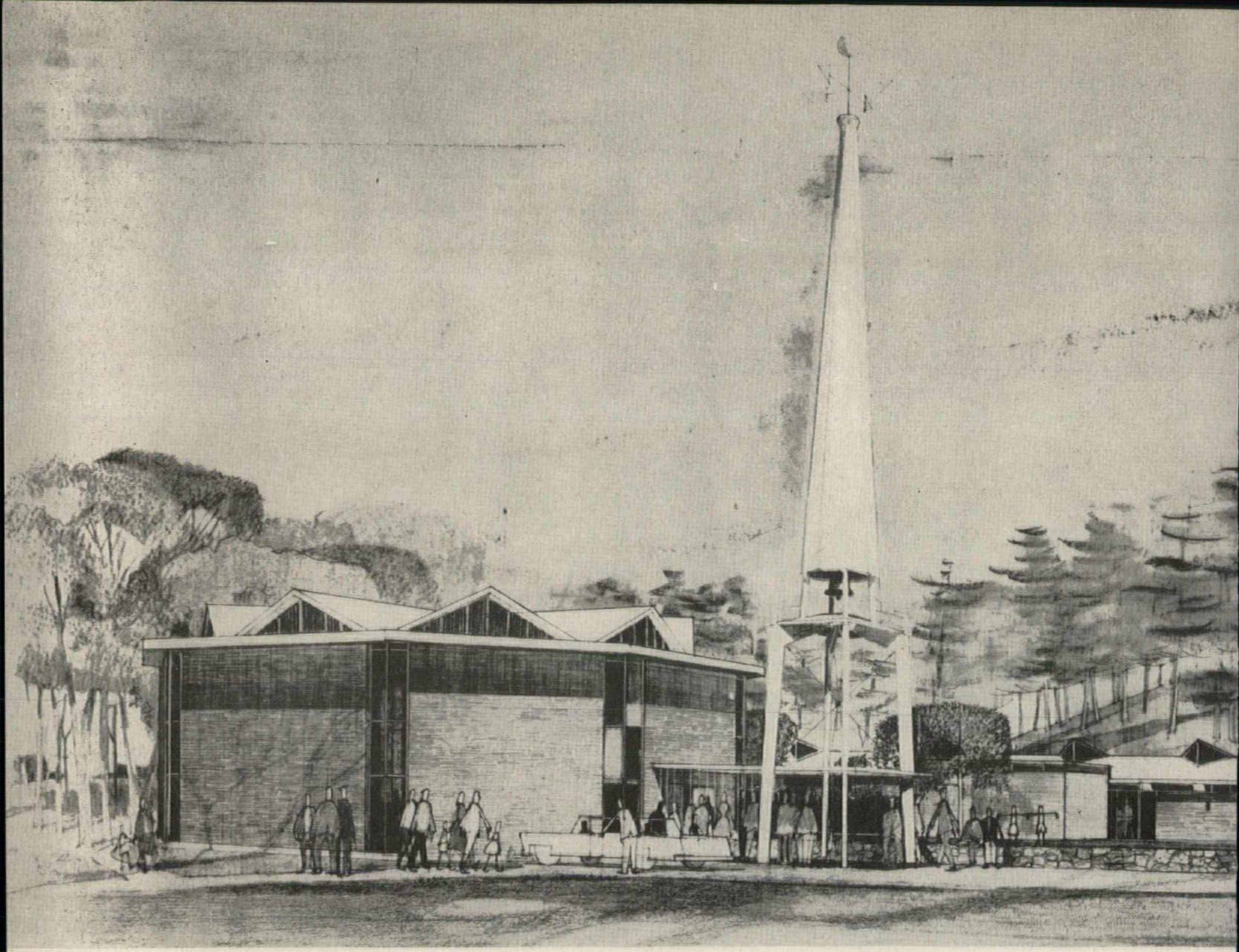
Schematic plans of all buildings were developed along with the master plan, and a common structural system, intended to be used throughout the project was devised. This structural system consists of concrete floors on grade, and reinforced masonry columns and masonry walls which support short-span reinforced concrete lintels. These in turn support the roof structure which is made by placing full-span precast "Double T" reinforced concrete sections side by side. The component parts of the structure can all be manufactured a few miles from the site. The wall space between the masonry columns is filled with glass, ventilating sash, or other materials. The "Double T" sections project beyond the walls and lintels to form a considerable overhang shading classrooms and walks. Their end sections when left exposed provide a distinct motif.





Natural ventilation, tree shaded areas, covered walkways, roof overhangs, generous plazas and water are provided in master plan. Height of the buildings will vary as to use and size

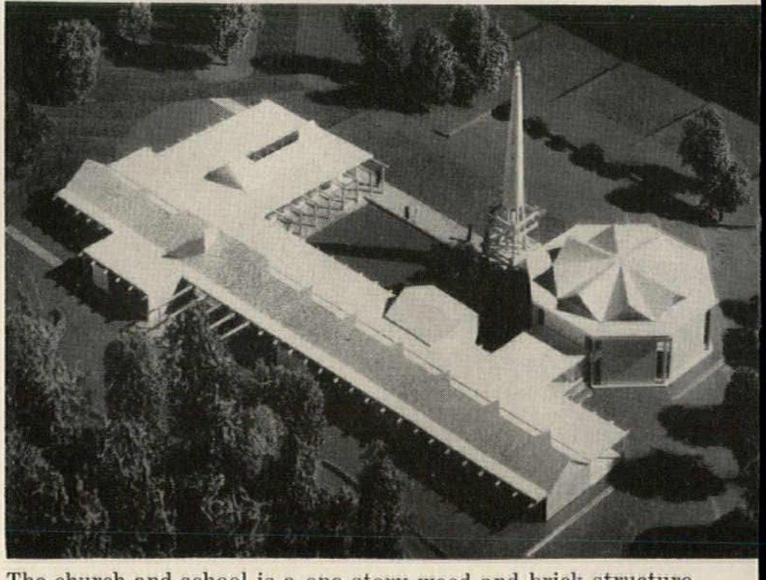




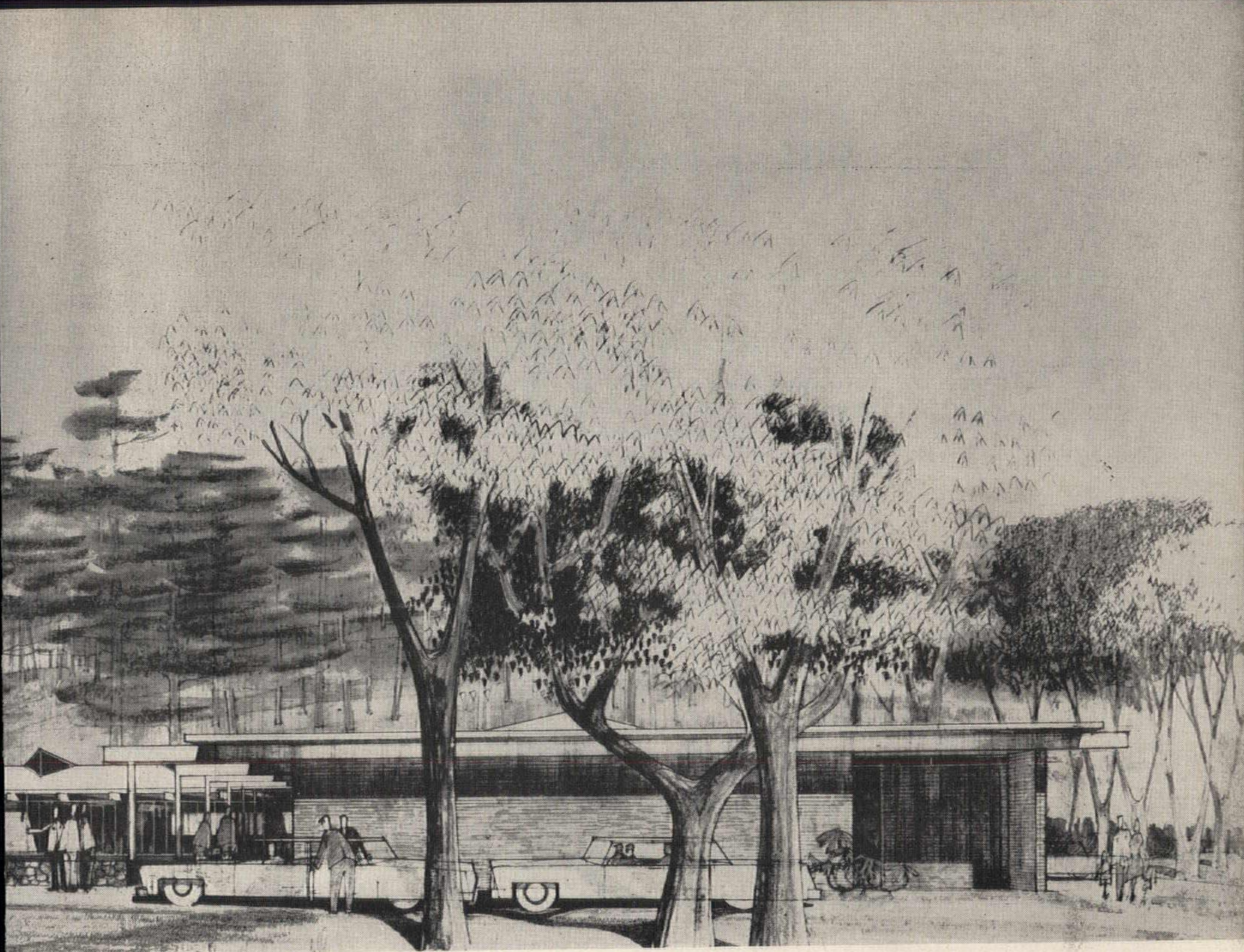
3. A Church

NAME: *The Second Congregational Society in Concord (Unitarian)*
LOCATION: *Concord, New Hampshire*
ARCHITECTS: *Hugh Stubbins and Associates, Inc.*

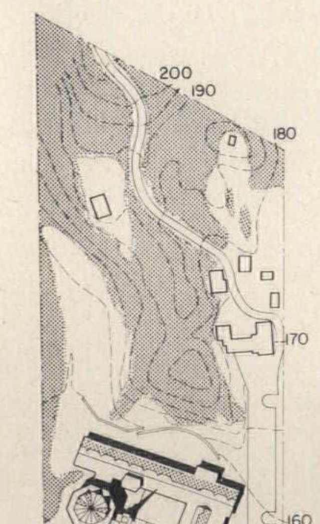
The Building Worship Committee of the Unitarian Church of Concord established their hopes in the following sentences directed to the architects: "We feel strongly that we want a church that is appropriate to our times and truly beautiful. We want one that is sympathetic to our form of Unitarian worship and to our educational and social activities. We want a church, furthermore, that is compatible with our New Hampshire landscape and in particular with the beautiful site we have. There should be an expression of freedom, both freedom in relation to belief and freedom within the democratic congregation. There should be an expression of simplicity and of light. Somehow the search for truth should be felt, perhaps in simple unconcealed building construction methods and honest direct use of materials. There should be a feeling of warmth and stillness and aspiration."



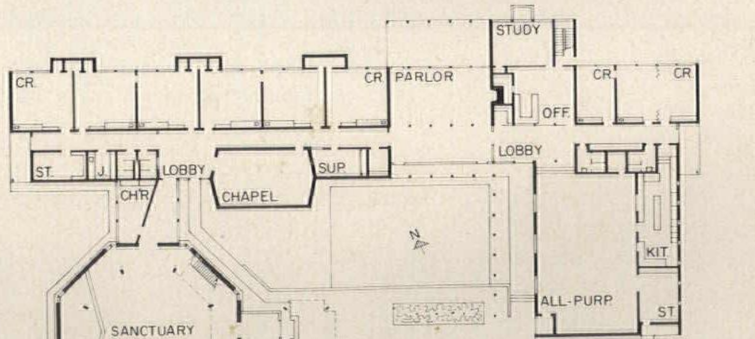
The church and school is a one-story wood and brick structure



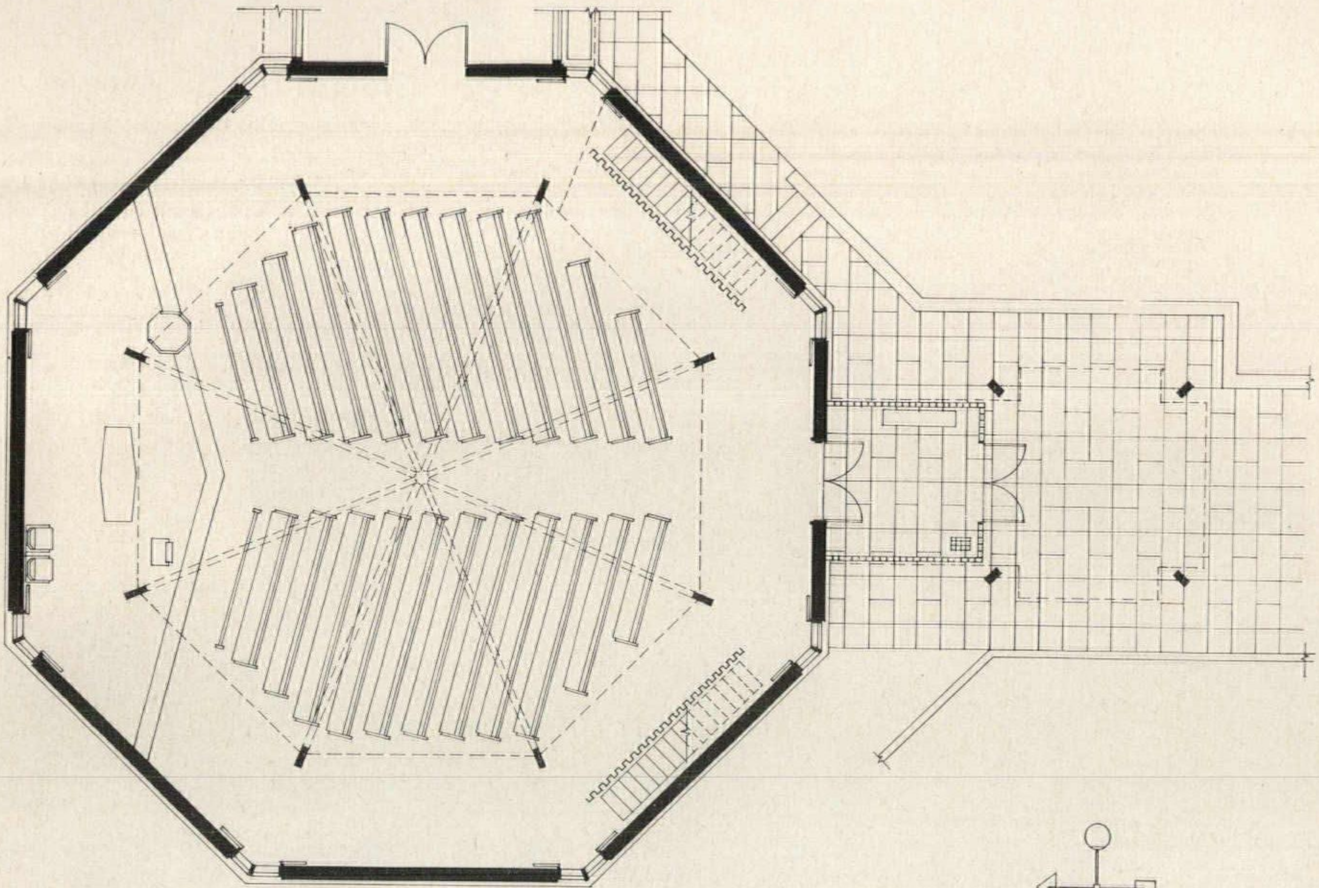
The sanctuary on one side, with the all purpose room and classrooms on the other two sides, form an opened landscaped court, which separates the entrance to the office and activities section from the entrance to the sanctuary. The slope of the folded roof over the sanctuary is repeated in the clerestory windows, regularly spaced along the ridge of the classroom wing



PLOT PLAN



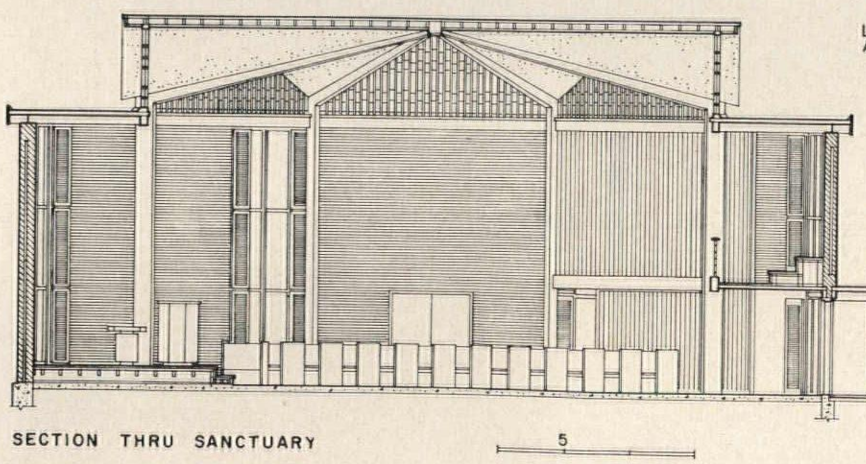
GROUND FLOOR PLAN



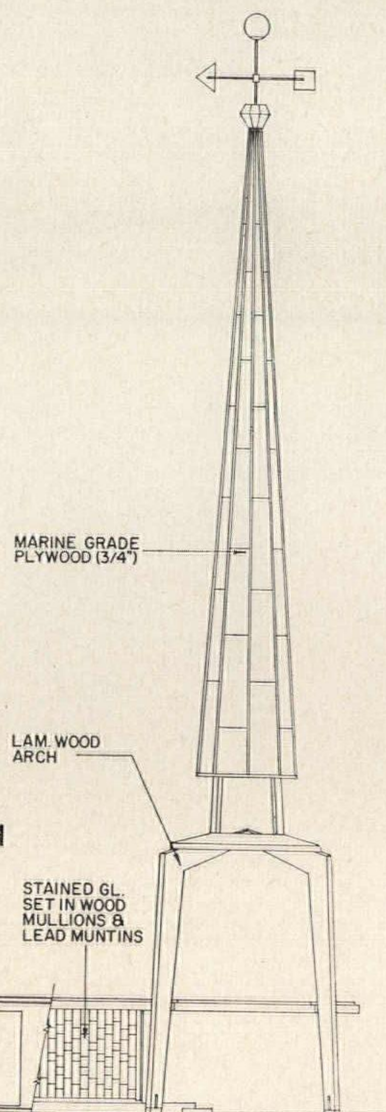
PLAN OF SANCTUARY

The octagon shape was selected as an expression of unity. The sanctuary is planned to accommodate seating for 200 people and does not consider permanent seating for seasonal crowds

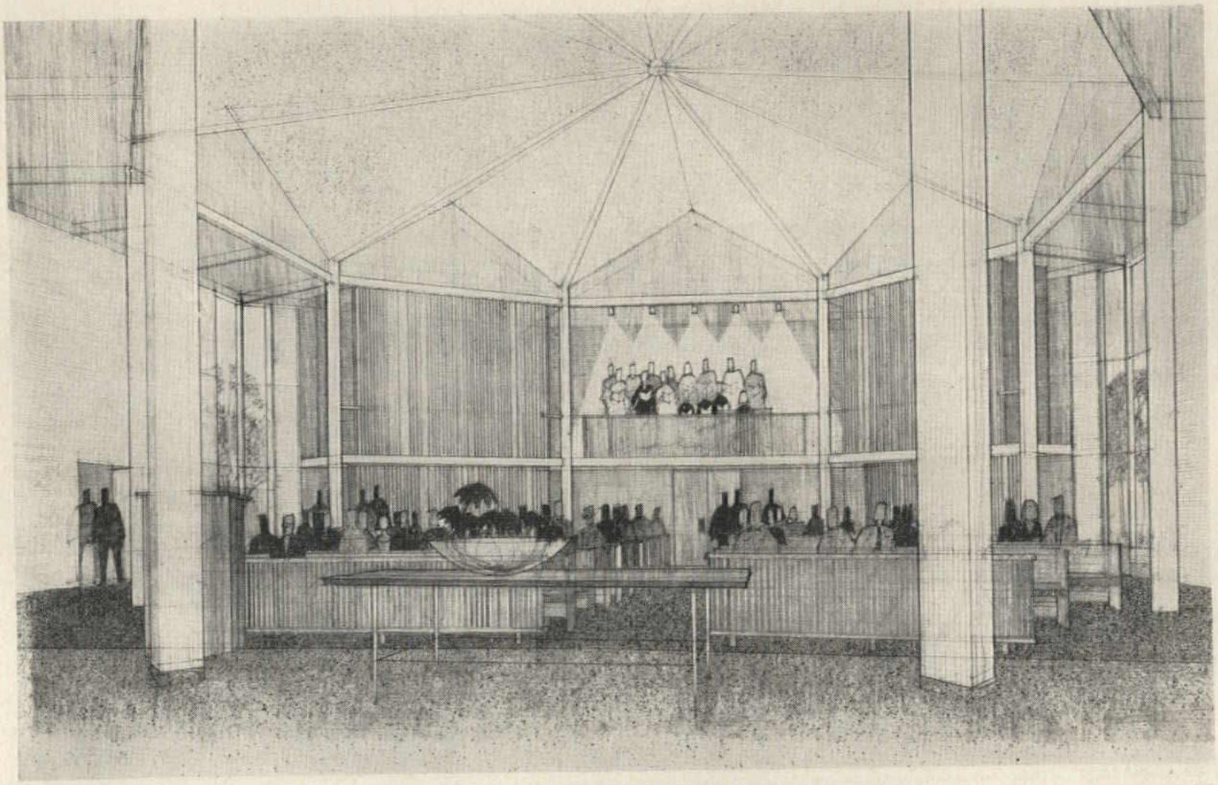
The tall white belfrey spire is reminiscent of typical New England church spires in the New Hampshire landscape, but its open, laminated wood support reaches to the ground as a separate structure and creates a sheltered entry. This vertical element is placed at a balanced focal point in the overall scheme



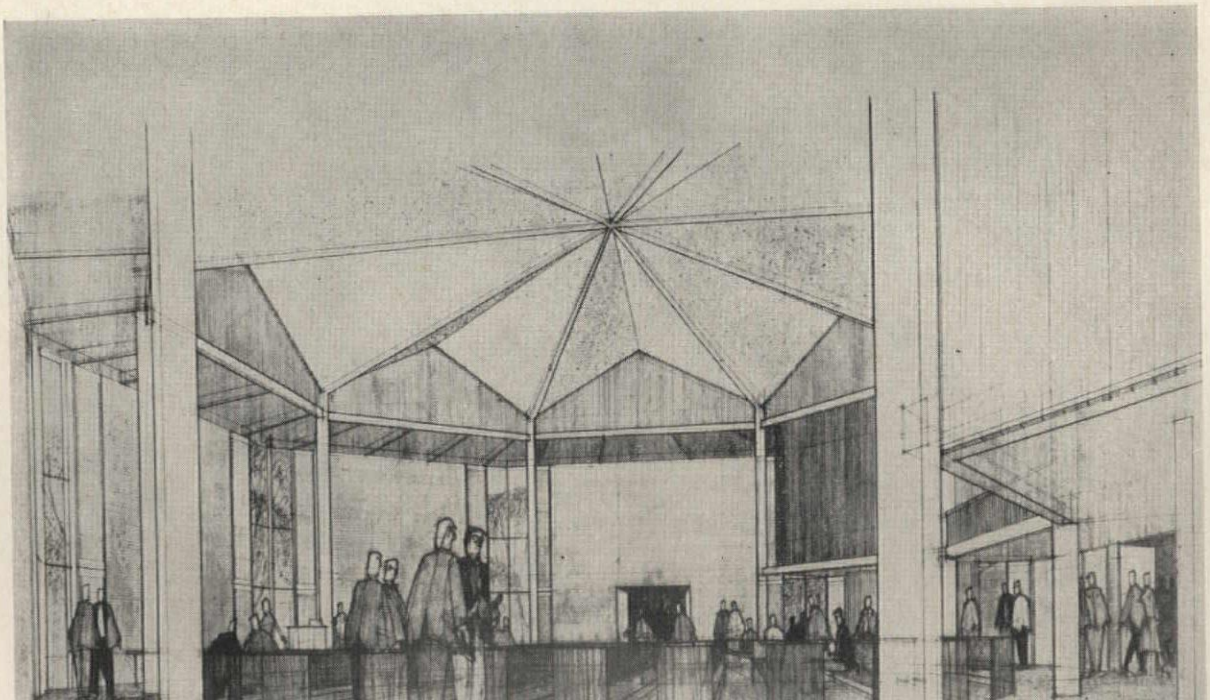
SECTION THRU SANCTUARY



TOWER ELEVATION

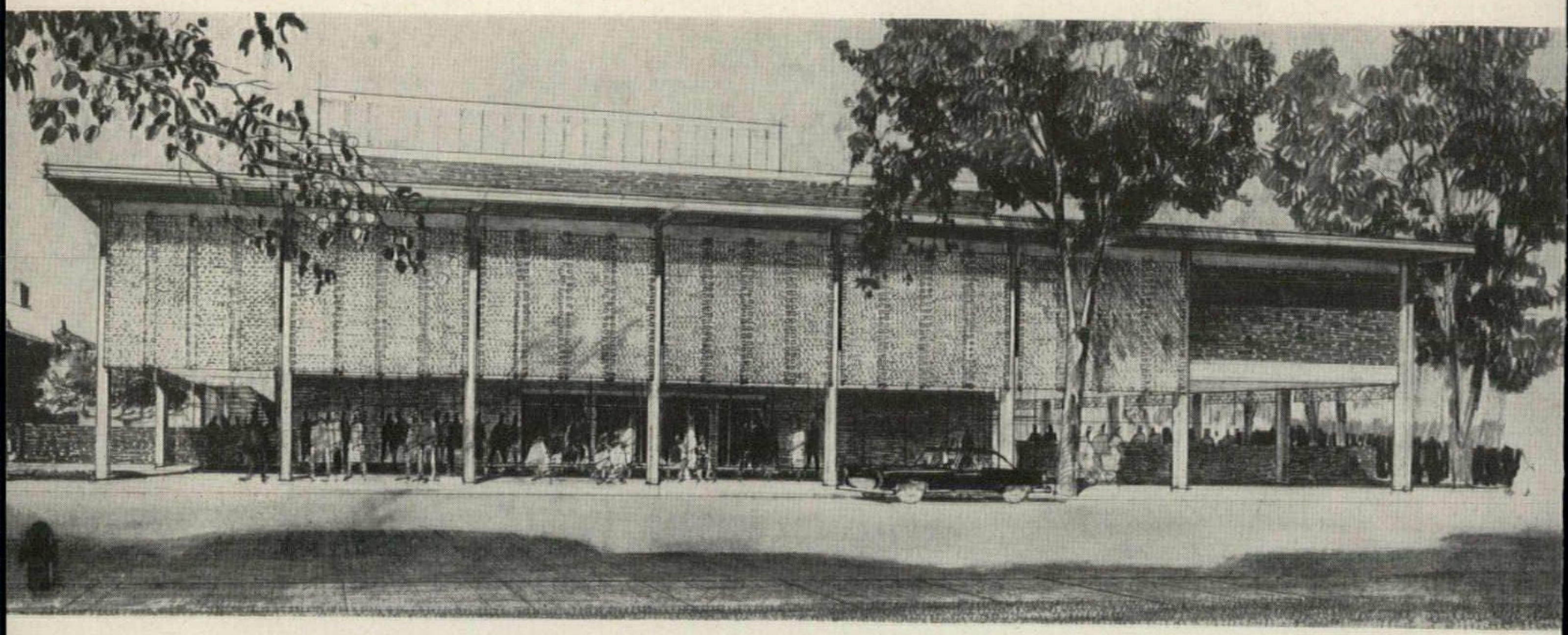


The placement of an electric organ, choir and attendant space was of particular importance. Their location was solved by providing a balcony and adjoining screens at the rear of the auditorium over the entrance, which left the rest of the sanctuary completely open and spacious, with uninterrupted vistas through the room high windows in the eight corners of the octagon. These windows, in addition to the glazed but screened gabled ends of the folded roof, flood the sanctuary with light which is easily controlled by the interior shutters



4. University Drama Center

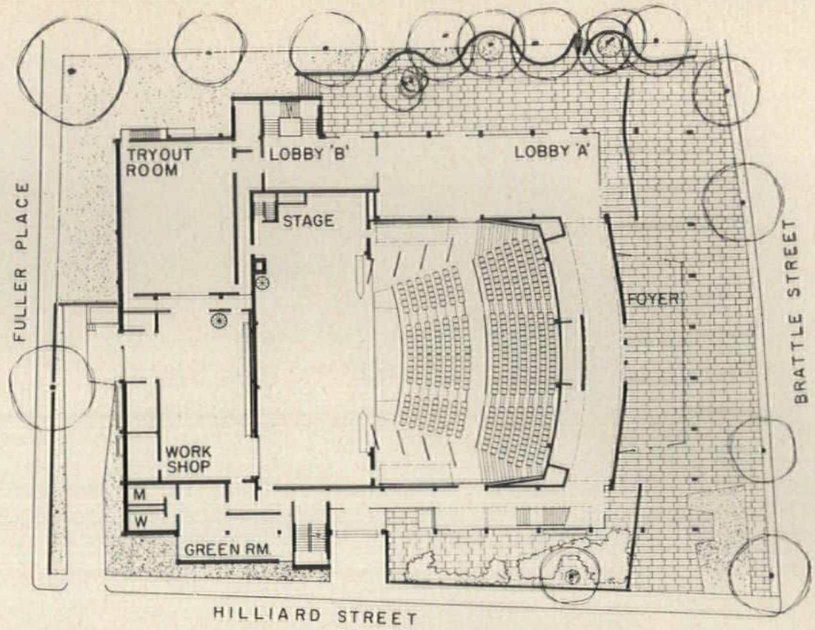
NAME: *Loeb Drama Center*
OWNER: *Harvard University*
LOCATION: *Cambridge, Massachusetts*
ARCHITECTS: *Hugh Stubbins and Associates, Inc.*



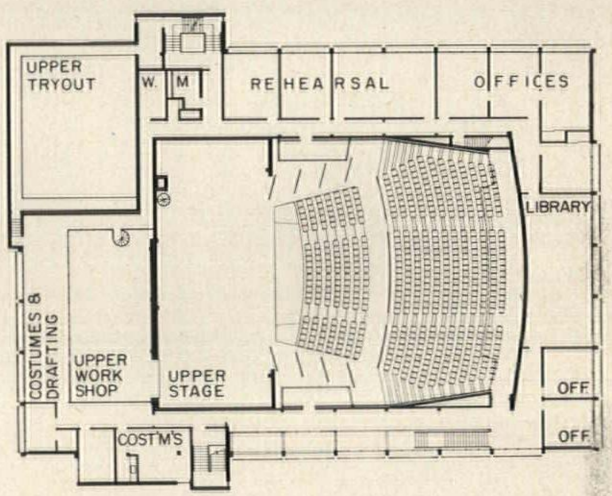
The Loeb Drama Center, currently being constructed on the perimeter of Harvard Square is intended to provide both Harvard and Radcliffe students with facilities for the production of plays and for drama workshop activities. It was decided by the university that the theater should be used primarily for the production of plays for audiences rather than for the teaching of dramatic arts and skills. The structure, therefore, has been conceived from the point of view of the audiences which will use it.

The problem of fitting a theater into a neighborhood predominantly residential in scale and colonial in character was further complicated by the decision to have a fly galley as well as accommodations for a wagon stage. The fly galley will be located approximately in the center of the building and is therefore less apparent from the streets. The elm trees have been carefully preserved and a large lawn will be provided off the main lobby to give the center a spacious and pleasant setting unexpected in its built up neighborhood. (See plot plan opposite)

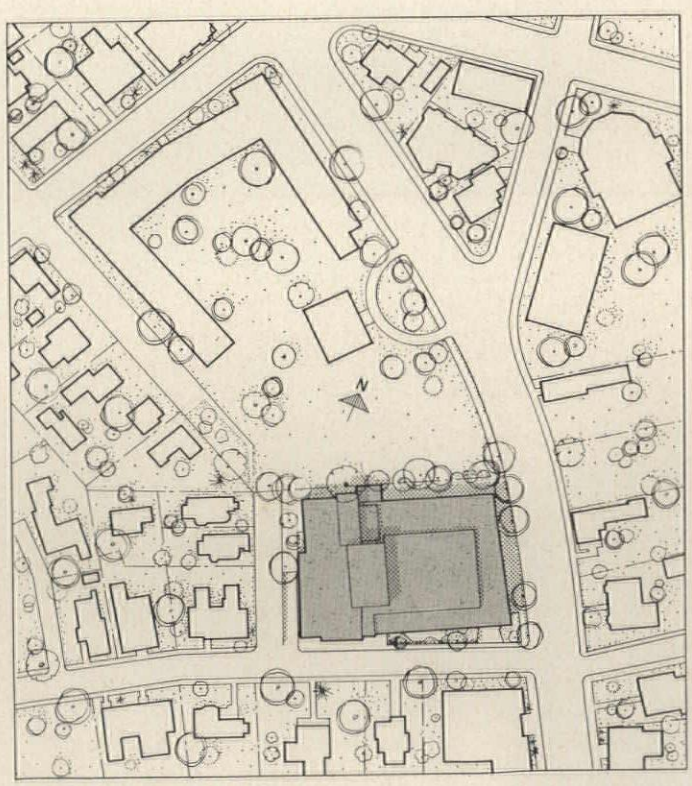
Left: red brick, bush-hammered concrete, extensive landscaping and enclosing garden walls, textural paving, together with a continuous grille on three sides of the second floor, tend to reduce and soften the scale and make the building compatible to its surroundings

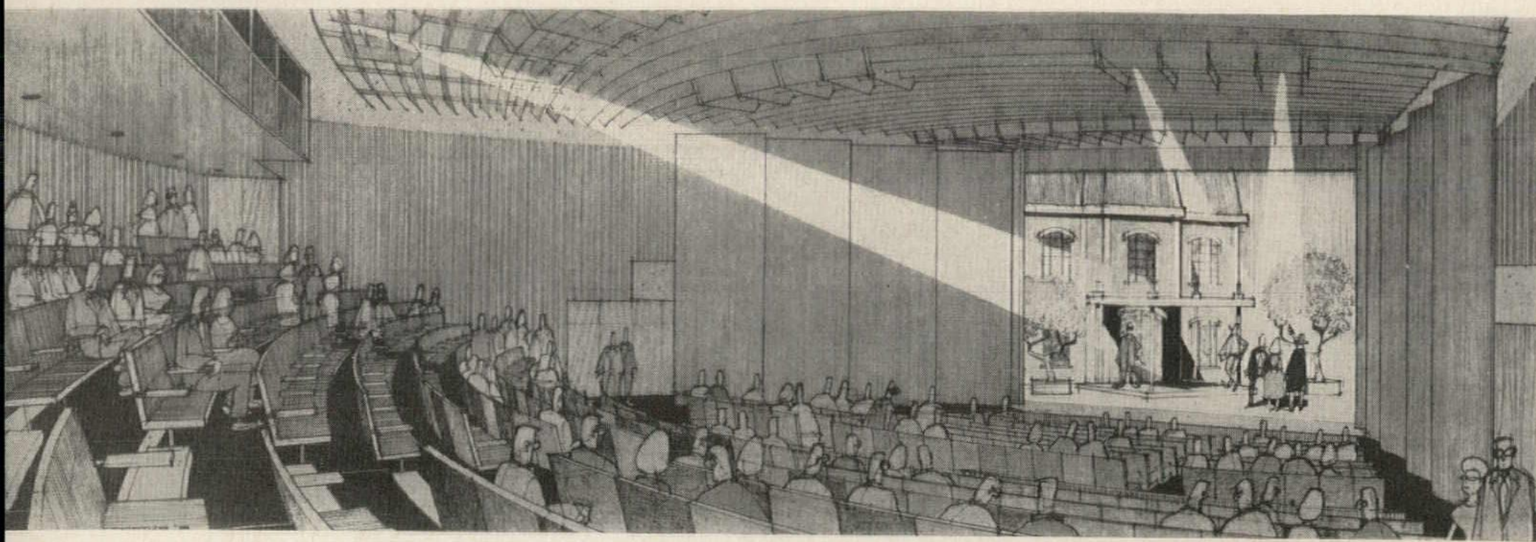


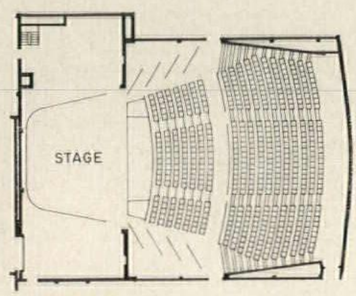
GROUND FLOOR PLAN

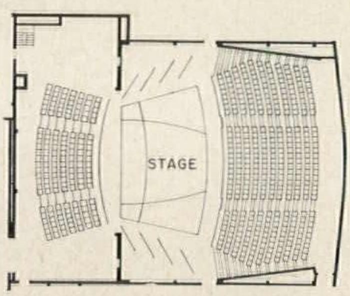


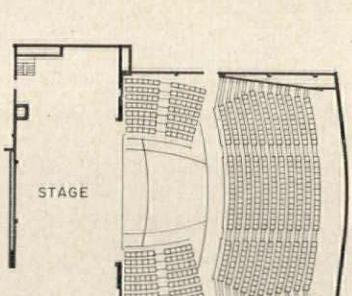
The main lobby was designed to accommodate the entire audience of the main auditorium at the same time. A maximum of 600 persons has been provided for. The two story "Try-Out" or workshop room is lighted from above an overall grilled ceiling as well as from a balcony around three sides of the room which provides space for extra lighting equipment and an additional area for acting and directing. The basement contains dressing rooms, service rooms and mechanical and storage spaces necessary for the extensive equipment and shifting platforms of the special flexible seating arrangement described on the following pages. Heating, ventilating and mechanical equipment are also located in the basement





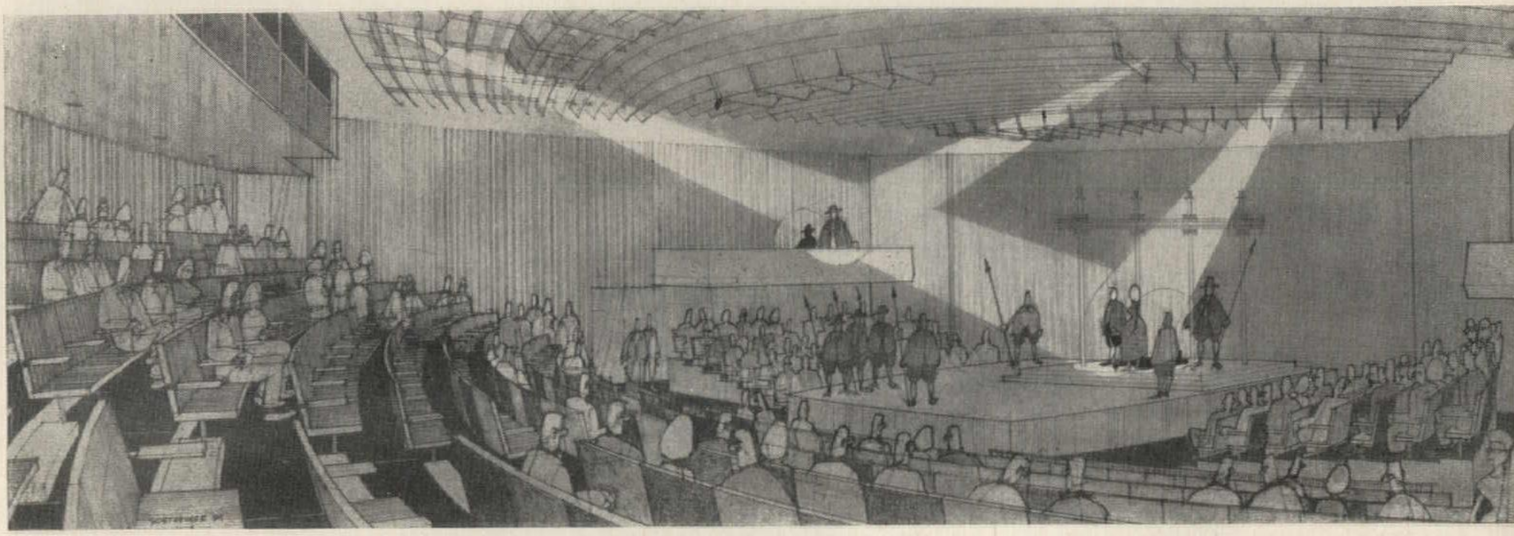


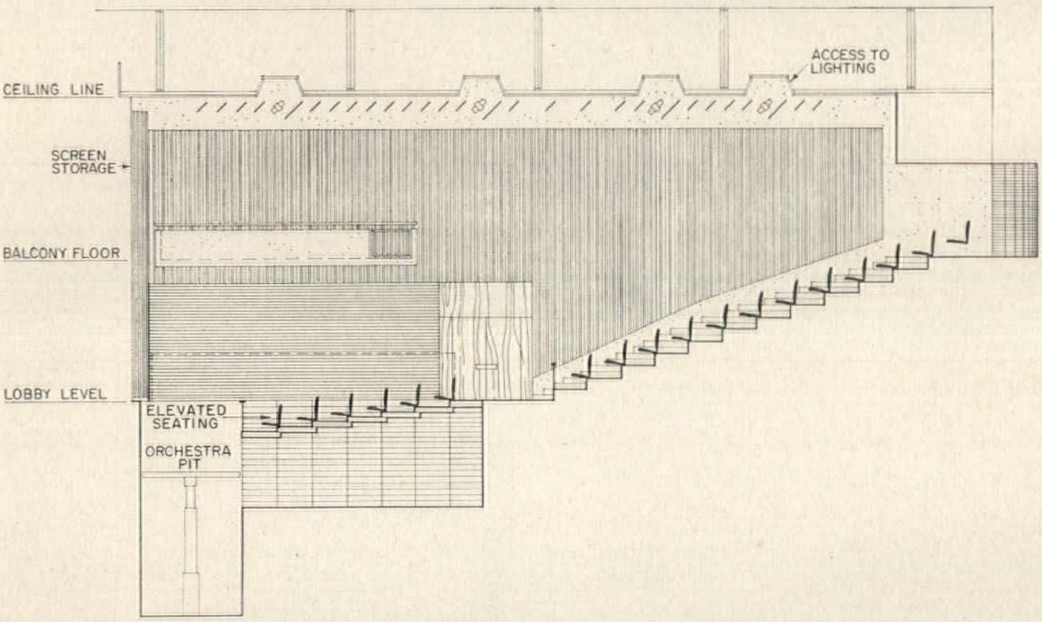


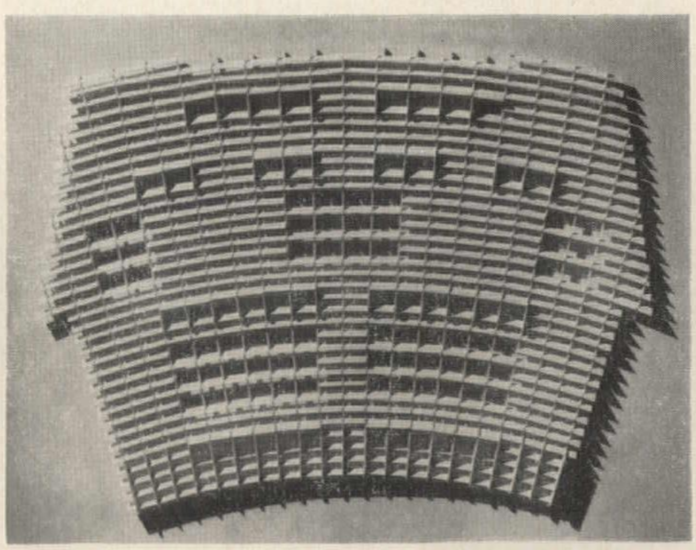


Harvard requested that "the stage be adaptable enough to accommodate any classical or modern play and to present it in a manner consistent with the style in which it is written." This problem had to be solved without sacrificing the view from a single seat. This requirement posed a major design challenge to the architect and his associates who had to provide proscenium seating, Elizabethan seating and a theater in the round, each arrangement demanding contrary sight lines and special seating.

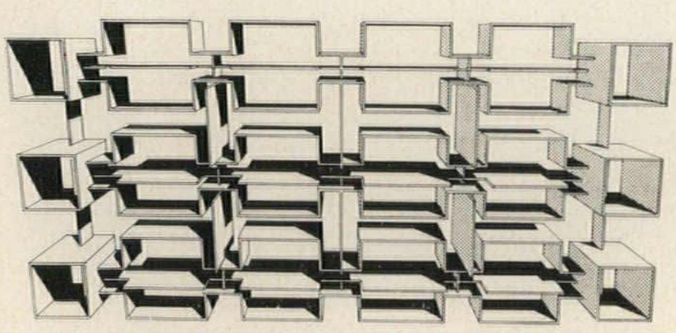
Briefly, the solution was attained by keeping that portion of the seating back of the cross aisle permanent and inclined, and that portion of the seating in front of the cross aisle closest to the stage, flexible, mechanized and on lifts. The plan includes a device by which 13 tons of seating can be moved in 30 minutes. The first 140 seats are on motorized platforms and can be shifted to the right and left sides. The stage, also on lifts, is converted into various shapes and levels. George C. Izenour, director of the Electro-Mechanical Development Laboratory at the Yale School of Drama, acted as theater consultant and engineered the flexible arrangement as well as the lighting and stage machinery.



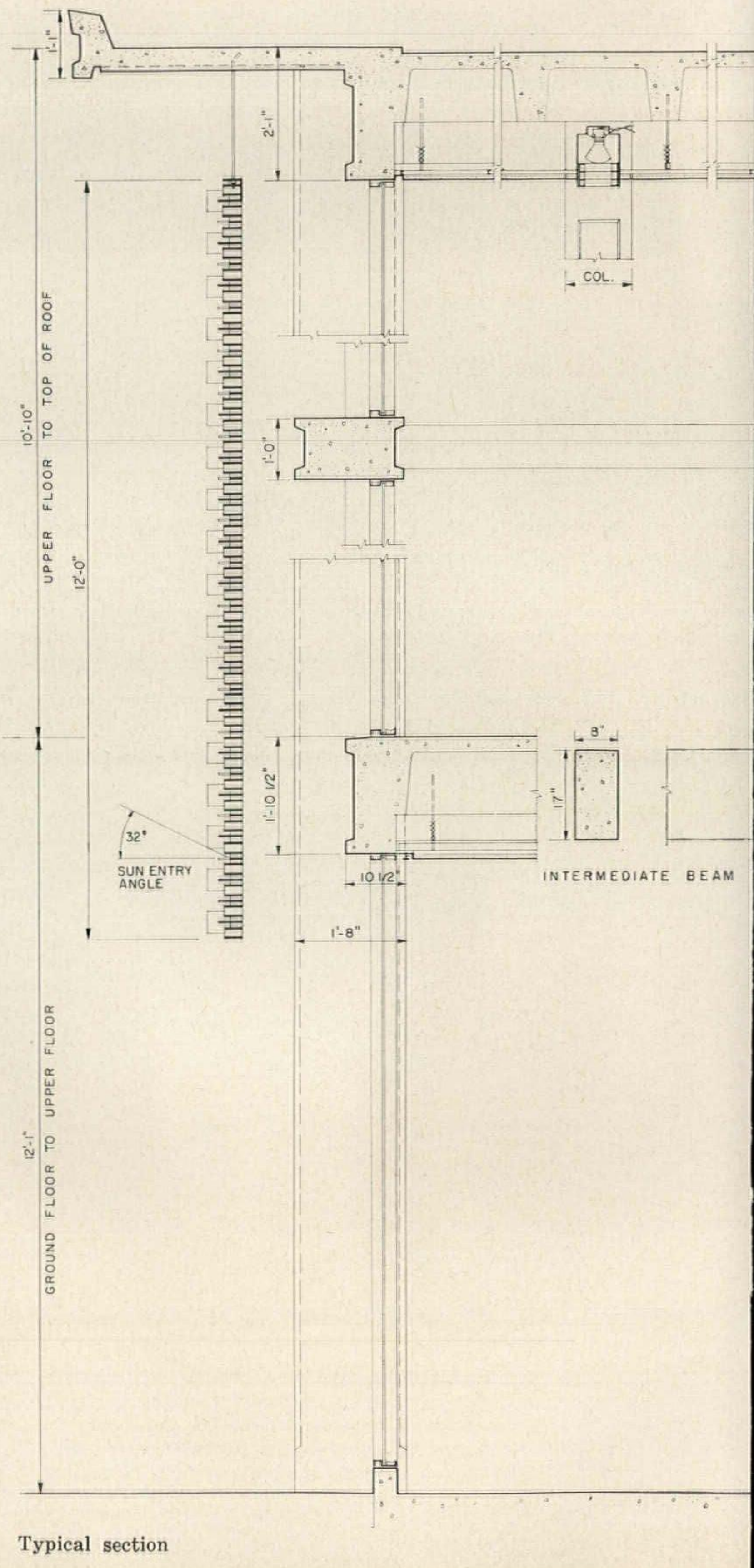




Right: a study model of auditorium ceiling. It is a floating raft of sloping wooden baffles following the pattern of the rows of seats below it and incorporating within its baffles banks of spot and flood lights, planned for maximum flexibility of lighting



Metal screen detail



Typical section

Notes Toward a Basis for Criticism*

OMNIS PORRO PULCHRITUDINIS FORMA UNITAS EST:

by Albert Bush-Brown,
Associate Professor, Architectural History,
with Imre Halasz, Assistant Professor, Architectural Design,
The Massachusetts Institute of Technology

It would hardly be necessary to fly St. Augustine's Latin banner were it not for the tower-wrecking Babel of critical tongues that chat loosely about architecture today.

Turning the pages from Poissy to Ronchamp, from Bauhaus to Baghdad, watching the spread-eagle glide from Miesian transparencies to the convoluted walls of the Dublin Embassy, one is tempted to ask, as some critics have, whether Modern is dead—a victim of Ornamental Eclecticism, rasping an ugly death-rattle in New Brutalism, expiring as the litany of New Freedom is sung over the corpse of Functionalism.

But the obituaries are premature, for at no time have more corporate and governmental clients sought good design (do they now believe it nurtures business and commonwealth?), and at no time have we seen a higher standard of modern work or more variety, so that architecture now is a plenum, from Aalto to Zimmerman, offering both the universalized, dependable brilliancies of S.O.M. and the personal and often poetic statements of a Wurster, Rudolph or Yamasaki.

What has happened in fact is that architecture, which long lagged behind theory, has now outstripped it. The assault upon the narrow theory underlying early modern design proved to be as easy as shooting fish in a barrel. Early in the 1950's Nowicki killed the leading functional slogan with the phrase "Form follows Form," and then the nascent architecture's social underpinnings were loosened by postwar prosperity, best reflected in Yamasaki's statement, "The social function of an architect is to create a work of art." Unfortunately theory and criticism were bereft of their touchstones exactly when they knew little about form and less about art.

If that ignorance is not to waste today's enormous opportunities for building, architecture must again develop a theoretical climate equal to its ambitions. However much we may prize the fleeting but highly productive moments of intuitive insight, we still need the theory that experience accumulates. For the

*Professor Bush-Brown is collaborating with Dean John E. Burchard in writing the forthcoming AIA book, *Architecture in America: A Social Interpretation,* where these lecture notes are further developed in a critical review of American architecture.

creative mind, whether the client's or the architect's (and both are necessary to good building), must be a critical mind. It must scrutinize, it must study and store; it must supervise, and it must appraise and discard, guiding an idea to its inevitable perfection. Is there an architect who has no higher ideal than he has yet attained? If so, let him polish his Latin and read Augustine again.

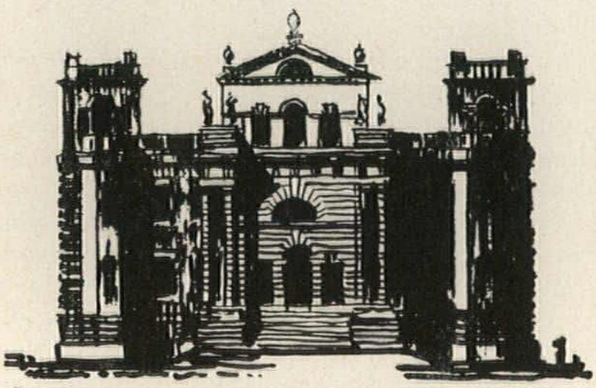
I. THE MEASURES OF ARCHITECTURE

Great architecture offers many levels of enjoyment. It touches our intellect, it invokes moods, it stirs our memories; but most of all, and most directly, it appeals to our senses, stimulating our knowledge of environment through textures, sounds, fragrances and especially through vision.

1.

A. *A building may fail to be architecture on three counts:*

1. *It may fall down.*
   a) These are clear-cut failures.
   b) They leave no room for dispute.
2. *It may not accommodate its purpose.*
   a) This is the *functional* failure. As a criticism it is of more importance in guiding the housing of machines than in judging dwellings for people, who by their adaptability overcome, even capitalize, upon inefficiencies.
   b) Excellent performance is not always beneficial to total purpose. Acoustics intended for clear listening, for example, are not always best for churches where, to mention an extreme case, a priest may invoke the Trinity with soul-searching effect if he can discover the focal point from which the Third Person may be reverberated throughout the vaults.
   c) Fully satisfactory performance is not something that stands apart from beauty; it is beauty's result, not its generator. In this sense, *function may well follow form,* as happened when Cram's Gothic Marquand Chapel helped gradually to anglicanize the religious services at Presbyterian Princeton.



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3. *It may not be a work of art.*
   a) This is the most debatable criterion of all, for it fairly screams for the rejoinder, "What is a work of art?"
   b) First, let us not confuse biography with judgment: The statement, "It is beautiful because I like it," is an interesting bit of biography; whether I *should* like it, whether it is *really* beautiful, are left unanswered. All I have done so far is to exhibit my level of taste, good or bad as it may be.
   c) Second, study the statement, "I like it because it is beautiful." This is a judgment on quality; its biographical information may be irrelevant, or gratuitous, as in the statement, "It is beautiful, but I do not like it."

B. *Unity as the foundation of art*

1. *Taste is obviously subjective.* History is a morgue of good and bad taste. It swings easily, as fashion is turned, sometimes by little more than Clark Gable's bare chest in "It Happened One Night," which nearly wrecked the cotton undershirt business. People can be found who *like* anything. But the judgment of the ignorant is no fair tribunal; a man who knows nothing of Hagia Sophia, the Taj Mahal, or Amiens is no wise counsel for judging the Milwaukee County War Memorial Center.

2. *Critical judgment* among informed people, students of art, *has been remarkably constant.* Make a list of the 100 great buildings in the world. You may include ten that another critic omitted, but neither of you listed the Paul Revere House, the cook shack at the Mother Lode, or even the local post of the American Legion. Some may mention buildings by Philip, but not by Howard, Johnson. For however admirable or interesting these may be *as social documents,* they do not share the standard of excellence expected in great architecture. What then suggested which buildings should be included?

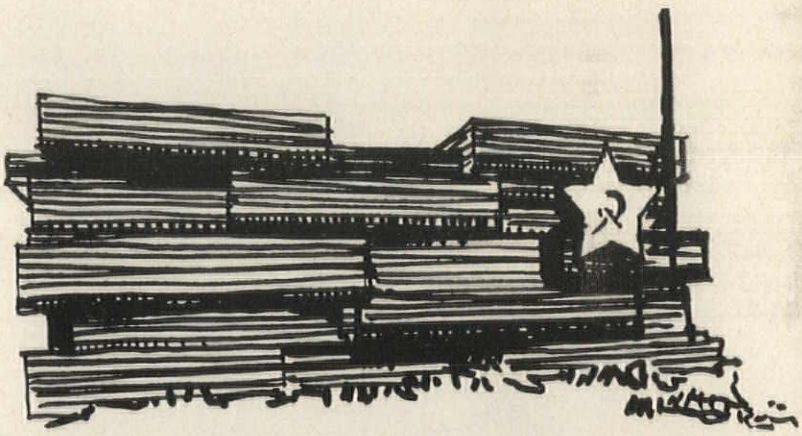
3. Could it be the building that makes *a strong and unified statement,* entirely consistent with itself, so that we see masses in light and shadow, planes that come forward and planes receding, projections and hollowed places, all working securely to shelter a clearly-stated purpose?

a) Unity results from a self-consistent organization of elements. Great architecture sets a dominant theme and sustains it. It may be eminently serene, like the Villa Capra (Fig. 1); or it may be filled with jarring oppositions and surprising violations, like Seaton Delaval (Fig. 2), so that the theme, equally sustained, disquiets and provokes.

b) A work of art is not always pleasing. Mies van der Rohe's Liebknecht Monument at Berlin (Fig. 3), no less than Picasso's *Guernica,* is not beautiful in any saccharine sense; both condemn inhuman actions, and they are masterfully beautiful in the ugliness they denounce.

c) Thus the organization of a work of art is dependent upon purpose. In that sense beauty is relative—relative not to its observer but to its total intent. Its principles of composition are not subjective; they are instruments for accomplishing specific effects. To take a small example, a red wall may be used to diminish a space, to mark an axis, to increase apparent weight, to make the wall seem closer, and to bolster its dimensional scale. The principle of using color for its optical effects on space operates universally and is an objective fact.

d) But whether a principle should be employed at a particular point depends on the purpose to be accomplished. Thus, the relation of a curve to a straight wall will ordinarily be most precisely clari-



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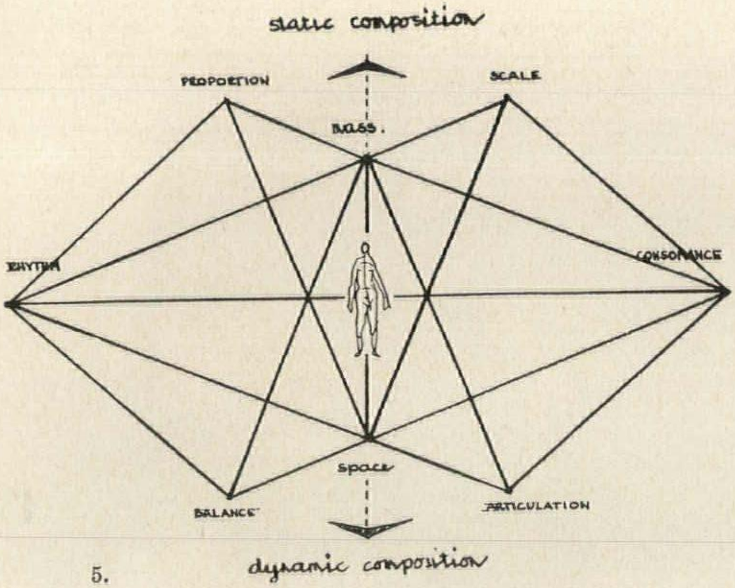
fied if the curve breaks at a tangent parallel to the straight wall and joins it through a perpendicular plane. While that principle properly clarifies the organization of many buildings, it would seriously impair Ronchamp where indefinite relations among straight, battered and curved planes enhance the intended mystery announced by the cavernous roof and baseless walls (Fig. 4).

e) Let us repeat: each principle has a valid contrary; their use depends upon the purpose to be achieved. Discord and harmony: each has its proper role. That is very different from saying there are no principles at all.



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C. *Unity in space and its enclosure*

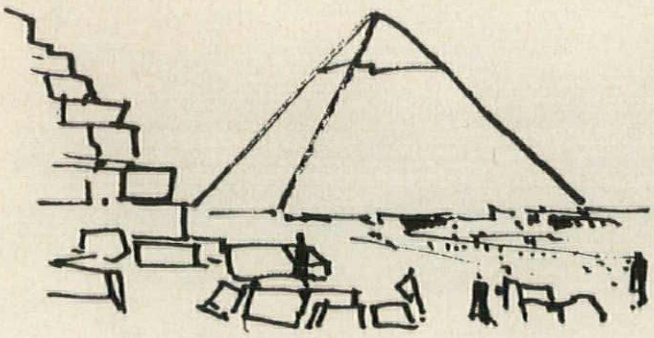
1. Most public environment today suffers esthetically from four principal errors:

a) The failure to recognize that enjoyable and useful environment proceeds from an *orderly, continuous and rhythmical sequence of spaces,* organized for use and revealed by light and shade.

b) The failure to realize that coherence among buildings comes about through their *composition* (the arrangement of spaces and masses—their balance, rhythm, scale and inflection), *not* through conformity to a *style* (whether Gothic, Georgian or Modern).

c) The failure to be concerned with gateways, climaxes, terminations and interior rhythms of a campus or public space.

d) The failure to realize that there are *two different kinds of composition:* the *Static,* singular, unitary forms, such as the Parthenon; and the *Dynamic* multifaceted, programmatic ones. The Dynamic may be of two sorts: either the *Programmatic,* where many parts of a program are arranged asymmetrically and present several parallel or confluent axes, and the *Directional* or *Rhythmical,* where long cadences of bays cause perceptual movement toward a distant mass or space (Fig. 5).



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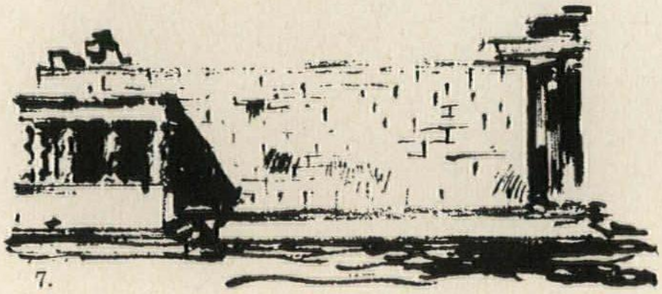
i) The static, a pyramid for example (Fig. 6), tends to stand *in* a space, isolated, self-sufficient, visible-in-the-round, terminating an axis, announcing a climax, serving as the emblem of a composition. The dynamic, where space outweighs mass, shapes the space outside itself; its axes are not self-contained, and it seems incomplete until it is balanced with other buildings or distant spaces (Fig. 7).



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ii) Both sorts of composition are needed for two reasons: first, while the static is a nodal, dominating climax, the dynamic delineates continuous outdoor spaces. Second, the two kinds of building enable functions to be housed properly, with permanent, relatively stable and communal functions within static buildings, while temporary, transient and private uses gain flexibility in the dynamic.

iii) Given their separate roles, the two types of building often follow contrasting principles

8.

of design. The static is aided by everything that seeks to isolate it as a whole, unified organization. Thus tripartite division of volumes, both laterally and vertically, enhance the static building (Fig. 8). The dynamic thrives upon dualities and long, almost immeasurable cadences, so that entrance into the building's mass is resisted in favor of visual resolution at spaces (Fig. 9). The dualities and rhythms force the observer to postpone the resolution, to transfer the point of balance outside the duality, as at Viterbo (Fig. 10).

2. *Example: The plan of the Piazza di San Marco at Venice* (Fig. 11).

a) In this judicious and unexpected use of site, the composition extends outside its own limits to admit neighboring and distant elements to a continuous, rhythmical sequence of spaces.

b) Coherence arrives through rhythm, scale, and balance, not through conformity to a particular style.

c) A hierarchy of building forms reserves strong architectural statements for communally significant buildings, which are the monumental ones, and these are introduced and terminated by gateways and vistas shaped by long interior rhythms.

d) The spaces become progressively larger and terminate at the monumental Basilica. Spaces are defined by programmatic buildings—arcaded walls composed of long sequences of bays, and the resulting spaces are punctuated by monumental elements such as the tower. There are misaligned axes focussing attention on the space between them. There are voluntary deformations of form in plan, creating optical illusions and perspectives, and these are enhanced by oppositions of mass and space, light and shadow, as well as differences in color, material, texture and scale.

D. *A fundamental distinction: style vs. composition* (Fig. 12)

Obviously, *Unity* is a function of the organization of spaces and masses, not of their style.

1. *Style* in architecture results when two or more buildings have certain elements of space, mass, and plane in common, so that there is a recognizable affinity in spite of differences in size, shape and function.

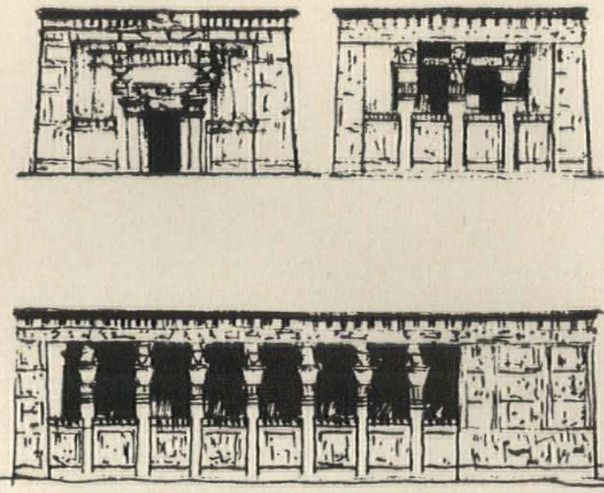
2. *Composition* refers to the organization of stylistic elements.

3. Some basic statements about their roles:

a) Of two buildings in the *same style*, let us choose Amiens and Chartres, *one may be inferior as a composition.*

b) Two buildings in *different styles*, say the Parthenon and Vierzehnheiligen, *may be equally admirable as compositions.*

c) A building in a style we do not approve for use today—for example, Richardson's Sever Hall at Harvard or Bacon's Lincoln Memorial at Wash-



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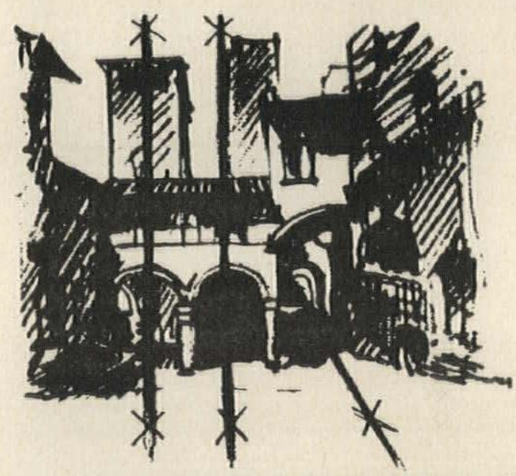

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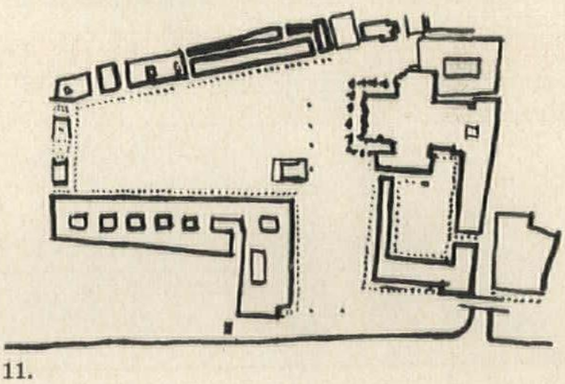

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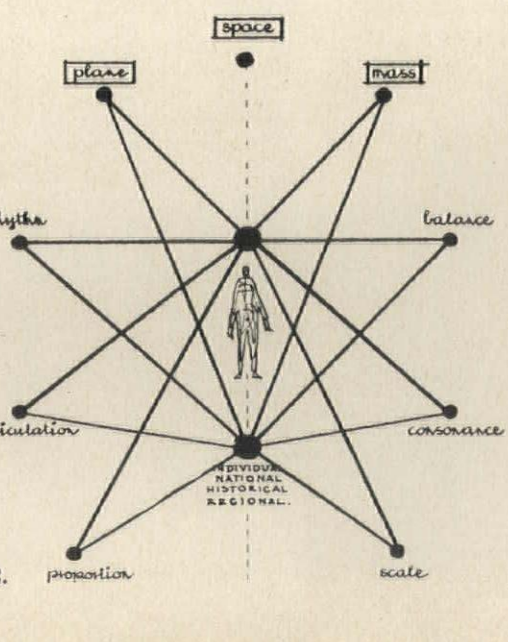


12.

ington—may be excellent compositions, while Frank Lloyd Wright's Community Church at Kansas City, in a style deserving approbation, lamentably fails as a design.

4. Thus *style—unlike composition—is not a criterion* for formal excellence. Let us discuss style.

II. TOWARD AN UNDERSTANDING OF STYLE

Few words are more abhorred by modern architects than "style," which mistakenly carries the bookish aura of Classical orders and implies a cosmetic over structure. Yet ironically most modern theory has discussed little except style, has argued for a new style, and that error of making style the whole of theory is one source of the frustrating confusion of critical standards today.

A. *The scope and meaning of style*

1. There are many kinds of style. There is a continuity in Western architecture that distinguishes it from Oriental and primitive buildings, which do not share Western predilections for parallelepipeds and tyrannical box-like shelters. Style may also be the hallmark of a *period in history*, as was the Gothic, lasting two or three hundred years. It may be exclusively *national*, as was the Plateresque in Spain and her colonies, or a *national version of a period style*, like Italian Gothic. It may be solely *regional* as was Provençal Romanesque, or it may be *local*, even comprising the work of a single *school*, like the followers of Palladio around Venice. At its most individual scale, style may be completely *personal*, as was Gaudi's, and personal style may have recognizable breaks, so that the career of Frank Lloyd Wright may be subdivided into stages.

2. *Style is a metaphor* of distinctive spaces, silhouettes, structural systems and decorations.

a) Architectural imagination works with geometric shapes and arithmetic dimensions. There are simple primary forms: the pyramid at Giza; the cylinder at Pisa; the parallelepiped of the Palazzo Strozzi; the half cylinder laid horizontally, the sphere, the half-sphere or dome, the parabolic vault; various cones like Indian wigwams; beehive domes like the trulli at Alberobello; triangular prisms as in the roof of San Antonio at Padua; and octagonal prisms like San Vitale at Ravenna.

b) Such elementary shapes may define a whole building; reduced, they may be a component or merely the support for another shape; reduced still farther, they become a column or ornament.

3. *Each stylistic metaphor is a hallmark of provenance*, divulging origin among a specific people at a specific place and time.

a) The Egyptian set a succession of planes in depth perpendicular to an axis; the rhythm of the resulting series of parallel images was irregular, and the single long axis remained the continuous reference for the dissimilar subdivisions of space.

b) Gothic architecture established its main axis as a recognizable void, subdividing it so that regular cadences of bays were bound by strong rhythmical integuments. Clear separations marked the many-celled space, and strong axes forced the perspective toward a focus consistent with the total geometry.

c) The Baroque church of Vierzehnheiligen, with its combination of *circles and ellipses,* remains a single space in which multiple undulations and partial compartments are interlocked and overlapped so the geometry unexpectedly focuses upon a space where rival axes converge.

4. Style is an index of provenance because each space metaphor uniquely expresses the people who created it.

B. *Style as expression*

1. At its *most personal,* style invokes *moods,* such as Ruskin found in Gothic and Geoffrey Scott in the Renaissance. At Paris, a hunchback lurks behind each gargoyle; the acrid stench of gladiatorial blood hangs in the Colosseum; at the Petit Trianon, the unfaithful Queen, a Venus, slips by night to her clandestine tryst with Mars; and the Sphinx, meanwhile, continues to ponder an enigma no one has yet discerned. But to pursue this very far is to follow a Will o' the Wisp.

2. More *objective interpretations of expression* mark the *intellectual connotations* of style, on the suspect Hegelian thesis that contemporaneity denotes origin in a common idea. (*NOTE:* Twentieth-century esthetics of space-time have no proven affinity with Einstein.)

a) *Political* interpretations suggest that the variety of Romanesque architecture indicates the absence of a strong ecumenical government and church; that Versailles reflects Louis XIV's absolute government.

b) *Religious* interpretation: the popularity of central-type ideal churches during the Italian sixteenth century, Sta. Maria della Consolazione at Todi, for example, reflects the adoption of Neo-Platonic ideas by Palladio, Michelangelo and others.

c) *Mathematical* interpretations suggest that Euclidean geometry was employed at the Temple of Zeus at Olympia; that Brunelleschi's discovery of perspective in 1425 paralleled the development of his architecture; that Guarini's exercises in descriptive geometry are reflected in his San Lorenzo at Turin; that Vierzehnheiligen and the Orangery at Versailles required the Calculus.

d) *Economic* interpretations suggest that the skyline of New York expresses *laissez-faire* capitalism; Egyptian pyramids a slave society.

e) *Technical* interpretations refer to the structural limitations of Greek trabeation; Byzantine developments of vault and dome; Gothic perfecting of stained-glass; modern use of iron and concrete.

f) *Climatic* interpretations point to Mediterranean rural architecture where many dispersed units catch breezes, as opposed to a Haute Savoye farm where all elements stand consolidated under one gently-pitched roof, to gain warmth and to hold the snow until it piles high and slips.

3. Such interpretations are possible because *society* tacitly or explicitly *affects architecture.*

a) It defines the *needs and desires* to be realized in architecture, and eliminates others.

b) It establishes which *building types* will be erected and what functions they will serve.

c) It prescribes the *materials and structural techniques* that are available.

d) It sets the *price* it will pay for architecture and whether *economy* will be more or less desired than *symbolism or beauty.*

e) It sets the *price* it will pay for *permanence or flexibility or expendability.*

f) It restricts the scope of architecture through *fire and hazard laws* that may eliminate from the designer's palette laudable elegancies, priority materials, or frank expressions of structure.

g) It may *destroy architecture* by the quick stroke of iconoclasm or by the slower attrition of obsolescence, changes in land use, improved techniques, or altered beliefs.

h) It affects the evaluation placed upon *tradition and innovation* and whether *originality* will be sought, even at the loss of perfected performance.

i) What is an *acceptable level of skill* is partly set by society, and environment suffers if a public willingly accepts techniques that are vulgar.

j) Society prescribes what architecture may express in the way of religious, political, and more broadly *social and philosophical ideas,* eradicating those it does not endorse.

4. *Architecture also works with society.*

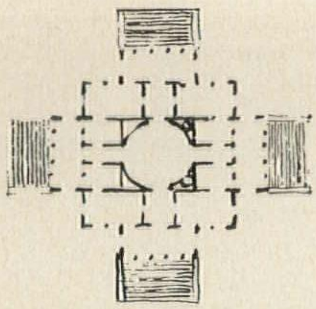
a) It would be exceedingly happy for the profession to be able to prove that great architecture alone is responsible for beneficial changes in society. Such proof is not forthcoming because *architecture* by its nature, *must be a response* to needs already recognized.

b) *Taste is a joint effort.* Just as advertising often creates markets for products, so architectural innovation serves as a catalyst, making further change possible and even desired. The architect improves taste through his art.

c) *Architecture,* together with society, *creates symbols,* sometimes functional emblems, sometimes purely artificial signs, and sometimes ideological ones.

d) With society, architecture acts to express *basic philosophical ideas.* Each building is partly a polemic, announcing and propagating the intellectual and social aims that its client and architect espouse. Currently four distinguishable, though blended, metaphysical ideas are reflected in architecture.

i) *Formalism:* Belief that the universe contains exact forms and ideal, abstract relations, perfected arithmetically, irrespective of their functional efficiency. Examples: Palladio's Villa Capra (Fig. 13); Mies's Crown Hall at I.I.T.



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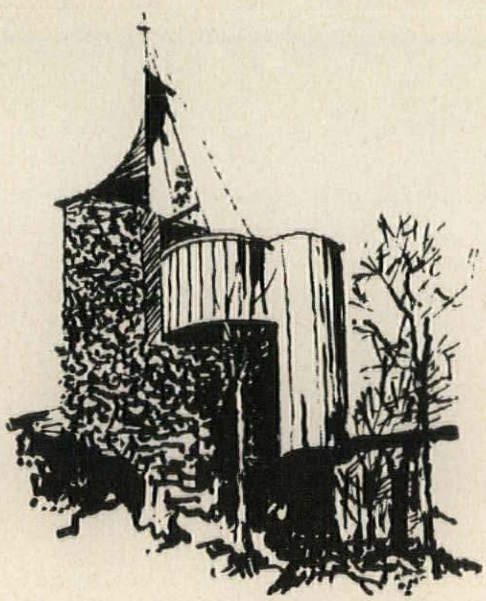
ii) *Romanticism:* Belief in the primacy of individual, particular things, vividly unique, rude and natural, whose differences and irregularities should be accentuated, uncontrolled by rational formalism. Sometimes the Romantic seeks to stimulate imagination through recall of distant societies and past times: The Gothic, the Classic, ruins, the primitive and Oriental. Examples: Petit Hameau at Versailles; Goff's Eavinger House at Norman, Oklahoma (Fig. 14).

iii) *Mechanism:* Belief in the primacy of inert matter whose interactions can be described by uniform and universal physico-chemical laws expressed statistically. High priority is given to machine esthetics. This is a modern version of *Formalism.* Examples: Crystal Palace; Le Corbusier's Savoye House (Fig. 15).

iv) *Organicism:* Belief in the priority of vital forms and biological laws, including adaptation to site, materials, and structure. This is a modern version of Romanticism. Examples: Sullivan's Prudential Building at Buffalo; Wright's Pauson House (Fig. 16) and Falling Water.



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e) Many buildings are magnets, furthering decentralization or nucleation; others have affected the prosperity or demise of institutions.

f) Architecture may reinforce society's conservatism, or encourage adventure.

g) Physical environment may facilitate communication or impede it.

h) But most of all, architecture's symbiotic relation to society may best eventuate in an environment conducive to abundant life, as the Institure for the Behavioral Sciences at Palo Alto attracts scholars there.

C. *Some debateable axioms about style*

1. It is sometimes *erroneously asserted that a great building must express* any or all of the following: its use, materials, structure, metaphysical base, client, architect, site, nation, region, climate, technology, and the age in which it was built. All of these have been pieces in the one-man band stumping for modern architecture.

2. *But they are all debatable* stylistic axioms. They are mutable indices to style, not to quality. Renaissance and Academic architects made no overt or self-conscious expression of them. Is it an

offense against honesty that the self-contained mass of St. Peter's dome, its vigorous, powerful contour, is secured by a hidden chain? Should we scoff because Palladio's noble scale, pure proportions and precise detail are cut in brick covered with stucco? Do we shudder at learning that the Gothic sculptors painted their stone statues? Do we admire the Parthenon less when we learn that it failed to express its interior spaces, their differences in shape and function?

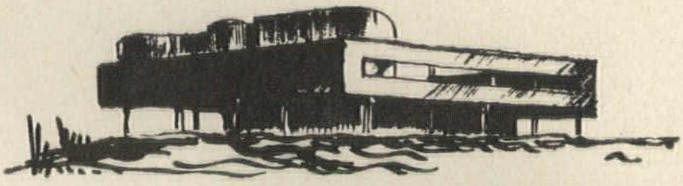
3. *A building* may express all these axioms, *may be the finest social document and still not be a work of art.*

a) Many buildings express their materials, structure, site, society and age without being works of art.

b) Even the expression of the most laudable metaphysical, political and ethical ideas is not enough. Ruskin has not been alone in invoking "honesty" as a virtue; but honest about what and to what purpose?

c) Conversely, the expression of amoral, even immoral or distasteful ideas is not a formal blemish.

4. Stylistic expression of the debatable axioms is the arena for preferences and prejudices—for taste, in short—and, while taste is a necessary constitutent of criticism, the esthetic judgment of form must refer to the organization of elements, —, mass and plane—even those that are stylistically ephemeral.



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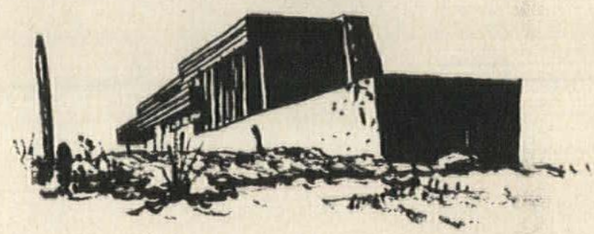

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III. COMPOSITION AS THE ORGANIZATION OF ELEMENTS

For the architect, the formation of a rhythmical pattern of useful spaces and masses, revealed by light and shade, is the fundamental problem of his art. Seeking sequences of fine spaces, he models his building within and without, adjusting its geometry, its light, its scale, critically inspecting each space, each mass, and all the transitions among them until everything is indissolubly joined.

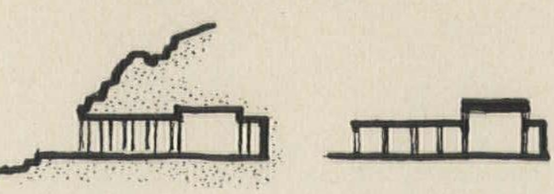
Let us here consider as the main element of architecture the shaping of space by dynamic composition and by the static compositions that stand in it and terminate it.

A. *The recognition of space*

Regardless of style, a building's primary and lasting impact is made by the quality of its spaces and masses.

1. *The process of creating space* occurs either by *extraction* or *impaction* (Fig. 17). In Western thinking, the second type of spatial generation is common.

2. *Absolute and relative limitations* upon dimensions affect the spaces we see and the reactions we have to them.



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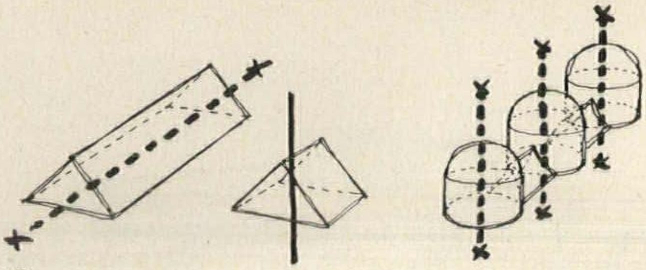

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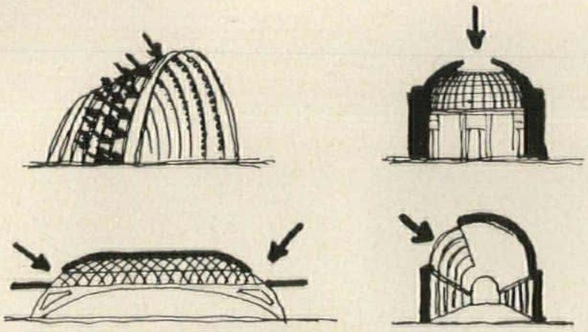

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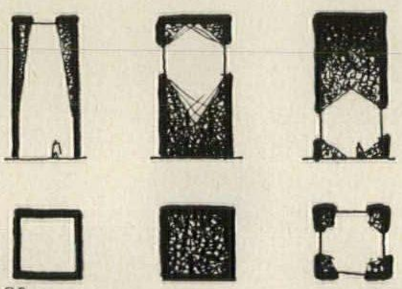

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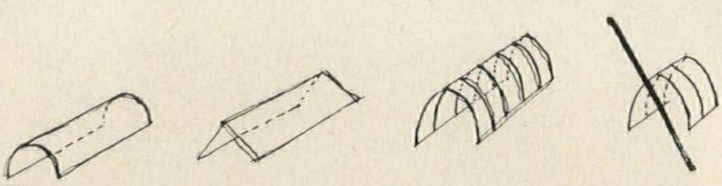

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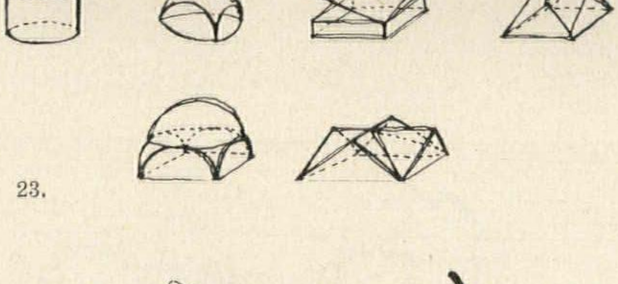

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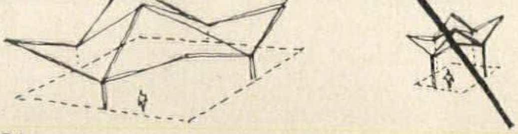

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a) The dimensions of a telephone booth are below the absolute minimum for comfortable experience.

b) Although the dimensions of a factory chimney are substantial, its relative width excludes it from the realm of architectural spaces.

c) A corridor may be excluded from the order of successful architectural spaces if its relative dimensions resemble a chimney. With enlargements made either to its width or length, the corridor becomes architecturally useful.

d) Similar conditions prevail with respect to spaces that are too low in relation to their other dimensions.

3. *The generators of space* (Fig. 18).

a) Architectural space can be generated with two or more planes, either virtual or indicated.

b) The simple varieties of generators may be combined to form intricate spaces.

c) Architectural space has direction, indicated by the geometry of its generators.

i) The directive axes may be basically horizontal, vertical, or oblique components of them.

ii) When spaces fail to emphasize their principal axes, they lose character, becoming useless in isolation. On the contrary, they may then gain value as neutral, connective elements in sequences of connected spaces.

B. *Revelation through light*

Our sensation of space, which may be affected by mood and memory as well as by textural, auditory, and olfactory impressions, depends primarily on *light*, which reveals the tectonic forms and articulates them.

1. *Light should support* and control the character and organic unity of space, not destroy it (Fig. 19).

a) The horizontal order of parabolic vaults is supported by the rhythmical strips of light.

b) The horizontal unity of a barrel vault may be destroyed by the introduction of lateral light strips.

c) The brilliant oculus of a pantheon harmoniously climaxes the vertical axis of its space.

d) Too often, an elegant structure is marred by allowing light to interfere with a consistently generated space.

2. *Light modifies the character* of space (Fig. 20).

a) In a high vertical space, a skylight provides a clear, overall distribution of light from floors and walls, achieving a uniform brilliance.

b) High windows or clerestories in a similar space bathe a prominently plastic ceiling, as in a basilica, resulting in a ceremonial atmosphere.

c) Low windows restrict visibility, the upper parts of the space retiring into obscurity, suggesting a mystical withdrawal.

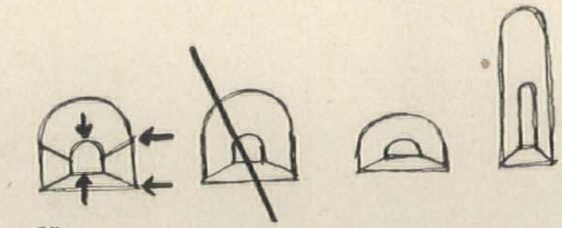
C. *The roof and space-form*

1. A flat roof encloses spaces without disturbing the geometry and usually without enhancing or clarifying it; the flat roof is a non-directional enclosure for space (Fig. 21).

2. Directional space-forms are highly articulated by directional roofs, seeking axial identity, whether horizontal (Fig. 22), or vertical (Fig. 23). Spaces with dominantly vertical axes are best articulated by central roofs generated by either centrifugal or centripetal geometry and by the intersection of horizontal roof-forms (Fig. 23).

3. The richer roof-forms demand large and clear volumes, becoming weak and ugly at small scales (Fig. 24).

4. The explicit statement of the intersection of wall, floor and roof planes is the visual and geometric determinant of spaces, which otherwise lose their character when the intersections are obscured or neglected. Explicit statements seem to be unnecessary when either the roof or wall dominates the space (Fig. 25).



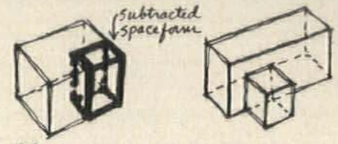
25.

D. *The composition of spaces*

There are only three types of spatial composition; all combinations of space fall into these categories: Connection, Subdivision and Sequences.

1. *Connected spaces*

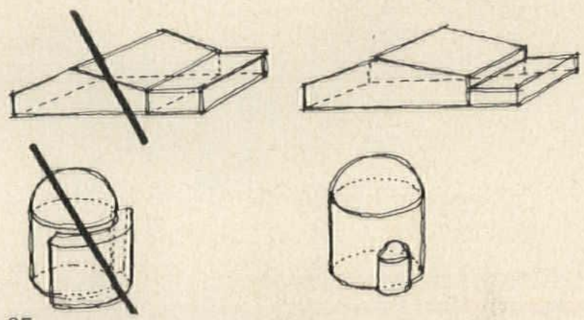
a) Spaces must consist of definite whole units clearly related and positively joined rather than being subtractions from larger volumes (Fig. 26).



26.

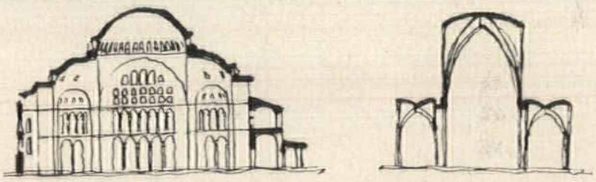
b) One space must dominate so that the lesser space is a clearly recognizable extension from it (Fig. 27).

c) The annex in central forms should be decisively subordinated, avoiding a scale that rivals that of the main mass (Fig. 27).



27.

d) In symmetrical compositions, the firmly subordinated lateral spaces strengthen organization (Fig. 28).



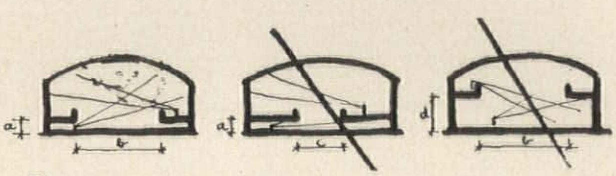
28.

2. *Subdivision of spaces: e.g., galleries*

a) *Galleries in a longitudinal space-form*

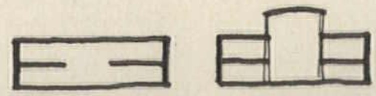
i) Subdivisions should reflect, not counteract, the dominant space-form.

ii) The dominant space-form should remain recognizable, as the master space organizing lesser, servant ones (Fig. 29).



29.

iii) Where the subdivision becomes strong, it is generally better to use a separate connected space (Fig. 30).

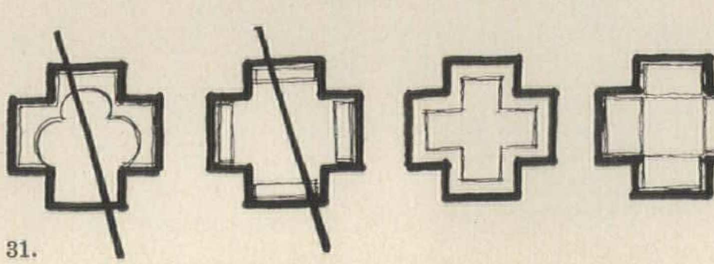


30.

b) *Galleries in a central space-form*

i) Subdivisions should conform to the space-form, being subordinated to it or following it, but not conflicting with it.

ii) In complicated space-forms, organization should emphasize the main character and avoid introducing new, irrelevant or redundant issues (Fig. 31).



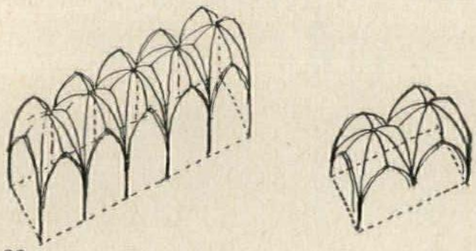
31.

3. *Sequences of space*

a) Spaces may be related to adjacent ones of equal importance either through dualities or unities in rhythm (Fig. 32).

b) Spaces may be related to adjacent ones of different value by clearly expressing *forced differentiations* between the spaces (Fig. 33), by contrasts between long and wide, high and low, horizontal and vertical, large and small, and light and dark.

E. *Some concluding generalizations about spatial organization*



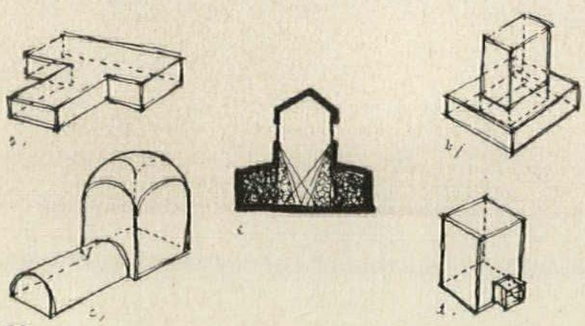
32.

Four sorts of error in spatial organization frequently appear in current architecture. The examples are numerous because the following principles and their possibilities for positive or negative use are ignored.

1. There must be *clear and obvious relations between spaces and their enclosing masses.*

a) One consequence of this principle is that all major deflections of contour in plan will be rendered explicit by having corresponding changes in section.

b) All ambivalencies and distortions in the geometry generating form should be avoided. For example, there is the classic problem of resolving the distortions produced when reentrant angles stand above salient ones.



33.

2. *A connection or sequence of spaces* should be evident in a connection or *sequence of masses,* while a subdivision should be a main form without necessarily expressing the interior compartmentation on the exterior.

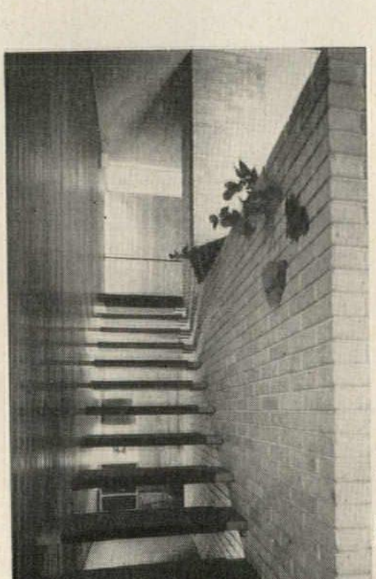
3. A *hierarchy of clear organization,* including the phrasing of both rhythm and scale, should allow the complexity of the building to unfold systematically as one approaches it (Fig. 34).

4. The *interior,* anticipated from the exterior, *must not be completely foretold* from the outside, leaving no additional richness for close inspection. Behold the oyster: the roughest of shells without, the mother-of-pearl within.

34.

In these notes, criticism flourishes only its prelude. The esthetic judgment of space, mass and plane —the elements of architecture—relies on principles of composition, while historical and personal evaluations are nourished by considering architecture as stylistic expression. Both are necessary in good criticism. Closer and extended examination would bring us to study *Balance, Proportion, Scale, Rhythm,* and *Consonance.* Nor would we omit *Articulation,* which requires that all the changes in a building's statement should be marked as *transitions*—from ground to building, against the sky, turning a corner, changes in level, entering and leaving, and moving from one space to another. But, obviously, though Augustine would denounce our dis-*Unity,* these are subjects for further notebooks.

A HOUSE OF CONTRAST AND SCULPTURED SPACE

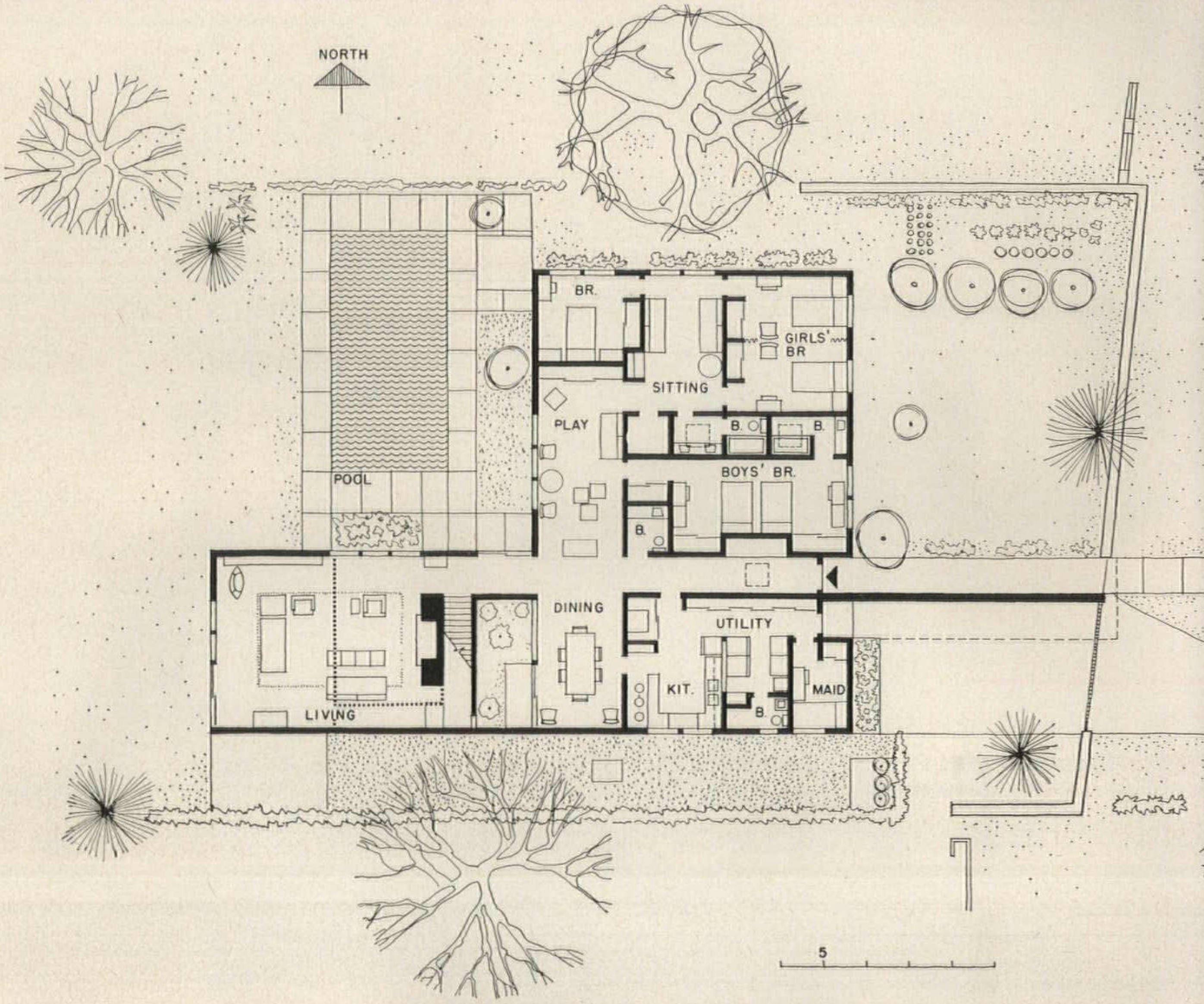


Frank Lotz Miller photos

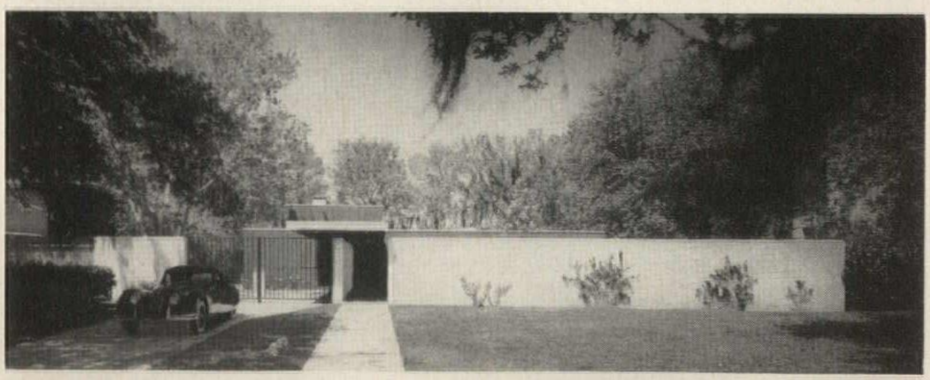
Residence for Mr. and Mrs. Charles R. Colbert, Metairie, La. Colbert & Lowrey & Associates, Architects; Guillot, Sullivan & Vogt, Engineers; Landis Construction Co., Inc., Contractor

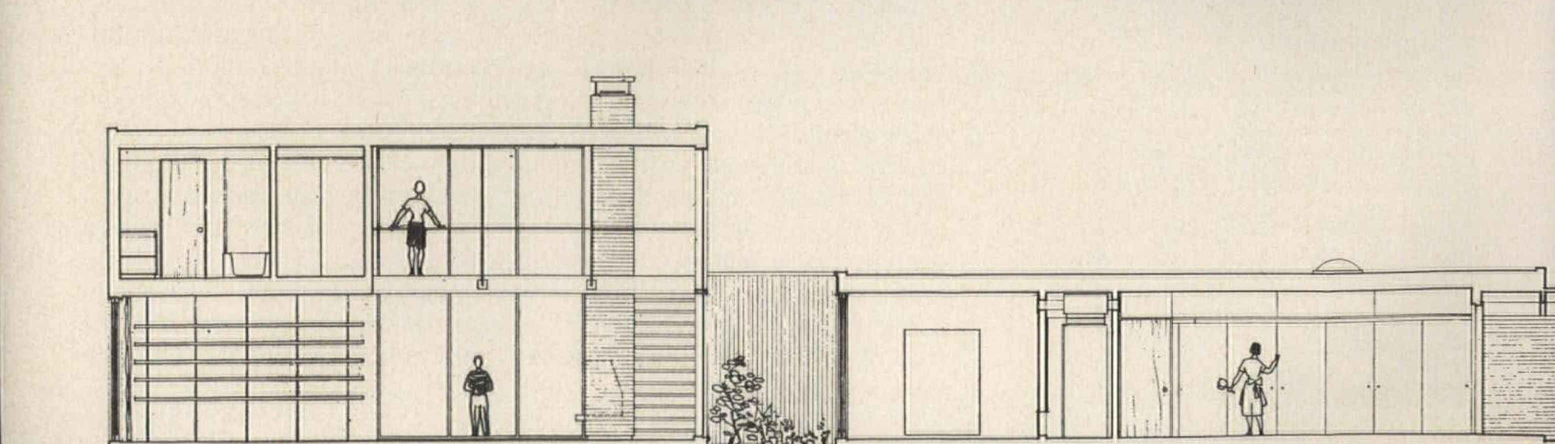
A contrast of high and low, open and closed areas, and an imaginative use of space make this a house of unusual interest. Planned for a family of seven, including five small children, the house is divided into two distinct units: a one-storied main wing incorporating dining room and kitchen as well as the children's bedrooms and playroom; and a two-storied living room wing with the master bedroom suite occupying approximately half of the upper floor.

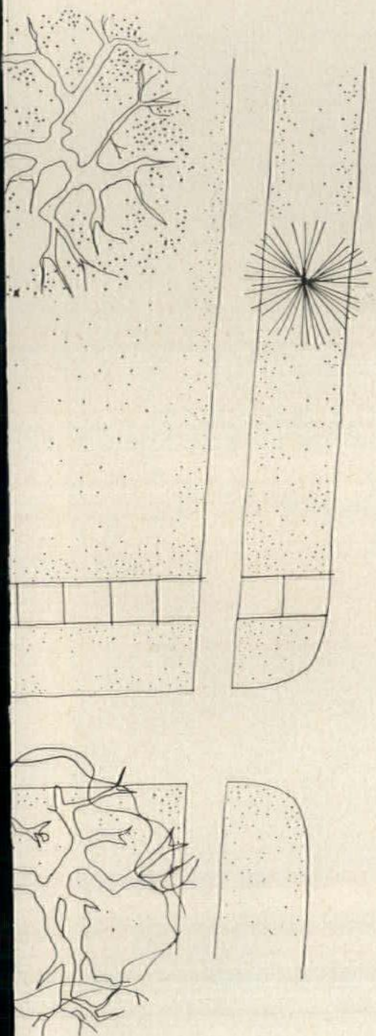
A 78-ft frontage, with a French Provincial residence on one side and "a massive redwood structure" on the other, presented a problem to the architect owner, whose prime objective was "to design a contemporary home which would fit comfortably into this environment, serve as a transition between the two contradictory structures, and possess architectural interest itself." A golf course at the rear of the site provided a pleasant view toward which all the main rooms were oriented.



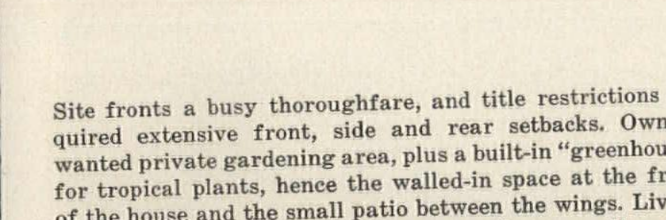
House of Contrast



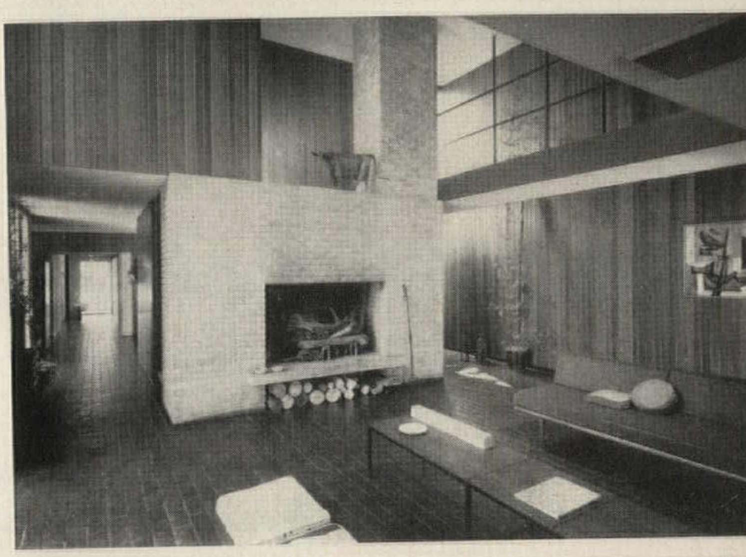


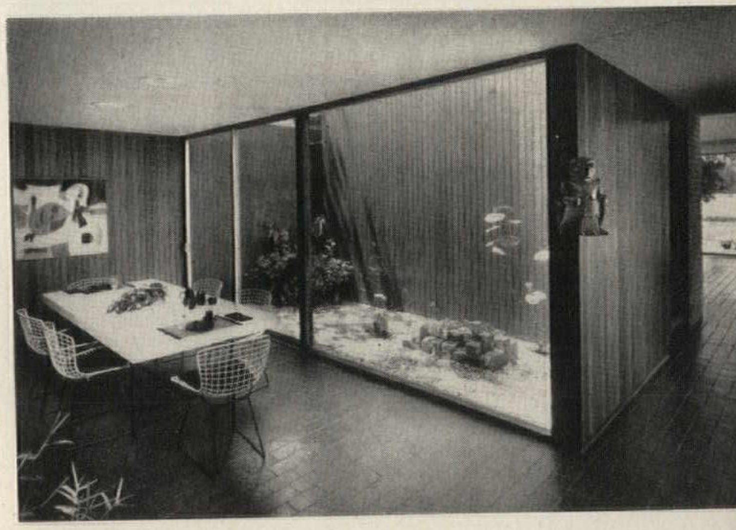


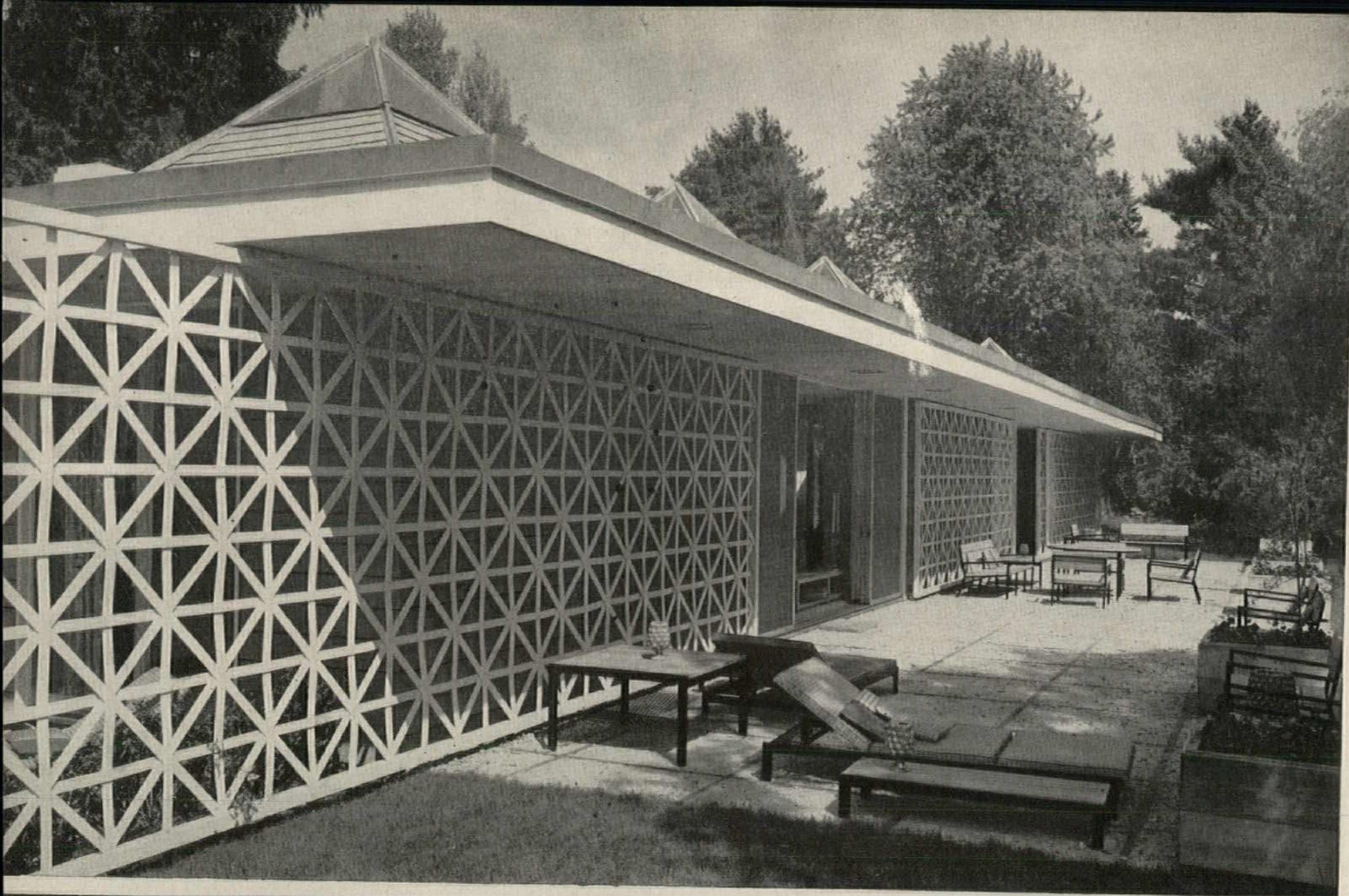
Site fronts a busy thoroughfare, and title restrictions required extensive front, side and rear setbacks. Owners wanted private gardening area, plus a built-in "greenhouse" for tropical plants, hence the walled-in space at the front of the house and the small patio between the wings. Living room, master bedroom and children's playroom all are at the rear of the lot, overlooking the golf course and the swimming pool. The long corridor made necessary by the right-angled wings achieves unexpected interest from varying ceiling heights, skylights, and room openings. Each of the two units has its own air conditioning system and an intercom links the two wings together



FRONT

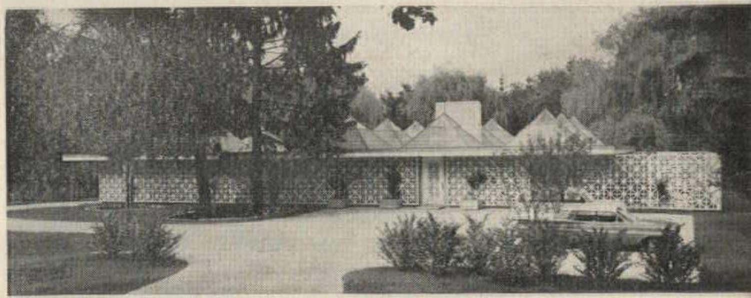


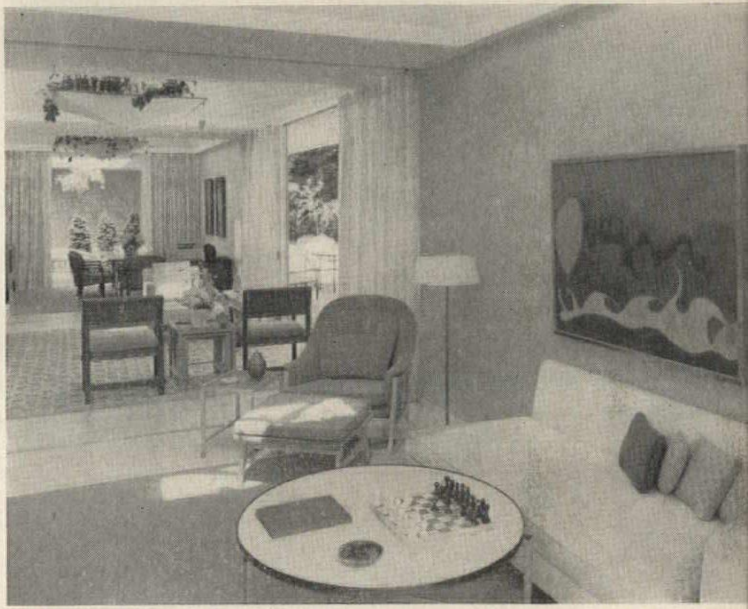




SPACE AND LIGHT USED AS DESIGN ELEMENTS

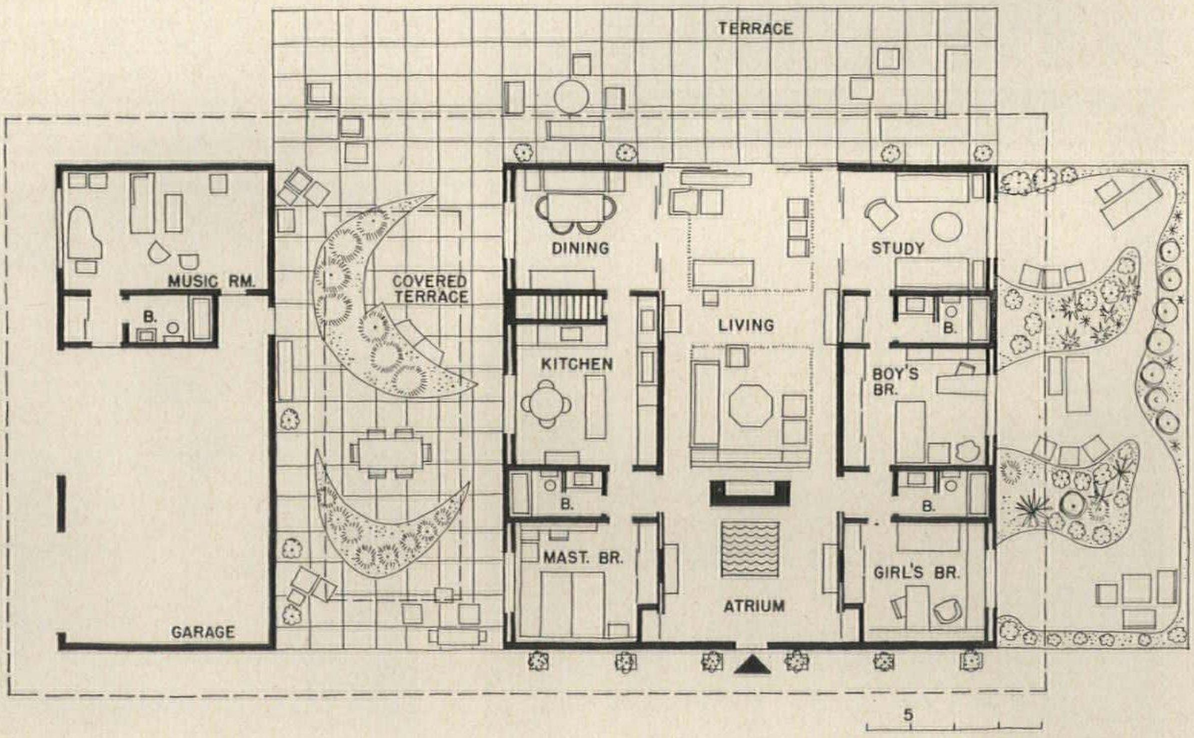
House in New Canaan, Conn. for Celanese Corporation of America. Edward D. Stone, Architect; Henry Gorlin, Structural Engineer; Harold Hecht, Mechanical Engineer; T. deF. Hobbs, Inc., Contractor; James Fanning, Landscape Architect. Interiors by Edward D. Stone, Edward Wormley, John and Earline Brice





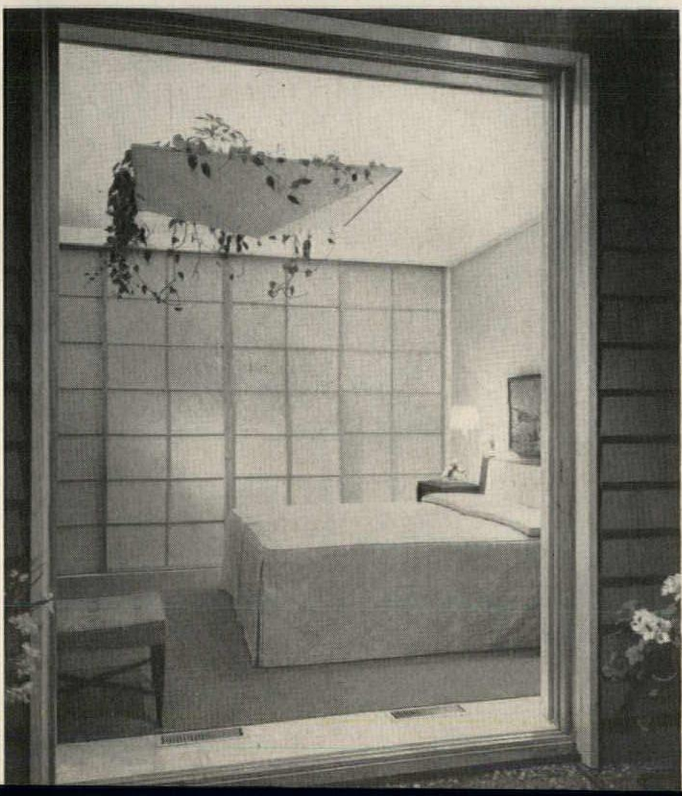
The most interesting thing about this house probably is the fact that Edward D. Stone designed it to dramatize "The American Idea" theme of the Celanese Corporation's 1959 Fall promotion program. The house is, in effect, a super-showroom for the new Celanese fabrics and floor coverings.

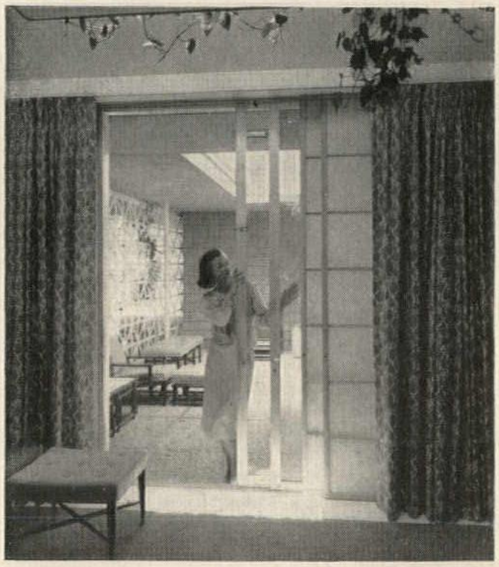
It is also, of course, much more than that: it is a residence thoughtfully planned and full of imaginative details. Most striking is the use of twelve glass pyramids in the roof, each with a hanging garden suspended below (watered by way of step ladder) which casts changing patterns of light and shadow throughout the house. Space is a tangible asset, particularly in the central living-entertaining area where a long view from front door to rear terrace is the visitor's first impression. The children's rooms are large enough to provide play space and are well apart from the master bedroom suite. A separate music room, connected to the main house only by the covered patio, make it possible for part of the family to enjoy piano, TV, or hi-fi without disturbing the others.



Space and Light

Main entrance leads to pool-dominated atrium which on each side of fireplace wall has view through living room to rear terrace. Living room, dining room and den can be opened into huge T-shaped entertainment area extending to terrace beyond. Every room in house is lighted by pyramid skylight with hanging garden below. Rooms on the north and south side open to terrace or garden areas through floor to ceiling sliding panels consisting of four layers: double insulating glass on the outside; screening; translucent plastic; and finally opaque shoji screens treated decoratively with stitched fabric in the panels. Shoji panels are also used to conceal closet in master bedroom (below left)



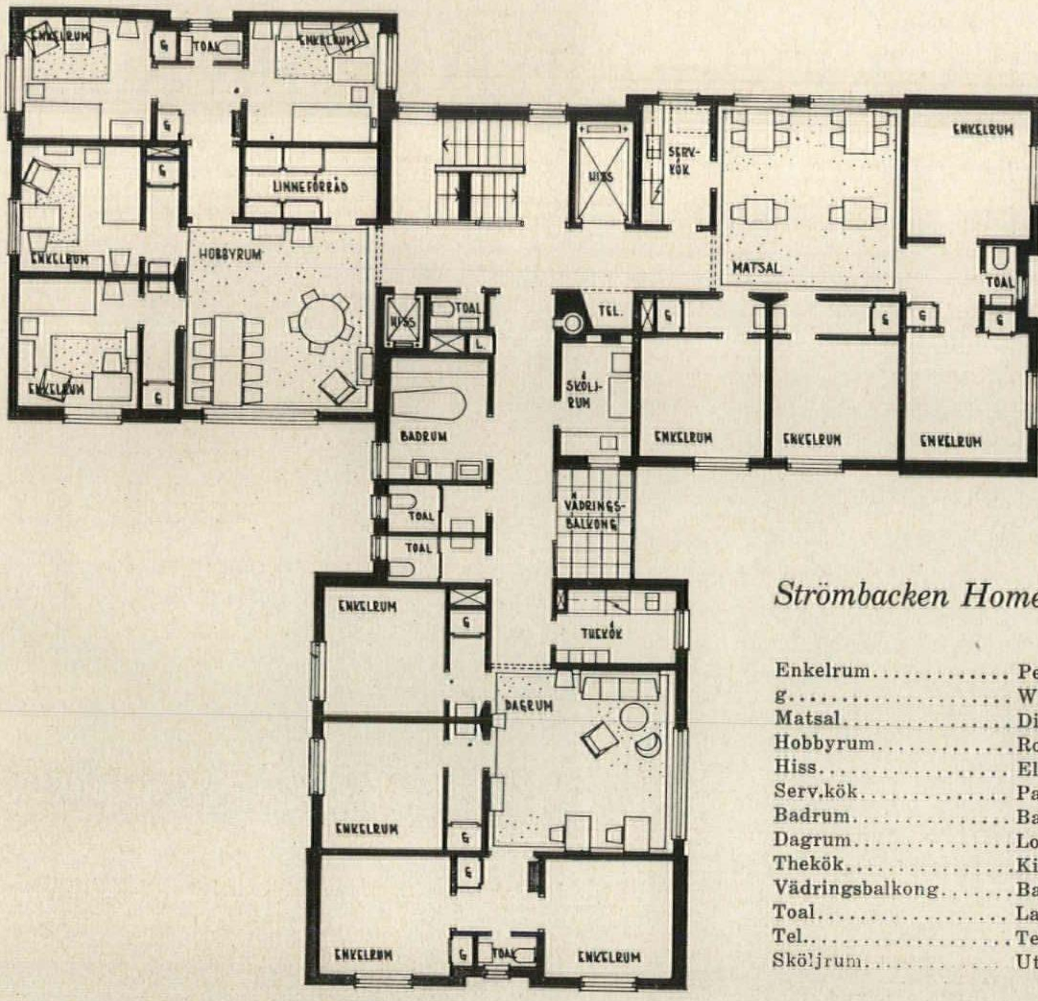


THE STRÖMBACKEN HOME FOR THE AGED

Norrköping, Sweden
Åke E. Lindqvist, Architect

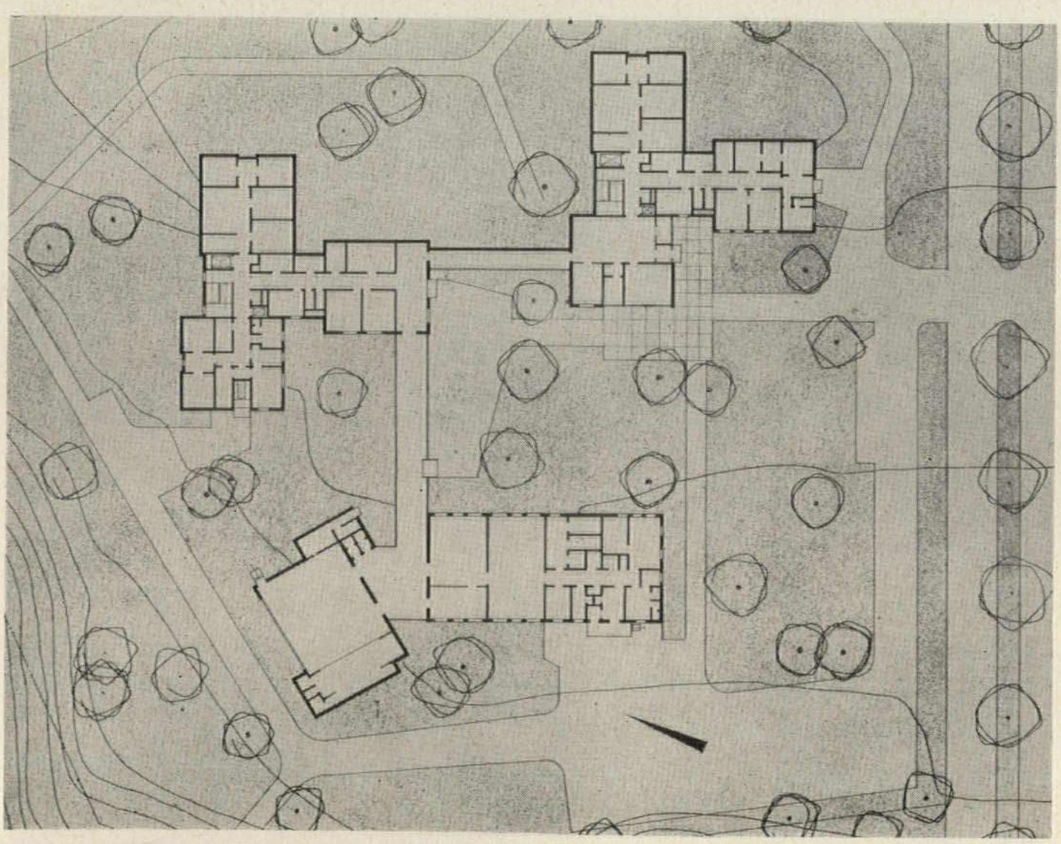
The progressive Swedish program for housing the aged (ARCHITECTURAL RECORD, October 1958) reveals some interesting new facets in these homes by Åke E. Lindqvist. Perhaps most noteworthy is the recognition of the differing needs of old people, and the relationship of these differences to the size and type of community.

The general practice in Sweden is for communities to help old people stay in their own homes, or in smaller, more easily managed apartments, as long as possible. Welfare workers go from house to house to look after them, do their shopping, and cook them one meal a day. Eventually, their failing strength requires the care found in a home for the aged. In large Swedish towns, the average life expectation of people coming to the homes at this stage is about two to five years. The scantier services of villages, however, induce pensioners to come



Strömbacken Home for the Aged

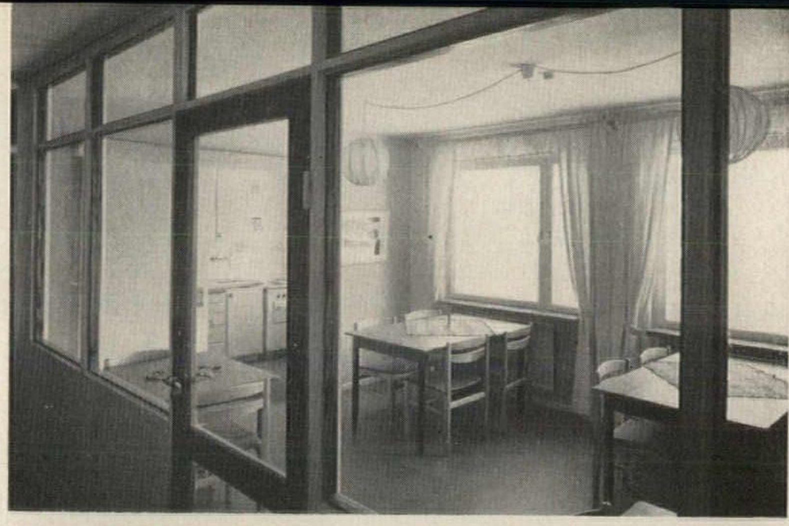
Enkelrum.............	Pensioner's room
g.....................	Wardrobe
Matsal................	Dining room
Hobbyrum............	Room for arts and crafts
Hiss...................	Elevator
Serv.kök..............	Pantry
Badrum...............	Bathroom
Dagrum...............	Lounge
Thekök................	Kitchenette
Vädringsbalkong.......	Balcony
Toal..................	Lavatory
Tel....................	Telephone
Sköljrum.............	Utility room

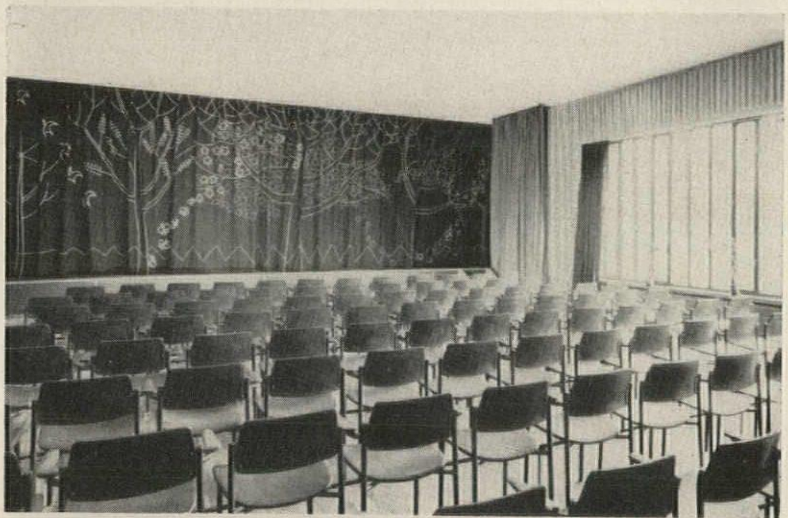


to a home much earlier, with an average stay of between ten and fifteen years; as a group, they still retain a great deal of their vitality. Lindqvist meets these differences by designing one-story buildings adjoining gardens for the more active in the country, and multi-story homes, with elevators, for easier care by staff and nurses of the less able in the city. The ideal would perhaps be a combination of the two types of structures, Lindqvist believes.

Beyond the requirements of basic care, the Swedish recognize the necessity for satisfying the needs for active interests and self-identity. They have tended toward building smaller homes, to minimize institutionalism, with rooms clustered into subgroups of about a dozen. Lindqvist goes a step farther in these examples by providing a dining room, hobby room and day room for each cluster—with four rooms or so grouped about each of the common rooms. As far as possible, those sharing the cluster are of the same age, education and previous standard of living. Each pensioner has a private "flatlet" of 121 sq ft, with "doublettes" for married couples. The clusters also have a little kitchen, scullery, linen room, and lavatory for its particular staff. A central unit contains general staff facilities, specialized hobby areas, and an auditorium. The overall volume of the homes is set at 485 cu ft per occupant, with an average cost of $6000 each.

The Strömbacken Home, shown here, is for 144 old people in a town of 90,000. It is situated in a park in a new part of town, where there are both detached houses and tall apartments. The home consists of twelve "community groups" with twelve pensioners in each. Each group has a separate floor. Communal facilities are in a separate low building also accessible to those living elsewhere.





Strömbacken
Home for the Aged

Some of the typical rooms of the home are shown on the preceding pages—a "flatlet" furnished partly with the occupant's cherished things, a dayroom, and the main lounge. On this page (top to bottom) are: a typical small dining room and kitchenette; the central kitchens; the main assembly hall; and the main entrance lobby, which is kept small and non-institutional

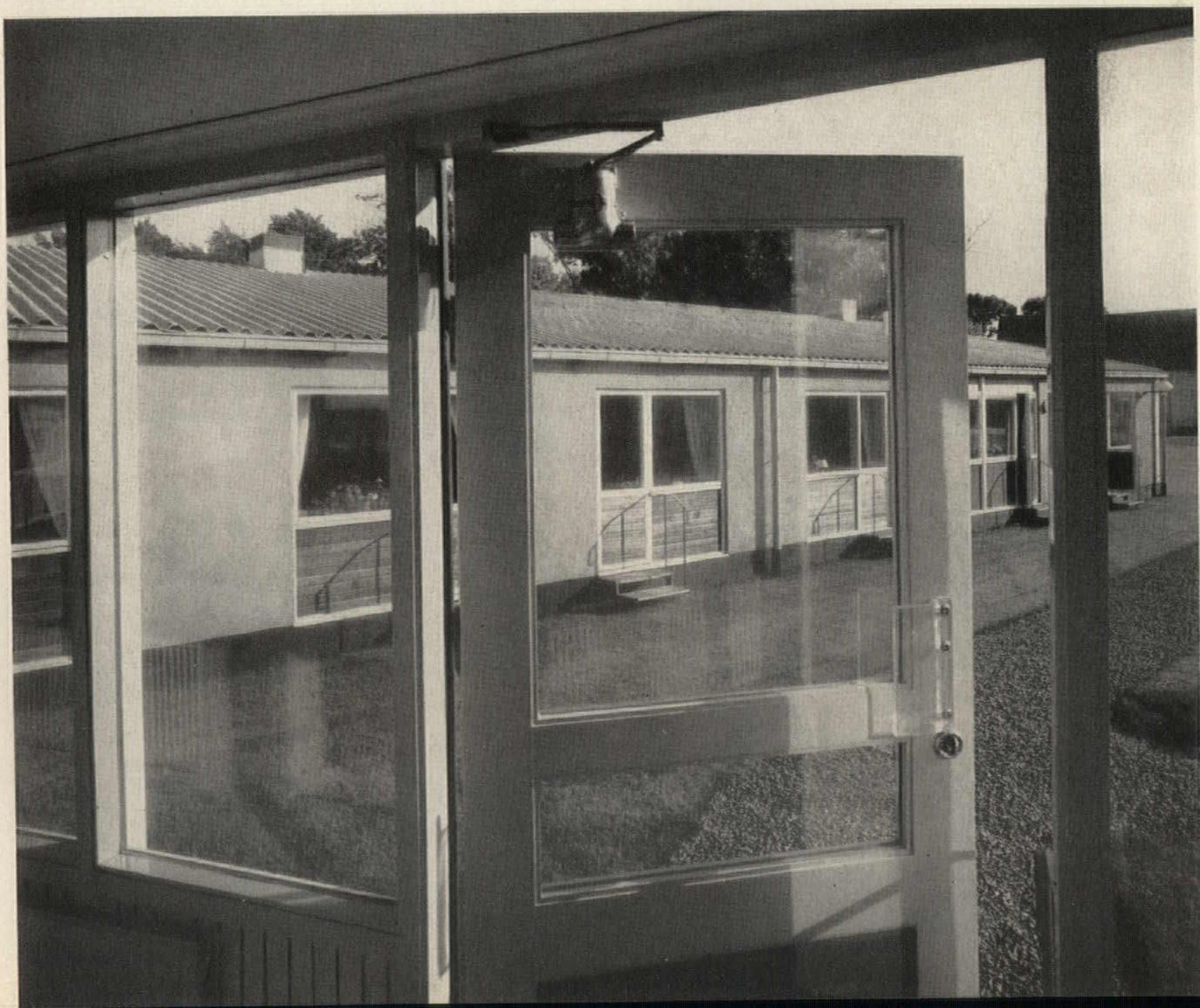
THE MOTALA HOME FOR THE AGED

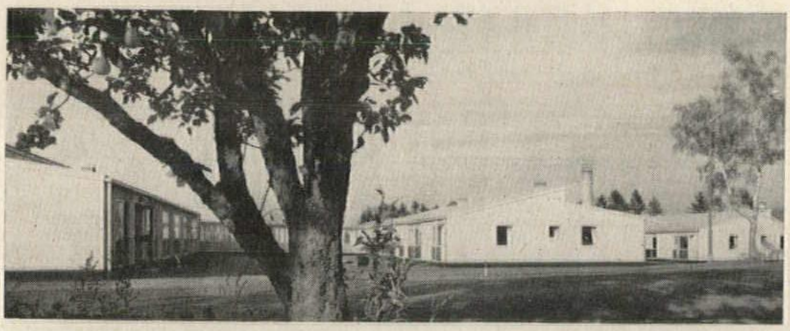
Motala, Sweden

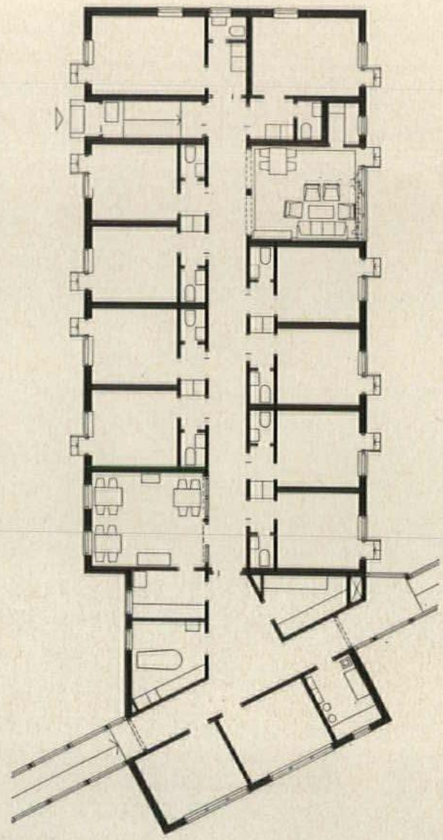
Åke E. Lindqvist, Architect

A lightly sophisticated residential character marks this one-story home for Motala, a smaller town of about 15,000. It was planned for 72 more active oldsters, and consists of six different "residences," each one containing twelve pensioners. Each room has its own entrance opening on the gardens. All units are connected by corridors with each other, and with the central kitchen, offices, assembly hall and special hobby rooms. The home is located in a new district of one-story detached houses and row houses. Lindqvist states that "if at all possible, the size of one of these single-story homes should be limited to 60 places, at the most 72." The Swedish calculate on one person in a thousand being in need of care at a home in small or country towns, and about one in two thousand in cities.

The photo at right shows a typical dayroom or lounge in one of the six "residence" wings.

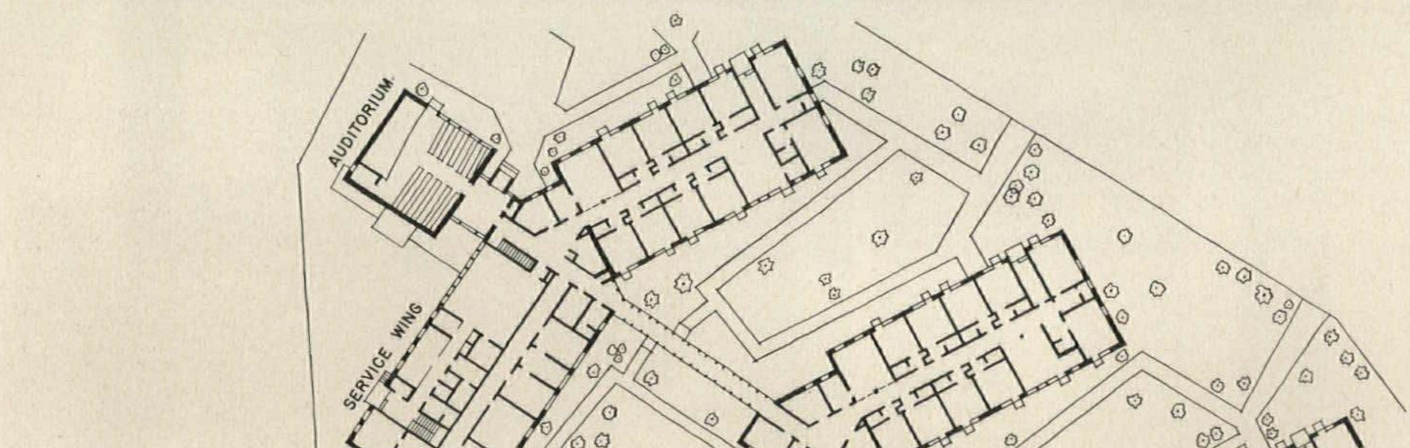


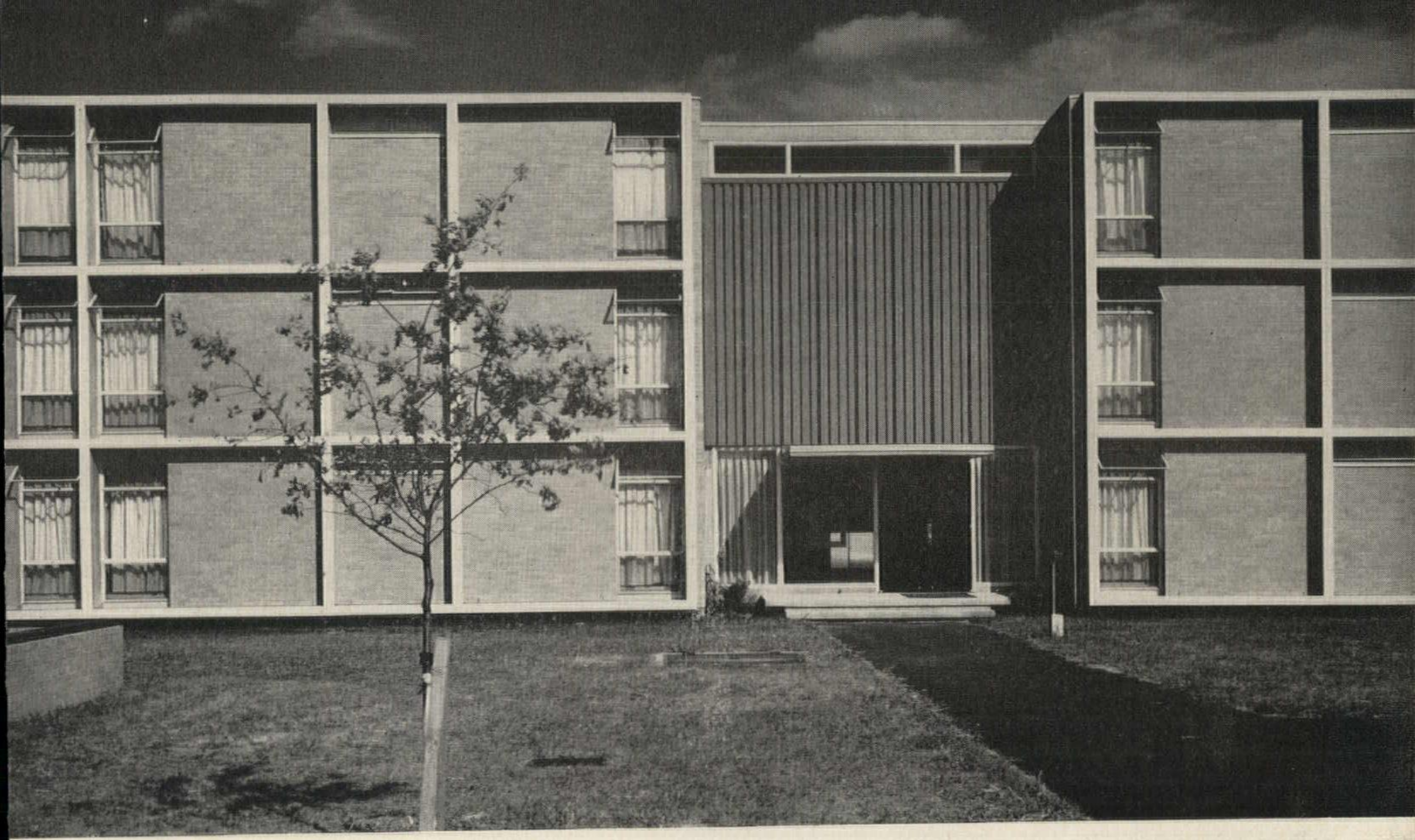




Motala Home for the Aged

Each of the six living wings of this home (see typical plan at right) has its own lounge, dining room, and small hobby rooms. The wings are disposed informally around gardens on the site to promote visiting and exercise. A seventh wing contains staff and service facilities and an assembly hall or auditorium for general get-togethers. Both outdoor paths and enclosed corridors link all units; clerestories illuminate the central halls of each wing, while the connecting links are mostly glass walled





PRIZE-WINNING QUARTERS FOR NAVAL OFFICERS

Bachelor Officer Quarters,
U. S. Naval Yard,
Philadelphia, Pa.

Vincent G. Kling, Architect

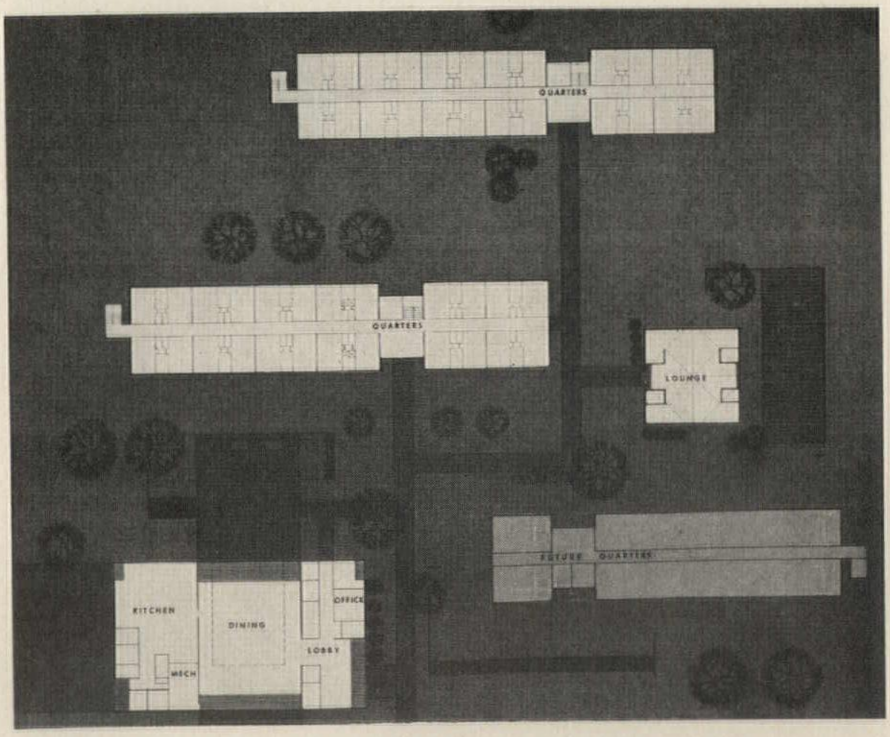
Joseph Marzella, Designer

Severud-Elstad-Krueger Assoc.,
Structural Engineers

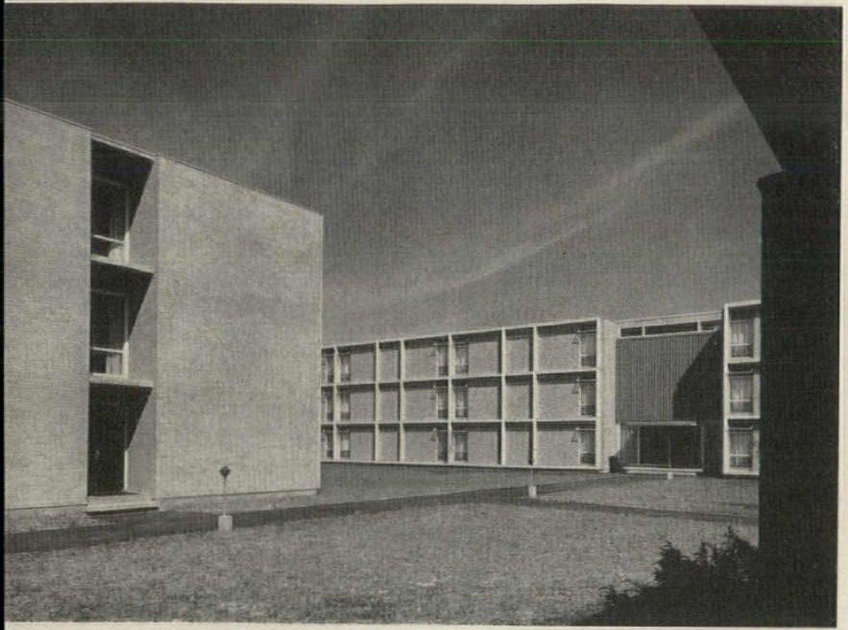
Ewald & Miller,
Mechanical & Electrical
Engineers

Irwin & Leighton, Inc.,
Contractors

Photos: Lawrence S. Williams



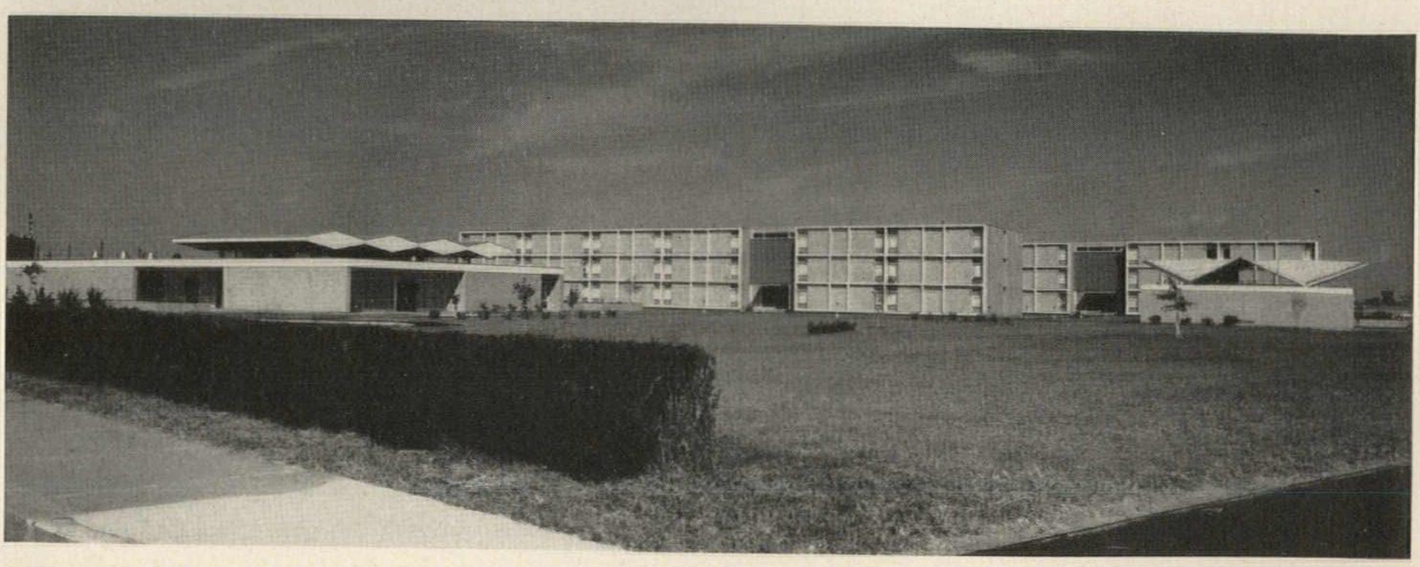
Officers' Quarters



For this lift slab, load-bearing, tiltup concrete wall building group, the architects were awarded the Silver Medal of the Pennsylvania Society of Architects, its highest design award. The buildings are unusual in several respects. The overall campus plan is unique for Navy quarters developments. Ranged around a central patio are two three-story dormitory buildings for 144 officers, a single-story lounge unit, and a single-story dining building. By separating the different functions, noisy areas were isolated from quieter ones, and considerable interest was created. The plan also helps break up the monotony which may often result from placing a building on an unexciting, low flat site.

Used for the first time in naval housing, the structural system has proved economical and workable. Erection went fast. The resulting walls act effectively as acoustical barriers, for protection of the occupants from nearby traffic and other objectionable noises. The dining and lounge buildings are roofed with poured concrete shells. For economy and expression of the structural systems, much of the concrete has been left exposed. As may be seen in the plan, individual rooms are spacious (180 sq ft each). Shared baths are provided between rooms. Enclosed outdoor courtyards are provided adjacent to the lounge and dining hall buildings for the use of the officers who occupy the dormitories.

The illustration indicates how the floor and wall precast concrete slabs were carried to the outside of the dormitory buildings. In this way an expression of these elements was obtained on the exterior and the vertical and horizontal lines of the concrete slabs provide contrast with solid areas of light tan face brick



CLUB FOR ARMY NON-COMMISSIONED OFFICERS

Non-Commissioned Officers Open Mess, 82nd Airborne Div. Fort Bragg, N. C.

MacMillan, Hicks & MacMillan Architects

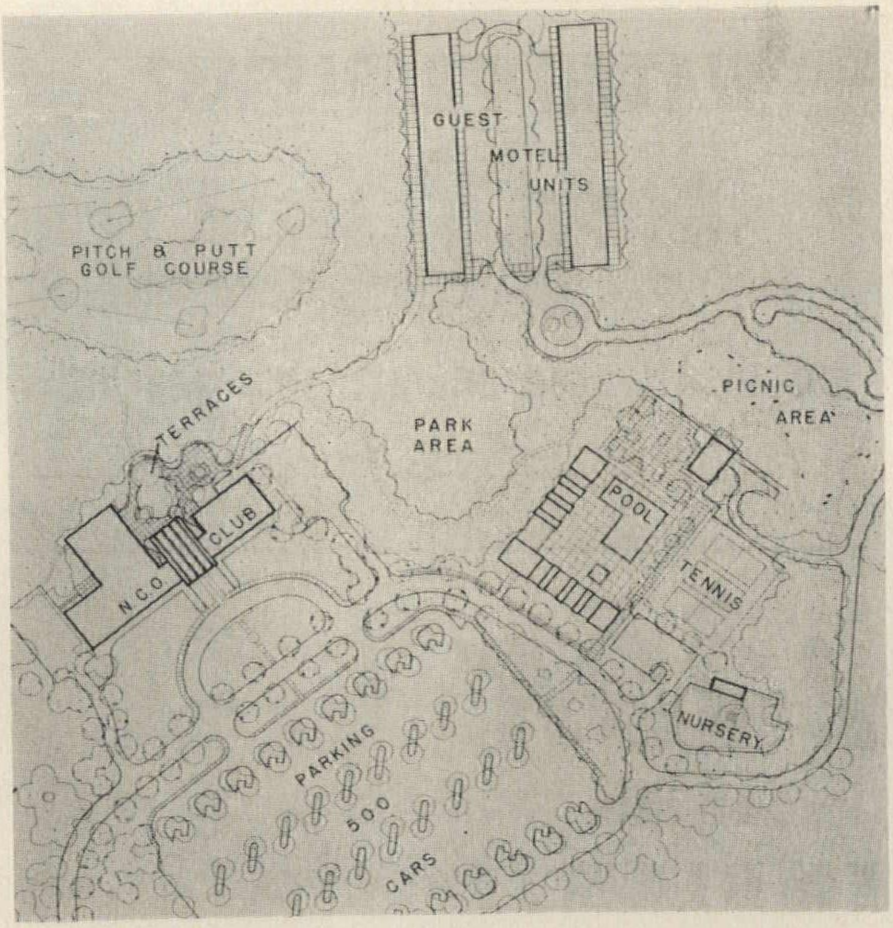
R. V. Wasdell Structural Engineer

Walter G. Smith Mechanical Engineer

Godwin & Bell Landscape Architects

Anderson Construction Co. Contractors

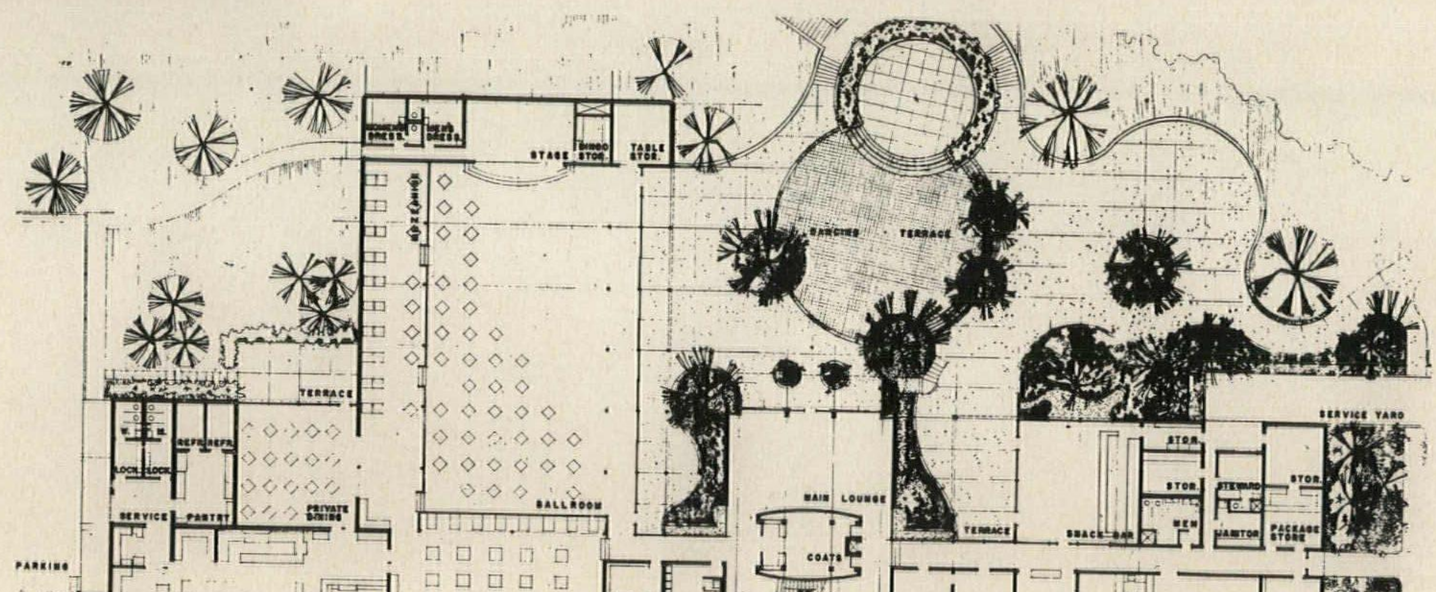
Photos: Seco

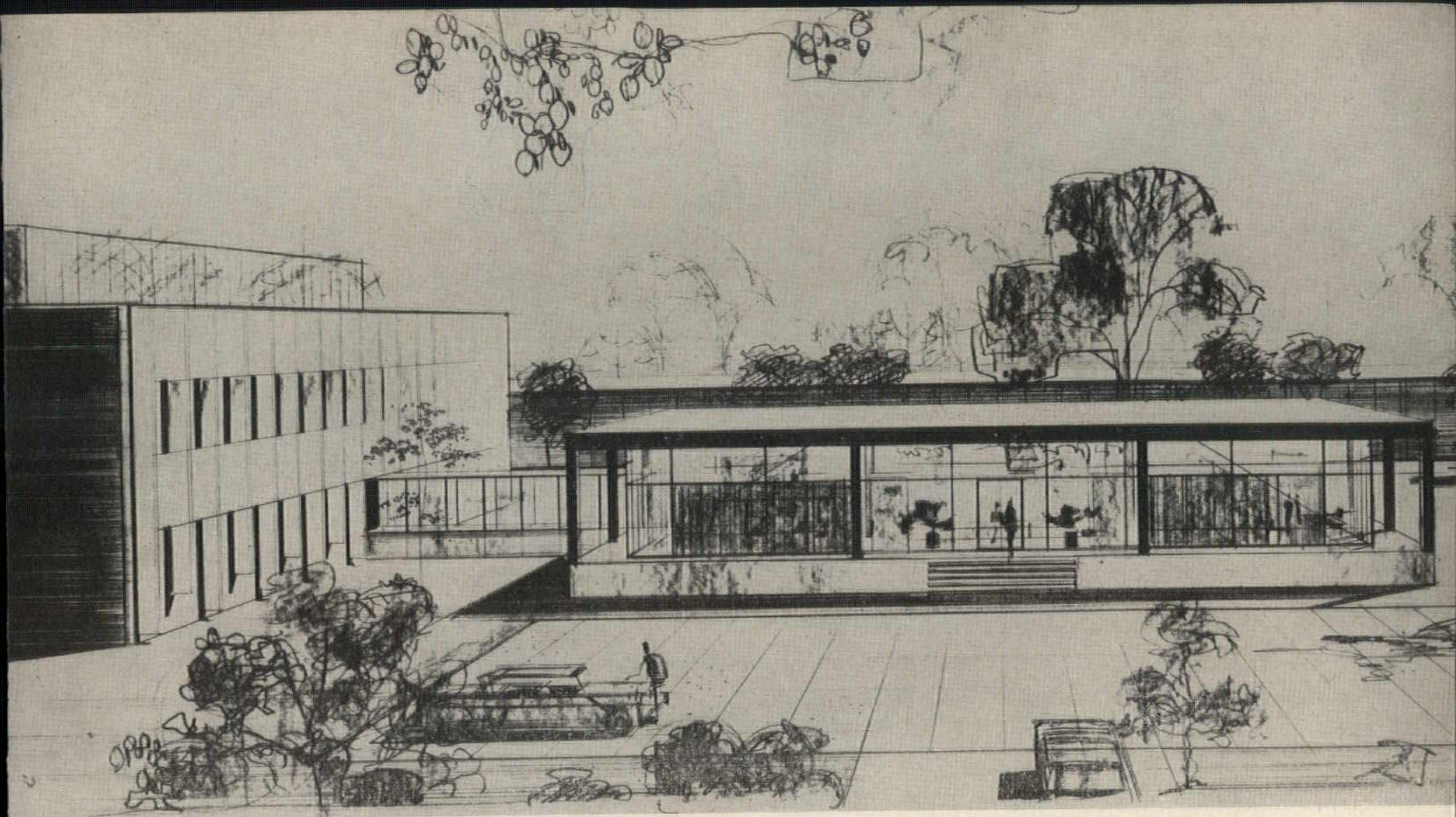


Army Non-Com Club

This club for the non-commissioned officers of the famed All-American Airborne Division goes a long way toward making a service career attractive. The completed club house shown is the first element of a master plan. Financed out of division funds (with the assist of an Army loan to be paid back out of proceeds), the final layout will be a complete country club for approximately 2000 non-coms and their families. The building is steel frame, except for the concrete barrel vaulted section. Exposed non-load-bearing brick cavity walls provide contrast with the large fixed glass areas.

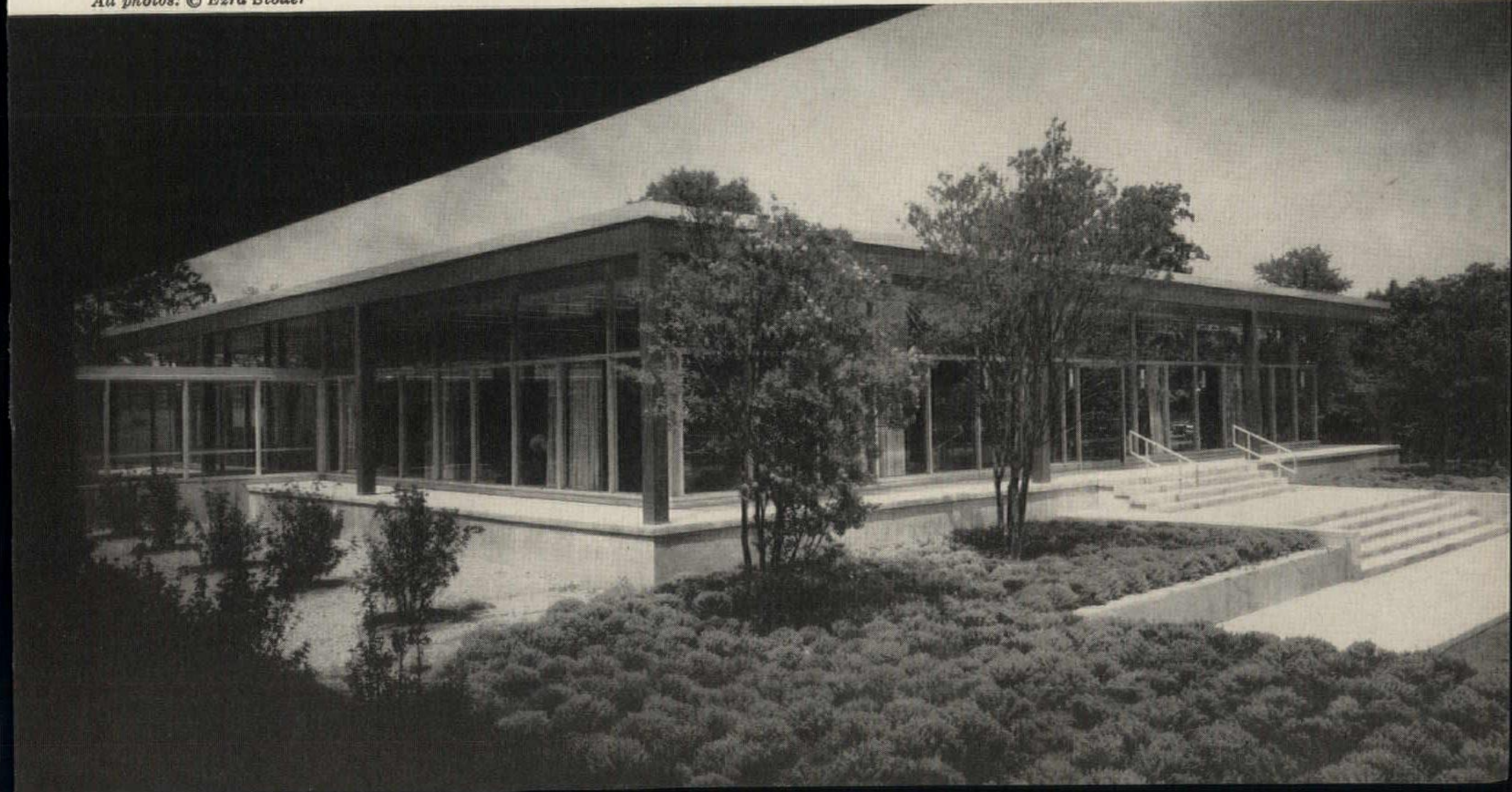
As shown in the plan, the completed club house has two large dining areas, a ballroom, bar-lounge, and numerous auxiliary spaces. Views from the club are interesting, the most spectacular being the parachute drop zones of Fort Bragg, as seen from the rear terrace

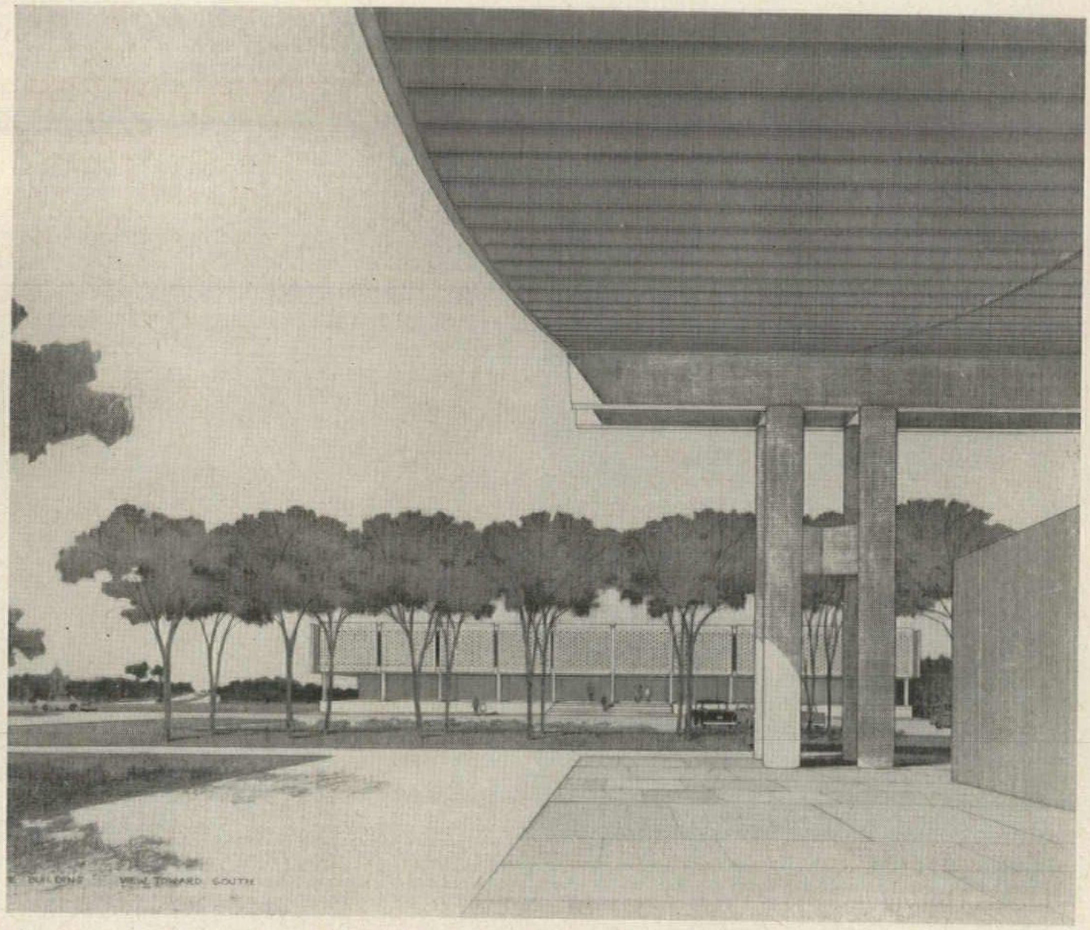




A Campus Setting for Research *Philip Morris Research Center*

All photos: © Ezra Stoller



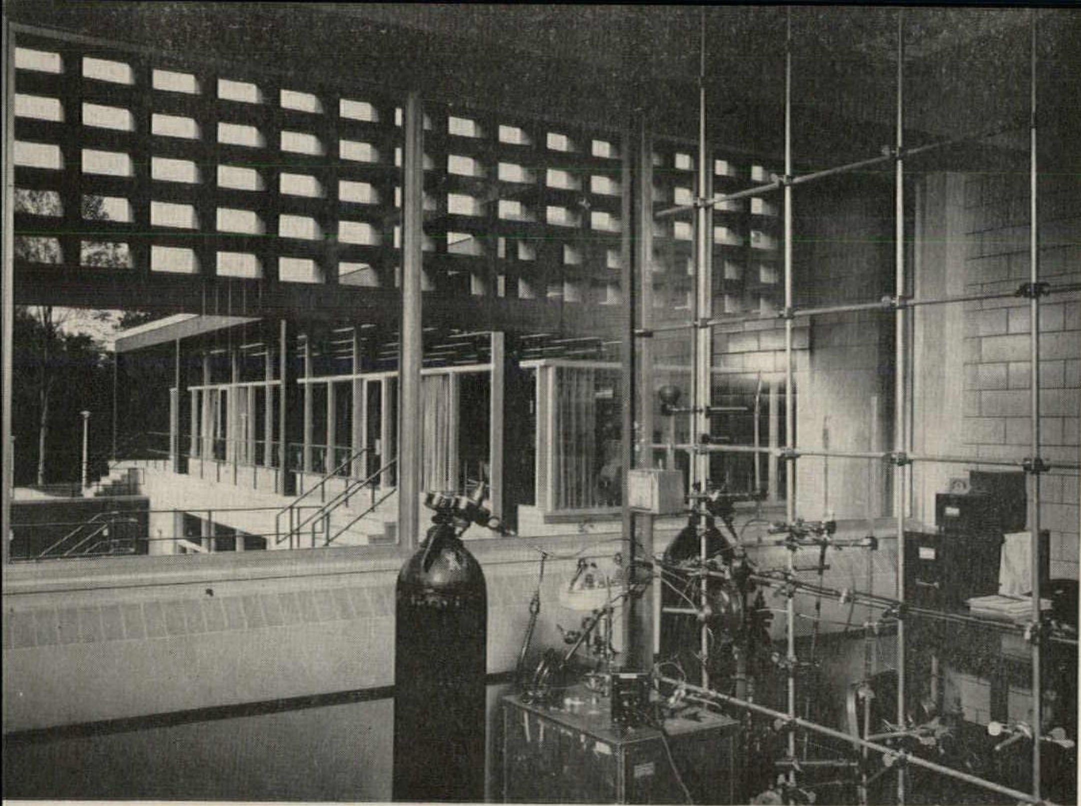


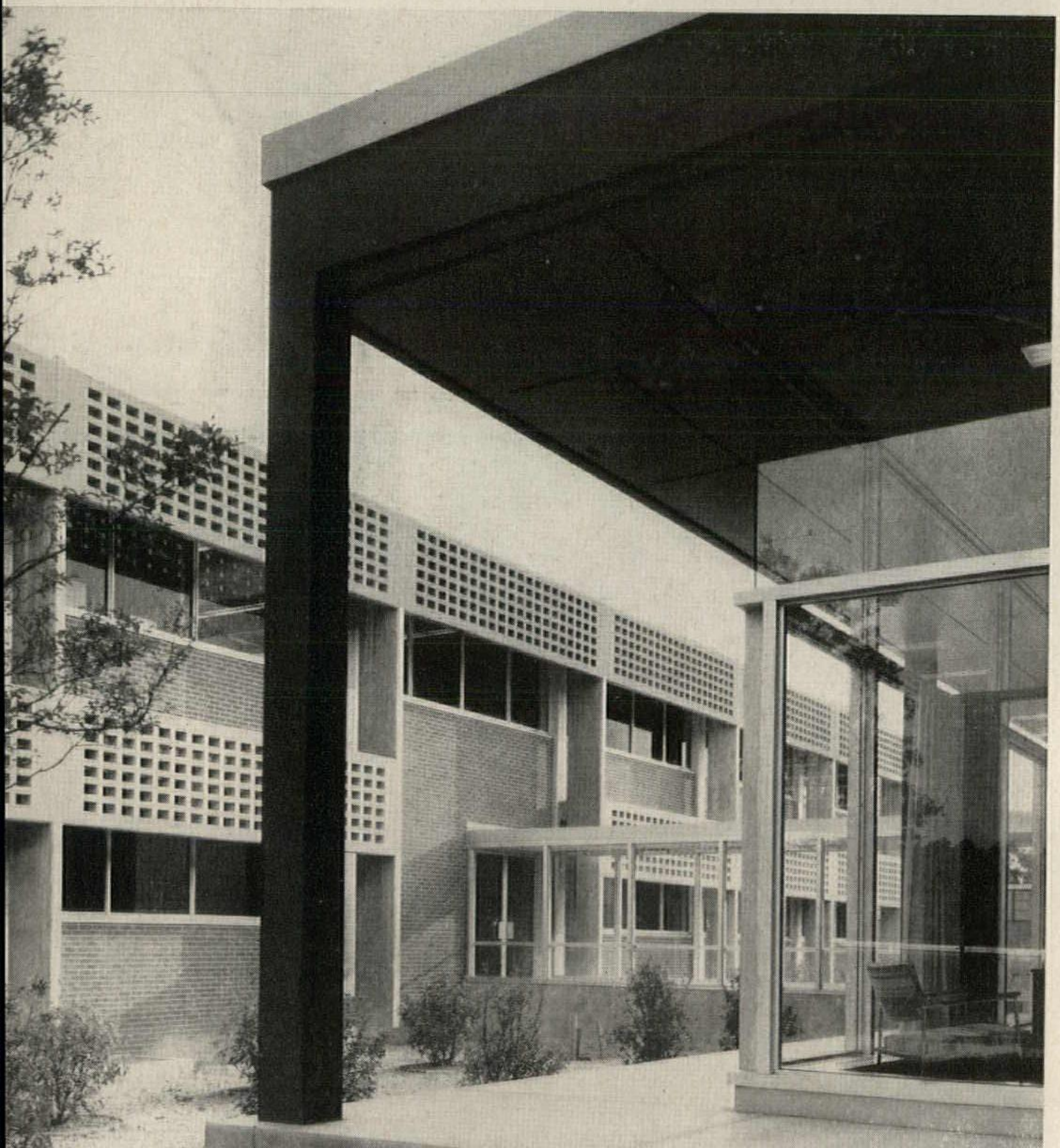
Philip Morris Research Center

Today's dynamic world of commerce for some time has been acutely aware of the values and virtues of establishing an appropriate corporate image. Now, more progressive firms are realizing what a tremendous impact an equally knowing sort of architecture—and general esthetics—can have in fostering an Image. It is a bold, straightforward method, which creates a singular, and well retained, concept in the public's mind. Witness the durable pictures of Corning, General Motors, Seagram, Lever Brothers.

The research buildings shown here are the beginnings of a projected long range program of this type by Philip Morris, Inc. Ulrich Franzen, architect for the entire project, and as part of the philosophy of the program, has prepared and executed a number of designs for the series of corporate graphics and symbols. Studies are also underway for projected buildings, as the sketch above of an administrative and research complex seen from a possible manufacturing area. The late president of Philip Morris, O. Parker McComas, in whose honor the center is dedicated, announced this inception of "a major tobacco center" at a meeting some three years ago. This first stage, costing \$3,000,000, consists of three major buildings on a 65-acre tract four miles south of Richmond, Virginia. A new factory warehouse is also on the site. The entire development is being devised to have "the ordered intellectual atmosphere of a university campus . . . adjusted to competitive business."

Ulrich Franzen—Consulting Architect, planning, design and detailing; H. K. Ferguson Co.—Structural and Mechanical Engineering, laboratory equipment and layout; Philip Morris Engineering Dept.—Supervision and coordination; Daniels Construction Co.—General Contractor; Charles F. Gillette—Landscape Architect

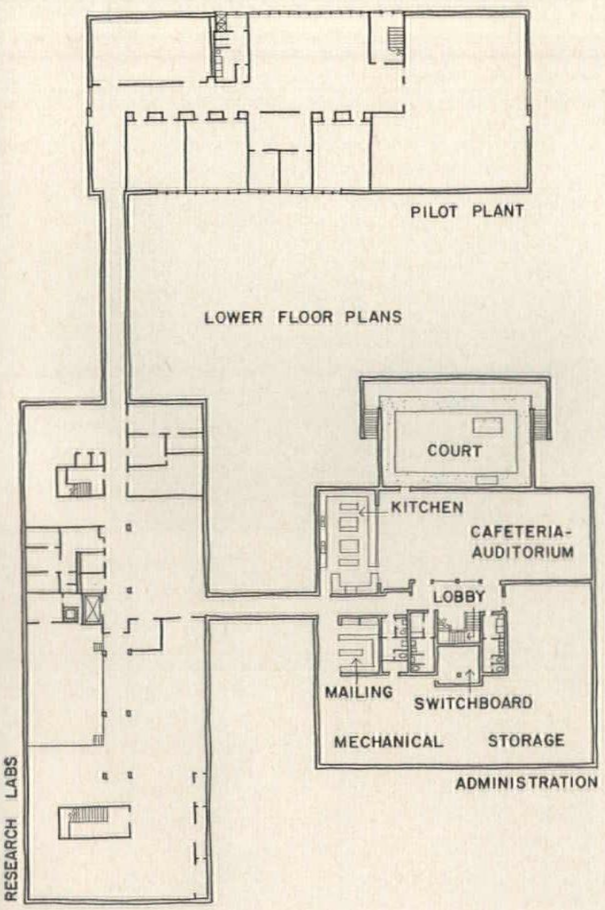


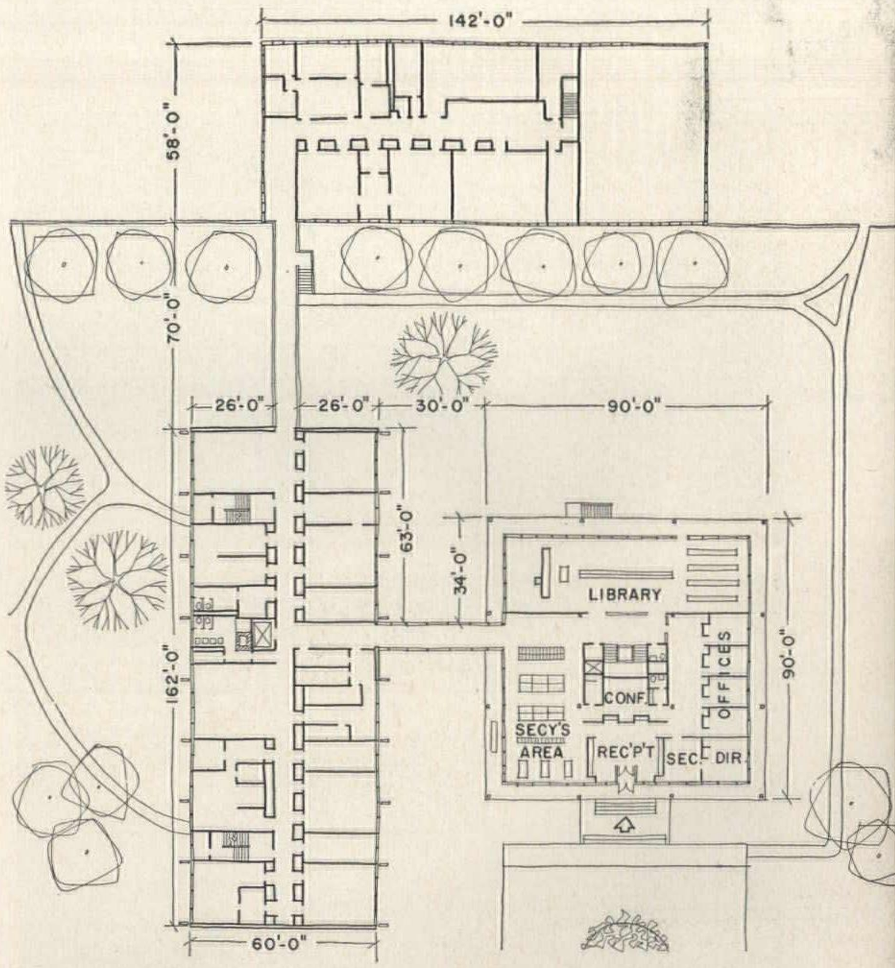


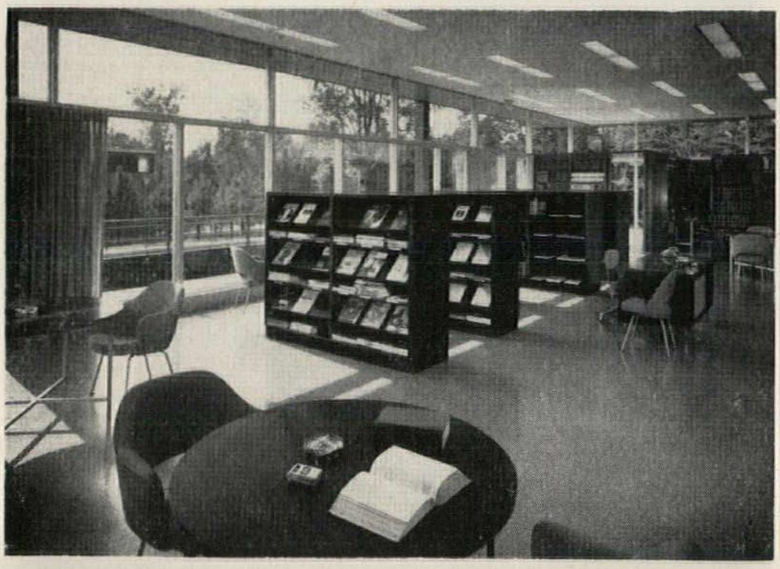
A serene environment for the exchange of ideas by scientists has been developed at the center: an informal but dignified grouping of buildings with a variety of small landscaped vistas and patios. The group is dominated by the steel frame, glass-enclosed administration building (preceding page), set on a podium of stone and concrete. It is flanked by a native brick and concrete-screened laboratory building, and by a painted concrete block and steel-frame pilot plant

The three buildings are connected by glazed "outdoor" (photo bottom left) and subterranean indoor walks. The administration unit has 8000 sq ft on each floor, and is devoted to general offices and a lower-level cafeteria-auditorium. The research building has 29,000 sq ft, two similar floors and basement. The first floor is devoted to applied research on tobacco and smoke; second floor labs concentrate on the qualities of the tobacco plant itself. The basement houses electronics, machine and glass blowing shops where special equipment is prepared for the labs,

Philip Morris Research Center





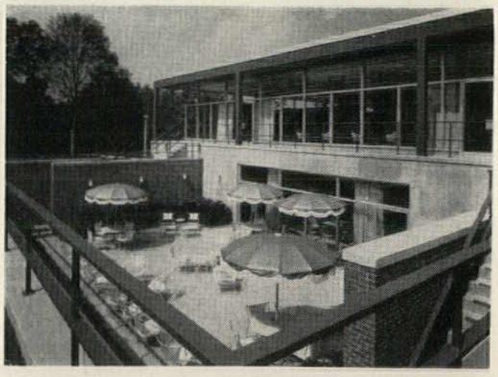


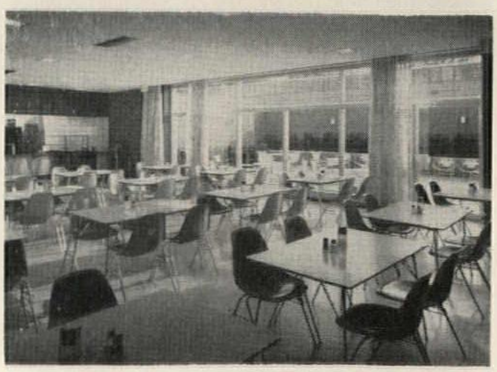
Philip Morris Research Center

Essentially, the main floor of the administration building is one enormous glass enclosed room, with a utility core at the center. The free-standing partitions are kept short of the ceiling to increase the feeling of spaciousness. The photo at top left shows the range of executive offices with adjoining secretarial area. The photo of the director's office, second from top, stresses the park-like atmosphere of the center. The next photo shows the library. The rest of this level is devoted to lobby space, secetarial pool and an office sales area.

The lower level of the administration building contains a modern cafeteria (bottom right), which converts into a conference room or auditorium (bottom left). A glass wall opens on a sunken garden and terrace patio where meals can be eaten or projects discussed. The rest of this level is used for storage and for mechanical equipment.

In the design of all the buildings, an effort was made to reflect the order and rhythms of the traditional buildings of the area, with columns, overhangs, native brick and stone





HOSPITALS

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- DIAGNOSTIC X-RAY SUITES
- SUPPLY DETERMINES DESIGN
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- FOUR GENERAL HOSPITALS

Diagnostic X-ray Suites For the General Hospital

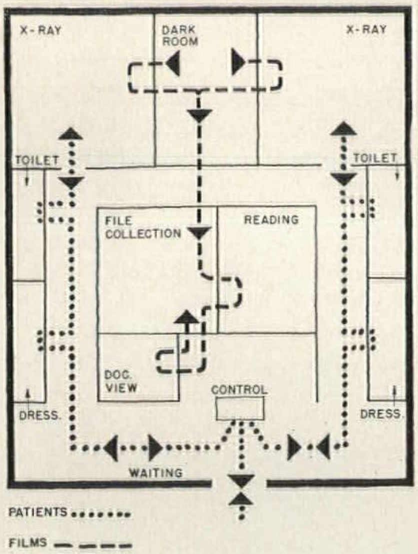
*by Wilbur R. Taylor, Clifford E. Nelson, M.D., and William W. McMaster**

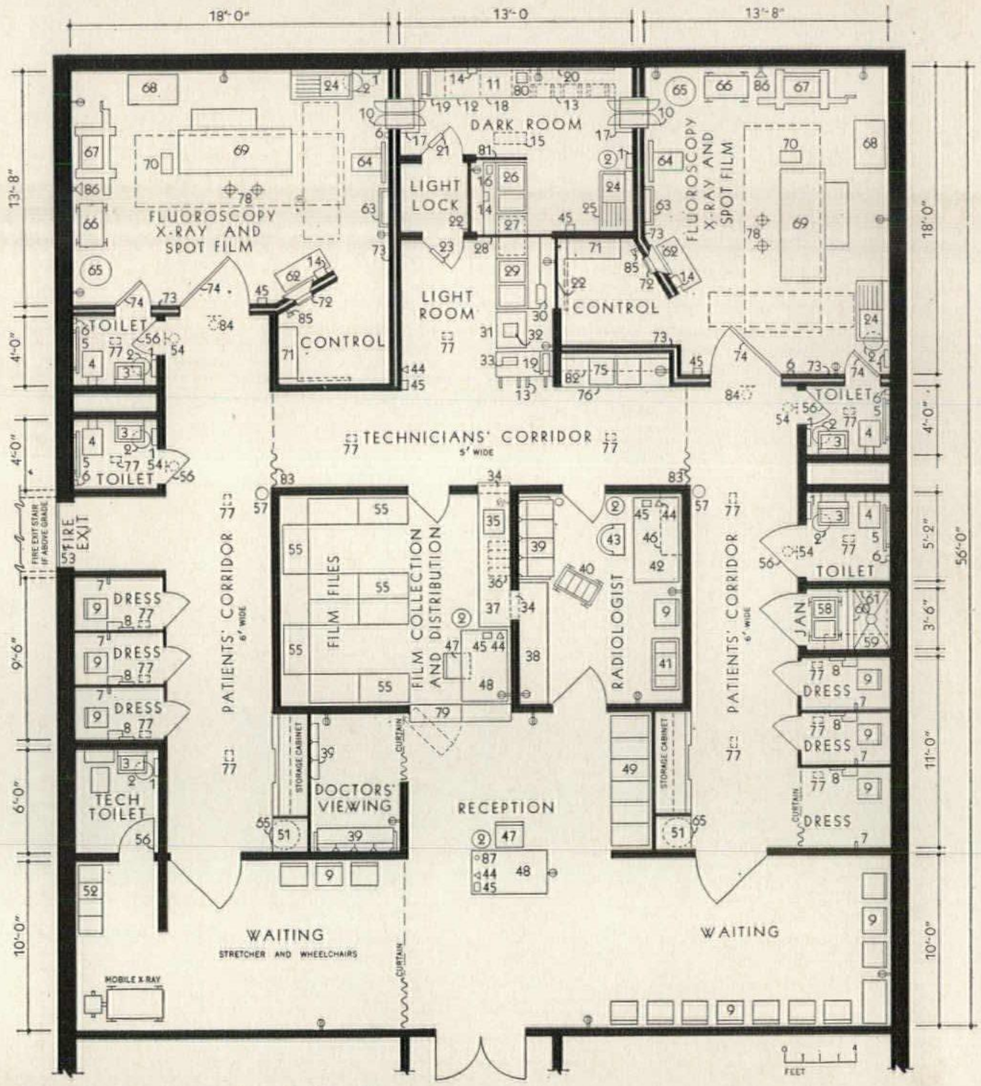
Programming for better medical and surgical care frequently depends on the availability of prompt, thorough, and skillful diagnostic services. Among the many modern diagnostic techniques, x-ray examinations contribute vitally to facilitating effective medication and treatment. A carefully planned diagnostic x-ray department assures an efficient flow of service that may be scheduled promptly and expedited with a minimum of movement and distance for the staff and the patients.

The plans for diagnostic x-ray facilities (pages 218 and 223) were designed to handle daily average workloads of about 35 and 20 patient examinations. The number of x-ray machines to be installed is based on the number of patient examinations and not solely on the number of beds in a hospital. The type of hospital, community need, proportion and extent of outpatient and inpatient examinations, the increasing number of older people in our population, and the patterns of facility usage will affect the number of patient examinations and determine the number of x-ray machines needed.

Flexibility in design is important in planning x-ray facilities, particularly in a small hospital, and it is a requisite in providing for an increase in the workload volume and for expansion of x-ray services. This can be done by adding to the staff or by installing another machine in space planned for future use. When expanding into an adjoining space, the area and shape should be adequate to permit an efficient layout.

* *The authors are all engaged in work for Public Health Service, Mr. Tay or and Mr. McMaster as architects in the Architectural and Engineering Branch, Division of Hospital and Medical Facilities, Bureau of Medical Services, Dr. Nelson as a radiologist, Division of Radiological Health, Bureau of State Services.*





Diagnostic Radiographic Suite—Plan A

LEGEND

1. Paper towel dispenser
2. Waste paper receptacle
3. Lavatory
4. Wall-hung water closet
5. Continuous grab bar
6. Emergency calling station (push button)
7. Hook strip
8. Mirror and shelf below
9. Straight chair
10. Cassette pass box
11. Film loading counter
12. Film storage bin
13. Film hanger racks under counter
14. Safelight
15. Ceiling light, white and red
16. Timer
17. Counter with storage cabinets below
18. Cassette storage bins
19. Trash deposit cabinet
20. Cassette cover retainer and wall guard
21. Door with light-proof louver in upper panel
22. Access panel
23. Door with light-proof louver in lower panel
24. Utility sink with drainboard
25. Refrigerating unit under drainboard
26. Developing tank with thermostatic mixing valve
27. Through-the-wall fixing tank
28. Light-proof panel
29. Washing tank
30. X-ray film illuminator (wet viewing)
31. Film dryer
32. Film dryer exhaust to outside
33. Film corner cutter
34. Film pass slot
35. Flush-mounted counter illuminator
36. Film sorting bins above counter
37. Film sorting counter
38. Counter with cabinets below
39. On-wall or mobile film illuminators
40. Temporary film file cart
41. Stereoscope
42. Executive type desk
43. Executive type chair
44. Telephone outlet
45. Intercommunication system outlet
46. Bookshelves, 42 in. by 14 in.
47. Typist chair
48. Typist desk
49. Filing cabinet, letter size
50. Gown storage, open shelves, storage cabinet above
51. Gown storage, open shelving with laundry hamper below
52. Technicians' lockers
53. Fire door
54. Dome light, buzzer and annunciator at receptionist's desk
55. Closed metal film files, 5 shelves high
56. Hook on toilet side of door
57. Fire extinguisher
58. Mop truck
59. Shelf
60. Curb and receptor on janitor's sink
61. Mop hanging strip
62. Storage cabinet and writing counter
63. Fluoroscopic apron and glove holder
64. Fluoroscopic chair
65. Laundry hamper
66. Clean linen cart
67. Cassette changer
68. Transformer
69. Radiographic fluoroscopic unit with spot film device
70. Foot stool
71. Control unit
72. Leaded glass view window
73. Lead lining (or other shielding material) as required
74. Lead-lined door, light proofed
75. Barium sink
76. Barium storage (below counter)
77. Red light for dark adaptation
78. Fluoroscopic ceiling light
79. Counter with gate
80. Film identifier, cabinet below
81. Anti-splash panel
82. Wall cabinet over sink
83. Curtain, floor to ceiling
84. Warning light
85. Microphone
86. Loudspeaker
87. Annunciator (for emergency calling station)

In a recent study it was found that many hospitals allotted inadequate space to the x-ray department, and expansion was often impractical. Adequate space for waiting, toilets, and dressing rooms helps insure continuous routines in handling patients. The lack of adequate space results in needless waste of effort and time in efficiently scheduling examinations. An unsatisfactory layout is a handicap to both the hospital and the radiologist since the hospital loses potential revenue, and the radiologist's time, as well as that of the staff, is needlessly wasted. This is particularly important to a small hospital which has a visiting radiologist, for it is to the advantage of the hospital and radiologist to schedule as many examinations as possible during his visit.

LOCATION

The diagnostic x-ray department should be located on the first floor, conveniently accessible both to outpatients and inpatients. It is also desirable to locate the department close to the elevators and adjoining the outpatient department and near other diagnostic and treatment facilities.

The functional requirements of the department are usually best satisfied by locating the x-ray rooms at the end of a wing. In this location, the activity within the department will not be disturbed by through traffic to other parts of the hospital, and less shielding will be required because of the exterior walls.

PLAN A

Plan A illustrates an x-ray suite that will provide an efficiently operating service for about 8400 patient examinations yearly, or an average of about 35 examinations daily. This average workload is typical in a hospital of approximately 100 beds (or somewhat more) with an outpatient x-ray service. Unforeseen scheduling problems, of course, will occasionally cause the average of 35 examinations per day to be exceeded.

The staff needed for this volume of work usually includes: 1 radiologist, 2 or 3 technicians, 1 secretary-receptionist, 1 secretary-file clerk, 1 orderly (as needed).

This plan will permit the workload to be augmented at least 50 per cent by increasing the staff, if no more than 20 per cent of the x-ray work is fluoroscopic.

Among the desirable characteristics that this plan attempts to provide for is the need for correlating the functions of the working group to obtain maximum efficiency. The arrangement of patient areas and examination rooms around the perimeter, with the administrative staff in the center, makes it possible for these units to operate more efficiently. The technicians' corridor in the rear of the department provides for easy access to the x-ray rooms, film processing rooms, and distribution areas without interference from patients' cross traffic.

ADMINISTRATION SPACES

Every radiologist has specific ideas on the most suitable ways for arranging and operating the administrative functions of the x-ray department. Some of the variables involved are assignment of personnel and functions, reception of patients, sequence of patient examinations, film distribution, and staff viewing facilities. This plan provides for flexibility of space arrangements by allowing for variation of several of the operations within the administrative unit.

Waiting room. General waiting space for about ten patients is located at the entrance to the department. From here the patient is directed to an assigned dressing room. A separate area, to the left of the entrance and in sight of the secretary-receptionist, is provided for wheelchair and stretcher patients. This section is partitioned off by a curtain which may be partially drawn to provide privacy, yet afford the necessary surveillance of unattended patients from the secretary-receptionist's desk. Additional chairs in this area can be used to accommodate the attendants of these patients or for an overflow of waiting patients when needed.

Secretary-receptionist. The administrative functions and business records of the department, scheduling of appointments, receiving of patients, typing of the necessary identification forms and requisitions for examinations, and assigning of patients to dressing rooms are handled by the secretary-receptionist. If time permits, the secretary-receptionist assists in typing the radiologist's reports. The desk is centrally located, directly in front of the entrance between the waiting room and administrative area, so that the secretary-receptionist may supervise waiting patients and have access to correspondence and report files.

Secretary-file clerk. The secretary-file clerk assembles, sorts and files all films and reports, assists the secretary-receptionist when needed, and transcribes and types the radiologist's reports. These functions are not rigidly fixed and can be interchanged, if desired. For example, a technician may be assigned to assist the file clerk with film assembling and sorting, or the file clerk may be given other functions as needed. The desk is located near a counter-partition in the film collection and distribution area. The low counter and the gate (No. 79) are designed so the entrance to the department can be observed and patients directed when required.

Doctors' viewing room. The doctors' viewing room is located near the office of the radiologist so that he may be immediately available for consultation. The room is near the film files, convenient to the secretary and file clerk, and situated so as not to intrude upon the functional flow of the work. Its location within the administrative unit provides privacy so that diagnostic comments and discussions will not be overheard by patients.

Radiologist's office. This office is conveniently situated near the x-ray rooms, the secretary-receptionist's desk and the filing distribution area, and is not too easily accessible to the public; it is also provided with a door which opens directly to the technicians' corridor. The fire exit which is located off the technicians' corridor provides a second exit from the department for the radiologist.

Film files. The film files are located in the collection and distribution area and convenient to the radiologist's office. Since it is desirable to keep active films for at least five years, approximately 125 linear feet of filing space is provided. After that time, additional storage space elsewhere will be needed for the less active files. Closed front metal x-ray files are recommended (see Fire Safety, page 224.) Teaching files may not be needed in a hospital of this size, but if desired, a section of the active files may be allotted for this use.

GENERAL FACILITIES

Dressing rooms. Three dressing rooms for each x-ray machine should be provided so that the equipment and staff can function without delay. Each dressing room should be equipped with a straight-back chair, clothes hook, mirror, and a shelf below the mirror. For the protection of patients' valuables, the doors may be equipped with locks, or centrally located lockers may be provided. Where doors are installed, they should swing outward to avoid the possibility of being blocked by a patient and should be at least 12 inches from the floor.

For the convenience of patients in wheelchairs, an outsized dressing room is provided. Instead of a door, it is equipped with a curtain so that the patient can maneuver easily.

Patients' toilet rooms. Toilets should be immediately available for patients undergoing fluoroscopy, and similar facilities should be conveniently available for waiting patients. A minimum of two toilets should be provided for each x-ray room. All toilets should be located near the x-ray rooms.

At least one toilet room should be directly accessible to each x-ray room and have an opening into the corridor. To prevent the patients from accidentally opening the door between the toilet and x-ray room, this door should be equipped with hardware which is operable only from the x-ray room. The doors of the toilet rooms which open into the patients' corridor should be equipped with bathroom locks, which are operated by knob latch bolts and dead bolts from both sides.

One of the patients' toilet rooms is designed to accommodate a patient in a wheelchair. The room is larger than the others, for easy maneuvering, and has a 3 ft door. The lavatory is set on wall brackets 6 in. out from the wall and 2 ft 10 in. from the floor.

One toilet should be provided with a bedpan flushing attachment. Water closets should be suspended from the wall to simplify cleaning. Each toilet room should be equipped with a grab bar for use by elderly or weak patients. A dome light and buzzer system with an emergency call station in each toilet room and an annunciator at the secretary-receptionist's desk is recommended.

Technicians' toilets and lockers. During busy periods it is essential that the staff be available at all times. Separate toilet and locker facilities are provided for technicians. This reduces the time technicians must be absent from the area and contributes to the efficiency of the department.

STORAGE FACILITIES

General storage. For bulk supplies, a storage cabinet equipped with sliding doors and adjustable shelves is located inside each patients' corridor near the entrance. Materials such as films, opaque solutions, developing solutions, and office supplies are stored here.

Daily linen supplies (x-ray rooms). Clean linen, requisitioned from the hospital central supply, is stored on a cart (No. 66) in each x-ray room; soiled linen is placed in a hamper (No. 65).

Gown storage. Open adjustable shelves for gown storage are placed next to each general bulk supply cabinet, just inside the corridor entrance. The shelving for clean gowns starts about 4 ft from the floor, leaving space beneath for a linen hamper (No. 65) for soiled gowns.

Janitor's closet. The janitor's closet must be readily available for emergency cleaning and it should be convenient to the x-ray rooms and toilets. The closet should contain a floor receptor with a curb or a janitor's service sink, a mop-hanging strip and a shelf, and provide space for parking the mop truck.

DIAGNOSTIC X-RAY ROOMS

X-ray equipment. Both rooms are equipped with combination x-ray and fluoroscopic machines with spot film devices. An overhead type tube support is indicated in the plan, as this facilitates x-raying a patient in bed or on a stretcher. For reasons of economy, however, it may be desirable to equip one room with a floor-ceiling track. If an overhead mounted track is used, it may be supported from the floor by columns or may be bracketed from the wall, although a ceiling suspension makes a neater installation.

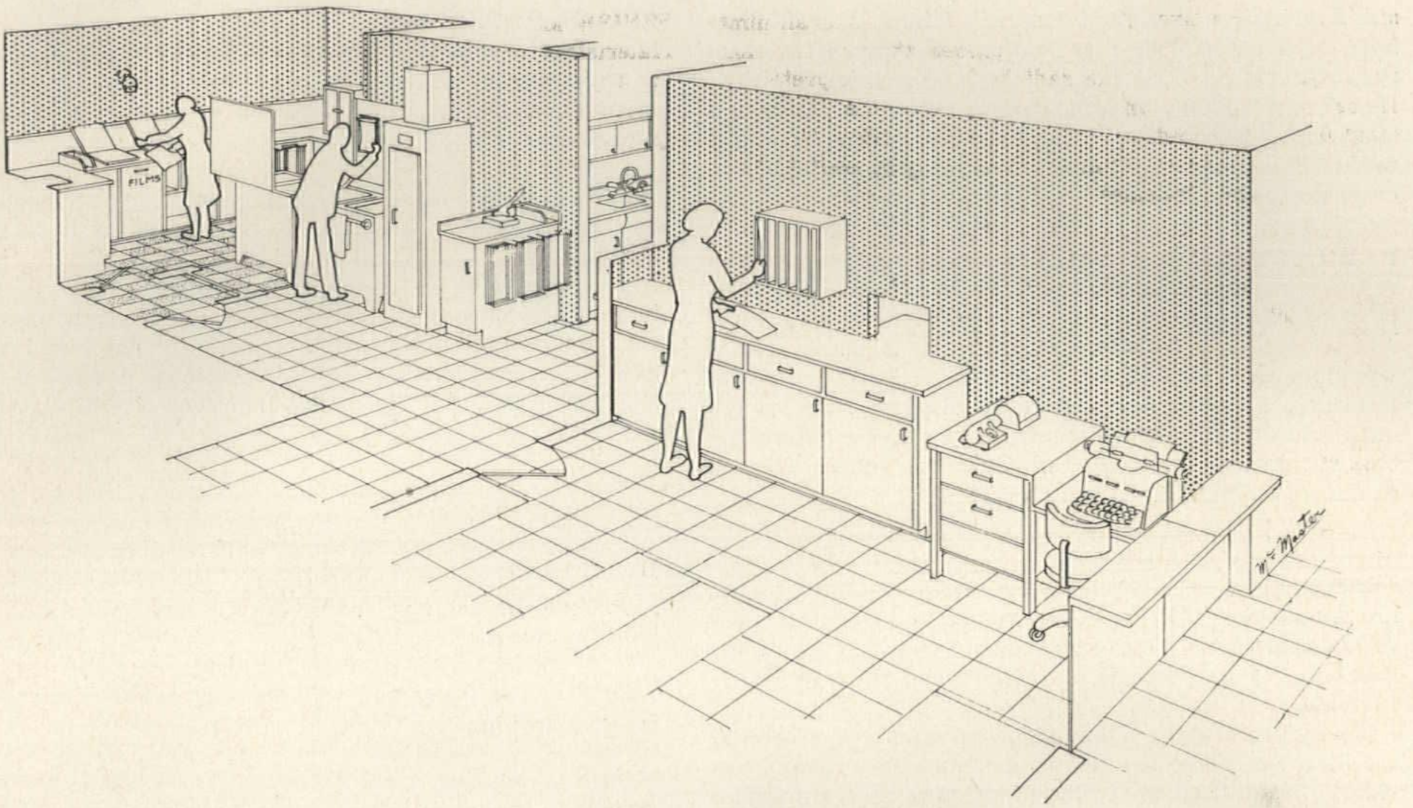
The optimum size of the x-ray room is about 14 by 18 ft. Ceiling height requirements vary for different x-ray machines, but a minimum of 9 ft 6 in. is recommended. The machine and transformer should be placed so as to allow adequate space for admittance of a bed or stretcher in the room. Mounting the transformer on the wall is recommended to save floor space. However, sufficient clearances (at least 2 ft above the transformer) for servicing the transformer should be provided.

The sink and drainboard, for handwashing and rinsing utensils and barium equipment, is equipped with a gooseneck spout. It is located near the foot of the x-ray table. The drainboard can also be used as a barium counter.

It is recommended that the control panel be wired to a signal outside each x-ray room to indicate when the machine is on, to prevent other personnel from inadvertently entering the room. A red light bulb will be satisfactory as a signal for most installations.

Control booth. It is essential that the control booth be located to the right of the machine so that the patient may be observed when the table is inclined, since machines with end-pivoted tables tilt to the right. In the plan, no door is shown on the control booth as the radiation will have scattered at least twice before it reaches the control booth area. This is in accordance with Handbook 60, as amended, issued by the National Bureau of Standards. The arrangement of the control booth to the right and the cassette changer to the extreme left, as shown in the plan, fully meets this requirement. In addition, since the beam is directed toward the outside wall, radiation exposure to other personnel is lessened, and the amount of shielding required is decreased.

If the cassette changers are placed to the right of the



View of X-ray Suite "A" Showing Darkroom, Lightroom, and Film Area

machine (on the wall opposite to that indicated on the plan), a door on the control booth or a baffle placed in the room is required to protect the technician in the booth. Furthermore, additional shielding is required to protect films and personnel in the department because the primary beam would not be directed toward the outside wall. In the present scheme, the shielding necessary in the interior walls is principally to safeguard against the scatter radiation.

Storage cabinet and writing counter. A storage cabinet (No. 62), with a safety light above, serves also as a writing counter for the radiologist and technicians. Shelves in the cabinet provide space for storage of accessory items such as sandbags, measuring devices used with x-ray machine, and disposable items needed for patients' examinations.

FILM PROCESSING AND DISTRIBUTION AREAS

Darkroom. This room is located between the two x-ray rooms to facilitate handling of films. Cassettes are loaded and unloaded on the counter (No. 11). Space is provided for loading and stacking cassettes at both ends of the counter.

A utility sink with a drainboard (No. 24), located opposite the processing tank, is provided for mixing chemical solutions and handwashing. A refrigerating unit (No. 25) for the tank is located in the space beneath the drainboard.

X-ray films are processed in an area separated from the loading counter by a partition (No. 81) at the end of the developing tank which helps to avoid accidental splashing and damage to the screens and films on the loading counter. A through-wall processing unit tank permits the radiologist or staff doctors to read the wet films in the lightroom area without interrupting darkroom procedures.

A lightlock between the darkroom and the lightroom, equipped with interlocking doors, is necessary to allow entrance into the darkroom of other personnel during film processing. Although a maze has some advantages over the lightlock, the additional space needed is not justifiable in a facility of this size. Access panels (No. 22), located in the lightlock and in the control space, are provided to simplify installation and servicing of the processing tanks.

Film processing area. To reduce unnecessary traffic, the film processing rooms are located near the collection and distribution area. This layout allows the technician to work without interruption during the processing routine. Processing of films begins at the developing tank (No. 26) in the darkroom, and continues to the final rinsing tank (No. 29) in the lightroom where the films may be wet-viewed at an illuminator, if desired, and then dried. After the films are dried, they are brought to the counter (33) in the technicians' corridor for final trimming, and passed through to the film collection and distribution area.

Collection and distribution area. Film sorting bins (No. 36) are provided above the counter in the collection and distribution area for temporary filing. After all films have been assembled, they are passed through the film pass slot (No. 34) to the radiologist for interpretation. He returns the films in a file cart or through a slot which leads into a box under the distribution counter. The films may then be temporarily filed for viewing by staff doctors or placed in the active files.

BARIUM MIXING FACILITES

A two-compartment sink (No. 75) in a counter, located in the technicians' corridor and accessible to both x-ray rooms, is provided for mixing barium. A duplex outlet for plugging in an electric mixer or a heating element is located above the counter unit. Barium supplies for daily use are stored in cabinets under the counter; the bulk supplies can be stocked in one of the general storage cabinets located in the patients' corridors.

DARK ADAPTATION

Patients must be allowed to become accustomed to the low lighting level in the x-ray rooms and the staff must retain their dark adaptation despite the opening of the doors of the fluoroscopic rooms between patients' examinations.

To facilitate dark adaptation, curtains are shown at the intersections of the technicians' and the patients' corridors. In addition to the illumination normally provided in the corridors, patients' toilet rooms, and dressing rooms, it is recommended that these areas be equipped with an independently controlled dim lighting system of red bulbs for dark adaptation.

MISCELLANEOUS SERVICES

It is assumed that the central sterile supply department of the hospital will provide all such services required by the x-ray department.

The mobile x-ray unit should be stored in the radiology department where it will be under the supervision and control of the department and available when needed.

OPTIONAL FACILITIES

Intercommunication system. Provision of a system within the department increases the efficiency of the staff and speeds up service. Outlets are shown at the desk of the secretary-receptionist, in the x-ray rooms and the darkroom, and in the technicians' corridor. It is recommended that a one-way intercommunication system, with a microphone in the control booth and a loudspeaker at the cassette changer, be installed so that the technician need not leave the control booth to give instructions to the patient at the far end of the x-ray room.

Refrigerator. Some items used in the x-ray department, such as barium suspensions for fluoroscopic examinations of the upper gastrointestinal tract, cream for a gall bladder series, and carbonated beverages for carbon dioxide distention of the stomach, require refrigeration. The space under one end of the barium counter at the sink (No. 75) in the technicians' corridor may be used for an under-counter type refrigerator.

High-speed film dryer. The plan provides sufficient space for an anhydrator, if desired, in lieu of the dryer shown (No. 31).

FINISH MATERIALS

Materials used in this department are generally similar to those usually provided in hospitals. However, special attention should be given to some of the areas in the x-ray suite.

Darkroom. The cassette loading counter surface should be of a material which is static-free; wood or linoleum is often preferred. Vinyl or vinyl-asbestos tile, 1/8 in. thick, appears to be a satisfactory material for floors in this size department. Experience indicates, however, that asphalt tile and linoleum floors do not stand up well under the effects of spilled solutions. A pattern of alternating dark and light tiles improves visibility when working under a safe light.

X-ray rooms. No special finishes are required for the x-ray rooms. Asphalt tile floors are satisfactory and a pattern of alternating dark and light tiles is also desirable here. Plaster walls and ceilings are acceptable, but acoustical tile ceilings are preferred since they aid in reducing reverberation.

Toilets. Tile floors and wainscot are highly desirable for easy cleaning.

Doctors' viewing room. Acoustical treatment is recommended to lessen the possibility of doctors' conversations being overheard by nearby waiting patients.

ELECTRICAL INSTALLATIONS

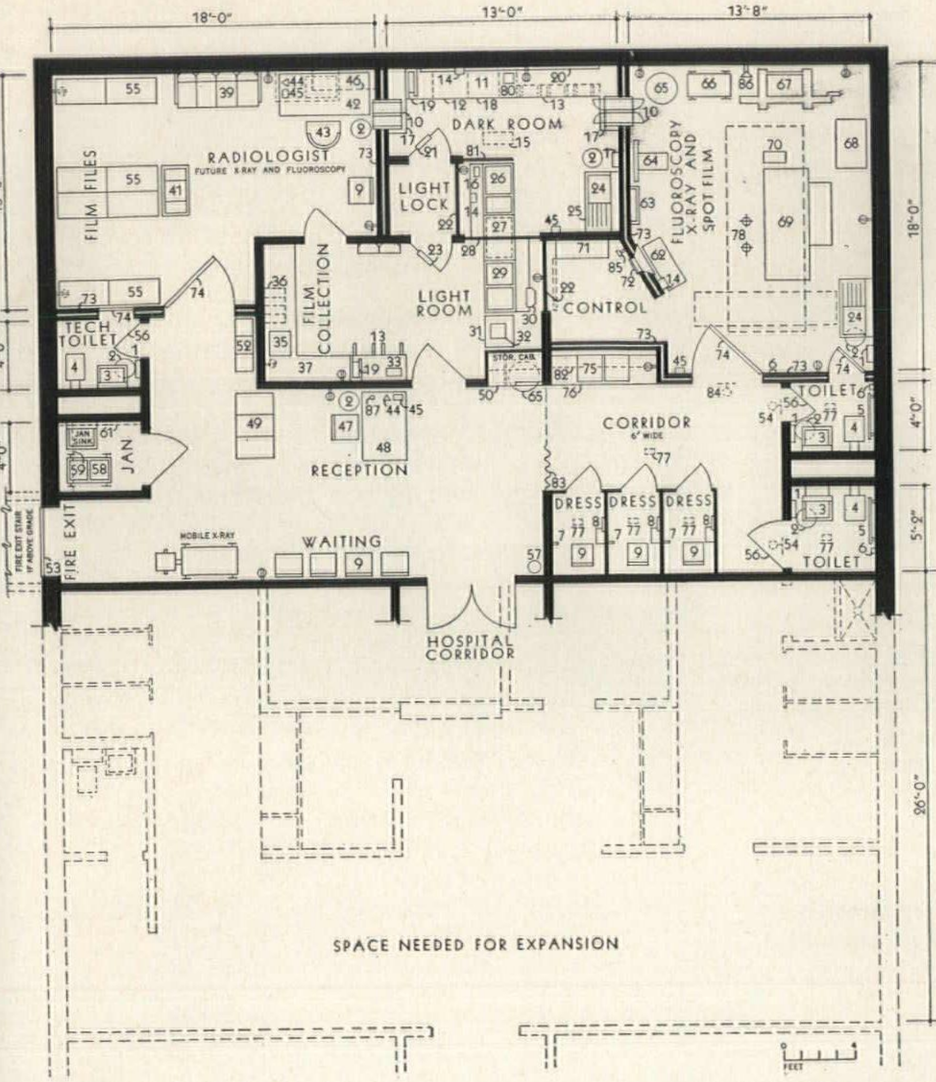
Voltage supplied to the x-ray unit should be constant so that fluoroscopic images and radiographs will be uniform. An independent feeder with sufficient capacity to prevent a voltage drop greater than 3 per cent is recommended. To minimize voltage fluctuations, a separate transformer for the x-ray feeder is required for most installations.

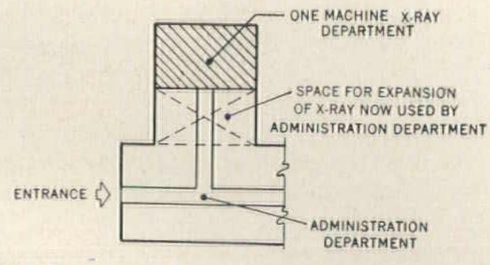
ILLUMINATION

Illumination intensities in the various areas of the suite should comply with recommendations given in the Lighting Handbook, 3rd Edition (1959), published by the Illuminating Engineering Society. Briefly, the general illumination should be not less than 10 footcandles in corridors and in rooms where reading is not required. The waiting room should have 15 footcandles, with supplemental lighting for reading. Offices and areas where clerical work is performed should have at least 50 footcandles, preferably 70 footcandles.

Indirect or cove lighting fixtures are recommended for the x-ray rooms so that patients need not be inconvenienced by glare when lying face upward during radiographic examinations.

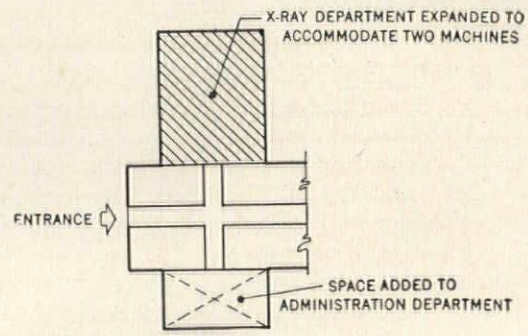
Primary barriers should be provided on all surfaces of the x-ray rooms which are exposed, or which may be exposed, to the useful beam between the x-ray tube and occupied areas. Secondary barriers should be provided on all other room surfaces where protection is needed. In determining secondary barriers, consideration should be given to direct or leakage radiation which passes through the tube housing, and also to the secondary or scattered radiation emitted from objects being irradiated by either the useful beam, leakage radiation, or other scattered radiation.





X-RAY DEPARTMENT BEFORE EXPANSION

Fig. 1



X-RAY DEPARTMENT AFTER EXPANSION

Fig. 2

Diagnostic Radiographic Suite—Plan B

PLAN B—DESIGN FOR EXPANSION

This one-machine department, designed to handle a daily average of about 20 patient examinations, could satisfactorily serve a hospital of 50 to 100 beds, depending upon the extent of outpatient services provided. As in Plan A, its volume of examinations can be increased, depending on the staffing pattern and other factors, discussed previously.

The staff usually required for this workload includes: 1 part-time radiologist, 1 technician, 1 secretary-receptionist-technician, 1 orderly (as needed).

This plan will result in a functional unit. It has another important advantage in that it may be expanded to include all the features of Plan A. Such expansion is usually indicated when the hospital is served by a full-time radiologist, when the average daily load approaches 30 examinations per day, and when the proportion of time-consuming examinations becomes high.

Expansion problems frequently occur in a hospital of 100 beds or less, where there is only one x-ray machine and a part-time radiologist. As the volume of work increases, the radiologist spends more time at the hospital, and a second machine is installed. Unfortunately, in most of these cases, the lack of planning for a future expansion program and expansion area results in an inefficient layout. This limits the usefulness of the equipment and the efficiency of the staff. Examples of such limitations are: poor location of the darkroom in relation to the new x-ray room, inadequate size of the darkroom, insufficient number of toilet facilities and dressing rooms, lack of office and waiting areas, and limited film filing space.

Remodeling an x-ray department is more expensive than remodeling other areas of a hospital because of the shielding, wiring, and plumbing. Expansion of the x-ray department should be incorporated in the original plan. Roughing in the plumbing and building in the shielding and electrical conduits in the expansion space will result in future savings and an efficient x-ray suite.

Minimum alterations to Plan B necessary to duplicate the facilities of Plan A would be the remodeling of the film collection area to accommodate a new control booth, the elimination of the partition between the lightroom and reception space, the elimination of the dressing rooms and the partition behind them.

Until the need for remodeling becomes apparent, part of the administration offices of the hospital may temporarily be situated in the expansion space. When enlarging the x-ray department, other space may then be added to the administration department. The dotted lines on Plan B and Figures 1 and 2 illustrate how this expansion may be designed.

AIR CONDITIONING

Air conditioning with positive ventilation and a well-defined pattern of air movement within the department is necessary to provide an acceptable environment. In order to prevent the spread of odors from the radiographic and fluoroscopic rooms, darkroom, toilets, and janitor's closets, the ventilation system should be designed so that a negative air pressure relative to the adjoining corridors will be maintained in these rooms. This can be done by exhausting more air from these rooms than is supplied to them, and by reversing this procedure in the corridors. Doors to the toilets and the janitor's closet should be undercut or louvered so that air from the corridors may flow into these areas and be exhausted without recirculation.

Because of the odor problem, the air from the fluoroscopic and x-ray rooms should not be recirculated during the time these rooms are in use, unless adequate odor removal equipment is incorporated in the ventilation system. For economical operation, where odor control equipment is not used, the exhaust system should be provided with motor-operated dampers, switched from within the room, which will direct the air to the outdoors when the rooms are being used, or recirculate the air during idle periods.

As the darkroom will be used for longer periods than the x-ray rooms, an independent system to exhaust the air to the outdoors should be provided. The exhaust from the darkroom should be controlled from a switch in the room and the system should be dampered to regulate the amount of air handled. The exhaust from the film dryer in the lightroom should be connected into the darkroom exhaust system.

The following conditions are recommended for the comfort of patients and personnel:

Administration and waiting areas. A temperature of 72 deg F with a relative humidity of 50 per cent and a ventilation rate of 1-1½ air changes per hour.

Patients' and technicians' corridors. A temperature of 75 deg F to 80 deg F with relative humidity of 50 per cent and a ventilation rate of 2 air changes per hour.

Fluoroscopic and x-ray rooms. A temperature of 75 deg F to 80 deg F with relative humidity of 50 per cent and a ventilation rate of 6 air changes per hour.

Darkroom. A temperature of 72 deg F with relative humidity of 50 per cent and a ventilation rate of 10 air changes per hour.

FIRE SAFETY

To provide an adequate measure of fire safety for the patients and the staff in this department, consideration must be given to factors of design and construction relating to fire prevention and fire protection. The basic structure should be built with fire resistive materials and incombustible finishes and provided with approved equipment.

Closed metal files are recommended for storage of x-ray films. If open shelves are used instead, an automatic sprinkler system should be installed over this storage area to neutralize the hazard of the large volume of combustible materials which would be exposed to possible fire.

Fire extinguishers (carbon dioxide type preferred) should be provided, as located on the plans, to assist in controlling fire.

In accordance with good fire safety practice, two means of egress are provided in the plan: one at the entrance to the department and an emergency exit located off the patient's corridor (door No. 53). The emergency fire exit should lead directly to the ground level outside the building, through an appropriate exit stairway.

Checklist for Good Diagnostic X-ray Facilities:

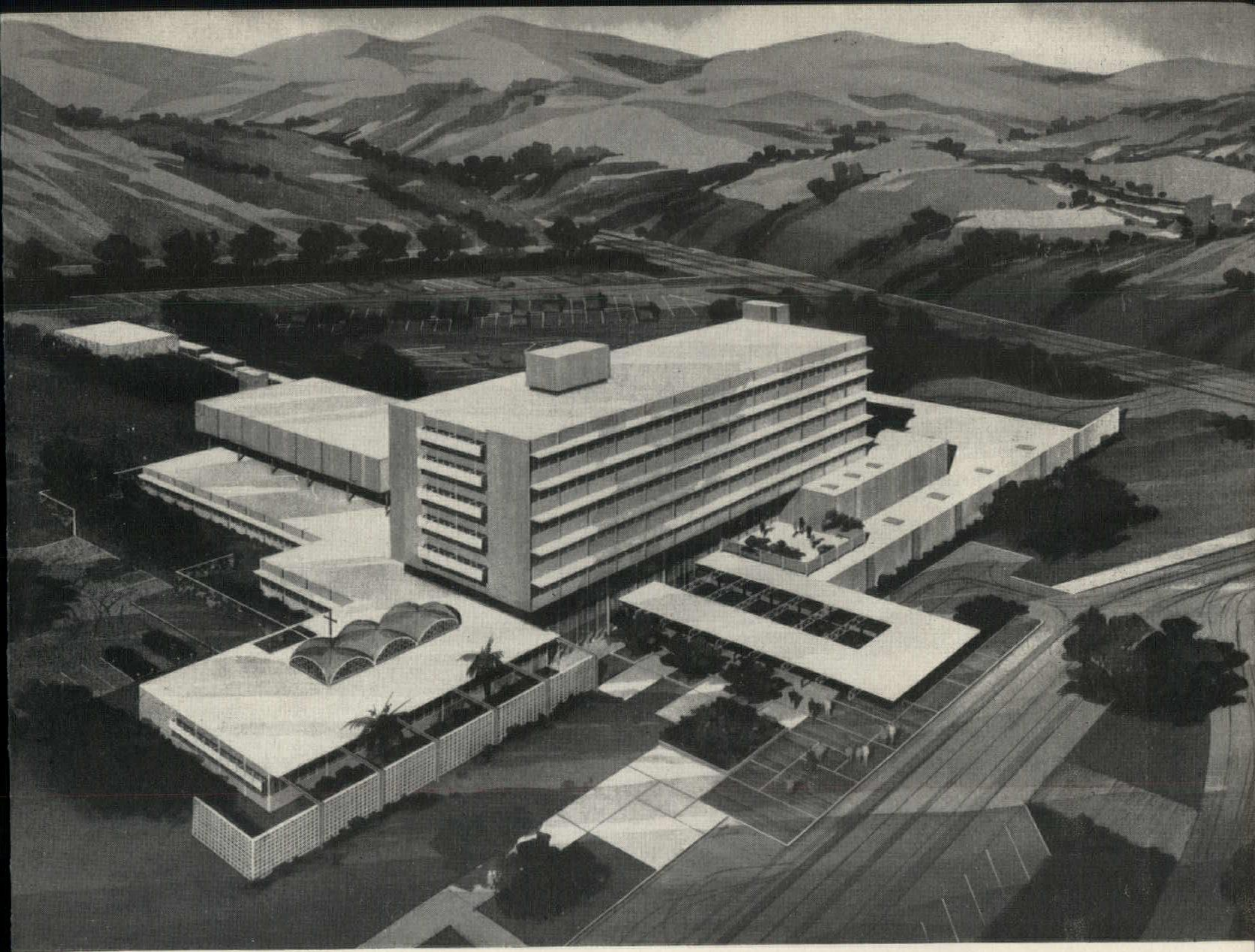
1. Adequate space, efficiently arranged
2. Toilet-dressing rooms adequate and properly related to other areas
3. Adequate waiting space for patients
4. Functional darkroom layout of adequate size
5. Ample space for film storage, office, and reading of x-ray film
6. Efficient, functional ventilating system
7. Air conditioning for increased efficiency

ACKNOWLEDGMENTS

"These plans are the product of extensive studies by the staff of the Division of Hospital and Medical Facilities in co-operation with the Division of Radiological Health, Public Service, and hospital architects, radiologists, administrators, engineers, and manufacturers throughout the country. Without their generous assistance, the work would not have been possible."

Jack C. Haldeman, Chief, Division of Hospital and Medical Facilities, Public Health Service

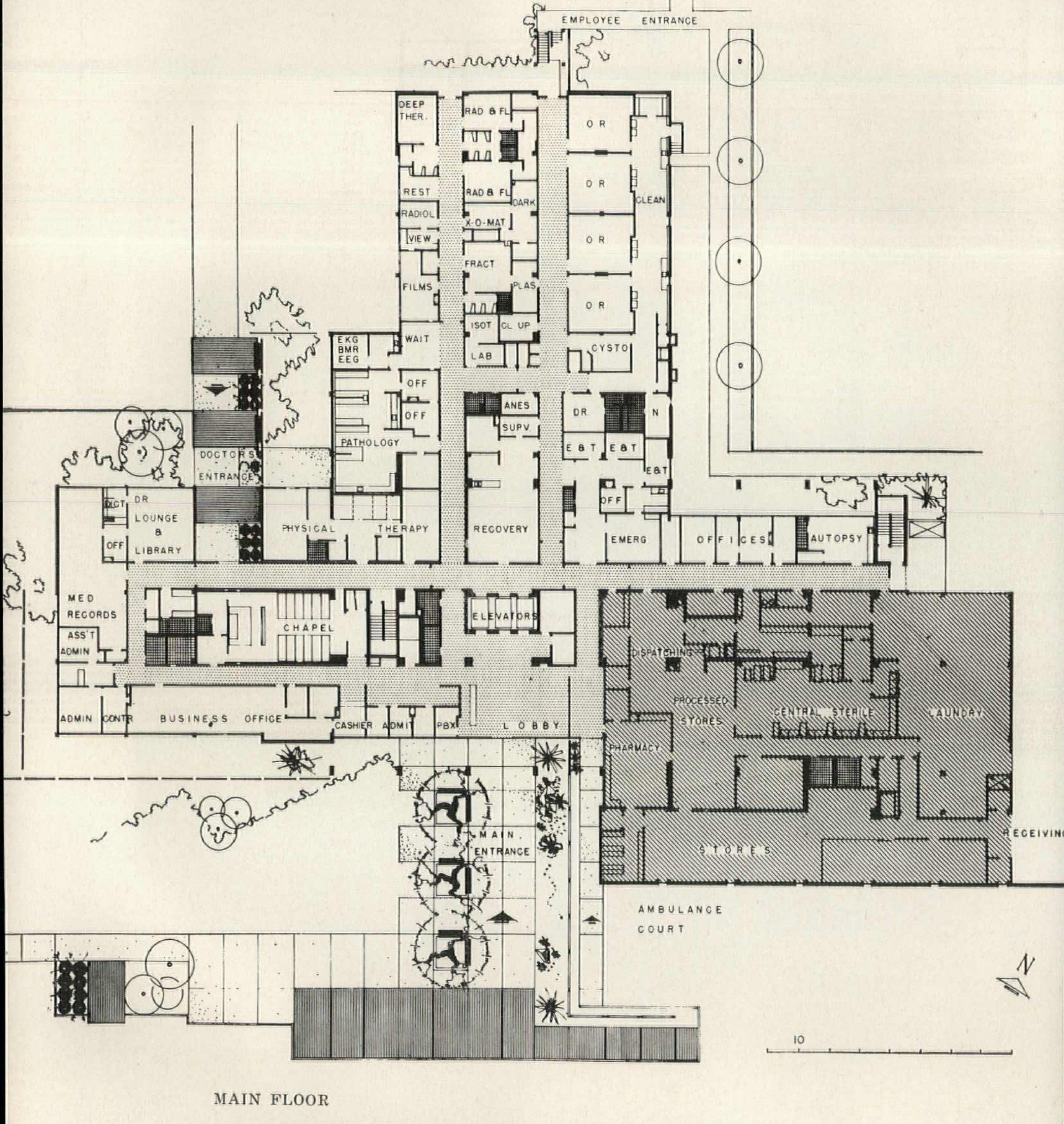
"The authors gratefully acknowledge the valuable assistance received from the following: J. Robert Andrews, M. D., Chief, Radiation Branch, National Cancer Institute, Bethesda, Md.; Joe Lee Frank, Jr., M. D., Director, Department of Radiology, Roanoke-Chowan Hospital, Ahoskie, N. C.; Philip J. Hodes, M. D., Professor and Head, Department of Radiology, Jefferson Medical College, Philadelphia, Pa.; Ira Lewis, M. D., Chief, Radiology Service, U. S. Public Health Service Hospital, San Francisco, Calif.; Russell H. Morgan, M. D., Radiologist-in-Chief, The Johns Hopkins Hospital, Baltimore, Md.; Jacque B. Norman, Hospital Consultant, Greenville, S. C.; Wendell G. Scott, M. D. Associate Professor of Clinical Radiology, Washington University School of Medicine, St. Louis, Mo.; W. M. Sennott, M. D., Chief of Radiology Service, U. S. Public Health Service Hospital, Baltimore, Md.; George Shipman, M. D., Chief of Radiology, U. S. Public Health Service Hospital, Staten Island, N. Y.; Richard E. Zellmer, M. D., Chief, Radiology Department, U. S. Public Health Service Hospital, Chicago, Ill.; Picker X-ray Corporation, Washington, D. C., and White Plains, N. Y.; Westinghouse Electric Corp., X-ray Division, Washington, D. C.



Improved Supply System For Better Patient Care

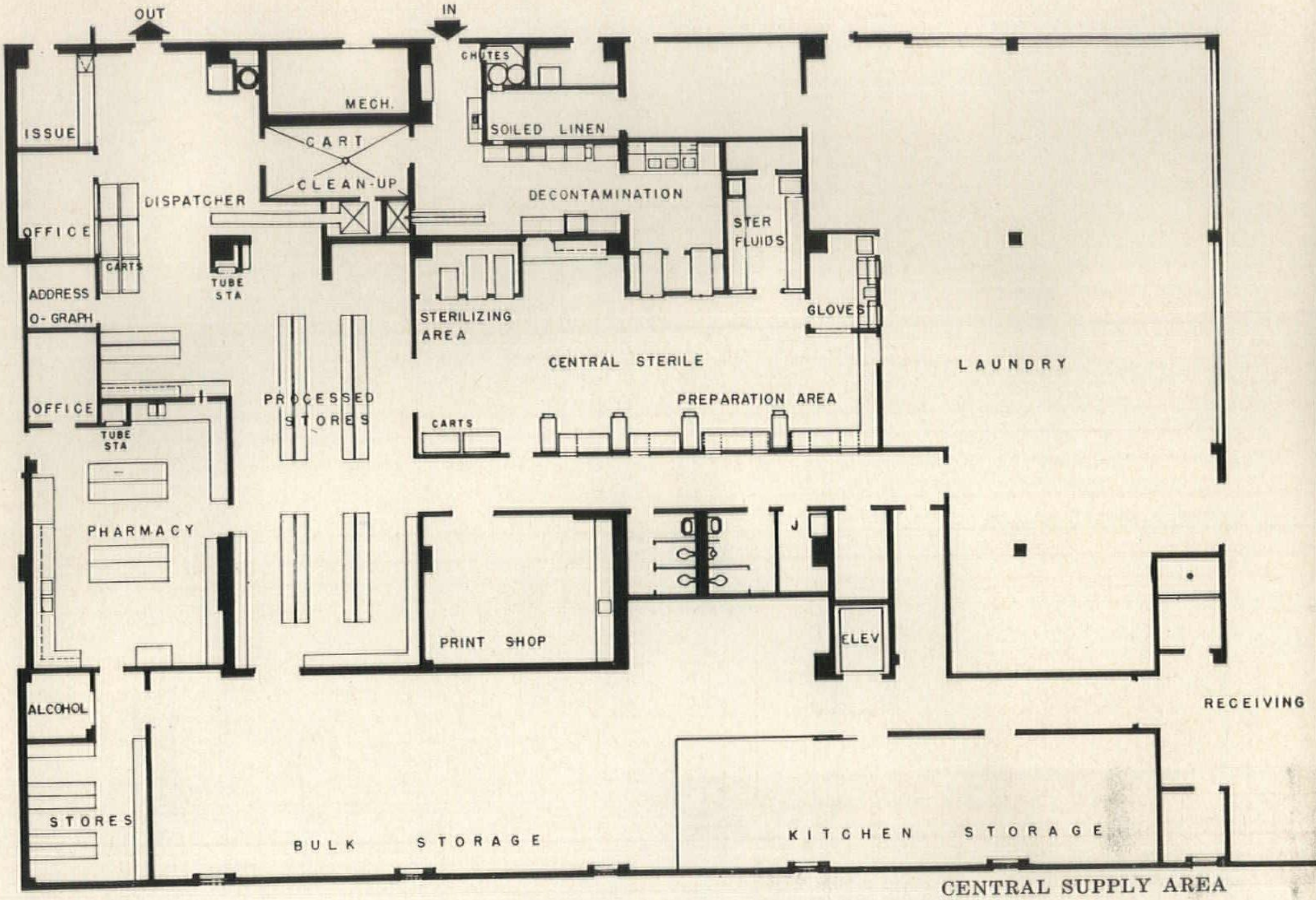
Holy Cross Hospital (Sisters of the Holy Cross), San Fernando, Calif.; Gene Verge and R. N. Clatworthy, Architects; Gordon Friesen and Associates, Consultants; Steed Brothers Construction Co., Contractors

The central guiding principle for the design of this hospital was the provision of intensive personal nursing care for each patient when and if he needs it. This sounds easy, but as every hospital architect knows, it isn't. The costs of good nursing care together with the extreme shortage of trained personnel combine to prevent—usually—a workable solution to this problem. In addition, the high costs of construction today often prevent some of the best planning principles from being applied. In this hospital, the architects, the consultant, and the Sisters of the Holy Cross have given their best efforts to the provision of topflight nursing care, at minimum cost in nursing time (and therefore, money). In order to accomplish these objectives, the plan utilizes an extension of the automated supply systems employed in the United Mine Workers hospitals and a few other institutions. In the main, the systems involve the prepackaging of sterile supplies, and their distribution through a flow system similar in many respects to those in industry. Through the use of this system and careful planning, it is expected that the patients of this hospital can be cared for in private rooms, at reasonable costs, and, in addition, that construction costs can be held down.



MAIN FLOOR

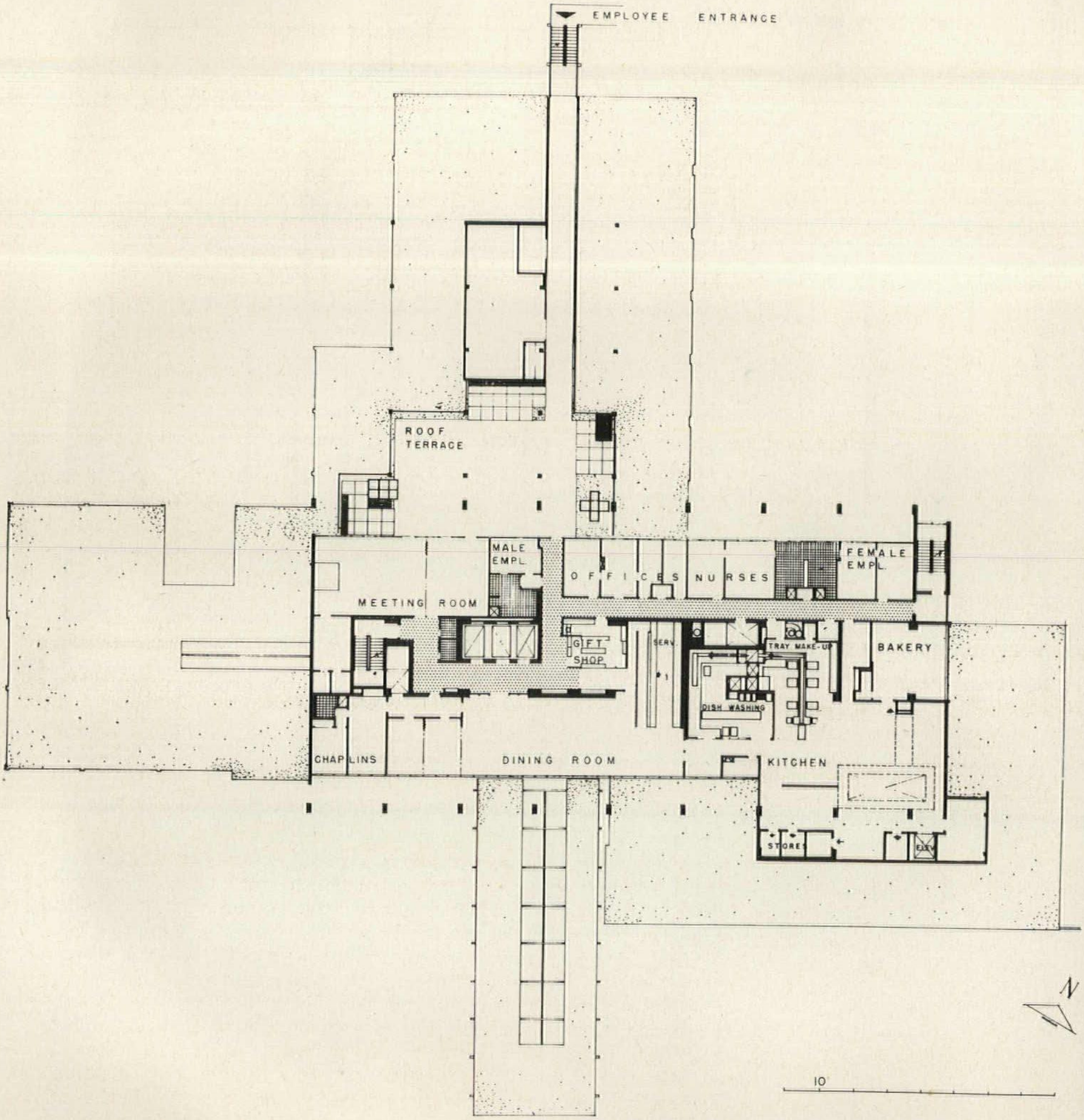
The hub of the supply system is the central area shown above and right. Incoming supplies are received and transferred to their respective storage areas; from here, the supplies are sent to the preparation area, and sterilized or otherwise processed, and then sent to the dispatcher. Soiled supplies arrive in their receiving area via chutes or conveyors. Waste and refuse go to the incinerator; linen and dry goods go to the laundry. Utensils and similar items are cleaned and sterilized. All clean supplies pass through the preparation area, and if not sterilized previously, pass on to the sterilizing area. From here, they go to processed stores, where the dispatcher sends them to their destinations via mechanized tray conveyors with ejector systems for automatic unloading



CENTRAL SUPPLY AREA

Holy Cross Hospital

Of utmost importance in reducing bacterial count and reducing the spread of infection are the techniques and equipment to be used in this hospital for processing soiled supplies and other items. Cleaning equipment to be provided in the soiled supply area of central supply will include a clinical hopper sink, a pair of manual washing sinks, an automatic mechanical utensil washer, an automatic mechanical laboratory glass washer, a needle cleaner, a large combination action ultrasonic cleaner and two large double door sterilizers. Items such as bedpans will be cleaned with brushes and germicide in the clinical hopper sink. Items that require more precise cleaning will be thoroughly processed in the ultrasonic cleaner. In this machine, sound waves of a proper type will be introduced into a germicidal detergent solution, causing great pressure differentials to build up (the process is called cavitation). The energy released as these pressures move toward equilibrium tears the soil from the items being cleaned, and breaks up bacterial clumps. In this way, the germicide can more effectively attack the bacteria, resulting in more efficient than usual germicidal action. The bacterial count is appreciably reduced. The mechanical washers are operated in the usual manner. The two large sterilizers (autoclaves) are both of the high-speed type, and are equipped with high pressure steam. In addition, one is provided with equipment for ethylene oxide gas sterilization. After all of the cleaning and sterilization processes have been completed, each item will be enclosed in a sterile plastic bag to insure that it is not contaminated with bacteria enroute to the place where it will be used. Handling of supplies after sterilization will be kept to a minimum, for the same reasons and for efficiency. After final cleaning, sterilization, and packaging, they will be checked and dispatched to patient floors on the tray conveyors.

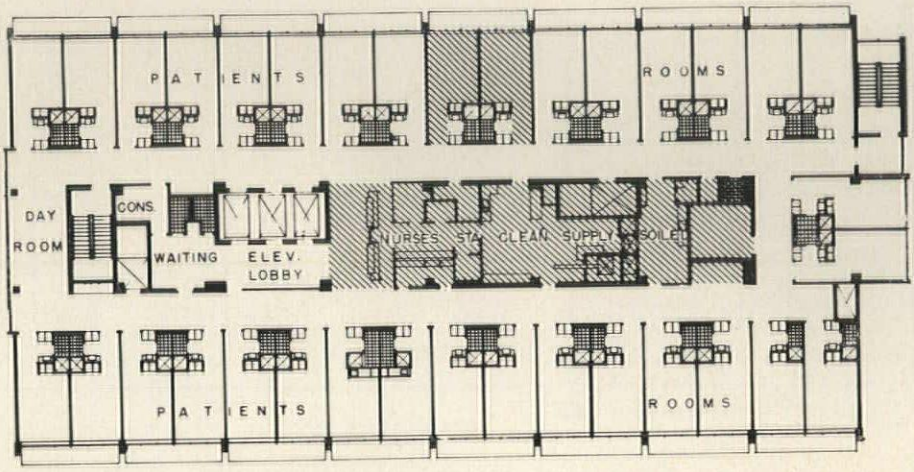


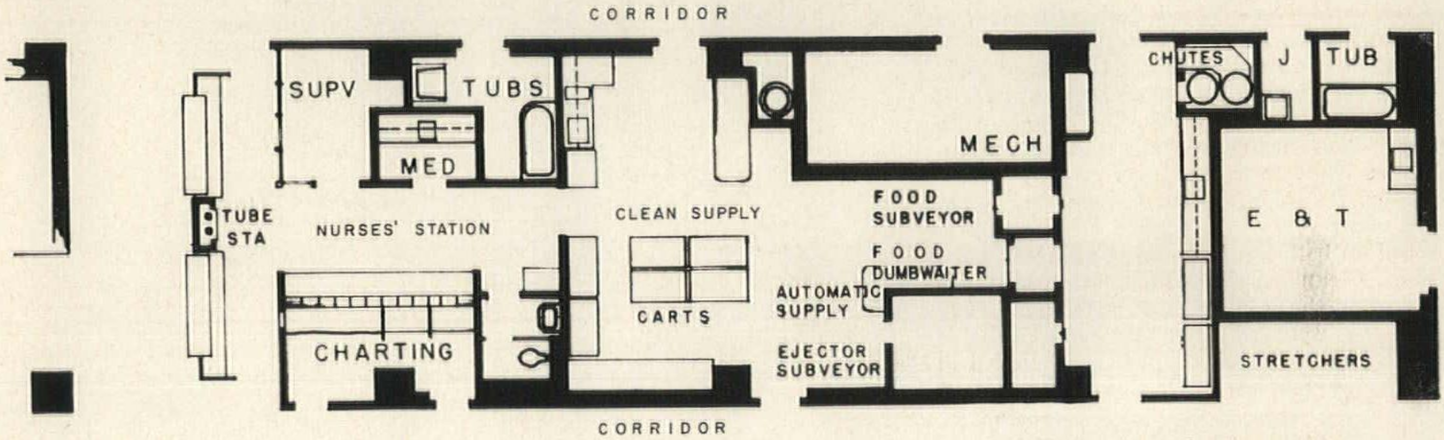
SECOND FLOOR

Shown in the plan is the second floor, which acts as a buffer between the main hospital floor below and the nursing floors above. Only non-medical facilities are located on this floor. These include offices for nurses and administration, the chaplains' offices, a large meeting room with adjacent roof terrace, a gift shop, and the dining-kitchen facilities. By concentrating these non-medical functions on one floor of the building, it has been possible to physically remove them from any direct interference with the major work of the hospital. The kitchen, in addition to servicing the dining area on this floor, prepares the food for patients in the rooms above. Prepared food is dispatched from the kitchen to nursing floors via automatic tray conveyors and several dumbwaiters

TYPICAL NURSING FLOOR

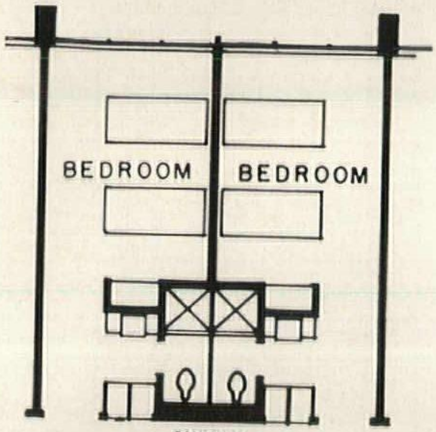
Clean supplies from the central supply area below arrive in the core areas on the patient floors via automatic subveyors. Included in the system are facilities for handling food as well as other supplies. From this area, items are sent directly to patient rooms or other places where they are needed. Soiled supplies collected will be brought to the soiled receiving area on the patient floors and dispatched via the chutes or conveyor to the main soiled supply area directly below.



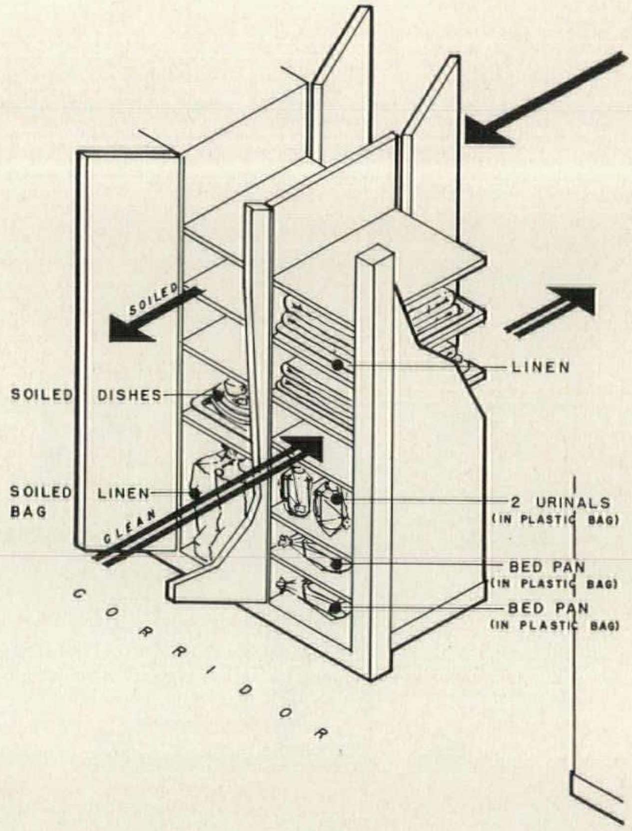


Holy Cross Hospital

The installation of the very advanced supply system in this hospital is expected to bring about many other benefits in addition to increased efficiency, and its corollary, better nursing care for the patients. Obviously, an important advance has been made if it is possible, as projected here, to give each patient a private room and complete bath, without increasing the budget to astronomical proportions. The amenities in this are most apparent. Additionally, patients are expected to benefit from a sharp decrease in cross-infection. This will be partially due to their isolation from each other brought about by the private rooms. Of equal importance in the reduction of infection will be the extremely good control of sterilization and handling of supplies throughout the entire system. The installation of the individual supply cabinets to be used in each patient room represents a long-cherished dream of the consultant, Mr. Friesen, who has felt that the supplies must be put where the nurses are. It is his conviction that the place of the nurse is at the bedside of the patient. The best way to keep her there is to give her what she needs, where and when she needs it. In this way, the nurses may spend their time profitably looking after the patients, rather than looking for supplies. Nurses may go from one patient to the next, giving care without ever doubling back to the supply area. If some item is missing, the nurse may have it dispatched immediately from the central supply area, by simply calling the floor dispatching center to deliver it. All of this, of course, adds up to increased performance in meaningful activities for the nurses, leading to increased benefits for the patients and, undoubtedly, speeded up healing processes.

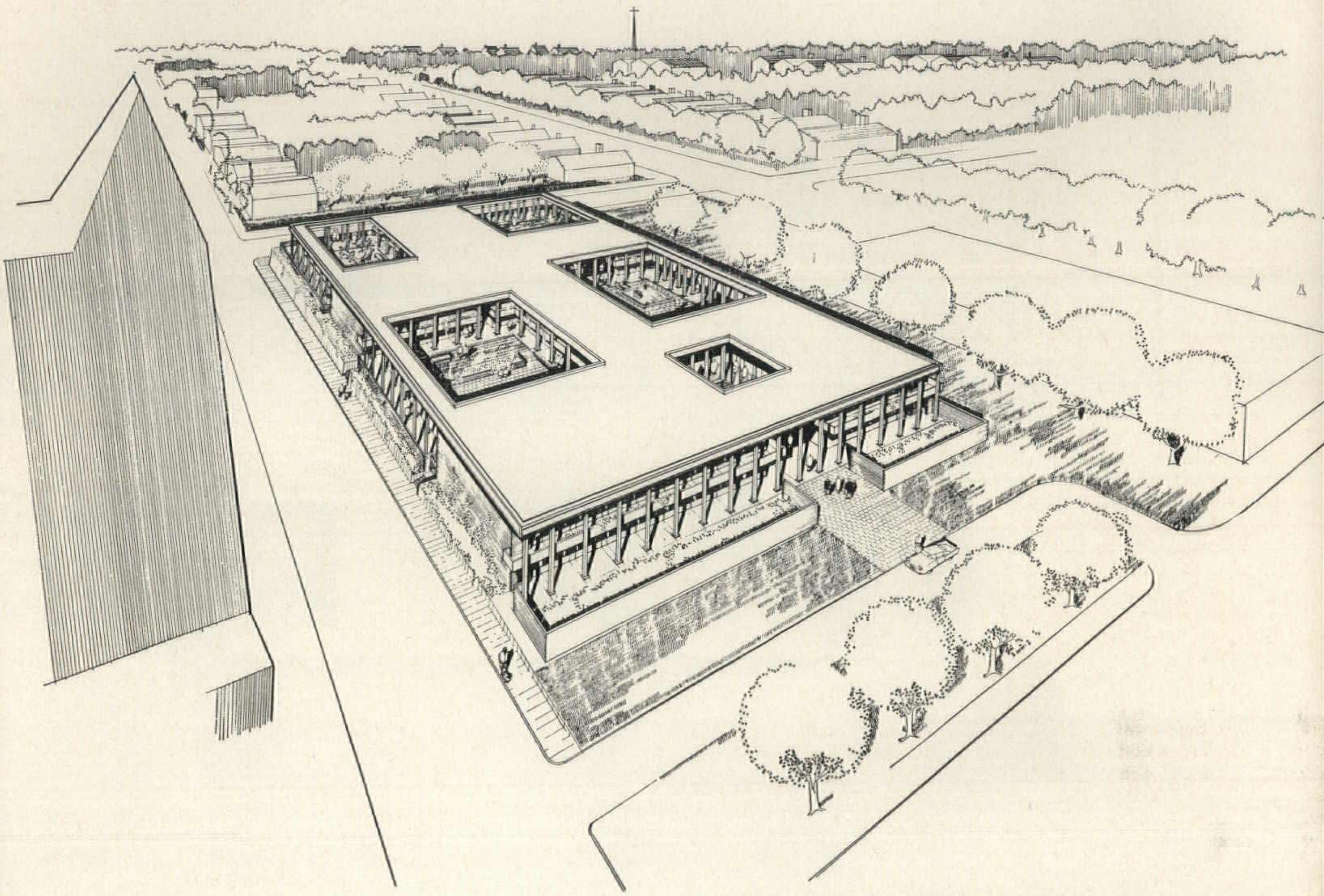


Each patient room is provided with a utility section which contains a complete bathroom with shower stall and a supply cabinet especially designed to become an integral part of the overall supply system. The supply cabinet is built into the wall, next to the entrance door. It is divided vertically in the center. One side is used for clean supplies, the other for soiled. Double doors are provided on both the hall and the patient room sides. Clean supplies (in plastic bags) are placed in the cabinet by an attendant. They may be removed from the opposite side when needed. Soiled supplies are handled in a similar manner with the flow reversed



The general treasurer of the Sisters of the Holy Cross, Sister Mary Gerald, says of the hospital, "the sisters of the Holy Cross are dedicated to caring for the physical, mental, social, spiritual, and financial needs of their patients. Their dedication recognizes the moral obligation to discharge with economy and efficiency the responsibility of spending the millions entrusted to them for the care of the sick to whom they are privileged to minister. Countless hours of valuable time are lost in hospitals because nurses, aides, and orderlies must obtain essential supplies from dozens of sources, generally remote from the surgery, delivery, or patients' rooms. Transporting supplies through busy corridors and elevators by day results in confusion and waste of time. Holy Cross Hospital will have a revolutionary system of supply that will save, it is estimated, about 30 per cent of the nurses' time. The basic principle for the system is the placement of all supplies on a production line. Much of the supply handling will be done at night. Early ambulation has decreased the need for bed baths. Therefore, each patient room is equipped with a shower. The private shower room enables the nurse to make the bed while the patient bathes, and makes unnecessary the need to walk with the patient to and from a general shower room. Since nursing service is the largest item of expense in any hospital's budget, the cost of individual showers will be amortized within a short time through the saving of nursing time. The entrance to the emergency department will be adjacent to the main entrance, enabling the night attendant to see that emergency cases receive immediate attention. The chapel, located off the lobby, will be convenient for patients, personnel, and visitors. All patients' rooms will provide excellent views of the towering mountains of the San Fernando Valley."

Holy Cross Hospital

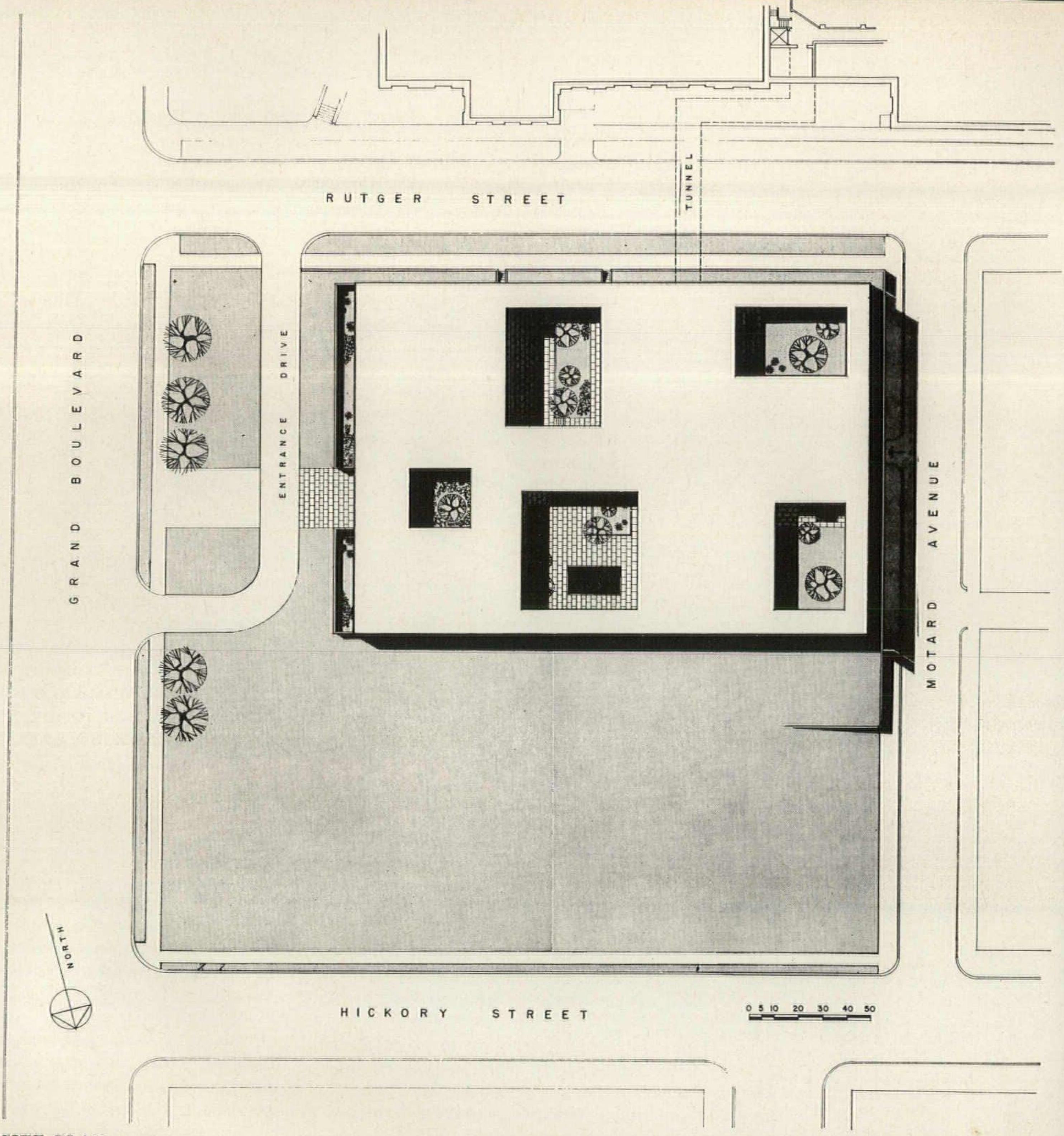


Pleasant And Open Plan for Psychiatric Patients

David Wohl Health Institute of St. Louis University, St. Louis, Mo.; Hellmuth, Obata, and Kassabaum, Inc., Architects & Engineers; Eason, Thompson and Associates, Structural Engineers

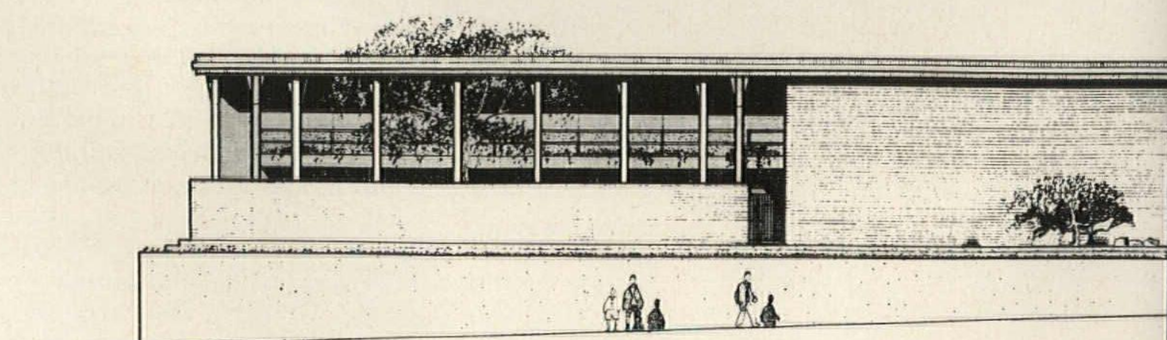
This psychiatric hospital has almost nothing in common with most other institutions of its type, except the specific illnesses of the patients to be cared for. Most psychiatric hospitals of the past have more closely resembled the maximum security prisons of the past. In them, patients were locked away from society and often from each other. Rooms were bare and, to say the least, uninviting. It was often said that these precautions were required in order to protect the patients.

The St. Louis University Medical School staff, which will operate this hospital, wanted an entirely different type of plant, one based on the most valid new principles of treatment now generally accepted. In place of a closed type of hospital, they desired one which would express openness to the utmost degree possible. This type of hospital, they felt, would be most conducive to patient recovery. In it, the patient would not be locked up, constantly watched, and barred from walking through the building. Instead, he would be provided with an atmosphere of freedom, within desirable limits. He would be placed in a pleasant environment, close to the ground, with many everchanging views of gardens, water, and trees. He would have access to varied social and recreational facilities. These things would help in the fight for early recovery, and these are the things the architects have provided in this building.



RUTGER STREET
TUNNEL
GRAND BOULEVARD
ENTRANCE DRIVE
MOTARD AVENUE
NORTH
HICKORY STREET
0 5 10 20 30 40 50

SITE PLAN

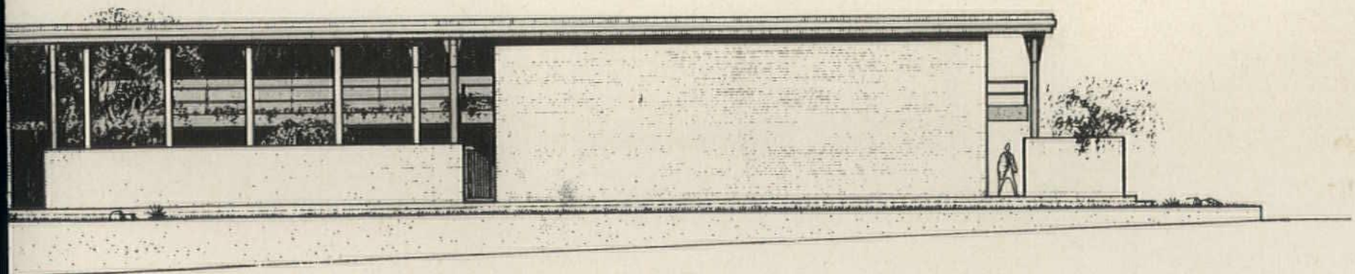


David Wohl Health Institute

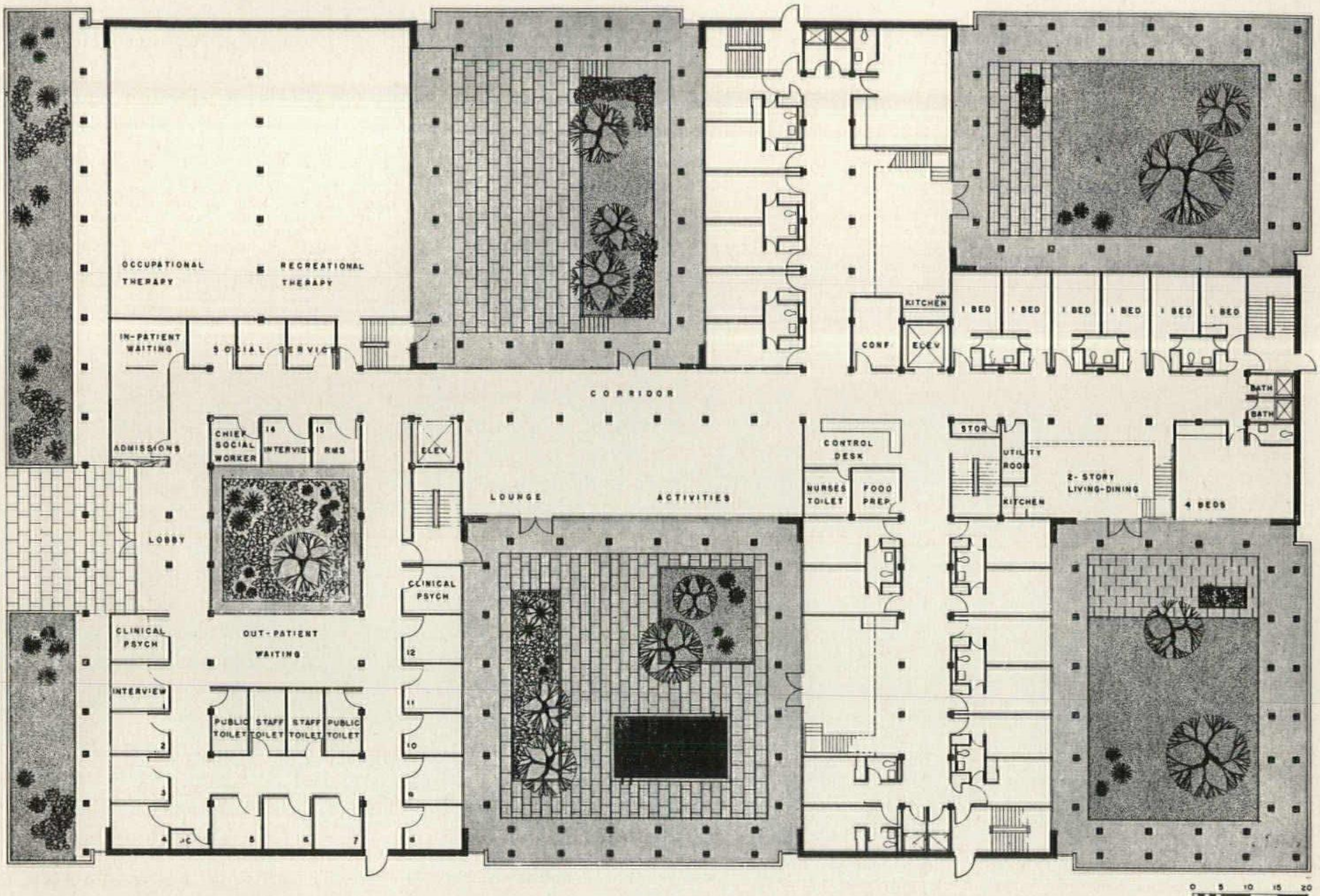
Of his intentions in the planning of this building, the designer, Gyo Obata, says, "Since the building is in an urban area, without pleasant views to the outside, we attempted to create our own views by using garden courts. Because of the size limitations of the site, we had to go to a two-level scheme. However, to bring the patients as close as possible to the ground, the two-story living-dining room was devised. This room makes access to the ground from the second level seem easy. The inpatient rooms are conceived of as dormitories rather than as hospital rooms, since the patients to be housed here will usually be ambulatory. The 60 patients will be divided into three equal groups. Each group will occupy a two-story wing composed of 20 private bedrooms (or 12 bedrooms and two 4-bed wards), and a centrally located living-dining area. Each of the living rooms will overlook a landscaped court. The nurses' control station is located at the junction of the three wings. This makes easy supervision of the wings possible, yet not too annoying or obvious to the patients. Each room will be furnished with a sofa-bed, desk, chairs, and wardrobe. Each will have a semi-private toilet. Baths and showers will be located within comfortable walking distance, at the ends of the wings.

"Adjoining the corridor connecting the inpatient wings with the other facilities are located areas for patient games, hobbies, and other pursuits. The lounge on the lower level may be furnished as a sidewalk café, where the patients may sit and talk, or simply look out into the garden. An attempt was made to design the lobby to be as attractive as possible. This was considered highly important since many patients are reluctant to enter a psychiatric hospital. It was felt that if we could avoid a "social outcast aspect" at the entrance to the building, and instead make it inviting and warm, much of the patients' natural initial reaction against the institution could be avoided and they could begin their treatment under better circumstances."

In order to achieve an open plan on the small urban site (only half of the lot shown was available for this building), the architects decided on a scheme which resembles a number of small buildings, closely related to each other, but separated by courtyards, under a common roof. In this way, the desired openness was achieved, yet the entire design has been controlled and unified. One of the important program requirements, that of placing the patient facilities as close as possible to the ground, was made quite difficult by the small site, which necessitated a two-story scheme. By the use of enclosed courtyards and a two-story living-dining area in the inpatient areas, many of the desirable features which would have been possible in a single story plan have been retained. The resulting building is in harmony with the surrounding residential area and the St. Louis Hospital buildings. As shown in the site plan, the building will receive its supplies, food, steam, and laboratory work from the nearby Desloge Hospital

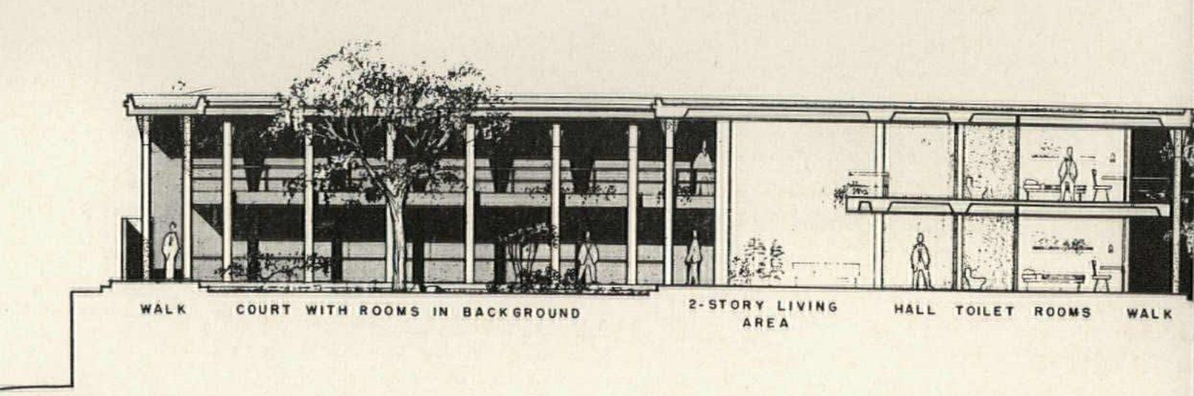


SOUTH ELEVATION



FIRST FLOOR PLAN

The first floor of the hospital is divided into two major areas, the inpatient portion (consisting of three almost identical wings with similar facilities on the second floor) and the outpatient area. Connecting the two is a corridor containing spaces for activities, lounge, and related functions. All of these areas open onto landscaped courtyards, enclosed by moderately high walls. Each of the inpatient wings together with its upper story functions as a self-sufficient unit. Each contains a two-story living and dining area with a kitchen. These are shared with the patients on the second floor. Thus, each of these units becomes much like a residential dormitory, complete with private areas and communal facilities. By the provision of spaces of this sort, it is felt that the patients can have experiences similar to those they might have in a non-institutional setting or at home, and that these experiences will be conducive to early recovery. The wing across the front of the building is divided into an outpatient department with consultation rooms and a complete occupational and recreational therapy department

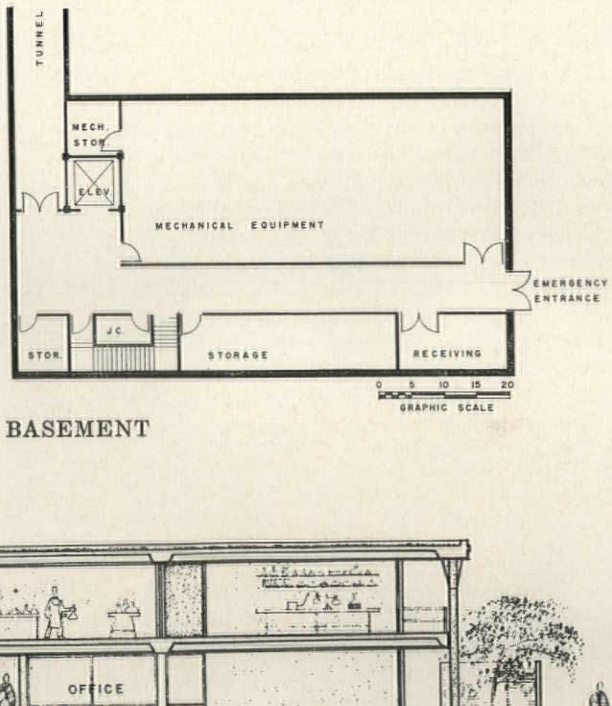


David Wohl Health Institute

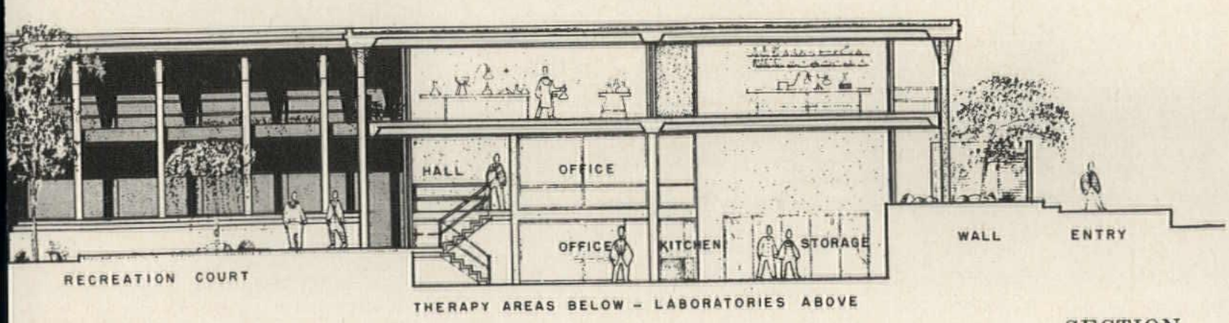
Dr. Charles E. Goshen of the American Psychiatric Association, who worked closely with the architects on this hospital, says of the principles on which its design is based, "the trend today is toward the liquidation of state and federal hospital psychiatric beds and their replacement by psychiatric sections in general hospitals. Of about 6000 general hospitals now in existence in the United States, about 10 per cent now have in operation efficiently functioning psychiatric facilities. This is an increase of almost 100 per cent within ten years, yet the present number of beds of this type in general hospitals remains only about 15,000 to 20,000 total. This compares to about 550,000 psychiatric beds in state hospitals.

"In spite of the extremely small number of beds available in general hospitals, there were more admissions of patients to these hospitals than to state institutions last year. This phenomenal record was made possible by the extremely fast turnover of patients (the average stay is about 17-21 days) in the general hospital sections. Contrasted with this is an average stay of approximately three years in state hospitals. In terms of costs to the taxpayer, the short-term general hospital stay is considerably cheaper, in spite of higher costs per day of treatment, than the total costs in state institutions.

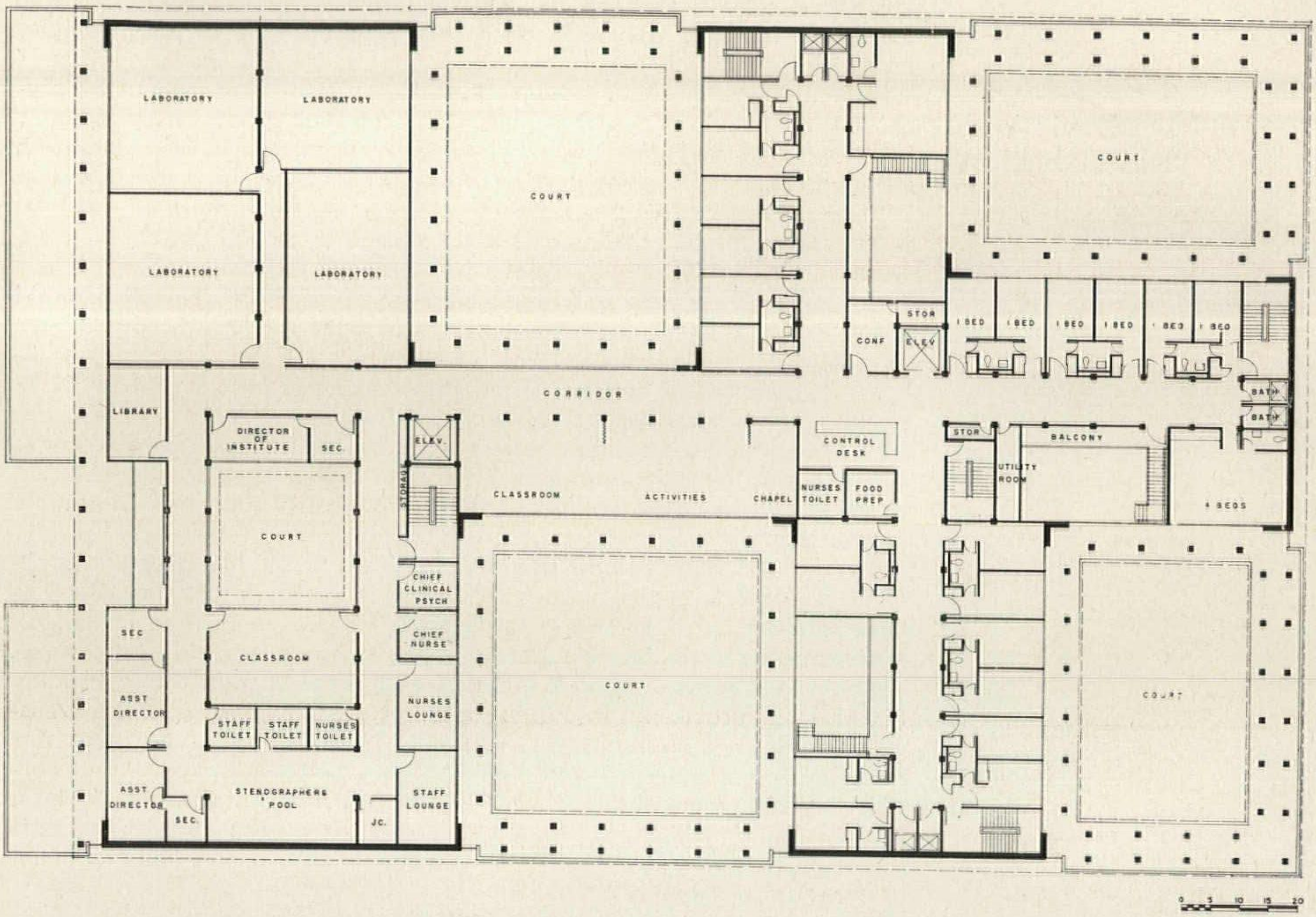
"In an institution such as this new hospital, many advantages will obviously accrue to patients. Here, the outside which is unattractive, has been shut out and a sort of "captive space" has been created inside. An environment for the best kind of psychiatric treatment will be provided. Less obvious, perhaps, are two other advantages to be gained in a building like this, the provision for training more professionals in psychiatric specialties and the opportunity for research. In addition, we expect that this new, exciting architecture will create the best possible impression of psychiatry on the general public. This will help in many ways, not the least of them being the probability that we can make contact with patients needing psychiatric care earlier. This can only result in better treatment and shorter periods of care."



BASEMENT



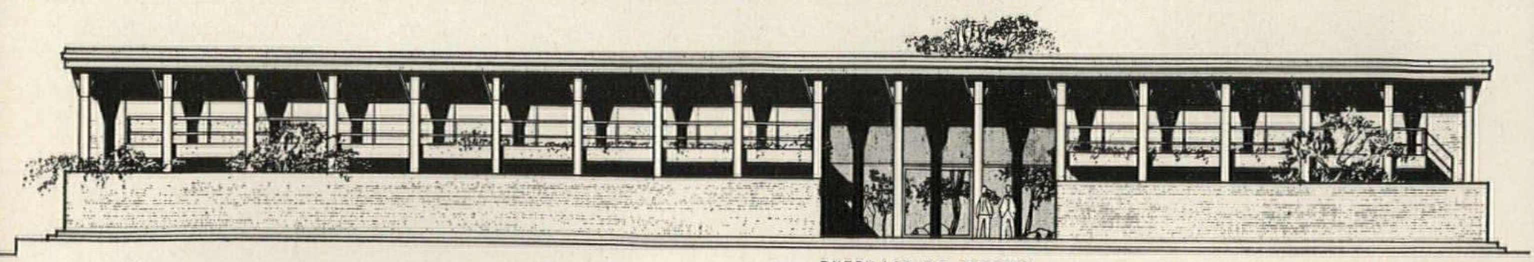
SECTION



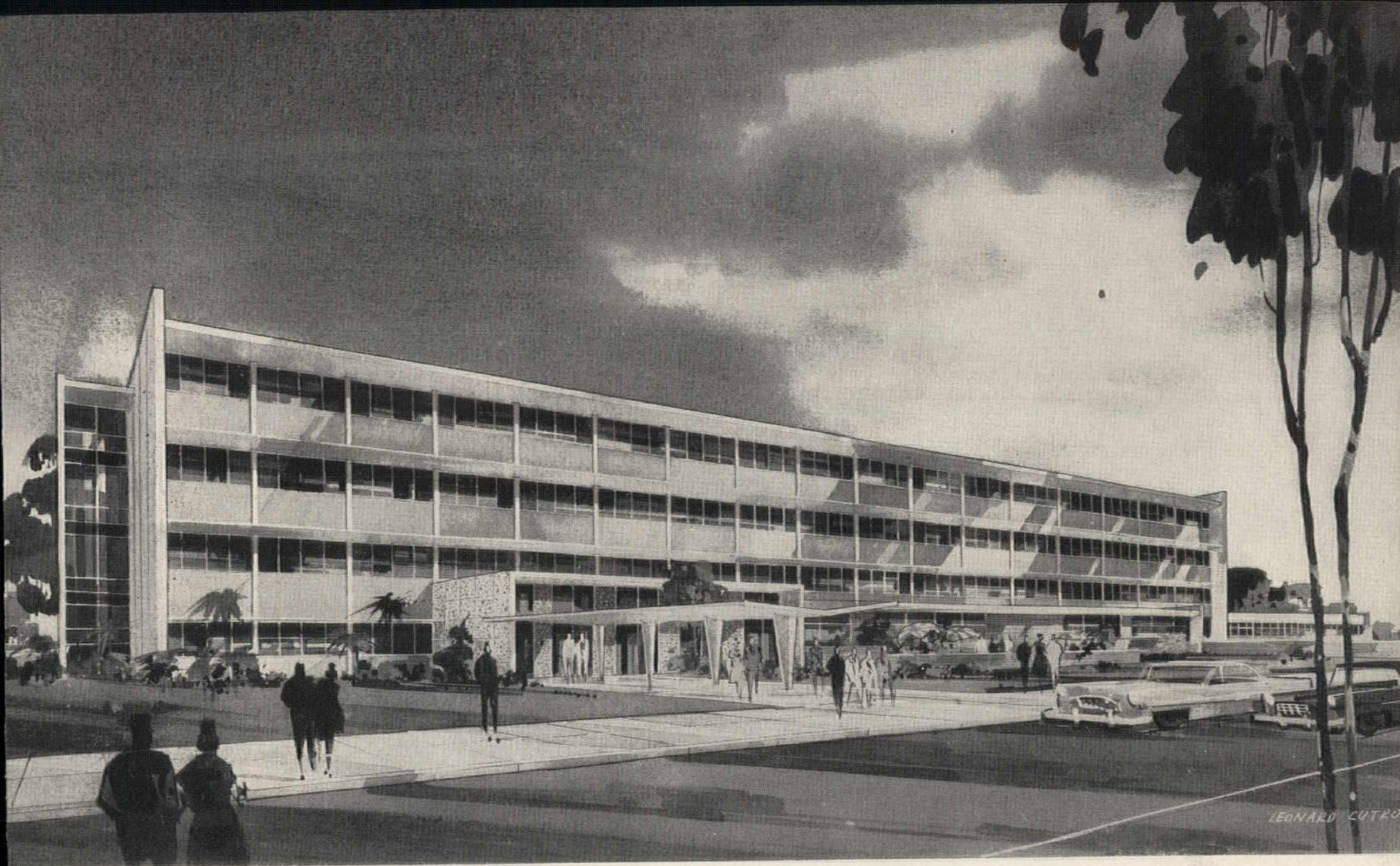
SECOND FLOOR PLAN

All major areas on the second floor are provided with balconies which may be used by patients and staff for secondary means of circulation. More importantly, these contribute to the atmosphere of openness and freedom which was considered such an all-important program requirement. From them, the landscaped courtyards below may be viewed from all of the important second-floor areas. Thus, the patients are provided with a variety of interesting and satisfying experiences with the spatial concepts of the building on both the first and second floors. As may be seen from a comparison of the two plans, the inpatient portion of the second floor is almost identical with the first floor. The patients are provided with rooms similar to those on the first floor. The two-story living-dining areas are shared by the patients housed on the two floors. Most of the administration spaces are located on this floor, as are the laboratories. Also included here are the library, chapel, and additional classroom and activity areas

David Wohl
Health Institute



EAST (FRONT) ELEVATION



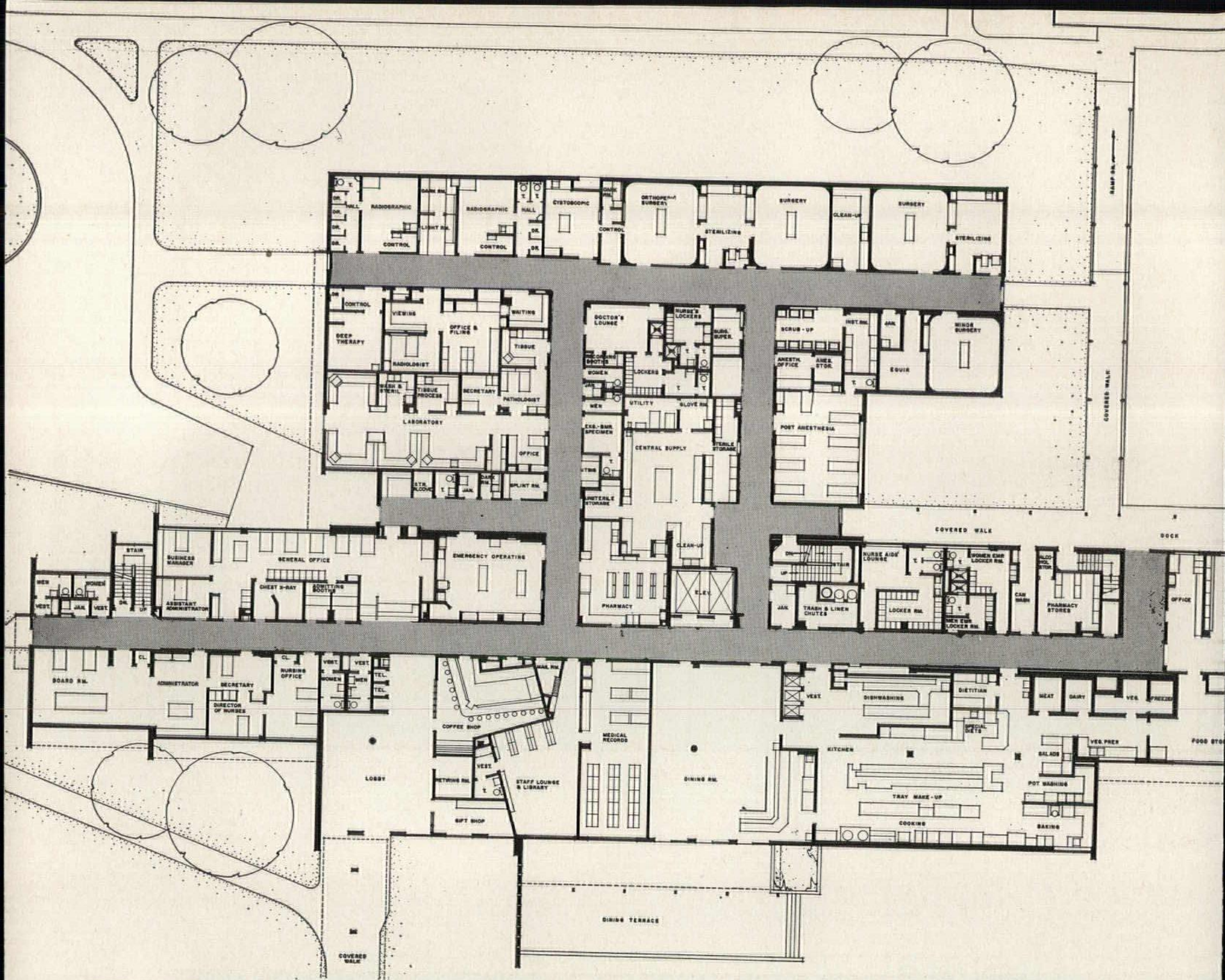
General Hospital Planned For Expansion

South Bay Hospital, Redondo Beach, California; Walker, Kalionzes, and Klingerman, Architects; August W. Koenig, Hospital Consultant

This hospital is a good example of a solution to a problem which often faces the architect. The need for an institution in this location having been established, its size was determined by a projection of future requirements, and then pared down to a size which would be feasible at the present time. Thus, all decisions made during the design and planning stages had to take into consideration not one, but actually two projects—the hospital to be built now, and the one into which it must grow later.

The hospital was designed for 250 beds. Only 149 of these will be provided for in the first stage of construction, the remainder to be included in a four-story nursing wing to be constructed later on the south side of the building. Most of the medical, surgical, and auxiliary facilities which will be needed for the complete hospital will be included in the first phase. In this way, all general hospital services will be available from the time the first phase is completed. The hospital is to be located on a ten-acre site, overlooking the Pacific Ocean. The decision to build it here grew out of a survey and study of this area made by the consultant, in 1955. The complete institution will serve a hospital district of approximately 40 square miles, which includes the cities of Manhattan Beach, Hermosa Beach, and Redondo Beach. The approximately 12 square miles these cities occupy is one of the most densely populated areas of California. The site is near the geographical and population center of the hospital district.

Close attention to expansion, the site, and other problems has resulted in a multi-story structure which is quite simple and compact. It is expected to be economical to build and operate, because of the importance given in the planning to details of traffic flow, general services, and vertical transportation.

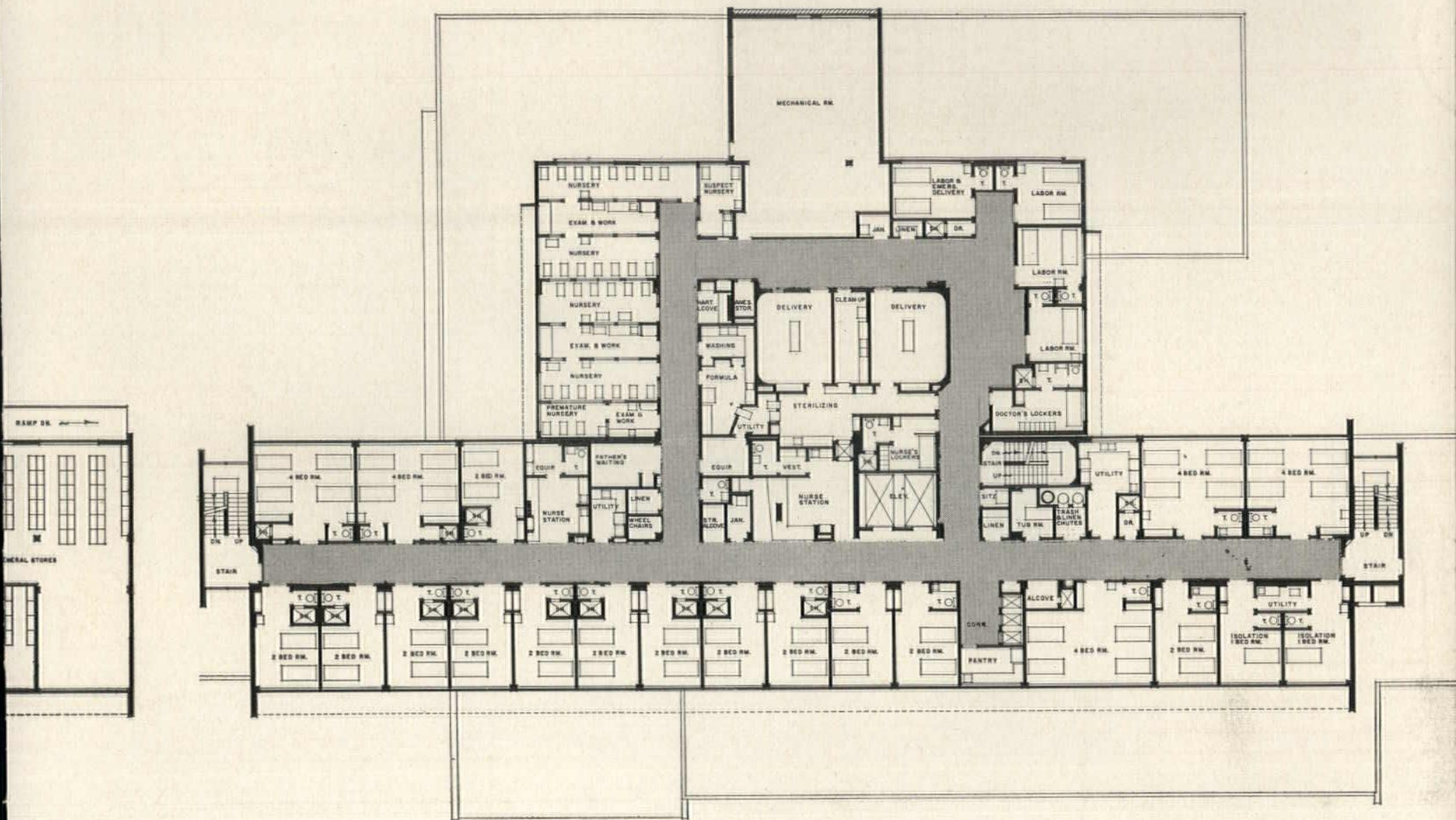


FIRST FLOOR

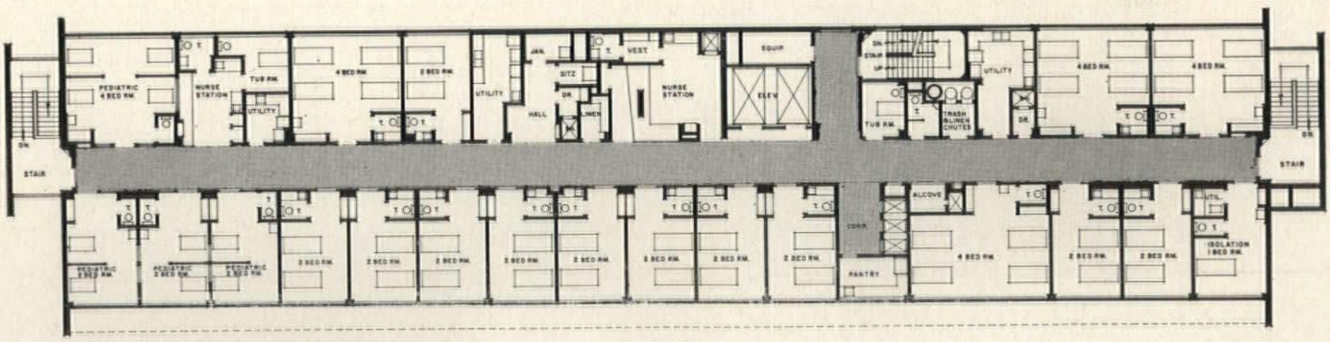
The over-all scheme for this hospital includes four floors and a partial basement. A separate building houses the boilers and other equipment. Future additions will include an additional 100 beds in a new nursing wing, and an extension of the boiler room to provide the additional capacity that will be required. The basement will contain equipment rooms, laundry, morgue, and physical therapy spaces. Approximately one-half of its area will be unassigned at present, but earmarked for future expansion of these facilities.

The first floor is devoted to admission facilities, administration areas, dining and kitchen, central supply, and complete surgical facilities with all necessary auxiliary spaces. As may be seen in the plan, these areas are zoned away from each other when possible. However, related facilities are conveniently placed near each other; all areas are connected by a system of interlocking halls. The second floor contains complete obstetrical facilities, including delivery suites, nurseries, nursing wings, and all auxiliary spaces required. The third and fourth floors are complete nursing units. They are quite similar in plan, except that a portion of the fourth floor is to be used for a separate pediatric nursing unit with a minimum of ten beds and its own nurses' station. A special post anesthesia room near the surgical suite has been provided for recovery of patients who have undergone surgery.

South Bay Hospital

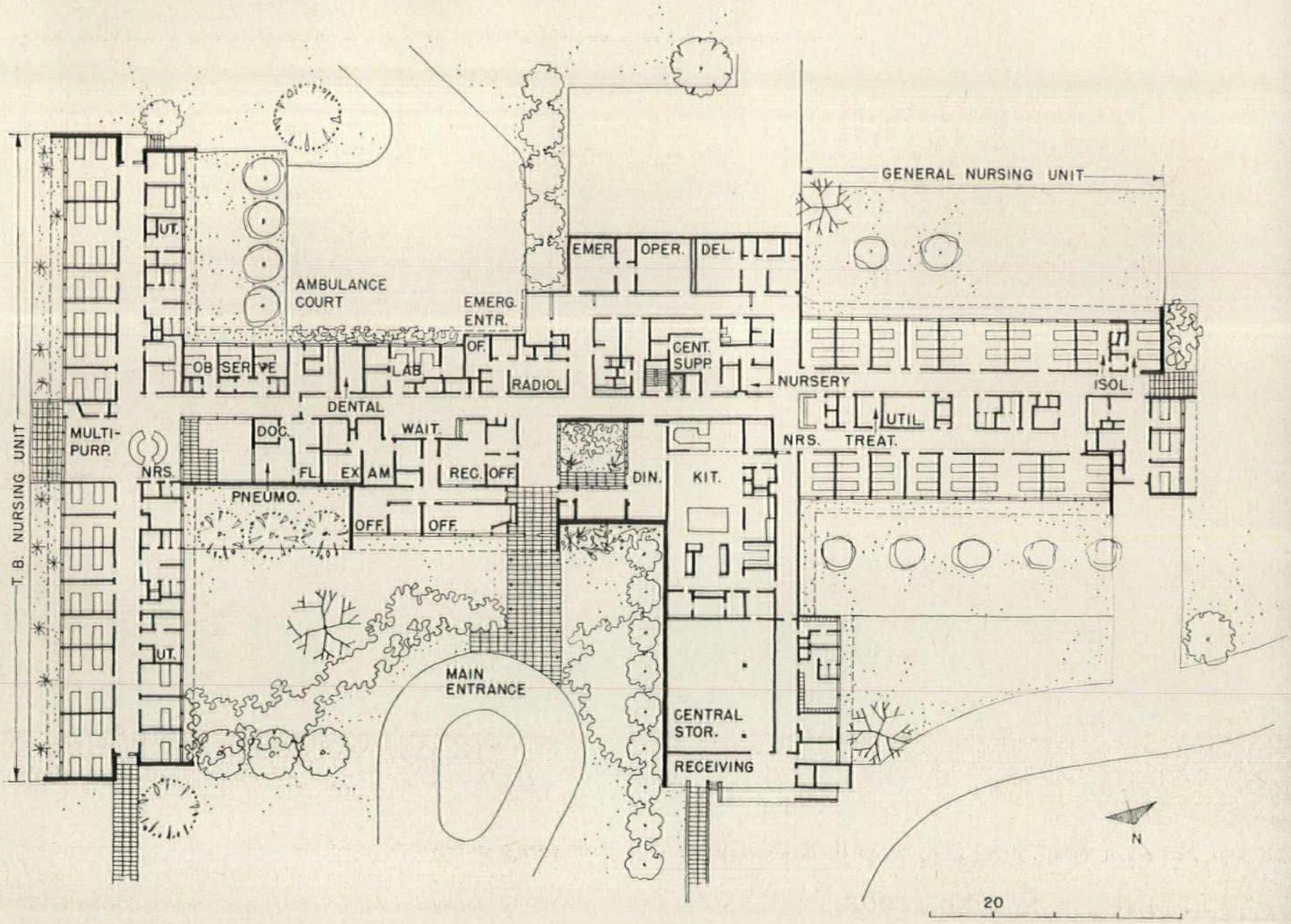


SECOND FLOOR



TYPICAL NURSING FLOOR

The supply system of this hospital revolves around the central supply area, located near the geographical center of the first floor. In this area, all of the necessary medical and surgical supplies are prepared and sent to surgery, emergency, and delivery departments, and to other areas of the hospital where patients are cared for. Complete sterilizing facilities are provided here. From central supply and the pharmacy located nearby, supplies are dispatched via dumbwaiters to the floors above, and are received in the delivery suite or nurses' stations on the patient floors. Another design feature of interest is the placement of the emergency near the admitting office rather than adjacent to surgery. It seems logical, in many respects, for emergency to be located in this position. It is intended that all surgery for emergency cases will be handled in the regular surgical suite, although cleaning up and preparation will be performed in the emergency room. In this way, it will be possible for emergency cases to receive the same high standard of surgical care available to any other patient, in the regular surgical suites away from the crowds which often gather in the emergency rooms during crises

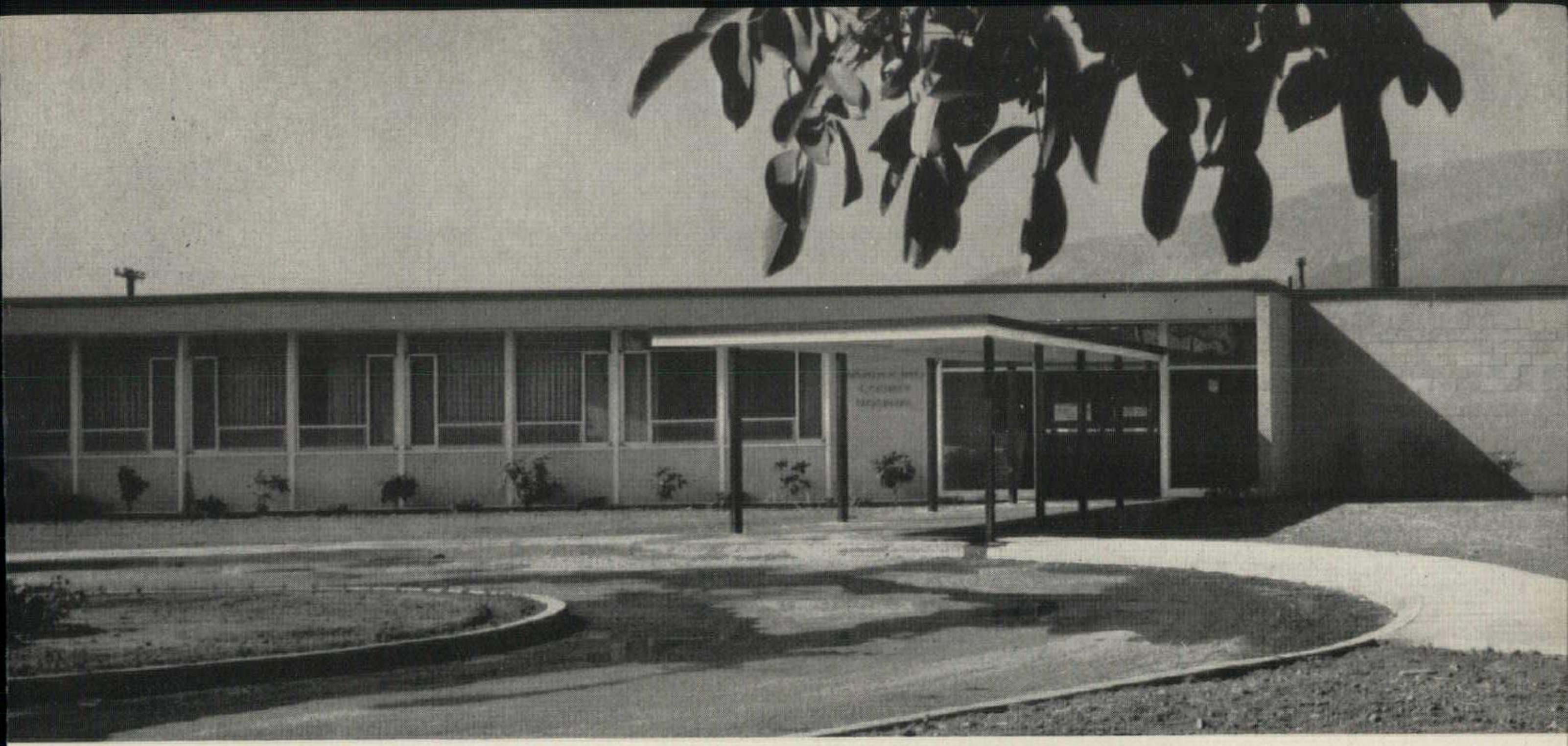


Small General Hospital Has Three Zones

Mendocino County Hospital, Mendocino County, Ukiah, California; Stone, Marracini & Patterson, Architects; Art Smith, Structural Engineer; Buonaccorsi & Murray, Mechanical and Electrical Engineers; Utah Construction Company, Contractor

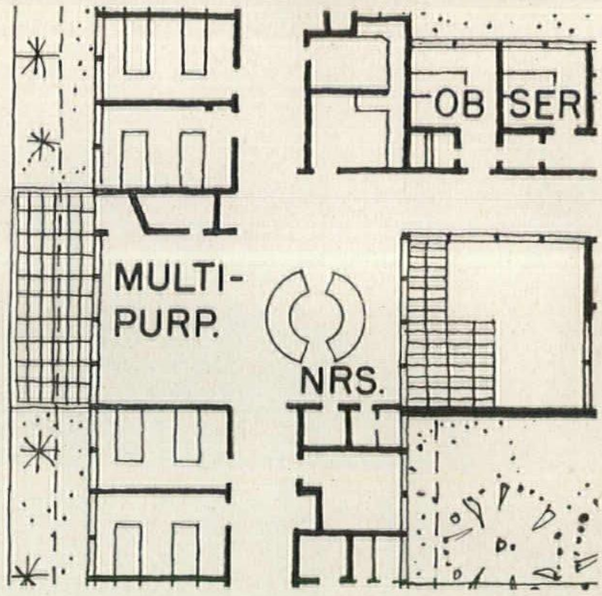
For this 80-bed county hospital, the architects worked out a simple and flexible plan, zoned for the present needs of the people in this area. Because these ends are not exactly the same as those which might be found elsewhere, the hospital becomes quite special in some ways. For example, there are two main nursing zones (with the beds equally divided between them), a wing for patients who require general nursing care and one for tuberculosis patients. In addition, there is a small three-bed psychiatric unit. One of the program requirements considered very important was the provision for fairly large numbers of outpatients. If a case can be made for the special features of the medical service to be rendered here, an equally strong one might be prepared for the design as a vehicle for general hospital care. The tuberculosis ward may be converted to general nursing either in part or in its entirety with little effort. This change would cause the hospital to be more similar to other general hospitals, though with rather more complete facilities than most others of this same size.

The overall layout of the hospital is unusually well defined into four major areas, the tuberculosis wing at the left, general nursing wing at



photos: Phil Fein & Assoc.

the right, the link between the two which houses all of the medical, diagnostic, surgical, and outpatient facilities, and the service wing which projects out from the front. The T B wing is a selfcontained unit zoned away from the remainder of the facilities. This area contains special observation rooms and very complete facilities of all types needed for treatment of tubercular patients. As may be seen from the plan, the wing may be completely cut off from the rest of the hospital. The general nursing wing is planned as a double corridor arrangement around a central core. Its position is such that it is shielded from outpatient and other types of traffic which are not directly related to the functions of the department. A unique arrangement in this wing permits the inclusion of two isolation rooms and three psychiatric rooms so placed that these patients are segregated from the general nursing cases, yet are accessible enough to be cared for by nurses in the general wing. Each of these small special departments has its own entrance. Central sterile supply is in a convenient location for serving the operating, delivery, and emergency rooms, yet can also handle its other demands. The emergency room is well-located with respect to the ambulance entrance and emergency court. It is completely separated from other elements of the hospital by a private corridor, yet conveniently located in respect to surgery and other important areas. The outpatient department has complete clinic facilities zoned away from other hospital activities, yet located with respect to the laboratories and the radiographic suite.



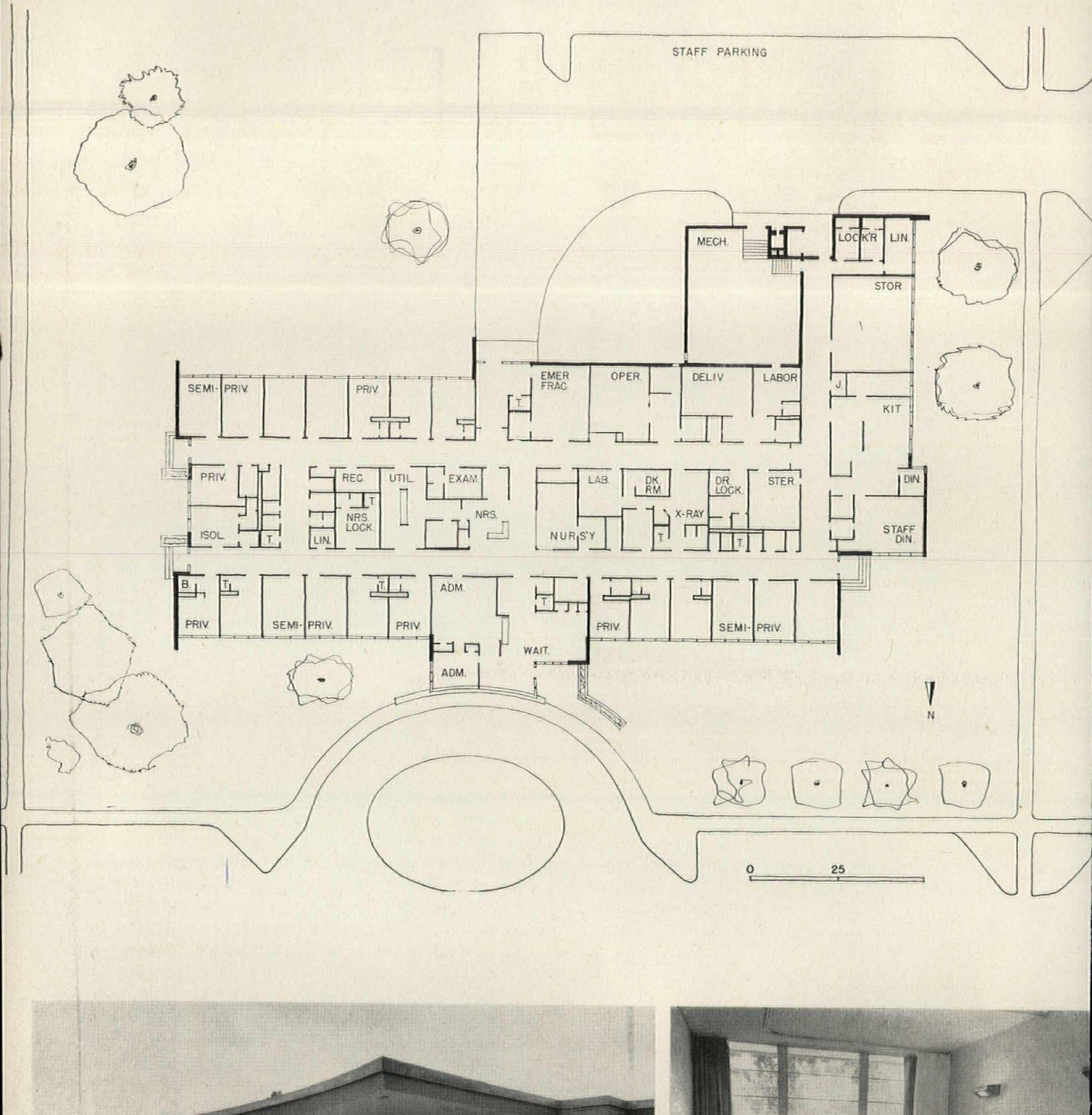
Mendocino County Hospital

The plan and photographs give some indication of the relationships worked out in the tuberculosis wing to simplify procedures. The nurses' center shown here is located between the two sections of this wing. One of the sections is now used for men, the other for women. Through the use of a central nurses' station, visual control of both sections from one location has been made possible. In addition, considerable flexibility has been gained, since at some later time when the expected decline in TB patients occurs, the function of one of the sections may be changed to some other necessary purpose

Core Plan Is Efficient For Small Hospital

Little River Memorial Hospital, Ashdown, Arkansas; Reinheimer & Cox, Architects; Rawland E. Blaylock & Associates, Consulting Engineers; Texarkana Construction Co., Contractors

This little 30-bed hospital was designed for expansion to 50 beds. All facilities needed for the expanded size have been provided. The additional beds may be obtained very easily by extending the patient wings. Located in a small community, the hospital provides complete general facilities for the population of the county and surrounding trade area. The major planning problem was the achievement of a design which could be built within the budget and could pay its own way. Quality could not be sacrificed since the hospital would be required to compete with larger institutions in neighboring towns. In order to provide a plant of the quality required and at economical first and long-run costs, the architects spent a great deal of time studying means which would permit efficient operation with a minimum number of personnel and with the lowest possible overhead expenses. The resulting structure has been successful in this respect. The friendly residential-like atmosphere is well received by patients and staff members. The plan functions well and adds greatly to the success of the building.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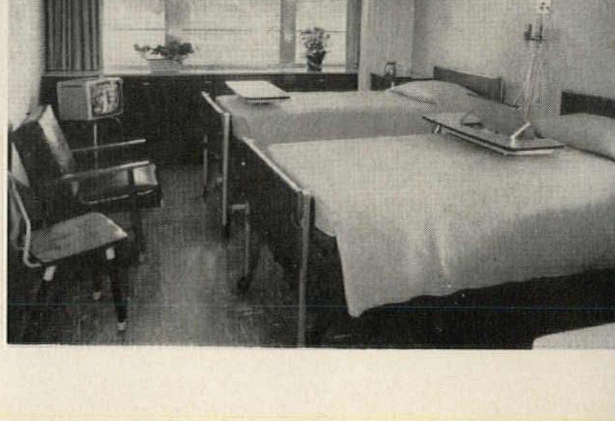
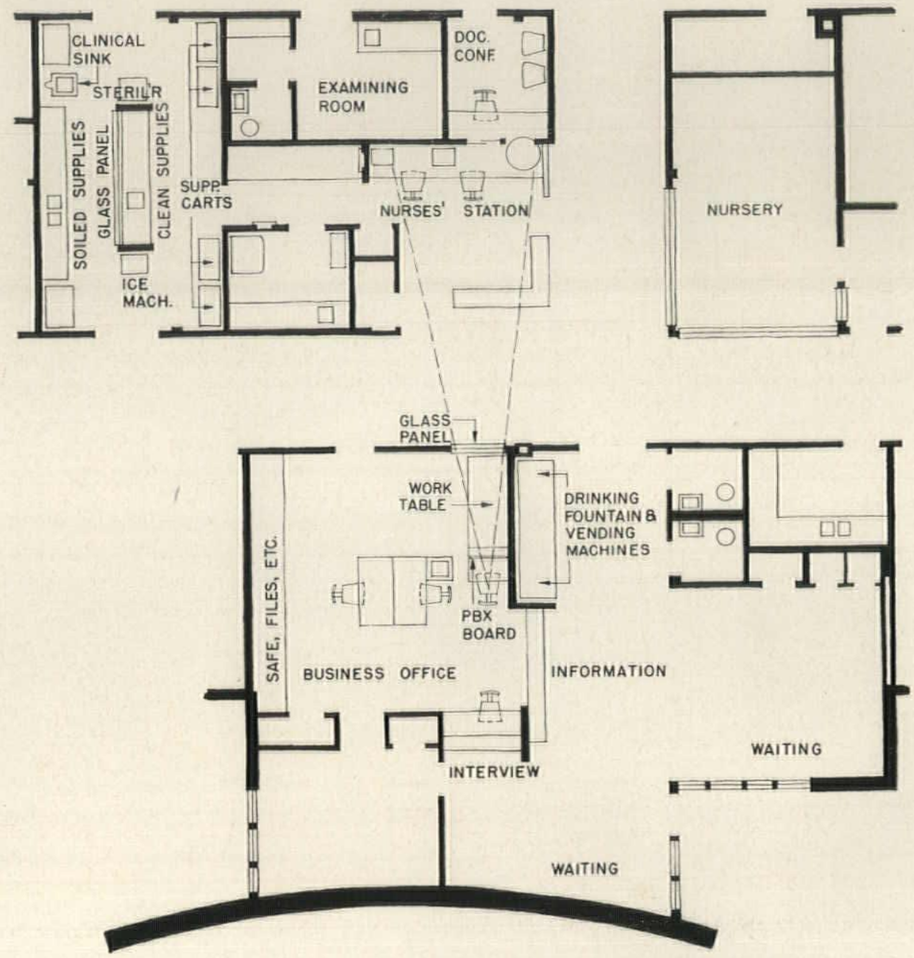




NURSES' STATION AND RECEPTION AREA

Little River Memorial Hospital

The major problem in designing this hospital for operation by a minimum number of personnel resulted in the selection by the architects of a core type design. This plan, often used for larger hospitals, seems especially successful here. Nursing and diagnostic facilities are grouped in the core. Patient room and related facilities are ranged around the outside. The nurses' station is located near the geographical center of the core. By these means, the travel required of nurses to care for the patients and perform other duties, has been reduced to a minimum. From the nurses' station, visual control of the waiting room, emergency entrance, and the nursery, has been provided for. This is particularly important during the later hours of the night when only two to four people are on duty in the hospital. During these late hours, entry to the hospital is confined to the emergency doors of the main entrance. All other doors are locked from the outside. In this way, one nurse seated at the desk can control all incoming traffic. Without leaving the desk, a nurse may attend to paper work, consult patients' charts, consult with doctors in the adjacent room (through a sliding glass panel), use the telephone (and take incoming calls through the night when the switchboard is closed), make calls on the paging system, talk with patients on the nurse call system, and observe warning lights for failure of boilers, piped oxygen, and other systems. In addition, the nurse may talk to doctors in their automobiles via two-way short wave radio. The business office is located to allow nurses and office personnel to cooperate fully and aid each other.

N. H. Aschan

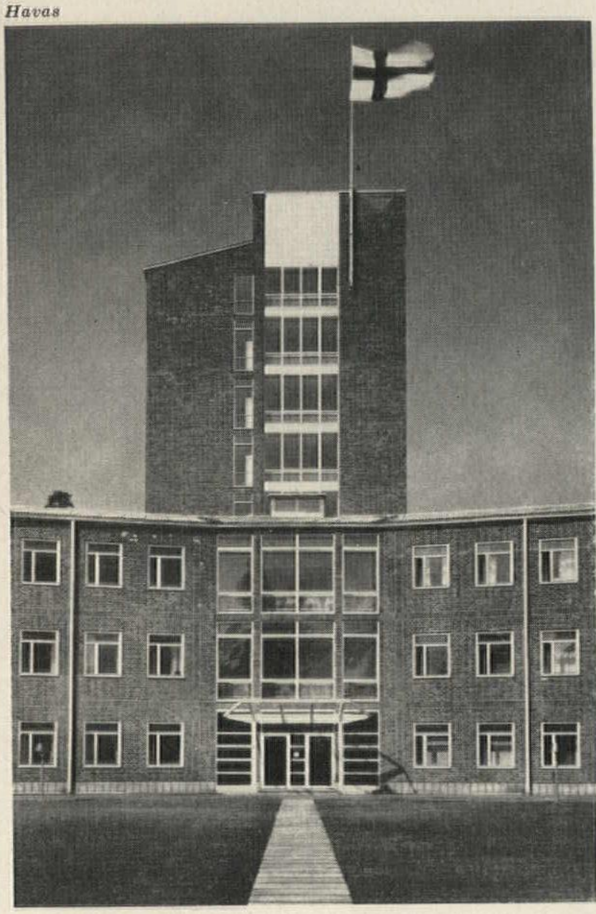
An Efficient Hospital, Scaled for People

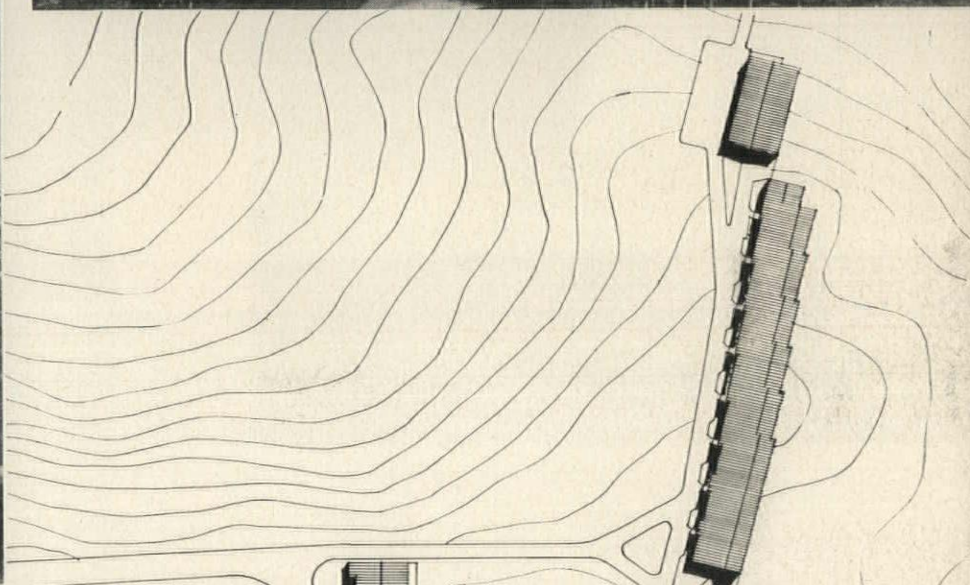
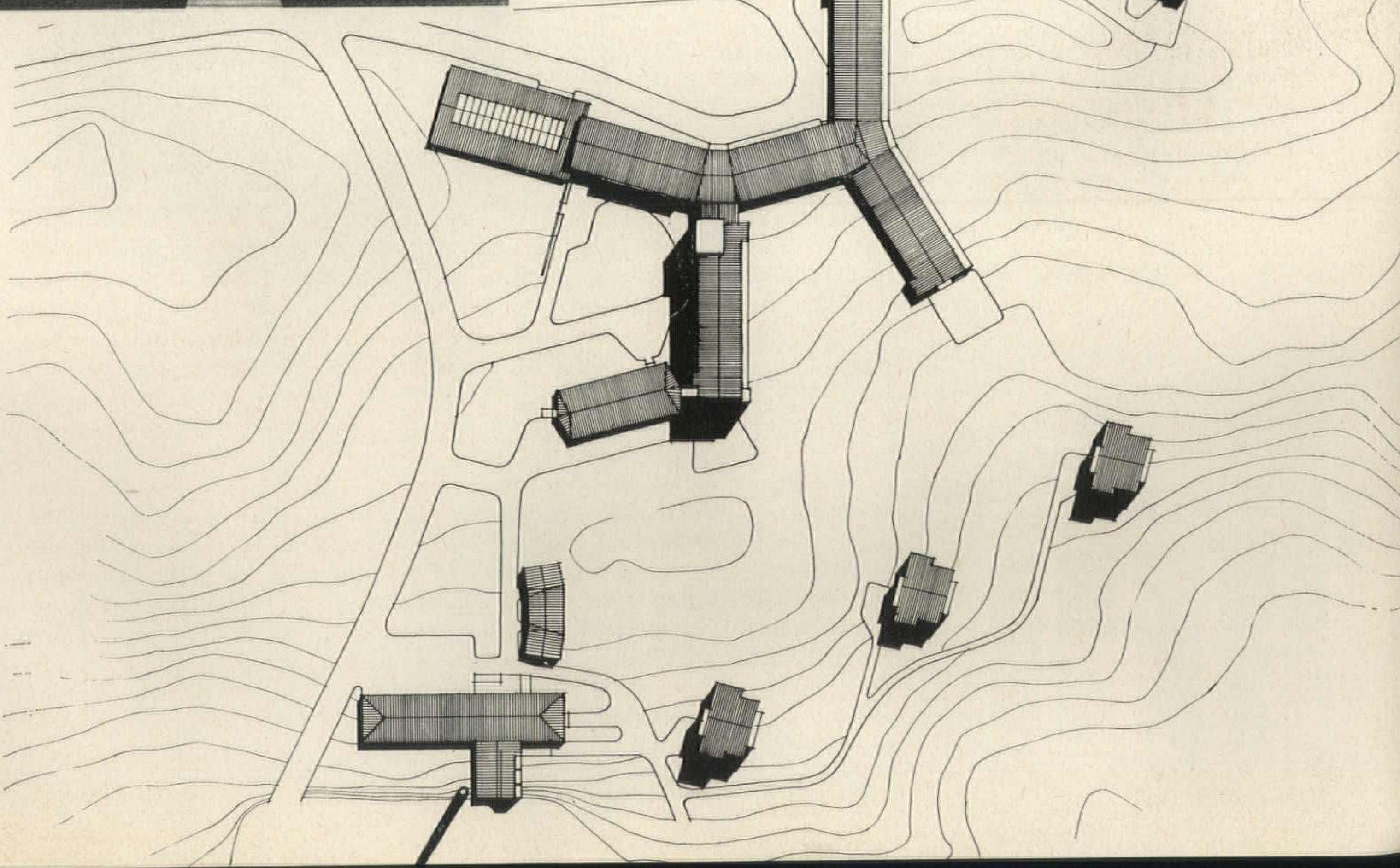
Central Hospital for Middle Finland, Jyväskylylä, Finland; Jonas Cedercreutz and Helge Railo, Architects; Esko Päivärinne, Lighting Engineer; Lasse Ollinkari, Interior Designer

While practices and procedures used in European hospitals differ in many respects from those in this country, there are a number of universal ideas and viewpoints which may, perhaps, be seen at their best in Scandinavian institutions. In the creation of an atmosphere for healing, efficient yet scaled to the human being (especially the one who is sick), the Scandinavian architects often seem to achieve successes in situations in which other designers fail. The hospital contains 375 beds. Contrary to American practice, these are placed in six-bed wards. Its site is rural, and partially because of this, provision is made for every conceivable function of a hospital. Included here are complete facilities for surgery, medicine, gynecology and obstetrics, pediatrics, ophthalmology, and otolaryngology. To service these medical functions efficiently, the hospital has its own power plant and central heating plant. Quarters are provided for the doctors, nurses, and technical staff members who operate it. In spite of the size and complexity of the hospital (the site includes 55 acres), the architects and their consultants working with the hospital staff have achieved a pleasant environment for patients and staff members. Particular attention was paid to the details of design for comfort as well as function. For example, a new type of lighting fixture with a special reflector to shield patients' eyes from glare was custom designed and used in the wards.

Ilmavoimat

Havas

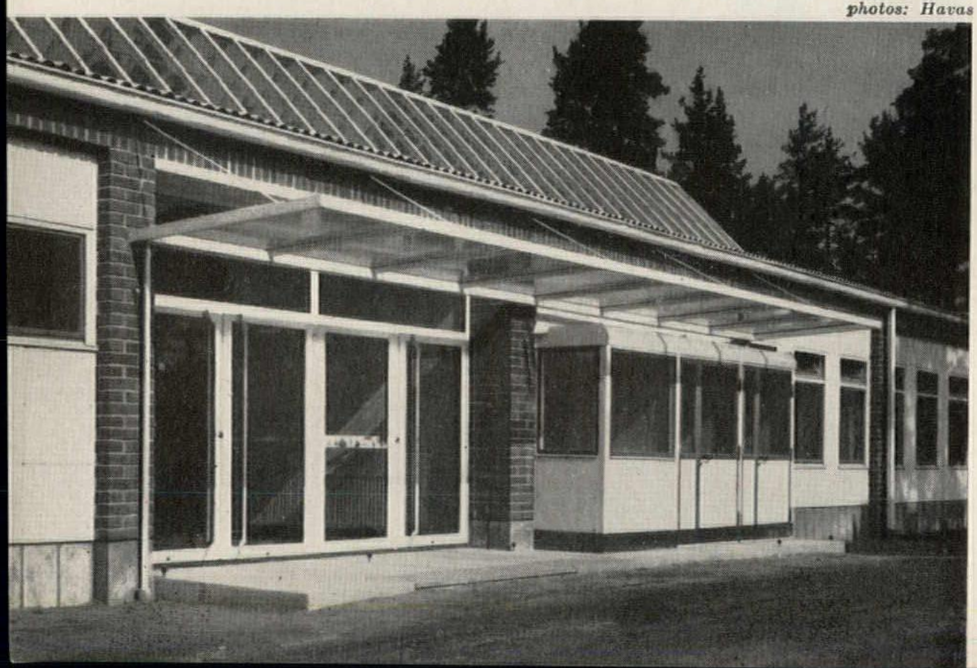


Central Hospital

Left, above: waiting room-solarium in the outpatients' department. Left, center: view of an operating room from adjacent surgeons' scrub room. Left, bottom: entrance to outpatients' waiting room-solarium. Below: patients' dayroom (typical of facilities provided for each patient wing through the hospital) and staff dining room (also used for an assembly hall at times)

photos: Havas



Architectural Engineering

Architectonics, East and West

"A Shower of Sparks" in Moscow

The American Exposition in Moscow was so much a tectonic display even when not specifically so labeled, that architecture found itself basking unaccustomedly in the public eye—at least for the duration of the Exposition. While the populace at large joined in the official mourning over the crumbling concrete that temporarily turned our shiny gold dome into a "dust bowl," Editor Norman Cousins, a recent visitor to the Soviet Union, pointed out in his *Saturday Review* that "the daring use of glass and lightweight structural materials; the sense of openness and the clear unimpeded lines" characteristic of modern construction elsewhere are largely absent in Moscow. "Against this setting," he observed with some satisfaction, "The American Exposition is more than an innovation; it is an explosion and a shower of sparks."

Precast Building Blocks in New York

Shower of sparks or no, if the architectural display at the Soviet Exhibition of Science, Technology and Culture in New York was at all typical of Russian architecture, Muscovites must indeed have found our plastic canopies and golden domes eye-opening in the extreme. Those visitors who tore themselves away from the Sputniks long enough to plod through the Soviet architectural exhibit were confronted with a dreary collection of no-nonsense precast concrete buildings that could be identified as schools or factories only by the printed cards alongside.

Since the exhibit yielded disappointingly little information on the Soviet Union's much-touted techniques for producing and erecting precast concrete, its highpoint (to one taxpayer at least) was a display showing a newly-developed system of some 55 standardized components for public buildings. Their use is expected to cut the cost of government buildings by 20 to 22 per cent.

Noted by the Professionals:

Russian Pile Drivers

As *The New York Times* mentioned early in August, engineers who visited the USSR's Exhibition here were much intrigued by a model of a machine called a "Vibrosinker," which is used in the Soviet Union to shake piles into the ground instead of driving them in, as we do, with steam or air hammers. The idea of vibratory pile driving is, of course, not new. (Anyone who has ever set up a beach umbrella is probably familiar with the advantages of the wiggling technique over brute force.) But the development of several types of vibrators, each designed for sinking a different type of piling under varied soil conditions, is. This time, it seems, the Russians really did invent it first.

American Plumbing

Ironically enough, while our engineers were busily admiring the Soviet Union's vibrating pile driver, the lady architect in charge of the model apartment at the Russian Exhibition was waxing enthusiastic over the penultimate symbol of capitalism à la U. S. A.—the modern bathroom. Mrs. Olga Bayar, who works for Moscow's Academy of Construction and Architecture when she is not exhibiting model apartments, was introduced to our late-model plumbing fixtures via a visit to American-Standard's New York showroom. She was accompanied on the tour by A. K. Chelnov, First Deputy to the Director General of the Soviet Exhibition. Although a display of heating equipment brought many questions, both visitors expressed greatest admiration—Mrs. Bayar in English and Mr. Chelnov in impeccable French—for colored fixtures, such modern fittings as single-lever faucets and pop-up drains, and the general emphasis on styling. They explained that the typical Russian bathroom is equipped with white fixtures only—an enamel-coated cast iron bathtub, shower, and small china lavatory and water closet. Mrs. Bayar was particularly delighted with the new "Contour" bathtub ("It's so clever—it takes the same space and gives you more room"), and the wall-hung water closet ("Wonderful . . . it makes it so much easier to clean"). But it was Mr. Chelnov who summed up their impressions. "Tout," he commented, "est pour la femme."

This Month's AE Section

CLAY MASONRY LOOKS TO AUTOMATION

Industry's Research Develops Structural Panels for Factory Production

by C. B. Monk, Jr.
Sructural Clay Products Research Foundation

A few glances around the new laboratory facilities and testing grounds of the Structural Clay Products Research Foundation in Geneva, Illinois, tell you that something new and surprising is happening to kiln-fired building materials: they are becoming panelized and, once again, structural.

Inside the laboratory building, pilot-plant facilities are producing story-high, load-bearing panels of brick and, believe it or not, panelized girders and columns of terra cotta.

On the testing grounds is an experimental structure, finished in June, which demonstrates the application of these newly developed structural elements as load-bearing walls, shear walls, plate girders and columns.

But before this building was designed and erected, SCPRF engineers and architects had behind them extensive tests on the behavior of the structural elements. Full-size specimens were tested under simulated dead and live loads, and last year SCPRF built a house with story-high brick panels.

The objective of the engineering and architectural research staff at SCPRF is to exploit the inherent physical potentials of clay products to keep pace with today's accelerating trend toward panelization, prefabricated components and structural efficiency.

Even beyond this goal, the researchers are looking for a completely integrated and flexible wall panel system having a range of possibilities for fired-clay exterior finish, various interior finishes and insulations.

Having passed the major hurdles of laboratory experimentation and analysis to the staff's satisfaction, "SCR building panels" must in the near future meet the test of the market place.

First will come the critical eye of the design professions and the builders, looking at such factors as: appearance; cost; weatherability; maintenance; space savings; weight; simplicity of design (i.e., architectural and structural design time and skill required); logic in theory and practice of the application; amenability to field-labor installation; acceptability by codes; thermal, acoustical and fire-resistant properties.

Second, when the industry is once in production, will come the question of how structural ceramics stack up commercially with other currently available materials.

It would take considerable prescience to predict what the outcome will be, but in any case all SCPRF's brain-stretching and experimentation can't help but bring renewed strength to the structural clay products industry. *R. F.*

Practical development of structural ceramics has been one of the most important long-range objectives of the Structural Clay Products Research Foundation since its founding 10 years ago. The "SCR building panel"*, shown and described in its various forms in this article, is the first tangible result of this research and development.

The panel is not yet in actual plant production. However, its development now has reached the stage where production capacity is being developed. Equipment for efficient and economical plant assembly has been built in the Research Foundation laboratories. From the standpoint of field use, much thought and study has been given to efficient and flexible methods of attachment, and to the application of panels to a wide range of building types and methods of construction.

This article is, in effect, a preliminary progress report on the development of the "SCR building panel." The testing and development program is reported and the physical and structural properties of the panel are covered. Our economic analysis establishes that for conventional curtain wall application, this structural ceramic panel should be more than competitive with other contemporary panel systems. When the panels are used structurally, our analyses show a significant reduction in steel, and thus in the ultimate cost of the building wall. In other words, we believe it is possible to achieve full structural use of fire clay materials with savings in overall costs.

The "SCR building panel" is a prefabricated, clay masonry wall panel, 2½ in. thick.† Cast in a jig with a quick-set grout, the clay units are reinforced with deformed rods and an attachment channel or structural tee. Originally designed as a curtain wall element, the clay panel has inherent structural properties that

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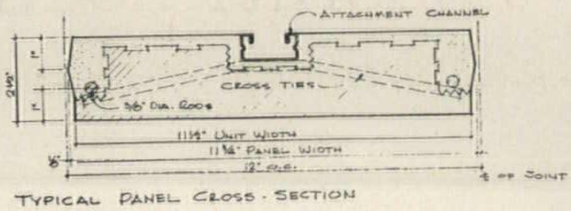
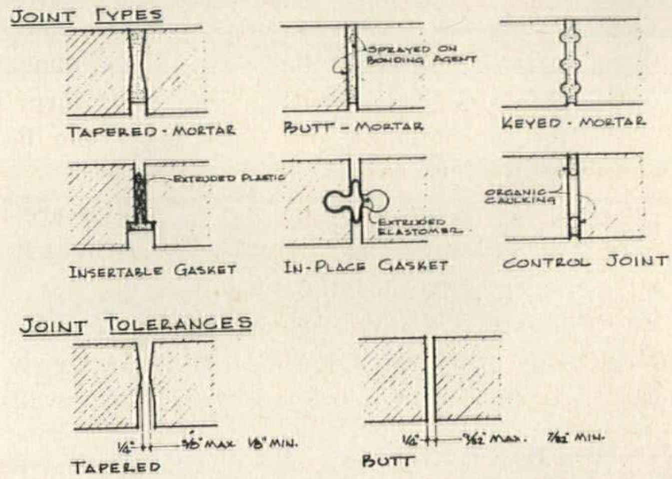
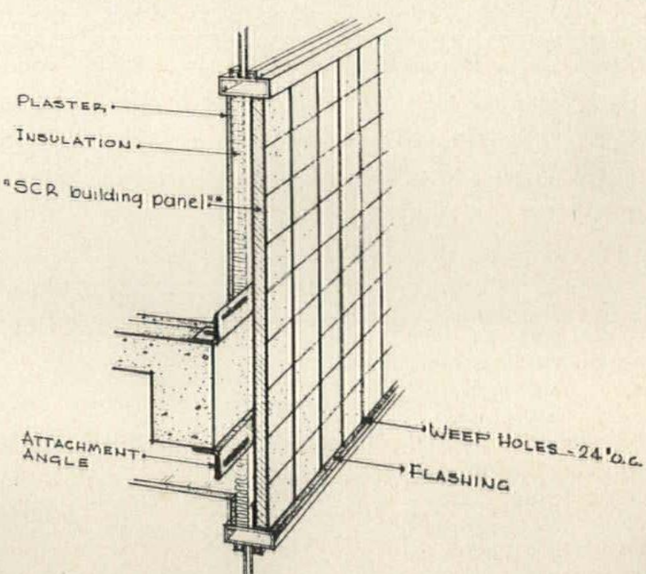
**Reg. T. M., Pat. Pend., SCPRF*
† This is the thickness for curtain wall panels. Add 1 in. of vermiculite plaster to get a 2-hr fire rating. Structural panels are 3-in. thick.





"SCR building panel," now modified for structural use, was originally designed for curtain walls, as shown here. Note particularly 2½ in. thickness, channel and angle for attachment. Suggested profiles and details for field-installed joints are above. Panels are made from clay masonry units cast in a jig with quick-set grout. Curtain wall panels are reinforced with deformed rods and an attachment channel.



permit its use as load-bearing walls, piers, spandrel girders or shear walls.

Currently, panels can be fabricated up to 13 ft long and installed over clear spans not in excess of 10 ft. The total weight of such long panels is less than 400 lb for 12-in. wide panels and less than 800 lb for 24-in. wide panels. Thus, ½-ton handling equipment can lift probable panel weights. With the aid of vacuum cups or end grappling clamps the panels may be installed either from the outside or inside of the building. Maximum flexibility of attachment is secured by casting longitudinal connection channels integrally with the panels, making possible attachment at any point in the length of the panel.

Physical Properties

The three properties: thinness, panel weight and strength, are actually interdependent. A lower limit of thickness of clay panels at 2½ in. is conditioned in part by limits of extruding, drying, and firing a clay cross-section containing relatively deep re-entrant grooves for placing reinforcing and the attachment channel.

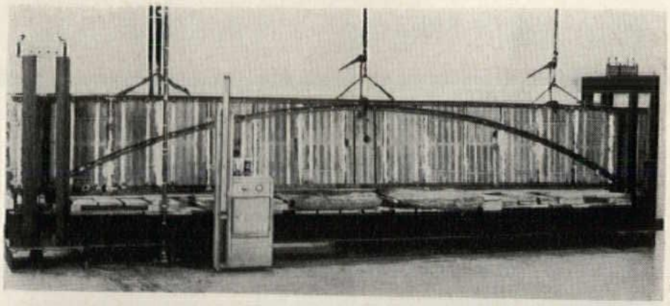
Strengthwise, a 2½ in. depth will allow simple spans up to 8 ft and continuous (or fixed) spans up to 10 ft, based on wind load requirements. Current casting equipment permits actual panel lengths up to 13 ft. The use of ⅜-in. reinforcing rods 6 in. o.c. is more than adequate for a 30 psf wind load. The structural problem is not one of strength but of stiffness; panels with span-to-depth ratios of 1:40 to 1:50 are relatively flexible.

Current fabrication techniques are most economically achieved through the use of ordinary steel reinforcing and a quick-set grout to bond the assemblage together in a minimum casting time. Stiffness of field installations is greatly enhanced by three factors: grouting of vertical joints, continuity of the panel at supports, and the application of interior wall finish.

A 2½-in. panel has almost 70 per cent less weight than a 10-in. cavity wall, currently the typical masonry curtain wall construction. How does such reduction in weight affect fire, thermal and acoustical resistance?

Fire Resistance. With 1 in. of vermiculite plaster applied directly to the back of the "SCR building panel," we get a 2-hr rating, as demonstrated by both pilot and full-scale tests. Naturally, even higher ratings are possible, with furred spaces, thicker plaster, and so forth.

Thermal Resistance. Contribution of fired clay to the total thermal resistance of the wall construction is relatively low if you consider outside air temperature and solar conditions as being constant (steady state).



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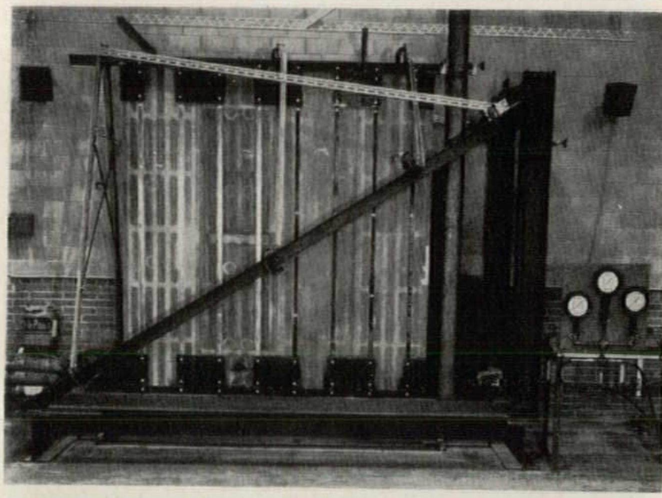

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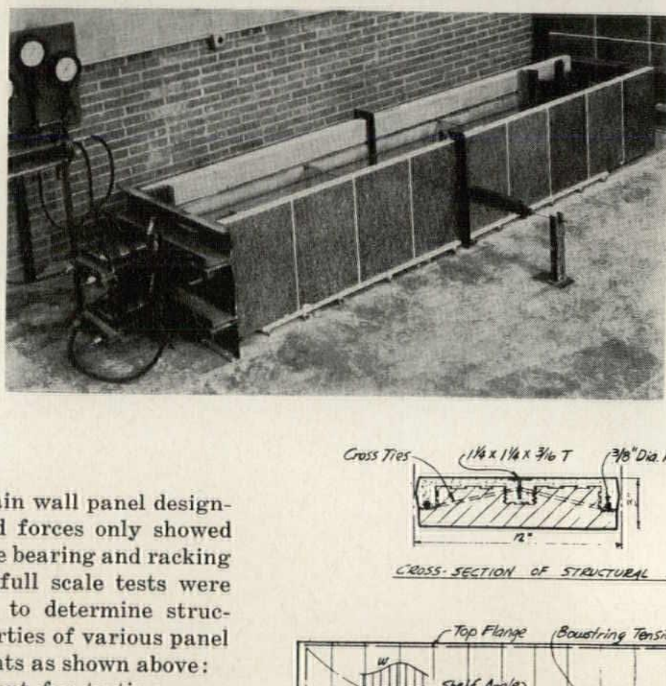

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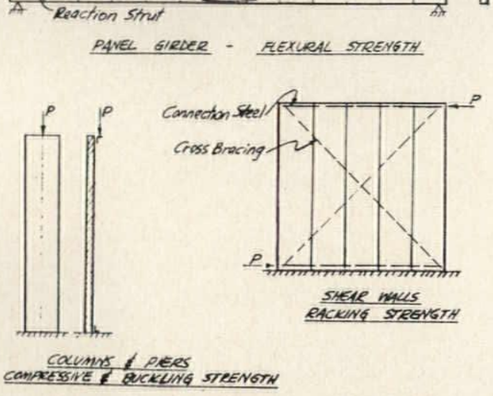


When curtain wall panel designed for wind forces only showed considerable bearing and racking resistance, full scale tests were undertaken to determine structural properties of various panel arrangements as shown above:

1) Equipment for testing spandrel girder. Note that specimen is upside down to allow force of air bag pressure to be exerted upward during test.

2) Racking test shows panels reinforced with bonded steel shear plates.

3) Double panel column test. Note lateral spring scales to simulate wind pressure effects. Tests resulted in modification of curtain wall panel for applications shown at right. (Compare structural panel cross section with section on preceding page)

Required thermal resistance (U factors from 0.10 to 0.20) must be obtained by using insulation. A furred air space with reflective backed wall board gives a U = 0.20; a U factor of 0.15 can be obtained with 1 in. of rigid insulation; and 2 in. of insulation brings the U factor down to 0.10.

The U factor alone, however, doesn't tell the whole story. Most of the time heat flow is cyclical, and under these conditions the thermal capacity of the material comes into play. To demonstrate the inclusion of this factor in design we have used the Equivalent Temperature Method as outlined in the 1959 ASHAE Guide. Each type of construction will have a different ETD for each compass orientation and each latitude. The ETD multiplied by the U factor gives the maximum heat flow due to the daily temperature cycle. Since clay has substantial thermal capacity, it tends to cause a lag between the time outside conditions change and when they are felt inside. For example, consider a clay panel with 1½ in. of insulation having a U factor of 0.159, and a metal panel with 2 in. of insulation having a U factor of 0.150. Assuming 95 F outdoors and 80 F indoors, during a daily temperature cycle of 20 F, a light colored clay panel facing south would gain 20 per cent less heat than the metal panel, as calculated by the ETD method.

Acoustical Resistance. Basically, sound transmission loss through a wall is a function of its mass and stiffness. The most massive wall with the least stiffness will give the best sound transmission loss. The "SCR building panel," with a density of 25 to 30 psf for a 2½-in. panel, has been measured as having an average TL loss of 45 db. The test results came out much better than was expected, based on past experience. This was due to the inherent flexibility of the panel.

Joints

Basically there are two kinds of joints in the "SCR building panel" system: factory produced and field installed. Those joints between ceramic units that are manufactured in the plant will be relatively impermeable both to liquid water and water vapor.

Joints between panels are field installed. There are two types: the vertical joint between panels and the horizontal joint between bands of panels or between the panel boundaries and adjacent structures. The vertical joint between panels can be made as water-tight as practicable and the horizontal joint between panels should contain weep holes and be flashed to the outside. The attempt to create an impervious, hermetically sealed wall system is impractical.

Ideally, joint materials have to meet five prime criteria below:

(a) Give low initial cost and minimum maintenance.
(b) Provide a durable weather seal.
(c) Accommodate differential building movements.
(d) Have fire resistance equal to the panel.
(e) Have structural properties to fully develop panel capacity.

If both structural and fire resistance is required of the joint material, organic substances cannot be used, for as a class they will not withstand temperatures above 350 F. Ideally, the compressive and shearing strength of the joint material should be comparable to that of the panel if full structural utilization of the panel is to be achieved. In this regard, mortar joints are superior, possessing both structural properties and fire resistance. Laboratory research and field development have shown that the following mortar is one of high workability, gun consistency, and low shrinkage:

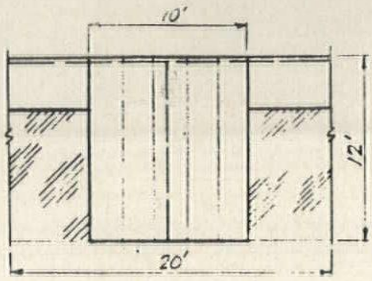
Portland cement	1 part by weight
Masonry sand	3 parts by weight
Ground clay	1/3 part by weight
Liquid latex	1/15 part by weight

Mortar has a relatively low adhesion. This may be improved in panel joints by spraying the panel edges with such adhesives as polyvinylacetate or butadiene-sytrene and by mechanical keys provided in the edge of the panel cross-section.

When mortar is used in clay masonry panel joints, the relative lack of elongation may be of some concern when building movements due primarily to thermal changes are considered. Fortunately clay masonry has low thermal expansion, and the mortar material as a joint filler is reasonably compatible with the thermal expansion characteristics of the clay panel.

When clay panels are attached to either concrete or steel skeleton frames, differential movements are likely to occur. Providing an expansion joint at every column for each bay (20 to 25 ft apart) should easily accommodate most building movements. Such a joint may be the regular panel joint filled with polysulphide or silicone polymer caulks. Silicone caulks will provide a measure of fire resistance (750 F) but are considerably more expensive. If for structural or esthetic reasons expansion joints must be farther apart, it

ONE-STORY PANEL CONSTRUCTION, STEEL FRAMING VS. LOAD BEARING



Typical 20 ft exterior bay

Shaded area is glass; rest, masonry

Assume dead load + live load = 0.5 kips/ft
Assume 50 per cent windows

STEEL FRAMING

COLUMNS
Use 3 in. diameter pipe at 7.58 lb/ft
Wt. of steel 7.58 x 12 ft = 91 lb

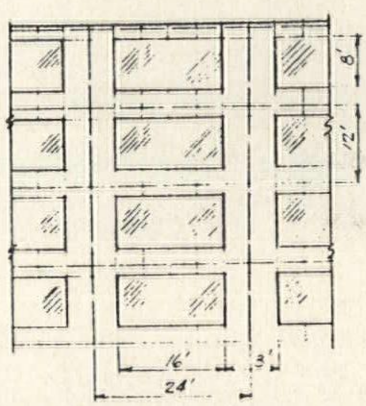
EAVE BEAMS
Use 12 B 16.5
Wt. of steel 16.5 x 20 ft = 330 lb
Total steel 421 lb

LOAD BEARING MASONRY

LINTEL
Use 5 in., 6.7 lb/ft channel continuous across top
Use 3 by 2½ by ¼ in. angle at 4.5 lb/ft for bottom connection of panels
Wt. of steel 6.7 x 20 ft = 134 lb
4.5 x 10 ft = 45 lb
Total steel 179 lb

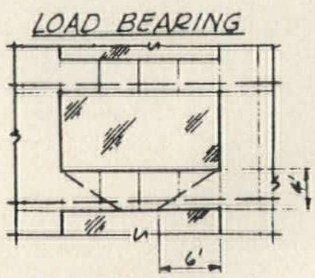
STEEL COST SAVED
421 — 179 = 242 lb at $0.15 per lb
= $0.30 per sq ft of panel area

MULTI-STORY PANEL CONSTRUCTION, STEEL FRAMING VS. LOAD BEARING



Typical 20 ft, four-story exterior bay

For steel framing, assume 10-in. brick cavity wall
For load-bearing masonry, assume 3-in. "SCR" panel



Assume dead load + live load:
roof = 0.5 kips/ft
floor = 1.2 kips/ft

STEEL FRAMING

COLUMNS, 1ST AND 2ND FLOORS
Use 8 WF 28
Wt. of steel 28 x 24 ft = 672 lb

COLUMNS, 3RD AND 4TH FLOORS
Use 6 B 15.5
Wt. of steel 15.5 x 24 ft = 372 lb

GIRDERS, ROOF
Use 10 WF 21
Wt. of steel 21 x 24 ft = 504 lb

GIRDERS, FLOOR
Use 16 WF 36
Wt. of steel 36 x 24 ft x 3 = 2592 lb

OUTER WYTHE SEAT
Use ¼ by 8 in. plate at 6.8 lb/ft welded to base of 16 WF 36
Wt. of steel 6.8 x 24 ft x 4 = 653 lb
Total steel 4793 lb

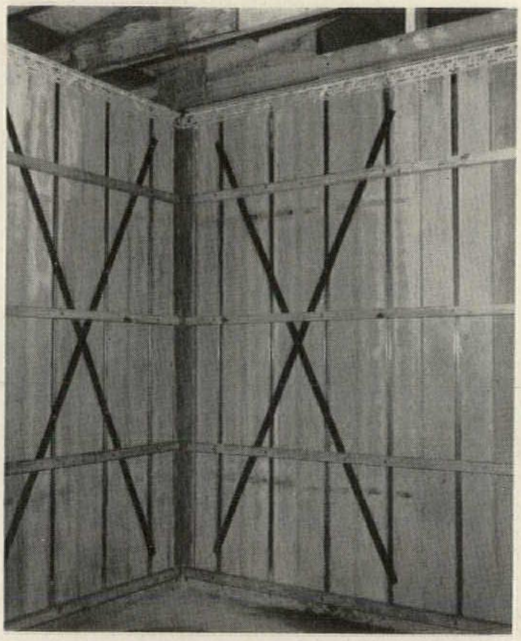
LOAD BEARING MASONRY

ATTACHMENT
Use 3 T 6.1 top and bottom of spandrel, continuous across column panels. (minimum size for attachment; also used to retain window system)
Wt. of steel 6.1 x 24 ft x 2 = 293 lb

SHEAR STEEL
Assume diagonals welded 6 ft in from each side as shown in sketch
Use ¼ by 4 in. plate diagonals at 3.4 lb/ft welded to 3 T 6.1
Wt. of steel 3.4 x 15 ft = 51 lb
Use 3 by 3 by ¼ in. angle at 4.9 lb/ft for shelf angle
Wt. of steel 4.9 x 24 ft = 118 lb
Total steel 462 lb per floor

STEEL COST SAVED
4793 — (4 x 462) = 2945 lb at $0.15 per lb
= $0.69 per sq ft of panel area

One-story, ranch type residence in Geneva, Illinois (above), was first building in which new load-bearing "SCR building panel" wall system was used (See ARCHITECTURAL RECORD, December 1957, p. 196). Horizontal truss built into bottom chord of roof trusses allowed panels to act as simple beams under lateral wind loads; end walls and interior cross walls were "X" braced to act as shear walls (see photo at right). Reaction of roof trusses tied to tops of panels delivered bearing loads of less than one kip per foot. Laboratory tests had indicated that such 8 ft panels could withstand bearing loads of over 30 kips per foot using boundary conditions identical to those in the actual structure.



is likely that joints 40 to 50 feet apart will prove satisfactory, as the history of conventional clay masonry attached to skeleton frames has shown successful construction free of cracks with expansion joints 100 to 200 ft apart, depending on the number of wall openings and abrupt changes in wall surface (i.e. re-entrant chases, short offsets etc.

Scale, Color, Texture

The choice of size of the individual panel units can greatly vary the appearance of the "SCR building panel." Since traditional clay product materials are intended to be laid by hand, the face size is proportioned accordingly. But the units for the "SCR building panel" will be fabricated into a panel in a factory, and the traditional sizes of clay units can be greatly expanded. Ideally, a panel unit should clearly express the fact that the unit belongs to a factory produced panel. Since industry's equipment can readily produce 12 in. wide units, 8 by 12 in., 12 by 12 in. or 18 by 12 in. face size units should prove desirable. Structural glazed facing tile units can be 16 in. wide and terra cotta 24 in. wide.

For curtain walls, a logical use of the panels is as horizontal bands over the spandrel beam. Also, filler panels may be used between the spandrel bands. The opposite approach to this arrangement may be vertical strips of panels. In addition, panels may be turned at right angles to the face of the wall and spanned from floor to floor as intermediate mullions. Panels arranged as mullions will provide considerable structural stiffness to the building facade. Where spandrel panels are used, projecting horizontal solar screens may be attached to the bottom of such panels, minimizing special structural supports within the building frame.

As to the choice of clay product materials, the palette of colors is almost infinite. For the unglazed clay products a wide range of colors are available, from pearl grays or creams through buff, golden and bronze tints, to a descending shade of red down to purple, maroon and gun metal black. Most of the unglazed tiles produced in this country are reds, buffs, and creams. Interesting color effects are secured through the use of iron or manganese spots.

With the use of glazed surfaces, it is easier to obtain green, blue and yellow hues. Structural glazed facing tile is obtained in a wide variety of mottles. The color possibilities of architectural terra cotta are almost unlimited; especially intriguing is reproduction of metallic colors.

The texturing of clay products is a matter of mechanically marking the face of the clayware. The traditional textures such as matte, rug, bark, scored, stipple, sand-molded, water-struck and sand-struck can still be obtained in the panel form, for these are matters largely concerning the manufacture of the ware and this, in no way, has been changed with the advent of the panel.

Since the panels are not a hand-laid piece of masonry, it is pertinent to reconsider the appearance of the joint. The imagination of the architect is certainly invited on this point. It is worthwhile to observe that the joints between clay units will be factory produced, whereas the joints between panels will be the result of on-site labor. Because of the difference in assembly, it is rather difficult to match in appearance these two kinds of joints. Where it is desirable to obtain a vertical joint identical in appearance to the horizontal, it is suggested that both be raked to such depth as to allow surface tuckpointing of the joint after the panel installation.

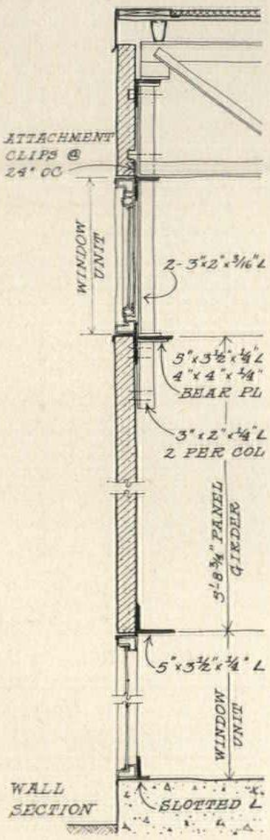
Field joints fall into two categories; the vertical joints and the horizontal. The horizontal joint would be flashed in most installations and contain weep holes. By considerable accent of either the horizontal joint or the vertical joint or both, the architect can create the feeling of large blocks of masonry, despite their creation from individual units precast into panels.

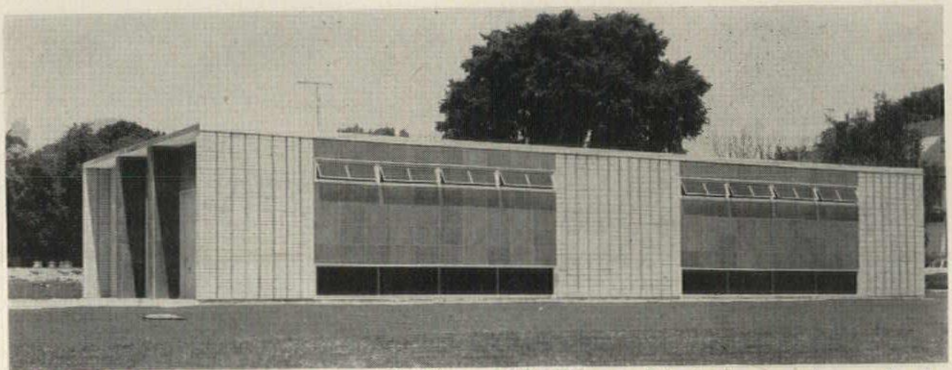
As in traditional mortar, a variety of pigments (green, tan, brown, red) may be added to suit the over-all color scheme. Such color admixtures preferably should be inorganic and added to the mortar in an amount not to exceed 10 to 15 per cent by weight of the cement (where black is desired the use of carbon black limited to 2 to 3 per cent by weight of the cement content is recommended).

The projecting or recessing of certain panel units, while possible, will of course be more costly. Consistent with the extrusion process, the face of units may be readily fluted to create a variety of effects. Folded or serpentine walls may be used easily with the "SCR building panel," and lap joints are possible also.

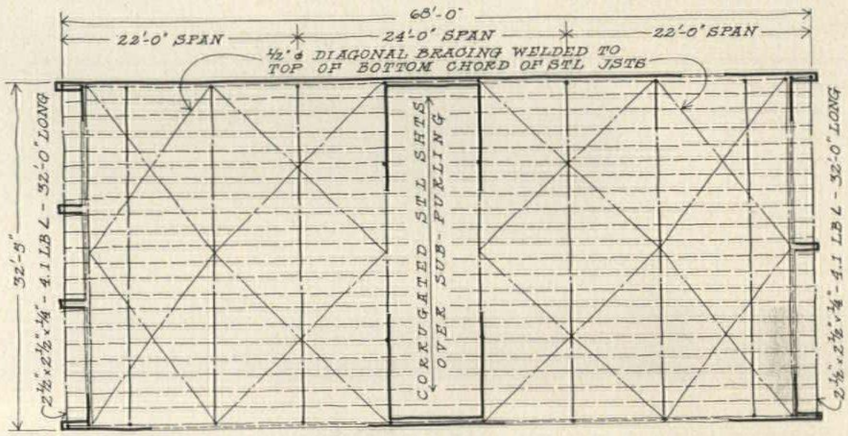
Structural Application

Under the curtain wall application of

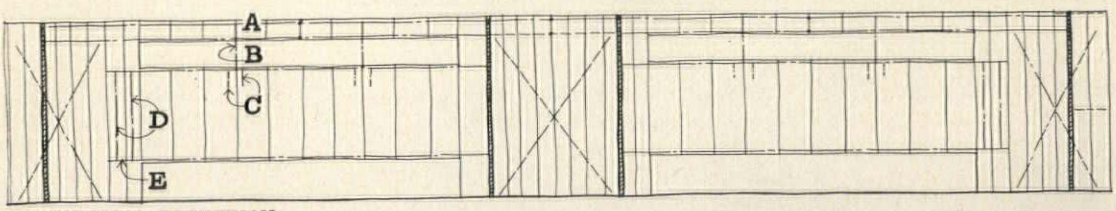




Structure above demonstrates application of "SCR" panel tests to one-story schools



ROOF PLAN

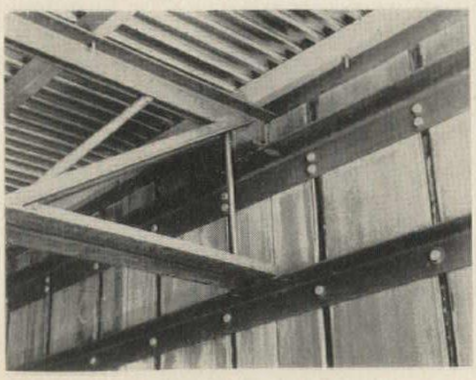


SOUTH WALL ELEVATION

Above: South elevation. A) 3½ by 3½ by ¼ in. top connection angle; B) 3⅛ in. mullion; C) 3 by 2 by ¼ in. angle; D) 2½ by 5/16 in. flat stock; E) 5 by 3½ by ¼ in. angle

Below: Structure simulates typical classroom layout with two rooms on either side of corridor (see roof plan above). Wall panels are tied together at top with two ledgers of steel angles (1). Interior view of plate girder (2) shows use of tie rods for shear resistance. "X" braced shear walls (3) carry lateral loads from roof diaphragm.

1



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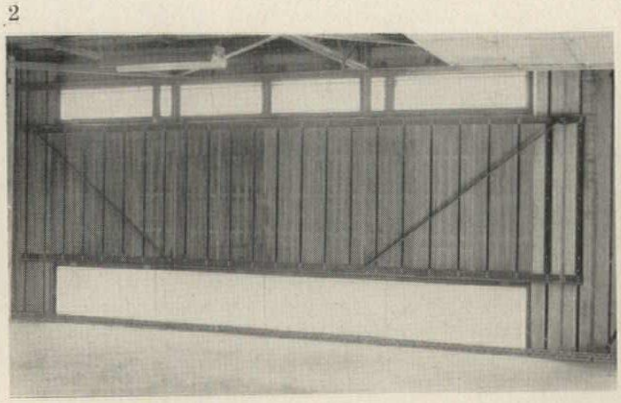

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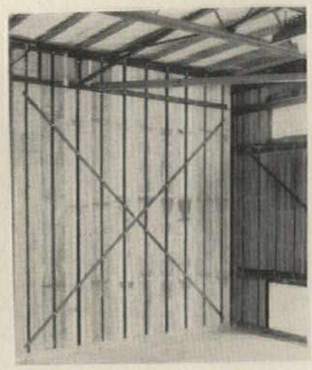
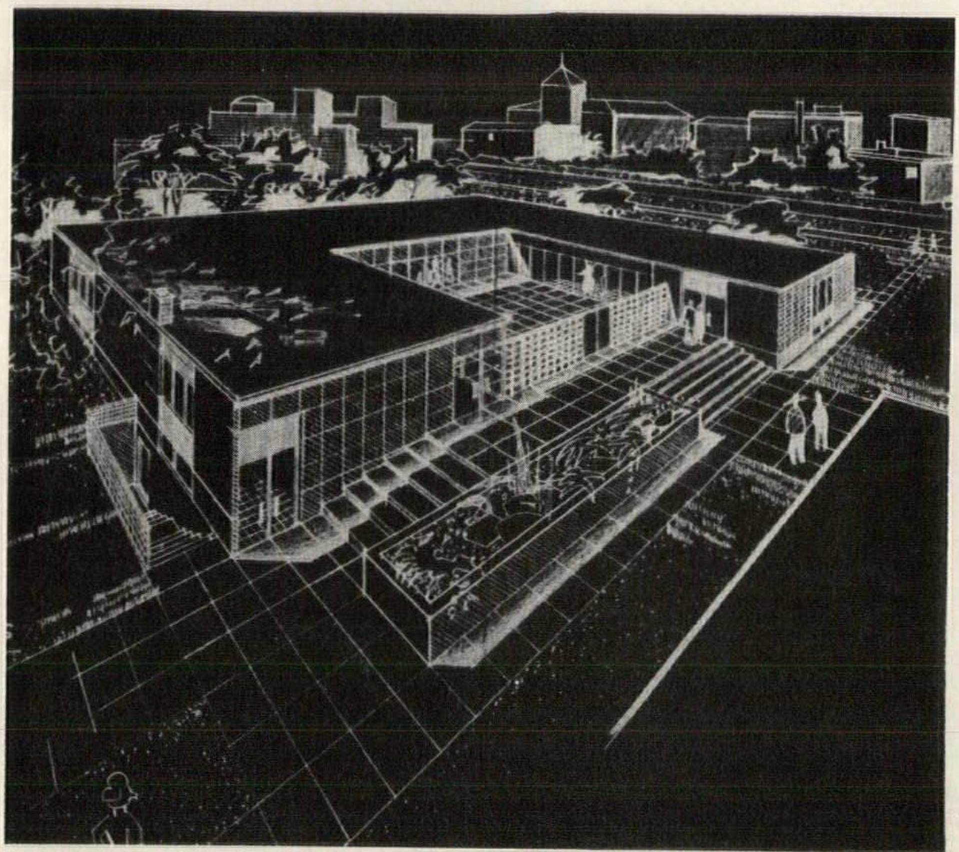
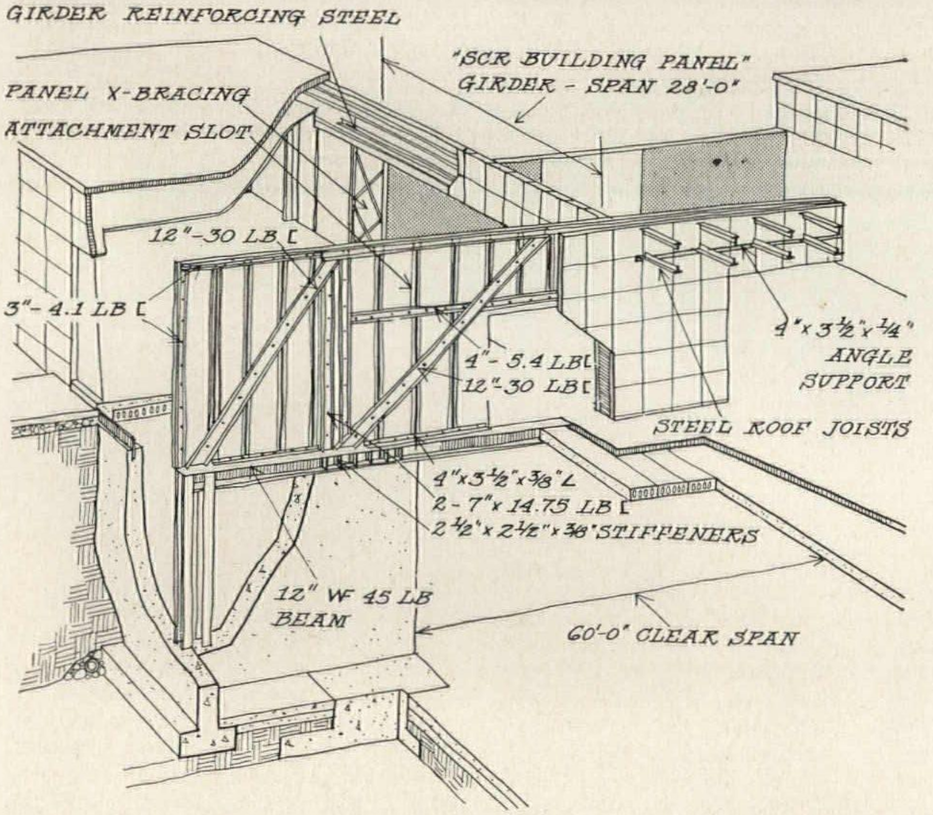




W. R. King, Architect



Design for a civic center in Batavia, Illinois, uses terra cotta building panels, each 13 ft high by 2 ft wide, for all exterior walls. The panels tie into a roof diaphragm at the top, and are "X" braced where necessary to provide racking resistance. As shown above, the roof load near the courtyard is taken by 28-ft spandrel girders. The central longitudinal wall is made up of a steel truss faced on both sides with terra cotta panels that assist the truss members in carrying the floor and roof loads across a 60-ft clear span over the basement

the "SCR building panel," its dimensions were largely proportioned by the requirement for wind forces resulting in a 2½-in. thick panel. During laboratory development and testing of the panel, it soon became evident that the panel had sizeable bearing and racking resistance. To fully exploit these properties, full scale structural tests were undertaken on bearing wall, shear wall, and spandrel girder arrangements of these panels. This work has suggested that the curtain wall panel be somewhat modified. The panel thickness has been increased to 3 in., and the attachment channel has been replaced by a structural tee whose cross is flush with the rear face of the panel. The two ⅜-in. reinforcing rods are placed as close to the front face of the panel as fire protection will allow. Cross ties hold the stem of the structural tee against withdrawal.

To create structural systems with these panels, the tendons of steel in the form of steel angles, channels, plates, or rods, must be attached to the back of the panels by arc welding, stud welding, or cartridge-driven bolts. It is anticipated that the structural panel will cost no more than the curtain wall panel because the increased material cost will be offset by the cheaper attaching steel. How will the structural utilization of the panel affect the total building costs? What credits may be applied to the ultimate costs previously obtained for the curtain wall panels?

To answer these questions, theoretical designs have been prepared to indicate the savings in the structural framing which the panel system is replacing. In general, for every three pounds of steel which the panel system replaces, over conventional steel framing, one pound must be used in the system to develop its structural capacity.

Structural utilization of the panel can result in substantial savings of steel framing costs. The largest credits are realized where spandrel girders are used and may approach $1.00 or more per sq ft of panel area. For one-story load-bearing use of the panels, the savings in structural steel are more modest: 30 cents per sq ft seems realistic, particularly where intermediate girts may have been required in the supporting frame. While this cost analysis has been carried out for comparison with structural steel, the same order of magnitude of savings over reinforced concrete framing should be expected.

Multi-story arrangements (maxi-

continued on page 274

Engineered Earth Fills: FOUNDATION SOILS MADE TO ORDER

by James L. Sherard
Woodward-Clyde-Sherard and Associates, Consultants in Soil and Foundation Engineering

General practice notwithstanding, buildings can be—and many have been—successfully founded on filled ground. Indeed, soil engineers can now construct compacted earth fills that are actually superior to most natural soils. In this article, the author reviews briefly some of the situations in which the use of such fills under building foundations has proved desirable, and some of their advantages and limitations.

It has long been an axiom in the architectural and engineering professions that buildings and other structures should not be placed on filled ground, except in those rare cases where the fill was originally of good quality and has been allowed to remain in place for many years. Like most of the "don'ts" of engineering practice, this one was firmly based on experience—primarily on unsatisfactory experience with fills that were nothing more than loosely-compacted masses of earth, frequently containing perishable and extraneous compressible materials, and almost inevitably unsuitable for foundations.

However, now that soil engineering has become a more precise science, and techniques have been developed for constructing compacted fills that are at least as good as, and often better than natural soils, the hard and fast "don't" is gradually being modified to "don't, unless" or even "do, if."

The initial impetus for the development of reliable engineered fills was provided by the hurry-up public works program of the early 'thirties. The methods now in use were devised then in an effort to find a way of producing uniform and dense rolled earthen embankments for reservoir dams, and were first described in a series of articles by Mr. R. R. Proctor which were published in *Engineering News Record* in 1933.*

Since that time, advances in soil engineering and the introduction of heavy compacting rollers have made it possible for engineers to construct earthen embankments and compacted fills whose properties are almost as uniform and well-defined as those of manufactured building products. Experience has demonstrated that controlled fills made up of a suitable material at a proper moisture content, placed in thin layers and compacted with a heavy roller under the continuous supervision of a competent engineer, are actually more uniform, less compressible, and less influenced by changes in ground water conditions than all but the best of natural soils. The procedures pioneered by Proctor have been used by dam engineers to construct earth embankments with heights of more than 500 ft, and are gradually moving into other branches of construction, where they have been used successfully to provide reliable foundation soils for many buildings and industrial structures. The movement, however, has been slow. In spite of the general acceptance of engineered fills in heavy construction, the building industry has not yet recognized the fact that the old—and well-founded—prohibition against the use of loosely-dumped, miscellaneous man-made fills under the foundations of buildings simply does not apply to modern "engineered" fills. At present, many large cities have codes which specifically prohibit the use of filled ground as a foundation material; and in others, building officials are, as a matter of general practice, adamant against approving any proposals for founding buildings on filled ground. Moreover, there are still many designers who, because of a lack of favorable experience or reliable information or both, do not yet take advantage of the opportunities offered by the use of compacted fills.

Essentially, since properly engineered fills are usually superior to equivalent natural soils, these "opportunities" may include considerable savings in the total cost of the structure, more flexibility in its design and, often, a shorter construction period. In some cases, the use of an engineered earth fill may even make it possible to build economically on a site that would otherwise be unsuitable for construction.

Typically, those site situations in which engineered fills offer distinct advantages, and have been used more or less extensively, can be broken down into three main categories: graded sites with large cuts and fills, sites with a surface layer of unsuitable soil, and sites which are underlaid with a thick layer of soft, compressible soil. More familiar, perhaps, is a fourth situation, which is often encountered in constructing warehouse-type buildings with raised floor slabs supported on earth fill.

Raised Floors Supported on Fill

Each year tremendous areas are enclosed by warehouse-type buildings with floor slabs constructed at an elevation several feet above the original ground level (dock height), as illustrated by Figures 1 and 2. Since the raised first floor is generally supported on earth fill, for this type of building there is a considerable advantage in also supporting the foundations for the interior columns on the fill.

In past years, the interior column footings were usually carried down to natural ground as shown in Figure 1, and placed by one of two methods:

*R. R. Proctor, "The Design and Construction of Rolled Earth Dams," Engineering News Record, vol. iii, 1933, p. 245

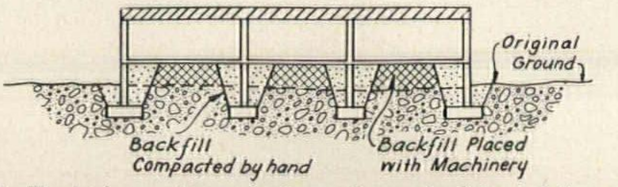


Figure 1. Typical one-story warehouse has raised floor slab supported on fill, footings for interior columns supported on natural soil below

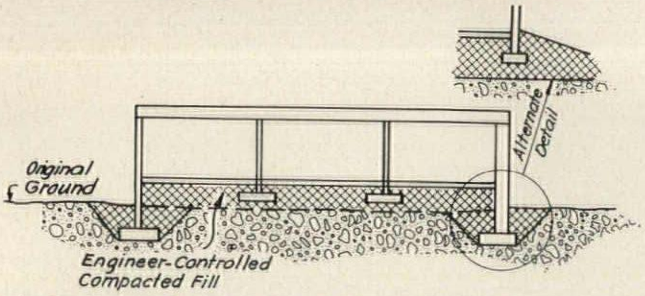


Figure 2. Preferred design places both slab and footings on engineered fill, with top of footings several inches below bottom of slab

1. The interior footings and pedestals extending up to the floor level are poured before the earth fill under the slab is placed; or
2. The fill under the slab is placed first and the interior footings are poured in excavations made through the fill.

Both methods are frequently used and both have disadvantages. When the first method is used, it is very difficult to obtain good compaction for the fill under the floor slab because the earth moving equipment and roller must operate without hitting the concrete footings and pedestals which are already in place. This frequently results in a poorly compacted fill and subsequent cracking of the floor slab. Also, the earth moving equipment frequently collides with the footings which are in place and breaks or moves them.

The disadvantage of the second method is that the limited volume of backfill placed over the footing must be compacted by hand labor. This is expensive and usually results in settlement of the slab adjacent to the column. The typical floor slab crack in the form of an angular ring around the column is well known to engineers using this type construction.

Another method (Figure 2), which avoids both of these disadvantages, places all the interior fill at one time as an engineer-controlled, compacted fill up to the bottom of the floor slab. The footings are then placed on the fill at such an elevation that the top of the footing is a few inches below the bottom of the slab. There are several advantages to this method:

1. The settlement of the column footings is less, and more uniform.
2. Less cracking of the floor slab develops. When the interior footings are to be supported on the fill, no one questions the need for placing an engineered fill and consequently the support under the whole slab is better.
3. The total cost is usually less. The extra cost of placing the fill properly is less than the saving resulting from the fact that the footings can be placed at a higher elevation.

Sites With Large Cuts and Fills

Another situation in which there are large economic and practical advantages to placing buildings on compacted fill is shown schematically in Figure 3. The designer is frequently faced with a construction site where the topography is too rough for the proposed buildings and occupancy, in which case it is common to grade or level the site by excavating the high points and filling in the low areas. If no special attention is paid to the compaction of the fill placed in the low areas, structures cannot be founded in these areas except by using piles or piers extending down into the natural ground. However, if the fill is placed as an engineer-controlled compacted fill, buildings often can be constructed on the filled ground on approximately the same type of footings as those used in the cut areas.

Many large housing and industrial developments as well as schools, churches and shopping centers have been successfully and economically constructed in graded areas using this technique, frequently with very substantial savings in money and construction time.

Figure 4, for example, shows an aerial view of a housing development constructed on the San Francisco peninsula in an area that once had extremely rough topography but was finally graded to a relatively smooth construction site with earth fills as thick as 80 ft in some areas. In this case, one-story houses were founded on the filled ground, but if the fill is properly engineered, there is no limit to the size of buildings which can be constructed on such a site.

Sloping Sites

A minor variation on the above situation occurs when the building site has a considerable slope over the whole area and it is desirable to cut and fill to obtain a reasonably level construction surface. Two methods that have been used to construct buildings on sites of this type are shown in Figure 5. Depending on the relative properties of the natural material and the compacted fill, the placing of foundations half on cut and half on fill may or may not be feasible. However, many buildings have been built in this way with so little differential settlement occurring that an expansion joint was not necessary or used.

Sites With a Surface Layer of Unsuitable Soil

Engineer-controlled compacted fills under buildings have also been used to great advantage in cases where the upper soil layer at the site consisted of soft silts and clays or loose uncompacted natural sands. In the past, in situations of this type buildings have usually been founded on piles or piers which carry the weight of the structure down to more competent soil bearing layers at greater depths. However, if the thickness of the surface layer of unsuitable material is not great or if the underlying material is not good for the practical or economical use of piers or piles, the construction method shown schematically in Figure 7 can often be very successful. In some cases it is possible to excavate the surface layer of material, stock pile it on an adjacent area, and then replace it in the excavation as a compacted engineer-controlled fill. In other cases, it is necessary to discard the material excavated and construct the fill with material brought in from another and better source.

At the site of the large steam-electric generating plant shown in

Figure 8, the surface soil was a dry, silty, medium sand which was considered by the designers to be too loose to support the heavy, vibratory loads of the plant without excessive settlements. The problem was solved by making an excavation to a depth of approximately 15 ft over the whole building site. The dry, silty sand that was removed was stockpiled directly adjacent to the excavation, watered and blended, and replaced in 6-in. water layers. The resulting compacted fill was extremely uniform, dense and incompressible. Careful settlement measurements taken during and after construction, and during the operation of the plant, indicated that the settlement was both low and uniform. The heavy stack shown was supported on a 30 ft diameter single footing. This settled very uniformly a maximum of about ½ in. which is considerably less than most structures of this type experience when founded on very good natural soils.

A similar method is currently being used to construct buildings in the "New Jersey Meadowlands," the unoccupied marshlands located in eastern New Jersey directly adjacent to New York City. For many years, even though the surrounding property is highly industrial and has commanded a high price, these rather extensive marshlands have remained vacant because they were considered unsuitable for construction. Now, buildings are being constructed safely in many of these areas by excavating a surface layer of the softest material and backfilling with a compacted fill of sand and gravel on which the building is subsequently founded.

Sites Underlined by a Thick Layer of Soft Compressible Soil

A somewhat different example of the use of compacted fill under buildings is shown in Figure 10. This is a more complicated case from the standpoint of soil engineering than the previous examples, but at some sites there is no other practical, economical solution.

The situation shown occurs when the natural soil underlying the site to a considerable depth is incapable of supporting the concentrated pressures imposed by a building foundation. This is often the case in the

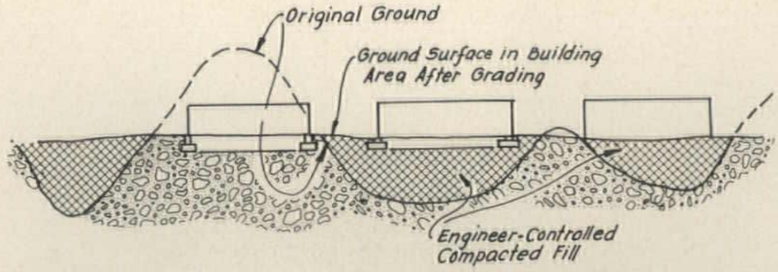


Figure 3. If fill is properly compacted when irregular site is leveled, same type of footings can be used in cut areas and filled areas

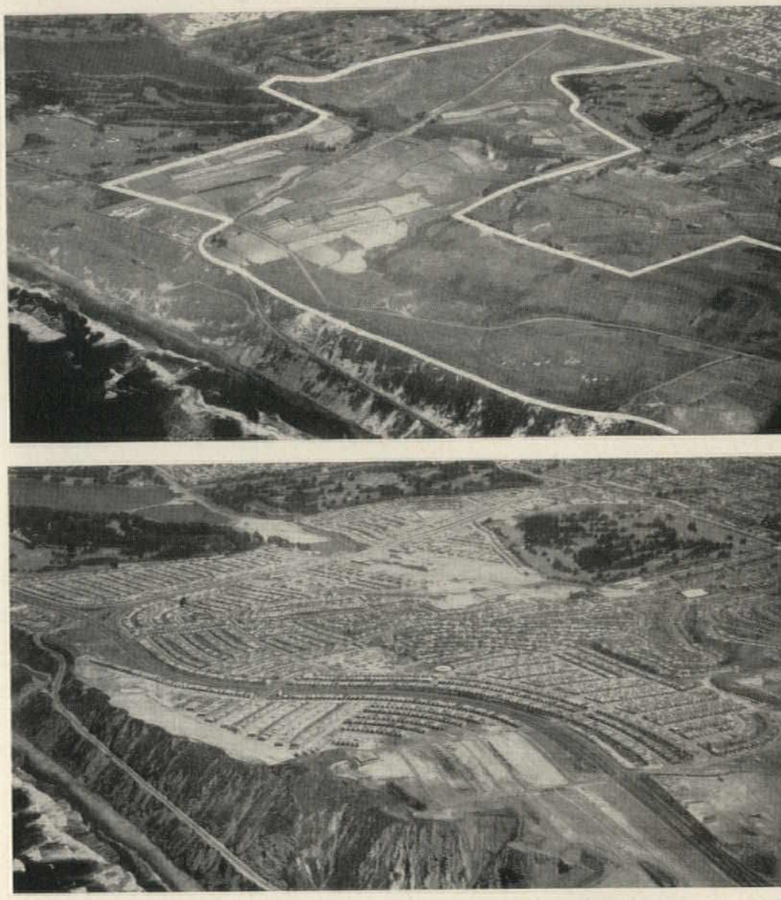


Figure 4. Contrasts present smoothly graded residential area with original rough site. Some houses are founded on fills up to 80 ft thick

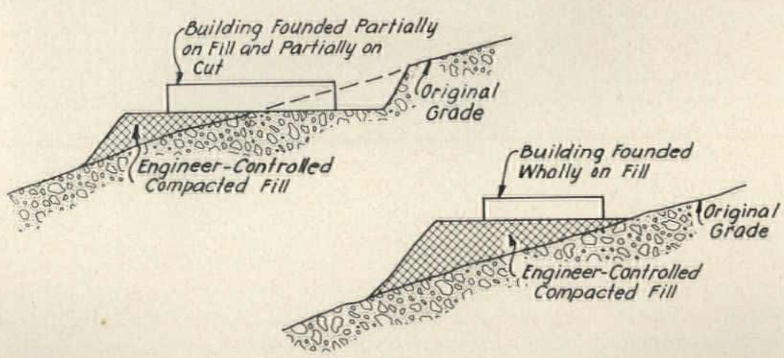


Figure 5. When sloping site is leveled by cutting and filling, building may be founded wholly on compacted fill or half on cut, half on fill

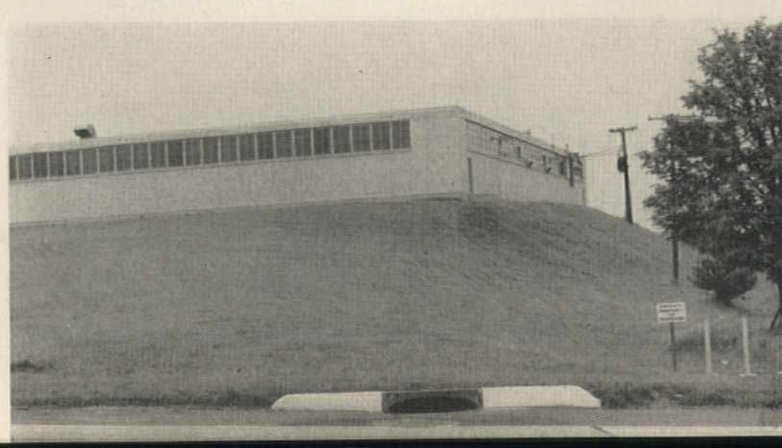


Figure 6. One-story building on New Jersey hillside rests partly on natural ground, partly on compacted fill (right in photo), as shown in Figure 5

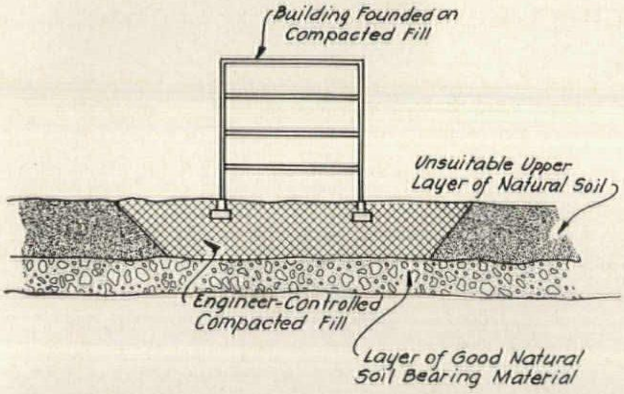


Figure 7. Surface layer of unsuitable soil may be replaced by engineered fill on which structures can be built without piles or piers

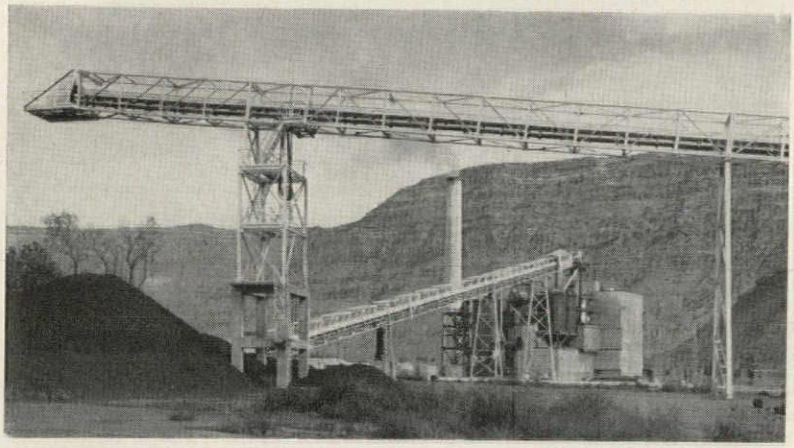


Figure 8. Heavy, vibratory loads of large generating plant above were supported by replacing surface sand with engineered, compacted fill

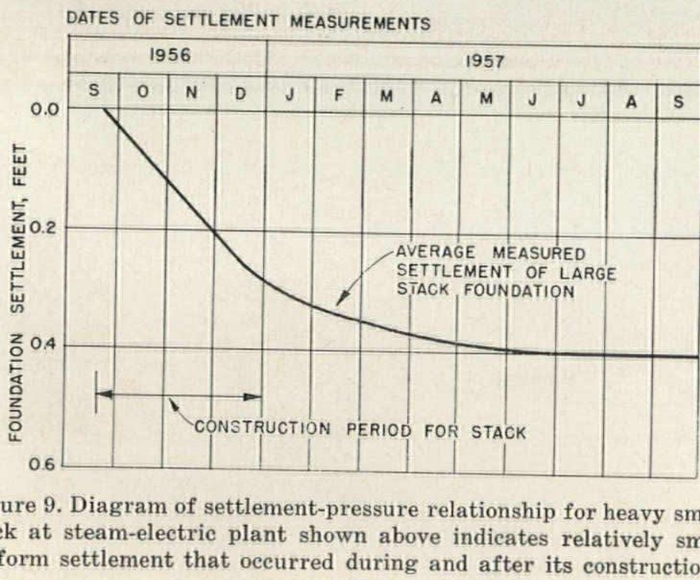


Figure 9. Diagram of settlement-pressure relationship for heavy smoke stack at steam-electric plant shown above indicates relatively small, uniform settlement that occurred during and after its construction

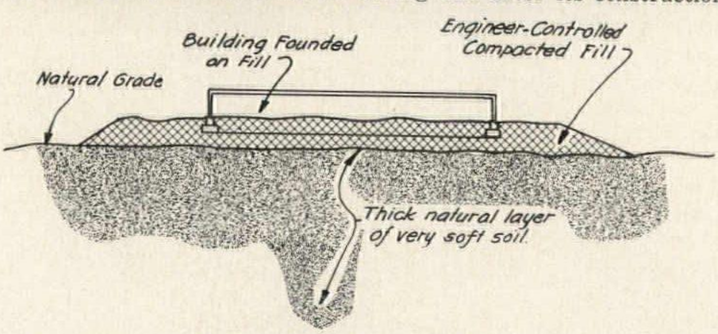


Figure 10. Building shown was founded on 6 to 8 ft of compacted fill placed over a thick layer of soft, compressible soil underlying a mud flat site

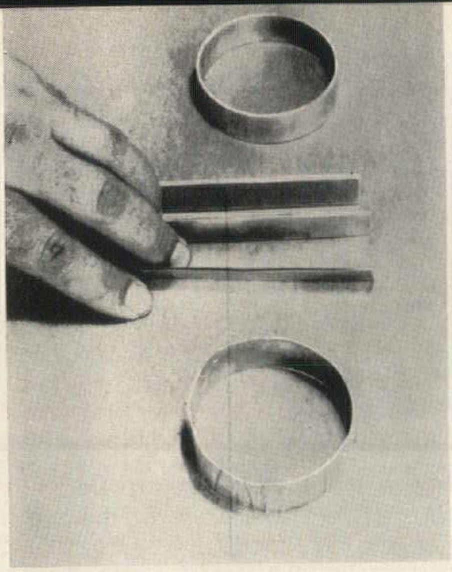
mud flats of a bay or estuary where the surface clay is extremely soft and also where it is necessary to raise the general ground area over the building site above high tide level.

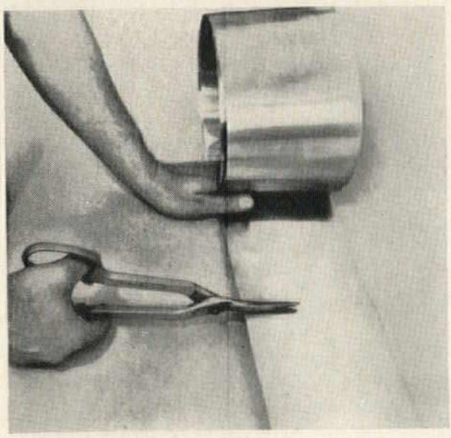
By placing a layer of well compacted fill on the surface, the engineer provides a strong and rigid surface layer which will spread out and dissipate the concentrated pressures of the building foundations before they reach the underlying soils. Obviously large total settlements are to be expected, but these may be taken care of in several ways. In some cases, the building area is pre-loaded with a heavier earth fill for a sufficient length of time to assure that subsequent settlements of the building will be small. In any event, buildings founded in this way must be designed as flexible structures anticipating appreciable differential settlement.

Construction Of Engineered Compacted Earth Fills

All the techniques described above for placing buildings and structures on compacted fill depend for their satisfactory use on the assumption that the fill is properly placed. The minimum specification for compaction acceptable in any given case of course depends to a large degree on the type of soil used for the fill and on the building details proposed. But in any situation where building foundations are to be placed on an appreciable thickness of compacted earth fill, the construction of the fill requires the full time supervision of a soil engineer equipped to take tests at regular intervals of time. The practice used by some designers of writing a set of specifications and then testing the end result usually results in unsatisfactory work.

Almost all soils can be used for satisfactory engineer-controlled fills. Generally the coarser the fill material, the more dense and incompressible will be the resulting embankment, but many perfectly satisfactory fills of considerable thickness have been constructed from clay-y soils. Most engineered fills are compacted in thin layers with sheepsfoot rollers. However, heavy rubber-tired rollers have also been used in many cases, and completely clean and cohesionless sands and gravels are best compacted with vibratory rollers.





Inflatable Tubing Offers Versatility, Economy

Experimental production of a light-wall seamless metal tubing that can be shipped in ribbon form and inflated at point of use got under way this fall. The new material, known as *Strubing* (strip tubing), is said to offer two major advantages. First, since only the tube "walls" are shipped and not the "hole," the inflatable tubing can be transported more economically. Field inflatability might, for instance, make it possible to ship the duct work for a seven-room house in a box the size of an orange crate, string the *Strubing* "ribbon" through the house, and then inflate it right in place for major savings in time and labor.

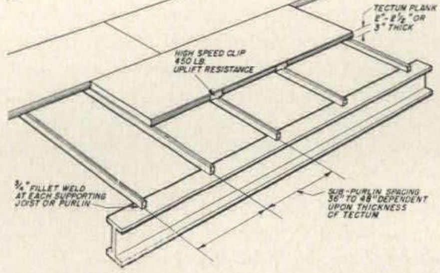
Second, the process used in making *Strubing* makes it possible to produce thin-wall tubing of materials, and in thicknesses, that are now either unavailable or available only at a prohibitive cost. The tubing is made by rolling conventionally-made pipe or tubing in such a way that the original tube becomes longer and thinner-walled as it is flattened (see photo above left), while the inside diameter remains the same. As a result, *Strubing* can be made in sizes smaller than a pencil lead or large enough for a man to walk through, and with walls as thin as household foil or as thick as conventional pipe. The methods used to inflate it will obviously vary with the application of the material and its dimensions. Hydraulic pressure, air pressure, and mechanical means have been used successfully thus far, and in some sizes, the tubing can be inflated simply by using water tap pressure.

Strubing is expected to find wide use in industries as diverse as packaging and communications. In the construction field, potential uses include downspouts and electrical conduit as well as ductwork. Because of its availability in long lengths and very light walls, the inflatable tubing might also simplify the problem of sheathing power distribution and communications cable. *Wolverine Tube Div., Calumet & Hecla, Inc., 17200 Southfield Rd., Allen Park, Mich.*

Box-Type Sub-Purlins Strengthen Low Cost Roof Deck Assembly

The new Tectum "Box Section Roof Deck Assembly," which is based on a rigid, box-type sub-purlin of galvanized steel, is said to offer both structural and economic advantages: the former via increased lateral rigidity and high uplift resistance, and the latter via lower material costs and faster erection. The sub-purlins are welded to the supporting beams or joists at spacings up to 48 in., depending on deck thickness. Each box-section measures 2⅜ in. high by 1⅞ in. wide, and weighs about half as much as a conventional bulb-tee sub-purlin.

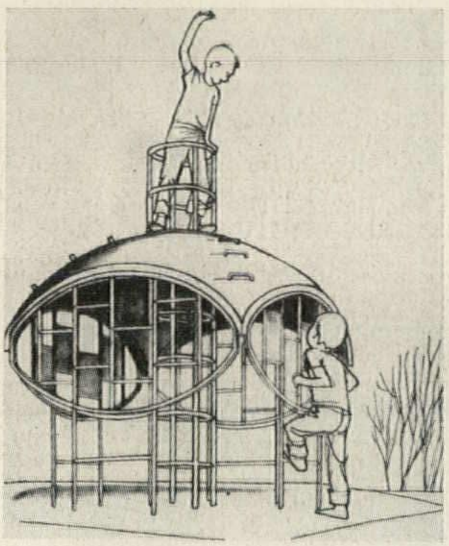
Tectum planks placed across the sub-purlins are anchored with special T-clips that slide easily into the slotted top of the box-section and are nested into the tongue and groove joint of the deck material. Uplift resistance is in excess of 450 lb per clip, so that with sub-purlins spaced on 36-in. centers, an uplift resistance of 60 psf is achieved—enough to meet requirements in hurricane areas. The system is also said to give maximum rigidity in all directions and, since there are no thermal breaks in the deck, improved thermal insulation. *Tectum Corp., Newark, Ohio.*



Recorder for Language Labs is Student-Proof, Easy-to-Use

A recent addition to the Califone line of language laboratory equipment is the *Simplex* Model LP 902 recorder, a precision tape deck which provides an easy-to-operate and virtually fool-proof means of tape recording in the classroom. When it is installed in a student booth, the student listens through headphones to a master tape which he records along with his own responses. Thus when he plays back the recording, he can compare his responses with the voice on the master tape. To prevent tampering, the tape deck is fully enclosed and operated by only two controls: a "Play-Record" lever and a "Rewind" lever. A signaling device that flashes a warning when the tape approaches the end also stops the reel automatically if the warning is disregarded, so that no tape handling of any kind is required. *Califone Corp., 1020 N. La Brea Ave., Hollywood 38, Calif.*

more products on page 284



The new PCA playground equipment catalog details a collection of 32 groupings, all related in design, coordinated in color, and correlated to the needs of specific age levels. Basic equipment groups include: *Magic Forests* made up of tree, stump and saddle shapes of reinforced concrete with colorful stationary steel crowns and attaching circular aluminum platforms; hexagonal, pressed-steel *Poly Blocks* with bright colored aluminum treads; *Play Shell-ters* (above) composed of dome-shaped cast aluminum shells with a variety of climbing grilles, supports and sliding poles; *Play-on-Words*, which are 2-ft-high aluminum letters generally used as fences; and flexible *Networks* of linked aluminum bars in kaleidoscopic color arrangements. Detailed information on the materials, sizes, colors, etc. of components in each group is supplemented by plans, elevations and renderings of the combinations recommended for particular age levels. A separate section describes packaged *Playscapes* made up of visually and functionally related equipment pre-selected to give the most activity for the lowest budget. 48 pp. *Playground Corporation of America, 5 Union Sq., New York 3, N. Y.*

How to Cure Sick Chimneys
Outlines problems encountered in venting combustion equipment, and the use of *Shur-Flo* draft inducers in solving them, 14 pp. *Walker Mfg. and Sales Corp., 1711 Penn St., St. Joseph, Mo.*

Panelfab Houses and Buildings
Discusses building system based on use of load bearing wall and roof sections; and describes the wide variety of modular sandwich panels and finishes available, panel construction, types, uses, typical plans, site preparation and erection. *Panelfab Products, Inc., 2010 N.E. 146th St., North Miami, Fla.**

Power-Strut Movable Partitions
Bulletin 401-3 illustrates and gives specifications and construction details for *Power-Strut* line of movable partitions for use in research laboratories and industrial plants. 16 pp. *Power-Strut, Inc., Framingham, Mass.*

Fire Doors and Windows
NFPA No. 80, a complete revision of the previous standard on this subject, classifies doors and windows in terms of hours of resistance to standard test fires. It is fully illustrated with drawings showing standard methods of installation of fire doors, hardware, automatic closing devices and other details. 72 pp., 75¢. *National Fire Protection Assn., 60 Batterymarch St., Boston 10, Mass.*

Atlas White Portland Cements
(A.I.A. 3-A-23) Describes and illustrates with photos and typical installation details the principal uses of white, non-staining portland cements in building construction and products manufacture. 24 pp. *Universal Atlas Cement, 100 Park Ave., New York 17, N. Y.**

Flat-Plate Concrete Slabs
. . . and the Use of Sonovoid Fibre Tubes, by Humberto J. Benet, M.S., C.E., discusses and outlines a design procedure for two-way flat plate slabs with voids produced by laminated fiber tubes. A second paper by Mr. Benet and Fausto Bojorquez, M. E., gives detailed data on the effect of the fiber tubes on the strength and load distribution of the flat plate concrete slabs. Both papers are available from *Sonoco Products Co., Hartsville, S. C.**

Pneumatic Tube Systems
(A.I.A. 35-H-21) General Information Handbook contains information and operating details on *Transitube* fully automatic pneumatic tube systems. Detailed engineering and specifying data cover the design, application and installation of the systems and allied components. 52 pp. *The Grover Co., 25525 W. Eight Mile Rd. Detroit 40, Mich*

Safeguard Building Dollars
Discusses use of *Wolmanized* pressure-treated lumber to protect timber construction from damage caused by termites, decay and dry rot. 16 pp. *Wood Preserving Div., Koppers Co., Inc., 750 Koppers Bldg., Pittsburgh 19, Pa.**

Radiant Heating Slab Construction
(A.I.A. 30-C-44) Includes sketches of various types of radiant heating slab construction and a digest of construction recommendations. 8 pp. *A. M. Byers Co., Box 1076, Pittsburgh 30, Pa.**

Automatic Controls for Heating,
Air Conditioning and Refrigeration gives full specifications plus a description of operation and general applications for each model in a complete line of controls. Unit R-1650, 56 pp. *White-Rodgers Co., 1209 Cass Ave., St. Louis 6, Mo.*

Commercial Kitchen Equipment
Annual *Fact Book* of commercial electric kitchen equipment is a comprehensive buyer's guide to the products of 91 leading manufacturers in the field. Items in twenty major categories of equipment are illustrated and described in detail as to features, performance, dimensions, capacity or production, and electrical specifications. 76 pp., $1. *Fact Book, Food Service Magazine, 2132 Forden Ave., Madison 1, Wis.*

Laboratory Fume Hoods
(A.I.A. 35-E) Describes and illustrates complete line of *Airflow* and other laboratory fume hoods. Engineering data includes elevation, duct location and roughing-in drawings; face velocity and CFM recommendations; blower data; and hood service and electrical fixtures. 48 pp. *Kewaunee Mfg. Co., 5046 S. Center St., Adrian, Mich.*

Marble and Granite Source Book
Contains individual data sheets which illustrate, describe and give specifications for many varieties of marble and granite. Technical data on each includes physical properties, strength ratios, hardness characteristics, and density. *Vermont Marble Co., Proctor, Vt.**

**Additional product information in Sweet's Architectural File.*

more literature on page 312

A REFERENCE GUIDE TO HOSPITAL ELECTRICAL FACILITIES: 1

by Noyce L. Griffin, Electrical Engineer, Architectural and Engineering Branch, Division of Hospital and Medical Facilities

It is essential that the electrical supply be for hospitals adequate and dependable. Blood banks, refrigerators, respirators, surgical lighting, as well as other vital equipment, cannot be without electrical power for even short periods.

The demand on electrical energy is usually higher than for most building types. For this reason, the quality of materials and equipment must be high and future maintenance must be considered during the course of the design.

ELECTRICAL SERVICE

MAIN ELECTRIC SERVICE

The electric service brought into the building may be primary or secondary depending upon the load demands and other local conditions. An underground service usually costs four to eight times that of a conventional overhead service but is generally preferred for hospitals because of landscaping and reduction of the probability of service interruption due to storms, ice loads, or other overhead disturbances.

TRANSFORMERS. If the service brought into the hospital is primary or high voltage, several types of step-down transformers may be used. A nonflammable, nonsludging, insulating, liquid-filled transformer offers high impulse strength and low maintenance. However, air-cooled and gas-cooled transformers of high quality are available.

The open dry-type transformer has less impulse strength than the liquid-filled type. Frequent cleaning is required and it is suitable for indoor use only. The sealed dry-type transformer has many advantages of the liquid and the open dry types, and it has the same impulse strength limitations as the open dry-type transformer; but in addition it is dust-tight and weatherproof. It can be installed at lower cost and requires less space than the liquid type.

CIRCUIT BREAKERS for switching of main secondary circuits are usually the drawout type in larger hospitals, or the molded case type in smaller hospitals. The drawout type is more expensive to install but provides a higher degree of protection, reliability, and ease of maintenance.

DISTRIBUTION. Three-phase, 4-wire 208y/120 volt distribution systems are generally preferred for small hospitals because of economy and convenience in providing for both 3-phase and single phase connections at the distribution panels. A higher voltage system such as the 3-phase, 4-wire 480y/277 volt system, using dry-type transformers for 120-volt service may be more economical for large hospitals which operate several large motors. The nominal voltage of any distribution system should be that of an industry standard conforming to American Standards Association Publication 84.1, "Preferred Voltage Ratings for A-C Systems and Equipment."

The simplest and cheapest scheme of distribution is the "simple radial system." Improvement in flexibility and dependability may be obtained at additional cost by one of several variations of this system. Many schemes of distribution are workable, and general information may be obtained from handbooks on electrical facilities for hospitals.

EMERGENCY POWER

A reliable source of emergency power for lighting and for operation of essential equipment is necessary. The three sources of power which have been used are storage battery, second utility line, and generator. A generator on the hospital site is preferable to either a storage battery or a second utility line for the following reasons: (a) storage batteries have a limited capacity and the direct current for services such as operation of motorized equipment or fluorescent lighting; (b) a second utility line is usually subjected to the same factors contributing to power interruption as those of the main utility service.

When a second utility line is used as the only source of emergency power, it should be from a generating plant separate from the source of main power and should be routed and connected so that any fault on the main feeder would not be transmitted to, or likely to cause an outage of the emergency feeder.

Generators on the hospital site may be driven by any suitable prime mover such as gasoline, gas, or diesel oil internal combustion engines or steam turbines. The selection of the type of generating unit is usually influenced by the dependability of fuel supply or whether the emergency power will be used frequently to carry a part of the load during normal operation. Generally, the internal combustion engine generating units are intended as a standby service only, while the steam turbine units are sometimes operated during periods of maximum demands daily, and where such operation may result in a more favorable power rate from the utility company.

A switch-over gas and gasoline fuel supply for small and medium sized internal combustion engines offers greater flexibility of operation in case of scarcity or depletion of either fuel. Starting gasoline engines on bottled gas and then switching to gasoline has been suggested as a more positive assurance of avoiding failure of automatic starting.

An arrangement of feeders so that a planned selection of loads may be connected or dropped from the emergency service is desirable, to more fully utilize the available capacity of the emergency service and also to prevent overloading to the point of trip-out of the entire service. Such a design is a particularly important convenience when adding fixed or mobile emergency capacity to an existing system and also for minimizing a trip-out of service to a highly important area. The switching of emergency power for critical areas should be automatic. Pickup or dropout of other circuits should be selective and may be either manual or automatic. In some hospitals designed for treatment of poliomyelitis patients, circuit feeders are divided into three groups designated as "critical," "semicritical," and "noncritical."

TELEPHONE SERVICE should be brought into the building underground, where practicable, and should be kept well separated from electric power service. Telephone cables should be routed to avoid locations where they would be subject to mechanical injury, excessive heat, or chemical erosion.

PANELBOARDS AND SWITCHBOARDS

All panelboards and switchboards should be of the dead front type, enclosed in metal cabinets with hinged doors and latches, and with the connection schedule under a transparent protective material. Where locked cabinets are provided, all locks should be keyed alike.

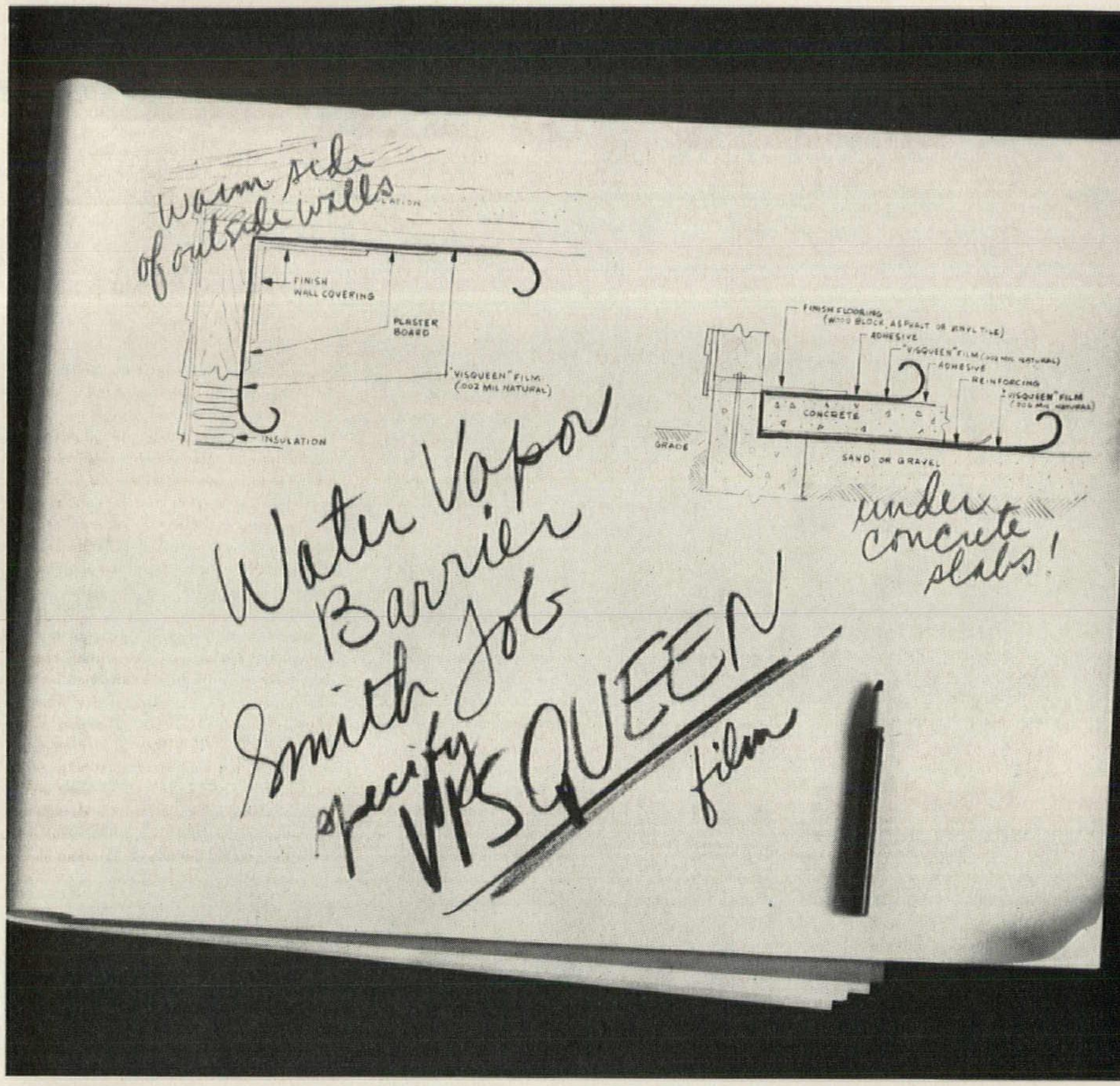
Suitable working space at panelboards and switchboards should be provided and maintained as required by the National Electrical Code, Section 1116.

Switchboards which have thermal trip overload devices should be located in a well ventilated space to prevent trip-out at less than the preset current rating due to excessive ambient temperature.

Distribution panelboards should be located in corridors rather than in confined spaces such as linen or janitor's closets. Panelboards serving lighting circuits should be located on the same floor as the respective lighting outlets and should be spaced so that the length of the branch circuits will not exceed approximately 100 ft.

SWITCHES

Automatic circuit breakers for power and light feeders and for the lighting and re-



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A REFERENCE GUIDE TO HOSPITAL ELECTRICAL FACILITIES: 2

by Noyce L. Griffin, Electrical Engineer, Architectural and Engineering Branch, Division of Hospital and Medical Facilities

ceptacle branch circuits, while more expensive than fused switches for the initial installation, are preferred.

The general types of automatic circuit breakers usually employed are thermal or magnetic, or a combination of both. The thermal type will permit a long delay before tripping on light overloads or a short delay on heavy overloads. The magnetic type will permit instantaneous tripping on heavy overloads or short circuits. A combination thermal and magnetic tripping action for the circuit breaker has wide applications and is preferred for protection of small wires and flexible cords used on lighting and appliance branch circuits.

Local and wall switches of the silent type are recommended in all patient areas to reduce noise. Wall-mounted switches are preferred to pull switches to reduce maintenance. Where lights are installed in small closets, door-operated switches are recommended. Switches installed or operated within a location defined as hazardous because of use or storage of combustible anesthetic agents should be approved for use in Class 1, Group C hazardous atmospheres. Switches controlling the ungrounded circuits in anesthetizing locations such as operating and delivery rooms must have a disconnecting pole in each conductor.

Switching of lighting circuits by means of a low voltage control system is applicable to hospitals, particularly in large areas such as auditoriums, assembly halls, or laboratories.

WIRE

All feeders and branch circuits should have high grade insulation as required or permitted by the National Electrical Code to assure optimum life and dependability of the electrical system. High temperature wire is required at range hoods, boilers, etc. Lead sheath or waterproof wire should be used underground and where condensation may form, as in outdoor conduits, refrigerator boxes, roof slabs, and connections to outside lights. The Code should be consulted for special conditions.

CONDUIT

All hospital wiring should be in conduit to facilitate alterations and repairs. Wiring for the patient-nurse call system should be in conduit of ample size to permit a reasonable amount of change in the system with a minimum amount of labor and structural changes.

Where only one set of service conductors is brought into the building underground, spare conduit facilities should be provided to expedite restoration of service in case of a failure in the service conductors between the building and the street or main service connection.

Underground conduit should be nonmetallic and encased in concrete. Explosion-proof wiring must be in rigid conduit. Spare conduits or conduit sleeves through walls or floors are advisable where future service is planned or contemplated.

LIGHTING

Lighting in all areas of the hospital should be designed for comfortable seeing. Luminaires should be durable, a standard type, neat, attractively designed, easily cleaned and relamped.

WORK SPACES should be relatively free from shadows and have sufficient illumination on work areas to eliminate the need for portable units with extension cords on floor or work area.

GENERAL AREAS. The lighting of offices, corridors, assembly halls, shops, boiler and machine rooms, kitchens, and storage spaces can be treated as in other types of buildings. The Illuminating Engineering Society Handbook should be consulted.

PATIENTS' ROOMS should have installed lighting for three distinct services: (1) general illumination for the room, (2) a reading light for each patient, and (3) a night light in the room. A fourth service, a doctor's examining light, may be an installed unit or a feature incorporated into the patient's reading light, or the light may be supplied by a portable lamp with an extension cord. This examining light should produce approximately 100 foot-candles over a limited area. A fixed ceiling-mounted examining light arranged to illuminate the entire bed area might be uncomfortably glaring for the patient, but it need not be left on longer than required for the examination. Such an arrangement is preferred to hand-held or portable examining lights.

NIGHT LIGHTS can be included as an added feature to the reading light or other units, but the flush wall-mounted type is generally preferred. Wall-mounted night lights should be about 18 in. above the floor, located so that they are not likely to be covered by furniture or drapes. Night lights should be switched at the door.

RECOVERY ROOMS and intensive care rooms of Progressive Patient Care units should have about 30 foot-candles of general illumination.

Patients frequently complain about the radiation of heat from a nearby reading light. A unit with an output intensity sufficient to permit adequate lighting when the unit is located a greater distance from the patient will reduce the objectionable heat. Where two or more beds are located in one room, the reading lights should be of a type that can be installed or adjusted so as not to shine in other patients' eyes. Each reading light should have a switch control accessible to the patient.

OPERATING AND DELIVERY ROOMS should have general illumination of about 100 foot-candles for the room area and special, separately controlled lights for the tables.

The major operating light should provide a multibeam of larger area for directing a minimum of 2500 foot-candles in the center of a 10-in. diameter circular area on the operating table, and tapering to not less than 500 foot-candles at the edge of that circle.

DELIVERY ROOMS require about the same general illumination as operating rooms. If the room is used for all deliveries, including Caesarean section and others which require extensive surgery, lighting at the table should be equal to that recommended for operating rooms. Where it is contemplated that the room will be used only for normal deliveries and for those which require only minor surgery, the light at the table may be somewhat less than that required for operating rooms.

MINOR SURGERY, EMERGENCY ROOMS, CYSTOSCOPIC ROOMS, AND AUTOPSY ROOMS should have about 100 foot-candles general illumination. These rooms should have supplemental lighting either by ceiling-mounted adjustable luminaires or portable units which will provide spot intensities of 2000 to 2500 foot-candles.

FRACTURE ROOMS need about 90 foot-candles general illumination with supplemental lighting for the table of about 200 ft-c.

LABORATORIES require about 50 to 100 foot-candles, depending upon the seeing task. Currently recommended foot-candles listed in the IES Lighting Handbook, Third Edition, 1959, should be consulted.

Where critical observation of color is required, as in surgery, laboratories, and autopsy rooms, color correction of the light may be necessary to provide a color effect as nearly as possible to that by which tests or specimens are ordinarily viewed. Daylight and incandescent filament lamp lighting have in the past been the most commonly accepted sources of illumination for critical seeing involving color determination.

A REFERENCE GUIDE TO HOSPITAL ELECTRICAL FACILITIES: 3 *(Concluded in November)*

by Noyce L. Griffin, Electrical Engineer, Architectural and Engineering Branch, Division of Hospital and Medical Facilities

CURRENTLY RECOMMENDED ILLUMINATION FOOTCANDLES FOR HOSPITAL LIGHTING

(Minimum on the task at all times)

Anesthetising and preparation room	30
Auditorium	
Assembly	15
Exhibition	30
Autopsy and morgue	
Autopsy room	100
Autopsy table	2500
Morgue, general	20
Central sterile supply	
General	30
Needle sharpening	150
Corridor	
General	10
Operating and delivery suites and laboratories	20
Cystoscopic room	
General	100
Cystoscopic table	2500
Dental suite	
Waiting room	
General	15
Reading	30
Operatory, general	70
Instrument cabinet	70
Dental chair	1000
Laboratory, bench	100
Recovery room	5
Dining areas	20
Encephalographic suite	
Office	100
Workroom	30
Patients' room	30
Emergency room	
General	100
Local	2000
EKG, BMR and Specimen room	
General	20
Specimen table (supplementary)	50
Examination and treatment room	
General	50
Examining table	100
Eye, ear, nose and throat suite	
Dark room	10
Eye examination and treatment room	50
Ear, nose and throat room	50
Exits, at floor	5
Flower room	10
Formula room	30
Fracture room	
General	50
Fracture table	200
Kitchen	
Central	70
Floor, kitchen and pantry	70
Dishwashing	30
Laboratories	
Assay rooms	30
Work tables	50
Close work	100
Laundry	70
General	30
Pressers and ironers	70
Sorting	70
Libraries	70
Linen closet	10
Locker rooms	20
Lobby	30
Lounge rooms	30
Maintenance shop	
General	30
Work benches	100
Paint storage	10
Medical records room	100
Nurses' station	
General	20
Desk and charts	50
Medicine room counter	100
Nurses' workroom	30
Nurseries	
General	10
Examination table	70
Play room, pediatric	30
Obstetrical	
Cleanup room	30
Scrubup room	30
Labor room	20
Delivery room, general	100
Delivery table	2500
Offices	
General	100
Bookkeeping and fine work	150
Conference and consultation room	30
Information and switchboard	30
Retiring room	10
Waiting room	20
Parking lot	5
Power plant	
Boiler room	10
Machine room	20
Switchboard room	30
Transformer room	10
Pharmacy	
General	30
Work table	100
Active storage	30
Alcohol vault	10
Private rooms and wards	
General	10
Reading	30
Psychiatric disturbed patients' areas	10
Radioisotope facilities	
Radiochemical laboratory	30
Uptake measuring room	20
Examination table	50
Retiring room	10
Sewing room	
General	20
Work area	100
Solariums	20
Stairways	20
Storage, central	
General	15
Office	70
Surgery	
Instrument and sterile supply room	30
Cleanup room (instruments)	100
Scrubup room	30
Operating room, general	100
Operating table	2500
Recovery room	30
Therapy	
Physical	20
Occupational	30
Toilets	10
Utility room	20
Waiting room	
General	15
Reading	30
X-ray room and facilities	
Radiography and fluoroscopy	10
Deep and superficial therapy	10
Dark room	10
Waiting room, general	15
Waiting room, reading	30
Viewing room	30
Filing room, developed films	30
Storage, undeveloped films	10

EMERGENCY LIGHTING should be provided for safety of patients, staff, and protection of plant. As a minimum in any case, emergency lighting should be provided for operating and delivery rooms, exits, stairs, corridors, switchboard, and boiler rooms. Additional emergency lighting will be needed where hospitals may be without the normal service for days or weeks due to disasters and where care is to be provided for a large number of casualties.

Exit, stair, and corridor lighting should conform to local and State codes, or if such codes are not in effect, the "Building Exits Code" of the National Fire Protection Association.

Illuminated signs may be required in areas where there is much visitor traffic, such as at the information desk, cashier's office, and outpatient department. Where such lighting is likely to be required, plug-in receptacles should be conveniently located.

An X-ray film illuminator is required in each operating room. It is also desirable that one be installed in the doctors' locker room of the obstetrical suite.

RECEPTACLES

Convenience outlets should be installed in all places where plug-in service is likely to be required. Duplex receptacles are generally preferred, except for heavy duty service or other specific requirements. Grounding type receptacles should be installed in kitchens, pantries, utility rooms, laundries, laboratories, boiler rooms, and other work areas likely to have wet floors.

Each operating and delivery room should be provided with not less than three receptacles of the lock-in type suitable for interchangeable type plugs as described in NFPA No. 56 of The National Fire Protection Association.

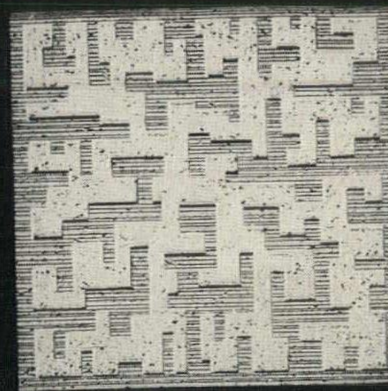
Patients' bedrooms should have at least three duplex outlets for single-patient rooms, with two outlets near the head of the bed. Rooms for more than one patient should have a similar arrangement of outlets. Preferably, there should be two duplex outlets at the head of each bed, or at least three outlets on the head wall for each two beds side-by-side.

Each bed in recovery rooms and in intensive care nursing rooms should have two duplex receptacles near the head of the bed. Intensive care nursing rooms should, in addition, have two 3-phase, 4-pole outlets, 30 amperes or larger, as required, for motorized equipment and mobile X-ray. The recently introduced 30 ma mobile X-ray requires 60-ampere, 230 volt receptables.

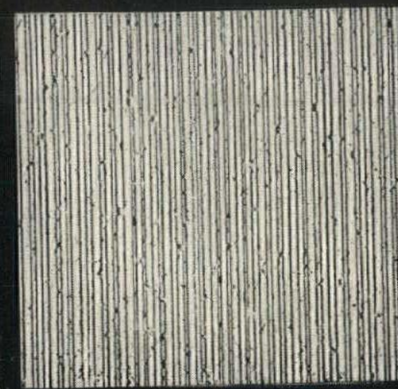
Corridors should have grounding type outlets, rated at 20 or 30 amperes, as required for use of mobile X-ray and cleaning machines. In corridors of patient areas, outlets should be spaced on 40-ft.


FRENCH CURVE

PRISM



LABYRINTH



STRIATED

New SCULPTURED TRAVACOUSTIC designs... for acoustical function with a flair

Sculptured Travacoustic tiles give the whole interior a touch of quiet elegance. These four handsome ceiling patterns stand out in rich bas relief with the subtle texture of chiseled stone. Used either alone or in combination with the basic Fissured Travacoustic tile, Sculptured Travacoustic adds striking new dimensions to private offices, board rooms, fine restaurants and any interior where a touch of design is important.

Sculptured Travacoustic is eminently practical, too. As an acoustical tile, it soaks up the clatter of the workaday world (up to 80 NRC) Made of mineral fibres, it's non-combustible, easy to vacuum-clean, and may be repainted as often as necessary.

Ask your local Gold Bond® Acoustical Contractor (see the Yellow Pages) for full-sized samples and technical information, or write Dept. AR-109.

NATIONAL GYPSUM COMPANY, BUFFALO 13, NEW YORK

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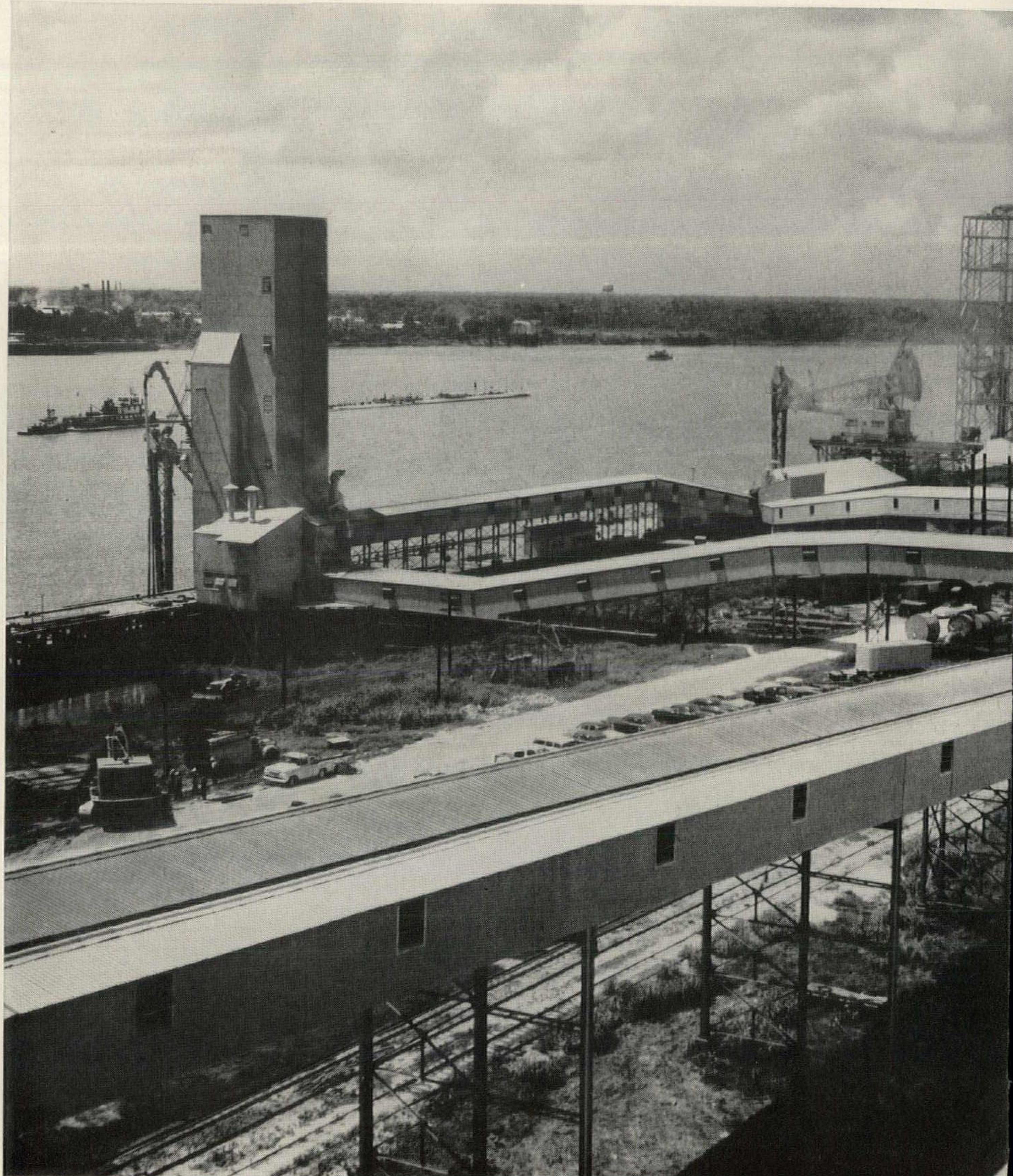
Gold Bond
BUILDING PRODUCTS



Gold Bond Applicator: Taylor Seidenbach, New Orleans, La.

CLAY MASONRY

continued from page 256

mum of 4 stories with single thicknesses of the "SCR building panel") of load-bearing panels and spandrel panel girders can result in steel savings intermediate between these two extremes: about 65 cents per sq ft of panel area.

Experimental work has included compression, shearing and flexural tests on panel assemblages. Compression tests indicate that any bending of the relatively slender panel is due primarily to chance crookedness and inherent eccentricities within the panel, plus those eccentricities that are a part of the design at the point of load application. Only further empirical testing will tell at what thinness (less than 2½ in.) buckling will be the dominant mode of failure.

Compression tests were carried out on panels under simulated lateral wind loads. In both the racking and flexural tests (full scale tests on shear walls with spandrel plate girders) the dominant factor is the slip or shear transfer between panels.

For shear walls the use of shear plates over the panel joints has proved successful in tests. Ideally, such plates may be adhered to the back of the panels with a uniform contact; for such purposes 100% reactive organic cements (such as epoxy) has been investigated.

In plate girder assemblages the shear transfer between panels is best obtained through the use of a chord member that follows the moment diagram; for uniform load this gives rise to a "bow-string" member, preferably the tension flange. The outstanding legs of any steel members attached to the back of spandrel girder assemblages afford a significant measure of lateral stiffness. As the probable depth to span ratios of spandrel girders will range from 1:4 to 1:8, such panel systems are very stiff. From tests the comparable deflection of steel beams of equal strength is about twice as great.

Before design formulas and tables will be available to the design profession, some analysis remains in order to evaluate current test results and apply theoretical studies to extrapolate this knowledge for general engineering design. However, the experimental work to date has made it possible for the engineering staff of SCPRF to carry out designs for three structures described below.

In August, 1957, a load-bearing "SCR building panel" wall system was applied to a one-story residence in Geneva, Illinois. A horizontal truss built into the bottom chord of the roof trusses allowed the upper ends of the panels to react in simple beam action from lateral wind loads. The end walls plus interior panel cross walls were 'X" braced to act as shear walls.

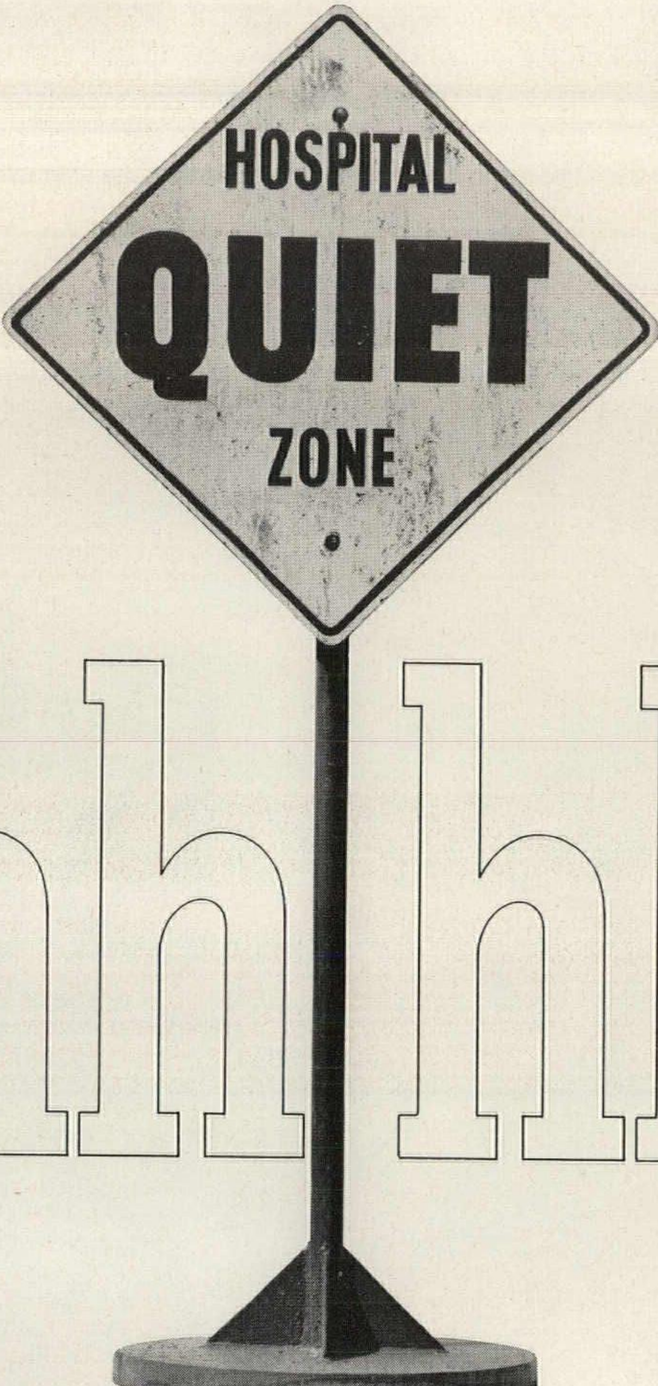
To demonstrate the application of the "SCR building panel" to one-story schools, a demonstration structure was built by SCPRF on its research property in Geneva, Illinois. The plan simulates a typical classroom layout with two 28-by-32-ft rooms on either side of an 8-ft central corridor. The load-bearing walls were tied together at their tops with two ledgers of steel angles, 13 in. apart. The top and bottom chord of the roof trusses rested on the ledgers. The panel itself had a clear vertical span of 10 ft.

Such panels tested over 12 kips per ft; this was felt to be more than adequate, for the roof loads were not expected to produce much in excess of 4 kips per ft at openings.

The wall panels were relatively stiff due to the partly fixed end condition provided by the ledger steel

continued on page 278


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



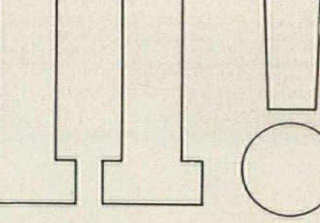
shhhh!

Putting up steel in a hospital or school zone?

Specify high-strength bolting. Tightening with a pneumatic wrench (all that's needed) is far less noisy than a riveting gun. It's quicker than riveting too, so there's less "noise time." Safe? With high-strength bolting there's no fire hazard, no danger of injury from tossed rivets. And every joint is tight—*permanently*. Bethlehem supplies a full size range to meet every construction need. Each bolt meets the requirements of ASTM Specification A-325. Plan to use Bethlehem High-Strength Bolts on your next job.

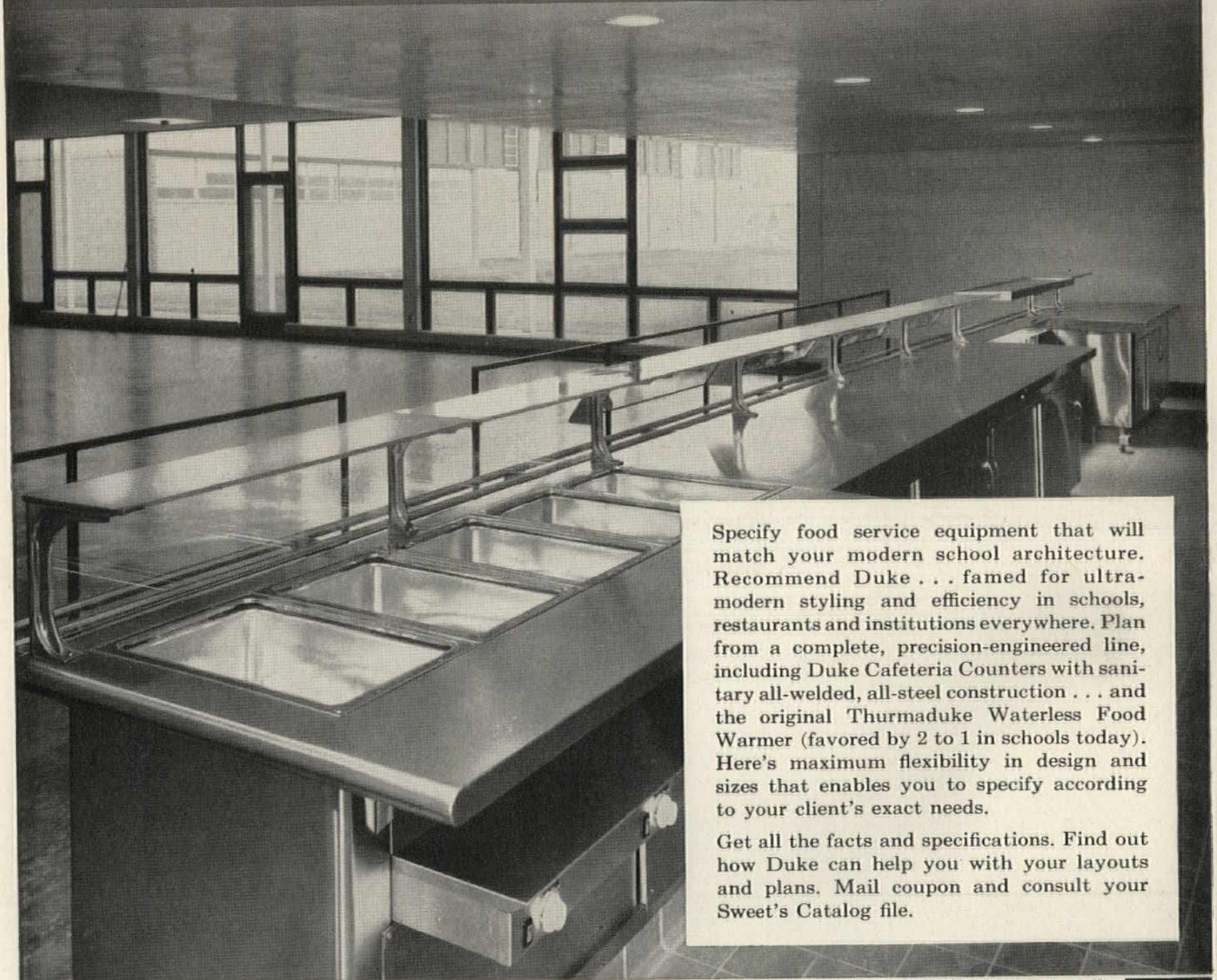
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



DUKE... *Pioneers in Food Service Progress!*

Food service equipment to match modern school architecture: DUKE



Specify food service equipment that will match your modern school architecture. Recommend Duke . . . famed for ultra-modern styling and efficiency in schools, restaurants and institutions everywhere. Plan from a complete, precision-engineered line, including Duke Cafeteria Counters with sanitary all-welded, all-steel construction . . . and the original Thurmaduke Waterless Food Warmer (favored by 2 to 1 in schools today). Here's maximum flexibility in design and sizes that enables you to specify according to your client's exact needs.

Get all the facts and specifications. Find out how Duke can help you with your layouts and plans. Mail coupon and consult your Sweet's Catalog file.

Duke Cafeteria Counter, St. Thomas Aquinas High School, Florissant, Mo.
Hellmuth, Obata & Kassabaum, Inc., Architects
Frank T. Hilliker and Associates, Food Service Consultants

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AEROHOT

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Please send me information and specifications on one or all of following:

☐ Thurmaduke Waterless Food Warmers and Portable Food Warmers ☐ Service Tables
☐ Cafeteria Counters ☐ Low-cost Aerohot Food Warmers and Tables

Are you interested in name of Duke dealer-representative in your area who can help you with food service equipment planning? Check here if you desire this information: ☐

Name ______ Title ______
Firm ______
Address ______
City ______ Zone ______ State ______

continued from page 274

and the roof stiffness. The base joint of the panels is grouted; this, too, provides some degree of fixity against deflection from wind loads.

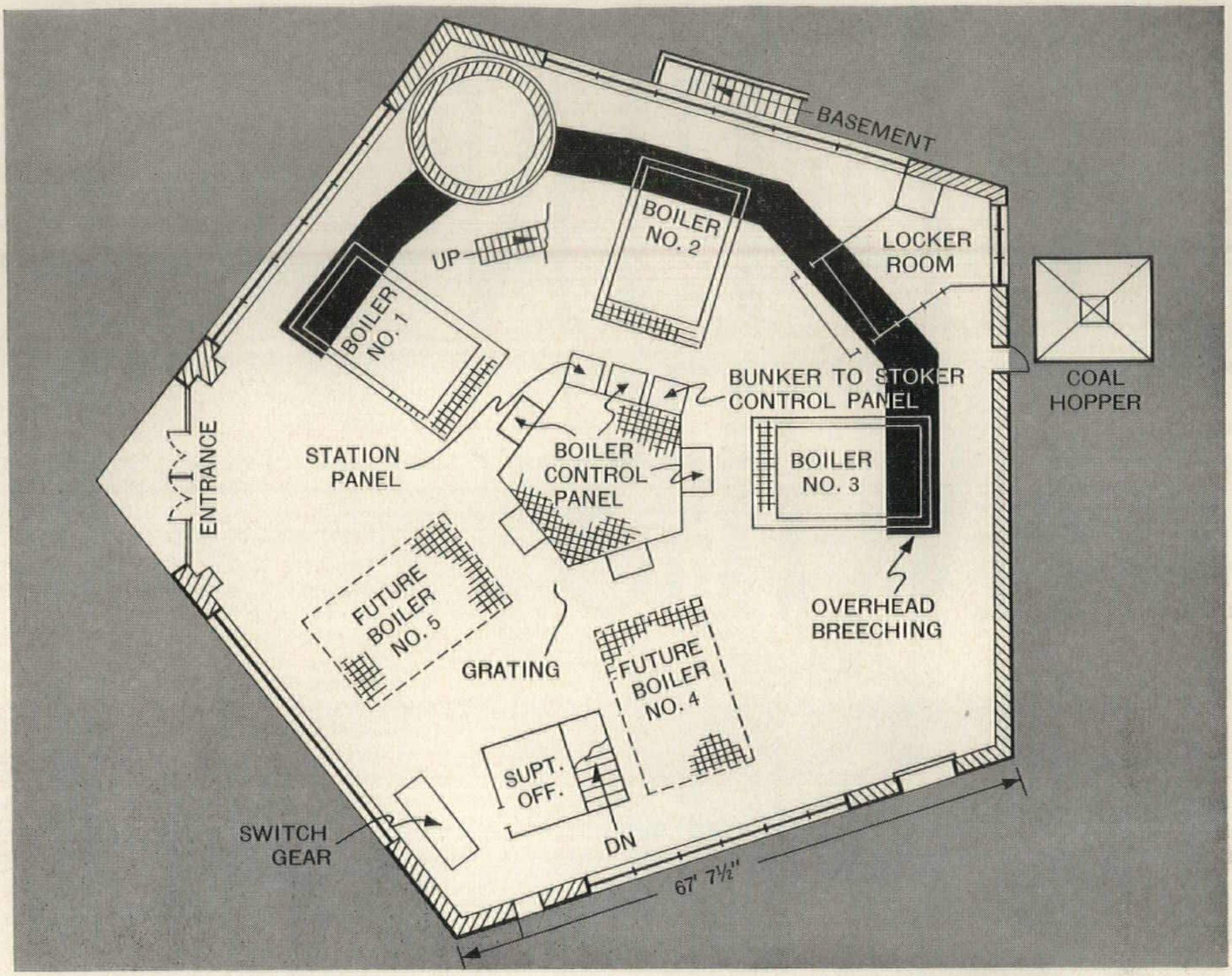
Three additional features are worthy of note in this demonstration building. The photos show the use of a plate girder of panels in carrying two roof trusses; note the use of diagonal tie rods. The flange steel was strong enough to withstand the wind pressure over the length of the span. As the roof was designed as a horizontal diaphragm, lateral loads delivered into it are carried to the ground by shear walls. The structure had two panel types: 12-in.-wide brick and 24-in.-wide terra cotta. Two terra cotta panels were placed back to back to form 10-in. piers; the pier has a closure panel especially cast to close the space between the 24-in. panels. From tests the bearing capacity of the pier should be in excess of 50 kips.

In the fall of 1958, the engineering staff of SCPRF collaborated with W. R. King, Architect, Geneva, Illinois, in the design of a civic center. All exterior walls were to be terra cotta panels 13 ft long (clear span 10 ft), tied into a roof diaphragm similar to that of the SCPRF panel demonstration structure. Where necessary the panels were "X" braced to provide racking resistance.

To sustain the roof reaction over the doors facing the courtyard, a 28-ft spandrel girder 4 ft deep was designed.

An interesting feature of the civic center was a 60-ft clear span area in the basement carried by a structural system contained in the central longitudinal wall running the full length of the building. This wall structure carried both floor and roof loads amounting approximately to 8.5 kips/ft of span.

The structural analysis indicated that a double plane of panels covering an internal steel truss would permit door openings in the wall required by circulation of occupants on the first floor. The cost of the truss steel amounted to $1.60 per sq ft of panel area. The covering of the steel truss members by panels eliminated bending in many members and provided added lateral stability of compression members. This structural assistance of the panels covering the truss reduced the cost of the steel by 55 cents per sq ft of panel area; or viewed from another point, the truss would have cost nearly 35 per cent more had the panels not covered the structure.



Hospital cures fuel ills with "little Pentagon"

Richmond State Hospital burns coal for economy and availability in modern pentagonal power plant

After a power system failure at the Richmond State Hospital, Richmond, Ind., the administration conducted an engineering survey of its steam-generating operation. Over-age equipment indicated the need for entirely new facilities. The shape of the boiler room site prompted the unconventional pentagonal installation for best possible adaptation of space to present and future needs. *Economy* and *availability* dictated the choice of coal as the fuel. Today a new power plant—designed by Fleck, Quebe and Reid, Indianapolis, with F. B. Morse, of Purdue University—burns coal in a completely modern, automatic operation. The outstanding features of this compact installation are its high combustion efficiency, minimum manpower requirement and continuing ease of maintenance.

Consult an engineering firm

If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you in efficiency and economy of fuel.

Coal is lowest cost fuel

Today, *when the annual cost of fuel often equals the original cost of the boilers,* you should know that bituminous coal is the lowest cost fuel in most industrial areas. And modern coal-burning equipment gives you 15% to 50% *more* steam per dollar, while automatic operation trims labor costs and eliminates smoke problems. What's more, tremendous coal reserves and mechanized mining procedures assure you a constantly plentiful supply of coal at stable prices.

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Dept. AR-10, Southern Building, Washington 5, D. C.

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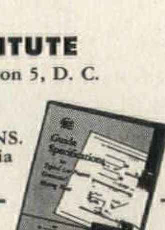
SEND COUPON FOR NEW BCI PUBLICATIONS. Guide Specifications, with complete equipment criteria and boiler room plans:



BITUMINOUS COAL INSTITUTE AR-10
Southern Building, Washington 5, D. C.

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☐ GS-1 (low-pressure heating plant, screw-type underfeed stoker); ☐ GS-2 (high-pressure heating and/or process plant, ram-type underfeed stoker); ☐ GS-3 (automatic package boiler for heating and process plants). ☐ Case histories on larger plants.

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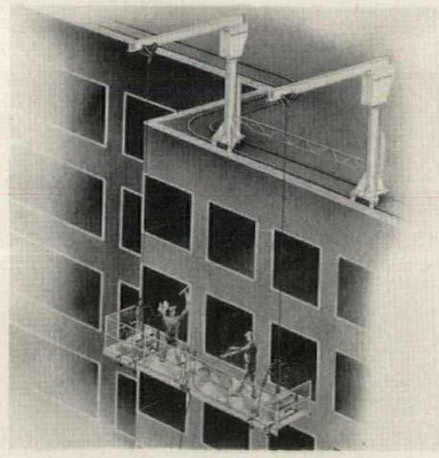
Title ____________
Company ____________
Address ____________
City ____________ Zone ______ State ______

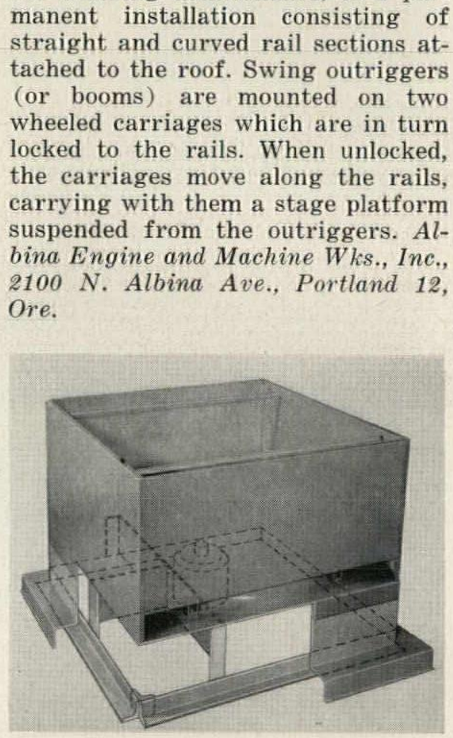
Product Reports

continued from page 261



Permanent Support for Scaffold

The *Roof Railer*, designed for use in conjunction with powered scaffolds for building maintenance, is a permanent installation consisting of straight and curved rail sections attached to the roof. Swing outriggers (or booms) are mounted on two wheeled carriages which are in turn locked to the rails. When unlocked, the carriages move along the rails, carrying with them a stage platform suspended from the outriggers. *Albina Engine and Machine Wks., Inc., 2100 N. Albina Ave., Portland 12, Ore.*

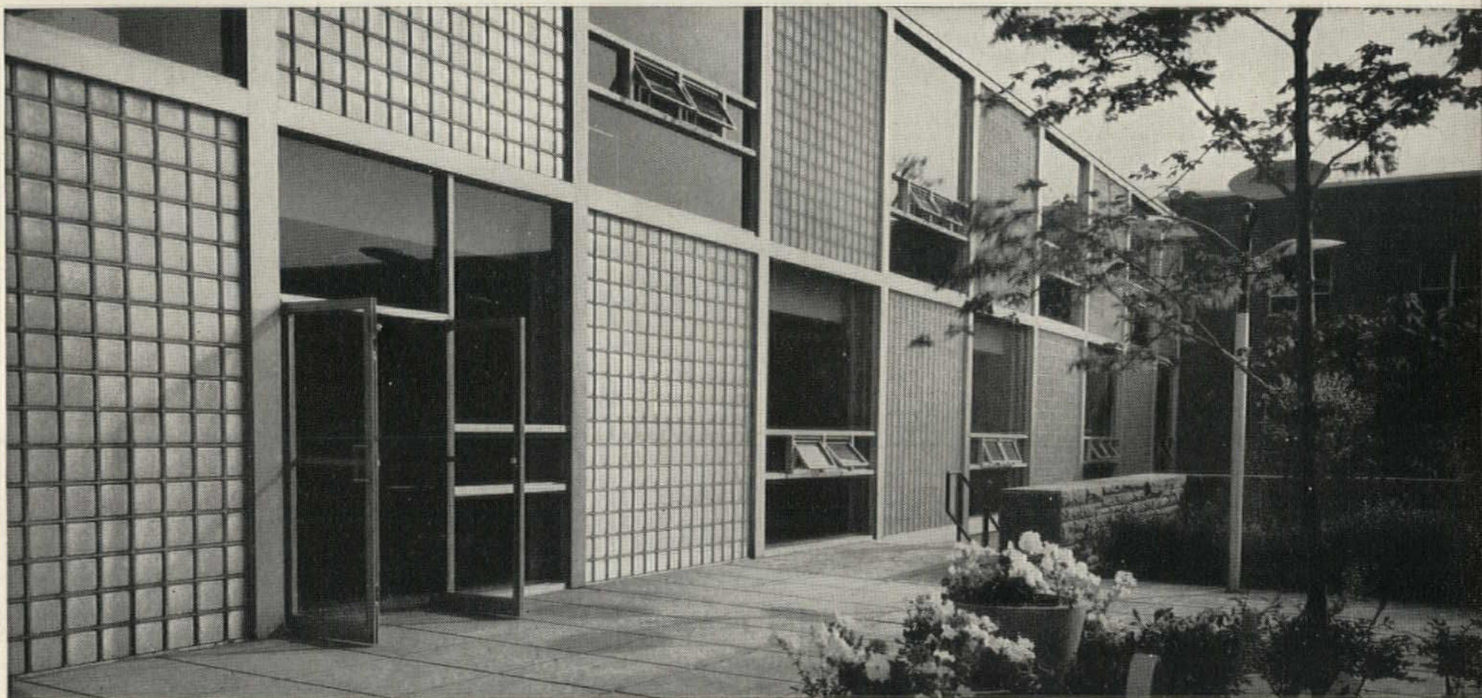


High Efficiency Ventilator

The *Structa-Lung*, a new power roof ventilator, is said to exhaust 50 to 100 per cent more air per horsepower than conventional units, thus making it possible to ventilate a building with fewer units than would otherwise be required. Available in capacities from 8000 to 80,000 cfm, it can be installed on any type of maintenance. For durability, the fan is supported on a welded framework of structural angles and heavy plate (see cutaway above). *Structa-Lung Co., 36407 Euclid Ave., Willoughby, Ohio*

more products on page 290

See why Pittsburgh Corning Products make the things you build cost less, last longer, look better



John J. Kane Hospital, Pittsburgh, Pa. Architects: Button & McLean—Mitchell & Ritchey, Pittsburgh, Pa.

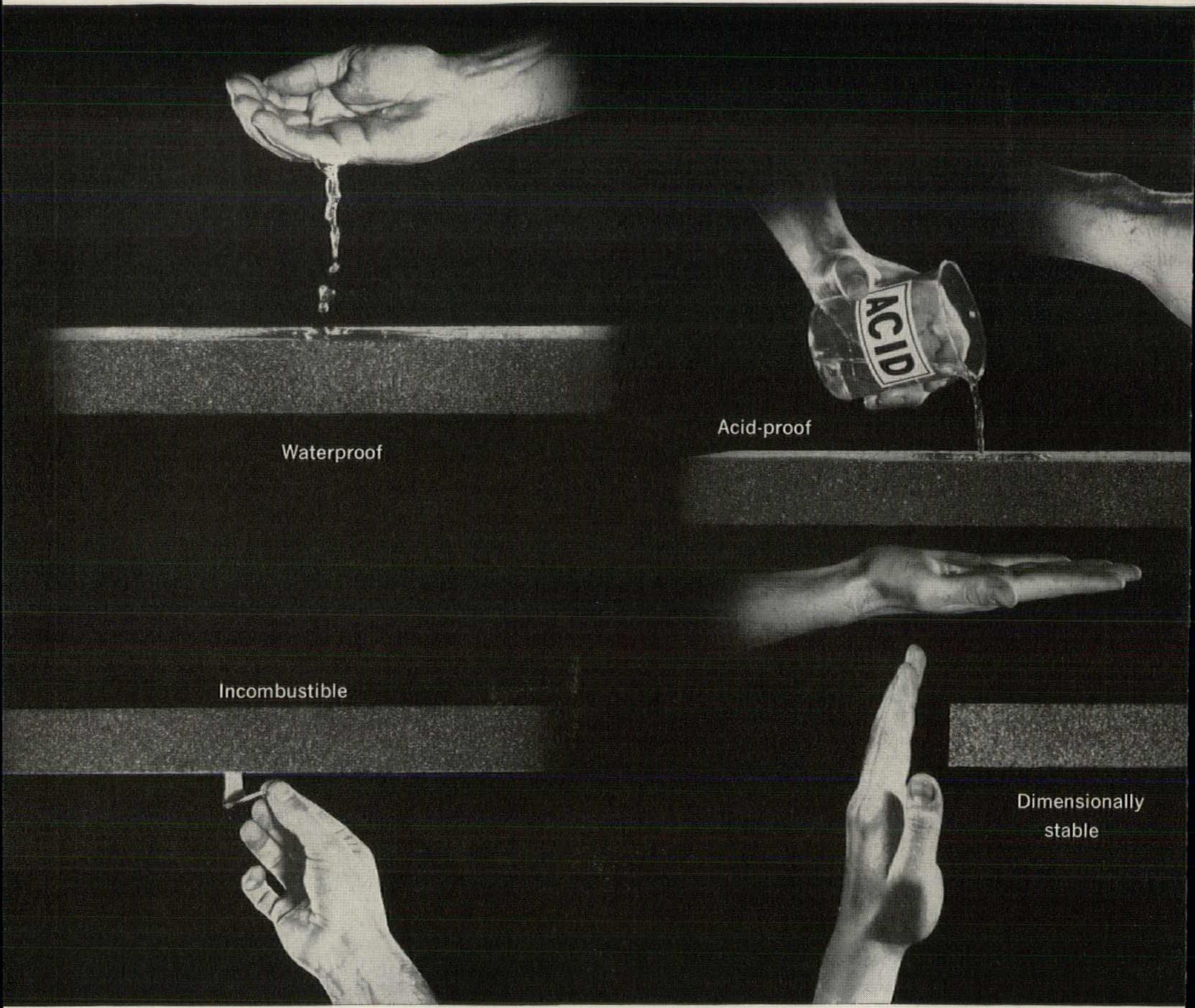
example:

PC Glass Block curtain wall in a core building. Considerations of psychological security, plus exterior interest and harmony dictated major curtain wall use of PC Glass Blocks in this core building . . . the connecting link between units of the new John J. Kane Hospital in Pittsburgh. Set at regular intervals along corridors in the building, the Glass Block panels create a feeling of solidity and protection for the patients moving through.

The alternate areas of functional Glass Blocks and plate glass set up an interplay of voids and solids to increase the interest level of the environment. And the Glass Blocks' texture, substance and non-institutional appearance add measurably to the visual appeal of the design. All this while the Glass Block panels admit soft, diffused daylight—reduce glare and heat.

Good designs like this grow out of materials which give the architect true authority over his designs. And the final page of this advertisement describes the Pittsburgh Corning product development program which blends form and function to give the architect just such design authority. (*Continued*)

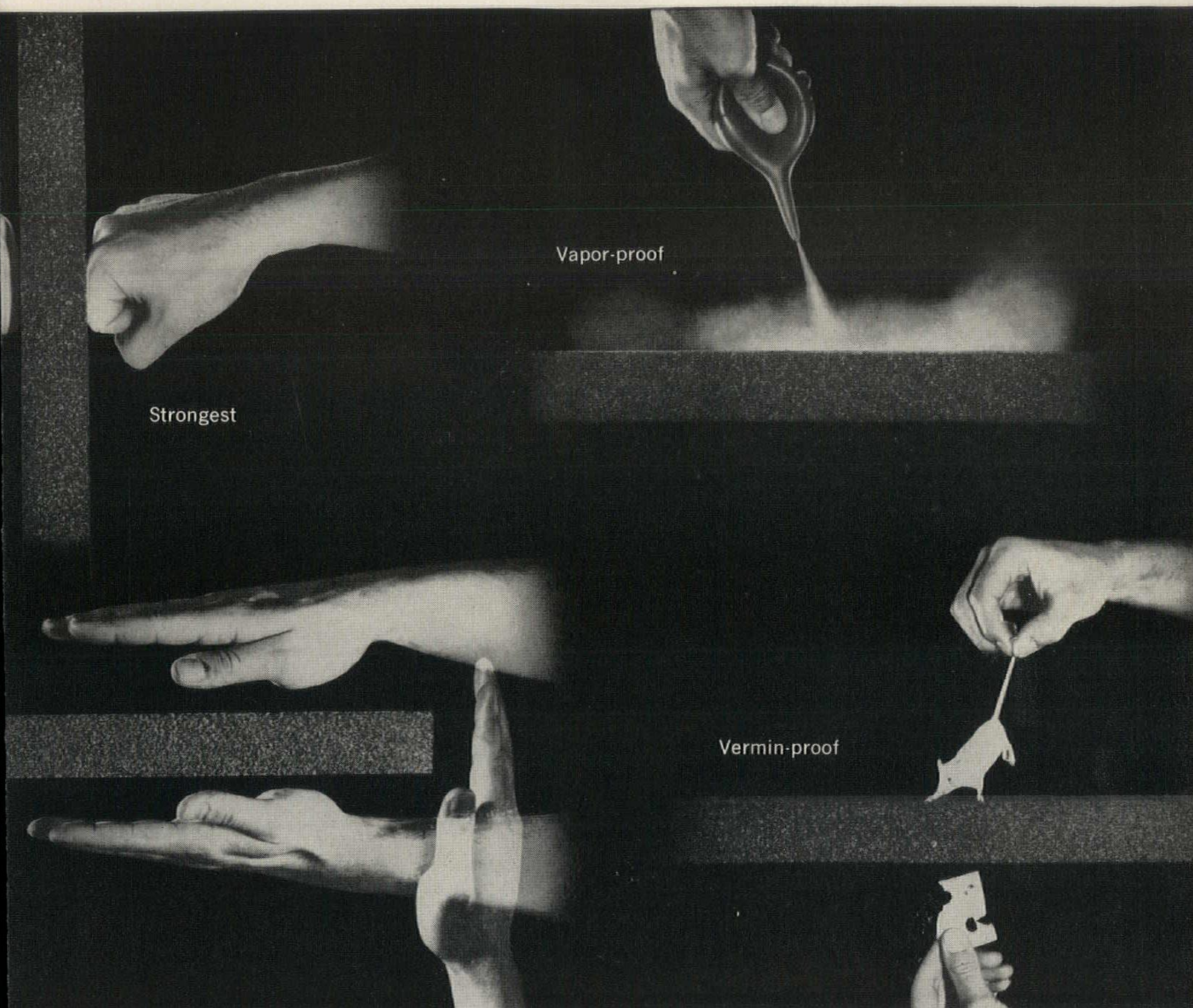
ITTSBURGH pc CORNING



example:

FOAMGLAS®: the one insulation combining the seven benefits pictured here. These seven photographs illustrate a single important point about FOAMGLAS, the one cellular glass insulation. The point? No other insulation wraps up so many important benefits in one material.

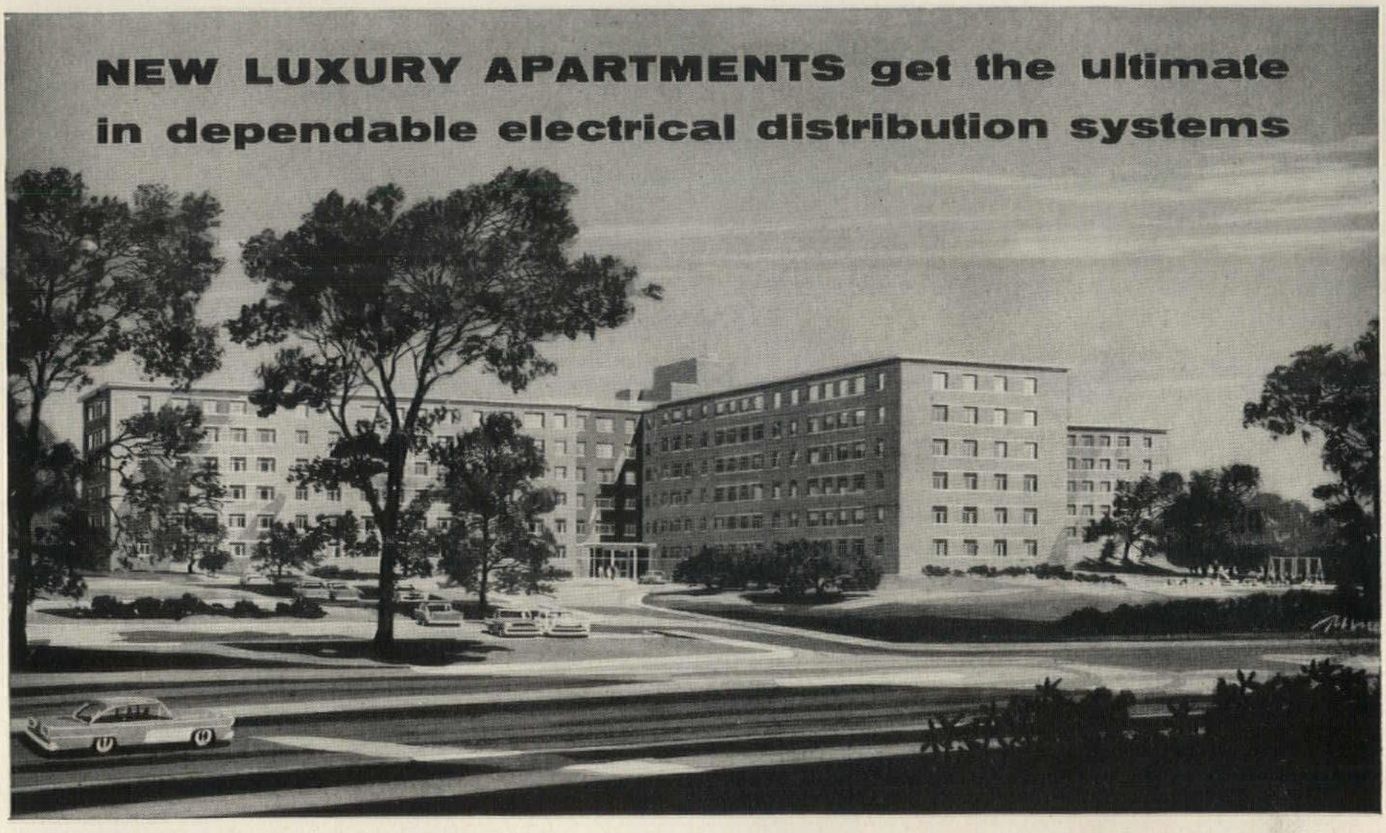
However you use insulation, you'll find it of vital importance that FOAMGLAS is completely impervious to moisture—both liquid and vapor. This insures that FOAMGLAS will never fail to deliver the same high insulating efficiency. Its strength and rigidity give



FOAMGLAS surprising structural value in many applications ranging from curtain wall panels to roof insulation, to cavity wall or even pipe insulation. The incombustibility and dimensional stability of cellular glass are important in many applications . . . as are its acid resistance and imperviousness to vermin attack.

With FOAMGLAS, Pittsburgh Corning makes available a single material capable of furnishing the answer to your most demanding insulating problems. A solution which is truly low in cost because of its lasting effectiveness. *(Continued)*

PITTSBURGH pc CORNING



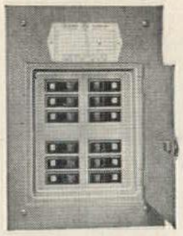
THE CARDINAL HOUSE
Arlington, Virginia
Architect: Edwin Weihe A.I.A. & Associates, Washington, D. C.
Builder-Manager: Louis Richman, Washington, D. C.
Electrical Engineer: General Engineering Associates, Washington, D. C.
Electrical Contractor: Electrical Associates, Washington, D. C.

FRANK ADAM ELECTRICAL EQUIPMENT

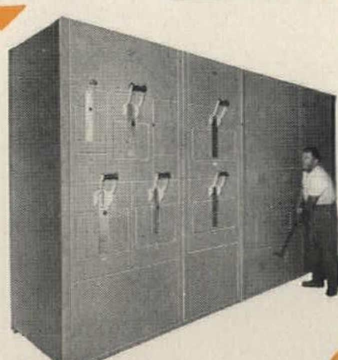
This is the equipment that gives the Cardinal House a modern electrical system for years to come!

S-A-W PANELBOARDS

QP LOAD CENTERS



MAIN DISTRIBUTION SWITCHBOARD



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QS, "E" Frame and "F" Frame Panelboards
High Efficiency Busduct

The very heart of any modern housing project is its electrical distribution system. So much depends on its failure-free operation day after day.

That is why Frank Adam equipment was chosen for the beautiful 231-unit air-conditioned Cardinal House—the finest in ultra modern living.

To help *you* with any electrical problems in your multi-unit housing projects, the Frank Adam representative has all the the information you'll need. Contact him without obligation, or write the factory.

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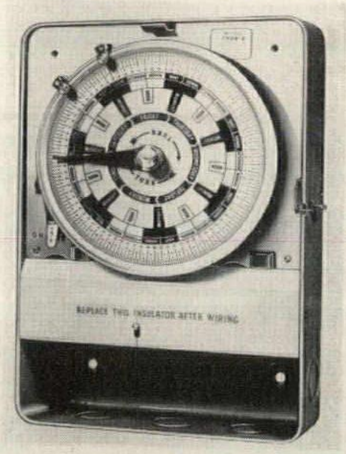
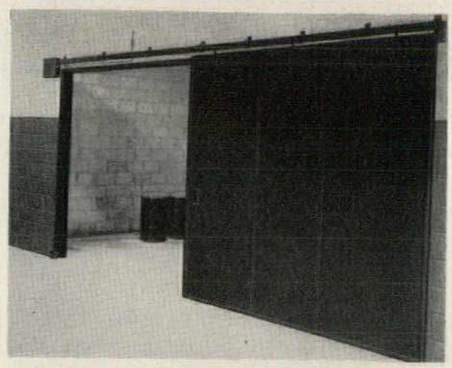
Product Reports



Seven-Day Calendar Time Control

Because it separates day and night periods as well as days of the week, the new Paragon 7000 Series 7-day time control can be set to turn heating, ventilating, air conditioning and lighting systems on or off at different hours of each day, or to omit certain days altogether. Settings are usually made for a week in advance, but can be quickly changed, and a manual trip makes it possible to transfer switch operation at any time without disturbing the daily or weekly tripping schedules. As many as four different voltages can be controlled by a single switch. *Paragon Electric Co., Two Rivers, Wis.*

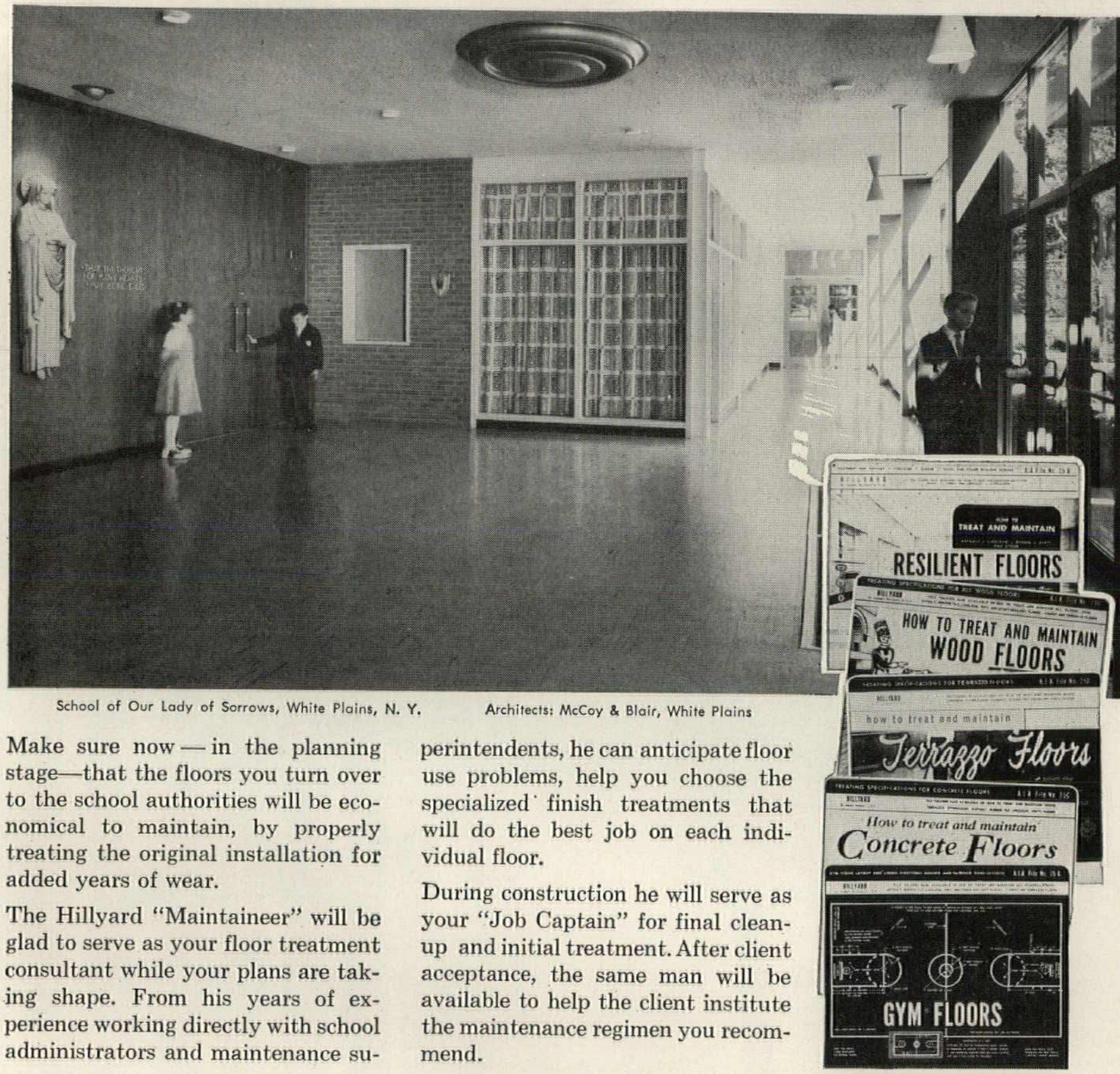


Streamlined Sliding Fire Door

As a result of Underwriters' Laboratories tests, the Model SL sliding *Pyrodor* has been given a Class A, 3 hour Fire Test Rating plus the lowest heat transmission rating, a temperature rise of 250 F maximum in 30 minutes. It also features a *Pyromatic* release which closes the door automatically in the event of fire. For easier shipping and installation, the *Pyrodor* comes in sectional panels that are interlocked on the job to produce a single flush-surfaced unit. Door hangers and guide rollers are completely concealed. *Dept. D, Dusing and Hunt, Inc., Le Roy, N. Y.*

more products on page 294

Hillyard HELPS YOU PLAN ECONOMICAL MAINTENANCE FOR SCHOOL FLOORS



School of Our Lady of Sorrows, White Plains, N. Y. Architects: McCoy & Blair, White Plains

Make sure now — in the planning stage—that the floors you turn over to the school authorities will be economical to maintain, by properly treating the original installation for added years of wear.

The Hillyard "Maintaineer" will be glad to serve as your floor treatment consultant while your plans are taking shape. From his years of experience working directly with school administrators and maintenance superintendents, he can anticipate floor use problems, help you choose the specialized finish treatments that will do the best job on each individual floor.

During construction he will serve as your "Job Captain" for final clean-up and initial treatment. After client acceptance, the same man will be available to help the client institute the maintenance regimen you recommend.

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Practical floor treatment guides with draft specifications, product information, detailed step-by-step treatment instructions for your contractor. One for each type of flooring.

The Maintaineer's experience covers thoroughly, but is not limited to, the school field. Consult him also on floor treatments for hospitals, churches, clubs, restaurants, commercial and industrial buildings. No charge, no obligation—he's

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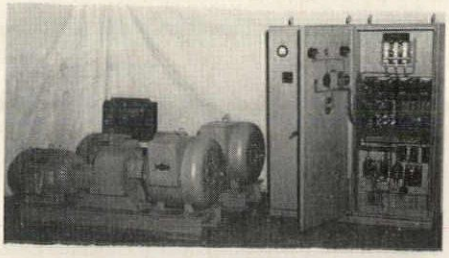


Power Converting System

A new motor-generator unit which converts 60 cycle to 800 cycle alternating current is designed to supply power for such applications as high frequency lighting and electronic control systems. The 60 cycle Synduction drive motor operates in combination with an 800 cycle, revolving field type generator which produces an output frequency of 400 cycles at 2400 rpm. A speed reducer, direct-connected between the two machines, permits the motor to operate at a slower speed of 1200 rpm. All necessary controls for the unit are mounted in the free standing cubicals shown above. *Kato Engineering Co., Mankato, Minn.*

Off-White Curtain Wall Sealant

Weatherban, a two-part polysulfide rubber-based sealer for curtain walls and building maintenance, now comes in a off-white color designed to blend with light colored masonry materials such as marble, limestone and concrete. The sealer is said to have excellent flexibility, aging and non-flow qualities; high tensile strength; excellent adhesion; and outstanding weather resistance. *Adhesives, Coatings and Sealers Div., Minnesota Mining & Mfg. Co., 900 Bush Ave., St. Paul 6, Minn.*

Integral Distribution Center

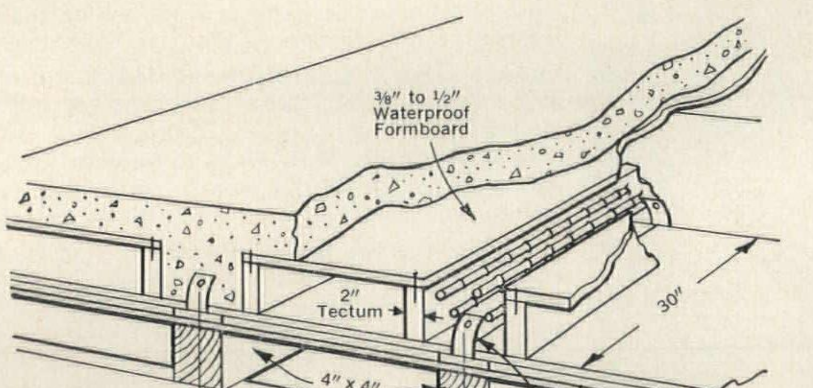
A new integral distribution center with high temperature insulation is said to be up to 30 per cent smaller and 15 per cent lighter than previous designs, and 16 decibels quieter than NEMA standards for transformers of similar ratings. The new one-piece design uses *QHT* (quiet-high temperature) transformers and combines all three sections necessary for load center application—incoming line switch and fusing, transformer, and outgoing feeder breakers—into an integral unit. The standard line is completely metal-clad and is available in ratings from 75 to 225 kva. Standard primary voltage ratings run from 2400 through 4800 volts; secondary voltages run from 208Y/120 through 600 volts. *General Electric Co., Schenectady 5, N. Y.*

more products on page 298

The "tent-like" dome of this hyperbolic paraboloid design utilizes acoustical values of Tectum form plank to absorb sound*.

"BIG TOP" soaks up sound

Huge Hyperbolic Paraboloid Retains Tectum Form Plank As Effective Acoustical Ceiling Bonded To Concrete Shell



Typical form plank layout using 2", 2 1/2" or 3" Tectum form plank materials. Tectum offers many functional values as a structural, insulating, acoustical board.

HERE'S A REPORT of imaginative design, utilizing materials and methods for economical construction. The new Oklahoma City University Field House, Oklahoma City, makes excellent use of Tectum 1" form plank material, both as a form plank during pouring of the concrete shell and also as an effective acoustical ceiling, "left-in-place" after the concrete has cured.

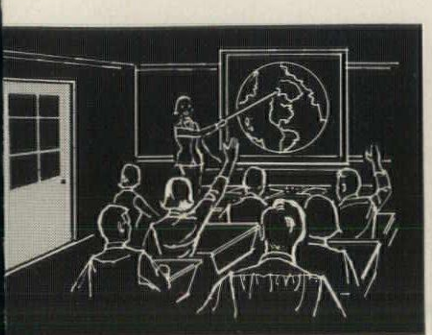
Tectum conforms to the doubly-curved structure perfectly and after concrete cures, retains the desired shape, securely bonded to the concrete slab. Note the clean uniformity of this ceiling. The savings in time, in forming lumber and in acoustical materials are important considerations. Tectum insulates, is attractively textured and may be painted without loss of acoustical values.

Tectum as a form plank, offers many opportunities for firesafe construction without the cold, bleak atmosphere sometimes created by concrete. For complete information, write Tectum Corporation, 535 East Broad Street, Columbus 15, Ohio.

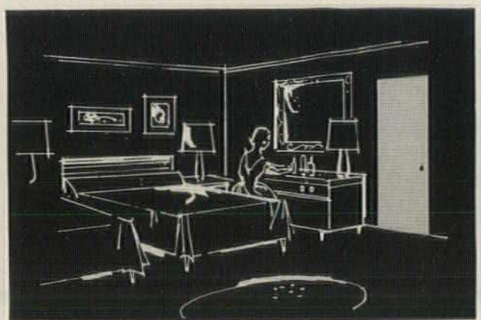
QUALITY • INTEGRITY • SERVICE
9-33

Tectum

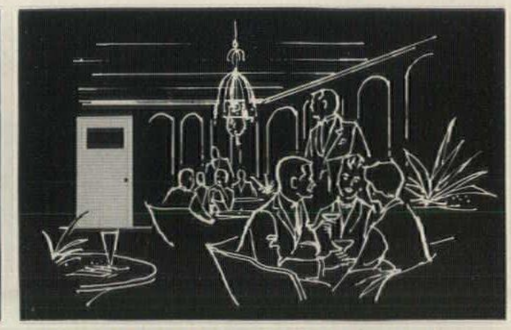
* *Architect:* R. Duane Conner, A.I.A., Oklahoma City
* *General Contractor:* Fredrickson Construction Co., Oklahoma City



lid Core Doors. Choose the Golden Dowel or with lifetime guarantee. Or Standard solid e doors. Ideal for interior and exterior usage. eptional beauty, long wear.

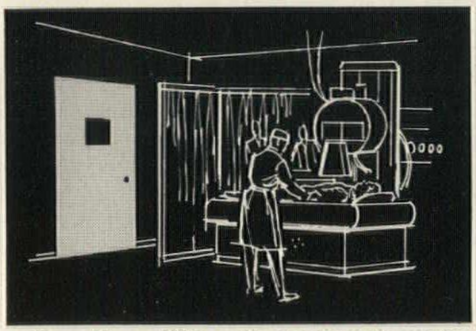


Hollow Core Doors. New 7-ply Housemart hollow core door gives economy, flexibility of installation. Strength without extra weight. Ideal for limited budget applications.

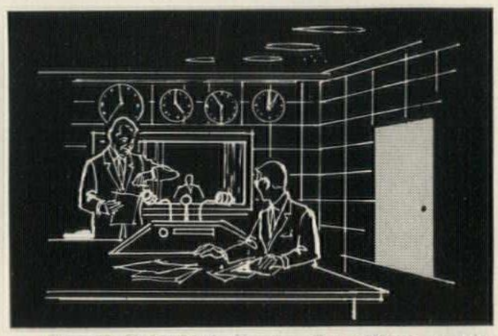


Plastic-Faced Doors. Designed for hard wear, easy maintenance. In restaurants, offices, schools, public buildings. Choice of many colors and patterns. Mar-proof.

ine

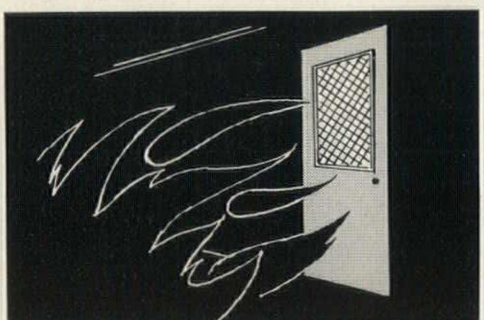


X-ray Doors. With continuous sheet of protective lead midway between divided core. Combine vital protection, outstanding beauty. For hospitals, medical and dental offices.



Sound-Retardant Doors. For offices, music rooms, radio and TV studios, sound stages—anywhere passage of sound needs control. Available veneered to match regular Roddis doors.

titutional Doors. For hospitals, offices, ools, churches. Built for special hardware . . . sures, kick plates, panic bars. Laminated nes add strength. Economy priced.



Fire Doors. Roddis patented core assures equal strength in all directions, extra weight gives outstanding fire resistance, high sound resistance. B-label, 1 hour; C-label, ¾ hour.

RODDIS DOORS NOW AVAILABLE WITH FACTORY PRIME AND SEAL PROTECTION or COMPLETELY PREFINISHED

You gain important on-the-job cost-savings—assure beauty—when you specify factory *"prime and seal"* for your Roddis Doors.

This service makes possible a uniform, perfect first coat on every door. Dirt, moisture and stains are locked out during transportation and storage. Final finishing is faster, more foolproof.

If you prefer, Roddis will *completely finish* your doors to your own specifications. Colors may be selected and Roddis' famous finishes (or those of other manufacturers) are available.

LIFETIME GUARANTEE! The Roddis Golden Dowel and B-label Fire Doors are guaranteed for the life of the installation. All other Roddis Doors are guaranteed for 2 years!

FREE!

RODDIS PLYWOOD CORP.

MARSHFIELD, WISCONSIN (DEPT. AR-1059)

Please rush illustrated brochure and detailed information on famous Roddis wood doors to:

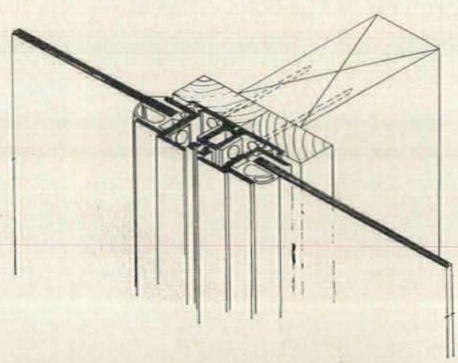
NAME ____________________

FIRM ____________________

ADDRESS ____________________

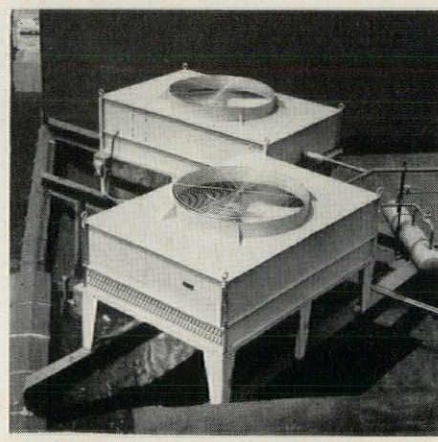
CITY ____________________ STATE ____________________

Product Reports



Wood and Aluminum Window

The insulating qualities of wood and the maintenance-free features of aluminum are combined in the new *Wood-A-Lume* window, which has a decorative, condensation-free wood interior surface bonded to a durable aluminum outer frame. The window can be installed without framing or trim by simply mounting it into position and nailing it through the prepunched aluminum outer jacket and the interior wood frame directly into the studs. (The same simplicity and speed also applies to masonry construction.) It comes in casement, awning and picture window types in a full range of sizes. *Jervis Corp., Grandville, Mich.*



Low Silhouette Condensers

Horizontal mounting of the fan and coils in a new line of vertical flow air-cooled condensers for commercial applications gives a lower silhouette and reduced roof loads, while the upward draft directs noise away from nearby structures. Because the performance of the new *ACV* units is not affected by wind conditions, the entire system serviced is more stable. The condensers, which come in sizes from one to three hundred tons, are mounted on legs to cut down hot roof air which might otherwise be drawn in. *Halstead & Mitchell, Zelienople, Pa.*

more products on page 306

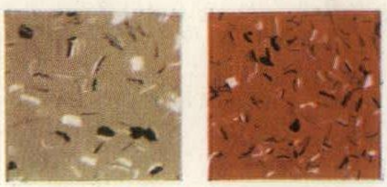
Illustrated above is B. F. Goodrich "Suprex" in Princess White, Crown Turquoise and Peacock Green.

New vinyl tile gives you new freedom of design!

LOOKING FOR A TILE as versatile as it is beautiful? A tile designed to cover any room with glamour—reception room, living room, bedroom, kitchen! Then B. F. Goodrich "Suprex" Koroseal is for you. New "Suprex" Koroseal is vinyl clear through . . . the last word in fashionable flooring.

TOUGHEST OF THE TOUGH, TOO! It will outlast the building it beautifies. No laminates to peel or crack. Detergents, oils, grease, household chemicals and other common spillages can't harm it. Simple maintenance leaves its permanent luster sparkling clean. Use on or above grade. 9" x 9" tiles, ⅛" and 80 gage, in 26 colors: 13 terrazzo patterns, 13 marbleized colors. For details, write: The B. F. Goodrich Company, Flooring Products, Watertown 72, Mass., Dept. AR-10.

"SUPREX"
A SOLID
Koroseal®
VINYL FLOOR TILE



B.F.Goodrich *Flooring Products*

Photo courtesy Wheeling Steel Corporation, Wheeling, West Virginia (Benwood Works)

Wheeling Steel specifies...

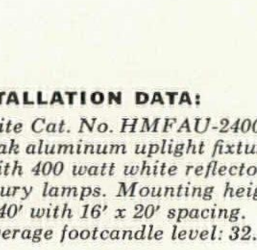
Abolite uplight fixtures for extra eye comfort, economical high bay lighting

These Abolite uplight fixtures are mounted forty feet high, yet there's comfortable, glareless 32 footcandle average light throughout this high bay building. Light directed upward through the fixture's open top eliminates sharp contrasts by washing out dark background shadows. Glare is virtually eliminated by 35° lamp shielding.

Abolite's modern air-swept design also reduces maintenance costs. Air circulating through the fixture sweeps it clean of dulling dust.

You can choose from several Abolite uplight units for high bay lighting: 18″ and 24″ diameter Alzak aluminum fixtures for use with 400 and 1000 watt mercury lamps and 14″ and 18″ diameter Alzak aluminum fixtures for 300-500 watt incandescent lamps (ideal for gymnasium lighting). For full information see Sweet's Industrial Construction File 12i/AB, or write *Abolite Lighting Division, The Jones Metal Products Company, West Lafayette, Ohio.*

INSTALLATION DATA:
Abolite Cat. No. HMFAU-2400 Alzak aluminum uplight fixtures with 400 watt white reflector mercury lamps. Mounting height 40′ with 16′ x 20′ spacing. Average footcandle level: 32.



ABOLITE *Lighting*

THE JONES METAL PRODUCTS COMPANY
West Lafayette, Ohio

eye-fi RE LIGHTING

MOSAIC®

CERAMIC TILE color comes of age in the new Mosaic Harmonitone Palette! The new Palette includes nine compatible color groups coordinated to each other. There is a planned co-ordination of colors *within* each group, which enables glazed wall tile to blend with glazed or unglazed mosaics. Glazed and unglazed mosaics can now be combined into patterns. Using the modular sizes, various *shapes*, as well as colors, can be combined.

The variety of hues and tones in each group permits broad selectivity. The character of the colors gives harmony with various other building materials and plumbing fixtures. A new color numbering system aids simple and accurate color specification.

These are some of the reasons the new Mosaic Harmonitone Palette has been called the most logical and useful aid to ceramic tile selection ever presented to architect, contractor, and owner.

Design in MODULAR HARMONITONE

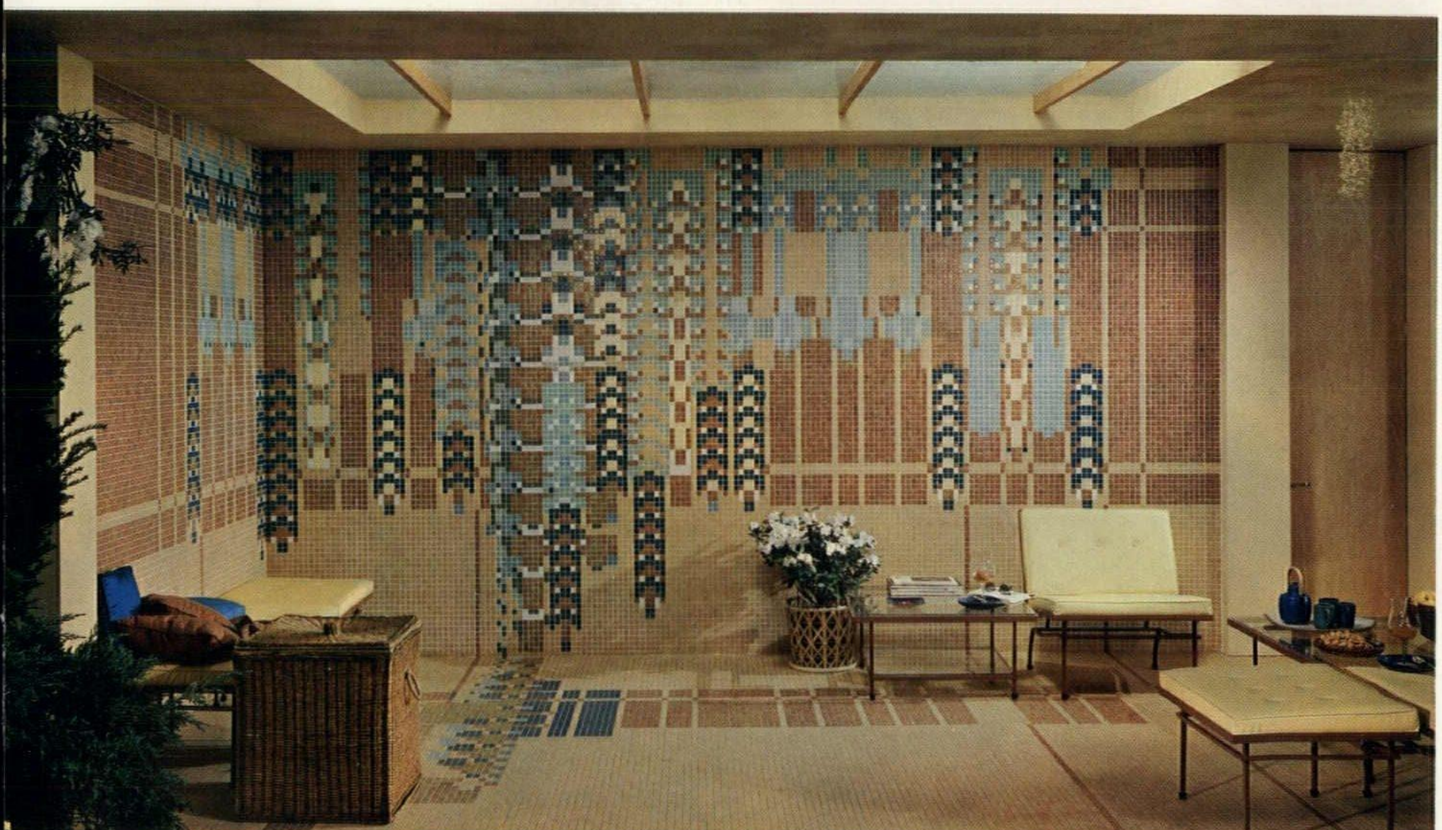


Plate No. 662

AMERICA IS ENTERING THE CERAMIC TILE AGE

Design in MODULAR HARMONITONE

Where would a ceramic tile manufacturer be without the creative imagination of the designer? (Where would the world be?)

The designer is our teacher. He opens for us new avenues in the use of our products. He is our color consultant. He continually broadens our point of view—with ideas.

Shown here, and on the reverse side, are four examples of creative design in Mosaic Harmonitone Ceramic Tile. They dramatically illustrate two functional advantages of the new Harmonitone system—color coordination and modular sizes.

LANAI—Here, modular Harmonitone sizes make possible combining Faientex, Evertex, Velvetone, Mellotone, and Granitex tile into a multi-color, multi-texture mural, designed by Eugene Masselink.

FOYER—Close-register color selection of glazed and unglazed mosaics is demonstrated in this impressive tile treatment. Ceramic tile pilasters classically frame the patterned walls.

SERVICE ROOM—Hobby room, laundry, "rainy day" entry—call it what you like—this idea room may well be the functional home feature of the year. Ceramic tile is, of course, essential for permanence and easy maintenance. Note special tiled compartment for "drip-dry" garments, etc.

BATH—Simplicity of design high-lighted by colorful Harmonitone surfaces. The classic-patterned floor finds new interest in these ultra-modern surroundings. This floor, wall and countertop tile is readily available through the Mosaic Service Plan.

Tile contractor for all installations: National Tile & Marble Corp.

The 1959 Mosaic Ceramic Tile Workbook for Architects, Form No. 236, gives complete data on the new Harmonitone Palette in addition to much interesting information on all Mosaic ceramic tile. The 1959 "Workbook" is in Sweets.

THE MOSAIC® TILE COMPANY

America's largest manufacturer of ceramic tile

GENERAL OFFICES: ZANESVILLE, OHIO

Member: Tile Council of America, Inc. and The Producers' Council, Inc.

Showrooms and Warehouses: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Corona, Calif., Dallas, Denver, Detroit, S. El Monte, Calif., El Segundo, Calif., Ft. Lauderdale, Fresno, Greensboro, N.C., E. Hartford, Hempstead, L.I., N.Y., Ironton, O., Jackson, Miss., Kansas City, Little Rock, Los Angeles, Matawan, N.J., Miami, Milford, Conn., Milwaukee, Minneapolis, New Orleans, New York (*Showroom only*), Philadelphia, Portland, Salt Lake City, San Antonio, San Diego, San Francisco, Santa Clara, Seattle, Tampa, Washington, D.C., Zanesville, O.

Representatives: Birmingham, Fair Haven, N.J., Memphis, Oklahoma City, Pittsburgh, Spokane, St. Louis.

Distributors: Albuquerque, Havana, Honolulu, Houston, St. Louis, Hata Rey, P.R.

Plants: Zanesville and Ironton, Ohio, Matawan, N.J., Little Rock, Ark., Jackson, Miss., Corona and El Segundo, Calif.

Plate No. 663

Plate No. 661

Plate No. 660

Why select air-conditioning equipment by the piece instead of the package?

In buying a car, you wouldn't dream of going to one company for the engine, another for the body, another for the wheels and so on. You get the complete package from one source.

Today it's possible to select air-conditioning, heating, and ventilating equipment by the package instead of the piece — and get a more integrated system. American-Standard* Industrial Division offers *all* major components, from the combined American Blower, Ross Heat Exchanger, and Kewanee Boiler product lines. You benefit by having one-source responsibility for quality and performance in equipment designed, engineered, and manufactured to work together.

There are offices in all principal cities staffed with product specialists to assist with equipment selection and on-the-job problems. Call the one nearest you. AMERICAN-STANDARD INDUSTRIAL DIVISION, DETROIT 32, MICH. IN CANADA: AMERICAN-STANDARD PRODUCTS (CANADA) LIMITED, TORONTO, ONTARIO.

*American-Standard and Standard ® are trademarks of American Radiator & Standard Sanitary Corporation.

AMERICAN-Standard
INDUSTRIAL DIVISION

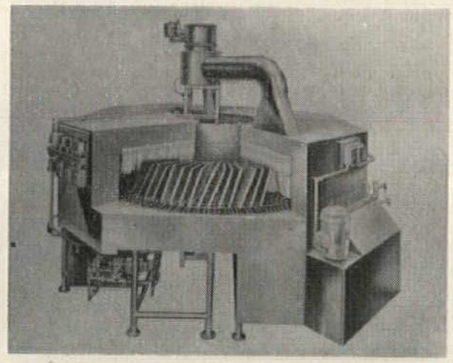
AMERICAN BLOWER PRODUCTS • ROSS PRODUCTS • KEWANEE PRODUCTS

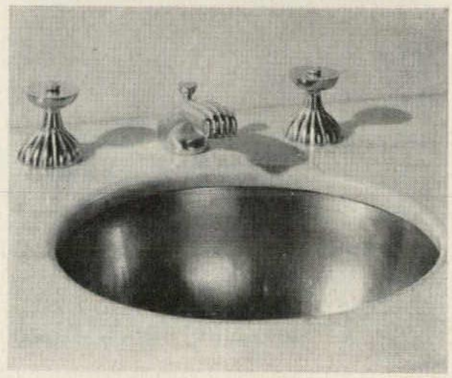
Interference-Free Lighting Panels

A glass lighting panel that eliminates radio interference from fluorescent lamps has been developed for laboratories, hospitals and other areas where sensitive electronic equipment is used. It consists of Corning's Pattern No. 70 low brightness lens panel coated on one side with a thin, transparent electrically-conductive film that intercepts radiated interference while transmitting about 75 per cent of the open troffer illumination. The interference is grounded by a ¼-in. wide silver strip fired onto the film around the periphery of the glass. *Corning Glass Works, Corning, N. Y.*

Compact, Efficient Pan Washer

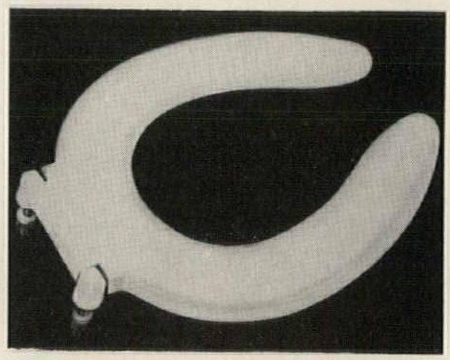
The new *Turntable Model 1340* for washing and sanitizing sheet pans, strap layer cake pans, shelf racks and other items up to 21 in. in height, offers one-man operation and high efficiency in a small area. Available in 13 by 13 ft and smaller sizes, it features a high pressure, high temperature wash, a recirculating and fresh water rinse, and hot air drying. The unit comes in gas fired or steam heated models. *Alvey-Ferguson Co., 5905 Disney St., Cincinnati 9, Ohio*





Luxury Bathroom Fittings

The "Classic" design shown above is the first bow to contemporary taste to be included in a luxury line of lavatory and bath spout sets in traditional design motifs. The spout sets are solid brass, gold or silver plated, and are engineered for dependable service. *Marion Wieder, 120 East 57th St., New York 22, N. Y.*



Heavy-Duty Plastic Toilet Seat

The strength and heavy weight of a new toilet seat made of Dow's *Styron 475* make it particularly suitable for commercial, institutional and industrial applications. According to the manufacturer, the seat is easy to install, easy to clean and virtually indestructible. It comes in black and white, for regular or elongated bowls. *Beneke Corp., Columbus, Miss.*


BARTON'S

Here's why it pays to

SPECIFY KILN-DRIED LUMBER

You make sure your buildings go up right and stay right when you specify Weyerhaeuser 4-Square Kiln-dried Lumber. Scientific kiln-drying firms the "patterning" of wood cells, brings the excess natural moistures of wood down to optimum levels, preparing lumber for the best results in final uses.

This controlled seasoning gives lumber increased bending strength, vertical strength, stiffness, and hardness. Because of these increased strength properties, kiln-dried lumber holds nails more securely, adds strength to the framing, and substantially reduces movement in the finished structure. These advantages keep maintenance at a minimum, resulting in satisfaction to the owners.

You'll find your builder agrees with you on the importance of specifying Weyerhaeuser 4-Square Kiln-dried Lumber for a building that is true to your plans, that you can point to with pride.

Weyerhaeuser 4-SQUARE®

LUMBER AND BUILDING PRODUCTS

Kiln-drying

offers outstanding advantages

Dimensional Stability—Scientific seasoning before milling to size promotes a more uniform degree of dimensional stability in lumber. Weyerhaeuser 4-Square Kiln-dried Lumber is thus better able to resist possible dimensional changes.

Finish and Workability—Through kiln-drying, the cells and fibers of wood become more evenly spaced and more compact, which improves the workability of the lumber. Kiln-dried lumber welcomes all types of finishes and serves to prolong their protective life.

Strength and Durability—The kiln-drying process adds the *inherent* strength in lumber to its natural strength and stabilizes its cellular composition, so that it easily meets structural requirements for both strength and durability.

Call your Weyerhaeuser 4-Square Lumber Dealer for full information on the choice of species and complete line of kiln-dried lumber he carries . . . dimension, board, finish lumber, paneling, and specialty lumber products. Or write:

Weyerhaeuser Sales Company

FIRST NATIONAL BANK BUILDING • ST. PAUL 1, MINNESOTA

All About Primer Sealers
Outlines the purpose of paint primer sealers, the three basic types available and their application to various surfaces. 8 pp. *William Zinsser & Co., 516 West 59th St., New York 19, N. Y.*

Builders' Hardware Catalog
Covers enlarged line of builders' hardware, with detailed selection and installation information. 48 pp. *Milwaukee Stamping Co., 800 S. 72nd St., Milwaukee 14, Wis.**

Marble Forecast
Lists domestic and foreign marbles currently (1959-1960) available in this country, and gives information on texture and color characteristics. 8 pp. *Managing Director, Marble Institute of America, Inc., 32 S. Fifth Ave., Mount Vernon, N. Y.**

Industrial Coatings Color Chart
Contains 21 color chips of industrial protective coatings, and a table that gives the chemical resistance in various weathering environments, and the cost percentage higher or lower than standard gray or white for each color. Chart No. 5, *Carboline Co., 32 Hanley Ind. Ct., St. Louis 17, Mo.*

Dielectric Pipe Unions
Presents technical specifications and performance data on Epco line of dielectric pipe unions. 8 pp. *Epco Sales, Inc., 3204 Sackett Ave., Cleveland 9, Ohio*

Contemporary Lighting
Folio includes individual sheets on contemporary commercial and ecclesiastical lighting fixtures, along with matching companion units for subsidiary areas. Dimensions and wattage capacity are given for each. *NL Corporation, Dept. N-4, 2480 E. 22nd St., Cleveland 15, Ohio*

Hollow Metal Doors
(A.I.A. 16-A) Illustrates and gives complete selection data and construction details on hollow metal doors and matching frames and hardware. Brochure No. 2040-G, 32 pp. *Ceco Steel Products Corp., 5601 West 26th St., Chicago 50, Ill.**

Low Velocity Air Diffusers
Gives nominal sizes, cfm capacity ranges, special features and applications for each of five basic types of low velocity air diffusers. A description of the *Multi-Vent Troffer*, a combination air diffuser and fluorescent light fixture is also included. *Multi-Vent Div., Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill.*

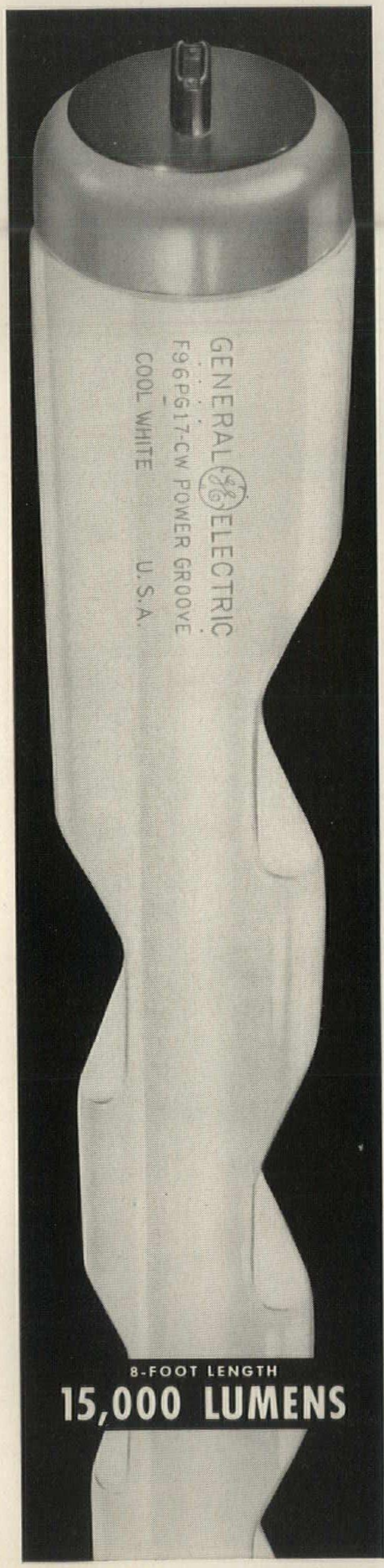
Wasau Air Mover
Includes complete specifications, dimensional data and velocity graphs for new low silhouette design. 12 pp. *Greenheck Fan and Ventilator Corp., Schofield, Wis.*

New Interiors
. . . With Large Size Ceramic Tile includes architectural renderings and color photos showing the use of large glazed tiles for interior walls. Complete trim shape charts are also included. Booklet 910, 16 pp. *American Olean Tile Co., 1000 Cannon Ave., Lansdale, Pa.**

Fusible Entrance Equipment
Includes descriptions, photos, wiring diagrams and enclosure dimensions for series and parallel connected, factory-assembled fusible entrance equipment with ratings of 30 through 200 amps. Publ. ED-50, 12 pp. *Cutler-Hammer, Inc., 439 N. 12th St., Milwaukee 1, Wis.*

**Additional product information in Sweet's Architectural File, 1959*

more literature on page 318



Cut clients' fluorescent lighting investment as much as 40¢ per square foot —with new General Electric Power Groove Lamps!

- Power Groove gives lowest cost of fluorescent light for most users . . .
- Saves 10-30% on initial investment, alone . . .
- Stays cleaner, brighter longer—cuts end darkening
- Will last about 3 years in single-shift service

INITIAL INVESTMENT REDUCED—*You can save your clients up to $4,000 on every 10,000 square feet of lighted floor area* by recommending new General Electric Power Grooves over other types of fluorescent lamps. This is based on a typical industrial area and a practical 100 footcandle lighting level which will help increase production through higher worker efficiency and comfort.

NEW G-E POWER GROOVES are the most powerful fluorescent they can buy. If you're in the midst of planning a new building, or remodeling an existing one, your clients will welcome the sizeable savings in capital investment. For a given lighting level, they need fewer G-E Power Groove Lamps, fewer fixtures . . . less installation time.

COMPARE POWER GROOVE COSTS. Using average conditions, figuring the cost of the lamps, fixtures, distribution equipment and labor, here's a cost comparison of the major types of fluorescents:

YOUR CLIENTS CAN SAVE THIS MUCH ON INITIAL INVESTMENT BY USING 8-FOOT G-E POWER GROOVE LAMPS

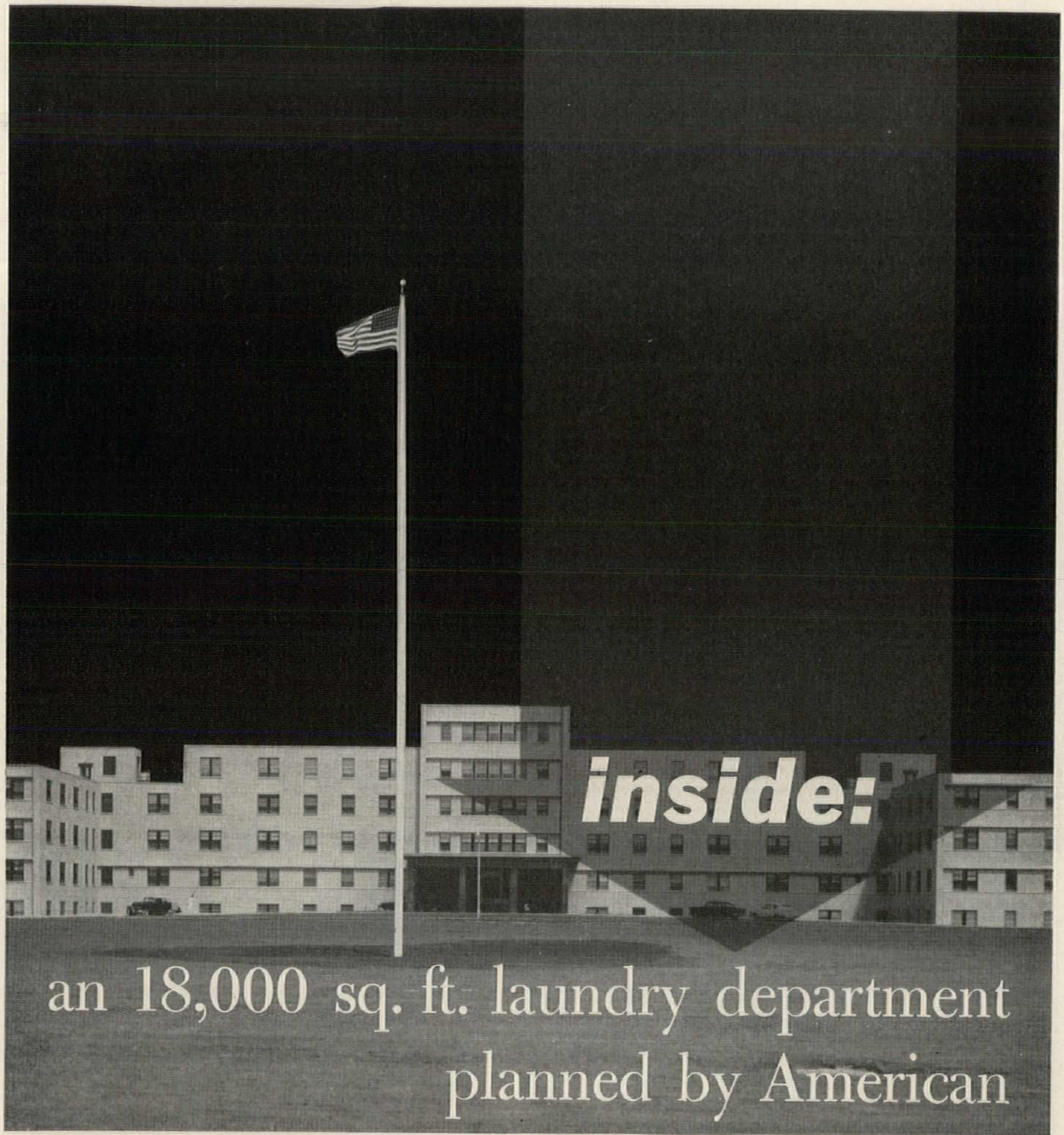
(Based on a desirable 100 footcandle level, at about 95¢ per square foot using Power Grooves)

	SAVINGS PER FOOT	SAVINGS PER 10,000 FT.
POWER GROOVES vs. 4′ 40-WATT RAPID START (at $1.35/sq. ft.)	40¢	$4,000
POWER GROOVES vs. 8′ SLIMLINE LAMPS (at $1.35/sq. ft.)	40¢	$4,000
POWER GROOVES vs. 8′ HIGH OUTPUT LAMPS (at $1.15/sq. ft.)	20¢	$2,000

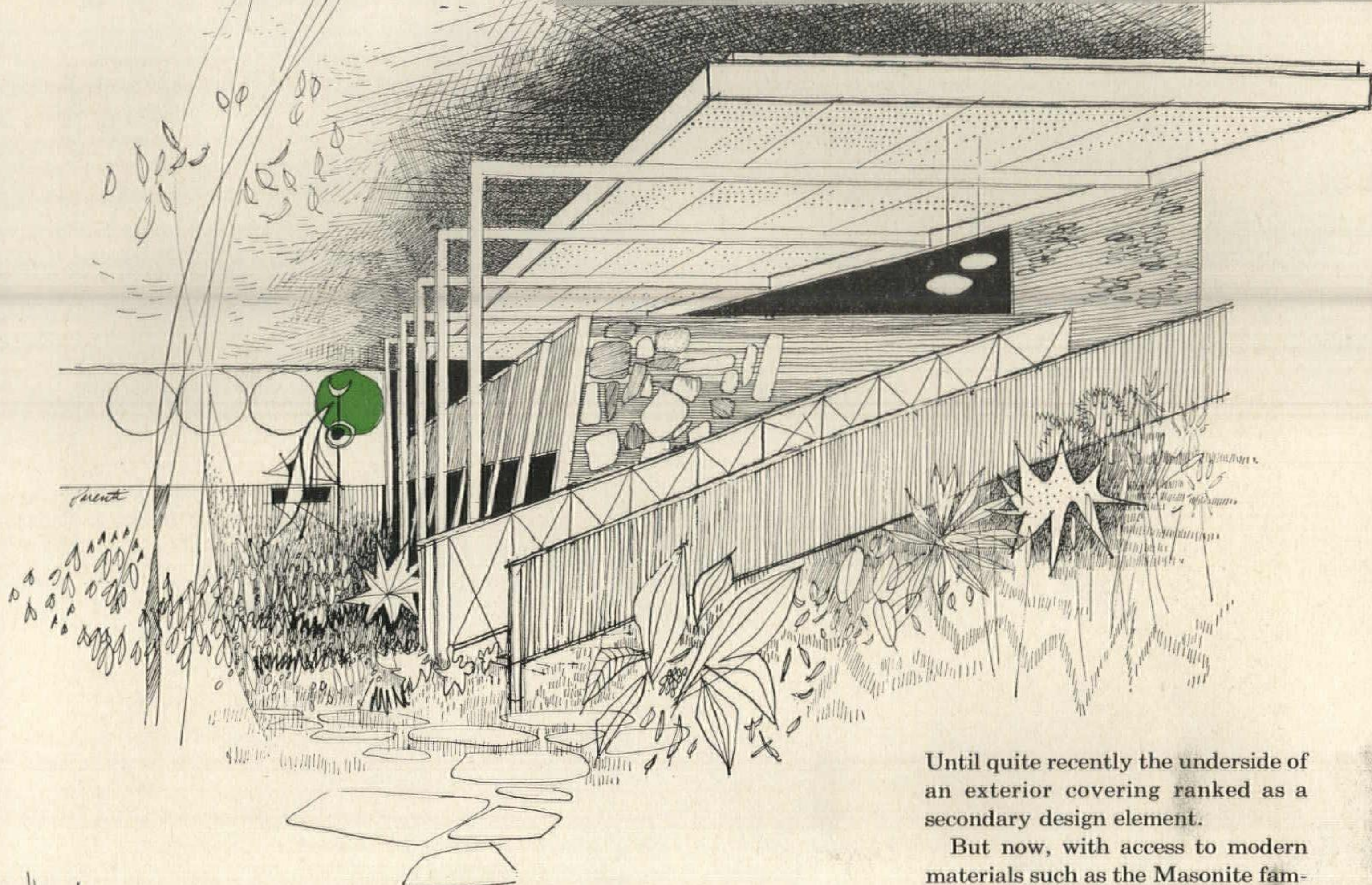
NEW G-E POWER GROOVES come in 4, 6, and 8-foot lengths—and all have the new G-E cathode shield that keeps ends brighter longer. This collects the tiny electrode particles that would otherwise be deposited on the tube wall. These lamps are interchangeable with original Power Grooves—yet they sell for the same price! For more information, write: General Electric Co., Large Lamp Dept. C-935, Nela Park, Cleveland 12, Ohio.

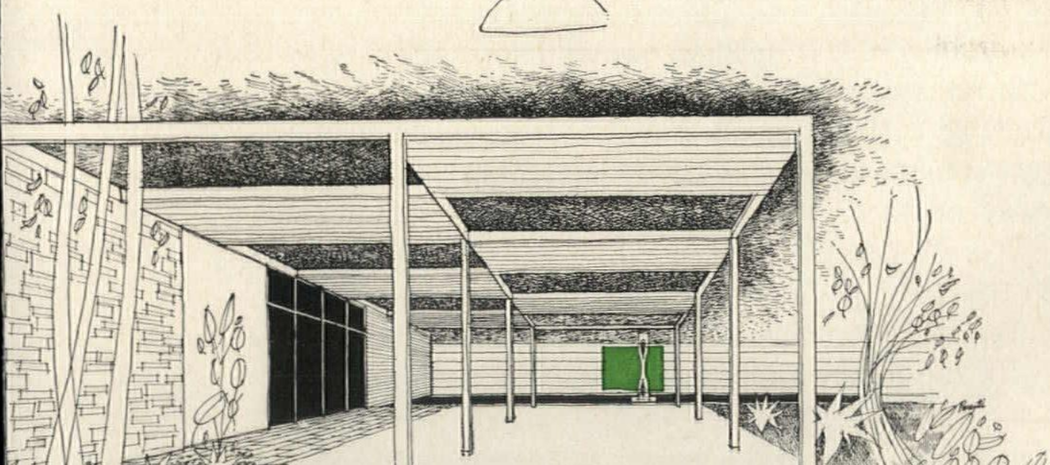
Progress Is Our Most Important Product

GENERAL ELECTRIC

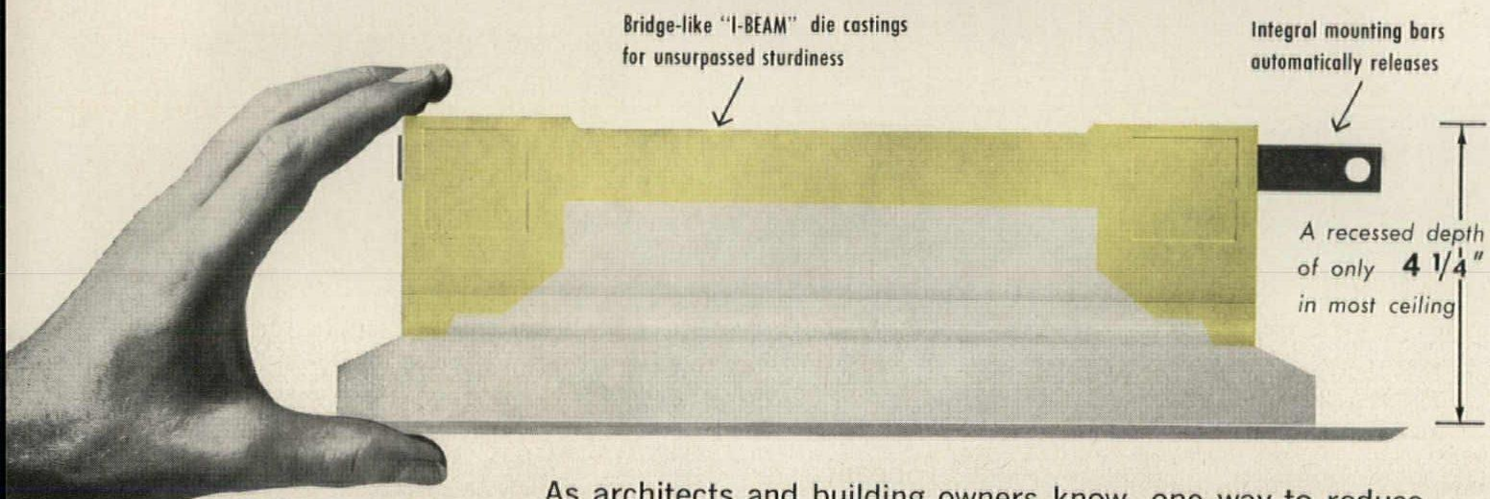


New Jersey State Hospital at Ancora, Hammonton, N.J. Architects: Epple and Seaman.

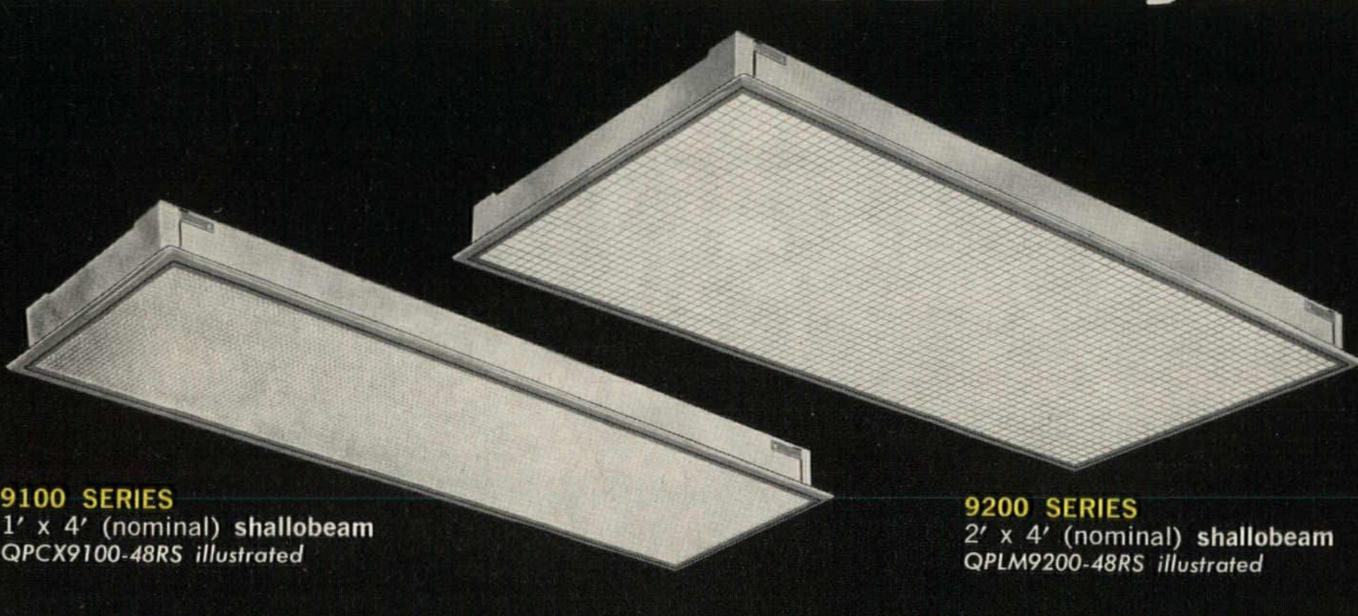




NOW IT'S shallobeam

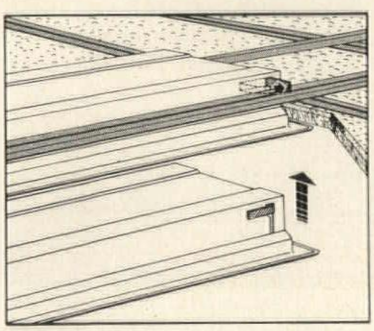


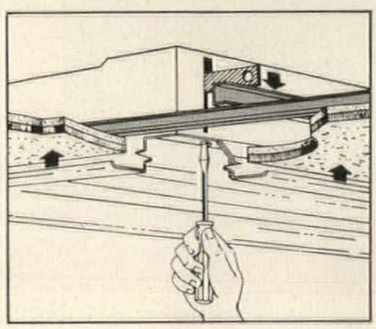
As architects and building owners know, one way to reduce building costs is to reduce ceiling heights. Leading in this direction, Sunbeam Lighting Company now has available a series of ultra-shallow, recessed luminaires — the **shallobeam.** Amazingly compact, these completely integrated "lighting packages" occupy a recessed depth of only 4¼" in most ceilings. Modular in concept, **shallobeam** units of 1′ x 4′, 2′ x 4′, and 4′ x 4′ can be "matched" within a single ceiling plan. Application flexibility is greatly enhanced by the wide variety of light control and diffusing media available. The smartly refined trim with no visible latches give the fixtures a crisp, modern, clean appearance.

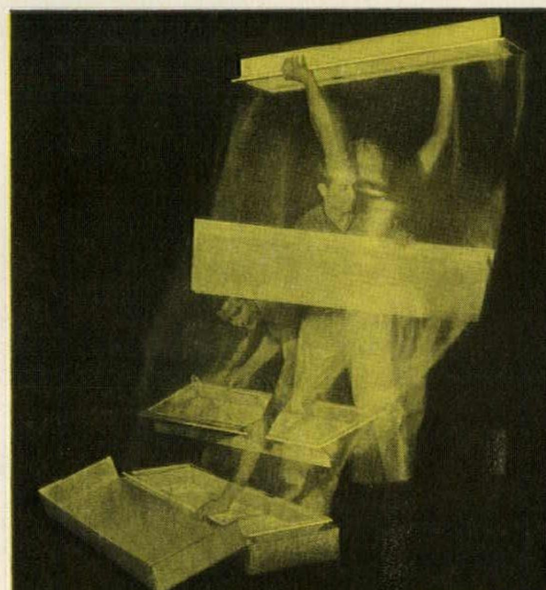


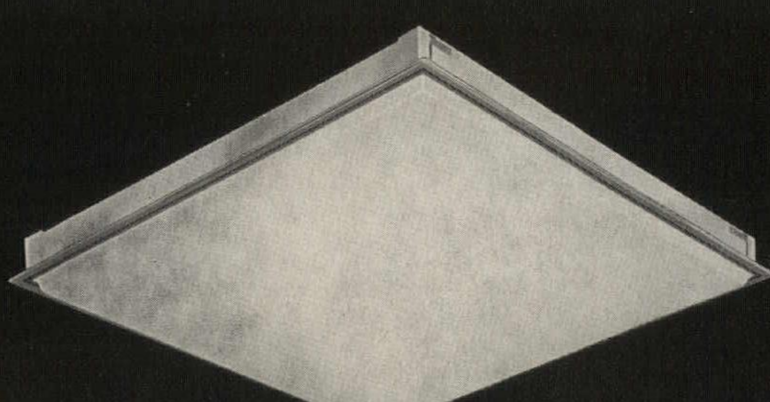
9100 SERIES
1′ x 4′ (nominal) **shallobeam**
QPCX9100-48RS illustrated

9200 SERIES
2′ x 4′ (nominal) **shallobeam**
QPLM9200-48RS illustrated









Office Literature

Window Wall Systems
(A.I.A. 17-A) Gives structural details, typical applications and a description of the features of the *Ador-Wall* window wall system. 8 pp. *Ador Corp., 2345 W. Commonwealth Ave., Fullerton, Calif.*

Recessed Low Brightness Downlites
(A.I.A. 31-F-2) Describes, and gives selection and photometric data and installation details for complete line of recessed low brightness downlights. 8 pp. *Gotham Lighting Corp., 37-01 Thirty-first St., Long Island City, N. Y.*

Young Convector Radiators
Gives complete specification data and capacity information on fifteen models in an enlarged line of convector radiators. Catalog 2328, 16 pp. *Young Radiator Co., Racine, Wis.**

Damper Control Manual
Contains detailed description of the design, installation and operation of the *Du-Air* damper control for central heating-cooling combinations. *Morrison Products, Inc., 16816 Waterloo Rd., Cleveland 10, Ohio*

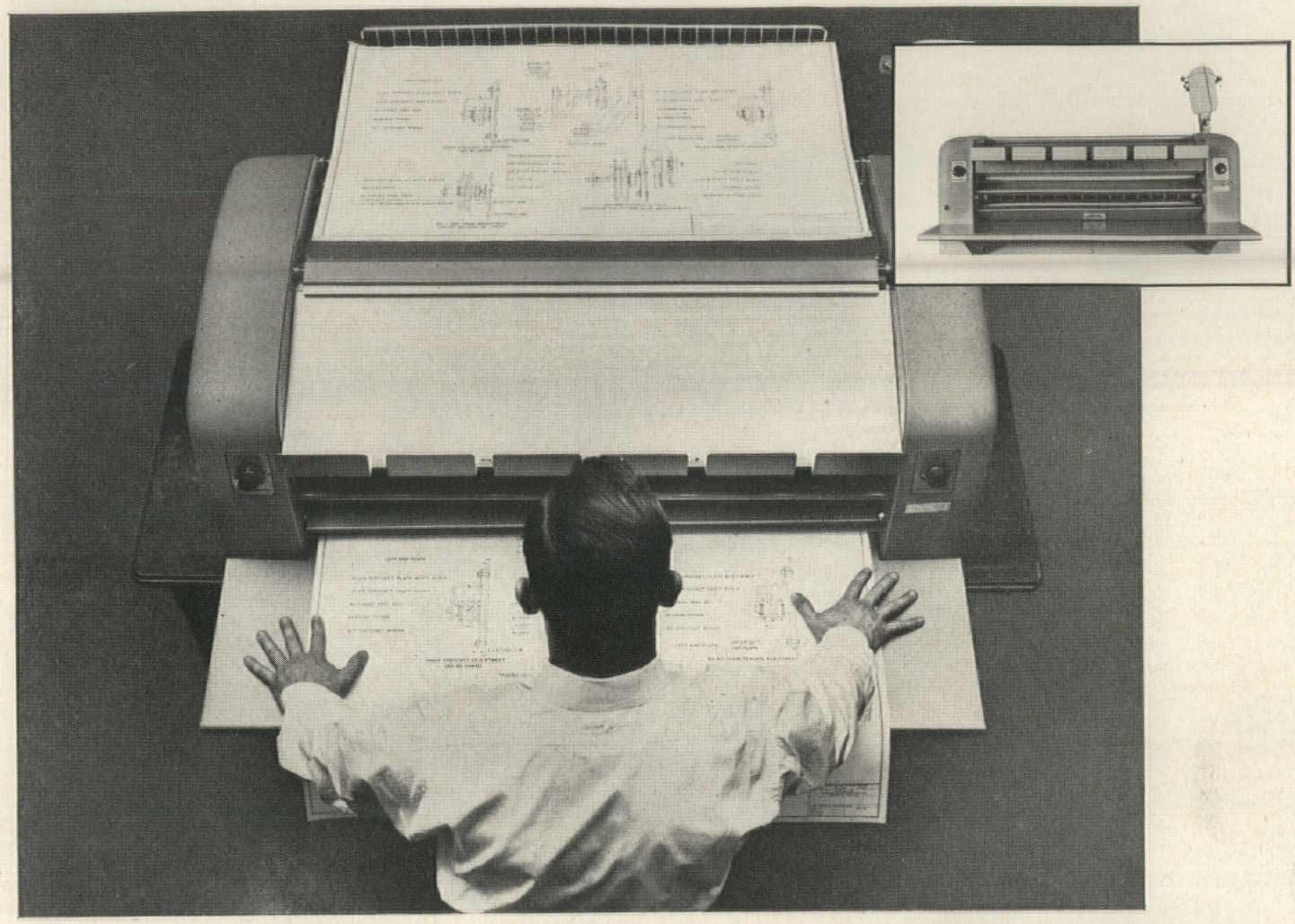
Direct Expansion Coil Catalog
Describes and illustrates Type "X" direct expansion coils; and gives detailed temperature and altitude conversion, rating tables and psychromatic tables and charts for quick coil selection. Catalog 405. *McQuay, Inc., Minneapolis 13, Minn.*

Fire Check Book
(A.I.A. 29-E-2). Gives basic requirements for non-sprinkler fire equipment (standpipe systems, hose stations, exterior fire protection centers and fire extinguishers), with helpful reference tables and coupon specification forms. 8 pp. *W. D. Allen Mfg. Co., Bellwood, Ill.*

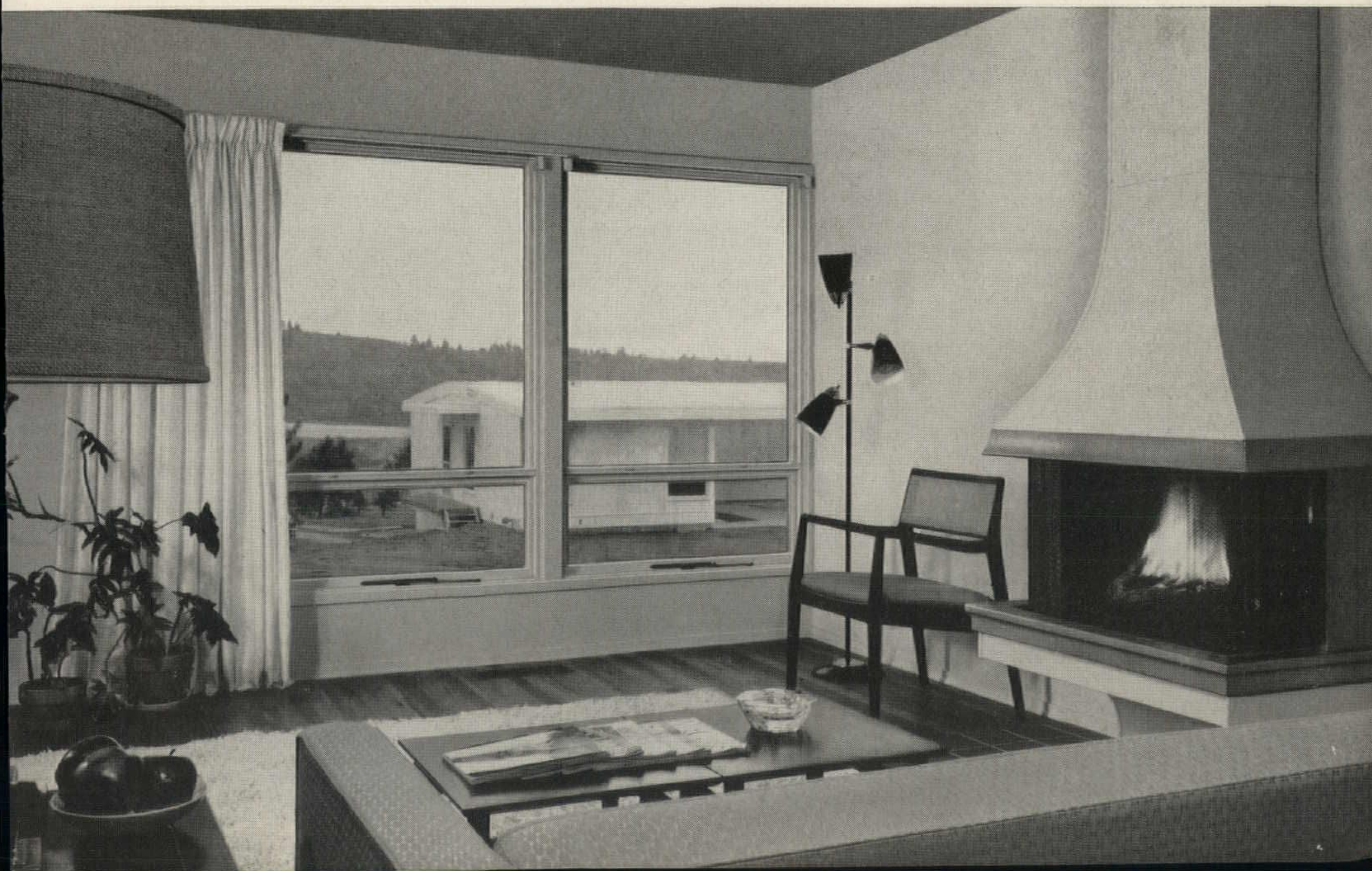
Architectural Stainless Steels
(A.I.A. 15-H-1) Engineering data sheets prepared with the assistance of architectural consultant Wayne Koppes discuss relative properties of various stainless steel alloys; available lengths, widths, gauges and weights; finishes; fabrication methods; textures; costs; and design considerations. Bulletin 259, 6 pp. *Washington Steel Corp., Woodland Ave., Washington, Pa.**

**Additional product information in Sweet's Architectural File, 1959*

more literature on page 326



BELOW—Two Andersen Strutwall units butted together result in this handsome picture window effect. Lower operating sash are awning type. Permit ventilation even during rain storms.



Office Literature

Custom and Standard Mirrors
Describes framed and unframed plate glass mirrors in a wide range of sizes, and details concealed and direct mounting methods. Catalog No. 6, 4 pp. *Faries-McMeekan, Inc., P. O. Box 35, Elkhart, Ind.*

Aluminum Curtain Wall Units
Gives details, dimensional data, and specifications for *Quikset* metal curtain walls. Similar information on a line of projected windows is also included. 4 pp. *Construction Products Corp., 775 Colorado Ave., Minneapolis 16, Minn.**

Low Pressure Air Conditioners
Describes and illustrates the new *Inductor* units for perimeter air conditioning of multi-room buildings, with capacity tables, installation drawings and specifications. Bulletin 9127, 8 pp. Similar information on packaged air conditioners is also available. Bulletin 8525, 8 pp. *American-Standard Industrial Div., Detroit 32, Mich.*

CB Packaged Boilers
Discusses design, operation and efficiency of packaged firetube boilers through 600 hp. 12 pp. *Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee, Wis.**

Single Handle Ball Faucets
Catalogs and gives specification drawings for complete line of single handle ball faucets. 8 pp. *Delta Faucet Corp., Greensburg, Ind.*

Electric Warm Air Heating Manual
. . . for All-Season Comfort discusses the engineering and installation of electric warm air heating systems for homes. Methods of converting the heat losses in Btu's to kilowatt requirements and of estimating annual kilowatt requirements are included. 16 pp. *The Majestic Co., Inc., Huntington, Ind.**

Lighting Fixture Guide
Gives photometric, installation and construction data on complete line of lighting fixtures. 126 pp. *Solar Light Mfg. Co., 400 N. Ashland Ave., Chicago 22, Ill.*

GCA Eterna Granite
Reproduces in full color *Eterna* natural granites which are available in a wide range of colors and veneers as thin as ⅞ in. 8 pp. *Granite Corp. of America, P. O. Box 1, Clifton, N. J.*

**Additional product information in Sweet's Architectural File, 1959*

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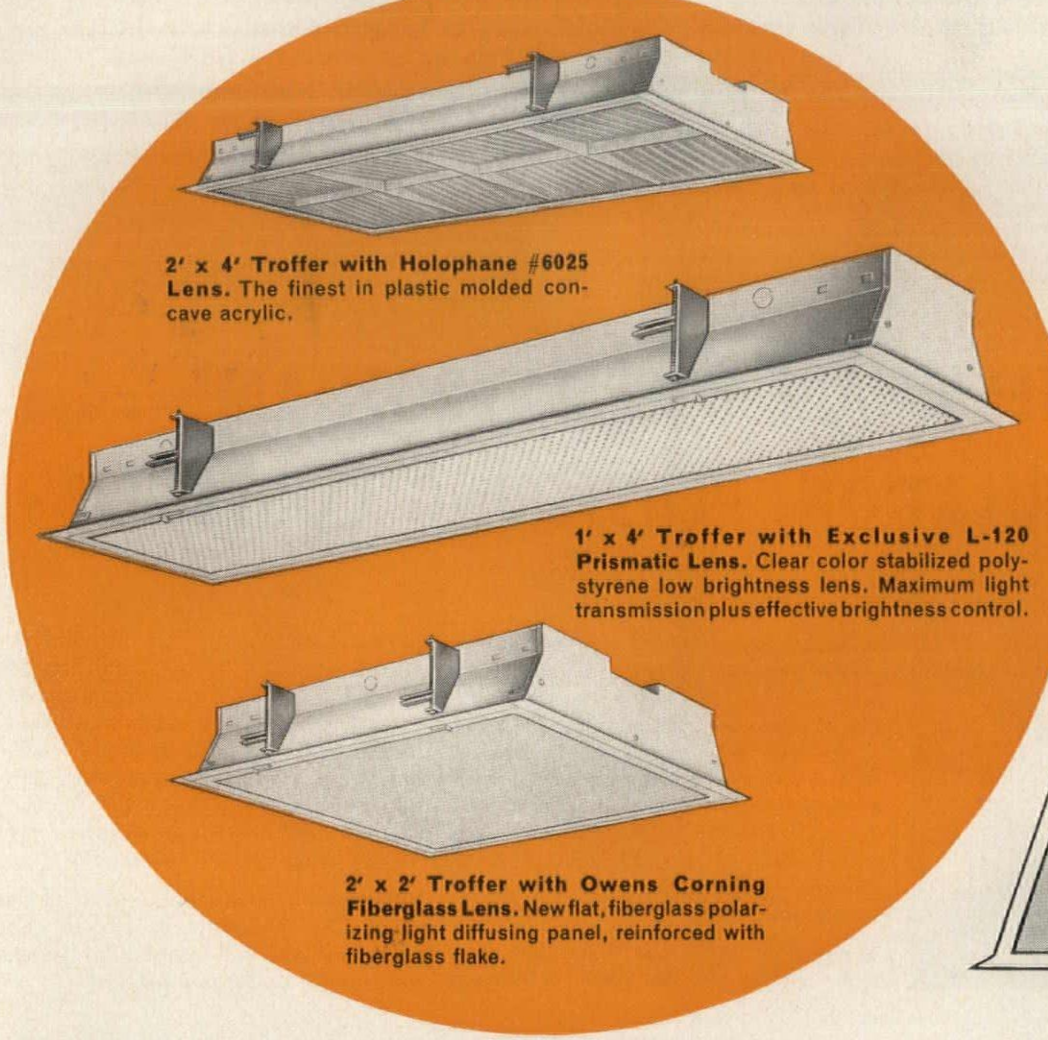

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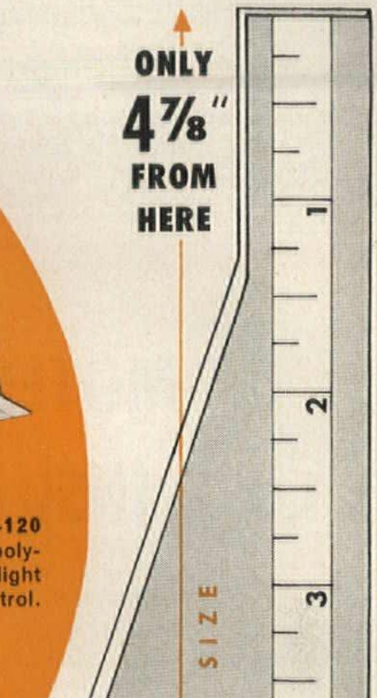

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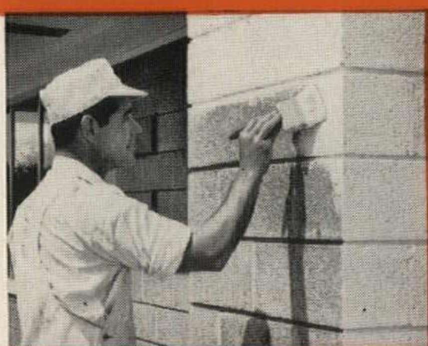

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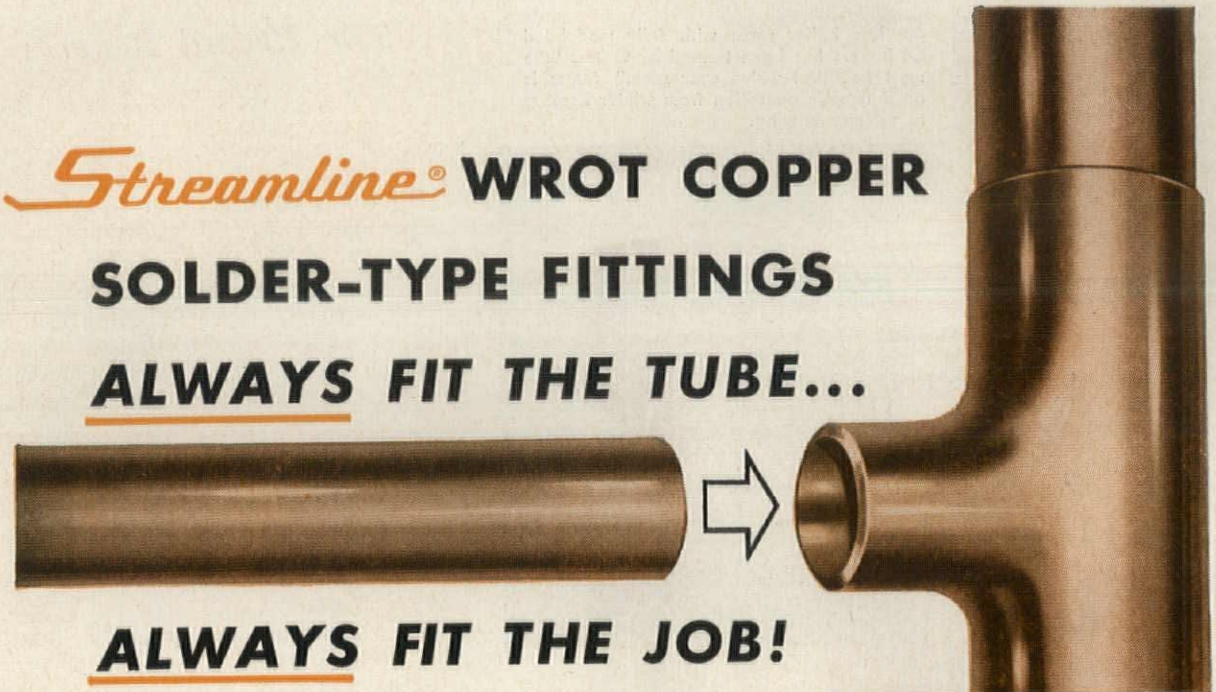

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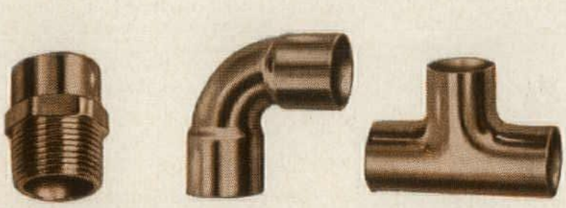

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The Record Reports

On the Calendar

October

- 5-30 Seminar on Urban Planning, conducted by Inter-American Housing and Planning Center of the Organization of American States—Bogota, Colombia
- 7-9 Central States A.I.A. Regional Conference—Des Moines
- 7-14 First Pacific Rim Conference, sponsored by California Council, A.I.A. (and including the annual convention of the Council, the California Regional Convention, and the Women's Architectural League Conference)—Hawaiian Village Hotel, Honolulu
- 8-10 Regional Conference, New York State Association of Architects—Whiteface Inn, Lake Placid, N. Y.
- 8-10 Eighth Western Mountain A.I.A. Regional Conference—Western Skies Hotel, Albuquerque
- 8-10 Northwest A.I.A. Regional Conference—Spokane
- 13-14 First National Technical Conference of Society of Plastics Engineers—Ambassador Hotel, Los Angeles
- 14-16 Annual Convention, Architects Society of Ohio—Sheraton Hotel, Akron
- 14-16 Annual Convention, Texas Society of Architects—Austin
- 18-21 26th Annual Conference, National Association of Housing and Redevelopment Officials—Netherland-Hilton Hotel, Cincinnati
- 19-21 "New Schools for New Education," conference sponsored by Department of Architecture, University of Michigan—University of Michigan, Ann Arbor
- 19-22 National Convention (third of three in 1959), American Society of Civil Engineers—Washington
- 19-23 47th National Safety Congress, sponsored by National Safety Council—Conrad Hilton Hotel, Chicago
- 19-28 Sixth Advanced School for Home Builders, conducted by University of Illinois Small Homes Council-Building Research Council, in cooperation with National Association of Home Builders—University of Illinois, Urbana

continued on page 338

CALIFORNIA REDWOOD, specified by architects and builders for decorative effects such as exterior grilles, adds interest and warmth to garden apartments and other multi-unit dwellings. Not only does redwood harmonize naturally and beautifully with the planting but it also has the very practical advantage of requiring far less maintenance than most woods.

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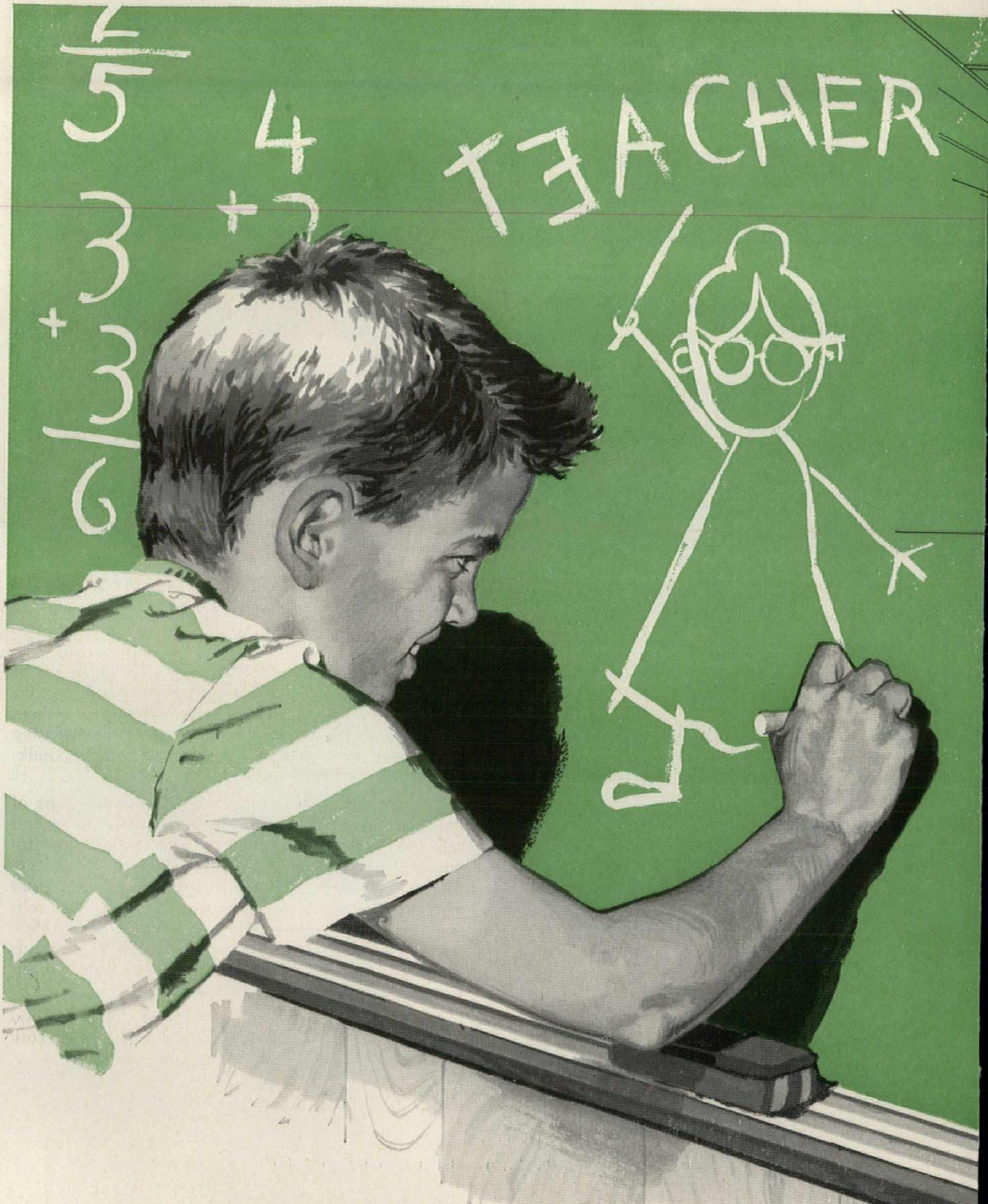

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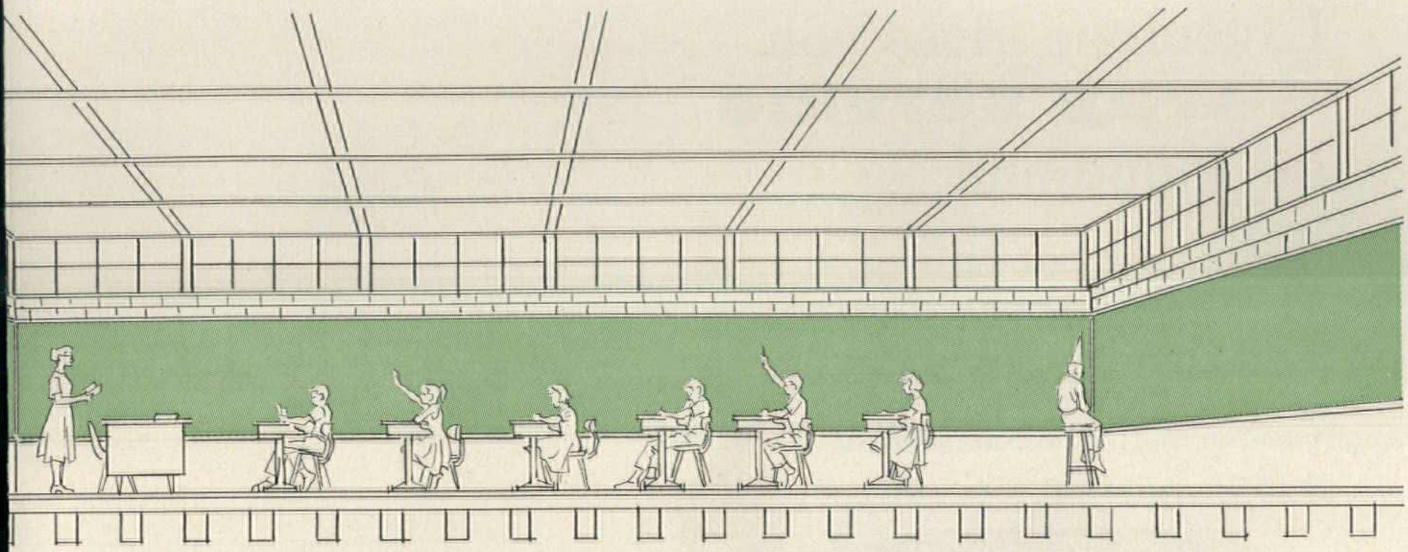


The Record Reports

20-30 Annual Convention, Architectural Institute of Japan—Kyoto and Osaka

23-24 14th Annual Meeting and Forum, Pennsylvania Society of Architects—Galen Hall Hotel, Wernersville

25-28 Annual Convention, Home Manufacturers Association—Hotel Roanoke, Roanoke, Va.

November

1-7 Fifth Annual Convention, Prestressed Concrete Institute—Deauville Hotel, Miami Beach

2-5 12th Regional Meeting, American Concrete Institute—Continental Hilton and Del Prado Hotels, Mexico City

2-5 11th Exposition of the Air-Conditioning and Refrigeration Industry—Convention Hall, Atlantic City

2-6 National Hotel Exposition—The Coliseum, New York

2-6 Annual Conference, Atomic Industrial Forum, and Winter Meeting, American Nuclear Society—Sheraton-Park Hotel, Washington

2-6 National Metal Exposition—Chicago

12-13 Annual Meeting, American Society of Industrial Designers; theme, "Planning by Design—In a World of Product Change"—Hotel Statler, New York

12-14 Annual Meeting, Florida Association of Architects—Jacksonville

14-17 Sixth Annual National Retail Lumber Dealers Association Building Products Exposition—Public Auditorium, Cleveland

16-20 Automation Show and Conference on Materials Handling—New York Trade Show Building, New York

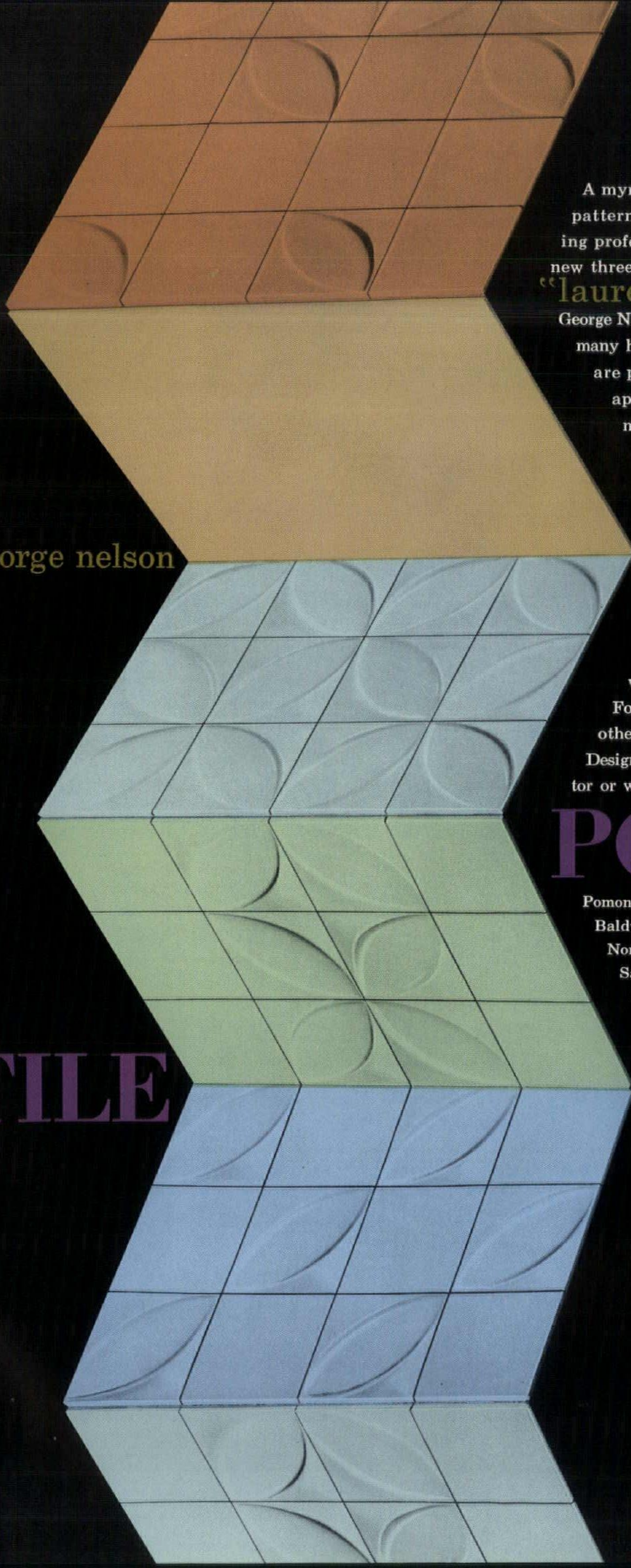
17-19 Fall Conferences, Building Research Institute—Shoreham Hotel, Washington

29ff Annual Meeting, American Society of Mechanical Engineers; through Dec. 4—Chalfonte Haddon Hall, Atlantic City

December

1-4 Annual Convention, National Warm Air Heating and Air Conditioning Association—Chase Park-Plaza Hotel, St. Louis

continued on page 344



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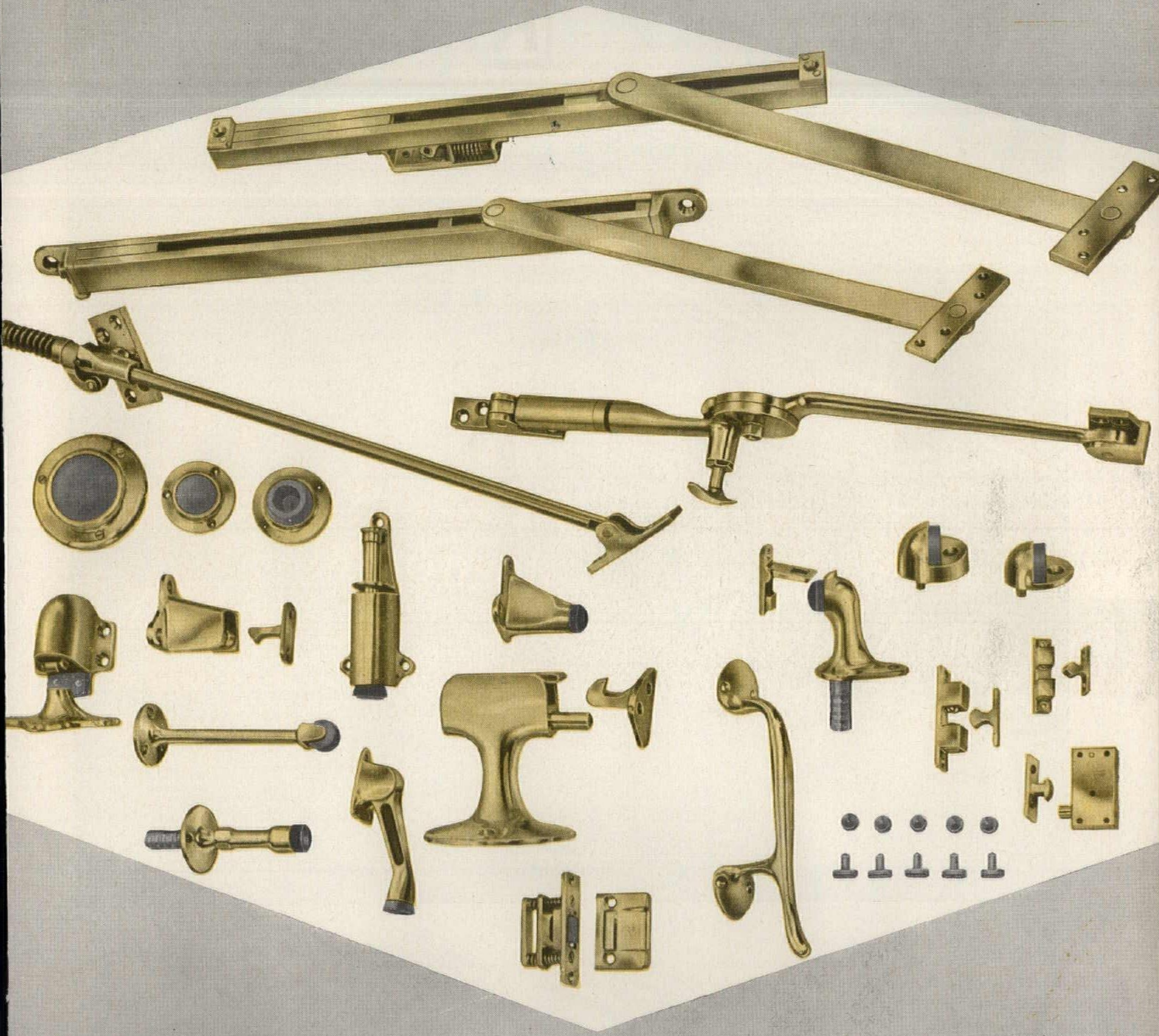

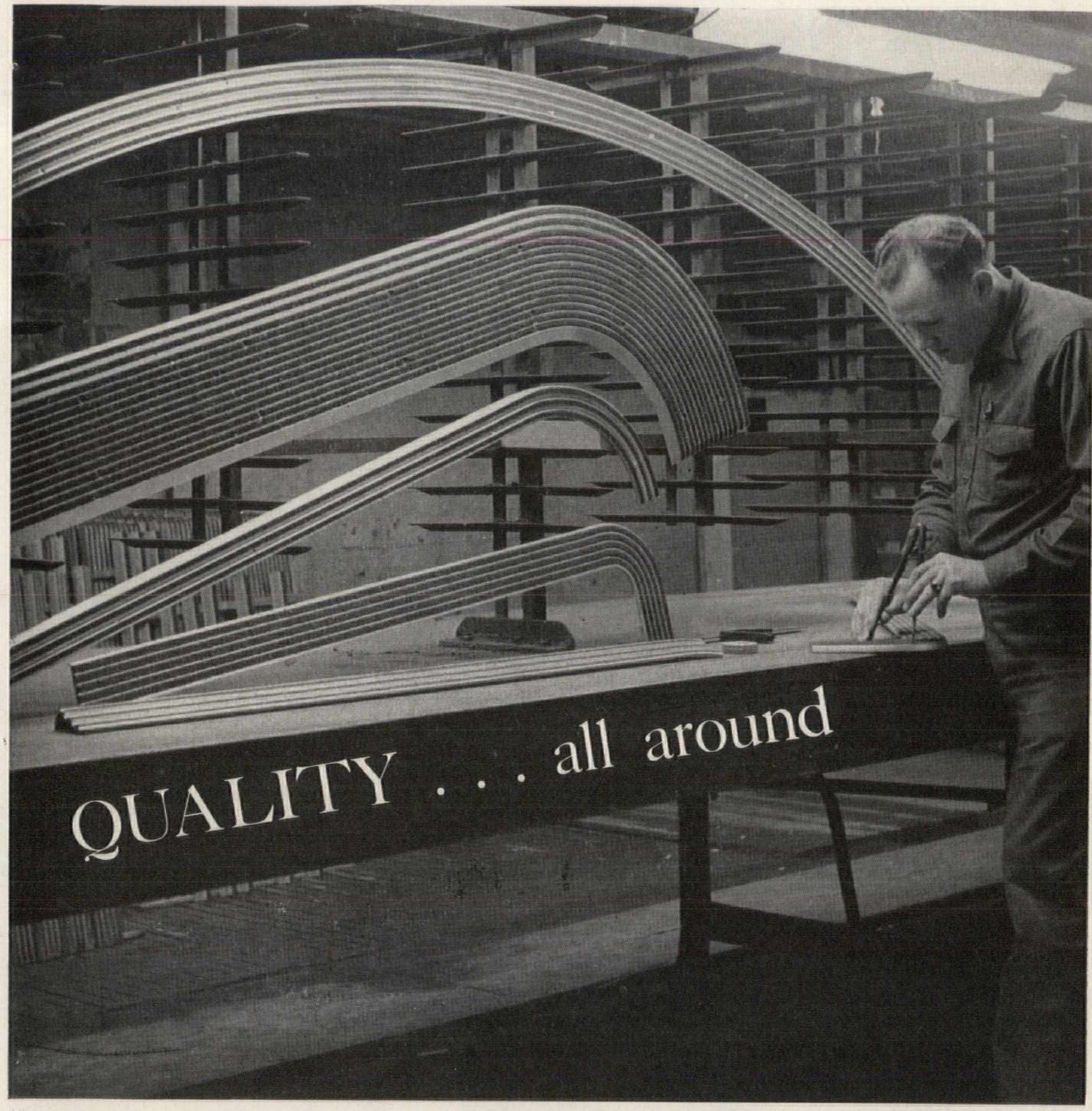

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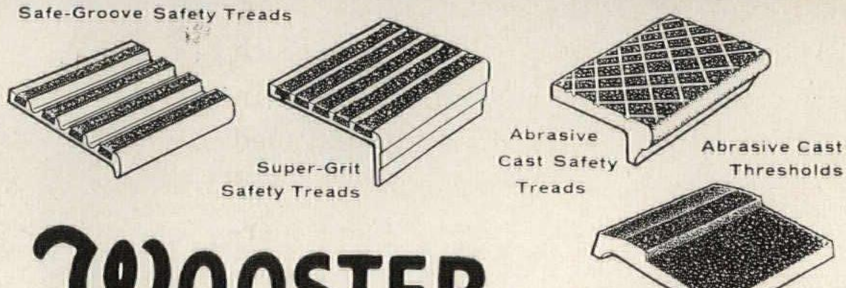

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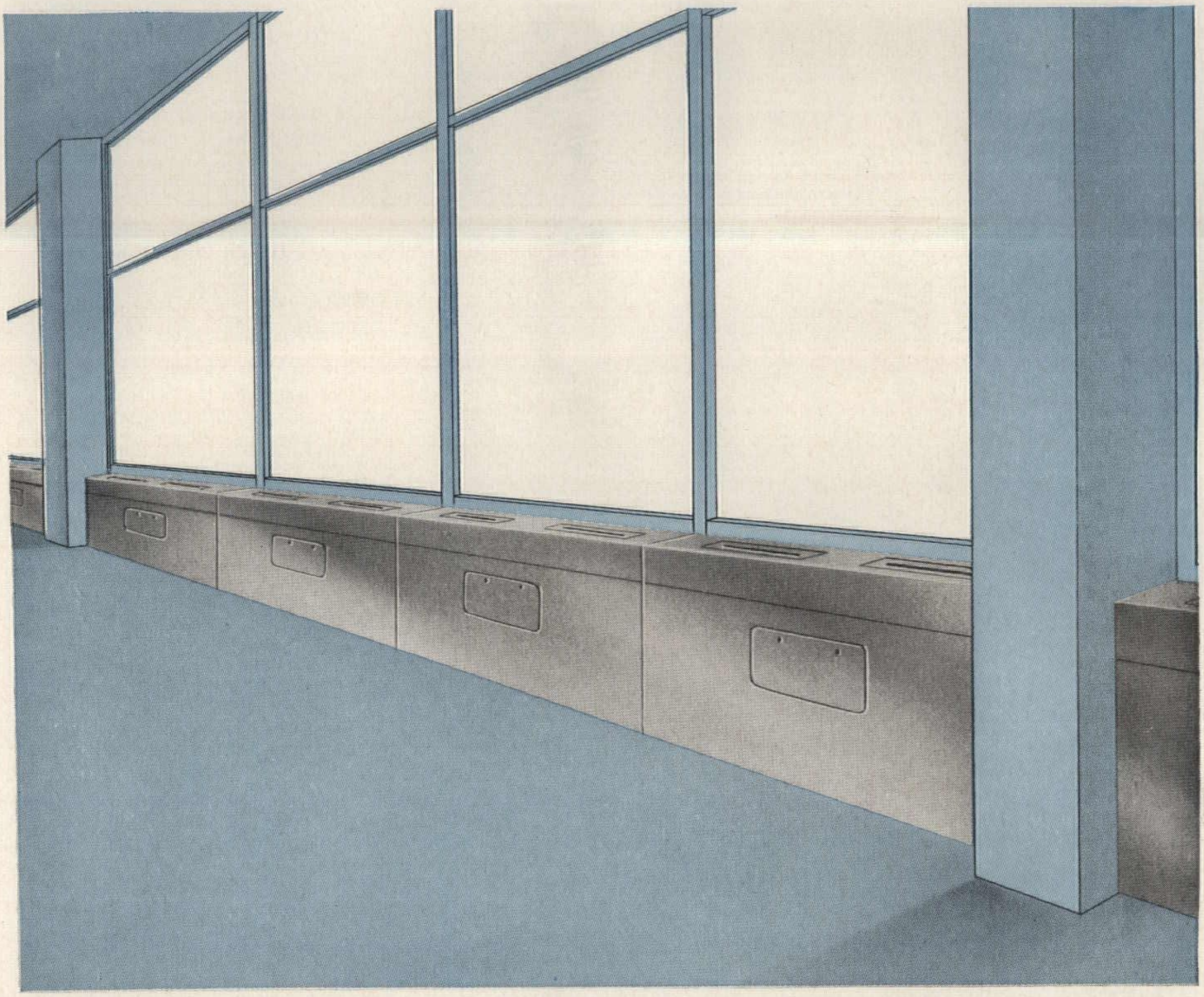

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11-15 Third Annual National Swimming Pool Exposition and National Convention of National Swimming Pool Institute; theme, "Pools for Better Living"—The Coliseum and Statler-Hilton Hotel, New York

Office Notes

Offices Opened

Marvin J. Cantor, A.I.A., has opened an office for the practice of architecture at 261 Constitution Ave., N. W., Washington 1.

Phil H. Feddersen, A.I.A., has opened an office for the practice of architecture at 818 N. 2nd St., Clinton, Iowa.

Jack Arthur Myers and Sheldon Lee Anonsen announce the opening of the firm of Myers & Anonsen, Inc., Architects, at 303 Wesley Temple Bldg., Minneapolis 3.

Firm Changes

Daniel, Mann, Johnson & Mendenhall announces the appointment of Michael C. A. Henderson, A.I.A., as head of the firm's new Hawaii office in the Aloha Tower, Honolulu.

Harley, Ellington & Day, Inc., architects and engineers, announces that John V. Sheoris, A.I.A., has joined the staff as chief designer. Address: 153 E. Elizabeth St., Detroit 1.

Stefan J. Medwadowski, consulting structural engineer, announces the opening of a San Francisco office at 111 New Montgomery. (The East Bay office continues at 1722 Walnut, Berkeley 9, Calif.)

Edgar Tafel, A.I.A., announces that Leonard Scheer, A.I.A., has joined his office as associate and that the firm is now known as Edgar Tafel Associates, Architects. Address: 14 E. 11th St., New York 3.

New Addresses

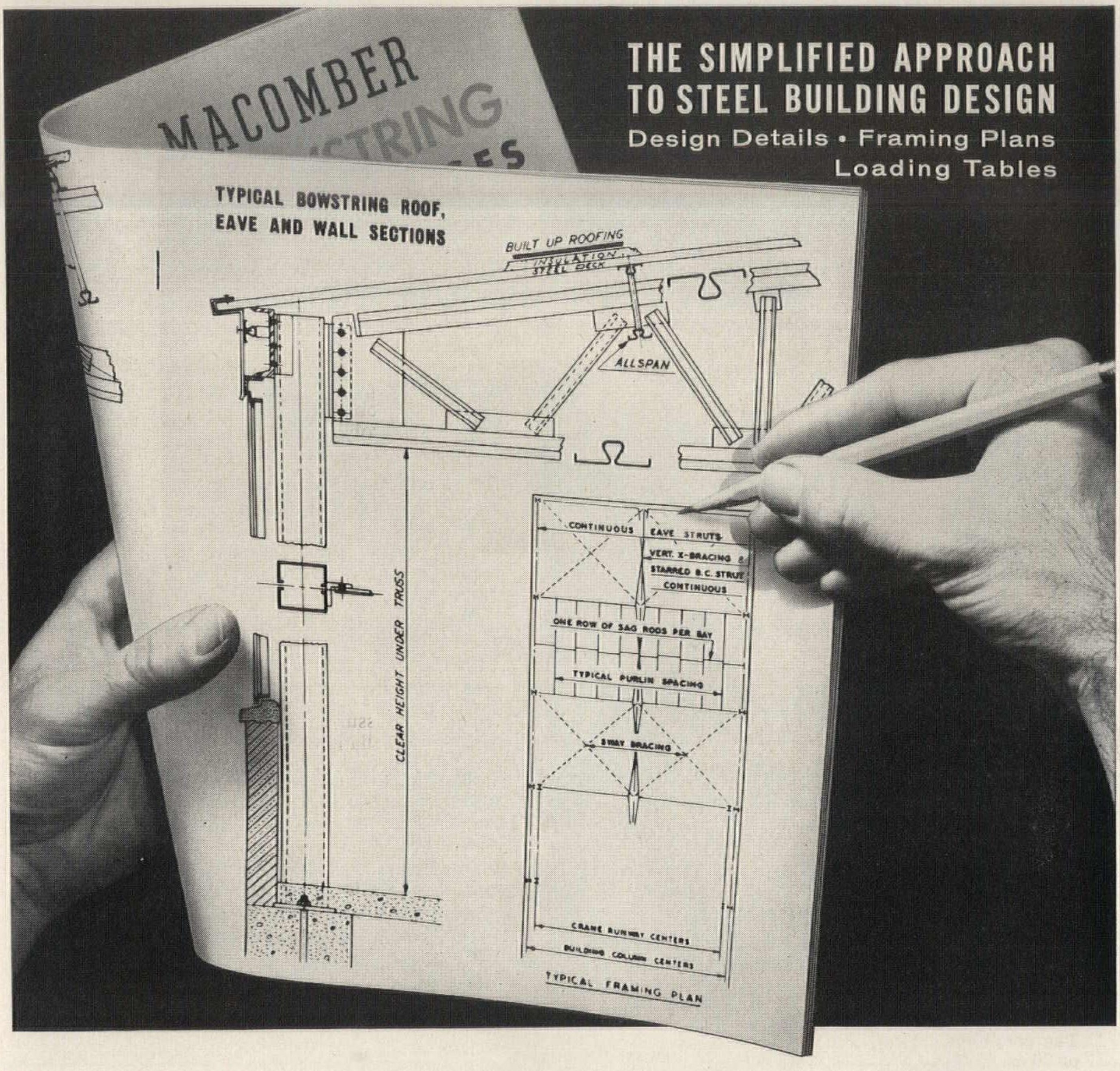
Joseph G. Hoffmann, Architect, 3101 Brown Rd., St. Louis 14.

Page & Werner, A.I.A., 212-4th St., N., Great Falls, Mont.

Correction

The RECORD deeply regrets that the names of two of the new Fellows were omitted from the list included in the July story (page 10) on the assembly of the Royal Architectural Institute of Canada. They are: Robert P. Fleming and Charles A. E. Fowler.

more news on page 348



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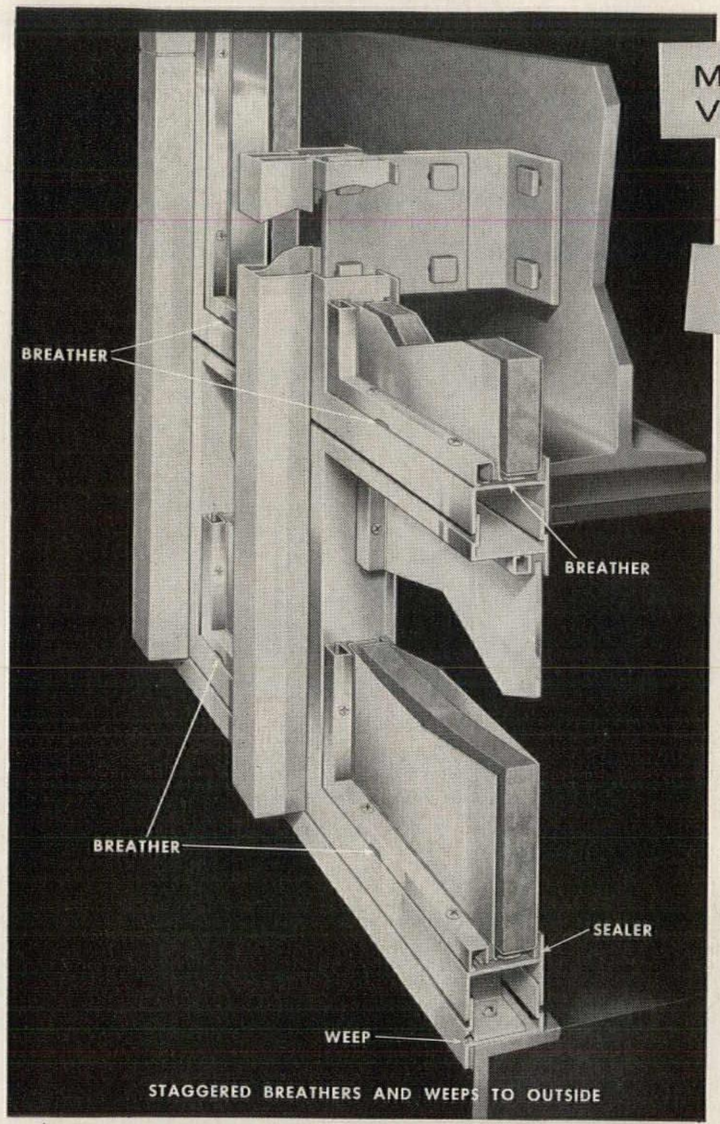

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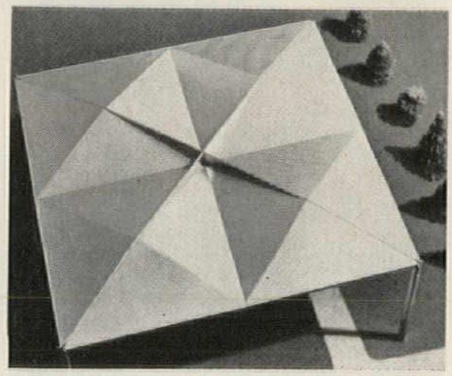
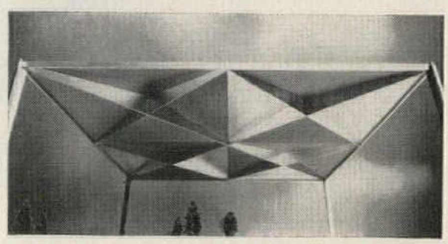
The Record Reports

Aluminum Shelter With Many Uses Designed by Noyes

Eliot Noyes has designed a 400-sq-ft aluminum shelter, intended to be usable in many ways. The shelter, known as the "Forecast Gazebo," was commissioned by the Aluminum Company of America for its "Forecast" collection of aluminum designs. Werner-Jensen and Korst, engineering consultants, collaborated with Mr. Noyes on the structural design of the gazebo.



The shelter is basically a 20-by-20-ft aluminum roof supported by four thin aluminum columns. It is designed to withstand all normal loads and to be produced, if necessary, by pre-fabrication in sections. The roof structure of squares and triangles provides different planes which exhibit changing light patterns or which may be decorated in many colors.



Some of the uses envisaged for the gazebo are: carport, cabana, barbecue shelter, boat house, beach pavilion, boardwalk cover, commuter platform. Also, multiple units could be joined to form larger structures; when appropriate (as in an open-air market), some units could be left open at the top.

According to Mr. Noyes, the shelter can readily be moved, is almost maintenance-free, and appealingly expresses its function. He believes the gazebo should never be walled in or be attached to another type of structure. Partitions, he says, should stop short of the roof.

more news on page 354

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holds lead firmly at any length you want. Lead can't be pushed back in barrel, won't twist in sharpener.

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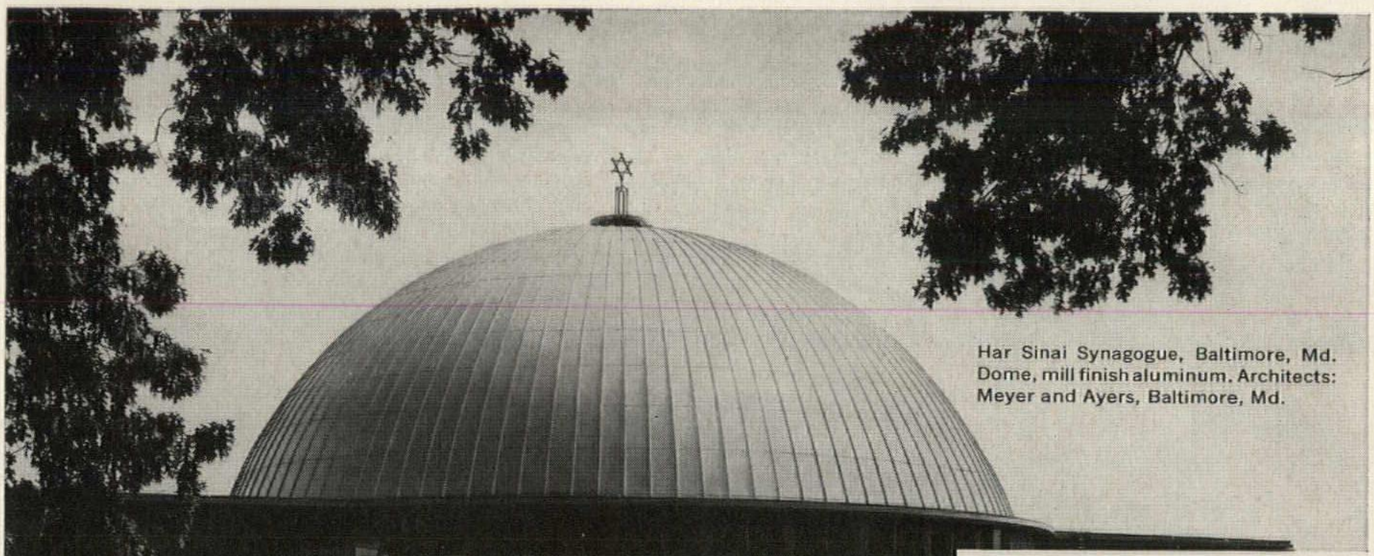

Har Sinai Synagogue, Baltimore, Md. Dome, mill finish aluminum. Architects: Meyer and Ayers, Baltimore, Md.

Ahavath Achim Synagogue, Atlanta, Ga. Gold anodized aluminum dome. Architects: Roberts & Co. Associates, Atlanta, Ga.

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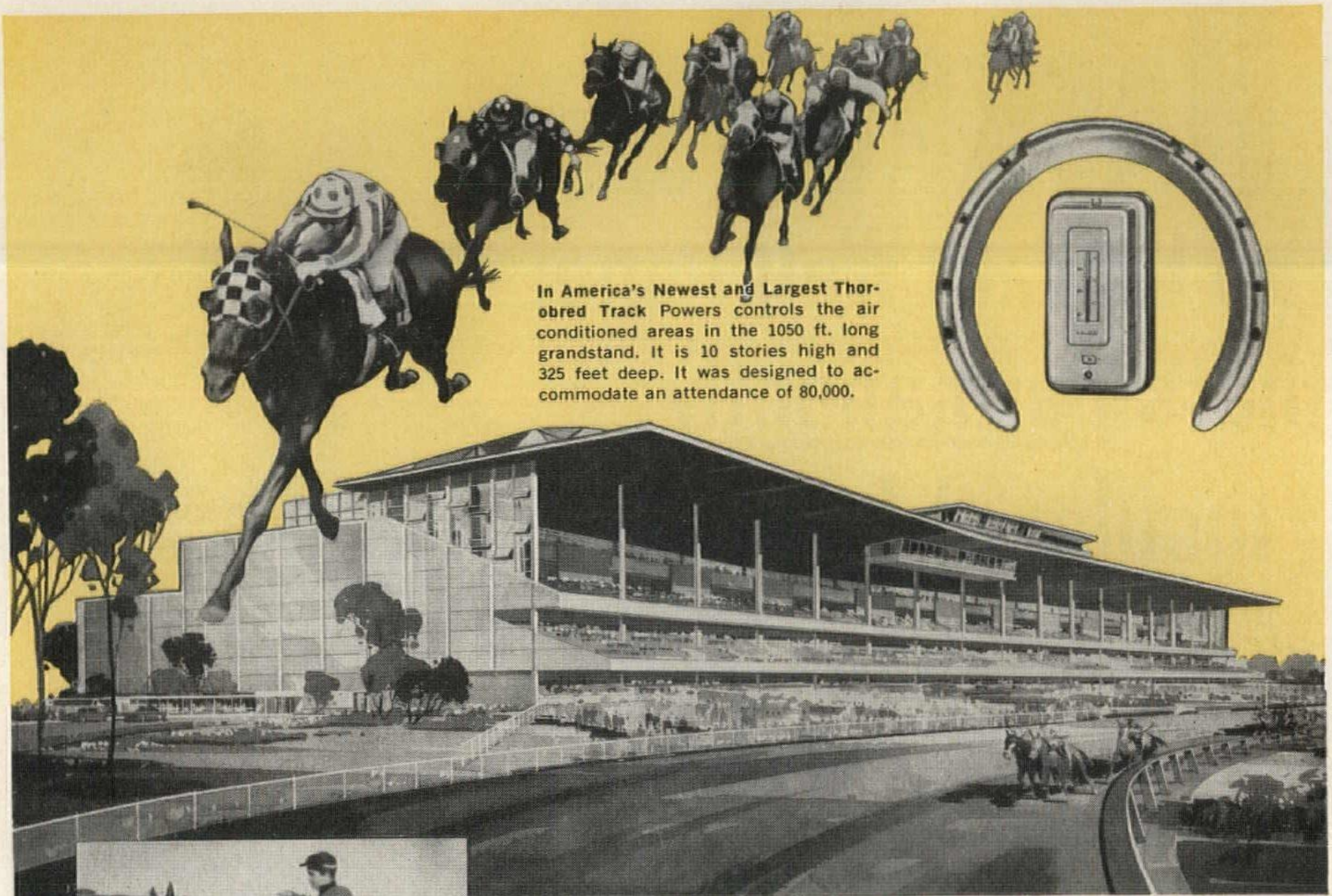
Cleveland Park Synagogue, Cleveland Heights, O. Dome of sheet copper. Architect: the late Eric Mendelsohn. Associate: Michael A. Gallis.

The Woodsdale Temple, Wheeling, W. Va. Dome of mill finish aluminum. Architect: Nathan Cantor, Pittsburgh, Pa.



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D-19

NEW AQUEDUCT RACE TRACK, OZONE PARK, LONG ISLAND, N.Y.

Architects: ARTHUR FROEHLICH & ASSOCIATES, Philadelphia and Beverly Hills, Cal.
Engineers: STONE & WEBSTER ENGINEERING CORPORATION, New York
Mechanical Contractor: H. SAND & COMPANY, Inc., New York

POWERS Air Conditioning Control

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sive annual rise. The all-time high this year is 46,480,000, the Department said.

The increase amounts to 1,940,000 over the 44.5 million in school last year. A continuing teacher shortage also was stressed.

One out of every four persons in the country now is attending school, from kindergarten through college. Enrollments this year by grade level: 33,460,000 in kindergarten through grade 8 and 9,240,000 in grades 9 through 12, compared with 32,010,000 and 8,940,000, respectively, last year. And the institutions of higher learning were expecting a total enrollment of 3,780,000 this year compared with 3,590,000 last.

In announcing these totals, Education Commissioner Lawrence G. Derthick warned that the swelling enrollments and their attendant problems were likely to continue for many years. Four years from now, he said, the school age population—pupils five through 17 years of age—will probably go as high as 48.8 million or 13 per cent more than at present.

Local Planning Called Vital

The Population Reference Bureau, a non-profit Washington, D. C., organization, stressed the need for greater local emphasis in planning school capacity. Noting the exploding trends in school age populations and the demands that will be placed on physical facilities in the years ahead, the Bureau said planning must be in terms of each individual community—not in terms of national averages or predictions of increase of children for the whole country.

Despite nationwide population inflation, it continued, it is expected that about 40 per cent of counties in the U. S. will show a decline in numbers of people in the 1960 Census. In the past, growing rural communities frequently have resisted consolidation of their schools from the traditional one-room, or few-room, schoolhouses to the modern 1000-2000 pupil buildings, the Bureau noted, predicting that shrinking rural populations may force the development of new patterns of consolidation in many communities. On the other hand, it said, needs for expanded school facilities will grow at an astonishing rate in the metropolitan areas.

The Bureau explained that the 168 standard metropolitan areas of the country grew by 13.7 per cent in the years 1950-55 and accounted for virtually all of the nation's population growth. The rest of the country increased in population in that time by only 0.5 per cent. Nearly seven eighths of the increase occurring in the metropolitan areas came in the suburbs, not in the central cities, according to the Bureau.

If birth rates remain at the 1955-1957 level, the Bureau estimates, by 1980 the number of kindergarten and elementary school age pupils will have increased by 64 per cent, those of high school age by 80 per cent, and those of college age by 92 per cent.

Robert C. Cook, the Bureau's president, commented: "With a fifth of the population changing residence each year, it is extremely hazardous to make long-term predictions on a state or local level. Trends can be reversed overnight in response to special or localized situations. But we can be certain that in the immediate future suburban and exurban communities face tremendous . . . school building problems. The most rapid growth is expected to take place in the western section of the country."

continued on page 358

IN RETAIL SHOPS, TOO, IT'S

Quietly beautiful... Beautifully quiet...

ULTRACOUSTIC® CEILING BOARD

- Quietly beautiful—the only incombustible* glass fiber ceiling board with *travertine* texture.
- Beautifully quiet—85 NRC.
- All the permanence, stability, and easy-application characteristics of glass fiber
- The ideal ceiling board for any suspended ceiling application where appearance and acoustical efficiency are important. . . offers uniformity without monotony.

FOR ADDITIONAL INFORMATION SEE SWEET'S FILE 11A/GU OR WRITE FOR 4-COLOR AIA BROCHURE TODAY.

*Carries Underwriters' Laboratory label

GUSTIN-BACON *Manufacturing Company* GUSTIN gb® BACON

Thermal and acoustical glass fiber insulation for duct work, pipe, curtain walls, metal buildings.

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Johns-Manville *Aquadam* Built-Up Roofs

Built with a bitumen that means better application—longer life

AQUADAM IS A SUPERIOR CEMENTING AGENT developed by Johns-Manville for dead-level roofs. It combines the best features of coal tar pitch and of asphalt without their weaknesses. It quickly cements and securely seals the felts. And, as years roll on, Aquadam retains its self-sealing properties.

In addition, Aquadam offers these other proven advantages: ability to end "standing water worry"; high resistance to all kinds of weather conditions; "superior bond," because Aquadam spreads, wets and saturates the roofing felts uniformly.

For further information on how Aquadam Built-Up Roofs pay off in longer roof life and maximum protection send for a copy of booklet, "J-M Aquadam Built-Up Roofs." Write to: Johns-Manville, Box 158, New York 16, New York. In Canada, write Port Credit, Ontario.

JOHNS-MANVILLE

JOHNS-MANVILLE JM PRODUCTS

Use your foot to wash your hands!

EVERYONE likes these modern Bradley Duo Washfountains! They give the user a new feeling of cleanliness because hands touch only clean, tempered, running water. You use your foot to turn the water on and off—never touch dirty faucets. The bowl is rinsed constantly when in use. It stays clean, bright and pleasant.

New Duos are more popular today than ever. They are being specified by leading architects for scores of new schools, offices, restaurants, markets, institutions, parks and public buildings. Bradley Foot-Control is the easy and sensible way to achieve the sanitary washing facilities people want. In addition, Duos provide *twice* the washing facilities with the same piping connections required by a single person basin.

BRADLEY *Duo washfountains*

Mint Green | Sun Tan

Citrus Yellow | White

Sky Blue | Forest Green

- Sanitary Foot-Control—No Faucets
- More washing facilities in a given area
- Easy Maintenance
- Six harmonizing colors *and stainless steel*
- Three heights: Standard 31″, Intermediate 29″, Junior 27″
- Now shipped ready to hang for lower cost installations

BRADLEY *washfountains*

FOR SCHOOLS, PLANTS, INSTITUTIONS

The "Standard" for new and remodeled buildings—wherever there are many hands to wash.

Wide acceptance over many years has made Bradley Washfountains the logical selection for group washing in schools, mill, mine and factories —institutions and public buildings of all kinds. The "Bradley Circle" should be included in *your* design. It makes washroom layout easier, faster, better.

CITRUS YELLOW VITREOUS ENAMEL

STAINLESS STEEL 36″ and 54″ BOWLS

SAGE GREEN MARMORITE

Bradley Semi-Circular Washfountains are available in 6 Vitreous Enamel decorator colors, stainless steel and Precast stone and Marble.

Drawing the "Bradley Circle" makes these advantages possible:

- Maximum sanitation
- Lower costs—first cost, installation, operating and maintenance
- Water Savings
- More facilities in less area
- Available with 54″ or 36″ full circle or semi-circular bowls

Radiant Ceiling News

With Burgess-Manning Ceilings — Your Building Is Better — Your Building Budget No Bigger

A Leader Chooses a Leader

A world leader for 50 years in the design and manufacture of calculating machines, Marchant Calculators Division of Smith-Corona Marchant Inc., has contributed an almost endless number of innovations and advancements in calculator design and operation. Among them are:

- America's first mechanical calculator.
- America's first electrically—powered calculator.
- High-speed proportional gear principle and mechanism.
- America's first calculator of streamline design.
- The world's first and only calculator that sets all decimal points automatically.
- Unique back transfer mechanism that takes back-tracking out of multifactor calculations.

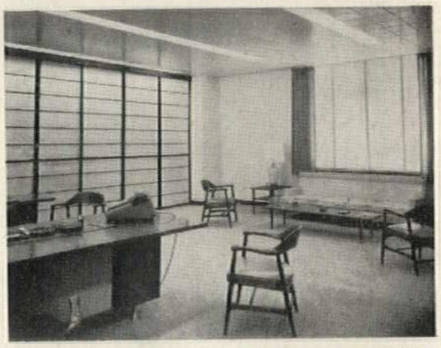
As contributors to increased efficiency and greater accuracy in figure work, and time saving ease of machine operation, Marchant executives are deeply conscious of the advantages of environmental comfort to people whose work requires thought and concentration. In planning their new headquarters and factory, they sought the most desirable method of providing comfortable surroundings for the Marchant staff.

Their choice was the Burgess-Manning Radiant Acoustical Ceiling. Radiant cooling and heating most closely matches the natural body demand for heat loss control—the key to thermal comfort—and the ceiling also supplies the best possible in practical work space acoustics.

Sixty-five thousand square feet of office space are thermally and accoustically controlled through the Burgess-Manning Ceiling. The entire structure, which includes the factory, was designed by Architect Albert Roller. It was erected by the Dinwiddie Construction Co. The Burgess-Manning Ceiling was installed by Cramer Acoustics.

The new headquarters and factory of Marchant Calculators Division of Smith-Corona Marchant Inc., Oakland, Calif. Radiantly cooled and heated by the Burgess-Manning Ceiling.

A section of Marchant's accounting division, clerical area. Incorporating thermal functions in the ceiling recovers for practical use valuable floor space otherwise wasted by heat distributing devices.

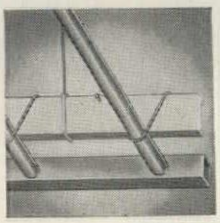


Radiant comfort for the General Sales Manager is supplied by the Burgess-Manning Ceiling.

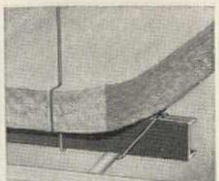
Basically Simple Construction of Burgess-Manning Radiant Acoustical Ceiling

1. Suspension Grid
The suspension grid of 1½" channels on 4 ft. centers is not unusual.

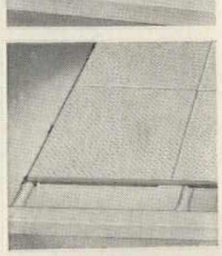
2. Water Circulating Coil
The grid type coil is made from pre-fabricated headers to which ½" laterals are welded. A sinuous type coil can be used where conditions make it desirable. It hangs from the suspension grid.



3. Acoustic-Thermal Insulation Blanket
The non-combustible sound-absorbing blanket, with the required noise reduction coefficient, is laid on top of the suspension grid.



4. Snap-On Panels
Heavy gauge perforated aluminum panels of the proper thermal conductivity are attached directly to the water circulating coil.



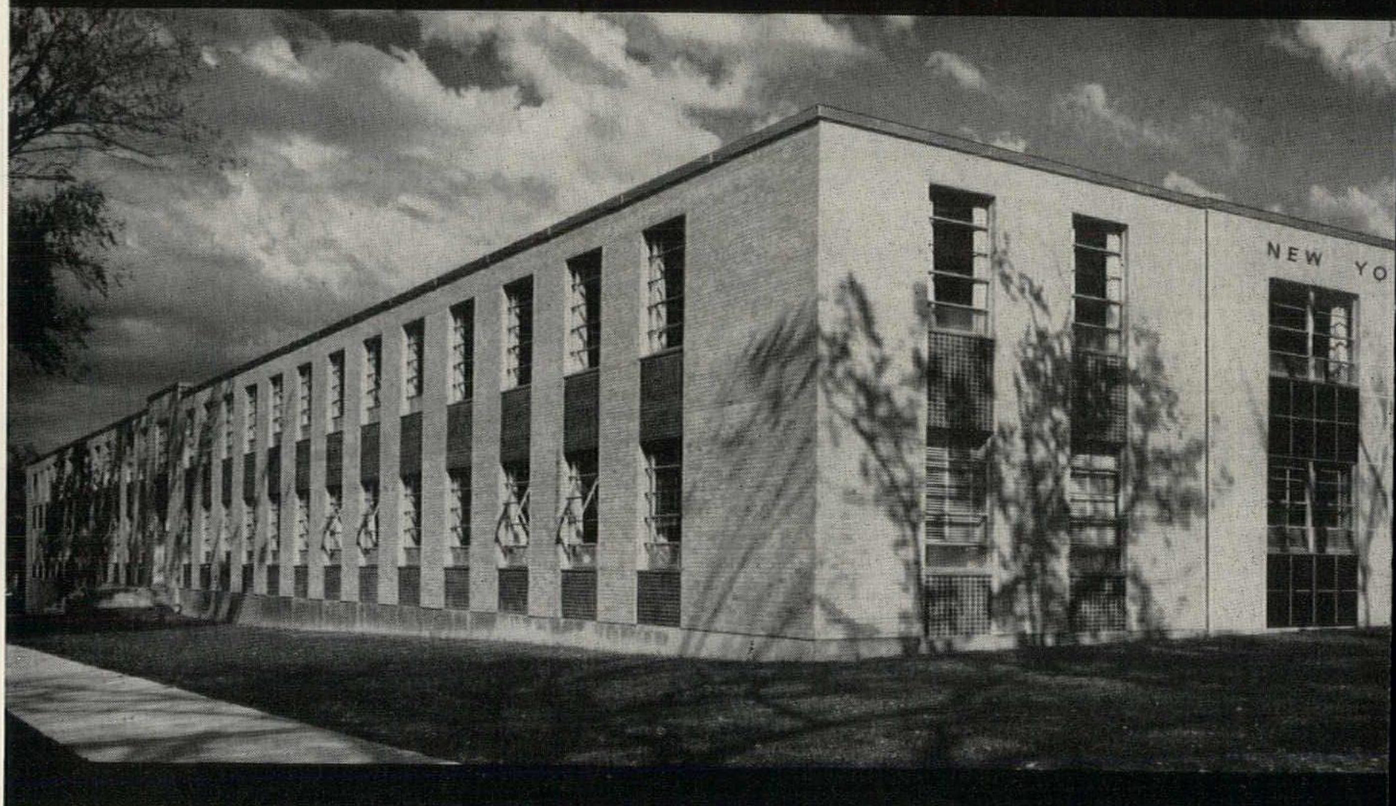
Write for descriptive Burgess-Manning Catalog No. 138-2L

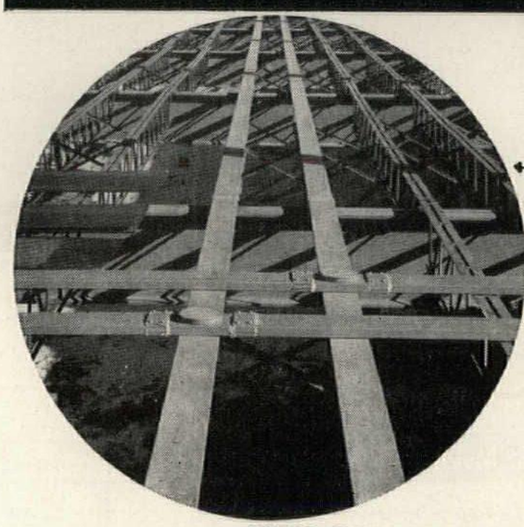
3 Heating Cooling Acoustical

BURGESS-MANNING COMPANY
Architectural Products Division
749 East Park Avenue, Libertyville, Illinois

SEE OUR CATALOG IN SWEET'S ARCHITECTURAL FILE OR WRITE FOR COPY

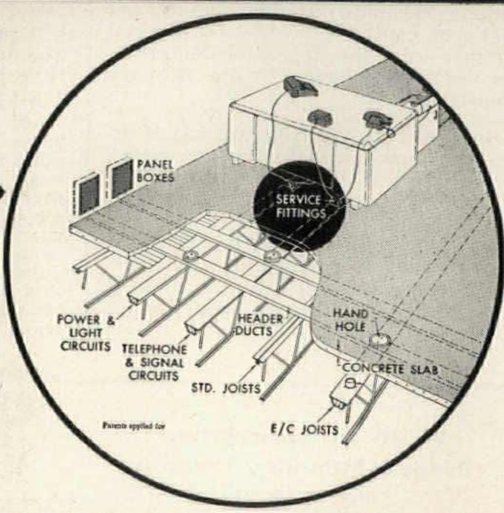
Underfloor Electrification isn't NEW...
But it's NEWS when a quality system offers big savings so any building "can afford" electrification





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

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



TOTAL MANUFACTURING FOR THE BUILDING INDUSTRY FROM RAW TO FINISHED PRODUCTS

designs are made for the specific hospital."

Housing received its special jibes in the report. For one thing, the committee said it found Department of Defense criteria to be so broad that it was impossible to compare requirements of one service with those of another. And this: "The rapidly changing concepts of the military forces of our country make it imperative that the utmost care be taken in the construction of permanent family housing. The committee questions whether the housing program is being administered so as to assure this care."

The Department was directed to inform both House and Senate appropriations committees before it advertised contracts for any Capehart housing not included in the specific funding programs presented to the Congressional units.

The report recommended that the Defense Department take immediate steps to standardize family housing in and between the military services wherever feasible and in a manner consistent with sound "engineering" principles. This, it argued, would result in savings of costly architect-engineer fees "currently being spent almost indiscriminately in many areas."

Public Works Bill Veto Backs Bar on All New Starts

President Eisenhower's veto of the public works appropriations bill late in August caught most of the heavy construction industry by surprise. Congress had toned down the original bills carrying fiscal 1960 funds for the Army Corps of Engineers' rivers and harbors and flood control work, and for the Bureau of Reclamation as well as the Tennessee Valley Authority. The final conference committee measure was sent to the White House in confidence it would meet with Presidential approval despite the January budget statement disapproving of any new projects.

The Administration since the first of the year had repeated its warning to Congress that this was a time for "a breather" in the huge public works program—that no new starts should be authorized while such a large carry-over of building activity was on schedule. Congress recognized this admonition in toning down the original bills until the final measure exceeded the President's request by only \$30 million, this in a total of \$1,206,748,549.

But Mr. Eisenhower stood firm on his "no start" policy and said the 67 unbudgeted projects slipped into the legislation would cost, eventually, around \$800 million.

The veto message noted that without any new work being started this fiscal year the expenditures for the Corps of Engineers and the Reclamation Bureau would reach an estimated \$1.1 billion. This, it was noted, would be an all-time high, nearly three fourths again as much as the outlay for these purposes in fiscal 1955. By 1962, it was observed, the money requirement just to carry on construction now under way will amount to still higher expenditures—almost twice those of fiscal 1955—representing ultimate costs of \$6 billion.

These future expenditure commitments result largely from the fact, the message said, that in the last four years the Congress has added to budgeted construction over 200 unbudgeted starts involving total costs of nearly \$3.8 billion. Then this comment: "This tremendous expansion in government expenditures in just this one area in so short a period of time brings into

continued on page 370

EXECUTIVE OFFICE

TREND-SETTING INTERIORS

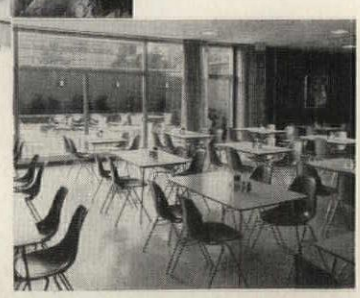
The new Philip Morris McComas Research Center in Richmond, Virginia, is a stunning example of the modern "trend setting" interiors designed by Thalhimers Industrial Sales Corporation. All arrangements including color specifications, draperies, floors and installation were handled by our staff. Thalhimers Industrial Sales Corporation has a complete staff of designers to design and decorate interiors for all types of office buildings, motels, banks, hospitals, colleges and clubs.

RECEPTION AREA

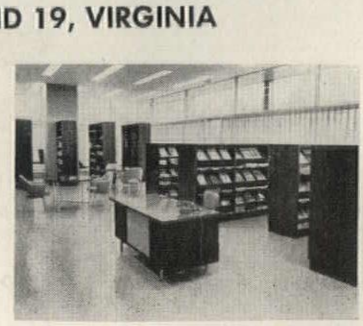
Thalhimers

INDUSTRIAL SALES CORPORATION, RICHMOND 19, VIRGINIA

H. E. Glave, N.S.I.D., Exec. Vice Pres.
J. Eldred Phillips, A.I.D., Designer



EMPLOYEE'S CAFETERIA

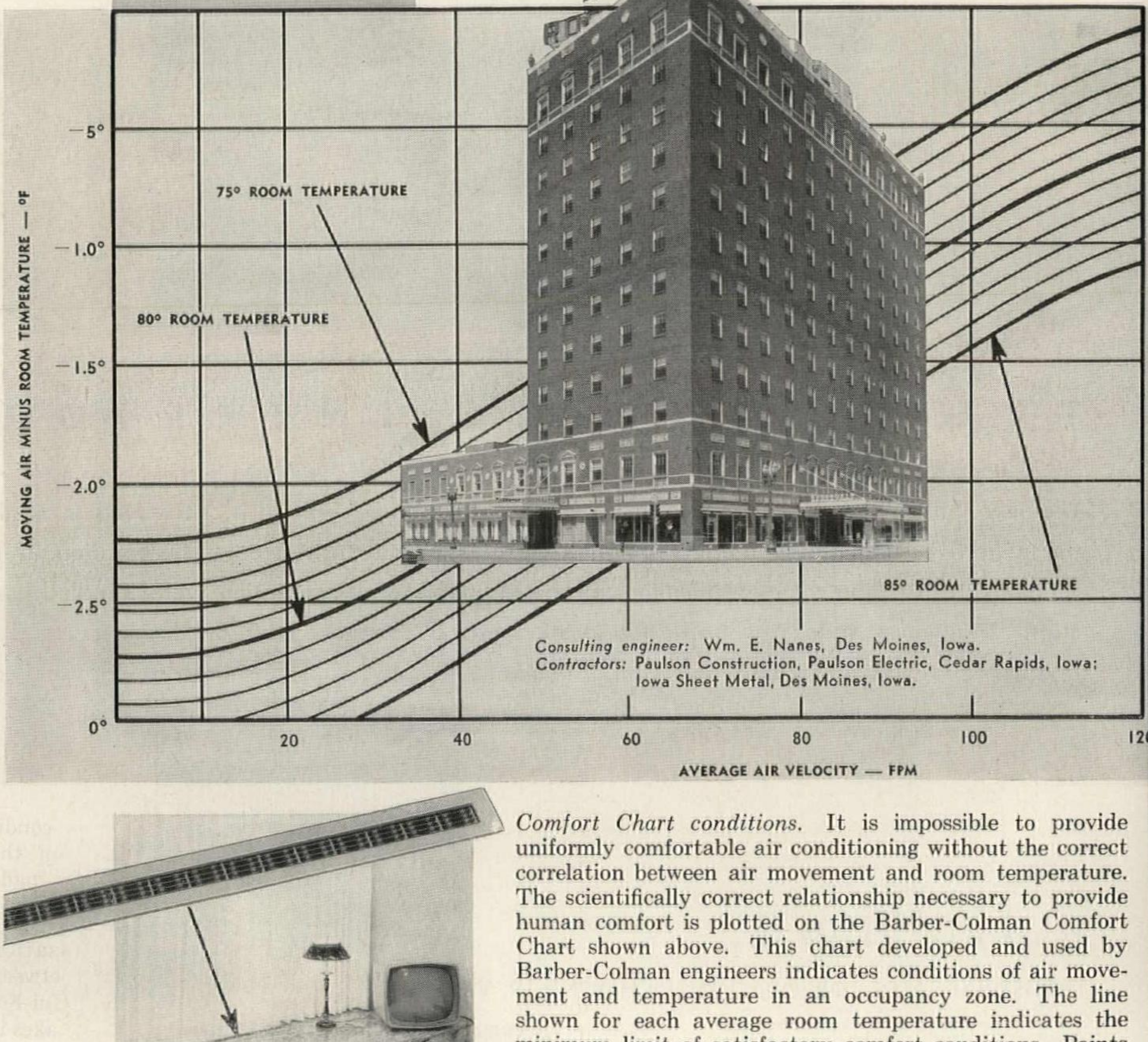


LIBRARY

THE MARK OF QUALITY

BARBER COLMAN

Comfort Chart conditions



Consulting engineer: Wm. E. Nanes, Des Moines, Iowa.
Contractors: Paulson Construction, Paulson Electric, Cedar Rapids, Iowa; Iowa Sheet Metal, Des Moines, Iowa.

(Above) Interior at Hotel Roosevelt, Cedar Rapids, Iowa, showing under-window installation of Barber-Colman Uni-Flo Continuous Line diffusers.

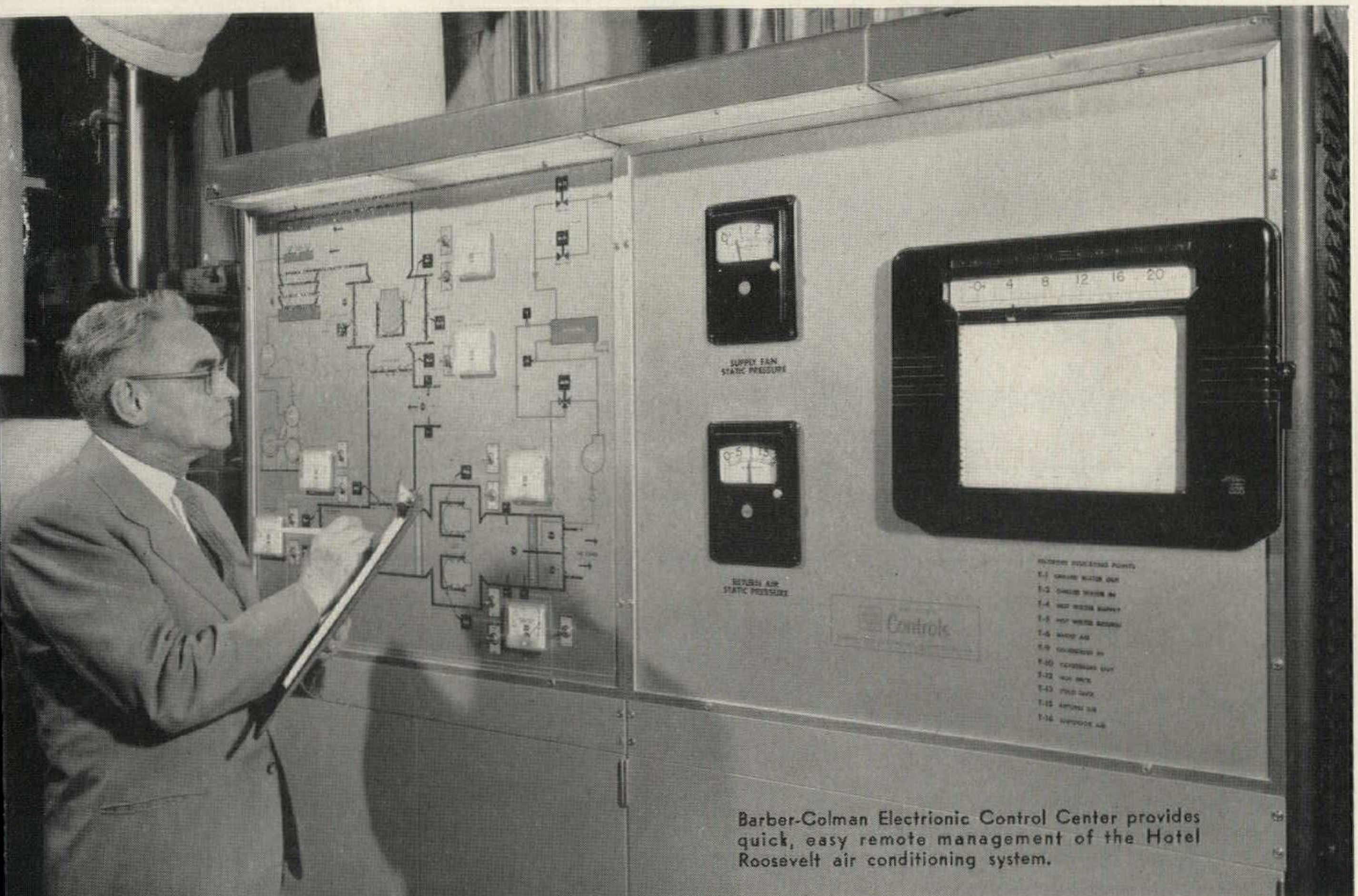
Comfort Chart conditions. It is impossible to provide uniformly comfortable air conditioning without the correct correlation between air movement and room temperature. The scientifically correct relationship necessary to provide human comfort is plotted on the Barber-Colman Comfort Chart shown above. This chart developed and used by Barber-Colman engineers indicates conditions of air movement and temperature in an occupancy zone. The line shown for each average room temperature indicates the minimum limit of satisfactory comfort conditions. Points above the line fulfill human comfort standards.

With a Barber-Colman "combination system" — Electrionic controls and Uni-Flo engineered air distribution products — you are assured of continuous system performance well within these standards.

One Source... Undivided Responsibility

at Hotel Roosevelt

CEDAR RAPIDS, IOWA



Barber-Colman Electrionic Control Center provides quick, easy remote management of the Hotel Roosevelt air conditioning system.

Ideal indoor weather guaranteed by Barber-Colman automatic controls and air distribution components working together in a "combination system"

Consulting engineer, Wm. E. Nanes, who handled the air conditioning project at the Hotel Roosevelt calls it "our job of tomorrow" and refers to the Barber-Colman Electrionic Control Center as "second to none."

Roosevelt Hotel president, Sutherland Cook, says, "We are delighted with the comfort that this system provides for our guests. The year-round air conditioning is an essential and integral part of the immense modernization program which has made our hotel one of the most modern in the country."

For your new construction or modernization projects, inquire about the relationship between Barber-Colman Electrionic Controls and Uni-Flo engineered air distribution products which makes it possible to guarantee comfort chart conditions to your clients.

Call your local Barber-Colman office for latest descriptive literature or see our catalogs in *Sweet's Architectural File.*

BARBER-COLMAN COMPANY

Dept. V, 1604 Rock Street, Rockford, Illinois

up ↑ and down ↓

. . . 'ROUND AND 'ROUND Two hundred trucks unload or receive through forty-four Barber-Colman OVERdoors, every day at Briggs Transfer in Chicago's Clearing District. Freight is picked up at the "receive" side of the building and whipped around to the "load" side via a cable-car system on a continuous-circle track. OVERdoors go up and down, cable cars go 'round and 'round . . . the freight moves in and out. Door action must be positive, fast, dependable. Closure must be precise, weatherproof. Another Barber-Colman OVERdoor installation that's giving complete, continuous service and satisfaction. Would you like the valuable data on our doors, electric operators, door radio control? Write now.

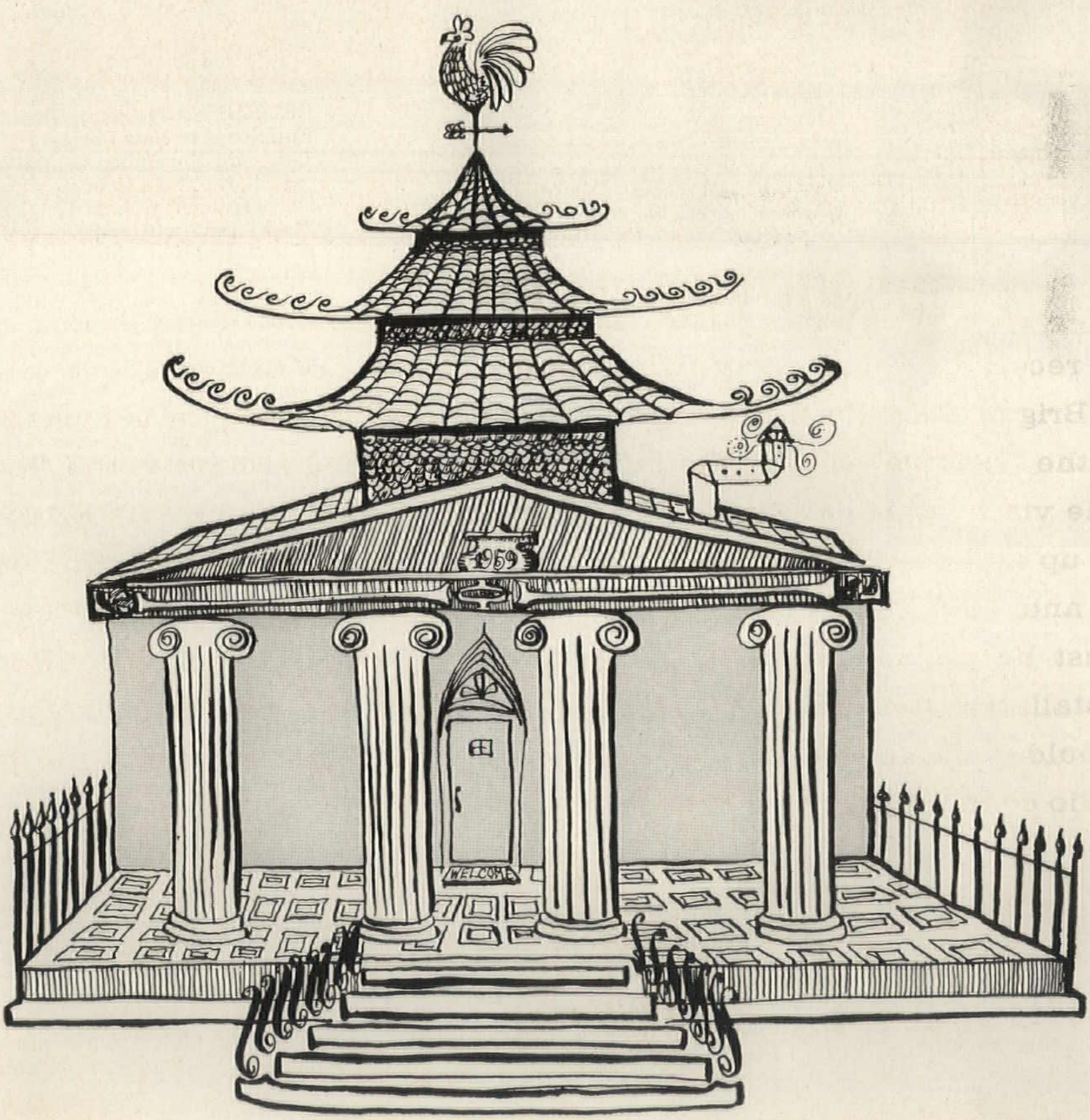
THE MARK OF QUALITY

BARBER COLMAN

BARBER-COLMAN COMPANY
Dept. P910, Rockford, Illinois

But don't tell that to Joe Grunch. He calls that thing below a "perfectly good house"—didn't he build it of perfectly good parts?
Of course Joe is no architect. But even good architects can make Joe's mistake (sometimes) about venetian blinds. Grunch-type blinds are often hard to spot. It's only *after* they're installed that poor functioning and mounting maintenance costs reveal their fundamental lack of unified design.
Why risk getting stuck? You *can* specify the Flexalum® Twi-Nighter, *the only venetian which was designed your way — from scratch, as an integrated whole.* And since it's assembled locally *only* by licensed Flexalum manufacturers, you're sure of getting all the Twi-Nighter's designed-together components — never any "perfectly good" standard parts.
Ask to see the specifications. By following the chain-reaction of integrated design from component to component, you can see *why* the Twi-Nighter is a much better blind. But you don't have to be an architect to see *how* it's better. Even those of your clients who can't tell their headrail from their bottom rail will notice the difference at a glance.
They'll see that it's neater, lighter, more compact. Tilt it—the slats stay where you put them. Close it—the room isn't dim, it's dark. Test the cord-lock—this blind is safe—it can't come crashing down. Note the smooth operation. All dead-weight has been eliminated. It's so free of stress, so perfectly coordinated that *we guarantee every part, in writing, for a full five years.*
So don't blur your building — and risk maintenance expense — with grab-bag-type blinds. Specify Flexalum Twi-Nighters. You owe it to your edifice.
For our latest specs, write to: Dept. AF-10, Bridgeport Brass Co., Hunter Douglas Division, 405 Lexington Avenue, New York 17, N. Y.

Diverse Parts Do Not a Whole Thing Make



sharp focus how Congress by action in one year builds increases into the Federal budget in future years."

Not Cabinet Post But "Study" Urged on Urban Affairs

Establishment not of a Department of Urban Affairs—as recommended by the legislation it had been reviewing—but of a study commission—as recommended by the American Institute of Architects among other organizations—was recommended by the House Committee on Government Operations in reporting the bill on metropolitan problems and urban growth. One of the bills heard by this committee called for a study commission such as that endorsed.

The committee's report said a temporary commission, selected from outstanding persons in and out of government, could make an important contribution to this major national question. Such a Commission on Metropolitan Problems and Urban Development should seek to obtain the assistance of other agencies or commissions in carrying out the assignment, it said.

The study commission approach was endorsed not only by the A.I.A., but by the American Institute of Planners, the National Association of Housing and Redevelopment Officials, and other groups. Organized labor also had approved the concept.

Minority views in the report called attention to an earlier bill passed by the House which would create a permanent bipartisan Advisory Commission on Intergovernmental Relations charged with considering problems of municipalities and metropolitan expansion.

This part of the report stated: "Creating two commissions simultaneously, with duplicating and overlapping functions, will not only be costly and confusing but may well lead either to divergent views and incompatible conclusions or to delay and inactivity because of the necessity of coordination and consultation to avoid conflict."

BRI Fall Conferences Give Full Scope to New Format

The mid-November Building Research Institute conferences to be held at the Shoreham Hotel here in Washington will embrace a number of construction subjects including sandwich panel design, metal curtain walls, research here and abroad, modular measure, and the problems of manufacturers whose products are used in component construction.

Agenda and procedure for the conferences are patterned after the Institute's eighth annual meeting in Pittsburgh last April, where a number of subjects were considered concurrently, but the fall conferences in Washington will represent the first full-scale trial of BRI's revised program format. This calls for the series of multi-subject conferences spread over the period November 16 to 19.

Chairman is Thomas E. Werkema, industrial research analyst for the Dow Chemical Company, Midland, Mich. Dr. Albert Dietz, Massachusetts Institute of Technology, will chair the meetings on sandwich panel design, which will run three days and consider fundamentals and case histories of new designs. Speakers in five separate workshops are scheduled to analyze design criteria for exterior load-bearing and interior non-load-bearing walls, partitions, floors, ceilings and roofs.

Sessions on building research are set for two of the conference days.

more news on page 376

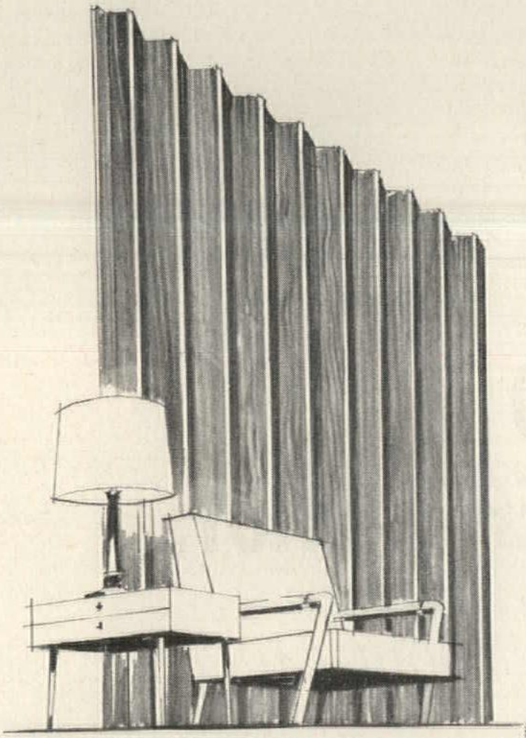
WELL DESIGNED COMMERCIAL INTERIORS DESERVE

WOOD

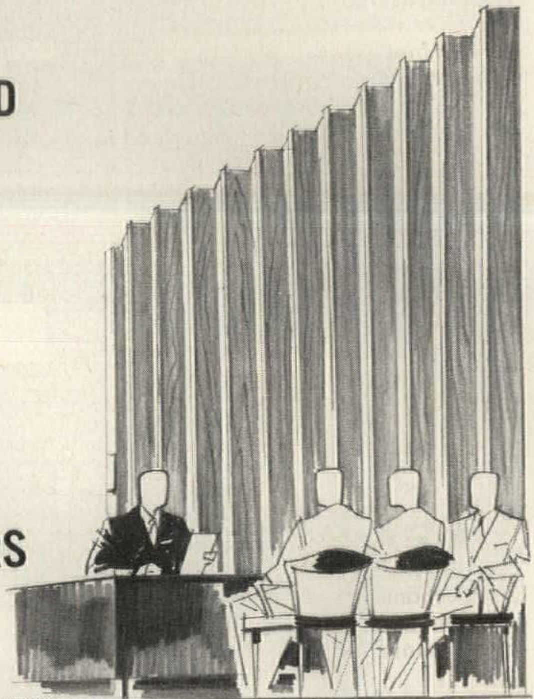
FOLDING DOORS

by

Pella

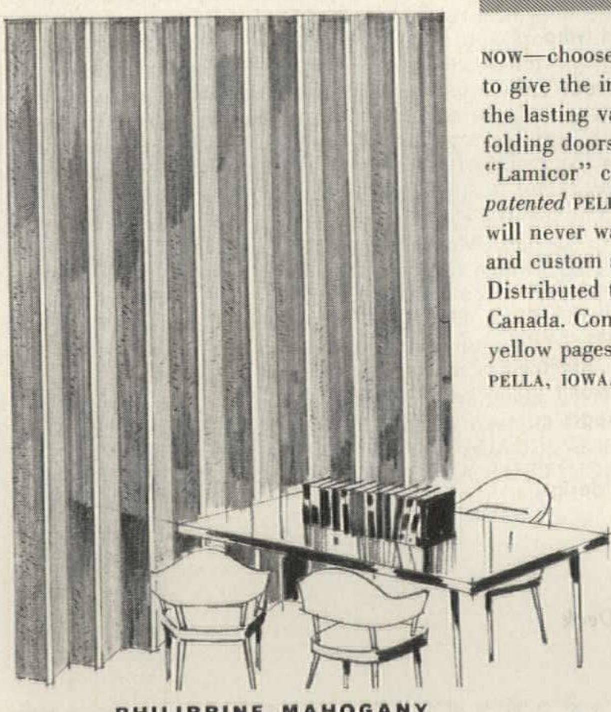


AMERICAN WALNUT veneered PELLA DOORS bring a rich warmth to executive offices, reception rooms.

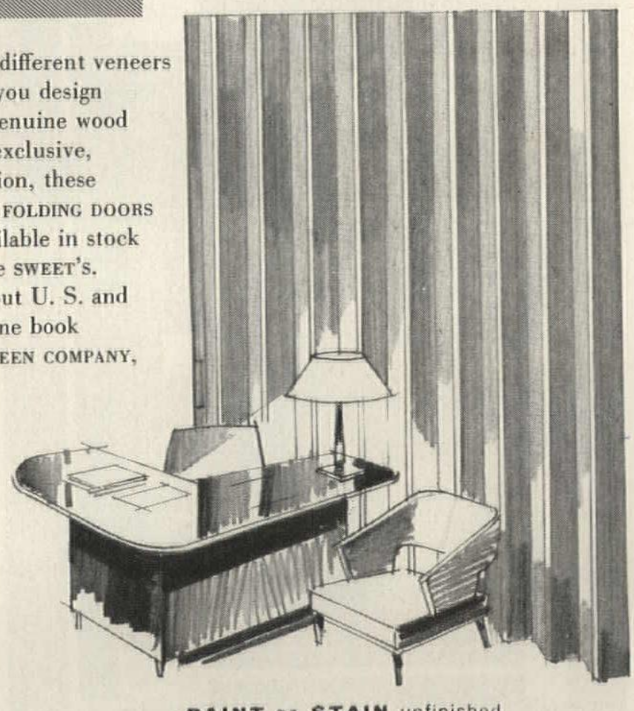


BIRCH, WHITE ASH, OAK or PINE veneers lend light, natural tones to auditoriums, meeting rooms.

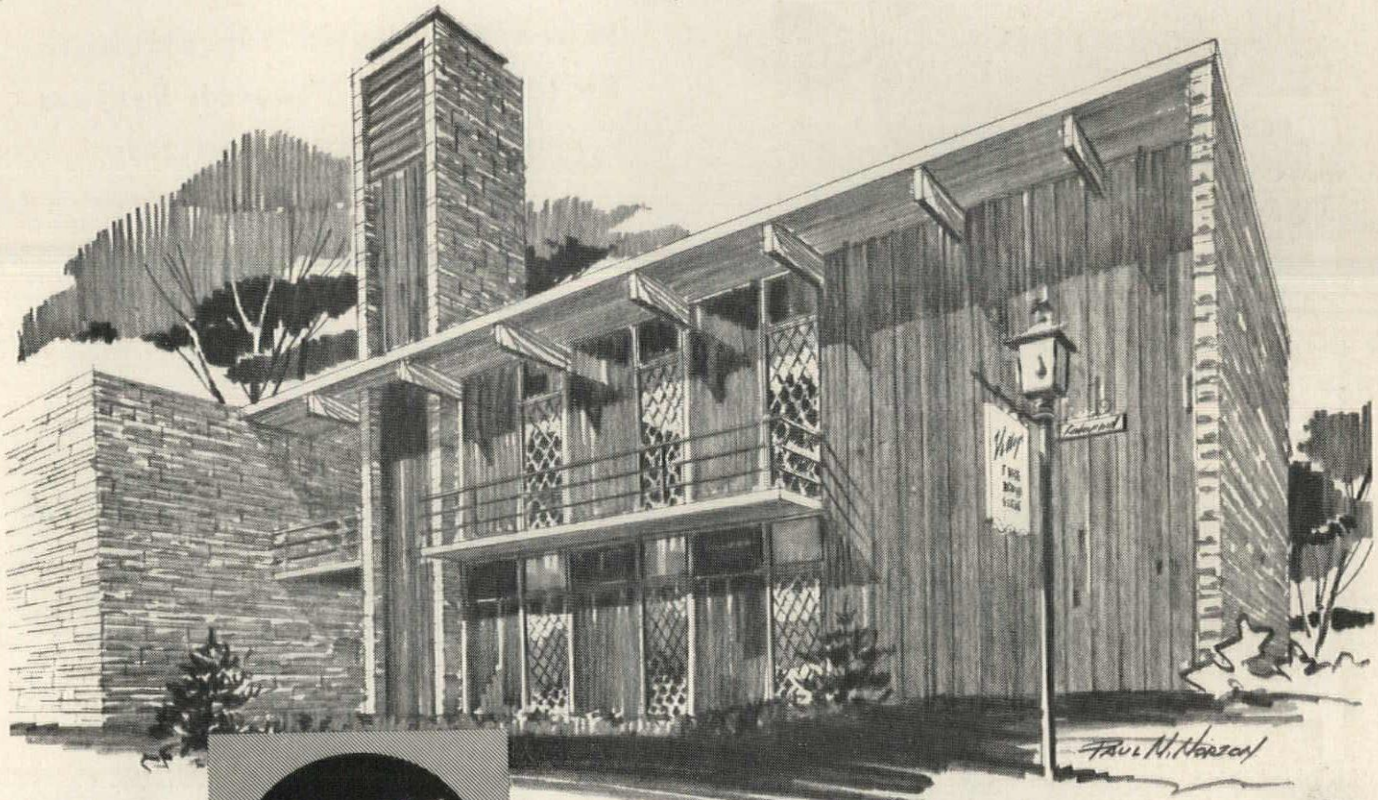
NOW—choose from 6 different veneers to give the interiors you design the lasting value of genuine wood folding doors. With exclusive, "Lamicor" construction, these *patented* PELLA WOOD FOLDING DOORS will never warp. Available in stock and custom sizes. See SWEET'S. Distributed throughout U. S. and Canada. Consult phone book yellow pages. ROLSCREEN COMPANY, PELLA, IOWA.



PHILIPPINE MAHOGANY adds beauty of full, deep wood color to conference rooms and libraries.



PAINT or STAIN unfinished PELLA DOORS to match or harmonize with practically any color scheme.



Pella®

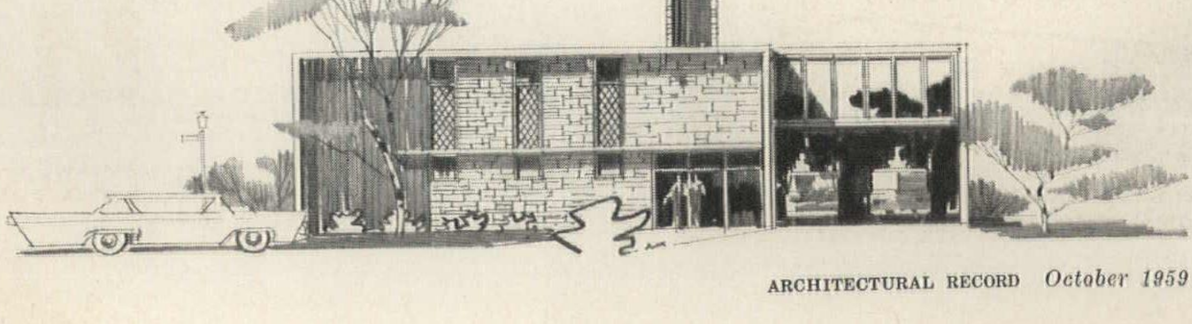
wood casements

help integrate fire station into suburban scene

Diagonal muntin bars in PELLA WOOD CASEMENT WINDOWS give attractive relief from the horizontal and vertical patterns in this redwood and stone fire station. As a utility feature, PELLA muntins are removable for fast, easy cleaning of glass.

Large 24″ x 68″ glass size PELLA CASEMENTS above and below the rear balcony provide a novel variation from stereotyped window arrangements and lend a home-like quality to dormitory and lounge areas. PELLA WOOD CASEMENT WINDOWS — with their built-in ROLSCREEN feature — deserve a place in your plans for municipal, commercial and residential buildings.

Glass height up to 68″, glass width up to 24″. Full specifications in Sweet's. For the nearest U. S. or Canadian distributor, consult your classified telephone directory. ROLSCREEN COMPANY, PELLA, IOWA.



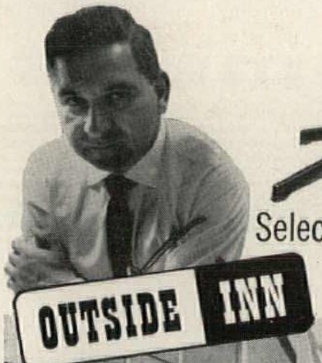
New from CHF

SOLID

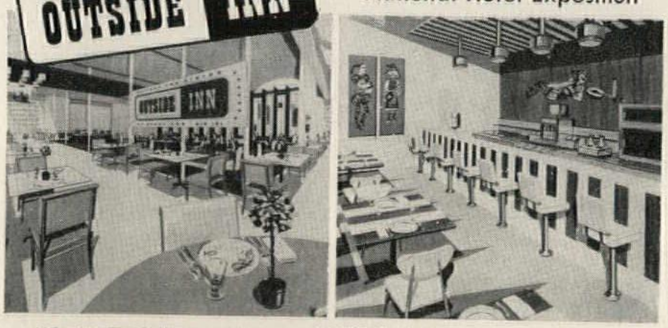
New "CHF" Flare Column Stool
in Exclusive lifetime Solid Bronze

BRONZE

**PLUS LIFETIME
PORCELAIN ENAMEL
CHF Thin-Line Raised Table**



Selected by HENRY END for
"Designs for Dining" Display
National Hotel Exposition

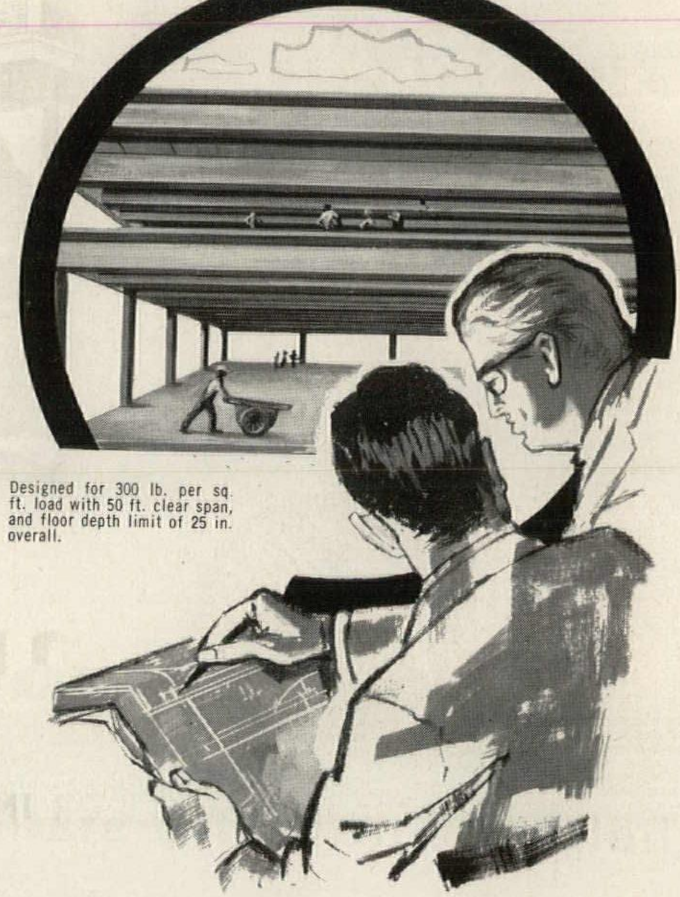


Henry End shows why new "CHF" *designs for dining* assure the beauty and charm that means profitable distinction! "CHF" gives you the world's widest Color-Choice for upgrading dining decors. SOLID BRONZE . . . an array of new metals and woods . . . 20 Lifetime Porcelain Enamel colors . . . plus the latest fabrics and Formica tops. Consistent Food Service Contest winners, "CHF" tables and stools are your key to truly personalized planning!

WRITE TODAY FOR NEW "CHF" CATALOG AND COLOR PLANNER

**THE CHICAGO HARDWARE FOUNDRY CO.
8109 COMMONWEALTH AVE. • NORTH CHICAGO, ILL.**

When You Build for Strength Build with The Prescon System of Prestressed Concrete



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Structural engineers and architects now build *living strength* into heavily loaded structures with concrete prestressed by The Prescon System of post-tensioning.

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When you want to build for strength . . . and good appearance . . . call your Prescon Representative for engineering and design recommendations on using The Prescon System of prestressed concrete for long span beams and girders, lightweight decking members, poured-in-place floors and roofs that give today's ultimate in construction material strength.

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The Record Reports

Architect's Changing Role Is Subject of Thesis Report

The problems of the present-day architect in many countries are described—and faced—in a provocative thesis prepared by a young Australian architect, Leslie M. Perrott Jr., and called "The Changing Status and Role of the Architect."

Mr. Perrott, of the Melbourne firm, Leslie M. Perrott & Partners, was the winner of the Sisalkraft Research Scholarship in 1958 and wrote his thesis—the subject was his choice—after a six-month tour to observe architectural practice in the United States and Europe. The recipient of the £1000 award—intended to make possible travel and study and the preparation of a thesis useful to architects and the building industry—is selected annually by the Royal Australian Institute of Architects from among Australian architects under 35.

Mr. Perrott considers the position of the architect primarily in relation to large building projects. Surveying the status of the architect through the ages, he concludes that in the last two or so decades "the architect's role (specific duties), if not necessarily his status, has been reduced." He then describes "factors which are encroaching on the established status of the architect as principal coordinator of major building projects." Some of these are:

1) The impact on major building of city and regional planning, involving not only the architect but also the engineer, surveyor, economist, sociologist, lawyer, and, of course, the city planner, has become marked. Private developers also are increasingly in command in this field.

2) The real-estate developer has become a major promoter of building activity.

3) The introduction into transactions of "lease-back" investors reduces the total area of direct contacts between architects and owner-occupiers.

The Package-Dealer Threat

4) Perhaps the most widely publicized threat is that presented by the package dealer who provides all services. Mr. Perrott thus puts his suggested remedy: "If, despite its advantages to the client in achieving competitive prices, the need for open tendering can be eliminated, a potentially good solution is available, namely, the teaming of the ar-

continued on page 382


ualco aluminum curtain wall
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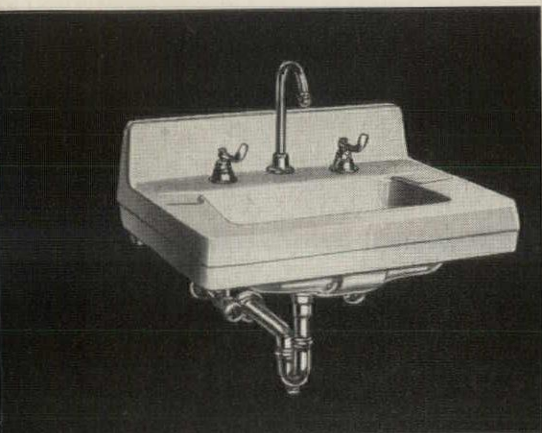
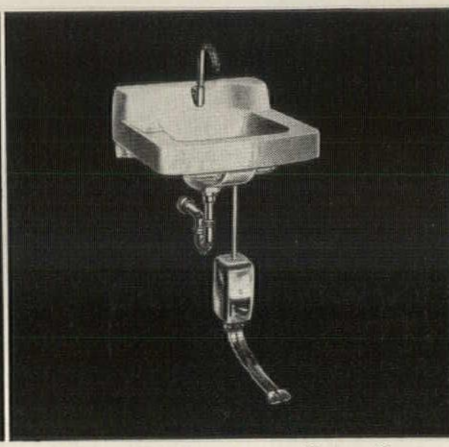
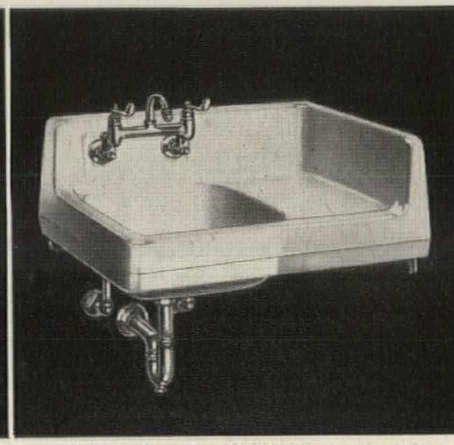
A favorite in many hospitals—Crane Mayo surgeons' scrub-up sink, with convenient knee-action valve. Made of Duraclay, a special vitreous glazed Crane material, its hard, smooth surface will not pit, crack or craze . . . is impervious to stains, unaffected by acids or ordinary cleansing powders.



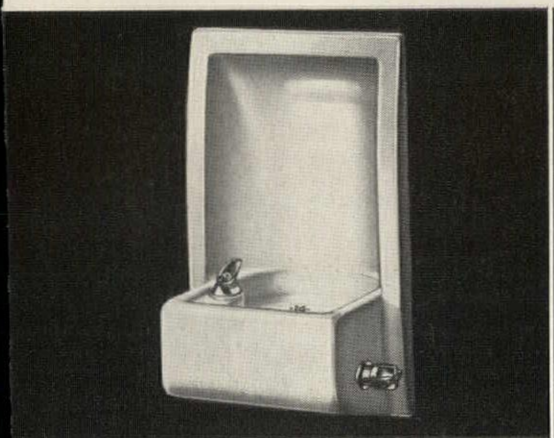
Convenient wrist operation is a feature of this Crane *Norwich* vitreous china lavatory. Gooseneck spout accommodates pitchers, vases, etc.



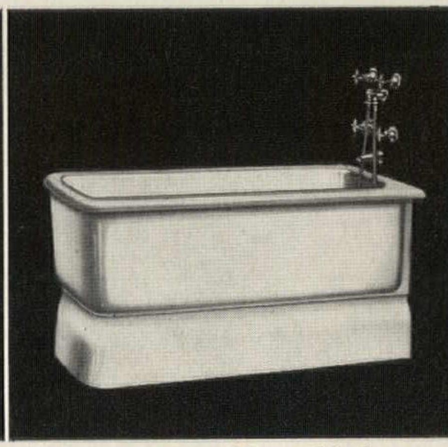
Foot-operated valve on Crane *Oxford* vitreous china lavatory prevents cross-infection. Hands never touch faucets.



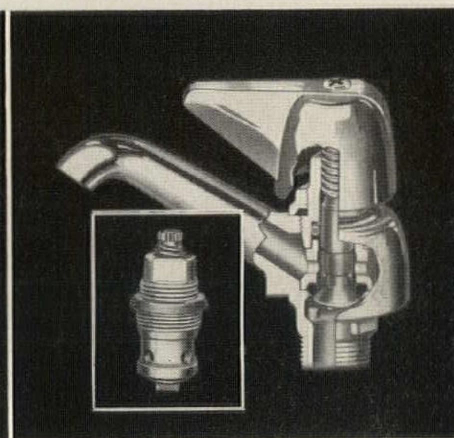
Hygiene lavatory is ideal for patients' rooms. Available for right- or left-hand corner installation, also, without side splash.



Crane *Coolbrook* vitreous china, semi-recessed drinking fountain has elevated bubbler base for maximum sanitation. Available with single or central water chiller.



Crane *Institutional* free-wall bath, to build into end wall. Made of durable cast iron with porcelain enamel finish. Cast iron base included.



A Crane exclusive—*Dial-ese* control —practically drip-proof because it closes *with* water pressure, not against it. All working parts contained in low-cost replacement unit.

Infants' bath made of Crane *Duraclay*. Smooth, vitreous china surface is kind to babies' skin. Includes 20-gallon tank with dial thermometer.

The *Cornell*, one of several service sinks in the Crane line. Has flushing rim and siphon jet flushing action. *Duraclay* construction assures long service, easy maintenance.

Crane *Placidus* closet has whirlpool, quiet-action bowl and flush valve that minimize noise. Has elongated rim, open front seat.

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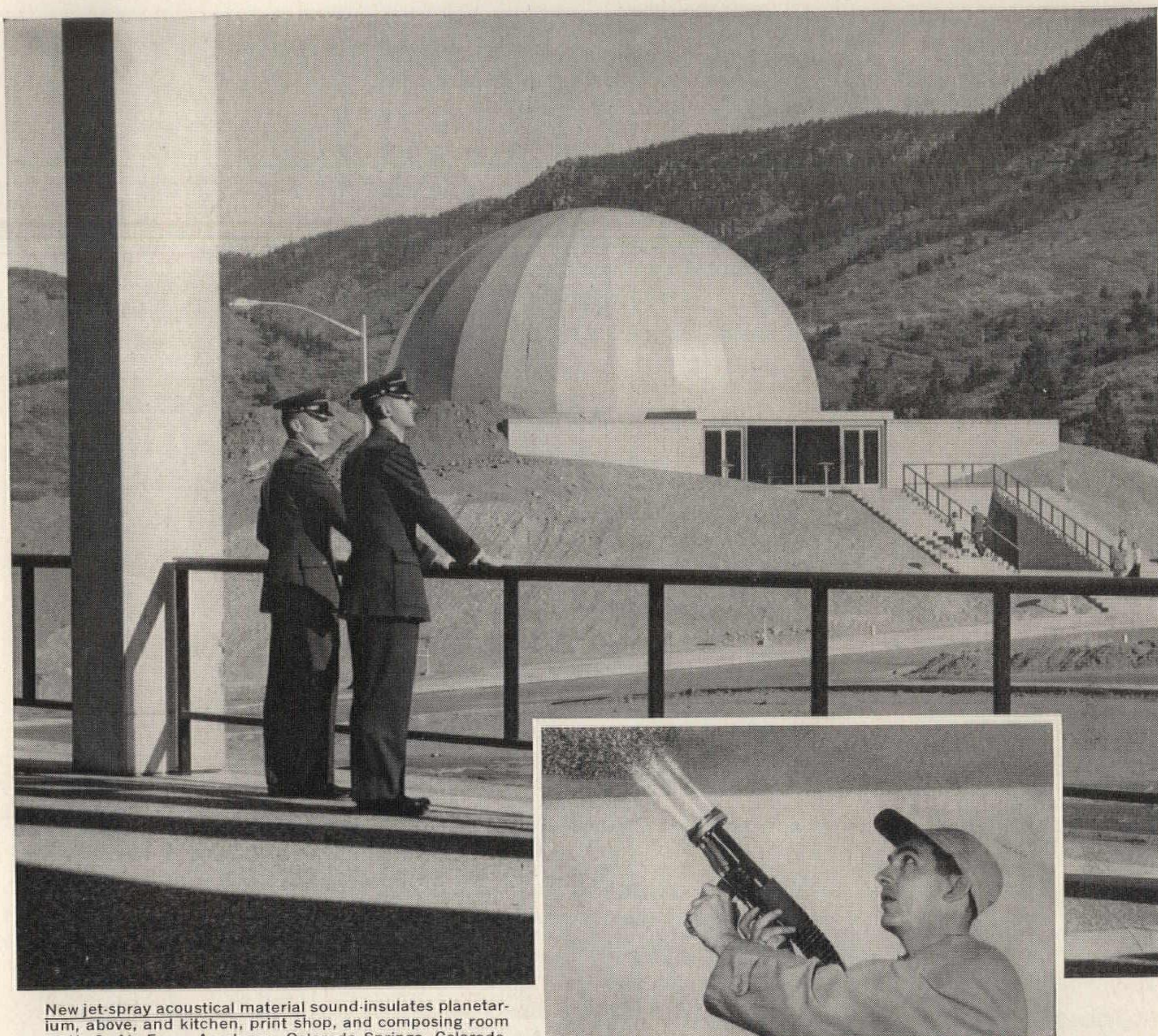

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The Record Reports

chitect with a selected builder from the point of initiating a project." He says also that the elimination of the time and cost involved in competitive bidding would save enough to offset the "possibly higher figure" of a negotiated bid. Thus, according to Mr. Perrott, a "team of private practitioners acting in consortium could give the client all the advantages of the dealer, while insuring him of the maintenance of the ethical standards of the independent." There would, of course, be a concomitant necessity for architects to expand and improve their services, to give their clients "more of the 'businesslike' service that owners have available from package dealers."

5) The factory production of standardized building components carries a potential "threat" to an architect who does not adapt himself.

6) Staff engineers and designers employed by equipment manufacturers are becoming increasingly necessary, and in that sense they minimize the architect's control over the job. Nevertheless, the increase in consultants' stature "need not adversely affect building standards, rather the reverse."

Mr. Perrott then describes the effects of changes in the building industry on the architect's various roles as adviser; planner, designer, specifier; adjudicator-arbiter; supervisor.

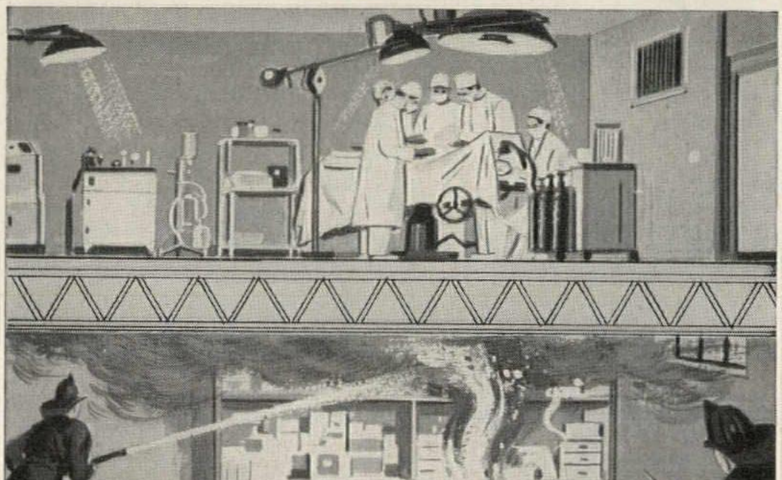
What Can Be Done?

"What, then, are the areas in which we can take action?" Mr. Perrott asks. He answers with five general recommendations:

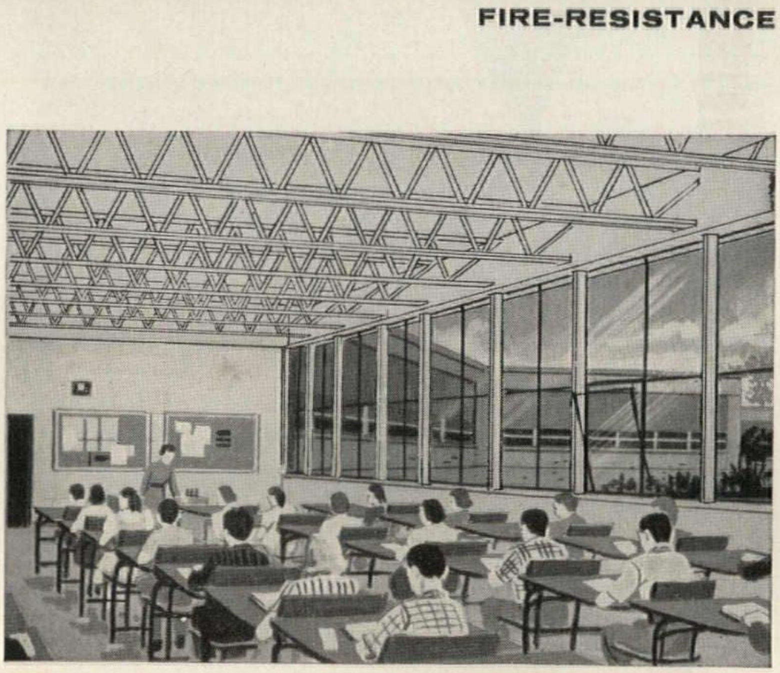
1) Architects should be permitted to engage actively in seeking commissions. "Why should the architect be precluded from conceiving needs that can be met by buildings and then taking steps to promote the buildings?" He suggests that professional codes, already often interpreted liberally in an informal way, should be officially relaxed on this point. 2) Architects should be allowed to participate in the control of building and material manufacturing firms. 3) Architects should become more interested in city planning and economics. 4) Architects and architecture should be publicized more widely before the lay public. 5) The formation of building teams of independent architects, engineers, builders, and real estate agents should not be hindered.

more news on page 388

SIX GOOD REASONS FOR DESIGNING WITH STEEL JOISTS



FIRE-RESISTANCE



NON-SHRINKING, NON-WARPING

FIRE-RESISTANCE—Steel joists in combination with floor slab and plaster ceiling form a barrier with up to four hours' fire-resistance, depending on slab thickness and the type of plaster. And greater fire-safety is of particular importance in multi-story buildings such as hospitals, apartments and schools.

NON-SHRINKING, NON-WARPING—Building maintenance is greatly simplified when you design with joists. They provide non-shrinking, non-warping construction which eliminates sagging floors and cracked ceilings.

COLUMN-FREE SPACE — Steel joists are ideal for long spans such as auditoriums, gymnasiums, garages, stores. And in any building they give a maximum of column-free space.

VIBRATION-RESISTANCE—Good, firm floor construction is assured with steel joists. Adequate stiffness in floors is of special importance in multi-story buildings.

SIMPLIFIED CONDUIT INSTALLATION—The open webs in Bethlehem Steel Joists allow for the passage of pipe, wires—even heating lines—in any direction. The open webs also greatly simplify installation of conduit and wiring for recessed lighting fixtures.

FAST, ECONOMICAL CONSTRUCTION—Joists arrive at the job fully fabricated and tagged, ready for immediate placing. Two men can easily place small joists, and a simple derrick lifts the larger sizes.

These are some of the important advantages you get when you use Bethlehem Open-Web Steel Joists. And Bethlehem Joists are fully approved by the Steel Joist institute.

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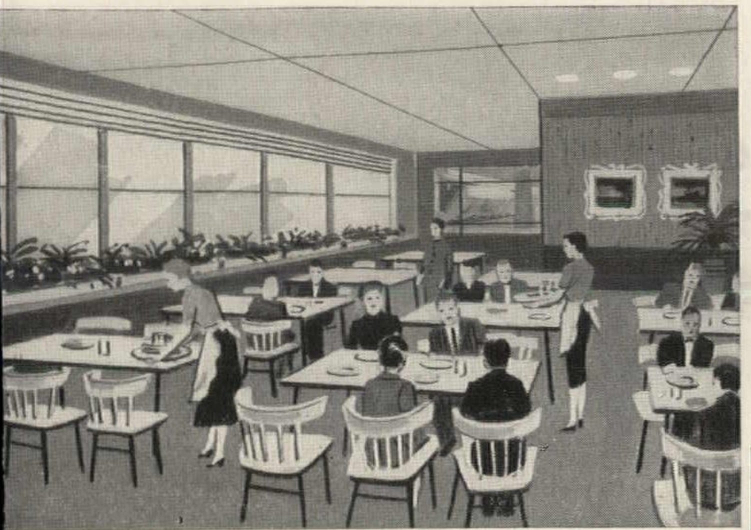
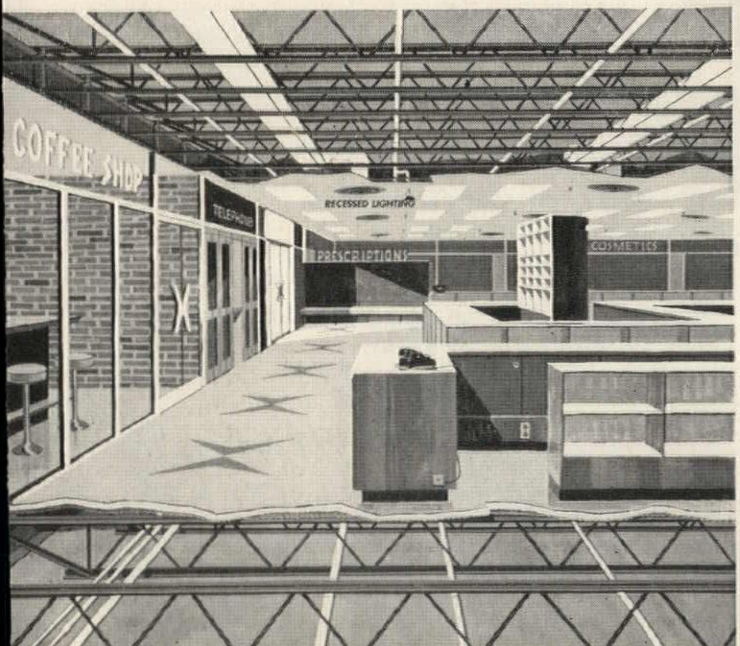
BETHLEHEM STEEL

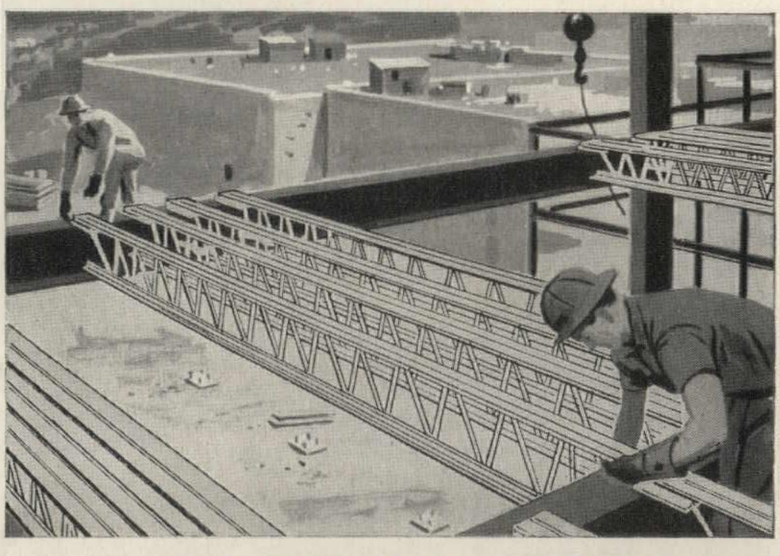


COLUMN-FREE SPACE

VIBRATION RESISTANCE



SIMPLIFIED CONDUIT INSTALLATION



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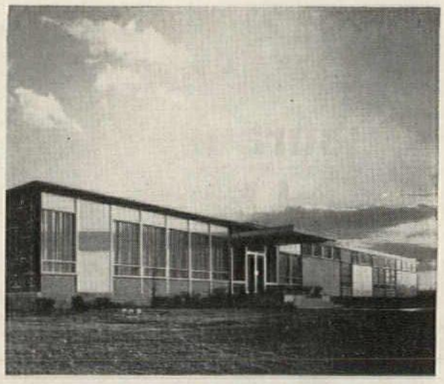
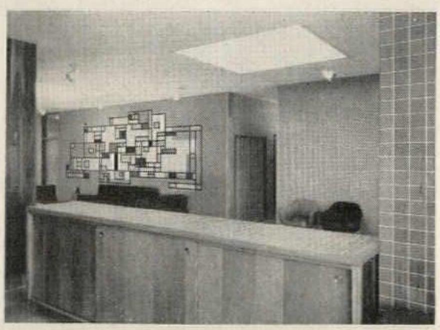
The Record Reports

Tile Uses are Featured in Research Center for Tile

The research center of the Tile Council of America is housed in a 9000-sq-ft structure set back from a main highway near Princeton, N. J. O. Kline Fulmer, partner in Fulmer & Bowers, was the architect; Lewis C. Bowers & Sons, Inc., was general contractor. The cost was about $500,000.



The building was, naturally, designed to exhibit as many uses of ceramic tile as possible. Both the mortar and mastic techniques were used in installation. Tile panels ranging from 15 to 200 sq ft cover the exterior of the steel-framed structure. The panels, in blue, red, yellow, and tan, are large outside laboratory areas and smaller near the office-area windows. Mosaics are used on the undersides of the three entrance canopies. The porches and walks are also tiled.



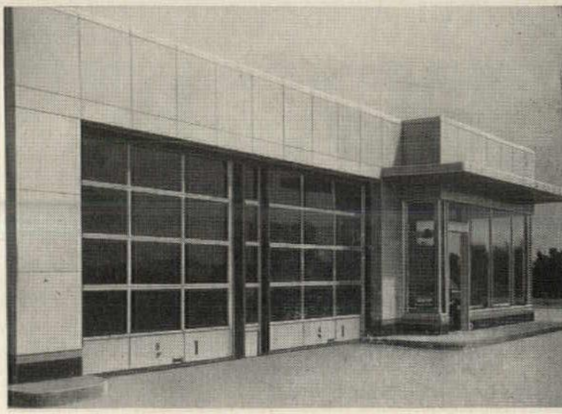
Inside, the public area includes the lobby, offices, director's and architect-engineer's offices, and a conference room-library. The rest of the interior contains engineering offices, laboratories, storage, a shop, a mortar-mixing room, a lunchroom, and a boiler room. Window sills throughout are tiled. Most of the floors are of ceramic or quarry tiles. Tile is used decoratively in a number of ways, including the mural in the lobby (see lower cut). Many of the walls are tiled.

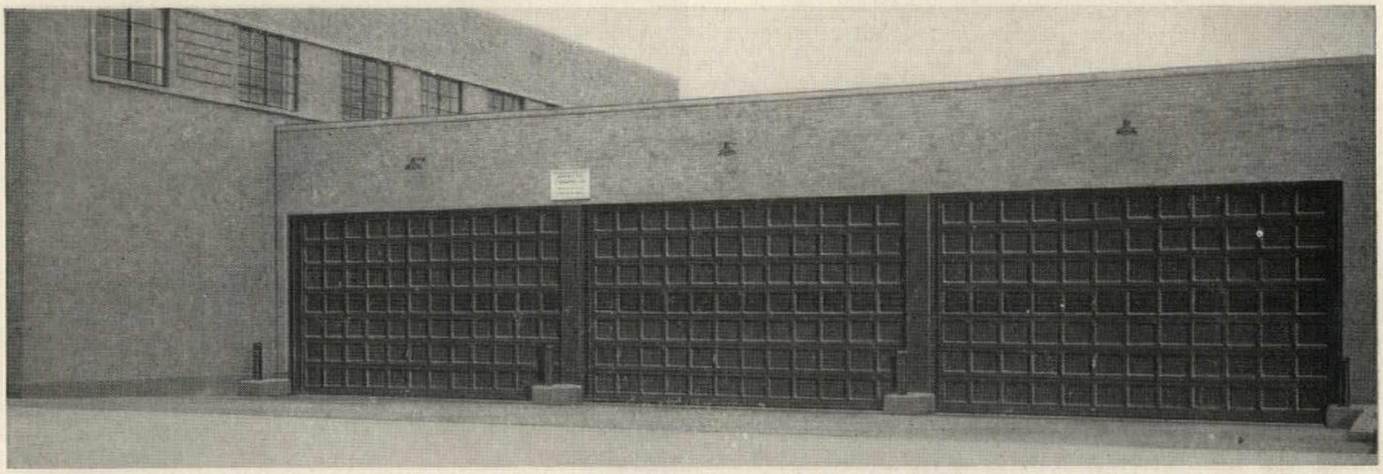
more news on page 394

■ Hallmark Cards, Kansas City, Mo., where Curtis Visioneers "personalized" the illumination system in keeping with the products of the company. Architect & Consulting Engineer: Welton Becket.

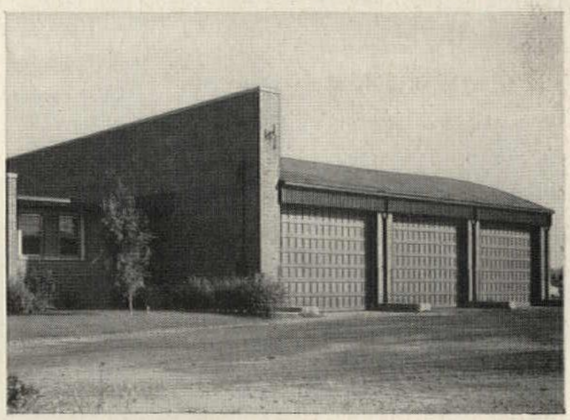
■ Curtis Vari-Spots produce attractive lighting patterns in several lobbies of the Hallmark Cards building. Reception room shown is approximately 45 ft. by 45 ft. Vari-Spots are used here to accent two areas. Each is impressively dramatized.

GOOD LOOKS
EASY OPERATION
LONG LIFE





Part and Parcel of Rō-WAY overhead doors



The qualities you look for in overhead doors for commercial and industrial applications are built into every Ro-Way door.

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Easy operation, too—that comes from sound and skilled engineering of all working parts. Specially designed track and hinges, heavy duty ball bearings, and springs tension-balanced to the weight of the door assure responsive performance day in and day out.

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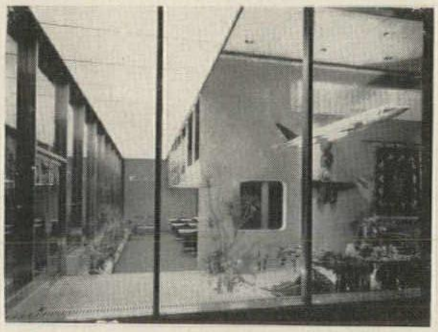
The Record Reports

Quarters for Two Airlines Are Fitted in Arcade Space

Two separate airlines flying South American routes wanted Fifth Avenue ticket offices, but neither could afford that location alone. Therefore the two, Transcontinental and REAL, combined in a single location in the arcade of 666 Fifth Avenue, New York. Freidin-Studley Associates, architectural firm, was retained and Jack Freidin, A.I.A., and his associate Joseph Solomon were the designers. The general contractor was the Boriss Breslow Corporation.



The two-story, 3300-sq-ft unit provides a ticket office and information center facing the street, a display area facing the arcade, and two levels of executive and operational offices in the inside core. The upper cut shows the display area at right, with vertical blinds at upper right indicating the executive area. The lower cut shows the travel advisory section, with a rosewood wall at right separating the public and private areas.

The end walls are blue and green, the carpet is dark gray; other decorative notes are photographic murals, tropical plants, a stainless-steel map, and a model jet plane with an 8-ft wingspread. A luminous ceiling and 22 adjustable spotlights are used for lighting.

more news on page 399

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The new Kroger Distributing Centers at Salem, Va. (above) and other locations are all Frick-equipped.

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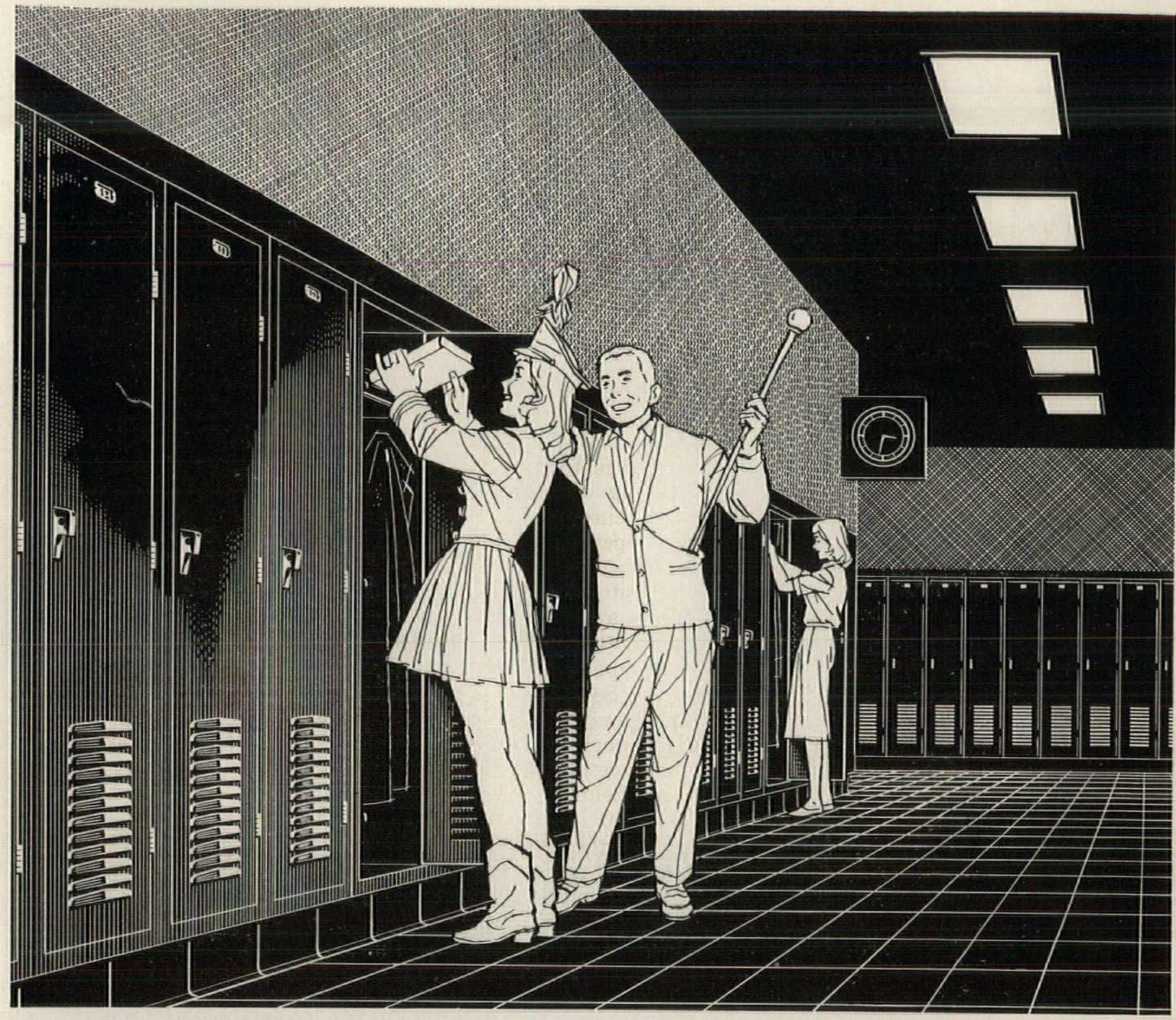
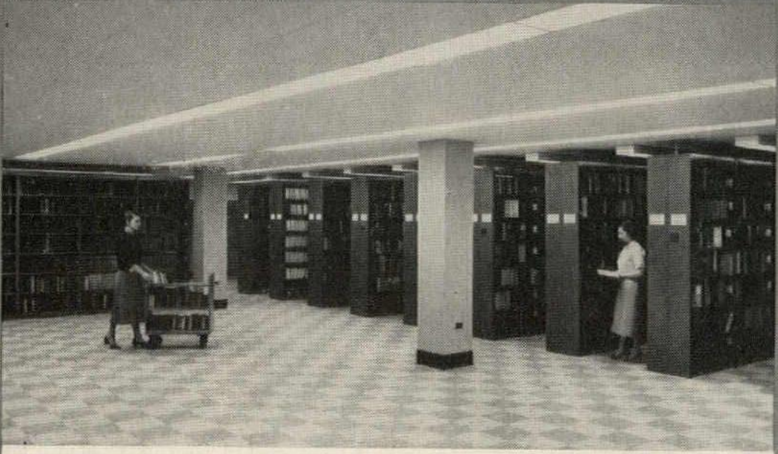
The Claypool at Indianapolis is said to be the first large hotel in the North completely air conditioned. "ECLIPSE" compressors carry the cooling load. The Hotel has used Frick refrigeration for food service since 1939.

St. Paul's Methodist Church in Houston, one of the finest in the City, is air conditioned with Frick "ECLIPSE" compressors.





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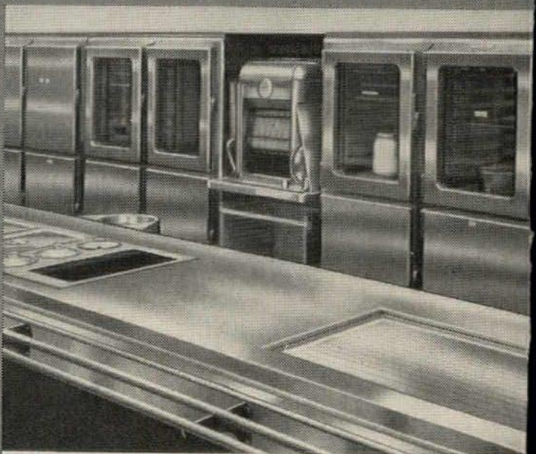

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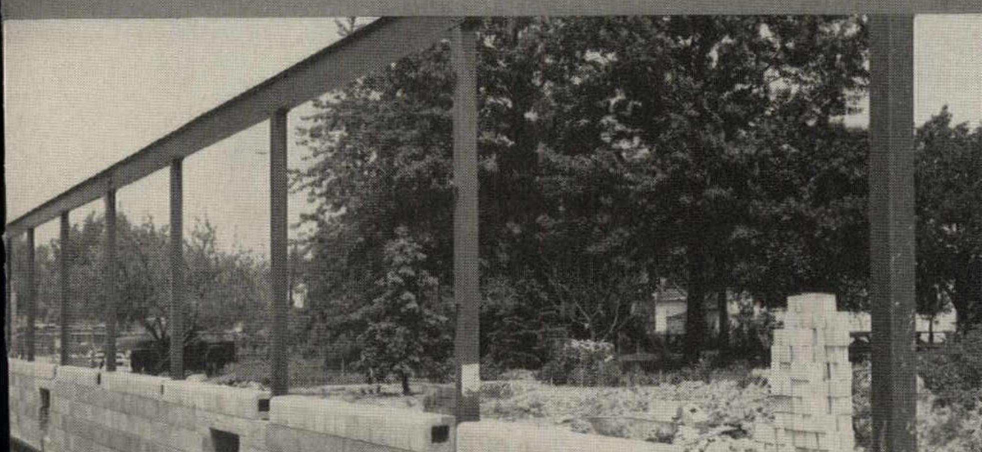

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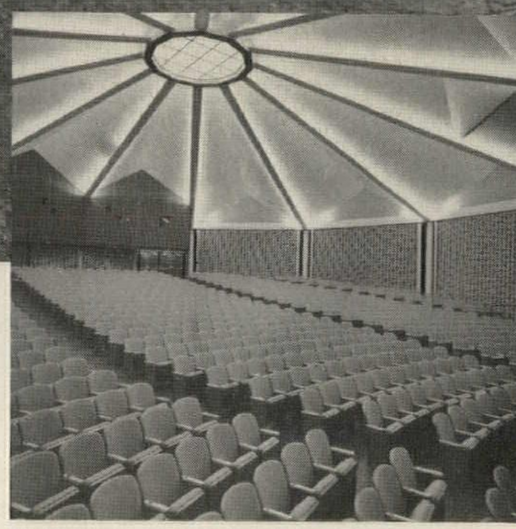

Reinforced Concrete Design Flexibility *expressed in*

MONOLITHIC *Folded Plate Dome*

Wayne Memorial Auditorium, Wayne, Michigan
Architects and Engineers: Eberle M. Smith Associates, Detroit
General Contractor: A. Z. Shmina and Sons, Detroit
Photos by Baltazar Korab© Birmingham, Mich.

The monolithic folded plate dome of the Wayne Memorial Auditorium is another outstanding example of reinforced concrete design flexibility and economy. Designed to be consistent with the expressive character of the auditorium and to break up and diffuse sound, the polygon dome consists of 12 V-shaped reinforced concrete plates supported by 11 concrete pillars. It rises 15 ft from a perimeter tension ring to a central reinforced concrete compression ring. The architect reports that an alternate design for the same shape was prepared, specifying other materials. However, total construction costs favored the reinforced concrete design.

Before you build any type of building, investigate reinforced concrete, the flexible and economical method of construction.

CONCRETE REINFORCING STEEL INSTITUTE
C.R.S.I.
FOUNDED 1924

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Chicago, Illinois

Washington Report

continued from page 44

for which the owner is paying. Well qualified professional assistance will help assure the owner that he gets a dollar's value for a dollar spent."

And this: "Seek standardization of component parts. Avoid the necessity insofar as possible of having special fabrication work done in the field. When practical, plan for the use of materials obtainable near the location of the project.

"Keep mechanical equipment in line with needs. It appears that this is an area in which more money than was necessary has been spent on school buildings during the past several years. Over-elaborate control systems are costly in the initial stage and expensive to maintain.

"Eliminate frills such as cupolas, columns, and gingerbread."

He also urged that schools be of sufficient quality that maintenance, operation and replacement costs will be held to a minimum.

School officials would do well, he advised, to call for bids including the total construction job. His view is that with one contractor having complete responsibility, better coordination of all trades can be secured.

"When something is found to be wrong in the construction," he commented, "the owner and architect would have, without question, only one person to look to for satisfaction."

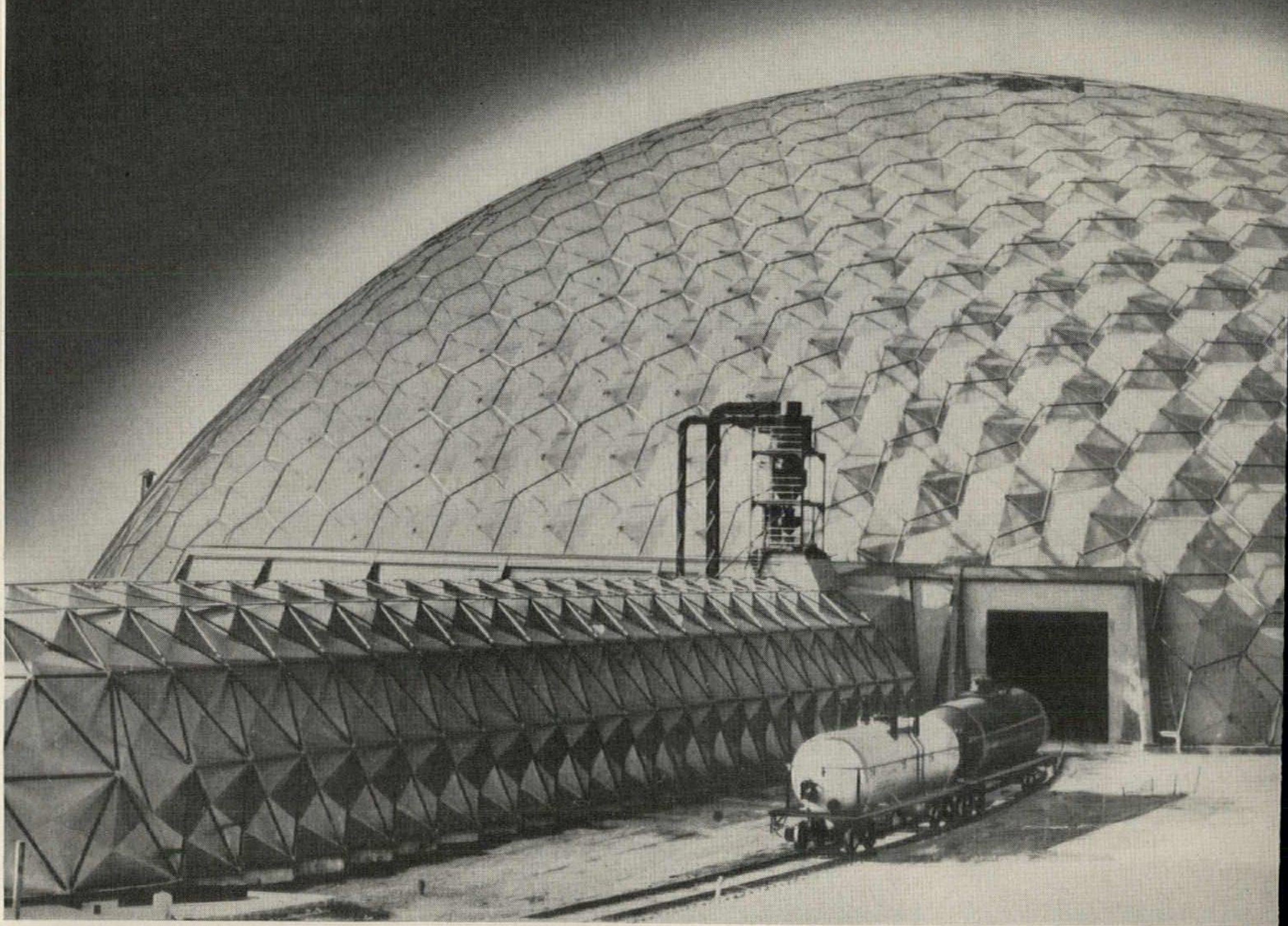
At one point, Mr. Cameron made the statement that "far more money has been wasted in North Carolina in constructing facilities which should not have been built or which were built larger than necessary, than has been wasted on so-called frills."

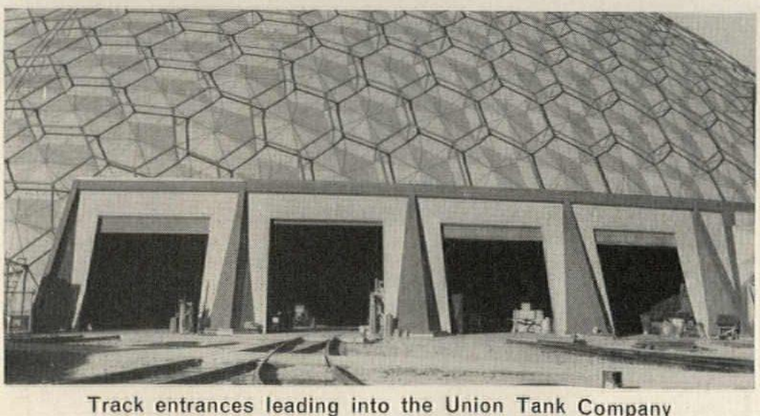
If and when additional funds can be obtained from Congress for the operation of this section, architects are likely to see a broad expansion of its regional activities. One of its avowed purposes is to make available to the states vital new information on research results in the school plant field. And it wants to disseminate this knowledge fast.

The end view is to encourage design and construction of schools that will measure up to the needs of today and future years as well; schools that will pass the test, architecturally as well as in other ways, in the decades ahead.

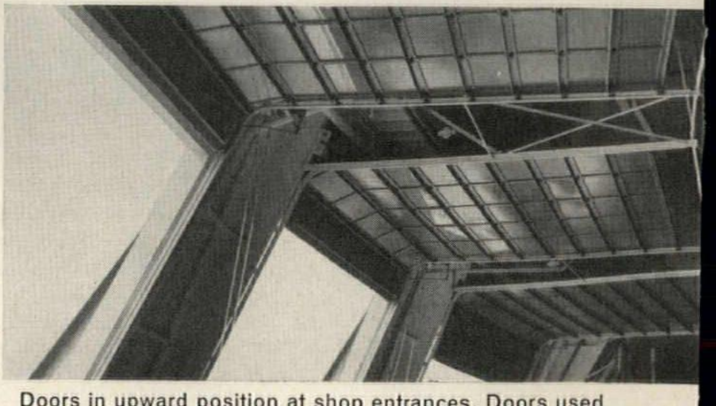
In Union Tank's New Roundhouse, Baton Rouge

entry to world's largest dome building



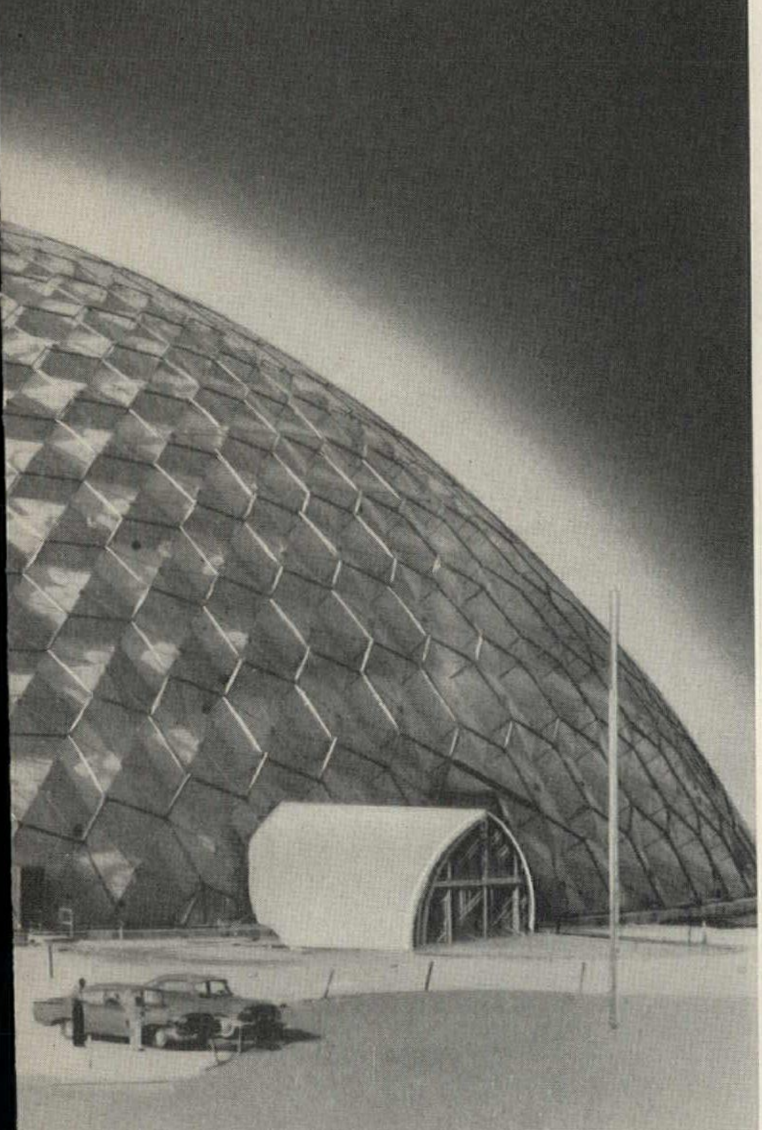


Track entrances leading into the Union Tank Company repair roundhouse. A feature of the specially planned building is the speed with which cars can be moved in and out of repair areas.



Doors in upward position at shop entrances. Doors used in this installation are fully automatic. However, The "OVERHEAD DOOR" is available to architects custom designed for any requirement; variety of materials, weights.

speeded by use of THE "OVERHEAD DOOR"



Last year, in Baton Rouge, Union Tank Car Company put into operation as a tank car repair roundhouse the first major industrial application of the geodesic principle of design. Despite the impressiveness of its size—it encompasses 110,000 square feet of unimpeded floor area—it has been termed the "world's biggest building bargain," for the huge steel shell was erected at a cost of less than $1,000,000.

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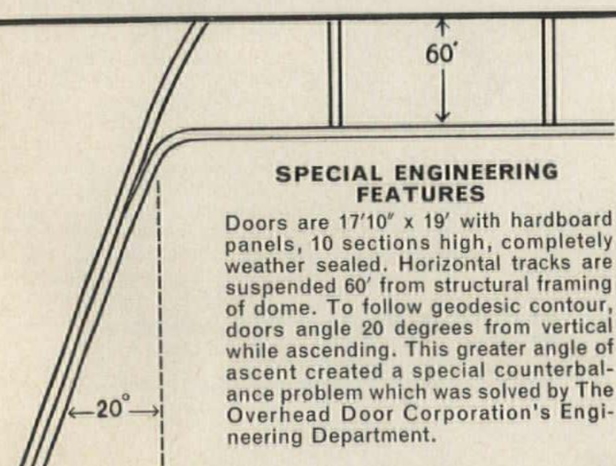

SPECIAL ENGINEERING FEATURES

Doors are 17'10" x 19' with hardboard panels, 10 sections high, completely weather sealed. Horizontal tracks are suspended 60' from structural framing of dome. To follow geodesic contour, doors angle 20 degrees from vertical while ascending. This greater angle of ascent created a special counterbalance problem which was solved by The Overhead Door Corporation's Engineering Department.

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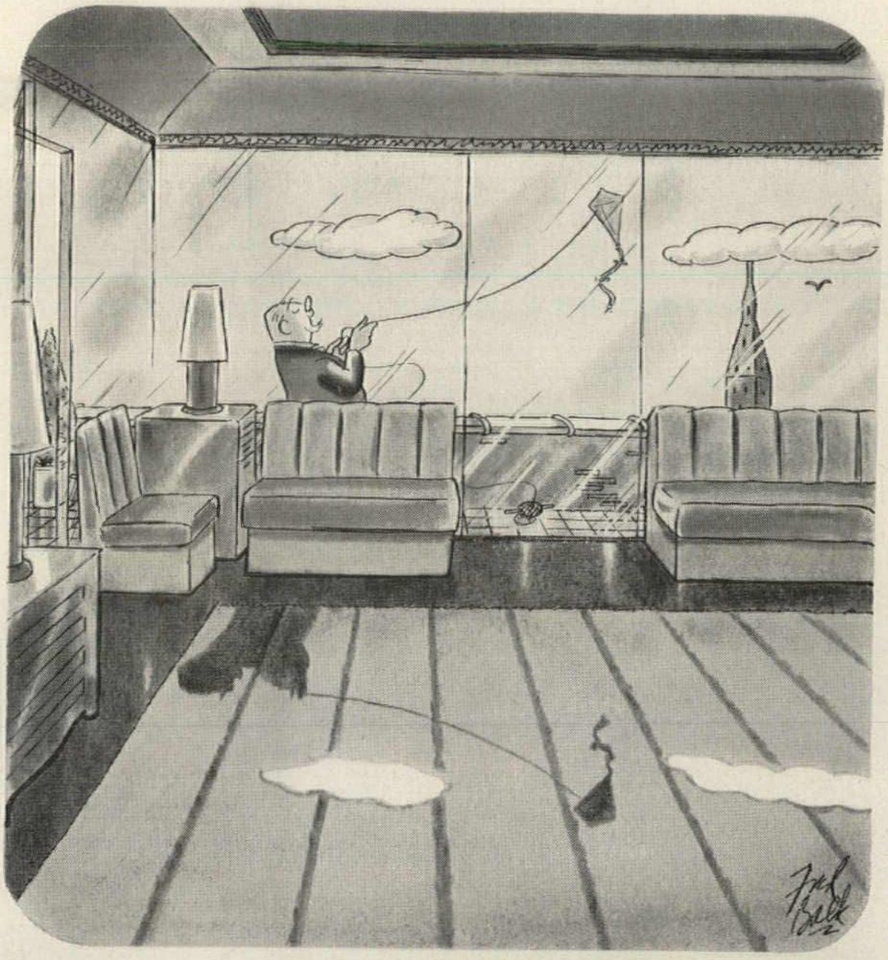

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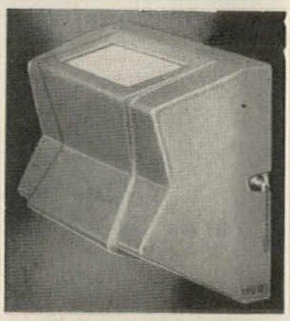

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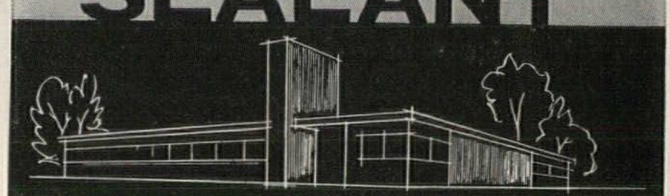

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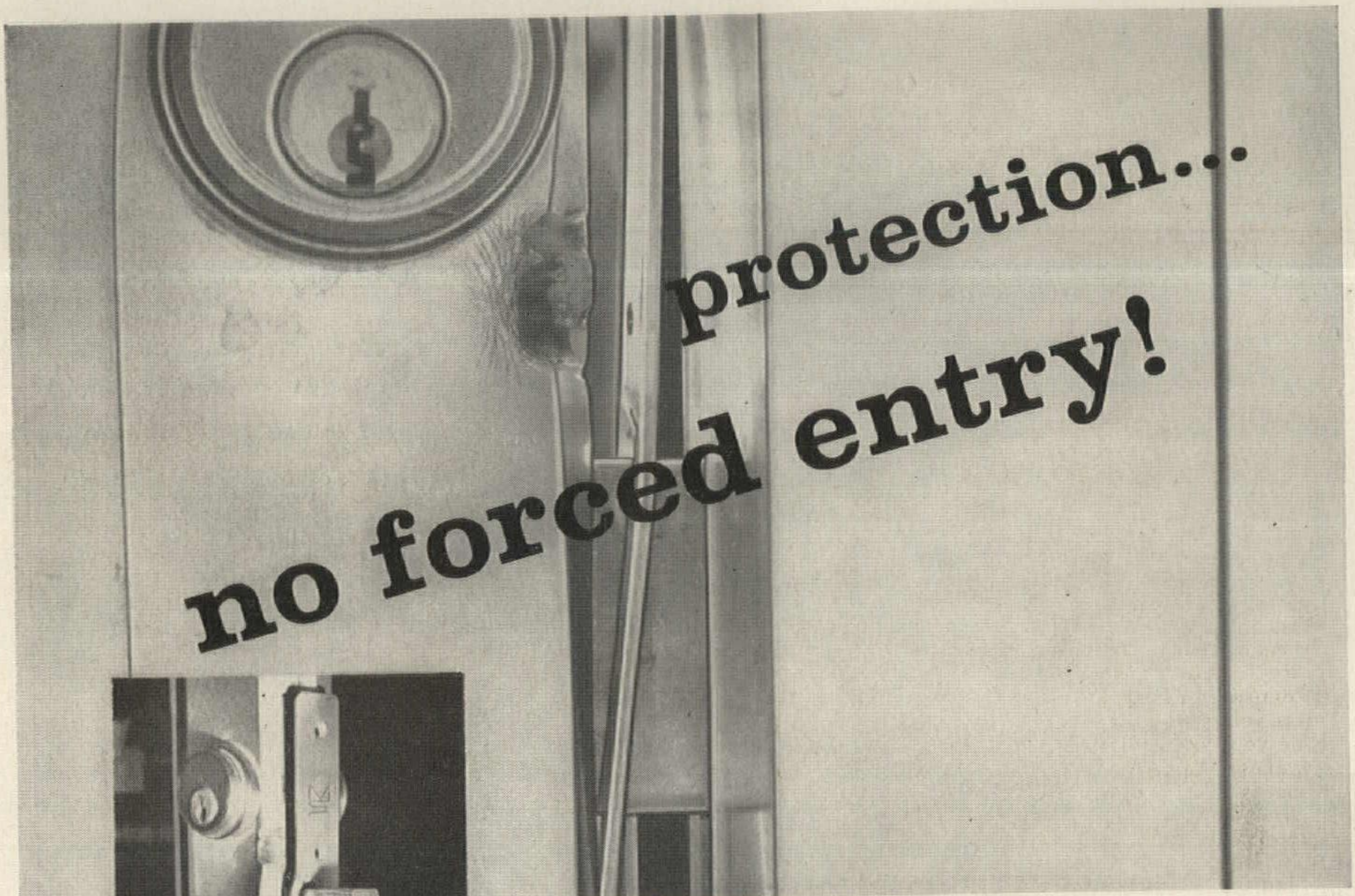
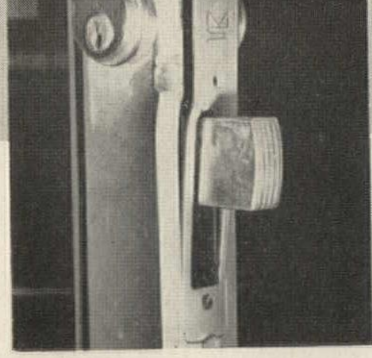
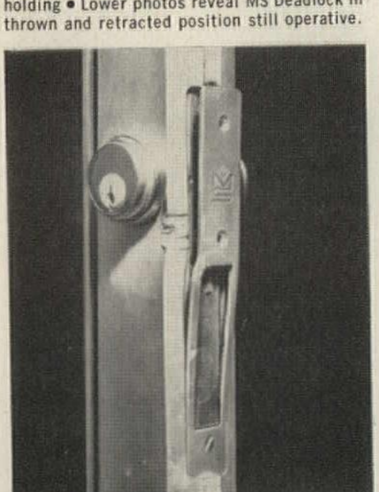




Large photo shows door stile twisted by attempted burglary with MS Deadlock still holding • Lower photos reveal MS Deadlock in thrown and retracted position still operative.



This door stile was destroyed in a forced entry attempt... *but Maximum Security Lock held fast!*

Burglars attempted to force entry through nine store front doors in a Phoenix, Ariz., shopping center, but failed in each try because doors were guarded by Adams-Rite Maximum Security Locks, which made forced entry impossible without complete destruction of the stile or jamb.

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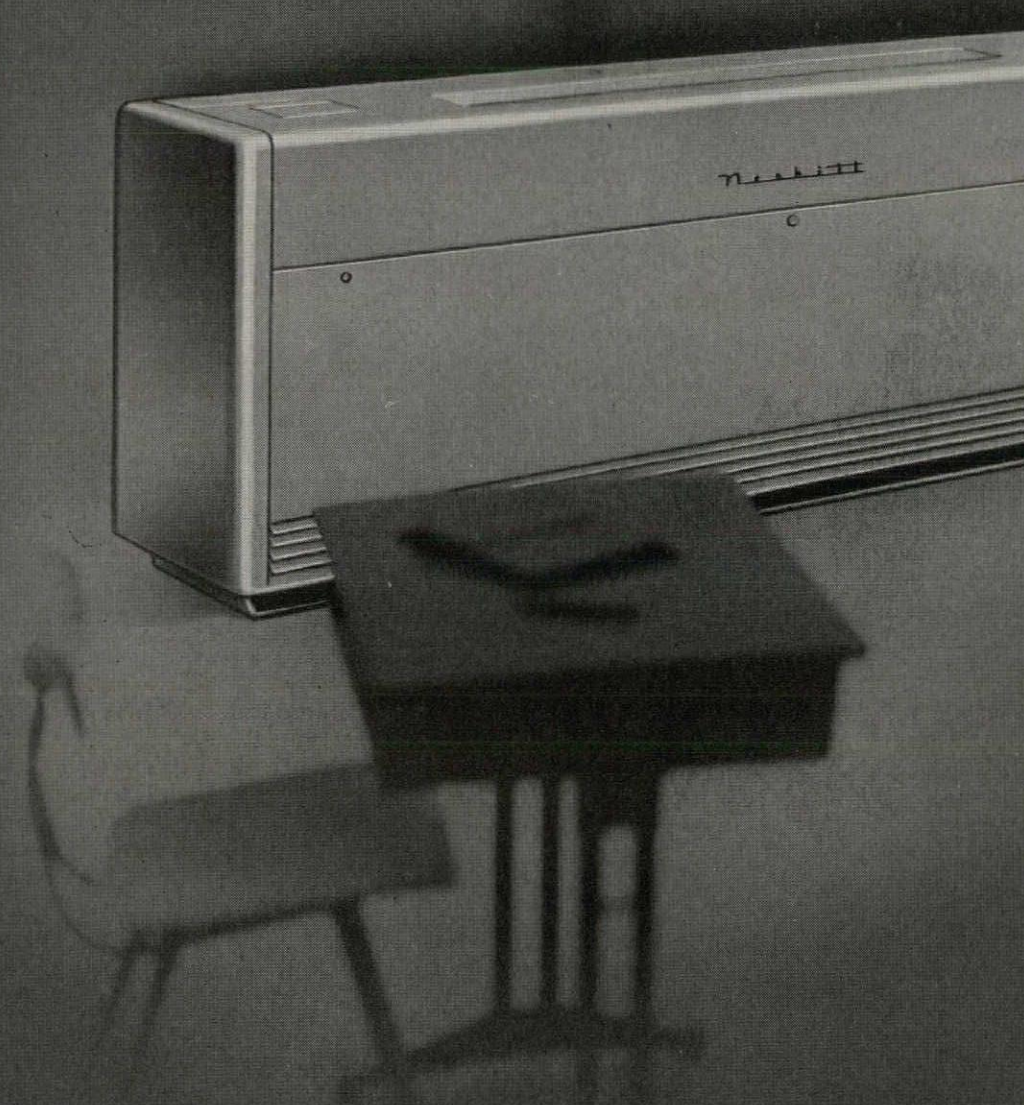

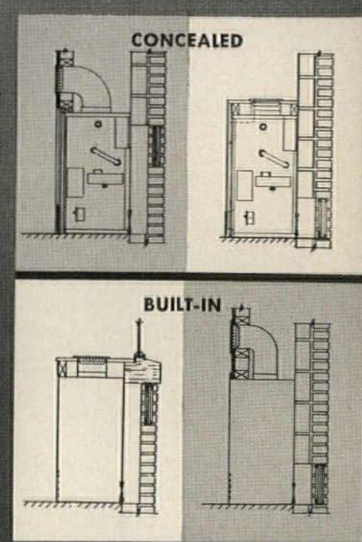

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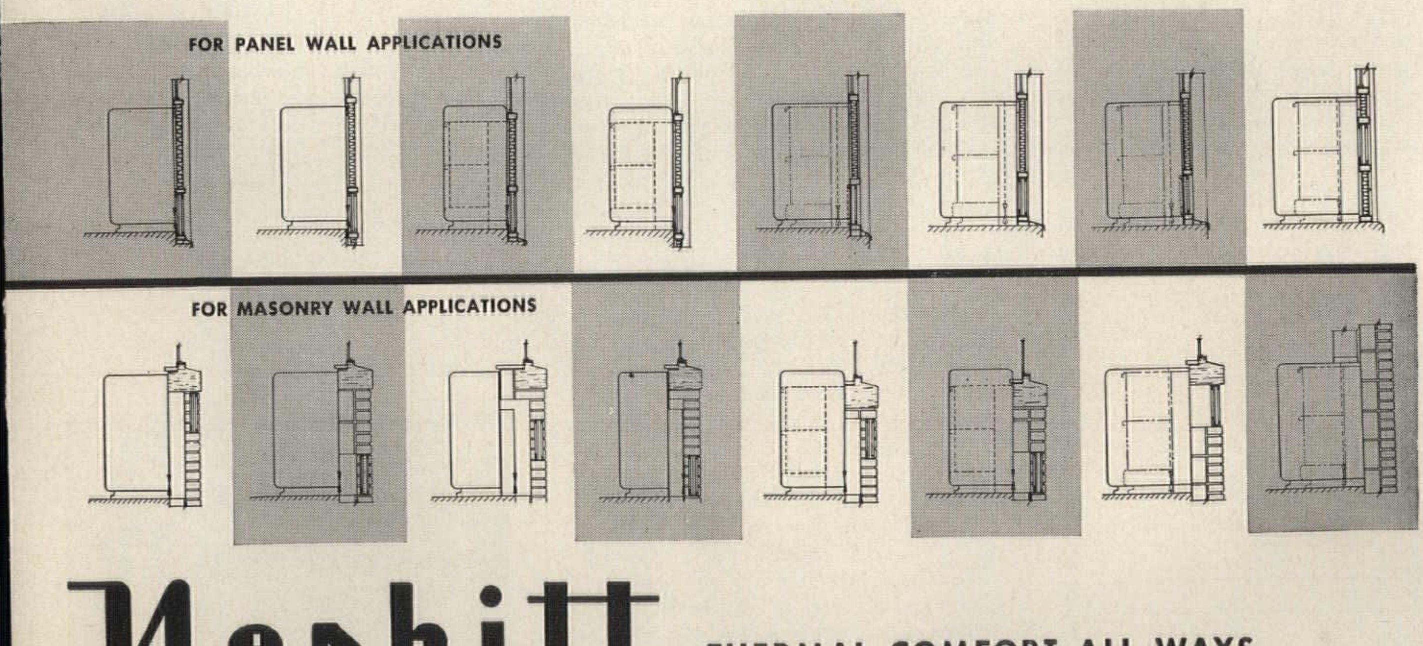

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Required Reading

Japanese Gardens in Detail

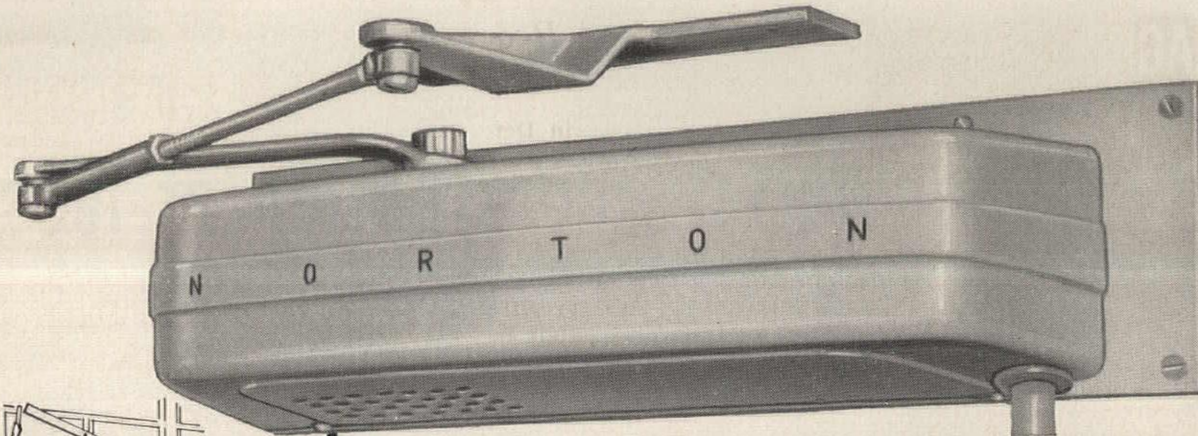
JAPANESE GARDENS FOR TODAY. *By David H. Engel. Foreword by Richard Neutra, F.A.I.A. Charles E. Tuttle Co., Rutland, Vt. 270 pp., illus. $15.*

This book is the outgrowth of several years of work and study in Japan by Mr. Engel, now a New York landscape designer. It might almost be called a documentation of the Japanese garden.

The scheme of the book is simple and effective. The first section of the text, "The Theory," discusses such matters as function, the need for privacy, spatial effects, principles (like asymmetry) derived from religion and the use of symbolism. The second section, "The Practice," deals with the armory of the Japanese garden designer: rocks, stepping stones, and paths; fences, gates, and walls; streams, ponds, lakes, islands, and waterfalls; lanterns, basins, bridges, and sculpture; and even sound effects: "The Japanese love to strike wood upon wood to create a hollow, haunting noise." Then follows "The Realization," 239 photographs of scores of gardens, exemplifying the points made in the text with the aid of accompanying captions. Finally, there is an illustrated description of 237 Japanese and other plants suitable for use in Japanese gardens, all of them available in North America. This information should, of course, prove quite valuable to both the landscape architect and the amateur gardener. Indeed, the book as a whole succeeds in presenting a useful and detailed picture of Japanese garden design, although it is not, despite the enthusiasm of the jacket blurb, a "how-to" book.

Mr. Engel is less successful, however, in dealing with Japanese esthetic theory, for he is quite carried away by Zen. The book is not helped, for example, by such passages as: "One who has trodden this garden path cannot fail to remember how his spirit . . . became uplifted above ordinary thoughts." Fortunately, the effect of this kind of incursion is outweighed by the overall quality of this handsomely bound, designed, and illustrated book. Richard Neutra's foreword sums up: "This book gives much more than a glimpse of . . . a landscape that proves that even a tightly massed civilization need not spell the defilement of the natural scene, but, in fact, can mean its glorification."

—ARTHUR FISHER



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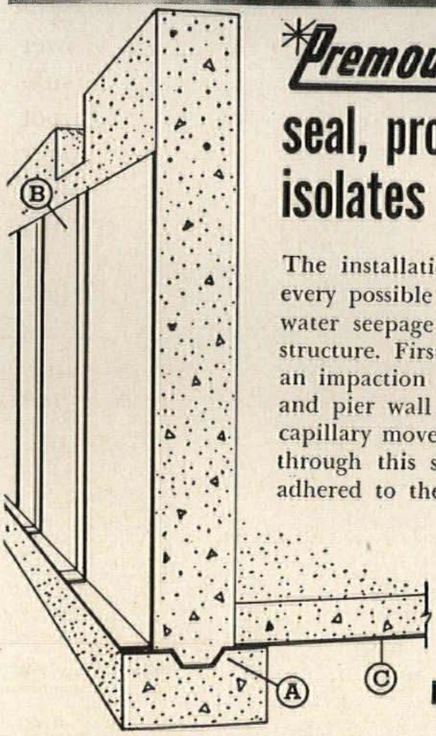

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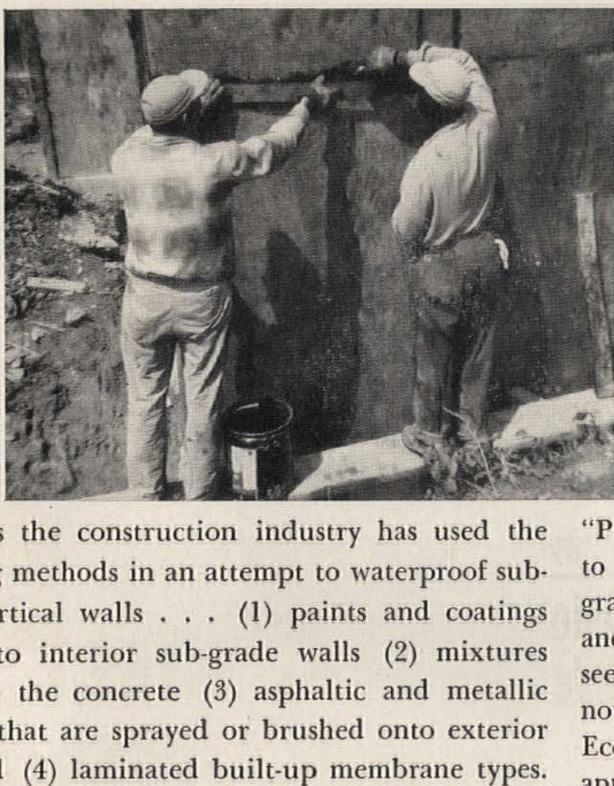

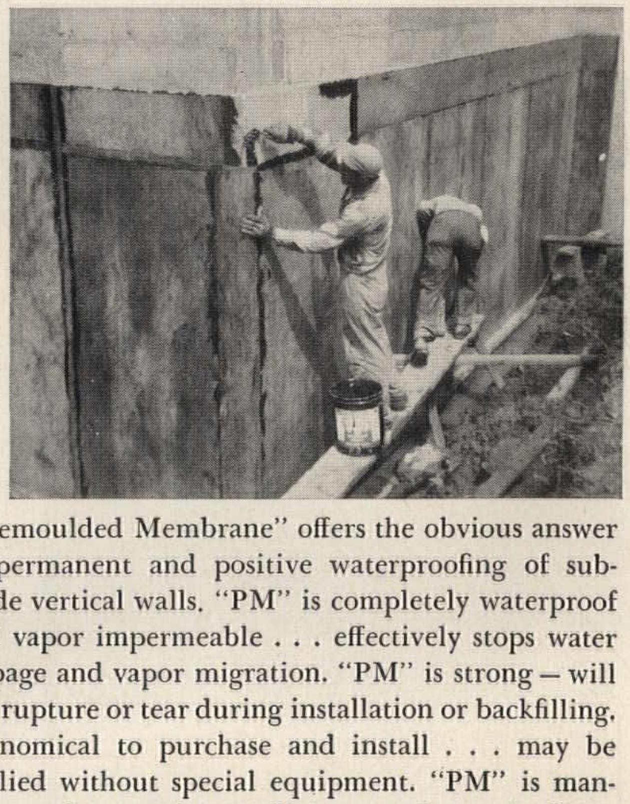

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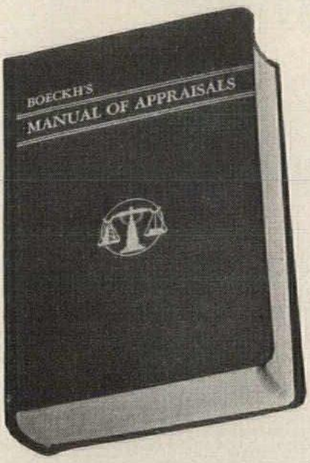

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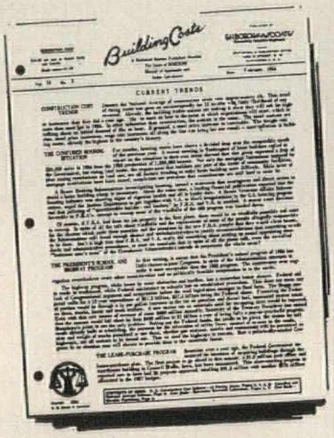

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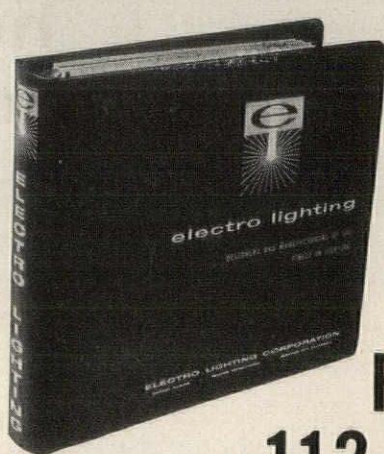

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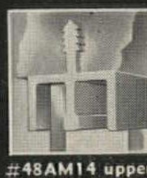
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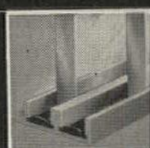
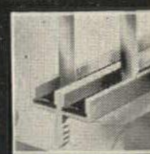
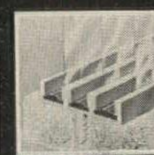

#38AS14 aluminum track with fibre inserts for 1/4" by-passing glass doors.


#38A14 aluminum track with fibre inserts for 1/4" by-passing glass doors.


#38AM14 aluminum track with fibre inserts for 1/4" glass doors.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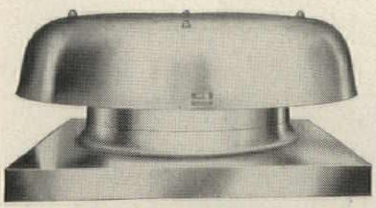

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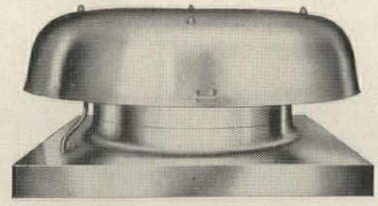

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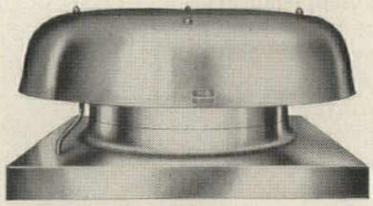

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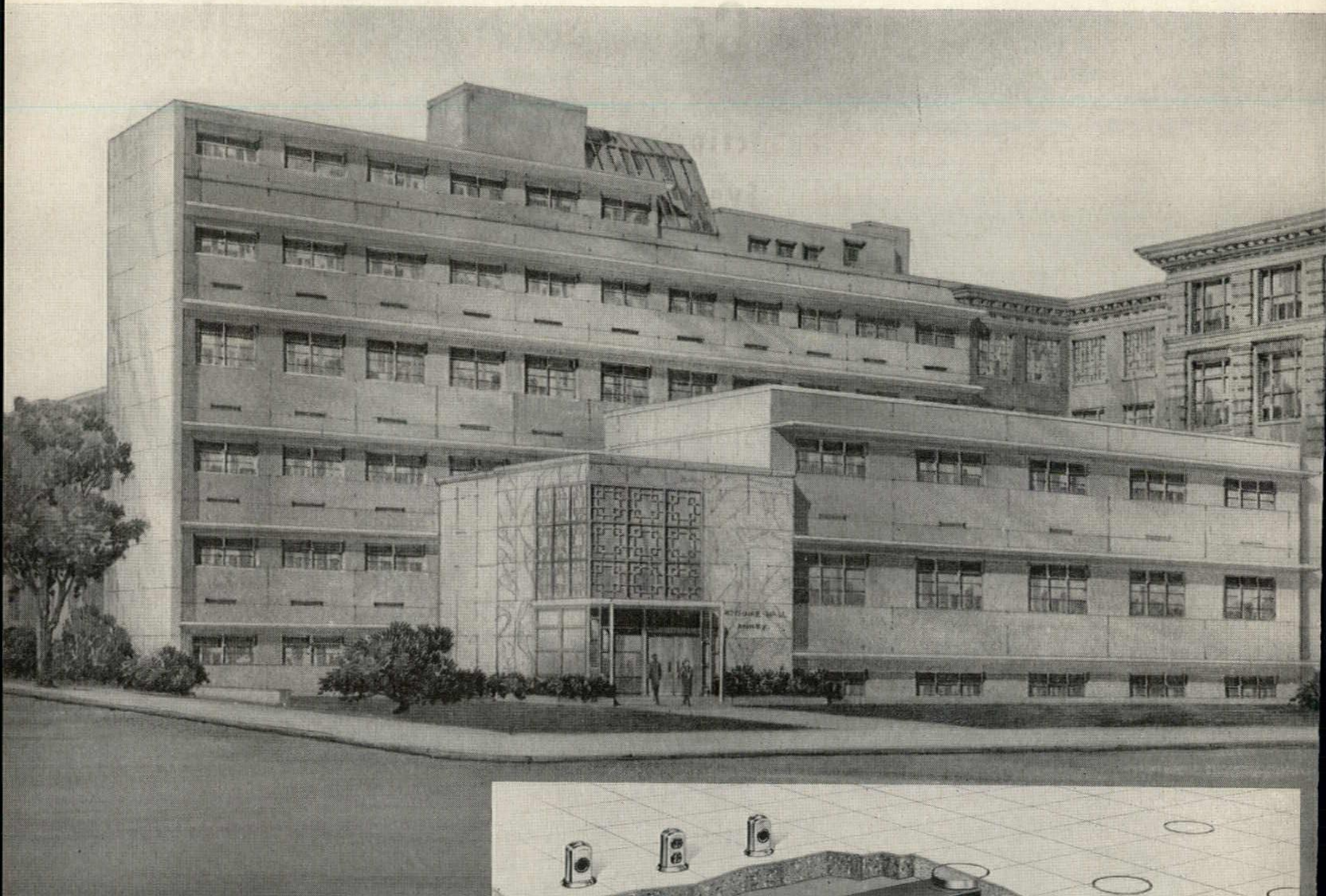
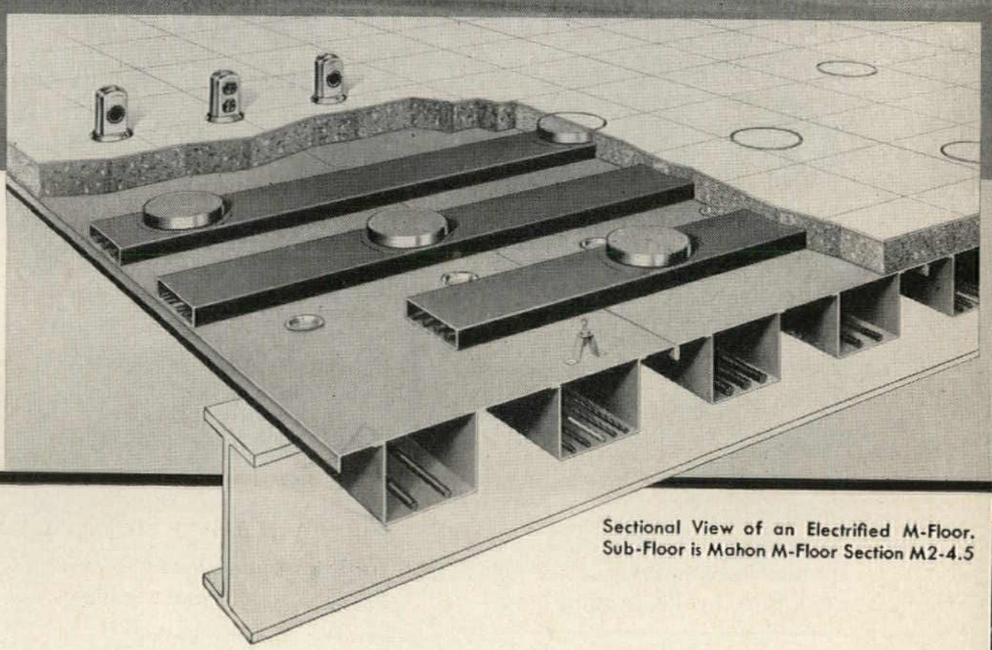




Required Reading

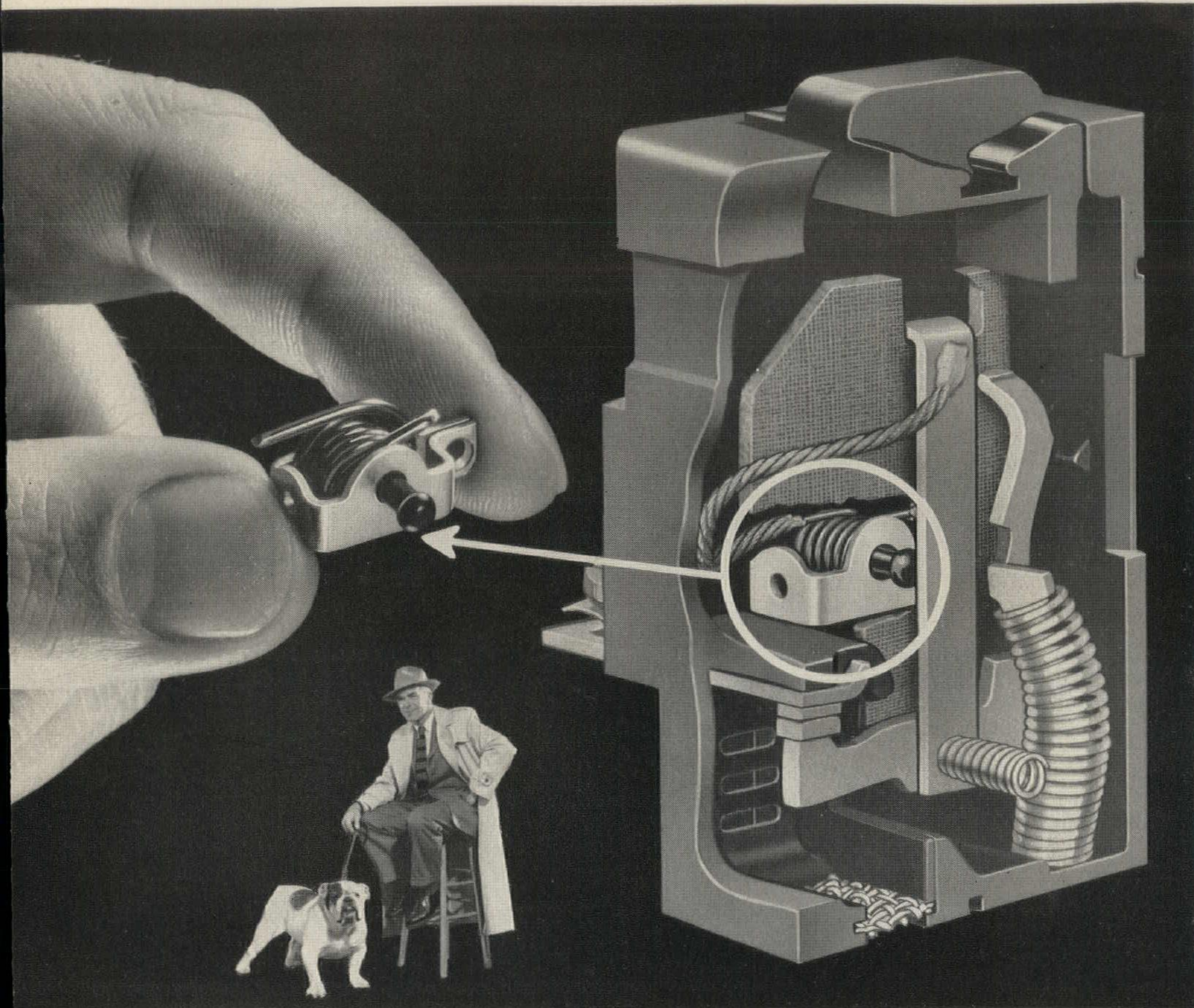
continued from page 64

as with architects or significant architectural designs. "The Search for a New Architecture" is a résumé of the various early theoretical attitudes toward concrete, few of which seem to be blessed with any genuine clairvoyance. Mr. Collins handles this material with forebearance as well as objectivity. Regrettably, the early development of concrete architecture produced little in the way of fascinating, thought-provoking buildings.

The third part, "The Contribution of Auguste Perret," takes up roughly half the text. Perret's historical importance and the distinction of his best work cannot be denied. Nor can one overlook Mr. Collins' very solid observations concerning the intimate relation between Perret's compositional methods and results and those of the 17th- and 18th-century French classical tradition. Thirty years ago, Professor Hitchcock saw that even in his most advanced work, such as the glass-walled garage in the rue Ponthieu of 1905, Perret had actually had recourse to a traditional national style rather than newly invented design principles, and it is good to have Mr. Collins' perceptive elaboration of this point.

The drawback of this book, however, appears when, after a thorough elucidation of the nature of Perret's work, the author mars his effort by frequently over-playing his hand. Having established in detail the links between traditional French classicism and Perret's concrete designs, he would then have us believe that this was a logical and inevitable process, further implying a special virtue and correctness in this action. This interpretation is accompanied by secondary comments that tend to negate or at least depreciate the distinctive achievements of other architects. While never overt or disconcerting, this attitude detracts from the seriousness of tone and semblance of objectivity which is necessary in any detailed study of style. Perret's architecture is of considerable consequence, but it has no special claims to distinction as *the* "vision of a new architecture" in concrete, as the author so often implies and occasionally states. On the other hand, in its best pages the book throws much light on the problems that Perret set out to solve. If Perret's work is unfashionable at the moment, there is all the more reason to give Mr. Collins' argument careful consideration.

—JOHN M. JACOBUS, JR.
Princeton University



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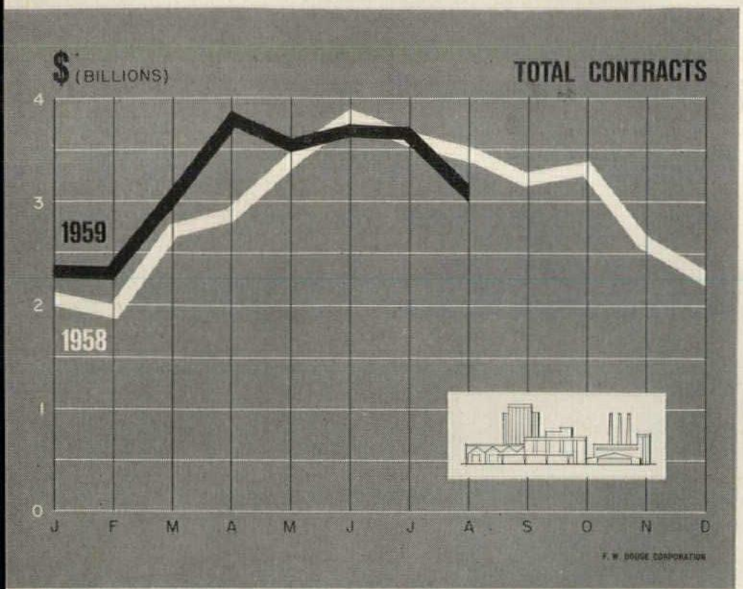
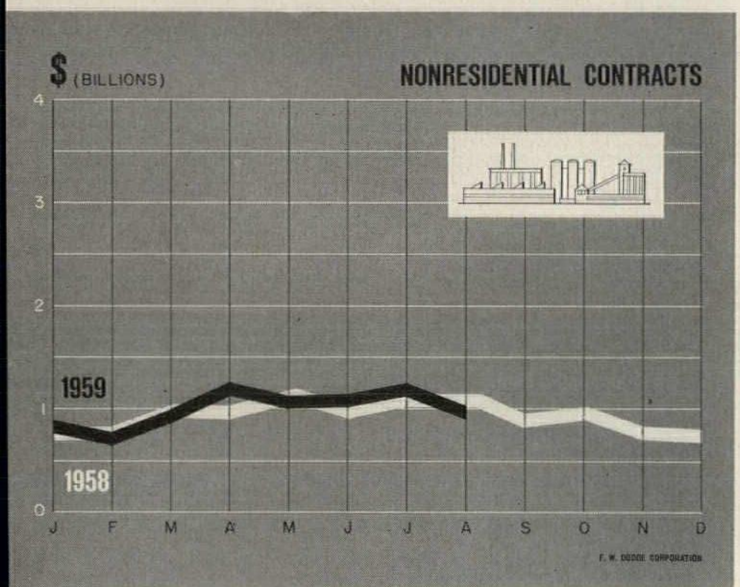
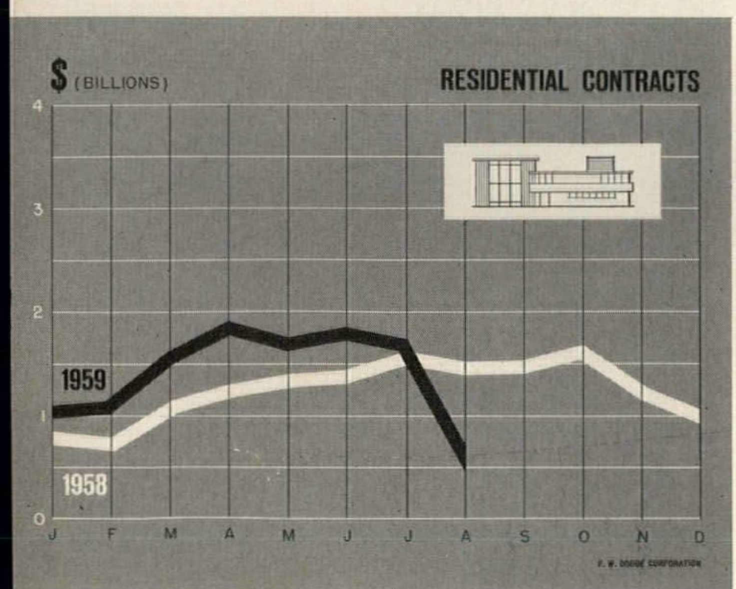
Current Trends in Construction



Total contracts include residential, nonresidential, heavy engineering contracts





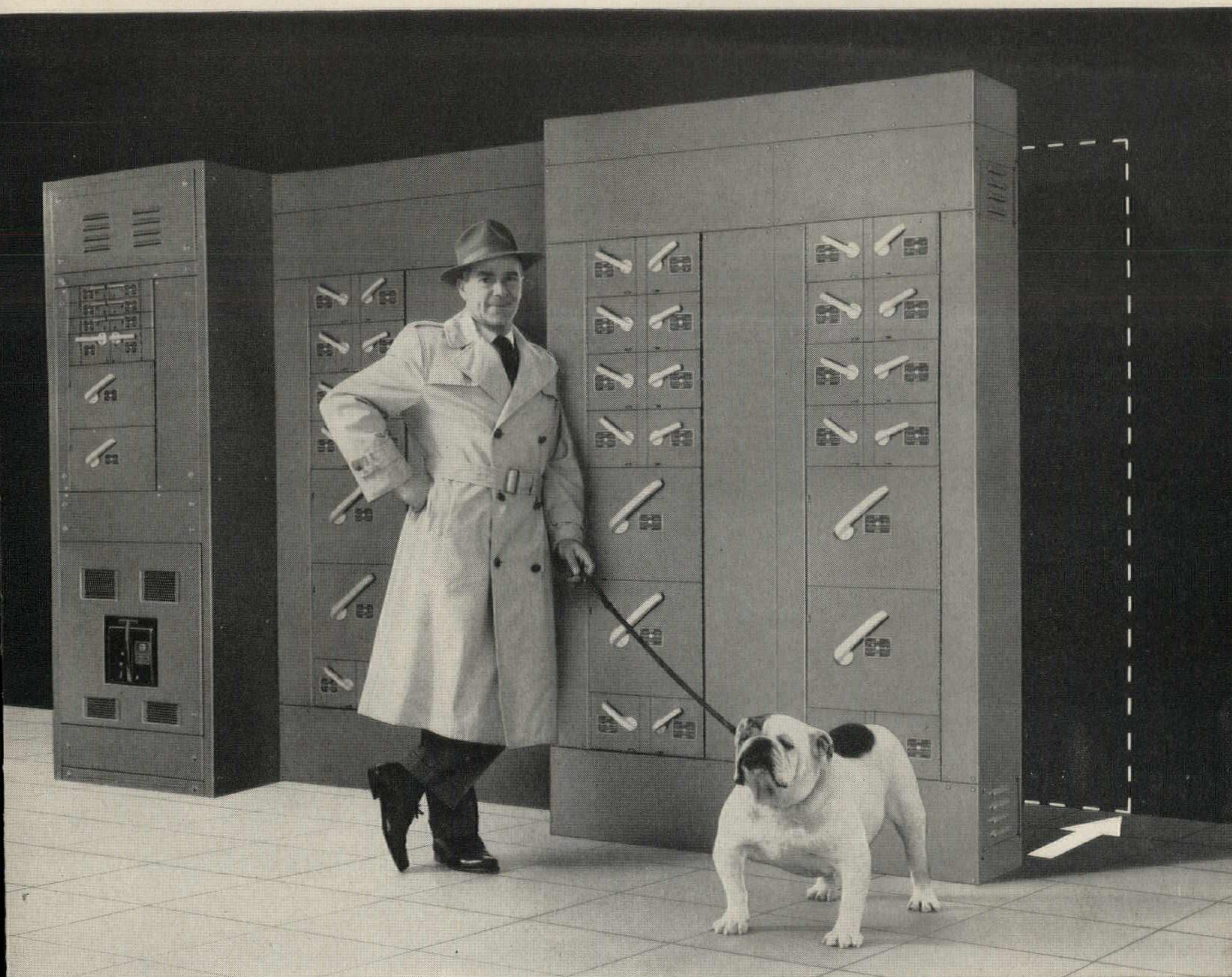
SOMETHING HAPPENED in late summer to dampen the earlier exuberance of the construction contract figures. The downturn was unexpected, and there is no explanation to be found either in broad economic trends or in the basic demand for building. Nevertheless, there was a softening in August which affected practically every construction category other than single-family housing. The indications are that the decline will prove temporary, but the question remains: What caused it? We have a couple of explanations to offer—but we also have the feeling that architects, with their intimate relationship to bidding and contract awards, might have some worthwhile thoughts to contribute. If any of our readers care to give us their opinions, we would be happy to hear from them.

IN CASTING ABOUT for unusual circumstances which might have some bearing on the peculiar performance of construction contracts in August, the steel strike comes immediately to mind. There is little evidence that the strike had any serious effect on the progress of construction work actually under way, until about the middle of September. Construction employment, a good indicator of activity, was higher in August than it had been in July. Contracts for work not yet started, however, are subject to a different set of forces and considerations, and there is a good possibility that uncertainty over prices and deliveries of steel had a delaying effect on bidding and contract award schedules. Some temporary delay of this sort could be made up later, but there is no denying the fact that the strike, at this writing, is beginning to pinch. Most people seem to have been prepared for a six- to eight-week strike, but with that period over, the effect becomes progressively more pronounced.

AUGUST was characterized by one other unusual feature: some of the most unbearable weather known to man. While no proof exists that this could have had a perceptible effect on the contracting process, we know that the weather did affect some parts of the economy adversely. Department store sales dropped sharply in the last two weeks of the month, mainly because people just stayed home, or went to the beaches. It isn't inconceivable that the building business was at least slightly affected by the same phenomenon.

ONE THING prospered more than ever this summer: crabgrass. We have a new house, and the new lawn looked pretty good in July. Coming back from vacation at the end of August, however, it looked as though the Battle of the Marne had been fought over it (moles played a part in the overall effect). We felt better, though, when we attended a meeting of one of the nation's leading scientific organizations in Washington and found that their lawn was in worse shape than ours. Incidentally, they had resorted to burning the crabgrass off with a blowtorch. It was unscientific, but it seemed highly effective.

GEORGE CLINE SMITH
Vice president and economist
F. W. Dodge Corporation



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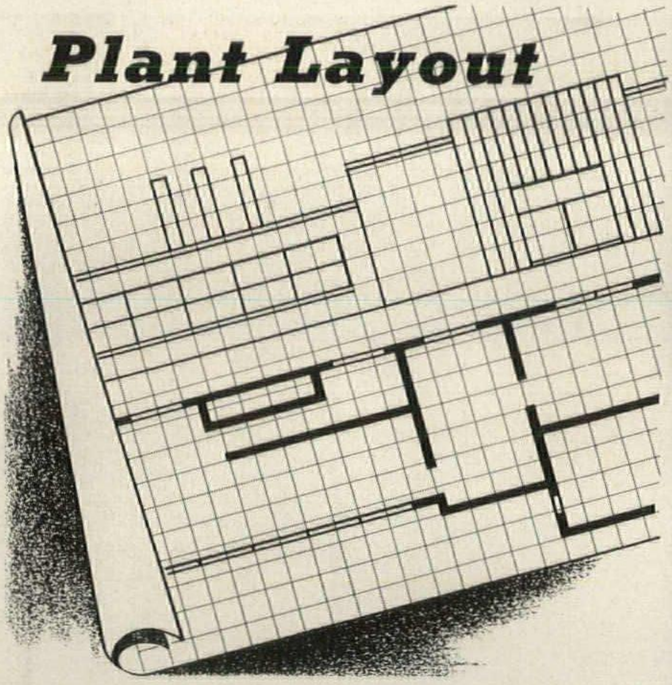

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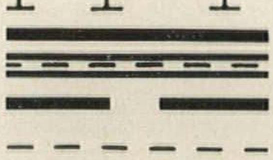

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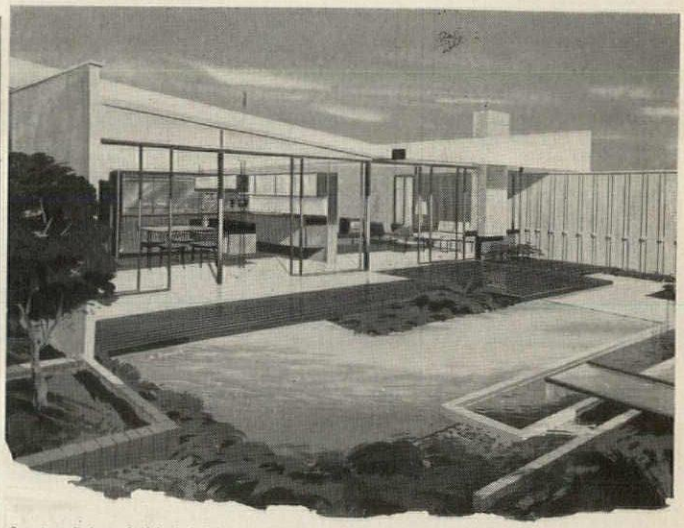

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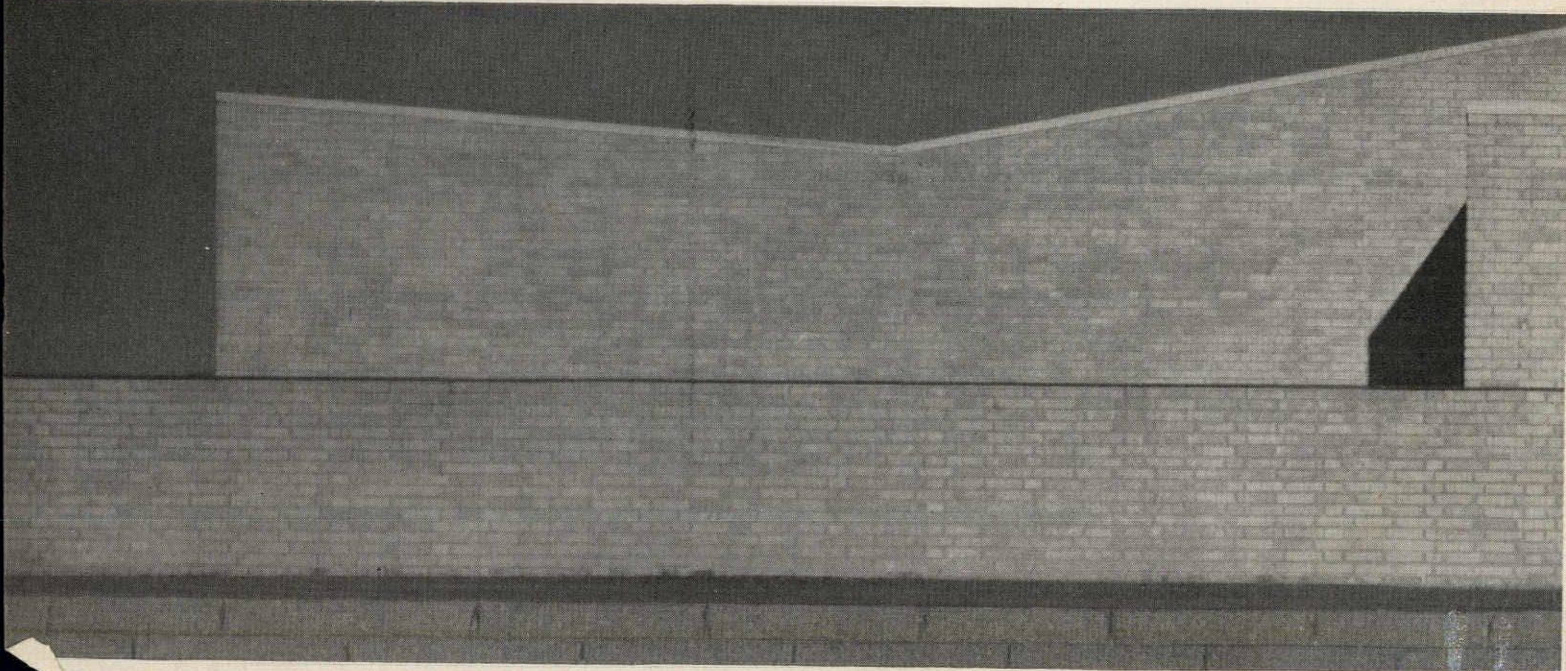

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