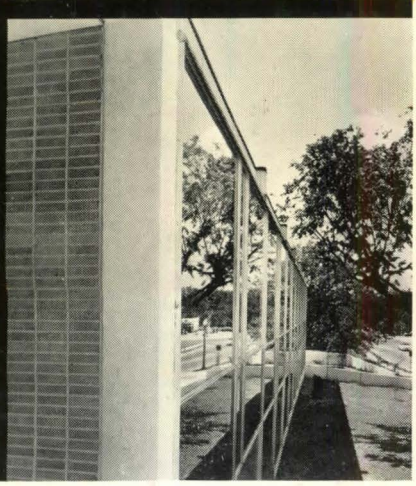
GRESSIVE ARCHITECTURE

display techniques

10
october 1952



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PROGRESSIVE ARCHITECTURE

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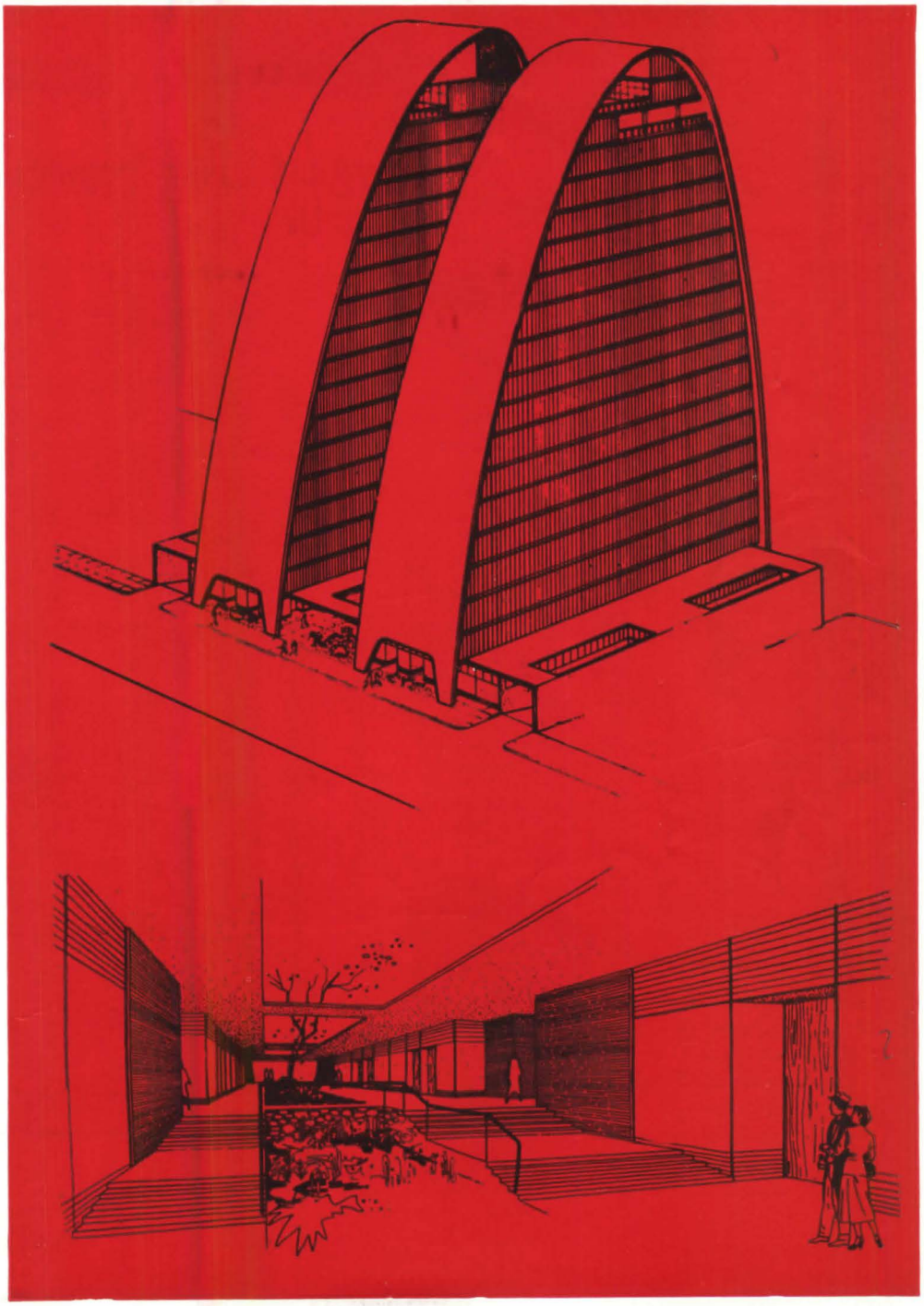
twin office buildings and mall



its of the legal setback lines for dings in São Paulo, Brazil, defined asymmetrical arches of these twin e buildings proposed by Rino Levi, hitect, and Roberto Cerqueira Cesar, ociate Architect, for a site between thoroughfares that would be con- ed by a mall (right) *serving as an rior shopping street.*

king the simplest design to provide ximum areas of well lighted, freely tilated, unpartitioned rental space with- the legal cubage limits for office build- s in downtown São Paulo, Brazil, hitect Rino Levi and Roberto Cer- ira Cesar, Associate Architect, devel- d the twin structures shown here, for quare site extending through a block n one business street to another. The nt is National Life Insurance Company São Paulo.

t was decided to erect two vertical slabs, placed at right angles to the streets atop a submerged block containing a two-level parking garage. This scheme would create three courts for light and air—above the shopping mall through the center of the project, and above the projections at either side containing ramped entrances to the garage. The window walls would face these courts.

Accepting the setback limits as the governing maximum, the architects described within those limits a parabolic curve which would become the structural arch of the two buildings. This curve is somewhat asymmetrical, as the widths of the bordering streets differ and hence the angles of façade setback differ. The elevator stacks are also off-center, as they are located at the peak of the curves. It is proposed to surface the steel-and-concrete arches with copper. The enclosed walls would be composed entirely of windows protected by structural sunshades.

Each office building would contain ground floor shops, 17 floors for office rentals, and roof clubs or restaurants.

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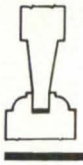
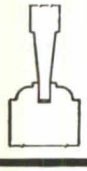


M-117 Tri-Panel Exterior Door
Thickness: 1¾" with heavy 1⅛" hip-raised panels, 2 sides; ovolo sticking.



M-1073 Tri-Panel Interior Door
Thickness: 1⅜" with heavy ¾" hip-raised panels, 2 sides; ovolo sticking.

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ound-conditioning materials

by Paul J. Washburn*

e of the recurring problems which con-
t the architect is the specification of
articular type of acoustical material
a particular job. When the architect
cifies an acoustical material, he is in-
sted, primarily, in the reduction or
trol of sound. However, a selection
ed solely upon acoustical efficiency
sometimes be a needlessly expensive
n. A factor that occasionally goes un-
ded by the architect is that a differ-
e in noise reduction of .05 between
materials cannot be detected by the
an ear, while the cost difference
ht be quite significant.

As the architect knows, no one ma-
al will solve every architectural prob-
. For this range there are available
y many acoustical materials, each
its own important characteristics.
an aid to the architect, we will sum-
ize, generally, in this article the dif-
nt kinds of materials and where they
be installed to produce the best re-
s. Dut to the fact that so many vari-
es are involved, such as noise co-
ients, thickness, light reflection, mois-
e resistance, insulation value, installa-
, maintenance, and fire resistance, it is
air and incorrect to say that any one
e of tile is best suited for a particular
e of job. Nevertheless we will try to
sent a comprehensive generalization as
urately as possible.

what are acoustical materials?

oustical materials are made from a
at variety of substances and combina-
s of ingredients. Very efficient sound-
orbers have been made from vegetable
rs such as bagasse or wood.

Bagasse is the fiber residue of sugar
e after the juice has been extracted.
od fibers are produced from various
es of trees in the south and the north-
t. Hair felt is still used, but not to the
nt of former years.

Mineral fibers, such as asbestos, glass,
mineral wool, enter into many com-
tions, as do the vermiculite, pumice,
perlite aggregates. The binding agent
can often contribute considerably to the sound absorption of a product; the porosity of materials is often increased by adding a foaming agent to the mix.

Practically all products listed and used as acoustical materials can be classified in three groups. In the order of use, they are:

1. Monolithic tiles, with or without perforations extending into the material.
2. Assembled units, consisting of perforated facings over an absorptive element.
3. Plaster compositions with acoustical properties.

The monolithic prefab tiles are by far the most widely used. For general application, this type has a number of advantages. Through adequate control of density, thickness, dimensions, and finishes during the manufacturing process, tiles with uniform absorptive characteristics and matching appearance can be produced in large quantities. Absorption capacities and characteristics are inherent in the tiles. Due to this possible precision in manufacture, their performance after installation can be relied upon to match that indicated by the standard test data on which they are rated.

Assembled units include the various combinations of sound-absorbing elements, such as rock-wool and glass-wool blankets, pads, or other materials with acoustically transparent facings, most of which are perforated. While a great many of these combinations are used in offices, some are designed primarily for broadcasting and recording studios, special music rooms, etc., where some controlled variation of sound-absorptive characteristics may be desirable. They are also used in general sound conditioning where the greatest possible sound-absorbing capacity may be required. By varying the thickness of the sound-absorbing element and the spacings between the element, the wall, and the facing, some variation in the over-all absorption and the absorption at the different frequencies can be obtained. In practically all instances today, the facings used are some form of durable, perforated panel such as metal, asbestos board, or hard board. The original use of cloth, usually muslin, has been discontinued because of difficulties and expense in maintenance.

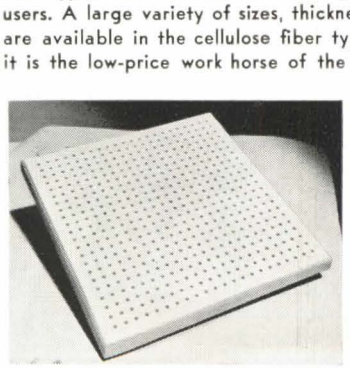
Plaster compositions broadly include the acoustical plasters and the various kinds of "sprayed-on" materials. The plasters are built up on the wall and ceiling surfaces in the usual way. The sprayed-on types are applied by special guns. These materials are characterized by their smooth, unbroken surfaces. Their limitations lie in the indeterminate absorptive characteristics and difficult maintenance. With this type, absorption depends critically on proper application and, due to their fine surface porosity, paintability is narrowly restricted.

Practically all sound-absorbing materials owe their efficiency to the fact that they are highly porous. The absorption coefficient of a porous material depends, in a rather complicated manner, on the thickness, the size of the pores, the ratio of pore volume to total volume, and the frequency of the sound. Although it is quite difficult to evaluate all of these factors with a view to predicting the absorption ability of a material, several approximate statements may be made. In the first place, so that the pores of a material can absorb sound effectively, they must communicate with each other and with the surface of the material. Secondly, the absorption increases with the thickness, particularly at low frequencies. At high frequencies, for some materials, an increase in thickness has little or no effect on absorption. Thirdly, the absorption increases up to a certain point with the degree of porosity, as measured by the rate at which air can be forced through. For a given type of material, the lower the density, the more porosity as measured by the rate at which air can be forced through it. If the size of the pores is increased beyond a certain point, however, producing an extremely loose-textured material, the absorption decreases. Fourthly, the absorption of practically all materials is greater for high frequencies than for low frequencies.

irman, Technical Committee, Acoustical Materials

TYPES OF TILES AND THEIR CHARACTERISTICS

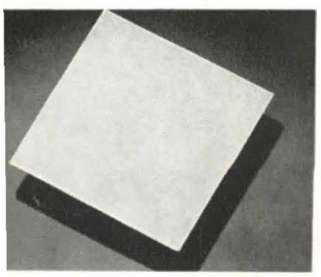
	cellulose-fiber tile	mineral tile
description	Most fiber tiles are made from the long, tough sugarcane fibers called bagasse, or from wood fibers. After fabrication, there are myriad minute interstices between the fibers throughout the entire tile. These tiny voids exposed by perforations give the tile its sound-absorbing qualities. All tile can be made termite-, fungi-, and dry-rot proof by special manufacturing processes.	Rock wool is the general component of mineral tiles is felted in a menner similar to that used in the ma facture of wood fiber, but with the addition of a suit binder. This binder is added to provide strength toughness in the finished product. Mineral fiber til available with fissured surfaces or with perforated faces. Like the wood-fiber tile, sound is dissipated friction in the minute interstices between the fibers, posed by the fissures or perforations.
efficiency (noise reduction coefficient)	Most efficient at high frequencies and has a noise reduction coefficient in the range of .55 to .75.	Has high sound absorption for the middle and hi frequencies. Noise reduction coefficient, from .65 to
cost	Low initial and installation cost. Varies from low to medium, depending upon method of installation.	Medium initial and installation cost.
moisture resistance	Has a moderate moisture resistance and can be used except where conditions of excess humidity prevail for long periods. Excessive moisture tends to destroy cement bond and warps most fibrous acoustical materials.	Moderate moisture resistance with safe margin for under all normal humidity conditions. Not recommen for use in washing rooms or where it will be exposed steam or constant high humidity.
light reflection	Has a rating of .76 to .80.	Good light reflection with a range of .78 to .84.
insulation value (thermal conductance)	Thermal conductivity ranges from about 0.30 to 0.40 Btu/hr/sq ft/in. thickness/degree F temperature difference.	Thermal conductivity ranges from about 0.40 to Btu/hr/sq ft/in. thickness/degree F temperature di ence.
fire resistance	It is a combustible tile but, when ordered with special paint finish, it is classified as slow burning.	It is classified as an incombustible tile.
maintenance	Easy to maintain, needs occasional cleaning. Can be repainted without loss of efficiency. Either oil- or water-based paints can be used and no special equipment is necessary. Brush or spray can be used.	May be cleaned with damp cloth or vacuum. Can spray or brush painting will not affect efficiency of sured material. Perforated material may be repair repeatedly, without loss of efficiency, by spray or br Neither type should be used below wainscot height where subject to impact or abrasion.
installation	Can be cemented to existing surfaces, nailed or screwed to furring strips, and can be mechanically suspended.	Can be cemented to existing ceiling or mechanic suspended. Nailing is not recommended.
size	6" x 12", 12" x 12", 12" x 24", 24" x 24". Thicknesses: 1/2", 5/8", 3/4", 1", 1 1/4". Butt-bevel edges, t & g edges.	12" x 12", 12" x 24". Thicknesses: 5/8", 3/4", 13/16", Bevel or square edges, edge-kerfed, spline-grooved.
general use	The low tile and installation costs of this material create a demand for its use, especially where a large area of ceiling space must be treated. Although it is one of the most widely used materials and can be found in almost every type of installation, commercial buildings and various types of institutional buildings are the principal users. A large variety of sizes, thicknesses, and efficiencies are available in the cellulose fiber type of acoustical tile; it is the low-price work horse of the industry.	Because of their mineral composition, these tiles will support combustion when exposed to conventional resistance tests. For this reason, they are used in theat restaurants, night clubs, and other places of busines which the public gathers and where fire safety requ ments must be met. Fissured material is frequently u when appearance is a primary consideration. Perfora materials are used in commercial and institutional bu ings and other areas requiring continued maintenanc



Perforated, wood-fiber tiles (as well as light-weight concrete masonry units) are the sound-absorbing materials specified for a laboratory (left).

Fissured, mineral-wool tiles that will not support combustion are appropriate for an automobile display room (right). Photos: courtesy of Johns-Manville Corp., Armstrong Cork Co.

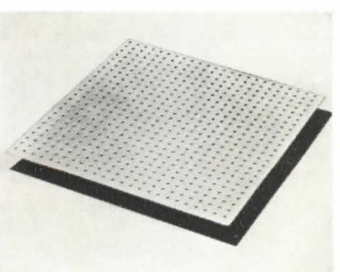
	ass-fiber tile	perforated-asbestos tile
description	the manufacturing process of glass-fiber tile, molten ass is drawn into fine fibers under controlled techniques. /hen combined with a small percentage of a stable nding agent, the glass fibers are compressed and onded into board form. The boards are then cut into es of desired sizes and thickness and finished to re-ired specifications.	Perforated, asbestos-board-type tile is made of asbestos and cement and is backed with an inorganic wool acoustical backing. It is manufactured in several thicknesses and the panels are perforated with small holes to allow the sound to be absorbed by the acoustical backing.
efficiency (noise reduction coefficient)	ost efficient in the middle frequencies. Noise reduction efficients range between .65 and .85.	Most efficient in the middle and high frequencies. Has a noise reduction coefficient between .75 and .85.
cost	edium initial and installation cost.	Medium initial and installation cost.
moisture resistance	oisture resistance. Can be used in installations where rying conditions of humidity and temperature exist.	Excellent moisture resistance. Useful in places where continued high humidity and varying conditions exist.
light reflection	as a rating of about .65 to .80.	Unpainted.
insulation value (thermal conductance)	ermal conductivity about 0.24 Btu/hr/sq ft/in. thick-ss/degree F temperature difference.	Thermal conductivity about 0.24 Btu/hr/sq ft/in. thickness/degree F temperature difference.
fire resistance	is classified as an incombustible tile.	It is classified as an incombustible tile.
maintenance	an be cleaned with wallpaper cleaner or vacuum, and n be spray-painted without loss of efficiency. Tile ould not be used on areas which are subject to physical use.	Easily cleaned and can be painted numerous times without loss of efficiency. Can be used where physical wear is present, as tiles will withstand hard usage.
installation	an be cemented to existing ceilings and be mechani-lly suspended. Nails or screws not recommended.	Can be mounted on wood or applied with metal suspension system. Screwed or nailed to a framework of wood furring strips.
size	" x 12", 12" x 24"; ¾", 1" thicknesses; bevel and uare edges, edge-kerfed, spline-grooved.	12" x 12", 12" x 24", 24" x 24", 24" x 48". Thicknesses: 1 3/16", 2 3/16".
general use	cause this tile has an incombustible rating, it will be ind in all types of installations that require flame istance. Schools, public places, and offices are major ers. Its good moisture resistance also permits use in ices where humidity and dampness are prevalent. It is t recommended where physical wear will be encoun-ed, such as gymnasiums or below wainscot height.	Because it does not retain moisture, it is especially useful in installations like swimming pool areas or restaurant kitchens. Its high acoustical efficiency has made it widely popular for scientific acoustical treatment in radio and television studios, concert halls, auditoriums, and in gymnasiums, music rooms, and on wall surfaces where hard wear or abuse will occur.

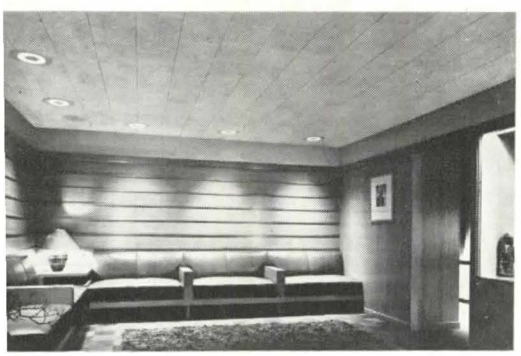


Glass-fiber tiles installed on ceiling of a reception room (left) *can be cleaned with wallpaper cleaner or vacuum; should not be below wainscot height.*

Easily cleaned and moisture-resistant asbestos-cement tiles are an excellent choice for kitchen ceilings (right).

Photos: courtesy of Owens-Corning Fiberglas Corp., Johns-Manville Corp.

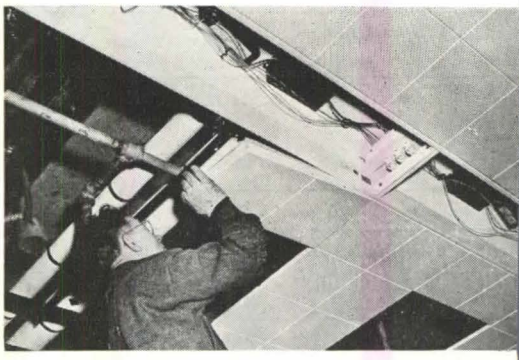


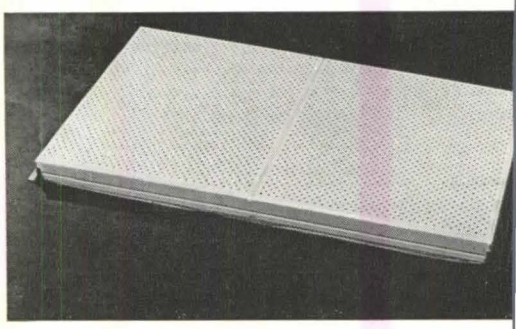


perforated-metal tile

description	The metal-type acoustical material consists of perforated metal with supporting flanges which provide structural strength, and a mineral-wool pad which absorbs sound. This tile is usually made of 26-gage steel or aluminum, with perforations to permit sound to reach the pad. It usually has a baked-on white enamel finish.
efficiency (noise reduction coefficient)	Highly efficient over entire frequency range although most efficient in low middle; has a noise reduction coefficient between .75 and .85.
cost	Generally higher initial and installation cost, compensated by high efficiency and removability features.
moisture resistance	Has moderate moisture resistance.
light reflection	Has a rating from .74 to .76.
insulation value (thermal conductance)	Thermal conductivity about 0.22 Btu/hr/sq ft/in. thickness of insulating material/degree F temperature difference.
fire resistance	It is classified as an incombustible tile.
maintenance	Easily repainted and washed; low maintenance cost.
installation	It is normally installed by mechanical fastening to furring channels or it can be fastened directly to existing ceilings.
size	Usually comes in only one size, 12" x 24", but bevel in middle gives appearance of two 12" x 12" units.
general use	The perforated, metal-type has the highest acoustical efficiency of commercial acoustical tile; however, it may also cost more than other types. It is used in installations where severe service may be encountered. As it is mechanically suspended, it can be taken down and moved to other areas. It is used quite frequently in large office and industrial plants. Office buildings use this material because it is particularly adaptable to air-conditioning systems, since special air-flow channels can be installed which allow cooled air to pass through the perforations into the room below.

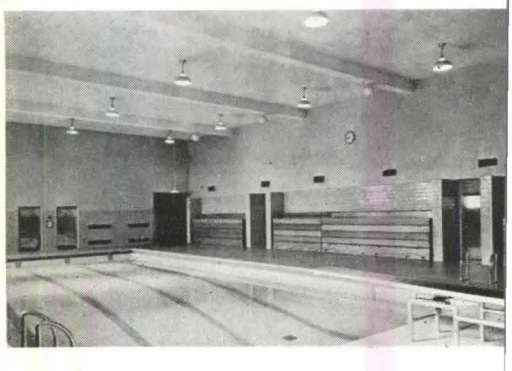
Perforated-metal tiles backed with sound-absorbing material have the highest degree of acoustical efficiency. Easily combined with other mechanical services (below), *they are especially suitable for large office areas.*
Photos: courtesy of Armstrong Cork Co.





cork tile

Cork tile is made entirely from selected cork particles ground to specific particle size, baked under heat and pressure to form blocks. While cork tile has excellent insulation value and moisture resistance, its use as an acoustical tile is limited for it has lower noise reduction qualities. However, because of its resistance to extreme conditions of moisture, it is used in swimming pools, commercial kitchens, high humidity test rooms, and special manufacturing areas. Its high insulation properties make it possible to apply the tile to the top story of a building that has no roof insulation. Except in cases mentioned above, where other factors beside noise reduction are primary, its use is restricted to special type projects.



Extreme resistance to moisture favors cork tile for swimming pool ceilings (right).
Photo: courtesy of Armstrong Cork Co.

STALLATION OF ACOUSTICAL MATERIALS

st as there is sometimes a best type of oustical material for a particular job, re is usually a preferred method for olying that material. Therefore, the sys- of installing an acoustical ceiling ould be chosen with care, as a wise oice of method will mean not only a ing in time and money but will also ult in a more serviceable installation. As each structure has its special struc- al problems, it will sometimes be neces- y to employ different methods of aching the acoustical tile or a combina- of several methods. These methods suggested as possibilities rather than standard operating procedures, and are ered in the general order of their cost, m lowest to highest.

cementing

remodeling work it is very often possi- to cement acoustical tile directly to plaster ceiling. This is the most com- of all methods and usually the least ensive. The plaster, however, must be good condition since cementing re- res a smooth, solid-base surface to ch the tile can be applied. Where the ing has been painted, tests should be de to determine if the adhesive will d satisfactorily. The recommended test install a single tile, leave it in place 48 hours, then remove it. If the paint not softened, it is considered safe to the cement method.

ail to wood furring

d-furring strips, 1″ x 2″, may be used base for nailing or screwing the stical material where the ceiling sur- is rough and uneven. The strips, how- should be shimmed so that they are ectly level. In new construction, it is possible to fur across the joists. ng methods have the advantage of tly higher absorption efficiency. ling paper as a backing between the and the furring is used to avoid athing" through the joints of abutting

menting to gypsum lath

e acoustical material is one that can- not be nailed, such as certain types of mineral wool tile, it may be best to install gypsum lath and cement the acoustical tile to it. This type of installation not only provides more rigid construction but has the added advantage of providing additional fire resistance.

screwing to gypsum board

The best method of applying a perforated, fiber tile material is accomplished by screwing the material to a base of gypsum board. The use of screws is one of the most secure methods of attaching an acoustical material.

cementing to brown coat plaster

For an acoustical ceiling requiring rigidity and a dependable fire stop, tiles can be cemented to the brown coat of plaster. This method will also reduce sound transmission through the ceiling.

mechanical suspension

Mechanical suspension systems do much to eliminate problems of ceiling design, and are adaptable to both old and new construction. They conceal overhead pipes, air-conditioning ducts, and electrical conduits, and produce a clean, modern appearance. Mechanically suspended ceilings are often used where old ceilings are too high. They are suited to receive trofer-type lighting fixtures and the extra space made available above the ceiling simplifies the installation or repair of these concealed fixtures. In addition, overall lighting in the room is often improved by a lower ceiling with good light-reflecting properties. Suspended ceilings usually do a better sound-conditioning job because the absorbent surface of the material is brought closer to the source of sound. In many cases, they make heating systems more efficient by reducing the volume of the room.

Mechanical suspension methods in old construction are likely to be more expensive because of the extra time and material necessary for each job. In new construction, however, money may be saved by eliminating plastering and other finishing. For example, ducts are concealed by the suspended ceiling for appearance.

H-runner system

There are several good ways of suspending acoustical materials mechanically. One of the most economical is the H-runner system which is rapidly erected because the materials are attached directly to the supporting members. Acoustical materials must be kerfed and back-cut to fit in the runner.

cementing to suspended gypsum board

Sometimes it is desirable to suspend gypsum board as a cementing base for the acoustical material to be used. This provides a nonbreathing ceiling and additional fire resistance. In the case of suspended mineral wool materials, this is probably the most desirable system to use.

cementing to dropped plaster ceiling

The use of a dropped ceiling of brown-coat plaster and cement application of acoustical tile is approximately in the same cost range as the preceding system. This method provides a solid base, a nonbreathing ceiling, and an excellent fire stop, as well as reducing sound transmission.

metal pan suspension system

Generally speaking, the suspension of metal pan materials is more costly than other methods but it has practical advantages for many installations. Quite often it is the most efficient for acoustical sound

Combined acoustical baffles and luminous ceiling provide a high degree of hearing and seeing comfort in this conference room (above).

Photo: courtesy of F. W. Wakefield Brass Co.

reduction. This special system allows the units to be taken down individually and moved for remodeling, or for quick access to pipes, ducts, and wiring. Access doors can be eliminated in this type of construction.

acoustical baffles

In certain types of occupancies, particularly in areas containing light manufacturing operations, it is often very difficult to install the conventional type of acoustical materials. The use of acoustical baffles, suspended absorbers, or space absorbers, then becomes both economical and effective. The presence of pipes and other obstructions frequently found in rooms of light manufacturing operations would make it both difficult and expensive to install acoustical tile over the entire ceiling area. The suspended absorbers are attached by means of wires or clips. These attachments may be used at spot locations on the ceiling or to the pipes that may already be present. An important additional merit of suspended absorbers is the fact that they may be installed quickly and easily if only temporary occupancy is expected. Also, as they can be hung at any desired level, they can be located near the source of noise. Excessive air currents in a room may cause them to be set in motion unless they are well supported.

Since the sound waves reach both sides of the absorbers, the efficiency of these units is enhanced. Another type of acoustical baffle is available, combined with a fluorescent lighting fixture. It is used in commercial areas, however, and not normally in the manufacturing areas of the kind described above. The vertical ribs of sound absorption support a suspended ceiling of translucent, corrugated plastic material behind which fluorescent tubes are located.

miscellaneous products

There is a number of additional produ available. Most have limited sales, though they are adaptable for spec uses. Among these are products made pumice or similar granules which can molded into tile or special shapes. though these products may be cal ceramic, actually they should be pla in the category of mineral tile. Hair f particularly when mixed with asbes fibers for fire-retardant features, is u as a flexible duct lining and other s applications. Materials, such as gl fibers and rock wool products in both rigid and flexible types, are conventi ally used for both the inside and outs of air-conditioning ducts, to reduce noise that otherwise would exist in conditioning systems. All acoustical c ing tiles, however, are rigid in chara and normally come in the conventio 12″ x 12″ size.

SUMMATION

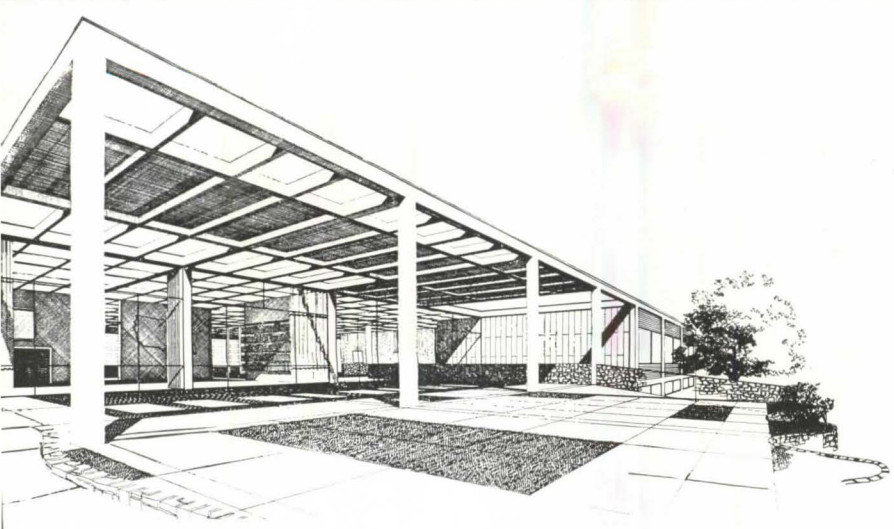
After receiving a description of the respective sound-conditioning products available—their size, efficiencies, appearance, etc.—the architect must then select one for his particular job. The factors which govern his decision depend largely upon the type of building designed and the amount of noise expected. For example, the acoustical materials to be selected for a school building should be based largely upon their efficiency, cost, and maintenance characteristics. The more efficient materials must be used in areas that contribute most to the noise problem of the school. Corridors, for example, can carry the noise throughout the building (especially into the adjacent classrooms) unless highly efficient acoustical materials are installed. Other noise centers include typewriter rooms, band rooms, music rooms, etc.; there, too, a material of greatest efficiency must be installed. On the other hand, a ½″- or ¾″-thick material can be used in classrooms where modest absorption is desired. Thus, by using more efficient materials in the classrooms, it will be easier to keep this part of the construction within the budget. In commercial buildings, the materials that provide the greatest efficiencies, best light reflection, and ease of maintenance should be specified for general offices and typewriter rooms; the more decorative materials are used for reception rooms, executive offices, conference rooms, etc.

The effect of various mounting systems on acoustical efficiency can be obtained from each manufacturer or from the Acoustical Materials Association. If a suspended ceiling is not required, it is usually more economical to install acoustical tiles directly against the ceiling surface. If suspension is desired, the architect can take advantage of the additional 5 percent in acoustical efficiency contributed by the air space.

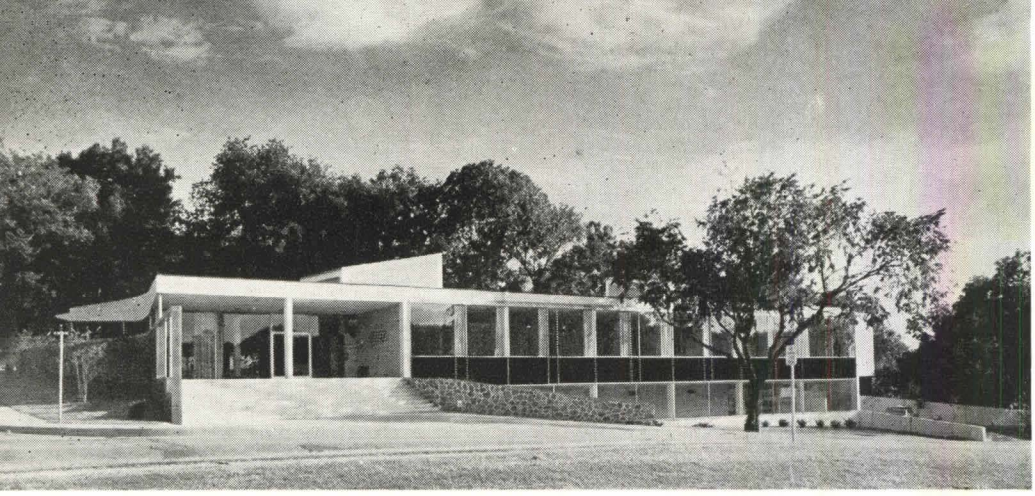
Acoustical tiles that are suitable for proper maintenance should always be considered. Materials that contain holes are usually the easiest to maintain over a period of years; all types of perforated tile (including perforated metal with baked-enamel finish) may be repainted repeatedly without affecting their acoustical efficiency. Where severe maintenance problems are anticipated, the situation should be discussed with the manufacturers of the respective products. Air-conditioning systems with inadequate filtering systems tend to increase acoustical ceiling maintenance problems; rooms where considerable smoking takes place must be cleaned and repainted more frequently than other types.

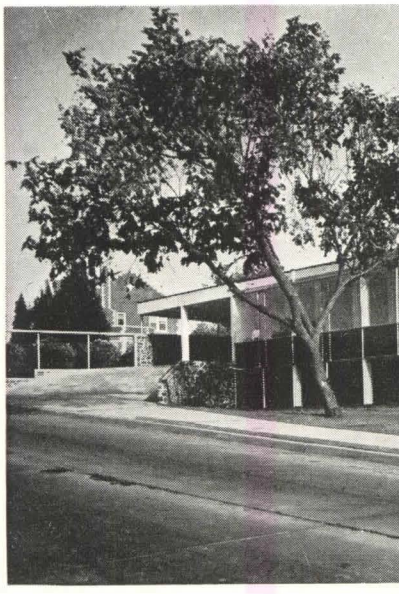
Acoustical tile reduces sound inten in a room by the absorption of refle noises. Since the ceiling constitutes greatest reflective surface of most roo it is conventional to place the acoust materials there and thus cover the gr est amount of what otherwise would reflective areas. In small rooms cont ing mechanical equipment, it is freque necessary to treat not only the ceiling also the side-wall areas; this condit exists because the ceiling may freque constitute only a small portion of entire room surface and also because noise intensity is so high. The pro amount of acoustical materials requ for commercial buildings can be com ed by assuming the maximum level noise that will be caused by both pe and equipment at specific locati Changing conditions of occupancy n also be contemplated for these spa Careful acoustical analyses, however, required for auditoriums, music roo and other places of public assembly a fixed number of seats and specific erating conditions. An architect who not gained sufficient experience to be own consultant in sound-conditio problems, must rely upon an acous engineer or competent acoustical sultant.

jaycee headquarters



Rare in this country is architecture that comes into being as a result of a national design competition. The headquarters building for the U. S. Junior Chamber of Commerce in Tulsa, Oklahoma, is not only one such instance, but encouraging proof that this approach can produce progressive work. Architects for the building were selected in a competition conducted in 1949 by P/A, with Jedd Stow Reisner as Professional Advisor, and Servel, Inc. and General Portland Cement Company as sponsors. The competition was limited to those between the ages of 21 and 35. Jury for the selection of the winning design (rendering, left) *were: Pietro Belluschi; Karl Fred Kamrath; Hugh Stubbins; J. Robert F. Swanson, and Robert Law Weed.* Photos: Hawks-Terrell, Inc.





jaycee headquarters

Location	Tulsa, Oklahoma
Competition Design Team	J. Edward Luders, Hideo Sasaki, James V. Edsall
Building Architects	J. Edward Luders and Harry A. Morris
Associated Architect	Donald H. Honn
Consultant Architect	Joseph H. Saunders
Landscape Architect	Hideo Sasaki
Furnishings Consultants	Honn-Nordling
Structural Engineer	J. W. Johnson
Electrical Engineer	D. T. Mason
Mechanical Engineer	P. G. Dunbar
General Contractor	H. R. Lohmann, Company

The program called for a fireproof, air-conditioned building to serve as the national headquarters for the U. S. Junior Chamber of Commerce and also as a memorial to World War II Jaycee heroes. Major requirements were a memorial lobby; offices for the president and administrative staff; offices for the compiling, editing, and distribution of the organization's voluminous printed matter; business offices; file and storage rooms; work space for the efficient handling of purchases and supplies; receiving, addressing, and mailing rooms.

The site is a rectangular corner lot, with a depth of 140 feet and a 200-foot frontage (to the north) overlooking a park and the city skyline. Fine trees on the south and west, with an irregular slope from southeast to northwest.

The two-level plan solution consists of an interior core of storage, utility, and toilet rooms, with the perimeter allocated to offices and work spaces. On the upper level, the memorial lobby occupies the entire east end of the building, with the main entrance on the north and doors out to a landscaped terrace at the rear. At some later date, a penthouse floor with a series of lively free-form roofs will be added to house the president's office, a conference room, lounge, etc. The building is of reinforced-concrete construction with portions of exterior walls of brick, stone, or structural glass; a grout of Trinity White Cement surfaces all exposed concrete. Interior walls are either plaster, or prefabricated, flush-metal partitioning. Floors are surfaced with asphalt tile or terrazzo, and acoustic tile is used on ceilings. The fixed plate-glass window areas have spandrels of structural glass.

The building is year-round air conditioned with a system using equipment manufactured by Servel, Inc. Because of the large sealed window areas, and wide variations in solar load, a zoned system was adopted to provide accurate temperature control of individual areas. Five zones, located in different parts of the building, are operated as individual units and have their separate air-distribution systems. Thus, on an Indian Summer day in fall, if the sun's heat on the south wall is strong while it is cool on the north, the system serving the south zone can cool while the one serving the north zone heats, kee the entire building within a one-half de plus or minus variance.

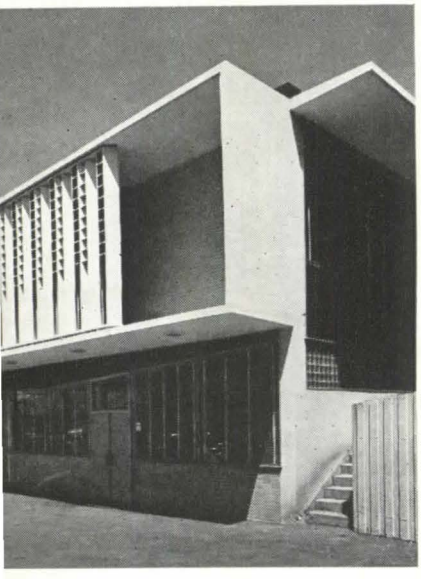
Control of natural lighting includ deep structural sunshade on the sout freestanding louver in the projecting f on the west face, and the stone wal the east. Both incandescent and fluores fixtures are used for artificial lighting

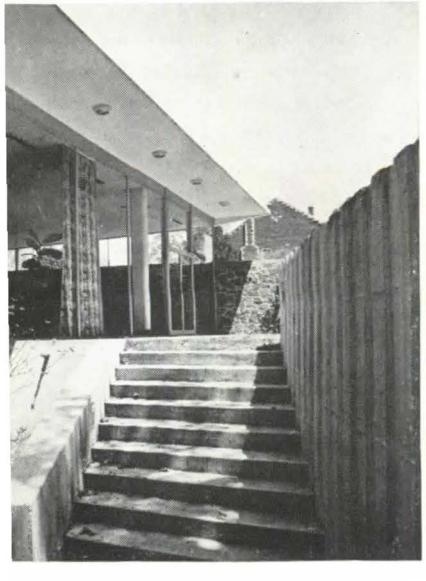
We asked the members of the ori design-competition jury and Jedd Rei the Professional Advisor, for their ments on the actual building. Excerp

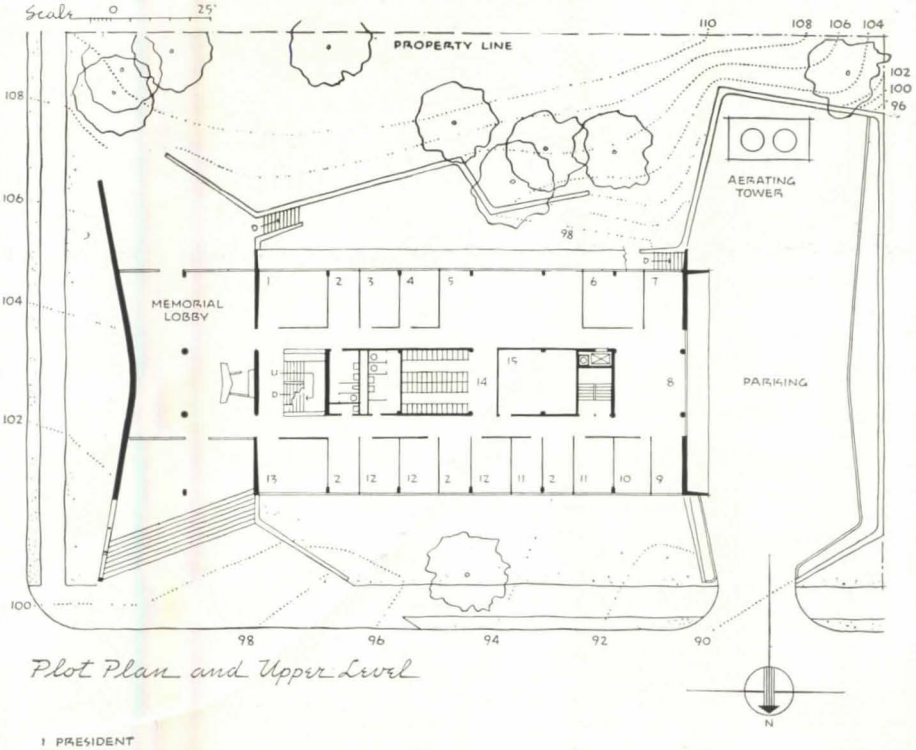
Belluschi: "The plan as carried seems to have the fine qualities of fit economy and efficiency for which the inal design earned the prize . . . As a morial, it is no better than expected, w may not be quite enough. As a fini piece of architecture, I cannot help l somewhat disappointed by its detailing execution and by certain tricky feat nevertheless, it is a distinguished pie architecture, which may contribute to the country's general standards."

Kamrath: "A good simple plan solu logical in arrangement. As I recall, better than the original competitio

present roof penthouses will soon be joined with a temporary enclosure, which later (when funds allow) will become part of manent rooftop executive suite. Exterior color is limited to black ural glass spandrels, white concrete, aluminum-sash members, ed-brown sandstone.

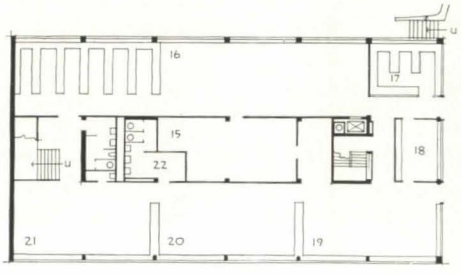




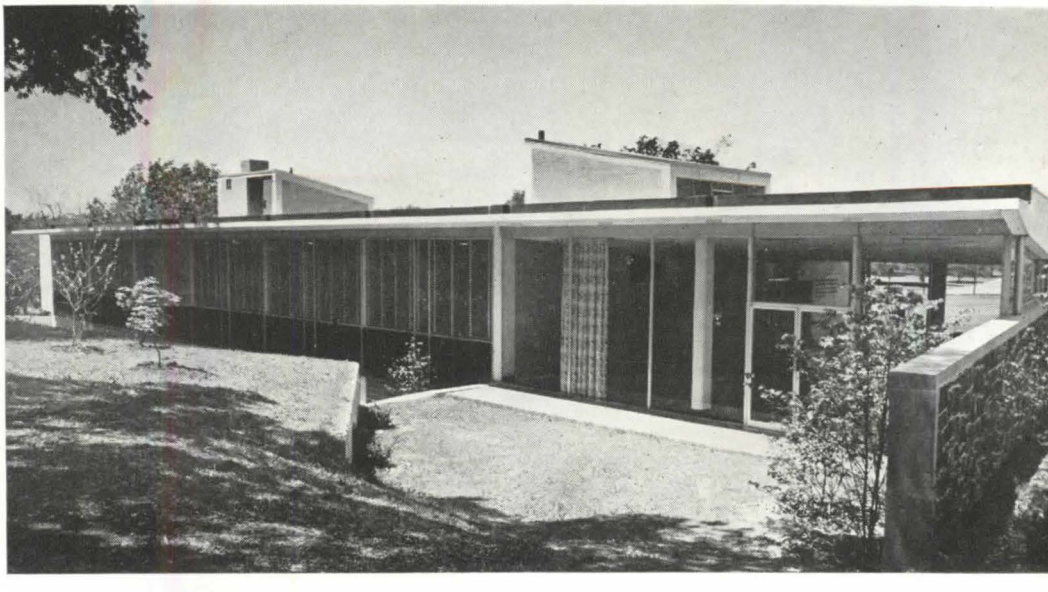


Plot Plan and Upper Level

1 PRESIDENT
2 SECRETARY
3 PURCHASING AGENT
4 CHIEF ACCOUNTANT
5 ACCOUNTING
6 MANAGING EDITOR
7 ASSISTANT EDITOR
8 EDITORIAL STAFF
9 STAFF ARTIST
10 EDITOR
11 FIELD SECRETARY
12 DEPARTMENT HEAD
13 EXEC. VICE PRESIDENT
14 CENTRAL FILES
15 AIR CONDITIONING
16 STORAGE
17 SHIPPING-RECEIVING
18 PRODUCTION CHIEF
19 MAILING ROOM
20 MAILING LIST ROOM
21 PRINTING
22 WOMEN'S LOUNGE



Lower Level



jaycee headquart

sign." As to War Memorial quality—"
tionable, but as good as one would ex
from 'shoebox' architecture." Regar
the final design, as compared with the
inal, "I do not care for the architec
character of either."

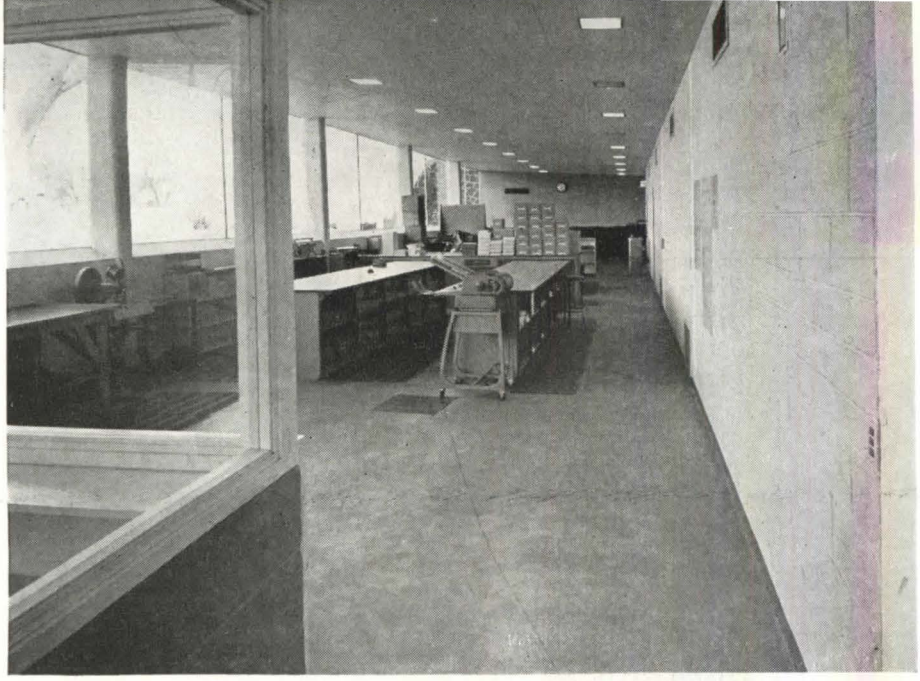
Stubbins: "The plan seems orderly
efficient in the office and work section
the *memorial lobby* and entrances
somewhat a disappointment . . . It is t
and does not have the strength and
plicity that a design must have to
lasting quality . . . However, it is
esting for me to see a building exe
that was awarded on the basis of a nat
competition."

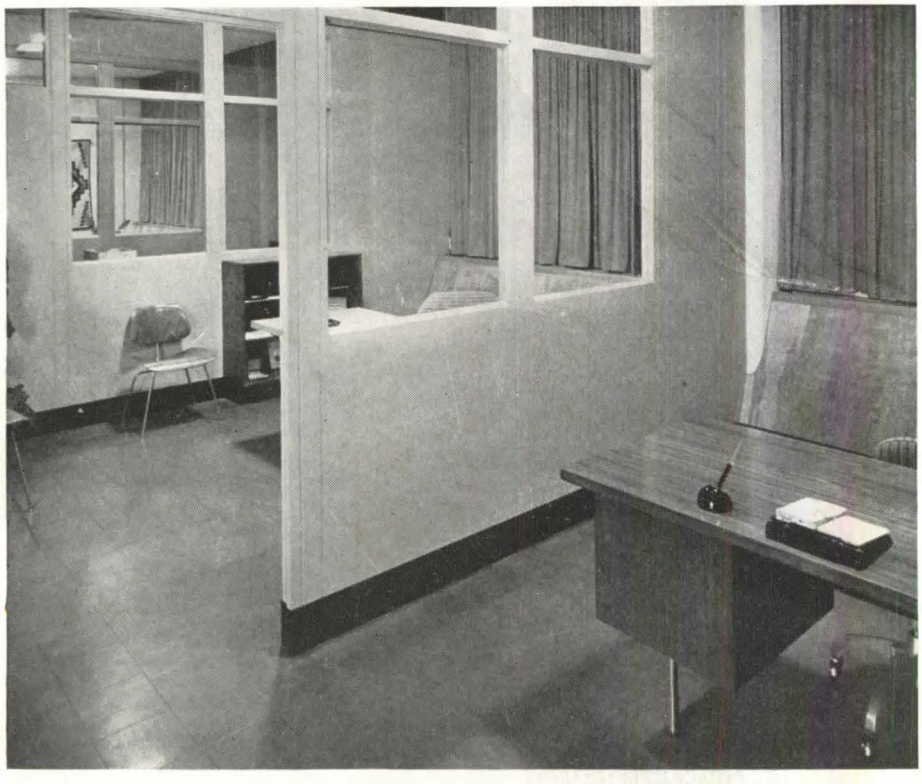
Weed: "I feel that the plan solutio
good one and the accommodation t
sloping site well handled. I think the
has the basis of a good memorial are

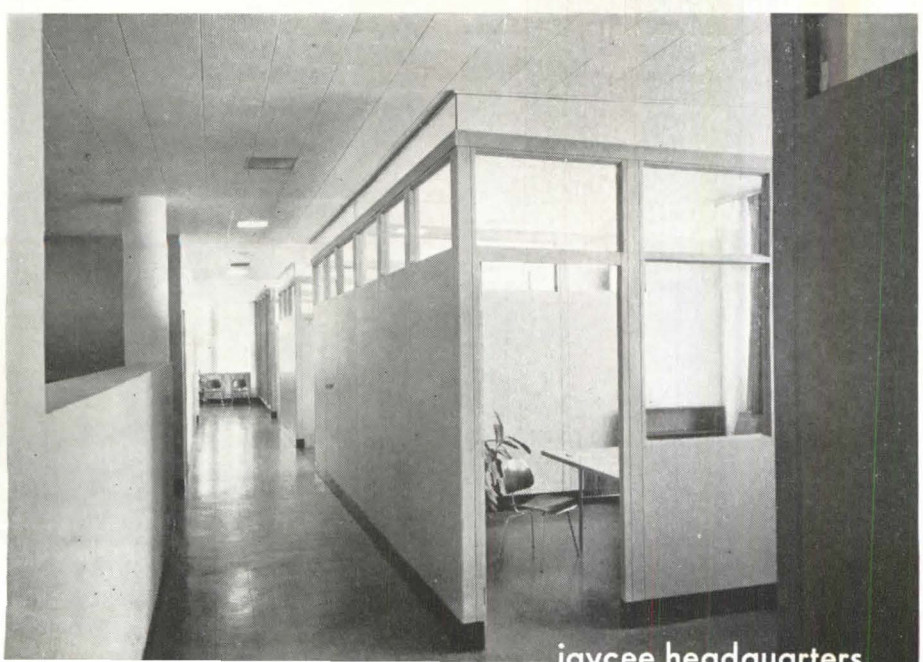
e memorial lobby (acrosspage, top) *the zo floor is dark blue; the editorial suite* sspage, bottom) *is protected from western y an exterior louver device. The main ial office* (right, above) *is at the north- corner of the upper floor. Panels of glass separate stair hall* (right) *and lor.*

a certain follow-through in detail and hing . . . The 'nubs' at the eave line e north elevation bother me. All in think it is a swell little building even h it misses in detail and therefore some of the cleanness I anticipated."

sner: "My reaction is generally fav- e; the building is in good scale, well ged, and has a restrained monumen- . . . It is compactly arranged with a l service core that makes the most f storage and mechanical space with interference with office space." On oint of memorial character, "I feel uilding does well by itself . . . It man- memorial atmosphere without shout- out it." Compared with the original etition design, "I would say that it as good in plan or elevation . . . but certain that the Jaycees have a build- which they may be proud and which mprove with time . . . I am proud to been connected with this work."







jaycee headquarters

construction

Foundation, frame, floors, roof: reinforced
crete: reintorcing steel—Sheffield Steel C
ration; cement—Ashgrove Cement Com
Dewey Portland Cement Company. **Wall
facing:** exterior: exposed concrete sur
grouted with Trinity white cement—Ge
Portland Cement Company; stone—Cart
Marble Corporation; structural glass—Li
Owens-Ford Glass Company; brick; int
including rest rooms, toilets: plaster—Ce
teed Products Corporation; ceramic tile—
bridge Tile Manufacturing Company; as
tile—Flintkote Company, Tile-Tex Div
Floor surfacing: asphalt tile, terrazzo—
bridge Tile Manufacturing Company. **C
surfacing:** acoustical tile—Armstrong
Company. **Roof surfacing:** 20-year tar
gravel, membrane waterproofing—Allied C
ical & Dye Corporation, Barrett Division.
lation: thermal: 2" glass fiber, semi-rigid
rial—Gustin-Bacon Manufacturing Com
Roof drains: cast iron drains—Josam Ma
turing Company. **Partitions:** 3" flush m
Mills Company; flush metal toilet partiti
Sanymetal Products Company, Incorpo
Windows: plate and structural glass—Li
Owens-Ford Glass Company. **Doors:**
metal interior—World Steel Products Co
tion; narrow-stile aluminum entrance—Ka
Company. **Hardware:** push plates, pulls
troit Hardware Manufacturing Company,
ray R. Womble Company; roller lato
Glynn-Johnson Corp.; locksets—Sarge
Company; hydraulic door closers—
Closers, Inc.; hinges—The Stanley Works.

equipment

Lighting fixtures: flush-mounted, square
round incandescent units in office and
ceiling areas—Kirlin Company. **Electric
tribution:** service entrance switch, panelb
multibreaker—Frank Adam Electric Com
floor duct—Walker Duct Company; cable
duit—Triangle Conduit & Cable Com
wiring devices—General Electric Com
Plumbing and sanitation: syphon-jet
closets, tubs and lavatories, water heater
cealed flush valves—Crane Company;
rubber toilet seats—C. F. Church Manuf
ing Company. **Heating:** forced-air, s
operated unit—Servel, Incorporated; bo
American Radiator & Standard Sanitary
poration; controls — Minneapolis-Hon
Regulator Company. **Furnishings:** walnut
beige Micarta tops, and walnut storage
bittersweet fronts; benches, chairs, etc—
man Miller Furniture Co.; executive ch
Knoll Associates, Inc.; lobby drapery—
Adler.

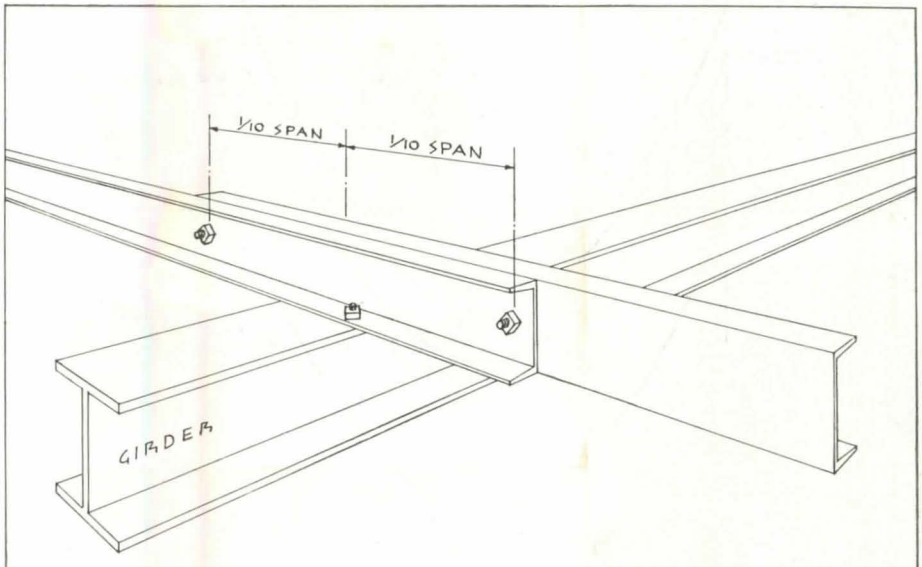
In the northeast corner of the lower level is the efficient mailing and printing room (top). *Private offices* (two lower photos) *line the north wall of the upper floor. Color schemes upstairs are built around yellow, silver-gray, blue, and white; downstairs, Swedish yellow and blue are used. Washrooms are painted in varying schemes, including apple green, tangerine-pumpkin, and blue-gray.*

eel design economy

by Julian Smariga*

conservation practices are a must r in building design today. The high dards of design currently used make y efficient application of structural ma-l, therefore a great reduction in the weight of steel-framed buildings is generally possible. However, an appre-le saving in some elements of framing be achieved by certain design and con-tion techniques which have proven omically feasible.

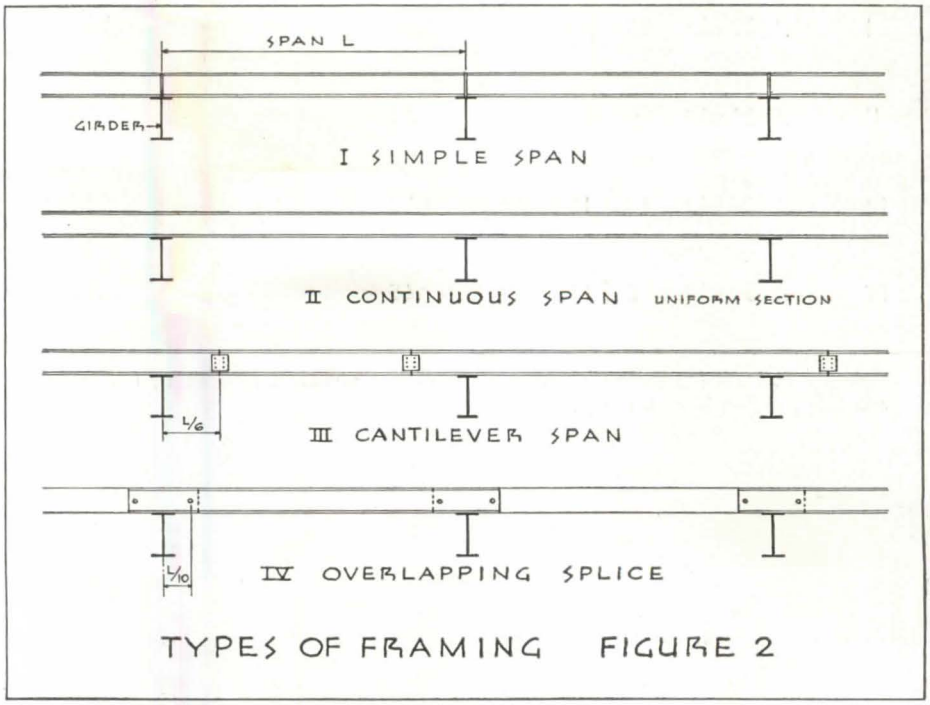
ntinuity of framing presents one of greatest opportunities for using steel tively. Complete continuity is readily eved by welding. This method is widely in those areas of the country blessed progressive building teams. A modi-form of continuity (described as can-er steel construction) is economically ble without welding, as demonstrated veral examples.[1] Another way of de-ping controlled continuity without ing, known as the overlapping-splice od, is illustrated (*Figure 1*). This od achieves substantial weight savings ut a corresponding increase in fabri-n or erection costs, and has been used e roof construction of several building .[2]



DETAIL OF OVERLAPPING SPLICE FIGURE 1

erlapping-splice construction

web splice connection of the overlap-splice method of construction (*Figure ws a typical detail*) should be de-d for a shear force of 0.425 wL. For ge conditions, this connection will ally require only one or two bolts; for al spans and heavier loading condi-rivet bolts may be used to reduce the er of connecting units required. The rtions of the overlap indicated are ed for uniform loading conditions therefore, are generally applicable or roof construction. Isolated condi-of concentrated loading could be care of by strengthening the indi-

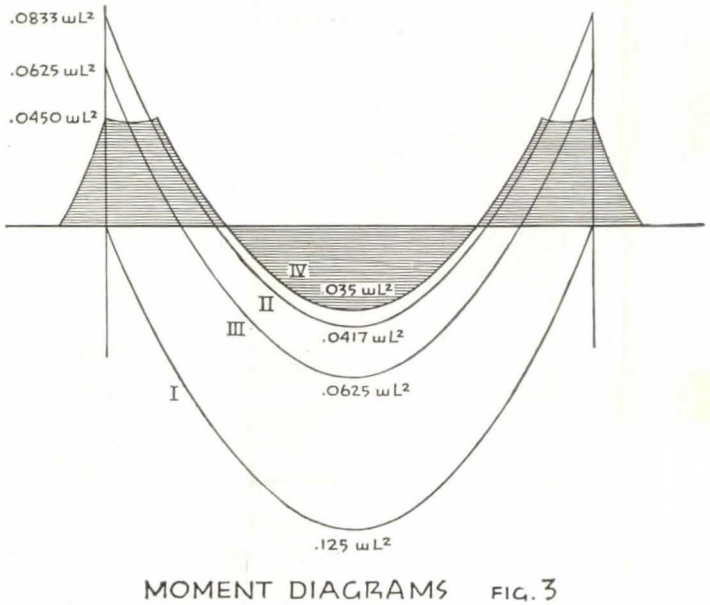


TYPES OF FRAMING FIGURE 2

ral Engineer, Division of Hospital Facilities, Health Service.

ruction Techniques That Conserve Steel," by Allwork. November 1951 P/A.

d Rigid Frame Structures," by A. Amirikian. 1940 The Welding Journal.



MOMENT DIAGRAMS FIG. 3

Type of framing	Design moment	Comparative section required*	Relative weight factor excluding connections	Maximum deflection	Relative deflection factor
I	.1250 wL²	10 WF 21	1.00	$\frac{5\ wL^4}{384\ EI}$	1.00
II	.0833 wL²	8 WF 17	.81	$\frac{wL^4}{384\ EI}$	.38
III	.0625 wL²	10 [15.3	.73	$\frac{wL^4}{192\ EI}$	.64
IV	.0450 wL²	8 [11.5	.65	$\frac{wL^4}{542\ EI}$	.47

* Assume that the net section modulus at the critical section is reduced by having one hole punched in each flange.

vidual members involved. It should b noted that fabrication and erection proce ures are simplified by the elimination splice plates and angles.

comparative study

Several commonly used design scheme were selected for comparative study (*Fi ure 2*). The stress pattern for unifor loading in each scheme is shown (*Figu 3*), where the relative stress economy clearly evident. It is believed that the ove lapping-splice detail provides the best po sible balance in positive and negative m ments for rolled structural-steel membe

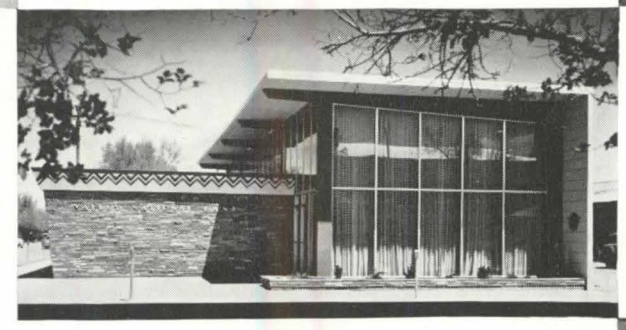
A comparative study of the performan of each design scheme was made and t results tabulated (*left*). An examinati of the sections, weights, and deflections w show that the theoretical advantage of d sign moments for the overlapping spli is reflected in an appreciable weight savi without penalizing the deflection charact istics.

The technique of overlapping is es cially suited to purlin or girt sections su porting a surface subjected principally uniformly distributed loads, such as r or large wall areas. For main frames a supporting girders, individual design a proportioning is desirable to distribu the required material in an efficient m ner.

The comparative summary does not clude fabricated joist members, since c siderations other than weight economy m enter into the decision to use steel jo construction. However, in comparing t relative weights of steel-joist constructi verses overlapping-splice construction, t span length appears to be the controlli feature. It seems that for spans up to ab 22 feet, rolled steel with an overlappi splice detail is more economical in wei of material than bar joists, while for sp over 22 feet long, bar-joist construction be lighter.

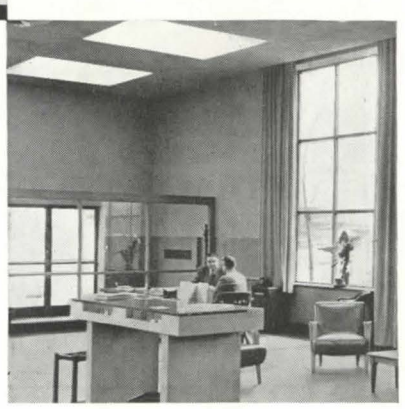
Cleveland, Ohio

Phoenix, Arizona



Winslow, Arizona

Providence, Rhode Island



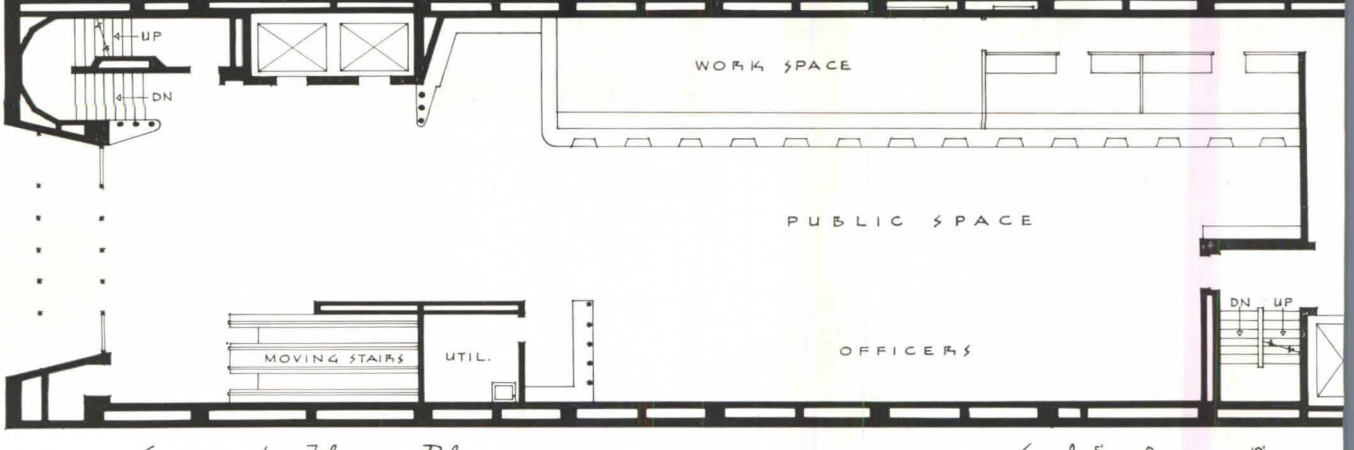
bank planning

Where formerly temples of finance catered only to the chosen few with large sums of money, oday banks all over the country conduct lively campaigns to lure anyone with a dollar unpent. Indicative of this trend are such relatively new services as Christmas Clubs, and the special" checking accounts with no minimum balance required. One finds, too, that big-city anks are building more and more branches in the suburbs, quite literally bringing banking ervices "close to home." With the greatly increased patronage that this implies, the approach bank design has altered radically.

In planning to simplify and expedite the new customers' use of the bank's facilities, llers' windows are almost invariably grouped together so that there is a minimum of conision for the customers. The formidable cages and grilles have all but vanished, so that cusomer and banker now meet on common ground. Even the creature comfort of those who bank as become a matter of concern, and more and more banks—all those shown in this study, for xample—have summer cooling systems as well as winter heating.

What of the architectural form that has been developed to express these broadened nctions? More and more banks have opened their façades, as well as their doors, in a welming gesture. Inside, in place of the impressiveness of a palatial hall or the aura of a ligious sanctuary, a light and airy room is found, one that is pleasant rather than challenging enter. And with construction of branch banks in residential areas, the scale of design tends become more intimate—less intimidating.

Cleveland, Oh

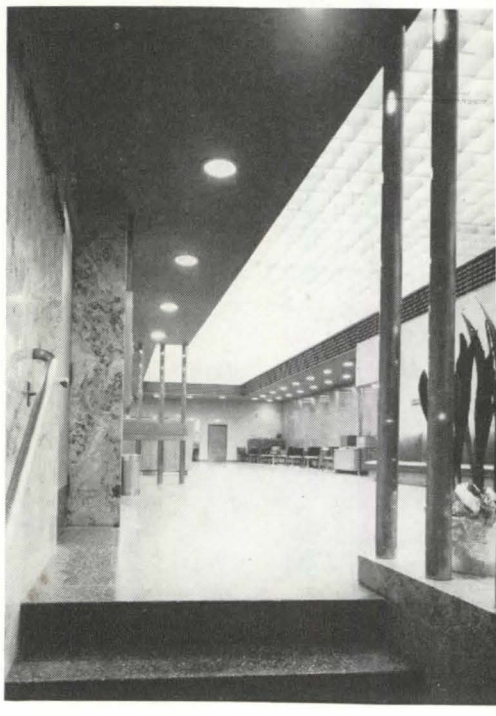


The bank occupies the basement, ground, and second floors of this new six-level structure. Admittedly less efficient than a layout on a single floor, the three-level solution was dictated by the limits of the building site—41 feet wide and 130 feet deep. The safe-deposit department—vaults, lobby, coupon booths, and conference room—is located in the basement. On the ground floor is the savings department (where most customers make but a single transaction; hence, turnover is fast), facilities for opening accounts, paying loans and utility bills, and a travel service. The second floor, practically identical with the ground floor, except for an officers' platform at front of the floor, is the commercial banking floor, including checking and loan facilities, offices, and conference rooms. The building is served by two passenger elevators at the front and one combination passenger-freight elevator at the rear, addition to electric stairways joining the ground and second floors.

Because of a familiar Cleveland soil condition—water-bearing sand from —5 feet to —221 feet—the foundations were designed with support on floating footing pads. Frame is structural steel, with brick curtain walls and a cellular-steel floor system, which also is used for electrical distribution. The front of the building is surfaced with a one-inch veneer of Swedish "Imperial Red" polished granite, with frames, lettering, and spandrel areas in stainless steel. Interior walls are surfaced with oak paneling, marble, or painted plaster.

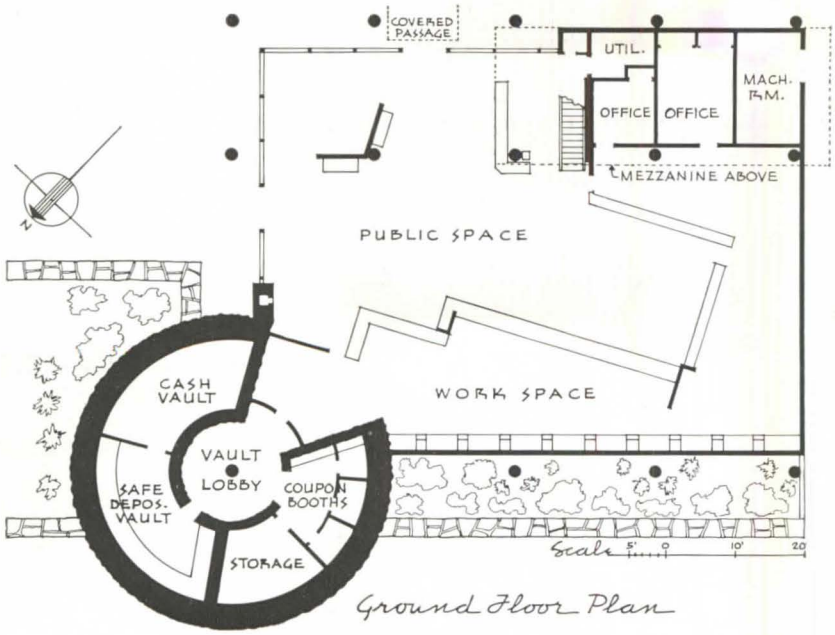
Floors in public spaces are dark-gray-green terrazzo, with aluminum screeds; asphalt tile in offices. Complete air conditioning includes cleaning, heating, cooling, humidifying, and dehumidifying, with individual controls for each floor; all glazing is heat-absorbing plate glass.

Architects	Conrad, Hays, Simpson & Ruth
Designed by	J. Byers Hays
Structural Engineer	John F. Fierbaugh
Mechanical Engineer	Vincent Eaton
General Contractor	Hunkin-Conkey Construction Company



On both the second floor (top) *and ground floor* (left, and immediately above) *lighting is handled with a combination of fluorescent and incandescent lamps with over-all ceiling light consisting of fluorescent tubes spaced 2 feet on centers, above an aluminum eggcrate. This, plus recessed spotlights above officers' desks and tellers' counters, produces 50 foot-candles at desk-top heights.* *(See page 139 for* SELECTED DETAIL, *teller's counter.)*

Photos: R. Marvin Wilson



Ground Floor Plan

Phoenix, Arizona

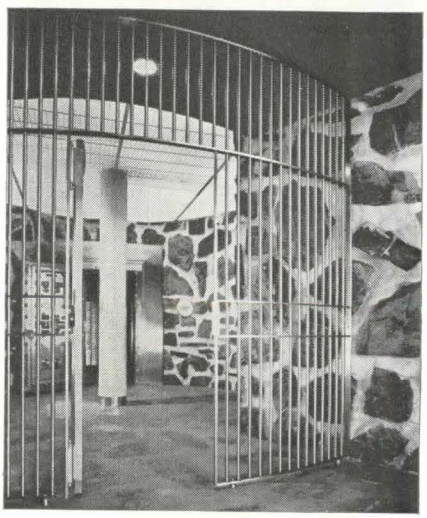
A highly original expression of bank function is perhaps the highlight of this remarkable bank which, according to the architects, was designed "to produce a building with a character of financial security and informal reception for men accustomed to big thinking and rugged outdoor activity." Built in the heart of a cattle-raising area, it makes a bold design statement of the two basic functions of a bank—the safekeeping of money and records, and the conduct of business transactions.

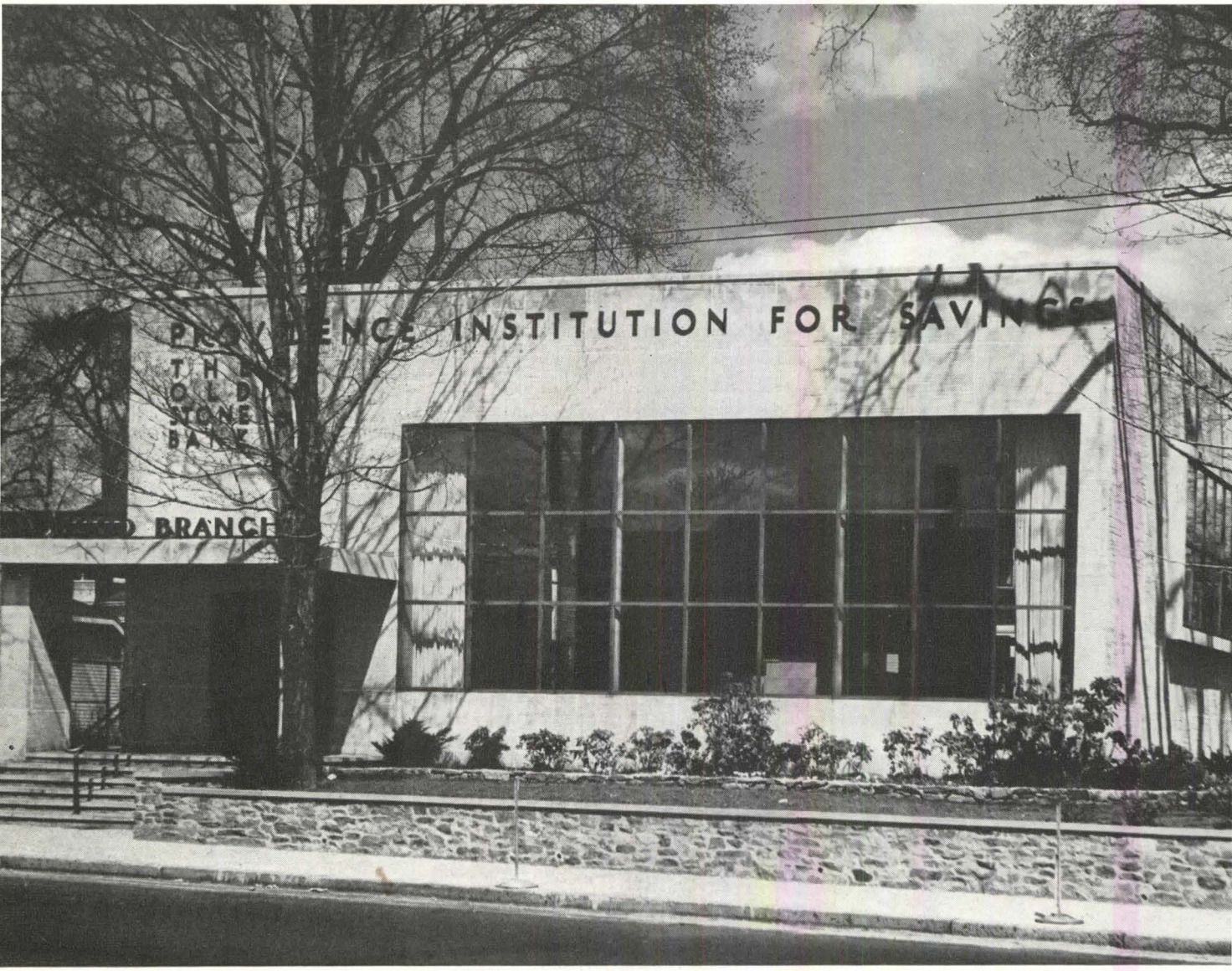
The reinforced-concrete circular vault, with a rugged veneer of native stone, projects through the north corner of the many-windowed, high-ceilinged banking room, the openness of which provides a sweeping panorama of herds, desert, and mountains. Random-laid stone is used for flooring, while counters and other wood furnishings are rough-sawn wood. Brand marks are used for wall decoration. The ceiling is finished with acoustic plaster. To shield the bank from the intense afternoon sun, louvers are used outside the glass of the northwest wall. A small mezzanine at the southeast corner accommodates offices, a conference room, and rest rooms.

Built on reinforced-concrete foundations, a modular steel and concrete framing system is employed that, in conjunction with exterior walls of demountable crenellated steel decking, allows for future expansion with minimum basic change. The concrete roof, supported on bar joists, is surfaced with built-up gravel. Plate-glass windows are fixed in aluminum frames. The completely air-conditioned building has a forced-air heating system serviced from a gas-fired furnace.

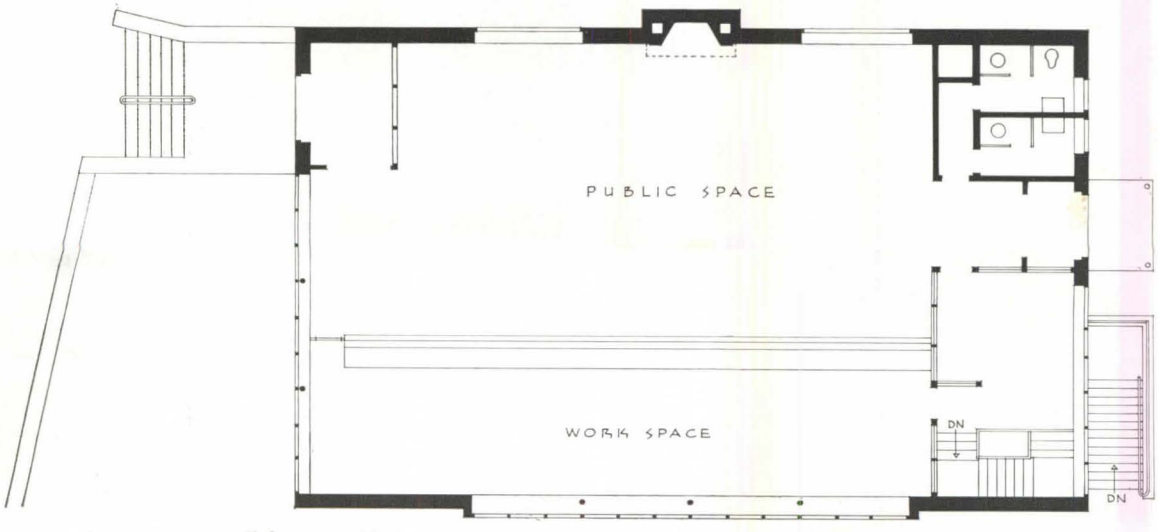
Architects & Engineers	Pereira & Luckman
General Contractor	Perry Brignell Construction Company

The steps leading up to the mezzanine (right) *are of solid Douglas fir. An eggcrate ceiling lights the circular masonry vault* (right, below). *The ceiling of the banking room is painted green; otherwise, color derives from the subtle tones of natural materials.* Photos: Julius Shulman





Providence, Rhode Island



Ground Floor Plan

Scale 5' 0 10' 20'

Architects	Office of Harkness & Geddes*
Heating Engineer	Christopher D. Potter
ectrical Engineer	Thompson Engineering Company
Landscaping	James D. Graham
neral Contractor	Frank N. Gustafson & Sons, Inc.

lbert Harkness; Peter Geddes; Donald S. Reed; Randolph E. Anderson

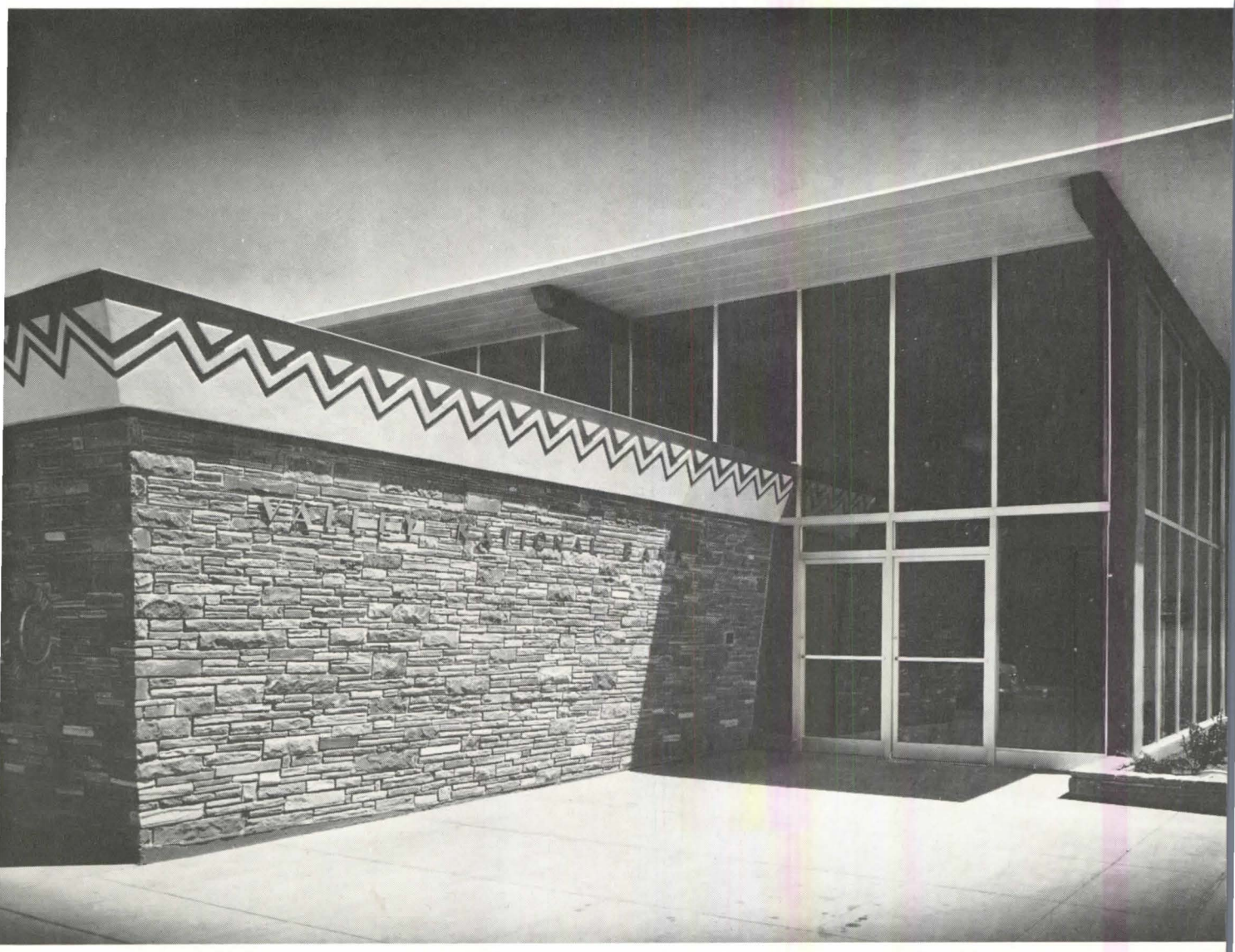
A continuing trend is establishment of branch banks in residential districts, away from downtown confusion. This particular branch was built on the site of the oldest house in the neighborhood. Hence, the carefully preserved fine trees and adoption of a design scale that does no offense to a residential environment. Carrying even further this bow to the domestic surround is the open fireplace that is kept burning through the winter.

Framed with concrete-filled steel columns and steel lintels, the bank has a floor of concrete-joist construction with removable pan forms; embedded in this floor is wrought-iron piping for a forced hot-water radiant-heating system; the floor surface is terrazzo. Exterior walls of 4-inch shot-sawed limestone are backed by 8-inch brick walls. The roof uses long-span open-rib steel joists with precast-concrete slabs. The hung ceiling has a float finish of vermiculite plaster.

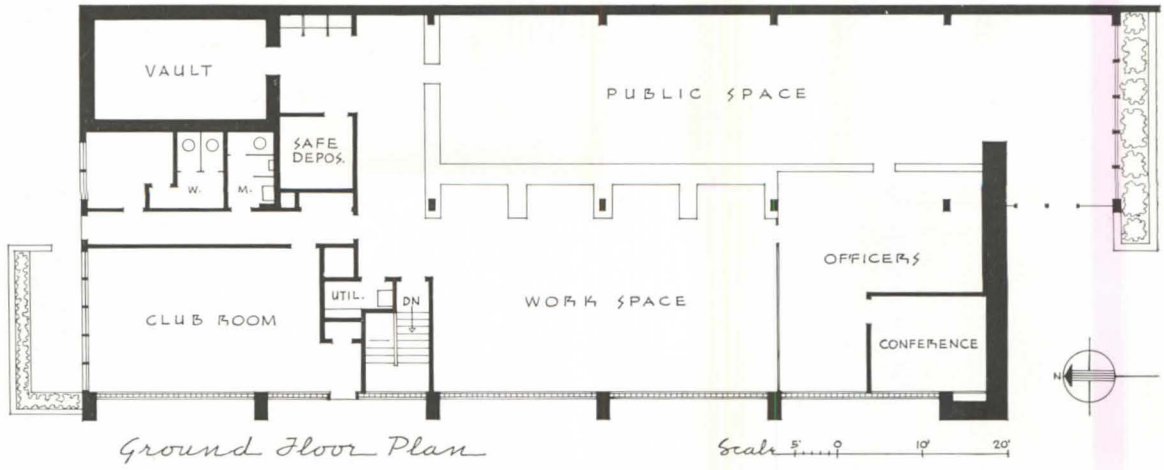
The radiant-heating system is supplemented by cast-iron radiators in vestibules, toilets, and basement lounge rooms, the entire system being served by on oil-fired boiler. There is also a summer air-conditioning system. Sash are bronze or steel, with double insulating glazing.

For ease of snow removal, the sidewalks, entrance steps, and platform are equipped with radiant-heating coils. The large windows provide excellent daylighting for the bank, with summer sun tempered by tree foliage and light glass curtains. Artificial lighting in the banking area is provided by 6-foot square fluorescent ceiling panels, with metal-eggcrate grilles; teller counters have individual, 24-inch fluorescent lamps.

Photos: Laurence E. Tilley



Winslow, Arizona



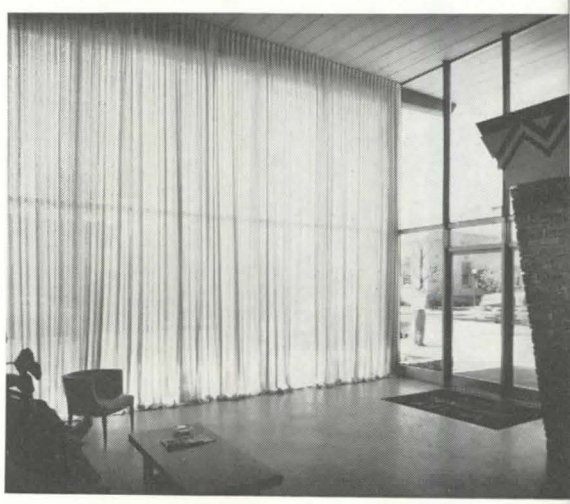
cated in northern Arizona, in a town at edge of the Navajo-Hopi Indian Reservation, this branch bank serves both the n's year-round residents and a lively rist business. While the basic consideron was to design a thoroughly modern nking establishment, the client specifily requested that the building in some nner echo the environment. This requirement was met in such choices as use native sandstone in color range from ht buff to dark earth-red, and familiar ian motifs for decorative emphasis.

The architect wished to have the fined design express the structure. Hence exposed rigid concrete frames at 20-t intervals, and the lightweight precast crete plank for roof decking. The ire east wall of the public space is sured with turquoise-blue tile with a texed face. Against this wall are mounted four half-relief Hopi dancer groups symbolizing the four seasons. The work of Phillips Sanderson, these sculptures are in polychromed Spanish cedar. The club room, with separate street entrance, is used for meetings of civic groups. In the basement are storage rooms, mechanical equipment, and employes' lounge.

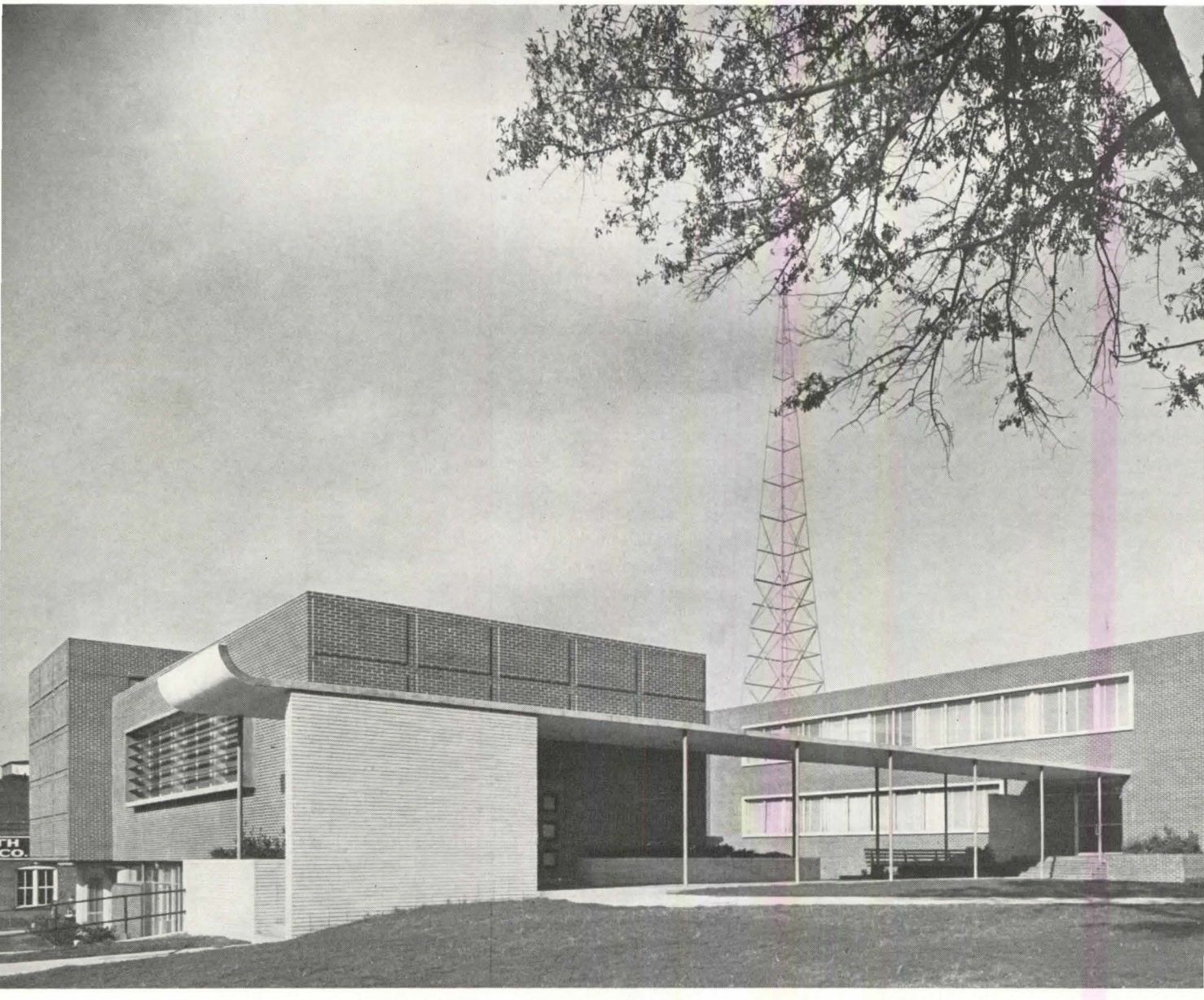
The floor of the public space is terrazzo; elsewhere, flooring is rubber tile. Low ceilings are surfaced with acoustic tile. Directional glass block is used on the west wall of the work space, with heat-absorbing glass in the clerestory above. Due to the extension of the canopy above the counter, direct sunlight strikes the east wall above head height. Heating is a combination of copper radiant floor coils with tempered air delivered through duct space in the canopy, that also distributes cool air from air washers in summer.

Photos: Julius Shulman

Architects & Engineers	Edward L. Varney-Associates
General Contractor	Daum-Donaldson Construction Company



courthouse



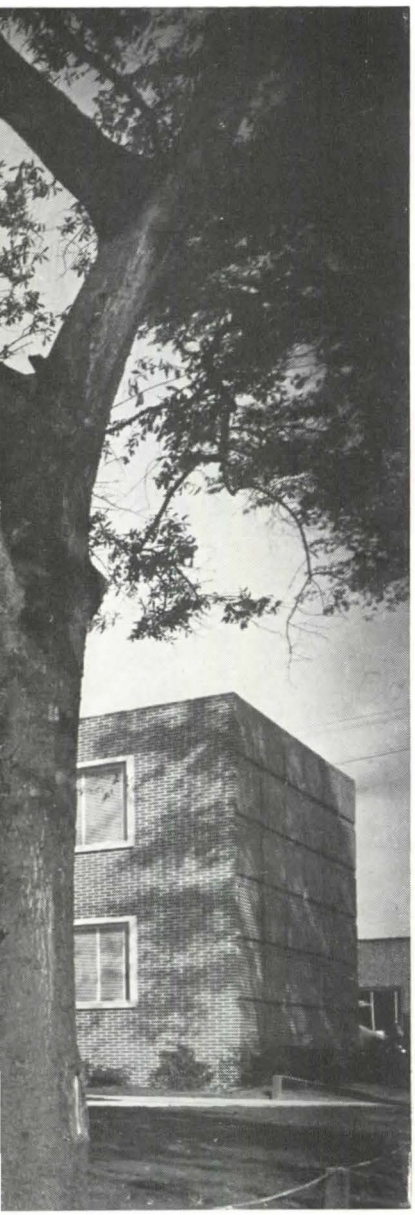
Location	Cordele, Georgia
Architect	Bernard A. Webb, Jr.
Engineers	Cherokee Engineering Company
Heating and Air Conditioning	Harry Torch
General Contractor	S. J. Curry Company

The architect had a most remarkable client, in the Building Committee for the County Commissioners. Not only did the committee expressly state it did *not* want a monument to itself (one special request was that the building *not* have a tower and a clock), but the architect was asked to write his own program, so long as the result would be a courthouse and up-to-date office building, "with emphasis on economy and the housing of the County's working needs so that the functions of a modern and progressive community would be carried on efficiently."

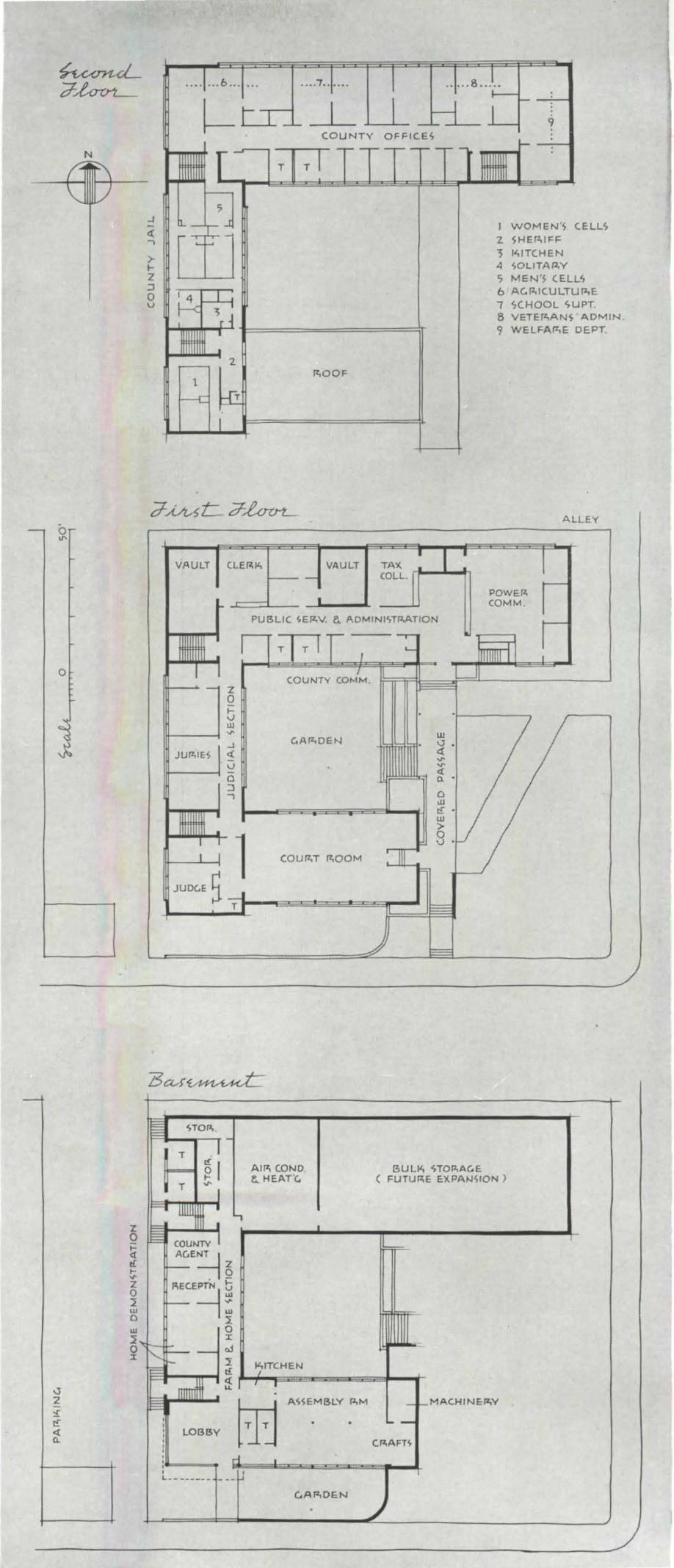
Throwing out all preconceived ideas of government-building design, the architect conducted exhaustive interviews with all the personnel who would use the building —from judges to janitors—to determine actual working needs. As a result, the new building contains 31,514 square feet of space, whereas the old quarters it replaced had a wasteful 60,000.

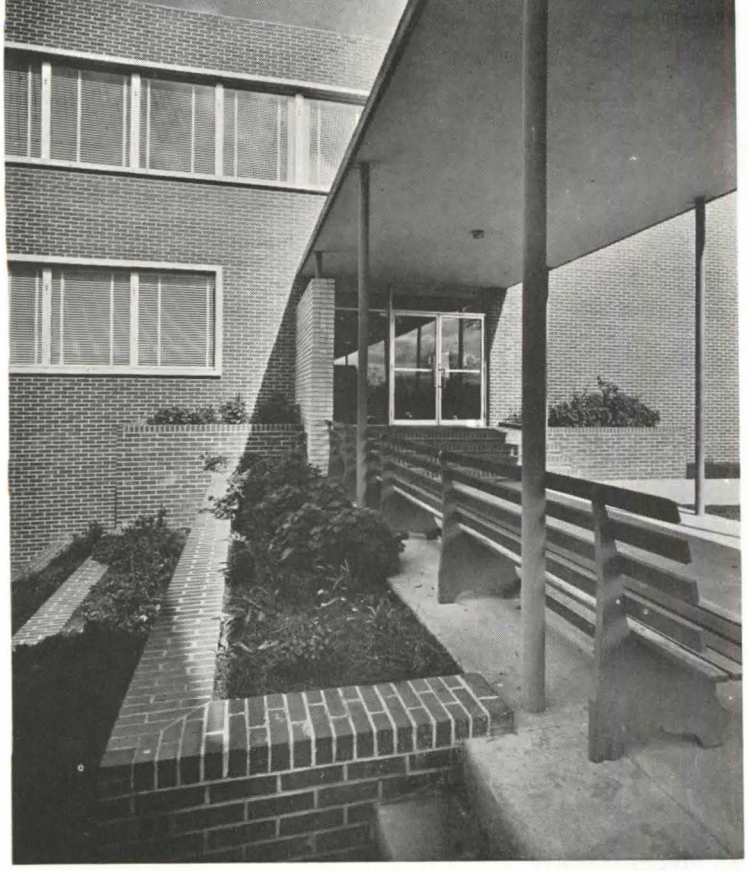
The site has a slope of 10 feet from f to back, a situation that was capital to provide a secondary entrance for Home Demonstration offices at the l level. To avoid a ground-water cond near the center of the site, the plan developed in a U-shape.

Since Crisp County owns its own p supply, it was decided to employ a pump installation for complete sum and-winter air conditioning. Alth



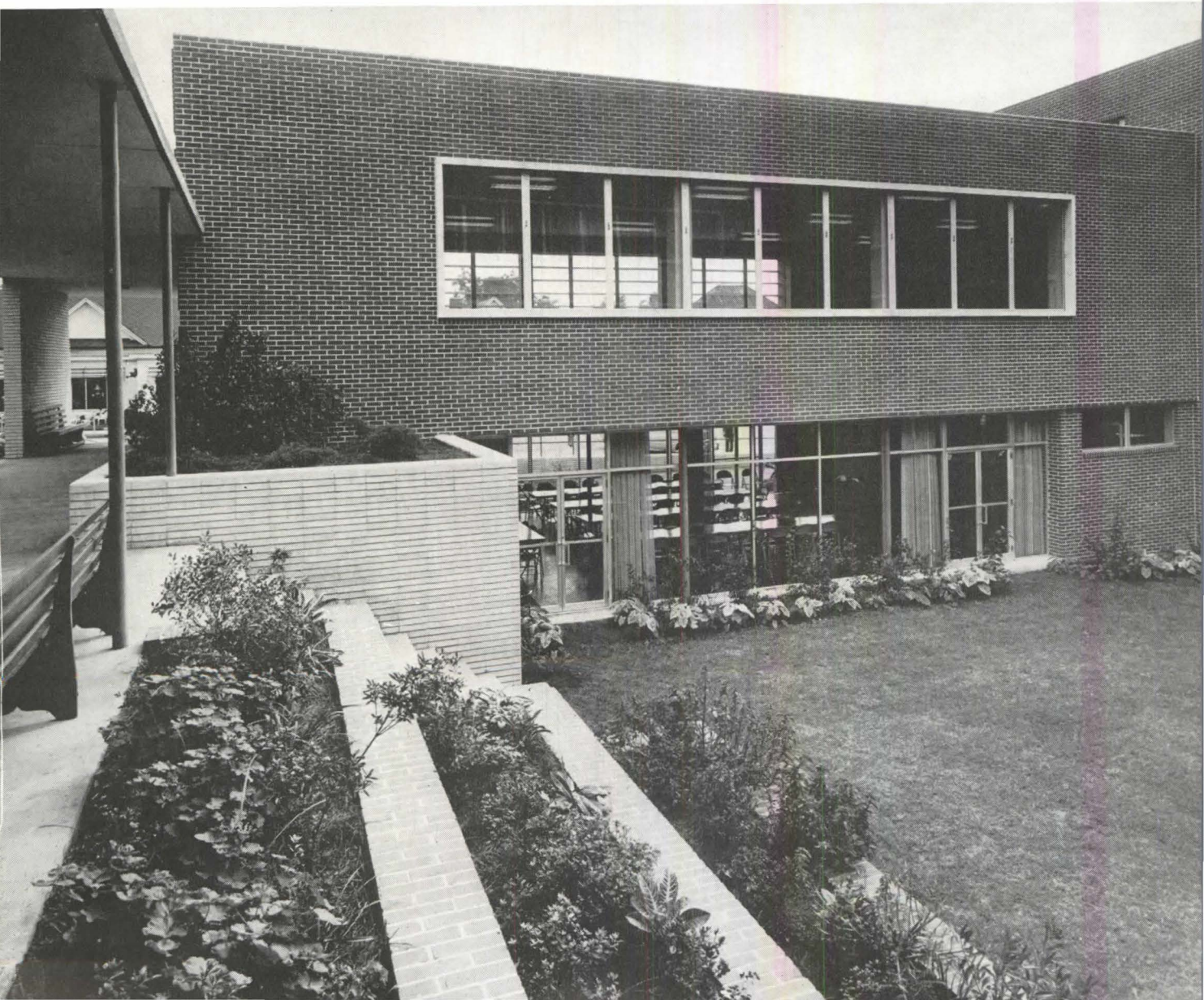
ıer in initial cost than more conven-
al systems, it proved actually to be an
ıomy, since fixed glass was used
ughout, boiler-room space was saved,
no smoke stack was needed. It also
wed use of thinner floor-slab construc-
and resulted in a per diem heat-cost
ng of $5 compared to coal ($10 to $12
pared to butane or propane gas). Not
least remarkable by-product of this in-
ation was a fully air-conditioned jail!



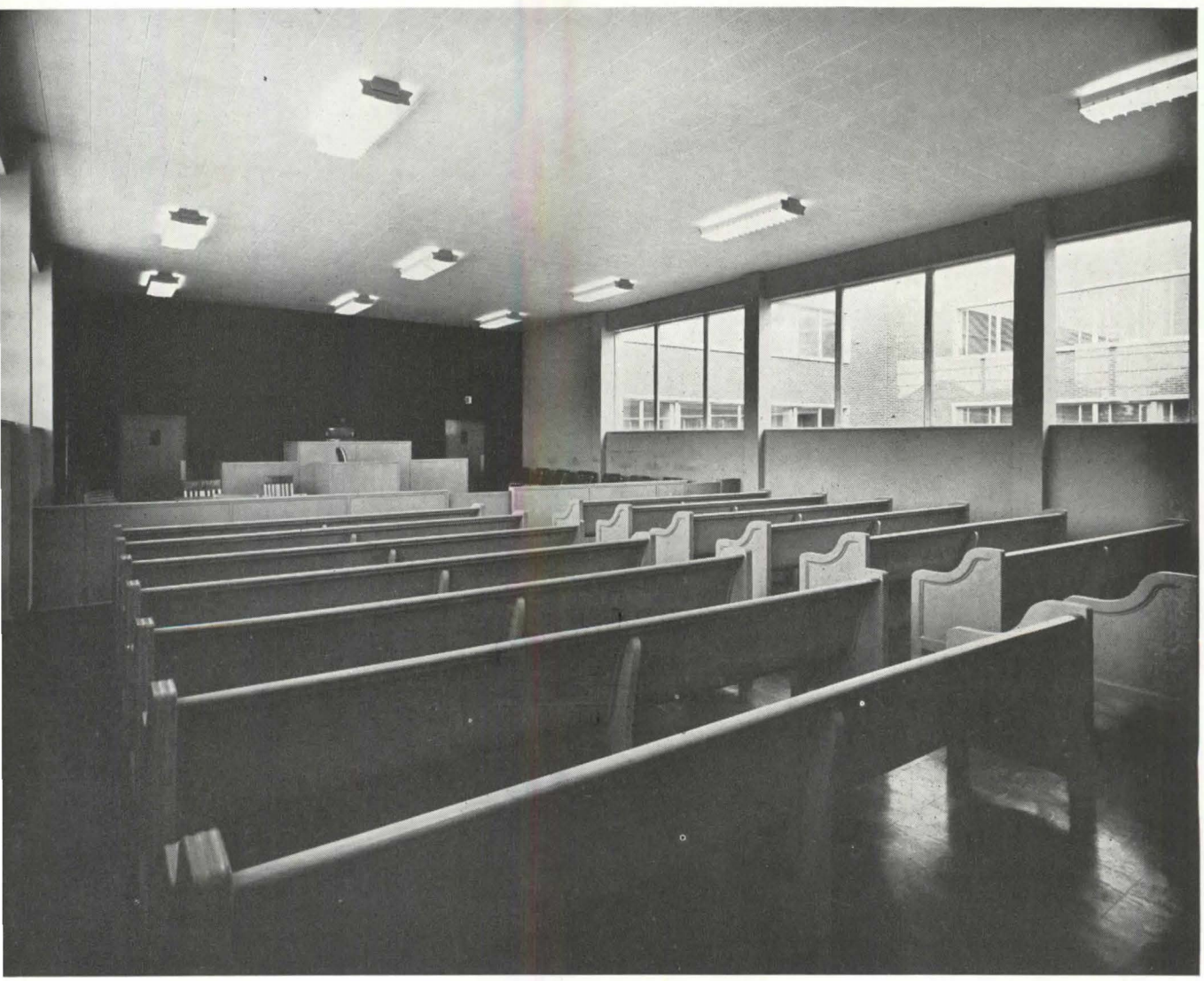


courthouse

A bench-lined covered passage leads directly to the public service offices at one end (left) *and to the courtroom* (bottom, both pages) *at the other. The assembly-dining room* (top, acrosspage) *occurs at the lower level, directly under the courtroom. In the main, the building is of reinforced concrete construction; in the assembly-dining room area, lally columns were used to minimize obstruction, while junior beams span the courtroom ceiling. Exterior walls are of red brick, with white brick and cast-stone trim.* Photos: Gabriel Benzur

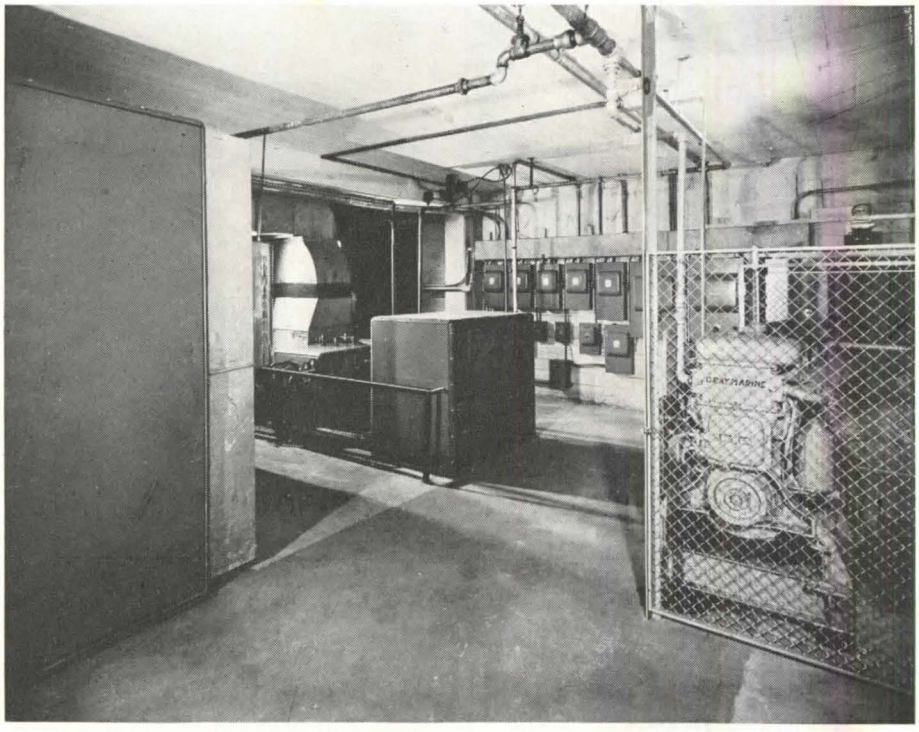


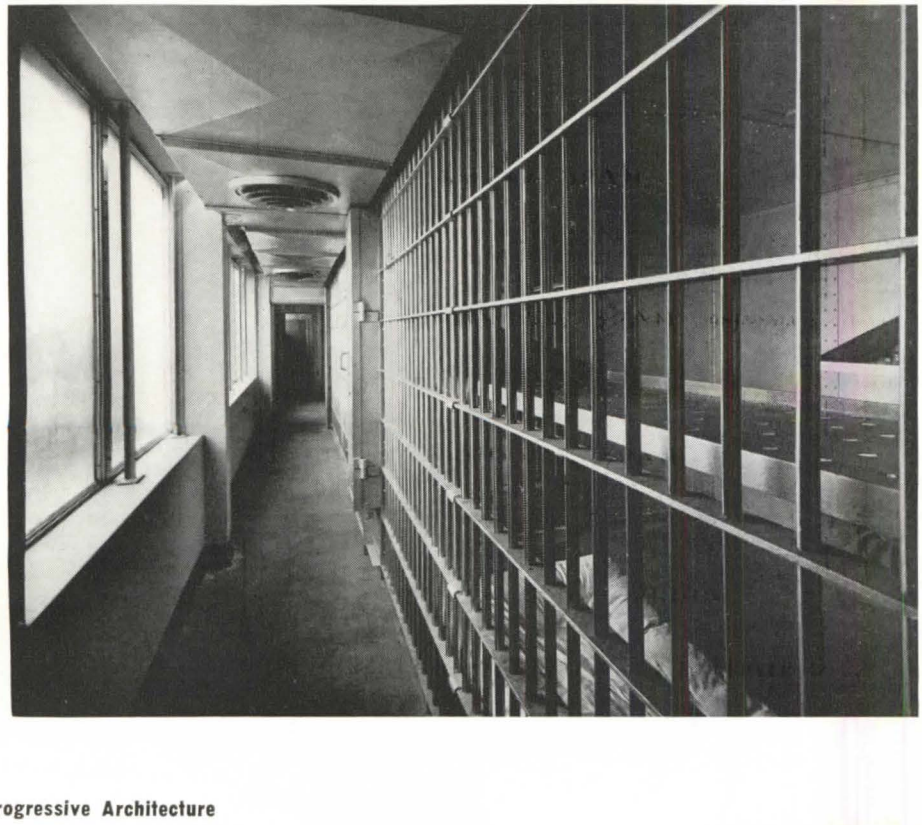
Mullions for the fixed plate glazing are aluminum. Interior partitions (in general) are 2" solid plaster on metal lath—"space saving and easily movable." Flooring is asphalt tile, and ceilings are finished with acoustic tile. Ceiling-mounted fluorescent fixtures are supplemented by both incandescent units and tubular lamps in coves.



Since the Power Commission is a prime producer of electric power, and as fairly high-temperature well-water is available, a heat-pump air-conditioning system was selected. The conditioning system was zoned geographically—northeast, south, and west—as the heat gain from human occupancy in those areas was fairly constant and only the solar load factor was variable. A fourth zone, comprising the courtroom-assembly room which would be subject to wide occupancy variations, was zoned separately

Equipment includes: four air-distr tion units (one for each zone), equip with both hot-water heating and chil water cooling coils; two 40-ton recip cating-type condensing units; a expansion chiller; and two circulat pumps—one located in the chiller circ the other in the condensing circuit. A pr matic control system was selected, for e adaptability for heat-pump operation.





The air-conditioned jail on the top fl (left) *has fixed, obscure glass in alumin frames. The heat-pump year-round air-c ditioning equipment is housed in a sn room in the basement* (left, above).

vhat the architect should know about the heat pump

y Robert H. Emerick*

very one of us who operates an electric refrigerator is, ines-ıpably, operating a heat pump at the same time.

Here is how it works: (a) the liquid refrigerant, usually reon 12, evaporates in the refrigerator coils, obtaining the heat eeded for evaporation from the nearby foodstuffs; (b) the gas ormed by this evaporation is withdrawn from the coils by the ıction of a motor-driven compressor; (c) the gas is com-ressed to condensing temperature, usually around 110 F, the ompressor "pumping up" the heat content as necessary to pro-ıce the condensing temperature; (d) in the condenser, usually coil on the exterior back panel of the refrigerator where the oom air can reach it, the gas yields its heat to the room air ıd, resuming its original liquid form, is ready to repeat the ycle. In short, if we had enough hot gas we could heat the hole house simply by passing the room air over the condenser.

The commercial heat pump, as we know it today, does hat our refrigerator does, on a much larger scale—it produces ıough hot gas. Instead of our watch-charm size refrigerator ompressor with its fractional horsepower motor, we have multi-linder jobs driven by motors of any practical size. For home stallation, the standard cabinet package is being built in 3), 5 hp, 7½ hp, 10 hp, and 15 hp units. Larger cabinets for mmercial applications also are available.

theory of economy

ıe economy of the heat pump is based on our ability to get a rtain amount of heat for nothing, to abstract heat from the r, earth or water around us. We do this by permitting liquid frigerant to evaporate in the air, earth, or water, exactly as permit it to evaporate in our domestic refrigerators. The lue of this heat harvest is illustrated by the following example:

Suppose we take heat from the outdoor air when the ther-ometer stands at 30 F. Then, to obtain a good rapid heat ex-ange, our compressor *must* produce a suction temperature in evaporating coil of 20 F. At 20 F, the Freon gas carries a at load, saturated, of 80.49 Btu per pound. When pumped to the condensing temperature of 110 F, the gas heat load s grown to 89.43 Btu per pound, the difference having been ded by the compressor.

In the condenser the gas reverts to liquid refrigerant, this uid still holding heat to the extent of 33.65 Btu per pound, *ile the heat given up*, amounting to 89.43—33.65, or 55.78 ı per pound, is what we use for house heating.

Since this liquid then goes to the outdoor evaporator, our heat harvest from the air is 80.49—33.65 = 46.84 Btu per pound, or (46.84/55.78) = 80.37 percent approximately of all the heat we use for heating.

Any scheme that appears to produce 80 percent of our heating needs, free, is of universal interest but, unfortunately, the theory is subject to certain practical factors which shrink the apparent advantages. First of these factors is the problem of selecting a suitable heat source for our theoretically free supply. Here are the pros and cons we meet:

air as a source of heat

Commercial designs of heat pumps, using air as the source of heat, generally deliver the air to the evaporator coil by means of a duct which begins at a louvered opening in the outside wall. After giving up its heat to the refrigerant in the evaporator coil, the cooled air is discharged outdoors through a companion duct. Obviously, the architect is faced with problems of louver location, complicated by the necessity for discharging the cooler air at a level lower than the intake, or at a point safely distant to avoid recirculation.

Next, an air-source design almost inevitably must be augmented by supplemental heating of some sort during severe weather, the usual practice being to provide resistance heaters in the warm-air duct. Resistance heaters in large numbers are not viewed happily by the power company, since they impose heavy demands on the system for comparatively short periods. Their use is not viewed happily by their owners, either, as the cost of operation is considerable.

Clients generally are puzzled by these limitations of the air-source design, which result from two characteristics of the refrigerating system. First, the compressors operate at a constant speed, thereby definitely fixing the volumetric capacity of the machine; and second, the *volume* of the refrigerant gas fluctuates widely as the suction temperature fluctuates. Because of these characteristics, a heat pump that does a satisfactory job on air at 30 F, becomes totally inadequate at 0 F.

For example, with a 20 F suction temperature, common for a 30 F atmosphere, one pound of Freon 12 gas occupies 1.121 cubic feet, and reaches the compressor with a heat load of 80.49 Btu. At 0 F, our suction temperature becomes —10 F, and the one pound of Freon 12 expands into a volume of 2.003 cubic feet, while reducing its heat load to 77.05 Btu.

The comparative effects of these two conditions show up most startlingly in figures, like those shown (*Table I*).

Obviously, those 20 Btu per cubic foot which never reach the compressor on a zero winter day must be made up somehow

nsulting Mechanical Engineer, North Charleston, S. C.

Table I

A. Suction temperature of 20 F (ambient 30 F)	
Heat in gas going to compressor, Btu/lb	80.49
Heat in liquid from condenser, 110 F, Btu/lb	33.65
Heat picked up in evaporator, Btu/lb	46.84
Gas volume at 20 F, cu ft/lb	1.121
Btu/cu ft, picked up, 46.84/1.121 =	41.78
B. Suction temperature of —10 F (ambient O F)	
Heat in gas going to compressor, Btu/lb	77.05
Heat in liquid from condenser, 110 F, Btu/lb	33.65
Heat picked up in evaporator, Btu/lb	43.40
Gas volume at —10 F, cu ft/lb	2.003
Btu/cu ft, picked up, 43.40/2.003 =	21.67

Table II

Heat in gas going to compressor, Btu/lb	83.25
Heat in liquid from condenser, Btu/lb (110 F)	33.65
Heat picked up in evaporator, Btu/lb	49.60
Gas volume at 45 F, cu ft/lb	0.730
Btu/cu ft picked up, 49.60/0.730	67.94

Table III

Temp. of heat source	Temp. of suction	Heat per cu ft, Btu
55 F	45 F	67.94
30 F	20 F	41.78
0 F	—10 F	21.67

—and that is when the resistance heaters are called into action.

We might note that faster compressor operation or additional volumetric capacity, while possible, adds so much to the cost that resistance heaters are much the lesser evil.

Falling temperatures not only affect our compressor volumes unfavorably, they introduce certain dangerous potentials insofar as loading the outside air fan is concerned. For example, if we pass 2000 cfm over the evaporator coil, the total weight of this air at 20 F is approximately 165 pounds. At 0 F, the weight grows to 174 pounds, not a serious increase unless, at the same time, the coil becomes badly frosted and thereby injects a strong resistance against the fan. If the fan is of the nonoverloading design, no damage is done, but the heat harvest from the frosted coil is an exceedingly sparse one, and comfort in the house shrinks.

This frosting of the coil is one of the major discouraging features of the air design. Some form of periodic and efficient defrosting is a must.

Here is the balance sheet for air:

For—

1. Air is all around us, available for the using.
2. The system design is simple.
3. The initial investment is less than for any other source of heat.
4. As a heat reservoir, the atmosphere is practically inexhaustible.

Against—

1. Defrosting can be inconvenient.
2. Sizing of the equipment is a critical problem. We must decide at what temperature economic requirements bring on the supplementary heating equipment.
3. An unsupported air evaporator should not be consi ered in climates where the temperature goes below 20

earth as a source of heat

Unless our building enjoys a fairly large plot of ground, t installation of ground coils can pose a difficult problem. F instance, the ground coil provided for a 7½-ton heat pump in home near Philadelphia, used up 2218 feet of 1½" iron pi laid horizontally in 1109 lineal feet of trench. A similar arrang ment for a 5-ton installation employed 1390 feet of pipe in 6 feet of trench.

The situation is easier with vertical pipes driven into t ground, a practice seen in a number of cases, but obviously will find vertical coils impractical in rocky earth.

In any event, before deciding on a ground coil, we shou obtain data on the earth's conductivity in the area of the p jected installation. Unless tests are run, we may find our h pump withdrawing heat from the coil faster than nature c replace it; the cure for such a condition is more coil, spre out to lessen the concentration of draw.

In general, moist earth shows greater heat conductiv than dry earth, but should the moisture freeze, our coil is sulated as effectively as an air evaporator is insulated by fr From time to time in northern latitudes, injection of an a freeze solution into the ground around the coil is suggested a safety measure.

With ground coils, an auxiliary liquid is used, such glycol, which circulates through the coil and meets the refrig ant in a heat exchanger where the transfer of ground heat to refrigerant takes place. Pumping the ground coil *liquid in* duces another auxiliary into the heat pump design, but

pump usually is small and inexpensive.

The balance sheet of the earth source looks like this:

For—

1. Ground temperatures remain fairly high below the frost line, even in winter. This condition is favorable to the heat pump operating economy.
2. The earth is generally convenient.

Against—

1. Installation of a ground coil can be expensive.
2. Locating the coils of separate systems in close proximity to each other, as in a city where ground area is limited, possibly may spread out the yield of heat so thinly that none of the systems will perform satisfactorily. Local ground conductivity is critical here.
3. When rocky ground is met, adequate coil bury may become impossible.
4. The coils are subject to the corrosion attacks commonly suffered by piping buried in the earth.

water as a heat source

In Myrtle Beach, South Carolina, a 5-ton heat pump, which harvests heat from a flowing supply of city water, reports average monthly water bills of $55. In Minnesota, a Rural Electrical Administration co-operative operates a 7½-ton system on well water at a cost of approximately $100 per month, maximum.

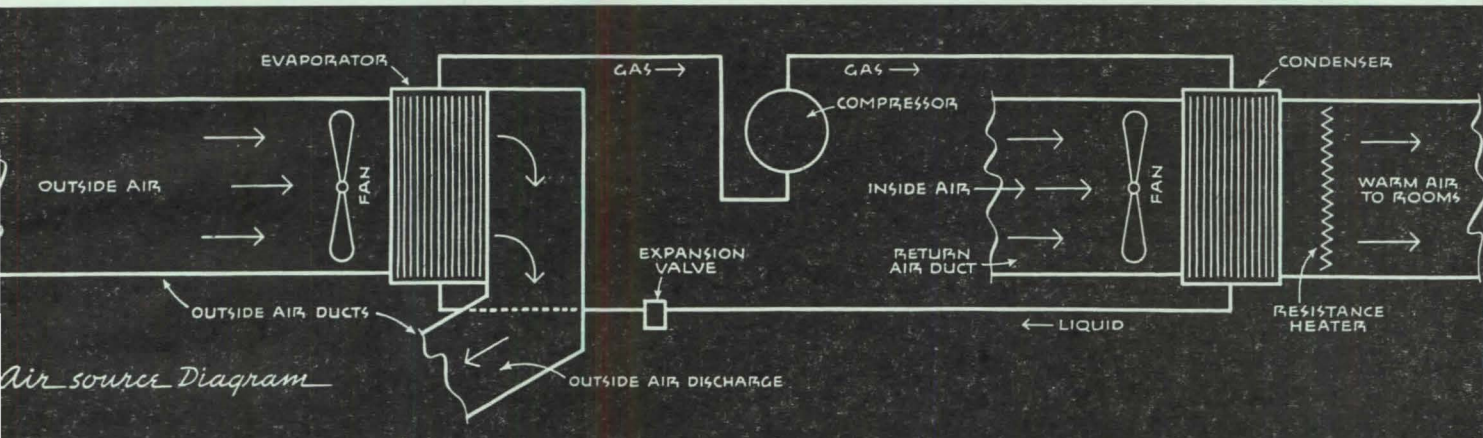
Water is not obtained free unless we are located on a lake, river, or ocean, and even then we must sink the refrigerant evaporator in the water or accept a cost for pumping.

Water has some highly desirable characteristics as a heat source. For instance, its temperature is never lower than 32 F, and nearly always is much higher. In Minnesota, with temperatures 35 degrees below zero, well water reaches the surface at 38 F to 40 F. In the southern states, 60 F is common. Even New England produces 50 F water.

The importance of a high temperature heat source becomes clear the moment we examine some figures. For example, with 55 F water and an appropriate 45 F suction temperature, the total heat of the gas entering the compressor is 83.25 Btu per pound, and its volume is 0.730. What the evaporator can do with this 55 F water, is shown (*Table II*).

Compare this with the heat content per cubic foot which reaches the compressor, when suction temperatures are lower (*Table III*).

This comparison illustrates an important characteristic of heat pump systems: the higher the temperature of the heat



Air source Diagram

Water and Earth heat source Diagram

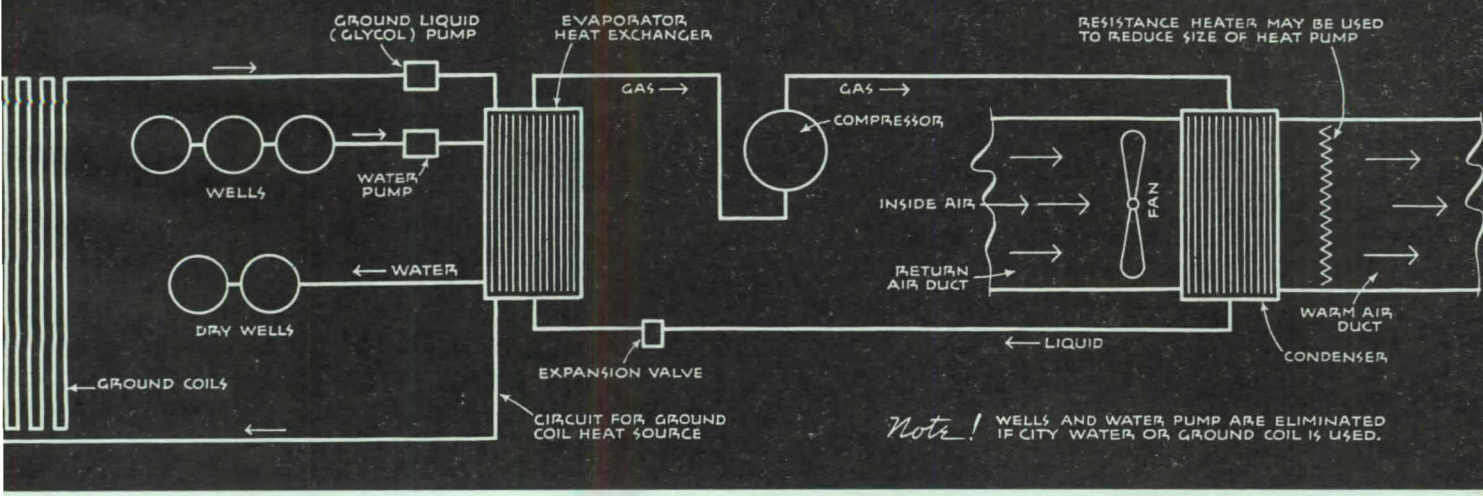


Table IV: Approx. Cabinet Dimensions, Air-Source Units

Standard size, horsepower	Over-all width, inches	Over-all depth, inches	Over-all height, inches	Weight pounds
3	62	48	74	1930
5	78	54	74	2890
7½	90	66	80	3880
10	99	76½	83	4750

Table V: Approx. Cabinet Dimensions, Water-Source Units

Standard size, horsepower	Over-all width, inches	Over-all depth, inches	Over-all height, inches	Weight pounds
3	70	58	69½	1288
5	70	58	69½	1691
7½	83	61½	76	1809
10	99	79½	80½	2800

Table VI: Heat Production, Air-Source Units

Standard size, horsepower	Heat produced, Btu per hour, various air temps. 20 F	30 F	40 F
3	30,400	33,400	36,700
5	50,600	55,500	61,000
7½	75,000	83,300	91,500
10	101,000	111,000	122,000

Table VII: Heat Production, Water-Source Units

Standard size, horsepower	Heat produced, Btu per hour based on 50 F water	Water required* gpm
3	48,000	16
5	80,000	20
7½	110,000	25
10	160,000	25

* Less water is needed if temperature of water is higher than 50 F; more water, if temperature is lower.

source, the more of nature's heat is garnered by the machine. Engineers and salesmen refer to this characteristic when they talk of the "COP," or coefficient of performance. The coefficient of performance is simply a ratio of the total useful heat delivered by the heat pump, and the amount of electrical energy required to run it.

This writer considers the "COP" to be a significant measure of results accomplished, after the system is in operation, but does not use it to predict a system's behavior, since the "COP" varies with the weather, changes in temperature of the heat source, and fluctuations in the efficiency of the system components. In general, a high coefficient is essential if economy of operation is to be realized.

One problem that can be exceedingly troublesome with water heat sources, concerns disposal of the water after the heat has been extracted. City installations naturally look to the sewers, but sooner or later municipalities will take cognizance of such practices as producing sewer overloading hazards. In the southern states, running the water to dry wells is a fairly common practice, particularly if local wells produced the water in the first place. The problem is far more acute in northern latitudes, being complicated by freezing.

Just where the water is going is a question that the architect will be required to answer, and should be able to answer, before a heat pump installation is approved.

There is also the question of water sources. City water is expensive, and a water bill of perhaps $2 a day for a 5-ton system can make the owner loudly unhappy. There is also a strong possibility of the city's refusing to sell water for such usage particularly where the supply is critical, as in New York. A complication which arises from the use of a well as a source of supply, is that some areas tend to limit or prohibit withdrawal from wells, as such practice may deplete the water table. This means that legal blessings on a well project should be secured before the well is driven, and perhaps before a decision is made to use water from any source, as convenience for a heat pump.

If we set up a balance sheet for the water plan, we have:

For—

1. The temperature of water from any source, never falls below 32 F (or it ceases to be water).
2. Water temperatures remain quite constant throughout the heating season. These temperatures are pleasingly high in most sections of the country.

Against—

1. Buying water in a city is expensive, and *it may not be available* at any price.
2. Obtaining water from wells imposes a substantial expense for driving the wells, and is followed forever after by a pumping cost.
3. Disposal of the water can become a difficult and disagreeable problem.

Since the obtaining and handling of water is likely to be somewhat expensive, the decision to use it or not to use it depends largely on its temperature. If its temperature is high enough, say 55 F to 60 F, the resulting economy in compressor operation may justify our selecting it. Each case must be weighed on its merits, another worry for the architect or engineer.

For reasons of economy, we sometimes can arrange a combination of heat sources, for example, air and ground coils, or air and water. In Indiana, air and ground coils function successfully in a small residence, while air and well water are as efficient in Virginia. In Ohio, at Portsmouth, the Ohio Power Company uses air for their office building until the outside thermometer shows 20 F, at which temperature a switchover is made automatically to city water. *On a rising mercury, the* city water stops and the air evaporator resumes the function of furnishing heat.

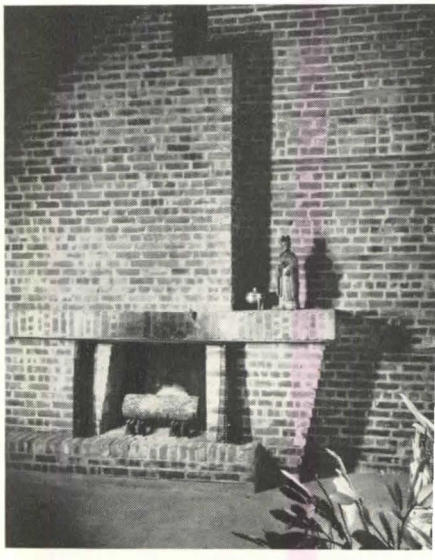
These combination systems are interesting and effective, but the mixing of heating agents into a co-ordinated design is not always accomplished without architectural headaches. Perhaps the more simple way, though possibly more costly, is to have the heat pump designed for an outside 20 F, and supplement its output with resistance heaters.

(This discussion is continued on page 142)

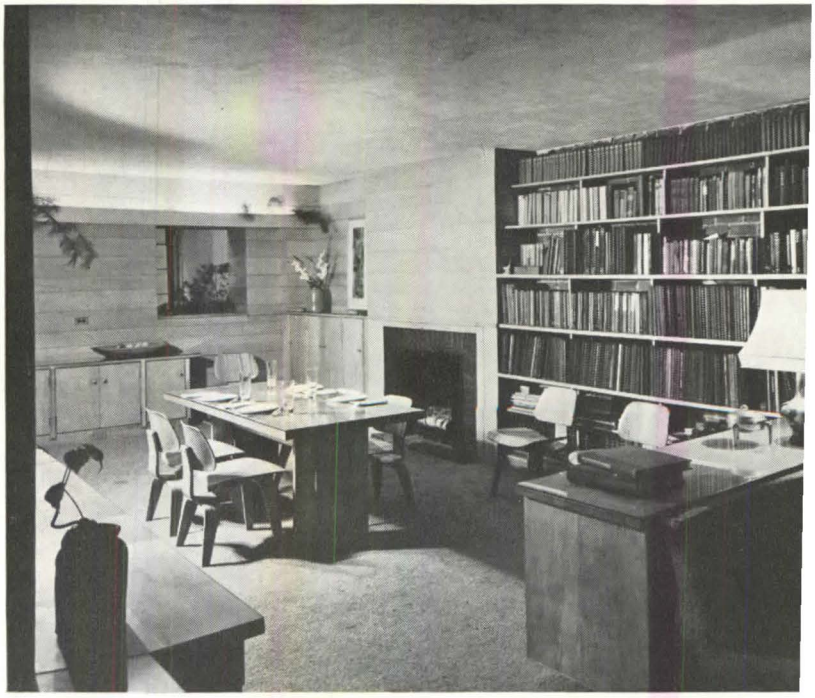
duplex apartment

duplex apartment

The problem was to alter the two low floors ("English basement" and first floo of a typical, pre-Civil War, five-story tow house into a self-contained duplex apa ment. Since the house faces north on heavily traveled cross-street, it was impra tical to think of employing extensive cle glass on the street-front. However, it w desired to introduce as much north da light as possible and somehow to open some of the interior space to the natu light source.



Location	New York, New York
Architect	Edgar Tafel
General Contractor	John Post Construction Company



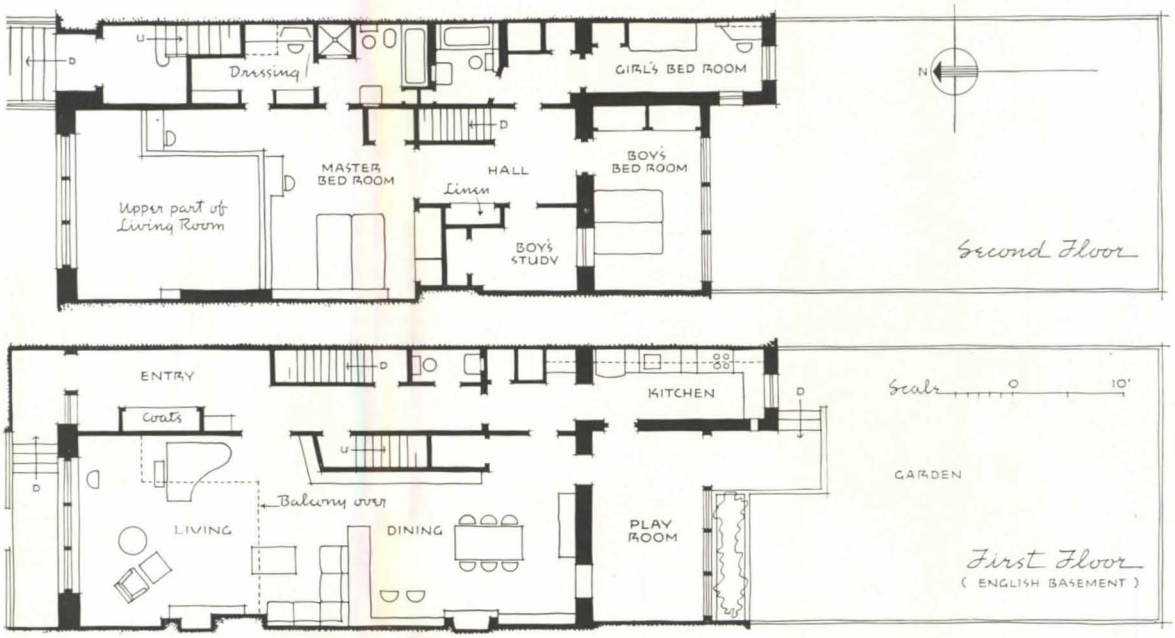
Flush-mounted light fixtures occur in the balcony soffit (above) ; *the brick of the fireplace wall* (above, right) *is the masonry of the party wall; the ceiling of the dining area* (right) *is finished with acoustic plaster. The bedroom balcony and view down from it* (acrosspage) *illustrate the warm effect gained by simple use of simple materials. "The best compliment I have received from the client," the architect reports, "is that he cannot remember who designed the house —himself or the architect—for it is so close to the solution and feeling he desired."*

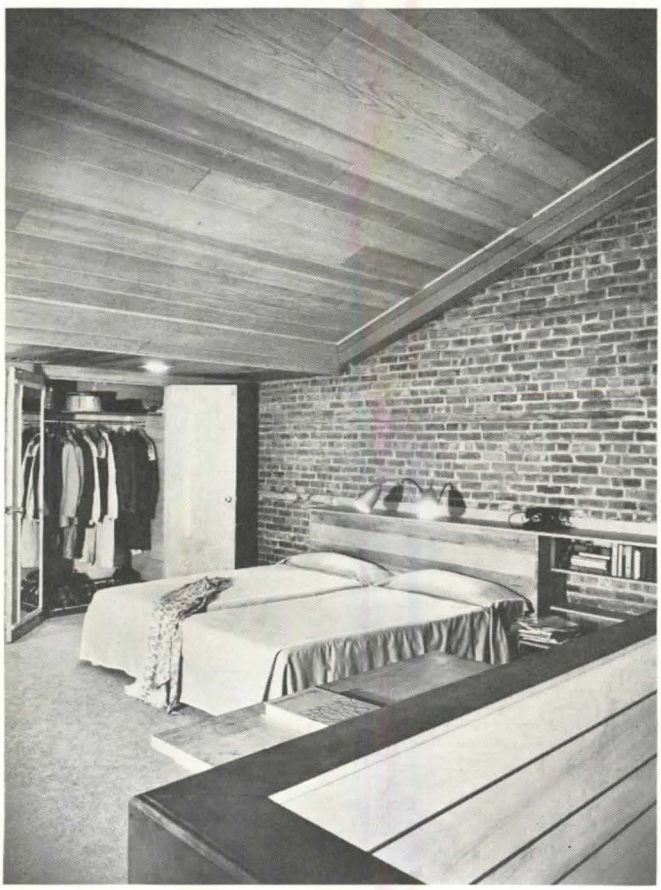
Photos: Gottscho-Schleisner

To solve this, the architect removed a portion of the upper floor, providing a full two-story height at the front for the living room, the upper-level master bedroom becoming, in effect, a deep balcony above it. The entire north wall, except for the portion below grade, is a huge window, glazed with obscured, patterned glass. The only added structural elements were two steel beams and two angles.

The party wall of the house, toward the west, was cleaned to the original brick by removing the plaster, steaming the brickwork, and repointing where necessary. Living and dining spaces are treated essentially as one area, the only divisions being a low cabinet unit and the lower ceiling of the dining area.

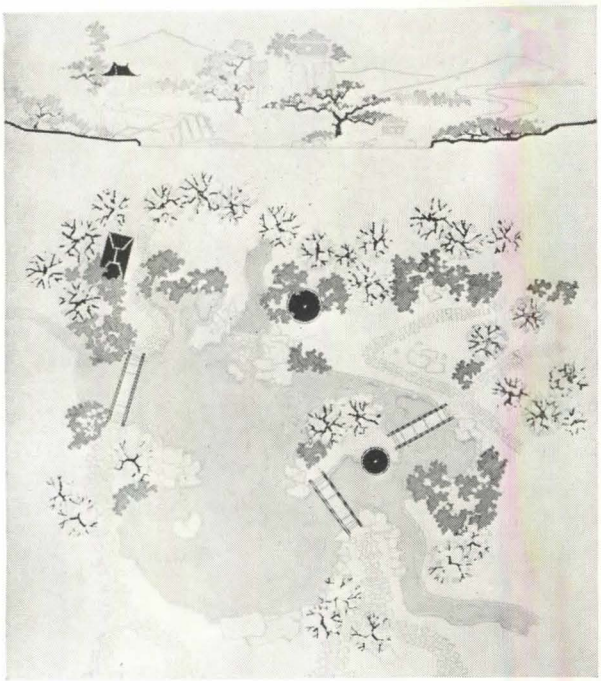
The combination of plain brick and the new cedar woodwork (for built-in elements, balcony railing, and ceiling of the big room and bed balcony) result, in the architect's words, in a "warmth not expected in this locale."

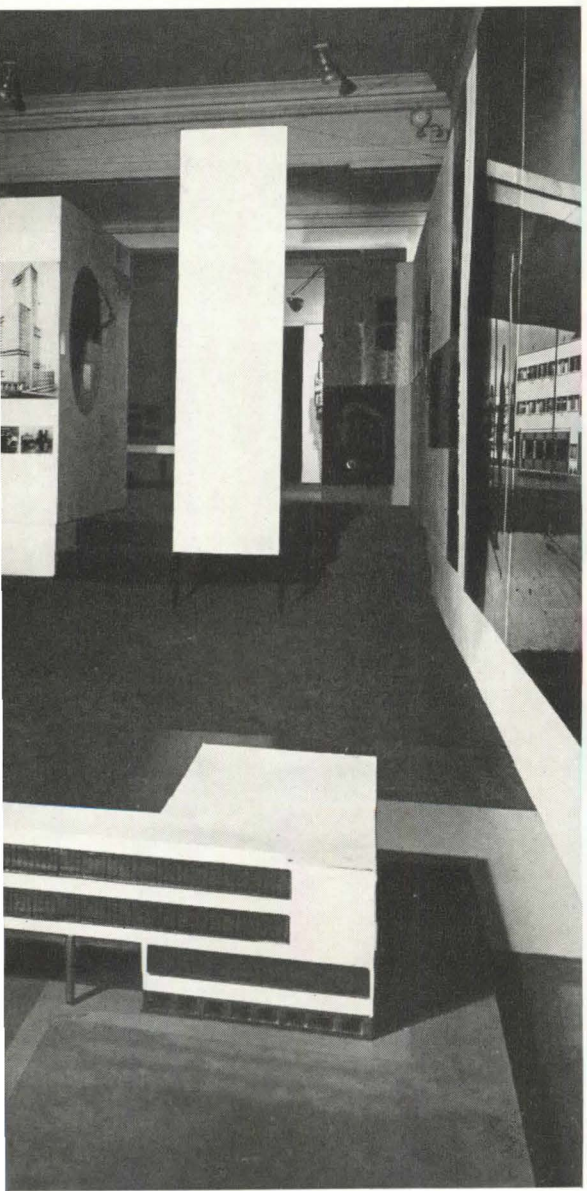




display techniques

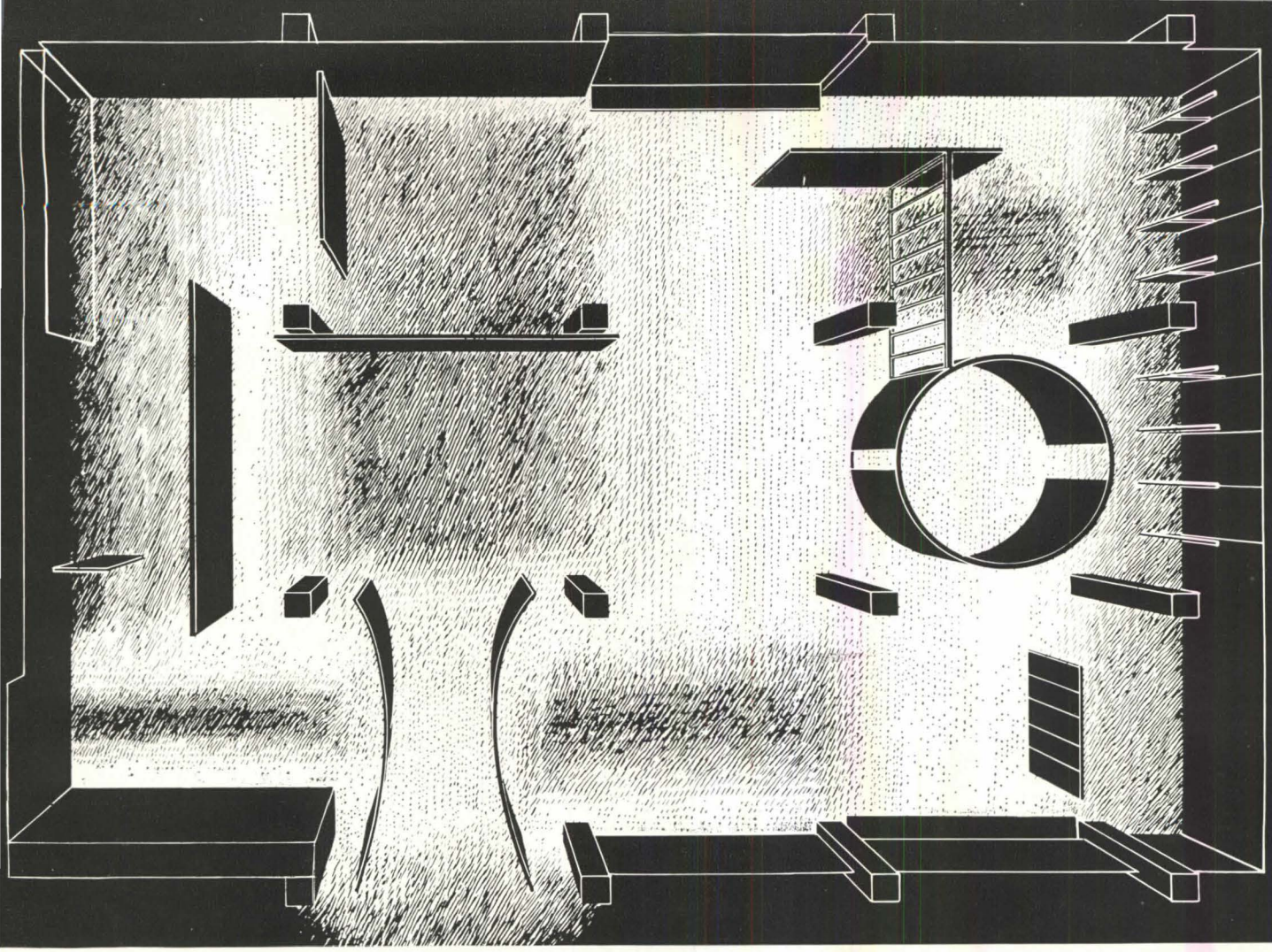
The three drawings here are excerpts from Chapman's display-design research: the Paris Opera House ("vanity of humans showing off before humans"); a Japanese garden of Shin Dynasty ("progressive and continuous merging of one space into another"); and the 1938 Zurich Exhibition, wherein "a flume and boats provide visitors with a moving panorama" in a directional, controlled path, in addition to pedestrian circulation.

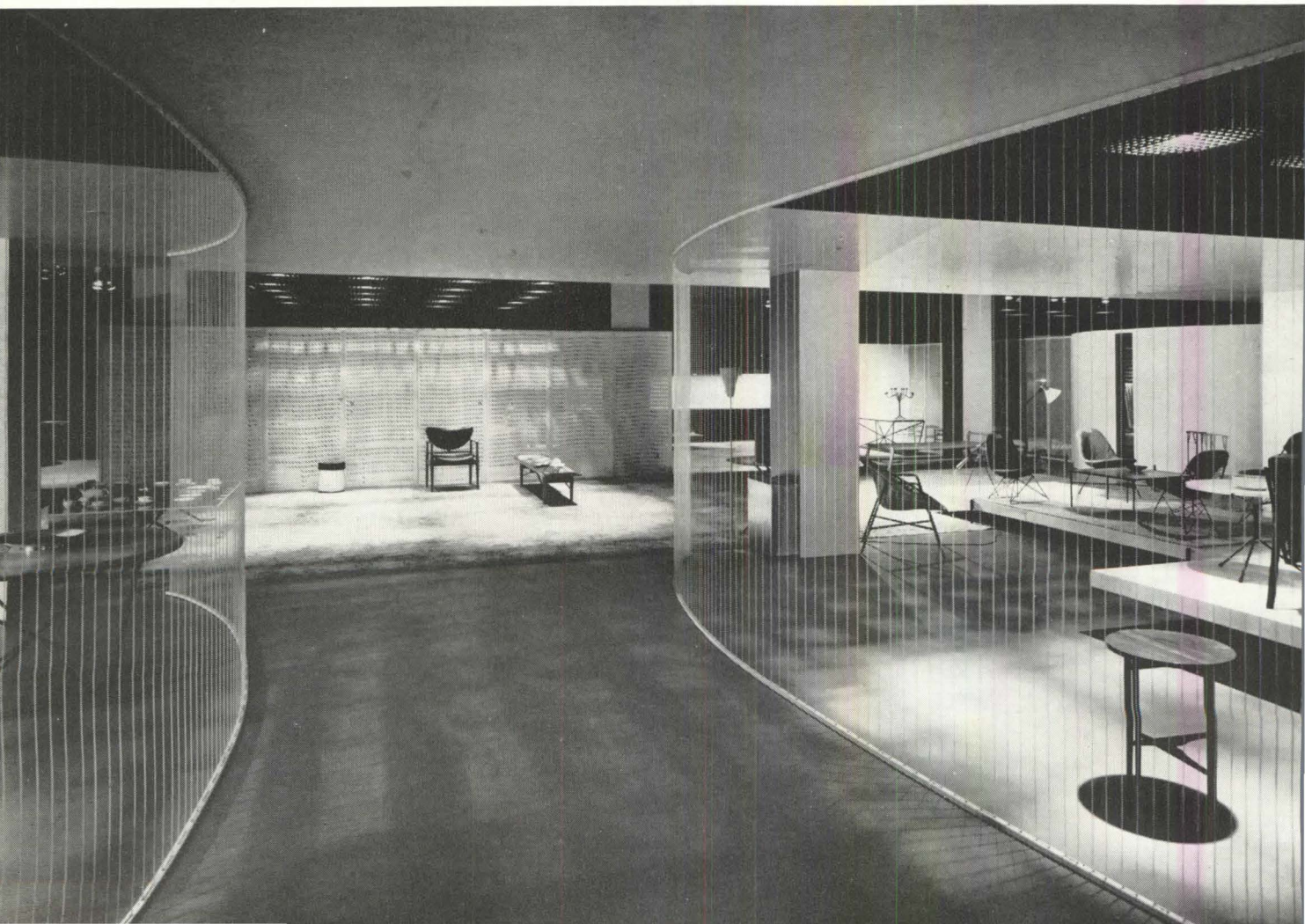




Salient factors involved in design for display are (1) dramatization of the characteristics of objects on display; (2) organization of components in an arresting sequence; and (3) provision for movement of visitors within or around the exhibit. To highlight these criteria, we borrow from an exhaustive thesis developed at Princeton University by Donald E. Chapman, M. Arch. '49. He proceeded from a study of display fundamentals to their application in the design of a remarkable zoological garden (pages 111-113). To link theory with practice, we supplement Chapman's thesis with photographs of a few actual recent exhibits.

The retrospective exhibition of work by Dr. Walter Gropius, planned for its major opening at the Boston Institute of Contemporary Art (left) *but adaptable for knock-down, shipment, and rearrangement in numerous other places, was designed by Gyorgy Kepes, Professor of Visual Design at the M. I. T. School of Architecture and Planning. It not only provides an architectonic background that echoes qualities of the work displayed, but organizes the work in a rhythmic, horizontal flow-sequence of photographs, with occasional vertical emphasis. This, plus the left-right "rail for the eye" that the textual matter provides and slight directional changes in wall panels and baffle panels, tempts visitors in and around the exhibit.* Photo: Fred Stone

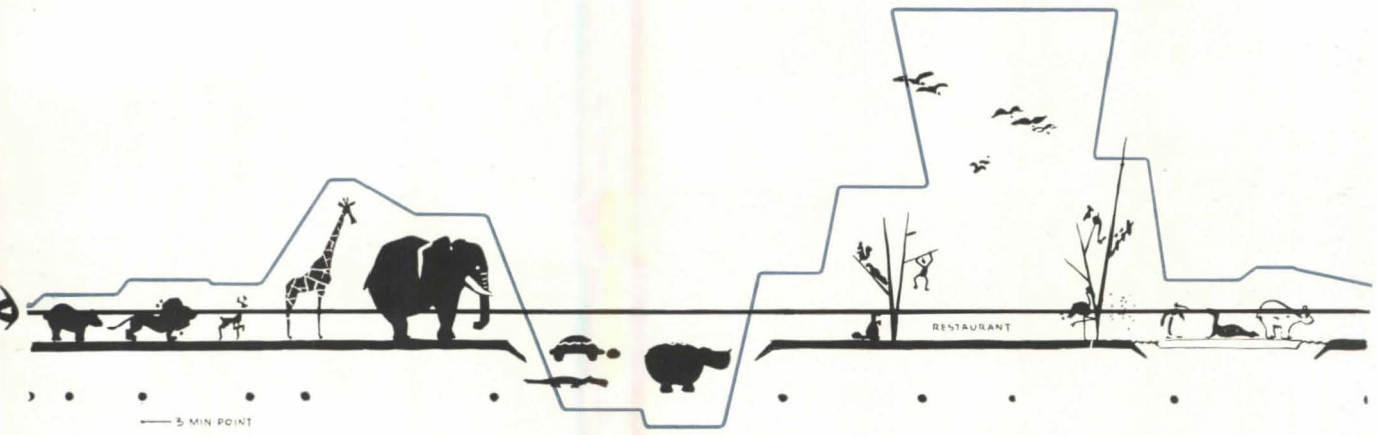




display techniques

In developing the setting for the "Good Design" show at the Merchandise Mart in Chicago *(plan and photo acrosspage)*, Architect Paul Rudolph brought visitors almost into the center of the exhibit between curved, transparent screens made of plastic cord strung between floor and ceiling frames. While allowing the spectator complete freedom of movement, his subtle use of lighting, alternating shadowy areas with brilliant pools of light flooding exhibit groups, estabished a predetermined path which most visitors actually followed. Freely placed wall panels and the peek-a-boo circular room were further devices introduced to maintain interest and lead the visitor from exhibit to exhibit.

The zoological garden designed by Donald Chapman aims "to forward the premise that a zoo is a condensed garden community of animals in which the spectator is a tolerated intruder." Chapman's analysis first isolated the two main components—the static and the dynamic. Among the former are the particular animal environments—terrestrial, aquatic, airborne, or polar; the scale of

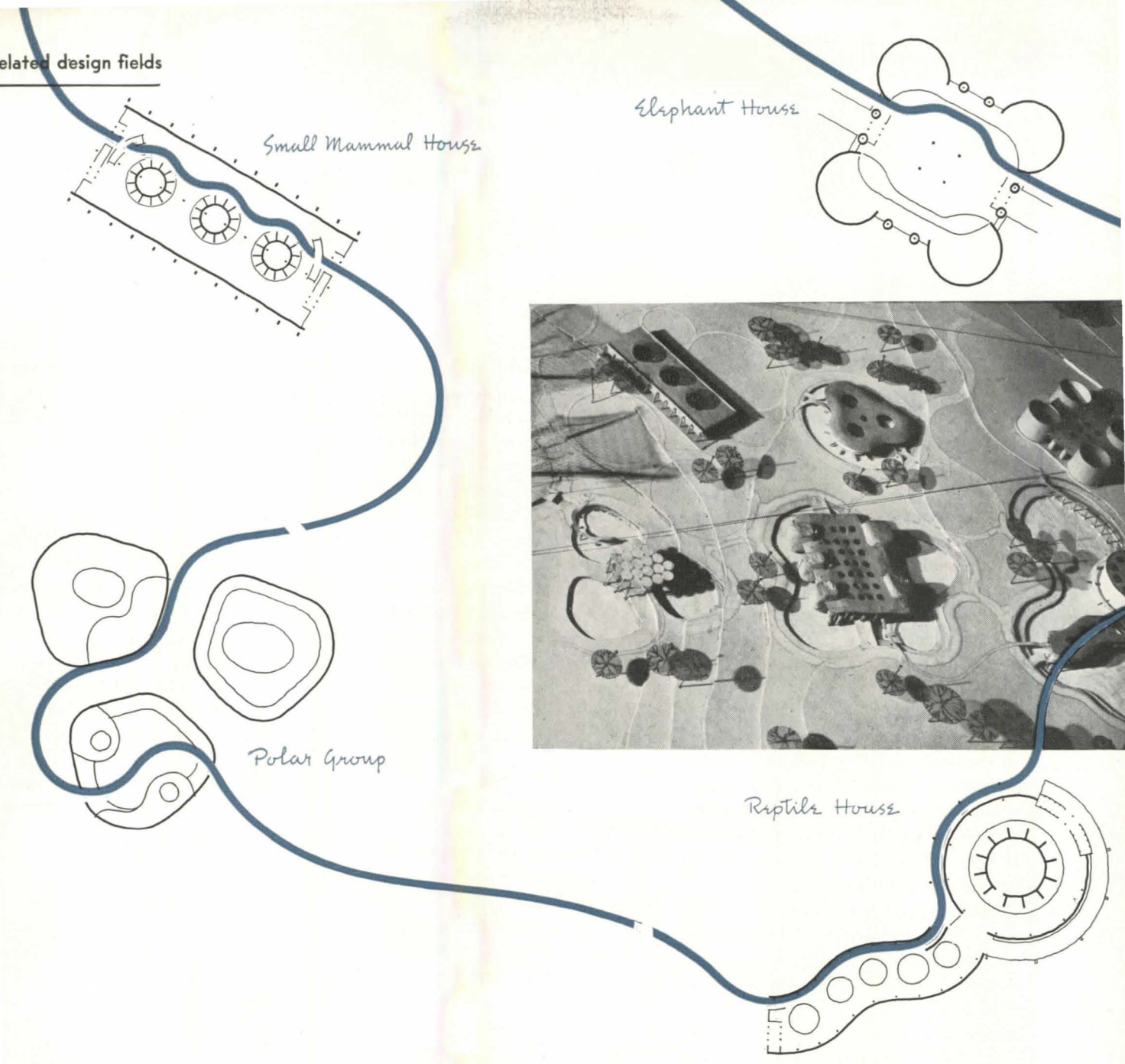


the habitat (with large animals, needing large dwellings, generally placed on the perimeter and the numerous small animals in the center, so that the spectator can view a number of small animals as readily as one large one); topographical considerations, and organization of major vistas. Dynamic elements include the movement of the animals themselves and two types of locomotion provided for visitors—pedestrian and vehicular.

Since Chapman reasoned that most pedestrians would follow a casual path, changing their course as whim dictated, walks are arranged as a series of tangential circles, allowing a free, meandering movement. For those who wish to view the zoo with a minimum of effort, Chapman worked out a flume system, whereby small, flat-bottomed boats (like those in "tunnels of love" at amusement parks) glide through a shallow waterway, between and through the various animal dwellings, in a controlled, continuous movement. The system allows visitors to disembark at any point and proceed on foot, if they so choose.

At the end of the ride, both water and boats are raised on Archimedes screw mechanisms (displays in themselves, advertising the fluid nature of the flume device) to their starting point, ready for the next trip. The path followed by this continuous flume is punctuated by two climaxes *(see "spatial sequence chart" above)*. The flow is from land animals (bears, lions, giraffes, elephants, etc.), to reptile and water creatures (turtles, alligators, hippos, etc.), to birds and tree-leaping monkeys, to the polar group. The two climaxes occur in the giraffe-elephant area, where sheer size and bulk are impressive, and in the monkey-bird-house area, where altitude and maximum spatial awareness constitute the most striking contrast.

Photo: Carl Ullrich, Inc.



display techniques

he model of the zoo Chapman designed clearly indicates the "animal world" environment provided. he designer emphasizes that the "architectural expression" derives from his effort to find the appro- riate "animal expression," resulting in "the emancipation not alone of the animals but of the archi- cture itself." All the houses emulate aspects of their occupants. To look at just a few, close up: e house for small mammals is small, and "it expresses the multiplicity of its small occupants through e multiplicity of its supports, placed outside its walls so that the spectator may count them." The ephant house "expresses bulk and solidity through the monolithic nature of its construction." Water om an overhead canopy tumbles down into the pools of the polar group, with the animals able to ıjoy and penetrate the falls, while the spectator feels somewhat cooler himself, "just from viewing much cascading water." And the reptile house "creeps across its pools, just as do crocodiles and akes and alligators. Reptiles sport in concrete tubs standing in the same water that surrounds their ıuse."

Model photos: Richard Garrison

The Architect and Public Relations:

by Asher B. Etkes and Raymond Dodd

For the architect specializing in industrial, school, or mass housing design, publicity on a national scale can pay dividends in the form of widespread recognition and potential commissions. An interested reader today may be a client tomorrow.

Thus, when publicizing a project, make certain that it has outstanding merit. Editors are discriminating; so are readers. Make sure that a job has one or more strong focal points of interest—appearance, construction economy, or unusual function. If it doesn't, forget it and choose another. Weak publicity is worse than none.

Always study a project carefully from the standpoint of story (or pictorial) interest before launching a publicity venture. To determine whether a job is newsworthy is not difficult if the architect can learn to regard his project impersonally. Nothing clouds vision like ego.

Say the project is a school or industrial plant. Ask yourself whether it is different in appearance from a thousand others, whether functional design has solved a problem efficiently, whether these specific benefits will be of real service to other school boards or manufacturers.

determining news value

In appraising the newsworthiness of a project, either for national or local publicity, bear in mind that fresh ideas make news; clichés seldom do.

Most people have little conception of what constitutes news although they read, listen to, or view it daily. But while they may fail to define news, they do recognize an interesting story. They talk about it.

This provides a rough bench mark in appraising news value; if a building project excites favorable conversation, it may be potential news. It's not an infallible rule but generally reliable, provided the news is directed at an audience interested in the *subject matter*. In other words, aim carefully and make each publicity shot register.

The publication field is enormous, catering to a wide variety of appetites ranging from movie star worship to abstract technology. If an architect's field of vision has not extended much beyond the perimeter of his drawing board, he may be surprised at the tremendous scope of American publishing. In addition to the many thousands of daily and weekly newspapers and hundreds of general consumer magazines, there are better than 2000 major trade publications covering every conceivable phase of art, construction, retailing, science, and manufacturing.

trade magazines

This is a rich field, capable of yielding a bumper publicity crop, if you know where to plant seeds of interest.

For instance, magazines other than architectural publications are interested in architecture—or certain segments of it. Few architects see these periodicals; most don't even know they exist. They are the magazines concerned with component parts of building—roofing, air conditioning, engineering, illumination, and so forth. Most want and need good story material.

Let's examine a theoretical project, a modern textile plant, in relation to these building trade publications. Pretend that it is a fine functional job offering new ideas in the use of new materials, that it indicates smart money-saving engineering in addition to a pleasing and imaginative exterior.

In addition to the architectural periodicals, an obvious "market" for stories and pictures of this plant is the textile magazine field. Depending on the type and location of the project, the editorial welcome mat might well be out at *Textile World*, *Textile Age*, *Textile Industries* or *Southern Textile News*—the more "general" publications in this field.

But let's dissect the project piece by piece to determine how much more licity mileage can be obtained.

Is the roof construction novel? a new type of insulation and surfa specified? Does the air conditioning any fresh ideas in design or installat What's unusual about the fenestrat Has it been integrated cleverly with matic artificial illumination to pro continuous good lighting on work faces? What about floor arrangem Has it provided a smart answer to cult traffic, equipment, and mainten problems? In the basic construction, design and good engineering cut c provided speedy construction, or over unusual site deficiencies?

There are a number of publica definitely interested in good copy on one of these components. Here's a pa list:

The roof:
American Roofer and Siding Co tor; Journeyman Roofer and W proofer; Roofing, Siding and Insul
The air conditioning:
Air Conditioning and Refriger News; Heating, Piping and Air C tioning; Domestic Engineering.
The fenestration and lighting:
American Glass Review; Glass Di Glass Industry; Illuminating Engi ing; Electrical Engineering; Elec World.
The floor arrangement:
Factory Management and Mainten Industrial Equipment News; Me cal Engineering; Mill and Fa Plant Engineering.
The basic construction:
Construction Methods and Equip Constructor; Engineering News-R

Remember, this is only a partial the more general trade magazine would be interested in this theo textile mill; if it were tangible t could be expanded. There are a many more periodicals in each above categories interested only in

ational publicity

s of their fields or concentrating on news from given geographical

the uninitiated, picking a selective through this maze of publications rs *a bewildering if not* insurmount- ask. As the architect seeks specific ces for his publicity, just how does ermine what type of magazine they or even find out about magazines ver knew existed?

task is *not easy but* neither is it fficult. There are a number of books ng listings of all types of publica- some available in public libraries. is one, however, that fills the needs novice publicity planner more than her: the business publications issue ndard Rate and Data Service, Inc., . Michigan Ave., Chicago 1, Ill. It ng been a vital tool of the advertising ; it can prove a handy tool for ct as well.

nain value is the careful breakdown oss indexing of individual and re- *rade fields, the magazines* that serve and a census of the type of readers h publication listed. These furnish le clues in determining editorial and the character of readership. orrow, or order a copy of this direc- t can save much time, money, and ointment in a publicity program.

to approach an editor

most magazine editors are hungry od copy, they seldom snap at it. sely, the average editor is friendly, and inclined to answer correspon- romptly.

u have a story for a selected maga- ist sit down and write the editor. m who you are, what you have nd why you think it will interest d his readers. Include details— iem short—and enclose a couple ographs. Only one of two things pen; the editor will either want y or he won't. Incidentally, if he understands he has exclusive rights to the story in his field, chances of acceptance may be enhanced.

If you have really sparked interest, the editor may request a prepared story of designated length, specify photographs needed and even forward a sample copy of his magazine to indicate "style." On the other hand, he may desire staff coverage of your project and assign either a staff writer or regional correspondent to gather the facts firsthand.

Don't despair, if you're a wizard with the lettering pen but a poor man of letters. Just get the facts down on paper, remembering to stress in detail all the points of apparent "conversational" interest.

Of course, editors of small-staffed trade magazines enjoy receiving copy that requires little or no editing. But such "outside" copy is the exception rather than the rule. Magazine staffs are fully prepared to rewrite copy to conform with policy or style and no good story is discarded merely because it fails to reveal literary genius.

co-operative publicity

The personal approach is not the only way to get publicity results in these valuable trade publications. There's another method available to most architects, but seldom exploited by them.

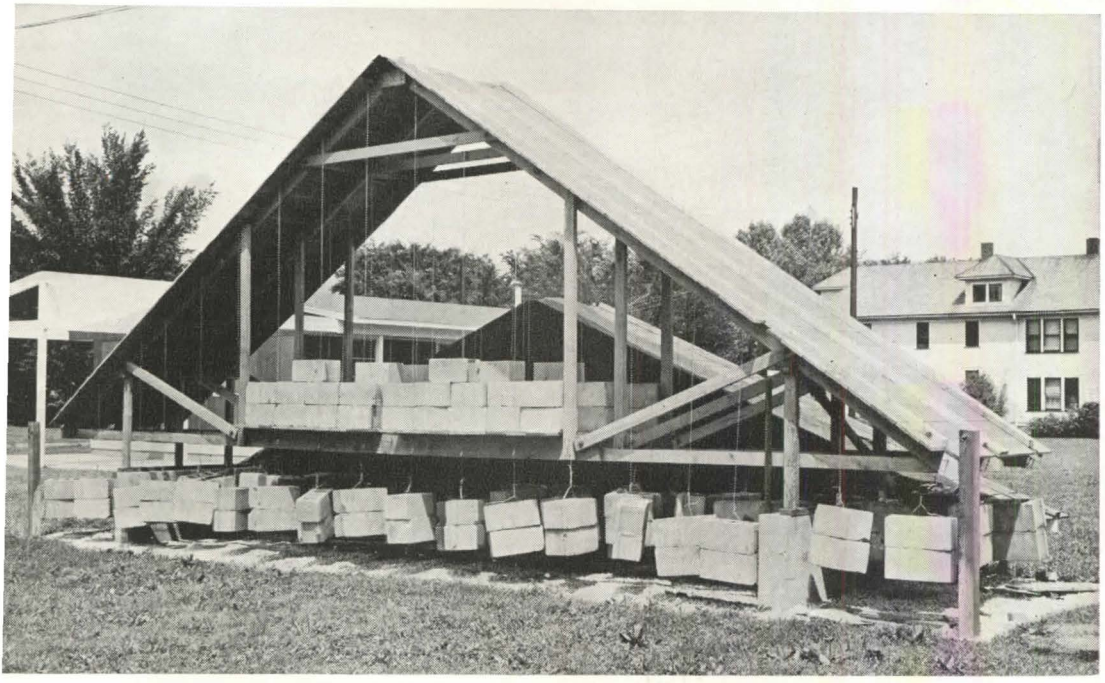
Major makers of building materials already are involved in publicity, have experienced staffs or agencies ready and willing to lend a helping hand to the architect using their companies' products. A newsworthy building design is the only entry fee.

The logical starting point of such a co-operative publicity venture is the company salesman. Some are alert to publicity possibilities, others need gentle prodding. In any event, sound them out. The company publicity staffs lean heavily on the salesman for story material; he is their field reporter. And it's to his advantage—as well as yours—to submit good publicity material from his territory. So prod him if you must.

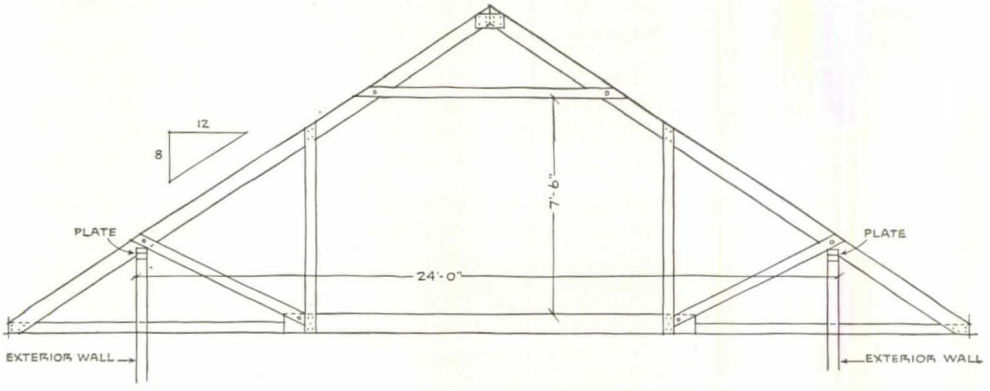
For your own information, manufacturers of glass, cement, insulation, floor surfacing, paints, and electrical equipment all have extensive publicity setups that can reap a surprisingly rich publicity harvest for the architect in every conceivable type of publication. For example, a school architect specifying prismatic glass block fenestration for classroom daylighting may eventually read the story of his school plant in influential school magazines, in general consumer publications, in major Sunday newspaper magazine sections, and in farm papers as well as in the leading architectural journals, all as a result of a manufacturer's publicity activity.

There's still another possible—and profitable—aspect of such co-operative publicity: the use of an outstanding job (and credit to the architect) in the manufacturer's advertising. The word "profitable" is used advisedly; we mean the obvious value of receiving design credit in an attractive advertisement appearing in a large number of national-circulation magazines.

It cannot be stressed too strongly that the benefits accruing through this co-operative publicity and advertising should not be left to chance. Many company salesmen are vitally interested in such customer service but they must be told about your story. When such co-operative ventures are launched, be prepared to supply all the needs of the publicity staff. The same advice applies when using the personal approach to an editor. Prepare extra blueprint copies, arrange to have photographs taken by a competent photographer (snapshots seldom are adequate), answer all questions excepting confidential ones involving the client and, above all, make certain that all story copy and correspondence is neatly typewritten. Sloppy material and longhand scrawls are certainly out of character with the fine contemporary work the architect is trying to publicize.



During tests for rigidity and str of trusses, concrete blocks hung top chords simulate a roof load to 5 ft of snow per sq ft; blocks p on bottom chord (floor of upper s *represent normal occupancy loa 30 psf.*



trusses for story-and-a-half houses

Builders of one-and-a-half-story houses may soon benefit from the structural economies now possible with one-story houses through the use of roof trusses. A truss has been especially designed for the story-and-a-half house by the University of Illinois Small Homes Council, as part of an FFHA-sponsored research study on roof construction and wood-framing practices. Selected as the most successful design among others developed by the Council, the truss was found to be the easiest to fabricate and erect, and used materials most economically.

On a 24-ft span, the truss frame will support a second-floor space 12 ft in width, with a ceiling height of 7½ ft—a flexible living area which can be extended the full length of the house and divided into rooms without any necessity for load-bearing partitions and their costly supporting construction *(see illustrations)*. The truss forms a prot overhang on both sides of the stru roof pitch is held to 8/12.

Upon completion of a concrete load test, which is expected to ru several months, the findings will b mitted to the FFHA Division o Housing Research. These result then be made generally ava through the FFHA, although no publication will be made until nex

PRODUCTS

air and temperature control

ype Ventilator: weatherproofed, quiet-ng, power-driven fan ventilator with ilhouette, for use either as exhaust ıtor or fresh-air supply unit; can be ɔed with motor-driven fan or with and pulley drive. Sizes range from 60″ fans. Standard construction is galvanized steel; other materials avail-or special-purpose use. Burt Mfg. Co., PA, 44 E. South St., Akron 11, Ohio.

r Grease Eliminator: inexpensive trap device for installation in restau-itchen ventilating systems reduces fire in exhaust ducts, helps protect motor lower equipment, and provides better tion. In wide range of sizes and fin-to match existing kitchen equipment. Co., P.O. Box 10187, Airport Station, ngeles 45, Calif.

eraire Small Pipe System: completely ged unit for use with all types of forced air heating systems. May be installed type or size house, whether built with partial basement, or with crawl space. eter diffusing-type registers and grilles ed for this unit are available. L. J. er Furnace Co., 2005 W. Oklahoma Milwaukee 15, Wis.

Bilt Oil Burner: quiet, automatic, ss boiler-burner units; factory pack-nd wired, connect only oil line to tank ıermostat wire. Flush jacket, built-mbustion chamber, flange-mounted, ɔed with three Minneapolis-Honeywell ls. Rated at 79,000, 96,000, and 132,000 Quiet Automatic Burner Corp., 33 field Ave., Newark, N. J.

red Unit Heaters: new line of heaters orating "boiler-tube" design; horizon-el tubes of heat exchanger staggered vide maximum areas of prime heat ; curved louvers direct heated air o worker comfort-zone. Burners, pilot, ntrol valves combined in one remov-rawer-type assembly for easy mainte-Capacities range from 50,000 to 230,-u. Trane Co., La Crosse, Wis.

re Base-Heat: new heating system es advantages of radiant, perimeter, rced-warm-air heating; warm, humidi-is circulated in small-size ducts and ıted through special distributors at baseboard of outside walls in rooms warm air will block off all drafts and . Units available for both oil- and gas-ɔeration. York-Shipley, Inc., York, Pa.

doors and windows

Bi-Rail 5000: sliding-door hardware ɔd with large, solid nylon wheels pro-ɜmooth, easy operation. Track is made -resistant heavy-gage steel; one size all door thicknesses. Acme Appliance ɔ., 35 S. Raymond Ave., Pasadena 1,

ɔk School Window: heavily-extruded ım awning window designed espe-ɔr schools and institutions; features ut" operation of all vents by means of rigid push-bar attached horizontally to base of bottom vent; positive opening to any position up to 90°. New construction does away with protruding and detachable window operators. Ludman Corp., P.O. Box 4541, Miami, Fla.

Kling Felt No. 113: solvent-activated adhesive-backed felt permits weather stripping of metal casements and all other windows, doors, and vents. Application is easy and quick, assuring deterioration-resistant seal against rain, wind, dust, and cold. Felt can also be used as "anti-bang" cushion for doors. Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.

Rex Combination Screen and Storm Window: steel-reinforced, extruded aluminum screen and storm window unit is quickly adaptable to almost all double-hung, primary windows without special preparations or bulky superstructure. Screen or lower storm sash can be stored, when not in use, in upper part of window. Rex Windows, Inc., 487 Bonham Ave., Columbus 3, Ohio.

electrical equipment, lighting

McKinley Luminaire: pendant-mounted, luminous-indirect unit, wide and shallow in appearance, particularly suited for office buildings, schools, drafting rooms, and other applications requiring low surface brightness in lighting. Side and bottom panels are of white, ribbed polystyrene. Available in 4′ units, 16-5/16″ wide x 4″ deep. Pittsburgh Reflector Co., 421 Oliver Bldg., Pittsburgh 22, Pa.

Aisle-Light: recessed unit for installation along stairs or corridors; can double for porch or interior night light. Housing, finished in soft gray baked-on enamel, is 3½″ x 7″ x 3½″; equipped with louvered faceplate with glass behind louver. Pressteel Co., 800 Bancroft Way, Berkeley, Calif.

finishers and protectors

Ruf-Seal Cement Paint: prime coat developed primarily for porous masonry surfaces to increase workability of succeeding coats of paint. Easily mixed by adding water; applied with scrub brush to work thoroughly into masonry pores. Available in one color, white. Medusa Portland Cement Co., 1000 Midland Bldg., Cleveland 15, Ohio.

Super-Hot: ready-mixed aluminum paint, when applied to any metal surface, becomes permanently bonded to this surface upon subjecting painted metal to heat of from 500F to 1600F; maintains its brightness, will not crack, chip, or peel. Recommended especially as protective and decorative finish to furnaces, pipes, boilers, and other metal surfaces withstanding 1600F of heat. Sheffield Bronze Paint Corp., 17814 Waterloo Rd., Cleveland 19, Ohio.

Hydrocide Colorcoat: oil-based, exterior paint primes, seals, and finishes highly porous masonry surfaces in one application only; is said to withstand roughest abuse and weathering. Applied by brush or spray. L. Sonneborn Sons, Inc., 80 Eighth Ave., New York 11, N. Y.

insulation (thermal, acoustic)

Celotone: incombustible, acoustical tile molded from mineral fiber and special binders, with deep, irregularly shaped fissures providing shadowed texture similar to that of travertine. Available in thicknesses of 11/16″, 13/16″, and 15/16″, in 12″ x 24″ and 12″ x 12″ with square or beveled edges. Factory-applied white finish is thoroughly washable. Celotex Corp., 120 S. La Salle St., Chicago 3, Ill.

Sonofaced Tile: incombustible acoustical tile (for photo see p. 123, August 1952 P/A), consisting of 12″ x 12″ Fiberglas board faced with easy-to-clean plastic film which absorbs sound by diaphragmatic action; film serves as vibrating drumhead, transmitting sound waves into millions of tiny air spaces in Fiberglas board. *Now available in six basic decorator colors.* Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

sanitation, water supply, plumbing

"Close-Cupid" Horizontal Cellar Drainer: self-priming, centrifugal sump pump for use as protection against flooded cellars. Flexible assembly permits pump to be set away from sump pit up to maximum distance of 8′, if user finds it inconvenient to place pump on edge of sump. Units available for 2′ and 5′ pit depths. Goulds Pumps, Inc., Seneca Falls, N.Y.

Combination T & P Valves, 200 Series: new line of temperature and pressure relief valves, for use in preventing excessive pressure and temperature in hot-water tanks and heaters. Automatic resetting type; Btu-rated for proper selection. McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago, Ill.

Electric Water Cooler: completely packaged cooling unit with hermetically-sealed refrigeration system, designed for remote installation; will supply fresh cold water to as many as three separate drinking fountains. For use in hospitals, offices, terminals, and any location where there is need to save valuable floor space. Westinghouse Electric Corp., E. Springfield, Mass.

specialized equipment

"Space-Saver" Grill Stands: two new, all-metal units added to standard line of soda fountain and luncheonette equipment. Design offers choice of sraight or offset top for deep friers and up-draft, down-draft, or straight-out venting. Removable, laminated cutting board provides wide, ample working area. Storage facilities include readily accessible stainless-steel lower shelf, wide top shelf, and self-closing bread drawers. Units available in 5′ and 6′-6″ lengths. Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.

Drive-In Bank Window: electrically-operated, bullet-proof bank-teller's window offers effortless, fast operation, greater visibility, increased counter space, and considerably reduced installation costs; stainless steel trim around window is designed to eliminate grouting or concreting; two spacious drawers in counter. Safety devices protect deposit receptacle. Mosler Safe Co., Hamilton, Ohio.

pa MANUFACTURERS' LITERATURE

★ *Editors' Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.*

air and temperature control

1-199. Agitair Square and Rectangular Diffusers (RC 105), 4-p. bulletin giving dimensions and installation details for three types of square and rectangular air diffusers equipped with mounting frames and removable cores. Photos. Air Devices, Inc., 17 E. 42 St., New York 17, N. Y.

★ **1-200. Manual for the Design of Box-Plenum Type Air-Conditioning Duct Systems** (Project DGR-2-AC), 18-p. booklet. Design procedure for inexpensive types of air-duct systems for winter, summer, or all-year-conditioning units, with efficiencies equal to some higher-cost systems now in use. Worksheets for supply and return-air duct sizing; tables, drawings. American Gas Assn., 420 Lexington Ave., New York 17, N. Y. ($1 per copy; make out check or money order directly to American Gas Assn.)

1-201. Central-Control Panel Systems (F-5265), 8-p. bulletin outlining method of installing economical, automatic-electric, central-control panel system for heating and air-conditioning units. Advantages, wiring installation diagram. Barber-Colman Co., 150 Loomis St., Rockford, Ill.

1-202. Kno-Draft (K-29), 4-p. folder describing several types of high-pressure air diffusers, made to handle static pressures ranging from 1 to 4 in. water gage, duct velocities up to 3000 fpm, and 25-degree temperature differentials; air volumes precisely regulated from full open to completely closed positions by unit's calibrated damper. Types, uses, advantages, photos. W. B. Connor Engineering Corp., Shelter Rock Lane, Danbury, Conn.

1-203. Central Station—Cabinet Type Air-Conditioning Units (114), 4-p. folder defining function and purposes of four commonly accepted types of air-conditioning unit assemblies. Typical designs, specifications check list. National Assn. of Fan Manufacturers, Inc., 2159 Guardian Bldg., Detroit 26, Mich.

1-204. Water Tube Steam Generators, AIA 34-B-1 (B-3275), 6-p. bulletin on completely shop-assembled water tube boilers available in capacities from 7500 to 27,500 lbs steam per hour; can be fired with light or heavy oil, combination light or heavy oil and gas, natural, manufactured, or coke oven gas; erection time and expense claimed to be substantially reduced over conventional field-assembled or semi-packaged units. Dimensions, elevation drawings, operating data. Titusville Iron Works Co., Titusville, Pa.

1-205. Installing the Viking Attic Fan (528), 6-p. leaflet. Guide to proper location and mounting of compact, residential attic fan. Step-by-step installation photos. Viking Air Conditioning Corp., 5601 Walworth Ave., Cleveland 2, Ohio.

1-206. Package Air Conditioners, Models SCY-1050 and 1550 (C-1100-S81), specification sheet describing two packaged air-conditioning systems, of 10-ton and 15.5-ton capacities, respectively; cooling, dehumidification, ventilation, circulation, air cleaning (and heating if desired) provided by both units in five sizes. Capacities, photo. Worthington Corp., Harrison, N. J.

construction

3-167. Economy in Long-Span Steel Arches, Trusses, 4-p. bulletin illustrating representative types of patented steel arches. Advantages of arch-roof method, typical installation photos. Arch Roof Construction Co., Inc., 113 W. 42 St., New York 18, N. Y.

3-168. Pittsburgh Steeltex Floor Lath, AIA 4-E-2 (DS-133), 12-p. booklet. Description of combination form and reinforcement for concrete floors and roofs over steel or concrete-joist construction. Advantages, specifications, test data, safe loads table, installation data. Pittsburgh Steel Products Co., 1448 Grant Bldg., Pittsburgh 30, Pa.

3-169. Trip-L-Grip Framing Anchors, 4-p. folder. Instructions on use of adjustable framing anchors as joist hangers for any common span; claimed to be money-, labor-, and space-savers, and more economical than strap hangers. Advantages, span limits, application data, other uses. Timber Engineering Co., 1319-18 St., N.W., Washington 6, D. C.

doors and windows

4-202. Strand All-Steel Garage Doors (S-306), 16-p. folder illustrating five types of galvannealed-steel garage doors for 8′, 9′, and 16′ openings. Proper procedure for building garage-door openings in those sizes with minimum of trouble. Photos. Detroit Steel Products Co., Strand Garage Door Div., 3209 Griffin St., Detroit 11, Mich.

4-203. Duo-Glaze Windows and Doors, 6-p. leaflet on horizontal-sliding aluminum window and door frames designed to accommodate ½″ and 1″ dual glazing. Advantages, full-size details, typical installation. Glide Windows, Inc., 7463 Varna Ave., North Hollywood, Calif.

4-204. Overhead Operating Doors, AIA 17a2, 20-p. booklet on various types of overhead doors and equipment for industrial, commercial, and residential installations. Types, construction features, details, custom specifications, photos. Huck-Gerhardt Co., Inc., Luzerne & G Sts., Philadelphia 24, Pa.

4-205. Porch Enclosures, 4-p. folder illustrating uses of aluminum-framed, glass-louvered jalousies. Advantages, photos. Lud Corp., P.O. Box 4541, Miami, Fla.

Booklet and folder illustrating decor door designs, applied to both single-slid center-opening or two-speed passenger vator entrance doors. Photos. Otis Ele Co., 260 Eleventh Ave., New York, N. Y

4-206. Ornamental Designs for Otis vator Entrance Doors (B-812)

4-207. Special Entrance Designs (B-8

electrical equipment, lighting

5-137. Pushmatic Electri-Centers, AI D-3 (B-360), 8-p. bulletin on electric-co panel using "push-button" circuit brea designed to replace conventional fuse b in homes, small factories, and comme buildings. General information, types, s fications, accessories, illustrations. Bul Electric Products Co., 7610 Joseph Ca St., Detroit 32, Mich.

Two 4-p. catalogs, one describing se types of chrome-finished, recessed fixture all purposes; the other illustrating pe fixtures, portable table and pin-up s lamps, all of contemporary design. P illustrations. Pressteel Co., 800 Ban Way, Berkeley 2, Calif.:

5-138. Prescolite Lighting, Recessed S (R-7)

5-139. Prescolite Lighting, Architec Series (A-1)

finishers and protectors

6-77. Monco-Alochrom (C-54-8), 4-p. phlet. Advantages of decorative, alum chromium coating that provides wate protection for all surfaces; widely us factory and office interiors; exteriors of water towers, bridges, fire escapes, ga workshops, machinery and equipment, ies, etc.; heat resisting, impervious t and corrosion. Uses of individual g covering capacity. Monroe Co., Inc., Quebec Ave., Cleveland 6, Ohio.

6-78. Cuprisote, AIA 19-A-3, 4-p. fold scribing lumber treated with acid c chromate wood preservative. Types of cations, general data, consultation se applicable to treatment and preservati wood. Protexol Corp., 81 Market St., worth, N. J.

6-79. Hydrocide Colorcoat (BP-3055 folder. Data on pigmented oil paint a gregate coating for protection of old an masonry surfaces; primes, seals, an cracks in one operation; available i masonry colors and white. Color sa application directions. L. Sonneborn Inc., 80 Eighth Ave., New York 11, N.

insulation (thermal, acoustic)

9-81. Mono-Block and Powerhouse 52-J-33), 4-p. pamphlet. Description

ıting materials: porous, lightweight blocks made of black mineral wool and anic clay binder, with low thermal con- ity over entire temperature range; in- ng and finishing cement, consisting of ixture of black mineral wool, hydraulic g binder, and other ingredients, with al conductivity comparable to that of insulating cements. Advantages, tables ermal conductivity, photos. Baldwin- Co., 500 Breunig Ave., Trenton 2, N. J.

9-82. Insulations for Metal Build-ings, 8-p. booklet offering complete line of glass fiber acoustical and ther- insulations for metal building needs. uct data, insulation design considera- finishing instructions, photos, drawings. as-Corning Fiberglas Corp., Nicholas , Toledo 1, Ohio.

Perlite Insulating Aggregates, AIA 5, 21-C-1, 3-D-3, 4-p. folder containing fications for insulating perlite plaster erlite concrete. Mix designs, advantages, al applications. Perlite Mfg. Co., P.O. 478, Carnegie, Pittsburgh, Pa.

Porex, 8-p. brochure describing struc- slabs made of mineralized wood fiber d under pressure with portland cement, nsulating and acoustical treatment of , floors, walls, etc. Properties, where and used, allowable spans, specifications, il- ations. Porete Mfg. Co., North Arling- N. J.

Where and How To Use Stramit, 8-p. ıure on rigid building board, manufac- from ordinary wheat straw, with high ating and sound-deadening values, elim- ıg need for additional insulating mate- Properties, specifications, details, ns. The Strawick Co., 1847 N.W. 5 St., homa City, Okla.

sanitation, water supply, plumbing

36. National Disposer, 6-p. leaflet illus- ıg kitchen sink garbage disposer; fits ingle or double bowl with 3½" or 4" opening, or larger openings with spe- adaptor. Operation, installation data, ical rough-in diagrams, advantages, gen- pecifications. National Rubber Machin- o., Plumbing Equipment Div., 47-55 W. ınge, Akron 8, Ohio.

37. Fabricated Fittings by Nayler , 4-p. bulletin. Specifications and illus- ns of standard, carbon-steel fittings for eight pipe—elbows, tees, laterals, wyes, s, bends, hoods, etc. Fittings also avail- in other metals. Naylor Pipe Co., 1230 St., Chicago 19, Ill.

38. Symbols of the Modern Bath- , 4-p. folder. Dimensions and illustra- of recessed, stainless-steel towel dis- rs for light and heavy traffic areas in c lavatories. Scott Paper Co., Chester,

specialized equipment

19-289. Kitchen Products, AIA 35-C-12 (KP52), 28-p. catalog presenting full line of baked-enamel-finished steel kitchen equipment, including cabinets for all purposes, counter tops, various types of sinks and sink fittings. Illustrations, dimensions, selection guide, installation data, contents table. American Radiator & Standard Sanitary Corp., Bessemer Bldg., Pittsburgh 30, Pa.

19-290. Crosley Complete Kitchens (FL-8797-171), 12-p. catalog. Illustrations of rust-resistant, baked-enamel-on-steel refrigerators, ranges, sinks, cabinets, electric water heaters, counter tops, and accessories. Dimensions, features, specifications. Avco Mfg. Corp., Crosley Div., 1329 Arlington St., Cincinnati 25, Ohio.

19-291. Bessler Disappearing Stairway (500), 4-p. bulletin offering seven models in disappearing stairway line, adaptable to new or old residential needs; units permit quick, easy access to upper areas that otherwise might not be used in homes, garages, etc. Dimensions, illustrations. Bessler Disappear ing Stairway Co., 1900 E. Market St., Akron 5, Ohio.

19-292. Grant Cubicle Hardware, AIA 27-C, 4-p. bulletin showing construction features of hospital-cubicle curtain-track and assembly hardware. Typical plan views and other drawings, suggested specifications. Grant Pulley & Hardware Co., 31-85 Whitestone Parkway, Flushing, N. Y.

19-293. Rolling Gymstands, AIA 35-F-11 (R-52), 16-p. catalog describing combined wood and steel rolling gymstands. Design and construction, dimensions, specifications, planning aids for gym seating, photos, drawings. Wayne Iron Works, Wayne, Pa.

surfacing materials

19-294. Asphalt Roofing and Siding (4647E), 32-p. catalog covering line of asphalt roof shingles and siding products, illustrated with full-color pictures reproducing color blends, two-tone colors, and solid colors. Discussion of manufacturing process. Certain-teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa.

19-295. Dolomite Roofing Granules, AIA 12-B-1, data sheet containing new information on white, crystalline mineral granules for built-up tar-and-gravel type roofing. General data, comparative properties. Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.

vertical traffic

20-10. OILIFT Elevators, AIA 33, 16-p. catalog presenting line of oil-hydraulic elevators for freight and passenger service; wide range of installations, from small apartment house elevators to heavy-duty units capable of lifting fully loaded motor trucks from floor to floor in factories, warehouses, etc. Types and sizes, requirements, construction data, illustrations. Globe Hoist Co., Mermaid Lane & Queen St., Philadelphia 18, Pa.

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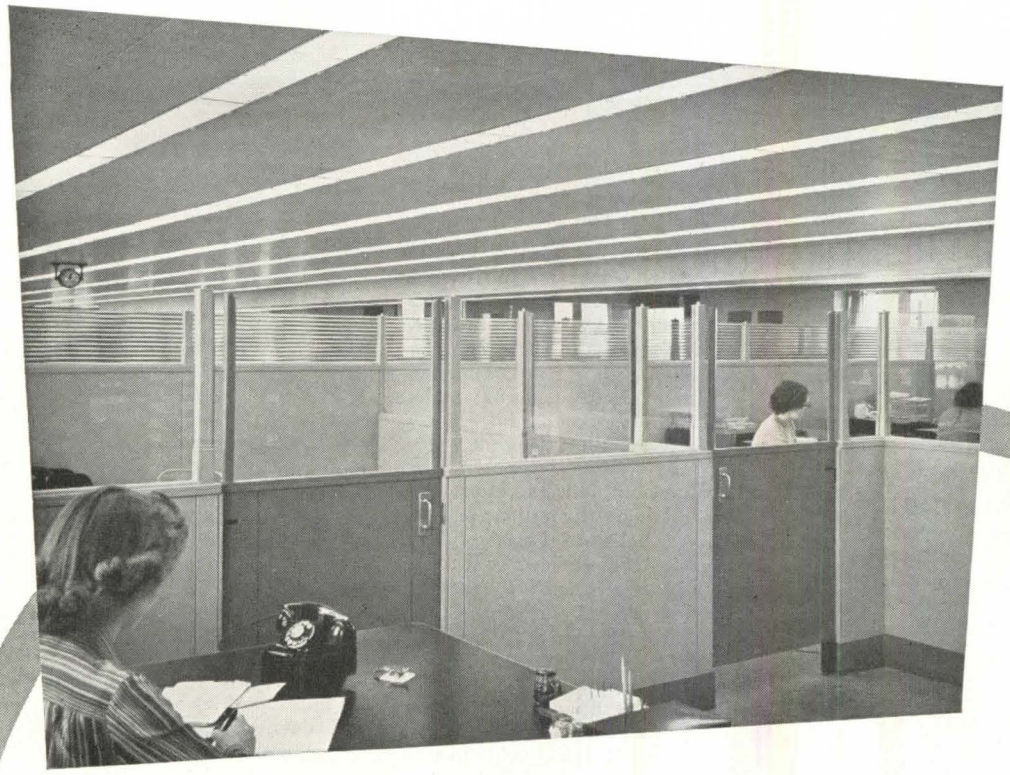

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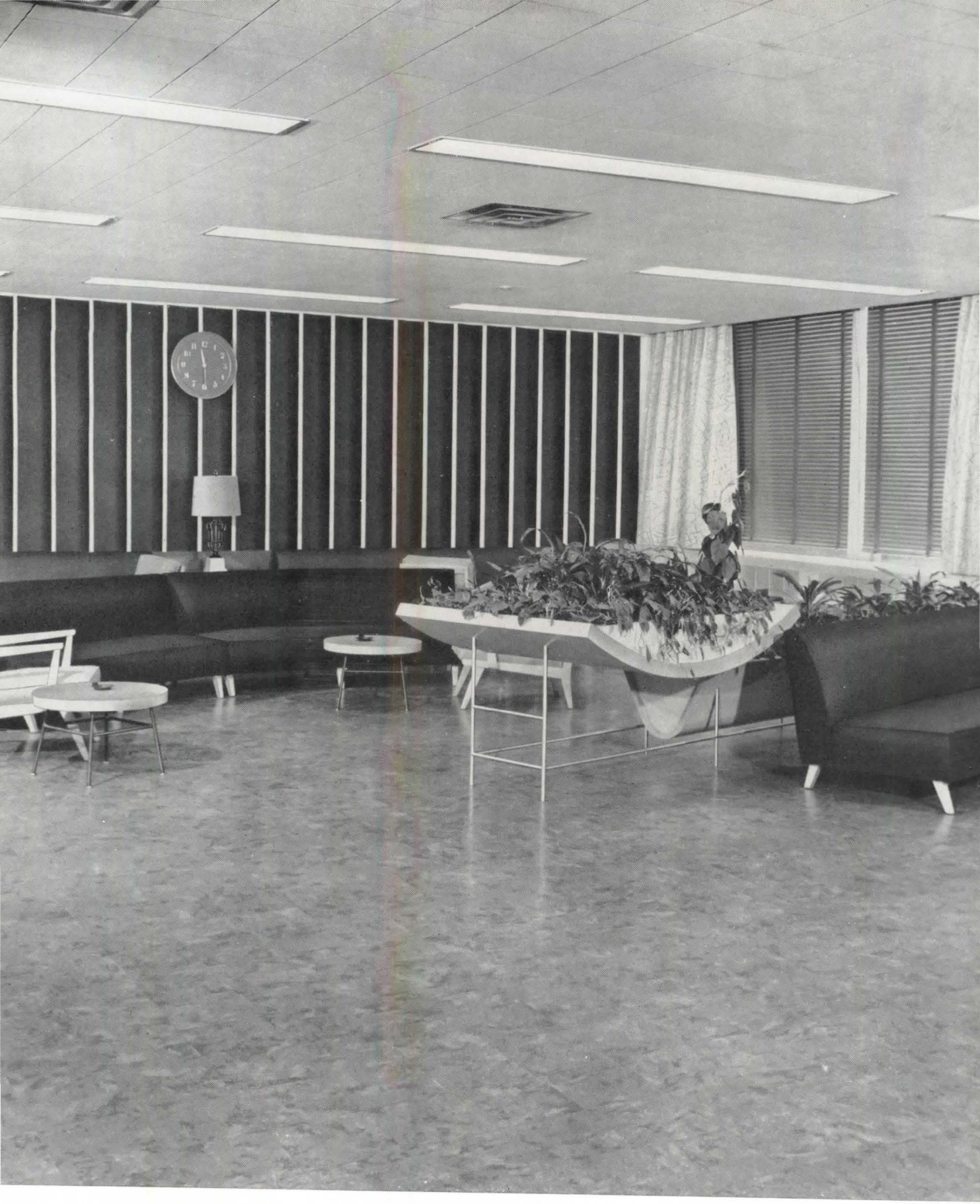

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employe facilities

he provision of employe lounge and recreation space—even dining space—is no longer considered a ıxury or a generous gesture in American business and industry, but is recognized as a functional ecessity, contributing to personnel efficiency. These may range from facilities which include a huge ining room—as in the U.N. Conference Building (pages 124-125) where 4000 people are saved ıe trouble of scattering all over the adjoining neighborhood to find restaurants—to a simple resting lace near the office work areas. But in all cases the standards for location, planning, and interior esign are the same.

The facilities should be near the work space, so that no time is lost getting back and forth, ut they should be sufficiently insulated from the sounds and the sights of the work itself so that a eal change of scene is provided. If a pleasant outside aspect is available, it should obviously be sed (as it has been in three of the four instances that follow).

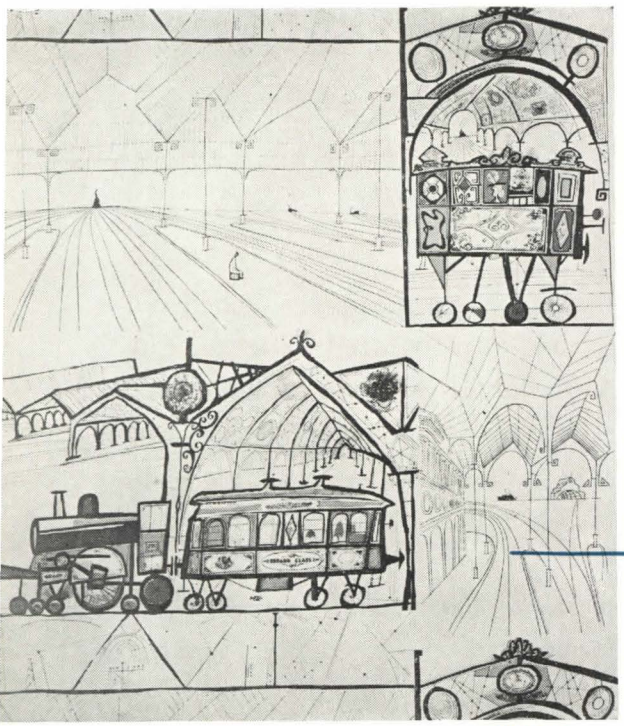
In plan and in furnishings, a distinction should be made between quiet lounging places, here one may rest, and recreation areas, for those who want to play games as relaxation. Fabrics ıd furniture, as well as wall and floor finishes, should be selected with two thoughts in mind—cre- ion of a gay, cheerful atmosphere, and resistance to the wear and tear of use and maintenance. (It interesting that three of the examples shown on the following pages have asphalt-tile floors; the urth—which includes an out-door terrace—uses stone. All four spaces are furnished with tables pped with laminated plastic.

Proper air conditioning is essential; carefully conceived lighting is equally necessary. Since asks" in these spaces vary from noise-making to somnolence, acoustical control is also of prime ıportance (the examples shown use four different acoustical materials, but they all recognize the ed for control). The problems here are interesting ones, and the solutions may be various, but e reigning criteria seem to be constant—cheerfulness, comfort, and durability.

p/a interior design data

employee facilities

location	U. N. Conference Building, New York, New Y
architect	U. N. Planning Office
director of planning	Wallace K. Harrison
interior design	Abel Sorenson, in charge

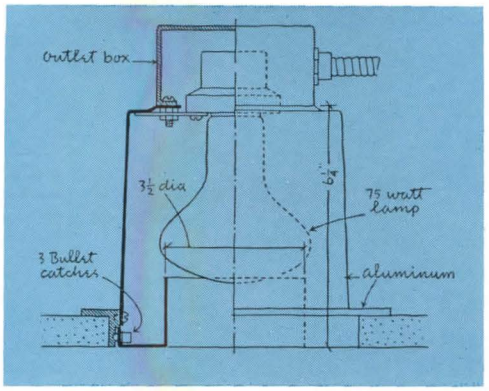


wallpaper

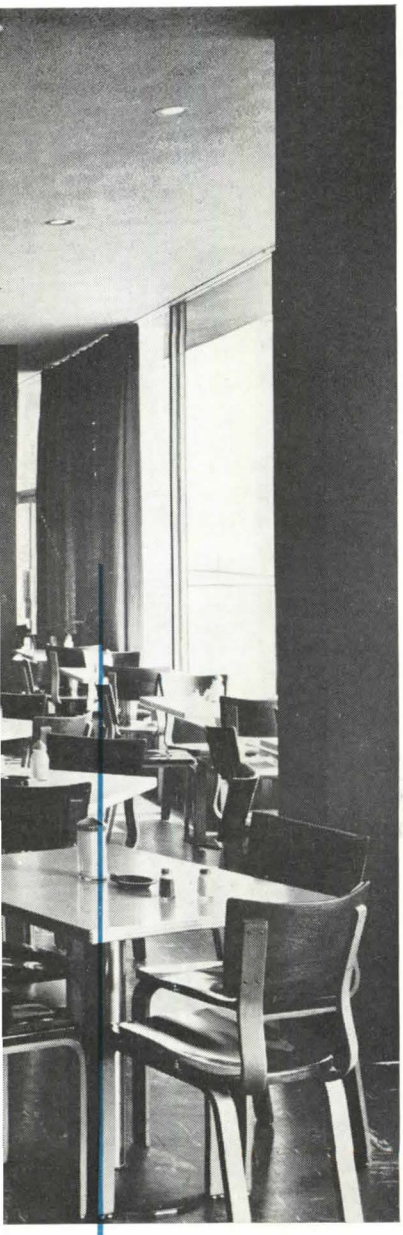
acoustical plaster

asphalt tile

ceramic tile



lighting



belgian linen

An outstanding fact about this employes cafeteria is that it has a clientele of four thousand from more than sixty countries. It is equipped to serve four hundred at one time. The decoration has a sort of universal quality—the wall behind the service area is red over a white tile wainscot, the columns are blue-green, the draperies are panels of solid red, solid yellow, and solid green, and the wallpaper is a multi-colored print on a white ground. Every nation could find its own colors.

Most of the exterior wall is glass, but supplementing the natural light are spotlights recessed in the ceiling, which are trained over the individual tables, and stronger ones which highlight the food at the service tables.

Few dining places can boast the magnificent view this one has, nor can they afford a changing panorama of this scale.

Photos: Gottscho-Schleisner

data

Chairs: #1216/ solid saddle-seat, solid back/ walnut finish on hardwood/ bent-plywood legs and supports for back/ Thonet Industries, Inc., 1 Park Ave., New York, N. Y.

Tables: #3163/ metal pedestal base, aluminum column/ 30" sq. top, tan linen Formica/ Thonet.

Draperies: L/ Belgian linen/ Konwiser, Inc., 39 W. 17 St., New York, N. Y.

Cabinetwork: designed by United Nations Headquarters Planning Office

Wallpaper: "Trains"/ designed by Saul Steinberg/ Piazza Prints, Inc., 509 Madison Ave., New York, N. Y.

Flooring, dining area: asphalt tile/ Kentile, David E. Kennedy, Inc., 58 Second Ave., Brooklyn, N. Y.

Flooring: quarry tile/ Carlyle Mfg. Co., Ironton, Ohio

Ceiling: acoustic plaster/ "Kilnoise"/ Kelley-Island Lime & Transport Co., Cleveland, Ohio

Windows: aluminum sash/ General Bronze Corporation, Garden City, Long Island

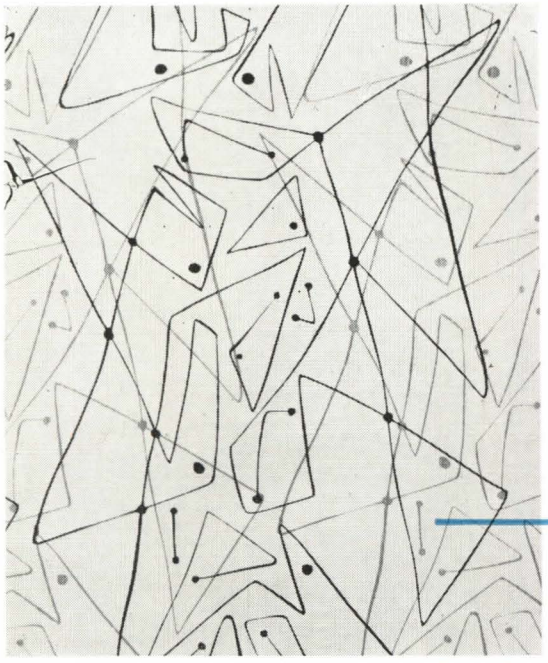
Air conditioning: conventional comfort cooling/ ceiling diffusers/ Anemostat Corp. of America, 10 E. 39 St., New York, N. Y.

Convectors: Vulcan Radiator Co., 50 Church St., New York, N. Y.

Paint: Mercatone Flat Finish, M. J. Merkin Paint Co., 1441 Broadway, New York, N. Y.

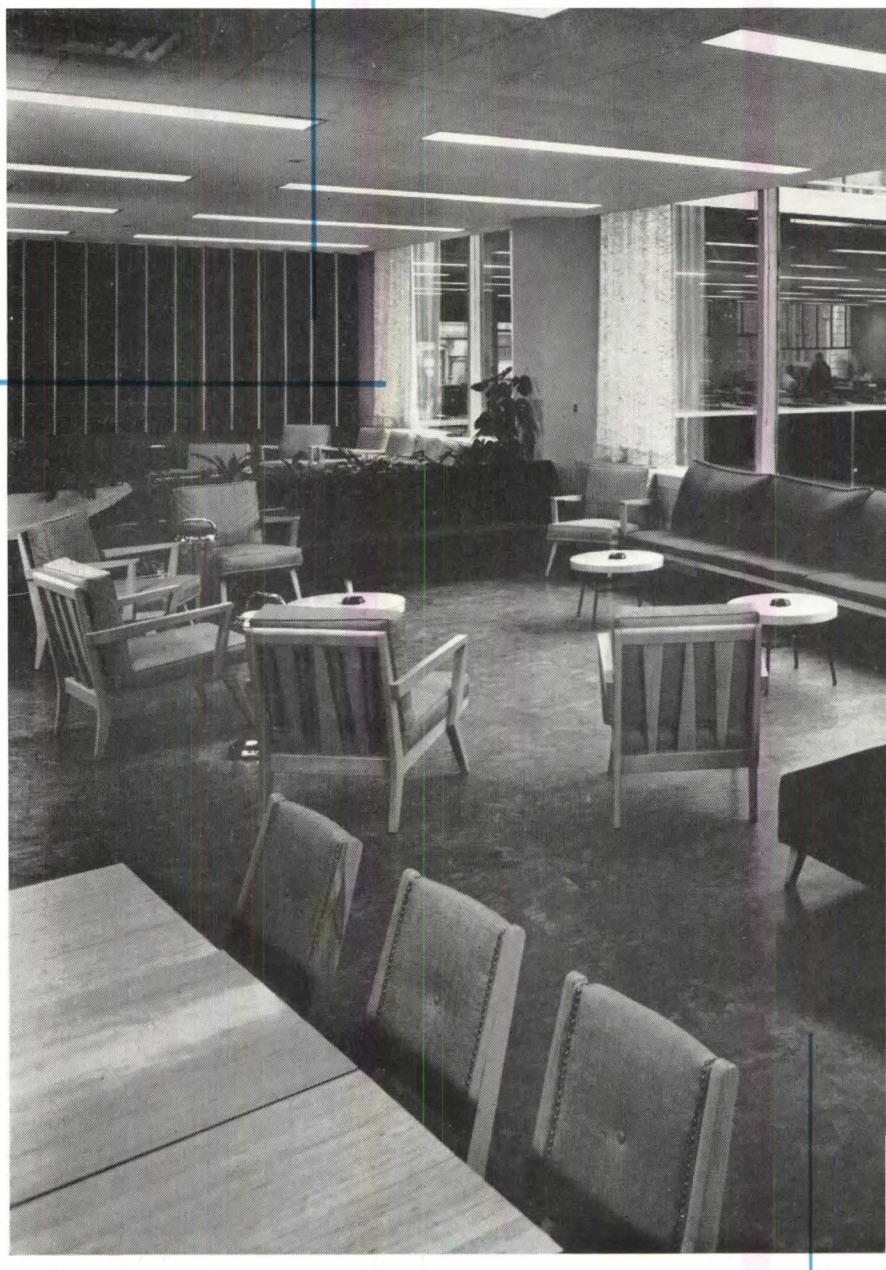
employee facilities

location | Lever House, New York, New Yor
architects | Skidmore, Owings & Merrill
interior designers | The Raymond Loewy Corporation

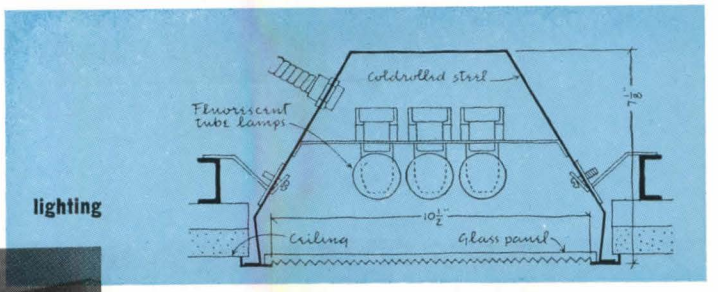


draperies

louver screens



asphalt tile



Various areas of the employes lounge at Lever House, those for lounging and those for game playing, are separated by louvered-screen walls and planted boxes which extend from the window wall. The decoration, mainly in greens and yellows and simple in execution, lends its part to the creation of an airy, informal atmosphere. Lighting, achieved by the uncluttered window wall overlooking the central court and by inconspicuous yet effective flush-fluorescent ceiling fixtures, has become a very real part of the decoration. The drapery fabric, a fine-lined abstract pattern in three values of green on a light ground, forms an effective frame and contributes to the lightness of the lounge.

Photos: Don Morgan

data

Lounge chairs: natural-wood finish/ executed by Advance Design, Inc., 45 W. 33 St., New York, N. Y./ **upholstery:** emerald green, chartreuse, yellow plastic upholstery/ F. Schumacher & Co., 535 Madison Ave., New York, N. Y.

Occasional chairs: Advance Design, Inc.,/ **upholstery:** yellow-beige plaid/ Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.

Sofas: Advance Design, Inc.,/ upholstery, black and gold metallic fabric/ Goodall Fabrics, Inc., 525 Madison Ave., New York, N. Y.

Card tables, cocktail tables: legs, black-painted metal/ topped with grass cloth Formica-treated/ designed by the Raymond Loewy Corporation/ executed by Advance Design, Inc.

Planting boxes: blond-wood troughs/ brushed-brass pipe legs/ designed by the Raymond Loewy Corporation/ executed by Ebner & Raible, 319 E. 64 St., New York, N. Y.

Louver screens: designed by The Raymond Loewy Corporation/ executed by Ebner & Raible.

Draperies: "Busy Bye Ways"/ designed by Ruth Adler/ three-value green on light ground/ Creative Looms, Inc., 210 E. 51 St., New York, N. Y.

Fluorescent lighting: Ruby Philite Corp., 32-02 Queens Blvd., Long Island City, N. Y.

Flooring: green textured asphalt tile/ Tile-Tex Division of the Flintkote Co., 630 Fifth Ave., New York, N. Y.

Ceiling: "Softone" acoustical tile/ American Acoustics, Inc., Keyport, N. J.

Windows: "Solex" plate glass, heat-absorbing/ Pittsburgh Plate Glass Co., 2108-A Grant Bldg., Pittsburgh, Pa.

p/a interior design data

employee facilities

location | International Minerals & Chemical Corp., Bartow, Florida

architects | Robert Law Weed & Assoc.

data

Upholstered armchairs and settees: #3001 #3003/ aluminum frame/ coil spring construction/ plastic upholstery/ Globe-Wernicke Co., 5029 Carthage Ave., Cincinnati, Ohio.

Aluminum chairs: varicolored plastic webbing/ Bird Mfg. Co., Clearwater, Fla.

Aluminum tables: Formica tops/ Bird Mfg. Co., Clearwater, Fla.

Walls: Brikcrete/ terra-cotta colored from salmon pink to deep red/ Brikcrete, Inc., Tampa, Fla.

Louvered concrete block: Munday block/ George Munday, 3655 NW 7 St., Miami, Fla.

Flooring: Crab Orchid, Tennessee stone flagging

Lighting: "Slim-Line" fluorescent/ Pittsburgh Mfg. Co.

Air Conditioning: Westinghouse/ Titus Airfoil Direction Grills/ Titus Mfg. Co., Waterloo, Iowa

Ceiling: "Porex" roof slabs, Porex Mfg. Co., North Arlington, N. J.

This particular lounge fills a very real need—and admirably. Most of the employes bring their lunches to work, because there is no suitable nearby place to eat. A terrace and an air-conditioned lounge, apart from the busy workings of the organization, give the employes a pleasant, comfortable resting place where they may enjoy the out-of-doors. Normally, the terrace (which is semi-enclosed), is ideal, because the entire wall is louvered concrete block which gives privacy from the street, but ventilation in the direction of the prevailing wind.

The inner area needs no draperies because the surrounding grounds are shady, noise is absorbed by an acoustical ceiling, and Nature supplies the decoration. *Photo: Jack Holmes*

data

Sofa: #37/ clear birch, natural finish legs/ 78" x 33½" x 31"/ 8½ yards to cover/ app. retail $270/ Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.

Arm chair: #35/ clear birch, natural finish legs/ 29" x 33½" x 31"/ 4½ yds. to cover/ app. retail $168/ Knoll.

Wood-frame chair: clear birch, natural finish/ upholstery, foam rubber and cotton felt, no-sag springs/ 23½" x 29½" x 29½"/ 2½ yds. to cover/ app. retail, $96/ Knoll.

Webbed chair: #652W/ clear birch, natural finish/ 24" x 28" x 29½"/ cotton or plastic webbing, available in brown, green, red, gray, black and white, white, yellow/ app. retail $48/ Knoll.

Side chairs: clear birch, natural finish/ 17½" x 21" x 30½" high/ ½ yard to cover/ app. retail $33/ Knoll.

Stacking tables: #106/ birch/ black or white Formica tops/ Knoll.

Drapery fabric: #K300/ "Apples"/ Stig Lindberg design/ app. retail $4.80 a yard/ Knoll.

Bamboo curtains: Bamboo & Rataan Works, Hoboken, N. J.

Masonite panels: executed by Knoll Planning Unit.

Flooring: Asphalt tile/ Tile-Tex Div. of The Flintkote Co., 630 Fifth Ave., New York, N. Y.

Acoustical ceiling: Metal Pan Acoustic, Armstrong Cork Co., Lancaster, Pa.

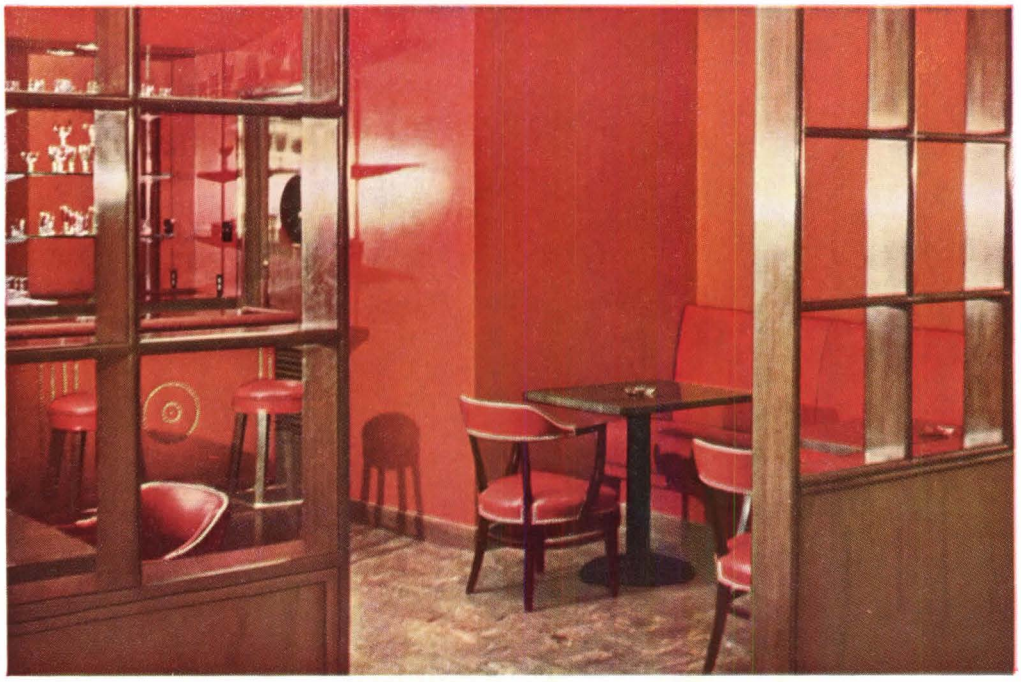
Lighting: Day-brite Lighting Inc., 5411 Bulwer Ave., St. Louis, Mo.

Air Conditioning: Carrier Corp., Carrier Building, Syracuse, N. Y.

In the basement of this office building is a combination recreation and dining room. Screens in varying textures—Masonite, bamboo, and fabric—divide the areas, but permit flexibility in arrangement. All fabrics and materials have been carefully chosen to be extremely durable and practical, with minimum housekeeping necessary. Many of the fabrics are plastic, and the table tops are both cigarette-proof and stainproof.

Photos: Knoll Associates, Inc.

location	Auto-Owners Insurance Co., Lansing, Michigan
architects	Lee & Kenneth Black
rior designers	Knoll Associates, Inc.



Above: Engineers Club, Dallas, Texas. Architect: Everett Welch. Walls and upholstered furniture in bar covered in Special Tomato Red Kalistron.

UNBELIEVABLE DURABILITY

on our walls and furniture...

That's the comment frequently heard about *Kalistron* installations. When walls, doors, columns or furniture are covered with Kalistron, they literally defy the wear and tear of "heavy duty" service. Years after installation, the Kalistron is still in excellent condition . . . unmarred, unscratched, with practically no sign of wear.

Kalistron is different because its color is fused to *underside* of clear sheet of wear-resistant Vinylite. Since nothing can touch this under-surface, Kalistron's beauty stays fresh and new-looking.

Kalistron cannot chip, crack or peel; minimizes maintenance costs. Cleans easily with a damp cloth. In 28 standard colors: special colors matched.

SEND COUPON BELOW for sample of Kalistron and nail-file. Test Kalistron yourself . . . prove its unbelievable durability.

Kalistron†
PAT. APPLIED FOR
←COLOR FUSED TO UNDERSIDE
PLASTIC COVERING MATERIAL

U. S. Plywood Corp., Dept. F-13
55 West 44th St., New York 18

Please send me FREE Nail-File Test (swatch of Kalistron plus actual nail-file) and folder "Facts About Kalistron."

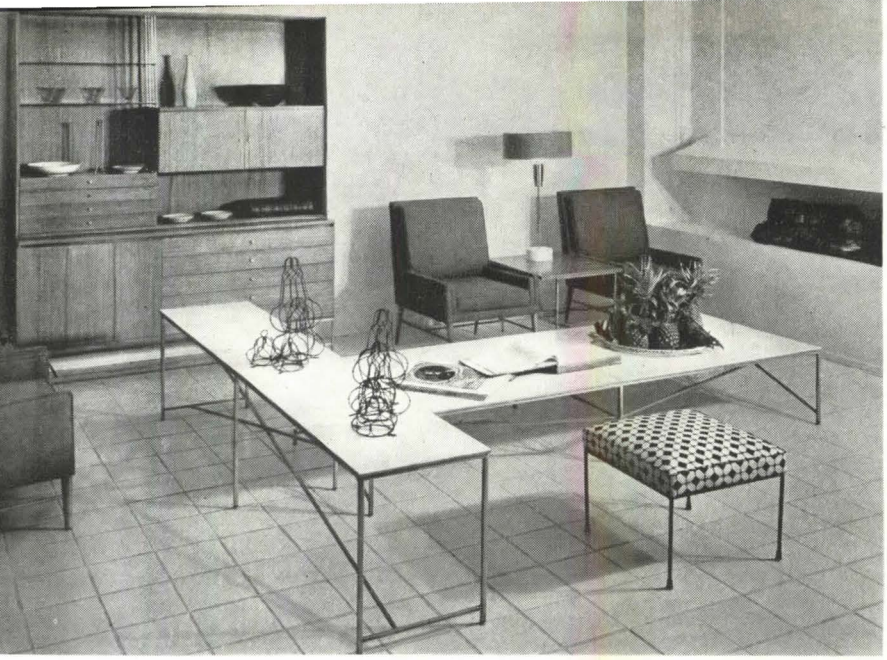
NAME_____

ADDRESS_____

Distributed by: UNITED STATES PLYWOOD CORP., N. Y. C.
and by: DECO SALES, 408 Freylinghuysen Ave., Newark, N. J.
In Canada: PAUL COLLET & CO., LTD., MONTREAL

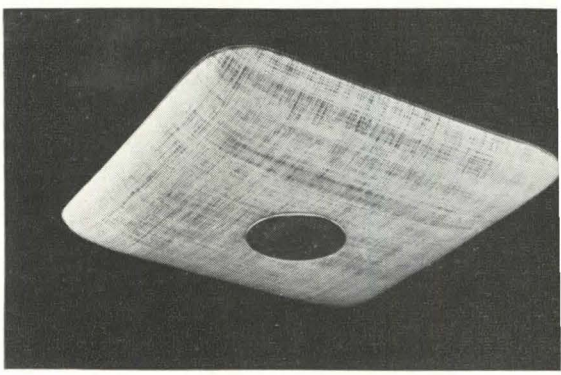
†TRADEMARK

Color fused to underside of transparent vinyl sheet . . . backed by flocking

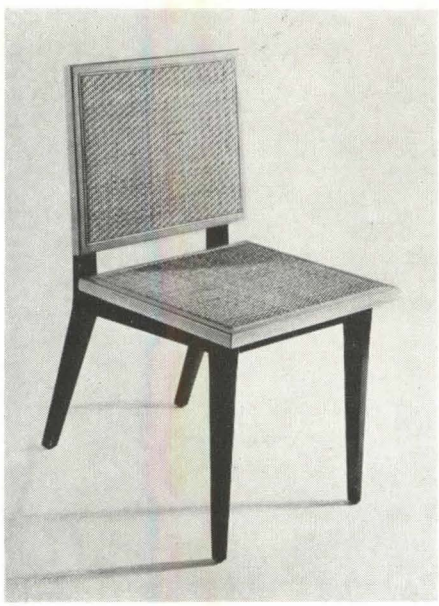


Living Room Furniture: designed by Paul McCobb/ **cocktail tables**/ vitrolite glass top, brass base/ 96" x 36"/ **retail:** $350/ 22" x 18"/ **retail:** $250/ **breakfront**/ 72" wide x 84" high/ fold screen door in base/ #8006 top/ **retail:** $550/ #8506B base/ **retail:** $400/ **end table**/ #8722/ 28" x 24" x 20" high/ **retail:** $60/ **high back lounge chairs**/ **retail:** $148 in muslin/ **B. G. Mesberg National Sales, 201 E. 57 St., New York, N.Y.**

Ceiling Light Fixture: #4624/ linen-like textured glass with pewter disk/ diffuses light over large area/ 18" square, 4" deep/ **retail:** $20/ **Lightolier, Inc., 11 E. 36 St., New York, N.Y.**

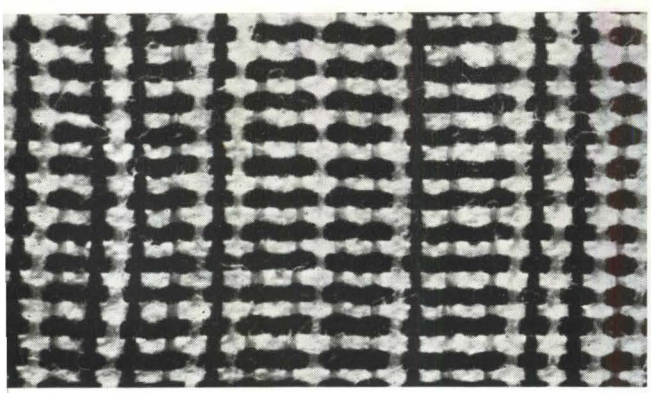


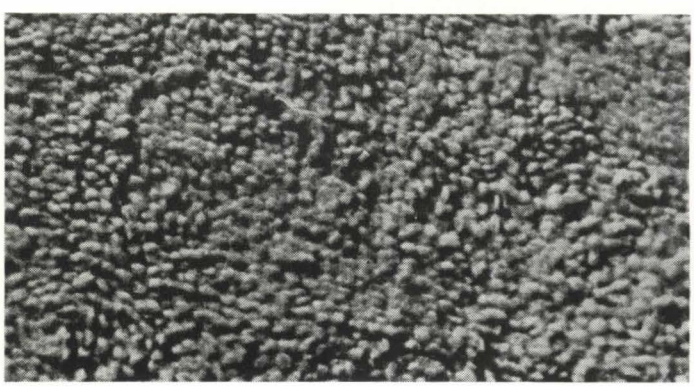
Side Chair: #512/ oak with Sunrise finish or Midnight Black lacquer legs, with or without cane/ **designed by Edward D. Stone,** Architect/ **retail:** $45/ **Fulbright Industries, P.O. Box 417, Fayetteville, Ark.**

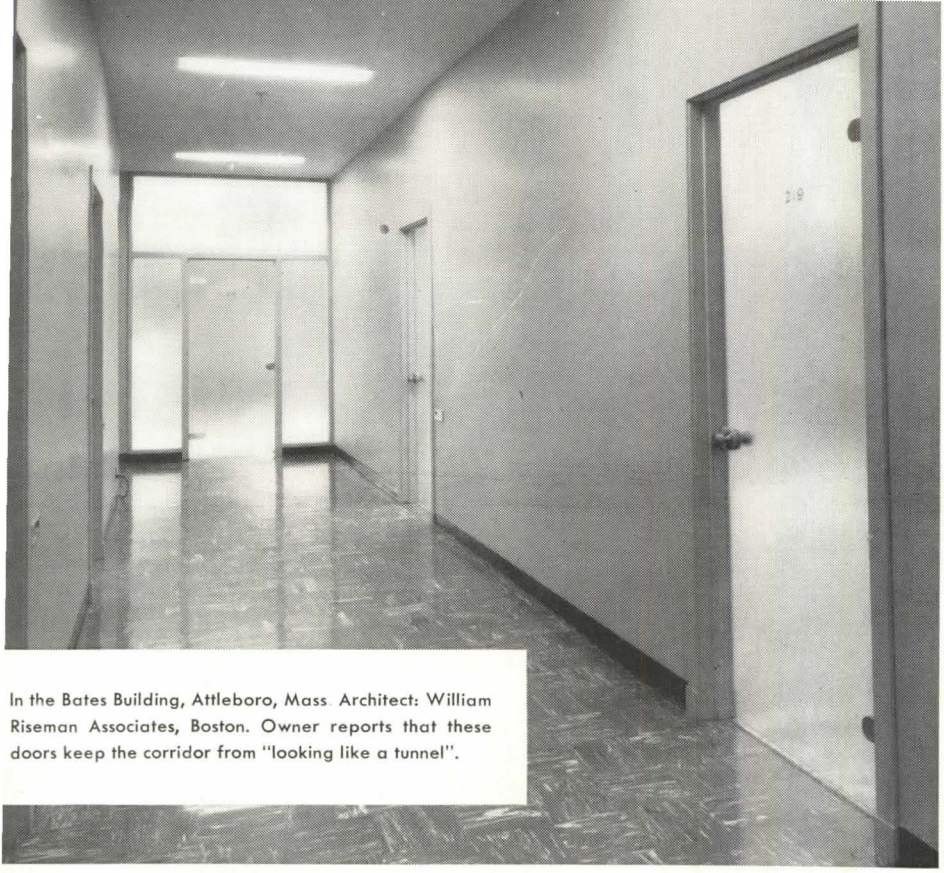


Jute and Cotton Textile: designed by Jack Larsen/ has texture of tweed and looks handwoven/ available in taupe, gold, olive, orange, turquoise, and black-and-white/ width 54"/ **retail:** $13 a yd. **Thaibok Fabrics, Ltd., 37 E. 61 St., New York, N.Y.**

"Nobility" Rayon Carpeting: constructed of "Spunvis" viscose yarn/ 3/4" pile/ designed by John and Earline Brice/ wear and stain resistant/ can be had in 9' and 12' seamless widths and a large range of standard rug sizes/ available in 14 colors/ **retail:** $9.95 a sq. yd./ **Needle-tuft Rug Div. of Cabin Crafts, Inc., Dalton, Ga.**







In the Bates Building, Attleboro, Mass. Architect: William Riseman Associates, Boston. Owner reports that these doors keep the corridor from "looking like a tunnel".

LIGHTEN INTERIORS

with this flush door of translucent glass

The Blue Ridge *Securit* Interior Glass Door creates a feeling of lightness that's in keeping with modern interiors.

It actually does make them lighter, for it lets light pass from room to room. Yet the Muralex pattern in this big, clean slab of lustrous glass obscures vision to provide privacy.

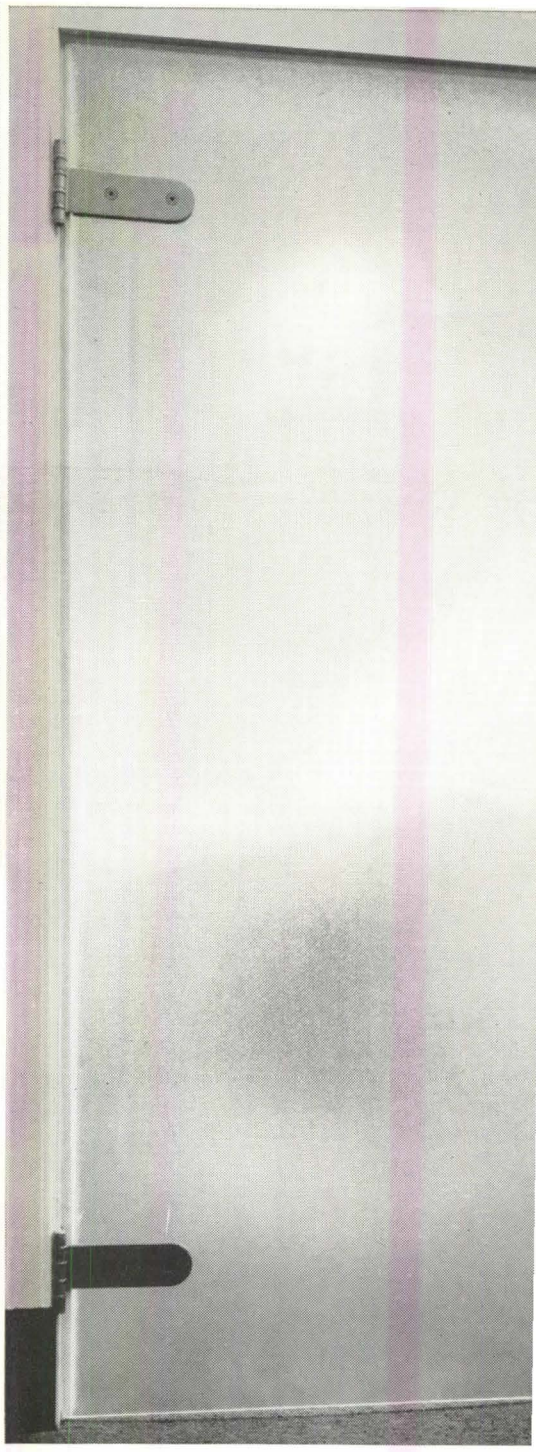
This modern flush door is both attractive and practical. It's tempered for toughness. It swings freely on specially designed, ball-bearing Stanley Hinges. It is equipped with modern Sargent Hardware.

SEE OUR CATALOG IN SWEET'S

And you can get the *Securit* Door already drilled to take Sargent door closers or concealed LCN closers.

Installation is simple and quick. No cutting, mortising, drilling or painting. All hardware and complete instructions come with each shipment.

Securit Doors add a note of elegant simplicity to interiors. Keep them in mind as you plan for offices, stores, hotels, hospitals and homes. Their installed cost compares favorably with quality doors used for interiors. Ask your L·O·F Distributor or Dealer for further details; or mail the coupon.



Modernization of offices in the Fisher Building, Detroit, Michigan, features *Securit* Doors.

BLUE RIDGE GLASS CORP. KINGSPORT, TENN. MANUFACTURERS OF QUALITY GLASS

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INTERIOR GLASS DOO

BRIEF DATA

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

Tempered—3 to 5 times stronger than untempered glass of same thickness.

Reversible—can be used right or left hand.

Standard Sizes—2'6" x 6'8", 2'8" x 6'8", 3'0" x 6'8", 3'0" x 7'0".

—also 4 sizes for openings of these dimensions with proper allowance for clearances.

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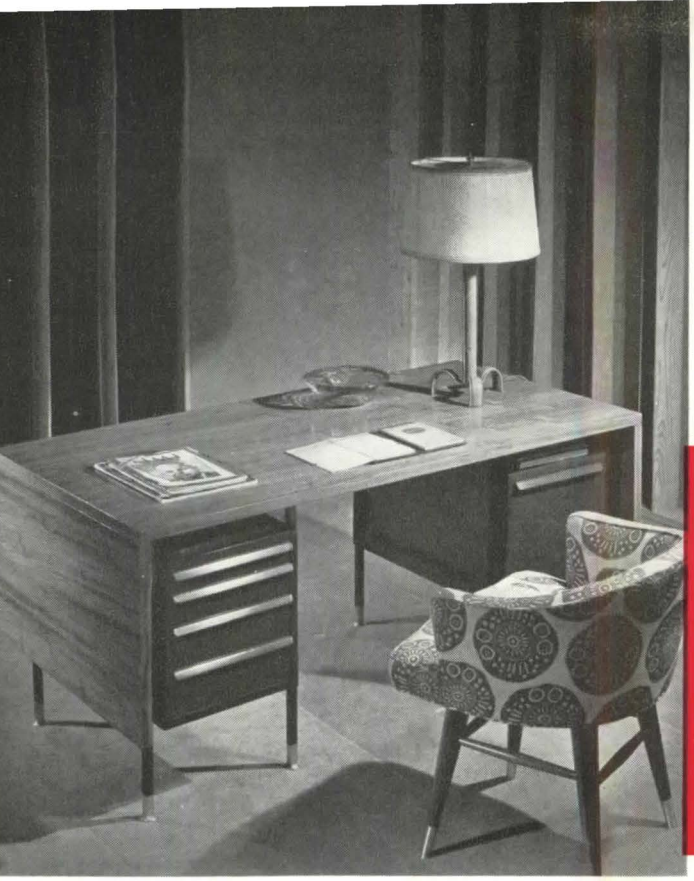
Patterned & Wire Glass Sales
B-22102 Nicholas Building, Toledo 3, Ohio.

Please send me your folder on *Securit* Interior Glass I

Name (please print) _____

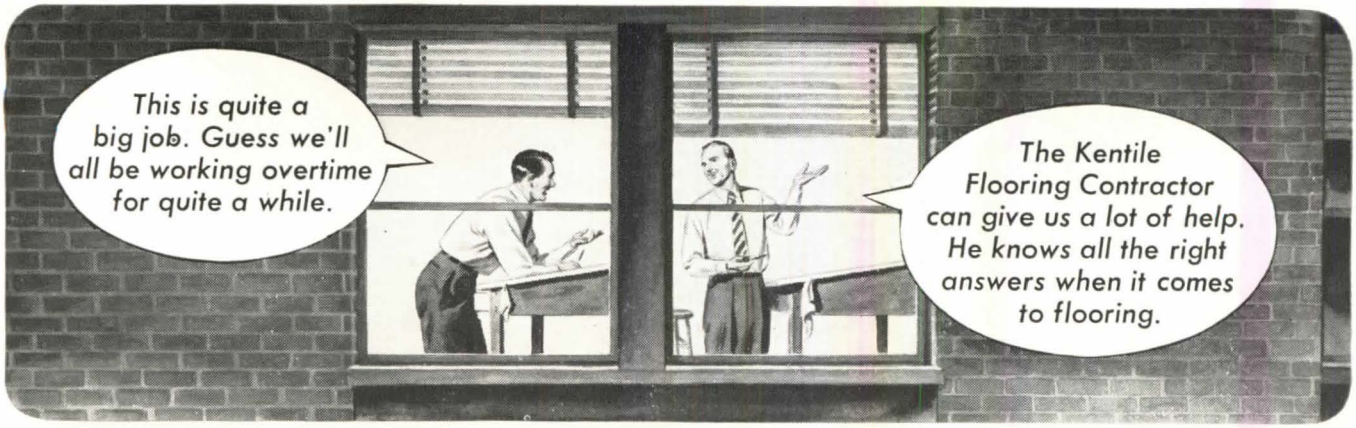
Address _____

City _____ State _____



Drop-leaf Desk: #5265/ 60" long and 20" wide/ extends to 88" with leaves raised/ mahogany cabinets are suspended in slim brown baked-lacquer steel frame/ one side has flexible partitions file drawers, the other regulation desk drawers/ recessed section for books at back/ feet and anklets of brass/ designed by Edward Wormley/ **retail:** $892/ **Dunbar Furniture Corp., Berne, Ind.**

Aluminum "Lattishade": window shade/ originally created for the S.S. United States/ 5/8" aluminum slats and rods, woven together with a decorative warp design/ mounted on conventional shade rollers/ **approx. retail:** $.85 a sq. ft./ **The Columbia Mills, Inc., Syracuse, N.Y.**



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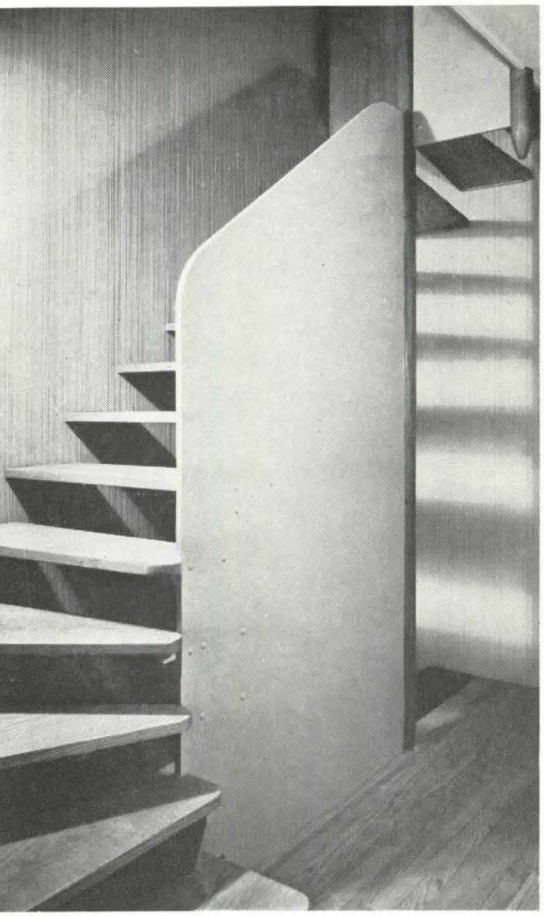
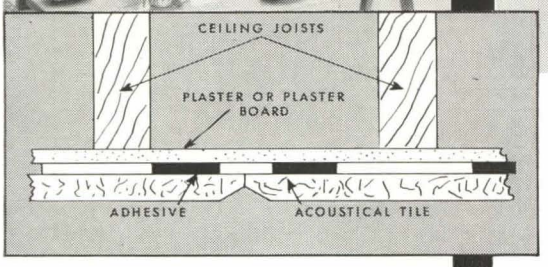


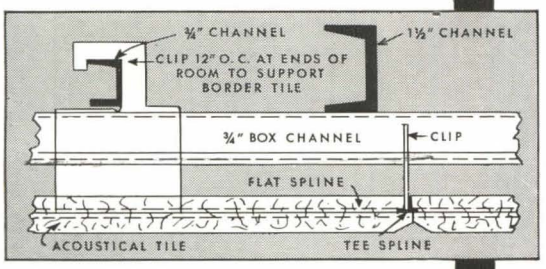
DNEY McKAY MORGAN

ANFRED PAYER RESIDENCE, Morristown, N. J.

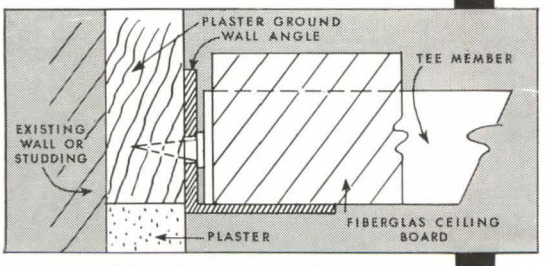
ıst Payer, Architect



ADHESIVE APPLICATION



MECHANICAL APPLICATION
(TILE)



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that's easy to install...

Whether you plan an acoustical ceiling for a new building, or include it as part of a remodeling scheme, Fiberglas* Sound Control Products are easily installed. They offer the advantage of being light in weight, with resultant savings in suspension system materials and installation time.

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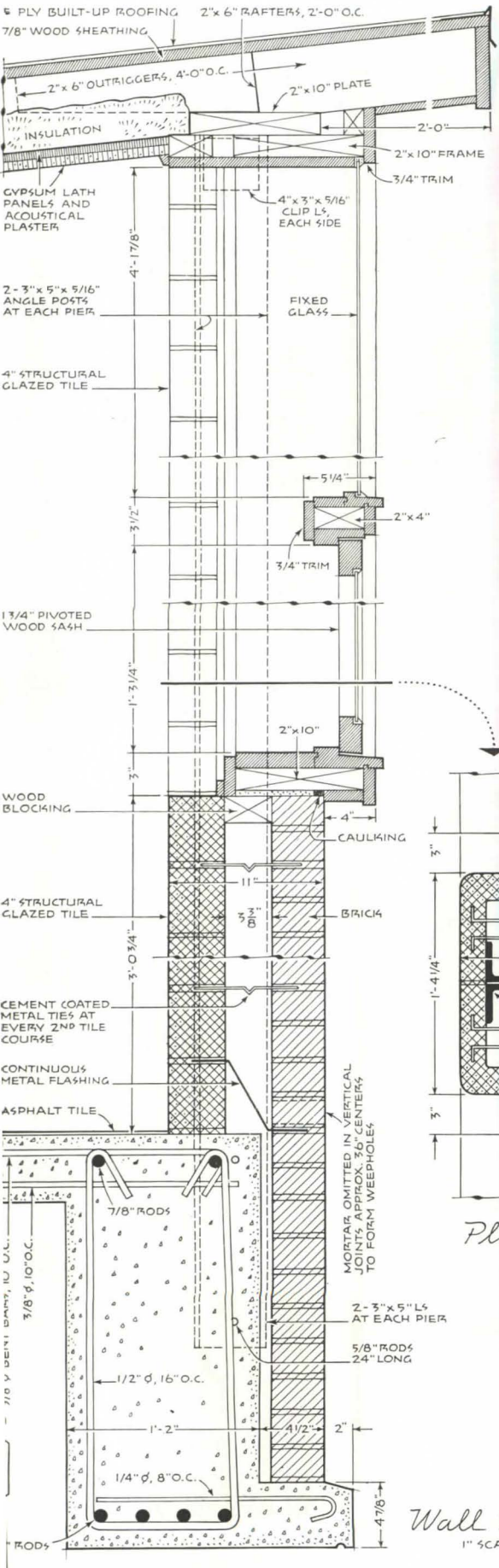
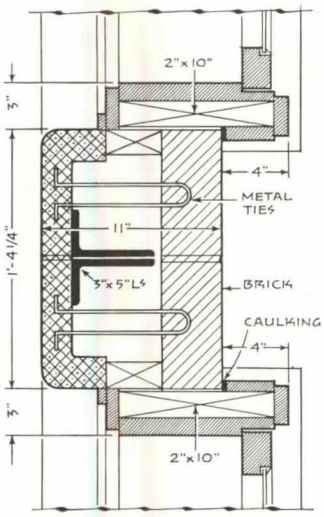
school: covered bridge

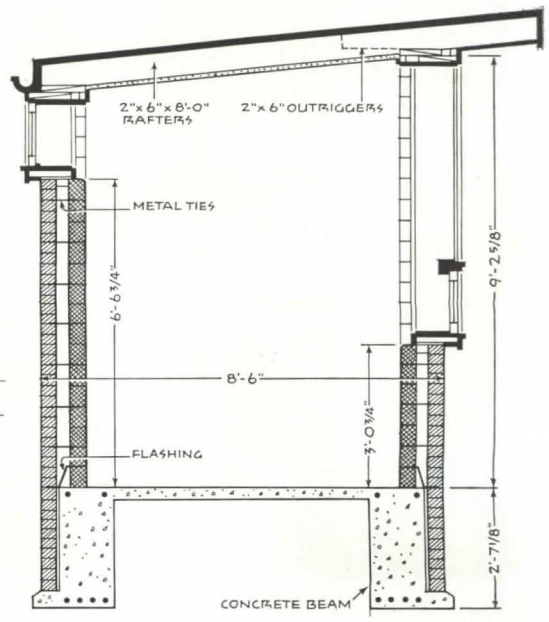
SUZANNE SZASZ PHOTOS



Wall Section
1" SCALE



Plan at Pier
1" SCALE



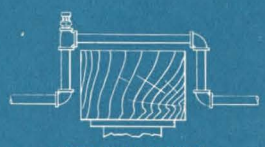
Bridge Section
1/4" SCALE

OST ROAD SCHOOL, Rye, N. Y.
aleb Hornbostel, Architect

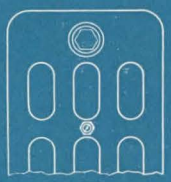
HOFFMAN HOT WATER VALVES

A TYPE FOR EVERY VENTING REQUIREMENT

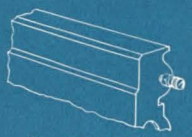
Announcing No. 500 UNIVERSAL AIR VENT



FOR HIGH POINTS

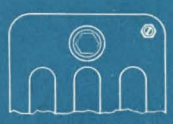


FOR STEAM RADIATORS

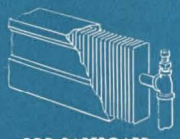


FOR BASEBOARD RADIATION

FOR CONVECTOR RADIATORS

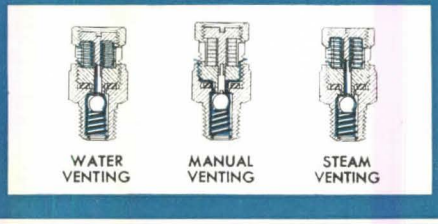


FOR HOT WATER RADIATORS



FOR BASEBOARD RADIATION

Now, one Hoffman Radiator Valve will vent *all* systems—automatically! Only one Valve to stock—one twist to adjust for Manual, Steam or Hot Water venting. Nothing to get out of order. Valve can be cleaned of leak-sealing compounds or minerals without draining water system. Hygroscopic fibre discs *automatically* open to allow air to vent, *automatically* close against steam or water. Selector Screw controls the rate of venting. Operates at maximum steam pressure of 15 lbs., and maximum water pressure of 50 lbs.



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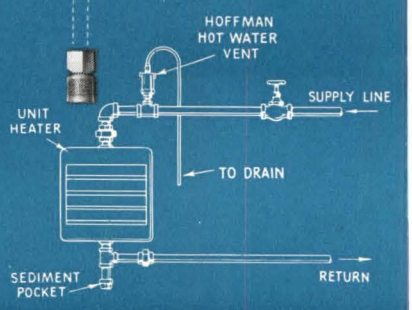
NO. 791 LOW PRESSURE HOT WATER VENT

Another Hoffman star-seller for low pressure water systems. All brass construction. When water is encountered float rises to seal pin in seat and prevent water leakage. Can be taken apart for cleaning. Typical applications include Unit Heaters, Hot Water Heating Systems, any installation where the pressure does not exceed 35 lbs. Size conn.: ¼".

Valve is threaded for a drain, furnished on order at extra cost. Drain pipe guides moisture from vented air to convenient location.



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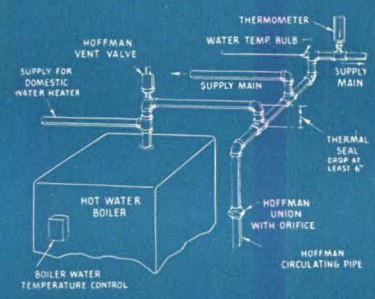
A typically fine quality Hoffman Vent Valve developed for positively removing air from the piping of any hot water system. This valve will give continuous venting under all conditions. Drawn brass body, nickel trim. Tapped at top for ¼" pipe connection to conduct away moist air, where needed. Size conn.: ¾" male, ½" female. Max. operating press. 75 lbs.



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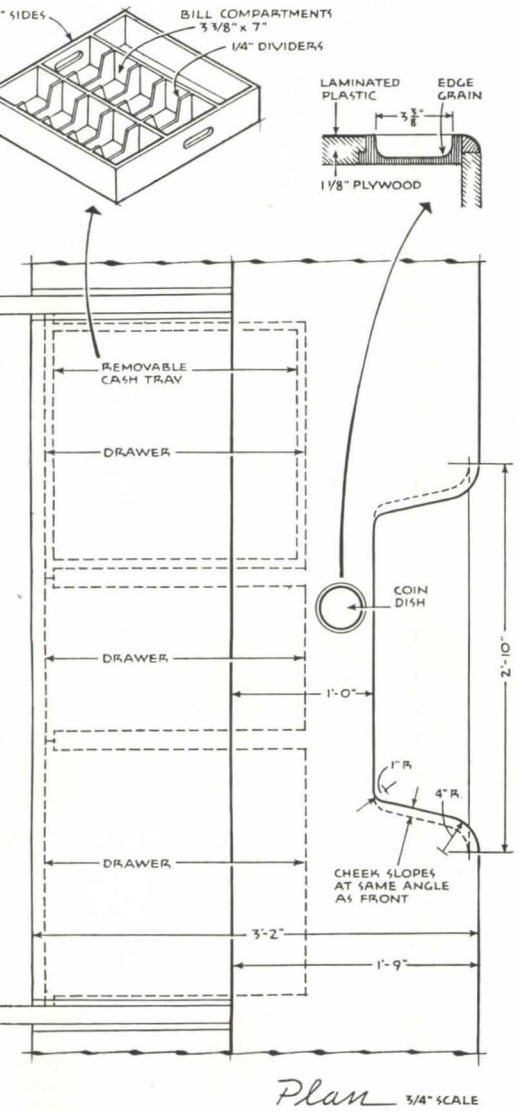
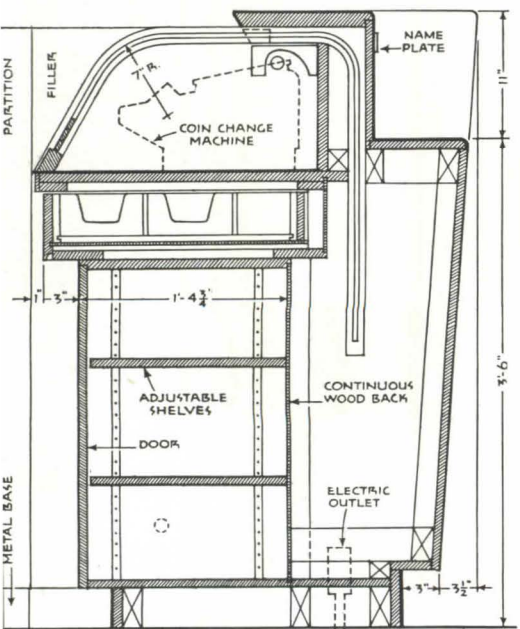
Makers of Valves, Traps, Hot Water Heating Systems, Vacuum and Condensation Pumps . . . Sold by Leading Wholesalers of Heating and Plumbing Equipment



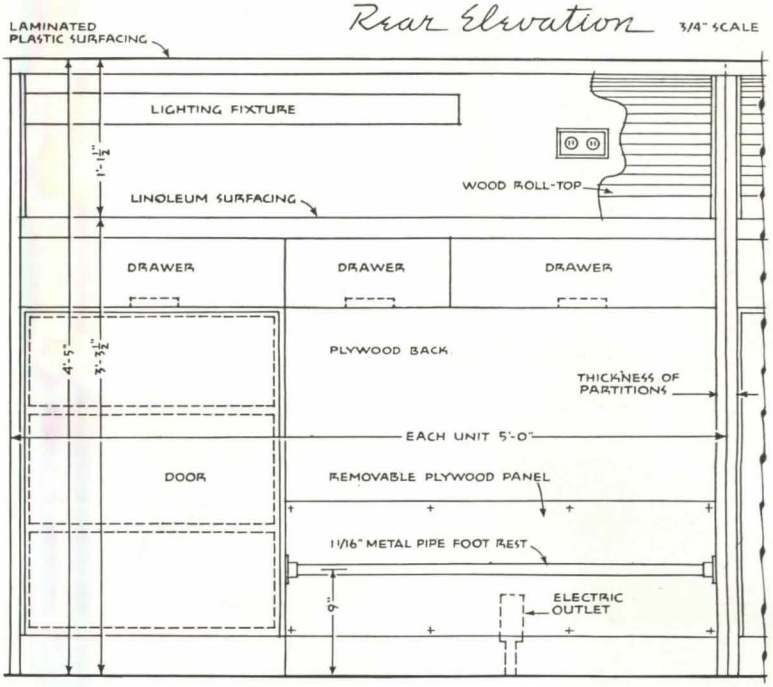
Plan 3/4" SCALE

R. MARVIN WILSON

ruction 3/4" SCALE



Rear Elevation 3/4" SCALE

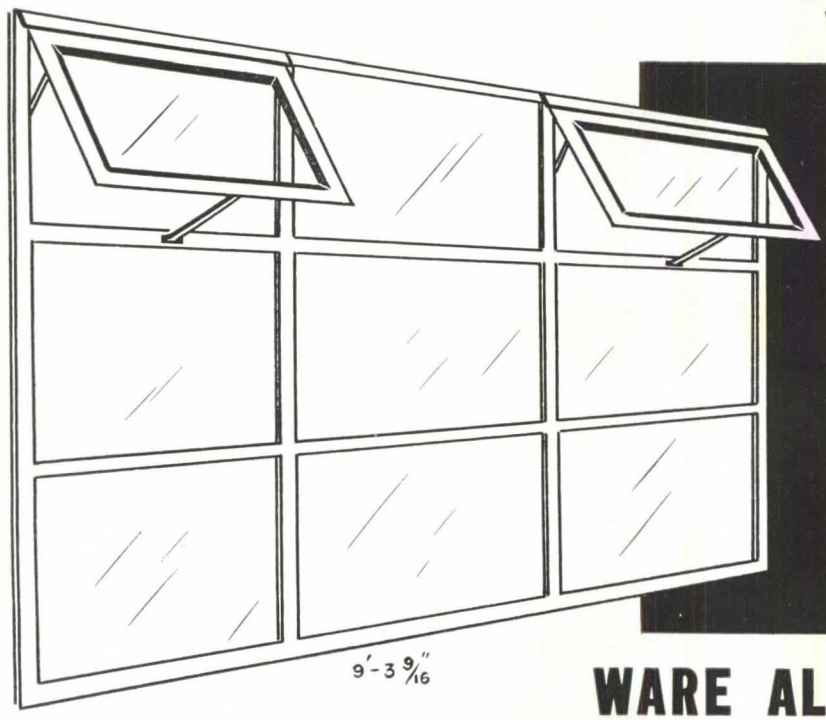


NTRAL NATIONAL BANK, Cleveland, Ohio
nrad, Hays, Simpson & Ruth, Architects

WARE ECON-O-WALL ALUMINUM WINDOWS

meet ARCHITECTS' & BUILDERS' specifications for

- √ ECONOMY
- √ VARIABLE VENT ARRANGEMENT
- √ STANDARD THERMOPANE THROUGHOUT
- √ SPECIAL GLAZING ADAPTERS NOT NEEDED



The proven Econ-O-Wall window unit by WARE brings new beauty to the modern home . . . offers maximum light and controlled ventilation . . . at low cost. Hardware designed for underscreen operation, the Econ-O-Wall will take DSB to ½" double glass . . . can be supplied in units 3 lites high by one lite wide vented or fixed for varied arrangements.

A combination of downright functionability and economy.

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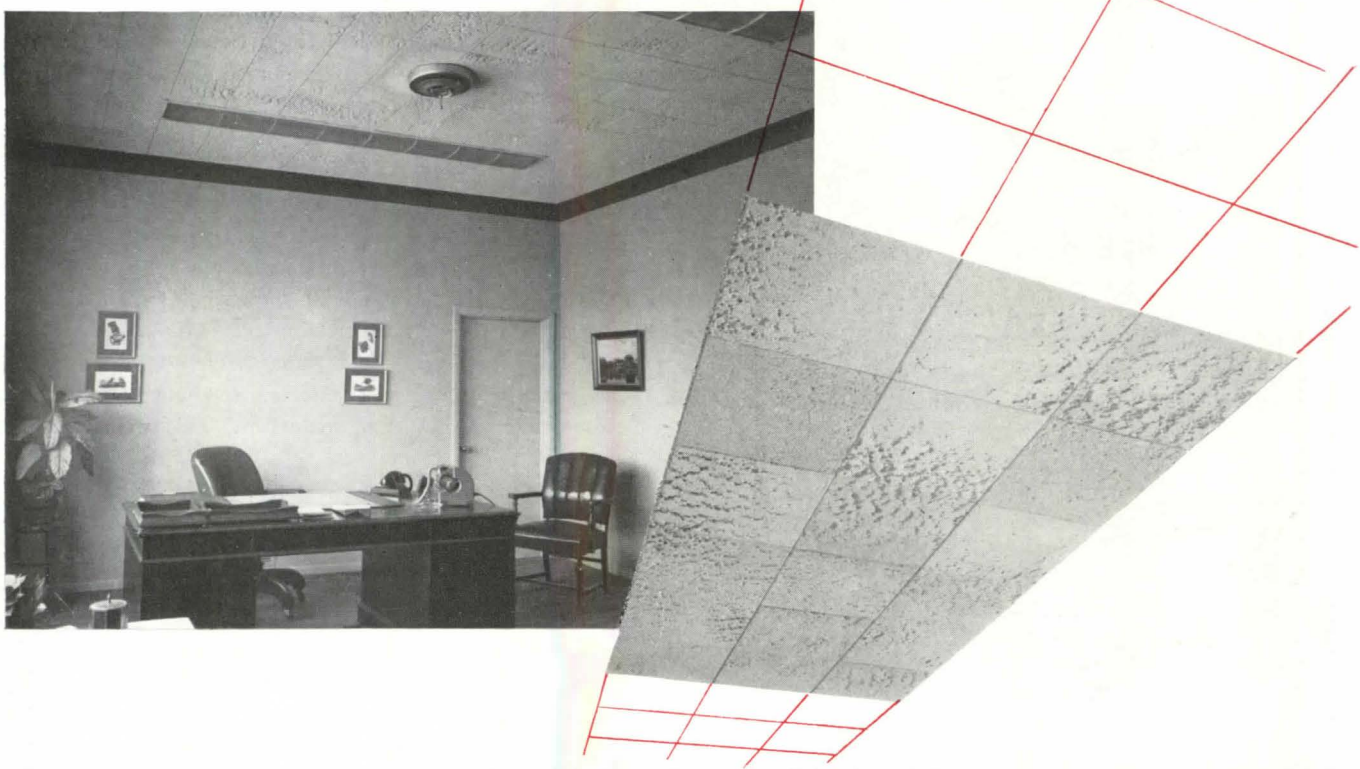
Introducing

KAISER ACOUSTICAL MINERAL TILE

A product which represents a completely new approach in the manufacture of incombustible acoustical tile. It is the result of experiments by Kaiser research technicians in which they have combined the fireproof properties of expanded perlite ore, strong mineral fibers and a synthetic binder, to produce a tile of superior fire resistance and high decorative qualities.



INCOMBUSTIBLE — Made of exploded volcanic glass (perlite), Kaiser Acoustical Mineral Tile meets the requirements of building codes which specify the use of non-combustible acoustical material.

HIGH SOUND ABSORBTION — Perfect acoustical control is obtained from the scientifically designed fissures and the inherent porosity of the expanded perlite ore.

LIGHT REFLECTION QUALITIES — Its highly efficient light reflecting qualities make it completely adaptable to the indirect lighting methods used in the design of modern schools, hospitals, offices and public buildings.

ARCHITECTURAL SYMMETRY — The casual fissured pattern of the tile presents a beautiful expanse of surface which blends attractively with any type of well-designed interiors.

EASE OF APPLICATION — The lighter weight and exact uniformity of dimensions makes the installation of Kaiser Acoustical Mineral Tile a speedy and inexpensive operation.

12" x 12" TILES

Available in two thicknesses $\frac{13}{16}$" , $\frac{15}{16}$"

Attractive travertine finish

Color: Oyster White

For further information and free descriptive brochure, write:
KAISER GYPSUM, *Kaiser Building, Oakland 12, California*

KAISER GYPSUM COMPANY

LOS ANGELES · OAKLAND · SEATTLE

heat pump*

(Continued from page 104)

design thinking for heat pump installations

When a client says, "Warm my new house with a heat pump the architect must begin at once to orient his thinking towa the meeting of several special material and arrangement r quirements.

First, appreciation is needed of the comparatively low hea ing temperatures with which the house will be heated. War air emerging from grilles will range from 95 F to 110 F, ar these temperatures obviously are not favorable to the rap warming up of a cold structure. Heat stored in the buildi materials, therefore, should be maintained and augmented the heating season waxes colder; the hours of operation mu be increased and interruptions are to be avoided if continui of comfort is to be maintained.

Second, realizing that heat loss is not easily recovered, t structure must be designed for heat tightness. This means pr viding insulation for the ground floor as well as for the wal and ceiling. It means double-glass windows, storm doors, ar a thorough job of weatherstripping. In fact, heat conservati can be so critical that an apparently insignificant item, su as insulating the return air ducts, can change an uncomfortab complainer into a smug eulogizer. This writer has seen happen.

Third, although the heat pump is a summer cooling sy tem, the winter heating load determines the size of the plan For example, 5 tons of calculated cooling is easily delivered b a system that will not warm the same building adequately winter. If we install a 5-ton plant, we shall be obliged to au ment its heat production on extra-cold days by resistance heate or some other source of supplementary heat.

The reason for this apparent discrepancy of capacity found in the simple fact of there being wide differences b tween the inside-outside temperatures of winter and summer o eration. In summer, the machine must produce an inside-ou side differential of 15 to 20 degrees maximum; in winter, ze outdoors calls for 70 F to 75 F, indoors. And whatever th differential happens to be, we must meet it with a constan speed, fixed-volume compressor.

In short, we must design the system with heating as o basic objective; summer cooling is a pleasant bonus.

sizes and capacities of package units

Since we must locate the heat pump in some part of the hous the following tables of dimensions and weights will be helpf in early planning. These dimensions vary with equipment fro different manufacturers, *just as any* other form of heati equipment varies, and final decisions on location should b based on accurate catalogue information (*see Tables IV and V* Tables on air and water capacities also provide useful da (*Tables VI and VII*).

how much does a heat pump cost to buy?

The answer to the above question: more than a convention heating system of equal capacity; about the same or a little le

* This is a continuation of Robert H. Emerick's discussion beginning on page 101.

han a conventional heating system plus a summer mechanical cooling system.

A 10-ton system installed during the past year cost the owner about $4500 for the heat pump cabinet and its controls; the wells for water supply and dry wells for water disposal added approximately $800 to his total investment.

The current price for a 5-ton, water-source unit is approximately $3000, installed. The water-supplying equipment, such as pumps, wells, disposal facilities, involves another $100 to $400 of outlay, depending on the complexities encountered.

The designs that harvest heat from the atmosphere, carry price tags approximately equal to those on the water-source units. For example, the asking price of a 3-ton job is about $2800; for a 5-ton installation, $3200; 10 tons around $4400. These quotations include the supplementary resistance heaters, and there is nothing else to buy—no pumps, no wells.

Ground-coil installations are the most expensive in many localities, involving as they do excavation, substantial weights of pipe, and extensive pipe fittings. The cabinet itself is equivalent to the water source arrangement, and pumps are needed to circulate the glycol through the coils.

By contrast, a five- or six-room house which would require a heat pump of from 5 to 7½ tons, depending on the heat tightness of the structure, can be heated by:

(a) A floor-type, space-heating furnace for a total installation cost of approximately $300.

(b) A warm-air duct system, oil- or gas-fired, for about $1500.

(c) A forced-circulation hot water system for $1800.

(d) A one-pipe steam system for $1900, more or less.

If we use any of these systems with a radiant-panel design, the investment will be a little higher, perhaps 10 percent.

However, and this is important to many people, the heat pump eliminates the need for a chimney, for fuel and ash handling, and substantially reduces fire hazards, since all temperatures are low. A true comparison of equivalent costs should consider these factors, and give each a valuation in dollars. To do this, is a responsibility of the architect or engineer.

Whether allowance should be made for summer cooling, depends on circumstances. Should the client consider summer cooling simply as a desirable by-product of the heating system, then no allowance is in order, or perhaps a limited one based on the client's evaluation of what the cooling function means to him. Conversely, if the client plans on summer cooling, regardless, full allowance is correct, but the comparison of costs must be made with the heat pump on one side, and a conventional heating system *plus* conventional cooling equipment on the other. This latter comparison is obviously most advantageous to the heat pump.

operating costs and maintenance

Operating costs vary with electric rates and the source of heat. Here are some typical reports:

(a) A 5-ton installation, air source, in a mid-Florida clothing store. Average winter monthly cost: $30.

(Continued on page 145)

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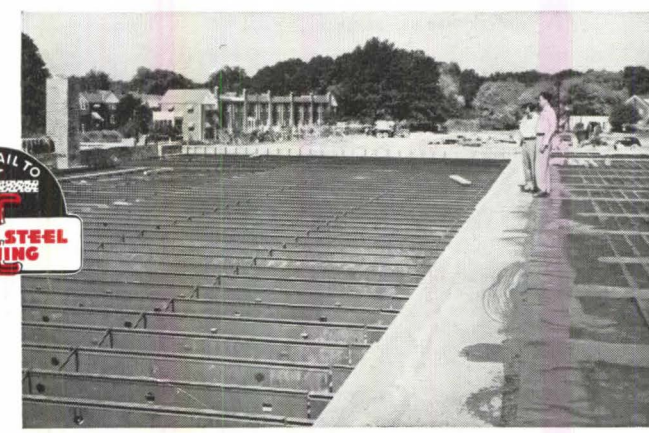

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heat pump

(Continued from page 143)

(b) A 7½-ton installation, well-water heat, serving an office building near the Canadian border. Maximum monthly cost: $100.

(c) A city water system, 5-ton capacity in South Carolina, averages $55.86 per month for water, plus the usual electric charges.

(d) By comparison with (c), a 5-ton residential installation in South Carolina, using well water, shows $25 for an average winter month as the total for all costs.

We might observe here, that statements are made in public from time to time, crediting the heat pump with providing cheaper heating in 80 percent of its installations. The experience of this writer does not verify these statements; in fact, it shows quite the reverse, although conceivably in some sections of the country very low electric rates can result in cheap heating.

Maintenance tends to be higher for heat pump equipment than for conventional systems. A recurring trouble which probably can be eliminated with small difficulty by the designers, is the loss of lubricating oil from the compressor. When this happens, the compressor quickly burns out and must be replaced.

We encounter refrigerant leaks from time to time, apparently the result of poor workmanship, and possibly augmented by vibration. Another source of annoyance is observed in the automatic-control system. We should make allowance, however, for these difficulties, when we remember the machine runs both summer and winter; it is seldom without load. Conventional systems probably would show no better records under such continuing burdens.

These matters should be pointed out to clients when they say, "I want a heat pump." The design is not perfect, and the owner who is led to expect miracles may meet with disappointment. He should be told the worst of it, as well as the best, *before he buys one.*

summing up

Prospective users of heat pumps should understand these facts of a general nature:

(a) For economy of installation and operation, extra money must be provided in the building design for heat tightness.

(b) Money is saved by the elimination of a chimney and by escaping the need for fuel-handling equipment.

(c) A heat pump installation is practical, even if electricity is not available. One standard manufacturer catalogues units powered by gasoline engines.

(d) Installation costs, operating costs, and maintenance troubles may be less favorable than with conventional equipment. Dependability of operation is not viewed by this writer as being equal to conventional systems.

(e) Since working temperatures are low, interruptions of service for any substantial period are followed by slow heat make-up, with resultant dislocations of comfort.

(f) The ultimate selection of any heat source, or combination of heat sources, must be predicated on a thorough evaluation of all contributing factors. Neither the air, the earth, nor the waters under the earth, is best suited to all local conditions.

VIEWS

(Continued from page 9)

tion and layout of 23A (Le Corbusier's design) is not maintained.

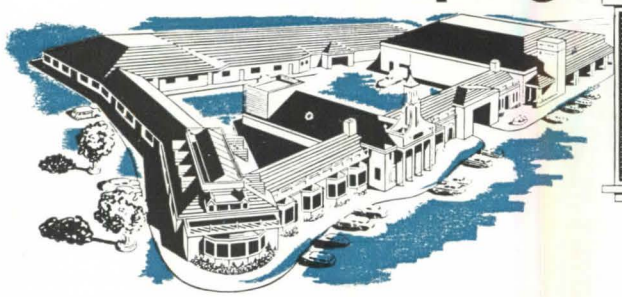
After this history of troubles, UNESCO has chosen a different method in undertaking the erection of its new headquarters in Paris. At present, as is well-known, UNESCO is housed in a former palace-hotel on the avenue Kleber. In December, 1951, a single architect was invited to make a preliminary sketch for the new headquarters. He was assigned a most unfavorable site on a half-circle just behind J.-A. Gabriel's Ecole Militaire (built 1751-82) on the axis of the Eiffel Tower. Here was made available a large slice that had been cut out from the almost completely built-up half-circle. Even the greatest architect would not have been able to design a decent building in the midst of this mosaic!

A jury was selected from lists supplied by the two international organizations of architects (The International Union of Architects and the International Congresses of Modern Architecture). This jury consisted of Walter Gropius (U. S. A.) Chairman, Lucio Costa (Brazil), Le Corbusier (France), Sven Markelius (Sweden), and Ernesto Rogers (Italy). They met in Paris in May, 1952. The Jury did not restrict itself to making the usual professional criticisms of the projects laid before them; they attacked the problem of the UNESCO headquarters in its entirety. The first result was that they came to the unanimous conclusion that the proposed building site was absolutely inadequate for the headquarters of a world-wide cultural organization. They spared no energy in making this clear, not only to the client but also to the donors of the site—the City of Paris and the French Republic. After careful investigation, a site was discovered on the fringe of the Bois de Boulogne, about five minutes by car from the Arc de Triomphe. The City of Paris agreed to grant this to UNESCO. This location, with the Bois de Boulogne before it and the City of Paris behind, is the most ideal building site that a contemporary architect could desire for the erection of a great edifice of an unusual nature.

The Jury felt it necessary to reject the preliminary scheme, because it did not fulfil present-day requirements for a building of this stature. Again the question arose: who should be the architect? It appeared natural, in this situation, to entrust the building to Le Corbusier, and this was the unanimous recommendation of his colleagues of the Jury. However their recommendation was rejected by UNESCO on grounds of professional ethics.

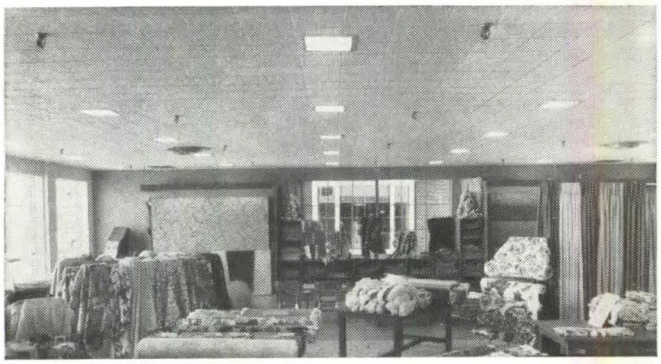
(Continued on page 148)

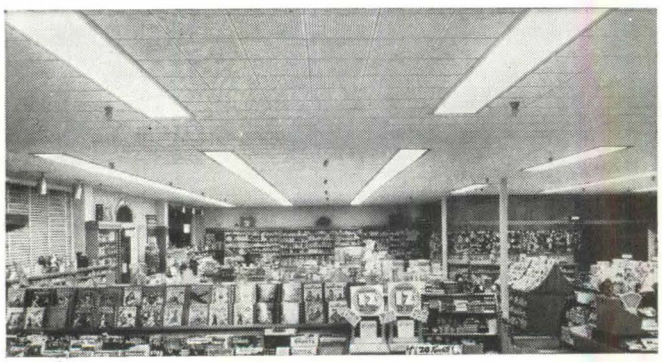
we're keeping

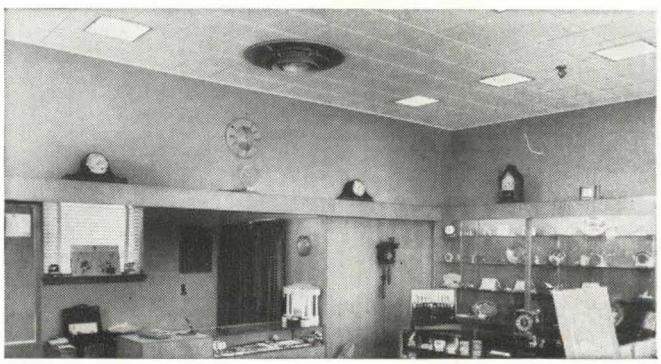


Lakewood Center

QUIET







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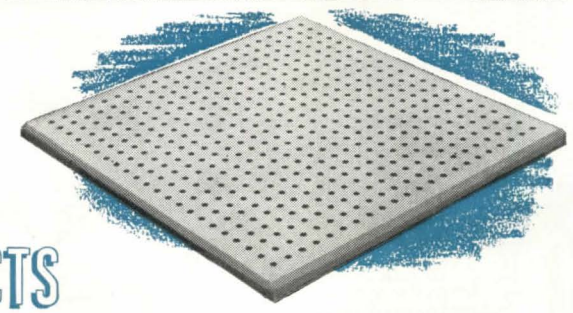

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VIEWS

(Continued from page 146)

Now UNESCO searched the lists supplie by U. I. A. and C. I. A. M. for two arch tects and an engineer and in July, 195 Marcel Breuer (New York), Bernard H. Zehrfu (Tunis-Paris), and Luigi Nervi (Rome) we assigned the task. Marcel Breuer, as is we known, belongs to the younger generation contemporary architects, and it is importa that this generation is now being offered t possibility of displaying its capabilities in difficult a problem. Bernard Zehrfuss is be known for his buildings in the Fren Colonies. And the engineer, Luigi Nervi, who genius approaches that of Maillart a Freysinnet, has the great advantage that his buildings and huge airplane hangars has been accustomed to working closely wi architects. Drawings for the headquarters h to be ready by mid-September, so that th could be printed and distributed before t meeting of the General Conference of UNESC in November.

How will things work out this time aft all the dismal experience of the past? N definite prediction can be made. The auspic are more favorable than ever before, thou it is already certain that the building pr gram outlined by UNESCO is far too lar for the funds at present available. Also, o can have no idea of the attitude that w be adopted by the General Conference UNESCO in November, in whose hands w lie the final decision. And after the expe ences of Geneva and New York it is as w not to expect too much! It is a good si that from the start the new team has felt t need of working in close contact with t Jury (whose members retain their position Another very important factor is that the thr partners share a similar outlook — which indeed the first requirement for real teamwo

Up to now, the outcome can be regard as a victory for the contemporary approa so that perhaps this time it really does lie the hands of the architects to produce scheme equal to the possibilities of the bui ing and the possibilities of the site. A b liant solution could do much to lighten t oppressive atmosphere which now weig upon architectural development in so ma countries.

elected

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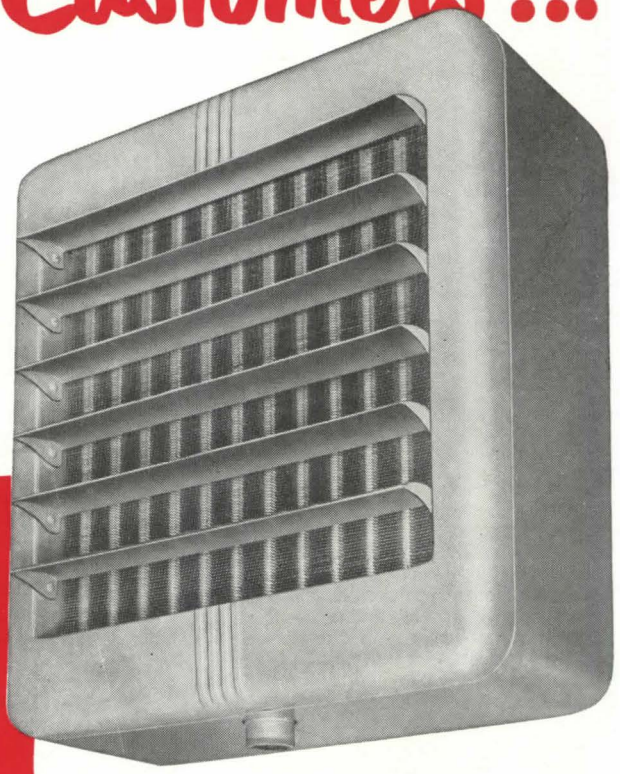

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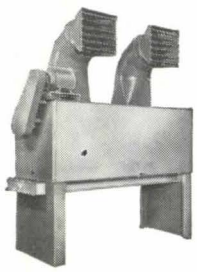

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books received

The Art of Ancient Peru. Heinrich U. Doering. Frederick A. Praeger, Inc., 105 W. 40 St., New York 18, N. Y., 1952. 240 pp., illus., $12.50

Children and The City. Olga Adams. Sponsored by Michael Reese Hospital Planning Staff, 29 & Ellis Ave., Chicago 16, Ill., 1952. 29 pp., illus., $1

How to Plan a House. Gilbert Townsend, and J. Ralph Dalzell, American Technical Society, 848 E. 58 St., Chicago 37, Ill., 1952. 584 pp., illus. $6.95

Mexico's Modern Architecture. I. E. Myers. Architectural Book Publishing Co., Inc., 112 W. 46 St., New York 36, N. Y., 1952. Illus., 264 pp., $12

the contemporary arts

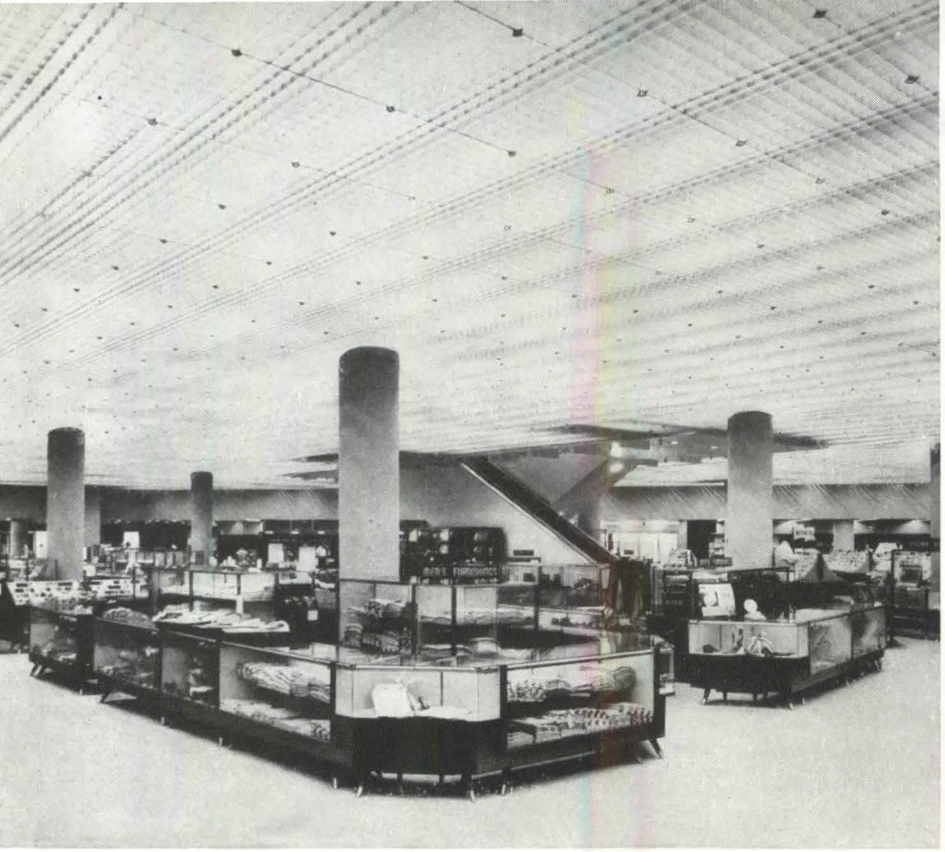
Art in Modern Architecture. *Eleanor Bit mann. Reinhold Publishing Corp., 330 W. St., New York 36, N. Y., 1952. 178 illus., $10*

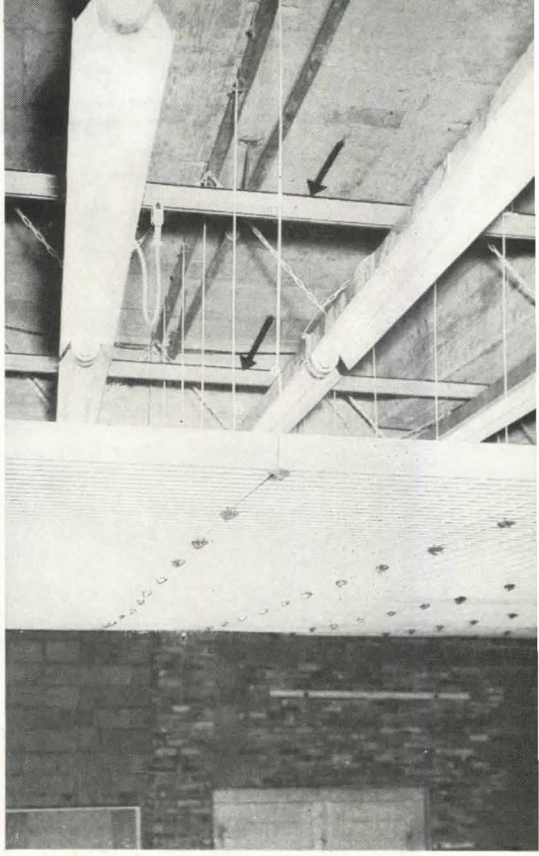
This is a well designed book in which author endeavors by words and pictures establish the level of artistic competence America and to explain the significance what is happening to the plastic arts at particular moment in our architectural hist Mrs. Bittermann appraises the place that and ornament hold in the hearts of men optimistically suggests that Architecture, ditionally the mother of all visual arts, again and with renewed concern drape it with the paraments of pure artistic crea to win back some if its age-old charm (so what battered by the functional revoluti It is encouraging to see fresh proof through architecture the creative fruits o good society may be enjoyed by all peo that Art is a living, ever-changing experie which belongs in the market place as as in the museum; and that new conditi new techniques, and new materials can be grist to the creative mill.

If the illustrations cannot be said to stitute yet the dawn of a new Golden A they show nevertheless the seriousness of contemporary artist, a seriousness which i sharp contrast to the imitative and superfi efforts of the artists of only a few gen tions ago. The modern artist seems to un stand again what function art has in ar tecture, and he is slowly and paint attempting to find his way through his discipline to a high standard of performa Perhaps it may yet be necessary to hav great many works of art before we can h good art at all, but we know that good will soon invite more of it. The fact that government is now willing to spend eve small percentage of the cost of a public b ing for works of art is encouraging. We learning that integration of art and a tecture to be successful must come at a early stage.

I believe that this book can have a great influence, because it communicates important message at a crucial period of development as a nation—it invites not architects and artists, but all interested men, to cultivate and protect the seed

(Continued on page





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REVIEWS

(Continued from page 150)

of our creative efforts from the cold climate of indifference. It is important because it is increasingly becoming apparent that only through a spiritual and cultural growth will America be able to retain the advantage it has gained over the world through mass production and armed strength.

PIETRO BELLUSCHI

sources listed

August Perret: A Partial Bibliography. *Compiled by George E. Pettengill. American Institute of Architects, 1741 New York Ave., N. W., Washington, D. C. 17 pp. $1*

The A.I.A.'s librarian, George Pettengill, compiled this bibliography primarily to secure data about the sources of information on August Perret, in connection with the award by the A.I.A. of the Gold Medal, its highest honor, to M. Perret. Though the list is neither complete nor selective, it contains most, if not all, of the important references to this eminent French architect, whose design of buildings in reinforced concrete has brought him international recognition in the field. These references have been arranged in general groups, as follows: Writings of M. Perret; Book Refences; Biography and Criticism; Honors; Reinforced Concrete; Miscellany; Major Works Individually by Date; Other Buildings; Projects. E. T.

characteristics of trees

Painting Trees & Landscapes in Watercolor. *Ted Kautzky, N. A. Reinhold Publishing Corporation, 330 W. 42 St., New York 36, N. Y., 1952. 112 pp., illus., 16 full color plates. $9.95*

To his widely admired previous books on drawing and watercoloring—*Pencil Pictures, Pencil Broadsides,* and *Ways With Watercolor* —Ted Kautzky, well known artist and renderer, now adds this handsomely illustrated volume. Basic factors such as selection of papers, brushes, and palette; organization of the composition; and arrangement of values are again considered here in summary chapters. But the bulk of the book concerns itself with minute examination of the problems of painting *elements* of the landscape—trees, roads, and

(Continued on page 154)

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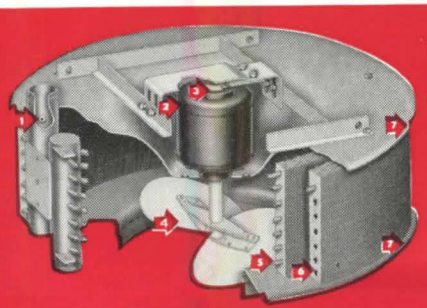

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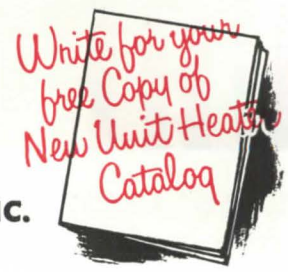

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REVIEWS

(Continued from page 152)

puddles—and with the visual effects of fog and rain.

Beautifully illustrated chapters take the reader through the fundamentals of brush stroke that may be used—not the *only* ways, the author emphasizes—to produce credible facsimiles of foliage, branches, trunks, and groups of trees. Then ten chapters, that constitute more than half the volume, consider particular tree species in exhaustive detail—willows, evergreens, maples, birches, sycamores, palms, elms, oaks, poplars and aspens, and the Monterey cypress. In each of the chapters, the basic growth-shape of a variety is analyzed, followed by suggestions as to satisfactory methods of expressing the characteristic trunks, limbs, branches, and foliage. Supplementing these analyses are finished watercolors in which the particular trees under discussion are prominently featured. Here Kautzky takes pains to explain what papers were used, the palettes, the order in which the paintings were executed (illustrations at the half-way point are shown), and what brushes were used. The completed paintings are all reproduced in full color.

A concluding chapter offers ten pencil drafts, again involving the various tree types, as "practice subjects" for the experimenting artist to work out for himself.

For the amateur like this reviewer, there are a few recurrent instructions such as "keep the surface lively" and the brush strokes "spontaneous" that serve more to admonish than to inform. And, in my opinion, the finished paintings, which were all specially made for this book, are less lively than the black-and-white illustrations of brush strokes, individual trees and partially finished watercolors.

Nonetheless, this is a painstaking and useful book. For anyone who has ever dabbled in watercolor painting, it is certain to provide the stimulus to try again. After a little practice, I find that even I can now put on 300 pound rag stock a few blobs that, my best friends tell me, do look a little like foliage.

G.A.

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Legal Guide for Contractors, Architects and Engineers. *I. Vernon Werbin. McGraw-Hill Book Co., 330 W. 42 St., New York 36, N. Y. 374 pp., illus. $4.75*

With the authority of 35 years' experience as practicing lawyer—much of it in contract li

(Continued on page 15

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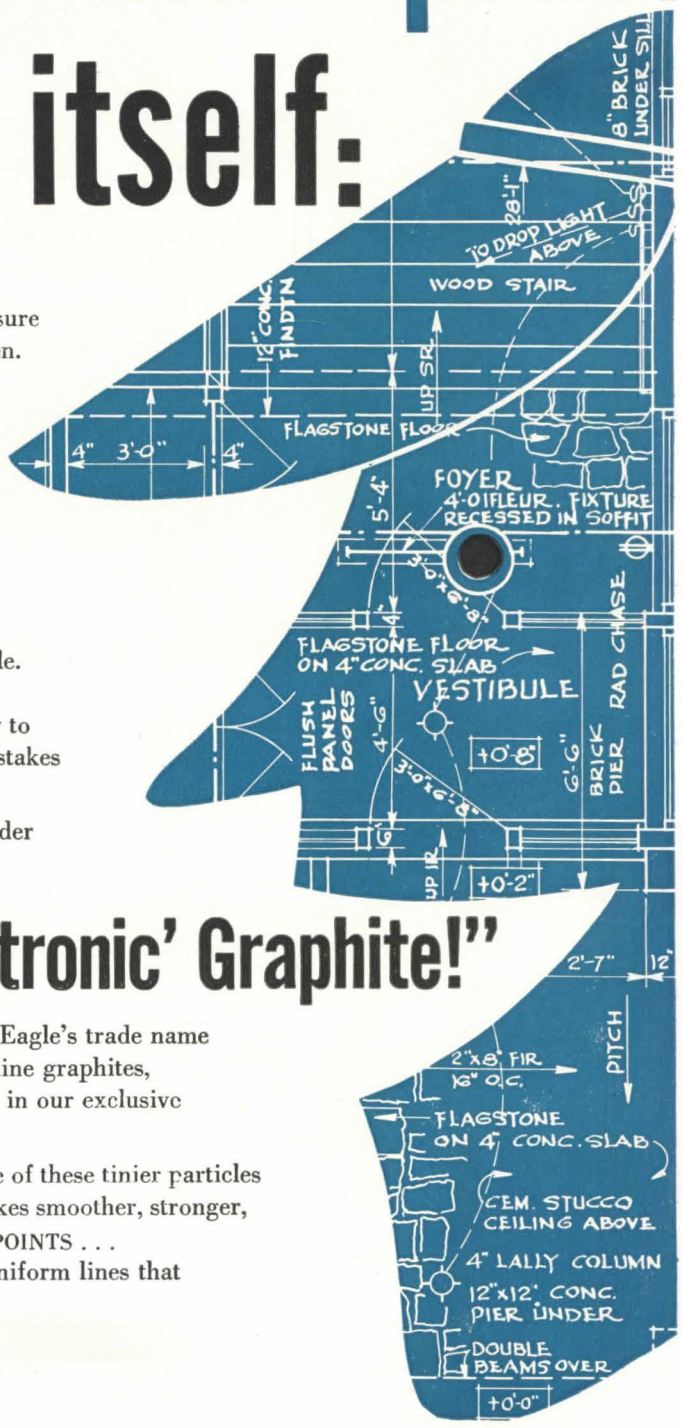

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REVIEWS

(Continued from page 154)

gation—and licensed engineer, the author e plains in these pages the rights in litigati of contract, what steps must be taken to pr serve these rights, and how to prepare co tracts that will not cause trouble. He has s lected 83 typical cases of contract litigati involving construction, engineering, and arc tectural contracts handed down by United Stat courts. Pertinent contract provisions, the cour decision, and the basis for the decision, a given for each of the 83 cases.

Though written for nonlegal-minded laym the Guide should also be helpful to lawye who are interested in this field, since ea principal of law set forth here is sustain by a case citation. A detailed index of eve subject covered completes the book. E.

following the firemen

As You Pass By. *Kenneth Holcomb Dunshe Hastings House, 41 E. 50 St., New York 2 N.Y., 1952. 270 pp., appendix, over 600 illu color and black-and-white, including maps. $*

There have been many books written about t early days of New York, but this one is uniq in its approach. Here is a colorful and roma tic story of the old days of Manhattan, as se through "the fire laddies' eyes." Surely, group of citizens knew more about places a people and the daily activity of the city th its volunteer firemen, many of whom were d tinguished members of the community. In the days of taking everything for granted, f realize the importance of the fire-fighters in t early political and social life of the city. Sir the volunteers were well acquainted with the highways and byways, the real charac and makeup of the city can be recaptured following their route.

Unique though the approach may be and whether one is especially interested the early fire companies—this is a book wh will appeal to all New Yorkers, as well as all lovers of Americana. In it, by text and p fuse illustrations including the splendid "th and now" drawings by E. P. Chrystie, brought alive interesting people and plac the fabulous happenings, and just plain, dinary days of living in a bygone era. T author, who is curator of the H. V. Smith M seum of the Home Insurance Company (wh houses the greatest collection of fire memo bilia in the country), has been most painstak

(Continued on page 1

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REVIEWS

(Continued from page 156)

in the vast amount of research he has do over a period of years. He has uncover many sources of information that have nev before been used in any books about Ne York—diaries, journals, minute books, a archives of the old fire companies; old prin and photographs. From the great wealth information he has assembled, he has sk fully reconstructed the lives and adventur of the city's citizens and added many deta to the existing knowledge of old New Yo His efforts are the result of an intense ci pride and although the romantic anecdotes a hitherto unknown facts are recounted wi humor and a fondness for the subject, Du shee's book contributes much to the city's h tory which makes for fascinating reading. particular interest is the Directory of Forgott Streets, found in the Appendix.

It might be somewhat carping to think omissions in so comprehensive a book, b because of the particular approach and all t material about the early fire companies, o wonders why there isn't more about the live Dalmatian dogs that were so much a part the scene. An insignificant point, perhaps, b only two mentions of dogs are made: o about a Newfoundland called Major, th "served" with the Mechanics Hose Compar the other, a black-and-white dog named Ro (ancestry unrecorded), that belonged to Frederi Van Wyck—himself a writer about New York when he was a youthful runner with the Met mora Hose.

Although it might not have been any spec intention of the author's, Dunshee's book is singular significance at the moment, in awake ing New Yorkers to the need of preservi certain features of the city. Other cities—su as New Orleans, Boston, and Philadelphia still can boast many of their old houses, histo buildings, and landmarks. Unfortunately, Ne York has *built* over its past, torn it down, a continues to do so. As one reads this book, cannot but feel that every effort should be ma to support the activities of the Municipal Society and other organizations that are doi useful and important work toward preservi characteristic architecture of the city.

FRANK A. WRENS

(Continued on page 1

This Sloane Koroseal Tile Supreme floor provides low-cost, care-free service, beauty and quiet comfort in the display room of the Peoples Gas, Light and Coke Co., Chicago, Illinois.

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A Sloane Koroseal Tile Supreme floor provides greater beauty . . . more service and economy than any other resilient floor made. It's all virgin-vinyl composition, has unmatched color-clarity . . . plus unequalled toughness that assures service long after most resilient floors require repair and replacement. Grease, oil, acid, alkalies and strong soaps will not affect Koroseal Tile Supreme . . . the through-and-through colors won't fade or stain . . . it won't crack or break and tests show that its indentation recovery is far superior to any other type of resilient floor.

You save money year after year on maintenance because the nonporous surface of Koroseal Tile Supreme stays beautiful with a minimum of care . . . dirt can't cling to it, or mar the smooth, tough surface . . . soap and water mopping keeps it clean and bright . . . even occasional waxing is optional.

Sloane Koroseal Tile Supreme comes in a beautiful range of 18 striking colors—either Marbletone or Crystaltone effect.

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REVIEWS

(Continued from page 158)

code interpretation

Code Manual for the State Building Construction Code. *State Building Code Commission, 1740 Broadway, New York, N.Y. 300 pp., illus. $2*

The State Building Code Commission of New York has issued a manual to assist building officials, architects, engineers, builders, and others in the interpretation, application, and enforcement of the State Building Construction Code. The primary significance of this manual lies in the fact that it describes methods and materials acceptable as meeting State Code requirements, without prescribing their use. All techniques, equipment, and products meetin the performance requirements are acceptabl whether they are described or illustrated the manual. Since the Commission's technic staff will continue to study construction mat rials and methods, the manual has been pu lished in loose-leaf form to permit insertio of new data pages supplementing or supe seding the ones in the original book.

picture of a code

The National Plumbing Code Illustrated. *Written and published by Vincent T. Manas, 45 Potomac Ave., N.W., Washington 7, D.C. Illu 200 pp.*

About a year or so ago, a committee represe ing the federal government plus numerous fected groups such as the National Associati of Master Plumbers, the American Society Mechanical Engineers, the U.S. Public Hea Service, and many others, came out with a n National Plumbing Code which has since be adopted by some 200 communities in the Unit States. The purpose of this book is to transl the technical and often legalistic language the printed Code into mechanical design a construction of a plumbing system, for the be fit of engineers, contractors, manufacturers, a others. The author *has, almost literally,* dra a picture of the National Plumbing Code, illustrating it with about 200 simple drawi so that the Code's meaning can be crystal-cl to everyone. E.

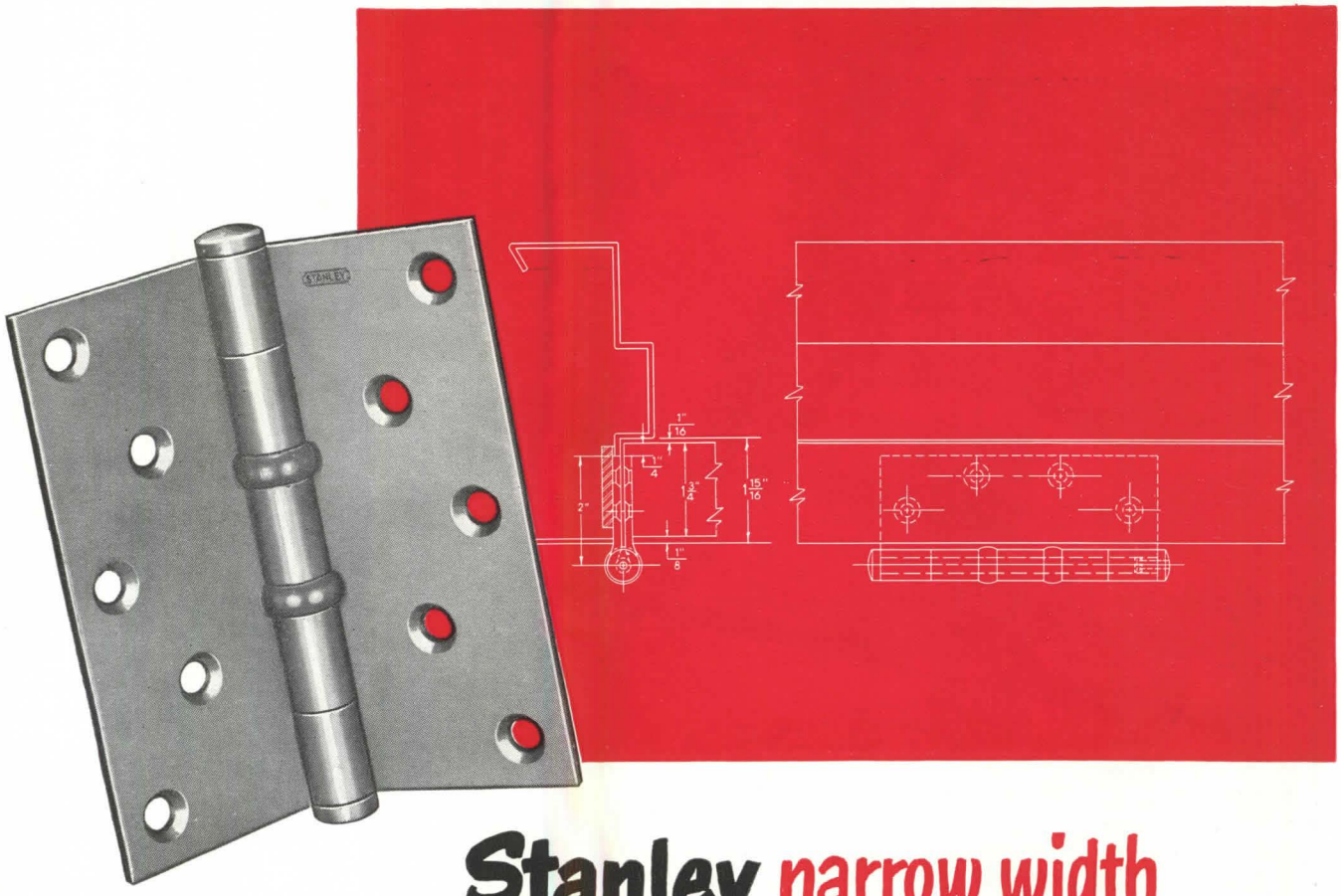
fixture standards

Enameled Cast-Iron Plumbing Fixtures, Co mercial Standard CS77-51. *Superintendent Documents, U. S. Government Printing Offi Washington 25, D. C. 39 pp., illus. 15 ce*

Superseding an older standard of 1948, t newest edition provides minimum stand specifications, definitions, inspection rules, typ and sizes of standard items, and test meth for enameled, cast-iron plumbing fixtures the guidance of manufacturers, distributors, a buyers of these products. Minimum requi ments include material, thickness, warpa enameling, acid resistance, inspection rules, marking. A list of associations, firms, and ot organizations which have accepted this sta ard for use as far as practicable, is append at the end. E.

(Continued on page 1

for **modern** trim construction...



Stanley narrow width Butt Hinges

Today's trend toward having little or no trim around doors makes Stanley "Narrow Width" Butt Hinges the hinges to specify in any building you design—office, school, hospital, plant or warehouse.

The Stanley "Narrow Width" Butt Hinge hugs door and trim—reduces stress and strain in bringing the pivotal axis closer to the junction of door and trim.

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REVIEWS

(Continued from page 160)

canadian farm houses

Farm House Remodeling. *Planning Resear Centre, School of Architecture, University Manitoba, Winnipeg, Manitoba, Canada. 195 Illus., 56 pp.*

Farm House Planning. *Planning Research Ce tre, School of Architecture, University of Ma toba, Winnipeg, Manitoba, Canada. 195 Illus., 88 pp.*

Although the material in these two booklets based on surveys in western Canadian pro inces, they are intended to assist all those w plan to build or to modernize farm homes fr the standpoint of utility and comfort. Phot graphs and drawings illustrate ways of ov coming the more common problems to found in construction and repair. A numb of fairly varied case examples are represente E.

NOTICES

research grants at M.I.T.

The F. W. WAKEFIELD BRASS CO., Vermilio Ohio, has established a research fund $10,000 at the MASSACHUSETTS INSTITUTE TECHNOLOGY and granted a student fello ship of $2650 to CASE INSTITUTE OF TEC NOLOGY.

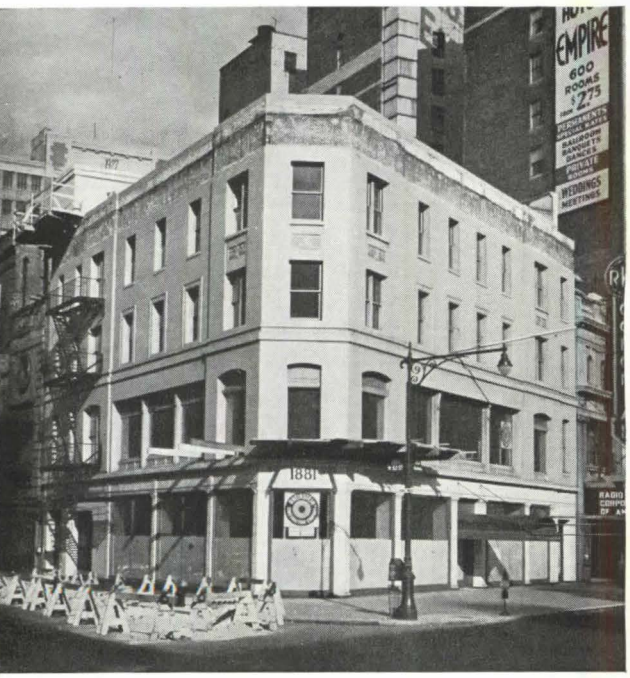
The M.I.T. fund is to the School of Arc tecture for study of all environmental facto contributing to the process of seeing.

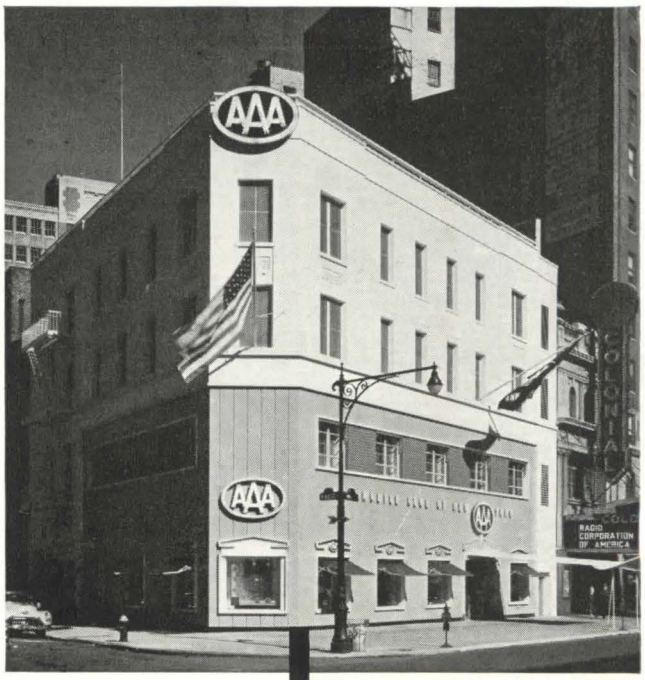
The Case fellowship is for research in therm environment and the production of a the covering certain phases of air conditioning a radiation.

engineering research

Appointment of DONALD R. GUTHRIE, as Exe utive Engineer in charge of engineering *search was announced* by MINNESOTA MININ & MANUFACTURING CO. He will organize engineering research group consisting of thr sections: chemical engineering, machine velopment and instrument engineering. T purpose of the new group is to provide sp cialized engineering assistance to engineers the company's various product divisions.

(Continued on page 1





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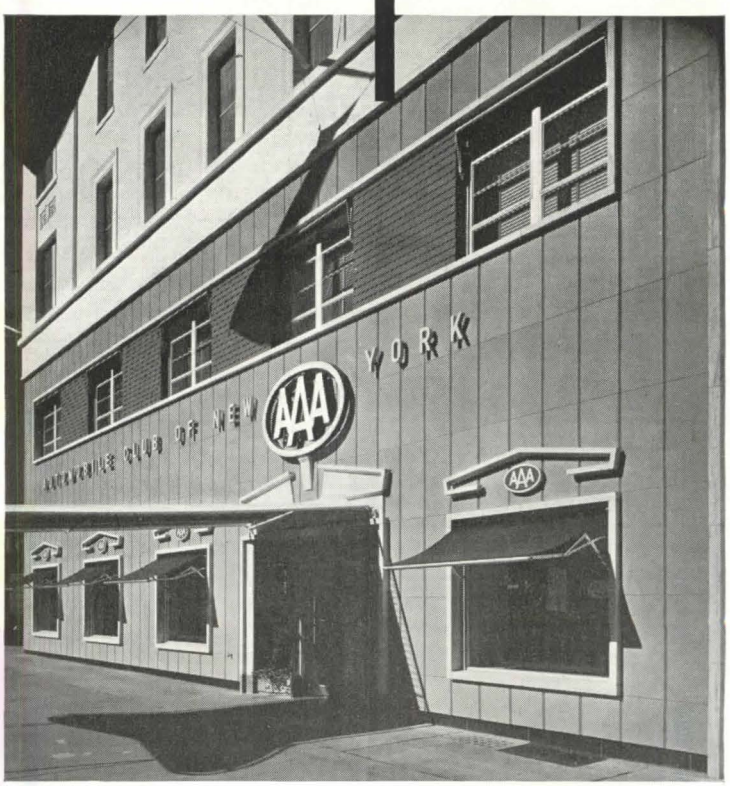
New York, N. Y.
Julian von der Lancken—*Architect*
Rheinstein Construction Co., Inc., *Builder*
Refacing to the Broadway and 62nd Street fronts is 2" thick architectural terra cotta in units 18" x 36" with rusticated vertical joints. Field color is a soft gray glaze. Horizontal rusticated panels are a harmonizing blue.

You can work remodelling magic with architectural terra cotta

Old buildings can be given colorful new facades when you design in architectural terra cotta. It is custom-made to meet your most exacting requirements—individual units large or small, plain surfaces or decorative sculpture, brilliant colors or delicate tints. This versatile building material enables you to create attractive buildings with walls of lasting beauty, yet the cost is less than you would expect. Moreover, the original richness of terra cotta can be retained indefinitely by simple soap-and-water washings. When you consider the plasticity of form, color and texture, when you compare costs as well as creative achievement, architectural terra cotta clearly is in a class by itself.



Construction detail, data, color samples, estimates, advice on preliminary sketches, will be furnished promptly without charge. Send your inquiry today.

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Plants at Perth Amboy and South Amboy, N. J.

F S T C

NOTICES

new courses

The School of Architecture, GEORGIA INSTITUTE OF TECHNOLOGY, announces a two-year graduate course in City Planning to be inaugurated in September under the direction of HOWARD K. MENHINICK, Regents' Professor of City Planning, formerly director of Regional Studies at TVA. This course, housed in the new million-dollar architecture building, will be limited to 20 students. Applications are now being received from those holding a bachelor's degree.

A new college course in home building leading to a degree will be available to students next fall through co-operation of the nation's home builders. The course, carrying a B.S. degree in Business Administration, will be offered by TRINITY UNIVERSITY, San Antonio, according to the National Association of Home Builders. The course will offer college training in the various subjects making up the business of home building.

new slide series

The HERBERT E. BUDEK COMPANY, INC., 55 Poplar Ave., Hackensack, N. J., will act as distributor for black-and-white filmstrips and slides based on the photographic archive of the MUSEUM OF MODERN ART LIBRARY, New York. Prices obtainable from the distributor.

The material will be offered in four editions: Edition A—single-frame filmstrips; Edition B—double-frame filmstrips for self-mounting of 2x2 slides; Edition C—glass-mounted 2x2 slides; and Edition D—glass-mounted 3¼x4 slides. Each strip or slide series will provide, in addition to 35 to 40 picture frames, a brief preface, essential captions, and a selected reading list.

Among titles to be offered are: M B 4—"MODERN ARCHITECTURE: The Development of Design in Space"; and M B 6—"INTERIOR DECORATION: Current Trends and Master Designers."

new addresses

A. EUGENE CELLAR, Architect, 502 Riverside Ave., Jacksonville, Fla.

JOHN LYON REID, A.I.A., Architect, 1069 Market St., San Francisco 3, Calif.

ISADORE ROSENFIELD, Architect and Hospital Consultant, announces the change of his office address to 45 W. 45 St., New York 36, N.Y.

Yes—it's a Flexstone* Roof

Each ply is a flexible covering of stone!

● The secret of a Johns-Manville Flexstone Built-Up Roof is in the *felts*. They're made of fireproof, rotproof, weatherproof, enduring *asbestos*.

Flexstone Built-Up Roofs won't dry out from the sun . . . need no periodic coating. They're *smooth-surfaced*, too—permit thorough drainage, make any damage easy to locate and repair. They are engineered to each job . . . applied only by *J-M Approved Roofers.* J-M Asbestos felts are perforated to make application easier, give a smoother job, conform better to roof decks.

For your added protection, the Johns-Manville Asbestile* System of Flashing insures proper treatment of all critical areas. Asbestile is a heavy-bodied plastic cement designed for use with asbestos flashing felts to give thorough watertightness. As it sets, Asbestile becomes hard and forms an integral part of the wall itself.

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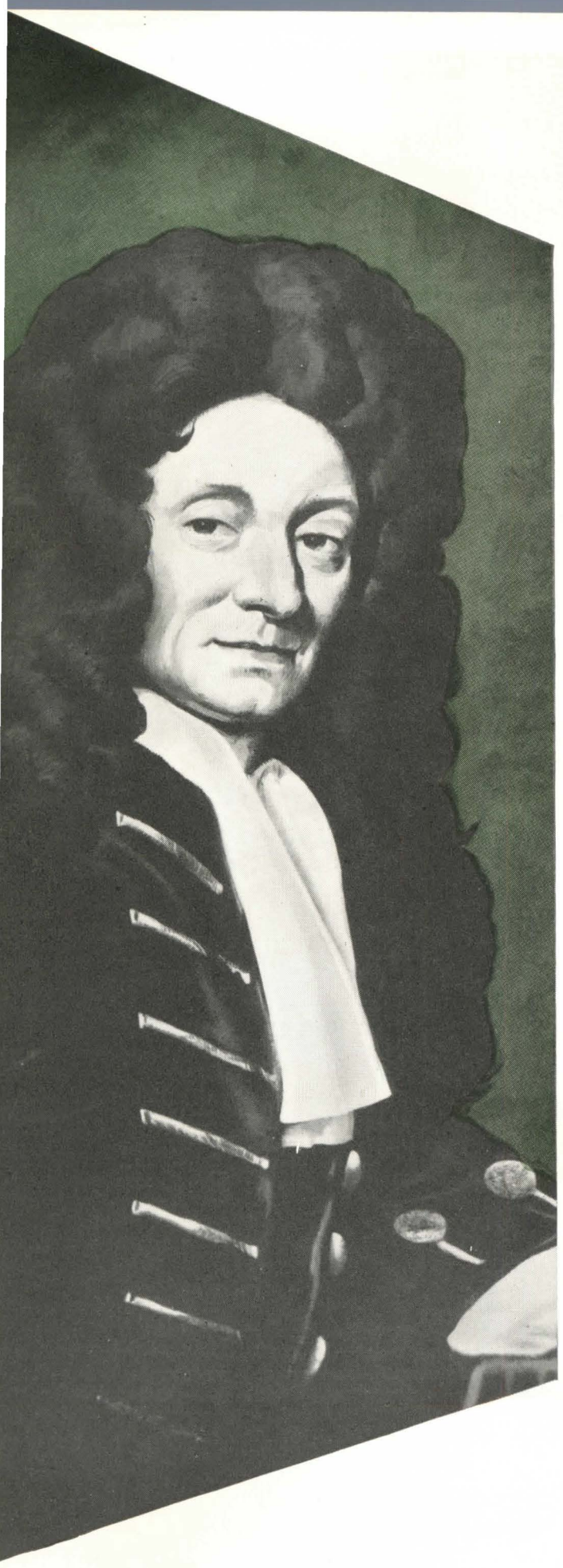
DECORATIVE FLOORS • MOVABLE WALLS • ETC.

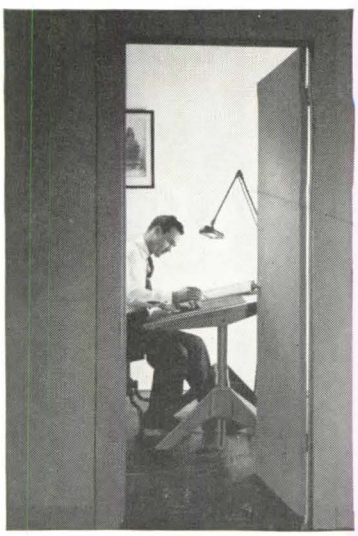


250 years ago Sir Christopher Wren wrote:

"We architects are scrupulous

in small things . . .

AND ARCHITECTS TODAY HEARTILY AGREE WITH THE GREAT ENGLISHMAN.



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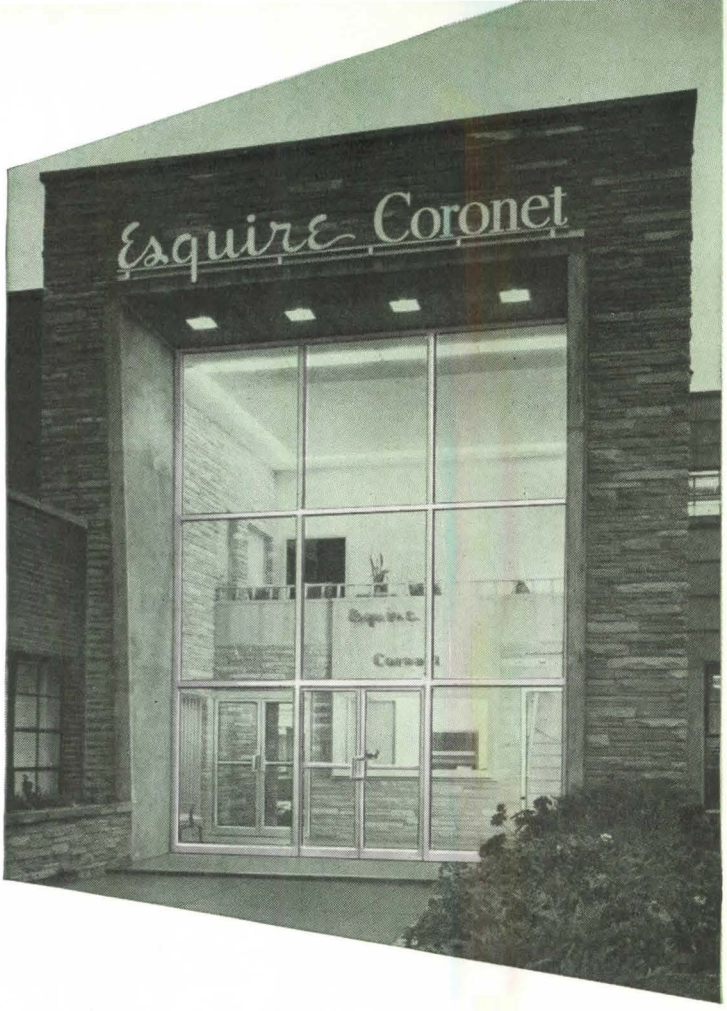
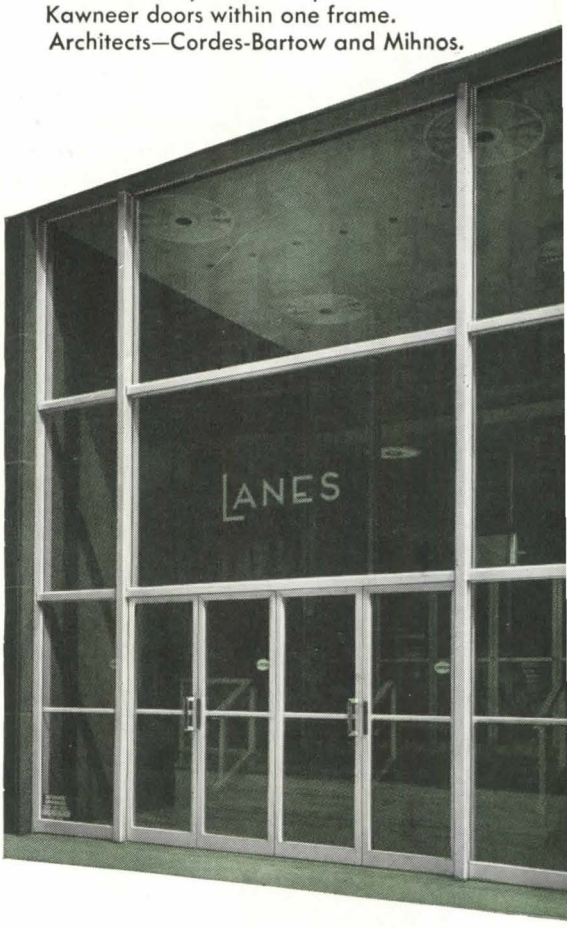
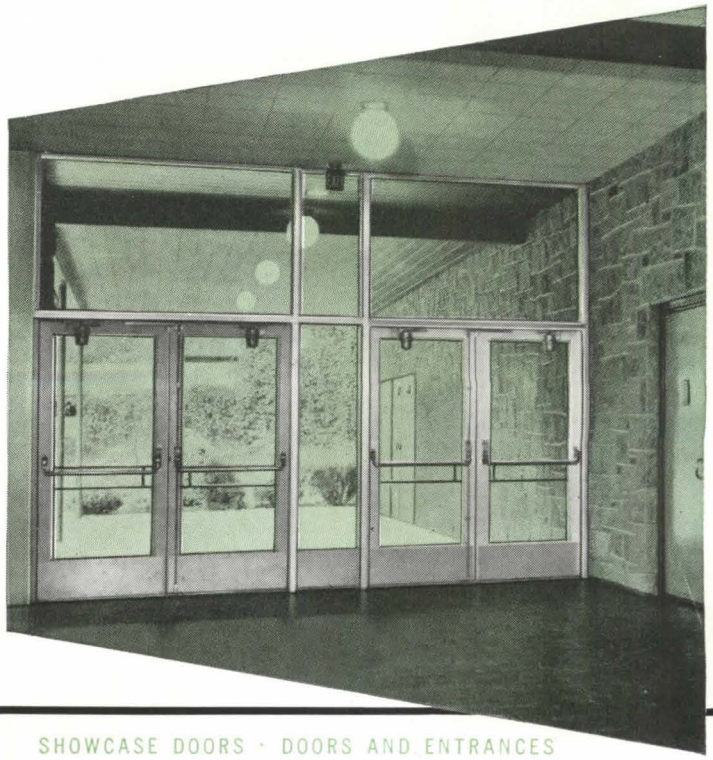


Esquire Coronet publications building in Boulder, Colorado. A striking treatment of an entrance unit featuring Kawneer doors and mullion construction. Architect—Ralph Stoetzel.

Lanes Department Store in New York City uses two pairs of Kawneer doors within one frame. Architects—Cordes-Bartow and Mihnos.



. PAINSTAKING ATTENTION TO DETAIL HAS ALWAYS BEEN THE ARCHITECT'S TRADEMARK. To meet high contemporary standards, Kawneer Entrances are cleanly and handsomely styled to reflect the utmost simplicity in line and form. They are precision-engineered for maximum strength, smooth operation, and weather protection.



Transfiguration School in Tarrytown, New York, shows an excellent solution to an entrance problem that required panic exit devices. Architect—Robert A. Green.

Kawneer

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out of school

by Carl Feiss

"It is pathetic enough that a whitewashed castle, with turrets and things,—materials all ungenuine within and without, pretending to be what they are not,—should ever have been built in this otherwise honorable place; but it is much more pathetic to see this architectural falsehood undergoing restoration and perpetuation in our day, when it would have been so easy to let dynamite finish what a charitable fire began, and then devote this restoration-money to the building of something genuine."* "Castles and Culture," *Life on the Mississippi* by Mark Twain

"The next haouse to the saouth, ladies and gentlemen, was built by Mr. E. T. Stotesbury of Philadelphia. It has recently been bought by the Taown of Bahabah for a baout terminal for a new line to Nova Scotia." A cream-colored Grand Trianon hove into sight through the pines above the rockbound coast. I didn't have my history book, but I guessed Charles A. Platt after Stanford White, but maybe I was wrong, because the stucco Villa Medici from Lago Maggiore, just north and next door, may have been from those same drafting boards. It's quite confusing. Fortunately, no one got around to putting a German castle on that serene granite monolith, Mt. Cadillac.

I had just flown over Tuxedo Park, that recently incorporated village of incredible mansions, into which Democracy has just filtered. According to *The New York Times* of August 8, incorporating the village means that it gets certain privileges, such as passing local "blue" laws, issuing dog licenses, and enabling it to receive from the state $3 per person for general operating expenses. (Undoubtedly a necessary form of Socialism, even for so Republican a community, these days).

Over Tuxedo Park to Saranac Lake, from there into the White Mountains, and then to Mt. Desert Island, passing by and looking down upon the seats of the mighty in the wilderness. Right behind our cottage at Hull's Cove is the famous Pot and Kettle Club where at one time, according to our barker on the Frenchman's Bay excursion boat (seats sixty people for a three-hour cruise of the seaside mansions of Bar Harbor, at $2 a head), the small and exclusive membership controlled 82% of the wealth in the United States. The phenomenon of the great mansions of our coasts, from Bar Harbor and Newport to Palm Beach to Santa Barbara, and of our mountain resorts, from Ashville to Lenox to Colorado Springs, remains a historical wonder which, like the great English manor houses (of unquestionable authenticity), should and will continue to be a tourist attraction as long as they survive.

Of course, Veblen was right. It is hard to believe that these houses were not built to be viewed by us gawkers, touring in droves to see the sights. Otherwise, why build with such conspicuous ostentation? Otherwise, why build with such obvious inappropriateness to the

(Continued on page 170)

*Louisiana Capitol at Baton Rouge.

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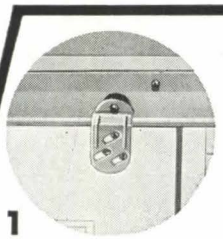
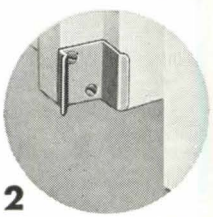
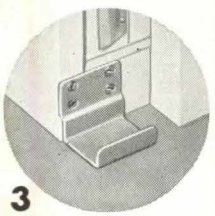


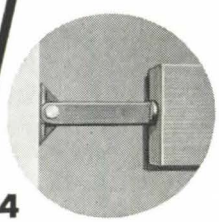
1 **Adjustable Hangers** with **Track** for doors up to 3' wide.



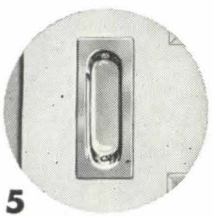
2 **Edge Guide** aligns door in closed position and makes it secure.



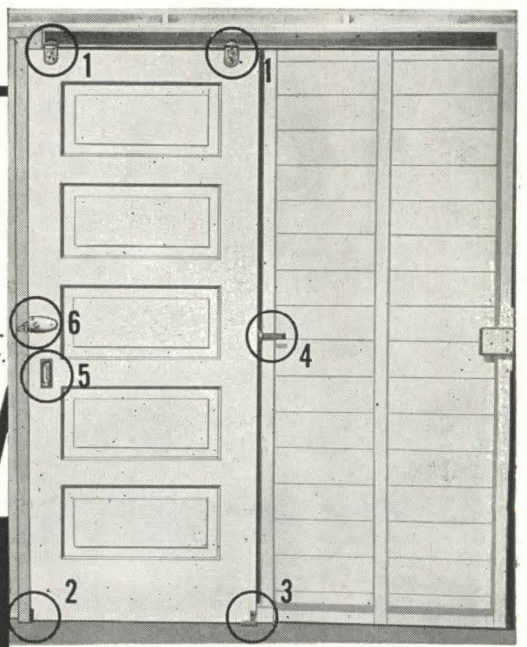
3 **Floor Guide** eliminates track on the floor. No grooving of door.

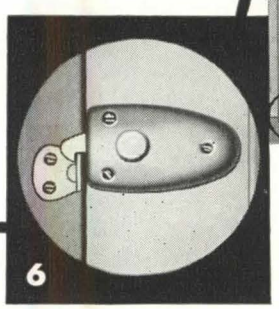


4 **Back Stop** permits full door opening, yet protects fingers and key.



5 **Flush Pulls.** Large for easy operation. Two furnished.





6

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2345 W. Nelson Street • Chicago 18, Illinois

out of schoo

(Continued from page 168)

site—the sea, the forest and the mountai
The architect, enoying his ability to comp
with God's untutored esthetics, provides
client with the fruits of their mutual egoti
In so doing, he also provides a vicarious th
to those of us who, as stepsisters to Cindere
never get to marry the Prince and live in
Golden Castle.

The curious thing to me about these gr
houses is how ugly they are. The old drafti
board architects, with all the money in
world to waste, lacked two vital design fa
ties—one, the sense of three dimensions, wh
would have given their palaces and man
the proper sculptural aspect; the other, the
ability to *land* their buildings. This latter
ficiency results from a lack of sense of top
raphy and site. The buildings hover just ab
the ground, not in a light and fantastic w
which could be beautiful, but in a he
indecision, as though about to be dropped
a clumsy Djinn out of Aladdin's lamp on
the elaborate terraces and shrubbery desig
by the most ingenious landscape architects
conceal the awkward gap between the ho
and the ground.

Be all that as it may, these are architectu
concoctions to conjure with. As social e
cepts they are receding, with the days
many Scotch gardeners, uniformed chauffe
and limitless house staffs. They still exist,
are aging with the grand old ladies in
grand old automobiles one still sees on
geant Drive beside the beautiful fjord
Somes Sound at Northeast Harbor. What h
pens next is in the lap of also aging go

●

I was talking the matter over the other
with the Dean of the School of Architectur
Theleme, who was also on vacation here.
met at the Bar Harbor Laundromat, whe
was delousing the children's blue jeans.
was staying at "Mon Repos," that beau
house at Seal Cove. As we sat by the s
ing waters, he confided to me that there
no longer laundresses at the big house,
that guests had to see to their own "blan
sage du fin." He is after all an old Be
Arts man like me, and we talk the same
guage.

"What," I asked the Dean, "is going t
the design training of our boys as fa
domestic architecture is concerned? Wil
have to continue indefinitely in this pre
trend of minimal houses? Will they n
again splurge into palaces for exiled

out of school

(Continued from page 170)

oad tycoons on rock-bound coasts? Will their
naginations never be taxed beyond the mo-
ule for the miniscule?

"At Theleme," said the Dean, above the
oar of the Surf* in the enameled boxes,
the matter is of serious debate among the
esign faculty. We see, on one hand, the re-
uirements of our age; on the other, the loss
f stimulus and excitement to the mind. In-
identally, we are also puzzled by this question
f the module. Here on Mt. Desert Island we
nd that our forefathers were Gargantuas.
eilings are fifteen feet high, bedrooms are a
inimum of thirty by forty feet, windows rise
ix feet wide to a height of eleven feet.
low we design for a ceiling of six-feet-eight
r perhaps to a maximum of seven-feet-two.
Our master bedroom is nine by ten, with a
ouble decker which just permits a body to
queeze between top mattress and ceiling. And
et, according to the latest statistics, our youths,
timulated by orange juice, breakfast foods,
nd lots of milk, are now averaging one and
ne-third inches more in height than our great-
randfathers. I have nightmares trying to
gure how to fold an average six-feet-three
asketball player into one of our prize-house
ackages. Maybe more frequent washing
oudl shrink them—the basketball player,
m thinking of, not the house—those could
ot be shrunk further.

"This is where the module problem arises.
e Corbusier has attempted through "Modulor"
invent a dimension based on the human
gure. But the human figure is not only in-
nitely variable, but also it is apparently en-
rging. While many of us attempt to reduce
ur horizontal dimension, our youngsters con-
nue the vertical trend. Our architecture, be-
g at present of horizontal design even for
any of our vertical buildings, continues to
amp the lid on us. Sometimes I wonder if we
ouldn't return to the Gothic. I'm getting a
austrophobia which no picture window can
itigate. I feel like a worm looking out from
ider a fallen log."

●

e Dean had wandered far from the subject,
is a Dean's prerogative, when on vacation.
changed the subject still further by ask-
g,

"When are you coming to Theleme as a
iting critic? You have been writing about
sign training for a long time. In fact, I
allenge you to try out your theories in prac-

(Continued on page 174)

wer Brothers, New York.

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2. **Kodagraph Autopositive Paper Translucent** has an exceptionally durable and translucent pa base . . . and a print-back speed which is 3 faster than regular Autopositive—*an import advantage in large-volume print production.*

3. **Kodagraph Autopositive Film**—with its hig translucent Kodak safety film base—is especia valuable in reclaiming "hopelessly poor" traci . . . and in reproducing extremely fine line det It is also widely used to reproduce catalog pag etc., including half-tone illustrations.

4. **Kodagraph Autopositive Cloth**—is reco mended for producing the most durable pri (nearly exact in scale) from drawings in g condition. Its base is white fabric—tough, crea resistant, highly translucent.

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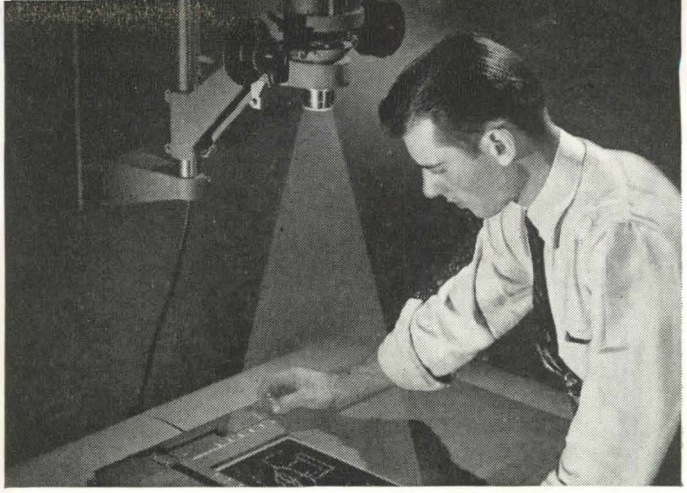

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agraph Contact Cloth, with an extremely durable, cent base and with similar emulsion character- is widely used to produce long-lasting second ls from paper negatives. (Unwanted design detail se negatives can be blocked out before printing.)

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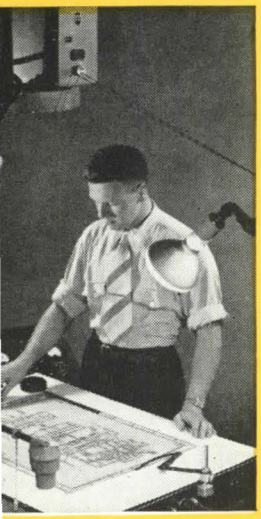

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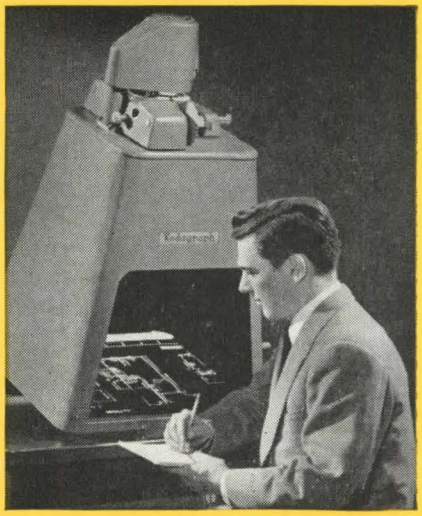

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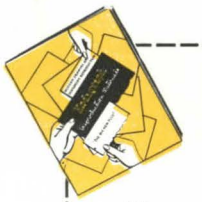

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(Continued from page 171)

tice! By the way, are you handicapp previous teaching experience?"

I had to admit that I was—some twelve of it. The Dean shook his head.

"The students won't like it. They are to practicing architects without teachin perience or training as critics. We c critics at Theleme every week. The ver known architects in the country are o lists and they prove a very real att and keep our enrollment way up. Yo have seen our bulletin advertising our c In it we have pictures of our critics, wives, and of their best buildings. We more names than any other school country. It is a very good system too b the boys by looking in the archit magazines can judge well in advance wh critic likes. This saves time, while edu the student by stimulating him to do re in the periodicals."

"That is going to constitute a proble said. "I have no recent buildings credit. I am sort of an educator and s of architecture and city planning at p There would be great difficulty in f photographs of my work anywhere. I think I could fit into your system too easil

"Well, it is something to worry about," the Dean, checking on his wrist watch how much longer the laundry needed, "b do pride ourselves on our flexibility. P you might prove a challenge to the boys would really have to guess hard to fi what it is you like. It would mean c of psychological research which, if yo willing to be subjected to it, could be stimulating."

"I wouldn't mind that so much," I saic why do the boys have to find out like?"

The Dean looked at me in astonis "That isn't a serious question, is it? Ho is a student to get the most out of a After all, architecture is a personal art student is to learn from the practition must study everything the man has don gains thereby a vocabulary—an alpha his teacher's design skills. By continu change our teachers we assist in the enl of this vocabulary. It is a practical, and obvious pedagogical system."

"Is it a system or is it an expedie asked, not meaning to be critical—just own information.

The Dean looked injured. "That is ob a double-barreled question, and I see n

(Continued on pa

Architect Henry Sprott Long
of Long & Gatling says:

"We specified Truscon "O-T" Steel Joists for the Highland Tower Apartment Building to assure...

light weight

strength

fire resistance

Hundreds of structures such as the Highland Tower Apartments in Birmingham, Alabama, indicate the trend toward lower cost per square foot construction while assuring adequate strength and safety with Truscon "O-T" Steel Joists.

Light Weight. The light weight of Truscon "O-T" Steel Joist construction lessens the time and labor required for erection and also saves materials in the supporting framework and foundations. Every detail of joists and attachments has been perfected by practical experience to simplify installation and assure dependable results.

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Fire Resistance. Fire tests prove that ¾ inch of cement or gypsum ceiling plaster protects Truscon "O-T" Open Truss Steel Joist Construction against high temperatures. The majority of insurance rating bureaus have recognized the merits of this construction and have accordingly given it a first-class fireproof classification.

See SWEET'S for complete specifications on Truscon "O-T" Open Truss Steel Joists. Write for illustrated literature describing the entire line of Truscon Steel Building Products.

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TRUSCON MARK OF MERIT PRODUCTS

TRUSCON a name you can build on

out of school

(Continued from page 174)

to answer it. The visiting critics have been enthusiastic about the system for years. One of them said to me recently, 'I can hardly keep ahead of the students. They know everything about my work. I really enjoy sitting down over the boards with them and debating design with them.' "

"Do you choose your critics by any sequence or do you fit them into a selected set of problems and dovetail them with other courses in construction, theory, etc.?" I asked.

"Our system of design training has proven by the fine quality of student work that it does not need to be 'integrated.' Our critics like their independence of the more academic and less realistic part of our curriculum. And we occasionally introduce our visiting architects to the regular faculty at a faculty club lunch."

"Well, if you think I might fit in, I'll be glad to try my hand at your system," I said. "Do you want me to sketch out a problem in advance? If so, will you be kind enough to send me a list of subjects in sequence for the year so that I can see where to fit in?"

"Oh, that won't be necessary. We do not like to routinize things to that degree at Theleme. There'll be plenty of time to work up a problem after you arrive. Just leave it to the students. They'll tell you what they want . . . "

At this point there was a violent death rattle in the Dean's washing machine—and his laundry was done.

"Well, it was fun seeing you," he said, as he bundled it up. "I'll have to get back to the house for cocktails before I iron my collars. I can roll up my sleeves and save ironing the cuffs. I'll send you a letter, later, giving you an official invite. And I do hope you will try to conform, at least for once. Cheerio!"

I look forward to a return visit to Theleme with great pleasure.

●

To revert to my vacation trip, the most conspicuous new architecture of our touring day, and the most sought after come late afternoon, is the tourist camp or motel. Its design, if it can be called such, is a never-ending wonder. First, one takes a bulldozer, dynamite and other lethal weapons, and completely clears a space in a virgin forest, alongside the road. Then having prepared the soil, one plants sugar lumps of clapboard or insulating board, with red or white roofs, in rows equally spaced. Then one places in front, in the middle, a filling station and office, and

(Continued on page 178)

GLASS that helps bottle up FIRE!

575 Madison Avenue Building, New York
Emery Roth and Sons, *Architects* • David Shuldiner, Inc., *Glaziers*

Mississippi Wire Glass Selected for *Protection* Qualities in Modern New York Building

The menace of fire is held in check in this outstanding new Manhattan structure by Mississippi Wire Glass.* Exterior windows are glazed with 25,000 square feet of this proven product which has so often helped to avert tragic and costly fire losses resulting from exposure through unwired glass. Mississippi's fine Polished Wire Glass not only serves to help hold fires within bounds of origin . . . it floods interiors with maximum daylight for easier seeing and better working conditions. Mississippi Wire Glass offers constant protection at minimum cost in doors, windows, skylights, corridors, fire escapes, vertical shafts and other places where fire or breakage protection is required.

Consider the record. Mississippi Wire Glass is the *original* wire glass upon which the Underwriter's Standard was based in 1899—the standard today by which others are judged. For over 50 years architects have specified Mississippi Wire Glass with confidence. Available everywhere from distributors of quality glass.

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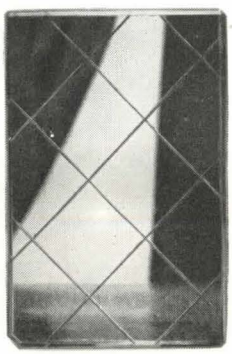
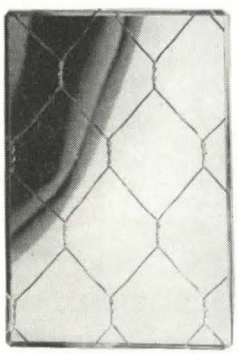


Polished Misco Wire Glass combines approved protection with modern beauty.



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This seal identifies Mississippi Wire Glass.

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WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

out of school

(Continued on page 176)

flanks the ensemble for five miles in all directions with signs tacked to trees, advertising the comforts and conveniences of home. This all-pervading architecture seems to be accepted by the American public without a murmur. It is part of the rapidly developing blight which is racing along our highways almost as fast as the automobile itself.

Was it for this that our forefathers pioneered this wilderness? Is this the American dream? Let no one gainsay the owner's right to earn his living. Let no one for a moment doubt the utility of these projects in our motor age. They are a necessary adjunct to our travel, our wanderlust. But who can justify for one moment this hideous destruction of our birthright and this irreparable damage to our souls? And why, oh why, is the American public so completely impervious to these sights? And where are the architects and planners? Or isn't any of this their business?

NOTICES

credit omitted

Credit to HOWARD T. FISHER & ASSOCIATES of Chicago was omitted in the advertisement for BRASCO MANUFACTURING COMPANY which appeared in June 1952 P/A *(Page 57)*.

The advertisement listed Holabird & Root & Burgee as Architects for the Evergreen Park Plaza Shopping Center; Sidney H. Morris & Associates as Architects for the Lincoln Village Shopping Center.

Howard T. Fisher & Associates should also have been credited as Associated Architects and Engineers for both projects. The shopping centers and all three architectural organizations mentioned are located in Chicago.

new firm

Announcement is made of the formation of "SCOPE: Interiors," an organization for complete interior design service. MICHAEL M. KANE, A.I.A., will be consulting architect. The work will be entirely in the contemporary idiom and cover all fields of interiors—commercial, industrial, apartment houses, etc. Headquarters will be located at 12381 Cedar Rd., Cleveland Heights 6, Ohio.

(Continued on page 180)

en people see in

nore come in...

and SPEND!

Eddy Harth, Beverly Hills, Calif.
Architect: Paul Laszlo, Beverly Hills

lay is necessary in order to move merchandise is
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NOTICES

heating and ventilating course

DEPARTMENT OF ARCHITECTURE AND DEPARTMENT OF ENGINEERING at the UNIVERSITY OF ILLINOIS announce for this fall a short course in "HEATING, VENTILATING, and AIR CONDITIONING." This course is to be directed specifically to architectural practitioners and it will be given Oct. 29-31. Inquiries may be addressed to: R. K. Newton, Supervisor, Engineering Extensions, 715 S. Wright St., Champaign, Ill.

regional A.I.A. conference

The regional conference of the A.I.A. for the NORTH CENTRAL STATES DISTRICT will be held Nov. 7 and 8, 1952, at the St. Paul Hotel, St. Paul, Minn.

new practices, partnerships

FREDERICK S. CATES, Architect, announces op ening of his office at 334 St. Paul St., Balti more, Md.

Howe & Foster, Architects, announce that J ROWLAND SNYDER has joined their partner ship. The firm now is HOWE, FOSTER & SNY DER, 1636 Connecticut Ave., Washington 9, D. C

EPHRAIM F. HUBERT, Architect, announces th opening of his office for practice of archite ture, at 55 W. 42 St., New York, N. Y.

JOSEPH T. GEMMI, A.I.A., announces his ass ciation with FRANK A. AMODIO and WILLIA C. MARTUCCI for practice of architecture, 24 Walnut Street, Newark 2, N. J.

CHARLES HENRY CONRAD and GEORGE BA CUMMINGS announce that they have admitte to associateship *their sons,* CHARLES HEN CONRAD, JR., Licensed Prof. Engineer, a JOHN BUTLER CUMMINGS, Registered Arch tect. The association will continue under t name of CONRAD & CUMMINGS, Associat Architects, at 99 Collier Street, Binghamto N. Y.

HARRY MILTON GRIFFIN, Architect, announc partnership with WILLIAM RAWLE GOMO for practice of architecture under the name GRIFFIN & GOMON, Architects, at Bldg. No. Municipal Airport, Daytona Beach, Fla.

Announcement is made of the formation of partnership under the name of CORROUGH WONG for practice of architecture, at 20 Pacific Ave., Stockton 4, Calif. The partn are DANA D. CORROUGH and WARREN C. WONG, both California certified architects.

LUCAS E. BANNON announces the associati of DANIEL P. ANTINOZZI, R.A. and KA SCHUMACHER for practice of architecture, 261 Rock Rd., Glen Rock, N. J.

The partnership of FRANCIS C. PUCKEY AUSTIN D. JENKINS has been dissolved as April 30, 1952. AUSTIN D. JENKINS CLAUDE W. THOMASON announce format of a partnership for practice of architect at Room 2100, Wrigley Bldg., Chicago, Ill.

THE PEPPER ASSOCIATES, Architects, annou withdrawal of MAURICE FLETCHER as a p ner. The firm includes F. F. SCHUMANN, A.I Partner, THEODORE S. MILLER, A.I.A., Part HEYWARD M. PEPPER, Partner and FREDER W. CROWN, Associate with offices at 225 15 St., Phila. 2, Pa.

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The ultra-modern new LEVER HOUSE, in New York City is beautiful throughout. It is also smoothly *functional* and *safe* from top to bottom.

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These *wood-faced* fire doors carry the Underwriters' Label for all Class B and C openings. Should a fire break out in any of the offices, it would be isolated. Should it attempt to invade from elsewhere, Weldwood Fire Doors, with their remarkable mineral core, stand ready to give the kind of protection for which they are famous.

In addition, the Weldwood Fire Door is so dimensionally stable that when properly installed, it is guaranteed not to warp for the life of the installation.

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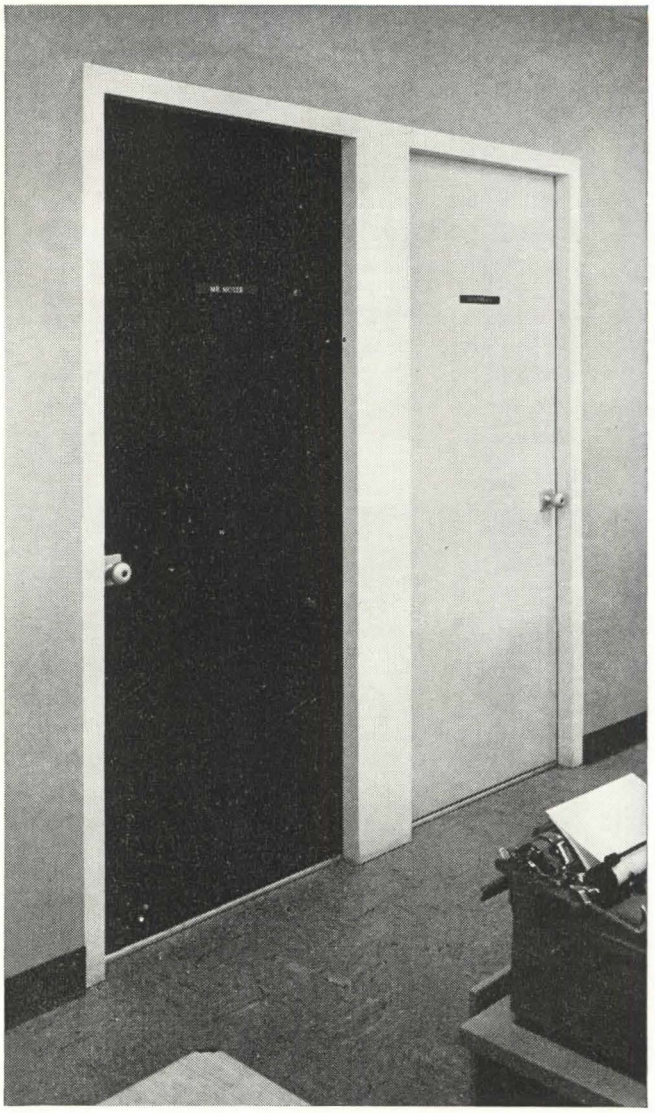

Weldwood Fire Doors in the LEVER HOUSE, New York City. Arch: Skidmore, Owings & Merrill.

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it's the law

by Bernard Tomson

construction bids, private and public construction; withdrawal of bids on grounds of mistake (continued).

Last month's column discussed those elements which are essential, for a court to allow a bidder to withdraw his bid, as well as those cases disallowing such relief. This present column deals with those cases where the equitable relief of rescission was granted, as well as a discussion of the effect of legislation in this field.

withdrawal of bid allowed.

Where the Court has found the presence of one or more of the elements previously discussed, they have been inclined to grant to the bidder the relief he has requested. The result of th holdings have been to relieve a bidder, v has incorporated some error into his bid, fr the onerous position of forfeiting his dep or performance of the contract at a substan loss. In *Kemper Const. Co. v. City of Los geles, 37 Cal. 2d 696, 235 P. 2d 7 (1951),* Supreme Court of California had before it determination a claim of a bidder for cance tion of his bond, on the grounds of mistake fact. The plaintiff had been preparing his until 2:00 a.m. of the last night prior to deadline and during the preparation an er in excess of $300,000 was made. The bid notified the city within hours after the b were opened and prior to any award be made. In granting the relief requested, Court stated:

"The type of error here involved is which will sometimes occur in the conduct reasonable and cautious businessmen, a under all the circumstances, we cannot say a matter of law that it constituted a negl of legal duty such as would bar the right equitable relief.

"The evidence clearly supports the conclus that it would be unconscionable to hold company to its bid at the mistaken figure. city had knowledge before the bid was cepted that the company had made a cleri error which resulted in the omission of an it amounting to nearly one-third of the amo intended to be bid, and, under all the circ stances, it appears that it would be unjust unfair to permit the city to take advantage the company's mistake. There is no rea for denying relief on the ground that city cannot be restored to status quo. It ample time in which to award the cont without readvertising, the contract was actu awarded to the next lowest bidder, and city will not be heard to complain that it not be placed in status quo because it not have the benefit of an inequitable barg Finally, the company gave notice promptly u discovering the facts entitling it to rescind, no offer of restoration was necessary bec it had received nothing of value which it c restore. See *Rosemead Co. v. Shipley Co., Cal. 414, 420-422, 278 P. 1038.* We are s fied that all the requirements for resci have been met."

In *School District of Scottsbluff v. C Constr. Co., 153 NEB. 451 45 N.W. 2d (1950), the Supreme Court of Nebraska* sidered the error so fundamental that municipality receiving the bid must have aware of the mistake when the bid was sidered. The court further found no negli on the part of the bidder and reasonable tice on his part. The Court stated:

"The record establishes that the cl error of $23,600 in the amount of the bi a clerical mistake in tabulating and comp

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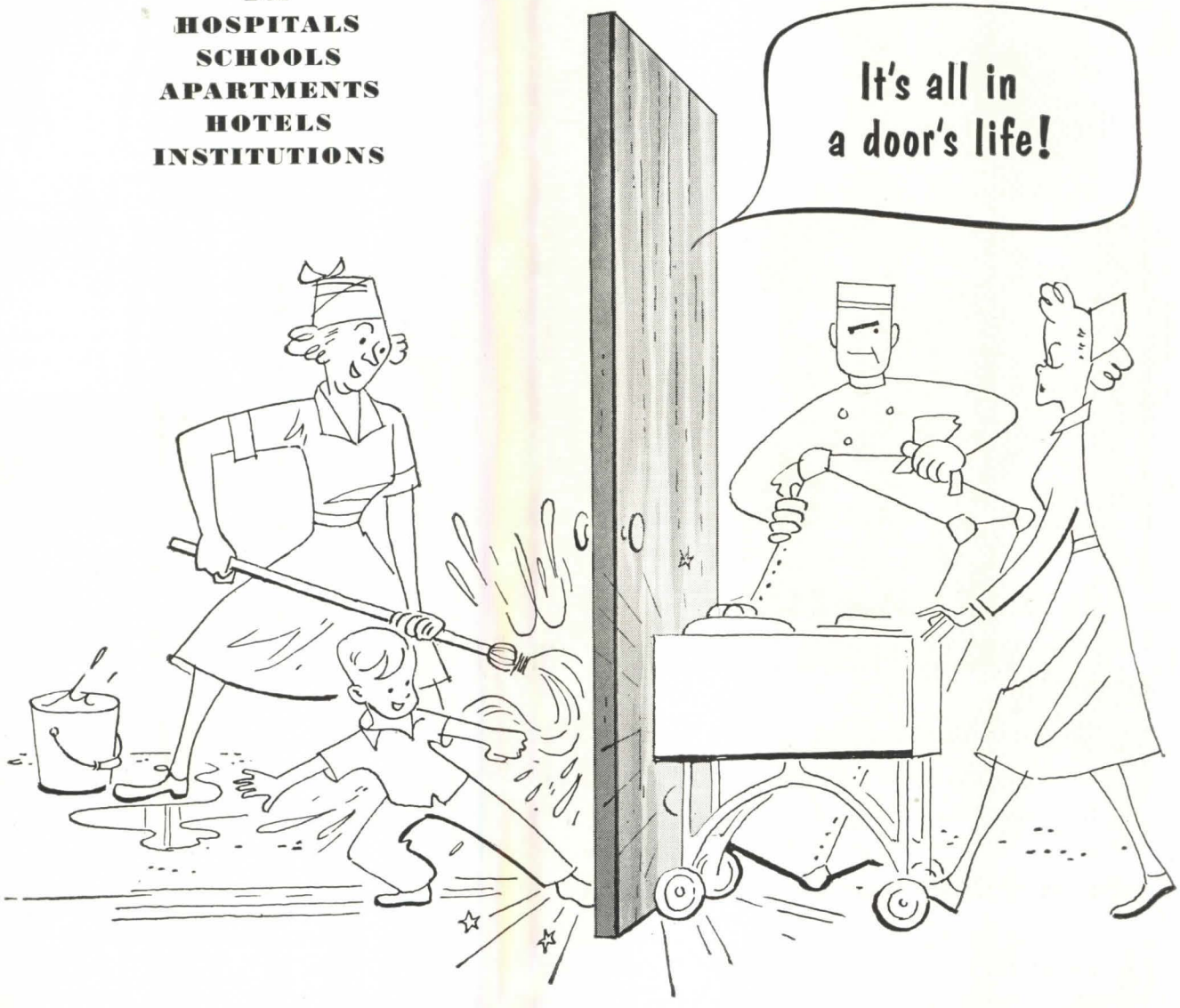

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the bid. It was not an error of judgment computing the quantity or cost of materia and labor. The mistake was unilateral, the being no allegations or evidence of mutu mistake. The school district contends that und such circumstances a bidder may not be r lieved of his bid except where it is shown th the party receiving the bid knew or ought have known, because of the amount of the bi or otherwise, that the bidder had made a mi take. While we think it could be said that th difference in the bids on the vocational agr culture and grandstand building was such to indicate to the school district that a mistak had been made and thereby bring it within th rules applicable to mutual mistake, the bidde has the right under the facts shown by th record to withdraw its bid even though it wa the result of unilateral error.

"The rule under such circumstances is: Whe the mistake is so fundamental in character th the minds of the parties have not, in fact, me or where an unconscionable advantage ha been gained by mere mistake, equity will i tervene to prevent intolerable injustice whe there has been no failure to exercise reaso able care on the part of the bidder and whe no intervening rights have accrued. In the cas before us the mistake was discovered an notice thereof given to the school district with in four days after the opening of the seale bids. It was a fundamental mistake as di tinguished from an incidental one. While th bid of the Olson Construction Company ha been accepted and the contract awarded to i no contract had been entered into; it wa wholly executory. Failure to use reasonabl care on the part of the Olson Constructio Company is not shown and rights of third pe sons had not intervened. The parties could hav been placed in status quo at the time of th withdrawal of the bid."

The Supreme Court of Oregon, in *Rushlig Automatic Sprinkler Co. v. City of Portlan 189 Ore. 268, 219 P. 2d 732 (1950)*, also a lowed a bidder to withdraw, where his erro was the omission of the cost of steel for construction project. The Court was of th opinion that the error was not due to an negligence on the part of the bidder and th he had given timely notice of error to th municipality. Furthermore, the Court felt th error was such as to apprise the municipali of the fact that a mistake had been made. Th Court said:

"One who considers in the cloistered cal of appellate court chambers the mistake whic the *plaintiff made* is prone to indict. Tra quil repose magnifies mistakes made by thos who work under stress and strain. It is eve inclined to condemn alacrity and insist upo such methodical care that error will be virt ally eliminated. Courts, however, cannot crea a Utopia and must deal with the realities life. Contractors who compute estimates do n work under ideal conditions. The record show that those who computed the plaintiff's b

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were compelled to cope with conditions which afforded error opportunity to steal in. The trial judge who saw the witnesses, and who himself questioned some of them, recited in his findings that the mistake was excusable and not culpable. We know of no reason for rejecting that finding; we think that the evidence warrants it.

"We believe that it is manifest from the evidence that the difference between the plaintiff's bid and the next higher was so large that all of those concerned with the undertaking were rendered uneasy. The plaintiff's officers at once returned to their work sheets, fearing that they must have committed a mistake. The City Engineer, according to his own words, found the variation so great that it 'scared us to death.' A member of the Board of Engineers, who seemingly expressed himself in wary words, described the plaintiff's bid as 'a very low' one and termed the difference between it and the City's estimate 'a very decided difference.' The bid aroused suspicion in all minds. We think that the difference apprised the City that a mistake had probably occurred."

Knowledge of the error by the receiver of the bid is one element given a great deal of weight. The Supreme Court of Illinois d tinguished earlier cases (discussed in previ article) and held the bidder entitled to res sion where there was actual knowledge of error on the part of the city. The Court stated *R. O. Bromagin & Co. v. City of Bloomingt 234 Ill. 114, 84 N.E. 700 (1908)*, as follows

"The bid submitted showed by one it thereof that appellees proposed to furnish a lay 6020 feet of 16-inch pipe for a sum ther designated. This sum was *less than they co* purchase this pipe for, leaving out of cons eration the expense of laying the same. T city engineer, who was a member of the boa of local improvements, observed this fact, a acquainted the other members of the boa therewith. It seems apparent, therefore, t the board of local improvements accepted bid knowing that this mistake had been ma It is suggested that the board could not kn but that appellees may have fixed this sum less than its actual cost and fixed other ite at a correspondingly high price so that up the whole they would be able to realize profit from doing the work at the total of bid."

●

the effect of legislation on withdrawal of bids.

Statutes have been enacted to govern conduct of the parties with regard to errors bids for public construction. Such legislation effect codified the existing rules of law w regard to this problem. They set forth the p cedures to be followed with regard to withdrawal of a bid, due to a mistake of f

The case of *Krasin v. Village of Almond, Wis. 513, 290 N.W. 152 (1940)*, was decid upon a statute then in force, regulating procedure in the withdrawal of a bid. T statute[1] required immediate notice of e upon its discovery and the filing of proof t the error was not due to any negligence. Court held that the bidder, having compl with the terms of the statute, could recover deposit. The Court stated:

"The plaintiff furnished such evidence complying with the statute as thus far sta by showing to the Village Board his final e mate sheet, which showed on its face that mistake was in wrongly setting down ther an '0' for a '6' in the thousand space of total of a column of figures representing cost of materials required for the work. T estimate sheet also showed on its face that total was one of the items that made up amount of the bid. The plaintiff on the day the opening of the bids explained his mist in detail to the Board. None of his statem in this respect was disputed. In showing how his mistake occurred the plaintiff sho that it did not result from any carelessnes examining the plan and specifications or conforming to the statute as thus far sta The trial court considered, and so do we, the plaintiff fully complied with the statute to this point.

"The defendant also claims that the plai cannot recover because of the closing par subsec. (5) which reads: 'and in case of feiture (the bidder) shall not be entitled

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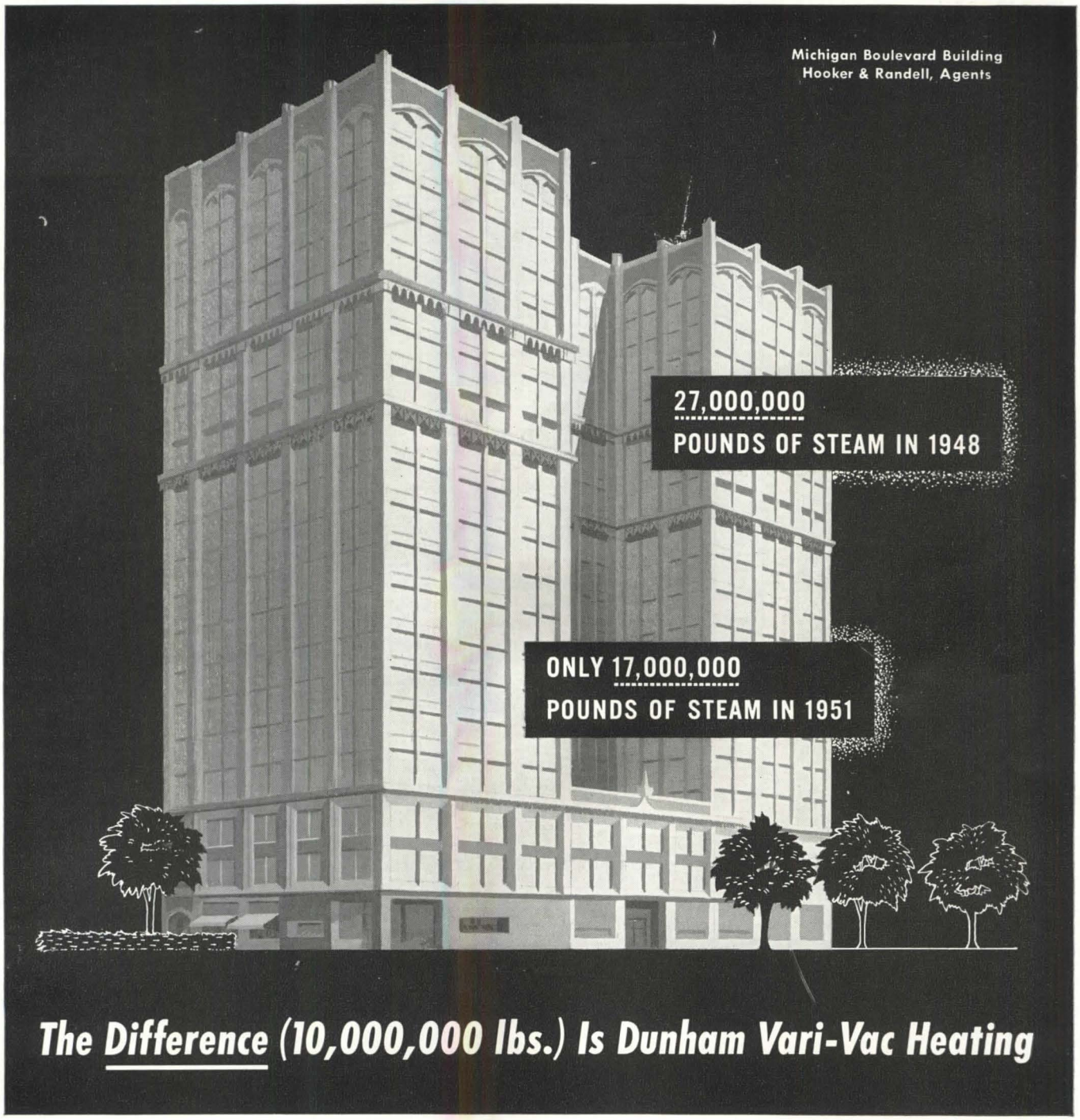

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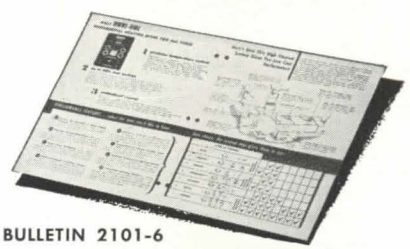

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recover the moneys or certified check forfeited as liquidated damages unless he shall prove before a court of competent jurisdiction, in an action brought for the recovery of the amount forfeited, that in making the mistake, error or omission he was free from carelessness, negligence or inexcusable neglect.' The three terms last above appearing as applied to the instant facts are synonymous. 'Carelessness' consists of the doing of some act or omitting to do some act. So as to negligence. The 'carelessness' or 'negligence' here involved, if any there was, consists of an omission to do some act. The 'neglect' involved, if any there was, consists of that same omission. The 'carelessness' or 'negligence' if any, was thus only 'neglect.' The only neglect that under the statute visits the penalty of forfeiture is 'inexcusable neglect.' Assuming that the legislature has power by its mere fiat to create a forfeiture by calling a penalty liquidated damages, a point which we do not here consider, unless the plaintiff's 'neglect,' if any there was, was 'inexcusable' there was no forfeiture under the language of subsec. (5) relied on as creating a forfeiture, and if such neglect did not create a forfeiture because it was excusable, neither did carelessness or negligence which consisted of the same thing as neglect."

The court was of the opinion that under the facts of this case, the bid, as corrected, should have been allowed to stand. The Court stated:

"Subsecs. (5) and (7) of the statute on which the defendant relies, so far as here material, are set out in the margin. Subsec. (5) is headed 'Corrections of Errors in Bids.' This heading manifestly contemplates that corrections of errors may be made in proper cases, and this would seem to imply that a bid when properly corrected may stand as a bid. Under this concept of the purpose of the statute, the Village should, under the facts found by the trial court, which are well supported by the evidence, have permitted substitution of the correct amount in the bid."

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[3]*Sec. 66.29 '(5) Corrections of errors in bids. Whenever any person shall submit a bid or proposal for the performance of public work under any public contract to be let by the municipality, board, public body, or officer thereof, who shall claim mistake, omission, or error in preparing his bid, the said person shall, before the bids are opened, make known the fact that he has made an error, omission, or mistake and in such case his bid shall be returned to him unopened and the said person shall not be entitled to bid upon the contract at hand unless the same is readvertised and relet upon such advertisement. In case any such person shall make an error or omission or mistake and shall discover the same after the bids are opened, he shall immediately and without delay give written notice and make known the fact of such mistake, omission, or error which has been committed and submit to the municipality, board, public body, or officers thereof, clear and satisfactory evidence of such mistake, omission, or error and that the same was not caused by any careless act or omission on his part in the exercise of ordinary care in examining the plans, specifications, and conforming with the provisions of this section, and in case of forfeiture shall not be entitled to recover the moneys or certified check forfeited as liquidated damages unless he shall prove before a court of competent jurisdiction in an action brought for the recovery of the amount forfeited, that in making the mistake, error, or omission he was free from carelessness, negligence or inexcusable neglect.*

'(7) On all contracts the bidder shall incorporate and make a part of his proposal for the doing of any work or labor or the furnishing of any material in or about any public work or contract of the municipality, a sworn statement that he has examined and carefully prepared his bid from the plans and specifications and has checked the same in detail before submitting the said proposal or bid to the municipality board, department, or officer charged with the letting of bids, and also at the same time as a part of such said proposal, submit a full and complete list of all the subcontractors and the class of work to be performed by each.'