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GRESSIVE ARCHITECTURE

religious buildings

3

march 1952

interior design data

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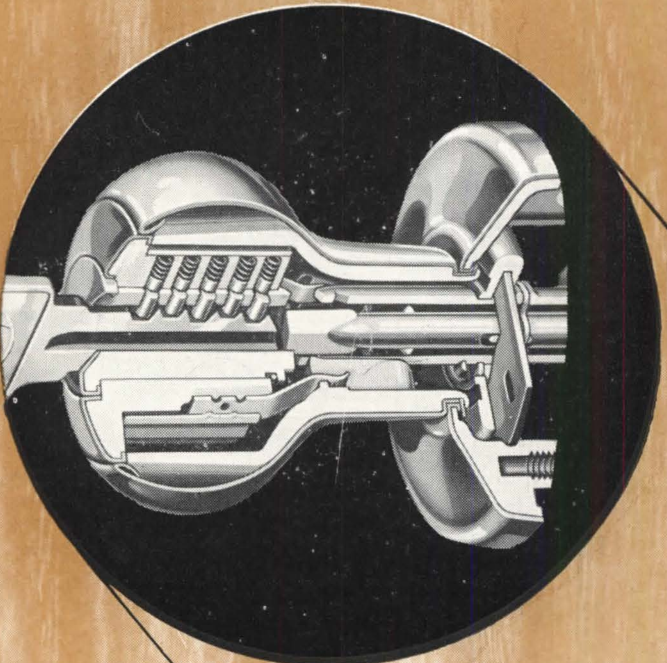
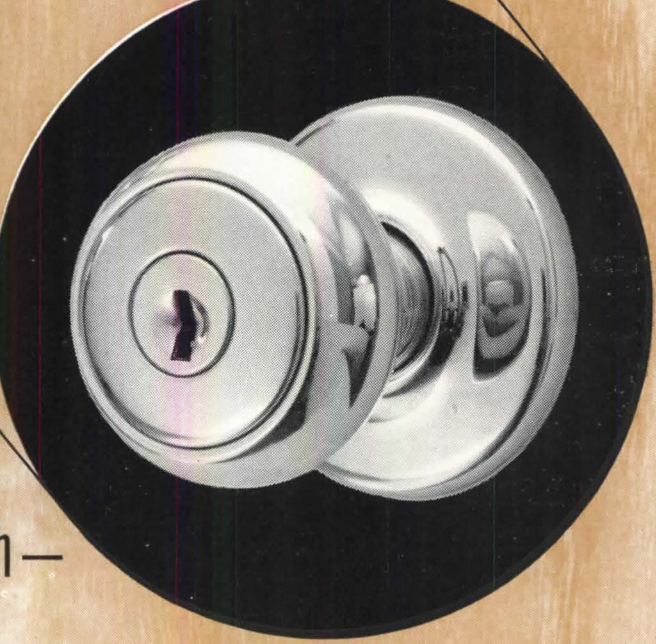
March 1952



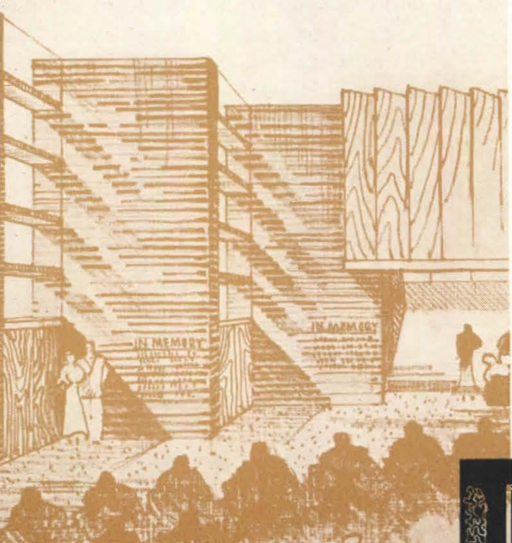


behind the glistening finish—

precision manufactured security

kwikset LOCKSETS

kwikset sales and service co.
anaheim, california

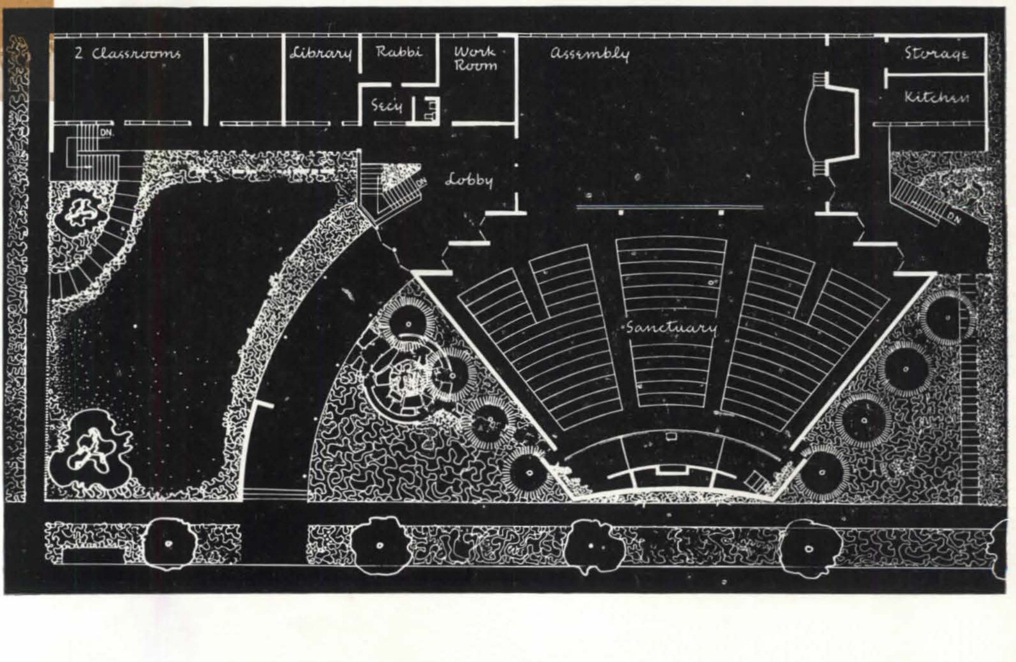


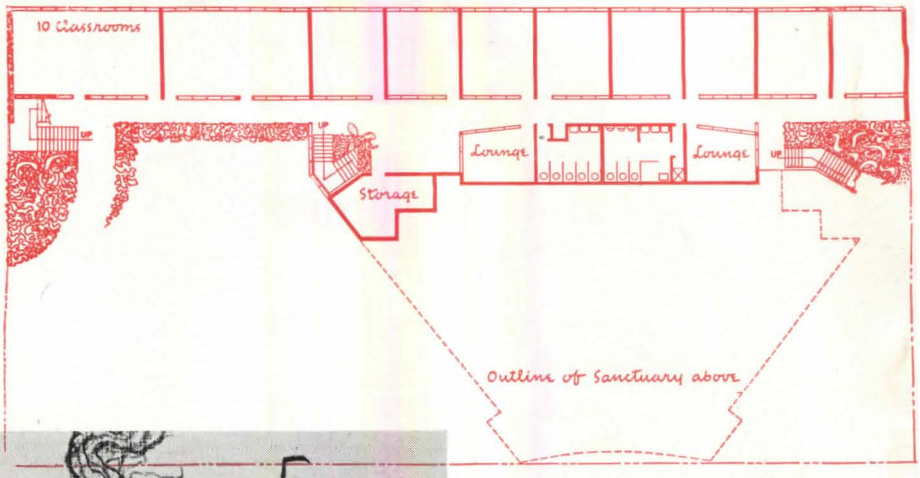
synagogue and educational center

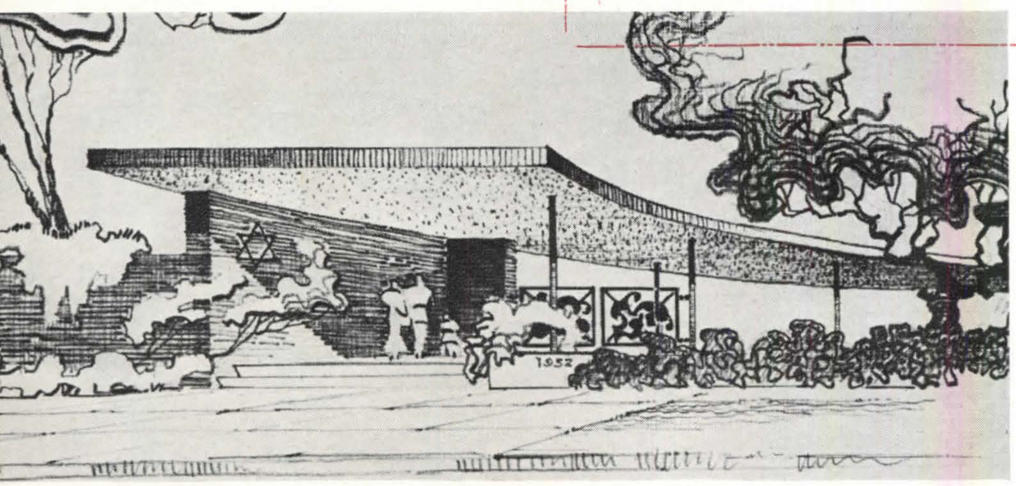
Temple Isaiah has been designed by Kenneth N. Lind, Architect, Los Angeles, California, for a steadily growing congregation of that city that wanted to symbolize its progressive attitude in the architecture, also to provide for a busy social and education program as well as the center for worship.

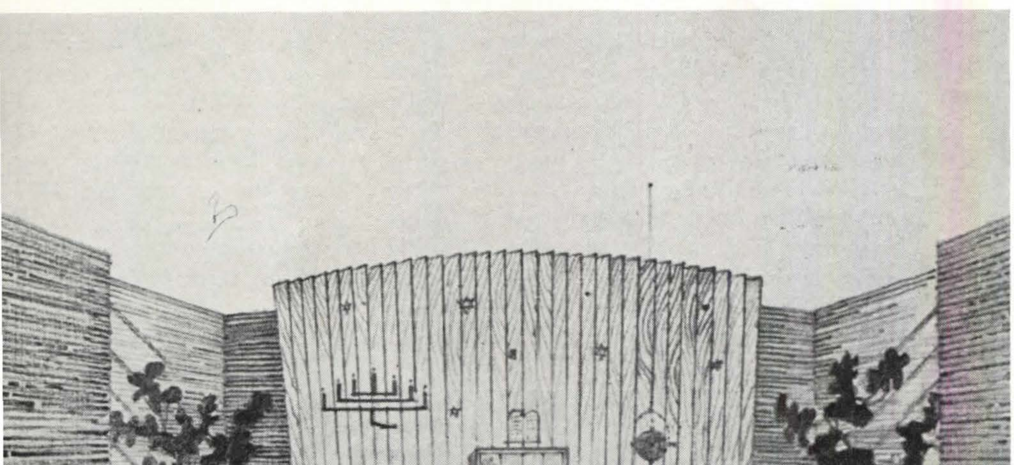
The plan indicates the use of a central, second-floor lobby, approached by a covered ramp curving through the garden, to link the sanctuary, assembly room, and block of educational classrooms, library, and workrooms. Folding doors between the assembly room and sanctuary would permit throwing the areas together when needed. This would seat more than 1000 persons.

Traditional construction and architectural styles, were carefully weighed by the rabbi and congregation before it was agreed that these were unsuitable for the







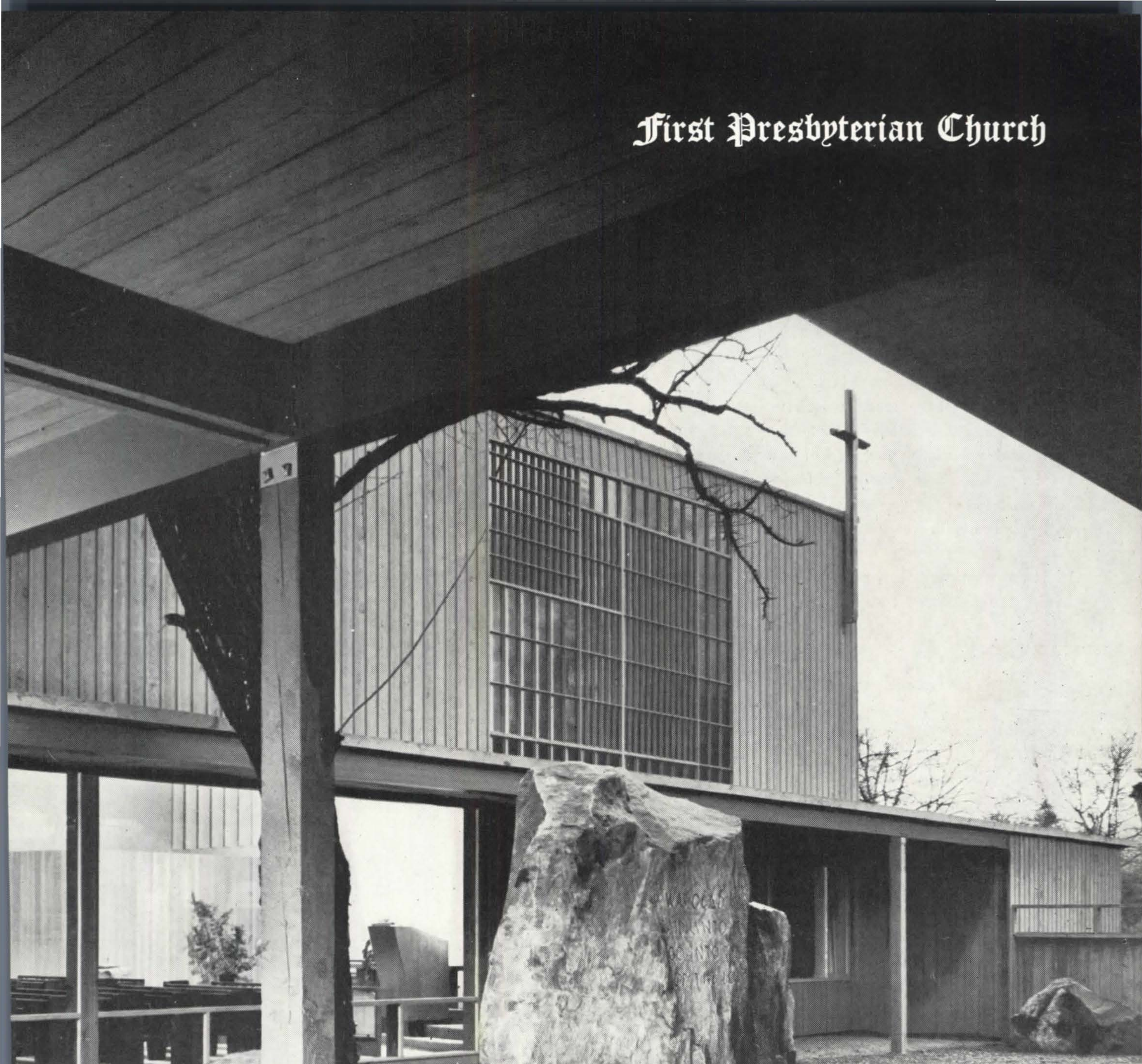


A light, curving loggia (top) *will lead through gardens up to the entrance of the Sanctuary* (above), *where the altar area will be dramatically lighted from the sides by hidden windows.*

objectives of a contemporary congregation. The concrete structure is to be erected by the lift-slab method. Brandow & Johnston are the structural engineers. Interior and exterior treatment, as well as decorative elements, all will be chosen for best contemporary expression. It is estimated that the temple and furnishings will cost $280,000.

In the educational center, along the north side of the site, there will be classrooms for the Sunday religious school and the weekday Hebrew school. In addition, there will be dual-purpose classrooms for study of arts and sciences. These light, well ventilated rooms are to have best modern classroom and shop equipment.

First Presbyterian Church



cation	Cottage Grove, Oregon
hitect	Pietro Belluschi

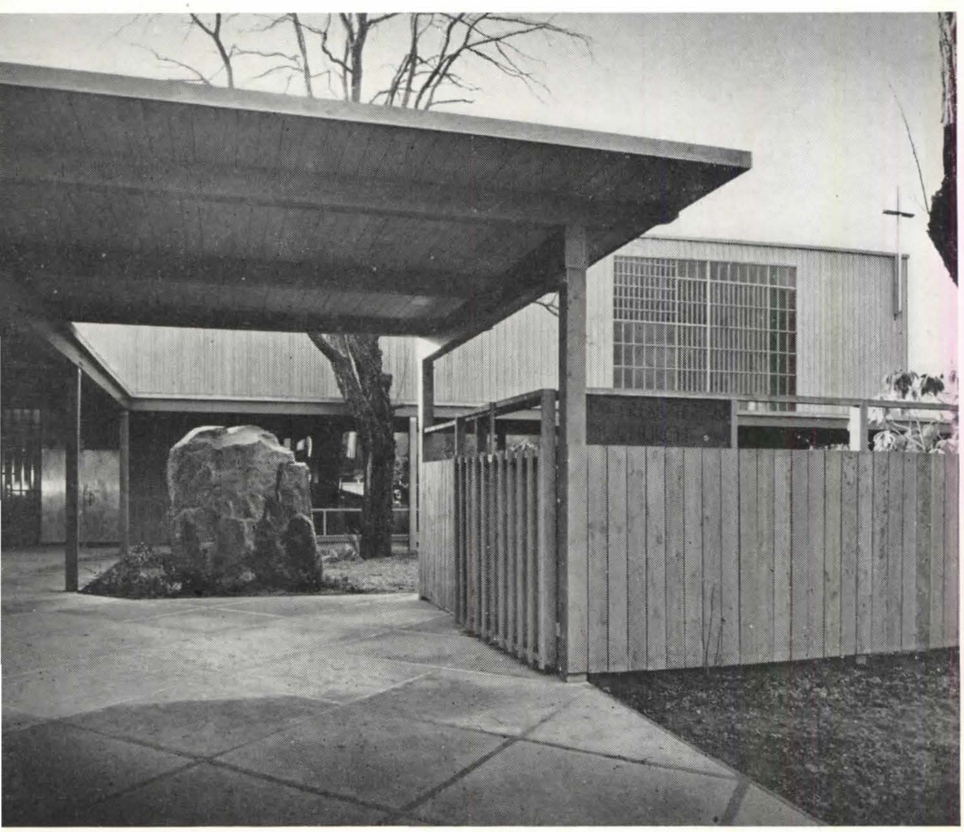
Forecourt looking toward the great chancel window. Exterior walls of the frame structure are rough-sawn fir boards and battens. The inscribed boulder at the entrance (foreground) symbolizes the joint spirit in which the church was built. "We almost gave it up," the architect reports, "as being too heavy and costly a job . . . but the committee decided that if the old Egyptians could move obelisks, they ought to be able to move small boulders. So they went ahead on their own . . . That's the kind of swell committee we had to deal with." Photos: Julius Shulman

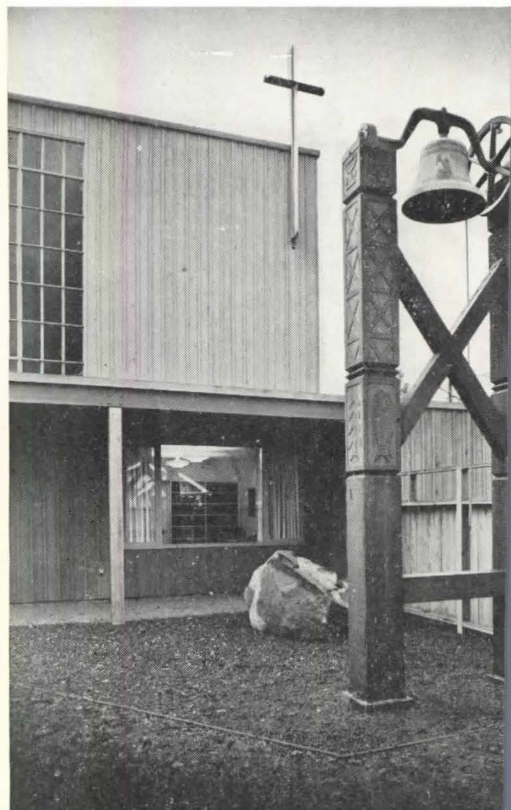
First Presbyterian Church

In approaching the problem of designing a religious building, Belluschi comments that "the contemporary architect is confronted by the difficult problem of creating forms appropriate to a modern society without destroying the symbols that have given formal validity to the idea of 'church' in the past." While Belluschi refuses to build with tools of the past or imitate old forms, he believes in respecting and preserving "that feeling of emotional continuity which is the very essence of religion." In designing the Cottage Grove Church, "the aims and reasons expressed by the architects were shared by Pastor and congregation."

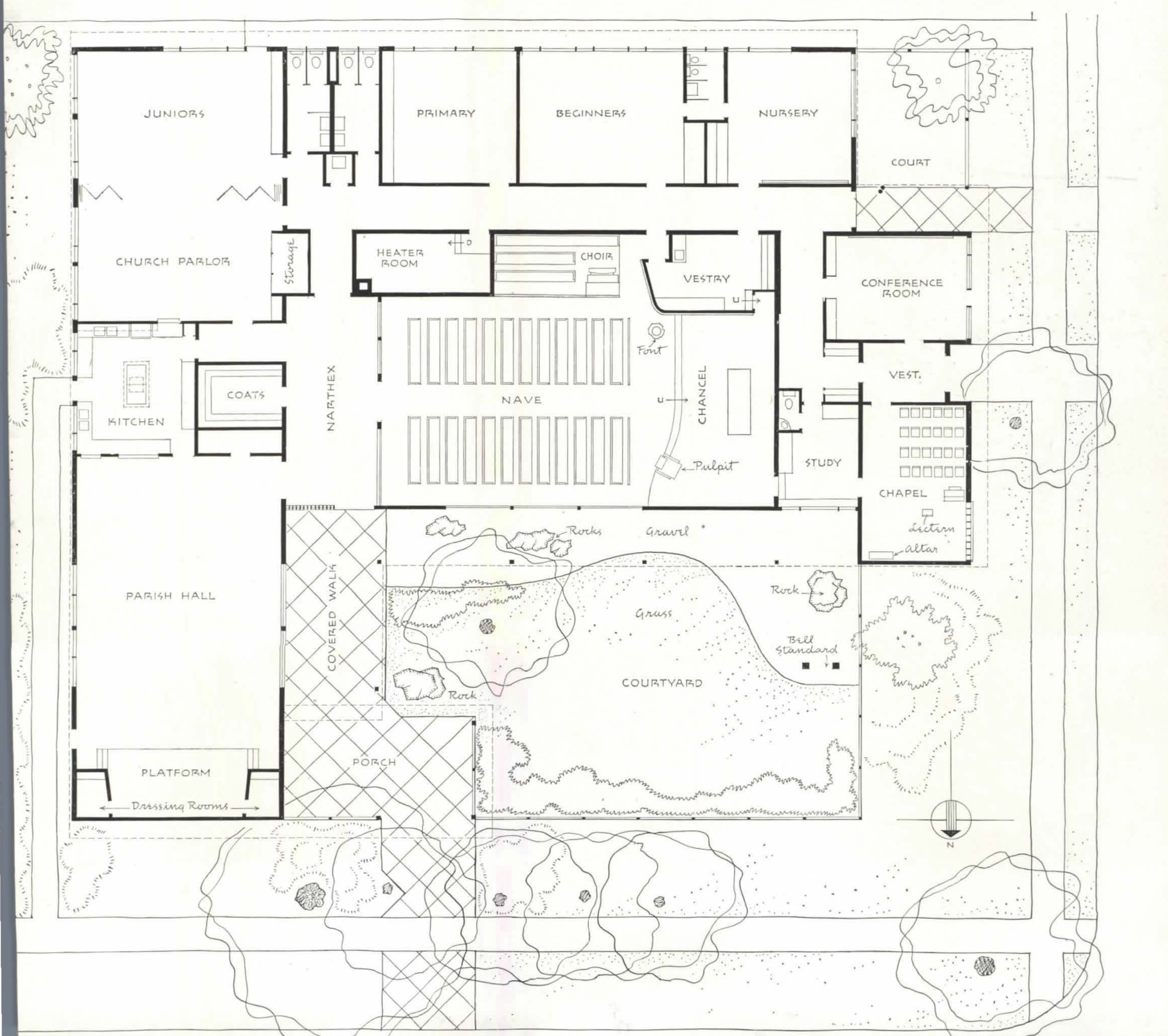
The lot, in the midst of a residential district, had beautiful trees on it, which have been preserved. The design aim was to produce an intimate and inviting atmosphere. Hence the landscaped forecourt, to provide a sort of transition area "to dispose the churchgoer inwardly, and to create a feeling of space and expectation . . . The materials used are humble ones, and the details very simple, chosen more to convey the idea of purpose than that of richness, and to prove that architecture is an intr
sic art and not an arbitrary dress to
applied at the designer's whim."

D. Hugh Peniston, the Pastor, car
the posts of the bell standard himself.
feels that "everything about the plan s
gests a small friendly church where peo
know one another, and work together to
God's will. It is not a small-sized mo
of a large city church . . . We have tried
be honest . . . expressing our faith in te
of our own day. Whatever else you may
of the building, it is our own."



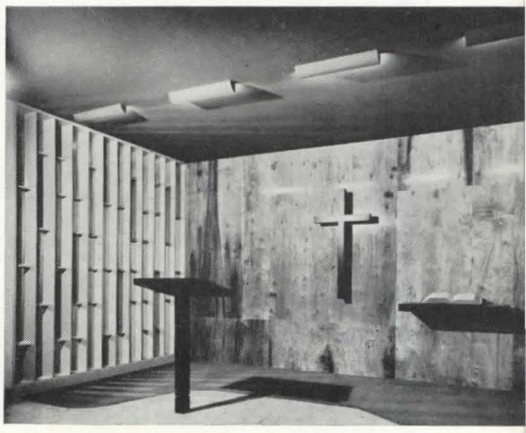


The entry porch (above) *and side loggia provide covered passage into the church. The bell standard, with posts carved by the Pastor* (above, right), *is freestanding, in the courtyard just outside the Pastor's study. Panels on the church side of the narthex* (right) *may be opened to take care of overflow congregation. The Pastor's study may be reached directly from the side street* (right of general view, acrosspage).


JUNIORS
PRIMARY
BEGINNERS
NURSERY
COURT
CHURCH PARLOR
Storage
HEATER ROOM
CHOIR
VESTRY
CONFERENCE ROOM
KITCHEN
COATS
NARTHEX
NAVE
Font
CHANCEL
Pulpit
VEST.
STUDY
CHAPEL
Lectern
Altar
Rocks
Gravel
Rock
Grass
Bell Standard
PARISH HALL
COVERED WALK
COURTYARD
Rock
PORCH
PLATFORM
Dressing Rooms
N

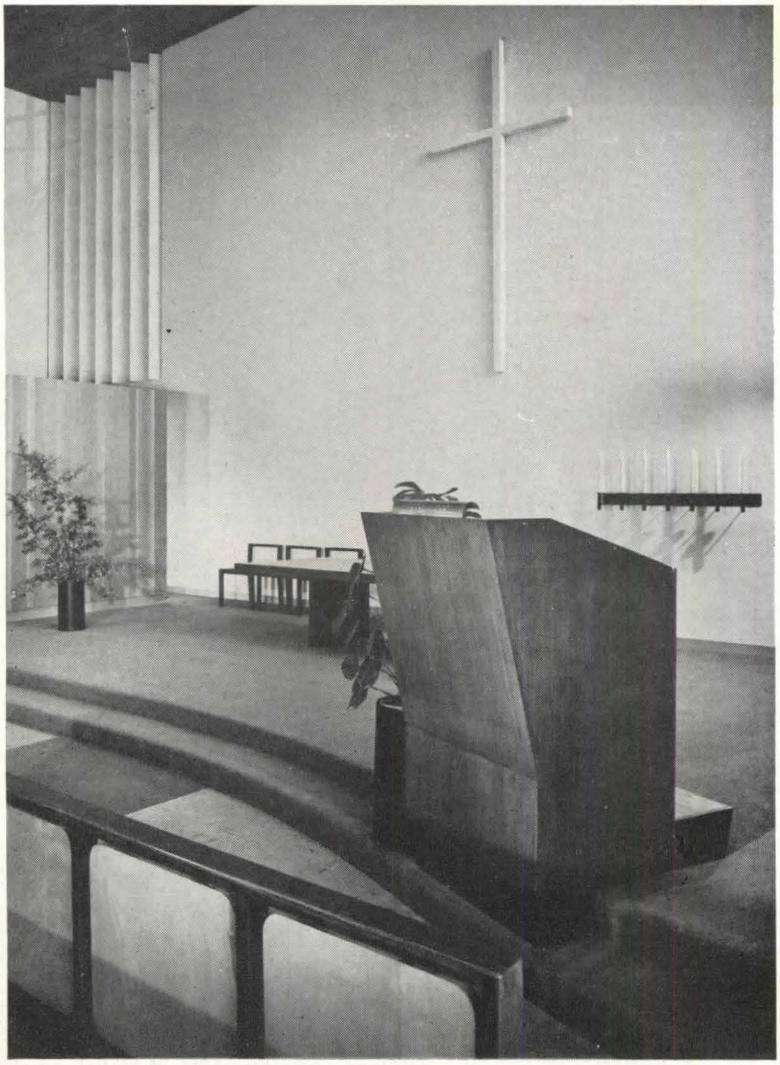
First Presbyterian Church

Interior walls are of plaster or spruce flooring. The church ceiling, that curves upward above the chancel, and the rear wall of the church are of grooved spruce, the grooving providing inexpensive acoustical correction. Flooring is asphalt tile. See Selected Detail of the pulpit, page 68. Heating is handled by a radiant floor panel system.

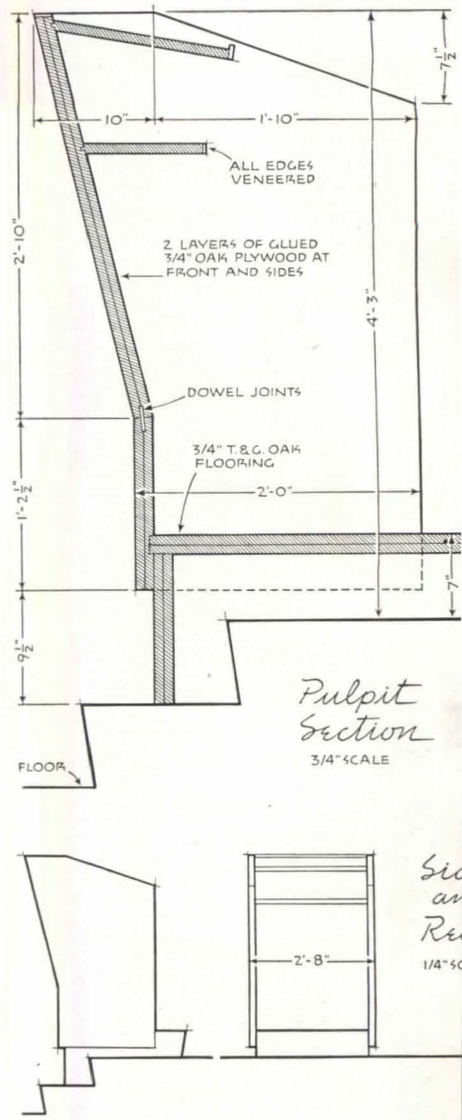


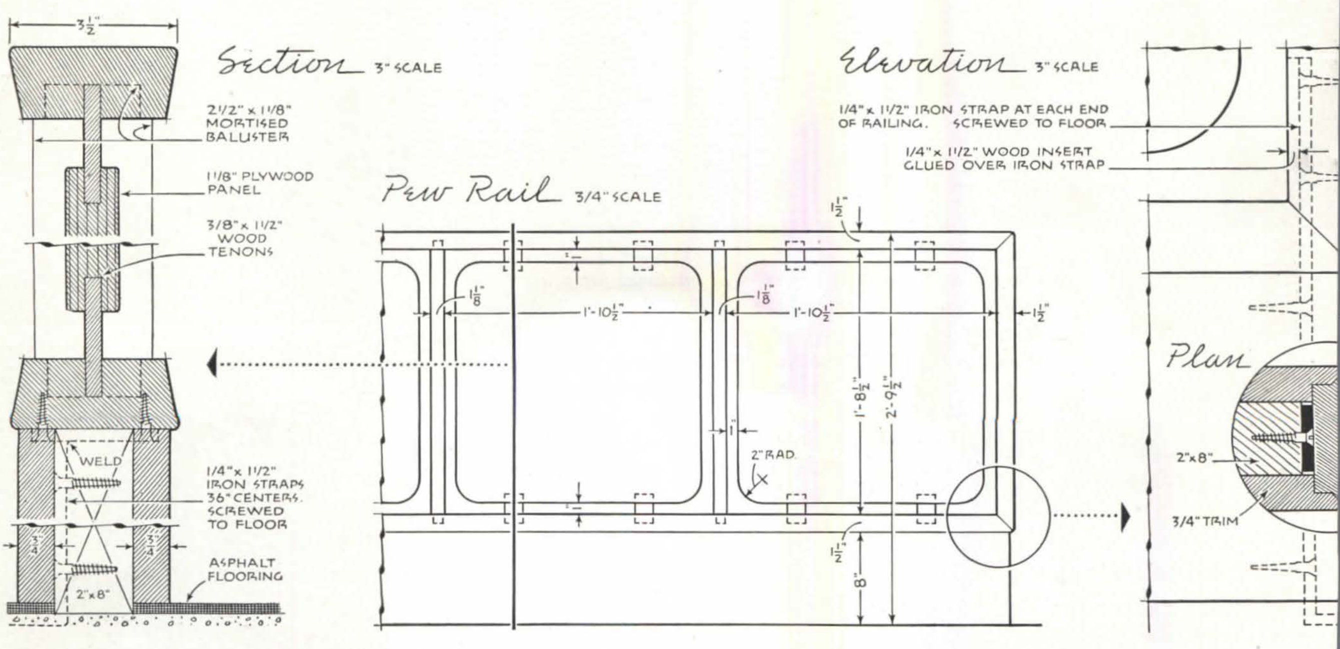
The chapel (right, top) *is open at all times for prayer and meditation. At the end of the parish hall* (second photo in strip) *is a stage. The church parlor* (third photo) *has a folding partition that creates two classrooms. At the southwest corner is the nursery classroom* (bottom photo). *Acoustical tile surfaces the ceilings. The architect asks that special credit be given to the contractors, Albert Vik & Son: "The workmanship throughout is superb. . . . They were inspired in their work."*

church: furniture



JULIUS SHULMAN





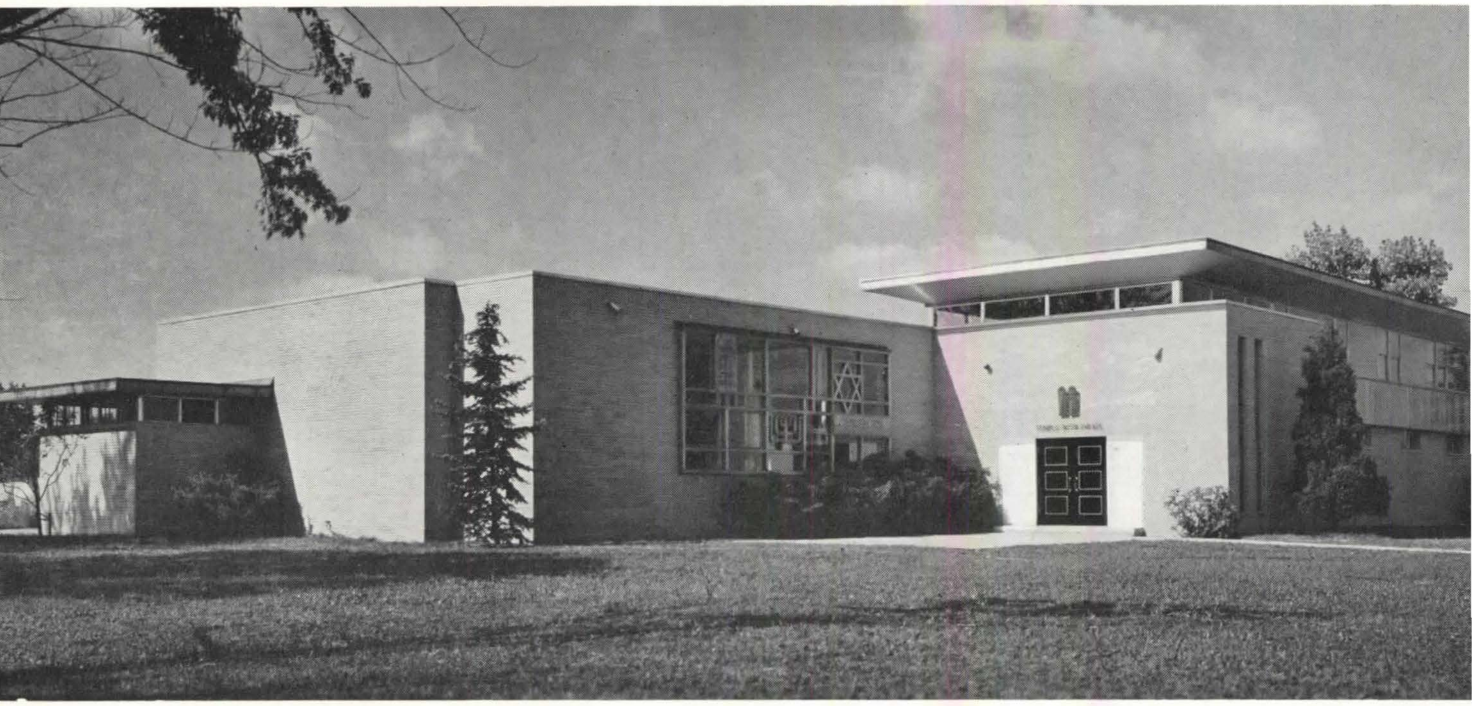
FIRST PRESBYTERIAN CHURCH, Cottage Grove, Ore.

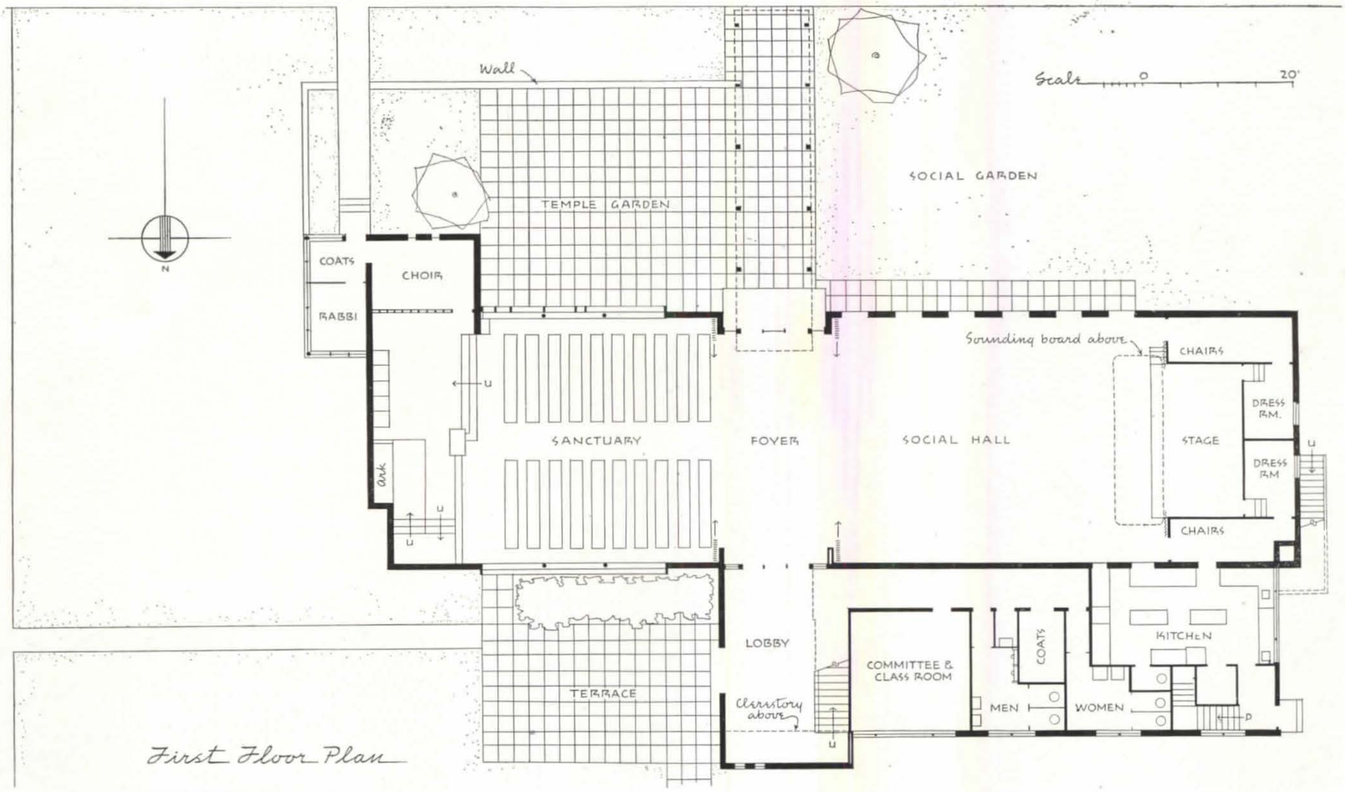
Pietro Belluschi, Architect

location	Lima, Ohio
architect	Percival Goodman
ssociate architects	Thomas D. McLaughlin and John J. Keil

TEMPLE BETH ISRAEL

Temple Beth Israel





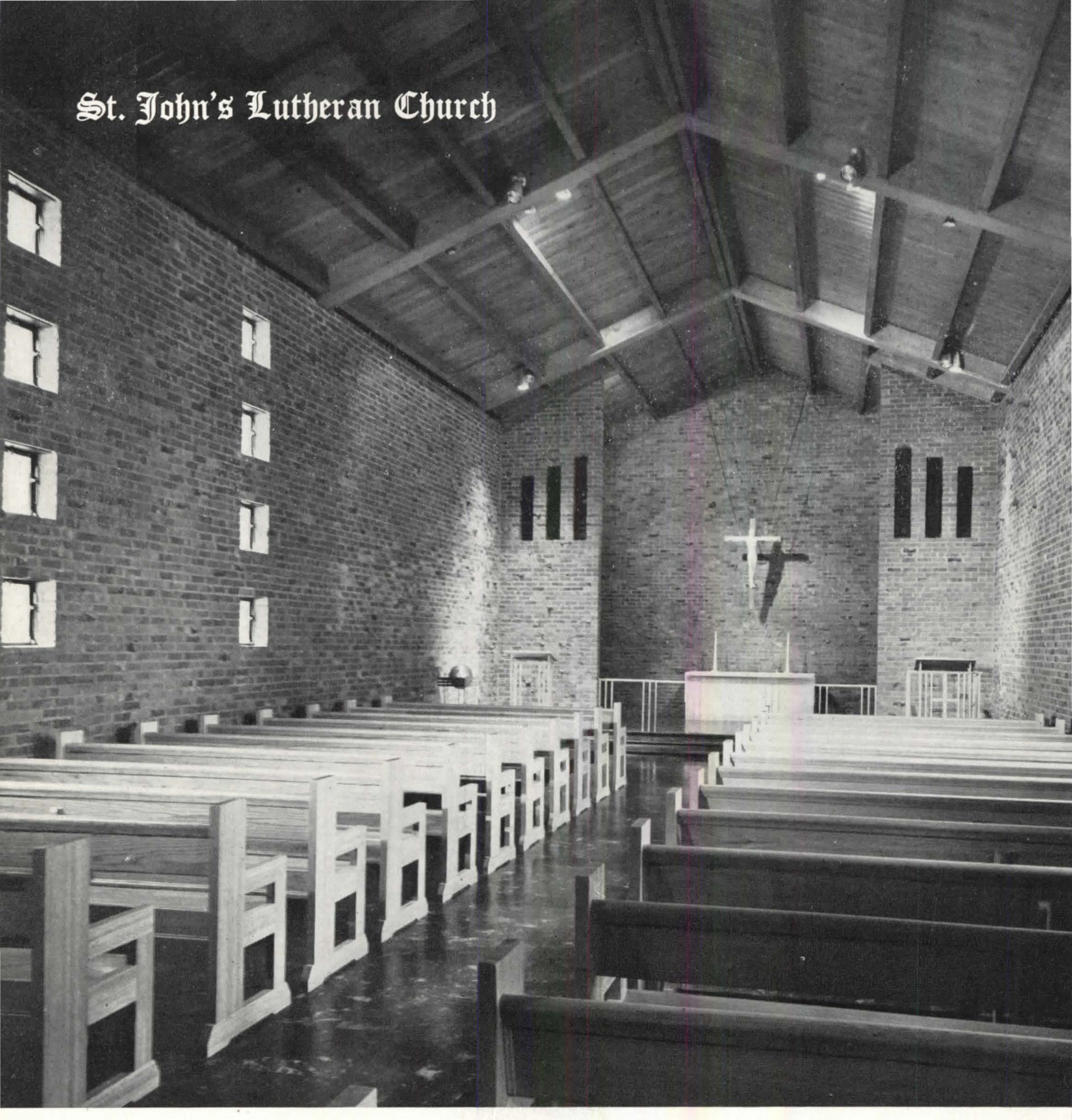
The planning problem was to provide a Sabbath temple with permanent seating for a congregation of 200, plus adjoining space related to the temple in such a way that the two areas could be thrown together to accommodate 500 or more on High Holy Days. During the remainder of the year, this expansion space would be used for social functions, lectures, assembly, theatricals, etc. In addition, four classrooms, a committee room, kitchen, office, coat room, and toilets were needed.

The flexible area is aligned along the south side of the building; entrance, offices, toilets, etc., are on the north. At the east end, about one-third of the open area constitutes the permanent temple; the portic alongside is normally used as a loung foyer, and the western end is a social hal equipped with a stage. A serving kitch adjoins. Folding partitions make it possib to divide or join the major spaces needed. A second floor on the north side the building contains the four classroom

The stair landing (right) *is suspended from the roof framing on turnbuckle steel tension rods. Throughout, interior finishes, as in the temple* (below), *are brick or red cedar; spotlights are recessed in the attached acoustic ceiling. Two sets of folding partitions* (below, right) *define the social hall (foreground), lounge, and temple. Cavity brick bearing walls were used since they provide in one operation bearing, insulation, and finish; open-web steel joists span the main hall, while wood-joist floor construction is used in the school area.* Photos: Hedrich-Blessing Studio

As a primary element in the Jewish ser-
e is reading, ample daylight is provided
the temple by two large windows; arti-
ial light comes from recessed spots, pro-
cing 20 foot candles at reading level.
e heating system is radiant type—steel
e in the first floor; copper coil in the
ling of the second floor.

St. John's Lutheran Church



location	Fayetteville, Arkansas
designer	I. Jack Gural

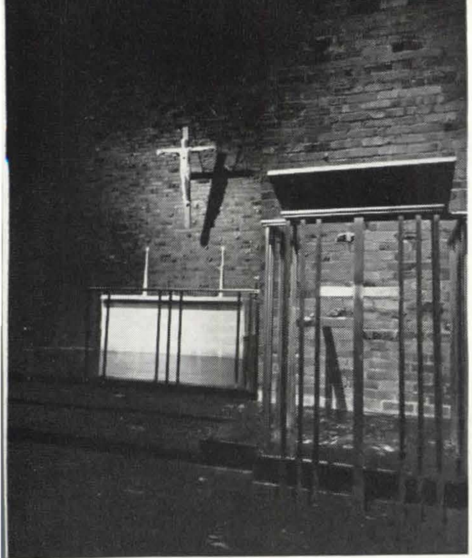
Designed to serve the needs of both townspeople and students at the University of Arkansas (whose campus it adjoins), this project has two major parts—the church to seat 150, with choir loft above the narthex, and a recreation-fellowship wing.

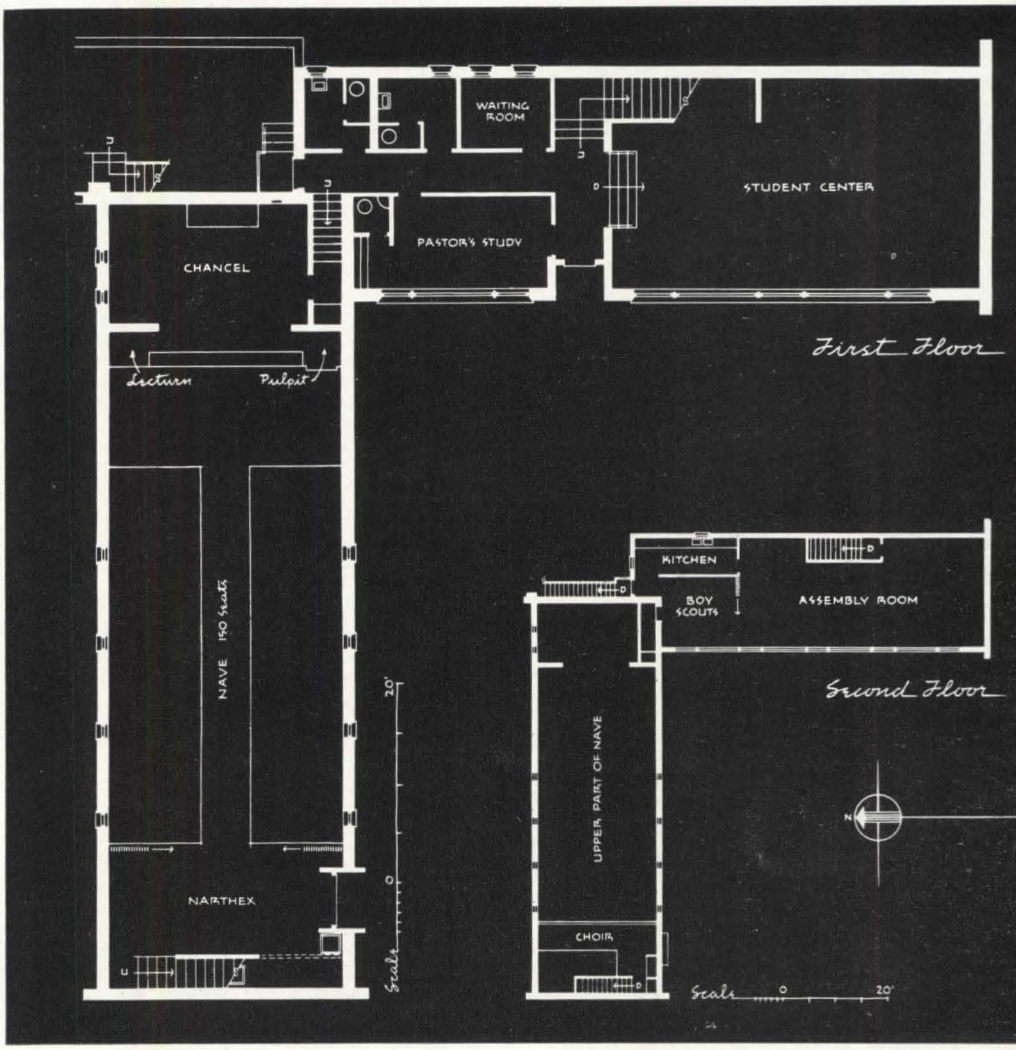
Elements were consciously kept simple, and the church was designed to focus maximum attention on the altar. The frame is of steel-frame trusses, with columns embedded in the 12-inch sidewalls of clinker brick; window openings are glazed with pale gold, translucent lights. Exposed fir purlins extend the length of the roof and protrude through the rectangular brick wall at the west end. The 12-foot cross wood, in front, is floodlighted at night.

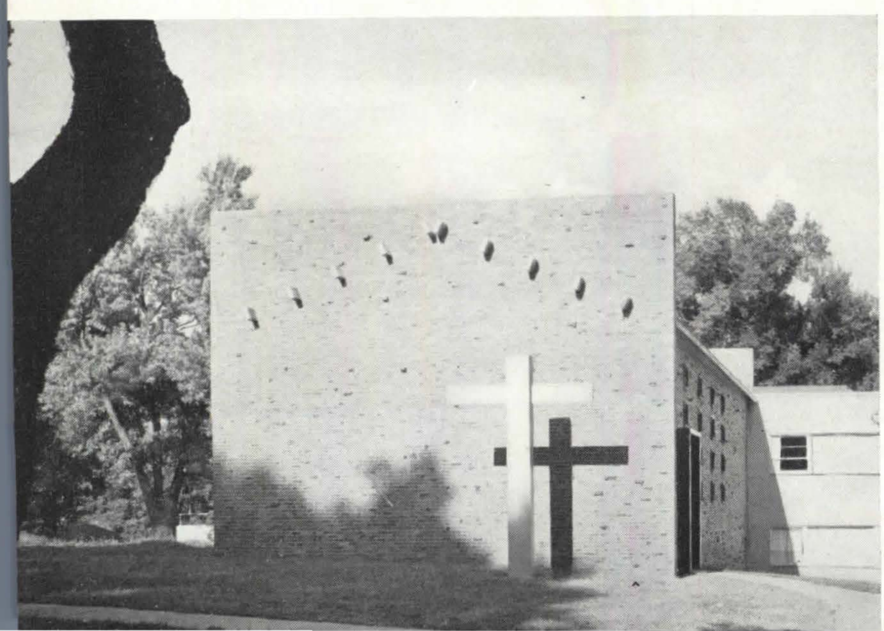
The altar is of marble and limeston altar rail, pulpit, lectern, and baptism font are aluminum. The Crucifix w *sculpted by* Harriet Reinhardt. The tw story wing uses bar joist and steel roof co struction; pumice-block walls. A forc warm-air system heats the building.

"In its simplicity, it effectively sets t tone of and for worship," says Pastor Ma cus Lang. "Its small, community feeli is all to its advantage, the very thing f which I believe we should strive toda

Photos: Bob's Studio; *Lionel Freedm*

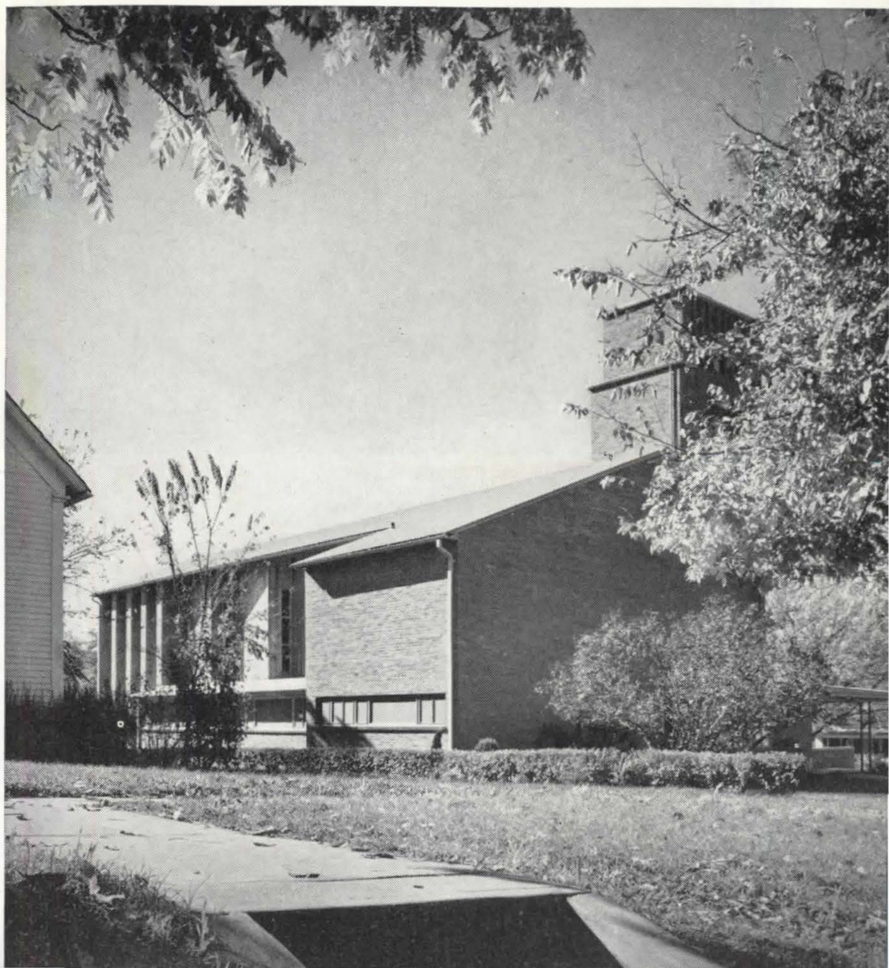



WAITING ROOM
STUDENT CENTER
PASTOR'S STUDY
CHANCEL
Lecturn
Pulpit
NAVE 150 Seats
NARTHEX
Scale
20'
0
First Floor
KITCHEN
BOY SCOUTS
ASSEMBLY ROOM
Second Floor
UPPER PART OF NAVE
CHOIR
N
Scale 0 20'



St. Paul Lutheran Church

location	Clay Center, Kansas
architects	Ramey, Himes & Buchner



This structure, designed to house two congregations joined, is built on the site of one of the old churches. Since designing the building, the architectural firm has become two offices, with Ramey & Himes continuing their practice in Wichita, while Robert E. Buchner has established his own firm in Tulsa.

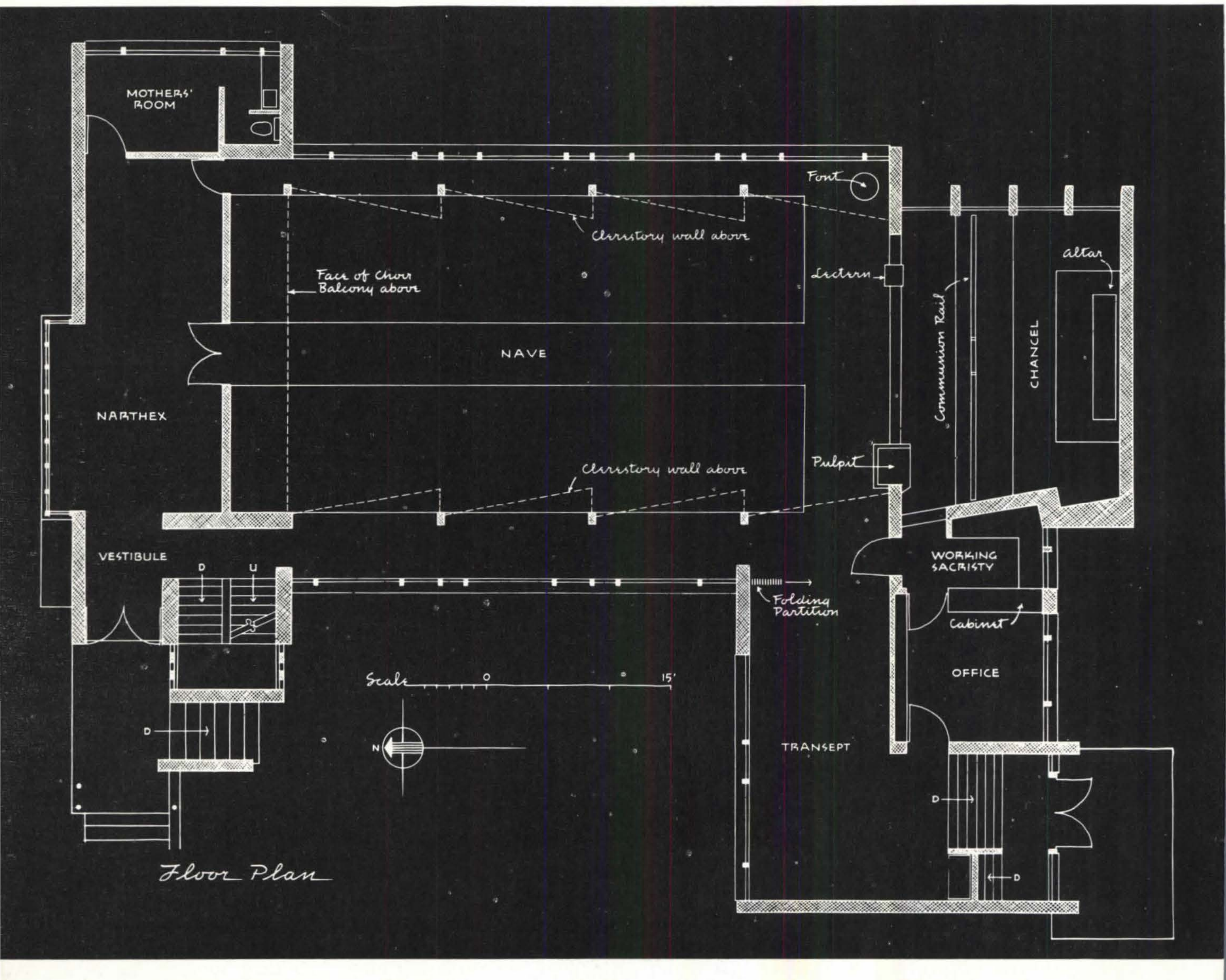
Photos: Julius Shulman

St. Paul Lutheran Church

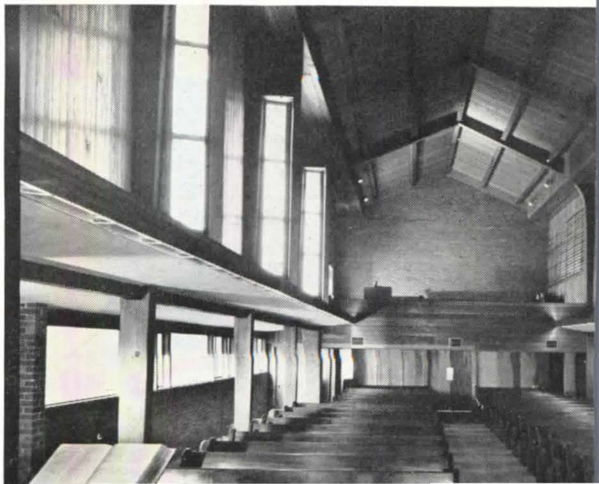
The joining of two congregations led to the decision to build a new church, and the architects were asked to produce a structure "to interpret the spirit of Christ and to enrich and perpetuate a Christian faith among us and our children."

Happily, no stylistic strings were attached, and the success of the design is indicated in the comment of *The Clay Center Dispatch:* "A building of this kind is a real asset to the community." The Pastor feels the building to be symbolic of a sincere and living Christian faith through the honest use of materials and modern construction."

In addition to facilities shown, there is a full basement, with parish hall, a classroom, kitchen, and service rooms; also (above the narthex) a choir loft and pipe organ. The



The natural lighting is designed to focus the eyes and minds of the congregation on the chancel and altar; strip-windows in side aisles are a greenish, glare-reducing translucent glass; the clerestory wing-panels direct light forward, and at left of the altar is a huge window panel that floods the area with light. The curtain behind the altar, with gold thread on a blue-green field, was specially woven for the church by Marianne Strengell. In plan, note the rear motor entrance, for use for small functions or in inclement weather.



ping corner lot is the site of the former urch, and the new building was built ile the old one was still in use; hence, fortunate lawn setbacks from sidewalk es. The slope allowed full above-grade ndows for basement rooms.

The structural system consists of a com- ation of open-web steel-joist framing the main floor, with the roof and high e walls carried on laminated wood ches. End walls are of brick masonry. As the architects explain, "this system gave us freedom to form the side walls—splayed window panels in the upper portion, etc.—with low side aisles which, by contrast, in crease the apparent height of the nave." Brick and wood were selected as major materials for their simplicity, beauty, and economy. The church is heated by a natural gas-fired, forced warm-air system, with separate zoning and control for the main floor and basement.

In this article, the author discusses five principles affecting the design of church-heating systems and applies them to two of the churches presented on the preceding pages. As he had only basic floor plans to consider, and was denied the benefit of consultation with the architect concerned, his analysis should be valued primarily as a method of applying these principles.

principles and violations of church heating

By Robert H. Emerick*

Two unusual but vital factors guide our approach to church-heating design.

First, all church monies are provided by voluntary, and sometimes uncertain, contributions from parishioners. This means that a lack of funds is a constant and well-established church ghost.

Second, the hours of heating, depending on the particular church considered, will range from two hours per week, for a single service, to almost continuous heating for a church that remains open between services for personal worship and meditation. This means that fast heating is desirable for a brief use of the facilities, while some form of partial or area heating should be provided for the open-door condition.

These factors create the first principle of church heating, which is: *provide economy in the design.*

The spending money of one church, for example, comes from 450 families; more than half of these families contribute less than $1 per week per family, and only three of them can be counted on for as much as $5 per week, or more. Also, these are weekly averages taken over a full year; many times, the income drops substantially as individual families meet sickness or other immediate obligations. This is a relatively large and affluent church; nevertheless, there simply is not enough *sure* money available to allow an elaborate heating system. In short, any design that violates this first principle is asking for rejection.

Figure 1 illustrates an application of the utmost economy for a short-use church. Ornamental grilles conceal gas-fired unit heaters and acoustically lined ducts satisfactorily reduce fan noise. From an investment standpoint, there is seldom a cheaper way of heating than this one; in some areas of the country, however, gas fuel is expensive and, for a church with medium to long hours of use, the operating cost may soon nullify the investment saving.

The second principle is a requirement so obvious that only its frequent violations require us to consider it in some detail. It is: *provide uniform heating, without drafts or hot spots.*

Usually the designer, if he is a professional, knows all about uniformity in heating. Unfortunately, he sometimes allows church authorities to convince him that short cuts must be taken to save money or space.

Figure 2 shows a heating system that was abandoned eventually, on orders from the church authorities, in favor of Figure 3. The latter arrangement clipped $6000 dollars from a $14,000 installation: and also clipped heating satisfaction since the back of the church, where the air in the underfloor plenum was comparatively stagnant, remained much cooler than the altar end.

Figure 4 illustrates another way that violates heating uniformity. In this arrangement, the warm-air supply is being forced to go too far and remain warm too long. The employment of return-air grilles at regular intervals throughout the full length of the church, cannot overcome the trouble since air, like water, takes the path of least resistance, and the returns near the heater will do most of the work.

In this church, the installation of a few radiant-glass, electric-heating panels at the chancel end would contribute substantially to better and more uniform heating. Although electric panels would create a hybrid system of heating, one should not hesitate to combine varied heat sources to achieve a harmonious effect.

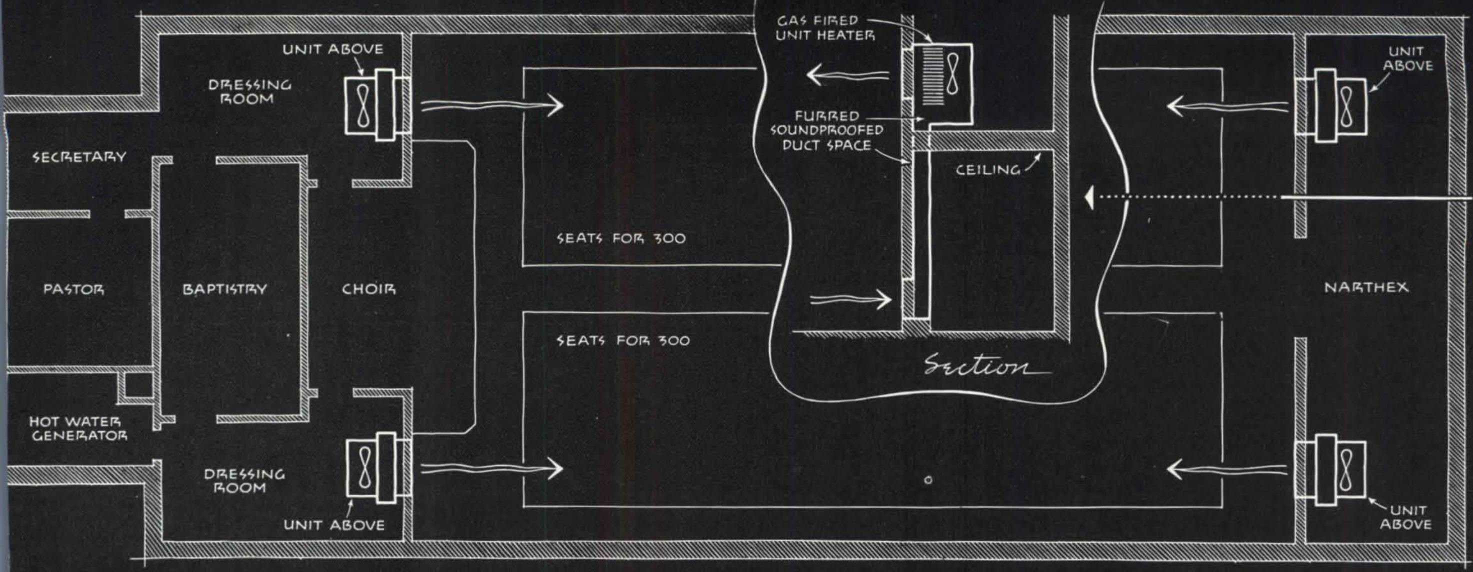
Problems of draft can be difficult to solve when warm air, introduced into the

* *Consulting Mechanical Engineer, North Charleston, South Carolina.*

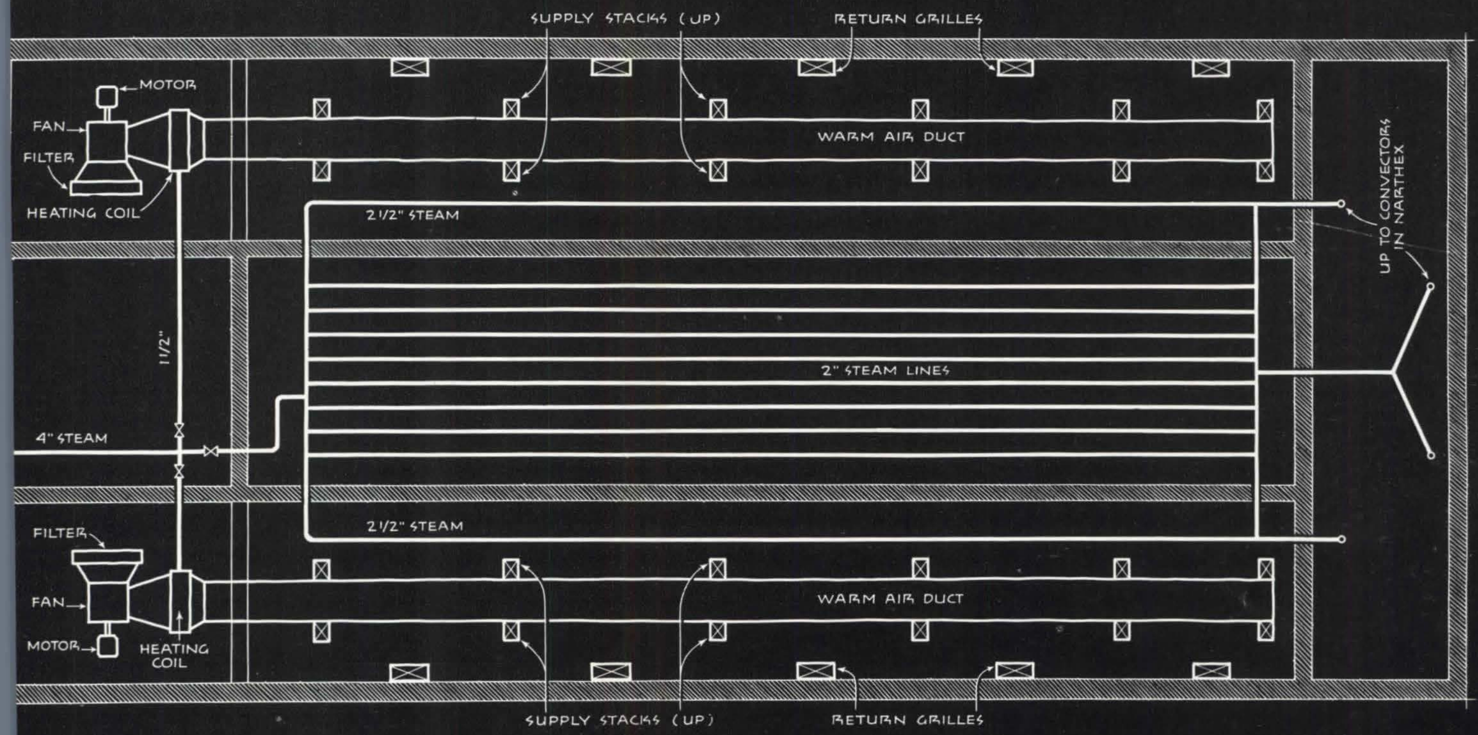
Figure 1—floor plan shows locations gas-fired unit heaters for short-u church. Gas-steam radiators heat t Pastor's and secretary's offices.

Figure 2—underfloor plan of propo heating system. Warm air enters chu through registers located in ends pews on side aisles; entire underfl space serves as return plenum. Wh needed, steam grid under nave provi booster. Branches to apse and trans not shown.

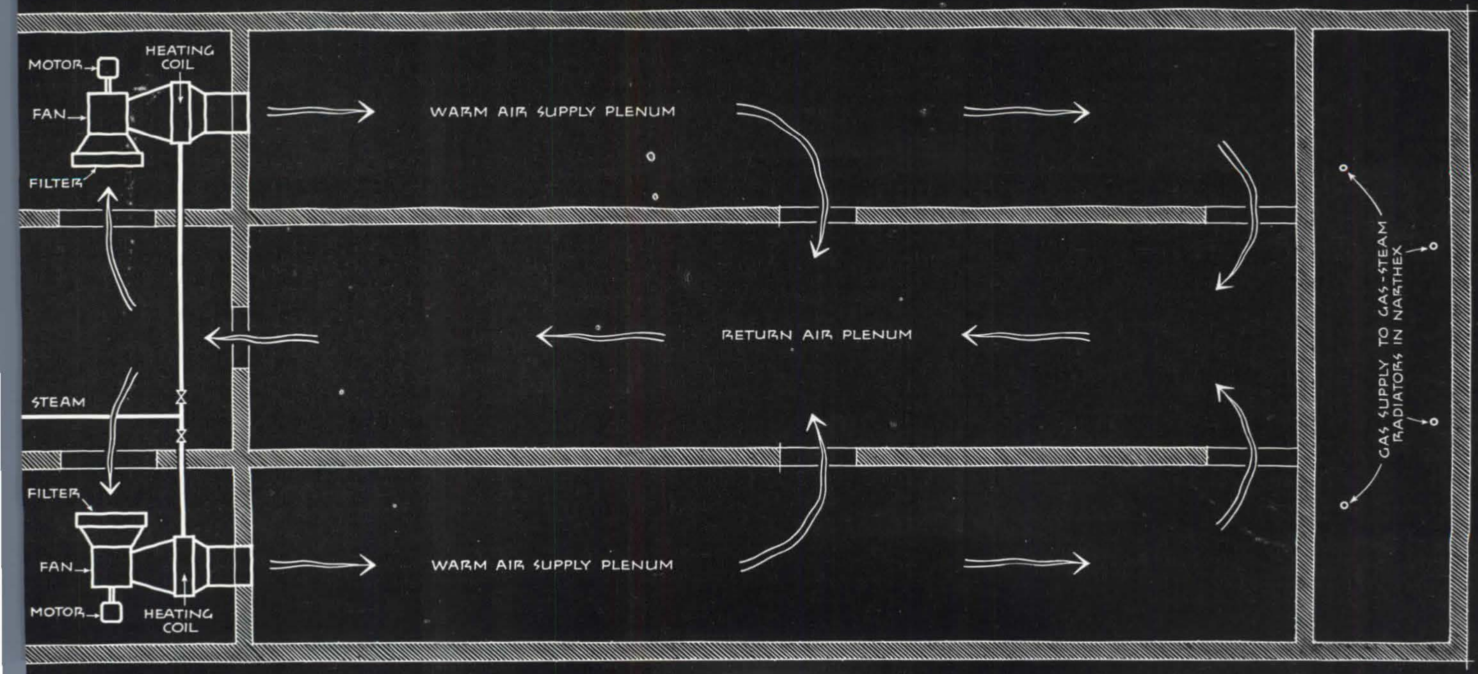
Figure 3—underfloor plan of unacc able solution. This method was inten to provide a radiant floor using w air as the agent. As the back of church remained cool, the design not furnish uniform heating.



Floor Plan



nderfloor Plans



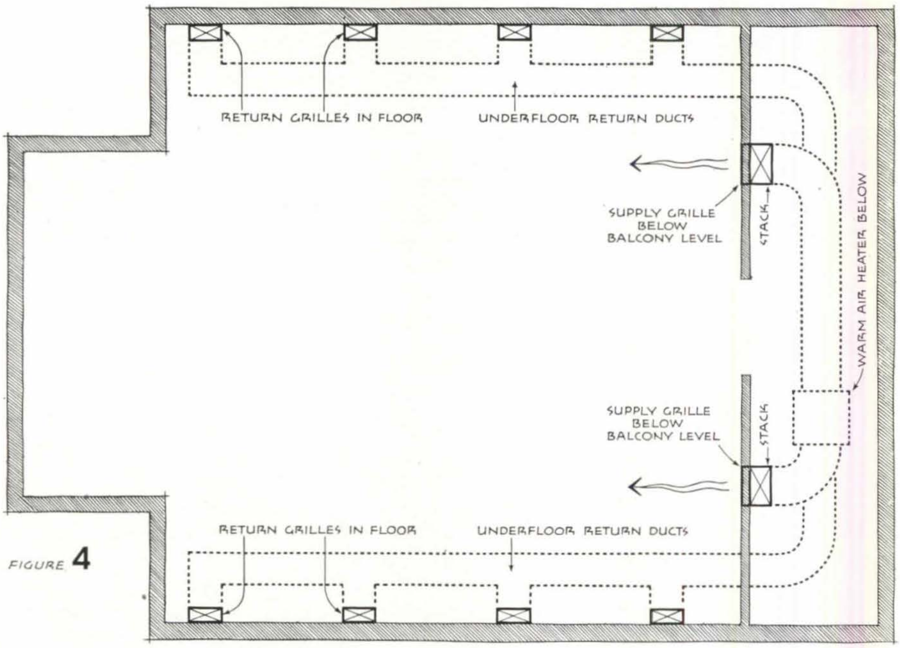


FIGURE 4

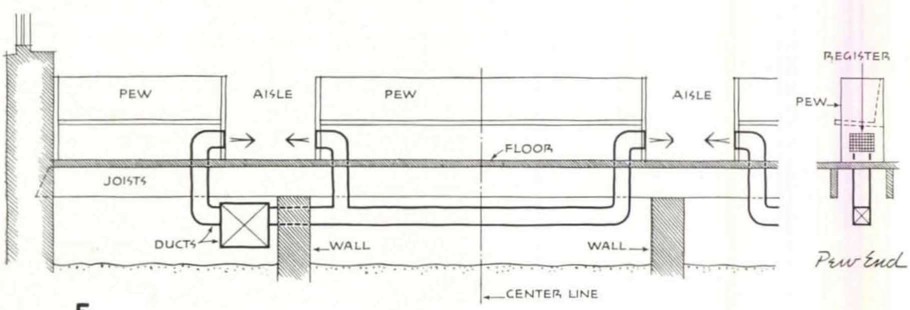


FIGURE 5

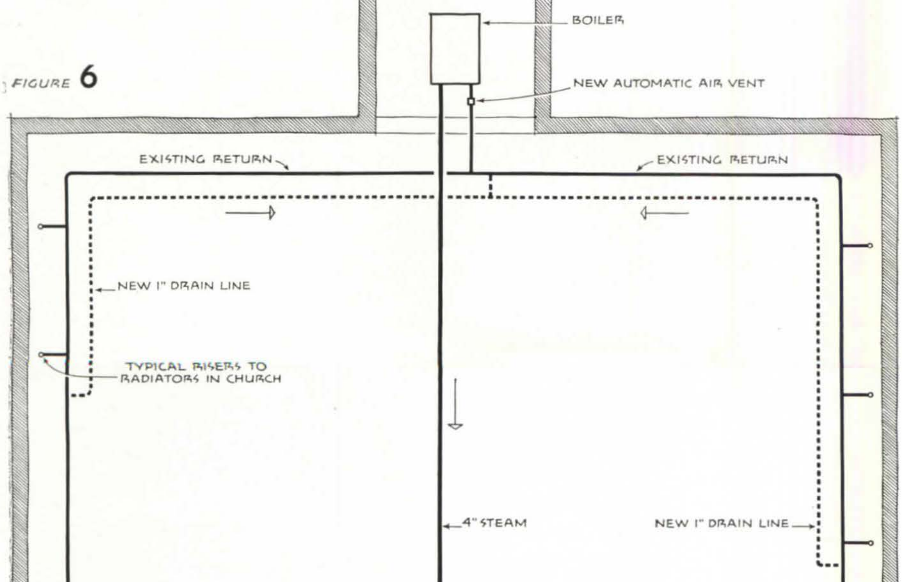


FIGURE 6

church, is the heating agent. To provid every pew with warm, still air require skillful engineering, and is seldom wholl achieved. Figure 5 illustrates a metho used by this writer with considerable suc cess. The warm air is introduced into th aisles from registers so arranged in th end panels of the pews that air stream from opposite sides of the aisle collide an merge, losing their velocity in the colli sions. This arrangement also eliminate large, unsightly grille openings.

The third principle of church heating is *provide heat without noise.*

Steam and water systems rarely offen in this way, although water hammer in a improperly designed steam system can b extremely irritating. To avoid this condi tion, the designer must provide generou pipe-line drainage; the presence of ham mer is a proclamation of poor design, poo installation, or both. Of course, hamme can develop years after a system is in stalled, as the ultimate result of buildin settlement or system sag. In either cas correction is neither difficult or expensiv For example, the one-pipe steam system il lustrated in Figure 6 gave a great deal o annoyance to the church it served unt loop drips were provided at the point shown. Thereafter, the heating was n only quiet but was also more efficie and the boiler was no longer forced. On pipe systems are particularly susceptible t the development of water hammer as a r sult of building settlement; they are al particularly favored by many churches b cause of the comparatively low initial cos

Noise in forced-air heating systems ori inates primarily in the fan, although o burner sounds are not unknown. This fa noise often causes a church to reject un heaters for a more expensive system, d spite painful, financial stringency. If t unit heaters can be arranged with soun treated, short ducts, as shown in Figure the problem is easier to solve. Units wi the lowest practical decibel rating shou be obtained—and one need not accept t manufacturer's guarantee blindly. A co mercial sound meter that reads directly decibels enables one to check the claim ratings, after the unit is installed. T A.S.H.V.E. recommends a maximum allo able noise factor of 30 decibels in church

Sound lining for ducts should exte for a distance of at least 10 times the gre est diameter of the duct, beginning at t noise source, or heater. A minimum thic ness of 1/2" is necessary, since the princip of sound absorption is to trap the vibratio in multitudinous crevices and caves. In thinner material the caves are too shall to be effective.

The transmission of noise can often

ctively stopped by the insertion of a ric joint between the heater and the t. Its purpose is to interrupt the har- ıious transfer of vibrations across a al-to-metal joint.

'elocity noises through ducts and les do not occur if the designer holds speeds to the following feet per minute ıes: main ducts, 900; stacks, 500; les and registers, 500.

'he fourth principle of church heating *the heating system must not offend the hitecture.*

n their efforts to observe this principle, ıe designers have stuffed heating plants ı closets and under stairs, demanded the sage of air through ducts too small for volume required, set radiators behind ricades which thoroughly imprison the , and finally, have provided chimneys of ior size where a senior structure was ential. Fortunately, by some careful ıking, the designer usually can avoid of- se and at the same time provide ade- ıte heating.

:hurch chimneys create special design blems. More important than our de- :s, is the basic fact that a simple chim- will fail in its purpose if it lacks ght. Height provides the natural draft t pulls air into the fire for combustion. ight compels fumes and cinders to jour- far above our heads before finding ir freedom. For architectural harmony, ght may be lessened if we substitute ft fans, but the amputation can be a ential neighborhood nuisance.

ɔo far as heating equipment is con- ned, probably the least conflict with rch architecture occurs if we use some m of panel heating. This practice is ng viewed by designers with consid- e favor, but caution is recommended. he service ritual involves much kneel- , individual worshipers may object here l there to alternating a dozen times an r between the desert warmth of the r and the comparative coolness of ıding. The fact that radiant floors are sfactory in many churches is no guar- ee that such floors will be *satisfactory* every church. Before adopting this plan, should evaluate operating experiences :hurches *of the same denomination* for ch we are designing.

Much can be done with baseboard radia- , particularly if no supplementary ting is needed. In 23 churches brought he attention of this writer from various s of the country, four indicated the l for heating assistance from another ce. Extremely interesting is the una- ity shown in selecting the peak-period ɔer: it was a unit heater in each case. ıufacturers of baseboard equipment ht do well to develop thoroughly docu- mented data on their equipment perform- ance in religious buildings, with particular reference to the basic requirements dis- cussed in this article.

The fifth principle of church heating is: *design for simplicity.*

The sexton of a church is a busy man. Occasionally he is equipped with a flair for mechanics and an interest in machinery; more often, however, the less he must do with a heating system, the better he likes it. In consequence, the average system is asked to run year after year, providing comfort to every exacting pew-occupant in the church, and without any mechanical considerations whatever.

Since this treatment is the rule rather than the exception, we certainly should not install a control system that will be made inoperative, perhaps during the first season, by the vibration of passing traffic. It is far more likely to be excised than repaired. Nor should we seek the utmost operating economy with a multiplicity of dampers, bypasses, or regulating valves, for they are quite sure to assume fixed positions even- tually, and the heat, as directed by the sexton, will be either off or on. In short, a simple, sturdy arrangement is what we want for long and probably neglected service.

Suppose we discuss the application of these principles to the Temple Beth Israel (*plan on page* 70).

A firm decision will not be offered, since decisions always emerge from studies too extensive for our present space and time, but the reasoning that leads to the adop- tion of one system or another will provide a signpost of method.

First—economy. Since unit heaters cost least if gas fired, we study the plan to spot suitable locations. There are none of these in the sanctuary and but two possibilities in the social hall, both dependent on the availability of wall space above the chair- storage rooms. Dressing rooms and all the other small offices, classrooms, and kitch- ens are still to be heated. The verdict is not favorable.

Our next thought is to use a forced cir- culation warm-air system, with basement ducts and baseboard registers. A disad- vantage is observed in the need for large ducts—can their bulk be tolerated in the basement? We can use registers in the pew ends, discharging toward the decora- tive windows, thereby achieving a kind of perimeter heating. If there is no basement under the temple, the application of air becomes more complicated, but obviously this arrangement merits our more exhaus- tive study.

The combination of radiant floors in the sanctuary, using forced hot water, and con- vectors in the other rooms, offers another approach. But the writer doubts if a heated floor would be satisfactory in the social hall during dances, the warmth underfoot tending to produce foot fatigue earlier than other forms of heating.

Next, consider the second principle, the importance of uniformity in heating. The design of this structure is such that uni- formity is not difficult to obtain. Except for the choir space, it is notably free from offsets, alcoves, and cubby holes. In con- sequence, forced warm air, a radiant floor, or the judicious locating of convectors will meet our needs on this score.

The question of noise, the third prin- ciple, is answered largely by the location of the heater room. Noise weakens as it travels (called attenuation in duct sys- tems) and its journey from the heater room to the sanctuary outlets is a long one. For the registers at the ends of short runs, the use of a fabric interrupter joint and, per- haps, the insertion of acoustical material inside the duct, should assure comfort to all ears. If we use steam or hot water in- stead of air, the noise problem is simplified to the provision of a properly designed system.

Considering architectural harmony, the fourth principle, we need have no visible ducts in either the sanctuary or the social hall, and the registers, as we have already observed, will be in unobtrusive positions. If we go to a radiant floor in the sanctuary, the problem does not exist. The adoption of convectors, however, will suggest the need for recessed construction or, if this is not practical, a fitting-in of their phys- ical bulk. Fortunately, the seating in the sanctuary is arranged with side aisles adjacent to the outside walls; when the pews extend into contact with outside walls, comfort in these extreme seats is most difficult to provide. This writer would consider the employment of baseboards along these outside walls, with the possible addition of cabinet convectors backed up against the last row of pews and discharg- ing toward the foyer. By such a design, we observe the bold precept of making impor- tant what must be seen.

Our fifth principle, the need for sim- plicity, must be viewed in the light of op- erating practices. The entire building, with the exception of the rabbi's study, probably will not be used during the day- time hours more than one or two days a week. The sanctuary will be used for serv- ices Friday nights and Saturdays, but the social hall and other rooms are likely to house activities during most of the non- religious evenings.

Obviously, some kind of sectionalized or zone operation is indicated. For the warm- air system, this would involve a two-speed fan and motor-operated dampers; for steam, either motor-operated or solenoid-operated sectionalizing valves; and, for circulating hot water, a separate circulating pump for each zone. In the opinion of this writer, the last would be the simplest for this particular case, since all the circulators could be concentrated in the heater room; dampers and steam valves, however, might be expected to take stations elsewhere in the system in order to best employ duct and piping facilities.

In any event, some form of supplementary heat appears to be justified for the rabbi's study, considering the isolation of both its physical location and its hours of use. Operating the main plant for such a comparatively tiny load is disproportionate and wasteful. A gas-steam radiator, a radiant-glass panel heater, or some similar unit should be satisfactory.

The view of the problem, as we now have it, suggests that either forced warm air or some arrangement of circulating hot water could best be adapted to this particular case. However, as we noted previously, the data and considerations examined are incomplete, and a firm decision must be deferred pending a detailed study.

An extremely interesting arrangement is illustrated by Pietro Belluschi's design for the First Presbyterian Church *(page 65)*.

Relative to our principles of church heating, the central location of the heater room is a strong assist to economy, since the heat-conveying channels, whatever they are, are both shortened and reduced in individual sizes.

From the standpoint of noise, the heating plant is subject to some suspicion because nothing but a partition separates the heater room from the church. This writer would be inclined to specify sound-absorbing material for all walls and the ceiling of that room, regardless of the type of heater selected.

Uniform heating in this church is not difficult to achieve, for the reasons pointed out in the Temple Beth Israel design. In fact, the presence of enclosing and heated structure on three sides makes uniform heating almost easier to obtain than not to obtain. Exactly how we would heat this church cannot be determined from the plan alone, as we need information concerning heights and materials, but the distribution problem is not complex.

Unit heaters probably could be used, at a saving, for the parish hall. The walls on each side of the proscenium offer possible grille positions, with the heaters set behind them. At the other end of the hall, the kitchen and storage walls also might provide grille areas. The arrangement could be similar to that shown in Figure 1.

From the standpoint of economy, these unit heaters should be separately fired, using gas-fuel and thermostatic control. Nothing would be saved by extending steam or hot water lines from the central heater.

The reduced need for heat-emitting equipment in the church, simplifies the problems of architectural harmony in proportion. The cost of a radiant floor seems unjustified in view of the warm walls on three sides, and we cannot decide from a plan alone if warm-air ducts are feasibl These eliminations bring us to the consi erations of steam and hot water, the forme seemingly impractical since the heat room is not below the floor level of th church, and condensate drainage would i volve underfloor trenches, a receiving sum and pump. Therefore, hot water circulate by pumps appears at this moment to be th best solution of the problem. The arrang ment of this church suggests that h water equipment could be concealed boldly positioned, as the architect migh desire. Actually, the beauty of utility everywhere illustrated by the human for and designers might ponder this fact wi profit.

The principle of simplicity, as of eco omy, is assisted by the central location the plant. Even if we were to use war air ducts—perhaps locating them in a su able ceiling, although the existence of su a ceiling is merely speculative—all zo dampers might be contained in the heat room. A similar concentration of contro for either steam or hot water is equal practical and indicated, each being act ated by a thermostat in the area served.

These discussions should emphasize th the principles of church heating are n complex in either idea or application. fact, we can summarize each in a sing word:

Economy Silence
Uniformity Beauty
Simplicity

Violations result when we are guilty superficial or wishful thinking.

house: Atlanta, Georgia

Moscowitz, Willner & Millkey, Architects

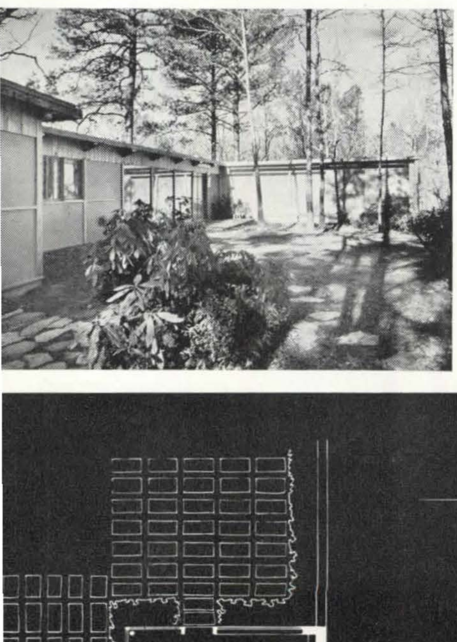
Designed for the family of one of the architects—Herbert C. Millkey, his wife, and their three children—this house is located on a beautifully wooded, 7-acre site about three and a half miles from downtown Atlanta. Apart from the rooms needed, and the wish to build the house as inexpensively as possible, a major requirement was a separate living area, both indoors and out, for the children. Hence, the house is placed on the site in such a way that all adult living rooms are on grade with the southern living terrace, and an above-grade partial lower floor, with direct outside access, is provided for children's play.

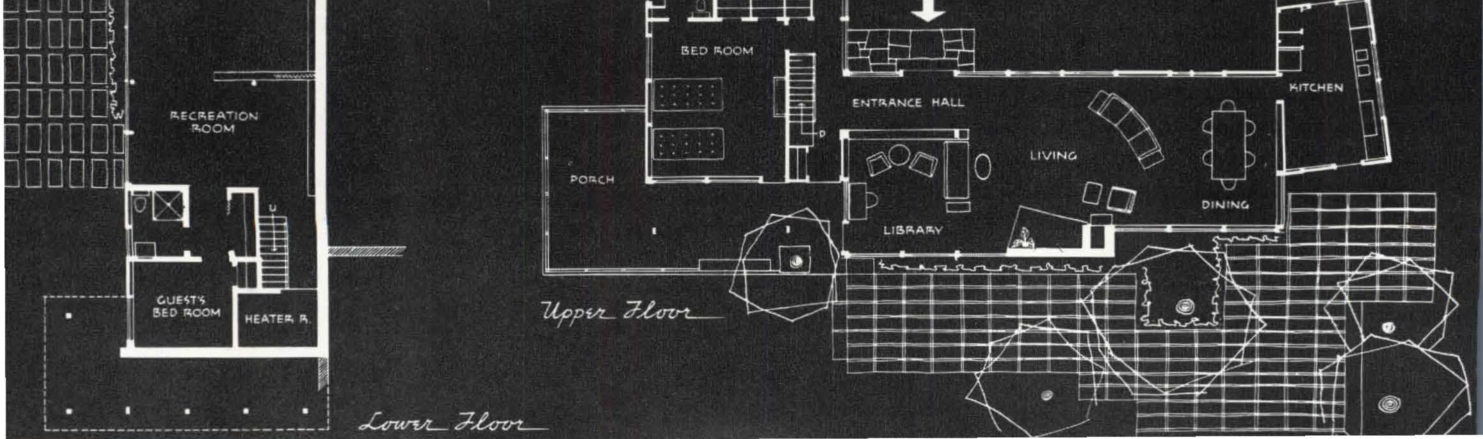
The house, completed in late 1950, cost less than $7 a square foot to build. The structural system consists of a building frame independent of all interior partitions and with all millwork eliminated.

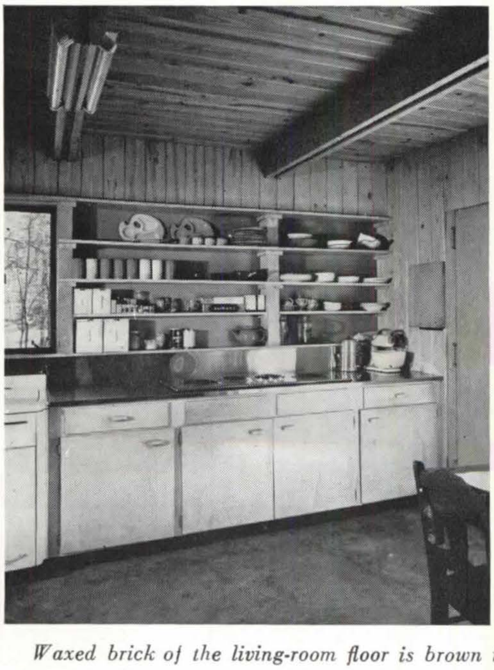
Typical mill construction is used—4 x 6 yellow pine posts spaced 5½ feet on center, with roof beams on the same spacing covered with 2-inch t & g exposed sheathing. Above this is insulation board and a builtup roof. Fixed glass is framed directly into the posts; and a wall material used for the solid areas—insulating fiberboard between layers of asbestos cement—is also framed into the 4 x 6's. The living-dining area has a brick floor, while cork flooring occurs in other areas.

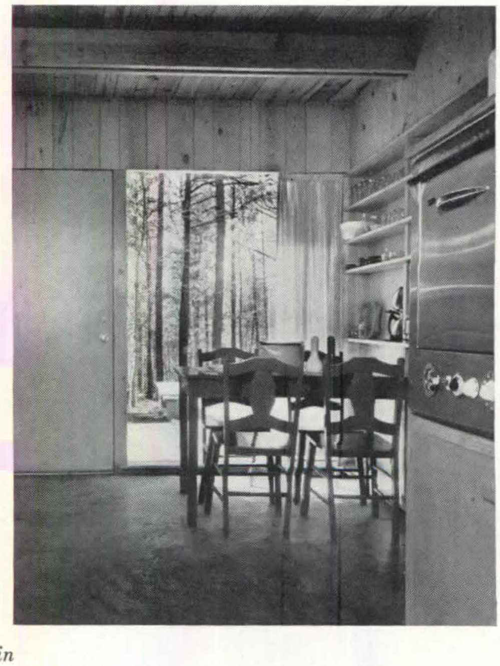
The south front of the house (acrosspage and at right) *is bordered by a living terrace paved with lightweight 18" x 36" precast concrete tiles; at the west end is a covered porch* (page 83). *Exterior panels of the asbestos-cement-surfaced fiberboard are painted red, green, and blue.*

The approach side of the house (below). *In the background is the east wall of the bedroom wing, that has the children's play room and guest room on a lower level.* Photos: Richard Garrison









Waxed brick of the living-room floor is brown in tone; wall surfaces are either birch plywood or asbestos-cement panels painted Swedish red, while the exposed pine framing is pickled and waxed. Immediately above are two views of the kitchen, with its dining space opening out to the terrace.

The master bedroom (below) *has a door out to the southwest living porch. As elsewhere, framing is exposed. The flooring is cork.*

Throughout, there is a continuous electric base mould allowing lamp attachment at 3-foot intervals. Heating is handled by a forced warm-air system, from overhead ductwork that may be used for a future air-conditioning installation.

This discussion, an analysis of some of the architectural and engineering problems related to the design of a successful solar-heating system for a house in the vicinity of New York City, was originally prepared as a thesis for a Bachelor of Architecture degree at Pratt Institute. In editing his manuscript for presentation in **P/A**, *it was necessary for the author to reduce its text and to eliminate a number of his substantiating charts, diagrams, and tables.*

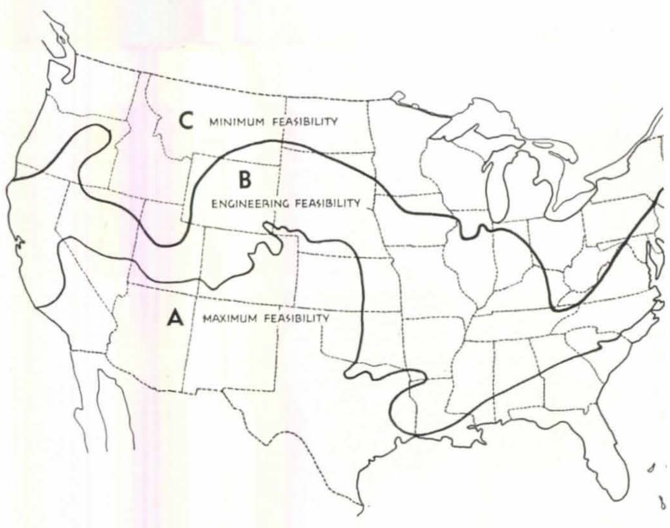


Figure 1—feasibility zones for solar house heating. Heat requirements can be supplied in zone A—by solar radiation collection devices without expensive enginering; B—by solar radiation collection devices and careful engineering design; C—full heat requirements cannot be supplied by even the most elaborate solar heating system.

design procedure for a solar house

By George S. Sharon

The dream of having a home fully heated by the sun has at last become a reality. Several houses in the Boston area now contain collectors (each composed of a black-painted metal plate, an air space, and two panes of glass) which successfully gather solar energy and efficiently store it in either water or chemicals ready for release when needed for house heating.

regional feasibility

Before the design of a solar house can be considered, it is necessary to know whether it can be sustained by its regional location. (*Figure 1, based on the available solar radiation and degree days, indicates the various regional suitabilities for solar heating.)*

architectural considerations

In a solar design, an architect is faced with definite restrictions imposed by the heating system. Because it is necessary to receive the maximum available solar energy, south orientation of the collector is mandatory. High ceilings, over-use of glass, large exterior wall perimeters, and many exterior wall openings are sources of excessive heat loss and should be avoided. Glass areas should have drapes or screens which can be drawn during the evening and inclement weather, and structural areas should be well insulated.

A lampblack collector plate has the highest absorptivity of the known pigments. Because black is not appropriate for a home, a better color scheme is desirable to reduce the somberness created by the large collector surface. Medium green (trim color) may be used as a satisfactory substitute.

In order to prevent the collector from being cracked by overheating during the summer months, an overhang, awning, screen, shade, or a whitewashing of the glass may be considered as an adequate safeguard.

collector placement

The basic positions of the collector are on the roof and on the ground. Either of these positions may be used with a level or sloped site. A design for a level site may be considered as a universal solution, since no special land contours are required, at the same time, it is easily adaptable to a sloped site.

roof placement

One scheme for a level site has been the placement of the collector on the roof and the treatment of the collector and living areas as one complete structural development (*Figure 2*). In such a solution, the length of the house is governed by the length of the collector. A collector requiring an area of 720 sq. ft. and a 10′ height has to be 72′ long; as a result, there is a loss of human scale and a complete domination of the living areas by the collector. Other disadvantages of such a design are the long, thin plan, large exterior wall perimeter, and the low proportion of usable volume. The design, however, has the advantages of a large, unobstructed, heat gain through a dominant south orientation, good insulation given to the ceiling and collector, and simple construction. Using the elongated plan, whose façade incorporates the heat collector, other design forms are possible (*Figure 3*). Human scale and collector subordination may be achieved in the elongated plan by splitting the collector (*Figure 4*). In the vicinity of New York City, a 5′-high collector casts a maximum horizontal shadow of 17.7′; thus the split collector is architecturally feasible (*In scheme "A" of Figure 4, the exposed backside of the collector creates a heat-loss problem. Schemes "B" and "C" reduce heat loss through the backside by incorporating attics, but have the disadvantages of being structurally and esthetically more complex.)*

The roof itself offers a large area for solar collection. A roof pitched 40° has a favorable solar tilt and sheds snow well (*Figure 5*). This scheme offers a compact plan, small exterior wall perimeter, and good insulation to the ceiling and collector. The steep roof, however, may be esthetically questionable.

ground placement

The placement of the collector on the ground results in many compromises. Although south orientation is mandatory for the collector and desirable for the living areas, it is difficult to satisfy both conditions simultaneously. By orientating the living areas other than south, the south wall itself may become the

Figure 1: Dr. P. A. Siple, "Space Heating with Solar Energy", Heating and Ventilating, Sept., 1950, pp. 88-90.

collector and thereby permit construction economy and ultimate lower heat loss. Researchers at M.I.T. have suggested placing the collector on the south wall and puncturing it with windows for the living areas (*Figure 6*). By abandoning a dominant southern exposure for the living areas, other schemes are conceivable (*Figures 7 and 8*).

The basic premise of forsaking a southern exposure is a questionable compromise. By elevating a structure, a favorable orientation may be given to both the collector and the living areas (*Figure 9*). The large heat loss through the backside of the collector, however, is a serious disadvantage of this scheme.

split collector placement

The basic collector positions may be combined to give a split placement of the collector on the roof and on the ground (*Figure 10*). Such an arrangement compliments human scale and gives dominance to the living area; however, it has the disadvantage of the extra cost involved in splitting the collector.

A slope site has the advantage of providing good orientation for the collector and living areas; it also permits a collector to be separated from a continuous façade and offers good insulation for its backside. (*In Figure 11, scheme "A" has the disadvantage of having its collector plate located away from the home which it is to heat; therefore a high heat loss in transmission can be expected.*)

solar collector design

Having determined a feasible solar house design, the designer must compute the collector size. In the following paragraphs, the calculations required for a collector for a solar house located in the vicinity of New York City (*Figure 12*) will be discussed and solved.

critical months

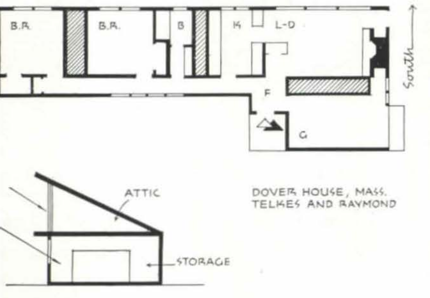
The collector area is governed by the most critical months of the heating season. A factor rating the severity of the heating month may be expressed by:

$$Mc = \frac{\text{Degree days per month}}{\text{Monthly total of average solar radiation}}$$

Because December, January, and February are the most critical heating months for the New York City vicinity (*Table 1*), they will determine the collector size.

collector tilt

The collector tilt and shape is governed by architectural feasibility. Because the maximum solar radiation is delivered from 11:00 am–2:00 pm, the optimum tilt should be based on the corresponding hourly solar angles. The average solar angle, therefore, is 29° resulting in an optimum tilt of 61° (*Table 2*).



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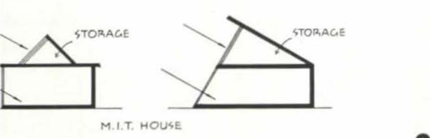

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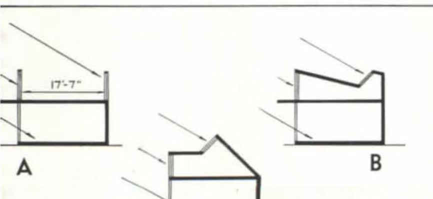

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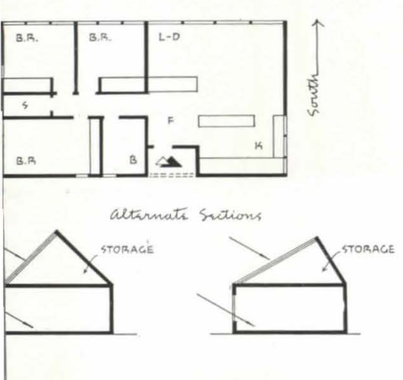

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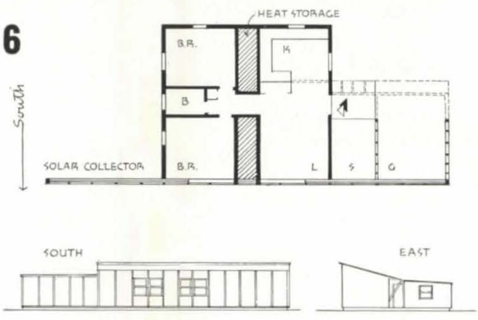

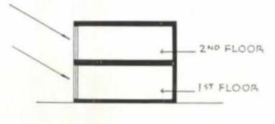

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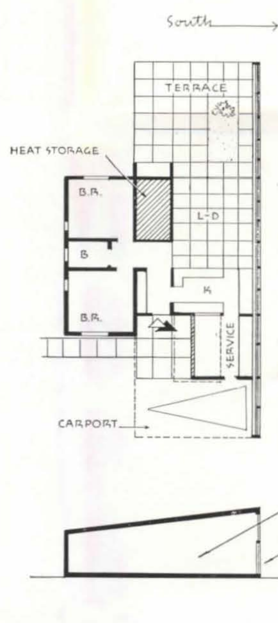

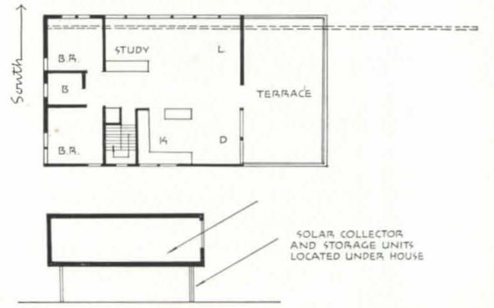

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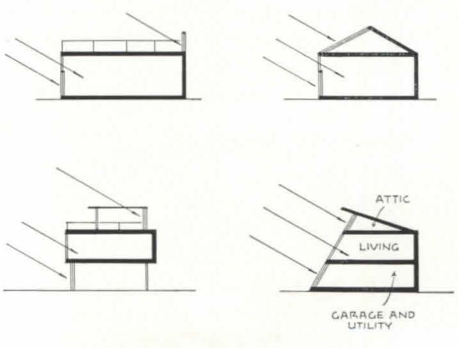

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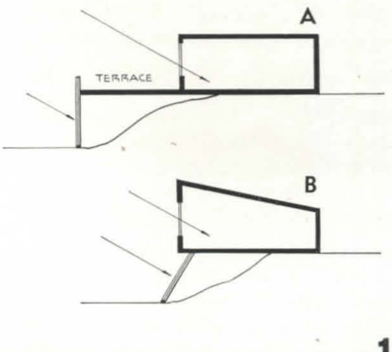

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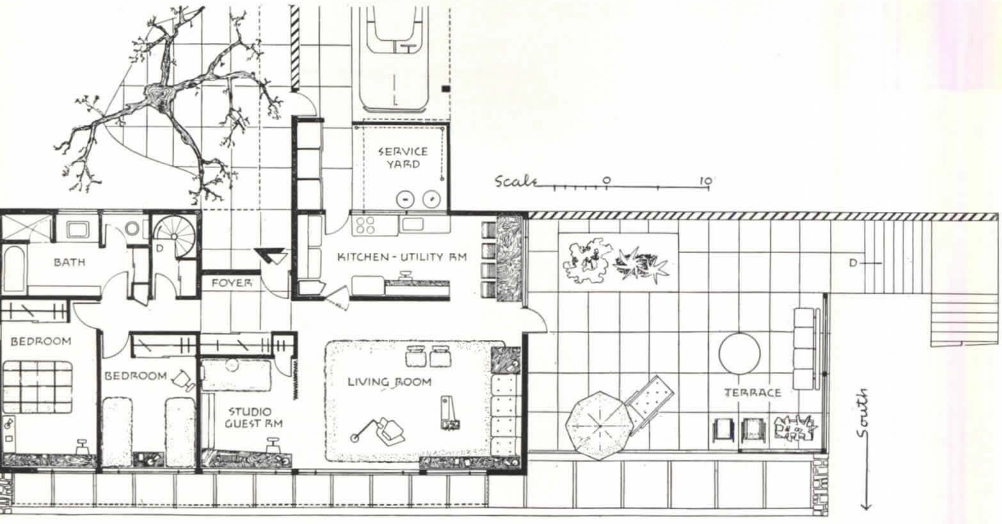
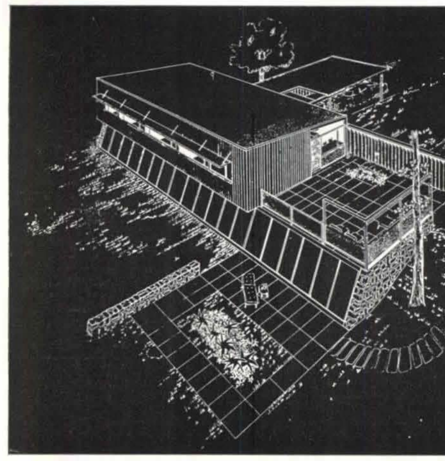


Figure 12



incident solar energy

The energy delivered to a collector may be expressed by (*Equation 1*):

$$q_A/A = (Hs - Hd)\ (\cos \Theta T / \cos \Theta Z)\ \tau\alpha + Hd\ (\cos \Theta T' / \cos \Theta Z')\ \tau'\alpha'$$

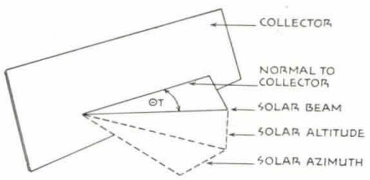
where:

q_A/A = Rate of heat delivered to 1 sq. ft. of collector plate: Btu/hr/ft^2.

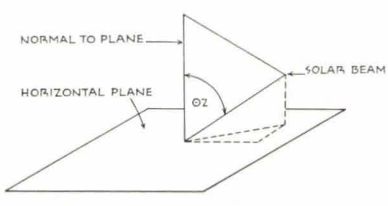
Hs = Total direct solar radiation on a horizontal surface: Btu/hr/ft^2.

Hd = Diffuse radiation on a horizontal surface: Btu/hr/ft^2.

$\Theta T (\Theta T')$ = Angle between direct (diffuse) solar beam and normal to the tilted collector surface: Degrees.



$\Theta Z (\Theta Z')$ = Angle between direct (diffuse) solar beam and normal to a horizontal surface: Degrees.



$\tau (\tau')$ = Over-all transmittance, for direct (diffuse) sunlight, of a system of glass plates, allowing for absorption and reflection.

$\alpha (\alpha')$ = Absorptivity of surface of collector for direct (diffuse) solar radiation.

solar radiation: Hs and Hd

Values of direct and indirect solar radiation are obtainable from regional weather stations (*Table 3*).

solar angles: $\cos \Theta T / \cos \Theta Z$ and $\cos \Theta T' / \cos \Theta Z'$

The maximum solar energy strikes a collector when $\cos \Theta T / \cos \Theta Z$ approaches infinity. Having established the collector orientation, the values of $\cos \Theta T$ and ΘZ can be found by descriptive geometry (*Table 4*). The values of $\cos \Theta T' / \cos \Theta Z'$ may be assumed to be 1.

solar transmission: τ

The factors influencing solar transmission through a series of glass plates are the number and type of plates, thickness, and angle of incidence. Two water-white plates (each .117″ thick double-strength glass and separated by an air space) at a 33° angle of incidence will transmit 82% of the incident energy (*Figure 13*).

solar absorptivity

The factors influencing solar absorptivity are the angle of incidence and color of the collector plate. At a 33° angle of incidence, a medium green collector absorbs 96% of the energy absorbed by lampblack resulting in the absorption of 91.2% of the incident energy (*Figure 14*).

incident energy

Because solar altitudes and intensities vary through the day, the incident energy should be evaluated for the morning and afternoon hours (*Table 5*). For all hours, τ and α may be assumed to be constant, $\cos \Theta T' / \cos \Theta Z' = 1$, and $\tau'\alpha' = .61$ (*Table 6*). Evaluating (*Equation 1*), it is seen that q_A/A (morning) = 72.9 Btu/hr/ft^2 and q_A/A (afternoon) = 70.2 Btu/hr/ft^2.

usable solar energy

q_A/A represents the solar energy impingent upon a collector. In order to determine the quantity of energy actually utilized for storage, plate dirtiness, transmission losses, and "warming up" of the collector must be considered. The total collectable energy may be expressed by (*Equation 2*):

$$Q_U/A = F[q_A/A(1-D) - q_L/A - q_B/A] - Q_H/A$$

where:

F = Ratio of useful heat collection for the method of heat transmission.

q_A/A = Rate of heat delivered to 1 sq. ft. of collector plate: Btu/hr/ft^2.

D = Fractional reduction in transmittance of glass plate system due to surface dirt.

q_L/A = Rate of total heat loss through 1 sq. ft. of the top of the collector: Btu/hr/ft^2.

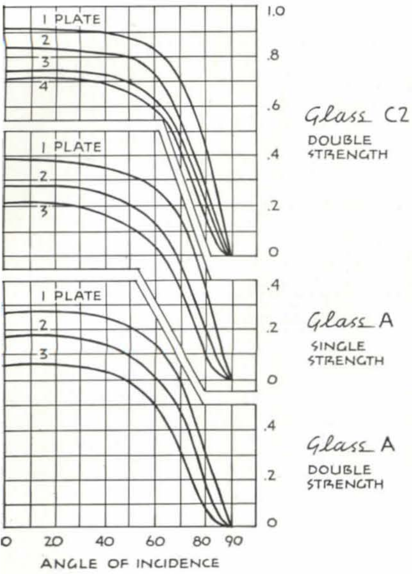
q_B/A = Rate of total heat loss through 1 sq. ft. of the bottom of the collector: Btu/hr/ft^2.

Q_H/A = Loss, per collection period, due to heat capacity of the collector: Btu/hr/ft^2.

lateral resistance: F

The value Q_U/A involves the assumption that the collector plate is at a uniform temperature "T," whereas, a collector design having tubes soldered to the backside of the collector has only an average value of "T" along the contact lines of the plate and pipes through which the fluid flows; it is higher between the pipes. It may be shown that the ratio "F" of useful-heat collection from the latter system to one having a uniform plate temperature is given by

Figures 13-15 and Equations 1-8: H. C. Hottell and B. B. Woertz, "The Performance of Flatplate Solar-heat Collectors", Am. Soc. Mech. Eng. Trans. Vol. 64, 1942 pp. 91-104.



ure 13—transmittance of glass-plate sys-
s allowing for reflection and absorption
ses (above). Top, middle, and bottom
nilies are for glass with kL per plate
ualing .0125, .0370, and .0524 respectively.

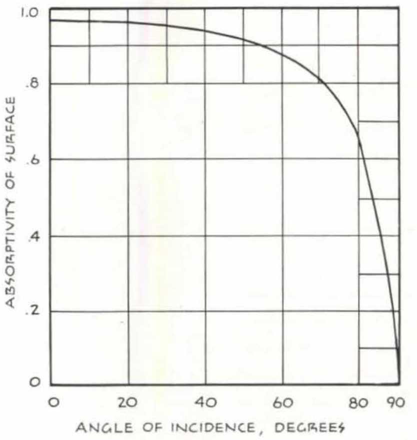
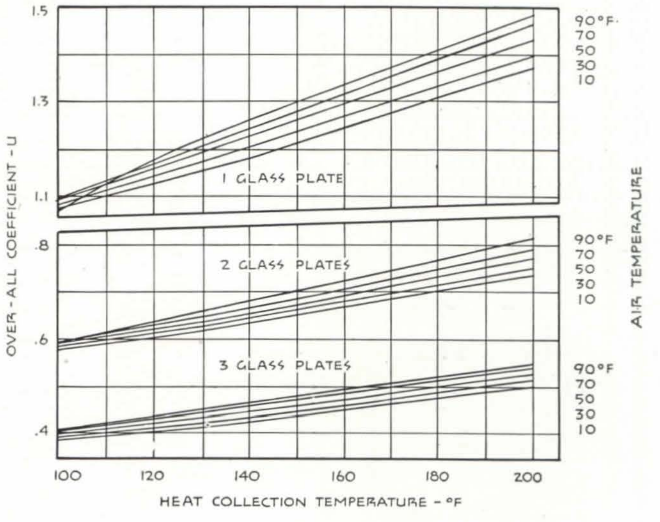


Figure 14—absorptivity of a blackened surface for artificial sunlight transmitted through glass (left).

Figure 15—over-all heat transfer coefficient for use in calculation of heat losses from flat-plate collectors (below). *Tilt from horizontal, 30°; collector surface emissivity, 95; wind coefficient, 4.07, 10 mph.*



Month	Degree days	Avg. daily radiation on a horiz. surface	MC
September	50	1240	.040
October	272	982	.277
November	594	590	1.05
December	940	450	2.09
January	1028	476	2.16
February	953	731	1.32
March	771	1092	.710
April	465	1410	.330
May	172	1675	.102

Table 1: Severity of heating months for N. Y. C.

Month	Hours	Avg. solar altitude
January	11 am–2 pm	27°
February	11 am–2 pm	36°
December	11 am–2 pm	23°
	Average	29°

Table 2: Avg. solar altitudes of most critical angles for N. Y. C. (above).

Table 3: Avg. direct and diffuse radiation, btu/hr/ft², for Jan. in N. Y. C. (below).

	Hour ending	Total solar radiation	Diffuse radiation: HD	Direct radiation: HS-HD	Total HD	Total HS-HD	Total
	8 am	3.96	.821	3.14			
	9	27.3	4.78	22.5			
4.65 hrs.	10	44.6	6.05	38.5	31.9	211	243
	11	78.0	9.40	68.6			
	12	90.1	10.8	79.3			
	1 pm	88.3	10.1	78.2			
	2	68.9	9.30	59.6			
4.97 hrs.	3	44.6	7.85	36.7	34.6	198	233
	4	27.3	5.70	19.5			
	Sunset	5.52	1.63	3.89			
	Total	476	66.5	409	66.5	409	476

Table 4: Hourly values of Cos θT and Cos θZ for Jan. in N. Y. C.

Solar time	Solar altitude	Solar azimuth	θT	COS θT	θZ	COS θZ	COS θT/COS θZ
8 am 4 pm	9°	124°	57° 30′	.537	81°	.156	3.44
9 3	16°	136°	46° 30′	.688	74°	.276	2.49
10 2	24°	149°	31° 45′	.850	66°	.407	2.09
11 1	28°	163°	15° 0′	.966	62°	.469	2.06
Noon	29°	180°	0′	1.000	61°	.485	2.06
Average	24°	147	33° 30′	.787	70°	.300	2.47

	Time	HS-HD	COS θT/COS θZ	(HS-HD) COS θT/COS θZ	HS-HD	Avg. HS-HD
	8	3.14	3.44	10.8		
	9	22.5	2.49	56.0		
Morning 4.65 hours	10	38.5	2.09	80.5	453	97.3
	11	68.6	2.06	141		
	12	79.3	2.06	164		
	1	78.2	2.06	161		
	2	59.6	2.09	124		
Afternoon 4.97 hours	3	36.7	2.49	91.0	457	93.9
	4	19.5	3.44	67.0		
	5	3.89	3.44	13.7		

Table 5: Avg. direct radiation, btu/hr/ft², delivered to 61° collector tilt during Jan. in N. Y. C. (above).

Table 6: Avg. HD, but/hr/ft², delivered to 61° collector tilt during avg. Jan. day in N. Y. C. (below).

Period	Avg. HD	HD (COS θT′/COS θZ′) τ′α′
Morning	6.86	4.18
Afternoon	6.96	4.25

Period	Outward heat loss QL/A: Btu/hr			Avg. inward heat loss QL/B: Btu/hr	Total collector heat loss QL/A-QL/B: Btu/hr
	U	ΔT	QL/A		
Morning	.57	69°	39.3	1.02	40.3
Afternoon	.57	65°	37.1	1.02	38.1

Table 7: Outward and inward collector heat losses.

Year	December			January			February		
	Dark	Partly cloudy	Above average	Dark	Partly cloudy	Above average	Dark	Partly cloudy	Above average
1941	1	1	4	4	1	5	2	1	10
40	3	2	6	3	1	14	1	1	6
39	2	2	4	2	1	4	2	1	3
38	3	1	4	3	2	4	2	1	3
37	2	2	7	8	1	5	2	1	4
36	2	1	9	3	2	12	2	2	3
35	3	3	8	4	2	7	2	2	3
34	2	3	4	1	2	8	1	2	6
33	4	1	2	1	3	4	1	1	5
32	4	1	9	3	2	3	3	1	6
31	3	1	7	2	2	6	4	1	8
30	3	2	4	7	2	4	1	3	5
29	4	1	4	1	1	6	1	2	5
28	2	3	3	2	2	8	2	2	11
27	3	1	6	4	2	6	4	5	3
26	2	2	2	3	3	3	4	1	2
25	5	1	5	2	2	5	2	5	5
Avg.	2.82	1.65	5.17	3.24	1.82	6.35	2.12	1.88	5.17

Table 8: Max. consecutive number of days.

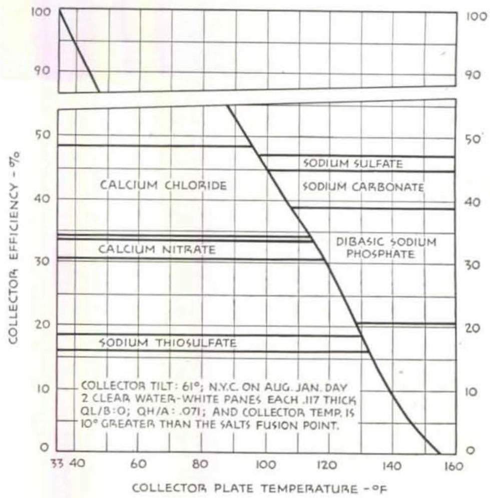
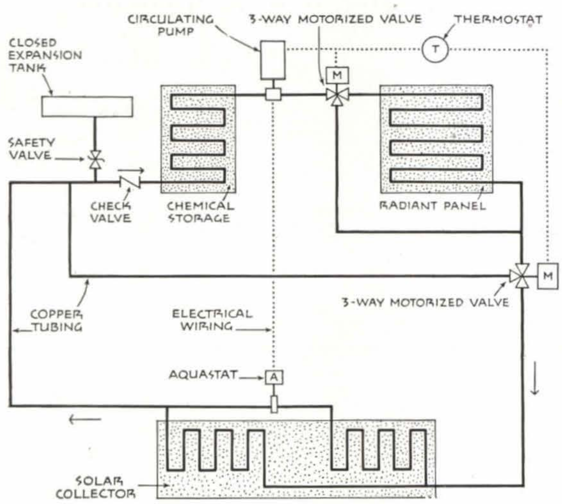
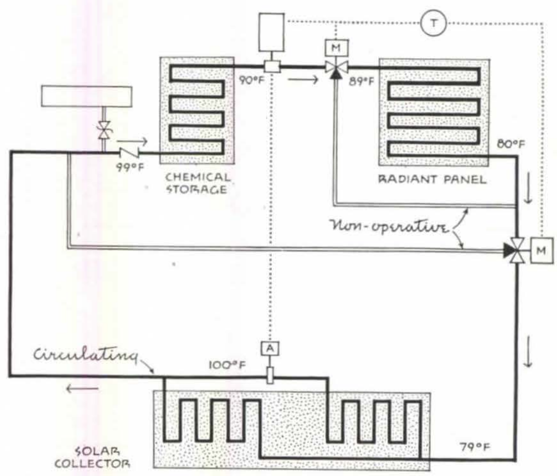


Figure 16—chemical performance in terms of collector efficiency.

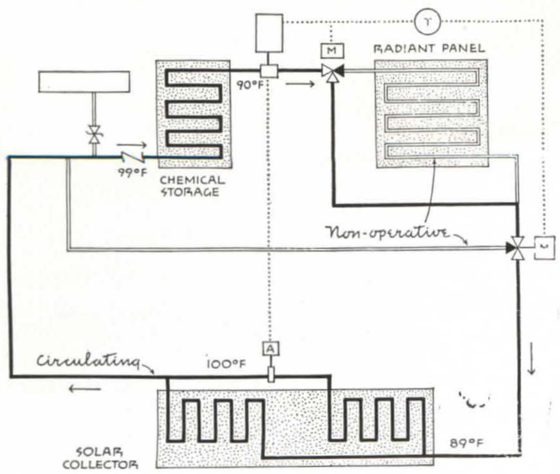
Figure 17—elements of a solar-heating system and the three phases of operation (below).



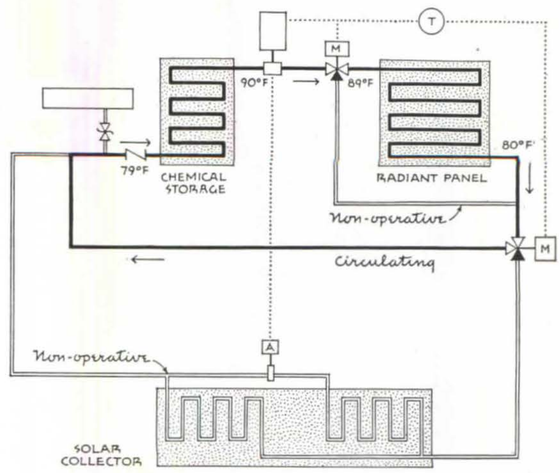
Solar Heating System



Phase I SOLAR ENERGY STORAGE AND HOUSE HEATING



Phase II SOLAR ENERY STORAGE, NO HOUSE HEATING



Phase III HOUSE HEATING WITH STORED ENERGY, NO SOLAR COLLECTION quation 3):

$$F=\frac{2}{a}\left(\frac{e^a-1}{e^a+1}\right)$$

ere:
$=W\sqrt{U'/kM}$
$=U+U_D$
=Over-all loss coefficient, plate to upper air (*Figure 16*).
$_D$=Over-all loss coefficient, plate to box bottom, through insulation.
=Thermal conductivity of collector plate: Btu/°F/ft/hr.
=Minimum distance between parallel pipes measured along collector plate: Ft.
=Thickness of collector plate: Ft.

A 24-gage copper collector with ⅜" copper tubes 6" o.c. has an "F" of .975.

te cleanliness: 1−D

rt and dust deposited by wind, rain, and snow to some extent event the collection of solar energy. Tests, however, indicate at window dirtiness is not too detrimental to a collector system. ly .62% of the collectable energy is lost due to collector dirtiss; therefore (1–D) = .944.

tward heat loss: q_L/A

calculate the heat loss of a collector through its glass panes quires a cumbersome formula. Results of a heat-loss test made th a collector tilted 30° to the equator may be used without seris error for other collector tilts for determining "U" (*Figure 15*). lowing the over-all "U" for a collector, the outward heat loss may found in the conventional manner by (*Equation 4*):

$$q_L/A=U(T-Ta)$$

ere:
/A =Rate of total heat loss through 1 sq. ft. of the top of the collector: Btu/hr/ft².
=Over-all coefficient of heat transfer for calculating upward losses from the collector: Btu/ft²×hr °F temperature difference of collector and outer air (*Figure 15*).
Ta) =Temperature of collector plate (outer air): °F.

ward heat loss: q_R/A

e inward heat loss is found in the conventional manner by quation 5):

$$q_B/A=U_D(T-Ta)$$

e heat loss of the collector is shown (*Table 7*).

at capacity: QH/A

ring the morning hours a portion of the absorbed heat is utilized bringing the glass plates and the insulation below the collector te up to equilibrium temperature. The heat loss due to the heat pacitance of the collector system may be expressed by (*Equation 6*):

$$QH/A=C(T-Ta)$$

ere:
I/A=Heat loss per sq. ft. per collection period, due to heat capacity of collector: Btu/ft².
Ta) =Temperature of collector plate (outer air): °F.
=Loss due to heat capacity: Btu/ft² collector per °F, temperature difference of collector plate and air per cycle of operation.

e equation for C (*above*) is (*Equation 7*):

$$C=\frac{2}{3}\,q_A/A(T-Ta)\left[\underbrace{\left(\frac{Q_U/A+q_L/A+q_B/A}{q_A/A}\right)}_{\text{afternoon values}}-\underbrace{\left(\frac{Q_U/A+q_L/A+q_B/A}{q_A/A}\right)}_{\text{morning values}}\right]$$

ere:
/A =Average value of q_A/A for morning and afternoon: rate of heat delivered to 1 sq. ft. of collector plate: Btu/hr/ft².

T−Ta=Average difference between the temperature of the heat collector and that of the early morning outside air: °F.
QU/A=Useful heat collected over a period for 1 sq. ft. involving several cycles of heating and cooling, with allowance for dirt on glass, heat capacity, and fin effects.
q_L/A =Rate of total heat loss through 1 sq. ft. of the top of the collector: Btu/hr/ft².
q_B/A =Rate of total heat loss through 1 sq. ft. of the bottom of the collector: Btu/hr/ft².

Tests indicate that the glass plates and bottom insulation contribute 52% and 28% respectively of the total heat capacity, and the copper absorbing surface and tubes account for but 20%. Solving *Equation 6*, is found that QH/A=.335 Btu/hr/ft²/°F.

useful energy: Q_U/A

During an average day in January, in the vicinity of New York City, a collector tilted 61° (having two water-white plates each .117" thick, a 24-gage copper plate painted medium green with ⅜" copper tubes soldered to the backside 6" o.c., insulated with 1" air space, aluminum foil, 4" rockwool, and 1" fiber board) collects 30.9 Btu/hr/ft² and 287 Btu/day. The resulting collector efficiency is 32.3%.

collector size

The collector area may be expressed by (*Equation 8*):

$$Ac=H_L/Sa$$

where:
Ac =Collector area required: Sq. ft.
H_L=Net average heat load: Btu/day.
Sa =Solar energy gathered on a unit area during the most critical heating month: Btu/hr/ft².

heat balance

The heat loss of a solar house cannot be computed as a conventional heat loss problem. Because the solar energy gained for house heating is based on an average monthly value of solar radiation, it is necessary to base the temperature difference on the average outside temperature and not on the regional winter design temperature. The heat balance equation may, therefore, be expressed by (*Equation 9*):

$$H_T=S_M$$

where:
H_T=Total average daily heat load during the most critical month.
S_M=Average daily solar heat collected during the most critical month.

Based on an average outside temperature of 33°F, the heat loss of the solar house is 373,000 Btu/hr. Although the glass area on the south façade loses considerable heat during the evening and inclement weather, it admits a large quantity of heat during an average day which results as an aid to house heating. The total energy gained through 170 sq. ft. of south-facing window is 128,000 Btu/day, resulting in a net heat loss of 245,000 Btu/day. The collector area, therefore, is 850 sq. ft.

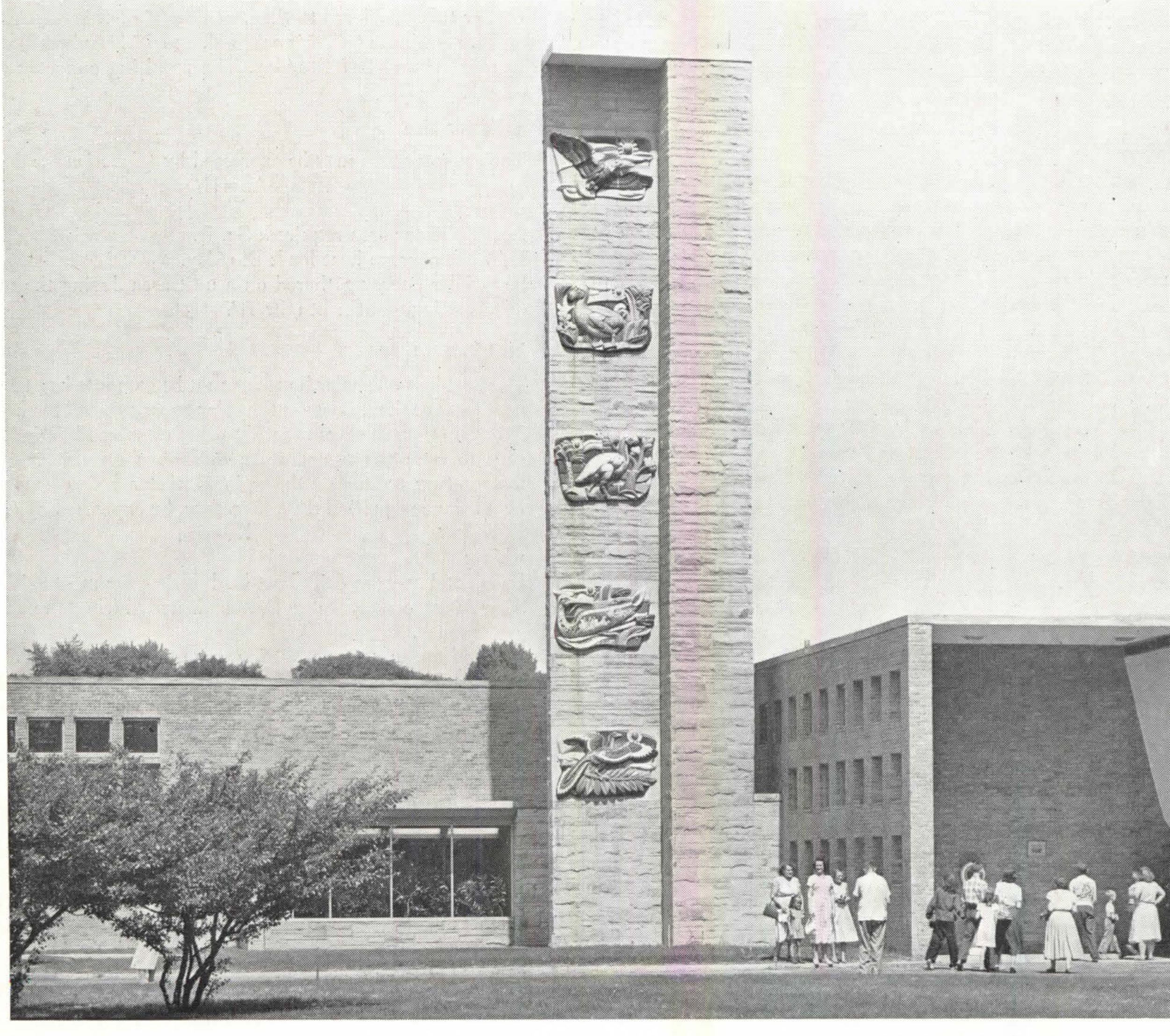
chemical storage

In the design of the collector, the plate temperature was assumed to be 100°F. Glauber's salt was chosen because of its efficiency (*Figure 16*). The amount of chemical storage is dependent upon the heat capacity of the salt, heat loss of the house, and the maximum number of days that the house is to be heated solely by chemical storage. For eight consecutive sunless days (*Table 8*) and a 65% efficiency due to heat loss and chemical sluggishness in changing state, chemical storage should be provided for 11 days. During this 11-day period, no heat assistance is considered gained through the south façade. The total heat loss is 4,100,000 Btu; therefore 21 tons of Glauber's salt occupying 434 cu. ft. are required.

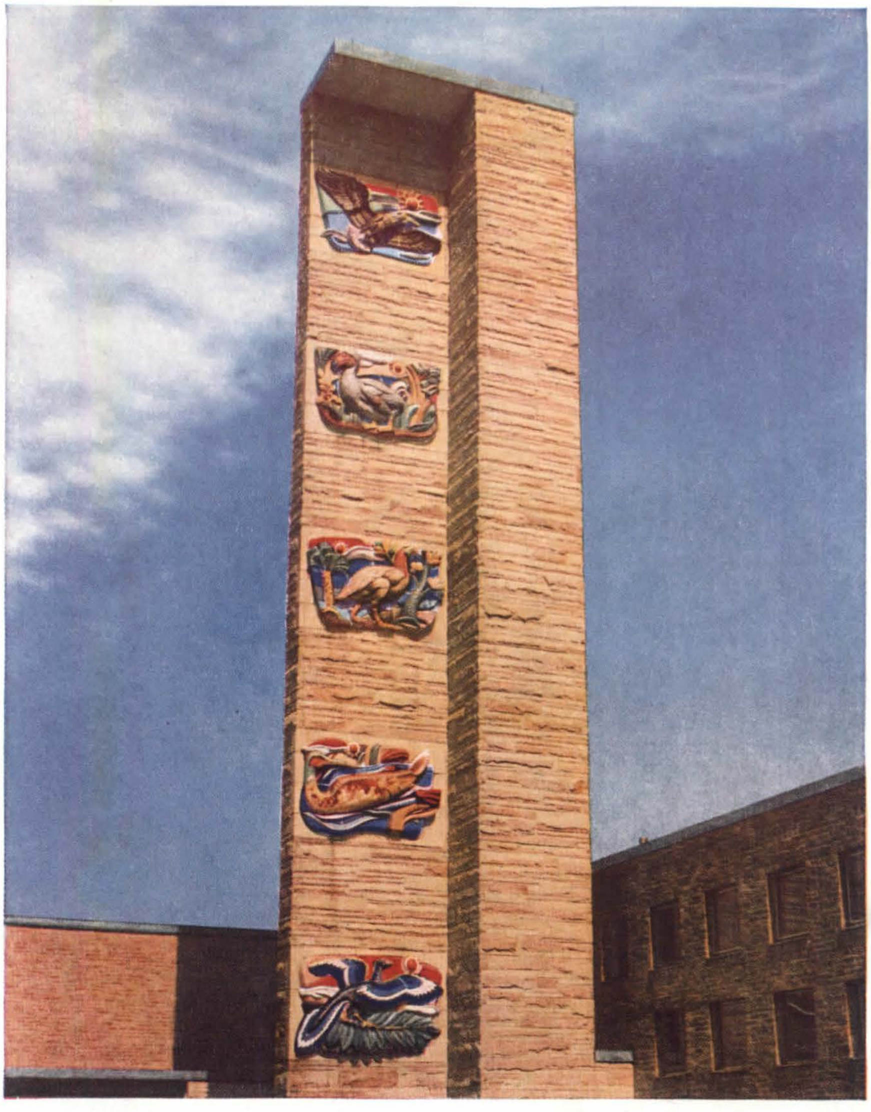
solar-heating system

Basically there are three phases of operation for a solar-heating system. *Phase I* consists of solar-energy storage and house heating; *Phase II* consists of solar-energy storage, but no house heating; and *Phase III* consists of house heating with stored energy, but no solar collection (*Figure 17*).

Ceramic sculptures by Viktor Schreckengost, of Cleveland Institute of Art, adorning the 60-foot sandstone heating stack of the new $500,000 Bird Building in Cleveland, Ohio, Zoological Park, won first architectural ceramic citation in the 16th Ceramic National sponsored by Syracuse Museum of Fine Arts. J. Byers Hays, of Conrad, Hays, Simpson & Ruth, architects for this highly specialized and modern structure, terms the dominant decorative motive "a sort of contemporary totem pole." The sculptures, representing (*bottom to top*) the evolution of bird life from the earliest Archaepteryx to the American eagle, symbolizing living species, were meticulously studied for scientific accuracy. Twenty-four smaller plaques, depicting North American birds now extinct, are inserted in the masonry walls to further decorate the interior and exterior of this building, first unit of the rehabilitation program of the 70-years-old zoological park. *Photos: Robert C. Hoffner*



ceramic sculpture



offices for six associates

On this and the next pages is shown the office building of a remarkable professional organization known as Six Associates, Incorporated, Architects and Engineers. Not the least remarkable fact about the firm is that, in spite of its name, there are just *five* principals in the firm. When the name was adopted, evidently there was a consulting engineer who might have been the sixth, but he had "other fish to fry."

Briefly, the group of principals consists of three architects, one architect-engineer, and one engineer, all of whom had successful practices of their own when they decided to pool resources and thus be able to handle commissions of a variety and scope that no one of them could entertain alone.

President of the group is Erle G. Stillwell, F.A.I.A., who had conducted his own architectural practice for 26 years. There are two vice presidents — Henry Irven Gaines, architect, A.I.A., and Anthony Lord, architect-engineer, A.I.A. Gaines had 17 years in private practice before joining the group, and Lord, who is past president of the North Carolina Chapter, A.I.A., had been in partnership or independent practice over a period of 13 years. S. C. Minnich, Jr., engineer, A.S.H.V.E., who formerly had a private engineering practice in Kingsport, Tennessee, serves as secretary of Six Associates; while the organization's treasurer is Stewart Rogers, architect, A.I.A., who for 9 years conducted his own private architectural practice.

The origin of the association was a matter of expedience. For the design of two slum-clearance projects, the Asheville Housing Authority wanted participation of several local men, rather than giving the work to any one office. To meet this demand, four architects decided to join forces. Because of war restrictions, the projects were not built, but the design work was carried through jointly; expenses and income were equally shared. Meantime, each participant continued his private practice.

Since war demands — as with defense needs today—meant that most of the plum jobs were going to large, fully equipp firms, the group decided in 1942 to set a formal organization and, after addi another architect and a consulting engine they became Six Associates, Inc.

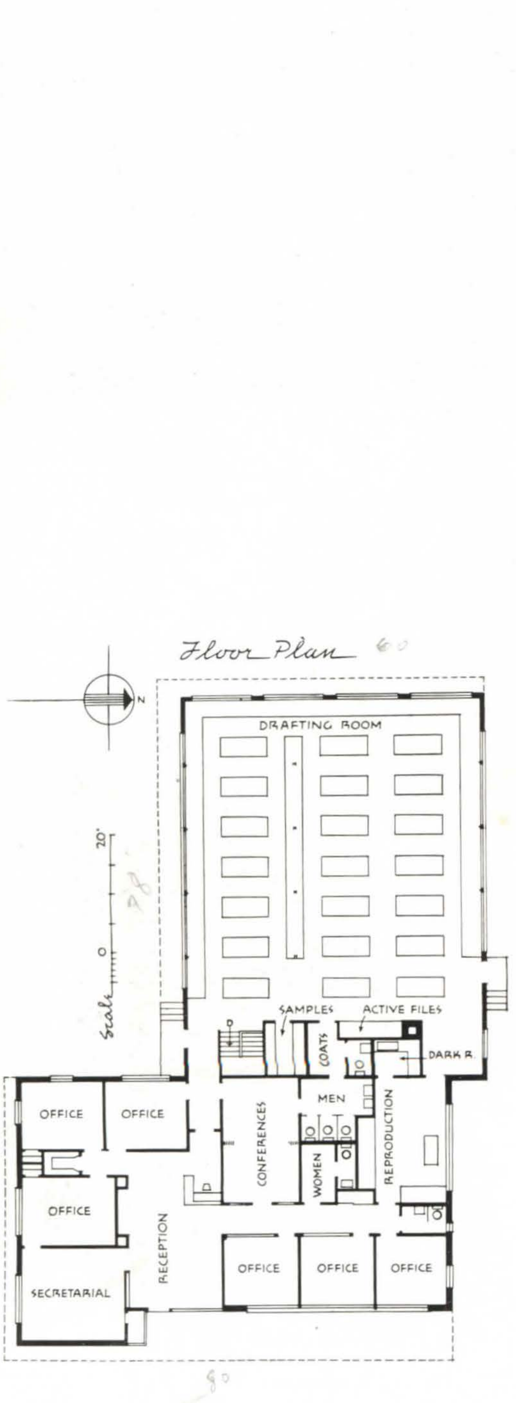
A brochure was prepared describing t constitution of the organization, the w each member had done, letters from p clients, etc. This was distributed widely with emphasis on the offices of the Ar Corps of Engineers and the Navy Bure of Yards and Docks. As a result of t and other efforts, "a contract for archite engineer services for construction of Army general hospital was promptly cured." Income and expenses were equa shared by the (now) five members w gave full time to war work—mainly for t Army.

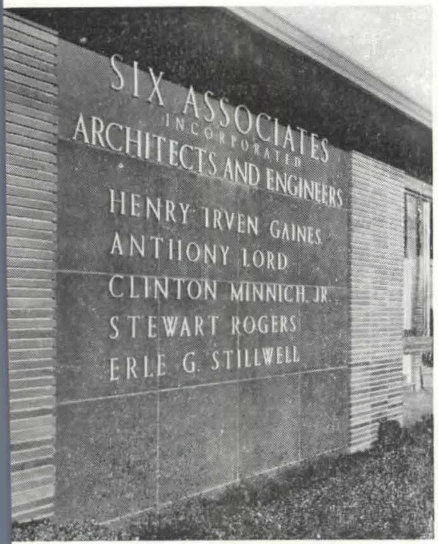
Eventually, the participants began opening their individual offices. But S Associates was continued—to handle lar scale commissions, such as industrial wo work for the State of North Carolina, so school work, and other big projects. In t interim period, an hourly wage system w established by the associates and, after t amounts earned by each were paid, t remainder was equally divided.

However, this dual type of practice some group, some individual—proved cu bersome, and the associates finally agre to pool all offices, all work, and all eff This was also the time they decided build the group office building shown he

Today, the office force, including pr cipals, totals 45 persons; 7 architects; architectural draftsmen; 2 structural en neers; 2 structural draftsmen; 3 mecha cal engineers; 3 mechanical draftsme 6 civil engineers; 2 electrical engineers job engineers; 1 landscape architect a site planner; 3 in the reproduction depa ment; and 5 secretarial workers.

The end result has been that dollar v ume of work, as well as number of jo has steadily increased and is far grea than the joint efforts of the separate n previously. With its own mechanical, e trical, civil, and structural engineering





location	Asheville, North Carolina
architects and engineers	Six Associates, Inc.

offices for six associates

Opening off the reception room (right, top) *is the south-facing secretarial room* (center). *The engineering department* (bottom) *occupies the south third of the drafting-room wing.*

The building is 4 miles from the center of the city, on a principal highway. Plenty of parking space; clean air; no smoke; excellent view. Combination of load-bearing walls, steel frame, and wood floor and roof construction. Photos: F. S. Lincoln

partments, the firm is well set up to handle the large-scale work that it increasingly obtains. However, it continues to do considerable private residential work—as a feeder and fill-in for the drafting room, as well as a goodwill factor in the business.

Things sometimes become overloaded in the drafting room, but the firm feels that "much of this could be overcome by better scheduling." The principals do not act rigidly as department heads. In general, the man with whom a job originates takes charge of the project from start to finish. But, on larger work, frequently two or more principals may be engaged, and they now have one giant commission on which all are actively working. "No doubt a conventional setup with department heads in charge of particular sections and others who looked after client contacts etc. would be more efficient, but our setup has worked and we look forward to improving it as time goes on."

As with any organization, some members like to be busier than others, and this problem is currently being met by a sliding scale of payment. The first thousand hours worked in a year are at a minimum rate; the second thousand, at a higher rate, and the third, still higher.

As to a workable size for such an organization, "the group should probably be no larger than five and perhaps smaller. It is not easy to find five architects and engineers who can get along together."

A few questions suggested for any who might contemplate establishing a similar type of group practice:

"Do the prospective participants all subscribe in general to the same underlying principles of architectural design?

"Are the talents of the members such that they supplement one another?

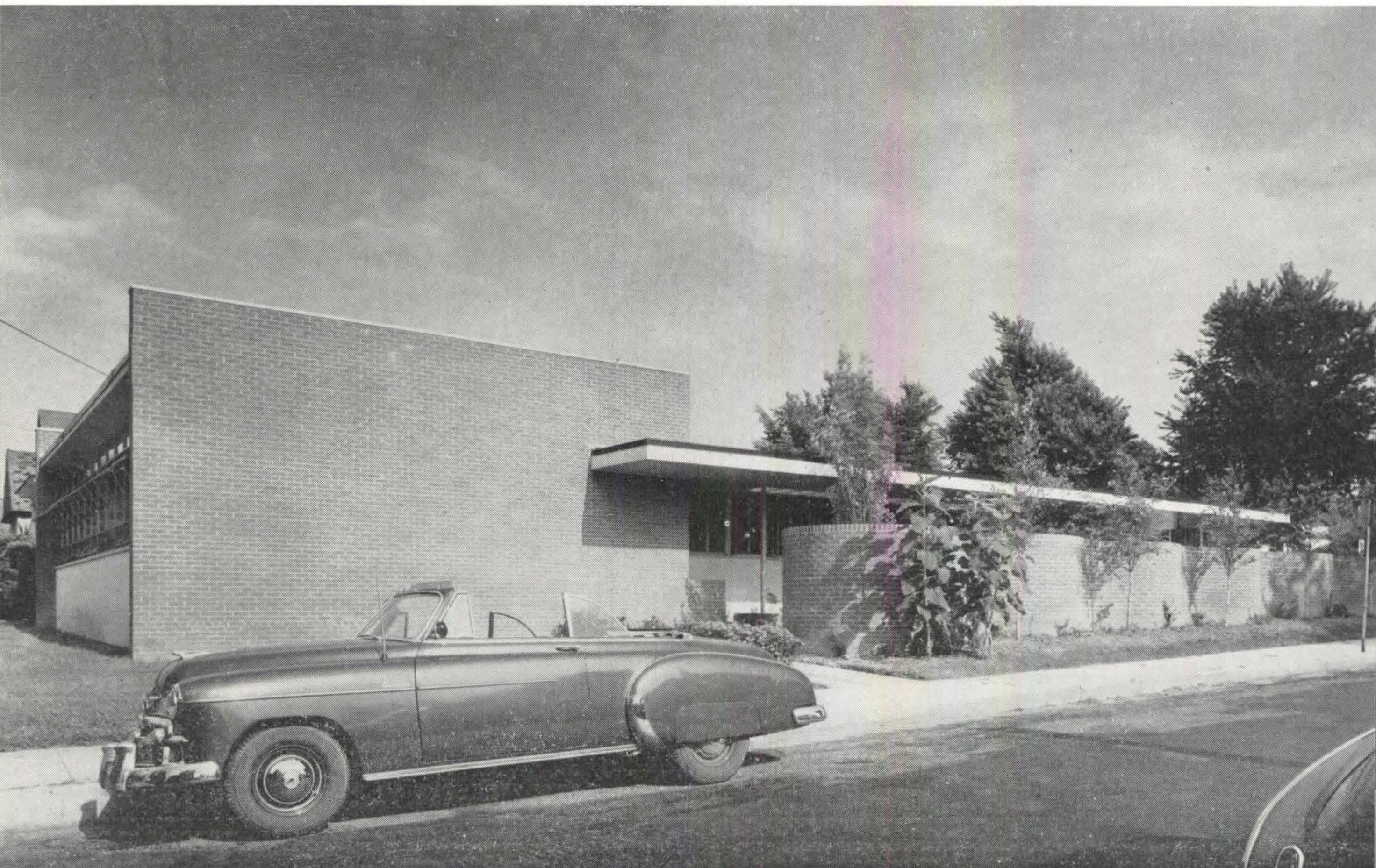
"Are the engineer members imaginative men who can offer fresh approaches?"

Mr. Rogers' private office (above) *and* (at left) *the architectural drafting room. Throughout, various floor, wall and ceiling finishes, lighting units, etc., were used to serve as a sort of materials and equipment exhibit. An intercommunication system assists office efficiency.*

The heating system is forced circulation hot water, operating in two zones—one for the drafting room; one for the office area. The system is oil fired and has automatic control with outside pilot. Ceilings are acoustically treated.

location	Memphis, Tennessee
architect	Alfred L. Aydelott
landscape architect	Wiley T. Jones
interior design consultants	Knoll Associates
lighting	Kurt Versen

associates' offices

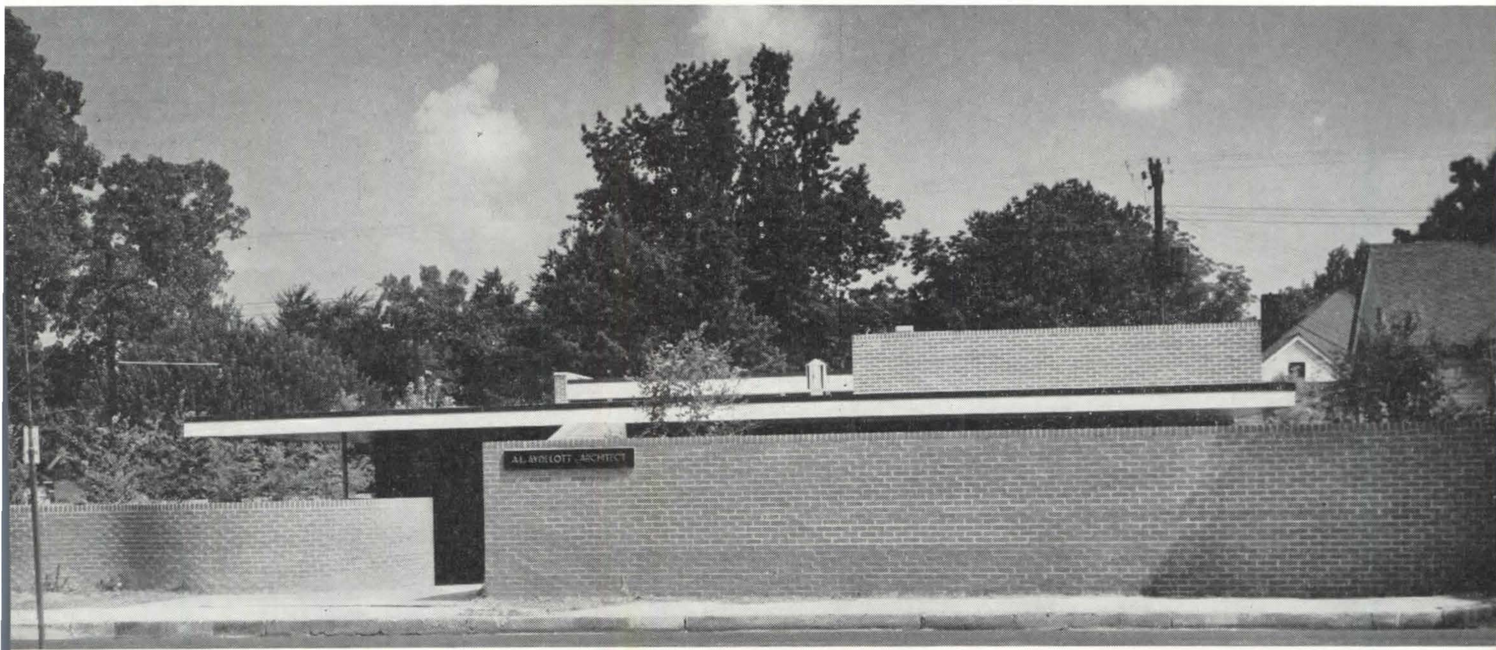


For his own offices, the architect wanted an efficient, attractive building that could be built at minimum cost. That he achieved his goal is evidenced by the plan and photographs, and by the surprising fact that this tidy structure, completed in the fall of 1950, cost only $8 per sq. ft.

Specific requirements included a drafting room with space for 14 boards; three private offices; a conference room; reception-office space; and ample storage and utility work area.

The site is a small lot bounded by three streets, in an outlying residential section that is gradually becoming commercial. The architect is most proud of "the full use of land and an open plan, with privacy for offices." Also, he points out, within the compact scheme good orientation has been p[...] vided for all spaces and there is dir[...] access to all rooms.

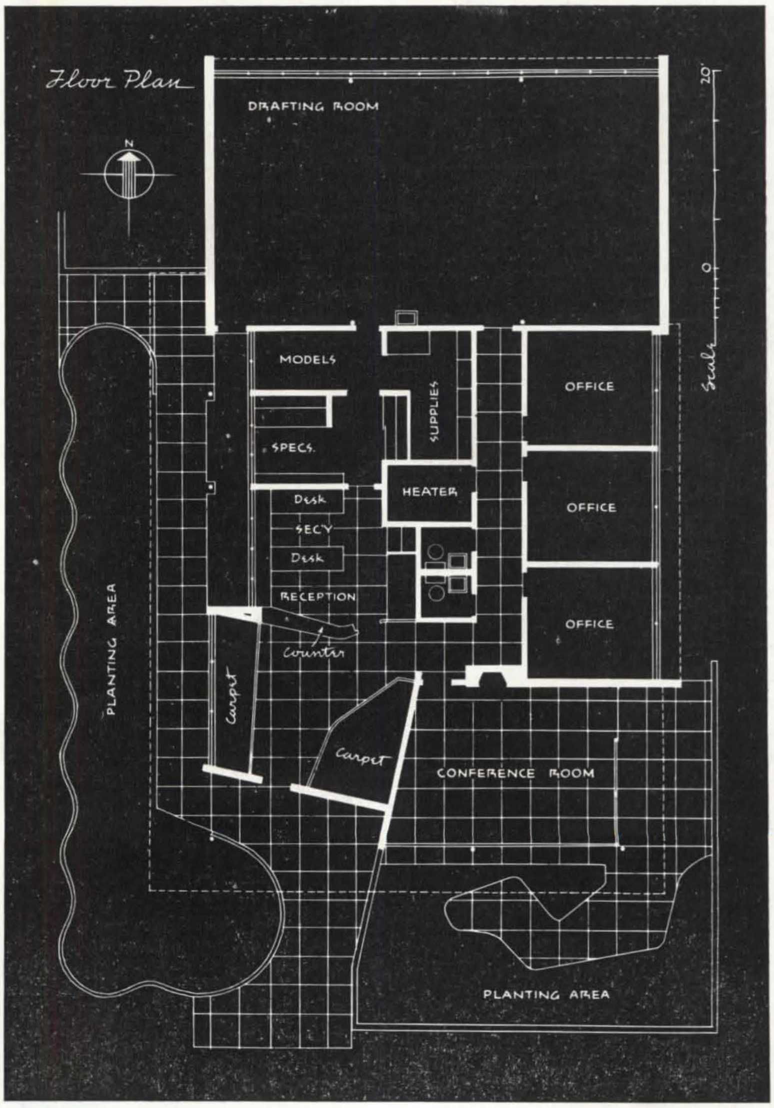
A particularly resourceful plan elem[...] is the use of garden walls to provide co[...] plete privacy outside full windowed are[...] while maintaining the openness and e[...] gance that the glass wall allows.



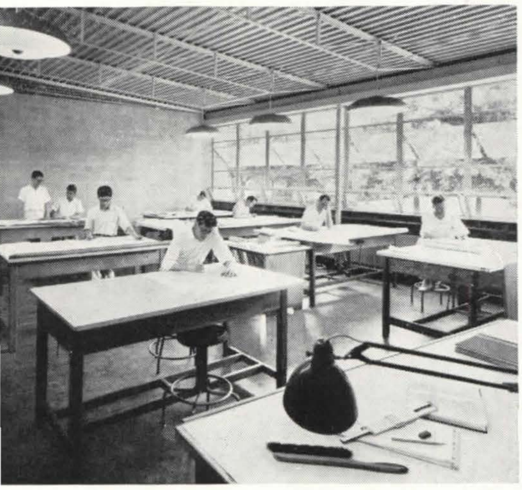
ieen from a side street (acrosspage), *the tall nass at the left is the drafting room. The en-rance for draftsmen occurs just at left of the end of the serpentine wall.*

At the front of the building (above), *the tall rick wall at right encloses the garden outside he conference room.*

Inside the serpentine wall (below). *The win-ow wall of the reception room is made up of lternating fixed and operable sash; door to the rafting room in background. The exterior side alk consists of concrete squares with surface ggregate washed and exposed, separated by rips of the same red brick used in the walls of e building.* Photos: Lionel Freedman



associates' offices



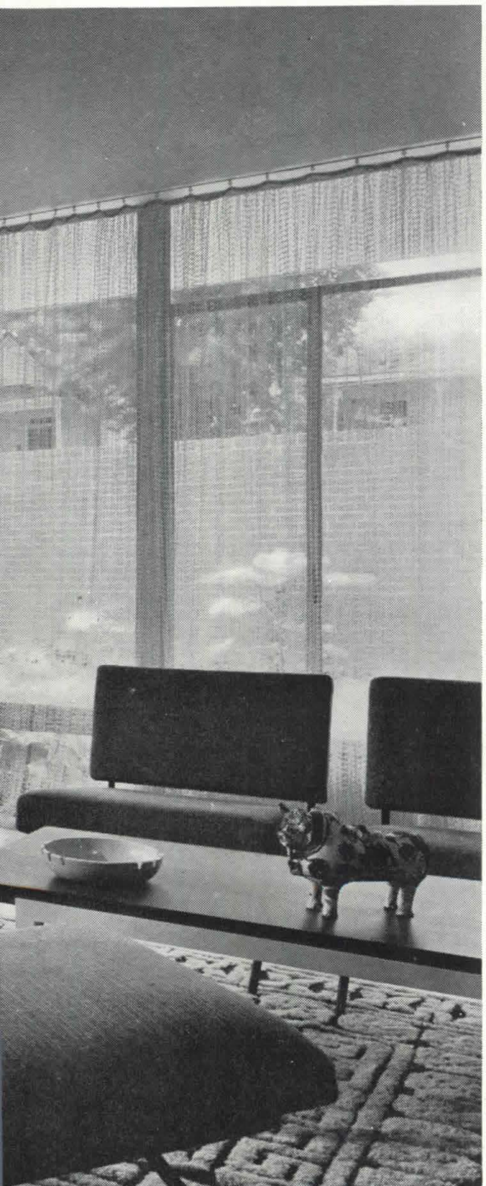
The reception room and drafting room (above) both illustrate the use of exterior materials as interior finishes.

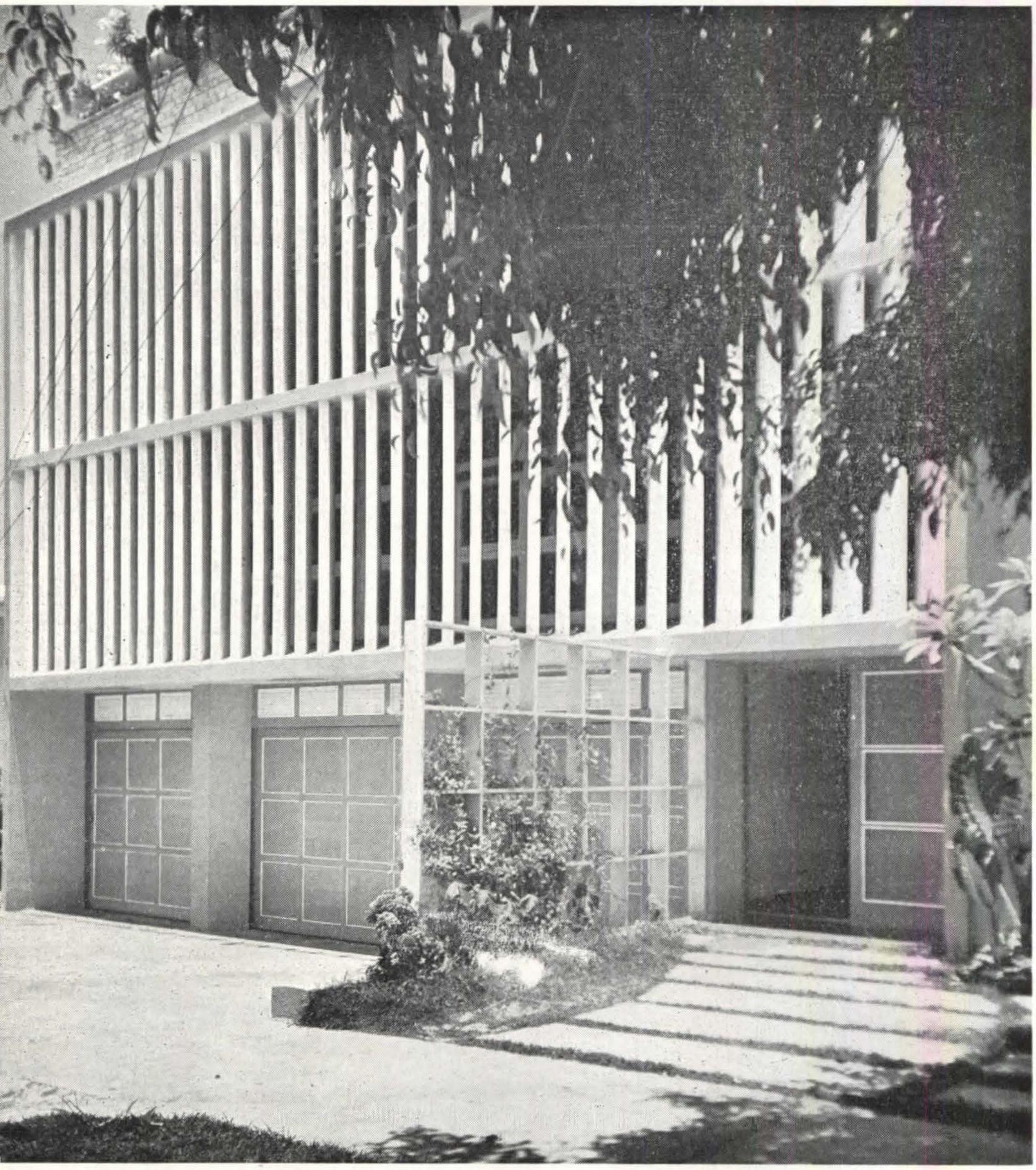
The three photos of the conference-room area (right and acrosspage) *show the combined openness and privacy worked out by means of window walls and enclosing garden walls. The plate glass of the windows is framed by intermediate steel-sash sections, combined with operable sash that was fabricated locally.*

The terrazzo flooring has black and green marble chips; the conference table is natural birch, the chairs upholstered in brown fabric; side chairs around the slate-topped, metal-framed coffee table are upholstered in blue and brown; the hanging wall cabinet is of natural birch, with sliding door panels finished with plasticized grass cloth.

Structurally, the building is a combination of wood frame with steel pipe columns and brick bearing walls. Footings and foundation walls are concrete, as are also the floors, which are surfaced with either terrazzo or asphalt tile. Exterior walls combine three materials—red brick, stucco, and yellow-painted plywood. Soffits and steel residential sash are gray; the fascia is white, and doors are natural-finish oak.

Interior walls in the office area are of plywood, burlap-surfaced building board, brick, or plaster. The south wall of the drafting room is covered with prefinished oak flooring, while the two side walls are of lightweight concrete block, providing "good acoustical and thermal conditions." The roof framing for the 28-foot span of the drafting room is the lightest possible steel-bar-joists and steel decking; elsewhere, roofs are wood framed. The building is heated from a combined floor-and-ceiling radiant system, using steel piping and served by a gas-fired boiler.





offices and home

location	Havana, Cuba
architects	Nicolas R. and Gabriela M. De Arroyo

The architects are husband and wife, an their former home-office arrangement ha consisted of a generous living space an minimum office area. Since both were bus practitioners, however, they found that the spent most of their time in the crampe space and used the large living area ve little.

ı the design of the new building, they ded to reverse the emphasis and provide rge, flexible office area and just a small pendent apartment that they could er use themselves or rent. By keeping e two areas on separate floors, it would be possible (if ever desirable) to ert the present office floor into a sec- two-bedroom apartment.

The solution is a four-level building, with garage, storage, and utility space on the ground level; office floor, one flight up; the apartment above that; and a roof recreation room and garden at the top.

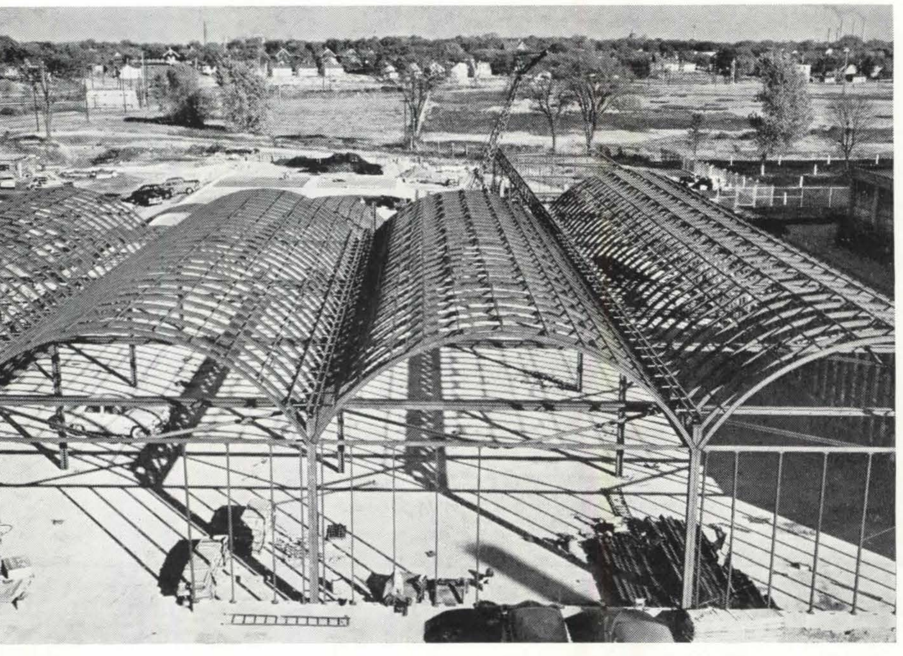
Since prevailing daytime breezes derive from the northeast, the drafting room and main apartment rooms are located along the east wall, with reception space, service rooms, bathrooms, etc., on the west. The latter are protected from excessive sun and heat by precast, fixed, vertical louvers of lightweight, insulating concrete.

The structure is reinforced concrete throughout, with concrete block filler walls, either left exposed or finished with stucco. Flooring is black terrazzo, and ceilings are of acoustic tile.

offices and home

The architects' private office (bottom) *on the working floor of the building and* (below) *the living room of the apartment. Both of these rooms face the favored east exposure to gain both good light and the desirable north-east breezes. Windows are specially designed jalousies and clear glass units. The roof garden* (right) *has a pavilion at the south end, that may also be used as an out-of-the-sun loggia.*

ng - span multiple - arch building



st addition to the Stran-Steel line of mul- -arch buildings is the Long-Span Quonset truction system, which provides a struc- suitable for most industrial and commer- requirements without requiring hot-rolled —a material in critically short supply at ent. Similar to predecessor Quonsets, ex- for an increase in clear height and span oof truss, the latest system is designed for inimum of two bays. From this minimum, ructure can be widened in increments of 5" and lengthened in increments of 40′ to desired size.

he frame consists of columns, shop-welded ses, struts, and knee-braces (the latter are ed only in the outer bays regardless of width of a building). Designed in accord- with A.I.S.C. specifications, these mem- are made of high tensile steel in light- , cold-formed shapes having 50,000 psi imum yield and a working stress of 27,000 All members are factory-fabricated, pre- ched for bolts and screws, and packaged shipped to the construction site ready for tion.

he entire curved segment of the roof (in- ling the rib section, rib splice, purlins, solid bridging which can be assembled at ground level in 20′ sections and lifted into place) utilizes the same standard building components that are found in other Quonsets. Those responsible for the design of the Long-Span system exploited the economy of using parts already in production; where new sections were required, gages and sizes were made as alike as possible to effect maximum savings by repetitive use of identical components. The arch ribs are supported on the lower chord of the truss to minimize the difference between the structure's clear height and the dome height. This design also accommodates truss depth, provides pipe space between the ribs and the truss, helps reduce steel tonnage, and leaves the upper chord clear to supporting gutters. Gutter capacity is sufficient to carry off 8" of rainfall/hour/sq. ft. of roof area. As only one downspout is needed for each row of gutter in a building 240′ long, the total cost for downspouting and underground sewers for storm water is materially reduced.

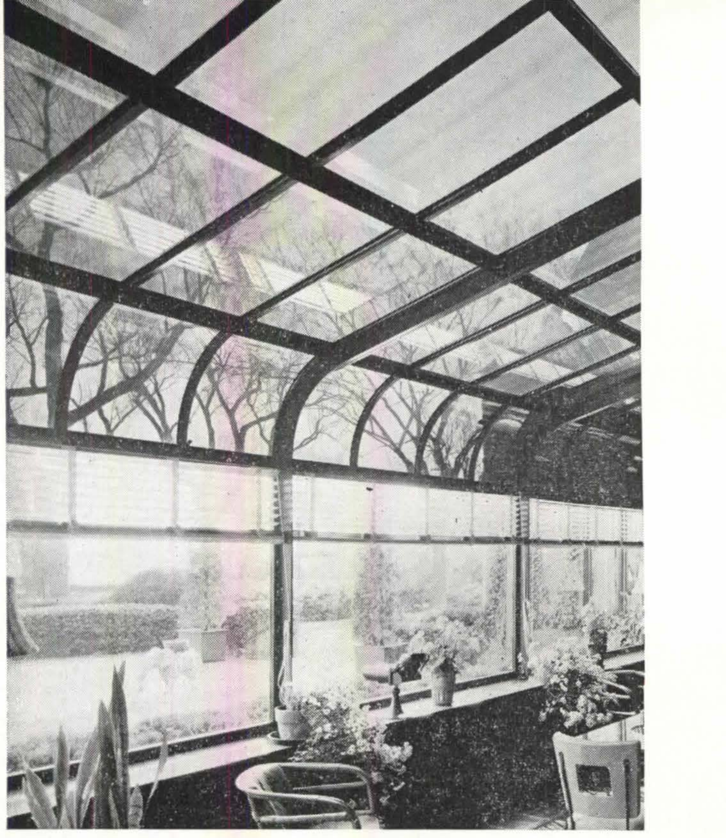
Rigidity is obtained by a transverse knee-bracing system and by the deep truss connections in the longitudinal plane of the structure. Adequate expansion joints are provided in larger buildings to absorb expansion and contraction caused by temperature changes.

The exterior covering consists of galvanized, corrugated-steel sheets nailed directly to the steel framework. The framing members contain specially designed grooves that deform and clinch nails driven into them.

A new, already-occupied 60,000 sq. ft. multiple-arch factory warehouse was completed at the Nash-Kelvinator Corporation plant in less than 45 working days with a 16-man crew *(construction photos above)*. The plant is four bays wide at one end; the over-all lengths of bays vary at the opposite end in accordance with plot limitations. The four-bay width extends 440′, a three-bay width also extends 440′, and a two-bay width stretches 480′. Insulation and interior finish, not required for warehousing, can be installed quickly and inexpensively whenever the building may be desired for manufacturing purposes.

Quonset Long-Spans are now available for prompt shipment. As the cost of any Quonset is determined by many factors such as size, number of door and window openings, freight charges, and local labor rates, it is impossible for the manufacturer to quote exact prices; however, estimates on any specific building requirement may be obtained without obligation.

PRODUCTS



laminated glass roof

Solex, a green-tinted plate glass which absorbs the sun's heat, reduces eyestrain, and keeps fading and bleaching of show-window displays at a minimum, is the newest product offered by the flat glass industry and it is expected eventually to replace the conventional colorless glass used in public buildings, trains, buses, and even homes.

The material may be bent, laminated, or tempered for use in practically every known type of flat-glass application. Recently, it was incorporated into a new method of glazing for skylight, terrace, and other canopy enclosures. Conceived by Dr. J. Hervey Sherts, product development director of the Pittsburgh Plate Glass Company, the Flexseal laminated glass roof illustrated on this page employs plate glass, Solex glass (a room glazed with Solex alone is 10 to 20 degrees cooler than a room with windows of ordinary glass), and double layers of neutral vinyl plastic which reduces glare from the direct rays of the sun. The roof is assembled in individual sections but becomes a self-sealing, continuous unit by the overlapping and sealing of the vinyl plastic layers.

In addition to being absolutely leakproof, the Flexseal glazing method is said to overcome a number of other outstanding objections to regular glass roof installations. Simple to install, it cuts transmission of the sun's in red rays by 95 percent, reducing the r temperature under glass by as much as degrees. Since the assembly is mounted cleaning problems are considerably rec Pittsburgh Plate Glass Co., 632 Duc Way, Pittsburgh 22, Pa.

air and temperature control

High-Capacity Power Ventilator: especially designed for rapid, localized removal of air contaminated with smoke, fumes, and dust. Standard construction of unit is of prime galvanized sheets but is also available in aluminum, stainless steel, Monel, other metals. Powered by axial flow fan directly connected to motor; is available in 7 sizes, with motors from 1/3 to 5 h.p.; capacities range from 5000 to 75,550 cfm. Burt Mfg. Co., Dept PA, 927 S. High St., Akron, Ohio.

Basement Forced-Warm-Air Furnace: oil- and gas-fired furnaces, with output of 93,000 Btu/hr. Exceptionally small unit—only 20″ wide, 46″ long, 45″ high—is factory assembled, ready for installation, and equipped with full-size blower and three-pass heat exchanger. Switch device permits supply of cool, circulating air during summer months. Delta Heating Corp., Trenton 8, N.J.

Motorstokor Crossfeed Stoker: commercial and light industrial, automatic, hard coal burner constructed with all moving parts outside of boiler away from high temperature zone. Feed-rate adjustments made from outside of unit without disturbing fire; burner can be mounted on either side of boiler, in single or double installations, and may be equipped for either bin or hopper feeding. Approved by Anthracite Institute, is available in capacities of either 200 or 300 lbs. of coal per hour. Hershey Machine & Foundry Co., Motorstokor Div., Manheim, Pa.

Multi-Zone Air Conditioners: heating or cooling is provided by these units as required by zones, each zone operating independently of others. Individual control accomplished by separate, built-in face and bypass dampers for each zone and by parallel arrangement of heating and cooling coils, rather than in series as normally used. Multiple service access panels, moisture-sealed insulation. In sizes up to 19,800 cfm. Kennard Corp., 1819 S. Hanley Rd., St. Louis 17, Mo.

Double-Flow Aquatower: water-cooling tower, all steel or wood with asbestos cement board casing, for use wherever intermediate cold water capacities are required. Low height (only 7½′ for 150-ton unit) detracts little or nothing from appearance of building. Patented "double-flow" fan arrangement cools more gallons per minute than towers of any other design. All parts—piping, nail-less redwood filling, basin fixtures, fan and motor, distribution basin—are readily accessible. In 7 standard sizes, starting with 50-ton unit, Marley Co., 222 W. Gregory Blvd., Kansas City 5, Mo.

Pressuretrol: low-pressure steam control, now introduced on mass volume basis, can be applied to almost any domestic steam job. Convenient conduit outlets; concealed tamperproof device prevents abusive adjustment of setting. Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis 8, Minn.

Morell Tube Vent: new type of wall-vent tube, made of nonrusting alloy, is equipped with domed cap that sheds water, locks flush against wall siding, and is almost invisible; for use in preventing lifting, peeling, and blistering of paint. Tiny slot dome provides assurance of circulating also reduces condensation in inner walls releasing pocketed moisture. Morell Ca Tube Vent Co., Inc., 1041 Carlyon Cleveland 12, Ohio.

Room Air Conditioners: mass-priced h.p. window units for small bedrooms, fices, dens, etc. Automatic temperature trol progressively reduces cooling effect outdoor temperature drops, thus eliminat need of turning compressor on and thermostat may be set by user to fit indiv ual comfort. Philco Corp., Tioga & C Philadelphia, Pa.

Convector Grilles: custom-made to size, for lower wall installation in mar tile, or other surfaces. Ruggedly construct with extra-wide louvers for air deflecti but spaced closely to prevent gum wrapp waste paper, etc., from being dropped tween blades. Grilles are available w damper and knob control. Titus Mfg. Co Waterloo, Iowa.

doors and windows

ABCO Weatherstripping: plastic weat stripping with extruded rubber inset, m exclusively for tempered Herculite g doors to eliminate drafts and dust and crease efficiency of air-conditioning syste constructed so that it can be easily slip on and off. Abbott Glass Co., 160 E. 120 New York 35, N.Y.

Fenestration for Industrial Rolling Doo narrow, transparent panes of heavy-d

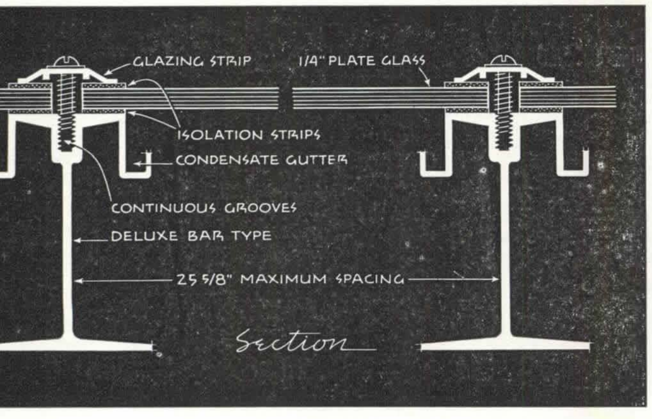
...tyless skylights

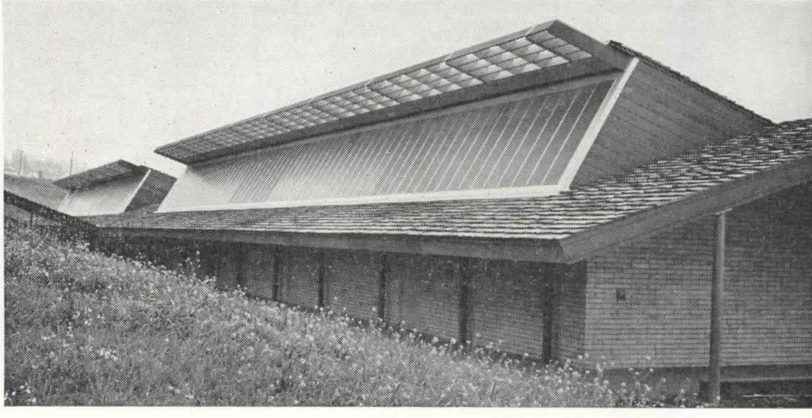
Skylights which requre no putty have been designed with aluminum mountings that hold any thickness of glass and provide a completely watertight frame. Its simplified construction *(cross-section below)* not only offers a greater expanse of uninterrupted light area than found in other types of skylights, but also makes installation easy and has proved to be as economical as conventional skylights.

Corrosion-resistant aluminum alloy is used in the mountings and its high tensile strength, according to tests performed by the Materials Testing Laboratory of the University of California, will withstand a midspan weight up to 1700 pounds without causing deflection sufficient to crack the glass panels. Glazing caps, equipped with self-tapping aluminum screws and felt isolation strips, hold the glass under uniform tension to allow for expansion under solar heat, thus eliminating any danger of glass cracking.

The Technical Committee of the Pacific Coast Building Officials Conference have approved the skylights for use with glass panels 24″ x 144″, or 3456 sq. in. in size, as compared with the maximum panel of 720 sq. in. approved for standard galvanized skylights.

An average installation can be made by a two-man crew at the rate of 300 to 500 sq. ft. of skylight per day; a job involving a small series of small skylights would, however, require more time. Large speed screwdrivers and adjustable wrenches are the only tools needed. The aluminum bars and mountings are now being shipped to all sections of the country and contractors have already reported on the low installation costs incurred. O'Keeffe's, Inc., 55 11th St., San Francisco 3, Calif.





...now installed in interlocking steel ... Kinnear rolling doors. Suitable for ...ions where more interior light is re... these lookout panes also provide ...actor against intruders and unauthor...itors. Kinnear Mfg. Co., 1191 Fields ...olumbus 3, Ohio.

...rrison Roly-Door: new 16′ width of ..., four-sectional, overhead garage door ...rd 7′ height) that is permanently ...lling" on fully ballbearing parts. ...ype end hinges produce smooth, ..., noiseless action. Morrison Steel ...s, Inc., 601 Amherst St., Buffalo, ...

...": New 12″ additions to line of func...lass block for light control in critical ...reas, each color-coded with installa...ide marks. Blocks weigh 1/3 less ... concrete building block, yet provide ...ore wall area, have higher insulating ...Pittsburgh Corning Corp., 307 Fourth ...ttsburgh 22, Pa.

...trical equipment, lighting

...pot: all-purpose, glare-free, incan... downlight provides interchangeable ...t or floodlight distribution for wide ...f commercial and industrial uses. ...t, easily maintained unit utilizes new, ... 100w A-21 silvered bowl lamp; light ...utput said to be greater than that ...uipment using 150w projector or re...lamps. Assembly consists of one-...teel housing, porcelain receptacle, ...m reflector, concentric louvers, and ...ring. Silvray Lighting, Inc., 1270 6 ...ew York 20, N. Y.

Hinged Lens Plexoline: new light fixture allows hinging of Holophane reflector from either side or complete removal for maintenance. Enclosure and chassis finished in hot-bonded white enamel; Holophane reflector and ribbed glass side panels distribute low surface brightness with high light transmission quality. Available for either Slim line or fluorescent lamps, in 4′ and 8′, 2-lamp units. Day-Brite Lighting, Inc., 5405 Bulwer Ave., St. Louis, Mo.

insulation (thermal, acoustic)

Acoustilite: perforated, acoustical tileboard made from Northern wood fiber, available with either flanged tongue-and-groove joint for application with staples or with beveled butt-edge joint for adhesive application. Painted finish with high reflection, may be repainted many times without loss of acoustical efficiency. Insulite Co., 500 Baker Arcade Bldg., Minneapolis 2, Minn.

sanitation, water supply, drainage

Automatic Trap Primer: constructed of cast bronze, with IPS connections in ½″ and ¾″ sizes, affords positive protection against dangerous, unsanitary air arising from drains in which water seals have evaporated. Two vacuum-breaking ports below bleed valve insure against possibility of waste being drawn into supply line. J. A. Zurn Mfg. Co., 1801 Pittsburgh Ave., Erie, Pa.

specialized equipment

Efficiency Sink and Tub Combination: 48″ kitchen unit has acid-resistant porcelain sink with one deep and one shallow bowl, sliding top to serve as drainboard; equipped with chrome swing faucet and chrome cup strainers. Deep storage drawer and two regular size drawers with cutlery tray built into top one; cabinet door has towel rack and wire soap basket. Hubeny Brothers, Inc., Roselle, N. J.

Disappearing Toothbrush-Holder Unit: paneled, revolving stand that fits into bathroom wall, holds 4 toothbrushes, drinking glass, and bar of soap; touch of the panel revolves toilet items out of sight when not in use, leaving smooth panel, flush with wall. Closed compartment also protects articles from dust and dirt. Complete unit is molded in lustrous white plastic. Hall-Mack Co., 1344 W. Washington Blvd., Los Angeles, Calif.

Natural-Line Cabinets: new line of hardwood kitchen base and wall cabinets in natural wood finish; built to accommodate built-in ovens and cooking units of leading manufacturers. One model is designed for storage of electric food mixers and accessories. Kitchen Maid Corp., 123 Snowden St., Andrews, Ind.

surfacing materials

Saf-T-Floor: easily applied floor resurfacing material can be troweled over any wood or concrete floor; hardens overnight to form dense, stone-like surface of fine, smooth texture. Impervious to solvents, grease, and moisture, is specially recommended as flooring for bakeries, garages, and food plants. Available in light gray, tile red, russet-brown, and green. Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.

p a

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

1-152. Radiant Panel Heating with Steel Pipe, 48-p. booklet. Discussion of heating method employing large, warm radiating panels. Outline of system's development and operating principles, advantages, example of design and application for moderate-size home, diagrams, photos. Also, section on snow melting and ice removal. American Iron and Steel Institute, 350 Fifth Ave., New York 1, N.Y.

1-153. Weather-Flo (A-751), 4-p. folder illustrating indoor-outdoor temperature control for heating systems, which anticipates weather changes and automatically adjusts heat input accordingly. Method of operation, advantages, typical installation diagram. Automatic Devices Co., Inc., Western Springs, Ill.

1-154. Model "G" Air-Conditioning Cabinets (3703A), 40-p. bulletin. Engineering data on redesigned and improved central air-conditioning units available in sizes from 875 to 22,000 cu. ft. of conditioned air per minute. Capacity table, charts, details, proper selection for given conditions. Buffalo Forge Co., 490 Broadway, Buffalo, N.Y.

★ **1-155. Kno-Draft Adjustable Air Diffusers** (K-20-A), 34-p. bulletin displaying complete line of air diffusers and accessories. Applications, performance charts, general duct design and balancing procedures, technical and installation data, photos. W. B. Connor Engineering Corp., Shelton Rock Rd., Danbury, Conn.

1-156. Portable Window Fans (615), 4-p. folder describing line of window fan units, furnished with safety grille guards, designed for installation in casement windows; may be lifted easily from window support and carried wherever desired. Sizes, installation photos, advantages. Lau Blower Co., 2007 Home Ave., Dayton, Ohio.

★ **1-157. Warm-Air Perimeter Heating** (No. 4), 30-p. booklet, including 6 worksheets, providing detailed information for design and installation of warm-air perimeter heating systems for basementless structures. Sections include site selections and preparation; performance characteristics; classifications of systems; warm air outlets and returns; concrete slab construction; installation details; and crawl space construction. Diagrams, contents table. National Warm Air Heating and Air Conditioning Assn., 145 Public Sq., Cleveland 14, Ohio. ($1 per copy; please pay directly to National Warm Air Heating and Air Conditioning Assn.)

1-158. Thrush Flow Control (FCE-1251), 40-p. booklet on hot-water heating equipment. Contents include: boiler details and wiring diagrams; engineering data for design of one- and two-pipe systems; greenhouse and brooder-house heating; unit heater engineering data; domestic water installations; radiant heating engineering; snow melting applications; pipe size tables; other engineering data. Also, catalog section illustrated with flow control equipment. H. A. Thrush & Co., Peru, Ind.

Two catalogs, one on blower-type unit heaters for factories and warehouses; applications, capacity and performance data, dimensions, diagrams; other catalog contains full line of air-conditioning, heating, ventilating, and heat-transfer equipment; construction, cutaways, photos of products and parts, capacities, sizes, dimensions. Trane Co., La Crosse, Wis.:
1-159. Torridor Unit Heaters (DS-327A)
1-160. Trane Products (PB-290)

1-161. Turbo-Ventilation, AIA 12-K (52), 12-p catalog on rotary turbine ventilators with extremely high exhaust capacity, despite wind fluctuations. Features, types, capacities, engineering data, specifications for size and number of ventilators, diagrams. Western Engineering & Mfg. Co., 4116 Ocean Park Ave., Venice, Calif.

construction

3-136. Asbestone, 24-p. brochure. Uses of corrugated asbestos-cement products—roofing, siding, shingles—in industrial and decorative fields. Properties, photos of typical installations, engineering services. Asbestone Corp., 5300 Tchoupitoulas St., New Orleans 15, La.

★ **3-137. Copper Sheet Metal Work,** AIA 12. Portfolio of drawings showing suggested details of new or improved methods of copper sheet-metal work frequently performed in residential and commercial construction; each drawing suggests design requiring minimum use of sheet copper for maximum weather protection. Portfolio is prepared for easy incorporation into user's architectural file. American Brass Co., Waterbury 20, Conn.

3-138. Architectural Terra Cotta, folder describing facing material of cotta and illustrated with photos of ty interior and exterior applications in mercial and industrial buildings. Type facing, advantages. Northwestern Terra Corp., 1750 Wrightwood Ave., Chicago Ill.

3-139. Philippine Mahogany Churches, 16-p. booklet demonstrating of mahogany in church interiors—pews tars, paneling, confessionals, furniture, Color plates. Philippine Mahogany A Inc., 111 W. 7 St., Los Angeles 14, Cal

doors and windows

4-152. Arnold Products, Inc., 4-p. phlet containing specifications for caser windows of extra-heavy extruded-alumi construction. Types, dimensions, glass features. Arnold Products, Inc., 3501 Miami Ave., Miami, Fla.

4-153. Venetian Blinds, 20-p. bookle scribing lightweight, all-steel venetian bl electro-galvanized, Iridited, and zinc- mate-treated for maximum corrosion tance; permanent plastic finish prov porcelain-smooth surface that will not peel off, or crack. Types, construction performance details, size requirements stallation and other data, drawings, i Eastern Machine Products Co., 1601 comco, Baltimore 30, Md.

4-154. Gate City Wood Awning dows, AIA 16-L. Portfolio containing catalog and 3 installation detail sheet wood awning windows, toxic-treated fo sistance to rot, fungi, and termites. S fications for complete unit, including ware; schedule of sizes and types. City Sash & Door Co., P.O. Box 901, Lauderdale, Fla.

4-155. World's Finest Awning Win 6-p. bulletin describing all-alumi weather-stripped awning windows for types of buildings. Sizes, details, spec tions, features. Miami Window Corp., N.W. 37 Ave., Miami, Fla.

4-156. National Butt-Way Mould (52-S), 16-p. bulletin illustrating va types of simply contoured storefront sill, jamb, and transom bar molding, able in aluminum or stainless steel, bright polished or satin finish. Design tails, index. National Store Fronts Co., 57 Cliff St., Boston 19, Mass.

7. **Pennsylvania Corrugated Glass** , 8-p. catalog. Types of corrugated glass, and without wire, for sidewalls with ed or continuous windows, skylighting, tions, screens, etc. Designing data, stand- light coverage, sidewall elevation draw- typical sections. Pennsylvania Wire s Co., 1612 Market St., Philadelphia 3,

8. **Industrial Pivoted Steel Windows,** 16-E, 4-p. folder giving types and sizes ivoted, heavy-duty steel windows utiliz- louble contact weathering. Types, sizes, size details, specifications. Steelcraft Co., Rossmoyne, Ohio.

ectrical equipment, lighting

4. **Meter Socket Selector** (B-5284), booklet. How to determine proper me- ocket, once user knows type of service ed and wire size to be used. Data on it-closing provision, terminals, service nnects, ordering, and determination of number; additional information in- s reference wiring diagrams, dimen- , auxiliary parts. Westinghouse Electric ., Box 2099, Pittsburgh, Pa.

ıishers and protectors

6-55. **Interior Color Suggestions.** Ring-binder holding five catalogs, each of which contains 2- and 3-color nes recommended for specific areas in itals, hotels, industrial plants, offices, schools, respectively. Color charts, lay- drawings, general data. Devoe & Ray- s Co., Inc., 787 1st Ave., New York 17,

sulation (thermal, acoustic)

different forms of vermiculite insulating rials described in two brochures; first, weight, resilient concrete designed for ating underground heated piping; the , fireproof acoustical plastic that may roweled on any type of flat or irregular ce. Application data. Zonolite Co., 135 Salle St., Chicago 3, Ill.:

. **Z-Crete,** AIA 37-D-2 (Z-11)

. **Zonolite Acoustical Plaster** (PA-5)

terior furnishings

. **Structural Modern,** *folder of loose-* sheets illustrating decorative bowls, can- icks, and lamps, all constructed of ght iron in choice of six colors, includ- white. Dimensions, price list, photos. schalk Sales Co., 225 Fifth Ave., New 10, N.Y.

anitation, water supply, drainage

16. **Shone Pneumatic Ejectors** -C), 12-p. catalog. Complete informa- on both mechanically and electrically rolled ejectors for pumping, sewage, age, and solids-carrying liquids; units be installed in either round or rectangu- its. Operation, capacity table and lay- imensions, selection chart, typical specifications, photos, drawing of municipal installation. Yeomans Brothers Co., 1433 N. Dayton St., Chicago 22, Ill.

specialized equipment

19-217. Steel Kitchens, Lavanettes, AIA 35C-12. Portfolio comprising 12-p. booklet on various models of de luxe and standard cabinet sinks, either with single or double bowls; and 4-p. folder describing bath and powder room fixture consisting of vanity-lavatory unit with Formica top; drawers and storage space incorporated in all-steel cabinet. Photos, illustrations. Toledo Desk & Fixture Co., Maumee, Ohio.

19-218. Uniflow Soft Drink Dispenser, 4-p. folder describing two models of soft drink dispensing units made of stainless steel. Construction features, advantages, dimensions. Uniflow Mfg. Co., Erie, Pa.

surfacing materials

19-219. Amtico Rubber Flooring, 16-p. folder. Color plates illustrating rubber floor installations in rooms furnished by well-known decorators. Color samples, floor plan suggestions, advantages. American Biltrite Rubber Co., Trenton 2, N.J.

Booklet and sample folder showing many applications of new, hard-wearing plastic surfacing material for wall paneling, counters, cabinets, radiator enclosures, etc.; resistant to boiling water, hot grease, fruit acids, alcohol. Color plates of actual installations, properties and other technical data, construction details. General Electric Co., Chemical Div., Pittsfield, Mass.:

19-220. Textolite Plastics Surfacing (CDL-32)

19-221. Textolite Monotop (CDL-45)

19-222. Parkwood Decorative Laminates, 4-p. folder describing group of high pressure laminates with surfaces protected by transparent overlay sheet of melamine plastic. Types, finishes, properties, specifications and application data. Parkwood Laminates, Inc., 33 Water St, Wakefield, Mass.

Catalog presenting complete assortment of Douglas fir plywood panels and allied products such as doors, chalk-board, etc.; recently-new products included, are rigidized, textured metal-plywood panels; porcelain-enameled steel bonded to plywood; termite-resistant plywood; fire-resistant, subdividing partition panels. Uses, sizes, photos, technical data, index. Booklet illustrating architectural applications of wood veneer wall covering which may be applied to either flat or curved surfaces. Solutions to architectural problems demonstrated with actual installations. U. S. Plywood Corp., 55 W. 44 St., New York 18, N.Y.:

19-223. The Weldwood Catalog, AIA 19-F

19-224. Flexwood

(To obtain literature, coupon must be used by 5/1/52)

(We request students to send their inquiries directly to the manufacturers.)

PROGRESSIVE ARCHITECTURE, 330 West 42nd Street, New York 18, N. Y.

I should like a copy of each piece of Manufacturers' Literature circled below.

1-152	1-153	1-154	1-155	1-156	1-157	1-158	1-159
1-160	1-161	3-136	3-137	3-138	3-139	4-152	4-153
4-154	4-155	4-156	4-157	4-158	5-104	6-55	9-69
9-70	9-71	19-216	19-217	19-218	19-219	19-220	19-221
19-222	19-223	19-224					

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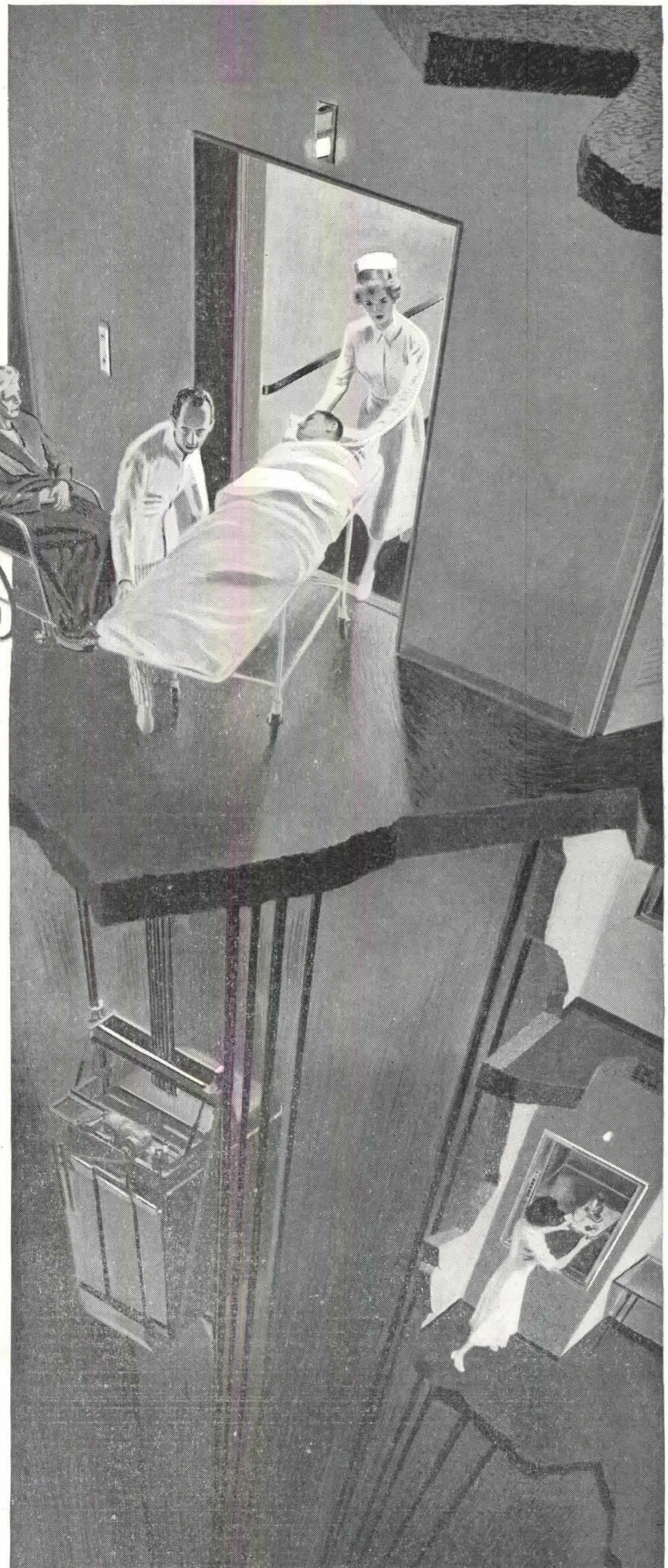
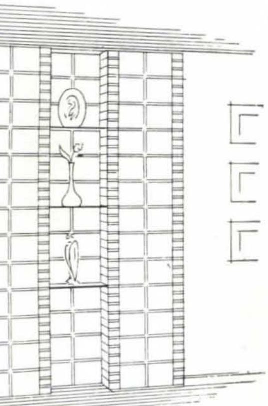
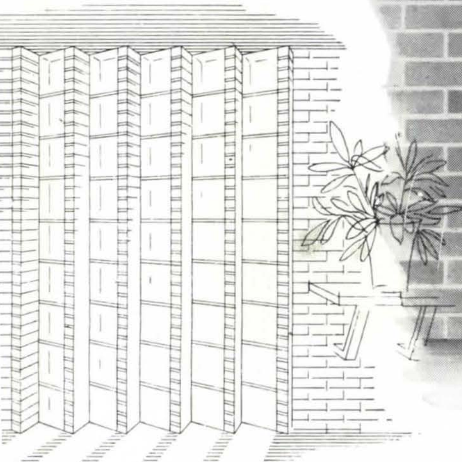


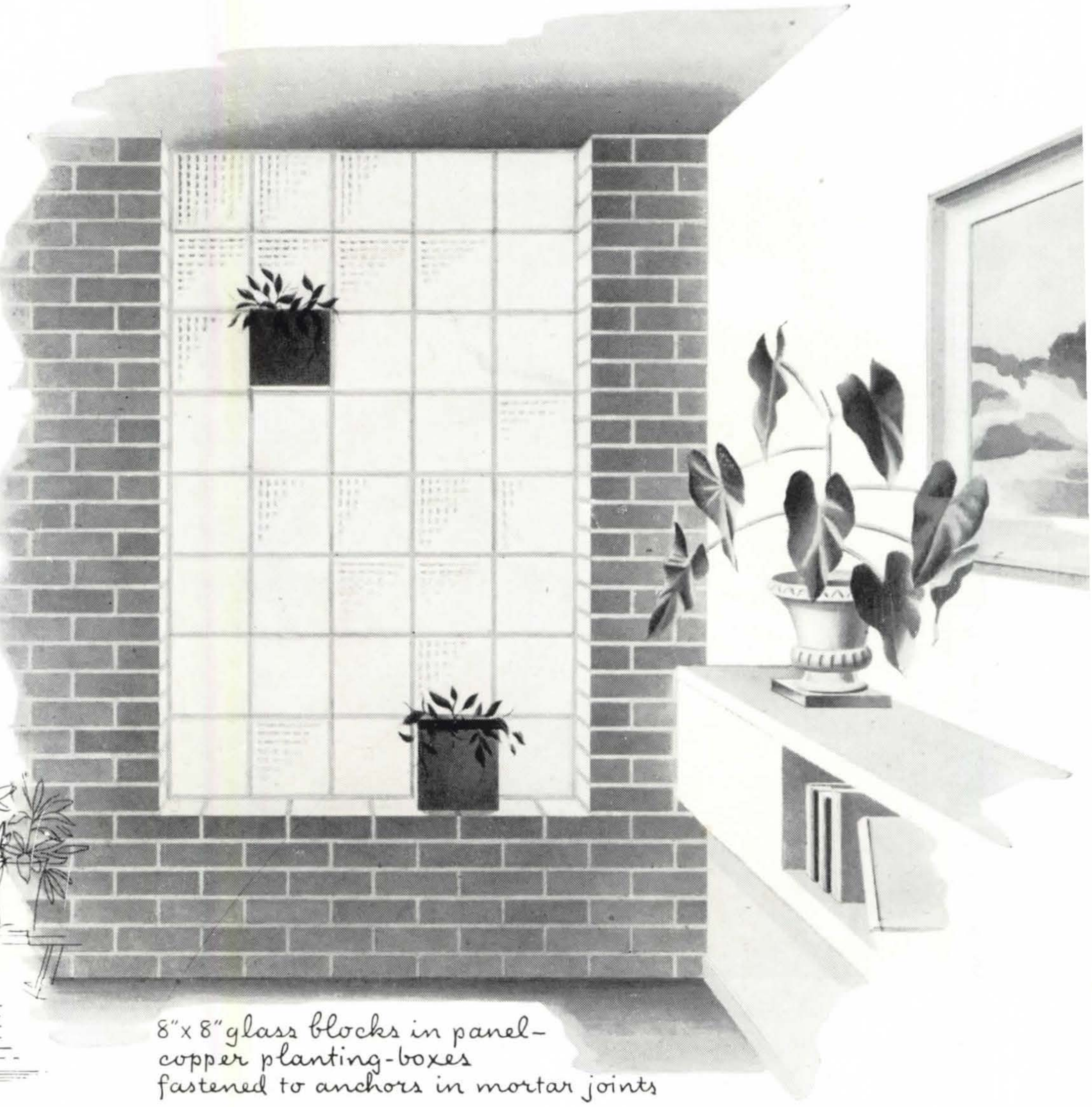
. from the INSULUX sketch book



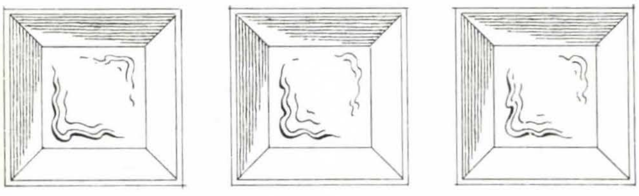
ical panels of 8"x 8"
ss block-staggered
plan with brick
ical "fins" between.
plate glass shelves
in brick joints.



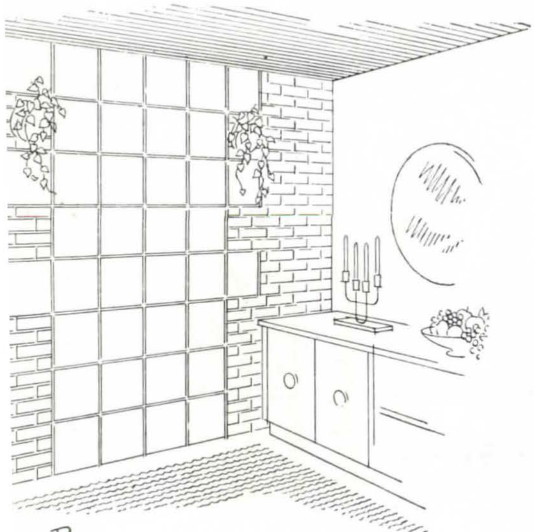
"Directing Light"-Interior Partition
12"x 12" glass block set at an
angle with single brick "fin"
separators between each row.



8"x 8" glass blocks in panel-
copper planting-boxes
fastened to anchors in mortar joints



STAIR HALL
three 12" blocks with individual frames



ng Room
ass blocks worked in with the
e of a face brick wall interior

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Insulux Glass Block® offers you opportunities to create new architectural designs that cannot be achieved with any other material.

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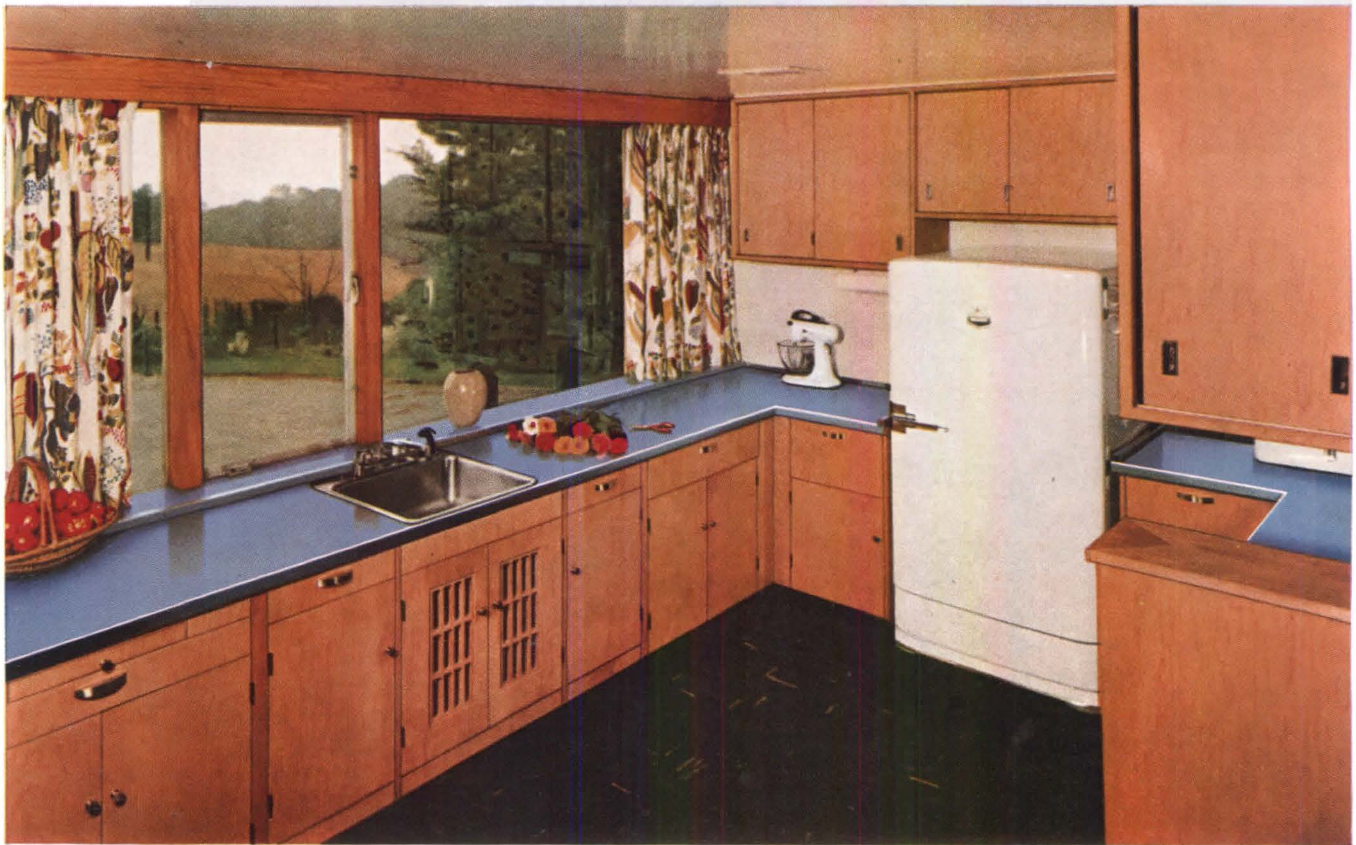
INSULUX
GLASS BLOCK

INSULUX GLASS BLOCK

A product of the Owens-Illinois Glass Company

Designed WITH A LONG VIEW—INSIDE AND OUT



Albert Kennerly, Architect

The picture windows in this kitchen face on scenic beauty that extends for miles. The specifications, which read "Sinks and Counter Tops 1/16" Formica on water-proof plywood," provided the "long view" inside.

That qualifying phrase "or equal" is seldom associated with Beauty Bonded Formica. For beauty, for durability, for range of color and pattern selection, Formica is in a class alone.

If years and years of carefree use with no maintenance cost is the aim—the long view calls for genuine Formica.

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;chool classrooms

by Henry Wright*

chool buildings, like factories, are among the most disciplined forms of architecture we have roduced. In the well designed classroom, little is left to chance. Illumination is adequate nd all pervading. Color schemes conform to specified contrast limits. Furniture and equip-nent must meet well defined functional requirements. Materials are scrutinized from the arying points of view of ease of maintenance, sound absorption, sound insulation, and light eflectance. Performance is evaluated with the aid of objective instruments and, at another evel, through statistical studies which attempt to determine the effects of the resulting envi-onment on pupil health and achievement records.

Those who fear the stultifying influence of such an approach—and there are many who o—may take heart from the result. Far from stifling architectural imagination, the engineers vith their light and sound meters have had a stimulating effect on school design similar to hat noted, a decade or two ago, in the case of the factory. Only the more rabid romanticists vould deny that today's schoolrooms are pleasanter, more attractive, more effective places for earning than the schoolrooms of 10 or 20 years back; while only the most prejudiced observer vould fail to recognize that this change has been a result, to a considerable extent, of the demand or better seeing and hearing conditions, with the "better" defined in precise physical terms.

Fortunately, this is not the only way in which school architecture excels. Among recently ompleted structures, it is a good deal easier to find 10 ponderous public buildings, 20 retentious offices, 50 flamboyant shops or a hundred rococo restaurants than one really objec-ionable school. Modern school buildings tend to be good or dull—but not bad. And schools of eally excellent design, like those shown here, differ from work in other fields in somewhat he same way that our better children's books—exhibiting the same clarity of purpose, simplicity f means, and colorful, light-hearted treatment—differ from those published for adults. It may be nerely a coincidence that the ultimate critics are in both cases the same. It is nice to think, owever, that having accepted the criteria of the foot lambert and the decibel, we are also begin-ing to accept the candid vision of the child as a standard to which design should conform.

Thus, in approaching the problem of the school classroom, the interior designer must start rom a more-than-usual respect for functional requirements, expressed in specific, measurable erms; and move towards a more arresting, more meaningful expression of the educational rocess, aimed at the child's level of perception. Despite efforts to make it warmer looking, nore *inviting*, the present-day schoolroom often presents a rather aseptic atmosphere, induced n part by a (probably unnecessary) uniformity of illumination, and in part by a tendency to ettle for tan and beige, pale green and maple, to make certain of avoiding high brightness ontrasts.

It is not necessarily a bad thing that the only surface in a modern classroom likely to have reflectance of less than 40 percent (and thus to provide a spot of highly-visible color) is the urface of the children's clothing; but it may suggest that other areas might, for sufficient eason, sometimes also depart from the reflectance rule. So, too, the practice of lighting every it of horizontal surface to the level required for "close visual tasks" might be improved by add-ng still more light in certain areas (or on certain occasions) for the deliberate purpose of reating dramatic foci of attention, or modeling solid objects. This is the type of "plus" that etter interior design can offer the well designed school building—a natural next step in a rocess already under way.

echnical and promotional consultant, New York, recently concentrating on schools.

p/a interior design data

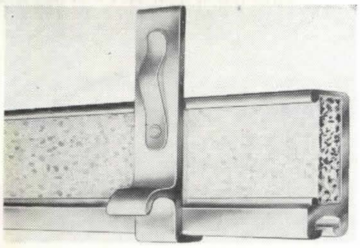
school classrooms

type	fifth grade classroom—Barrington Countryside Scho
location	Barrington, Illinois
architects & engineers	Perkins & Will

Bilateral lighting is achieved in this typical classroom at Barrington Countrysid within a simple structural scheme. The roof is supported by the concrete-block cros walls, and the east and west walls are glazed from sill to ceiling. Low cabinets sepa rate classroom from corridor, thus borrowing light from the west and creating a pleas ant sensation of openness. Where necessary (in the less dignified lower grades, w presume) the space between top of cabinet and ceiling is also glazed.

Artificial illumination is provided by concentric ring fixtures, notable both fo adequate, well diffused lighting and as a poor harbor for rubber bands. The desk and chairs are single-pedestal units. Height of seat and top is adjustable to suit indi vidual comfort. Restful colors, mild in contrast, are used. Light green is the back ground for the green chalkboard and light gray is used for the other concrete-bloc wall. Asphalt tile is also gray and the acoustical-tile ceiling is white.

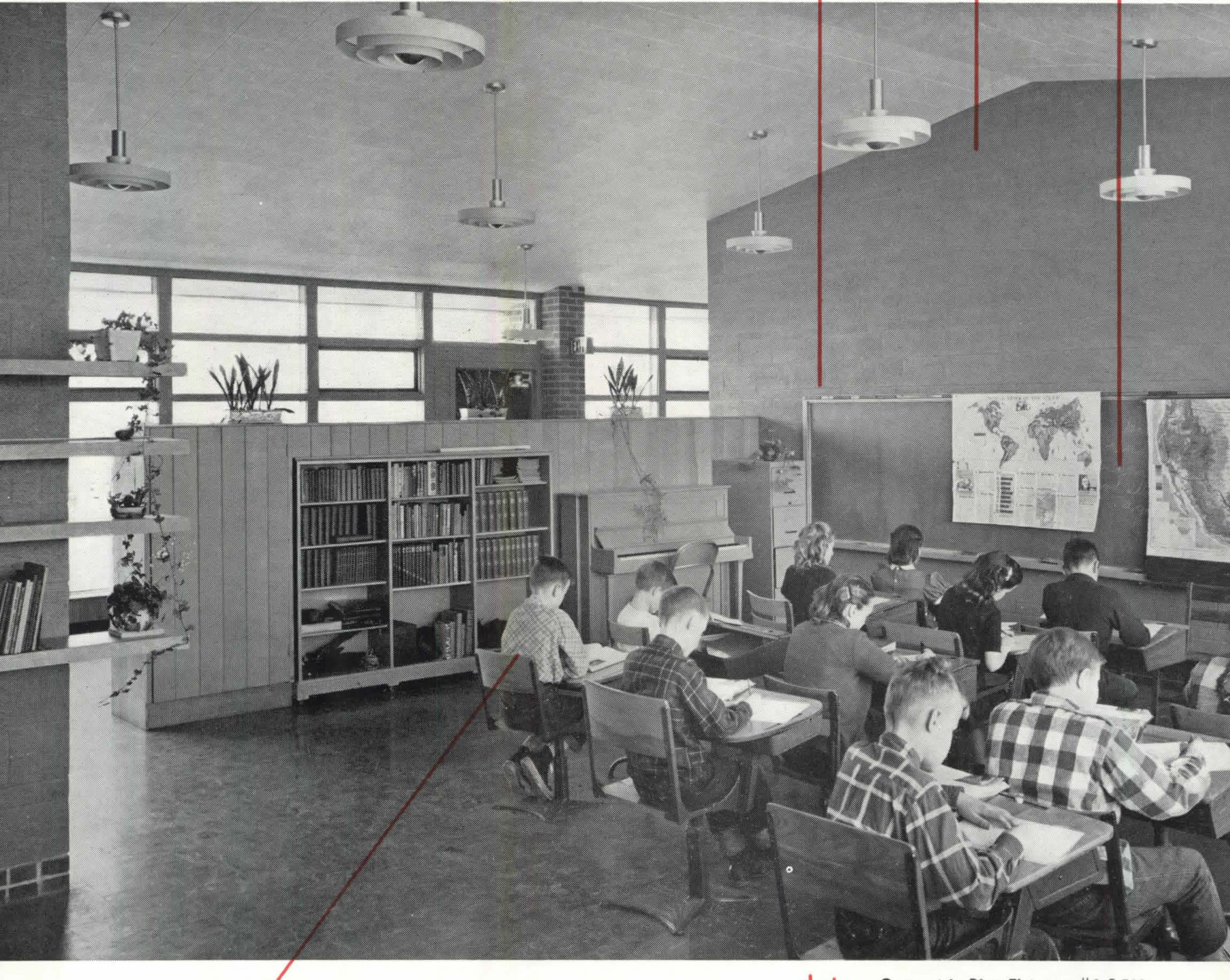
Room Photos: Hedrich-Blessin



concrete block painted light green

map rail

green chalkboard



single-pedestal unit with adjustable top and seat

data

Desk and Chair: #38 Adjustable single-pedestal unit/ closed or open chair back/ top pivots in and away from chair/ height of seat and desk top adjustable/ lifting-lid book box/ built-in pencil tray/ offset movable pedestal with rubber shoe/ natural finish wood/ metal parts in "Arabian sand" baked enamel/ General School Equipment Co. (formerly, Bargen-Built Industries Inc.) 44 South 12 St., Minneapolis 3, Minn.

Cabinetwork: architect designed/ fabricated on site.

Chalkboards: "Endurarok"/ green/ E. W. A. Rowles, Arlington Heights, Ill.

Map and Display Rail: satin-finish aluminum/ movable hooks/ "see-green" or tan cork insert/ stock lengths: 9, 10, 12 ft/ E. W. A. Rowles.

Concentric-Ring Fixture: #3-S 523 "Draco"/ 24" stem/ 300-500 silver-bowl wattage/ satin-aluminum hanger and baked-eggshell-enamel rings/ list $16.00 approx./ Kurt Versen, Englewood, N. J.

Walls: concrete block painted

Ceilings: "Cushion-Tone" acoustical tile/ white perforated fiberboard/ beveled edges/ Armstrong Cork Co., Lancaster, Pa.

Floor Covering: Asphalt tile/ C-760 gray/ Tile-Tex Division, The Flintkote Co., Chicago Heights, Ill.

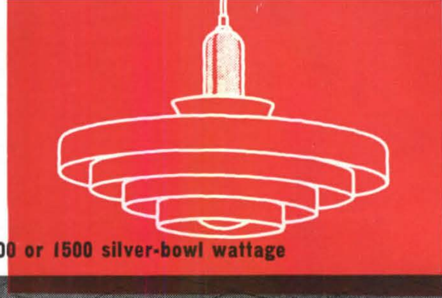
Windows: Detroit Steel Products, 2250 E. Grand Blvd., Detroit 11, Mich.

Heating: Wall-fin pipe heating elements/ Warren-Webster, 17 & Federal Sts., Camden, N. J.

School furniture is usually sold in contract lots. List prices are therefore not usually available.

p/a interior design data

school classrooms



concentric-ring fixture for 750, 1000 or 1500 silver-bowl wattage

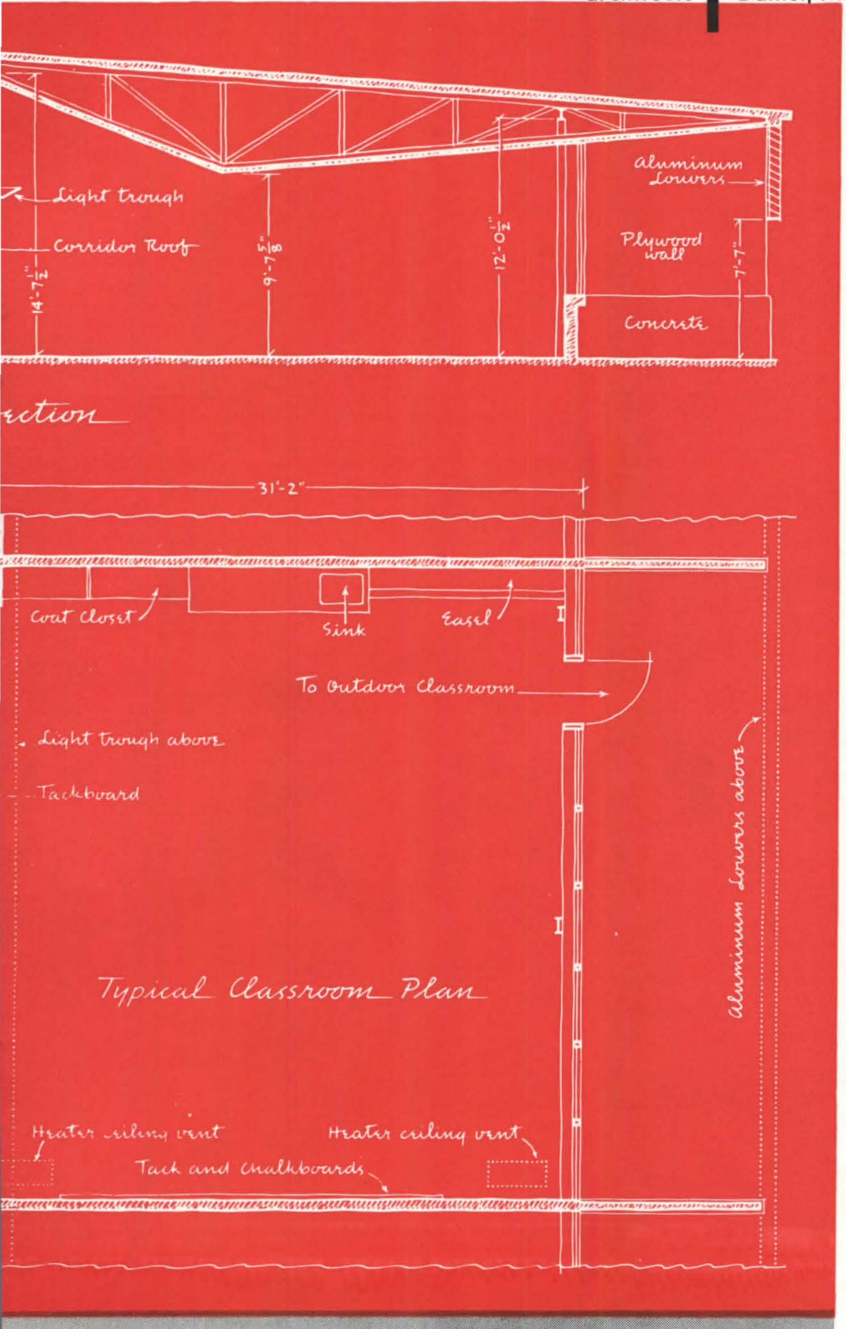
acoustic tile

The inverted roof in this Seaside School classroom makes possible high window which provide sufficient daylight even on dark days. Sky glare, a serious problem i this foggy territory, is controlled by louvers under the overhang. Flexibility was requirement for these classrooms and, therefore, cross walls are non-bearing, to allo for relocation when necessary. The paved area under the overhang is used as an ou door classroom in suitable weather. Colors are gay, but light, and contrast is held to minimum. Walls and columns are yellow; cabinets, yellow-green; ceiling, natural fib color; and floor, gray with red inserts. *Room Photo: Julius Shulma*

gray asphalt tile

wood-and-metal posture chair

type	typical classroom—Seaside School
location	Torrance, California
architects	Daniel, Mann, Johnson & Mendenhall



data

Chair: "Rheem Standard Chair"/ solid hardwood saddle-shaped seat/ form-curved back rails/ rubber-cushioned glides/ natural wood finish/ beige baked-enamel metal/ eight seat heights from 11" to 18"/ Rheem Manufacturing Co., 4361 Firestone Blvd., South Gate, Calif.

Cabinetwork: architect designed

Concentric-Ring Fixture: RK-1000-S "Rocket"/ aluminum hanger/ rings finished in satin white/ 750-1000-1500 silver-bowl wattage/ list $33.30/ Smoot-Holman Co., Inglewood, Calif.

Walls: plaster, painted pastel colors

Paint: washable for walls and ceilings/ semi-gloss on trim and sash/ W. P. Fuller & Co., 135 N. Los Angeles St., Los Angeles 53, Calif.

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

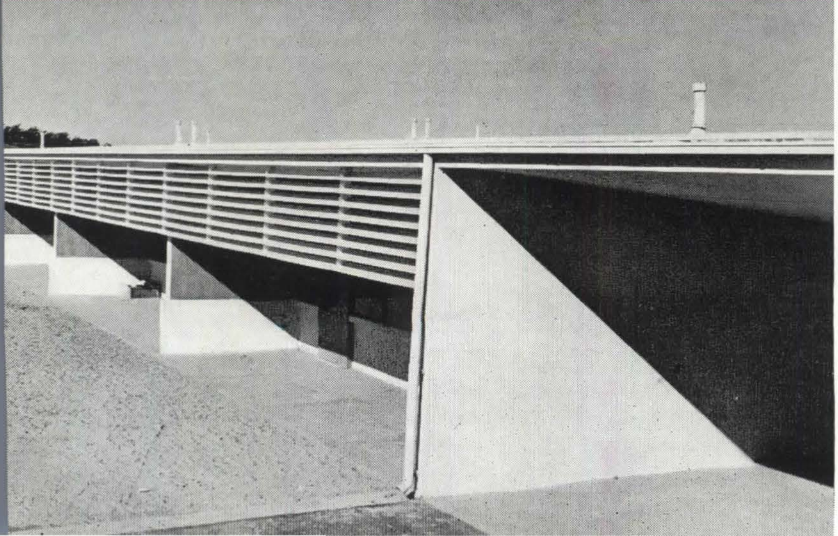
Louvers: Fixed Vanes CX-9/ extruded aluminum/ Lemlar Manufacturing Co., 715 W. Redondo Beach Blvd. (Box 352) Gardena, Calif.

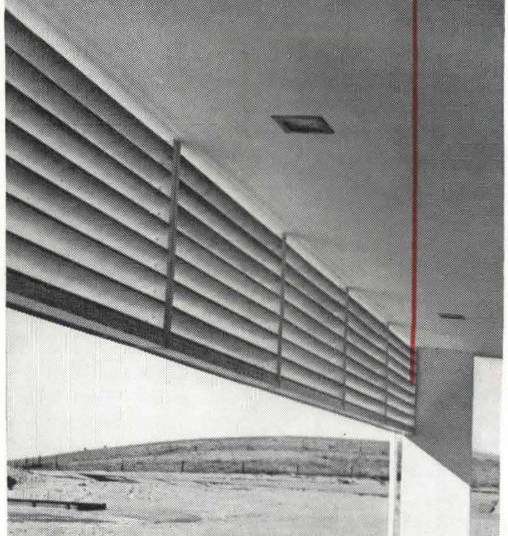
Door Hardware: Sargent & Co., New Haven, Conn.

Heating: radiant floor panels/ 1-BAC-150-14 Janitrol unit/ Natural Gas Equipment Co., Pasadena, Calif.

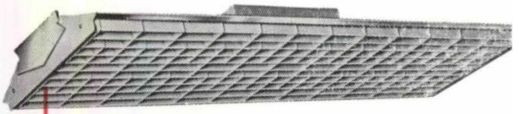
School furniture is usually sold in contract lots. List prices are therefore not usually available.

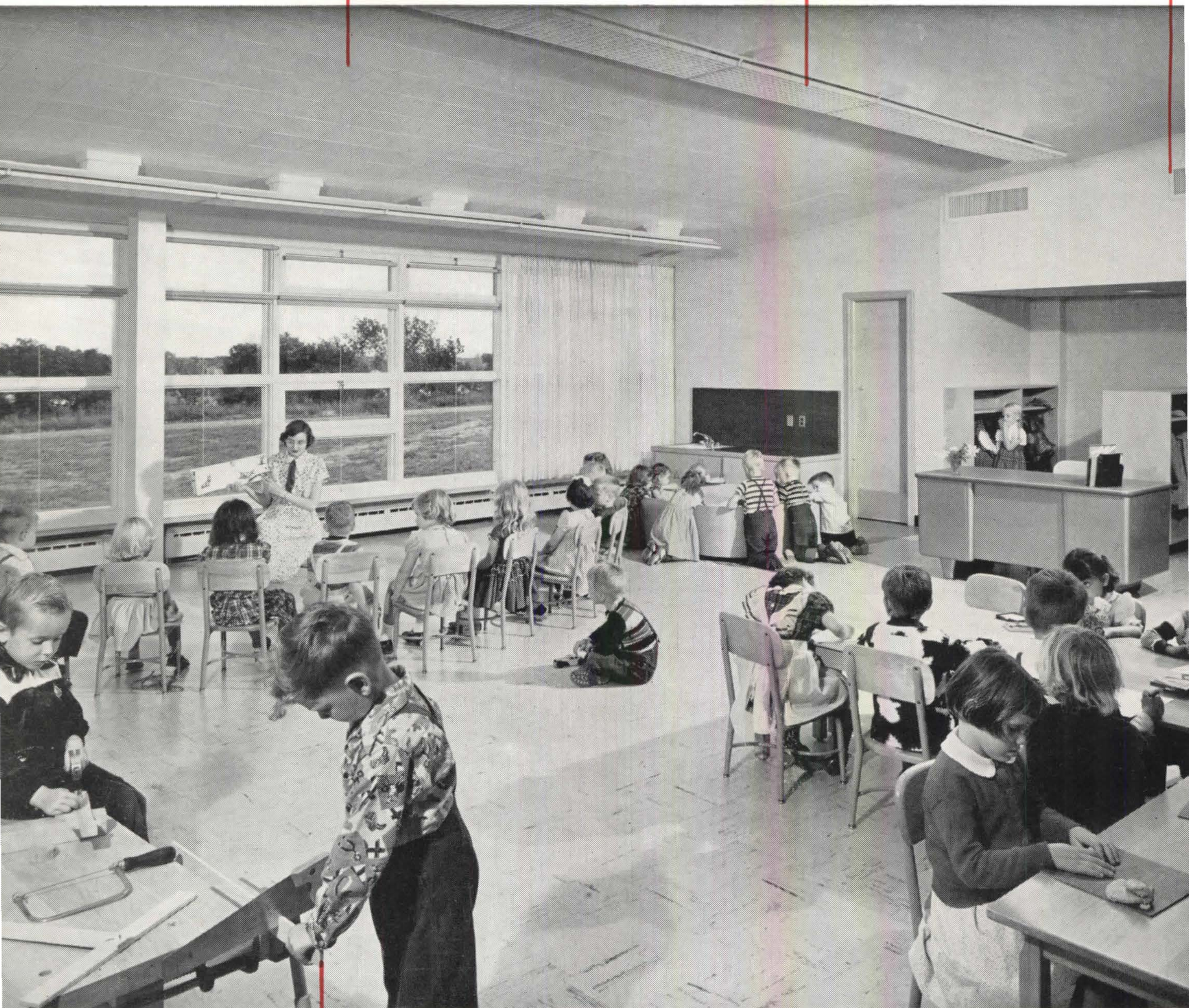
fixed-vane louvers modify sky glare





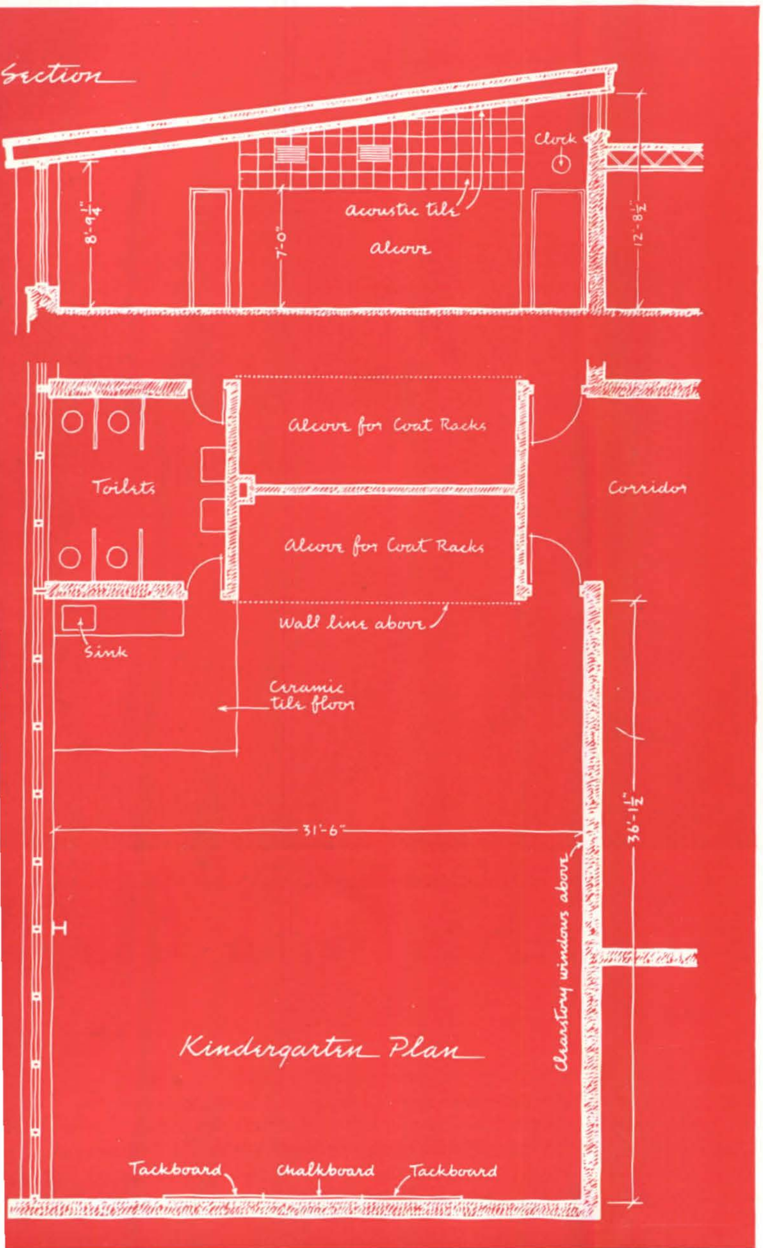
school classrooms





The kindergarten at Waite Park School functions as a self-sufficient unit, with co closets and toilet as part of this special wing. Built-in cabinets are thoughtful designed to provide neat and easy storage for a variety of play equipment. The lig chairs glide easily over the rubber-tile floor, left substantially free for groupings suit various activities. The children can sit and take their rest periods on the floo which is radiantly heated. High clerestory windows *on one side*, and large windov oriented towards the view on the other, provide bilateral lighting as in the secti shown on opposite page, which is typical of most of the classrooms in the school. Th kindergarten in a separate wing is a variation of the typical section. The expos brick is painted "Swedish pink" under the clerestories and other walls are yello The curtain is also yellow; the floor, white with black striations; and the acoustic tile, natural fiber color. *Room Photos: Photography In*

type	kindergarten—Waite Park School
location	Minneapolis, Minnesota
architects	Magney, Tusler & Setter
associated	Perkins & Will



data

Chair: S 915 "all-purpose chair"/ tubular-steel frame with baked-enamel finish in "school brown" or "cocoa"/ rubber cushioned glides/ birch saddle-seat/ birch bentwood back/ available in eight seat heights from 11" to 18"/ Heywood-Wakefield, School Furniture Division, Menominee, Mich.

Table: Board of Education shops.

Cabinets: architect designed/ fabricated by Lake Street Sash & Door Co., Minneapolis and the Minneapolis Board of Education.

Blackboard: W. E. Neal Slate Co., 1121 Dartmouth Ave., S.E., Minneapolis 14, Minn.

Cabinet Hardware: Colonial Bronze Co., Torrington, Conn.

Curtain Hardware: Dalmo, Architect's Bldg., Los Angeles 53, Calif.

Lighting Fixture: D-2 "Smithcraft Dayliter"/ two 40-watt T-12 fluorescent lamps/ patterned eggcrate louver hinged/ white baked-enamel steel/ list: $40.00/ Smithcraft Lighting Division, A. L. Smith Iron Co., Chelsea 50, Mass.

Walls: #344/ series #2800/ Alton Panel Brick/ radiant texture/ painted rose or yellow/ Alton Brick Co., Alton, Ill.

Paint: Pratt & Lambert Inc., 79 Tonawanda Street, Buffalo 7, N. Y.

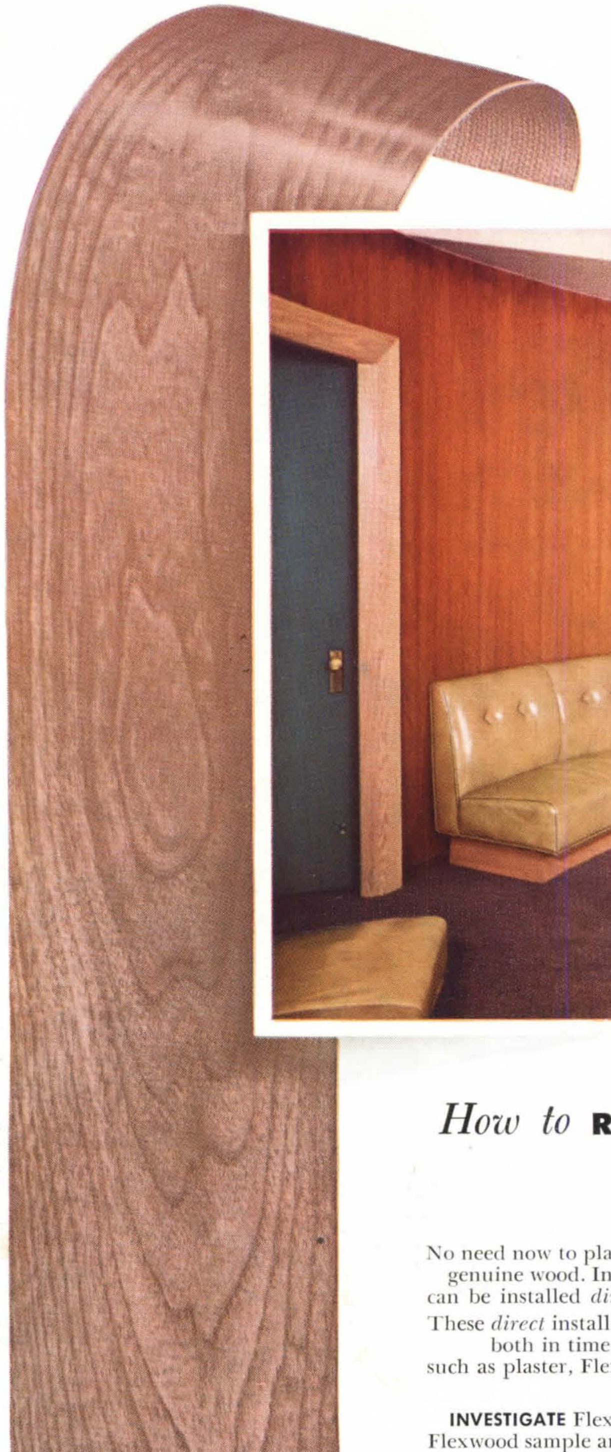
Ceiling: "Acousti-Celotex"/ The Celotex Corp., 120 S. La Salle St., Chicago, Ill.

Floor Covering: Hood rubber tile #511/ white-black/ B. F. Goodrich, Watertown 72, Mass.

Heating: supplied by radiant floor panels and wall convectors.

Convector: "Radi-vector"/ FSF cover/ Vulcan Products, 26 Francis Ave., Hartford, Conn.

brick painted pastel color



Reception Room. Miller and Burstein, Bridgeport, Conn. Architect: Victor Civkin.
Figured Teak Flexwood on walls and compound curve of desk pedestal.*

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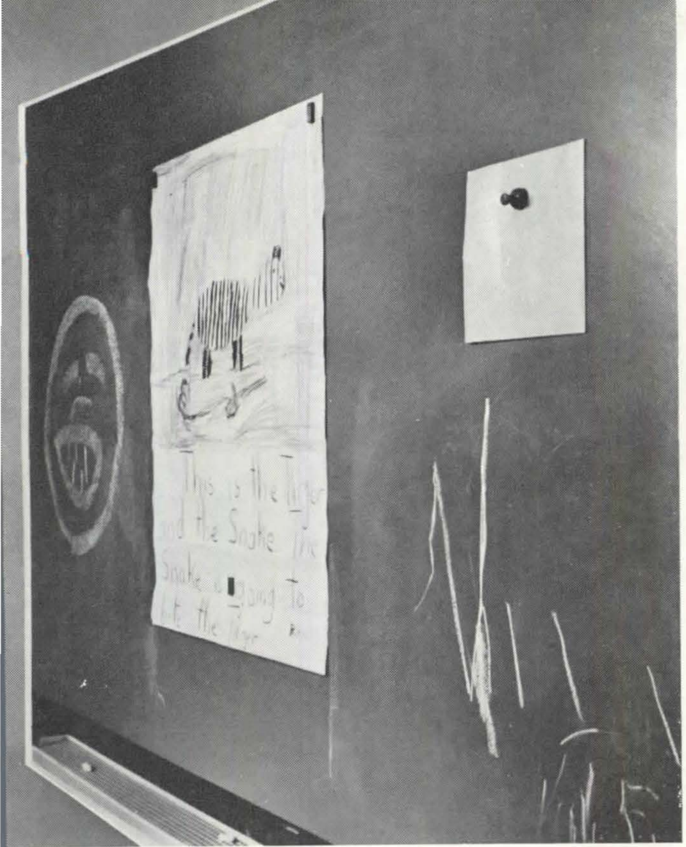

Porcelain-enamel chalkboard: will not scratch, chip, crack, break, buckle, or warp, according to its developers, the Bettinger Corp. and U. S. Plywood/ papers and notices can be attached to surface by magnets/ porcelain-on-steel bonded to exterior-grade plywood with metal backing sheet/ permanent installation or portable unit/ material also available for desk tops/ **width:** 36", 42", and 48"/ **length:** as required/ 8' x 10' most economical size/ **color:** "chlorophyll green"/ other colors to order where quantity permits/ **price for raw paneling:** $1.50 per sq. ft./ **price installed:** approx. $2.30 to $3.00 per sq. ft./ **mfr: the Bettinger Corp., Waltham, Mass./ dist: U. S. Plywood Corp., 55 West 44 St., New York, N. Y.**

The move-about": ** #550/ lift-lid ox with adjusting device for level r inclined top/ adjustable seat nd desk height/ **natural finish ood/ beige baked-enamel metal/ **rlington Seating Co., Arlington leights, Ill.**

chool furniture is usually sold in ontract lots. List prices are therere not usually available.

Tubular desk and chair: STW/ natural finish or "school brown" solid hard wood / beige, taupe, or brown baked-enamel frame/ STWL has solid wood lift-lid with book box under/ STPL has plywood lift-lid book box/ STP has plywood top and shelf/ 9 sizes/ **The Norcor Mfg. Co., Green Bay, Wis.**

Lifting-lid desk: 18" x 24" top/ adjustable height from 19" to 25" or 21" to 29"/ also available in fixed height from 19" to 31"/ other models have fixed tops or split-slant tops/ natural wood finish/ beige baked-enamel metal/ **chair: saddle seat**/ 8 heights from 11" to 18"/ **Rheem Mfg. Co., 4361 Firestone Blvd., South Gate, Calif.**

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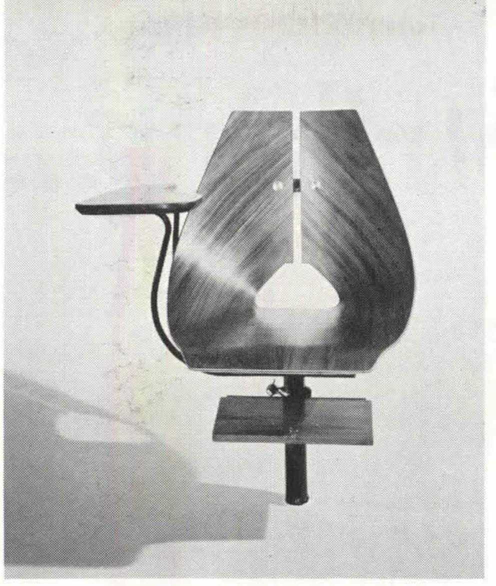

p/a interior design products

Classroom chair: #939 special/ adapted from original desk chair by Ray Komai/ molded walnut plywood/ post in black, brown, or gray baked-enamel/ can have pivoting mechanism/ available with or without tablet-arm and book shelf/ **J G Furniture Co., Inc., 102 Kane St., Brooklyn, N. Y.**

K 111—S 7: bentwood with saddle seat/ light or dark maple/ seat heights 10" to 17"/ **Thonet**

School furniture is usually sold in contract lots. List prices are therefore not usually available.

Thonet chair: the classic bentwood model designed 100 years ago is available in kindergarten and grade school sizes. K 18/2—S 4/ light or dark maple/ veneer seat/ **Thonet Industries Inc., 1 Park Ave., New York 16, N. Y.**

Tablet arm chair: right or left hand model/ 17" or 18" seat height/ natural finish wood/ beige baked-enamel metal/ **Rheem Mfg. Co., 4361 Firestone Blvd., South Gate, Calif.**

"The skyliner": #500/ seat heights 13", 15" or 17"/ open book compartment or enclosed side pocket/ natural finish hardwood/ baked-enamel frame in beige, taupe, coral, sage green, or ocean blue/ **The Griggs Equipment Co., Belton, Tex.**

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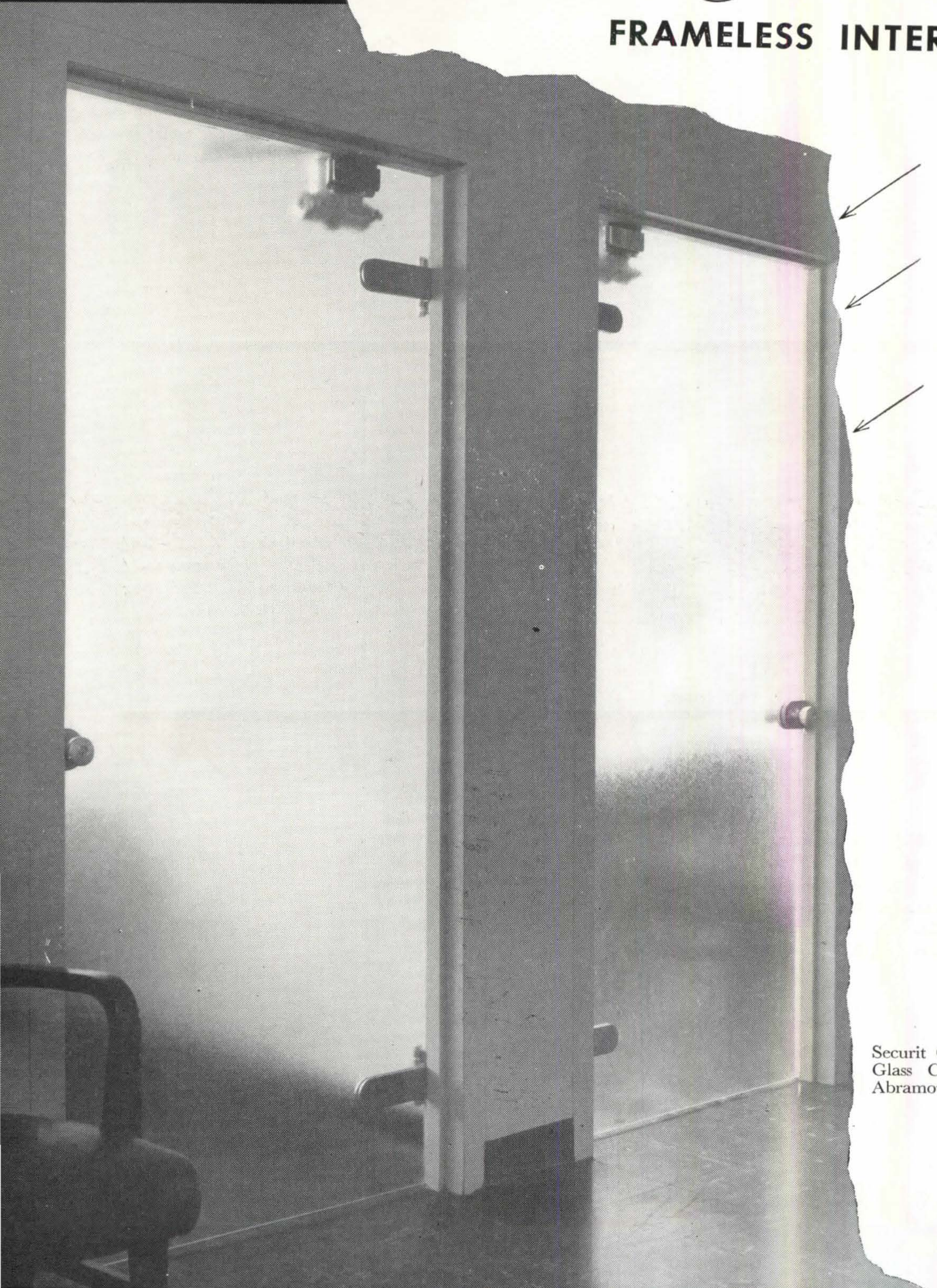

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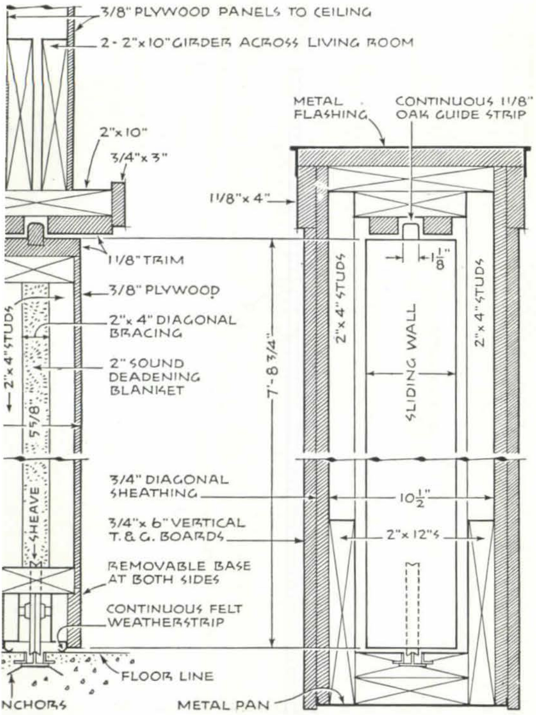
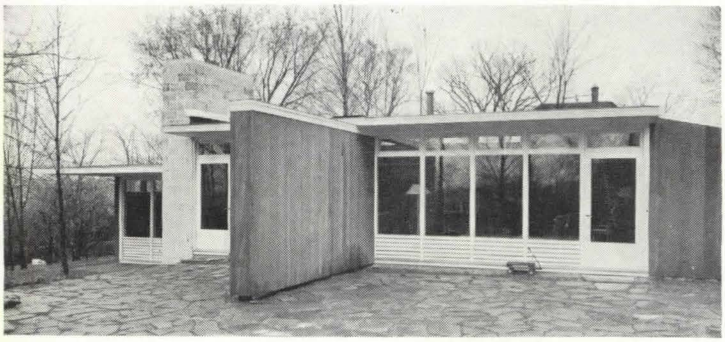
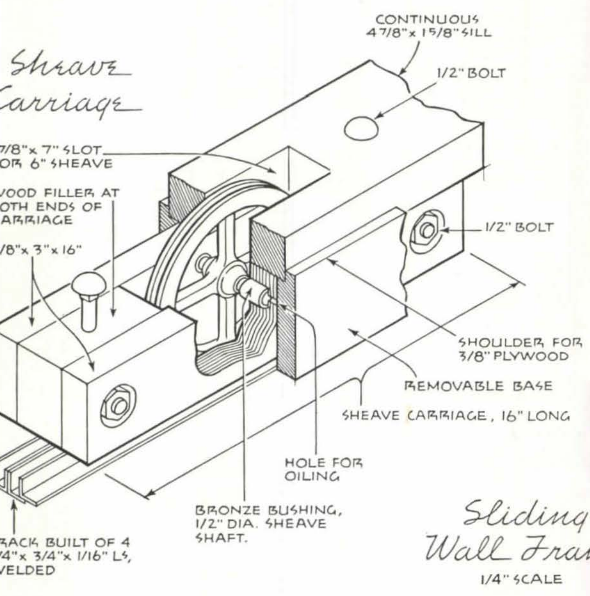


Interior and Exterior Sections
SCALE

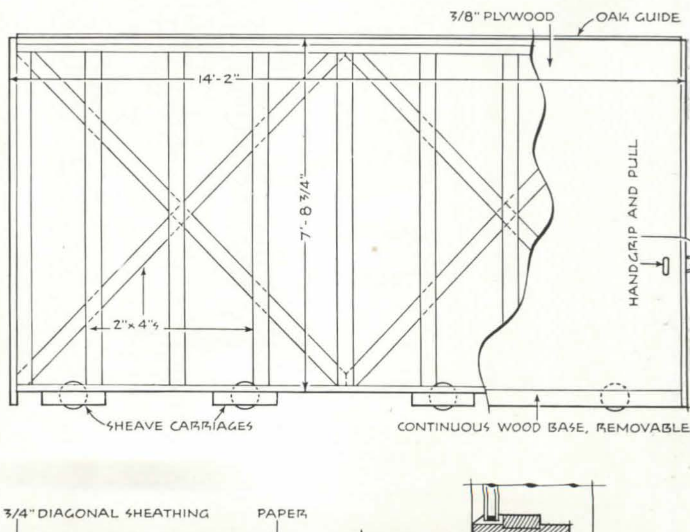


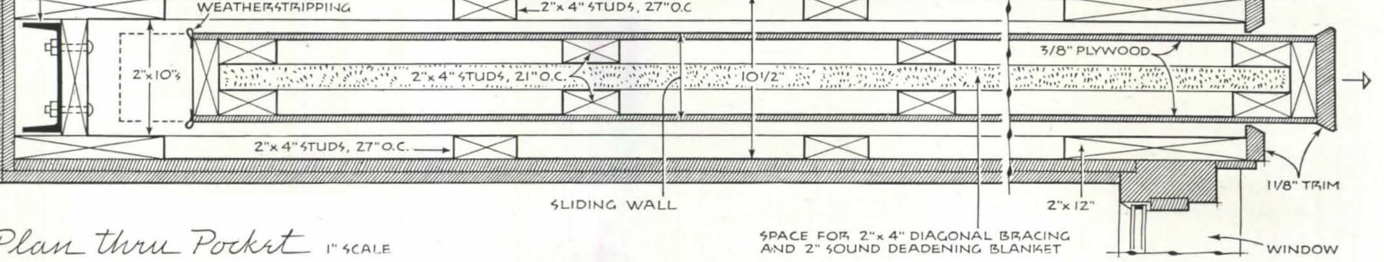
PHOTOS BY RICHARD A. MAURER

Sheave Carriage



Sliding Wall Frame
1/4" SCALE





Plan thru Pocket 1" SCALE

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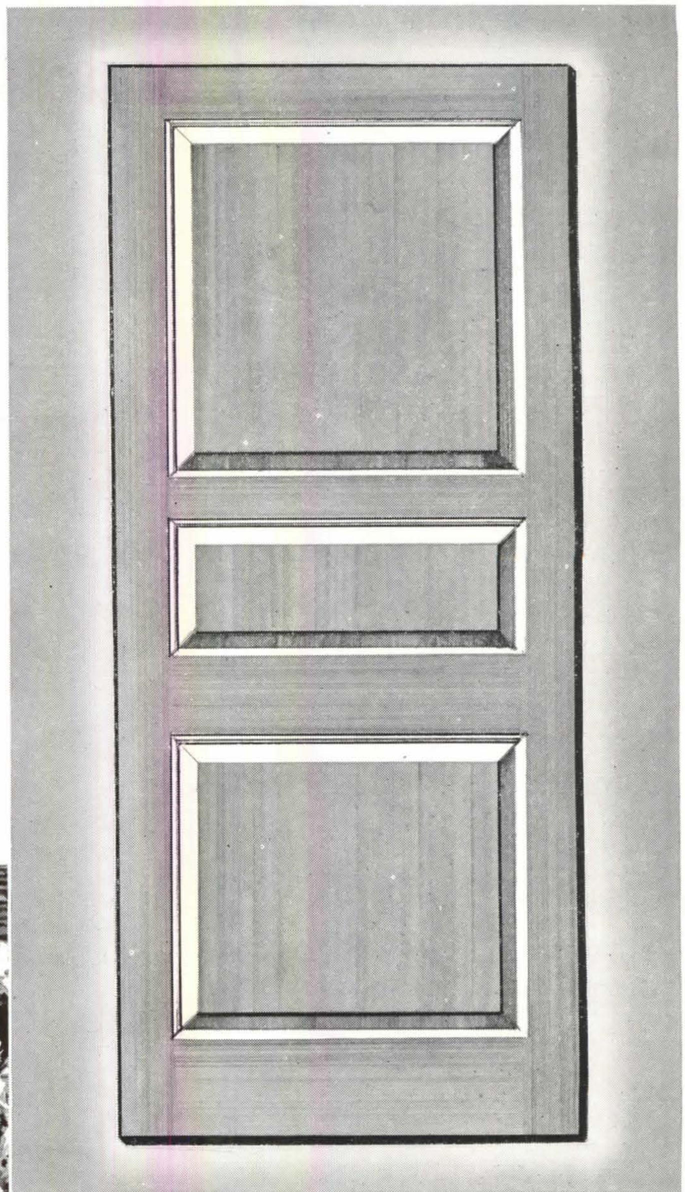
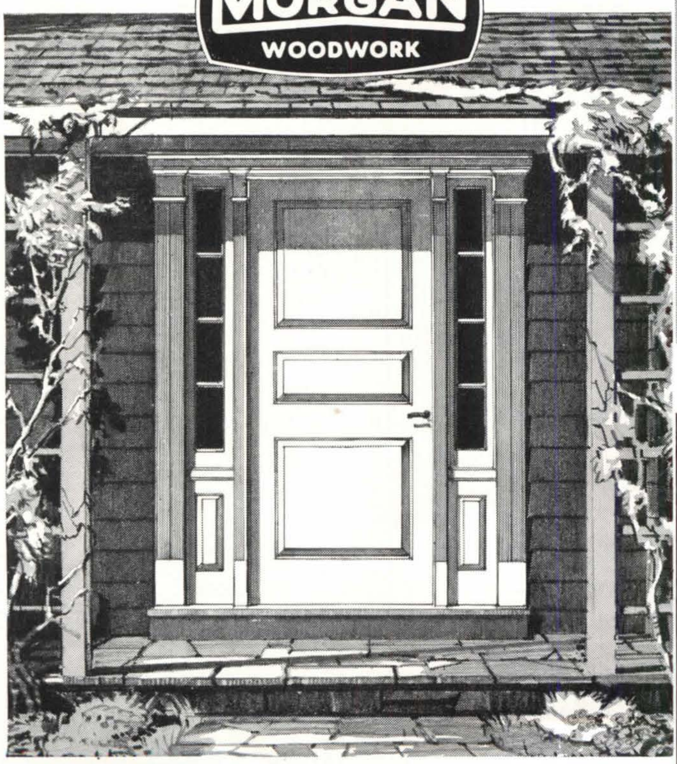
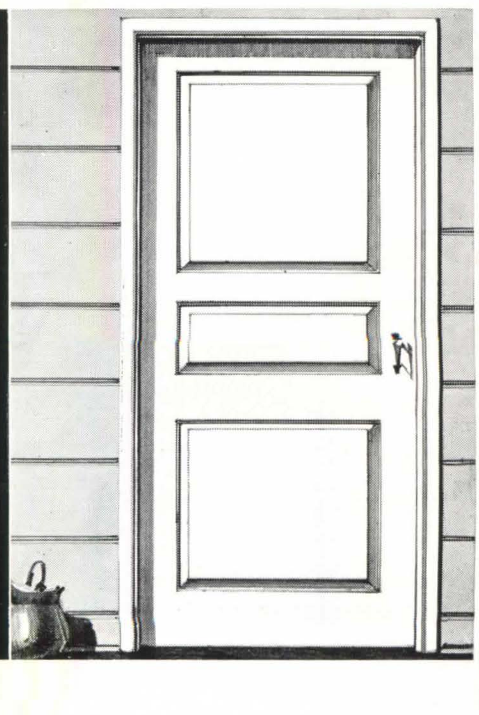


Above: M-117 Tri-Panel Exterior Door; Below: M1073 Tri-Panel Interior Door



Above: Tri-Panel Exterior Door M-117 in Morgan M-14 Entrance



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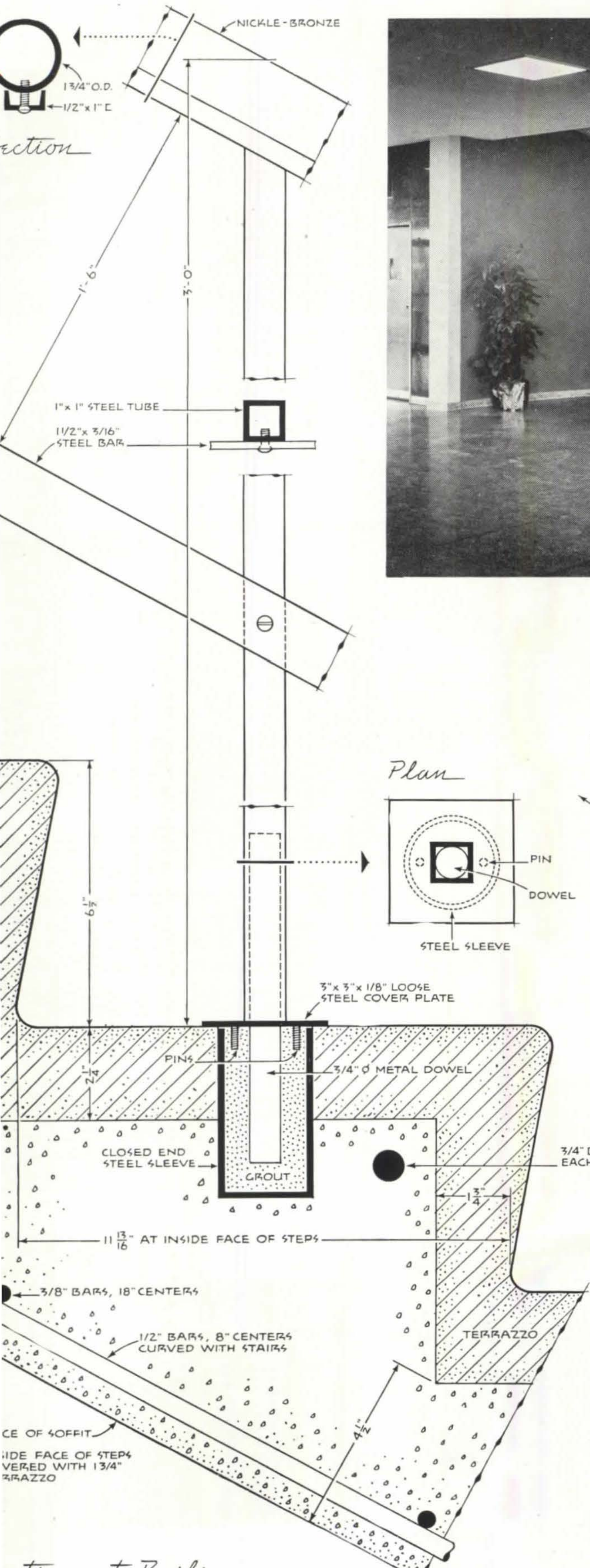
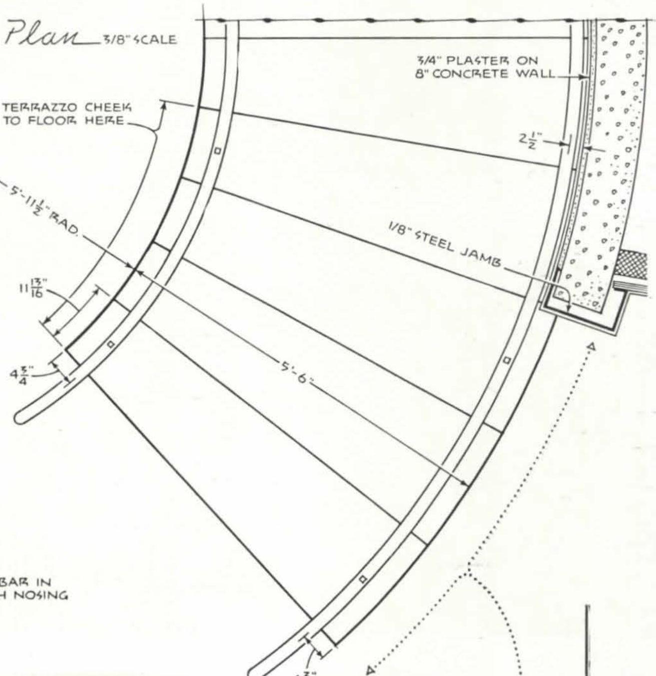
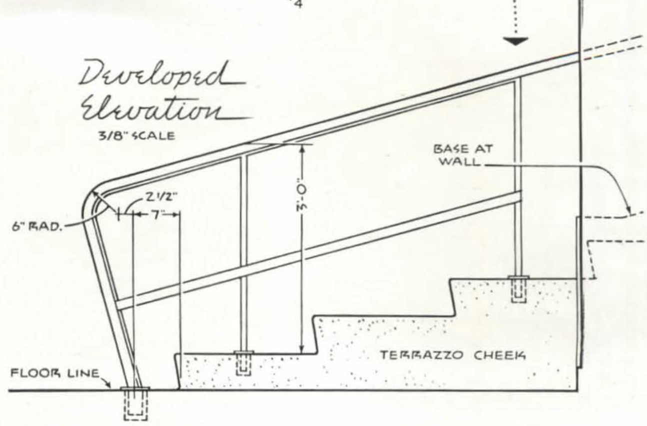


ction at Railing 3" SCALE

GOTTSCHO — SCHLEISNER

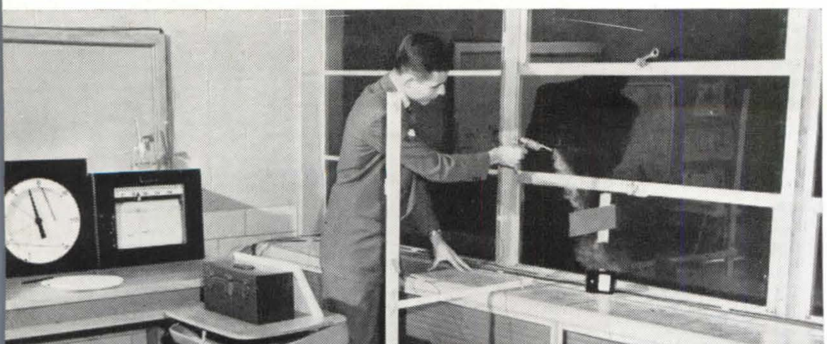




O OFFICE BUILDING, Baton Rouge, La.

rop Douglass, Architect; Carson & Lundin, Associate Architects

It's Ju



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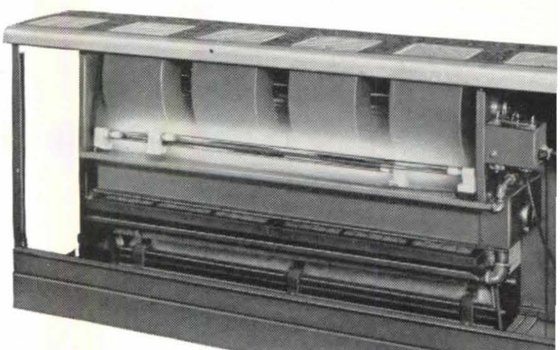

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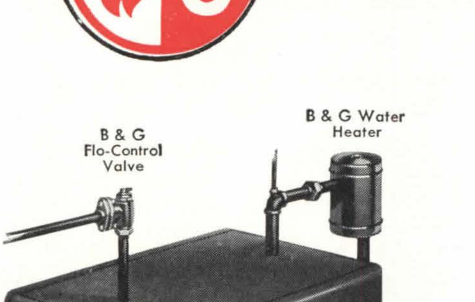

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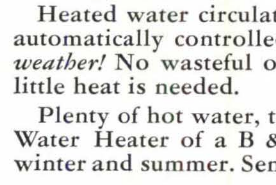
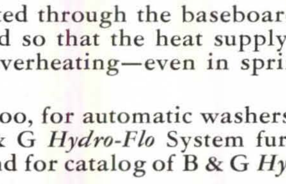
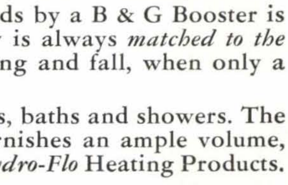


Warm draftless floors



Inconspicuous heating units



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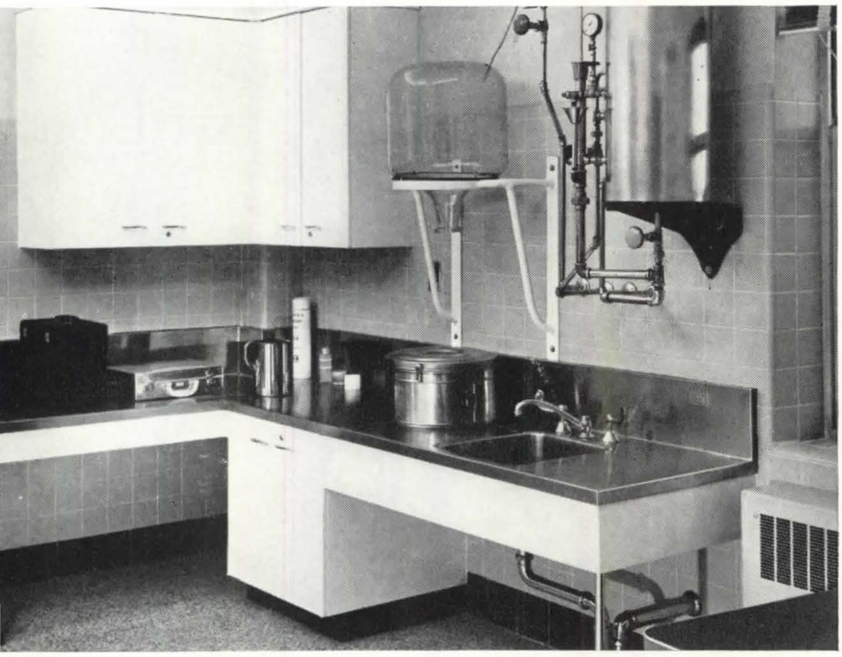

Wherever critical seeing tasks are performed, authorities say a neutral, non-distracting background is advantageous.

Likewise, it is important to reduce glare and produce a better, more diffuse light reflection.

Proper attention to these factors allows the eye to concentrate with less strain on the involved detail of inspection operations, small parts assembling, laboratory or research work, surgical technique or classroom study.

The new Suntile functional color line includes soft tones and finishes that were developed with the *eyes in mind*. With them you can design and build interiors that will give better lighting, improve production, and reduce accidents . . . interiors that integrate the room with the task to be performed.

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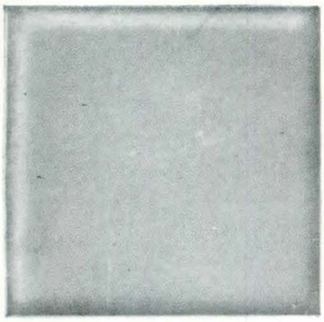
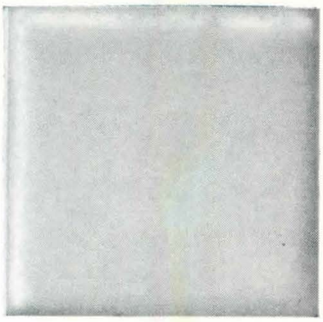


Light Pearl Gray 333



Bright Pearl Gray 733

Suntile LIGHT PEARL GRAY, BRIGHT PEARL GRAY

Versatile colors of wide application

Gray is one of the most acceptable colors in the tile field. These two Suntile grays are new tones developed to meet specific needs of commercial, industrial and institutional interiors. Light Pearl Gray, for instance, has a soft "satiny" tone. It is a neutral shade that will not distract the eye and is helpful where glare should be avoided and eyestrain relieved. Like Suntile Sea Green, Light Sea Green, Marble Tan and Fawn, Light Pearl Gray is most suitable for operations involving critical and severe use of the eyes.

Bright Pearl Gray has a hard, lustrous finish that is virtually scratchproof. It is best applied where critical seeing tasks need not be performed as in larger, more open wall areas. These two new Suntile colors are part of the Suntile line of functional colors developed by Faber Birren, noted color authority, and The Cambridge Tile Mfg. Co.

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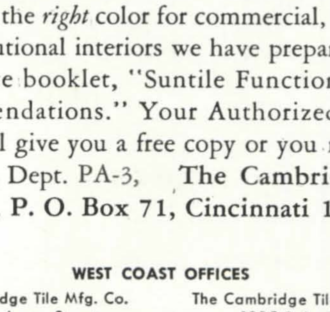

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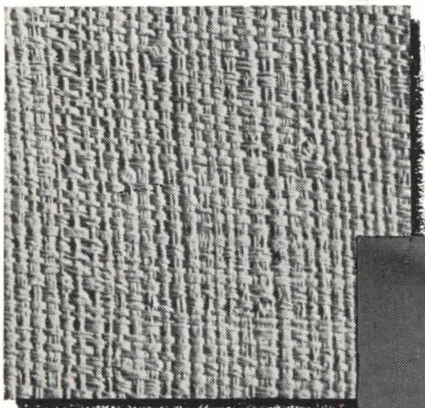
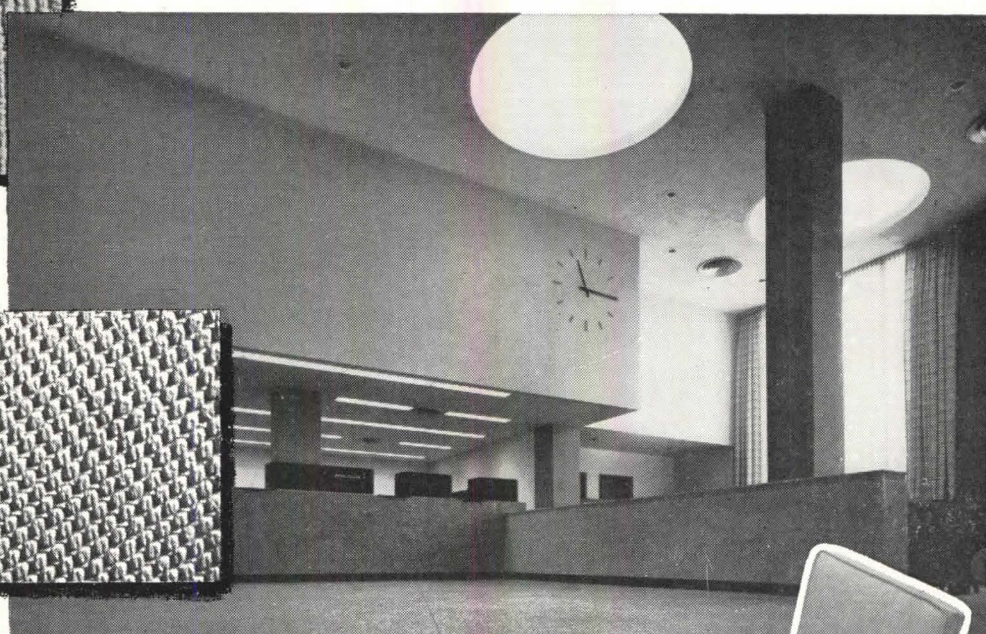
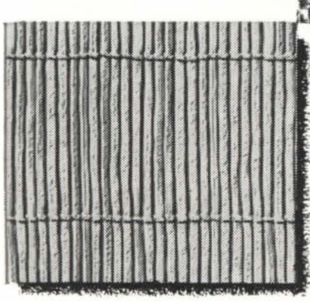


vicrtex
MADAGASKA
looks like expensive Madagascar straw



vicrtex
TWEED-TONE
looks like nubby woven fabric

vicrtex
BAMBU
looks like luxurious woven bamboo



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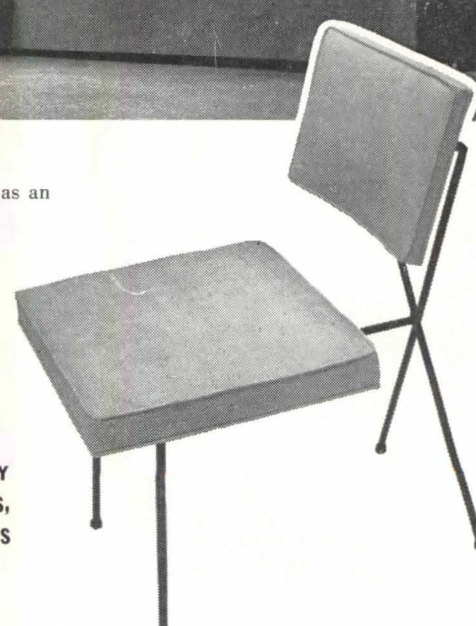

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appeal of modern design

American House Today. ***Katherine Morrow ɟ and Thomas H. Creighton. Reinhold Pub-ing Corp., 330 W. 42 St., New York, N. Y., ;1. 239 pp., illus. $7.95***

ple who want to dislike modern architec-ɛ ought not to read *The American House* lay, by Katherine Ford and Tom Creighton; , if they do, they are certain to change ir views. No one has ever described with re clarity and conviction the true character ɟ intention of the present movement in hitecture, so far as this relates to the ividual house, and the text is illustrated h such cogency that it is hard to believe it any person could resist the appeal of the v architecture in this, its most human phase.

The book illustrates and describes 85 houses, ich are arranged in six chapter divisions the program, the site, space organization, vironmental influence, construction and ma-ials, and appearance—with several pages text introducing each chapter. Additional xt appears as introduction to subheads, thin the chapters.

The book is singularly free from dogmatic erances and propaganda. The different prob-ns which surround the architect of a house ɛ set forth, one after the other, and from ch the architect's method of approach and ution is made clear, together with difficulties ich he confronts. And, what is sometimes usual in books on houses, the difficulties of ɛ client are given a sympathetic considera-n.

Among the many books on the modern use, *The American House Today* is out-nding and should have a wide and ap-eciative audience. JOSEPH HUDNUT

general review

e Modern Factory. ***Edward D. Mills, F.R. .A. The Architectural Press, 13, Queen ne's Gate, London, S. W. 1, England. 190 ., illus. 30s***

esent-day problems of factory layout, plan-ng, design, and construction, are discussed re in what the author confesses to be a oad, general manner; in fact, he suggests at any detailed consideration be best studied ough the medium of books especially writ-n by experts in the particular fields. In view this, he has included a bibliography for the

(Continued on page 136)

books received

Data Book For Civil Engineers: Volume 1, Design; Volume II, Specification and Costs. 2nd Ed. Elwyn E. Seelye. John Wiley & Sons, Inc., 440 Fourth Avenue, New York 16, N. Y., 1951. Vol I: 658 pp., $10. Vol. II: 505 pp., $13

The Art Nouveau. H. F. Lenning. Martinus Nijhoff, 9 Lange Voorhout, The Hague (Netherlands) 1951. 142 pp., illus. 21 guilders

Physical Properties Of Some Samples of Asbestos-cement Siding. Cyrus C. Fishburn. United States Department of Commerce, National Bureau of Standards, Building Materials and Structures Report 122. 15 pp. pamphlet

REVIEWS

(Continued from page 135)

convenience of any reader who wishes to pu sue further technical knowledge of the subje into a "department of further explanation E.

influential book

Acquisition for Avery Architectural Librar Columbia University, of a first-edition copy the earliest architectural book written and pu lished in the United States—Asher Benjamin *"The Country Builder's Assistant"* (1797)- has been announced by PROF. JAMES G. VA DERPOOL, Avery Librarian. Commenting th the importance of such early American boo cannot be overemphasized in the study of n tive architecture, Professor Van Derpool adde that Avery Library has in its possession no virtually every rare architectural book pul lished since 1485.

for the layman

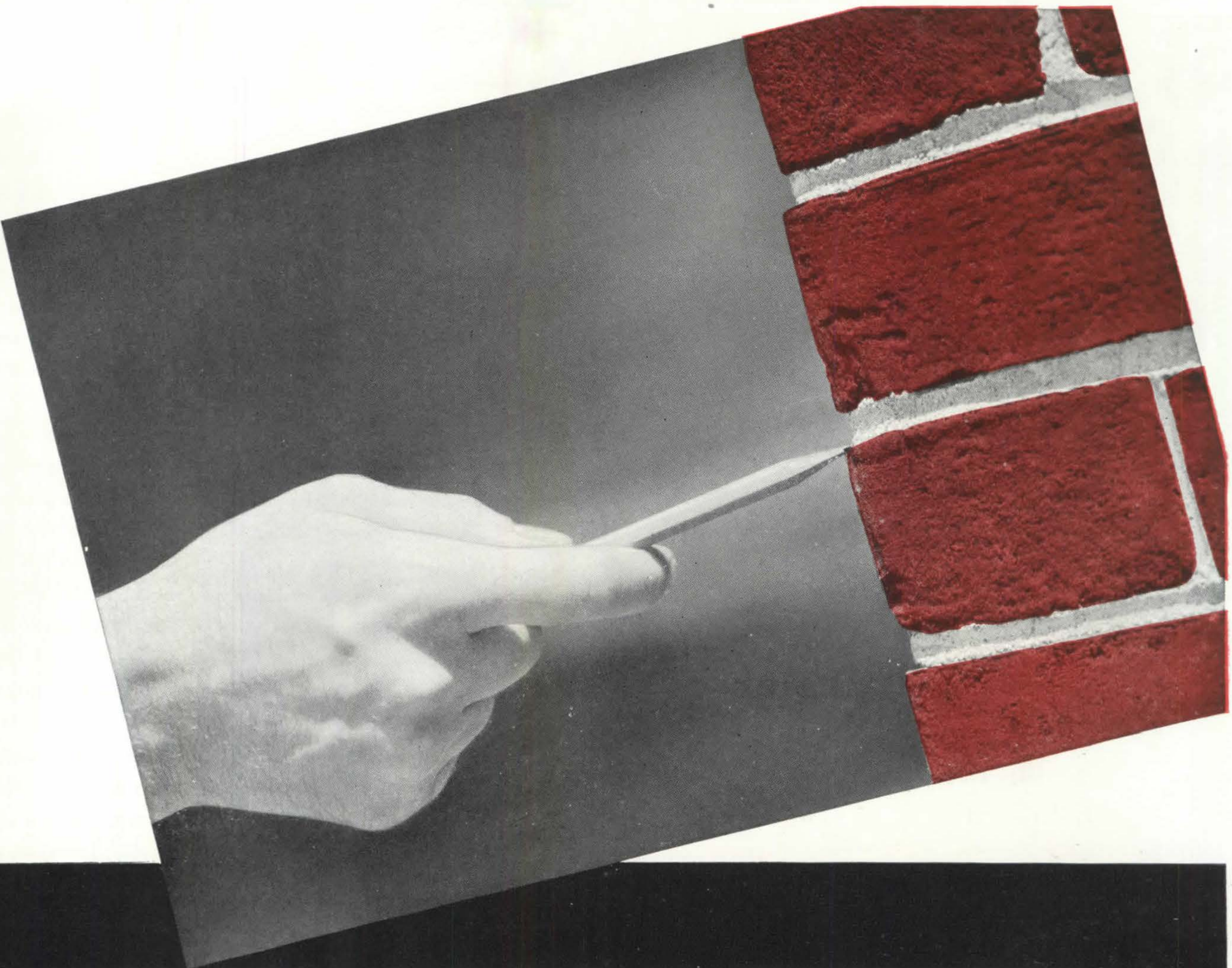
How to Build Walls, Walks, Patio Floors. *Lan Publishing Co., Menlo Park, Calif. 96 pp illus. $1.50*

The latest in the series of how-to-do-it book on outdoor living by the publishers of *Suns Magazine,* tells the layman how to mak walls, patio flooring, and steps out of suc materials as concrete, stone, brick, adobe, til redwood rounds, etc.; how to mix mortar concrete; cut brick, dress stone, saw tile; ho to estimate materials needed for a projec how to build a wall so that it won't toppl over and to lay paving so that it won't di appear in the mud; how to build steps th are comfortable to ascend. To follow thes clear, step-by-step directions calls for only modest understanding of masonry. A few the processes may demand a higher degree craftsmanship or special and expensive equip ment; although these are best entrusted to professional, full information is given abo them to judge the professional's work or devise specifications. Excellent constructio drawings and photographs. E.

gold medal winner

Annual Gold Medal of the Society of Arch tectural Historians has been awarded to A THONY GARVAN for his *Architecture and Tow Planning in Colonial Connecticut* (Yale Unive sity Press, 1951). Cited as "the outstandin contribution to architectural history by American author in 1951," the book is al praised for its general interest as well specific reference value.

(Continued on page 13



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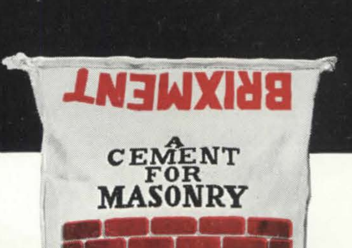

FOR permanent strength and beauty, mortar must be *durable* — must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

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REVIEWS

(Continued from page 136)

the new shopping centers

Shopping Centers. *Geoffrey Baker and Bruno Funaro. Reinhold Publ ing Corp., 330 W. 42 St., New York, N. Y. 228 pp., illus, $12*

This work, in starting with "why, how and where," among other pertin information makes the clear distinction (and one often forgotten in c cussing shopping centers) between the neighborhood center, the co munity center, and finally the new concept of the regional center tha revolutionizing so-called "shopping goods" distribution.

The book is evidently the result of a very considerable amount traveling, interviewing, correspondence, and collecting of important do It reports authentically on the actual types of stores in a given cen their ground coverage and operating problems. It is an important do ment because there has been so much partial reporting on this comp subject. It clearly states the problems of economic marketing analy the basic reasons for the radical shifts of retail distribution, and change in transportation habits, all of which explains some of the inco sistencies of any published works on the relationship of stores, populati and transportation factors. Incidentally, it proves also the usefulness a worth of such institutions as the McKim Fellowship at Columbia Universi

This book has a wealth of good advice scattered throughout, a numb of authentic and useful tables, sources of information, and mention the many small but important details to be watched, for example, g bage collections, the design of show windows, the proper use of sig and a good section on the design of the parking and parking requireme for shopping centers.

Among the many tables are typical Bureau of Labor Statistics expenditures by income groups, percentages of sales for rent for vari kinds of stores, the rental charges by some five large developers, relat costs of parking—self vs. attendant (as varied by land and structu costs)—, freight dock requirements as well as the rather complete of store types with dimensions and ground coverage.

While types of centers are clearly defined and sound principles of ba economic studies, design and even operations are outlined and ma sensible warnings are sounded, the reader is left pretty much to find himself many of the deficiencies, shortcomings, and mistakes that we made, especially in a number of the larger centers illustrated. Conside ing the well-stated principles that are involved, this is not too difficult the reader to do, and to have published in more detail the shortcomin of all the centers would have added considerably to the linage.

The national chains, primarily food and variety, have through the re estate approach evolved methods of locating the retail outlets in neig borhood and community centers. But the new regional center requi a broader, more comprehensive method, which is well explained in t chapter on market analysis.

There is an interesting story of Cameron Village Center in Raleig North Carolina, the lopsided growth of the city and the intelligent u of the acreage of an old family estate for a planned residential ar and a community center. Incidentally, this process of utilizing large, estates and built-up areas has failed in a number of cases throu inability to re-zone. This was true in the case of the Severance esta ınd Heights, Ohio, and of the Whitelaw Reid estate, Purchase, New However, as in the case of Raleigh, it has been successful and in others, as for example, the Park Central Plaza in Phoenix, a (now being planned by Welton Becket).

e are a number of statements made in the text that this reviewer take some slight exception to, none of them too important, but tingly controversial:

example, I do not think that the majority of people move to the s to escape taxes or dwelling costs in general as, in our expand-d current inflationary economy, new housing costs and rents are ing at a greater rate than other costs. I can agree they are going suburbs to get away from the overcrowding, the dirt, and the tion and, I would like to add, the poisoned air and excessive t of masonry and hard surfaces that exists in the central city. This ings up the point "when there is a certain amount of landscaping in a center, it produces the feeling of relaxation." This is true, se, but I think it also reflects and is compatible with this seeking reater amount of green and that blending of the rural and urban ople move to the suburbs to find.

gard to so-called parking ratios, namely structural area and park-ea, there is still much missing information. The attempt to de-a ratio on complicated formulas of average sales, customers, tc. entails too many assumptions. It can be better based on the dge gained in the actual operation of larger regional centers. the average of 1.7 persons per car pertains to certain automobile he person per car in regional centers is well over 2. Also, the e gross sale of center per customer can increase materially be-when a center is well-planned to concentrate the pedestrian traffic ke pedestrian intercommunication between stores very easy, people d buy certainly in an average of over two stores and possibly nan three. In this manner, the average gross sale for the center materially increased which again relates to the parking require-Perhaps not enough emphasis has been placed on the great tial in the turnover of parking space between convenience-goods and shopping-goods centers and the considerable difference in ship of parking space to dollars and cents or unit sales activity are foot of structural area. This reviewer still thinks the best is to relate the number of parking spaces required to the total quare footage of building, including basement and service areas. n have only to establish a standard for the number of square r car including access roads, magazine areas, and some minor ping. This comes out, in my experience, in the very large center ess than 400 square feet per car. This sort of arrangement and essary (to handle December peaks) ratio is not out of line cally on low-cost land which is the only kind of land to use arge regional center, assuming that the tenants are, in the main, s of established stores and use the typical amount of regional .

ing of ratios of two to one might be perfectly all right for the hood center with a high parking turnover. But, in a regional ith high productivity, the ratio of parking area at 400 square car, which is not too much, for the total gross square footage ing is nearly 7 to 1 and probably parking spaces should be in f 1 space per 60 gross square feet of structure. Also, the

(Continued on page 140)

(Continued from page 139)

amount of parking ratio required is certainly, in the regional center, an indication of the productivity. The productivity of the stores depends, of course, first upon the management of the stores and second, on the management of the center. For example, Shopper's World, Framingham, with a plot of a little under 70 acres, with a total gross building area (when opened October 4th) of a little over 350,000 square feet, 6000 parking spaces have proved insufficient a number of times prior to the December peak.

In other words, in this case, it is doubtful if the formula of 60 square gross feet of building per car space will provide enough car spaces to handle the peak and, from the standpoint of ground coverage in mostly two-story buildings, the ratio is only about 5.3 percent of the total plot area. However, the productivity of the structural area in this center is probably higher than at any other one opened to date. It is also a basic fact in the retail distribution field that high productivity means a greater return for the developer, a larger profit for the merchant, and a relatively higher income for the store personnel, all of which has a tendency to basically lower the cost of distributing these kinds of goods.

One other factor is important today and that has to do with property management which, among other things, takes the responsibility for obtaining the complete co-operation of all the tenants. This materially helps so-called accumulative pull. Probably one of the best examples of this is in the Farmers Market in Los Angeles where they have a tenants' organization with an active executive committee. They hold banquets every month or so and publish an house organ for the benefit of the tenants.

This reviewer takes exception to the statement that amateur observation is as good as the proper charting of traffic by highway officials and trained traffic engineers. The Public Road Administration has developed excellent procedures to determine, through origin and destination surveys, and highway usage in general, both current and potential traffic. The important thing is to be able to superimpose the traffic generator that is the center itself on travel already existing on the highways that wil serve the center and traffic which might exist in the future.

Also, it is often better to get an option on property or to make an agreement to purchase subject to possible re-zoning, rather than purchase the land outright. The high and medium income group families, especially in single family zones or so-called dormitory towns never want the best of shopping centers in their areas. They mostly have their food delivered in any event and they all own one or more cars. They even resist, with all the political pressures possible, even a small traffic generator being placed in their area.

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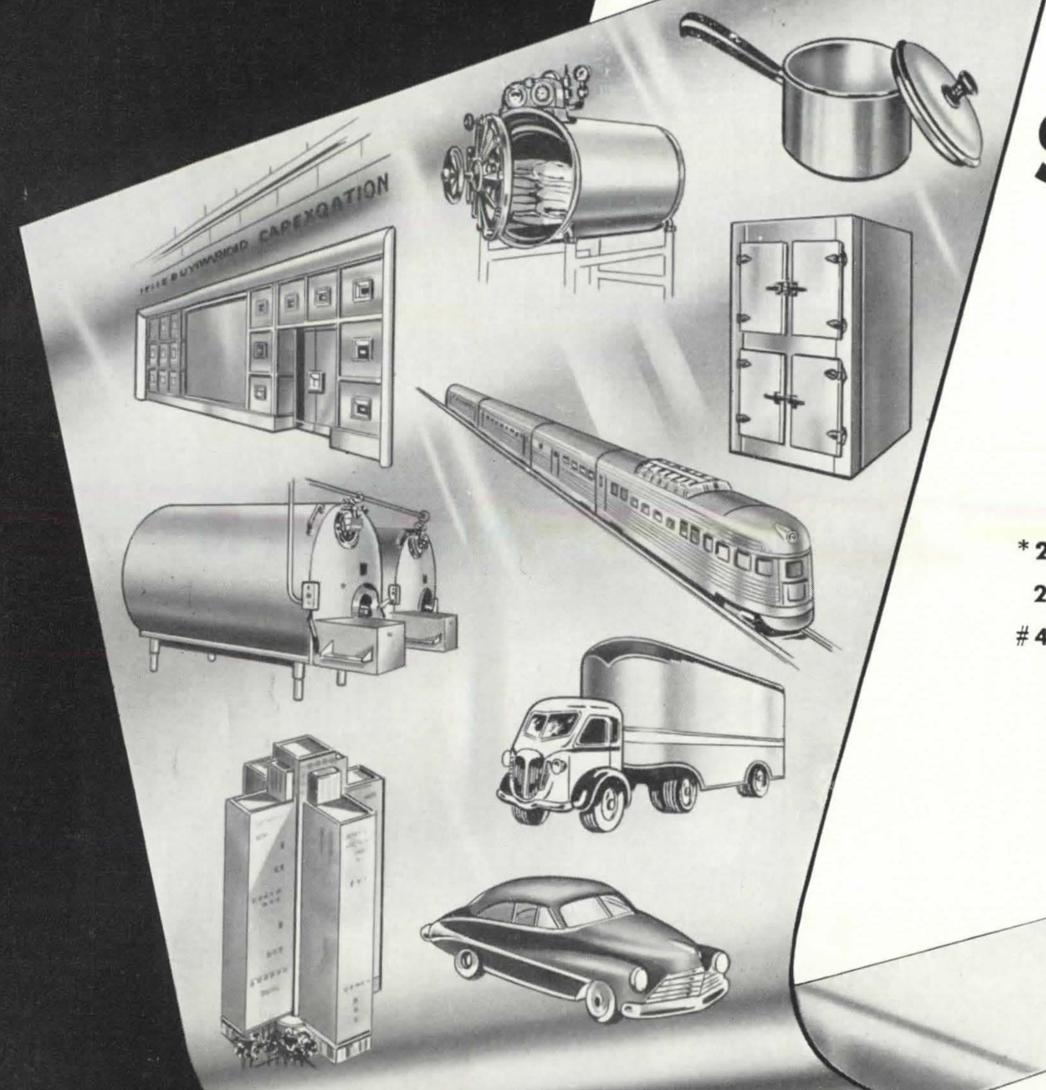

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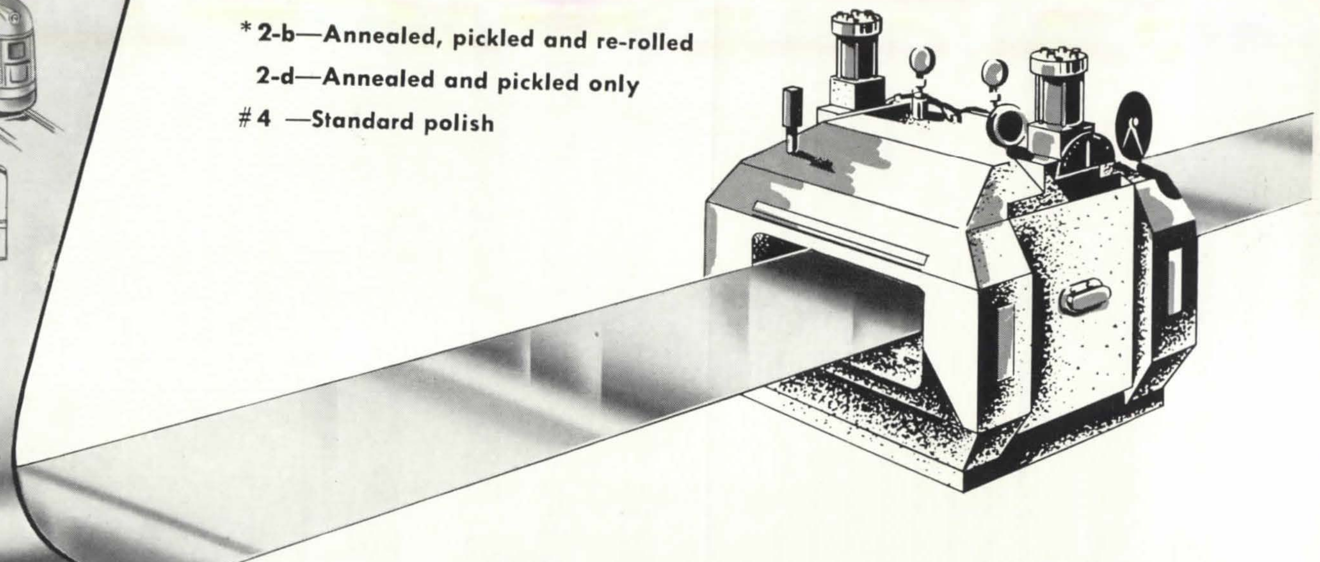

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(Continued from page 140)

This reviewer is convinced that the higher-priced site regional center is not as good as further-out inexpensive acreage. Five to ten minutes more driving time, when there is an ample and balanced presentation of goods and a not-too-inconvenient parking space always available, does not detract one bit from the pulling power of the center. Framingham has proved this without question. Higher-priced land for this purpose might be defined as anything over $4000 to $6000 per acre. It is always higher priced because there is a built-up area in the immediate vicinity, desirable for the neighborhood center but not necessary for the regional center designed for the automobile.

There is one other factor in the neighborhood or community center where there is considerable amount of so-called walk-in trade It is possible to have important branches o downtown stores largely supported by the im mediate population if it is of high density a in Parkchester or Fresh Meadows, New York and can even be applied to some extent t Stonestown in San Francisco.

In very large parking areas of 4000 or mor cars, it has been found that curbs, especiall interlocking curbs, are a considerable and un necessary expense. Also, most people wh have dealt with these large areas now agre that 90-degree parking is far better than less angle parking which requires one-way lan which, confusing the customers, too often r sult in bottlenecks, inconvenience, and anno ance. If the width of the parking sections a made 65 feet and the parking stall is nine fe wide (not too narrow for self-parking wi modern cars), no one has difficulty turning a parking. Also, the lengths of the parking se tions are vitally important. If they are t long, bottlenecks can develop. That is o reason parking sections running at right ang to the building or the pedestrian approach the structures are the best solution for lar centers.

The section on the design of show windo has some very useful hints but it might called an over-simplification of a very comp subject. A great many architects in shoppi centers play with so-called spatial environm and arrive at undoubtedly pleasing space lationships. However they too often forget t reflecting high brightness and, especially, open sky so prevalent in one-story centers pretty well nullify the important merchand display in the daytime. This is evidenced careful examination of many of the ph graphic illustrations. Most show windows w out the desirable overhang are actually d lighted as far as the merchandise immedia adjacent to the glass is concerned. Howe as mentioned, overhangs and covered w ways are very desirable in outlying shopp centers to promote shopping in inclem weather and make it generally more enjoy in any kind of weather. However, this d in the outlying areas, present new problem

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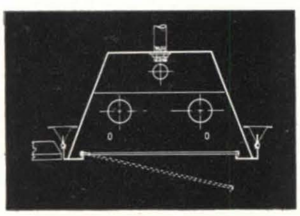

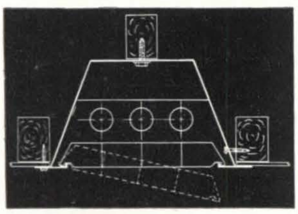

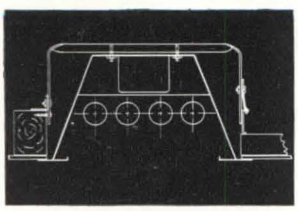

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far as the geometrical disposition of the glass is concerned.

Overhangs with down-lighting have the advantage at night of visually reducing the barrier between the sidewalk and the store interior, whether it be an open front or an enclosed display window. The open front, however, seems to be the best solution for the large regional center when high pedestrian traffic on the walkways has been achieved. It adds materially to the almost carnival air that these centers produce. It is the complete antithesis of the empty sidewalks of the great majority of strip developments.

You see very few supermarkets on the important shopping streets in the downtown areas of large cities, which have always been and will be the very successful regional centers. The very large city downtown stores on the Fifth and Woodward Avenues, the State Streets and even in cities of 500,000 will always cater more conveniently to the transient who so often uses public transportation.

KENNETH C. WELCH

paint diagnosis

Paint Film Defects—Their Causes and Cure. *Manfred Hess. Reinhold Publishing Corp., 330 W. 42 St., New York 18, N. Y. 544 pp. illus. $12*

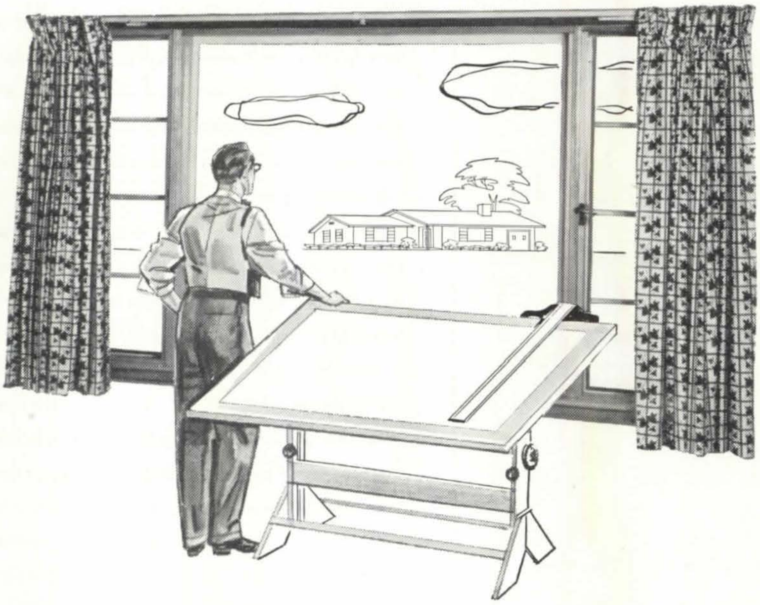
The true value of a reference book cannot be appraised except by respected use. When tested in this manner, the work of Manfred Hess qualifies as a generally dependable source of practical advice to the several groups of people who may be interested in diagnosis of a paint failure. Considerably more than a layman's knowledge of paint technology will be required before a reader can feel confident that his own case of trouble with a paint job can be cured by the prescribed remedy.

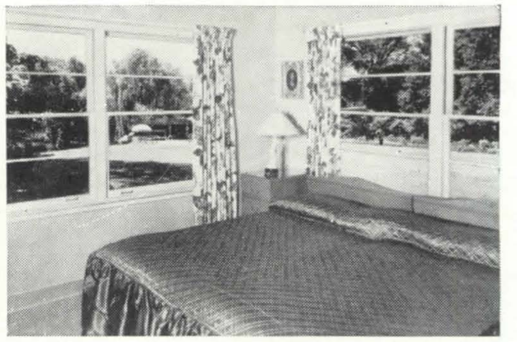
The thoroughness of the German mind is reflected both by the orderly arrangement and by the complete index of the subject matter. In actual practice a beginner in the study of paint technology may be confused by too much cross-reference material. After some experience, the careful reader will be rewarded by thoughtfully sifting all cross references in his search for an answer to a specific problem.

While most of the many illustrations are truly informative, a few paint defects such as "blushing" of lacquers or "lifting" of o

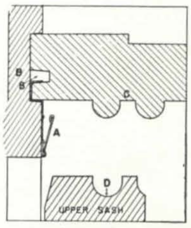
(Continued on page 14

THE WINDOW THAT LOOKS *to the future*

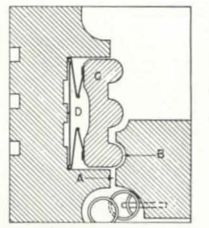




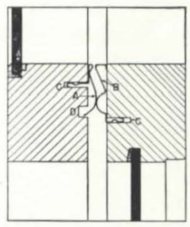
These are the famous Silentite windows—which we believe are the most weather-tight double-hung windows made. A glance at their construction will show you why.



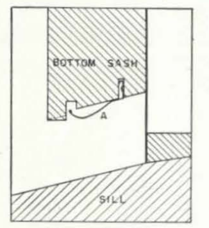
Head weather-strip



Side weather-strip



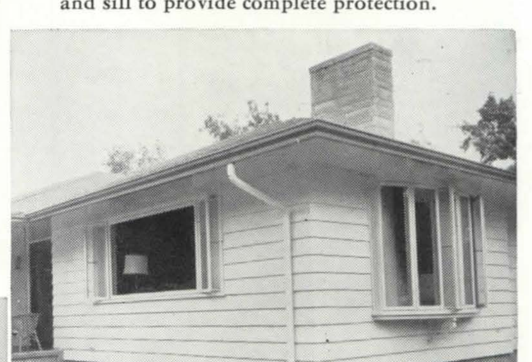
Meeting rail weather-strip



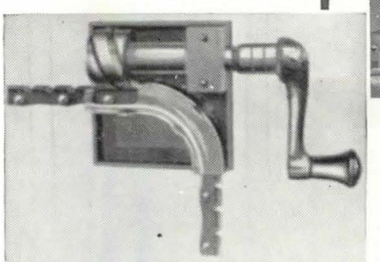
Sill weather-strip

These details show the built-in weather-stripping of the Silentite double-hung wood window. The sliding bars are supported by double "Z" spring leaf-type weather-strip, providing uniform pressure on both sides of the window, yet permitting unusual ease of operation. The Silentite spring suspension eliminates weights and cords. Spring leaf weather-strips are used at head, meeting rail and sill to provide complete protection.

There is one type of window that has never stood still in offering important improvements and advantages to you and your clients. It is Curtis Silentite—the window that is constantly being studied and tested to improve still further its ease of operation, weather-tightness and other features that provide increased value. At the right are some reasons why:



Silentite wood casements can cut total heating cost in the home as much as 16%. Silentite casements are supplied with insulating glass and screens. Operation is exceptionally easy—the adjuster provides 15 times greater opening pressure than the lever type. No inside projecting hardware—no hardware visible outside when sash is closed. Several sash styles are available. These are one-light casements.



Silentite casement adjuster.

Curtis makes a complete line of architectural woodwork and kitchen cabinets for the modern home. Make your next house "all Curtis."

1866 CURTIS WOODWORK
SILENTITE PRE-FIT the "Insulated" window

Curtis Companies Service Bureau
PA-3 Curtis Building, Clinton, Iowa

Gentlemen:

I want to know more about Curtis Silentite Windows. Please send me your free window booklet. I am ( ) architect, ( ) contractor ( ) prospective home builder, ( ) student. (Please check above)

Name..

Address..

City.................................... *State*..............

(Continued from page 144)

paint coatings are not photogenic subjects. Some use of color photography would be welcome in a later edition of the book.

The author's limited uses of simple sketches are well handled.

The encyclopedic nature of this book commends it for reference by the home owner, the architect and builder, and by the industrial user of paint. This reviewer believes the author has proper respect for the complex nature of paint selection and paint service. He hopes the author would agree that this book should not be closed to any earnest student, but that the book's teachings should encourage a layman to seek the advice of an experienced paint laboratory. PAUL R. CROLL

ingenious pioneers

The Rise of the Skyscraper. *Carl W. Condit. University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill. 255 pp., illus., 108 photographs. $5*

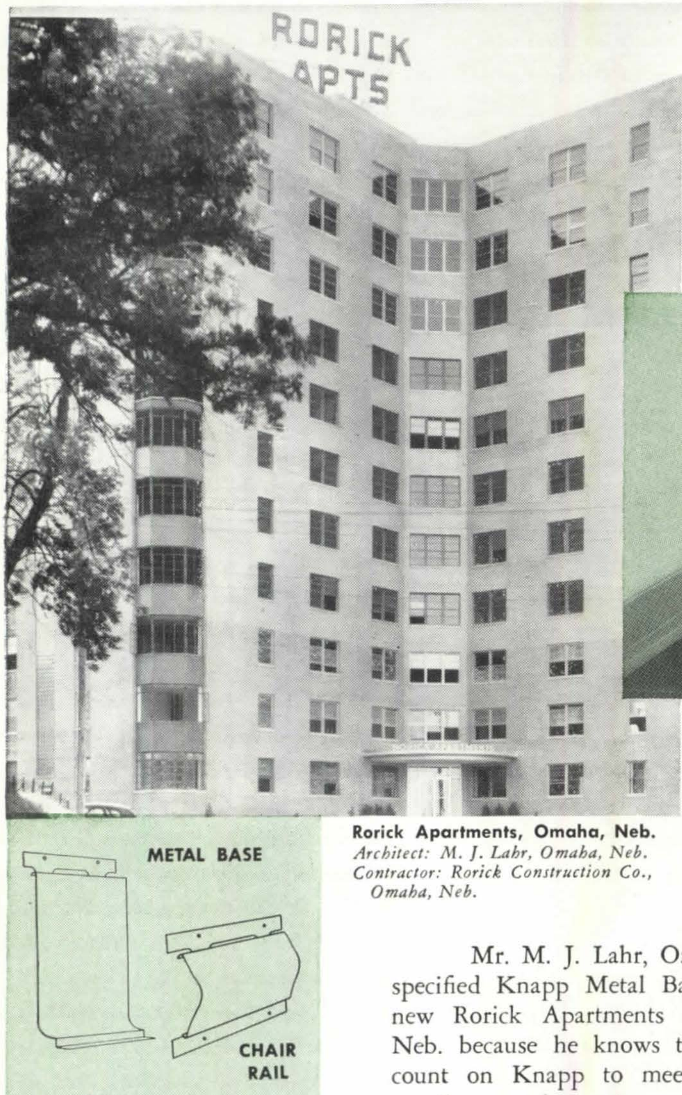
Condit has put together the kind of book which American architects, united by chauvinism if by nothing else, will surely applaud. He has chronicled that phase of our architectural history which, far from being the pleasantly irrelevant dream of antiquarians, *still* reverberates in our frantic streets. His book is a valuable documentation of the ideas, aspirations, and achievements of the gifted architects (all but one of them came from other cities) who created, from 1871 until the turn of the century, the Chicago, or commercial, style of building.

On the night of October 8, 1871, a small blaze in a barn on De Koven street overpowered a fire department already exhausted by the previous day's battle. Before burning itself out in Lincoln Park, Chicago's Great Fire destroyed $192,000,000 worth of property and rendered 100,000 people homeless. By 187[illegible] over 10,000 permits for reconstruction had been issued. Rebuilding, added to the fantastic commercial growth of the city, provided architects with opportunities as extensive as the problems involved were formidable.

In the fight for light, space, and air, load bearing masonry walls were a trying handicap; the masonry walls of the 16-story Monadnock building, tallest of its kind, were 7[illegible] thick at the base—a dimension which made openings resemble tunnels more than windows. The great invention, of course, was the multistory metal frame. Theoretically, it reduced the function of the wall to that of a mere curtain against the elements, supporting only itself. Fireproof hollow-tile walls and reliable elevators, *along with steam* heating and hot and cold running water, made these towers both sound and practical. Today, the U. N. Secretariat and Lever House, in New York, and the recent glittering glass and steel towers by Mies van der Rohe in Chicago, demonstrate what powerful forms this rationalization of structure can yield. But because the decisive esthetic, the all-important abstract concept of space with its

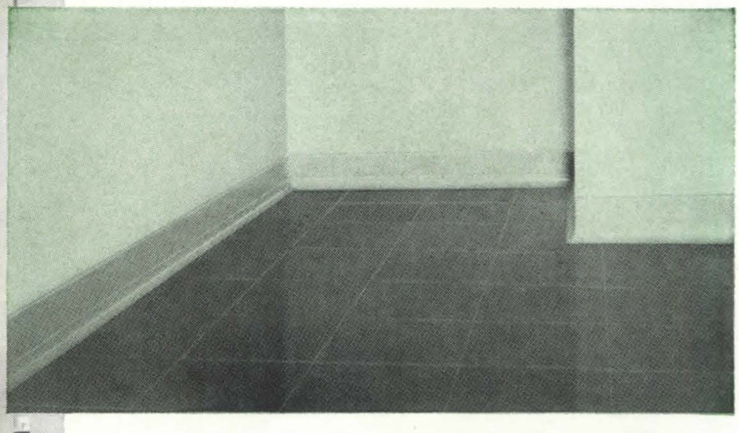
(Continued on page 1

Architects specify KNAPP METAL BASE

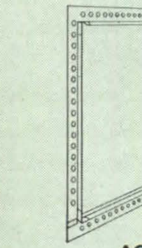


Rorick Apartments, Omaha, Neb.
Architect: M. J. Lahr, Omaha, Neb.
Contractor: Rorick Construction Co., Omaha, Neb.

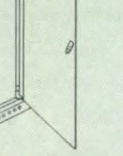
for: permanence
fire resistance
neat appearance
low-cost upkeep



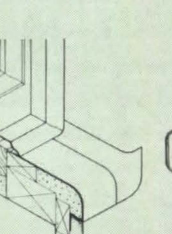
Knapp No. 219 Metal Base was used throughout this installation. Its permanence, chip and crack resistance make this type of base an essential item for modern apartment construction.



METAL BASE



CHAIR RAIL



ACCESS PANEL

Mr. M. J. Lahr, Omaha, Neb. specified Knapp Metal Base for the new Rorick Apartments in Omaha, Neb. because he knows that he can count on Knapp to meet his most exacting requirements.

Knapp's standard of quality is always the highest . . . for more than fifty years, they have taken pride in their ability to produce precision metal trim products that meet the most exacting specifications. Knapp Metal Base is the recognized standard for schools, hospitals, public and institutional buildings. No matter how large or how small, each job is handled with the utmost care and efficiency.

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KNAPP BROTHERS MANUFACTURING CO., CINCINNATI 16, OHIO

(Continued from page 146)

propriate vccabulary of plastic forms, has come back to us from Europe, Americans often lose sight of the long native history such buildings have.

"The style is a monument to the advance of Chicago in commerce and commercial greatness," the authors of *Industrial Chicago* wrote as the price of the world's bread came under local control, "and to the prevailing penchant for casting out art where it interferes with the useful." But a businesslike statement of technique is not enough, and art, in fact, though cast out came back. There were others besides the great team of Adler and Sullivan and Frank Lloyd Wright who sought to create plastic form through a controlling esthetic idea.

And yet, the less Chicago's architects did t their metal cages, the better they were. Hola bird & Roche's McClurg Building and Burnhan & Root's Reliance Building are two such un adorned statements, valuable today not merel because they foreshadow 20th Century though but because they achieve, in their own righ the Doric strength and directness of grea building. In both structures, horizontal an vertical divisions of the cage were maintaine on the façade as a relatively neutral gri describing the equilibrium *characteristic* of th technique itself. What is missing, perhaps, the justness of proportion and the harmony detail that transforms a building into archite ture. Excellent as it is, for example, the R liance Building, with its projecting bay wi dows, only hovers on this side of clarity: i mass is blurred rather than enhanced by t projecting bays.

The multistory metal cage is a skeleton wi a unique, rather inorganic, advantage: unli other skeletons it can be made to grow by t repetition of identical parts. Within certa limits, nothing hinders an upward extension the skeleton frame (as was done to Sullivar building in the Gage group) and it is ev easier to stretch a building out along the stre like the extension of the Carson Pirie Sc store. But the formal problems of this additi architecture, in which mass is cumulative a rhythm tends to be inflexible, were only pa tially defined and seldom solved by Chicag architects and engineers.

Condit has assembled, obviously with d votion, much obscure and fascinating materi including photographs of buildings that are longer standing. But his critical insights a not always satisfactory, and even the m appalling defects of Chicago's buildings do n dampen his otherwise admirable enthusias It is too *kind to* an architect to suggest th his building be studied at nightfall, wh merciful shadows conceal its gross stone folia The author cites so many arbitrary divisions a façade into base, shaft, and capital, and much insensitive detail, that it seems excess to discover in Chicago's buildings a compl architectural maturity.

(Continued on page

A Statement by Anaconda on the Copper Situation

MANY users of copper have vital decisions to make . . . usually in connection with the present defense-induced shortages of copper and aluminum. This statement is an effort to remove the smoke screen surrounding the copper picture . . . to wipe away the confusion caused by too much talk supported by too few facts.

Substitution poses problems – Industry has been urged to substitute aluminum and other materials for copper. In some instances this may be logical and practicable. In many others it is difficult, if not impossible. But – before making *any* long-term decisions that may cost a great deal of money in engineering, new plant facilities or rescheduling of production operations – one should know the facts about the future of copper.

New Anaconda projects – The first major increase in copper production will come from Anaconda when the Greater Butte Project and the new Sulphide Plant at Chuquicamata, Chile, begin operations this spring. By 1953, these two projects should raise present levels of copper production by about 95,000 tons yearly.

Toward the close of 1953, Anaconda's new Yerington project in Nevada is expected to start producing at an annual rate of 30,000 tons. By then, Anaconda will be adding to the present yearly copper supply at the rate of about 125,000 tons.

Other new projects – During 1954-55 still other new projects in the U. S. and friendly foreign countries will further augment the increasing copper supply. All told, it is estimated that by 1955, not less than 450,000 tons of copper could be produced annually – over and above present production levels.

Accordingly, in 1955-56, domestic production plus imports could bring the U. S. copper supply to 1,800,000 tons yearly. This would represent an increase of about 20% over present levels. Based on historical comparisons, and barring a large-scale shooting war, this amount of copper could support a Federal Reserve Board Index of Industrial Production of 270, an increase of 24% over the present, and 45% above the first half of 1950.

• • •

These are the 'things to come' in copper. On the basis of the facts there is no necessity for considering long-range substitution of other materials for the red metal.

52320A

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COPPER MINING COMPANY

The American Brass Company
Anaconda Wire & Cable Company
International Smelting and Refining Company
Andes Copper Mining Company
Chile Copper Company
Greene Cananea Copper Company

PRODUCERS OF: Copper, Zinc, Lead, Silver, Gold, Cadmium, Vanadium, Superphosphate, Manganese Ore, Ferromanganese.

MANUFACTURERS OF: Electrical Wires and Cables, Copper, Brass, Bronze and other Copper Alloys in such forms as Sheet, Plate, Tube, Pipe, Rod, Wire, Forgings, Stampings, Extrusions, Flexible Metal Hose and Tubing.

REVIEWS

(Continued from page 148)

Chicago's great contribution to 20th Centur architecture was made by ingenious men con cerned with techniques and immediate prac tical goals. If they failed to establish a con cept of space which would give direction an formal abstract value to those techniques, the did create a peculiarly American architecture

ARTHUR DREXLE

amateur photographers

Williamsburg Pictures. *Walter H. Miller. Th Dietz Press, Inc., Richmond, Va. 118 pp., illu $3*

The amateur photographer should find th camera tour through Williamsburg, Virgini of considerable interest and help, since it wa compiled expressly to assist him in locatin and capturing the most desirable sites in th photogenic city. Technical annotations accom pany each picture and provide data in th matters of film, season, time of day, filter and exposure. The end-sheets in the boo are guide maps for the city, with each of th sites and buildings marked and numbered a cording to the itinerary in the book. E.

book of graphs

Short Cuts in Concrete and Steel Design. *Fr C. Whitney. Fred C. Whitney, 16502 Wa Ave., Detroit 35, Mich. 1951. 82 pp., $3.50*

This book of graphs will be useful to structu designers who habitually use handbook hel wherever pssible. It is about evenly distribut between graphs devoted to reinforced concre and to structural steel design.

Sets of graphs for reinforced concrete, bas on 2500# and 3000# strengths, include curv for design of floor and stair slabs, compre sion reinforced beams and columns with ben ing, plus stirrup charts and bar area tabl They have been adapted for both the 19 and 1951 A.C.I. codes.

Charts of moment and shear factors continuous beams of two, three, and fo spans and various conditions of loading, a a graph of concentrated load factors for in solving Three Moment equations are p sented. There are five pages of curves moments and shears in single span beams a variety of loading and end fixity conditio The structural steel section includes tables lintels for masonry walls, curves of rive

(Continued on page 1

REVIEWS

(Continued from page 150)

brackets, and a set of curves for the desig of crane columns. There are many addition graphs of less universal interest, some of whi are adaptations of material in other han books.

The book is wire-bound to lie flat. Leg bility is good, but on several plates the le tering is crowded and lines fuzzy. Most d signers will think of more charts which mig have been included to good advantage.

DONALD G. RADWA

designing for industry

Industrial Buildings. *Compiled by Kenne Reid, A.I.A., F. W. Dodge Corp., 119 W. St., New York, N. Y. 542 pp, illus $9*

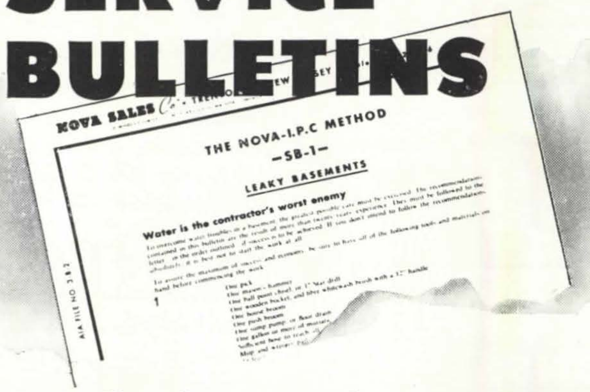
Informative material on industrial buildin that were published in the *Architectural R* cord during the years 1940 to 1949 has be assembled into a handy, compact presentati of photographs, text, and drawings for u in the drafting room. There are also articles foremost architects discussing related techni matters of lighting, heating and ventilati plumbing, plant layout, etc., which are a plicable to all factory buildings Not the le valuable inclusion in the book are the *Recor* Time-Saver Standards Sheets which appea in that magazine during that decade. E.

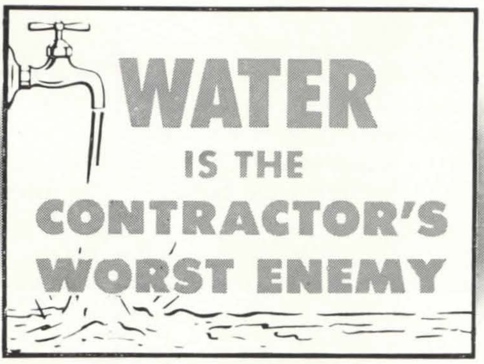
products for hospitals

Hospital Purchasing File, 1952. *Purchas Files, Inc., 919 N. Michigan Ave., Chic 11, Ill. Illus., approx. 800 pp.*

The Hospital Purchasing File—this is the 2 edition—continues to be the standard sou of hospital product information It provide complete classified list of products, equipm services, and the names and addreses of known manufacturers, suppliers, and ser organizations. Roughly about 800 pages catalog data have been contributed by 3 firms. Complimentary copies of the file sent routinely to the architect and other c trolling personnel on every new hospital p ect announced during the one year's life the volume. E another **HOMASOTE FIRST** — *designed to reduce the cost of building*

SERVICE BULLETINS





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- **(SB-16)** Cause and correction of condensation below grade
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NAME..

ADDRESS..

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My lumber dealer is..

out of school

by Carl Feiss

"On your first appearance before the (Supreme) Court, do not waste your time, or ours, telling us so. We are likely to discover for ourselves that you are a novice but will think none the less of you for it." Justice Robert H. Jackson, *Cornell Law Quarterly.*

In these Dark Ages, I've been wondering, can the architect and planner afford to be a man? I'm not sure at the moment what the role of man is in a scowling society. Whatever it may be, it isn't a sinecure. But only in rare instances in history has it been such.

When I talk of the architect's being a ma
I am not so much interested in the wealth
his knowledge, the breadth of his experienc
the catholicity of his tastes, or the evidenc
of his learning as I am interested in two oth
attributes, one a faith in and affection for h
fellow man, and the other the zeal for a ju
cause.

What is wrong with us these days is that w
have no burning torch, no banner bearing
strange device, no white plume to keep unsulli
in the thick of battle, in fact damned litt
interest in anything that should get our dand
up. We cuss our government, our clients, a
in general our competitors, but we do not see
to be fired any more with the mountain-toppi
zeal that is the stuff of which pyramids a
cathedrals and cities and TVA's are made.

A cause means a belief in something whi
to the believer is so real, so vital, so true, a
so compelling that the 24 hours of the day a
too short and the limits of life itself are a pulsi
frustration. Belief in one's self may be a j
cause, once there is proof that one's self
worth making into a cause. That proof can st
not from an internal egotism but from the o
reliable source, that of an irresistible urge
accomplish what must be done.

The choices of what must be done are
immutable choices of each individual wh
outside compulsion and interference may ma
difficult of accomplishment, but they still rem
the deep-down, inviolate rights of every m
In a world of conflicting emotions, tensions, a
a threatening terror which no man can eva
the importance of making the right choice
belief in one's self and a cause becomes t
much more difficult.

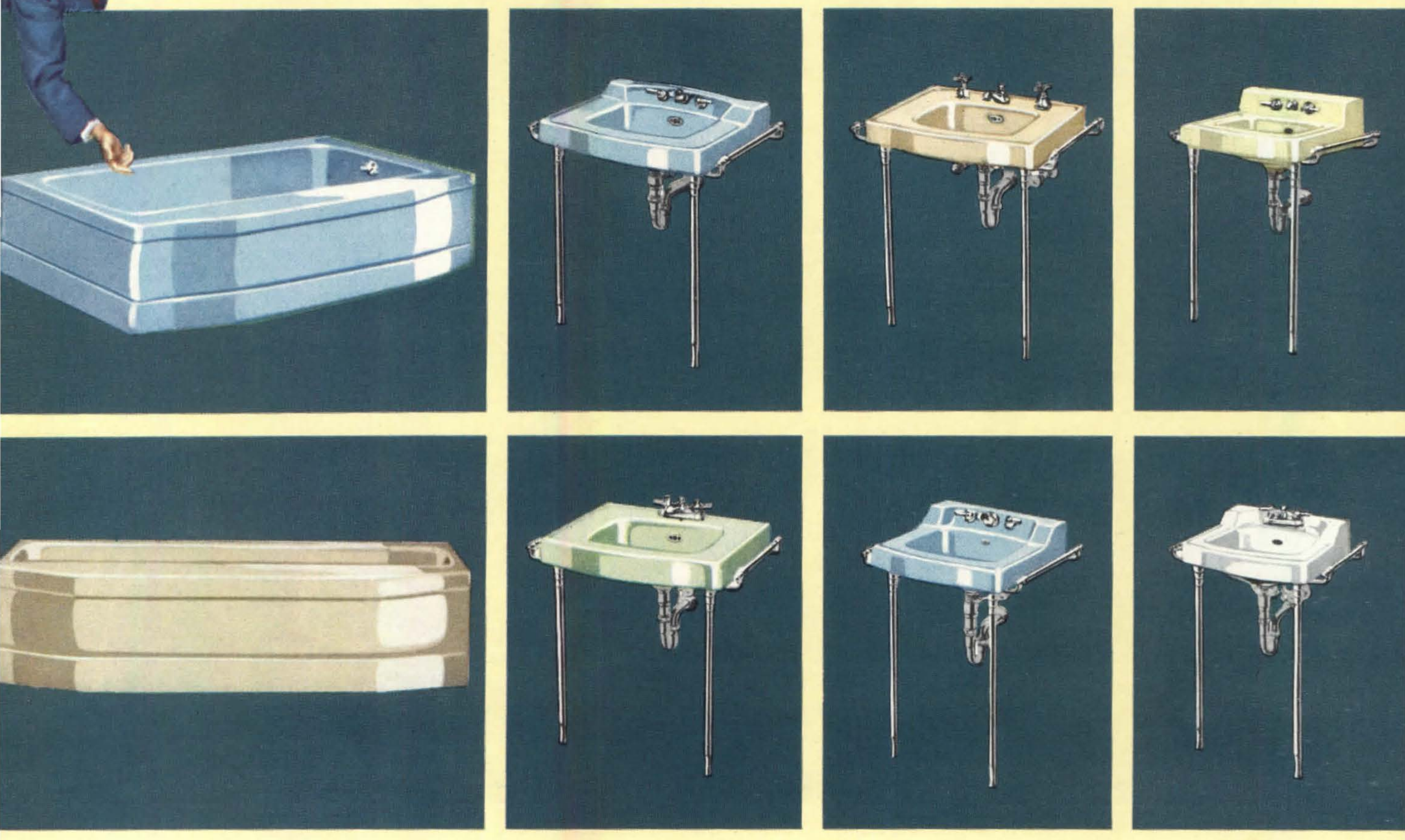
•

Too many of us today are seeking that n
existent cloud, "security", on which we plan
find a solid spot to rest our bones. There
no security in this world made for us by oth
What we make for ourselves and our fami
is a point in time. I have had young m
come to me right out of college looking fo
job offering "security". These men are cowa
who want offered on a silver platter ($5
the first year and an annual raise) what no m
can offer and what no man can achieve, e
in a padded cell.

The pattern is further deteriorating. It is
only a question of security; it is also a n
cynicism. "Nothing can be done that is w

(Continued on page

NOW glamorous new styling in the finest modern fashion



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PLUMBING FIXTURES IN COLOR

More and More reasons why Mr. and Mrs. America prefer these brilliant formed steel fixtures!

If you know Briggs Beautyware plumbing fixtures, you undoubtedly know about the years of pioneering development work—the intensive program of product improvement—responsible for the tremendous popularity of these fast-selling, top-quality fixtures.

Now Briggs gives you *new* beauty—*extra* smartness—*added* eye appeal—sure to increase this popularity still further. Many of the Briggs porcelain enameled, formed steel lavatories and each of the tubs have been completely redesigned—restyled throughout! Several entirely new lavatories have been added. This dramatic new line is ready now to take its place with the superb Briggs vitreous china water closets, lavatories and urinals—to make doubly certain that Briggs Beautyware keeps out in front as the most brilliant, most desirable line on the market!

Remember—Briggs Beautyware bathroom fixtures are available in Sky Blue, Sea Green, Ivory and Sandstone, as well as sparkling white. *All* Briggs colors are non-fading; *all* Briggs fixtures are stain-proof and acid-resistant.

See the *new* Briggs Beautyware *now!*

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"You may have to stand outside!"

REMEMBER Aesop's fable of the camel and his master--how the kind master allowed the shivering beast to put into the tent first his head, next his shoulders, then his forelegs!

And then the camel said, "Master, I think I ought to come wholly inside," and crowded in. Immediately he said, "There is hardly room for us both, so I think it would be better for you to stand outside so I can turn around and lie down." And without further ado, the camel kicked the man out and took the entire tent.

Men have heard this story for 2,500 years--repeatedly have seen how it illustrates what happens when one man or group of men gain power over others. Men saw it happen in Italy and Germany when Mussolini and Hitler took over. Men saw it happen in Russia.

Even here in America a similar trend is evident. Powerful influences overlook no opportunity, through political manipulation, central controls and bureaucratic regulations, to intrude more and more in our private lives. The situation demands continual, alert watchfulness by all citizens who believe in individual liberty and freedom, to prevent this camel of big government from creeping further into the tent. Before we realize it, "we, the people," the master, may find ourselves "standing outside." In America it is government, which is the servant of the people.

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out of scho

(Continued from page 154)

doing. Nobody wants my kind of work. Nob
is liberal enough, intelligent enough, to m
it worth my time. In such a period of conse
tive taste and choice, nothing which I wo
do would be understood or treated right. I
up to others to recognize my ability and I d
see much point in trying to do things until t
do." Or—and this is as bad, "Hell! What's
use? I might as well give in to make a livi
I'll conform."

The interpretation of a period by the peo
living in it is always difficult. No one can
sure just where in the cycles of human acti
he has been fortunate enough to be born.
interlocking and *overlapping* cycles for e
movement of man in time separate into
few which are the direct or indirect influen
on each of us in the role chosen for each of
and by each of us to be played in our
histories. As comprehensive architects
builders of the physical environment of
own society we should have a constant, fun
mental interest in that cycle. This is the c
that can be identified by the word "form".
rotation, beginning at the bottom of the cir
goes clockwise—reform, form, conform, defo
and back to reform again. There is no alte
these seasonal changes. In Angus Davids
life of Edward Lear, he quotes from a criti
the *London Times* on the subject of Pre-Raph
ite painting. The date is 1851—101 years
Believe it or not, the *Times* is speaking of
man Hunt, the Rosettis, Watts, Burne-Jones,
the rest of the Brotherhood and not of s
recent and not-absorbed modern. I quote
quote:

"The public may fairly require that such
fensive jests should not continue to be exp
as specimens of the waywardness of t
artists who have relapsed into the infanc
their profession."

●

And so it is with all the arts—applied or ot
wise. Architecture and planning are contin
moving round and round.

I've been interested in recent months in
seems to be interesting—really interesting
the "dear reader". In the design fields, I
that there is a new element in large-scale de
of shopping centers in which a bit of an
aginative flash is appearing—the first l
scale thinking evidenced by any body of a
tects in some time. I am, however, contin
shocked by the fact that architects see
have lost the verve and driving force o
years ago and appear to be afraid of desig
large-scale housing developments. I join
thusiastically with Lewis Mumford in atta

(Continued on page

(Continued from page 158)

the incredible stupidity of the multi-family garden and high-rise rental monstrosities to which the American architects' and site planners' names are being attached. Apparently these buildings have no meaning to the designers. The fact that the total enterprise may consist of greater agglomerations of people and bricks than architects and planners have ever created before seems unimportant. On the contrary, this is perhaps the most important architecture of our day—or rather, it could be.

Not long ago, at a meeting of well known architects, I was shocked to hear them agr that housing projects could be too large for a one architect to design. Shades of Berni Shades of Mansart and Le Notre! What mi we have become that we spend our time the permutated minutiae of thousands of lit designs for little single houses (and fill our ma azines with the results)! All this while thousan of people are jammed into the thousands unstudied pigeon-holes in those great, gl tonous, horizontal and vertical masses kno as developments, projects, or what have yo and by whatever means. I'm getting sore aga If one half the time were spent today on t design of buildings as much as 1500 to 20 times as important as one little box, the ve nature, size of projects, and number of peop involved would help put architecture and pla ning back where it belongs in society. A don't forget that a family is a family is family.

But what an admission of defeat! Wh eunuchs! Or is it that our education in lit things—that gadgeteering which walks as arc tecture—has blinded us to the virile underta ings which modern life demands? The arc tect says, "It is not my fault, there aren't enou site planners and city planners." What is site planner? Why isn't an architect capable grouping his own buildings? Why can't he them to the land and in the places they belon Is he lazy? Probably. Is he unimaginati *(In all likelihood.)* Is he badly trained? *(T is obvious.)* Does he lack guts? *(That's gett more and more obvious too.)*

Why leave the guts to the few grand men? Theoretically manhood begins to wa after 60. But there are still four or five fighters around who are showing up everyb else. They aren't afraid of the lawyers, materials salesman, the engineer, public o ion, A.I.A. traditions, the future. They are makers of both tradition and the future. for them a profession which is afraid to virile, afraid to fight for itself, afraid to petty security as a status in society, would w down the drain.

•

Being a man in society means more than fi ing for one's own rights. It means more thinking and creating big—important as is. It means having that cause in which believe—you yourself—not the cause of tl grand old men or any one's else. They their own which can never be yours. You

(Continued on page

Venetians made with LEVOLOR Orange Line
(De Luxe) metal heads and bottom bars
vere installed throughout the modern Sterling-
/inthrop Research Institute, Rensselaer, N. Y.
W. Stewart Thompson, Architect;
Grove, Shepher, Wilson & Kruge, Inc.,
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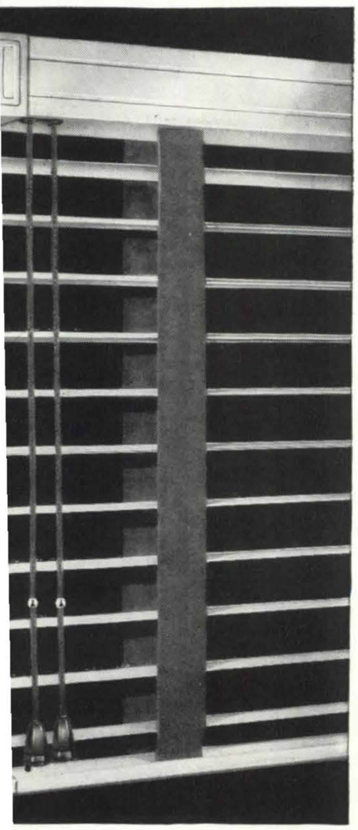

features that set LEVOLOR-built
s apart: smart, enclosed head that
est precision-built hardware; dur-
ingy plastic-coated metal slats;
s disappear in the sleek bottom
re chip-, mar- and stain-resistant.
gentle pull makes tilt-cords even,
o the LEVOLOR patented tilter
m.

talog in Sweet's Architectural File,
nd Sweet's File for Builders, 3E-5.

Approximately five hundred windows in the new, modern Sterling-Winthrop Research Institute, Rensselaer, N.Y., are fitted with Venetians made from parts supplied by LEVOLOR. And since most of the blinds are twelve feet wide, covering three windows, sound planning called for the *best* in hardware, all LEVOLOR-made, enclosed in streamlined LEVOLOR heads.

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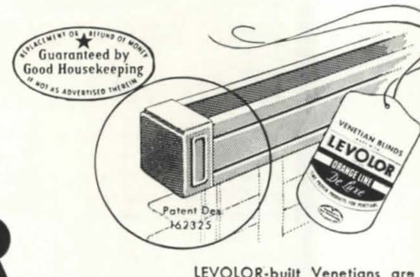

LEVOLOR-built Venetians are identified by this head design and this tag.

Specify **LEVOLOR**
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Time-proven Products for Venetians

out of school

(Continued from page 160)

fight alongside another man or in the great company of men whom you admire and for whom you have the affection which great purpose engenders. But in any true democracy you fight as a man for what you personally believe and no one else can fight that battle for you.

Today there is one cause which is every man's responsibility and which requires the teamwork of *men*. That is the job of developing means and fighting for the life of our society. The architect and planner has a peculiar and unique role in national and world defense. There are responsibilities of his inventive genius, his possible public leadership, and his reputed standards of performance which, if he is a man among men, he will apply to the preservation and creation of the environment which democracy under stress of defense badly needs. Despite petty differences in belief and approach to our problems of living and working, this cause should be sufficient to bring out every iota of manhood in what, I am sure, is an adolescent and not a senescent profession.

NEXT ISSUE the Best Informed Men in the Architectural Profession will read . . . DESIGN OF COMMERCIAL BUILDINGS, major topic of April P/A. There will be two related technical articles "Aid in Selecting and Detailing Aluminum Windows" and "Power Distribution Systems for Commercial Buildings." Other features: "Hotels and Motels" of exceptional design . . . a luxurious home—designed by Henry Hill . . . and many other articles of practical interest to you. Interior Design Data will feature guest rooms for resort hotels.

PROGRESSIVE ARCHITECTURE

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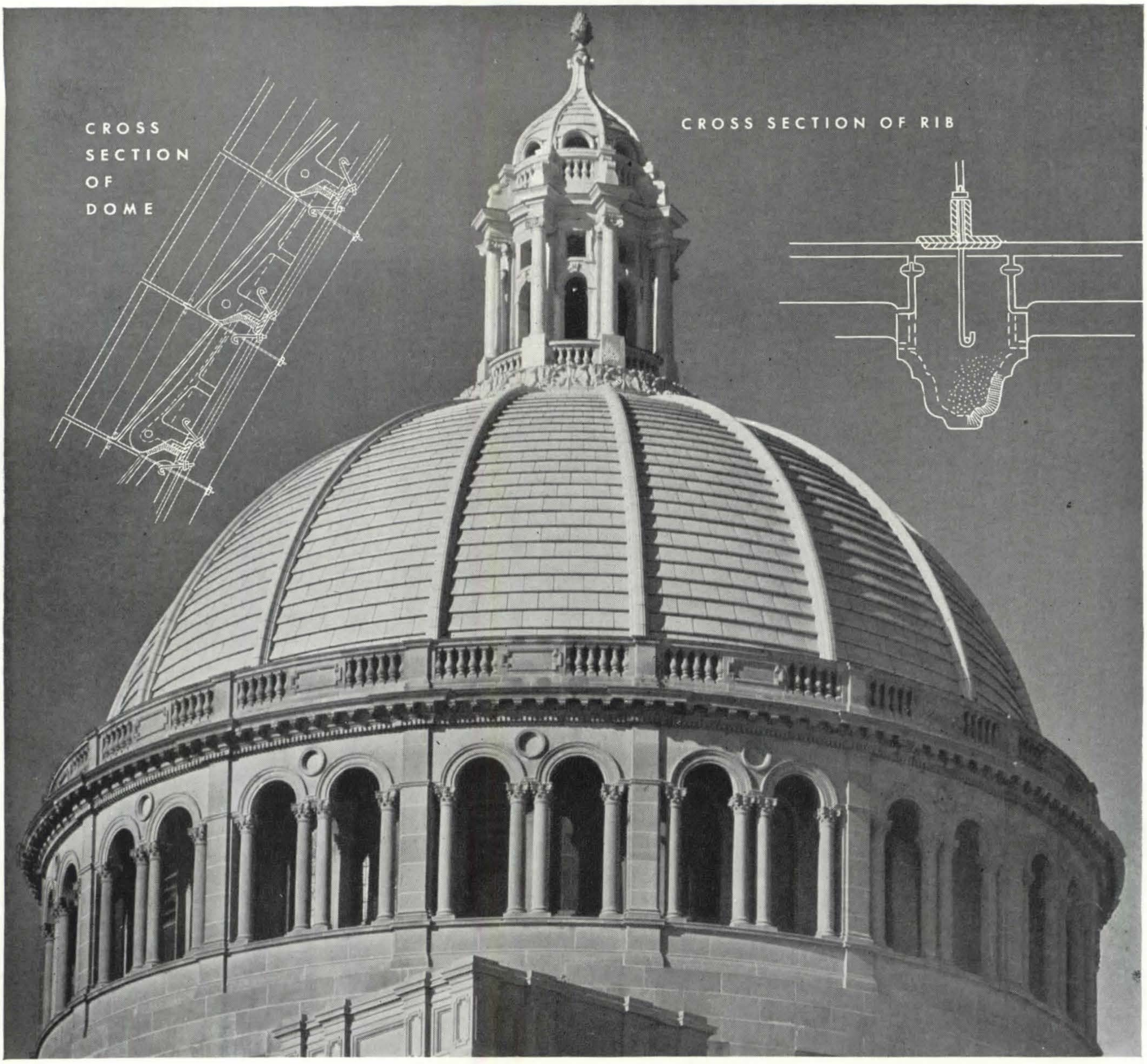
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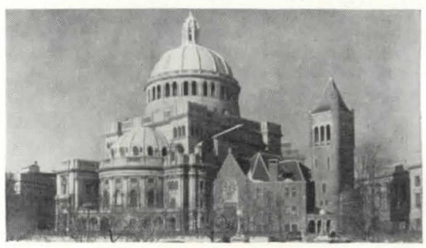

it's the law

by Bernard Tomson

This month's discussion is related in subject to Part IV, "The Decision or Certificate of the Architect or Engineer," of Tomson's recent book, Architectural & Engineering Law *(Reinhold).*

It is the rule rather than the exception for a speculative builder to sell his house from a "model." The purchaser makes a down-payment and usually makes periodic payments during the course of construction, which are not alw matched by a correlative amount of perfo ance on the part of the builder. What happ when the builder decides not to carry out part of the bargain, and abandons the wo This may take the form of an obvious ab donment, or it may take the more subtle f of a slow-down. What can the buyer do? he, in the parlance of the courts, get spe performance of his contract? That is, can get a judgment of the court requiring builder to complete the building in accorda with the plans and specifications within a sonable time? The answer is, unhapp "probably not." It is unfortunate that m people purchasing a home under these circ stances do not understand the importance investigating the reliability of a specula builder. Not to do so is to make a specul of the buyer, as well as the seller.

•

A recent New York case illustrated one co attitude toward the problem of specific formance of construction contracts. The p tiffs were purchasers of real property which the defendant was to erect a dwel The building constructed failed in many res to comply with the plans and specificat as required by the contract between the pa The plaintiffs paid $1800 down on contract claimed they were ready to pay the bal provided the builder finished the buildin accordance with the plans. The relief so by the plaintiffs was a judgment directing defendant to remedy all defects and com the building. The court refused to grant relief, relying upon the "general" rule on account of the great difficulty and, often impossibility attending a judicial superi dance and execution of performance, con for the erection or repair of buildings an conduct of operations requiring time, sp knowledge, skill, and personal supervision not be specifically enforced. *(Stern v. Fre Acres, Inc.).*

The plaintiffs in the above case, althoug feated in their attempt to obtain specific formance of the construction contract, not without any legal remedy. The law a a purchaser three distinct legal remedies

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MIDGET SIZE

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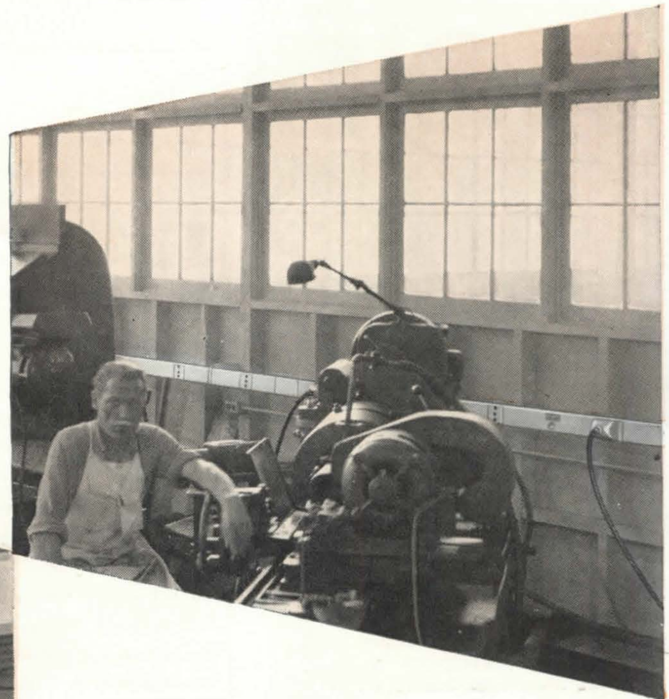

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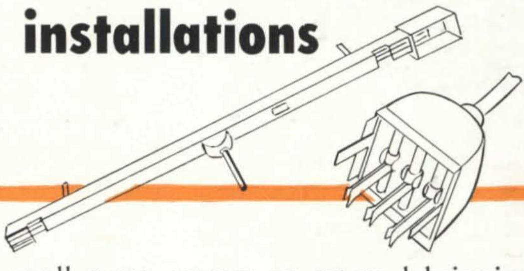

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(Continued from page 164)

(1) The purchaser is permitted to reject title and recover a judgment for his down-payment, with interest, and in furtherance of this, he is entitled to a purchaser's lien upon the real property for that amount.

(2) The purchaser may complete the building and bring action against the builder for the expense incurred.

(3) The purchaser may prove the difference in value between the building, as constructed, and as the plans provided, and obtain a corresponding abatement in the sales price.

The three remedies available to the purchaser, although compensating him to some degree for the builder's failure to complete the project, do not afford complete relief. A purchase of real property always has been considered by the Courts as something special. It was for this reason that equity courts early developed the doctrine of specific performance of contracts for the purchase of real property on the theory that a money judgment alone would not adequately compensate for a breach of a contract to sell real property.

•

An exception to the rule that contracts for the purchase of real property may be specifically enforced exists, however, in the ruling found in the *Stern* v. *Freeport Acres, Inc.* case, which has been stated by the Courts as follows:

"There is a class of special and exceptional contracts in which courts of equity refuse to exercise jurisdiction by way of specific performance. These are contracts having such terms and provisions that the court could not carry into effect its decree without some personal supervision and oversight over the work to be done, extending over a considerable period of time, such as agreements to repair or build, to construct works, to build or carry on railways, mines and the like." *(Wharton* v. *Stoutenburgh, 35 N.J. Eq. 266.)*

The United States Supreme Court has also expressed itself in the following language:

"It must be liable to perpetual calls in the future for like enforcement of the contract, and it assumes, in this way, an endless duty, inappropriate to the functions of the Court, which is as ill-calculated to do this as it is to supervise and enforce a contract for building a house or building a railroad, both of which have in this country been declared to be outside of its proper functions, and not within its powers of specific performance." *(Texas & R.R. Co.* v. *Marshall, 136 U.S. 393.)*

•

The policy of completely rejecting the purchaser's plea for specific performance and relegating him to the law court for an action for money only, in many instances works a hardship upon the purchaser and in reality affords him inad-
quate relief. The alternative of allowing a
abatement of the purchase price means th
the purchaser becomes a reluctant builder–
something he did not contemplate or desi
when he signed the original contract. The oth
legal alternatives, *i. e.* the completion of th
dwelling by the purchaser and his action f
damages, or the rejection of title and an actio
for return of the purchase price, leave the pu
chaser with a money judgment which may b
uncollectible because of the builder's insolvenc

For these reasons, therefore, some courts c
permit specific performance of building co
tracts. Where the work to be performed by th
defendant was for the benefit of land sold, co
veyed, or leased by him to the plaintiff, the
courts have found stronger equities in favor
specific performance of the contract. In *Zy
munt* v. *Avenue Realty Co.*, 108 N.J. Eq. 46
the defendant had sold a lot to the plainti
but with a stipulation to construct a street a
sidewalks in front of the lot within a year. T
judge permitted evidence to be present
whereby the character of the sidewalks cou
be fixed. The following should be noted in h
opinion granting specific performance:

"In cases involving building and constructi
contracts, the court usually weighs, on the o
side, the difficulties of enforcing and superv
ing the execution of a decree, and on the oth
side of the balance, the importance of speci
performance to complainant and the inadequa
of an action for damages. If the difficulti
attendant upon enforcement are not impressi
and the actual performance of the contract see
of much moment to complainants, courts are c
to grant equitable relief. The court may decr
performance of a contract for construction w
on land of the defendant when the difficulty
enforcing and supervising the execution of t
decree is not great and the work is essent
to the use of complainant's adjoining land a
damages are not an adequate remedy. But
contract is specifically enforced unless it
certain in all its part. . . . . The decree sho
be so exact that a defendant may not be
doubt with respect to his duty under the decr
he should not be left to guess what is requi
of him by the court. . . . . The importance
performance to complainants and the ina
quacy of damages are apparent. I cannot
sume complainants have sufficient funds to
prove Orchard Street, and even if they are a
to do so, an adequate remedy is not ther
indicated. . . . . Whether, after spending t
money for this improvement, complainants c
recover from defendant for the expense,
doubtful; there is no evidence concerning

(Continued on page

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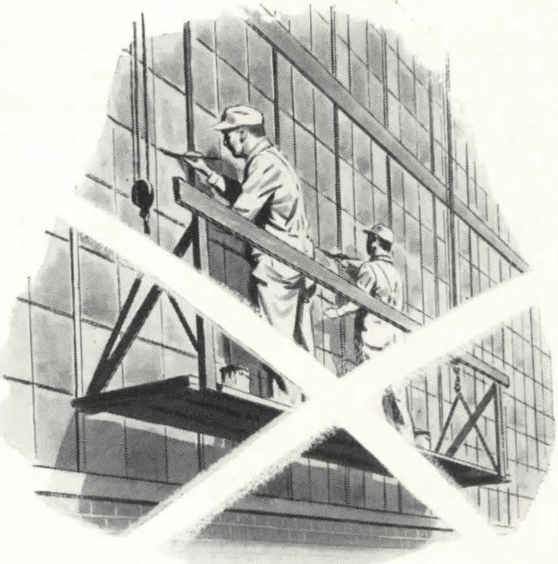
. . . get *Fenestra* Super-Galvanized Steel Windows



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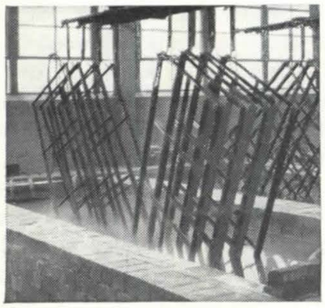
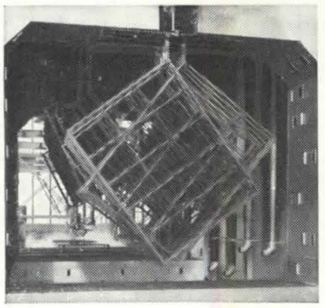
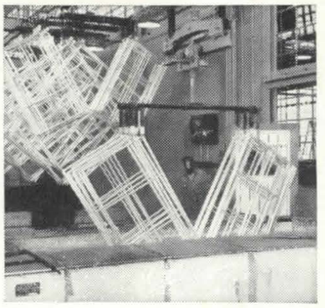


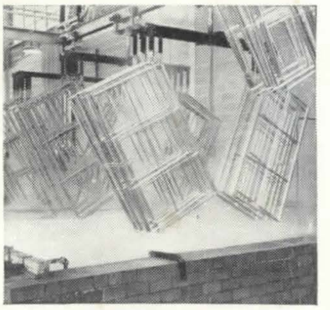
FLUXING. After cleaning, pickling and rinsing, Fenestra Windows dip into a flux bath that provides a film to prevent contamination of the cleaned steel as it passes to galvanizing tank.



DRYING. In this oven, the flux is dried on. Of course, in the galvanizing tank, this protective coat of flux volatilizes on contact with the molten zinc to permit a strong zinc-iron bond.



GALVANIZING. Assemblies dip deep into molten zinc, and come up with a thick, smooth, uniform coating. Temperature and timing are automatically controlled with laboratory accuracy.



BONDERIZING. Here you see the galvanized assemblies being Bonderized to give the surface a soft silver color and to provide a holding surface for decorative paint, if it is ever desired.

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it's the law

(Continued from page 166)

financial standing of defendant. . . . . A breach of contract which deprives one of the use of his land is a breach which cannot be adequately compensated by a judgment for damages."

●

The decision also serves as a guide to the owner or architect considering a contractor or builder. The owner particularly should understand that the lowest bid does not necessarily mean the lowest cost. He should understand how inadequate is an action for damages if the contractor does not properly perform. He should understand how important it is for the contract to be "certain in all its parts" so that neither the owner nor the contractor "should be le to guess what is required of him." He shou know whether contractors considered by hi "have sufficient funds", whether "they are able to perform, whether if the contractor unjusti ably breaches his contract the owner can recov his damages—whether the contractor is goo for a judgment. He should keep in mind th "a breach of contract which deprives one of th use of his land is a breach which cannot b adequately compensated by a judgment fo damages."

Not until he understands all this should h choose his contractor.

NOTICES

five win scholarships

Five youthful New York students have w $500 scholarships for study at The Institu of Design and Construction, Brooklyn, direct by Vito P. Battista. The grants from a fu established by the director in memory of h parents, Vincenzo and Sabina Battista, go WILLIAM A. ANDERSON and JOHN McNI both Delehanty Institute students; RICHA ORTIZ, Alexander Hamilton vocational hi school; FRANCIS W. OTTAVIO, National Tec nical Institute; and PETER McPARTLAND, the office of Bro. C. J. B. Baumann, O. F. architect.

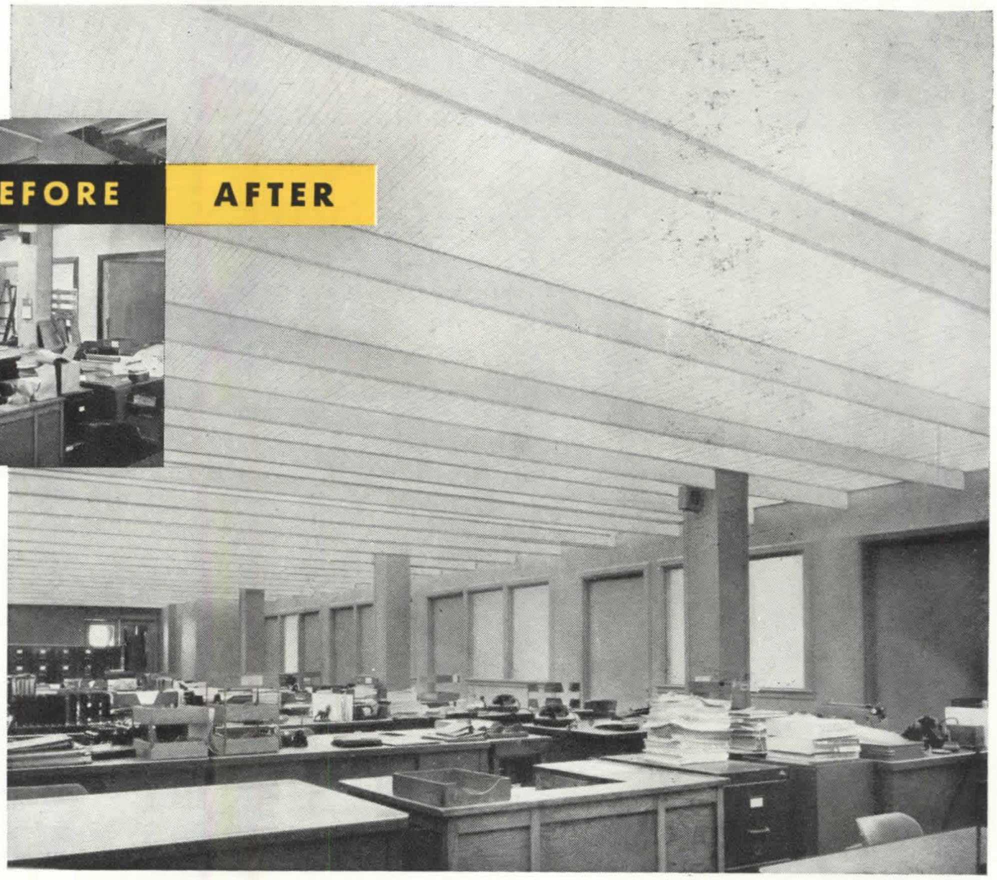
for engineering study

American Institute of Steel Construction a nounces that, for the third year, ten schol ships of $1000 each will be awarded to hi school seniors desiring careers in civil en neering. The grants may be used at any o of 125 accredited colleges offering a deg in civil engineering. Applicants must be no inated by steel fabricating companies and m obtain names of such companies by writing A.I.S.C., 101 Park Avenue, New York 17, N. Applications will be accepted until April The jury of awards, a committee of promin engineering educators, will make their fi selections in July.

traveling scholarship

The New York Chapter, A.I.A., announces LE BRUN TRAVELING SCHOLARSHIP for 19 The prize is $2800 for at least six mon travel in Europe. The subject of competi is "A Small Town Library" and programs now available. (*Rendu* April 30, 1952).

Requests for nomination forms are being received by Chairman, Le Brun C mittee, New York Chapter, A.I.A., 115 E. St., New York 16, N.Y.



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