p a

PROGRESSIVE ARCHITECTURE

junior high school

house

12

december 1952

largest architectural circulation in the world

Republic Publishing Co. Plant, Yakima, Washington. Archt.—John W. Maloney, Seattle, Wash.; Contr.—Howard S. Wright & Co. Inc., Seattle, Wash. Pozzolith Ready-Mixed Concrete supplied by Yakima Cement Products Co., Yakima, Wash.

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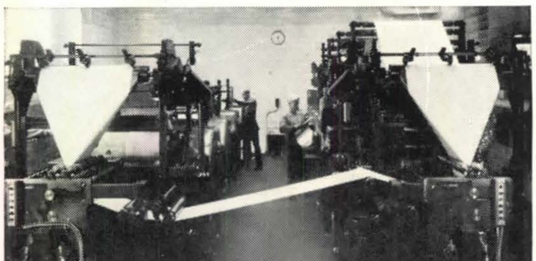
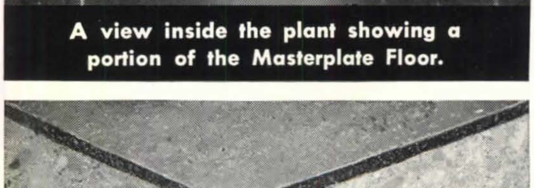


A view inside the plant showing a portion of the Masterplate Floor.



Section of Masterplate Floor. Armored Surface Approximately ⅛" Thicl

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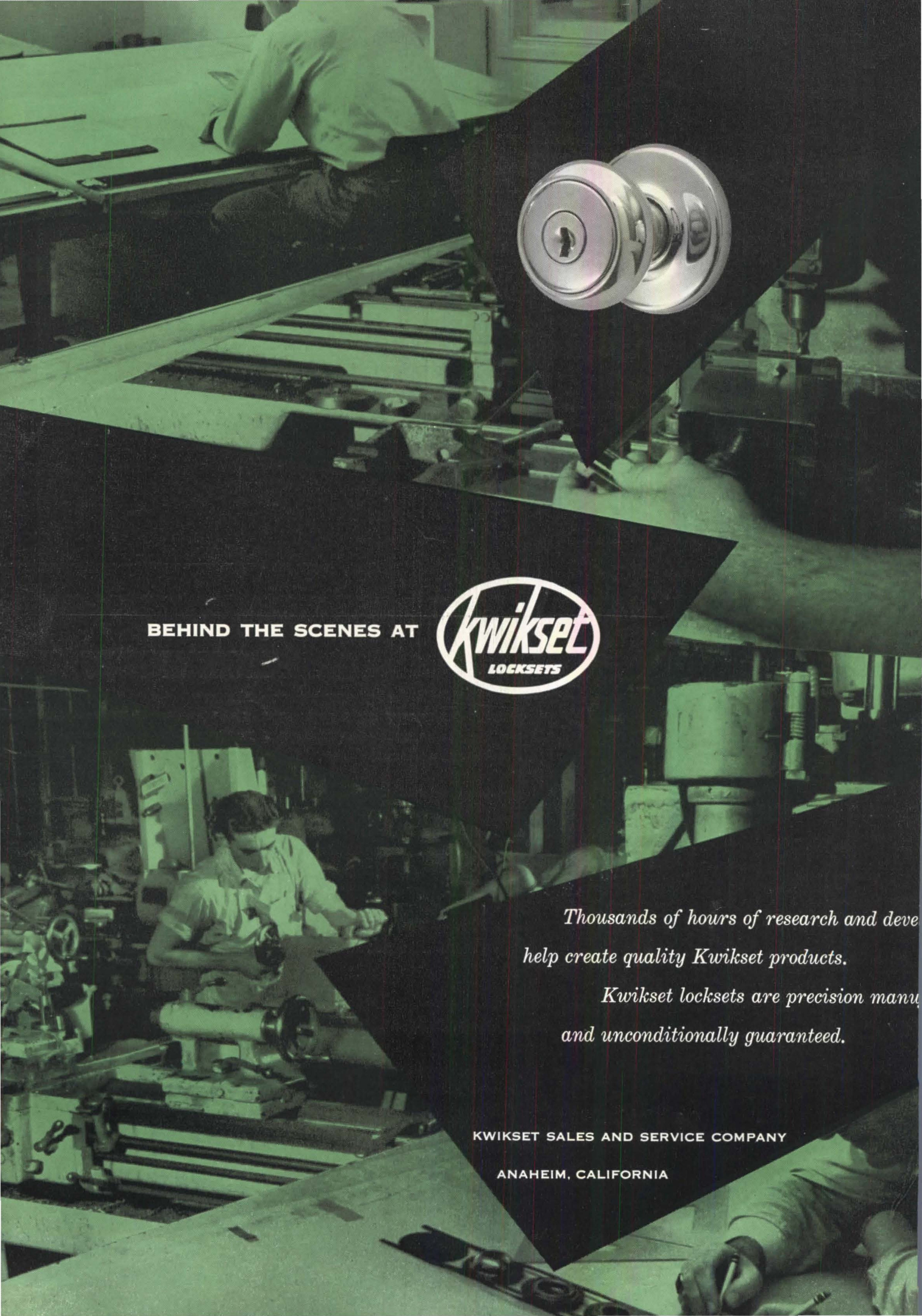
PROGRESSIVE ARCHITECTURE

December 1952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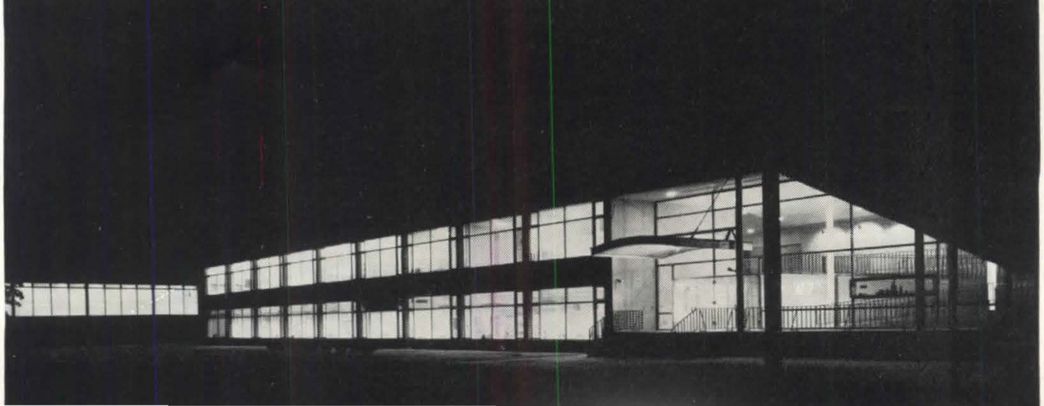
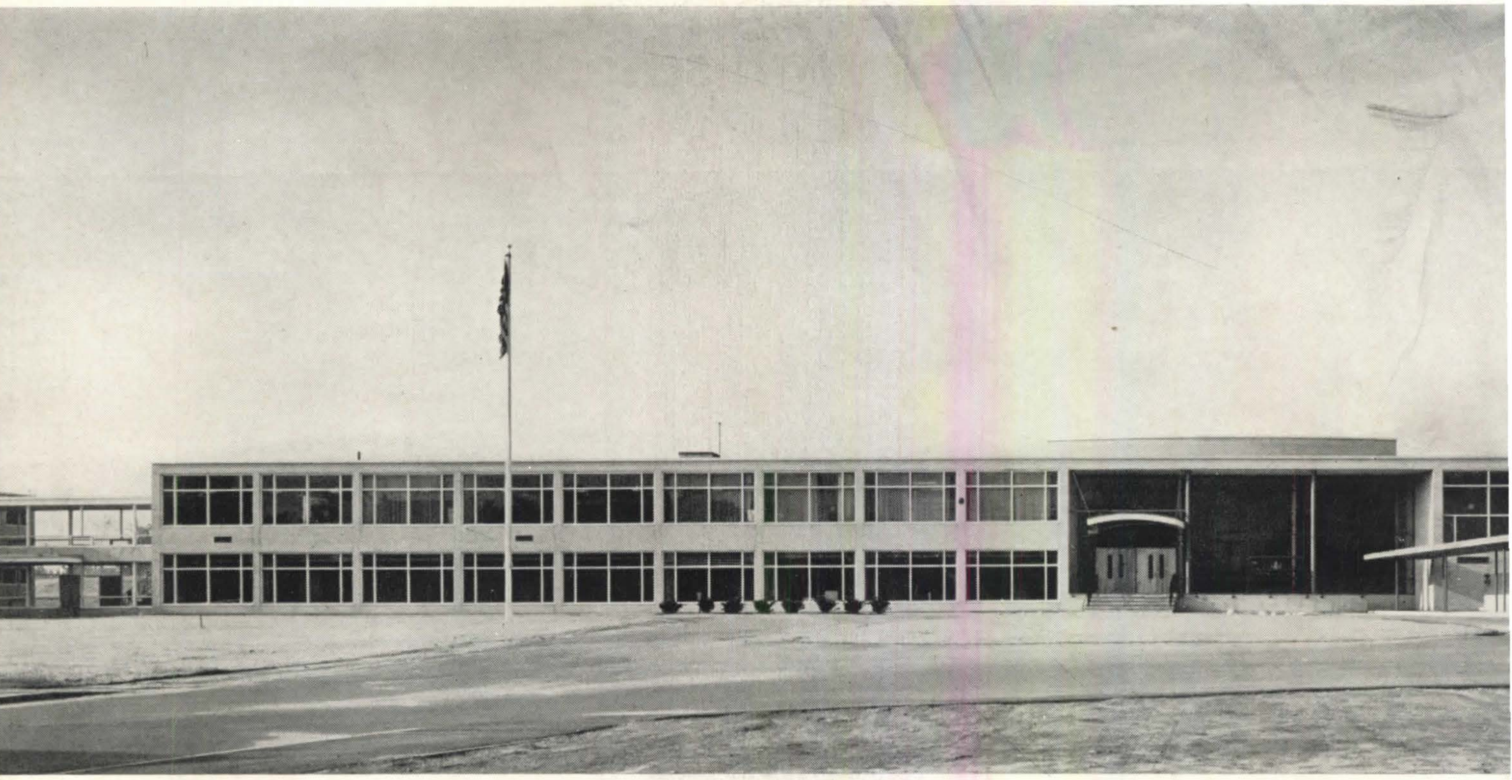
KWIKSET SALES AND SERVICE COMPANY
ANAHEIM, CALIFORNIA

junior high school

location	Attleboro, Massachusetts
architects	The Architects Collaborative
structural engineer	LeRoy M. Hersum
mechanical engineers	Thomas Worcester, Inc.
acoustical engineer	Robert B. Newman (Bolt, Beranek & Newman)
school consultant	Dr. Homer W. Anderson
general contractor	Westcott Construction Company

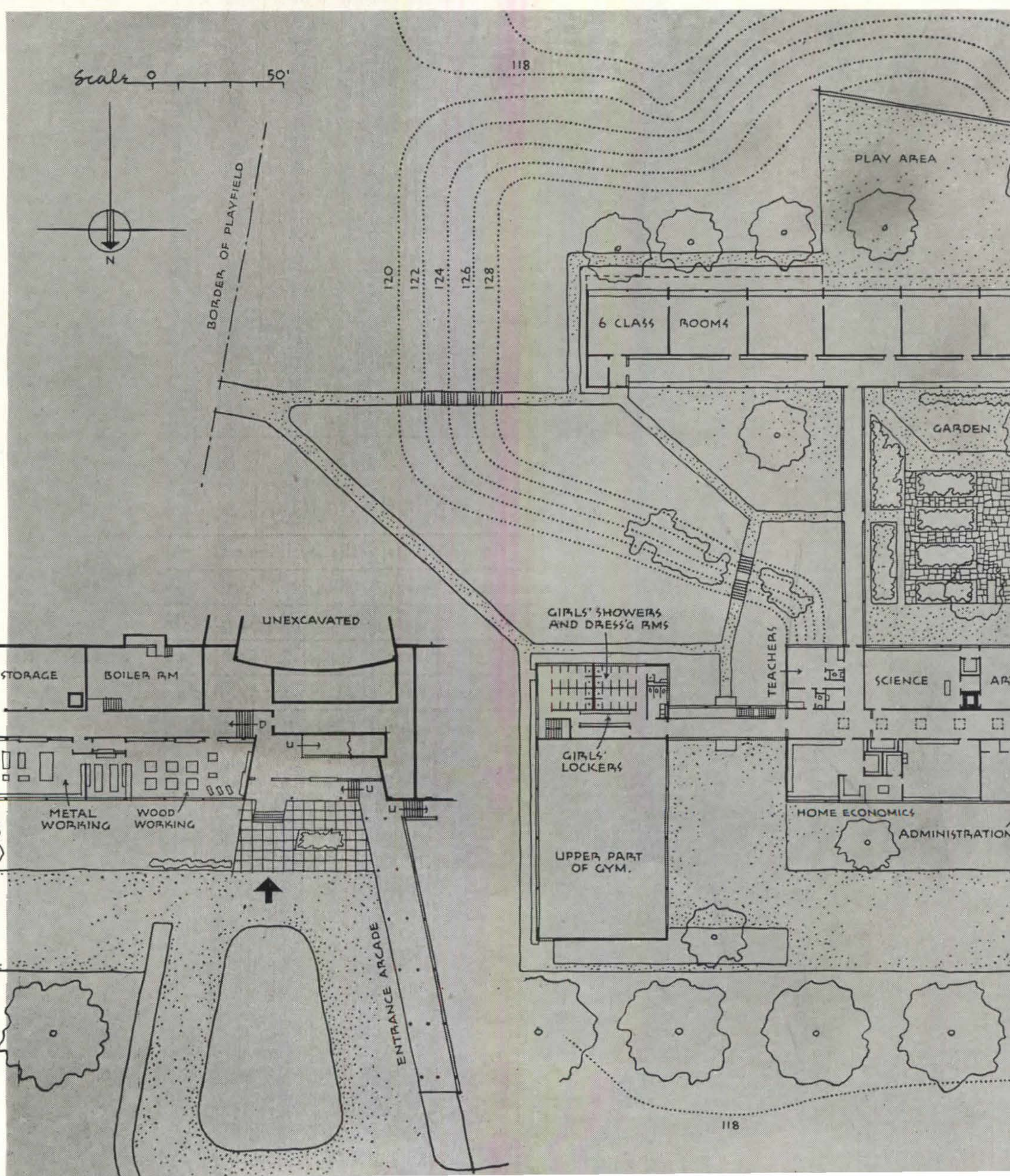


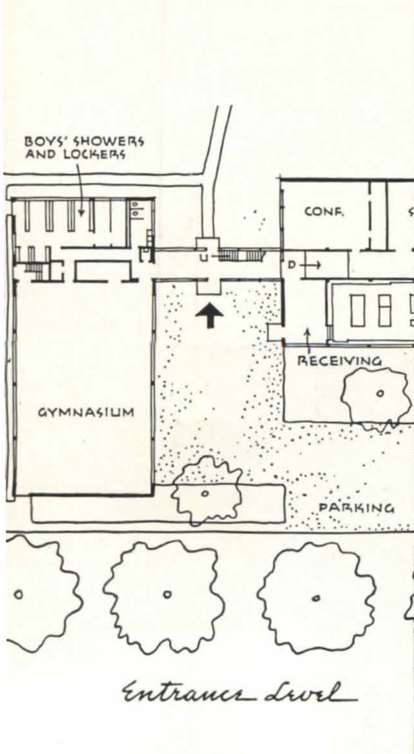


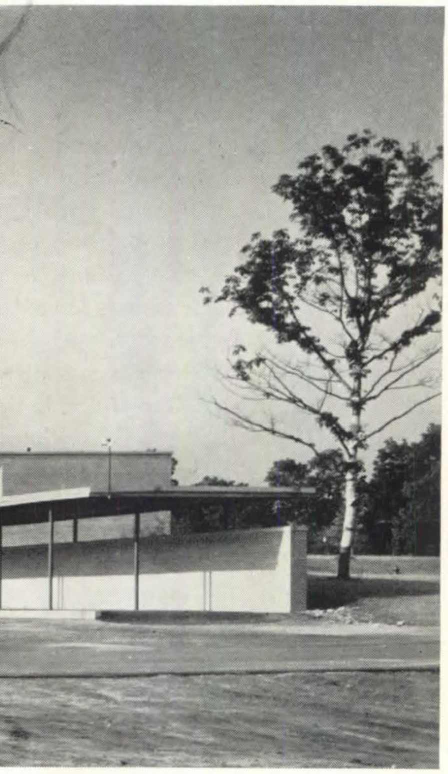
Plot Plan and Upper Level

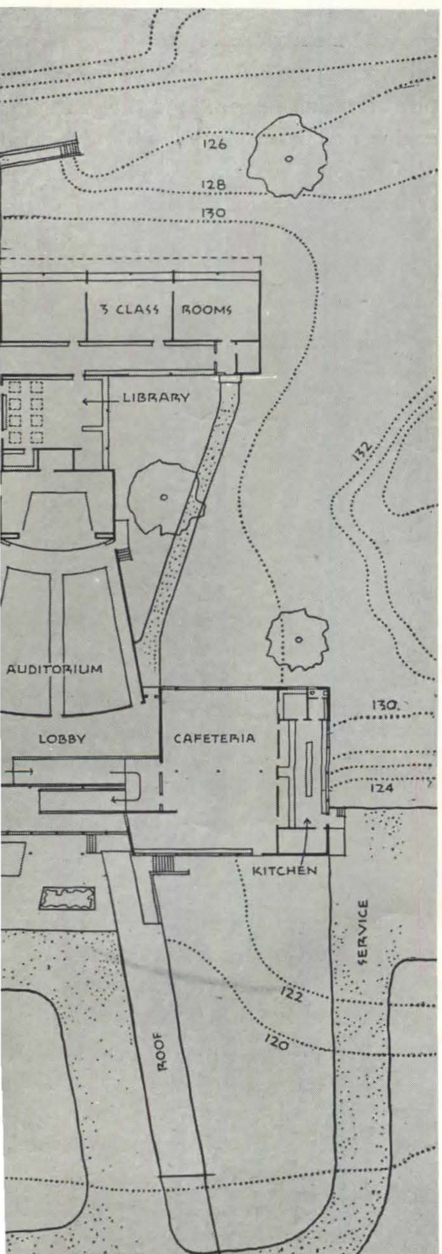
Adapted to an irregular site, the school is organized on two levels—two stories high on the front (above), *with one-story wings to the rear. The main entrance* (acrosspage, bottom) *occurs at the lower level, with a switchback ramp* (across-page, top) *leading up to the main classroom level.*

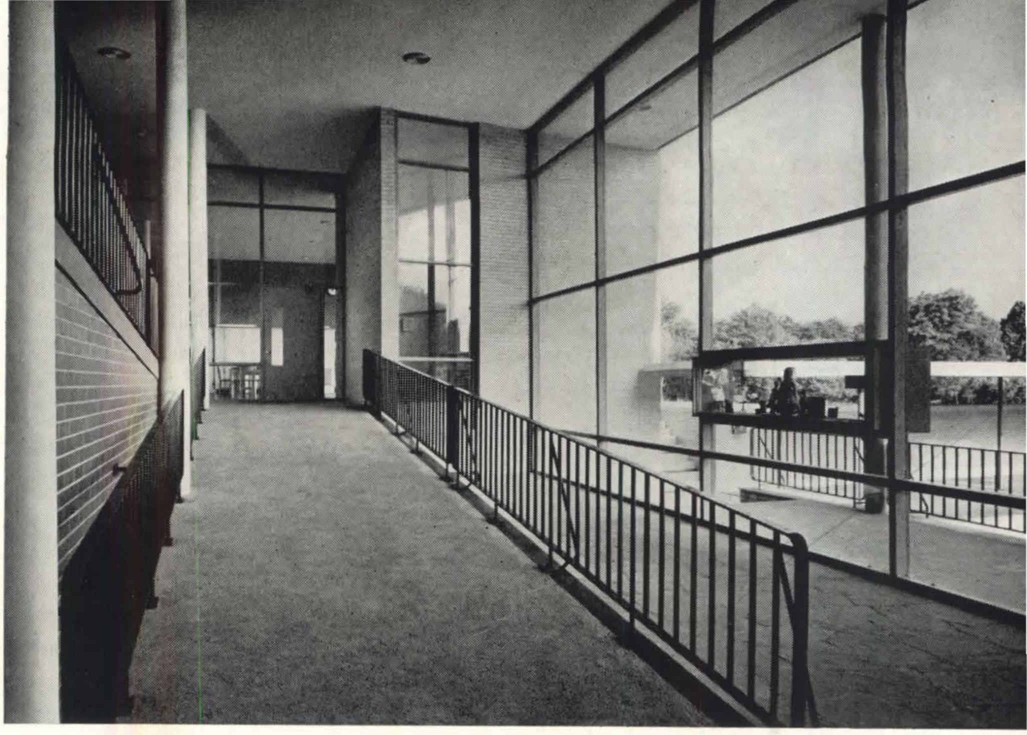
Photos: Ezra Stoller











After studying Attleboro's present and future school-building needs, the School Board, the Mayor, and the City Council joined in recommending a junior high school to house seventh, eighth, and ninth grades, as well as an extensive extracurricular program.

On at least three counts, the Peter Thacher Junior High School constitutes an outstanding architectural accomplishment. For a New England school committee to entrust the design of its new junior high school to one of the country's most progressive *firms*—a firm that had come to its attention through winning a previous school-planning competition *(page 15, April 1952 P/A)*—is not only rare news, but also once again proves that excellent architecture can come via the design-competition route. For TAC to understand and employ many of the recent advances in school-planning technique, yet weave these into a fresh and convincing pattern almost devoid of the current clichés, is an accomplishment for which the architects deserve much credit. Finally, to have the finished building enthusiastically applauded by those who use it, both for its economy and its efficiency, is firm supporting proof that here is good architecture, not just a design performance to impress the beholder.

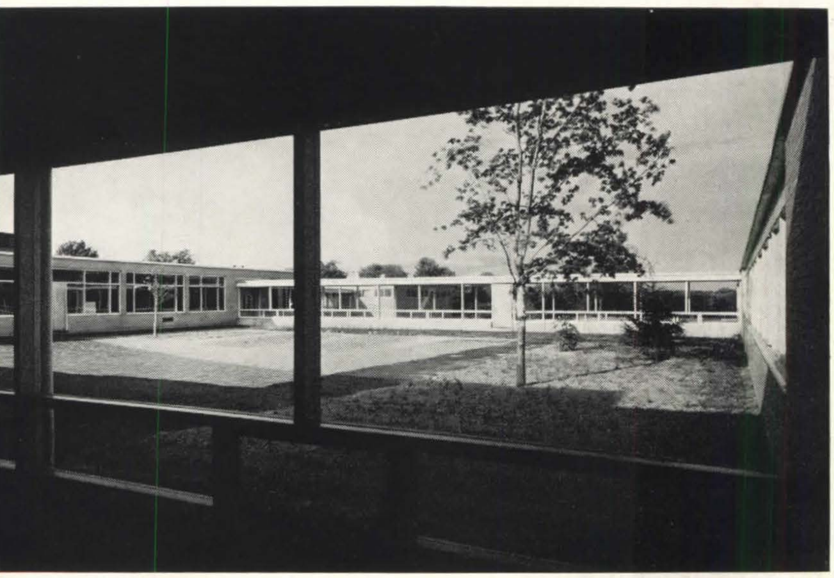
Perhaps a better understanding of the design will derive from TAC's statement of general approach to school planning: "We believe that the principal justification for architecture, as opposed to building, is that physical environment can play an important part in the well-being of individuals. Assuming this is true, school buildings are particularly important because the children are in their most formative period and spend a large portion of their waking hours in the school for a considerable number of years. Furthermore, if it be true that education is a process of constant stimulation as well as discipline, this brings the challenge to the architect to develop an environment for the students that will most effectively forward this aim . . . This approach was fundamental in our work on the Attleboro school."

The curriculum for the new school includes English, social studies, mathematics, music, art, science, physical education, dramatics, and speech for all; home economics for the girls; wood and metal working for boys; and an extensive extracurricular program. Special-purpose rooms required were a gymnasium, cafeteria-multi-purpose room, auditorium, and library.

The site was an irregular, 26-acre plot largely made up of gravel bank and swamp. To exploit the situation, the building was organized with a cross section that required cutting down the top of the bank. The gravel thus salvaged was used to fill the swamp, providing level playing fields. Basic organization of the building consist[s] of a two-story wing at the front (housin[g] the special classrooms) and a one-stor[y] wing of typical classrooms to the rear, th[e] two being connected by facilities used b[y] the entire school. In the entrance lobby, [a] broad ramp connects the two floors, meet[-]ing the cafeteria level at the halfway point[.] The separate gymnasium wing is joined o[n] both levels by a glazed passage.

This separation of elements has give[n] the building great flexibility of use, in th[e] opinion of Anson B. Barber, Superinten[-]dent of Schools. "Recently, a dramatic[s] program brought a capacity crowd to th[e] auditorium," he reports, "while the studen[t] body held a party in the gymnasium. Be[-]cause the pupils' party started earlier . . [.] people attending the play were not awar[e] of the school party, except as they had ad[-]vance notice of it." In addition to suc[h] functional advantages, this also furthere[d] the architects' wish "to eliminate awkwar[d] juxtapositions resulting from masses al[l] pushed together."

Before proceeding with the basic struc[-]ture *(outline, page 76)*, the structura[l] engineer analyzed many types and method[s] of framing. The result is that differen[t] systems were chosen for the one- and two[-]

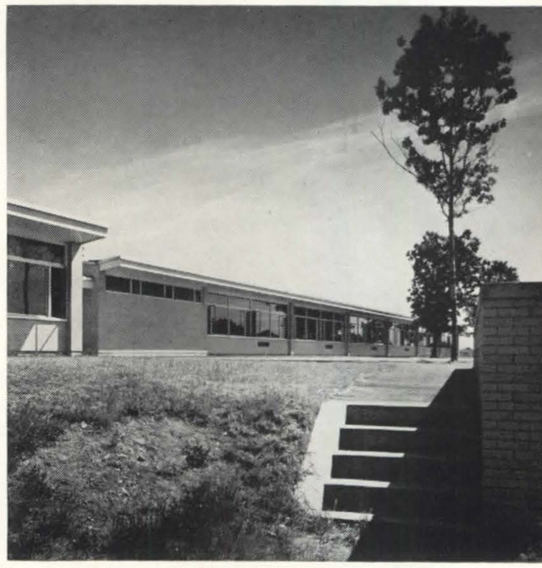


A glazed corridor (left) *joins the special-classroom wing on the north* (at left) *with the southern wing made up of regular classrooms. It also forms the fourth wall of an interior courtyard that is used for experimental planting. "We attempted to join each wing to the other in such a way that no dark corners resulted and each part of the building form was made free to breathe," the architects comment.*

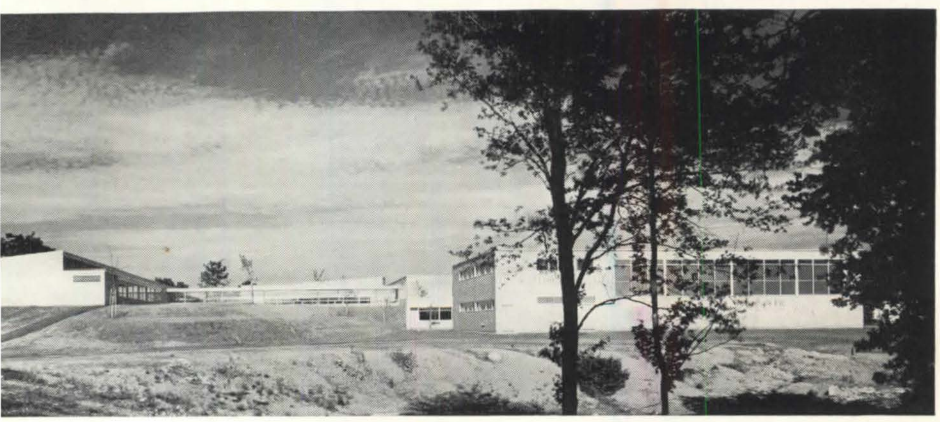
story portions of the building. In the two-story section, it was thought advisable (though not required by the building code) to encase all primary steel members in two inches of masonry. In the one-story section, exposed lally columns are used in the classrooms, set free from the walls.

As to how the building works, the lighting, and general amenity, we can do n[o] better than quote from Superintenden[t] Barber: "The building has proved to b[e] efficient in both a positive and negativ[e] sense," he states, "by having all the spac[e] needed for the program planned withou[t] needless or slightly used space . . . Th[e] cost of 89 cents a cu ft compares favorabl[y]

The auditorium and library occur at the west end of the building (above) *between the two main wings. Stairs lead up to a walled play area at the rear of the south classroom wing* (right).

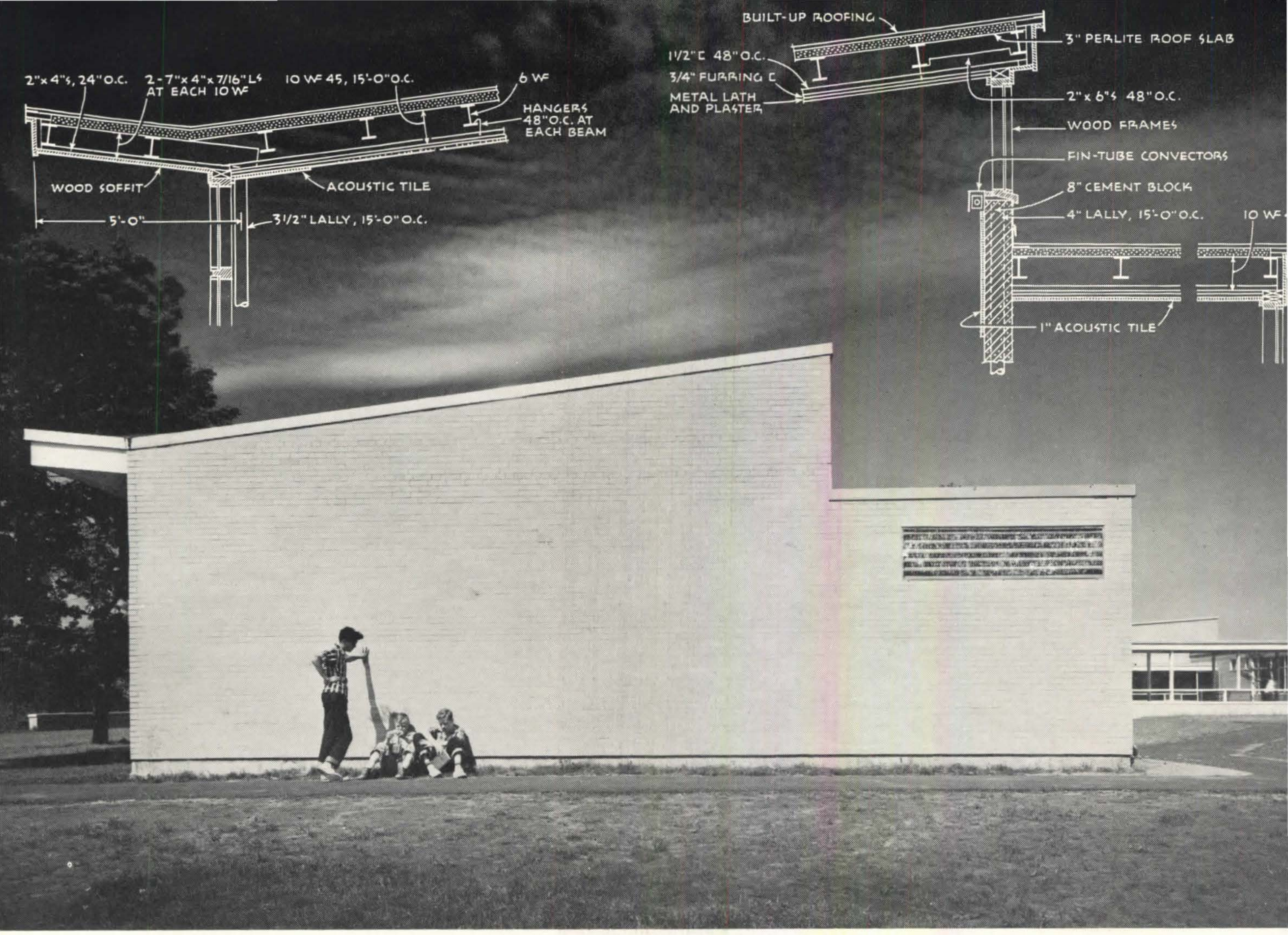


A double-decker glazed corridor connects the forward wing of the building and the gymnasium (top, below). *A general view from the east* (bottom, below) *shows the one-story classroom wing at left; gym, at right.*



vith any reported for the 1950 season in his area, and the cost per pupil of less han $1900 is also low for a building to iouse a junior high school program . . . The safety features of the building are utstanding, since there are not more than wo sections of pupils on a second story at any given moment of the school day . . . In the early stages of building, the simple lines brought forth comments that it would be too severe, but as the building neared completion, the effectiveness of the total plan led to general enthusiasm upon the part of the public."

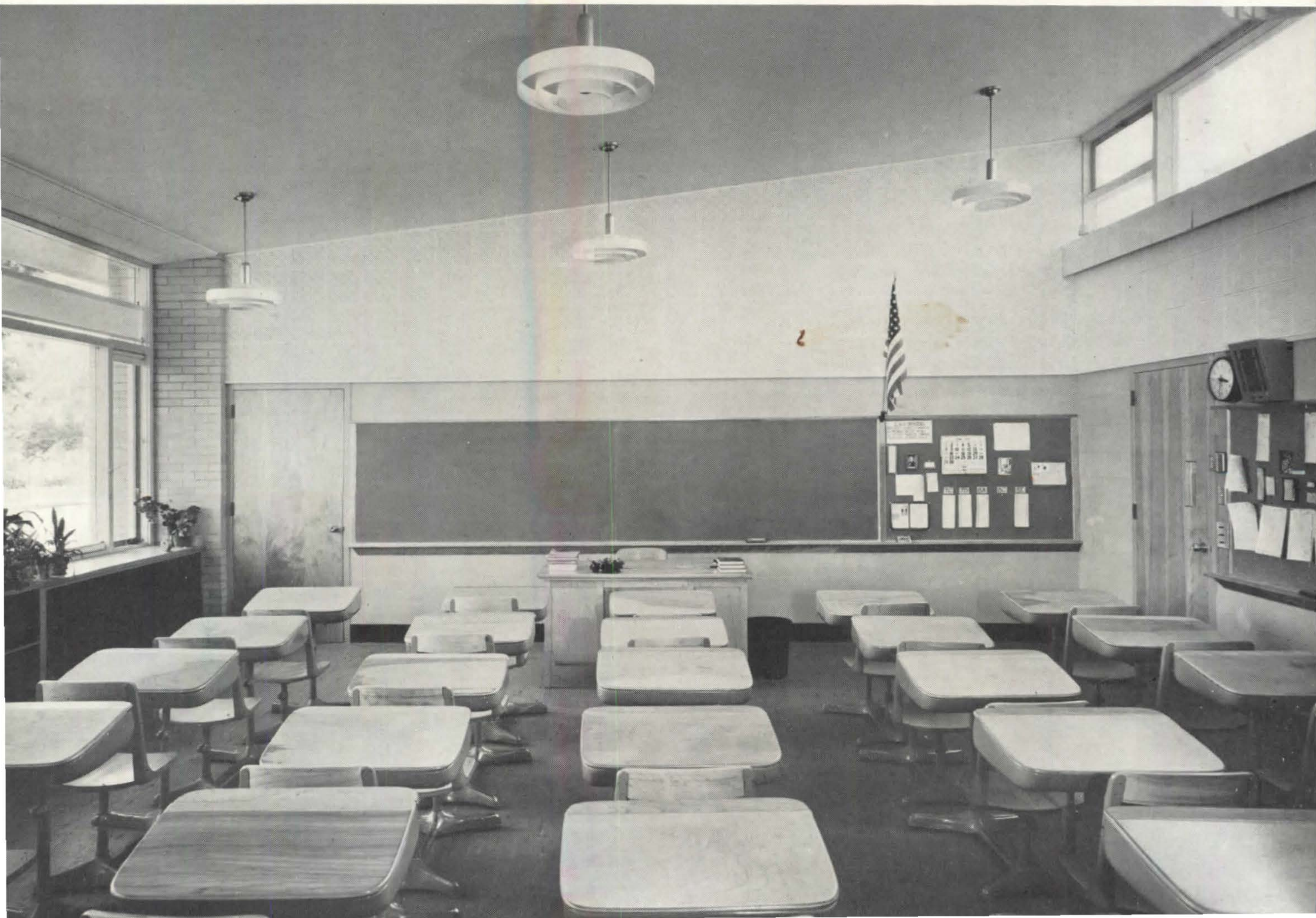
According to Pierre B. Lonsbury, Chairman of the Attleboro School Committee, "the administrative and teaching staff are enthusiastic . . . The pupils seem to have a better spirit than is seen elsewhere, partly by contagion from the enthusiasm of the staff, partly from appreciation of their surroundings."

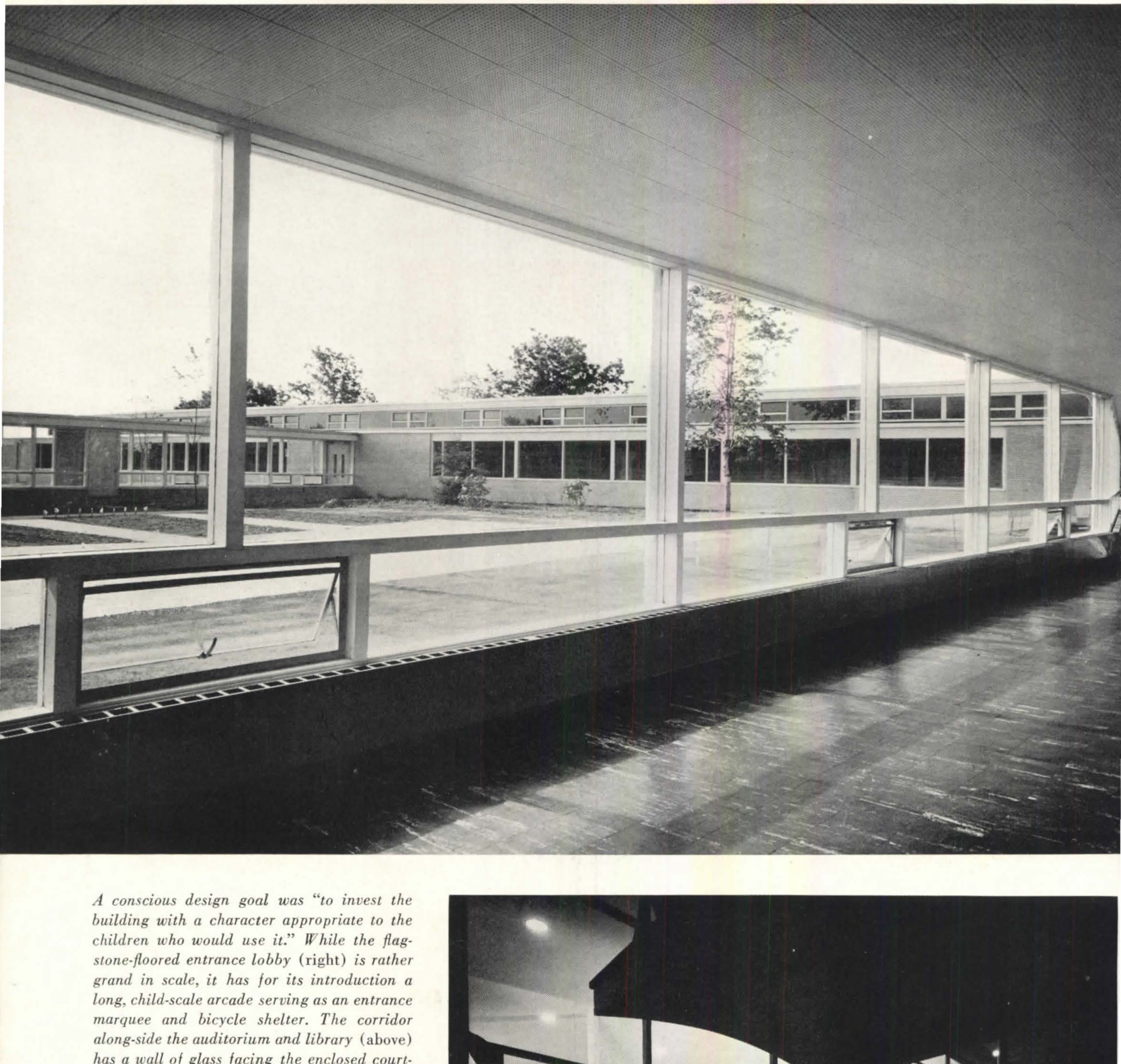


Typical classrooms in the one-story south wing (above, right, and acrosspage) *have large, south-facing windows, protected by the roof overhang, and obtain bilateral lighting from a north-facing clerestory. "Teachers seldom find occasion to turn on lights," reports Superintendent Barber, "since outside light is so generously admitted . . . Light-meter readings tell an almost unbelievable story of daylight utilization . . . Morale of both teachers and pupils has been very high in this building."*

junior high school

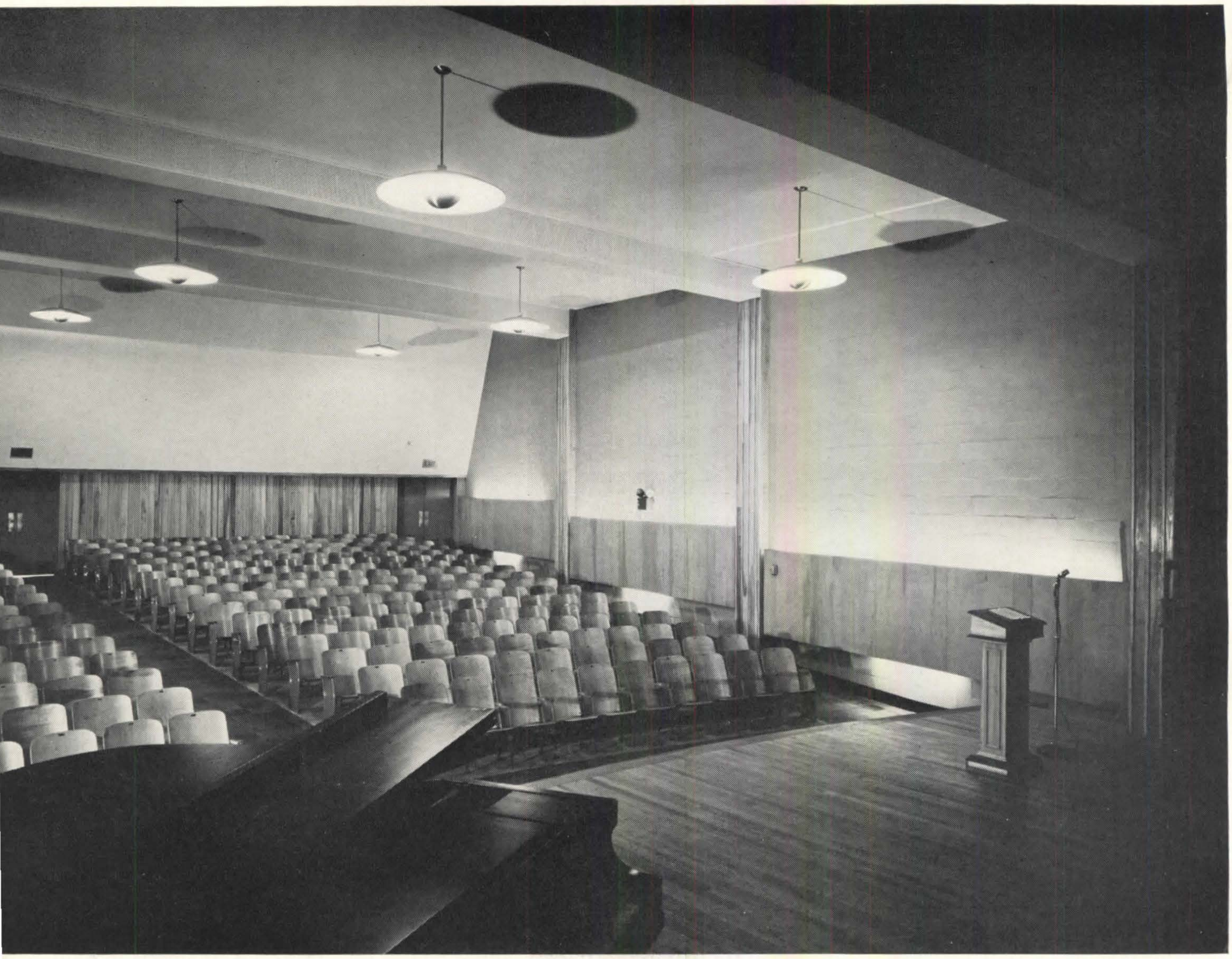
Corridors (left) *and classrooms have asphalt-tile floors. Corridor ceilings are acoustic tile. Plaster is used for ceilings of classrooms, except for a strip of acoustic tile just inside the south windows. Interior walls of classrooms are painted concrete block, with acoustic-tile surfacing on upper portions.*

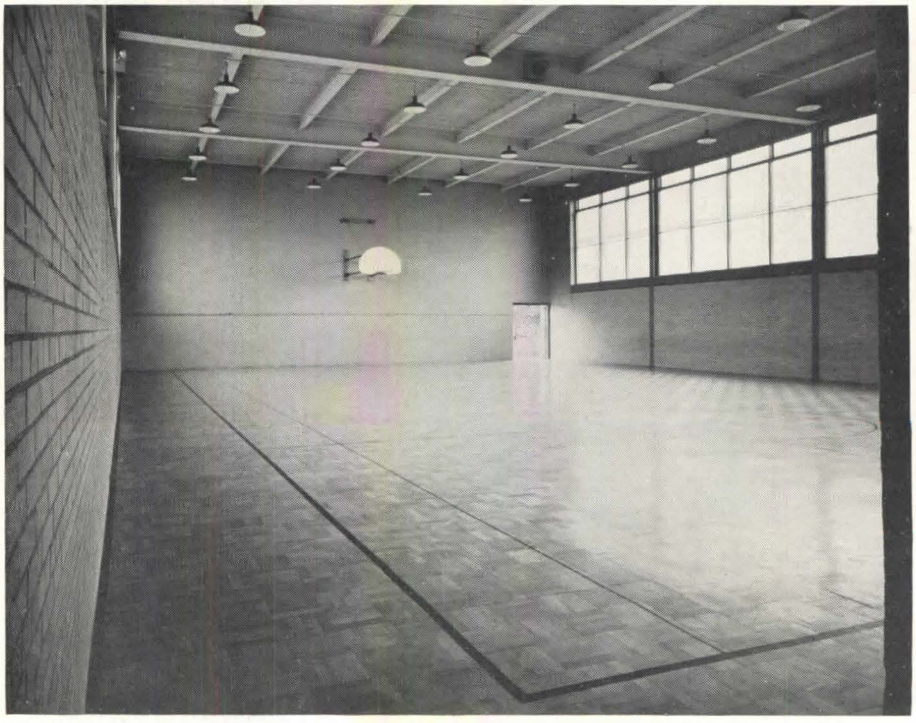




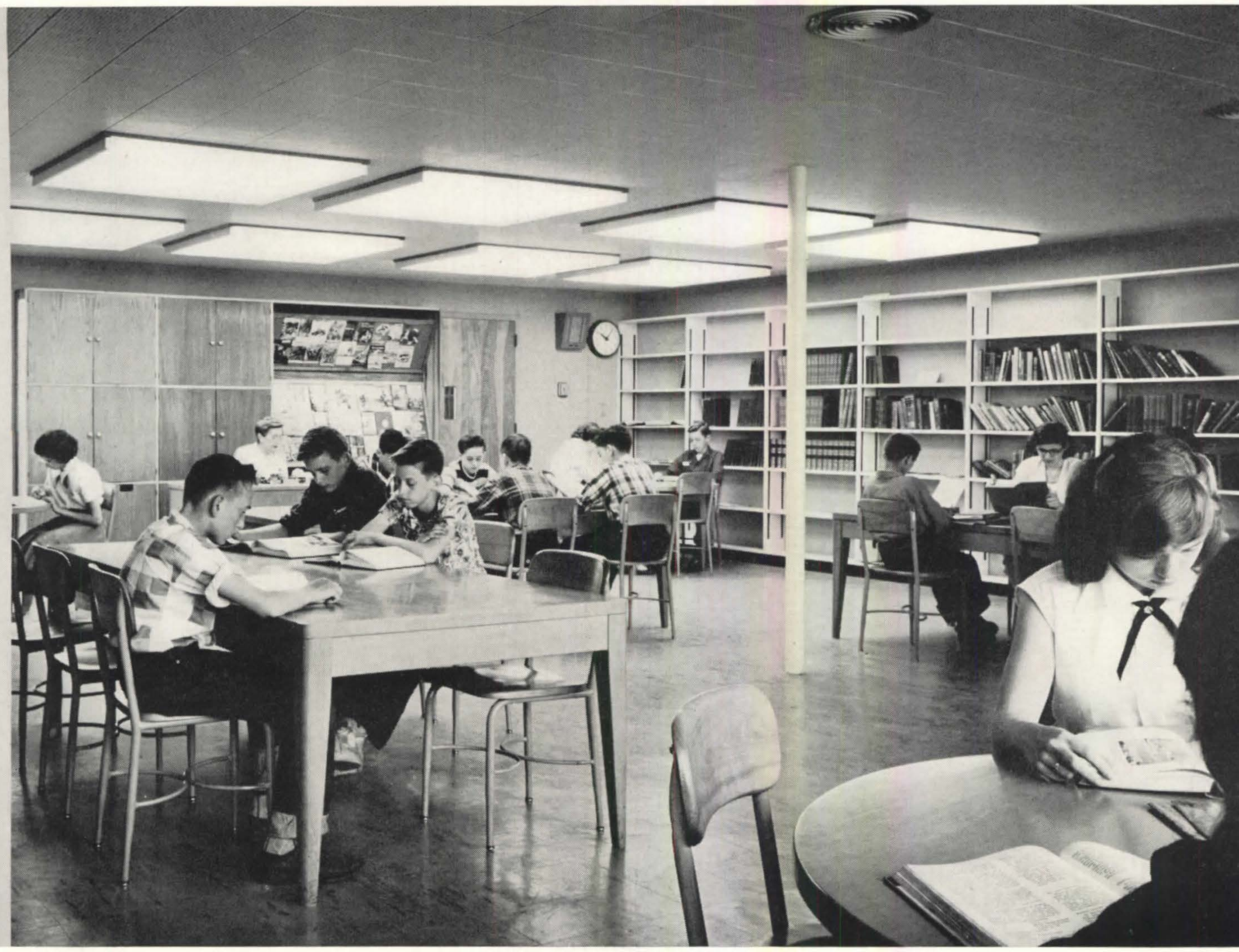
A conscious design goal was "to invest the building with a character appropriate to the children who would use it." While the flagstone-floored entrance lobby (right) *is rather grand in scale, it has for its introduction a long, child-scale arcade serving as an entrance marquee and bicycle shelter. The corridor along-side the auditorium and library* (above) *has a wall of glass facing the enclosed courtyard.*

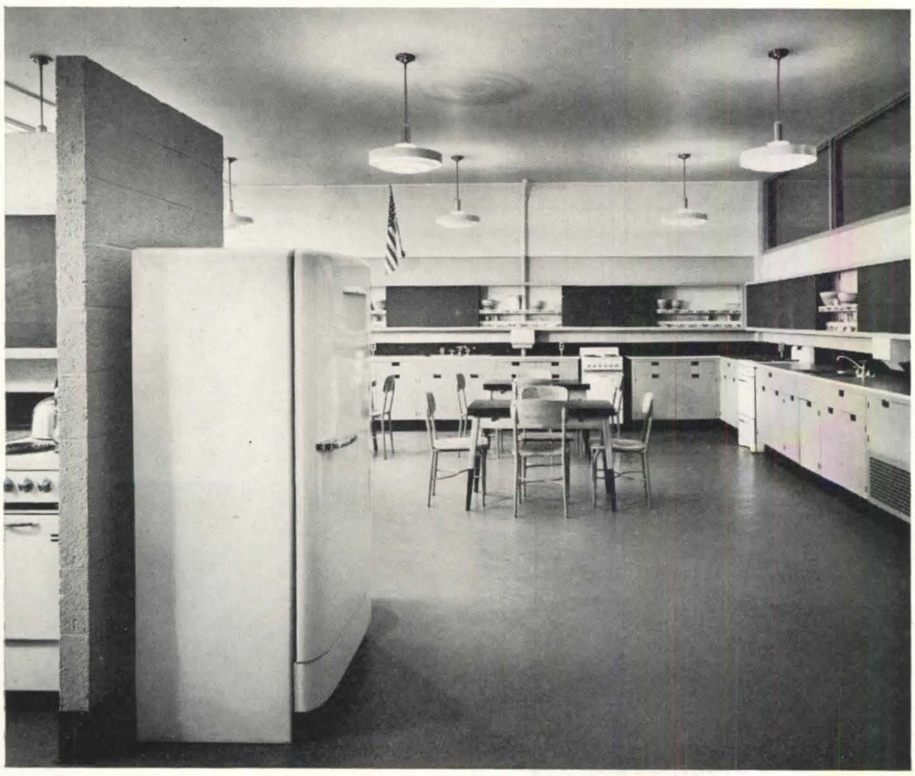
To introduce a feeling of warmth and avoid the monotonous tunnel effect, some corridors, like the one in the special classroom wing (left) *have walls of natural cypress siding. "We sought to articulate the separate functions as clearly as possible," the architects say. In joining the wings, for example, connecting corridors or stair halls were used to separate elements. Two examples are the glass connection between classroom wings* (below, left), *and the two-level connection to the locker rooms and gym* (below, right).





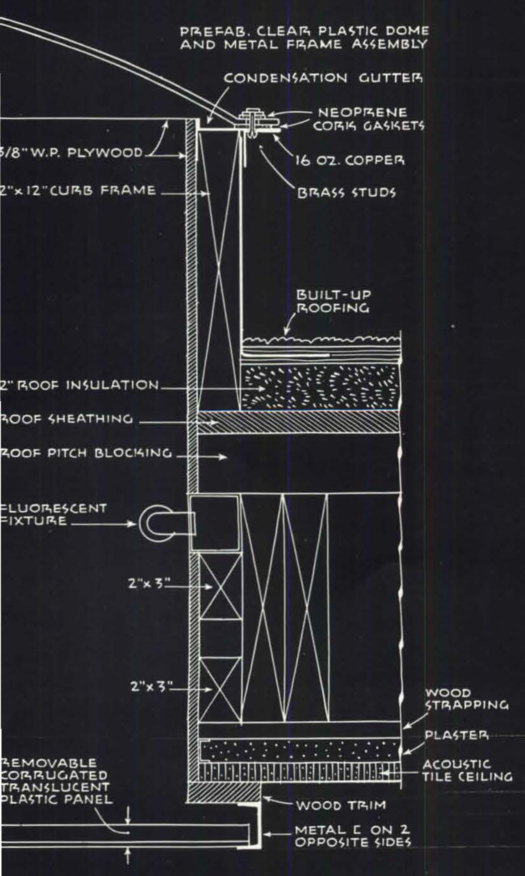
The wide separation of the group-use rooms, such as the auditorium (above and across-page) *and gymnasium* (right), *makes it possible to carry on different activities at the same time without interference with each other and wholly independent of the classroom wing. For detailed discussion of acoustical provisions, see page 77.*



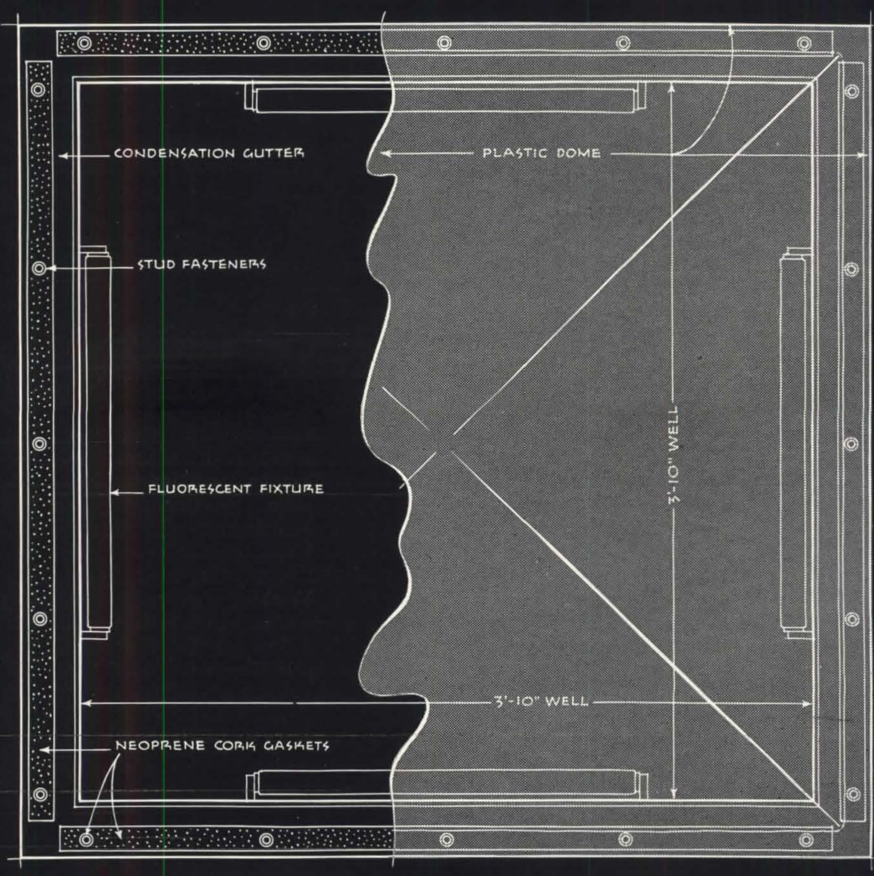


Facilities used by the entire school—auditorium and library (above) *serve as the connecting link between the one-story typical classroom wing at the rear and the two-story forward block that houses special classrooms — home economics* (left); *science room* (acrosspage), *art room, health room, and (on the ground floor) wood and metal work shops*

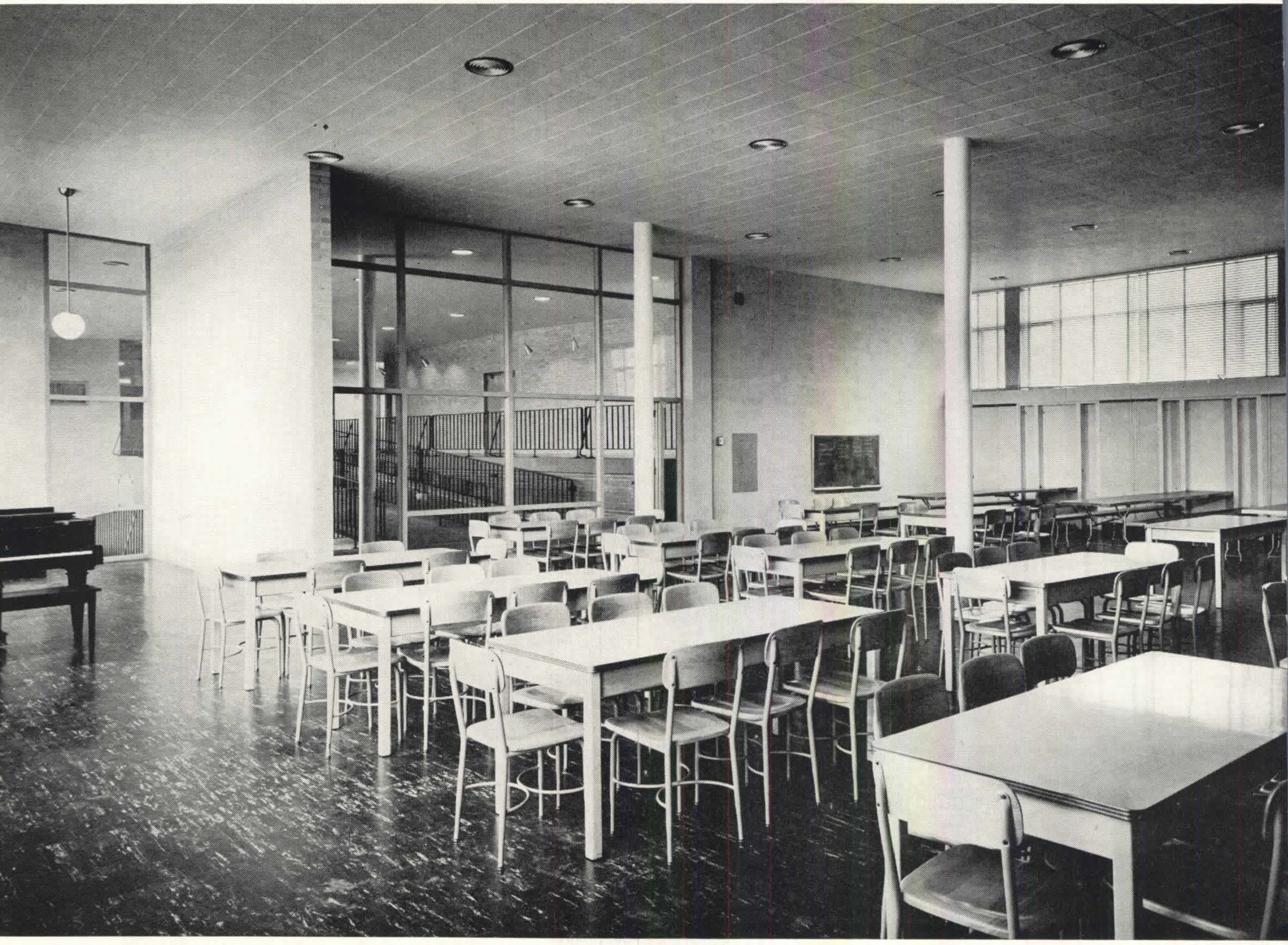
The upstairs corridor and interior portion of the library are lighted by plastic-dome skylights (detail, below), *in addition to light borrowed from corridor clerestories. The centralized sound system and electronic clock and program signaling systems are described in detail on page 78.*



Curb Section 1 1/2" SCALE



Plan of Skylight 1" SCALE



The cafeteria, conveniently located at the halfway point of the entrance ramp, is variously used as a music room, a study hall, a committee meeting room, dramatics rehearsal room, PTA meeting room, dancing classroom, and cloak room, to serve evening activities in the auditorium. Fold-away tables along the interior wall allow a quick change of activities, or two activities to proceed simultaneously.

construction

Foundation: poured concrete: portland cement—Lehigh Portland Cement Company; reinforcing bars—Joseph T. Ryerson & Sons. **Frame:** steel—Groisser & Schlager Iron Works. **Floors:** concrete slab. **Roof:** perlite slab—Perlite Corporation. **Wall surfacing:** exterior: brick—Hanley Company, Belden Brick Company; interior: painted concrete block; glazed structural tile in rest rooms, toilets—Hanley Company. **Floor surfacing:** asphalt tile in classrooms and corridors, cork for auditorium aisles—Kentile, Incorporated; maple gym flooring—Robbins Flooring Company; nonslip, plastic composition floor covering—American Abrasive Metals Company. **Ceiling surfacing:** plaster; acoustical tile—Celotex Corporation. **Roof surfacing:** built-up—Allied Chemical & Dye Corporation, Barrett Division. **Waterproofing, dampproofing:** all walls *between* brick and inside concrete block—Chapman Waterproofing Company. **Insulation:** acoustical: fiberboard on roof slab—Celotex Corporation; thermal: precast planks of wood shavings with cement binder in auditorium and gym—Durisol, Incorporated. **Roof drainage:** cast-iron and copper drains. **Partitions:** concrete block; metal toilet partitions between stalls—Henry Weis Manufacturing Company. **Windows:** wood subframes — Hudson Door Company; metal opening vents — Detroit Steel Products Company; plate glass—Pittsburgh Plate Glass Company; acrylic-plastic, domed skylights—Wasco Flashing Company. **Doors:** natural birch, solid-core interior—Crooks Door Company; hollow metal doors and metal door frames — Waxman Company. **Hardware:** semi-recessed locksets—Schlage Lock Company. **Paint, stain:** interior: concrete block sealer, resin-based water-paint—California Stucco Company; shellac—Pittsburgh Plate Glass Company; varnish—Thompson Porcelite Company; wood, oil coats.

equipment

Kitchen: Faust Company. **Intercommunication:** sound system—Stromberg-Carlson Company; clock and bell system—International Business Machines Corporation. **Lighting fixtures:** offices: fluorescent, recessed, classrooms: concentric-ring incandescent, shops: fluorescent—Gill Glass Company; auditorium: fluorescent lamps along aisles, incandescent pendant fixtures, stage: incandescent—Gotham Lighting Corporation. **Electrical distribution:** rigid conduit—National Supply Company, Spang-Chalfant Division. **Plumbing and sanitation:** lavatory fixtures, drinking fountains—American Radiator & Standard Sanitary Corporation; flush valves—Sloan Valve Company. **Heating:** cast-iron boilers—H. B. Smith Company, Incorporated; fin-tube convectors—American Radiator & Standard Sanitary Corporation, Shaw-Perkins Manufacturing Company; classroom unit ventilators—John J. Nesbitt, Incorporated.

For "realization of the school," TAC ask special credit to Richard A. Martin, Super intendent of Schools during the early stage of design; Dr. Anson B. Barber, presen Superintendent; William A. Nerney, Chair man of the School Committee during th design phase; Pierre B. Lonsbury, presen Chairman; Victor G. Vaughan, who was o the School Committee at the time of th school-planning competition; and Cyril K Brennan, Mayor of the City of Attleboro

junior high school, attleboro, massachusetts

acoustics considerations

by Bolt, Beranek, and Newman*

In every school building there are many areas in which acoustics must be considered. The primary aim of architectural acoustics design is to achieve both a *comfortable acoustic environment* and *good hearing conditions.* A satisfactory or comfortable acoustic environment may be one which is very quiet; at times, however, it may be desirable to have a more "lively" surrounding. In spaces where hearing conditions are important, it is essential that the background noise levels be very low, that there be a good distribution of sound, and that successive sounds are properly separated for good articulation. These ends are sometimes achieved through careful shaping of rooms and, in some cases, with unusual structural and finish details.

For a public school, however, such measures are seldom justified, and one must attempt to achieve satisfactory acoustics within the framework of simple and economical construction. These considerations were kept in mind in the study of the acoustics problems in this school. In a number of areas where noise control was the primary problem, over-all sound absorbing ceilings have been used. The corridors and links, for example, have their ceilings covered with acoustic tile, both to make them less reverberant and thus quieter, and also to minimize the transmission of noise from one part of the building to another. In the cafeteria and gymnasium the problem is one again of noise repression, and general ceiling treatment has been used. The library is inherently a quiet area, and here acoustic treatment has been used in the ceiling to minimize the noises of occasional conversations, walking, etc. In most of these areas the ceilings are treated with a standard perforated acoustic tile cemented to ¾ in. plaster. In the gymnasium, the needed sound absorption is obtained from the wood-fiber roof plank which serves a threefold function of structure, heat insulation, and sound absorption. This type of multiple use of material can often effect real economies in providing the satisfactory environment.

In a number of areas, the principal problem was one of providing good hearing conditions, rather than one of simple noise suppression. In the typical classroom, for example, almost all of the ceiling area is finished in hard sound-reflecting plaster. The sound-absorbing material necessary for reverberation control is confined to peripheral areas. Acoustic tile has been placed on the walls above the line of door heads at the ends of the room and under the clerestory windows. In addition to these wall areas, a narrow strip of sound-absorbing material has been placed on the ceiling at the windows. This type of treatment makes the conduct of classes much easier by providing reinforcement from the ceiling and by giving an optimum reverberation characteristic. The more conventional treatment of the entire ceiling in a classroom eliminates the very useful reflections of sound from the ceiling and, in many cases, makes the room too "dead."

The interior shape of the auditorium follows closely its exterior form and, for reasons of economy, there was no attempt to shape the ceiling. This is not a large room, having a seating capacity of only about 400, and although hearing conditions can often be materially improved with more elaborate ceiling and wall shaping, it was not felt justified here. As in the classrooms, the central portion of the ceiling is used as a sound-reflecting surface and is finished in hard plaster. Such a treatment aids in providing more uniform hearing conditions throughout the auditorium by building up the intensity of sound toward the rear of the room. The sound-absorbing materials necessary for reverberation control are placed on surfaces from which reflections are not wanted. The treatment thus serves the dual function of controlling reverberation and unwanted reflections. The rear wall, for example, is tilted forward above the door-top height and is treated with an acoustic tile. This minimizes the possibility of an annoying echo from the rear of the room, and, at the same time, affords considerable reverberation control. In addition to the rear wall treatment, a 4 ft strip of sound-absorbing material is placed along each side of the ceiling. This gives some general distribution of treatment in the room. and again, is placed where useful reflections cannot be obtained.

The reverberation characteristics of the auditorium will vary with the size of the audience and a compromise solution has been reached assuming an average audience size. Thus the room may seem slightly "dead" when it is fully occupied and slightly reverberant when empty. The only solution to this problem is the use of upholstered chairs, and this can seldom be done in a public school.

* *Consultants in Acoustics, Cambridge, Mass.*

junior high school, attleboro, massachusetts

communication systems

by George I. Savage*

THE ELECTRONIC CLOCK AND PROGRAM SYSTEM. Manufactured by the International Business Machines Corporation, this equipment represents the latest development in clock and program-signaling equipment effecting accuracy, flexibility, and economy.

The twenty-nine clocks located in classrooms, offices, etc., throughout the school are individually checked once each hour by an electronic impulse emitted from an electronic transmitter timed by a master time control.

The master time control acts as a director of the system and maintains true time —continuing to operate even during a commercial power failure for approximately eight hours. Each time-indicating clock is operated directly from the 60 cycle alternating current lighting lines with no wired connection to the master clock. Once each hour a signal timed to the second is released by the master time control and transmitted electronically via a transmitter connected to the main power lines entering the school. Upon receipt of the hourly supervisory signal, each clock initiates its own self-corrective cycle by means of an electronic receiver. At this instant one of three conditions must prevail: (a) the clock is on time to the second; (b) it is ahead of system time; or (c) it is behind system time.

(a) When an indicating clock is on time, it continues its normal operation with no outward evidence of supervision.

(b) When it is ahead of system time, its hands pause at the next even minute until the exact time for resuming operation.

(c) When it is slow, it will reset itself to exact time at 60 times its normal operating speed.

The transmitter utilized in this installation is capable of providing four separate electronic frequencies. Therefore, in addition to operating the clocks electronically, it is also possible to utilize the remaining three frequencies for the electronic control of classroom signals. In this installation these frequencies which constitute three separate circuits for signals, are divided among the corridor bells and the outside gongs.

The program signals operate from electronic relays which receive impulses timed by the master time control and are electronically transmitted throughout the school. Thus, any need for special wiring from the individual bells back to the master clock is eliminated.

Since no special wiring is employed to operate this system, clock or program bell locations can be changed at any time or new locations added by merely connecting additional units to the nearest available alternating current line.

THE CENTRALIZED SOUND SYSTEM. With this system, manufactured by the Stromberg-Carlson Company, it is possible to broadcast radio programs, phonograph programs, or various speeches and announcements throughout one, several, or all the rooms equipped with individual loud-speakers. In this manner, the principal of the school can make announcements to any one or several classrooms.

A feature enabling announcements to be made through the whole school serves a multifold purpose. Fire drills and calls of emergency nature can be made instantaneously by use of this public address system. Heretofore, instructions of an urgent nature, or otherwise, were accomplished by messenger service.

Each room equipped with a loud-speaker is also equipped with a switching device whereby the room instructor can signal the main office that he wishes to intercommunicate. Intercommunication is then accomplished by means of the sound system equipped for two-way conversation.

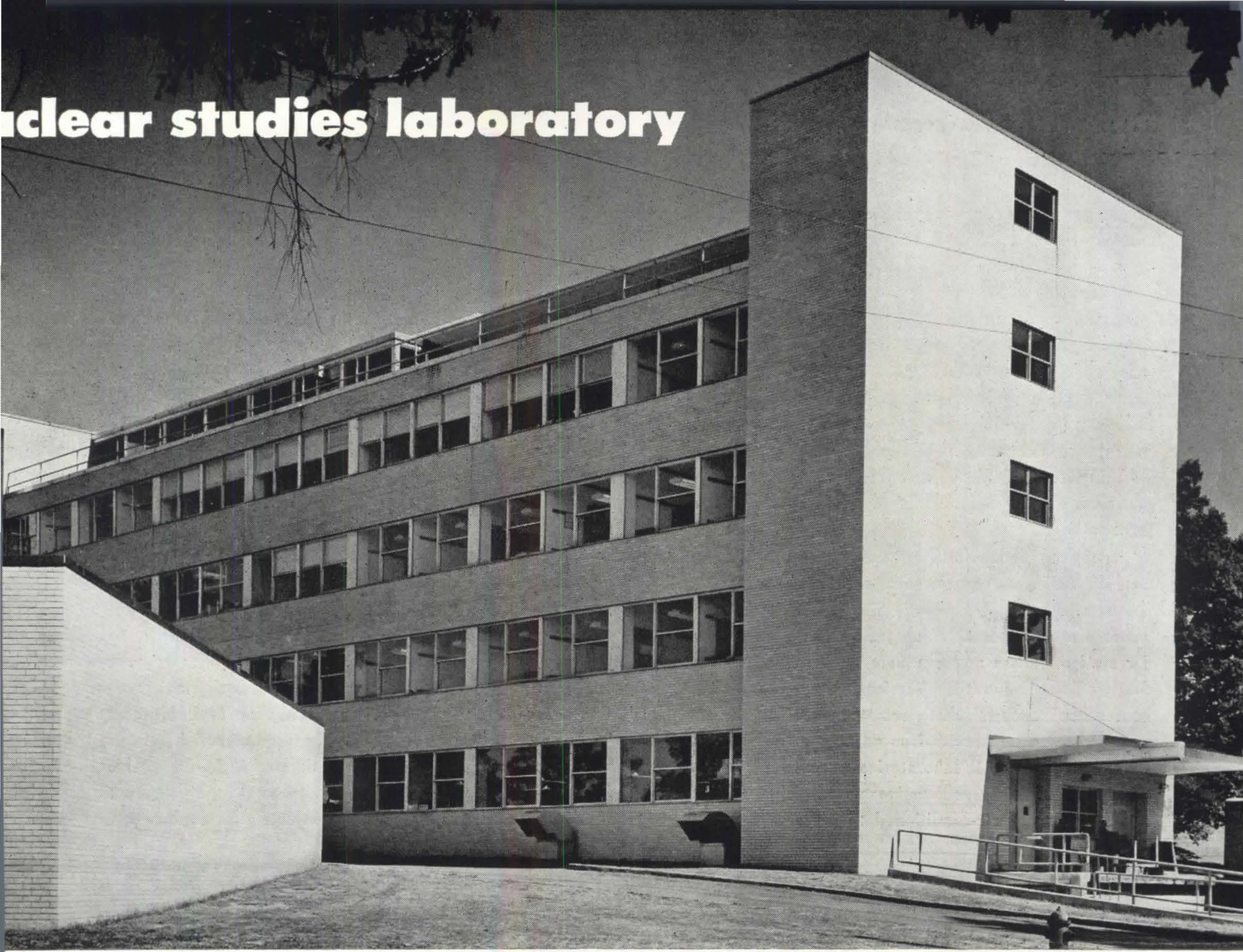
Another detail, but of relative importance, is the supervisory signaling device which is part of the console equipment. In the event that the classroom loud-speaker is connected to the intercommunication channel, an intermittent, automatic, audible signal is transmitted through the respective room speaker, indicating that that particular room speaker is connected to the intercommunication channel.

With this equipment three separate programs can be broadcast simultaneously.

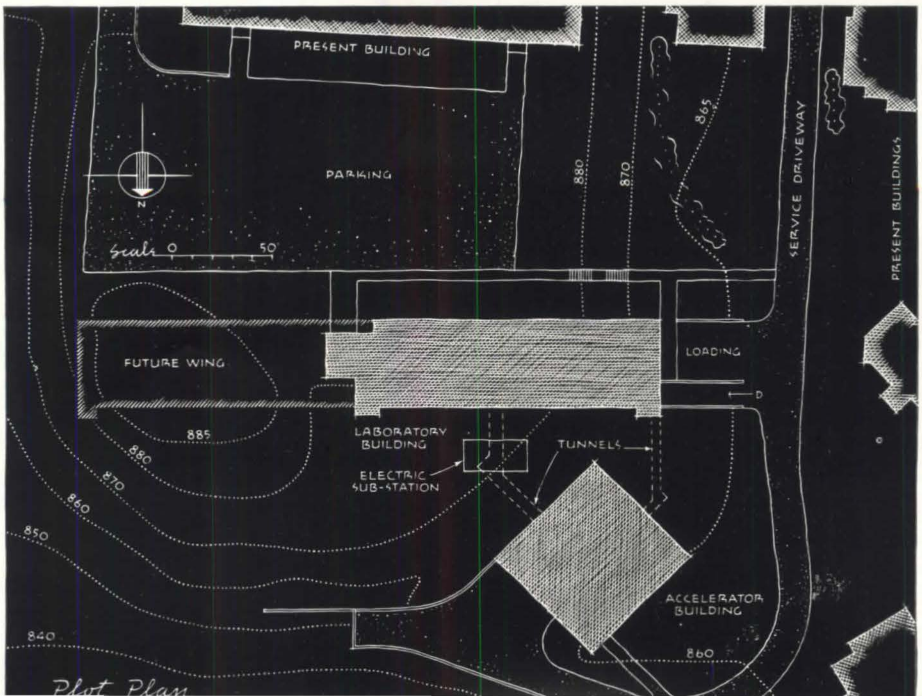
Although a part of the centralized sound system, the sound systems for the gymnasium and auditorium operate independently; facilities are provided, however, so that they can be connected to the central system. This enables microphone programs originating in either the gymnasium, the auditorium, or the main office to be broadcast throughout the entire school.

* *Chief Electrical Engineer and Director, Thomas Worcester, Inc., Mechanical Engineers, Boston, Mass.*

clear studies laboratory



client	Cornell University
location	Ithaca, New York
architects and engineers	Skidmore, Owings & Merrill
structural engineers	Strobel & Salzman
mechanical engineers	Guy B. Panero
general contractor	Barr, Gleason & Barr



nuclear studies laboratory

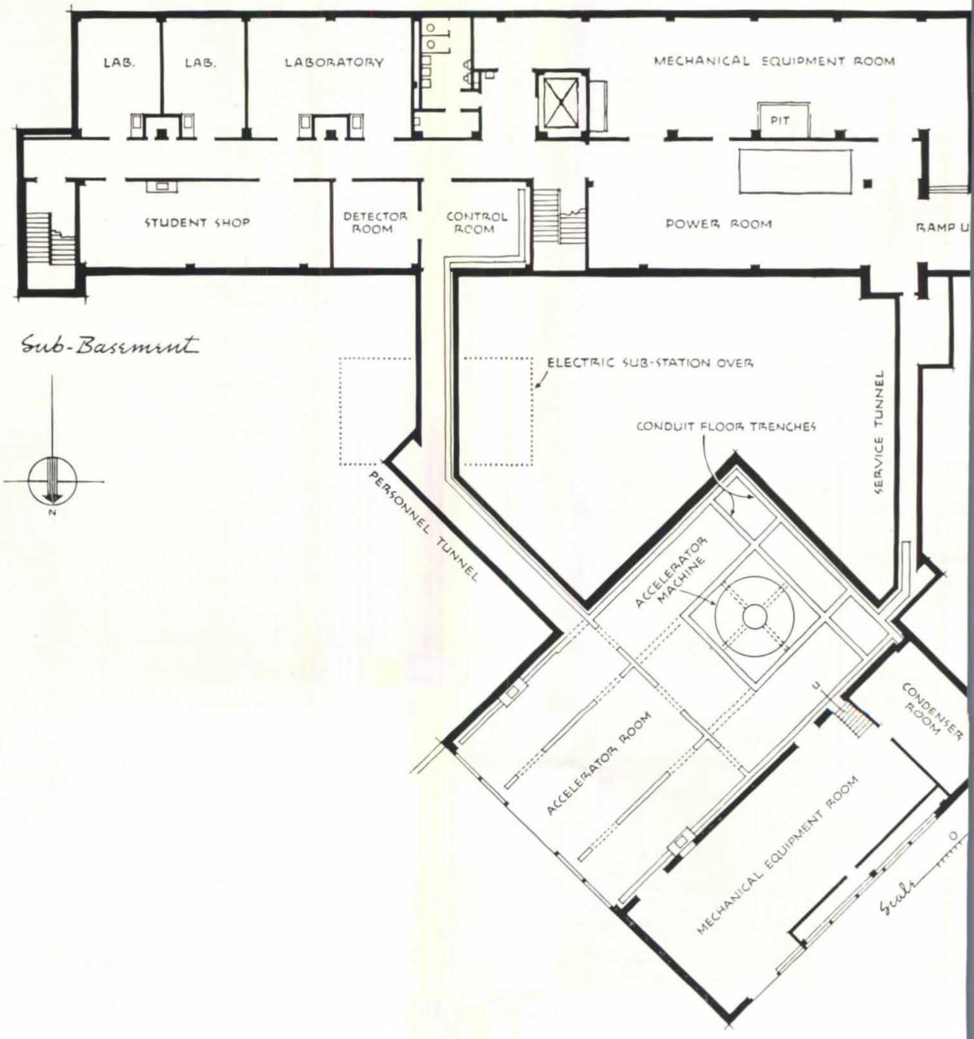
Recognizing the growing importance of nuclear research, Cornell University trustees in 1946 authorized a laboratory for fundamental study of the elementary particles of nature and forces that act between them. Constructed to further this vital work was the research building shown here—the Floyd Newman Laboratory of Nuclear Studies, named for the Cleveland petroleum industrialist who donated the building funds. Contemplated future expansion would double the size of the present facility.

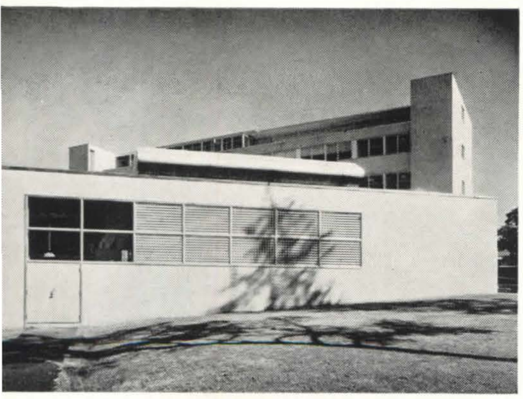
As the architects state it, "the problem was to house an accelerator mechanism (a synchrotron) for atomic fission and provide nuclear research laboratory space for staff scientists and graduate students. Staff offices, laboratory services, shops, conference rooms, and remote-control areas were to be provided as adjunct requirements . . . All laboratories were to care for low-level radioactive materials and were to be air-conditioned to insure evenness of temperature for experiments. The accelerator was to be shielded from other areas."

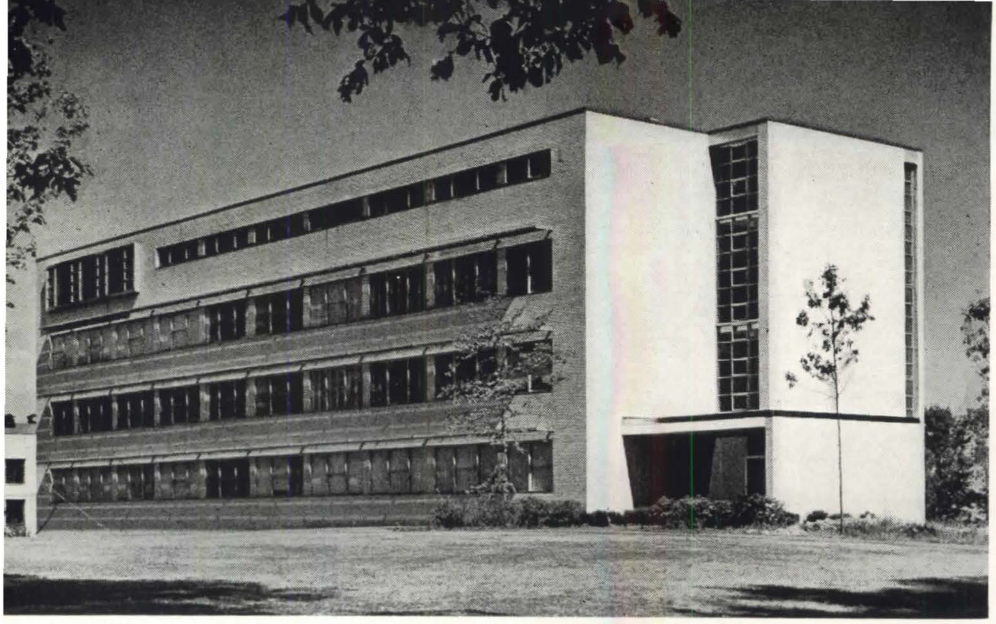
The site is a plateau sloping sharply downward on the west side. The building is placed to take advantage of this condition, allowing outside access to two levels below the main entrance floor; upper floors contain the laboratories and offices; on the lower floors are storage space, shops, control rooms, etc.; the roof level contains a cosmic-ray laboratory, open terrace, and staff recreation facilities.

The accelerator is located in an outbuilding to provide shielding protection to the habitable lab building. Here again, the grade slopes allowed placement of this structure in such a way that it is above grade at the outside entrance level, but built into the ground adjacent to the laboratory building. "The earth between provides excellent radiation shielding," the architects comment. Two underground tunnels—one for pedestrians, the other for service lines—connect the two buildings. Control and detector rooms occur at the lab-building end of the personnel tunnel.

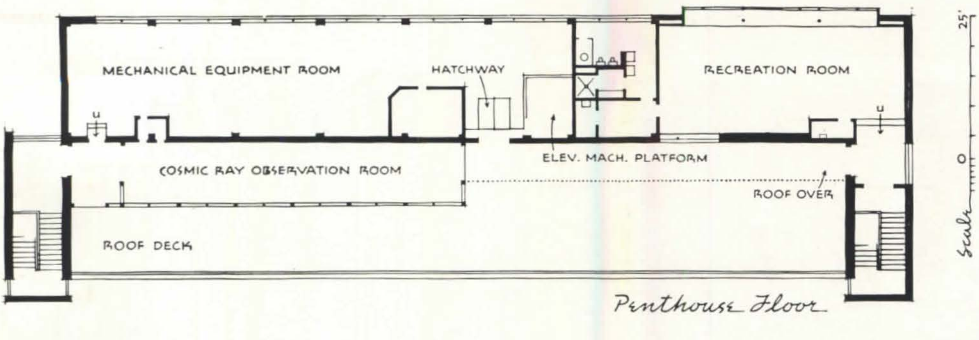
Of reinforced concrete construction, the laboratory is built on spread footings; filler walls are of light gray brick with concrete-block backup; aluminum sash are glazed with polished plate glass. Above the south windows, continuous aluminum louvers provide sun control. In general, interior walls are plaster on metal lath, though ceramic tile is used in certain areas, and partitions include steel and structural glass in addition to the standard cinder block. Floor surfaces are concrete, asphalt tile, or quarry tile. Acoustical insulation is cane-fiber type, and cellular glass is used for thermal insulation. Lighting throughout is fluorescent, while the heating system, served from the University plant, is steam. In the accelerator building, unit heaters are used. Both structures are completely air conditioned.

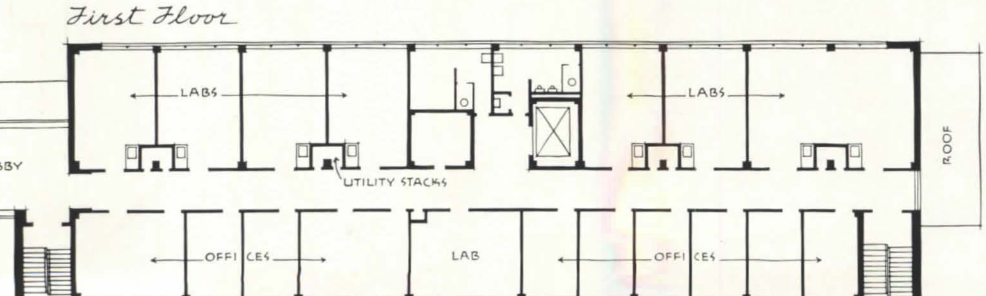


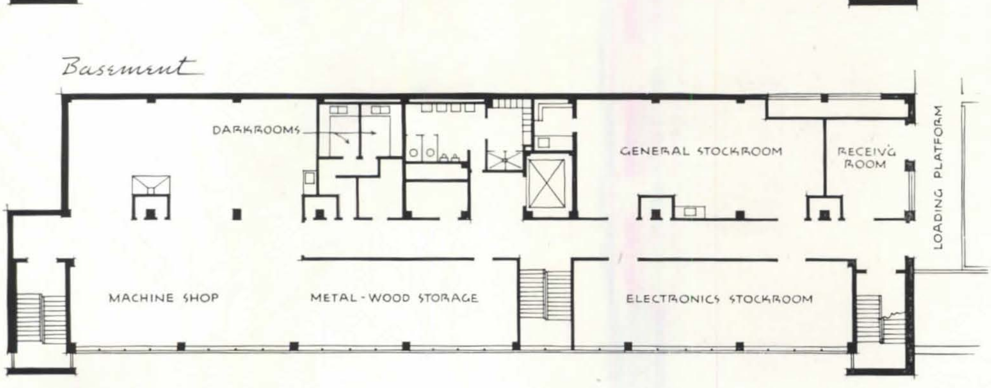


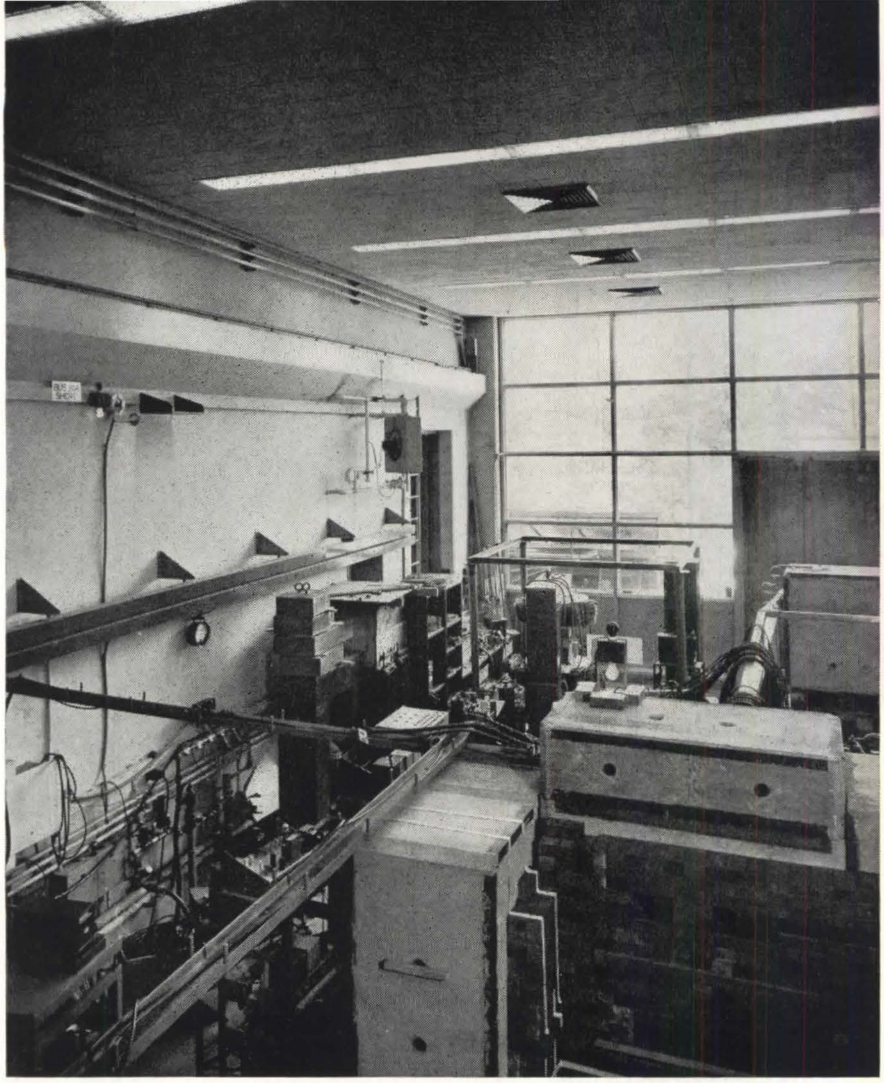


Prominent elements of the south front (above) *are the window bands with aluminum, louver sunshades above them* (right, top), *and the main entrance and lobby* (center and bottom). *The large window at the far end of the top floor marks the staff recreation room.*
Photos: Gottscho-Schleisner



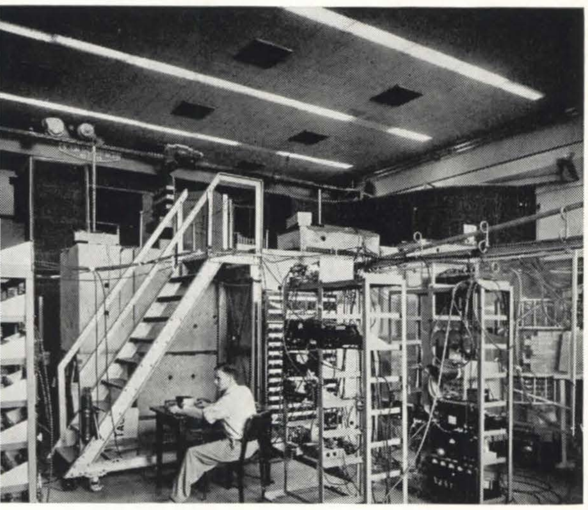




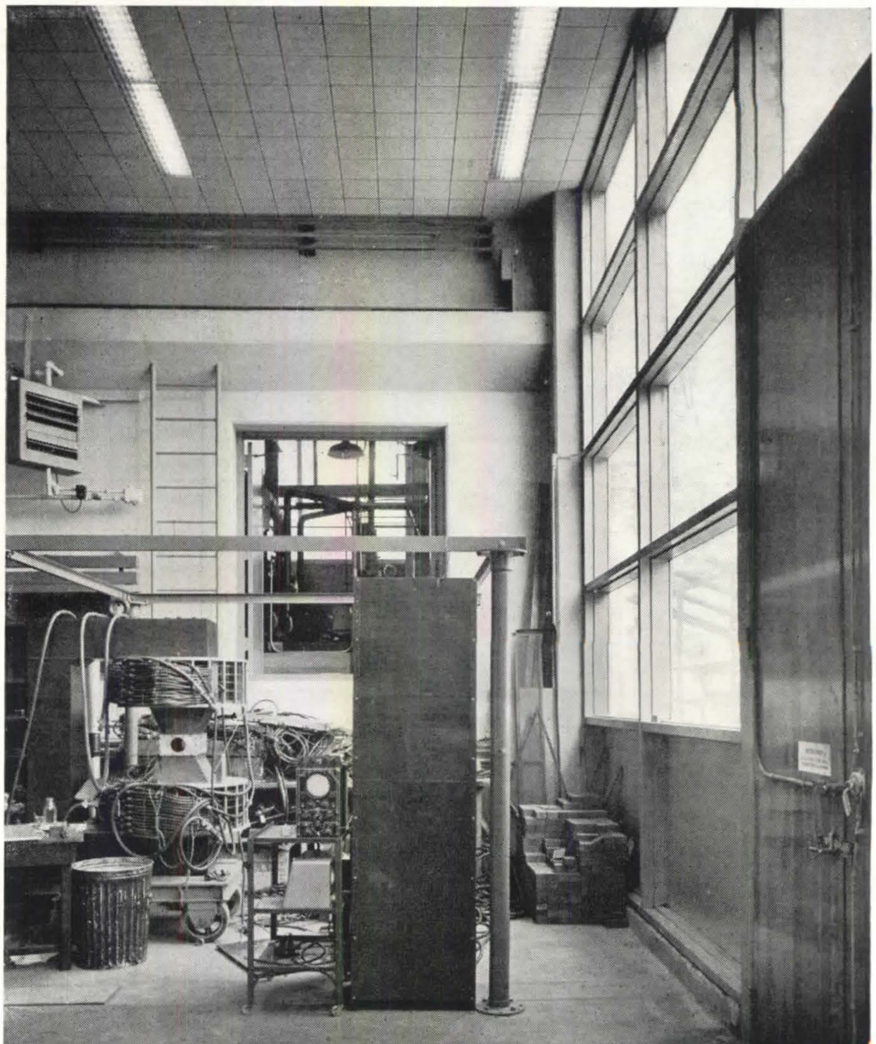


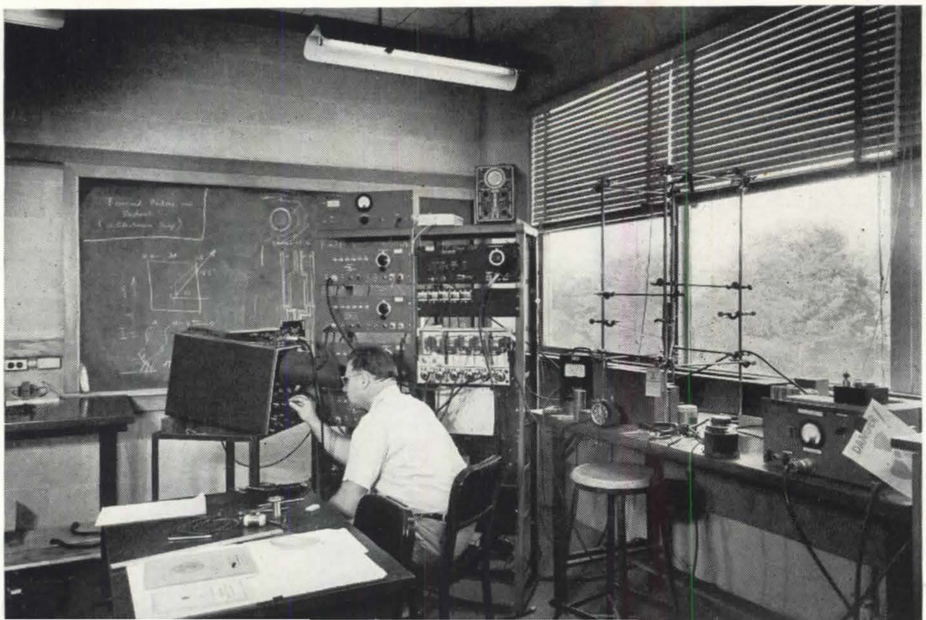
nuclear studies laboratory

A huge window in the south wall of the rooftop recreation room (acrosspage, top) *commands a view over the Cornell campus. Typical laboratories* (other two photos) *face south and have acoustic-tile ceilings and asphalt-tile floors. Offices occur across the corridor, along the north wall.*



The accelerator building (three photos, this page) *is joined to the main laboratory building by two underground tunnels, but the slope of the site allows natural daylighting and outside access at grade.*





construction

Foundation: spread footings. **Structure:** reinforced concrete: reinforcing bars—Bethlehem Steel Company. **Walls:** light gray brick—Hanley Company. **Floors, roof:** concrete. **Wall surfacing:** interior: metal lath, plaster, ceramic tile; accessories—Inland Steel Products Company. **Floor surfacing:** asphalt tile—Johns-Manville Corporation. **Dampproofing:** asphalt plasterbond—Toch Brothers, Incorporated. **Insulation:** acoustical: mineral fiber tile—Celotex Corporation; thermal: cellular glass panels—Pittsburgh Corning Corporation. **Roof drainage:** drains—Flockhart Foundry Company. **Partitions:** interior: cinder block; rest rooms, toilets: steel—Flush Metal Partition Corporation; structural glass—Mississippi Glass Company. **Windows:** aluminum sash—Adams & Westlake Company—Libbey-Owens-Ford Glass Company; calking. **Doors:** interior: flush veneer, solid core—Hyde-Murphy Company; steel, rolling overhead—Kinnear Manufacturing Company; aluminum entrance, in Accelerator Building—General Bronze Corporation. **Hardware:** P & F Corbin Division, American Hardware Company. **Paint:** Devoe & Raynolds Company.

equipment

Kitchen: steel cabinets—Excel Metal Cabinet Company, Incorporated; refrigerator—Westinghouse Electric Corporation. **Elevators:** monorail hoisting equipment—Shepherd Niles Crane & Hoist Corporation; cabs—Warsaw Elevator Company. **Lighting fixtures:** all fluorescent—Monarch Lighting Fixture Corporation. **Electric distribution:** service entrance switch—Westinghouse Electric Corporation; panelboards—Cole Electric Products Division, Federal Electric Products Company, Incorporated; cable—General Cable Corporation; conduit—Central Tube Company; wiring devices—Hart & Hegeman Electric Company; air-cooled transformers—Westinghouse Electric Corporation. **Plumbing, sanitation:** fixtures—American Radiator & Standard Sanitary Corporation; water-closet flushometers—Sloan Valve Company; safety showers—Speakman Company. **Heating:** unit heaters in Accelerator Building—Clarage Fan Company. **Air Conditioning:** Carrier Corporation.

hospital radioisotope laboratories

by Carl B. Braestrup* and Edith Quimby**

The use of radioisotopes in diagnosis and therapy has passed the experimental stage and is now routine in many hospitals. Since the safe and efficient employment of radioisotopes requires adequate laboratory facilities, it is important in the planning of new hospitals to determine whether they are likely to be used.[1]

While not all hospitals require isotope laboratory facilities at the present time, it may in many cases be advantageous at least to make arrangements for their future installation without expensive alterations. It is not possible here to generalize as to what hospitals should provide the use of isotopes. It is not merely a question of size; it depends on local conditions, such as the availability of qualified specialists and the avoidance of duplication of nearby facilities.

The architect planning a hospital isotope laboratory needs the following information:

(1) Number of rooms required and approximate floor space.
(2) Preferred location in hospital and location of individual laboratory rooms in relation to one another.
(3) Special requirements: a) structural gamma ray shielding; b) ventilation; c) plumbing; d) floor loading.
(4) Built-in equipment: hoods, fixed laboratory benches.
(5) Detailed requirements: type of walls, floor and ceiling finish, size of doors, electrical outlets, etc.

The answers to these questions depend, to a large extent, upon the scope of the isotope program; that is, the type and the amount of isotopes to be used, and the nature of the clinical program.

The requirements of the radioisotope laboratory devoted mainly to research vary widely, and the architect usually has the advice of the scientists who are going to direct its activities. It is, therefore, not necessary here to consider the design of such specialized facilities. The purpose of this report is to provide the information required for planning the average hospital laboratory to be used primarily for hospital work. It is assumed, therefore, that the minimum facilities should permit the safe handling of the following isotopes: iodine, iron, gold, phosphorus, and cobalt *(as listed in Table I)*. Some of the data in this report have already been published[2] and more detailed information may be obtained from several Atomic Energy Commission and National Bureau of Standards reports.[3, 4, 5, 6, 7]

ROOMS REQUIRED AND FLOOR SPACE[8]

The laboratory should generally consist of at least three rooms *(as shown in Figures 1, 2, and 3)*.

(1) The high activity radiochemical laboratory for the handling and preparation of large amounts of isotopes, up to several hundred millicuries; this room should not be less than 150-200 sq ft. Directly connected with the radiochemical laboratory should be a storage space for radioactive isotopes and specimens; a closet 4 ft x 4 ft will usually suffice.

(2) A measuring or counter room for the assay of radioisotopes and the measurement of excretions and specimens for radioactivity, with minimum floor space 120-150 sq ft. This room may possibly be used also for up-take measurements on patients *(as shown in Figure 5)*, although it is preferable to do this in a separate room.

(3) Patients' up-take measurement room. This room is used to determine (usually by means of Geiger or scintilla-

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**Associate Professor Radiology (Physics), Department of Radiology, Columbia University, New York, New York

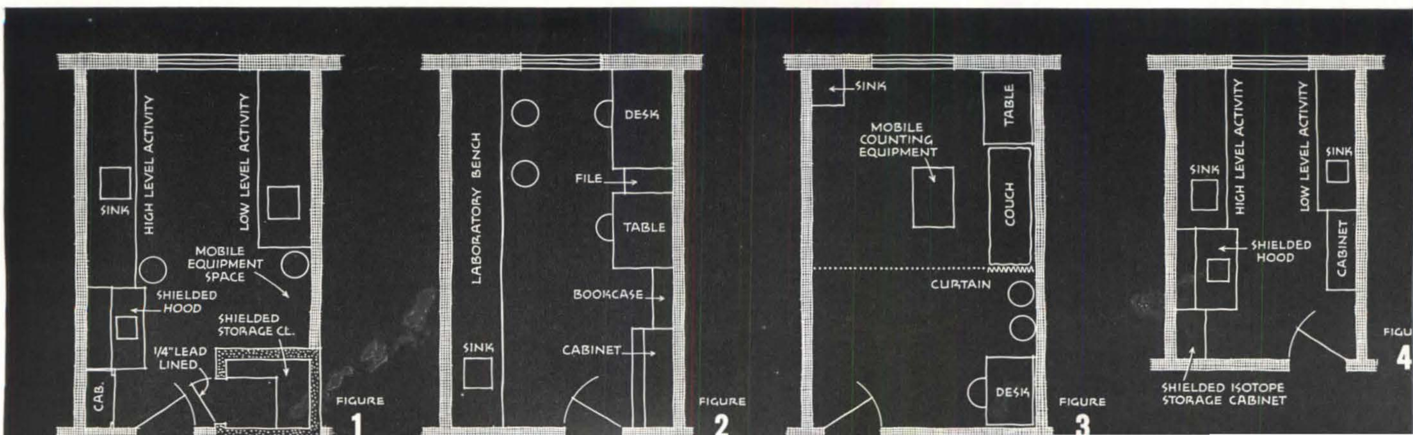
[1] Certain isotopes like cobalt-60 and cesium-137 usually do not require laboratory facilities; however, if used in teletherapy in place of supervoltage X-ray equipment, extensive shielding is required for the treatment room. The requirements vary widely according to location, etc.; an expert's advice is usually required to insure adequate protection at minimum cost.
[2] Quimby, Edith and Braestrup, Carl B.: "Planning the Radioisotope Program in the Hospital." The American Journal of Roentgenology and Radium Therapy, *Vol. LXIII, No. 1, January 1950.*
[3] Ward, Donald R.: "Design of Laboratories for Safe Use of Radioisotopes." Advisory Field Service Branch, Isotope Division, Atomic Energy Commission, Oak Ridge, Tenn., 1951.
[4] National Bureau of Standards Handbook 42. "Safe Handling of Isotopes." (Obtainable from Superintendent of Documents, Washington, D.C.)
[5] National Bureau of Standards Handbook 48. "Control and Removal of Radioactive Contamination in Laboratories and Hospitals."
[6] National Bureau of Standards Handbook 49. "Recommendations for Waste Disposal of P-32 and I-131 for Medical Uses."
[7] Building Research Advisory Board, Research Conference Report No. 3. "Laboratory Design For Handling Radioactive Materials." Sponsored by The American Institute of Architects and the Atomic Energy Commission, November 1951.
[8] Prepared isotopes ready for use are likely to be more readily available from commercial sources in the future. This will tend to reduce the required laboratory facilities.

Figure 1—radiochemical laboratory. Where an active radioisotope program is planned, it may be advisable to divide this laboratory into two rooms—one for low-level activity and one for high-level activity.

Figure 2—assay of radioisotopes and office. Only low-level isotopes are used in this room. Where space permits, it is desirable to have a separate room for office.

Figure 3—Patients' up-take measurement room. The door to this room should be sufficiently wide to permit the entrance of patients' beds. This room is used also for the administration of radioisotopes to patients.

Figure 4—small isotope laboratory-radiochemical laboratory. Shielded cabinet replaces closet for radioisotope storage.



design and recommendations

tion counters) the location and amounts of radioisotopes taken up by the patients after administration. The minimum satisfactory floor space is 120-150 sq ft. It should be so arranged that a stretcher can be brought into the room and should have additional space for a couch, movable table, and counting equipment.

LOCATION

In deciding upon the location of these rooms, first consideration should be given to their accessibility to the service most closely associated with the isotope program. In general, the radiochemical laboratory should be near the clinical laboratories, and readily accessible to the radiotherapy department, if its staff is responsible for the isotope service. Furthermore, where space is very limited the radiochemical laboratory may serve also as a radium preparation room. A top floor location of the radiochemical laboratory has the advantage of simplifying the exhaust of the isotope hood, since this cannot be connected to the general hospital ventilating system. On the other hand, a basement or ground floor location may permit the drains of the laboratory sinks to be connected directly to the main soil line of the hospital, thereby minimizing contamination of the local plumbing. This, however, is a minor consideration unless large quantities of isotopes are used.

The patients' measuring room should be readily accessible to both in- and out-patients and it need not be near the radiochemical and measurement laboratories. The measuring and the patients' up-take rooms should be located at some distance from intense sources of radiation, unless adequate shielding can be provided. On the other hand, these rooms, especially the measuring room, should not be too far from the radiochemical laboratory, in order to minimize the possibility of contamination of intervening halls and to eliminate unnecessary steps for the technician. At the Francis Delafield Hospital (New York City), both a high degree of shielding and easy communication have been obtained by placing the radiochemical laboratory on the floor below the measuring room and using dumb-waiters for the transfer of the radioactive materials *(illustrated schematically Figure 6)*.

SPECIAL STRUCTURAL REQUIREMENTS

gamma ray shielding

The question of structural gamma ray shielding has been the subject of a great deal of controversy. Twenty-four-inch concrete walls have been recommended by some physicists, while others advocate the use of shielding around the individual radiation sources only. The subject may be considered from two angles: (1) health hazards; (2) radiation affecting instruments.

Structural Shielding for Reducing Health Hazards

Obviously little is gained in providing structural shielding against gamma ray sources located in a room which is occupied eight hours a day by the same persons. On the other hand, rooms such as storage rooms, which are occupied only for a short time, may be shielded to advantage. For instance, individual shielding around the sources might permit one hour per day occupation inside the storage room while structural shielding allows eight hours occupancy outside it.

The amount of structural shielding depends on the isotopes used. To increase permissible exposure time from one hour to eight, without increasing the distance, requires the interposition of three half-value layers of shielding material. For iodine-131 this is 6½ in. of concrete, for sodium 24 it is 13 in. *(See Table 1.)*

Structural Shielding for Reducing Background

In using radiation measuring instruments, the maximum acceptable radiation level above normal background is usually 0.01 mr/hr or less. To attain this level in measuring rooms structural shielding may be justified, although the same reduction often may be obtained by increasing distance from sources of radiation and by the use of shielding around sources and counter tubes. When providing structural shielding, consideration should be given not only to the walls, floor, and ceiling but also to doors. As was shown *(Figure 1)*, a shielded storage room can be so arranged that the radiation passing through the door is scattered before

Figure 5—combined radioisotope assay and patients' up-take measurement room.

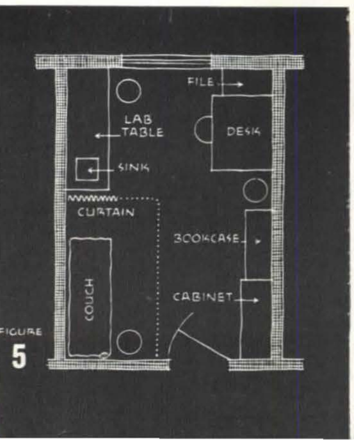
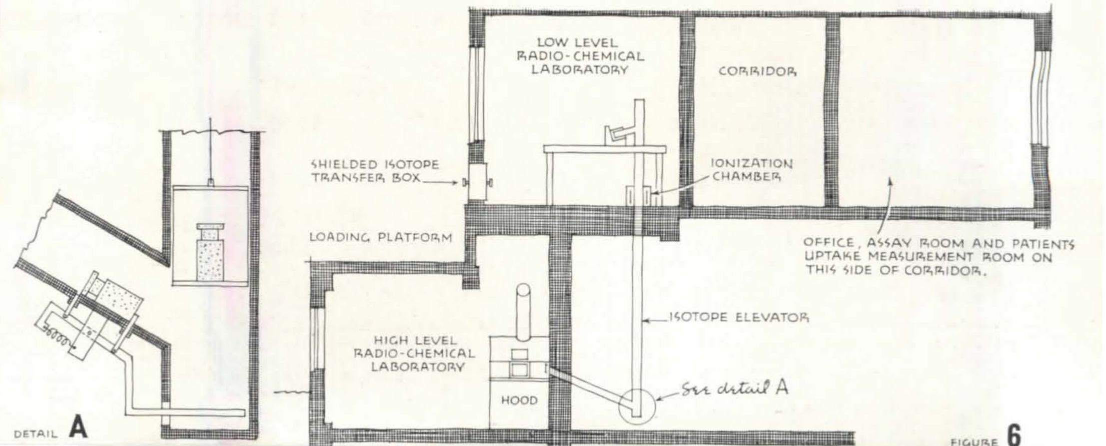


FIGURE 5

Figure 6—automatic handling of isotopes. The isotopes are prepared and bottled in hood in basement. Bottles are placed in inclined tube and automatically loaded on dumbwaiter car. Each time car reaches bottom it picks up one bottle; stops in center of ionization chamber are made for check measurements. At top, bottle is ejected from car and slides into lead container.



DETAIL A

FIGURE 6

reaching working areas, thus reducing the necessary shielding of the door. The main objection to extensive structural shielding is, in addition to its cost, the permanency which prevents future changes in the laboratory layout.

When the measuring rooms must be near the radium or X-ray therapy rooms, the possible need of structural shielding must be considered. The distance from a radium source at which the radiation will be 0.01 mr/hr is determined by the formula:

$$\text{Distance (in feet)} = \sqrt{30 \text{ mg of RA}}$$

(Assuming no shielding.)

However, the hospital radium supply is usually shielded so that the dose rate outside its safe or its preparation room is not more than 6.25 mr/hr. A reduction factor of 625, or an increase in distance of 25 times is necessary to reduce the dose rate to 0.01 mr/hr. This can usually be arranged for the radium where the distance from the source to the 6.25 mr/hr level is only a few feet. However, for X-ray rooms, when the distance from the target to the position of 6.25 mr/hr may be of the order of 8 feet, the distance from the X-ray room to the measuring room would have to be 200 feet and this may be impracticable. Intervening walls may offer considerable shielding but the final reduction may have to be made by a local shield around each counting tube.

ventilation

The hood of the radiochemical laboratory should be provided with a separate exhaust to the outside. The exhaust should terminate at a distance from occupied areas; it is, therefore, usually necessary to provide a duct terminating above the roof, to prevent discharge near windows or air

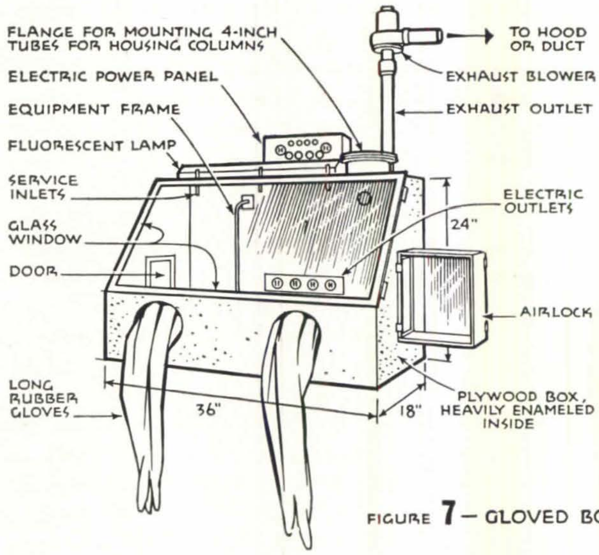


FIGURE **7** — GLOVED BOX

TABLE I: COMPARISON OF RADIOISOTOPES

	Half-life	Beta radiation: Maximum energy mev	Completely stopped by: water mm	pyrex mm	air cm	Gamma radiation: Energy mev	r/mc hr at 1 cm	"Danger range" for 1 cm	H.V.L. cm Pb	Approx H.V.L. concrete
Bromine $^{82}_{35}Br$	34 hrs	0.465	1.4	0.7	115	0.547 0.787 1.35	15.1	49.2 cm 19.4 in.	1.3	8.5 cm 3.4 in.
Carbon $^{14}_{6}C$	5100 yrs	0.15	0.2	0.1	16		None			
Cobalt $^{60}_{27}Co$	5.3 yrs	0.31	0.8	0.4	62	1.1 1.3	13.6	46.6 cm 18.4 in.	1.2	7.8 cm 3.3 in.
Gold $^{198}_{79}Au$	2.7 days	0.98	4.0	1.8	380	0.12 0.41	2.4	19.6 cm 7.7 in.	0.31	6.2 cm 2.4 in.
Iodine $^{131}_{53}I$	8 days	0.60	2.0	1.0	160	0.080 0.367	2.65	20.6 cm 8.1 in.	0.28	5.6 cm 2.2 in.
Iron $^{59}_{26}Fe$	46 days	0.46	1.4	0.7	115	1.1 1.3	6.55	32.3 cm 12.7 in.	1.3	8.5 cm 3.4 in.
Phosphorus $^{32}_{15}P$	14.3 days	1.7	8.0	3.5	620		None			
Potassium $^{42}_{19}K$	12.4 hrs	3.5	17.5	7.9	1800	1.51	1.95	17.7 cm 7.0 in.	1.4	9.1 cm 3.6 in.
Radium $^{226}_{88}Ra$ *	1560 yrs	3.15	15.6	6.9	1550	0.047 0.19 1.8 2.2	8.4	36.7 cm 14.5 in.	1.3	8.5 cm 3.4 in.
Sodium $^{24}_{11}Na$	14.8 hrs	1.4	6.4	2.8	500	1.4 2.8	19.1	55.3 cm 21.8 in.	1.7	11.0 cm 4.3 in.
Sulphur $^{35}_{16}S$	87 days	0.17	0.2	0.1	16		None			

NOTE: The "danger range" is the distance at which the dosage rate is 6.25 mr/hr (or 0.3 r/week for 48 hours weekly exposure).

$$\text{Attenuation factor to reduce dose rate to 6.25 mr per hour at any distance} = \frac{(\text{Danger range})^2}{(\text{Distance})^2} \times \text{mc}.$$

* In equilibrium with its decay products

intake ducts. The blower should be located near the discharge end of the duct in order that any leakage of the duct will not cause contaminated air to be blown into occupied areas. The blower motor should be mounted outside of the duct to prevent contamination of the motor and to facilitate repairs. The blower should have sufficient capacity to give an air velocity of about 75 ft/min at the face of the hood with maximum openings. A damper should be provided at the hood to reduce the air flow to any required value.

Air conditioning is recommended for the measuring rooms, but not for the radiochemical laboratory, where it would be very wasteful due to flow of air into the hoods.

special facilities

No special facilities are required except the usual laboratory sinks. No floor drains are needed. An emergency shower is recommended if large amounts of isotopes are handled; this should be near or in the radiochemical laboratory. Most industrial plants handling radioactive materials have provisions for the workers to take showers and change clothes before leaving the premises. Similar facilities have been advocated for hospital isotope laboratories; however, the possibility of general body contamination is remote in a well-supervised hospital isotope laboratory, and ordinary dressing room facilities are all that are necessary. Stress should be put on preventing contamination rather than on clearing it up afterwards.

floor loading

Special attention should be given to the floor construction to insure adequate carrying capacity. Lead-shielded hoods may weigh more than a thousand pounds, and in addition the floor must be able to support mobile shields weighing several hundred pounds.

BUILT-IN EQUIPMENT

The fixed equipment and facilities of the radiochemical laboratory vary greatly with the type and quantity of isotopes used. It is advisable at least to provide space for a chemical fume hood designed especially for the handling of radioisotopes. The hood may not be required initially if only rather small amounts of isotopes are used and there is no drying of radioactive materials. Isotope hoods may be divided into two general types: those which provide built-in gamma ray shielding and those which depend entirely on shielding around the radioactive sources. In a busy isotope laboratory it may be desirable to have one of each type, the shielded type for gamma ray emitters and the unshielded one mainly for isotopes emitting beta radiation only. It is not always practicable to provide sufficient shielding of the hood to give complete gamma ray protection, since this may require lead several inches thick for such istopes as Na^{24}. Instead, barriers of lead bricks may be placed around each radioactive source; the shielding of the hood then serves mainly to absorb the scattered radiation, which is much more readily attenuated, due to its lower energy. A typical shielded hood for hospital isotope work has two sliding lead panels that provide openings for the hands and at the same time double the shielding thickness in front of the technician when it is needed the most. It is generally recommended that the hood be lined with ½-in. lead. The double thickness in front (one in.) gives adequate protection (6.25 mr/hr for 500 mc of I^{131} at a distance of one ft). The ½-in. lead will give a similar degree of protection at four ft. Where Na^{24} is used, it is necessary to provide additional shielding around the source if the amount is more than one mc. It should be emphasized here that the hospital shielding requirements are considerably less than those used on most Atomic Energy Commission projects where kilocuries may be handled. On the other hand, the better the shielding of the hood, the less is the dependence on proper arrangement of movable barriers.

Frequently too little consideration is given to the protection of people on the other side of the wall near the hood or storage space. The ordinary cinder block partition offers very little attenuation of the type of gamma radiation ordinarily present. Considerable shielding economy may be gained by placing the hood against a wall which has no occupancy on the other side; for example, against an outside wall, where usually no shielding is required, due to the greater distance to occupied regions.

Where feasible, provisions should be made for the remote handling of radioactive materials. Effective manipulators have been devised, but such elaborate equipment will be necessary only where large gamma ray emitting sources are handled routinely. Simpler devices will suffice in most hospital isotope laboratories. Where possible, sufficient shielding should be provided to stop all the beta radiation at the source. The thickness required is indicated *(Table 1)* for the more commonly used isotopes. When handling isotopes which are beta emitters only, the main problem is to prevent contamination. A "glove box" *(Figure 7)* permits carrying out experiments without actual contact with apparatus which may be contaminated, and which provides protection against soft beta emitters such as C^{14} and S^{35}.

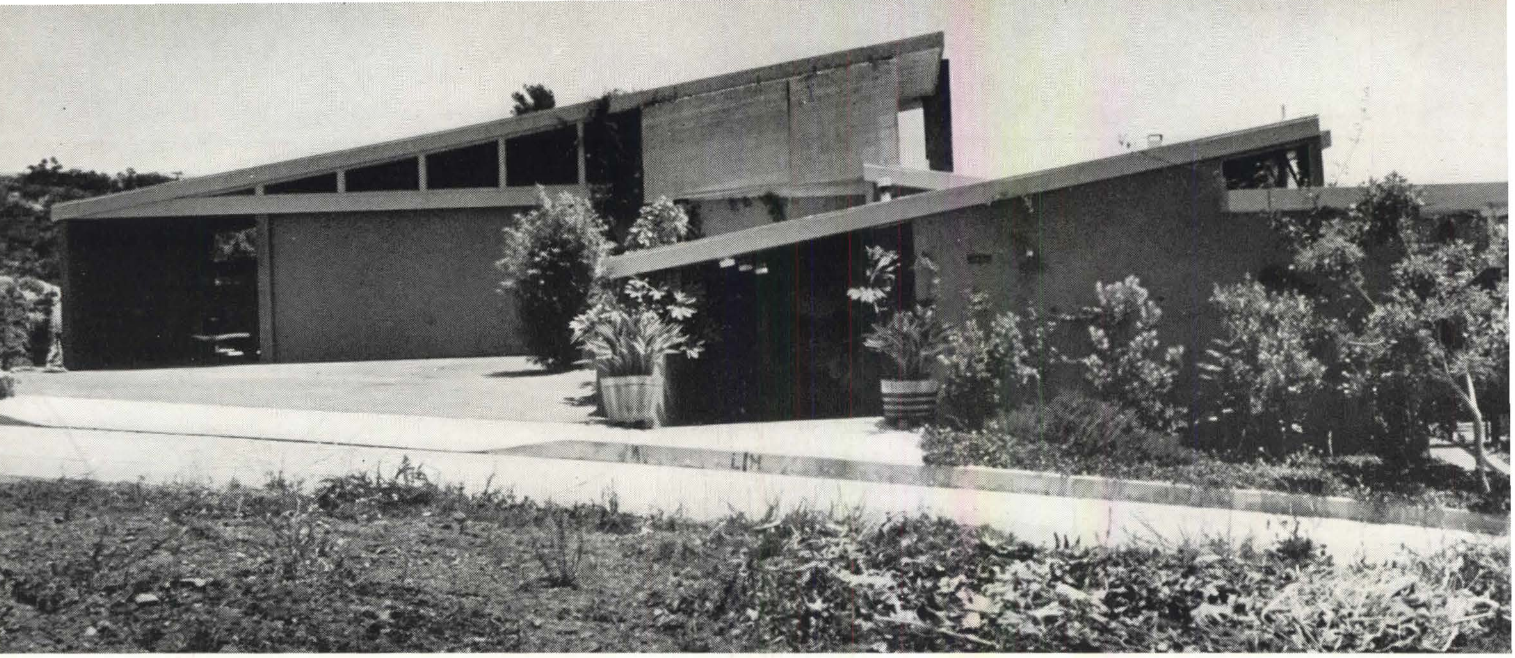
The radiochemical laboratory should have a chemical laboratory bench provided with the usual facilities such as a sink, gas, air, and electrical outlets. This bench should preferably have a stainless steel top with raised edges to prevent overflow and contamination of the worker in case of spills. The same end may be achieved by keeping all equipment on stainless steel trays during use. The occupancy of the radiochemical laboratory should be restricted to that actually required in conjunction with the isotope work, in order to minimize the exposure of the personnel to radiation. This may be encouraged by limiting other equipment and furniture to a minimum.

The measuring room does not require any fixed equipment except a laboratory sink and a suitable array of electric outlets, movable tables for measuring instruments allow greater flexibility than built-in furniture. On the other hand, a laboratory bench *(shown in Figure 2)* requires less space and offers the convenience of semi-permanent electrical installations. Air conditioning is desirable, especially where the summer climate is very damp, in order to insure better operation of electrical equipment.

DETAILED REQUIREMENTS

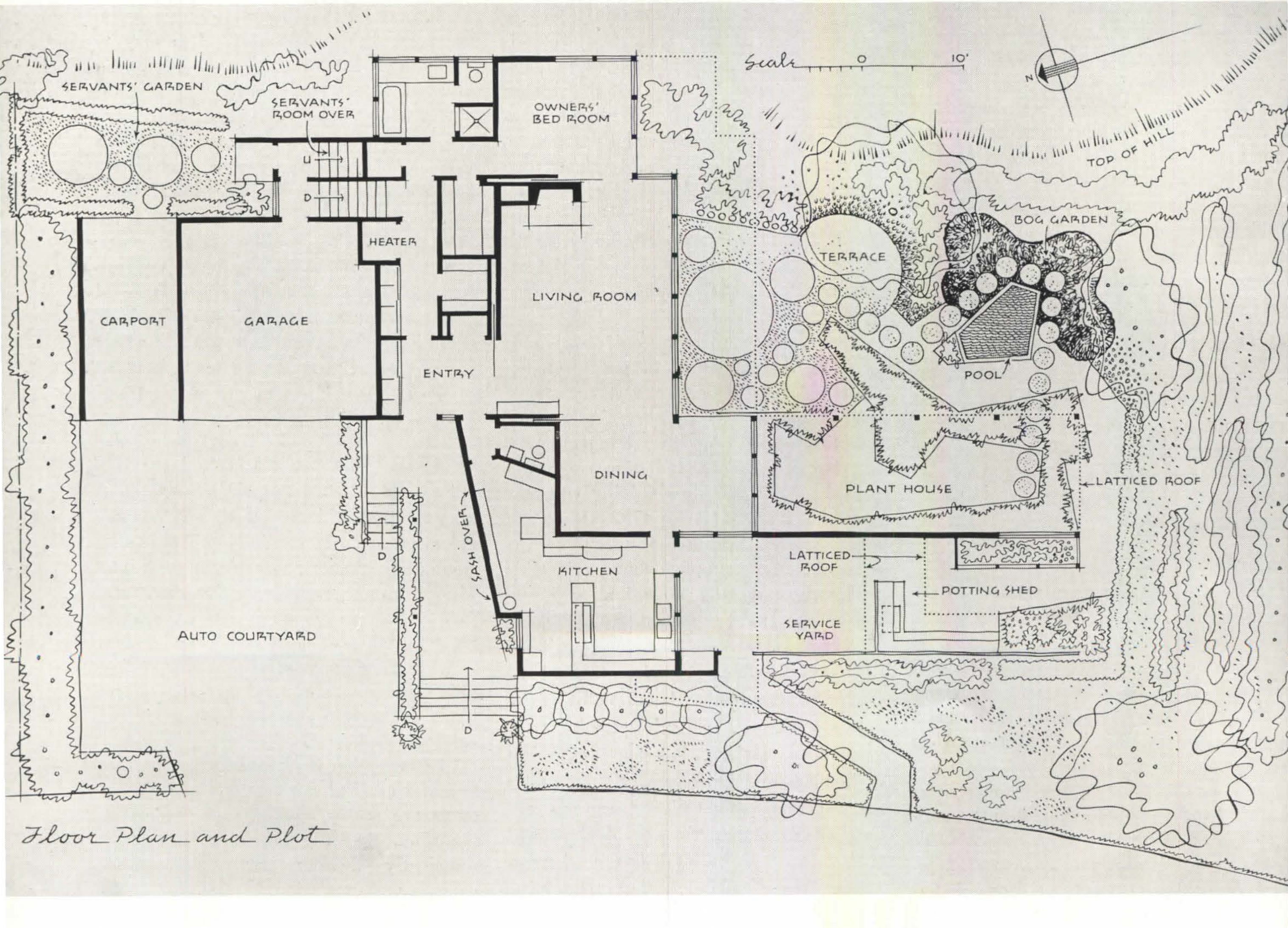
All exposed surfaces of the radiochemical laboratory should be smooth and nonporous to minimize contamination. Uncovered wood and concrete floors are not desirable. Linoleum and particularly tile offer satisfactory floor covering, as they can readily be replaced in case of serious contamination. Strippable coatings of the "vinyl base" type should be used on wall surfaces likely to become contaminated, as it can easily be peeled off.

In conclusion, it should be pointed out that the medical applications of radioisotopes are still growing. It is important, therefore, that the laboratory layout be sufficiently flexible to permit future changes and expansion.



house: Los Angeles, California

architect	Gregory Ain
collaborating	Joseph Johnson and Alfred Da
landscape architects	Eckbo, Royston and Williams
interior decoration	Greta Grossman
general contractor	Aldon Construction Company



Floor Plan and Plot

Located on one of Los Angeles' fabulous mountain sites, this house has exceptional provisions for outdoor enjoyment and the cultivation of exotic plant materials. The front door (left) *is down a few steps and at the back of a covered passage leading to the street. Nearer the entrance is a separate stairway to the garage court* (below).

Photos: Clarence John Laughlin

house: Los Angeles, California

This colorful house was designed for a couple, both doctors and writers. In addition to their varied professional and cultural interests, a major hobby to be accommodated was the husband's avocation of horticulture. While they entertain frequently, they seldom have overnight guests, and the only bedrooms wanted were the owners' room and a room for a husband-and-wife housekeeper and gardener who work for them.

A hilltop site, with the access road on the west and a magnificent view down over the city to the southeast, determined the orientation and organization of major rooms and the related lath house and terraces. The entire main living area, including the owners' bedroom, may be thrown together as one large space for a party—space that is almost indefinitely extendable when opened to the outdoor areas. Everywhere, flowers and plants are part of the environment and the lath house itself is used for outdoor living. Service rooms and the two-car garage are placed along the street and uphill sides of the house and act as screens for privacy.

Built on a concrete slab, the house framed with 4″ x 4″ posts and lintel with standard stud framing between. E terior walls are stuccoed, while interi wall surfaces are plywood, or plasti finished panels; flooring throughout asphalt tile. For insulation, reflecti aluminum foil was used. The projecte or casement sash are of wood, while doo are of the hollow-core flush type. Th house is heated by a forced warm-a system.

Sliding glass panels open the living-dining area (across-page) *to the living terrace, lath house* (above, top), *and distant city view. At the east end of the living room* (immediately above), *a sliding door makes it possible to combine the living and bedroom space for entertaining. A fluorescent light trough borders the clerestory.*

One of the basic ways to prevent decay and termite damage in a house is to avoid those conditions that stimulate their insidious growth. Here, the author has noted some of the common sense precautions that will help the architect and home owner to escape some of the grief that might otherwise develop. For those situations where additional protection is required, the reader's attention is called to the author's previous article for P/A, "Wood Preservatives and Preservative Treatment," which appeared in May 1951.

avoid decay and termite damage by good house construction

by George M. Hunt*

Decay in houses is unnecessary. A moderate application of common sense in planning, building, and maintenance can save the home owner hundreds of dollars in repair bills. The responsibility lies first with the architect to know and avoid the practices that invite decay, stain, and termite attack and to tell his client that some of his pet desires can be granted only at the risk of high repair and maintenance costs. Secondly, it is the duty of all contractors, builders, and real estate developers to be aware of the damage that fungi and insects can do and how it may be avoided. The prospective home owner, in his turn, should inform himself on the subject and make sure that the home he purchases or builds is not vulnerable to its ever-present enemies.

We have much more trouble with decay and other deteriorating agencies than our forefathers did because we build our houses tighter, insulate them better, try to maintain high humidity in cold weather, build closer to the ground, and otherwise make conditions more favorable to deterioration. In addition, our houses are more expensive and repairs more costly than they were a generation or two ago. Avoidance of deterioration has correspondingly increased in importance. In the log-cabin days, if decay or insect damage became serious, it was a simple matter to slip in some new logs for repair, or to build a new cabin and let the old one rot. Now we call in the carpenter, the plasterer, the mason, the decorator, and others, and put a second mortgage on the house to pay them. Most of such mental and financial anguish can be avoided by following the simple rules of good practice.

Water is the villain in most cases. Whether the water comes from condensation within, from high humidity or soil contact beneath, or from snow or rain that gets in through the walls or roof of the house, its presence makes conditions favorable for the development of wood-destroying and wood-staining fungi, and for the activities of ground-nesting termites. Certain insects, such as powder-post beetles and dry-wood termites, like their wood dry but relatively few home owners are ever bothered by them. Fungi and soil-nesting termites do not attack dry wood. It is true that these termites can carry the needed water into the house from the soil, if allowed to do so. Similarly, there are a few fungi that, if given the opportunity, can develop water-conducting strands which serve as pipe lines from the soil. Both enemies are easily kept out but expensive to dislodge if allowed to get a foothold.

But how can water be kept out of the house? Numerous publications have been written that go into this subject more deeply than can be done in a short article. Here, in brief, are some of the important precautions; they vary in relative importance in different parts of the country because of variations in climate, building styles, construction practices, prevalenc of termites, and other factors. For ex ample, prevention of termite damage i important in all parts of the country, bu there are many localities in which ther are no termites or where they are of onl minor importance. The local architect and builders should know all these rule and perhaps most of them do. Nevertheless good practice is too frequently ignored

The first and most important precautio is to avoid contact between wood and th soil or any surface from which moistur can be absorbed. The house siding, fo example, should not touch the ground bu should remain several inches above it. I there is a full, excavated basement, and th location is well drained and normally dr the foundation need not extend more tha six in. above the ground at the neares point. It must be possible at all times however, to inspect the sills and the sidin for the presence of termite or fungu activity. No wood posts, door frames grade stakes, or other wood should b allowed to extend into or through th concrete of walls or basement.

If there is space beneath the hous but no basement, all wood should be kep at least 18 in. from the ground, and th space should be clean, well ventilated and easily accessible for inspection. Fu thermore, shrubbery should not be plante close enough to the house to interfere wit good ventilation. All waste wood an organic matter of any kind should b cleared from beneath the house, includin

*Former Director, U. S. Forest Products Laboratory, Madison, Wisconsin

In the old days, it was a simple matter to build a new cabin and to let the old one rot.

ld tree stumps, roots, builder's stakes, nd the like. Such material furnishes ex-ellent starting places for both termites nd decay.

If the house is built on a concrete slab, nake sure that everything possible is done o prevent the seepage of moisture through r around the slab into the woodwork. Vood floors over concrete laid directly n the soil are especially in danger of lecay and other moisture troubles unless reat pains are taken to prevent all ingress f moisture through the concrete. Wood posts or sleepers imbedded in the concrete lab are especially vulnerable.

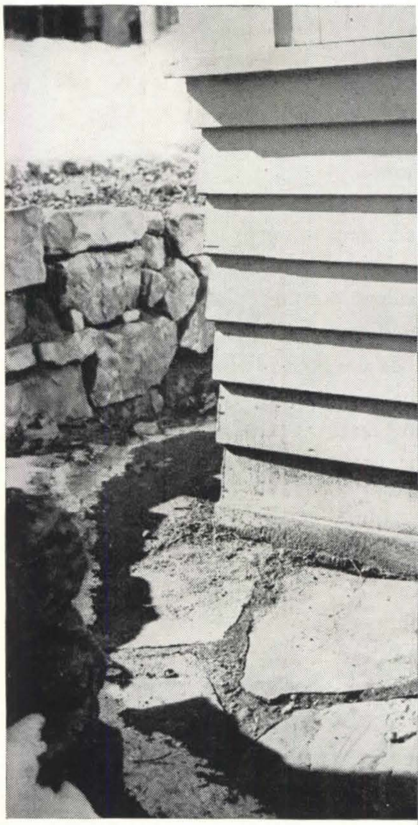
Grading and drainage of the yard sur-ounding the house are of high importance vith all three types of homes. Be sure hat all water drains rapidly away from he building and does not get under it or emain near the foundation.

Watertight roofs and sides are obviously mportant but not always attained. Steep oofs favor rapid drainage and minimum eakage. With low-pitch or flat roofs, op-ortunities for leaks increase and greater recautions are necessary to avoid them. n localities that have cold winters with eavy snow, alternate thawing and freezing ften forms ice dams at the ends of hingles and permits water to back up nder them. Water entering in this way eldom remains long enough to favor decay ut it may cause serious water damage o the insulation in the walls and to in-erior finish and furnishings within the ouse. Snow shoveling in the snowy states is not confined to sidewalks and drive-ways, for many a house owner must also clear the snow and ice from his roof at times, particularly at the eaves line. Where this hazard prevails, it is helpful to lay a full width of good quality roll roofing along the lower edge of the roof before applying the shingles. Wide flashing should also be laid in the roof valleys and, of course, good flashing around chim-neys is always important.

The man whose home has wide roof overhangs at the eaves and gables is fortunate. They help greatly in keeping storm water away from the sides of the house and it is only the occasional driving storm that wets the siding. With no over-hang, on the other hand, one or more walls of the building are wet by almost every rain, thus providing opportunities for wind to drive water through any imperfect joint that may exist.

Humidifying houses during cold weather invites trouble in many ways, but whether any compensating advantage is derived from the practice is questionable. Usually there is enough humidity from cooking, bathing, and clothes washing in a tightly built house to cause some condensation on the windows on cold days but, when additional humidity is provided, the re-sults may be serious. When humid air is cooled appreciably, it gives up part of its water. If the cooling is accomplished by passage over a cold surface, such as a window or a cold wall, water collects on the surface in the form of droplets or frost. In humidified houses the amount of such condensation on windows may be sufficient to run down over the window sill to the woodwork below. One house-wife in a Detroit, Michigan house, told investigators that she did not have time to go shopping because it was necessary to remain home and wipe the water from the window sills frequently. Wet window sash and sills quickly develop loose putty, dark stains, paint peeling, or discoloration and, in time, decay. The remedies? Lower humidities, more ventilation, and storm windows.

When humid air or water vapor passes into the walls of a house and cools as it penetrates toward the outer surface, a point is reached where some of the water is deposited on the back of the sheathing and siding. This may back up into the insulation in the stud space so that it becomes saturated with water during an extended period of cold weather. Such a large amount of water not only reduces the effectiveness of the insulation but also causes paint blistering and, eventually, decay. Condensation in house walls is avoided by placing an effective moisture barrier between the insulation and the interior surface of the wall. The barrier may consist of strong, durable paper covered with aluminum foil or sufficiently coated with asphalt to be practically im-pervious. The building paper between the sheathing and siding, however, should be of the "breathing" type; that is, it should allow the escape of such small amounts



High humidity caused water condensation in the walls and ruined the paint on this apartment house (above). *House siding touching the ground invites termites and decay* (right).

Photos: courtesy U. S. Forest Products Laboratory

of moisture as may find their way into the walls through the vapor barrier or otherwise. Moisture barriers cannot well be inserted in a house originally constructed without them but some good can be accomplished in such homes by using a moisture-retarding paint on the interior *surface* of the outside walls. Aluminum paint covered by subsequent coats of the color desired provides a good moisture-retarding film. An important point to remember is that, since the condensation moisture comes from within the building, the moisture barrier must be as near as practicable to the *inside* surface of the wall, to prevent the passage of moisture vapor into the region where the cooling is sufficient to cause condensation.

Cold attics may also accumulate condensation in the form of water or ice. The access of water vapor to the cold area may be prevented by well-placed moisture barriers or by providing good ventilation to dissipate any vapor that reaches the attic.

Our ancestors had little trouble from condensation because their houses were not so humid or so well heated as those of the present. Furthermore, their windows, usually, were not so tight nor their walls well insulated, and the resulting good ventilation, although uncomfortable on cold, windy days, easily took care of their excess moisture.

Wood porches and steps are especially vulnerable to both fungi and termites because of their exposure to frequent wetting and their nearness to the soil. When built of untreated wood, ground contact should be avoided and good ventilation provided beneath both porch and steps. Lattice work may be used to conceal the opening. Porches and steps that are closed in provide conditions favorable to rapid deterioration and may conceal the damage until it is too late for anything but a major repair job, not only to the porch but to the house itself.

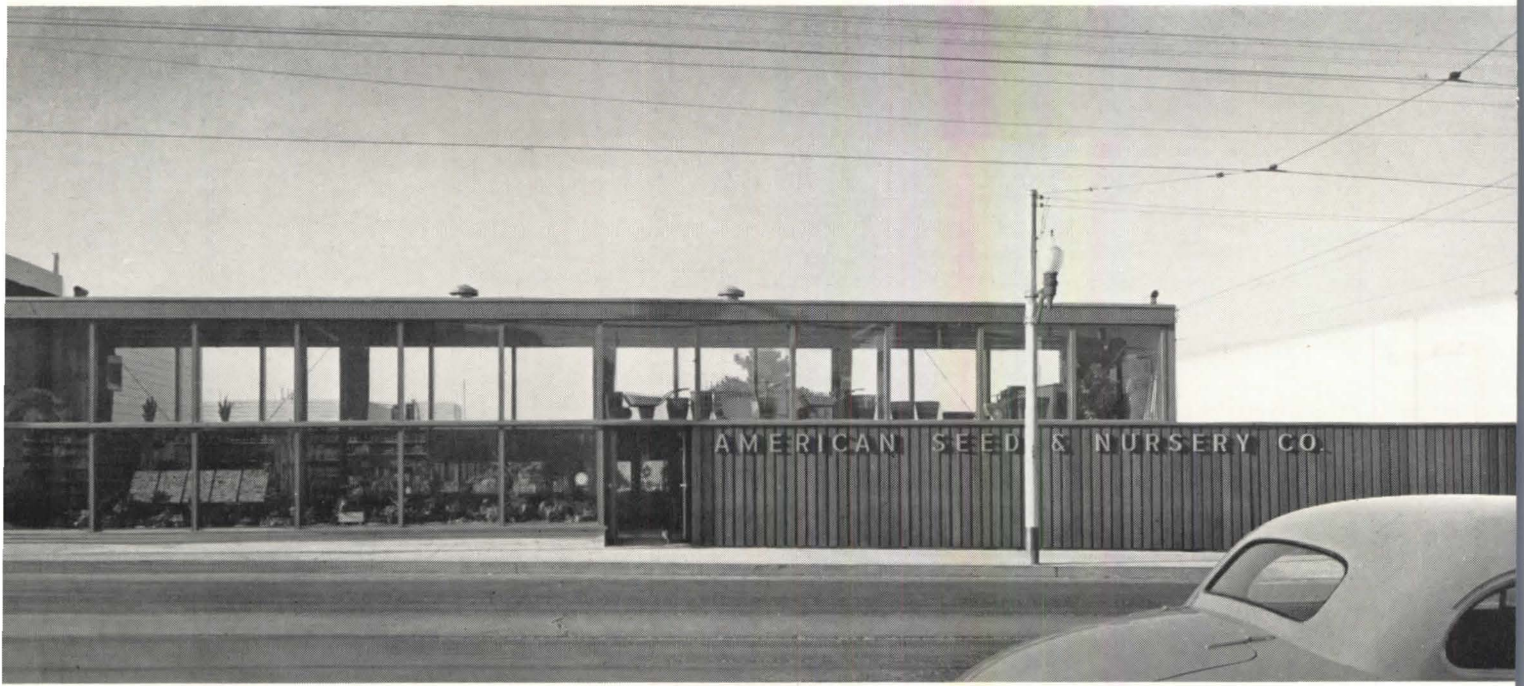
Porch columns, whether resting on a wood or masonry floor, tend to collect water at the base. A ventilating stool of corrosion-resistant metal or durable wood can be a great help if designed so as to favor good ventilation and rapid drainage of water.

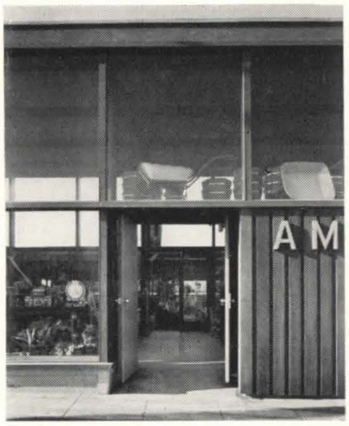
Garage doors, if not protected by preservative treatment, preferably should have smooth exterior surfaces from which storm water can drain rapidly, rather than paneled surfaces that tend to collect and hold moisture. The modern type of overhead door that swings in out of the weather when open is better, from the standpoint of decay hazard, than the door that swings outward. Overhanging eaves help protect garage doors just as they do the sides and doors of a house.

Termites pose a special problem in localities where they are plentiful. The dry-wood termites are confined to a rather narrow strip along the southern border of the country, extending from southern Virginia into northern California, and including practically the whole state of Arizona. Even in this range they do only a limited amount of damage in the aggregate, although the loss of even one piece of furniture or damage to one house may seem serious to its owner. Complete protection against dry-wood termites would be difficult and so costly that the attempt to provide it is not recommended. There are a few, simple precautions, however, that every builder in the dry-wood termite region should take, including the inspection of the lumber before it is built into the structure and the plentiful use of paint. Treating the lumber with a suitable preservative can also be a great help. Lumber that has been in storage a long time or salvaged from an old building should be regarded with suspicion and not used unless steps are taken to destroy any termites it may contain. Exterior woodwork should be painted promptly and all crevices and holes in which the termites might start housekeeping should be filled. Fortunately, the dry-wood termites work slowly and, in this country, seldom cause a serious structural failure. They should not be regarded as something that can devour a house overnight, but as timid creatures who may require years to do serious damage and who, when discovered, may frequently be eradicated without great expense. If allowed to become thoroughly established and widespread, however, their control may require extensive repairs. The home owner in the dry-wood termite area should inform himself about the habits of these insects and learn how to detect their presence.

Ground-nesting or subterranean termites are found in practically every state of the Union but they are usually less serious in the northern states than in the warmer parts of the country. Builders, architects, real estate men, and city officials in each locality are usually informed as to the prevalence of termites and the seriousness of their depredations. In most localities, the precautions that are effective against decay will provide protection against subterranean termites. Additional precautions that can be taken in places where they are plentiful and aggressive, include the use of soil poisons and termite shields, as well as preservative treatment of the lumber. Soil poisoning consists in digging a trench beside the foundation to a depth of several feet, then pouring in a suitable preservative. Additional preservative is poured in as the soil is backfilled into the trench. Termite shields are made of corrosion-resistant metal and placed over the foundation and around all pipes entering the building, in such a manner that the termites cannot get around or through them. Both soil poisoning and the installation of termite shields must be well done in order to be effective. Termite shields have frequently been applied in such a manner as to be completely ineffective, although the home owner thought he was receiving good protection for the money he invested. Whether the improper installation results from ignorance, carelessness, or intention to deceive, the result is the same and the termites are not disappointed. Few builders understand termites sufficiently to do a good job of excluding them without close supervision. The wise home builder will inform himself thoroughly on the subject and will make sure, by inspecting the job in progress, that everything is done properly.

There are two inexpensive Government bulletins that every prospective home builder should study and digest before starting to build, and a third one that applies especially to those who live in the dry-wood termite zone. They can be secured from the Superintendent of Documents, Government Printing Office, Washington, D.C., for 5 cents each (but don't send stamps). They are: *Farmers' Bulletin No. 1911*, "Preventing Damage to Buildings by Subterranean Termites"; *Farmers' Bulletin No. 1993*, "Decay and Termite Damage in Houses"; and *Farmers' Bulletin No. 2018*, "Control of Nonsubterranean Termites." For home builders concerned with moisture accumulation, there is a comprehensive bulletin of the Housing and Home Finance Agency (prepared by the U.S. Forest Products Laboratory), entitled "Condensation Control in Dwelling Construction," which the Superintendent of Documents will supply for 20 cents. In essence, all four documents say that the way to avoid damage from these enemies of houses is: "Don't let them in." They also give detailed instructions as to how that desirable objective may be accomplished. The home builder who follows the recommendations of these publications will have little to fear from decay, termites, or moisture accumulation.





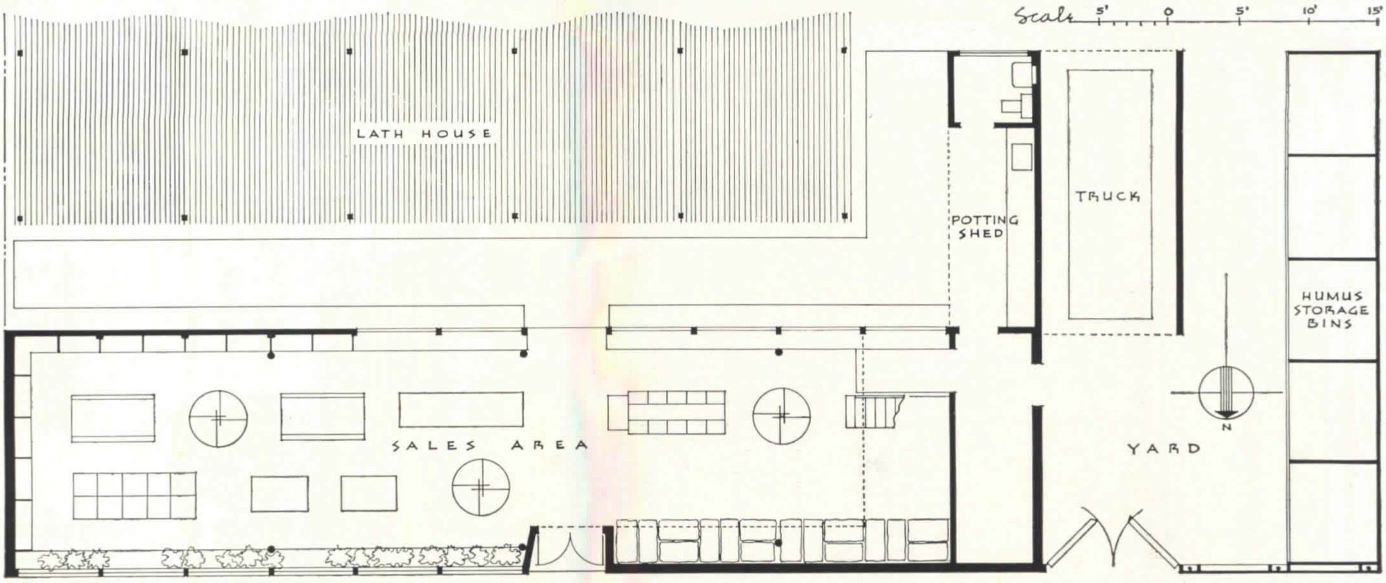
nursery and seed store

location	San Francisco, California
architect	Francis Joseph McCarthy
structural engineer	A. V. Saph, Jr.
electrical engineer	Chas. A. Von Bergen
general contractor	R. S. Silverberg

The design problem was to provide sales and storage space for a nursery catering to owners of small city gardens. Required elements: display and storage for seeds, bulbs, house plants, garden hardware, insecticides, fertilizers etc; small office space; a truck and unloading shelter; and a potting shed. The building also had to be related in design to an existing lath house (at the rear) used for display and sale of outdoor plants and shrubs. Located on a busy street in a shopping area the site is approximately 100 feet square.

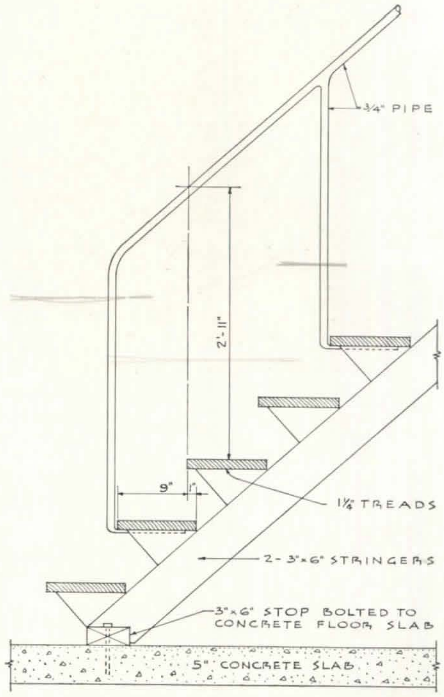
The light, open building, planned as a "garden structure" extends across 75 feet of the frontage. The balance is fenced, a continuation of the inverted board-and batten screen hiding the important bu least attractive merchandise—sacked fertilizer stored near the entrance for ease in loading into customers' cars.

Glass walls exploit the (decorative) lath house in back. A few materials are used simply, with informal finishes. Pipe columns and steel beams support the plank ceiling. The floor is a concrete slab. Col



Floor Plan

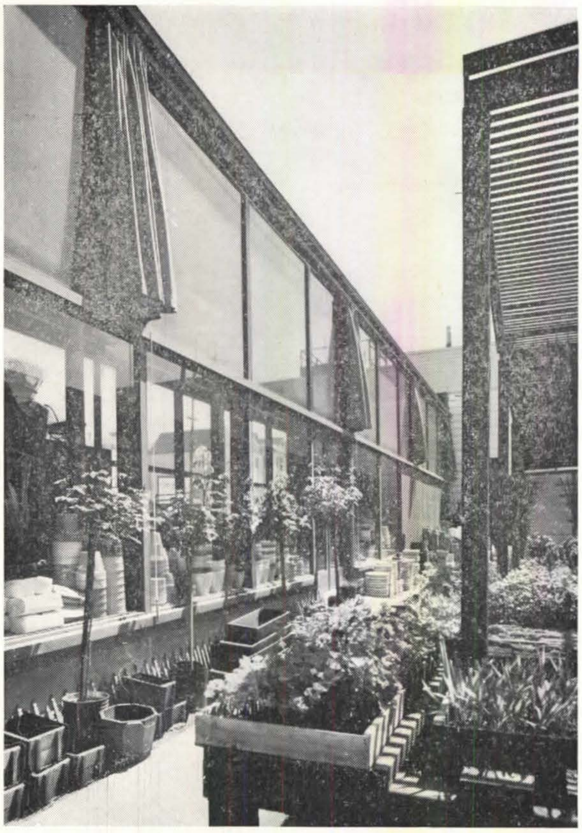
Supports of the implement racks are painted brilliant yellow, and vermilion is used for a bulletin board and exterior lettering. A whimsical staircase (left and below) *leads up to the small office mezzanine.* Photos: Roger Sturtevant



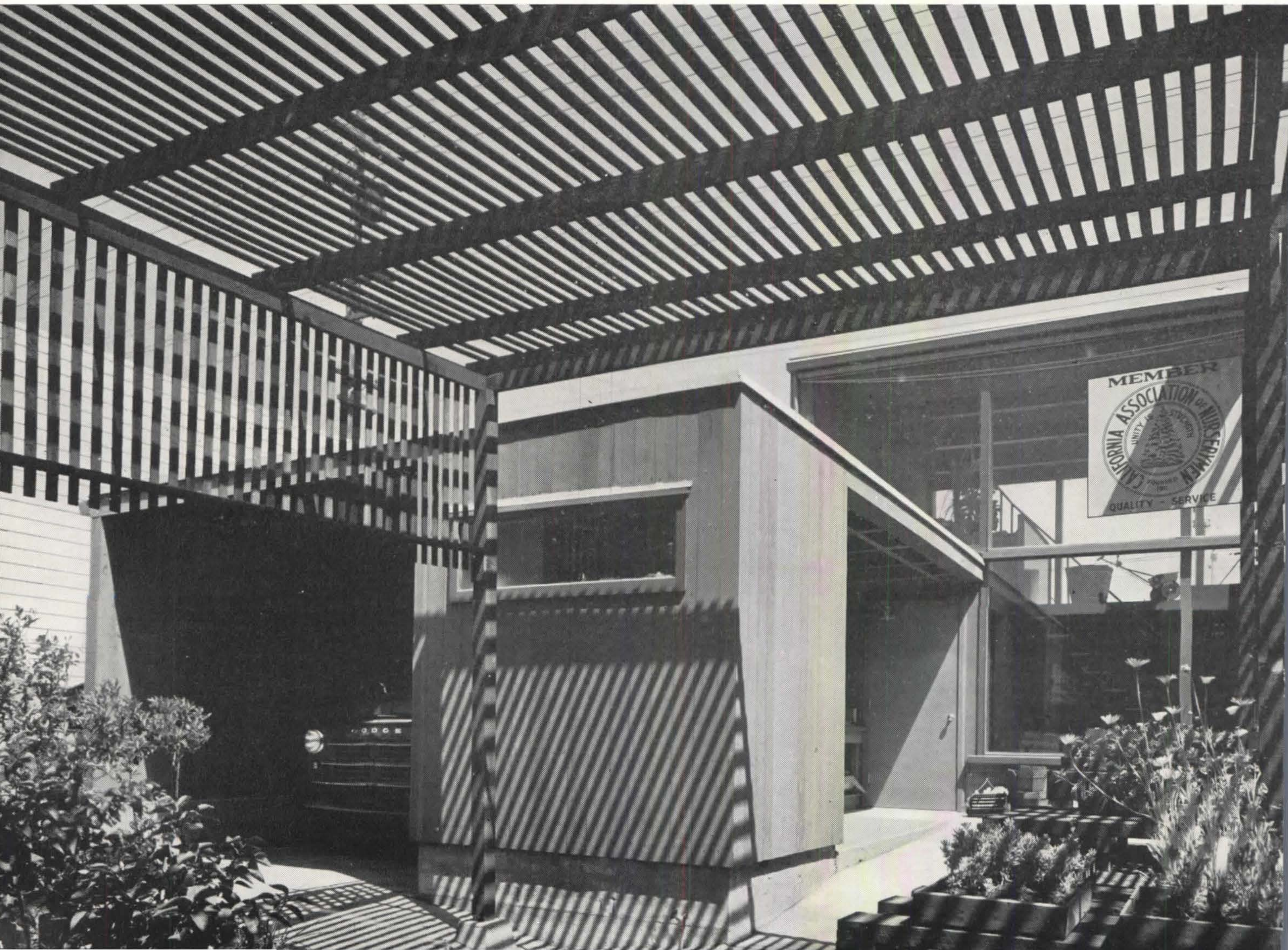
Stair Detail 1/2" SCALE

umns, beams, and sash members are painted in two shades of greenish blue, and the balance of the redwood and fir areas (with the exception of small highlights of yellow and red) are stained in warm grays and brown to provide a subdued background for the colorful displays. The office space is on a small mezzanine, over the stock room that connects with the unloading shelter.

nursery and seed store



The upper portion of the sou
the structure (right) has ext
curtains to control excessive
The unloading shelter and po
(below) form a design link
extensive lath house (for
Business so flourished after th
of the new building that the o
he wished he had had enough
build twice as large a store.



heat transfer calculations: graphic method

by E. W. Jerger*

Heat is transferred whenever there is a temperature difference — the direction of heat flow being from hot to cold. Thus, the temperature difference is the heat transfer potential. Heat flow, in turn, is proportional to the resistance offered to the transfer; accordingly, the mathematical expression for a generalized heat flow is:

$$\frac{q}{A} = \frac{\Delta T}{\Sigma R}$$

where: $\frac{q}{A}$ = rate of heat flow per unit area perpendicular to direction of flow. (Btu/hr ft²)

ΔT = temperature difference. (°F)

ΣR = total resistance to heat flow. $\left(\frac{\text{hr ft}^2\ {}^\circ\text{F}}{\text{Btu}}\right)$

When the heat transfer is by the mechanism of conduction, the resistance offered to heat flow is equal to $\frac{x}{k}$ or $\frac{1}{C}$ for the material; where x is the thickness, k is the thermal conductivity, and C is the conductance of the material. The thermal conductivity, k, is a property of the material reflecting its heat transferring capacity and is generally reported in the units of $\frac{\text{Btu}}{\text{hr ft}^2\ {}^\circ\text{F}}$ for each inch of thickness. Conductance is, by definition, simply $\frac{k}{x}$. For the case of a composite wall made of various thicknesses of several materials in series, the total resistance is the sum of each individual resistance.

* *Assistant Professor of Mechanical Engineering, Iowa State College.*

Convection heat transfer may be treated in a similar manner, by pursuing the concept that the heat transferred from a surface by convection is equal to the heat conducted through a stagnant film at the surface. Then, the convection equation for heat flow is:

$$\frac{q}{A} = f\,\Delta T$$

where: f = a film coefficient of convection heat transfer $\left(\frac{\text{Btu}}{\text{hr ft}^2\ {}^\circ\text{F}}\right)$

ΔT = the temperature difference across the film.

Now, the resistance to heat flow offered by the film is equal to $\frac{1}{f}$.

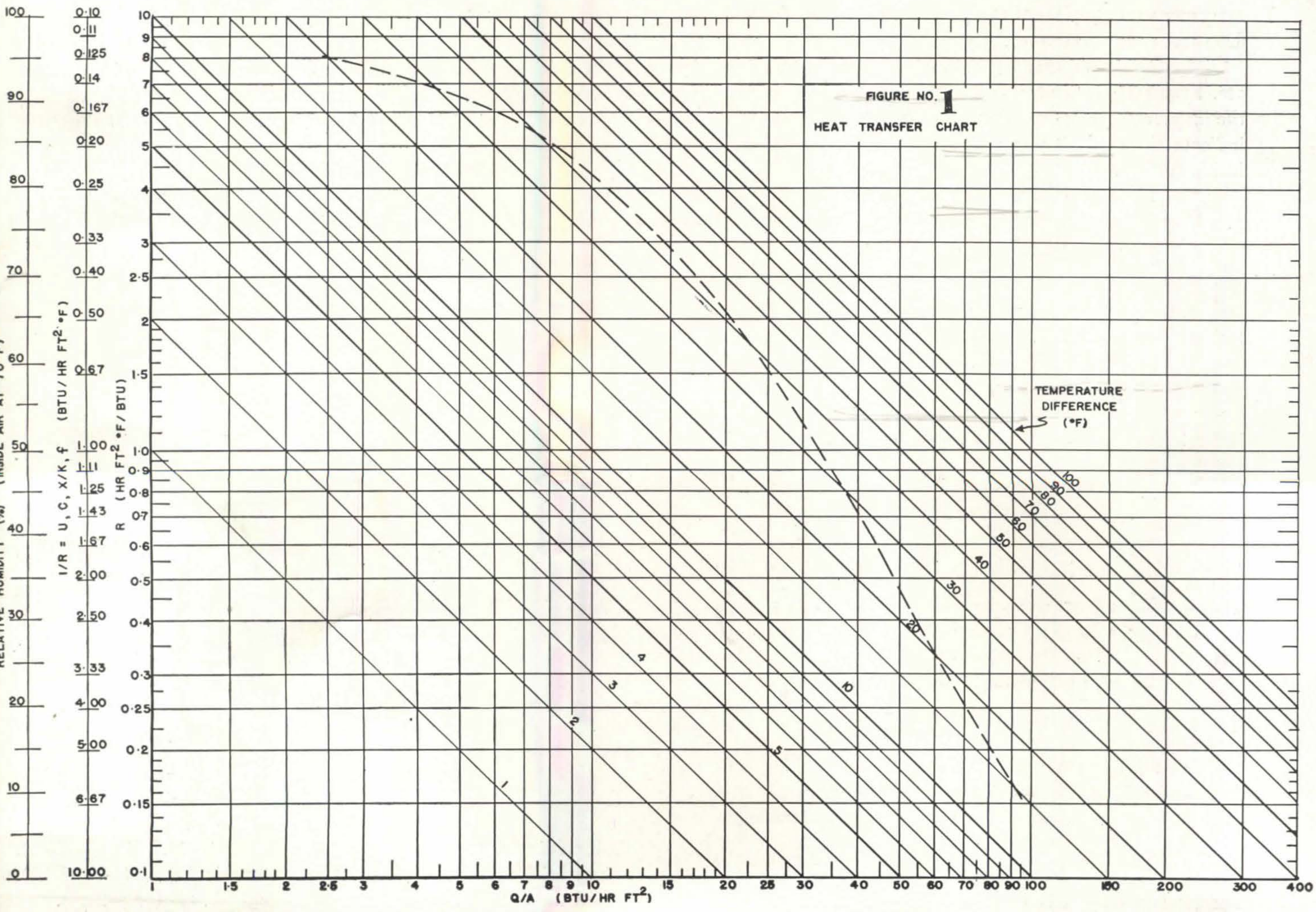
The general heat transfer problem for a composite section is often treated as:

$$\frac{q}{A} = U\,\Delta T$$

where: U = an over-all heat transfer coefficient $\left(\frac{\text{Btu}}{\text{hr ft}^2\ {}^\circ\text{F}}\right)$

ΔT = the over-all temperature difference.

Then, the total resistance to heat flow is simply $\frac{1}{U}$. Values of U for many standard types of wall, roof, and floor constructions are given in the American Society of Heating and Ventilating Engineers Guide.



Referring to Figure 2; it may be noted that the heat flow through each resistance is equal to the total heat flow. Then, the heat transfer through the wall may be expressed according to the following equations:

$$\frac{q}{A} = f_i\ (t_i - t_1) = \frac{t_i - t_1}{R_1} \qquad (R_1 = \frac{1}{f_i})$$

$$\frac{q}{A} = \frac{t_1 - t_2}{R_2} \qquad (R_2 = \frac{x_2}{k_2})$$

$$\frac{q}{A} = \frac{t_2 - t_3}{R_3} \qquad (R_3 = \frac{x_3}{k_3})$$

$$\frac{q}{A} = f_o\ (t_3 - t_o) = \frac{t_3 - t_o}{R_4} \qquad (R_4 = \frac{1}{f_o})$$

$$\frac{q}{A} = \frac{t_i - t_o}{\Sigma R} \qquad (\Sigma R = \frac{1}{f_i} + \frac{x_2}{k_2} + \frac{x_3}{k_3} + \frac{1}{f_o})$$

$$\frac{q}{A} = U(t_i - t_o) \quad (U = \frac{1}{\frac{1}{f_i} + \frac{x_2}{k_2} + \frac{x_3}{k_3} + \frac{1}{f_o}})$$

Since the inside and outside temperatures are generally known, the surface temperatures and interface temperature may be found by combining several appropriate equations of those presented above.

Figure 1 is a graphical representation of the general heat transfer equation: $\frac{q}{A} = \frac{\Delta T}{\Sigma R}$ The co-ordinates are $\frac{q}{A}$ and ΣR, while a reciprocal scale for U, C, or f is also given for convenience. Problems are solved by drawing a horizontal line through ΣR, to intersect the proper temperature difference line, and reading $\frac{q}{A}$ by passing a vertical line through the ΣR, ΔT intersection. A reverse procedure may be employed to determine the temperature drop across any resistance.

A relative humidity at 70 F scale is also given as the ordinate. By passing a horizontal line through the relative humidity of the inside air, the intersection with the dotted line on the chart will indicate the condition at which condensation will occur on the inside surface.

The use of the chart in solving typical heat transfer problems is demonstrated in the following illustrative problems.

illustrative example I

A building wall is constructed with 10-inch hollow tile faced with stucco. Calculate the heat loss through this wall for an inside design temperature of 70 F and a −10 F outside design temperature.

Basis of Calculations: 1 sq ft wall area

For this case: $q/A = U\Delta T$

U is found to be 0.39 Btu/hr ft² °F

Referring to the chart, the horizontal line for $1/R = 0.39$ intersects the line of $\Delta T = 80$ F at

$$\frac{q}{A} = 31.2 \text{ Btu/hr ft}^2$$

The $\frac{q}{A} = 31.2$ line intersects the dotted line at RH = 51%; hence, condensation on the inside surface of the wall may be expected to occur when the relative humidity of the inside air is at or above 51%.

In order to find the tile surface temperature, a horizontal line is drawn through $\frac{1}{R} = f_i = 1.65$ until it intersects $\frac{q}{A} = 31.2$, at this point ΔT is read as 19 F; and the tile surface temperature is 70 − 19 = 51 F. The outside surface temperature, or stucco surface temperature is found in a similar manner by finding $\Delta T = 5.2$ F at the intersection of $\frac{q}{A} = 31.2$ and $\frac{1}{R} = f_o = 6.0$; then the stucco surface temperature is −10 F + 5.2 F −4.8 F.

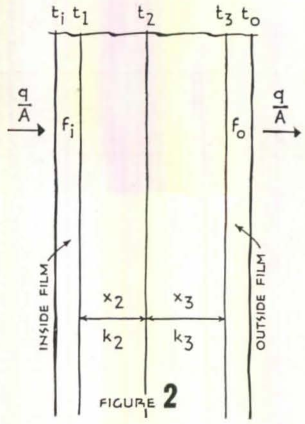


FIGURE 2

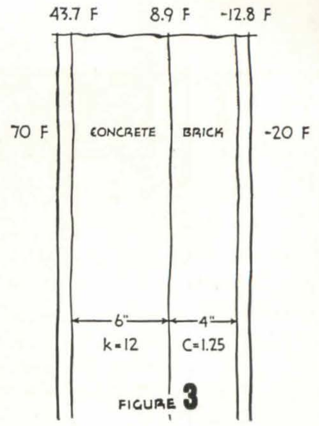


FIGURE 3

illustrative example 2

A glass-block section is to be installed in an outside wall. The over-all heat transfer coefficient (U) for the block is equal to 0.48 Btu/hr ft² °F. Inside-air design condition is 70 F with a 45% relative humidity. Calculate the outside air temperature that will cause condensation on the inside surface of the glass block.

Basis of Calculations: 1 sq ft glass area

$$\text{Again, } \frac{q}{A} = U\Delta T$$

Referring to the chart, a horizontal line through RH = 45% (70 F) intersects the dotted condensation curve at $\frac{q}{A} = 37.5$ Btu/hr ft².

Then passing a line through $\frac{1}{R} = U = 0.48$, it is found to intersect $\frac{q}{A} = 37.5$ at $\Delta T = 78$ F. Thus, the outside temperature would have to be 70 − 78 = −8 F or less before condensation difficulties would be encountered.

illustrative example 3

A building wall is made of 6-in. concrete (sand and gravel aggregate) faced with a 4-in. common brick (*see Figure 3*). Determine the heat loss through the wall, as well as the temperature gradient through the wall for a 70 F inside air temperature and a −20 F outside temperature.

Basis of Calculations: 1 sq ft wall area

k concrete = 12.0 Btu in./hr ft² °F

C Brick = 1.25 Btu/hr ft² °F

$$R_C = \frac{x}{k} = \frac{6}{12} = 0.5$$

$$R_B = \frac{1}{C} = \frac{1}{1.25} = 0.8$$

$$R_{fi} = \frac{1}{1.65} = 0.606$$

$$R_{fo} = \frac{1}{6.0} = 0.167$$

$$\Sigma R = 2.073$$

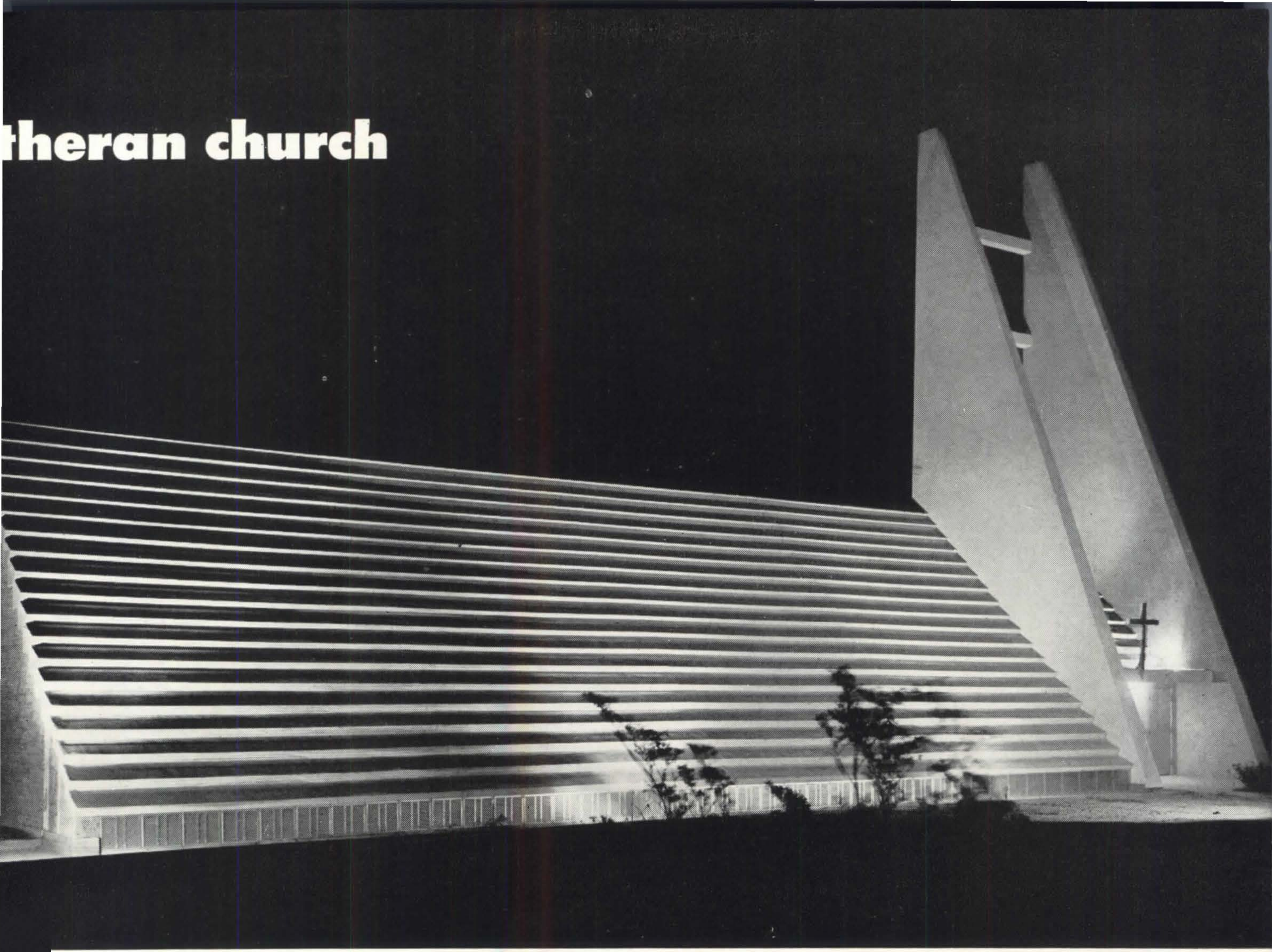
Referring to the chart, for a resistance, R = 2.07 and $\Delta T = 90$ F, $\frac{q}{A} = 43.5$ Btu/hr ft². A condensation condition will develop on the inside surface when the inside air has a RH = 63% or more

Entering the chart for each resistance, the temperature drop across the resistance is read off of the chart at $\frac{q}{A} = 43.5$.

R_{fi} = 0.606,	ΔT = 26.3 F
R_C = 0.50,	ΔT = 2.17 F
R_B = 0.8,	ΔT = 34.8 F
R_{fo} = 0.167,	ΔT = 7.2 F

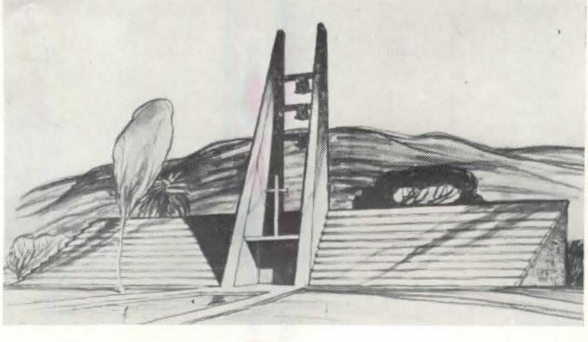
Accordingly, the inside wall temperature is 43.7 F (70 − 26.3), the brick-concrete interface temperature is 8.9 F (43.7 − 34.8), and the outside surface temperature is −12.8 F (8.9 − 21.7).

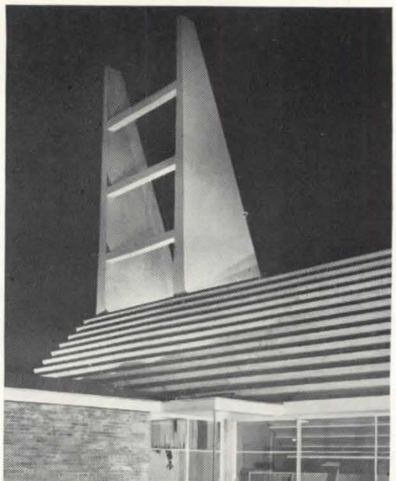
theran church



location	Tucson, Arizona
architect	Arthur T. Brown
structural engineer	Fred H. Jobusch
general contractor	James S. Blackmore

Most dramatic departure from convention in this unique church structure is the use of overlapping, hollow-core, precast, prestressed concrete units to serve as roof structure, roof covering, and finished ceiling. Its unusual appearance has earned for the structure such local epithets as "Catapult to Heaven"; "The Ship in the Desert"; "The Building that Comes Out of the Basement"; and "Jacob's Ladder." Photos: Frank L. Gaynor



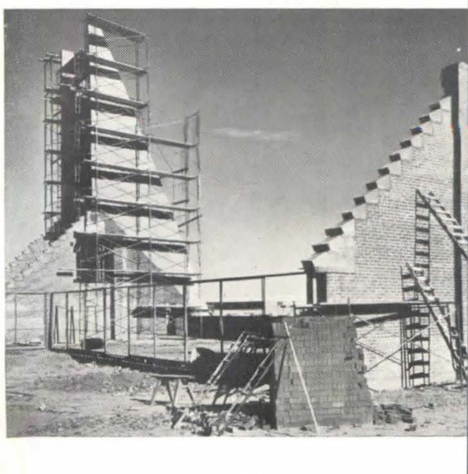


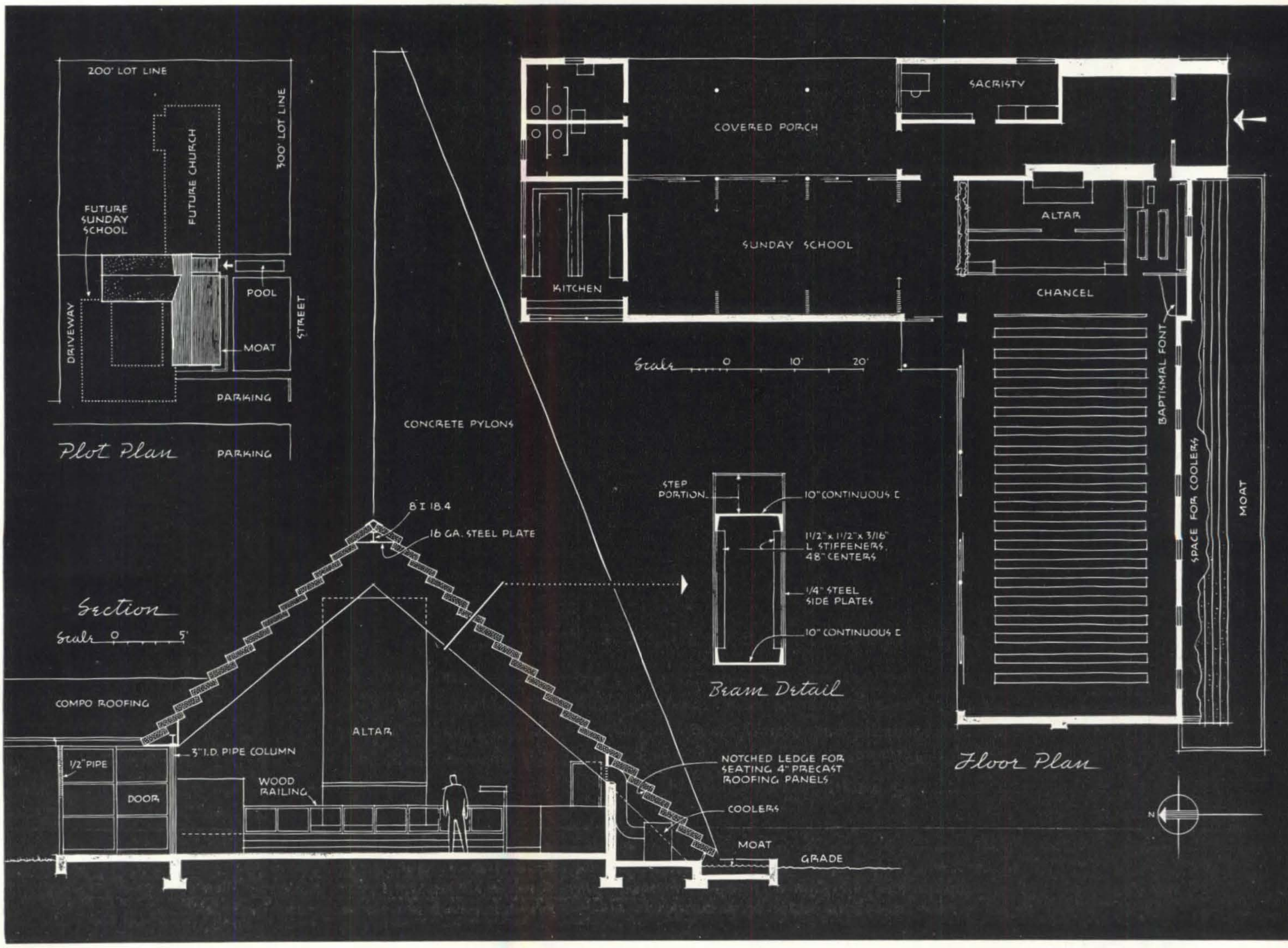
Lutheran Church

The triangular space under the low roof on the street side of the building is used for cooler space, with the overflow emptying into a reflecting pool alongside. Louvers backed by cooler pads extend the full length of this front, and air is drawn through these by blowers and circulated through the chapel.

Heating of the chapel is handled by a unit heater hung at the ceiling at the rear of the room, while gas wall furnaces are used in the classroom wing; classrooms are individually cooled by evaporative coolers, placed on the roof of the east porch.

This extraordinary church, which eventu ally will be more than twice the presen size, is an attempt to achieve an appropri ate design expression for a house of wor ship through frank use of contemporar materials. The hollow-core roof units ar supported on sawtooth-edged, built-up steel trusses, spaced 22 feet on center which come down to the foundations alon

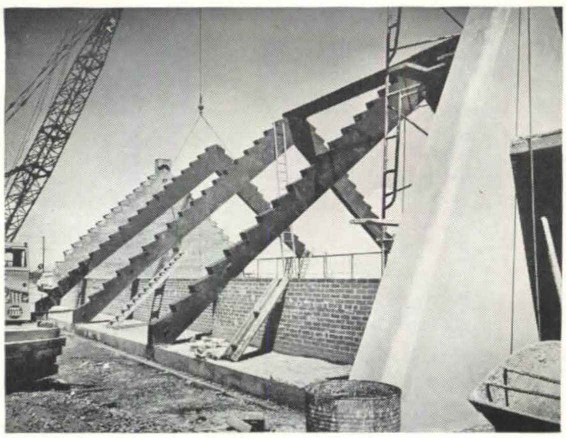




the south wall of the building. Along the north wall, they rest on a simple steel truss which, in turn, is supported by masonry end walls and concrete-filled pipe columns. The wall-roof-ceiling slabs were waterproofed, before and after erection.

The site is a corner lot facing south with a view of the Catalina Mountains to the north. Initial plan requirements included a permanent structure with a chapel to seat 250; Sunday-school classrooms, dining space, and kitchen facilities. Since liturgical considerations required that the altars of both the present and future sanctuaries be to the east, an in-line plan with entrance tower beween the two became a logical solution. The north-extending classroom wing is equipped with folding partitions so that the space can be used either as three separate rooms or as one combined area. It is also readily adaptable for use as overflow congregation seating space.

Walls are either steel framed, or common brick masonry; floors throughout are of integrally colored concrete. Plywood trusses span the roof over the low wing. Sash are either steel or aluminum.



The Architect and Public Relations: 4

by Asher B. Etkes and Raymond Dodd

"Be a good neighbor" is an excellent work-a-day motto for the architect concerned with public relations on a local level. For, in essence, neighborliness is the true base of a community public relations program and certainly is an all-important principle for the architect who frequently is unknown even in his hometown. This anonymity, the result of a lack of contact with the general public, stems from the architect's reluctance to develop aggressive tactics. The professional ethics that dictate this attitude are worthy in aim, but sometimes archiac in practice in this modern world of business.

Other professionals in the community—the doctor, the dentist, the lawyer—have lofty ethics too, but they have one salient advantage: they come into daily contact with the public, in one way or another. The very nature of an architect's work limits the number of people he sees, meets, and serves.

Although others in the building field are dependent upon his creativeness, planning, and engineering, the architect receives little or no public credit for his work. The world knows who the builder and contractor are; their names are emblazoned on trucks, equipment, building shacks, billboards, and in newspaper advertisements. The plumber and mason tack up signs, as does the electrician. The architect may, at the most, rate a conservative mention on billboard or advertisement.

But if the architect is unknown even in his own community it is no one's fault but his own. He's an artist, sure, but also he's a businessman who offers his services for a price—and in a period when competition crowds him from all sides. It is important to the architect, on a dollar-and-cents basis, that the public should know who created and designed a building. Recognition can mean more commissions in a community—whether his latest project is a public building, a factory, or a low-cost house. It's up to the architect himself to change the current picture, to build up his reputation, to raise his stature as a community figure. And he can start his community public relations program by deliberately being a good neighbor. Frequent mention in local news columns is the fastest way of making your name and work known to the public. But first you have to make or be news. How? It requires careful planning, a sure-footed campaign of action and an appraisal of your fellow citizens and of the community in which you live.

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Being a good neighbor means meeting and serving more people. Your local newspapers have no interest in John Smith, architect; they do have in John Smith, the architect with a message, a helping hand, or an interesting idea. The speaker's platform is an ideal vantage place. Newspapers cover it religiously. No matter whether your community is big or little, dozens of groups congregate day and night to hear someone speak. They range from large business service clubs and women's organizations right down to small church and parent-teachers associations. The point is that they all need and welcome speakers.

Your ability as an interesting public speaker—hence, a newsworthy one—depends more on your material than on your oratory. It also depends on your audience, the kind of community in which you practice, and current local problems. A learned treatise on the history of architecture might rate you polite applause and a one-inch story; a critical blast at some local situation—poor housing, slums, or bad building codes—would not only be a public service, but could win you acclaim and page-one headlines.

Offering you a blueprint of what to say and how, is impossible and impractieal. Your material should be dictated by local circumstances and local needs. Study your local newspapers to understand what makes, and what is, news in your community—especially in connection with your field. If you gear your talk to a topic of current interest, you are more likely to carry your audience and win favorable editorial comment, too.

Temper your talks with cautious reasoning. If you criticize, try not to antagonize; you're out to make friends and influence the public—not to make enemies. If, for instance, your community seems to favor traditional architecture, don't argue for a contemporary approach in a belligerent manner; rather, map a campaign of education about the advantages and principles of modern design. Only a genius can insult his audience and still keep its attention; few of us are Frank Lloyd Wrights.

If you're a novice at public speaking, don't despair. Like a cold bath, the first few seconds are the worst; then you warm up. Best of all, you know your subject and any audience is receptive to an authorita-

community public relations

tive delivery. Furthermore, most people will be downright interested in learning about your role in the community. Architecture touches them right where they live.

But how do you attain speaker's platforms of organizations that never heard of you? The initial step in emerging from your shell of reticence is to affiliate with a few groups outside your architectural orbit; the second is make known to other organizations your availability as a speaker.

Try affiliating with one of the major service clubs; it's vital to your new role as a public figure. The membership of such clubs as the Rotary, Lions, and Kiwanis are made up of the businessmen of your town. It's important that you know them—not only from the standpoint of future commissions, but for real assistance in developing your public relations program. How you offer your services to your new club depends on circumstances. If your sponsor can submit your name as a speaker, so much the better; if not, do it yourself as a service to the club. Service organizations need at least one speaker a week; you'll be welcomed. And newspapers invariably have a reporter at this weekly function.

Meanwhile, there is a multitude of other organizations ready and willing to accept your services. They represent all facets of community life. Pick those with audiences you wish to reach, then approach them by friend, letter, or telephone. Merely inform the club secretary who you are and what you have to say.

Who wants to hear about the architect and architecture? Here's a partial list:

Women's organizations: political, social, garden, and school clubs.

Men's clubs: community service groups; Young Men's Christian Association; Junior Chamber of Commerce.

Church groups: men's clubs, women's organizations, young people's groups.

Schools: student assemblies; parent-teachers' associations.

Young Women's Christian Association; Community Chest; Salvation Army; Red Cross.

You can compile a list of possibilities from daily newspaper "event" calendars, or from banquet managers of hotels in your community. If your specialty is industrial design, your choice is obviously limited; if it's housing, you can play the field. And to widen your scope, you also might consider organizations in communities in the periphery of your hometown.

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Regarding your public appearances, here are a few useful hints:

Don't talk too often. Excess limelight can fade a newsworthy personality quickly—especially in the eyes of the local press.

Don't expect too much publicity mileage from the same talk. Switch to a new one if you know the press will be present; nothing is colder editorially than last week's speech.

If you can't prepare a good talk, hire someone who can help you. In most communities there are individuals or small agencies specializing in "ghosting" speeches or articles—and strictly on a confidential basis, choose a reliable one. The cost is justified because expertly prepared material definitely is important.

If you're worried about your delivery or diction, borrow or rent a tape recorder and listen to yourself. You will be able to correct a surprising number of faults—hems, haws, and hesitations.

Before outlining ways and means of obtaining publicity results through public appearances and services, it might be well to point out the importance of practicing good neighborliness — off the podium as well as on.

For, while your public relations program is a planned effort to raise your community status, it also must be an honest one. Willingly lend a hand, serve on a committee, or accept an office in any of the worthy service organizations that seek to enlist your help. Apart from paying off in publicity, such efforts offer excellent opportunities to widen your circle of business and social acquaintances—and to perform a real service for the community in which you live. Spare even a little more time than you can afford; it will return rich dividends.

Remember that a worthwhile public relations program requires daily applications. As described in a previous article, it's the way you tip your hat, shake hands, answer the telephone. And when you're the focal point of publicity, it's more than that. It's doing the right thing at the right time—and before the right people. But don't conspire to make your every good deed pay off in publicity; your motives may show.

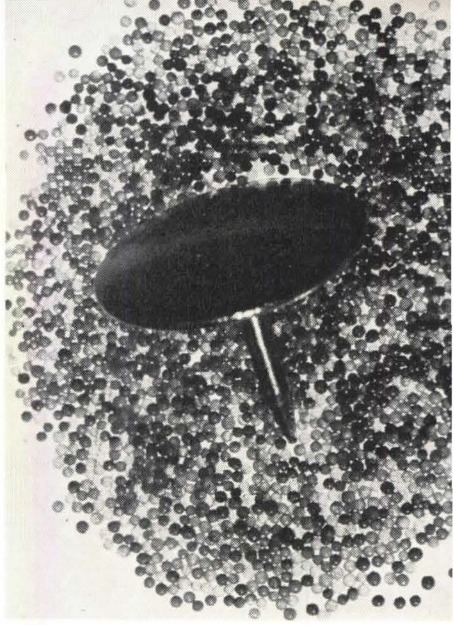
Just keep in mind that good public relations is a modern application of the golden rule.

The next article in this series will appear in February 1953 P/A.

new lightweight aggregate

Concrete mixes using a radically new lightweight aggregate, Kanamite, in place of sand or other aggregates, are so fluid that for the first time in building history, contractors can fill forms with concrete poured through rubber hose—thus reducing construction costs by eliminating shovel work and the clumsy metal-type hose now used.

The new material is the result of a four-year research and development program carried on by the Armour Research Foundation of Illinois Institute of Technology. The program was sponsored by the Kanium Corporation which was founded by a group of industrialists for the purpose of developing new materials. Made of expanded clay blown into tiny, hollow glass balloons by a unique process in a special furnace *(photo at right shows uniformity and size of particles, compared to a thumb tack)*, Kanamite may also be used in plaster and mortar mixes; the foundation reports that the material has many other potential applications. Tests made of Kanamite plaster samples have shown a compressive strength greater than that of specimens made with sand. The high strength given to the plaster will allow coatings of thinner plaster to be applied on walls than are now possible. Good insulating qualities are also claimed for mixes using this new aggregate. Individual particles of Kanamite are almost spherical, varying in size with the types of raw clay or shale used and the method of processing. Density varies from 17 to 25 pounds per cubic foot.



Grain sizes ranging from .0116 in. to .0069 in. diameter are reported to be the most useful. Kanium Corp., 332 S. Michigan Ave., Chicago, Ill.

wood beam and girder selector

A wood joist, rafter, or girder can be selected in 20 seconds with the aid of a newly invented folded plastic, rule. Scales B and C, used for members in bending, slide separately; scales B1 and C1 (reverse sides) are used where deflection governs. To operate: (1) set total uniform load on slide B opposite span length on scale A; (2) set arrow on slide C opposite allowable fiber stress on slide B; (3) read size directly, opposite *desired* joist or rafter spacing, or girder indicator. Reverse sides operate similarly, except that the joist or rafter spacing on slide C1 is set opposite modulus of elasticity on slide B1

air and temperature control

Warm-Air Floor Furnace: low-cost furnace fired with gun-type flanged oil burner, equipped with fuel pump capable of lifting oil from oil tank located at lower-than-furnace level; 10" fan circulates warm air and built-in suction box permits installation of 4" round return-ducts from distant rooms; Minneapolis-Honeywell controls. Unit is exceptionally shallow to allow installation in crawl-space areas. Produced in two sizes: 70,000 and 80,000 Btu/hr. Delta Heating Corp., Trenton 8, N.J.

Boiler-Burners: Compact, integrated units, produced jointly by two companies, consist of packaged burner with all controls and fully assembled boiler with accessory equipment for oil, gas, or combined oil and gas firing. Available for high pressure steam and water (also low pressure) for wide variety of commercial and industrial applications. Units are designed for forced draft operation, eliminating necessity of high stack. Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, Ohio; Kewanee-Ross Corp., Kewanee, Ill.

Temp-O-Matic: automatic day and night thermostat control shuts off furnace at night until room temperature lowers from 6 to 10 degrees, turns it on at specified time in morning to heat home immediately; eliminates all need for changing theromstat setting by hand. D-Frost-O-Matic Corp., Temp-O-Matic Div., 173 W. Madison St., Chicago 2, Ill.

Oil-Fired Hi-Boy Series 521: two new winter air conditioners added to 521 line, feature horizontal baffle that provides additional flue passage for lower stack temperatures; oversize blower is designed to overcome higher static pressures when unit is used in conjunction with cooling coil. Models are available in 70,000 and 100,000 Btu ratings. Thatcher Furnace Co., Garwood, N.J.

doors and windows

Flexivent Window Unit: utility window, of wood construction, provides choice of four different types of installation: outswinging awning ventilation; inswinging hopper ventilation; outswinging casement ventilation; and fixed sash. Easily combined in ribbons, groups, or stacks; can be used as ventilating opening with fixed glass, in combination with other types of ventilating windows, or as single vent in basements, bathrooms, etc. Weathertight; double-glazing and hinged screen optional. Andersen Corp., Bayport, Minn.

Sager-Barrows Door Locks: new series of pin-tumbler, key-in-knob, cylindrical locks of solid brass with bronze trim, heavy-gage steel parts, for installation in wood or metal doors 1¼" to 2" thick; lifetime lubrication. Recommended for use in homes, schools, hospitals, and commercial buildings. Yale & Towne Mfg. Co., Berrien Springs Div., Berrien Springs, Mich.

electrical equipment, lighting

Dust-Tight Light Fixture: 300/500-w incandescent fixture, approved by Underwriters' Laboratories for use in hazardous areas where metal, carbon, coal, coke, and grain dusts are present. Aluminum canopy contains lamp socket and inner auxiliary reflector threaded into canopy. Fixture uses no globe; glass lens is spun into edge of reflector, making dust- and vapor-tight joint. Crouse-Hinds Co., Wolf & Seventh Sts., W., Syracuse, N.Y.

Uni-Flow Fluorescent Troffer: 85-w bi-pin model in 5' or 10' tandem sizes, designed for economical maximum light output and minimum wattage consumption; equivalent to 100-w lamps. Both shallow and deep troffer types with or without flanges available in one- and two-lamp units. All models equipped with starters. Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago, Ill.

Model 305CK Electric Plant: new 3500-w a-c electric generating plant designed to meet demand for higher capacity in small-sized plants. Conservatively rated at 4000-w peak overload capacity for periods of up to two hours' operation. Unit provides primary or emergency power for stationary, portable, or mobile applications. D. W. Onan & Sons, Inc., 2500 University Ave., S.E., Minneapolis, Minn.

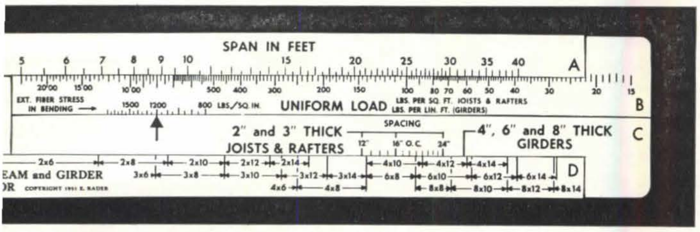
finishers and protectors

Dashide: invisible, liquid waterproofing coating, claimed to be only exterior masonry-wall waterproofing compound that will withstand hurricane-driven rain and water years after application. Material breaches and seals all hairline cracks; completely resistant to acids, alkalis, and tem-

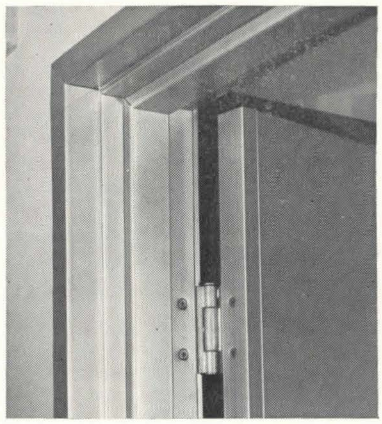
aluminum doors and frames

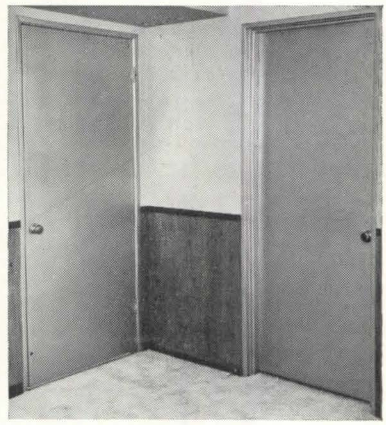
Installation of the new Truline aluminum door and frame unit is possible in less than 30 minutes—averaging two complete installations per man hour. Built for all types of residential and commercial buildings, the flush metal doors have honeycomb cores of phenolic-impregnated plywood providing resistance to sound and thermal transmission; they will not warp, swell, shrink, or splinter. Frame sections may be installed after all rough work and painting have been finished; each frame is furnished with multiple clamp screws for positive clamping on any wall with a reasonably smooth surface. Tests on the satin aluminum finish have proven that the units will withstand a five percent salt spray solution at 95 F for a period of 500 hours without blistering, corroding, chalking, or loss of color. Hinges are equipped with suitably plated steel pins, to prevent electrolytic action and squeaky operation.

Three styles of Truline doors are available: standard flush; flush, with mail drop and door chime; and flush, with mail drop, chime, and circular glass panel. Dimensions are: height, 6 ft. 8 in.; thickness, $1\frac{3}{8}$ in.; six widths are obtainable. Hunter Douglas Corp., 150 Broadway, New York 38, N.Y.



and members are read opposite their respective thickness indicators. Rule, leatherette case, and instructions: \$2.50. Everett Rader Co., P.O. Box 122, Bowling Green Station, New York 4, N.Y.





perature extremes without checking, cracking, or peeling. Applied by brush or spray. Dasco Chemical Co., Inc., 1602-04 Thames St., Baltimore 31, Md.

Driwall: transparent, silicone water repellent for protection of exterior stone, formed masonry, brick, concrete, and asbestos siding against water, dirt, and staining; resists white efflorescence, unaffected by heat, cold, or sunlight. Only one coat required. Glidden Co., 2080 W. 110 St., Cleveland, Ohio.

Asbestolite: roof coating made of aluminum flakes, asphalt, and asbestos suspended in waterproofing oil vehicle, reputed to lower interior building temperatures 15 F to 20 F and prevent roof deterioration. Coating forms firm, metallic shield which reflects hot sun rays, seals out moisture, and is impervious to rust, corrosion, and fumes. Applicable to any type of roof. Monroe Co., Inc., 10703 Quebec Ave., Cleveland 6, Ohio.

Paintseal: general purpose formula which stabilizes wood against swelling, shrinking, warping, and checking while priming surfaces for paint or other finishes; also valuable as paint mix to prevent paint from blistering and peeling on weather-exposed wood surfaces. No sanding required after application. Nelsonite Chemical Products, Inc., 900 Monroe Ave., N.W., Grand Rapids 2, Mich.

insulation (thermal, acoustic)

Fyrate Systems: quickly installed ceiling construction with positive mechanical suspension of acoustical tile with fire-resistive rating of $1\frac{1}{2}$ hours. Advantages include thermal insulation, sound deadening, lightness of weight, lasting suspension, and elimination of need for plaster ceiling. Unit consists of double blanket of specially treated rock wool, separated by center membrane of aluminum foil; suspension membranes and long-shanked steel clips plus transverse T splines form support and maintain level ceiling; lower surface is noncombustible tile (any standard brand will fir into systems). Fyrate, Inc., 1909 First Ave., S., Birmingham 3, Ala.

sanitation, water supply, drainage

Brulé Home Incinerator: improved model added to residential incinerator line; features tougher refractory-lined firechest, enlarged charging door, added insulation, redesigned clogproof burner, and automatic gas controls. White enameled cabinet and base to match kitchen appliances. Dimensions: 22″ wide, 24″ deep, 41″ high; holds $2\frac{3}{4}$ bushels. Suitable also for grade schools, shops, offices, etc. Brulé Incinerator Corp., 407 S. Dearborn St., Chicago 5, Ill.

Compartment-Type Water Cooler: new unit equipped with spacious refrigerated storage compartment located at front of all-steel cabinet. Space for 35 six-ounce bottles, or other items such as food snacks, biological drugs, and similar products; also stores and freezes two ice trays holding 28 cubes. Push-button water faucet automatically shuts off stream when released. Unit is quickly plugged into any convenient electrical outlet; no plumbing of any kind needed. General Motors Corp., Frigidaire Div., Dayton 1, Ohio.

"52" Metering Lavatory Faucet: especially designed metering basin faucet, push-button type, meters water accurately for water economy. Monel screen prevents dirt, scale, etc., from passing through washer, thereby preventing damage to seat, seat washer, and Neoprene cup washer. Nonhammering, nondripping, nonclogging. Suitable for schools, hotels, hospitals, and public buildings. Speakman Co., Riverview Works, Wilmington 99, Del.

surfacing materials

Amtico On-Grade Cement: waterproof flooring cement, with unusually high tensile strength, made for installation of rubber tile, cork, and vinyl tile, or to bond linoleum, ceramic, and terrazzo floor coverings to wood, steel, composition, and nonporous, suspended subfloorings, or to concrete and brick at grade level. American Biltrite Rubber Co., 3 Assunpink St., Trenton, N.J.

Mardi Gras: colorful new spatter pattern in Micarta decorative plastic sheet, suited for use in kitchens as table, counter, and work surfaces, in bathrooms as cabinet and vanity tops, in living rooms as durable surfaces for coffee tables, etc. Will not chip, splinter, or corrode; resists acids, heat, and cold. For both home and institutional applications. U.S. Plywood Corp., 55 W. 44 St., New York, N.Y.

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

1-214. Herman Nelson Unit Heaters, AIA 30-C-43 (3570), 48-p. catalog on vertical and horizontal shaft unit heaters, applicable not only for space heating, but also for combating condensation and drying; other special uses in industrial and commercial areas. Types, component parts, steam capacities, conversion factors, selection and application, piping diagrams, specifications, dimensions, photos, diagrams. American Air Filter Co., Inc., Herman Nelson Div., Moline, Ill.

1-215. How to Reduce Stack Dust from Small Stationary Plants, AIA 30-i, 12-p. bulletin describing types and uses of dust and soot arrestors for installation in stacks of industrial plants with up to approximately 300 boiler hp. Typical trap designs, drafts and capacities of stacks, conversion factors, other technical data. Photos, drawings, contents table. Bituminous Coal Research, Inc., 2609 First National Bank Building, Pittsburgh 22, Pa.

1-216. Automatic Comfort with Reznor Gas Heaters, AIA 30-C-43, 30-B-1 (GN-52), 20-p. catalog, completely revised to include new designs and data on line of gas heaters, classified into four types to serve every heating need in commercial, industrial, institutional buildings, and residences. Types and styles, advantages, specifications, dimensions, cutaway drawing, construction features, photos. Reznor Mfg. Co., Mercer, Pa.

1-217. CWF Shell and Tube Liquid Coolers, Direct Expansion Evaporators, 8-p. bulletin describing new direct expansion evaporators and water chillers for service in refrigeration and air-conditioning systems. Sample specifications, selection chart, dimensions, dimension diagram, list prices and weights. Taco Heaters, Inc., 137 South St., Providence 3, R.I.

1-218. U.S. Unit Heaters, AIA 30-d-11 (A365), 16-p. catalog offering wide range of horizontal and vertical unit heaters for industrial installations. Capacities, dimensions, conversion factors, typical location layouts, specifications, wiring diagrams, various piping arrangements, coefficients of heat transmission, steam pipe sizes. U.S. Radiator Corp., 300 Buhl Bldg., Detroit, Mich.

1-219. Feather Valve Compressors (L-676-B1), 32-p. bulletin. Advantages of heavy-duty, packaged-type compressors requiring minimum floor space. Components, operational data, cutaways, typical installations, accessories, photos. Worthington Corp., Harrison, N.J.

construction

3-174. Summary of Metal Lath and Plaster Fire Resistive Ratings, 4-p. bulletin listing 85 different types of fireproof constructions, including steel columns, girders and trusses, joists, floors, and partitions. Authorities for ratings given. Metal Lath Manufacturers Assn., Engineers Bldg., Cleveland 14, Ohio.

★ **3-175. Seaporclad,** AIA 17-A, 8-p. booklet discussing properties of porcelain-enamel curtain wall panels of sandwich construction, with skins of diversified metals laminated to fire-resistant, thermal and sound-insulating cores; used to replace heavy masonry walls, also as veneer or ashlar material. Advantages, design details, typical sections, drawings. Seaporcel Metals, Inc., 2800 Borden Ave., Long Island City 1, N.Y.

3-176. Sharon 430 Stainless Steel, 12-p. booklet on use of straight-chromium-type stainless steels as alternate material for metals now in short supply. Physical properties, fabricating data, typical applications, photos. Sharon Steel Corp., Sharon, Pa.

★ **3-177. Stressteel Manual,** 60-p. handbook providing basic data on high-strength-steel tensioning bars equipped with anchorage assembly, for use in prestressed concrete construction; also for strengthening and repairing existing steel and concrete structures. Advantages, applications, design data, specifications, tables and charts, order requirements, contents table, photos. Stressteel Corp., 207 E. 37 St., New York, N.Y.

doors and windows

4-216. Amweld, AIA 16-A (1952), 12-p. booklet covering line of interior steel doors and frames, steel sliding closet door units, fire doors and frames. Advantages, details, elevations, construction data, architect's specifications, tables of sizes, American Welding & Mfg. Co., Warren, Ohio.

4-217. Builders' Hardware for Modern Hospital Service, 4-p. folder featuring proper hardware for all types of new and old hospitals. Typical functions, construction data, illustrations. American Hardware Corp., Russell & Erwin Div., New Britain, Conn.

4-218. When You Use Shatterproof Corrulux, 4-p. folder discussing advantages of translucent, corrugated plastic panels for skylighting of industrial and commercial buildings. Physical and chemical properties, installation directions, available colors, photos, diagrams. Corrulux Corp., 410 Holmes Rd., Houston 25, Tex.

4-219. Interior Adjustable Shutters by Shuttercraft, 12-p. booklet illustrating decorative uses of adjustable wood shutters for residential windows and interiors. General data, photos. Shuttercraft of California, 4 La Porte at Santa Anita, Arcadia, Calif. (25 cents per copy; pay manufacturer directly.)

4-220. Sterling Hardware, AIA 27-A (15), 24-p. catalog describing sliding door, casement window, storm sash, and transom hardware for residences. Cutaways, photos, drawings, specifications, contents table. Sterling Hardware Mfg. Co., 2345 W. Nelson, Chicago, Ill.

4-221. Parts Manual and Specifications of Overhead Door Hardware, AIA 27-C, 16-p. booklet on all types of home and industrial overhead-door hardware. Detailed specifications for standard and "low head" jamb types, "roll-in" track, and pivot installations; door truss assembly data, recommendations for door dimensions, diagram, photos. Sturdee Steel Products Co., 6820 Brynhurst Ave., Los Angeles 43, Calif.

electrical equipment, lighting

5-142. Safety Mineral Insulated Wiring System, 16-p. brochure containing detailed explanation of new, self-contained wiring material for nearly all types of electrical circuits in 0-600 volt range, and adaptable to most types of wiring installations. Characteristics, typical installations, construction data, list of sizes, photos. General Cable Corp., 420 Lexington Ave., New York 17, N.Y.

Three folders illustrating cold cathode fluorescent lamps for classroom and other installations. Fixture data, advantages, special shapes and sizes, drawings of cold cathode cove lighting with straight and right-angle electrode lamps; suggested type specifications for custom cold cathode lighting. Chicago Electrode Laboratories, Inc., St. Charles, Ill.:

5-143. Cold Cathode Lighting, AIA 31-F-21

5-144. Cold Cathode School Lighting, AIA 31-F-21

5-145. Cold Cathode Custom Lighting, AIA 31-F-21

5-146. Federal Noark Safety Switches (SS1-52), 12-p. booklet listing types of general purpose safety switches ranging from 30 to 1200 amp; units equipped with weather-resistant enclosures. Operational advantages, illustrations, accessory data. Federal Electric Products Co., 50 Paris St., Newark 5, N.J.

5-147. Electric Specialties (49-A), 36-p. catalog. Descriptions and illustrations of complete line of electrical specialties, including switches and sockets, portable and stationary lamp guards, lamp changers, etc. Construction data, additional parts and accessories, index. McGill Mfg. Co., Valparaiso, Ind.

5-148. Protect with Onan Standby Plants (A 305), circular. Standby electric plants in wide range of sizes and standard voltages for every hospital need. Photos of typical installations using various models. D. W. Onan & Sons, Inc., 2500 University Ave., Minneapolis, Minn.

finishers and protectors

6-83. Horn Construction Data Hand Book, 106-p. guide to proper selection of exterior and interior paints and coatings, moisture repellents, calking and glazing compounds, floor preservatives, and miscellaneous products. Types and uses, coverage tables, painting defects and how to correct them, construction details, general information. A. C. Horn Co., Inc., Tenth St. & 44 Ave., Long Island City 1, N.Y.

6-84. Over the Rough Spots, 48-p. manual discussing building maintenance and repair problems and solutions; covers industrial flooring, roofs, wall surfaces, water seepage, and acid conditions. Illustrated descriptions of products used in repair and maintenance. Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa.

insulation (thermal, acoustic)

9-88. Laykold for Cold Insulation Construction, AIA 37A (B16), 8-p. booklet providing data on asphaltic insulation adhesive and other asphaltic products for use in cold insulation construction; applied cold, with spray, broom, or trowel, eliminating expense of costly heating equipment. Typical wall, floor, and ceiling applications, photos, construction drawings, application data chart. American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 4, Calif.

9-89. 6 New Design Analyses for Lightweight Roof Decks, 4-p. brochure describing six designs (prepared and supervised by Levon Seron, Member A.I.A.) for built-up roof decking, using lightweight, insulating, fire-resistant perlite aggregate. Advantages, cost breakdown and comparative weight psf for each design. F. E. Schundler & Co., 500 Railroad Ave., Joliet, Ill.

sanitation, water supply, plumbing

19-308. Transite Plumbing Vent Pipe (TR-107A), 4-p. folder summarizing advantages of asbestos-cement pipe for venting stacks and fixtures in plumbing systems. Sizes, weights, and dimensions of pipe and fittings, photos showing use of tools for cutting and machining pipe. Johns-Manville Co., 22 E. 40 St., New York 16, N.Y.

specialized equipment

19-309. Audible Signals, AIA 31-i-13 (105), 10-p. bulletin covering line of audible signals, including bells, buzzers, chimes, horns, and sirens for homes, offices, institutions, and industry. Descriptions of units, standard voltages, photos, installation data. Auth Electric Co., 34-20 45 St., Long Island City 1, N.Y.

19-310. New Curtis Kitchens (E 9-8), 16-p. booklet describing new line of sectional wood cabinets for all types of residential kitchens and listing modern efficiency features. Photos of various kitchen arrangements, specifications for cabinets and accessories. Curtis Companies, Inc., Clinton, Iowa.

19-311. Gould Drapery Hardware, 16-p. catalog supplement illustrating wide variety of drapery hardware. Drawings of tracks, master carriers, pulleys, cut-to-measure track sets, self-pleater and hooks. Construction and finish data. Gould-Mersereau Co., Inc., 35 W. 44 St., New York 36, N.Y.

19-312. Hotpoint Commercial Cooking Equipment Scale Templates (Y-700), 12-p. series of templates for tracing on layout directly, or cut out and placed on layout or cardboard to try numerous arrangements of industrial cooking equipment. Scaled templates of electric broilers, griddles, ovens, ranges, food warmers, and counter appliances. Hotpoint, Inc., 227 S. Seeley Ave., Chicago 12, Ill.

19-313. Space, the Need of Our Time, AIA 17-D, 8-p. folder showing wood wall cabinets, closets, and closet fronts for use in homes, schools, stores, and offices. Description of main features, photos, drawings, specifications, installation details. Milo Products Corp., 1703 Susquehanna St., Harrisburg, Pa.

19-314. Air-Flow Locker, 4-p. folder summarizing clothing storage facilities of new, scientifically ventilated, recessed locker for installation in new or existing industrial plants. Installation and ventilating data illustrated by diagrams; floor plan, elevation drawings. Penn Metal Corporation of Penna., Oregon Ave. & Swanson St., Philadelphia 48, Pa.

surfacing materials

19-315. Recommended and Not Recommended Uses for Kentile, Kencork and KenRubber, AIA 23-D, 23-B, 23-C (107), 4-p. guide to residential, commercial, and industrial applications of asphalt, cork, and rubber tile flooring. Composition of materials, types of surfacing for proper installation, charts of light-reflecting qualities, approximate installation cost. Kentile, Inc., 58 Second Ave., Brooklyn 15, N.Y.

19-316. Proof That Marble Costs Less, AIA 22-A, 16-p. brochure. Typical applications of marble in corridors and lobbies of commercial buildings. Photos, membership list of Marble Institute of America. Marble Institute of America, 108 Forster Ave., Mt. Vernon, N.Y.

19-317. The Tile That Needs No Adhesive, 4-p. folder describing new vinyl-plastic tile flooring, constructed with honeycomb backing, enabling tile to lay smoothly over uneven subfloor and creating suction cup adhesion to subfloor; honeycomb backing increases resiliency up to 10 times that of ordinary solid tile. Advantages, available colors. Robbins Floor Products, Inc., Reed City, Mich.

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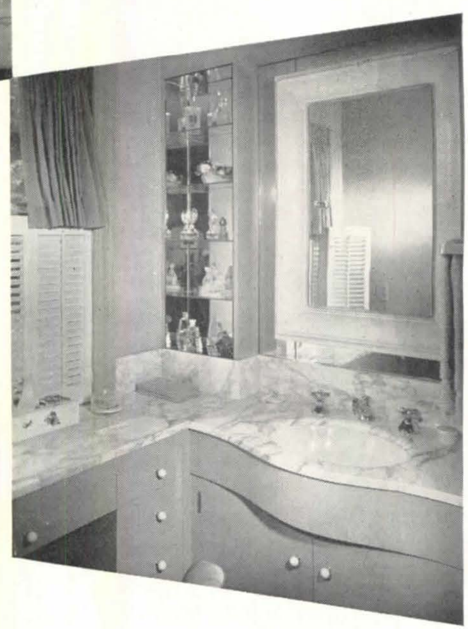

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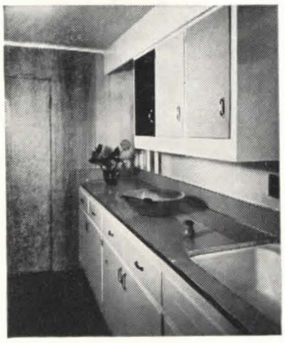

Kitchen of Mr. Schladermundt's home. Oak Plankweld is used for one wall. Weldwood Plywood, painted, is used for other walls. Cabinets are also of Weldwood Plywood.

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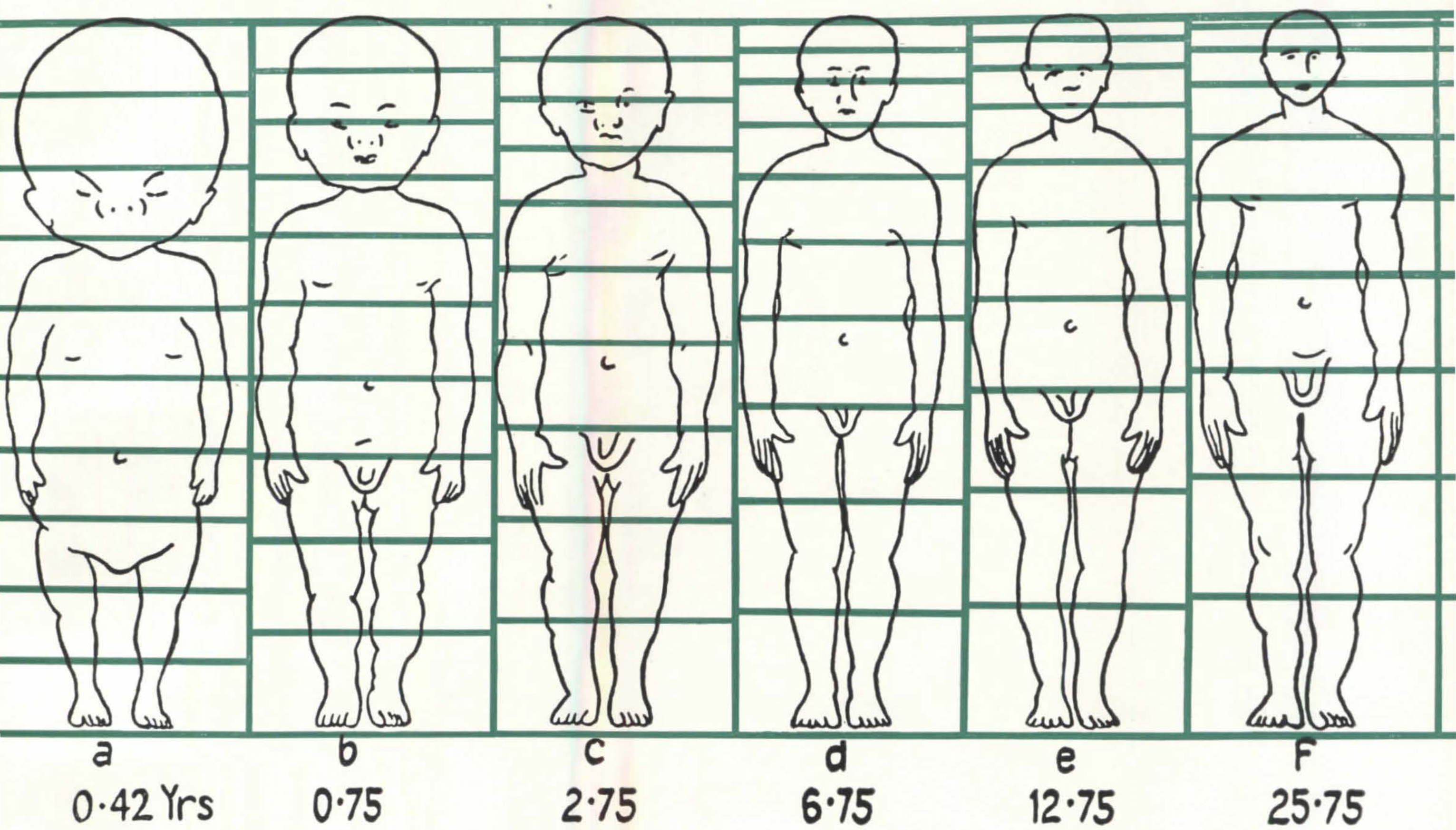
This illustration after C.M. Jackson is from the essay "Size, Shape, and Age" by P.B. Medawar, in Essays on Growth and Form, *published by Oxford University Press, 1945. The "transformed co-ordinated grids" are superimposed on frontal elevations of the human being, from the fifth month of fetal life to maturity.*



children's rooms

It may be instructive to study the charted growth (*above*) of a human being from babyhood to manhood. All too often, the designer tends to think of a child's room as simply a scaled-down version of an adult's living space. When one sees, however, the differences in proportional relationships—the head to the rest of the body, for instance, or the location of the hands in relation to the total height, or leg length related to torso—it becomes clear that design for children's activity requires special attention to usable dimensions, locations of furniture, storage units, and all other elements of the interior space.

The designer's approach to planning children's rooms, then, should include not only these considerations, but also recognition of *changing* functional needs. One must, after noticing the differences in proportional relationships as the child grows through a twenty-year period, think of the equally changing activity interests, and then consider the problem of furnished space adaptable to the obvious changes, but always usable and comfortable.

Children's room (below) *in house in Westchester County, New York. Architect, Edward D. Stone.*
Photos: Lionel Freedman

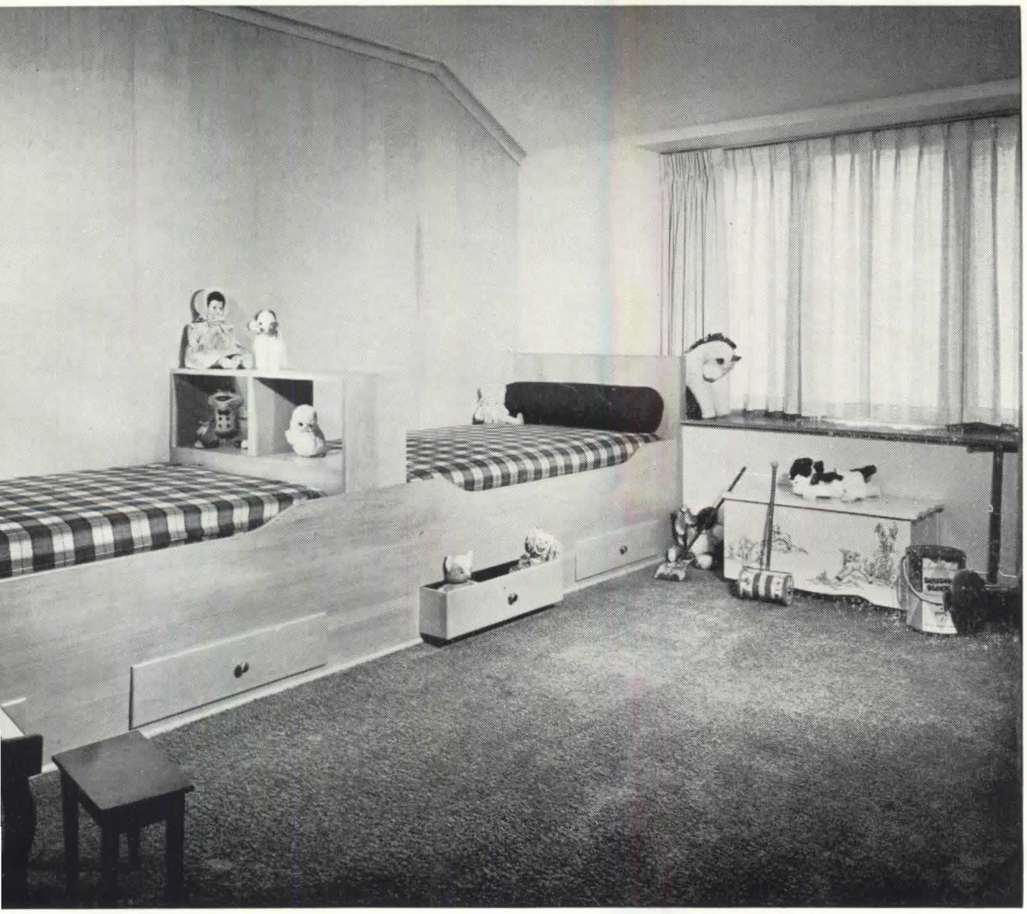
The long-range planning viewpoint is perfectly expressed in the two photographs above. The boy's room in this house designed by Edward F. Stone is obviously a young child's room now, but can grow admirably. The mural decorations and small table and chair are the only parts that need to be dispensed with later. The built-in desk and engineered closet will be good always. All surfaces have been planned to take the abuse of years of living without harm.

In the two bedrooms (*top, acrosspage*) in the home designed by Paul S. Hoag, storage will never be a problem. Ample closet space is provided and the window walls incorporate cabinets from window sills to floor. The girl's room has a double desk which can easily be a dressing table. Bed arrangement is particularly nice, because the right angle setting affords more floor space in the center of the room.

The room (*right, acrosspage*) has built-in beds along one wall, which take a minimum of space and allow more play area. The drawers under the beds relieve the toy chest and allow separation of individual possessions. This would usually be wasted space. On the four pages following that are two more examples, one of a combination living and bedroom with accommodation for a guest, another which is really an entire apartment in one house wing.

Two children's rooms (above and right) *in a California house. Interiors by Paul S. Hoag.*
Photos: Robert C. Cleveland

Another California example (below) *of a well-designed children's space. Furnishing Consultants, W. & J. Sloane, Contract Division.* Photo: Robert C. Cleveland



children's rooms

cork flooring

location	Orinda, California
designer	Henry Hill
interiors	Margery Hoffman Smith

Aside from being an attractive combination of living room-study and bedroom, with a fold-away bed provided for guests, this boy's room has been expertly planned and designed. Although each area looks onto the other, the wall case for the guest bed and the beautifully executed built-in desk make just enough division so that they seem to create separate rooms.

The study looks over a gallery to the court below and has a shed ceiling to allow direct sunlight, whereas the bedroom is completely private with more subdued lighting. Fabrics are all dark brown, draperies and bedspread match, and painted areas are cocoa brown, rust red, and gray-gold. All are harmonious and sympathetic with the variety of woods: Philippine mahogany, birch, and walnut. Coloring could not be more perfect for a boy's room.

Photographs: Morley Baer

data

Sofa: designed by Margery Hoffman Smith.

Cases, bookcase, and desk: dark red birch and Philippine mahogany/ designed by Henry Hill/ executed by Paramount Fixtures, Oakland, Calif.

Bed: walnut and birch/ head and footboard designed by Margery Hoffman Smith/ **bedding:** Simmons Co., 1870 Merchandise Mart Plaza, Chicago, Ill.

Built-in-wall bed: Murphy Door Bed Co., 19 W. 44 St., New York, N. Y.

Drapery and bedspread: designed by Margery Hoffman Smith.

Curtain track: Streamlined I-beam/ Kroder-Reubel Co., Inc., 556 Meeker St., Brooklyn, N. Y.

Lighting fixtures: designed by Henry Hill/ executed by Carl Erkine van Hacht.

Veneer walls: Philippine mahogany, walnut/ U. S. Plywood, 55 W. 44 St., New York 18, N. Y.

Flooring: cork/ "Corinco"/ Plant Insulation Co., Los Angeles, Calif.

Ceiling: plaster/ U. S. Gypsum, 300 W. Adams St., Chicago 6, Ill.

Windows: Steel sash/ Soule Steel Co., P. O. Box 3510, Rincon Annex, San Francisco, Calif.

Bamboo blinds: ¼" vertical slats/ Lun On, San Francisco, Calif.

built-in-wall bed

Philippine mahogany

built-in desk

p/a interior design data

children's rooms

location	Inglewood, California
designer	James F. Jones

custom-made cabinets

vinyl cork flooring

There's a heap of living for the children in their area of this home. Primarily, the owners' requirements concerning location within the house have been filled. The children's area is close to the kitchen, to facilitate serving meals; close to the master bedroom, to facilitate control of the smaller children; and close to the rear entrance, to relieve traffic through the rest of the house. The playroom incorporates built-in television, an eating place, and a place for each child to study. All fabrics and materials have been sensibly chosen for sturdiness and easy upkeep. The coloring is particularly pleasant—the draperies and bedspreads striped lemon-yellow, cocoa, and blue-gray. These colors are carried throughout, with addition of blue corduroy couch covers and handsome redwood and brick walls. The result is ruggedness plus cheerfulness. *Photographer: Robert C. Cleveland* brick walls

redwood

folding door

data

Swivel desk chairs: blond-finished oak/ upholstered in abstract print fabric/ California Chair Co., Beaudry Ave., Los Angeles, Calif.

Cabinets: custom-built/ natural finish oak and white pine painted cocoa/ contractor, Erville Crumm.

Couches and beds: manufactured by Bailey Schmitz Co., 7th and Sante Fe St., Los Angeles, Calif.

Walls: redwood/ lemon-colored pigment and dull-varnish finish, Paint Division, Pittsburgh Plate Glass Co., 2108-A Grant Bldg., Pittsburgh 19, Pa./ natural finish oversize brick, Higgins Brick & Tile Co., Gardena, Calif.

Flooring: vinyl cork tile/ Dodge Cork Co., Inc., 664 Manor St., Lancaster, Pa.

Accordion folding door: fabric-covered/ "Modernfold"/ New Castle Products, P. O. Box 987, New Castle, Ind.

Curtain fixtures and hardware: Marshall McMurray Co., San Julien St., Los Angeles, Calif.

Door hardware: Schlage Lock Co., Bayshore & Blanken Ave., San Francisco, Calif.

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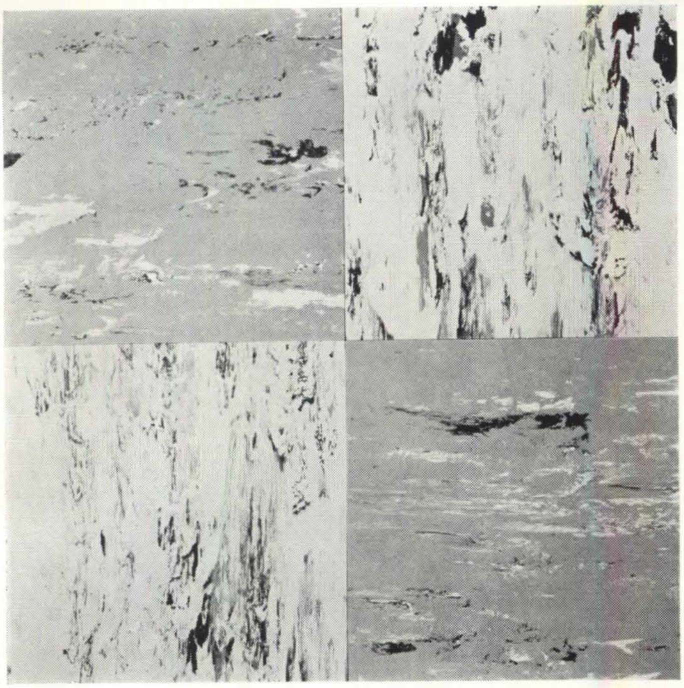
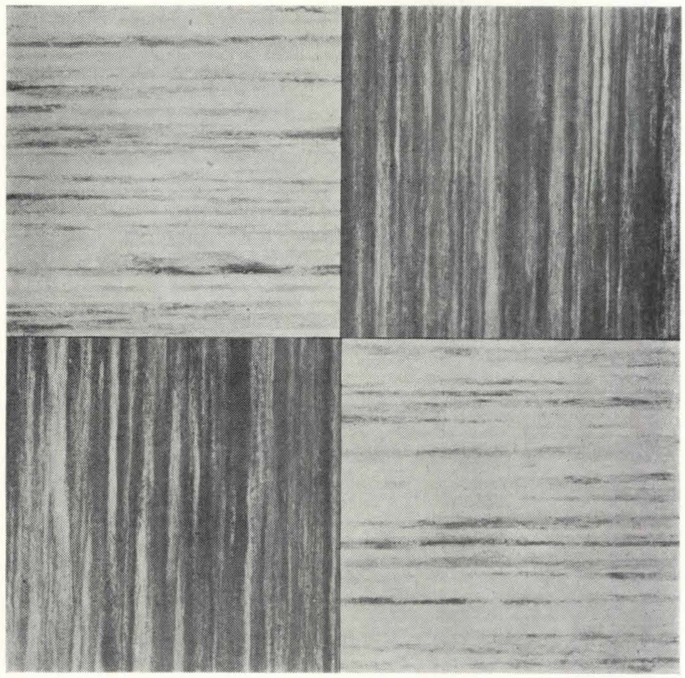
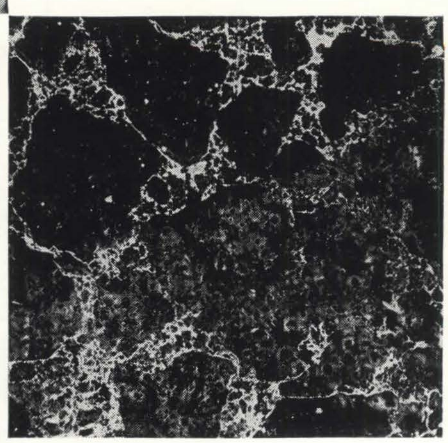


Rubber floor tile: designed to fill home-owner's need for clearer coloring in tile/ available in 6-, 9-, and 12-inch squares and 18" x 27"/ 1/8" and 3/32" thickness/ color-co-ordinated with other home furnishing items/ **retail:** 48 cents sq ft/ **Congoleum-Nairn Inc., 195 Belgrove Dr., Kearny, N. J.**

Vinyl floor tile: "VinylTile" in "Bermuda Hues"/ 9" x 9"/ softer coloration than formerly with striated color rather than marbleized/ tiles carry secondary colors to enable use of two-color floor installations effectively/ **retail:** 35 cents sq ft/ **Congoleum-Nairn Inc., 195 Belgrove Dr., Kearny, N. J.**



Antiqued gold vein mirror: available in several color combinations: gold, white, green, red, lead, and silver vein, all on dark or light mirrors/ for walls/ **retail:** $4.50 a sq ft/ **Abbott Glass Co., 160 E. 19 St., New York 3, N. Y.**



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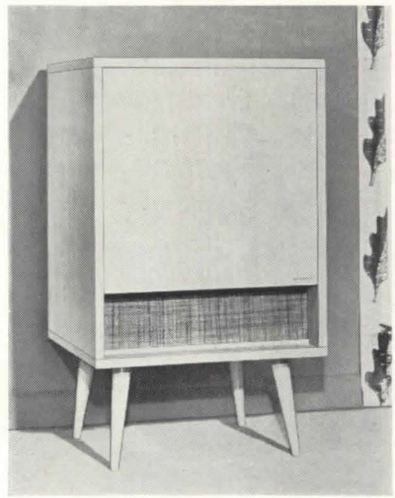
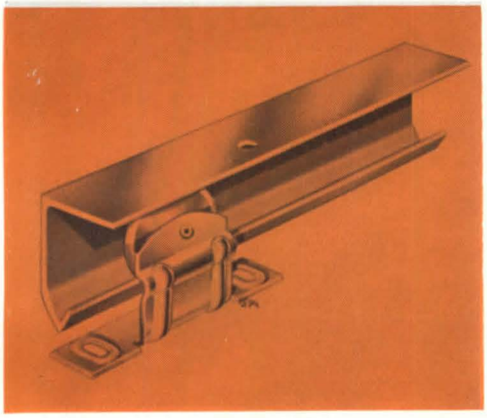
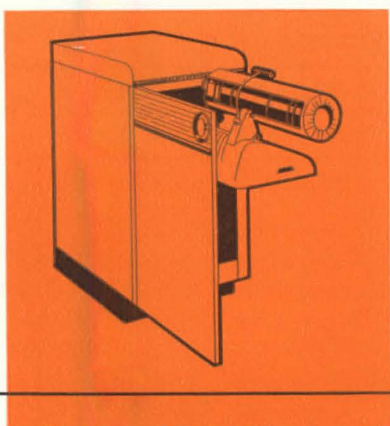
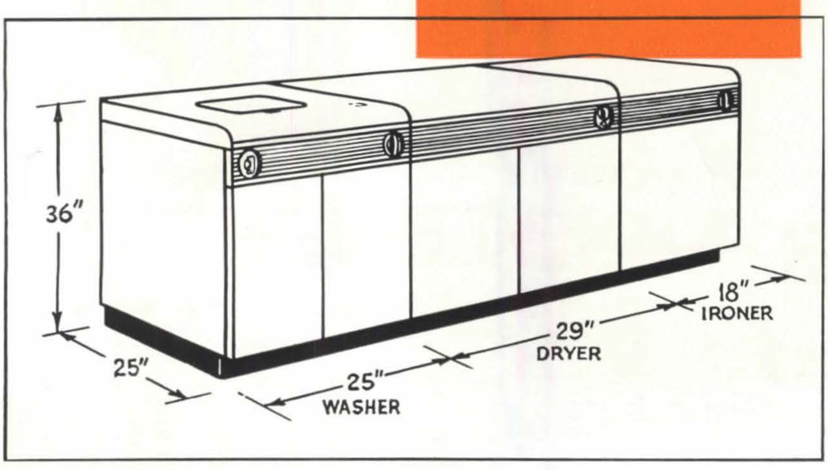


Television set: Model 17K16/ natural birch finish/ sliding door covers screen, space-saving and effective/ removable legs to permit setting on table tops/ **retail:** $319.95/ **Motorola, Inc., 4545 W. Augusta Blvd., Chicago, Ill.**



Rolling-door hardware: #70-IT, Har-Vey Challenger Series/ rust-proof aluminum V-grooved track/ Cadmium-plated ribbed steel hangers/ nylon roller glides on self-lubricating "Oilite" bearings/ **retail:** track 30 cents ft; hanger 70 cents each/ **Metal Products Corp., 807 Northwest Twentieth St., Miami 37, Florida.**





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3/16" 24 BTU/sq. ft./hr./°F	5/16" 2.2 BTU/sq. ft./hr./°F	3/16" 24 BTU/sq. ft./hr./°F
	1/2" 1.4 BTU/sq. ft./hr./°F	

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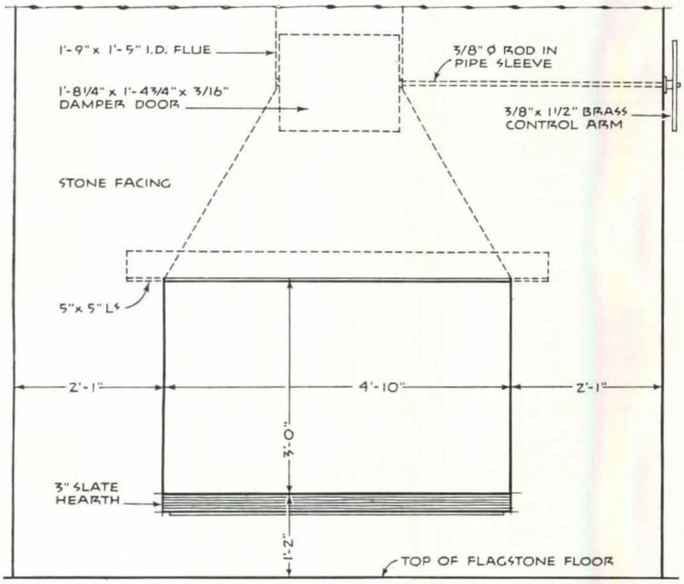
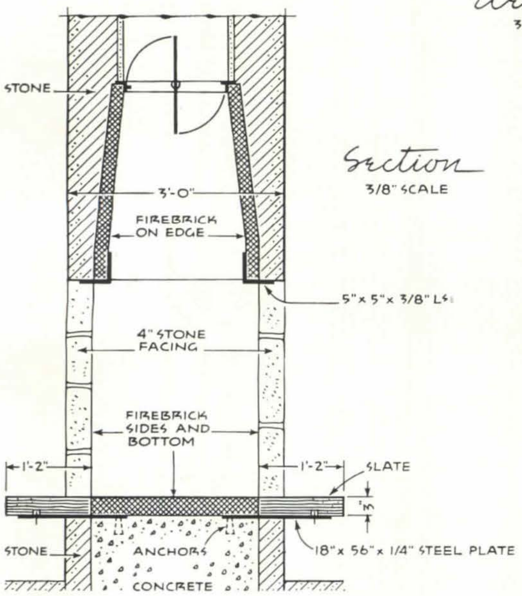
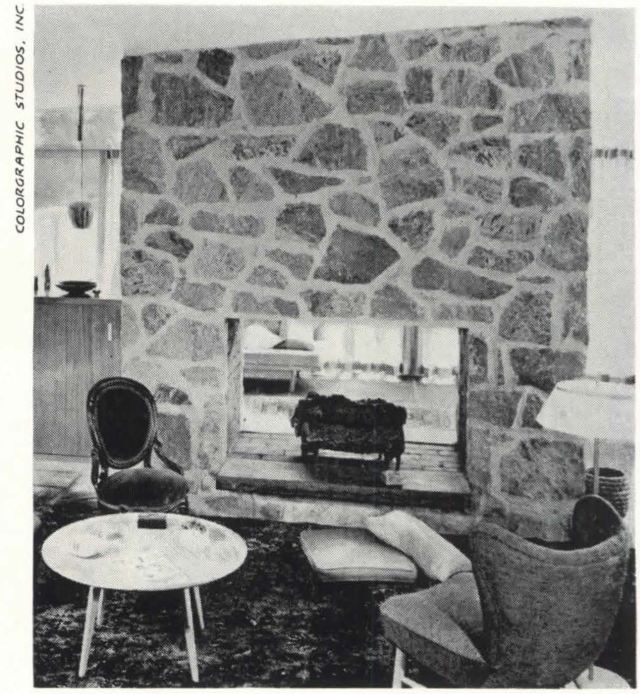


Elevation
3/8" SCALE





DIAMOND RESIDENCE, Woodmere, N.Y.
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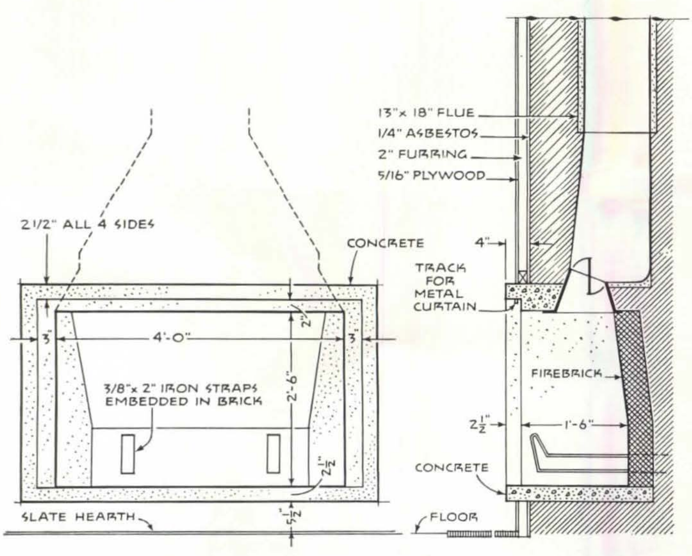
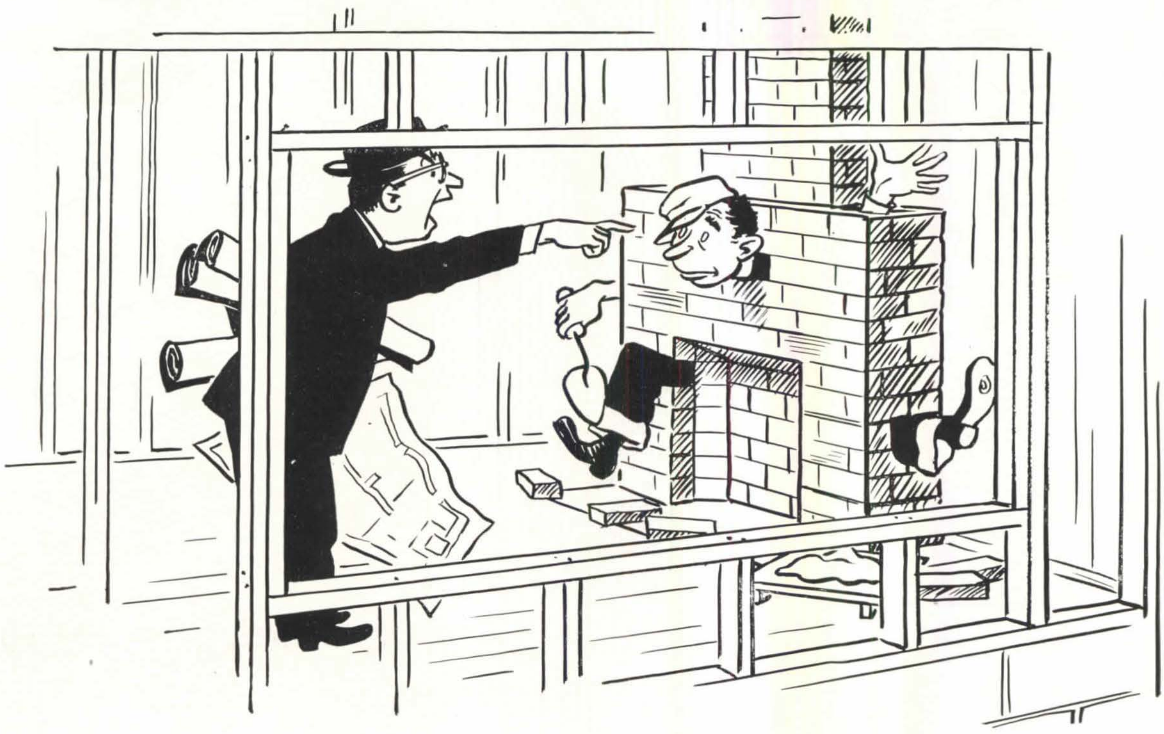


Elevation 3/8" SCALE

Section

SMITH RESIDENCE, Brookville, N.Y.
Furno & Harrison, Architects



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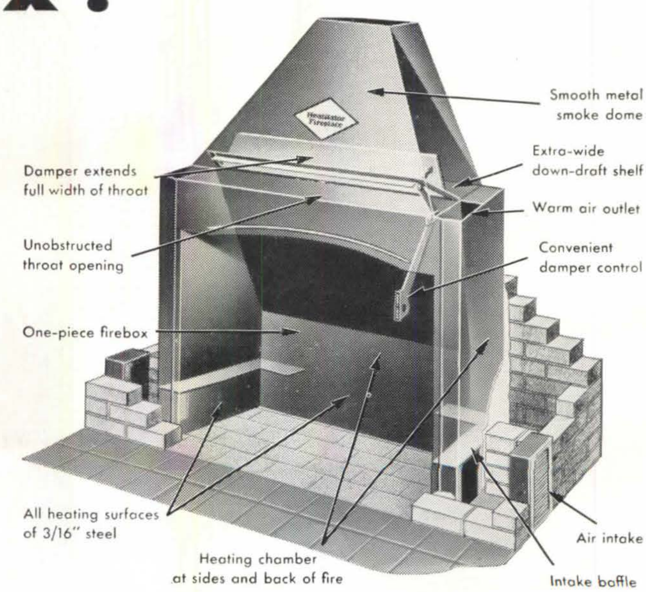

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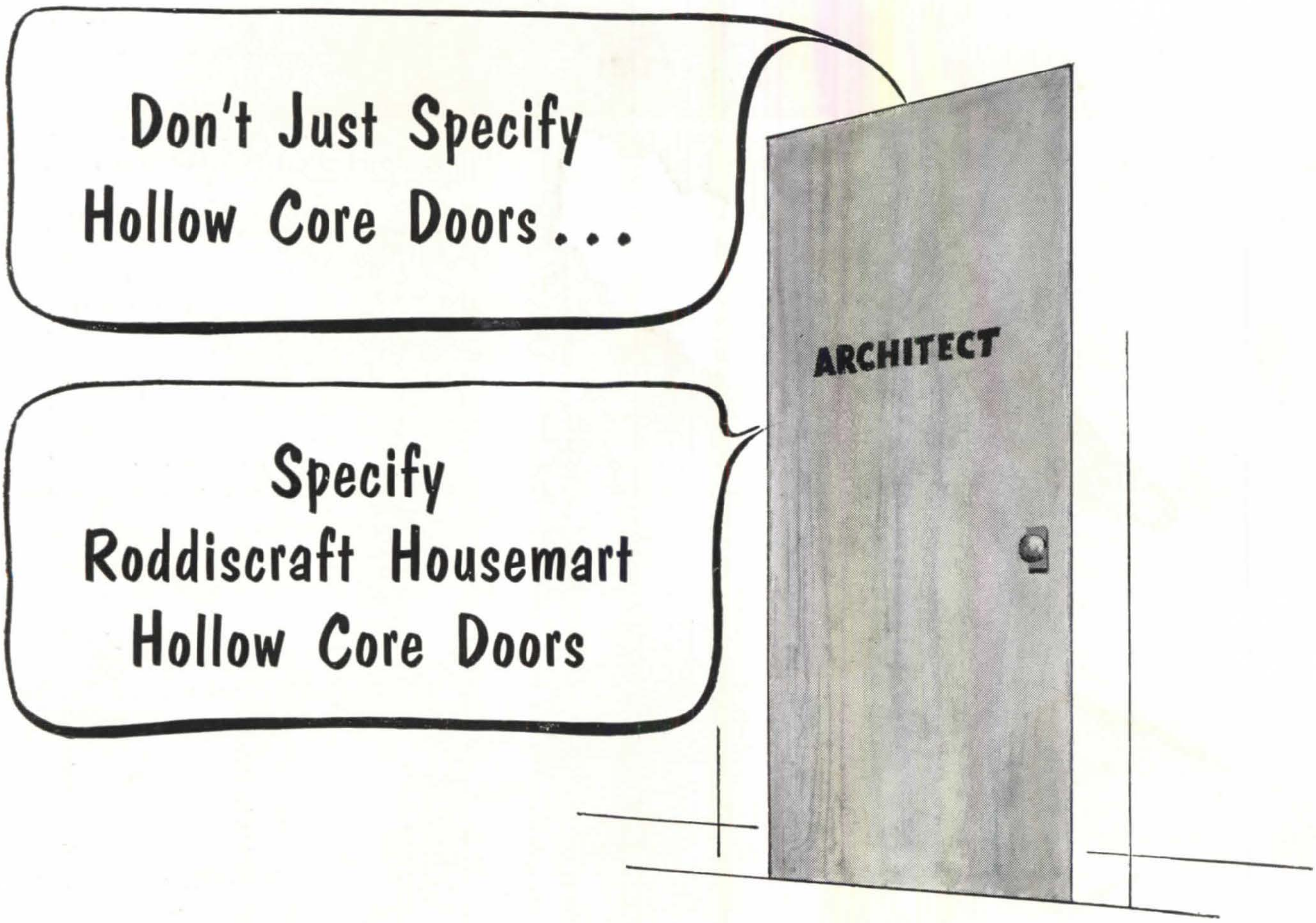

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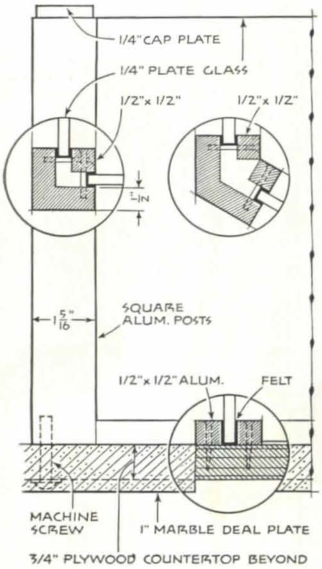
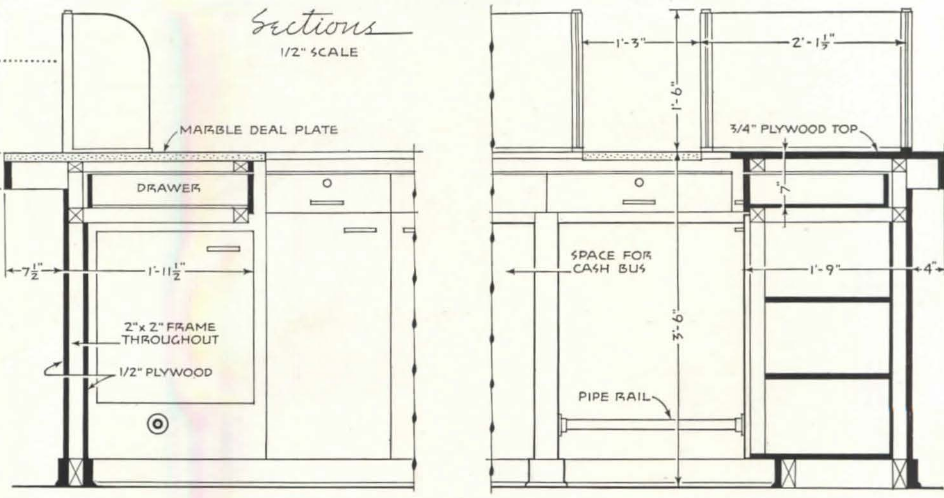
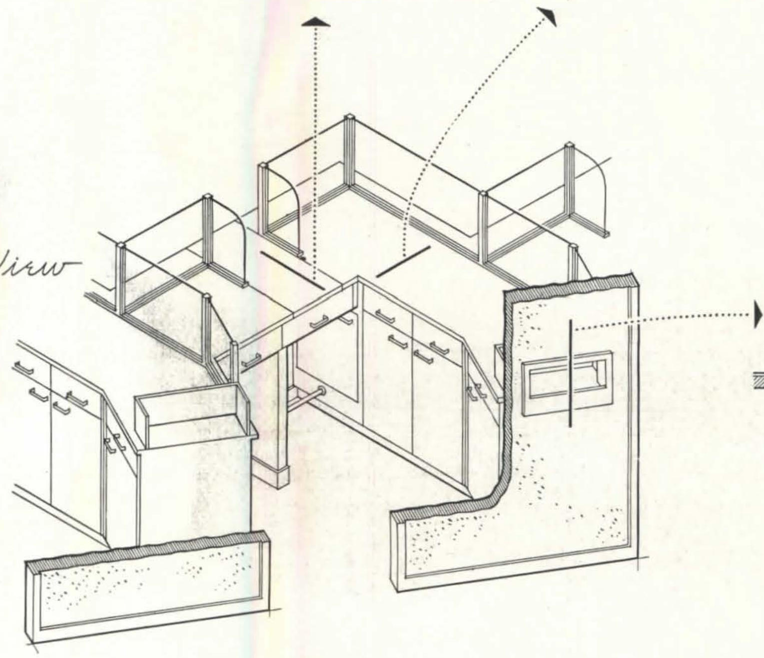


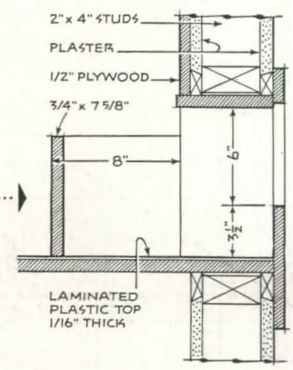
Railing Details
3" SCALE

Sections
1/2" SCALE



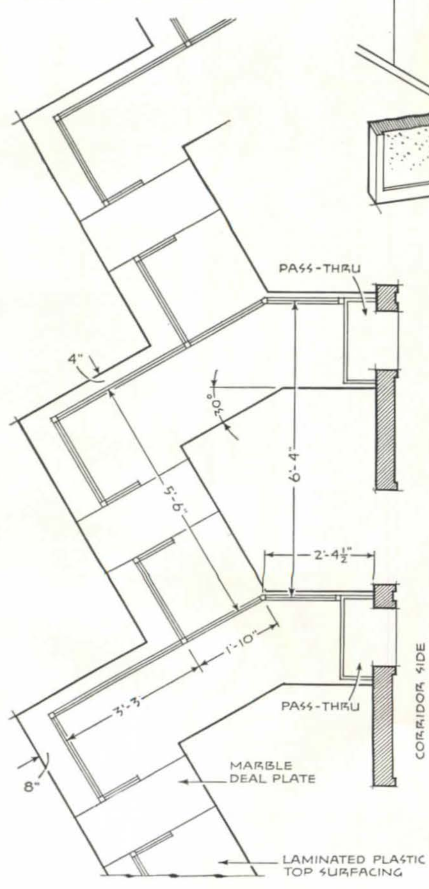
Rear View





Pass-thru Section
1" SCALE

Plan 1/4" SCALE



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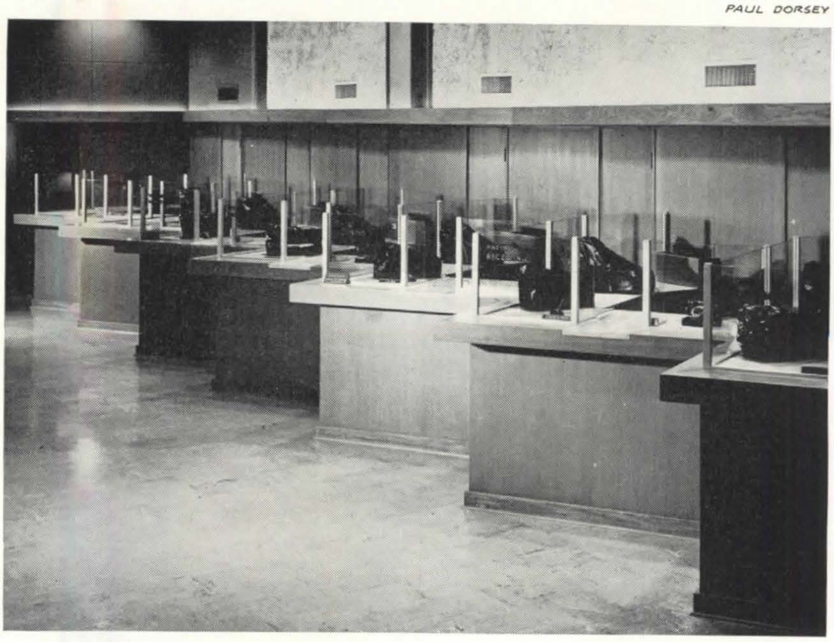

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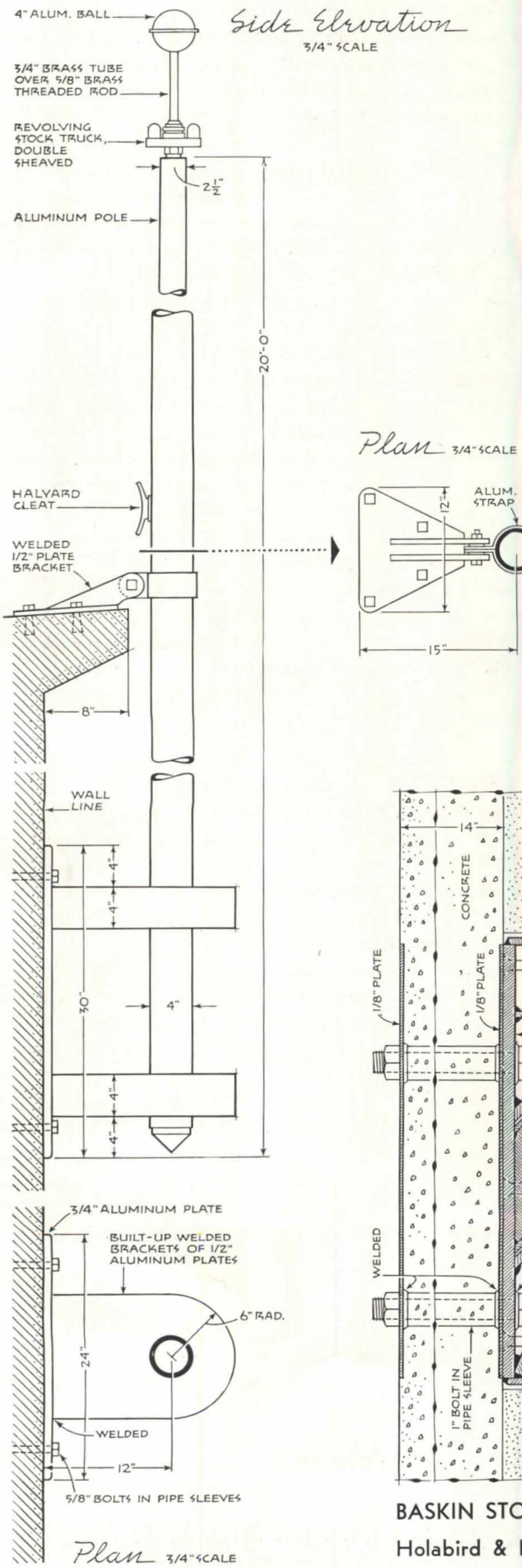

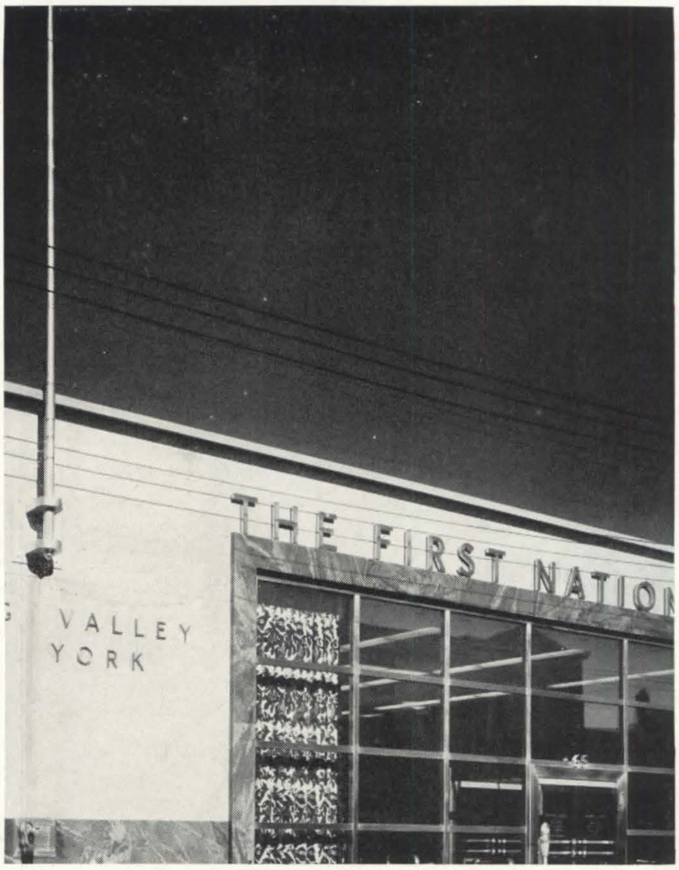

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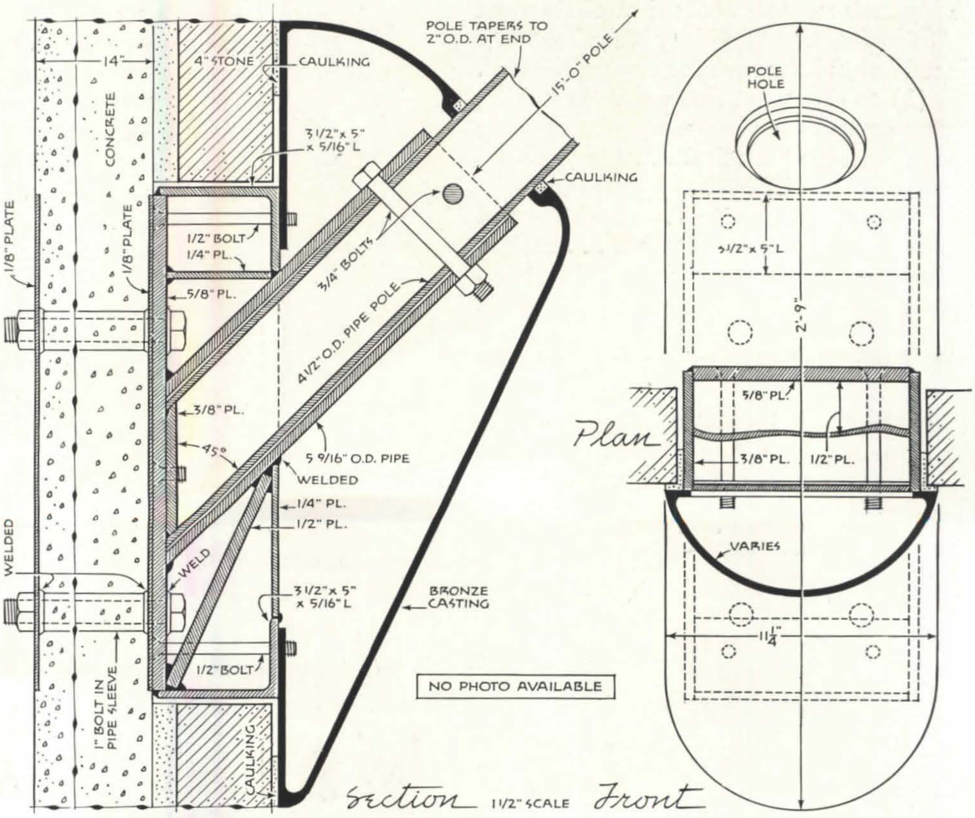

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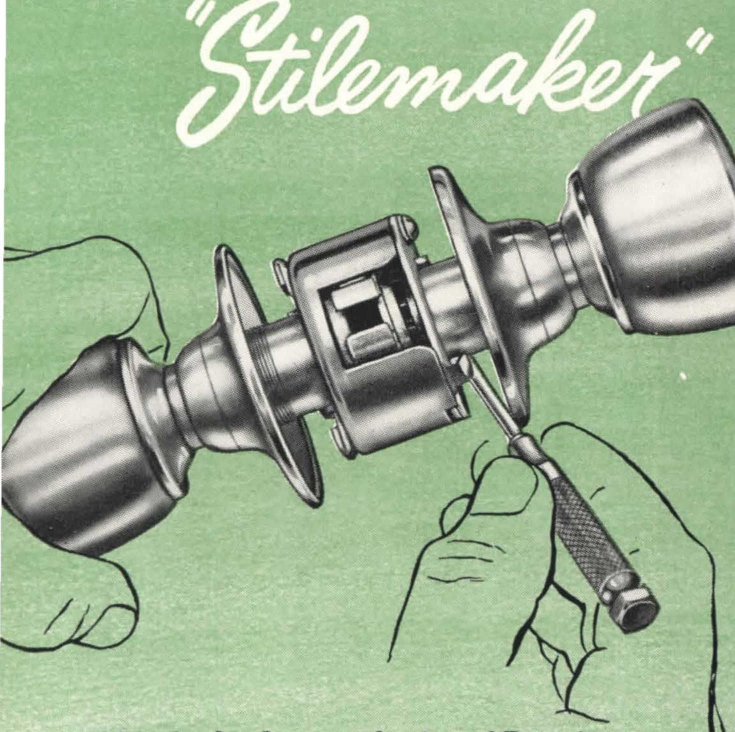

the heritage of the bauhaus

By Robert Woods Kennedy*

For some fourteen years, this month, American architects have been the objects of a continuous and ably directed bombardment. The bombardiers were those architects, painters, photographers, and commercial artists who participated in the great German Bauhaus experiment. The projectiles used have seemed to Traditionalists explosive and dangerous in the extreme. Among Modernists, the very same bombs have been welcomed as carrying messages of support, examples, and precepts. This year—in which Dr. Walter Gropius retires from Harvard's School of Design and which follows so closely on the tragic death of Laszlo Moholy-Nagy—is bound to herald a change in the nature of the campaign. This change is evident in Mrs. Sibyl Moholy-Nagy's recent attack on one facet of modern painting. It marks the end of an era. What do we have in store for us now?

In order to glimpse the shape of things to come, we must examine first the shape of things as they are. Just as sons inherit or acquire their salient characteristics from their fathers, so do artists and architects inherit and acquire from their masters. The artists of the Bauhaus—Walter Gropius and Mies Van der Rohe in architecture; Marcel Breuer in furniture; Paul Klee, Lyonel Feininger, and Wassily Kandinsky in painting; Laszlo Moholy-Nagy in photography; Herbert Bayer in advertising—are, certainly, among the principal masters of our generation. Much of the clearly visible and understandable territory behind us was discovered and explored by them. Most of our strength will be found, sooner or later, to have been derived from them. And, by the same token, the areas which we, in our turn, choose to discover and explore, will be in reaction to what we conceive to be their failures.

•

What are the strengths and failures of the Bauhaus movement? Their creed, as stated by Dr. Gropius, is as follows:

"We want to create a clear, organic architecture, whose inner logic will be radiant and naked, unencumbered by lying facades and trickeries; we want an architecture adapted to our world of machines, radios, and fast motor cars, an architecture whose function is clearly recognizable in the relation of its forms."

How well did they succeed? They did strip building of "lying facades and trickeries." They did achieve some highly "radiant and naked" architecture, in which function and form are clearly related. And they also succeeded, alas, in creating a style "adapted" to "machines, radios, and fast motor cars." They forgot that architecture is an art of itself—not to be adapted but to be created. They forgot that buildings are permanent, craft produced, unmoving, and silent—unlike machines in every respect. Into their architecture they put "biological and physiological man," forgetting that man is also a crying, lying, laughing human. They forgot that man is part poet, that he was created in the past, dies in the future, and experiences only an infinitesimal present. Mrs. Moholy-Nagy tells us that the familiar adjectives, "life-like," "illustrative," "poetic," relating painting to the narrative standards of the photographic or literary world, became (after Cezanne) obsolete." They were rejected by the Bauhaus, but it seems highly unlikely that they could ever, by any possible stretch of the imagination, become obsolete. Such analogies are the very stuff of creativity and appreciation, regardless of whether they are made in concrete or abstract terms.

The failure of the Bauhaus school to include in its working philosophy some realistic link with Man's emotions has become more marked with time. The school has become ever more precious, exclusive,

*An answer to "The Heritage of Cezanne" by Sibyl Moholy-Nagy in August 1952 P/A.

and doctrinaire. And, with its success, it has gradually assumed a vested interest in all modern architecture. Newcomers, deviators from the party line, and personal expression are looked upon askance.

•

Dr. Gropius has gone so far as to remark, in a speech, that the battle of modern architecture is won, and that all that remains for the younger generation is the mopping-up operation. The emphasis on victory is not infrequent. Mrs. Moholy-Nagy remarks that: "Today . . . the battle of Cezanne and Berlage has been won." Why this insistence on victory?

It seems clear that the object of the war, and the objective claimed, is the reduction of all art to a purely technical, structural, and, above all, visual level. Technique and asceticism are to be the goals. Emotion is to be evicted. Mrs. Moholy-Nagy makes this point in several ways:

"The Representational Expressionism of the early 20th Century has been replaced by a totally unformed color language that serves only one purpose: to project the painter's most intimate emotions.

"Too many painters of today have abandoned responsibility and asceticism to externalize their agonized egos.

"At no other time in history has the dynamic and experimental character of visual expression been so wholly recognized. But, in spite of the diversity of form produced by this revolution, there always remained one common denominator: *structure as the basis of vision.*"

This rear-guard action against the forces of emotion and personal expression is, of course, utterly hopeless. As a result, the Bauhaus school takes on, increasingly, the atmosphere of a beleaguered camp. Every evidence that there are other than purely visual values *in art must* be violently attacked. Mrs. Moholy-Nagy says:

"The subconscious, once it has been declared supreme, absolves man of all rational responsibility. It guarantees, above all, freedom from value judgments." *(sic).*

And the paintings of those artists most concerned with the expression of pure emotion, Pollock, Baziotes, and Tomin "leave one," she adds, "sick with shock."

Reactions such as this to one of the strongest and most interesting of the phenomena in contemporary painting, remind one of the similar remarks made about Beethoven in his time, about Lehmbruck in his time, and even about Dr. Gropius in his early years. The present is obviously becoming increasingly disagreeable. And, as one might expect, the more the times tend to depart from the concept of art as a purely visual expression, the greater the sense of doom experienced by the adherents of the Bauhaus. Mrs. Moholy-Nagy ends her article on the note that we must return to Cezanne's principles ". . . if our civilization is to survive."

•

If my views are at all typical of that aging "younger generation" which owes so tremendously much to Dr. Gropius and to the whole Bauhaus movement, then that generation has no argument with the importance of structure, planes, and volumes; i.e., with the concept of visual order in art. Our argument is, quite simply, that as creative resources they are not enough. The sense of our time is catholic. We have inherited, from the masters of the Bauhaus their sense of form and function. What we urgently require, and will not be denied, is the key to expression, in order, so we conceive, that we may finally make a whole architecture.

(Continued on page 135)

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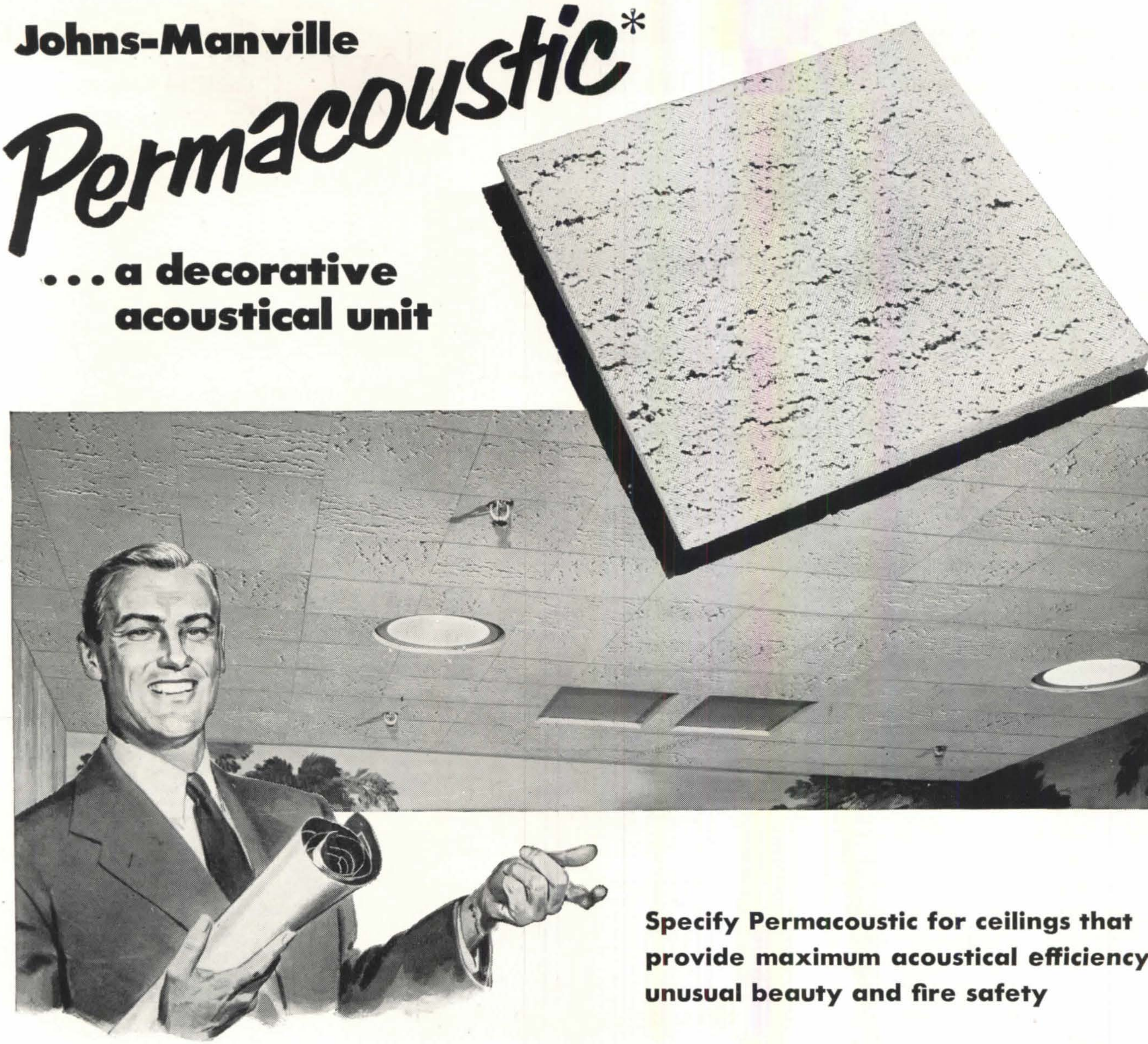

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(Continued from page 133)

The life of the emotions is our most ever-present preoccupation. The things we have learned about them through the work of the sociologists, psychoanalysts, and comparative anthropologists are explicit in most current art and writing. Planes and volume, yes—but how can we make them tell us of love, of sociability, of welcome, of joy? And must we not understand how they can tell of hate, loneliness, rejection, and despair; in order that we may avoid the *inadvertent* expression of such emotions?

Messrs. Pollock, Baziotes, and Tomlin are doing for our time exactly what Piet Mondrian did for that of the Bauhaus. They are exploring—exploring ways and means to better express the life of the soul; exploring techniques for evoking more immediate and more fundamental responses to color and design. Mondrian's experiments were in technique. These are in emotion. His were invaluable for their time. The values of these can be glimpsed when one tries to conceive of a serious artist or architect who did not crave desperately for more insight into his own, and into his generation's, soul.

Has Mrs. Moholy-Nagy forgotten, so soon, the cries of indignation which met Piet Mondrian's work when it was first shown? Certainly no architect of my generation can forget the cries of "chicken coop!" and "shoe box!" which invariably greeted his early work. "Give me a ruler," people said of Mondrian, "and I'll whip you up a dozen in no time flat." More recently, Alexander Calder has come in for the same treatment. The gifts required, in his case, are "some pliers and some wire," but the time limit remains the same. Now Mrs. Moholy-Nagy tells us that:

"The mechanics of color application, such as the flow of oil paint from a can . . . have become self-purposive. The guiding principles of plan and preconcept are negated, and if there is depth in this passion, it is the deep passion of total abandonment to chance."

•

Here we are at the nexus of the disagreement between the Bauhaus generation and our own. The Bauhaus architects, who limited themselves to purely visual and abstract order, could approach their work almost as would a scientist conducting an experiment. And indeed "design research" is one of the favorite cliches of its latter-day disciples. In our time, the insistence on the expression of emotion vastly complicates the creative process. The ebb and flow of emotion and intuition is—in contrast to the Bauhaus scientific determinism—messy, inchoate,

(Continued on page 136)

(Continued from page 135)

and unpredictable. It must be, as Mrs. Moholy-Nagy rightly implies, guided at least in part by unconscious drives. The problem this imposes on us is one of control. The age-old principles of design, of discipline, of use, must be applied to the stuff of the emotions without outrage to either.

The battle for modern architecture, the taking of that node between form, function, and expression, far from being won, has just begun. The Bauhaus school has accomplished the first important task, the clearing of the field of battle (cluttered with the ruins of antiquity) for this present action. Will they now use the field for a civil war within the ranks of the Modernists, rather than for a concerted attack on their ancient enemies, the Traditionalists?

experiments forgotten

It is difficult to reply to Robert Woods Kennedy's spirited counterattack on my article, "The Heritage of Cezanne," because he chose to interpret my personal opinions as expressions of the Bauhaus Movement. Since I was a late-comer to the Bauhaus Circle, I never felt qualified to be its spokesman, but there are already certain, one might say, historical facts that can be discussed.

The peculiar American interpretation of the Bauhaus idea as "technical, structural, and, above all, purely visual" can hardly be blamed on its originators. The Bauhaus program was planned and realized as a way of living, with the over-all aim of creating a happier and more harmonious social world. It was saturated with emotional elements. Schlemmer's theater and dance workshop; the purely emotional experiments in touch, shape, and color, first of Itten's and later of Albers' Foundation Course; Kandinsky's *Improvisations* of which he wrote: "A largely unconscious, spontaneous expression of inner character, nonmaterial in nature;" and Klee's metaphysical visions, all were matters of the mind and not of the intellect. There was a community life of intense emotional appeal: festivals, dances, bands, publications. But all of it died when the physical reality of the Bauhaus was destroyed: what survives is the dogma. We know today the *abstract arguments of Scholasticism*, but we find it difficult to relive its religious fervor. The heart is a sensitive organ, and cannot be easily transplanted—as all emigrants know.

When Gropius demanded "a clear organic architecture, whose inner logic would be radiant and naked" he formulated a principle, he did not hand out a recipe. The current

(Continued on page 138)

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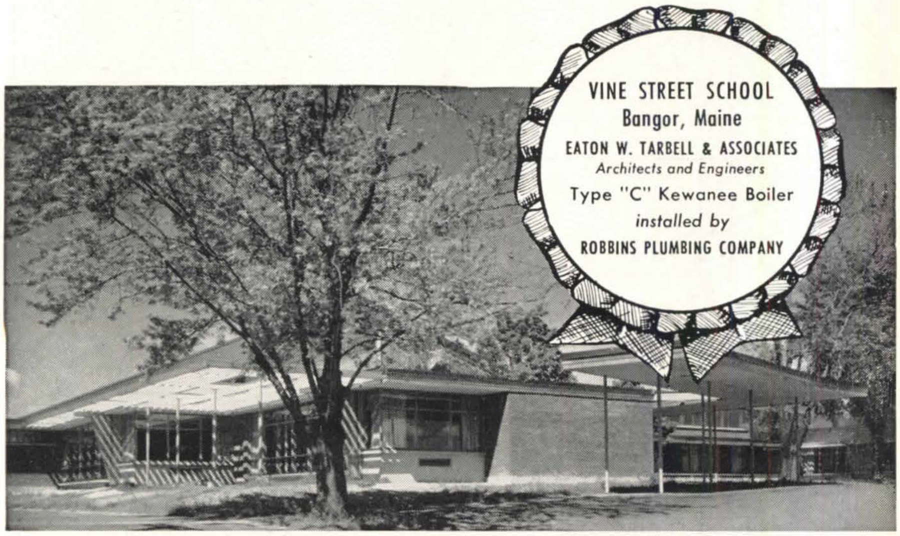
architectural scene shows the unending variations as well as the unchallenged validity of this principle. The unfunctionality of Mies van der Rohe's latest glasscraper is defended with passionate acclamations of its beauty, and objections to the playfulness of the Lever House courtyard are silenced with comments on its emotional value. Yet both buildings are —if anything—"radiant and naked." Kennedy's concluding remark on "the shape of things as they are" speaks of a "precious, exclusive, and doctrinaire" Bauhaus clique that rejects "newcomers and deviators from the party line" and this, it seems to me, is a gross injustice. The record of the Bauhaus men working in this country—the teaching methods of Gropius and Albers, Moholy's *Vision in Motion* which is used as a textbook to the rate of 16,000 copies, Breuer's use of color and texture in building, Schawinsky's color-light displays, Bayer's commercial art for Aspen—show profound variations from the German Bauhaus program, variations that are the result of a reciprocal influence of European and American ideas.

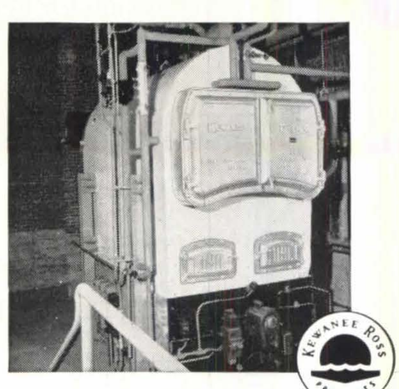
When he finally returns to the subject matter of my article, which was painting and *not* architecture, he raises an all-too-familiar warning finger that points at the unjust condemnation of all new art movements in the past. But I, for one, refuse to be intimidated by the mere adjective "new." Perhaps it was the experience of Bolshevism and Fascism in Europe that drove home the profound fallacy of the equation: new and essential. Art History bears out this conclusion. Were not the Nazarenes, the Pre-Raphaelites, the Art Nouveauists and Vorticists attacked and praised, simply because they were new? In an era of frantic instability all one can do is to hold to instinct and knowledge, and take a chance with immortality.

As dubious as the equation of new and good, is the second of Kennedy's combinations: namely, "purely visual and abstract," which he blames on the Bauhaus. These are terms that can be, and were, applied only to painting and sculpture. If a house is purely visual, it has a facade architecture which even Kennedy could not identify with the Bauhaus; and if it is purely abstract, it is nonexistent. The same goes for the terms "lifelike, illustrative, poetic," which I had applied to pre-Cezanne art, and which cannot, by any stretch of the imagination be valid for the judgment of buildings. And here the work of the Abstract Expressionists furnishes the absolute proof of the obsolescence of these terms. What we want of painting is neither illustrative content, nor eclectic construction.

Our need, as Kennedy so aptly states, is "the ebb and flow of emotion." But we are unable to find the form that conveys this emotion. My concern was precisely with the absence of emotional contact, and particularly with the absence of a will to create a language that would contact the beholder. What we all hope for is, to quote Kandinsky as the father of it all: "an expression of slowly formed inner feeling, tested and worked over repeatedly, almost pedantically. This I call Composition. Reason, Consciousness, Purpose, but of calculation nothing appears: only feeling."

To interpret this statement of a deep concern as an "utterly hopeless rear-guard action of the Bauhaus Movement against the forces of emotion and personal expression," is an all-too-swift conclusion, based on no more than an identity of names. SIBYL MOHOLY-NAGY





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Streamlined Specifications Standards. Vol. I—Architectural. Three Pads: Pad I: Contractual; Site Work; Structural. Pad 2: Masonry; Weather Protection; Metal Work. Pad 3: Finishing. Ben John Small. Reinhold Publishing Corp., 330 W. 42 St., New York 36, N. Y., 1952. $20

Scandinavia. Eric de Mare. B. T. Batsford, Ltd., 15 N. Audley St., W.I & Malvern Wells Worcestershire, London, England. Distributed by the British Book Center, Inc., 122 E. 55 St., New York 22, N.Y., 1952. 262 pp., illus., $4.50

The Age of Wren. Ralph Dutton. B. T. Batsford, Ltd., 15 N. Audley St., W.I & Malvern Wells Worcestershire, London, England. Distributed by the British Book Center, Inc., 122 E. 55 St., New York 22, N.Y., 1952. 136 pp., illus., $9

architectural rarity

The Works of Architects Olgyay and Olgyay. *Reinhold Publishing Corp., 330 W. 42 St., New York 36, N.Y., 1952. 72 pp. illus. $5*

This is a book with a strange and fascinating history. Originally published in 1946 as the first volume of a series on Arts and Artists in Hungary, the first printing was sold out, with the exception of five hundred copies, before the Iron Curtain was drawn across Hungary's western border.

The subjects of the book, twins Aladar and Victor Olgyay, left Hungary for the United States in 1947. They obtained an invitation from the University of Notre Dame to join the faculty of their architectural school. For four years they taught architectural design, and at the same time were active in practical and theoretical fields. One of these is a method of applying climatological data in dwelling design and site planning.

Now they are staff members of the Massachusetts Institute of Technology, where they are further developing this method in a project called "Climate and Housing Research."

The unbound sheets for the last five hundred copies of "The Works of Architects Olgyay and Olgyay" were shipped to Stockholm and then to New York. The Olgyays asked Marcel Breuer, a former compatriot, to write an introduction; they asked Gyorgy Kepes, another former compatriot, to design a jacket and title page; both agreed.

As Breuer says in his introduction: "The Olgyays . . . have the colorful talent and dynamic vigor of the educated, cosmopolitan Hungarian—the imagination and sensitiveness of a poetic and musical heritage—the power, precision and responsibility developed by Western influences." This limited edition makes available an unusual book for those architects who would like to know of the work that was accomplished and projected in Hungary after the war, and before the present domination from the east.

analysis of shadow projection

Sciagraphy. *John M. Holmes. Sir Isaac Pitman & Sons, Ltd. Pitman House, Parker Street, Kingsway, London, W.C.2, England, 1952. 58 pp., illus., 15 Shillings*

The theory and practice of shadow projection are developed here in a similar form to that of the author's earlier book, *Applied Perspective,* for use by architectural students and for reference by practicing architects. An analysis of methods employed for all forms is presented and those considered most typical are demonstrated. Included is a section which shows direct methods of obtaining shades and shadows of typical forms without the need for projection. Study of the analysis contained in the book will aid students in understanding the effect of light and shade. B. L.

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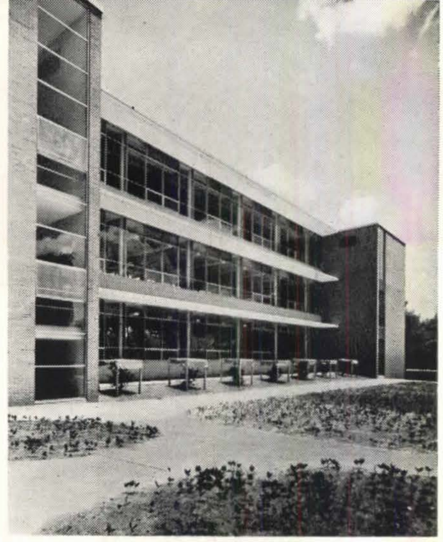
out of school

by Carl Feiss



School of Architecture, Georgia Institute of Technology, Atlanta, Georgia. Bush-Brown Gailey & Heffernan, architects.
Photo: Gabriel Benzur.

Christmas and the New Year are around again. It has been a busy and exciting year—what with a new President, and the completion of the United Nations buildings. I still think the UN buildings would have been better on the hills overlooking Denver or on that site overlooking San Francisco Bay. There could be nothing worse than that slimy East River front of Queens and the backdrop of the rear walls of Tudor City, as a setting for World Order. Despite the general mediocrity of the ensemble, it still would have had some chance to mean something, in another *location in another* part of the world.

But I'm digressing from Christmas and the New Year! Actually, one of the most interesting if not exciting news items of the past architectural year was the opening of Georgia Institute of Technology's new building for its School of Architecture. You will be seeing it reproduced in its entirety in one or more of the architectural periodicals and will be able to draw your own conclusions about its design. The purpose of this article is to let the Director, Harold Bush-Brown, F.A.I.A., talk about his school. Bush-Brown is a quiet, modest man who, without fanfare, has produced a dramatic new school and a large grant-in-aid from the General Education Board. In a year in which several schools of architecture have been struggling for identity, and others for their lives, in a year when internal dissensions in several schools have caused much unhappiness among faculty and students, the renaissance of the school at Atlanta is an encouraging event and, I am sure, a portent of better times elsewhere.

I am proud to have Director Bush-Brown as the guest writer of this column, this month. He will give you in his own words the "hows and whys." I have been to Atlanta recently and can tell you that there is more to it than he has written, or perhaps could write. The New South is making tremendous strides. Atlanta is industrializing at a terrific rate. Everywhere there is new building or the refurbishing of old. There is verve and spirit and new architecture. The School of Architecture at Georgia Tech is within the context of this new spirit. May the School, Harold Bush-Brown, Howard Menhinick, Sam Hurst, and the rest of the fine

(Continued on page 144)

(Continued from page 142)

faculty launch their sparkling ship on calm seas for a long and successful voyage!

I'm signing off with best wishes for a Merry Christmas and a Happy New Year.

a change for the better

By Harold Bush-Brown

"When, in the middle 30's, Bosworth and Jones returned from their famous trek around the country, they reported that they found most architectural schools located in attics. They were there on sufferance, occupying unused space in a building assigned to some larger and more important department. How was it that this oldest of professions, this so-called mistress of the arts, this builder of cities should have been so ignominiously kicked upstairs?

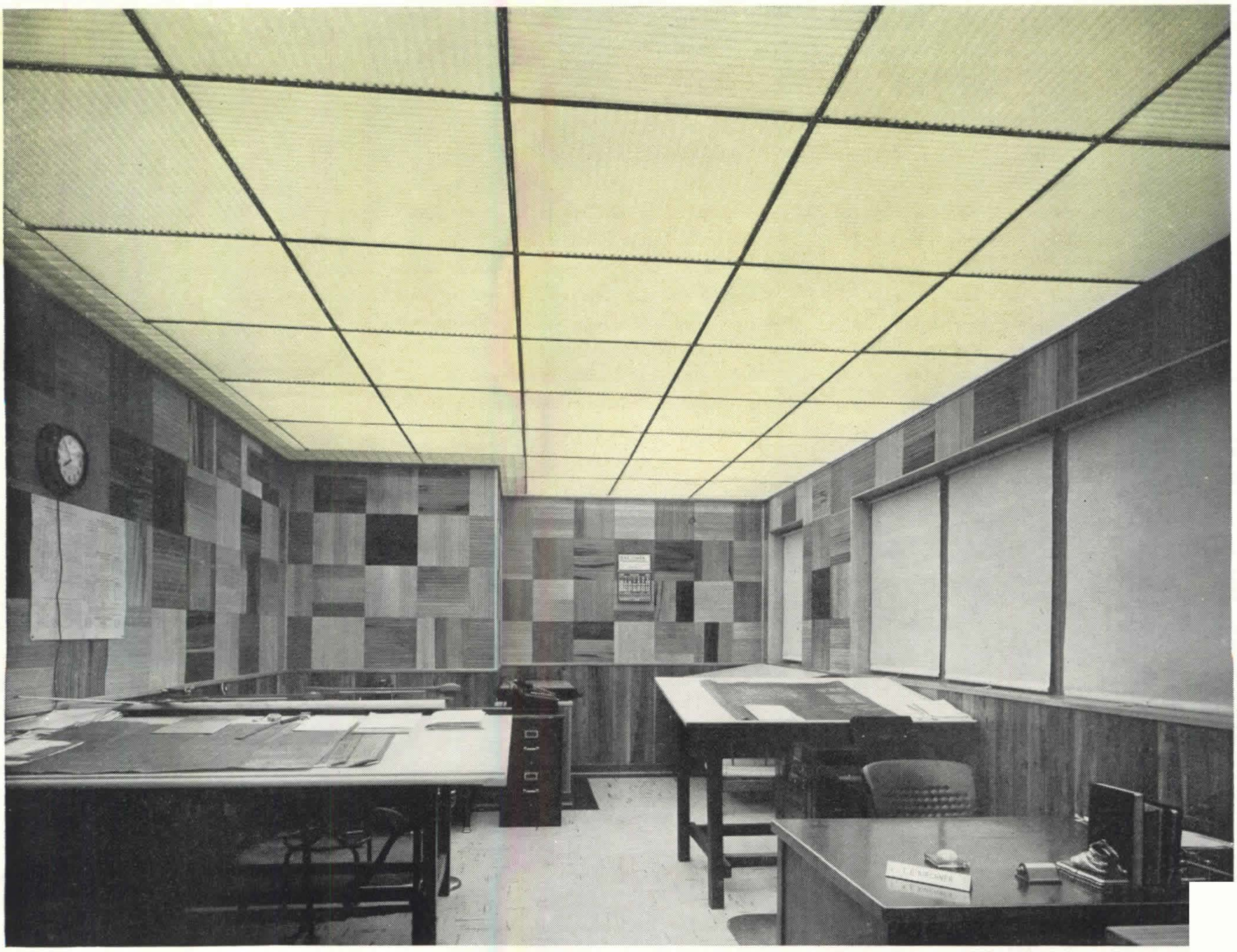
"This is not the place to go back over changes brought about by the Industrial Revolution or to try to explain why architecture has declined, relatively speaking. In the world of education, we can only say that our pretentions to a tradition of leadership would appear to be unknown or ignored.

"If these words seem unduly pessimistic, let me hasten to make amends. Architectural education may have had to take a beating and we are still not without difficulties. The diagnosis of our troubles is uncertain, but the patient is still very much alive, and, as of today, there are signs of a change for the better.

"I have been asked to write of the new building just completed for the School of Architecture, Georgia Institute of Technology. As a result of a fortunate combination of circumstances, the State of Georgia has presented us with up-to-date facilities meeting all our requirements. For the first time, so far as I know, in the recent history of architectural education, the building was designed and supervised by those who were to occupy it, members of the faculty. We worked up our own plans, recommended the site located on our master plan of the campus, and, not long after the war, we were authorized to prepare contract drawings.

"What should a modern, up-to-date architectural school contain? The President of the Institute had already set up one condition to apply to all degree granting departments, namely, that there should be an assembly room or auditorium capable of accommodating all the students of that school. We therefore included a room with 300 seats. At the time

(Continued on page 146)



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Notice how the clean, sweeping effect of this ceiling enhances the lines of the whole room. Pipes, ducts and beams are concealed. Since VINYLITE Rigid Sheets lose their corrugations and fall at combustion temperatures, sprinkler systems remain effective, so that fire insurance rates are unchanged in the majority of cases.

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out of school

(Continued from page 144)

the program was formulated and approved this was considered the optimum enrollment to shoot for. Experience dictated that an important element in the scheme should be a large judgment and exhibition room which could be closed off when desired. Our judgments had been held in corridors and we had had no way of giving real protection to traveling exhibitions. This room is placed over the auditorium, lighted and ventilated from two opposite sides. In addition to the usual drafting rooms, classrooms, offices, and library; we felt the need of a shop; a darkroom; large storage areas for models, drawings, and fabricated materials; a room for building materials displays in a special classroom; a student-visitor lounge; and a seminar or staff room. Graduate students and men taking theses need separate cubicles or alcoves. We also considered the need for certain outdoor activities. Let us now have a look at the building and see how these requirements have been taken care of.

"It would seem self-evident that a School of Architecture building should illustrate sound principles of planning and design. Among these it was felt that the relationship between the building and the site was of special importance. The fact that there were changes in level to deal with made for some difficulties, but at the same time provided an unusual opportunity to develop interesting spaces and constantly changing outlooks as one moves about. The pleasing effects will be enhanced as the landscaping is carried out. The open tile deck over the library, the covered open-air concourse under the library, and the garden area adjoining within the enclosing wings play a part in this indoor-outdoor relationship and, in addition, are *all adaptable* for freehand sketching on the part of students and also for demonstration and research in the use of building materials exposed to the weather.

"In arriving at a *parti,* the functioning of the building was naturally of the greatest importance. The four and one-half story working part of the building to the north includes the drafting rooms, classrooms, offices, and shop. The two-story south wing includes the auditorium, exhibition and judgment room, director's office and staff room, and the student lounge. The two wings mentioned above are joined together, above an open concourse, by the library and gallery. Between the north and south wings and on the intermediate level of the concourse, is the garden in the process of being developed.

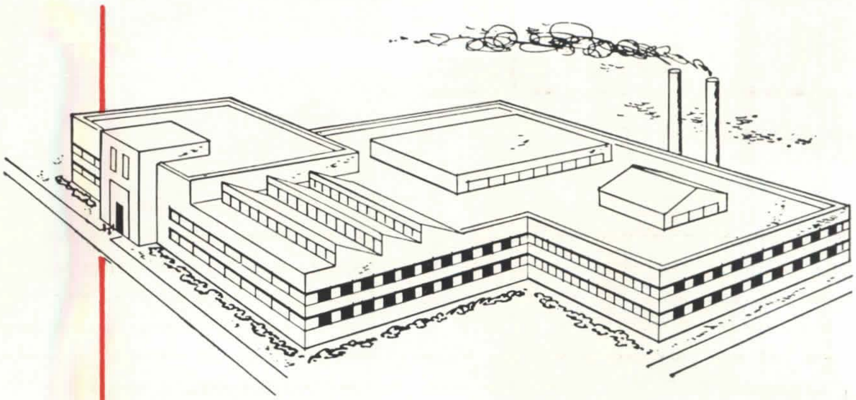
"The construction is reinforced concrete; the walls of brick; windows framed with aluminum. Except for the gallery, all the long lines of windows face north or south. This is to obtain maximum daylight and at the same time provide sun protection against excessive heat from the morning and afternoon slanting rays. The projecting canopies over the windows at floor level serve a double purpose: (1) sun and rain control, and (2) a means of window cleaning from the outside. These canopies and the spandrels are faced with light-colored glazed tile.

"The library, auditorium, lecture room, and staff room are air-conditioned. The auditorium is partly below ground and has no windows.

(Continued on page 148)

Large area heating...

WITH OR WITHOUT DUCT-WORK



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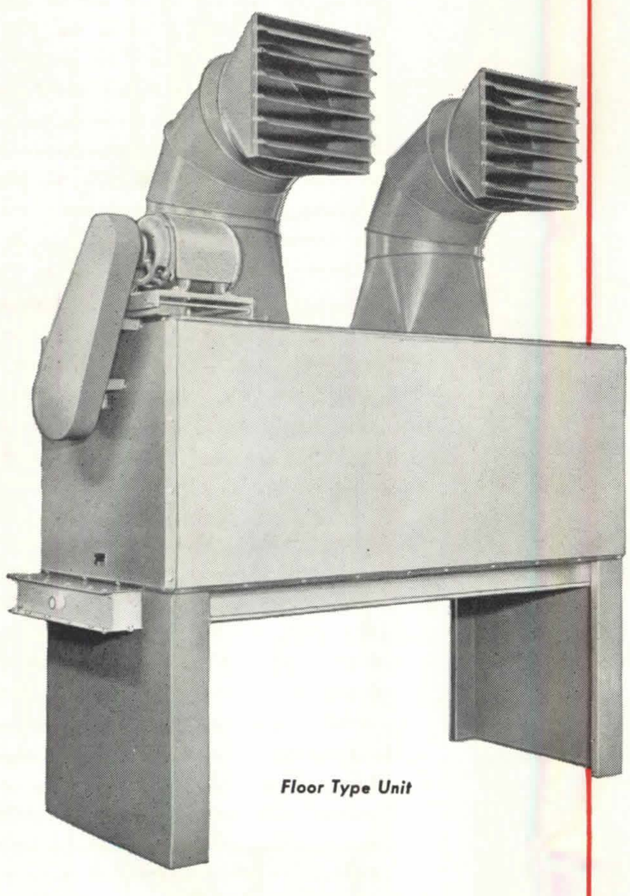
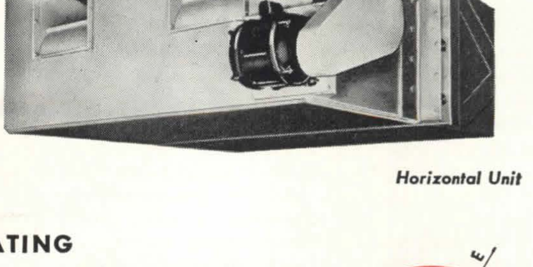


Floor Type Unit



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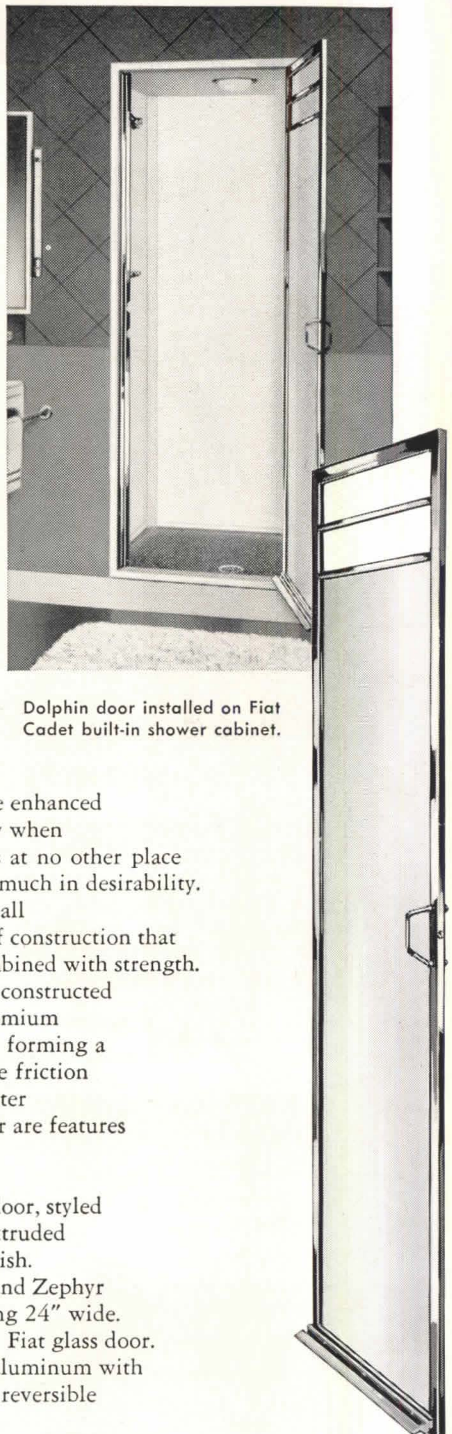

out of school

(Continued from page 146)

The library also has no outside windows but has a row of high interior windows supplying borrowed light. Eliminating windows gives more shelf area along the walls, and the air-conditioning preserves the books. Needless to say, this room is a comfortable place in which to study and has already proved to be especially popular in the heat of summer. The lecture room has to be darkened for illustrated lectures, hence the need for air-conditioning this room. The drafting rooms are not air-conditioned but do have through ventilation.

"There are other items of more than minimum cost which may be noted. The lighting of such a building as this, where the major subject of study consists of long hours in the drafting rooms and a great deal of night work, makes it important to provide adequate artificial lighting. Finally, the architects felt it necessary to treat the ceilings of most of the working spaces with an acoustical tile to cut down the noise.

•

"The flexibility of the building has already been tested by a change and extension of our educational program brought about by a grant from the General Education Board. This expansion program includes two new curricula—City Planning and Industrial Design. Industrial Design had already been anticipated by designating a shop on the ground-floor level in the north wing, and this is now being developed into an industrial design lab. City Planning can be, and is being, taken care of without too much difficulty, by making certain adjustments.

"The School of Architecture is now giving examinations for the registration of architects and the building is admirably adapted to the performance of such service under the jurisdiction of the State Board. There are many ways in which this building can serve the Institute and the community.

"What is it that has made almost everyone, old and young, Traditionalists and Modernists, alike, express delight on entering and going through our building? I think it is largely the flood of light which permeates the building and the openness of its plan, one space leading into another, and always something seen beyond which draws one on. Perhaps, also, the color selection, light in value with occasional accents of rather intense hues or dark end walls.

"There is also another purpose, hinted at above, the carrying out of which, I believe, has

(Continued on page 150)

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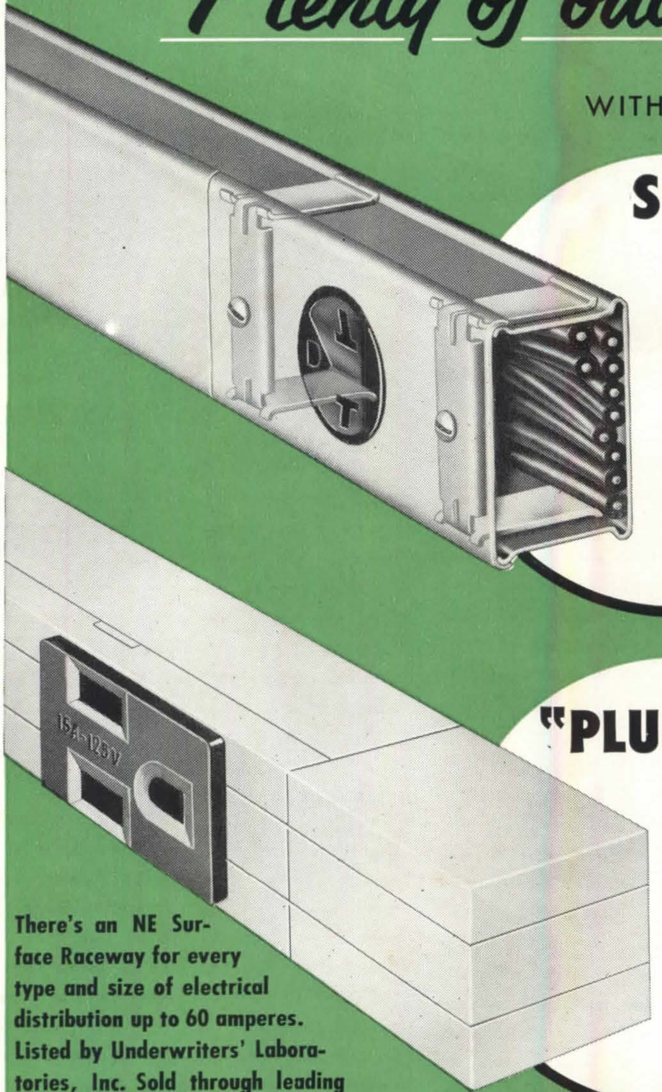

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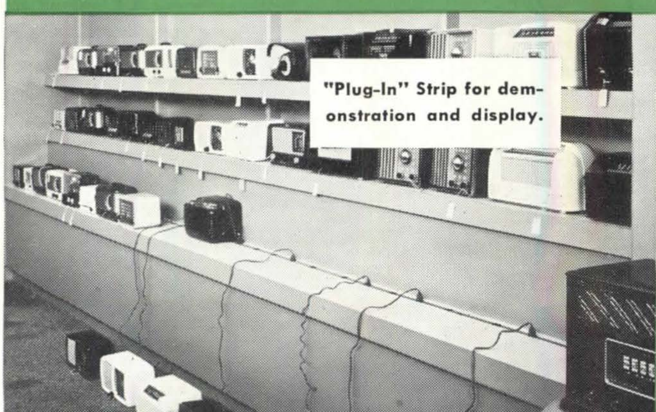
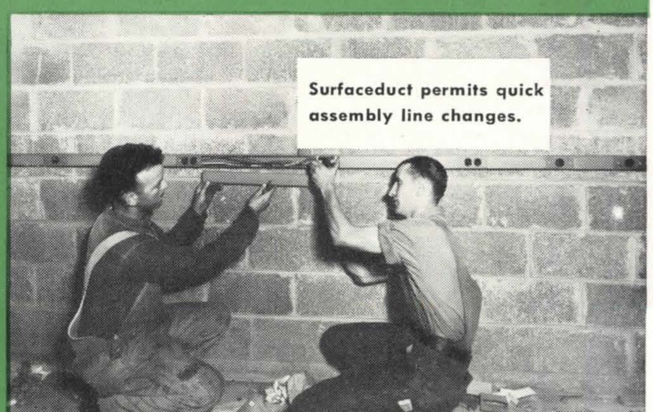


"Plug-In" Strip for demonstration and display.



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out of school

(Continued from page 148)

its effect. I refer to the ease of access and egress, the close relationship with the ground. At all three levels—upper landing (front), intermediate (concourse and garden), lowest level (back and end)—there are entrances to the building, all on ground level. And in every case, one walks into or out of the building on one horizontal plane, without a single step up or down. Once in the building, there are easy-to-find broad staircases leading to the various levels.

"The extensive use of glass for doors and windows and for certain interior partitioning all carrying right up to the ceiling; the freeing of structural members from walls and making them independent of partitions; the frank expression of structural elements and their reduction to a minimum; these are all techniques which have now become familiar and need not be dwelt upon.

•

"If I have indulged in self praise, there is a purpose. Let the reader come to Atlanta and judge for himself whether to approve or disapprove. The point is, I am directing your attention to the South, a part of the country which some years ago was designated as the *number one problem* of the country, now loudly acclaimed as the *number one opportunity*. The erection of a new architectural school building is just one indication of the emergence of the dynamic spirit of the New South.

"Regarding architectural education and our aims at Georgia Tech, we are moving in two directions: (1) outward to include the planning of neighborhoods, communities and cities; (2) inward to the design of the products of industry. That we are able to engage in such a broad program is due to the fact that we have the space and facilities generously provided by the state. To put over such a program, however, takes more than a building. It takes money as well; and here we have to acknowledge another provider, namely a great foundation, General Education Board. The men who are charged with the responsibility of wisely disposing of their funds have important decisions of policy to make. Apparently they felt their help could be most effective where most needed, and at this particular moment that meant the South. They were looking for the development of an educational center, the prospect of a concentration of the opportunities for higher education. Atlanta, with its several

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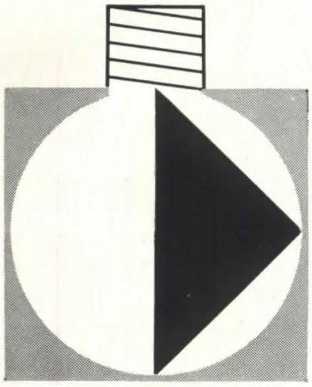

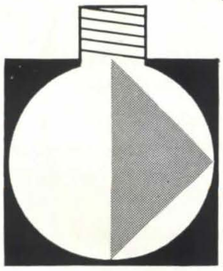

out of school

(Continued from page 150)

institutions of learning—including Emory (liberal arts), Agnes Scott (women), Columbia (theological), High Museum (art), and Georgia Tech (technology), and with the University of Georgia at Athens not too far away—seemed to offer the widest spread in existing educational facilities and the most promising potentialities.

"The Director of the Board had one other predilection (some might term it prejudice—I will call it enlightenment), he was interested in the Fine Arts. That we in the School of Architecture already had in our minds a long-held dream for expansion of our services, that we had the backing of our administrative officers and were able to submit definite proposals at short notice, and that we had a building in prospect of construction, all led to a favorable conclusion. (I am told that this is the first time G.E.B. has donated any money for architecture.) The terms of the grant list four areas for which financial help is being provided.

(1) The development of an outstanding graduate program in the convential fields of Architecture;

(2) The establishment of a strong program in City Planning;

(3) The re-establishment of a strong program in Industrial Design;

(4) The establishment of a Research Program in building materials and construction methods.

"For the above, G.E.B. has given us approximately a quarter of a million dollars to be spent over a five-year period. The State Board of Regents has matched this with an equal contribution. What we are doing about the four areas of expansion may be briefly related as follows:

I. The Master of Architecture degree was authorized in 1950. This provides for majoring in Architectural Design, Structural Design, or City Planning. We hope before long, with the rapid growth of our library, to be able to offer a fourth major, Architectural History.

II. Howard K. Menhinick was appointed Regents' Professor of City Planning in the autumn of 1951; a two-year graduate course in city planning was approved and announced in January 1952; and the course is being offered beginning this fall with an enrollment of ten students, nine of whom are candidates for the degree of Master of City Planning and one for the Master of Architecture. These men are graduates of various disciplines: five in Architecture, three in Civil Engineering, and two from the Social Sciences and Humanities. They

(Continued on page 154)

MAY I ALWAYS BUILD

I will open my eyes to VISION, that I may unlock the message in the stone and the clay. Let me sense in the sand and the iron and the tree the Mystery beyond all mysteries, the Builder beyond all building. With Vision MAY I ALWAYS BUILD.

I will open my mind to HUMILITY, that I may remember my debt to those who have taught me, and strive to discharge it to those whom I teach. Let me be always aware that my days are short, my work is long, my talent endures not forever. In Humility MAY I ALWAYS BUILD.

I will open my heart to PATIENCE, that those for whom I plan may not be denied their true answer through any haste of mine or shallow expediency. As my art grows in the building of man's shelter, so may my heart grow in the building of man's happiness. Patiently MAY I ALWAYS BUILD.

I will open my hands to ARTISTRY, that I may skillfully turn point, line and plane to the support and protection of man's body, to the nourishment of his hope, to the preservation of his culture. Let my tools be adroit and ready weapons in his resistance to decay and his struggle to be free. With Artistry MAY I ALWAYS BUILD.

Even if the whole world ravage and destroy, MAY I ALWAYS BUILD. Let my work go beyond creed and color and nation, bridging the world of difference, letting fall to ruin the House of War and enlarging the House of Peace. While the breath of the Great Architect is in me, MAY I ALWAYS BUILD.

CRANE CO. *presents the above statement of ideals as a contribution toward recognition of the importance of the planning function of the architect.*

THE ABOVE ADVERTISEMENT APPEARED IN THE NOVEMBER, 1952 ISSUE OF FORTUNE MAGAZINE

To our friends in the profession we offer copies of the above, suitable for framing, upon request. Crane Co., 836 S. Michigan Ave., Chicago.

out of school

(Continued from page 152)

represent a wide educational and geographical distribution: two from Princeton; one each from Georgia Tech, Emory, Purdue, University of Virginia, University of Michigan; one from Eidgenossische Technische, Zurich, Switzerland; one from Central Universidad, Quito, Ecuador; and one from Fuad I University, Cairo, Egypt.

III. A four-year course in Industrial Design is also being offered this year under the direction of Hin Bredendieck, a former student of the Bauhaus and for many years a teacher at the Institute of Design, Chicago. This is an option in the School of Architecture. The first year and a quarter is uniform for all options; thereafter industrial design parallels architecture with some courses in common. The fact that we have a shop, essential for industrial design, is of advantage also to architectural students for use in connection with model making and learning first hand about materials.

IV. Research: The Institute, with an active State Experiment Station located in a large building on the campus is research minded, and now that we are in our new building we have some space available (mostly outdoor space) for experiments. A committee is studying several possible programs. Most of our teachers, if they have time over and above teaching, are busy on creative activities relating to design and have no time left for research as such. But there is the possibility of taking part in research projects by collaboration or as consultants working with those in other departments of the Institute and there are also student programs of limited scope included within our thinking. We hope and expect to be able to announce one or two definite programs of research in the near future.

•

"By recognizing the essential unity, the common interests and objectives of the design and planning professions, and by bringing them together under one roof on the educational level, is it not just possible that we may help to pave the way to a better understanding and a greater amount of cooperation and even collaboration among the several professions which in former years were one? Can we not set before us a common goal, so that all of us may work together in the creation of a better environment for our people?"

NOTICES

appointments

Clarence L. Eckel announces that THOMAS L. HANSEN of the Washington State College faculty, will head the University of Colorado's new Department of Architecture and Architectural Engineering.

JOSEPH BLUMENKRANZ, Architect and Hospital Consultant, has been appointed as Consulting Architect to the Yeshiva University of New York, on the programming and planning of its projected Medical Center, including a Medical College, School of Dentistry, Nursing School, Graduate School, Dormitories, and University Hospital.

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When you use American Welded Wire Fabric for reinforced concrete walls, you can use *28% less steel area* than with ordinary reinforcing materials. You just don't have to buy so much steel to do your job. This specification is partly due to the high strength of American Welded Wire Fabric, and to its efficient bond provided by small high strength members closely spaced and by the positive anchorage provided by the cross wires rigidly welded to the longitudinal wires.

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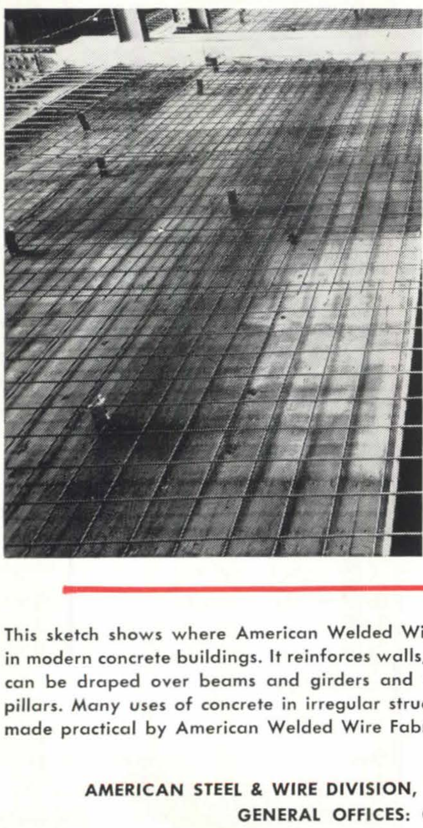

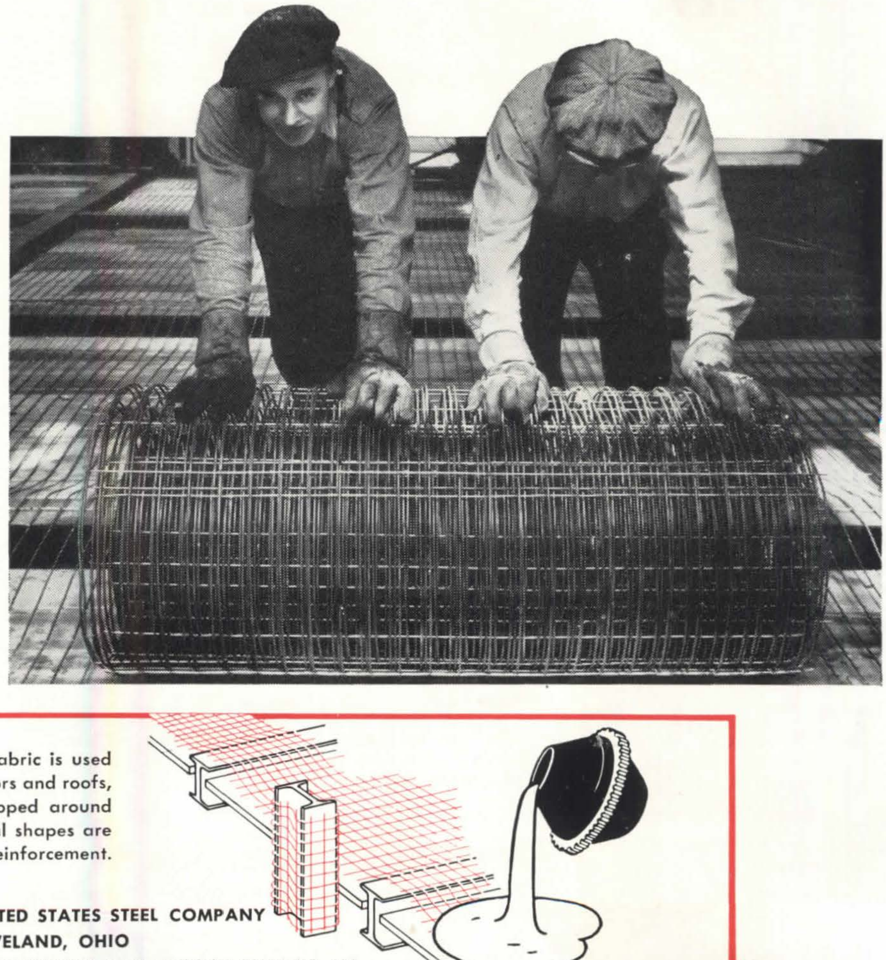

This sketch shows where American Welded Wire Fabric is used in modern concrete buildings. It reinforces walls, floors and roofs, can be draped over beams and girders and wrapped around pillars. Many uses of concrete in irregular structural shapes are made practical by American Welded Wire Fabric reinforcement.

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UNITED STATES STEEL

it's the law

by Bernard Tomson

Last month's column stated the proposition that it was not sufficient merely to order a "bond" from a surety company—that it was important that the coverage of the bond be checked to determine whether the owner be adequately protected.

BONDS and INSURANCE

This month's column with the same purpose in view will discuss recovery by persons, other than the owner, under a Labor and Materials bond. The owner under such a bond has little difficulty establishing his right of action. The problems arise in situations wherein the bond itself is limited to some degree in its scope and coverage, and persons furnishing materials or labor, who are not specifically mentioned in the bond, present claims.

The questions to be answered in each instance are (1) Does the bond contain a specific provision for the protection of the claimant? (2) If there is no specific clause, was such claimant intended to be protected by the parties to the bond or agreement?

Prior to the 20th Century it was not possible (save in isolated instances) for a person to recover on a contract to which he was not a party. The modern legal principle of "third party beneficiary" in force in many jurisdictions today, permits a party, who is a stranger to an agreement, but yet the one to whom the benefits of the agreement run, to enforce the contract. It is under this concept of "third party beneficiary" that laborers and materialmen are able to institute actions, as against the surety on the bond, though not specifically mentioned in the bond.

•

To answer question "(1)" above, one must examine the bond to ascertain whether adequate coverage is afforded persons furnishing labor and materials. A sample provision contained in bonds, which provides adequate coverage, reads as follows:

"1. A claimant is defined as one having a direct contract with the Principal or with a subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the contract, labor, and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental of equipment directly applicable to the contract."

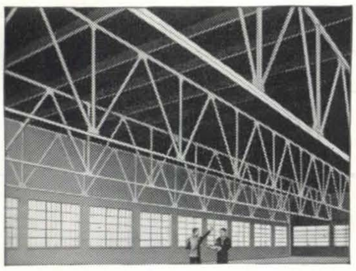
Under this or similar clauses, laborers, and materialmen, having been specifically enumerated as persons protected by the bond, have little difficulty when instituting actions against the surety.

•

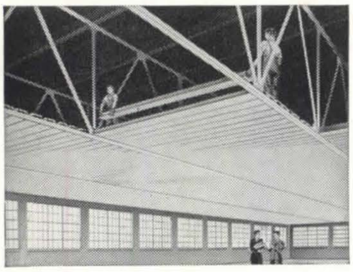
The answer to question "(2)" above is more complex, as the courts in our various jurisdictions are not in complete harmony. It is well settled that the intention of the parties *to a* contractor's bond is the controlling factor in the determination of the rights of laborers and materialmen to recover on a bond. The Court, in *Algonite Stone Mfg. Co. v. Fidelity & Deposit Co.*, 163 P. 1076, stated this principle as follows:

"It may be conceded that it was competent for the parties to agree that the church

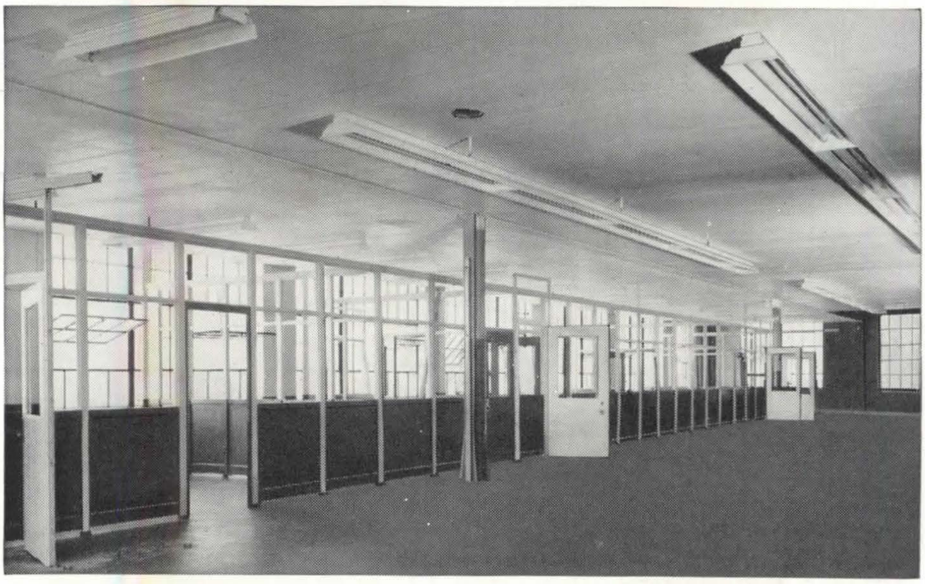
(Continued on page 158)



To this old factory . . .



they simply did this . . .



to get this . . .

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Out of a sow's ear . . . !

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Steel beams (the bottom chords of the roof trusses) ran clear across the building . . . every 20 feet.

So they simply laid 20-foot Fenestra* Acoustical-Structural Steel Panels side by side, from one beam to the next. Quickly, inexpensively, the long, strong panels interlocked into a flat, handsome acoustical ceiling . . . and acted as a load-carrying storage floor for ducts, air conditioning, electrical services and such.

While they were doing all this, the company employees went right on working below. Using the first few panels laid as a storage and working platform the installation crew stayed up above. And, of course, there was neither dirt nor dust to shower down below.

They can clean their Fenestra acoustical ceiling with soap and water, or paint it without hurting its acoustical efficiency. And, of course this acoustical ceiling is noncombustible.

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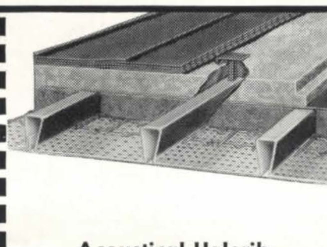
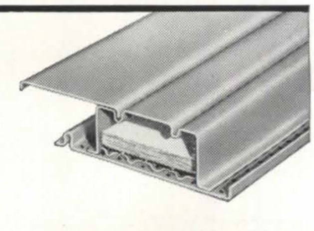
. . . engineered to cut the waste out of building

Acoustical "D" Panels for roofs, floors, ceilings. Width 16". Depth 1½" to 7½".

"C" Insulated Wall Panels. Width 16". Depth is 3". Steel or aluminum.



Acoustical Holorib for acoustical-structural roof. Width 18". Depth 1½".



Acoustical "AD" Panels for ceiling-silencer-roof. Width 16". Depth up to 7½".

it's the law

(Continued from page 156)

society would be satisfied, provided the building was turned over completed according to the plans and specifications and free from all liability on the part of the owner for any claims on account of material or labor. Plainly, the intent of the parties to the contract of suretyship is the *controlling* question. In arriving at the intention it is reasonable to take into consideration the fact that it is seldom an owner of residence property would be satisfied to live in a home erected of material or by labor which would never be paid for. The church organization which made the contract for the erection of the building intended the edifice to be used for religious services, and was careful to insert in the contract a provision that no work upon it should be performed on a church holiday. It is fair to assume that the organization had no intention of securing a building to be used for religious worship upon which claims for labor or material might remain unpaid."

Beyond this point of intention, some courts have required that there must be some form of agreement or "contract" between the owner and the person making claim upon the bond. Courts espousing this point of view have expressed their position in the following manner:

"And the question comes to this: Where, in a contract between two persons one promises the other to do something for the benefit of a stranger to the contract, and the promisee has no relation to the thing to be done nor to the stranger to be benefited, can such stranger bring an action to enforce the promise. In some of the text-books and decisions it is stated generally 'that, where one person makes a promise to another for the benefit of a third person, that third person may maintain an action upon it.' But we do not think there is a case to be found in which such an action was sustained upon a bare promise, with no other circumstances to justify an exception to the general rule that an action upon contract can be maintained only where there is privity of contract between the parties.

"Without undertaking to lay down a general rule defining when a stranger to a promise between others may sue to enforce it, we are prepared to say that, where there is nothing but the promise, no consideration from such stranger, and no duty or obligation to him on the part of the promisee, he cannot sue upon it. Such is this case.

"Order affirmed." (*Jefferson, et al v. Asch, et al 55* N.W. 604, 605.)

Other jurisdictions adhering to the principle of "third party beneficiary" do not require a contractual relationship between the owner and the claimant. It is sufficient, if it was the intention of the parties to the bond that *the* claimant was of a group to be benefited thereby. The Court, in *Royal Indemnity* Co.

(Continued on page 160)

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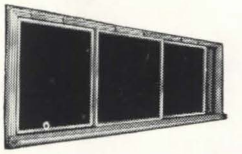

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it's the law

(Continued from page 158)

v. *Northern Ohio Granite & Stone Co.*, 126 N.E. 405-406, stated this position, as follows:

"Where contracts for improvements are entered into between an owner and a surety, who receives a premium for its engagement of fidelity, terms may be employed which fairly contemplate the financial protection of subcontractors, who employ labor and furnish material for the structure contemplated in the bond. That labor and materialmen may eventually perfect liens against a structure would be a sufficient consideration for immunity of the owner upon the part of the surety.

"While under our statute our mechanic's lien law may not have provided for liens on this particular structure, because of its public nature, the city, in this case, knowing that fact, may have had in contemplation the protection of mechanics and materialmen who could not obtain a valid lien upon this structure. Unlike an ordinary private surety, a surety of the character here involved, which accepts money consideration, has the power to and does fix the amount of its premium so as to cover its financial responsibility. This class of suretyships, thereof, is not regarded as 'a favorite of the law.' Bryant v. American Bonding Co., 77 Ohio St. 90, 99, 82 N.E. 960, 961. And if the terms of the surety contract are susceptible of two constructions, that one should be adopted, if consistent with the purpose to be accomplished, which is most favorable to the beneficiary."

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Due to the conflict existing in this field, various states have enacted legislation requiring *private* contractors to execute bonds specifically naming laborers and materialmen as beneficiaries. The *Louisiana statute* (which is typical), after setting forth many of the requirements of the bonds, states:

"The bond shall be attached to and recorded with the contract in the office of the clerk of court or recorder of mortgages, as above set forth, and the condition of the bond shall be the true and faithful performance of the contract and the payment of all subcontractors, journeymen, cartmen, workmen, laborers, mechanics and furnishers of material, machinery or fixtures jointly as their interest may arise."

In the field of *public* construction, legislation has been enacted by almost all municipalities requiring bonds to be executed covering possible claims discussed in this article (See footnotes [1] and [2] IT'S THE LAW, November 1952 P/A.)

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In summary:

1. A labor and materials bond should contain specific clauses naming laborers and materialmen as beneficiaries.

2. The coverage of the bond should be no less than that required by statute.