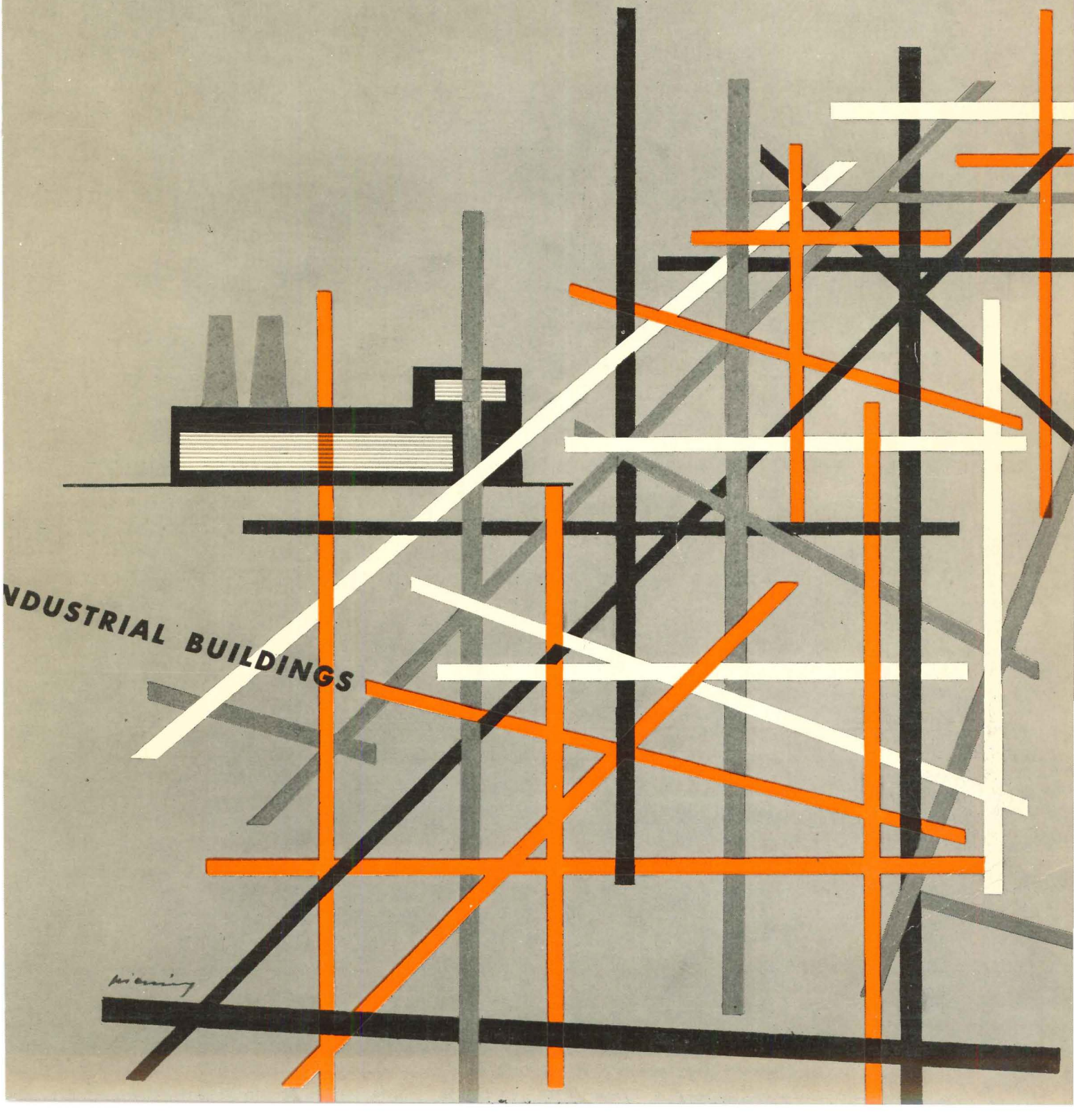
FEBRUARY 1952

ARCHITECTURAL RECORD



NDUSTRIAL BUILDINGS

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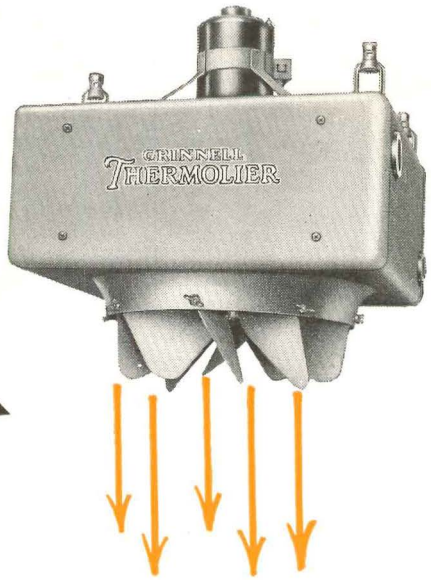
better performance



Vertical Delivery
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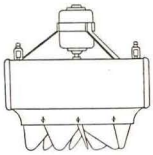
Unit Heaters . . .

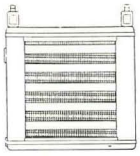
RIGHT DOWN

where maximum heat is desired...

in warehouses, plants and other hard-to-heat buildings

4 MODELS . . . . . 18 SIZES


Vertical Delivery


Horizontal Delivery


Textile Model


Velocity Nozzle

A thermostatic trap, the simplest and least expensive of all traps, is practical because of Thermolier's exclusive cooling leg.

Maximum capacity assured, annoying destructive water hammer eliminated — by built-in pitch of tubes and internal cooling leg which assure continuous drainage of condensate.

Damaging strains caused by expansion and contraction eliminated by "U" type expansion tubes.

Safety and durability assured with leak-proof tube-to-header construction.

Five other important construction features. Write for Thermolier Catalog.

HEATING COMFORT AND ECONOMY. Heat is forced down to the working level . . . not banked uselessly at the ceiling level. Thermoliers provide quick heating from a cold start. Desired room temperatures are easily maintained within a close range.

ADAPTABILITY TO EQUIPMENT AND FLOOR LAYOUT. The units and the simple piping are overhead where they do not interfere with arrangement of operating machinery or equipment and do not take up valuable floor or wall space. Units are easily relocated at any time to meet changes in plant layout or heating requirements.

LOW FIRST COST. Thermoliers are so efficient and so compact that their heating capacity is often equivalent to the capacity of cast iron radiation or pipe coils of twice the cost.

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Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
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LESS BUILDING, MORE CONTROLS; HOME BUILDING IS HIT

Ernest Mickel Reports from Washington on Tight Second Quarter Allotments, Housing Slash, Wilson Summary, Meetings to Watch

SECOND QUARTER ALLOTMENTS of critical materials were expected by government planners to support construction of all types in the second quarter at the rate of about $6.5 billion, as compared (with price adjustment) with a level of $7.6 billion in the second quarter of 1951 and $6.7 billion in second quarter 1950.

Chief Mobilizer Charles Wilson's fourth quarterly report to the President crystallized the recent indications that officialdom had ceased to think of any easing of restrictions before 1953.

Manly Fleischmann, testifying before the Congressional Joint Committee on Defense Production, said the year 1952 "will unquestionably be the most difficult which we face."

DPA Administrator Fleischmann announced that allotment of critical materials to manufacturers for housebuilding in the second quarter would be cut to 60 per cent of the 1951 level.

Henry Fowler, now NPA Administrator

A few weeks later, government housing officials were saying that 800,000 units can be started in 1952 "if strict conservation of scarce metals is practiced." A limitation on the *size* of houses was being studied, but no ceiling on starts.

CMP Regulation 6 probably will be amended this month. The National Production Authority alerted its Construction Industry Advisory Committee for an early February meeting at which proposed changes are expected to be presented. NPA said all construction regulations will be redrafted into "one package." No drastic changes were expected.

Two possible changes of special interest to architects: (1) allotments on a project rather than a quarterly basis; (2) permits without allotments — to make planning feasible with assurance materials would be forthcoming later.

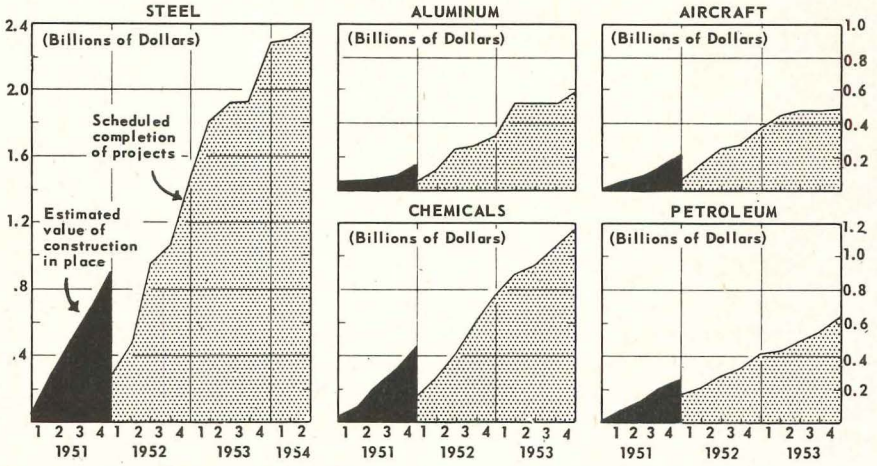
Another meeting on controls — this one sponsored by the United States Chamber of Commerce — is scheduled for February 12 in Washington. Every segment of the building field will be represented.

HOME BUILDERS PROTEST: 650,000 STARTS TOO FEW

HOME BUILDERS, who were represented at a meeting of NPA's Construction

(*Continued on page 14*)

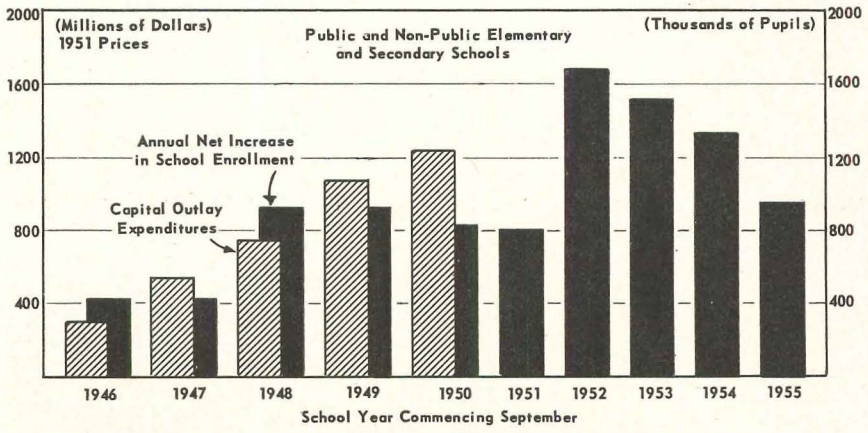
Construction of new industrial capacity over 40% toward completion; two-thirds of plants will be finished in 1952*



*Projects aided under defense mobilization program

These charts are from Wilson's fourth quarterly report. The school chart is a graphic illustration of why second quarter allotments were upped to provide for 500 new elementary and secondary school starts and continue 2400 projects under way

School construction needs reach peak as 1.7 million will be added to enrollment in September



Note: For each additional pupil enrolled, approximately $1000 must be spent for new school construction.

GROPIUS IN RETROSPECT: EXHIBIT OPENS IN BOSTON

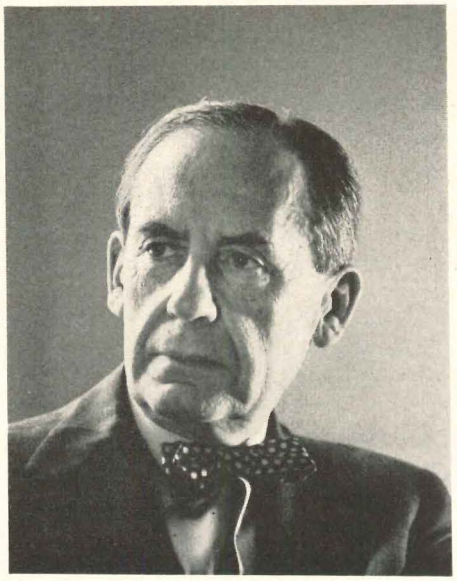


Photo: John Brook

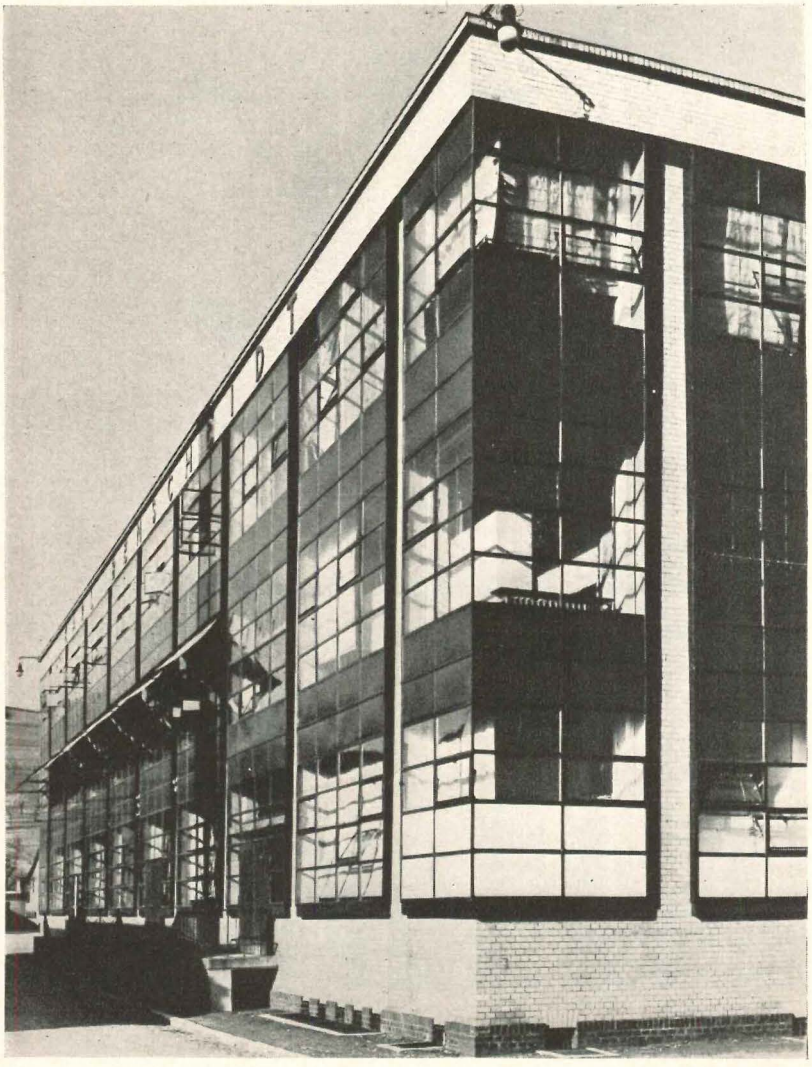
BOSTON'S INSTITUTE OF CONTEMPORARY Art last month opened its retrospective exhibition of the works of Walter Gropius, "designer, builder, philosopher and teacher" — and more specifically, founder of the Bauhaus, chairman of the Department of Architecture of Harvard's Graduate School of Design and one member of the team in The Architects' Collaborative.

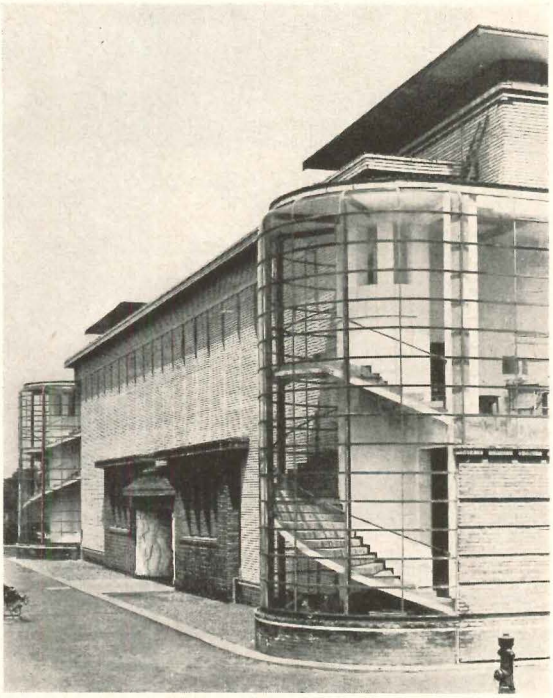
The exhibition had a special setting created by Designer Gyorgy Kepes, professor of visual education at the Massachusetts Institute of Technology, who also installed it. Professor Kepes masked the Institute galleries with a new wall, by means of which he "distorted the axis of one gallery in order to create a tension between that gallery and the next." Material, including plans, drawings, photographs and models, was presented chronologically against this backdrop.

The text accompanying the presentations, taken mostly from Gropius' own writings and speeches, should waken the echoes of many an old discussion and provide fuel for some of the current ones.

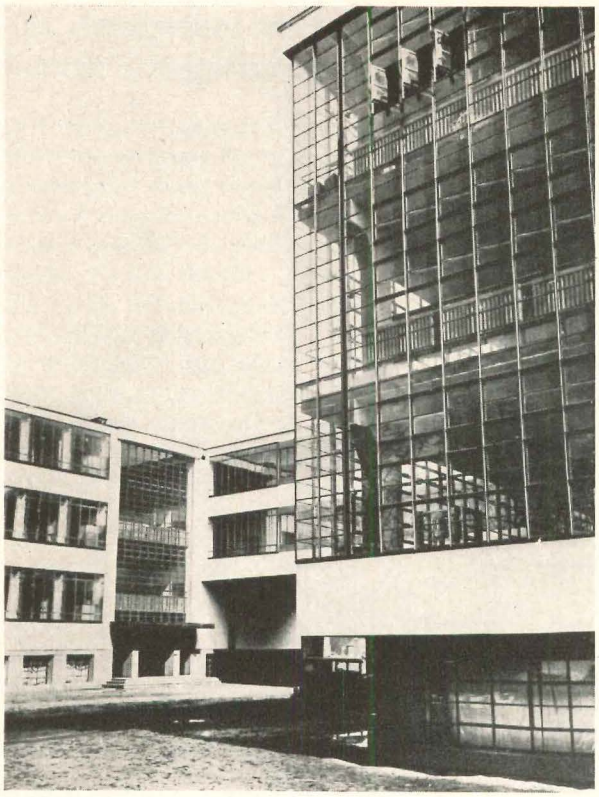
The exhibit, which presents 37 examples of Gropius' projects and works over a 40-year period, has a coast-to-coast itinerary ahead — a showing at M.I.T. when the Institute showing closes February 9; then Philadelphia, Colorado Springs, San Francisco, Cleveland, Chicago and other American cities.

Fagus Shoe Last Factory (1910-11)



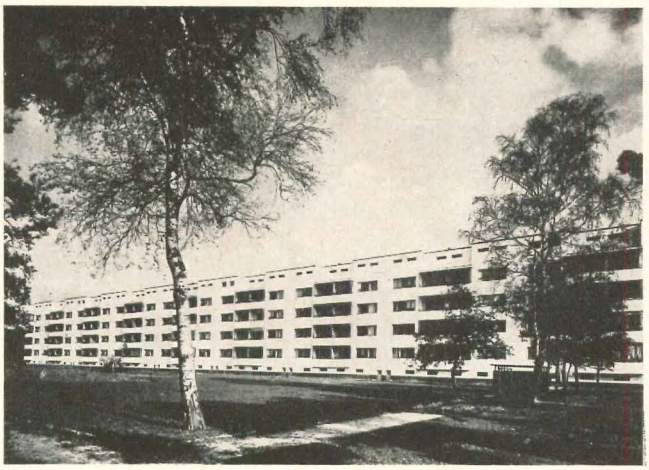


Office Building, Cologne "Werkbund" (1913-14)



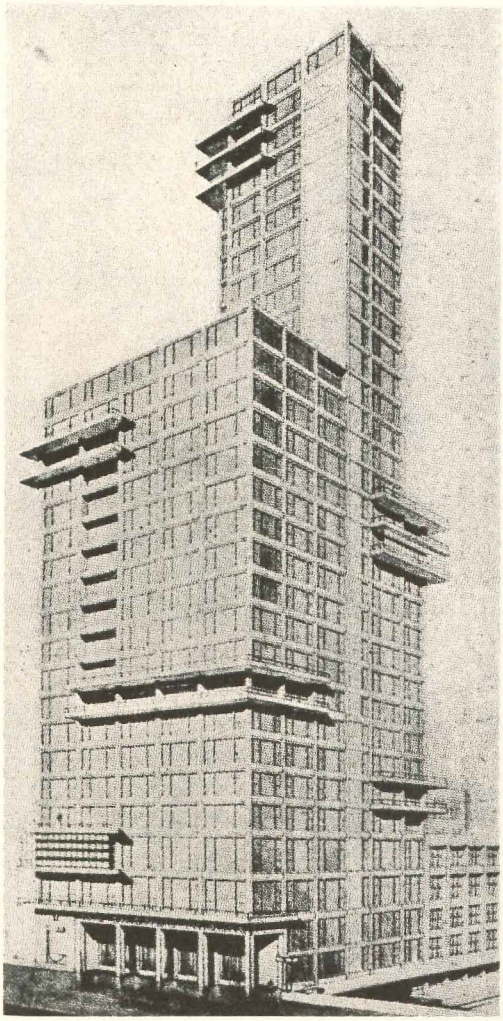
Bauhaus, Dessau (1925-26)

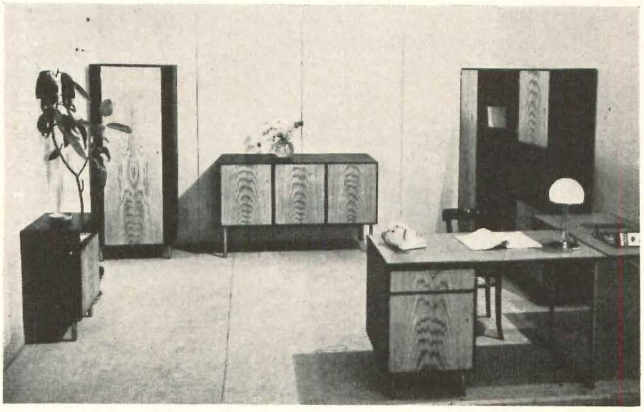
Photo: Courtesy of the Museum of Modern Art, New York



Siemenstadt Housing Development, Berlin (1929)

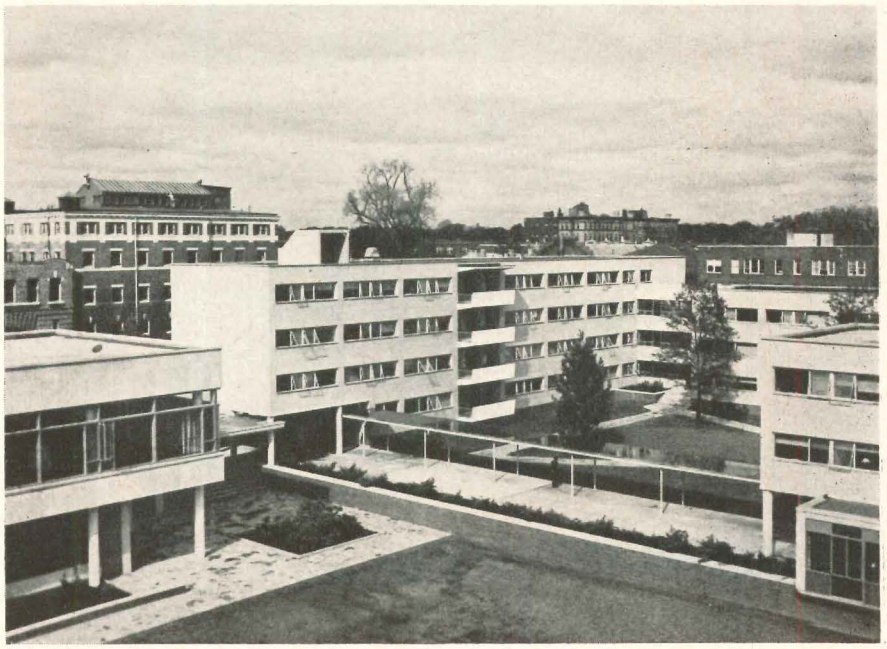
Chicago Tribune Competition (1922)





Low Cost Modular Furniture (1929)

Harvard University Graduate Center (1949)—with The Architects' Collaborative



HOME BUILDERS (*Cont. from page 11*)

Industry Advisory Committee the day the DPA announcement was made, were quick to protest. They told the authorities the new rate would provide far too few homes to keep up with demand.

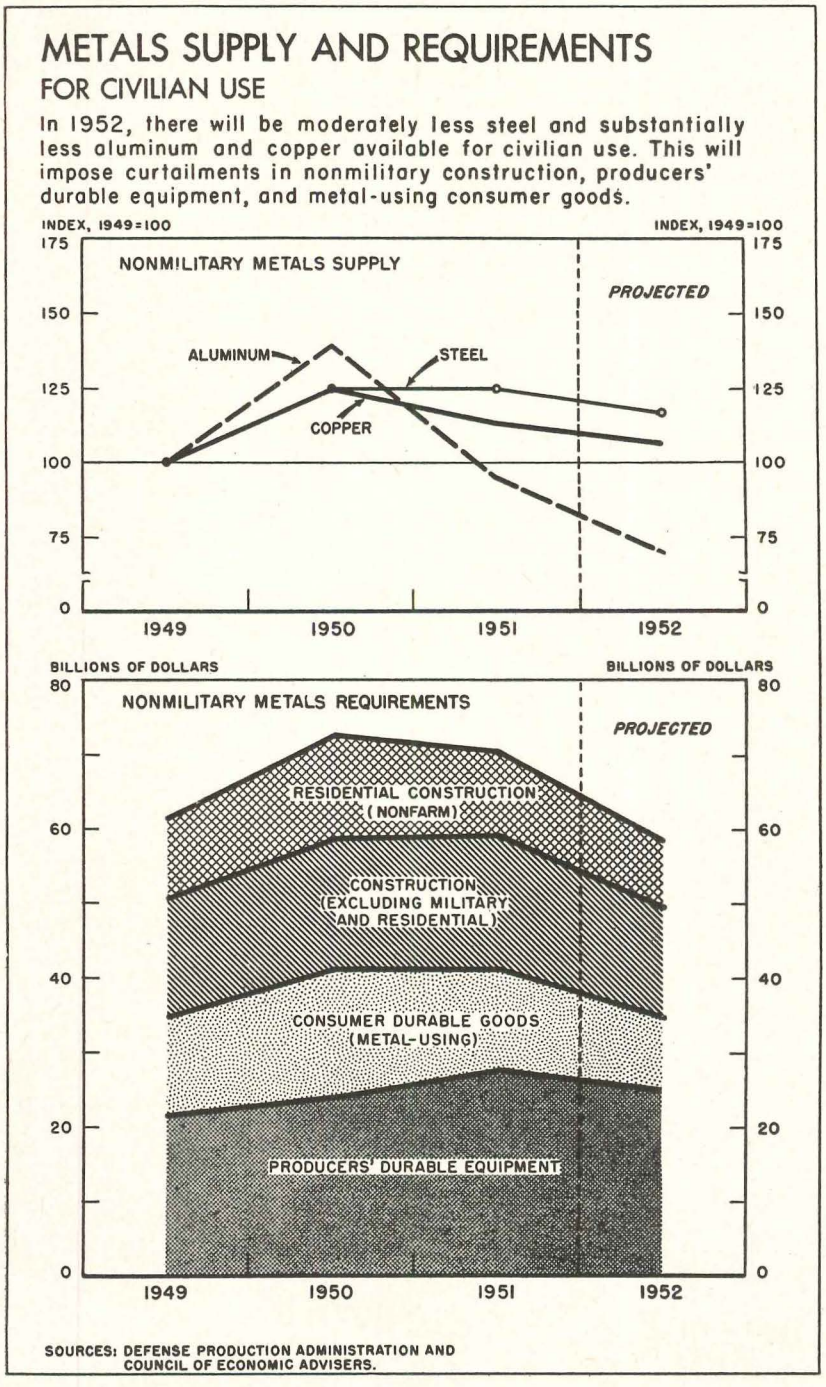
The further cut was necessary, according to Mr. Fleischmann, "to conserve materials directly used in such construction as well as materials necessary for building materials and building products, including utilities."

His statement to Congress pointed out that the requirements for residential construction go far beyond those necessary for construction only, extending to refrigerators, stoves, water heaters, washing machines and other products.

NPA and HHFA Divide the Job

Meanwhile, jurisdictional lines had been pretty well drawn at administrative levels. NPA Chief Fowler (formerly Mr. Fleischmann's deputy) indicated, clearly enough, that his agency would concern itself primarily with the Controlled Materials Plan operation, leaving to the Housing and Home Finance Agency setting of any unit ceilings.

HHFA will also have the responsibility, a continuing one, of spreading the allotted materials as far as possible among the various types of housing.



OUTLINE PROSPECTS ON OTHER BUILDING TYPES

ARCHITECTS had an even keener interest in the effects of second-quarter decisions on the heavier types of construction. A resume given Congress by Fleischmann included the following points:

Schools — In the case of elementary school construction, the allotments are considered sufficient to support all school projects under way (about 2400) and to begin construction of about 500 new buildings. For higher education, materials are granted to projects under way (241) and to start 19 urgently needed projects, like medical schools and research laboratories.

Hospitals — Materials allotted will support continuance of projects under way, plus some new critically needed projects.

Industrial expansion — Expanding military requirements forced curtailment of allotments here; few new starts are possible in the second quarter.

Commercial building — Virtually nothing but defense-related construction can go forward in this field.

Fleischmann Keynote: Balance

One brief sentence in the Fleischmann statement to Congress keynoted the tight materials situation. It was this: Balance in the economy necessitates a slowing down of construction.

The DPA chief noted that following Congressional authorization of the $6 billion military construction program, military authorities quite naturally rushed in to get the job done at the earliest possible moment. But they soon discovered that such speed was useless, since the materials budget would not lend itself to a quick consummation of the work authorized. Thus, much of the construction originally planned with an eye to speedy accomplishment is being phased out with later completion dates.

In fact, the same process has occurred with the industrial expansion program.

WILSON REPORT SUMS UP: NO RELIEF BEFORE 1953

THE BATTLE FOR PRODUCTION," fourth quarterly report to the President of Chief Mobilizer Charles Wilson, made it clear that the "pinch" on construction from scarcity of vital materials will continue into 1953.

Requirements of the military and atomic energy programs can be expected

(*Continued on page 378*)

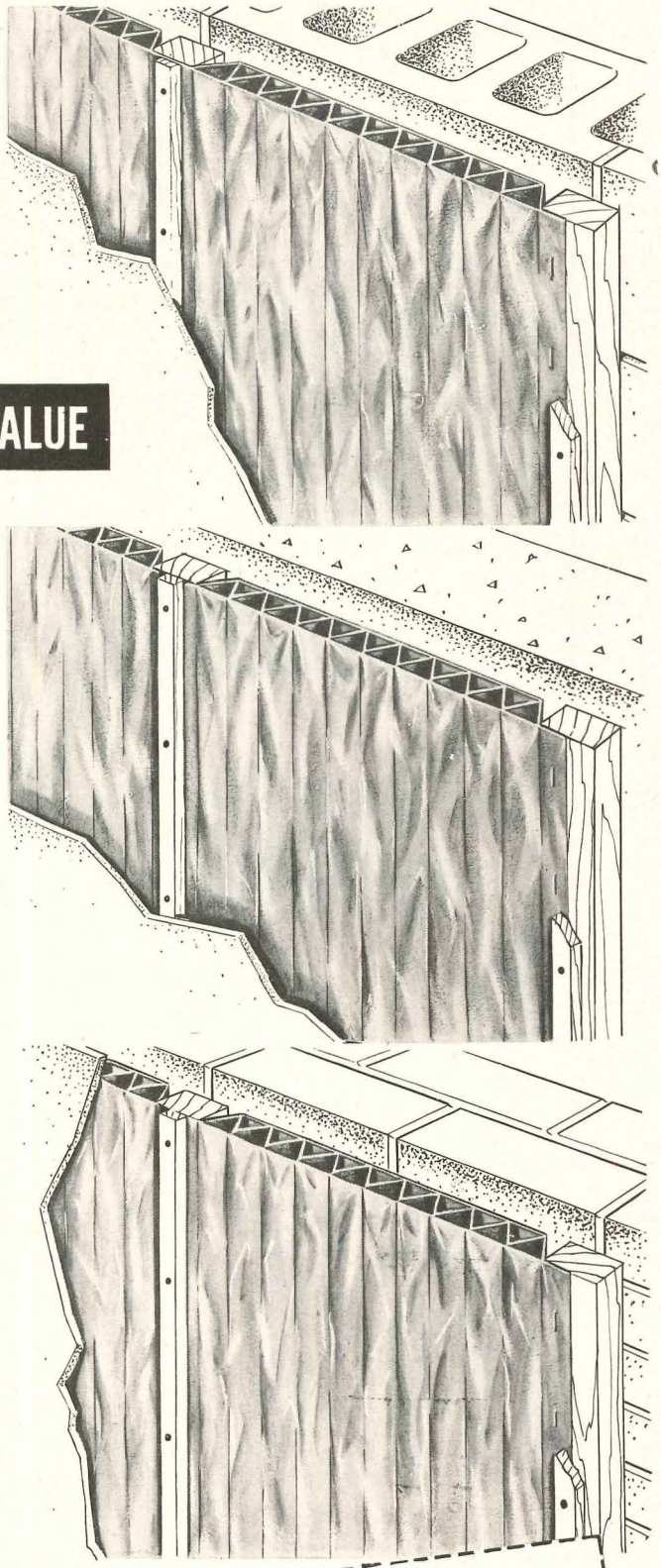
How to

INSULATE MASONRY WALLS

CREATE 1" WALL SPACE

GET 2" to 3" DRY INSULATION VALUE

At 12¢ a Square Foot*



Convert to active use—for playrooms, storage, laundries, workshops, even living-quarters—basements and other areas which have walls of brick, stone, cinder or cement blocks, or poured concrete.

Create comfortable *insulated* areas in factories, warehouses, piers, terminals, garages, etc.

This requires solving the twin problems of insulating against DAMPNESS and HEAT LOSS.

The solution: Install TWO or THREE aluminum sheets, spaced to create FOUR reflective air spaces. They are vapor-proof with ZERO permeability; non-condensation-forming; and waterproof.

The air spaces practically eliminate heat flow by CONDUCTION. The aluminum surfaces throw back 95% to 97% of heat RADIATION, and block heat flow by CONVECTION.

Pre-fabricated with tough, accordion aluminum sheets, and ONLY ONE-HALF INCH DEEP, this is commercially known as Type 4 Jr. Infra insulation.

INSTALLATION TECHNIQUE

On 16" centers, attach 1" furring strips to walls. Tack flange of Type 4 Jr. to FACE of furring with staples, flat surface facing room. Nail rough lattice strips over flanges. This prevents contact with wall and creates additional air space. Finally attach wallboard or lath for plaster.

*Cost of furring, lattice strips and Infra installed, 12¢ sq. ft.

TYPE 4 Jr. THERMAL FACTORS, IN 1" SPACE

Wall-Heat C.150, R 6.66 = $2\frac{3}{4}$" dry rockwool
Down-Heat C.097, R 10.30 = $4\frac{1}{5}$" dry rockwool
Up-Heat C.194, R 5.15 = $2\frac{1}{5}$" dry rockwool

INFRA INSULATION, INC.

525 Broadway, New York, N. Y. — WORTH 4-2241

Write for technique of installing Infra Type 4 Jr. under floors.

INFRA INSULATION, INC.
525 B'way, New York, N. Y. Dept. R-2
Please send Techniques for Installing Infra Type 4 Jr.

Name_____

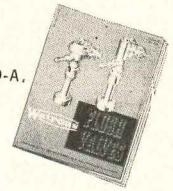
Firm_____

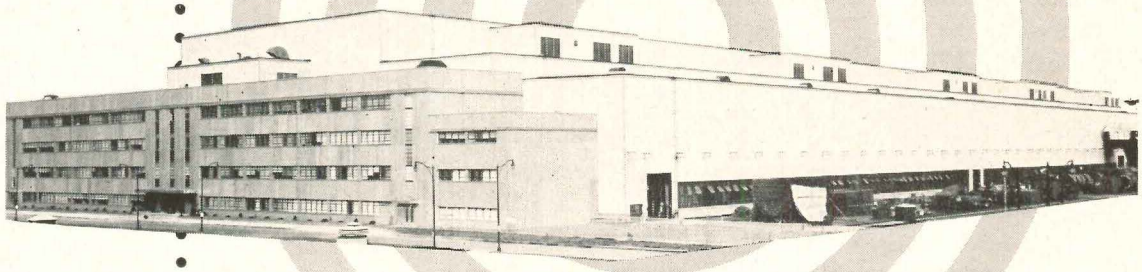
Address_____

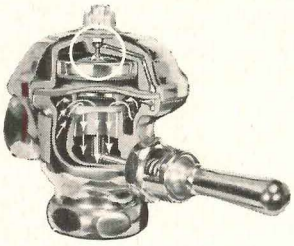
☐ Send prices of Infra Insulations
☐ Send Sample

Fine Flush Valves for Fine Buildings

For complete information on Watrous Flush Valves write for Catalog No. 449-A.







Among Watrous Fine Features

Self-Cleansing By-Pass . . .

It's the by-pass that governs the length of flush. Watrous design includes a special mechanical device which results in cleansing of by-pass during each flush — a safeguard against prolonged flushing due to dirt or sediment in water.

GENERAL ELECTRIC TURBINE PLANT

Schenectady, N. Y., one of the many fine buildings in which Watrous Flush Valves are installed.

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ADJUSTABLE FLUSH VALVES
BOTH DIAPHRAGM AND PISTON TYPES

THE IMPERIAL BRASS MANUFACTURING COMPANY
1240 W. Harrison Street, Chicago 7, Illinois

SURVEY REVEALS VARIETY IN ARCHITECTS' PRACTICE

Dodge Statistics Provide Data for Study of Design Activity

ARCHITECTURAL RECORD has recently completed a study which throws more light on a subject of great natural interest to architects — the practice of architecture.

The conclusions are not surprising, but they have fresh authority because they are based on actual statistics on 12 months of practice by 490 architectural firms — 10 from each of the 48 states and the District of Columbia — chosen, to provide a fair sampling, on an arbitrary alphabetical basis, from the Construction Activity Record file of F. W. Dodge Corporation. All selections were made among firms whose projects totaled $100,000 or more during the period of the survey, the year ending August 31, 1951.

More architects (300 of the 490, or 61.2%) design *both* houses and other types of buildings than design either *houses only* (43 of 490, or 8.8%) or *non-residential and other heavy building only* (147 of 490, or 30%).

The "Average" Firm

The hypothetical "average" firm on the basis of the RECORD survey designed 28 buildings during the 12-month period, and had a dollar volume of $1,781,000. The same hypothetical firm designed three different types of buildings; and the study notes that the average practice would appear even more varied over a longer period.

What They Designed

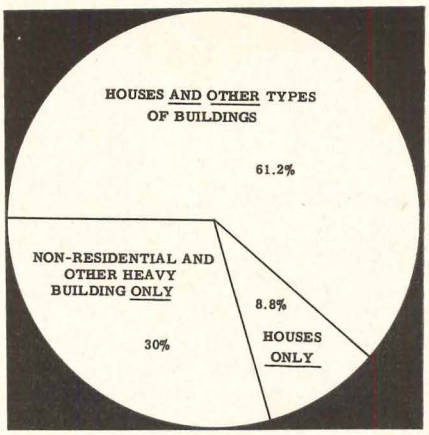
The 490 architects designed 11,563 houses with a total dollar volume of $143,299,000 and a mythical "average" cost of $12,393.

Their total dollar volume of $872,813,000 also included 794 schools ($186,553,000) designed by 326 of them; 306 stores ($43,869,000) designed by 132 of them; 289 religious buildings ($32,186,000) designed by 129 of them; and 264 "miscellaneous nonresidential buildings" ($162,505,000) designed by 264 of them. The latter group includes railroad, bus, air terminal buildings; aircraft hangars; greenhouses; refreshment and road stands; animal hospitals, havens, pounds; private garages; boat houses; boiler houses when built as separate projects.

Other building types included in their practices: 167 offices ($36,515,000) — 112 architects; 135 manufacturing buildings ($69,737,000) — 79 architects; 104 hospitals ($74,291,000) — 58 architects; 74 public buildings ($21,131,000) — 53 architects; 67 warehouses ($33,760,000) — 45 architects; 48 hotels or dormitories ($31,987,000) — 31 architects; 33 recreational buildings ($9,838,000) — 22 architects; 31 garages ($6,106,000) — 20 architects; 21 apartments ($10,278,000) — 15 architects; and 19 service stations ($317,000) — 12 architects.

What Non-Specializers Design

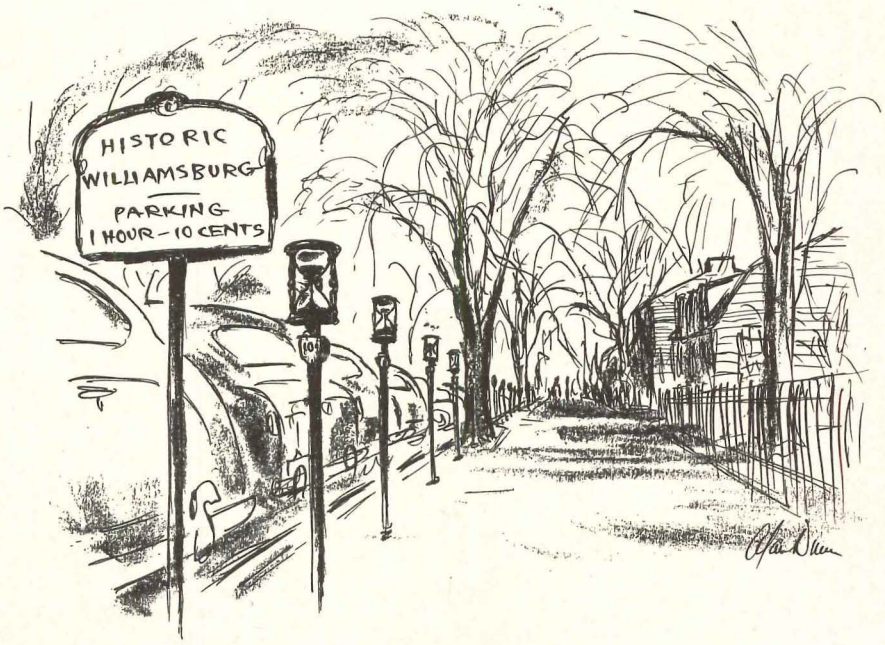
The table below is an analysis of work done by firms which did not specialize. *X* is used to denote non-specializing architects.



Percentage of architectural firms designing various types of buildings

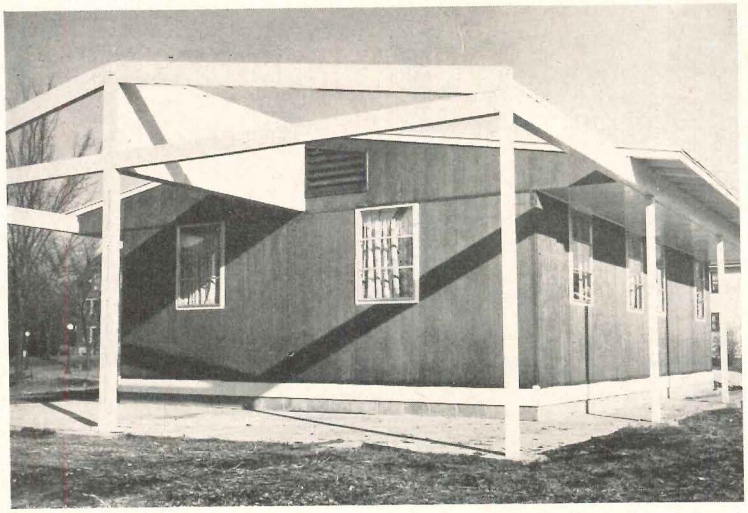
Kind of Project	Non-Specialists X	% of X to Total (490)	No. Projects X Designed	$ Volume of Projects	% Done by X of Total $ Volume *
Houses	300	61.2	6938	$112,780,000	79
Schools	293	59.3	717	167,533,000	90
Stores	131	26.7	304	43,211,000	98.5
Religious Buildings	125	25.5	271	30,382,000	94.4
Misc. Non-Residential	111	22.6	255	134,475,000	83
Offices	109	22.2	163	27,970,000	77
Mfg. Bldgs.	74	15.1	127	159,112,000	85
Hospitals	56	11.4	101	73,771,000	99.3
Public Bldgs.	52	10.6	73	21,011,000	99.4
Warehouses	44	9.0	66	33,558,000	99.4
Hotels-Dormitories	29	5.9	46	21,334,000	67
Recreational Bldgs.	21	4.3	31	8,888,000	90
Garages	19	3.9	30	5,956,000	98
Public Works-Utilities	17	3.5	26	9,166,000	88
Apartments	13	2.7	17	9,098,000	89
Service Stations	12	2.5	19	317,000	100
			9184	$758,562,000	87.0%

** $872,813,000 total activity of 490 firms studied*

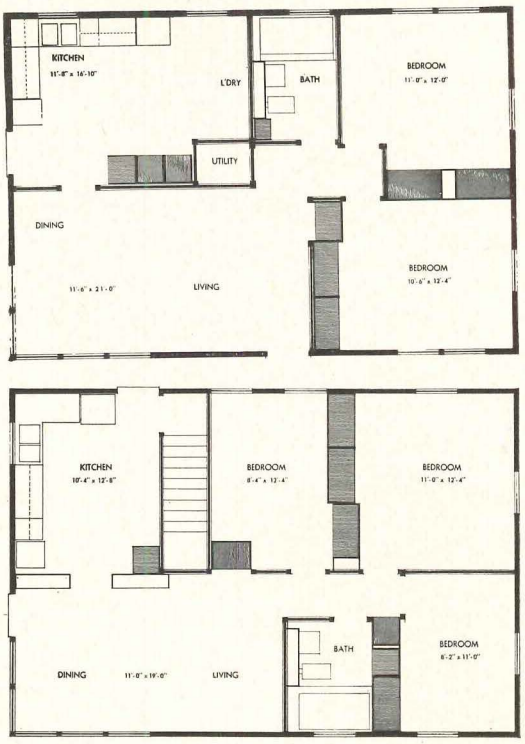


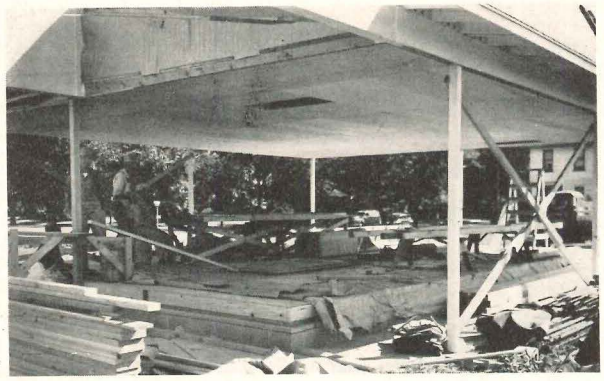
—Drawn for the RECORD by Alan Dunn

RESIDENTIAL SPACE USE TESTED IN EXPANDABLE HOUSE AT ILLINOIS



Test house for space research project of Small Homes Council, University of Illinois, is now (above) 24 ft by 36 ft, can be made larger (up to 32 by 48) or smaller by merely changing position of outside walls and adding floor panels. Roof, with ceiling attached, is supported by 10 columns, has plywood box girder for ridge





Photos: Public Information Office, University of Illinois

Two families living in house for successive six-month periods will test "liveability" of different arrangements (two variations are shown above). Interior partitions of laminated fibreboard, 1½ in. thick, 4 by 8 ft sheets, have tongue and groove joints on both sides; some are formed by movable closet units 4 ft by 2 ft. For moving, kitchen and bathroom have flexible tubing and piping in plumbing connections; bathtub is on rollers, other fixtures on movable wall panels. Designer: Prof. Rudard A. Jones, in consultation with Prof. James T. Lendrum and Prof. William H. Kapple

ARCHITECTS LEAD SEARCH FOR COPPER SUBSTITUTES

THE AMERICAN INSTITUTE OF ARCHITECTS is well on the way toward publication of a series of technical reference guides on the use of aluminum as a substitute for copper.

The first of the series, planned for the Institute's March *Bulletin*, will deal with substitutions in the electrical field. Tentative plans call for succeeding pieces on weather protection construction (flashing, gutter, etc.), building hardware, plumbers' brass, and other subjects.

The A.I.A. has been in touch with the principal aluminum producers, compiling their literature on aluminum uses in fields traditionally reserved for copper.

While the Institute takes the initiative in promoting this drive from the organizational standpoint, other segments of the industry are involved. The Institute is consulting with the National Electrical Contractors Association, for example.

Specifications Come First

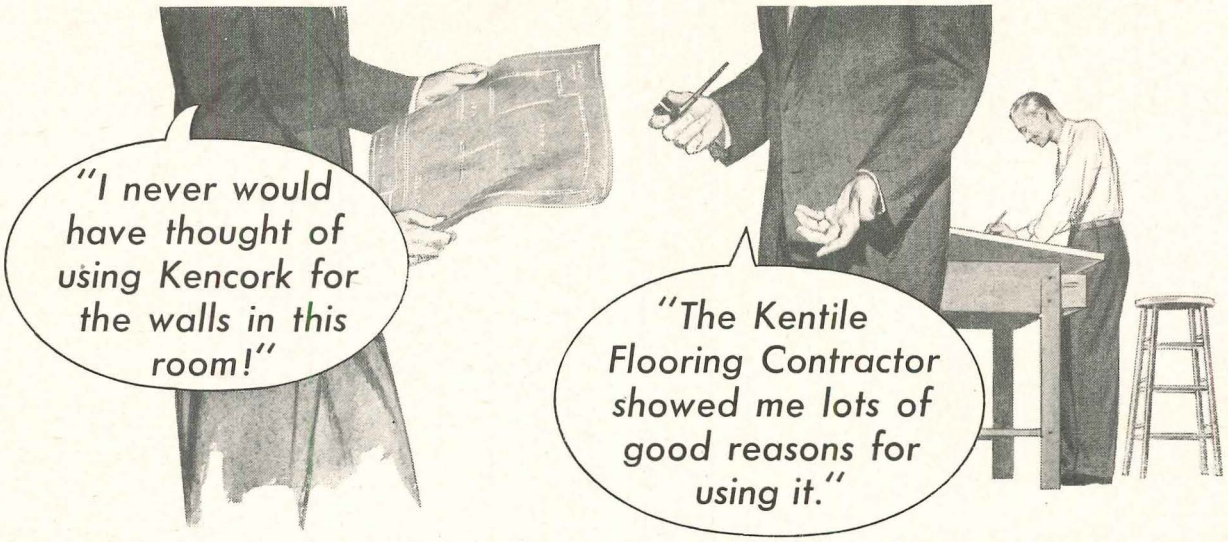
As the A.I.A. approaches this transition in metal uses, it conceives the first-line struggle to be in the minds of the men who write the specifications. Then, step by step, and through a process of education, the resistance to adapting aluminum where copper served before must be removed from the minds of builders and finally the artisans who make the installations.

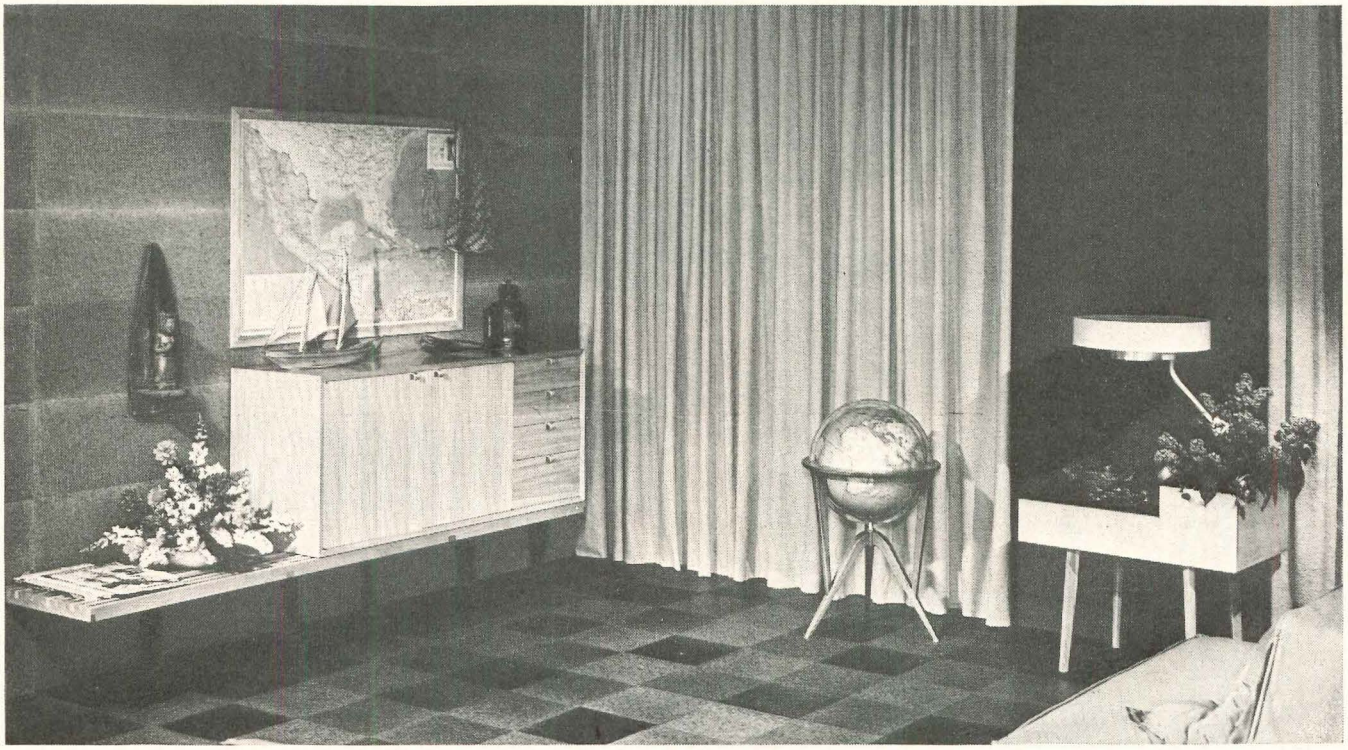
Government Supports Project

The federal government is supporting the A.I.A. plans. They were developed to their present detail following a meeting with Ralph Trigg of Defense Production Administration, and have DPA's blessing. Furthermore, the Office of Defense Mobilization is encouraging a shift from copper to aluminum.

Long-Range Planning

It is recognized in all quarters that there will be no plentiful supply of aluminum this year. It's going to be sometime in 1953 — perhaps beyond that — but the aluminum supply in adequate amount is coming: it is sure; but copper will remain short for years.





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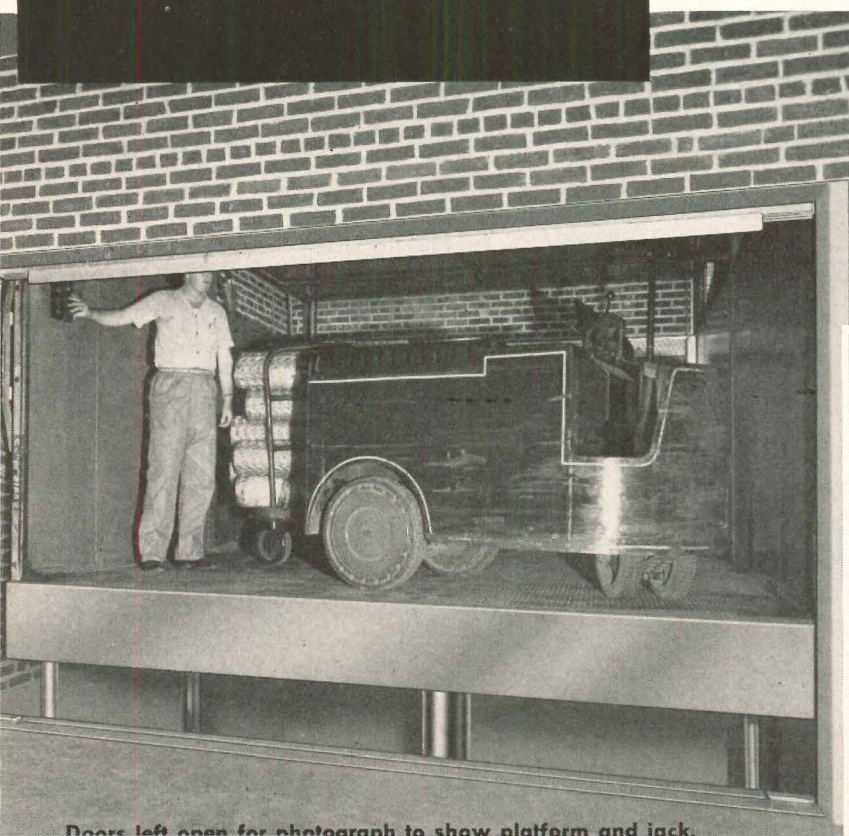
METHODIST HOSPITAL NURSES' HOME

Dallas, Texas
Architect: George H. Dahl
Contractors: Inwood Construction Co.
Rotary Oildraulic Elevator (Passenger) installed by Hunter-Hayes Co.

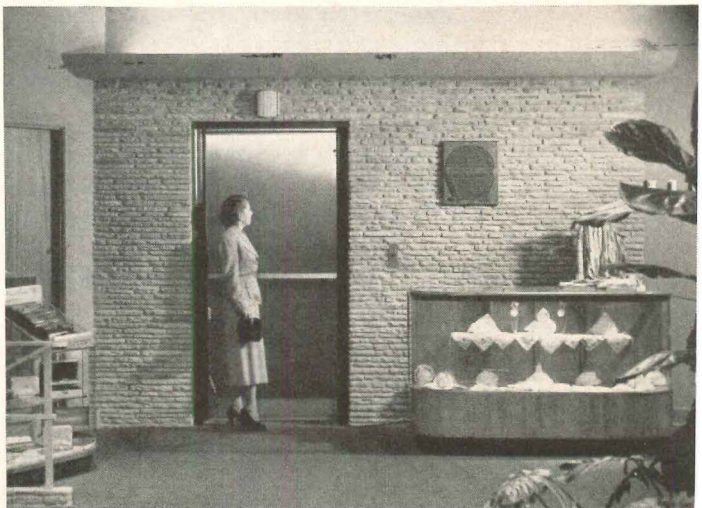
Rotary Oildraulic the modern elevator

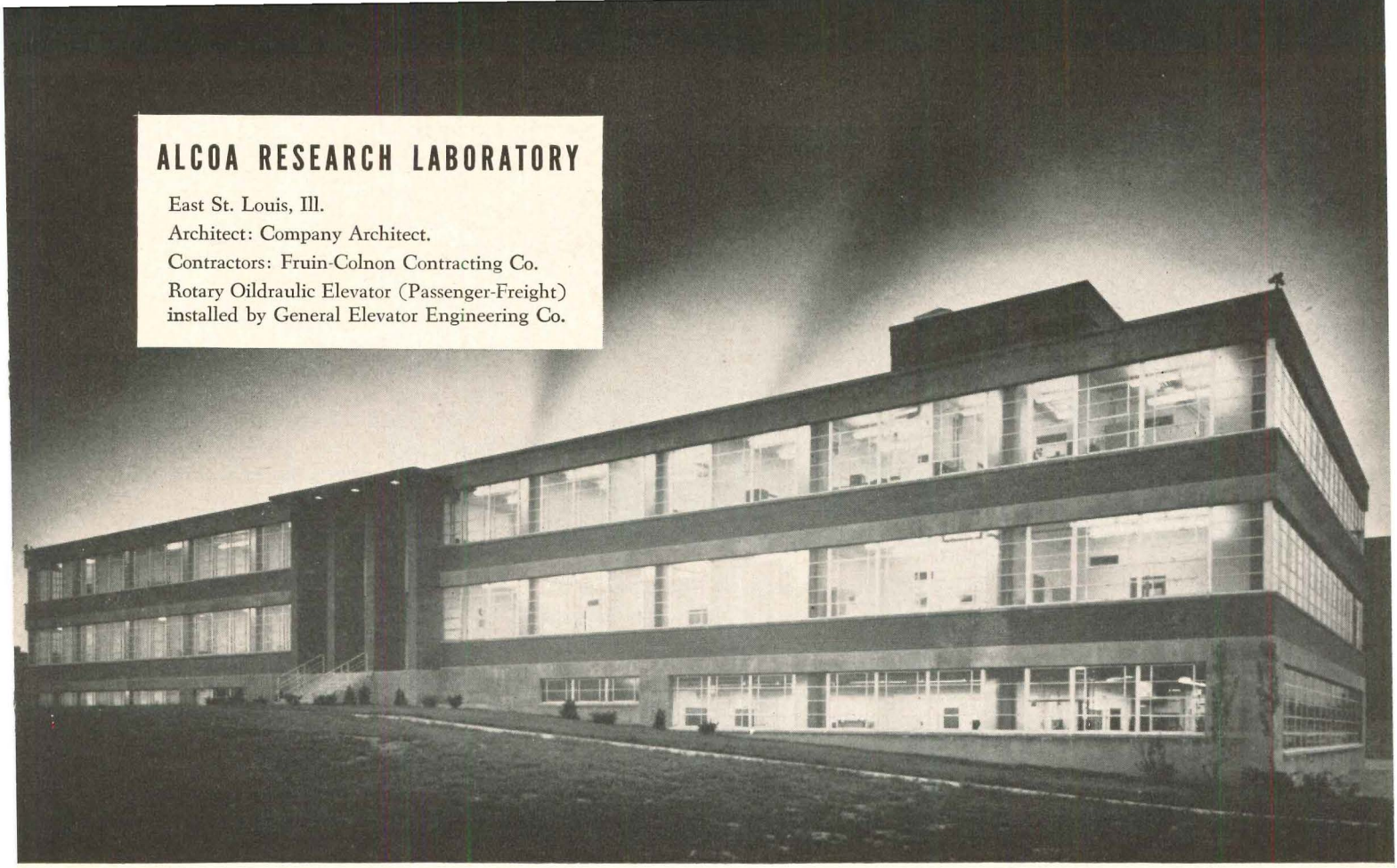
FREIGHT—Oildraulic operation makes it practical and economical to design Rotary Elevators to carry loads up to 80,000 lbs. Power is applied directly to the load; there is no lost motion. The car will not move downward as heavy loads are rolled in, because the elevator is supported on a solid column of oil. Rotary Elevator cars have extra-rugged construction essential for rough, tough freight service and power truck loading.

PASSENGER—The velvet-smooth fluid operation of the Oildraulic system is ideal for passenger elevator service. Gentle starts, cushioned stops and accurate landings please users. Rotary Passenger Elevators are furnished with any desired type of cabs, doors and controls.



Doors left open for photograph to show platform and jack.

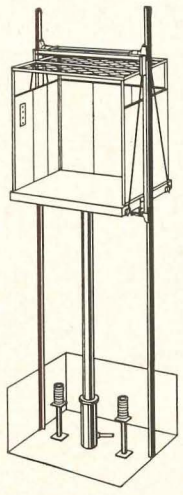




ALCOA RESEARCH LABORATORY

East St. Louis, Ill.
Architect: Company Architect.
Contractors: Fruin-Colnon Contracting Co.
Rotary Oildraulic Elevator (Passenger-Freight) installed by General Elevator Engineering Co.

for modern 2, 3 and 4-story buildings



Smooth, dependable elevator service at minimum cost

A tremendous advantage of the Rotary Oildraulic Elevator is that the car and its load are supported by the hydraulic system—not by the building structure. This permits a substantial lightening of the shaftway structure. There's no need for heavy, load-bearing sidewalls, supporting columns and footings ordinarily required to carry the overhead machinery, the car, and the load.

A penthouse can also be dispensed with and, in many cases, a special machine room is unnecessary. Rotary's compact power unit can be located on any landing, on any side of the hatchway—anywhere within 50 feet of the elevator.

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Smooth starts and stops are a feature of Rotary Elevators. Oildraulic automatic floor leveling positions the car to each landing with exactness . . . ¼" accuracy guaranteed!

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M.I.T. CONFERENCE SHOWS NEED FOR LONG-TERM HOUSING RESEARCH

Foster Gunnison, prefabrication advocate, analyzes housing proposals of students in the Bemis Foundation housing conference at Massachusetts Institute of Technology January 14. Other jurors (left to right): John W. Galbreath, Columbus, Ohio, realtor and developer of Fairless Hills, Pa., community; Howard T. Fisher, Chicago architect and building research consultant; Edward P. Brooks, dean of M.I.T.'s School of Industrial Management (moderator); Fritz Burns, California builder of large housing developments; and Alfred Levitt of Levitt & Sons, builders of Levittown, Long Island, and Levittown, Pa.

ALTHOUGH INDUSTRIALIZING OF HOUSING was the basic subject of M.I.T.'s January conference at Cambridge, a lively exchange of ideas led the discussion all the way from Buckminster Fuller's geodesic dome to the life history of Alfred Levitt.

M.I.T.'s School of Architecture and the Albert Farwell Bemis Foundation were joint sponsors of the one-day session. Dean Pietro Belluschi, in his introductory remarks, pointed out the importance of a "continuing endeavor to stimulate and encourage the study of industrializing production of housing."

What made the meeting lively was the panel of outspoken builders and prefabricators who acted as judges and critics of four community projects developed by M.I.T. graduate students.

Following the appraisal of the student projects, the judges themselves spoke and were then subjected to sharp questioning and comment from the floor.

Dean Brooks of M.I.T.'s School of Industrial Management was moderator.

The panel members — who judged and were judged — were William Levitt, Long Island builder; Fritz Burns, Los Angeles builder; Foster Gunnison, prefabricator; John W. Galbreath, realtor; and Howard Fisher, architect.

Buckminster Fuller's geodesic dome, shelter design form used by a team of M.I.T. students in planning a theoretical house development on a 275-acre Massachusetts site. The plans were presented for panel discussion at the Jan. 14 housing conference

Basis of all the discussion was a 275-acre site in Wayland, Mass., which each of the four teams of students had developed as a project from land purchase to final sale of houses. Each project employed a different type of house: a Gunnison prefab, the Acorn packaged house; a site-fabricated panel unit — and Fuller's geodesic dome structure.

The students indicated they had had considerable difficulty attempting to fit standardized units to the rolling terrain of the site.

Detailed criticism of the projects soon led to a broad discussion of mass housing methods objectives and most important — research.

Among the students, keenest interest was shown in Fuller's geodesic dome and 1970X prototype. Fuller's house was described by graduate student John Rauma as an approach to better living "like the design for the first airplane."

Sharp differences of opinion were shown in the comments on design, planning techniques, building costs.

Director Burnham Kelly of Bemis Foundation summed up by saying "we need some way to get more of our people into these building organizations — to bring about greater exchange of information between them and the schools. *Management* is the key to the mass building operation problem."

What They Said

Some of the remarks and comments:

Levitt — "The shell is really unimportant. More than one half of our man hours are in ground work. You can't prefabricate streets, earth-moving — or a community."

Galbreath — "Too much land is a burden — people don't want such big lots."

Gunnison — "Distribution is the major problem. Anyone can make a house — the problem is to sell it."

Fuller — "It's not what people *think* they want but what we *know* they need."

Koch — "Would integration of housing be aided by having municipalities do planning and developing of land?"

Fisher — "We should not accept FHA regulations or codes without questioning. Students must know about them — then try to change them."

Burns — "There is a constant improvement in design and land planning — people are becoming more house conscious."

Belluschi — "Cannot builders develop more research — perhaps try one project that might *lose* money."

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Also available in roll form for flooring, wall covering and counter topping.

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High bays or low ceilings, moist or dirty locations, assembly lines or drafting tables, continuous-line lighting or individual units, lighting for inspection or mass production—whatever the seeing conditions and requirements of the task, you can get a "Magna-Flo" System that is MATCHED TO THE TASK because it is *so complete!* Further, in "Magna-Flo" Systems you get the most important features for sustained lighting performance and simplified maintenance, including exclusive Benjamin "Springlox" Lampholders for "easy-in, easy-out" lamp maintenance.

Write for Bulletin AD-5705 for complete specification data on Benjamin "Magna-Flo." Benjamin Electric Mfg. Co., Des Plaines, Ill.

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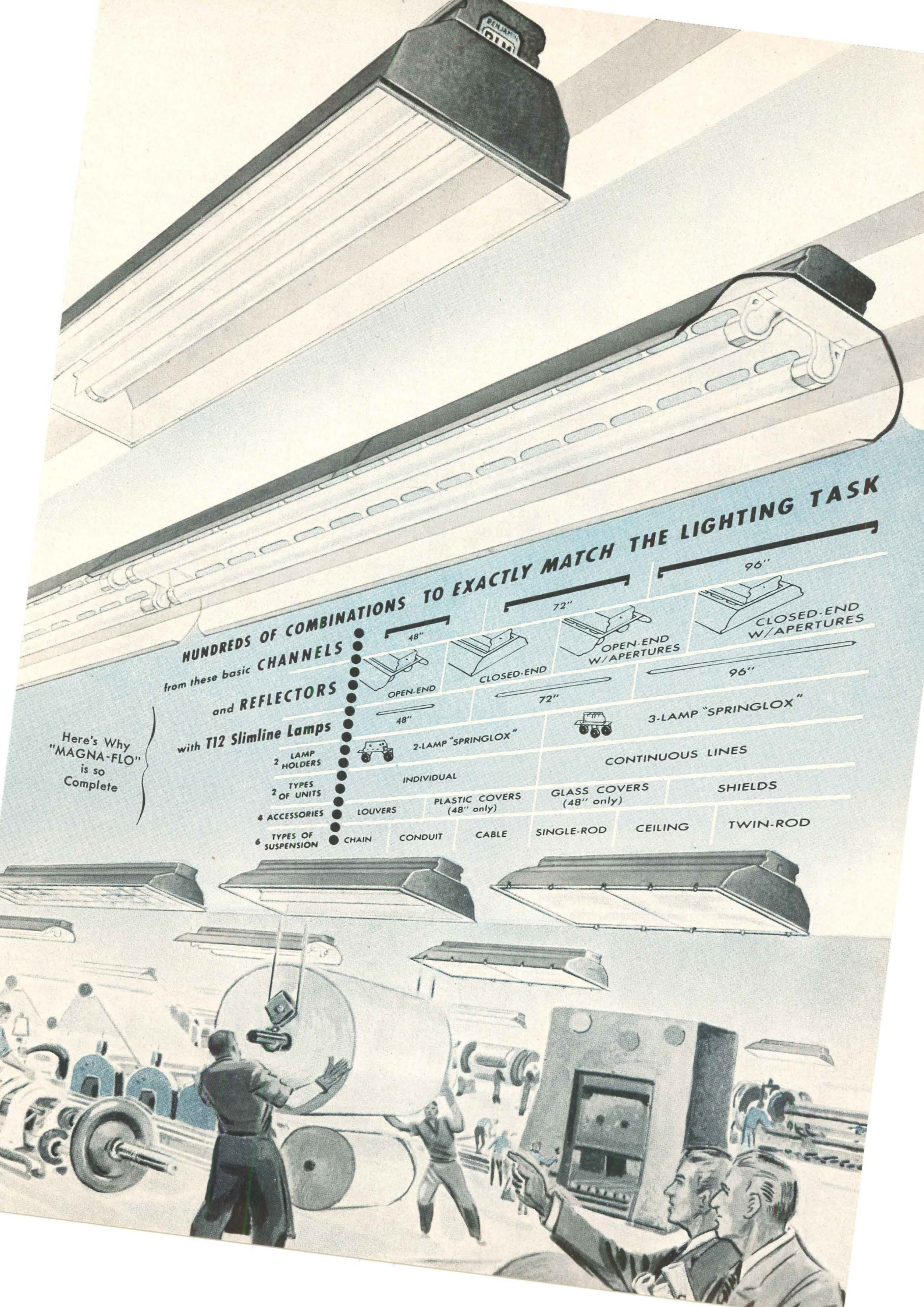
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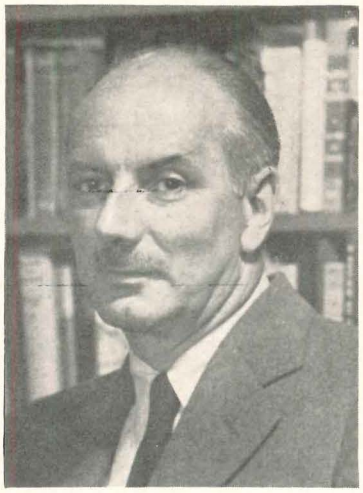


Critic Lewis Mumford, who was unable to be in Chicago for the A.I.A. convention last May, finally was presented with his certificate of honorary membership in the American Institute of Architects at a meeting of the New York Chapter last month. No fair expecting him to blunt any arrows because he's "inside," he indicated!

FLW PLANS BLOCK HOUSE: ANY MAN CAN BUILD IT

THE MAN IN THE STREET, already an object of universal solicitude in this election year, has one promise from Frank Lloyd Wright.

New concrete blocks and rods designed by Mr. Wright will enable him within a year to build for $6000 a Usonian house that would otherwise have cost $12,000.

The "Usonian automatic" system was used on the Arizona Biltmore Hotel, but has since been restudied and simplified to make it "foolproof" for amateurs. Mr. Wright notes that the system will permit an individual builder-owner to lavish on his house the "appreciative understanding which hasn't entered into architecture; nobody has loved it enough to make it a thing of beauty."

The blocks and rods will be stocked all over the country, eventually, just like lumber; but forms will also be available for rental "at about $45" so the individual builder can make his own blocks if he wishes.

Pilot models of the houses will be built, probably this summer, in Phoenix, San Francisco and Milwaukee.

Mr. Wright announced the plans for the new venture last month in San Francisco at the supervisory office which he recently opened in that city with Aaron Green in charge.

NEWS FROM CANADA *by John Caulfield Smith*

Construction Level in 1952 Expected to Reach '51 Mark

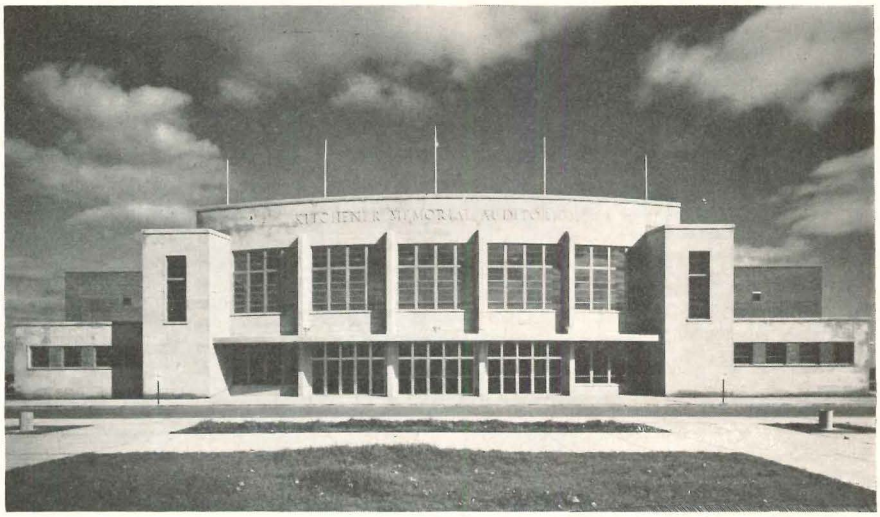
CONSTRUCTION IN CANADA in 1952 is expected to reach the record level established in 1951. Declines in contracts awarded for some types of projects will be offset by gains for others.

Prospects are bright in engineering, even if the St. Lawrence Seaway doesn't get a green light. Industrial building, sparked by increased spending on defense construction, will continue to boom. Institutional volume should remain unchanged, with all but the most essential non-defense public works deferred. Possibility of a dip in commercial building, highway construction and housing is very evident. Supplies, with the exception of steel and steel products, should not be too great a problem, nor should labor. Efforts will be made to hold the firm price line, but costs will undoubtedly rise.

Major Record Seen for 1951

Final figures are not available at the time of writing, but there is reason to believe that 1951 contract awards will exceed those of 1950 — previously the

(*Continued on page 30*)

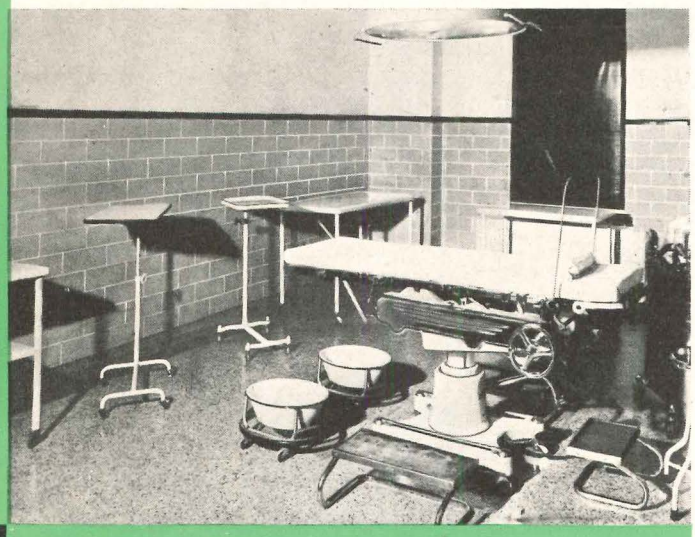


Photos above and below by Belair

Kitchener, Ont., Memorial Auditorium has facilities for every kind of public entertainment from musical comedies to ice hockey. Exteriors are limestone for the front and brick and concrete block for sides and rear. Main roof is supported by 110-ft lateral trusses carried on 220-ft longitudinal trusses, the longest steel trusses ever erected in one piece in Canada. Architects were Jenkins and Wright

Wonderful treatment for hospital interiors

STARK GLAZED FACING TILE



When you design and build hospital interiors with Stark Glazed Facing Tile you do more than merely build a wall.

YOU SAVE ON CONSTRUCTION COSTS.

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YOU ASSURE LOW COST MAINTENANCE AND REPAIR.

YOU PROMOTE HIGH STANDARDS OF SANITATION.

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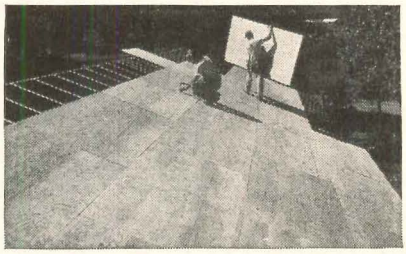
PANEL DISCUSSION

FHA Accepts 3/8" Plywood Over Rafters 24" O. C.



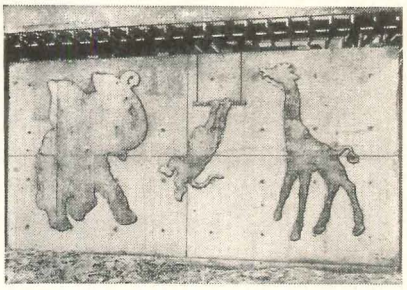
On the basis of recent tests and experience data, Federal Housing Administration now accepts plywood 3/8"-thick as roof decking over rafters spaced 24" on centers, according to a letter from Curt Mack, assistant commissioner of the FHA underwriting office, to Douglas Fir Plywood Association. A revision of FHA Minimum Property Requirements is planned; meanwhile, FHA at Washington (Underwriting Office) will advise any insuring office upon inquiry that 3/8" plywood over rafters 24" on centers will be accepted. Plywood roof deck thicknesses now accepted by FHA are shown below in tabular form.

Roofing Material	Max. Rafter Spacing	Min. Plywood Thickness
Wood, Asphalt Shingles	16"	5/16"*
	24"	3/8"*
	24"	1/2"
Slate, Tile, Asbestos-Cement	16"	1/2"
	20"	1/2"
	24"	5/8"
Flat Roofs	16"	3/8"
	20"	1/2"
	24"	5/8"

*Under wood shingles: If plywood is less than 1/2" thick, apply 1" x 2" nailing strips.

A folder giving detailed information regarding use and acceptance of Douglas fir plywood in homes built under FHA financing may be had free of charge from Douglas Fir Plywood Association, Tacoma 2, Washington.

Concrete Intaglio



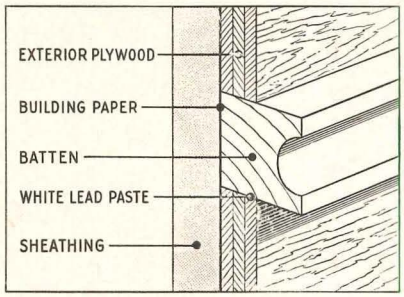
Plywood cut-outs, nailed to the plywood form face, were used to create these whimsical nursery figures on the exterior concrete wall of the kindergarten play yard at the Whitman School, Tacoma, Wash. Architect John G. Richards of Lea, Pearson and Richards developed the idea. Over 7' high, the figures were formed using 3/8" plywood cut-outs, secured to 5/8" form panels. On the soon-

to-be-completed project, plywood forms are being re-used as roof decking. Contractors: Standard Construction Co., Tacoma, Washington.

Speeds Siding Application

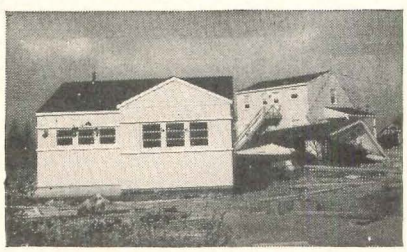
Builder-Owner H. J. Cox reports application time and labor costs were reduced by one-third with Douglas fir plywood siding in building this Eugene, Oregon, home. "Not only did the plywood help hold costs down," Builder Cox reports,

"but after over four years exposure to our rainy Northwest weather, the siding looks as good as the day it was finished." Architect Percy D. Bently specified the interesting batten detail shown. Exterior plywood panels were sawn to correspond with the bevel of the specially run molding and tightly fitted with a sealing of white lead paste. Corners were formed with 5/8" quarter rounds. The siding—4'x8' sheets, cut to 2'x8'—is painted beige, the molding tobacco brown.



Plywood Cottages Weather Hurricane

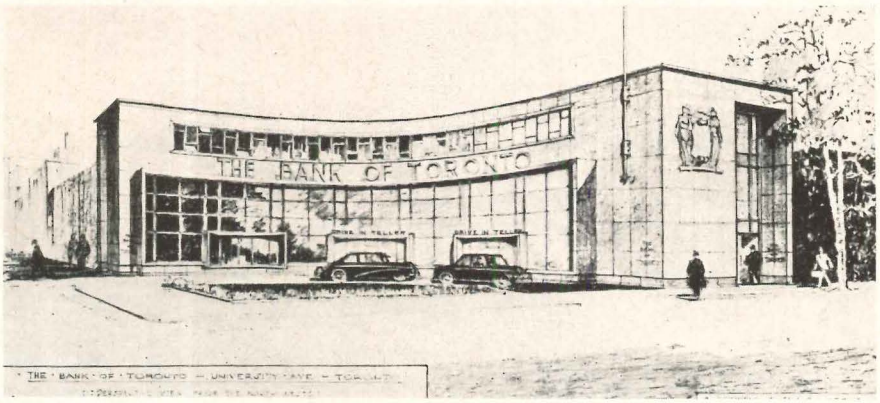
Dramatic proof of plywood's superior strength and rigidity was given last year when up-to-100 m.p.h. winds lashed the Jersey coast in one of the worst hurricanes to hit since 1938. Among the luckiest of those who took the full brunt of the screaming wind were owners of the 500 plywood cottages at Ocean Beach, N. J. All around the development, roofs were ripped away, church steeples toppled and conventional homes smashed beyond repair. According to A. C. Pearl, project sales manager, not one of the plywood houses suffered structural damage. "We attribute this to the outstanding bracing strength provided by plywood which was used as combined siding-sheathing."



THE RECORD REPORTS

CANADA

(*Continued from page 26*)



The Bank of Toronto plans a new drive-in branch at University Avenue and Dundas Street in Toronto. Construction will be limestone with granite base. Architects: Blackwell and Craig of Toronto

CONSTRUCTION LEVEL (*Continued*)

best year in Canadian building history — by 49 per cent. Estimates indicate that this year's awards will reach the unprecedented height of $2.3 billion, compared with $1.5 billion for last year.

The 1951 total is the icing that tops a cake which has been baking for the past five years. Construction in every year since 1946 has substantially exceeded the year preceding it. Steadily climbing costs are also apparent.

Here is how the volume and cost picture has been developing:

	Contract Award Total ($ million)	*Increase Over Previous Year (per cent)*
1946	663	62
1947	718	8
1948	954	33
1949	1140	20
1950	1526	34
1951 (Est'd)	2275	49

	Construction Cost Index (1935–39) — 100	*Increase Over Previous Year (per cent)*
1946	147.6	4
1947	165.4	12
1948	189.0	14
1949	197.8	5
1950	216.9	9
1951	241.0	12

(Source: MacLean Building Reports Ltd.)

Physical Volume Also Up

Despite the creeping inflation of the postwar period, the increase in physical volume of building has not lagged far behind the rise in dollar value.

"We face," says Robert Drummond, president of the Canadian Construction Association, "two major problems. We must keep up our record program of vital projects, despite the acute steel shortage, and at the same time see that

(*Continued on page 32*)

. . . and no wonder. AGITAIR Type R is the only diffuser to assure 100% air distribution in any shape area . . . from any location . . . without blank-offs or oversized outlets. Tailor-made for each application.

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Air Devices Inc.

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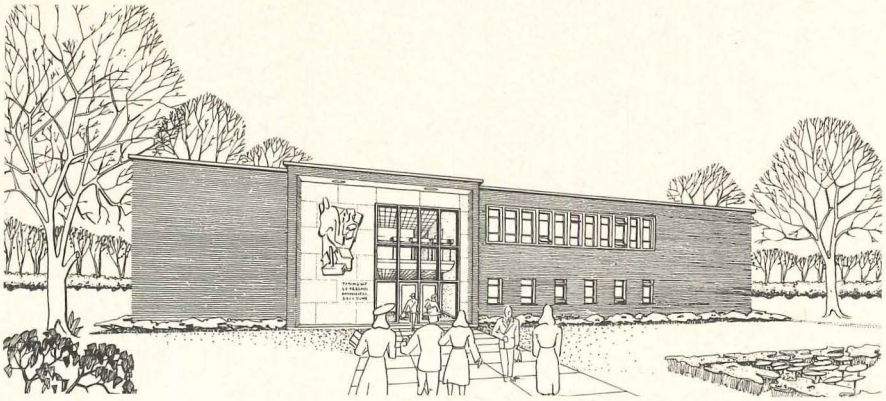
Air Diffusers • Air and Grease Filters • Exhausters

THE RECORD REPORTS

CANADA

(*Continued from page 30*)



The new municipal office building for the township of Toronto focuses attention on the entrance, which has a sculpture beside a two-story window. Gordon S. Adamson of Toronto is the architect

CONSTRUCTION LEVEL (*Continued*)

construction does not fall behind the discovery and development of our natural resources."

In so far as the steel situation is concerned, structural members, pipe and wire lath are hard to find for non-priority jobs. However, marked improvement is expected towards the end of 1952. Canadian steel producers are rapidly expanding their facilities. Within 12 to 15 months, our ingot capacity will be boosted by a million tons — more than we imported from U. S. in 1950. At the same time, output south of the border will be mounting and Canada stands a good chance of getting some of this increased production.

Brick, cement, and certain types of lumber may be tight during the height of the building season in various parts of Canada, but, generally speaking, shortages of the crippling nature encountered in 1946 are not anticipated. Cutbacks in the manufacture of asphalt shingles, gypsum lath, bathtubs, domestic boilers and warm air furnaces seem likely if housing starts decline seriously.

Defense Peak in 1952

Defense and armed services construction is calculated to reach its peak in 1952. This is assured by the large carry-over of building from 1951 and the program now being planned for the next fiscal year. By 1953, some tapering off is indicated, though of course every prospect would be changed if the international crisis worsened.

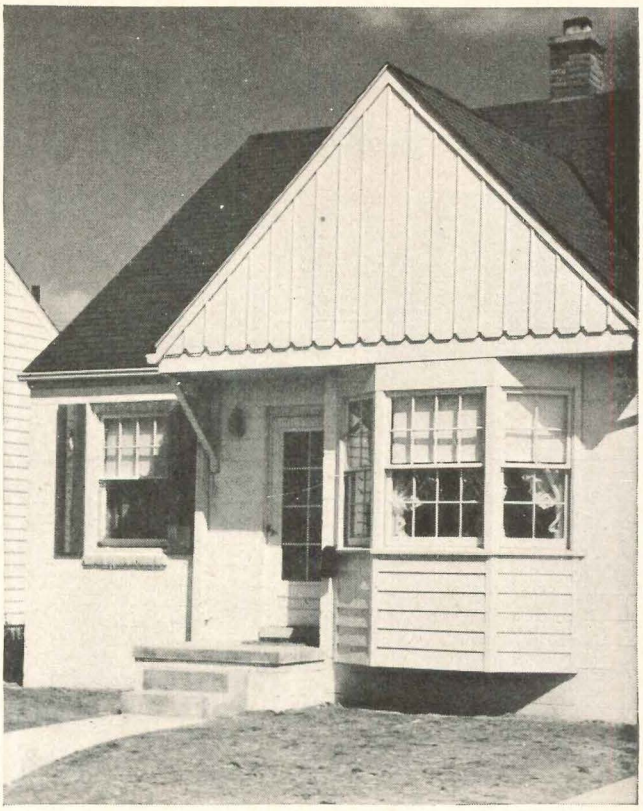
Even more important are the projects allied to defense. In 1951 they pushed the value of industrial contracts a whopping 200 per cent ahead of the previous year.

Capital investment in our basic industries is another factor contributing to large-scale construction activity. Pro-

(*Continued on page 34*)

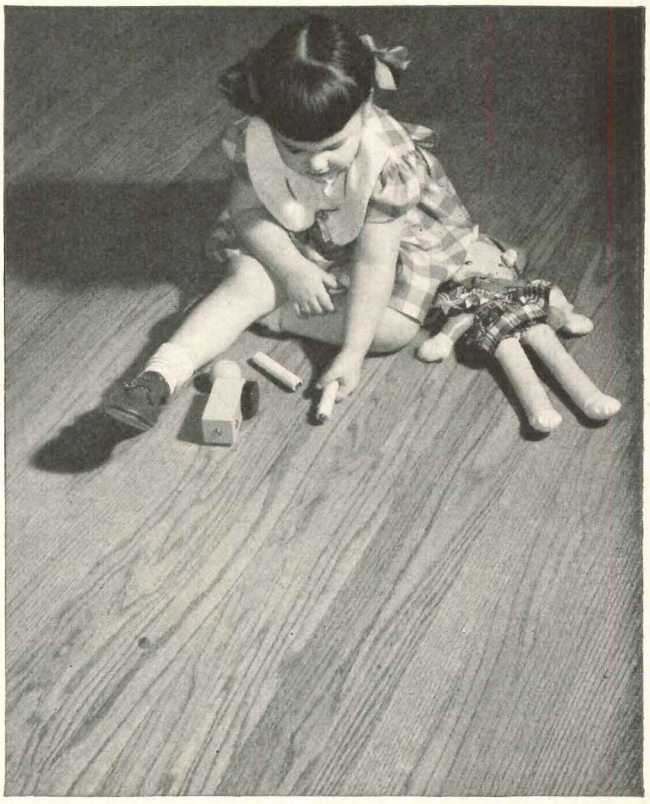
EVERY HOME REGARDLESS OF PRICE CAN HAVE THE BENEFITS OF OAK FLOORING

Only oak flooring provides the basic flooring needs—beauty, economy, adaptability and "healthfulness."



The cost of a home should have no bearing on such fundamentals as "healthfulness," durability, economy and beauty. Cost should affect only over-all size and finishing "frills."

For example, low-cost homes need not forego the benefits of oak—which 85% of all prospective homeowners want. Now, oak can be laid over concrete slabs, using screeds set in mastic.* To go with concrete slab construction are grades of oak flooring for even the lowest cost homes.



With oak laid over concrete, children can play right on the floor. The natural insulating qualities of oak, plus the cushion of air between the concrete slab and the oak flooring, makes the floor warmer in winter and cooler in summer, a strong plus-factor for use in selling homes.

***SEND TO NATIONAL OAK FLOORING MFRS. ASSN., STERICK BLDG., MEMPHIS 3, TENN., FOR FREE FHA-APPROVED INSTRUCTIONS FOR LAYING OAK OVER CONCRETE.**

THE RECORD REPORTS

CANADA

(*Continued from page 32*)

jecting our sights to 1953 and the years beyond, it is obvious — barring all-out war — that even greater construction programs are likely in future. Canada's economy is a dynamic one. Its building industry is big, and will stay big. Resources development paves the way for establishment of secondary industries, new townsites, schools, hospitals, houses, roads and utilities. In addition, there is a growing backlog of projects postponed because of the steel shortage, restricted credit, and deferred depreciation.

Housing Ebb Indicated

Housing, which accounted in value for one third of all construction contracts awarded in 1950, shrank to one fifth of the total in 1951.

And the outlook, according to F. A. Mager, president of the National House Builders Association, is far from promising for 1952.

"Unlike other years," he points out, "we will not carry over into 1952 a large number of uncompleted dwellings. Combined with the federal government's policy of discouraging new house starts, it looks as if next year's production may drop as much as 25 per cent. In other words, we may build 55,000 or 60,000 units, compared with about 75,000 in 1951 and 90,000 in 1950."

No Lag in Demand

Slackening of demand will not, in Mr. Mager's opinion, be responsible for the cut in volume. Canada is prosperous and her population is increasing by leaps and bounds. With incomes at an all-time high, young people can afford to marry earlier, and to set up their own domestic establishments earlier. At the same time, because of the growth of savings and the introduction of old age pensions, older couples are able to maintain separate households longer. Thus, at both ends of the family cycle, there is greater demand for houses.

The anticipated drop in production is explained by what Mr. Mager terms "the unrealistic sales prices" set by Central Mortgage & Housing Corporation under recently altered landing regulations.

"Builders are no different from other business men. They cannot operate

The Dominion Bank has a new main office building in Vancouver, B. C. Exteriors are stone and granite. "Main" offices of banks in Canada are not headquarters but major units in branch system. Architects of this one are McCarter & Nairne of Vancouver

when a rigid price ceiling and a rising floor of costs squeeze out a fair profit."

The remedy, he suggests, is for material prices and wages rates to be controlled as well as builders' sales prices. Either that, or an escalator clause in builders' contracts to absorb rising costs.

Awards of Merit Planned for National Home Show in May

Awards of merit to architect-builder teams responsible for the best postwar residential subdivisions in Canada will be made at the National Home Show, to be held at the Horticultural Building, Exhibition Park, Toronto, May 23–31.

Manager Grant Smedmor announces that the Show will be both a trade and consumer exhibition embracing all branches of the residential building industry, including home furnishings and equipment. An advisory committee comprising representatives of the design, contracting and supply organizations has been set up.

First Awards Are Made in Defense Housing Program

Rex Heslop, Etobicoke, Ont., builder, is the first to participate in Canada's new defense housing scheme. He has been awarded 117 loan approvals for defense houses and 22 loan approvals for other houses in his new 153-acre Islington Avenue subdivision.

The 117 approvals are part of a package of 500 approvals offered by Central Mortgage & Housing Corporation to help get accommodation for workers at the giant A. V. Roe aircraft

(*Continued on page 36*)

THE RECORD REPORTS

CANADA

(*Continued from page 35*)

plant at Malton. The remaining 383 approvals are being offered, in blocks of up to 100 or so units, on a "first come, first served" basis. Builders must have serviced land on which to build within reasonable commuting distance of the plant, and adhere to National Housing Act standards of construction.

Under its recently revised lending regulations, CMHC will make 90 per cent mortgage loans to A. V. Roe employees purchasing these 117 defense houses. The transaction is handled direct. No lending institution is involved. The 22 other houses may be purchased by anybody, but the 80 per cent mortgage loan is handled through a lending institution.

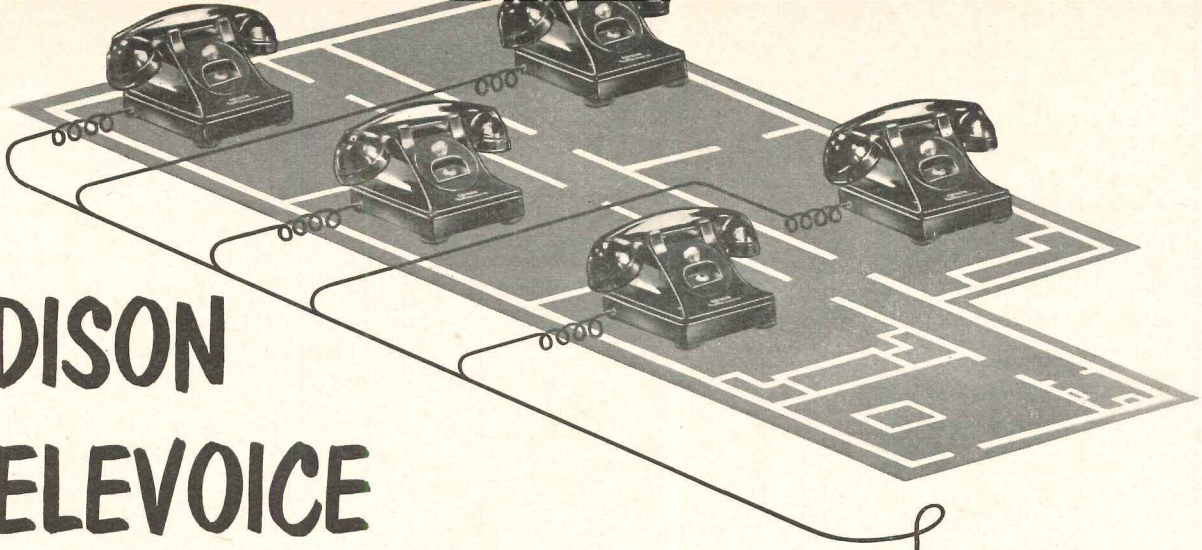
Agreed-on Price: $10,000

However, both the defense houses and the other houses have one thing in common. Their price, in the neighborhood of $10,000, was mutually agreed upon by Heslop and CMHC. This power to set the sales price gives the Corporation a throttle to control the number of new houses started in Canada in the immediate future.

Materials No Problem

Heslop certainly has no worries about the two latter items. Lumber and brick yards in the Toronto area are full to overflowing. Furnaces, boilers, even bathtubs — the "bête noir" of the postwar supply situation — may be had in abundance. About the only scarcities are steel beams, lintels, pipe and wire lath, and these are by no means impossible to get. Subcontractors are knocking themselves out to get a chance to bid, and skilled and unskilled labor come running at the crook of a finger.

It is likely that CMHC's agreement with Heslop will serve as a model for similar agreements elsewhere. At the moment, it doesn't look as if there'll be many of them, since Defense Production Minister Howe has designated only a handful of defense plants whose employees will qualify for 90 per cent mortgage loans. Besides Avro at Malton, there is Dowty, Ajax; Light Alloys, Renfrew; Cockshutt, Renfrew; Sorel Industries, Sorel; Canadair, Cartierville, and Canadian Car Foundry, Fort William, Port Arthur.



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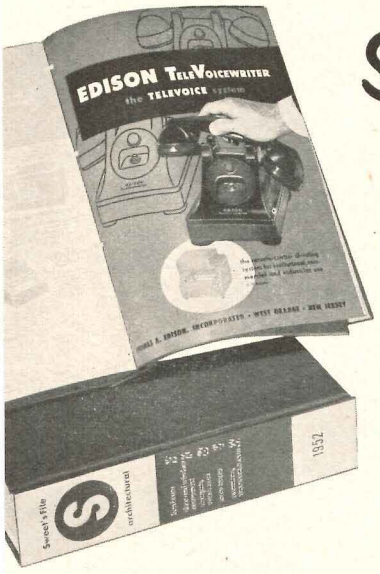

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By Ernest Mickel

"Temporary" Defense Housing: How to Get It and Install It

THE PUBLIC HOUSING Administration has implemented Title III of the Defense Housing and Community Facilities Services Act (1951) with the announcement of procedures for acquiring and installing temporary defense housing in critical defense housing areas.

By the end of last year, Raymond M. Foley, Housing and Home Finance Agency administrator, had made assignments for the provision of 4575 dwelling units in 24 projects destined for 22 critical defense housing areas. This temporary housing was expected to meet only partially the needs of the Army, Navy and Air Force installations it would serve.

Included in the initial assignments in the program were trailers and temporary portable units referred to as "prefabricated family demountables." The housing agency said that trailers will be procured by the central office in Washington on a competitive bid basis. Contracts for site work and installation of the mobile units will be let on a competitive basis by the PHA field offices within the respective critical area jurisdictions.

For the portable units, competitive bids will be taken in the PHA field offices and contracts let on the basis of overall development cost, including preparation of the site and erection of the homes. The temporary houses may be fabricated at the site or in a factory.

PHA field offices would select an engineer or architect to prepare the site plan, while the plans and specifications for the portable units are being made available to the field offices from Washington.

Engineers: FCDA Suggests Quotas for Civil Defense

Engineering services, vital to the economy at any time, take on a special significance during a period of national emergency. Add to this the possibility of enemy attack on American cities and the role of the engineer — and the architect — is projected into a new field of importance.

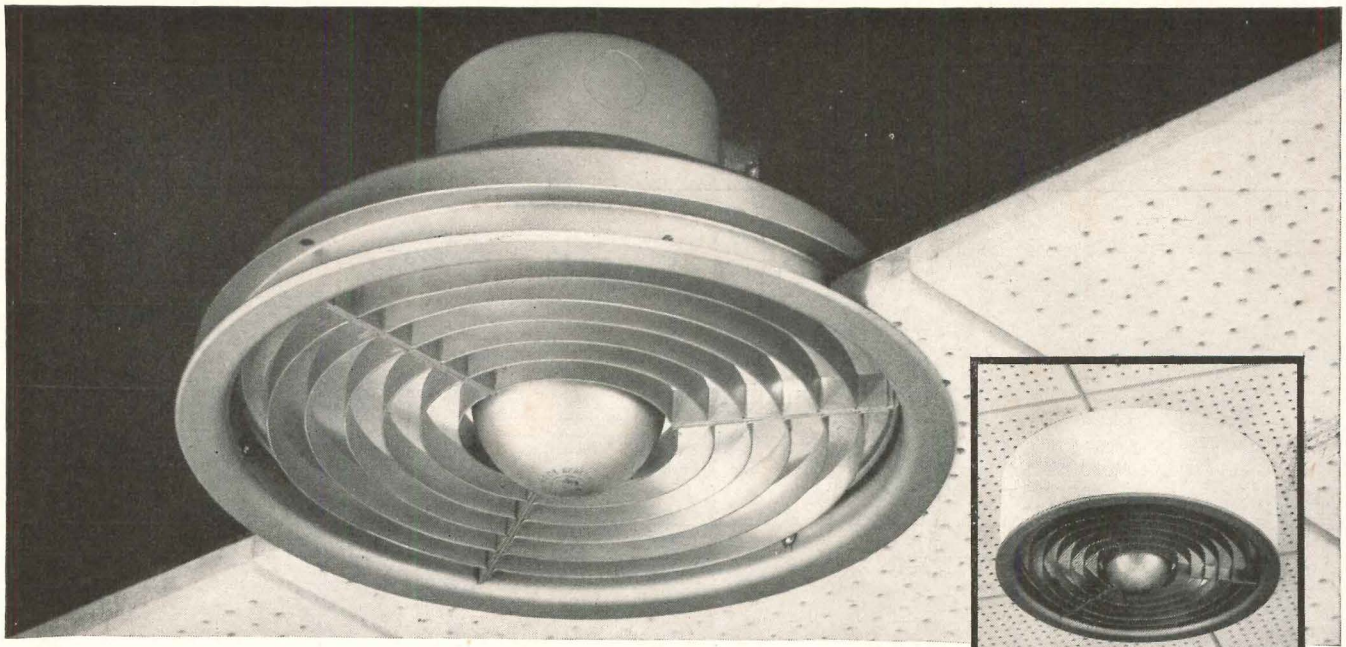
This was indicated in a recent tabulation by the Federal Civil Defense Administration listing percentage quotas by civil defense services for volunteers. It is recommended that in "target areas," those locations defined as most vulnerable, 190 volunteer engineers would be needed for every 10,000 population count. These would be part of a citizen volunteer force of 17.5 million estimated as necessary to man community emergency groups.

Post-Attack Functions

Following an attack, said the FCDA, engineering services would have the task of restoring such essential community services as communications, transportation, power and water supply; and emergency repairs to hospitals, streets, highways and bridges, would be handled by them.

In "support areas," adjacent to targets, the estimated percentage quota for engineers would drop to 130 per 10,000 population. Altogether an effective civil defense organization for the country will require the services of one out of every 12 citizens, civil defense authorities said.

(*Continued on page 340*)



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CONSTRUCTION COST INDEXES

Labor and Materials

United States average 1926–1929 = 100

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assocs., Inc.

NEW YORK

Period	Residential		Apts., Hotels Office Bldgs.	Commercial and Factory Bldgs.	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1925	121.5	122.8	111.4	113.3	110.3
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1946	181.8	182.4	177.2	179.0	174.8
1947	219.3	222.0	207.6	207.5	203.8
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.4	240.0
1950	256.2	254.5	249.5	251.5	248.0
Sept. 1951	273.7	271.6	264.8	266.5	263.6
Oct. 1951	274.4	272.5	264.9	266.6	263.8
Nov. 1951	274.4	272.5	264.9	266.6	263.8
	% increase over 1939				
Nov. 1951	**122.2**	**122.6**	**102.7**	**99.9**	**102.8**

ATLANTA

Period	Residential		Apts., Hotels Office Bldgs.	Commercial and Factory Bldgs.	
	Brick	Frame	Brick and Concr.	Brick and Concr.	Brick and Steel
1925	86.4	85.0	88.6	92.5	83.4
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1946	148.1	149.2	136.8	136.4	135.1
1947	180.4	184.0	158.1	157.1	158.0
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
1950	194.3	196.2	185.4	183.7	185.0
Sept. 1951	213.0	214.8	205.0	203.7	206.9
Oct. 1951	214.6	216.4	206.6	204.7	208.3
Nov. 1951	214.6	216.4	206.6	204.7	208.3
	% increase over 1939				
Nov. 1951	**148.7**	**160.4**	**117.2**	**110.2**	**120.0**

ST. LOUIS

1925	118.6	118.4	116.3	118.1	114.4
1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1946	167.1	167.4	159.1	161.1	158.1
1947	202.4	203.8	183.9	184.2	184.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
1950	232.8	230.7	221.9	225.3	222.8
Sept. 1951	253.5	249.5	241.4	243.8	241.4
Oct. 1951	255.6	252.4	241.2	243.9	241.6
Nov. 1951	255.6	252.4	241.3	243.9	241.6
	% increase over 1939				
Nov. 1951	**131.9**	**135.9**	**103.3**	**103.6**	**103.0**

SAN FRANCISCO

1925	91.0	86.5	99.5	102.1	98.0
1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1946	159.7	157.5	157.9	159.3	160.0
1947	193.1	191.6	183.7	186.8	186.9
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
1950	227.0	223.1	222.4	224.5	222.6
Sept. 1951	248.1	243.0	242.0	244.9	245.4
Oct. 1951	248.5	243.5	242.1	244.9	245.5
Nov. 1951	248.5	243.5	242.1	244.9	245.5
	% increase over 1939				
Nov. 1951	**135.3**	**145.2**	**106.2**	**100.9**	**110.7**

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

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

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

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

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

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

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

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

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

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

These index numbers will appear regularly on this page.

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— in brick and stone mortar (AS-5)?

— in concrete floors for industrial use (AS-2)?

•

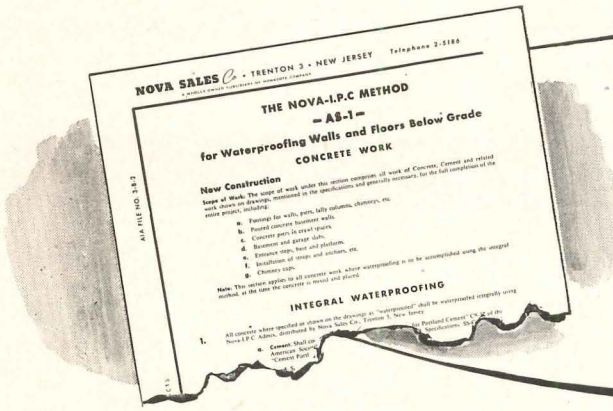
— in all exterior stucco finishes (AS-6)?

•

— in masonry paint on masonry surfaces (AS-7)?

•

— in restoring existing concrete (AS-8)?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☐ AS-5 ☐ AS-6 ☐ AS-7 ☐ AS-8

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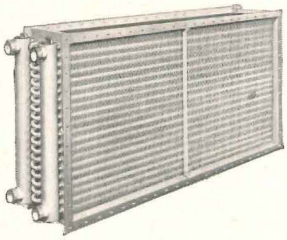
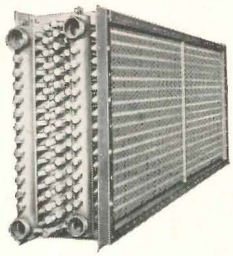
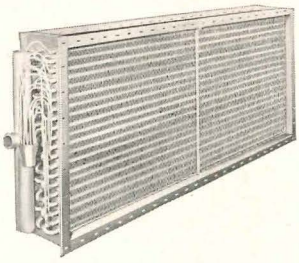


WATER COIL
For Cooling and Heating, 1 to 10 rows deep.



CLEANABLE TUBE WATER COIL
Removable Plug Type, 1 to 10 rows deep.



DIRECT EXPANSION COIL
For Cooling, 1 to 8 rows deep.

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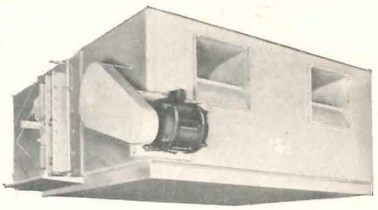
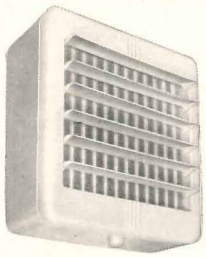


(SUSPENDED MODEL)
AIR CONDITIONER
Type "A" Central Station Air Conditioners for large industrial and commercial applications.

UNIT HEATERS



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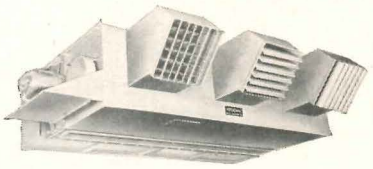
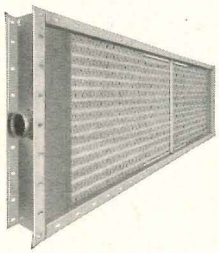
Nominal Capacities from 25,400 to 500,000 Btu's.



(SUSPENDED MODEL)
BLOWER TYPE UNIT HEATER
Nominal Capacities from 20,600 to 1,600,000 Btu's.

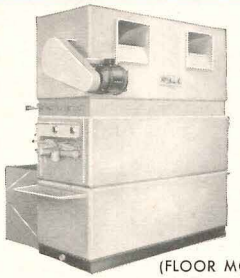
SPECIFY McQuay

TO INSURE CUSTOMER SATISFACTION



"BLAST" HEATING STEAM COIL

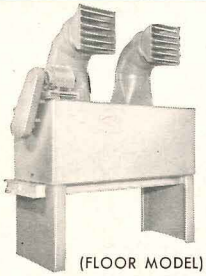
For Heating, 1 or 2 rows deep, using low or high pressure steam.



(FLOOR MODEL)

AIR CONDITIONER

Type "A" Central Station Air Conditioners for large industrial and commercial applications.



(FLOOR MODEL)

BLOWER TYPE UNIT HEATER

Nominal Capacities from 20,600 to 1,600,000 Btu's.

Proved and Preferred!

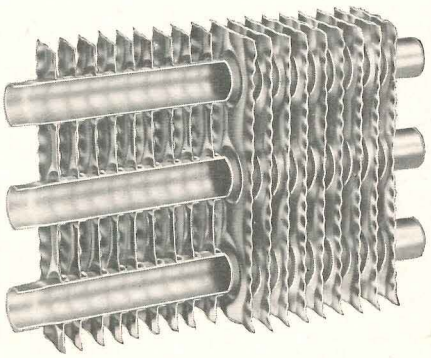
You, and your customers too, are money ahead when you specify McQuay . . . because McQuay products are proved and preferred—for their efficiency, economy of operation, and the way they stand up under long hard use.

Join the growing list of architects, engineers and contractors who depend upon McQuay to satisfy all of their heating and air conditioning requirements. Quality and price comparisons will convince you that it pays to specify from McQuay's complete line—pays in profits from the job and in customer satisfaction.

NEW RIPPLE-FIN COIL CONSTRUCTION

Only McQuay gives you Ripple-Fin surface—the product of years of research aimed at producing the ultimate in heat transfer for any weight of metal. High efficiency is assured by forcing the air to follow an ever-changing direction of flow in passing through the coil. Thus air repeatedly contacts coil surface to give maximum contact time, maximum contact velocity, and a resultant optimum heat transfer.

With this advance in design, McQuay retains the staggered tube and the McQuay rippled edge features so well known in the industry, and which contribute greatly to higher heat transfer, construction ruggedness, and eye appeal.

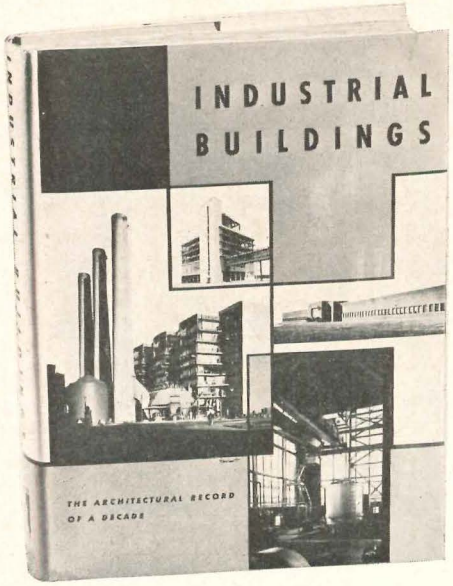


McQuay INC.

HEATING
AIR CONDITIONING
REFRIGERATION

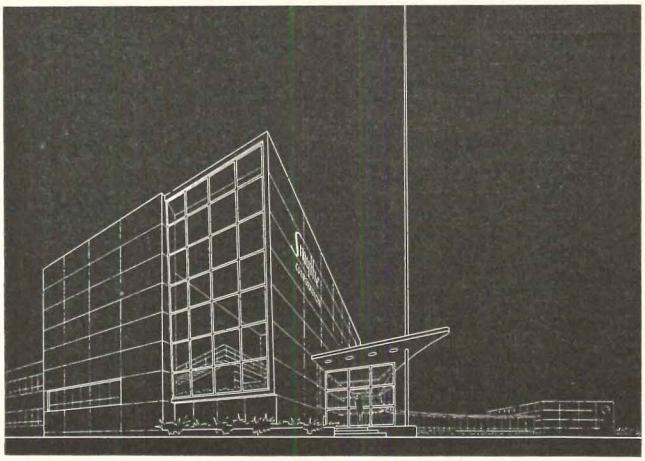
1605 BROADWAY STREET, N. E. • MINNEAPOLIS 13, MINNESOTA

REQUIRED READING



Above: Book jacket designed by Frances Torbert

Below: "a 1945 project for an industrial office building, by Albert Kahn Associated, Architects and Engineers. In place of rigid symmetry behind monumental entrance piers there is fluidity, off-center massing, grace"



INDUSTRIAL BUILDINGS

Industrial Buildings. The Architectural Record of a Decade. Compiled by Kenneth Reid, A.I.A. F. W. Dodge Corporation (119 West 40th St., New York, N. Y.), 1952. 8¾ by 11½ in. 546 pp., illus. $9.00.

REVIEWED BY JOSEPH DOUGLAS WEISS

This volume should be a welcome addition to the reference library of every architect. In it are such fine examples of contemporary architecture as Raymond McGrath's Chemical Factory, the Johnson and Johnson group of factories, the Van Nelle Plant in Rotterdam, and the by now historic Turbine Factory which was designed by Peter Behrens in 1909.

It is a thorough and informative book for those who seek more detailed data on the subject of industrial construction. It includes production flow diagrams, the plans resulting from and based on these studies, the description of the architect's job, and covers in detail many aspects of construction. A number of large projects for mass production plants, as well as small projects, are well described and illustrated. Other subjects covered are such things as standardized buildings for low-cost plants, the functional use of colors, standards of lighting, ventilating and heating, and many pages of Time-Saver Standards, all co-related to the subject. Special problems are discussed in a competent way by such eminent practitioners as members of the Albert Kahn organization and others.

It is in a way ironic that the portions of the book that deal with World War II construction contain such timely information as wartime substitute solutions to shortages of copper and other metals, as well as protection against external explosions. With our industrial potential being built up again to take care of defense needs, this material is indispensable to architects who are interested in this field, or who are about to enter it.

The reviewer has seen most of the contents of this book in ARCHITECTURAL RECORD, but it was rewarding to see the articles again, so ably organized by Kenneth Reid. Nothing but thumbing through the book can give an idea of the variety of subjects covered in this field, where more progress has been made both esthetically and technically than probably in any other field of architecture.

DESIGN THEORY

An Approach to Design. By Norman T. Newton. Addison-Wesley Press, Inc. (Cambridge 42, Mass.), 1951. 6 by 9 in., 144 pp. + xi.

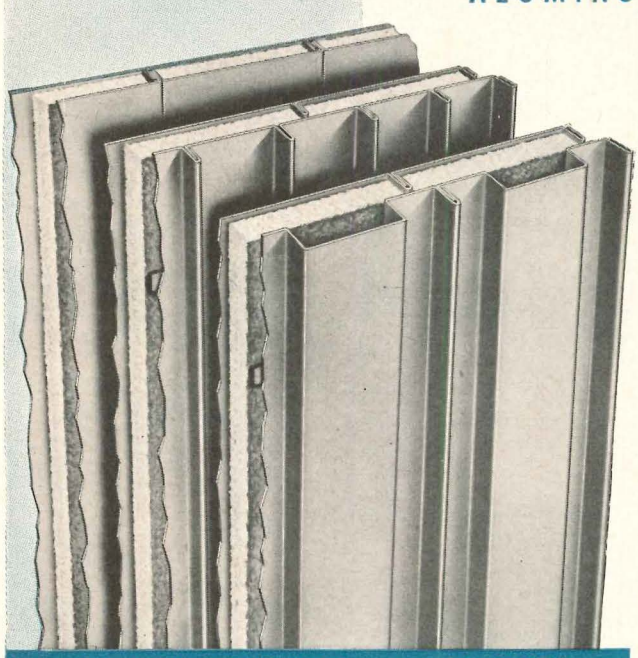
In 1946 a program of unified First Year work was established for students of the three professional schools of the Harvard Graduate School of Design. This book has grown out of a series of talks and discussions designed at that time to encourage the individual student to develop an attitude toward the "unified field of design" that would serve as a "broad and soundly flexible basis" for his creative work.

(Reviews continued on page 48)

INSULATED METAL WALLS

for INDUSTRIAL and COMMERCIAL BUILDINGS

ALUMINUM, STAINLESS or GALVANIZED STEEL



FLUSH, RIBBED, or FLUTED

Over-all "U" Factor of Various Types is Equivalent to or Better than Conventional 16" Masonry Wall

The trend in modern building is to this permanent, economical, quickly erected wall construction. In the past ten years Mahon Insulated Metal Walls have been employed in the construction of every conceivable type of building up to and including great power houses and complete industrial plants like the one illustrated below, in which 127,600 sq. ft. of exterior wall surface and all coping, flashing, etc., are aluminum. Mahon Insulated Metal Walls are available in two "Field Constructed" types, and in two types of "Prefabricated Panels", flush, ribbed, or fluted exterior. Walls of the "Field Constructed" type may be erected up to fifty feet in height without horizontal joints—a feature of Mahon walls which is particularly desirable in power house construction where high expanses of unbroken wall surface are often unavoidable. Mahon Prefabricated Insulated Metal Wall Panels, ready for rapid erection in the field, can be furnished in any length up to thirty feet. All Mahon wall plates and panels are one foot wide. These Mahon Insulated Metal Walls, together with a Mahon Steel Deck Roof, provide the ultimate in economy, permanence, and fire-safety in modern construction. See Sweet's Files for complete information including Specifications, or write for Catalog No. B-52-B.

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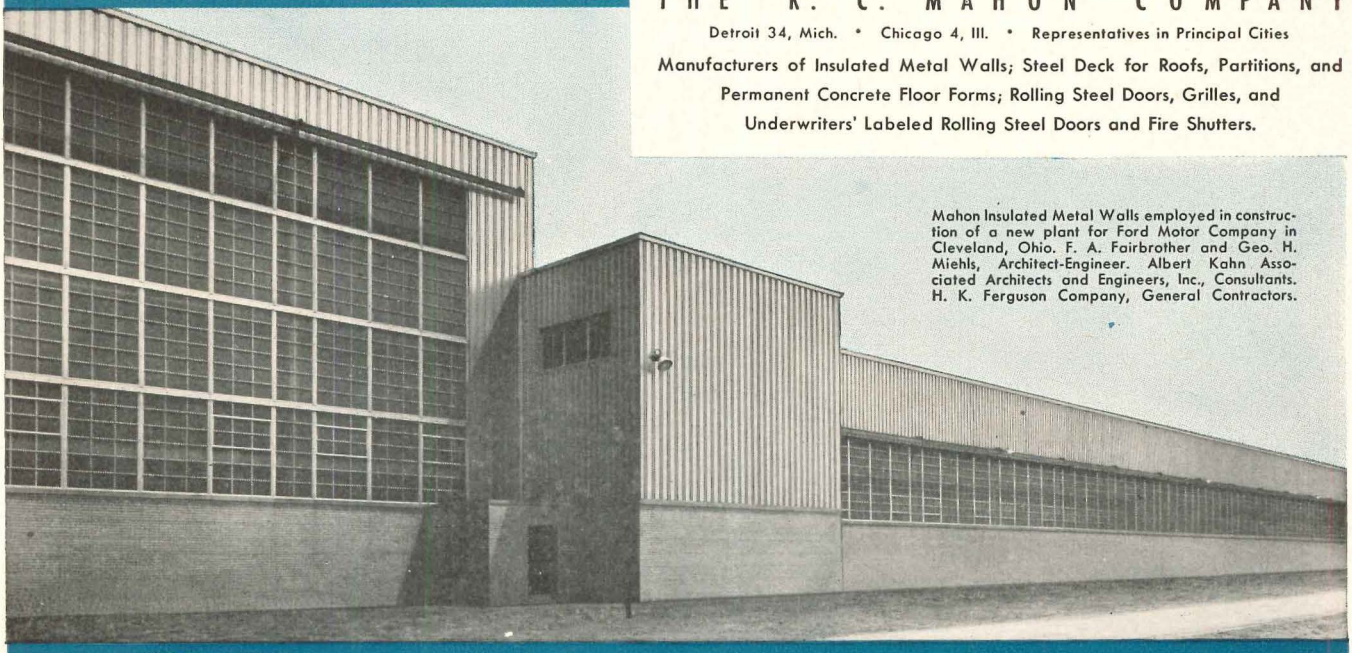
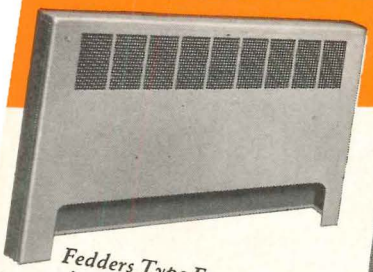
Manufacturers of Insulated Metal Walls; Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms; Rolling Steel Doors, Grilles, and Underwriters' Labeled Rolling Steel Doors and Fire Shutters.



Mahon Insulated Metal Walls employed in construction of a new plant for Ford Motor Company in Cleveland, Ohio. F. A. Fairbrother and Geo. H. Miehls, Architect-Engineer. Albert Kahn Associated Architects and Engineers, Inc., Consultants. H. K. Ferguson Company, General Contractors.

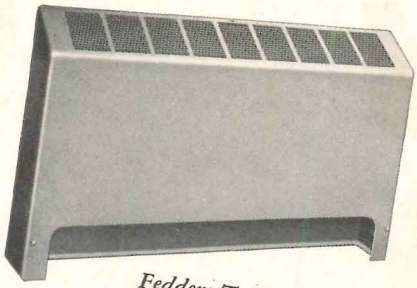
MAHON

fedders OFFERS AMERICA'S

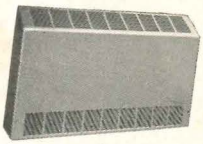


Fedders Type F made in stock sizes for free standing and semi-recessed installations. Also Type FO.

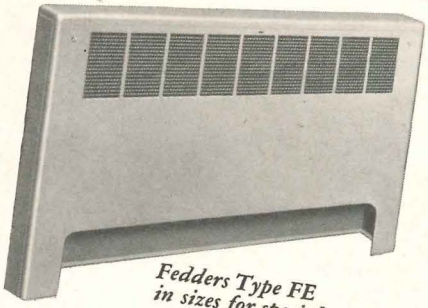
Fedders Type FB with base grille.



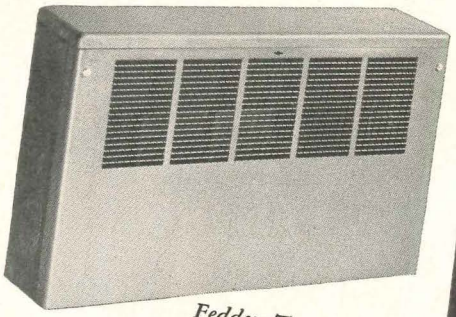
Fedders Type SF free standing with sloping top.



Fedders Type SFB free standing with sloping top and base grille.

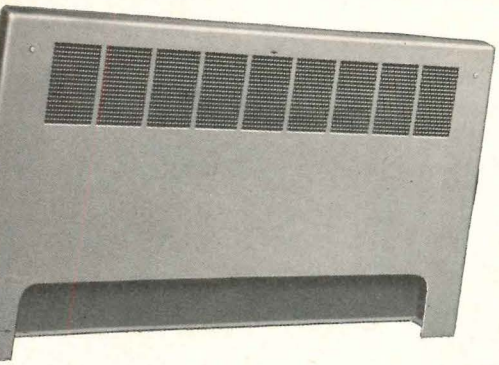


Fedders Type FE in sizes for special applications.



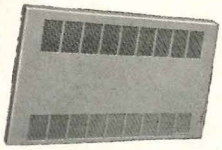
Fedders Type W wall hung with flat top.

Fedders Type S wall hung with sloping top.

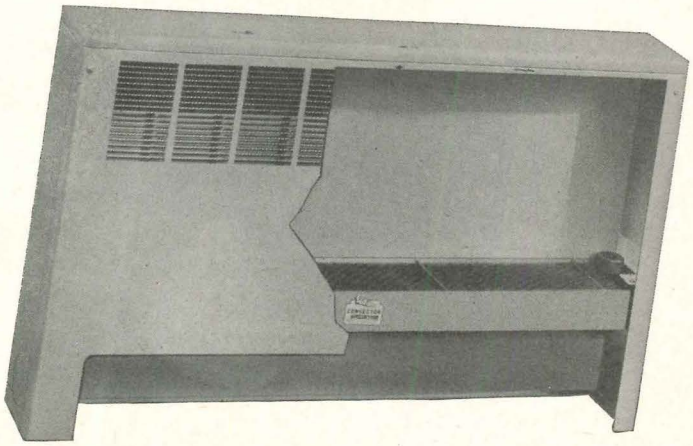


dders Type R i-recessed with rlap front.

Cutaway view showing location of Fedders finned heating element in Convector cabinet. Note convenient arrangement for piping connections. Edges of cabinet are rounded for handsome styling.

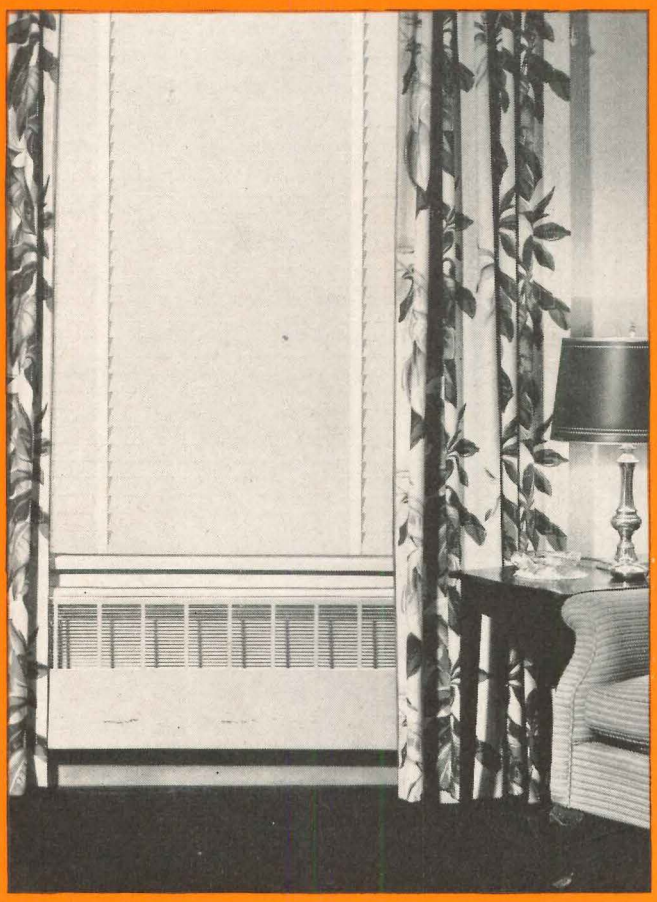


Fedders Type RB semi-recessed with overlap front and base grille.



QUALITY LINE OF

CONVECTOR-RADIATORS



Photograph shows attractive space-saving design of Fedders Type F Convector-Radiator installed in modern living room.

* FEDDERS Convector-Radiators offer architects, interior decorators, contractors and home owners a wide range of sizes and types to fit new and remodeling requirements.

Standard Type F free standing and semi-recessed models fit the majority of needs. Also, for one-pipe steam installations, Fedders now offers the new Type FO convector. In addition, other models give the profession and the industry wide latitude for special applications.

Flat, sloping top, wall hung and free standing models are available with and without base grilles to conform to any decorative treatment.

Fedders heating elements are also available for use with individually designed, concealed systems. Heating elements provide quick response to manual and thermostatic control.

Write for data sheets or consult yellow section of phone book for your local Fedders representative.

fedders

A GREAT NAME IN COMFORT

FEDDERS-QUIGAN CORPORATION, 57 TONAWANDA STREET, BUFFALO 7, N. Y.

REQUIRED READING

(*Reviews continued from page 44*)

Concerned primarily with an approach to design, the book considers design — which involves "questions of structure, of order, and relation" — as a highly personal affair. Just as that which the designer builds must be structurally sound, so must the "thoughts, feelings, actions and reactions" with which the design was created, be sound. So also, the designer must be well-balanced, with a sympathetic understanding of people and a comprehension of the "major problems of human living."

Throughout the book, the author stresses the need for the individual to view the whole field of design as one of relations — a "continuing totality." Important though "space and the surface of the earth" are as basic working materials of design, the most important is people. Basically then, design has to do with the adjustment of relationship between humans and their environments, and the designer thus shares in the common goal — the quest for "optimum relations between people and their environments."

TODAY'S HEATING METHODS AND EQUIPMENT

Heating Design and Practice. By Robert Henderson Emerick. McGraw Hill Book Company, Inc. (330 W. 42nd St., New York 18, N. Y.), 1951. 6 by 9 in., 453 pp., illus. $8.00.

Heavy emphasis is placed in this book on how various types of heating, from one-pipe steam systems to radiant panels, work in actual practice. The purpose of the book is to provide a rounded knowledge of both design and practice. The author outlines the basic theories of heating design and evaluates the different types of steam, hot water and warm air systems in the light of his personal experience and case histories. A detailed theoretical treatment is beyond the scope of the book, but it is sufficient for the reader to fully understand the operation of any system included. Up-to-date pictures show new types of heating equipment on the market which are also described in the text.

Another feature is the collation of information on such allied subjects as fuel handling, design of fireplaces and incinerators, and specifications and analysis of bids.

(*Reviews continued on page 380*)

2800-square-foot PLEXIGLAS luminous ceiling in Rohm & Haas Company Engineering Building, Bristol, Pa. Corrugated white translucent PLEXIGLAS is mounted wall-to-wall below continuous runs of fluorescent lamps. Upper window glazing is corrugated gray PLEXIGLAS, for prevention of sky glare.

ENVIRONMENTAL LIGHTING . . . With a PLEXIGLAS Luminous Ceiling

For *environmental* room lighting, the whole field of view must be in brightness balance . . . as in this drafting room with its PLEXIGLAS luminous ceiling.

The surface brightnesses of the ceiling, the walls, and the window areas of this room are less than three times as bright as the paper on the drawing boards. Note how these surfaces produce a field of uniform brightness in which there are no eye-fatiguing light-to-dark contrasts.

An average illumination of 118 footcandles is provided through the PLEXIGLAS diffusing panels, without objectionable direct glare from the large-area ceiling surface.

PLEXIGLAS acrylic plastic offers other advantages as a diffusing medium. Because it is rigid, light in weight, and strong, PLEXIGLAS can be handled easily and safely during installation, cleaning, and relamping operations. And because it is highly resistant to breakage and discoloration, it gives long, low-maintenance service.

If *you* have a lighting problem, investigate *environmental* lighting with a PLEXIGLAS luminous ceiling. We'll be glad to send you full technical details about the installation shown above. Write for them.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

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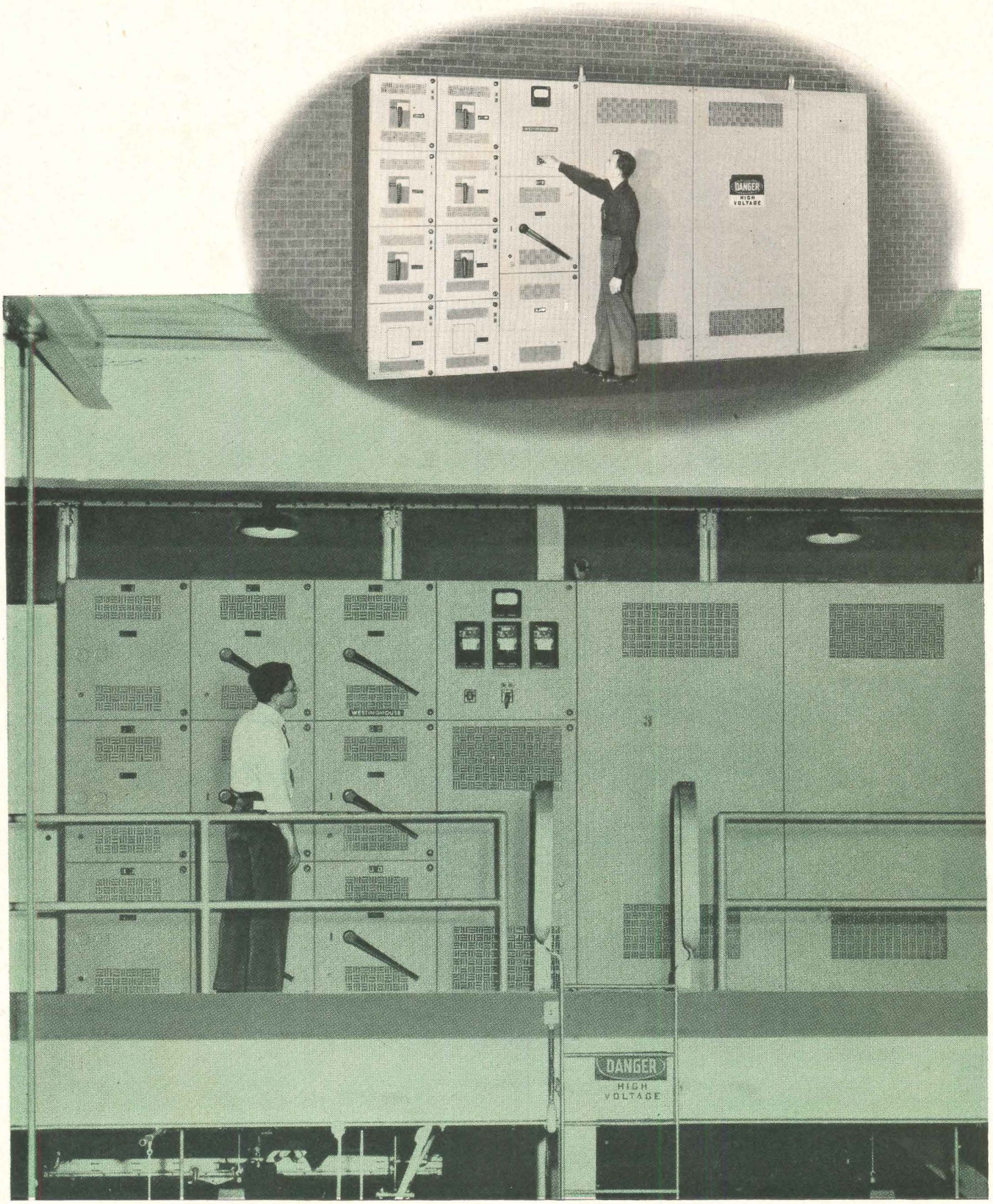
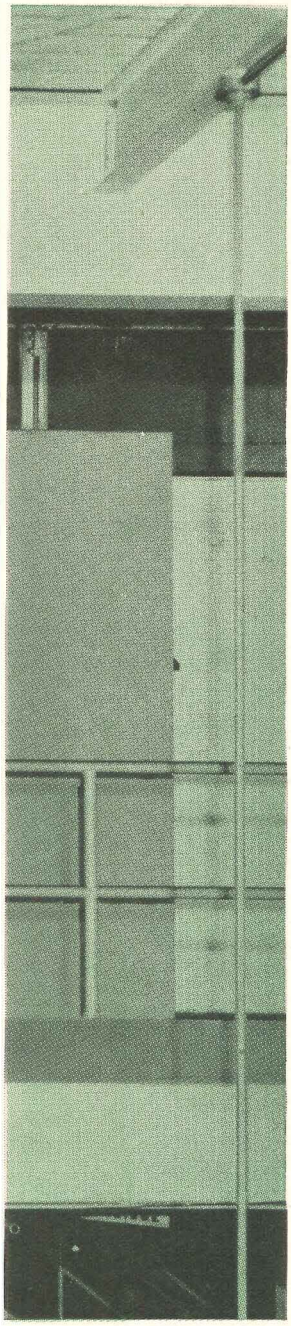

DANGER
HIGH
VOLTAGE
DANGER
HIGH
VOLTAGE

Westinghouse Power Centers

Trim Power Control Costs

for Chicago Pneumatic Tool Company



Six Westinghouse Power Centers, consisting of dry-type transformers and switchgear, are serving operations in Chicago Pneumatic Tool Company's new plant at Utica, N. Y. And their favorable effect on power control costs—summed up in the following statement—suggests a savings opportunity for you.

"By bringing high voltage to the power centers, heavy copper from the main substation was avoided . . . voltage regulation and voltage drops were well within acceptable limits. Compact design enabled us to place some of the units on a small mezzanine to provide more space for production on the main floor.

"Since all units are duplicates, we enjoy maximum interchangeability and a resultant savings in spare parts. For future convenience and economy, spare feeder compartments are equipped to take additional breakers as the load increases."

Dry-type power centers will enable this user to realize even further savings. The elimination of vaults, oil conditioning and testing, promises a saving in routine maintenance. Freedom from fire hazard warrants lower insurance rates. Maintenance of a good voltage condition assures more efficient performance of manufacturing equipment.

GET THE COMPLETE STORY

Westinghouse Power Centers are the key to efficient power distribution. They offer better service continuity, greater flexibility, better regulation . . . all the things that contribute to power control economy. Most important, they provide the simplest, lowest-cost means of attaining the power system that best meets your operating requirements.

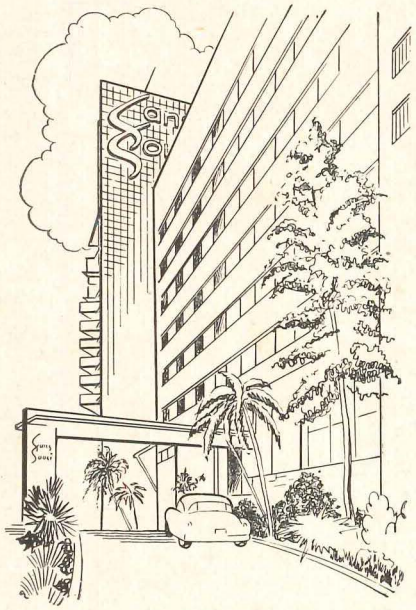
Booklet B-4162 covers Westinghouse Power Centers in detail. Booklet B-4045 discusses various types of plant distribution systems wherein power centers offer maximum advantage. For your copies, contact your Westinghouse representative or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-60763

YOU CAN BE SURE... IF IT'S

Westinghouse

POWER CENTERS

SELECTING ACOUSTICAL MATERIALS



Card room: Cushiontone White factory-finish

Lobby, looking west: Cushiontone, painted Coral

SANS SOUCI HOTEL, Miami Beach, Florida

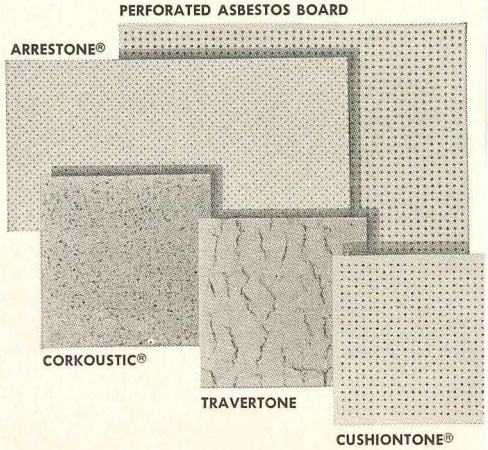
Roy F. France & Sons, Architect for the Structure
Morris Lapidus, Associate Architect and Interior Designer
Acoustical Contractor, Lotspiech Flooring Company

Lobby terrace: Cushiontone, painted Coral

The exciting use of color in the beautiful Sans Souci Hotel demanded acoustical ceilings that could be repainted. Acoustical efficiency and architectural beauty were also important factors in the choice of an acoustical material.

Architect Morris Lapidus selected Armstrong's Cushiontone because it can be repainted without losing efficiency. This popular wood fiber material is high in sound absorption, and its attractive surface is cleanly perforated.

Armstrong's complete line of acoustical materials offers you a wide range of special features. Your Armstrong Contractor will give you expert advice without obligation. Write for free booklet, "How to Select an Acoustical Material." Armstrong Cork Company, 5402 Stevens St., Lancaster, Pennsylvania.



ARMSTRONG'S ACOUSTICAL MATERIALS

HOW BALLASTS CONTRIBUTE TO BETTER FLUORESCENT LIGHTING

FREE! New G-E Book Tells "Flora's" Story

Meet a young lady you should get to know—Fluorescent Ballast ("Flora" for short). Says Flora:

"If you haven't met me before, that's because they keep me backstage out of sight and let the lamps take all the bows. I don't mind because, as you'll soon see, the lamps couldn't perform at all without my help.

"My name comes from what I do. My main job is to keep fluorescent light steady . . . on an even keel . . . something like the 'ballast' in a ship. I stabilize the flow of electricity through the lamp . . ."

And so Flora tells her story in simple, easy-to-understand language. In addition to explanations of fluorescent lighting itself, the booklet contains simple explanations of various ballast circuits and the advantages and disadvantages of each. From the simplest resistance ballasting to automatic starters, up through two-lamp ballasts, instant-starting lamps, series operation with sequence starting and, finally, trigger-start ballasts—all are carefully described.

To find out how good ballasts save you money, and why they are vital to fluorescent lighting, fill out the coupon and send it in. You'll receive your copy of "Fluorescent Ballast Tells Her Story" immediately.

General Electric Co., Sect. F 412–95,
Schenectady 5, New York

Gentlemen: Please send me FREE copy of your booklet, GEA-5731, "Fluorescent Ballast Tells Her Story."

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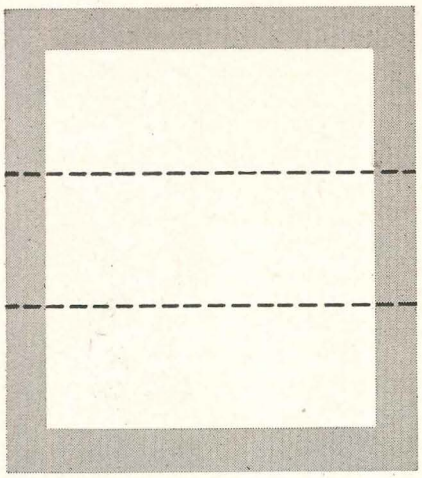
City.....State.....

GENERAL ELECTRIC



as fundamental as shelf space

A good plan is always better when it includes symbols for telephone outlets

Appearance counts, as well as convenience, in planning locations for open shelves. It's the same with telephone outlets. By including outlet locations in your mechanical plans, you can be sure your client will enjoy conveniently placed telephones. And by specifying built-in telephone raceways, you guarantee that telephone wires will be concealed.

Your Bell Telephone Company will be glad to help you plan economical raceway installations. Just call your nearest Business Office.

BELL TELEPHONE SYSTEM

NOW in production!

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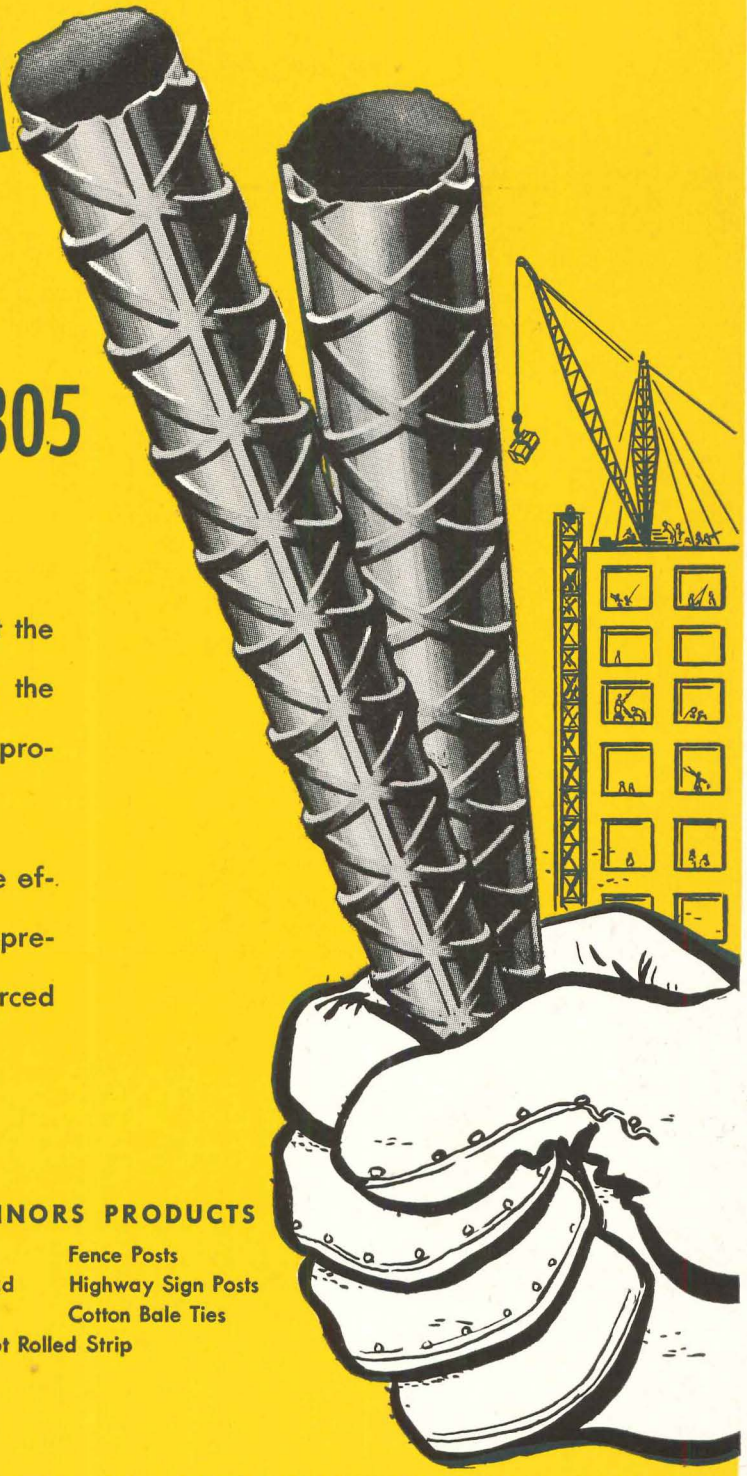

- We are pleased to announce that the new improved reinforcing bar meeting the ASTM A305 specification is now being produced at CONNORS.

- This new bar is an improved, more efficient, concrete reinforcement, which represents an advancement in the field of reinforced concrete construction.

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TABLE OF ASTM A-305 SPECIFICATIONS

BAR NUMBER	WEIGHT	DIAMETER	AREA	PERIMETER
②	.167	.250	.05	.785
③	.376	.375	.11	1.178
④	.668	.500	.20	1.571
⑤	1.043	.625	.31	1.963
⑥	1.502	.750	.44	2.356
⑦	2.044	.875	.60	2.749
⑧	2.670	1.000	.79	3.142
⑨	3.400	1.128	1.00	3.544
⑩	4.303	1.270	1.27	3.990
⑪	5.313	1.410	1.56	4.430

OTHER CONNORS PRODUCTS

Merchant Bars
Tobacco Hogshead Hoop
Fence Posts
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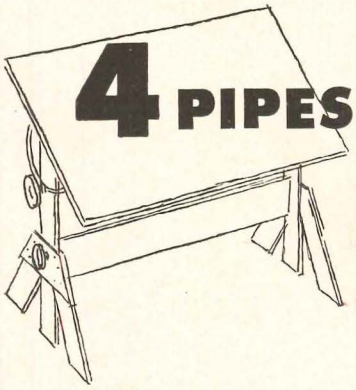
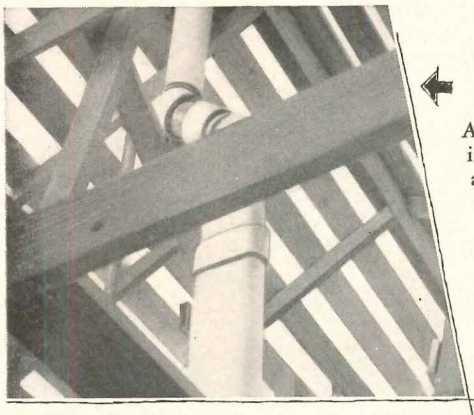
DIVISION OF H. K. PORTER COMPANY, INC.
BIRMINGHAM, ALABAMA



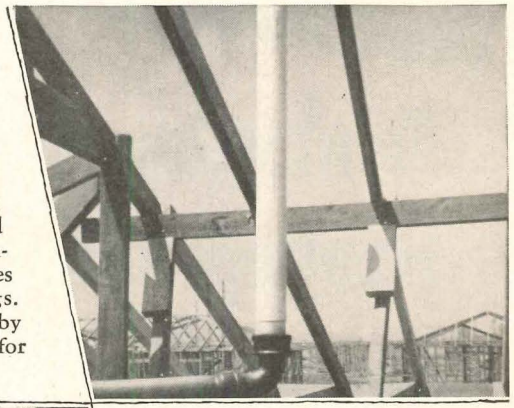
4 PIPES *Designed* TO DO 4 JOBS BETTER

. . . each one a Johns-Manville quality asbestos-cement product



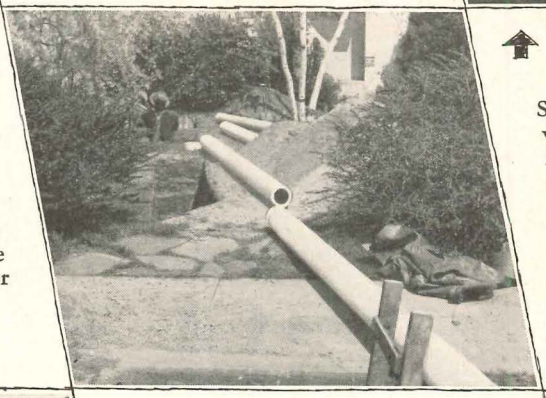
TRANSITE FLUE PIPE

A favorite with both architects and installers for venting gas-burning appliances, more than 65 million feet of this popular pipe are now in service. It cannot rust, is tough and strong, easy and economical to install. Made in round and oval shapes with a complete line of fittings. Transite Flue Pipe has been listed by UL continuously since 1932. Ask for Brochure TR-13A.



TRANSITE HOUSE CONNECTION SEWER PIPE

Specify this pipe for the most economical performance in house sewer line service. Its Ring-Tite Couplings are specially designed to safeguard against root-clogging; its long 10-foot lengths and wide choice of fittings simplify installation. Tough, strong, corrosion-resistant, it provides a lasting, dependable connection between house and street sewer or septic tank. Ask for Brochure TR-82A.



TRANSITE PLUMBING VENT PIPE

Specifically designed for the dry vent portions of building plumbing systems. Its strength, durability and inherent corrosion-resistance assure lasting serviceability. Ten-foot lengths reduce number of joints, facilitate installation. On many jobs, a single length is all that's required. Installed in accordance with standard plumbing practices. Ask for Folder TR-107A.

TRANSITE WARM AIR DUCTS

The modern duct for perimeter and radial heating systems. Made of time-tested Transite for strength and corrosion-resistance — can't rust or scale. Their long lengths, light weight and easily assembled joints simplify handling, cut installation time to a minimum. Ask for Folder TR-111A.

Each of these is a Transite* product made of the Johns-Manville asbestos-cement material widely known for its durability and resistance to corrosion. Each provides dependable, economical service on the job for which it was designed. For further information, write for literature mentioned above. Address Johns-Manville, Box 290, New York 16, N. Y.

*Reg. U.S. Pat. Off.

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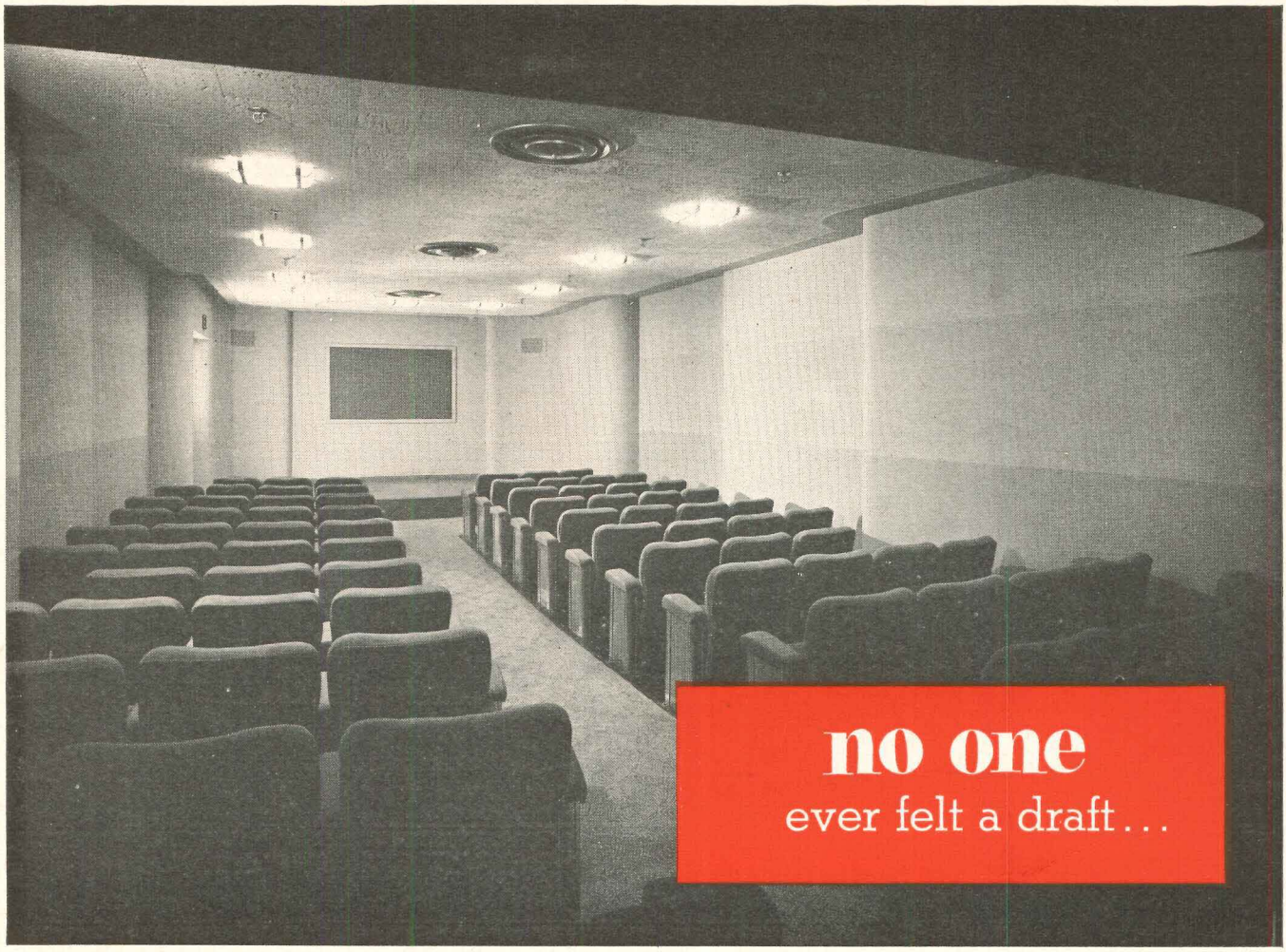
Johns-Manville TRANSITE PIPE

Designed for Better Home Construction

THE UPJOHN COMPANY's new manufacturing building in Kalamazoo, Michigan. Auditorium, cafeteria, employee lounge and offices are air conditioned and use Kno-Draft *Adjustable* Air Diffusers throughout. *The Austin Company, Engineers and Builders.*



from a kno·draft adjustable air diffuser

No. 1 reason why so many Kno-Draft *Adjustable* Air Diffusers are being specified and installed these days is because they do their job right. Soundly engineered and uncomplicated in operation, they distribute air evenly and *without drafts.*

No. 2 reason is beauty. Dynamically simple in design, Kno-Draft *Adjustable* Air Diffusers are "at home" in any surroundings—whether left in their natural spun aluminum finish or painted to match the ceiling.

No. 3 reason is adjustability *after* installation. This saves an enormous amount of slide rule figuring. A simple screw-driver adjustment balances temperature and air distribution throughout the conditioned area.

No. 4 reason is customer satisfaction. Users *like* the results they get with Kno-Draft *Adjustable* Air Diffusers. There are types and sizes to meet every need.

NEW EDITION! KNO-DRAFT DATA BOOK now in new 32-page format. Complete up-to-the-minute specifications, engineering and installation data on Kno-Draft *Adjustable* Air Diffusers. Bring your files up to date. Mail coupon today.

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CHECK WHAT'S READY-MADE

IN ALUMINUM!

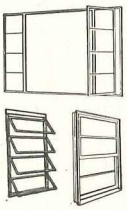
The best promoters of aluminum's versatility as a building material are the designers and builders themselves. Each great step forward in architecture has been brought about by a new freedom from the shackles of *weight* ...and the lightness and strength of aluminum have introduced a new era in building.

To these structural advantages, aluminum adds inherent beauty... forever free from rust...needing no protective painting. And its radiant heat reflectivity is an important bonus in roofing and siding...a means of combining, in insulation, high thermal efficiency with positive vapor barrier.

For these advantages, aluminum is specified in many forms. But the most economical forms, where they fit your purpose, are the building products *mass-produced* by Reynolds, the leaders in the field. Their applications are more versatile than may at first appear! Write for literature.

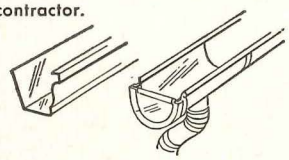
Reynolds Metals Company,
Building Products Division,
2015 South Ninth St.,
Louisville 1, Kentucky.

Reynolds Aluminum Residential Casement Windows in the Armour Towers Apartments, Kansas City, Mo.—Luther Willis, architect; Colliers Const. Co., contractor. These corner-welded casements are adaptable to many architectural functions. Reynolds Awning Windows are also ideal for institutional and commercial use. These and Reynolds Double-Hung Windows are all made of Reynolds own extruded shapes, superbly finished.



Five miles of Reynolds *Lifetime* Aluminum Gutters in this Overland Park, Kansas, development. H. Duncan & Mulhern, architects; George Miller, contractor.

Six buildings on Long Island roofed with **Reynolds *Lifetime* Aluminum Industrial Corrugated**—.032" thick with corrugations 7/8" deep.



Remember, too, Reynolds *Lifetime* Aluminum Flashing — in convenient rolls or flat sheet.

Reynolds Aluminum Reflective Insulation...embossed foil on both sides (Type B) or one side (Type C) of kraft paper. In rolls of 250 sq. ft., 25", 33" and 36" wide.

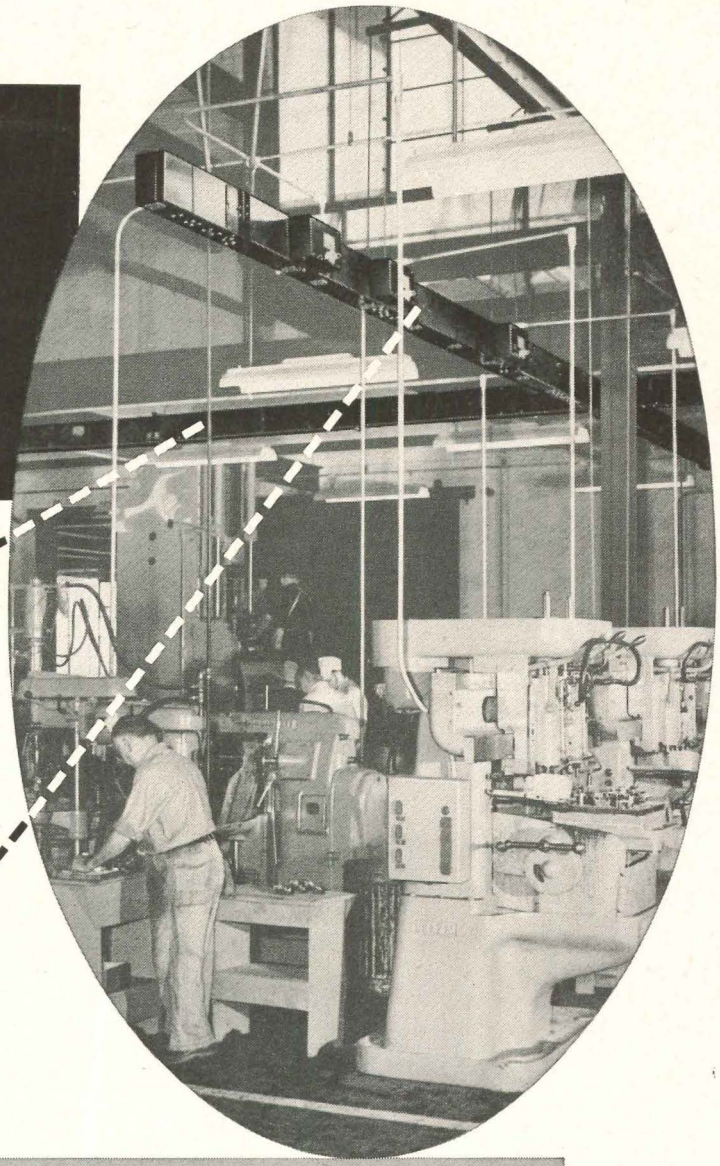
Military demands for aluminum limit supply of these products. Reynolds is rapidly expanding aluminum production. Keep checking your supply source.

REYNOLDS ALUMINUM

"The Kate Smith Evening Hour" on Television, Wednesdays — Tallulah Bankhead in "The Big Show" on Radio, Sundays — NBC NETWORKS

for time-saving, money-saving

POWER DISTRIBUTION



SQUARE D FEED-IN DUCT

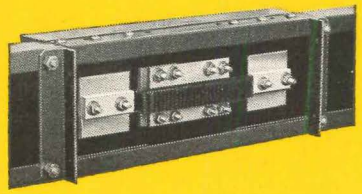
is the most efficient way to transmit large amounts of power. It provides the lowest known voltage drop—only 1.8 volts per 1000 amperes per 100 feet.

Exclusive design requires no ventilation—permits a totally enclosed, compact, dust-excluding enclosure. Rigid construction provides high resistance to heavy electrical stresses.

SQUARE D PLUG-IN DUCT

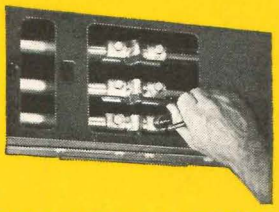
provides flexible power distribution for branch circuits. Machinery can be rearranged quickly at minimum cost. Plug-in units can be attached at frequent intervals along the length of the duct, providing power where it's needed, when it's needed.

BUSWAY FEATURES PROVE DESIGN LEADERSHIP



NEW JOINT DESIGN. Feed-in Duct joint design saves installation time and reduces maintenance cost. Duct ends are identical—unnecessary to select mating ends before positioning or hanging duct sections. Outward-facing, pre-installed bolts permit rapid assembly and easy maintenance.

ROUND BUS BARS for Plug-in Duct provide greater mechanical strength and resistance to short-circuit stresses. Circuit breaker or fusible type plug-in units are easily installed at 2-foot intervals along both sides of the duct. Plug-in stabs grip the round bus bars with exceptionally high pressure.



FLEXIBLE CONNECTORS of laminated copper join bus bars between sections—permit proper alignment, insure tight joints and provide for expansion and contraction at Plug-in duct joints. All bolt heads face outward for greater accessibility.

ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

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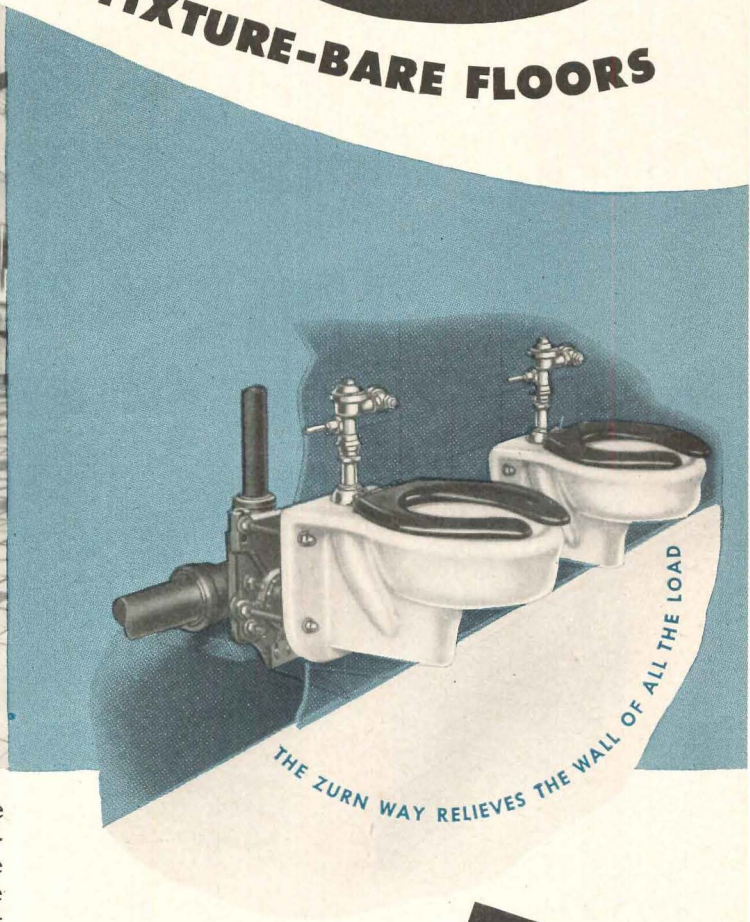
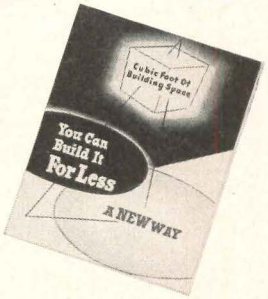
ZURN TYPE REST ROOMS HAVE FIXTURE-BARE FLOORS

A FIXTURE-BARE FLOOR IS, AS IT IS, ALWAYS!



Immaculately clean! Cleanliness is no problem in toilet rooms where plumbing fixtures are off the floor, because there is nothing to interrupt the sweep of the broom and the swish of the mop. Fixture-bare floors reduce the day by day dollar cost of maintenance to an all-time low while lifting sanitation to a new high. A New Way of building utilizes wall type plumbing fixtures throughout, installed the Zurn Way—the simple, fast, safe way of installing wall type closets, lavatories, sinks and other fixtures. This New Way reduces the use of building material; eliminates need of suspended ceiling constructions; requires less space for walls; saves time and labor and protects rest rooms from premature obsolescence. Specify wall type plumbing fixtures installed with Zurn Wall Closet Fittings and Carriers. Write for booklet entitled, "You Can Build It (Cubic Foot of Building Space) For Less The New Way".

Write for this booklet. It tells how "You Can Build It (Cubic Foot of Building Space) For Less A New Way".



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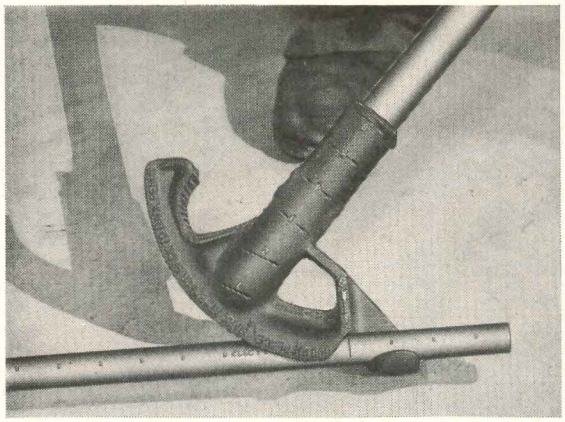

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EASY TO INSTALL

Conductors are fully protected from fire, moisture, and mechanical injury when they're housed in ELECTRUNITE E.M.T. . . . the strong-and-light steel raceway that carries the inspection of Underwriters' Laboratories and meets requirements of The National Electric Code for exposed, concealed, and concrete locations.

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Announcing... THE NEW FABRON COLLECTION— UNSURPASSED IN THE BEAUTY AND RANGE OF ITS COLORS AND PATTERNS

In the new Fabron collection, you'll find colors that sparkle in gay, lively accents . . . colors that parade in deep and luxurious "decorator tones" . . . colors that soothe in delicate pastel tints! You'll find geometrics . . . textures . . . abstracts . . . florals . . . plaids —yes, even "juveniles"! In short, you'll find a collection styled to meet your every decorative need . . . and at a cost within even the average budget.

Best of all, you'll *still* find in FABRON the most *practical* answer to your wall decorating problem. For, only with FABRON, is decoration wedded with long-term durability . . . positive protection against plaster-cracks . . . unlimited washability . . . sunfast colors . . . easy installation . . . and—of vital importance—*fire-protection certified by the Underwriters' Laboratories.*

Whether you're familiar with FABRON or not—whether you've observed first-hand its unmatched service and performance . . . or are just in the "I want to be shown" stage—you'll want to find out more about this new collection. Why not mail the coupon—today!

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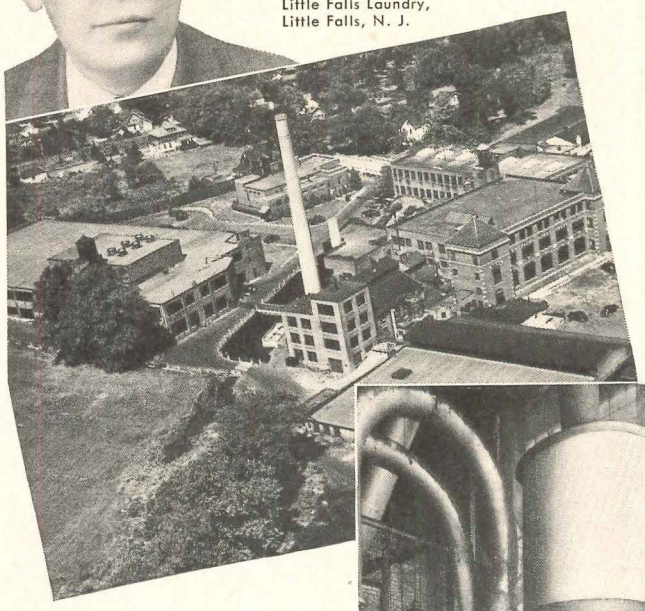
"How we save $20,000 a year—USING COAL INSTEAD OF OIL"

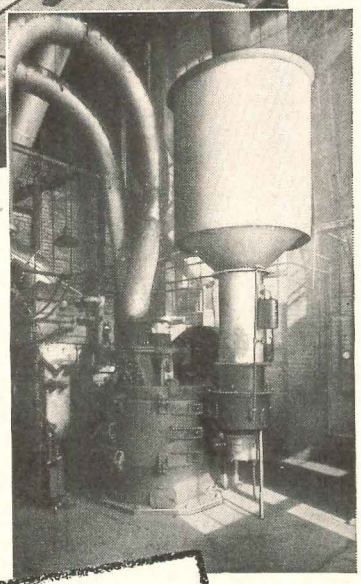
Louis G. Notte,
Chief Power Engineer,
Little Falls Laundry,
Little Falls, N. J.

(ACTUAL CASE HISTORY OF THE LITTLE FALLS LAUNDRY, LITTLE FALLS, N. J.)

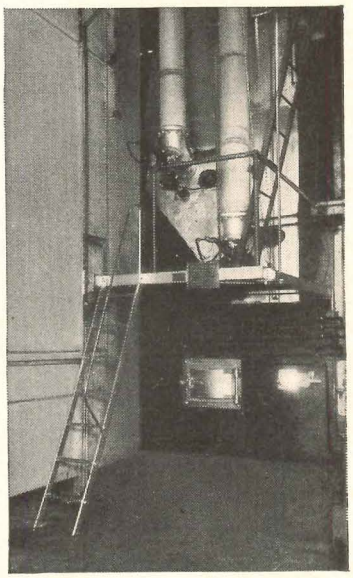
"Our laundry is one of the largest in the country," says Chief Power Plant Engineer Notte, "and, we think, one of the most progressive. Our company insists on superior performance at lowest possible cost all along the line. That's exactly why we depend on coal-fired equipment. From coal we get the daily amount of BTU's we need at a cost of $200—to get the same BTU's from oil would cost $280. We can change to oil on less than a day's notice—but so far we've *never* done it. Coal does a great job—cheaper."



To this plant in Little Falls 500 employees come to take care of the laundry for an estimated 100,000 people. And from this plant 100 trucks travel to customers across a 5,000 square-mile area! The laundry depends on coal to provide all electric power and lights—heat for all buildings—steam for hydraulically-operated machines—steam for pressers and dryers.



The pulverizer from which coal is blown into the boiler. Before this operation, the laundry employs a conveyor belt to feed a precrusher. From there, conveyors carry the coal to the 100-ton hopper which feeds the pulverizer. *Modern coal devices slash labor costs—make coal's basic economy even greater.*



A section of the modern coal-fired boiler. With equipment like this it's possible to add 10% to 40% to the power derived from the same amount of coal in years past—to bring over-all boiler efficiency to 85% or more.

If you're running your own steam plant, here are a few down-to-earth facts you don't want to miss!

COAL in most places, is today's most economical fuel.

COAL resources in America are adequate for all needs—for hundreds of years to come.

COAL production in the U. S. A. is highly mechanized and by far the most efficient in the world.

COAL prices will therefore remain the most stable of all fuels.

COAL is the safest fuel to store and use.

COAL is the fuel that American industry can count on more and more—for with modern combustion-and-handling equipment, the inherent advantages of well-prepared coal net even bigger savings.

● Plants that use coal are in an enviable position—at the present *and* for the future. *For they are more certain than the users of other fuels of a dependable fuel supply—at stable prices.* The reasons are compelling. Of America's total fuel reserves, 92% is coal: Even today, oil is *imported* while this country can and does *export* coal. In addition—this country's mines are the most highly mechanized and efficient in the world.

To get *all* the great economy that coal is capable of delivering—to find out how much more efficient and dependable a job coal and the very latest coal-fired equipment can do—call in a competent consulting engineer. He'll recommend the right equipment for your specific needs. Then you'll see exactly why coal *on a performance basis, on a dollars-and-cents basis . . .* is your best fuel buy, by far!

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25" 32

of Solid Beauty

■ Here's beauty that's not just "skin deep." Bruce Blocks are made of solid hardwood strips, 25/32" thick. Even after many years of hardest wear, this floor can be refinished to look just like new. Its beauty never wears off, its natural colors never fade. And the smart, functional design of a Bruce Block Floor will match even the most modern interior.

Bruce Blocks are ideal for all types of construction . . . can be laid in mastic over concrete slab or blind-nailed over wood subfloor. They are available unfinished or finished at the factory. To save time and money and to give owners a superior finish, specify *Prefinished* Bruce Blocks . . . ready to use as soon as laid. See our catalog in Sweet's File. Write us for booklet with room photos in color.

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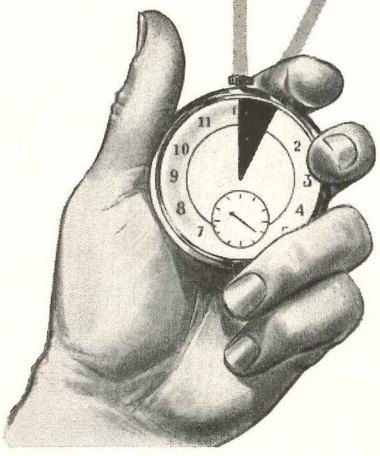
Time-Proven Choice

for schools . . . for hospitals!

five minutes to install

. . . Years of trouble-free service



It has been proven in time tests and confirmed through the years, that it takes an average workman only five minutes to install a factory-assembled Corbin Unit Lock. That's faster than any other type of lock! The economy of this labor saving, coupled with their handsome appearance, quiet operation and rugged security, make Corbin "900" ideal for installation in hospitals and schools.

Corbin Unit Locks can be master-keyed with other Corbin cylinder locks. They are made in functions and finishes to meet every normal hospital or school need.

Specify Corbin "900" Unit Locks. For long service, for fast application . . . it's the time-tested choice.

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GOOD BUILDINGS DESERVE GOOD HARDWARE

CORBIN

NOT YET PAINTED

but . . . SAFE!

NEW Crawford Magi-Cote PROCESS

seals all surfaces (*including those not usually painted*) against moisture, fungus, molds, dry-rot, insects, etc.

EACH section of each Crawford-built door (east of the Rockies) now undergoes a 3-minute Magi-Cote Process immersion in colorless liquid chemical seal which closes wood pores to all destructive elements.

Magi-Cote penetration is such that a 10′ x 10′ door drinks up five quarts of liquid. Sections are then air dried. Magi-Cote effectively seals all surfaces (including those usually left unpainted) against moisture, fungus, molds, dry-rot, insects, etc. It protects the door against soiling during erection and against moisture while it is waiting for whatever finish is to be applied. Because it controls the porosity of the wood, it is an excellent base for varnish or paint, and gives these finishes superior stand-out and durability because their binders are not absorbed but stay where they belong, in the material, on the surface.

When you specify Crawford-built doors (Marvel-Lift, Fleetwood, Stylist or Doormaster, all sizes, all models, east of the Rockies) your client gets Magi-Cote Process protection as standard.

A sample of Magi-Cote treated wood is yours for the asking.

"Standard of the Industry"

CRAWFORD DOOR COMPANY

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FABRICATING PLANTS in Portland • Tacoma • Los Angeles San Francisco • Dallas • Kansas City • Chattanooga • Milwaukee Hudson • Cadillac • Williamsport • Ottawa, Canada.

DISTRIBUTING WAREHOUSES in 79 major cities.

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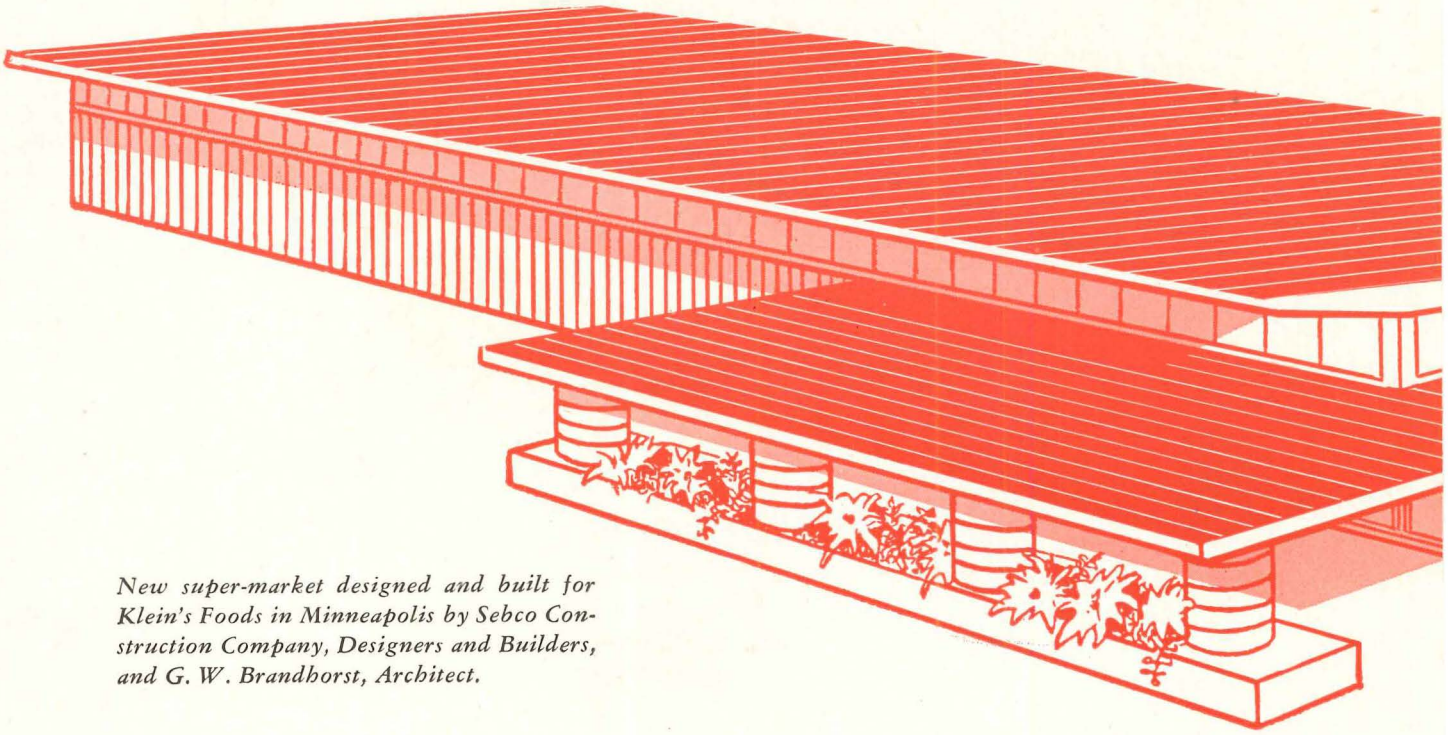
A ROOF THAT'S A CEILING



New super-market designed and built for Klein's Foods in Minneapolis by Sebco Construction Company, Designers and Builders, and G. W. Brandhorst, Architect.

Here a Wheeling representative takes a close-up look at fixtures, fastened directly to roof structure.

Sense of perspective and depth is enhanced by parallel lines of roof deck, serving both as roof and ceiling.

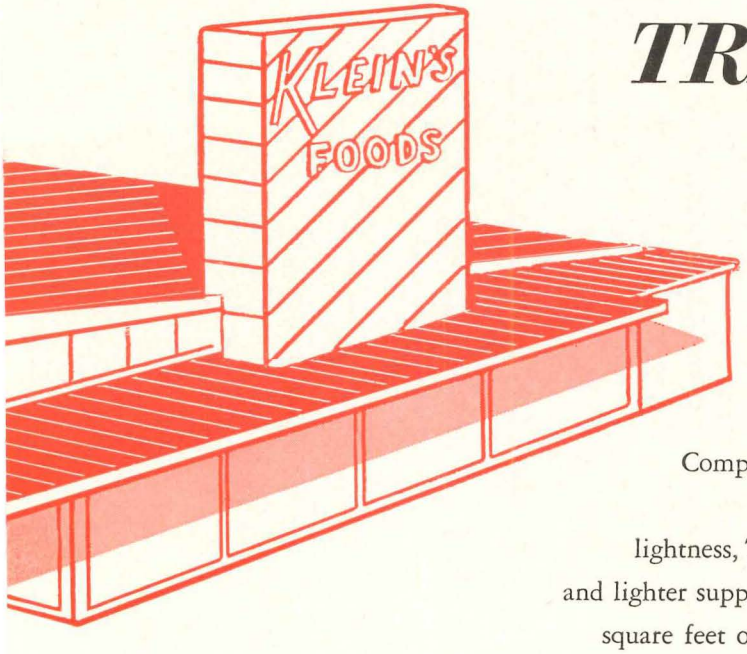
Tri-Rib Roof Deck is but one of many Building Materials for which Architects and Builders turn to Wheeling. The Wheeling line of building materials includes:

Steelcrete Reinforcing Mesh • Expanded Metal • Metal Lath and Metal Lath Accessories • Tri-Rib Steel Roof Deck • ExM Angle Frame Partitions • ExM Vault Reinforcing to meet #10 Insurance Classification

WHEELING CORRUGATING COMPANY • BUILDING MATERIAL DIVISION

ATLANTA BOSTON BUFFALO CHICAGO COLUMBUS DETROIT KANSAS CITY LOUISVILLE MINNEAPOLIS NEW ORLEANS

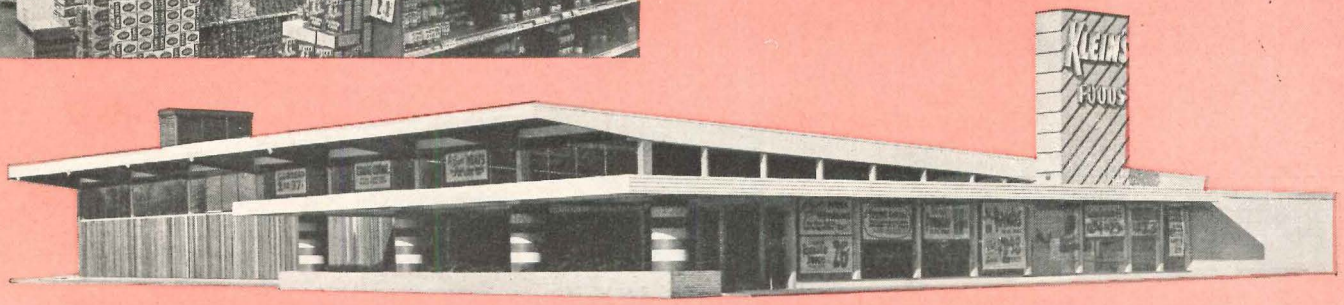
TOO... IT'S WHEELING TRI-RIB STEEL ROOF DECK!



In this Minneapolis super-market, Sebco Construction Company achieves an unusually "wide-open" interior, made possible through use of Wheeling Tri-Rib Roof Deck. Because of its lightness, Tri-Rib allowed use of longer span joists, lighter roof structure and lighter supporting members—a saving of 25 lbs. of supports for each 100 square feet of deck! Taking advantage of Tri-Rib's pleasing appearance, the designers omitted underfinish, permitting the deck sheets themselves to form the "ceiling." The long parallel lines of the ribs thus add to the perspective and sense of space.

Spaciousness of interior is clearly seen here, with minimum of columns—even those of lightest weight.

Wheeling
CORRUGATING COMPANY
®

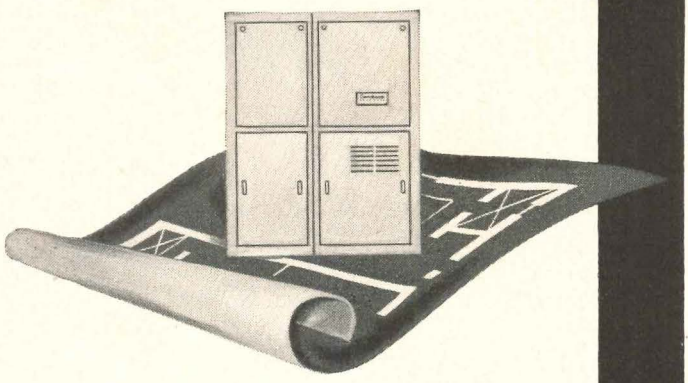


WHEELING, WEST VIRGINIA

NEW YORK PHILADELPHIA RICHMOND ST. LOUIS

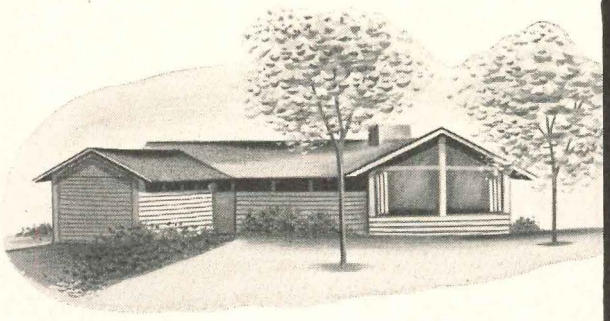
How would you do it?

If you were commissioned to design a house around air conditioning, would the air conditioning affect your design?



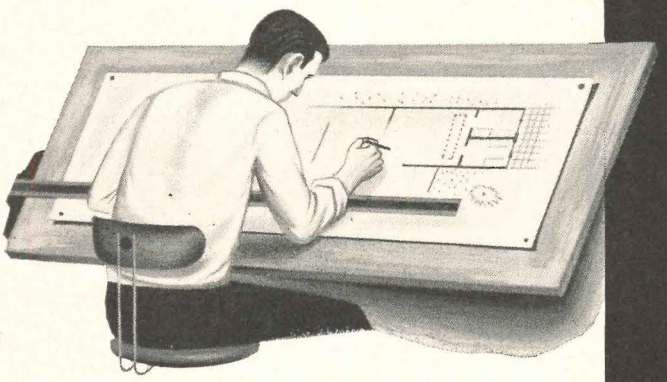
We think it would

We've seen air conditioning at work before. We've seen it revolutionize the textile industry, we've seen it redesign skyscrapers. That's why, when we developed the new Carrier Weathermaker Air Conditioner for homes, we thought of it in terms of a new kind of home . . . a Weathermaker Home.



We asked around

We asked architects . . . and we asked builders. And they told us that a Weathermaker Home could be more compact, that it wouldn't need to use its windows for ventilation, that it would be simple to orientate. They told us that it might cost no more than a conventional home. And that it could be a much better home.



What do you think?

What do you think? How would you design a Weathermaker Home? Would it be all-glass or no-glass? Would it take its cue from the compass or blithely ignore the compass to face a view? We'd be glad to send you a book we've had written on the idea — and the facts on the Weathermaker Air Conditioner.

CARRIER CORPORATION
312 S. Geddes Street, Syracuse 1, N. Y.

Please send me "How to Have a Carrier Weathermaker Home."

*Name*_____

*Street*_____

*City*_____ *State*_____

Carrier

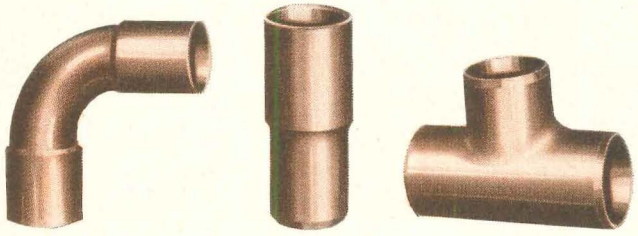
AIR CONDITIONING • REFRIGERATION

look! ...it must be a *Streamline*® fitting!

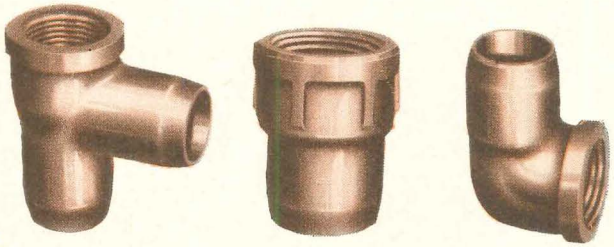
Streamline® solder type fittings are really made to last . . . and they'll make a neater, quicker installation

If Cleopatra's plumber had used STREAMLINE fittings we wouldn't be surprised if they would still be in pretty serviceable condition today. For STREAMLINE solder type fittings are really made to last. They cannot rust, they're not loosened by vibration and they're virtually free from clogging. STREAMLINE fittings assure a snug-fitting, tightly joined system that tests leak-proof on the first try and doesn't develop leaks later. When you install STREAMLINE fittings, you can be sure you're installing a permanently reliable conducting system whether for plumbing, heating, air conditioning or industrial use.

And here's something else . . . because of their design, precision manufacture and accurate dimensions, STREAMLINE solder type fittings can be installed quickly and the uniform depth of the solder joints makes it easy to compute the exact length of tubing needed. Thus STREAMLINE fittings not only assure a permanent installation, they also reduce job cost and increase the number of installations a contractor can handle.



STREAMLINE wrought and cast fittings are available in a complete range of standard sizes.



See your jobber for further information or write for catalogs S-351 and W-251 describing our complete line of STREAMLINE wrought copper and cast bronze fittings.

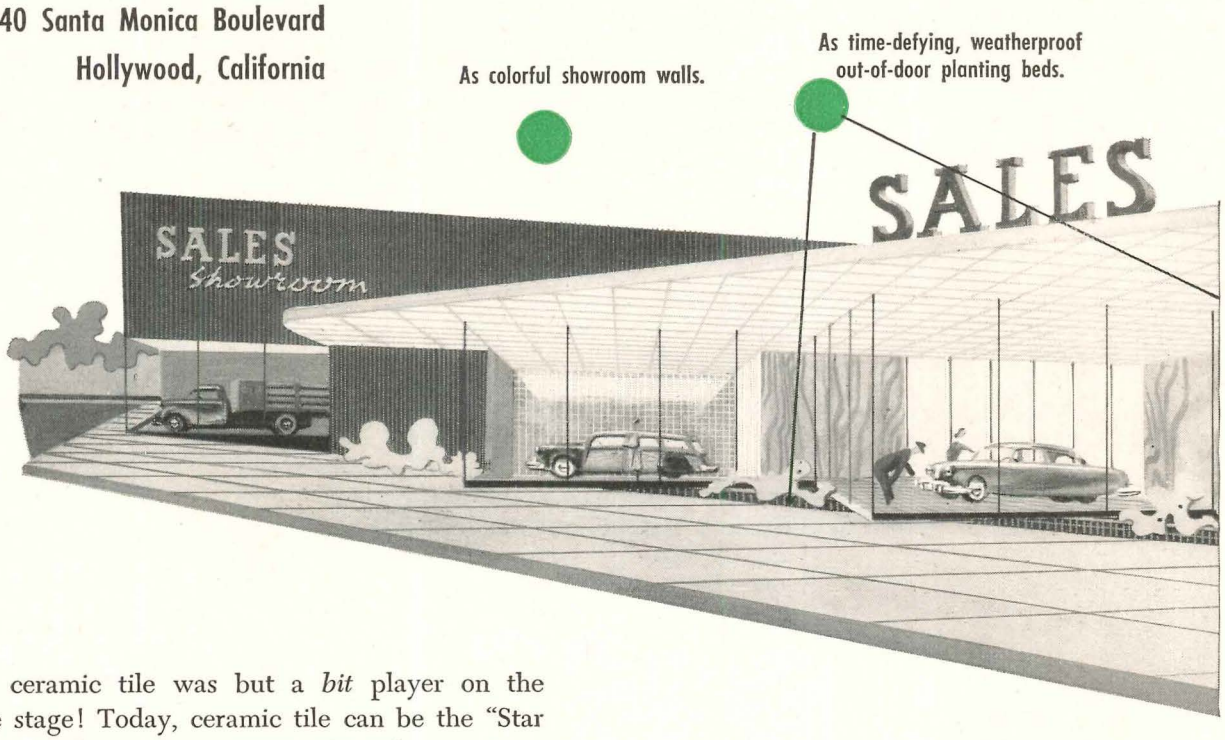
65

MUELLER BRASS CO. STREAMLINE PRODUCTS

MUELLER BRASS CO. PORT HURON 7, MICHIGAN

a design study for The Mosaic Tile Company to illustrate uses for ceramic tile in an automobile showroom

by Victor Gruen, A.I.A.
8640 Santa Monica Boulevard
Hollywood, California



Yesterday, ceramic tile was but a *bit* player on the automotive stage! Today, ceramic tile can be the "Star of the Showroom" . . . play a major sales role in present and future automobile merchandising plans.

Why? Simply because Mosaic Tile gives an amazing combination of beauty, color, permanence and "rock-bottom" maintenance expense . . . plus that much sought-after atmosphere of quality and prestige!

Models change . . . but Mosaic Tile – never! It's a hard-as-nails material with qualities of permanence and low-maintenance ideally suited for walls and floors in sales, service, maintenance and lubritorium areas. The smooth, pit-and-pore free surface of Mosaic Tile resists the penetration of dirt and grease . . . is easily cleaned by conventional methods. And, the *first cost* is literally the *last cost,* for Mosaic Tile won't burn, warp, crack or fade –it wears and wears but doesn't wear out!

How Mosaic Tile may assume a star's role in the automotive field is revealed by this design study, made by Victor Gruen, A. I. A., Hollywood, California.

The results, including sketches and floor plan, have been incorporated into a six-page, full-color folder which is available to you now. For details on how to receive your *free* copy, see the adjoining page!

Send for this folder TODAY!

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Phone: Twinbrook 3-1254

Boston, Massachusetts
384 Main Street, Waltham 54
Phone: Waltham 5-7292 & 5-7202

Hollywood 38, California
829 North Highland Avenue
Phone: Hillside 8238

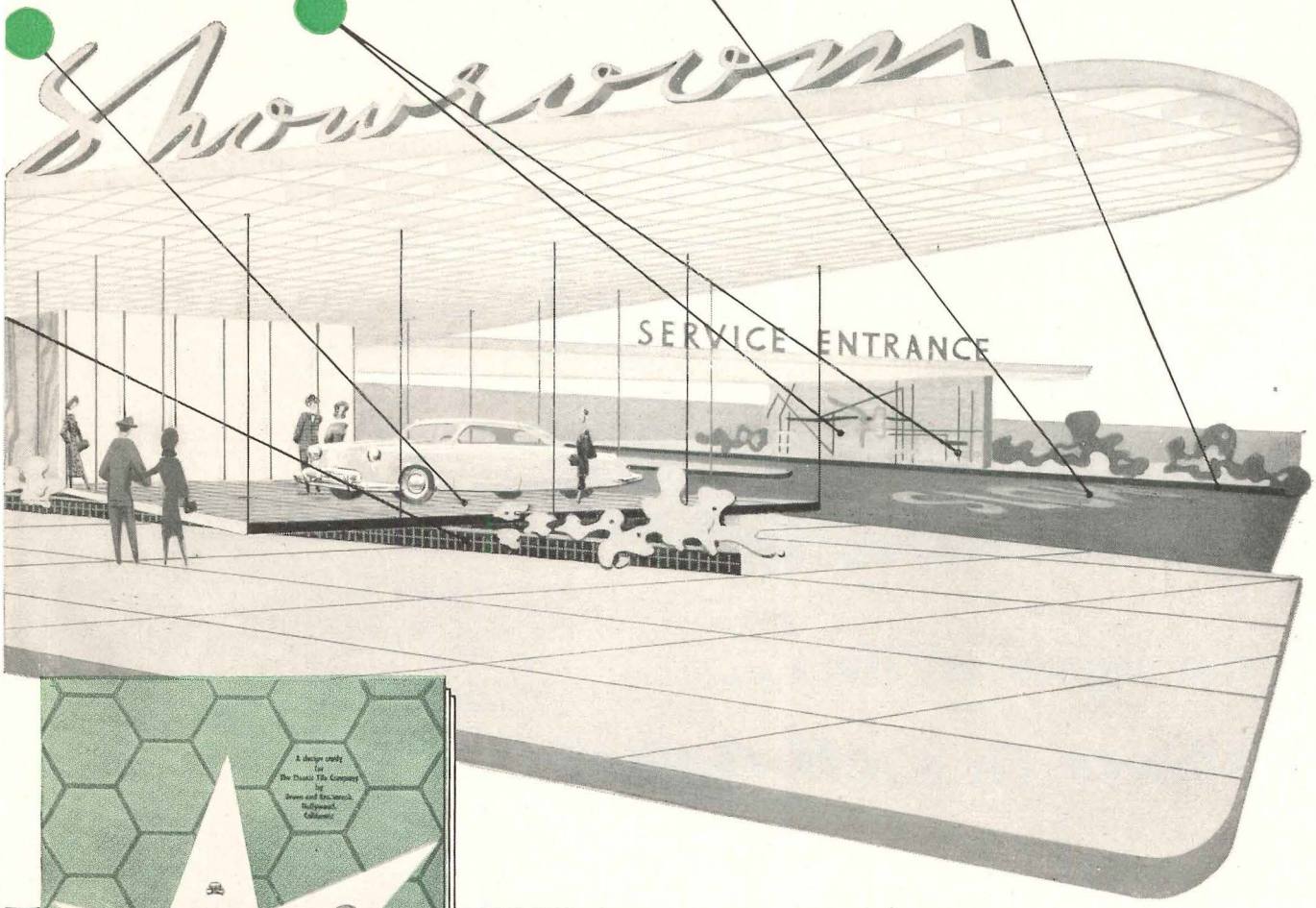
Areas where Mosaic Tile performs a major selling and service job in a truly-modern automobile showroom!

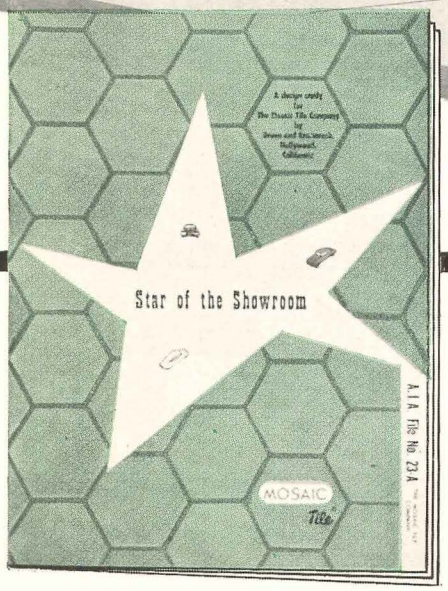
As showroom floors of lifetime beauty and utility.

As intriguing, moisture-resistant decorative panels at service and receiving entrance.

As trouble-free facing, traffic directional insets, drive and walkways.

As attractive curb areas defining drive and walkway.





There's a place in your files for this folder; a place in all of your building and remodeling plans for Mosaic Tile. A letter on your business stationery will bring you a copy of this idea-inspiring folder free of charge. Write Dept. 30-7, The Mosaic Tile Company, Zanesville, Ohio. Contact any Mosaic office shown here for information on the many types of Mosaic Tile.

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(Member—Tile Council of America)

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Phone: Valencia 6-3924

Seattle 4, Washington
538 First Avenue, So.
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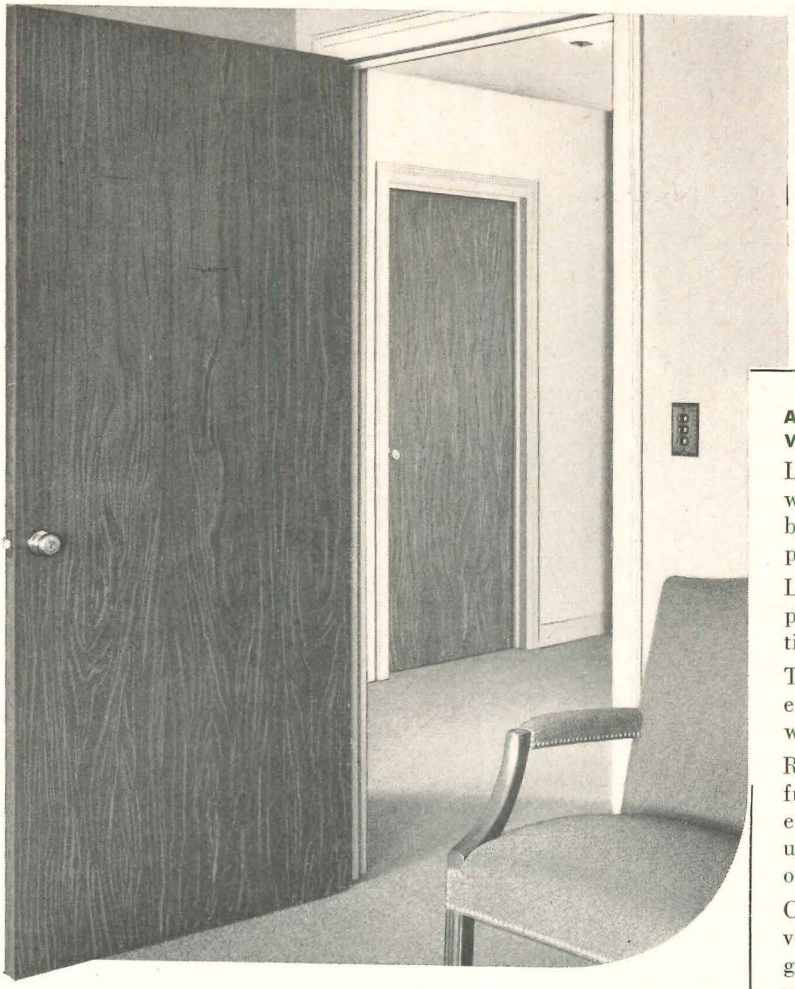
Washington, D. C.
P. O. Box 32, Fairfax, Virginia
Phone: Fairfax 144



Beautiful Weldwood Fire Doors, in the offices of Arthur Andersen and Co., New York City.

Architects: George B. Post and Sons.

And Now . . .
WELDWOOD PARTITION PANELS

Like Weldwood Fire Doors, Weldwood Partition Panels have all the beauty of luxurious wood . . . offer positive protection against fire.

Like Weldwood Fire Doors, these partition panels have the incombustible Kaylo* Core.

They are made in 2 types — with either non-treated or fireproofed wood edge banding.

Readily adaptable to low railing and full ceiling height partitions — and easily movable — they are ideal for use in offices, hospitals, schools and other institutions.

Can be obtained with such choice veneers as ash, avodire, birch, elm, gum, Korina, oak, mahogany, prima vera and walnut.

Write for illustrated new booklet — just off the press.

*Reg. Trade-mark Owens-Illinois Glass Co.

Opens eyes wide . . .
Shuts fire off tight!

One glance can tell you more than a bookful of words

. . . about the soft, luxurious beauty of the Weldwood Fire Door

. . . and the warm, welcoming atmosphere it imparts to a reception room or office.

But you can *take our word* for THIS: Weldwood Fire Doors have much more than *appearance* on their side!

When *they* are on the job, *no fire can pass* or spread!

The secret of this great protective quality lies in the door's unique construction. Choicest domestic and imported wood veneers are bonded to an incombustible mineral core — winning for the Weldwood Fire Door the Underwriters' Label for Class B & C openings.

In addition, the Weldwood Fire Door offers exceptional stability . . . extraordinary durability . . . and is proof against rot, vermin and decay. It's unusually *lightweight*, too.

Send for complete information about the Weldwood Fire Door today.

United States Plywood Corporation carries the most complete line of flush doors on the market including the famous Weldwood Fire Doors, Weldwood Stay-Strate Doors, Mengel Hollow-core Doors, Mengel and Algoma Lumber Core Doors, 1⅜" and 1¾" with a variety of both foreign and domestic face veneers.

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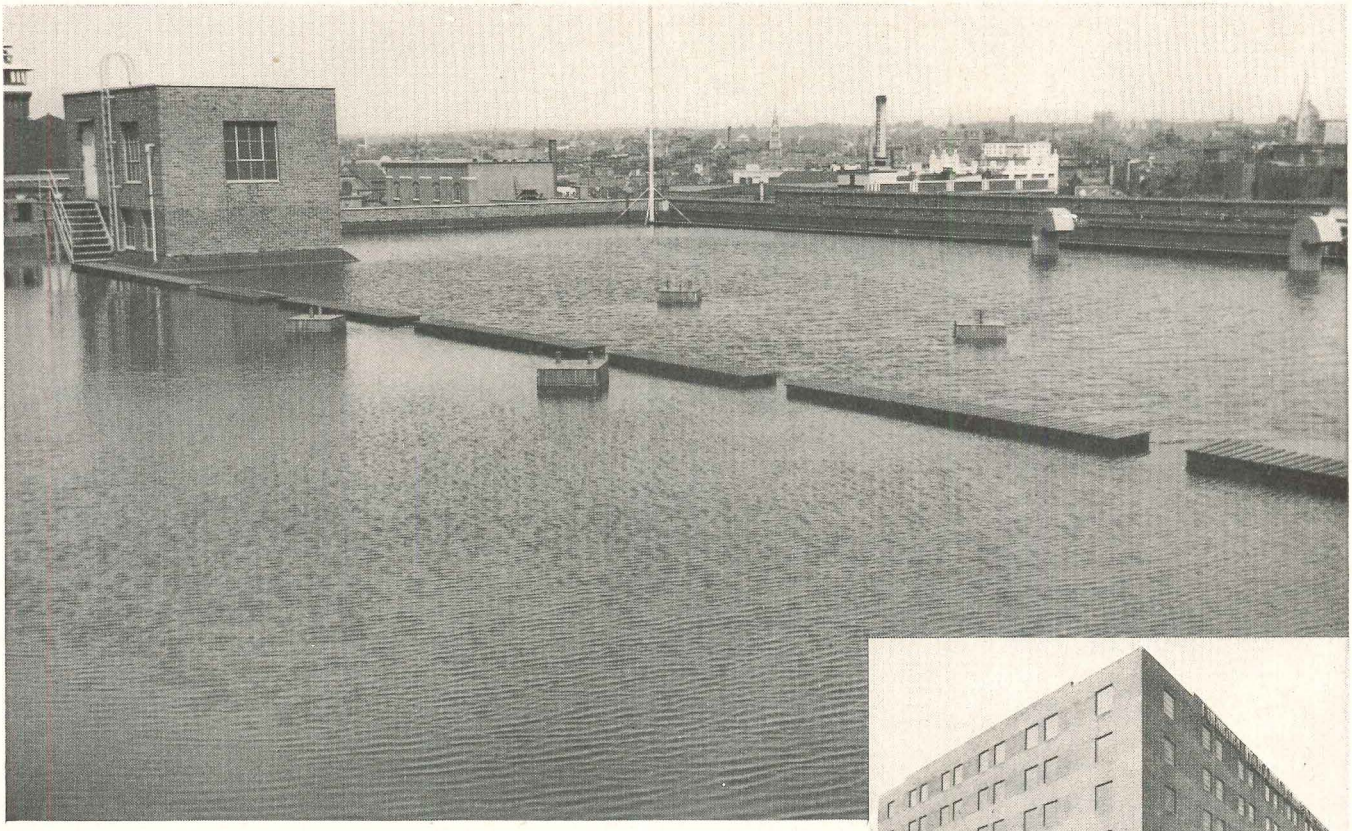

A ROOF SHOULD BE *more* THAN A COVERING!

That's why a Ruberoid water-cooled built-up roof was chosen for the Hochschild, Kohn & Co. furniture store in Baltimore, Md. A lot of care and thought goes into the selection and construction of a good roof. Merchandise, equipment and property should be lastingly safeguarded against all sorts of weather, wet and dry spells, heat and cold. And the right roof can make an important contribution to working conditions by aiding in temperature control and reducing the load on air-cooling equipment.

More and more architects are now specifying water-cooled roofs, a decided plus factor in offering better value to clients. They know that a dry roof on a hot summer day has a heat flow factor of 11 BTU's per hour per square foot. The heat flow factor is reduced to 4.7 BTU's when that same roof has one inch of water covering it. They know, too, that the *right* roofing specifications applied by experienced. Approved Ruberoid Roofing Contractors are essential ingredients. A Ruberoid Built-Up Roof fulfills all these requirements.

You are bound to find the Ruberoid Built-Up Roofing Specification Book and Built-Up Roof Selector invaluable in planning more efficient roofs, no matter what type of roofing problem you may have. If you don't have these aids, write on your letterhead for your free copies. The Ruberoid Co.. 500 Fifth Ave., New York 18, N. Y.

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Architects:
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General Contractors:
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Applicators:
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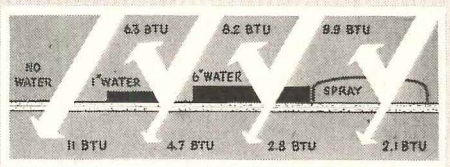
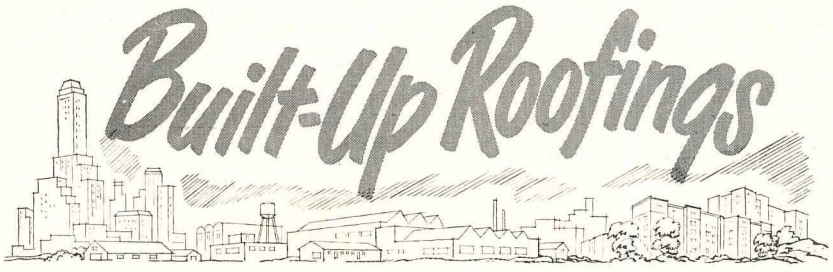


The relative cooling effect of a roof pool is graphically demonstrated in this diagram. The pool depends primarily upon reflection or water evaporation for effectiveness. Based on controlled scientific tests, the chart shows that water in any form is an excellent barrier to solar radiation.



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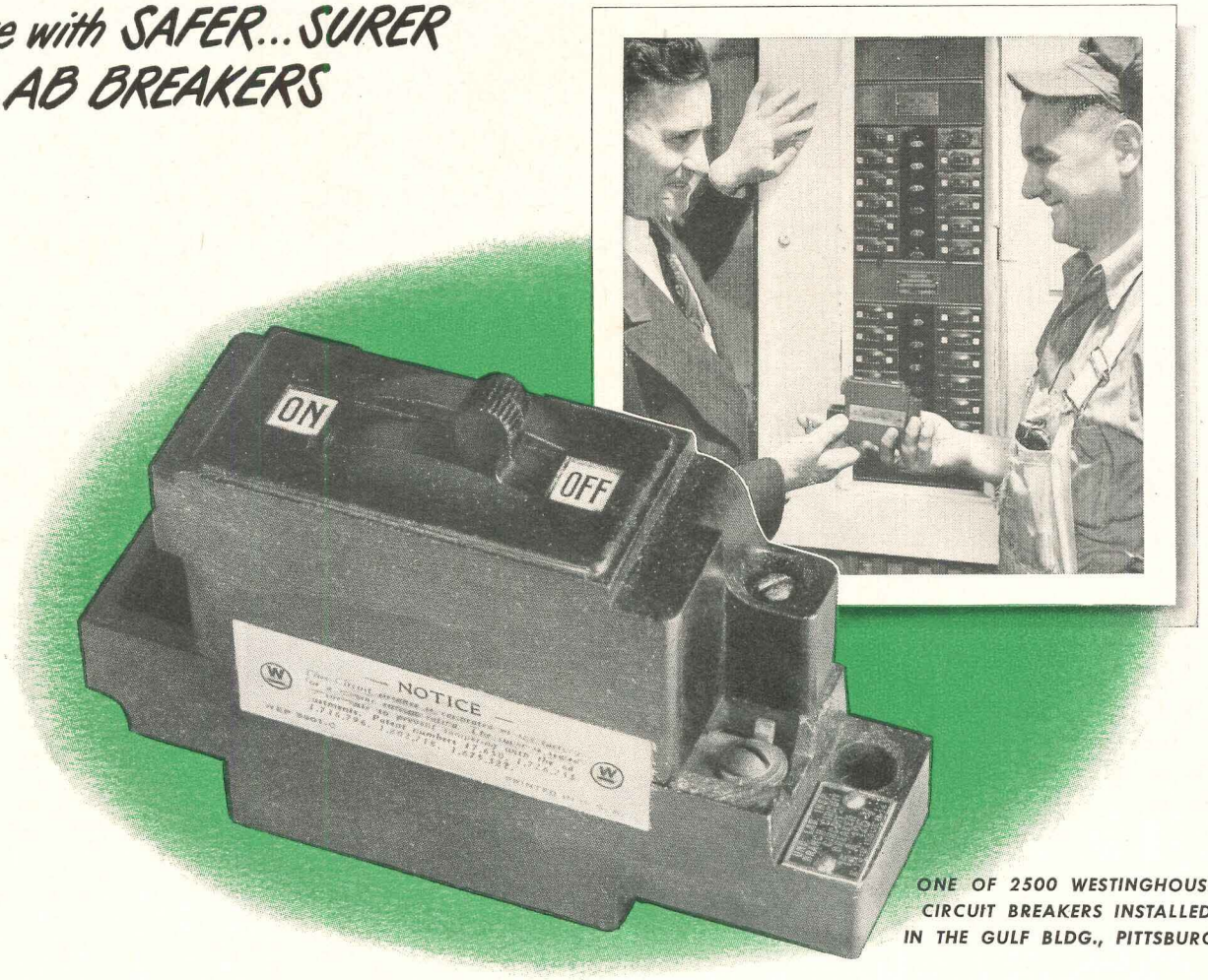
ASPHALT AND ASBESTOS BUILDING MATERIALS

Save with SAFER... SURER AB BREAKERS



ONE OF 2500 WESTINGHOUSE CIRCUIT BREAKERS INSTALLED IN THE GULF BLDG., PITTSBURGH

18 YEARS OF CONTINUOUS SERVICE without failure, replacement or maintenance

2500 thermal-type branch circuit breakers, installed and then forgotten, in the Gulf Building, Pittsburgh, Pa., have written an unparalleled story of circuit protection. B. E. Moore, Building Superintendent, reports that after 18 years of service without failure, replacement or maintenance, these breakers were recently checked in random tests and were found to be "as good as new". On both overload and short circuit protection, they performed precisely to their original specifications. And on inspection, mechanical parts and contacts were found to be in "excellent condition".

What better proof can we give you that when you install Westinghouse Circuit Breakers you install the finest in dependable, grief-free equipment. They are miserly with maintenance time, too—when trouble is cleared from the circuit, a flip of the breaker handle restores power instantly. No running after fuses, nothing to replace, nothing extra to buy.

For assistance on any circuit protection problem, contact your nearest Westinghouse office, or write for Bulletin No. DB-29-060, Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. J-30049

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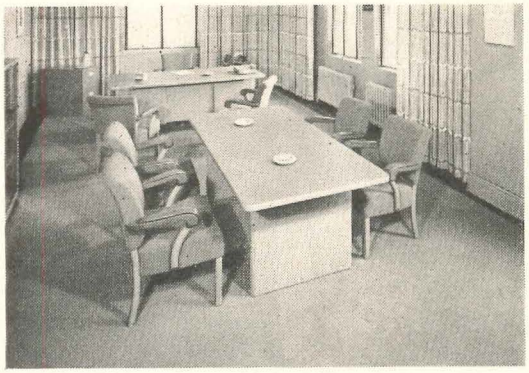
YOU CAN BE SURE... IF IT'S **Westinghouse**

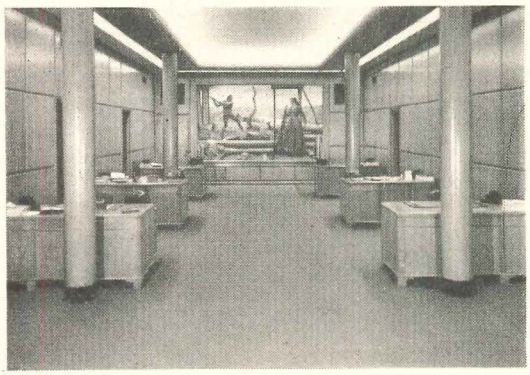
AB CIRCUIT BREAKERS

THE COMPLETE LINE

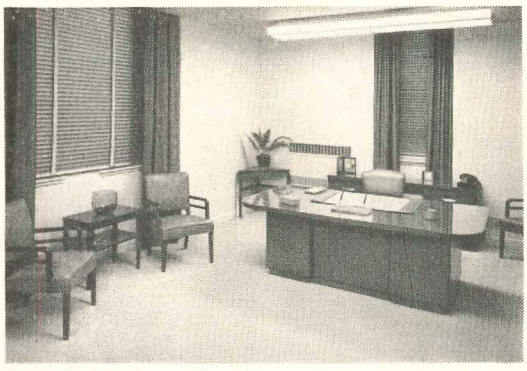
Specify **Goodall Seamloc* Carpeting for these 4 plusses**



Remington Rand, Inc., New York, carpeted the office of A. N. Seares, Vice-President with Goodall *Sampson* in harmonious Taupe.



The Fidelity Trust Company, Pittsburgh, achieves elegance in this office with Goodall *Sampson* . . . the color, Turquoise.



The California Packing Corp., San Francisco, color-keys the office of its Vice-President with Goodall *Sampson* in Willow Green.

1. Wide Color Range:

You'll marvel at the richness, softness, and clarity of Goodall Seamloc's colors. Colors with the subtle variations you need for true decorator beauty. Goodall's Luxuria, Araby, and Sampson qualities come in 22 colors each . . . more than any other wool carpeting. *Every* Goodall quality, of course, comes in a wide range that meets every decorating theme.

2. Velvet, Hard Twist and Loop Pile Qualities:

Seamloc is available in many qualities. Your dealer will help you select the one that is exactly right for your particular job.

3. Easier Installation:

Seamloc comes in 4½′ widths to fit rooms of every size with less waste. Special seam construction allows practically invisible seams. Seamloc makes special insertions of design or color possible without custom-weaving. Seamloc can be moved elsewhere . . . re-cut and relaid . . . even cigarette burn repairs scarcely show. And the "welded" seams have a tensile strength of 70 pounds to the square inch . . . 2½ times stronger than sewn seams.

4. Long Wear:

Goodall Seamloc is *Blended-to-Perform* of selected all wool yarns. That means long wear, greater resilience, greater luxury. Double backing holds the rich pile *in* and *up* . . . allows Seamloc to be washed right on the floor. See any of the dealers listed below . . . get the right Seamloc carpeting for office, store, institution, and housing project installations.

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Sea Swirl is a decorative plywood, made from superior grades of Douglas fir plywood. Interior and exterior types are available in 4'x8' size, 5/16" thickness. (Other sizes on special order.)
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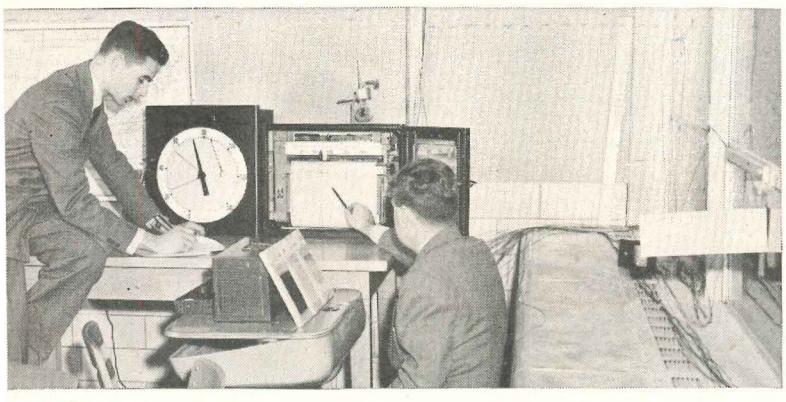
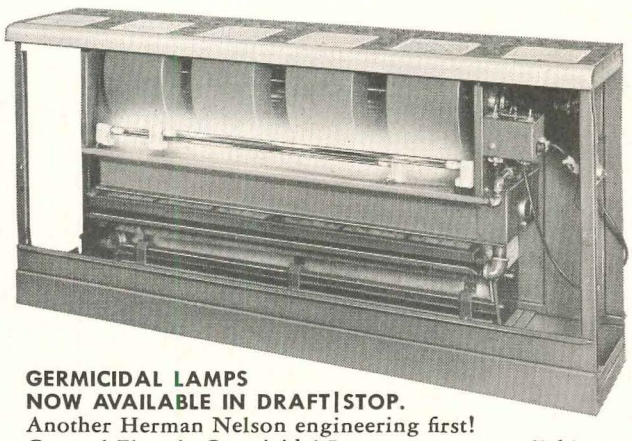
He can have



HERMAN NELSON LEADERSHIP—the result of constant research— Developments from Herman Nelson are the result of exhaustive testing carried on in field laboratory projects using the most modern electronic equipment and progressive methods. Research, not conjecture, evolved DRAFT|STOP—the practical solution to control of drafts and efficient heating and ventilating in the modern classroom.



GERMICIDAL LAMPS NOW AVAILABLE IN DRAFT|STOP.
Another Herman Nelson engineering first!
General Electric Germicidal Lamps are now available as an accessory in DRAFT|STOP units. Ultraviolet rays disinfect the air passing through the unit, provide air as pure as if the unit were always pumping more than twice the usual volume of outdoor air into the room.

spring climate *all year round*

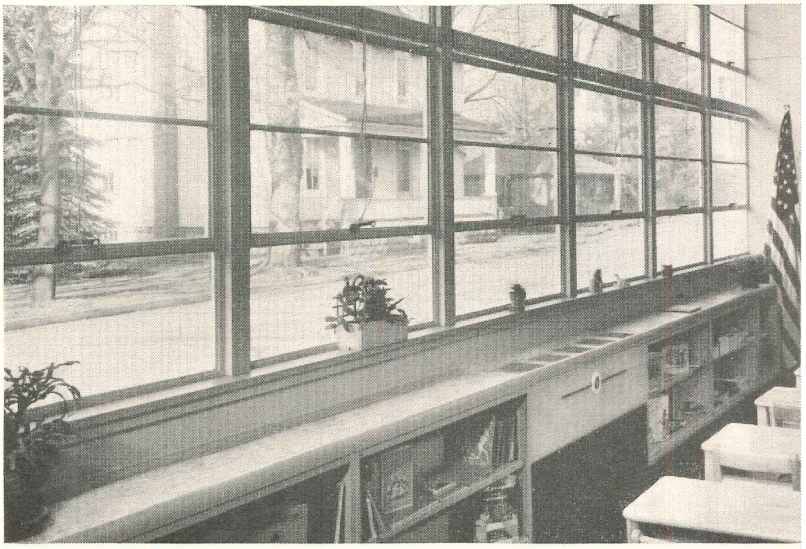
Pick out the month you consider ideal for work and study in your section of the country. It's April or May most likely. This same ideal climate is now being brought indoors to schoolrooms year 'round by the Herman Nelson DRAFT|STOP system.

DRAFT|STOP provides an entirely different and superior answer to the heating and ventilation needs of the modern schoolroom. It overcomes the problem of drafts created by large window areas by intercepting the cold air from the windows before it spills into the room. The captured cold air is either drawn into the unit and heated or expelled from the building.

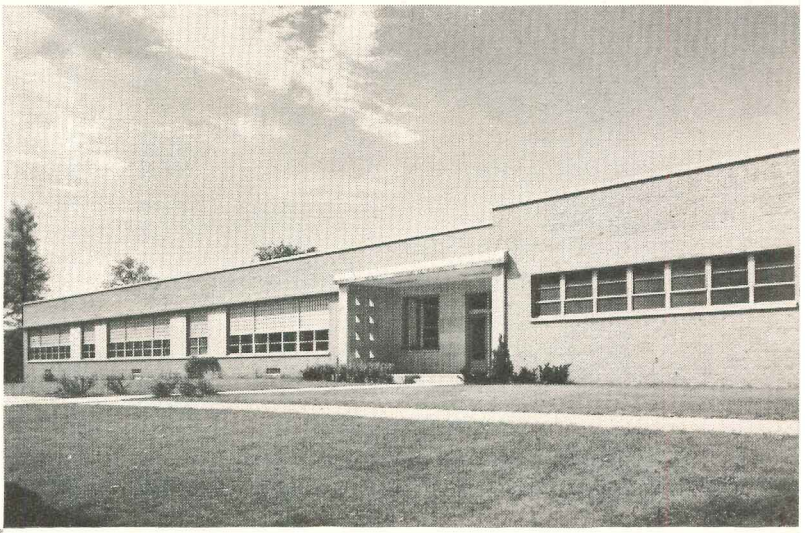
DRAFT|STOP is completely automatic. It introduces outside air only as needed to satisfy *true* ventilation requirements of the room. It tempers the outside air before circulating it; it re-circulates a portion of the room air so there is no necessity of heating a constant flow of outside air.

DRAFT|STOP also provides *cooling action* when needed by drawing in enough outside air to reduce temperatures to proper levels.

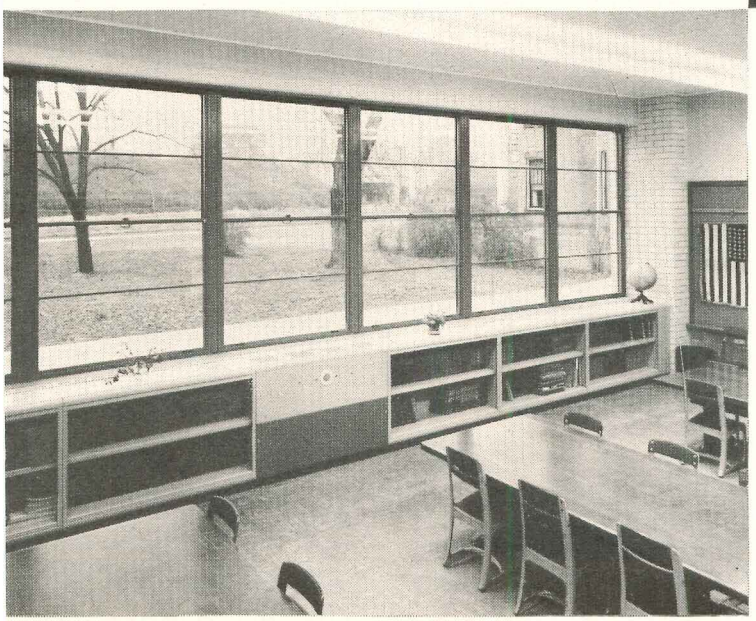
By providing the proper heating, cooling and ventilation *without* drafts Herman Nelson DRAFT|STOP creates the perfect indoor climate for work and study. It should be part of your plans for a new school building or a modernization program. For further information write Dept. AR-2, Herman Nelson Division, American Air Filter Company, Inc., Moline, Illinois.



South Ward Elementary School. Lewisburg, Pennsylvania. Supervising Principal, Robert E. Beckman; Architect, Malcolm A. Clinger. There is spring climate inside this school year 'round because it's equipped with DRAFT|STOP Unit Ventilators.



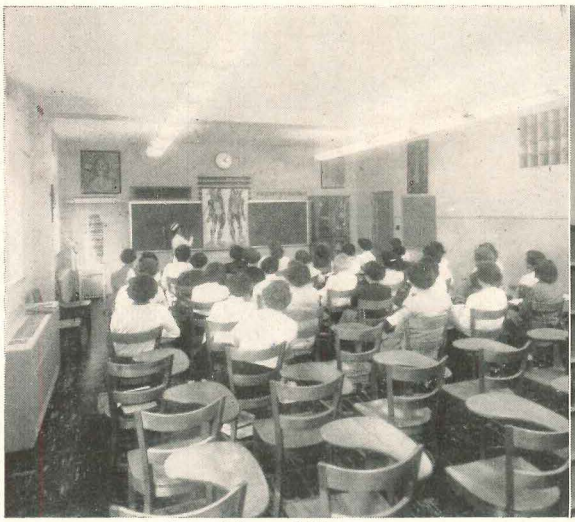
Columbus Boys Academy. Columbus, Ohio. Headmaster, Sumner F. Dennett; Architect, Dan A. Carmichael, Jr.; Consulting Engineer, Robert S. Curl. Newest addition to one of the Midwest's oldest and best known boys' schools is fully equipped with DRAFT|STOP.



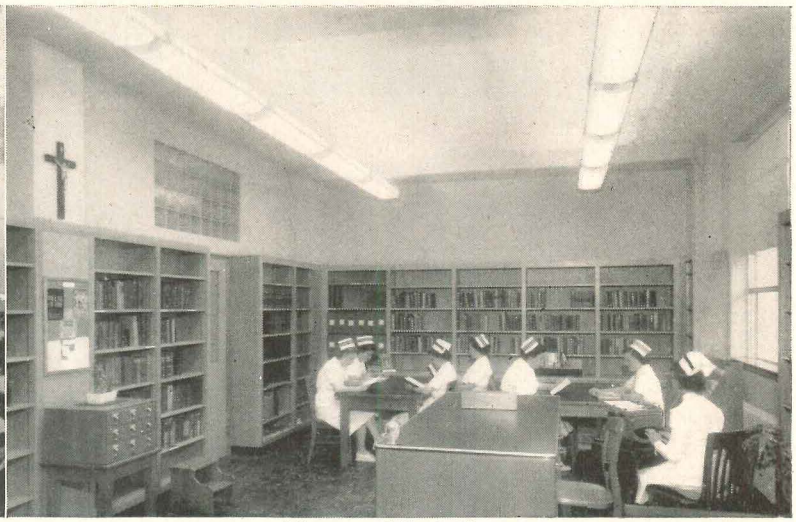
John Laidlaw School. Western Springs, Illinois. Superintendent of Schools, James V. Moon; Architects, Berger, Kelley and Samuelson; Consulting Engineer, Beling Engineering Consultants. Modern equipment for this most modern school includes famous DRAFT|STOP Unit Ventilation equipment.

DRAFT STOP HERMAN NELSON

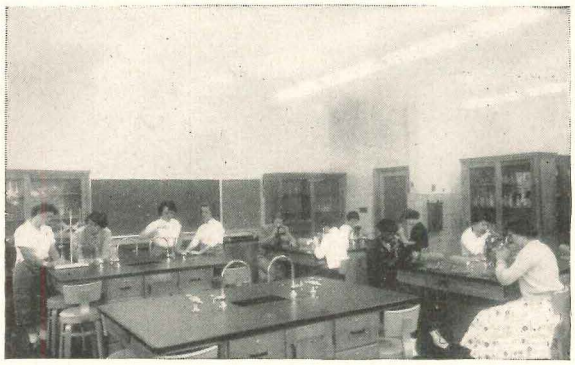
SYSTEM OF CLASSROOM VENTILATION



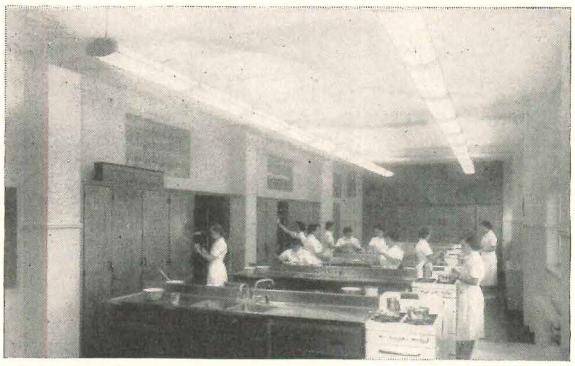
One of Several Classrooms



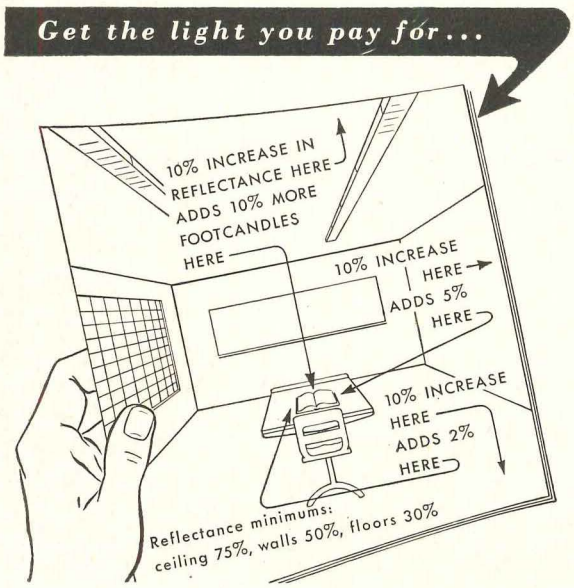
Library and Study Room



Basic Chemistry and Science Laboratory



Nutrition Laboratory



Architect Chooses *Wakefield* Grenadiers for School of Nursing

Hampson and Fisher, architects
Springfield Electric Company, electrical contractor

Soon, up to 165 student nurses will be in training in the new School of Nursing of St. Luke's Hospital in Pittsfield, Massachusetts. In the specialized instruction rooms—fifteen in all—Architect John H. Fisher has provided a comfortable visual environment for study and instruction, using Wakefield two-lamp fluorescent Grenadiers. These photographs show four of the special training rooms, where the nurses will learn dietetics, basic chemistry and hospital nursing practice.

A direct-indirect fluorescent luminaire, the Grenadier provides diffused light from louvers and through the white translucent plastic side-panels. Half of the light is directed upward and reflected from the ceiling. The Grenadier is available in a variety of mountings, and for use with two or four bi-pin or slimline lamps.

Grenadiers are designed to keep maintenance costs low. All reflecting surfaces are turned downward so that a minimum of dust collects. Dust films can easily be wiped off. For regular maintenance, the louvers and side panels can be quickly removed.

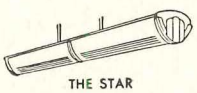
THE F. W. WAKEFIELD BRASS COMPANY, VERMILION, OHIO

Wakefield

Over-ALL Lighting

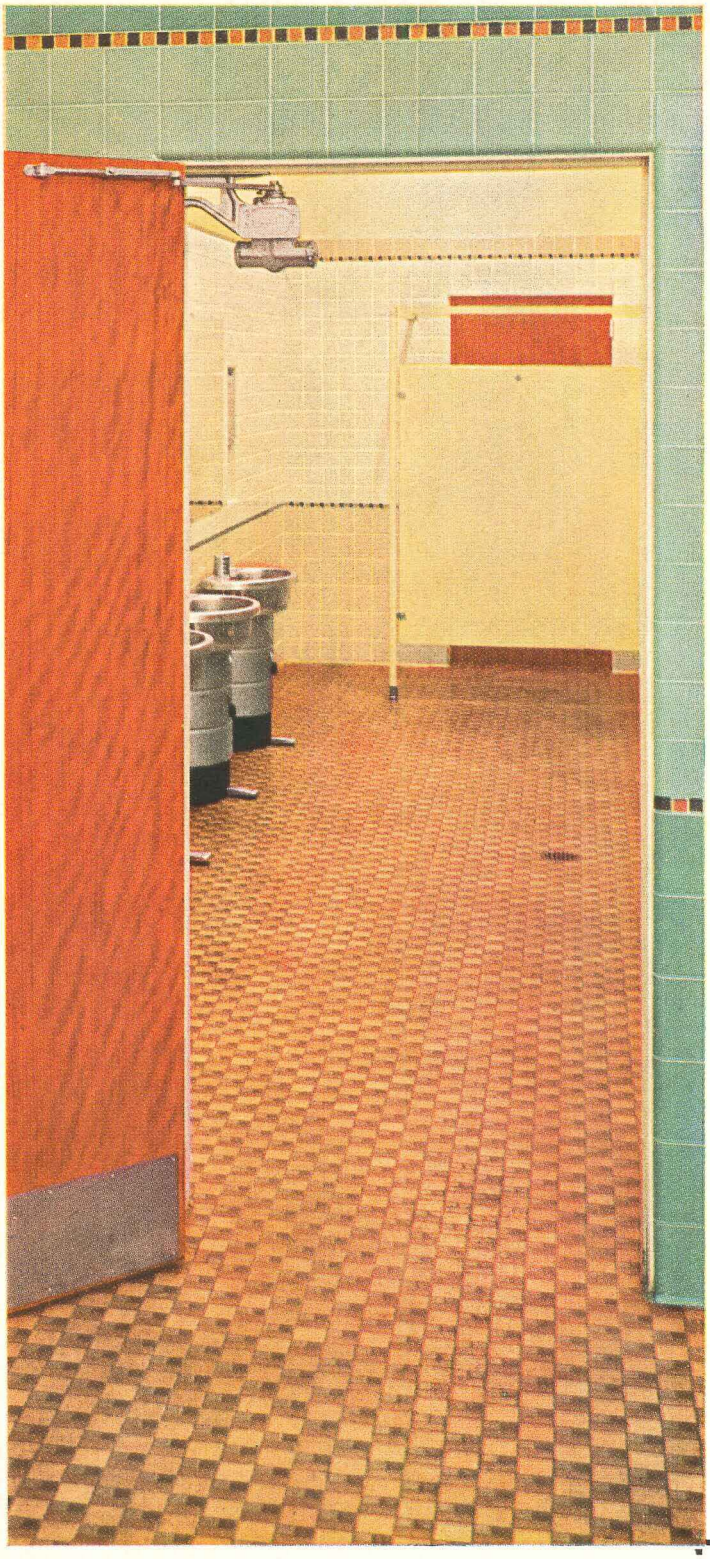
BASIC FOR CO-ORDINATED CLASSROOMS

THE COMMODORE



THE STAR

THE WAKEFIELD CEILING



Girls' Washroom, Standard Pressed Steel Co., Jenkintown, Pa.

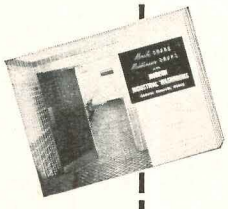
NEW

Booklet Shows You How to RAISE *MORALE* and LOWER *MAINTENANCE COSTS*

Among the major sources of personnel gripes are unsightly and outmoded washrooms—and their costs in janitor service and maintenance expenses are high.

American-Olean's new 20-page full color booklet gives you the full story on how to cut out refinishing and repainting expenses . . . how you can help your client slash janitor costs to the bone. And it explains why clean, colorful American-Olean tile installations boost workers' morale and help eliminate one of labor's four major complaints against management.

It's the only book of its kind! Page after page of color photographs of actual installations, with specifications. Send for your file-size copy today.



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AMERICAN-OLEAN TILE COMPANY
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Gentlemen:
Please send me my free copy of Booklet 300, Modern Industrial Washrooms.

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*Firm Name*_____

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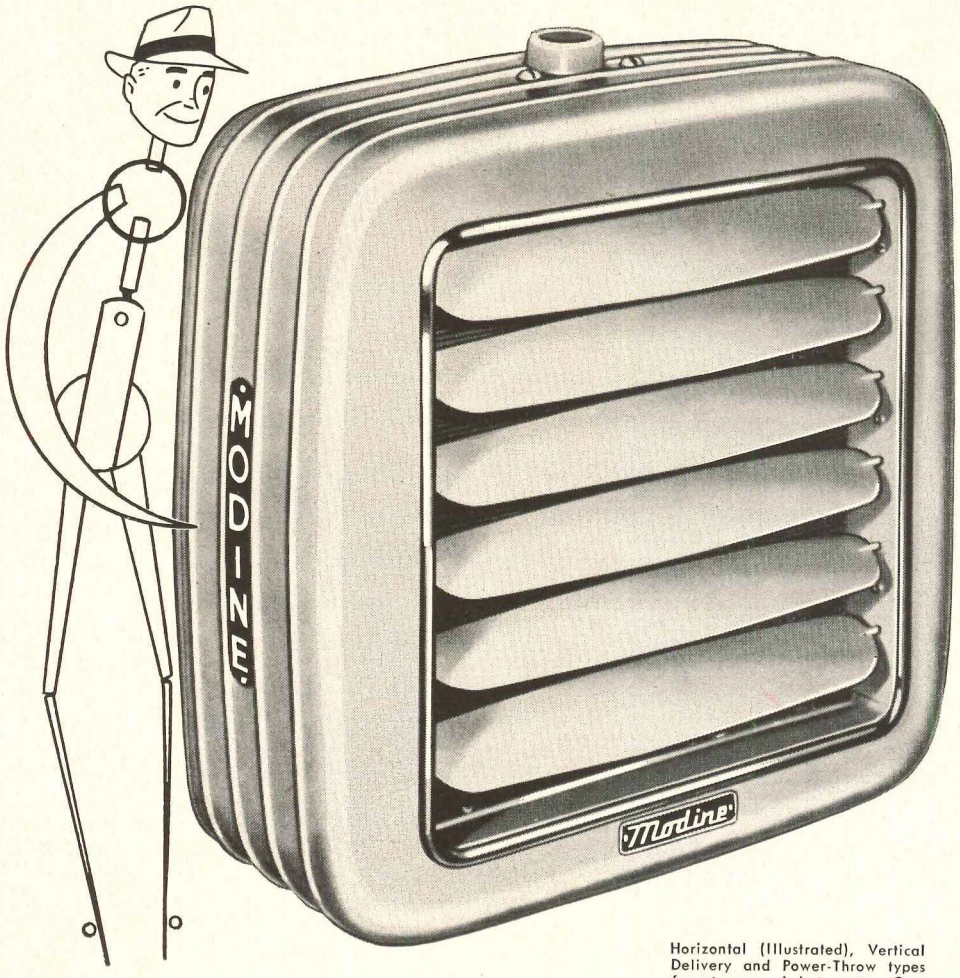
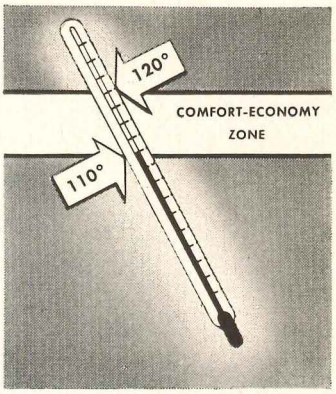
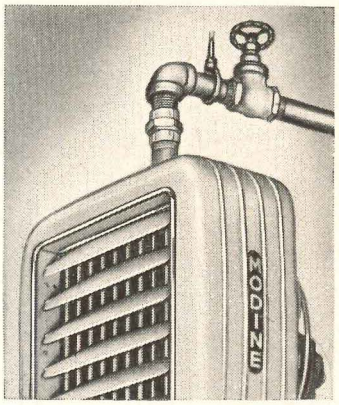


Horizontal (Illustrated), Vertical Delivery and Power-Throw types for steam and hot water. Gas-Fired units also available.



Discharge air temperatures of 110° -120° F are correctly related to air velocities—assure perfect heating comfort, lower fuel costs.

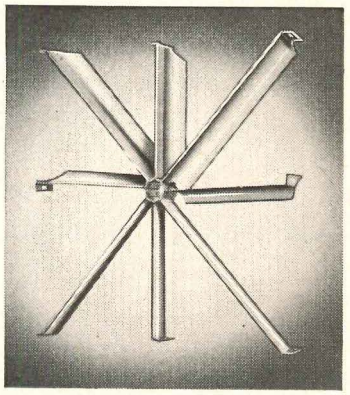


Direct-from-pipe suspension is safe and economical, with no hanger-rods. Heated air stream may be easily redirected over full 360°.

for comfort and economy Modine Unit Heaters top the field

Yes, on every count, Modine Unit Heaters stand out. For balanced heating performance . . . for high fuel economy . . . for long years of trouble-free service—Modine is first choice of experienced heating men. *Compare*—you'll choose Modine every time. Modine Mfg. Co., 1510 DeKoven Ave., Racine, Wis.

Write for Bulletin 149-A, "Modine Unit Heating." Or contact your Modine representative listed in your classified phone book.



Built-in velocity generator effectively steps up heat throw. This assures positive heat penetration of cold air strata near the floor.

Modine UNIT HEATERS

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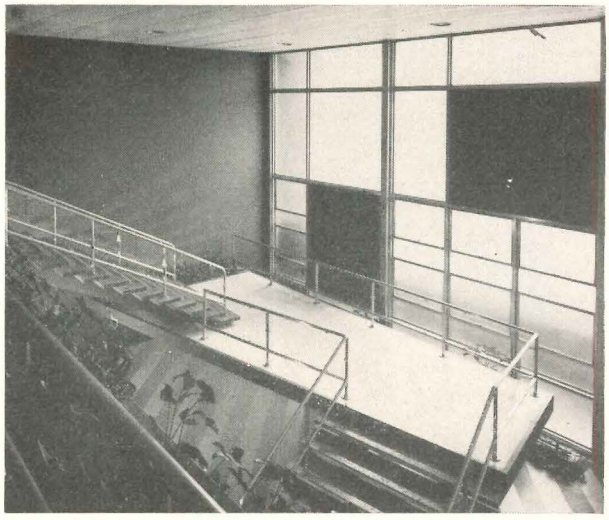
SEE OUR CATALOG IN SWEET'S

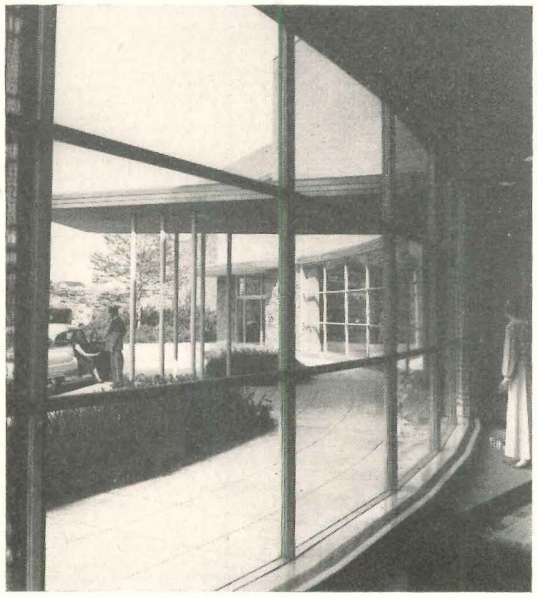
How American architects are utilizing

Pittsburgh Glass in heavy construction

CONTRIBUTING to the over-all distinctive appearance of the new Drayton Arms Apartments in Savannah, Georgia, is the ample use of Pittsburgh Products. Windows are glazed with Solex Heat Absorbing Plate Glass—"the best glass under the sun"—to keep rooms ten to twenty degrees cooler. The soft greenish coloring of Solex, while almost unnoticeable when looking through the glass from inside, acts as a wonderful guard against eyestrain from glare of bright sunlight. Pittsburgh Doorways, Polished Plate Glass, Pittco De Luxe and Premier Metal help to create an open-vision lobby, and Pittsburgh Mirrors are used in every room. Architects: Cletus W. and W. P. Bergen, Savannah, Ga.

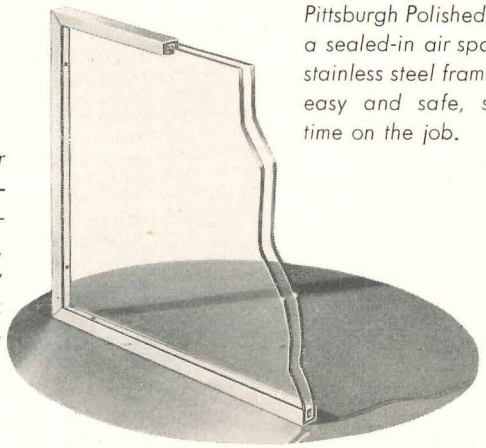


THIS STAIRWAY of a remodeled office building in Charlotte, N. C., shows the application of 1/4" Herculite Polished Plate Glass on the stair rails. The first floor of this building features large expanses of Pittsburgh Plate Glass. The second floor, which overhangs the first, is glazed with Solex Heat Absorbing Plate Glass. Other glass products used here include Herculite Doors, Pittco Premier Store Front Metal, Pittsburgh Mirrors in the washrooms Architects: A. G. Odell, Jr. & Associates, Charlotte, N. C.



ALL EXTERIOR GLAZING at the new John Wanamaker department store at Wilmington, Del., with the exception of the display windows, utilizes Twindow, Pittsburgh's window with built-in insulation. Additionally, 2700 sq. ft. of Pittsburgh Polished Plate Glass, ninety Herculite Doors and 1/4" Pittsburgh Copper-Back Mirrors are effectively used in this most appealing structure. Architects: Massena & du Pont, Wilmington, Del.

TWINDOW® permits designing large window areas, without sacrificing heating or air-conditioning efficiency. That means abundant daylighting, with interior comfort. Twindow, as shown in the cutaway section here, consists of two panes of Pittsburgh Polished Plate Glass, with a sealed-in air space between. The stainless steel frame makes handling easy and safe, saves installation time on the job.



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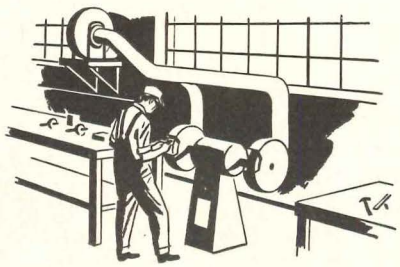
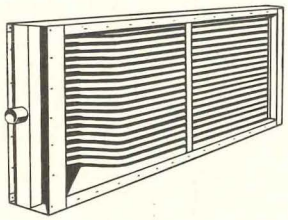
Fresh, invigorating air, indoors, does much to increase employee morale and efficiency. American Blower Ventura Fans are ideal for the job. They're attractively streamlined propeller fans with smooth-flowing lines that harmonize well with modern business interiors. Wiring is fully enclosed for safety. A square mounting panel makes them easy to install. All Ventura Fans are sound-rated and capacities are Certified.



ABRASIVE MATERIALS

If you've found dust from grinding machine operations hard to handle, American Blower Type V Fans are well worth investigating. The heavy cast-iron housing of Type V fans easily withstands the wear of hard, gritty, abrasive materials. Also, their volume and pressure range is more than adequate to handle the normal requirements of this type of work. Remember, good ventilation is good business.



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Current demands for heating from business and industry are greater now than ever before – a good reason to take early action on American Blower Heating Coils. Whether you need coils for use in blast heating or zone reheating – you'll find the size and type to fit your needs in the American Blower line. All tubing is helically wound with copper or aluminum fins in 3 standard spacings. Casings are heavy galvanized steel; headers are die-formed steel.

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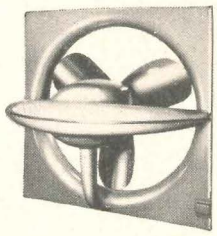
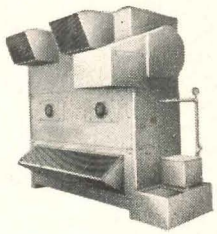
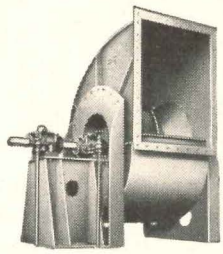
Unit Heaters



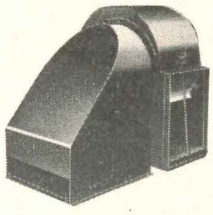
Ventura Fans



Air Conditioning Equipment



Industrial Fans



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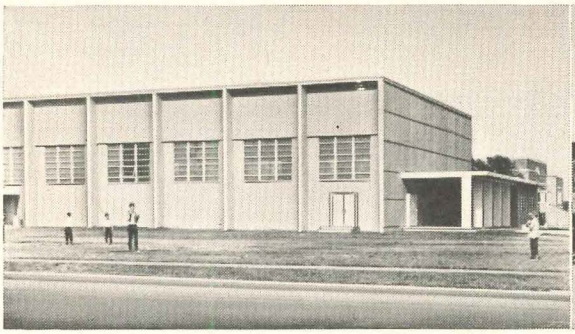
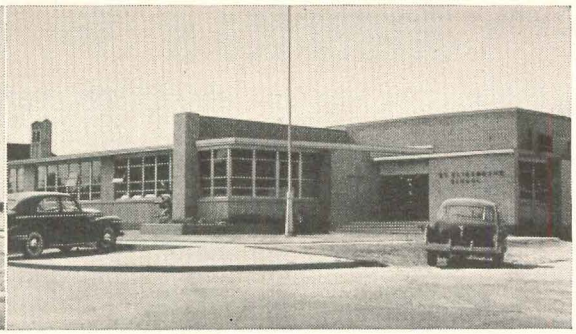
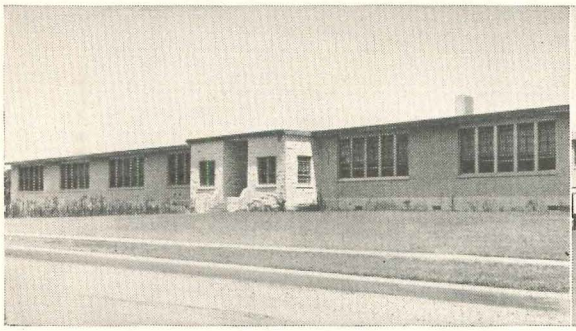


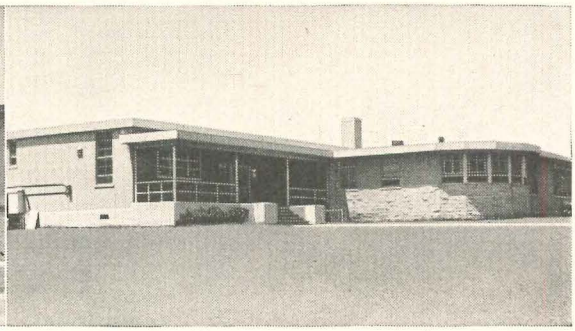
Benjamin K. Wyatt, architect, specified Stran-Steel Framing in the construction of Robstown High School Gym, Robstown, Texas.



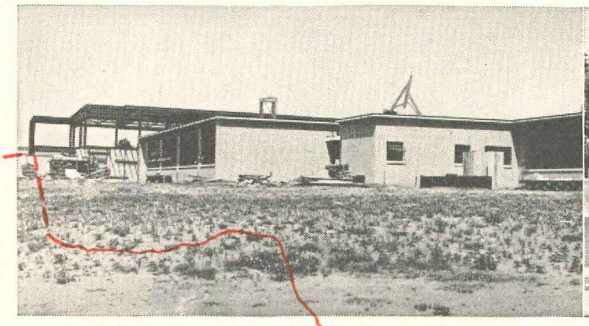
Stran-Steel Framing was used in walls, roof and partitions in the St. Elizabeth School, Alice, Texas. Wade, Gibson & Martin, architects.



In San Antonio, the Esther Perez Carvajal School is constructed of Stran-Steel Framing. Percy W. and J. Clyde Williams, architects.



The James Madison Elementary School, San Antonio, Texas, is built around Stran-Steel Framing. Phelps, Dewees & Simmons, architects.



Roof of the George West School, George West, Texas, is constructed of Stran-Steel Framing. Wade, Gibson & Martin, architects.

The W. J. Knox Elementary School, San Antonio, is another example of widespread use of Stran-Steel Framing. Benjamin K. Wyatt, architect.

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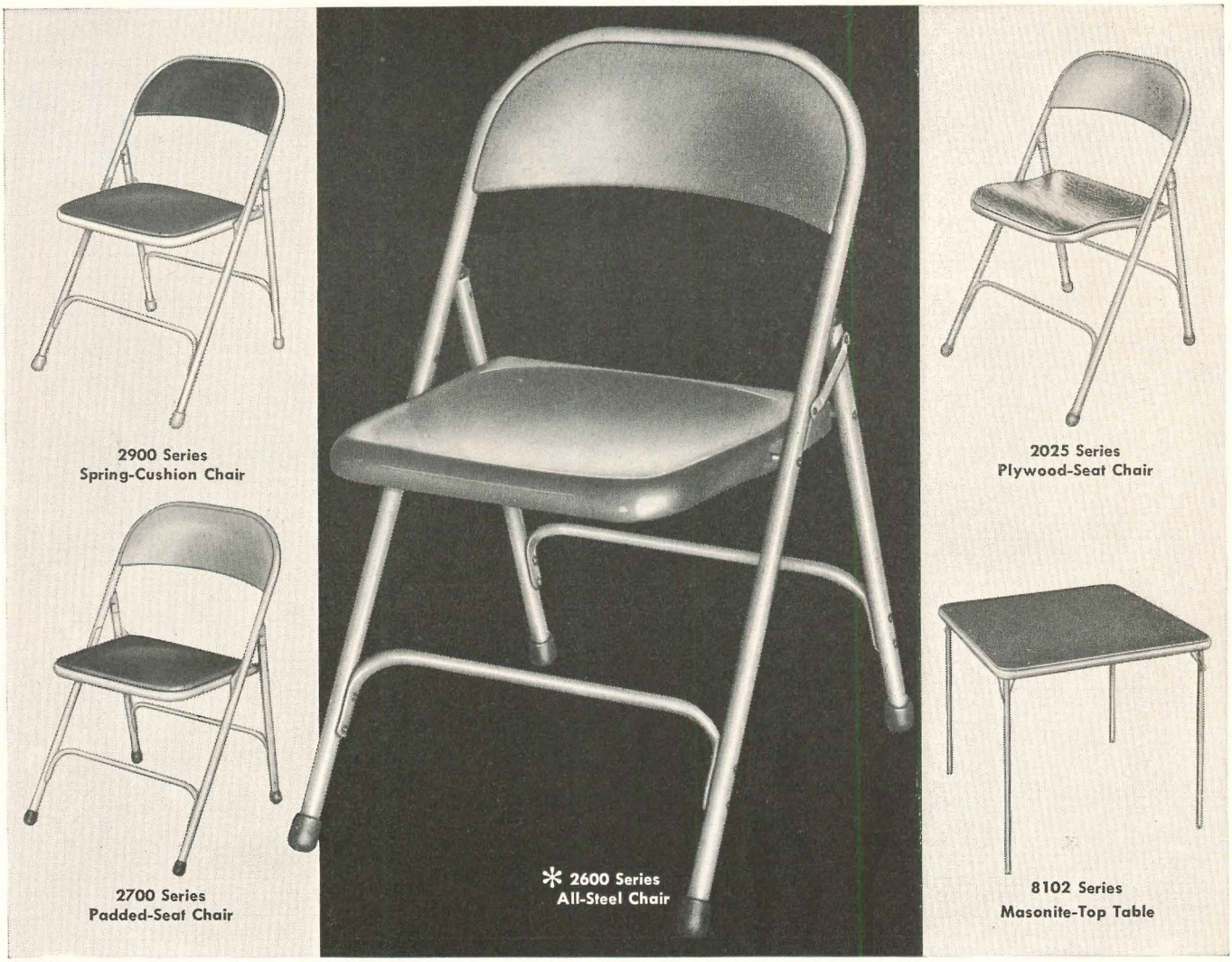

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SAMSON FOLDING CHAIRS are definitely your best public seating buy because they offer you: (1) low cost; (2) long life; (3) real comfort; (4) unsurpassed ease of handling!

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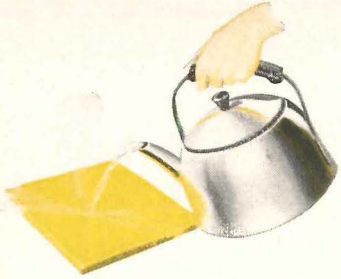
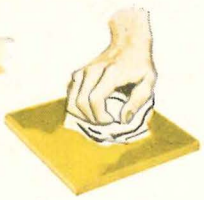
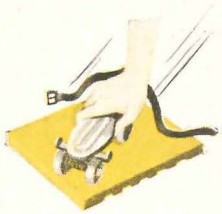


TILE IS WATERPROOF

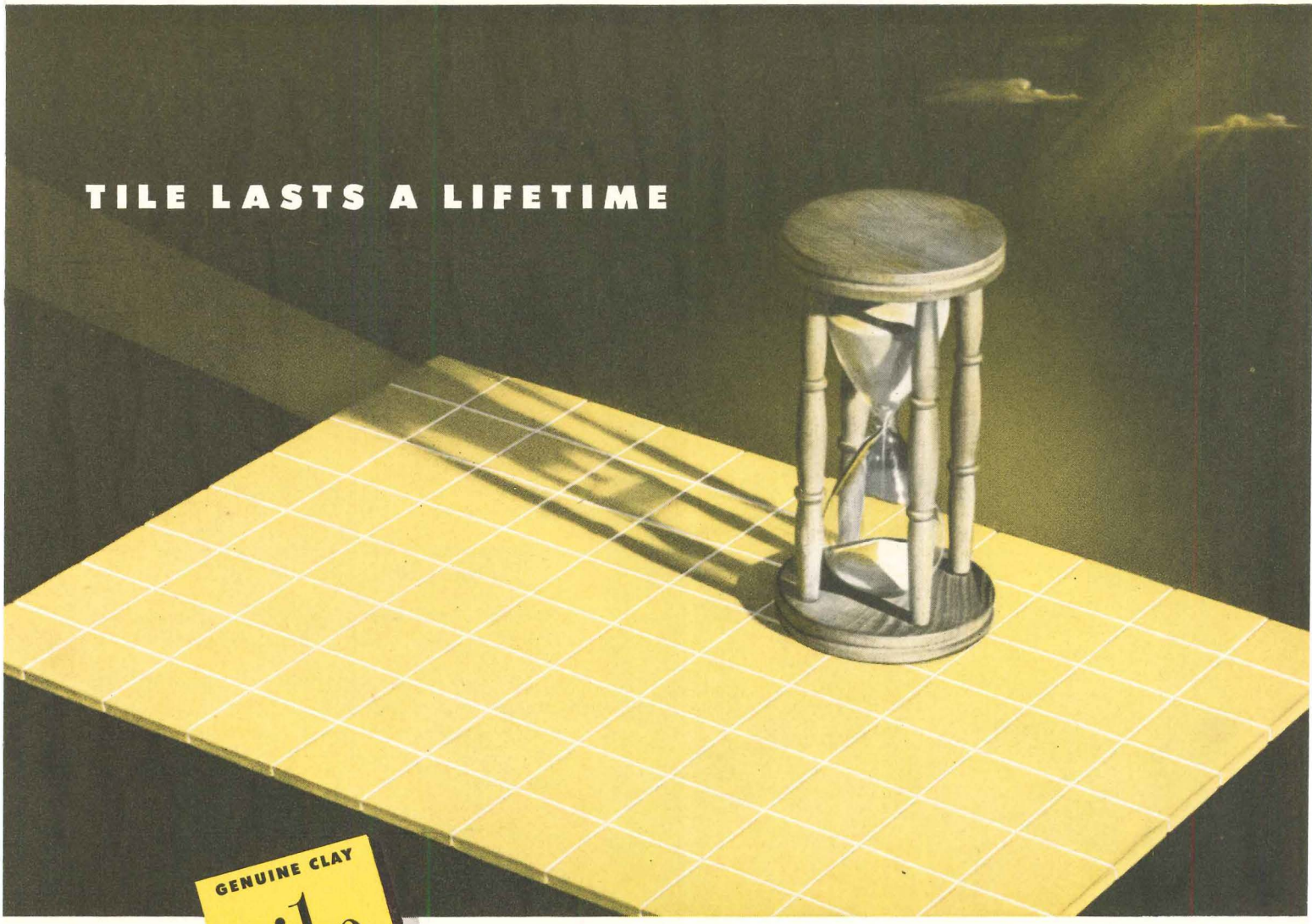
TILE IS FIREPROOF



TILE CLEANS LIKE CHINA



TILE DEFIES SCRATCHING



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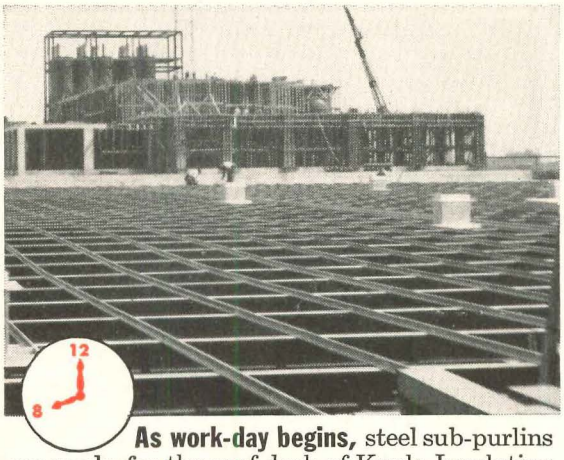
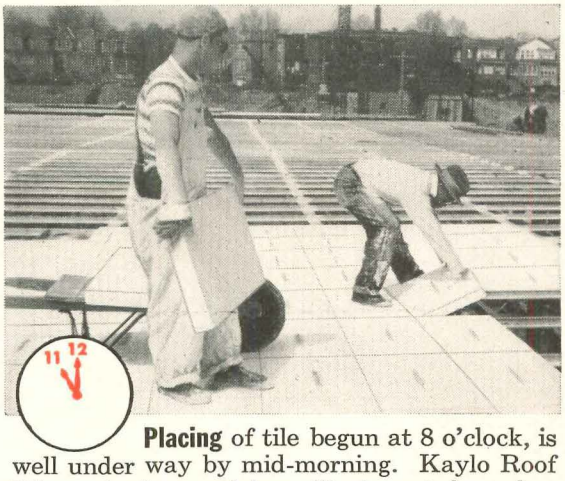
Plants in Camden, N. J.; Milwaukee, Wisconsin; New Castle, Pennsylvania; Redlands, California; Hondo and San Antonio, Texas

Speed—ON DECK...

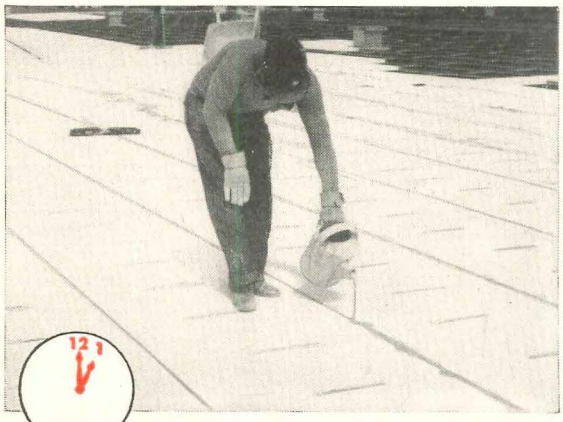
15,000 square feet of roof completed in 8 hours with Kaylo Insulating Roof Tile



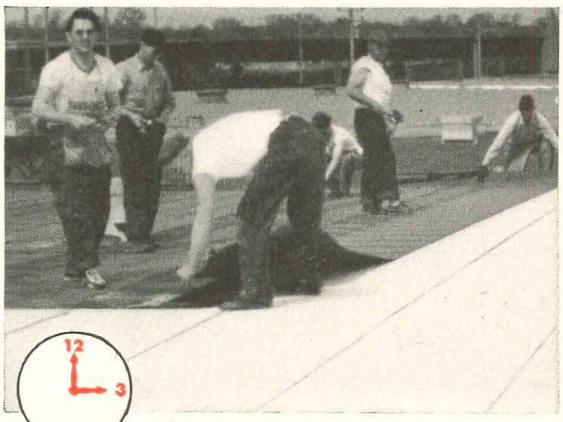
As work-day begins, steel sub-purlins are ready for the roof deck of Kaylo Insulating Roof Tile. Lightweight Kaylo Tile (only 5 lbs. per sq. ft.) permits the use of lighter and more economical structural members and foundations.



Placing of tile begun at 8 o'clock, is well under way by mid-morning. Kaylo Roof Tile—a hydrous calcium silicate, *not glass*—has billions of sub-microscopic air spaces giving it light weight and low thermal conductivity.



Grouting of end joints, including cleaning off excess grout, begun shortly after first tile were placed, is almost finished. Kaylo roof deck is incombustible; has more than adequate strength for typical roof loads.



Final Step. Covering of the Kaylo roof deck with conventional built-up roofing materials was started as soon as the first section had been grouted. By 4:30, 15,000 sq. ft. of roof has been finished in an eight-hour work-day.

For complete details on Kaylo Insulating Roof Tile, write Dept. N-211, Owens-Illinois Glass Company, Kaylo Division, Toledo 1, Ohio.

see our CATALOG in SWEET'S FILE ARCHITECTURAL

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... first in calcium silicate

...pioneered by OWENS ILLINOIS Glass Company

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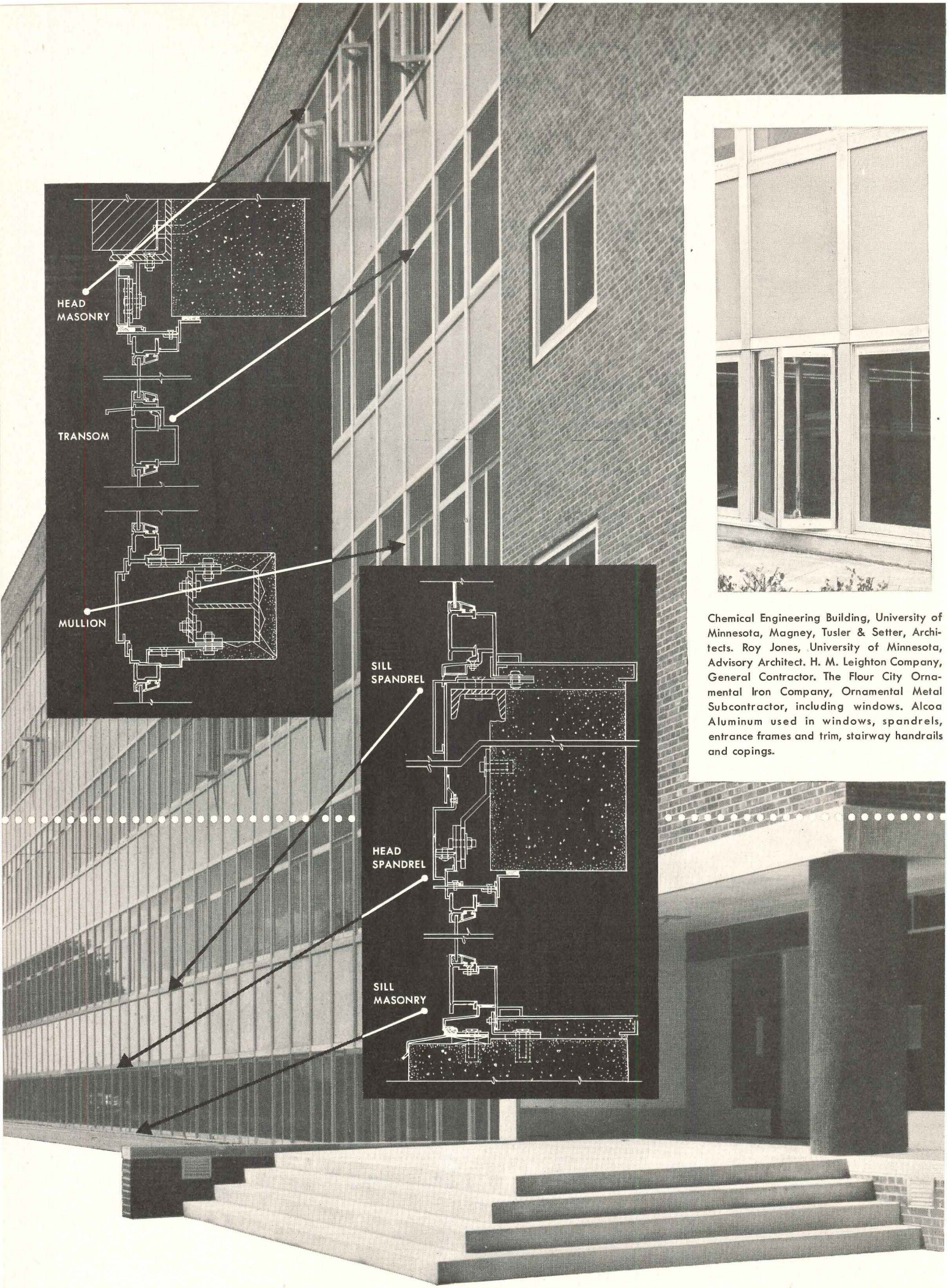
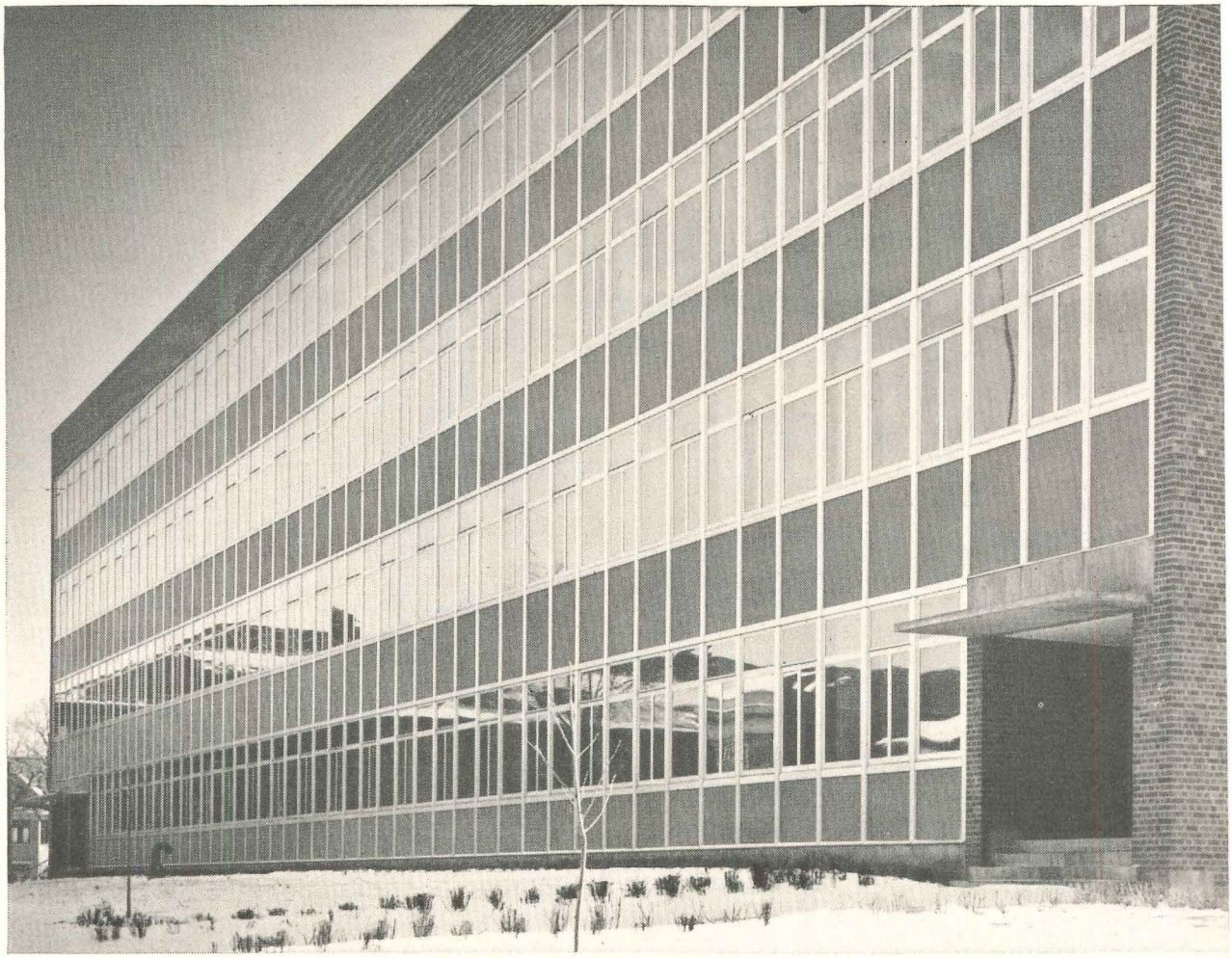


Chemical Engineering Building, University of Minnesota, Magney, Tusler & Setter, Architects. Roy Jones, University of Minnesota, Advisory Architect. H. M. Leighton Company, General Contractor. The Flour City Ornamental Iron Company, Ornamental Metal Subcontractor, including windows. Alcoa Aluminum used in windows, spandrels, entrance frames and trim, stairway handrails and copings.



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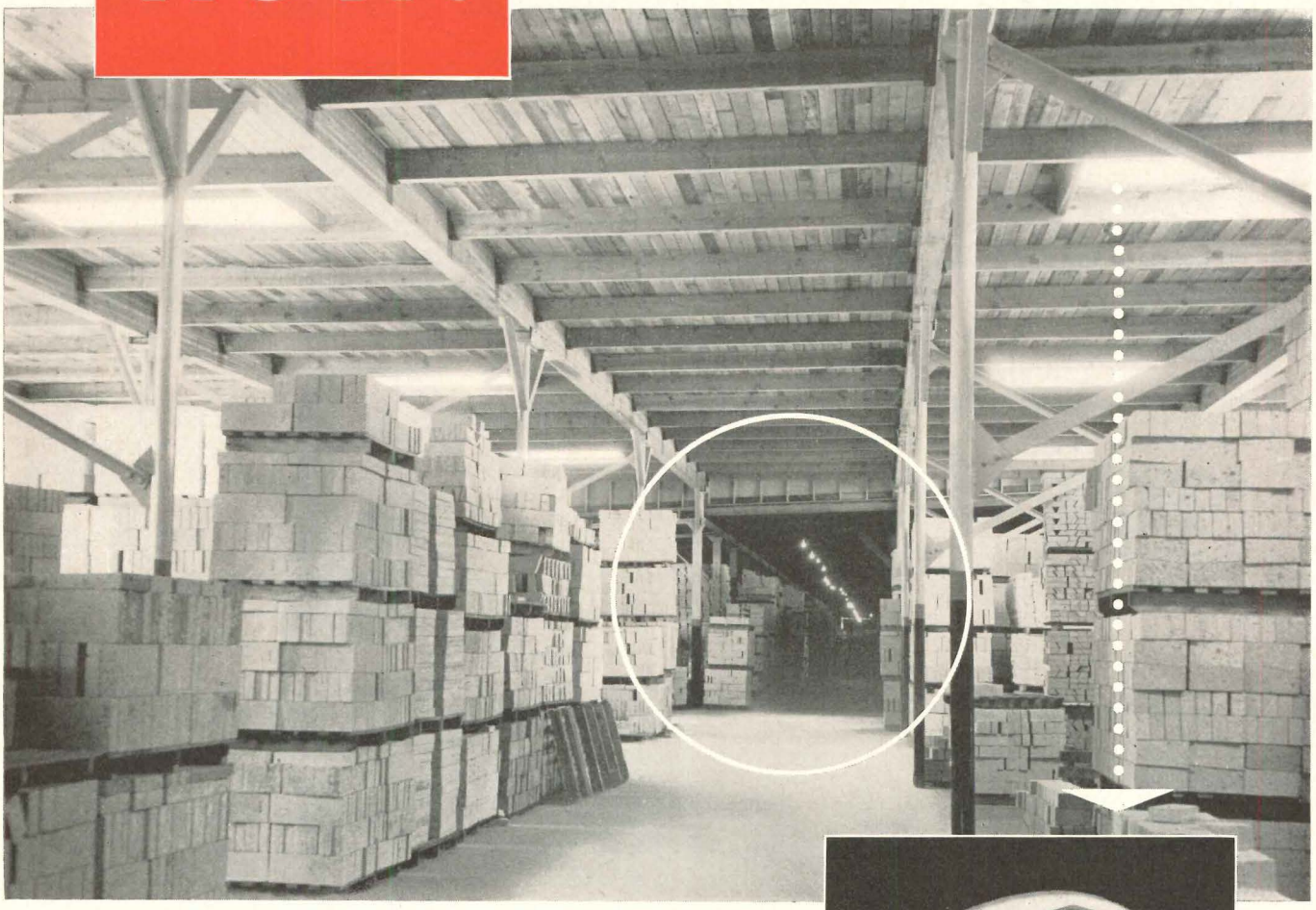

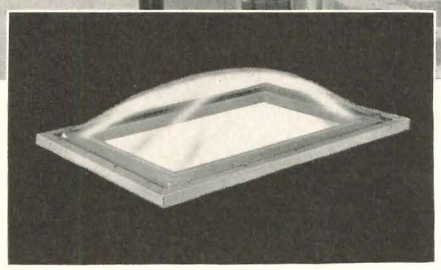

***"Elimination of electric lighting** during daylight hours, better distribution of light to create better working conditions . . . consequently safer conditions and better inspection of the merchandise" are the reasons of the Lindblad Construction Company for recommending Wascolite Skydomes in the new addition to the General Refractories Co. plant, Rockdale, Ill. Note sharp contrast between daylighting by Skydomes and illumination by incandescent lamps in adjoining structure (circled).*

Thousands of dollars annually in power costs alone can be saved with Wascolite Skydomes . . . world's most efficient daylighting units. Improved production, safer working conditions, and elimination of lighting maintenance for daytime operations are also achieved.

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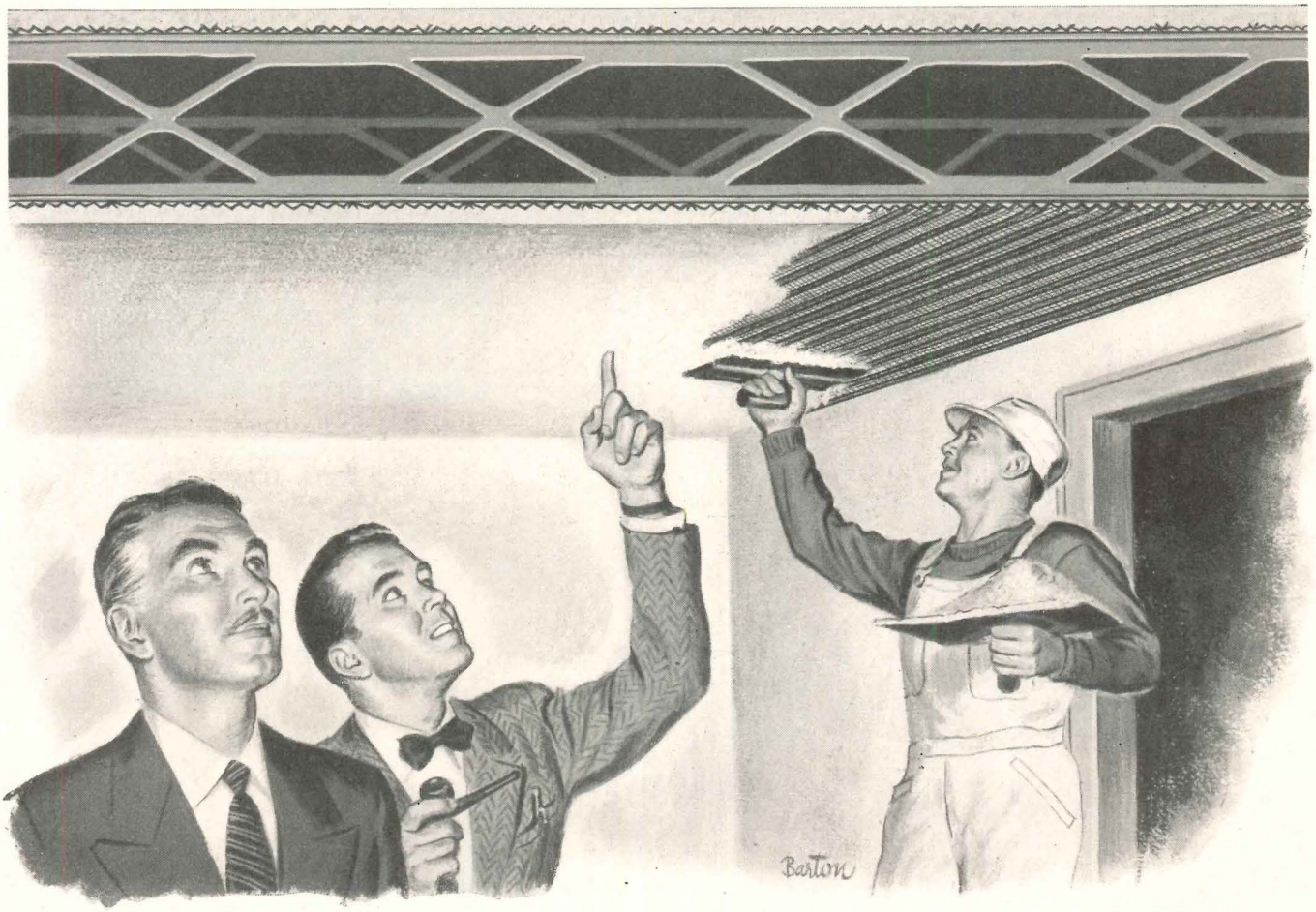
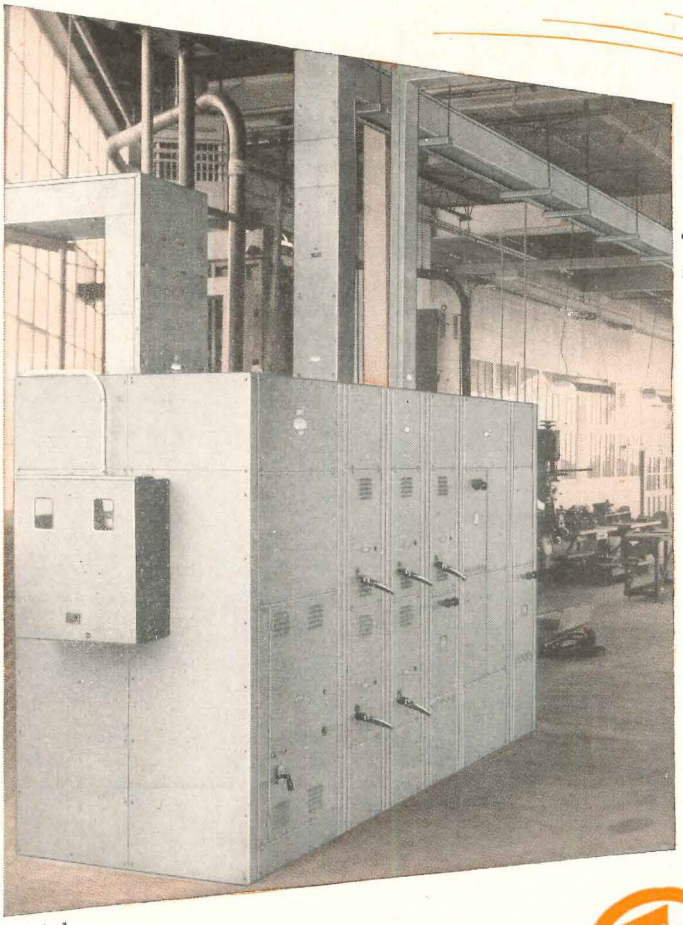
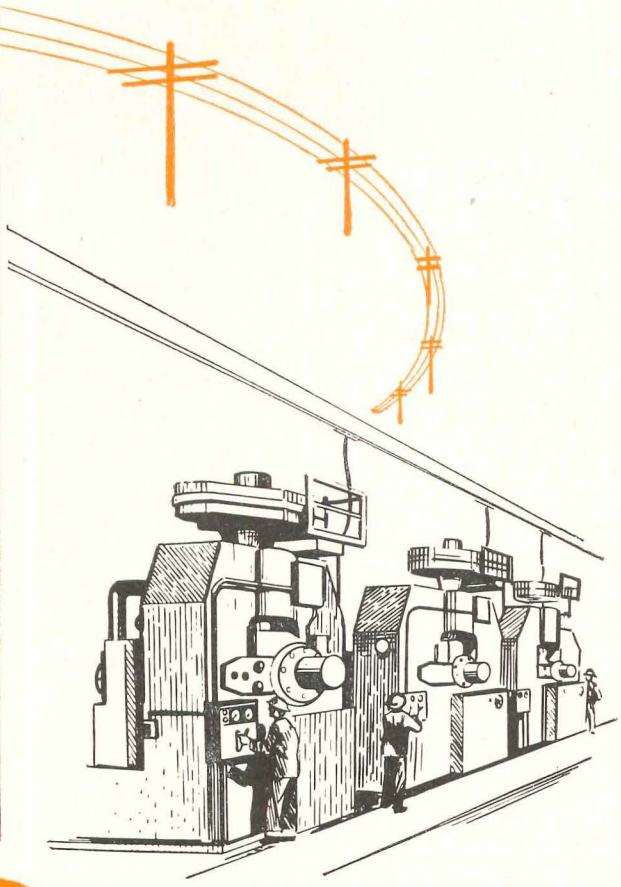


BETHLEHEM OPEN-WEB JOISTS

From Service Entrance to Machine





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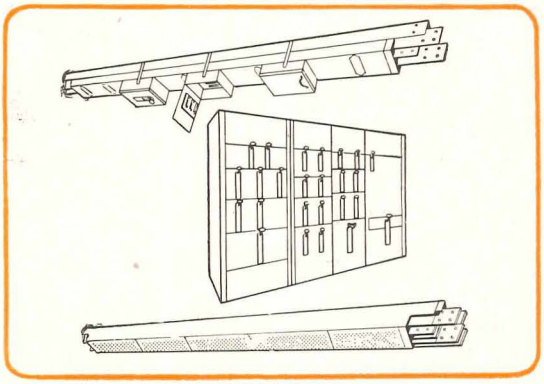

A typical Ⓕ Installation is shown in the photo above (top left). Features include Ⓕ High Efficiency busduct to bring power into the plant from service entrance, a Ⓕ dead front Switchboard, and Ⓕ Power Plugin to carry power to machines.

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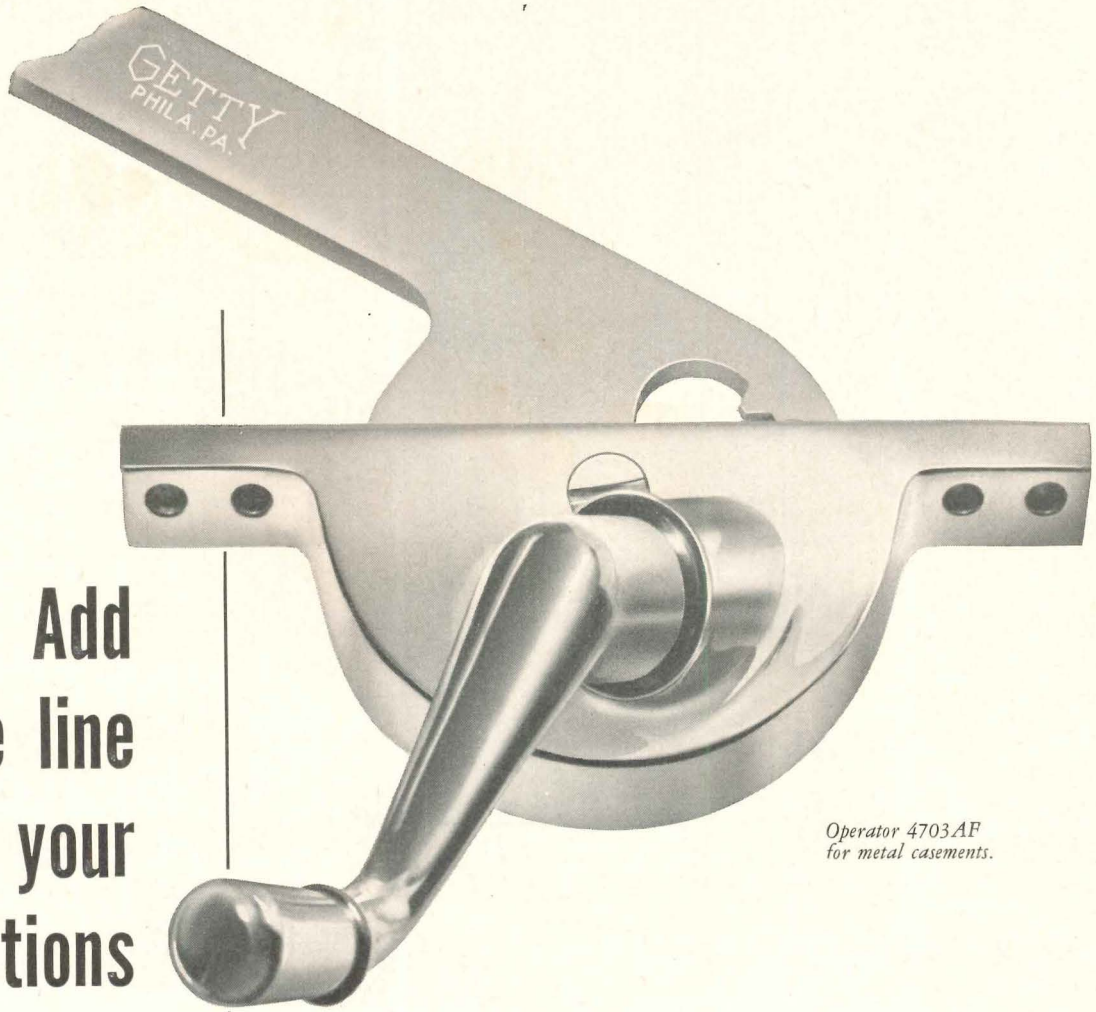

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GETTY Operator 4703AF is the only *internally* geared metal casement operator. This exclusive feature permits the entire length of the worm to be engaged at all times with the gear teeth—assuring "fingertip" control and a lifetime of faithful service.

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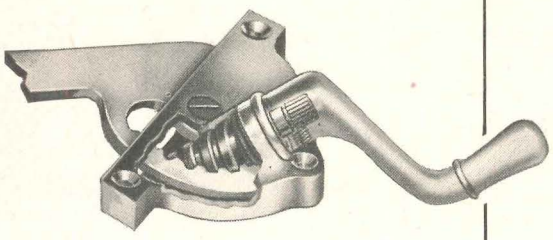

Operator 4703W for wood casements — cutaway shows internal gearing.

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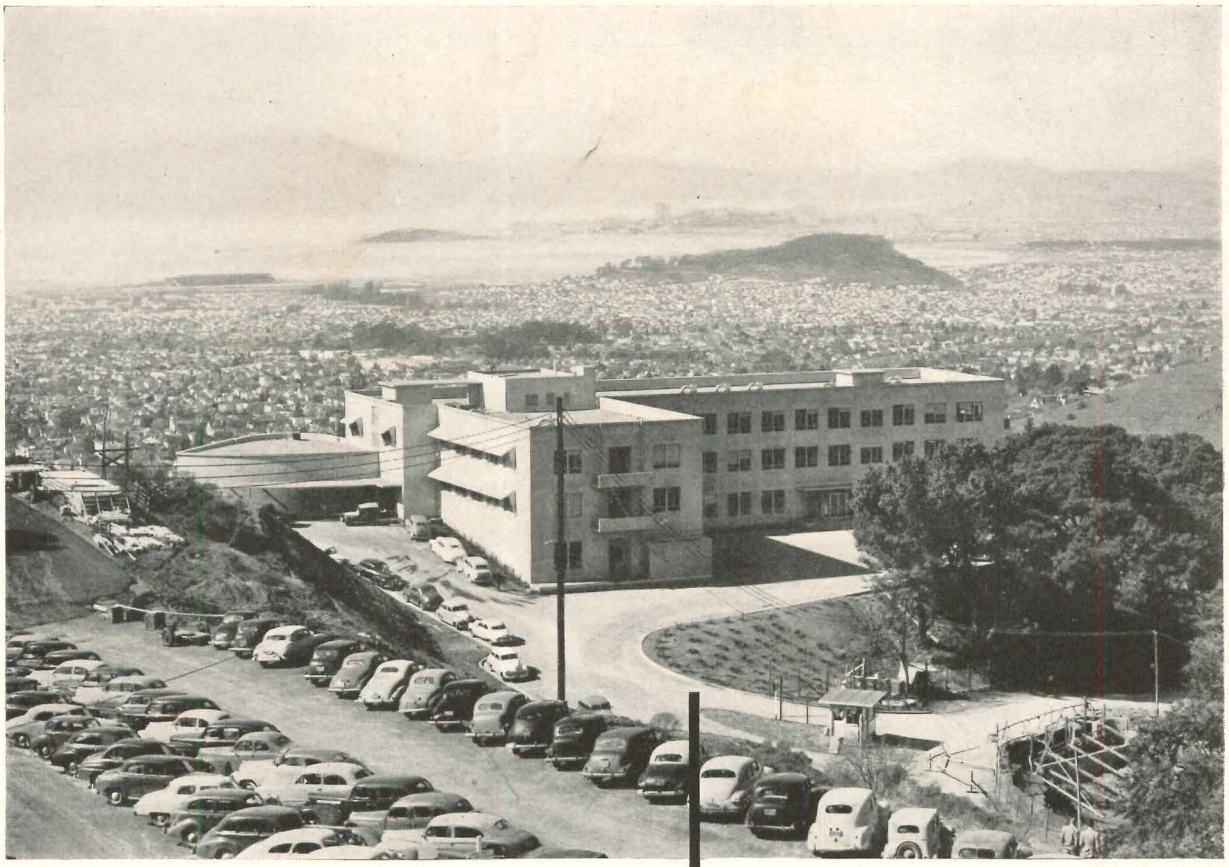


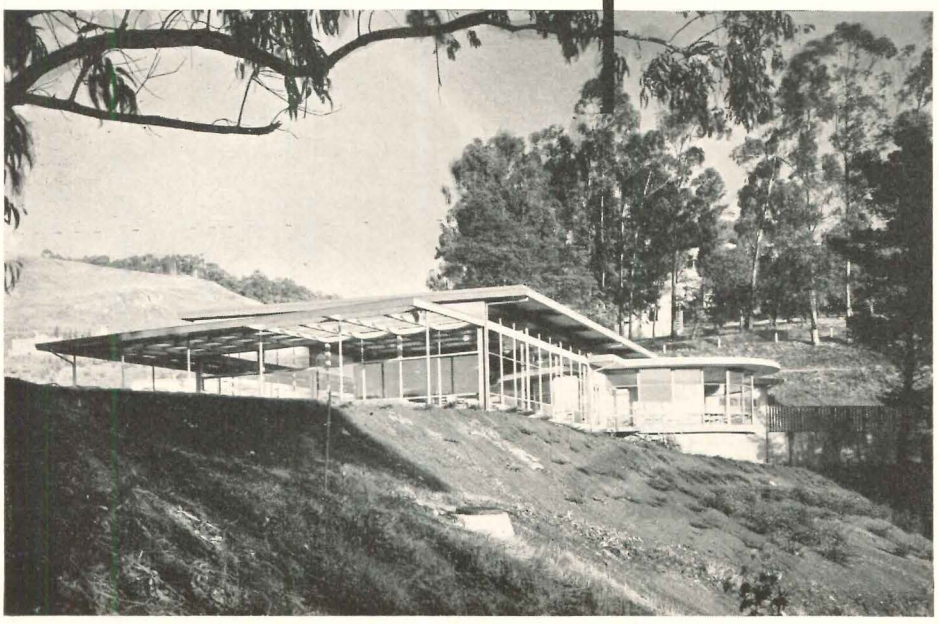
CENTRAL LABORATORY

A-E RESEARCH BUILDINGS

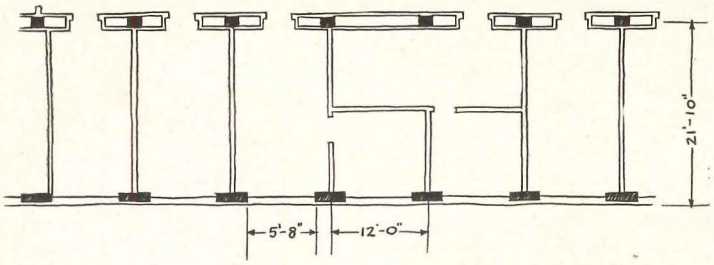
U. S. ATOMIC ENERGY COMMISSION . . . UNIV. OF CALIFORNIA

Hertzka & Knowles, Architects

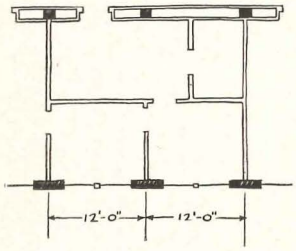
CAFETERIA



Photos: Ernest Braun



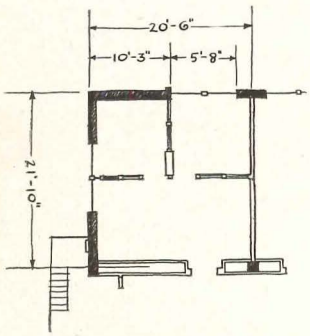
Plans, left and below, show the 12-ft modulus and single row of interior columns which were found most adaptable to space requirements of individual laboratories. Usable wall space was needed on all four sides of each laboratory, and in this building large glass wall areas were found to cause serious problems. Hence a fairly small window unit was centered in each bay



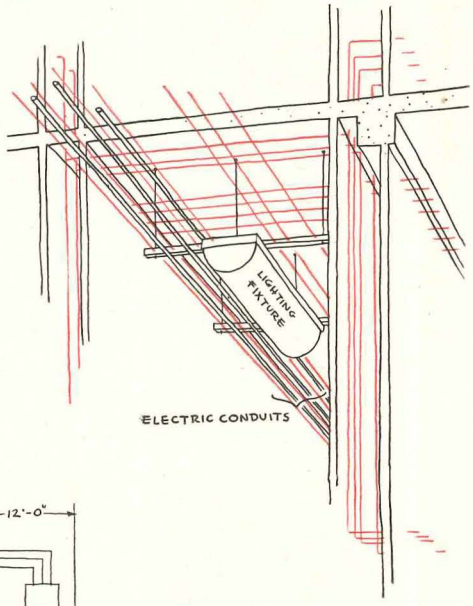
A.E.C. BUILDINGS

CENTRAL RESEARCH LABORATORY

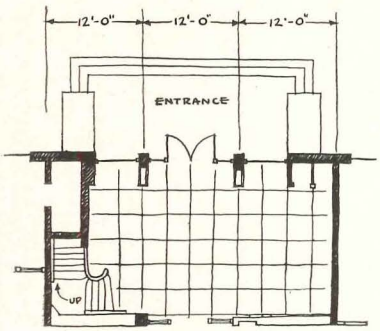
Perspective and detail show exposed plumbing and services at ceiling of second-floor corridor with risers running in walls to other floors. Air supply duct is furred in first-floor corridor ceiling, return exposed in third-floor corridor. Furred spaces, which might constitute hazards, are eliminated from individual laboratories

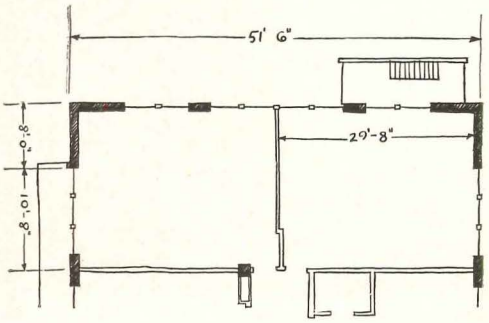


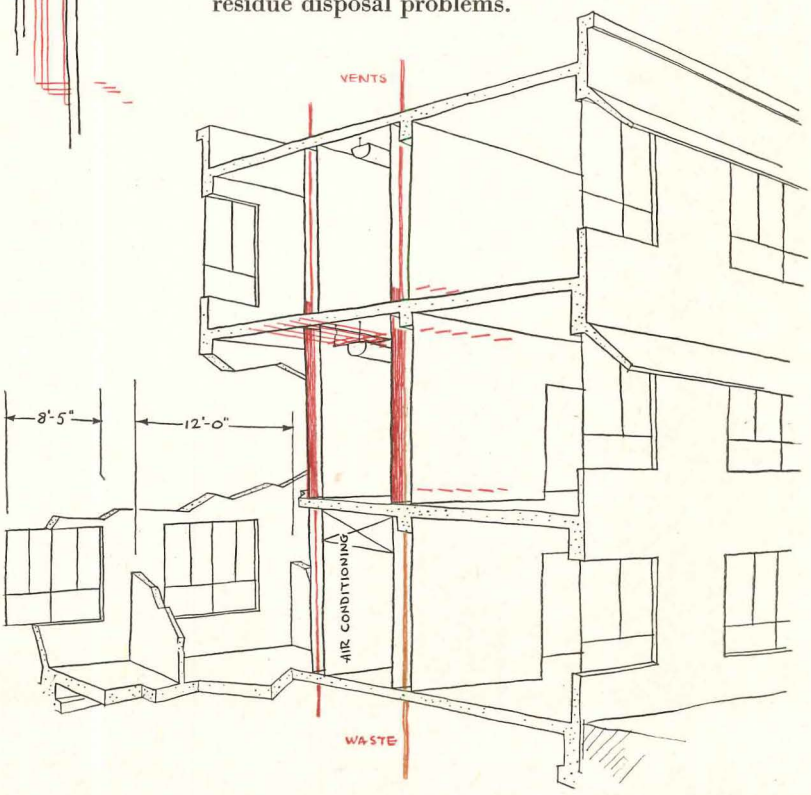
Location of chemical and medical labs on top floor permits simple ventilating system (pressurized corridors exhausted through rooms, blowers for greater airflow when needed) and short duct runs



THIS CENTRAL RESEARCH LABORATORY differs little from the conventional industrial research laboratory. Its first two floors house administrative areas, etc., and offices and laboratories for physicists. On its third floor are conducted experiments using one curie or less of radioactive substances, but structurally the third floor is like the others. This could be done because, where quantities of active materials and radiation hazards are small, the building can be designed in accord with what has been nicknamed the "concentrate and contain" philosophy. Under such a program only the small content of a box laboratory, within which all experiments with radioactive substances are conducted, is "hot." Negative pressure within the box insures that the small volume of contaminated air will pass through a filter before being exhausted. This simplifies ventilating problems, and using box labs means that no excessively large, heavy equipment need be built into the structure. Such simplicity cannot be attained in an A-E lab designed according to the "dilute, disperse, decontaminate" theory which permits handling radioactive materials openly under hoods and entails extensive air treatment, laundry, water decontamination, and residue disposal problems.







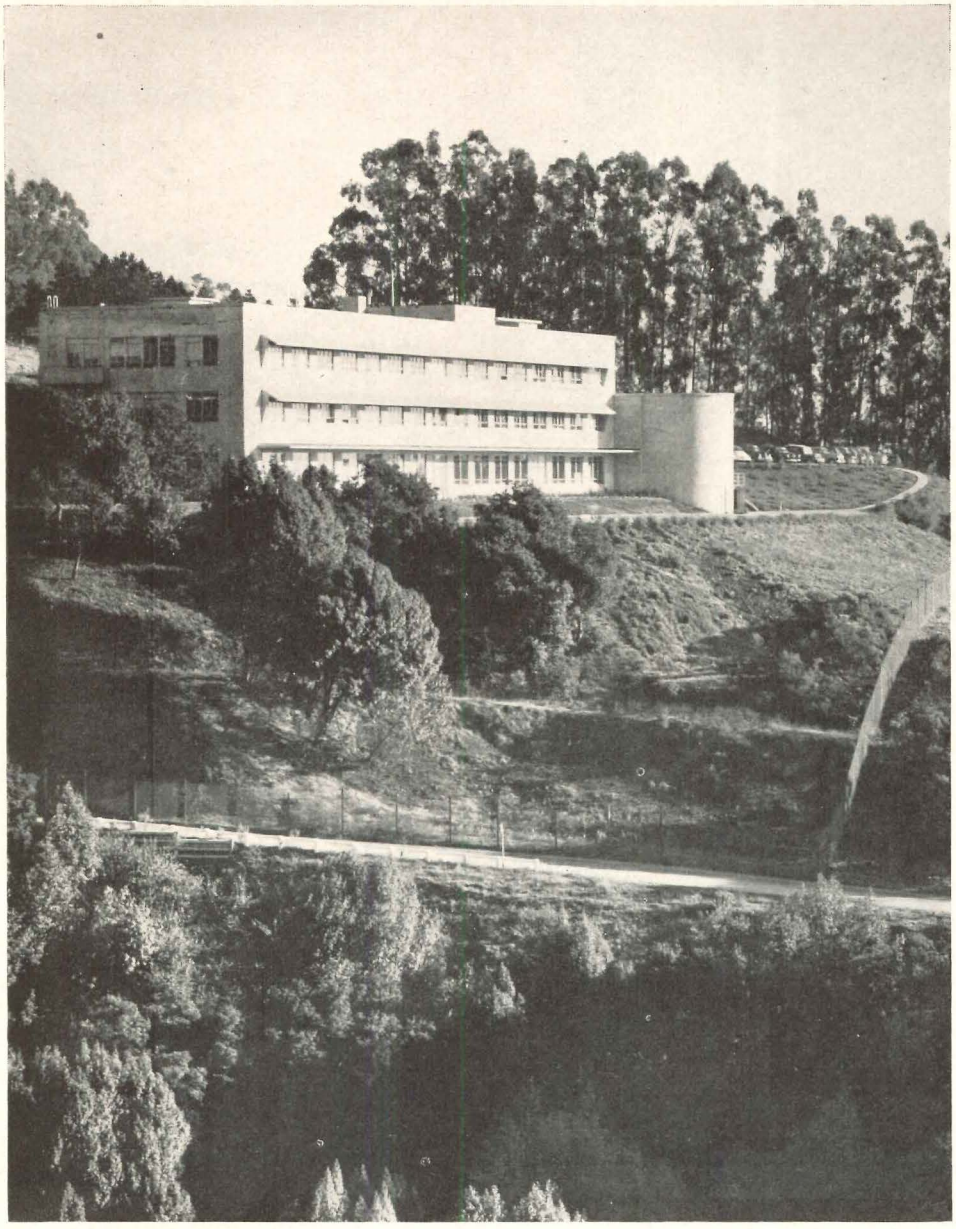
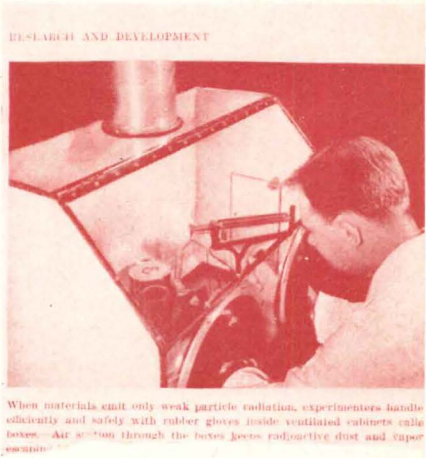


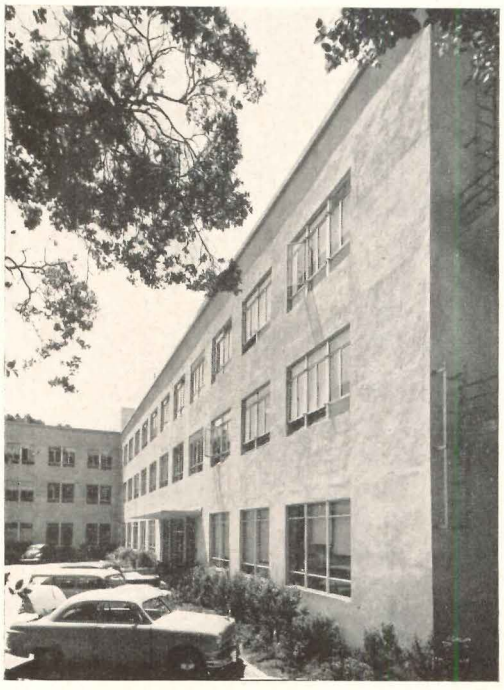
Photo below, reproduced from the Atomic Energy Commission's handbook, "Control of Radiation Hazards in the Atomic Energy Program," shows one type of cabinet or box. Worker inserts hands in protective gloves fixed to cabinet

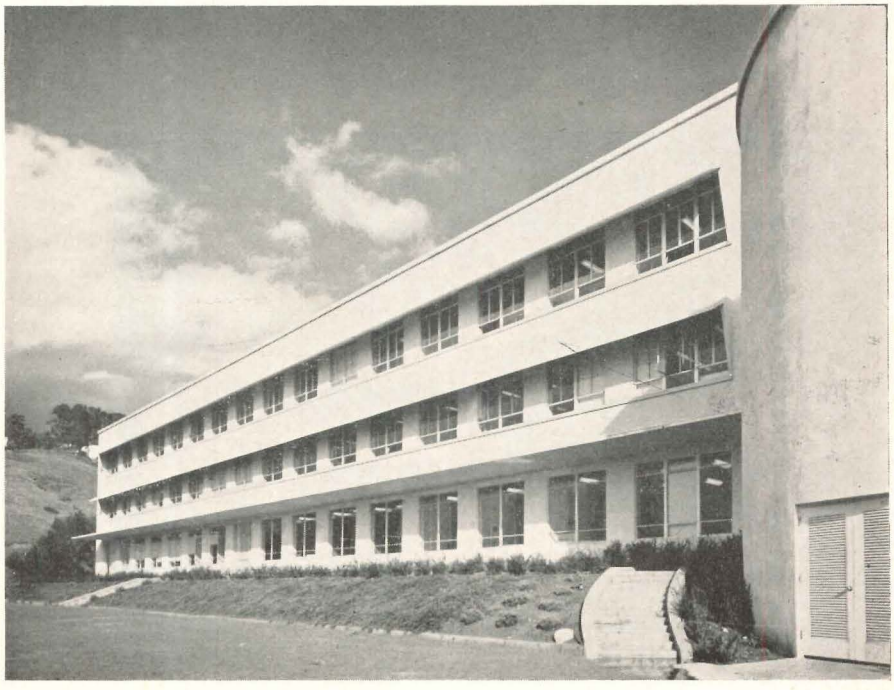


RESEARCH AND DEVELOPMENT

When materials emit only weak particle radiation, experimenters handle efficiently and safely with rubber gloves inside ventilated cabinets called boxes. Air suction through the boxes keeps radioactive dust and vapor

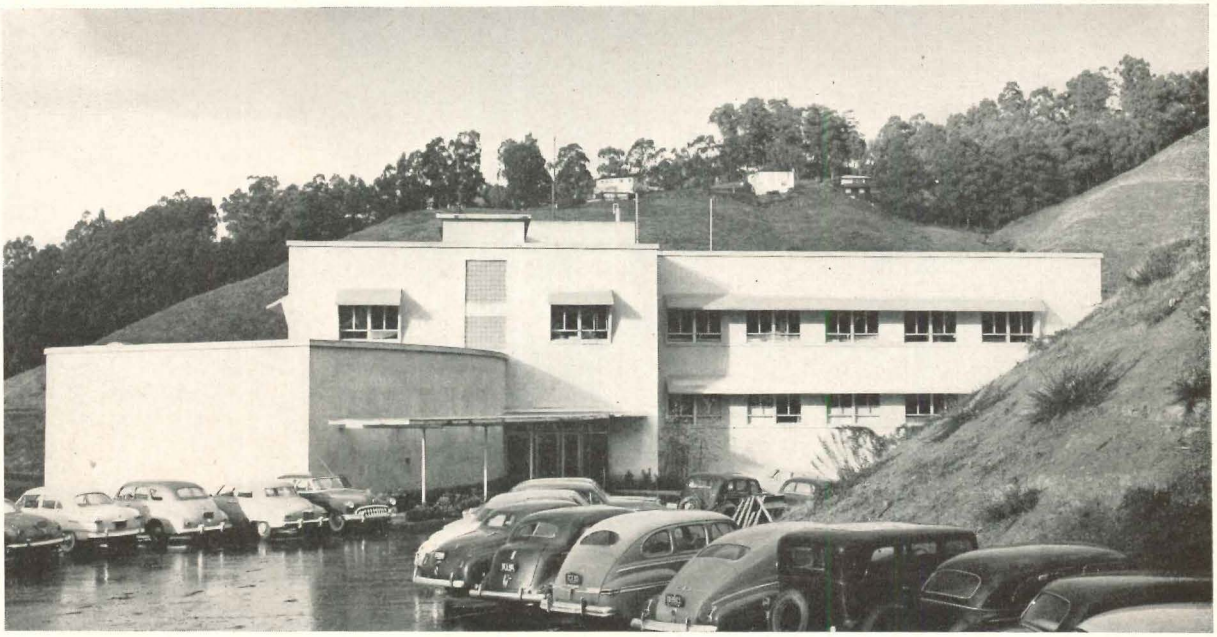
Photos: Ernest Braun



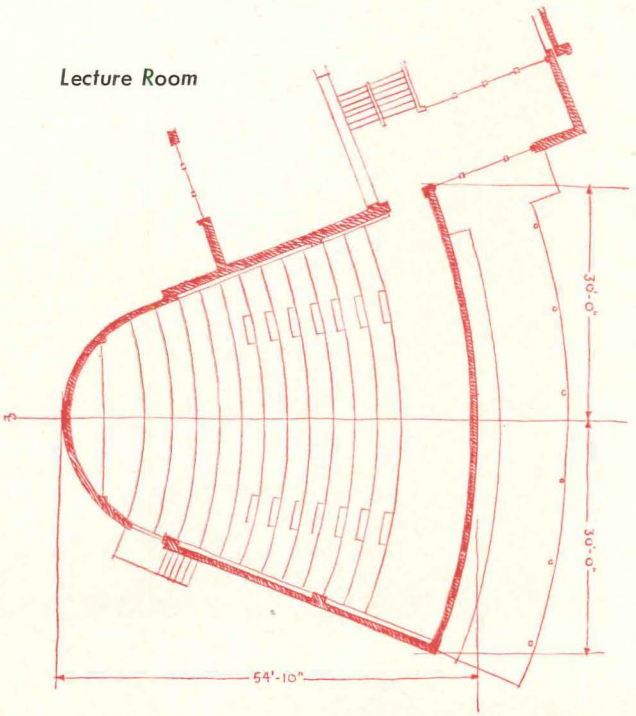


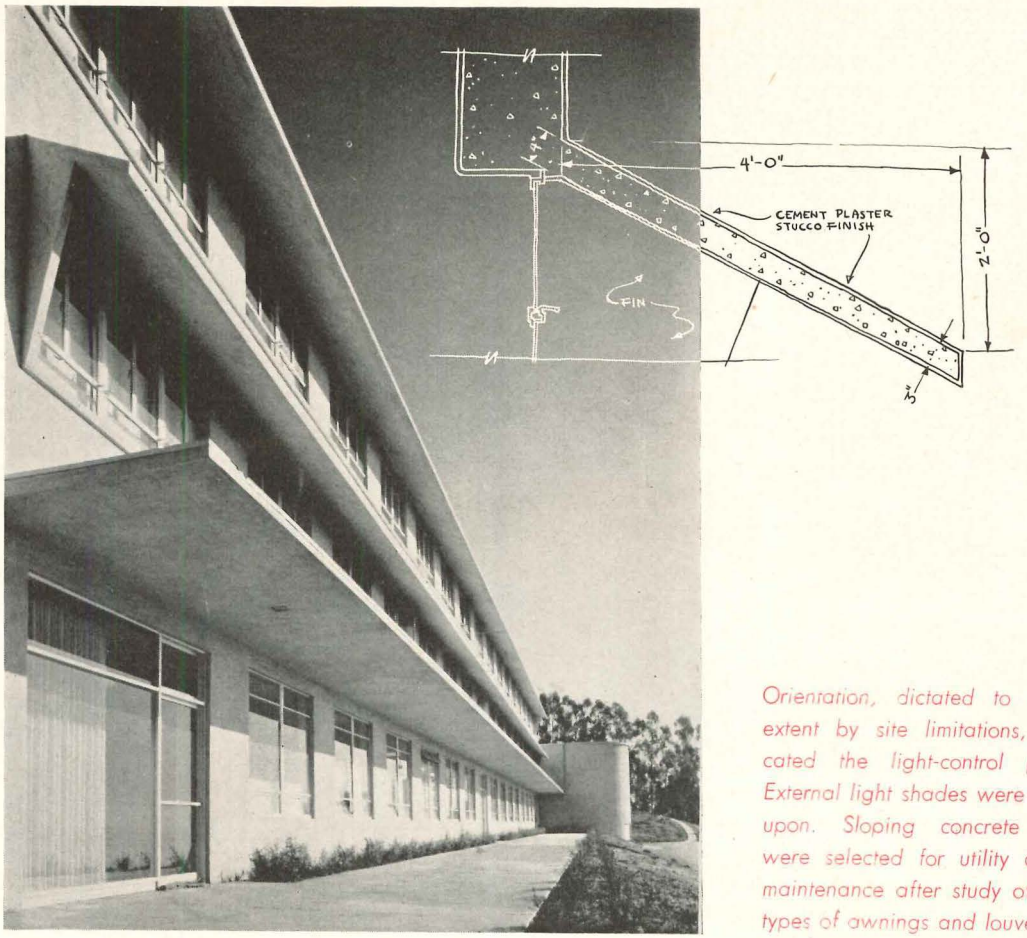
CENTRAL RESEARCH LABORATORY

Construction: reinforced concrete columns, floors, walls, roof. Interior partitions: wood stud for economy and easy removal. Interior walls are smooth plaster, ceilings acoustical tile and plaster, exterior cement stucco, windows steel, entrance doors aluminum



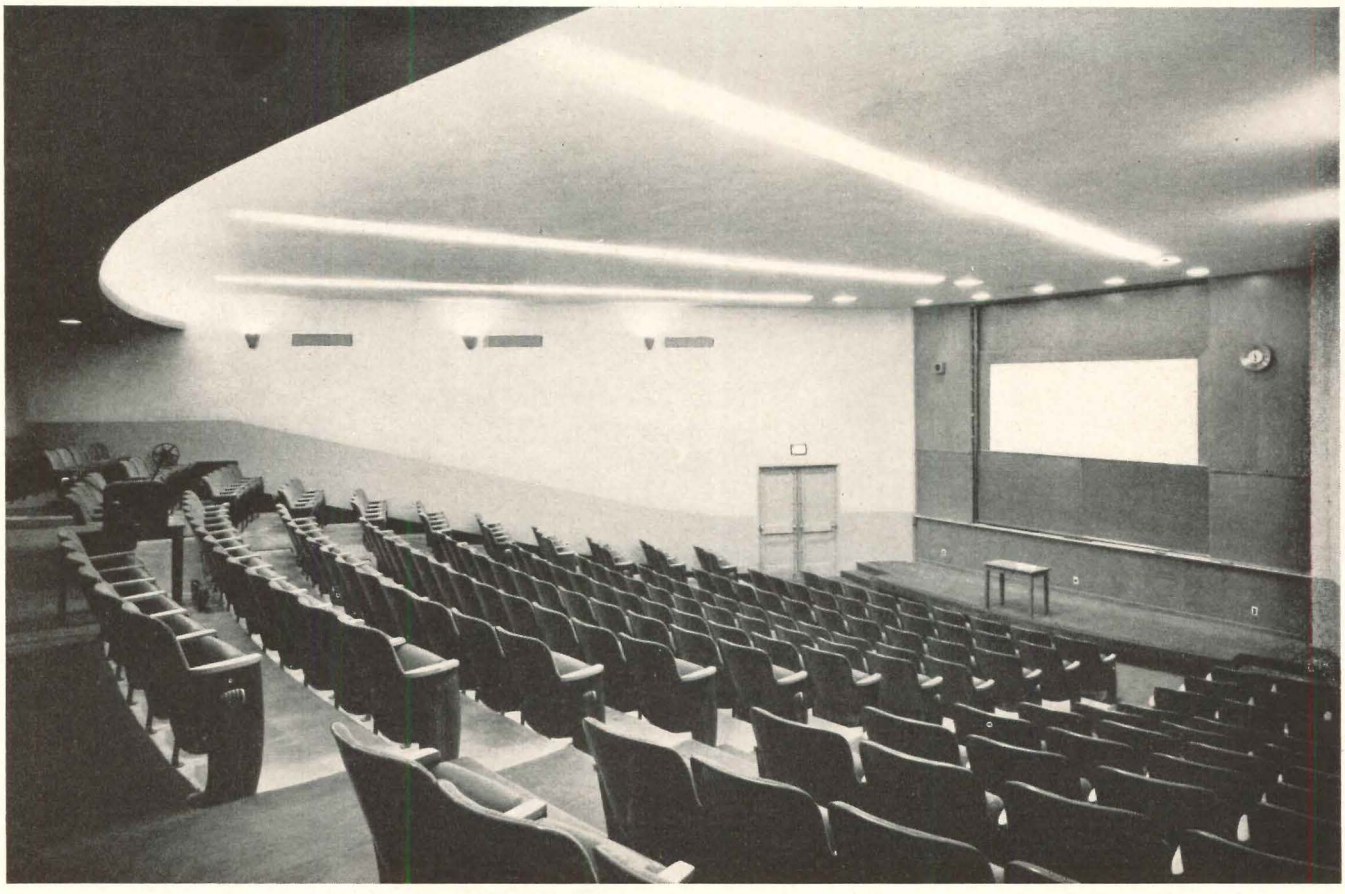
Lecture Room

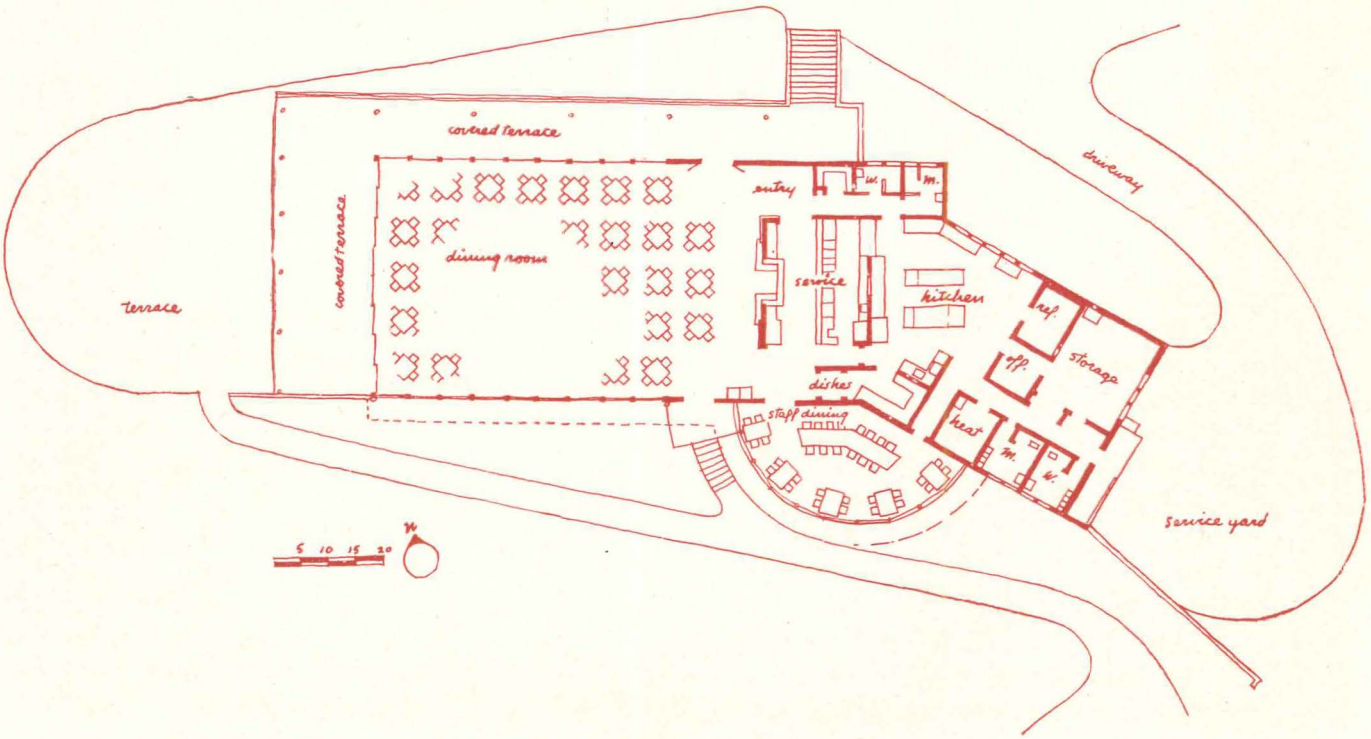




Photos: Ernest Braun

Orientation, dictated to a great extent by site limitations, complicated the light-control problem. External light shades were decided upon. Sloping concrete shades were selected for utility and low maintenance after study of various types of awnings and louvers




covered terrace
entry
w.
m.
driveway
dining room
service
kitchen
ref.
storage
off.
dishes
staff dining
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covered terrace
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N

CAFETERIA

Photos: Ernest Braun

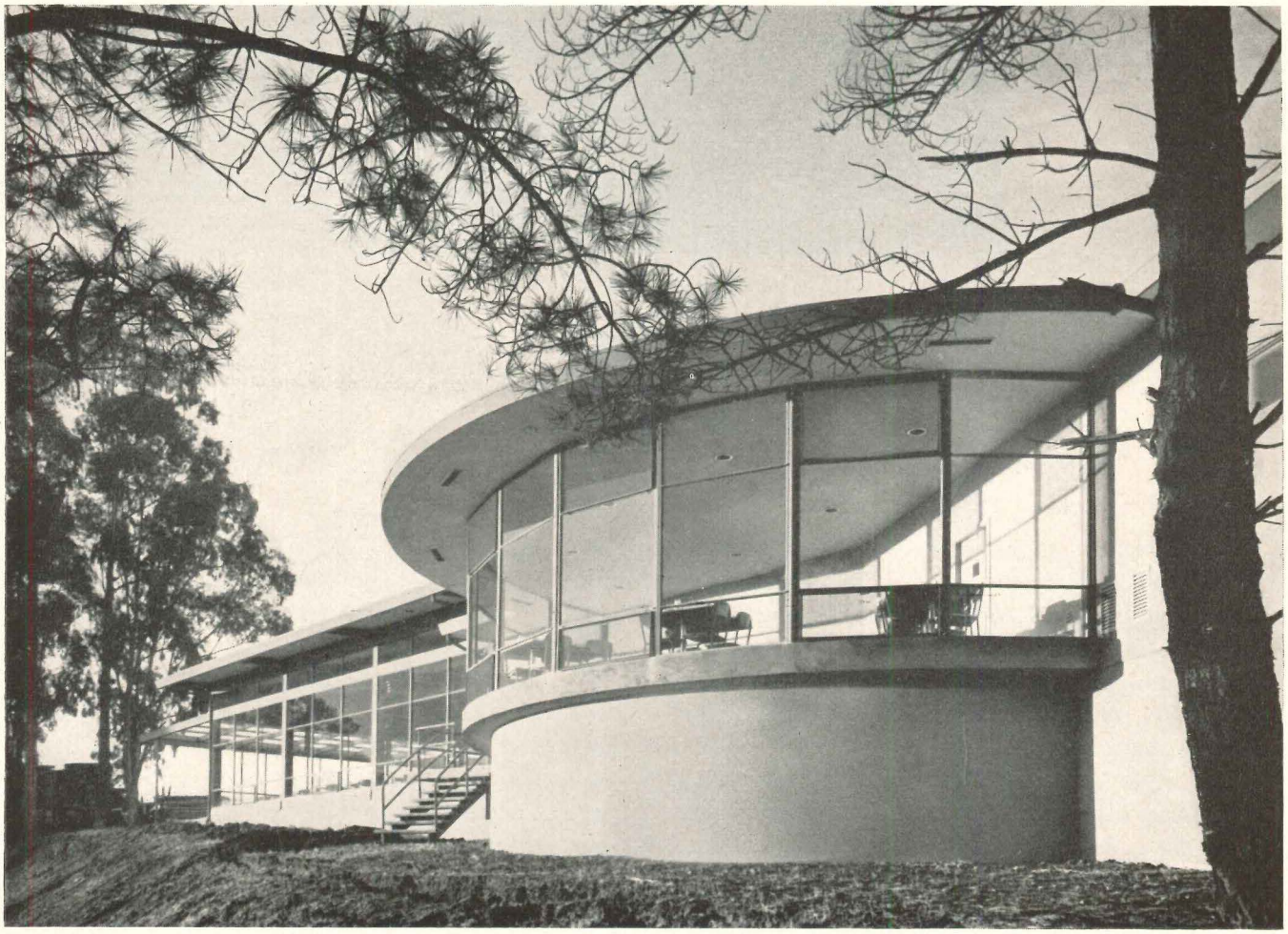
THE CAFETERIA at the University of California's radiation installation has a main dining room capable of seating two hundred and a smaller dining room for staff or guest luncheons. It is designed to serve only the laboratory personnel, comprised of mechanics of all trades, office and administrative workers and staff, and scientists.

All the available land is extremely hilly. Since it was desired that this building should not occupy space suitable for a more important or essential structure, selection of a site was limited to those which were considered marginal. The one finally chosen is sloping and has an inspiring view over Berkeley, San Francisco Bay and the Golden Gate, channeled down a ravine with trees on either side. Economy and provision of a pleasant atmosphere governed the Cafeteria's design.

To take advantage of the views and to establish an atmosphere conducive to relaxation, it was decided to create a glass-walled pavilion with ready access to several terraces for lunching outdoors in good weather. Strict economy of construction was important due not only to budget limitations, but also to the fact that the building is considered to be something less than permanent.

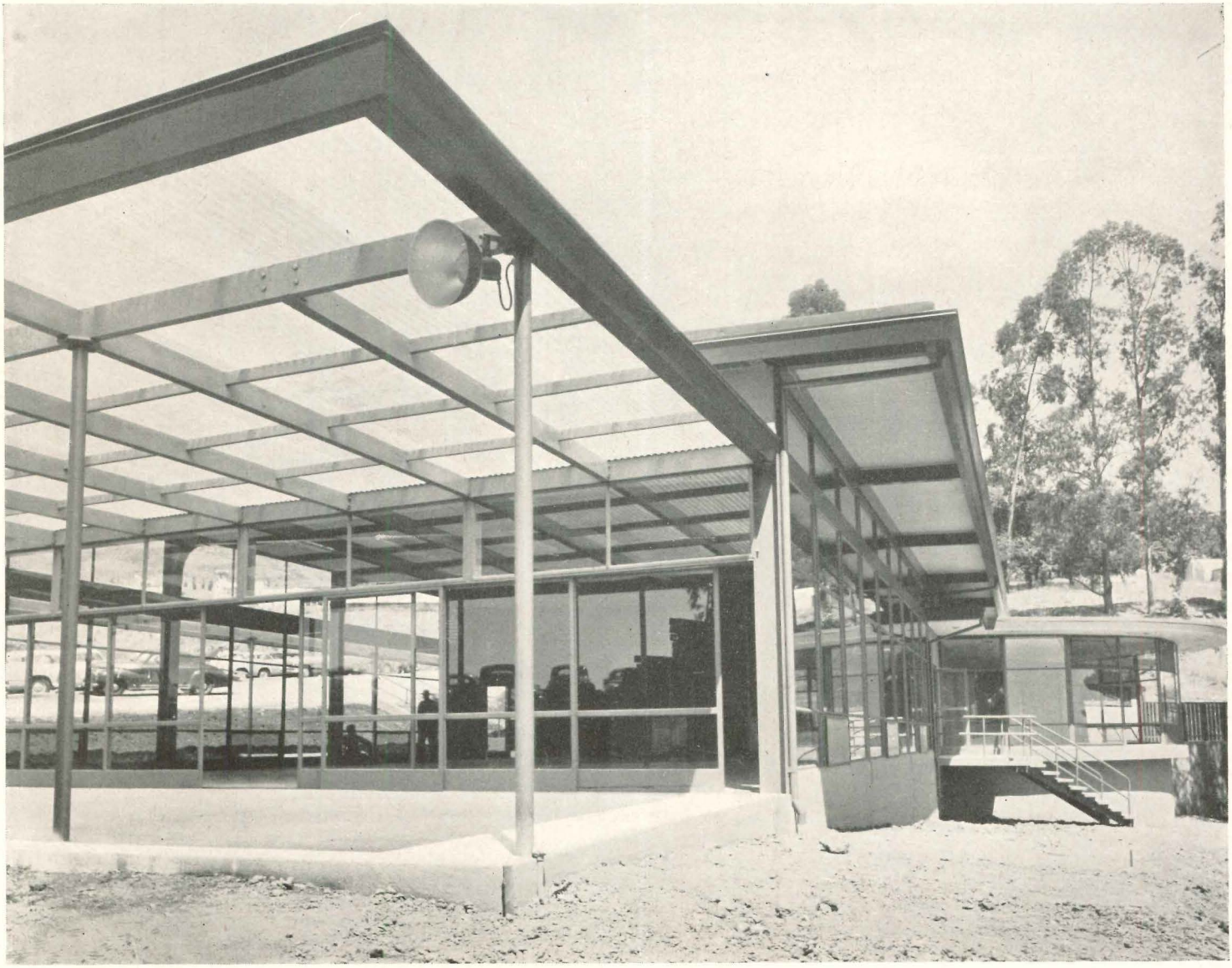
A.E.C. CAFETERIA

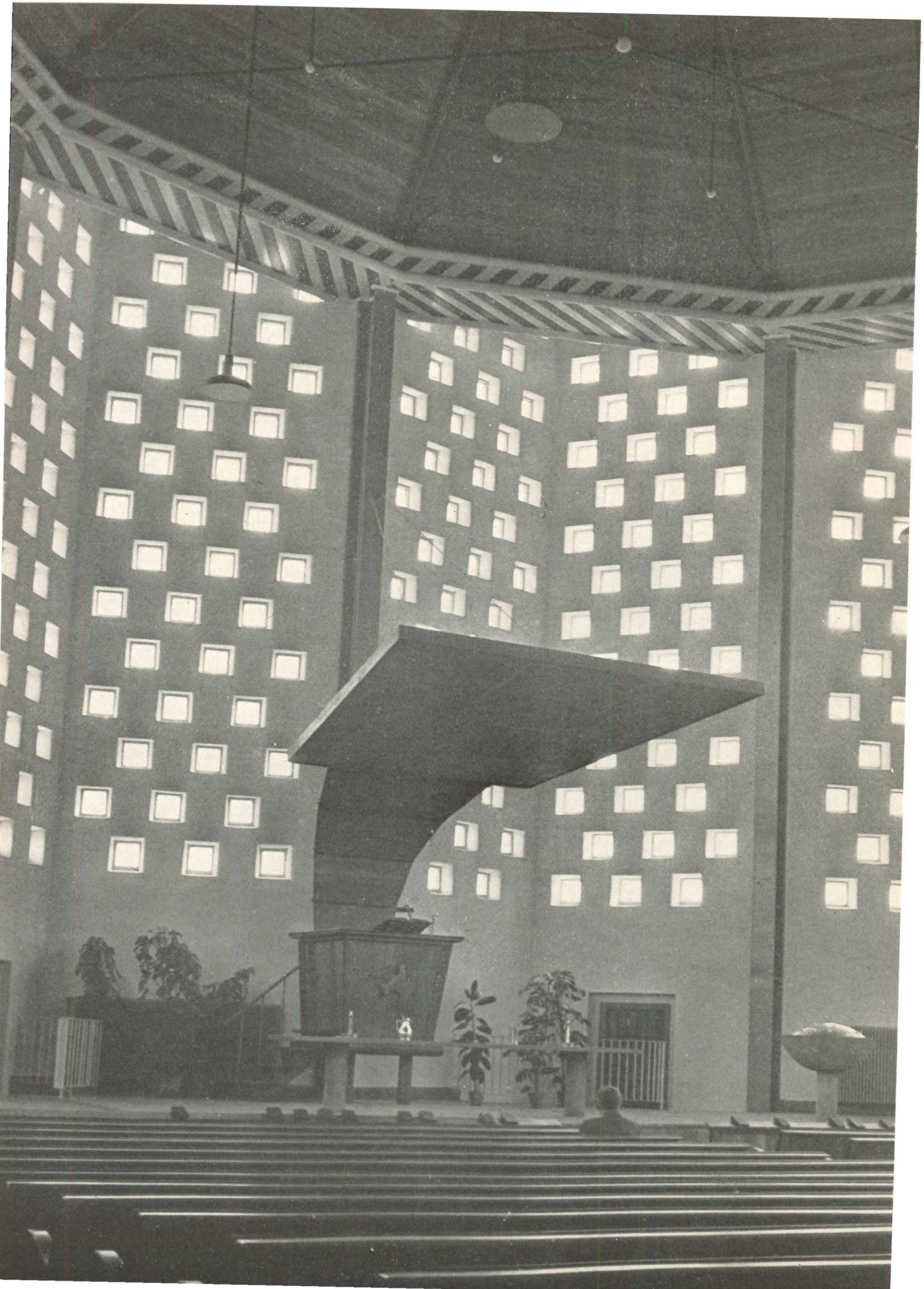
Dining rooms are constructed of rigid steel frames with wood purlins and 2-in. roof planks; kitchen is wood framed. Dining room floors are concrete slabs, radiant heated and covered with asphalt tile. Sash are steel in steel frames; ceilings, acoustical tile. Lighting fixtures were designed by the architects



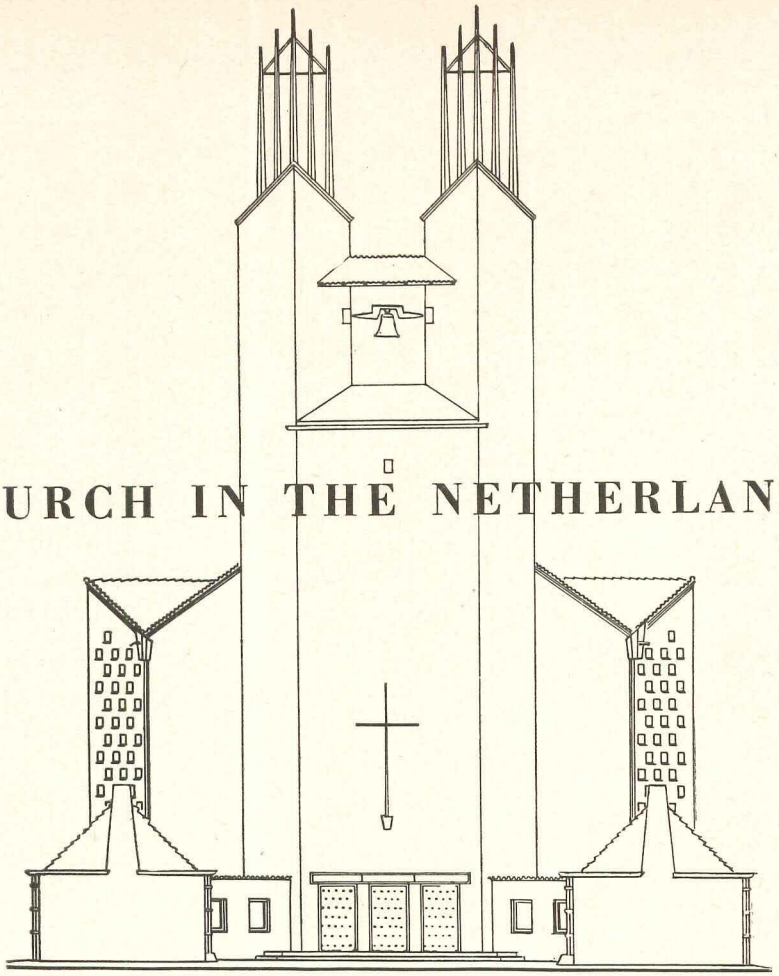
The Central Research Laboratory and, in a different fashion, the Cafeteria at the University of California show the effects of flexibility as a prime design consideration. In the Laboratory, though the building shell is concrete, because radioactivity is confined to comparatively small experiment boxes the structure is uncomplicated and interior partitions can be shifted relatively easily. The Cafeteria could be dismantled with ease. The two buildings, so different in appearance that they scarcely seem to have been designed in the same office, thus have much in common. In addition, the Cafeteria demonstrates that low-cost, temporary construction need not be ugly.

Photos: Ernest Braun





CHURCH IN THE NETHERLANDS



KRUISKERK (CROSS CHURCH), AMSTELVEEN

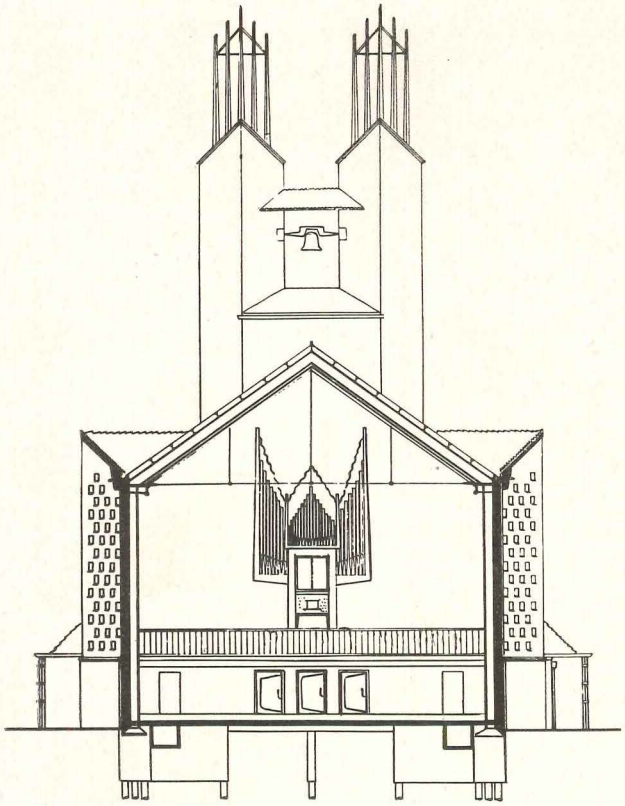
Marius Duintjer, Architect

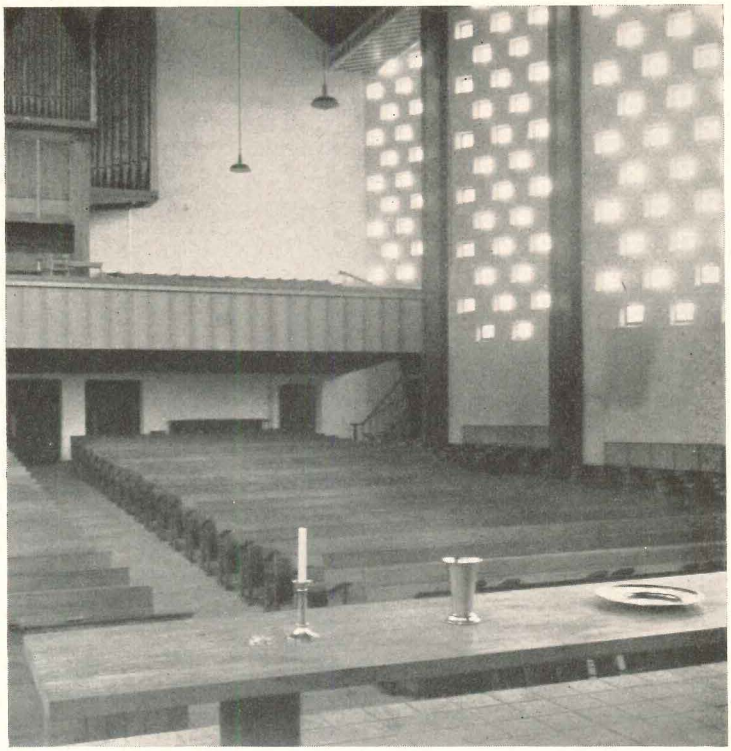
CHURCH BUILDING COMMITTEES are not always as far-sighted and intuitive as the one responsible for this Dutch Reformed Church in Amstelveen, near Amsterdam, The Netherlands. The Amstelveen committee instructed its architect that "every effort should be made to bring the church closer, in a modern and progressive manner, to the community," and that "we want a church, not a hall." More prosaic requirements were location of the pulpit

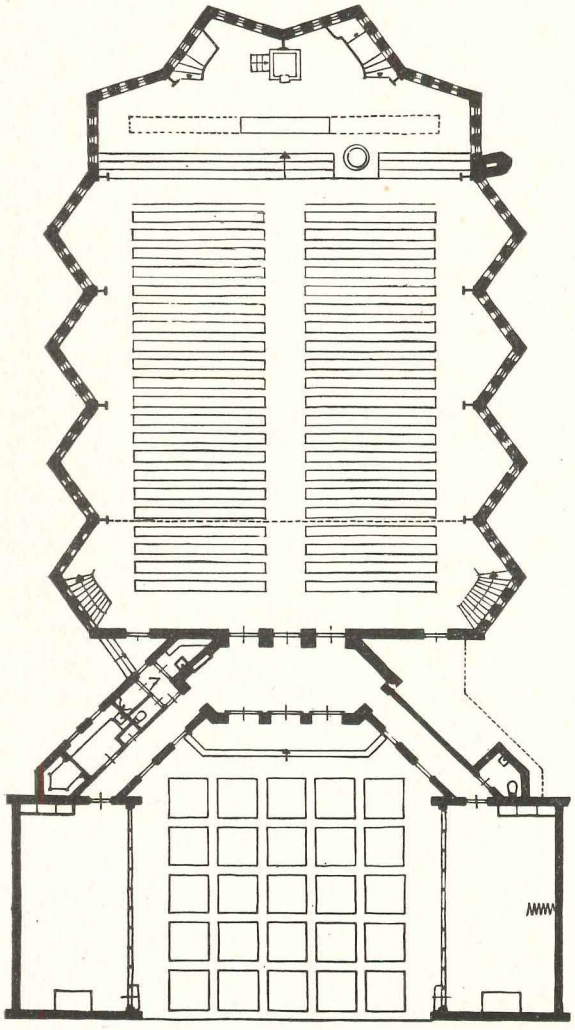
P. van der Weiden
Consulting Engineer

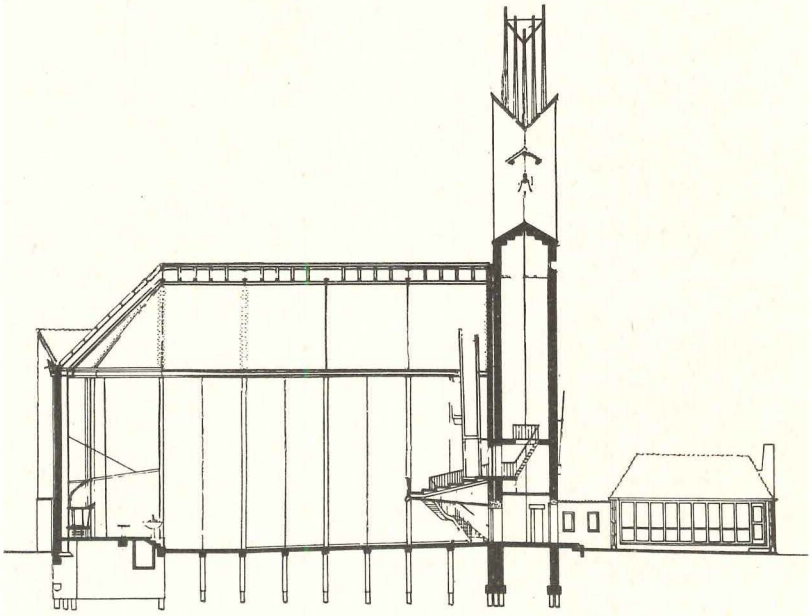
B. Guntenaar
Sculptor

Photos courtesy Netherlands Information Bureau







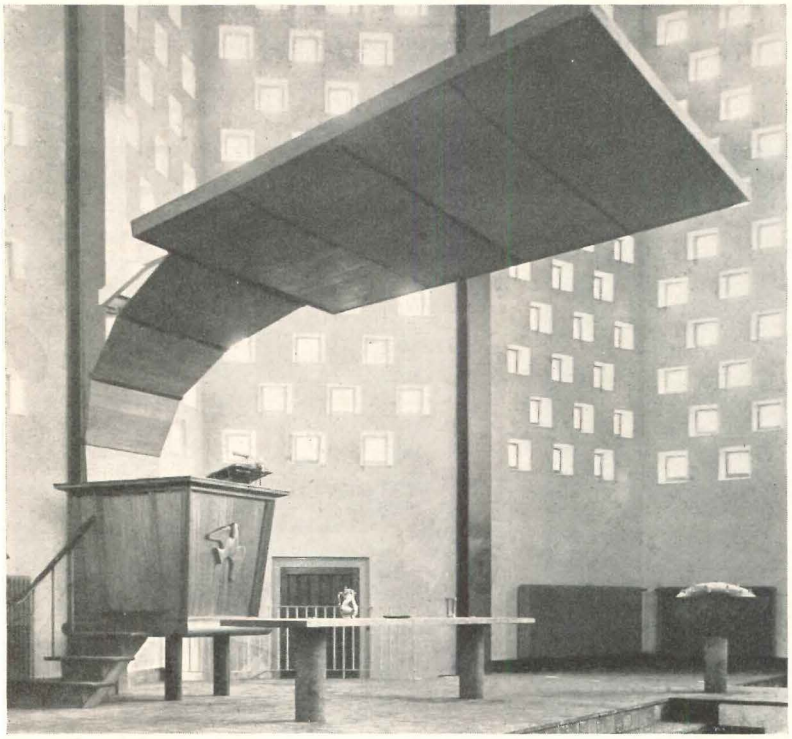


Top: organ loft is at rear of church to permit seating of 1000 in nave. Left: pulpit is at head of center aisle, with communion table directly below it; table can be extended (dotted lines) to accommodate a total of 65 communicants. Above: foundations are wood piles, approaches are concrete

in the center of the chancel, a large communion table and a large baptismal font.

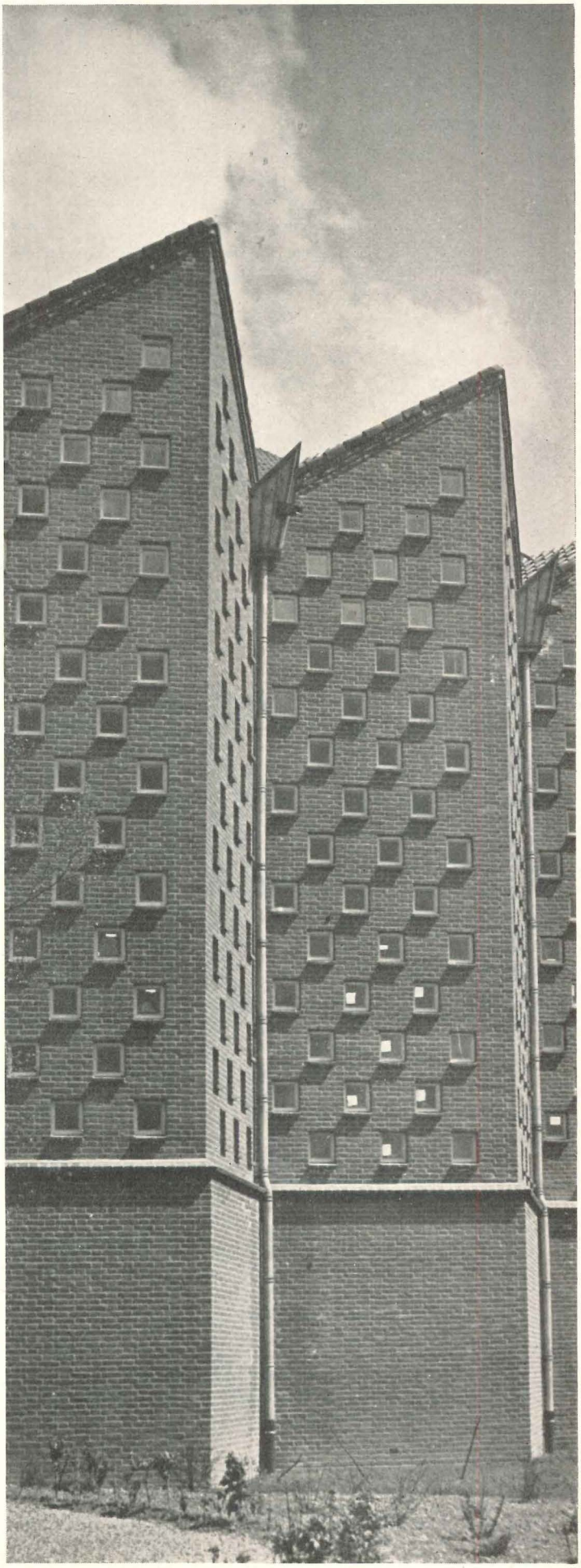
The site of the new church could not have been better chosen to stress the community relationship: it borders on a municipally owned park area (page 118) which, when fully developed, will include a promenade, a children's playground, and an open-air theater at its eastern end. The church itself eventually will be surrounded by open lawn, so that there will be no visible separation between it and the municipal property.

The idea of the centrally-located pulpit was the starting point in the design of the church. "The movement in the Reformed Church in favor of a reduced length of nave, in the direction of the pulpit," the architect comments, "has grown little by little. We also sought this moderation of the longitudinal direction in fixing the transverse axes. . . . This was the reason for cutting into the outer walls."



Photos courtesy Netherlands Information Bureau

Above: carved dove, symbolic of the Holy Ghost, on front of the pulpit was designed by Guntenaar; sounding board over pulpit has as much esthetic value as practical



The most striking design feature of the building is the substitution of 996 small windows for the few large windows customarily used in churches. Distributed over three of the four walls, they permit a screened light to penetrate to every corner of the church proper; they also contribute materially to the feeling of space created by the accordion-like walls and the high ceiling.

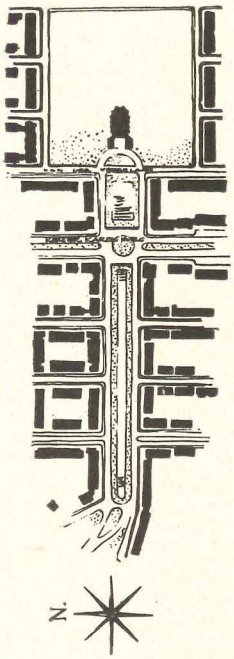
The organ was placed in a balcony at the rear of the church to boost the seating capacity to an even thousand. Sunday School room, deacons' room, a tea room, archives and wash rooms are provided in the two small buildings flanking the church front.

Construction is reinforced concrete and steel. Tower spires are lead-covered wood; ceilings are wood; pews, pulpit, communion table top and organ casing are mahogany. Floors are covered with red tile, walls are finished in white cement. The baptismal font of basalt has a red copper lid with a handle representing Jonah and the whale; it was designed by the sculptor, B. Guntenaar.

CHURCH

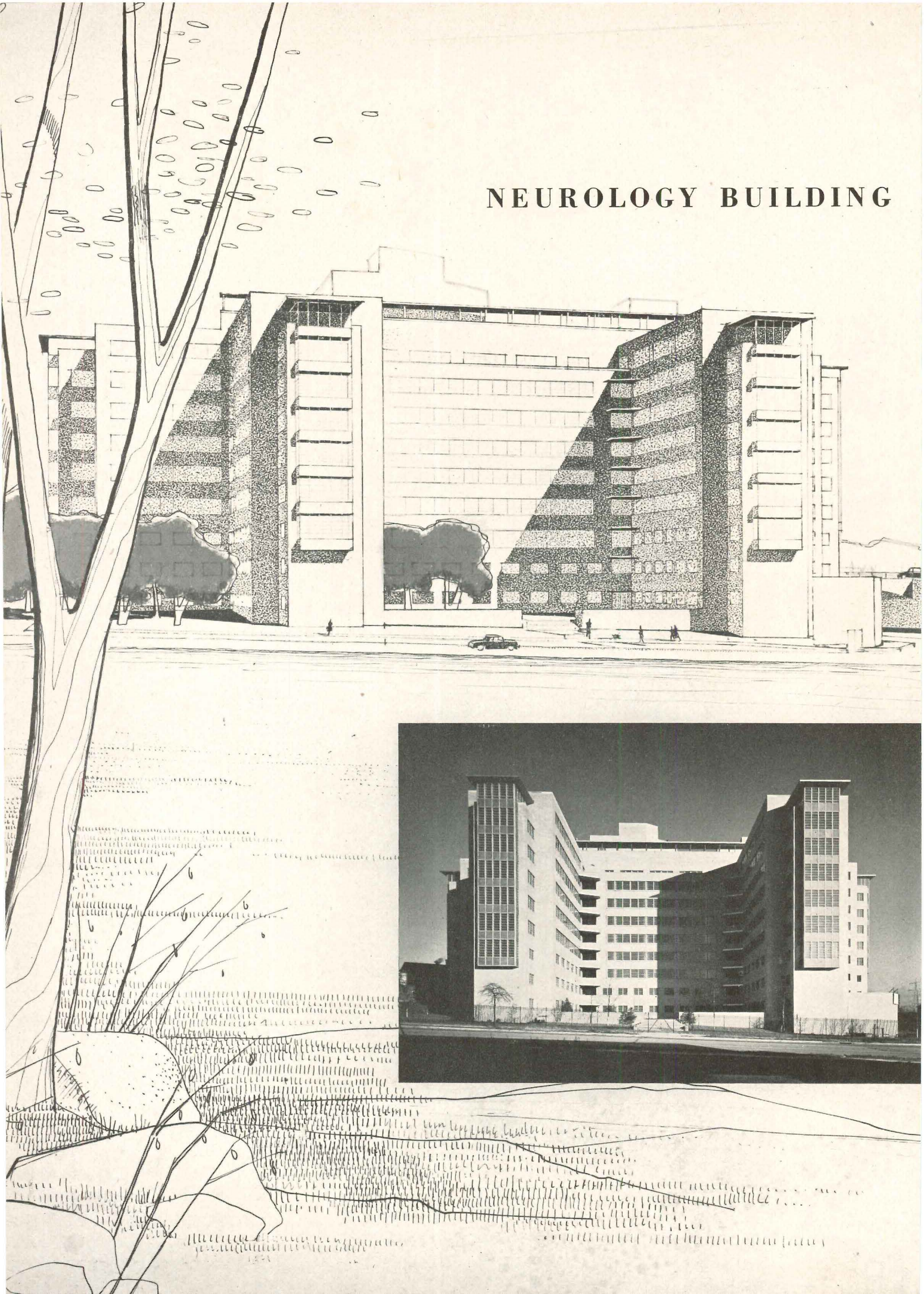
IN THE NETHERLANDS

Photos courtesy Netherlands Information Bureau



Front of church is completely closed, contrasting pleasantly with window-studded walls on other three sides. Bell hangs free between the towers, far above church doors

NEUROLOGY BUILDING



Harbeson, Hough, Livingston & Larson, Architects

PHILADELPHIA GENERAL HOSPITAL

Dr. Rufus S. Reeves, Director
Philadelphia Department of Public Health

Dr. Pascal Lucchesi, Director
Philadelphia General Hospital

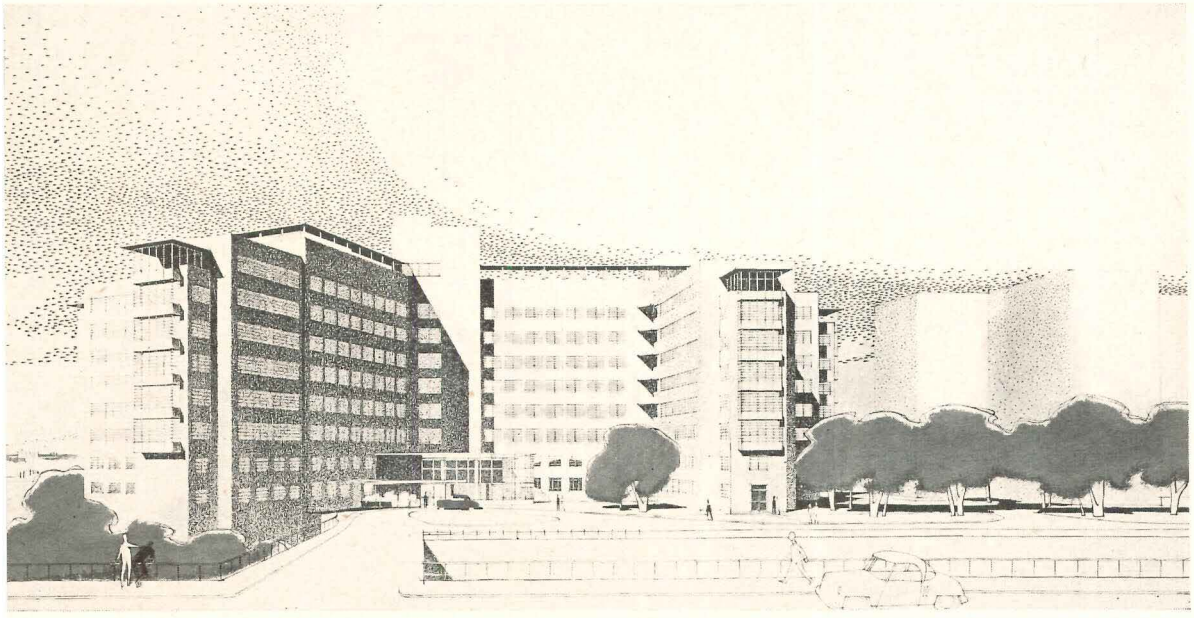
Sauter and Castor, Structural Engineers

Moody and Hutchison, Mechanical Engineers

IN THE COUNTRY-WIDE EFFORT to improve standards of treatment and care of mental patients, this building represents a major advance. It is a large facility for a huge municipal hospital group, and so is in position to serve a great need, not only in inpatient care in 750 beds, but also in outpatient work and in teaching medical personnel and nurses.

In developing the program for the Neurology Building, the director of the hospital, the building committee of neurologists and psychiatrists, and the staff were concerned that the building provide for the most advanced methods of treatment and rehabilitation, also that it provide cheerful surroundings conducive to modern therapy. Essential to the program were class and lecture rooms and demonstration facilities for instruction of nurses of this and other hospitals and of medical students from five schools in Philadelphia.

It is the policy of the hospital to have a minimum of private rooms, in a concept of economy and of equal care for all patients, and in the rest of the hospital large wards are the rule. In this building there are 16-bed and 24-bed wards, but they are divided into 4-bed groups by partial partitions, as some sense of privacy is desirable for nervous patients. Additional partition-



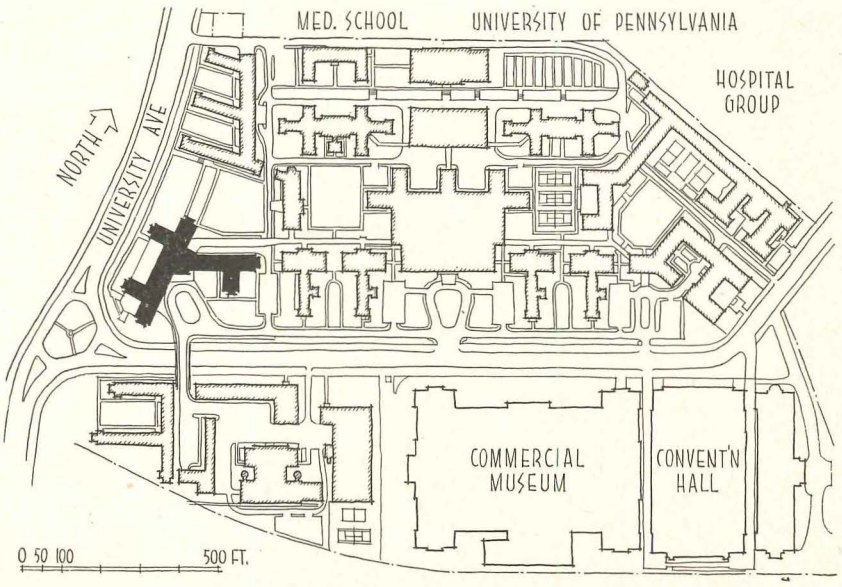
First of many new buildings in a 20-year plan, the Neurology Building adds 750 beds for care of mental patients, and extensive facilities for outpatient treatment. Cost: $8500 per bed

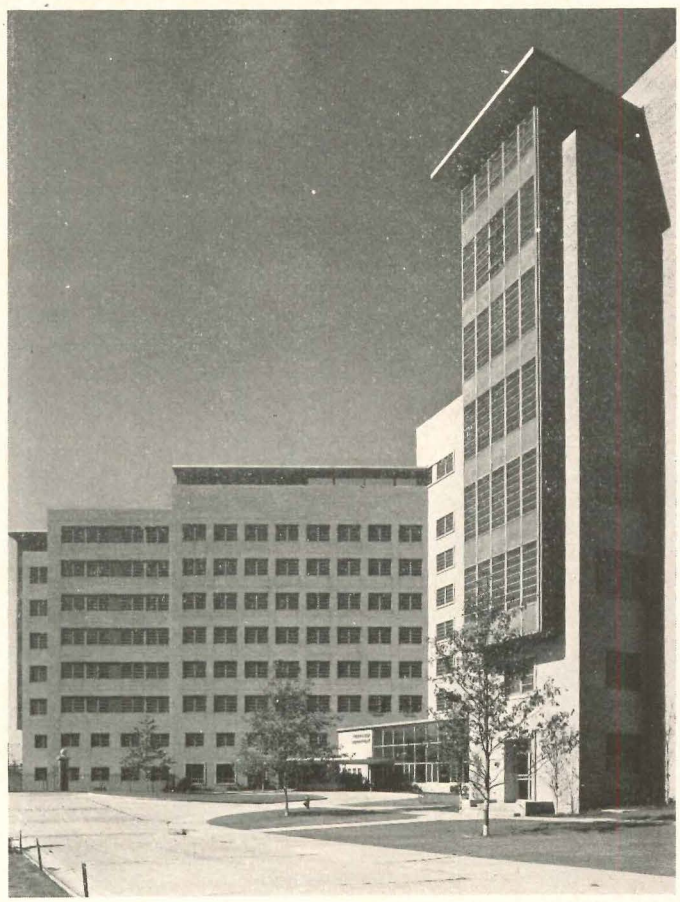
Photo opposite page: Cortlandt V. D. Hubbard

ing could make them entirely separate 4-bed units. Single rooms are provided for disturbed patients or for those needing real quiet. Nurses stations are placed in the reentrant angle between the larger wards to provide close supervision with a minimum staff.

Form of the building comes from restrictive site conditions. The site is in a fairly congested part of Philadelphia, bounded on the north by the University of Pennsylvania and on its other frontages by heavily traveled streets. These limitations, coupled with the desire to develop outdoor recreational areas, made a tall building the obvious solution.

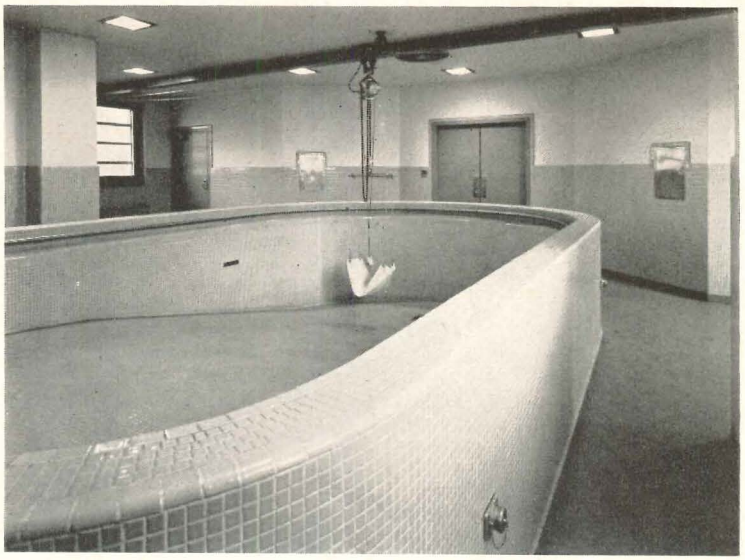
The hospital centralizes all possible facilities. Thus food is prepared in a central kitchen, transported by heated carts to various buildings. A system of double-deck corridors provides both service and other circulation through the whole hospital group. The Neurology Building does not have extensive medical facilities, as



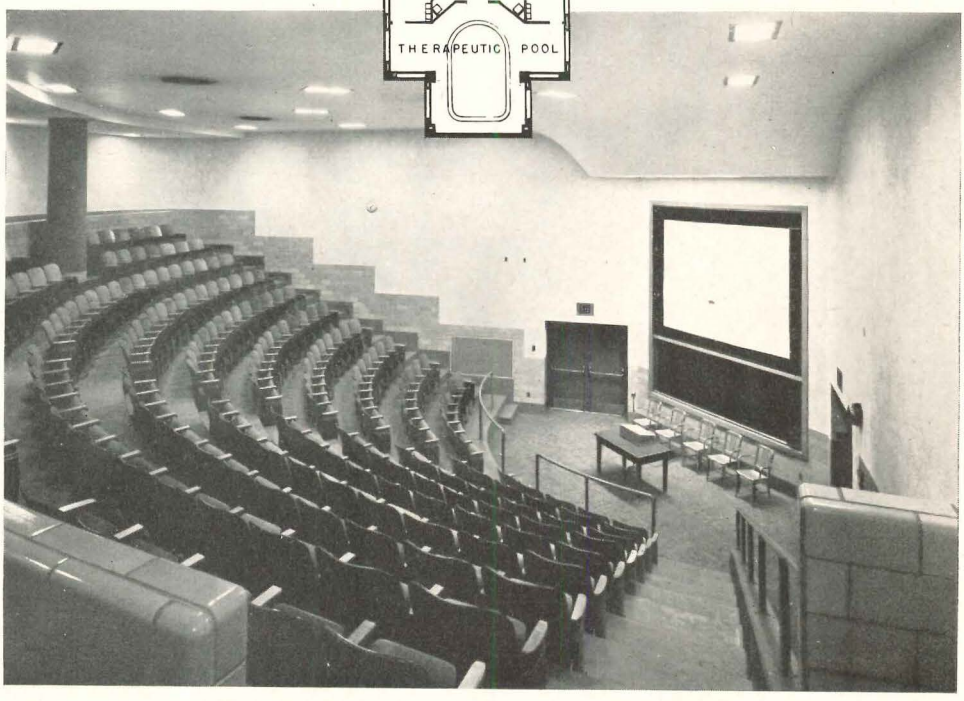


Entrance canopy serves a double entrance — outpatient department on the left, main lobby entrance at the right

Photos: Cortlandt V. D. Hubbard



Photos: Cortlandt V. D. Hubbard



BASEMENT FLOOR PLAN

0 10 20 30 40 50

SCALE IN FEET

Main portion of basement is above grade, concentrates a great amount of physical therapy facilities. Mechanical services and food come from centralized facilities serving the entire hospital group. Occupational therapy facilities are on second floor (plan not shown) and on individual nursing floors

FIRST FLOOR PLAN

these too are centralized for the hospital. It does have, however, very extensive treatment and interview rooms, hydrotherapy, occupational therapy, and dining and day room facilities.

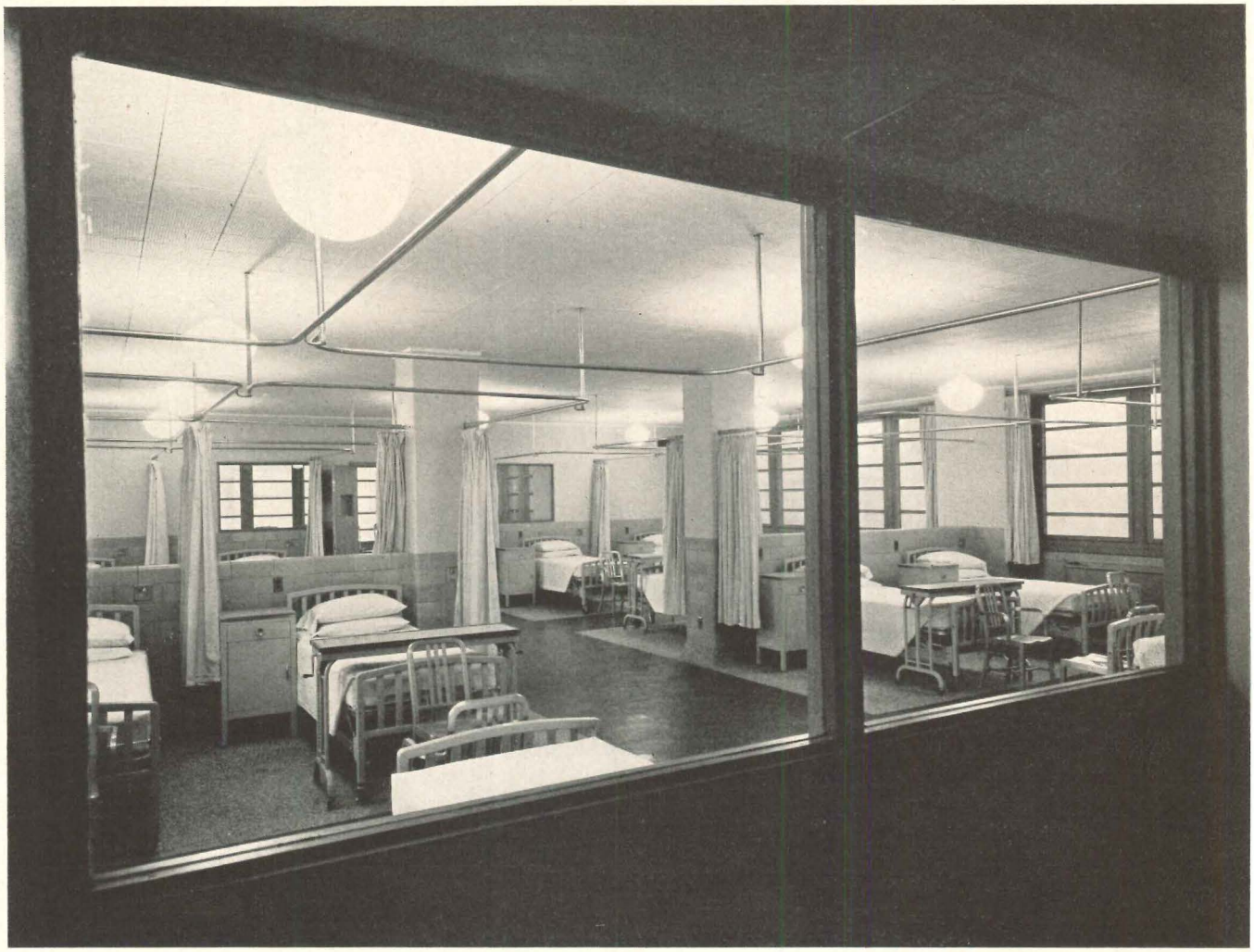
The building is without a basement in the usual sense. A difference in grade gives full story height to much of the basement level, for gymnasium, hydro room, physical medicine and amphitheater.

Second floor (not shown) is primarily a service level, for food distribution, laundry services, exercise rooms, and various shops which aid in patient rehabilitation.

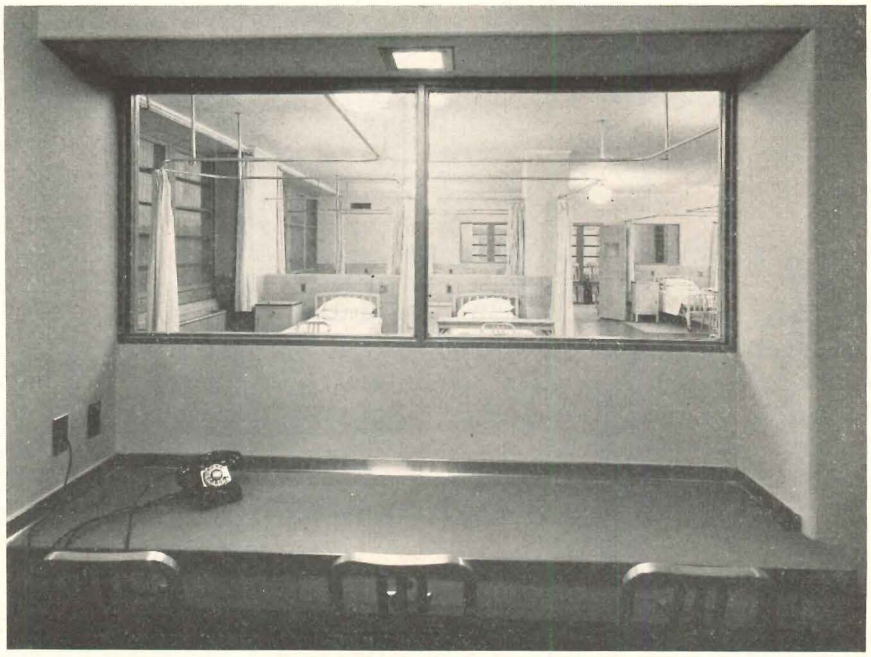
Nursing floors generally alternate for male and female patients. The eighth floor is special, was originally designed for detention cases, is now to be used for alcoholics, narcotics, and in some instances criminal cases.

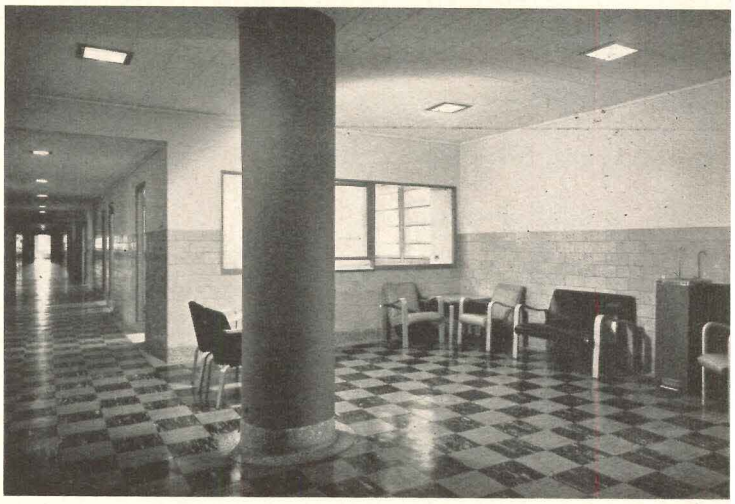
The roof deck, as in most mental hospitals, is developed for recreational areas, is floored with quarry tile and provided with shelter canopies.

Color has been extensively used for both exterior and interior. Sash is gray green, soffits of canopies a chrome yellow, lally columns venetian red. In the interior color was carefully studied for therapeutic value. In general colors are soft; corridor walls are pale yellow, doors natural birch. Wards are pale green, cubicle curtains a green in harmony, beds and cabinets green.



Photos: Cortlandt V. D. Hubbard

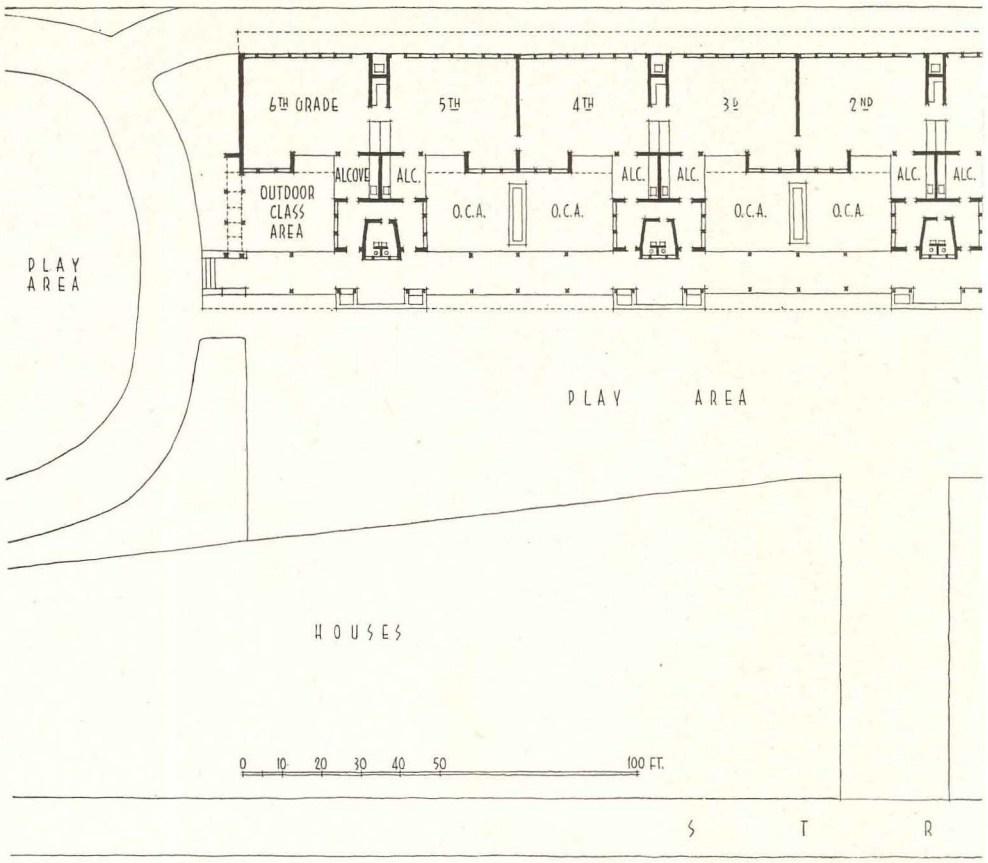


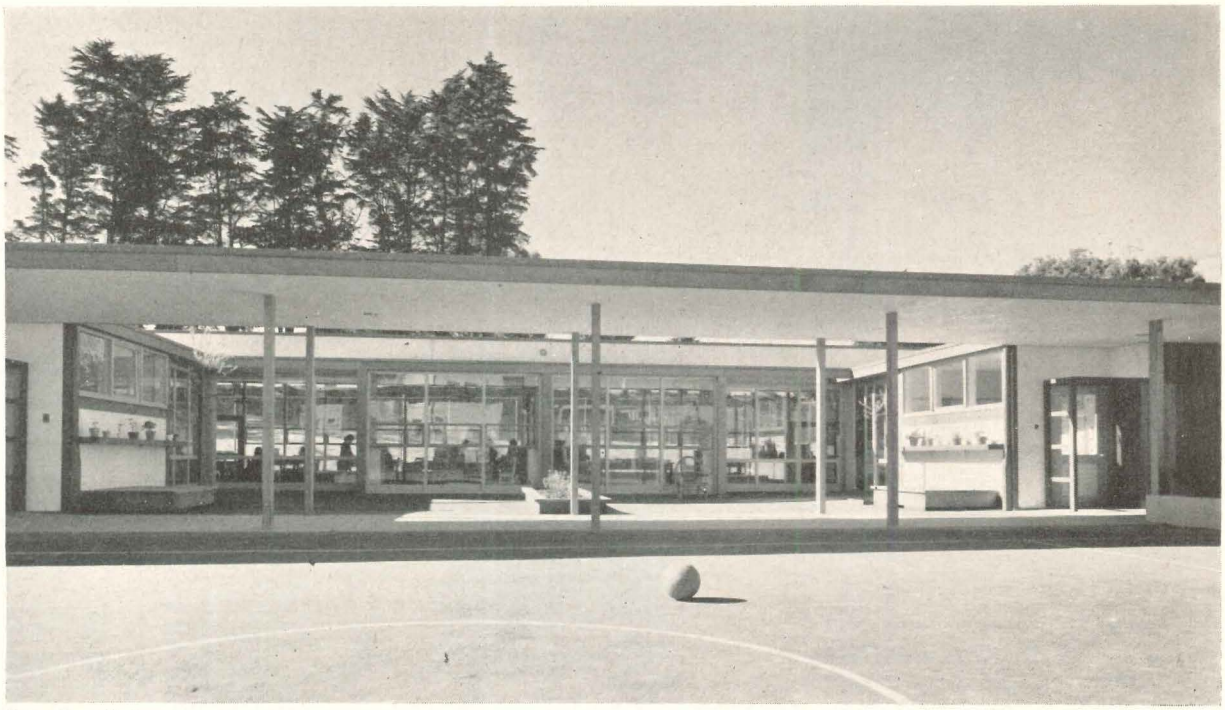


TYPICAL FLOOR PLAN

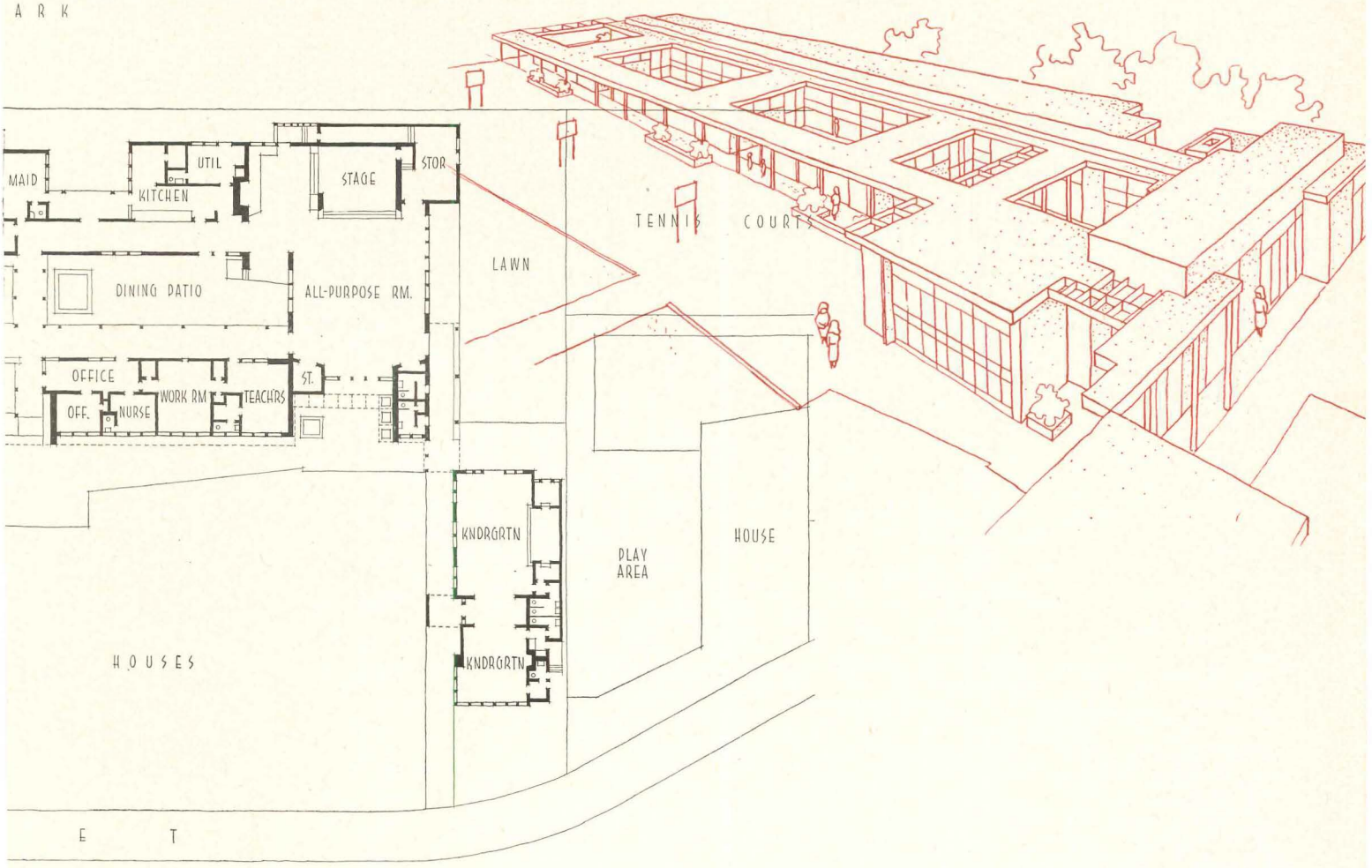
Nursing floors use large wards, in accordance with general hospital's policy of economy and equal care for all patients. But 4-bed groups are separated by low partitions, can be completely partitioned if need for more privacy proves itself. Floors in wards are terrazzo under beds, linoleum elsewhere. Glazed tile is used extensively for wainscot. Ceilings are of acoustic tile

Though completed before the present building materials crisis, this pleasant private school offers many suggestions for design in times of shortages





Photos: Roger Sturtevant



KATHERINE DELMAR BURKE SCHOOL

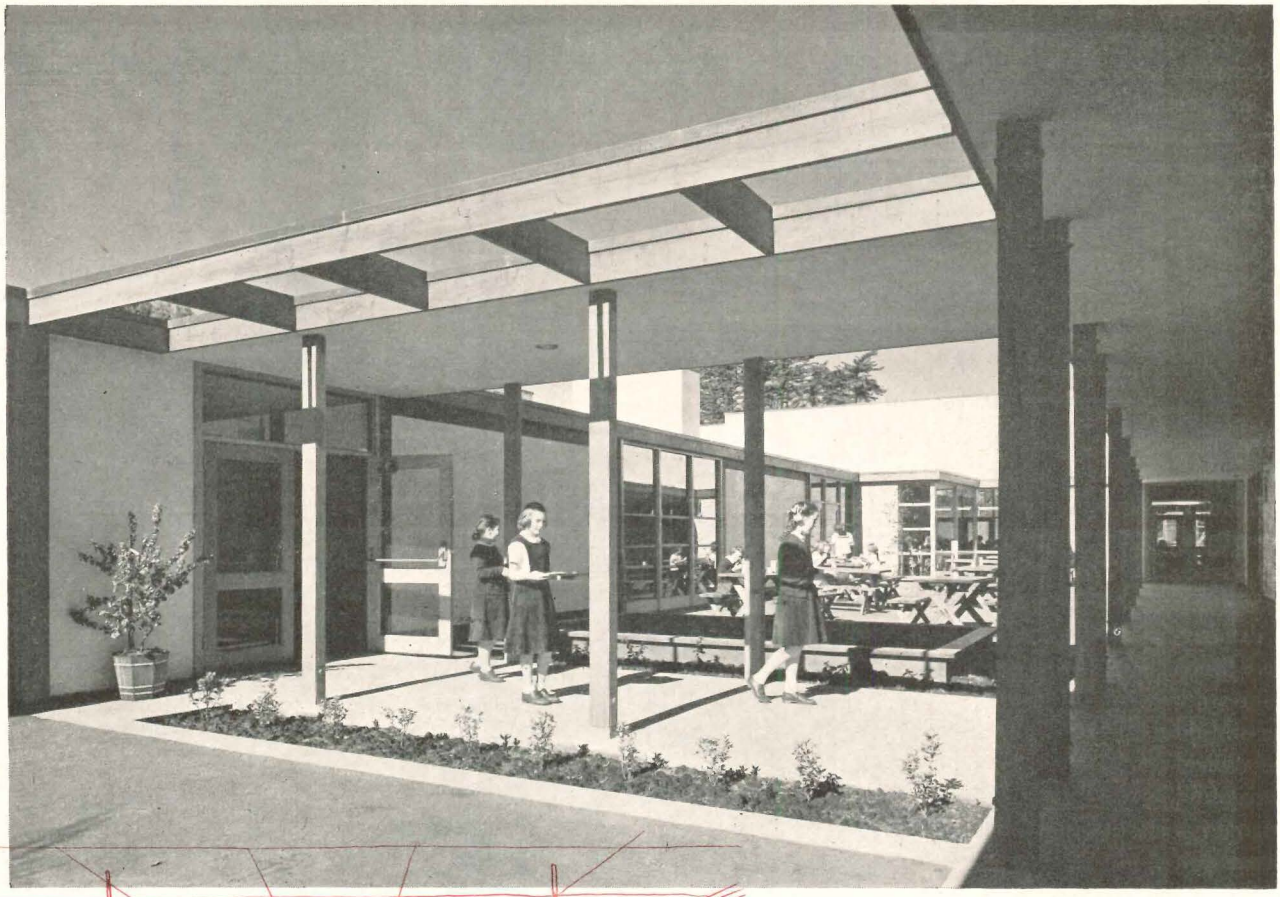
San Francisco, California

Donald Beach Kirby,

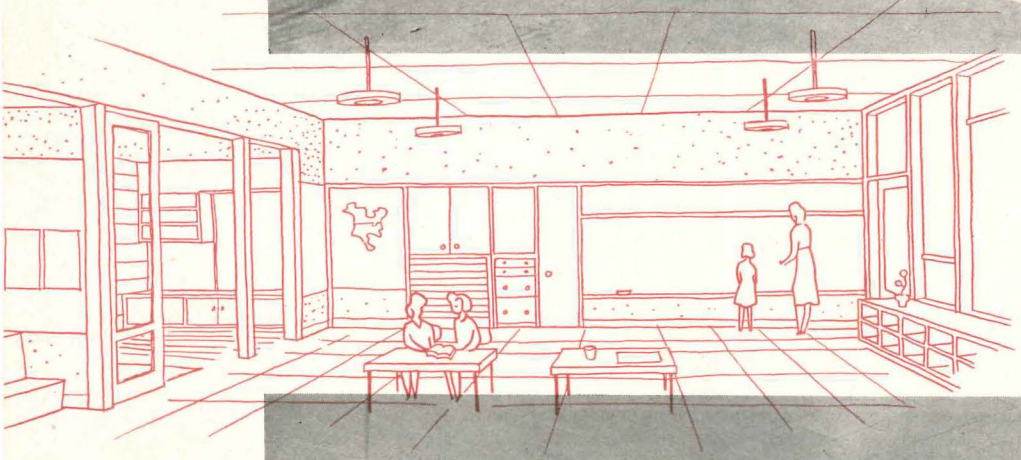
Thomas B. Mulvin, Architects Associated

THIS IS A PRIVATE SCHOOL, for girls only, and the building shown is for classes from kindergarten through sixth grade. Thus its circumstances are somewhat special; nevertheless it comes closer to the ideal of a school designed inside and out for children than most of those an editor sees. Miss Barbara Burke, president and principal, felt that the children should enjoy the informality of modern residential design. The architects, more than sympathetic to her ideas, produced neither a modern "house" nor a residential front for a cold institution. They achieved a more difficult goal: a building frankly an institution, and yet with a heart, an institution designed with understanding of what is appropriate to and what is appreciated by children. You will search in vain for a false note in the concept. There aren't any of the adult whimsies which we so often palm off on our youngsters. There is complete utility in the school's arrangement, and beyond that there is comprehension in its proportioning. It is a simple wood-framed structure, low in cost (about $12.50 per sq ft) for its circumstances, designed with true economy of means but without the sacrifice of essentials.

1



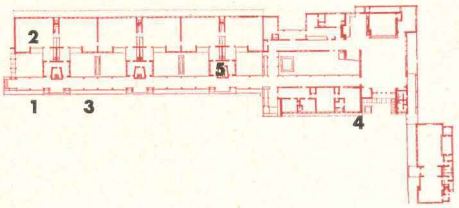
Classrooms, outdoor

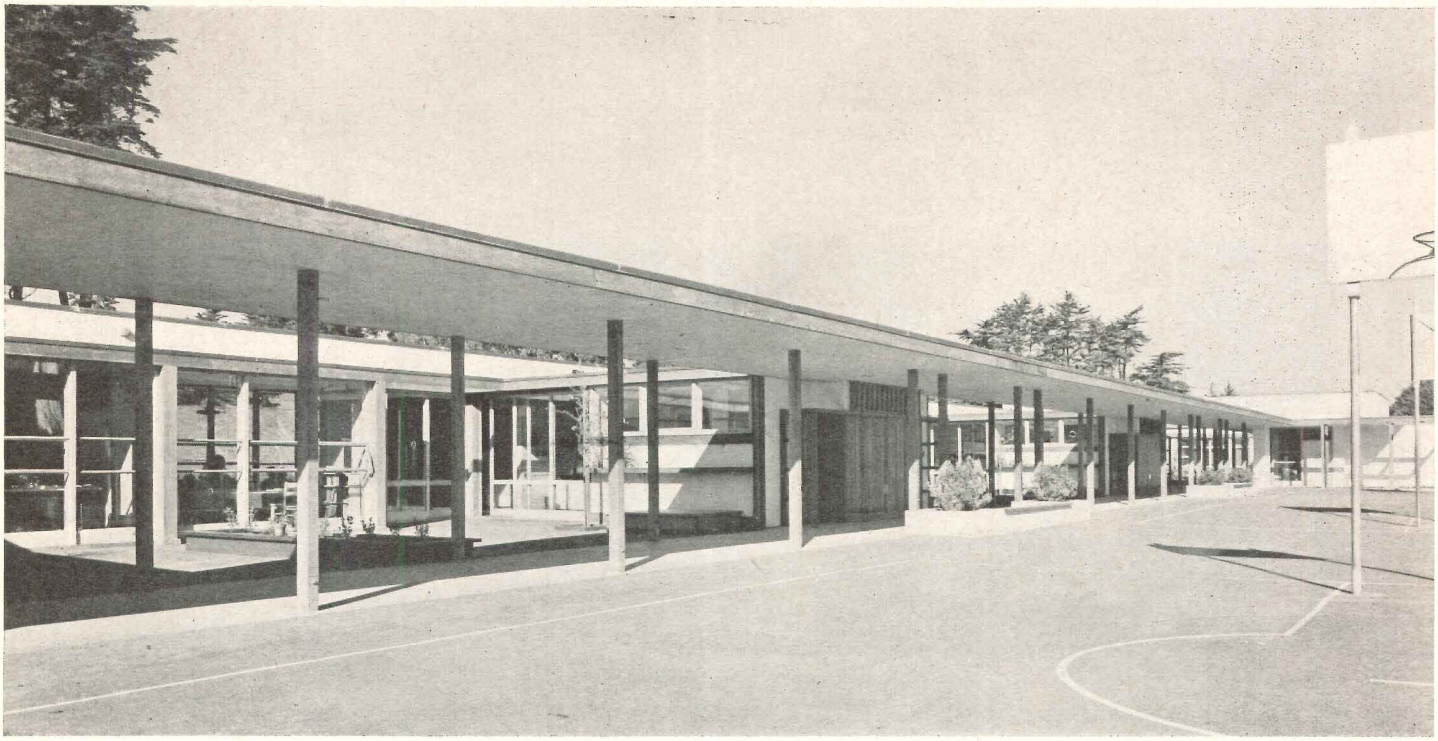


Classroom, indoor

2

Part of a long-range project to provide elementary and high school facilities which will be built as property is acquired, this private school has for a site a narrow strip of land in San Francisco bordering on Lincoln Park and the Golden Gate. In the building now finished, a one-story, wood-framed structure with stucco

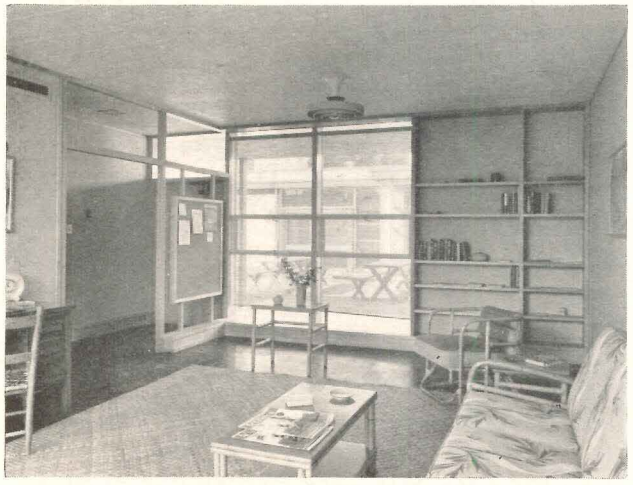




3

exterior and redwood trim, classrooms for kindergarten through sixth grade were required to be flooded with sunlight, to be up-to-date pedagogically yet decidedly not clinical nor ultra-scientific if this meant sacrifice of human qualities

Photos: Roger Sturtevant



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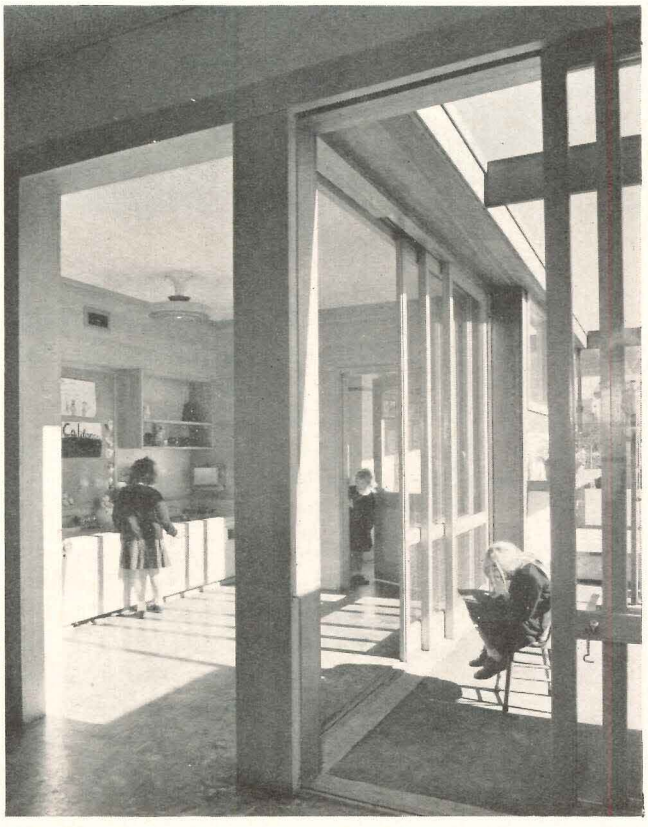

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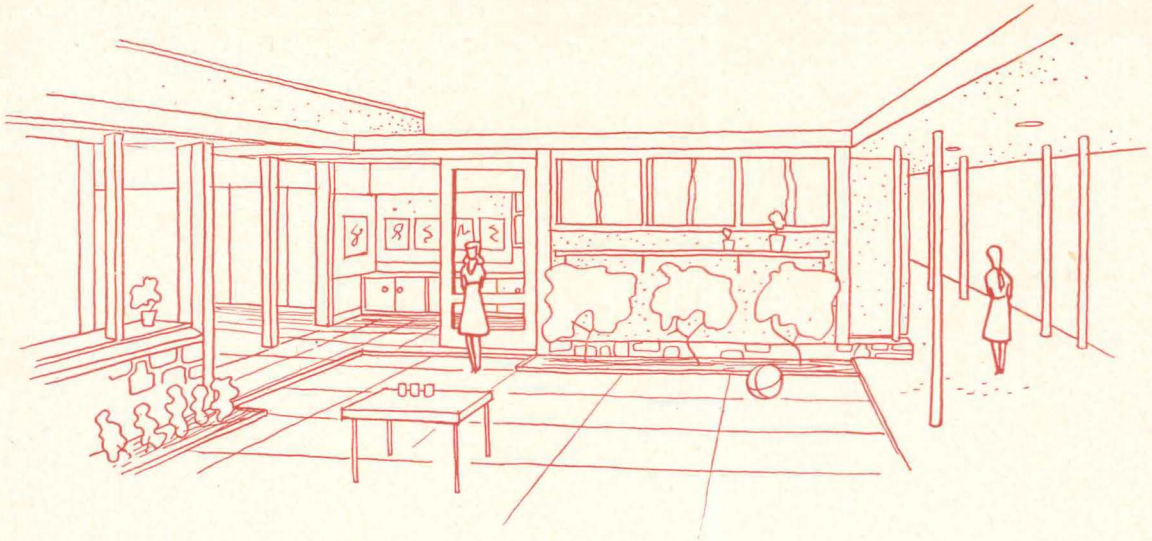

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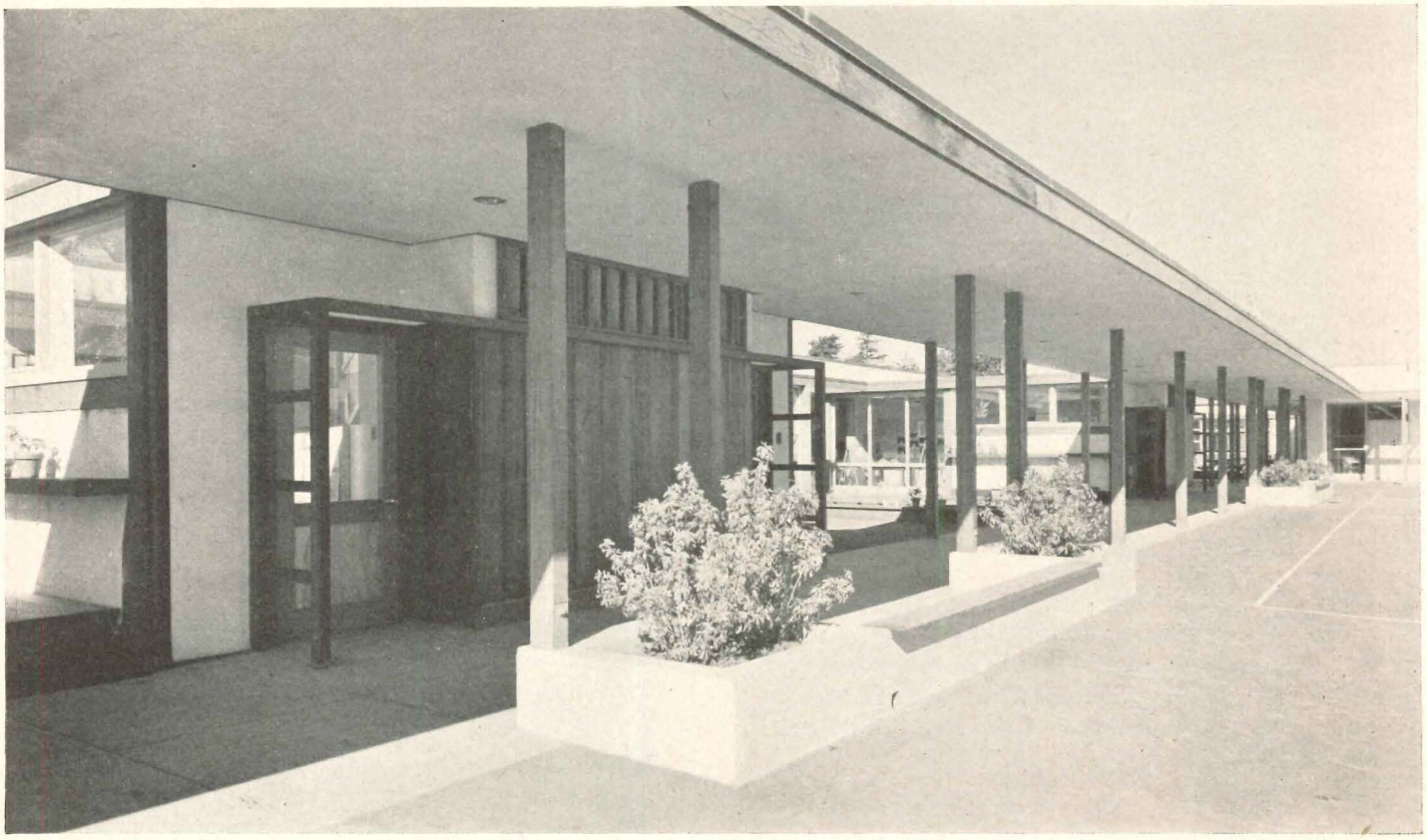
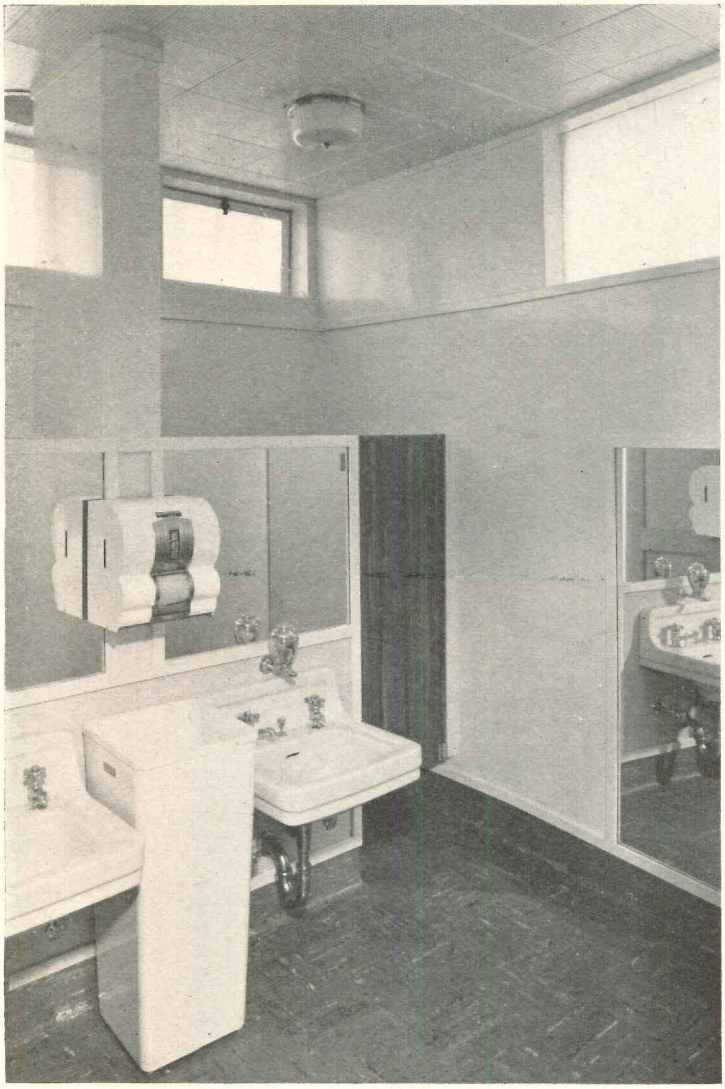


Each classroom has a large glass wall facing the park, a sunny project alcove and large sliding glass doors facing south on an outdoor class area, and ample built-in storage space on one wall. The concrete slab floors are covered with asphalt tile. Interior finish is plaster and composition board on walls with birch and vertical-grain fir paneling and trim. Ceilings are acoustical tile. A combination of radiant floor panels and warm air units heats the school. The building is oriented to provide a barrier against prevailing winds, so outdoor areas are comfortable. The all-purpose room is used for recreation, dining, dramatics and meetings. E. Jasper Winnie was the architects' chief assistant; Engelhardt, Engelhardt and Leggett were educational consultants; Harold M. Engle was structural engineer; Clyde E. Bentley, mechanical and electrical engineer. John H. Kelly was project manager.

Between each pair of classrooms, and joining them with the playground, are toilets and coat rooms which help define outdoor class areas. Location of these facilities, and the access to rooms by either covered walk or intercommunicating doors, constitute tacit recognition of California's not always clement weather



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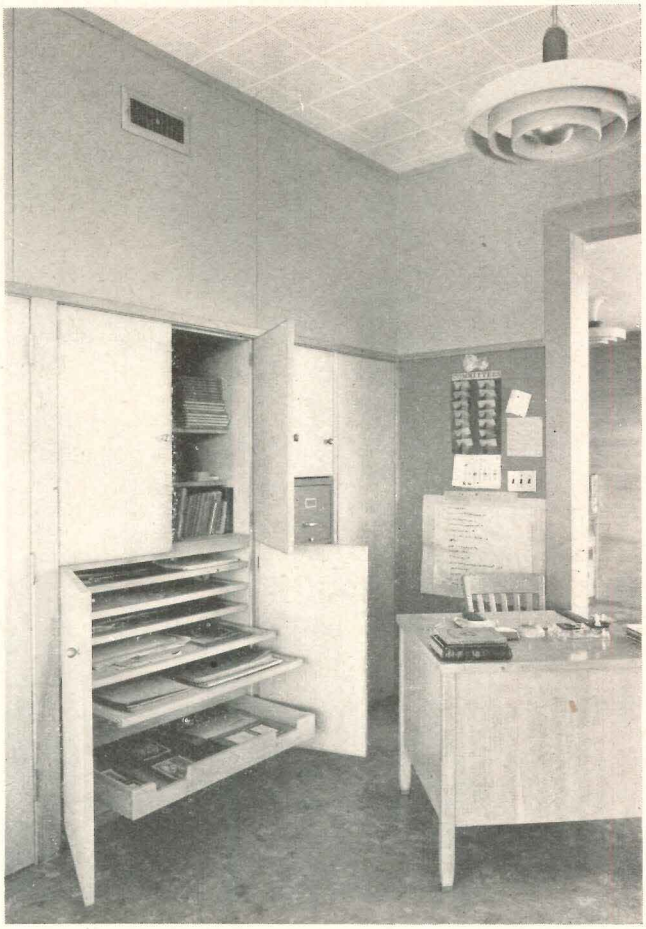

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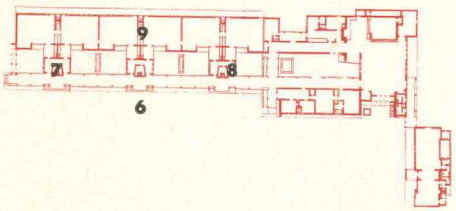
Photos: Roger Sturtevant

KATHERINE BURKE SCHOOL



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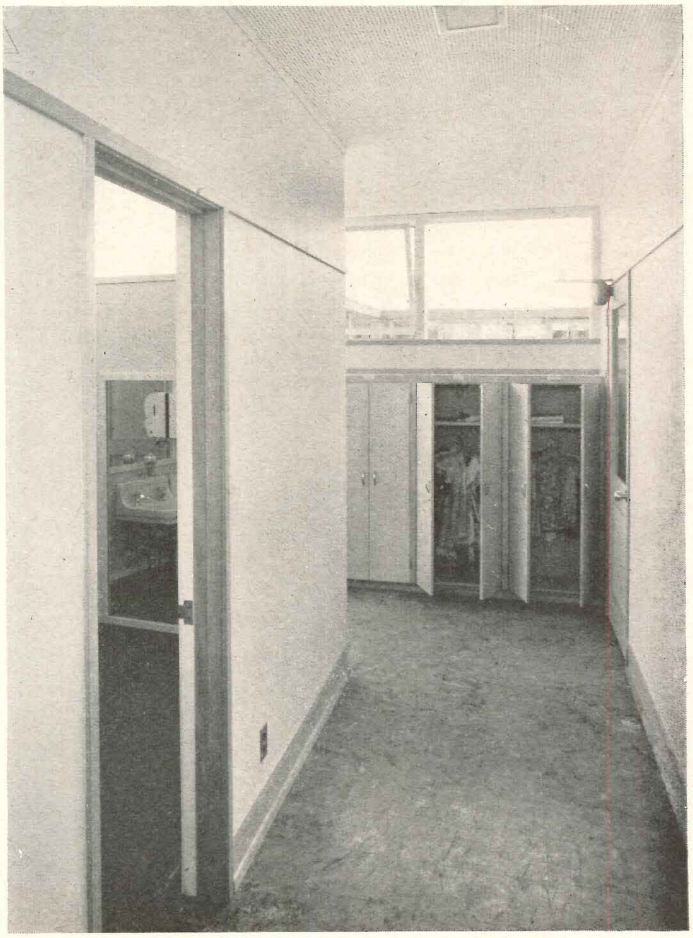

Photos: Roger Sturtevant

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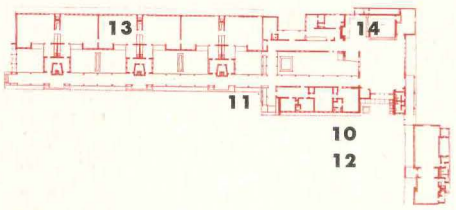
KATHERINE BURKE SCHOOL



11

Space for supplies in workroom (top of page) is supplemented by storeroom behind stage in all-purpose room. Even the office (right) is a friendly place

12

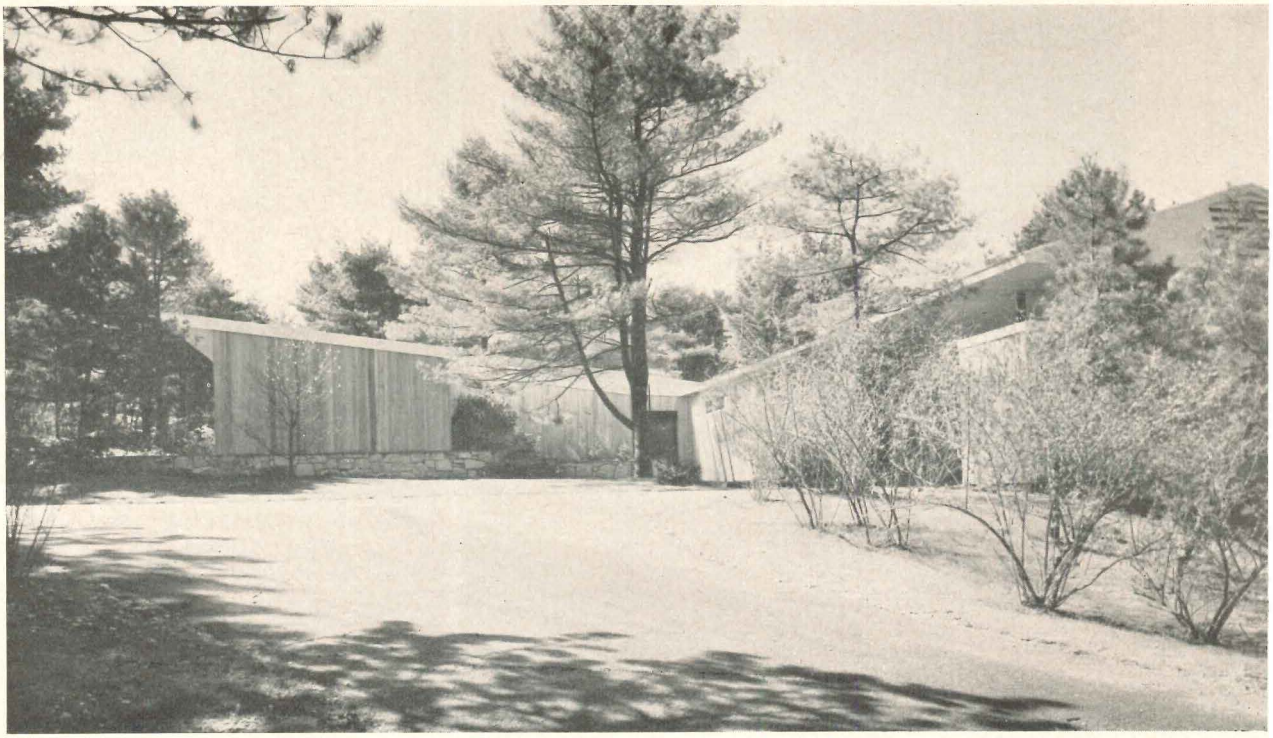
Workroom

13

Classroom

Fireplace alcove in all-purpose room; dining patio (sketch) adjoins

14



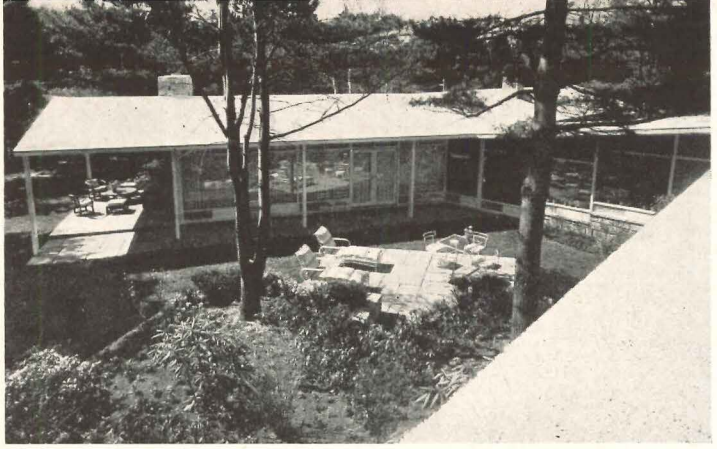
John Hancock Callender and

Allen & Edwin Kramer

Associated Architects

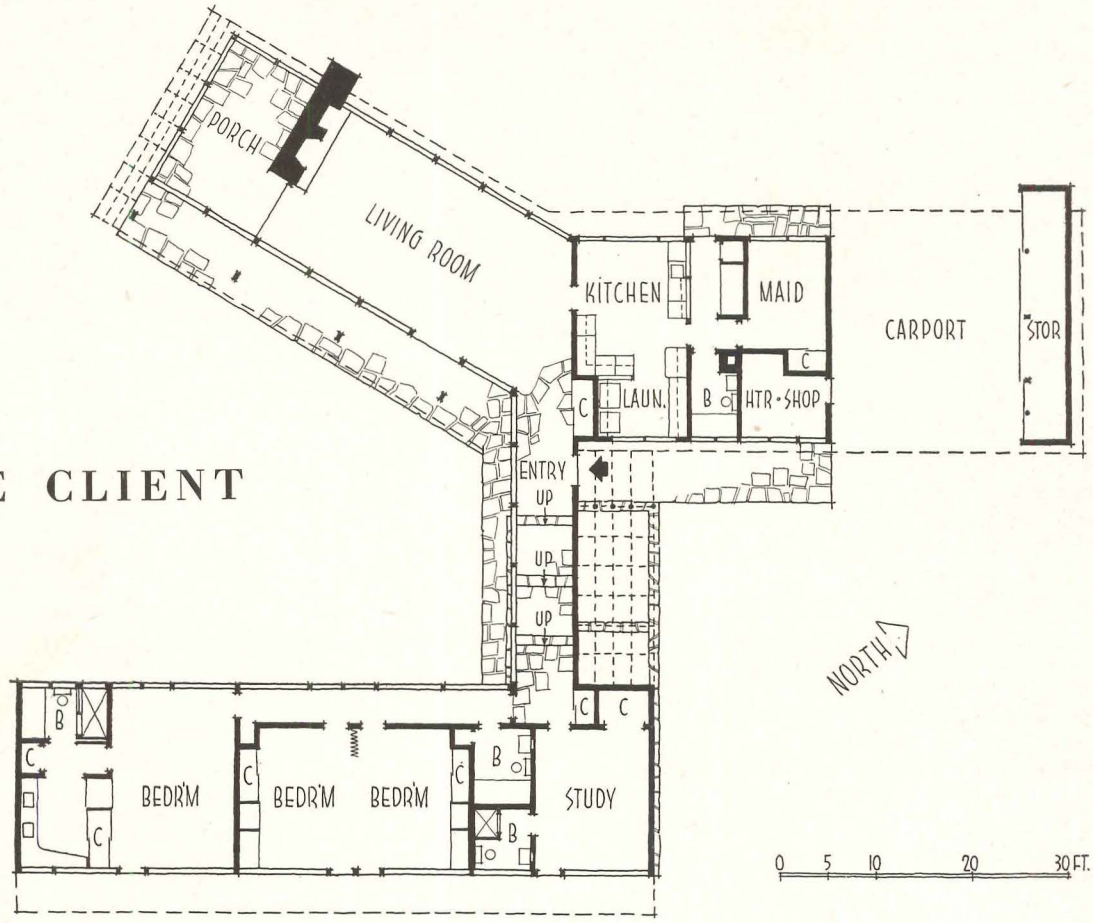
HOUSE DESIGNED FOR

Upper Brookville, Long Island, N. Y.

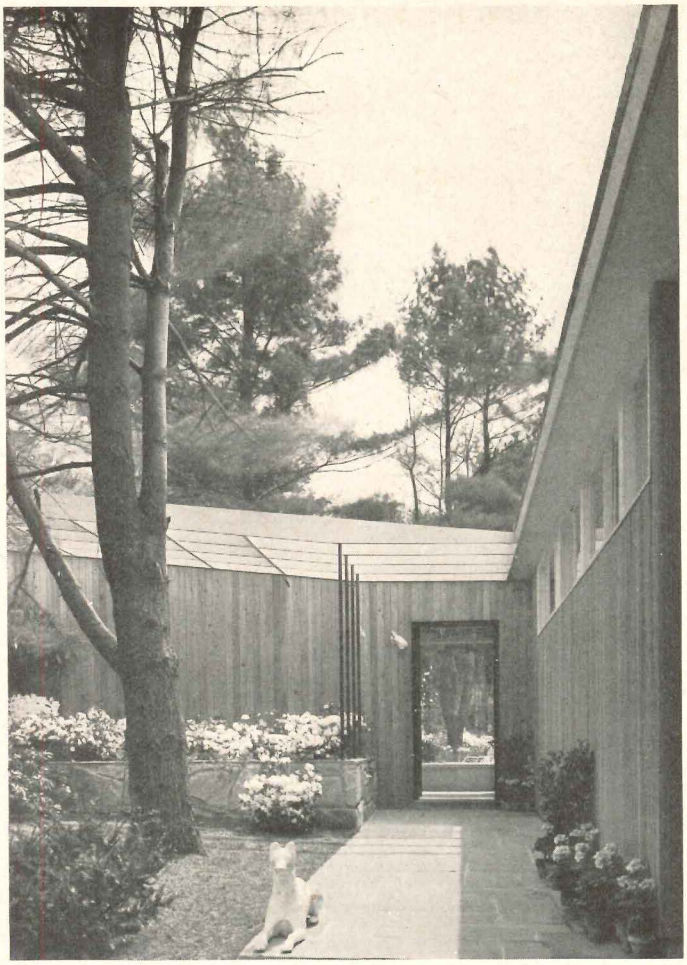


Photos: Tom Leonard

A MAGAZINE CLIENT

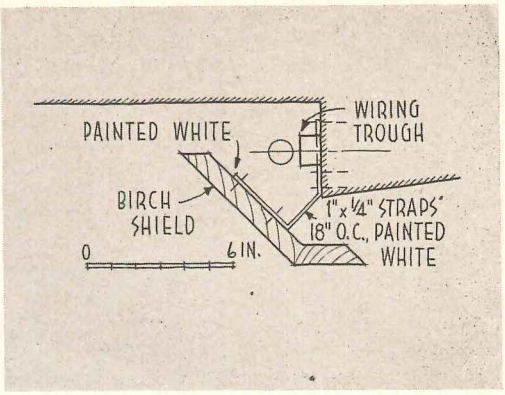


THIS EXTREMELY PLEASANT AND LIVABLE HOUSE, officially known as "House & Garden's House of Ideas," suggests one idea that is perhaps especially worthy of note. Its design seems to indicate a careful fusion of many better qualities of two widespread style influences — the crisp, clean lines of the International Style, and the rambling openness of the popularized Ranch House Style. Yet, it has eliminated the severity of the one, and the ungainliness and awkward combination of materials frequently found in the other. The house was conceived and sponsored by *House & Garden Magazine* in collaboration with John Hancock Callender and Allen & Edwin Kramer, Associated Architects, and constructed by Cy Williams, Inc. The landscape architects were Umberto Innocenti and Richard K. Webel.

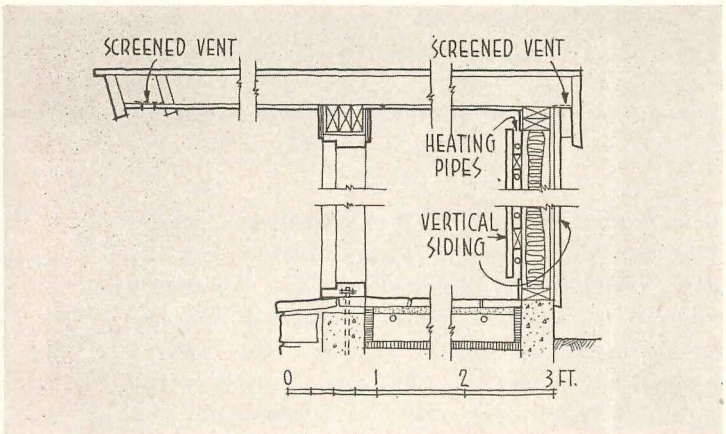


Photos: Tom Leonard

HOUSE FOR A MAGAZINE CLIENT



The entrance facade (left) has a closed-in look, was planned to give dramatic impact as front door opens on vista of outdoor courtyard. Entrance corridor (below) connects bedroom and living room wings, serves as transition in grade levels. Difference in corridor and living room ceiling heights is concealed by light trough (detail above). Entire house is heated by radiant coils in floors, supplemented in corridor by coils behind wall panel (below left)

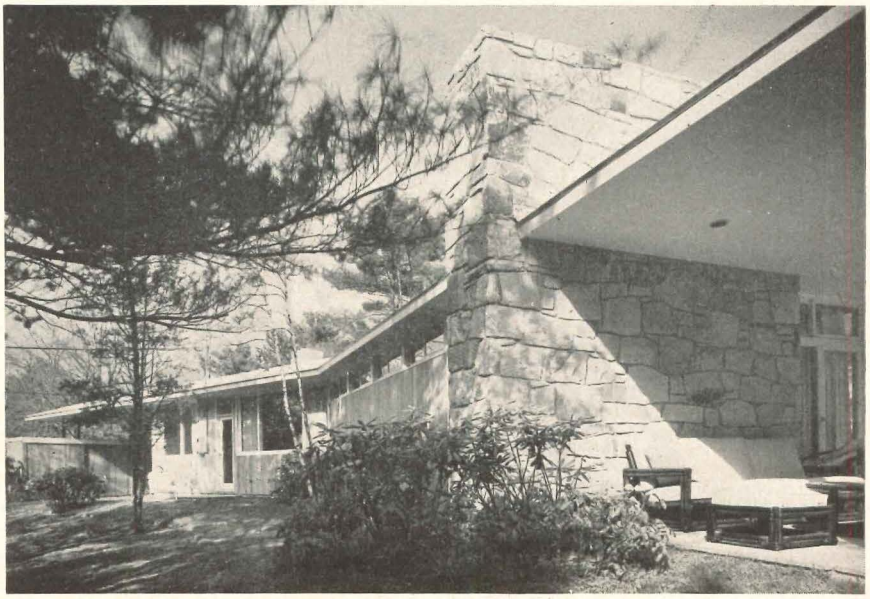


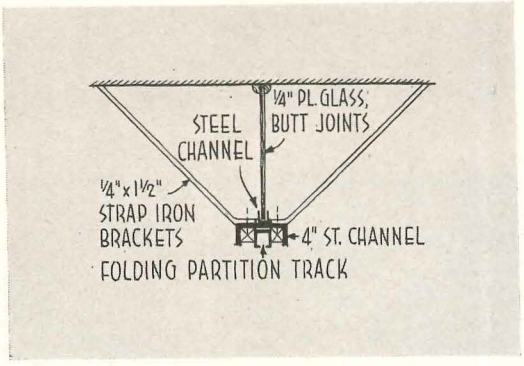
Careful, well studied planning and detailing are conspicuous throughout the house. Exterior walls are vertical cypress planks finished in clear creosote; trim is painted crisp black and white. The roof is of a special built-up type, consisting of aluminum foil, vegetable mastic and white marble chips. Rough stone is sparingly used to edge planting areas and for the chimney.

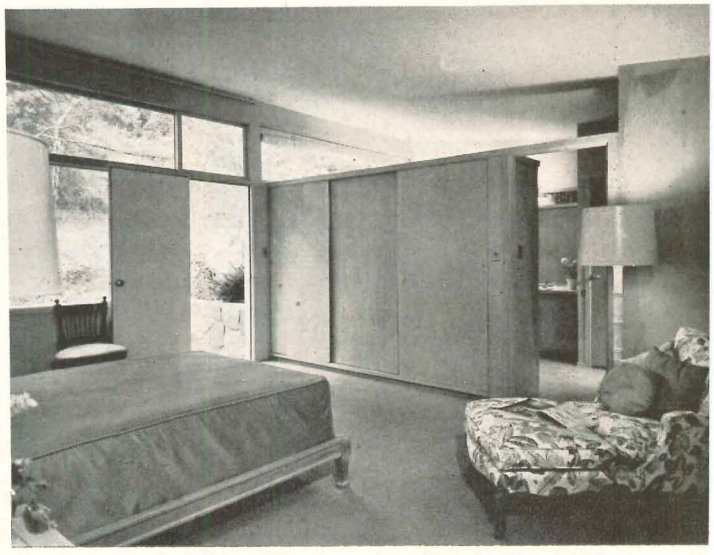
The house was planned for an "average family of four," and consists of three distinct wings for living, sleeping and service facilities, disposed around a central outdoor living area. A great sense of space and openness exists in each of the rooms, brought about chiefly by use of half partitions, glass panels, and window walls. Each room also has its own outdoor terrace.

Interior walls and ceilings are finished with painted gypsum board; floors are concrete slab, finished with flagstone or one of a variety of tiles. Interior furnishings were done separately by Macy's, New York. Heating is by copper tube radiant floor panels, split into three zones with outdoor bulb and indoor thermostat controls. The boiler is oil fired. All walls, ceilings and slab edges are insulated. An intercommunication system is installed throughout the house. Flush downlights are used in most of the rooms.

Space is added to living areas by covered walk, porch and central courtyard. Panels at top and bottom of window walls open for ventilation. Photo below: side exterior view of carport, kitchen, living room

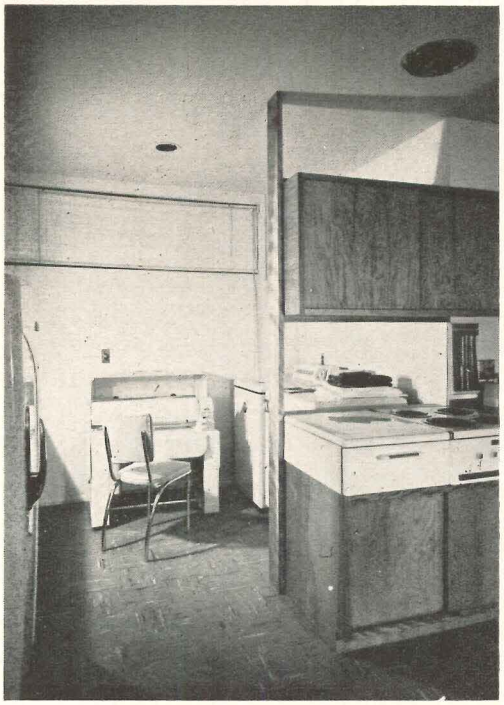




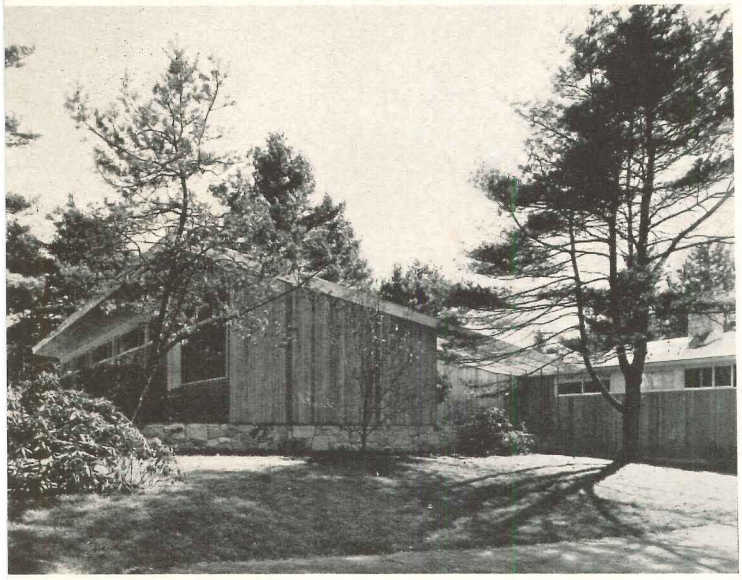


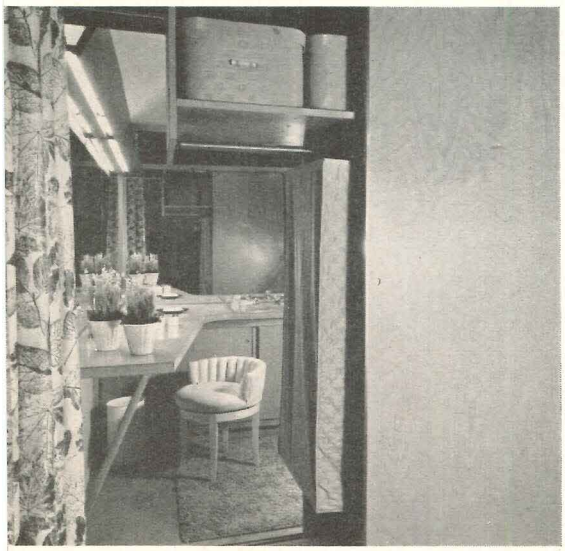
Children's bedroom (above) can be divided by folding partition; a glass panel (detail above) simplifies problem of joining track with sloping ceiling. Master bedroom is separated from dressing room by two-way closet (two photos right). Each bedroom has terrace

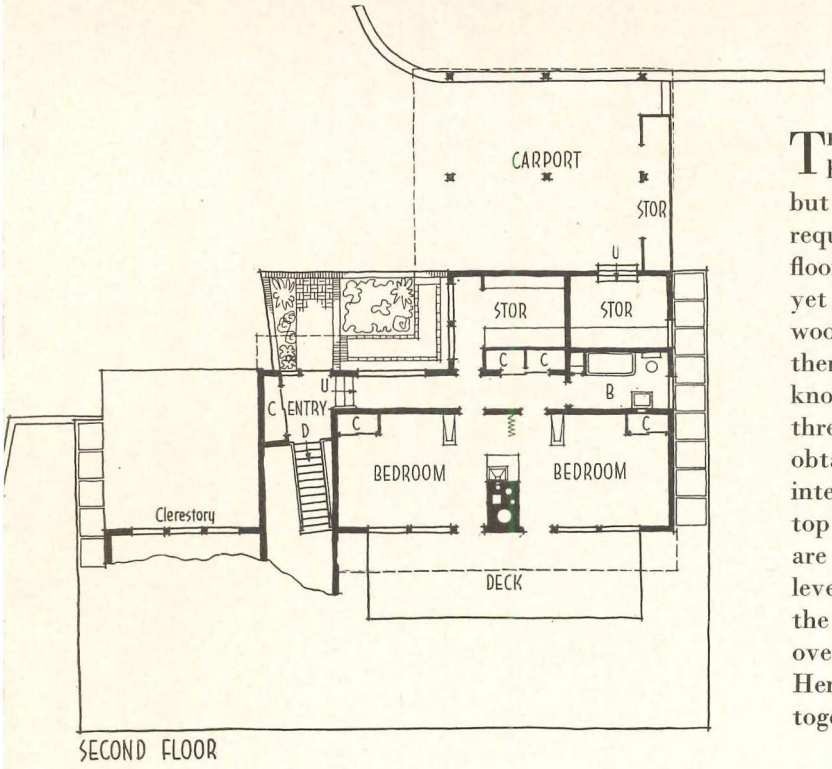
The sense of openness which carries through entire house is continued in kitchen by use of suspended cabinets, plate glass behind range and sink (right, top and bottom). A larder is provided adjacent to service entrance for storage of groceries. Exterior view (below) shows bedroom wing at left, service wing at right



Photos: Tom Leonard





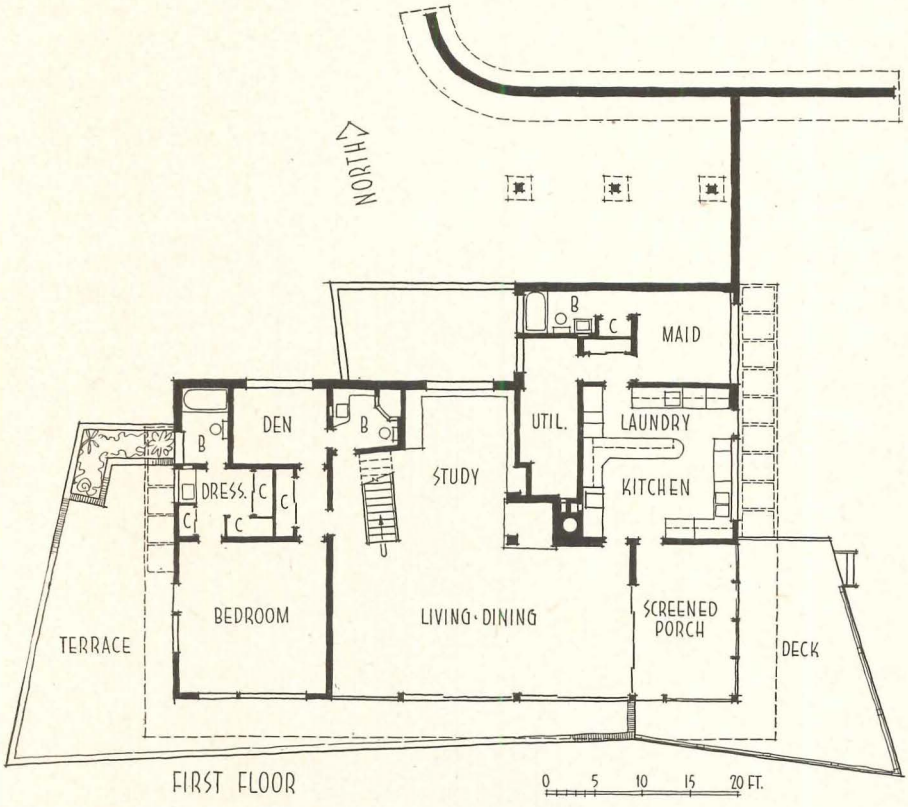


SECOND FLOOR

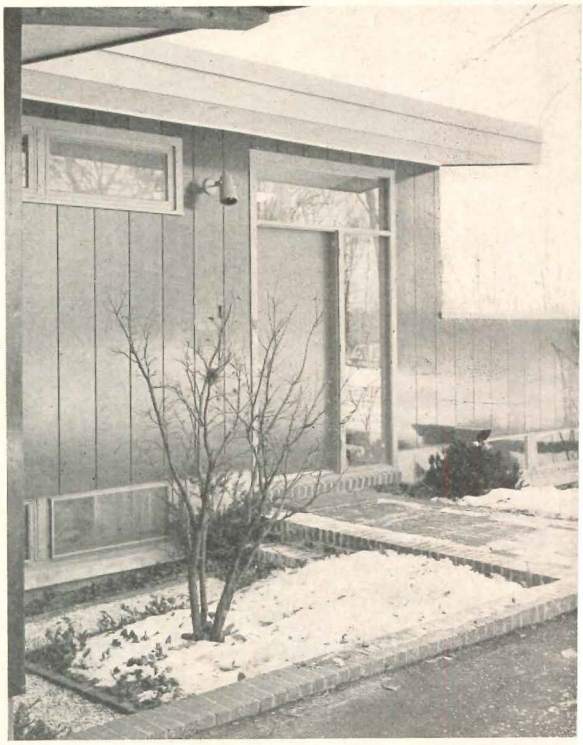
THE CASCADING FORMS and roof lines of this hillside house not only express the character of the setting, but also reflect skillful handling of the client's basic requirements. The owners desired an essentially one-floor house, secluded from the main road at the front, yet affording terraces for all rooms and good views of woods, creek and waterfall to the rear. The house was therefore kept low at the front, and placed where a knoll shields it from the road. Rooms were divided into three levels. Principal areas are on the lower floor to obtain the best views; entry and carport are on an intermediate level. The children's bedrooms are on the top floor, where they may be closed off when the children are away at camps and schools. The variety of roof levels provides a series of open decks, a clerestory for the master bedroom, a skylight for the open stairs, and overhangs for all windows. The site was landscaped by Henry Fletcher Kenney, with the idea of blending together the house and the woods.

SPLIT-LEVEL HOUSE FOR CINCINNATI, OHIO

Residence for Mr. & Mrs. J. Ralph Corbett — ***Carl A. Strauss, Architect***

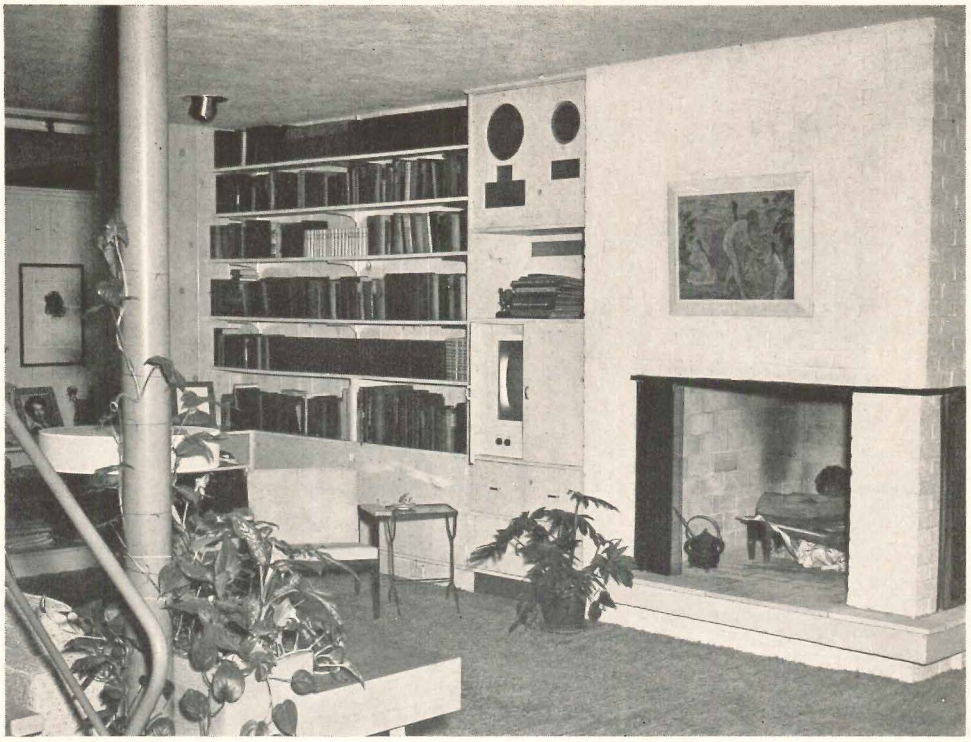


FIRST FLOOR

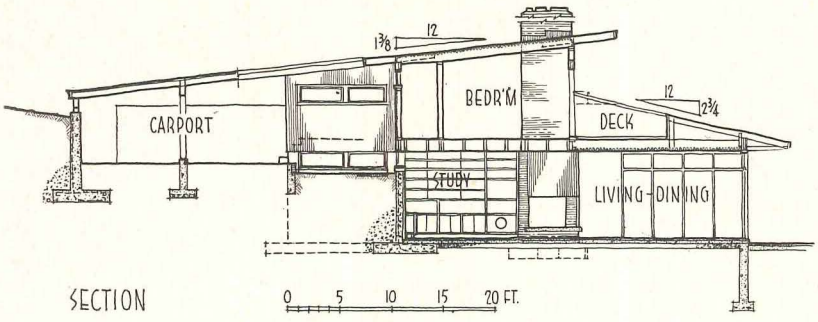


The house is built on a concrete slab, with wood frame construction. Exteriors are natural finish redwood. Trim is painted blue-gray

Photos: George Stille

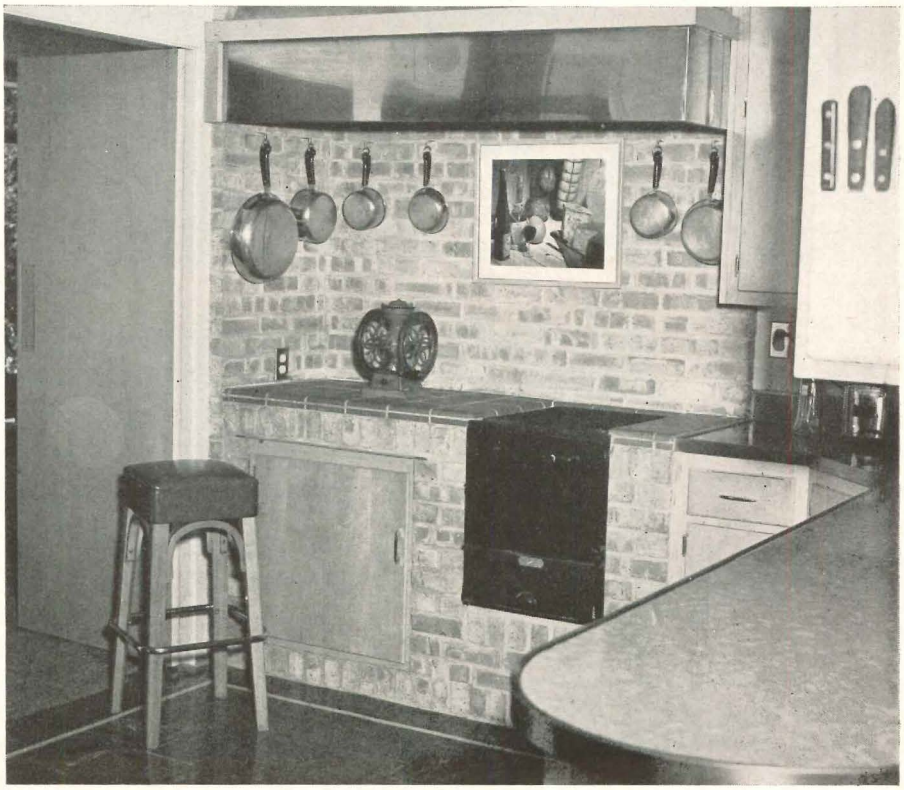


SPIT-LEVEL HOUSE

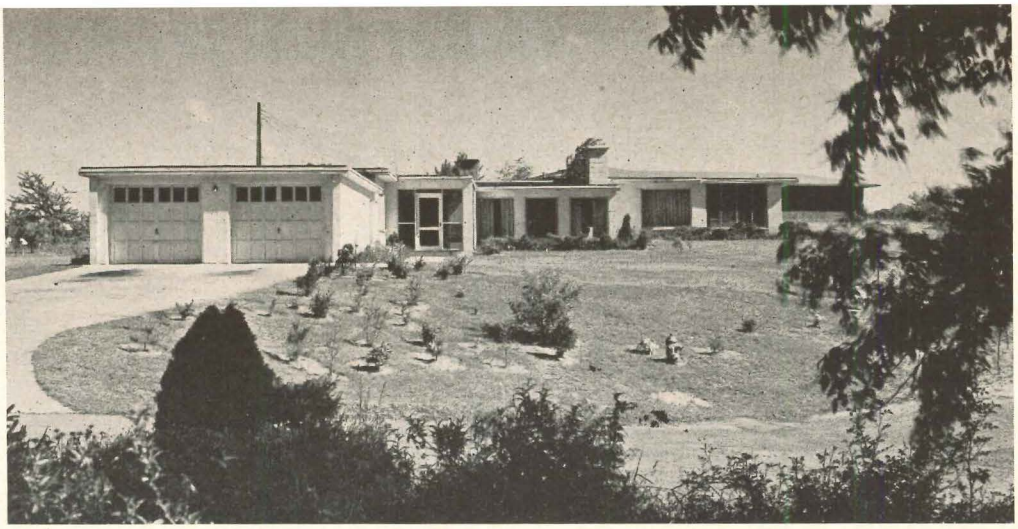


Principal living areas form single, open room with two walls of sliding sash. Corner fireplace is visible from all parts of room. A convertible screened and glazed porch beyond dining area has combination heating and lighting units in ceiling to permit year-round use. The rest of the house is heated by radiant ceiling panels. The furnace is oil fired. Study alcove and stair well are pine paneled, other walls plaster

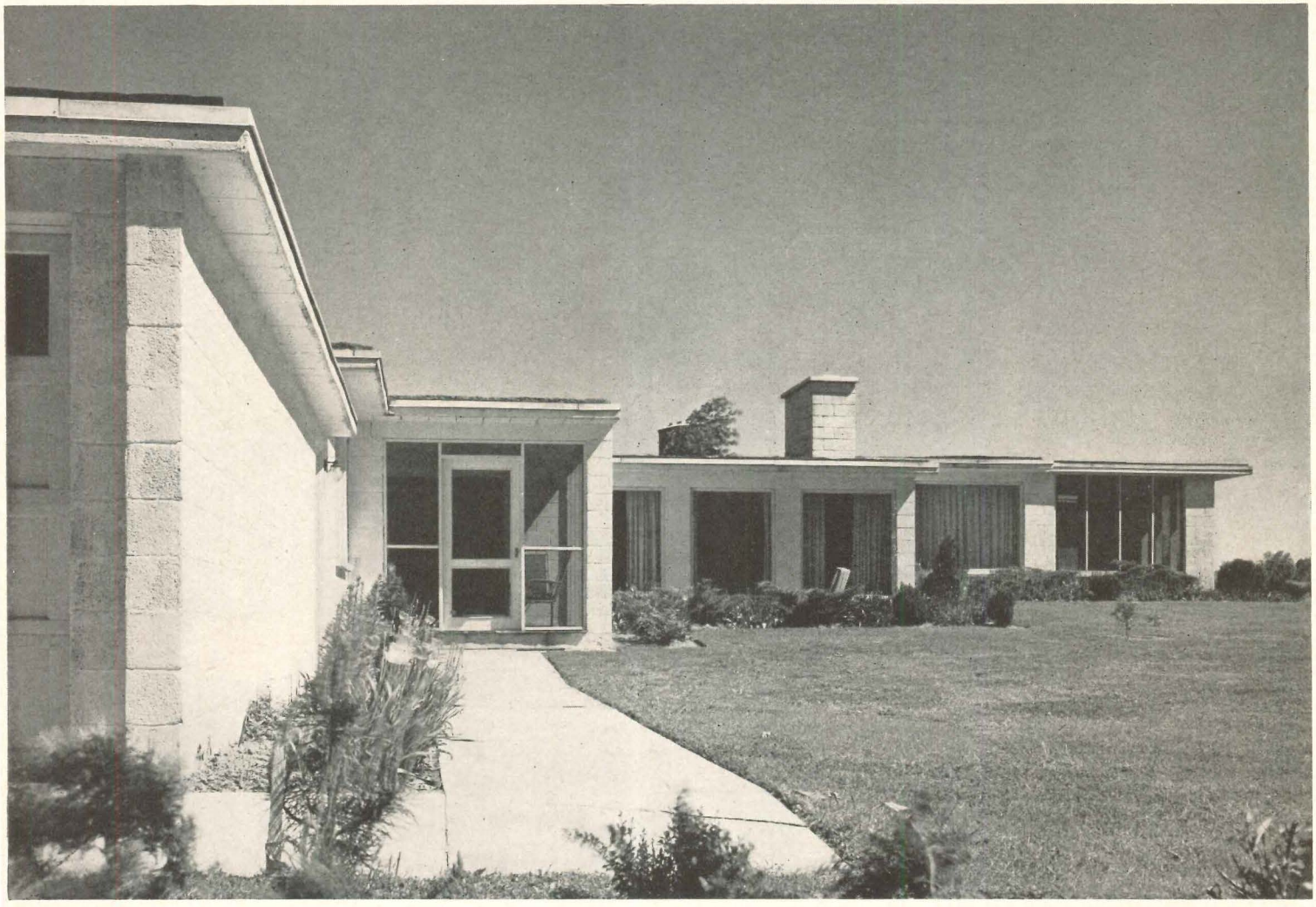
Photos: George Stille

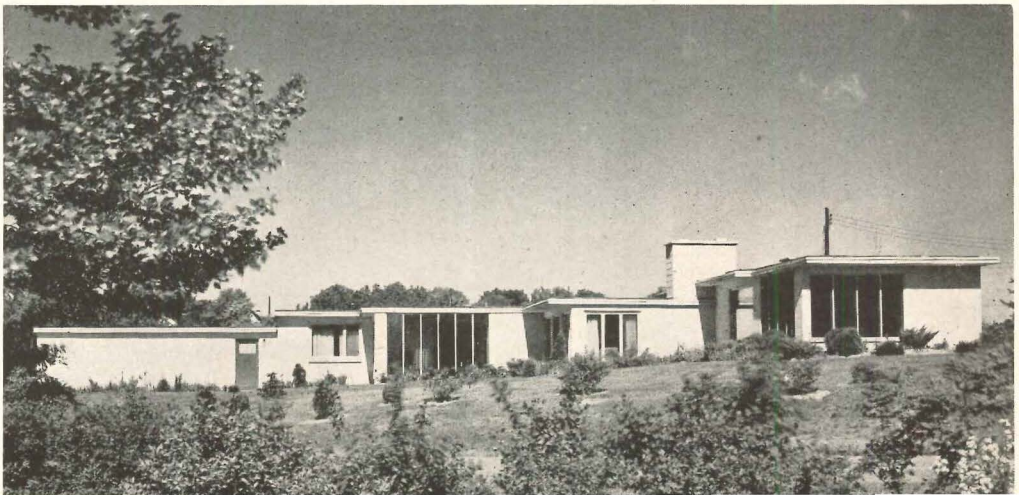


Kitchen (right) is placed to serve both dining area and screened porch. A service entrance in the laundry portion opens onto a drying yard with steps up to carport. A built-in charcoal grill in the kitchen uses central chimney. Concrete slab floors are carpeted in the main living area; other areas are covered with asphalt or plastic tile. Recessed ceiling fixtures, some with flexible swivel lights, are controlled by low voltage switches. Master control panels are in upper hall and in the master bedroom. Bedrooms have built-in air conditioners



Photos: Joseph Molitor



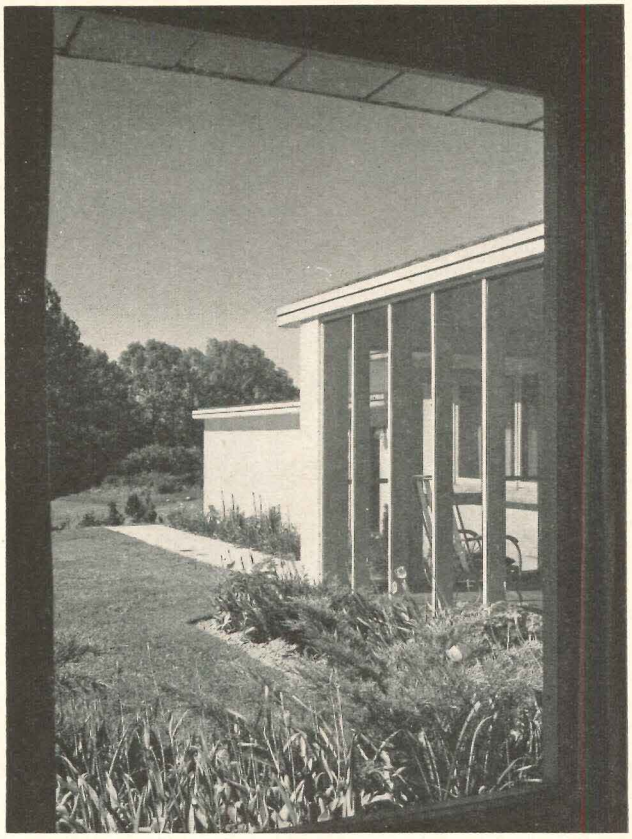


HOUSE MAKES THE MOST OF STOCK MATERIALS

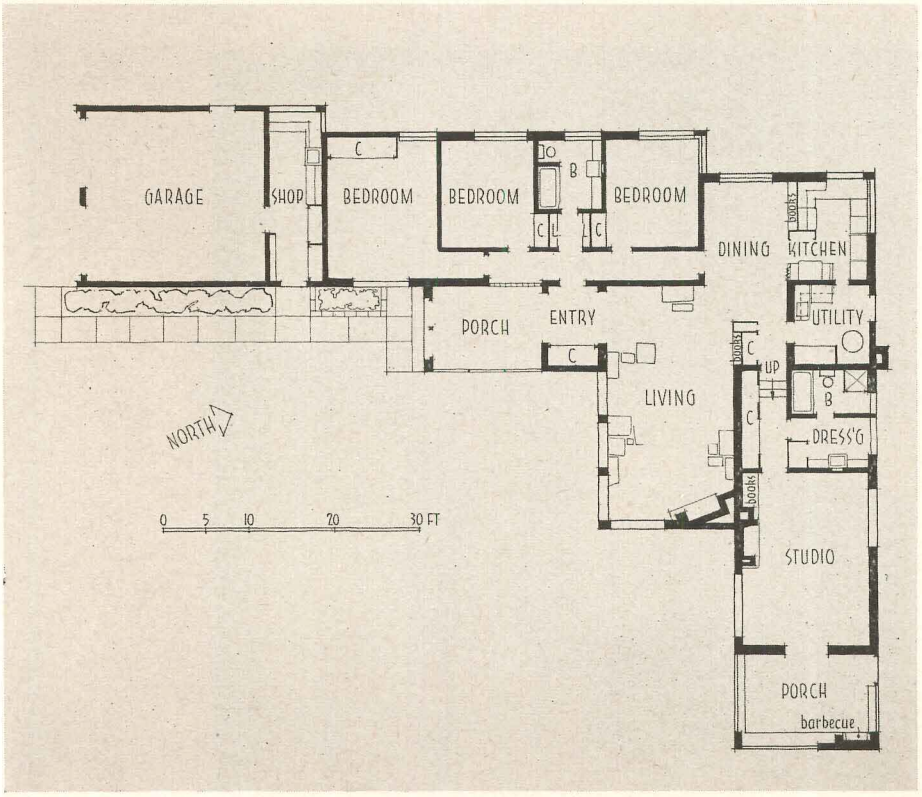
Residence for Miss Veronica McCarthy

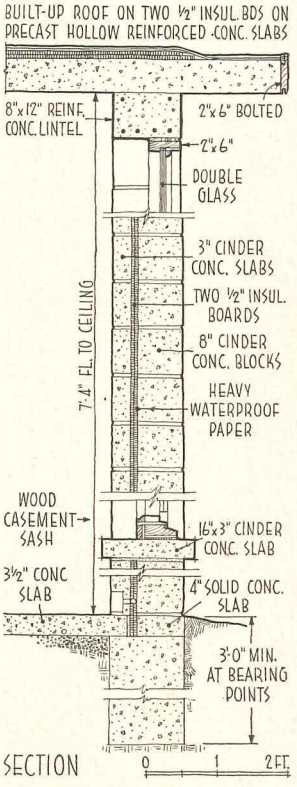
Fairport, N. Y.

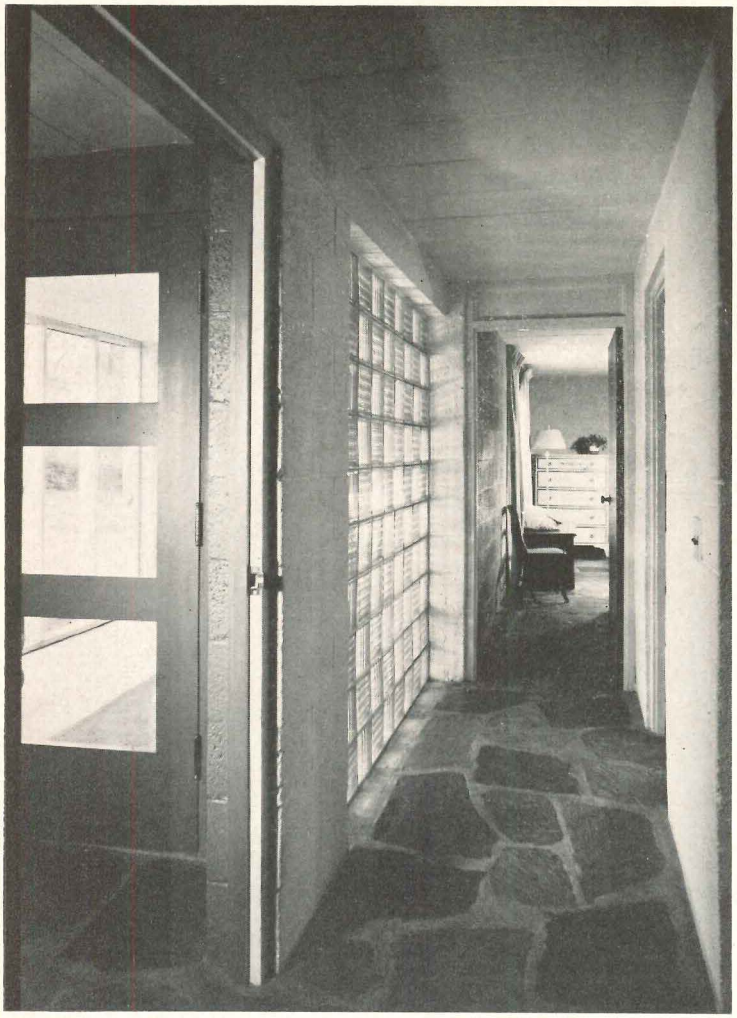
Don Hershey, Architect

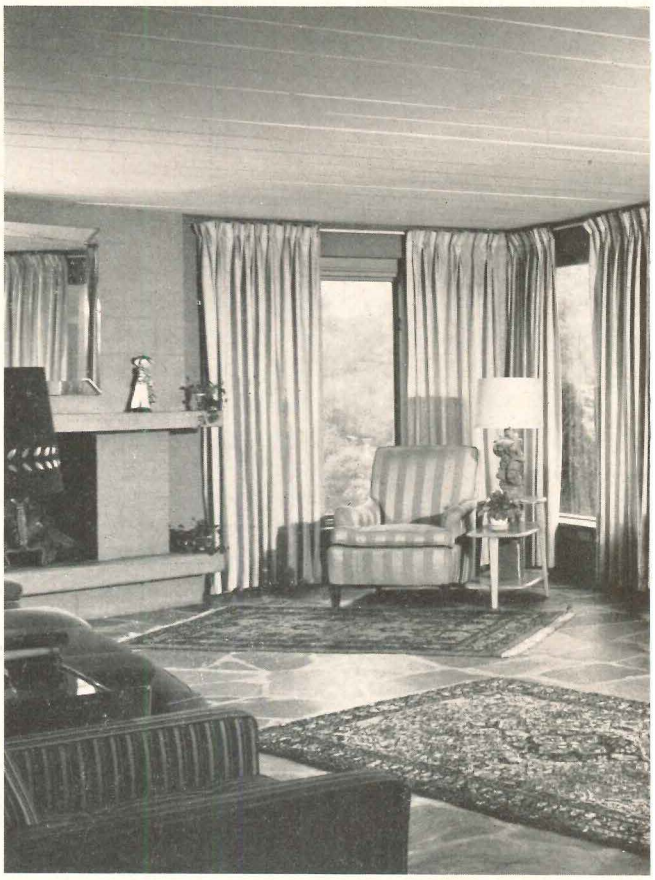


AN UNUSUAL AMOUNT of space and equipment at a cost of little more than half that of neighboring residences of similar size was provided in this simply designed house. Results of the architect's idea that construction costs could be lowered substantially by reducing the number of structural components involved are evident throughout the house. Only standard stock materials are employed, as in wall section, below right. The house is, in effect, designed to fully exploit these materials in the most straightforward and economical manner possible. The simplicity and logic with which the materials were treated made both for a low-cost, livable home and also for direct and uncomplex relations between architect and contractor. The ultimate benefactor of course was the client, who was afforded a maximum of space and conveniences for his expenditure. In addition to this, the direct expression of materials — cinder block, prefabricated concrete slabs, Vermont slate — without costly finishes results in a house as pleasingly simple as it is practical.

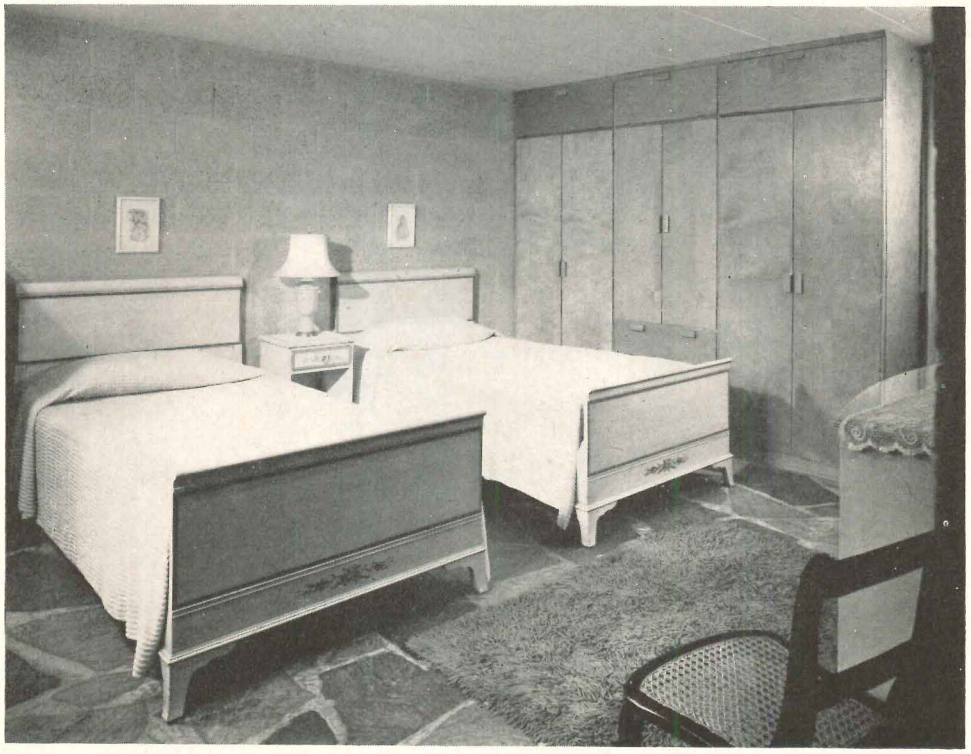




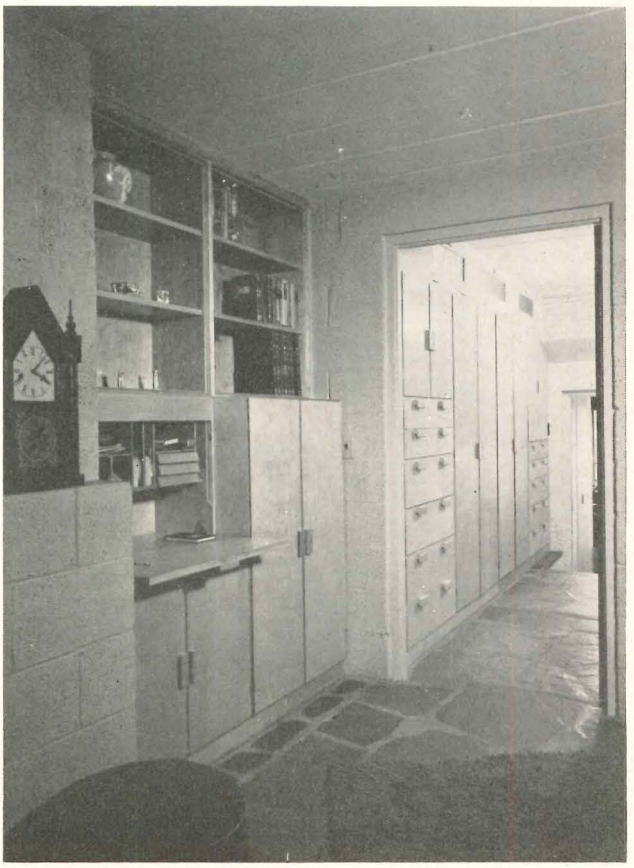




Simplicity with which materials are combined is evident in entrance hall, above, and master bedroom, below. Prefabricated cabinets are used throughout

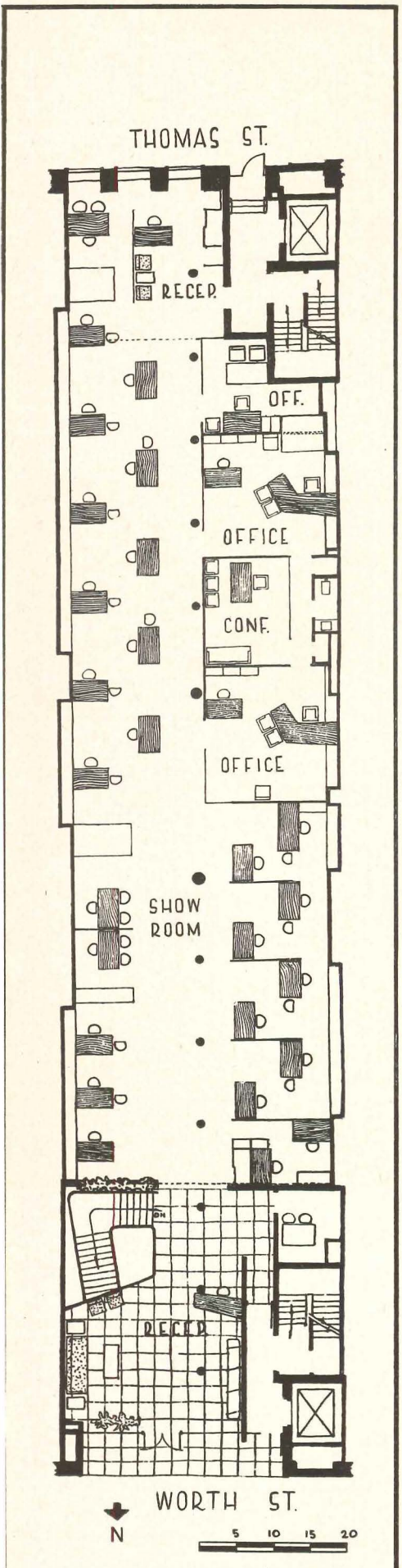


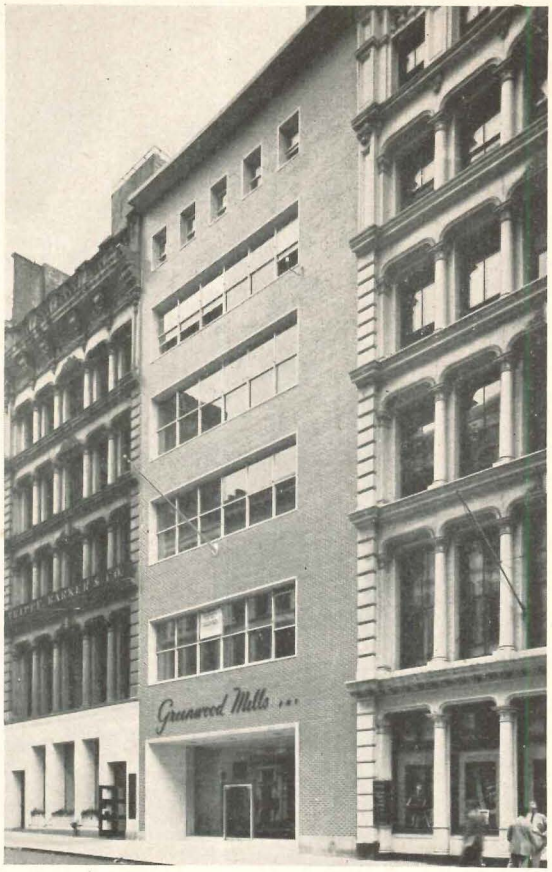
Living room, above center, and dining room, above right, are adjoining. Comfortable, uncluttered appearance of studio, below left and right, is effected by generous storage facilities

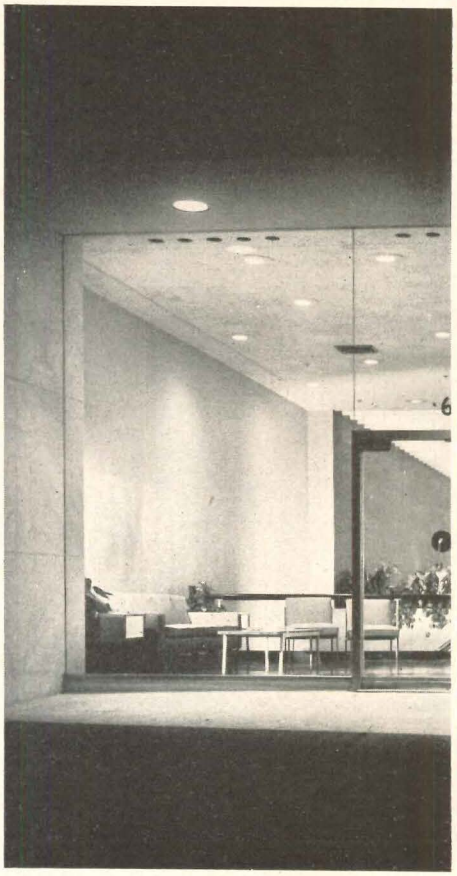


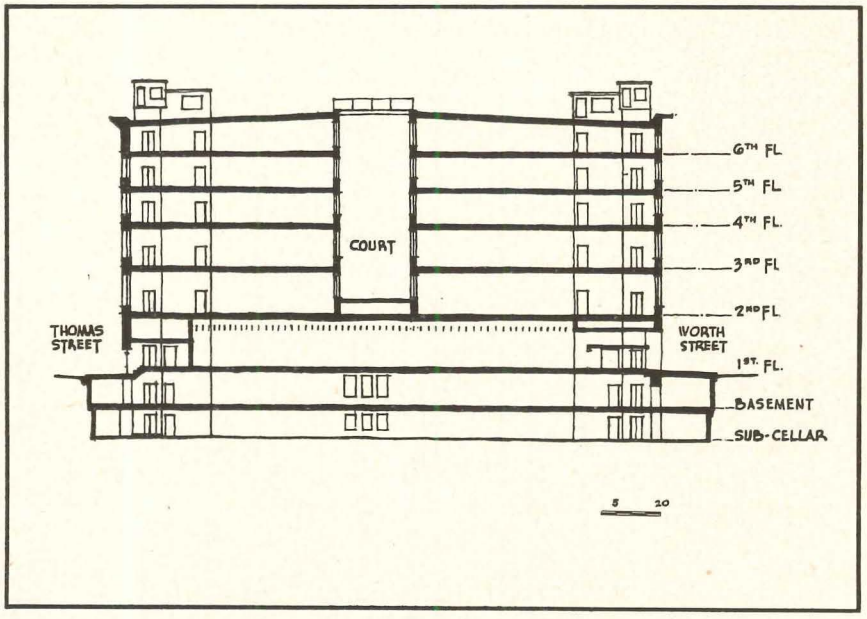
Photos: Joseph Molitor

REMODELED OFFICES

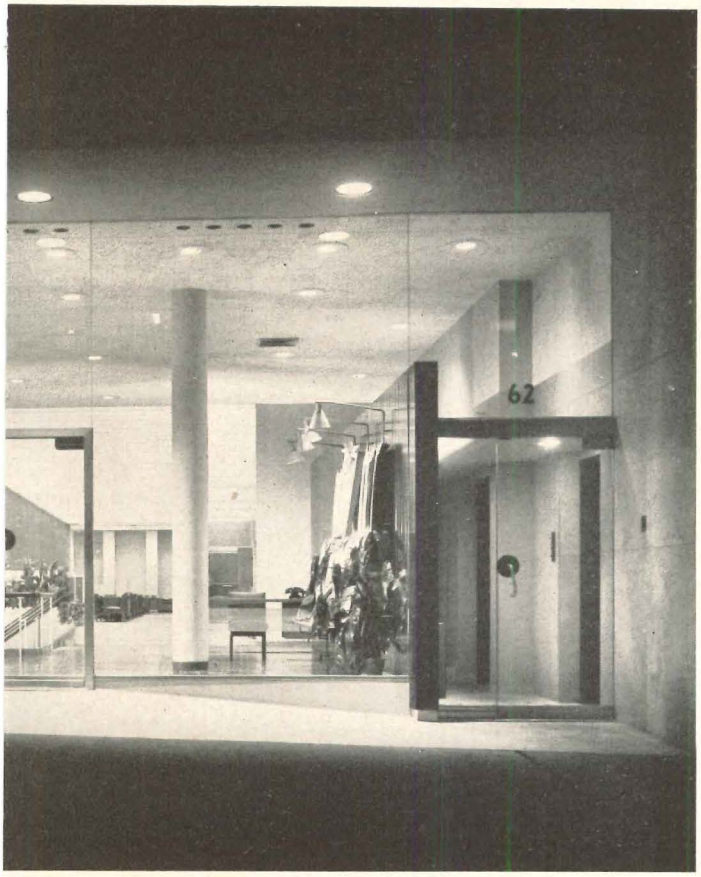








GIVE LIFT TO OLD TEXTILE AREA



Photos: Richard Garrison

Beeston and Stott, Architects

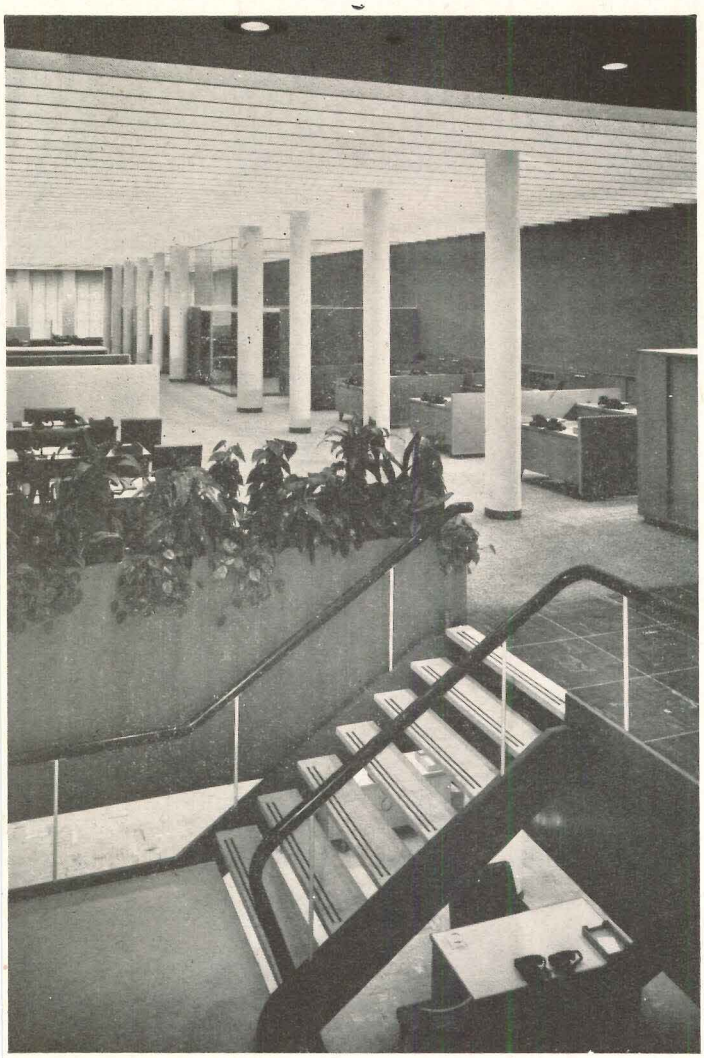
Beeston-Stott-Patterson, Designers

THE GROWING TREND of competitors to relocate uptown in the big buildings of New York's congested West 30's and 40's led Greenwood Mills, Inc., to carefully analyze their own position. Their New York sales rooms and offices were housed in a narrow, cast iron front, post Civil War structure that was almost identical to its neighbors. It was located in the heart of the old wholesale textile district where the uptown movement had lessened realty values — and the traffic problem. The final decision to remain and completely remodel the building has helped considerably to add to the prestige of both the district and the firm.

The architects and designers succeeded in providing a series of inviting, open interiors from the long, narrow plan, which had a row of cast iron structural columns through the center. As a light court divided the upper portion of the building, it was decided to provide a separate entrance to the front half so it could be rented. The front of the building was replaced with a new facade of soft blue-green matte-glazed brick and white marble trim. The Thomas Street facade was provided with a new entrance and painted the same blue-green. New stairways, elevators, toilets and air conditioning were installed throughout the building.

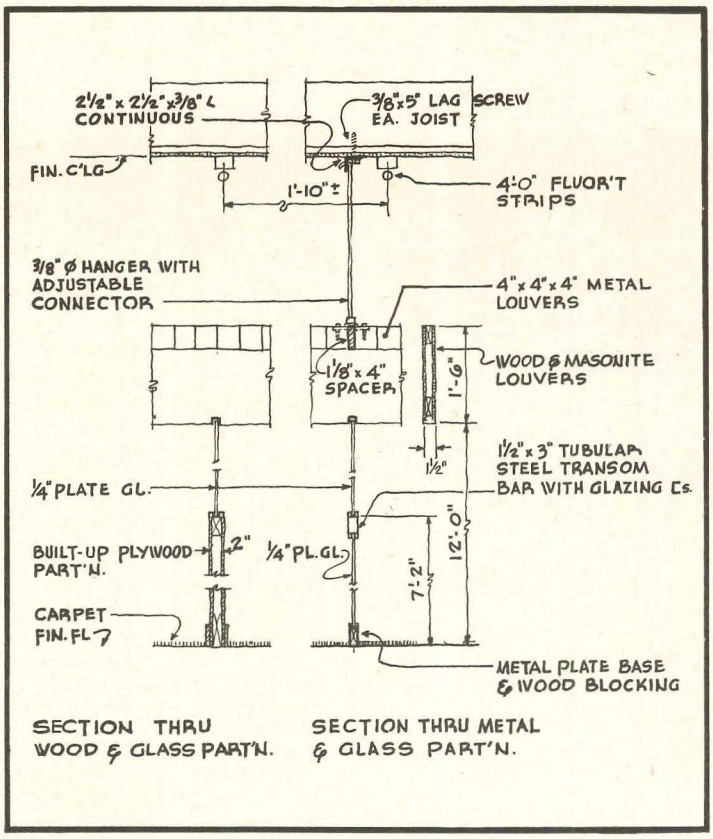
The reception lobby (below) leads directly into main sales and office area. Interior colors and textures were carefully studied; greens and browns were used throughout, with coral and yellow accents

The stairway shown above and upper right, was planned to be as open and attractive as possible to permit use of basement as a sales area. Besides the general interiors, the design contract included the special louvered ceiling, most of the desks, the wall cabinets, and such accessories as blotter pads, letter trays and waste baskets. Side walls were furred out to hide pipes and pilasters, recess new cabinets

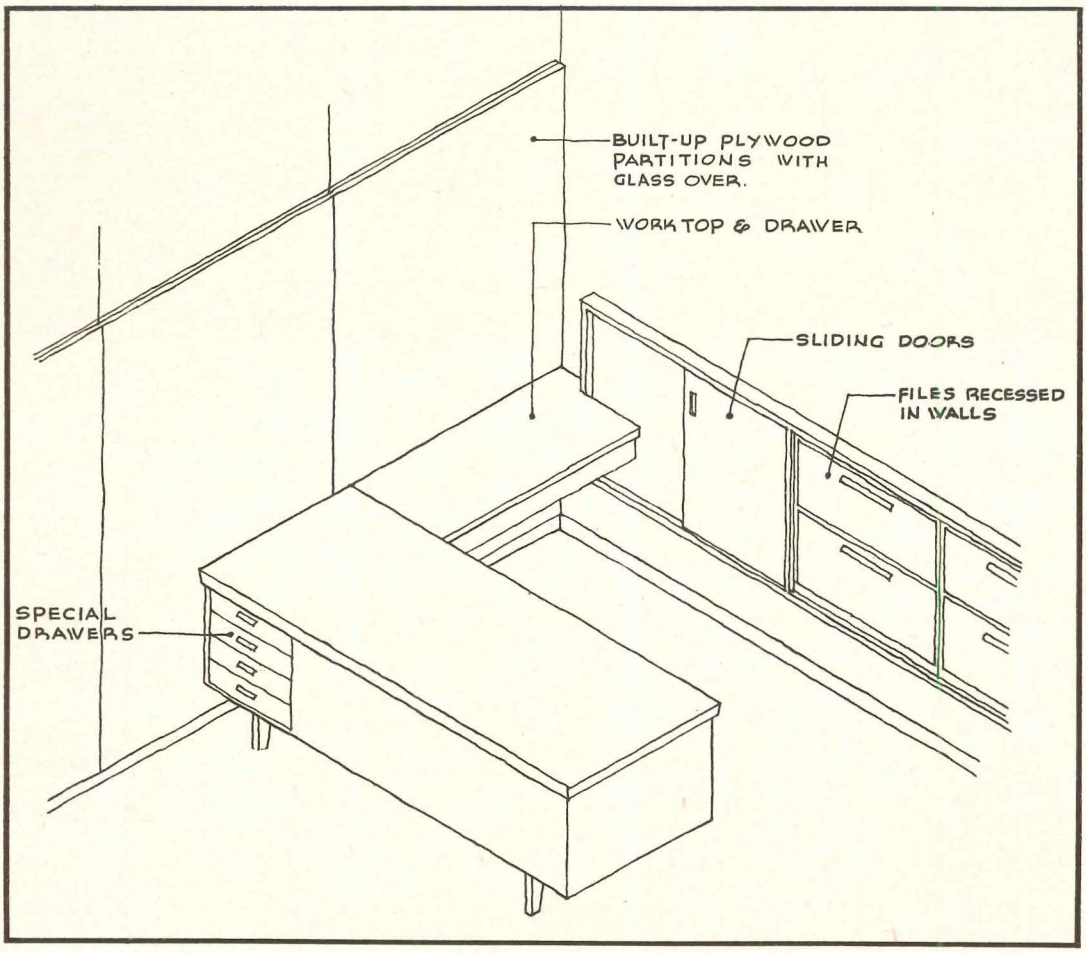


Photos: Richard Garrison

Open planning and glass partitions are also used in upper floors, as in second floor office at right. All floors are surfaced with asphalt tile, rubber tile, or carpet. Walls are plaster, with many surfaced with plastic or textured fabric



Detail above shows sections through typical office partitions and through the louvered ceiling of the main floor



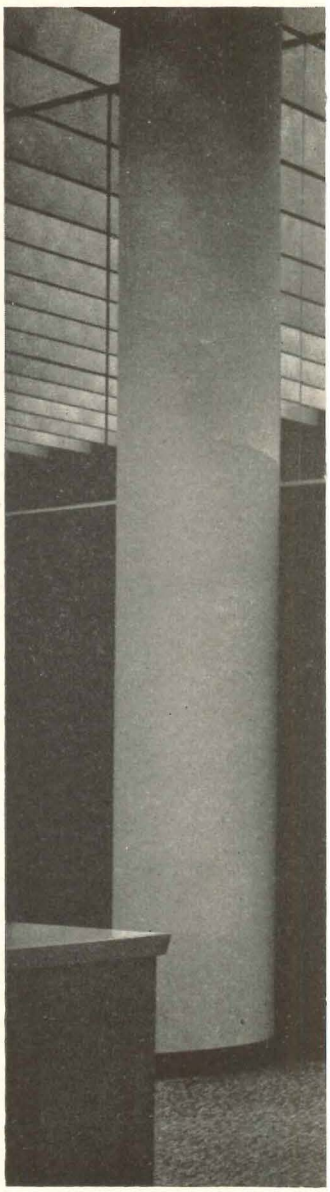
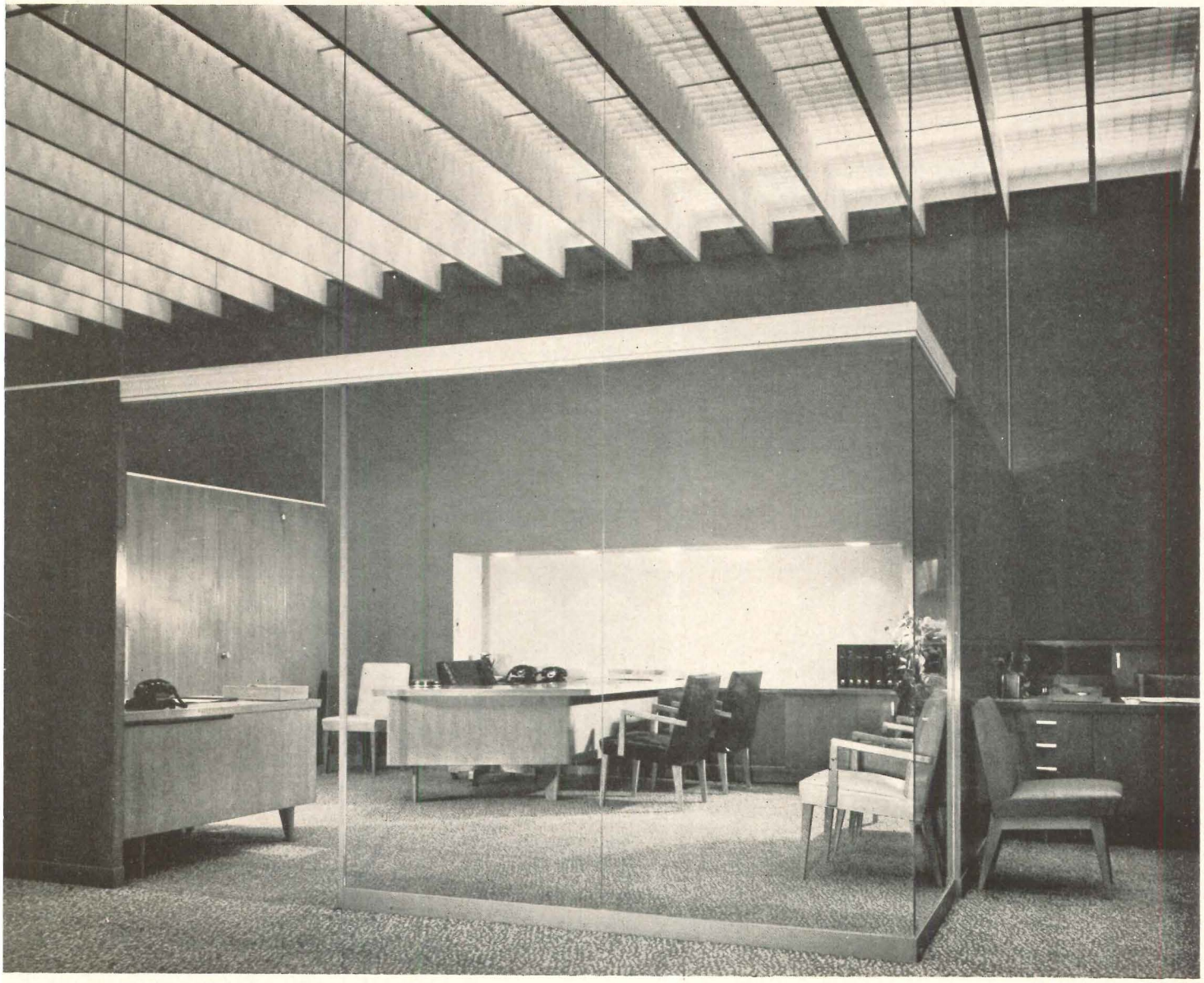
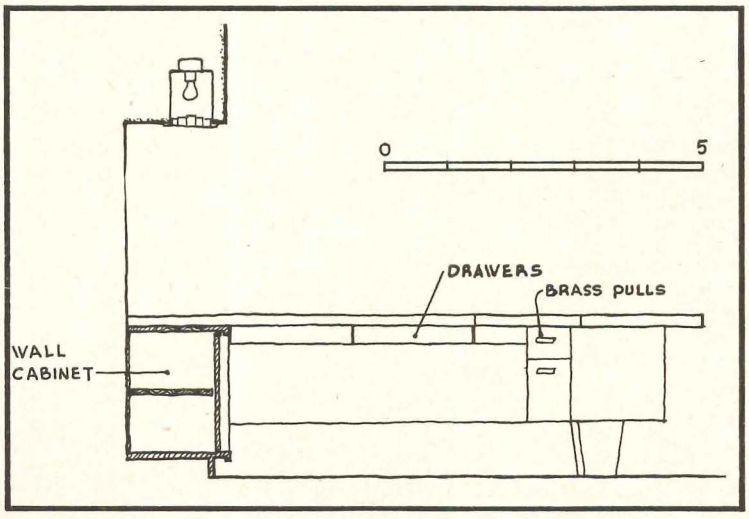


Photo: Richard Garrison



The president's office (above) is in the center of the main floor, and planned at his request to be as open as possible yet give a reasonable amount of privacy. This was solved by using glass and thin wood screens. Detail of president's custom-designed desk is shown right. Sketch at left shows arrangement of junior executive's desk (visible at right in photo)



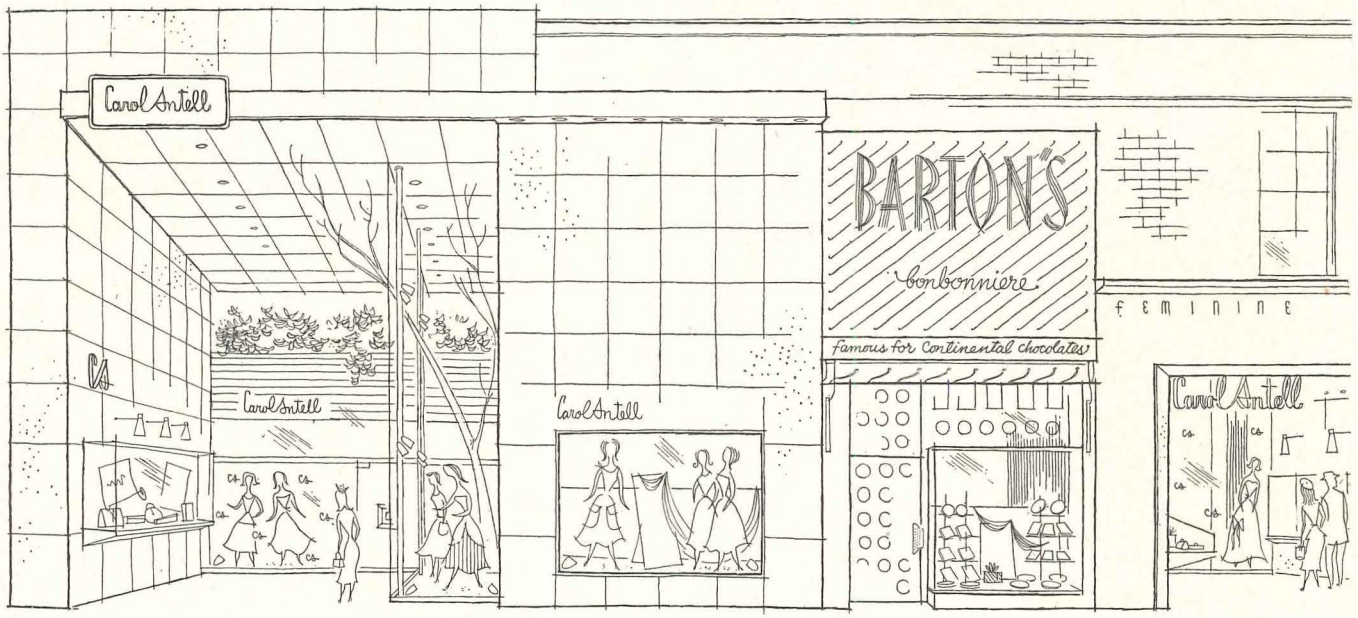
EXPANDING STORE CREATES DESIGN PROBLEM

Carol Antell, New York City

Seymour R. Joseph of Joseph and Vladeck, Architect

THIS NEW YORK SPECIALTY SHOP has approximately tripled its area since it first opened. Its method of expansion was unusual: first, half the ground floor of a former garage was acquired; then a year later a two-story building two doors away was added; and finally the two were linked together. The three-phase development provided an interesting design problem for the architect, and his solution brought him the First Award in the commercial classification at the 1950 convention of the New York State Association of Architects.

First part of the project was the Accessory Shop (extreme right on plan and sketch, photos on pages 158–159). Designed for the display and sale of costume jewelry, blouses and handbags, it is straightforwardly open, with cases lining both long walls. Much of the display area is in the deep entrance arcade, which has a large circular showcase as well as counter-height cantilevered cases on both walls.

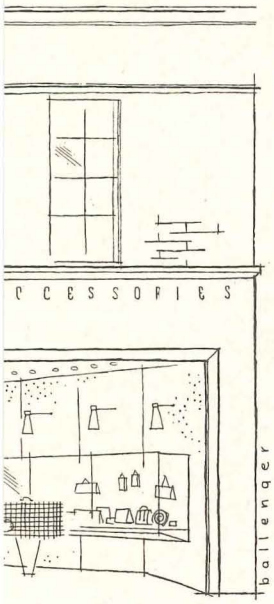


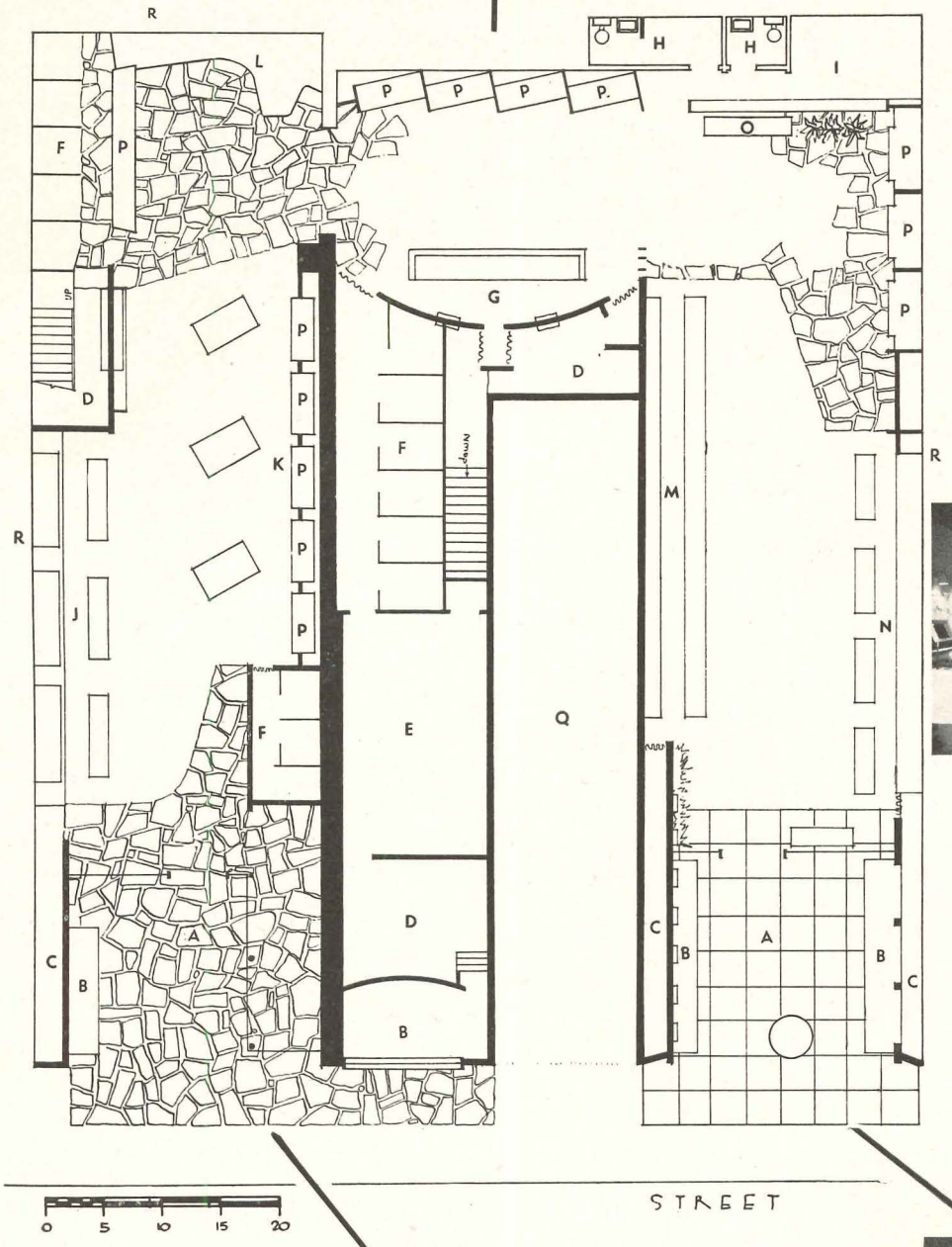
Next came the Sportswear Shop (left on plan and sketch, photos on pages 160–161), which occupies all of the two-story building. Everything about this shop was designed to suggest the outdoors — the two-story arcade, the flagstone floor, the tree growing out of the show window, and the pool in the rear of the store. (Offices and stockrooms are on the second floor.)

The last and most difficult phase of the expansion came when half the space between the two shops was acquired, along with a continuous area to the rear which permitted a connecting passage. This new space was utilized for facilities such as stock and alteration rooms, fitting rooms, and wrapping desk. The connecting passage itself also permitted the use of surfacing materials as a visual link between the two quite different shops.

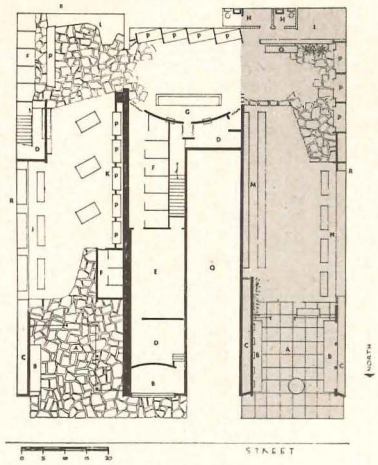
Exterior walls of both shops are precast terrazzo block; interior walls are plaster, wood panels, and Tennessee ledgestone. Ceilings are plaster and redwood, floors are carpeted in sales areas. The architects designed all showcases and fixtures, and selected everything that went into the entire shop — even to the ashtrays.

Photos: Ben Schnall

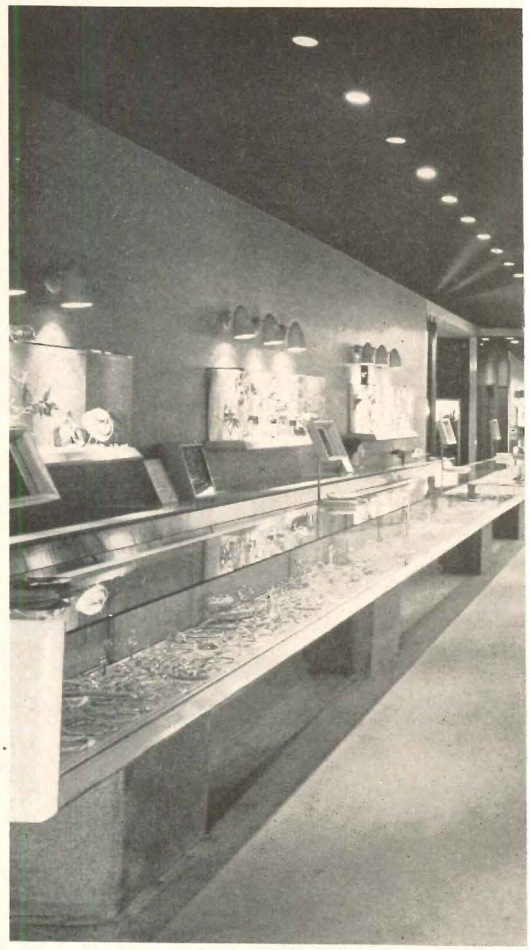




A. ARCADE
B. WINDOW DISPLAY
C. PASSAGE
D. STOCK ROOM
E. ALTERATION ROOM
F. FITTING ROOMS
G. WRAPPER DESK
H. TOILETS
I. AIR CONDITIONING
J. BLOUSES and SWEATERS
K. SPORTSWEAR
L. POOL and DISPLAY
M. JEWELRY
N. HANDBAGS
O. DISPLAY
P. DRESS CABINETS
Q. AREA NOT INCLUDED
R. ADJOINING BUILDING



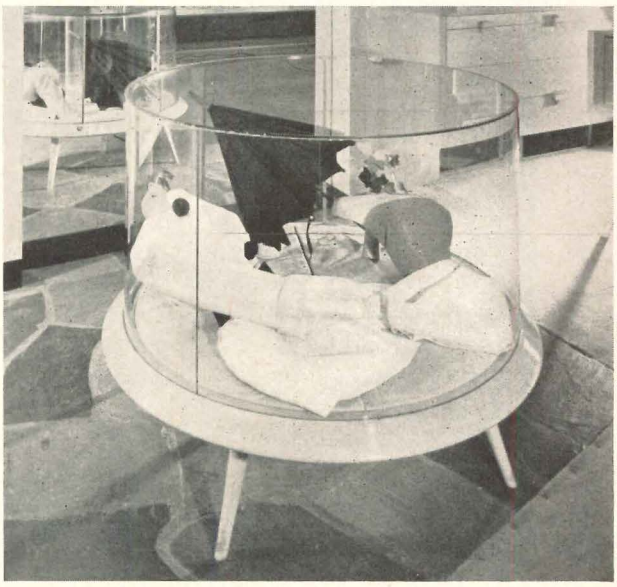
The Accessory Shop, first part of the store to be completed, has plaster walls and ceiling, concrete floor. Mirrors on jewelry counter are mounted on universal joints, can be swung down behind counter. Rear wall is illuminated glass panel with mirror spots

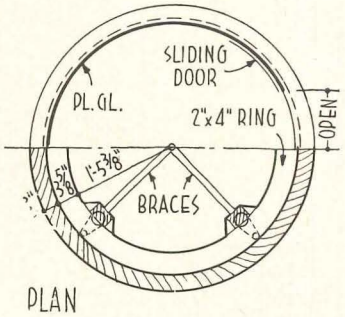


CAROL ANTELL—ACCESSORY SHOP

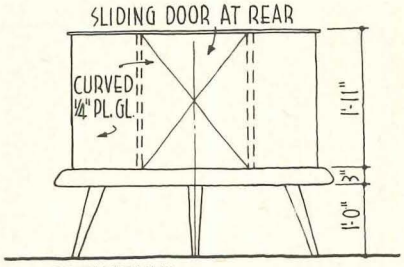
Three circular show cases (details and photo opposite) were designed by the architect especially for this shop; a fourth, mounted on a tapered pedestal, is used in the arcade (left)

Photos: Ben Schnall

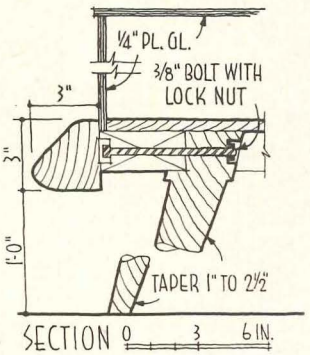




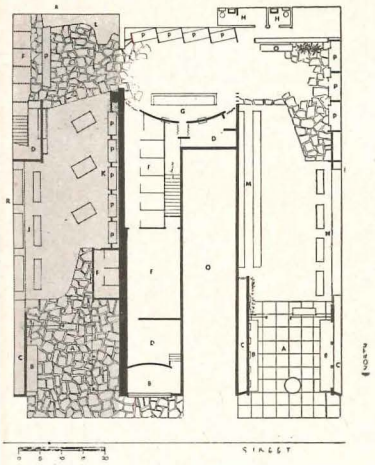
PLAN



ELEVATION



SECTION

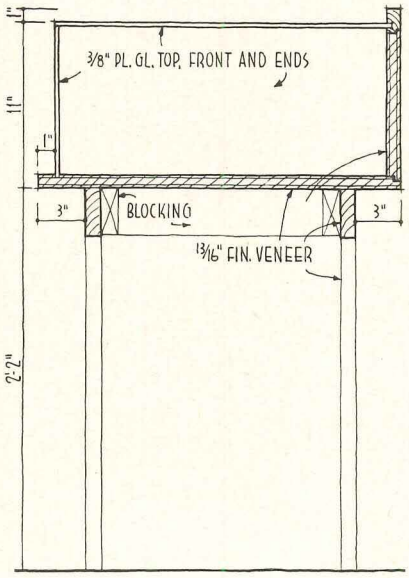


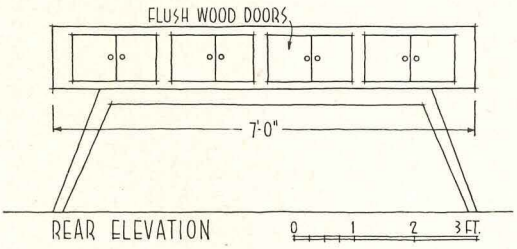
Second part of property acquired was a two-story building which offered more freedom in design of exterior. Since this is a sportswear shop, an outdoor atmosphere was desired. Hence the flagstone floor in arcade, the tree growing out of show window. Side walls here are wood panel, rear wall is Tennessee ledgestone

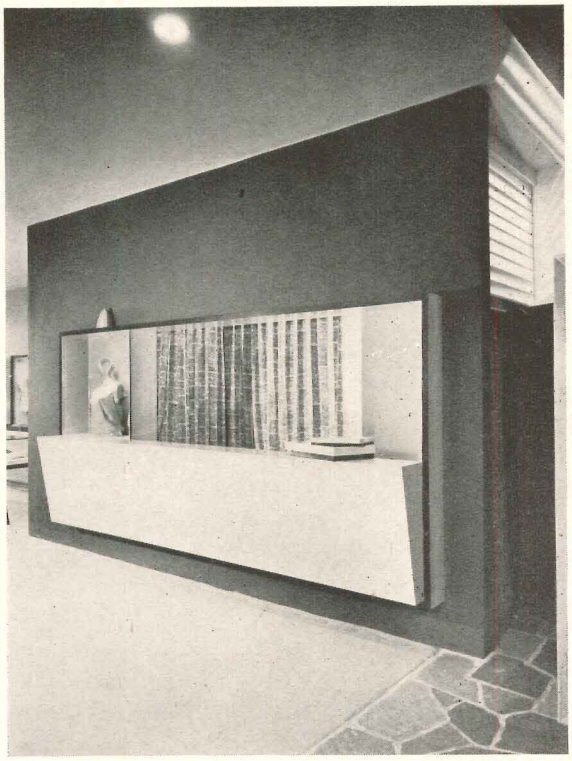
CAROL ANTELL—SPORTSWEAR SHOP

Photos: Ben Schnall

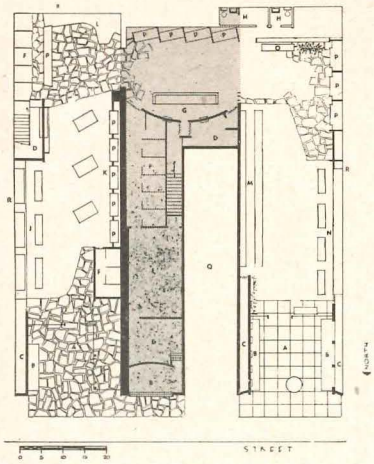
Ledgestone wall is clearly visible from street, adding to outdoor emphasis of planting box on second-floor balcony. A few fitting rooms and stairs to second-floor offices are behind stockroom desk (top, opposite page)





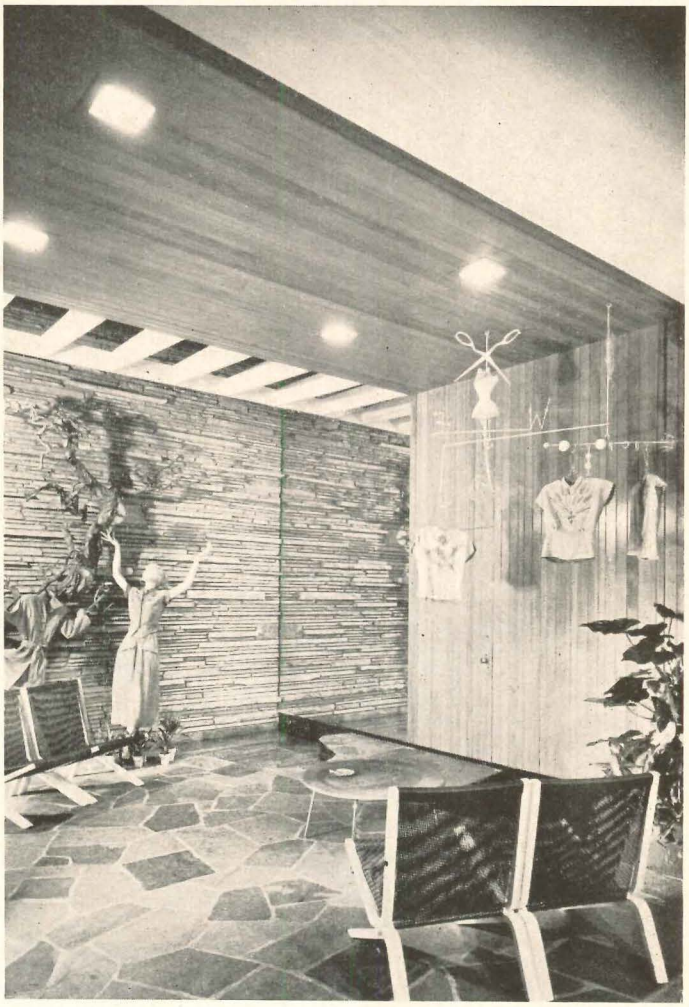


The architect designed all showcases and fixtures, cantilevering most of the wall cases. Flagstone floor of arcade is carried into interior and repeated in rear of shop which connects with Accessory Shop (next page)

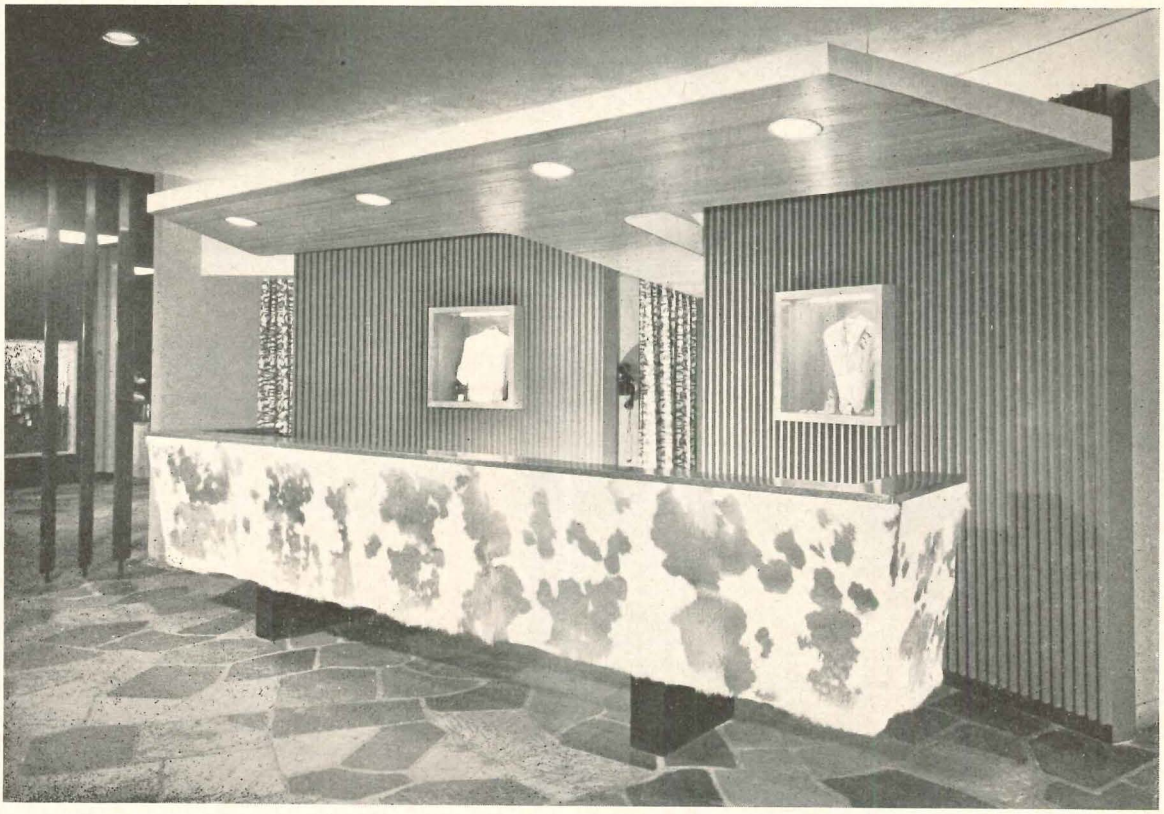


CAROL ANTELL—CONNECTING PASSAGE

The two shops were tied together visually by repetition of certain materials, particularly in passage between them, where common facilities such as wrapping desk are located. Wrapping desk is covered in cowhide, which is repeated on bench at rear of Accessory Shop (page 159). Note small pool in extreme corner of Sportswear Shop (right)

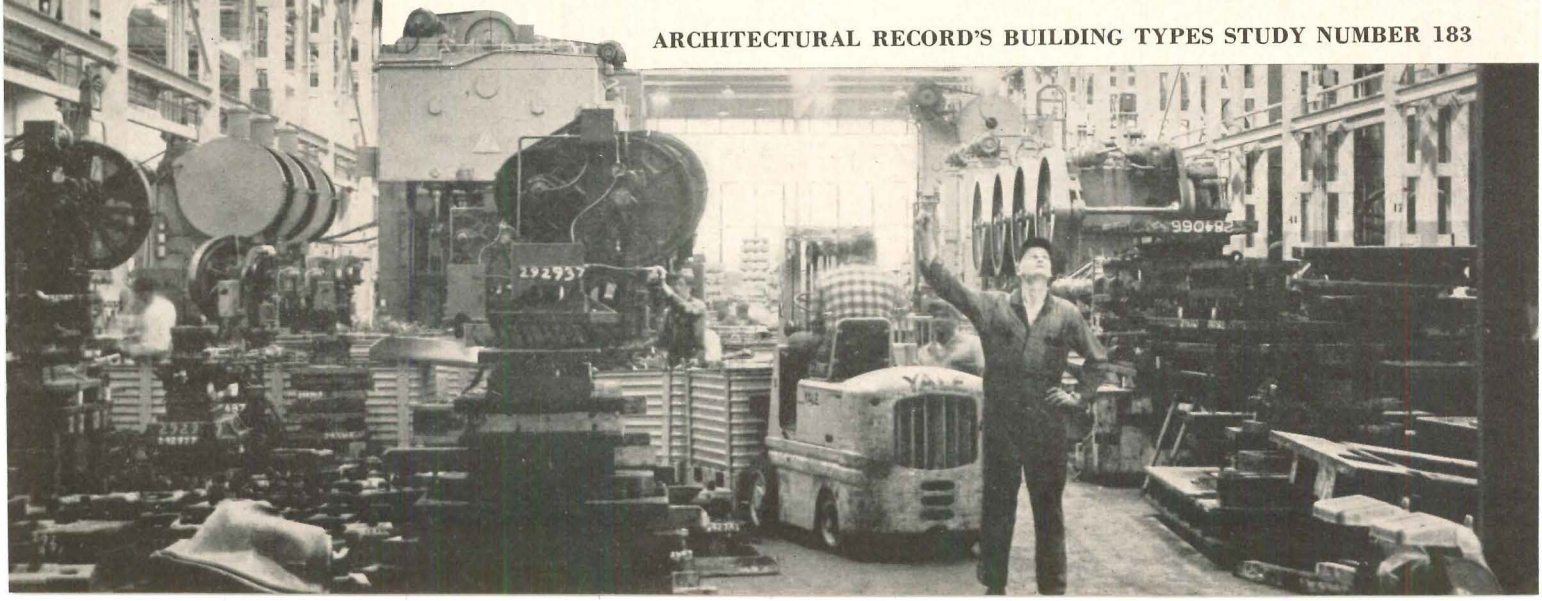


Photos: Ben Schnall



INDUSTRIAL BUILDINGS

ARCHITECTURAL RECORD'S BUILDING TYPES STUDY NUMBER 183



CONSTRUCTION OF INDUSTRIAL BUILDINGS has roared on through 1951, and goes roaring ahead into 1952. In the Dodge outlook for this year industrial construction was estimated at just under the volume of last year. And last year was terrific.

How long any country can continue to expand its manufacturing capacity so rapidly, without reaching some limit, is a question nobody seems moved to answer. Right now America is still adding its war production onto its civilian manufacturing, and, except for some metals shortages, doing quite well by both. Business is good, money is flowing, and expansion continues.

It is not just tank plants and steel mills that swell the statistics. It is automobile plants, and pickle factories, and doughnut assembly lines. It is chemicals, medicinals, and perfumes. It is baby foods, and toys, and schoolbooks.

There are other reasons, besides real expansion, for building new factories. New plants are built to house more modern, more efficient, more automatic machinery. To cut costs, to get closer to markets or material sources. To improve transportation. To improve labor conditions. To escape taxation. To simplify or unify operations. To whip competition, in one way or another. There are still ancient and seemingly revered buildings that should long since have been replaced.

All of these factors have a bearing on planning and design. Choosing the location for a new factory has become a complicated study, especially now that industry rather generally is pioneering new and undeveloped areas. The government is actively encouraging decentralization or dispersion as a safety measure in case of enemy attack. Decentralization is a natural development, in any case, as industry seeks new labor sources, new material sources, new transportation efficiencies, increased amenities for workers, freedom for future growth, and so on.

Architects and engineers are then called upon to add to their program basic items which are sometimes merely assumed — water supply, fuel, power and so on. In many instances a whole new community must somehow develop, with workers' housing, schools, shops, everything a town must have. Industry generally has seemed to dodge the responsibility, because of a dread of paternalism and its evils. In the end, however, the success of the entire project may hinge on proper community planning and development, and industrial management is not as blind in this as sometimes appears.

Which is to say that industrial expansion is a very dynamic movement, continually shifting and sharpening its requirements for buildings. It is sometimes said that industrial buildings have settled into a pattern, that they all look alike, that their designs might as well roll off some assembly line for blueprints. But it takes very little reflection to see that design can never become static. Design of buildings for industry, like industry itself, feeds upon change. Like an airplane, it must have forward movement, or fall.

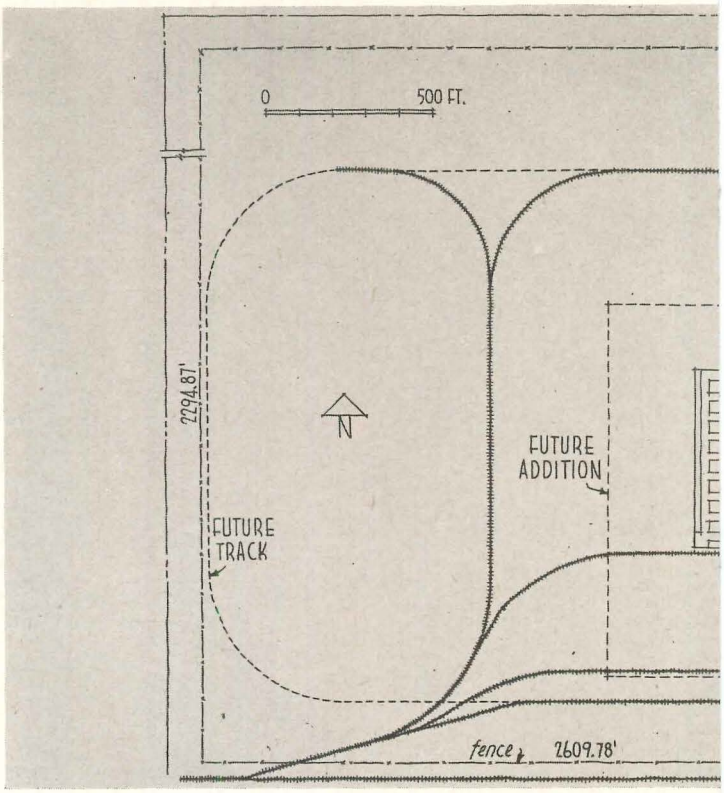
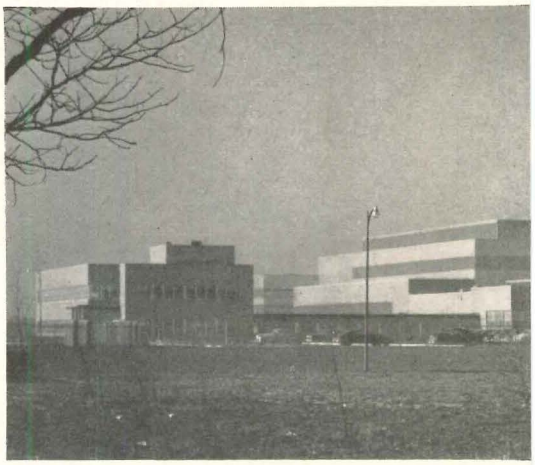
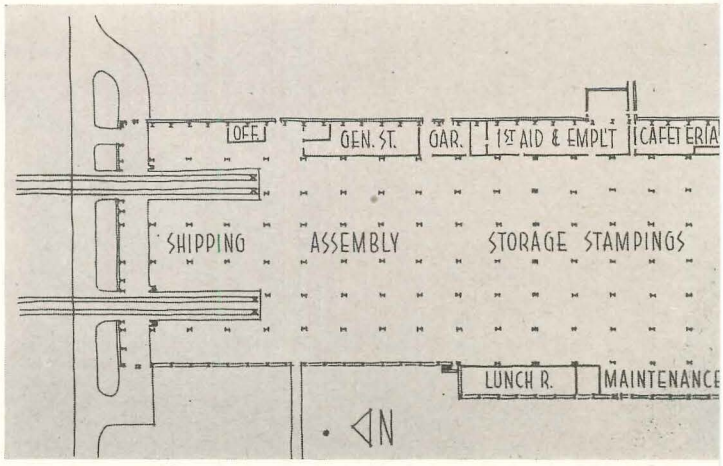


Photo: Lens Art

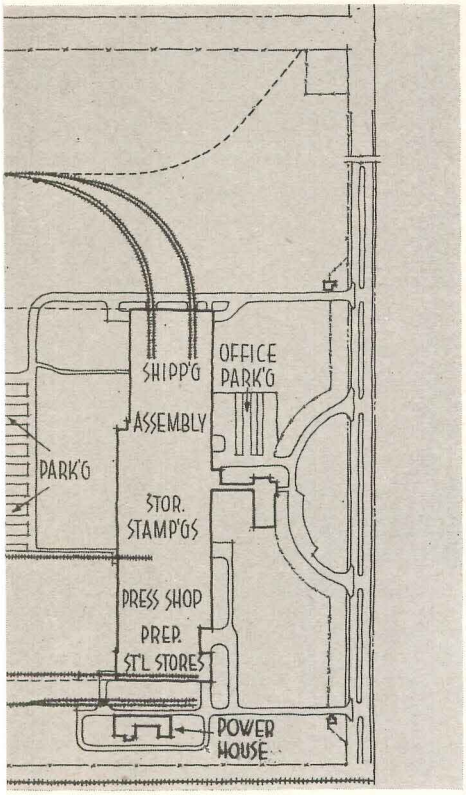




FLEXIBLE PLANT FOR AUTOMOBILE BODIES

The Budd Company, Chase Plant, Gary, Ind.

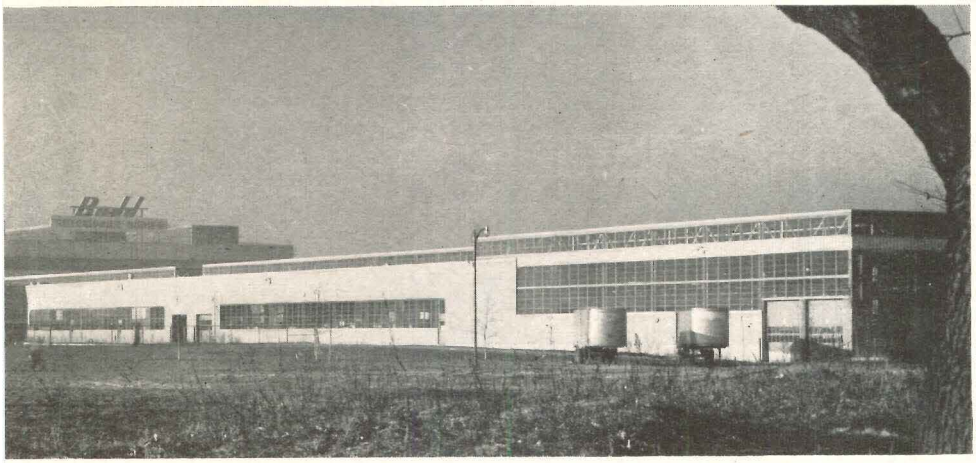
Giffels & Vallet, Inc., L. Rossetti, Architect and Engineers



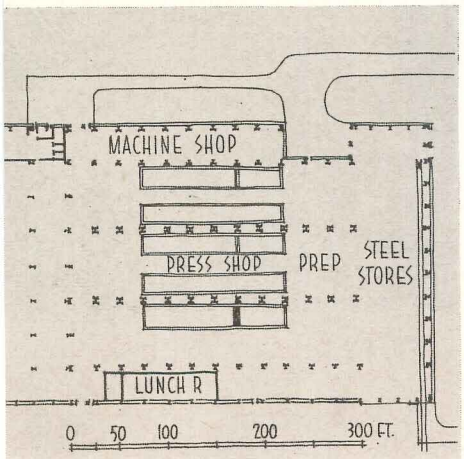
THE AUTOMOBILE INDUSTRY is probably the best client industrial architects and engineers ever had. It has been a huge industry, a growing one, but perhaps more important still, an industry of constant change. In Detroit you hear of a radically improved engine which is coming in a couple of years "as soon as new plants can be built to make it." Each new development seems to require drastic changes, including new buildings, to make the new gimmick with the necessary efficiency.

This Budd plant concentrates on two parts of an automobile body, doors and roof, was needed in a hurry when efficiency required such specialization.

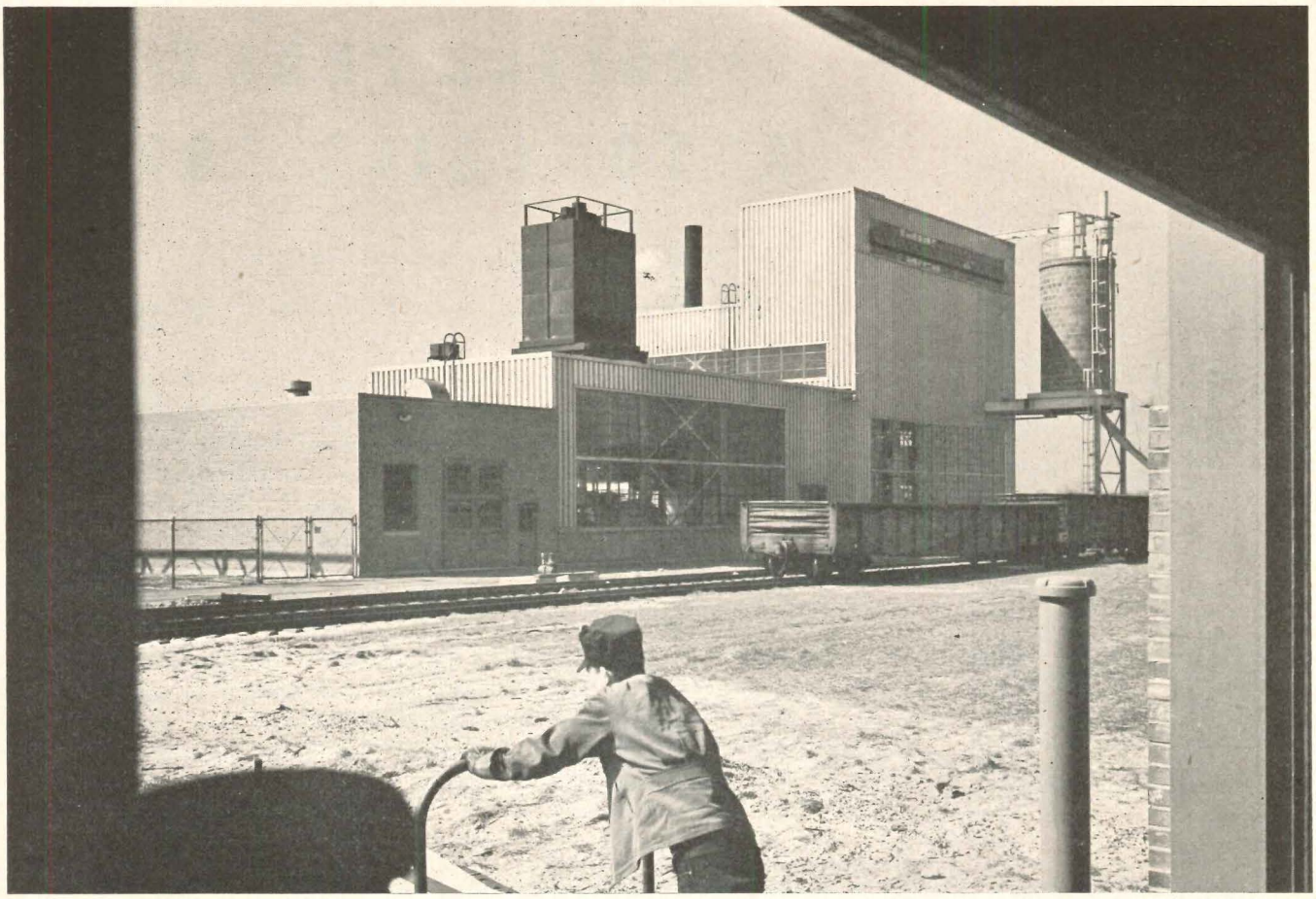
One addition has already been built, increasing the assembly and shipping area by 65,000 sq ft. As the site plan shows, the plan was designed for great expansion. The first plant could be tripled in size, then a fresh start made in a second loop of railroad tracks. The power plant was placed so as not to block this growth. The original press shop, where body stampings are made, was made large enough to permit the present expansion to assembly and shipping areas.

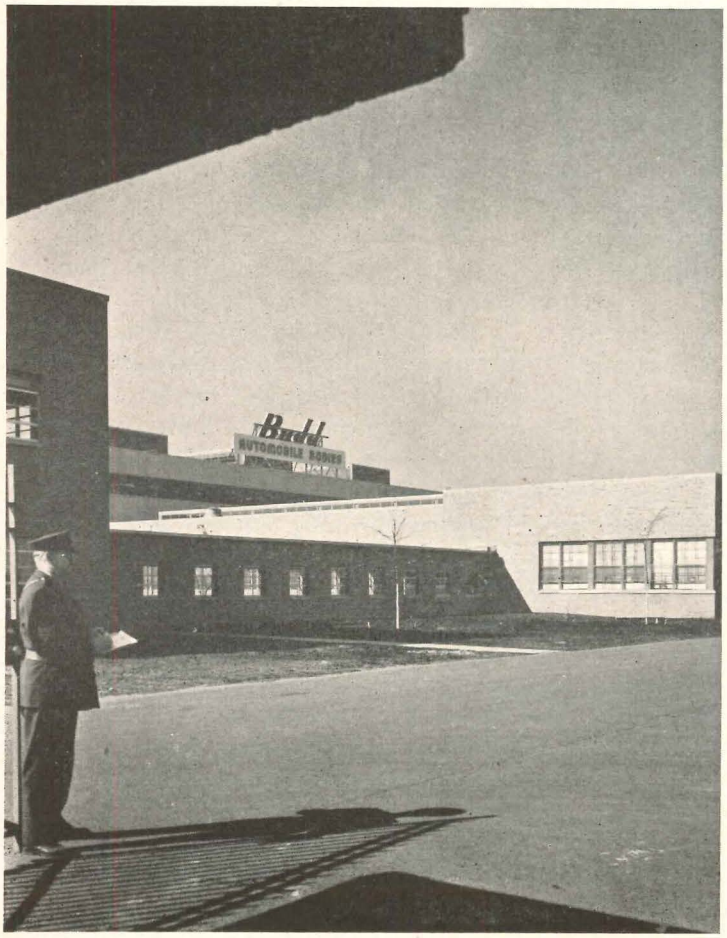


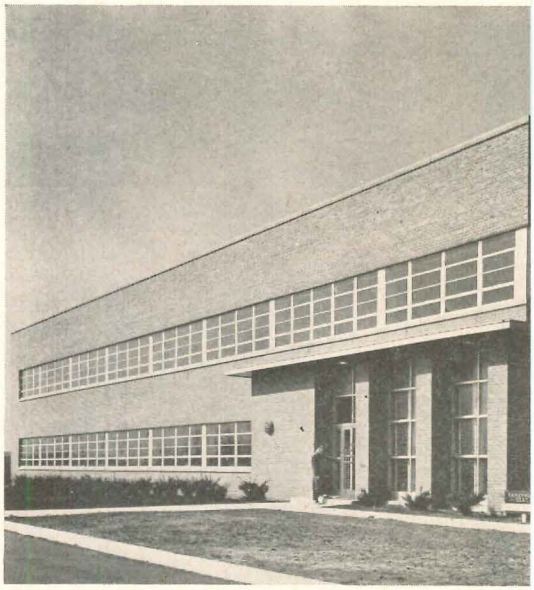
The press room has one interesting contribution to flexibility. Normally the huge stamping machines are set in individual pits and thus are difficult to move to accommodate changes in the work line. Here the engineers worked out a long trench (there are five of them) to take the machines in any desired location (plan and sections, page 168). Prebuilt, trussed slab floor sections can be placed across the pits between machine mountings. This system makes it possible to move the huge presses back and forth at will, or even change their place in the rotation, without the delay and expense of building new pits. Actually there are three different cross sections in the five trenches; changes from one line to another would be rare, but to an extent even these could be accommodated.

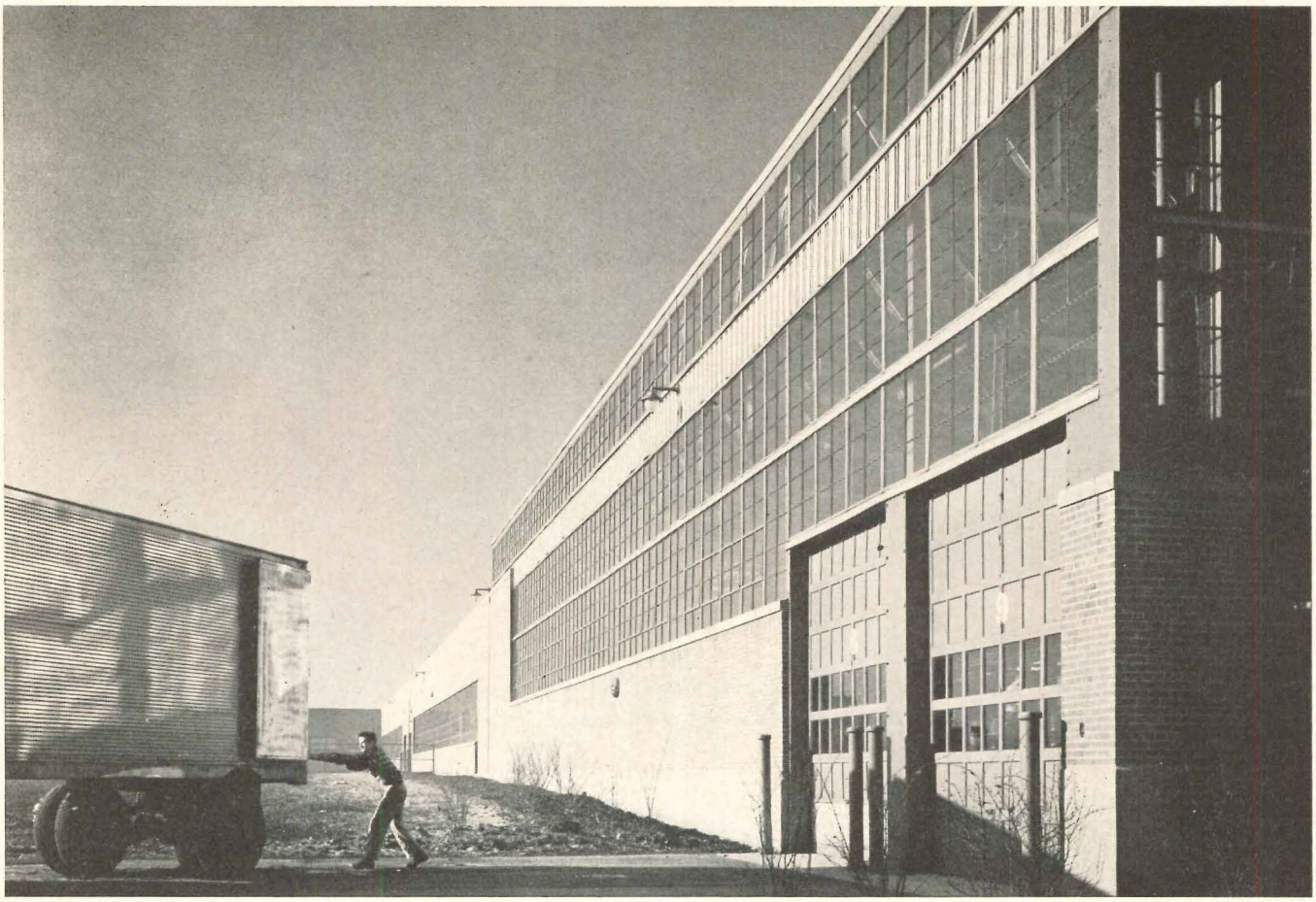


It is interesting to note that the bottom seven or eight feet in the deepest pits are below the water line in the marshy base of the sand dunes on which this building stands. Metallic waterproofing has avoided any trouble in this respect. The engineers have also been able to cope with some settling, by opening the floors at spots and pumping in sand.



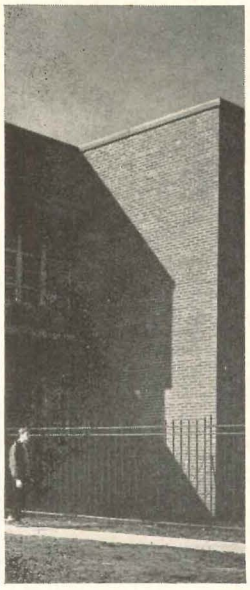

Budd
AUTOMOBILE BODIES



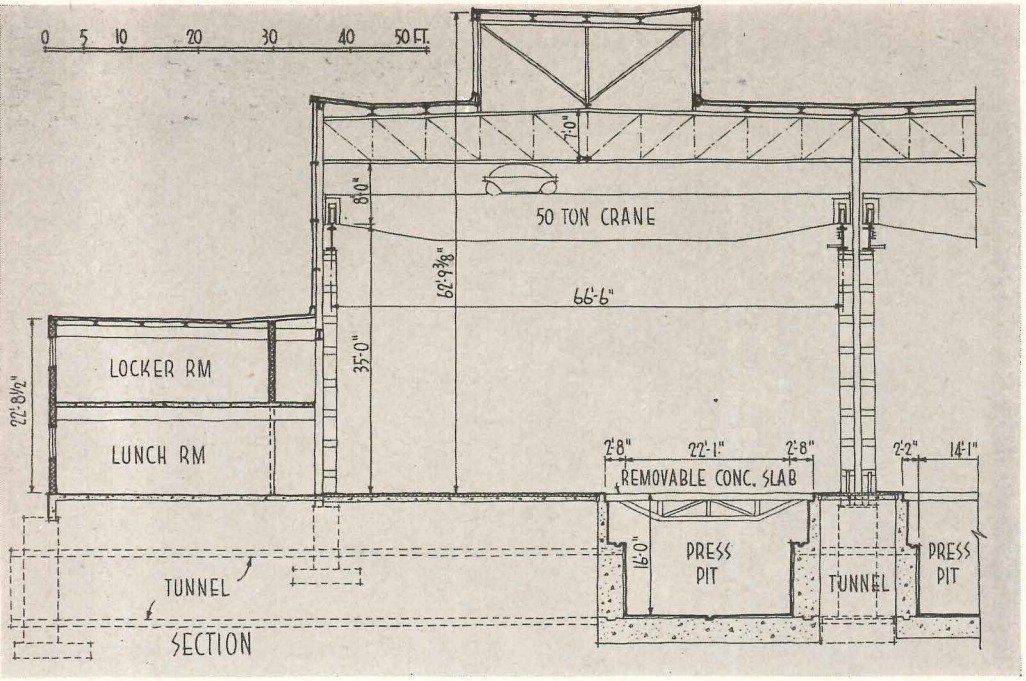


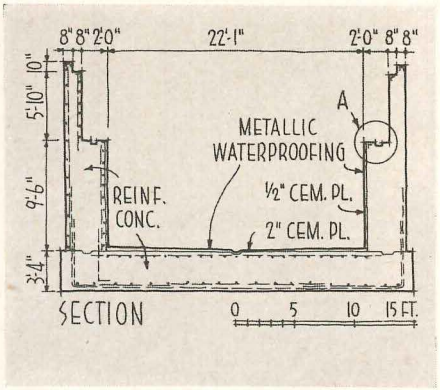
Photos: Lens Art

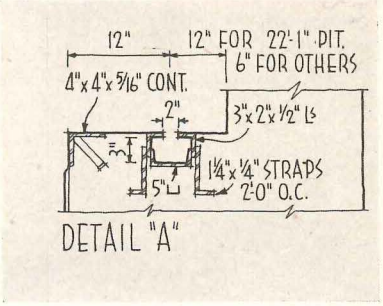
The above photograph is already out of date, as this shipping and assembly area has been enlarged by 65,000 sq ft



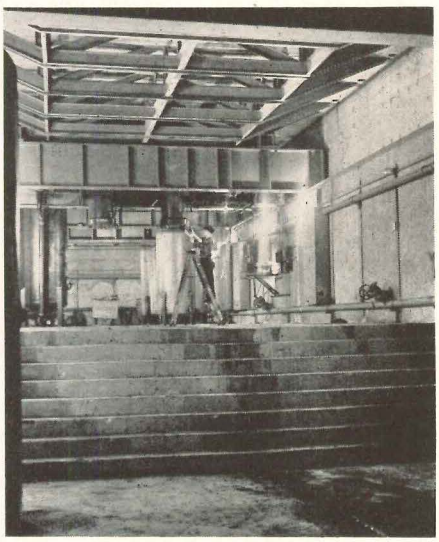
Offices are in separate buildings relatively far away from the plant, for isolation from noise of heavy metal presses





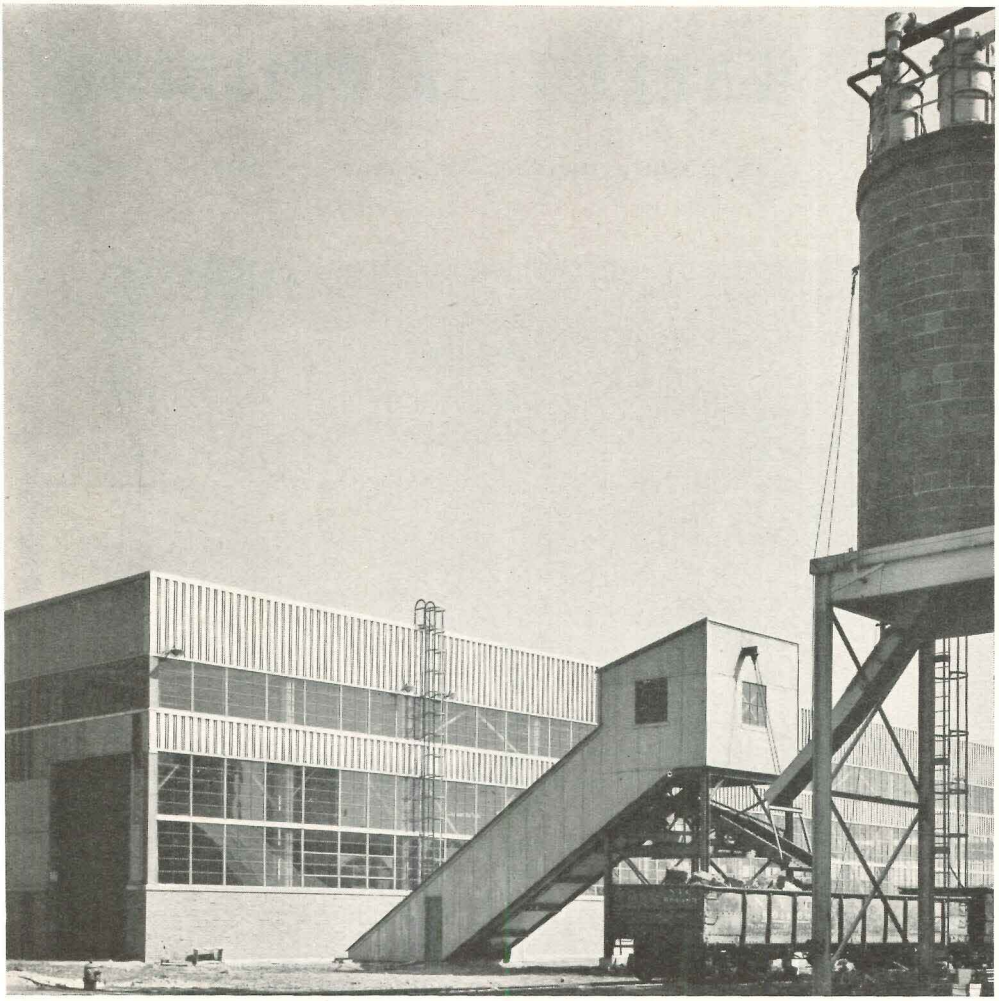


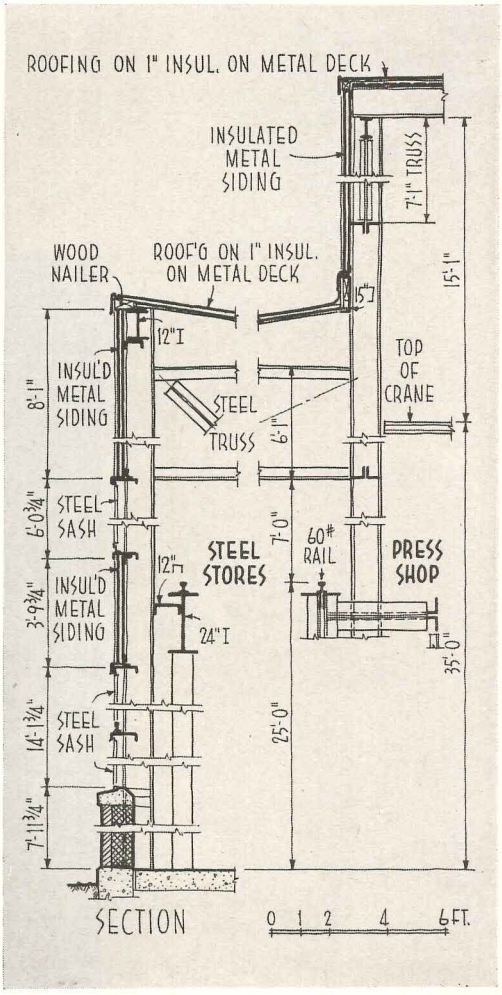
Press pit is a long trench in which the huge presses can be moved up or down the line as production changes require, are deep enough for maintenance servicing of presses. Removable trussed slab floor sections cover pits between press locations (see also small photo below)

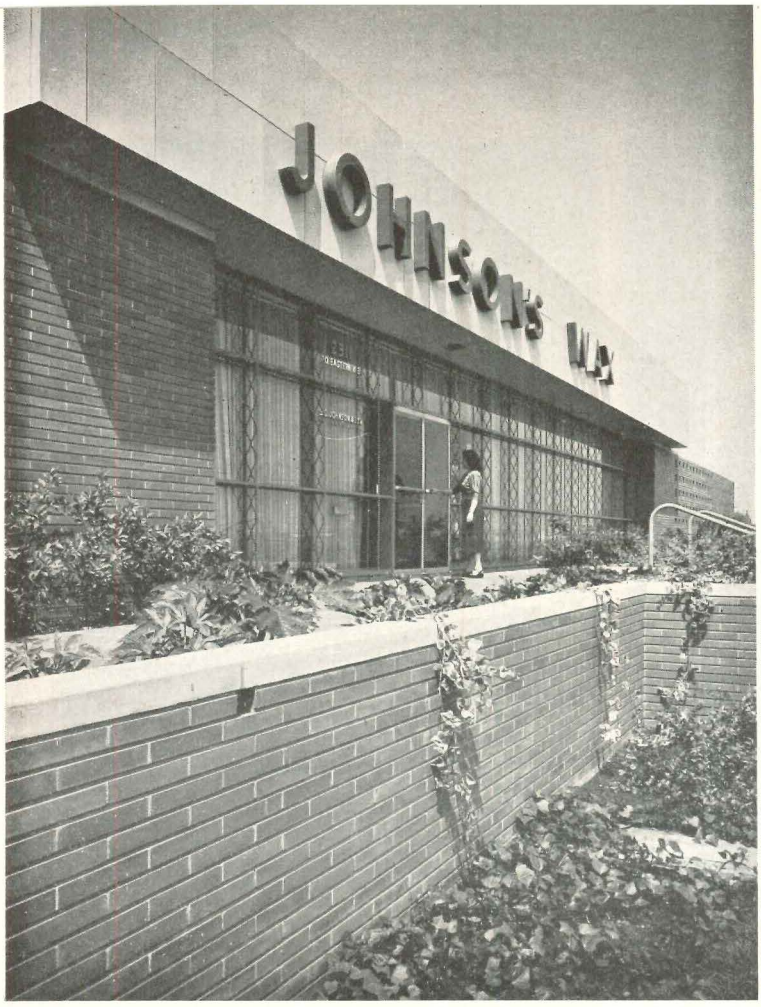


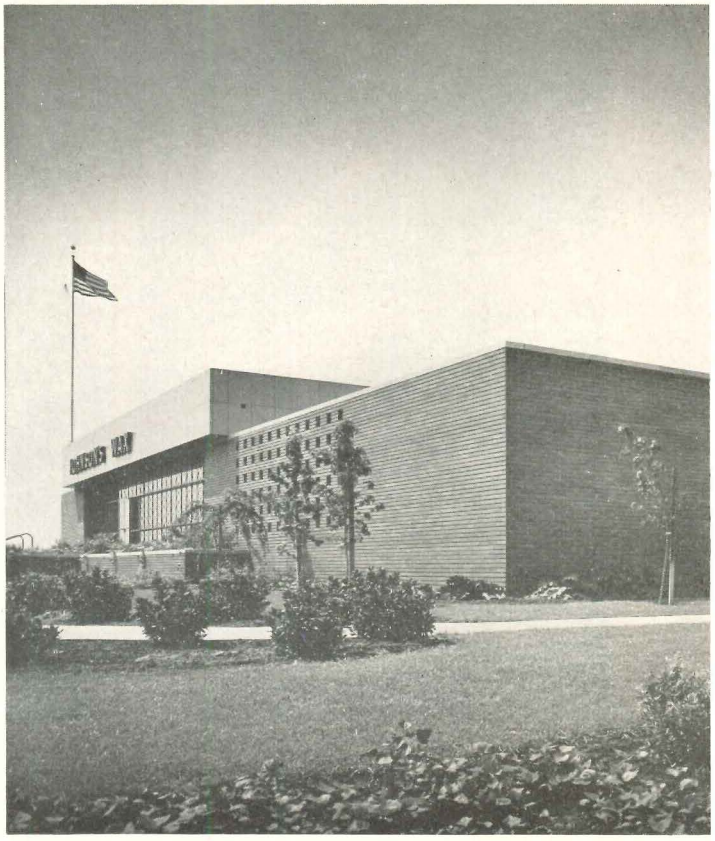
Photograph at left shows largest metal presses in line over pits. Photo above shows underneath view of press being serviced from the trench. Note floor section in place spanning pit trench between machines

Photos: Lens Art



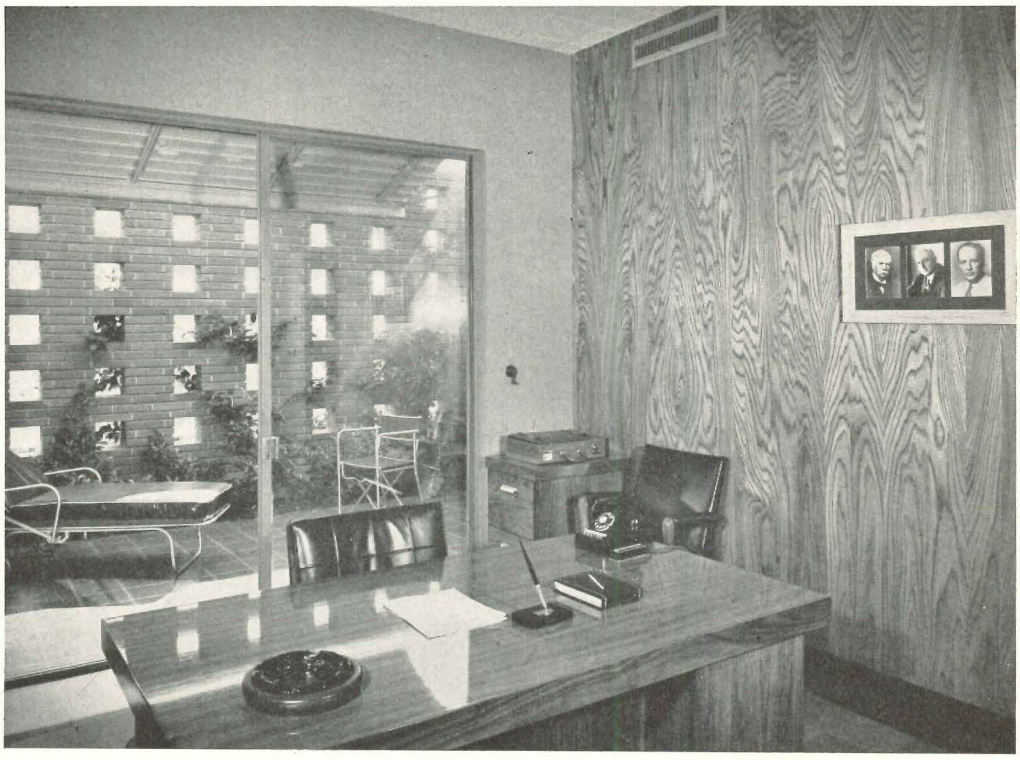




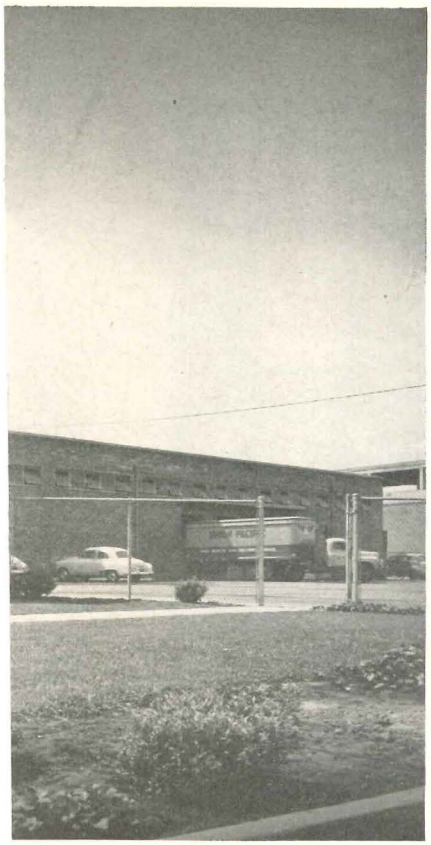


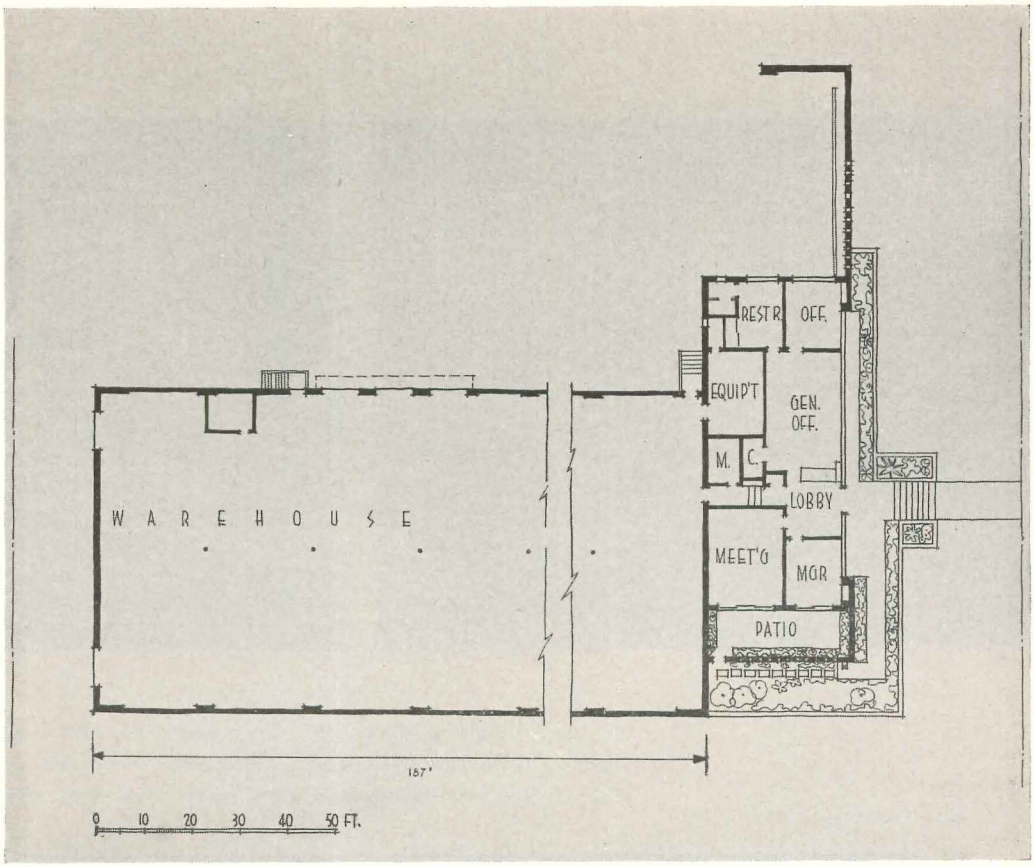
WAREHOUSE BUILDING

District Offices for S. C. Johnson & Son, Inc., Los Angeles



Photos: Julius Shulman





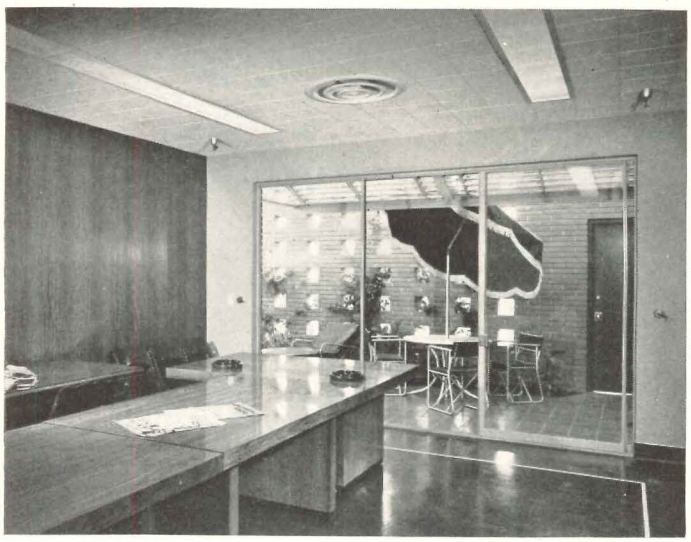
FOR FUTURE MANUFACTURING

Albert C. Martin and Associates, Architects and Engineers

This building was awarded an honorable mention in the recent Honor Awards Program of the Southern California and Pasadena chapters of the A.I.A. "Plan was simple and direct," said the jury report, "with fine relation between office and warehouse. The interior of the warehouse has real beauty . . ."

DISTRIBUTION of nationally advertised products on the West Coast frequently calls for a building such as this, a district office building and warehouse planned for later manufacturing operations. In such an enterprise the site is chosen with consideration for both administrative and truck traffic, in this instance in a fast-growing industrial area southeast of Los Angeles proper. Site and building are planned to allow for expansion of both office portion and manufacturing space. And architectural values are developed for both prestige and advertising purposes.

Structure is reinforced brick masonry, using common brick for the warehouse and face brick for the office portion. Windows are steel sash, mechanically operated in the warehouse. Floors are quarry tile in the patio, slate on the terrace; office floors are covered with rubber tile, asphalt tile, linoleum, cork tile and hardwood parquet floors. In the warehouse floor is concrete, treated to increase its hardness and to control cracking. Walls in the warehouse are exposed brick; office walls are finished with several species of hardwood paneling, natural wax finish. Acoustic tile ceilings; fluorescent lighting.



Walled-in patio at one end of office building provides a pleasant outlook for the district manager's office, and for the sales meeting room (upper left). Sliding doors open these rooms to the patio

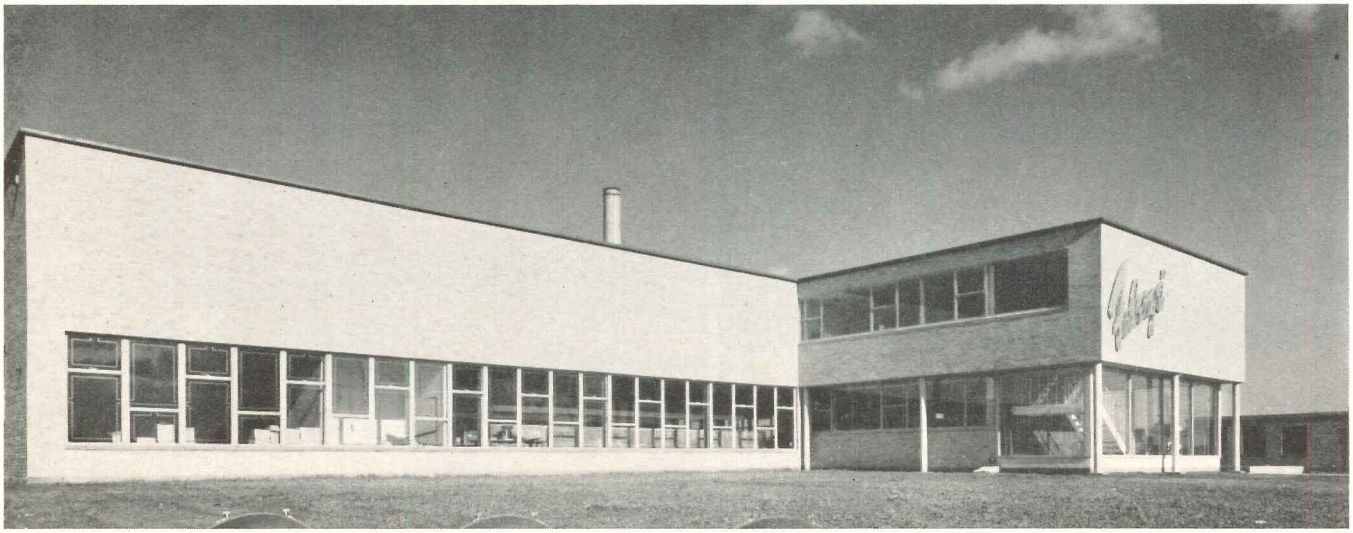
Photos: Julius Shulman

FACTORY AND SHOWROOM FOR PERFUMES

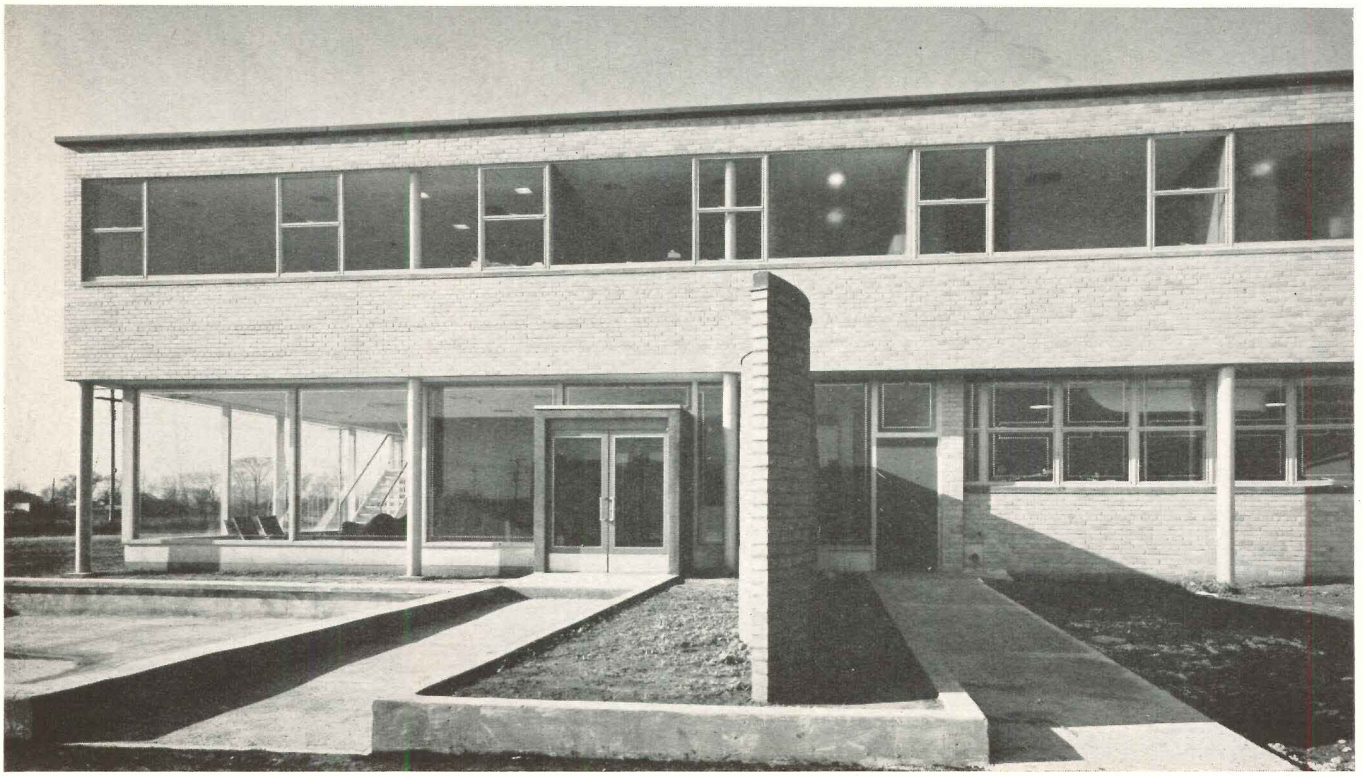
Fabergé Perfumes (Canada) Ltd., Etobicoke, Ont.

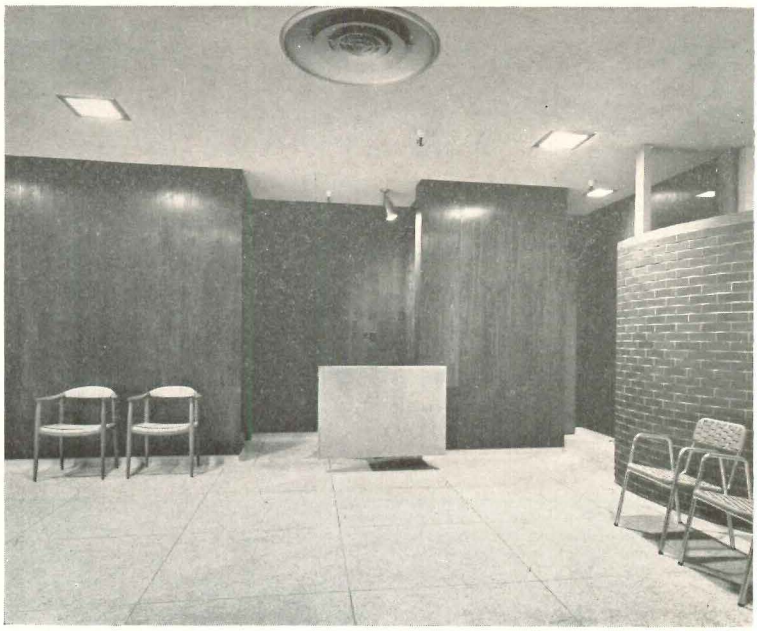
John B. Parkin Associates, Architects

In another era a showroom would not be combined with a factory unless the location were in a downtown section, on routes well traveled by buyers. This one, however, is designed to attract retail representatives to an outlying location, on Queen Elizabeth Way, Etobicoke, Ontario. It provides full manufacturing facilities for perfume, cologne, and other cosmetics, complete employee facilities, and office and showrooms. A cosmetic showroom does not amount to much, measured in square feet, but it does call for a certain sales approach in design — reflecting pool at entrance, gardens (yet to appear), serpentine wall separating main and employees' entrance, spacious lobby, general attention to display. Interiors are quite colorful.



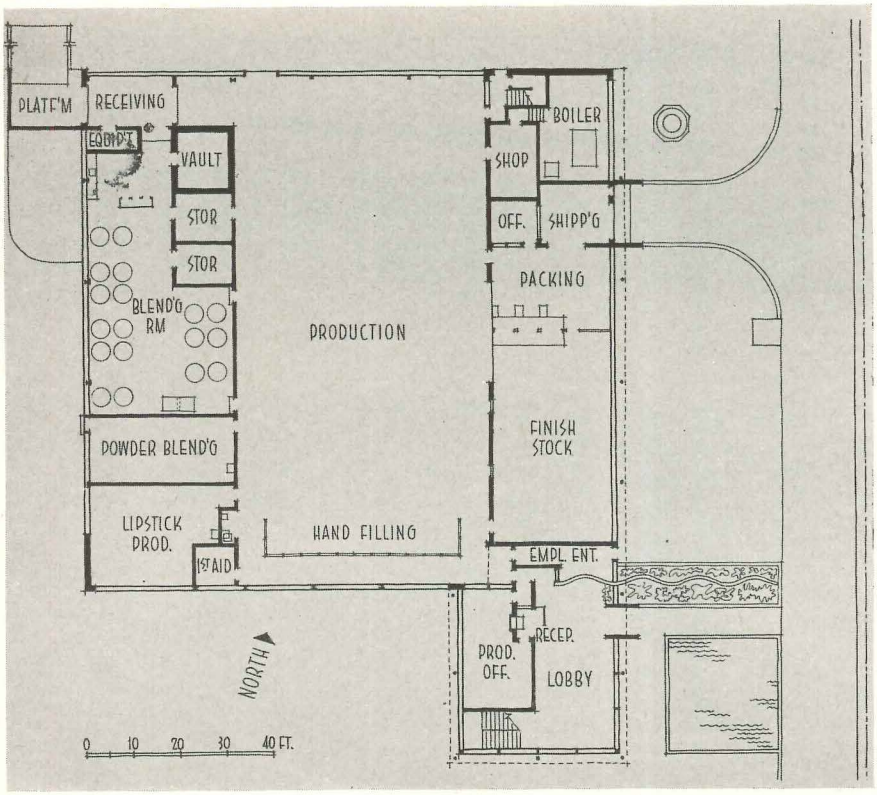
Photos: Panda

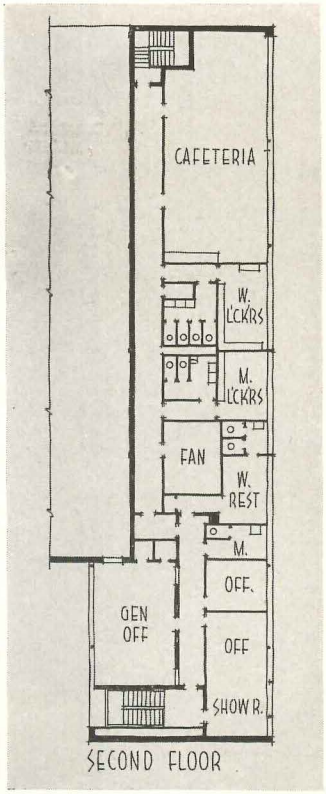


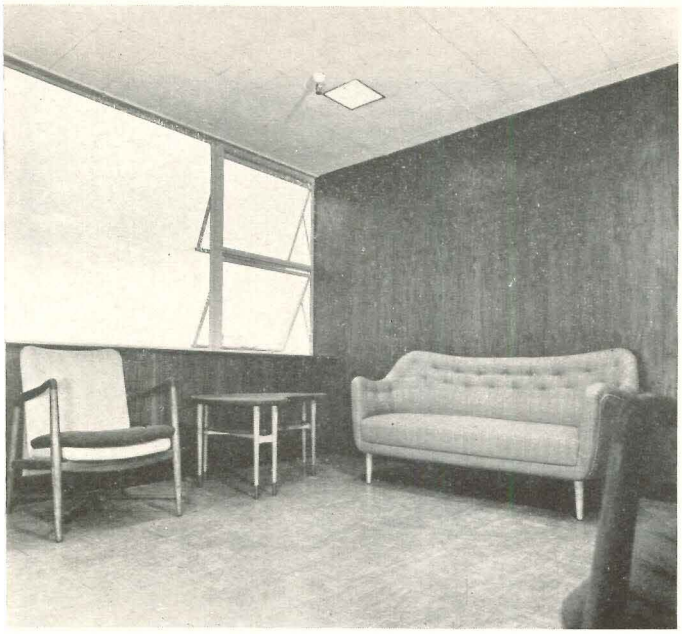


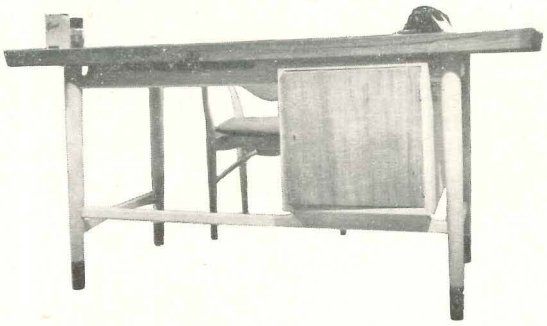
Photos: Pando

Main lobby, above and left, is unusually spacious, since this is showroom for Fabergé as well as factory. Serpentine wall is continuation of one outside, separating entrances

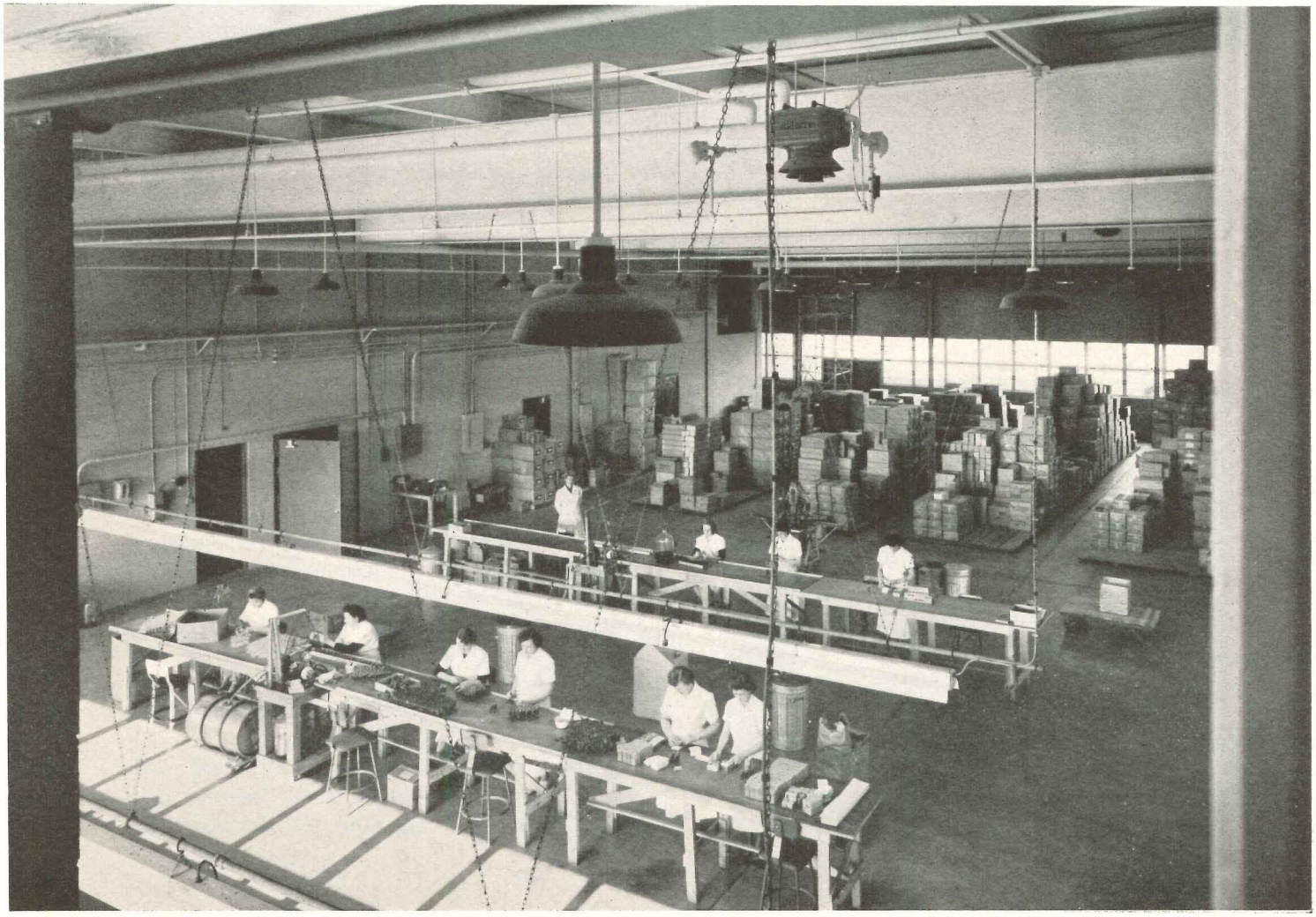




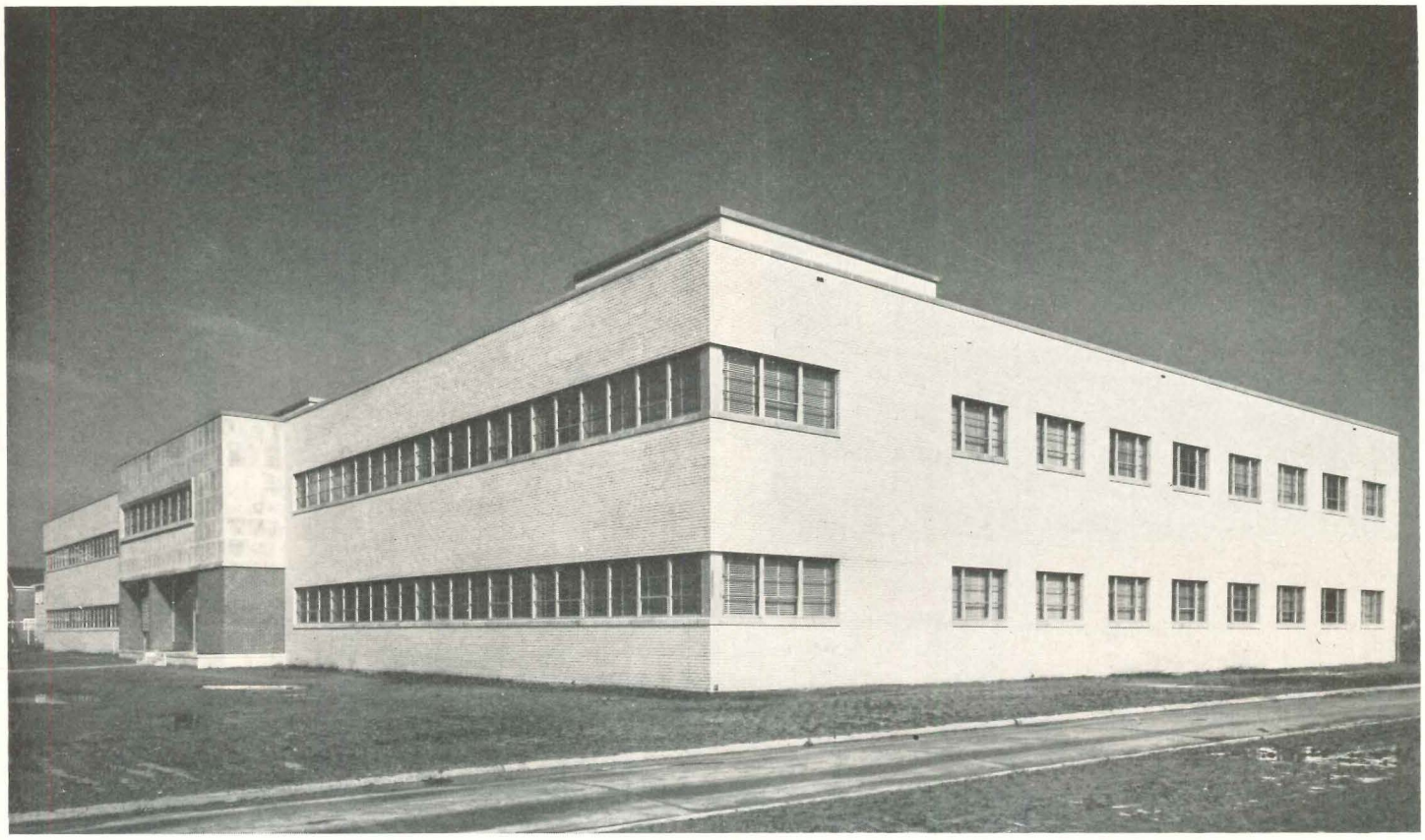




Sales offices, even for cosmetics, manage to avoid the chi-chi effects in furniture and decoration usually associated with displays of feminine items. Main production area, below, has 60-ft clear span, bright colored walls, general and local lighting



LABORATORY FOR MUD ENGINEERING



Offices and Laboratories for Baroid Sales Division,

National Lead Company, Houston, Texas

Wyatt Hedrick, Architect

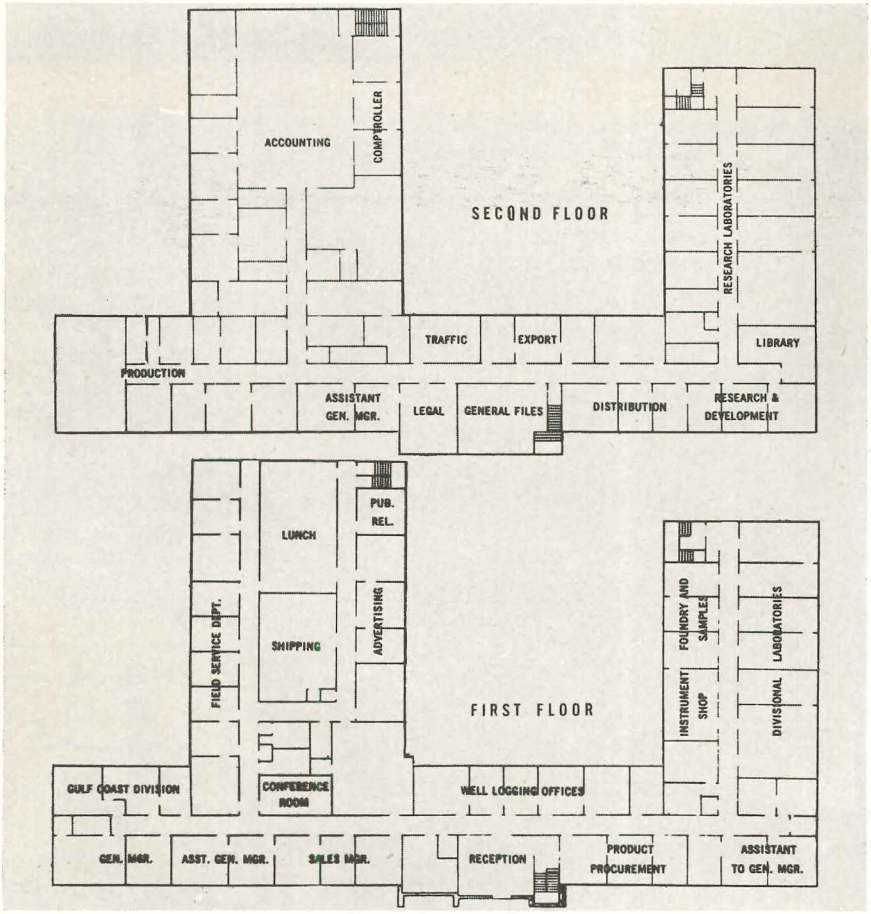
The H. K. Ferguson Company, Builder

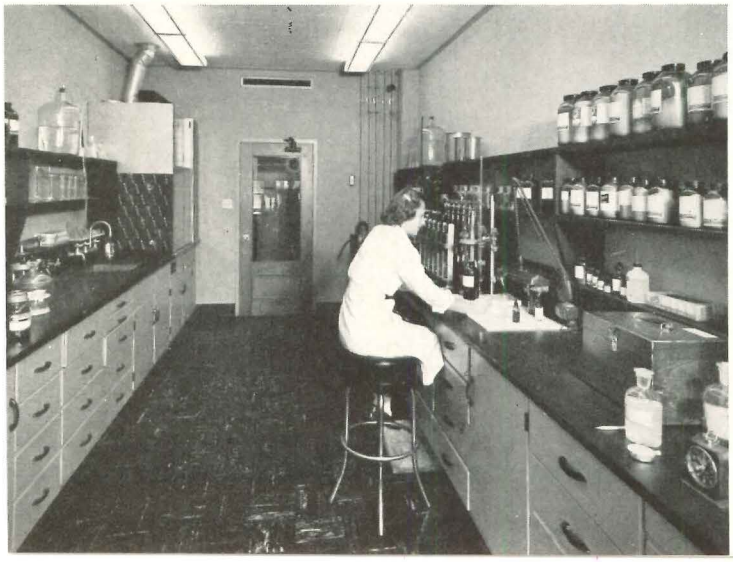
MUD RESEARCH means the development of various drilling mud concoctions to lubricate, cool and clean the operation of drilling an oil well, and is, of course, important in the world's search for new petroleum fields. This new building combines mud laboratories and offices, and consolidates two company divisions, one being moved in from the Pacific Coast.

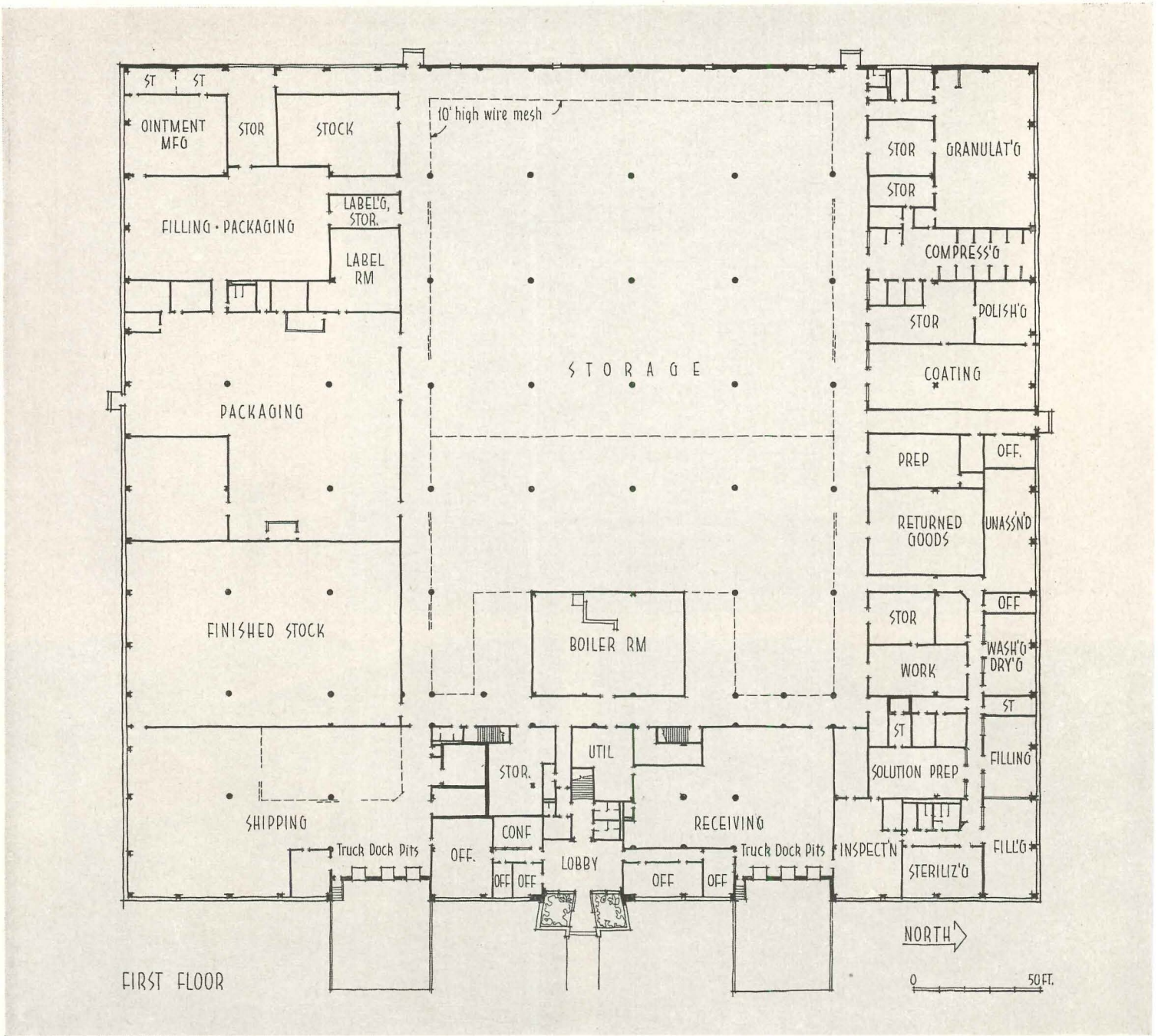
The building is of reinforced concrete construction with buff face brick walls. It contains a total area of approximately 40,000 sq ft. For the office space at the front, unbroken fenestration extends the length of the building. Windows along the laboratory wing (photograph above) are separated by piers which are necessary to good space use in laboratory space.

The building is completely air conditioned, and is equipped with its own heating plant. Lighting is provided by fluorescent lamps hung just below ceilings of acoustical tile.

Photos: Litterst Comm.



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ST
OINTMENT MFG
STOR
STOCK
LABEL'G, STOR.
FILLING • PACKAGING
LABEL RM
PACKAGING
FINISHED STOCK
SHIPPING
Truck Dock Pits
10' high wire mesh
STORAGE
BOILER RM
STOR.
UTIL
CONF
OFF.
LOBBY
OFF
OFF
OFF
OFF
RECEIVING
Truck Dock Pits
STOR
STOR
GRANULAT'G
COMPRESS'G
STOR
POLISH'G
COATING
PREP
OFF.
RETURNED GOODS
UNASS'N'D
STOR
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WASH'G DRY'G
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FILLING
SOLUTION PREP
INSPECT'N
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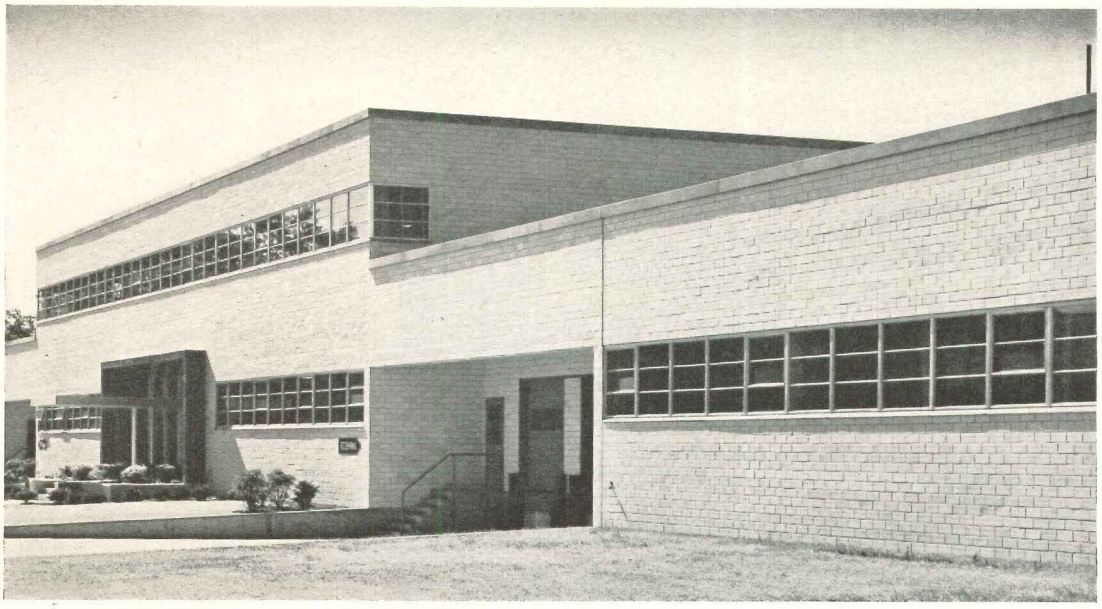
NORTH
0
50 FT.
FIRST FLOOR



Photos: Gottscho-Schleisner

PLANT FOR PHARMACEUTICAL PRODUCTS

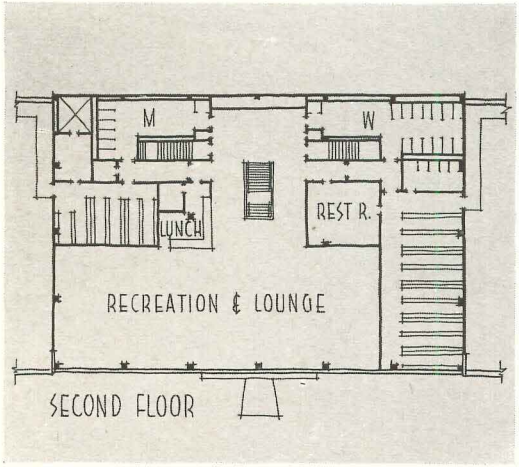
Ciba Pharmaceutical Products, Inc., Summit, N. J.

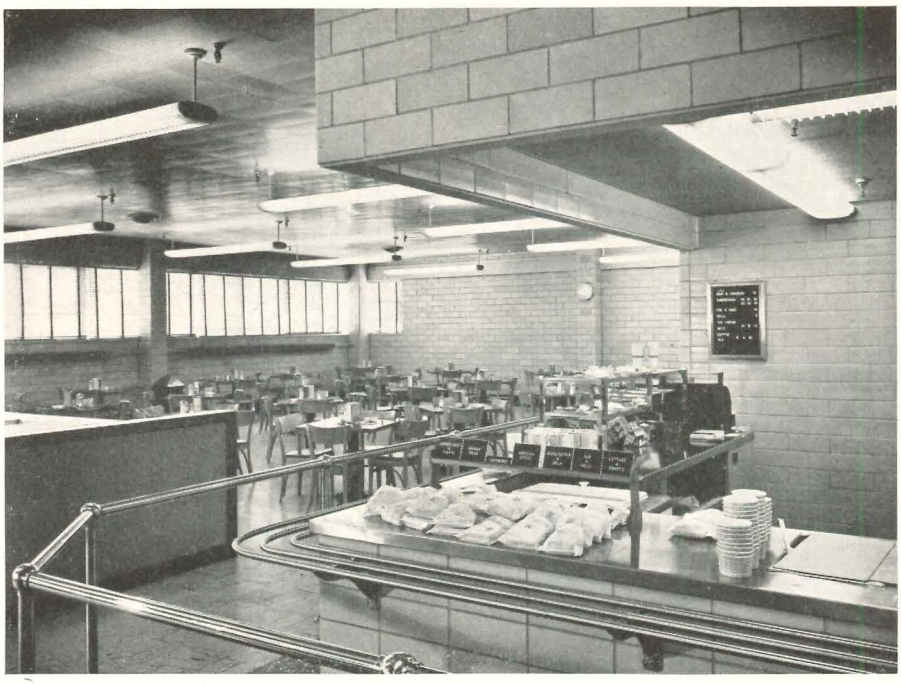
Petroff & Clarkson, Architects

Guy B. Panero, Engineers

John W. Ryan Construction Company, Builders

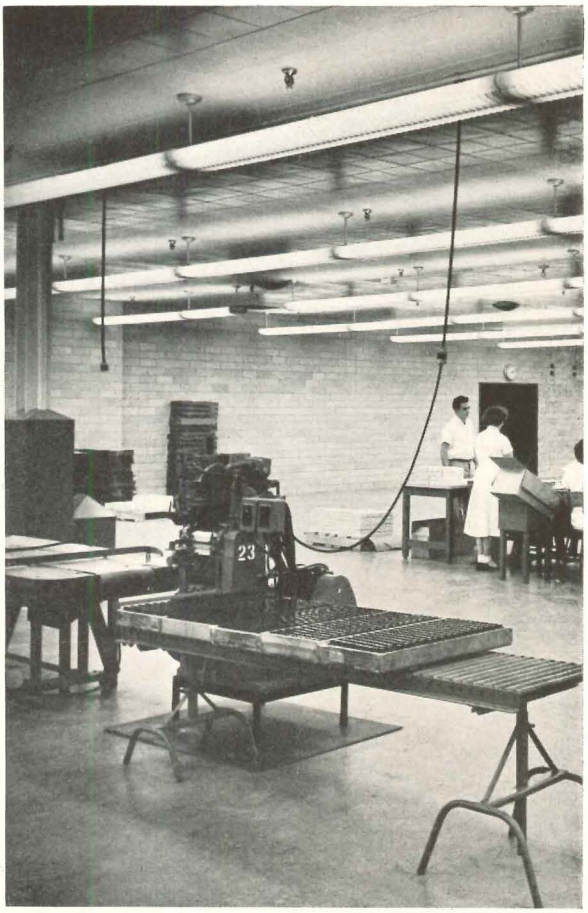
SIX ESSENTIAL REQUIREMENTS were specifically laid down for this pharmaceutical plant: 1. closely controlled temperature and humidity conditions, plus highest standards of cleanliness; 2. layout for four separate manufacturing operations; 3. design for good employee and community relations; 4. materials and finishes for hard wear and easy maintenance; 5. provision for expansion of any one area; 6. blending of the new building with the existing group. Contributing to these ends, the plan puts manufacturing operations along outside perimeter, warehousing and mechanical equipment in the center. This scheme gives workers best locations; also permits separate zone controls for air conditioning and humidity control.



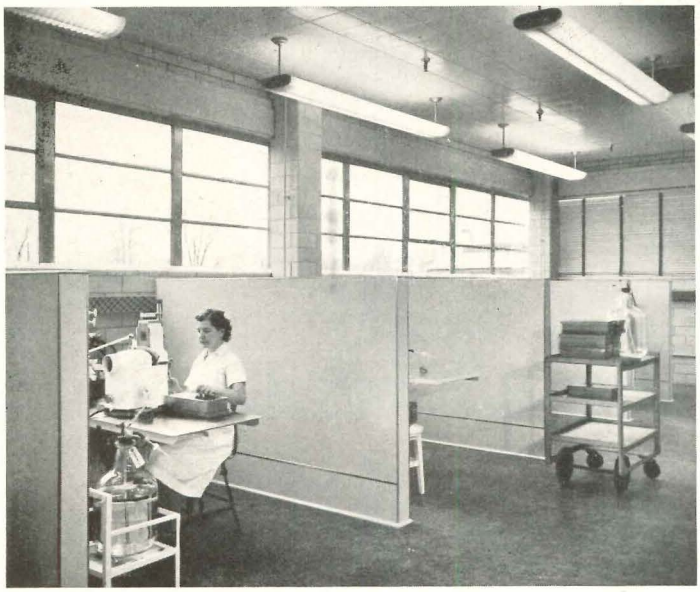


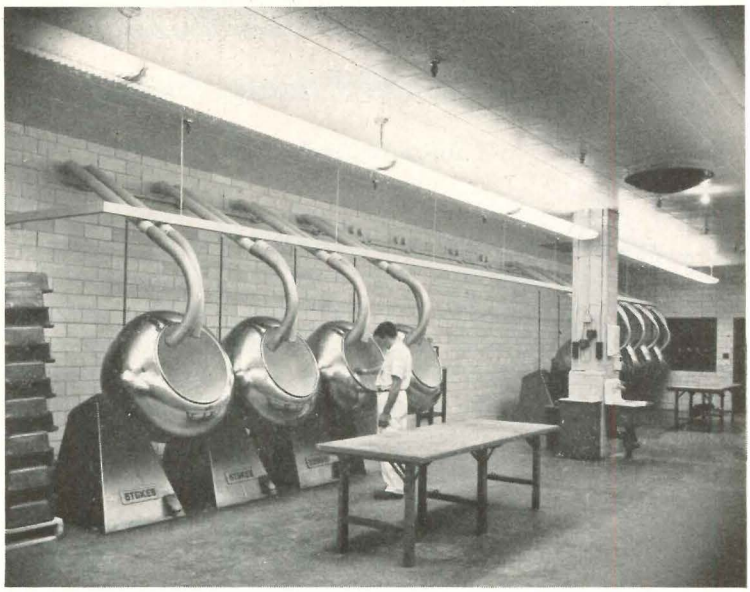
Photos: Gottscho-Schleisner

In addition to the cafeteria, the second floor has recreation room with ping pong tables and so on. Second floor can be added to as required. Below, left: solution preparation room, where begins the manufacture of various ampule products. Below, right: packaging operations

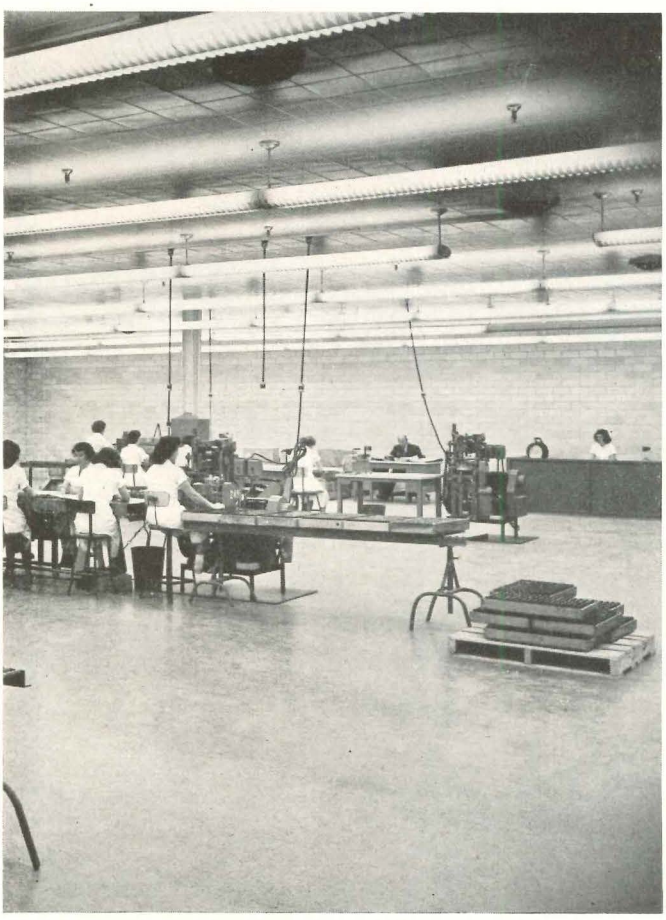


Below, left: ampule filling and sealing is done by operators in these cubicles along outside perimeter, for most pleasant working conditions. Below, right: kettles for sugar coating pills; one hose supplies warm air, the other is an exhaust. Relative humidity is 40 per cent





Below, right: large central warehouse area has ceiling height of 19 ft, and is the only part of building in which structural steel is exposed. Columns, however, are protected at base with concrete



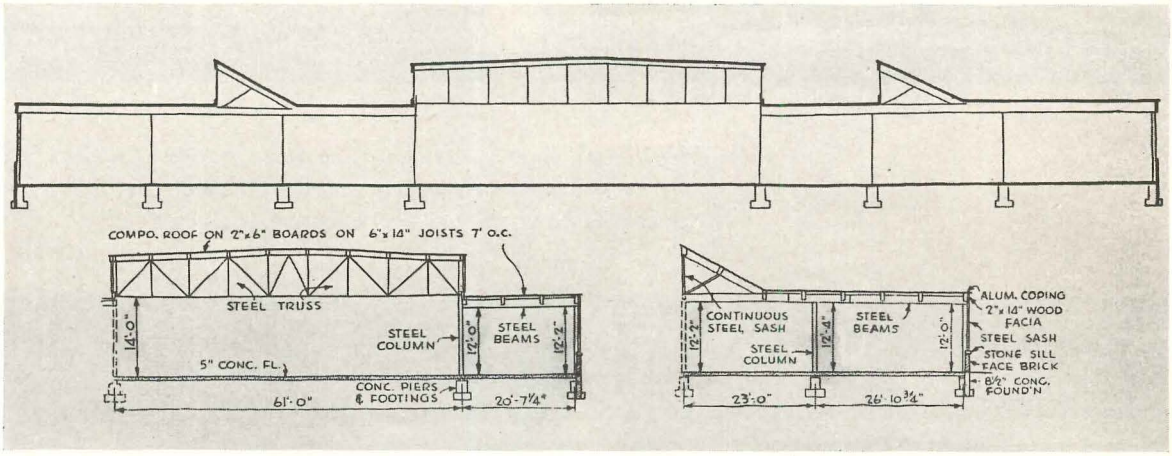
TWO VARIATIONS OF PROTOTYPE DESIGN

Two Food Products Plants at

Clearing Industrial District, Chicago

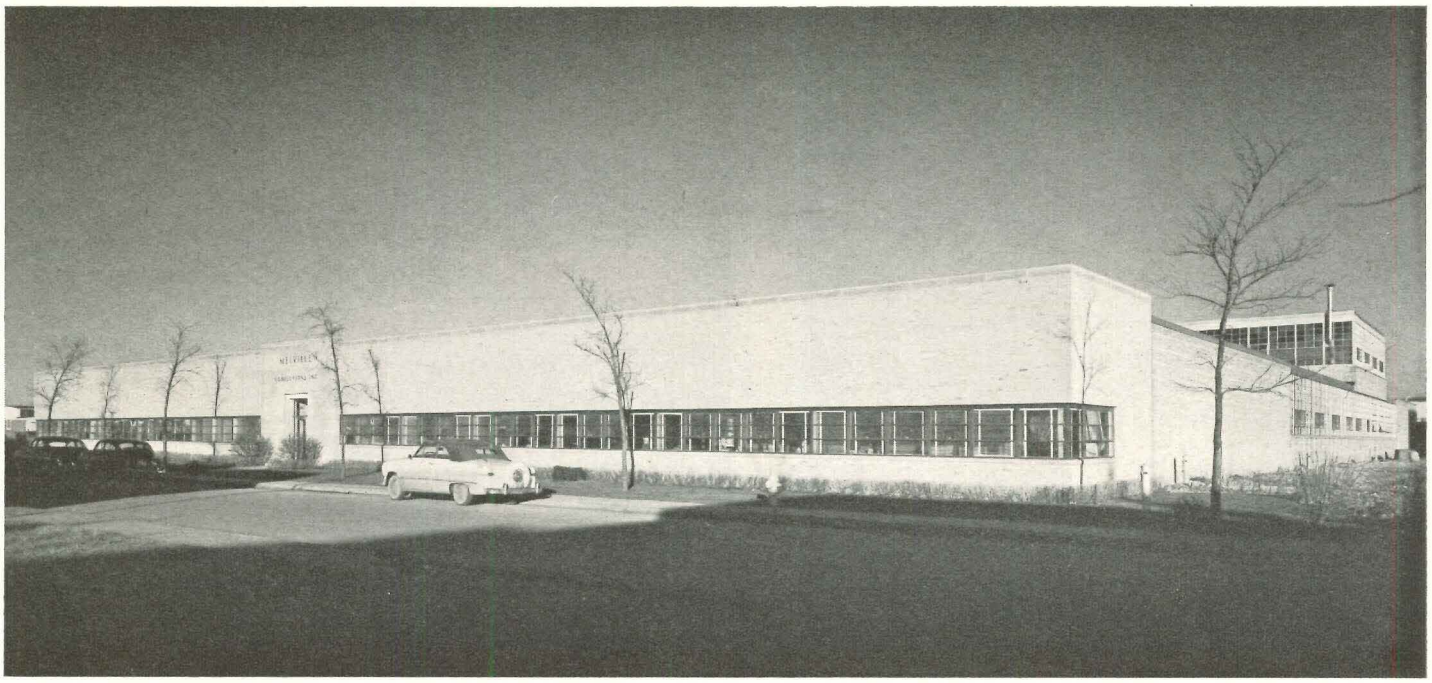
John S. Cromelin, Architect

Photos: Hedrich-Blessing



At this old and well-established industrial subdivision, small factory buildings tend to follow a prototype design worked out many years ago (see sections below, from Architectural Record, December 1946). Here are two similar buildings, both for food products, which follow the pattern in some respects, differ in others. The basic scheme uses various combinations of more or less standard bays, wider center bays with trussed monitor roof, A-frame roof sections to light interior bays, mostly with wood joists on steel beams, and mill type of roof construction. The Melville building, in which speed was of paramount importance, was designed as far as possible to use a supply of fabricated steel which the Clearing Company already had. Minor adjustments were made in column spacing, and in a wide bay where bar joists were used.

In the Chapman & Smith building, a standard bay of 26 by 30 ft was used, to meet special pallet storage requirements. Alternate bays were raised to provide monitor lighting, with the usual steel beam and wood joist construction. Here a variation was made: wood joists were placed above beams, instead of set flush on steel angles. In these bays this scheme saved on sprinkler heads and connections.



In Melville building speed of construction was necessary, as previous quarters had to be vacated to widen street

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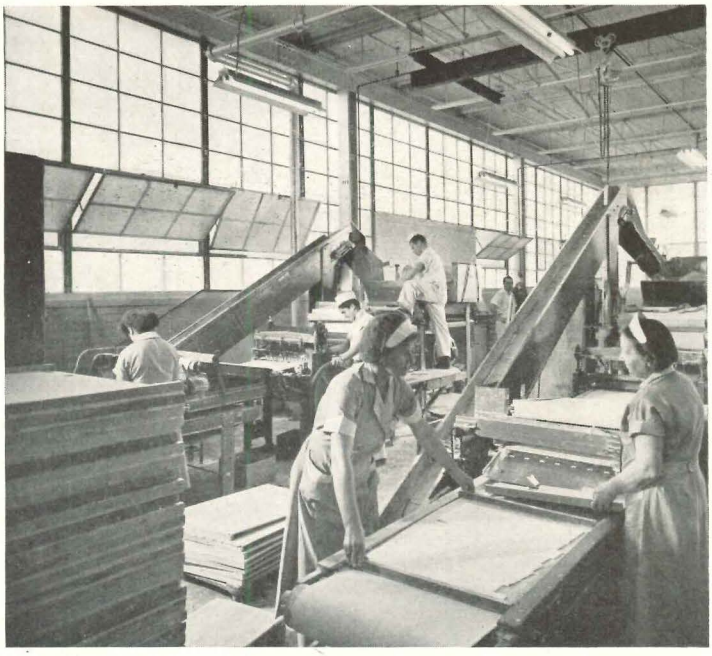
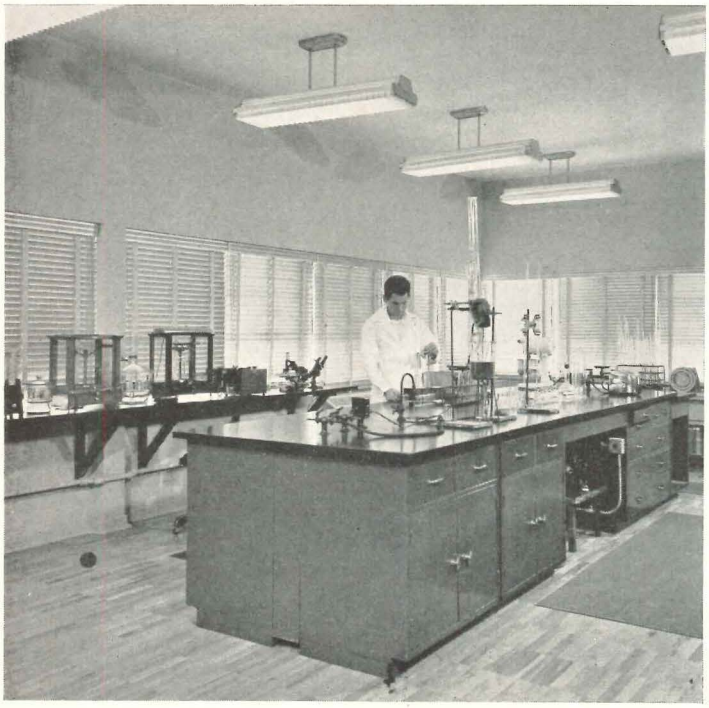
Chapman & Smith makes a display of its new building for visiting women's groups, as company makes bakers' mixes for doughnuts, pie crust, cakes, also jellies and fruit syrups

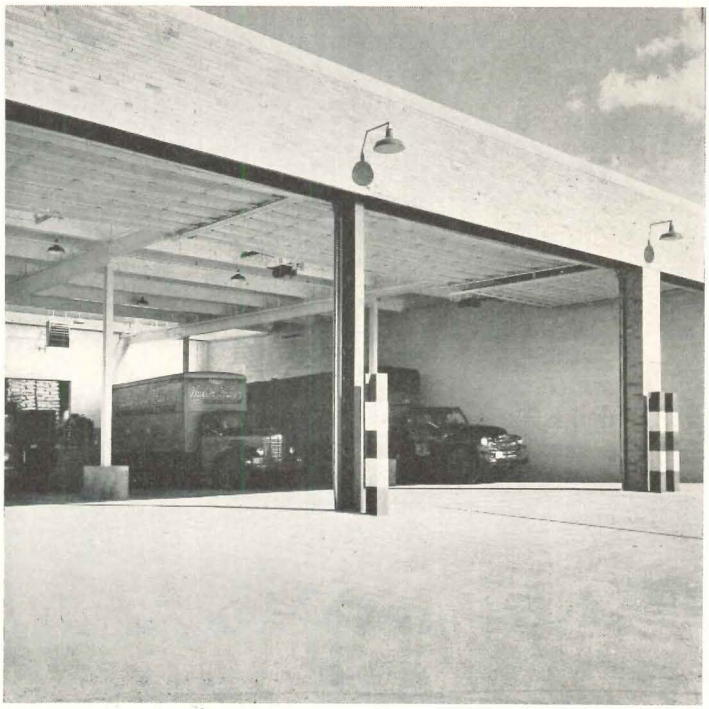


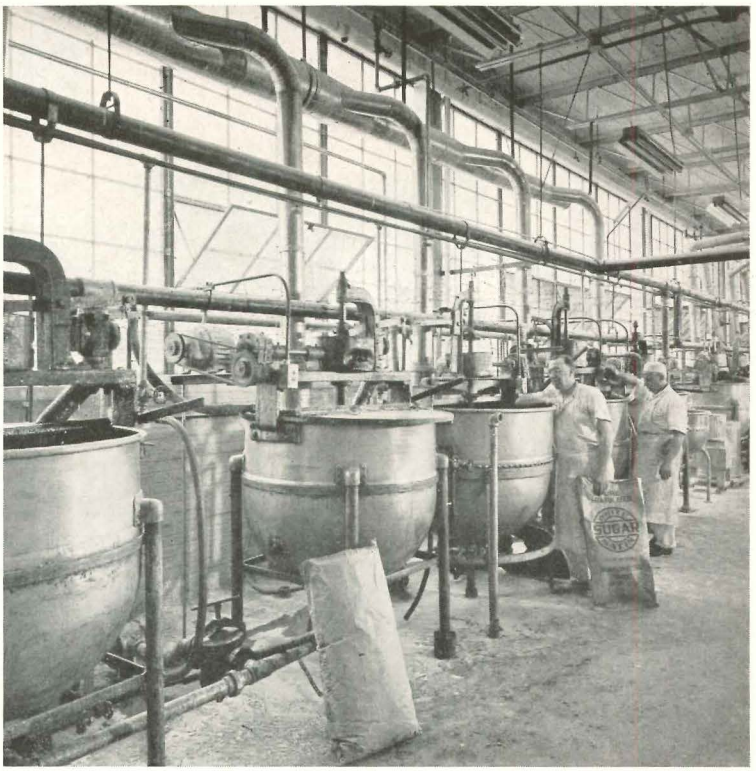
Photos above: Hedrich-Blessing

Melville plant, making many different kinds of confections, has very complicated production flow, and resulting lines have a Rube Goldberg look; but they are result of much study and many rejections, and they work

Chapman & Smith laboratories are air conditioned, as are also offices and kitchens. Below, right: completely enclosed truck dock is necessary for loading and unloading perishable materials, is lighted by monitor



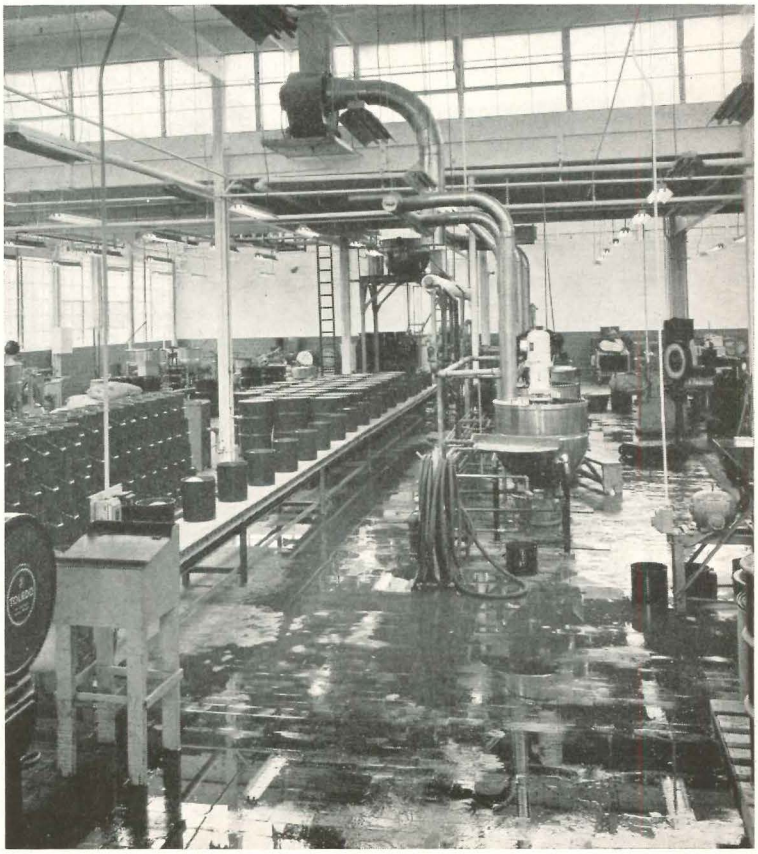




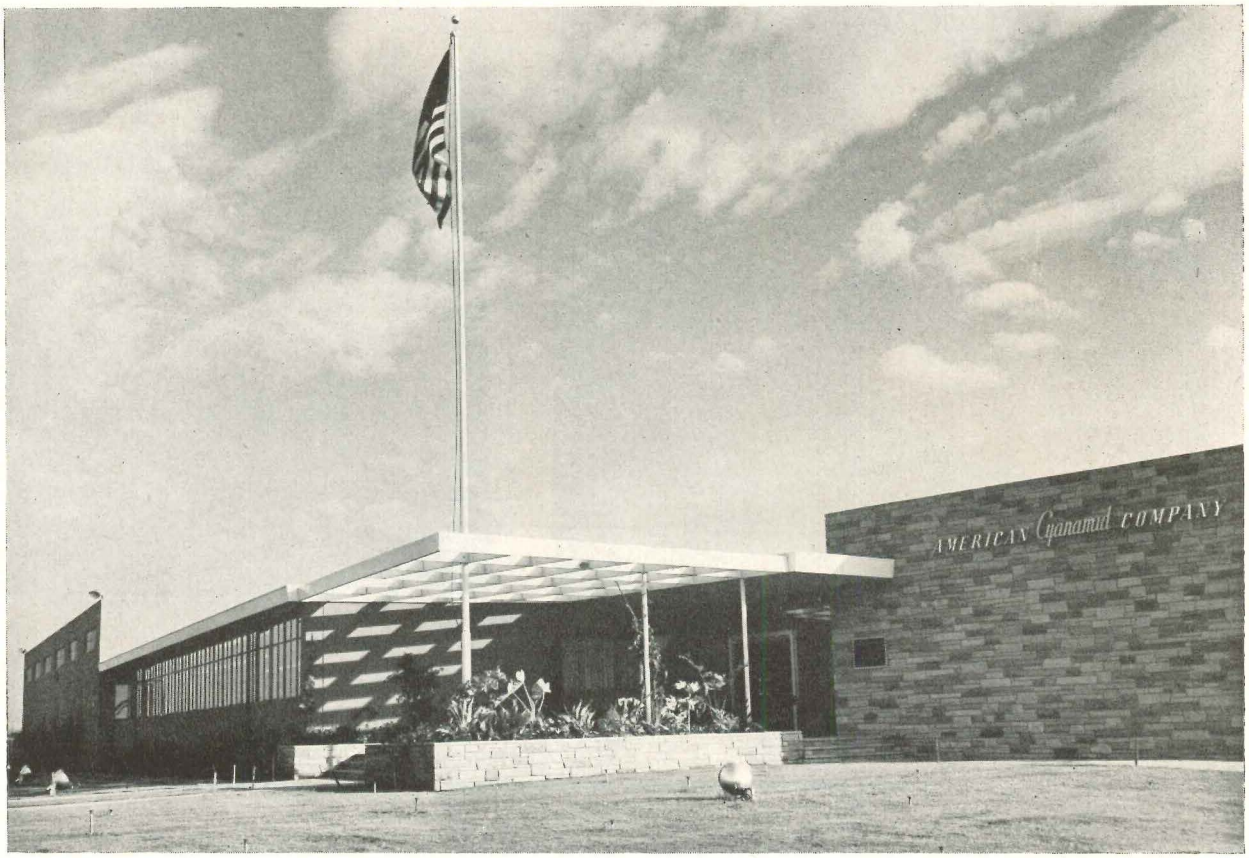
Photos above: Hedrich-Blessing

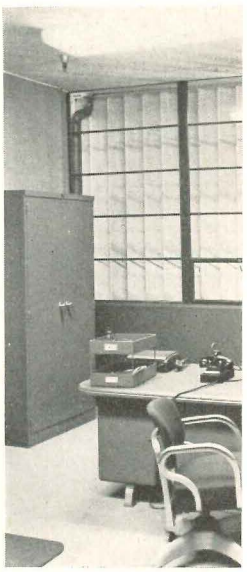
Most of plant is quite open; some areas, however, develop explosive hazards of starch dust, have elaborate precautions

"Wet room" has quarry tile floor and wainscot, to protect it against the corrosive action of fruit juices used in jellies



CONSOLIDATED OFFICES





AND WAREHOUSE BUILDING

American Cyanamid Company Building, Los Angeles

John M. Stahl, Owner

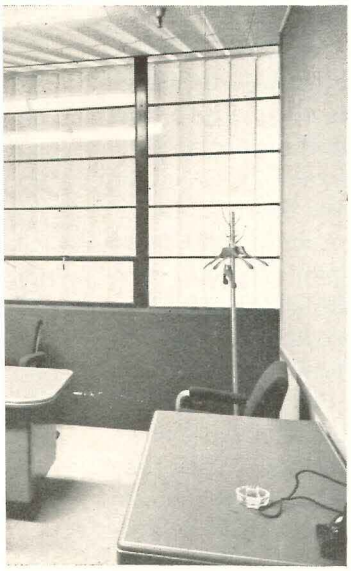
McClellan, MacDonald & Markwith, Architects

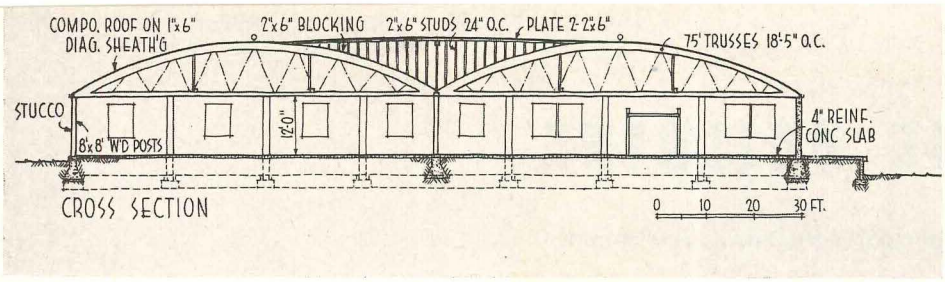
M. J. Denn, Designer Associated with Owner

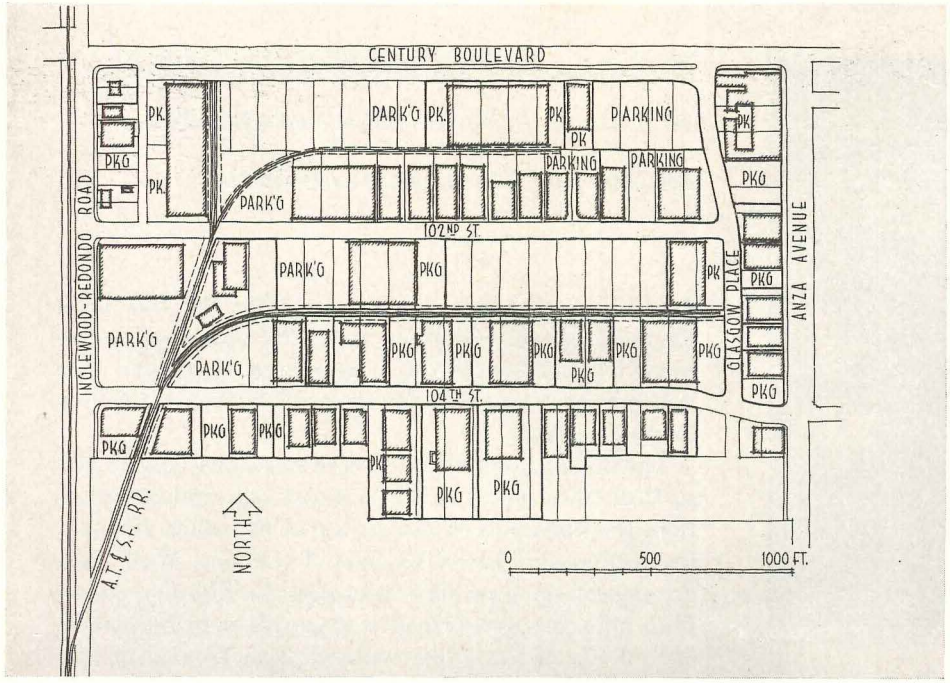
Buttress and McClellan, Contractors

CONSOLIDATION was the *raison d'être* for this little building, consolidation of several office and warehouse locations in the Los Angeles area. Cyanamid does not own it; it was built for them by the owner under a long-term lease.

The building has 44,700 sq ft of warehouse and 18,400 sq ft of office space. It is of pre-cast slab wall construction, the slabs poured one on top of the other, then set in position and joined by poured columns. Wall slabs are poured on floor slabs protected by Hunt's process from adhering. A stack of wall panels may be poured one on top of the other, with windows framed in and reinforcing bars projecting out the sides. Concrete is vibrated after being poured and one surface troweled smooth for an interior finish. Panels are then lifted into position, steel projections welded together, column steel forming set and the column poured.







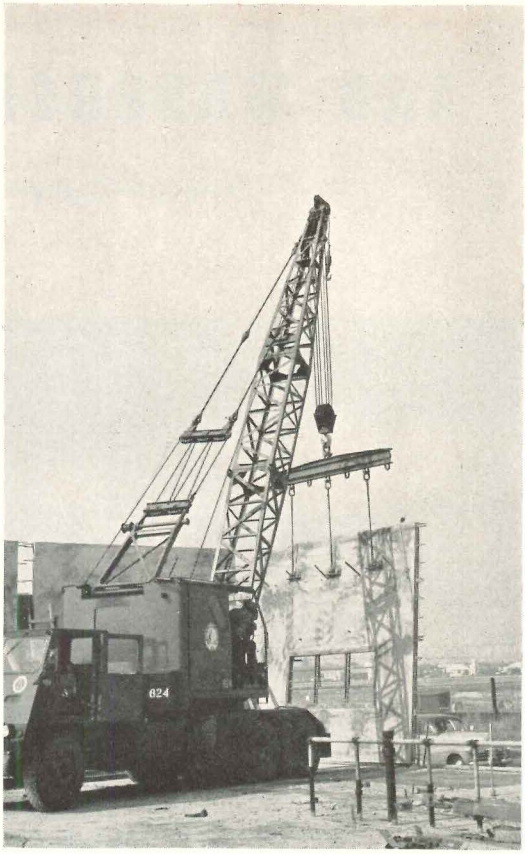


Photo: William Eccles

TILT-UP BUILDING FOR INDUSTRIAL

International Airport Industrial District, Los Angeles — *S. Charles Lee, Architect*

THE INDUSTRIAL SUBDIVISION, or "district," is by no means a new idea, but is one that has seen much development in the postwar industrial expansion. The advantages of prearranged rail lines, roads, utilities have been attractive to small factories. Frequently, in fact usually, there have been further advantages of efficient and economical construction, so that many of the factory management's building problems have been solved for them by specialists of the district.

The International Airport Industrial District at Los Angeles is one that has developed rapidly in the last year or two, until the site plan for its 95 acres now shows more than 40 plants, with more in progress. It is being developed by Samuel Hayden and S. Charles Lee, architect, with Frank A. Schilling as project manager. There are 120 plots, each slightly over a half acre, zoned for M-2 light industrial buildings. There are certain controls over plans, set-backs, parking provisions, and so on, so that there are guarantees of continued smooth operation.

Virtually all of the buildings use the Precastructural system of tilt-up concrete construction, with methods and modules standardized. The standard spacing of trusses, based on the maximum allowable length of 2 by 8 rafters spaced 24 in. o.c., automatically establishes a modular length of side wall panels for 18 ft 5 in. bays. An early fault of some precast wall panels — shrinkage cracks at corners of window and door openings — was eliminated by the use of diagonal steel in the panels.

The standard practice on the Hayden-Lee tract has been first to prepare the grade for the floor, whether it be ground level or car height. The isolated footings on which the wall panels rest are then poured, then a strip of floor of suitable width is laid, in checkerboard pattern to control cracks. Next the floor is coated with a bond-breaking agent — and simple wall forms are placed on the slab in a horizontal position. Steel sash, held in forms, are then placed, followed by reinforcing steel, and the concrete poured. After the required curing time has elapsed, the wall panels, weighing up to 30 tons, are raised by heavy truck cranes or derricks, placed in vertical position and braced by means of adjustable braces. Column steel and enclosing forms are erected and the columns poured, after which the trusses, which have been built and assembled on the job, are raised, and the roof completed.

Typical arched truss spans 75 ft, and typical building combines so many units of space 18 ft 5 in. by 75 ft. Usually about 10 per cent is devoted to office space, and fronts are given treatment to suit the client.

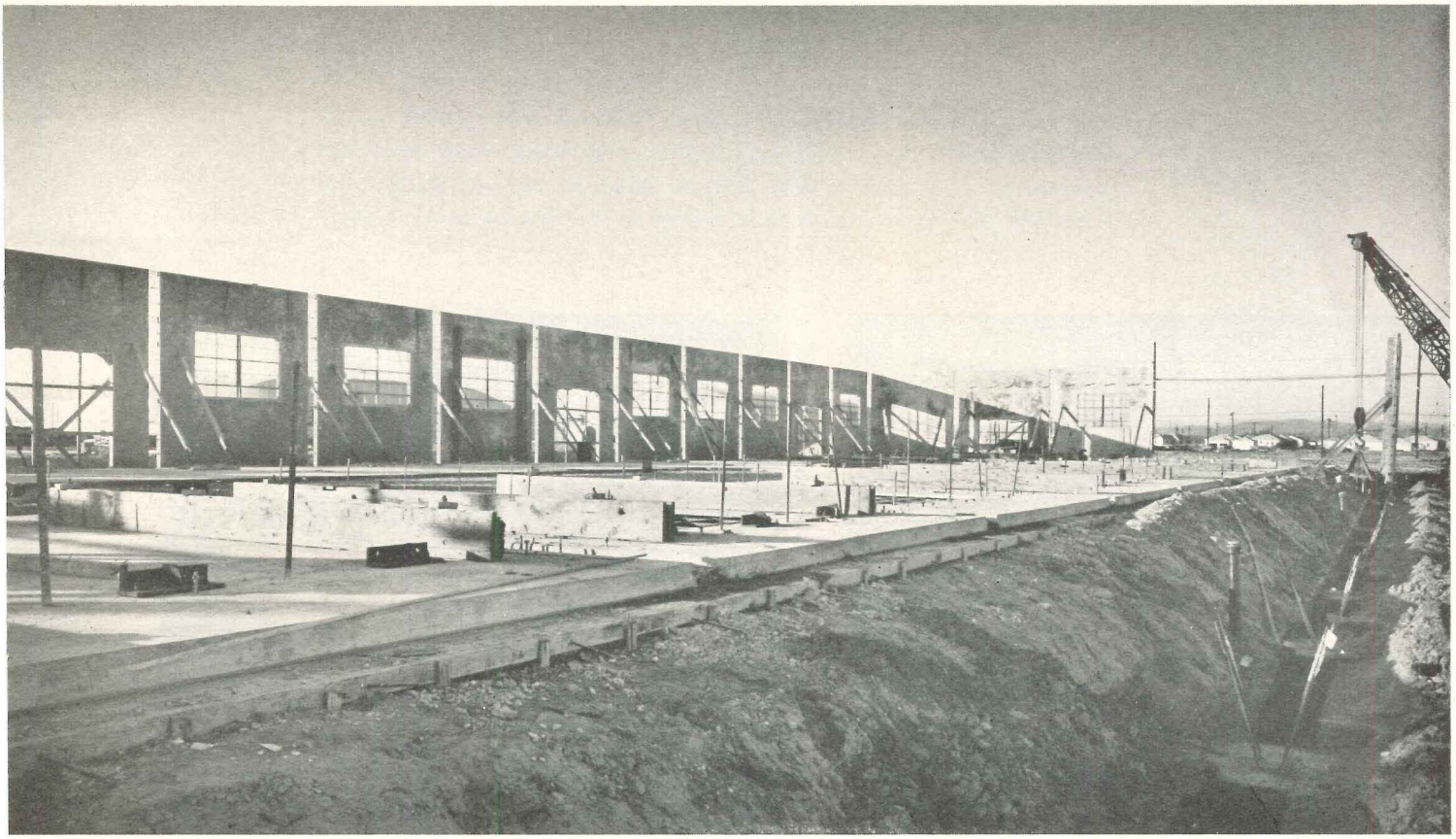
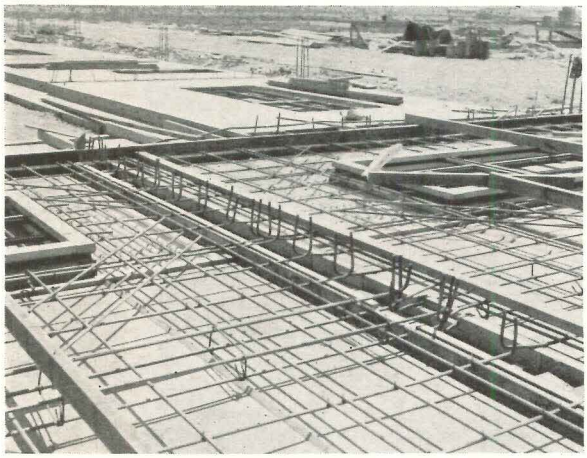
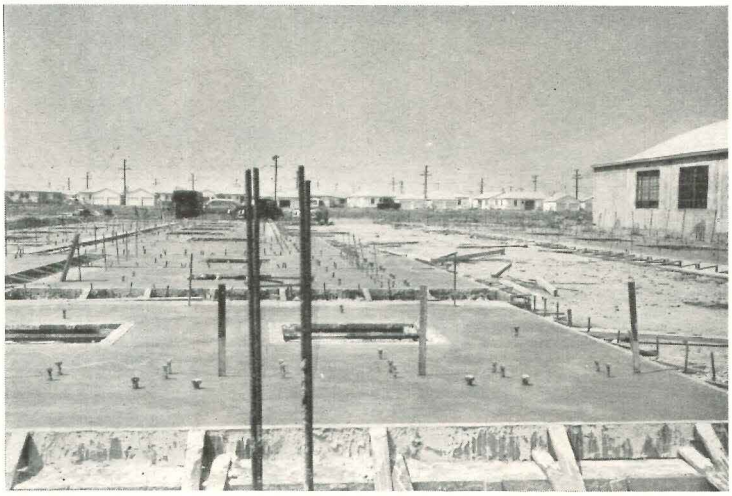


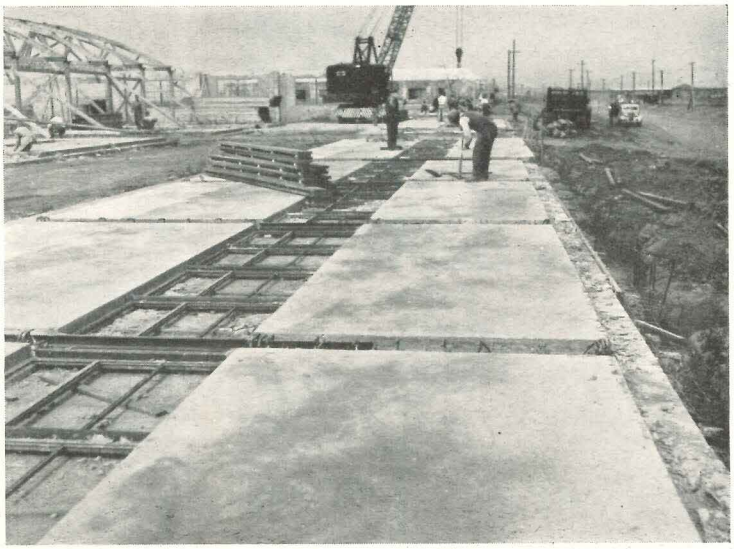
Photo: Julius Shulman

DISTRICT

Samuel Hayden, Builder



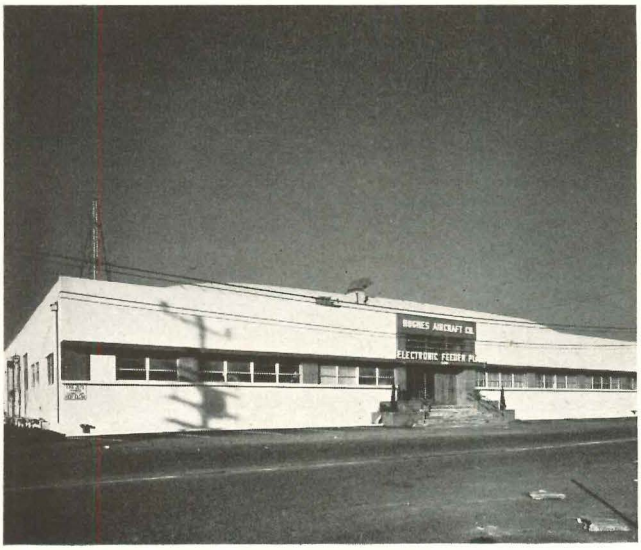


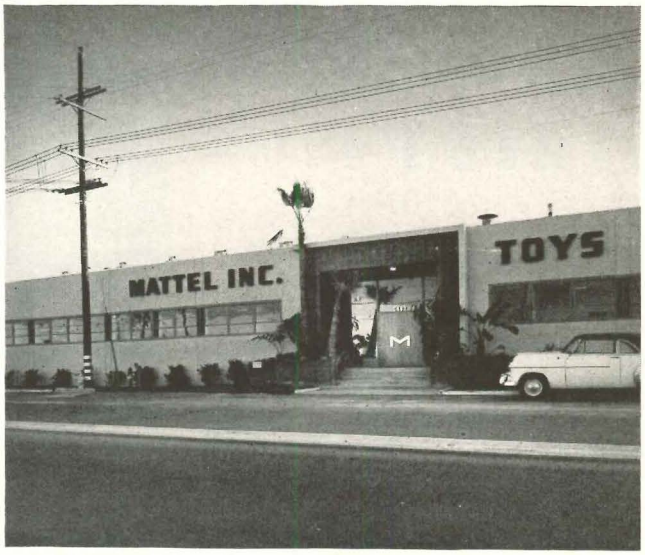


Various stages in the tilt-up process in which side wall panels are poured on the floor, raised into position and joined by poured columns. Wall panels are dimensioned to fit an 18 ft 5 in. column spacing, usually are 12 ft high. Roof trusses, 75 ft, are built on site

Most plants at International Airport Industrial District are small factories, making small products or parts — plastics, food products, sheet metal products, electronics, cosmetics, and so on. Buildings look much alike except for the fronts, where trademarks and promotional displays show strongly as the determinant for esthetics

Photos: Julius Shulman





TRENDS IN WARM AIR HEATING

Part 1: Houses

METAL SHORTAGES combined with high building costs are encouraging novel designs of warm air heating in houses. This does not imply that these systems are only substitutes. It does mean that they lend themselves to the application of non-critical materials, that the structure itself can be made part of the heating system to reduce costs, and that a deterrent to their more widespread use has been the lack of correlated performance data and of knowledge concerning how air behaves in unorthodox distribution systems.

This article reviews many new types of warm air heating and shows examples of non-critical materials being used. It also reports the results of some current laboratory research and field investigations to show that these systems meet present-day comfort standards, and that proper attention must be given to the design of the system, including site selection as well as location of ducts. Most of the discussion will be devoted to the basementless house, but other examples show systems for houses over crawl spaces and houses with basements.

Concepts of warm air heating have had to be revised in line with modern house building practices such as the concrete floor slab, extensive use of glass, application of the panel heating principle, the desire to save cubage and to cut the cost of the mechanical system, and the desire for greater flexibility in planning.

Non-Critical Materials

It was natural that many non-metallic materials would be used for ducts in concrete slabs, as well as traditional galvanized ducts and less conventional galvanized downspouts (see ARCHITECTURAL RECORD, Dec. 1948, pp. 135–6), the governing factors being the type of system, availability and cost of materials, and local labor practices.

Following is a list of non-metallic duct materials and some systems being used that require practically no metal: (1) cellular clay tile, (2) clay pipe (sewer tile), (3) concrete pipe, (4) plastic pipe, (5) pre-cast hollow concrete slabs, (6) fiber pipes impregnated with plastic, (7) asbestos pipe, (8) wood sleepers over a concrete slab (warm air panel), (9) furred down ceiling of wood and gypsum board (ceiling panel), and (10) crawl space heating.

Space Saving Equipment

Some of the new warm air heating systems in which air is admitted to the rooms have many inherent advantages. They can provide ventilation, banish odors, and control humidity. They respond rapidly to outside air temperature change. They permit cooling as well as heating. Air blankets windows to counteract the effect of their low temperature.

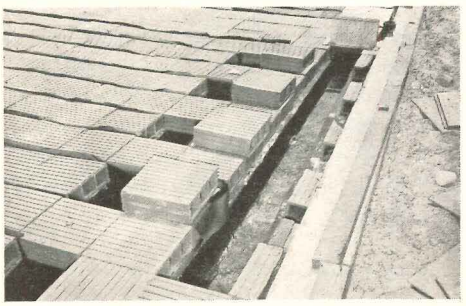
Air's biggest disadvantage is its low density and specific heat, which means that a much larger conductor must be used to deliver heat by air than by water or electricity. This need not be a disadvantage where the warm air supply and return ducts are part of the structural slab, but it could be with conventional forced warm air. High velocity warm air systems with small 4-in. ducts have been developed to overcome this difficulty, especially in houses of more than one story.

Warm Air Perimeter Heating

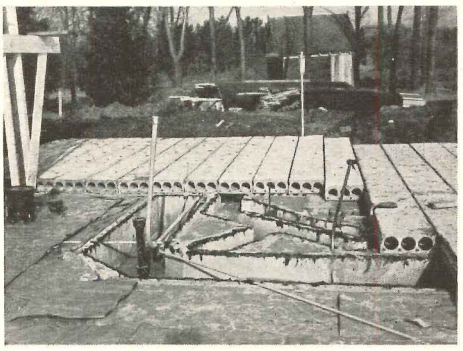
In this article the term "warm air perimeter heating" designates systems which heat primarily by convention, forming a curtain of warm air in front of windows and at the outside walls of the house at the point of greatest heat loss. It is estimated that from 60 to 80 per cent of the heat loss from a basementless house occurs here. There are three "perimeter" methods of heating concrete slabs.

Perimeter Loop System. The perimeter loop system utilizes a continuous duct loop around the perimeter of the house, located 2 in. beneath the concrete and from 3 to 5 in. in from the edge of the

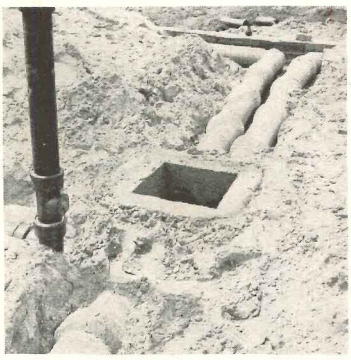
Non-Critical Duct Materials



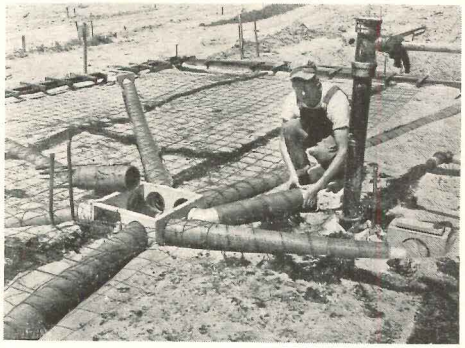
Stock, three-cell clay tile



Hollow-core structural concrete slabs



Concrete pipe



Above: Plastic impregnated fiber tubes

Below: Vitreous clay pipe

slab. This loop is then connected to a warm air plenum in the concrete slab by means of feeder ducts. Warm air is delivered into the rooms through registers placed in the floor beneath the windows and opening into the perimeter loop duct.

Radial System. The radial system also utilizes registers placed in the floor beneath the windows, but differs from the perimeter loop system in that a separate warm air conduit is installed from each register location to the warm air plenum cast in the concrete slab. Floor surface temperatures between registers may not be as warm as with a perimeter loop system.

Lateral System. The third method is the lateral system, in which a series of small, parallel ducts are installed in the floor from a central distribution duct that runs the entire length of the building to two collecting ducts on either side of the building. It is estimated that heat from the loop system and the radial system is about 30 per cent radiant and 70 per cent convection.

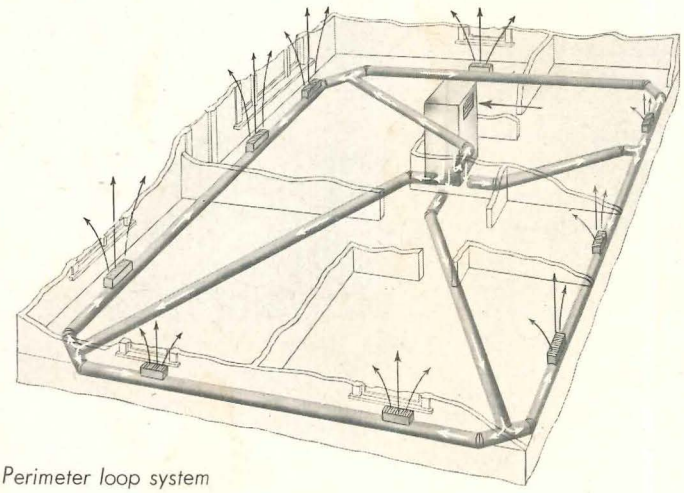
Design Considerations. Air flow through the perimeter duct must be adequate and the temperature must be high enough to maintain comfortable floor temperatures. With a low velocity air flow, the temperature drop in the ducts is too great. Most of these systems are designed for duct air velocities, particularly in radial ducts, of between 600 and 800 ft per min.

Radial feeders must be spaced at intervals along the perimeter duct not greater than 25 to 30 ft, and there should never be more than three outlets between any two feeders. A register must never be located closer than 2 ft to the intersection of a feeder duct and the perimeter loop duct. Usually it is best to have an intersection of a radial feeder duct and a perimeter loop duct at the point of greatest heat loss.

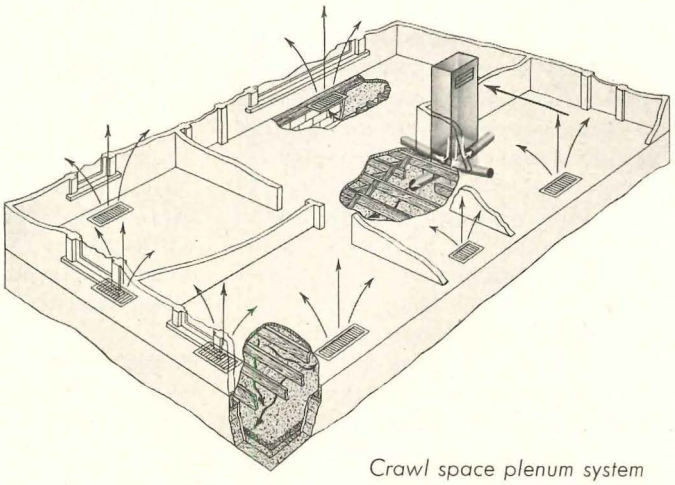
The feeder ducts should slope downward toward the plenum so that they will be at least 5 to 6 in. beneath the slab at the point where they enter the plenum. This pitch places the feeder ducts farther beneath the floor surface at their hottest point so that the floor surface temperatures will not be excessive. Registers should be placed from 5 to 7 in. in from the inner surface of the outer wall.

Crawl Space Heating. In houses built over a crawl space, it may serve as a warm air plenum. The warm air is delivered into the crawl space from the furnace through a suspended sheet metal duct, which extends down from the furnace into the crawl space, and then through short ducts that direct the air into all corners of the house. If the furnace is centrally located, a minimum of four ducts, probably 6 ft long and 6 or 8 in. in diameter, will be sufficient. If the furnace is located at one end of a long, rambling building, it may be necessary

(*Continued on page 194*)



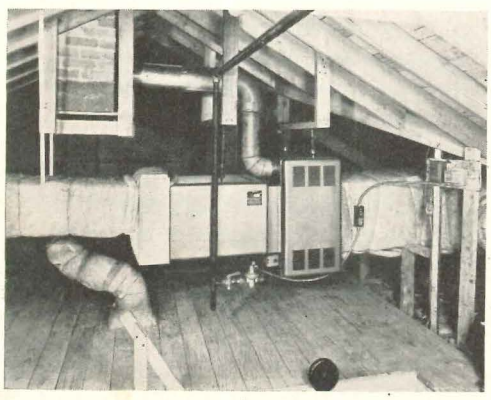
Perimeter loop system

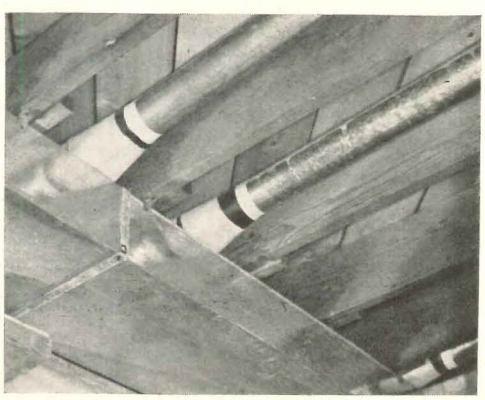


Crawl space plenum system

Space-Saving Equipment

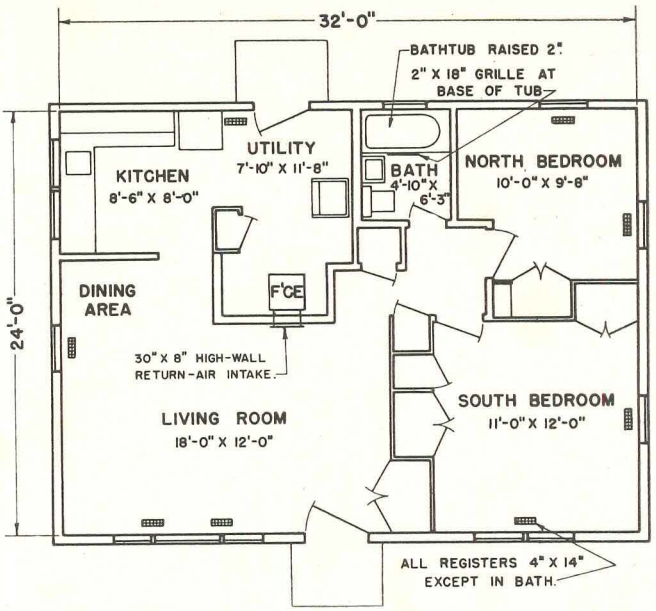
Left: vertical, downflow furnaces fit compactly into a small utility room. In small houses, the return air flows freely through the rooms and back through a louvered opening in the door of the utility room. Center: horizontal furnaces save space when installed in an unused attic. Right: high velocity systems blow air through small 4-in. ducts

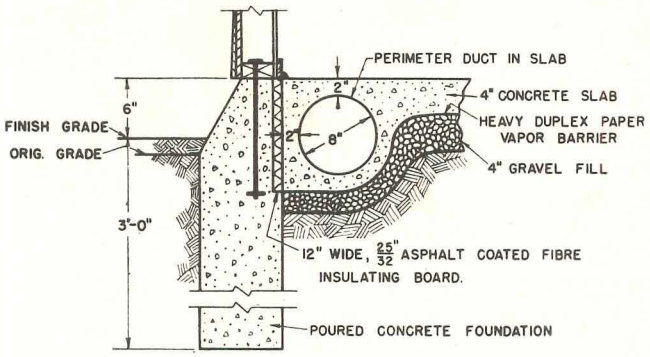




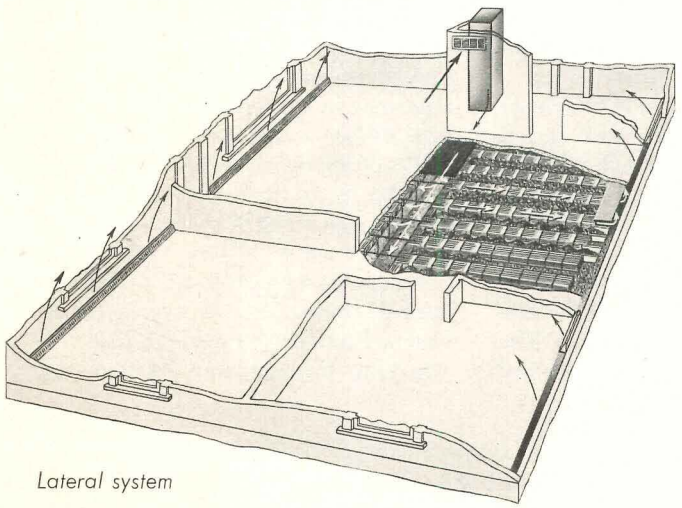
Graphs and a table on this page and the next show the performance of a perimeter loop heating system with radial feeders installed in Warm-Air Heating Research residence No. 3 at the University of Illinois. This type of system is illustrated in the drawing farthest left across the page. The system consists of an 8-in. warm-air duct embedded in the concrete slab in the form of a single loop around the periphery, and a series of 8-in. radial feeder ducts, connecting the perimeter duct with a subfloor plenum. Four arrangements of feeder ducts were studied as indicated in the sketches on this page marked A, B, C, and D. At the bottom of the page are given the floor to ceiling air temperature differentials for a typical winter day. And on the next page, floor temperatures are shown for duct arrangement "A".

The tests are part of a continuing research program under the sponsorship of the National Warm Air Heating and Air Conditioning Association.

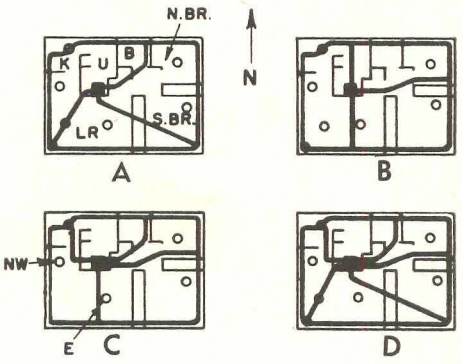




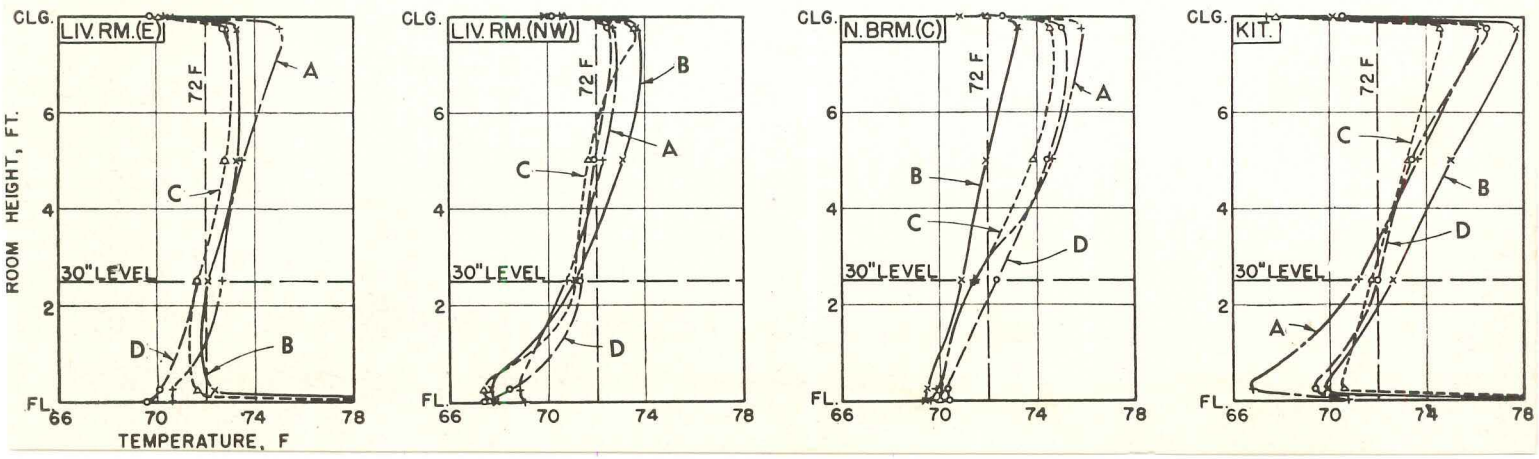
Above: plan of Warm Air Research Residence No. 3 at the University of Illinois and section through floor slab showing warm air duct located at periphery of the slab; note insulation and vapor barrier

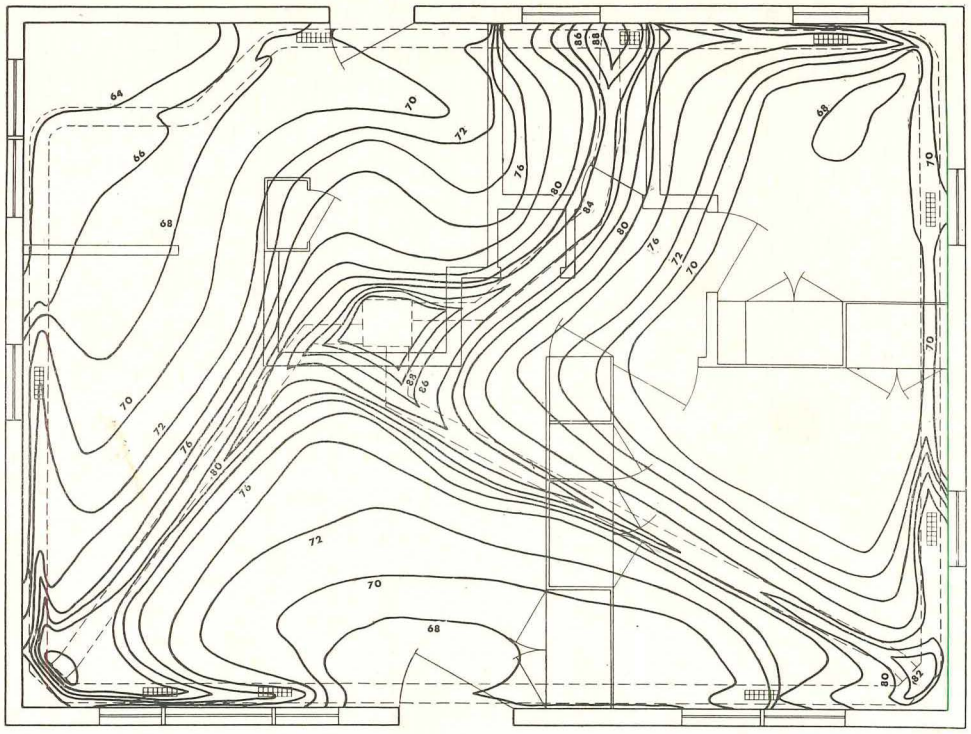


Lateral system



Right, below: four duct arrangements were tested to determine their effect on room air and floor surface temperatures. Below are floor to ceiling air temperatures for this weather: no sun; wind 2–7 mph; outdoor temp. 18–21 F. Average differential for D was only 2.7 F, attributable to greater panel effect





Floor surface temperatures for Residence No. 3 with outdoor temperature 30–35 F, no sun

Heat Balance for Perimeter Arrangement "A"

Items	Measured Values, Btu per Hr
Subfloor Loss	6,280
Above-Ground Losses	16,100
Total Heat Loss	22,380
Heat Supplied Above Ground	
a. Warm air from floor registers	9,350
b. Panel Heating effect	3,090
c. Furnace casing heat transfer	1,100
d. Flue pipe heat transfer	370
e. Electrical energy	1,190
f. Heat from Occupants	1,000
	16,100

Note: Values based on outdoor temperature of 35 F and wind velocity of 10 mph, SW. No solar heat gain occurred.

to install one or two ducts (8 to 12 ft long or longer) to get the heated air into the far corners of the crawl space.

The air is then delivered into the rooms through registers placed in the floor beneath the windows and connected directly with the open crawl space. There is no duct work connecting each individual register to the furnace.

Crawl Space Treatment. It is fundamental that the site be well drained and properly graded, and every precaution be taken to avoid the collection of ground water in the crawl space or around its foundation walls.

The crawl space area up from the foundation wall must be air-tight.

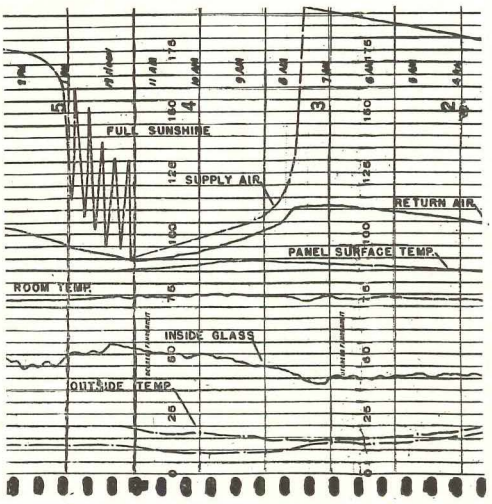
The inner surfaces of the foundation walls should be insulated, and at least one surface should be treated to act as a vapor barrier. The *U* factor of foundation walls should be about that of the walls in the habitable area. Outside wall surfaces between the joists should be insulated with a 2 or 3 in. thick batt.

The ground in the crawl space should be covered first with a coarse gravel about 2 or 3 in. thick, particularly if the house is located on ground with a high water table. The gravel should be covered with roll roofing of at least 55 lb weight with the edges lapped and sealed, and the membrane brought up the side walls 6 in. and sealed to them. The moisture membrane is covered with 1 or 2 in. of sand or coarse gravel for mechanical protection and to keep the heat from direct contact with the roofing.

Field tests have shown that ceiling temperature differentials, measured 3 in. above the floor and 3 in. below the ceiling, are from 1 to 3½ F, and that floor surface temperatures in the center of the rooms are in the low seventies, and the floor surface temperatures within a few inches of the walls averaged about 65 F.

There is some drying out of the wooden structural members exposed to the warm air within the crawl space. Shrinkage is an accelerated action of a normal process. In the average house over a basement with wood floor construction, this shrinkage goes on for

Portion of graph showing results of tests on a "split" system with air flowing in sinuous pattern through cellular clay tile and admitted to the living room under windows. Note that room air temperature changes only slightly with full sun



Photograph is of a typical warm air floor panel. Stock, unglazed tile was employed, 12 by 12 by 4 in. Notice that the tile was cut to form a "U" turn. Tile is covered by 2½ in. of concrete

several years. In the crawl space warm air system, it will take place in the first year.

Warm Air Panel and Split Systems

Some engineers advocate panel heating, or, the "split" system in which the air follows a sinuous pattern in the floor or ceiling panel and then is "bled" into the room through small openings near windows.

For large houses where the total heat loss exceeds 100,000 Btu/hr, one independent heating system can take care of the total heating load, if a panel or "split" system is used. But with "perimeter" systems, when the heat loss is greater, two or more independent systems are required; and the systems can then be zone controlled.

These engineers also believe that most of the heat from the air should be dissipated in floor or ceiling panels, resulting in surface temperatures around 85 F and 100 F respectively. Temperature of air to rooms approaches that of the room.

One consulting engineering firm describes their floor panel heating system for residences, comprised of cellular clay tile topped with 2½ in. of concrete, as follows:

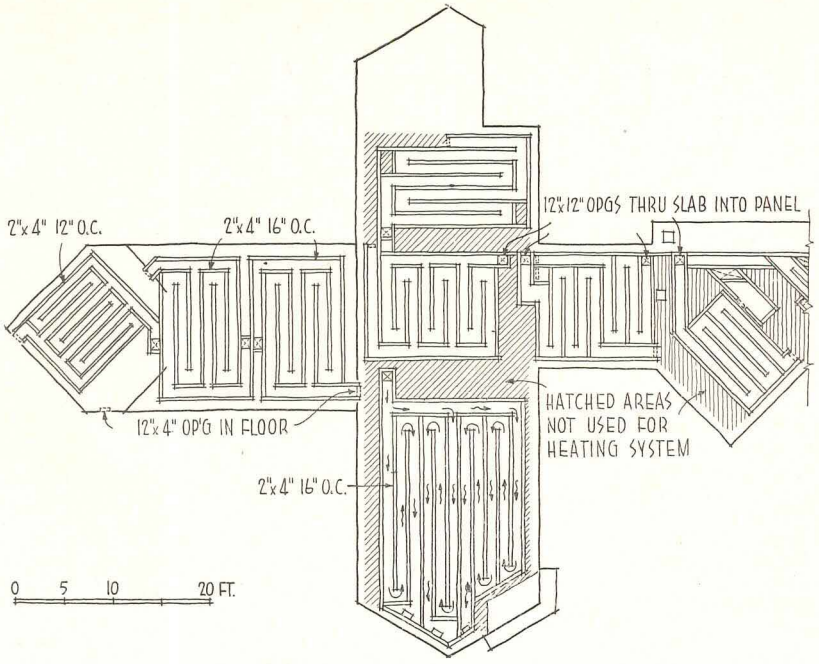
The residential installation is controlled by room thermostat and conventional warm air bonnet control except that continuous fan circulation is not used. When the thermostat signals for heat, the burner provides constant heat input to the slab until the thermostat has been satisfied. The fan is controlled by a high-low limit setting. If the fan ran continuously after the thermostat shut off the burner, the slab would continue to store heat, and the house would become too warm.

Night set-back is not recommended because then the system is forced to operate in the morning for a good while after sunrise when the outside temperature and solar effect is gradually increasing. Overheating will result.

With a fixed room thermostat setting, the off period of the burner is from 8 a.m. to around 4 p.m. During this period, the solar heat is absorbed by the floor slab, which consists of a 2½ in. concrete mass and the tile air space below providing a low heat storage. High heat storage is prevented.

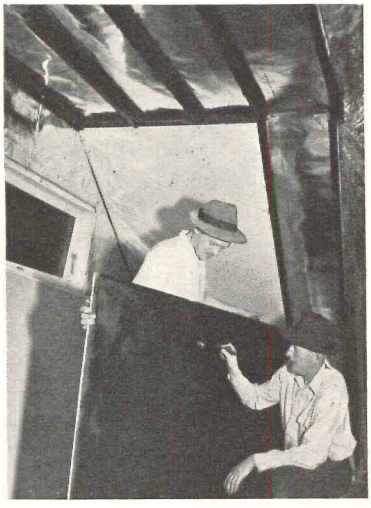
Other systems making use of non-critical materials include a floor panel system with wood sleepers laid on a concrete floor slab, and a plywood subfloor above. Ceiling panels are being constructed with gypsum board furred down from ceiling joists, and the furring strips act to guide the air in a sinuous pattern. See the two sketches on this page.

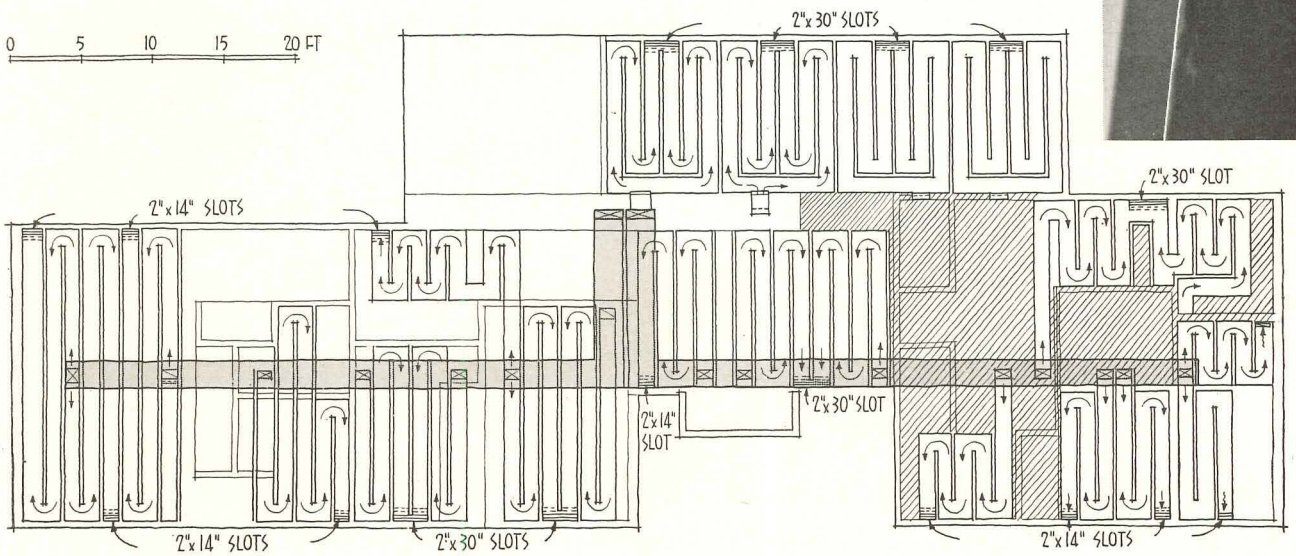
The editors wish to acknowledge the help of the following people in providing material for this article: C. W. Nessell and Randall Nelson, National Warm Air Heating and Air Cond. Assoc.; R. W. Roose, University of Illinois; and Richard P. Goemann of John D. Dillon, Consulting Engineers.



Above: portion of a large house laid out with a floor panel system consisting of wood sleepers over a concrete slab, all covered by a plywood subfloor. Trench underneath distributes heat to panels

Below: layout of a typical ceiling panel system. Furred down ceiling is used similar to photo (note reflective insulation). Gray tone indicates large distribution duct to front panels. Slots admit air near outside walls





NATURAL FINISHES FOR EXTERIOR WOOD

By F. L. Browne, Chemist, Forest Products Laboratory, Madison, Wisconsin

NATURAL FINISHES for exterior wood siding have become increasingly popular, and when applied and maintained correctly usually have been found attractive and satisfactory. On the other hand, natural finishes applied without the knowledge of what they require often have been disappointing. Woods that have a rich brown or red color of their own, such as redwood and western red cedar, lend themselves particularly well to natural finish, though woods of paler color, such as cypress, pine, knotty pine, and Douglas fir are sometimes finished in that way.

Natural Finishes Need Frequent Renewal

The first thing to learn about natural finishes is that they are much less durable and, therefore, must be renewed much more frequently than coatings of paint. Paint should go at least four years before needing renewal, but natural finishes nearly always need renewal at least once a year. On parts of a building that are fully exposed to sunshine and rain, natural finish usually needs renewal every six months until it has been done three or four times, after which the intervals may be somewhat longer, though seldom more than 12 months. On more sheltered parts of the building, yearly renewal may suffice, and in deep shade, the intervals may be even longer.

Need for renewal of finish becomes evident when the luster or glossiness originally imparted to the wood by the finish fades to the dullness of unfinished wood. Another test is to splash water on the surface to see whether the water rolls off quickly in droplets or spreads on the wood and is soon absorbed. In the latter case, fresh application of finish is in order. Needed renewal of finish must not be delayed too long. If it is postponed unduly, the wood begins to acquire a gray color that turns still darker gray when more finishing eventually is done. To restore the desired color after serious grayness has developed, the surface must be scraped or sandpapered until the wood is bright again. If the wood is allowed to become roughened and cupped as well as grayed by weathering, the restoration of a smooth, bright surface becomes very laborious. For that reason, the timely renewal of natural finish simply cannot be neglected. Similar neglect of coatings of paint is less serious.

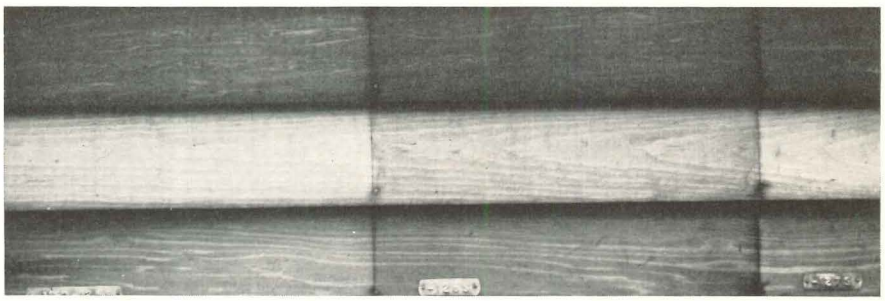
There is no way of keeping wood very long with exactly the color and nearly complete absence of gloss with which it comes from the lumber yard. A finish that could do so would enjoy a good market. Any protective finish that can be applied necessarily penetrates slightly into the wood, displaces air from wood cells, and seems to deepen the color of the wood even if the protective material has no color of its own. Moreover, by filling the pores in the wood, the protective material makes the surface smoother and, therefore, imparts at least a moderate degree of luster or glossiness. As time passes, there is further change of color because sunlight gradually darkens the color of most woods by changing yellows and reds toward brown. Even the weakened sunlight that gets through windows eventually darkens interior woodwork. If, in addition, the protective finish itself darkens with age, as most of them do, still more change in color must be expected.

Natural finishes may be divided into three broad types, oil finishes, wood sealer finishes, and the varnish finishes. They differ in the composition of the material used, in the appropriate methods of application, in the resulting appearance, and in important characteristics of performance.

Oil Finish

Oil finish has the lowest degree of luster or gloss. It also darkens the color of the wood more than other natural finishes do because the oil penetrates farther into wood. Also, the oils are inclined to continue darkening with age more than most sealers or varnishes do. The darkening, however, can be largely corrected by incorporating a little pigment in the oil as is described later.

The simplest and oldest oil finish is ordinary linseed oil, either raw oil or boiled. Unless the work can be done in warm, dry weather, it is best to use boiled oil or else to add about one-sixth of a pint of liquid paint drier to a gallon of raw oil. Most painters also like to add some volatile thinner to linseed oil, thinking that it makes the oil penetrate deeper. That is not the case, but thinning the oil helps to avoid leaving any excess oil on the surface. Turpentine, mineral spirits, or other thinner sold for mixing with paint may be used, but not more than a half gallon of thinner should be added to a gallon of oil.



Portion of a Forest Products Laboratory test panel at Madison, Wis., treated with a "redwood finish." It has been exposed to the weather for 7 months, facing south. The top board is redwood followed by white pine and cypress. Experts recommend refinishing once a year after the second application

Natural finishes for major areas of wood exteriors are a relatively new development. This report deals with the various misunderstandings and difficulties that have come up in the Forest Products Laboratory's consultations with architects and others. When the requirements and limitations of natural finishes are considered in advance, and the necessary precautions have been taken, natural finishes have been found both practicable and pleasing.

The oil may be applied by brushing, spraying, or mopping. For new wood, two good coats are needed. But it is most important to see that all of the oil sinks into the surface of the wood. If, after the second coat has been applied and has stood 20 to 30 minutes, there are any glossy places where excess oil stands on the surface, it should be wiped off before it has time to harden. Coatings of linseed oil that stand on the surface are unsatisfactory, not only because they are too glossy, but because they are inclined to run or to wrinkle when drying. These coatings of oil are too soft, tend to hold dirt, and become mildewed easily. In renewing the oil finish after it shows signs of wear, one fresh application should suffice.

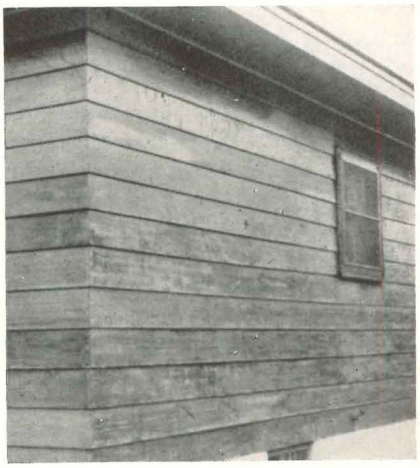
Commercial products are often called log oils or log cabin oils because the natural finishes for exterior woodwork first became popular for summer cottages built of peeled logs. These commercial products are usually made of bodied linseed oil, tung oil, or other drying oils and thinners. Bodied oils have been heated or treated chemically to increase the viscosity greatly, after which a greater proportion of thinner must be added to restore suitable viscosity for application. The bodied oil finishes do not penetrate so deeply into wood as raw or boiled oil, and, therefore, do not darken the color of the wood so much. The product approaches the properties of a wood sealer more and more closely as the degree of bodying is increased.

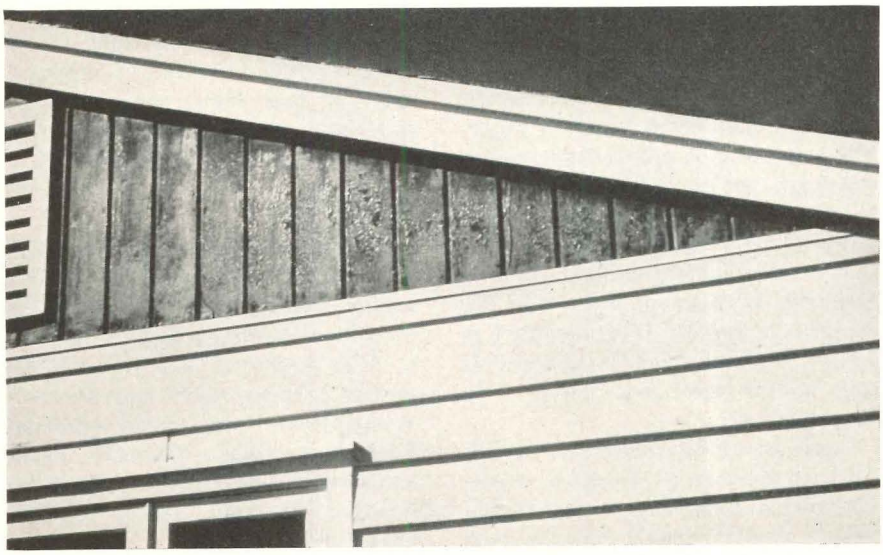
The commercial oil finishes should be applied and maintained just as has been described for the raw linseed oil finish. Since a bodied oil is more apt to leave an excess standing on the surface than raw oil is, special care should be taken to wipe off the excess before it becomes hardened.

The oil finishes give their best service in dry places where there never are any prolonged periods of dampness. Where dampness may linger for some time, the oils are subject to attack by molds, usually called mildew. A dark, almost black discoloration may result. Mildew can be prevented by incorporating suitable preservatives in the oil finish. Some, though by no means all, of the commercial oil finishes already contain preservatives. If so, the kind and amount should be stated on the label.

Suitable Preservatives. If linseed oil or a commercial product not containing preservative is used, there are two ways of incorporating suitable preservative. One way is to mix one of the concentrated solutions of pentachlorophenol or other chlorinated phenols with the linseed oil, instead of adding turpentine or paint thinner. If the directions on the preservative say that it is to be mixed with three times its volume of fuel oil for use as a wood preservative, it may be mixed one volume of concentrated preservative to three volumes of linseed oil for a linseed oil finish. The other way of accomplishing the purpose is to apply one of the water-repellent preservatives to the wood before the linseed oil finish is put on. In the second case, most renewals of the finish can be done with the linseed oil alone, for the treatment with water-repellent preservative need not be repeated for three or four years.

Adding Pigments. The oil finishes may be further modified to advantage by incorporating a small amount of pigment in them. Usually a pigment of reddish-brown color simulates the color of the heartwood of redwood or red cedar.





Some natural finishes whiten (loss of adhesion) and scale when applied to rather large areas of exterior siding. At left is a 3-year-old house in Arizona which had been refinished 1 year before the photo was taken. Above is an 18-month-old house in Madison, Wis., which had been refinished only 6 months before

The pale color of any sapwood present in the lumber is thereby changed to resemble the heartwood more closely, and such woods as pine or Douglas fir are given a richer color. Moreover, better maintenance of color is achieved because the presence of the pigment tends to mask the gradual darkening in the color of the wood itself. If renewal of finish should be delayed until some boards become slightly grayed from weathering, the pigment helps to restore the desired color, provided the graying has not been allowed to go too far. Finally, presence of a little pigment usually adds appreciably to the durability of the finish. Of course, the amount of pigment must be small, well short of the point at which it would give a painted or even a stained appearance.

A number of the commercial oil finishes on the market contain pigments. Linseed oil or prepared oils without pigment can be pigmented just before use by adding a small proportion of burnt sienna ground in oil. About one-half pint of sienna-in-oil to a gallon of oil may be right, but the exact proportions are best determined by trial on sample cuttings of the wood.

Wood Sealer Finish

Like the oil finish, the wood sealer finish is a penetrating finish that should not be permitted to build up on the surface into a glossy coating. Sealers do not penetrate wood so deeply as oils do. For that reason, the sealers usually darken the wood less and give the surface more luster or glossiness than the oils do. The sealers, however, are less glossy than varnish finishes unless too much sealer is applied and the excess is not wiped off.

In composition, wood sealers are much like varnishes except that the sealers contain more thinner and less nonvolatile matter. Both are made as a rule by cooking resin and drying oil together in suitable proportions, incorporating driers, and thinning to proper consistency. Many kinds of resin, both natural and synthetic, may be used. The difference between a sealer and a varnish lies more in the method of application than in the composition. Wood sealer finish, like the oil finish, sinks into and saturates the wood surface without forming a continuous coating of appreciable thickness over it, as varnish finish does.

If excess sealer finish is not wiped off, what may start out as a sealer finish will end up, after one or two renewals, as a varnish finish. A good spar varnish or marine spar varnish will give sealer finish if thinned with about an equal volume of turpentine or other paint thinner and applied like the oil finish.

Although most wood sealers are more resistant to mildew than the oils are, sealer finishes are more readily attacked by fungi than are paints. Wherever there may be lingering dampness, it is advisable to have a preservative in the sealer finish. Some of the commercial products already contain preservative. Otherwise, preservative may be incorporated in a sealer finish by either of the two methods suggested for oil finishes.

Some commercial wood sealers contain pigments for the same desirable purposes already described for oil finishes. The user may also add pigments to sealers lacking them by following the methods suggested for pigmenting oil finishes.

Varnish Finish

Unlike either oil finish or sealer finish, varnish makes a highly glossy coating of appreciable thickness covering the wood. Varnish may not darken the color of the wood to begin with much more than a sealer does, but with the passage of time, there may be more darkening caused by change in the varnish itself than would be the case with a wood sealer.

Varnish is applied by brushing or spraying. At least three coats are needed for new wood, but for renewal, one coat at a time is sufficient. On new wood, the first coat may be thinned moderately with turpentine or other paint thinner. Shellac must not be used for the first coat on exterior surfaces, even over the knots in knotty pine. Succeeding varnish coats are expected to stand out without penetrating the wood and, of course, none of the varnish is wiped off.

Where there is dampness at times, varnish finishes need preservatives against mildew much like sealer finishes. Unless the varnish already contains a preservative, it is advisable to apply a water-repellent preservative to the wood before starting to put on varnish. It is seldom practicable to add a concentrated preservative to a varnish because varnish cannot stand much addition of thinner. Similarly, it is not good practice to add pigments to varnish. If pigmentation is desired, it is best to apply a pigment oil stain to the wood first and then to varnish over it.

On the whole, experience with varnish finish on large areas of exterior woodwork such as siding has not proved satisfactory. Often the varnish finish develops milky, opaque patches where the coating has lost its adhesion to the wood without breaking open. Some varnishes craze or crack in an unsightly manner, after which renewal of the finish is difficult.

Finishing Hardwoods

The methods of natural finishing described so far are suitable for all of the softwoods and for hardwoods with pores no larger than those in birch. Hardwoods with pores larger than those in birch, however, usually need special treatment for the pores after water-repellent preservative, if used, has been applied, but before oil, sealer, or varnish is put on. The treatment for pores is the application of a paste wood filler.

Paste wood filler is applied by thinning it with paint thinner to a consistency suitable for brushing, like paint, but brushing across the grain of the wood rather than with the grain.

For varnish finishes on hardwoods with large pores, use of wood filler is necessary to avoid danger of premature failure of the finish. For wood sealer finishes, the use of filler is strongly recommended, though it may not be essential. For oil finishes filler may be omitted.

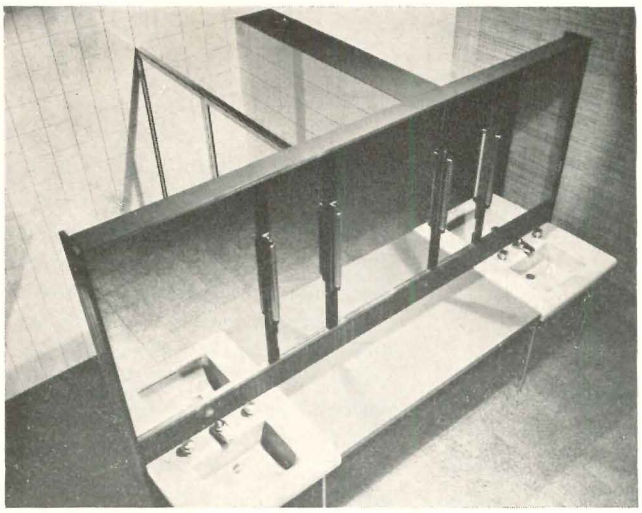
Finishing Doors and Windows

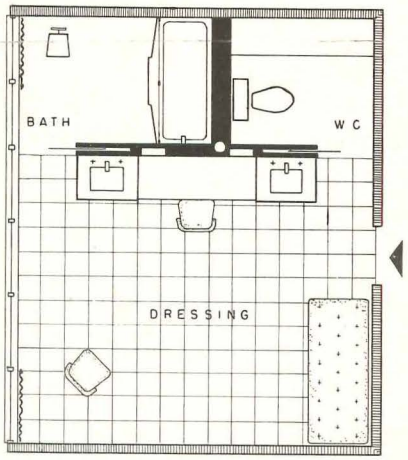
Doors and windows usually need more careful maintenance of protective finish than is necessary on wood siding. Paint or trim enamel affords the most reliable means of maintaining the needed protection. Careful consideration should be given to the choice of paint or trim enamel for the exterior surfaces of doors and windows even when natural finish is selected for the siding. Paint of a color matching that of the naturally finished siding may be used if desired.

But if natural finish is wanted for doors or windows, it is probably best to apply a full varnish finish consisting of three or four coats, because varnish gives better protection against weathering than oil or sealer finishes do.

Rust Stains

Woods that contain tannins, such as redwood, red cedar, oak, and chestnut, readily produce a black color when brought in contact with iron rust and a little moisture. Other extractives present in many woods may also form strongly colored compounds with iron. Exterior woodwork, therefore, should always be fastened in place with corrosion-resistant nails, screws, or other fastenings.





Left: Free-standing T-shaped partition subdivides bathroom facilities in separate compartments. Above: Plan of typical "T" core arrangement

New Bathroom Planning Service Accents Flexibility and Economy

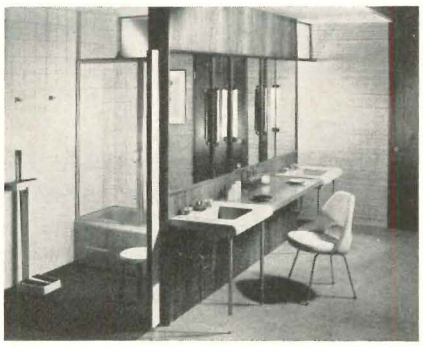
One of the first fruits of a new *Crane* service which will offer suggestions for bathroom plans, room designs and remodelling designs is the development of a family "T" bathroom, designed by Edward L. Barnes, Architect. A number of varied and flexible arrangements are possible with the scheme, which utilizes a central T-shaped core, either free-standing or extended to the ceiling, subdividing a room into separate compartments for tub, lavatory and water closet, so that these fixtures may be used privately and simultaneously. Sizes of compartments can be adjusted to suit particular family needs and the scheme is adaptable for homes from luxury to modest classes.

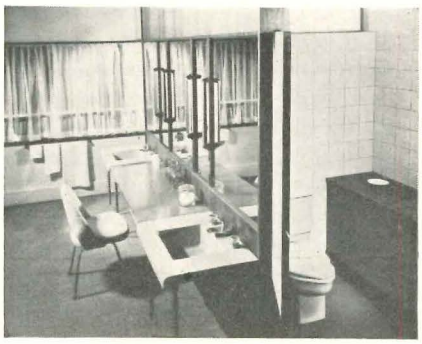
Of especial interest are economies in construction made possible by the plan. Since fixtures are placed back-to-back around the T core in which all the plumbing is "stacked," installation of costly additional roof vents and soil pipes is eliminated. In addition, in the T plan there is less distance between piping connections of the three main fixtures than in the normal "minimum" bathroom in which fixtures are ranged along perimeter walls. Perimeter walls in the T plan, besides, can be planned with complete flexibility since they are not tied down by plumbing. Any wall can be a closet wall, windows may run on any side, and access is possible from anywhere on the perimeter. Separate access from different adjacent rooms, combined with the separation of facilities in the scheme, often makes it possible to eliminate entirely the need for a second bathroom or guest washroom.

A variety of fixture arrangements is also possible with the plan. The dressing room may have one, two or more lavatories. The toilet room may have its own lavatory with separate access to the hall or it may be simply a room for the water closet and the utility cupboard. The bathroom may incorporate a tub shower or a stall shower and, if desired, a separate toilet. Exact arrangement of fixtures can be adjusted to specific needs.

Not only does the T plan permit simultaneous use of separate functions, it also allows additional use of the bathroom area for many secondary household functions and activities currently centered elsewhere in the house. Personal hygiene, dressing, make-up, exercise, sun-lamp bathing, and storage of clothes, linens and household equipment may all be transferred to the new multi-purpose room.

A dossier of plans and suggestions for bathroom and kitchen planning, including further specifications for the T plan will soon be available to architects, builders and home owners through dealers. Crane Co., 836 So. Michigan Ave., Chicago, Ill.

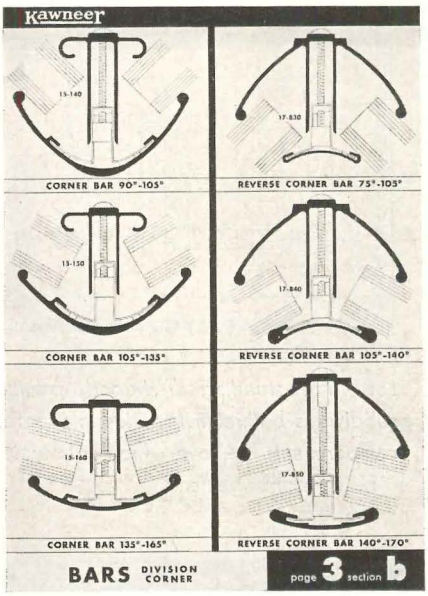




Above: Dressing room features Crane Criterion lavatory designed by Henry Dreyfuss and awarded N. Y. Architectural League Gold Medal. Bath is at left. Below: Dressing room with toilet compartment at right

(*Continued on page 308*)

LITERATURE FOR THE OFFICE



Page shows typical details of architectural metal products, facilitates specification and drafting

Architectural Metal Details

Portfolio of Construction Details for Kawneer Architectural Metal Products. A handy complete reference file of construction details for *Kawneer* architectural metal products is now available to architects and is designed to facilitate both specification and drafting entailed in the employment of the products. The manufacturer's complete line is included and the material has been divided into nine basic sections, such as Sash and Jambs, Trim, Facing Materials, etc. Each of these sections is clearly indexed and each sheet is marked with page and index number. Pages have loose leaf punchings so that the entire file may be kept either in its accompanying envelope or in a loose-leaf folder as desired. The loose-leaf arrangement further permits the draftsman to conveniently use the details on the drawing board, and, if necessary, to reverse the pages for opposite-hand details. All moldings are shown in full size and are fully dimensioned, and quarter-size typical details illustrating possible uses of the products are also included. 45 sheets, illus. The Kawneer Co., Architectural Service Dept., Niles, Mich.*

Radiant Heating

Radiant Sunshine Comfort for Every Heating Purpose (Catalog No. EL-16). Brochure gives complete specifications of Electriglas panels for radiant heating. A description of the unit is given and features of the thermostatic zone control are shown. Illustrations point out the features of baseboard panels and Dial-temp panels and also demonstrate the use of the automatic portable heaters. 8 pp., illus. Appleman Glass Works, Bergenfield, N. J.

Commercial Doors

Ellison; the Balanced Door. Brochure points out features of the manufacturer's commercial door, showing operation, hardware and construction details. Photographs of a number of varied installations of the doors in both new construction and remodelling jobs are included, and serve to illustrate a number of frame designs as well. Specifications and a list of other installations throughout the country are also given. 12 pp., illus., Ellison Bronze Co., Inc., Jamestown, N. Y.*

* *Other product information in Sweet's File, 1952.*

Heating Equipment

Airtherm Convectors (Catalog 702A). Catalog contains description of convectors for schools, institutions, apartments, homes, offices and public buildings. Working drawings point out the features of floor, wall and recessed cabinets, giving roughing-in dimensions for each type. Tables are given on steam capacity and forced circulation hot water capacity. Other hot water capacity data and typical convector specifications are also included in the catalog. 16 pp., illus., Airtherm Mfg. Co., 747 S. Spring Ave., St. Louis, Mo.*

Vinyl Cork Tile

Dodge Vinyl Cork Tile. Catalog demonstrates with illustrations the various types of interiors in which vinyl cork tile flooring may be used. Test results are given, pointing out the many features of this material. A complete color chart is included in the pamphlet which shows the available solid colors and marbleized patterns. Standard sizes are also shown and installation specifications contained in the brochure. 8 pp., illus., Dodge Cork Co., Inc., Lancaster, Pa.*

Fabric Wall Coverings

Two new booklets are now available on fabric wall coverings, giving illustrative information on each:

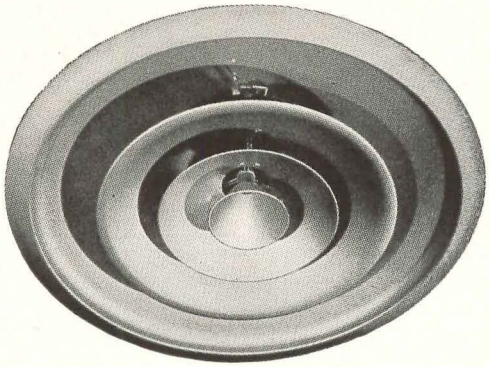
• *Joanna Vinylized Wall Fabric.* Booklet discusses the qualities of new plastic-on-cloth material. Gives a step by step presentation of the fabrication, application, wearing qualities and recommended uses of the vinyl coated fabric. Included with the brochure is a card of samples showing the 25 colors available, along with a larger sample of suitable size for testing. Booklet available if requested on firm's letterhead. 12 pp., illus. Joanna Western Mills Co., Wall Covering Div., 22nd & Jefferson Sts., Chicago 16, Ill.*

• *Fab-Rik-O-Na Cloth Wall Coverings.* Illustrated brochure describes the available types of this line of wall coverings, showing microscopic details of textures. Advantages and uses are discussed and specifications are given. Interior photographs are included in the pamphlet, illustrating several treatments. 4 pp., illus. H. B. Wiggin's Sons Co., Bloomfield, N. J.*

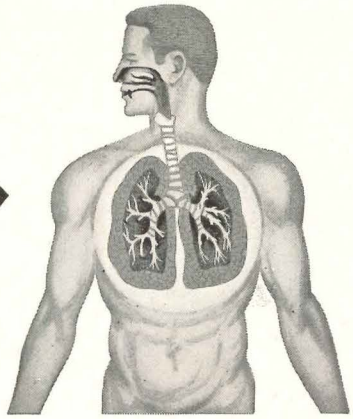
(*Continued on page 334*)

Anemostat

Air Diffusers...



actually "breathe"...



to give you

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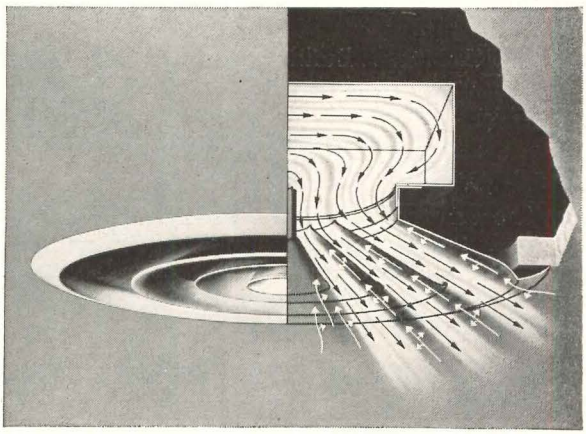

The familiar process of breathing dramatically illustrates the Anemostat principle of aspiration. Just as we inhale air, mix it within our lungs and expel it, so Anemostat air diffusers also aspirate . . . by drawing room air *into* the unit and mixing this room air with supply air *within* the outlet before distributing the mixture in many planes traveling in *all* directions.

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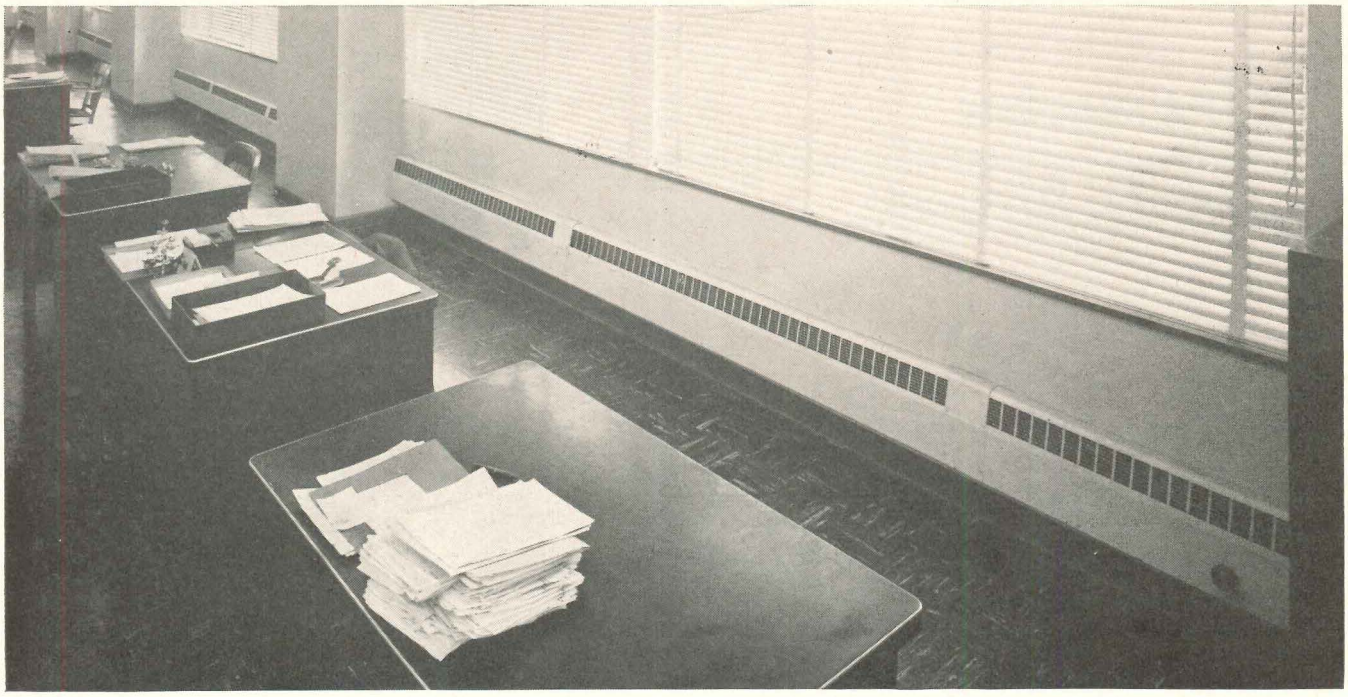

Typical view showing Webster Walvector ® providing heat the full window length, column to column. The steam risers and the returns are in alternate columns. Webster Radiator Valves provide shut-off of the heat in each bay.

Steam Cost 12% under estimate

The Commerce Building, first new office building in Harrisburg since 1935, is obtaining Webster Tru-perimeter Heating results with Webster Moderator low-pressure steam heating, using 12% less steam than estimated.

The Pennsylvania Power & Light Co. estimated the cost of steam for heating at $3,527 per season. Meter readings for the first complete heating season showed steam cost of only $3,101, less by $426 than the estimate.

Architect William Lynch Murray specified a Webster Moderator System to assure "controlled-by-the-weather" economy in this 13-story building; Webster Walvector ® to spread the heat the full length of exposed walls.

Edward H. Bower, managing director and co-owner, says: "The continuous radiation beneath continuous window bands is just what we need. All sections of the building heat evenly, rapidly and comfortably regardless of outdoor weather conditions."

Webster Tru-perimeter Heating with steam or hot water is a development you will want to know more about when planning new buildings or extensive modernization. It is a development of the Webster organization—with direct representatives in 65 U. S. cities working with architects, engineers and heating contractors in the solution of specific problems of heating. Write us or get further information from your Webster representative.

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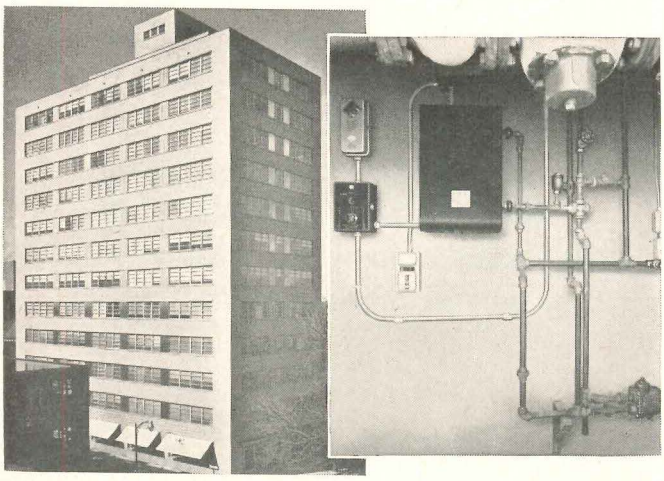

WEBSTER

MODERATOR

SYSTEM

OF STEAM HEATING

"Controlled by the weather"

Commerce Building, Harrisburg, Pa. Architect: William Lynch Murray & Associates. Mechanical Engineer: Benj. A. Johnson. Heating Contractor: Herre Brothers.

Inset shows the heart of the Webster Moderator Control. Variator and Electronic Pressure Control Unit shown here operate in conjunction with the following equipment not shown: Outdoor Thermostat, motor-operated Main Steam Control Valve, and extended tube orifices installed in each Walvector ® unit.

RADIANT HEATING SYSTEMS FOR HOUSES—16: Controls

By William J. McGuinness, Professor of Architecture, Pratt Institute

CONTROLS

Basic Assumptions

If domestic hot water need not be generated from the same boiler, the boiler may be used to deliver water at the lower temperature needed for radiant panels. However, since most modern installations produce both water for heating and domestic hot water from the same plant, it will be assumed that the boiler water temperature must be kept at about 180 to 200 F, and that some mixing device is needed to produce water in the usual range of about 100 to 150 deg for use in the radiant panels. The second assumption is that the fuel used is gas or oil, rather than coal. The systems of control described apply to these two fuels. The third assumption is that high- and low-limit aquastats are used to operate the automatically controlled gas or oil fires to keep the boiler water at a fairly constant temperature for use in the mixing devices.

Water Temperature Control

The common method of delivering water of the temperature required is to mix some of the hot water from the boiler with the cooler return water from the radiant coils. Fig. 16 shows three methods for doing this. The first of these uses gate valves, which may be adjusted manually to deliver water at the correct temperature. An improvement on this scheme is seen in the second example where a thermostatic mixing valve is used. It can be set to deliver water at any desired temperature provided the boiler water temperature is higher. Either of these is suitable for use with a circulator which operates at intervals to make up the heat losses as required. The third arrangement in Fig. 16 is a blending valve which constantly changes the temperature of the water delivered in accord with the dictates of indoor and outdoor bulbs, as described later. This valve is used with a circulator which operates continually, except that, occasionally, it is turned off for brief intervals when the room temperature exceeds that set for it. The graph in Fig. 16 shows two typical points on the curve of operations for such a

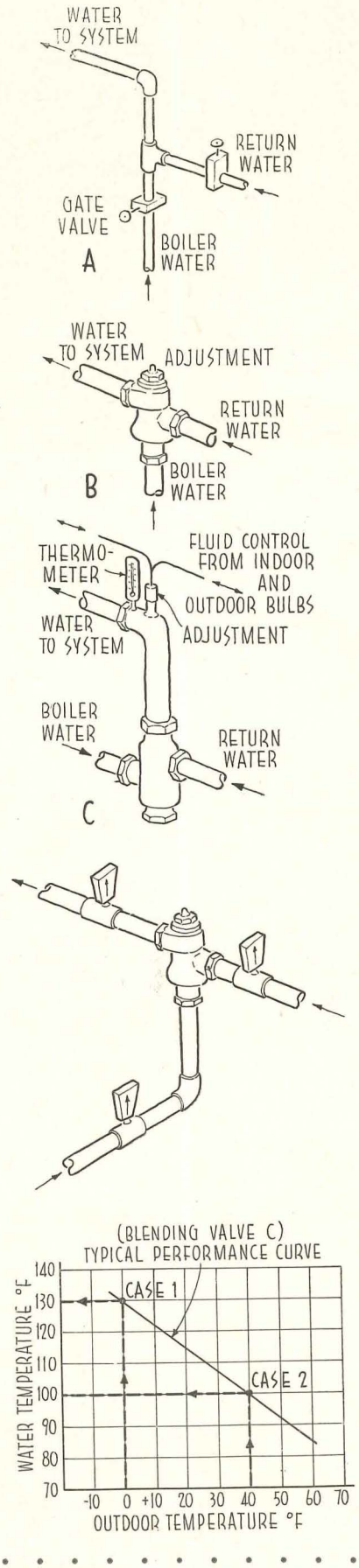

Fig. 16

Three methods of adjusting temperature of water for coils

A

Valves on return water and boiler water can be adjusted manually to deliver water to coils at proper design temperature. System works quite satisfactorily with intermittent use of circulator

B

Temperature control valve with thermostatic element will assure delivery of water at any predetermined temperature, provided boiler water temperature is higher. It is an improvement over "A" at some additional expense

C

When circulator is run continuously, temperature of water delivered to coils can be changed by this automatic blending valve. Control is by indoor and outdoor bulbs

In any system, liberal use of thermometers is recommended as an adjustment aid

Case 1. Design conditions. Water delivered at design temperature (130° F) when outside temperature is 0° F

Case 2. Mild weather. Water delivered at lower temperature, in this case 100° F, when outside temperature is 40° F

(*Text continued on Sheet 18*)

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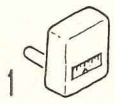
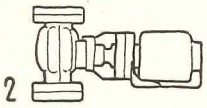
RADIANT HEATING SYSTEMS FOR HOUSES—17: Controls

By William J. McGuinness, Professor of Architecture, Pratt Institute

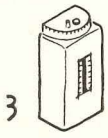
Fig. 17 Control Devices *(See Fig. 18 for combined uses)*



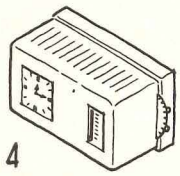
1. Aquastats
High and low limit immersion aquastats in the boiler water turn fire on and off to maintain water temperature high enough to generate domestic hot water, and for use in radiant coils after mixing



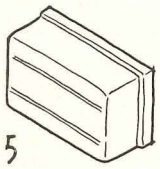
2. Circulating Pump
Intermittent use with fixed water temperature or continuous use with varying water temperature are two usual schemes. In both cases, room thermostats or room controls generally stop circulator when room temperature is adequate



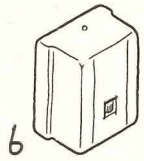
3. Thermostat
For intermittent circulator use, thermostat turns circulator on when heat is called for, and off when satisfied. This type with no automatic night set-back is often used when lower temperature is inadvisable at night, as in concrete floor slabs. Heavy slabs recover slowly from low temperatures



4. Clock Thermostat
The temperature of ceiling panels can be lowered at night (morning recovery is fast). For this purpose, clock thermostat can be used. For use in connection with outside anticipator, it can be electronic

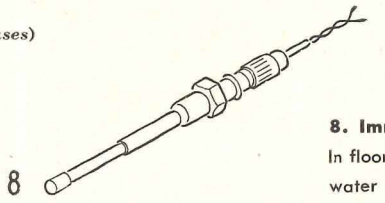


5. Averaging Thermostat
In large houses, it is sometimes advisable to average the temperature at which thermostat operates. This one acts in tandem with main thermostat and the average temperature of the two is used. In ceiling systems where panels cool off unevenly, this is a good equalizing device

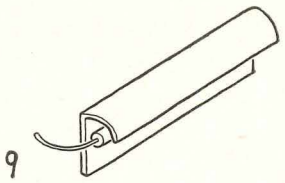


6. Outdoor Anticipator
This device is part of an electronic system. Together with thermostat and (in floor systems) immersion bulb in return water, it operates circulator. This anticipates cooling off of house by sensing a drop in outdoor temperature before inside thermostat does. It is placed on a north wall

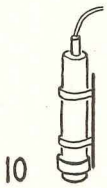
7. Cycler
It is evident that with multiple controls, fire and circulator would be turning on and off at short intervals. Cycler assures periods of operation not less than three or four minutes



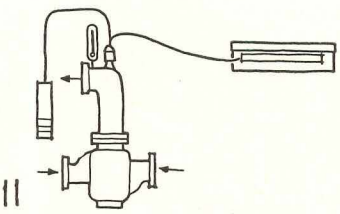
8. Immersion Bulb
In floor slab systems, this is set into return water to sense any drop in temperature. It operates together with outdoor anticipator to turn on circulator when needed. The outdoor anticipator varies control point of immersion bulb



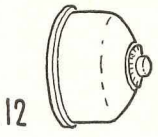
9. Outdoor Bulb
Before inside devices can observe change in outside temperature, outdoor bulb operates. When outdoor temperature drops, a contracting liquid opens valve at boiler water supply, increasing temperature of mixed water. With outside rise, reverse occurs. It is placed on a north wall



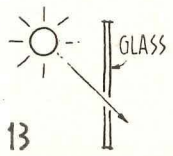
10. Indoor Bulb
This is operated by the room control. When room temperature exceeds setting of room control, it warms indoor bulb electrically. Indoor bulb then delivers an expanding liquid to blending valve. This tends to close boiler water opening in blending valve, reducing temperature of water delivered. If room temperature continues to rise, it shuts off circulator



11. Blending Valve
Continuous use of circulator demands varying water temperature. Increased temperatures of either indoor or outdoor bulb cause an expanding liquid to depress mechanically the valve which admits hot boiler water to mixture. This reduces temperature of water delivered to system. With decreasing bulb temperatures, hotter water is delivered

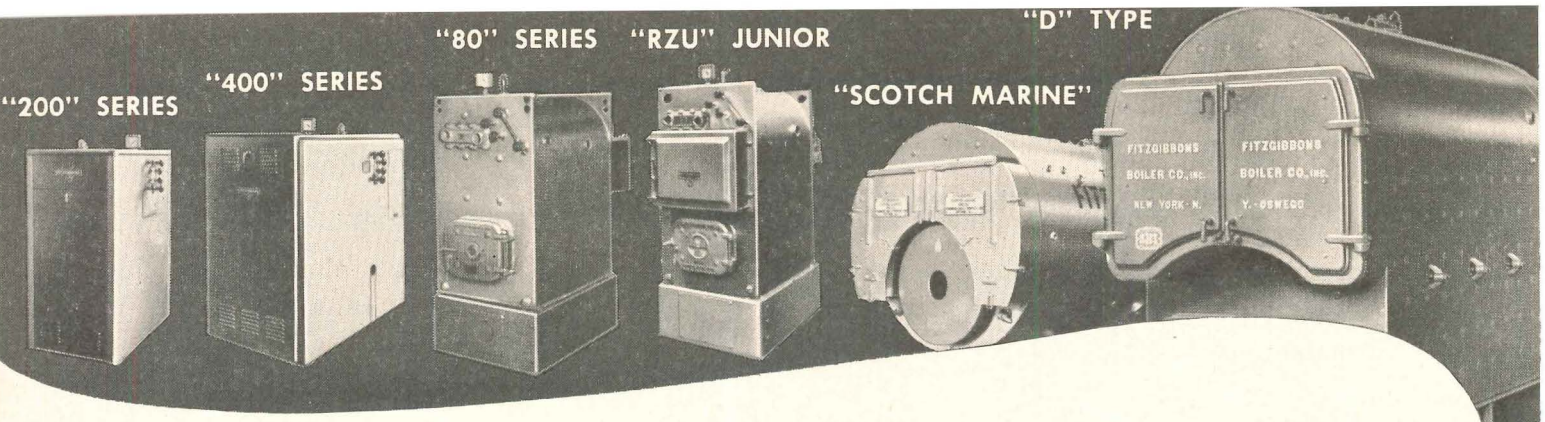


12. Room Control
About the size of a thermostat and with similar setting dial, this control operates as described in (10) (Indoor Bulb). It is upper limit control only, outdoor bulb taking care of operating system when temperatures drop. Room control senses radiant and convective changes as well as changing room temperature. Flush type is also available



200± Btu
Per Sq. Ft.
Per Hour

13. The Sun
In solar houses with much glass on the south, sun is part of heating system and is more than adequate to heat house. Interior heating system, or at least the south zone, must turn off when sun is operating



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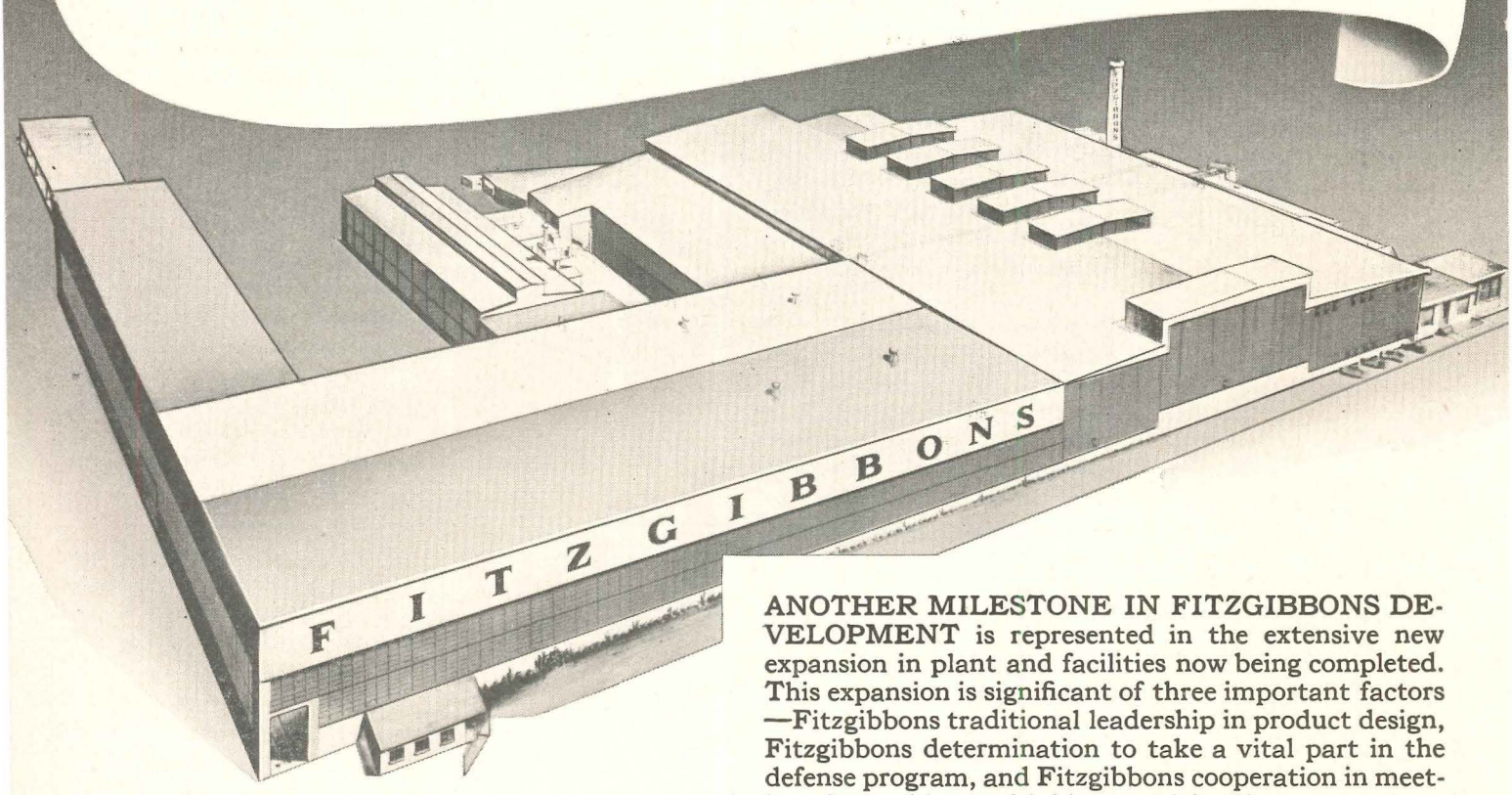

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RADIANT HEATING SYSTEMS FOR HOUSES—18: Controls

By William J. McGuinness, Professor of Architecture, Pratt Institute

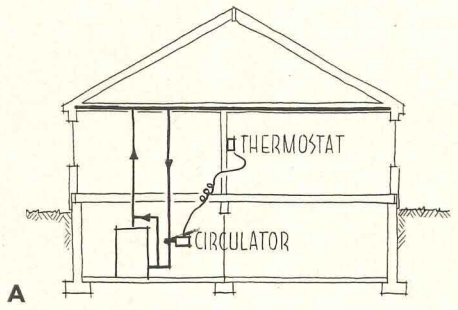
valve. Case 1 occurs when the outside temperature is zero (design temperature in many localities). In this case, the water is delivered at 130 deg, which could be the design temperature called for at this critical condition. At the milder outdoor temperature of 40 deg, the water is delivered at 100 deg, which is sufficient to make up the smaller heat losses which occur at this higher outdoor temperature.

Systems of Control

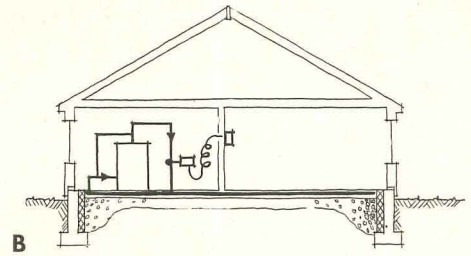
Two important influences in selecting a control system are the thermal lag of the panel and the amount of glass facing south, which makes solar heating a part of the heating system. For houses having little glass and employing ceiling coils, fixed proportions for water mixing are possible with intermittent use of the circulator, controlled by a simple electric thermostat. The mixing may be as shown in Fig. 16, A or B. Ceiling coils have a fast response. They heat quickly and cool quickly. This house is little influenced by changes in the intensity of sunshine. See Fig. 18 (A) for this arrangement. The use of floor coils in concrete in this kind of house would preclude the possibility of night set-back because of the thermal lag. Otherwise, the control could be the same. Outdoor control might be of some advantage in this case if budget permits.

In solar houses receiving much heat gain from glass on the south, the use of outdoor controls is recommended in all cases, and they are most necessary with the use of floor coils. It is necessary to anticipate the heat that will come from the sun and to shut off the system before this heat is received. Conversely, when the sun is about to set and outside temperature drops, it is well that the system start in response to an outside sensing device early enough to replace the effect of the sun when it sets. The additional importance of anticipating outside temperature changes by regulating the temperature of coils in concrete slabs is obvious because of their greater thermal lag.

Fig. 18 Recommended Control Systems For Radiant Panels



A



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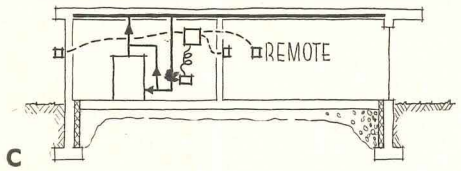

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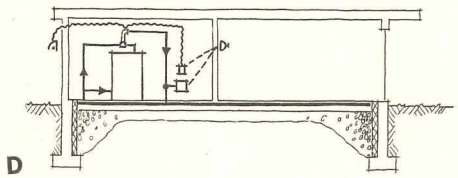

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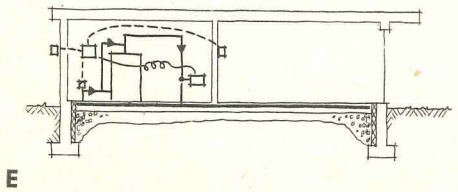

E

A. Conventional House, Ceiling Panel
Glass represents about 10 to 20 per cent of wall areas, orientation is unimportant. Circulator is operated intermittently by clock thermostat which can serve for night set-back. Outdoor controls not needed

B. Conventional House, Floor Panel in Concrete Slab
Glass and orientation same as case "A" above. Plain thermostat without night set-back operates circulator intermittently. A radiant-and-convective type room control, Item 12, Fig. 17, is slightly preferable. Outdoor controls are of some advantage. If used, they could be as in cases "D" or "E" below. Night set-back not recommended because of slow return of slab temperature

C. Solar House, Glass on South, Ceiling Panel, Electronic Controls
Electronic relay amplifier receives signals of outdoor anticipator and of thermostat-set comprising clock thermostat and averaging thermostat remote from it. Through a cycler assuring at least 3 or 4 minutes operation, circulator is controlled by amplifier for intermittent operation

D. Solar House, Glass on South, Floor Panel in Convective Slabs, Blending Valve Control
Outdoor bulb and combination of room control operating indoor bulb regulate blending valve. Room control location is same as for thermostat. Temperature of water varies to compensate for varying temperatures. Circulator operation is continuous unless indoor bulb cannot cool slab quickly enough, in which case room control turns off circulator. No night set-back. *Note: System may be used for ceiling panel as in case "C" without change except night set-back may be added*

E. Solar House, Glass on South, Floor Panel in Concrete Slab, Electronic Controls
Electronic relay amplifier receives signals of outdoor anticipator, a plain thermostat (no night set-back) and an immersion bulb in return water. If one indicates temperature drop, circulator is started. Immersion bulb helps prevent lag in floor slab systems. A cycler is used

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Architects: Northup & O'Brien. General Contractor: George W. Kane.

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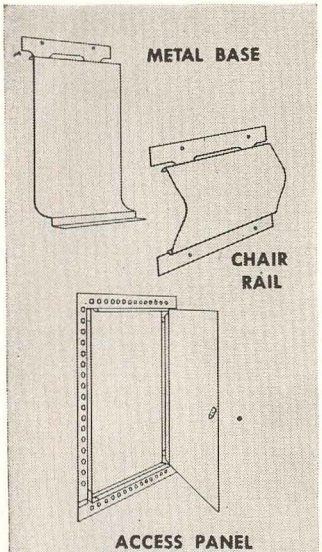

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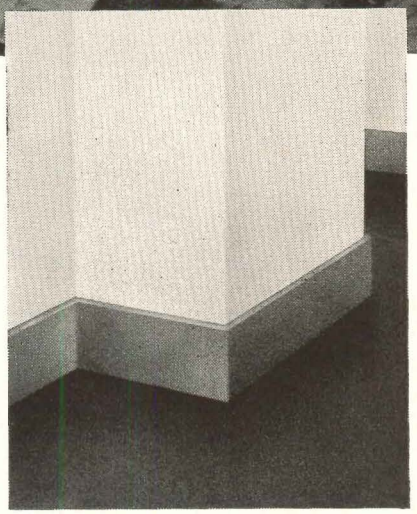

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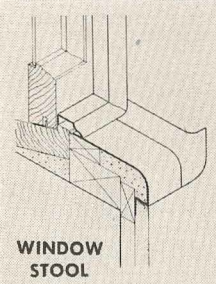

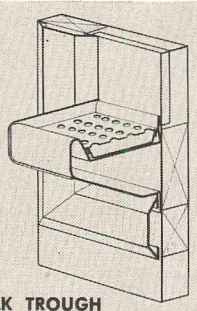

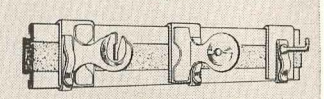

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RADIANT HEATING SYSTEMS FOR HOUSES—19: Controls

By William J. McGuinness, Professor of Architecture, Pratt Institute

Selecting A System

In Fig. 18, electronic and mechanical systems are shown for the control of radiant panels. In general, the electronic systems use a fixed water temperature adjustment with intermittent circulator operation, while the mechanical systems use a blending valve and continual circulator operation. Each has its particular merits. The electronic system is inexpensive and very sensitive. The system of continuous circulator operation has the advantage of adjusting closely to the actual heat loss from the house. By some it is thought that continuous operation is a distinct advantage in floor slab panels and in larger installations, both situtions where, because of great thermal capacity, the panels would not be flexible enough to follow quick changes in heat delivered to coils.

ZONING

Selection of Zones

In modern solar houses the first zone to pick is the no-sun zone. This is shown in Fig. 19 on the north side of the house. This zone receives no sun during the day, and at low outdoor temperatures the heating panels might operate all day. Under these same conditions and when the sun is shining, all south zones might be turned off. A further split could be between the sleeping and living wings. This is possible only when ceiling systems are used, permitting night set-back. Further zones might be suggested by remote, isolated wings or second stories. In these cases, the north sides of isolated wings or upper stories should still be separately zoned if the south receives much sun during the day.

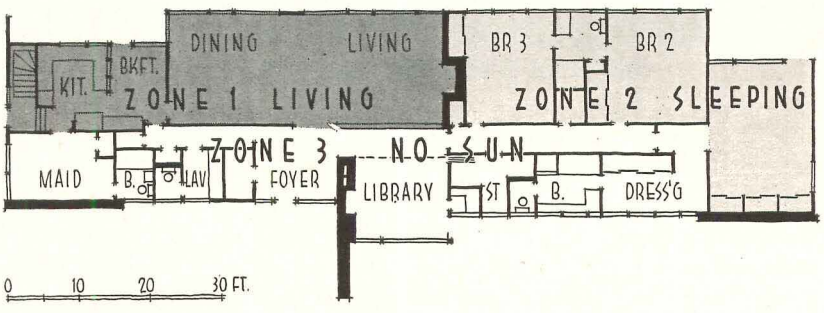
Piping For Zone Control

The piping shown in Figs. 11 and 15 (see Time-Saver Standards Sheet 11, October 1951, and Sheet 15, January 1952) for single zone systems would have to be modified for multi-zone operation. For instance, in a three-zone system such as shown in Fig. 19, a header would be needed to receive the mixed water. The three mains serving the zones would each start through a separate flow-control valve. The piping for each zone would run separately and return as a zone-return-main from each of the zones. A circulating pump would serve each individual zone-return-main before the return water was assembled in a master return header.

Controls for Zoning

A full set of controls is required for each zone. In the house shown in Fig. 19, three sets of controls are needed. A ceiling system is assumed. If the controls were electronic, they would comprise three each of: clock thermostat, averaging thermostat, outdoor anticipator, and electronic relay amplifier. If continuous operation were selected, the controls would comprise three each of: blending valve, outdoor bulb, indoor bulb, and room control. In either case, three pumps and three flow-control valves would be needed.

Fig. 19 Zoning Layout for Large Solar-Type House



Plan: Courtesy of Daniel Schwartzman, Architect

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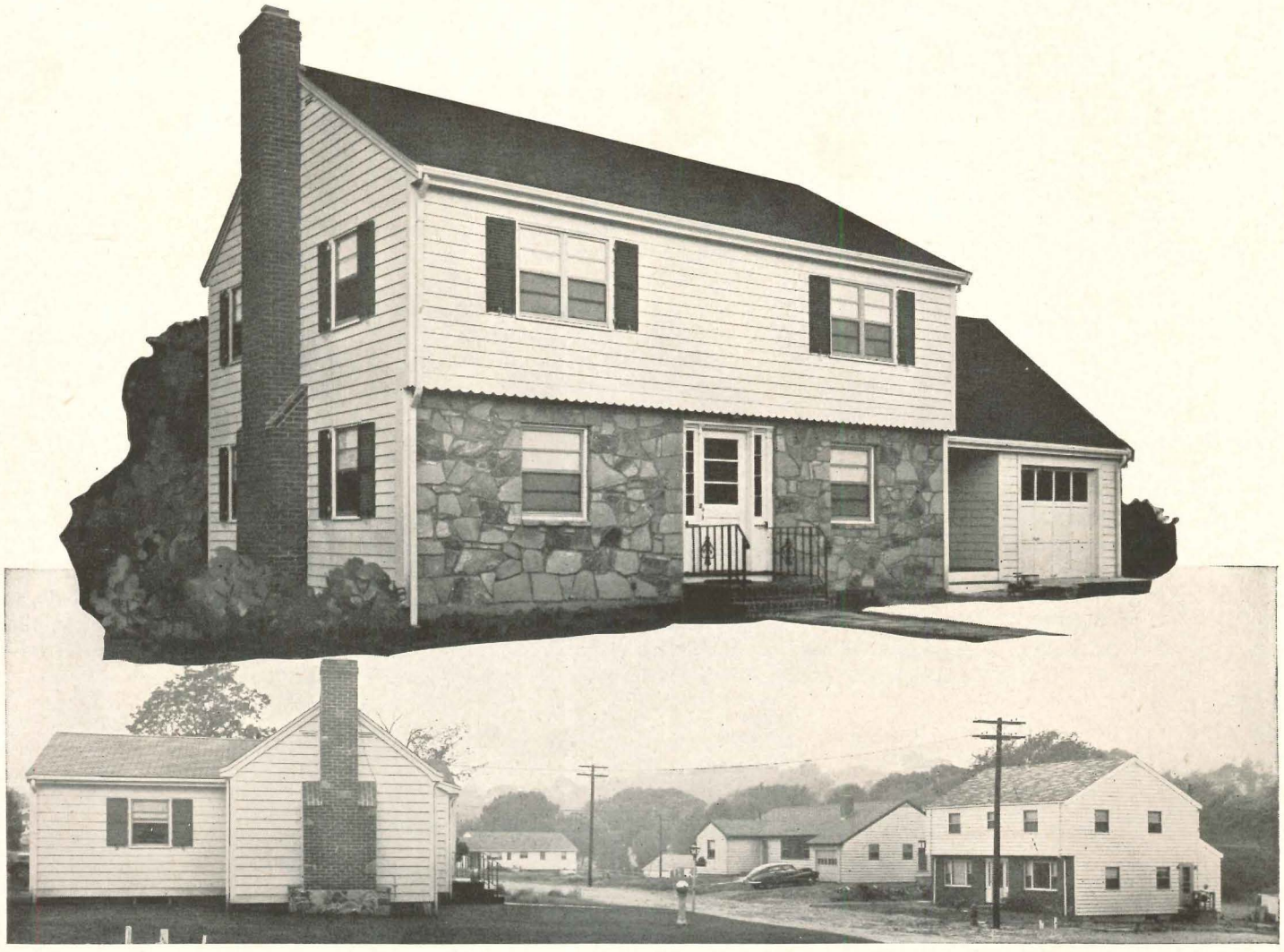

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