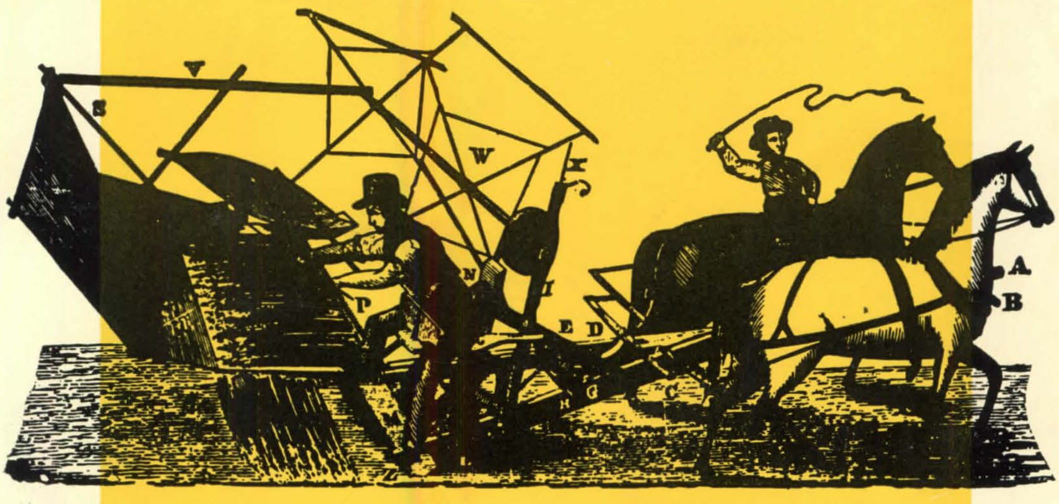
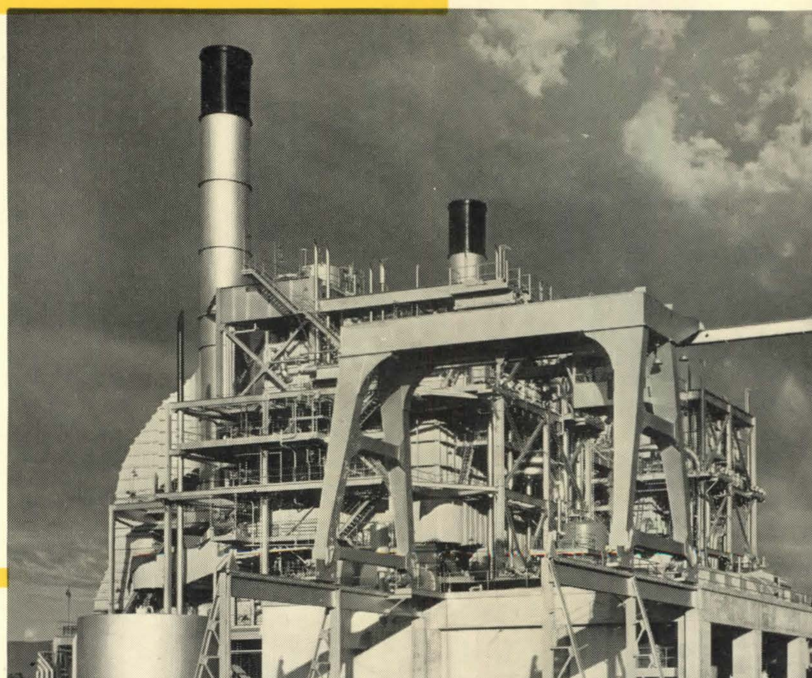
Progressive Architecture



expanding enterprise



ld's largest architectural circulation

11

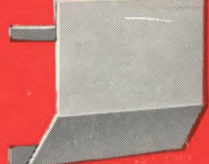
november 1954

MILCOR* Metal Trim

combines the advantages of fire-resistance, durability, beauty, sanitation, and low maintenance costs

Beautifully paneled library at Moody Bible Institute, Chicago, Illinois is effectively protected with Milcor Applied Base No. 675. Integral cove permits smooth joint between base and rubber tile floor.

No. 521 Window Stool



No. 72 Picture Mould

No. 675 Applied Metal Base

No. 730 Chalk Trough

No. 721 Blackboard Mould

Lends itself to attractive treatments in interior design, provides unobstrusive modern beauty

There is an appropriate Milcor Metal Trim item for every exposed interior detail. Milcor, leader in this field, offers everything you need for either monumental or residential construction — flush and applied metal bases . . . window trim and stools . . . picture moulds and special moulds . . . cove moulds . . . blackboard moulds and trim . . . chalk troughs . . . chair rails.

All of these provide the basic advantages of *steel.* And all can be insulated against noise with Milcor Insulmat Sound-Deadener.

Discover the versatility of Milcor Metal Trim, as so many architects have. Turn to the Milcor catalog in Sweet's, for planning help.

INLAND STEEL PRODUCTS COMPANY

4109 WEST BURNHAM STREET • MILWAUKEE 1, WISCONSIN

BALTIMORE 5, MD., 5300 Pulaski Highway — BUFFALO 11, N. Y., 64 Rapin St. — CHICAGO 9, ILL., 4301 S. Western Blvd.—CINCINNATI 25, OHIO, 3240 Spring Grove Ave. —CLEVELAND 14, OHIO, 1541 E. 38th St.—DETROIT 2, MICH., 690 Amsterdam Ave — KANSAS CITY 41, MO., P. O. Box 918 — LOS ANGELES 58, CALIF., 4807 E. 49th St. — NEW YORK 17, N. Y., 230 Park Ave. — ST. LOUIS 10, MO., 4215 Clayton Ave.

*Reg. U. S. Pat. Off.

p/a newsletter

November 1954

Under new lease-purchase plan, 35 Government projects totaling $80 millions will be open for private construction and financing in 1955, easing the $2.5 billions backlog of Federal construction. Largest buildings proposed are the $9.6 millions AEC headquarters outside Washington and Federal Barge Office for New York City, also priced at $9.6 millions.

U. S. Commissioner of Education, Dr. Samuel M. Brownell, reports need for schools is acute and will become even more so within the next 5 years. By 1960, elementary and secondary schools will require 720,000 classrooms with related facilities; colleges must be prepared to handle a 3-millions increase in enrolment.

Committee composed of AIA Executive Director Edmund Purves, realtors, builders, and public administrators met in Washington to advise the Housing and Home Finance Agency on requirements and procedures arising under the new urban renewal program authorized by Housing Act of 1954. Revised Act releases Federal funds for conservation and rehabilitation projects and provides measures for prevention and elimination of slums.

American and Canadian cities along route of St. Lawrence Seaway are already planning expansion of port facilities, development of industrial areas, and additional housing to permit them to share in the proceeds expected from 40 million tons of new cargo.

Construction figures for first eight months of year, released by Departments of Labor and Commerce, make it clear that much of 1954's "boom" has been in utility and highway fields. Private work rose 5%, with commercial and educational building showing sharpest gains in architect-designed categories. Public work outlays were about the same as in 1953.

American Society of Civil Engineers installed officers for the coming year at its annual meeting held in New York last month. William Roy Glidden, elected president, is Assistant Chief Engineer of Virginia State Department of Highways, in charge of bridge construction, and a member of the faculty of Virginia Mechanics Institute. Vice-Presidents are Frank L. Weaver, Washington, D. C., and Louis R. Howson, Chicago.

First-place honors in AISC's Annual Aesthetic Bridge Competition were won by: Class II—Ninth and Tenth St. Connections, Bayshore Freeway, San Francisco; Class III—Robert Street Underpass, South Freeway, Fort Worth, Tex.; Class IV—New York Central Railroad Bridge over Cuyahoga River, Cleveland. Top honors in Class I, bridges spanning 400′ or more, were withheld again this year.

Carnegie Institute of Technology's Department of Architecture celebrates its 50th anniversary, November 6, with an exhibit, "Architecture in Retrospect," prepared by alumni and Department Head John Knox Shear, comprising examples of students' work from the past and present.

PROGRESSIVE ARCHITECTURE published monthly by REINHOLD PUBLISHING CORPORATION, 430 Park Avenue, New York 22, N. Y. Ralph W. Reinhold, Chairman of the Board; Philip H. Hubbard, President and Treasurer; Fred P. Peters, Vice-President and Secretary; Gilbert E. Cochran, H. Burton Lowe, Merald F. Lue, William P. Winsor, Vice-Presidents; Kathleen Starke, Assistant Treasurer. Executive and Editorial offices: 430 Park Avenue, New York 22, N. Y. Subscriptions payable in advance. Subscription prices to those who, by title, are *architects, engineers, specification writers, designers or draftsmen, or employes of architectural and engineering firms, and to government departments, trade associations, members of the armed forces, college libraries, college students, publishers, advertisers, prospective advertisers and their employes*—$5.00 for one year, $8.00 for two years, $10.00 for three years. Above prices are applicable in U. S., U. S. Possessions and Canada. Latin America and Philippine Republic—$10.00 for one year, $16.00 for two years, $20.00 for three years. All other foreign subscriptions — $15.00 for one year, $25.00 for two years, $30.00 for three years. Single copy — $1.00; special issues — $2.00 per copy. Printed by Publishers Printing Co., New York, N. Y. Re-entered as Second Class Matter September 21, 1951, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Volume XXXV, No. 11, November, 1954. In Art Index, Architectural Index.

Turn page for WASHINGTON PERSPECTIVE

Washington Perspective

Frederick Gutheim

For the last couple of months, the years-long issue of a new Potomac bridge in Washington's monumental core has been played as a drama of tragic stupidity. No Greek ever better conceived a situation in which the individual interests of the contending parties were sacrificed, a conclusion reached in which all were lost. The mysterious working of the gods has certainly made hash of the limited wisdom of the plans of men. Highway engineers, city planners, bridge builders, architects—all have lost out in the currently favored solution which proposes a new bridge immediately upstream and parallel to the Memorial Bridge connecting the Lincoln Memorial and Arlington Cemetery.

This plan of the District of Columbia highway department has now received the substantial concurrence of the National Capital Planning Commission and the National Park Service, two of the official guardians of this part of the city. A bridge of this general nature was authorized by the last Congress and appears to have received some Presidential endorsement. Plans are now being drawn. The next month or two will tell whether the opposition of the Fine Arts Commission, meeting this month to discuss the crisis, and a belatedly aroused citizenry on both sides of the Potomac, will be able to bring matters to a halt before the real damage has been done.

The planning issue here is relatively plain. Washington's central area (between the Capitol and the White House) contains now about 40,000 more workers than it should. These can generally be described as the occupants of the temporary buildings. These structures dating from World War II, and in some cases from World War I, occupy park land. Thus they cause double trouble: they increase congestion, and they destroy planned open space. No authoritative plans for the capital assume a continuation of this state of affairs. The President nailed this down with his April 15 directive compelling drastic measures of dispersal, and precluding any effort to maintain existing congestion. The only question is how fast the "tempos" can be demolished and government agencies reallocated—some of them to outlying suburban locations, some to remote cities. With the resulting lower densities in the central area, the need for another bridge here would be greatly reduced.

Other Potomac River bridges are needed. A lower river bridge at Jones Point, near Alexandria, also has been authorized. Two other bridges are contemplated farther up the river. These bridges form links in an outer belt route. When this route is completed, the change in traffic patterns will cause a further major reduction in the central-area traffic volume and the demand for a central-area bridge. Certainly these bridges should have the top priority.

Central-area bridge enthusiasts and the calculations of the highway traffic engineers also ignore what other planners believe the only realistic prospect for moving people—a better mass-transportation system.

If a central-area bridge must be constructed, the National Capital Planning Commission has provided a site at Roaches Run, in the general vicinity of the National Airport, and well out of the Lincoln Memorial area. This site has the further merit of connecting with the Southwest Expressway, the central area's best hope for a modern, direct connection with the superhighways that are now beginning to stretch out to Baltimore, Richmond, and the northwest.

From a planning point of view, then, the proposed central-area bridge is not needed, if the planned reduction in office-building population takes place, if bridges are built in other locations as planned, and if adequate mass transportation is provided. All of these are immediate prospects, not remote contingencies. The proposed bridge at the Lincoln Memorial will breed more problems than it will solve. But from an architectural point of view, its consequences will be appalling.

Another bridge in the vicinity of the Lincoln Memorial would make a heavy dent in Washington's tourist structure, itself, but the traffic it would attract and spew into the entire monumental core of the city would be fantastic and ruinous. The destruction of park and architectural values would make a heavy dent in Washington's tourist structure, next to Government the city's second largest business. All this was pointed out in the earlier stages of the controversy that has raged over the bridge question for years—chiefly by Gilmore D. Clarke, a former Fine Arts Commission chairman, who was retained by the National Park Service as their adviser. But, with this exception, there has been incredible silence on any of the esthetic aspects of the bridge question. If there is any place where these considerations ought to be governing, it is certainly here. Even the custodians of Roosevelt Island Memorial, a wild park just upstream from the proposed bridge location, based their objections on the legal ground that the bridge would violate the agreement by which the Government accepted their park gift. Not a peep about the desecration of park lands. An AIA group interested in this problem appears to be dormant. Utilitarian factors alone are being considered.

The time has come to end this nonsense, and tell the bridge engineers to take their project out of this nationally sacred park. It is wrong; it is superfluous; it is harmful. A bridge design cannot be conceived that will make it any better.

PROGRESSIVE ARCHITECTURE

November 1954

Editorial Staff

Thomas H. Creighton
Editor

Charles Magruder
Managing Editor

George A. Sanderson
Feature Editor

Burton H. Holmes
Technical Editor

Ilse M. Reese
Associate Editor

Margaret Bernstein
Valerie Butta
Anne Fallucchi
Lois Greulich
Hilda Ottway
Erika Sattler
Assistant Editors

Stamo Papadaki
Art Director

Elmer A. Bennett
Drafting

Page Beauchamp
Interior Design Consultant

Executive & Business Staff

Brad Wilkin
Publisher

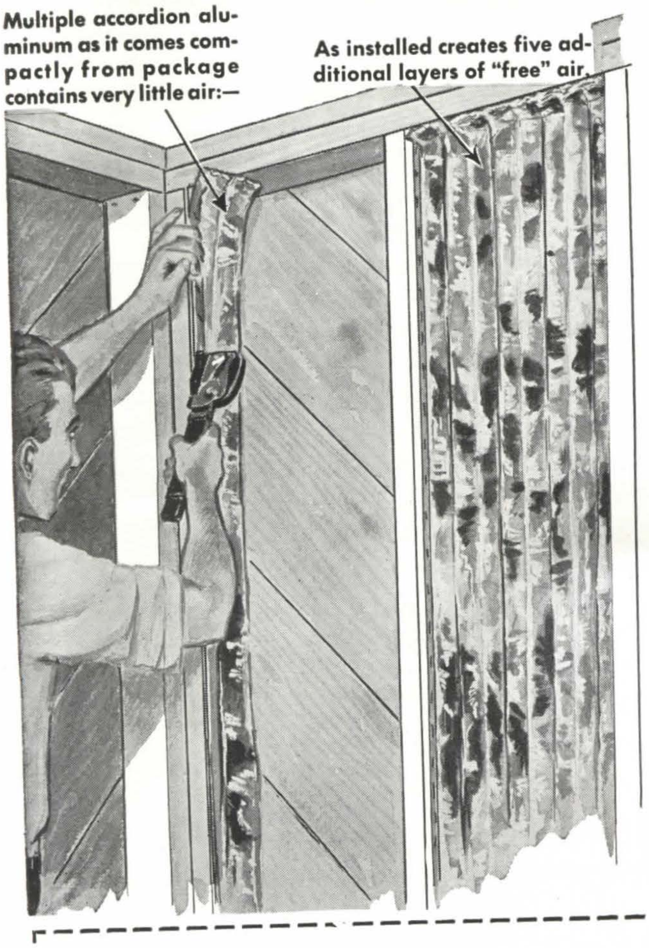
Frank J. Armeit
Production Manager

John N. Carlin
Circulation Manager

H. I. Sirota
Promotion Manager

James T. Burns, Jr.
Service Manager

WHO SAID AIR IS FREE?



Were it not for Radiation and Convection, empty air spaces inside walls, roofs, etc. would be the best insulation. But why pay costly labor and storage bills for handling "free" air entrapped **before** it is used in bulky insulation? Bulky materials also require more freight cars, trailers and trucks. The "free" air is paid for over and over again.

Multiple accordion aluminum envelops large volumes of air and creates layers of air spaces **only** as it is opened when finally stapled in place. This air is **really** free.

With respect to radiant heat flow, the aluminum sheets have 97% reflectivity, and 3% absorptivity and emissivity. Low conduction results from the preponderant air spaces of low density. The layers of multiple aluminum and fiber retard inner and outer convection. The tough aluminum sheets are almost impervious to vapor flow. Infiltration under flat stapled flanges is slight. Condensation formation on or within is minimized by the scientific construction of multiple layers of joist-to-joist full-depth accordion aluminum, fiber, and air-spaces.

MILLION SQ. FT. IN ROOM 12′ x 13′ x 13′

Because of the low mass of unopened, practically airless multiple accordion aluminum, an ordinary passenger automobile will hold 20,000 sq. ft. of it without being or even looking overloaded. A standard railroad freight car, a huge interstate trailer, or a number of trucks would be needed to transport an equivalent amount of ordinary insulation.

To obtain MAXIMUM, **uniform-depth** protection against heat loss and condensation formation, it is necessary to use the new **edge-to-edge** multiple aluminum*, **each** sheet of which stretches from joist to joist, and also all through the flanges for further vapor protection as well as permanent attachment of each sheet.

The AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS has published a booklet which describes convection, conduction, and radiation heat flow through *ordinary* air spaces and what happens when an ordinary building space is lined or subdivided by reflective metals, thus creating reflective air spaces. Ask us for a copy—it's free.

*Patent applied for.

INFRA INSULATION, INC.
525 Broadway, New York, N. Y., Dept. P-11

☐ Please send ASHVE booklet "Insulating Effect of Successive Air Spaces Bounded by Bright Metallic Surfaces."
☐ Please send description of new Infra Insulation.
☐ Please send samples.

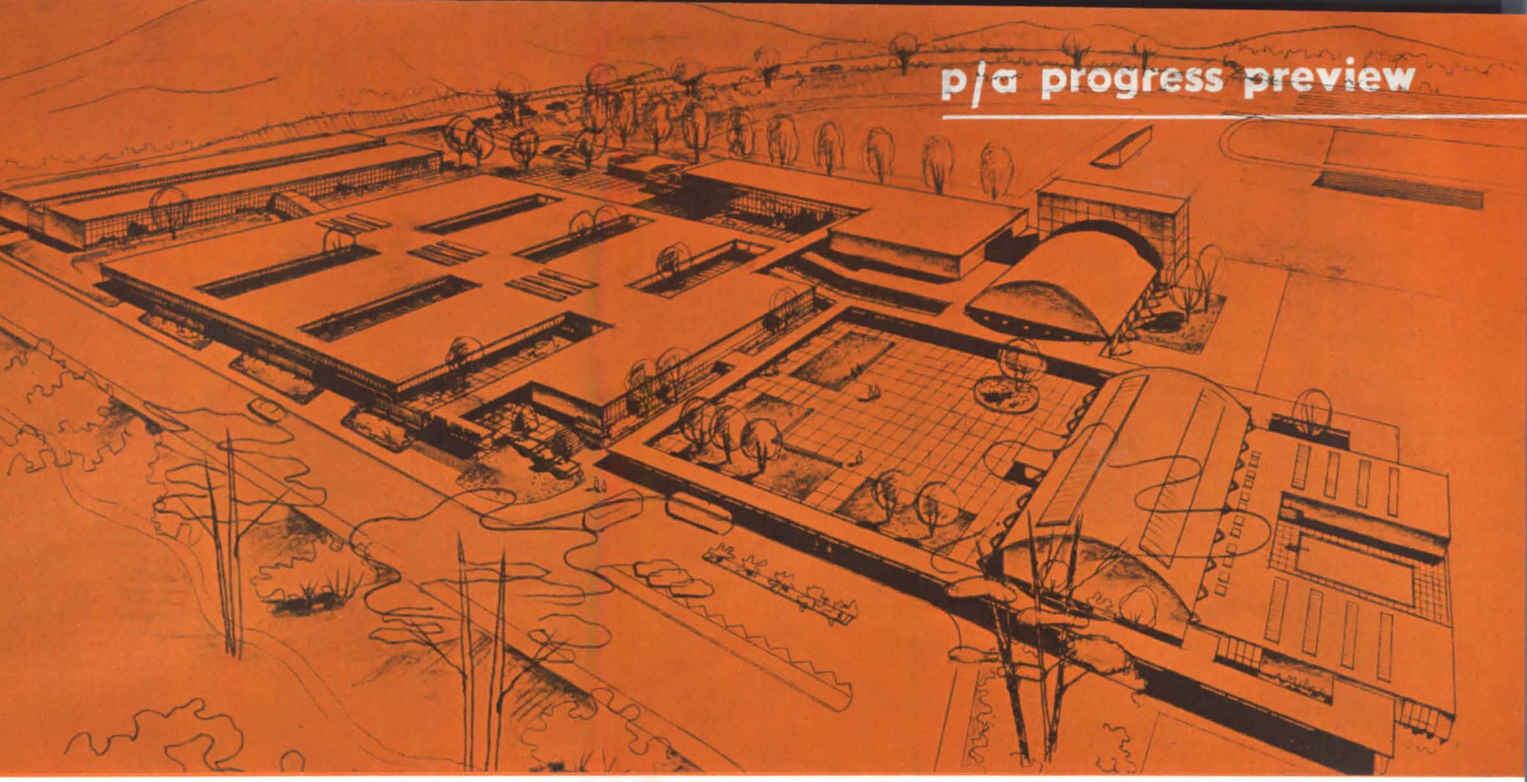
Name____________________

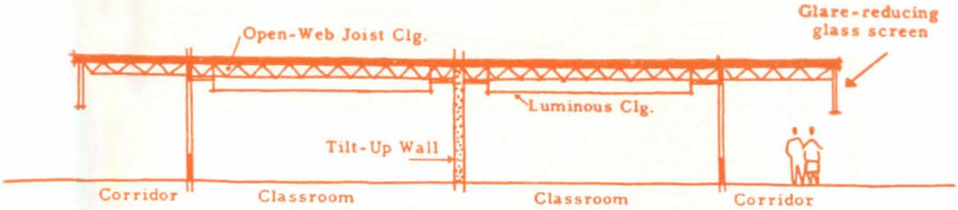
Firm____________________

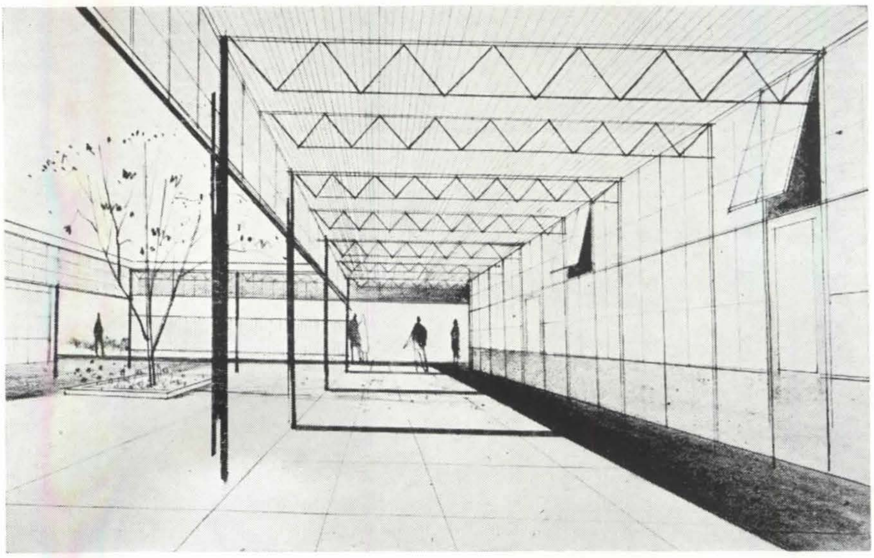
Address____________________

COST OF EDGE-TO-EDGE INFRA
Multiple Aluminum Insulation installed in new construction between wood joists, material and labor
Type 6-S under 9½¢ sq. ft.
Type 4-S under 7½¢ sq. ft.

INFRA INSULATION, INC., 525 BROADWAY, N. Y., N. Y.







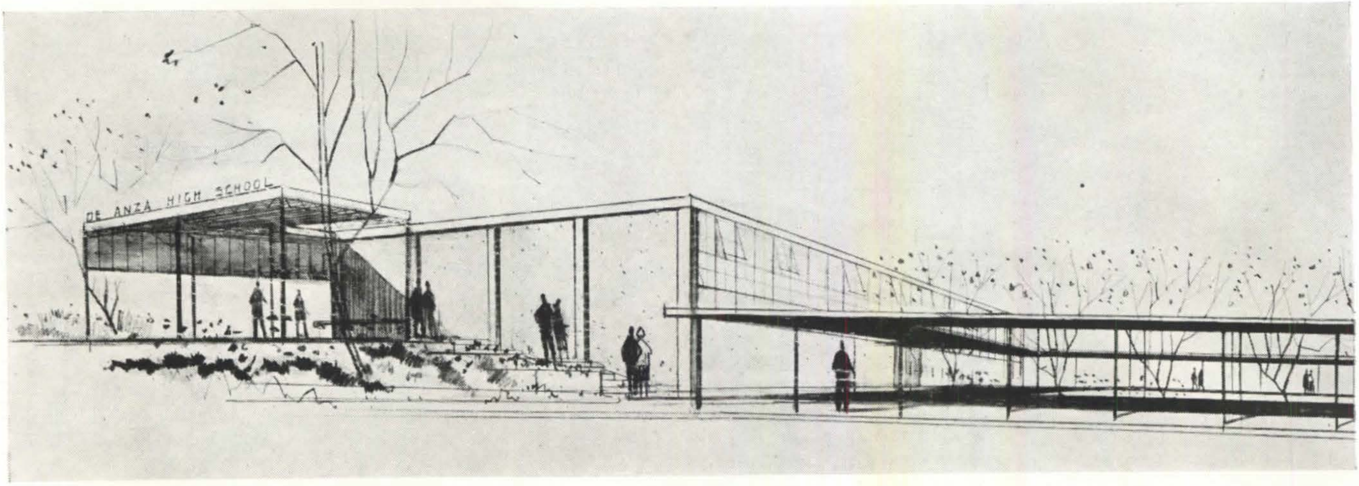
one-story high school for a new community

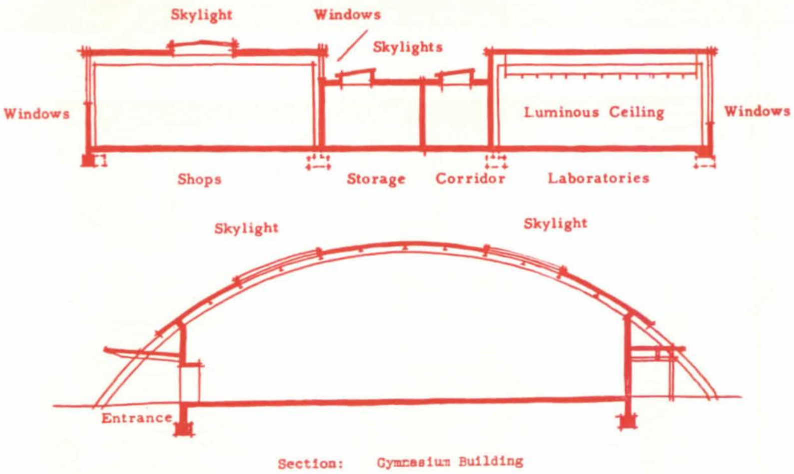
Parents and educators joined Architect John Carl Warnecke in the design development of the De Anza High School—to be built in El Sobrante, California. The school will be constructed in three stages: the first unit will accommodate 1250 students; a later addition will bring the school to a capacity of 2000 students; the final stage will include an auditorium and swimming pool, for school and community use.

In order to arrive at a practical solution for a one-story high school, the classrooms were arranged in a rectangular block. Light and air wells puncture the large roof, while a central corridor provides room for lockers, toilets, and major circulation.

Extensive studies were undertaken to enable the architect to apply the latest industrial building methods. These, he feels, can contribute much to the economy of a building, to improved ventilation and lighting, greater flexibility, and speedier construction.

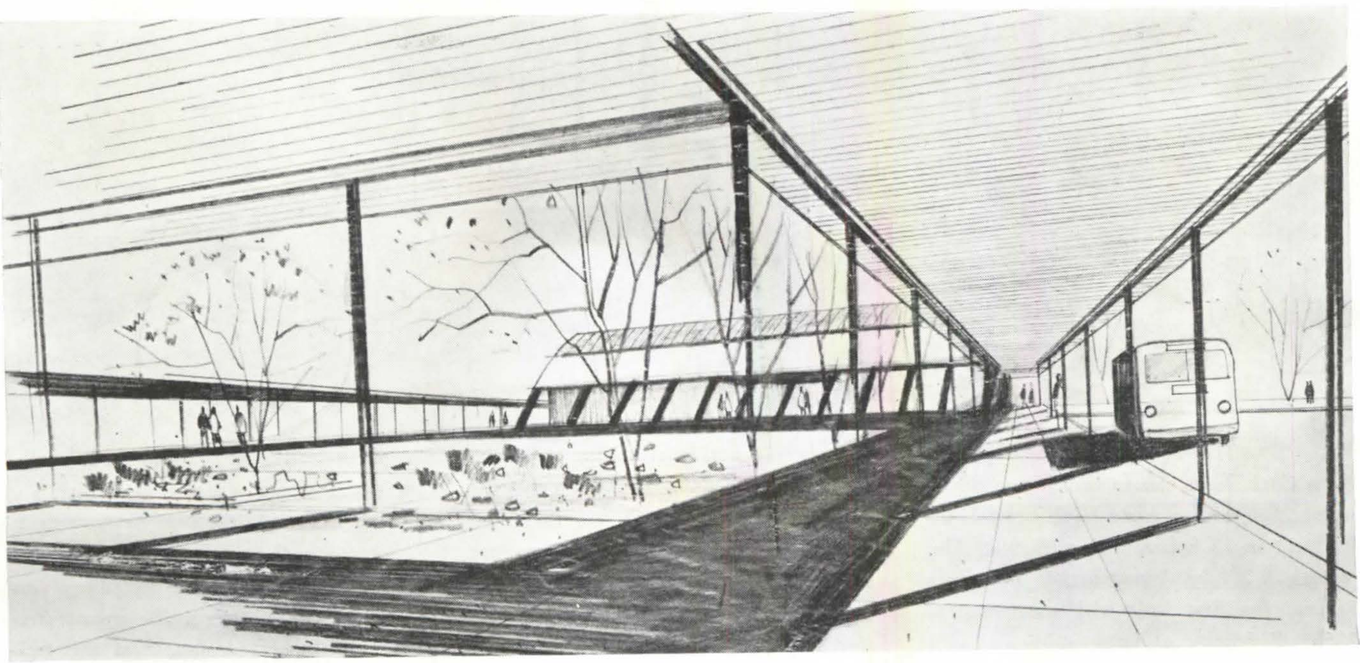
Rows of back-to-back classrooms *(section above)* are separated by tilt-up concrete walls. Window walls are of steel sash with insulated panels at the base and glass above. Cross partitions are demountable. Steel joists are left exposed in the corridors, but concealed by the luminous ceilings in the classrooms.





Shops and laboratories (section *and* drawing above) *are a separate unit reached by a covered stairway from the end of the main concourse. Shops have trilateral lighting through normal windows, clerestory windows, and sky lights. Classrooms and laboratories have luminous ceilings, which utilize corrugated plastic sheets to conceal the fluorescent lights.*

Gymnasium (section *and* drawing below) *for boys and girls is steel-arch construction with reinforced-concrete buttresses. Skylights provide natural overhead illumination.*



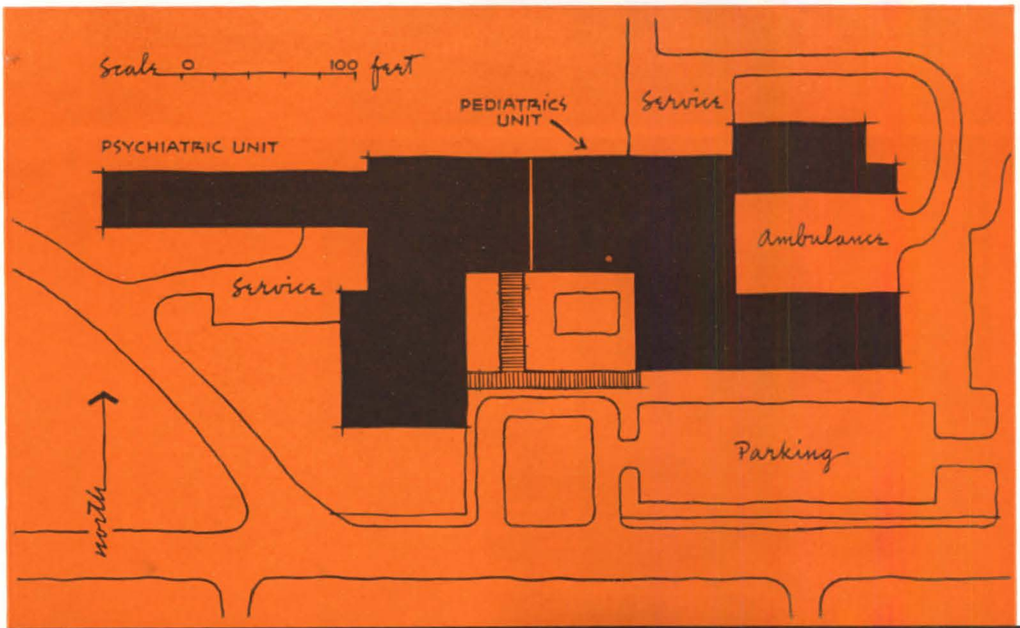
children's hospital with psychiatric unit

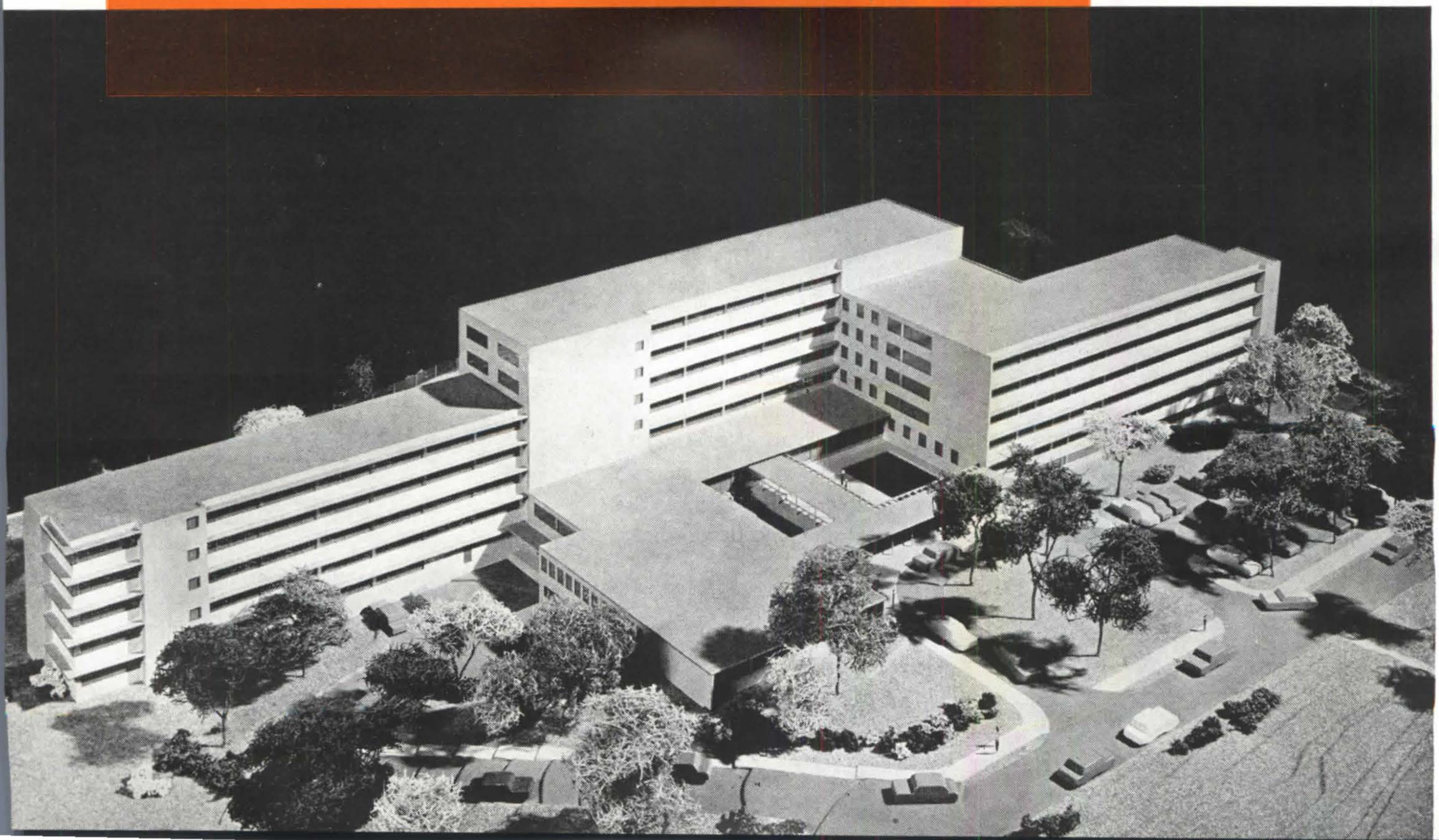
The establishment of a children's hospital as part of the Medical Center of University of Michigan, Ann Arbor, has long been contemplated. Funds have now been made available for a psychiatric unit: a complementary 200-bed pediatrics division to be constructed later, as additional funds are forthcoming. Careful studies have been made by Swanson Associates, Architects, to integrate the two units, which will have a common lobby and coordinated food services.

The psychiatric unit contains nursing facilities for 75 children, ranging in age from 5 to 15 years, and school facilities for these young patients. Further administrative and teaching space had to be provided for the student psychiatrists and visiting doctors who will observe the children. Another unique feature of the completed hospital will be the rooming-in units for parents, permitting a mother or father to stay at the hospital while the child is receiving medical care.

A sharply sloping site determined the placement of the nursing units on the upper levels, classrooms opening out at grade in the rear. Administration and out-patient section will be housed in one-story wing facing the street.

The building will be concrete frame with exterior walls of brick, and limestone spandrels. Interiors will be made as cheerful as possible through use of color and careful choice of materials—selected for finish, scale, and durability.





copyright protection—patent medicine gag or professional service?

Dear Editor: I have read and studied your October story on "copyright." I accept your ideas as they are studied; they make sense, and the seeking for protection is probably desirable.

The subject of "copyright" does not interest me particularly; there has been no instance in my experience where I felt I needed or deserved such protection.

The following thoughts occur to me related to design—possibly design does not relate to copyright or the problem in the legal sense:

(1) Would it be possible that the present protection, which is weak, be given real strength in such a way as not to bring on border cases that would stultify—such as the fear of a writer to libel and the dulling of his pen?

(2) I can't help but feel that if something is good enough to be copied, the designer should by then already have developed a better or improved design, material or method, or be ready to do so.

(3) I don't know of any specific design of a building that (I believe) belongs to one man.

(4) I don't know of any specific building that I have ever wanted to copy. I know of many that inspired me and started me off to a net result that may have contributed a little bit compared to the other's considerable contribution.

The weakness of my viewpoint probably lies in my inability to compare design protection to protection of a safety valve, or whatever. All of this is certainly not a criticism of your story. And now that I have put down a few random thoughts, I begin to think I really am against the protection! RICHARD L. AECK
Atlanta, Ga.

•

Dear Editor: I read with interest the article concerning the copyright situation regarding architects and architectural designs. I like very much the way you start out discussing ideas which cannot be copyrighted—and it is perfectly true that same or similar ideas come out from several sources at once—but the cribbing or stealing of plans or finished designs, which I guess happens in the home building field more than any other, is a deplorable thing.

This has happened for so many years that a good many people think that it is a prerogative which should be exercised. I certainly hope that Cliff May & Chris Choate win their suit and that some fair and logical arrangement can be made to protect a designing architect from such plunder. HUGH STUBBINS
Lexington, Mass.

•

Dear Editor: Leave concern with the patenting of static architectural designs to the legal journals. P/A has far more important concerns: with dynamic architecture and with that which makes architecture dynamic. This patented medicine kind of affair dignifies your pages not at all. ALEXANDER S. COCHRAN
Baltimore, Md.

•

Dear Editor: In the last few years, as you know, we have designed many thousands of "merchant builder" houses, and the problem of the "copyright" is becoming increasingly important.

The automobile companies seem to solve this matter by "pooling" appropriate patents. There is, however, a vast difference between automobiles and houses, since the former are not attached to the land, and the latter are.

All architects are aware of the vast historical debt which they owe to every building ever built (good or bad), and to all builders, workmen, technicians, and architects who have had a hand in bringing our civilization forward, from the cave or mud hut to the excellent techniques which we enjoy today.

Ideally, any device, or information, or way of doing, which makes a better product for the increased use and pleasure of the public at large, should be available to them without proprietary costs.

Particularly those merchant builders who see fit to expend large sums of money to commission top-notch architects to provide a "better package" for the public must, of necessity, be protected from those of their fellows who would "copy" their well-thought-out designs, thus competing in the market place next door to the forward-looking builder.

Each builder's product should be reviewed at least once a year with a view to making improvements and betterments. Thus, while the question of copyright is important, and we ourselves copyright all our "builder houses," we think that because of progress and the continuing changes which are always necessary for greater betterment, that the question of copyright is really academic.
S. ROBERT ANSHEN
San Francisco, Calif.

•

Dear Editor: Thanks for the article on copyrighting plans or buildings. You are right, this is important. The AIA Committee on The Home Building Industry is studying it and will soon meet with Arthur Fisher, Register of Copyrights, who has also brought up the question with us.

There is unfortunate court precedent which states that filing of plans in a municipal building department constitutes "publication" and therefore throws it into the public domain. Therefore, following this precedent, it would be impossible for the architect to force payment for re-use of plans after the structure had once been built, unless agreement to that effect had been made previously with the subsequent user.

Copyrighting the plans themselves, as you point out, merely protects the architect against copying of those plans themselves, not of copying the building from which they are erected. Your thought that indirectly such plans are being copied by copying the building is an interesting one.

Among architects there are two divergent attitudes. One is that architects,

(Continued on page 16)

(Continued from page 15)

working for the public good, should have no trade secrets and that all they can learn or evolve should be common property for the common good. The opposite attitude is that the architect's labors should be protected from pilfering, so that he himself is more able to profit by them. Certainly such possible profit is incentive to greater labor and thought and should produce more advancement in design. Altruistic though we may wish to be, we cannot long survive without means of livelihood. And if the architects do not survive, they cannot continue to produce advancement in architecture.

I am sure it is the feeling of the Committee on The Home Building Industry that architects' plans should be protected, in the face of the growing multiple use of plans in the development, home building business. Indeed, if it were not possible for an architect to charge in accordance with the multiplicity of use, he could not survive in this business, for the fee for an individual house is relatively small.

Furthermore, a builder who purchases from an architect the right to use plans would be in a poor competitive position if any other builder could build a similar house without paying for any plans at all. This, of course, is the point that May & Choate are making. They are not only protecting themselves, but their builder clients as well!

Architecture then is no longer a one-shot proposition. Copyright laws and legal precedent which would protect our clients as well as ourselves from design infringement would seem to be in the interest of the profession.

L. MORGAN YOST, Chairman
Committee on the Home Building Industry
American Institute of Architects
Kenilworth, Ill.

•

Dear Editor: This important case is one which all of us are following with keen interest. We are highly cognizant of the great professional ramifications of this case and we believe it is most timely for PROGRESSIVE ARCHITECTURE to editorially comment on it. You have treated a complex subject with clarity, logic, and a fundamental understanding of the problem and issues involved.

JACK B. BEARDWOOD
Welton Becket and Associates
Los Angeles, Calif.

•

Dear Editor: The copyright law in relation to architecture has been brought to the fore by two major building operations which had not existed before in this country: first, the building of quantity houses on a large scale, 200 or more; and second, the prefabricated house, such as the May & Choate one discussed in the article.

It has been my experience in working with builders of 200 houses or more that the changing taste of the buying public causes any given original creative idea to have a very short life, and that one must constantly search for new ideas.

(Continued on page 19)

(Continued from page 16)

In this field I don't see how a design patent could do much good.

In the case of the prefabricated house, I feel that the question is not of copyright law, but of patent law, whereby basic technics of construction could be patented. Here you have many legal precedents to protect the architect. For example, one could patent a simple system of answering a minor detail of plank-and-beam construction, out of which comes a distinct architectural feature or design. Then, anyone who copied this design feature would automatically infringe upon the patent and become liable to a law suit.

My whole feeling on this rather complicated matter is that the architect has not been made conscious enough of the design patent law and the patent law generally. After all, the sliding door on closets, large fixed glass, and many other elements of a building which are stock items today, were originally created in an archittect's office as part of his job. I am sure the manufacturers of these items hold basic patents and are very well protected, while the originator of the idea most likely has nothing but the satisfaction of saying, "Oh, I did that 10 years ago on Blank's house!"

To sum up, it is about time this problem was discussed and I would suggest that Bernard Tomson in his IT'S THE LAW could do a most worthwhile series on how the architect can protect himself using the copyright—and the patent laws.

CALEB HORNBOSTEL
New York, N.Y.

needs no introduction . . .

Dear Editor: We were greatly interested in "The Architect's Files: Part 2" (*July 1954 P/A*) by Siegmund Spiegel, especially in his statement that, "The drawback of most magazines seems to be the lack of comprehensive periodic indices which would permit easy reference to certain articles."

May we suggest that at this point in his article, he might have made mention of our publication, *Art Index*, which indexes the contents of some 15 leading architectural magazines published here and abroad, including your own* excellent publication?

The *Art Index* has been published quarterly since 1929 and complete files are found in nearly all large libraries and in many architectural offices. Inquiries may be addressed to this Company. Howard Haycraft, President

THE H. W. WILSON COMPANY
950 University Ave.
New York 52, N. Y.

* *As noted regularly on P/A masthead. This magazine formerly printed a complete index at close of each year, discontinued service because copies were sought by few except libraries (which presumably already had the* Art Index).

wheel-chair standards

Dear Editor: All large cities are putting up small, inexpensive houses for the "little" people. Many of these are being built to codes—my daughter, Caroline Thacher, is a student of architectural drafting at the Lindsey-Hopkins School here and has to learn about codes. Being

(Continued on page 20)

(Continued from page 19)

an old draftsman, myself, I feel that I could point out something that has been lost sight of when they turn out all the houses so badly needed now.

What about us—the wheel-chair victims? We are not all wealthy and out of the hundreds of thousands of us, very few can afford a custom-built house. We must turn to the little standard house in the neighborhood that looks all alike. Only last night, I saw a wheel-chair victim ask on TV for money to build a house. Who knows that he may not be the next in this dilemma?

This is what I want to point out to those who *can* raise standards:

The wheel chair that is used by most crippled persons today is the E-J, 24″ wide with hand-rails on the wheels. But the over-all opening of bathroom doors is 2″ less! So we cannot get into the bathroom without aid, to use the toilet, to brush teeth, to wash hands and face, even to bathe.

Next, the very narrow halls let us barely get through—and we are always knocking against the walls. The bones of the hand are so easily broken!

Porches are lower than the floor of the house, so that we cannot roll ourselves out into fresh air and sun.

The kitchens are so tiny, and the sinks raised so high, that we cannot fix ourselves a meal, even a snack when hungry.

Even a wheel-chair victim has chores, but a house with no back porch has no place to put out garbage, and without a utility room it is hard to find space for a washing machine.

Why can't houses—they are getting $10,500 for these places—be just a little larger? A 24″ wheel-chair isn't very wide.

(MRS.) G. B. THACHER
Miami, Fla.

the basic foundation

Dear Editor: For a long time I have wanted to tell you how favorably impressed we are with your "Architect and His Community" series.

The position of the architect, which you bring to attention, should be the basic foundation for an architect to build a successful practice— and from a public relations angle it can't be beat.

Just to confess how far I am behind, only last night I got to reading the last December P/A and noted your accurate account of my story on F.L.W. and the picture.

KARL KAMRATH
Houston, Tex.

WHEN YOU CHANGE YOUR ADDRESS

Please report both new and old addresses directly to P/A five weeks before you move. The Post Office will not forward your magazine to the new address unless you pay extra postage. Avoid this needless expense by notifying us five weeks in advance.

PROGRESSIVE ARCHITECTURE
Circulation Department
430 Park Ave., New York 22, N. Y.

government as client—1

by Siegmund Spiegel*

A typical "private" client will state to an architect his over-all building program—and his budget—and then he will seek analyses, advice, and the particular design that result from the architect's study of the problems involved. Public building programs, however, initiated by agencies of the federal, state, or municipal governments, offer a client whose over-all approach will differ considerably from that of a private client.

The types of structures encountered (and the number of government agencies contracting for them) are many. Depending upon the particular agency's degree of autonomy, and the source of its construction funds, the architect may encounter freedom or restriction in design and choice of materials. In general, the larger the agency, the more restrictions will govern the architect's work, especially with respect to such criteria as area of rooms, choice of materials, "standard" construction details, "standard" specifications, architectural "style," and so on.

basic cautions applicable

While ordinary practice of architecture is frequently subject to disputes about scope of work, interpretations, and decisions; in the case of work for government agencies, these points must be given very special attention. The following list attempts to itemize some of the numerous points which must be watched.

1. ***Program.*** Every agency contemplating retaining an architect will have worked out a program, on the basis of which a fee can be negotiated. While it is always of utmost importance that the scope of the project and of architectural services required be enumerated in detail, this is of particular importance in the case of a lump-sum contract (generally used in cases of military work). Innocent-appearing phrases in a program or directive (e.g., "such site and utility work as may be necessary") could develop into a scope not anticipated originally, and might cause expenditures far beyond estimation.

It is therefore essential that an architect obtain clarification of all items which are not clearly stated, *before* he enters into a contract.

2. ***Decisions and Approvals.*** In contrast to the private client—though that may consist of a number of persons comprising a "building committee" whose members' individual tastes may certainly be hard enough to please—the government client will have even more reservations about instant decisions and granting of approvals at required stages. Exhaustive proof must usually be submitted that the choice of materials, layout, methods, etc., are in full compliance with applicable requirements and standards. The architect negotiating with a government agency for a commission will generally not be called upon to quote his fee and enter into a contract at the first meeting. At that time, however, he should obtain a copy of all standards and criteria which may apply to the project under consideration, and study them thoroughly before preparing his budget and fee proposal.

Hardly any government agency contracting for architectural services will have such status of autonomy as not to be subject to review by a higher authority; neither will an individual government-agency representative generally take it upon himself to authorize additions and deletions, nor to grant approvals. While an architect, acting in good faith, may want to proceed with phases of his work on a verbal approval, he would obviously be wise to insist on a written authorization, or at least to confirm in writing any verbal decisions or telephoned instructions before incurring expenses.

Since most government contracts designate submission dates for all phases of the work, the architect may find himself frequently working overtime at the last minute, due to not having received review comments or approvals as early as he had anticipated. To avoid such situations, the architect should protect himself with a clause specifying that the number of days elapsed between the due date of review comments and the actual date when comments are received, be added to the completion time. If such a clause cannot be accommodated, he should carry a budget allowance for last-minute overtime work.

3. ***Deviations from Standards.*** Although his experience over the years may have caused an architect to solve a basic detail in a certain way, the application of this particular solution may not conform to a government agency's accepted standards. While it is an architect's obligation to all his clients, whether government or private, to strive for perfection in design, and the utmost economy, a suggested deviation from government construction-detail standards will inevitably cause him to prepare a detailed analysis in order to *prove* that the deviation will be as structurally sound as (and less expensive than) the particular "standard." Unless such proof can be furnished readily and, on close examination, will cause the governmental reviewing body to concur and authorize the deviation, the architect may spend considerable sums on work which ultimately must be changed to conform to "standards."

Although the above may lead some to

* *Architect, Office Manager for Mayer & Whittlesey, Architects, New York, N. Y.*

forego exploiting possible solutions not conforming to standards, the conscientious architect—if a situation warrants it—will obviously pursue his efforts to find an alternate solution to a specific problem. Such a solution, once accepted, may help to revise a "standard" which has possibly become out-dated.

4. ***Budgets and Fees.*** Most government agencies abide by a schedule of fees negotiated between them and committees of the AIA and the engineering societies. While fees for federal housing projects are generally based on a percentage of construction cost, some individual, local housing authorities base their fees on a unit number of dwellings to be designed. Numerous agencies—federal, state, and municipal—now use fees exclusively based on percentage of construction cost. But others, especially the armed services, are using lump-sum contracts only. While contracts based on cost-plus-fixed fee are agreed to at times (for instance, when a detailed scope of "services required" is not available) almost all contracts entered into by the military agencies, especially district engineers' offices, are based on a lump-sum. The maximum lump-sum fee to which the awarding agency can agree is governed by a set of "curves." Different curves are applicable to either complicated, simple, or repeated structures. These curves, however, are classified "Confidential" and are not published or given to anyone except accredited officers of the respective agencies.

To prepare a lump-sum proposal for services, the architect has to undergo a considerable mental exercise, as no phase of such proposal—which must be backed up by detailed analyses—can be taken lightly. It is of particular importance that a careful study be made of a sample contract form and, in the case of a project for an office of an Army District Engineer, *Form ENG 2180, Record of Contract Negotiations.* These documents will show the scope of and the number of required submissions for drawings, specifications and reports, such as:

Schedule of Operations and Progress Reports;

Preliminary Project Evaluation or Site Report and/or Preliminary Sketches;

Preliminary Plans, Outline Specifications, and Preliminary Cost Estimate;

Design Analysis—preliminary (exterior utilities & major structures) and final (including all utilities, paving, etc.), generally required in multiple copies, bound;

List of critical materials;

Controlled Materials Plan (CMP) requirements tabulated in appropriate form;

Final Plans and Specifications (This specifically includes the checking of all data and drawings by the architect-engineer and complete coordination of his subcontractors and/or consultants.);

Quantity Take-off and Cost Estimate;

List of Shop Drawings and Samples;

Shop Drawings, Review and Approval;

Record Drawings (an infrequent requirement);

Equipment Operating Instructions and Flow Diagrams (generally required for Mechanical Work);

Other (This may include consultation service during construction, etc.);

Topographic Surveys, Foundation Exploration (While these are frequently furnished by the agency, extent of survey and boring work required and on occasion, award of survey and boring plus test contracts may be part of architect-engineer's services);

Investigation and Report (This may involve Field Inspection prior to construction.)

In connection with some of the items listed above, the alert architect-engineer should be aware that:

Unless his office has a staff of fully qualified personnel to prepare such work as quantity take-offs, detailed estimates, detailed lists of critical materials and CMP requirements, he would do better financially and save himself headaches if he were to engage consultants who are experienced in this particular type of work.

In addition, his budget must make considerable allowance for changes and issuance of numerous addenda caused by reviews of all submissions by several departments and agencies.

Spiegel's discussion of the particular problems of dealing with the Government As Client will be concluded next month.

AIA clarifies advertising code

In its February 1954 issue, PROGRESSIVE ARCHITECTURE took to task the American Institute of Architects for its unclear stand on the ethics of architectural advertising, and the use of architect's work, names, and pictures in advertising by others. An article in *Printers' Ink*, trade magazine in the advertising field, which had quoted a statement in the AIA Journal by President Clair Ditchy, had started the discussion. After reviewing a series of commercial ads extolling the architect, and the Institute's *apparent* objection to them, *Printers' Ink* had said: "Such codes constitute a suppression of advertising—particularly when they go so far as even to forbid advertising that is dignified and in good taste."

P/A Editor Creighton, in the February issue, attempted to analyze the "ethics" involved, pointed out the various types of advertising there might be, regretted the confusion in the recent statement of AIA position, and urged clarification.

As a result of that P/A discussion, it was suggested to Creighton that he write an additional analysis of the problem for *Printers' Ink*—which appeared in the April 1954 issue of that publication. He ended by saying, "I don't think anyone can blame the advertising fraternity (and the architects who are members of the Institute) for being confused as a result of this situation . . . if the discussion in *Printers' Ink* helps to bring a straightforward decision on these questions and a clarification of the confusion at the coming National Convention of the AIA, much will have been accomplished. Architects and advertisers will then know where they stand."

Editor C. B. Larrabee of *Printers' Ink* wrote to Creighton after that article appeared and said that he, too, wished the discussion would bring a decision and clarification, but added that "after having argued this question back and forth with dentists, architects, doctors, and lawyers for years," he wasn't too hopeful.

However, shortly after the National Convention in June, AIA members did receive a "clarification," in the form of a *Guide* to specific activities, reproduced below. It was drawn up by the Public Relations Committee of the Institute, and approved by the Board of Directors at its June meeting. P/A Editors feel that it is still vague in some of its wording: just what is "self laudatory" on the one hand, and what is "in the best interest of the profession," on the other, may cause some discussion. But in general it is a good, clear statement of position on the subject, and it seems that the discussion early in the year was not without result. Congratulations to the Public Relations Committee and the Board of the Institute.

Guide to Permissive Publicity and Advertising Practice for Members of the American Institute of Architects

	Newspaper and Magazine Publicity	Radio and Television Publicity	Newspaper, Magazine, Radio and Television Advertising	Brochures, Pamphlets, Reprints, etc.	Speeches and Panel Discussions
By the individual architect	May furnish material concerning participation in building projects but may not stimulate self-laudatory, exaggerated or misleading publicity.	May participate in radio or TV programs as part of chapter, region or national AIA activity. May participate as individual Architect if the program is in the best interest of the profession.	May participate where an endorsement of the product by the individual Architect is not required . . . where the participation is not to the detriment of fellow Architects . . . where advertisements (or commercials) pay tribute to the profession. May not purchase space (or time) in own interest or interest of the architectural firm. May not advertise by person or architectural firm in special editions or programs.	May produce a brochure or pamphlet covering facts about the firm and can use this medium in discussions with potential clients, provided it is produced at his own expense and that it contains no advertisements.	May speak to public service, community and educational groups to better explain the profession but not to advertise his own professional availability.
By Chapter and Region	May initiate newspaper and magazine publicity in the public interest and for the good of the profession. May encourage the use of Architect credits in newspapers by diplomatic press relations.	May participate in radio and TV programs to better explain the profession.	May participate in interest of public and profession. May purchase space or time in any of above mediums if the advertisement is in the interest of chapter, region or entire profession. May purchase space in special editions of newspapers and magazines if there is no identification of individual Architects or firms.	May produce brochures, pamphlets, etc., for purpose of enlightening public about the services of an Architect and the value of the profession. May mail interesting articles, brochures, pamphlets, reprints, to selected list of community leaders for purpose of explaining the profession to the public.	May through a Speakers' Bureau participate for the express purpose of better explaining the profession to the public.

Bernard Tomson **it's the law**

Is the purpose of a payment bond given by a subcontractor to a general contractor primarily for the protection of the general contractor or for the protection of unpaid materialmen?

In a recent case in New York, *Morris Co., Inc.* v. *Glen Falls Indemnity Co., et al.*, a Materialman who furnished materials to a Subcontractor sued the surety company under a payment bond furnished by the Subcontractor to the General Contractor. The Subcontractor had been required under its contract to furnish a payment bond which covered 20 percent of the contract price and a performance bond which covered 20 percent of the contract price. The issue before the Court was whether the Materialman had a right to sue as a third-party beneficiary, or whether the payment bond had been given for the sole benefit of the General Contractor.

The Court conceded that undoubtedly the bond had been obtained by the General Contractor primarily for its own protection, but further ruled that it was not the motive in securing the undertaking that determined the issue, but rather the intent of the parties as to who was to be benefited by the furnishing of such bond. The Court stated that such intent was to be ascertained from the terms of the bond, plus the provisions of the building contract considered in the light of the surrounding circumstances.

In determining the intent of the parties, the Court was influenced by the fact that both a performance and payment bond had been furnished by the Subcontractor to the Contractor. The Court stated that, since there was no question that the purpose of the performance bond was to protect the General Contractor from damages in the event of the failure of the Subcontractor to perform, the object of the payment bond must have been to secure some other protection not afforded by the performance bond. The surety company, however, argued that the performance bond covered only 20 percent of the contract price, and that, in view of the large amounts of mechanic's liens which had been filed, it might well be that the General Contractor would need a sum in excess of 20 percent in order to be adequately protected.

The Court, in reaching the conclusion that the Materialman could recover from the surety as a third-party beneficiary, reasoned as follows:

"If there were no payment bond in existence, and an unpaid materialman of a subcontractor placed a lien on the job, he would only be able to recover against the general contractor to the extent that the said contractor had moneys in his possession to which the subcontractor might have recourse. In the absence of such fund, any lien filed by any materialman or laborer would be ineffective as against the general contractor. The claimant would be relegated to an action against the subcontractor. It would seem, therefore, that the purpose of the payment bond between the subcontractor and the general contractor would involve more than indemnifying the latter as to the risks of mechanics' liens and related litigation. It was designed to assure the general contractor that the materialmen and laborers would in fact be paid by the principal or the surety. Such payment would be in the direct interest of and inure to the benefit of the general contractor. The condition, therefore, would evidence an intent to benefit the third parties referred to . . ."

One Judge in a dissenting opinion pointed out that the Materialman was not named in the bond, nor was he expressly given the right to sue, and that, in the absence of a clear showing that the parties entered into the undertaking with the intention of benefiting him, the Materialman had no right to sue under the bond. The dissent emphasized that, while a Materialman's lien against the General Contractor is limited to the moneys of the Subcontractor in the possession of the General Contractor, no such restriction applies to a lien which may be asserted against the property itself. The dissenting opinion points out that it is common practice for owners to withhold payments to the General Contractor in the event a lien is asserted, and that it was, therefore, probable that the General Contractor insisted on both a performance and payment bond to guard against this contingency.

A Pennsylvania Court has denied recovery to a Materialman against a surety on a Subcontractor's bond which covered both payment and performance (*Dravo-Doyle Co.* v. *Royal Indemnity Co.*) The contract between the Subcontractor and the General Contractor provided that the former would pay or provide security to his Materialmen for the payment of any obligation they might have "in aid of the enforcement of which a lien or right of any kind is established." The Materialman involved in this case had not been paid, but he had not asserted a lien.

The Court held that a Materialman who could not assert a lien could not recover against the surety on the bond as a third-party beneficiary. The Court differentiated between the liability of a surety who guarantees the performance of a contract by a contractor who has promised the owner to pay those furnishing labor and materials from the liability of a surety who guarantees the performance of a contractor who merely agrees to complete the work free of liens. This is a rather technical distinction, but was sufficient to defeat the claim of the Materialman in this case.

The foregoing cases and many similar ones emphasize the importance of clearly stating the intention of the parties in payment or performance bonds. The mere securing of a bond does not guarantee adequate protection. The bond must be so written as to clearly set forth the nature, extent, and type of coverage desired. (*See* IT'S THE LAW, *November* and *December 1952 P/A*.)

three-story prestressed lift-slab building

by Fred E. Koebel*

Three new ideas in construction were combined recently to build a new laboratory building at the Southwest Research Institute in San Antonio, Texas. Prestressed concrete was combined with lift-slab and plastic pans to produce a three-story building. This building is to be utilized for offices and laboratories for the Physics Department of the Institute and because of equipment and working space requirements, a minimum of 35-ft spans was desired. It was also required that slab construction be used, to blend with the surrounding buildings at the Institute. Comparison studies were made between flat slabs prestressed and nonprestressed, and it was found that the prestressed flat slab was more economical. However, since it is recognized that the deeper the slab, the more economical it will be when prestressed, it was decided to eliminate unnecessary dead weight and still gain the advantages of depth by utilizing a pan system which would form joists at equal distances on center in each direction. For that reason, plastic pans were obtained which formed joists 2 ft on center in both directions. The pans were 10 in. deep and 3 in. of topping were added to bring the total depth of the joists to 13 in. The joists were 4 in. in width, tapering to 6½ in. at the top. The depth required for the nonprestressed flat slab was 14 in. and the depth of the prestressed flat slab was 9 in. Thus, using the pan system, the advantages of a larger depth of member were obtained with savings in dead weight. The pan system has an average weight of 100 psf, including the solid concrete in the shear areas around the columns, while the nonprestressed flat slab weighed 175 psf and the prestressed flat slab weighed 113 psf. As a comparison, the amount of material used in the various slabs investigated are shown:

Type	Steel psf	Concrete
Flat slab — unprestressed	9.75#/ft²	1.17 ft³/ft²
Flat slab — prestressed	2.15#/ft²	.75 ft³/ft²
Coffered slab—prestressed (actual values)	1.15#/ft² .6#/ft² mild steel	.67 ft³/ft²

design information

The criteria for the lift-slab portion of the design, including columns, lifting collars, and footings, is very similar to that used for any standard lift-slab design. This criteria was explained in a previous paper *(page 93, February 1953 P/A)*.

In the design of these slabs, an approximate solution was made to determine the flexural stress and magnitude of prestressing required in the slabs, since the exact determination of the elastic deformations, and hence bending moments and stresses, is impractical by the theories of elasticity. The following are the specifications under which the design was made:

Concrete stresses:

(1)	Minimum cylinder strength @ 28 days	5000 psi
(2)	Minimum cylinder strength @ time of initial prestressing	4000 psi
(3)	Maximum allowable compressive stress	2000 psi
(4)	Maximum tensile stress without reinforcement	0 psi
(5)	Maximum tensile stress with reinforcement for all tension	500 psi
(6)	Maximum diagonal tensile stress without tensile reinforcement	200 psi

Steel stresses:

(1)	Minimum ultimate tensile strength	220,000 psi
(2)	Minimum .2% offset (yield strength)	185,000 psi
(3)	Initial working stress	145,000 psi

general considerations

The loss in initial prestressing force, due to creep and shrinkage in the concrete, was assumed to be 15 percent in the calculations. However, it is felt that this is quite conservative for two reasons: first, the axial compressive stress in the slab is very small and, second, when restraint is applied equally in two mutually perpendicular directions, it is thought that the amount of creep in the concrete is materially reduced. However, since this is not definitely known, the value of 15 percent was used in the design.

It was also assumed that wire groups could not be concentrated in the joists in areas where high flexural stresses existed. It is felt that the axial compressive stresses due to the prestressing wires on any plane a distance away from the end anchorage would be the average $\frac{P}{A}$ stress of all the units. Thus, it was necessary to determine the maximum number of wires required for the maximum flexural stress and then use these wires in all joists—checking to see that no overstressing existed at points of lower stress.

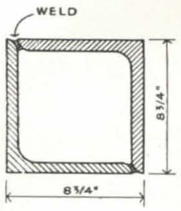
The prime considerations in the design are shear at columns and flexure in the slab. The column reaction is obtained, knowing the dead load and live load on the slab.

Column loads
Dead load per slab = 63,100 lb
Live load per slab—
2nd and 3rd floor = 39,600 lb
Live load per slab—roof = 19,800 lb
Total maximum load per column

$$
\begin{aligned}
3 \times 63{,}100 &= 189{,}300 \\
+2 \times 39{,}600 &= 79{,}200 \\
+1 \times 19{,}800 &= 19{,}800 \\
\hline
&\ 288{,}300
\end{aligned}
$$

* *Vice-President and Chief Engineer, Prestressing, Inc., San Antonio, Tex.*

Column size—2 angles 8″ x 8″ x ¾″



$$I = 240 \text{ in.}^4$$
$$A = 22.8 \text{ in.}^2$$
$$r = 3.23 \text{ in.}$$
$$\frac{l}{r} = 32.5$$

Free length of column in final position = 8 ft 9 in.

$$\frac{P}{A_{allow.}} = 17{,}000 - .485\left(\frac{l}{r}\right)^2$$

$$\frac{P}{A_{allow.}} = 16{,}490 \text{ psi}; \frac{P}{A_{act.}} = 12{,}700 \text{ psi}$$

Free length for lifting = 30′−1″ roof slab

$$P_{allow.} = \frac{\pi^2 \times 29 \times 10^6 \times 240}{4\ (361)\ \ (361)} = 132{,}000 \text{ lb}$$

$P_{act.} = 63{,}100$ lb F. of S. = 2.08 o.k.

The punching shear stress at the collar should be checked, although in general sufficient depth of slab exists at this point, so that this is not critical. It is doubtful that diagonal tension at this point will ever be critical because of the effects of the two-way compression introduced by the prestressing. However, it should be checked.

Vertical punching shear around collar
Collar size = 22″ × 22″
Reaction = 102,700 lb

$$v = \frac{102{,}700}{4\ (22)\ (13)} = 90 \text{ psi}$$

The next critical area for shear is at the section where the solid section of the slab joins the coffered slab. This section should be checked. The section is assumed to be homogeneous at this point, so the value of shear stress is obtained, using the elastic shear equation and the properties of the coffered section. When the shear stress on this section is within the allowable and the size of the solid area required is determined, the flexural analysis is made.

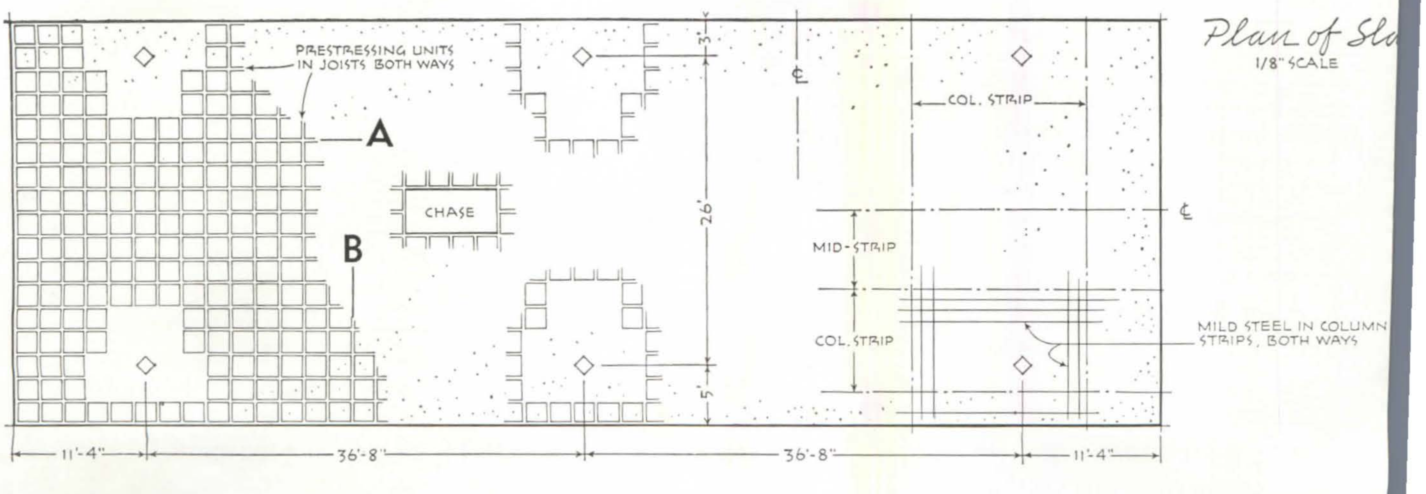
The flexural analysis is made, assuming that the slab bends in mutually perpendicular planes, thus forming bents at right angles across each column line. These bents are analyzed as continuous bents in the long direction and as simple bents in the short direction. In the long direction, since the solid area shown in the layout is a large portion of the bent, and since the moment of inertia of this section is larger than the moment of inertia of the coffered section, it is necessary to include this effect in the calculation. The author thus used the general slope deflection equation as a solution of this problem. The generalized slope deflection equation is written as

$$M_{AB} = M_F + \frac{2EI}{L}\left(-\,C_{AB}\,\Theta_A - C'\Theta_B\right)$$

where no sidesway or displacement of one end of the member relative to the other exists.

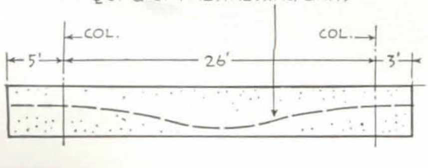
The notation for the above equation is

M_{AB} = Final end moment at A in member AB
M_F = Fixed beam end moment
Θ_A = Joint rotation of A in radians
C_{AB} = Coefficient of moment at A due to joint rotation Θ_A
C' = Coefficient of moment at A due to joint rotation Θ_B or conversely coefficient of moment at B due to joint rotation Θ_A

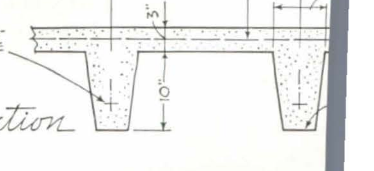


Plan of Sl
1/8" SCALE

Longitudinal Section **A**



Cross Section **B**



Coffer Section

The typical analysis below indicates the use of this equation to determine the negative moments at the supports. In the design the unit load is used to obtain the unit moment coefficient. The same type of analysis is used for the bent section with a constant moment of inertia. After the unit moments are obtained, the total weight of the bent is proportioned into column strips and middle strips and the final dead load and live load moments obtained. Having the section properties and moments, the stresses are obtained. The magnitude of prestressing is then obtained from these figures.

From a study of the moment diagram, it can be seen that the negative moments are much larger in magnitude than the positive moments. However, these moments occur in a much smaller area than the positive moments and the peaks occur in a very small area. Thus, when obtaining the amount of prestressing steel, the positive moment is used. The negative moment stresses are held to three general specifications: (1) the dead load moment when combined with prestressing shall cause no tension on the top fibers; (2) the stresses due to combined dead load, live load, and prestressing moments shall not exceed one half of the allowable tensile stress; (3) the amount of moment between cases (1) and (2) above shall be reinforced against by mild steel. Using these criteria, the solution is:

Slab design

Section properties for coffered area (*see drawing acrosspage*)

$I = 1542 \text{ in.}^4$

$r^2 = 12.4 \text{ in.}^2$

$A = 124.5 \text{ in.}^2$

$Y_b = 8.9 \text{ in.}$

$Y_t = 4.1 \text{ in.}$

Section properties for 2′ solid strip

$I = 4400 \text{ in.}^4$

$r^2 = 14.05 \text{ in.}^2$

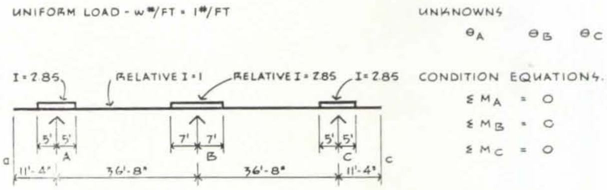
$A = 312 \text{ in.}^2$

$Y_b = 6.5 \text{ in.}$

$Y_t = 6.5 \text{ in.}$

Typical analysis

Bent through column strip



$$\Sigma M_A = 0$$

$$0 = M_{Aa_F}$$

$$0 = M_{AB_F} + \frac{2EI}{L}\left(-C_{AB}\theta_A - C'\theta_B\right)$$

I $\quad 0 = \Sigma M_F - K_1\theta_A - K_2\theta_B$

where K_1 and K_2 are constants

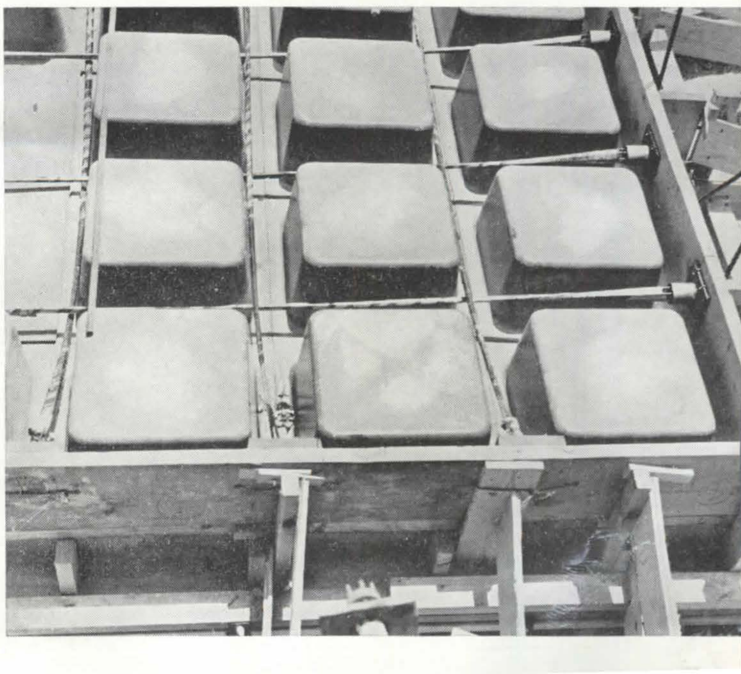
$$\Sigma M_B = 0$$

$$0 = M_{BA_F} + \frac{2EI}{L}\left(-C_{BA}\theta_B - C'\theta_A\right)$$

$$0 = M_{BC_F} + \frac{2EI}{L}\left(-C_{BC}\theta_B - C'\theta_C\right)$$

Plastic pans are laid out between edge forms before placement of steel (above). *Note absence of pans in shear areas around columns and formwork for opening in slab. Detail photo of prestressing wires in groups* (right) *shows how end hardware is fastened to forms.*

Photos: A. J. Baxter and R. Hauck



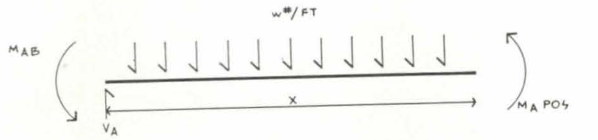
II $\quad O = \Sigma M_F - K_3\Theta_B - K_4\Theta_A - K_5\Theta_C$

From symmetry $\Theta_B = O$ and $\Theta_A = -\Theta_C$

Knowing I and II, values of Θ_A and Θ_C are obtained and moments are obtained, utilizing the above equations.

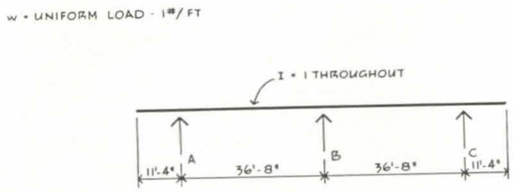
Fixed end moments and slope-deflection constants are obtained by Conjugate Beam methods.

Positive moments



$$M_{A\,Pos} = V(X) - M_{AB} - \frac{WX^2}{2}$$

Bent through middle strip



When the unit moments for middle strips and column strips are obtained, the live load and dead load are determined for each condition. The loads per bent are obtained as follows:

$$w_{\text{(dead load)}}\ \#/\text{ft} = w_{\text{(dead load)}}\ \#/\text{ft}^2 \times W$$
$$w_{\text{(live load)}}\ \#/\text{ft} = w_{\text{(live load)}}\ \#/\text{ft}^2 \times W$$

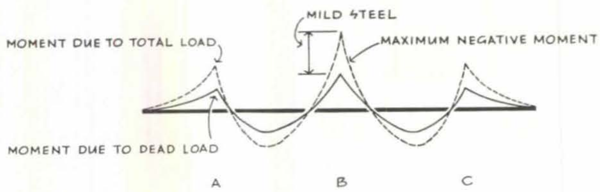
where W is the width of bent

The total moments are then obtained by multiplying the unit moment obtained in each analysis by the loads above. The moments are then distributed to column strips and middle strips in a 70%-30% relationship in the negative moment area and a 50%-50% relationship in the positive moment area.

The moment diagrams are then plotted for the dead load moments and total load moments for the middle strip and the column strip.

The moments for the column strip are obtained using the unit moments obtained from the bent analysis through the column strip and the moments for the middle strip are obtained using the unit moments obtained from the bent analysis through the middle strip.

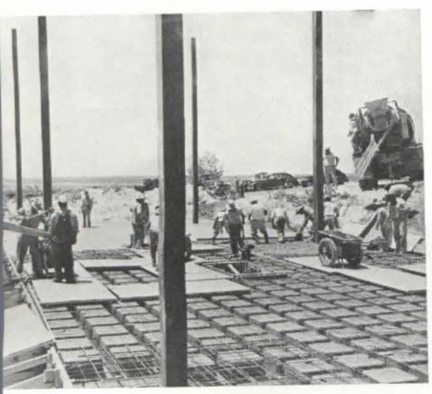
Typical moment diagram:



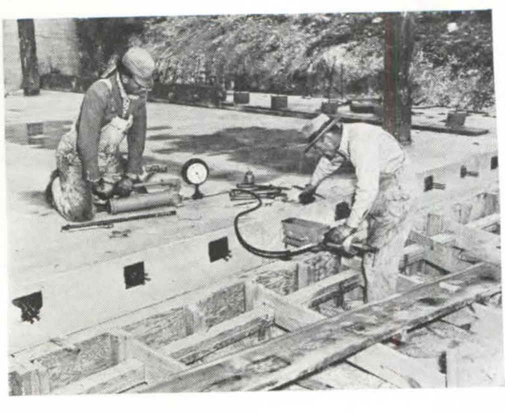
From these moment values for the column strip, the amount of prestressing steel to accommodate the total bending moment in the positive moment zone is obtained. In the negative moment area, the prestressing accommodates at the least the dead load moment with the remainder of the toal moment accommodated by mild steel reinforcing.

For the bending moments in the middle strips, the same amount of prestressing steel is used and the stresses checked. In general, there is no necessity for mild steel in the negative moment area in the middle strip. The same procedure is followed for bents in the other direction.

As shown in the reflected plan, an opening was left in each slab. This opening serves two purposes. A heavy piece of laboratory equipment was to be placed on the roof. The roof was designed for a uniform live load of 20 psf and if this heavy piece of equipment was placed directly on the roof, it would necessitate a significant change in the roof framing. The building was also designed so that all equipment such as air-conditioning ducts, electric wiring, and water lines, was to be carried in



After placement of prestressing wires and mild steel reinforcement, concrete is poured, using buggies and ramps, then vibrated (left). *Workmen are stressing unit with easily operated hydraulic jacking equipment* (below center). *After roof slab has been raised and fixed* (below right), *third floor is lifted into position while pans are removed simultaneously.*



chases down the center of the building. Thus, it was decided to combine the requirements of a shaft for the utilities with a load-bearing shaft to support the heavy laboratory equipment on the roof. Load-bearing walls were built which transmitted the load of the piece of equipment directly to the foundation.

The stairway for the building is between an existing building and the new building, thus connecting the two. The first floor level of the existing building is level with the second floor of the new building. Access to the new building will be from the north side. On the south side a three ft cantilever provides shade against the Texas sun for the solid window area. Shear walls are erected at the east and west ends after the slabs are in place and fixed.

construction procedures

The construction of the building proceeded in a manner very similar to that used for any lift-slab construction. Isolated spread footings bearing on caliche were used for the column supports. Grade beams and a 5 in. base slab were poured over a 6 in. sand fill with membrane moisture seal. After the base slab was completed, edge forming was placed for the roof slab. The two ft square plastic pans were placed as shown (*see drawing*). Prestressing wires, headed with duplex heads and assembled in 4 or 6 wire groups were placed in each joist. These wires were coated with a heavy grease and then wrapped with plastic stripping to prevent bond. Wires were held in position with specially designed chairs tied to the mesh which was placed over the entire area. After securing the prestressing wires in place, the concrete was poured. When the concrete had gained its required strength, the prestressing operation was started. The prestressing steel in the long direction was stressed first. In order to minimize frictional losses, jacking was done from each end of the wire group simultaneously. The stressing was done by use of hydraulic jacks equipped with calibrated pressure gages. The necessary elongation of each group of wires can be calculated and checked by field measurements. This is then checked by the gage reading on the jack which indicates the force necessary to provide the necessary elongation. If any variation exists, shims are added to take up the differences. However, in most instances the difference in actual and computed elongation was found to be negligible. After the required elongation was reached, it was held with split plates behind the anchorage hardware. The exterior head was used to attach the hardware necessary to apply the pulling force. This exterior head and the extension between heads were removed after stressing had been completed, thus decreasing the over-all length of hardware to be grouted in.

After stressing, the slab was lifted and the pans removed as the lifting proceeded. The pans are removed with air by holding an air hose to a 1/16″ hole drilled in the center of the pan. This breaks the bond between the pan and the concrete and the pan pops out.

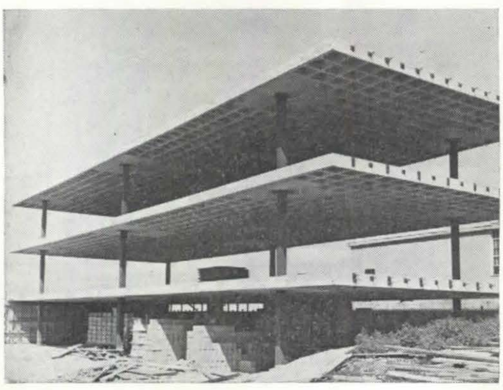
While the roof slab was being welded in place, edge forms and pans were placed for the third floor slab where the same procedure was again followed. The same procedure was also followed for the second floor. Thus it was necessary to provide only one set of pans for all three slabs.

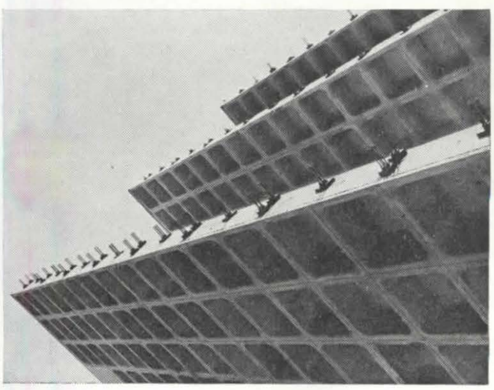
After lifting and fastening, readings were taken of deflection at various critical sections of slab. On no slab was any deflection apparent and in fact, a slight camber existed in the center of the spans and on the cantilevers under dead load.

The resulting ceiling is said to be advantageous for sound dissipation. Scientists at Southwest Research Institute feel that the coffered effect of the slab will dissipate sound waves saisfactorily, thus eliminating the necessity of any sound insulation.

In conclusion, it may be stated that the design and construction of the prestressed lift slab was no more difficult than comparable slabs in reinforced concrete. Costwise, it was found that a savings was effected over a comparable building in reinforced concrete. Thus, it has been shown that with the use of prestressing and pan-type slabs, spans heretofore thought infeasible with slab construction are entirely possible.

All slabs in place—welded and fixed (below left). *End view of three slabs* (below center) *shows prestressing hardware and coffered-slab effect. These prestressing units will be built into wall for protection against rust. End view of building* (right) *indicates end-wall prestressing units encased on second and third floors.*



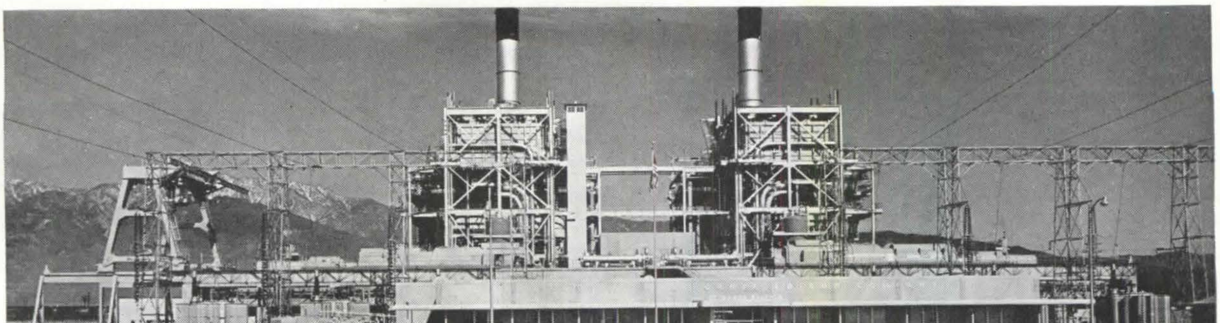


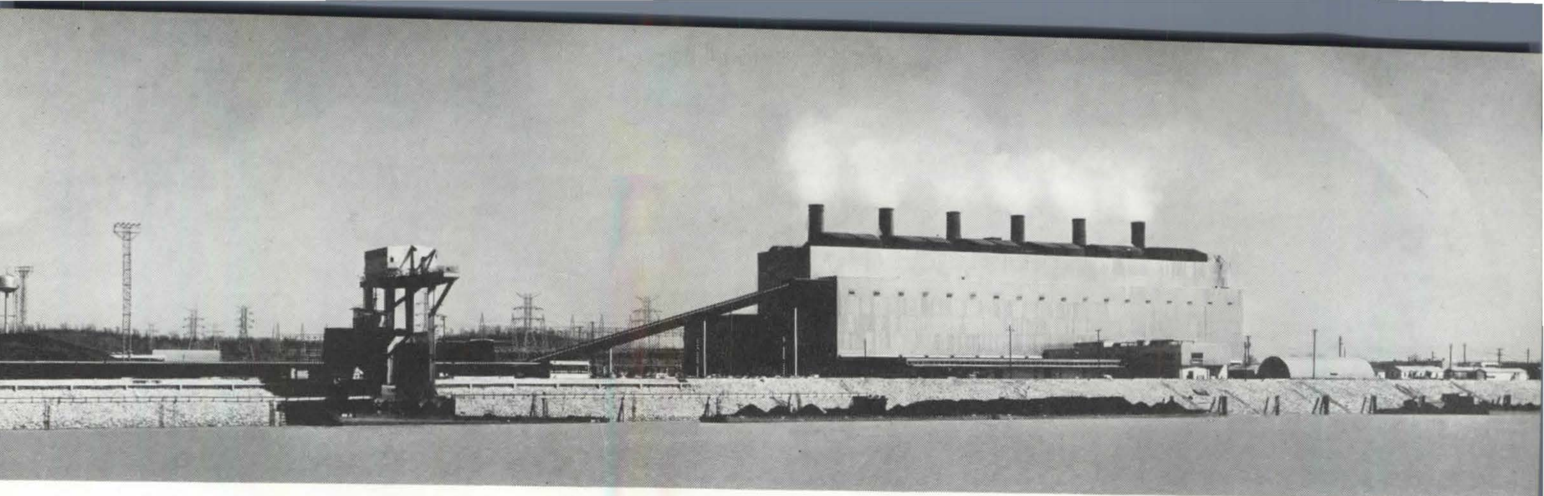
expanding enterprise

1954 has been a year of readjustment in the business of architecture. As some building categories have dropped sharply in volume (notably defense construction), others have increased to compensate. Greatest gains have been in public and private utility work—and in commercial building, a trend which the Administration has encouraged through such features of its legislative program as tax-law changes favorable to the commercial community. Thus private enterprise has become one of the architect's largest clients. In this issue of P/A we focus on a group of structures, all of which serve the needs of this expanding economy.

It is encouraging to see more and more evidence of design articulation of the complicated elements in power production and distribution (as in the Etiwanda steam-electric station for the Southern California Edison Company, designed by Stone & Webster, at bottom of page). Equally heartening is the slowly increasing amount of fine architecture in the realm of purely private enterprise. Design-conscious businessmen, like Olivetti in Italy (whose New York showroom is pictured in the IDD section) have been too few in the United States. Now we see more often such clients as the Dayton brothers (whose new store in Rochester, Minnesota, is shown above and later in this issue) sponsoring progressive architectural thinking.

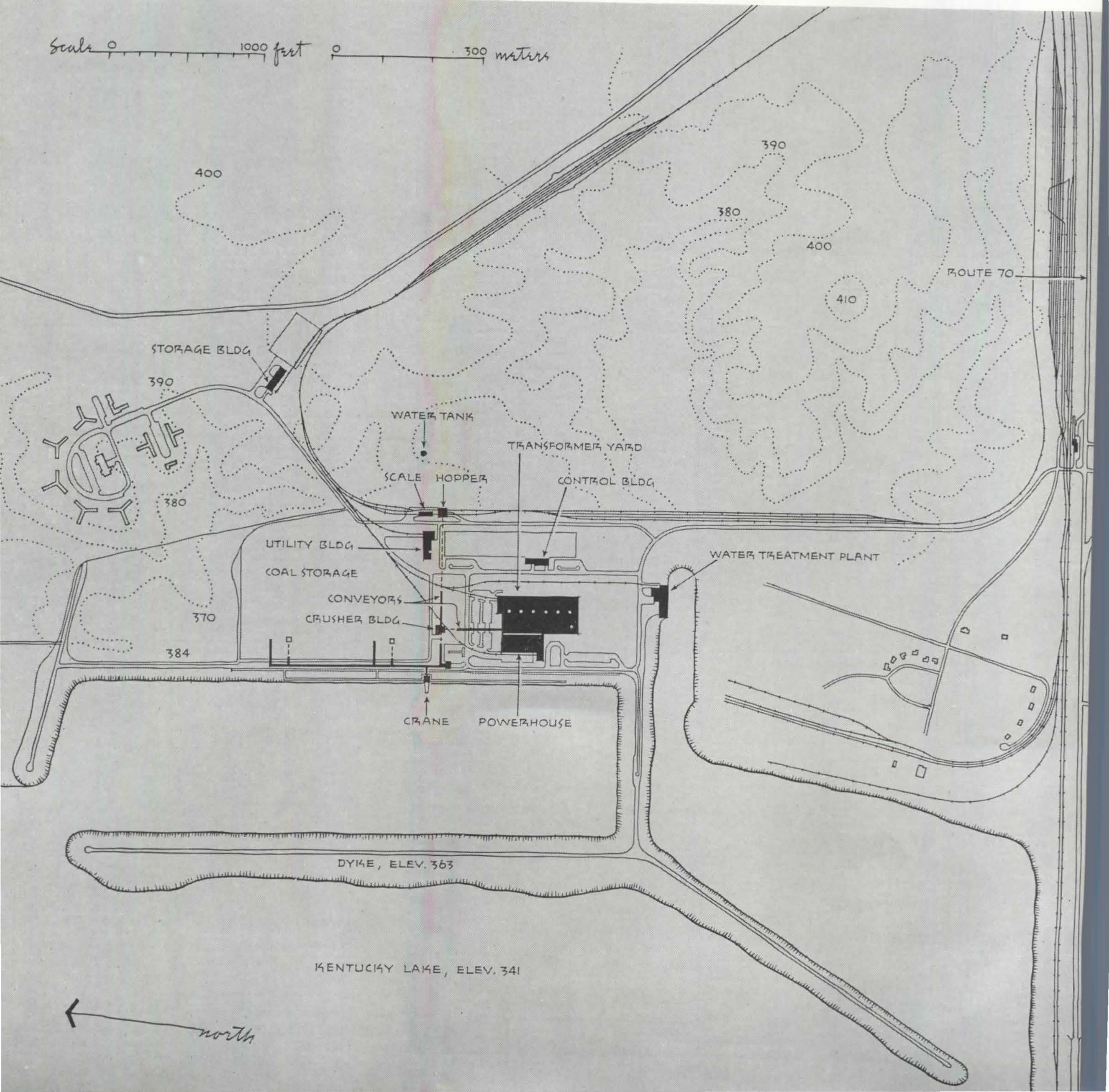
While the commercial client may be conservative in personal or corporate taste, the needs of business competition often make him open-minded in design. Architect-specialists can prove that contemporary use of color, light, texture, and display techniques will make the cash register ring—when economic planning is equally careful. It is the architect's responsibility to translate these business impulses into orderly design results.

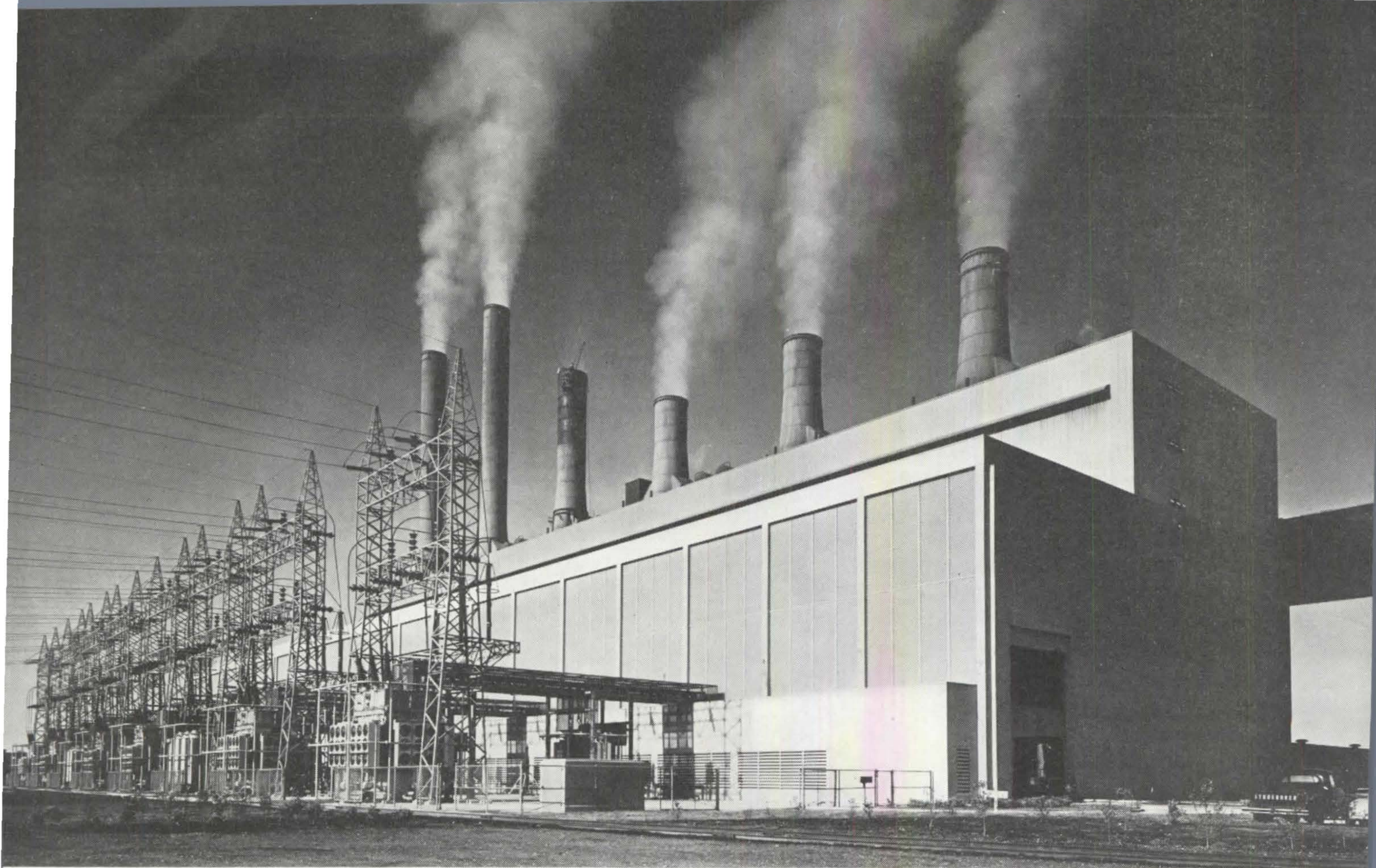


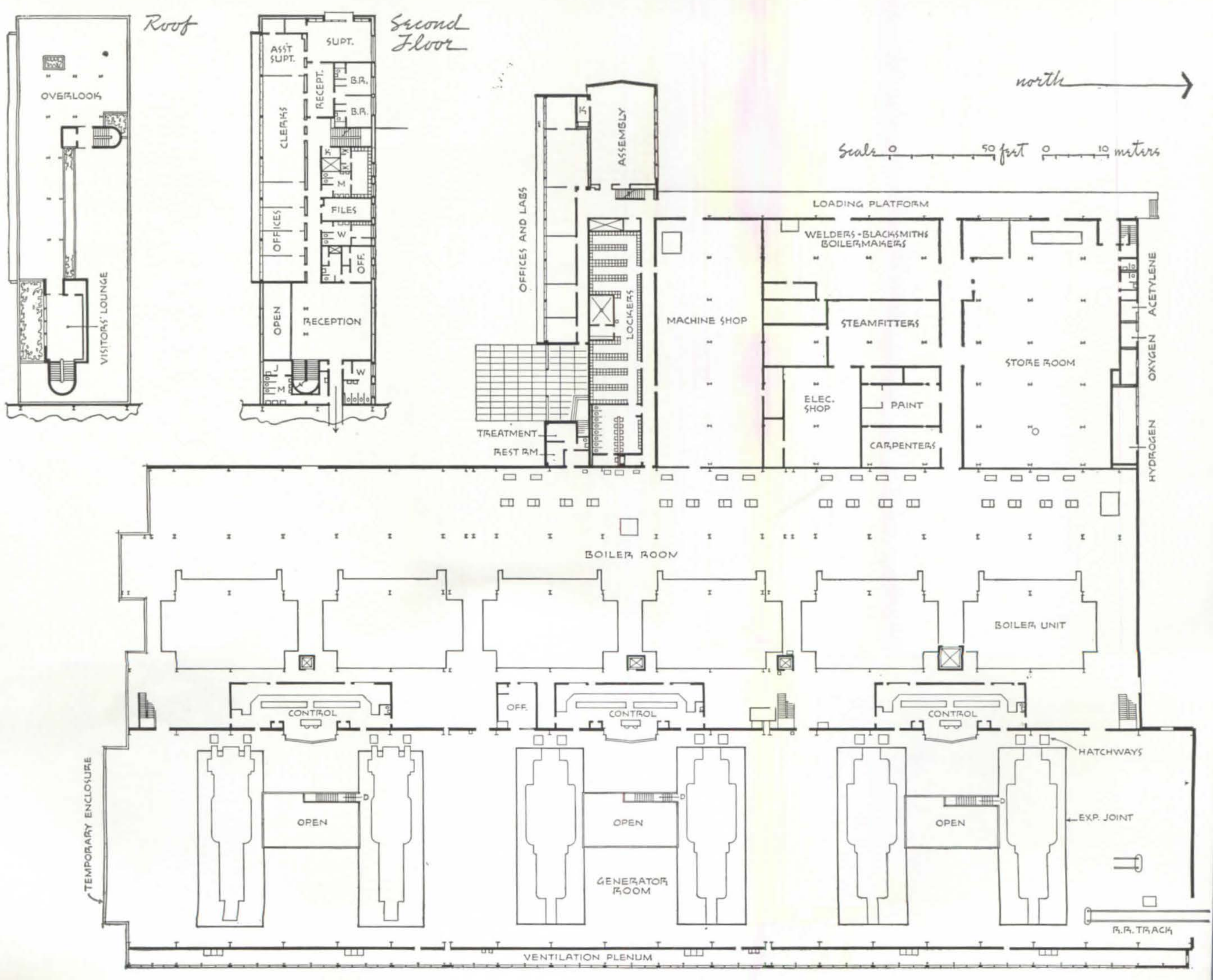


TVA steam plant

location	New Johnsonville, Tennessee
design and construction	The Tennessee Valley Authority






Roof
OVERLOOK
VISITORS' LOUNGE
Second Floor
ASST SUPT.
SUPT.
RECEPT.
B.R.
B.R.
CLERKS
FILES
OFFICES
OFF.
OPEN
RECEPTION
north
Scale 0 50 feet 0 10 meters
OFFICES AND LABS
ASSEMBLY
LOCKERS
TREATMENT
REST RM.
LOADING PLATFORM
MACHINE SHOP
WELDERS-BLACKSMITHS BOILERMAKERS
STEAMFITTERS
ELEC. SHOP
PAINT
CARPENTERS
STORE ROOM
ACETYLENE
OXYGEN
HYDROGEN
BOILER ROOM
BOILER UNIT
CONTROL
OFF.
CONTROL
CONTROL
HATCHWAYS
OPEN
OPEN
OPEN
EXP. JOINT
GENERATOR ROOM
TEMPORARY ENCLOSURE
R.R. TRACK
VENTILATION PLENUM

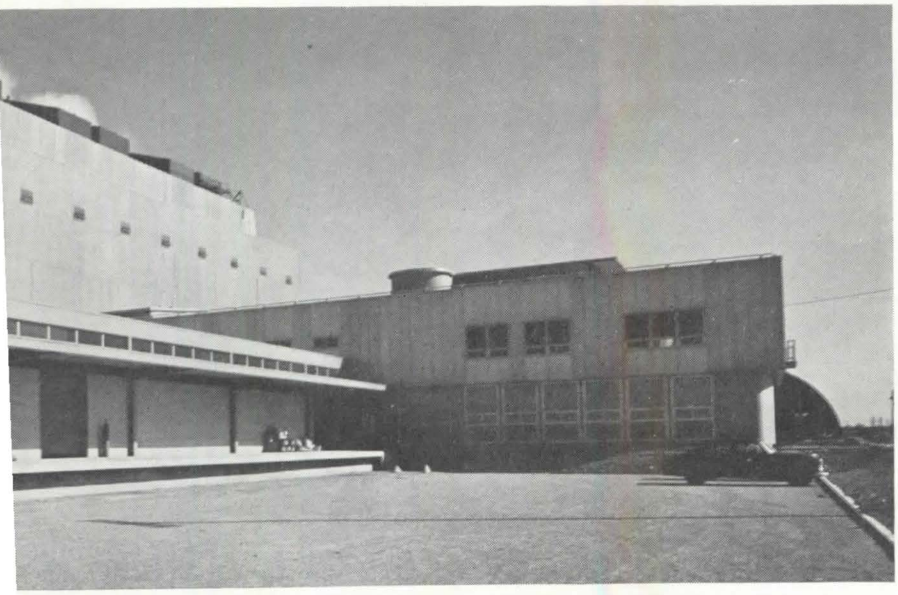
Nowhere is the impact of expanding enterprise more apparent than in a region that is undergoing physical and economic regeneration. Probably no such region in the world has experienced as impressive comeback and forward march as the Tennessee Valley. Here, under the public enterprise of the TVA, over-exploited farm lands have been brought back to fruition; dams constructed in the river system have controlled floods and extended navigation channels; related hydro-electric plants produce enormous amounts of electric power, which (distributed to 145 municipalities and co-operatives) bring the clean, modern advantages of electricity to more than 1,200,000 customers living in an area 80,000 square miles in extent. Expanding enterprise of impressive proportions!

Power from the 27 major TVA hydro plants varies from year to year, depending on the flow in the rivers. Supplementing these and increasing the *dependable* power supply in all seasons are several steam-electric plants. One such—and most recent of TVA's series of distinguished structures throughout the Valley—is the Johnsonville Steam Plant shown here.

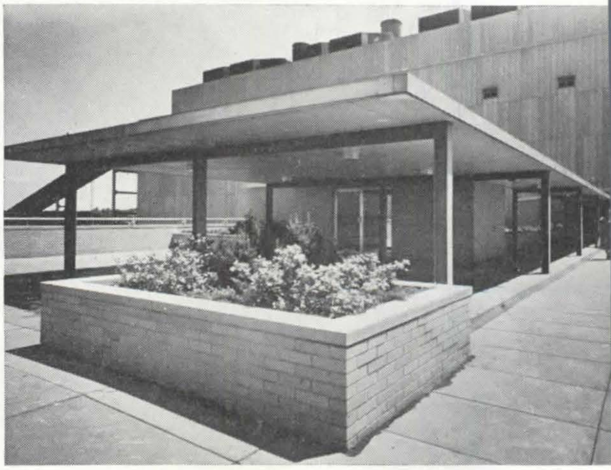
To meet the rapid increase in demand for electric power following World War II, Congress in 1949 authorized construction of the Johnsonville plant—three generating units initially, but so schemed that the plant could eventually be extended to as many as ten units. In 1950, three additional units were authorized, resulting in the present 6-unit (750,000 kw) plant.

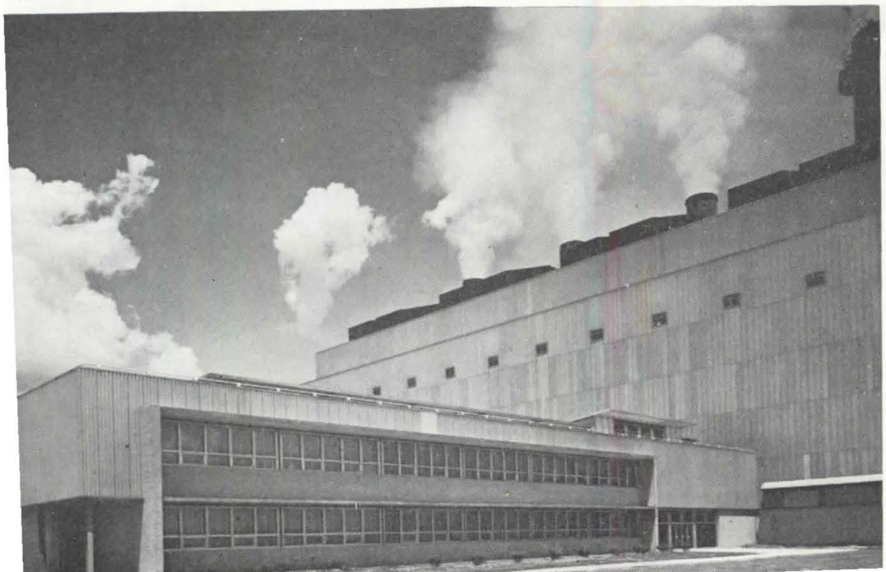
These first six units burn more than 300 tons of coal per hour and use up to 650,000 gallons of cooling water per minute. Hence, a basic requirement was that the plant be located where there would be adequate space, abundant water, and ready access to fuel supply. All these are found in the 575-acre site, on the east bank of Kentucky Lake, less than a mile north of U.S. Highway 70, at the point where it crosses the Tennessee River. A main-line railroad parallels the highway, so coal can be delivered directly to the site by barge, rail, or truck.

"The lake serves as a mammoth reflecting pool and brings the buildings into a position of prominence seldom found in a grouping of this magnitude," the architects comment. "This called for a design that would symbolize the machine-like character of a modern industrial plant and which, at the same time, would embody bold masses of shape and color to present a striking outline at a distance of some 5000 feet from the highway. Bringing gigantic building elements into human scale as visitors approach the plant became one of the most interesting architectural problems."



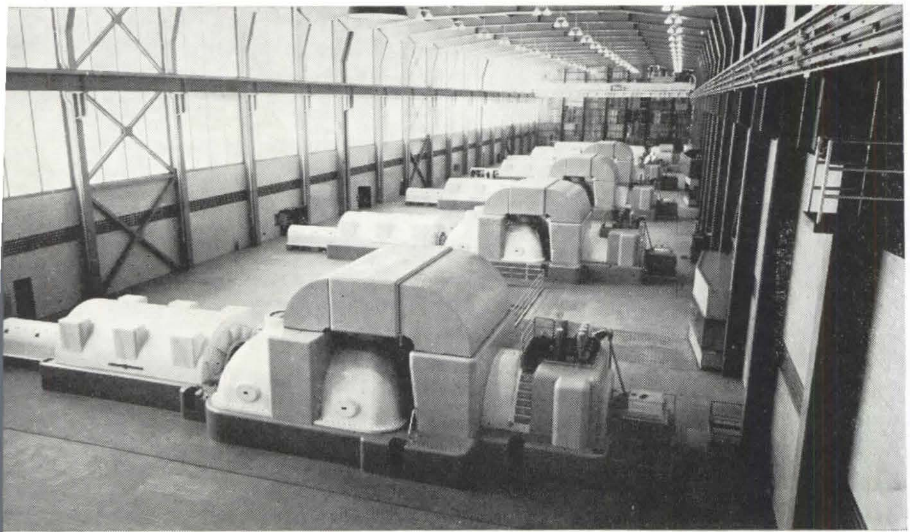
Basically, the process here consists of burning coal in boilers to create steam that turns turbines generating electricity to go out via transformer and switchyards and power lines, to eventual consumers. The south wall of the powerhouse is of temporary construction to simplify addition of generating units. Photos: TVA





On the lake side of the powerhouse, a two-story and roof-top wing (left *and* above) *contains visitors' accommodations, as well as offices, labs, and employes' locker and toilet rooms. For visitors, a windowed corridor on the second floor crosses the boiler bay to a viewing balcony overlooking the vast turbine-generator room. From the roof, visitors enjoy the lake view and watch barge-unloading operations in the harbor.*

TVA steam plant



Lobby of the office-visitors' wing (top) *has a rear wall of marble. Floor is terrazzo.*

In the turbine-generator room (above) *roof framing consists of long-span, rigid-frame, welded girders instead of conventional trusses; the far* (south) *wall is temporary, to simplify adding more units.*

A unit control room (right) *governs each pair of generating units. Windowless, the rooms are lighted by a battery of cold-cathode tubes mounted above an aluminum eggcrate ceiling, providing high-intensity* (75 *f.c.*), *shadowless illumination.*

Above foundation base slabs, all buildings are framed with structural steel—selected because of the tremendous loads in the boiler and turbine bays, as well as for erection speed and economy.

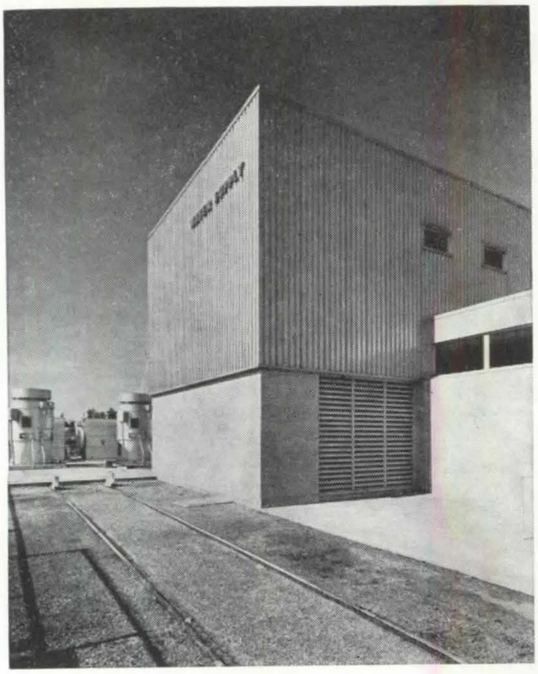
To assist a co-ordinated design expression, the architects wished to keep finish materials not only few in number but also usable for large areas. This led to the "typical" solution of bases of light-gray face brick with aluminum siding above. The prefabricated metal panels consist of 16-gage fluted sheets of striated aluminum, backed with 18-gage, zinc-coated flat-steel sheets, with a 1½-in. space between filled with glass-fiber insulation. They arrived from the factory in varying lengths—up to 16 ft—and were welded directly to adjustable steel girts attached to the structural-steel frame. In most cases, the inside steel sheets, painted, became the interior wall finish. On the east wall of the turbine room, huge panels of directional glass block are set within the exposed steel frame.

In general, the various yard buildings are variations on the basic theme—a combination of aluminum and brick. To identify the conveyor system and emphasize its extent, maroon-colored, asphalt-asbestos-protected steel siding is attached to girts on the supporting trusses of the structures concerned. An aluminum eave fascia defines the upper edge of these enclosures.

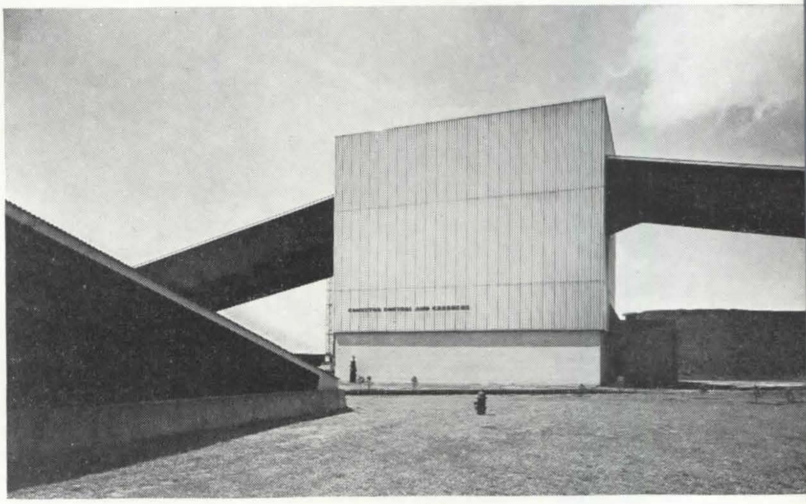
Advantages of the metal wall-panel system, in the architects' opinion, are that it is easy to erect; easy to replace if damaged during installation of heavy equipment; economical to maintain; and subject to almost no damage from weathering.

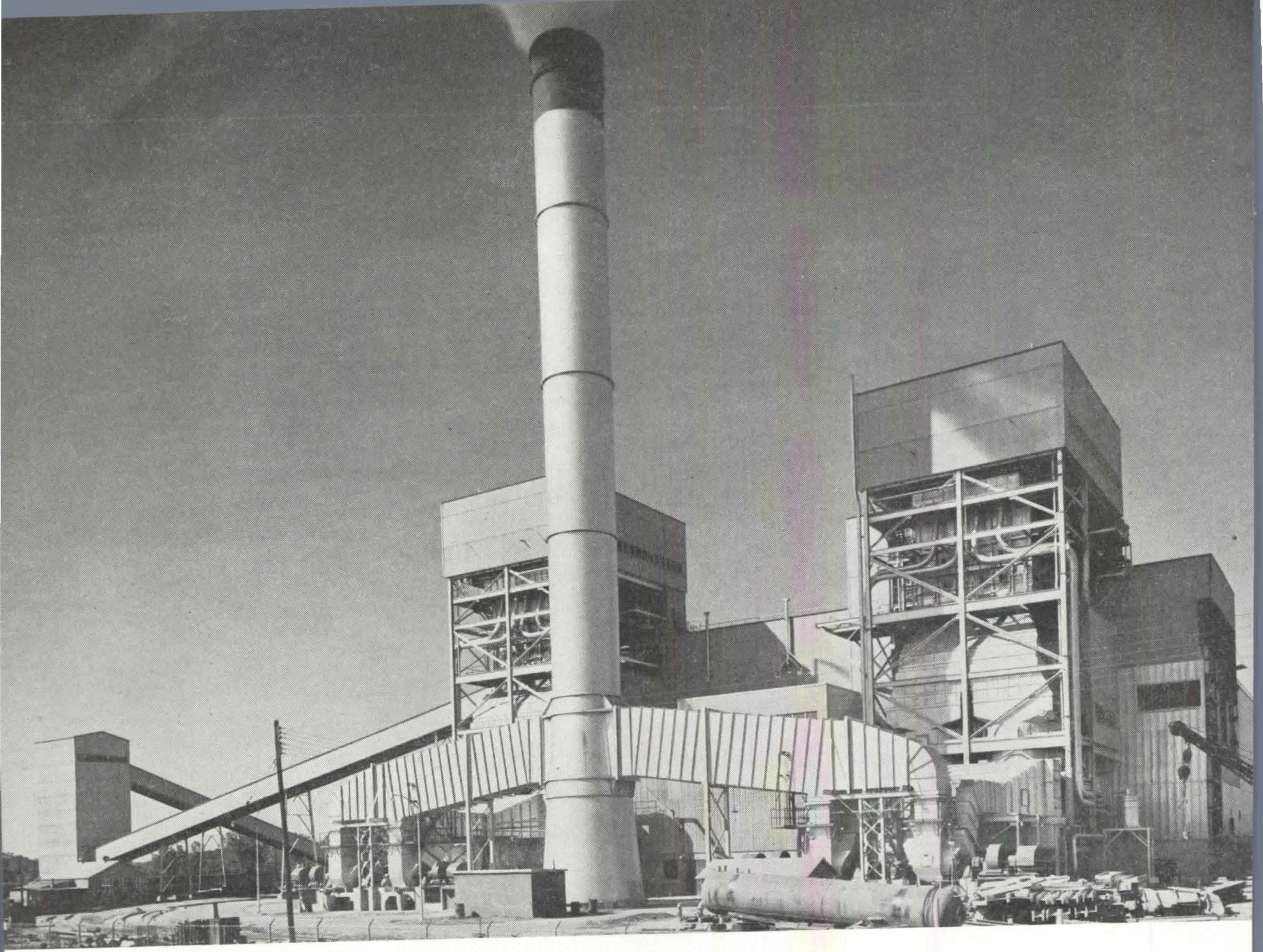
Roofs vary from precast-concrete slabs (turbine room) to poured-concrete slabs (boiler house) to cellular-steel roof decking (yard buildings and shop and storage areas of powerhouse).

Interior wall finishes range from the interior flat-steel of the wall panels to glazed and facing tile, plaster, and—in portions of the office-visitors' wing—marble. Floorings include concrete, tile, terrazzo, rubber tile.



Though varying widely in design, yard buildings follow the formula of the main plant—insulated, prefabricated metal panels above gray face brick, on steel frame. Here are shown the water-supply building (left) and the conveyor-control and crusher structure (below), to which coal comes from both the harbor dock and the rail dumper and hopper building.





steam-electric station

location	Kansas City, Missouri
owner	Kansas City Power & Light Company
design and construction	Ebasco Services Inc.

The space requirements of the mechanical and electrical equipment are understandably rigid in a building of this sort—to find a solution which goes beyond the mere housing of industrial equipment becomes a special challenge to the architect. Now, more than ever, choice of proportions (although definitely limited), materials, and colors assume prime importance.

In the realm of PROPORTIONS, the conflict in scale, due to large masses of equipment and relatively small numbers of persons required for the normal operation, has been successfully reconciled. Enclosed parts of the plant have been harmoniously balanced with exposed parts and careful provision has been made in the design for three-to-four-fold future extension.

As MATERIALS—instead of masonry walls—insulated-metal panels were used, consisting of an exterior sheet of fluted aluminum with 2 in. glass-fiber insulation and an inside sheet of light-gage steel. These walls are less costly; they are lighter and can be erected faster than brick walls. Corrugated asbestos-cement panels were used on boiler enclosures and coal-conveyor galleries. Windows in the turbine room are corrugated wire glass. The same wire glass, but doubled with air-space in between, has been used in the lobby. Interior partitions are mostly cement block.

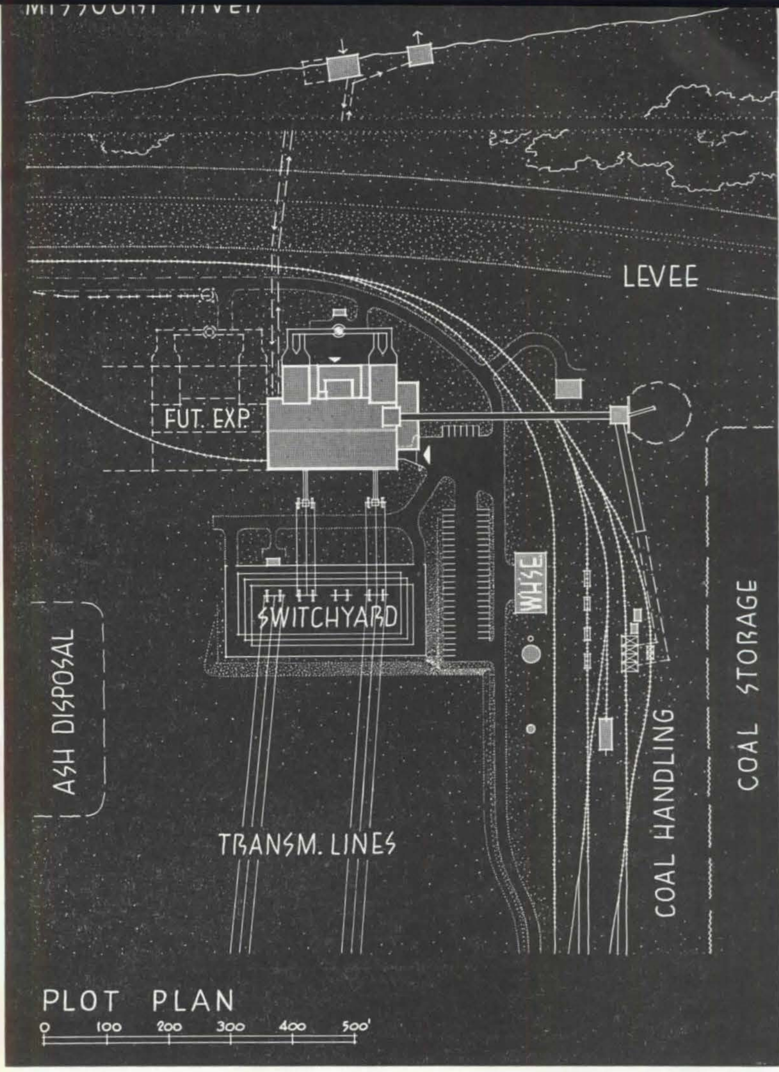
To introduce COLOR, a red quarry-tile floor defines the turbine room area, while coal bunkers, generators, evaporators, and accessory equipment are painted contrasting shades of green and yellow. The control room is also a neutral green, to reduce eye strain and to provide maximum contrast with red warning lights.

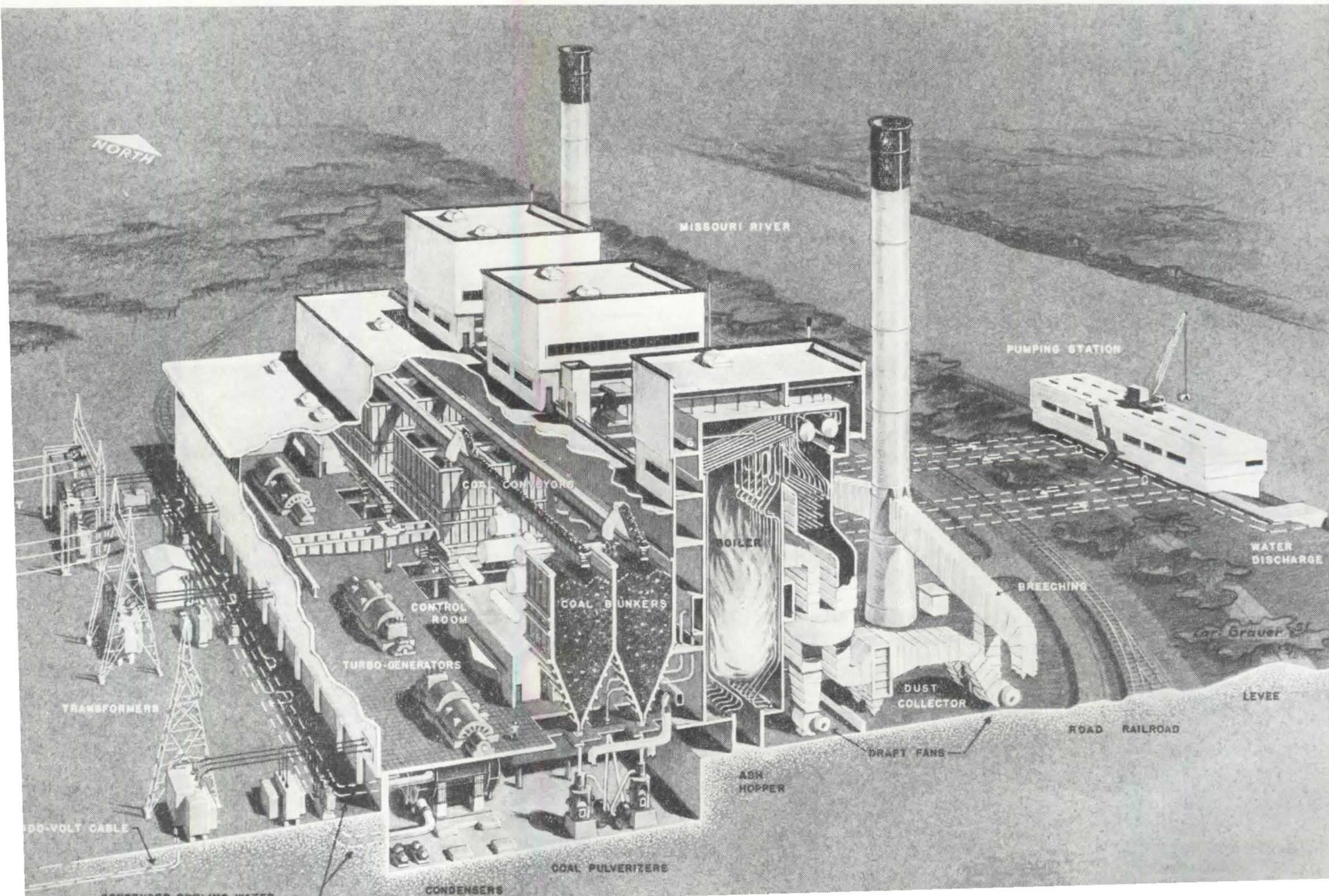
View of steam-electric plant (acrosspage) *from river side. An extension was already in progress when photos were taken.*

Since the river provides a reliable source of condensing water, a site near it, of approximately 100 acres, was chosen. Plan (right) *indicates the location of all supplementary buildings and future additions.*

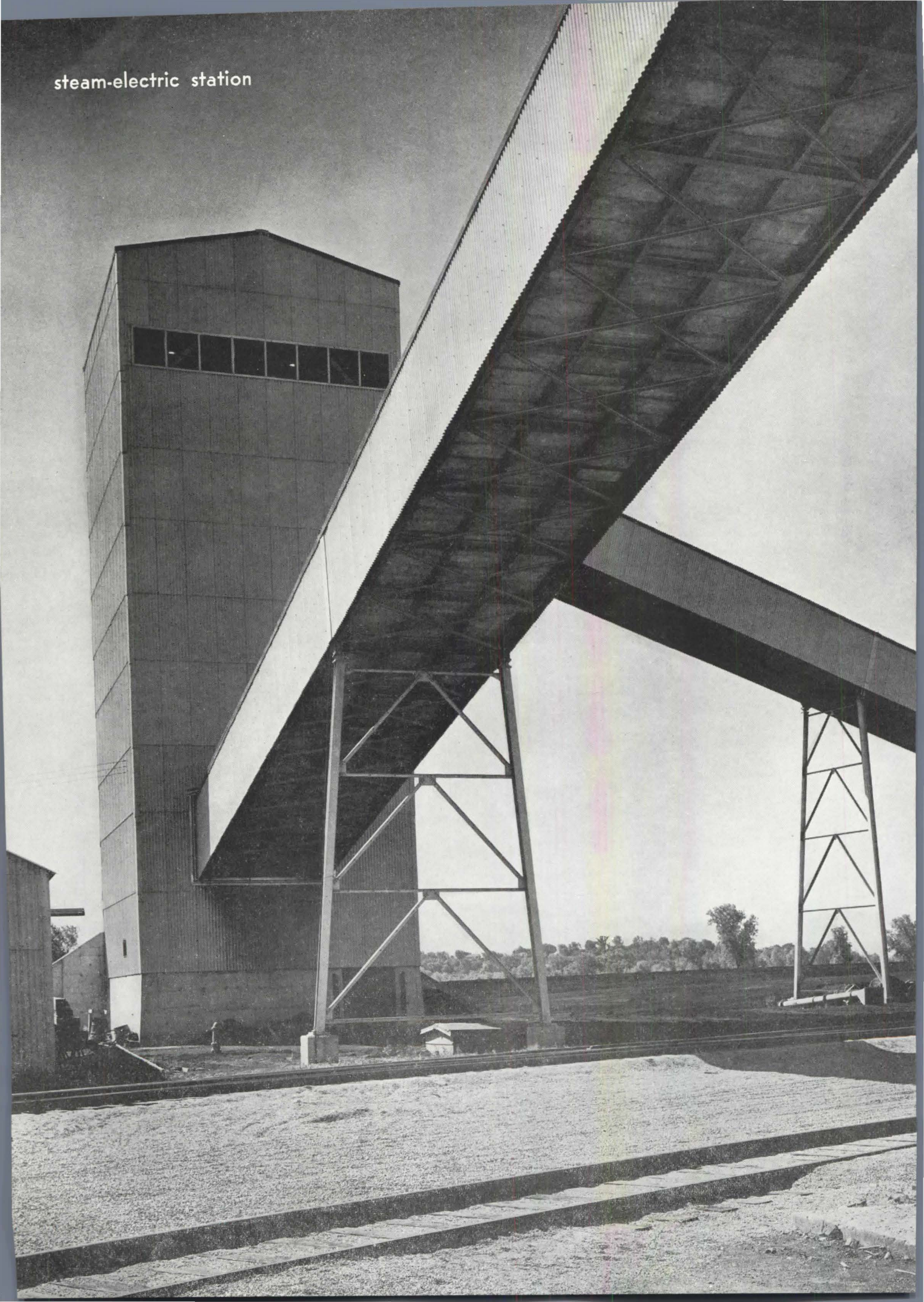
Diagrammatic drawing (below) *is by Architect Carl Brauer, who was associated with Ebasco Services during the development of this building and brought it to P/A's attention. Edgar I. Williams is consulting architect to this firm.*

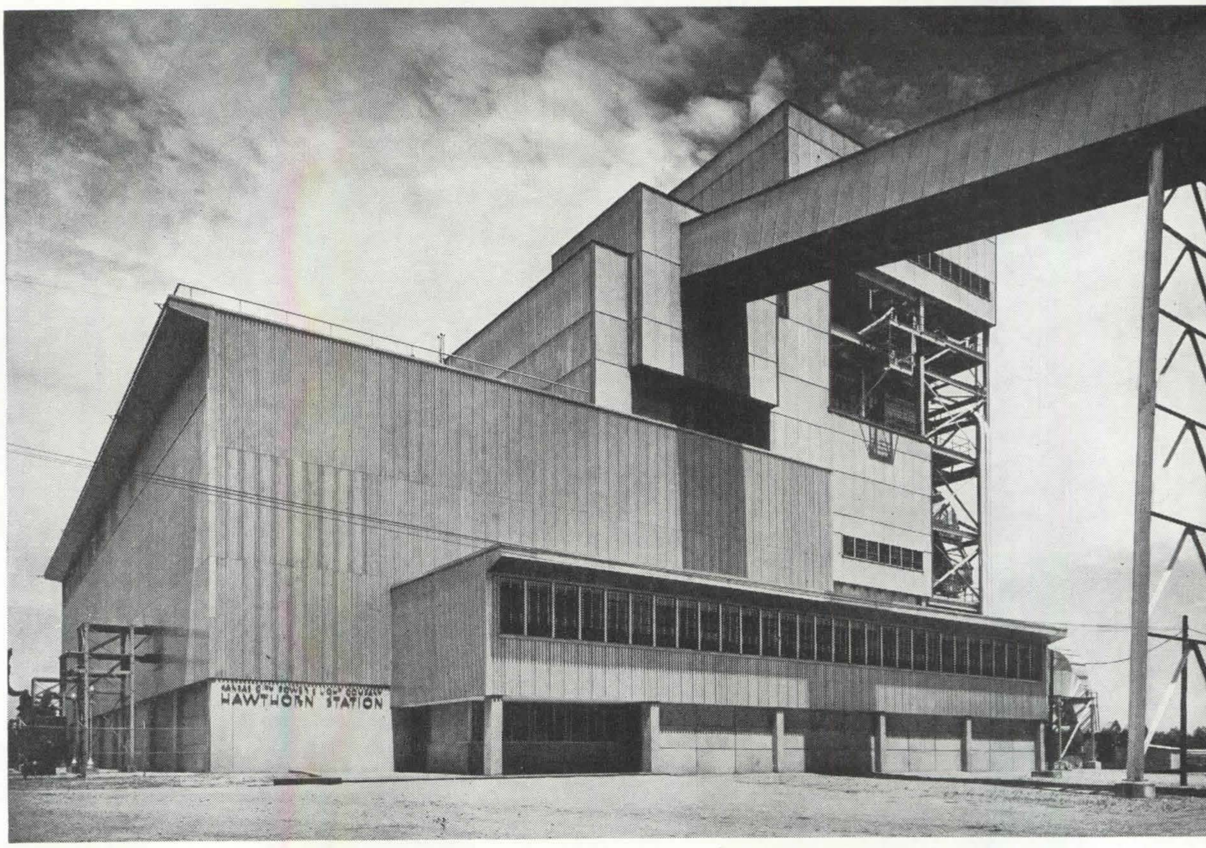
Photos: Gottscho-Schleisner

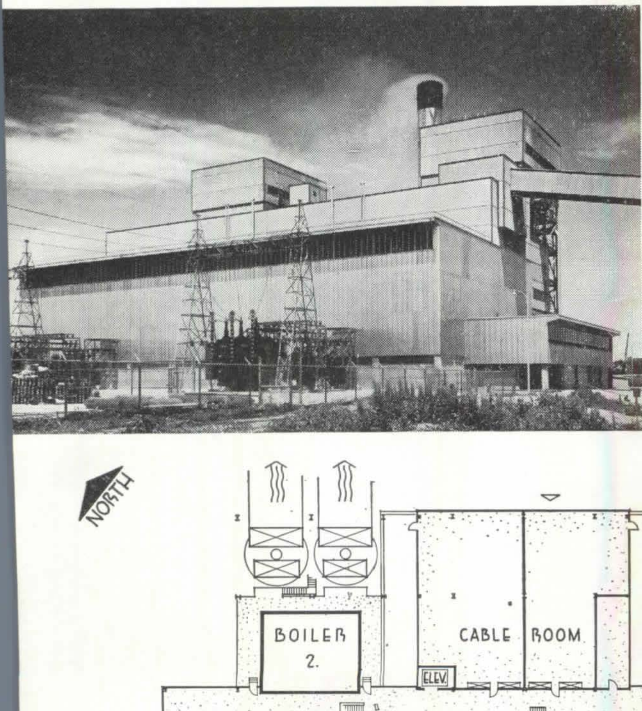




steam-electric station



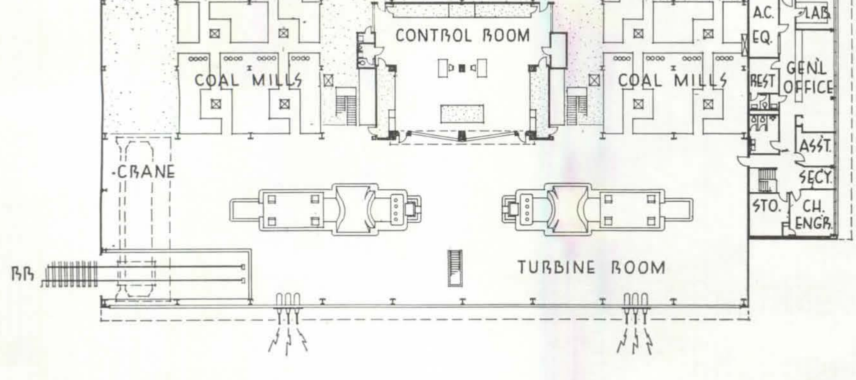




Coal-conveyor system (acrosspage) is enclosed with corrugated asbestos-cement panels. Black coping helps relate conveyor galleries to main buildings.

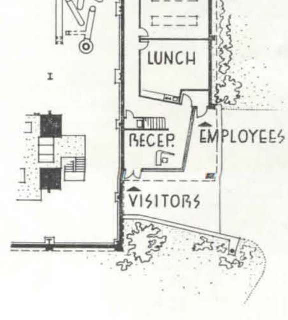
Main entrance for visitors and employes is through reception area of two-story office wing (above). *The steel-frame structure is carried on concrete foundations set on piles. Curtain walls above are of aluminum, fluted, interlocking panels. Precast-concrete slabs form the roof, except over boilers where poured-concrete slabs have been employed.*

Large clerestory window of turbine room (left) *is of corrugated wire glass.*



OPERATING FLOOR PLAN

0 20 40 60 80 100'

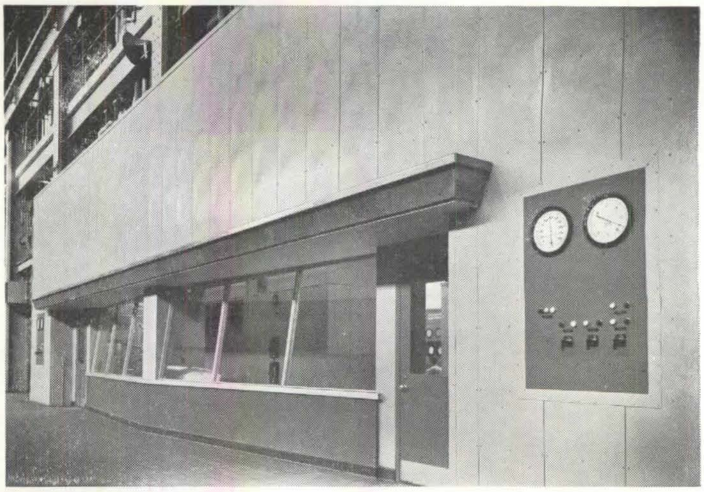


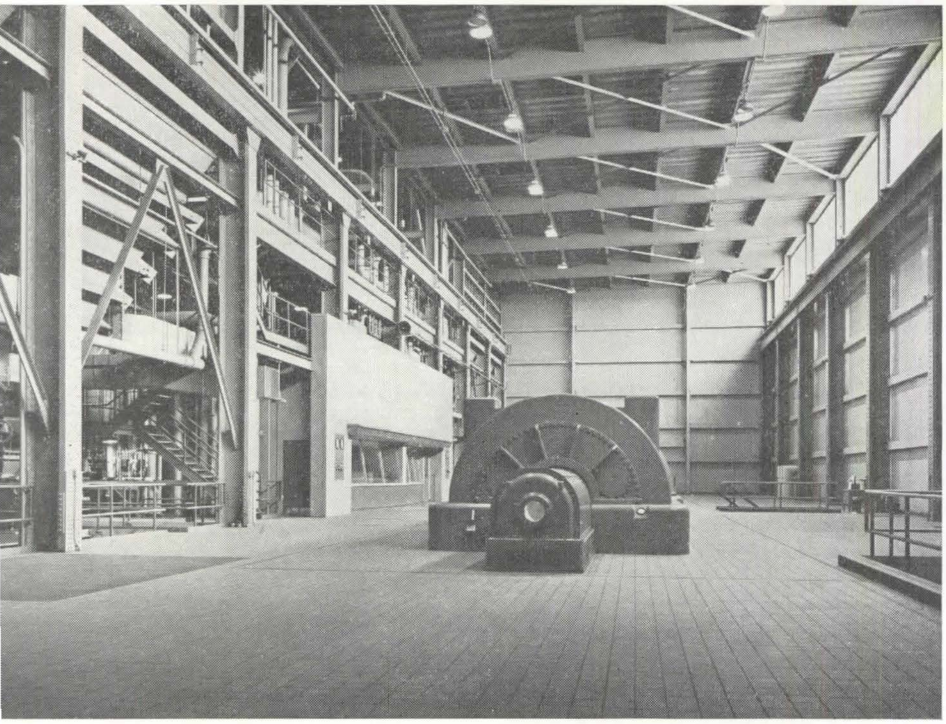
PART PLAN AT GRADE

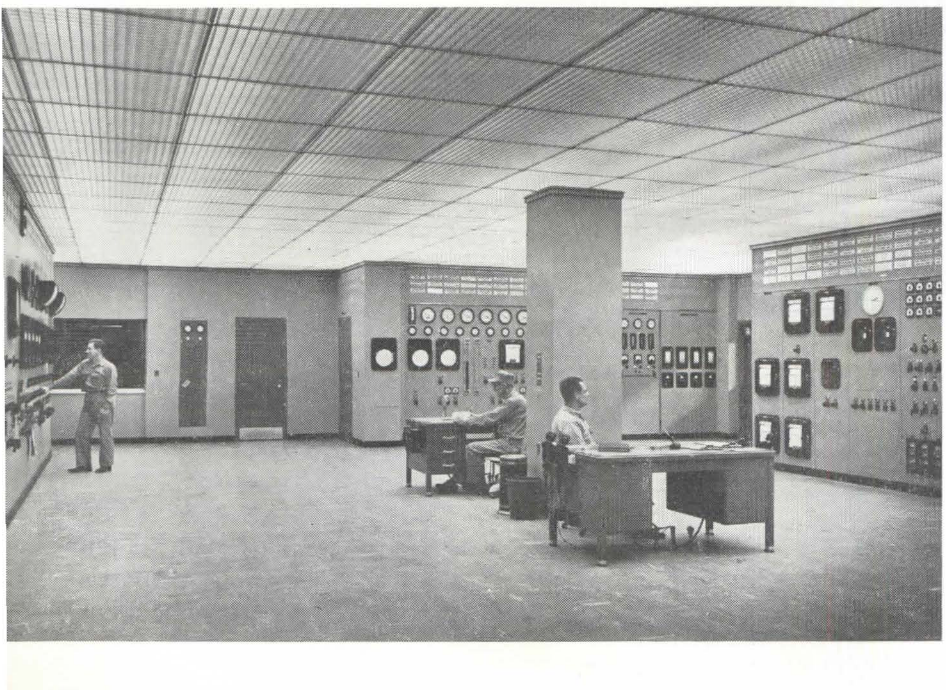
Window connecting control room (top) *with turbine room is of insulated double-plate glass, tilted to reduce reflections of panel instruments.*

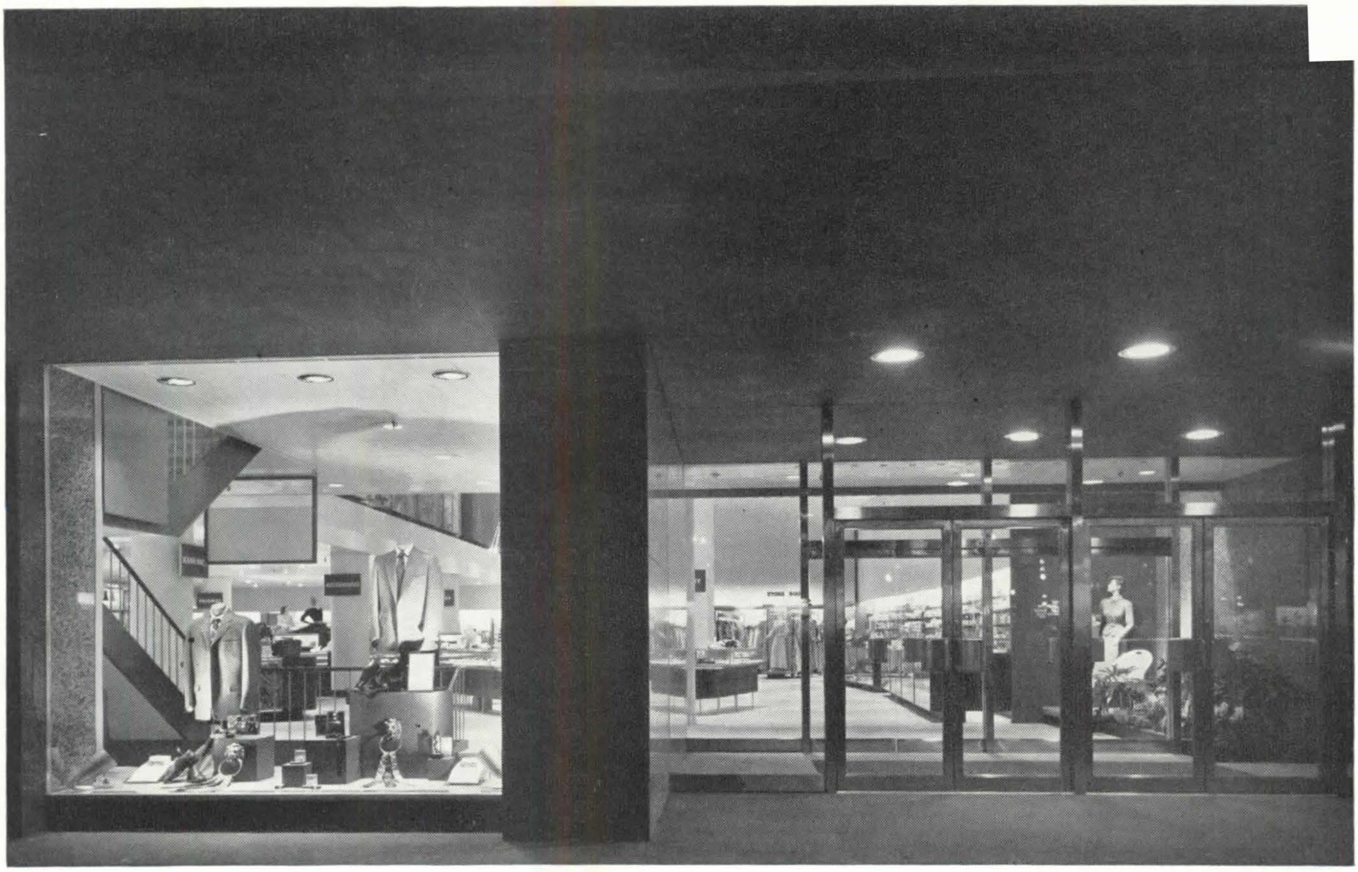
Interior of turbine room (center) *shows smooth steel-panel facing.*

Control room (below) *and office wing are air conditioned, while remainder of plant has forced-air ventilation. Louvered ceiling with fluorescent fixtures above provides even illumination at working plane.*









department store

location	Rochester, Minnesota
architect	Victor Gruen
associate-in-charge	Rudolf L. Baumfeld
project co-ordinator	Herman Guttman
associated architects	Larson & McLaren
structural engineers	Schuett & Meier
mechanical engineers	G. M. Orr Company
air-conditioning designer	David N. Berks
general contractor	C. F. Haglin & Sons

The predecessor of today's Dayton Department Store in Rochester, Minnesota, was founded when Rochester was little more than a village. Now the city is the center of a trading zone of more than 200,000 people while an annual transient population of 150,000 visits the world-famous Mayo clinic there. An extended building program was necessary to meet this great expansion.

When, as in this case, growth is so rapid that marketing experts can only guess at potential buying power and buying preferences, store owners and architects are faced with a real problem.

To solve this problem, the architects for the Dayton store placed their design emphasis on TOTAL FLEXIBILITY so that, after a reasonable trial period, departments might be enlarged, contracted, eliminated or added as needed.

The emphasis on flexibility has brought about some noteworthy departures in department store design techniques:

Flexibility In Space Layout: In the new six-story structure, columns in the actual sales area were kept to a minimum. To permit flexible arrangement of most of the floor space, all utilities were grouped along one wall. The unbroken walls of the building allow stockrooms and fitting rooms to be located peripherally, without regard to window openings. Floor coverings, for the most part carpets, are wall to wall. Movable partitions are wedged between floor and ceiling to permit simplified revision.

Flexibility In Store Fixtures: A 4′ module was found appropriate for most materials sizes and still in scale with the relatively small floors (10,000 sq ft). Fixtures are convertible from hanging to shelving. Showcase fronts are either ¼″ glass or ¼″ plastic-surfaced panels. Peg boards are used extensively for display. Wall panels in the men's store may be removed and shelves or hang-rod brackets fastened to slotted aluminum studs underneath. Free-standing base units, 4′ square and finished on all sides, are equipped with removable superstructures to accommodate a variety of display devices.

Flexibility In Lighting: Even illumination is achieved by an over-all pattern of fixtures. Where 2′ x 2′ square units are used, these have either translucent-plastic diffusers or directional-louver glass to distribute the light, which is provided by both fluorescent and incandescent lamps. To enhance the shop-like character of some departments, special fixtures were installed. However, none of the lighting units is permanently wired into the distribution system. Each

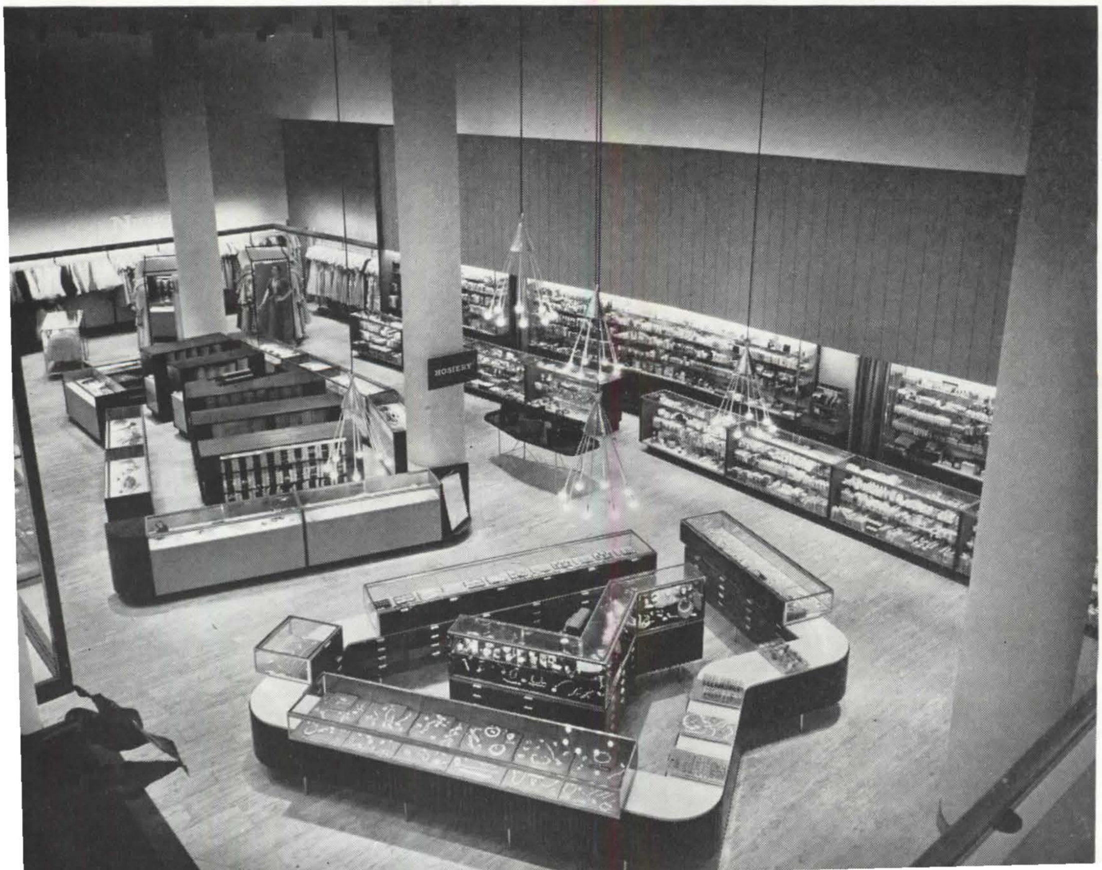
department store

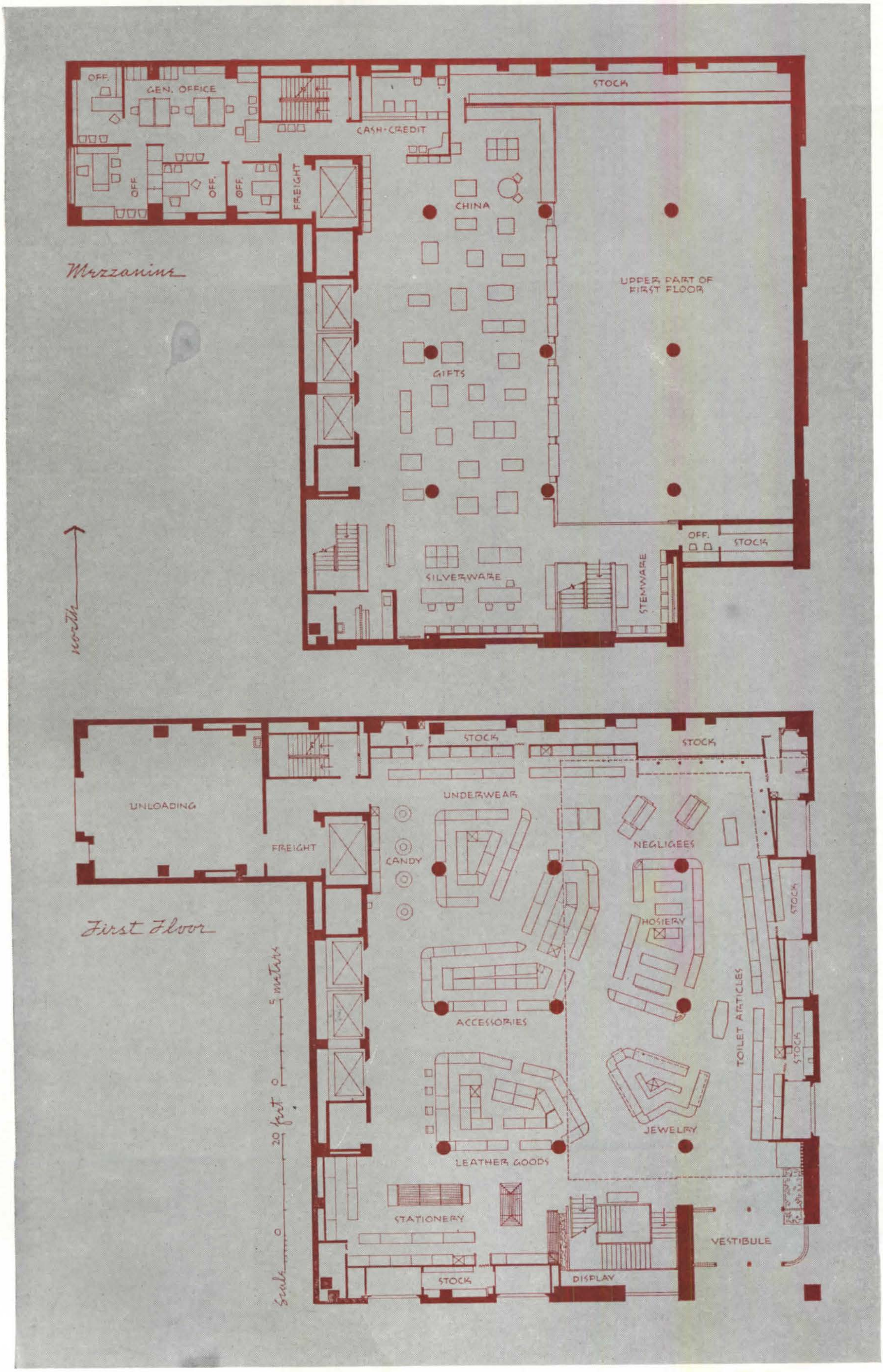
Simple brick façade (color photo on page 89) is unbroken except for an over-all pattern of projecting header courses. Public stairway from lower level (below) to street floor (right) is well integrated into the total design. A fine series of signs guides the shoppers to all departments.

Photos (except as noted): Warren Reynolds

Special lighting fixtures, a part of the flexible lighting plan, lend individual touch to candy shop (right).

Mezzanine offers spacious view into uncluttered street level (below). Brass chandeliers, suspended from 23'-high ceiling, add sparkle and brilliance to walnut jewelry case beneath.



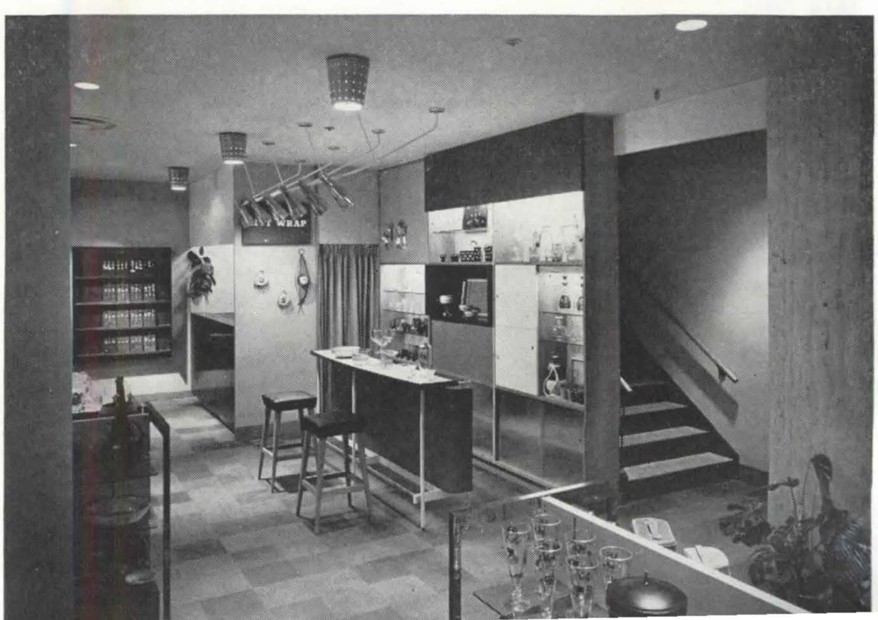

OFF.
GEN. OFFICE
CASH-CREDIT
STOCK
FREIGHT
OFF.
CHINA
Mezzanine
UPPER PART OF FIRST FLOOR
GIFTS
OFF.
STOCK
SILVERWARE
STEMWARE
north
STOCK
UNLOADING
UNDERWEAR
NEGLIGEES
FREIGHT
CANDY
HOSIERY
First Floor
ACCESSORIES
TOILET ARTICLES
JEWELRY
LEATHER GOODS
STATIONERY
VESTIBULE
STOCK
DISPLAY
Scale 0 20 feet 0 5 meters

Special glass cases for the display of gifts, at mezzanine level **(left)**, *are attractive from all angles.*

is connected to a trolley duct, on the underside of the floor slab. Attached to the system by a cord and a special fused connector, the fixtures may be moved to illuminate special displays. They also can be readily moved.

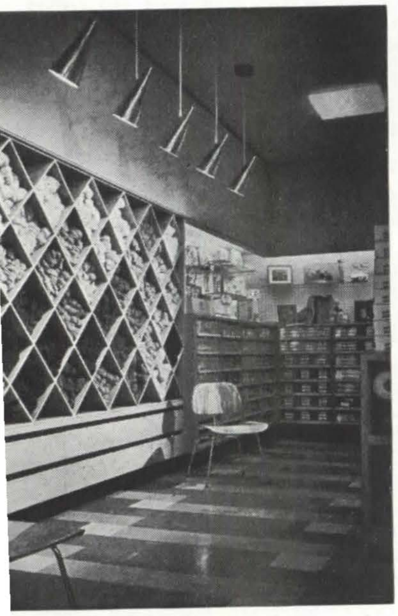
Flexibility In Ceilings: Perforated-metal pans, suspended from a channel carrier system, have been used for all ceilings except that of the first floor. Access to any part of a ceiling is obtained by removing pans. Low-voltage wiring and telephone lines were run without special conduits. Floor fixtures and cash registers requiring electrical outlets can be plugged, through floor, into sockets beneath slab. Display wires or posts are fastened to the pans or slab above. Damaged pans may be replaced. Pans containing neither lighting fixtures nor air-diffusers are backed with an acoustical pad.

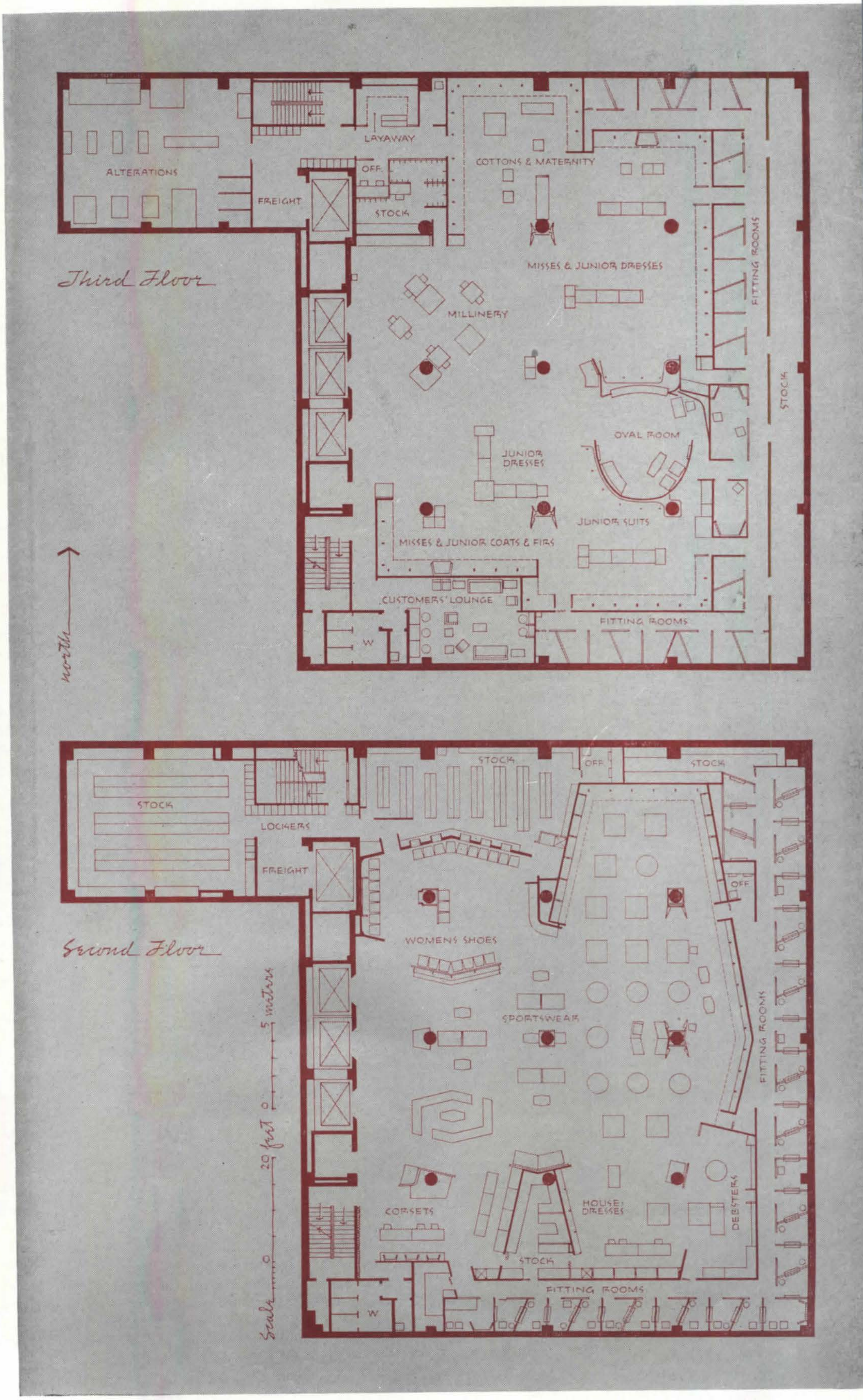
Flexibility In Air Conditioning: All mechanical equipment is located in the penthouse, from which a central station unit supplies air for the entire building. From the penthouse, air temperatures are controlled by a central panel board. Round ducts of constant size are spaced to give complete coverage of all floors. After departments, lights, and partitions were established, special bipressure diffusers were attached to the bars of the metal-pan system. The diffusers were then connected to the supply duct by flexible tubing connectors. After that, air could be delivered inconspicuously through the perforations of the metal-pan ceiling.



Emphasis on flexibility has not resulted in a mechanical appearance: on the contrary, each department has its own highly personalized character.

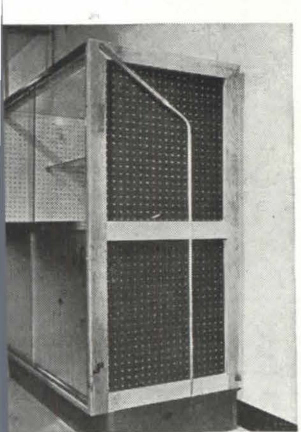
Lounges (above left) *are comfortably and attractively furnished. Shades of blue, soft grays, sandy tans, and touches of bright orange are used here and throughout the store.*





Third Floor
ALTERATIONS
LAYAWAY
FREIGHT
OFF.
STOCK
COTTONS & MATERNITY
MISSES & JUNIOR DRESSES
FITTING ROOMS
MILLINERY
STOCK
OVAL ROOM
JUNIOR DRESSES
JUNIOR SUITS
MISSES & JUNIOR COATS & FURS
CUSTOMERS' LOUNGE
W
FITTING ROOMS
north
Second Floor
STOCK
STOCK
OFF.
STOCK
LOCKERS
FREIGHT
OFF
WOMENS SHOES
SPORTSWEAR
FITTING ROOMS
CORSETS
HOUSE DRESSES
DEBSTERS
STOCK
FITTING ROOMS
W
Scale 0 20 feet
0 5 meters

department store



By removing perforated-metal pans (above), *access may be gained to air-conditioning ducts, electric and telephone lines. Lighting fixtures conform in size to the ceiling grid and may be relocated as necessary.*
Photo: Newman Kraft Studio

All casework (left *and* below) *is based on a 4′ module, for ease of construction and complete flexibility.*
Photos: Robert R. Blanch

Materials & Methods

construction

Foundation, frame, walls, floors, roof: concrete footings; steel frame: structural steel—United States Steel Corporation and Bethlehem Steel Company; walls: brick—Twin City Brick Company, granite—Cold Spring Granite Company, Incorporated, cellular-steel panels—H. H. Robertson Company, metal panels; concrete floors; steel roof deck—Ceco Steel Products Corporation. **Wall surfacing:** interior: marble, metal lath, and plaster; wainscoting—Northwestern Marble Corporation; rest rooms, toilets: glazed tile—Olean Tile Company. **Floor surfacing:** cork—Dodge Cork Company, Incorporated, asphalt tile—Tile-Tex Division of The Flintkote Company, rubber tile—American Biltrite Rubber Company, linoleum—Pabco Products Incorporated, marble—Northwestern Marble Corporation, carpet—Mohawk Carpet Mills, Incorporated. **Ceiling surfacing:** metal pan—The Celotex Corporation. **Roof surfacing:** four-ply tar and gravel—Barret Division of Allied Chemical and Dye Corporation. **Waterproofing and dampproofing:** membrane waterproofing. **Insulation:** acoustical: The Celotex Corporation, Owens-Corning Fiberglas Corporation; thermal: reflective insulation (periphery walls)—Infra Insulation, Incorporated, roof insulation—Insulite Division of Minnesota and Ontario Paper Company. **Drainage system:** cast-iron pipe. **Partitions:** lightweight-concrete block—Carter-Waters Corporation; plywood panels (back to back)—United States Plywood Corporation; sheet rock—United States Gypsum Company; marble — Northwestern Marble Corporation. **Windows:** glass and store fronts—Pittsburgh Plate Glass Company. **Doors:** hollow-metal interior doors—Trussbilt Division of Siems Brothers, Incorporated; overhead doors—Overhead Door Corporation; entrance doors—Flour City Ornamental Iron Company. **Hardware:** lock sets and door closers—Sargent and Company; other hardware—Capitol Hardware Manufacturing Company, Incorporated, Weber Show Case and Fixture Company, Incorporated, Garden City Plating and Manufacturing Company. **Paint and stain:** Pratt and Lambert, Incorporated.

equipment

Store fixtures: sixth floor—Equipment Manufacturing Company; fifth and fourth floors—St. Louis Fixture Company; remaining floors—H. J. Nelson Fixture Company. **Special equipment:** metal stockroom shelving—De Luxe Metal Furniture Company; sidewalk snow-melting equipment—Bell and Gossett Company. **Elevators:** passenger elevators and service elevator—Otis Elevator Company. **Lighting fixtures:** square, recessed ceiling fixtures—Branham, Mareck and Duepner, Incorporated; recess spotlights—Litecraft; Century Lighting, Incorporated; recess downlights—Century Lighting, Incorporated, Hub Electric Company; show window lighting—Curtis Lighting, Incorporated; special fixtures—Charles A. Anderson; special spinnings (first floor)—Branham, Mareck and Duepner, Incorporated. **Electrical distribution:** high-voltage switch gear—S and C Electric Company; secondary circuit breakers—BullDog Electric Products Company; distribution panels—Trumbull Electric Department of General Electric Company; disconnect switches—Square D Company. **Plumbing and sanitation:** water closets, urinals, lavatories—Eljer Company; gas water heater—Sellers Company; storage tank and heater—Patterson-Kelly; sprinkler heads—Reliable Automatic Sprinkler Company; water cooler—Filtrine Company; drinking fountains—Crane Company; water softener—Infilco Company; service sinks—Eljer Company; condensation pump—C. A. Dunham Company. **Heating and air conditioning:** unit heaters—C. A. Dunham Company; cooling coils—McQuay, Incorporated; fans, motors—Westinghouse Electric Corporation; centrifugal compressor—Carrier Corporation; pumps—Peerless Pump Division of Food Machinery and Chemical Corporation; fluid drive—American Blower Corporation; isolators—The Korfund Company, Incorporated; filters—Trion, Incorporated; controls—Minneapolis-Honeywell Regulator Company.

high-frequency fluorescent lighting:

what it may mean to the architect

by J. H. Campbell and J. L. Tugman*

The purpose of this article is to review and compare fluorescent lighting of today with a system of lamp operation which may have a far-reaching effect on tomorrow's plans for general lighting. The operation of fluorescent lamps on power frequencies higher than 60 cycles has been studied for a number of years and special applications such as airplane, motor coach, and experimental plant-growth lighting have resulted. Periodic reports in the form of articles or technical papers have been made to keep industry informed of the status of this promising development.

In her article, "Fluorescent Lighting: What Frequency Is Most Suitable?" (*March 1953 P/A*), Domina Eberle Spencer discussed the benefits of high-frequency power as compared to the present 60-cycle system. We wish to commend Dr. Spencer on her excellent approach to this subject and for her foresight in disseminating this information directly to the architect, who should be kept informed of new developments in the important field of lighting.

Our investigation[1] of high-frequency operation of fluorescent lamps included comprehensive tests to determine lamp characteristics at various frequencies. Circuits were also developed for use on the new system. This work is currently progressing toward a practical solution of the many problems involved in converting 60 cycles to the desired frequency.

The increase of fluorescent lighting in the past few years has been little less than sensational—even to the most optimistic illuminating engineers who helped design the lamps, circuits, and fixtures. Architects have made good use of fluorescent lighting by adapting this new lighting tool to a wide variety of applications. By designing new interiors and exteriors to take maximum advantage of available fluorescent equipment, they have demonstrated the power of lighting as a creative resource. It would be far from the truth if anything said here gave the impression that the expansion of fluorescent lighting was accomplished by merely introducing this new light source to the market. The principle of operation alone demanded control devices which were not required by the filament lamp. Since these devices form an integral part of the lamp circuit, fixture manufacturers had to produce a physical design incorporating all of the necessary components and wire each type in accordance with the electrical circuit requirements. With the introduction of new lamps and ballasts, it became increasingly more important for the architect and electrical contractor to be familiar with many details in order to select properly the components of the lighting system to match each application. The fact that the fluorescent lamp has surpassed all other sources in the production of light is ample proof that the various professional groups have sought maximum utilization of the lighting tools available.

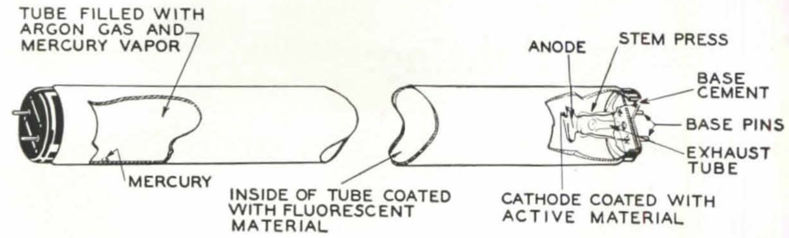
One of the important factors in the economics of fluorescent lighting is the size, weight, and cost of the auxiliary equipment. At present, the circuit components are responsible for 10 to 50 percent of the cost of the luminaires. However, simplification of fluorescent circuits and the corresponding components has resulted in advantages other than reduction of over-all cost.

In the brief history of fluorescent lighting many improvements have been made in the lamp, circuits, components, and luminaires. However, a reduction in cost or an increase in efficiency does not always follow after a simplification in the circuit is made. In the process of eliminating starters, for example, the first instant-start ballast was considerably larger, heavier, and more costly.[2] In addition, the losses in the ballast were increased so that over-all efficiency was lower. But improvements soon followed. The development of the sequence-starting series circuit resulted in considerable gain on all counts, and the present rapid-start lamp and ballast now provide the advantages of starterless operation at approximately the same over-all cost as the starter type.

Unless a radical change can be made in the present characteristics of fluorescent lamps, the ballast designer will soon reach a limit beyond which no further simplification or reduction of ballast size, weight, and cost can be made. The limiting factor is our present 60-cycle power system. To comprehend why this is so, it is necessary to understand a few of the inherent characteristics of a fluorescent lamp.

When lamp electrodes are preheated by means of a series starting switch, thermionic emission takes place (*Figure 1*).

* *Lamp Division, Application Engineering Department, General Electric Company, Nela Park, Cleveland, Ohio.*



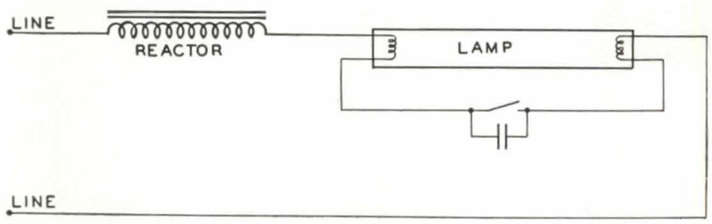
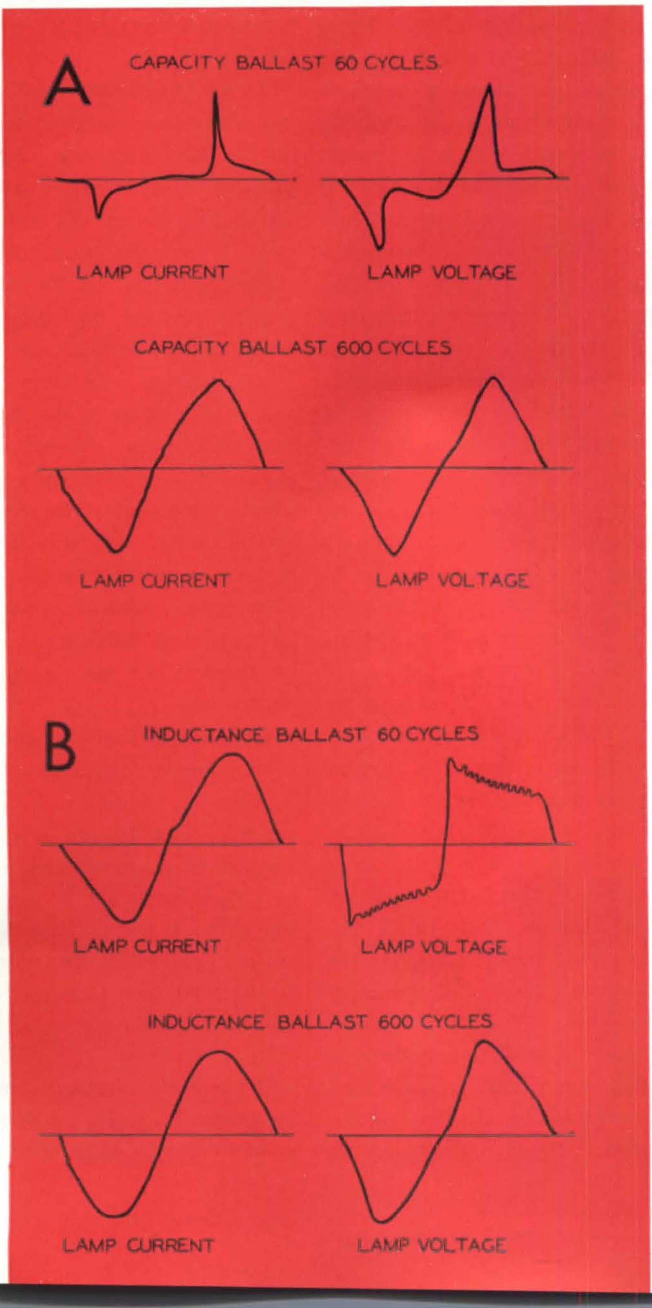


Figure 1—typical fluorescent lamp with starting and operating circuit.

Figure 2



The argon or krypton starting gas and mercury vapor becomes ionized because of the collision of electrons with gas molecules. Ionization reduces the resistance of the arc path, thus preparing the lamp for starting. Starting takes place when sufficient voltage is applied between electrodes to start and maintain the arc. In the case of the starter-type circuit (*Figure 1*), the line voltage plus the surge voltage, developed when the switch opens, causes the lamp to start. Fluorescent lamps can be started without electrode preheat by increasing the applied voltage until free electrons are accelerated sufficiently to produce a cascade of ionization with subsequent current conduction and eventual arc discharge. This is the method by which lamps on instant-start ballasts start.

Regardless of the starting method, each lamp must have some form of impedance in series to control current. Since a mercury arc has a negative resistance characteristic, the lamp will pass as much current as the ballast will allow. In practice, the impedance of the ballast is predetermined for the optimum current specified by the lamp manufacturer. With standard 60-cycle power the ballast generally consists of a step-up transformer to provide starting and regulating voltage and a series choke coil, or choke coil and capacitor, to control current. These components can be made smaller and more efficient as power-line frequency is increased. At a frequency of 300 cycles or higher it is practical to use a simple capacitor as a ballast. The capacitor is only a small fraction of the weight of a 60-cycle choke coil, makes an excellent regulator of current, and is much more efficient.

Why the capacitor can be used as a ballast at high frequency but makes a very poor ballast at 60 cycles is shown (*Figure 2A*). Referring to the oscillograms of lamp voltage and current for 60 cycles, the lamp conducts current for a relatively short period each half cycle, resulting in low lamp efficiency and pronounced flicker. At the higher frequencies, in this case 600 cycles, the current wave shape improves and lamp effiiciency increases. The corresponding wave forms for the choke-coil ballast at both high and low frequency are shown (*Figure 2B*).

The over-all circuit efficiency of the two types of ballasts operating a 40-watt fluorescent lamp over a range of 60 to 600 cycles are compared (*Figure 3*). The points on the curves are made relative to choke-coil operation at 60 cycles as 100 percent. From these curves it is easily seen that it is possible to have a small low-cost ballast with sufficient gain in circuit efficiency to allow for losses in frequency conversion.

If there had been a choice of frequencies at the time the fluorescent lamp was developed, there is little doubt that a frequency higher than 60 cycles would have been chosen. However, since this was not the case, steps were taken early in the high-frequency project to develop a suitable converter. There are at least three methods by which 60-cycle power can be converted to higher frequency: rotary converters (motor generator), electronic (thyratron converter), and magnetic frequency-multiplier. Of the three systems, the rotary is the oldest and lowest in initial cost and will no doubt be used in many fluorescent-lighting installations. The electronic or thyratron type may be developed for low power, but it is thought that tube replacement cost may offset the advantages where power demands are large. The static-type converter or magnetic frequency-multiplier as it is now called, was developed for high-frequency fluorescent lighting. This equipment has no moving parts or electronic tubes and can, therefore, be treated as a transformer. In its present stage of design, the initial cost is such that only special applications have been made. However, promising new designs may result in lower costs. Subsequent use of this equipment for general lighting—particularly industrial, office, and store installations—are expected to follow.

In order to understand the features of the high-frequency system which look so attractive to the illuminating engineer, let us examine the characteristics of the various components and then compare these features with our present 60-cycle system.

the lamp

When the frequency of the power supply is increased, lamp efficiency is increased.[3] This is due to the reduction of end losses at the higher frequency. End losses for

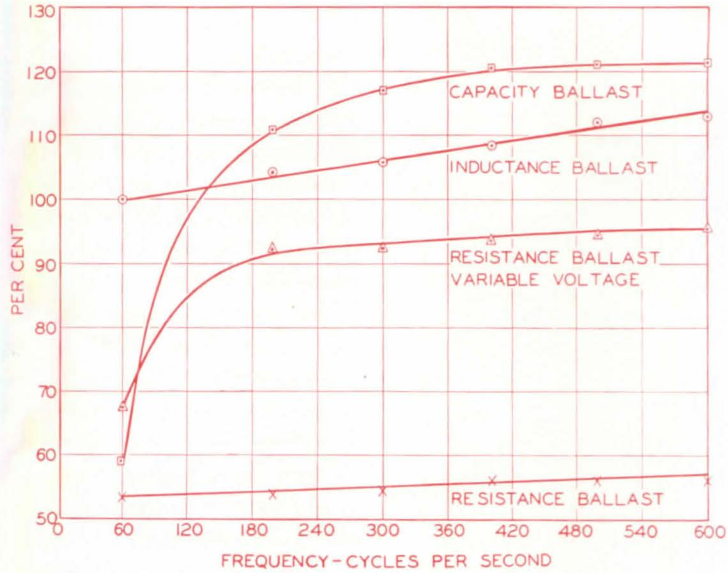
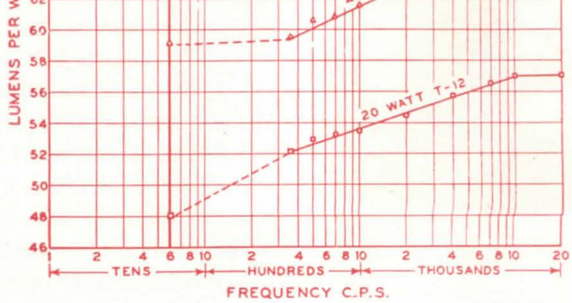
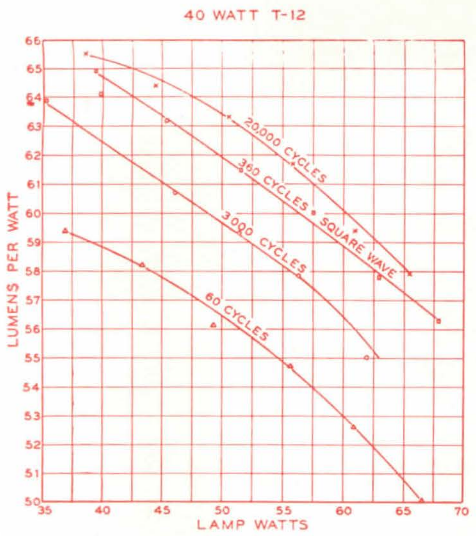


Figure 3—relative over-all luminous efficiency for 40-watt lamp with inductance, resistance, and capacitor ballasts.

Figure 4—lamp efficiency v. frequency for constant lamp watts, plotted in a family of curves for common lamp diameters ($T\text{-}12 = 1\frac{1}{2}''$).





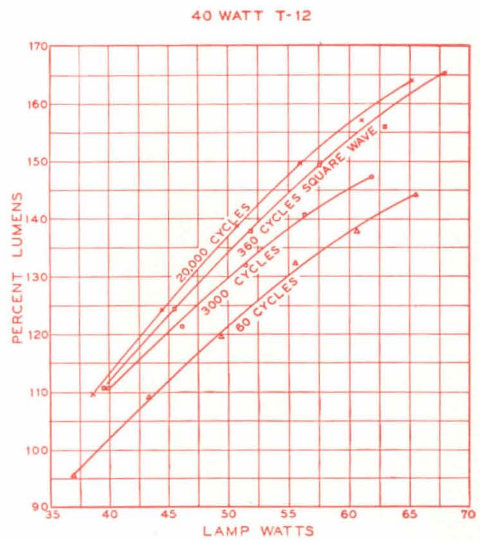


Figure 5—lamp efficiency v. lamp watts, comparing 60, 3000, and 20,000 cycle sine waves with 360-cycle square waves (top).

Figure 6—lamp lumens v. lamp watts, comparing 60, 3000, and 20,000 cycle sine waves with 360-cycle square wave (above).

lamps alike in all respects except length are equal, and are made up of the potential drop at the cathode, the potential drop at the anode, and the IR drop across the filament portion of the electrodes.

Lamps operating at 60 cycles will have cathode drops of 10 to 15 volts, anode drops of 3 to 6 volts, and electrode filament drops of 2 to 3 volts. If all the end losses of a 40-watt lamp were eliminated, the increase in lamp efficiency would be approximately 20 percent. The curves (*Figure 4*) show the increase in efficiency with frequency. Lamp watts were held constant throughout the frequency range, consequently it is assumed that reduced end losses make more of the total watts available for light production.

The 40-watt lamp shows a gradual gain in efficiency with a maximum of 12 percent at 20,000 cycles. In practice it would be difficult to retain this advantage because of the cost of generating and distributing power at 20,000 cycles. Perhaps a compromise to 3000 cycles, as suggested by Dr. Spencer,[4] would be practical, but the small gain in a further reduction of ballast size over a lower frequency, such as 400 cycles, could easily be overcome by the higher cost of generating and distributing 3000 cycles. Final judgment as to the best frequency for rotating equipment must necessarily await a more complete study of over-all economics.

In our investigation of lamp circuits for use at high frequency, it was discovered that the magnetic frequency-multiplier could be conveniently made to produce a square current wave. Further tests showed that a frequency as low as 360 cycles with a square current wave form would produce lamp efficiencies equivalent to 7000 cycles sine wave. The lower frequency can then be distributed economically with conventional 60-cycle wiring.

The family of curves (*Figure 5*) shows the comparison of lamp watts versus lamp efficiency in lumens per watt for 60, 3000, and 20,000 cycles sine wave and 360-cycles square wave. If the lamp is operated at 40 watts, a 3000 cycles sine wave will produce a gain of 6 percent in efficiency whereas a 360-cycle square wave produces a 10 percent gain. It is also important to note that a 40-watt lamp can be operated at 60 watts on a 360-cycle square wave and still retain the same efficiency as 60-cycle operation at only 40 watts.

High-frequency power provides the opportunity to operate our present line of lamps at considerably greater light output. The curves (*Figure 6*) show the relationship of lamp watts versus percent lumens for various frequencies. If a 40-watt lamp is operated at 60 watts 360 cycles square wave, an increase of 54 percent in light output over the present 60-cycle rating is realized. To approach this same increase at 60 cycles it is necessary to redesign the lamp and provide a larger and more expensive ballast.

lamp circuits

The ballast circuits for high frequency are similar to those used at 60 cycles, but the components can be considerably smaller. A group of circuits representing various methods for starting and operating fluorescent lamps is shown (*Figure 7*). The choice of circuit will depend upon the method of frequency conversion and the magnitude of distributed voltage. For example, if the required starting voltage is distributed to the lamp load from a rotary-type converter, Circuits A and B would be used alternately in two-lamp fixtures to obtain high power factor and secure maximum utilization of the generator kva rating. If starting voltage is distributed by means of the magnetic frequency-multiplier, then Circuit B with a simple series capacitor would be used exclusively. Circuits F and G would be used where only the voltage required for regulation is distributed to preheat-type lamps. The element in parallel with the lamp provides preheat current and at the same time raises the voltage to that required for starting. Circuits B and C are convenient to apply to slimline lamps which cannot be preheated and where it is desirable to distribute a low voltage.

ballasts

It has been previously mentioned that ballasts become smaller as frequency increases. If we use a rotary converter, to produce 400 cycles, the size of an instant-start ballast will be approximately 1/5 the size and weight of the 60-cycle equivalent. If a magnetic **frequency-multiplier** is used, a capacitor **weighing** only about 1/25 of a conventional **ballast** is employed. (*Figure 8 shows the size comparison.*)

In addition to the small size of the high-frequency ballast, we have a considerable gain in ballast efficiency. Most 60-cycle ballasts have a watt loss of about 20 percent of the lamp load. A choke-type ballast at 360 cycles can be designed for a loss as low as 10 percent, but a capacitor ballast at the same frequency has a loss of only 2 percent. (*Table I shows the comparative circuit efficiency of various lamp and ballast combinations with 60 cycles in each case taken as 100 percent.*) Converters designed for efficiency in the range of 72 to 85 percent will, therefore, provide an equal over-all efficiency with 60-cycle systems.

luminaires

The 360-cycle square wave system allows fixture manufacturers complete freedom of design insofar as size, weight, and thermal losses are concerned. An experimental 2-lamp, 96″ T-12 fixture has been designed using two 3-oz 360-cycle capacitor ballasts. The ballast channel was eliminated and lightweight aluminum used for the reflector, making a total weight of 7½ lb. Compare this with a 2-lamp, 96″ T-12, 60-cycle fixture containing a two-lamp ballast weighing 13 lb, a continuous channel to house the ballast and wiring, and a heavy-gage steel reflector—making a total weight of 40 lb.

In addition to lightweight fixtures, it is possible to obtain over 50 percent more light in the 360-cycle system by operating the lamps at higher wattage with little increase in size and weight of ballast. Ballast losses are three watts for the above 360-cycle fixture and 28 watts for the above 60-cycle fixture. In plants or offices where thousands of fixtures are in use, these losses become a factor in calculating the capacity of air-conditioning systems.

applications

High-frequency fluorescent lighting is now being applied in a number of special applications.[5] Until recently, most

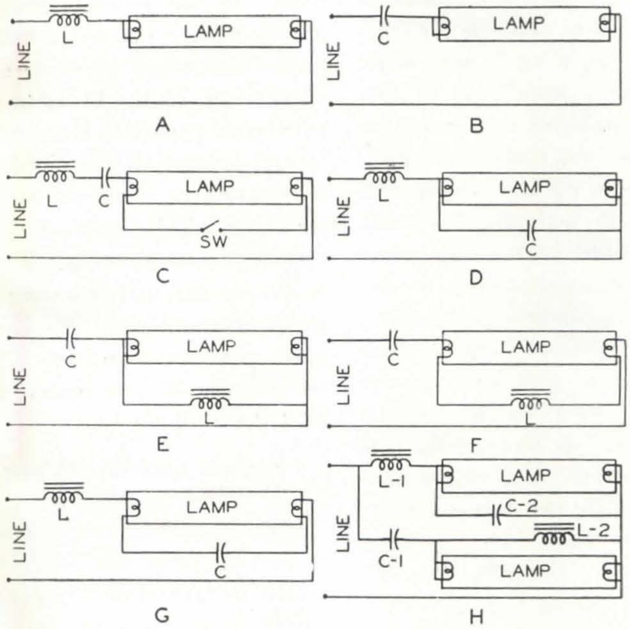


Figure 7—circuits for operating fluorescent lamps at high frequency.

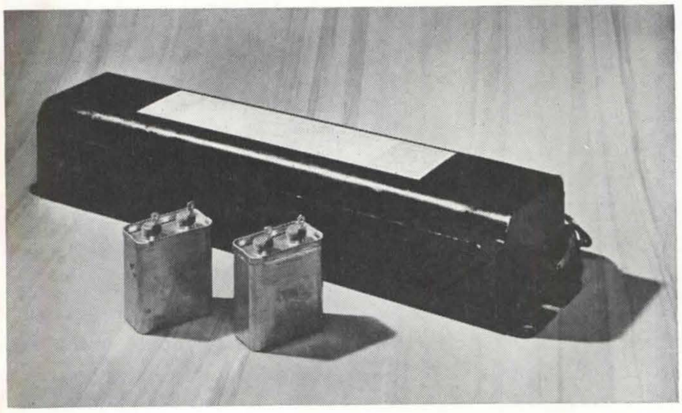


Figure 8—size comparison: 360-cycle v. 60-cycle 2-lamp 96″ T-12 ballasts.

Table I: Comparative Over-All Circuit Efficiency

Lamp	60 cycle over-all efficiency in percent	360 cycle ballast	360 cycle over-all efficiency in percent
90WT17	100	capacitor 150 v	115-125
96T12	100	capacitor 600 v	120-125
40WT12	100	capacitor 400 v	124-131
96T8	100	capacitor 600 v	128

applications were in locations where high frequency power was available for other purposes such as aircraft and motor coaches. The first installation of 360-cycle lighting employing a magnetic frequency-multiplier was made at the Plant Industry Station of the U. S. Department of Agriculture in Beltsville, Maryland. This made an excellent beginning since all of the advantages of the system were needed to meet the desired specifications.

Plant physiologists at Beltsville have been experimenting with plant growth using artificial light on a carefully planned schedule.[6] It was necessary to provide each growth room with a maximum growth of light radiation obtainable with even distribution over the plant growth area. To accomplish this, 96″ T-8 lamps were spaced 1 in. apart and located 4 ft above the surface of the flats. The first rooms were operated on 60 cycles using conventional 300 ma ballasts. It was necessary to locate the ballasts outside the room because of space limitations and the desire to eliminate the long-wave infrared resulting from ballast losses. In order to bring power to the lamp load, it was necessary to use a cable containing one common lead and one wire for each lamp. In one room the cable consisted of 89 wires. (*Figure 9 shows one of the 60-cycle rooms and Figure 10 the ballasts.*)

Through the use of the 360-cycle system it was possible to locate the small capacitor ballasts at each lampholder. Then only two wires were required to bring power from the converter to the entire lamp load. (*Figure 11 shows a section of the fixture installed in the growth room.*) Two 5 kw magnetic frequency-multipliers were located in a transformer vault. In addition to the advantages previously mentioned, a small control located on the multiplier panel is used to vary the output current of the multiplier. This made it possible to operate lamps at currents from 250 ma to 550 ma and vary light output accordingly. The 360-cycle room provided a range of illumination from 1600 to 2400 ft-c whereas 60-cycle rooms had a fixed level of 1600 ft-c.

magnetic frequency-multiplier advantages

(1) Low maintenance. Since there are no moving parts, the device should be nearly as maintenance free as a transformer.

(2) Produces square current wave. Lamp advantages as described (*Figures 5 and 6*).

(3) Converter can be located in transformer vault.

(4) Output current can be regulated. Simple control at panel can be used to increase or decrease current to lamp load.

(5) High efficiency (approximately 75 percent).

magnetic frequency-multiplier limitations

(1) The present installation requires 3-phase power input—probably a disadvantage in outlying districts or small installations. (A single-phase multiplier can be designed.)

(2) Higher initial cost. At this writing, the multiplier cost is considerably greater than 60-cycle ballasts for the same load.

360-cycle system advantages

When the advantages of the magnetic frequency-multiplier are coupled with the previously reported fluorescent lamp gains, we have the following 360-cycle system characteristics:

(1) Lighter weight fixtures. Fixtures can be considerably lighter than with the 60-cycle system because of the use of ballasts weighing only a few ounces.

(2) Considerably less heat loss at the fixtures. With some slimline lamps the reduction in ballast loss amounts to 90 percent or more. In large installations there would be considerably less load on the air-conditioning system.

(3) More lumen output per lamp. In some installations it will be desirable to increase the lumen output of each lamp. The square current wave form developed by the magnetic frequency-multiplier is a large factor in obtaining the increased light output.

(4) Lumen output can be regulated. Lamp current can be increased or decreased by means of a simple control at the multiplier panel. This suggests a convenient way to make up for the depreciation in lamps and fixtures by merely adjusting each multiplier as the depreciation takes place. This would eliminate the need for cleaning fixtures until the lamps can be replaced as a group. After cleaning and relamping, the system could then be adjusted to normal lamp current and the cycle repeated.

(5) Silent operation. In many instal-

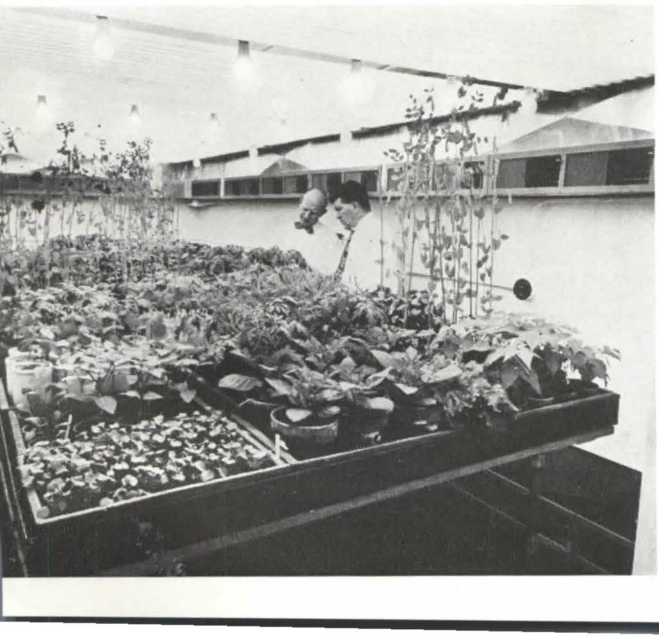


Figure 9—scientists at U. S. Dept. of Agriculture's Plant Industry Station, Beltsville, Md., shown with plants grown by radiation from fluorescent and filament lighting (left). *Figure 10—60-cycle ballasts located in adjacent hallway.*

lations such as libraries and television and radio studios, it is sometimes necessary to place 60-cycle ballasts in a remote position from the lighting installation in order to avoid hum. This requires at least one wire per lamp plus a common to deliver power to the fixtures. In the 360-cycle system the capacitor is silent during operation and the multiplier can be placed in the transformer vault where noise and heat dissipation are relatively unimportant. Only two wires are needed to deliver power to the lighting installation.

(6) Reduced stroboscopic effect. With a square current wave at 360 cycles, the decrease in light output each half cycle is so low that it is difficult to measure.

high-frequency system using rotary equipment

Rotary converters are comparatively low in cost and reliable in service. Consequently, it is expected that some large industrial or office installations will take advantage of the 400-cycle lighting system.

One installation to be completed this month involves a College Field House. The arena is equipped with 35 fixtures each containing 14 96″ T-12 fluorescent lamps. The system consists of two 30 kw package-unit rotary converters. The primary power source is 480 volts, 3 phase, 60 cycles and the secondary is 575 volts, 3 phase, 400 cycles connected to be under 300 volts to ground. The distribution system consists of a central panel board with only 14 circuits for the entire lighted area. Since 400 cycles as well as starting voltage is distributed, it is possible to use a simple series capacitor and series choke for ballast on alternate lamps. This split-phase circuit produces near unity power factor to obtain maximum utilization of the converter.

The advantage of lightweight fixtures is predominately important in this installation since the special 400-cycle, 14-lamp fixture weighs approximately 120 lb, whereas an equivalent 60-cycle fixture would weigh approximately 250 lb. Installation and lowering of the 400-cycle fixture for maintenance becomes considerably easier.

The standard 96″ T-12 slimline lamps are operated at 15 percent over their 60-cycle rating in watts but light output is 30 percent higher than the combination filament-mercury system generally specified for this type of installation.

summary

At the present time there are three practical methods for changing 60 cycles to a higher frequency: static system (magnetic frequency multiplier), rotating converters (motor generator sets—400 cycles or higher), and electronic converters (thyratron converter).

The magnetic frequency-multiplier was designed for use with fluorescent lamps. It has no moving parts and can be treated as a transformer. A control on the panel makes it possible to regulate current to the lamp load for maximum flexibility. At the present time, the initial cost, size, and weight of the converter are such that it is limited to special fields of application. However, developments now in progress may result in considerably reduced costs and an extension of the use of 360-cycle square wave fluorescent lighting.

The rotary converter is well known and has been in use since the turn of the century. In large sizes, this equipment is low enough in cost to provide an economical means of conversion and several installations have been planned.

Electronic converters may be developed for applications where small blocks of power are used to supply high frequency to fluorescent lamps.

With advantages such as higher efficiency, greater light output per lamp, simplified wiring, and lighter weight fixtures, it is expected that high frequency will offer the architect, builder, and user a lighting tool of great value.

references

[1] "High-Frequency Operation of Fluorescent Lamps" by J. H. Campbell, *Illuminating Engineering,* Vol. XLIII, 1948.

[2] "The Trend Toward Instant Starting of Fluorescent Lamps" by J. H. Campbell, *Electrical Engineering,* Vol. 70, No. 6, June 1951, p. 533.

[3] "Characteristics and Applications of High-Frequency Fluorescent Lighting" by J. H. Campbell, J. E. Shultz, and D. D. Kershaw. *Illuminating Engineering,* Vol. XLVIII, No. 2, February 1953.

[4] "Fluorescent Lighting: What Frequency Is Most Suitable?" by Domina Eberle Spencer, PROGRESSIVE ARCHITECTURE, March 1953, p. 118.

[5] "Special Circuits for Fluorescent Lamps" by J. H. Campbell, *Illuminating Engineering,* Vol. XLV, No. 4, April 1950.

[6] "2,000 Footcandles With Slimlines in High Frequency System for Underground Greenhouse" by J. R. Jolly, *The Magazine of Light,* Vol. 20, No. 3, 1951.

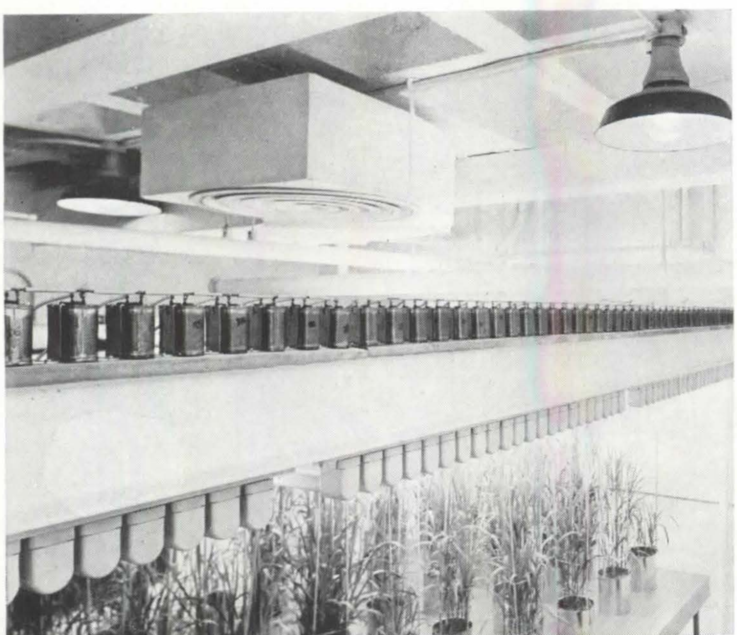
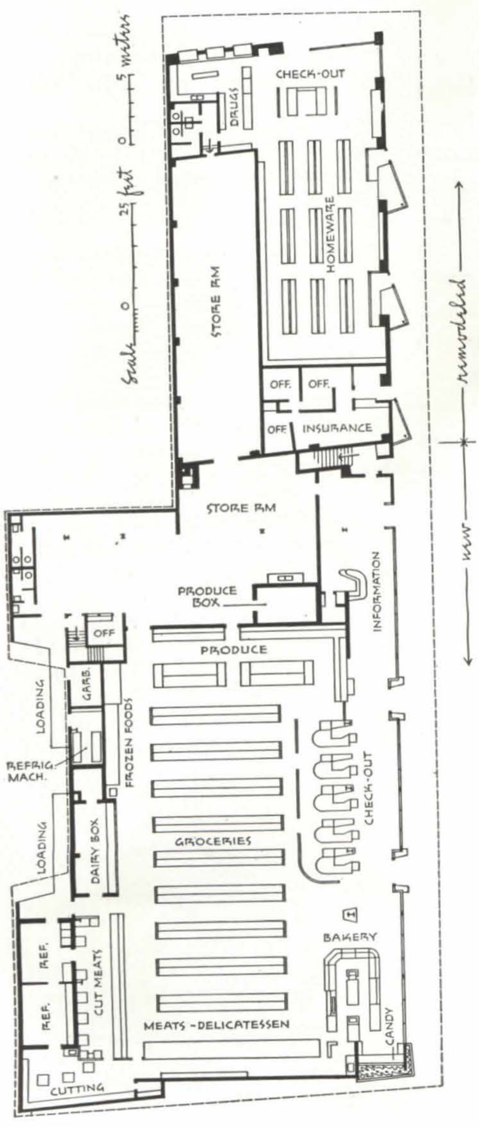
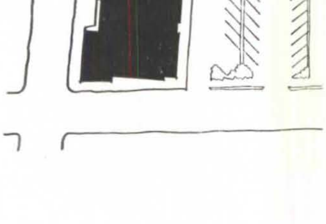


Figure 11—360-cycle capacitor ballasts on fixture in room equipped with high frequency.

co-op shopping center

location	Palo Alto, California
architects	Bolton White & Jack Hermann
structural engineer	Hyman Rosenthal
electrical engineer	Charles Von Bergen
mechanical engineers	Robert Bruen and George S. Erskine & Associates
general contractor	Howard J. White, Inc.



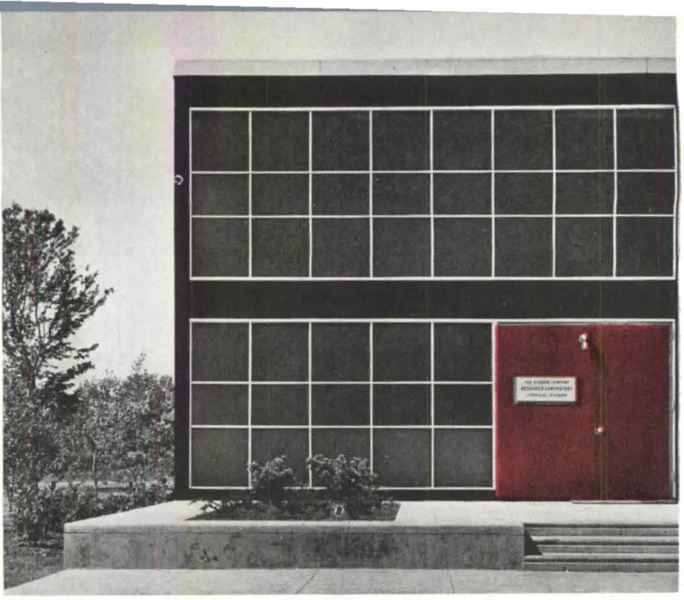


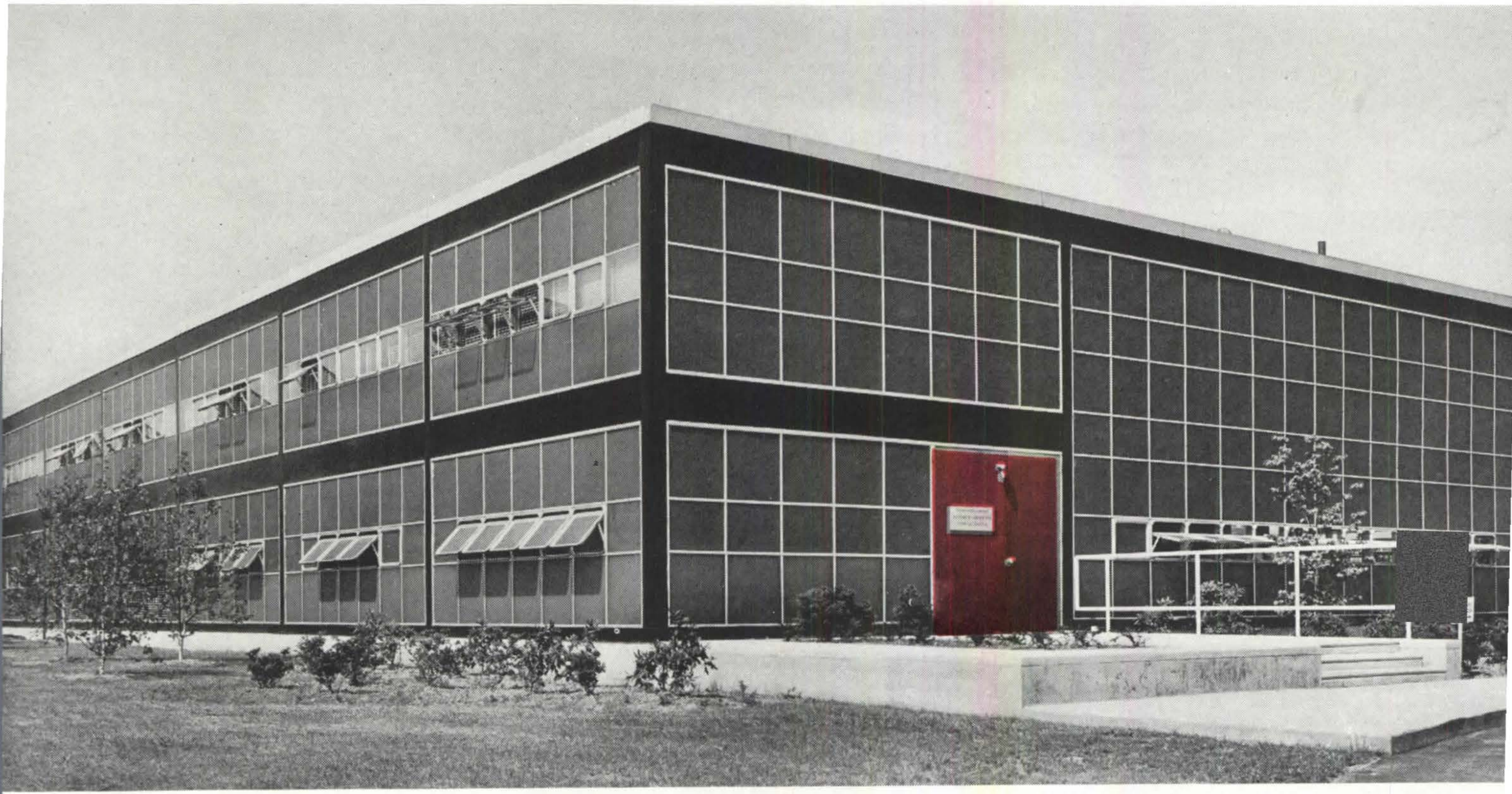
Another type of expanding enterprise is the co-operative undertaking, wherein consumers themselves form co-operative societies, set up their own enterprises, and share patronage refunds. The Consumers Co-operative Society of Palo Alto, Inc., owners of the shopping center shown here, is an excellent example of successful operation. Established in 1935 with but 35 pioneer members, the Society did a gross business in its first year of only $1090. Today, with more than 2000 members, who are the owners of five different enterprises, gross annual volume is approximately $1,500,000.

The new market structure is an addition to the former market, which was remodeled into the housewares and drugs departments, insurance department, and (upstairs) offices and co-op meeting room. The almost ideal site has streets on three sides. Parking runs from street to street, and service deliveries are handled from the third streetfront, wholly out of sight and with no conflict with customer traffic. Concrete was used for floor slab and (because of its four-hour fire rating) exterior walls. To enclose the tall, main market, a structural-steel rigid frame was used—and left exposed as a design motif. Asbestos-cement panels in both corrugated and flat-sheet form are used on portions of the exterior walls. Radiant floor heat warms areas where heating is required.

research laboratory

location	Philadelphia, Pennsylvania
architects	Skidmore, Owings & Merrill
consulting engineer	Harry H. Bond
general contractor	Wm. F. Lotz, Inc.



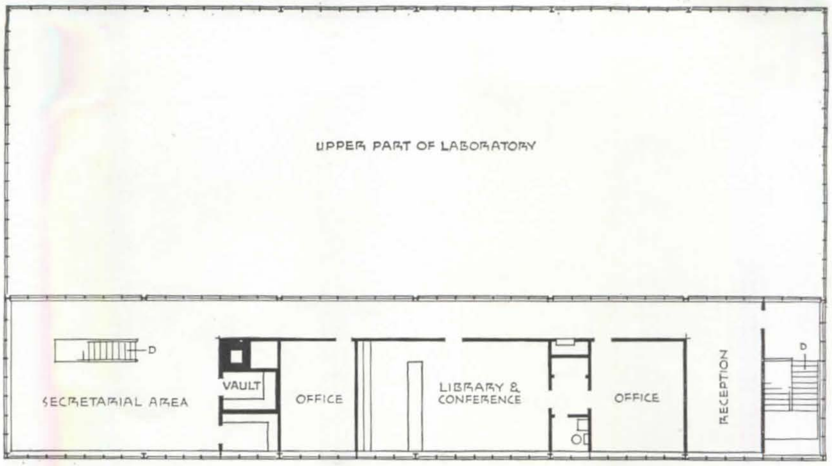


In any productive enterprise, laboratory research is fundamental to refinement of existing products and the discovery that leads to new ones. It is not surprising, therefore, that an increasing number of forward-looking organizations find it essential for business expansion to construct their own research laboratories.

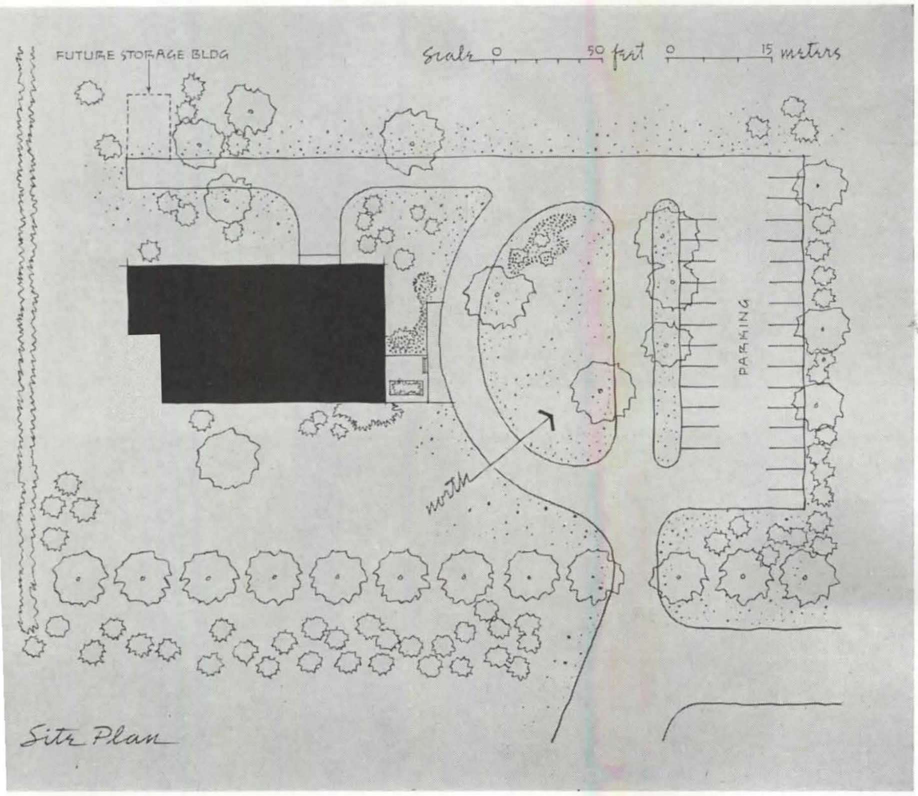
A distinguished recent instance is this unit for the Chemical Division of The Borden Company. Designed for study of the company products and their potential uses—and possibly to develop new ones—the building is placed well back on a spacious, landscaped area of the grounds of Borden's Philadelphia factory.

Structurally, the building consists of a steel frame, with concrete-arch floors and a poured gypsum roof on glass-fiber insulation. The modular filler walls are a patented aluminum-bar window system, with most panels of translucent, wired, blue (heat-absorbing) glass; transparent blue glass is used in the central units (out-swinging sash) along the long wall of the laboratory and bordering mezzanine offices. Exterior flanges of the black-painted steel columns are exposed on the long exterior walls of the building, while the ends of columns on the short walls and the fascia and girder areas are surfaced with steel plate; gravel stop is aluminum.

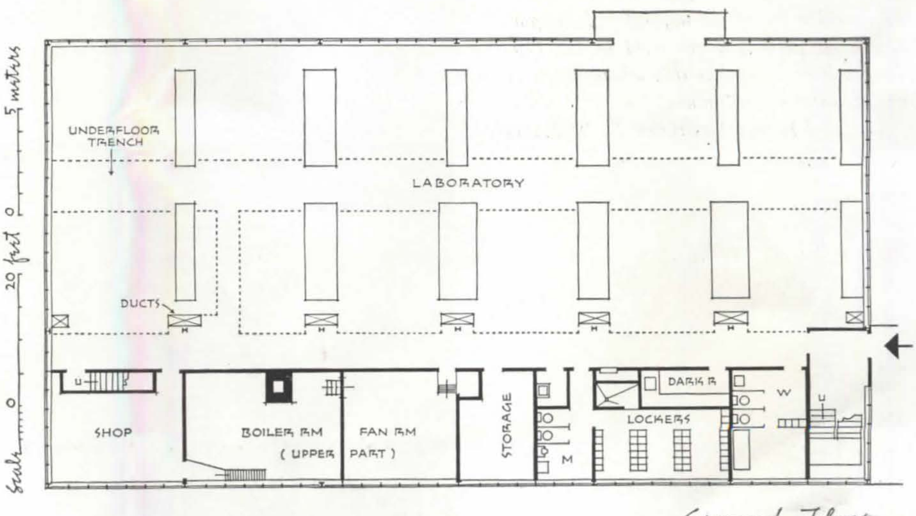
Mechanical services are available at each interior column (under the mezzanine) in the laboratory. With 20-ft column spacing, service lines can extend to bench equipment anywhere in the lab area. Steam finned pipe radiators heat the offices, utility spaces, etc., while unit heaters occur in the laboratory. Artificial lighting is fluorescent throughout.



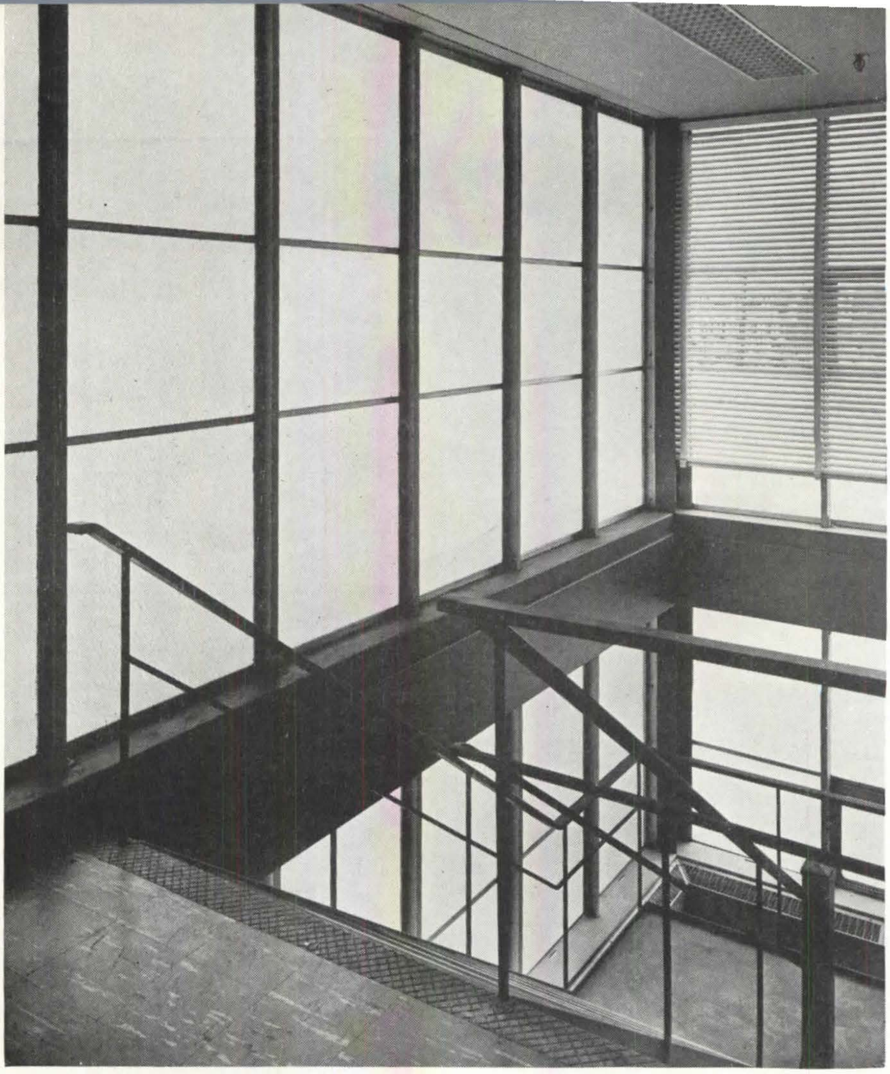
Second Floor

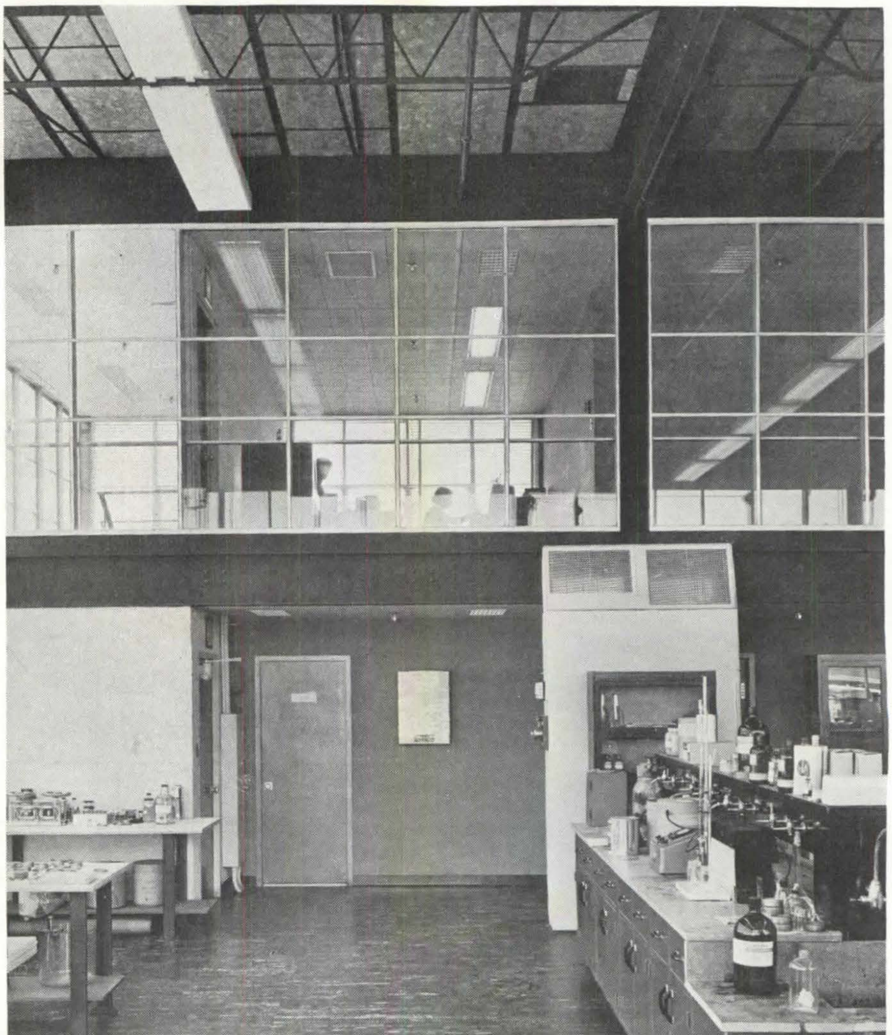


Site Plan



Ground Floor

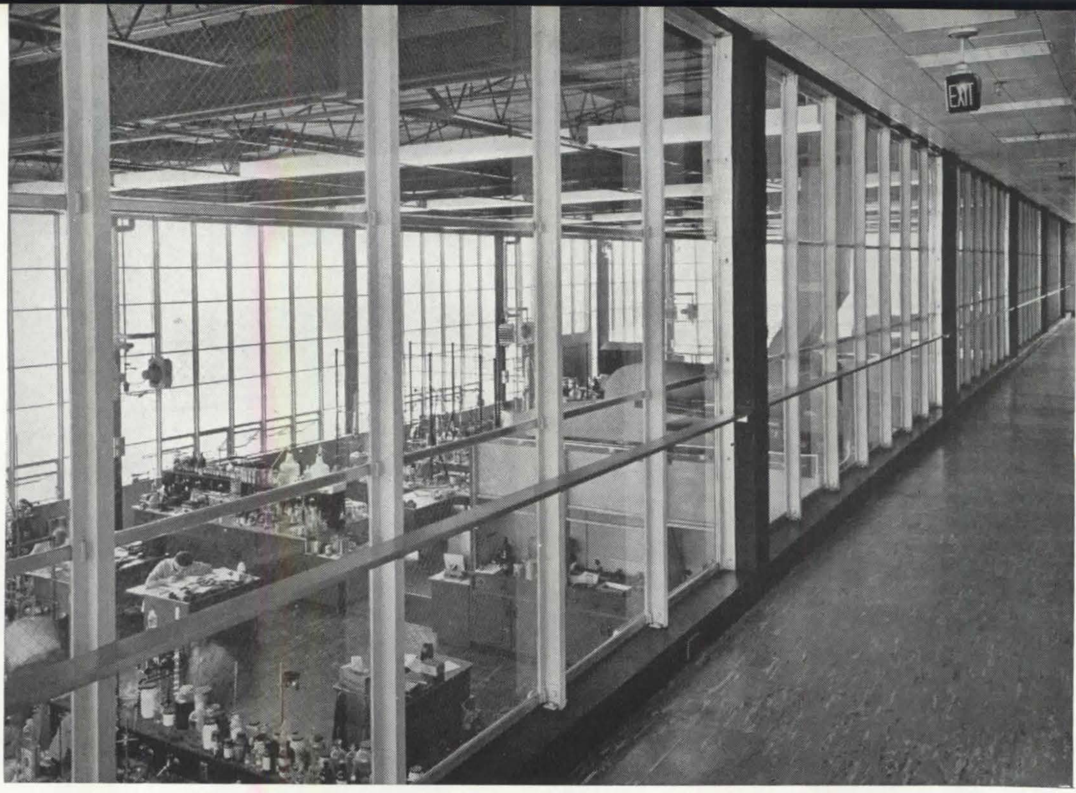


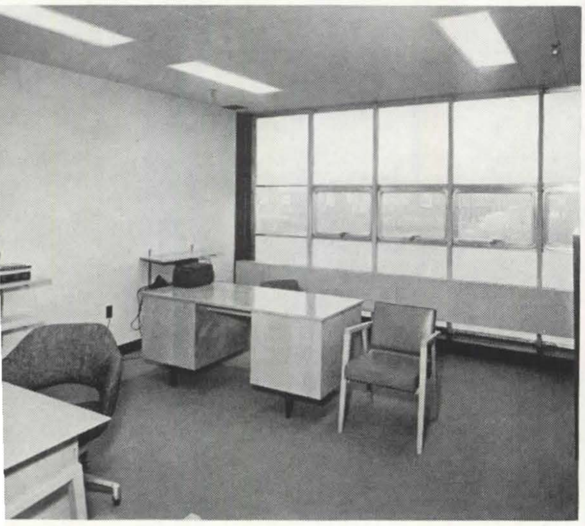


The typical wall of translucent, heat-absorbing, blue-glass panels, as in the mezzanine stair hall (top), *provides maximum light, yet protection from bright sunlight.*

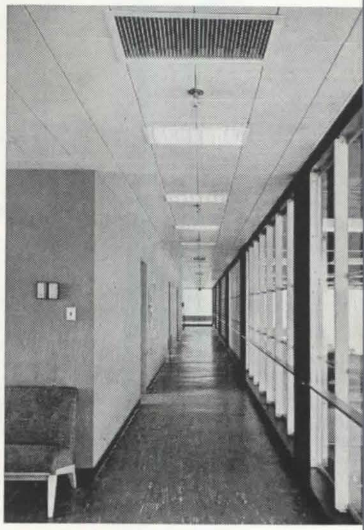
From the laboratory floor (bottom), *one looks up through the glass-walled mezzanine corridor to offices beyond. Clear-span joists 42 ft in length are used in the 120-ft-long lab area so that this whole space is free of interior columns.*

Photos: Lawrence S. Williams





The office-mezzanine floor is separated from the two-story laboratory area by no more than a corridor screen of clear wire glass. In all office spaces, ceilings are suspended acoustic tile; walls are plaster; flooring is asphalt tile.



studio and factory

location	Los Angeles, California
architects	A. Quincy Jones & Frederick E. Emmons
associate	Emiel Becsky
engineer	Richard Bradshaw
general contractor	Morris Pynoos

As industry expands, buildings needed to serve it become ever more specialized. This ceramics design-studio-display-room-factory is a remarkable instance. Sascha Brastoff, ceramicist, has here not only his own studio but also a display gallery for ceramic products, a factory, a large outdoor display yard for sale of "seconds," and a parking lot.

The full-city-block site is in an expensive industrial area bordered by a heavily traveled boulevard—a location justified by the considerable business transacted in the "seconds" yard. Approximately 30 percent of the area is for parking; the factory occupies 30 percent; the "seconds" yard, 20 percent; and office-display-studio, 20-percent.

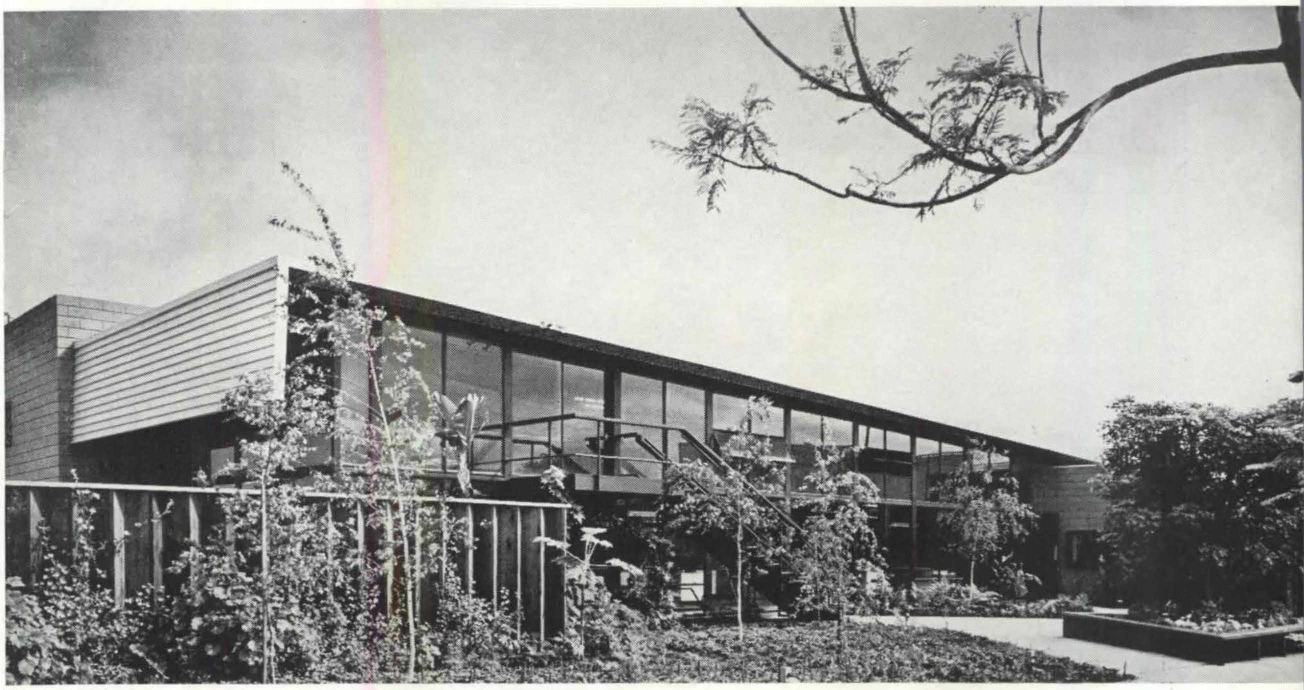
The factory is designed around use of inverted, tapered, steel beams that span from the exterior frame or concrete-block walls to a central row of pipe columns: wood roof joists frame into the webs of the beams. Finished composition roofing has a white reflective surface. The offices and studio are mainly frame and plaster, with some local stone veneer. The studio, however, is supported on steel pipe columns embedded in concrete footings. The factory portion cost \$4.75 per sq ft, including architects' fees; the office-studio area was built within the \$12-per-sq-ft budget.

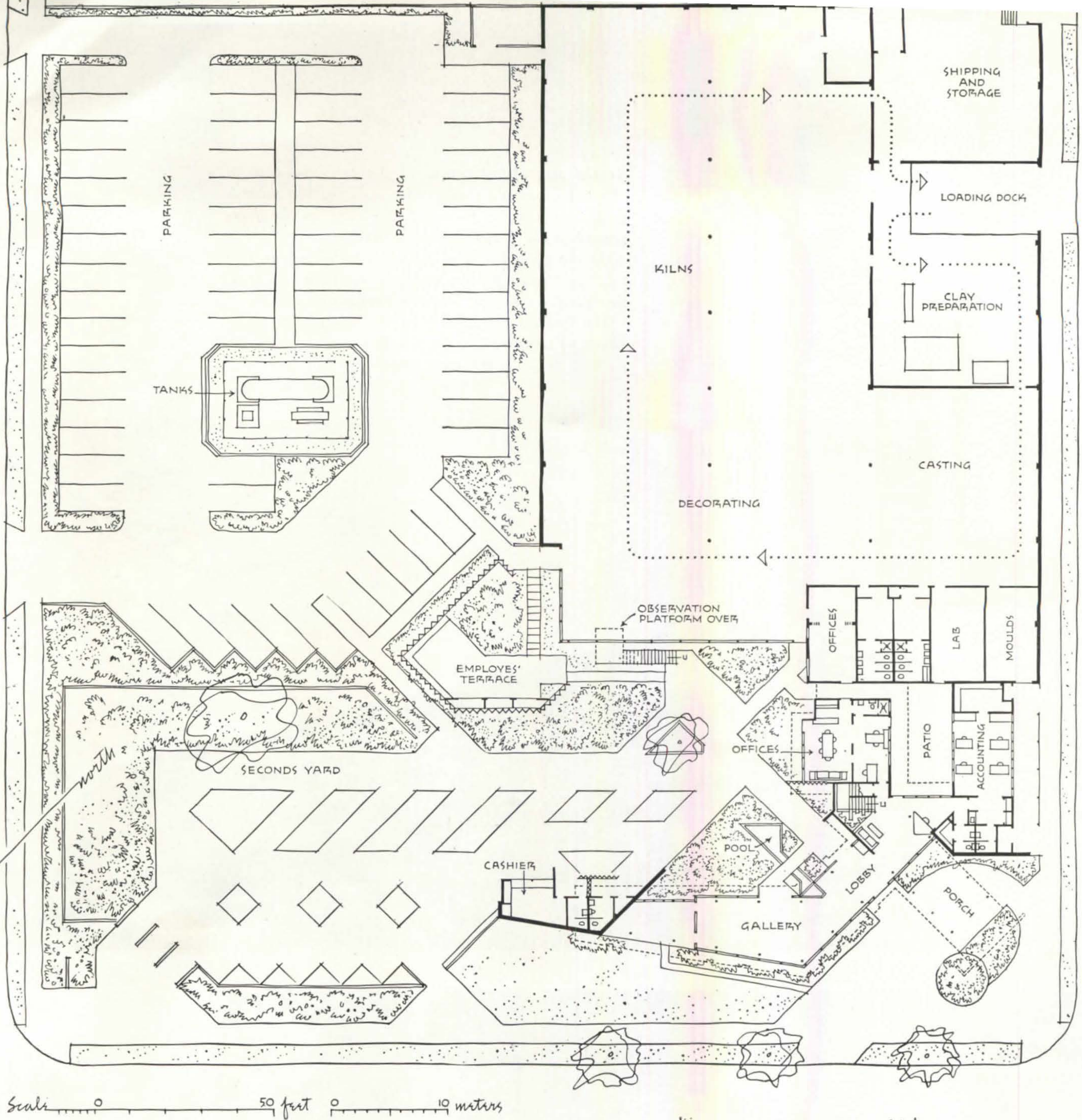
At the street-front corner of the property (across-page) *the owner's studio suite occupies the second-floor bridge unit; the one-story wing in the foreground is the ceramics-display gallery.*

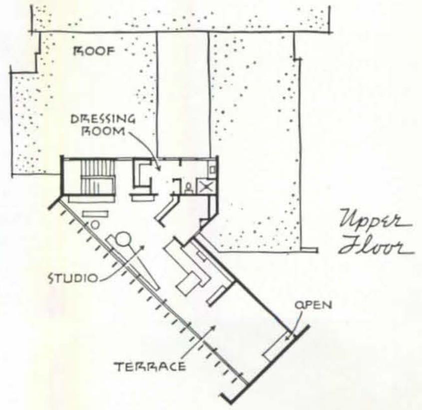
On the garden side of the factory (below) *an outside stair leads customer-visitors up to an observation platform overlooking the production area.*

The large, landscaped yard for sale of "seconds" (bottom) *borders the busy highway and is an important part of the enterprise.*

Photos: Julius Shulman

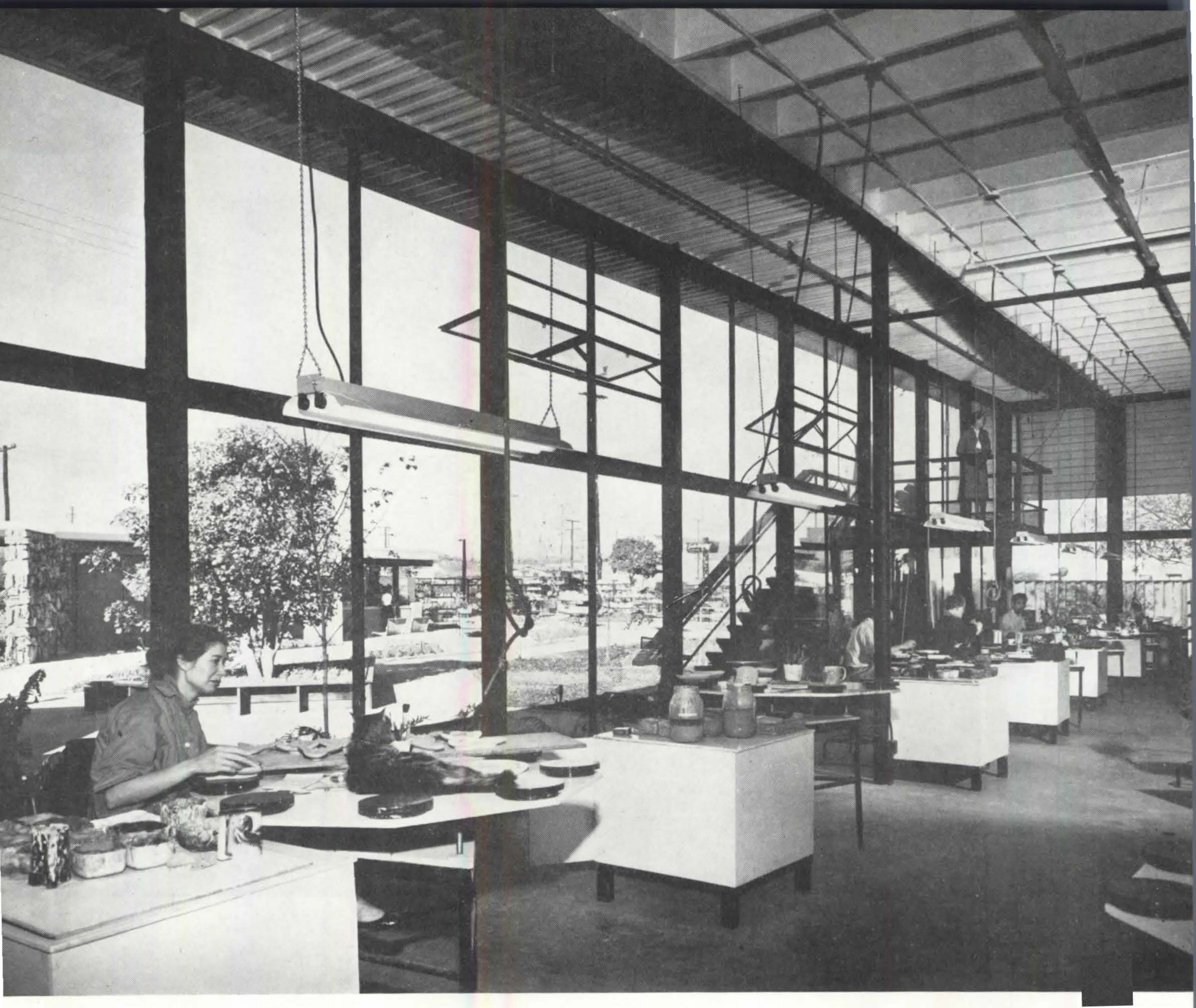






Enclosed by office areas is a private patio—a lunching and coffee-break spot for office personnel. For production personnel, a separate terrace and recreation area were provided.

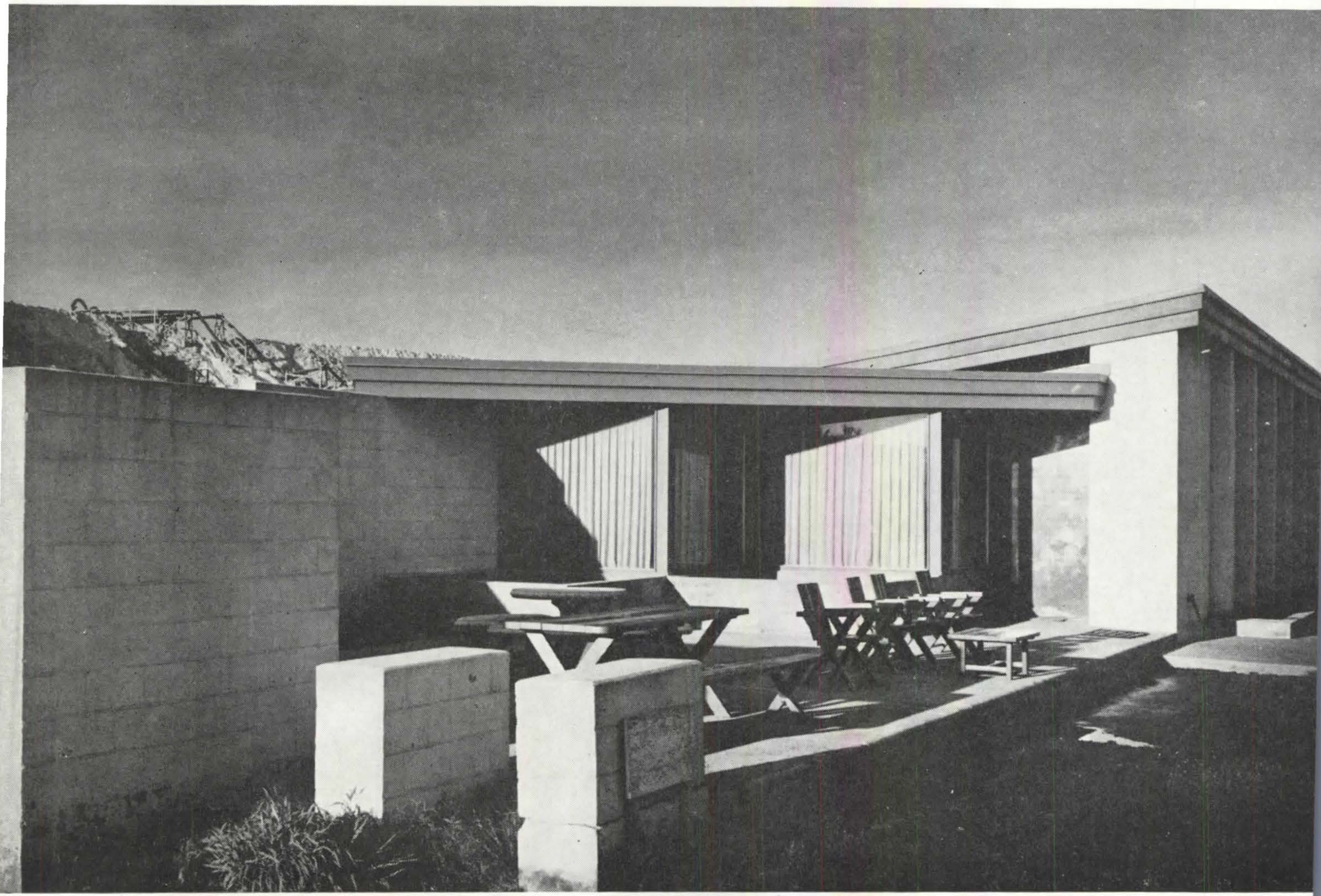
The owner's studio has a full glass wall facing northeast, broken at intervals by metal louvers that exclude early morning direct sunlight. A kitchenette unit, bath, and sleeping space are included, as Brastoff occasionally works intensively for days and nights in a row.



Along the windowed garden wall of the factory (above) *are the tables for glaze-application artists (decorators). Note visitors' observation platform in background.*

The long display gallery has windows on both sides—toward the boulevard (left) *and toward the central landscaped area* (right).

studio and factory



recreation building

location	Pasadena, Texas
architects	MacKie & Kamrath
structural engineer	Walter P. Moore
mechanical engineers	Cook & Holle
general contractor	Tech Construction Co.

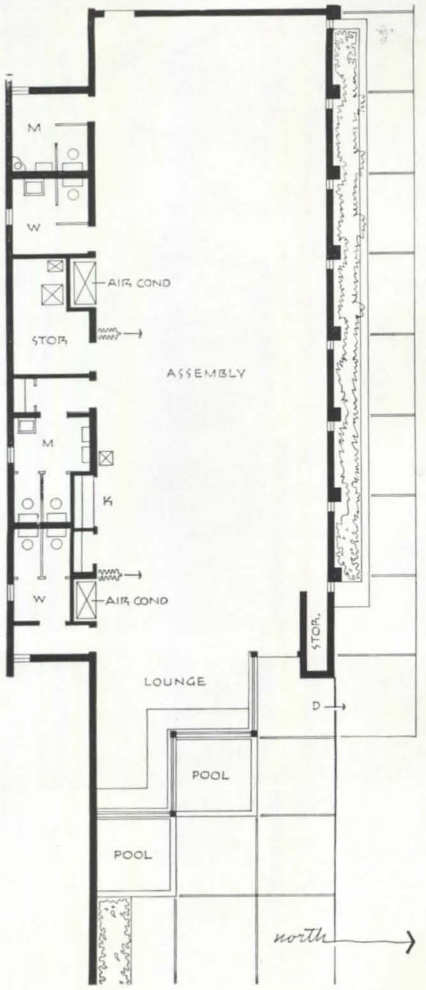
The managements of expanding enterprises are ever more appreciative of the importance of fostering and maintaining good relations with employes. Corresponding to this trend, the architect's work is of primary importance in designing healthful and cheerful settings for work. This company has gone one step further in providing its employes with a place to relax between work periods. Here, too, wives can call for their husbands at the end of the day and families can meet together for varied social and recreational purposes.

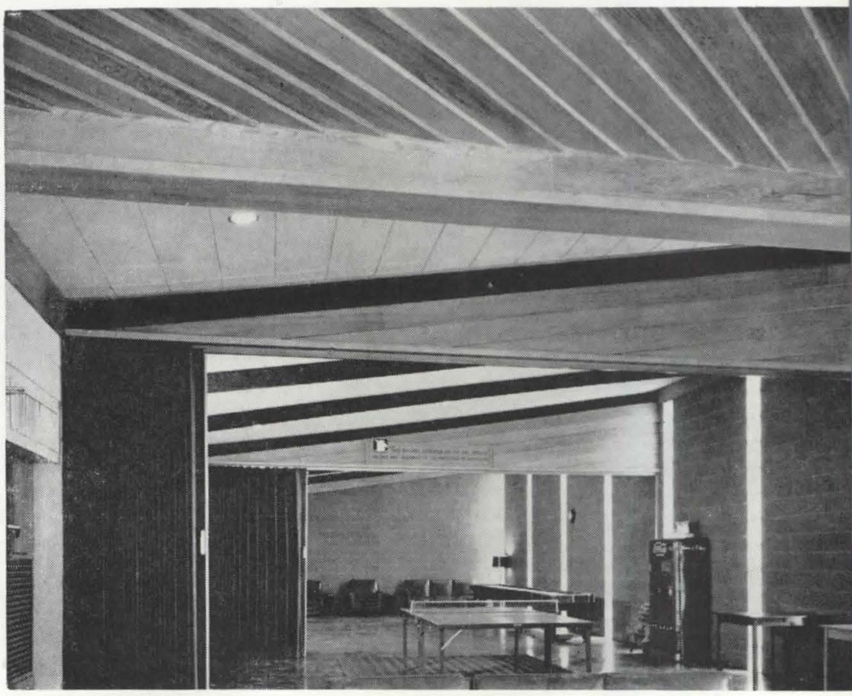
The building (*above*) located close to the Chemical Production plant, offers a large multipurpose assembly room, a lounge, rest rooms, and a terrace with comfortable seating facilities.

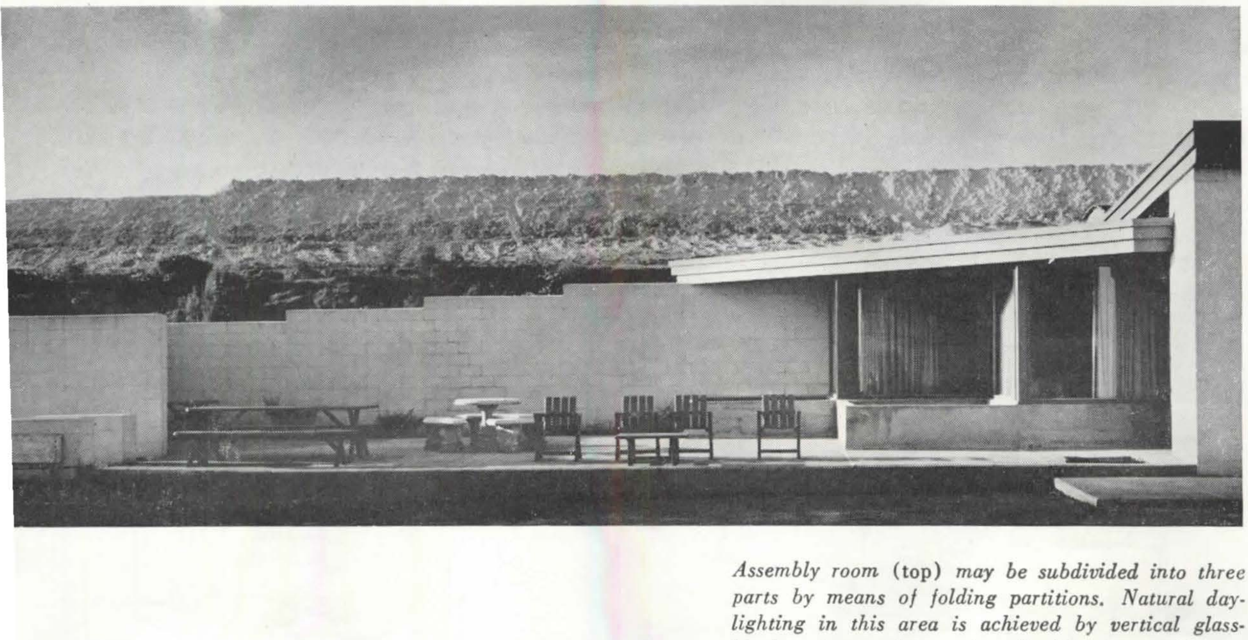
The structural system entails a flat-slab foundation supported on spot footings and load-bearing concrete-block walls. The roof is constructed of 6" x 14" wood beams and 2" x 6" joists with solid wood sheathing. Concrete blocks, used throughout the building are lightweight and painted for waterproofing. Interior wood beams were given one coat of colored stain.

A slanting ceiling and perforated tiles between *ceiling beams* provide fine acoustics. The building is heated and air-conditioned by central self-contained units.

Beige-painted concrete blocks along with natural redwood trim provide the neutral background for pools, planting on the terrace, and the yellow and turquoise fabrics used in the interior.







Assembly room (top) *may be subdivided into three parts by means of folding partitions. Natural daylighting in this area is achieved by vertical glass-block strips at the north wall. Fluorescent fixtures serve at night.*

Terrace (bottom) *with pools and planting offers pleasant outdoor recreation space.*

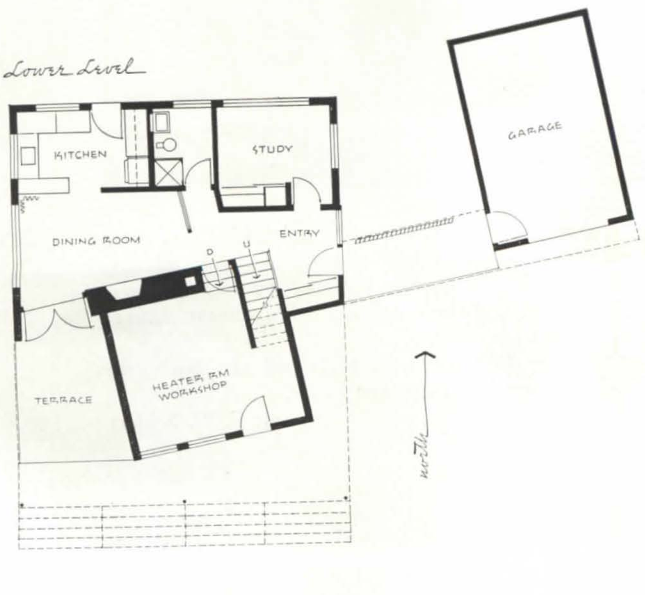
Photos: F. W. Seiders

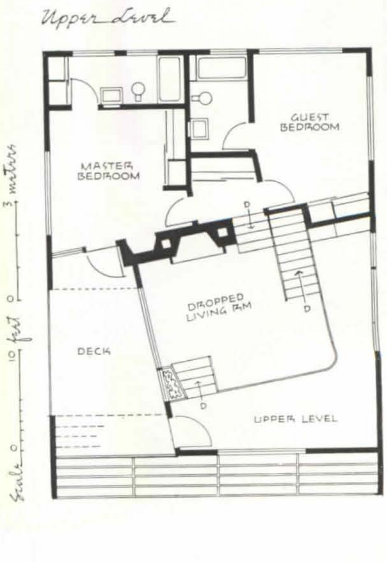
house

Rarely do architects have the opportunity to determine in their design the siting and landscaping, the selection of furniture and fabrics and all interior accessories, down to the last piece of tableware. The architects in this case were fortunate and the result is a well-balanced building, inside and out.

To take advantage of the fine views across the Connecticut River Valley, the major rooms were raised above the ground. In all, there are four levels conviently arranged for the use of the bachelor-client who wanted, first, to have a comfortable home and quiet place in which to write; second, enough space to entertain many friends; and, third, a place specially devoted to the enjoyment of fine piano and recorded music.

The structure is essentially wood frame with occasional steel members. Floors are poured slabs on the lower levels, wood frames on the upper levels. Concrete blocks painted white and natural color rift-sawn fir boards combine as exterior wall materials. Trim has been painted white, lally columns yellow.





location	Norwich, Vermont
architects	E. H. & M. K. Hunter
general contractor	Trumbull-Nelson, Inc.
foreman	Robert Rich

Site for the house (acrosspage) *is an open field at fairly high elevation, with wind protection on the north and east afforded by a wooded grove.*

Upper level of living room and master bedroom open onto sun deck (right). *Shady flagstone terrace underneath connects with dining room.*

The living room (below) *with its planned hard and soft surfaces and slightly angled walls has fine acoustical properties.* Photos: Richard Garrison

Mélange in Milan

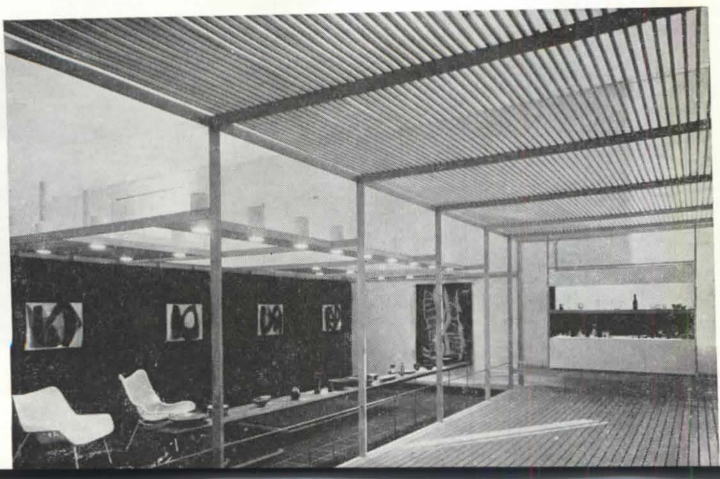
Notes on the Triennale, by Alfred Auerbach*

The Triennale in Milan this year had high points of interest, though it is generally agreed that it is not as provocative nor as significant as the one staged in 1951. Some 14 foreign lands participated but, as usual when one country invites others to an industrial design show, the host dominated. The space here permits only a telegraphic resumé:

Installation and presentation had dash and imagination. The Italian bravura flair (a postwar phenomenon in architecture and design) was in full evidence. . . . The Scandinavian countries had the most finished, the most precise installation. All else seemed a bit raw and unpolished, by comparison. Yet theirs was an oft-told story, little new and mostly recapitulation. . . . The Italians repeated themselves, too. Much sponaneity and ingenuity—but somehow in a groove. A new preoccupation with mass production and low-cost items, but the Italian efforts were crude and unsuccessful. Their architects and designers are learning a game at which we in the U.S. have become expert. . . . U.S. participation was sad. A few items of furniture, a few lamps and lighting fixtures (somehow, no funds from Government or industry for a representative presentation), whereas an accurate cross-section of U.S. industrial design, 1954, would have rocked the Triennale. For shame!

Much experimentation with chairs. Seating seems to have irresistible challenge for contemporary designers. A crop of molded-plywood chairs—mainly derived from the Eames original, but not as perfected in detail. Eames metal bases also in evidence—one instance of U.S. impact on Continental design that is unmistakable.

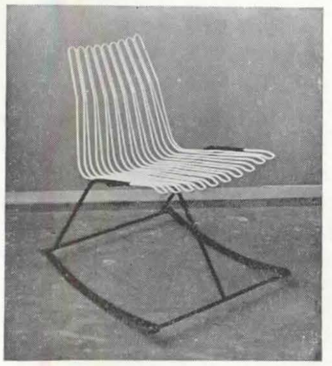
** Writer, lecturer on modern design for more than 20 years; Professor of Marketing, Pratt Institute, Brooklyn; head of Alfred Auerbach Associates, New York advertising agency; officer of Design & Display (store and showroom planning).*



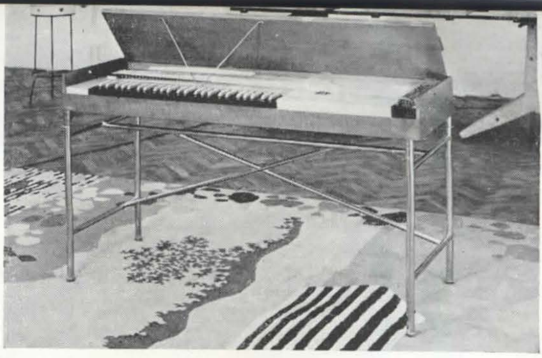
In Italian area (above), *black walls and ceiling dramatized shallow cones of white cotton suspended over floor displays of small objects.*

Norwegian installation (left) *was a meticulous statement which, with other Scandinavian displays, made most impressive impact.*

1



2



3

4

1. Free-form dropleaf table by Gio Ponti, Italy; 2. Amusing metal-and-plastic rocking chair by Ernest Race, Great Britain; 3. Clavichord of metal-and-wood by Rainer Schütze, Germany; 4. Room divider by Gustavo Latis, Italy.

Dramatic highlight of the Triennale's architecture was the "Theater in Space" (below) *supported on demountable tubing. Designed by Agnoldomenico Pica, it was another token of Italian imagination and skill.* Bravo *and* a rivederci*!*

°perm

I see no need to prolong my gripe against tricky proprietary names for building products, but it is a pleasant relief when one comes along whose name tells so complete a story so succinctly. "Zero Perm" is the name. If you are as batty as I am on the subject of vapor barriers, "Zero Perm" would ring an instantaneous and shall we say impermeable bell?

It is a one mil thickness of aluminum coated on both sides with ½ mil thickness of a new transparent polyester film. A one mil thickness of aluminum in itself is a good moisture vapor barrier having a permeability range of practically zero. However, it is quite fragile since handling creates pin holes which decrease its effectiveness. Zero Perm 1½" wide joints are cemented with a Methyl Ethyl Ketone (MEK) type adhesive by hand or roller pressure. It is an interesting product. Ask C. T. Hogan & Company, Inc., 385 Madison Avenue, New York 17, N. Y., for more data. Oh, I nearly forgot—it is used for refrigeration insulation, dehumidified spaces, packaging, covering for pipes exposed to weather.

It is not recommended as reflective insulation. For the benefit of the boys in the back room, to perform satisfactorily, vapor barriers should have a certain maximum vapor-permeability rate. For example, to qualify as a vapor barrier, a material should not permit the passage of more than a specified amount of vapor through it in a given period of time based on a certain standard vapor pressure difference. This maximum vapor-permeability rate is one grain of moisture per hour per square foot per inch of mercury-pressure difference. A low permeability rate of this order means a high resistance to vapor transmission, and vice versa. A vapor barrier, therefore, is defined as a material having a vapor-permeability rate not to exceed one (perm). If you thirst for more dope, see Reinhold's *Thermal Insulation of Buildings* by P. D. Close.

rat-tat-tat-tat

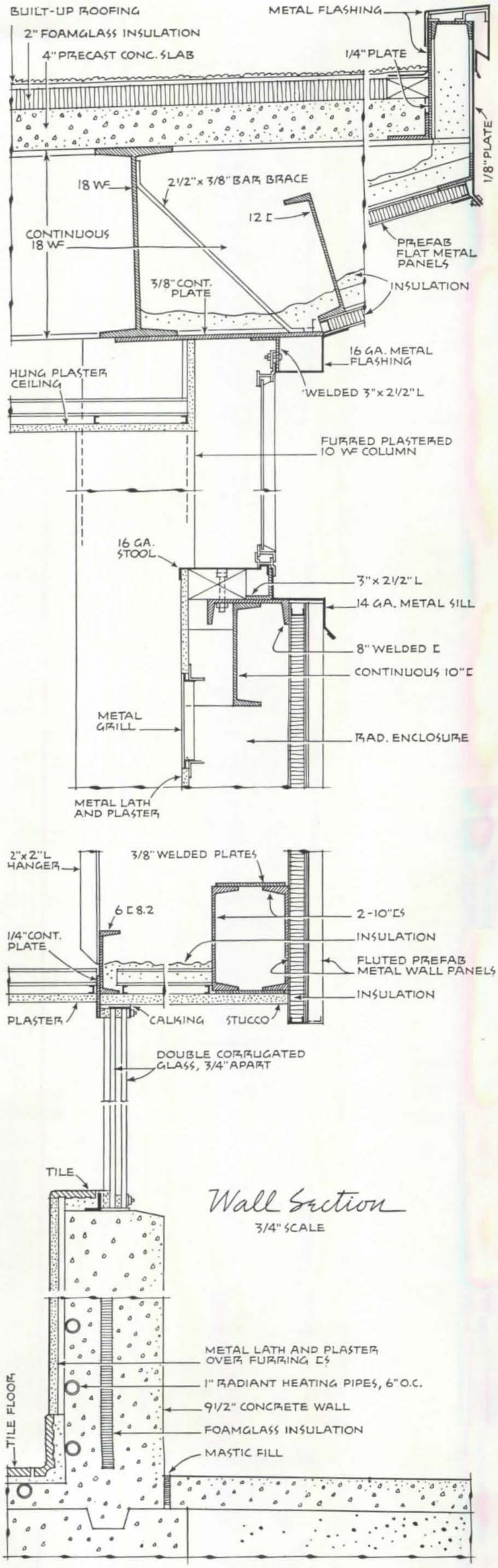
If I did not live in such a decrepit home I don't suppose I would have anything to write about. Here I am, minding my own business, trying to fall asleep after slaving over a hot specification all day when bang, crash, rat-tat-tat-tat—the subject for today is water hammer. For you kids taking your state licensing examination you can define water hammer as an abrupt rise in pressure in a piping system, which is at least twice as great as the flow pressure. To me it was an abrupt rise in blood pressure beyond the elastic limit of my calcified arteries. Water hammer is caused by the sudden stoppage of the flow of liquid in a closed piping system. Because liquids are essentially noncompressible the sudden stoppage of their flow builds up immediate and high pressures. This increased pressure can be absorbed only by the energy spending itself in expanding the pipe, compressing the liquid, and in friction losses. Consequently, the piping system must absorb the punishment of these sudden pressure increases. Because water hammer is caused by the abrupt stoppage of the flow of liquid, any factor that affects the speed of the flow will contribute to water hammer. The flow pressure, determined by the size and length of the pipe, and the speed with which the flow is stopped are related to the amount of pressure rise which creates water hammer. For instance, closing a valve in an oversized piping system when there is low flow pressure, would create negligible water hammer. However, closing a valve rapidly in an undersized piping system with high flow pressure, would create much greater pressure rises and maximum water hammer. Incidentally, Wade Mfg. Co. of Elgin, Illinois, has a constructive story to tell on this subject in a handsome new brochure entitled—guess what—*Water Hammer*.

union hassle no. 2

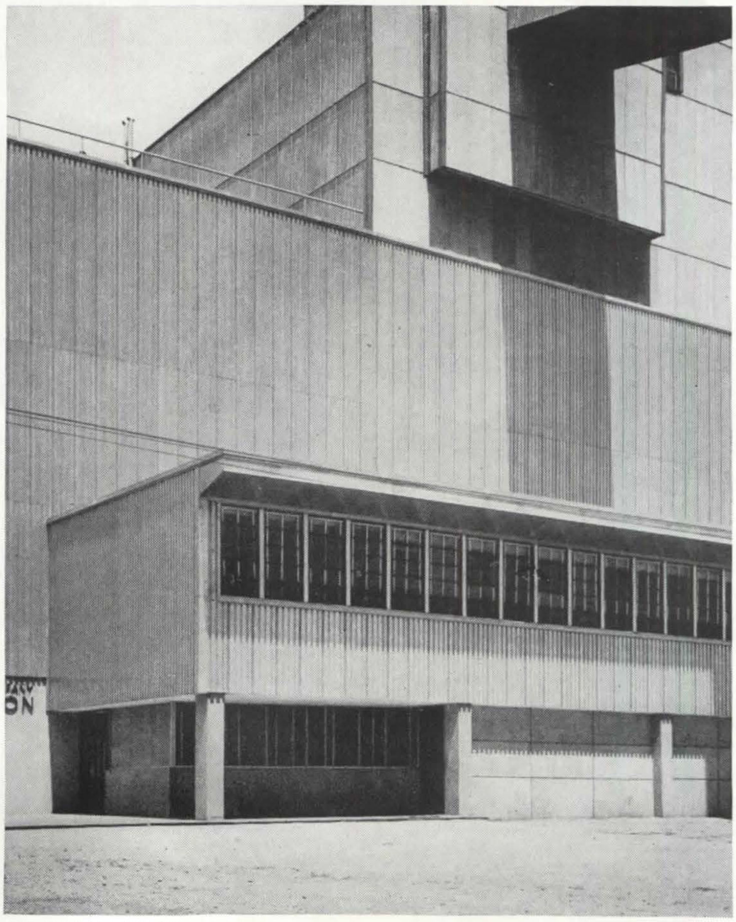
For every new type of prefabricated wall panel that appears on the architectural scene a new type of hassle is sure to shadow it. Take for instance an innocent little plywood panel faced with light-gage aluminum. I know of an instance where the iron workers claimed it because the panel was to be set in metal window frames, but since the panel had a wood core and facings were of light-gage metal the carpenters protested only to have the whole shebang settled by the calkers who installed it on the grounds that the panels were required to be set in calking. It is a good thing the panels did not have one face of porcelain for the glaziers would have been heard from, since porcelain is glass.

thar's gold in them thar bauxite

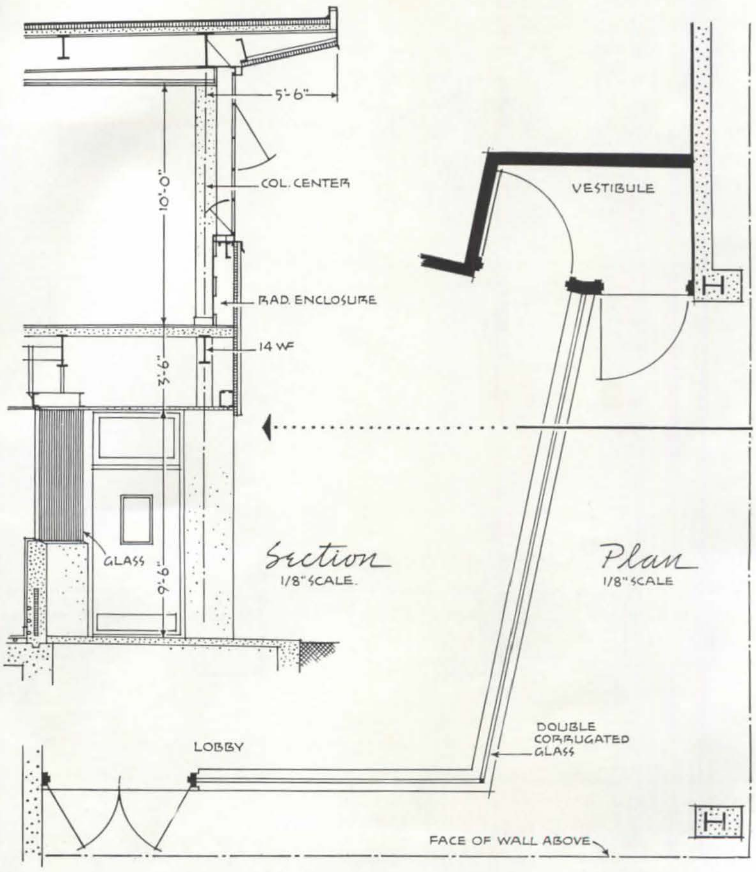
It's true! Now you can obtain aluminum that does *not* look like aluminum at all. It really is aluminum, tastes like aluminum, but looks like gold—well, not exactly, let's say bronze. With Alcoa's blessing, several companies (Alumiline Corp., Pawtucket, R. I., and Hankins & Johann, Richmond, Va.) have come up with an alumilite finish in a bronze color similar to satin- or polish-finished gold. These people say the color will last and doesn't take nearly the amount of maintenance that bronze does to keep it bright. It may be used for exteriors and therein lies its major contribution as a decorative nonferrous metal. Colorfastness field tests are now 12 years old and show no appreciable disintegration. It's worth looking into, if you are seeking color in architecture. Presently there is a project developing, in Cincinnati, in which the entire building wall surface will be in gold color, with the opposite wall done in blue. Colors other than gold, blue, and black are now cooking.



Wall Section
3/4" SCALE



GOTTSCHO-SCHLEISNER

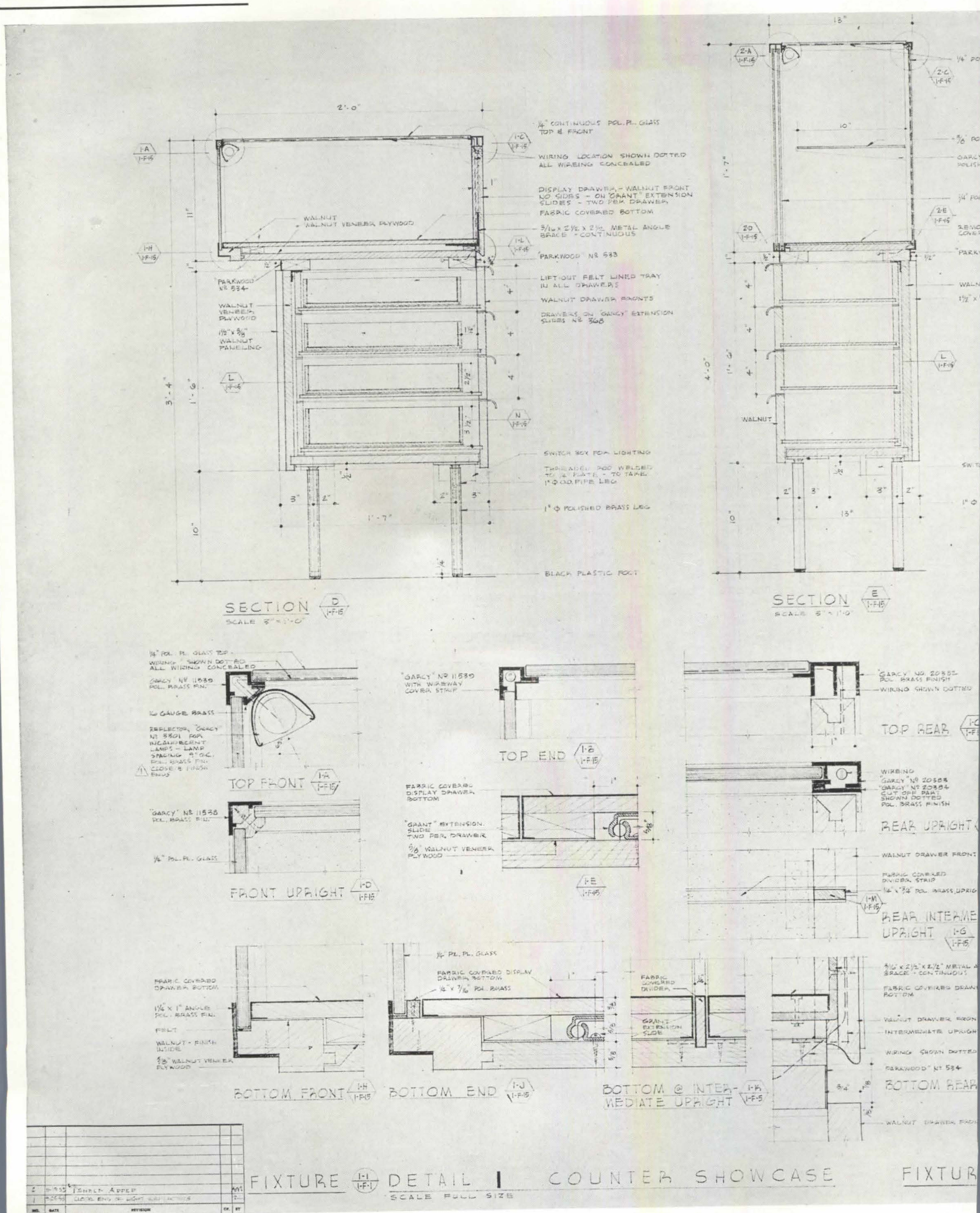


Section
1/8" SCALE

Plan
1/8" SCALE

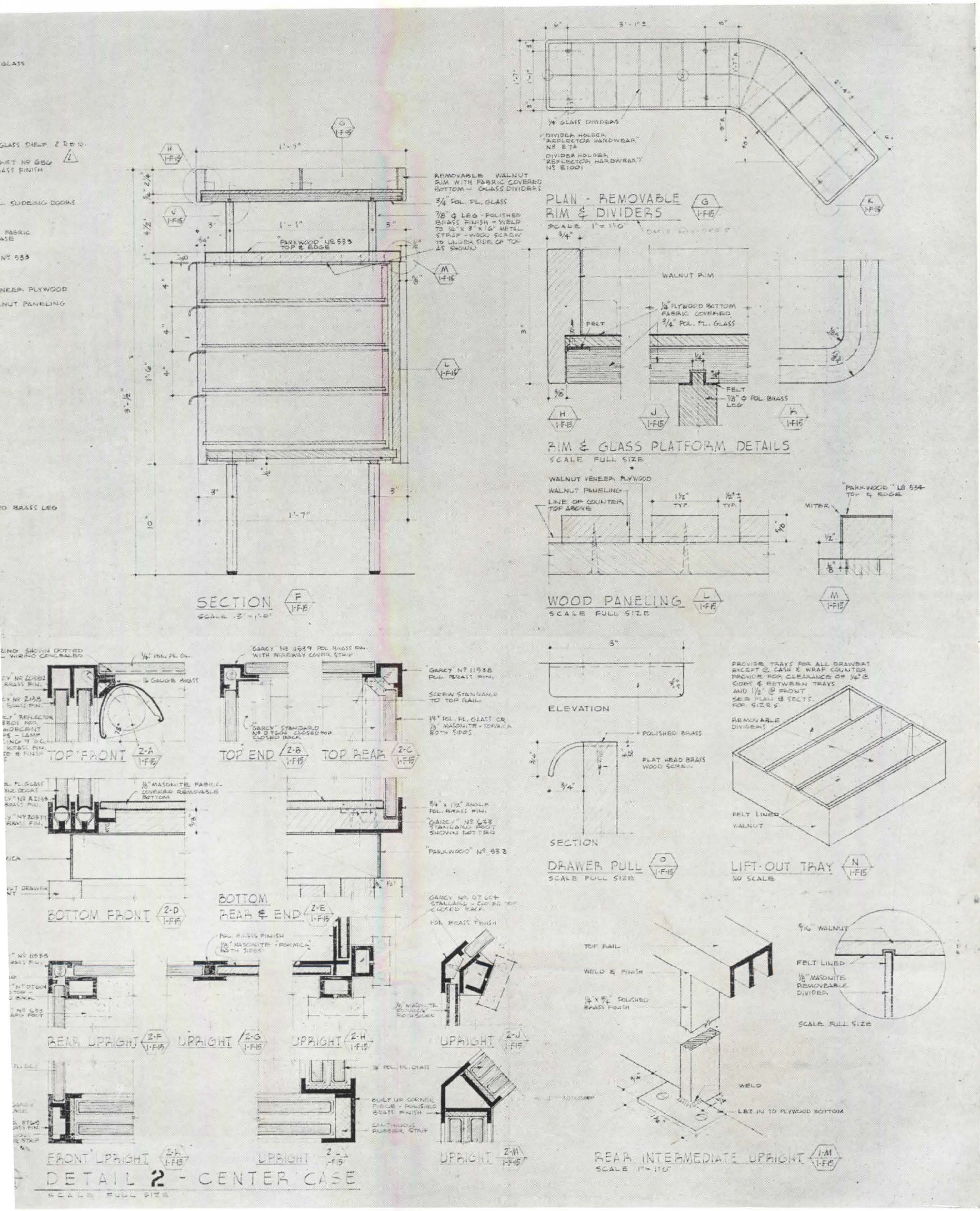
STEAM-ELECTRIC STATION, Kansas City, Mo.

Ebasco Services Inc., Design and Construction



display cases: Department Store, Rochester Minn.

Victor Gruen, architect



Rudolf L. Baumfeld, associate-in-charge; Larson & McLaren, associated architects

Cyrus L. Baxter, Arch. Jack E. Hodell, Assoc., DeWitt Wood Products Formica Fabricator
Erected by Ferro Concrete Construction Co. all of Cincinnati, O.

EMPHASIS THROUGH RESTRAINT

Combine the inherent beauty of a rich Formica woodgrain with clean simple lines of good design and you have a building interior that is at once business-like and friendly, combines dignity with warmth.

Appeal of this interestingly simple Formica interior is not limited to the esthetic.

The spiraling cost of maintenance man hours makes rugged, easy to clean Formica a practical investment in low up-keep.

For more information on Formica see Sweets Architectural File 13a/FO or write

DEMAND THIS CERTIFICATION

This mark certifies genuine

REMOVE WITH SOAP AND WATER

Beauty Bonded FORMICA Reg. U.S. Pat. Off.

Guaranteed by Good Housekeeping — Replacement or refund of money if not as advertised therein

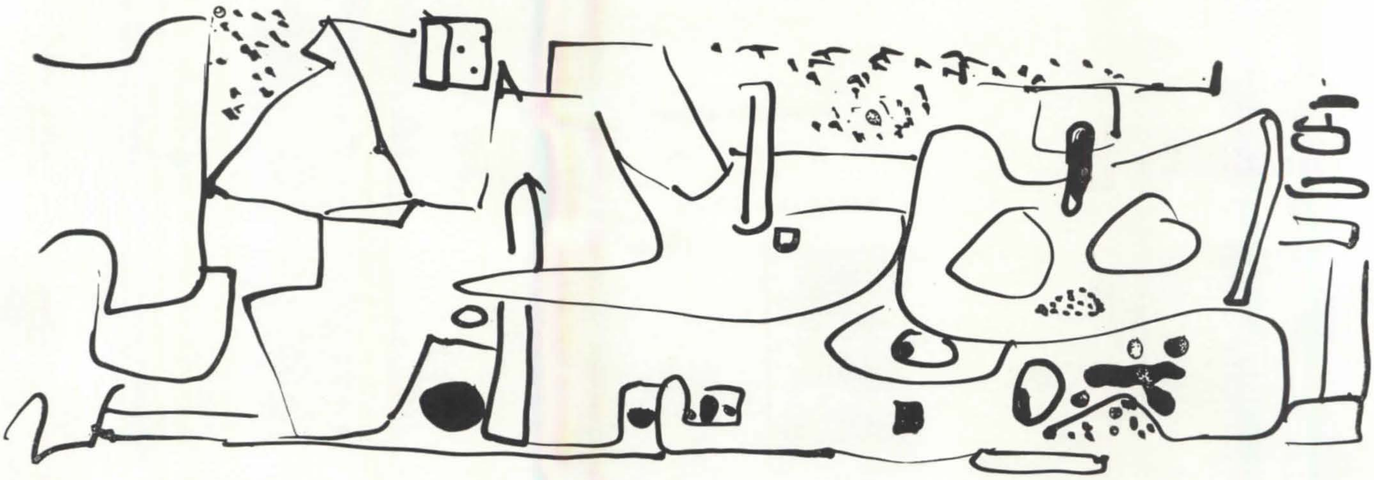
Pays in Performance

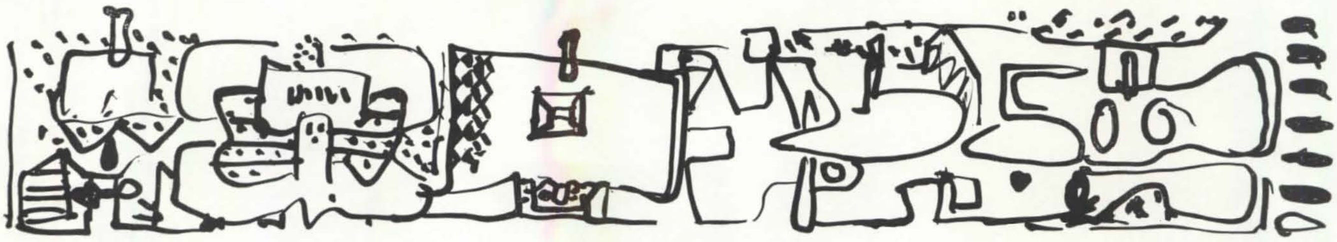
Seeing is believing. If this wash-off identification is not on the surface, it's not FORMICA.

THE FORMICA COMPANY

4633 Spring Grove Ave., Cincinnati 32, O.

In Canada: Arnold Banfield & Co., Ltd. Oakville, Ontario





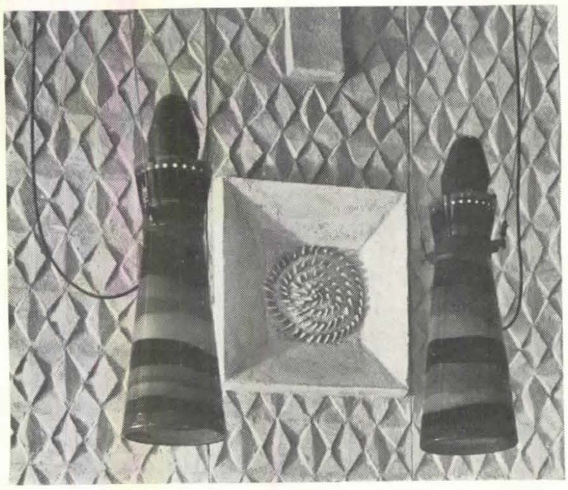
Page Beauchamp

showrooms

A showroom has one important function—to display the merchandise to best advantage. Our three examples this month were chosen because they do just that. The Fifth Avenue showroom of Olivetti Corporation of America provides a handsome setting, rich and spacious, to enhance the importance of the relatively small business machines shown. Both the showroom and the merchandise reflect the Olivetti belief that good design is good business.

Two more milestones in design advance are the lighting fixture department and the lamp department of Lightolier, Inc., because of their architectural backgrounds and their movable display panels which permit maximum flexibility in rearrangement. In the past, displays of lighting have usually been massed, with little attempt to show any individual unit. Ceiling fixtures have been hung indiscriminately, as many as could be crowded in, while the table lamps have been shown side by side—regardless of shape, size, or meaning—becoming a hodgepodge of shades, bases, and bulbs (the latter often winning the attention). But with backgrounds designed to permit selective display, the units can be seen and almost sell themselves. Light, textures, and colors in proper distribution of space are probably more important here than with any other type of merchandising background.

showrooms



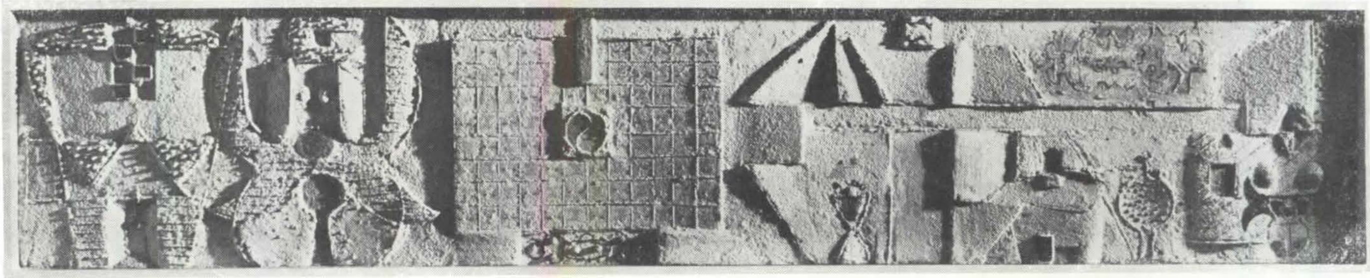
blown-glass cylinders

No area could more properly be called a showroom. Lavish use of rich marble and the dramatic sand mural proclaim the importance of the typewriters and business machines on display. The machines are shown on marble pedestals like stalagmites which rise smoothly from the marble floor. These and the marble-topped display tables and the plastic-topped desks were designed by the architects. The hanging lights are tapered cylinders of Venetian glass in spiralled colors. Other light glows behind the suspended walls. Reminiscent of Italy are the light blue on the ceiling and the warm mustard tone of the back wall.

The abstract mural cast in sand molds offers an attractive play of light on soft textures, contrasting effectively with the plain walls and the highly polished marble floor.

Photos: Ben Schnall

client	Olivetti Corporation of America
location	New York, New York
architects	L. B. Belgiojoso, E. Peressuti, E. N. Rogers
sculptor	Constantino Nivola



preliminary study of mural

data

doors and windows

Door: 16' x 3' 5", solid walnut/ designed by architects, executed abroad.

Windows: plate glass/ Pittsburgh Plate Glass Co., Glass Div., Room 3798 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa.

equipment

Heating and Air Conditioning: W. H. Peepels Co., Inc., 12-17 Jackson Ave., Long Island City, N. Y.

furnishings and fabrics

Desks, Work Tables, Display Tables: designed by architects.

lighting

Ceiling Lighting: Century Lighting, Inc., 521 W. 43 St., New York, N. Y.

Blown Glass Cones: Venini-Murano, Italy.

mural

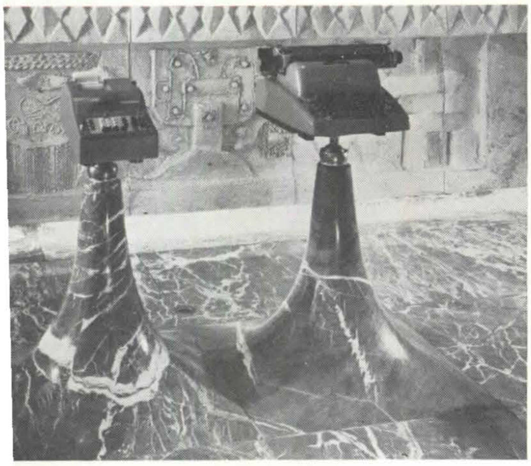
Sand Sculpture: Constantino Nivola, 47 W. Eighth St., New York, N. Y.

walls, ceiling, flooring

Walls and Ceiling: painted plaster.

Floor: marble of the Val d'Ossola "Challand"/ Uferradini, Via Procaccini, Milan, Italy.

marble stair



display pedestals

plastic-topped desk

showrooms

client	Lightolier, Inc.
location	New York, New York
designer	Alvin Lustig

"thin skin" panel

black vinly tile

data

furnishings and fabrics

All Furniture: white-enameled frames/ mustard, flame, blue, and black upholstery/ designed by Lustig.

Fabric: white raw silk/ Far Eastern Fabrics Inc., 171 Madison Ave., New York, N. Y.

lighting

Ceiling Lighting: Lightolier, Inc., 11 E. 36 St., New York, N. Y.

walls, ceiling, flooring

Walls: painted plaster.

Ceiling: dropped ceiling/ 9" x 24" white-painted wood panels suspended on aluminum tracks.

Panels: white perforated-metal screening, red birch, "Thin Skin"/ Polyplastex United, Inc., 441 Madison Ave., New York, N. Y./ **cabinetwork:** Loosen & Brautigam, 40 East End Ave., New York, N. Y.

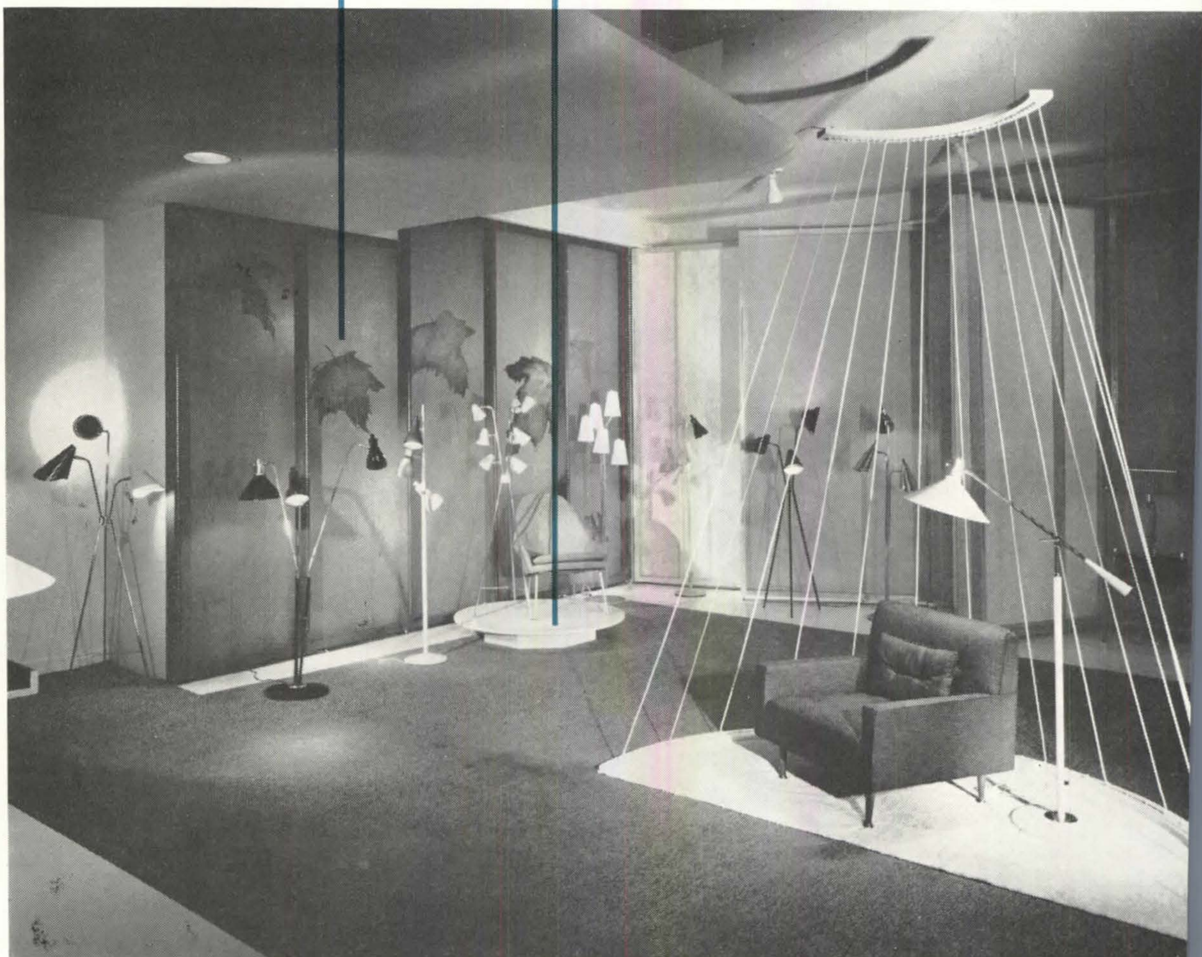
Flooring: existing black vinyl and asphalt tile.

Through the use of strategically placed panels of a range of materials, the designer has created a perfect background for this showroom of lighting fixtures. Unlike most lighting displays, each fixture has been isolated to allow it to show to its best advantage. Brilliant color combined with black and white, as well as variations in texture in a clean, straightforward presentation, make the design exciting.

The furniture has been designed especially for the space. In its forms it adds to the beauty of the showroom and becomes an integral part of it, also supplying spots of color where needed. *Photos: Ben Schnall*

showrooms

client	Lightolier, Inc.
location	New York, New York
designer	Eugene Tarnawa, Design & Display, Inc.



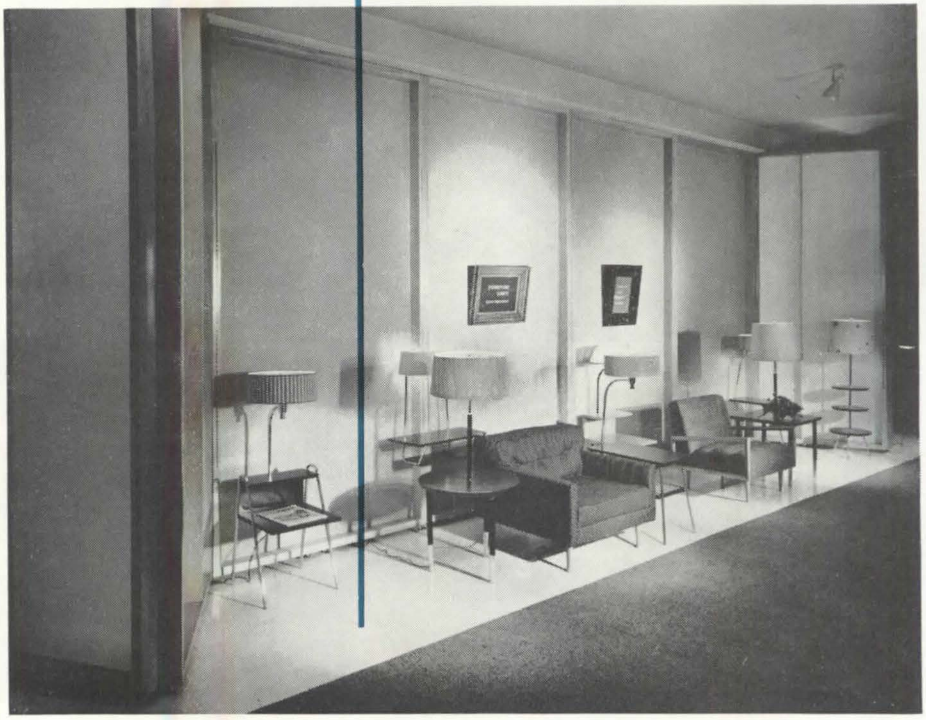
Previous theory in lamp display has been that the fixtures themselves supply more than enough light for display. However, this showroom disproves that theory: each lamp has here the advantage of soft, diffused, or indirect lighting which attracts the eye and dramatizes the bases, allowing their forms to show dramatically.

Platforms of colored squares and circles adjust in height to accommodate varying sizes of lamps. Polyplastic panels arranged in a zigzag isolate units so that there is no confusion.

White cork flooring, gray carpeting, and gray curtain combined with strategically placed seating units, create a gentle, uncluttered background—allowing color and texture to present merchandise successfully. *Photo: Ben Schnall*

column display

display platform



data

furnishings and fabrics

Chairs: Murray Furniture Company, Inc., 2191 Third Ave., New York, N. Y.

Curtain: "Fiberglas"/ Owens-Corning Fiberglas Corp., 16 E. 56 St., New York, N. Y.

lighting

All Lighting: Lightolier, Inc., 11 E. 36 St., New York, N. Y.

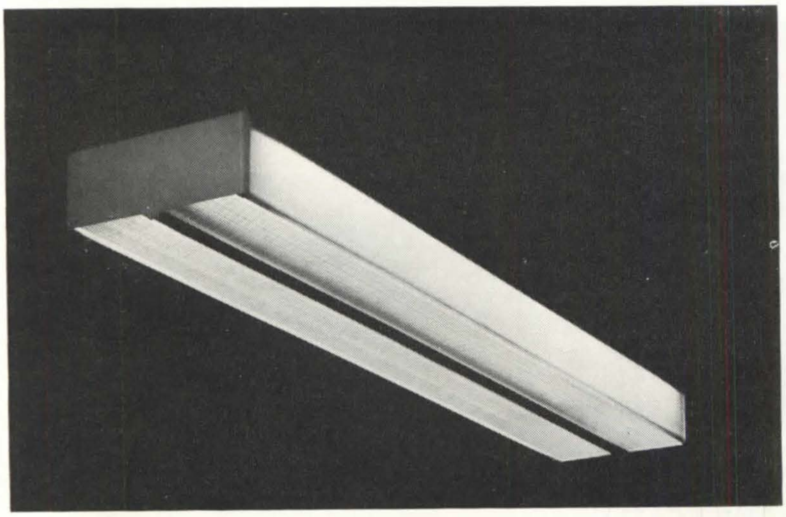
walls, ceiling, flooring

Walls, Ceiling: painted plaster.

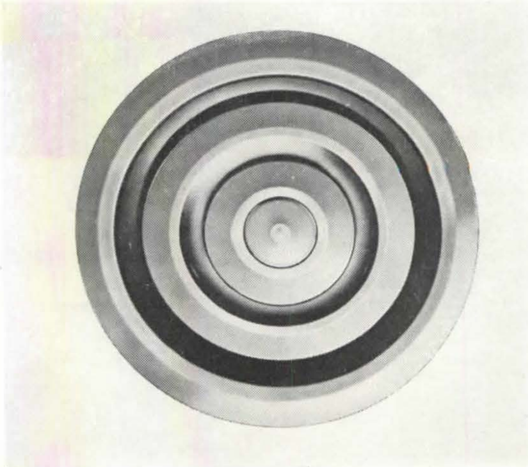
Flooring: cork/ Dodge Cork Co., Inc., 11 E. 36 St., New York, N. Y.

Display Fixtures: Harold A. Brandt, Inc., 250 E. 43 St., New York, N. Y.

p/a interior design products

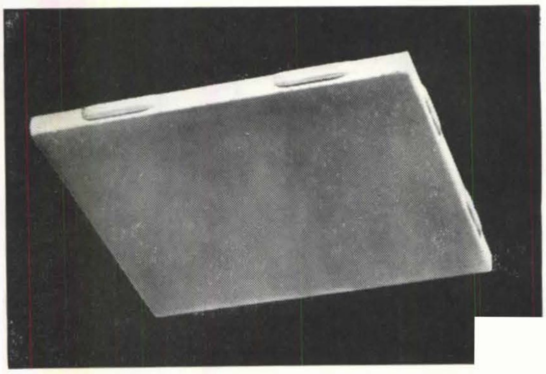


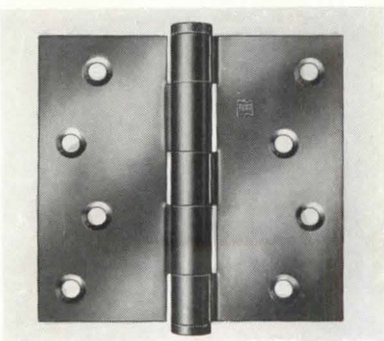
Luminaire: "Challenger"/ 4" depth/ prismatic lens bottom extruded of clear polystyrene directs maximum intensity elements, all plastic, interlock/ **Globe Lighting Products Inc., 2121 S. Main St., Los Angeles, Calif.**



Ceiling Diffuser: "Agitair"/ four 90-degree segments may be adjusted as desired—horizontally, vertically, 45 degrees, or 20 degrees downward, individually, or collectively/ aluminum spinnings not affected by adjustments/ **Air Devices Inc., 185 Madison Ave., New York 16, N. Y.**

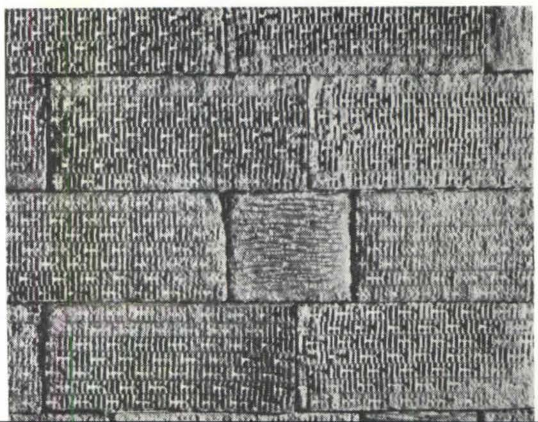
Ceramic Tile: "Self Spaced"/ 1/16" grout lines happen uniformly because of lugs which extend 1/32"/ simplifies installation and eliminates variation/ **Royal Tile Manufacturing Company, Fort Worth, Tex.**





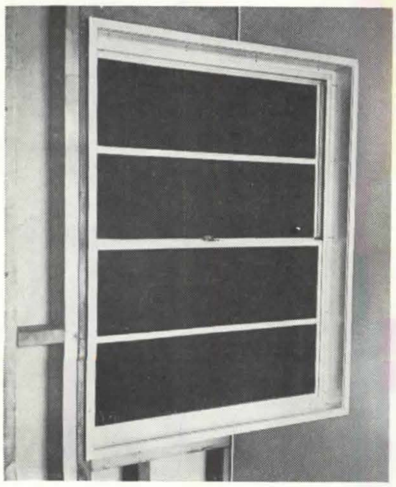
Steel Hinge: "Luma-Sheen"/ "permanized" true color match for all aluminum hardware and trim/ priced within range of steel hinge/ **C. Hager & Sons Hinge Mfg. Co., 2451 DeKalb St., St. Louis, Mo.**

Ceramic Tile: hand-pressed with three-dimensional texture/ finished in antique-white matte glaze with gold undertones/ terra-cotta clay/ 4" square and 4" by 8"/ designed by Lee Rosen for Design Technics/ **retail:** $4.50 a sq ft/ **LaVerne Originals, 160 E. 57 St., New York, N. Y.**



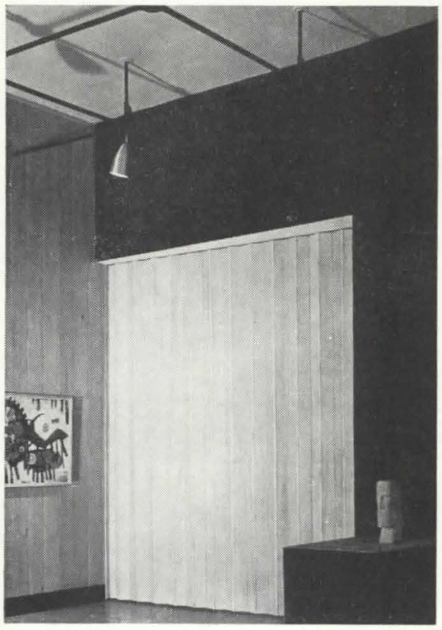
Aluminum Sliding Door: four-sided, sealed box-type aluminum extrusions/ stainless-steel roller bearings/ weatherstripped with mohair at top, interlocker, jamb, and threshold/ "Alumilite" finish provides corrosion resistance to salt air/ **Ador Sales, Inc., 1631 Beverly Blvd., Los Angeles 26, Calif.**

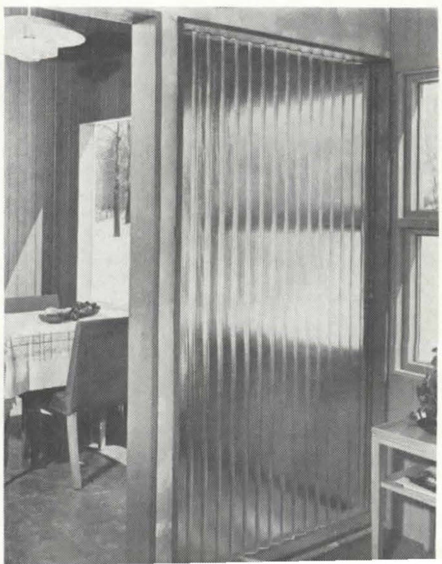
Interior Trim for Aluminum-Framed Windows: tight mitred corners with trim edge which laps interior wall surfaces by 1"/ etched and lacquered finish/ **Per-Fit Products Corporation, 200 E. 52 St., Indianapolis 5, Ind.**



Decorative Glass: corrugated, with light-diffusing patterned surface/ 3/8" thick, corrugated 2-1/2" center to center/ same pattern of tempered-glass doors/ transluscent, obscures vision without cutting off light/ for room partitions, dividers, exterior entranceway windbreaks/ manufactured by Blue Ridge Corp. **Libbey-Owens-Ford Glass Company, Nicholas Bldg., Toledo 3, Ohio.**

Wooden Folding Door: "Pella"/ laminated-wood panels, 3/8" thick, 3-5/8" wide, joined by spring hinge-fold, accordion fashion/ available in pine, oak, mahogany, or birch veneer/ may be ordered painted, clear varnished, or unfinished in custom-built or stock sizes/ **Rolscreen Company, Pella, Iowa.**





Lighting Units: "Lytecaster"/ sculptured Phenolic-plastic hood-shape with contoured rim/ may be swiveled and turned to desired position/ white-finished interior for maximum light reflection/ colors: Flamingo, Spring Green, Gunmetal, Bone White/ **retail:** $8.50 to $20/ **Lightolier, Inc., 11 E. 36 St., New York, N. Y.**

Light Control: "Luxtrol"/ setting of light intensity of lamps in a room to any value from very dim to brightest/ operates on dimmer principal used in theaters/ each unit, a knob control can handle up to 360 watts/ safety assured by fuse and bimetallic thermal overload relay/ for use in homes, churches, hotel rooms, restaurants, lounges, small auditoriums, offices, stores, and show windows/ can change mood of room and vary color scheme/ **The Superior Electric Co., Bristol, Conn.**

Teakwood Hanging Units: may be set at convenient height and conserve floor space/ multipurpose cabinet combining two glass-fronted shelves, vanity mirror, bookshelves, four drawers/ **retail:** $120/ three drawers, sliding door cabinet, two open compartments and bookshelf/ **retail:** $96/ teakwood wall strip for mounting, 6'6"/ **retail** $8.50/ **Raymor, 225 Fifth Ave., New York 10, N. Y.**

Automatic Home-Laundry Equipment: "Imperial"/ available in Stafford yellow, Sherwood green, and white, matching existing refrigerators, ranges, and food freezers/ all-porcelain finish/ washer and dryer designed to be used side by side/ **retail:** washer, $299.95; dryer, $259.95/ **Frigidaire Division, General Motors Corporation, 300 Taylor St., Dayton 1, Ohio.**

Automatic Electric Range Ensemble: "Customline"/ in-a-wall oven and separate surface cooking units/ stainless finish satin chrome oven and stainless steel surface unit/ oven: 18' h. x 22" w. x 24¾" deep; surface units, 34" wide, 20" deep/ **Hotpoint Co., Division of General Electric Co., 5600 W. Taylor St., Chicago 44, Ill.**

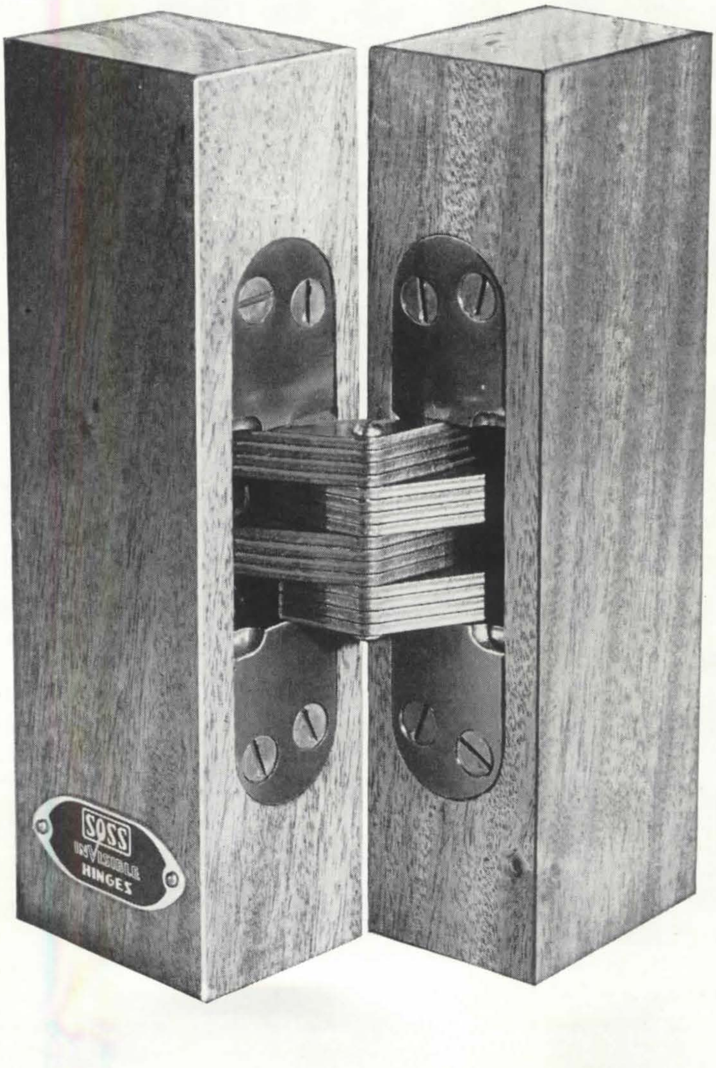
Silicone Upholstery Finish: "Sylmer"/ makes fabric more resistant to soiling, wear, and wrinkling/ easier to clean/ water repellent/ more luxurious to the hand/ **Dow Corning Corporation, 600 Fifth Ave., New York 20, N. Y.**

Unit Stock Program for *Sliding* Glass Doors: "Multi-Width" program/ nine basic units make possible variations for any width/ uniform height of 6'10", width varies from 3' fixed frame to 10' door with one vent sliding/ **Arcadia Metal Products, MW-57, 324 N. Second Ave., Arcadia, Calif.**

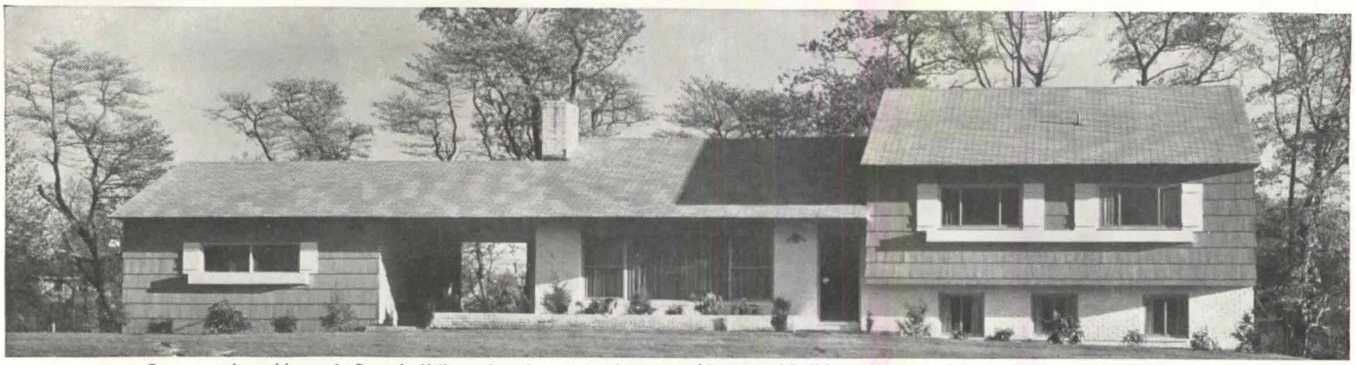
Acoustical Tile: Gold Bond Acoustifibre/ "linen-finish" to free it from variations in light reflection/ may be repainted without affecting efficiency/ available in standard 12" square, 12" by 24", 24" square tiles, ½", ⅝", and ¾" thick/ **National Gypsum Company, 325 Delaware Ave., Buffalo 2, N. Y.**

Additions to Color Line: "Georama"/ Bolta-Wall vinyl wall covering available in Valley Green, April Yellow, Polar White, Mojave Sand, and Autumn Rust/ slightly embossed texture, resistant to stains and abrasion, classified fire-retardant according to Federal Specifications/ **Bolta Products Sales, Inc., 151 Canal St., Lawrence, Mass.**

Stone Veneer: 1" thick/ may be applied to any smooth-finished wall surface, requires no foundation/ available in muted tones of Gunmetal, lilac, blue, green, and red/ applied with adhesive and clips screwed to surface/ grooved top and bottom/ 4" and 8" high, 8" to 20" in length/ **Allegheny Natural Stone Co., Patterson, N. J.**



Invisible Hinge: hinge is completely hidden from view when doors or lids are closed/ beautifies, streamlines interiors/ ideal for contemporary architecture/ special rust-proof alloy/ gives excellent service under all climatic conditions/ easy to install/ pleasing to clients/ available in wide variety of sizes/ catalogue free on request/ **Soss Manufacturing Company, 21715 Hoover Road, Detroit 13, Mich.**



Rusco-equipped home in Beverly Hills project, Long Island, N.Y. *Architects and Builders:* Siegel and Rapp. *Photo by* Herman Kroll.

Here's why leading architects and builders say:

RUSCO PRIME WINDOWS

offer outstanding improvements in window design!

RUSCO HORIZONTAL-SLIDE PRIME WINDOW

RUSCO FULVUE PRIME WINDOW

RUSCO *VERTICAL-SLIDE* PRIME WINDOW

When deciding on window specifications—it's good business to remember that only RUSCO makes a window that DOES EVERYTHING A WINDOW SHOULD DO—a fully prefabricated, finish-painted, ready-to-install unit made of Armco hot-dipped tubular galvanized steel.

Here's what a *good* window should do—
and what *only* RUSCO does!

- **GIVES COMPLETE PROTECTION.** Built-in weatherstripping and double-glass insulation give year 'round protection against heat, cold, wind, rain and insects—block outside noise.
- **ELIMINATES HANDLING OF "EXTRAS".** Nothing to change! Nothing to store! Rusco Windows with insulating sash (optional) and Fiberglas screen completely eliminate separate storm windows and screens.
- **EASY TO OPERATE.** The RUSCO PRIME WINDOW slides smoothly and silently on super-quality felt that banishes all possibility of binding or sticking! There's nothing to get out of kilter. No pulleys—no weights or counter-weights!
- **OFFERS SAFETY AND CONVENIENCE.** Each sliding glass panel or screen is quickly removable—*from the inside*—for easy cleaning. A remarkable safety factor.
- **GIVES DRAFT-FREE VENTILATION.** Rusco's patented MagicPanel® allows any desired amount of draft-free ventilation while offering positive protection from rain, sleet or snow!
- **PROVIDES MAINTENANCE-FREE SCREENING.** Rusco's Fiberglas screen will not rust, rot, corrode or stain and never needs painting. Even screens out airborne particles of dust and dirt!
- **MADE OF ARMCO ZINCGRIP.** The special purpose steel that prevents corrosion—bonderized and finished in beautiful baked-on enamel just like a fine automobile.
- **ADDS TO PROPERTY SALABILITY.** Nationally advertised—with universal consumer-acceptance—the RUSCO PRIME WINDOW is a needed, wanted and highly merchandisable unit. The *hottest* news in the field of building today.

For Complete Information
and Specifications, write

"Always one step ahead of the weather" with RUSCO

The F. C. RUSSELL Company

Dept. 7-PA114 CLEVELAND 1, OHIO • *In Canada:* Toronto 13, Ontario

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

air and temperature control

1-117. Acme "Flow Temp" Heat Pump (FT-50-A), 4-p. folder describing heat pump as source of clean, flameless heat, requiring no chimney nor vents. Lists 6 models for heating and cooling, 6 for heating only. Drawing of hookup with radiant floor or ceiling system, diagram of typical heating and cooling capacities, sizes. Acme Industries, Inc., Jackson, Mich.

Two 6-p. circulars on gas unit heaters; rotor type which may be used with duct system or installed where needed and propellor type used as complete heating unit. General specifications, diagrams, dimensions given for each type. General Gas Light Co., Kalamazoo, Mich.
1-118. Humphrey Rotor-Type Gas Unit Heaters (UA-50-1)
1-119. Humphrey Gas Unit Heaters (UA-49-1)

1-120. Pryne "Blo-Fan," AIA 30-D-1, 4-p. brochure on combination blower and fan for ventilating kitchens and inside rooms. Sectional drawings show recommended installation and ductwork in ceiling, interior or exterior wall. Data on dimensions and fittings; directions for specification. Pryne and Co., Inc., Pomona, Calif.

1-121. Residential Air-Conditioning Control (3023), 88-p. manual containing basic information for planning control systems; principles of several type systems, description of component parts—blowers, fans, thermostats, compressors, motors, and control panels. Drawings illustrate text, cooling and heating circuit diagrams. Penn Controls, Inc., Goshen, Ind., $1.50.

1-122. Webster Baseboard Heating (B-1602), 16-p. booklet describing forced hot-water heating system combining baseboard and convector units to replace heat at perimeter where heat losses occur. Isometric layouts of systems, IBR ratings, description of equipment, dimensions, and specifications. Warren Webster & Co., Camden 5, N. J.

construction

2-137. AP Skylight, AIA 12-J, 4-p. folder on acrylic-dome skylight set directly into roofing material to allow wide-angle spread of daylight. Construction details and photos of installation procedure. Specifications, schedule of stock sizes and dimensions. Architectural Plastics, Inc., 20 Fitch St., East Norwalk, Conn.

2-138. Brikcrete Line of Modern Masonry Units, AIA 10-B (B-476), 4-p. brochure by manufacturer of modular (Roman face) and standard bricks available in plain or wire-cut face. Color photos, construction diagrams, actual and nominal sizes. Brikcrete Assoc., Inc., Grand Rapids 8, Mich.

★ **2-139. Architect's Sketch Book of Porcelain Enamel Wall Panel Systems,** AIA 17-A, 16-p. booklet presenting 3 types of insulated wall panels designed for construction of curtain walls, window walls, or spandrels. Explains installation of panels on secondary framework consisting of mullion bar structure or sash frames. Sections, exploded views, and specifications; description of core materials, surface treatments, and joint seals. Erie Enameling Co., Erie, Pa.

2-140. Fairhurst Folding Walls, 4-p. pamphlet illustrating folding and sliding doors for public, commercial, and institutional buildings. Photos show flexibility of room arrangement with walls easily moved by hand. Description of operation and installation. John T. Fairhurst Co., Inc., 45 W. 45 St., New York 36, N. Y.

2-141. "Hexcelite," AIA 26-A-9, 4-p. brochure describing translucent structural material formed through bonding structural aluminum honeycomb with glass. Suggests use for walls, partitions, skylights, doors, and others; gives compression, tensile, bending, and impact strengths. Photos; thermal properties. Hexcel Products Co., 955 61 St., Oakland 8, Calif.

2-142. Lightair Marquees, AIA 35-P-2, folder containing 30 pages of material on ventilated aluminum marquees for weather protection and sunshade. Information on performance, price, and appearance; construction and erection details. Data on wind-tunnel tests of aluminum awnings performed at Texas A. & M. College. Shurtleff Co., Dept. C-3, 1313 L St., Lincoln, Nebr.

2-143. "Tectum" (1003), 8-p. bulletin describing compressed wood fibers processed into building material suitable for structural, insulating, and acoustical purposes. Outlines manufacture, properties and economic advantages. Diagrams; U and k factors, fire rating, sound-absorption coefficients. Tectum Corp., 105 S. Sixth St., Newark, Ohio.

2-144. Weldwood Catalog, AIA 19-F (1229E), 48-p. guide to plywood and allied products, featuring decorative textured panels, hardwood veneers and metals laminated on solid base. Also covers standard plywoods, plastic laminates, vinyl sheeting, adhesives, and finishing materials. Recommended applications. descriptions, sizes, and approximate retail prices. U. S. Plywood Corp., Weldwood Bldg., 55 W. 44 St., New York 36, N. Y.

doors and windows

3-107. Wood Frames and Windows, AIA 19-E-1, 8-p. pamphlet showing wide range of uses possible with different types of wood windows. Photos of installations with specification notes, comment by architects, and sections. Table of recommendations for window frames and sash, specification data for nonswelling paintable preservatives. Architectural Woodwork Inst., 332 S. Michigan Ave., Chicago 4, Ill.

3-108. Hope's Window Walls (134), 16-p. catalog detailing noteworthy installations of pressed-metal and rolled-steel sub-

(Continued on page 145)

PROGRESSIVE ARCHITECTURE, 430 Park Avenue, New York 22, N. Y. I should like a copy of each piece of Manufacturers' Literature circled.

1-117	2-139	3-109	6-43	11-2
1-118	2-140	3-110	6-44	12-1
1-119	2-141	4-84	6-45	
1-120	2-142	4-85	7-29	
1-121	2-143	4-86	9-42	
1-122	2-144	4-87	9-43	
2-137	3-107	5-26	9-44	
2-138	3-108	5-27	11-1	

Name

Position

Firm

Mailing Address ☐ *Home* ☐ *Business*

City *State*

please print

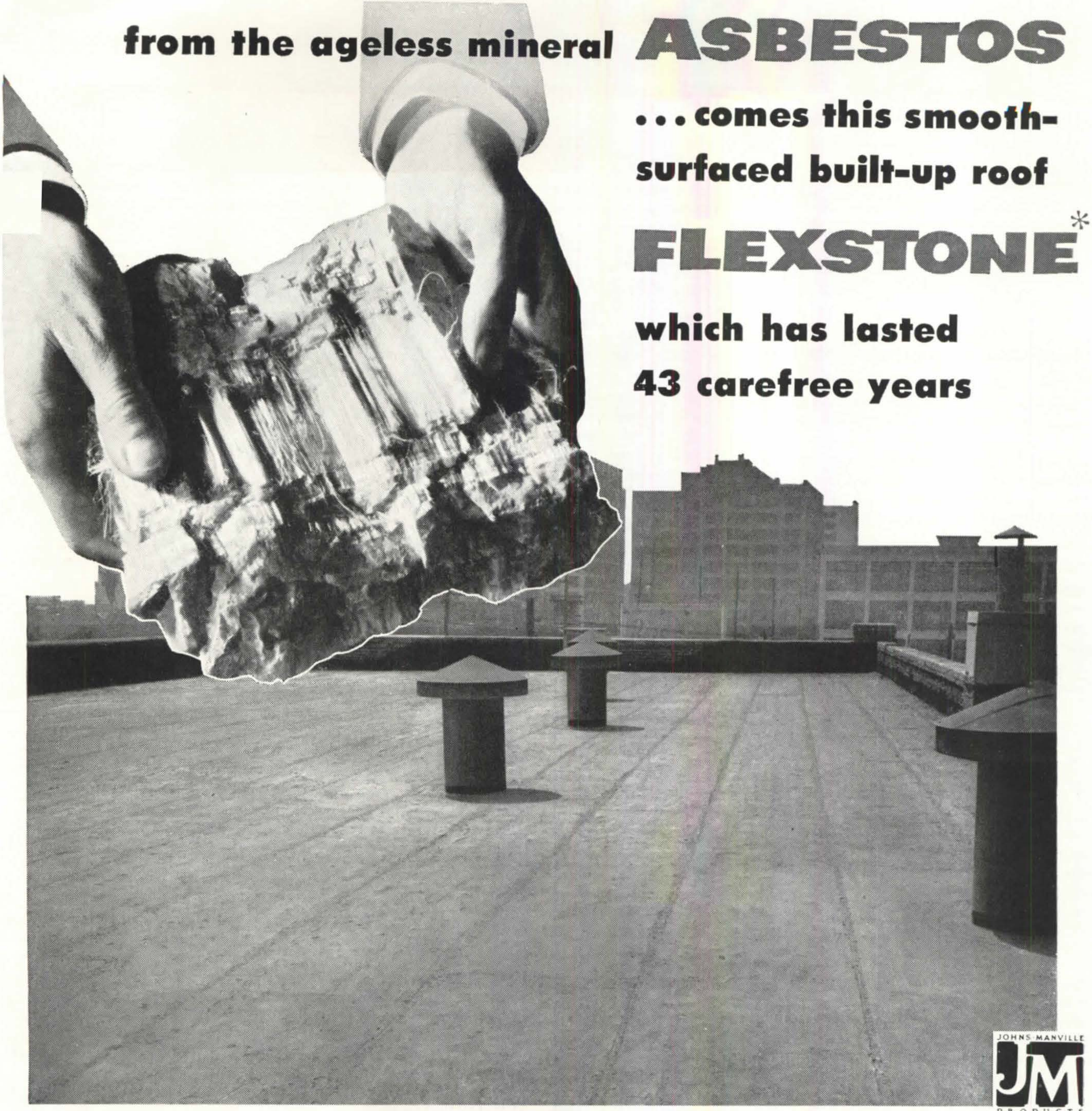
(To obtain literature, coupon must be used by 1/1/55. We request students to send their inquiries directly to the manufacturers.)

from the ageless mineral ASBESTOS

... comes this smooth-surfaced built-up roof

FLEXSTONE*

which has lasted 43 carefree years



The Johns-Manville Flexstone Built-Up Roof shown above was installed in 1911 when the building was erected. For 43 years, the owner reports, it has given continuous service without repairs or replacements.

Because they are made of the mineral, asbestos, the felts of a J-M Flexstone Built-Up Roof assure lasting service and protection. They will not support combustion. They effectively resist the drying-out action of the sun . . . won't rot, are weatherproof and need no periodic coating.

J-M Flexstone Built-Up Roofs are smooth-surfaced . . . permit thorough drainage, make any damage easy to locate and repair. They are engineered to each job . . . and can be applied on decks ranging from dead level to a pitch of 6 inches per foot.

For complete information about Flexstone Roofs and J-M Asbestile* Flashing System that provides thorough water tightness and effective treatment for critical roof areas, see your Approved Johns-Manville Contractor. He's listed in the Classified Section of the telephone directory. Or send for folder BU-51A. Write Johns-Manville, Box 158, New York 16, N. Y. In Canada, write 199 Bay St., Toronto 1, Ont.

*Reg. U. S. Pat. Off.

Johns-Manville *FLEXSTONE** Built-Up Roofs

ASBESTOS CORRUGATED TRANSITE* • ACOUSTICAL CEILINGS • DECORATIVE FLOORS • MOVABLE WALLS • ETC.

(Continued from page 141)

frames used in large window walls. *Photos* of buildings with elevations, sections, and details. Also contains instructions for use with glass block and general specifications. Hope's Windows, Inc., Jamestown, N. Y.

3-109. Modernfold Track Switches, AIA 16-A (551 SW), 4-p. brochure describing pivot switch for 90° turn, glide switch for transferring door from one track to another, and cross-track switch which permits 2 tracks to cross at right angles. Photos, diagrams, and drawings of arrangements possible with track switches. New Castle Products, New Castle, Ind.

3-110. Corrugated Wire Glass Skylights (16-A), 12-p. pamphlet covering installation of glass skylights. Details and notes on double-pitch, single-pitch, and sawtooth skylights. Drawings show use with metal roofing, corrugated asbestos, and wood. Information on installation of ventilators and table of light coverage. Pennsylvania Wire Glass Co., Philadelphia 3, Pa.

electrical equipment, lighting

4-84. Marco Fixtures (102-A), 20-p. bulletin on recessed-incandescent lighting fixtures, featuring prismatic glass reflectors and lenses. Drawings show installation and relamping of fixtures. Sections, dimensions, and tables of illumination values per watt. Marvin Mfg. Co., 648 Santa Fe Ave., Los Angeles, Calif.

4-85. Lumi-Tron Stageboards, AIA 31-D-22 (354 SG), 28-p. handbook on modern stage lighting control explains manually operated and remote-control stageboards. Drawings and wiring diagrams of each type unit and its parts. Chart of equipment recommended for various size installations; table of color range in stage lighting. Metropolitan Electric Mfg. Co., 2250 Steinway St., Long Island City 5, N. Y.

4-86. Smithcraft Fluorescent Lighting Equipment (U-216), 36-p. catalog primarily for use in ordering industrial and all-purpose fluorescent fixtures. Contains listing of available fixtures with dimensions, suggested mountings, louvers, reflectors, and prices. Smithcraft Lighting Div., Chelsea 50, Mass.

4-87. Westinghouse Lamps for Street and Highway Lighting Service (S-413), 8-p. guide to mercury, fluorescent-mercury, and incandescent lamps. Describes series and multiple circuits; standard service and group replacement. Technical data on lumens, amps, watts, and dimensions; typical lumen maintenance curves. Westinghouse Lamp Div., Westinghouse Electric Corp., MacArthur Ave., Bloomfield, N. J.

finishers and protectors

5-26. Standard Specifications on the Use and Application of Shellac, AIA 25-A-3, 12-p. manual of suggested specifications for shellac application, finishing floors and interior woodwork. Notes on wood fillers, stains, waxing, and preparing shellac. Shellac Information Bureau, 65 Pine St., New York, N. Y.

5-27. Maintenance and Restoration of Stone Structures, 4-p. brochure illustrating results of wet-aggregate cleaning process for stone structures. Information on nonshrinking mortar for restoring joints, treatment to prevent water penetration, and coppercoated flashing for use in cases of serious leaking around projecting courses. Photos of before and after treatment. Western Waterproofing Co., Inc., 1220-27 Syndicate Trust Bldg., St. Louis 1, Mo.

insulation (thermal, acoustical)

6-43. Jet-Sulation and Jet-Acoustic, 4-p. folder describing spray-applied thermal and acoustical insulations for use on metal, masonry, concrete, and wood. Diagrams; data on thermal conductivity, vapor permeability, and noise reduction. Air-O-Therm Application Co., Inc., 1575 Oakton Blvd., Des Plaines, Ill.

(Continued on page 146)

(Continued from page 145)

6-44. "Mylar" Polyester Film (MB-1), 8-p. bulletin outlining properties of transparent, flexible film, suitable for electrical insulation and laminating base. Features insensitivity to moisture, resistance to solvent and chemical attack, high strength, and wide operating temperature range. Tables of physical, electrical, chemical, thermal properties, and gages currently available. E. I du Pont de Nemours & Co., Inc., Film Dept., Wilmington 98, Del.

6-45. Koppers Expandable Polystyrene, 28-p. booklet on expanded plastic material highly resistant to heat passage but impervious to water. Describes heat process transforming granules into dense foam. Tables of thermal properties, water absorption, vapor transmission, and tensile strength. Koppers Co., Inc., Chemical Div., 1301 Koppers Bldg., Pittsburgh 19, Pa.

sanitation, plumbing, water supply

7-29. Septic Tank Soil-Absorption Systems for Dwellings, (5), 38-p. guide for the design and installation of individual sewage disposal systems. Covers septic tank design, construction and capacity of tanks, disposal or absorption fields, cleaning periods, and protection of water source. Layout drawings and construction diagrams. Supt. of Documents, U. S. Govt. Printing Off., Washington 25, D. C. 25¢.

surfacing materials

9-42. A Treasury of Hardwood Plywood, AIA 19-F (202), 20-p. guide for selection of hardwood plywood. Table of available colors and grains, installation and finishing methods, photos, and diagrams. Hardwood Plywood Institute, 600 S. Michigan Ave., Chicago 5, Ill.

9-43. Micarta Data Book (B-5878), 52-p. handbook covering all grades and forms in line of plastic surfacing material and chemical, mechanical, and electrical properties of each. Design and application information; machining data section giving modern fabrication procedures. Westinghouse Electric Corp., Trafford, Pa.

9-44. Ludowici Roofing Tiles, 8-p. publication featuring roof tiles available in several interesting surface textures. Color photos of interlocking and shingle tiles; construction details and drawing of use with prefab trusses. Also contains information on 4 quarry tile patterns for floors and 6 conventional roofing tiles. Ludowici-Celadon Co., 75 E. Wacker Drive, Chicago 1, Ill.

interior furnishings

11-1. Dunbar Book of Modern Furniture, 56-p. booklet of contemporary designs by Edward Wormley. Illustrations of furniture in regular Dunbar line and more modestly-priced Career Group. Photos of noteworthy pieces shown in good design exhibitions. Information on fabrics and finishes; dimensions. Dunbar Furniture Corp. of Ind., Berne, Ind.

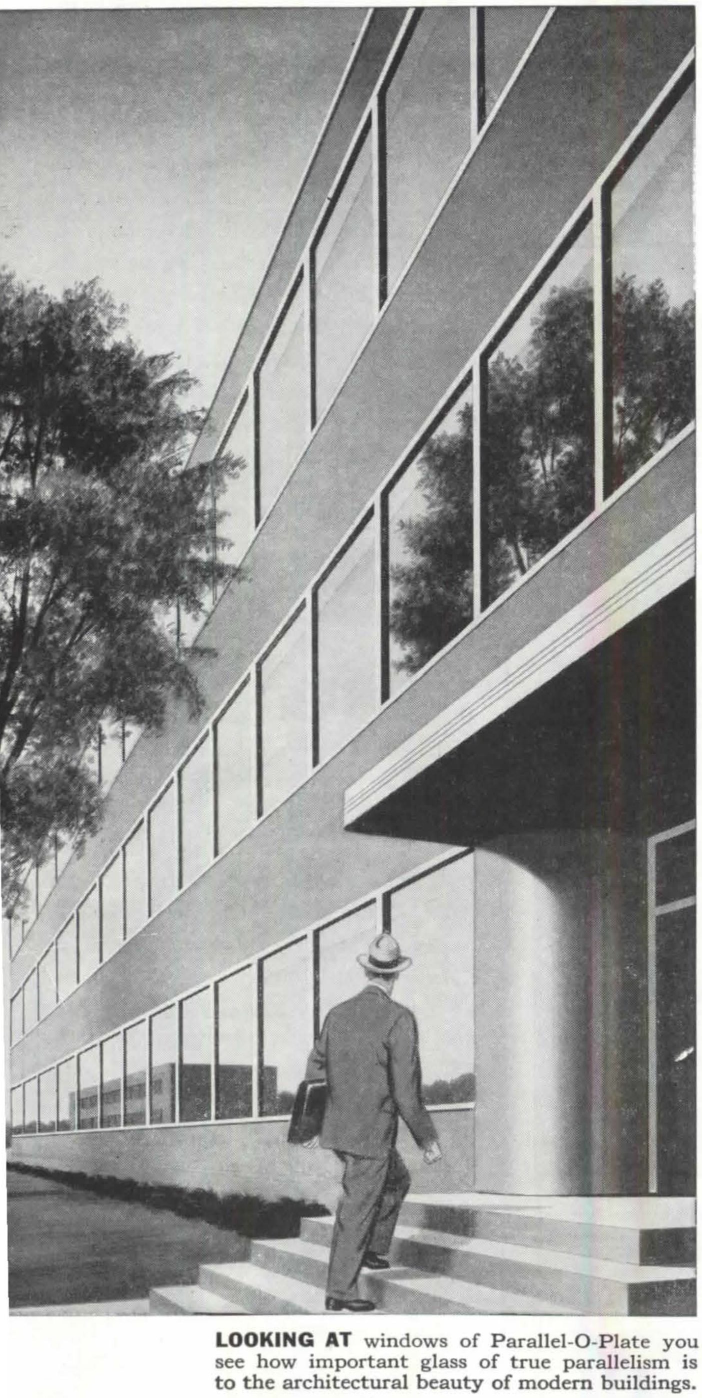
11-2. Museum Cases, AIA 35-H-5 (LB 468), 14-p. catalog on aluminum or bronze extruded metal-frame museum cases. Describes wall and table models for exhibiting all types of objects including books. Photos, construction details, illumination diagrams. Remington Rand Inc., Management Controls Div., 315 Fourth Ave., New York 10, N. Y.

special service

12-1. Subsoil Investigations, 20-p. brochure produced for architects and contractors deals with need for subsoil investigations and benefits derived. Covers drilling of underlying strata and analyzing samples. Photos, diagrams of test samples, typical boring log, and sample curves. Soil Testing Services, Inc., 3521 N. Cicero Ave., Chicago 41, Ill.

or AT

New L·O·F Parallel-O-Plate Glass is Amazing!



LOOKING AT windows of Parallel-O-Plate you see how important glass of true parallelism is to the architectural beauty of modern buildings.

It's the finest plate glass ever made in America . . . yet it costs no more than ordinary plate!

Parallel-O-Plate is the *first* and *only twin-ground* plate glass made in America.

For 12 months this L·O·F glass has been reserved solely for fine mirrors and military optical instruments.

Now it has been made available for *general* use.

It sets a whole new standard of performance for windows in stores, homes and offices.

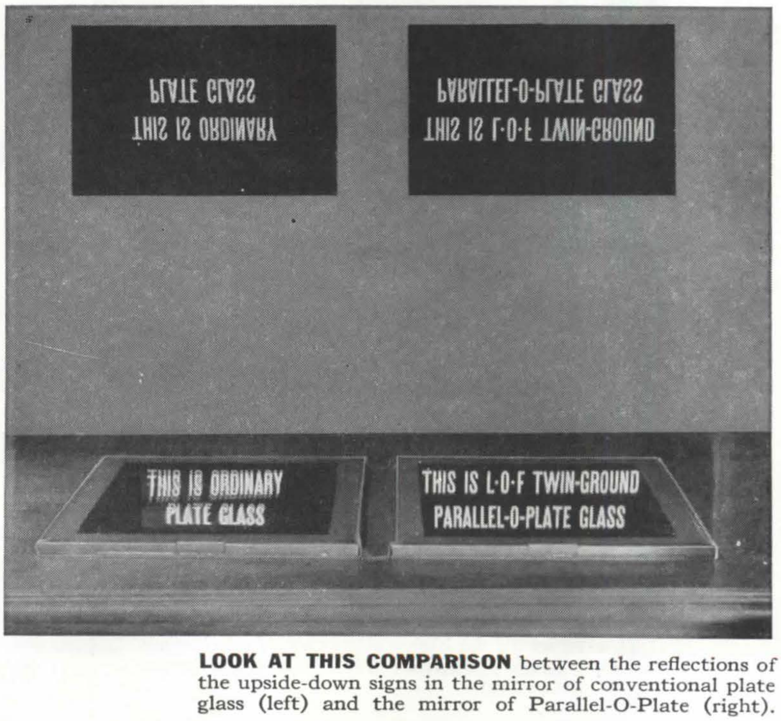
New Libbey·Owens·Ford *twin-grinding* is the most advanced method of perfecting plate glass! At L·O·F, a ribbon of plate glass 127″ wide and a fifth of a mile long moves continuously through ingenious machines which grind both sides *simultaneously!*

What does this mean to you?

Most distortion in glass is caused by a *lack* of parallelism.

Twin-ground plate glass is the most perfectly parallel plate glass in the world!

Yet L·O·F Parallel-O-Plate costs *not one cent more!*



LOOK AT THIS COMPARISON between the reflections of the upside-down signs in the mirror of conventional plate glass (left) and the mirror of Parallel-O-Plate (right).

Parallel-O-Plate Glass

The finest plate glass in America... made only by **LIBBEY·OWENS·FORD**

a Great Name in Glass

LIBBEY·OWENS·FORD GLASS COMPANY • TOLEDO 3 • OHIO

out of school

by Carl Feiss

"In certain respects man's brain is the greatest and most basic fact in nature. Its capacity has changed little, if at all, since Neolithic times. Is it not possible, however, that this conservative and yet peculiarly human organ is still capable of rescuing mankind from its present-day social predicaments?"

Dr. Leonard Carmichael, Secretary of the Smithsonian Institution, in his Phi Beta Kappa address before the American Association for the Advancement of Science, December 30, 1953.

Hurricane Carol, sweeping in frenetic and violent gusts through the shattering trees, found some of us on our August vacations in that usual state of unpreparedness and helplessness which is common to those who have lulled themselves to a lobster—sweet corn—blueberry muffin stupor. But as we drove through Providence, Rhode Island, 24 hours later, it was terrifying to see the complete anarchy which reigns in a big and usually well ordered city when traffic lights are off. Dr. Carmichael is indeed right that man's brain has changed little since Neolithic times. Neolithic man with a club or Modern man using his automobile as a club are the same savage, when his first instinct is to use selfish and brute force in a social predicament.

I cannot help wondering what would happen in such a city, were a much greater disaster to occur. We know that in Worcester, Massachusetts, and at Natchez, Mississippi, both fairly recently struck by tornados, the communities rallied instantly to the succor of the stricken spots. These, however, were only relatively small geographic portions of the whole urbanized areas involved. Not since the San Francisco Earthquake of 1906 has a major portion of a major North American city been destroyed. (I am not discounting, of course, the Texas City Disaster, but that was a small city.) The United States has been fortunate in not being put to the acid World War II tests imposed on the great European and Asiatic cities. But quick evacuation after city power is off is out of the question when one's daily associates turn into Neolithic enemies. And how dependent we have become on those technological controls of Neolithicism, the little red and green lights!

Education of technicians is one of the devices which mankind has used in historic times (and probably the Neolithic as well), to associate certain lobes and follicles of the mass brain of society in common protective purpose. And there is more to it than the protective pur-

(Continued on page 158)

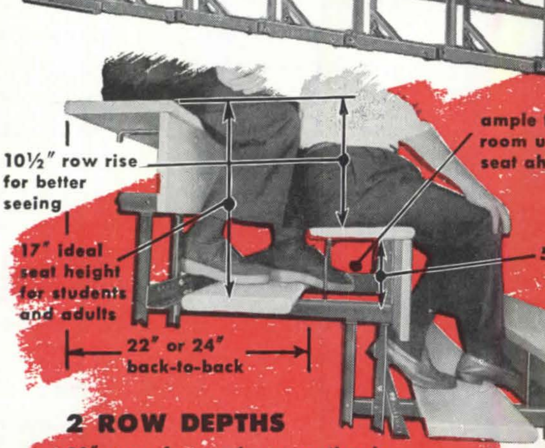
Bonus Built!

ROOMIER . . .
STRONGER . . . LIGHTER

MEDART
New Design
TELESCOPIC GYM SEATS*

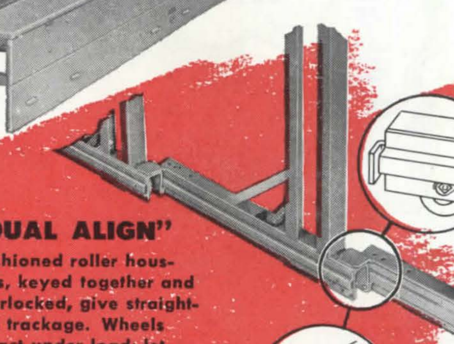
Medart sets the highest standard for all telescoping seats. Let your own comparison prove their superior value.

A NEW CATALOG tells all ...write for YOUR COPY



2 ROW DEPTHS

22″ rows for maximum seating in minimum space; 24″ rows for extra leg room, extra comfort.



"DUAL ALIGN"

Cushioned roller housings, keyed together and interlocked, give straight-line trackage. Wheels retract under load; let vertical uprights bear directly on floor.

"FLOATING MOTION"

Easier opening and closing achieved with interlocking members and multiple supports that insure true alignment, prevent binding.

STRONGER UNDERSTRUCTURE

—fully self-supporting, more rugged than ever. Wood parts give *additional* strength. 4 vertical uprights support each row—give controlled distribution of load over entire floor area.

LIGHTER

Weight has been reduced up to 70 pounds per row—the easiest of all gym seats to open and close.

SEE OUR CATALOG IN SWEET'S

*Medart Telescopic Gym Seats are fully protected by U.S. Patents.

FRED MEDART PRODUCTS, INC. • 3576 DE KALB • ST. LOUIS 18, MO.

Medart ST. LOUIS MISSOURI

out of school

(Continued from page 156)

pose—or the survival purpose. A large part of our "social predicament" lies in making of fundamental determinations as to what is right and what is wrong with the social environment within which history has placed each and all of us. Selective determinism is a brain tool which most of us in architecture, engineering, planning, and building trades are subconsciously and regularly using. When we select one building material as against another, one method of construction rather than another, we are making choices of a selective nature based on whatever knowledge and judgment man, environment, and heredity have placed at our disposal. But what we have to be reminded of, over and over, is that even as we advance the number of choices to be made, even as we devise the more ingenious and complex solutions to common problems, we are dealing with the Neolithic brain and the Neolithic body in a world whose climate is just as full of hurricanes and other weather, of land and sea, and all the things in between, as it was long before history began. It is true that a few birds, reptiles, and mammals have been extinguished in recent geologic times, but they have been replaced by many more Neolithic men, whose major claim to having made a step up the evolutionary ladder during historic times seems based upon their ability to shave themselves, to clothe themselves with some facility, and to build more complex caves within which to dwell with (occasional) comfort and safety. The rest is pretty much as it was. Man certainly can kill himself and his fellow men every bit as completely as did his hairy ancestor, and death, whether by *flint spear* or atom bomb, is just as final.

•

In the meantime, facts continue to creep up on us. As more men are born, there seem to be more men to gather data and write books and add to the great storehouses of knowledge. Dr. Carmichael,

(Continued on page 164)

(Continued from page 158)

quoted above, had this to say in this same speech:

"Today, children and university students must be helped by not infrequently somewhat bewildered teachers to deal with mountains of knowledge which did not exist when our grandparents sat at school or college desks. The piling up of known facts is one of the problems of modern education that has brought about some of its present undeniably unpleasant and undesirable characteristics.

"This increase in knowledge during the past century has occurred in almost every important area of study in the physical and natural sciences, the social sciences, and in the humanities. This very increase in knowledge with which the unchanging brain of man must deal is an important factor in pushing out from established programs of study some of the very subjects which since the Renaissance had given many educated men and women a conservative feeling for the great and, in certain respects, unchanging values of human living as seen in the literature of classical antiquity and in the Bible.

"Thus in a mere fifteen decades or so many new factors have come to influence the intellectual life of biologically old human beings. The industrial revolution was pulling apart some of man's ancient patterns of life at the same time that certain interpretations of science and rationalism were challenging his ancient belief in God and his political acceptance of an organized and stratified society, in which privilege and responsibility were somewhat in balance. As all these mutations were in progress, education was forced to face the problem of passing on to each new generation not merely a gradually increasing store of information, but a great flood of new, useful, interesting but often not well assimilated knowledge."

For the architect, the "great flood" of knowledge of new materials, new construction systems, and the many new combinations of old design ideas coupled with advances in the physical if not intellectual spheres of building has only caused confusion of choice without giving time for the Neolithic mind to catch up. The result is the kind of urban chaos with which we are all famliar, in which people struggle with each other and the environment of their own fabrication, knowing in their own hearts that these all could be improved but not finding time, energy, or mind to go about doing it. Dr. Carmichael suggests:

"Education must, it seems, accomplish the task of bringing order out of the world's present disorder, if it is to be done at all. The alternative to establishing values by fiat, or having no settled values, seems to be that Society must do a better job than in the recent past in showing the members of each new generation what the values are that have been judged to be valid in former ages. Teachers must thus select wisely from the vast and growing accumulation of human knowledge those materials which show how true wisdom of the past has developed and been expressed. Education must make clear how fundamental human and social problems have been solved in other ages. In this way inventive men and women of the present day will be encouraged to work out for themselves the solution of individual problems and social questions which now puzzle mankind but which are often seen on analysis to be very old except for the modern costumes they wear."

You know, as I was writing the above and quoting from Dr. Carmichael's very fine speech before one of this country's most scholarly associations, I have had some serious qualms. Is anything so thought-provoking and basic to understanding our fundamental problems of any interest to the few individuals who riffle through the back pages of this magazine? Am I just talking to myself?

(Continued on page 166)

WHEN YOU make these square Kno-Draft Adjustable Air Diffusers part of your air conditioning installations, everybody gets a square deal.

YOUR CUSTOMERS get the superior comfort that comes from accurate control of both volume and pattern of air flow. Handsome, unobtrusive and highly efficient, Kno-Draft Adjustable Air Diffusers mix incoming and room air *thoroughly*, well above the heads of room occupants. This means even temperature throughout the conditioned area — *no drafts.*

YOU have more to offer and less "engineering" to do. Kno-Draft Diffusers are adjustable *after* installation. This means less slide-rule work *before* the job goes in. It also means easy resetting to accommodate future layout changes. Installation in any type of ceiling is quick and easy.

You can get Kno-Draft Adjustable Air Diffusers in round as well as square units. For complete specifications, engineering and installation data, send for the Kno-Draft Data Book. Just clip the coupon to your letterhead and mail to Connor Engineering Corporation, Danbury, Connecticut.

CONNOR
ENGINEERING CORPORATION

kno·draft®
adjustable air diffusers

see our catalog in ARCHITECTURAL FILE or write for copy

CONNOR ENGINEERING CORP.
Dept. V-114, Danbury, Connecticut

Please send me the latest edition of the Kno-Draft Data Book. No obligation, of course.

Name..........

Position..........

Company..........

Street..........

City.......... Zone...... State..........

out of school

(Continued from page 164)

Are architects and professional men interested in much more than the problems of professional practice? Are the teachers of architecture being pressured to turn out not thinkers about architecture but glib designers in today's vernacular or draftsmen for today's production lines in the larger architectural foundries? Will the Editor send the column back saying, "You don't start writing an article about architectural education by writing about hurricanes."?

•

Actually, the last year has seen some remarkable advances in the thinking about architectural education—and some doing about it. *The Architect at Mid Century* has been published and I have been told (by the grapevine) some members of the Board of Directors of the AIA are reading it. This year also marks the inception of the four-power conferences between the Education Committee of the American Institute of Architects, the National Council of Architectural Registration Boards, the National Architectural Accrediting Board, and the Association of Collegiate Schools of Architecture. Further, for the first time in my memory and that of other of the oldest inhabitants, the subject of architectural education was a main feature of the annual AIA Convention. Then the annual meeting of the ACSA, prior to the AIA Convention, was a new high in intellectual content, with really serious discussion of fundamental problems of training young men today to fit into our complex social structure. Even the other architectural magazines have become interested in the subject. There has been a fascinating series of articles about the teachings of Mathew Nowicki, by Lewis Mumford, in *Architectural Record,* and John Knox Shear,[1] also in the *Record,* again has done an excellent job in evaluating an independent questionnaire issued by that magazine on some interesting educational questions. The

(Continued on page 168)

[1] *Not to rake up old coals for new warmth—but I might say that John Shear will find that in our discussions on student aptitudes in this column several times (one of our first was back in October 1950) we came to conclusions similar to his recent ones. It is merely to remind him that we are still Neolithic—all of us.*

Put Your Dimmer Board *In Your Lap*
Sit at the Vantage Point of Your Choice

With the POSITIONER System of LUXTROL light control equipment

The ultimate in lighting control is offered with the POSITIONER Systems. All the facilities of a large manually-operated switchboard are housed in a small, compact control station. You can electrically control any amount of power from miniature selector stations located at any vantage point or, by using a single cable, a selector station can actually become portable. The motor-driven LUXTROL controls are installed in any out-of-way space.

POSITIONER Systems, adaptable to large or small applications, provide pre-set lighting effects in advance, timed to coincide with the most complicated programming.

Send the coupon for detailed information.

See the Superior Electric's Mobile Display when it visits your area.

THE SUPERIOR ELECTRIC COMPANY

4114 Demers Ave., Bristol, Conn.

Manufacturers of: POWERSTAT Variable Transformers • STABILINE Automatic Voltage Regulators • VOLTBOX A-C Power Supplies • LUXTROL light control equipment • VARICELL D-C Power Supplies • Superior 5-WAY Binding Posts

THE SUPERIOR ELECTRIC COMPANY
4114 Demers Ave., Bristol, Conn.
Please send literature on the POSITIONER System of LUXTROL light control equipment.

Name..

Position..

Company Name..

Company Address..

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

out of school

(Continued from page 166)

AIA Journal has also bowed its gentle head several times in the direction of excellent articles on education and *Architectural Forum* has been acknowledging the subject from time to time. So progress is being made.

But perhaps the most encouraging experience of the year was the shape of thought struggling for expression at the AIA convention, which, if it can be developed into a genuine philosophy and program in regional meetings and succeeding conventions, may be the beginning of an intellectual maturing of the architectural mind in this country. I was personally aware of a real endeavor on the part of many of the speakers to express not only design objectives but also the objectives of a social culture[2] which would be at least Bronze Age rather than Neolithic. (With the recent rediscovery of the arch and the vault, via thin-shell concrete, we may soon re-achieve the architecture of early Mesopotamia.) Is Sassanian architecture the architecture of the future?

American architects, while often articulate in their own meetings, are not always wise. I suppose wisdom is too much to expect of any of us. But at Boston, this last go 'round, there were some authentic attempts to define superior architectural objectives and to suggest superior ways and means of reaching them. It looked like an honest search for wisdom on the part of several. And the audience sat on uncomfortable chairs, in an ugly and badly ventilated room, with the foulest possible acoustics, and ate it all up. And some of the papers would stand high in the archives of the AIA—if anyone ever bothered to look them up.

Some of you may have heard or heard of O'Neil Ford's beautiful, simple, and impassioned plea for education in the history and traditions which form the background of our life today. It was the opening speech at the Education session and set the pace for much of the discussion which followed in the next few days. The whole tone of the Convention by some curious conjection of the stars (for there was no actual guidance or control of the speakers) was in the direction of a return to the humanities and the basic traditions which make for great building. Not traditional architecture, of course! The speakers seem instinctively to have felt that the crisis of our age is due to the fact that we have not advanced beyond Dr. Carmichael's "Neolithic brain." They seem to have decided that now is the time to take stock of what we have lost—or could lose in the future, were we to exorcise forever the soul of our great cultural heritage and replace it with the

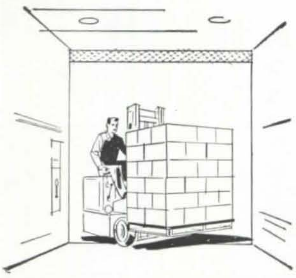
(Continued on page 172)

[2] *I commend to you the opening address by Edward Weeks, Editor of* Atlantic Monthly, *published in the August 1954 issue of the* AIA Journal.

"PUNISHMENT"

ARE DESIGNED FOR POWER TRUCK LOADING

You've got to change your thinking about freight elevators — *when you change to industrial power truck loading!* A power truck, which may weigh 8,000 pounds or more, plus its heavy pay load, sets up unusually severe off-balance, extra static loading, and heavy impact forces in the elevator car and structure.



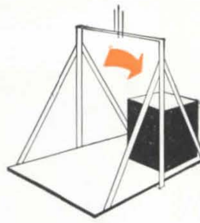
Let's examine this "punishment" in detail to see why an elevator for industrial power truck loading must be extremely rugged to stand up under these forces.

Let's start with

...OFF-BALANCE LOADING

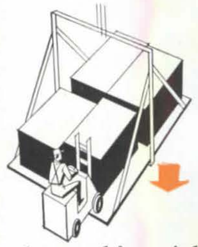
As a power truck enters the car, it suddenly concentrates most of its weight and all of its pay load at the front edge of the platform. Then it usually deposits its first heavy pay load at a rear corner of the platform.

This off-balance loading "punishment" is transmitted to the car, the rails and brackets, the elevator shaft, and finally to the building structure. All of these forces must be met with increased ruggedness of design.



Now for

...EXTRA STATIC LOADING



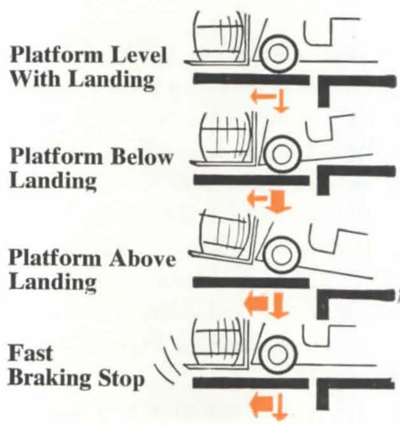
Watch the front wheels of a power truck as it deposits its final pay load. They usually stop at the front edge of the car platform. This adds up to 80% of the truck's weight to the load the elevator must withstand — which may be as high as 50% over the lifting capacity of the elevator.

This extra static loading "punishment" must be met with increased ruggedness of design.

Finally, there's

...IMPACT LOADING

Industrial power trucks travel fast, stop quickly, and deliver freight with heavy impact. They tend to tilt and twist the entire elevator structure with a variety of vertical and horizontal impact forces. See weight of the arrows in diagrams.



Impact "punishment" must be met with increased ruggedness of design. All of the forces described are at work, not singly, but simultaneously and in endless combinations.

Otis POW-R-TRUCK elevators with power-operated doors—*and lifting capacities from 8,000 lbs. up*—have the ruggedness of design, automatic controls, and traditional Otis safety needed for today's power truck loading. Write for Booklet B-705 or ask any of our 268 offices for details.

Otis Elevator Company
260 11th Ave., New York 1, N. Y.

Otis FREIGHT ELEVATORS

HEAVY DUTY · GENERAL DUTY · LIGHT DUTY

out of school

(Continued from page 168)

slick gods of today. For me, these were curious confessions to be listening to: a *series* of acute revelations of the doubts and hopes of some of today's architectural leaders, very humbly expressed (except for two who, out of courtesy, shall be nameless), and with sincerity and occasional awkwardness that was quite appealing. Since a number of such expressions were extemporaneous, we can only tell you about them and hope that a like event will happen again, this time in your presence, and in the near future.

•

Since I have devoted so much of this month's column to quoting a great speech of nearly a year ago, I might as well end with excerpts from an important and disturbing one-page statement to be found in *Civil Engineering* for May 1954. This is an article by S. D. Sturgis, Jr., Major General, U. S. Army; Chief of Engineers, Washington, D. C., and entitled "Inadequate Pre-college Training Imperils Nation's Future."

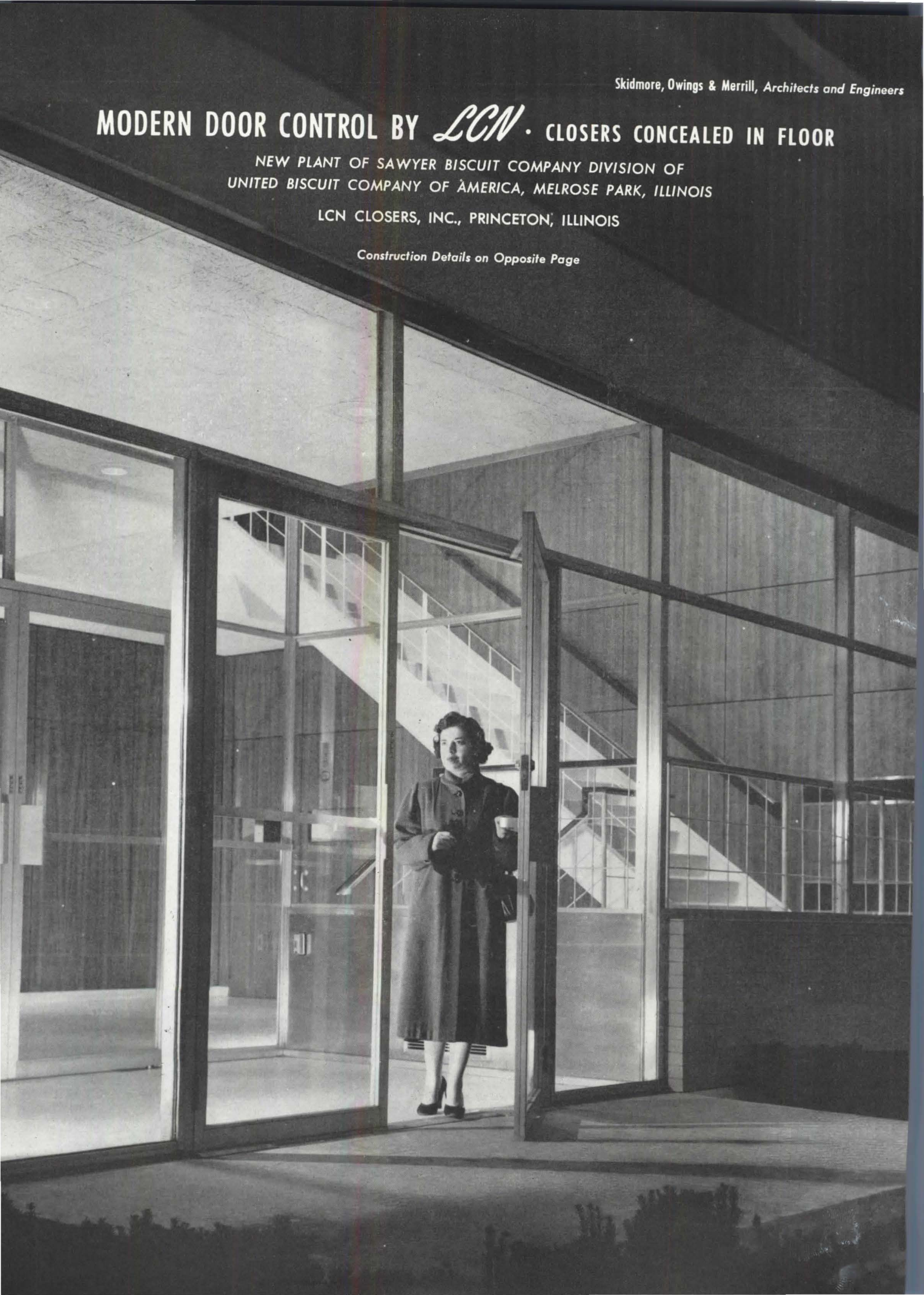
General Sturgis leads off with a statement about the well-known shortage of engineering talent. He describes the low level of mathematics training in freshman classes and the low enrolment rates of algebra and geometry students in high schools. Since I will end this article with the quotation, may I say that even though the national defense issue is clearcut in many of the many engineering fields and is less so in the architectural and building fields, the relationship is there by more than inference. Also, the low level of mathematical competence of our college entrants will, in time, slow down our ability to make use of all that technology has to offer the architect and what the architect in turn will have to offer to his people and their defense. Read what General Sturgis says (in part) and interpolate. *The* equation then reads: 0 Math = 0 Architecture + 0 Defense.

"As the influx of qualified students falls off, our engineering institutions are faced with the unhappy choice of reducing their output or lowering their standards. Either of these alternatives could be disastrous to the United States, for in Russia today the authorities are not much interested in so-called 'happy, well-adjusted children.' They want scientists and engineers who can develop and produce more effective means of waging war. We want scientists and engineers who can create and produce in peace, and we believe that the supreme happiness and the best adjustment to life are to be found in the towering realm of creation founded on hard work. But at the same time we need scientists and engineers for the defense of our civilization.

"We have every reason to believe that the Russians are making great strides in professional education. Between 1940 and 1950 the number of trained Russian engineers increased 43 percent to a total in 1950 of about 460,000 engineers. By way of contrast, there were an estimated 400,000 American engineers in 1950. But the contrast does not end there, for the Russian engineering effort is committed exclusively to increasing the Soviet war potential, while ours is devoted primarily to maintaining and improving our high standard of living. . .

"The full implications of the increase in

(Continued on page 174)


Skidmore, Owings & Merrill, Architects and Engineers
MODERN DOOR CONTROL BY LCN · CLOSERS CONCEALED IN FLOOR
NEW PLANT OF SAWYER BISCUIT COMPANY DIVISION OF
UNITED BISCUIT COMPANY OF AMERICA, MELROSE PARK, ILLINOIS
LCN CLOSERS, INC., PRINCETON, ILLINOIS
Construction Details on Opposite Page

out of school

(Continued from page 172)

Russian engineering potential as compared to our own have scarcely begun to be felt, but unless we reverse the present trend our country is in real danger. For in this technological age in which we live, we are, for the first time in our history, threatened by a power possesed of greater natural resources and greater manpower than our own. At present, the balance of peace and security is maintained only by our superior technology, which enables us to make better use of our limited resources to the point where attacking the United States is sheer folly. But as the gap between the American and the Russian technologies closes, this fine balance will become increasingly precarious.

"We make much of the fact that it takes 10 years of engineering effort to bring a new plane off the drawing boards, 5 years to develop a new tank, and 2 years to design a power plant. But who ever stops to think about the 16 years of formal education that go into the making of the American engineers, to whom we look for the accomplishment of these tasks? We cannot continue to look entirely to the old hands in the profession, for it is an inescapable fact that although age develops judgment and wisdom, truly creative thinking and new ideas usually spring from young minds. If we are to survive as individuals, as a profession, and as a nation, we must look to our youth and we must get the cream of that youth actively interested and participating in the several fields of engineering."

notices

fellowships

ROME PRIZE FELLOWSHIPS for 1954-55, valued at approximately $3000 each, awarded in architecture to JAMES A. GRESHAM, Enid, Okla.; ROBERT VENTURI, Rosemont, Pa.

FRANCIS J. PLYM TRAVELLING FELLOWSHIPS for 1954, of $1700 each, awarded to two University of Illinois graduates: RICHARD EDWARD NEVARA, Chicago, Ill., and DELBURT EVERETT ALLISON, Lyons, Ill., in Architecture and Architectural Engineering respectively. Fellowships are for travel and study in Europe.

ST. LOUIS METROPOLITAN PLANNING FELLOWSHIP for graduate study in city planning has been established at University of Illinois. ST. LOUIS REGIONAL PLANNING AND CONSTRUCTION FOUNDATION is sponsor of $500 grant. Graduates in architecture, landscape architecture, or engineering residing within radius of 100 miles of Eads Bridge, St. Louis, are eligible to apply.

books received

Industrial Site Selection. Gerald Breese. The Bureau of Urban Research, Princeton University, Princeton, N. J., 1954. 115 pp., illus., $2

Reinforced Concrete and Prestressed Concrete Structures. Riccardo Morandi. Libreria Dedalo, Via Barberini 75, Rome, Italy. 141 pp., illus., L. 4.600

The Genesis of Modern British Town Planning. William Ashworth. Routledge & Kegan Paul Ltd., Broadway House, 68-74 Carter Lane, London, England. Distributed by the Grove Press, 795 Broadway, New York 3, N. Y., 1954. 259 pp., $4.50

Inside Today's Home. Ray Faulkner. Henry Holt & Co., 383 Madison Ave., New York 17, N.Y., 1954. 653 pp., illus., $8

architecture's worth

Vanity and Value—The Importance of Art for Our Time. *Francesco Memoli. Exposition Press, 386 Fourth Ave., New York 16, N. Y. 1954. 502 pp., $5*

The practice of architecture involves the study of so many aspects of human behavior that it is no wonder architects sometimes feel they can tackle anything at all. This commendable self-confidence, in the case of Francesco Memoli, a Cincinnati architect who has read widely and thought deeply, results in a somewhat confusing but highly stimulating book which more than repays the reader for struggling through some of its heavier sections.

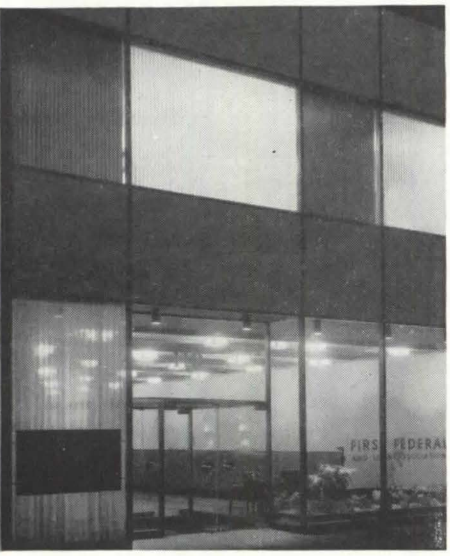
Memoli's main theme is that all value exists only as an interpretation by humans in terms of human reactions, emotions, and desires, so that any attempt to fix value by measurable quantities or mechanical processes is as hopelessly limited and doomed to failure in economics or physics as it is in esthetics. In the latter, at least, subjective human emotion is recognized. What our culture must do, says Memoli, is to extend this recognition into every field of human endeavor. Then, and only then, will we be able to replace the vanity of materialism by the true value of beauty and happiness.

"Value," says the author, "whether ethical, religious, esthetic, scientific, economical, political, practical, or what have you, is the measure of human effort in its attempts to achieve the good, the true, and the beautiful, or the merely expedient."

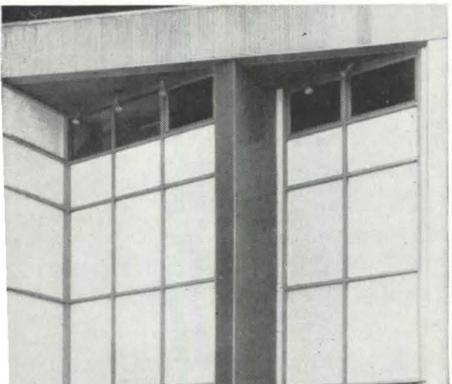
Although he makes specific observations on architecture in this connection, Memoli devotes the major part of his book to questions under the headings of Language, Thought, Government, Behavior, Justice, War or Peace, Culture, Civilization, and The Human Spirit—to name a few at random. His heart is clearly in the right place, and he is to be commended for his courage and his obvious sincerity. It is possible, however, that his chances of advancing his cause might be greater if he had decided to fight on a smaller front. EUGENE RASKIN

(Continued on page 182)

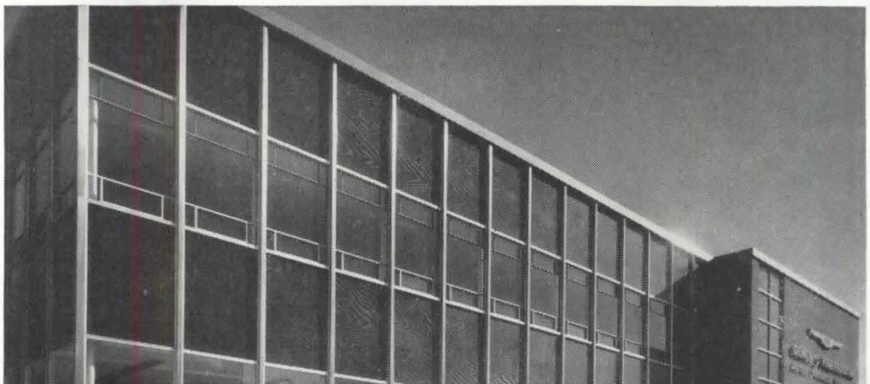
Today's glass-clad buildings utilize Pittsburgh Plate Glass for enduring, distinctive architectural appeal



FEATURED in this smaller glass-clad structure are 11/32" Tranquil Green Carrara® Structural Glass spandrels. Carrara Glass is noted for its colorful beauty, its homogeneous structure, imperviousness to weather and other deteriorating agents, as well as for its design flexibility. Other Pittsburgh Plate Glass Products used here include four Herculite® Tempered Plate Glass Doors and Pittsburgh Polished Plate Glass. Architects: Cull, Robinson & Green, Providence, R. I.



ꟷ **THIS BUILDING,** too, Pittsburgh's Carrara tructural Glass, backed with Foamglas® inılation, is effectively adapted to an ingeniıs architectural treatment. Included also are erculite® Tempered Plate Glass Doors, ittco® Store Front Metal and Tubelite® letal. Architect: C. Ralph Fletcher, A.I.A., hagrin Falls, Ohio.



ROUGH SOLEX PLATE GLASS units are alternated with regular green-tint Solex sections in the General Fireproofing Company Building to produce a glass-clad building of immediate appeal. Solex is particularly recommended for southern and western exposures. It reduces heat and sun-glare, keeps interiors cooler than outside temperature, thus helping to increase efficiency and employee morale. Design and construction by The Austin Company, Cleveland, Ohio.

Your Sweet's Catalog File contains detailed information on all Pittsburgh Plate Glass products . . . Sections 7a, 13e, 15, 16b, 21.

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS · FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

reviews

(Continued from page 176)

collaborative arts

The Modern Renaissance in American Art: Presenting the Work and Philosophy of 54 Distinguished Artists. *Ralph M. Pearson. Harper & Brothers. 49 E. 33 St., New York 16, N.Y., 1954. 300 pp., illus., $6.50*

Increasing awareness of the advantage of renewed use of painting and sculpture in architecture has been manifest for the last few years. Between contemporary architecture and modern art a certain measure of harmony is evident.

For such reasons, architects in this country should be interested in modern American art and in familiarity with its various forms—expressionism, abstractionism, realism, surrealism. This book is a basic anthology of work and thought in the field of American art; its simplicity of style and treatment makes it suitable as a starting point for a reading program on the subject.

Details of the life, work, and philosophy of 54 American artists are given in brief form; illustrations of the work of each in various stages of their development amplify the text.

If this reviewer might judge from the discussion of two artists whom he personally knew — Ruth Reeves and Peppino Mangravite—the presentation of the artists is unbiased, accurate, and reasonably adequate. LAWRENCE E. MAWN

design of synagogues

An American Synagogue for today and tomorrow — A Guidebook to Synagogue Design and Construction. *Edited by Peter Blake. The Union of American Hebrew Congregations, 835 Fifth Ave., New York 21, N.Y., 1954. 311 pp., illus., $10*

Although great synagogues were built in bygone centuries, none of them succeeded in establishing a definitely Jewish religious architecture. Very little distinguishes these older synagogues from the architecture of their varied surroundings. Thus, the synagogue in Kaifeng Fu in

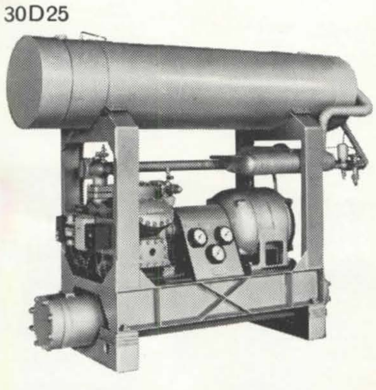
(Continued on page 186)

systems

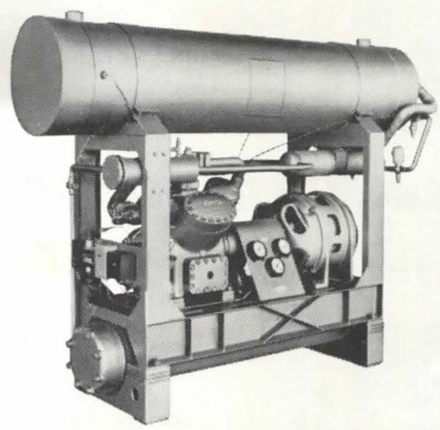
sizes

refrigeration

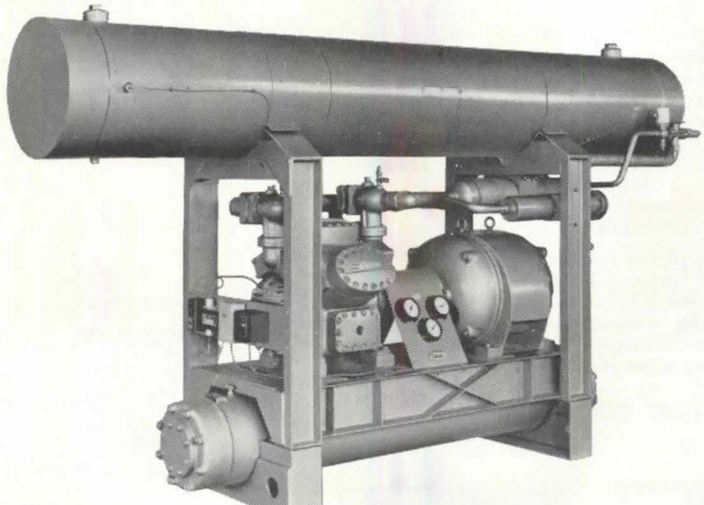
25 hp
Model 30D25



40 hp
Model 30D40



60 hp
Model 30D60



Carrier

air conditioning
refrigeration
industrial heating

reviews

(Continued from page 182)

China was reminiscent of Chinese pagodas; the synagogue of Late Antiquity in Palestine showed the influence of Greco-Roman art; the Great Synagogue in Toledo readily adapted all the characteristics of Moorish architecture.

Today, however, as the fine examples in this book indicate, the synagogue is coming into its own. "Fortunately" writes Rabbi S. Kline, one of the 30 or more noted authors and contributors to this excellent book, "adoption of the contemporary style for Jewish houses of worship has been easy, consistent, even congenial. It has been easy because, unlike other religions, we have had no dominating architectural tradition to maintain."

In a historical section, the book traces the evolution of Jewish houses of worship from the earliest tent-shrines, in use before Israel's migration into Palestine, to the solar sanctuaries, the temples, and finally to the synagogue, which became the accepted expression of Judaism.

A large part of the book is devoted to the interior arrangement of today's synagogues. Like the traditional synagogues, they must serve three functions: as House of Worship, as House of Study, and as House of Assembly. Every phase of synagogue construction and planning is comprehensively covered. Articles pertaining to program analysis, site selection, architects' fees, art and music in the synagogue, seating, lighting, acoustics, heating and ventilating, legal and financial arrangements (all with many well-chosen illustrations), make this excellent book an indispensible guide to architects and others interested in the building and form of Jewish houses of worship. I.M.R.

how towns grow

History Builds the Town. *Arthur Korn. Lund Humphries & Co., Ltd., London, England (Available at The British Book Centre, Inc., 122 E. 55 St., New York 22, N. Y.) 1953. 222 pp., illus. $10*

In view of the tremendous amount of current interest and activity in town devel-

(Continued on page 190)

reviews

(Continued from page 186)

opment in this country and other parts of the civilized world, the subject of this book is especially timely. The author's aim, as he states, is a "purely practical one": To establish "first principles" for the planning of the contemporary town. In his opinion, anyone engaged in mastering the problems of town planning must, first of all, know what a town really is and then understand the forces —such forces as birth, growth and decline—that not only govern a town's life but determine its structure as well. He points out how man, all through history, has been and still is struggling with nature and learning to control her—and that the town is a product of these struggles. Taking the main historical types of towns as examples, Korn sets out to show how society (or the social organism) with its political and economic structure has been responsible for the various kinds of towns created throughout the ages. First, he deals with the town in ancient times, showing the prehistoric communities of the primitive nomads, on to Egypt and Mesopotamia where growth depended upon an economic necessity such as irrigation, and then to Greece and Rome where the aristocratic society that sprang up depended upon the economic factors of slavery. From these very earliest types of towns, the author then deals with the growth and the governing factors in the development of the Medieval towns, the towns of the early and later days of Capitalism, on to the modern towns of Great Britain, the United States, and Soviet Russia. All have had their special influences, their particular reasons for coming into being and their growth. He concludes his historical researches with a chapter on the theory and practice of contemporary town planning with some suggestions on approaching the problems; citing, among other examples, the MARS Plan for London, of which he was chairman when it was worked out (1938).

A lecturer on Town Planning at the Architectural Association School of Architecture in London, Korn was trained in

(Continued on page 194)

TILE BY TILE,
you can't beat VINYL FLOORING for durability

Proof of durability of vinyl tile is its use in home economics laboratory of Kearny High School, in Kearny, New Jersey. Here, the tile stands up under extreme wear, resists stain by spilled foods, cleans in a jiffy.

What is "vinyl" tile? This new floor covering is made from synthetic resin, fillers, stabilizers and plasticizers. The resin and plasticizers are the binders and the most important ingredients—they impart durability, abrasion resistance, grease and stain resistance, flexibility, heat and light stability.

How can you use vinyl tile? This tile is your answer to questions of durability and rich, colorful appearance in flooring. Vinyl tile comes in a wide array of colors—light to dark; soft, warm pastels; unusual marbleized effects. You'll find it ideal wherever wear's a problem. It also keeps its gloss; requires little maintenance and can be used over practically any kind of dry, smooth subfloor. These advantages make vinyl tile the fastest growing floor covering. Available in a wide price range.

Monsanto's role: This new development in flooring is made possible by Monsanto Opalon* vinyl resins and Santicizer* plasticizers.

For more information on the companies manufacturing vinyl tile, get in touch with the nearest Monsanto sales office or write to Organic Chemicals Division, MONSANTO CHEMICAL COMPANY, Box 478, St. Louis 1, Missouri.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS AND PLASTICS

SERVING INDUSTRY...WHICH SERVES MANKIND

reviews

(Continued from page 190)

Berlin and practiced there many years before going to England. There is no question of his earnestness nor the infinite pains he has taken in producing this scholarly (rather ponderous) book—the statistical data and bibliography are prodigious, to say nothing of the fine quantity and quality of the illustrations. However, aside from the enlightening historical background, this volume—as far as being a worthwhile aid and inspiration to those concerned with modern town planning—leaves much to be desired in context and presentation.

FRANK A. WRENSCH

handling traffic

Urban Traffic: A Function of Land Use. *Robert B. Mitchell and Chester Rapkin. Columbia University Press. 2960 Broadway, New York 27, N.Y., 1954. 226 pp., illus., $5*

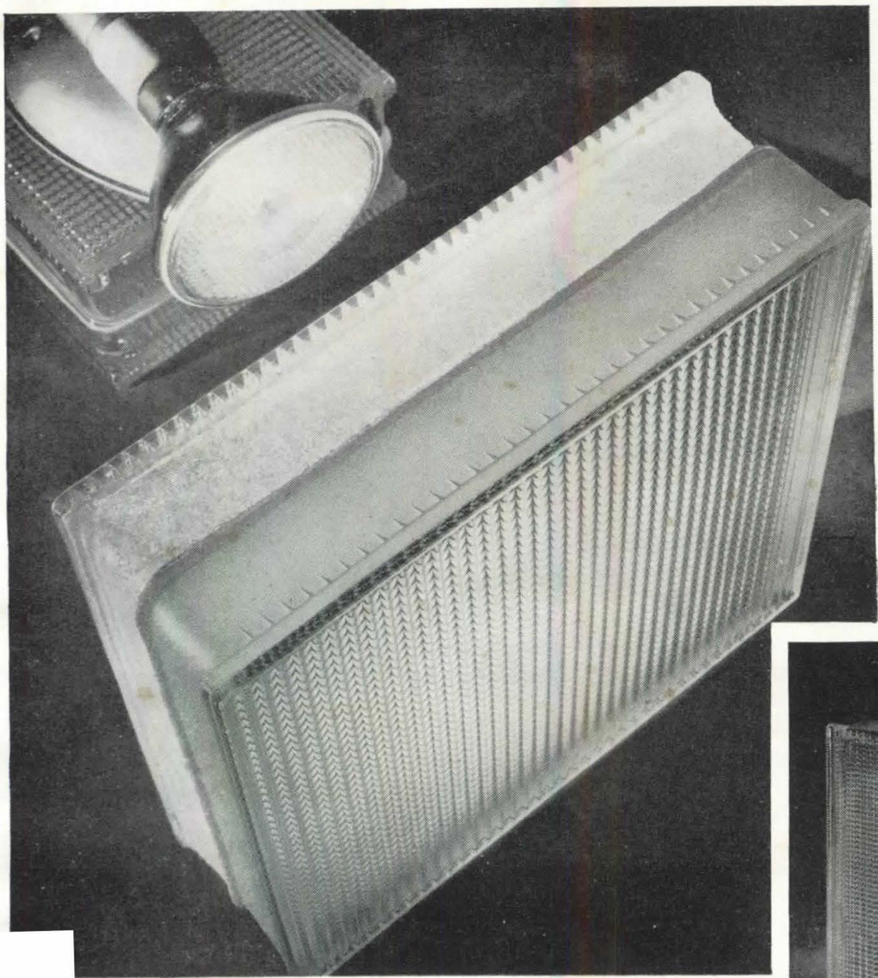
Traffic is defined by the authors, "Vehicles in motion, or temporarily prevented from moving." Motion of vehicles or prevention of motion have demonstrably definite relationships to the traffic-generating characteristics of various land uses.

In the process of urban land utilization there are three major steps: the improvement of a parcel of land to meet the needs of an anticipated user; the construction of a structure or facilities for the user; the occupancy of the land or structure by the user for his particular activities. Such activities require movement of both persons and goods. "The amount of traffic in a city . . . is a reflection of the total movement of people and goods through the various channels of movement."

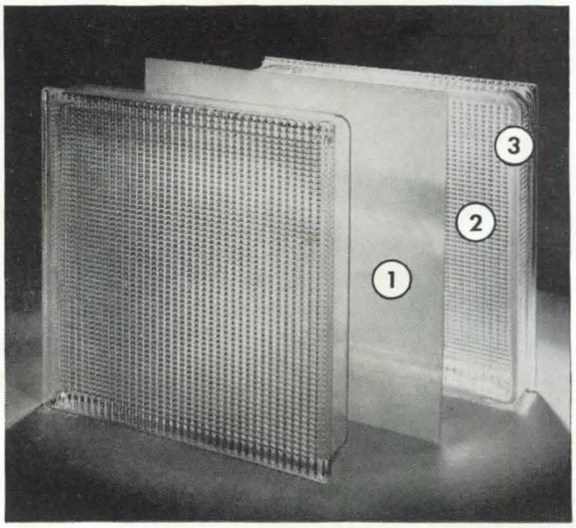
Architects are professionally interested in the construction phase of land utilization. For the ultimate good of their profession they should be interested in solution of the resultant traffic problems: ". . . the most basic level of action for a long-run solution of traffic problems is the *planning, guidance, and control of change in the pattern of land uses* in the interest of efficiency."

(Continued on page 196)

look closely . . .



you can see the secret of Suntrol



In the top photograph, you can see how the green Suntrol screen reduces the light intensity from the lamp. The outer half of the Suntrol Block is bright, but *inside*, on the room side, the raw light is softened and diffused until it's easy on the eyes.

The other photograph tells more of the story. You can see the green, fibrous glass diffusing screen (1) that filters the light and divides the block into two insulating cavities. You can see the internal prisms cast into every Suntrol Block (2) that direct the light upward or diffuse it according to the pattern selected. Lastly, you can see the exclusive PC Soft-Lite® Edge (3), of opal glass that eliminates glare through the edge of the block.

Suntrol Blocks reduce brightness 35%, and instantaneous heat gain by 25% compared with standard glass blocks. If you have an unusual location where glare and heat are a problem, it will be to your advantage to learn more about these remarkable Suntrol Blocks — available *exclusively* from Pittsburgh Corning. For complete information, write to Pittsburgh Corning Corporation, Dept. C-114, One Gateway Center, Pittsburgh 22, Pennsylvania.

PC Suntrol* Glass Blocks

® PITTSBURGH PC CORNING

ALSO SKYTROL® AND FOAMGLAS®

*T. M. Reg. Applied For

reviews

(Continued from page 194)

Obviously more information is needed about the precise nature of the relationship between land use and movement and about the extent of the effects of one on the other. This book might be summed up as an exploratory phase of a research program seeking such increased information. It is a publication of the Institute for Urban Land Use and Housing Studies, Columbia University.

The book is well organized and competently written; it is recommended to anyone interested in community planning problems. LAWRENCE E. MAWN

trends analyzed

The Volume of Residential Construction, 1889-1950. *David M. Blank. National Bureau of Economic Research, 1819 Broadway, New York 23, N.Y., 1954. 99 pp., $1.50*

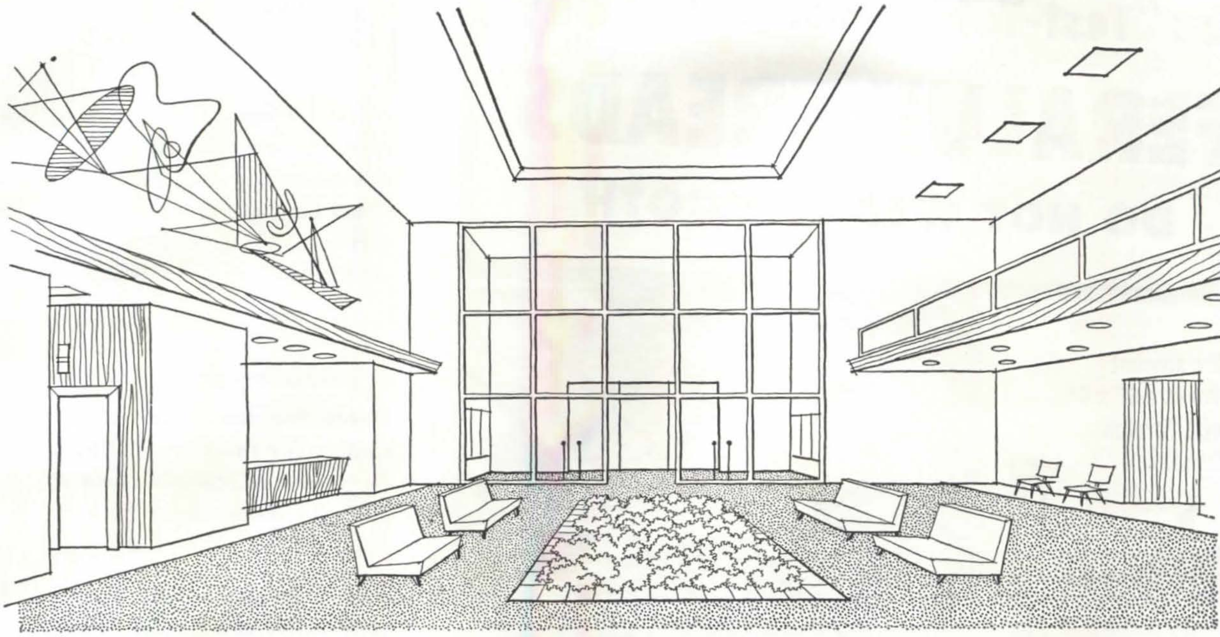
Prepared in conjunction with the Institute of Urban Land Use and Housing Studies, Columbia University, this report is part of a large examination of capital formation and financing. The comprehensive study of the volume of residential construction classed according to type and location, over a period of sufficient duration to allow an analysis of trends, has been made possible by access to previously unused information. Stress is placed on explicit presentation of methods used to prepare the new estimates and on comparison of these with existing figures. L.G.

supplies and equipment

Hospital Purchasing File, 31st Edition. *Purchasing Files, Inc., 919 North Michigan Ave., Chicago 11, Ill., 1954. 394 pp. and manufacturers' catalogs, $5*

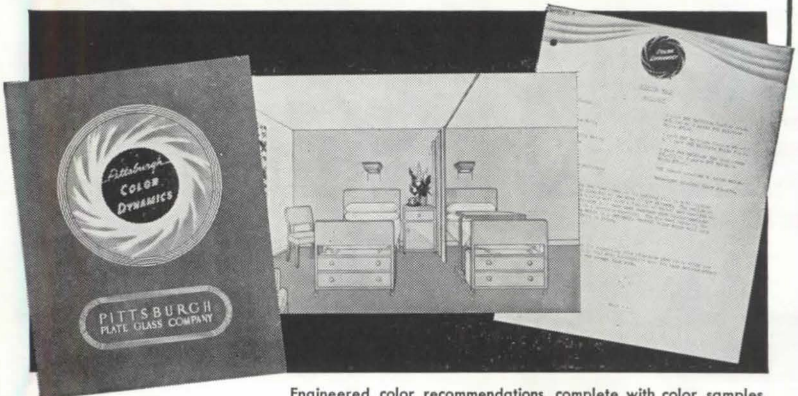
The 1954 edition of the Hospital Purchasing File provides information on equipment, services, and supplies in addition to "Planning and Reference Data," by Guy H. Trimble of the Public Health Service, for the architect engaged in

(Continued on page 198)



Why not add a comprehensive

Engineered Color Study to your plans?



Engineered color recommendations, complete with color samples, are bound in booklet form. Also included are suggestions for the correct types of coatings for every kind of material and construction.

TODAY, nearly everyone who owns or operates an industrial, commercial or service enterprise recognizes the importance of the effect of color environment on people.

● **You can often make** your plans more acceptable to clients by including a detailed color program. Why not let us submit *engineered* color recommendations to go with your plans? These recommendations are based upon the principles of COLOR DYNAMICS, Pittsburgh's modern painting system which has demonstrated its ability to improve productive efficiency, morale and well-being in many fields.

● **We'll be glad** to make such a detailed study without cost or obligation to you. Simply call your nearest Pittsburgh Plate Glass Company branch and arrange to have one of our color experts see you at your convenience. Or mail this coupon.

Additional information on COLOR DYNAMICS in Sweet's Architectural File, Section 14/Pi.

MAIL THIS COUPON TODAY

Pittsburgh Plate Glass Company
Paint Division, Dept. PA-114
Pittsburgh 22, Pa.

Gentlemen:

☐ Please have your representative provide us with further information about Pittsburgh's *Free* COLOR DYNAMICS engineering service for architects.

☐ Please send *free* copy of your booklet on COLOR DYNAMICS for ___industry; ___hospitals; ___schools; ___commercial buildings.

NAME__________

ADDRESS__________

CITY______COUNTY______STATE______

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED

reviews

(Continued from page 196)

hospital design. Manufacturers' catalogs cover the administrative, housekeeping, maintenance and operation, and professional functions of a hospital and are indexed according to manufacturer, dealer, products, and services. L.G.

group-client's story

Roofs for the Family: Building a Center for the Care of Children. *Eva Burmeister. Columbia University Press, 2960 Broadway, New York 27, N. Y., 1954. 203 pp., illus., $3.25*

This is the simple, detailed story of the construction of a new home for the Lakeside (Milwaukee) Home for Children; and of the removal of its 45 children from a single, antiquated Victorian mansion into three modern cottages; a story interestingly told.

Its interest for architects would be as an outline of a group-client's thoughts: In this case, those of the author-director of the home, as she worked with the architect and construction men to achieve satisfactory new quarters, and those of her coworkers and charges, under the changing and changed surroundings. It is a composite client's-eye view of an architectural and building project.

The account is in a beguilingly human style, manifesting great skill and understanding. LAWRENCE E. MAWN

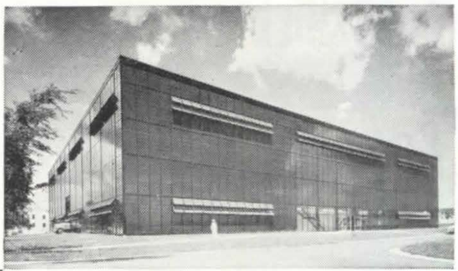
code requirements

Code Manual for the State Building Construction Code. *Second Edition. State Building Code Commission, 1740 Broadway, New York 19, N. Y., 1954. 308 pp., $3*

A revised manual has been issued to assist architects, engineers, builders, and building officials in the interpretation of the New York State Building Construction Code, relating particularly to one-family, two-family, and multifamily dwellings. As in the first edition, this one is significant in that it describes materials and methods acceptable as meeting State

(Continued on page 200)

Gunners Mate School, Great Lakes, Illinois
Architects: Skidmore, Owings & Merrill, Chicago, Ill.
General Contractor: Engineering Construction Corp., Chicago, Ill.
Windows: Lupton Steel Commercial and Fixed



Wrapped in Lupton Windows . . .

The new Gunners Mate School, at Great Lakes, is a revolutionary concept in school construction. It is a building within a building, for within a glass shell is a free-standing, three story classroom area. The exterior, an intricate steel framework 235 by 240 by 55 feet, supports 1,130 steel Lupton fixed and projected windows. With the exception of the entrances, all glazing is with green, heat repelling glass. Built at an approximate cost of $1,750,000, this new school is a tribute to the skill and imagination of the architects and engineers. Sparkling in the sunshine like an emerald jewel, it combines beauty and efficiency to an unusual degree.

More and more, Lupton windows are being used as exterior walls. Such glazed walls are often cheaper than masonry construction. Combinations of Lupton Metal Windows, glazed with the special glass now available, make it possible to have completely practical "glass houses".

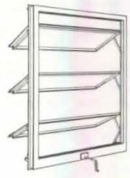
Architects all over the country find the Lupton line of steel and aluminum windows adaptable to a wide range of commissions — from extremes like the new Gunners Mate School to conventional housing. See the complete line in Sweet's or write for full information — your inquiry will receive prompt attention.

QUALITY APPROVED

Member of the Steel Window Institute and Aluminum Window Manufacturers Association

LUPTON MASTER ALUMINUM PROJECTED WINDOW

LUPTON CASEMENT ALUMINUM OR STEEL



LUPTON ALUMINUM AWNING WINDOW

LUPTON ALUMINUM DOUBLE HUNG WINDOW

MICHAEL FLYNN MANUFACTURING COMPANY
700 East Godfrey Avenue, Philadelphia 24, Pa.

LUPTON
METAL WINDOWS

reviews

(Continued from page 198)

Code requirements, without prescribing their use; all techniques, equipment, and products meeting performance requirements of the Code are acceptable, whether they are described in the manual. Fire-resistance ratings for various types of construction and detailed tables on maximum allowable spans of joists and rafters have been added to the new manual, published in a hard-cover, loose-leaf binder, to permit insertion of supplemental material.

L. G.

basis of modular work

Building Better From Modular Drawings. *Prepared by William Demarest, Jr., Secretary for Modular Co-ordination, The American Institute of Architects. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C., 1954. 22 pp., illus., 20 cents*

Several contractors, builders, and architects have assisted in the preparation of this booklet, as it is intended primarily for the contractor, his superintendents and foremen, to familiarize them with the basis of modular co-ordination. By means of integrated illustrations and text the 4-inch module, gridlines, and drawings dimensioned by the modular method are explained so that any difficulties in application should be avoided. L.G.

notice

church planning course

Third Annual Architects' Short Course on Church Planning, to be held in Urbana, Ill., Nov. 10-12, 1954, has been announced by Department of Architecture, University of Illinois, in co-operation with Division of University Extension.

visiting critics

The Dean of the School of Architecture at Pratt Institute, Brooklyn, N.Y.,

(Continued on page 202)

on the way...

a new star in the upholstery field

coming soon from United States Rubber Company —a revolutionary fabric which offers a new dimension in beauty and opens a whole new world of decorative opportunity in the upholstery field.

Watch these pages on December 14 for the complete story of this remarkable "U. S." achievement.

UNITED STATES RUBBER COMPANY • **Coated Fabrics Dept., Mishawaka, Indiana**

P.S.

Several months ago I wrote a column about an architect whom I called John Hollister. A number of people have thought that they recognized him; as a matter of fact, he was a composite character, drawn from several case histories with which I am familiar. I said in that column that you could find out more about him, statistically, in *The Architect at Mid-Century (Reinhold, 1954), the* final report of the Burdell Commission set up by the AIA four years ago. Perhaps I should explain what I meant.

Knowing nothing about statistical analysis, I am intrigued by it. What is the *average* architect? He is a completely meaningless creation, because averages, in the architectural profession, are influenced by the relatively few great power-house firms. The *median* architect is a more understandable fellow, and he is quite far removed from the *average*. For example, the *average* firm has about $3,500,000 of business on the boards at any one time. The median, on the other hand, has $1,250,000 or thereabouts. There's a big difference.

The average architectural firm has 10 (or slightly more) employes; the median is around four. Again, a big spread—in payroll, in amount of work that has to be brought in to feed all those hungry mouths. So let's consider the *median*, or more typical architect—the man in the position where there are just as many earning less and employing fewer than he, as there are with more income and larger offices than his. Actually, P/A's own business surveys seem to indicate that there are around 1000 practicing architects right in this median position.

•

What kind of a person is this median architect? First of all, he is in his forties. Median age of registered architects is 45.5 years; AIA members slightly older, nonmembers somewhat younger. It is a tossup whether he holds an architectural degree or not—44% of the registered architects surveyed by the Burdell Commission did not. He is likely to have had an uninterrupted practice (80% of present practitioners have had); and it is a good bet that he has conducted his practice in the same place all through his professional career (about two thirds of the present practitioners have remained in one location). The town in which he practices has a population of close to 500,000.

He probably did not serve in the armed forces during the last war, since only about 30% of architects did. If he did see service, it is a tossup whether he performed professional or nonprofessional duties; and he (as a median individual) probably held the rank of Captain in the Army or Lieutenant in the Navy.

Our man, being in his middle forties, earns about $9000 net a year. His colleagues, in their twenties, have net incomes of around $5000; those in their middle sixties have reached the peak of their earning capacity, some $12,000 a year.

In his office, our typical architect spends about 15% of his time on "design" as such; about 18% of his daily work is actually on the drafting board. Over-all activities of general practice and "client relation" work occupy together over 20% of his working day. He spends 10% of those precious hours managing his office; about 9% supervising jobs under way, and some 7% writing specs. What's left of the week is divided among many activities—such as part-time teaching, doing a little research, designing interiors, working on landscape and site-planning problems, and so on.

•

Coming back again to his education; he has strong feelings about what was right and what was wrong with his schooling—especially as it affected the securing of his registration. He feels that design courses are most important in the architectural schools; courses in building materials and methods next in importance. Mathematics, he thinks, should be given greatest emphasis among academic subjects; the social sciences he rates low in importance. Although he may not hold an architectural degree, he spent some time in college and probably did some supplemental studying—if not in architecture, in fine arts, engineering, or some related subject. He feels that he would still like the opportunity of supplemental study, but isn't sure whether it should be in the form of seminars, published courses, advanced work at an architectural school, or whatever.

He is likely to have secured his registration on the basis of a degree, plus experience, plus a written examination (only about 8% of the present practitioners came in under the "grandfather clause"), although there is an equal chance that he got away with an oral exam. He holds, on an average, two state registrations now, and very possibly the NCARB certificate. After this experience with registration, he wishes he had had more experience in structural and mechanical design and in field work; he is very sure his preregistration experience in drafting was adequate; and, rightly or wrongly, he feels his design training was sufficient. He is completely satisfied with the character of the examination that was given him at the time of registration but feels that it was somewhat too long, and is inclined to be unsatisfied with the way the questions were stated. If he has any specific criticisms of the tests, he feels that questioning on structural design and on the history of architecture was excessive.

Our median architect is in agreement with his fellows that candidate-training was utterly haphazard during his own apprenticeship period, and has not improved much since. Probably for that reason, 63% of architects feel that direct experience on construction jobs should be recognized as equivalent to office experience; they think three and a half years would be sufficient preregistration experience, and many (almost half) think examinations in history, structure, and compostion should be given directly after graduation.

•

There are many more facts about this architect in *The Architect at Mid-Century*, and I hope that you will all find it as interesting reading as I did. Turpin Bannister, in the volume called *Evolution and Achievement*, has done a marvelous job of interpretation and analysis, so that the bare statistical tables come to life and make a recognizable picture of the profession and its place in society. It isn't always a flattering picture—our median man has his faults—and in places it is slightly out of focus, because the subject is moving. The architect and the profession of architecture are maturing, improving themselves and their products, searching for ways to provide constantly better service. In this sense, also, the *average* is meaningless, because "the architect" ranges from an extreme of indifference (and, let us face it, low competence) to the other extreme of such impatience to raise standards and to do the best possible job that life seems all too short.

Any instrument of service to that dynamic, growing profession—be it a magazine, a professional society, an architectural school, or other—must understand, not only the *median* architect I've tried to picture, but also his colleagues at both extremes. Thank goodness some of the facts needed for that understanding are now available.

Thomas H. Creighton