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Dayton, Ohio
Edward C. Kemper Award for service to AIA was presented last month at Minneapolis Convention to Turpin C. Bannister, FAIA, for final editing of "The Architect at Mid-Century: Evolution and Achievement." Reinhold Publishing Corporation received Citation of Honor for publishing this two-volume Report of Commission for Survey of Education and Registration.

New AIA officers, elected at Convention, are: President, George Bain Cummings; First Vice-President, Earl T. Heitschmidt; Second Vice-President, John N. Richards; Secretary, Edward L. Wilson; Treasurer, Leon Chatelain.

Additional news from Convention: Board appropriated $3000 for study of aptitude testing in architecture. . . . Delegates voted special study of younger architect and the Institute. . . . Request for more competitions on public buildings was voted down. . . . Possibility of college-level training for building-industry personnel under egis of architectural schools will be explored. . . . Log book for apprenticeship system was approved. . . . Resolution for national-officer elections by mail ballot of all members was again vetoed. . . . "Dignified" use of architect's photo in advertising will be allowed.

Philip C. Johnson received Grand Festival Architectural Award—given by Boston Arts Festival for most outstanding architectural project built in New England within past five years. Winner was his Administration Building for Schlumberger Well Surveying Corp., Ridgefield, Conn., and Johnson also won Awards of Merit for two houses in New Canaan, Conn. Three other Merit Awards went to Hugh Stubbins Associates for house in Brockton, Mass., and to The Architects Collaborative for elementary school, Taunton, and church building, Natick, Mass.

"Homes for Korea" sponsors ask American building industry to take the lead in showing Koreans how to replace war-destroyed houses with mass-produced homes suited to country's customs, needs, and economy. The American-Korean Foundation, Inc., 270 Park Ave., New York 17, requests contributions of money, materials, equipment, or on-the-job technical assistance to provide housing designs, build modern pilot villages, and train native building industry.

New York designer, Jay Doblin, will assume leadership of Institute of Design in September when it moves to new building on IIT campus. . . . Kansas State College announces appointment of Emil C. Fischer as head of Department of Architecture and Allied Arts, effective July 1. . . . Harlan E. McClure will head Department of Architecture at Clemson College, starting this month. . . . Harwell Hamilton Harris has resigned as Dean of School of Architecture, University of Texas.

Although the American Institute of Architects in 1937 had voted its opposition to extension of the east front of the United States Capitol, its lack of response to the sudden action of the House in May authorizing this change led me to assume that there was no architectural interest in this subject today. As I was hesitating over the usefulness of writing about it, my judgment was firmed by no less an authority than Lorimer Rich, FAIA, fresh from a long, salubrious interview with Speaker Sam Rayburn on this subject. If the newly proposed desecration of the work of Thornton, Latrobe, and Bulfinch is halted, I am confident it will be the result of this providential conference.

The revived proposal to extend the east front of the Capitol originates in a need for more restaurant space. Some additional offices also would be provided, and probably a direct connection between the Senate and House chambers at the gallery level. But it would not be inaccurate to describe the project as a $7,500,000 restaurant. What the new "Architect of the Capitol," J. George Stewart, may be directed to do is to move the original central portion out 40 feet. The action appears to be based on legislation passed by the Senate in 1937, discussed in two admirable articles in "The Octagon" that year by Egerton Swartwout and Leicester B. Holland.

Swartwout reviewed the architectural evolution of the Capitol, but concentrated especially on the complaint that Walter's large dome appears to overhang the east front. He commented, "Few visitors to Washington have not heard of this defect; it is so unusual that it has become a point of interest, a kind of joke. And it is a joke, and an unnecessary joke, on the Government of the richest and most powerful country in the world. It is bad enough to have visitors from foreign countries discover that our beautiful dome is not a real dome, but a cast-iron imitation of a stone dome; but when they see that this dome of ours, in which we have so much pride, has really no visible means of support, it ceases to become a joke. It is a tragedy."

Holland's calm and witty argument was on the preservation issue, and left no doubt that in the east front is concentrated all that remains of the contribution of Thornton, Latrobe, and Bulfinch. He coined a new word for the overhang issue, calling it "the monumental snivy." He wrote that "this discrepancy shows clearly in a section of the building, but actually in elevation it is very hard to see. Only from points far around to the side and close to the face of the building is it apparent. I doubt if anyone ever noticed it unless it was called to his attention. Yet this is the much discussed 'overhang of the dome' which has served as the ostensible reason for later proposed additions to the façade."

Nothing material need be added to this debate of 18 years ago, won conclusively in my judgment by those wishing to preserve the east front, with its attractive shallow court, and its soaring lines of portico, pediment, and dome which always furnish such an architectural appetizer in the long waits of Presidential Inaugurations. What should be considered today is how the needs of Congress can be accommodated without destroying our architectural heritage.

The main Congressional expansion has been met by erecting new buildings and this is the direction in which Congress should grow. In the Capitol itself, the Senate and House chambers were comprehensively reconstructed only five years ago. What is needed now is a better separation of millions of tourists, visiting a national shrine, from legislators conducting the nation's business. In this general problem, the restaurant needs of Congress are but a single detail. The Capitol and Congress are in the grip of the motor age, whether it is the strangulation of the Capitol grounds by literally hundreds of tourist buses and thousands of private cars or the saturation of the Capitol's corridors and public rooms by the tourists who come there in those vehicles.

Serious problems, these, but not so difficult that Congress should despair and talk (as some Senators have been talking seriously this year) of abandoning the Capitol itself to tourists as an historic monument—and taking their legislative work to some wholly new building. With a little tidying up of the circulation and some zoning of parts of the building for the two conflicting groups, the Capitol can easily be made an agreeable working place. The west front, overlooking the Mall, could be the site of one of the world's most spectacular restaurants! And worth exploring is the possibility of further extensions of the Capitol, north and south, on Walter's expansion principle.

Any of these possibilities would avoid the destruction of what is valuable and irreplaceable in our cultural history.
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Even wood is still appropriate—in a cheerful fireplace; or charcoal in an outdoor grill. But for winter warmth, what fuel gives most comfort at least cost?

For summer coolness, shade trees are often relied on; also water evaporating on roofs. Electricity is widely used to operate mechanical cooling systems. How can its cost be reduced?

The problem is to find the fuel subject to the least loss in Btu's from Radiation, Convection, Conduction, and Vapor Flow. These four are responsible for all heat loss, regardless of what fuel is used or how heat is supplied.

Through wall, ceiling and floor spaces, the greatest amount of heat loss is by radiation; up to 55% for Up-Heat-Flow, 80% for Wall-Heat-Flow, and as much as 93% for Down-Heat-Flow. Little heat is lost by conduction through building spaces because air has slight density. Convection accounts for up to 45% of Up-Heat-Flow, about 25%, for Wall-Heat-Flow, and Zero for Down-Heat-Flow because there is no downward Convection.

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1,060 Btu's are lost with each pound of vapor which flows out of a building, enough to raise by 20° F the temperature of 2 rooms, 8 feet high, 13 by 14 feet in size. Thick, continuous aluminum foil, 875 feet to 750 feet long (which means mighty few breaks for infiltration of vapor), has almost zero permeability to vapor flow. Under its flat stapled flanges, infiltration is slight.

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8 Progressive Architecture
A suitable site near governmental, educational, and sport facilities has been selected for the proposed center, from which broadcasts and telecasts will originate and be transmitted to local and national audiences. Plans based on a carefully executed program study by Dr. Walter J. Duschinsky and Architects-Engineers Raymond & Rado, New York, have been submitted to the President of Republic of Colombia for approval. Local architects collaborating on this project are Cuellar, Serrano & Gomez. The flat and generous site will permit horizontal development, which is most economical and efficient to operate and construct. The six building elements of the center are: A. Administration; B. Television Studios; C. Radio Studios; D. Concert Hall; E. Dramatic Stage; F. Utilities. Since noise penetration into the operational areas must be prevented, all buildings, except Administration (center of drawing below) have a minimum of window openings.

Rendering: D. Leavitt
A giant studio (above) and smaller studio and camera rehearsal area in the Television building will occupy roughly 50 percent of the total floor area. Internal circulation has been carefully studied to separate visitor traffic from the auditorium of the large studio.

Radio Studios (left) will also be at ground level. Instrument and conference studios will be of double height, and special shape, for effective sound interpretation. Technical, production, and talent traffic has been clearly separated. Sketches: Dr. Walter J. Duskinsky

Dramatic Stage (below) acts as an originating facility for TV and radio pick-up. Circular shape of the theater, high camera runways, and use of two stage cars will assist in effective TV operation. Production and scheduling offices are in the administration building. Sketch: D. Levitt
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July 1955 11
Purity Stores Ltd. owns, operates more than 100 supermarkets in Northern California Bay Region. A new store which will serve as a pilot model for subsequent supermarkets to be constructed by this firm has been designed by Harry Weese, Chicago architect. Harold Engle is the structural engineer and Don A. Younger, the general contractor. It was the clients' desire, under the guidance of J. R. Niven as the company's chief executive, to adhere to a vaulted type of construction, which had proved successful in providing an uncluttered and spacious interior. The client wanted further emphasis placed on the effective and simple display of merchandise, without irrelevant trappings or sales gimmicks, and on the provision of plenty of fresh air and sunlight. The building will be consistent in plan but may vary from a curved roof (photo above) to a pitched roof (elevation below). The structure employs three-hinged steel arches placed 20 ft on centers; 3"x8" purlins 2 ft on centers; ½" plywood sheathing; porcelain-enamel panels set into wood-mullions with anodized cover strips. Skylights of translucent glass introduce light into the center of the building. Three-dimensional signs attached to the exterior of the end wall are of plastic and are designed to be illuminated. Five of these stores, each measuring 10,000 sq ft, are presently under construction.

Photo: Hedrich-Blessing
The Sanitary Age will have too much efficiency has become a must to me for our drafting room efficiency. A. D. Auger

Robert & Cornish

The Secretary of the Air Force has brought to our attention several factors effecting efficiency. This reawakened awareness should help many supervisors to better effect the desired efficiency. The need for "active" application of the principals enumerated should stimulate supervisors to greater efforts.

This office eagerly awaits the next two articles* for further ideas to improve our drafting room efficiency. A. D. Auger

Oakland, Calif.

* See June 1955 P/A and July 1955 P/A.

help to supervisors

Dear Editor: Your article, "Drafting Room Efficiency," in May 1955 P/A has a timely and constructive message.

As Chief Engineer with Indenco Engineers, Inc., Oakland, California—with 30 to 40 men to supervise—drafting room efficiency has become a must to me for successful business operation.

In this first article, Hans W. Meier has brought to our attention several factors effecting efficiency. This reawakened awareness should help many supervisors to better effect the desired efficiency. The need for "active" application of the principals enumerated should stimulate supervisors to greater efforts.

This office eagerly awaits the next two articles* for further ideas to improve our drafting room efficiency. A. D. Auger

Oakland, Calif.

* See June 1955 P/A and July 1955 P/A.

credits for architects

Dear Editor: Reading your P.S. column in May 1955 P/A, I thought for a moment I had picked up by mistake a copy of the trade journal of the hat or photo industry—so much having been made in the article of my hatless and hatted state and my photogenic qualities!

I want to thank you for your handsome compliments and advise you that aside from the personalities indulged in, you have, I believe, a good point. The architects are entitled to credit in connection with the design of public buildings and we do acknowledge their work in our printed invitations to dedications, etc., as well as on plaques in such buildings. I have issued orders that similar credit be given in the future in our Annual Report. Frederick H. Zurmuhlen

Commissioner, Dept. of Public Works

New York, N. Y.

P.S. I appear hatless in the May 19 issue of Engineering News-Record.

no cure-all

Dear Editor: The article titled "Limit Design," by Mario G. Salvadori (April 1955 P/A), is a very clear and interesting presentation of the subject. I believe most engineers will agree that the (Continued on page 16)
theory of limit design is the most logical method of designing structures because it reflects the true action of continuous members under load, thereby producing maximum economy. But, as the author says, limit design is no cure-all and requires conscientious analysis of all factors involved. And therein lies our most troublesome problem: so few designers are capable of properly analyzing all the factors involved.

Unfortunately, structural design in recent years has too often consisted of the solution of equations given in handbooks and building codes, with very little visualization of the action of the structure under load. Actually, though, whether the designer was aware of it or not, a redistribution of stress due to plastic flow has in many instances saved him from acute embarrassment.

Before limit design can be used generally, I believe it will be necessary for colleges and universities to teach the subject, briefly if necessary, in order to acquaint the student with these facts: that elastic analysis is not based upon immutable laws; that loaded structures sometimes appear to be disdainful of the most beautiful mathematical equations. I have known many young engineers who felt that, once negative and positive moments had been determined by elastic analysis, they were irrevocably fixed and that there could be no shifting of moment from one point to another. In fact, they could see only the mathematics, not the structure. This attitude will have to be changed before such engineers can successfully apply the theory of limit design.

Greater economy in construction could also be obtained by a few simple changes in existing building codes. For instance, I can see no real reason for using the same steel and concrete stresses for all types of buildings. What we strive for in design is maximum economy without a sacrifice of safety. And since overload is one of the greatest hazards, it appears that unit stresses could vary with the type of usage. A warehouse designed for a live load of 250 psf might at some time be loaded with 500 psf; therefore, steel and concrete stresses now in use are not too high. But an apartment building, designed for a live load of 40 psf, is not likely ever to be overloaded, provided the dead load was accurately calculated. Consequently, steel and concrete stresses in such structures could, in my opinion, be 15 to 20 percent higher.

Undoubtedly, limit design will eventually be recognized by the writers of building codes, but such recognition will come, I believe, only after careful consideration of the disparity in ability of designers.

I. E. MORRIS
I. E. Morris & Associates
Atlanta, Ga.

notice

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*Tested and proved for both indoor and outdoor use.*

---

**The Kawneer Touch brings another new decorating opportunity**

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No Cost Factor Is More Important To A Spec. Writer Than The Answer To This All Important Joist Question

Is It Nailable?

THIS STEEL JOIST has all the delays to building progress designed out and all the convenience and greater speed of nailability designed in. Think of the labor hours and accessory materials you save in every square foot when you specify Macomber Nailable Steel Joists. Our Steel Joist Catalog shows four types to meet specific needs. Send for it.

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STANDARDIZED STEEL BUILDING PRODUCTS

MACOMBER INCORPORATED

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ENGINEERING • FABRICATING AND ERECTING •
The Supreme Court has at last spoken in Berman v. Parker, and by its decision established a landmark in community planning. Consider these quotes:

"** Miserable and disreputable housing conditions may do more than spread disease and crime and immorality. They may also suffocate the spirit by reducing the people who live there to the status of cattle. They may indeed make living an almost insufferable burden. They may also be an ugly sore, a blight on the community which robs it of charm, which makes it a place from which men turn. The misery of housing may despoil a community as an open sewer may ruin a river.

"We do not sit to determine whether a particular housing project is or is not desirable. The concept of the public welfare is broad and inclusive. See Day-Brite Lighting, Inc. v. Missouri, 342 US 421, 424, 96 L ed 469, 472, 72 S Ct 405. The values it represents are spiritual as well as physical, aesthetic as well as monetary. It is within the power of the legislature to determine that the community should be beautiful as well as healthy, spacious as well as clean, well-balanced as well as carefully patrolled. The particular uses to be made of the land in the project were determined with regard to the needs of the particular community. The experts concluded that if the community were to be healthy, if it were not to revert again to a blighted or slum area, the area must be planned as a whole. It was not enough, they believed, to remove existing buildings that were insanitary or unsightly. It was important to redesign the whole area so as to eliminate the conditions that cause slums—the overcrowding of dwellings, the lack of parks, the lack of adequate streets and alleys, the absence of recreational areas, the lack of light and air, the presence of obnoxious attack. It was believed that the piecemeal approach, the removal of individual structures that were offensive, would be only a palliative. The entire area needed redesigning so that a balanced, integrated plan could be developed for the region, including not only new homes but also schools, churches, parks, streets, and shopping centers. In this way it was hoped that the cycle of decay of the area could be controlled and the birth of future slums prevented. Cf. Gold Realty Co. v. Hartford, 141 Conn 135, 141—144, 104 A2d 365, 368—370; Hunter v. Norwich Redevelopment & Housing Authority, 195 Va 326, 338—339, 78 SE2d 803, 900—901. Such diversification in inoffensive property located in a slum area which was being condemned and redeveloped. The decision is important not only for what it decides, but also for the aesthetic grounds on which the decision partly rests.

The case involved the constitutional..."
ity of the District of Columbia Redevelopment Act of 1945. This act established an agency with power to redevelop slum areas in Washington, D.C., into planned communities on a co-ordinated basis for the entire territory.

The *Berman* case arose when the owner of a department store located in a slum area objected to the taking of his property on the ground that it was not slum housing. The property was commercial, not residential, and it was in good condition. Therefore, the owner argued, it would be unconstitutional to condemn his property when it was not contributing to slum conditions.

On the other hand, the agency argued that Congress had authorized it to re-plan the entire area to eliminate slum-cause factors. This required the planning of balanced communities. The agency argued it could not do its job properly if it was not allowed to condemn every building and reconstruct the whole area.

The Court held that the property could constitutionally be taken even if it did not then contribute to slum conditions. It said that Congress could determine that “the community should be beautiful as well as healthy, spacious as well as clean, well-balanced as well as carefully patrolled.”

The decision noted that property might be taken for redevelopment which "standing by itself is innocuous and unoffending. But we have said enough to indicate that it is the need of the area as a whole which Congress and its agencies are evaluating. If owner after owner were permitted to resist these redevelopment programs on the ground that his particular property was not being used against the public interest, integrated plans for redevelopment would suffer greatly."

In the next issue I shall discuss the effects of the *Berman* case on community redevelopment and the significance of the Court's consideration of esthetic values.

B. T.

notices

P/A congratulates

WILLIAM H. HASSELLBACH, newly elected vice-president — engineering, LIBBEY-Owens-Ford Glass Company, and Roy A. Nyquist, Emmett L. Walters, Russell W. Abbott, Alfred H. Miller, Wayne W. Kohn, and Richard E. Warren, all of whom were recently advanced to keep pace with the most extensive development program in the history of Libbey-Owens-Ford.

EDWARD L. GLUCK, whose appointment as New York Sales Manager of Architectural Lighting Division is announced by McPherson Manufacturing Co., Inc., Brooklyn, N. Y.

ADON H. BROWNELL, whose election to office of Vice-President, in charge of sales, was recently announced by Lockwood Hardware Manufacturing Company, Fitchburg, Mass.; and SAMUEL GILBERT, newly appointed Sales Manager of the Company.
Sill-line: Beauty backed by VALUE

To the eye: America’s most beautiful enclosure for perimeter radiation

Back of the sturdy casing: a solid one-piece wall panel to save you time and money

The heavier 16-gauge enclosure finished in baked enamel will forever remind you of its beauty and endurance. The standard one-piece back panel that covers raw walls and insures quick, rigid, true-aligned installation more than pays its way in savings of time and face material.

Built up to a standard, not down to a price

Most for the dollar

Nesbitt Sill-line Radiation is today’s best buy in perimeter heating. It offers the most beauty, comfort and convenience for the dollar. For use with steam or hot water; capacities, 2.9 to 11.1 sq ft EDR. Five cabinet types; seven lengths of casing and element from 2' to 8'. Complete accessories and sleeves—no cutting on the site.

Make sure you get all the features Nesbitt Sill-line offers: one-piece back panel, sturdy 16-gauge enclosure, baked enamel finish, and a full range of matching accessories. Send for Publication 102.

Insist on Nesbitt

Nesbitt Baseboard Radiation
Ask for Publication 272

Nesbitt Convectors
Publication 262

Gas-fired Unit Heaters
Publication 280

Nesbitt Sill-line Radiation

is manufactured and sold by:
THIS GREAT NEW PRODUCT PROVIDES

DAYLIGHTING + FIRE PROTECTION

WASCOLITE PYRODOME

...could mean the difference between damage and disaster in your clients' plants

The WASCOLITE PYRODOME gives clients the added protection of automatic fire venting. Under excessive heat, PYRODOME's fusible link snaps, and the dome flies open. This allows heat, smoke and carbon monoxide to escape, and thus helps to contain the fire and minimize damage.

Even if there is no fire PYRODOME is on the job supplying uniform overhead daylighting through its Wascolite acrylic dome. It is inexpensive, easy to install, and cuts lighting costs.

Look into the WASCOLITE PYRODOME today... see Sweet's or write for illustrated catalog. Also available: Wasco Pyrovent with solid aluminum cover for venting only.

TOP SPECIALISTS IN DAYLIGHTING AND FLASHING PRODUCTS

WASCO PRODUCTS, INC.
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Pat. Nos. 2610593, 2693156 and pats. pend.
Today, the entrances with the color catch the eye . . . draw the trade through the doorways into the store for increased sales. Overline Entrance Doors can be ordered in any desired color—baked enamel finish on steel. They're handsome, yet really rugged! Send a sketch of your entrance requirements. Write us today for our "Overline Catalog 15-B."

OVERLY MANUFACTURING COMPANY
GREENSBURG, PENNSYLVANIA
LOS ANGELES 39, CALIFORNIA
Job Superintendent

W. C. BOWEN says, "Roofing time was really important and Tufcor kept work moving ahead smoothly. Pre-sizing made it easy for two-man crews to place 7 to 8,000 sq. ft. a day, and pouring was fast, too—28,000 sq. ft. in one day. Tufcor gave us a strong roof and a safe working platform."

Contractor’s Representative

WARREN O. LAMB says, "Speed and economy are two big advantages of Tufcor. Roofing proceeded on schedule and we saved the cost of shoring, too. That meant savings in time and labor costs."

Nashville architects and builders provide fire protection for owners and tenants, thousands of dollars in insurance savings.

An 85,000 sq. ft. roof of Granco Tufcor and Corruform with lightweight insulating concrete greatly increases the fire safety of the new Green Hills Village Center, a two-story multi-shop facility which will serve over 5,000 Tennessee families in the suburban area about 6 miles southwest of Nashville, Tenn.

Because of its fire-resistant qualities, the Tufcor-based roof serves as a positive check against the spread of fire via the roof should it break out in any one of the center's several stores.

The speedily constructed Tufcor roof follows closely the design of Granco's Tufcor roof which performed so sensationally well in an ASTM E119-50 fire test in 1954. In that 45 minute test, at temperatures up to 1720° (F.), the Tufcor roof didn't burn, didn't feed the flames, and didn't fall. After the test, the roof was still able to carry the full design live load.

Warren O. Lamb, Vice President of W. C. Holt and Sons, general contractors on the Green Hills job, says, "Tufcor is a great time and money saving way to build a fire-safe roof. All you do is open a bundle of Tufcor sheets, place and secure them to the steel framework, and immediately trades have a rigid working platform!"

Tough-temper, corrugated steel Tufcor makes fire-safe roof construction simple, fast and economical. For information, estimates or costs on your building plan, contact home or district office, attention Dept. P-4.

Handles Easily, Places Fast. Tufcor arrives pre-cut to building size. Measuring and cutting is eliminated. Two or three men can place up to 10,000 sq. ft. a day.

Permanent, Fire-Resistant Roof Deck is formed by cast-in-place slab. A strong bond forms between galvanized steel sheet and lightweight concrete fill giving high-strength rigidity to finished deck.
Green Hills Village Center, Nashville, Tennessee  •  Owners: William C. Weaver, Jr., & W. H. Criswell
 Architects and Engineers: Hart, Freeland & Roberts, Nashville, Tennessee  •  General Contractor: W. F. Holt & Sons, Nashville, Tennessee

safe Tufcor roof
new shopping center

Steel Sheets Are Quickly Clipped to the steel framing. Welding is equally fast. Positive attachment of tough-temper sheets adds rigidity to roof framework.

An Immediate Safe Working Deck is obtained as soon as Tufcor is attached. Light mesh is added for shrinkage control of the lightweight insulating concrete.

Insulating Concrete Placed on Tufcor is fast operation. On an average roof construction, this material weighs less than 6 pounds per square foot.

Perfect Base for Built-Up Roof. Deck offers two excellent advantages—a good firm base on which to apply the roof and an inorganic, permanent base for long life of the built-up roof.

Neat Plaster Ceiling over Fire-Safe Tufcor. Any normal ceiling treatment is easily applied to Tufcor. Its attractive galvanized surface is sometimes left unfinished when light reflection is wanted.

GRANCO
STEEL PRODUCTS CO.
Also manufacturers of Cofar, Corruform and Roof Deck
Subsidiary of GRANITE CITY STEEL CO.
Main Office: Granite City, Illinois
District Offices: Dallas  •  St. Louis  •  Kansas City
Chicago  •  Minneapolis  •  Atlanta
Distributors in 80 principal cities

July 1955 27
Often, the maintenance of resilient floors is considered to be outside the architect's province. There are, however, two very important reasons why familiarity with maintenance problems may materially affect your choice of resilient floors. First, architects are rarely consulted by owners on proper maintenance—and the owner goes ahead with his own methods. If these damage the appearance or shorten the life of the floor, the architect may be thought guilty of improper selection of flooring materials. Secondly, it is important to consider the amount of wear to which the floor area in question will be subjected. Excessive, uneconomical maintenance may result if an unsuitable resilient floor is installed. In his own interest, the architect should therefore be familiar with the amount of maintenance required by each type of floor before specifying one for a particular location.

Apart from their handsome looks, one of the main reasons for the great popularity of resilient floors for both residential and commercial floor installations is their ease of maintenance. They never need costly refinishing. Occasional washing and waxing, along with regular sweeping, are all the maintenance they normally require. However, resilient floors vary in the amount of care they need, and it follows that floors among the easiest to maintain should be specified for areas, such as entrance ways, where frequent cleaning cannot be avoided.

Since the maintenance characteristics of the different types of resilient floors overlap, and ease of maintenance is also affected by the color and pattern of the flooring selected, the following ranking is intended as an approximate guide to the amount of maintenance required by the various Armstrong Floors.

**Best**
- Linotile
- Excelon Tile
- Custom Corlon Tile

Linotile is considered the easiest to maintain of all the Armstrong Floors. Its exceptionally dense, tough composition makes it an excellent choice for heavy-traffic areas. Washing and waxing are usually required infrequently. Both Excelon Tile and Custom Corlon Tile are vinyl plastic floors with exceptional advantages from the standpoint of maintenance. Both provide resistance to the harsh cleaners which are all too often used in spite of manufacturers' warnings. In order to retain the appearance that a lustrous finish gives them, and to provide the added protection that waxing affords, Armstrong has always encouraged and specified occasional applications of a high-quality wax, after washing, as a necessary part of the proper care of plastic floors of all kinds.

**Excellent**
- Corlon
- Linoleum

Linoleum perhaps best typifies the years of popularity which resilient flooring materials have enjoyed for their ease and economy of maintenance. Regular sweeping and occasional washing and waxing are all that are required to keep linoleum in good condition. Armstrong Corlon, a sheet-type plastic flooring, offers the additional advantage of excellent resistance to common household reagents.

**Good**
- Rubber Tile
- Asphalt Tile

The smooth plate finish of rubber tile requires slightly more frequent maintenance than the floors described above if it is desired to retain the high gloss which adds so much to its beauty. Rubber tile also benefits from occasional buffing with No. 00 steel wool. This keeps the rubber in prime condition and helps preserve the finish. For its low cost, asphalt tile provides a floor that is remarkably economical to maintain. Careful cleaning and periodic waxing, especially in the first months after installation, will help assure easy maintenance.

**Fair**
- Cork Tile
- Custom Cork Tile

Cork tile is not ordinarily specified for heavy traffic areas and should not be installed where it will be subjected directly to tracked-in dirt. In areas of less severe traffic, cork tile is readily maintained by daily sweeping and occasional washing and waxing. In cases of excessive soiling, machine scrubbing or sanding and refinishing may be necessary.

The following recommendations for resilient floor care have been outlined by the Armstrong Research and Development Center. They are the result of continuing research over a period of many years on all types of resilient floors. In essence, they show that simplicity is the best technique.

**Waxing.** Dirt tends to slip off easily from the smooth, lustrous surface of any resilient floor. Daily sweeping with a soft broom or dry mop will keep this type of flooring clean for long periods. Oil mops or oil-type sweeping compounds are not recommended.

**Washing.** "More floors are washed away than worn away," says an old adage in the flooring industry. Unless they are subjected to unusual amounts of dirt, resilient floors should be washed infrequently. For all types, Armstrong All-Purpose Liquid Cleaner is recommended. This preparation is manufactured especially for resilient floors. New resilient floors should not be washed until the adhesive is thoroughly set—a period of at least four or five days for all resilient floors.

**Waxing.** As soon as a resilient floor has been allowed to dry after washing, it should be waxed. Most people have a tendency to use too much wax—a practice as expensive as it is inefficient. A thick film of wax forms a crust on top, leaving a soft, gummy mass underneath. Dirt penetrates the crust and lodges in the soft wax, making the floor appear gray and dirty. It is much better to apply two thin coats than one thick coat.
Paste waxes, which may contain oil, grease, or solvents such as naphtha or turpentine, should never be used on resilient flooring. The ideal wax for all resilient floors is a water-emulsion type such as Armstrong Linogloss Wax, which dries in less than 20 minutes to a hard, colorless finish that is lustrous but not shiny. Linogloss® Wax is made especially for resilient floors. It does not cover all types of blemishes, and the methods outlined may not remove all stains. However, they have proved to be the best and safest way to remove the most frequently encountered stains. Armstrong will always be happy to advise on any particular stain removal problem for which these methods do not prove fully effective.

Protection. An element in the care of resilient floors which is often overlooked, but adds greatly to their life and beauty, is the use of furniture rests. The function of a furniture rest is simply to extend the area over which the weight of furniture loads is distributed, and thus prevent indentation. The following table shows the recommended types of rests for various furniture weights.

<table>
<thead>
<tr>
<th>Type of floor</th>
<th>Type of stain</th>
<th>Linoleum</th>
<th>Linotile</th>
<th>Corlon</th>
<th>Asphalt Tile</th>
<th>Excelon</th>
<th>Tile</th>
<th>Rubber Tile</th>
<th>Custom Corlon</th>
<th>Cork Tile</th>
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<td>Drain Cleaners</td>
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<td>Nail Polish</td>
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<td>Fruit Juices</td>
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</tbody>
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Methods of removal
1. Wash with Armstrong Liquid Cleaner, rinse, wax.
2. Rub with No. 0 dry steel wool, rinse, and wax.
3. Rub with No. 0 steel wool dipped in Armstrong Liquid Cleaner, rinse, and wax.
4. Remove with putty knife, rub with No. 0 steel wool dipped in Armstrong Liquid Cleaner, rinse, and wax.
5. Rub lightly with cloth dipped in paste wax. Buff.

ARMSTRONG CORK COMPANY makes all types of resilient floors for all types of interiors. Almost any flooring problem can be met with one or more of the floors in the Armstrong Line. As a result, we have no special bias toward any one type and can offer architects impartial recommendations on any flooring problem. Our main interest is to aid you in making a sound flooring selection.

Armstrong's sales representatives throughout the country will be glad to consult with architects and make specific recommendations for individual jobs. Your Armstrong representative has a wide variety of experience and training in resilient flooring and can also call upon Armstrong Research and Development Center for assistance with special problems.

For helpful information on any flooring question, just call your nearest Armstrong District Office or write direct to Armstrong Cork Company, Floor Division, Lancaster, Pa.
Turns your wasted fuel into

Herman Nelson DRAFT|STOP System
Eliminates Overheated Classrooms;
Substitutes Controlled Cooling for
Costly Open Window Ventilation

CLOSE the windows and cut your heating costs! It's just that simple—with the installation of Herman Nelson DRAFT|STOP. And, in addition to the dollars saved, you eliminate the end product of the overheated classroom—laziness, listless students.

Herman Nelson DRAFT|STOP achieves these results because it "puts first things first" — makes COOLING the prime function during the hours of classroom occupancy. As your "extra heating plants"—students, lights and sun—go to work, this system automatically introduces outdoor air in sufficient quantities to keep classrooms at comfort level. Herman Nelson's thrift even extends to its method of draft elimination which requires no heat—thereby saving more fuel dollars and simplifying the cooling problem.

Yes, if you count the cost, you'll close the windows—and let Herman Nelson provide double dividends in the form of cash savings and true classroom comfort. For complete information, see our catalog in Sweet's Architectural File, or mail coupon on adjoining page.

Provides
COOLING, HEATING
VENTILATION, ODOR CONTROL
DRAFT ELIMINATION
All at minimum cost

herman nelson
UNIT VENTILATOR PRODUCTS
AMERICAN AIR FILTER COMPANY, INC.
SYSTEM OF
CLASSROOM COOLING, HEATING AND VENTILATING

CALIFORNIA. An outstanding school in a perfect setting. New San Lorenzo Valley High School, Felton, Calif., features Herman Nelson Unit Ventilators for day-long classroom comfort. District Superintendent: Dr. Eugene Haskell; Architect: John Lyon Reid & Partners; Engineer: Bayha, Weir & Finato; Mechanical Contractor: Atwood & Sons.
cool savings!

OTHER

SCHOOL PRODUCTS

MICHIGAN. Installation of Herman Nelson Unit Ventilators at the Ralph J. Bunche School, Ecorse, Mich., features unique DRAFTSTOP Wall which, in addition to eliminating window downdrafts, serves as an economical wall finish. Note how filler section fits around pilaster—another example of Herman Nelson flexibility. Superintendent of Schools: Ralph E. Brant; Architect: Bennett & Straight; Engineer: Benjamin Schulz & Associates; Mechanical Contractor: Standard Plumbing & Heating.

ILLINOIS. Perfect "teaching temperature" assured Grant School, Decatur, Ill., by Herman Nelson Unit Ventilators. Superintendent of Schools: Lester Grant; Architect and Engineers: Harris, Spangler, Beall & Sologga; Mechanical Contractor: S. E. McDaniel & Co., Inc.

KEEPS WOODWORKING SHOP SPIC AND SPAN
Type D ROTO-CLONE collects chips and sawdust from woodworking equipment at St. Bernard High School, Cincinnati, Ohio. The unit is self-contained and requires little floor space.

BALANCES HEAT AND BUDGETS
Illinois Selectotherm—an automatically controlled high vacuum steam heating system which through single dial control, balances heat supply against heat loss in many school spaces.

COMFORT WITHOUT CONFUSION IN THE AUDIO-VISUAL CLASSROOM
Herman Nelson Light|Stop accessory permits operation of unit ventilator in darkened classroom—prevents discharge air from billowing curtains and causing distracting light streaks.

American Air Filter Co., Inc.
Dept. PA-7
Louisville 8, Kentucky
I would appreciate receiving literature describing the following products—

- Classroom Unit Ventilators
- Illinois Selectotherm
- Light|Stop Curtain Accessory
- Dust Control for Woodworking Shops

Name:

Address:

City: State:
This latest U.S.G. development offers a host of high-performance advantages that make it the perfect partner to PYROFILL*, the preferred poured-in-place gypsum roof deck.

**PYROFORM is incombustible**—qualifies under Class A (incombustible) Federal Specifications SS-A-118b.

**PYROFORM insulates**—with a C factor of 0.24, an R factor of 4.17, it provides above-average insulation. U values for various PYROFORM-PYROFILL constructions prove the combination to be an exceptional barrier to heat transmission.

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Moreover, it's strong and stable, smooth and attractive. Placed on sub-purlins spaced 32 3/4" o.c., PYROFORM will support a 2" thick slab of PYROFILL slurry gypsum concrete with only minor deflection. The mineral fibers are unaffected by moisture and will not deteriorate. The under surface can be left exposed as the finished ceiling, saving on decorating costs.

**PYROFILL roof decks fear no fire**

For full information, call: Your authorized PYROFILL Contractor, your U.S.G. Architect’s Service Representative, or write United States Gypsum, Dept. PA-4, 300 West Adams Street, Chicago 6, Illinois.

![Typical installation of new PYROFORM Formboard, on steel cross tees. New process felts and bonds mineral fiber into boards, 1" x 32" x 48".]

Pouring PYROFILL slurry. Outstanding advantages: incombustible, low in cost, adaptable, light-weight, strong, durable, quickly installed.
Youngstown Buckeye Conduit protects Statler wiring in L. A.

Years ahead in design and accommodations, the new $25 million Statler Hotel in Los Angeles installed Youngstown Rigid Steel Conduit to protect wiring throughout its 13 stories. For the future, management can be sure that the electrical systems will be safe—adequately guarded against those enemies of all wiring jobs—water, moisture, vapors, dust and dirt.

WHY YOUNGSTOWN BUCKEYE CONDUIT IS BETTER

Youngstown is the one manufacturer who makes rigid steel conduit from ore to finished product. This enables Youngstown to control the complete manufacturing process—your insurance that each length of "Buckeye" is made of top-grade steel.
"Architecturally proper" is a good way to sum up the fine appearance of the block wall of this modern masonry home.

Vibrapac Block construction lends itself to permanence and shelter security.

The beauty of building with modern concrete block is this: It's permanently beautiful!

The precision-like beauty and simplicity expressed by pleasing new textures, patterns and colors in Vibrapac Block are always in "good taste"... for exteriors and interiors. Whatever your plans call for in terms of size, design or investment, there's a proper adaptation that's practical and effective in Vibrapac Block or Bes-Stone Split-Block.

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With all these and other plus values, the initial construction cost is low... financing becomes easier... insurance rates lower... upkeep, or maintenance, costs less... ideal structural flexibility is assured... good resale value is certain.

Charming beauty for interiors, too!
For complete interior walls and ceilings (soffit block ceiling and roof construction), or for "accenting" details like floral bays, fireplaces, etc., modern concrete masonry offers countless opportunities for distinctive beauty and colorful beauty. "Charcoal gray" and "coral," as well as other good color schemes, are "naturals" for modern concrete masonry. Helpful literature gladly sent on request.

BESSER COMPANY, Box 177, Alpena, Michigan


WHY MODERN DESIGN CALLS FOR DURAPLASTIC* 

More and more of today’s requirements for clean, functional design are being met by concrete construction. And where better concrete is important, you’ll often find it’s made with Atlas Duraplastic air-entraining portland cement.

There’s a reason. Duraplastic-made mixes are more workable, more cohesive... place better in forms and around reinforcement. Duraplastic Cement makes concrete with greater plasticity. Result: a more uniform concrete to place.

Atlas Duraplastic Cement requires less mixing water for a given slump... reduces water gain and segregation and, therefore, minimizes sand streaking and rock pockets. Result: a more uniform concrete in place.

Duraplastic-made concrete adds to concrete durability by fortifying it against the effects of freezing-thawing weather. It is superior for both structural and exposed surfaces.

Yet Duraplastic costs no more than regular cement, requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.
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CLEAN, SIMPLE STYLING—NO FRILLS—NO PROJECTING PARTS
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ceramic Suntile means longer life, less up-keep for schools

Pictured here are some of the many ways in which school architects are using beautiful ceramic Suntile as a triple-duty finish—colorful, economical, easily maintained.

For interiors, glazed Suntile offers a permanent, impervious surface and a wide range of colors especially developed for school use by color authority Faber Birren.

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We may be amused by the overworked expression, "from the rock-bound coast of Maine to the sun-kissed shores of California"... but that phrase well describes the sweep of the school-design revolution that is obvious everywhere.

Pride of our land, the magnificent schools are a credit to our national maturity and are receiving more specialized attention than perhaps any other type of building. Common sense, not indulgence, indicates that facilities that protect the health and well-being of students also promote the feeding of their minds.

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IF IT'S NEW
... IF IT'S DIFFERENT
... IF IT'S BETTER ... IT'S

BULLDOG ELECTRIC PRODUCTS COMPANY
A Division of I-T-E Circuit Breaker Company


July 1955 41
Thalhimers Department Store, Richmond, Virginia

Architects:
Copeland, Novak & Associates, New York, N.Y.

Engineers and Builders:
The Austin Company, New York, N.Y.

Architectural Metal Fabricator-Erectors:

REYNOLDS ALUMINUM SERVICE TO ARCHITECTS
Reynolds Architect Service Representatives offer specialized assistance on aluminum design problems, standard mill product applications and commercially fabricated aluminum building products. They can help coordinate varied aluminum needs for procurement efficiency and economy. Address inquiries to Architect Service, Reynolds Metals Company, Louisville 1, Ky.
The transformation of Thalhimers is the first department store application of this interesting modernization method—distinguished by unusual architectural treatment in its extruded aluminum spandrels anodized grey.

The principle is to enclose a group of buildings, both new and old, within a complete new shell—remodeling and air-conditioning the original interior.

Aluminum is ideal for this method. It makes possible a light, strong exterior shell that is easy to erect. Its freedom from rust and resistance to corrosion minimize maintenance. Its radiant heat reflectivity can be utilized to add insulation value.

Overlaid lines show how the Thalhimers buildings will be enclosed by an all-aluminum shell—all Reynolds Aluminum except for ground floor display windows. Spandrel panels are extruded aluminum, anodized grey. Horizontal mullions and pilasters are natural color aluminum formed sheet. Dotted lines indicate how the entire buildings at the left corner will be replaced by a new structure.
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One door is hung on a RIXSON offset style closer—the other is hung on a RIXSON offset style pivot set.

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4 offset hung types for doors of varying sizes and styles

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  Fastened to floor. Offset type for light interior doors.

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  Mortised into floor. Offset type for entrance, vestibule, and heavy interior doors.

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  Mortised into floor. Offset type for extra heavy or lead-lined doors.

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match the pivotal hanging style and general appearance of doors hung on RIXSON concealed floor closers. Provide a trim, secure hanging for doors not requiring a closer.

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For Additional information on COLOR DYNAMICS see Sweet's Architectural File, Section 14/PL.
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That's why so many schools have Daylight Walls in classrooms. Clear glass from wall to wall and sill to ceiling (or, as in the case above, sliding glass panels extending to the floor), brings the light and beauty and spaciousness of the outdoors indoors to make your school a happier place.

They cut costs, too. Artificial lighting isn't needed so much. There's less wall area to paint and maintain, and lower construction costs. In cold climates your daylight walls should be Thermopane® insulating glass for maximum comfort and heating economy.

Write for your free copy of "How to Get Nature-Quality Light for School Children". Dept. 4575, Libbey-Owens-Ford Glass Company, 608 Madison Avenue, Toledo 3, Ohio.
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July 1955
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Use it as a distinctive vertical panel, with or without battens as a novel and pleasing variation in horizontal siding, or as a non-splitting shingle. Painted, it reveals a rich, satiny luster with great eye-appeal.

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EASY-TO-WORK, 2-PIECE CAP FLASHING

Top photo shows a typical instal­
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Insert is furnished in 51" lengths, for recommended overlap of 3" 
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a) Standard 4" flat copper receiver; with ¼" hook dam.  
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July 1955 55
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**“Accordian” Type**

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In direct contrast to "accordion" type doors, Foldoor is constructed in continuous volutes. The fabric coverings are back to back. There are no "pockets" to trap large volumes of air which sets up resistance, retards ease of operation.

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And only Foldoor offers a track truly concealed, plus an attractive cornice when desired.

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For further information see: Sweet's Catalog; Foldoor installing distributors in every principal city; or Holcomb & Hoke Mfg. Co., Inc., 1545 Van Buren St., Indianapolis 7, Indiana.

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Architect: Robert Vignola.

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Aluminum Window Manufacturers Association
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Ware Laboratories, Inc., Miami, Fla. • Windsor Aluminum Corp., Kenlil, N. J.
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All this and high style too for the busiest part of the building. For more particulars about Brasco Entrances please address Dept. P 507.

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Metal Store Front Specialists for more than 40 Years
Designers of classrooms for colleges and elementary schools face some common problems these days: both must keep costs to a minimum, yet supply classrooms that have a low noise level and are easily maintained. Concrete masonry offers several important savings:

**Save on interior finishing:** Attractive wall patterns, textures, and colors in today’s concrete masonry units make possible decorative interior walls that need no expensive plastering or dry wall treatment — a big saving in cost.

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3/8” Lightweight concrete masonry cavity partition wall will absorb up to 55% of sound striking wall, and reduce sound transmission from room to room about 55 decibels.

Hard plaster or glass absorbs only about 3% of incident sound — 97% “bounces back.”

**For “sound-conditioned” classrooms, it’s**

**Concrete Masonry** — cuts costs, too!

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Elementary school: architect, William Rowe Smith, A.I.A.

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Because of its light-selecting principles this new block has a much lower surface brightness than other glass block. Maximum surface brightness as measured at the Daylighting Laboratory is less than 1400 foot-lamberts.

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GREATER FLOW. Josam SUPER-FLO Floor Drains are designed with perimeter slots in the grate which increase the free drainage area of the top and permit greater flow into the drain. In SUPER-FLO Floor Drains, waste water enters the drain at the very edge of the drain top instead of flowing over the wide rim of conventional drains before it reaches the grate openings. Because of this, water friction loss in Josam SUPER-FLO Drains is greatly reduced, and the flow rate (GPM) into the drain is greater than the flow rate in standard drains of the same or larger size top.

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Please send immediately my copy of Fenestra for Schools.

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“D” Panel. Width 24”. Depth 3” to 7½”
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Architect

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Brunswick-Horn Folding Gymnasium Seating locks secure opened or closed... cross-braced understructure stops sway or shake. In closing, foot boards tilt to spill litter on floor for fast, efficient removal.

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July 1955 71
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**Rx for a Nationwide Growing Pain**

Concrete Provides
Time- and Money-Saving
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AMERICA has a case of growing pains, and nowhere more so than with schools. Sound design and building now-how is avoiding skimpy construction in meeting urgent need. Careful analysis almost invariably shows that concrete provides utmost value in attractive, durable, fire-safe structures.

Such is concrete's flexibility that it is possible to meet almost any school-building budget and assure a structure of highest quality from every standpoint. Two examples:

One represents prefabricated concrete construction at its best, with factory-made, quality-controlled members, produced to closest tolerances, for fast erection with minimum supervision... quality concrete elements, produced at assembly-line speed—and economy—with 'Incor'® 24-Hour Cement.

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Two of many fine, new schools, built with Lone Star Cements, providing the finest in modern construction at minimum cost, initially and through the years.


WEST CHARLOTTE HIGH SCHOOL, Charlotte, N. C., is an outstanding example of attractive contemporary design in concrete. Vertical lines of exposed columns lend interest to the façade of this beautiful, reinforced-concrete structure, which well deserves its merit award as a national contest winner. Architects, GRAVES & TOY; General Contractor, C. D. SPANGLER CONSTRUCTION CO., INC.; Ready-Mix Lone Star Cement concrete supplied by JOHNSON MCMILLAN CONCRETE CO., INC.—all of Charlotte.

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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 141,000,000 SACKS ANNUAL CAPACITY
DENVER, COLO., JUNE 10, 1955—This sparkling, steel-framed, 23-story unit of Denver's renowned Mile High Center is one of the most "readable" buildings of our time. Guests this week at the Brown Palace Hotel just across Broadway from the Center, could study the completed exterior in armchair comfort.

The dark, cast-aluminum verticals and horizontals are a true expression of the structural columns and spandrel beams behind. (See October 1953 P/A, page 102.) The lighter, porcelain-enamel surfaces echo the building's perimeter heating and cooling elements—the 24-in.-deep horizontal lines covering room units, and the 7-in.-wide verticals sheathing air risers. Fixed glass—a 12-in. band between floors and air-conditioning units, and 6-ft panes above—complete the pattern.

Webb & Knapp, Inc., Architectural Division (Architect, I. M. Pei, Director); Kahn & Jacobs and G. Meredith Musick, Associated Architects; Severud-Elstad-Krueger, Structural Engineers; Jaros, Baum & Bolles, Mechanical Engineers.

"MILE HIGH" SHEATHED
NEW MIT BUILDINGS OPEN

By George A. Sanderson

CAMBRIDGE, MASS., JUNE 9, 1955—Graduation exercises at the Massachusetts Institute of Technology were held today in the new, domed Kresge Auditorium (photos below). This structure and the adjacent round Chapel form the nucleus of the Institute's emerging cultural and social center. It was my privilege to attend ceremonies dedicating these provocative buildings, both of which are the work of Eero Saarinen & Associates, Architects; Anderson, Beckwith & Haible, Associate Architects; Ammann & Whitney, Structural Engineers. In the general photo (above), note that the shapes of the new buildings echo existing forms of the older Tech buildings in the background.

The pictures show the buildings in their present state, with landscaping incomplete, and the Roszak-designed spire of the Chapel not yet installed. Since the architects (understandably) requested the architectural press not to document the buildings fully at this time, this is simply a personal account of my reactions to the buildings at time of the dedication ceremonies.

Three-Point Support

For the auditorium, a thin-shell concrete dome, in the shape of one eighth of a sphere, is supported on three points, while the great arched and convex spaces in the interstices are filled with glass set in narrow steel sash. Both the main auditorium, seating around 2000, and a little theater beneath it, are developed within the domical enclosure. In the main room, the soaring curve of the roof, painted a blue-gray, hovers in apparently infinite space above putty-gray acoustical baffles suspended in carefully calculated planes to provide exceptional acoustics. Above these baffles, which also serve a decorative purpose, are all manner of lighting and ventilating elements, out of sight from the audience.

The whole back wall of the stage, as well as sizable areas along the two sides of the auditorium, are surfaced with natural oak stripping to form a calm and handsome background. The metal backs of the auditorium seating are in various colors—blue, blue-green, yellow-green, lavender—providing a cheerful tapestry of color when the auditorium is empty or partially filled. Stadium seating is in upper and lower tiers.

On Dedication Day, we experienced the hearing environment under a wide variety of conditions. For there were speeches; fanfares and processional marches by a Brass Choir; and the MIT Symphony Orchestra, Glee Club, and Choral Society performed Aaron Copland's "Canticle of Freedom," especially...
The remarkable new nondenominational Chapel is a simple cylinder of skintled, red-brick masonry, with no apparent windows but broken near the base by recessed arches backed with natural-toned concrete. The circular structure rests in a water-filled moat. The concrete living of the base arches are actually part of an inner wall, whose purpose is evident only on entering the building. For the space between outer brick structure and inner concrete wall is the source of the mysterious, muted daylight that enters the Chapel perimeter, through horizontal glazing that joins inner and outer structures. Gently moving light, reflected up from the rippling water of the moat, weaves along the serpentine interior wall surfaces. A stunning play of brilliant light derives from a round ceiling skylight and streams down across the shimmering beauty of a delicately scaled golden screen, or re- redos—the work of Harry Bertoia—onto a pure white marble block that serves as the ceremonial table.

composed for the occasion, and later in the program, a noble Bach cantata. To my ears, at least, the unique auditorium lived up to its reputation for ideal acoustics. Bolt, Beranek & Newman, Inc., were acoustical consultants.

It is in the main lobby, which occupies more than the full east-facing, windowed segment of the building, that one appreciates most dramatically the design result of the bold design concept. For at each end, a great, fan-shaped pendentive of the thin-shell dome swoops down to its pinned, metal pedestal, which transfers the roof load to concrete piers and so to the earth. Walls between, baying out to follow the curve of the dome above, are mainly of glass, with only thin, black-painted metal frames and supports.

On the floor below, underneath the main auditorium, is the engaging little theater, with seating for 200. A bright scheme includes yellow doors, rough-textured seat upholstery, and a stage curtain in a bold tan, black, and white pattern. As in the big auditorium, several rows of the forward seating may be removed for flexibility of use or to bring stage and audience in closer relation.

Outside, the uncompromisingly simple form of the domed structure is a vigorous declarative statement. And the windowed side wall arches are crowned by the clear sweep of the white-surfaced dome, edged in aluminum. The building is surrounded by a round, gray-red brick terrace, which is a visual extension of the lobby floor within.

Mechanical Engineers for the project were Hyde & Bobbio; Stanley McCandless served as Lighting Consultant; George A. Fuller Co., General Contractor.
ST. LOUIS, MO., JUNE 12, 1955—The boldly conceived terminal building for the Lambert- St. Louis Municipal Airport, which has been widely reported in the national press and was heralded in January 1953 P/A as one of the two best-designed public-use structures of that year, now gives clear evidence that it will live up to its promise. While much finishing remains to be done, reports this week were that its doors will probably open early this Fall. Hellmuth, Yamasaki & Leinweber are the Architects; William C. E. Becker, Structural Engineer; Edgardo Contini, Consulting Structural Engineer; Landrum & Brown, Airport Consultants.

The structure is organized on three levels, with service drives, catering kitchen, offices, and air-mail and air-express spaces at the apron level; baggage handling and passenger concourse out to fingers (leading to plane stations) are at the middle level. At the top is the remarkable, huge 120’ x 360’ public room, enclosed under three 32-ft-high thin-shell concrete vaults, with glazed sides and ends flooding the interior with daylight. Here—the level to which taxis or buses will bring outgoing passengers (above)—are ticketing counters, waiting space, dining rooms, and access to visitors’ observation deck (above finger). Moving stairs go down to the intermediate level.
Architects will be affected, during the second half of 1955, by a number of economic factors, in ways not commonly traceable. Notable among these is the current wave of banking mergers, climaxing by the formation of four giant New York City institutions with resources totaling some $20 billions. Congress has noted that banks are fewer in number, nationwide, than at any time for 50 years, though far richer in resources.

Where banks open up in new places, they are for the most part offspring of important branches of neighboring banks. Establishment of such branches, even in an era of record-breaking bank construction and remodeling, tends to curtail opportunity for the local architect as compared with the design of independently owned financial units. Furthermore, banking chains and groups, through holding company media, are increasingly preoccupied with industrial activity at policy levels. The result is a tendency to concentrate architectural commissions among a few leading firms on new construction or expansion, both of plant and industrial housing. The number of possible clients available to the profession as a whole may be correspondingly reduced. Outright industrial consolidation will doubtless call into play a similar principle.

On the other hand, symptoms of a healthy reaction against the size of such presage a beneficial countermovements in the future. Such signs are economic rather than political and strongly favor the local architect. The smaller, more flexible manufacturing company with capital of less than $5 millions has been found to possess marked advantages over its larger, more remote parent. Establishment of new branches, even in an era of organized industrial chains and groups, through holding company media, are increasingly preoccupied with industrial activity at policy levels. The result is a tendency to concentrate architectural commissions among a few leading firms on new construction or expansion, both of plant and industrial housing. The number of possible clients available to the profession as a whole may be correspondingly reduced. Outright industrial consolidation will doubtless call into play a similar principle.

Despite consumer-debt warnings run up in highly placed quarters, liberal homebuilding credit remains a favored member of the banking and economic family. Installment credit in general, now 23% of all loans in commercial banks, was defended before a special group of the Tennessee Bankers Association by Dr. Frank S. Ward, Dean of Tennessee’s School of Business Administration. Such applicable primarily to “consumer goods” such as automobiles, appliances, and wearables, his thesis has resonances in the residential building domain. He dubbs installment credit “fractional selling”—that is to say “the breaking up of a large sales price ticket due now into a number of smaller price tickets” post-dated. Such a device, he avers, makes a large sales production possible “not only by moving demand closer to the present but also by adding to the demand.” Well received by participating bankers, this analysis of semiperishable purchases is doubly applicable to permanent dwellings and their modernization.

Additional factors, indicative of conditions that promote the architect’s prosperity, are abundant. To name a few:

- **Bank check activity** continues to climb; highest record totals are reported in 26 key cities, with from 5% to 12% average current increase over last year;
- **Industrial production outlook** is best yet, with rising order-tide foreplotting a 55 sales increase of at least 10%, individual gains touching 20% in many cases, and Federal Reserve Index up more than 11 points from 1954;
- **U. S. Government’s good collections** may slice the fiscal year’s deficit by some half billion dollars;
- **Fewer construction failures**—down 11% for first quarter as compared with same period in ’54—reflect healthful building climate;
- **Over-all business** will continue at higher levels during second half of year, three of nation’s largest banks join in predicting;
- **Anticipated capital investment** has been revised upward by government scanners—5% above current rate compared with the 5% decline looked for late last year;
- **35,000 new housing units** are authorized by Government as of June 30, being half of a 70,000-unit three-year program in step with near-record homebuilding starts;
- **Steel output** is averaging highest in history at 10-millions-ton monthly rate;
- **Prompt bill payments** by business concern provides evidence of improved cash position;
- **Machine tool orders mount** as manufacturing firms expand facilities and plan new factories;
- **Personal income** left over after taxes, for spending or saving, has touched a high record of $260 billions per year with total “national production” hitting a $370 billions annual rate;
- **Consumer spending**, up 5% since ’54, reflects individual well-being;
- **Unemployment still declines**, the State’s jobless decrease running around 12% monthly while employment increases in construction and allied fields help to offset seasonal layoffs in other activities;
- **Municipal and corporate bonds** are in steady demand, particularly for longer maturities, thus assuring a money-stream for public and industrial building.

Reinforcing this array of plus-sign factors, a reported easing of international tension at this writing further nourishes the hope that 1955 will round out its second half without sensible diminution of the “good times” which have marked it thus far. Money rates will be tighter, speculation will be curbed, activity will lessen in some quarters, but there will almost certainly be much new building with supporting funds in reasonable supply.
This engaging little chapel, accommodating 50 persons, is for use by faculty and students of the college. Secluded in a grove of walnut trees and just a short distance from the busy portions of the campus, it has become a favored spot for quiet, private meditation and the religious services of all denominations. A small memorial court, directly adjoining the chapel's window wall, is intended for outdoor services. "One cannot help but be pleased with the extent to which the Danforth chapel has come to be considered an essential part of the campus," comments Dean Bates. "In a large measure this can be attributed to its dignified atmosphere and distinctive appearance."

The basic structure of the chapel is simple and direct, employing native materials and crafts whenever possible. White native sandstone faces the masonry walls, deep red flagstone forms the floor, and redwood frames windows and doors.

For the chapel's construction an initial gift of the Danforth Foundation was supplemented by a subscription raised by the students. The understanding and foresight of these sponsors in assigning to the architect full control over building, landscaping, furnishings, and accessories, is undoubtedly responsible for the harmony and unity of the design. From the earliest planning stages, the architect worked closely with Emil Frei, who composed the stained glass window at the west wall, and with Lynn Wolfe, designer of the copper doors and altar appointments. Marshall & Johnson were Heating Consultants; Clarence Jones, General Contractor.

Photos: Reynolds-Photography Inc.
Brilliant blues and reds filter through the high and narrow stained glass window (right) to illuminate the altar. A regular pattern of deep red flagstone (below) surfaces the floor in the chapel. Laminated roof beams are wall-bearing on the solid west wall and column-bearing on the glazed east wall. Short distances between ceiling beams are spanned by 2" x 6" fir boards, stained light-gray and laid flat. Rigid insulation above is dense black to emphasize 1 1/2 in. joints between fir boards. Pews are of black walnut—foam-rubber seats covered with brown-black fabric. Radiant panel heating extends under the entire stone floor and to a height of 6 ft along the west wall. A strong spotlight concealed behind the ceiling beam nearest the altar and a few cone-shaped lights over the entrance provide dramatic night lighting. Spaces between columns along the window wall (arrowspage and selected detail, page 125) have been filled with a pattern of redwood muntins and mullions. Light through three shades of amber glass bathes the interior in a warm glow. A cantilevered slab of black marble is the altar, providing the center of interest. The cross of colored glass fused to copper recalls the fiery colors of the west window.
Orange Coast College

<table>
<thead>
<tr>
<th>location</th>
<th>Costa Mesa, California</th>
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<tbody>
<tr>
<td>architect</td>
<td>Robert E. Alexander</td>
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<tr>
<td>associate architect</td>
<td>Richard H. Pleger</td>
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<tr>
<td>landscape architects</td>
<td>Eckbo, Royston &amp; Williams</td>
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<td>color consultant</td>
<td>Rex Brandt</td>
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Fast emerging from a 243-acre section of a former Army Air Base is the striking new campus of Orange Coast College, a public junior college located in the busy agricultural and oil area southeast of Los Angeles. In February 1952 P/A, we presented the full campus plan and described three of the earliest completed structures — the Library, a cattle-feeding unit, and the Technology Building. Now, in this issue, we show three of the newer buildings — the Student Center, the Art Center, and the Business Education Building (first campus building completed since Richard J. Neutra formed a partnership with Alexander). Also, as a herald of good things to come, note the photograph (across-page) of the recently completed Speech Arts Building and Auditorium, which was designed by Neutra & Alexander, and will be presented in P/A later this year.

The curriculum of Orange Coast — which determined the required buildings — is based on impressively extensive surveys of the educational and occupational needs of the region. Essentially these are self-appraisals, since they were made by the College staff, including both trustees and administrative officers.

For development of the co-ordinated campus, Alexander gives very special credit to the Board of Trustees, all five of whom have served since inception of the project. These are: Louis Comrady, D. D. Lawhead, Harry R. LeBard, Walter M. Longmoor, and Horace Parker. The various administrative officers who have been highly instrumental in seeing that the scheme has prospered include: Basil H. Peterson, Ph.D., President of Orange Coast and District Superintendent; James W. Thornton, Jr., Ph.D., Vice-President; William J. Priest, Ed.D., Assistant Superintendent in Charge of Vocational Education, Adult Education, and Summer Session; and William F. Kimes, M.S., Assistant Superintendent in Charge of Business. Members of the Neutra & Alexander staff who are accorded particular mention are: Dion Neutra, Robert Pierce, Dike Nagano, Frank Kelly, Al Boeke, and Andrew Balfour. Credit is also extended to the California State Division of School Planning.

Photos: Julius Shulman
Photos on this page are keyed to aerial photograph (acrosspage). The Technology Building (A) and the Library (B) were presented in February 1952 P/A.

1 Wing of the Business Education Building

2 The canopied entrance to the Student Center

3 Speech Arts Building (to be shown in a later issue)

4 Court of the Art Center
Orange Coast: Student Center
Eating, lounging, and recreational facilities are supplemented by student group offices, a journalism classroom, and a bookstore. The lounge (right) may be used as an informal auditorium and stage (raised area at rear). Sliding panels and accordion-fold doors offer great flexibility in use of dining spaces. A landscaped, south-facing court (below) provides a sunny outdoor lounge.

Opened sliding doors join lounge and main dining room (right). Structure is basically wood frame on concrete slab, grade beams, and caissons. Exterior materials include plaster, brick, and enameled-metal sunshades. Floorings are wood block or asphalt tile; acoustical tile is used on ceilings. Sash is aluminum-projected type. Parker, Zehnder & Associates, Structural Engineers; Bartlett & Berky, Mechanical Engineers; Sheldon W. Swickard, Electrical Engineer.
Orange Coast: Art Center

![Diagram of the Orange Coast Art Center with labels for different rooms such as classroom, drafting, office, storage, gallery, ceramics, plaster room, glaze bath, dressing room, spray room, kiln room, grinding, patio, studio, and high window. The scale is 1 foot = 5 meters.]
Campus buildings containing classrooms are oriented to the northeast; special-purpose buildings, north. This building occurs at the pivotal point where the two types join; hence, the odd plan shape. Departments include painting, ceramics, lapidary crafts, photography, and drafting. A central display gallery (below) can be divided into two rooms by means of sliding, room-height panels. Note the hanging indirect-light troughs, into which vertical slotted-pipe frames can be inserted and screwed into floor sleeves. Horizontals may be inserted at any point—providing endless display possibilities.

Layout of the complete ceramics department (top) utilized suggestions by William Payne, art instructor. North-facing windows of the painting studios (right) have shade control. The structure is mostly of wood frame (posts and laminated beams, 8 ft on centers), but some steel is used in the gallery unit; roof is wood frame and decking. Natural brick and plaster are used for exterior walls; 2-ft-sq acoustical board surfaces the ceilings, and floors are asphalt tile. Sash are galvanized steel. Parker, Zehnder & Associates were the Structural Engineers; Bartlett & Berky, Mechanical Engineers; and Sheldon W. Swickard, Electrical Engineer.

July 1955
Orange Coast: Business Education Building

First of the campus buildings designed by the partnership of Richard J. Neutra & Robert E. Alexander, this T-shape structure houses a variety of facilities for instruction in business practices. The accounting lab serves also as a filing-systems teaching room. Most extraordinary unit is the merchandising lab, complete with its showcase and other elements to be found in a small store.

For details of lower at main entrance (top), see selected detail, page 124.
A landscaped court separates the merchandising lab unit from the main building (two photos acrosspage, bottom). Bordering the south-facing access corridor of the classroom wing (below) are bold masonry wing walls, set at an angle (right), that protect the passage from prevailing winds and rains, as well as sun. Basic structural scheme is of reinforced brick, the transverse walls supporting a continuous steel beam left exposed on the interior. Other portions utilize wood frame and brick veneer. Rooms are heated by individual gas-fired warm air furnaces, individually controlled thermostatically.
The merchandising lab is set off from the main unit in a separate little building (top), whose west-facing windows are screened by corrugated aluminum louvers. The large space within (above) offers complete flexibility for instruction in the many phases of merchandising. At the far end of the room, a display corner with three-way mirror and store-lighting fixtures (right) allows practice in display methods. This whole work end of the room may be divided from the main space by accordion-fold partitioning.
The office practice lab (right) is equipped with a demonstration office, a PBX board serving 10 stations within the room, and several dictating machines that may be operated at different speeds. At the far end of the room is a duplicating-machine room that is used both for practical use in the duplication of material or (with a vertically sliding door raised) as a demonstration room for duplicating equipment.

Bordering the campus entrance to the merchandising lab (left and below) is a typical store display window, where students can test their talents. The curriculum includes all phases of the practice and operation of a small store. For the Business Education Building, Parker, Zehnder & Associates were the Structural Engineers; Morton K. Shields Co., Mechanical Engineers; and Norman Levenson, Electrical Engineer.
This student center is so placed on its sloping, campus site that it has entrances at grade on the north (street level) front; to the south (campus level); and to the east (service entrance). Porter Butts was Planning Consultant, working closely with the college officials to determine needs.

To stay within the cubage limit, extreme flexibility was required, especially noticeable in the street-level ballroom-lounge-banquet space which may be variously subdivided by folding partitions.

Spaces used most continuously by students—snack bar, terrace, barber shop, billiard and table-tennis rooms—are placed at the campus level. The top floor houses meeting rooms; accommodations for college guests; and offices for administrative personnel and student organizations.

Structural system is reinforced concrete except for the floor over the ballroom and roof above the forum room, which consist of concrete slabs on long-span bar joists. Exterior walls are brick, with native bluestone spandrels. Interiors are plaster, or (in service rooms) glazed structural units. Floorings include vinyl tile, maple, terrazzo, marble, and ceramic tile. Acoustical plaster is used on the ceilings. All sash are aluminum, whether fixed, operating, or sliding. The warm air heating system is split into five automatically controlled zones. The system is designed for addition of future cooling, without alteration. T. A. Loving & Company, General Contractor.
The library-lounge area (above) occurs on the south wall of the main floor.

A typical guest bedroom on the upper floor (right) opens onto a balcony that is sheltered by a columned, two-story portico, echoing a local tradition.

The dining-assembly-lecture area on the main floor of the building (below) may be made into a number of smaller rooms, by means of accordion-fold partitions, for simultaneous use by different groups.
Architecture Building

<table>
<thead>
<tr>
<th>client</th>
<th>Georgia Institute of Technology</th>
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<tr>
<td>location</td>
<td>Atlanta, Georgia</td>
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<td>architects</td>
<td>Bush-Brown, Gailey &amp; Heffernan</td>
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"This million-dollar building is unique in the annals of architectural school buildings," comments Director Bush-Brown, "in that the State of Georgia has provided for all needs in a building designed and supervised by those who will occupy it—members of the architectural staff." Thoroughly familiar with the problems and requirements of an architectural school plant, the architects have achieved an environment both functional and harmonious, undoubtedly conducive to an effective architectural training program.

In consonance with principles of the master plan for the entire campus, the new building enjoys a spacious site, insuring light and air, and room for possible future expansion. By varying ground levels, the building has been closely related to its sloping site and an extensive garden now in process of development. The main entrance (photo overpage) is located in the two-story south wing, which houses an auditorium large enough to accommodate the 300 students of the architectural department, an exhibition and judgment room, a director's office, and staff rooms. This wing is also used on occasions by other departments of the university and by the Atlanta community.

The four and one-half story north wing (right of photo above) on the lower half of the site features privacy and ample natural light for its working areas, such as classrooms, offices, an industrial design shop, and a large drafting room with mezzanine study cubicles. A connecting structure (left of photo above) containing library and gallery, with open concourse below and roof deck above, links the south and north wings. Except for the gallery, all major windows have been oriented north or south for maximum daylight, also avoiding the slanting rays of the morning and afternoon sun. Projecting canopies over the windows serve as controls against sun and rain and as scaffolds for window cleaning.

J. J. Pollard was the Structural Engineer for this building; E. Gritschke & Associates designed the mechanical plant, including plumbing, electrical, heating and air conditioning; J. A. Jones Construction Co. was the General Contractor.
West façade (photo below) is almost entirely windowless, though offices facing south have large glass areas shaded by projecting canopies. Exterior materials, selected for their durability and ease of maintenance, include brick for walls and glazed tile for spandrels and copings. Exterior columns are faced with faience tiles. Aluminum-bar windows have partially fixed glass and projected type ventilators. Photos: Joseph W. Molitor
Third floor (above) is almost entirely devoted to a large drafting room, featuring bilateral lighting and a mezzanine arranged for individual study cubicles. Lighting throughout is by fluorescent fixtures. Ceilings are faced with acoustical tile.

Large unobstructed room (right) is primarily used for judgments and exhibitions. Auditorium and lecture room directly beneath accommodates all students of the architectural school. Flooring is asphalt tile, walls are faced with flexible wood veneer on plaster, and acoustical ceiling tiles are suspended. The room is windowless and air conditioned.
Library (above) has no windows but borrows natural light from the adjoining gallery and lobbies. Solid west wall provides ample shelf space. Air conditioning preserves books and makes for year-round comfort. Recessed fluorescents provide even level of illumination.

Gallery (left) serves as passage between north and south wings. Main entrance at far end (also photo below) is half story below gallery level.

Materials & Methods

construction


equipment


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With the tremendous increase in population in the Los Angeles area, more and more campus-type junior colleges (public schools offering two-year courses after high school and also serving adult needs of the neighboring communities) are springing up. El Camino, founded in 1947 and being built on an 85-acre tract that was formerly part of a County park, is one such. Herewith are a few of the most recent buildings—the administration-classroom quadrangle (these pages) and a commerce building and student center (overpage).

A second floor of the administration wing contains classrooms, aligned along the north wall, similar to the scheme used in the one-story classroom wing. The ground floor of the administration wing is wholly composed of offices, for both administrative personnel and student groups; covered walks join this wing to the classroom wing to the north.

Reinforced concrete frames the two-story side of the quadrangle, while light steel-frame construction was used in the one-story classroom wing. Both concrete and brick were used for the walls, and above the main entrance to the administration wing (above), wall surfacing is of precast concrete units, forming a bold geometrical pattern that is repeated elsewhere on the campus.

Most sash are steel, though some aluminum is used at major entrances, etc. Acoustical materials cover ceilings of the building, while floorings are both vinyl and asphalt tile. North walls of the buildings use continuous glazing (bottom).

Hillman & Nowell were Structural Engineers for all buildings shown; Hammond Sadler, Landscape Architect. General Contractor for the administration-classroom unit was Finan Construction Co.
A pool and rich landscaping border the north (corridor) side of the two-story wing of the quadrangle. "Functional appointments throughout have made all of these buildings a pleasure to look at and a pleasure to use," comments Forrest Murdock, El Camino President.
This building houses the classrooms for instruction in office operation and techniques. The long wing of east-facing classrooms is light-protected by continuous horizontal louvers. The central corridor of the building is lighted by a continuous skylight. As in the administration building, the concrete-framed structure combines concrete and brick for exterior surfacing. Other surfaces and finishes of the building are also similar.

Hahn-St. John Company was the General Contractor.

All El Camino buildings faced a common foundation problem: the level site consisted of heavy adobe soil. To provide proper surface drainage, two feet of sandy soil were imported to cover the site, and structural piers or columns had to be carried down through the adobe to concrete belled caissons.
El Camino: Student Center

The dining and recreational center of the campus is centrally located. The large cafeteria-dining room accommodates 700, in two parallel serving lines, while the fountain-snack room has a capacity of about 125. Two outdoor eating areas are also provided. The main dining space is daylighted from openings in the butterfly monitor roof (louvered on the east face) as well as from the side walls.

The lounge is three steps above the dining room level and is used on occasion as a stage, as a platform for a speaker or a dance band, and for similar uses.

The space at the northeast corner of the main room may be subdivided into small dining or meeting rooms—or joined with the big room for large assemblages. The center also includes a student bookstore.

General Contractor for the center was Harvey Nichols Company.
Contrary to the dictum, Form Follows Function, Mies van der Rohe places his design emphasis on the achievement of a satisfying building shape and later fits functions into it. "This is the only practical way to build, today," he states, "because the functions of most buildings are continually changing—but economically the buildings cannot change." This theory has been applied again for the Commons Building, one of many this architect—also director of the IIT Department of Architecture—has designed for the campus. At present, the Commons Building houses a student cafeteria, and, as a unique feature for an urban college campus, a shopping center for students, faculty, and staff. Space in the basement has been set aside for recreational facilities and meetings. However, as soon as amplified shopping facilities are available in yet another building to be constructed, the Commons will assume its intended function as a dining hall. In consonance with other structures on the campus, the building employs an exposed steel frame, painted black and combined with panels of buff brick and glass. The ceiling structure, also exposed and colored black, employs precast-concrete slabs. On the inside, the only permanent walls are those enclosing the kitchen. All other partitions are of concrete block or translucent glass, to a height of 7 ft, and removable when dining facilities are expanded. Dark terrazzo covers the entire floor area, irrespective of the placement of partitions. Above the 7-ft line, both exterior and interior walls are of glass. The central area is mechanically ventilated. Shops have natural ventilation through louvered exterior windows. Convector are located along the perimeter of the building. Robert E. Hattis, Mechanical Engineer; Erik A. Borg Company, General Contractor.
client: Illinois Institute of Technology
location: Chicago, Illinois
architect: Ludwig Mies van der Rohe
associated architects: Friedman, Alschuler & Sincere

July 1955
Work of Felix Candela

In Mexico City, there lives a man who works as an architect, engineer, builder, and even, at times, as a foreman on the structures that he creates. The possessor of this remarkable combination of abilities—he is also a brilliant mathematician and a professor at the Escuela Nacional de Arquitectura—is Felix Candela. He once wrote: "In the field of construction, we fortunately are ending a long, analytical period. The ideas that nourished it are fully developed and to continue exploiting them would be senseless. If the symptoms are to be believed, we are on the verge of a new creative epoch. Architects should be pleased with this situation, especially if they manage to regain their lost role as 'master builders,' since in order to build at such a time it perhaps will not be necessary to master so much science but to have some talent."

In his own community, Candela is very much a master builder and actively experimenting with new structural concepts. Currently, he is intrigued with the possibilities of the hyperbolic paraboloid as an architectonic form and its adaptability to reinforced-concrete construction. Two structures—just now being completed—are presented here to demonstrate the talents of this architect and the inventiveness of his work with doubly curved surfaces. They are a church and a warehouse.

In the Iglesia de la Virgen Milagrosa, the design approach and structural style are inseparable. They were adopted as a natural consequence of Candela’s previous work in the field of thin-shell structures and he regards this design as a long-awaited opportunity to allow pure structure to develop as the total expressive medium of the building. Over an unpretentious plan, the church enclosure has been formed by various combinations of hyperbolic-paraboloidal shells which have a thickness of only 1 ½ in. or less!

1 "Stereo-Structures," June 1954 P/A.

Photos show construction procedure for a typical vault. Reinforced-concrete frame is erected first (left: Candela standing atop the folded-slab roof over chapel). Wood-joist generators are covered by ½ in. planks to develop warped surface of the falsework for the shells (below left). Network of reinforcing steel is then placed and concrete is poured and vibrated (below center and right).

Photos: Antonio Candela

2 For an analysis of this type of structural design, the reader may refer to "Warped Surfaces: Hyperbolic Paraboloids" by F. Candela, published in the Proceedings of a Conference on Thin Concrete Shells at MIT, June 1954. Also, see page 114 in this issue of P/A.
Iglesia de la Virgen Milagrosa, Mexico, D. F.

East elevation (right) shows profile of roof as its height increases from 46 to 67 ft. Side entrance is being erected in west transept (below). Note confes­sionals between transept and campanile.

Photos (except as noted): Erwin Lang

The architect reports that: “I was allowed full freedom in the design . . . and have enjoyed the actual building so much that . . . given the opportunity I would not modify its essential design.”

Abundant natural lighting enters the nave through the immense transepts, the bays along both sides of the structure, and the triangular opening over the nar­thenx—all to be filled with stained glass. Daylight enters the small chapel through clerestory windows in its folded-slab roof. The hall common to the chapel and the nave is directly lighted by openings be­tween the brick walls and the vaults. Be­cause of the structural form of the in­terior, no acoustical treatment will be needed to insure good hearing conditions.

Color schemes are yet to be determined. Under consideration, however, is the use of colored mosaic over the entire roof surface. Interior concrete surfaces will be painted.

Office working time for the entire proj­ect, including preliminary drawings, took but two weeks. Structural computations —“rather boring, lengthy, and made at a later date”—proved the correctness of the original conception. Total ground area covered by the church is approximately 16,500 sq ft and construction was es­sentially completed in 10 months. Cost of the structure, including concrete floor and handmade brick walls, was $41,000 or about $2.52 per sq ft. Design and super­vision fees are included in this amount.

Candela was assisted in the design by Fernando Mata who also was the drafts­man for all of the plans. Architect José Luis Bealliuire is presently executing the stained-glass windows. Cubiertas ALA S. A. (a building organization headed by Candela and his brother, Antonio) was General Contractor.
Work of Felix Candela

The site is bounded by low residential buildings on the east and by the priests’ residence on the north. Stained glass will be placed in south elevation above narthex (above). Candela questions the merits of intermediate section of campanile where the four warped surfaces dwindle into plane slabs (below). Feature was introduced during construction to increase height of the tower to 97 ft.
Two views of east interior elevation: Note textures of brick and concrete in photo taken in area between nave and east wall (above); view from nave looking toward front side entrance (below). Workmen in construction scene (right) indicate scale of vaults.

Photos: Lola Alvarez Bravo (top) Antonio Candela (right)
Work of Felix Candela

View across nave indicates relationship of altar, pulpit, and entrance to small chapel (below). Confessionsals along west wall extend outward to sidewalk line (above). Voids above narthex (bottom) will contain stained glass.
Size of typical bay in nave is approximately 40' x 22', width of side aisles is about 13', and vault springers are located 10' above floor level.
Rio’s Warehouse

Another of Candela’s most recent and exciting designs has been for a warehouse, also in Mexico City. Basic program requirements were to cover economically a triangularly shaped plot of about 55,000 sq ft and at the same time provide a small amount of roof light—preferably from the north, bays of about 50 ft, and a clearance height of 15 ft. The solution was found in a reinforced-concrete structure containing 36 umbrellas approximately 30’ x 50’ formed by hyperbolic-parabolic shells.

Traveling falsework, used for the roof shells, was subdivided into four tympons for each umbrella. Each tympan was struck and moved separately to the next pouring position (acrosspage). The curvature of the formwork was established by placing straight joists along one system of generators and straight 3/4” x 4” planks along the second system (see page 114 for additional discussion of the basic shape for each roof element).

Employing high-early cement, a pour per week for each set of forms was possible. With four sets, the total time required to erect the umbrellas, columns, and footings was three months. Two-thousand psi concrete was poured throughout and vibrated even in the thin roof shells. A total absence of cracks, resulting from the good compaction of the concrete, made it possible to eliminate waterproofing of the roof shells.

The columns, considered as built-in at the level of the floor slab, were designed to resist a horizontal seismic force of 2.5 percent of the weight of the umbrellas. The value of the horizontal resultant of the normal wind loads was lower than the considered seismic forces. As the effect of wind in the umbrella slab would be suction only, it was not considered in the design of the roof.

Mexico City’s subsoil is considered one of the worst in the world on which to build a city. Under a superficial crust of natural and artificial fill, there is a 150-ft layer of very compressible clay having a water content that varies from 75 to 90 percent of its total weight. It is generally necessary to keep the contact load of the footings on the ground at a minimum. In search for an economical solution to this problem, Candela designed doubly curved concrete-shell footings for this warehouse (acrosspage and page 115). Structures of high intrinsic stiffness, with minimum thickness and weight, are obtained in this manner—providing a substantial economy in steel reinforcement as well.

The total cost of the warehouse structure, including columns and footings was kept at 50 cents per sq ft of ground projection. This amount—partially made possible by the Mexican labor situation—is about half the normal cost of a conventional steel structure with similar spans, roofed with corrugated asbestos-cement or aluminum sheets.

By tilting umbrellas slightly, Candela obtains a north-light, saw-tooth roof in an extremely economical manner. In a more recent warehouse of this type, he has placed glass blocks in the slabs for additional top-lighting. A 6-in. asbestos-cement drain pipe is located in the core of each column. Photos: Antonio Candela
Thickness of each umbrella slab is only 1\(\frac{1}{2}\) in. Formwork for individual tympan is dropped separately and moved to next pouring position (above).

Photos show construction sequence of concrete-shell footings (immediately above). A hyperbolic-parabolic template is made of lumber and wire. Each tympan contains equally spaced wires connecting the sides of the base with equally spaced locations on the inclined apex members parallel to the respective sides of the base (Figure 1). This template is used to (a) determine the hyperbolic-parabolic surface of the soil footing which is dug in undisturbed earth (Figure 2); (b) determine the curvature of the grout which covers the earth footing (Figure 3); (c) develop a doubly curved concrete form over which the network of steel reinforcement is assembled (Figures 4 and 5). After the footings have been prepared with grout surfacing, reinforcement networks are superimposed and the 6" shells are then poured (Figure 6).
Roof: Here is how the basic shape of each umbrella-like roof element is obtained. Assume a rectangle whose sides measure 2a and 2b. If one drops its center a distance $CC' = \frac{f}{a}$ and joins point C with midpoints A and B of the four sides, the warped quadrangles formed will develop the contour lines of four hyperbolic paraboloids (Figure 1). The surface of each paraboloid is obtained by dividing each pair of opposite sides of a quadrangle into an equal number of parts and joining the corresponding divisions by straight lines. Thus, the two systems of straight generators of the surface are materialized. Each system is parallel to a director plane. As both director planes ACA and BCB are vertical and at right angles to each other, the paraboloids are equalateral. Every point on the surface is an intersection of two straight lines or generators contained in the surface. The crown of each paraboloid—or intersection of two horizontal generators, one of each system—coincide with the corners O of the basic rectangle.

Considering the two horizontal generators and the vertical line passing through the crown O as co-ordinate axes, the equation of the surface will be: $z = k x y$, where $k = \frac{f}{a} b$.

Plane sections parallel to the bisecting planes of the director dihedral xOy are parabolic. They are called principal parabolas and are respectively curved upwards, as at AB, or downward as at OC; hence, the surface is antilastic or inversely doubly curved.

The fundamental work on the stress analysis of hyperbolic paraboloids was developed by the French engineer F. Aimond. Because of the double curvature of this surface, the method of analysis can be limited to an investigation of the membrane state of stresses, provided that the resultant stresses remain low. Even with only membrane stresses one may be lead to complex expressions when investigating the effect of arbitrarily distributed loads; however, the basic formulas become extremely simple if the loads are vertical and uniformly distributed in horizontal projection.

With a loading of the type just described, the expression of equilibrium along the three co-ordinate axes leads to these elementary equations $N_x = N_y = 0$, and, $S = -\frac{g}{2k}$ constant (S being the unit shear stress times the shell thickness and g the vertical lead per unit area of ground projection) which represent a plane pure-shear state of stress, identical at every point of the surface.

Principal tensile and compressive stresses are directed along the bisecting lines of the directions x y of pure shear—that is, along the principal parabolas—and their horizontal projections have the same absolute value as the shear stresses. Hence:

$$N_z = -N_z = S = \frac{g}{2k}$$

Under this assumption (but not with other types of loads) there are no stresses normal to the boundary generators which are directions of pure shear. Nonequilibrated shears accumulate along the four sides of the warped quadrangle, resulting in tangential tensile or compressive forces (according to the method of support for the surface). These are the only reactions of the shell. That is, the shell transforms vertical loads into tangential forces directed along their four straight edges.

Tilting the umbrellas actually moves the crowns of the paraboloids along the edges that remain horizontal (Figure 2). (In the illustrations and example below, the metric system has been used in order to operate with exact quantities and to simplify computations.)

The lower (L) and upper (U) paraboloids have the same equation, since

$$k_L = \frac{1.50}{5.75 \times 7.625} = 0.0525$$
$$k_U = \frac{2.50}{6.25 \times 7.625} = 0.0525$$

or $z = 0.0525xy$.

Thickness of slab is 4 cm (1.5 in.)
Slab load $= 4 \times 25 = 100$ kg/m²
Live load and waterproofing $= 100$ kg/m²
Total load $= g = 200$ kg/m² (41 psf)

Because of the relatively small slope of the surface, this load is approximatively considered as evenly distributed in
ground projection. Differences between the value of stresses obtained by this simplified assumption and those computed by accurate consideration of the real loads amount to no more than five percent in this case.

Unit stresses times shell thickness:
\[ N_1 = -N_{11} = \frac{g}{k} = \frac{200}{0.105} = -1904 \text{ kg/m}^2 \text{ (1280 lb/ft)}. \]

Compressive or tensile stresses in concrete:
\[ f = 4.76 \text{ kg/cm}^2 \text{ (68 psi)}. \]

Neglecting tensile strength of concrete, the necessary diagonal tensile reinforcement is:
\[ A_x = 1.59 \text{ cm}^2 \text{ (0.075 sq in./ft)}. \]

One-quarter in. bars at 8" o.c. would be sufficient; however, \( \frac{3}{8} \)" bars at the same spacing were specified as an additional precaution against cracking.

Tensile forces along the outer edges increase from zero at corners 0 to maximums at center points A and B
\[ T_A = 1904 \times 7.625 \times \frac{14,000}{1,200} = 14,700 \text{ kg (32,400 lb)} \]
\[ T_B = 1904 \times 5 \times \frac{9520}{1,200} = 7.94 \text{ cm}^2 \text{ (1.23 sq in.) or three } \frac{3}{4} \" \]

Compressive forces along the inner edges increase from zero at points A and B to maximum at point C
\[ C_{CAU} = \frac{2 \times 1904 \times 7.625 \times \cos \phi}{\cos \beta} = \frac{29,360}{0.9502} = 30,800 \text{ kg (68,000 lb)} \]
\[ C_{CB} = \frac{2 \times 1904 \times 5 \times \cos \gamma}{\cos \beta} = \frac{19,040}{0.9285} = 20,500 \text{ kg (45,000 lb)} \]

which require the slab thickness to be increased at the inner valleys forming compressive members capable of resisting these resultant forces (Figure 3).

Footings: The very low bearing capacity of foundation soil in Mexico City requires very ample proportioned footings. Shell footings of the same form as the roof umbrellas, but inverted, offer an economical solution for this problem.

Dimensions of a typical footing are:
\[ 2a = 2b = 3 \text{ m (10 ft)} \]
\[ f = 1 \text{ m (3.3 ft)}. \]

Thickness of slab = 15 cm (6 in.)
\[ k = 1 \text{ a b } = \frac{1.50 \times 1.50}{1.00} = 0.445. \]

Design load on each column:
\[ P = 10 \times 15.25 \times 200 = 30,500 \text{ kg (68,700 lb)}. \]

Soil reaction (without consideration of columns and foundation-slab weights):
\[ p = \frac{30,500}{3 \times 3} = 3390 \text{ kg/m}^2 \text{ (694 psf)}. \]

Unit stresses times shell thickness:
\[ N_1 = -N_{11} = \frac{P}{2k} = \frac{3390}{0.89} = -3800 \text{ kg/m}^2 \text{ (2570 lb/ft)}. \]

Compressive or tensile stresses in concrete
\[ \sigma = 2 \text{ kg/cm}^2 \]

which could easily be resisted by the concrete alone without steel reinforcement. A mesh of \( \frac{3}{8} \)" bars, however, was actually used as temperature steel.

Tensile forces at the exterior edges have a maximum value at the midpoint of each side. The amount is:
\[ T = 3800 \times 1.50 = 5700 \text{ kg (12,500 lb)} \]
which require a steel area of
\[ A = \frac{5700}{1200} = 4.75 \text{ cm}^2 \text{ (0.74 sq in.) or two } \frac{3}{4} \" \]

Compressive forces at interior edges have maximum value at the apex of the paraboloid
\[ C = \frac{2 \times 5700}{\cos \left( \frac{1}{1.5} \right)} = 11,400 \text{ kg (25,000 lb)} \]

which can be taken without danger of buckling by the angular members formed by the intersection of both contiguous surfaces. (All computations were made by slide rule, since no more accuracy was considered necessary.)
the heat pump in air conditioning

by James K. Campbell*

When we speak of heat and cold we think of them as two separate things. In summer we are correct in closing the windows in the morning to keep heat out of the house during the forenoon, but in winter when we put up storm windows and weatherstrip doors to keep the cold out, we are really trying to keep the heat in. Then we remember our high-school physics and realize that heat is something real—a form of energy—but that cold is nothing at all, simply an absence of heat.

A mechanical-cooling system, which is a contrivance to take heat from a building and dispose of it where it will no longer annoy us, may be correctly called a heat pump, because it takes heat from one place and forces it to a new location. Usually, however, the term heat pump is used to indicate a device which can not only cool the house in the summer but can also heat it in the winter.

It is a fundamental principle that heat flows from a higher-temperature source to a lower-temperature destination. This is the principle which governs all transfers of heat which occur in the heat-pump cycle, whether it is used for cooling in summer or for heating in winter.

In order to understand the action of a heat pump it may be helpful to review briefly the action of a typical refrigerating system. Let us consider a system consisting of (1) a compressor in which a gaseous refrigerant is compressed with the resultant production of heat, (2) a condenser in which the hot, compressed gas is cooled and condensed to a liquid (just as steam is condensed in a radiator), (3) an expansion valve in which the pressure of the liquified refrigerant is reduced, and (4) an evaporator or cooler where the liquid vaporizes, and in so doing, absorbs heat from the surrounding air. The gaseous refrigerant then returns to the compressor and the cycle is repeated again and again.

In heating and cooling a building the action of a heat pump is as follows: In summer the heat from the house is absorbed by the liquid refrigerant and this heat is what causes it to vaporize in the evaporator. The compressor then takes this refrigerant gas and boosts the pressure and the temperature—the temperature to a point above that of the condenser and the pressure to a point at which condensation will take place as soon as the heat in the refrigerant gas is allowed to escape to a lower-temperature destination, namely, the air surrounding the condenser.

The amount of heat handled in this condensing cycle is much greater than just the heat of compression, since it also includes the latent heat absorbed by the refrigerant in the process of vaporization. The total amount is several times as great as the heat equivalent of the electric energy required to operate the compressor. All of this heat is pumped or drawn from the air surrounding the evaporator and is discharged from the condenser when the hot gas from the compressor is cooled and condensed back to a liquid.

This pumped heat is taken from a low-level source, which may be room air at 80 F, and is raised in temperature and rejected from the condenser to the outside air at a higher level (100 F or more). This is a description of a comfort-cooling system operating under summer conditions with an air-cooled condenser.

Now consider how the same system can be made to furnish heat in the winter. In summer the outdoor air which cools the condenser may have a temperature in the 90s, while the hot, compressed refrigerant gas entering the condenser may be as much as 100 degrees hotter than the outdoor air. In winter outdoor air is still allowed to blow across the coils of the condenser, but the flow of refrigerant is reversed so that the condenser becomes the evaporator and the evaporator becomes the condenser. The low-pressure liquid refrigerant in what is now the evaporator will vaporize with the absorption of heat and will drop in temperature to minus 10 F or thereabouts. Thus, a favorable temperature difference will be created, which will enable the refrigerant to absorb heat from the surrounding air, even at outdoor temperatures around the freezing point. After this heat has been absorbed, the refrigerant will next be boosted in temperature and pressure by the compressor and will give off its heat to the indoor air as the hot refrigerant gas is cooled and condensed in the former evaporator coil, which is now acting as the condenser. This action is referred to as reverse-cycle heating.

Figure 1 shows a system using a finned coil as an evaporator for cooling air in summer. If the direction of flow of the refrigerant, as shown in Figure 2, is reversed this coil becomes the condenser and becomes a source of hot air for heating the building. The former condenser will then become the evaporator and, as stated previously, will act as a cooler, picking up heat from the outdoor air.

In the case of a heat-pump system of sufficient size to meet the cooling requirements of the building and using the atmosphere as a source of heat, the lower the outdoor temperature becomes, the less heat can the refrigerant absorb. As the outdoor temperature drops, a point will be reached, depending on the capacity of the system, where heat can not be provided in sufficient quantity to meet the increasing requirements of the house. When this point is reached, the alternatives are to increase the size of the system or provide an auxiliary source of heat. In choosing the size of a heat pump, the amount

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of original investment should be balanced against operating cost, so that the system will require auxiliary heat during comparatively few days in an average winter.

Electric-resistance heaters, located either in the heat-pump unit itself or in individual rooms, are the simplest source of auxiliary heat, being inexpensive to install and easily controlled automatically. Water is another source of auxiliary heat if available in a reasonable quantity and if not too close to freezing temperature. While water is cheaper in operating cost, its use might require a more expensive installation than electric heat.

Another heat source available for a small building on a plot of sufficient size is the earth. Pipe coils or grids—laid in the ground at a depth of five or six ft where the temperature is practically constant summer and winter—may be used either to heat or to cool water or refrigerant circulated therein. The earth temperature in the central portion of the U. S. will average a few degrees above or below 55°F. If water is circulated through long lengths of underground pipe it will either give off or take on heat until it reaches the average earth temperature. The earth is thus able to act as a heat source in winter and as a heat sink in summer.

While the heat capacity of the earth is practically unlimited, there is a limit to the rapidity with which heat can be taken from or replaced in a limited area. The use of earth heat is therefore limited to low buildings which do not occupy the whole parcel of ground in which the pipes are laid.

Where available in sufficient quantity, water may be a more desirable year-round source of heat and heat sink than either the atmosphere or the earth. For large buildings in particular, an ideal source of earth heat is found in well water, which usually remains at a fairly
constant temperature throughout the year. If well water is available in sufficient quantity and the pumping cost is not too great, the only controlling considerations may be possible governmental regulations limiting its use and the problem of how the waste water may be disposed of. In order to conserve water and incidentally to prevent overloading the sewer, it may be necessary to provide two wells some distance apart, returning to one well the water taken from the other. In some cases the use of two wells of different depths may be effective in preventing temperature build-up in a limited area.

When air is cooled by being blown through cooling coils in which the refrigerant is being vaporized, it is said to be cooled by "direct expansion." In large systems it is common practice to use the evaporator as a chilled-water cooler; instead of being cooled directly, the air is cooled by being blown through chilled-water coils in the air ducts.

In such a system using well water, for instance, the change from summer to winter operation would probably be made by rerouting the flow of water rather than by reversing the flow of the refrigerant. In winter the well water would be pumped through the chilled-water cooler, where it would be forced to give up heat to the evaporating refrigerant. The condenser would then act like a hot-water boiler and heat water to be pumped through heating coils in the air ducts or through radiators, convectors, and panel heating systems, and thence back through the condenser. This arrangement would still be referred to as reverse-cycle heating although the refrigerant cycle itself is not reversed.

Several devices may be used to increase the effectiveness of heat transfer and to increase the efficiency of a heat-pump system. During the cooling cycle, part of the well water may be passed through a precooling coil to precool fresh air before passing to the building. The remainder of the water taken from the well may be cooled in the evaporator, used in the cooling coil to cool the air in the building, and then used to cool the condenser before being discharged to waste or to the well which is being used for a heat sink.

During cold weather, on the other hand, part of the well water may be first passed through a heat-recovery coil through which exhaust air from the building is blown, giving up part of its heat to the water instead of wasting all of it to the outdoor air. This water may then be passed through the precooling coil, which will now act as a preheating coil for fresh air.

Figure 3 shows the flow diagram of the summer operation of a heat-pump system making use of two wells and a condensing refrigeration cycle for cooling. It will be noted that part of the water from Well No. 2 is shown going to the evaporator, while the remainder of the well water goes to the precooling coil through which fresh air is admitted. The water which is chilled in the evaporator passes through the cooling coil to cool the air in the building, after which this water is used in the condenser before being discharged to Well No. 1. This diagram shows the approximate temperature of
the water, which might occur in different parts of the circuit.

Figure 4 shows the same system in winter operation. In this case, as before, part of the well water goes to the evaporator. The other part of the water goes first through a heat-recovery coil where it takes up heat from the exhaust air. This heat is transferred to the fresh air passing through the preheating coil—the same coil which acted as a precooling coil in summer.

In many buildings having inside spaces remote from the outer walls, waste heat from lights, motors, machines, or occupants may have to be removed by mechanical cooling even during the heating season. In Figure 4 the dash lines show how part of the water which has been chilled in the evaporator may be used for cooling such portions of the building when required.

Figure 5 shows a typical arrangement of a ventilating fan with fresh air inlet having a coil used either for preheating or precuing. Beyond this coil is the recirculation duct with its damper. This damper is connected by linkage with the fresh-air damper, so that one opens as the other closes. Beyond the fan are the heating and cooling coils and a pair of mixing dampers also having interlocking linkage to permit control of the air temperature in the discharge duct. Only one pair of dampers is shown at this point in the diagram, but in practice there may be several pairs, each pair controlling the temperature in that portion of the building supplied through its discharge duct.

Since the principal feature of a heat pump is a refrigeration cycle, it follows that heat pumps will be installed only where cooling is required. Where the installation of a cooling system has been decided on, the question as to whether to install a heat pump will depend on several considerations. The first consideration will be the cost of electric energy compared to the cost of fuel. In an average installation, a heat pump may be expected to deliver about three times as much heat as would be furnished by the electric energy used for operating the compressor. The second consideration may be the availability of well water as a heat source and heat sink if the system is to be of considerable size. If the system is to be small—in which case an air-to-air installation will be the simplest—the principal consideration may be the severity of the winters in the location in question and, if in a northern location, the cost of electric energy for auxiliary heat.

If economic conditions are favorable, the heat pump will provide an almost ideal installation. It will cool in summer and heat without fuel in winter. Humidity will be controlled throughout the year. The air filters will keep out dust and dirt, preserving the furniture and decorations. Closed doors and windows will exclude drafts as well as street noises and dirt. All of this will be accomplished automatically, including the change from heating to cooling and vice versa.

Now that several of the largest manufacturers of air-conditioning equipment are producing packaged heat pumps designed for 5- to 8-room houses, many a homeowner will wonder whether he should install one in his present home. If he is already considering the installation of a cooling system, his decision whether to consider installing a heat pump should be influenced by the type of heating system he has and how satisfactory it is. If the existing heating system is satisfactory, the desirability of duplicating its functions by the heating facilities of a heat pump will depend on how attractive the homeowner considers the automatic operation and absence of fuel which characterize the heat pump. If, on the other hand, the existing heating system is not satisfactory and is due for replacement, the owner might well give serious consideration to having a heat pump installed—after taking into account the various factors which will influence the operation of the system, such as climatic conditions and electric rates as compared with the cost of fuel.
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GLYNN-JOHNSON CORPORATION
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sprayed plaster

I wonder if you read the Metal Lath News published by the Metal Lath Manufacturers Association as avidly as I do? You can almost always find therein some contribution to building technology. The latest wrinkle is—well, listen to them tell it.

At long last the Machine Age has arrived in the plastering industry for thousands of years the application of plaster has been by hand. In modern industrialized countries, the plasterer has been using a trowel to put on the mortar, but there still are areas where even a trowel is not available. Where that is the case, whatever is used as mortar is thrown or daubed in place by the workman, using only his hands. It has been the dream of inventors, both in and out of the plastering industry, to develop a machine to apply mortar. Pneumatically-applied concrete long has been in use but only recently has there been available a machine which would apply gyspum-lightweight-aggregate plaster. Even after development of the first plastering machine, it still continued to be the usual practice to apply the scratch coat over metal lath by trowel. The operator of the machine encountered some difficulty in holding the nozzle at an angle which would prevent an excessive amount of mortar from passing through the openings of the metal lath. For this reason, use of machine-applied plaster over metal lath generally was confined to the brown coat.

Now the E-Z-On Corporation has found a way to alter the nozzle so that the scratch coat as well as the brown coat can be applied very readily on metal lath by machine.

The solution to the use of the machine for application of the scratch coat over metal lath lies in reducing the frequency of emission of material at the nozzle, and increasing the size of the globules discharged. The same nozzle can be used, but the latter is altered somewhat. Owners of E-Z-On machines can write to the E-Z-On Corporation and obtain advice as to how the nozzle should be changed. There is no charge for this information, nor is there any cost connected with altering the nozzle.

These changes mean that now there is no loss of mortar, as was formerly encountered, and the operator finds the application of the scratch coat to metal lath very simple.

So, no longer is the application of plaster by machine a dream—it is a very definite reality!
Several years ago P/A conducted a survey to determine how successful offices which were accomplishing good work had solved organizational problems.

Thomas Creighton wrote (November 1948 P/A) "...all of the successful offices agree on certain things. First of course, that some method of operating efficiently and consistently is needed. Second, that all employees must be given a feeling of contributing to a complete design process, with some degree of responsibility, rather than being cogs in a mechanical wheel. Third, that discussions, group decisions, and cooperation must be fused into whatever method of producing the work is decided on."

How have these successful offices achieved their increased efficiency? How have they effected a sense of participation in the project among their personnel? How have they been able to translate talk and ideas into drawings and buildings? The largest part of the answer seems to lie in the caliber of production teams they have built and in the offices' abilities to mold a strong morale and loyalty among the teams' members.

One capable man who identifies himself personally with the success of the job is worth a dozen men who have been made to feel that their contributions are next to worthless. A technique these firms use is to select their team members carefully so as to get people they can trust—and then go ahead and trust them!

**picking the right man**

It isn't easy to pick the right man for the job; normal turnover of drafting room personnel testifies to that. But turnover is expensive, both in morale among those remaining and in actual dollars lost in advertising for new people, in interviewing applicants, choosing the replacement, and training him in the way you want the job done. The possibility of turnover begins with hiring and the best way to reduce it is by choosing the team's members very carefully.

What do we look for in an applicant: on what abilities can we predict his success on the job? If you ask 50 people what a good draftsman is, you are apt to get many different answers. Yet there is a fairly general agreement that a desirable applicant should have: (1) experience in the particular type of construction he will be dealing with; (2) the required skill in drafting and lettering; (3) inherent pride, initiative, and imagination in his work which will be reflected in his contribution to the total job.

Industry relies more and more heavily on "testing" of applicants in advance through tests scientifically designed to find out how much of the required abilities the applicant has. Of course, to do this you have to know just what abilities are required; you have to know exactly what you are looking for. There has been little done to date in developing tests for the selection of drafting room personnel, but there eventually will be exploration in this field.

In the meantime, we must rely on our own perception of the needs and ask ourselves: "Can we expect this applicant to deliver the quality of work we want; will he work well with the other people on the crew; can we give him the type of work with which he will be happy and willing to stay with us; is this the man to whom we can trust that part of the job, or will we constantly have to watch over his shoulder for fear he will make a bad mistake?"

If we are going to free our executives from trivial detail, we must divide the labor and the responsibility among people we can trust and then we must go ahead—and trust them. An efficient operation requires that each man do a prescribed part of the work, a part for which he presumably has special abilities. In this manner have been built some very successful production teams. Their method of operating is to choose the man carefully, see that he has a complete picture of what they want done, and then let him do it.

**drafting room organization**

Few offices stop to write down the basic principles of their organization. Among many offices, however, the following are found to be accepted in one wording or another:

1. Top management should be free of burdensome detail.
2. Authority should be delegated to the lowest practicable organizational level.
3. Over-elaborate organizations should be avoided.
4. No person should report to more than one supervisor.

Quite a few other offices would add:
5. Responsibilities of all members of the organization should be clearly defined.
6. Responsibility should be matched with commensurate authority to act.

These last two points seem to be very provocative. Although there is no disagreement about their value, responsibilities are often confused in their disposition. A may think that B is responsible and B may think that A is responsible while, all the time, the responsibility actually rested in C! In determining how far to go with a decision, in knowing where to go for a decision, in knowing which of two contradictory orders to follow, in these and many other instances it is valuable to have a clearly defined list of responsibilities of each member of the organization.

One reason cited for the lack of this definition is that it is a time-consuming process and that the only people who could approve the outlay for it do not consider the results sufficiently valuable. This is a strange paradox since, ordinarily, the approval needed would be that: of top management, which stands to lose the most by confusion of responsibility.

Yet responsibilities can generally be defined quite easily. The example shown here served the purpose on a multimillion-
the production team
dollar Navy project involving a drafting room budget of over $20,000. This simple memorandum established the responsibilities for 165 man-weeks of work. And on that particular job there was a minimum of confusion and an extremely high rate of production.

drafting room morale
Morale is not so easy to obtain as good organization. Drafting room morale is like marriage—you have to keep working at it if you want it to succeed. It is a subtle, fragile thing so hard to grow and so easy to destroy.

A hard-hitting drafting room crew can acquire a tremendous loyalty to the firm and with that loyalty and their own hard work forge a reputation (and gain a profit) on the jobs they do. When people feel that they and their work are respected for a vital contribution to the completed project, they are inclined to give the very best they’ve got to the job. When they trust their firm and are confident of their future with the firm, they tend to work for the firm’s success, as well as the completion of the job at hand.

But let a single injustice go unchallenged in the drafting room and you may find a different story. Let one unwise supervisor try dictatorial or domineering methods and some top-notch personnel may start looking for different jobs. Allow questionable layoffs without notice and the confidence of every man in the drafting room drops to a new low. Try to substitute exploitation and deceit for participation and truth and see how long it takes to get production back up to the standard you had before.

There are drafting rooms where morale is always high. Generally, in these firms good fortune or premeditated design have put operations on a sort of Golden Rule basis. Some people are “just that way by nature” and they don’t have to think much about what is the right thing to do in a situation. Instinctively, they treat employees and colleagues, alike, with genuine respect and courtesy. In so doing, they seem to inspire an almost fanatical loyalty to themselves and their organizations.

In other drafting rooms we have to work at morale and remain alert to the things which could damage it. We know by the records of industry that high morale and high productivity go hand in hand. We know that turnover is costly and should be avoided. Developing our skills in keeping morale high while getting the job out on schedule is a large order—but it’s worth the results.

Typical memorandum defining responsibilities on a large drafting project.

INTER-OFFICE CORRESPONDENCE
NEW YORK OFFICE

Memorandum

Date: October 18, 1953

From: S. K. Boyd

To: Drafting Room

Subject: Navy #423, Assignment of Work

1. Bill Meier is assigned to this project as Project Captain. He will be responsible to the Project Director for the time schedule and for over-all co-ordination of all architectural, structural, civil, mechanical, and electrical drawings and specifications of the project at the working level.

2. Del Summers is assigned to this project as Project Engineer. He will be responsible to the Chief Engineer for the time schedule of the Engineering Departments and for the co-ordination of structural, civil, mechanical, and electrical drawings and specifications.

3. The quality of work, its accuracy and completeness, will be the specific responsibility of the department heads. These responsibilities have been delegated, for the project, as follows:

   Architectural Department - Bill Meier
   Structural Department - Del Summers
   Mechanical Department - Ivan Ores
   Electrical Department - Perry Sampson
   Civil Department - Ed Rothschild

July 1955 123
CHAPEL, Fort Collins, Colo.
James M. Hunter, Architect
Matching panels and door of beautiful glass make this interior an impressive office suite.

The Blue Ridge Securit* Interior Glass Door is the key point of interest.

**It's decorative!** Being neutral in tone, the translucent door harmonizes with every décor, giving a fresh, clean, modern appearance. Handsome hardware comes in your choice of bronze or chrome finish.

**It's functional!** The glass panels and Seurit Door lend an air of spaciousness to smaller rooms... "borrow" light from one area for another, yet provide adequate privacy.

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Your L.O.F Distributor or Dealer will be glad to give you all the facts. Look for his name in the phone book yellow pages under "Glass".

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**BRIEF DATA**

Glass—\(\frac{3}{8}\) thick. Muralex patterned on both surfaces.

Tempered—three to five times stronger than untempered glass of same thickness.

Reversible—can be used right or left hand.

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

Closers—when specified, the door can be shipped with a Sargent closer or prepared for use with an LCN concealed closer.

For more complete information, see the Securit Door insert in Sweet's Architectural File.

Libbey-Owens-Ford Glass Co.
608 Madison Ave., Toledo 3, Ohio

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NAME (PLEASE PRINT).

Address.

CITY.

ZONE.

STATE.
Housing for resident students, whether at college or at preparatory school level, has relatively fixed problems. From the owner’s viewpoint, materials must be chosen for their ability to take strong punishment, as well as for their adaptability to a strict budget. From the student’s viewpoint, there are the three S’s to be considered—Sleep, Study, Storage—plus a fourth desirable, Sunshine.

That interiors which meet these demands need not necessarily be coldly monastic is demonstrated in the four dormitory rooms chosen for these pages. Color, texture, and interplay of surface materials remove the institutional chill. Built-in furnishings free floor space for an open look in even the smallest rooms. Tackboards bridge the gap between the student’s irresistible need to personalize walls and the owner’s legitimate concern for property damage.

In the Mount Hermon boys’ dormitory, Architect Britton designed built-in storage, dressers, desks, and bunk beds. Painted cinder-block walls contrast with natural redwood storage units. Acoustical-tile ceilings and asphalt-tile floors contribute to study quiet.

At Mount Holyoke dormitory, Architect Orr provided ample storage for the girls’ rooms by introducing the wardrobe system (an early use of such an idea, as the building planning started in 1946). Color was carefully chosen with regard to orientation, and room colors were coordinated with corridors, doors, sash, and bucks. Note dressing-table section in wardrobe unit, complete with lighted mirror cabinet and cosmetic shelves.

At Trinity College, Designer James of O’Connor & Kilham, created ingenious built-in units for storage and for sleeping. Double bunks are equipped with storage drawers, ladders, reading lights. Small-luggage storage is provided for in wardrobes. Concrete-block walls are painted for contrast with natural woods and asphalt-tile flooring.

Architect Breuer’s Vassar dormitory combines built-ins with portable furniture, bright colors, and contrasting fabrics to create a home-like interior. In the double rooms, a 7-foot-high partition divides sleeping from study area, provides closet and dressing-table space on one side and work space on the other.
dormitory rooms

client: Mt. Hermon School for Boys
location: Mt. Hermon, Massachusetts
building: J. Willard Hayden Dormitory
architect: James A. Britton

Design Theory: Functional design, straightforward use of materials. Requirements—durability for hard usage by students; omission of expensive materials.

Color Plan: Naturals and neutrals.

cabinetwork

doors
Doors: flush/maple/solid core.

equipment
Sprinkler System: Rockwood Sprinkler Co., 141 Milk St., Boston, Mass.

lighting
Flush Units: Holophane Co., Inc., 342 Madison Ave., New York, N. Y.

walls, ceiling, flooring
Partitions: cinder block/painted.
Ceiling: "Acousti-Celotex"/acoustical tile/Celotex Corporation, 120 S. LaSalle St., Chicago 3, Ill.
Mount Holyoke College  
South Hadley, Massachusetts  
Lakeside Dormitory  
Douglas Orr

**Data**

**Design Theory:** Adoption of wardrobe system cut separating partitions to a simple installation, saved over-all length in structure. Interior design was kept to utmost simplicity architecturally, relying on form and color for effect.

**Color Plan:** All west side bedrooms—warm gray, blue-green, gray-green, chartreuse; all east side bedrooms—Caenstone, Peach Buff, yellow. Sash and bucks inside bedrooms, limestone gray.

**Cabinetwork**

Built-in Units: Scott & Duncan Co., 504 Dudley St., Roxbury, Mass.

**Doors and Windows**


**Windows:** Hope's Windows, Inc., 84 Hopkins Ave., Jamestown, N. Y.

**Lighting**

Spun-Brass Receptacles in Ceilings: Charles Parker Co., Hanover St., Meriden, Conn.

**Walls, Ceiling**

All Walls: hard-finish plaster, painted.

Ceiling: concrete-slab soffit, rubbed and painted.
p/a interior design data

dormitory rooms

client: Vassar College
location: Poughkeepsie, New York
building: Cooperative Dormitory
architect: Marcel Breuer

study area in double room
data

Design Theory: Separation of study and sleeping areas in double rooms. Rooms designed for privacy, sunlight, quiet.

Color Plan: All floors, brown. Pale gray walls with blue curtains, or blue walls with beige curtains. Rust chairs. Natural wood tones.

cabinetwork
Cabinet Partition, Desks Attached, Storage Units: natural birch, masonite/ architect-designed.

furnishings and fabrics
Fabrics: Knoll Associates, Inc.
Beds, Pillows: William Inner Co., 344 E. 40 St., New York, N. Y.
Scatter Rugs: William Gold, Inc., 19 E. 53 St., New York, N. Y.

walls, ceiling, flooring
Walls: painted.
Ceiling: "Travacoustic" tile/ Gold Bond/ National Gypsum Co., 225 Delaware Ave., Buffalo 5, N. Y.
dormitory rooms

client: Trinity College
location: Hartford, Connecticut
building: Freshman Dormitory
architects: R. B. O'Connor & W. H. Kilham, Jr.
furniture-equipment designer: Stewart Ross James
color designer: Teresa Kilham

The image shows a dormitory room with a simple layout. The room includes a double bed, a desk, a wardrobe, and a sleeping area. An architectural plan is also included, showing the floor plan of the dormitory room.
two-room suite, separate study room

data

Design Theory: All furniture and equipment built-in wherever possible, both to prevent loss and to conserve space. Double-deck bunks permit housing 137 students in 52 double rooms, 6 suites.

Color Plan: Asphalt-tile colors and paint colors vary in blocks throughout building.

cabinetwork


doors and windows

Doors and Wood Sash: flush / birch / installed by C. H. Dresser & Son, Hartford, Conn.

Window Shades: "Temlit" / waxed basswood / Holland Shade Co., 999 Third Ave., New York 22, N. Y.

furnishings


Chairs: Thonet Bros., Inc., One Park Ave., New York, N. Y.

Double-Deck Bunks: anodized aluminum verticals / rubber-coated step bars / birch headboards and blanket bins / birch doors as mattress supports / architect-designed / executed by Frank B. Curry Co.

lighting

Bed Reading Light: Swiveller Co., 43 34 St., Brooklyn 32, N. Y.
**Kitchen Cabinets:** (left) "Convertible" storage space through interchangeable sliding shelves and drawers/snap-lock assembly, telescoping sub-bases/white baked-enamel cabinet surfaces/stainless-steel-and-colored-plastic handles/sub-bases neutral gray/Micarta counter tops/cast-iron sinks; (above) sliding wire shelves in utility cabinet permit operation of appliances directly from shelves/American Radiator & Standard Sanitary Corp., Bessemer Bldg., Pittsburgh 22, Pa.

**Buffet Kitchen:** "Dwyer 400"/includes refrigerator, electric cooking top, storage cupboard, sink/push-button door controls, automatic worktop light, keyed lock/counterbalanced top for fingertip opening or closing/finishes in mahogany or blonde/depth: 21½"; length: 48"; height (closed): 42½", (open): 61½"/retail: $495/Dwyer Products Corporation, Calumet Ave., Michigan City, Ind.

**Wall Refrigerator Freezer:** (below) mounted on 5-ft "picture-hook" bracket/in white, yellow, green, pink, blue, brown/39½" high, 64" wide, 17½" deep/total capacity 10.7 cu ft/General Electric Co., 310 W. Liberty, Louisville, Ky.

**Built-in Kitchen:** (above) "Tap'n Wall"/built-in electric oven, surface cooking units/optional griddle/oven serviceability without removal from installed position/The Tappan Stove Co., Mansfield, Ohio.
West Coast architects Marsh, Smith & Powell found clay tile a good collaborator to work with in their design for a modern school corridor with stair well. This rendering shows how clay tile performs a permanent double service of function and design.

The important check points: low-upkeep tile floors to take generations of student traffic—glazed tile walls that keep maintenance down and good appearances up for decades—tile treads and risers which absorb footsteps unmarred for years, and ceramic mosaics on the corridor columns which offer a striking treatment that is maintenance-free.

When you approach your next school project, keep clay tile in mind. It’s the ideal high traffic, low maintenance floor covering. It gives you and your clients a permanent solution for easily-cleaned, decorative walls that never need replacement. And it is flexible enough to give you unique, custom designs with standard units.

So be sure to check today’s range of clay tile colors, shapes and types—the widest of any modern building material. When it is a clay tile installation, it never fades, burns, stains, scratches or needs refinishing or redecorating—all the cost is figured in at the start!
1. **unit room conditioner**

The conditioner, sitting on a plenum, is located along an outside wall and backed up to a partition wall. Warm air is discharged from the top outlet grille across the outside wall and windows. Fresh air and recirculation air enters through the floor plenum.

This is a very inexpensive application. If desired, ducts can be extended into adjoining classroom and both rooms heated by one unit.

2. **enclosed room conditioner**

A deluxe type of installation with the same design features as one above. A ventilated closet completely encloses the conditioner. Combustion air is ducted into closet from outside. This concealed tamper-proof installation is extremely quiet in operation.

3. **overhead room conditioner**

A Janitrol Horizontal Conditioner is suspended from the ceiling. Warm air is directed parallel to outside walls and across glass areas. A built-in centrifugal blower provides quiet air circulation. This unit is also approved for installation with duct system.

This particular unit requires no floor space and is installed without duct work. Capacities available from 65,000 to 150,000 Btu/hr. inputs.

4. **suspended heaters**

Small, economical propeller-type heaters are installed overhead in this gymnasium. The small amount of propeller fan noise is not a factor here. An ideal system for intermittent occupancy areas, where installation cost is of prime importance. During unoccupied periods, minimum temperatures can be maintained automatically...an advantage common to all these models.

5. **central forced warm air system**

A heavy duty, forced warm air furnace distributes heat from a central furnace room through a duct system. In larger schools, remote rooms occupied intermittently, and less economically heated by a central system, may be efficiently handled by individual room units.

A central-type system of proven success. Temperature control can be zoned for different activity areas. Furnaces are factory assembled and tested...250,000 to 1,750,000 Btu/hr. input capacities.

MORE INFORMATION?

These are just a few of the successful installations on file at Janitrol. If you would like additional ideas on low cost installations of Counter-flow Conditioners in perimeter heating systems, or specifications, please write. There's no obligation.
Arm-Chair: "Swan" chair, #18RI/ steam-bent white ash, wrought iron, and transparent-rawhide lacing/ wood in clear natural, walnut, or black finish/ 18½" wide, 17" deep, 18" high/ retail: $35/ Vermont Tubbs, Inc., Wallingford, Vt.

Lounge Chair: "Classic Contemporary"/ foam rubber over Elasticweb/ frame walnut or satin-finish brass or pewter-finish nickel/ designed by Milo Baughman/ retail: $170/ Arch Gordon Co., Inc., 1335 N. Wells St., Chicago, Ill.

Desk: blackmetal frame and supports/ wood surfaces in mahogany, oil-and-wax finish/ retail: $49.50; in birch, natural or tawny finish/ retail: $59.50; with plastic top/ retail: $56.50 in mahogany, or $64 in birch/ Vista Furniture Co., 1040 N. Olive St., Anaheim, Calif.

Reading Table: "Trend Color Line"/ apronless top for maximum leg space/ cocoa-brown PermaSeal-finish top/ legs natural birch/ for Yale University Divinity School Library/ chairs by Norman Cherner/ Library Bureau of Remington Rand, 315 Fourth Ave., New York 10, N. Y.
on hundreds of campuses—in thousands of buildings

**THE CHOICE IS JOHNSON CONTROL**

Johnson, the originator of temperature control for educational buildings, has a vast fund of over 70 years' "know-how" to help solve any temperature or air conditioning control problem... with unequalled engineering excellence and greatest economy.

You'll find Johnson Control in the majority of college buildings everywhere—at Montana State University, for example, where the first installation was made 35 years ago.

Whether your particular temperature control problems involve a school, office, factory, hospital, store or some other type of building, they can be solved best by Johnson. An engineer from a nearby Johnson branch will be glad to submit recommendations without obligation. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin. Direct Branch Offices in Principal Cities.

Decorative Fabrics: (background) close-weave upholstery, nylon warp, Dynel fill/ in blue, green, Pumpkin, beige/ retail: $8.50 yd; (foreground) fishnet, all-Dynel/ pale-gold only/ retail: $5.50 yd/ Marie Nichols Fabrics, 300 E. 61 St., New York, N. Y.

Diffuser-Dome Ceiling Fixture: semi-rigid washable white vinyl/ pan of white baked enamel, 22" diameter/ hardware 4" satin-chrome disk and finial/ maximum wattage 3-100 w./ no-screw mounting, center support disk holds diffuser tightly against ceiling/ disk tilts to change bulbs/ retail: $20.95/ Lam Workshop, Inc., Wakefield, Mass.

Adjustable Lamps: (left) floor lamp/ vacuumatic clutch device in stem permits height to adjust from 42" to 66"/ Swedish brass/ shade 13'/ white Silkan Vinyl/ 3-way socket/ retail: $52.50; (above) table lamp/ adjusts from 21" to 28" in height/ shade 8'/ retail: $34.50/ designed by John Gartman/ Laurel Lamp Co., 235 Fifth Ave., New York, N. Y.
Sinclair Oil's New Chicago Headquarters

- Completely Sound Conditioned with Acousti-Celotex Tile

John W. Galbreath & Co., Inc. has gone all-out for employee efficiency and comfort in this outstanding new Chicago office building. Throughout the 200,000 square feet of the building, Acousti-Celotex Mineral Tile traps machine clatter and voice chatter, reduces routine noise in general and private offices and corridors. For the Sinclair Oil Company and other tenants, this means that errors will be reduced, over-time lessened, productivity increased.

Lighting and air conditioning also included in integrated system

Low in Cost—Easily Maintained—Acousti-Celotex Tile provides economical sound-conditioning. No special maintenance is required. Beauty and cleanliness add to the advantages of highly effective sound-absorption. Acousti-Celotex Tile can be washed repeatedly, painted repeatedly without loss of sound absorbing efficiency.

*Acousti-Celotex incombustible Perforated Mineral Tile is installed on the Celotex Acousti-Line* Metal Suspension Ceiling, where Tile, light fixtures and air diffusers become interchangeable parts of the ceiling. When a new layout is desired, units can be quickly relocated... economically!

FOR FULL DETAILS on the complete line of Acousti-Celotex products, please write to The Celotex Corporation, Dept. C-75 120 S. La Salle Street, Chicago 3, Illinois.

Lighting Unit: flush, recessed, fluorescent unit with dropped Plexiglas diffuser/removable pan, independent of housing, contains all wiring connections for repair access with minimum of dis-assembly/takes two 20- or 40-watt lamps/25" x 9½" x 4½"/instant start/ UL-approved/Model #22/Atlas Electric Products Co., 315 Ten Eyck St., Brooklyn 6, N. Y.

Wall Covering: “Velvetex”/vinyl plastic fused to fine-count cotton, printed in vinyl inks/Wall Covering: “Velvetex”/vinyl plastic fused to fine-count cotton, printed in vinyl inks/Velveray Corporation, 15 W. 34 St., New York 1, N. Y.

Kitchen Cabinet Specification Sheet: Architect’s Specification Sheet on steel kitchen cabinets/lists minimum standards, provides guide to basic strength and rigidity of steel kitchen cabinets/copies may be obtained by writing to: Steel Kitchen Cabinet Mfrs. Assn., 1008 Engineers Bldg., Cleveland 14, Ohio.

Bathroom Unit: “Vanitory”/flexible construction to enclose washbowls and plumbing fixtures, provide surface and storage as required/custom-fabricated of Formica to fit any floor or wall condition/washbowls range from 14"x16" up, in white or pastels/Formica in satin, furniture, or polished finish, wide range of Raymond Loewy-designed colors and patterns/The Formica Company, 4620 Spring Grove Ave., Cincinnati 32, Ohio.

Roll-Out Refrigerator-Freezer: caster-equipped, moveable/toe-lever lock/11.3 cu ft refrigerator capacity/123 lb food freezer at bottom/eye-height fresh-food compartment/Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.

Six-Unit Cooking Top: “L & H Custom Bilt” cooking top with six fast-heating surface units, four at 1250 watts, two at 2100 watts each/in stainless steel or eight porcelain enamel colors/controlled by 7-position heat switches for wide range of cooking temperatures/indicator switch-light/3½" deep, 45° long, 21½" wide/ A. J. Lindemann & Hoverson Co., Norris-Thermador Corp., 5215 S. Boyle Ave., Los Angeles 58, Calif.

Colored Washfountains: vitreous enameled washfountains now available in Sun Tan, Pastel Yellow, Sky Blue, Forest Green, Sea Green, Stainless White/heavy-duty stock/bowls of one-piece pressings of deep-drawing steel/porcelain enamel colors/acid-resistant stainless enameled in colors harmonizing with bowls/scratch bases in gray hammer finish/Bradley Washfountain Co., 2203 W. Michigan St., Milwaukee 1, Wis.

Soil Retardant: “Ludox” colloidal silica, anti-soil solution/colorless, odorless, nonflammable/applied to pile fabrics, such as rugs, carpets, upholstery textiles, to reduce soil/E. I. du Pont de Nemours & Co., Wilmington, Del.

Visual Education Blind: provides darkness control for movies, slides, opaque projection/controls sun and glare in normal use/tenoned slats fit into built-in metal molding, triangular light control shields, mounted vertically, force slats tightly together to eliminate all light/chain-operated/slats removable for washing/metal molding prevents blowing and banging/installed within window frames free of heating and ventilating units/Mackin Veneer Blind Co., Momence, Ill.

Venetian Blind Cord-Lock and Tiltor: “crash-proof” cord-lock/safety device that locks blind firmly in place as soon as pressure is released from pull-cord/“non-slip” barrel-type tiltor prevents slipping, keeps cords even and equal/The Eastern Venetian Blind Co., Baltimore, Md.
WHAT TO LOOK FOR IN QUALITY TOILET COMPARTMENT CONSTRUCTION
One of many major differences that give you your money’s worth in satisfactory service!

Doors WELDED so rigid...
THAT WRESTLERS CAN’T SPRING THEM!

MAXIMUM RIGIDITY in Sanymetal doors is achieved by welding. Here is how two strong men attempted to spring the door. They were not able to give it a permanent set—when released any slight deflection disappeared and it was flat and aligned as it was designed.

WELDS AND LOCKING STRIPS account for the exceptional rigidity of Sanymetal doors. Arrows 1 and 2 point to welds which join door surfaces. At 3 you see the locking strips which exert spring action to hold surfaces tightly together. On Sanymetal Porcena doors these strips are polished stainless steel.

This long-life feature is STANDARD at no extra cost on all types of Sanymetal Compartments.

Many quality construction features found in all Sanymetal Toilet Compartments mean longer satisfactory service. These features result from Sanymetal’s 41 years’ experience manufacturing compartments. Be sure you get this quality.

A feature you should notice is rigidity produced by welding at the edges to join the compartment door surfaces. This makes the door a rigid structural unit. The edges are then further reinforced and the door made stronger with a formed locking strip welded, ground and finished at the corners. Strong men cannot intentionally spring this door without use of heavy tools, an abuse more severe than extremely heavy service.

Welded, rigid doors are one of many special features you get at no extra cost on all Sanymetal Toilet Compartments. Ask your Sanymetal Representative about all these features available as standard from Sanymetal at no extra cost.

See Sweet’s or send for Catalog 92, describing all Sanymetal Compartments. If you wish, we will mail other advertisements of this series on quality construction details.

THE SANYMETAL PRODUCTS COMPANY, INC.
1683 URBANA ROAD, CLEVELAND 12, OHIO
Editors' Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, or to some other factor which makes them especially valuable.

p/a manufacturers' literature


1-37. Bros Type-S Boilers (WT-8), 8-p. brochure illustrating boiler designed for efficient, economical operation in limited space. Describes construction features; gives drawings and physical data on boilers burning coal, oil, or gas. Power Div., Wm. Bros Boiler & Mfg. Co., 1057 Tenth Ave., S. E., Minneapolis 14, Minn.

1-38. Connor Kno-Draft High-Pressure Air Diffusers (K33), 52-p. manual compiled to provide up-to-date information on design of high-pressure air-transmission systems. Discusses design procedure, single- and dual-duct systems, air velocity, and duct construction; describes high-pressure diffusers in detail, including selection tables, dimensions, and specifications for each model. Photos, layout drawings. Connor Engineering Corp., Danbury, Conn.

1-39. Slant-Fin Radiators and Enclosures, AIA 30-C-4 (505), 20-p. booklet describing finned-pipe radiators which induce natural convection. Gives data on square-footed units as well as more efficient slant-finned series; contains information on sloping top, flat-top, expanded-metal, and baseboard enclosures. Also provides rating tables, engineering notes, and architect's specifications on radiators. Slant-Fin Radiator Corp., 87-49 330 St., Richmond Hill 18, N. Y.

1-40. Trion Mechanical Air Filters, AIA 30-D-3 (M-10), 12-p. publication on filters for use where low initial cost outweighs high efficiency; where dirt load is unusually heavy; and where careful air cleaning is not necessary. Explains features of filter design; describes several fixed-panel and traveling-curtain filters. Contains design data and physical properties for all models; drawings, specifications. Trion, Inc., McKees Rocks, Pa.

1-41. Webster Custom Walvector Radiation (B-1553A), 8-p. pamphlet describing perimeter-heating units with enclosures custom-made to suit building requirements. Contains information on eight basic enclosure types; gives data on optional accessories. Also includes tables for selection of proper-size radiator unit; specifications, dimensions, drawings. Warren Webster & Co., Camden 5, N. J.

construction


2-47. Electrified Concrete-Joint Floors, AIA 31-C-62, 16-p. publication on reinforced-concrete joint floors with grid-like network of steel electrical conduits embedded in structure—eliminating need for fill. Details and drawings show how steel ducts are formed in concrete; design-data section contains instructions for layout of conduit system. Also gives notes on fire rating, cost comparison with cellular-steel floors, and specifications. Concrete Reinforcing Inst., 38 S. Dearborn St., Chicago 3, Ill.


Three brochures detailing aluminum building products. First booklet illustrates curtain-wall system with photos, elevations, and details of recent noteworthy installations. Second booklet contains large-size, two-color details of commercial windows; drawings, dimensions, and specifications are given for double-hung, projected, or ribbon windows. Third one provides data on exposed-grid suspension system for acoustical ceilings. Specifications are included as well as suggestions for arrangement of lighting and ceiling tiles. Cupples Products Corp., 2650 S. Hanley Rd., St. Louis 17, Mo.


2-53. The Curtain-Wall Story, AIA 17-A, 22-p. Two pamphlets containing information on use of stud welding in construction. First one provides data on welding of concrete anchors. Gives properties and dimensions of steel stud anchors; shows details of anchors used at expansion joints, door frame, and curbs. Second one describes erection of metal curtain walls with

(Continued on page 149)

I should like a copy of each piece of Manufacturers' Literature circled. We request students to send their inquiries directly to the manufacturers.

please print

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Coupon must be used by 9/1/55.

PROGRESSIVE ARCHITECTURE, 430 Park Avenue, New York 22, N. Y.
Saks Fifth Avenue in San Francisco has an atmosphere all its own. So does every department in the store. Four Carrier Zoning Weathermakers* meet the variations in heat load, keep comfort constant from foyer to fitting rooms.

Edward Malley Company in New Haven, Conn., cools four floors and a basement with 27 self-contained Carrier Weathermakers*. Units are located in storage spaces off the selling floor, require only a small amount of ductwork.

Kline's West, Carrier-equipped department store in St. Louis, has a unique air duct system. Conditioned air comes from "trees"—ceiling-suspended, tree-like lighting troughs centrally located over main floor and mezzanine.

Carrier is the quickest way to the right answer

JUST 1–2 AND THE JOB IS THROUGH!

Carrier has all the ways to air condition any job—and all Carrier equipment is engineered to the same uniform standard. So short-cut hours of selection by (1) using the Carrier line as your shopping guide and then (2) comparing values. Get in touch with your Carrier dealer or distributor. He's listed in the Classified Telephone Directory. Or write to us directly. Carrier Corporation, Syracuse, New York.


2-54. Sanymetal Suspended Ceilings, AIA 39-B-1 (NSP-7), 8-p. bulletin illustrating three different types of suspended-ceiling systems. Details show installation of channels and application of ceiling material; includes data on utility mailing channel for lightweight-ceiling construction. Photos, drawings, specifications. Suspended Ceilings Div., The Sanymetal Products Co., Inc., 1701 Urbana Rd., Cleveland 12, Ohio.

2-55. Teco Products and Services (55), 12-p. brochure containing information on timber connectors, shear plates, and framing anchors. Gives data on how and where to use each product for efficient, economical construction; provides drawings, dimensions, and specifications. Also includes listing of timber-roof truss fabricators. Timber Engineering Co., 1319 18 St., N. W., Washington 6, D. C.

2-56. Systems of Lightweight Construction, AIA 3-D-3 (C-66), 16-p. booklet outlining uses of vermiculite products in lightweight construction. Lists features of vermiculite aggregate; details many different constructions utilizing vermiculite plaster or concrete. Gives U-factors in addition to fire ratings of assemblies; specifications. Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.

doors and windows

3-35. Washington Hardware (332), 24-p. publication on cabinet and rolling-door hardware. Contains drawings, dimensions, and description of cabinet hardware; gives data on tracks, hangars, and guides for rolling doors. Also includes information on special equipment for custom-designed kitchens. Washington Steel Products, Inc., Tacoma 2, Wash.

3-36. Grant Sliding Door Hardware, 58-p. loose-leaf notebook containing information on line of hardware for sliding doors. Includes material on equipment for very-thin plywood, accordion-folding, and heavy-duty doors; describes operation of shear-and-track hardware. Cut-away photos show installation of hardware; technical data, drawings, specifications. Grant Pulley and Hardware Corp., 31-85 Whitestone Pky., flushing 54, N. Y.

3-37. Kawneer Store Fronts, AIA 26-D (55), 20-p. brochure on aluminum sash and moldings designed for store-front installations. Sections and cut-away drawings show 10 different sash styles; details illustrate corner bars, division bars, and show-case doors. Also gives information on interchangeable aluminum moldings; specifications. The Kawneer Co., Niles, Mich.

3-38. Quality Builders Hardware (10), 40-p. booklet showing line of builders' hardware. Covers door pulls, push plates, sliding-door locks, and cabinet pulls; gives drawings as well as description of each piece of hardware. Quality Hardware Mfg. Co., 702 E. Stimson Ave., Los Angeles 21, Calif.


electrical equipment, lighting

4-25. Better Seeing Builds Better Sales, 12-p. bulletin covering general aspects of lighting for food stores. Recommends kind of illumination to be used for special purposes, types of fixtures best for store lighting, and color of lamp to compliment different foods. Also contains data on lighting of store windows, store fronts, and (Continued on page 146)


4-27. G-E Load Center Line (GEC-1309), 12-p. publication on new line of circuit-breaker load centers for residential or light-commercial service-entrance installations. Describes advantages of load center to accommodate increased electrical loads; provides data on ratings, specifications, and wiring diagrams. Trubbull Components Dept., General Electric Co., Plainville, Conn.

4-28. Mercury Street Lighting, (B-6064), 36-p. booklet giving basic information on mercury-vapor lamps for street lighting. Contains data on performance of luminaires; describes operating characteristics of mercury-vapor systems. Also includes discussion on cost comparison with other types of systems. Circuit diagrams, performance tables. Lighting Div., Westinghouse Electric Corp., Edgewater Pk., Cleveland, Ohio.

insulation (thermal)


6-13. Foamglas in Thin-Wall and Sandwich-Panel Construction. AIA 37-B (FB 102), 12-p. booklet outlining advantages of cellular-glass insulation in curtain-wall construction. Photos illustrate several noteworthy projects utilizing porcelain-enamel, aluminum, stainless-steel, and concrete panels; detail drawings show how insulating material was used; job-data list gives properties of particular installation. Also contains physical properties of insulation and typical details. Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.

sanitation, plumbing, water supply

7-11. Flexon Expansion Joints (135), 28-p. catalog describing corrugated-steel expansion joints for installation in steam or hot-water pipe lines. Discusses features of several different types of joints; gives procedure for design of piping system with expansion joints, including examples, formulas, layouts, and selection tables. Drawings. Flexonics Corp., 1315 S. Third Ave., Maywood, Ill.


surfacing materials

We are now operating the first Oxygen Steel Process in the United States. This dramatic new method of refining is producing high quality steel with a low nitrogen content.

The advantages of the Oxygen Steel Process are another reason why McLouth high quality sheet and strip steels will serve you better in the product you make today and the product you plan for tomorrow.
Light-gage steel panels combining the functions of pan forms, acoustical control, and fluorescent lighting troffers can be integrated with reinforced-concrete framing by using Detroit Steel's new TAC (Troffer-Acoustic) system. All panels are 24 in. wide and have been designed for long-span construction. The acoustical panels are perforated and backed-up with a noncombustible sound-absorbing material while the troffer panels provide housing for fluorescent fixtures and plastic diffusers. Reinforcing steel is laid in the panel voids as T-beam sections are formed; depths and widths are comparable with those of rib-slab or metal-pan construction. While concrete is being poured, troffer-acoustical panels require support at mid-span only, thus reducing the cost of material and labor necessary for conventional forming and shoring. Electrification through the cells of the troffers is accomplished by conduit feeders running perpendicular to the span and individual feeder lines going through the panel units. When concrete has cured, only paint, finished flooring, and fluorescent fixtures need be applied to complete the installation. Presently, TAC is being used in 23 schools in the Detroit area. Detroit Steel Products, 2250 East Grand Blvd., Detroit 26, Mich.

aluminum awning sash for window replacement

When P.S.6 of Paterson, New Jersey, was constructed (below), wood sash and wood muntins framing 16 lights per window were originally installed. Eventually, these windows became so deteriorated, probably due to improper maintenance, that many were inoperable and air infiltration caused almost insurmountable heating problems. Architects Lee & Hewitt, commissioned to modernize the windows and to study how they could be replaced in a minimum of time, asked the Asco Window Corp. to work with them on this problem. It was determined that with proper co-ordination the replacement could be accomplished during the Christmas holidays. School closed on December 24 and when it opened on January 10 all classrooms were ready for occupancy. Largely responsible for the savings in erection time was the adaptability of the “B” & “C” aluminum awning sash that was installed (right). Brown & Grist Corp., 25 Tyler Ave., Warwick, Va.
air and temperature control

Dual-Duct Diffuser: temperature and volume are controlled separately in new diffuser for dual-duct high-pressure air-conditioning systems. Hot and cold air enter through separate ducts—fitted with perforated sleeve-type dampers—to sound-conditioned mixing chamber where it is blended for distribution. Thermostat-activated motor moves both dampers simultaneously, opening one as other closes.

Felt-edged piston-type dampers regulate total air delivery, which remains constant once adjustments are made for different static pressures in each duct. Connor Engineering Corp., Danbury, Conn.

Oil-Fired Unit Heater: suspended-type unit heater is designed for permanent heating installations or for temporary use during construction. Self-contained, factory-assembled unit comes equipped with thermostat controls—requiring only vent, electric outlet, and tap to fuel supply. Heater with 140,000 Btu output uses No. 2 grade, low-cost fuel and is claimed to give 80 percent fuel-burning efficiency. Interstate Heater Mfg. Co., 2627 W. Sixth Ave., Denver, Colo.

UniTrane Air Conditioners: new room air-conditioning units are designed for year-round temperature control in multi-room buildings. Development of two-row coil, which provides as much heat-transfer capacity as four-row coil, reduces cabinet depth to 9". Units also feature low-cost installation, quiet operation, and easy-to-change filters. Available in vertical, horizontal, and concealed models; regulated by manual or automatic controls in each room. The Trane Co., La Crosse, Wis.

Fenestra Movable Fire Wall: development of movable interior fire partition for industrial buildings permits rearrangement of space for changing production requirements. Light-gage steel facing panels and 4" noncombustible gypsum-board core are assembled during erection, forming 1½" fire barrier. Wall is given fire rating of 2 hr 35 min; manufactured in section 2' wide, up to 30' long. Building Panel Div., Detroit Steel Products Co., 3209 Griffin St., Detroit 11, Mich.

Expansion Joint: designed to reduce or prevent cracking of exterior stucco and acoustical-plaster ceilings, steel expansion joint also provides work stop usually required in acoustical plastering. Ground of joint, which expands or contracts with movement of plaster, relieves stresses that cause cracking. Joints are made of 26-gage galvanized steel in 10' lengths with V1/2 or V1/4 grounds. Penn Metal Co., Inc., 205-A E. 42 St., New York 17, N. Y.

Plastering Machine: new gun-type machine can be used to apply plaster containing half-sand aggregate as well as vermiculite or perlite aggregates. Base coats, fireproofing, and acoustical ceilings are applied more quickly and economically by machine; fine-textured plaster coats are also possible. Additional feature is that ceilings up to 14' high can be finished without scaffolding. Santa Anita Mfg. Corp., 2828 Newell St., Los Angeles 39, Calif.

A NEW ANSWER TO A PROBLEM AS OLD AS THE SUN...

Modern Vent Solar Shades

Solar shades in embossed aluminum and beautiful fibre glass operate from inside the room. Fingertip control of Modern Vent Louvers from inside of the schoolroom provide an easy method of controlling sun and glare. Modern Vent keeps out harmful sunrays, yet permits diffused light to enter the room.

Modern Vent is a practical, direct approach to your needs, combining sun and storm protection with distinctive design.

SUPERIOR WINDOW CO.
5300 N. W. 37th Ave., Miami, Fla.

doors and windows

Series 4505 Entrance Locks: new line of hardware for commercial or residential entrance doors features 5½" round decorative escutcheon. Massive trim is held snugly against door by threaded bushing with no screws to mar design. Screwless knobs are available in round, tulip, or modern cast style, finished to match escutcheon in brass, bronze, or aluminum.

(Continued on page 152)
The PROOF of a building's age is behind these doors!

Five seconds behind these doors, and you know your building's age!

Notice the plumbing fixtures. If they are off-the-floor...your building is new forever. If not...it is obsolete when the doors first open.

Off-the-floor fixtures installed today will never give away the age of your buildings. Year after year, they will continue to contribute to the desireability—and marketability—of your investment. They add spaciousness. They free washrooms of litter-traps and breeding grounds for bacteria. They do away with obstacles to easy cleaning and hospital-like sanitation.

In today's major buildings, more than 800,000 such fixtures are supported on the ZURN SYSTEM®. You should look into the reasons why. You will find, among other things, that Zurn-engineered, patented features simplify installation and alignment. The entire stress is on the Zurn fitting—not on the wall. And ZURN SYSTEMS never interfere with future alterations, but often make them easier.

Buildings age fast enough. Do not give yours a running start by designing washrooms that are obsolete when the doors first open.

Before planning your next building, be sure to write for the helpful new booklet, "Behind Closed Doors." It is your guide to modern, sanitary washroom decor. 110-1

J.A. ZURN MFG. CO.
PLUMBING DIVISION
ERIE, PA., U.S.A.
REVOLVING DOORS

cut air conditioning costs

The "Always Open — Always Closed" design of revolving doors assures a constant barrier against all but a merest trickle of outside air, even when entrance traffic is heaviest. Swing doors sweep in over 100 times as much hot, dirty, off-the-street air with each in-or-out passage!

Uncontrolled entrance of hot, humid outside air — or escape of cooled inside air — ends with the installation of a revolving door entrance. All area right up to the doors is kept uniformly cool and comfortable. Failure of cooling systems due to overloading is held to an absolute minimum. In fact, systems of less capacity can be specified ... safely and at sizable savings ... by including revolving doors in original building plans. And savings on year-round air conditioning costs average 25% or more, as proved by hundreds of tests in every part of the country! There's a host of cost-cutting facts like this in the new International Entrance-Planning Manual. Use the above coupon now!

INTERNATIONAL REVOLVING DOOR ENTRANCE DIVISION
INTERNATIONAL STEEL COMPANY
2052 Edgar Street, Evansville 7, Indiana

Send me without obligation my personal copy of the new International "Entrance-Planning Manual":

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ZONE STATE

This coupon brings you newest data on planning modern building entrances.

INTERNATIONAL REVOLVING DOOR ENTRANCE
AIR RUSHES THROUGH OPENED SWING DOORS

International Revolving Door Entrance at the Hotel Statler, New York City.

See Sweet's Architectural File or classified section of your Telephone Directory

REVOLVING DOOR ENTRANCE DIVISION
2052 EDGAR ST. • EVANSTON, 7, IND.

(Continued from page 150)

Features of backset lock are key-in-knob five-pin tumbler security, three-piece assembly, and guarded latch bolts. Sargent & Co., New Haven 9, Conn.

Stainless-Steel Locks: both trim and lock mechanism of cylindrical locks are now made entirely of stainless steel to withstand corrosion and abuse of commercial, industrial, and marine installations. Locks, manufactured in heavy-duty styles, are finished in polished or soft-brushed metal. To assure maximum strength, wrought stainless-steel trim has additional cross-reinforcement. Schlage Lock Co., 2201 Bayshore Blvd., San Francisco, Calif.

electrical equipment, lighting

Rapid-Start Ballast: new ballast for rapid-start lamps features 30 percent reduction in size and weight. In addition to savings in initial cost and ease of installation, ballast is claimed to have increased lamp-light output over existing models. Unit measuring 14" x 3-3/16" x 2-9/16" weighs 13 lb. Advance Transformer Co., 2950 N. Western Ave., Chicago 18, Ill.

Ortho-83 Industrial Fixtures: industrial lighting fixture is designed for mounting on channel sections in continuous runs or at spaced intervals. Channels, joined to provide open wiring of any desired length, insure alignment, exact spacing, and fixed power source for each light. Fixtures, offering 30° lateral shielding, with over-all efficiency of 83 percent, are easily moved to meet changing demands. Gibson Mfg. Co., 1919 Piedmont Circle, N. E., Atlanta, Ga.

“Luma-Ceiling”: luminous ceiling is claimed to be economical in installation and maintenance. Translucent vinyl, corrugated for rigidity, is supported by extruded-aluminum channels; entire assembly, light in weight, can be suspended from ceiling or lighting fixtures. Plastic is inserted or removed from bottom and is cleaned by mild detergent. Standard fluorescent-lighting fixtures are used; spun-glass acoustical baffles are optional. Pittsburgh Reflector Co., 410 Oliver Bldg., Pittsburgh 22, Pa.

finishers and protectors

Hot-Spray Vinyl: formulated for economical and efficient corrosion control, vinyl coating protects surfaces exposed to chemical action. Applied over primer coat, film gives five-mil protective thickness; greater depths are possible in uninterrupted multiple-spray application. Prufcoat Laboratories, Inc., 50 E. 42 St., New York 17, N. Y.

Fesco Board: new roof-deck insulation is made of expanded-perlite particles, mineral binders, and fibers. Formed in light-weight, easily cut boards, insulation is also (Continued on page 156)
Here's one subject California and Florida agree on.

**CALIFORNIA’S BEVERLY HILTON**

Newest and finest in the Conrad Hilton group, this ultra-modern structure has three wings emanating from a central service ‘core.’ A rare blend of good taste and striking beauty. Architect: Welton Becket, FAIA, and Associates.

**FLORIDA’S FABULOUS FONTAINEBLEAU**

From its formal gardens and private yacht anchorage to its superbly decorated guest rooms, this amazing Miami Beach resort hotel is a story ‘spectacular’ come to life. Architect: Morris Lapidus.

Superlatives fall flat in describing the fabulous new Fontainebleau and Beverly Hilton hotels. A continent apart, yet these famous hostelries share one thing in common good taste...

*each is equipped with Hall-Mack Bathroom Accessories — throughout!*

When modernizing, re-decorating, or building, specify Hall-Mack to give bathrooms extra sparkle and zest. Clean and simple, these gleaming chrome accessories belong in every bathroom...for solid utility and sheer beauty. Designed to blend with any decor...priced to meet any budget...Hall-Mack’s sparkling bathroom accessories give this much used room a real lift.

**HALL-MACK COMPANY**

Los Angeles 7, California • 1380 West Washington Blvd.
Chicago 41, Illinois • 7405 Exchange Avenue
Clifton, New Jersey • 1000 Main Avenue

July 1955 153
These deluxe windows give you a lifetime finish that never needs painting...plus the strength of steel!

RESULT— the lowest lifetime maintenance costs of any windows on the market!

Fenestra® Galvanized-Bonderized Steel Windows are made of solid bar steel sections, for the strongest possible window construction. Steel is noncombustible, and is the most fire-resistant material for windows... hardware never pulls off... steel offers ideal putty adhesion... no glass breakage resulting from expansion and contraction.

And all these wonderful qualities of steel are permanently preserved by an exclusive double protective coating. Super Hot-Dip Galvanizing alloys a thick zinc coating with the steel. This is done in Fenestra's own special plant—the only one of its kind in the world. Then a process called Bonderizing adds a nonmetallic coating over the zinc. The result is a handsome silvery-looking finish that protects the windows for life, without painting! And the cost of this modern, durable finish is as little as the cost of two inside-outside field coats of paint. Imagine the year-after-year savings in painting costs alone!

For complete information, contact your local Fenestra representative. He's listed in the yellow pages of your phone book. Or write for our free booklet on Fenestra Super Hot-Dip Galvanizing and Bonderizing. Detroit Steel Products Co., Dept. PA-7, 3409 Griffin Street, Detroit 11, Michigan.

For complete information, contact your local Fenestra representative. He's listed in the yellow pages of your phone book. Or write for our free booklet on Fenestra Super Hot-Dip Galvanizing and Bonderizing. Detroit Steel Products Co., Dept. PA-7, 3409 Griffin Street, Detroit 11, Michigan.

For complete information, contact your local Fenestra representative. He's listed in the yellow pages of your phone book. Or write for our free booklet on Fenestra Super Hot-Dip Galvanizing and Bonderizing. Detroit Steel Products Co., Dept. PA-7, 3409 Griffin Street, Detroit 11, Michigan.
In the retail grocery business—or in any business where pennies count—one way to cut maintenance expense is to specify Terrazzo. Traffic can't hurt it, dirt can't get a foothold in its smooth, jointless surface. Upkeep is minimized; sales are stimulated by its inviting surface and traffic-directing patterns. Specify low-annual-cost Terrazzo for floors, wainscots, walls and stairways—wherever long life is required. See our catalog in Sweet's. Use coupon for free AIA kit.

**THE NATIONAL TERRAZZO AND MOSAIC ASSOCIATION, INC.**

SHERATON BUILDING

711 14th St., N.W. Washington 5, D. C.

**Send free AIA Kit to**

Name ____________________________________________

Firm ____________________________________________

Street Address ___________________________________

City ____________________________ Zone ______ State ___

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**p/a products**

(Continued from page 152)

moisture resistant and noncombustible. Thermal conductivity is rated at 0.285; one-in. sheets, measuring 24" x 48", weigh .66 lb per sq ft. F. E. Schundler & Co., Inc., 606 Railroad St., Joliet, Ill.

**sanitation, plumbing, water supply**


Wilbro Garbage-Destruction System: newly developed machine quickly transforms large quantities of garbage into odorless material. Garbage and water are fed by conveyor to digester, where it is reduced to 1/10 original bulk in 10 minutes; indestructible matter (rags, cans, etc.) are screened from digested sludge, which is then dewatered to produce material suitable for compost. Machine is made in small sizes for institutional buildings and in larger models for municipal use. Wilbro Corp., 50 W. Hunter Ave., Maywood, N. J.

**specialized equipment**

Built-In Television: developed for custom installations, television receiver can be located for best lighting conditions, comfortable eye level, and planned seating arrangements. Television unit, with completely automatic adjustment, features remote-control volume and channel selector. Unit may also be used in conjunction with built-in high-fidelity components. Walco Electronic Corp., 3225 Exposition Pl., Los Angeles 18, Calif.

**surfacing materials**

Savannah-Oak Paneling: three-ply wood panels feature special clip system enabling installation without nailing. Grooved, horizontal furring strips are nailed to wall; metal clips lock into furring and into flush V-joints of paneling. Panels are available in 6", 8", 10", or 12" widths, 8' long, with matching moldings. Georgia-Pacific Plywood Co., 270 Park Ave., New York, N. Y.

Porcenell Chalkboard: vitreous-finish chalkboard was developed to produce superior writing surface within budget limitations. New method of applying vitreous finish to 22-gage steel by electrostatic spraying is claimed to make chalkboard lighter in weight, more chip resistant, and less costly than porcelain enamel. Glass-hard surface is easy to write on; nonporous surface does not trap chalk dust; mat finish eliminates glare. Available in unmounted sheets or laminated to hardboard backing; light, medium, or dark green colors. Porcenell Chalkboard Div., Benjamin Electric Mfg. Co., Des Plaines, Ill.

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156 Progressive Architecture
Better Mortar for Blocks

To build the best possible concrete-block walls, the bricklayer must use plastic mortar. The mortar must be plastic enough to stick to the long head joint. It must not drop off the edges of the block when the block is swung up, and lowered into place. It must remain plastic long enough to enable the bricklayer to tap the block down to the line, easily and accurately.

Brixment mortar provides this necessary plasticity. Moreover, it stays soft and plastic long enough to let the bricklayer level, plumb and straighten the unit and adjust it to its final position in the wall before the mortar stiffens.

Louisville Cement Company . . . Louisville 2, Kentucky
Towering Republic National Bank Building in Dallas, Texas, makes spectacular use of Pittsburgh Glass

THIRTY-SIX STORIES HIGH, this new bank building has an aluminum skin and is glazed with windows of Solex® Heat-Absorbing Glass. The eight-story-high rectangular structure, shown here, forms the base of the building and utilizes Solex, Solex-Twindow®, and rough Solex spandrels. Here is another important edifice, among the hundreds throughout the country, which features Pittsburgh products, both outside and inside, for greater architectural unity, beauty, and practicality.

Architects: Harrison & Abramovitz, New York, N. Y.
Associate Architects: Gill & Harrell, Dallas, Texas

THE LOBBY of this skyscraping Texas bank is enclosed with Pittsburgh Polished Plate Glass, equipped with Herculite® Tempered Plate Glass doors. Controlled separation is thus achieved, but with the maximum sharing of light among the various public and work areas.

AMPLE NATURAL DAYLIGHTING is afforded the offices by 3' x 5' Solex window units. Through its solar heat- and glare-reducing properties, Solex contributes to greater comfort and less eye-strain and fatigue among the building's occupants.

Look for our exhibit on the Producers' Council Caravan when it reaches your city.

Design it better with Pittsburgh Glass
ANNOUNCING

WILSON AIR-COR ROOF DECKING

The top piece overlaps \( \frac{3}{4} \)" on the groove side, thus shutting out moisture (and also the asphalt of built-up roofing). The bottom piece has a 45° bevel on each side. This overlaps the wood members by \( \frac{3}{4} \)" to insure a tight joint between sections. Between the wood members—under the top piece—a barrier of \( \frac{3}{4} \)" Balsam Wool, completely encased in vapor-barrier paper, is glued. At each end of each panel two wood blocks—2" x 2" x 8"—provide for satisfactory nailing to rafters or joists. Panels are easily cut to any dimension (or supplied in special lengths, to order).

Sound-deadening partitions and sub-flooring.

For interior, sound-deadening partitions, Wilson Air-cor Panels are supplied in 2', 3', and 4' widths and in heights up to 11' 2". The combination of Homasote and Balsam Wool creates an unusually efficient sound-deadening barrier. For use in partition walls, the Homasote surfaces are applied as panels beveled on both sides—and without overlap. For sound-deadening between floors, use the panels as sub-flooring; nail the finished flooring direct to the wood members of the panels.

Wiring—An additional advantage of the air cores is that electric wiring—whether conduit or cable type—may be passed across the roof, thus wiring the building from above. This is not only the most economical method, but permits the placing of light fixtures where desired. Our Engineering Service is available to work with you on any specific problems of roof decking, partitions or sub-flooring. Let us give you complete details and specifications. Kindly address your inquiry to Department G-7.

HOMASOTE COMPANY
TRENTON 5, NEW JERSEY

out of school

by Carl Feiss

"Wisdom lies in masterful administration of the unforeseen"

Robert Bridges

I see by the paper (The Evening Star, Washington, June 1, 1955) that Robert E. Ferry, General Manager of the Institute of Boiler and Radiator Manufacturers, says that a year-round heating-cooling system, powered by a nuclear reactor about twice the size of an automobile battery will be a "practical reality, possibly within a few years." He contends that an "A-boiler" system would be safe, explosion-proof, and cost only $300 for a 6-year charge. This is for a $1000 conversion job. A completely new integrated installation of a boiler and a baby reactor would cost $1500. Cheap at the price and safe from fall-out and chain reaction.

Unfortunately my old oil-heater has just given out and there are no baby reactors on the Washington market as yet. So I pay through the nose for the present technological lag. And this reminds me that I did not quite finish my commencement address last month! There are still some hard-bitten thoughts to get off my chest. Some of them are repeat items, for emphasis, but mostly they have to do with what every young man and every old man should be thinking about these days when faced with technological speed-ups.

Perhaps what worries me the most is the spiritual lag. The social impact of death on the highway! Slums! Juvenile delinquency! Low salaries for teachers and preachers! Drab and chaotic cities! Cheap architecture! Cheap and superficial homes for middle-class America, which should be classless! Baloney campaigns to clean up and fix up what should be torn down to make way for great buildings.

I look at the horrible FHA packing-box world we are creating around our old, dirty, and decayed cities and then wonder if we have the common sense, the ability, and the humanity to treat our swiftly approaching powers with the respect and the wisdom they deserve. Do we know

(Continued on page 164)
We invite you to look at these

Bayley FACTS

Your assurance of the complete service and greater value you want from the windows you specify or buy

Policy of Responsibility

Bayley recognizes that the architect and builder as well as the supplier stake their reputations on the quality and performance of every product specified or used. Through 76 years of progressive experience, Bayley has won full customer confidence through consistently superior window design, construction, and service, backed by the security of time-tested financial soundness.

Engineering Know-How

Bayley's large staff of highly qualified design engineers — many of them lifetime specialists — offer assistance that extends beyond the construction of windows alone. They have the pre-engineering know-how that integrates window design with building design, for maximum advantages in achieving the utmost in better light, air, vision, beauty and durability.

Background and Experience

Bayley's specialization and leadership in the design and manufacture of windows includes 30 years of pioneering experience in development and perfection of curtain wall systems — giving Bayley a strong lead in meeting today's design trends. A list of the country's outstanding industrial, commercial, public and multiple-residence buildings featuring Bayley Windows is also a list of fully satisfied Bayley customers.

Nationwide Organization

The skill and experience of Bayley's design engineers and service experts is always at "beck and call", through a nationwide organization of well-staffed company offices, supported by trained, franchised agents. The scope of service extends from consultation at the building's inception to actual window performance at the time of occupancy.

Manufacturing Facilities

You can be sure that every Bayley Window is Bayley-made; produced in Bayley plants by Bayley's own careful craftsmen and production technicians, whose long-accumulated skills in the art of making top-quality windows are supplemented by the finest and most modern manufacturing facilities available.

Design Leadership

Bayley has an outstanding record for anticipating new needs in window design, construction and operation . . . and for meeting new and changing requirements with improved windows that assure better combinations of light, air, vision, beauty and strength. And Bayley has tempered this pioneering of new trends by insistence on persevering in quality construction. Many Bayley "firsts" in window features have become standard for the industry.

NO WONDER IT'S SO OFTEN SAID THAT —

where the other services also count — it's always

BAYLEY WINDOWS

THE WILLIAM BAYLEY COMPANY Springfield, Ohio

District Sales Offices: Springfield New York 17
Chicago 2 Washington 16

July 1955 161
now... better than ever

NEW...
stronger, heavier galvanized nose

NEW...
extra reinforcing wires

NEW...
KEYZBEAD—with solid zinc nose, also available.
Ask for it by name—KEYZBEAD!
Beats problems of outside exposure and corrosive atmospheric conditions inside.

1. Keybead is easy to cut and splice with Wiss M-3 or similar snips.
2. Keybead is easy to apply...so easy on the hands, too.

KEYSTONE STEEL & WIRE COMPANY
Peoria 7, Illinois

Keymesh • Keybead • Keycorner • Keystone Nails
Keystone Tie Wire • Non-Climbable and Ornamental Fence
Figure it any way you want—new Keybead is by far your best value in corner bead.

New Keybead nose is 23-gauge steel. No other standard corner bead provides such protection against shock. The reinforcing mesh flanges are tough and strong, make new Keybead very rigid, easy to true up.

New Keybead is straight end to end—no waste. And the nose is double electro-galvanized against rust, including all edges.

With Keybead you get a *solid corner!* A corner completely filled with plaster. The plaster flows through the open mesh flanges easily, completely embeds every wire . . . does not break the bond of plaster with the gypsum lath. Corner has reinforcement of heavy gauge steel wires running in every direction.

**KEYBEAD IS FAR LOWER IN COST THAN ANY OTHER BEAD OF EQUAL WEIGHT!**

Only Keybead is available in your choice of Galvanized or solid zinc nose. Use zinc outside, even in salty atmosphere. Use it inside where corrosion is a problem. For zinc nose—ask for "KEYZBEAD."

You do get more for your money with new Keybead. Ask for it by name!

**better yet... use all 3 keys to stronger plaster**

1. **Keymesh** woven wire galvanized reinforcing lath—applied over the gypsum or insulating lath on the entire ceiling; for highest quality, over all walls, too. This network of multidirectional reinforcing increases strength; increases fire safety 50%. Keymesh assures a uniform thickness of plaster, and guards against cracks.

2. **Keybead** woven wire galvanized reinforcing lath with the precision-formed bead—applied at all outside corners—or zinc nose for outside applications. Open mesh of Keybead wings permits plaster to completely embed steel wires. Full, solid corners result. Available in standard lengths; easy to splice.

3. **Keycorner** preformed-for-corners, convenient width, woven wire galvanized reinforcing lath—applied at corners, joints and ceiling-wall junctures. Fits snugly in corners when you flex it. Lies flat, too, for stripping wherever required. Some multidirectional reinforcing as Keymesh for maximum crack resistance.
everyone talks about the weather

...But Arcadia solved the weather problem with Twin-Seal Wool Pile Weatherstripping—another important point of difference between Arcadia and other sliding glass doors.

Twin-Seal Weatherstripping on Arcadia's new custom aluminum door is shown below in a section at the latching jamb. A positive weatherseal between jamb and sliding panel is made by a double row of opposing wool pile weatherstrips. Wind, rain, cold and dirt are locked out tightly. Identical wool pile strips at head and interlocker, and a spring-loaded wool pile sill strip complete the four-side weatherseal. Arcadia's aluminum-backed weatherstripping, fully silicoated for moisture and abrasion resistance, is easily replaced without dismantling the sliding panel.

Twin-Seal Weatherstripping is just one Arcadia point of difference you should know about. Other important Arcadia features are detailed in our expanded 1955 Catalog 55-A. For a copy, phone your Arcadia distributor or wire us collect.

out of school

(Continued from page 160)

enough to be able to stop building more and more chaos and larger and more savage cities, having infinite energy and free flight at our finger tips but only greed and ambition in our heads and hearts? Are we to be wilful children, climbing into the seat of a powerful car, releasing all controls, flinging into the darkest night, and daring the inevitable?

Yet, as educated men, do we want to arrest the progress of science until man is wise enough to know how to avoid burning his fingers or blowing off his head with it? Our brains have not advanced beyond those of the Fifth Century Greeks, although our science has. We would therefore have to put science into the deep freeze for a long time if we wanted our minds to catch up with science. Perhaps we should go to the "wise" men who invented nuclear fission in the first place and ask them what they had intended mankind to do with it.

Architecture and planning, like this game our "wise" scientists have played with humanity, can be equally dangerous toys. The Pelions piled on Ossa in mid-town Manhattan, or the somber cliffs for homing pigeons we call residences, or the mile after mile of suburban septic tanks we call houses, may all be equally destructive to society—as fearful to consider in their effect on the genetics and soul of man as radioactive fall out from recent purely "scientific" tests in the Pacific and Nevada. That fall out, at least if caught quickly enough, I am told can be washed off with detergents, if you are still alive and your water and detergents are uncontaminated. But there is no detergent which can cleanse a man of the dull, stupid, crowded and worried world he builds for himself. Think about the world we should be building, because the chance is here.

If Lewis Mumford were to rewrite Technics and Civilization, (1934), he would undoubtedly question his thoughts of 20 years ago. I quote him below (not to point a finger but to indicate that even our most intelligent humanists have inadequate means of anticipating our purely scientific wise men). For those scientists
POWERS No. 11
Self-Operating
Temperature Regulator
Automatically holds temperature constant at the right point. Prevents losses caused by wasteful OVER-heating.

Why It Gives
BETTER CONTROL
and Saves More Money

Users Report 10 to 20 Years Service without repairs

Users Report 10 to 20 Years Service without repairs

Simplest, Reliable Control for WATER HEATERS, Heat Exchangers, Fuel Oil Heaters
They Stop Hot Water Complaints

ONLY POWERS No. 11 REGULATOR
Offers ALL These Advantages

• Simple, sturdy construction. Materials used are corrosion resistant.

• Powers bellows has 50% more power than used in the majority of regulators. The heart of a self operating regulator is its bellows. Powers with its 50% greater effective area gives better control and its durable 2 ply bellows outlasts ordinary single ply bellows.

• Oilitre thrust bearing facilitates easy temperature adjustment.

• Extra-heavy-wall capillary needs no armored tubing.

• 60°F temperature ranges available with accuracy of ±1°F, on some processes and 2 to 3°F, on others.

No. 11 TEMPERATURE INDICATING REGULATOR
with easy to read 4" dial thermometer helps adjust the regulator and check temperature at the bulb. Various dials and ranges are available.

• Valve stem lubricator with silicone grease aids easy movement of highly polished stainless steel valve stem and reduces drying out of packing.

• BETTER CONTROL results from Powers powerful bellows and minimum of valve stem friction.

• POWERS Nationwide Service is available in chief cities. Stock points in strategic centers aid fast delivery.

• Right type and size of valve is important for good control. May we help you make the right selection? Benefit from POWERS more than 60 years experience in self-operating regulators.

Call our nearest office or write us direct.

POWERS REGULATOR CO.
Skokie, Ill. | Offices in Chief Cities in U.S.A.
Canada and Mexico | See your phone book
Automatic Temperature and Humidity Control
Established 1891
Miami Beach’s new $15,000,000 Fontainebleau Hotel depends on Chase Copper Tube and Fittings for entire plumbing and air conditioning systems!

Luxury and practical utility are perfectly combined at the Fontainebleau! Everything is top quality—so Chase Copper Tube and Fittings were chosen for the plumbing and air conditioning systems!

Using Chase Copper Tube and Fittings pays off in top-performing, longer-lasting systems that add extra value to any home or building. Such systems, too, cost little or no more than ones of ordinary rustable materials! That’s because Chase copper tube and fittings can be installed faster—substantially reducing installation costs! Specify Chase copper tube and fittings on your next job!

Here’s how the mechanical contractors sum up their reasons for using Chase materials:

"We have been using Chase Brass and Copper for many years. Chase has always maintained the highest quality in their industry. Their quality along with their excellent service to customers is a combination that makes Chase superior."

—MARKOWITZ BROS., INC., MIAMI, FLA.
IT'S 100% CHASE COPPER TUBE!

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MECHANICAL ENGINEERS:
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How many points in a SUPER-DIAMOND?

You'll find 40 non-slip traction points, angle-engineered to safety, in every footstep of A.W. SUPER-DIAMOND, the lifetime-lasting rolled-steel floor plate.

Count the other points which make for combined economy and safety in this master flooring for entire floors or small areas—low cost, overnight installation, durability, easy cleaning, fast draining, resistance to fire, heat and most chemicals—and you'll find that every foot in your plant is safer when you install the exclusive-patterned

SUPER-DIAMOND
ROLLED STEEL FLOOR PLATE

"The diamond in the rough... a gem of a flooring."

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Please send A.W. SUPER-DIAMOND Booklet SD-33

Name
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Other products: A.W. ALGRIP Abrasive Rolled Steel Floor Plate—Plates—Sheets—Strip—(Alloy and Special Grades)

For plants where oil, water and grease raise special problems of slipping accidents, we suggest a check on the special qualities of A.W. ALGRIP... the world's only abrasive rolled steel flooring.

out of school

(Continued from page 164)

who believe in the perfection of "pure" science do not ask our all too few Mumford's what the results of their test-tube pure science may be on the people who may be afflicted with, or perhaps could enjoy the results of, the experiments. Mumford said in 1934: "In our techics, countless improvements of course remain to be made, and there are doubtless numerous fresh fields still to be opened; but even in the realm of pure mechanical achievement we are already within sight of natural limits, not imposed by human timidity or lack of resources or immature techics, but by the very nature of the elements with which we work. The period of exploration and unsystematic, sporadic advance, which seemed to the 19th Century to embody the essential characteristics of the new economy, is rapidly coming to an end. We are now faced with the period of consolidation and systematic assimilation."

This is not the end and we have no time for consolidation, but there is much to assimilate. Wishing will not build better cities with the powers now in our hands, since 1934. Using our older powers, we still are not doing too well. We are still unable to cope with the pedestrian, let alone the automobile and airplane. We have trouble in designing a good place to live in and then keeping it good. And we are lost in our complexities of living and work.

There is an interesting controversy raging which is perhaps the best illustration of what I am talking about. At Echo Park in Dinosaur National Monument, the confluence of the Yampa and the Green Rivers, near the spot where Colorado, Utah, and Wyoming meet, the Bureau of Reclamation wants to build a great dam for water power purposes. But conservation and recreation interests raise the cry that the great and beautiful canyons must never be violated by utilitarianism. There seems to be no valid compromise. By the time this article appears in print, a decision may have been made. Either way it will not have satisfied a problem—utility versus beauty, science versus humanism. Yet in this case, science is intended spe-
Montag's New Paper Plant Keeps Bright and Comfortable Under 24,000 Sq. Ft. of Coolite

Montag, maker of fine stationery and school supplies for 65 years, recently occupied its new plant. The Montag building covers 280,000 square feet and was designed to be the most modern stationery and school supply plant in the world. Conceived as an ideal plant for people and machines, it provides finest lighting, heating, humidity conditions and employee working and recreational facilities.

To achieve these aims, it is copiously daylighted with over 24,000 square feet of Coolite Glass by Mississippi. Coolite not only provides high levels of comfortable illumination, diffusing harsh sunlight for visual comfort... it absorbs much of the unwanted and uncomfortable solar heat rays, helps keep the vast interior cooler on brightest days.

Employees feel better, see better, work better under Coolite... for Coolite filters out unwanted harsh qualities of "raw sunlight"... permits extensive use of glass for low cost daylighting without undue heat.

In new construction or modernization, specify translucent light diffusing glass by Mississippi. Manufactured in a wide variety of patterns and surface finishes to help you solve any daylighting problem. See your nearby distributor of quality glass.

MISSISSIPPI Glass COMPANY

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

Write today for free literature.
Address Dept. 8.
SLIDING DOUBLE WELDWOOD CHALKBOARD installed in the physics laboratory, University of Pennsylvania, moves on tracks, is electrically operated.

AT EXAM TIME quizzes are prepared on lower chalkboard and covered until needed. Another example of the versatility of Weldwood Chalkboard! Arch: James R. Edmunds, Jr. Installed by: A. M. Masters & Son.

How Weldwood helps you answer the challenge

BEAUTIFUL Weldwood birch paneling and built-in storage wall keys decorating at Hillandale Elementary School, Montgomery County, Md. Arch: McLeod and Fer
of school design

School boards and building committees are looking for new ways to combine beauty and function, new ideas on saving space and lowering maintenance costs. And Weldwood school products can help...

Take Weldwood Chalkboard for example. It's a combination chalkboard, bulletin board and visual aid board. Its porcelain-on-steel* face attracts magnets for posting papers and visual aids, its glare-free green color is easy on young eyes, and chalk never "squeaks" on its velvety surface.

Weldwood Chalkboard never needs refinishing. It's composed of a porcelain-faced steel sheet bonded to strong, rigid plywood backed by a sheet of aluminum for balanced construction. It won't shatter, buckle, warp or break under impact, stress or temperature changes. Beautiful Weldwood hardwoods for paneling and built-ins are another example. Real wood adds a warm and cheery note to classrooms, gyms, lounges and corridors. And it practically eliminates periodic redecoration since Weldwood needs only an occasional waxing to keep it looking new indefinitely.

You choose from world's fine woods like walnut; oak; birch; African, Philippine, and Honduras mahogany; cherry; Korina®; maple; and American elm. Exotic species such as Brazilian rosewood, teak, satinwood and zebrawood are also available on special order.

And Weldwood Fire Doors provide the utmost in fire protection. They come in Weldwood veneers to match paneling and are made with the exclusive Weldrok® mineral core patented† by Weldwood.

Guaranteed for life. All of these superior Weldwood products for schools are guaranteed for the life of the building in which they are installed.

For more details on Weldwood Chalkboard, paneling and doors send the coupon or visit any of the 87 United States Plywood Corporation showrooms in principal cities.

*Porcelain faces by The Nettinger Corp.

UNITED STATES PLYWOOD CORPORATION

125 West 44th St., New York 36, N. Y.

Please send me data sheets and installation details on Weldwood Chalkboard ( ) Weldwood Hardwood Plywoods ( ) and Weldwood Doors ( ).

NAME
COMPANY
ADDRESS
CITY STATE

PA-75

WELDWOOD FIRE DOORS are available in flush style or with light cutouts. Lake Hiawatha School, Troy Hills, N. Y. Arch: Emil A. Schmidlin.

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(Continued from page 168)

out of school

In school specifically to assist human interests—not too separate from monetary, but for human needs at least—water and power.

When our buildings and our cities are heated and lighted by nuclear power, when our garbage and refuse are disintegrated by nuclear power, when our steel is made from heat generated not by coke but nuclear fission, when our coal mines are shut down, our gasoline refineries closed, our water power plants outmoded, then the arts of peace should have time to flourish. Echo Park will return to the wilderness it should remain, and we will all have time to dig in our garden. But....

If the game the scientists have been playing with atoms is won by them, and it is clearly proved by full scale experiment that nuclear chain reaction can circumnavigate the globe in one hour or less and without the use of hands, then of course you and I will be relieved of any responsibility for making limitless energy into a useful tool for mankind. Pure science will have succeeded in proving its final point. No such fine point can be determined within the impure science of humanism. But I don't like a psychology that says, "Until Armageddon let's do our best to make our last days pleasant and reasonably joyous!"

It is silly to wait around for someone to make the next move in this unprecedented situation. The arts of peace have never before been in such complete terrestrial opposition to the arts of war, with all of life at stake between them.

How do we find answers? There is one move that ought to be taken very soon. A group of young architects might be able to do it better than some of us old timers. It means working quickly to become architects and planners—active, recognized professionals with status in the professional organizations—peers in our profession on the same high plane as the nuclear physicist on his. Then, probably only then, can you go to him and say (and I would call a big conference at the White House to do this):

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A centralized motor control system was a basic objective in this new water purification plant. Over 100 motors are required.

The solution: Westinghouse control centers that group motor starting and protective devices in neat, compact enclosures. Moreover, complete flexibility of Westinghouse control centers assures easy, economical expansion—a major consideration here. Eventually, installed horsepower may more than double.

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Main support joists in this new classroom created a lighting problem: the possibility of shadows due to the broken ceiling surface.

The architect and consulting engineer approved the new Westinghouse LC luminaire, mounted in continuous rows perpendicular to the ceiling joists.

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*Photo courtesy of STAINLESS FOOD EQUIPMENT CO.

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Washington, Pennsylvania

out of school

(Continued from page 174)

ten away with it. We happen to be scientists who could, if we wanted to, also experiment with pure science. We could build so permanently that after your last bomb blast and all life is extinct, our cities would remain intact as proof that our skill is at least as great as yours. But how about adding to our formulas the now missing element of human well-being? Not just medical isotopes and isotopes used as tracers in household cleansers: we want to join forces to build a better world. We sincerely believe that this new element added to the core of the atomic pile will result in a greater civilization than we have ever dreamed of.

If this element cannot be added, then gentlemen, the world is yours—and let her rip!"

What has this to do with education?

I am not sure. Design is a curious element in the world of the spirit. Like poetry and music, its impact is emotional. It is rational only in the way that emotion may be identified scientifically by the few known measurements.

The man who designs a city, a hospital, a school, or housing project, who studies his problem not as a "machine for living" but as a living organism—feeling man's problems in terms other than book understandings; working toward those indefinable solutions, translatable into fire only by love and experience—that is the man who can transmute technology into destiny and convert a cheap FHA subdivision into a Parthenon. There are many things that you will build which I will never see. For good or evil they will stand for generations to use to their pleasure and satisfaction, or to their misery and possible destruction.

There are no searchlights other than your own conscience to tell you whether you are rescuing your fellow man from the shallow cities in which he drowns. The silent crowd stands helpless, futile, and deeply accusing.

notice

MIT will present a two-week Special Summer Program on "Noise Reduction" August 15-26. Dr. Leo L. Beranek will
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To put before the consumer the story of good interior design as conceived and executed by architects, few writers are better suited by their backgrounds than Thomas H. Creighton, P/A Editor, and Katherine Morrow Ford, who has been concerned with housing since 1930, has been associated with Knoll Associates and with House & Garden. These two architectural journalists have viewed at first hand the world's finest contemporary interiors, and across their desks has surely flowed the full stream of architectural interior design.

In selecting 175 examples of residential interiors, the authors have done a splendid job of winnowing, choosing to illustrate those interiors that express the most valid of contemporary design thinking. But it is not for this alone that they are to be congratulated. Truly noteworthy is their organization and presentation of their material in such a way as to be not only stimulating but also useful to the reader. Far too much material put before the consumer, intended to be "advisory" or "helpful," succeeds only in creating frustrated awe or an attitude of "a cat may look at a queen but what kitten can afford a golden throne." The Ford-Creighton book, on the contrary, while exposing to the reader the handsomest and most inviting work, accompanies its illustrations with text of such clarity, and with such well-made points, that it simultaneously administers a practical course of education.

Without patronizing the reader, the authors explain in detail the "whys" of the interiors illustrated, so that none who studies this book can fail to come away with a wider understanding of what makes a good contemporary interior, together with a background method for applying this understanding to his individual needs and uses.

Diversified as are the room plans, the
materials, and the design thinking (providing the reader with a panoramic picture of the scope of today's architectural design developments), the reader can only assume a starving lack of available choice when it comes to furniture. It would not be fair to criticize the authors for this apparent paucity of good furniture. It is the architects themselves, though they are constantly introducing creative concepts to interiors as a whole, who resort to the monotonous repetition of the few chairs and tables that have become the clichés of the modern house. Perhaps it behooves the architect to stir himself a bit and examine some of the excellent newcomers to the furniture field, even though it is so much easier to fall back on the old reliables! In a volume that brings together so many contemporary interiors, this almost institutional standardization of furniture shows up as a glaring weakness in the architects' otherwise inventive approaches to interior design.

An unmistakable service to architects is a subtle by-product of the book, for by educating the reader to the architectural facts of life, the authors lay the groundwork for an easing in the designer-client relations. Since the informed client is the client who needs just that much less persuading, we would suggest giving this book to any stubborn client who might see things more your way if his own architectural horizons were somewhat broadened.

In a trenchant introduction, the authors outline and detail six basic criteria for the design of residential interiors today, which, even to the professional, might serve as a reminder of a desirable goal.

"If the interiors in your house (1) suit you and your needs, (2) are consistent and harmonious, (3) are related to the space you have to work with, (4) have character and integrity, (5) have the basic, timeless elements of good design, and (6) relate to one another—you don't need to worry about 'style.' You'll have a good contemporary design."

Chapters are devoted to Space Relationships, Halls and Stairways, Living

(Continued on page 188)
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review

(Continued from page 185)

Rooms, Dining Spaces, Kitchens, Baths and Dressing Rooms, Bedrooms, Children's Rooms, Special Activities, Outdoor Living Spaces, Details. Each chapter illustrates examples of its subject with large clear photographs, plans, excellently detailed captions, and explanatory text.

Useful to the architect is a listing of the photographers whose work is shown, complete with addresses. An index of the architects and designers whose work is represented does its full share to emphasize to the consumer the names of these creative professionals, thus doing a fine job of public relations for the profession. Although intended primarily as a valuable guide to the literate consumer, Designs for Living deserves space in every architect's reference library as a comprehensive gallery of the best in contemporary, interior, residential design.

LOUISE SLOANE

conference summary

The Artist in Modern Society. UNESCO. Columbia University Press, 2960 Broadway, New York 27, N. Y., 1954. 128 pp., $1

This little book contains the General Statements and Final Reports prepared for The International Conference of Artists, held in Venice in 1952 at the invitation of UNESCO. The General Statements, largely devoted to the practical problems of the artist, were written by distinguished representatives of the Arts and include “The Architect and Contemporary Society” by Lucio Costa, “The Sculptor and Modern Society” by Henry Moore, and “The Painter's Rights in His Work” by Georges Rouault.

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2. In Creative Perspective, you go on to learn the original ways our best illustrators and painters deliberately violate conventional perspective methods to achieve originality, clarity or better design. It will amaze and enlighten you to see just how the art experts shun text book "rules" in their drawing; how they solve problems that call for imaginative "bending" of the rules; how these distortions of conventional perspective will serve as a point of departure to help you create better art through a clear understanding of modern perspective techniques.

How to Use Creative Perspective is the culmination of Ernest Watson's long-time dream to fill the need for a modern approach to the subject. He painstakingly gathered the work of top artists and skillfully organized the text to create a "must" book for students, practicing artists and architects. The design and presentation of the text and the many beautiful illustrations used as case histories truly provide an entirely new and fresh approach to the creation of appealing architectural renderings. This is one book you won't want to miss.

A fresh approach to architectural rendering! See the resourceful ways many famous contemporary artists use and violate perspective. You'll learn to apply the techniques to your own work.
I wonder how many of you have ever truly appreciated the handsome drawings with which P/A is able to grace its pages, thanks to the unique ability of Elmer A. Bennett. I have just been O.K.ing the page proofs of this issue, and I stopped, as I do every month, to admire Ben's remarkable work. Not only is it beautiful graphic presentation—whether he uses a straight edge or works free-hand, whether it is the controlled variation of a crow-quill, the sweep of a brush stroke, or the considered regularity of a ruling pen—it is *creative* drafting, in the best sense.

I wish some of you could see the material from which Bennett's selected detail drawings are sometimes made! From an often sketchy, incomplete architect's detail and a photograph (sometimes, I'm afraid, from very full details which do not agree with the results documented by the photograph) he selects, arranges, edits, decides on perspective, isometric, or straight orthographic representation, and then draws. Aside from the preliminary editing, I know of few draftsmen today who can do that final drafting part as well as Elmer Bennett.

In Texas recently I was talking to a group of architects about the quality of present-day drafting. From time to time I hear complaints of the inability of many recent graduates of good schools to draw well; and I am often surprised myself at the spotty level of competence in this elementary graphic tool among active practicing architects. I say spotty because I know some beautiful draftsmen, and I know some top-flight architects who just plain can't draw.

I have been inclined, up to now, to discount the criticism of drafting ability among those fresh from school. It has seemed to me, as I visit schools and see work done in some of the courses on graphics, that the instruction is better and the results at least as impressive as they used to be in "the good old days" that many of the critics look back to so fondly. But I'm frankly not sure any more. Recently several of the very best "progressive" architects have made this complaint. In fact, two people whose work I admire tremendously have made the same rather startling comment to me: that for the business of producing in the office crisp, clear, intelligible working drawings and details, they prefer to hire men trained in technical drafting schools rather than graduates of accredited architectural schools. They grant that these good but limited draftsmen will in most cases always remain draftsmen, while the B. Arch's and the M. Arch's will become the practicing architects of the future, even picking up drafting ability along the way. But, they ask, why in the world shouldn't drafting—that basic architectural method of expression, representation, explanation and documentation—be an elementary thing the architectural student learns, *along with* the other elements of the curriculum?

I agree with these people that drafting is that basic and that important. The ability of an architect to think with his pencil, to create with his pencil, and to explain with his pencil is such a characteristic of the species that it is ridiculous for the technical handling of that pencil to be crude. The lines it makes should be as expressive, as beautiful and as informative as possible.

As to whether that facility is less today than it was in preceding generations I'm not prepared to say. I would appreciate comments on the subject from those of you who are running drafting rooms. I will say this, as factual testimony: we receive in our editorial offices many more poorly drawn sets of drawings—both preliminaries and working drawings—than we do truly well-drawn ones. If anyone who has sent us material recently resents that testimony, he can assume, in the first place, that his are among the minority of good-drafting examples; and in the second place he is welcome to visit us and see for himself the average poor quality of graphic documents.

Once in a while I hear a schoolman say, in effect, "We are interested in training draftsmen; we are teaching deeper professional skills and abilities." While I admire the second part of this attitude, the first, I think, is nonsense. Not only is drafting the basic tool of the architect—draftsmanship is the beginning of the architect's career. To which my school man replies, "Yes, but this is something the apprentice learns after he leaves school." This also I think is nonsense. I feel that these teachers (and there must be a number of them, because the Report of the Commission for the Survey of Education and Registration speaks of "the definite decay in draftsmanship that plagues most schools today") confuse drafting as a trade with drafting as a creative process in the development of architecture.

If it is true that interest in drafting has "decayed" and ability in draftsmanship has deteriorated, this may explain the slowness of the architectural profession to *modernize* drafting methods. Perhaps too many of us look on graphic ability as something old-fashioned. We may be thinking of the beautiful ink tracings on cloth (neither presentation drawings nor working drawings, but a great satisfaction to the architectural office) where each egg and each dart in a reflected ceiling plan was drawn in beautiful detail. (I remember one ambidextrous draftsman in Schultz & Weaver's office whom we all admired because he could draw a full-size detail of a cartouche, both sides at once, with a pencil in each hand.)

But there is a whole new area of drafting ability almost unexplored. That is the fitting of graphic representation to contemporary building methods and the materials in use today. Modular co-ordination and the resultant method of dimensioning is one aspect of this new, unplowed field—but only one. Even that has been misunderstood, tried too briefly, or shrugged away by most architects' offices. Further than that is the business of simplification of graphic indication, co-ordination of drawings and other contract instruments, and elimination of redundancies. Many large industrial drafting rooms have studied this subject, and there is some literature available, but very few attempts have been made to apply principles of simplified drafting to architectural needs.

I refer the student of the subject to two sources: a pair of articles by Guy Rothenstein, which we published in February and March 1950 P/A; and a mimeographed brochure, *Simplified Drafting and the Architect*, published by the School of Design, North Carolina State College, as the result of a Conference on the subject held by the School and the North Carolina AIA Chapter in January, 1954. Jimmy Fitzgibbon ran the meeting, and prepared the report.

However, this new approach to drafting which is possible does not eliminate the need to draw well. And to come back to Elmer Bennett, and the tremendous lift I received in his drawings issue from an architect's or engineer's office as working documents? I haven't, and the fact that I haven't re-inforces my belief that we are losing an art which should be most important to us.
Design fundamentals of the

ALL-AIR HIGH VELOCITY
distribution system

By F. J. Kurth  
Vice President of Engineering
Anemostat Corporation of America

A national survey reveals that today, more than ever, engineers are studying, learning and using high velocity-high temperature differential air distribution. Here is a brief discussion of the advantages of the all-air high velocity system over conventional and mixed cycle (air and water) systems.

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