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ARCHITECTURAL RECORD

FEBRUARY 1968 **2** A McGRAW-HILL PUBLICATION TWO DOLLARS PER COPY

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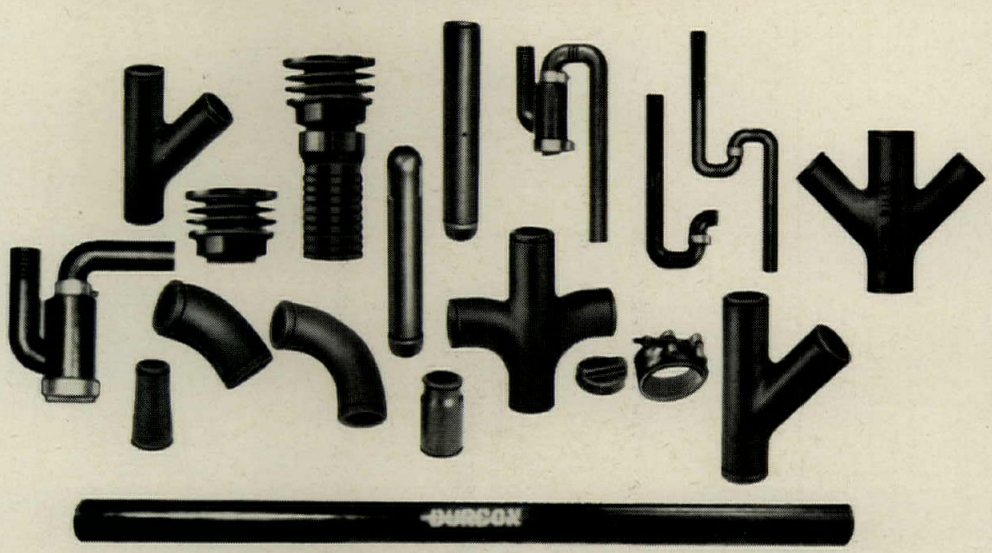

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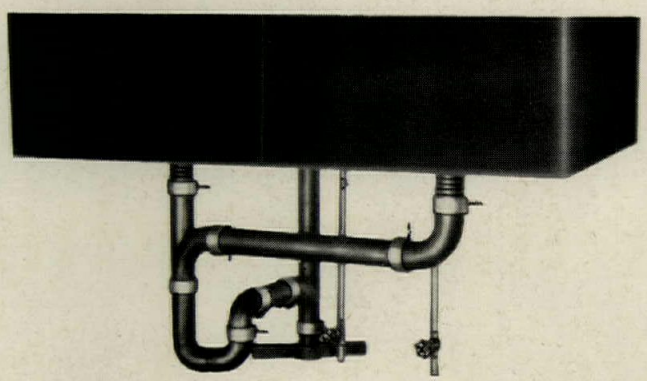

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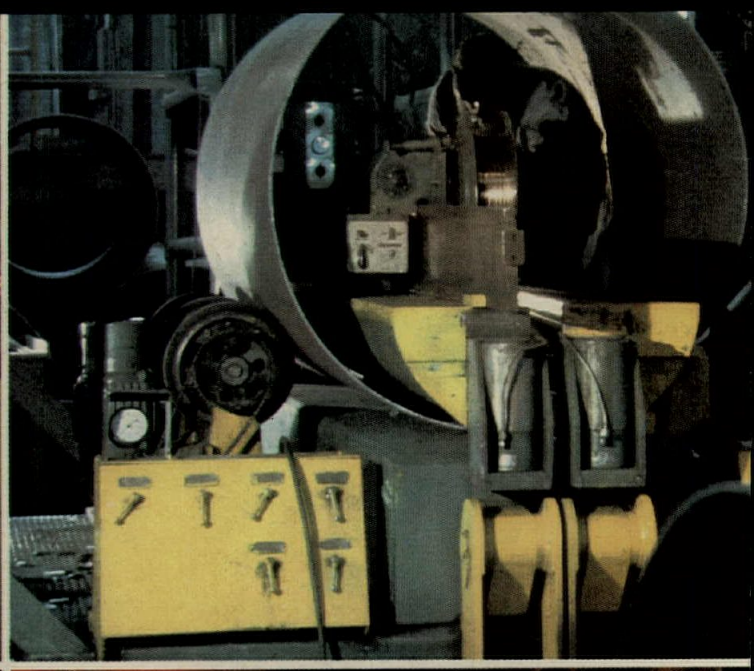

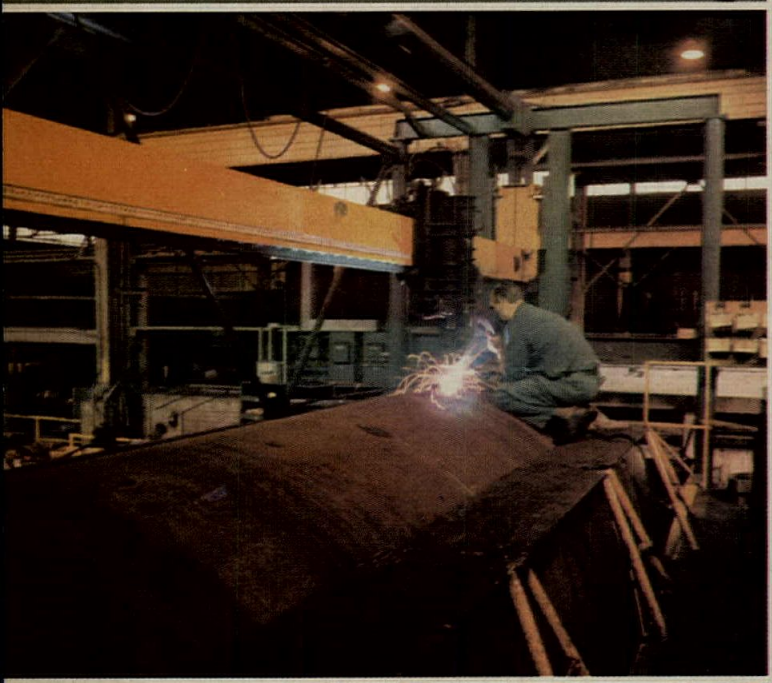

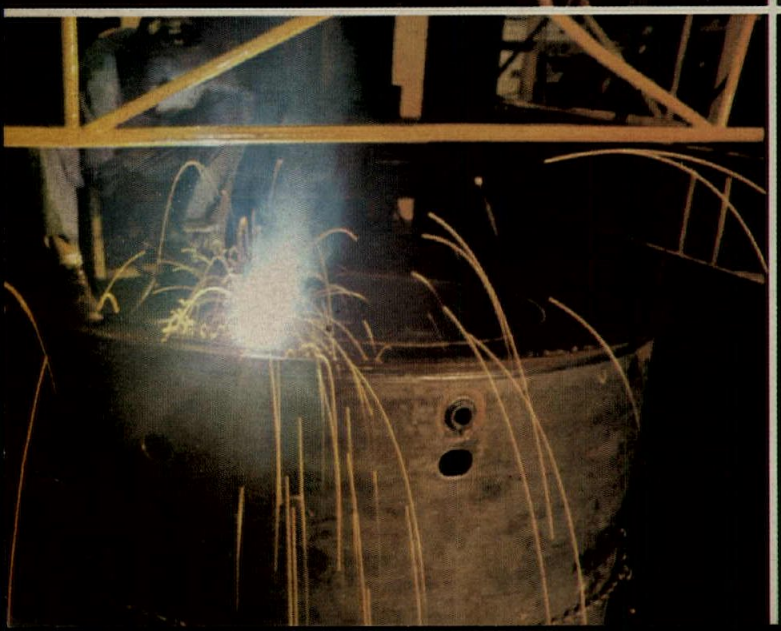

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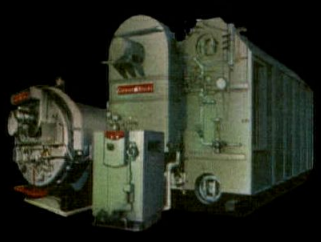

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David Hirsch

BUILDING TYPES STUDY 380

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ARCHITECTURAL RECORD, February 1968, Vol. 143, No. 2. Published monthly, except May, when se monthly, by McGraw-Hill, Inc., 330 West 42nd Street, New York, New York 10036. CORPORATE OFFICI Donald C. McGraw, Chairman of the Board; Shelton Fisher, President; John J. Cooke, Vice President and Se tary; John L. McGraw, Vice President and Treasurer. SUBSCRIPTION RATE: for individuals in the fields se $6.00 per year in U.S., U.S. possessions and Canada; single copies $2.00; further details on page 6. THIS IS is published in national and separate editions. Additional pages of separate edition numbered or allowed as follows: Western Section 32-1, through 32-6. PUBLICATION OFFICE: 1500 Eckington Place, N.E., Wash ton, D.C. 20002. Second-class postage paid at Washington, D.C. POSTMASTER: Please send form 3579 to fillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520.

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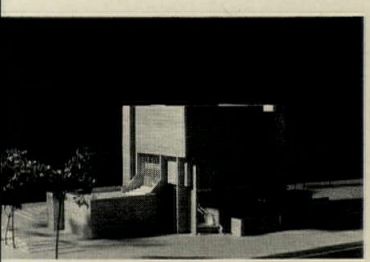

COMING IN THE RECORD

THE DESIGN OF OPEN SPACE

Landscape architect M. Paul Friedberg, whose imaginative designs for small parks have brought him wide attention and important commissions, has collaborated with architects in the design of many kinds of space at many scales, serving a variety of functions. A broad sample of his work will appear next month.

PLANNING FOR NEW AND ENLARGING CAMPUSES

Some of the compelling design objectives for unity, order and provision for future growth of college campuses will be explored in next month's Building Types Study, via campus plans and buildings by Edward Larrabee Barnes; Pancoast, Ferendino & Grafton; Warner, Burns, Toan and Lunde; and Myller, Snibbe and Tafel.

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EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: 330 West 42nd Street, New York, New York 10036. Western Editorial Office: 255 California Street, San Francisco, California 94111. PUBLICATION OFFICE: 1500 Eckington Place, N.E., Washington, D.C. 20002; second-class postage paid at Washington, D.C.

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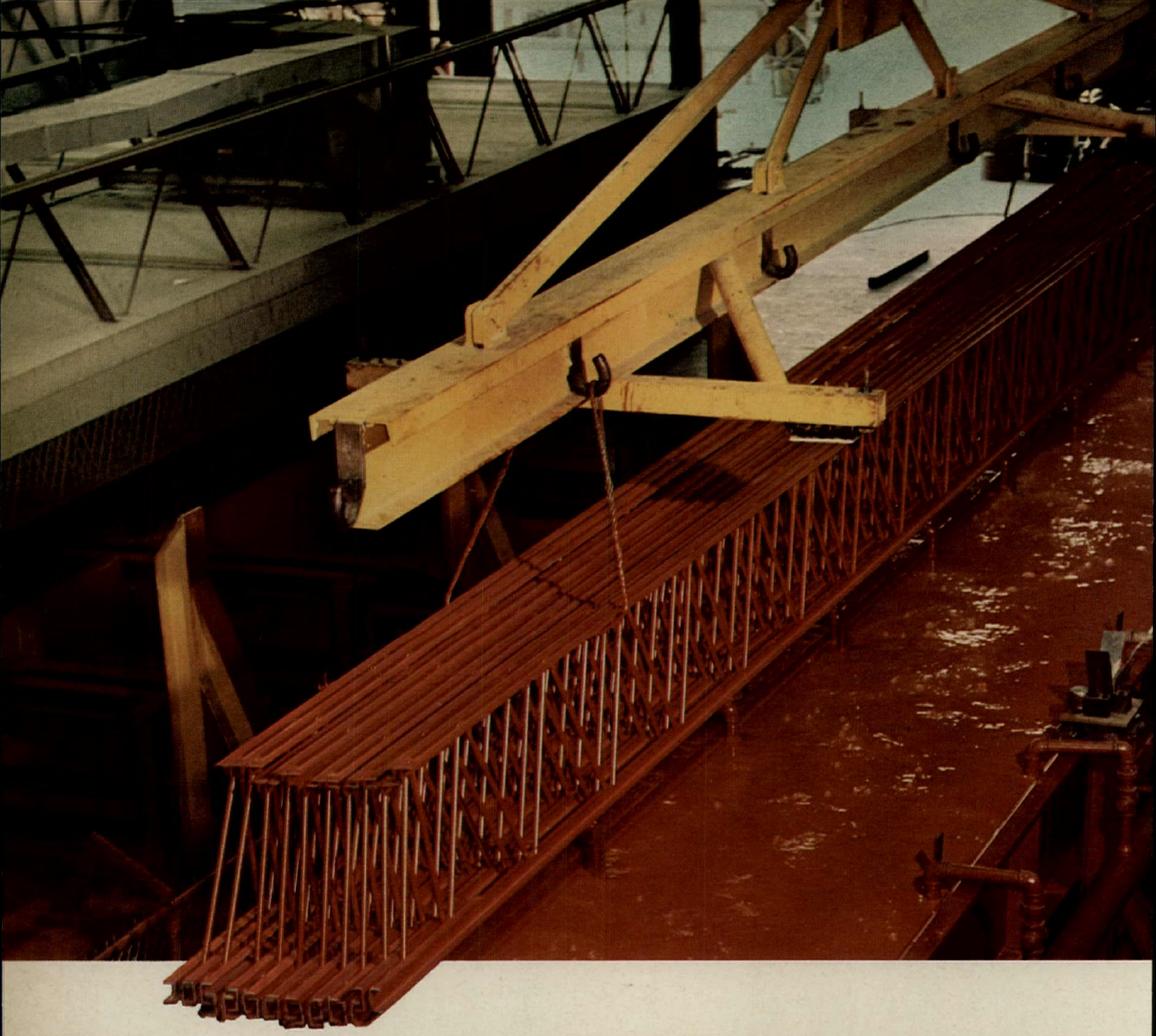

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It's not just a numbers game, OR when does the architect come in?

Beginning opposite page 80, there is a special 16-page report on some of the most important problems of our troubled cities—notably jobs, education, and housing—with some thoughtful and specific suggestions on what can be done about each of them before all the people who can afford it move out of the cities, and the people who are left burn big pieces of them down.

The report is appearing in the February issues of all McGraw-Hill magazines, and will therefore reach something over two million government, business and industrial management people who are in a strong position either to make or to influence the decisions that need to be made as a first step towards solving the problems.

I hope you will read the entire report, but I especially hope you will read the housing section. I'll confess to having some hand in researching and writing it, and to having learned some new things and changed some old prejudices in the process.

Specifically, I learned just how big the gap is between what it costs to build housing in the central city and what the people who need it can afford to pay, and I am persuaded that the only way to bridge this gap is by bolder (and more costly) subsidy. I'm more convinced than ever that we can't expect some technological miracle to drastically cut building costs, and less convinced that there's no hope of cutting Federal red tape. I became persuaded that we could have all the housing we need within a reasonable length of time if we change the rules enough for private enterprise to make a profit building it—the same simple process that gets us eight million automobiles a year with no trouble at all.

The report talks mostly about quantity—for to the government official (and quite properly), the in-city housing problem is first a problem of numbers —the number of housing units needed in his city. And to business and industry (and quite properly) the in-city housing problem first represents a market—for so many hundreds of thousands of refrigerators and boilers and window units and tons of steel and sheets of wall board and Redi-Mix trucks full of concrete.

The report does not talk much about quality—and this is where the architect and allied professionals come in. The architect is the only person in the whole machinery of creating new housing whose primary responsibility is the quality of the environment that is created. He is the only person trained and equipped and deeply concerned with what kind of living is created with the money and materials supplied by government and the business community. Happily, more and more architects are becoming involved in the problem. This involvement is now possible because government officials—from the Secretaries of HUD to local zoning officials—are searching hard for new and better approaches to in-city housing. They are searching because the public demand for something new and better has made action a political necessity. They are searching because what has been tried so far has not worked. And they are (at last) beginning to search the architectural profession for those new ideas.

The first thing that architects must do is face some hard facts. Facts of lower fees, a hydra-headed client, endless meetings with community groups, frustrating approval processes.

The second thing that architects must do is *succeed* in meeting the challenge—in creating that new and better kind of in-city housing within budgets not much bigger than those that so far have created only dreary and monolithic housing in most cities.

Both things can and are being done. At the risk of being considered parochial, let me cite New York, where Philip Johnson and Lewis Davis and Samuel Brody and William Conklin and Frederick Frost and Milton Glass and John Carl Warnecke and Paul Rudolph and I. M. Pei and Ulrich Franzen and Chloethiel Smith and Richard Stein (to name just some of the architects involved) are working in close cooperation with government officials in creating a whole new standard of design for the city. To be sure, most of their work is still in the design stage—and before the new housing is built these architects will have been through a political jungle of disagreements between the community affected and the city officials involved, between politicians who argue that public subsidy should be spent entirely on housing the poor and politicians who would spend some public money to attract the tax-paying middle-income group back into the city. These architects will lose some of the arguments, but they will win many—because they are deeply involved in showing government officials and the public alike that housing for our cities is not just a numbers game. —*Walter F. Wagner, Jr.*

Drawn for the RECORD by Alan Dunn

"I keep asking myself why I go on—"

The President's message: a real push for housing?

Without presuming to set priorities on the spending of Federal money (I save that kind of expertise for cocktail parties), I was pleased that the President got to housing only 21 minutes into his State of the Union message. It is also encouraging that he kept the goals high: $1 billion for model cities, 300,000 housing units for low- and middle-income families for next year; six million units within the next 10 years. It is now to be hoped that Mr. Johnson's once-magical ability to get Congress to approve appropriations can get the new effort financed. It is relatively easy to "call together the resources of industry and labor to start building . . ."—what's needed is the money.

Aims for the students: a good definition

One of my days last week was brightened by a copy of the new catalog from Bill Lacy's New School of Architecture, University of Tennessee. On the cover were these words: "To *see*, to *care*, to *build well* from a precise knowledge in technology and design: These are the aims for the students." That's about as neat and precise and thought-provoking a definition as I've heard lately. It is also, it seems to me, a pretty good reminder for the profession as a whole to keep in mind.

Honors—just for keeping the rain off the clients' heads?

It's always rather flattering to be invited to be the member of an architectural jury, though sometimes the actual process of judging makes you wish you hadn't been. The reason: you can't find anything to bolster your ever-living hopes that somehow, sometime, the whole standard of design quality for our environment is going to improve. I was a member of a jury which met last month to consider the assembled work of the architects of one of the state chapters. We made, to make a long story short, one award, an Award of Merit. Each of us championed one or another entry for a while, but we each found when pressed by our fellows that we could not in conscience go one step further.

And this is scary. Should there not be in a competition of this sort more than *one* building or complex that a jury (not particularly anxious to be particularly cantankerous) could premiate? And that, of course, is not the important question. The important question is: Should not architects be able (regardless of client or client's budget) to do better?

Speaking of competitions: a new kind of involvement

I received a phone call the other day from Miss Cassandra Hayes, manager of special events for The Times Union and The Democrat & Chronicle of Rochester, New York. It turns out that the newspapers are sponsoring a Better Rochester Building Contest, "an endeavor" it says on the entry blank I've since received, "to stimulate and encourage new design, construction, and improvement of commercial properties and renovation of historic buildings in the City of Rochester. . . . All commercial buildings which are new, or remodeled on the outside, are eligible." At any rate, Miss Hayes was calling to ask some advice on who might be on the jury, and I was so taken with the idea of newspapers caring enough about design to sponsor such a competition that I sort of hinted I'd like to be on it—and was duly invited.

Watch this space next month! to see whether this competition really seems an effective way to give the general public a little more awareness of architecture—even if all they do is stumble over it on the way to the crossword puzzle.

One more word on Reston

Some of the citizens of Reston, concerned (or at least uncertain) about the future development of their town in the wake of the firings by Gulf Reston of founder Simon and master-planners Conklin and Rossant, have set up a Reston Community Association to help shape future direction of the community. Two things: 1) It's refreshing to see an upper-middle-class neighborhood action group organized (most of them are confined to slum areas) and I wish them luck; and 2) If they really don't like the way the new developers steer Reston, what do they do? Most such groups can work to "throw the rascals out in the next election"—but what do you do when the rascals (if they turn out to be rascals) own the place?

No editorializing please —nothing but the facts

A review, in the New York Times, of a concert presented by the Contemporary Music Society begins: "The Solomon R. Guggenheim Museum, with its echoes of the Bauhaus school at its most antiseptically functional, proved . . ."—*W.W.*

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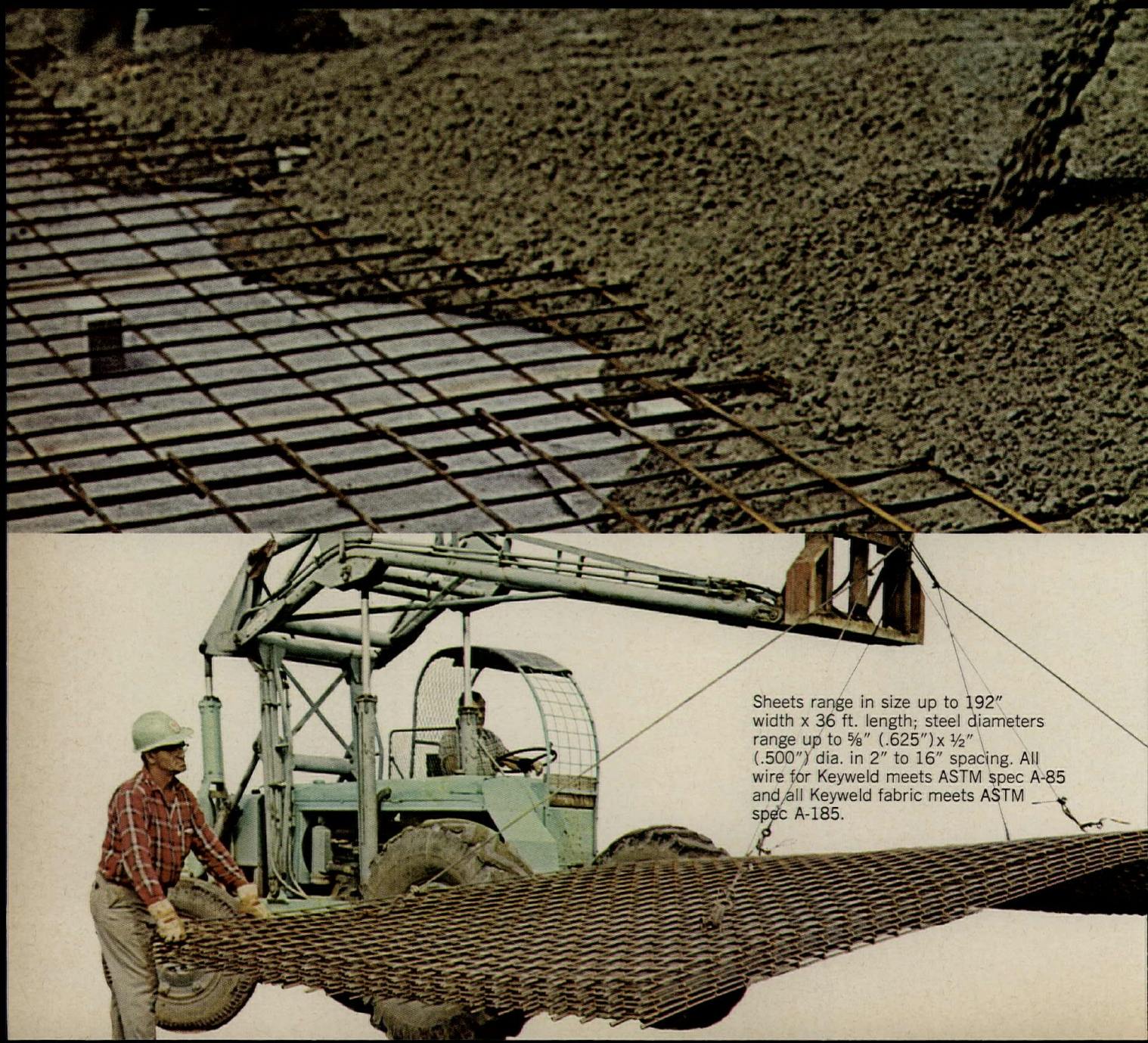

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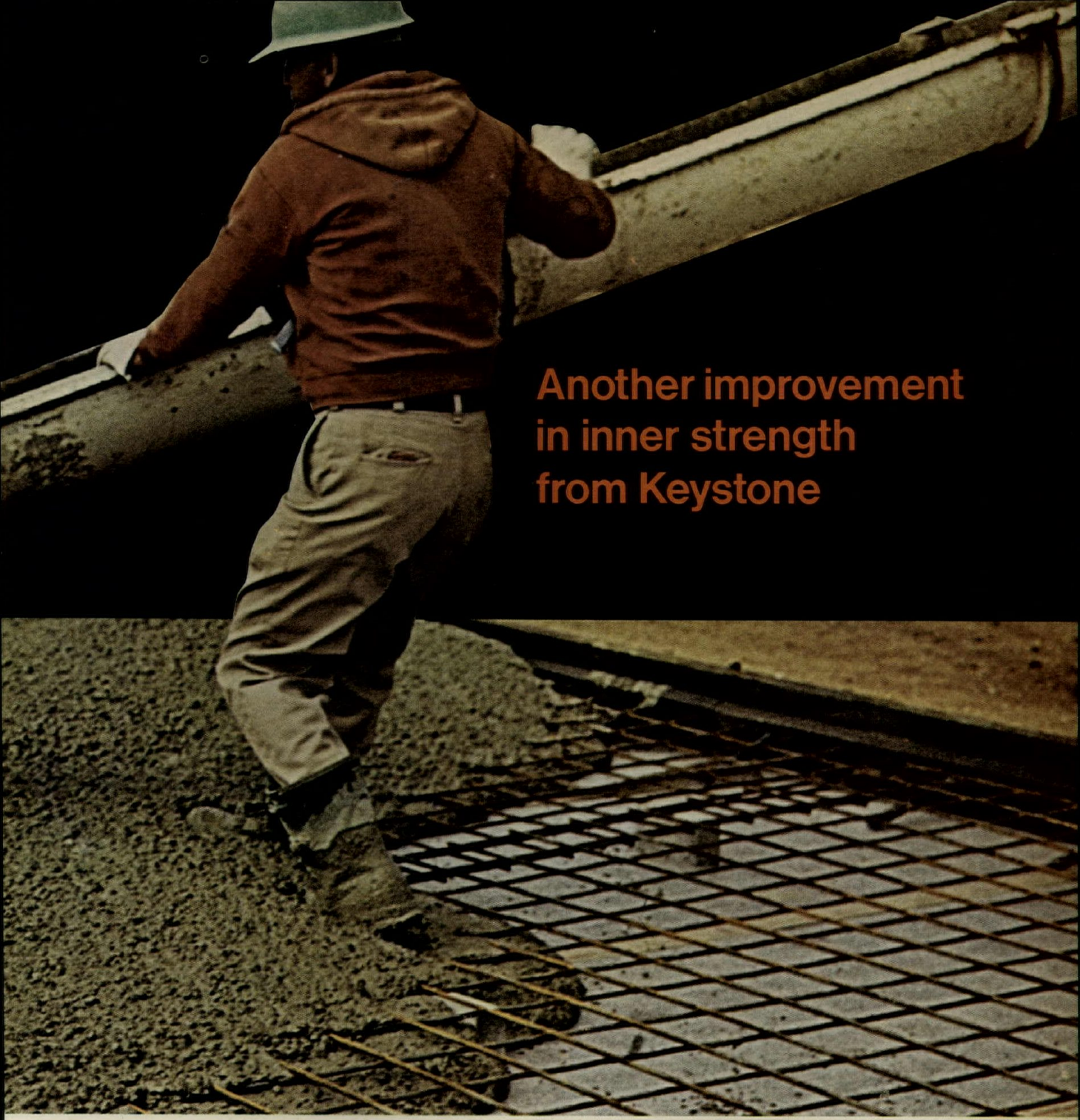

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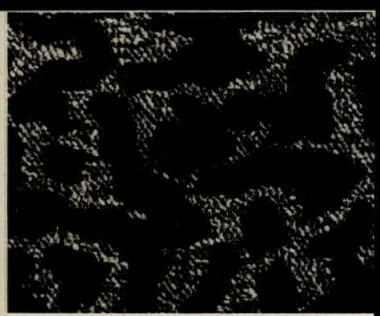

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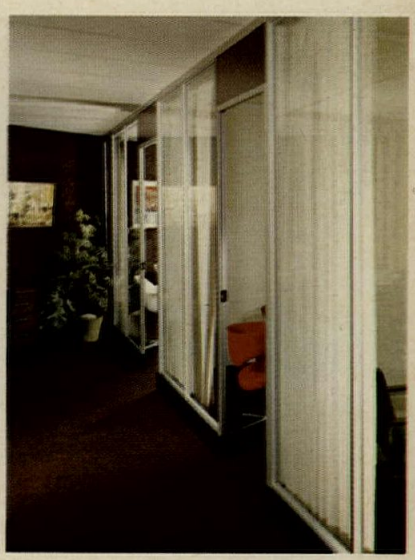

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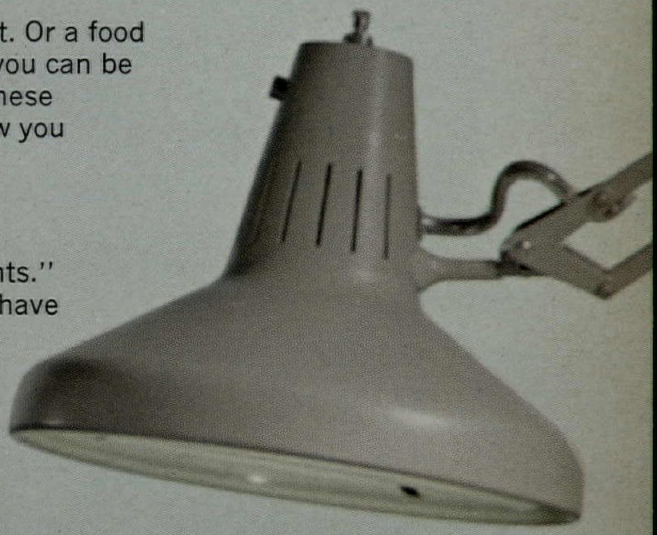

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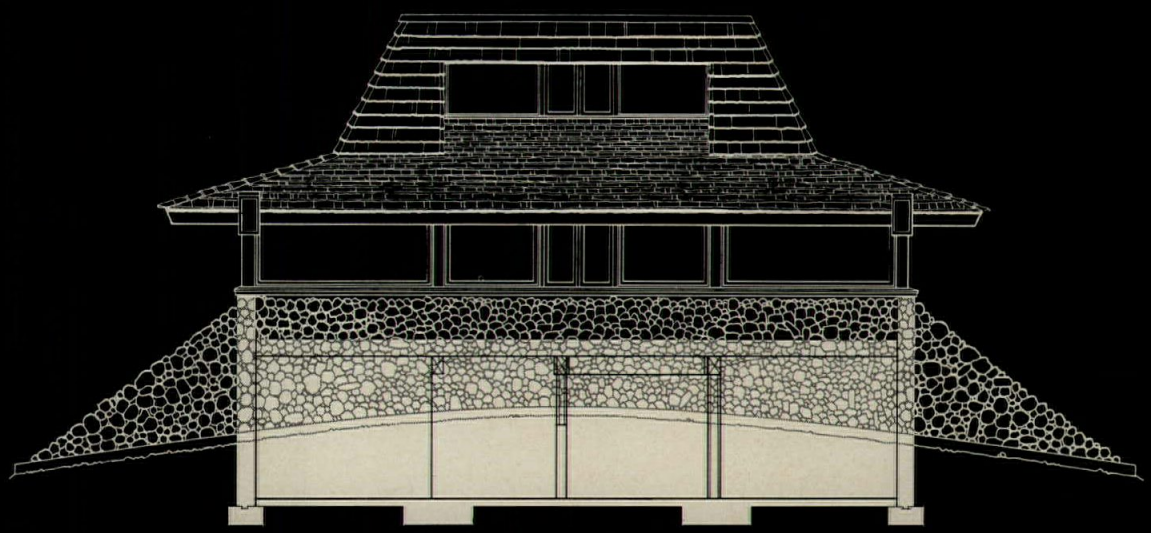
Three stories?



Architects' office: Collinsville, Illinois Architects: Architectural Associates Incorporated
Certi-Split, Handsplit shakes, 24" x 1-1/4" to 3/4" with 10" exposure.

When Architectural Associates, Inc., designed their new offices in Collinsville, Illinois, their objective was twofold: naturally they wanted their offices to reflect their ability and good taste, but also they needed a maximum amount of floor space—immediately and to provide for future growth.

The solution is a structure that manages to look like a two-story building yet actually has three functional levels. The third, housing the firm's conference room, printing and storage area, kitchen, future drafting area and rest rooms, is completely hidden by what appears to be a stone foundation. This stone fill, combined with the structure's broad, distinctive, handsplit cedar roof, gives the low, contemporary feel the firm was after.

In addition to its design function, the red cedar shake roof adds the desired extra dimensions of pattern and rich natural color plus practicality of more than adequate protection and insulation.

Perhaps red cedar Certi-Split shake Certigrade shingles can help provide of the answer to your next design prob too. Why not find out? For details, see Sweet's Catalog listing 21d/Re, or write: 5510 White Bldg., S tle, Wn. 98101. (In Canada: 1 W. Pender St., Vancouver 5, B

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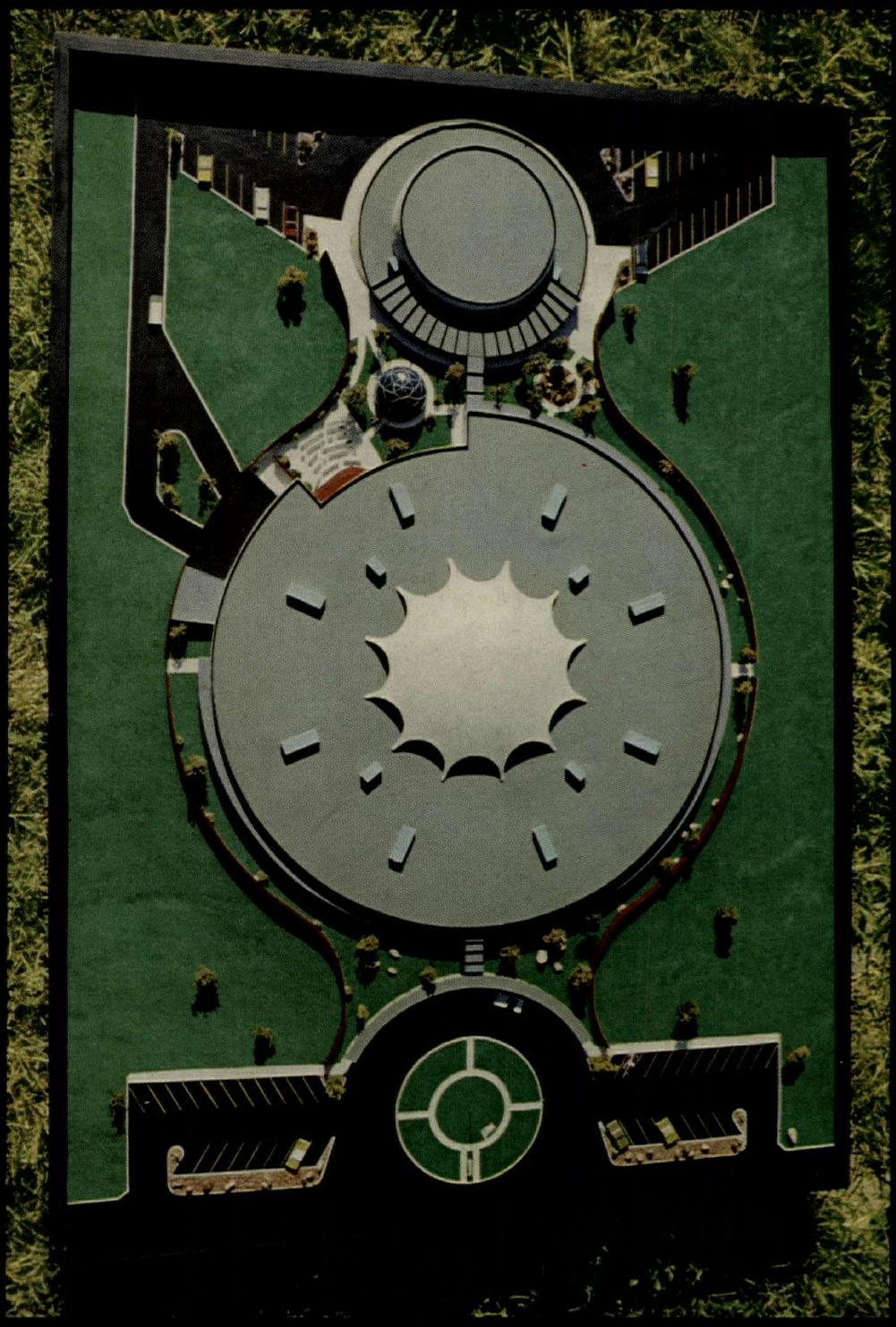
Red Cedar Shingle & Handsplit Shake Bureau



Lennox air conditions many types of buildings

FOR EXAMPLE: This flexible, advanced-concept teaching and learning center, the new John H. Glenn Junior High School, of San Angelo, Texas. Creative application of Lennox equipment held air conditioning/heating/ventilating costs to $1.35 per square foot, over 100,908 square feet.

LENNOX
AIR CONDITIONING • HEATING

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and Lennox offers designers a plus:

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You can, with Lennox, find new flexibility of building design, occupancy, use. You can add, change, or eliminate walls. Roof mounting, decentralization, and flexible ducts make it possible.

You can, with Lennox, have room-by-room control, simultaneous cooling/heating/ventilating, instant response to change in weather or occupancy, 100% ventilation, continuously moving air. You can cool free when outside air is below 57° F.

You can, with Lennox, gain great cost efficiency. Engineered coordination of single and multizone systems offered the San Angelo school planners cooling/heating/ventilating for $1.35 a square foot. No equipment room was needed. On-site labor costs were minimal. Lennox units are factory assembled and wired, including controls.

You can, with Lennox, have a service contract that provides a planned owning cost. And a single source of responsibility, Lennox, backing it. Life expectancy: Equal to the finest central system.

You can, with Lennox, have a choice of gas, oil, electricity or hot water for heat. Individual unit capacity ranges up to 22 tons cooling, 500,000 Btuh heating. Single or multizone. Clean, low silhouettes for all capacities. Typically 42″ high.

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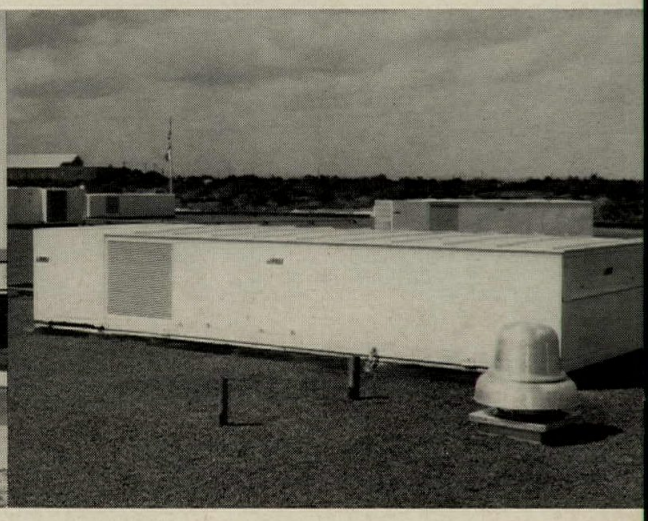
Lennox offers Total Comfort Systems for schools, offices, homes, clinics, factories, apartments, motels, laboratories.

For information, see Sweet's—or write Lennox Industries Inc., 325 South 12th Avenue, Marshalltown, Iowa. 50158.

The wide choice of versatile, compatible Lennox units enabled engineers to fit equipment precisely to the needs of each school area. Single and multizone systems of six different types were coordinated, in capacities ranging from 5 to 22 tons electric cooling, and 100,000 to 200,000 Btuh gas heating.

Eight Lennox Direct Multizone units handle classroom areas requiring individual zone control. Each delivers 22 tons electric cooling, and 195,000 Btuh gas heating.



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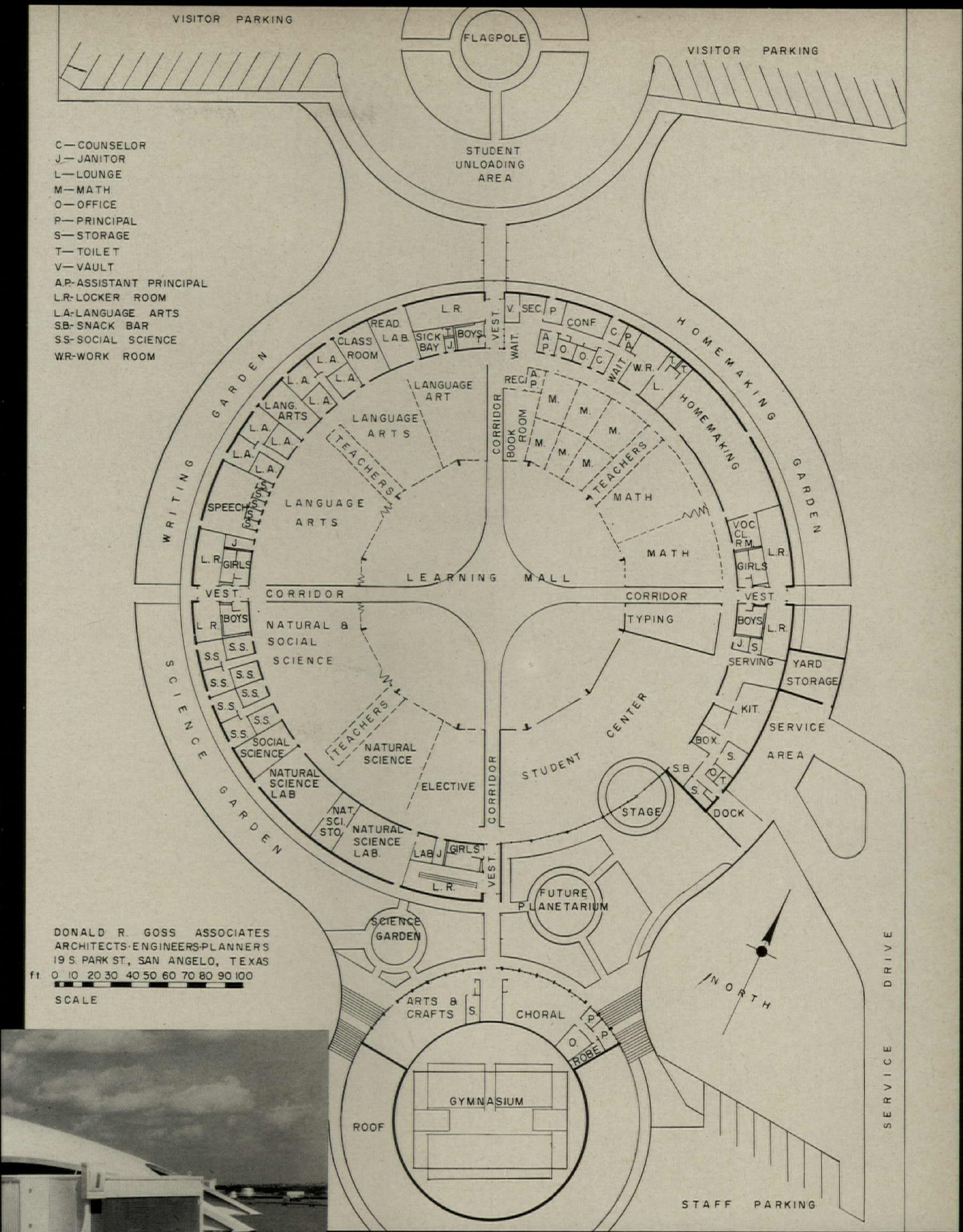

Design Concepts, John H. Glenn Junior High School, San Angelo, Texas: Plan view, above, shows how modern concepts of team teaching, flexible scheduling and individualized instruction find architectural accommodation. Roof mounted air conditioning equipment, with multizone distribution, permitted designers to eliminate "walls" of space and time. Thus, the building anticipates innovative teaching concepts of the future, as well as housing those of today. ARCHITECTS: Donald R. Goss Associates. ENGINEERS: Cowan, Love & Jackson, Inc.

Four Lennox GCS3 single zone units serve large open areas in the center of the school. Capacity of each unit: 15 tons electric cooling, 200,000 Btuh gas heating

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1/8 gauge (Pitch rate .216)
8 1/4 tufts per inch
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Outside and inside, the Modern Woodmen of America Building, Rock Island, Illinois, represents the best in materials, equipment, craftsmanship and design. Architect: Graham-Anderson-Probst and White. General Contractor: Priester Construction Co.

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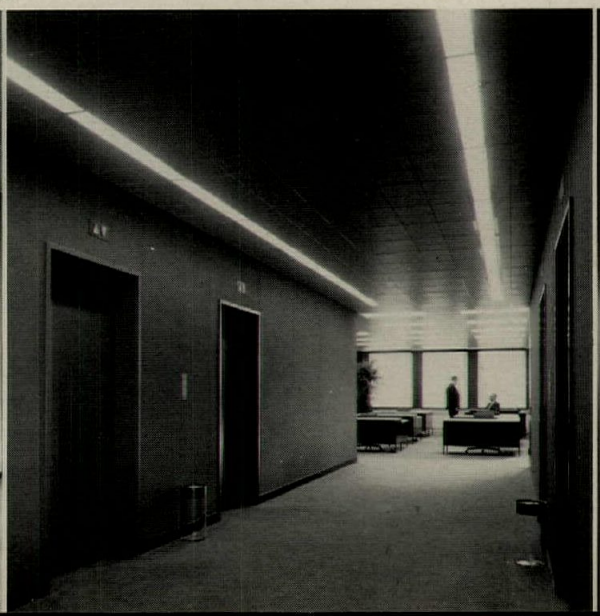
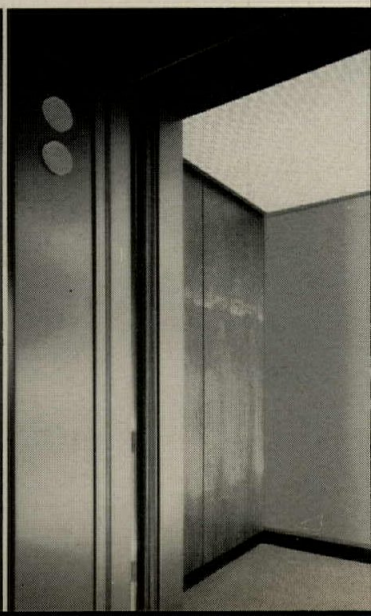
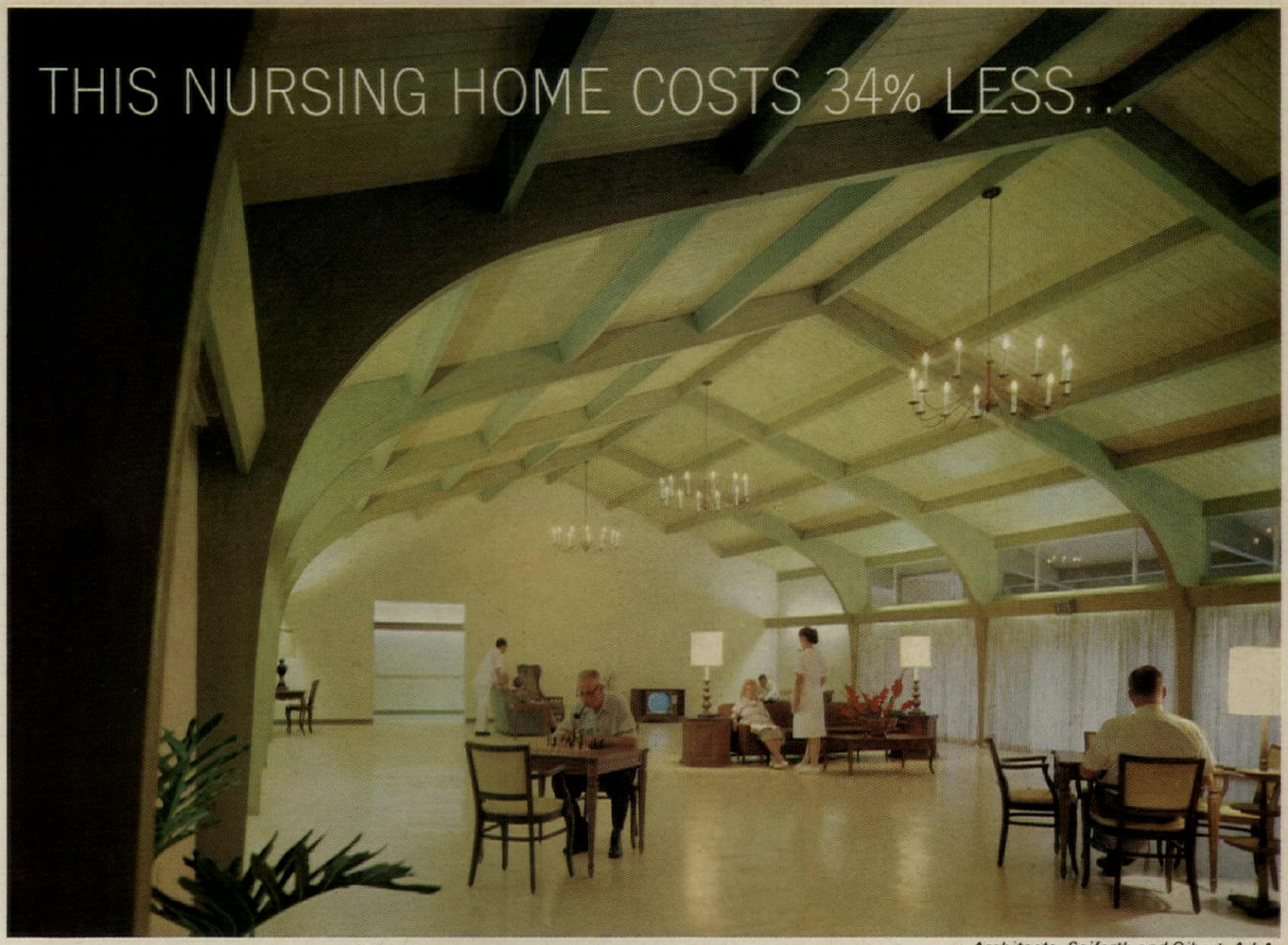
The cars, machinery and controls in this Montgomey installation provide the ideal combination of fast, smooth, comfortable elevator service for this nationally-known life insurance organization.







Architects, Seiferth and Gibert, A.I.A.

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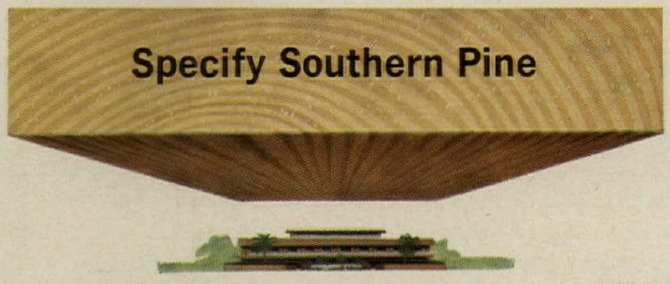
Beautiful Miramar Village—a facility for extended nursing and convalescent care—is located on the Gulf Coast shores. The building is as attractive and relaxing as the surroundings.

Southern Pine was chosen to give the home-like atmosphere of natural wood. Sweeping laminated arches and roof decking of Southern Pine create a warm, friendly feeling. The facility holds the highest classification of nursing homes awarded by the Mississippi State Board of Hospitals.

Pre-shrunk Southern Pine is utilized for partition, wall and roof framing throughout the expansive complex. Cost—exclusive of land, fees, furnishings and site improvement—is $13.94 per square foot and $5,878 per bed—34% less than $8,960 per bed average for 25 other nursing homes built in 1965, as reported by the U. S. Public Health Service.

The Southern Pine framework has structural safety—important in this area, where hurricanes can be so destructive. Use of a sprinkler system brought a 58% reduction in fire insurance rates.

MORE INFORMATION:—A special folder giving complete details is available. Write: Southern Pine Association, P. O. Box 52468, New Orleans, Louisiana 70150



As produced by member mills of the Southern Pine Association

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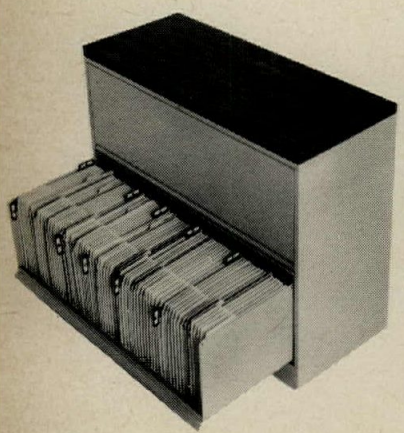
If we didn't say it was a file, you'd never know it.

It's a file.



Our Modi-File is more than a lateral file. It's also a piece of furniture.

Use it where you wouldn't dream of putting other files. In the front office as a wood-topped cabinet. Or stacked as dividers up to five units high. Modi-File doesn't have drawer pulls to give it away. No one will spot it as a file. Until it's opened.

Behind its beautiful face, Modi-File has more space than any lateral file its width. A unique hinge suspension eliminates wasted space, so it's nice and slim. Only 15 inches.

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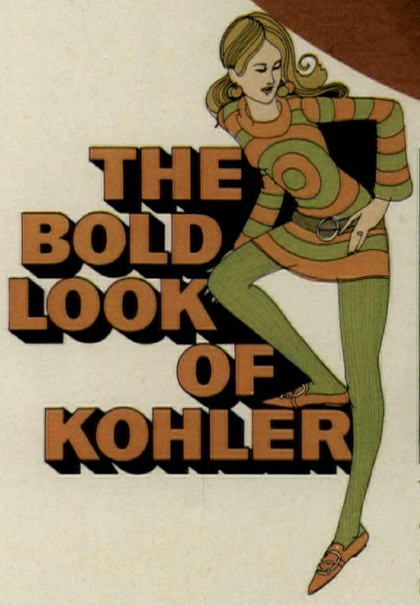

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Kohler Co., Kohler, Wisconsin

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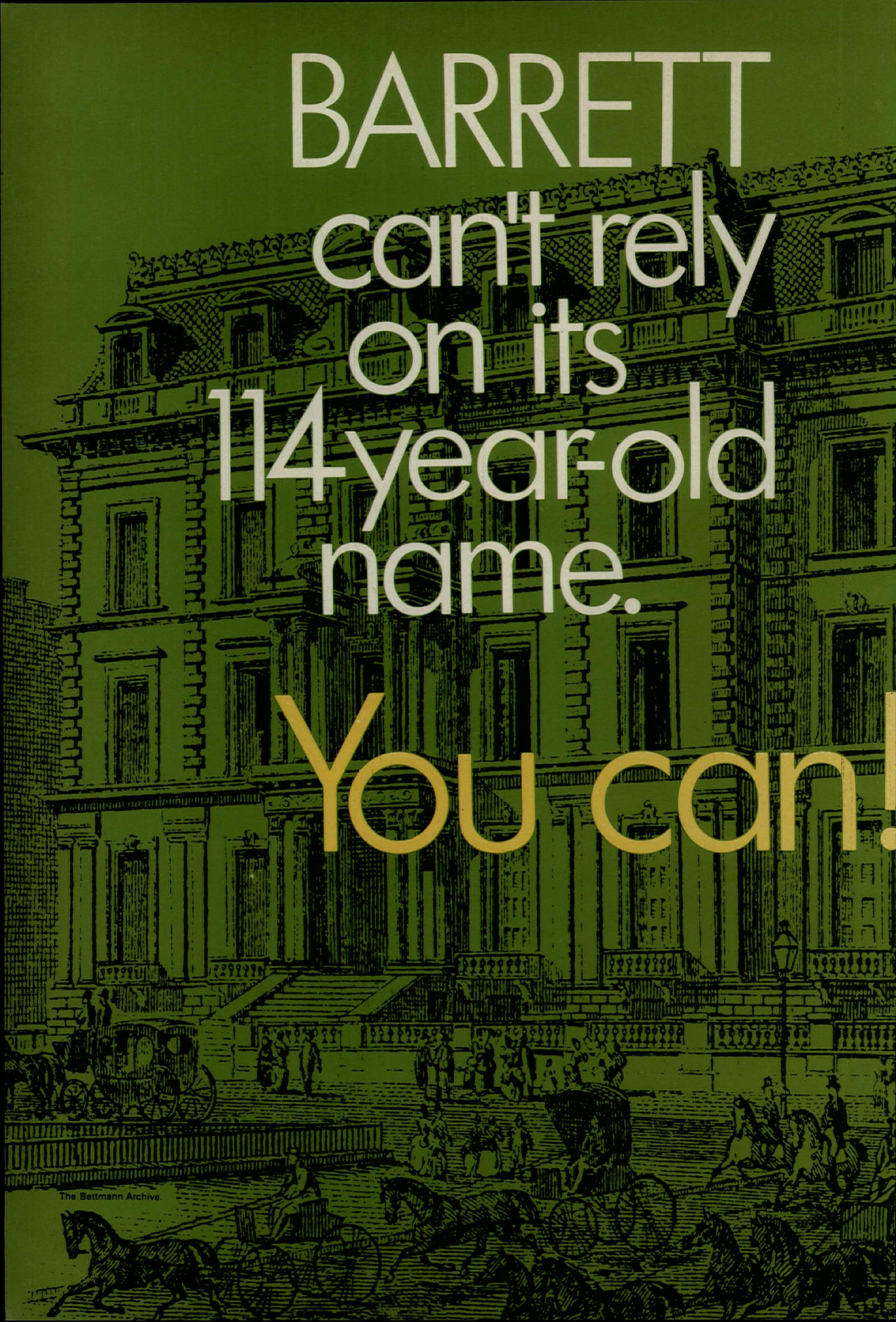

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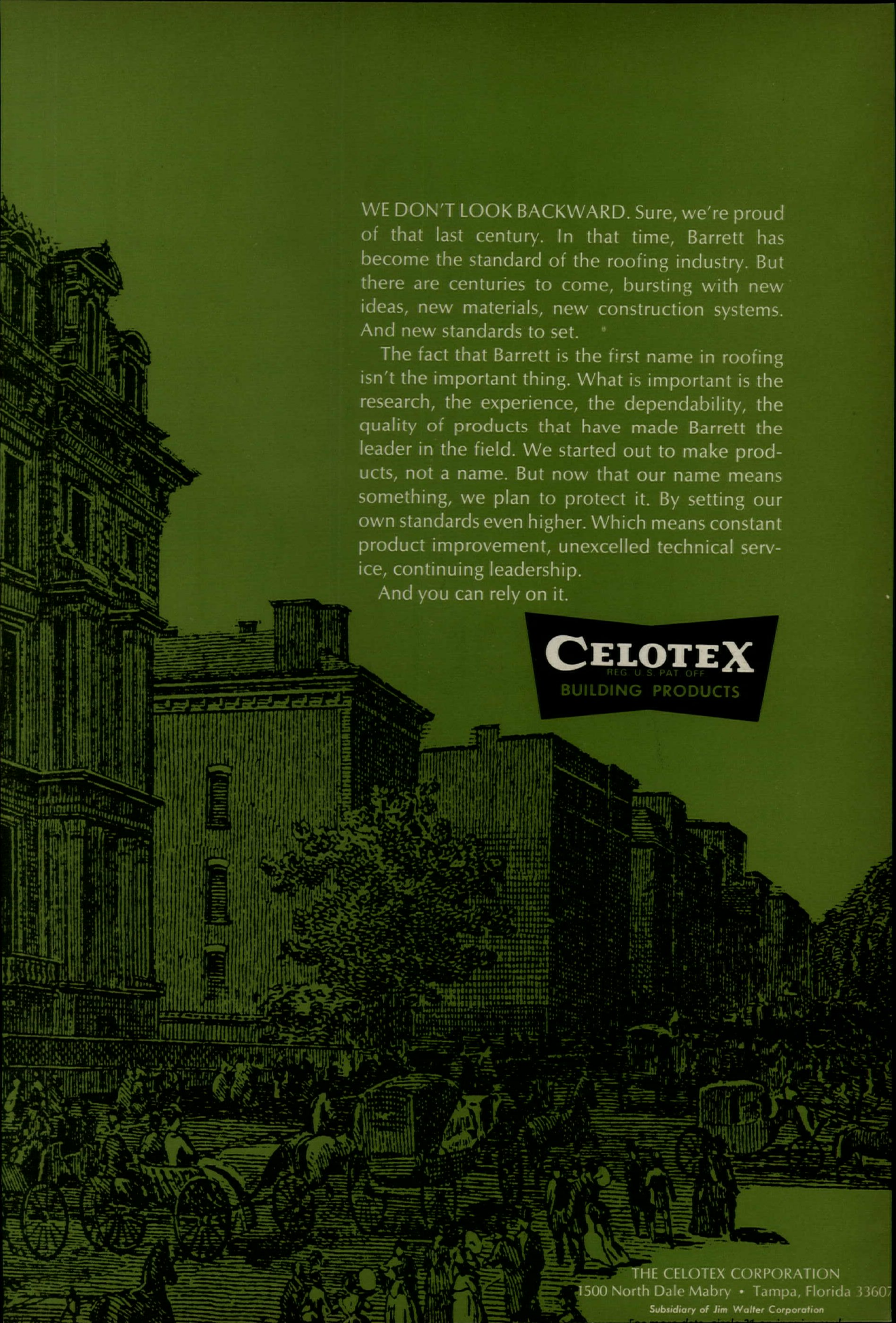

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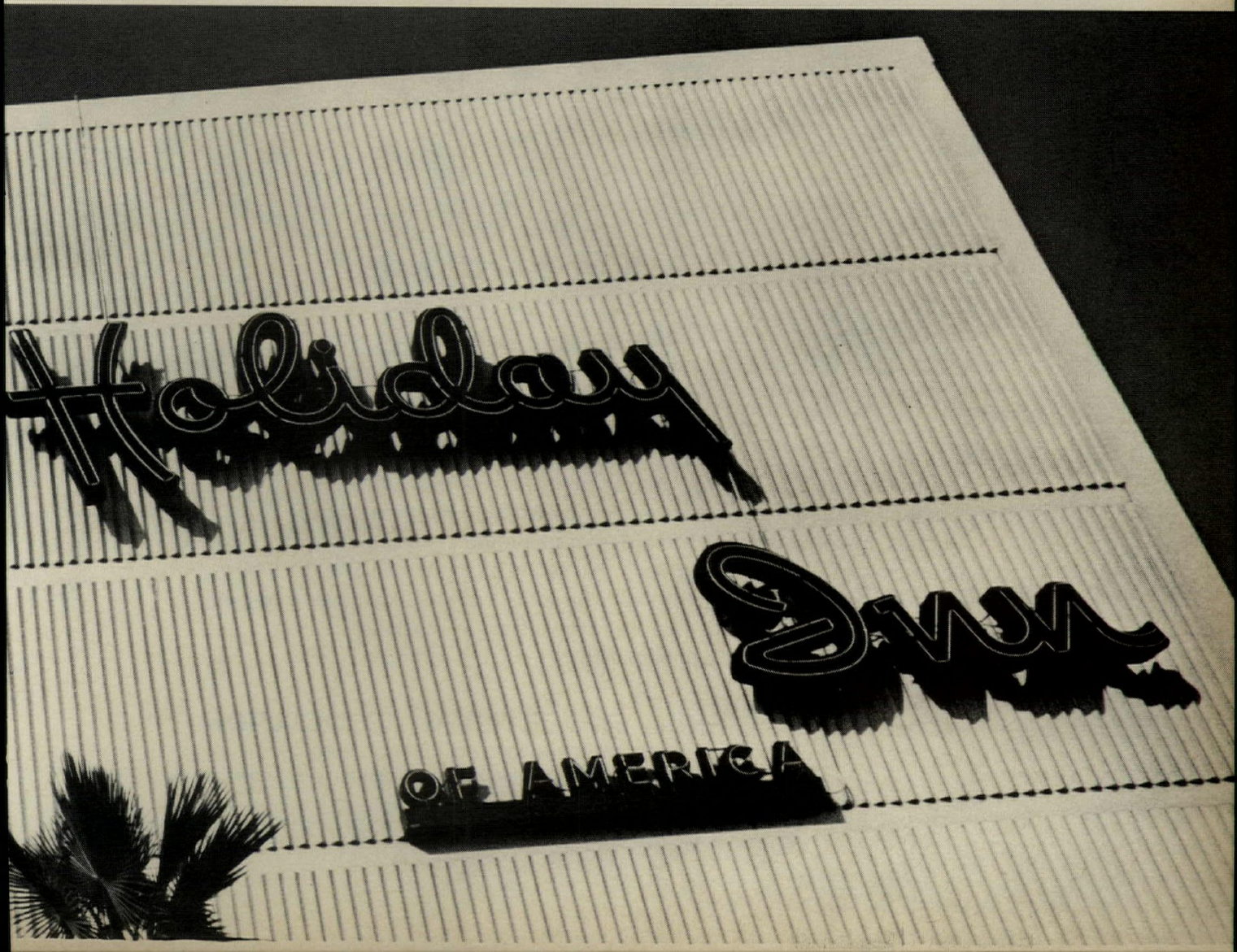

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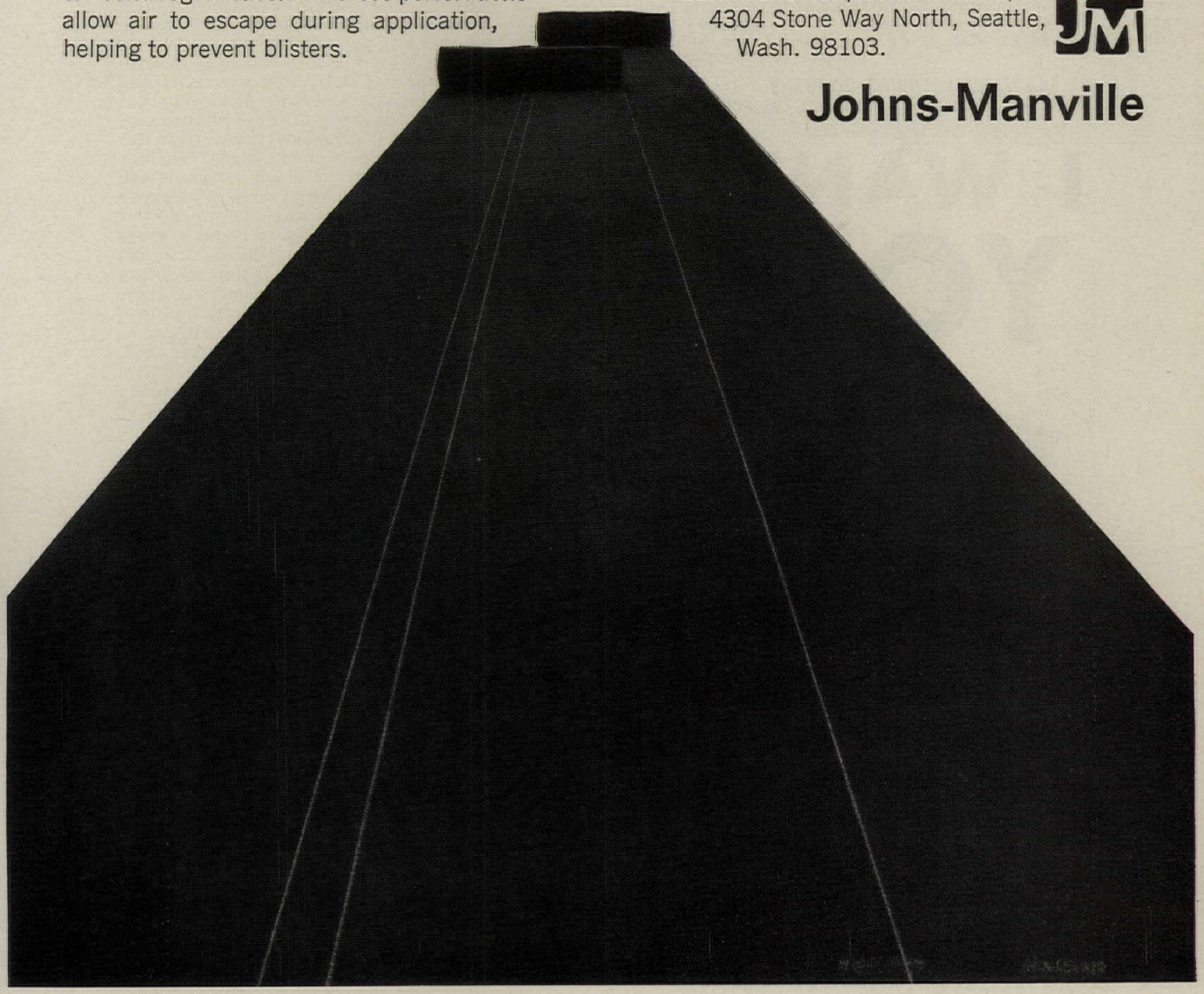

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. . . and not a student has entered its halls.

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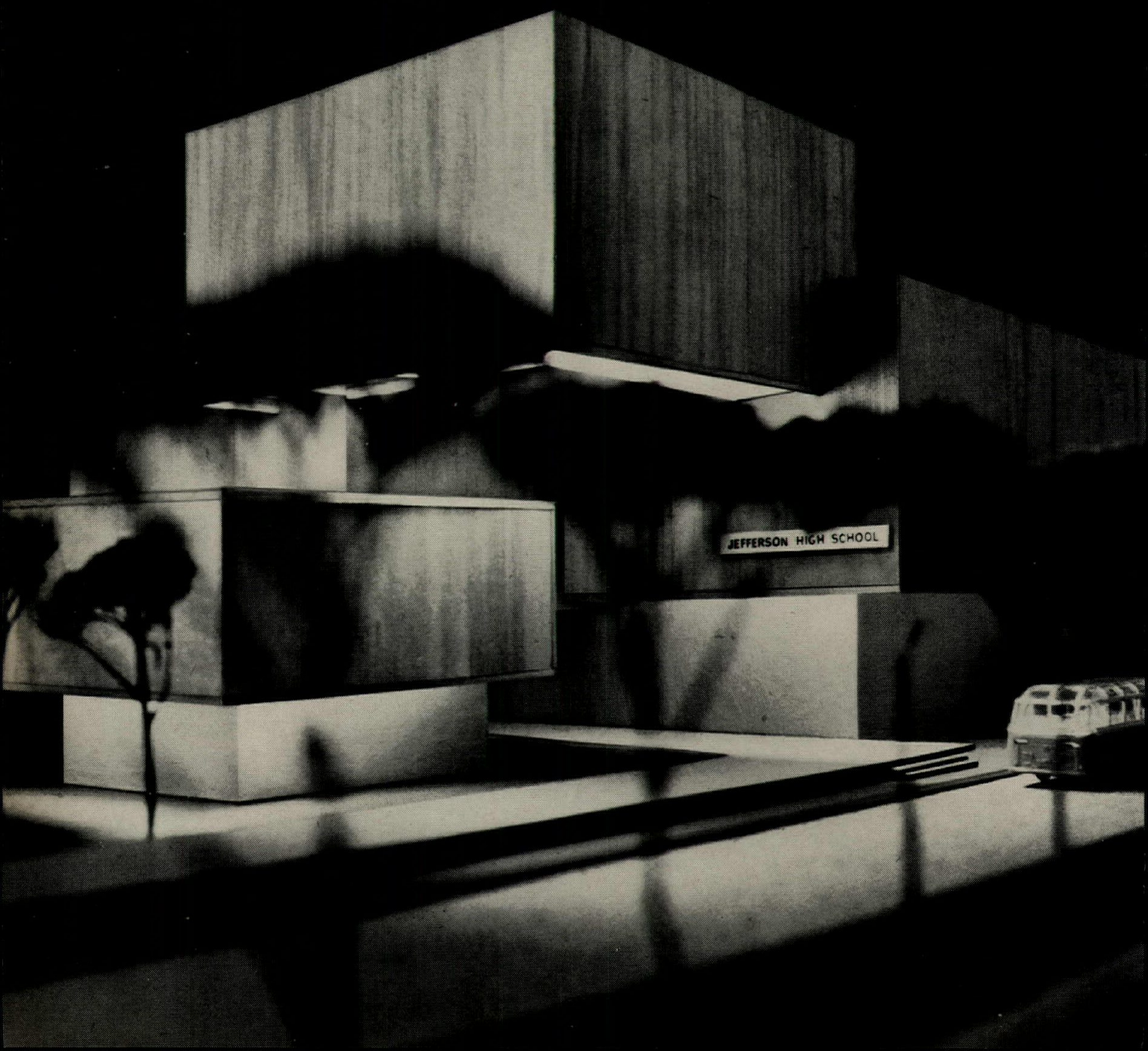


Memorial service will be held for Paul Lester Wiener

A memorial service for city planner and architect Paul Lester Wiener will be held at St. Paul's Chapel, Columbia University, New York City, on March 6 at 2 p.m. Mr. Wiener died suddenly on November 16 in Munich, Germany (January, page 36). Jose Luis Sert, dean of the Harvard Graduate School of Design, and Charles Abrams, chairman of the Division of Urban Planning at Columbia's School of Architecture, will eulogize the renowned city planner and architect.

Submissions are sought for architectural rendering prize

The Architectural League of New York is seeking entries for its 1968 annual Birch Burdette Long Memorial Prize for architectural rendering. The submissions will become part of an exhibition to be shown at the League from March 18 through April 6. A jury will judge the exhibited work, and will award a $500 prize and two honorable mentions on the basis of "excellence in composition, facility in technique, and expression of the character of the design illustrated."

Serving on the jury will be Minor L. Bishop, architect and chairman of the Birch Burdette Long committee, Walter F. Wagner, Jr., editor of ARCHITECTURAL RECORD, landscape architect M. Paul Friedberg, and architects Giorgio Cavaglieri and George Nemeny. Applications can be obtained by writing Minor L. Bishop, The Architectural League of New York, 41 East 65th Street, New York, New York 10021, with the deadline for submissions being March 15.

Applicants are sought for Rotch Travelling Scholarship

Applicants are being sought for the annual Rotch Travelling Scholarship, which carries a stipend of $7,000 to provide study and travel for a period of one year. Eligibility rules require that applicants must be under 31 years of age on March 30 and their architectural record must include study or experience of required time and degree in Massachusetts. A detailed statement of eligibility requirements and application forms can be obtained by writing to: Walter E. Campbell, Secretary, Rotch Travelling Scholarship Committee, 100 Boylston Street, Boston, Massachusetts 02116. Applications should be obtained before March 7, with completed forms due in the secretary's office by March 14.

For more data, circle 27 on inquiry card

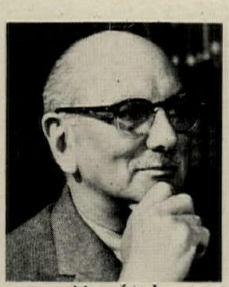
Zeckendorf proposes scheme for West Village in New York

William Zeckendorf has a new enthusiasm. His latest project, pictured in the rendering above is the Robert R. Young Village, proposed for a site on the Hudson River in New York City's West Greenwich Village. Residents of the West Village, who had their own plan for building on vacant sites and preserving the low-rise and historic character of the area, have raised a barrage of objections to the Zeckendorf proposal.

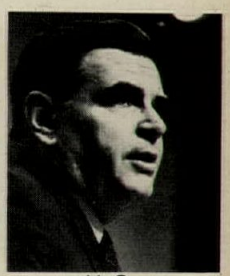
The Zeckendorf proposal is based upon the feasibility of an underwater garage structure for 10,800 cars to be developed at a cost of $3,000 per parking unit. The parking structure would support a 60-foot-high ceiling which would house the world's largest motion picture and television studio facilities. A deck on top would extend and step back into the West Village.

On top of the deck, which would encompass arterial highways, would be a total of 8,162 residential units. Shown in the rendering, developed by Mr. Zeckendorf and his renderer, would be a 104-story cruciform apartment tower (the I.M. Pei tower in Place Ville-Marie elongated vertically two and one-half times, says Mr. Zeckendorf) and 10 concrete 40-story helix-shaped apartment buildings (six shown in rendering), designed by I. M. Pei many years ago, but never built.

The architectural firms I. M. Pei and Partners, Harry M. Weese and Associates, and Kempa and Schwartz, have been retained to develop the actual design.



Mumford



McCue

Mumford and McCue to receive A.I.A. awards for criticism

Lewis Mumford of Amenia, New York, and George McCue of St. Louis, have been named as the first recipients of the newly established architectural criticism awards of the American Institute of Architects.

Mr. Mumford, an urban scholar, author and critic for nearly half a century, and a frequent contributor to ARCHITECTURAL RECORD, will be given the Architectural Critic's Medal on the basis of a distinguished career devoted to architectural criticism. Mr. McCue, art and urban critic for the St. Louis Post-Dispatch, was selected to receive the Critic's Citation on the basis of a series of articles written to increase the public's visual perception of the St. Louis environment. The awards will be presented at the annual A.I.A. convention in Portland, Oregon, June 23-26.

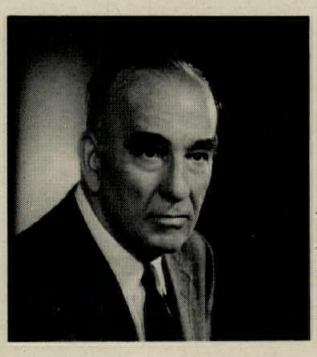
Serving on the awards jury were: Dr. Frank Stanton, CBS president; David Brinkley, NBC news commentator; I. W. Cole, dean of the Medill School of Journalism; architect Francis P. Gassner, who is chairman of the A.I.A. Committee on Esthetics; and Philip J. Meathe, A.I.A. Michigan Region director and chairman of the A.I.A. Public Relations Committee.

Breuer and Zetlin will teach at the University of Virginia

Architect Marcel Breuer and consulting engineer and structural designer, Lev Zetlin will both be teaching at the University of Virginia this semester. Mr. Breuer has been named Thomas Jefferson Memorial Foundation Professor of Architecture, and he will come to the University this month for a three-month term. At the University, Mr. Breuer will teach a fourth-year design course. "We look forward to having a practicing architect who also has an incredibly distinguished career as a teacher, to work with our students and faculty," said Joseph N. Bosserman, dean of the School of Architecture.

Dr. Zetlin, who was named professor of architecture and of civil engineering last fall, will come to the University this month on a part-time basis, and will become a full-time professor next September, while continuing his practice.

"We are very pleased with this definitive evidence of interdisciplinary work between the schools of architecture and engineering," said Dean Bosserman. "Dr. Zetlin's work and research with new structural techniques will be an important asset here." Dr. Lawrence R. Quarles, dean of the School of Engineering and Applied Science, added "Dr. Zetlin's broad experience and outstanding achievements in advanced structural design will serve as an inspiration to our students and make the latest methods and thinking in design available to them."



Fabian Bachrach

Perry Coke Smith retires from New York architectural firm

Architect Perry Coke Smith of New York City and Dark Harbor, Maine, has retired, as of January 1, as senior partner from the architectural firm of Smith Haines Lundberg & Waehler. Mr. Smith joined the firm, then known as Voorhees Gmelin & Walker in 1926. He became an associate in 1929 and a partner in the firm of Voorhees Walker Foley & Smith in 1938. The firm was established in 1885 by Cyrus L. W. Eidlitz. It has had nine changes in name as partners have left or joined the firm.

Mr. Walker is a member of the American Institute of Architects and he was elevated to fellowship in 1950. Mr. Smith is also a member of the New York State Association of Architects, Columbia Associates, The Architectural League of New York, National Housing Conference, Inc., New York Building Congress, Building Research Institute and the American Management Association.

RECORD HOUSE of 1963 is used for movie set

The residence for Marshall Safir, Kings Point, Long Island, designed by architect George Nemeny, is being used as a set for a motion picture entitled "For Love of Ivy." The Safir residence was one of 20 houses cited in RECORD HOUSES OF 1963, the mid-May issue of ARCHITECTURAL RECORD. Pictured above in the living room are Mr. Nemeny, right, with the motion picture's stars, Sidney Poitier and Abby Lincoln. According to the news release "the house, located on Long Island's North Shore, was selected after a long search by Director Daniel Mann as having the beauty, elegance and grandeur which satisfied the requirements of the plot."

Architecture symposiums are planned in Stockholm

A series of five-day symposiums on city planning and architecture is scheduled to meet in Stockholm in April, June and September. The meetings are open to "those engaged as professionals or students in planning, architecture, engineering, government, sociology and economics." Each symposium is a five-day series of lectures, discussions and tours devoted to achieving an understanding of the "Swedish accomplishment," which, according to the announcement, is "the creation of a slum-free society." Group travel arrangements are available and inquiries should be sent to: Symposium at Stockholm, Box 9137, Stockholm 9, Sweden.

August F. Hoenack retires after 26 years in USPHS

August F. Hoenack, chief of the Architectural, Engineering and Equipment Branch, Division of Hospital and Medical Facilities, U.S. Public Health Service, retired on December 15 after 26 years with USPHS.

Mr. Hoenack was one of the original small band of architects and consultants who, under the leadership of the late Marshall Shaffer, laid the groundwork for and later helped to implement the Hospital Survey and Construction (Hill-Burton) Act of 1946. He became chief of the branch after Mr. Shaffer's death in 1955.

The guides and criteria developed by the group to assist architects throughout the country in the design of Federally-aided hospitals have become the prime references for any architect with a hospital design problem, and the work of the branch is regarded by architects as a landmark Federal program.

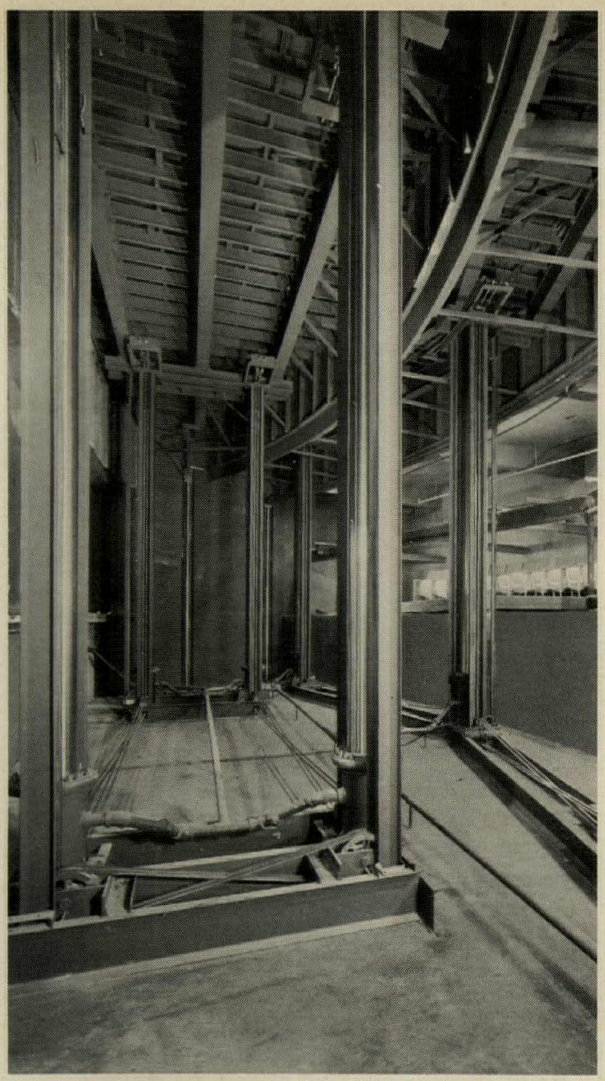
Mr. Hoenack joined the Chicago architectural firm of Jensen, Halstead & Rummel on February 1.

Dean Hudnut is shown above as he acknowledged receipt of a certificate of appreciation from the Association of Collegiate Schools of Architecture at its meeting in New York last May

Obituary

Joseph Hudnut, noted architectural educator, and for many years one of the most perceptive critics of architecture, died January 15 in Norwood, Massachusetts, at the age of 81. After studying architecture at Harvard, the University of Michigan and Columbia, Mr. Hudnut joined the faculty of the Columbia School of Architecture in 1926, where he became acting dean in 1933 and dean the following year.

Mr. Hudnut went to Harvard University in 1935 where he developed the university's Schools of Architecture, Landscape Architecture and Regional Planning into the Graduate School of Design. He served as dean of the Graduate School of Design from 1935-1953. While at Harvard, Mr. Hudnut was responsible for bringing Walter Gropius and Marcel Breuer of the Bauhaus to this country to teach at the Graduate School of Design



Below-stage view shows part of the lifting equipment designed and built by Dover for the Jesse H. Jones Hall for the Performing Arts, Houston, Texas.

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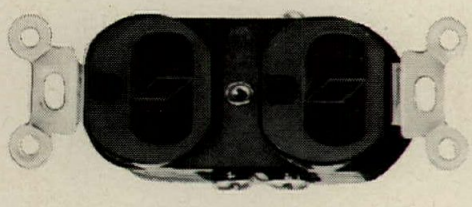
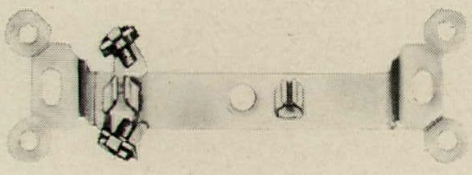
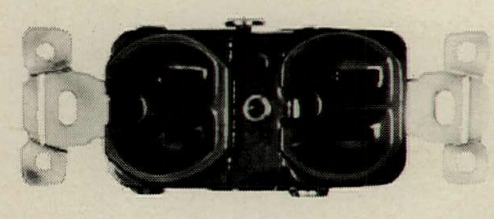
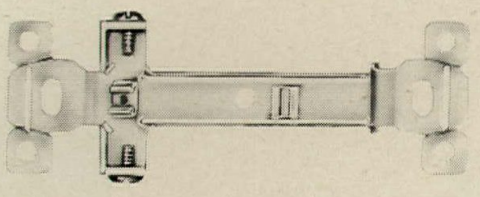
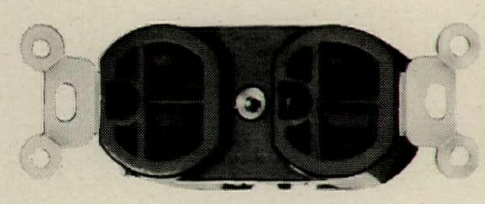
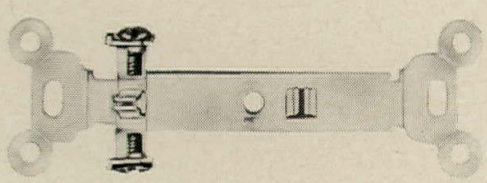
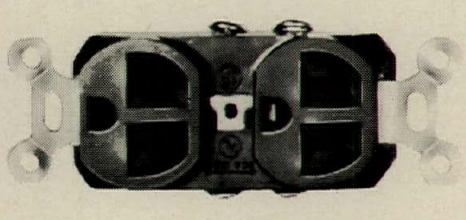
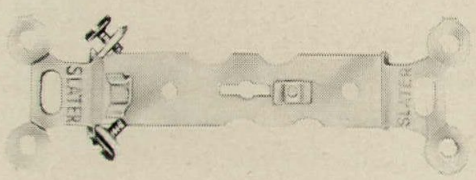
MANUFACTURER **A**		
MANUFACTURER **B**		
MANUFACTURER **H**		
Slater MEDALIST		

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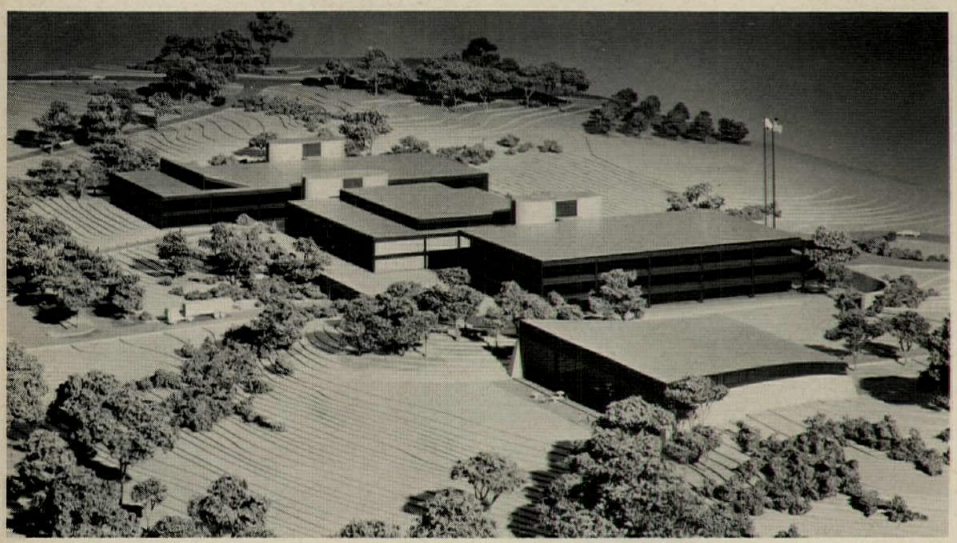
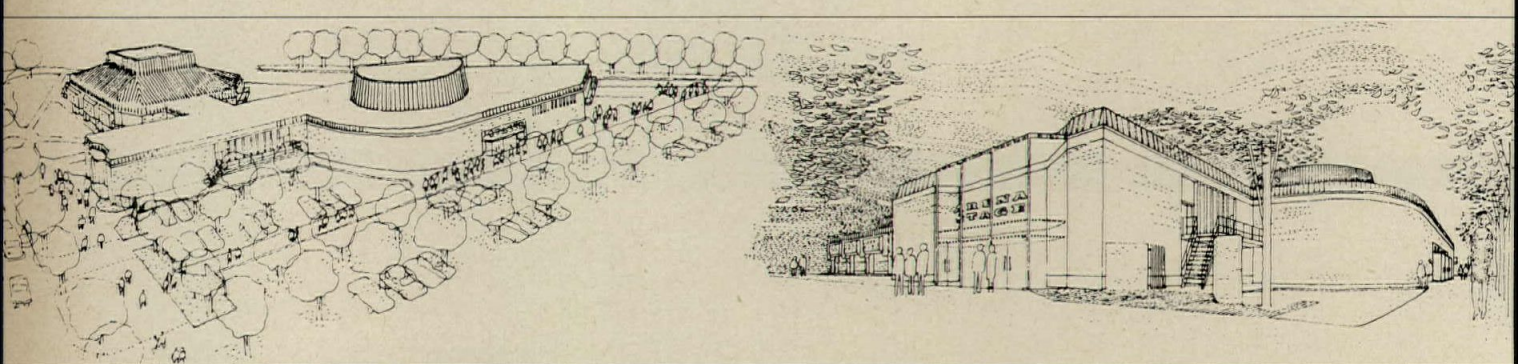


The Marketing Education Center of the Eastman Kodak Center, Henrietta, New York, designed by the Chicago office of Skidmore, Owings & Merrill, will be a complex of four interconnected buildings. There will be a three-story laboratory building, a three-story classroom and seminar unit, and a four-story administration building. These three buildings will be linked by towers which will house elevators, stairs, rest rooms and air shafts, therefore freeing the buildings for maximum flexibility. The fourth building, a terraced dining pavilion, will be connected to the complex by an underground passageway. The complex will provide approximately 360,000 square feet of floor space. Exterior materials will be unpainted weathering structural steel, masonry walls and glass. General contractor is John B. Pike and Son, Inc.

Richard K. Koch

An administration and engineering building for Scientific Data Systems, Inc., El Segundo, California, will be a three-story structure containing approximately 320,000 square feet. Architects for the $8.750-million building are Craig Ellwood Associates with Jim Tyler as associate architect and Daniel Dworsky as consulting architect. The upper floors will be 336 feet square with the ground level set back 24 feet on all sides. The building will have full-height steel columns every 48 feet with a glass facade. Precast concrete panels will be used at the back of the facility and as partial walls flanking the main entrance. General contractor is C. L. Peck Contractor.

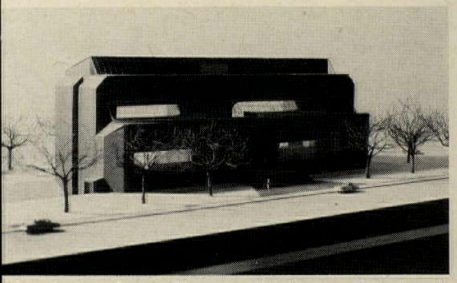


Stage II of the Arena Stage, Washington, D. C., will be a $1.5-million expansion of the present building. Architect for the addition as for the existing building is Harry Weese. The addition will attach to the existing building (located at the rear in the rendering, above left) and will contain a new theater to seat 450. The theater will be "an intimate playhouse for works of experiment and search" with seating disposed in 10 rows on the main floor and five rows in a sweeping circular balcony. It will have a neutral end-stage which will be flexible to take on many shapes. The theater has also been designed for the showing of films. Other new facilities provided will include: rehearsal space; office space; scene shop; storage; studios; classrooms; study rooms for actors and playwrights; and congregation areas—dressing rooms, actors' lounges and space for the audience and company to meet and mingle with one another.

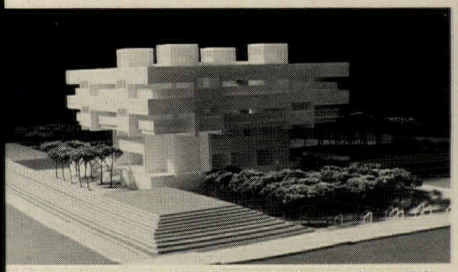
Birkey wins competition for design of Ball State University architecture building

Melvin D. Birkey has been named the winner of a two-stage competition for the design of a new $1.3-million College of Architecture and Planning building at Ball State University (January, page 35). Shown here are the designs by the five finalists, each of whom received a $2500 fee. This was the first American Institute of Architects-sponsored competition to be held in Indiana.

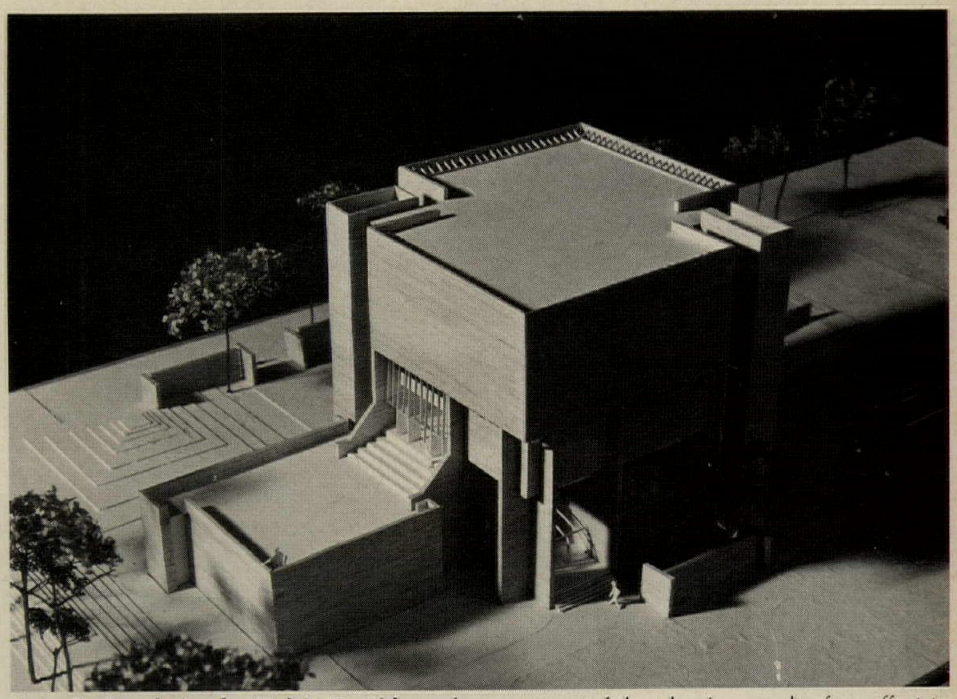
Serving on the jury were architects George W. Qualls, Philadelphia, Joseph Amisano, Atlanta, and Donald D. Hanson, Chicago. Charles P. Graves, dean of the School of Architecture at the University of Kentucky, was professional adviser.



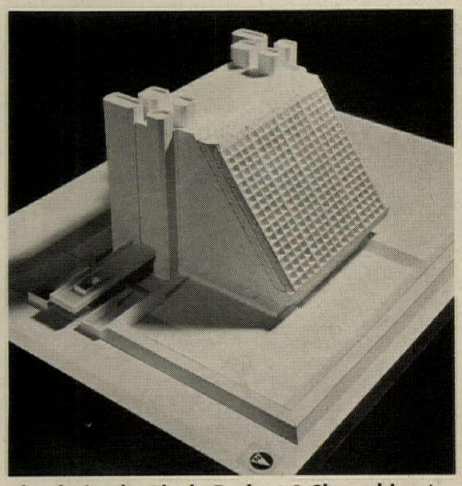
The design by Kellum and Foley and Ireland, Indianapolis, with George Jamison as project architect, places studio space on two levels above the more public functions of the building. The upper spaces are oriented to receive north light. The public spaces, located either one-half level above or below existing grade, include exhibition area, library, administration, design research, heliodon, and photo lab. "The main vertical load carrying elements are the walls of the three cores," say the architects. "These are 8-inch poured concrete bearing walls. . . . Pockets are left in the concrete wall for joist bearing, including the joists for future expansion."



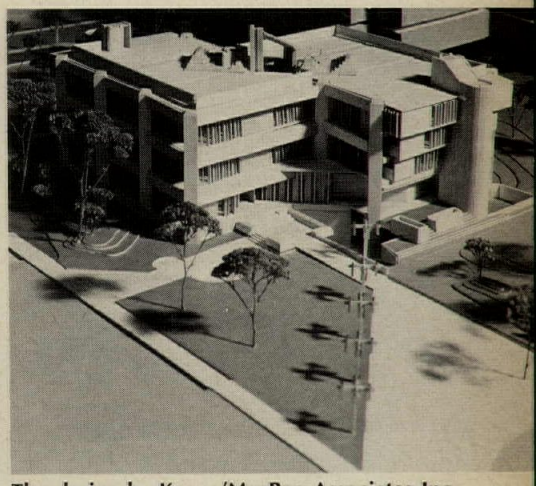
The design by Schenkel, Schultz and Huddle, Inc., Fort Wayne, with Philip L. Hodge as project architect and designer, organizes the building around a central skylit hall. The lower level would be used for exhibition area, lounges and circulation. The central vertical space would orient the architectural studios above to activity areas below. The structural system, say the architects, "consists of two pairs of deep girders located at approximate quarter points running in each direction with the intersections forming four 'tower' areas which house elevators, toilets, stairs, ducts and electrical gear."



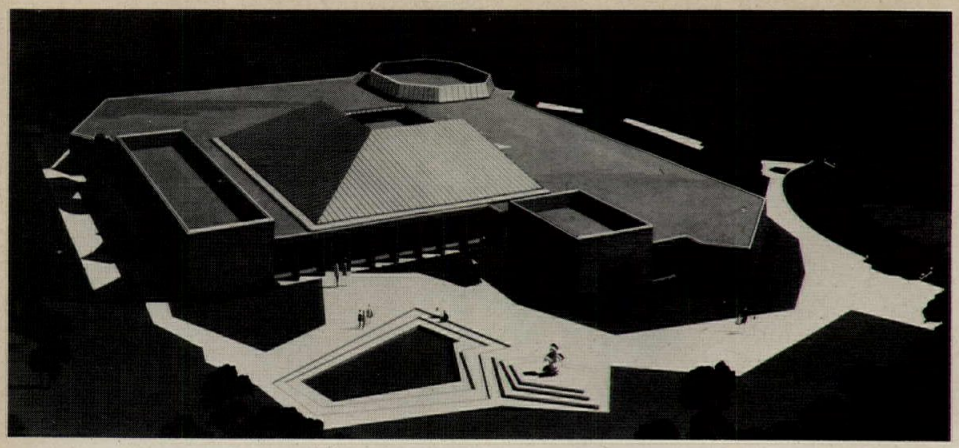
The winning design by Melvin D. Birkey of South Bend was designed "to create a learning space in which the student would have a maximum opportunity for individual expression," says the architect. "The basic geometry of the design consists of the square with all spaces generating around a symmetrical axis. The central 30 by 30 modular learning space creates a strong vertical core and interlocking elements for the two larger 60 by 60 squares expressed in the upper mass. The interlocking concept of the plan is a result of an effort to establish a close functional relationship between student and learning facilities. The 30 by 30 modular learning space is designed to accommodate staff, seminars, material resources, etc. with maximum flexibility and to closely relate with perimeter studio spaces. The perimeter concept of natural lighting provides uniform glare-free exposure on an equal basis to all studio spaces and creates spatial variety from floor to floor."



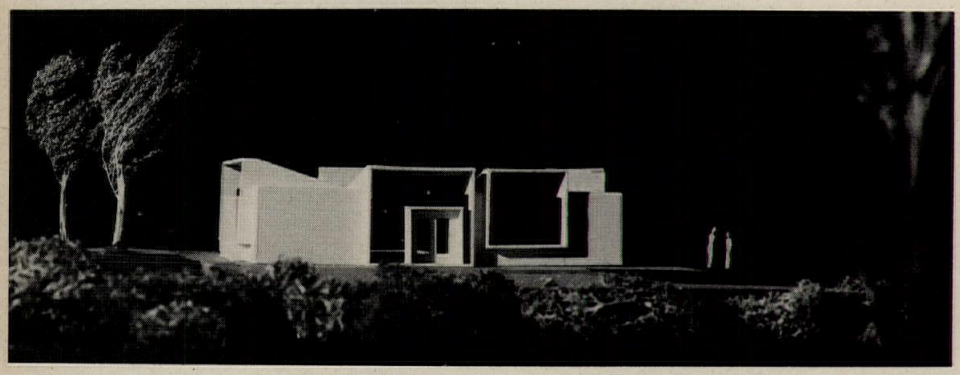
The design by Fleck, Burkart & Shropshire, Indianapolis, with Robert A. Fisher as architect and designer, has a vast sloped wall of glass to the north as an expression of the building's studio work spaces. The spaces on the south side of the spine will be fixed-use with permanent partitions. The other spaces will have semi-permanent or demountable partitions. Therefore, say the architects, "all spaces except those on the south side of the spine are alterable as educational requirements and techniques change." The structural system would be steel trusses 23 feet on center, spanning between sloping trusses on the north face and steel frame in the walls of the spine corridor.



The design by Keene/MacRae Associates Inc. & Richard Paul Miller, Elkhart, with Donald E. Sporleder as design consultant, would provide column-free, flexible loft space above "public contact" areas at lower levels. The structure is described by the architects as "primarily a skeletal system comprised of multiple frames interconnected by spandrel beams and the floor framing. The bay sizes are 30 by 60 feet, grouped in 15 space modules allowing an almost complete 'one room concept' for flexibility. A prominent design element is an "exploded column," a column at regular grid points expanded to contain a useful space—for integration of mechanical, electrical and circulation spaces.

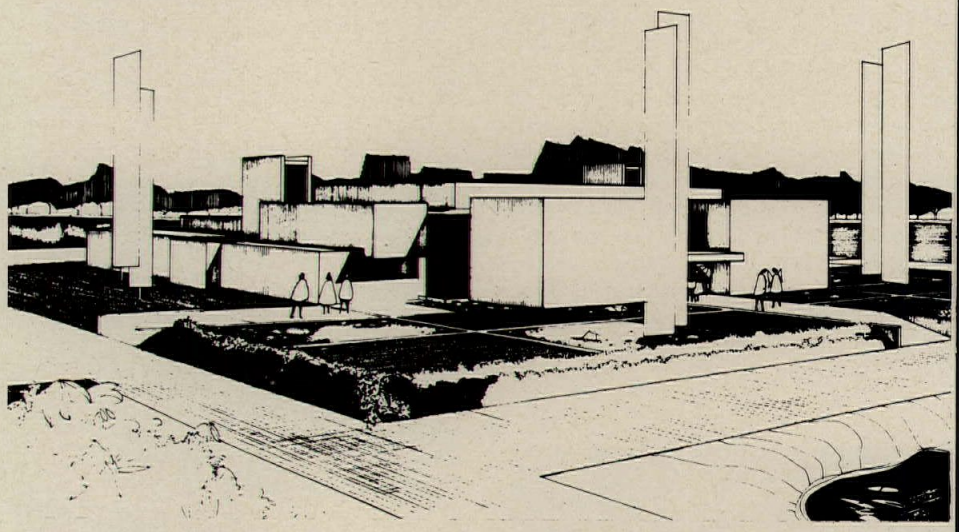


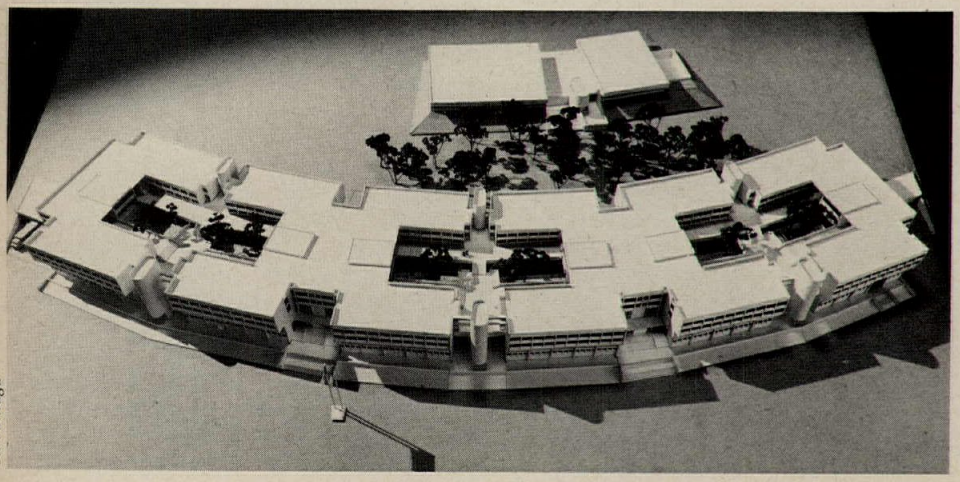
A junior high school in Eureka, Missouri, designed by Pearce and Pearce, Inc., Architects, will initially serve 400 seventh and eighth grade students, and then will become part of a four-building high school complex for 2,000 students. The building will contain two large open educational laboratory spaces, each equivalent to eight to 10 classrooms. It will also contain areas for arts and crafts and general sciences, each defined by temporary walls, and a combined dining and physical education area. The $515,490 project will have a steel structure with masonry exterior. The landscape architect for the project is Robert E. Goetz & Associates and general contractor is H. Kissel & Sons.



Two new offices for Citizens State Bank of Puyallup, Washington, being constructed on sites near Puyallup, will have six roof sections, varied in both width and slope, rising approximately six feet above roof line. Architects for the buildings are Harris & Reed. The roof sections will have tinted glass extending from the top to floor level. Floating within these expanses of glass are the vault, manager's office and two bank entrances. The exterior of stained horizontal cedar siding flows into the interior. General contractor is Neeley Construction & Cabinent Company.

A broadcast communications center for WLCY-TV and Radio, St. Petersburg, Florida, designed by C. Randolph Wedding & Associates, architects, will be a two-level building containing 33,000 square feet. The building will house two radio studios and two color television studios along with their ancillary facilities. The $500,000 building is being constructed of concrete block with bar joists and concrete floors and will have stucco on the exterior. Because of the heat load generated by the lights needed for television, fenestration has been kept to a minimum—the only windows being in the stairwells and entrance lobby. Occupancy is expected this April and the general contractor is D.E. and S., Inc.



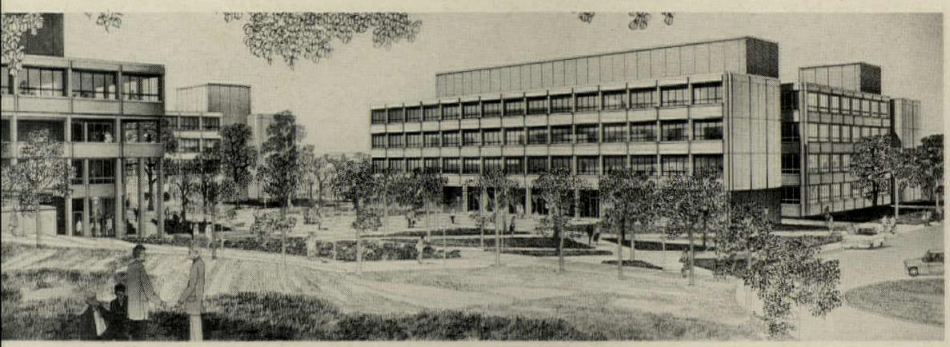


Gil Amiaga

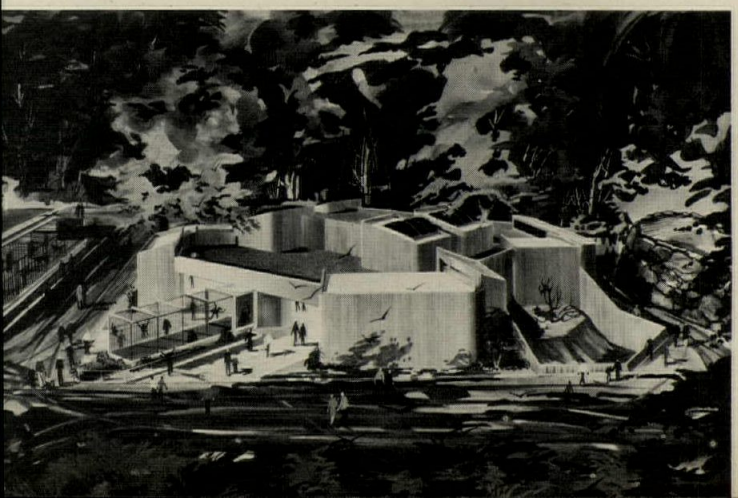
The Saw Mill Rehabilitation Center, Bedford Hills, New York, is a 600-bed facility for the treatment of female narcotics addicts. The building was designed by Curtis & Davis, architects of New York, to emulate a densely populated urban community, the type of environment from which many of the patients will come. The patient population is divided into living units of 200 on the upper two stories, each grouped around a quadrangle. Located below are a major pedestrian mall, and a linear service tube running the length of the building at its lowest level. Other facilities are arranged in relation to living units. The project is being constructed by the State's Mental Hygiene Facilities Improvement Fund for the State Narcotics Commission.

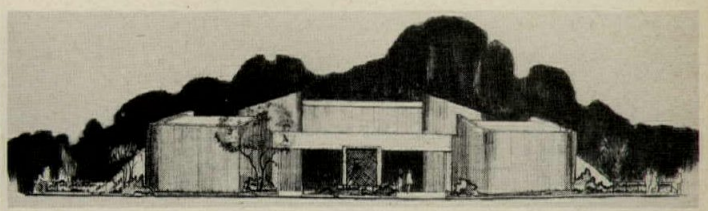
The arts building at the Fashion Institute of Technology, New York City, is part of a continuous and in some places interconnected expansion program which eventually will define and enclose a campus space by spanning a street. Architects for the project are de Young & Moskowitz, with Philip de Young as partner-in-charge and Youssef S. Bahri as project designer. The arts building will have six stories with a steel structure and limestone facing. Included in the $7-million project will be amphitheater and lecture halls, faculty offices, laboratories, and skylighted studios on the top floor. The building is part of a $32.6-million first-stage expansion program which will also include a student union, academic building and design laboratory/library.

The Student Cafeteria Building, at Queensborough Community College, New York, will be organized around the main lounge with its high sloping roof. The main lounge will be encircled by auxiliary lounges of varying heights and moods. The mezzanine level will be connected by a pedestrian bridge to an adjacent structure. Located below lounge level will be a 600-seat cafeteria served by a basement service level. The building will contain 39,640 square feet and will cost approximately $1.5 million. It will have a steel structure with brick exterior. Architects are Holden, Yang, Raemsch & Corser in association with F. P. Wiedersum Associates, with John Yang as partner-in-charge of design.



The Humanities Building, also at Queensborough Community College, New York, will have four stories and will provide 50 classrooms, two lecture halls each seating 75, and a 950-seat auditorium. Architects are Holden, Yang, Raemsch & Corser in association with F. P. Wiedersum Associates, with John Yang as partner-in-charge of design. The building, which will contain 171,862 square feet and cost approximately $4 million, will have an exterior of precast concrete, brick and glass.





The Primate House, Overton Park Zoo, Memphis, Tennessee designed by Dean E. Hill and Associates, architects, will have four center cages for large primates, with smaller primates displayed around the perimeter of the enclosed area. Outdoor display areas ring the exterior of the $500,000 building. The walls are poured-in-place reinforced concrete with reeded hand-hammered finish. The cage forms rise from the ground and express themselves above the roof.

YOUR CLIENT
MOVES TO THE SUBURBS
FOR THE SCENERY

WHY NOT LET HIM
SEE IT?

THOSE ARE
VENETIAN BLINDS
ON THE WINDOW.

YOU CAN BARELY
SEE THEM? THAT'S THE
WHOLE IDEA. THEY'RE
LEVOLOR RIVIERA BLINDS;
A CAREFULLY ENGINEERED
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COMBINES FUNCTION
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ONE-INCH-WIDE
ALUMINUM SLATS, NEATLY
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INVISIBLE POLYESTER
LADDERS. AND, FOR AN
ENCORE, TRANSFORMS
EACH TILT CORD INTO
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YOU CAN'T SEE THE
RODS? DON'T WORRY
ABOUT THEM.
JUST ENJOY THE VIEW.

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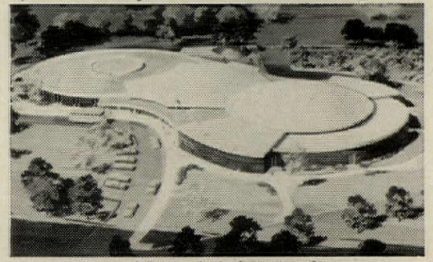
School Board chooses Gas heat over

(That's just on first costs.
So it's just first savings.)



Architect: Sigman & Tribbie, A.I.A., Coshocton, Ohio
Engineer: Ballard & Assoc., Canton, Ohio

The School Board of Ridgewood High in West Lafayette, Ohio got Gas and electric heat bids from independent contractors.

Here's what they found: Electric came in at $2.59 per square foot for the 60,000 square foot school. The Gas bid was only $1.95. The difference adds up to a big $38,200.

Another first-cost savings came from the $15,000 that the school didn't have to spe on heavier wiring and the sophisticated controls neede with electric heat.

But the savings from Gas heat go on. Because the

For more data, circle 30 on inquiry card

lectric and saves over $50,000.

rating economy of Gas goes
or as long as you use it.
his school is no isolated
e. There are many other
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value of competitive bids
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o if you're looking for a
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any other installation, take a good look at Gas heat. Just call your local Gas Company.

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For school heating, Gas makes the big difference.

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"Architecture cannot build the sacred"

After reading your editorial comment in November's feature "New Architecture for the Changing Church," I felt it necessary to reflect again on all that was said at the recent "International Congress on Religion, Architecture and the Visual Arts." The last paragraph of your editorial implied that the new Saint Vincent Monastery designed by Tasso Katselas identifies with the thrust for the monumental holy place represented by the position of Philip Johnson at the recent Congress.

When one sees from the exterior the size of the Saint Vincent Monastery (200 cells) one might be inclined to make this identification. However, one must understand in what sense the word "monumental" was used at the congress, and this sense must be interpreted in terms of the functions of the articulated spaces along with the intentions of the occupants and of the designer himself.

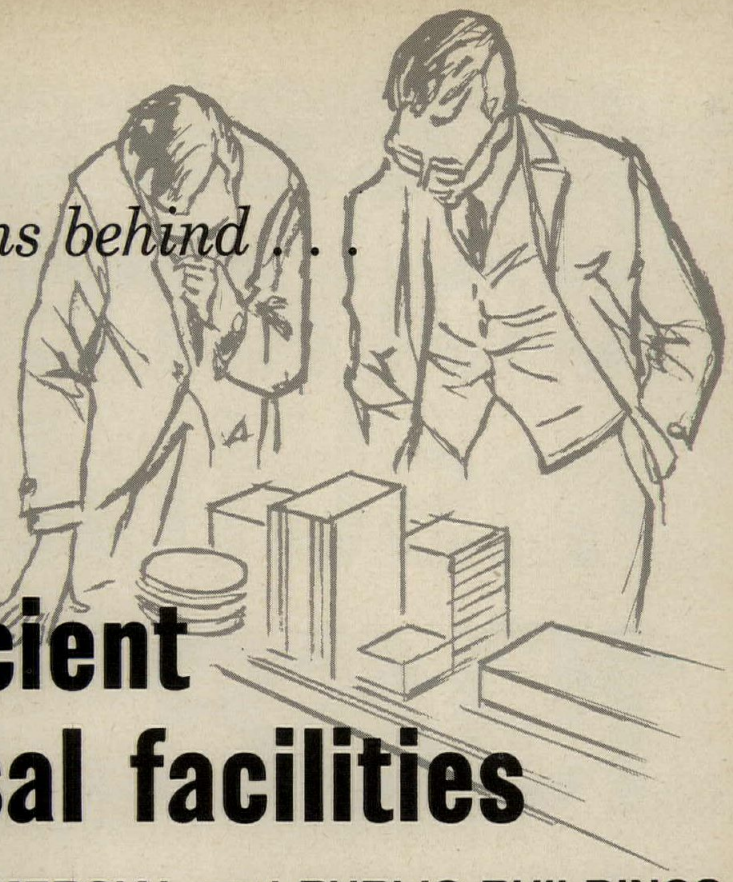
Dom Frederick Debuyst, a leading exponent of the position contra "monumentality," has made it quite clear that his position stresses the "world of living persons over that of objects, and hospitality over monumentality." His position emerges from a theological posture that does not seek the "sacred" in a place (monument) but rather in the world of living persons (interpersonal and assembly experiences on a human scale). His thrust therefore is to de-emphasize the cathedral image in church building which tends to monumental structures intended to symbolize the holy, the architecturally articulate "sacred space" or "holy place" which the Canon Francois H. Houtart believes is to conceptualize in a quasi-magical way. For this reason even the shrine church of Notre Dame du Haut at Ronchamp (which seats only 40 people inside) may be considered a kind of neo-sacralizing monument making. It attempts to articulate the sacred place with a kind of architectural mystique that emphasizes exteriority (architectural image as meaning) over and above service to interiority (the religious experience values of living people).

The Saint Vincent Monastery presents itself architecturally much like another residential building. It is designed to house the daily living needs of a group of celibate men who are engaged in a variety of work including educational, missionary, and pastoral activity. The interior consists mostly of cells (rooms) for each monk; each has sink, bed, desk, chair and closet; toilet and bath facilities are centralized. Two small chapels and several recreation rooms are provided for obvious reasons. The building does not attempt to be a sacred monument in the sense of the Breuer church; neither does it attempt to be the "great and holy place" sought after by Philip Johnson. It has attempted to provide a realistic human living place in our time for a group of living men. Inasmuch as one, several or many of the monks might achieve spiritual depth while living there we might be able to label the place holy; however, only time and the witness of these living men will provide that dimension for consideration. Architecture can only give service to living people; it cannot build the sacred.

I believe the issues raised at the congress are relevant to architecture far beyond the questions of the sacred place. An architecture for the human dimension of living creates life for all of us. We should indeed be cautious of the arch

more letters on page

problems and solutions behind . . .



planning efficient refuse disposal facilities

FOR APARTMENTS . . . COMMERCIAL and PUBLIC BUILDINGS

Many relatively new buildings are currently undergoing expensive alterations to provide more efficient refuse storage and disposal facilities. Solving problems caused by this un-ending flow of voluminous material requires enlightened planning and extensive knowledge of laws, trends and the techniques of the people who must ultimately dispose of it.

More Legislation Coming

Federal, state and local concern over air pollution is breeding a rash of legislation and statutes that impose strict standards on private and public incinerators. Many apartments and other buildings have had to shut down their incineration systems; and the shift to another disposal method has required extensive alterations to provide storage areas and access passage for the refuse collector.

Vast Technological Change

In addition to switching from incineration, other factors have forced major changes in refuse disposal practices. Mushrooming urbanization and surburbanization added to the population explosion have pushed once nearby disposal sites many miles outside the city. This has caused many vast technological changes in the techniques of refuse storage, collection and disposal.

Bulk Handling Techniques

To achieve economical payloads, handlers have turned to large-scale containerization and compaction equipment which mashes and reduces the refuse to a fraction of its former volume. Some of this compaction equipment is truck-mounted, some of it is stationary and mashes the refuse into large portable containers. All of it requires two things: provision for storage space and access passage for a container, a truck or a conveyor.

The Architect's Dilemma

With handling methods varying widely from city to city and with new conditions and laws causing frequent, major changes, the architect is hard-put to design a lastingly efficient refuse system for his project. One answer is to seek the assistance of a knowledgeable expert in future refuse trends, techniques and handling equipment.

The Refuse Consultant

A coast-to-coast network of Dempster Refuse Consultants is currently collaborating with leading architects to provide workable systems for a multitude of widely varying types of projects. Their counsel is also available to you, without cost or obligation of any kind. Your nearby consultant can help, even after the walls are up, but it's better to talk to him while it's still on the drawing board. He reads blueprints and can check out several projects in a short time, giving you specifics, optional courses or a pat on the back for a job well done.

Write today for his name or a free copy of the new booklet "Futuristic Trends in Refuse Handling".

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Knoxville, Tenn. Dept. AR-2

Please send:

- ☐ **Name of nearest Dempster Refuse Consultant**
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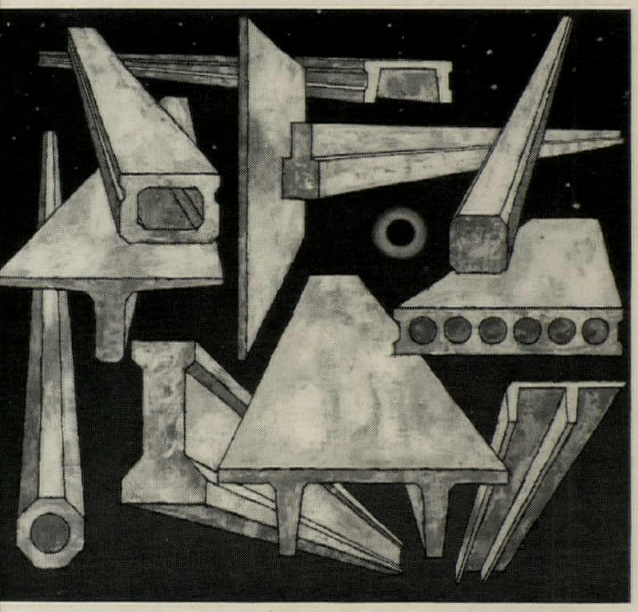

Purpose of the PCI Annual Awards Program is to recognize excellence in design using precast and/or prestressed concrete.

Attention in judging will be given to the use of precast and/or prestressed concrete to achieve aesthetic expression, function and economy. Importance is placed on the use of the structural system as an expression of design intent and to enhance the function of the project.

Interesting methods of systems integration will also be recognized as will ingenuity in the use of materials, methods and equipment to reach an outstanding solution.

Bridges will be judged as a separate category.

Any kind or type of structure in the United States or Canada using precast and/or prestressed concrete may be entered. Structures completed within the last three years, or those that are substantially completed now, are eligible for this year's program.

Because of broad diversity in the nature of problems offered to architects and engineers, no first place Award will be made, but all Awards will express equivalent recognition of a high level of excellence.

ELIGIBILITY: The Awards Program is open to all registered architects and engineers practicing professionally, and government agencies, in the United States, its possessions, and Canada, except Directors of PCI and all Active Members and their employees.

SUBMISSION OF ENTRIES: Entries must be made by the designer of record. An entry shall consist of the following:

1. The first page of the entry will be a "fact sheet" stating the following:

A. Type of project.

B. Size in total square footage, or in the case of bridges—the length.

C. Number and dimensions of precast components and prestressed components (and whether the latter are pretensioned or post-tensioned).

D. Special design features you wish emphasized for the purposes of judging.

E. Date structure was completed or is scheduled for completion.

2. Concise description outlining the advantages achieved by the use of precast or prestressed concrete, typed on 8½" x 11" sheets.

3. A minimum of two 8" x 10" photographs and two 35mm color slides of the completed or substantially completed structure. Detailed photographs, plans, perspective drawings, or large scale details if considered significant by the entrant.

4. Design computations and specifications if they show to a greater extent the design aspects of the entry.

5. Anonymity of entries will be preserved throughout the judging. A sheet giving the proper name of entry, type of structure and location, names and addresses of architect, engineer, and owner, and the date of completion shall be sealed in an envelope affixed to inside back cover of the entry.

All the above to be bound in ring or other type binder, approximately 10" x 12". Entries to be received not later than May 15, 1968, at the Prestressed Concrete Institute, 205 W. Wacker Drive, Chicago, Illinois 60606.

NOTIFICATION OF AWARD: Notification of Awards to entrants will be made as soon as practicable after judging is completed.

OWNERSHIP AND PUBLICATION OF ENTRIES: All entries and all material submitted with entries shall become the sole property of PCI.

Since one of the purposes of the PCI Awards Program is to encourage new and advanced architectural and engineering approaches in the use of precast or prestressed concrete, the Prestressed Concrete Institute shall have the right to make all entries and all material submitted with the entries available through publication and dissemination editorially, or in advertisements in its own or other publications. This shall include the right to publish photographs and names of any and all Award recipients without compensation.

The decision of the Jury of Awards shall be final.

By taking part in the program, the contestant agrees that he or she shall have no claim against the Jury of Awards or any member thereof, or the Prestressed Concrete Institute or its individual members.

Address all communications concerning this Awards Program to:

Prestressed Concrete Institute
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continued from page 48

tect who wants to build grand and overwhelming spaces; in hidden ways the "tower of Babel" ambition taps important human resources; our design and construction resources should work to create solutions for crises areas in human living in our mass culture.

The pharaohs built huge pyramid tombs in Egypt at a great cost to the people. We have architects among us who would erect grand tombstones for themselves if we could be sold. Many Christians today, aware of this fact, will have no part of tombstone architecture. The neo-sacralizing mystique is not a problem limtied to so-called religious architecture; tombstone monumentality in architecture for schools and government buildings is often glossed over with the mystique of architectural criticism, a kind of aesthetic mysticism. One real way to deal with the problem might be to have every architect, after he has "made it" for five years, live six months in one of our great city slums.

Rev. Roman J. Verostko, O.S.B.
Staff Editor for Art & Architecture
The New Catholic Encyclopedia
Faculty, St. Vincent College & Seminary
Latrobe, Pennsylvania

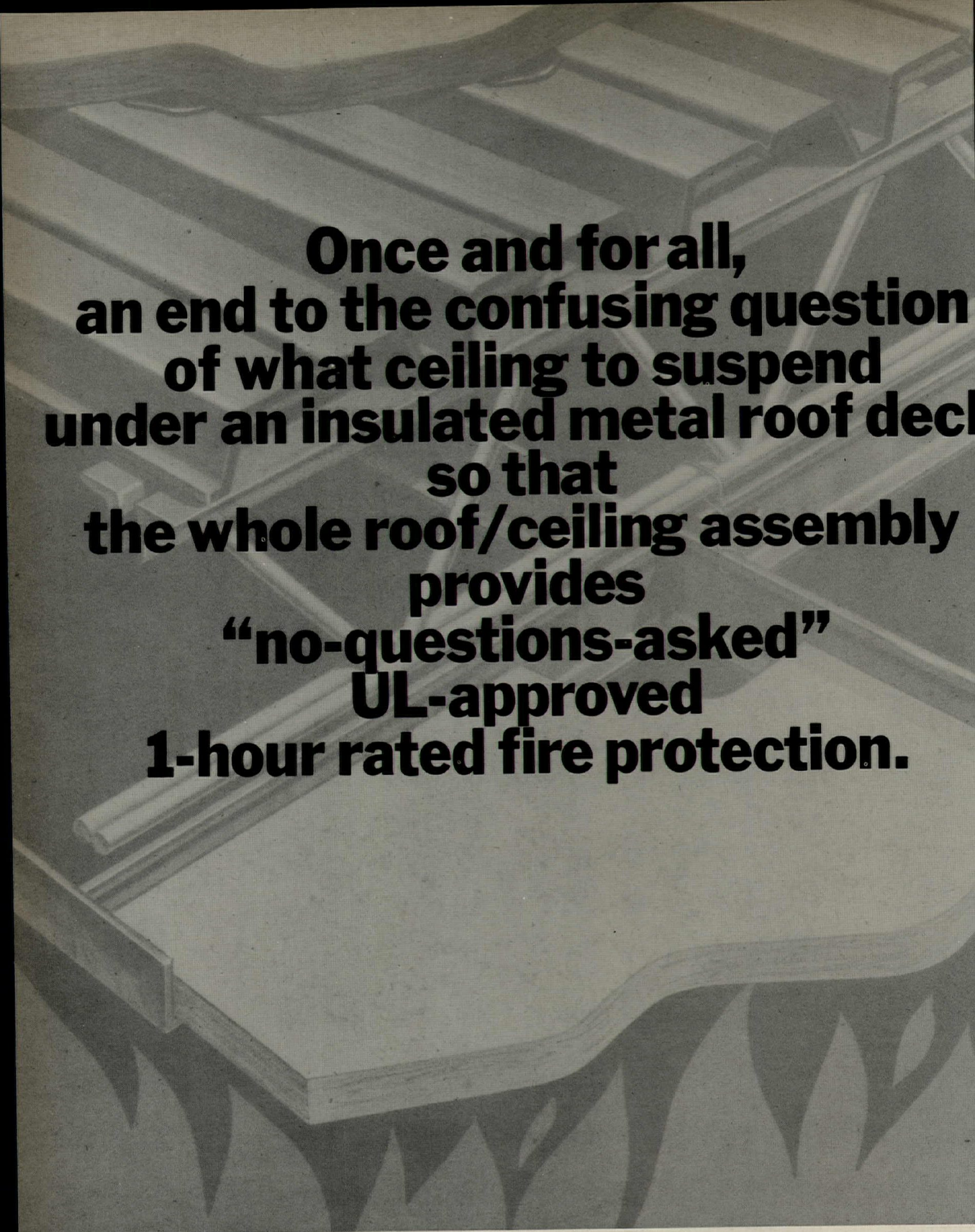
Your interesting report on the New York Congress gave me the impression that you rather supported Philip Johnson's views and that you used both the church by Breuer and Saint Vincent's monastery to illustrate the validity of his arguments. I believe that the two cases are entirely different and even opposite.

Breuer's church is a "great," but a typically monumental and neo-sacral, building, a fine exponent of "overscale imperialism." In its essence, it is a sculptural *shape*, with an enclosed *single* space suggesting "infinity." Materially, this single shape is as high as the *six* stories and 200 cells of Tasso's building. In such a space, the world of objects must unavoidably prevail over that of persons, exteriority over interiority, monumentality over hospitality. To realize this, it suffices to look at the extraordinary "chapel" for the Blessed Sacrament, which is 18 steps higher than the main altar (function!), which is itself situated in a purely optical setting, etc.

What now about Saint Vincent? The interior environment created by Tasso Katselas—I verified the fact myself— is first of all an extremely warm, human and hospitable experience. It marks out "fraternal hubs" which are found all over the building, without ever allowing any part to take on or suggest the atmosphere of a big machine or of a monument.

more letters on page 56

The LCN 2016 Closer is concealed in the head frame above the door. Arm disappears when door is closed.



Once and for all, an end to the confusing question of what ceiling to suspend under an insulated metal roof deck so that the whole roof/ceiling assembly provides "no-questions-asked" UL-approved 1-hour rated fire protection.

Fire codes can be complicated. Interpretations can vary. But when you must make a decision, you'd like to be certain.

Armstrong has eliminated the confusion and provided the certainty.

The Armstrong Ceramaguard™ Roof/Ceiling Assembly recently achieved a full 1-hour time-design rating from Underwriters' Laboratories, Inc. This make the first—*and only*—roof/ceiling assembly, using insulated metal roof deck and lay-in ceiling panels be UL tested and fire-rated as a unit.

Like complete facts and specs on this economic practical alternative to plaster? Write Armstro 4202 Rock Street, Lancaster, Pa. 17604.

CEILING SYSTEMS BY
Armstrong

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continued from page 52

Respect for persons and feeling for the group attain here a remarkable synthesis, one which we have not found in any residential building. And yet it is, essentially a residential building.

Breuer's concept of a church, like Johnson's, is a typically 19th century concept. In St. Vincent's monastery, speaks the real post-conciliar Christian, and I am, for my part, entirely with him.

Fr. Frederic Debuyst, Editor
Art D'Eglise
Abbaye de Saint-Andre
Bruges, Belgium

A sacred space is impossible to define—was the Acropolis sacred—the Pantheon —the Electric Circus? Each moves you "spiritually," yet the technological implication of the latter demands neon crosses and communion by computer as normal extensions to present-day compulsive expressionism.

The theologians' argument is extreme, yet valid. A call for awareness toward the human condition and its need to touch intimately with the church on a scale both may apprehend. A colossal structure used once a week is not the answer. Churches that tower and twist are thrust on our environment not because they should be, but because technology says they can be. Expression must generate from a much healthier architectural synthesis, where design involves the very life and activity of the present day church and grows out of this understanding into whatever it becomes. The monastery, as was clearly pointed out in your article, reached for this understanding and expression from the character of the activity, and I hope its meaning was not obscured by the editorial.

Philip Johnson's plea, however eloquent, for great and lasting buildings simply misses the point. A 20th Century liturgical space becomes great only if it recognizes human use, lasts only by answering a need born out of process. These requirements do not seem unreasonable even though they have little to do with marble or gold. Too often a garage answers them more effectively than a pseudo cathedral. Clarity occurs when a garage works best as a place of worship; why this one and not the other. Perhaps, the light, the acoustics, the height, the slope of the floor, the materials—all are factors seeking the most effective vehicle to assure affinity, reality, communication, born from the process of life to support intrinsic movement that continually verifies its authenticity.

Tasso Katselas
Pittsburgh

more letters on page 57

continued from page 56

What about scale?

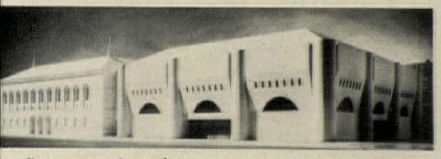
Horrified! is the word more nearly expressing my feelings upon viewing Mr. Johnson's proposed design for the addition to the Boston Public Library in the December issue.

In the not-too-distant past, this McKim, Mead & White building was considered by the architectural profession and the knowing public one of the ten most beautiful buildings in America.

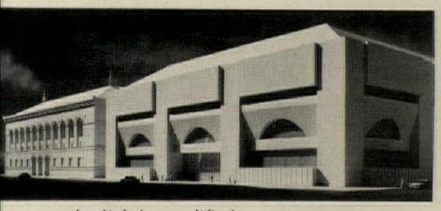
It now appears that "scale" is not considered as important as it was in classical and period design; however, in this case where there is such a vast difference, I would hesitate to place them close to each other, much less to join them.

It is hard for me to understand how his design was ever sold to discriminating Boston.

Edwin A. Early, architect
Washington, D.C.



he first was rejected.



he second, slightly modified.

he design which we showed is Johnon's second—the first was rejected after had been severely criticized for its brutal scale" by the advisers to the Lirary trustees as well as by Sanford Anerson (M.I.T. teacher and architectural ritic who wrote a scathing attack in the oston press). This second design is ightly modified as a result of this criticism, and Johnson himself is reported to elieve it is better than the first.

reen thumb?

nce it is symbolically planted in the arden of our national capital and atered by the blood of my April 15 eauty subsidy—The Hirshhorn Museum ust be subject to public appraisal.

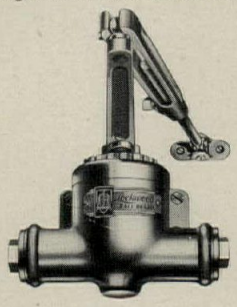
Apparently, the collector is adept in any things except design. The proposion you publish has all the grace and ignity of an elephant leaving the scene. he scheme is both over-ripe and underveloped. It is just plain bad.

Charles Colbert
New Orleans

No one notices a closer'till it breaks down

Meet the Door Closer nobody notices

We have been in the business of making unnoticed closers for years. Well, almost unnoticed. You see, our old standby the Lockwood Ball Bearing Door Closer (accepted by many architects as the best working door closer in the world) has one hang-up — it's not too glamorous, in fact, some might say it's downright ugly — although it works beautifully.



Lockwood's unglamorous ball bearing door closer.

Several years ago, architects began asking the industry for a streamlined unnoticeable closer — one that would blend with modern decor of a building. The problem was getting all the parts — the heavy rack and pinion and powerful steel spring — into a narrow case. Something had to be sacrificed — the compromise showed up in performance. Then building owners noticed that sleek, streamlined, but inoperable closer. The closer's *only* true function became apparent — controlling the door. It was obvious that the job of developing an unnoticeable streamlined closer would be tough but it had to be done sooner or later. Since Lockwood made the best closer for years, nothing less in a streamlined door closer was expected — the price of leadership, as the man said.

230° Design Theory

Lockwood's basic design theory was simple — put more into the closer, make it the best. The best place to start was in the opening range. *The New 180 Series Closer opens to a full 230°.* You'll have to go a long way to find a door that opens that far . . . so why the 230°?

First, let's focus on the very heart of the closer — the spring. *Since the 180 Closer is never opened to its greatest capacity (230°) the spring is never fully compressed, thus eliminating metal fatigue* — one of the primary causes of breakdown.

Secondly, by adding an extra 50° to this normal 180° opening, the door is always under total control from the point of release to latching. When a door using a normal closer is opened 180°, the spring in many cases is fully compressed or the closer has reached its mechanical limit. When the door is released, there is always a certain amount of free swing and "bounce" — then the power of the closer takes over. *With the 180 Series, the closer is already 50° into its closing cycle and control is immediate.*

Lockwood's "More" Theory

There is more of a spring in the 180 Series — it's longer and it's made of the same durable steel used in automobile valves.

The piston is larger too, with a long stroke moving *more oil* for better door control.

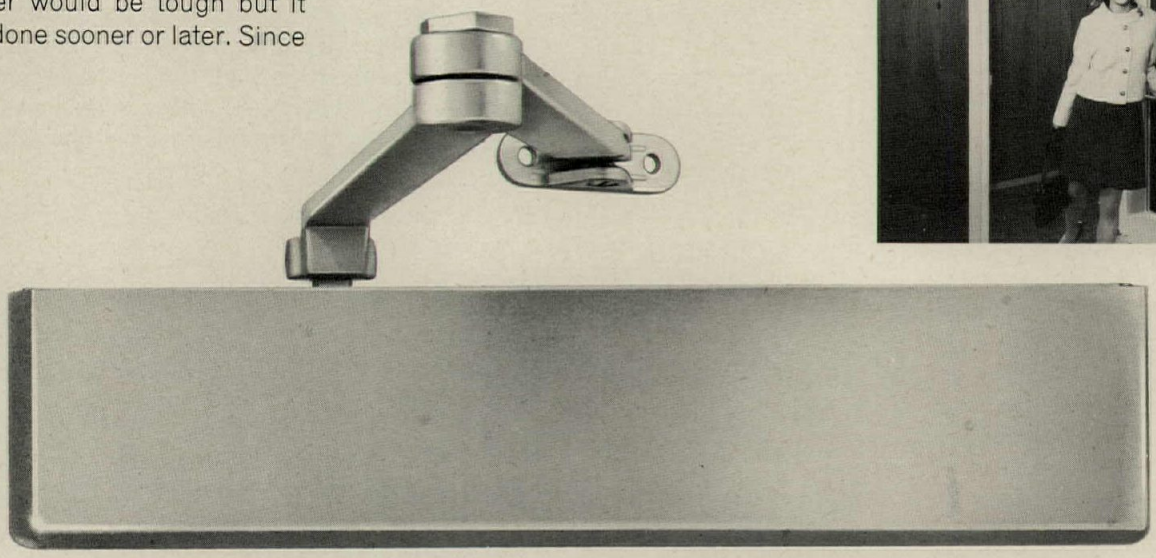
The *case is cast iron* — made in a special way to cut down porosity and eliminate leakage. Add to this a three valve control system — one for closing speed, the second for latching speed and a third for backcheck.

Just one more thing! Although the heavy die cast cover isn't usually subjected to wear, we ribbed the inside for strength — just in case.

Two types of 180 Series Closers are made — surface mounting and concealed (which is almost completely impossible to notice). All standard arms and finishes are available.

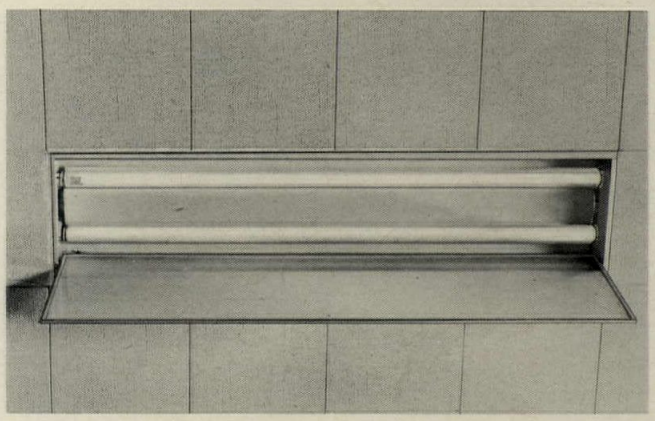
It took quite a while for Lockwood to come out with the 180 Series Closer but we think you'll find it was worth waiting for. To avoid any further delay we're putting them on the shelf in all available sizes, functions and finishes — Your wait is over.

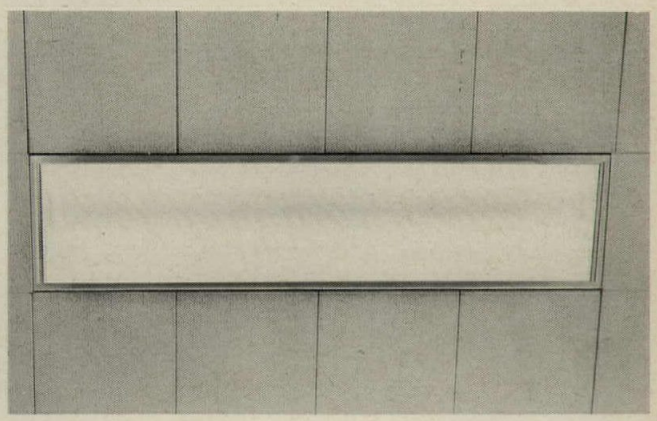
Anyone notice the closer?



Lockwood Hardware Division ILCO ILCO Corporation, Fitchburg, Massachusetts

New steel-pin hinged frame for easier handling, installation and maintenance.





OPEN: there's the strength of a steel frame, bonded to the prismatic glass lens. Permits confident handling and quick installation. Its integral steel-pin hinge makes maintenance easy. Has built-in, lifetime vinyl sealer flaps to keep light in, dirt out. Best for air-handling fixtures, because lens remains firmly seated. Widest range of dimensions, too.

SHUT: you barely notice the mini-frame. You do notice the light transmission; up to 15% more light per energy dollar. And you do notice that glass can cut cleaning costs as much as 25%. Glass that won't yellow, sag, warp, burn, or attract dust.

Now, from Corning, you can have the most efficient and attractive material adaptable to any fixture. For complete details, write to Building Products Dept. 8502, Corning Glass Works, Corning, N.Y. 14830.

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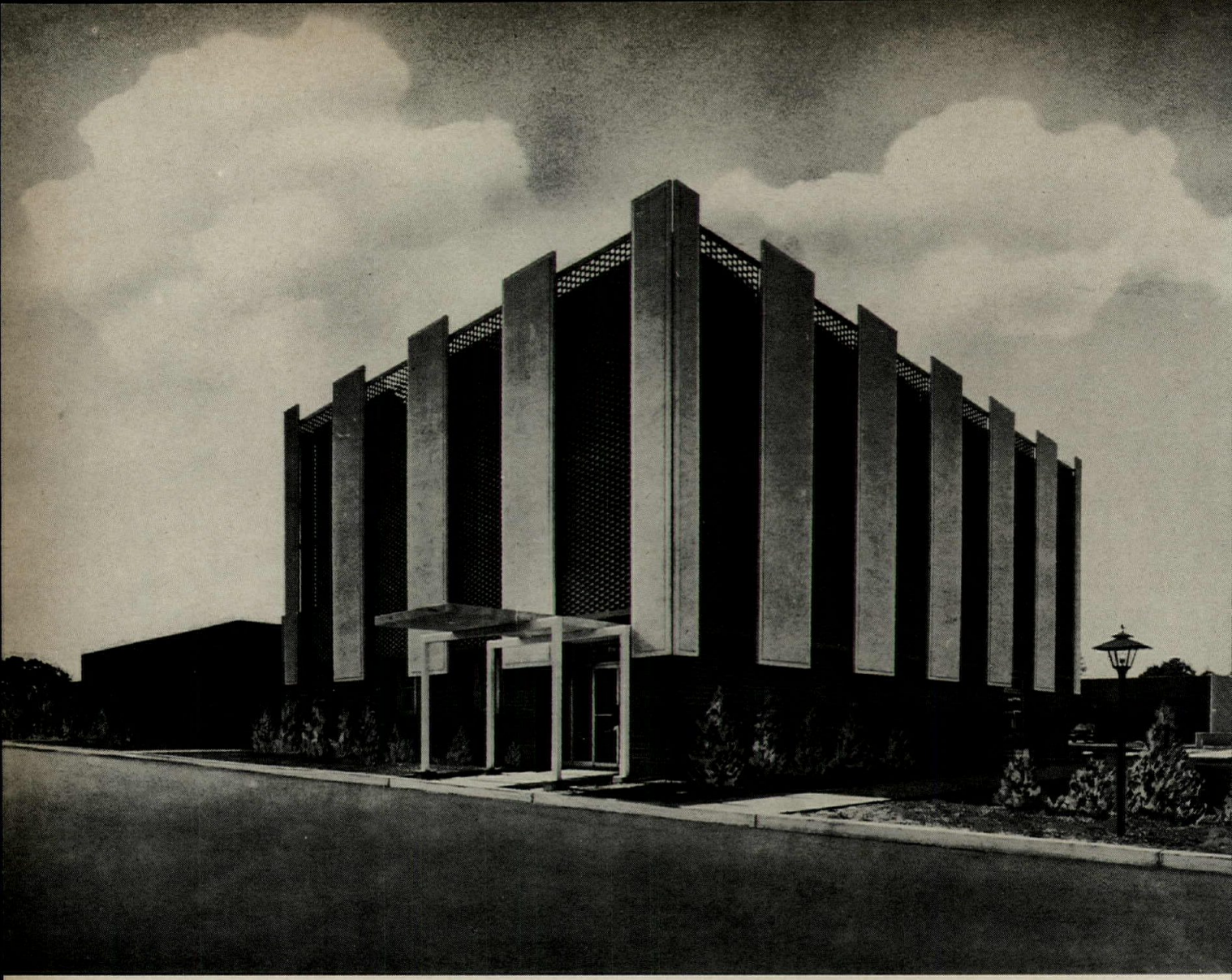

Architect: Walton & Madden, Riverdale, M
Screen erected by: Acme Iron Works, Inc., Washington, D

BORDEN DECOR PANEL AS BUILDING FACADES

Shown above is Deca-Grid style Borden Decor Panel used as a facade for the Pargas, Inc. building in Waldorf, Maryland. Set off by piers of white precast stone, the sturdy aluminum Deca-Grid panels are finished in blue HINAC, Pennsalt's new finish for metals.

This Deca-Grid installation has tilted spacers, a feature called the Slant-Tab variation wherein spacers may be mounted at angles of 30°, 45°, 60° or 90° as desired. The Slant-Tabs may be further altered by use of non-standard angles, or lengthened tabs.

All the Borden Decor Panel styles, including Deca-Grid, Deca-Gril, Deca-Ring and Decor-Plank, are highly versatile in design specification and in application as facades, dividers, grilles, fencing and the refacing of existing buildings. In standard or custom designs, Borden Decor Panels provide a handsome, flexible, maintenance-free building component.

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Illinois court demands re-think of limitations statute

The Illinois Supreme Court has put a crimp in the national drive by the A.I.A. to limit the professional liability of architects in connection with buildings they have designed.

Late last year the court declared unconstitutional Illinois' new law that would ban negligence suits against architects, engineers or contractors for failures that occur more than four years after the building is completed.

Illinois was one of the first of some 30 states that have enacted similar "statutes of limitation." The test case is widely regarded as having national significance since similar suits are now likely to be brought in other states.

Illinois' law specifically said "no action to recover damages for any injury to property . . . or person . . . shall be brought against any person performing or furnishing the designing, planning, supervision of construction or construction of such improvement for real property, unless such cause of action shall have accrued within four years after the performance or furnishing of such services and construction."

The court agreed that the law was discriminatory since it did not protect the owner or building materials producer as well. It added, however, that the law appeared to be invalid also because strictly speaking it was not a "statute of limitations." The court said:

"A statute of limitation normally governs the time within which a legal proceeding must be instituted after the cause of action accrues." In this case however, the court added, the law "goes further and bars a cause of action before it arises."

Some states limit liability to four years, as in Illinois, while others extend it to 12 years.

Housing and health criteria issued by HEW

Proposed housing criteria to help solve substandard housing problems of big city ghettos are currently being distributed to state and local public health workers in this country by the Public Health Service's National Center for Urban and Industrial Health in Cincinnati, Ohio.

The document, "Recommended Housing Maintenance and Occupancy Ordinance," was developed in cooperation with the American Public Health Association, and supplants the Association's "Proposed Housing Ordinance" issued in 1952.

The Center's Office of Urban Environmental Health Planning has also issued pre-publication copies of a revised "environmental Health Planning Guide" to state and local health and enforcement agencies. This booklet covers health-related utilities and services such as water, sewage, solid wastes and air pollution.

HEW agency combines aged and rehab services

Increased and better coordinated rehabilitation services for the aged is one of the major goals of the new Federal Social and Rehabilitation Service, Mary E. Switzer, Administrator, told participants in the fourth Annual Medical Symposium at St. Joseph's Manor in Trumbull, Connecticut, last November.

The Social and Rehabilitation Service was established in August by HEW Secretary John W. Gardner. It combines and reorganizes programs formerly carried out by four separate agencies of HEW—the Administration on Aging, Vocational Rehabilitation Administration, Welfare Administration, and the Division of Mental Retardation of the Public Health Service. For many years head of the Vocational Rehabilitation Administration, Miss Switzer is now responsible for all HEW social service and rehabilitation programs, public assistance, medical services for needy persons, child health and welfare, and programs for the mentally retarded.

Revised standards for Hill-Burton assistance in the construction of hospitals and medical facilities were released in Public Health Service Publication 930-A-7, dated December 1967, available for 35 cents from GPO. The regulations include a new provision permitting use of heavy timber construction in one-story buildings when suitable fire separation is provided.

ARCHITECTURAL BUSINESS THIS MONTH

Federal aid processing time to be reduced by half

Short cuts to processing Federal applications for state and local assistance, announced in late October, cover a broad area of programs which cross jurisdictional lines and involve eight separate Federal departments and agencies. Measures under implementation are expected to achieve a 50 per cent reduction in Federal processing time.

The programs include such areas as model cities, neighborhood centers, housing for low-income families, and water and sewer grants, all of which require the participation and approval of more than one agency.

A Joint Administrative Task Force consisting of assistant secretaries and directors of eight Federal agencies, was assisted by four special teams for those agencies, plus literally hundreds of program personnel with assigned tasks from the various agencies.

Typical of results was HUD's report on speed-up of processing multi-family project insurance. According to HUD, a 63 per cent reduction will be achieved by simultaneous processing techniques, delegations to the field, improved production, planning and scheduling systems, creating of a data bank to eliminate re-submission of information, and increased pre-application consultation. These approaches have been tested in seven FHA offices as part of a comprehensive program originated and conducted by FHA.

Pennsylvania architects to probe service costs

At the 1968 seminar for the Pennsylvania Society of Architects, costs of architectural services will be discussed in the light of their meaning to design. P.S.A., together with representative groups of landscape architects and consulting engineers, have commissioned Enion Associates, Inc. to determine what costs are, and what they should be in order to furnish comprehensive services. One purpose of the study will be to determine what better results can be obtained with more appropriate and realistic fees charged to and accepted by those several state government agencies which are major clients. Professionals from adjacent states are invited to attend the seminar to be held March 30, 1968 at the Hershey Motor Lodge, Hershey, Pennsylvania. J. Harlan Lucas of P.S.A., at 321 Front Street, Harrisburg, is chairman.

Briefs

Stick to "water or sewer pump huts," and leave the design of buildings to architects, the Rural Electrification Administration has told the Consulting Engineers Council. CEC had complained that an architect wasn't needed to design an unattended dialing station on an engineered telephone system, but REA insisted on its architect-only policy for any REA-financed buildings.

The New Towns Development Act of 1967, proposed by Senator Abraham Ribicoff (D-Conn.) and now pending before the Senate Banking and Currency Committee, would authorize planning assistance to states for aid in designing new towns. States submitting plans approved by HUD would become eligible for long-term, low-cost loans from a revolving fund to be set up in the Treasury for purchase, development and sale of land for new towns, and for construction of necessary improvements.

Two architectural computer graphics courses are being offered as a series by the Harvard Graduate School of Design. The introductory program is a correspondence course in five installments. No special computer or mathematical skills are required. The advanced course is a three-day training conference at the University of Chicago for which 30 scholarships are available. For course descriptions and tuition information, contact Mr. Laurence D. Yont, Laboratory for Computer Graphics, Memorial Hall 114, Harvard University, Cambridge, Mass. 02138.

U.S. approval of new building products might be conducted by the National Bureau of Standards under a new concept patterned after the French "agrement." Once NBS experts tested the new product and had a panel of experts approve it, presumably the U.S. certification would prove beneficial in getting it accepted by the local code bodies.

More social analysis in "model city" proposals and less detail on prospective projects is the emphasis for "second generation" applications. HUD plans April 15 as the next deadline and HUD Secretary Weaver has promised to announce winners as soon thereafter as possible.

Revamping urban aid budgetary impact is the latest goal of national housing policy planners. Problem: each year "commitments" are made that don't really reflect cash flow, so there's less money to spread around from Washington. Latest idea: have cities submit "capital projects" budget so that only year-by-year spending shows up in the Federal budget.

National land use policy is sorely needed, says former Senator Paul Douglas, now heading up an independent commission on urban problems. HUD Secretary Robert Weaver agrees—feels states should run any land acquisition program with some Federal aid and guidelines.

New publications cover legal pitfalls, office costs, specs

Three new books bear on the practice of architecture:

LEGAL PITFALLS IN ARCHITECTURE, ENGINEERING, AND DESIGN. By Nathan Walker and Theodor K. Rohdenburg. McGraw-Hill Book Company, 330 West 42 Street, New York, N.Y. 10036. 260 pp., $11.95.

Coauthored by a lawyer and an architect, the book explains practical legal principles in nonlegal terms using simple, interesting examples and cases. Special forms illustrate the problems discussed.

THE ECONOMICS OF ARCHITECTURAL PRACTICE. By the A.I.A. Documents Division, 1735 New York Avenue, N.W., Washington, D.C. 20006. $6.00—A.I.A. members price $4.80.

Based on Case and Company and A.I.A. Task Force research, the book contains information on income, direct and indirect operating expenses, and profit. Numerous tables and charts are included.

SURVEY OF CURRENT PRACTICE IN THE USE OF AUTOMATED TECHNIQUES FOR SPECIFICATIONS. By the Stanford Research Institute for the CSI. The Construction Specification Institute, 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036. $9.00.

The report details current techniques, providing ideas and advice to upgrade from the simplest to the most complex systems now in operation.

CURRENT TRENDS IN CONSTRUCTION

George A. Christie, Chief Economist
F. W. Dodge Company
A Division of McGraw-Hill, Inc.

More about 1967: regional building patterns

1967 wound up as a fairly typical year of construction activity, but in a most untypical way. The past year's results have to be considered typical in the sense that the total value of newly contracted construction projects added up to 5 per cent more than in the year before. And that's just about as average as you can get in the light of recent experience records.

What was unusual about it was the way that gain was achieved. For the biggest part of 1967, contracting for new construction was lagging far behind the previous year's value. It was only because of a record burst of activity in the closing months that any gain was shown at all.

Last year's gains in building activity were shared by most parts of the nation as the big residential market recovered and nonresidential building held steady.

No important regional differences showed up in the *nonresidential* building totals last year. All in all, 1967 brought a continued high level of industrial, commercial, and institutional building—but with little growth—and each of the regions reflected that national trend.

Last year's *residential* building totals showed one surprising variance, however. Nationally, housing made a strong advance of 10 per cent in 1967's much improved credit conditions. In three of the four regions—the Midwest, the South, and the West—residential building expanded that much, or more. But by contrast, the Northeast alone failed to show a gain in housing value last year.

Flywheel effect produces apartment lag in the Northeast

It wasn't for a lack of housing demand that the Northeastern region finished 1967 so far behind the rest of the country. Instead, it was more a matter of the region's unique housing requirements.

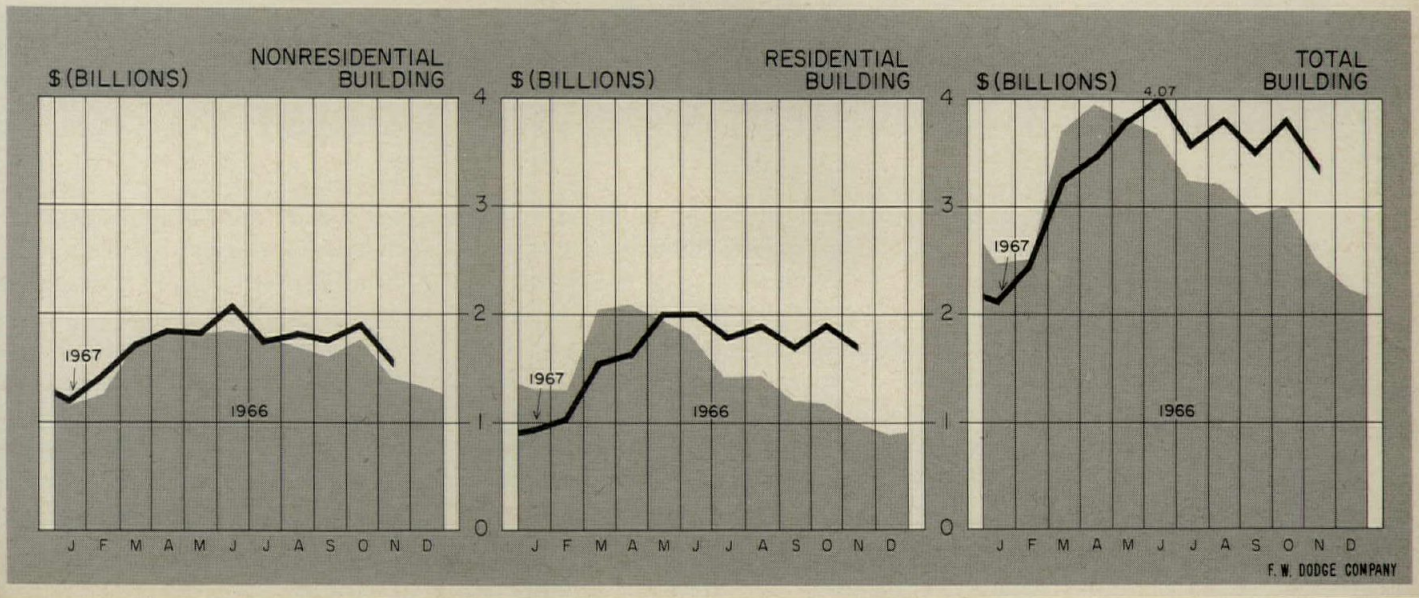
In this densely populated corridor of almost contiguous metropolitan areas —Boston, New York, Philadelphia, Newark, Trenton, Baltimore, District of Columbia, Wilmington, and more—multi-family building makes up a high proportion of the residential total. Even more important, this is the area of concentrated *high-rise* multi-family building. And that was where the main difference seemed to be in 1966 and 1967.

Because of the long lead-time in planning, design, and financing, high-rise apartments couldn't be turned off the way one-family units (and even some garden apartments) were when the mortgage squeeze hit. Nor could they be turned on again as soon as funds loosened up. What happened over the credit cycle of 1966-67 was this: Single-family building weakened early in 1966 with the first signs of credit tightness, but apartment building—supported by many big projects then only in their design stage, and with financing already arranged for—kept on rising through mid-year. The multi-family decline delayed by this flywheel momentum didn't start until the second half of 1966.

On the subsequent upswing, apartment building lagged once again. Late in 1966, when credit conditions began to improve, one-family building responded instantly with a firm upturn. But apartments continued to decline well into the early part of 1967.

By 1967's close, the delayed recovery in multi-family building had built up good momentum, and—barring another credit squeeze—will show faster growth than single-family building in the months ahead. And that could mean a better showing in the Northeastern region this year, as well.

Building activity: monthly contract tabulations



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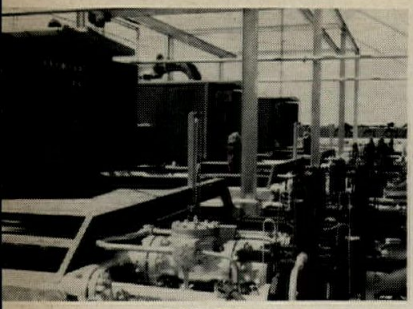	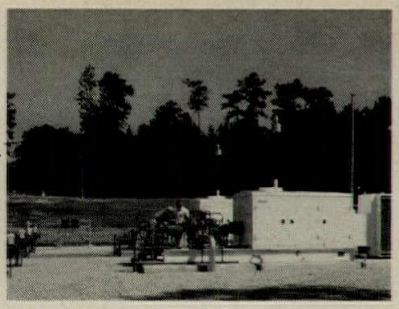	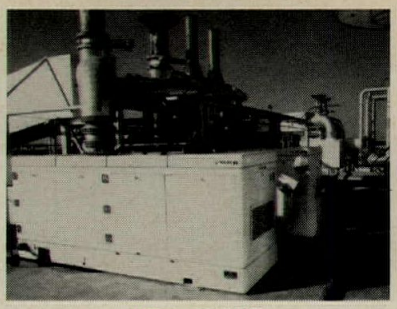	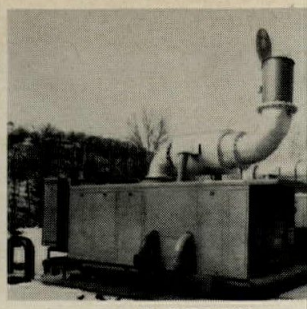
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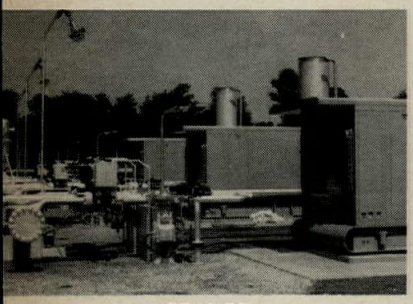	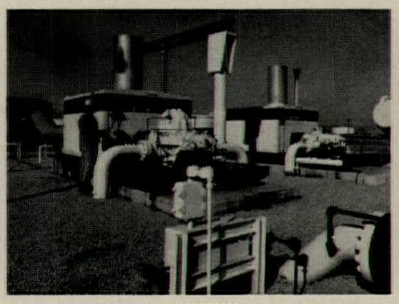	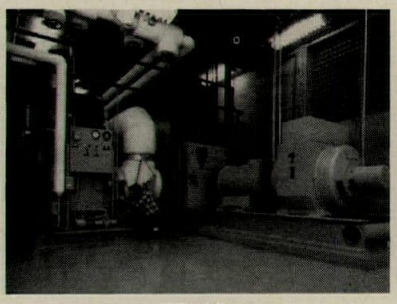	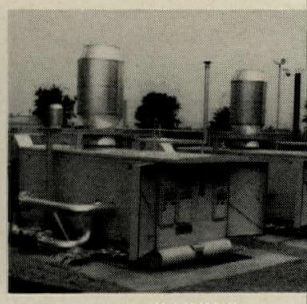
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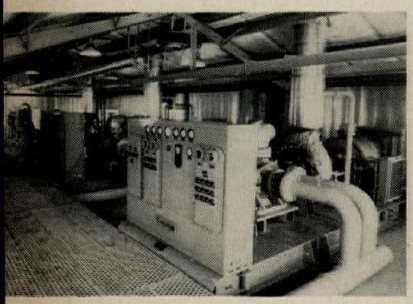	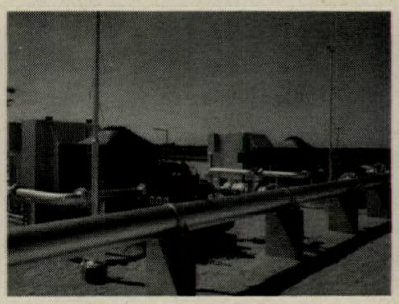	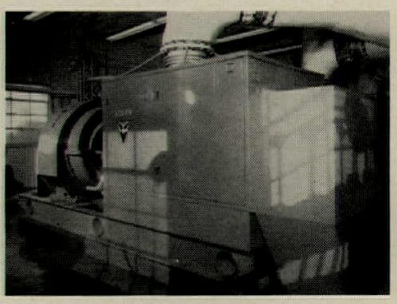	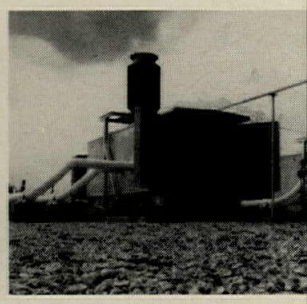
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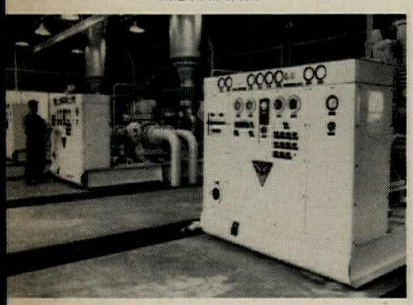	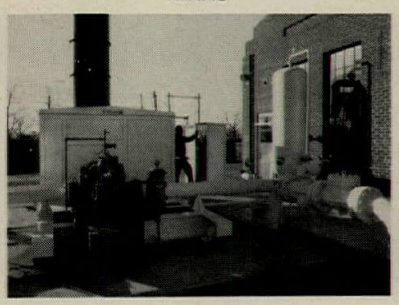		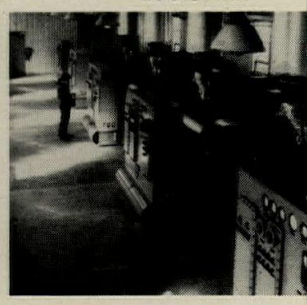
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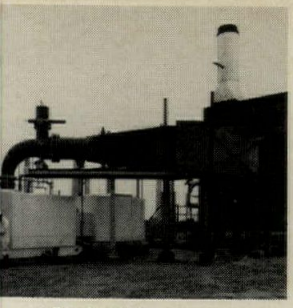
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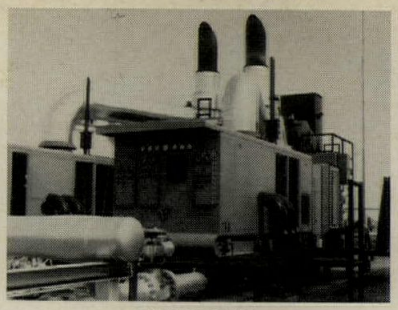
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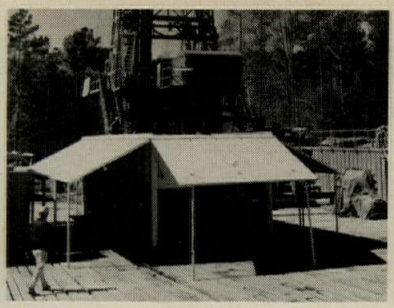
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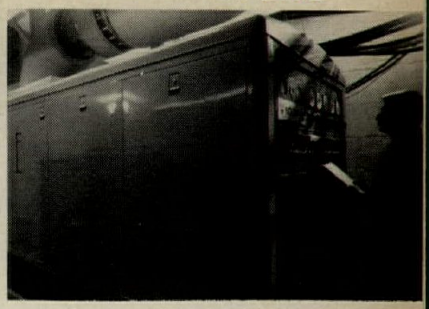
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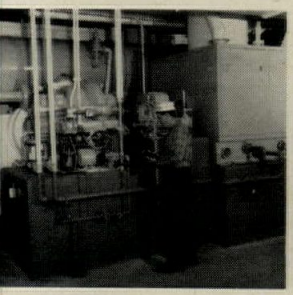
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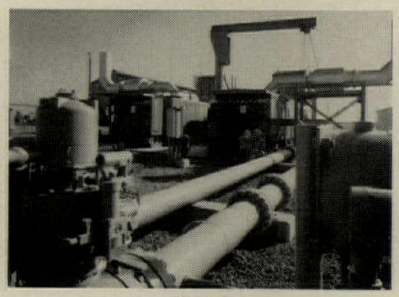
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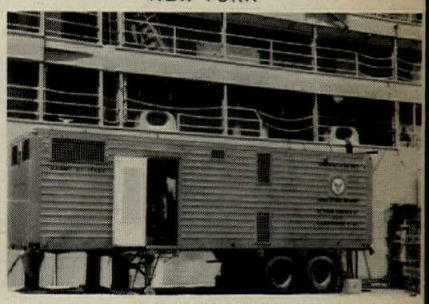
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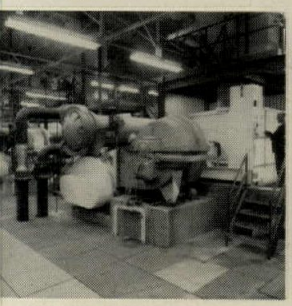
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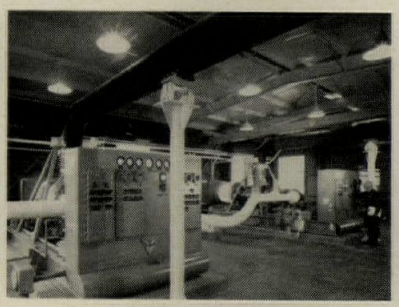
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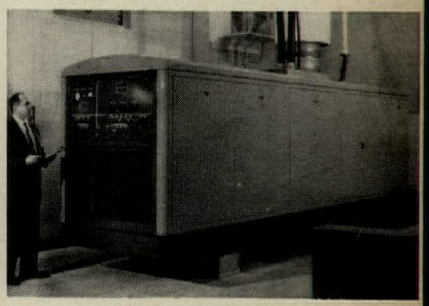
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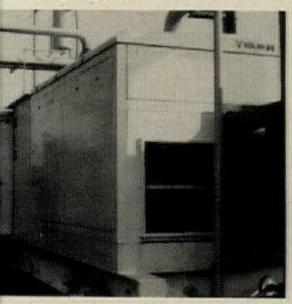
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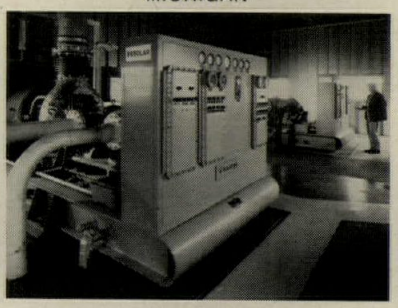
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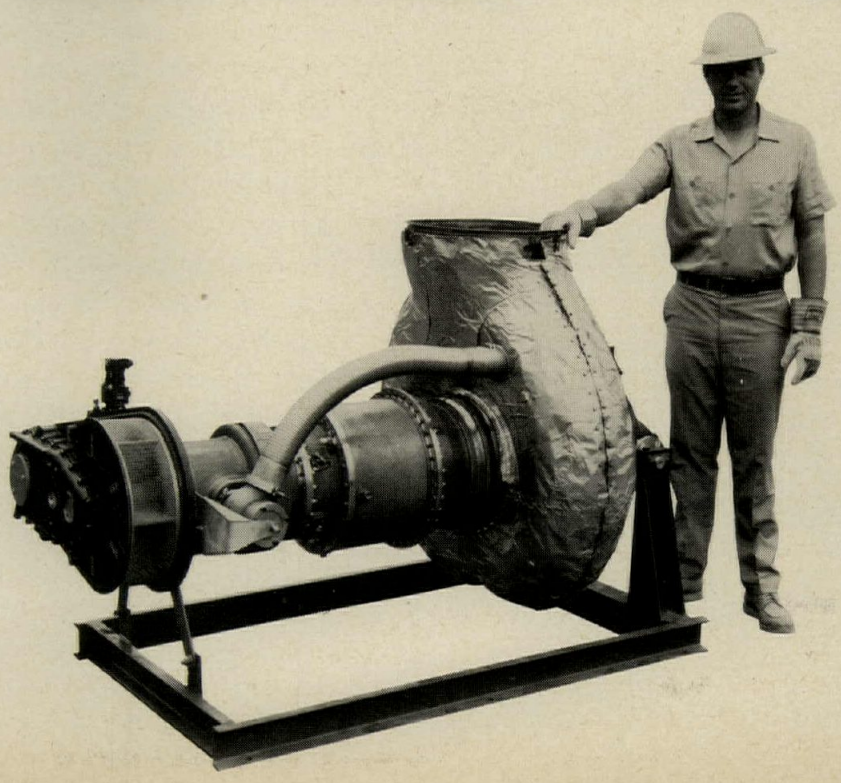

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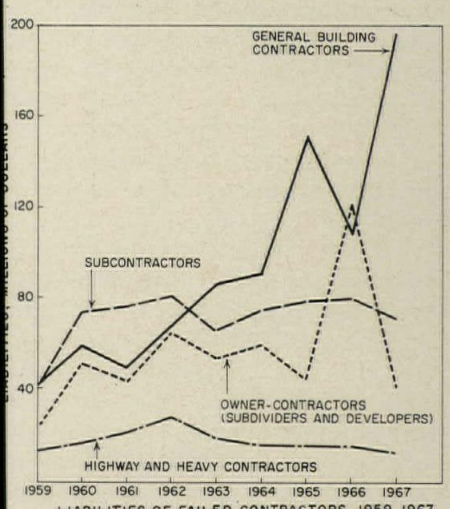
TRENDS AND ANALYSIS

Lawrence C. Jaquith
McKee-Berger-Mansueto, Inc.
Construction Consultants

A growing problem: Liabilities of contractors who fail

The chart below reveals a growing source of potential problems for the architect: the recent sizeable increases in the liabilities of contractors, specifically, general contractors, who fail. Absorbing most of the financial loss are the bonding companies, suppliers and owners. Yet many failures are not without cost to the ar-



LIABILITIES OF FAILED CONTRACTORS 1959-1967

chitect, both in dollars and in reputation, the latter from association with a job that has gone sour. To protect himself and the owner, the architect can utilize certain safeguards that will minimize the chances of incurring these costs. If the trend toward greater liabilities of failed general contractors continues, these measures will surely play a more significant role in the owner-architect relationship.

This trend is a recent phenomenon. Prior to 1963, subcontractor liabilities were actually greater than those of general contractors. But in the last five years general contractor liabilities have more than doubled. At the same time, subcontractor and heavy and highway contractor losses have remained fairly level. No significant trend is evident in the liabilities of owner-builders—the subdividers and developers. The huge jump in losses in 1966 for that category is attributable to the unusually severe monetary restrictions imposed during that year.

Combining contractor categories distorts liability figures

Two factors have contributed to the somewhat scant coverage that this problem has received to date. One reason is that the data on contractor liabilities, as compiled by Dun & Bradstreet, are usually presented in summary form under three main headings. Owner-builders and general building contractors are summarized as "general building contractors". Without an accompanying explanation, this category can be misleading. To some, "general building contractors" would logically include both owner-builders and general contractors because of similarities in their roles in the actual construction process. But to others, including architects, the distinction is significant. The point is that if the data for the two groups are combined as they usually are and labelled "general building contractors", the marked differences shown in the chart would not be apparent. There would be only one curve showing increases from $197 million in 1965 to $230 million in 1966 to only $239 million in 1967, indicating little cause for concern over an increase in liabilities.

Secondly, if viewed only in terms of the *number* of contractors who have failed over the past few years, the problem appears to be minimal. Fewer general contractors failed in 1967 (689) than in any year since 1959 (599). And over that period, general contractor failures did not exceed 847, averaging 763 per year. Similarly, subcontractor failures have declined somewhat since 1961, and have averaged less than 1,350 per year. Owner-builders and heavy highway contractor failures have fluctuated little, averaging 200 and 150 failures per year.

The only significant change then has been in the *liabilities* of failed general contractors. At the same time the number of general contractors failing has not increased proportionately. This means that the average size of the general contractor who fails is becoming substantially larger. Liabilities for this category averaged well over $300,000 in 1967. It may also mean that not only more but also larger projects were involved at the time of these failures. There is no strict relationship between contractor liabilities and the dollar value of incomplete projects at the time of failure; undoubtedly, the latter is much larger. One possible indication: a major contractor who failed with $10 million in liabilities left approximately $35 million of projects in various stages of completion. How many architect-designed projects were involved in the 1967 failures is not known. But with the average

size of the failed contractor increasing, the likelihood of the number being substantial is certainly greater.

Liability increase may be effect of credit squeeze

The nature of the problem is clear-cut; the reasons behind it are not. One explanation lies in possible delayed effects of the 1966 credit squeeze. While the speculative owner-builders were caught immediately, many contractors may have been able to hold out for a few months longer; then, faced with a tapering off in construction activity in 1967, they failed. The combination of the 1966 boom and the slowdown in 1967 was undoubtedly a contributing factor to many failures. If a contractor expanded too rapidly and overextended himself in new equipment, he might subsequently have been caught by declining sales.

These explanations are only partially satisfactory. They beg the question of why the liabilities of failed general contractors increased nearly 100 per cent in 1967, while the liabilities of other types of contractors declined in all cases. One reason might be a rise in the number of damage suits against general contractors, in turn causing financial strain and failure. It is becoming increasingly more difficult to determine who is responsible for damages because of an accident, but the attitude of the courts would seem to indicate a greater increase in the involvement of the architect.

GC's changing role may increase his risk

A related factor—the changing role of the general contractor in the management of a project—may provide a more meaningful explanation. With the subcontractors growing in importance on a typical job, and in many cases bidding as a prime, the direct control of the general contractor has diminished. The demands of management and administration in the more frequent role of quasi-broker may be more than some general contractors can effectively handle.

Dun & Bradstreet compiles data on both the apparent and underlying causes of contractor failure. In 1967, less than 10 per cent failed because of fraud, disaster (fire, strikes, burglary) or neglect—for example, because of poor health. The major apparent causes of failure are heavy operating expenses, inadequate sales, competitive weakness and difficulties with receivables. Underlying these apparent explanations are the more basic reasons of incompetence and lack of experience, which account for over 90 per cent of contractor failures. Perhaps a more accurate description is inadequate technical and managerial competence.

This is likely to take several forms: estimating errors are one area, especially in pricing. The contractor might assume incorrect time requirements and productivity rates. These errors, and insufficient discounting of rising wage rates, are easily made in the current labor market. Lack of experience may lead to a misunderstanding of special and general conditions on a complex project.

Contractor management faces complex problems

Poor management in the field and office is another problem. There may be inadequate planning for and scheduling of equipment and manpower requirements, purchasing sequences or construction activity. Incomplete job records and an unclear chain of responsibility often lead to difficulties in the administration of a job.

These circumstances, however, are more likely to have an effect only over an extended period of time. Failure can be brought about sooner by bad bid policies. Discounting subcontractor and equipment supplier quotes or calculating too small a margin for overhead and profit can be disastrous. When competition is tight, an inexperienced contractor may have to bid many jobs to get one. The temptation is great to shave bids and keep up a cash flow until volume picks up. And if a contractor lands a job with a low bid that will mean a loss he can't handle, the architect is in trouble.

Contractor failure can mean hidden costs for architects

The cost to the architect in actual dollars because of contractor failure on a project is not usually overwhelming. But the headaches may be. If another general contractor must be brought on the job, it means the preparation of new documents for re-bid. Additional reimbursement for the expense is seldom adequate. Similarly, the cost of additional man-hours for supervision and inspection is not likely to be fully covered.

Another problem: To find reasons for contractor failure, the bonding company usually looks closely at the plans and specifications. And finally the architect often finds himself party to a lawsuit to settle these findings. After the last round of paperwork and a lot of extra time, he is left with a smaller fee for the work involved and a project that by unfortunate association has done little to enhance his professional standing.

The problems for the owner are, of course, much greater and more expensive. So, the architect will probably have a sympathetic listener to any recommendations that will minimize failure. First of all, it is up to the architect to give close attention to setting up a realistic schedule of values as outlined in the A.I.A. Handbook. Based on this, and with continuing supervision by the architect, the contractor will receive payments in accordance with work actually accomplished. A realistic schedule of payments will help prevent a failure by insuring that the contractor has sufficient cash to meet his payments in the later stages of a job. Secondly, the architect should advise the owner to make sure that the proper bid documents are executed. While they seldom are not drawn up on time, it is an item worth double-checking.

Contractor screening can reduce hazard

One of the most important safeguards against contractor failure is the process of contractor screening. By screening the contractors who are interested in a particular project, and by permitting only those who qualify under certain criteria to bid the job, the owner and architect protect themselves against a financially weak contractor who might fail on the job.

In general, this evaluation should be based on financial strength, experience in the area, experience in projects similar to the project to be bid and an assessment as to whether the project would represent an overextension of the contractor's commitments.

Since a contractor in financial straits will often bid unusually low on a job to keep a cash flow coming in, or a technically inadequate contractor may do so because he has not assessed the job properly, screening provides advantageous protection in this respect. Also it can serve to keep out the contractor who bids low and attempts to make his profit through strict interpretation of change orders.

There is also an important side benefit from contractor screening: It generally produces good bids. A contractor knows that a limited number of bidders improves the odds of his getting a job. Because of this and because he knows an out-of-line low bid won't come in from some unknown source, he will spend extra time in coming up with a good bid. In fact, contrary to what might be thought, contractors, specifically the good ones, often *prefer* a screening process because of the way it improves their chances if they are selected to bid.

Contractor screening can be utilized on private projects and even on many projects where public money is involved. Restrictions on the latter vary considerably. There are many situations where the practice would be well recommended and if the increase in general contractor liabilities continues, it will become an increasingly useful safeguard.

INDEXES AND INDICATORS

William H. Edgerton
Manager-Editor, Dow Building Cost Calculator,
An F. W. Dodge service

FEBRUARY 1968 BUILDING COST INDEXES

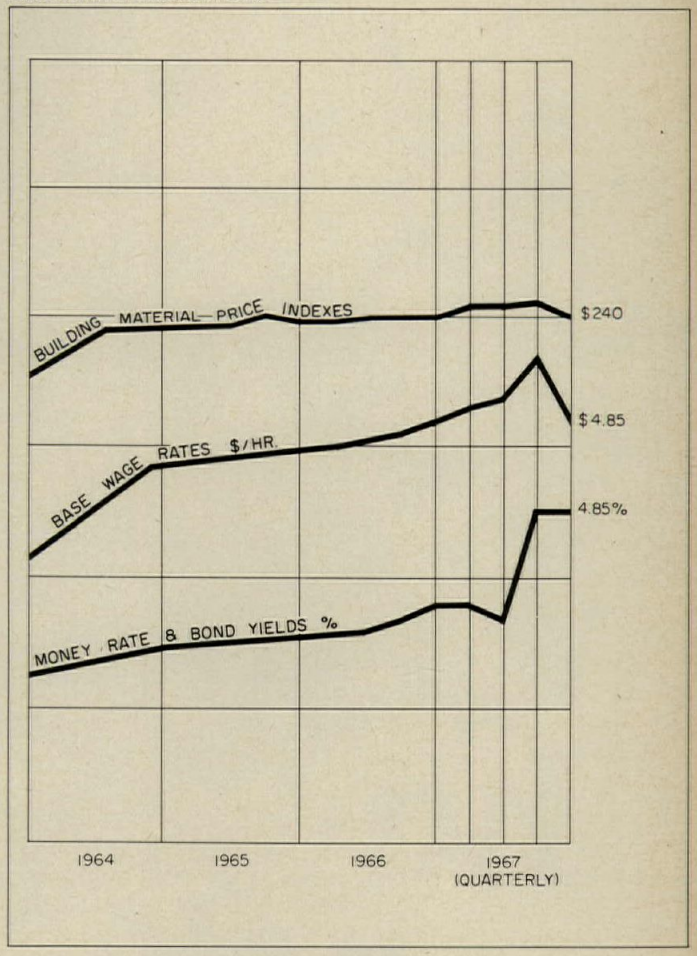
1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index residential	Current Dow Index non-res.	% change year ago res. & non-res.
U.S. Average	8.5	283.9	302.4	+2.03
Atlanta	7.2	320.9	340.4	+1.77
Baltimore	7.7	283.4	301.4	+1.68
Birmingham	7.5	259.3	278.8	+1.51
Boston	8.5	254.8	269.7	+1.37
Chicago	8.9	317.3	333.7	+2.49
Cincinnati	8.8	275.2	292.5	+3.55
Cleveland	9.2	290.3	308.6	+1.00
Dallas	7.7	264.7	273.4	+1.31
Denver	8.3	290.7	309.1	+2.52
Detroit	8.9	290.6	305.1	+1.41
Kansas City	8.3	253.4	268.2	+1.22
Los Angeles	8.3	290.2	317.5	+2.44
Miami	8.4	276.4	290.1	+0.74
Minneapolis	8.8	286.1	304.1	+3.73
New Orleans	7.8	256.4	271.6	+3.00
New York	10.0	298.9	321.5	+3.19
Philadelphia	8.7	283.4	297.5	+2.47
Pittsburgh	9.1	262.1	278.6	+1.21
St. Louis	9.1	281.0	297.7	+1.73
San Francisco	8.5	365.8	400.2	+1.24
Seattle	8.4	260.8	291.5	+3.05

Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those in the first (8.0÷10.00=80%) or they are 20% lower in the second city.

The information presented here indicates trends of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). Information is included on past and present costs, and future costs can be projected by analysis of cost trends.

ECONOMIC INDICATORS



HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1960	1961	1962	1963	1964	1965	1966 (Quarterly) 1st	1966 (Quarterly) 2nd	1966 (Quarterly) 3rd	1966 (Quarterly) 4th	1967 (Quarterly) 1st	1967 (Quarterly) 2nd	1967 (Quarterly) 3rd	1967 (Quarterly) 4th
U.S. Average	213.5	259.2	264.6	266.8	273.4	279.3	284.9	286.3	287.3	290.4	286.6	292.7	293.7	295.5	297.5
Atlanta	223.5	289.0	294.7	298.2	305.7	313.7	321.5	322.2	323.3	328.5	329.8	332.4	333.4	334.6	335.7
Baltimore	213.3	272.6	269.9	271.8	275.5	280.6	285.7	288.6	289.6	289.4	290.9	290.4	291.5	294.9	295.8
Birmingham	208.1	240.2	249.9	250.0	256.3	260.9	265.6	267.1	268.1	269.7	270.7	272.9	274.0	273.8	274.7
Boston	199.0	232.8	237.5	239.8	244.1	252.1	257.8	258.5	259.6	260.9	262.0	262.9	263.9	264.8	265.7
Chicago	231.2	284.2	289.9	292.0	301.0	306.6	311.7	312.6	313.7	318.9	320.4	320.4	321.3	327.3	328.4
Cincinnati	207.7	255.0	257.6	258.8	263.9	269.5	274.0	274.7	275.7	277.2	278.3	278.7	279.6	287.3	288.2
Cleveland	220.7	263.1	265.7	268.5	275.8	283.0	292.3	293.0	294.1	299.2	300.7	300.0	301.3	302.6	303.7
Dallas	221.9	239.9	244.7	246.9	253.0	256.4	260.8	261.7	262.6	265.8	266.9	267.6	268.5	269.5	270.4
Denver	211.8	257.9	270.9	274.9	282.5	287.3	294.0	294.6	295.5	296.6	297.5	297.6	298.5	304.0	305.1
Detroit	197.8	259.5	264.7	265.9	272.2	277.7	284.7	285.5	286.5	295.7	296.9	298.0	299.1	300.1	301.2
Kansas City	213.3	237.1	237.1	240.1	247.8	250.5	256.4	257.3	258.2	260.0	261.0	260.8	261.9	263.4	264.3
Los Angeles	210.3	263.6	274.3	276.3	282.5	288.2	297.1	298.0	298.6	301.6	302.7	303.6	304.7	309.0	310.1
Miami	199.4	256.5	259.1	260.3	269.3	274.4	277.5	278.4	279.2	282.9	284.0	283.4	284.2	285.2	286.1
Minneapolis	213.5	260.0	267.9	269.0	275.3	282.4	285.0	285.7	286.6	288.3	289.4	292.0	293.1	299.2	300.2
New Orleans	207.1	242.3	244.7	245.1	248.3	249.9	256.3	257.1	258.0	258.8	259.8	262.3	263.4	266.7	267.6
New York	207.4	265.4	270.8	276.0	282.3	289.4	297.1	297.8	298.7	302.8	304.0	309.4	310.6	312.5	313.6
Philadelphia	228.3	262.8	265.4	265.2	271.2	275.2	280.8	281.7	282.6	285.3	286.6	287.1	288.1	292.8	293.7
Pittsburgh	204.0	243.5	250.9	251.8	258.2	263.8	267.0	268.9	270.1	270.7	271.7	272.2	273.1	274.1	275.0
St. Louis	213.1	251.9	256.9	255.4	263.4	272.1	280.9	282.2	283.2	287.0	288.3	290.3	291.3	292.3	293.2
San Francisco	266.4	327.5	337.4	343.3	352.4	365.4	368.6	376.2	377.7	384.7	386.0	388.1	389.2	389.6	390.8
Seattle	191.8	237.4	247.0	252.5	260.6	266.6	268.9	271.1	272.1	273.9	275.0	276.5	277.5	282.6	283.5

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period (150.0÷200.0=75%) or they are 25% lower in the second period.

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Business and the urban crisis

"Absolutely terrifying. No wonder people riot."

So said William Day, president of Michigan Bell Telephone, looking over the ghettos in Detroit after last summer's riots.

Bill Day said it well. The urban ghettos are terrifying—in Detroit and in dozens of other cities. And until positive steps are taken to solve the ghetto problem, this country of ours faces social and economic chaos.

And unless business takes the lead—now—the problem will not be solved.

Yet what business can do is neither easy nor immediately clear. The problem of the cities is complex, of long duration, and made up of issues that range from lack of jobs to bad housing, from faulty education to inadequate police protection.

In some areas of the problem, business has already made a fine start. In others, there still are only glimmers of what can be done.

This special report, distributed through McGraw-Hill publications to their millions of business and professional readers, focuses on what must be done in the three most critical areas: jobs, housing, and education. It was written by a task force of McGraw-Hill editors, drawing upon the editorial resources of our 44 business publications and 19 U.S. news bureaus.

We believe we are especially qualified to gather, edit, and disseminate vital information on this subject—what companies and industries have done, are doing, plan to do. Hence this report. We hope to convey some of our own feelings about the terrible urgency for action, and thus to stimulate and encourage other business organizations to do what each is best qualified to do.

We would like to hear of action your company has taken or plans to take. We shall continue our reporting on this subject, and we offer the editorial pages of all our publications as a forum for the exchange of constructive thinking on this massive problem we share.

We all face this urban crisis together; together we must solve it.

Sincerely,

JOSEPH H. ALLEN
PRESIDENT
MCGRAW-HILL PUBLICATIONS

The problem

In the wake of riots that focus attention on the angry frustrations of America's slum dwellers, business faces a choice: Let the anger take its course, or act now to relieve it. For rational men, that's no choice at all

"If you cats can't do it, it's never going to get done."

The speaker: Frank Ditto, a Black militant leader in Detroit.

The cats: a group of Detroit businessmen who visited Ditto's Voice of Independence headquarters after last summer's riots.

"The government can't lick this problem," Ditto added. "So business has to."

Of course, business *has* to do nothing of the sort. What's more, no one—business included—can expect to come up with a swift cure for the ills that plague the cities.

But, if only for intelligently selfish reasons, businessmen can't afford to ignore the urban crisis. Here's why:

If you ignore the crisis, no one else may be able to cool the anger that boils up in riots. So far at least, no one else has gotten more than token results—not the government, not the labor unions, not the churches, and not the civic organizations.

Make no mistake—the riots are not yet revolutionary, nor do they involve more than a tiny fraction of the Negro population. They are significant only as a headline-grabbing symbol that focuses attention on the resentment felt by Negroes, now 11% of the nation's population. The real problem is not the riots but the frustration that generates them.

That frustration often explodes in rioting just when conditions are improving. Reason: Deprived people feel most frustrated when their hopes and expectations have been raised but not completely satisfied.

Detroit was a case in point. Its poverty programs were held up as models. Its mayor and police chief were sympathetic to Negroes. Detroit, in short, seemed well on its way to avoiding racial outbreaks. Yet Detroit was wracked by 1967's worst riot.

If you ignore the crisis, slums could siphon off more and more of your profits. Slums are a luxury few cities can afford, and much of what they cost is paid by taxes on business. Deterioration of the cities speeds up the flight of middle- and upper-income families (and some industries) to the suburbs. Result: Tax bases are reduced, retail trade slumps, and an increasing share of the tax burden falls on business.

New York City's annual slum bill, for example, is $3.2 billion. Welfare alone costs $1.5 billion—$1 billion in federal and state funds, plus $500 million raised by the city. To that, add a $1.7-billion subsidy in the taxes the slums don't pay, the extra fire and police protection they require, and the social and health problems they create.

But even that huge outlay isn't doing the job. Right now, according to the New York Regional Planning Assn., the city needs another $1.1 billion—$300 million for educating slum children, plus $800 million for a host of poverty services.

Is New York an isolated example? Not really. It is simply an advanced case of what many other cities could experience in less than a decade.

If you ignore the crisis, you may be overlooking a big potential market. The city has always been a social and economic necessity for businessmen. Markets thrive in healthy cities, waste away in sick ones.

If today's sick cities can be cured—if ghetto dwellers can be better housed, better educated, and, above all, better employed—new and profitable markets will open up for business.

Even the very process of saving the cities creates opportunities for some industries—construction, for example. Between now and the year 2000, the city ghettos will need some 10 million new dwelling units. No matter who builds these units—private operators or public authorities—they will add up to $200 billion in today's dollars in new business for developers, contractors, and building-product manufacturers.

What's needed to open up this huge market, to begin cutting the high cost of slums, and to cool the anger that boils up in riots is to break down the barriers that trap Negroes in the ghettos.

Slums, of course, have always been a fact of U.S. life. The rural and immigrant poor moved in, found jobs (especially in unskilled and semiskilled fields), and then moved up the economic ladder. Not so today. Now the poor (mostly nonwhites) still move in, but that's as far as they can go.

Why? What traps the Negro in the ghetto? One barrier—both a cause and a result of the problem—stands out:

The income gap between this country's whites and non-whites is wide and getting wider. Today, in the midst of general prosperity, over 30 million Americans live in poverty (family incomes under $3,130), and almost 30 million more live in deprivation (incomes from $3,130 to $5,000). Roughly half of each group is clustered in the city slums.

To be sure, slum dwellers' incomes are rising—but not at the same pace as the incomes of everyone else. And in the worst slums, incomes are actually falling. In New York's central Harlem, for instance, the average dropped from $3,997 in 1960 to $3,907 in 1966. Meanwhile, consumer prices in the New York metropolitan area rose 12%.

Just how badly off is the typical Harlem family? A Bureau of Labor Statistics study, released last fall, shed some light on that one. Said BLS: A year's moderate living for a family of four in New York City costs $10,195—or almost three times the average income in Harlem.

The gap between white and non-white buying power is largely the result of a paradox: Advancing technology, a boon to most Americans, has made it steadily more difficult for the hard-core poor to find work. Mechanized farming has sped the migration of Southern Negroes to Northern cities. And in the cities, automation has wiped out the very jobs that untrained, rural-bred Negroes can handle. In 1950 one out of six Negro migrants failed to find jobs in Northern cities; by 1960 the figure had doubled to two out of six.

But the income gap is just one of the barriers that trap non-whites in the city ghettos. Here are four others:

1. Zoning bars low-income families from the suburbs—first, by stipulating lot sizes (and thus house prices) that are beyond their reach; second, by keeping out blue-collar industry that could provide jobs for people now living in the city.

2. Welfare often hinders more than it helps. First of all, the welfare burden (annual cost: $7 billion) falls heavily on the Northern cities and lightly on the areas where the bulk of the poor came from. Second, even states and cities with liberal benefits fail to meet federally defined minimum-income levels. Finally—and this is the crux of the matter—welfare practices kill the slum dweller's incentive to find a job and hold his family together. If the father of a family on welfare gets a job, whatever he earns is deducted from his family's welfare payments. In effect, he is taxed 100% on his earnings. So he may face a hard choice: Quit the job or abandon his family.

3. A new legislative coalition has little sympathy for the sick cities. In state legislatures and Congress, there has always been an understandable rivalry between representatives of the cities and the rural areas. Now—and for equally understandable reasons—the rural spokesmen have a potent new ally: representatives of the burgeoning suburbs. This new coalition reinforces suburban zoning and limits the ability of urban-based legislators to put across programs aimed at solving the cities' problems.

4. Cities lack the financial base to do the job that must be done—to tackle adequate housing programs, for instance. The basic problem: Property taxation—source of most municipal revenue—is inequitable; it puts the biggest burden on business, the smallest on slum-housing owners. So, not surprisingly, many companies flee the city—which only loads a bigger burden on those who stay, puts the city in a worse financial bind than ever, and makes it less and less likely that slum problems will be solved with local money.

In theory at least, removing all those barriers is every American's problem. But this report is about what businessmen can do—if they get involved. And since this report stresses the purely practical reasons for business action, it goes without saying that getting involved invites economic risks.

When the president of Detroit's largest department store led a state open-housing fight last November, more than 10,000 customers closed out their accounts in 10 days. Every time Henry Ford II has made a pronouncement in behalf of Negro rights, Ford Motor Co. sales have tumbled in the South.

But Henry Ford still maintains: "People who don't face up to this issue are stupid. It's a great opportunity for business. It's shortsighted not to step in and do something to solve the problem."

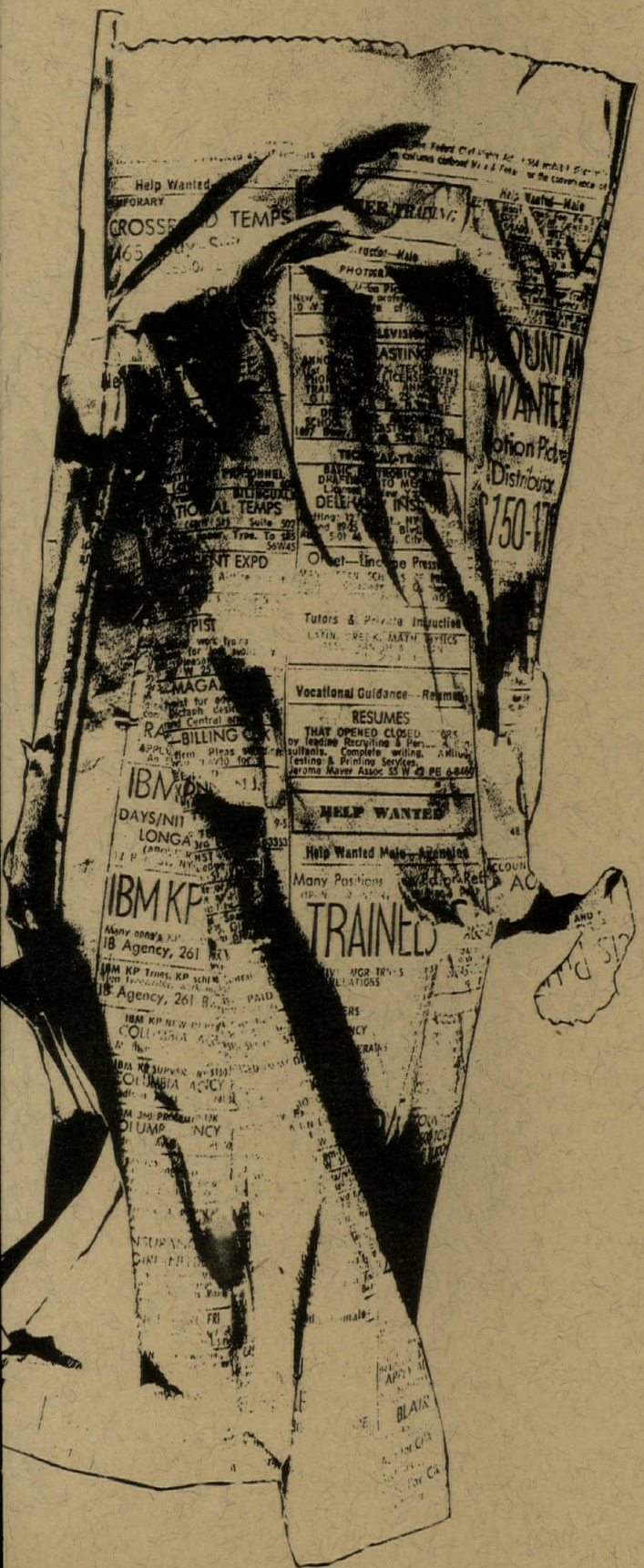
What, then, can business do to ease the frustration of the ghetto dwellers?

Business can turn the staggering need for low-rent city housing into a big and profitable market—if some of the government-imposed rules that now regulate housing construction are changed *(see p. C10)*.

Business can also put its influence and special skills behind sorely needed changes in the city school systems *(see p. C14)*.

And business alone holds one key to breaking the vicious slum cycle of unemployment, poverty, poor housing, poor education, and low productivity. That key is jobs.

Jobs



"Jobs are the live ammunition in the war on poverty," says Labor Secretary Willard Wirtz. And, he adds, it's up to business and industry to pass the ammunition

How many jobs are needed? Secretary Wirtz estimates a half-million for 100 city slums, another half-million for the rest of the country.

In a growing economy that produces a million and a half new jobs a year, the need to place half a million slum dwellers—or even a million—does not sound all that tough.

But it is. Business has found that hiring and training the people at the bottom of the ghetto barrel—"making the transition from the street corner to a job," as a Los Angeles training executive puts it—is tougher than it sounds.

Yet business must face up to it. President Johnson, for one, has issued a direct challenge: "...Help me find jobs for these people or we are going to have to offer every one of them a job in government."

Members of the Urban Coalition, which includes the nation's top industrialists, recently pledged a million jobs. And many businessmen cite practical reasons for action.

Says Chester Brown, Allied Chemical's chairman: "Business can broaden its markets by increasing people's purchasing power. One way to do this is to lift the economic status of poverty-stricken slum dwellers."

ays H. C. (Chad) McClellan, who heads the Los Angeles-based Management Council for Merit Employment: "Shall we go on paying $400 million a year in Los Angeles welfare costs, or shall we go down and take a realistic look at the potential workers in the slums?"

Just who are these potential workers? Mostly they are the hard-core unemployed—unschooled, unskilled, and unmotivated. To turn them into productive workers, business must help them overcome handicaps that bar them from good jobs: culturally impoverished lives, grossly deficient education, poor health, fear of failure, the exodus of jobs to the suburbs, and finally society's discrimination against them.

There is no clear-cut answer. Businessmen, in fact, are simply learning by doing. Here are some of the things they have learned:

No program to hire the hard-core poor will succeed unless top management is totally committed. "Any company that gets into this kind of project without the backing of the top man will fall flat on its face," says Richard Knapp, personnel manager at Warner & Swasey, Cleveland. Kodak Chairman William Vaughn says bluntly: "Unless top management lays it on the line, lower-echelon people won't do it. Even then, they may not do it without follow-up."

Follow-up by top management is vital if a project is not to drift. Humble Oil's recruitment coordinator, Harry G. Taylor, says: "We recently shook up a lot of our people when we called them together and told them they weren't doing as well as they should. Now those who have been taking it easy know management is serious."

A firm stand also heads off possible resistance from other employees.

"You find some resistance among plant employees," admits Walter Maynor, industrial relations director at Sherwin-Williams. "But we let them know in no uncertain terms that this policy had been set by our top people and that they intend to enforce it."

Martin Stone, president of Los Angeles' Monogram Industries, lost one foreman who wouldn't go along with his program. "You've got to sell the shop supervisors," Stone warns. "If you don't, the job will never get done—and you'll never be able to pinpoint why."

They won't come knocking at your door—recruiting may call for special efforts. You can't just hang out a sign and expect a flood of grateful, job-hungry applicants.

"If we had waited for them to come to us," says Harry Taylor, recruitment coordinator at Humble Oil in Houston, "we might still be waiting." Humble even finds it difficult to convince college people that it really wants to hire Negroes.

"Pessimism pervades the entire minority," says Charles Rutledge, assistant to the president at Lockheed Missiles & Space. "They feel they've got as much chance getting to the moon as getting a job at Lockheed."

When Kaiser Industries started looking for "qualified" minority employees in Oakland, "most of the unemployed didn't even bother to apply," says Vice-President Norman Nicholson. Now Kaiser has a program for "qualifiable" people and cultivates contacts with Negro groups.

Candor is the best antidote to diffidence and distrust, Nicholson finds. "We're late in doing this, and it was under pressure," he tells Negroes. "But don't cry about past history. The door is open now."

To reach across the barriers of suspicion, companies can call on dozens of job-development groups in the Negro-employment field. The Urban League, for one, has had long experience.

Another notable Negro-led effort, the Opportunities Industrialization Centers, stresses enlisting business to help Negroes help themselves. Started in Philadelphia by the Rev. Leon H. Sullivan, OICs have spread to 65 cities.

The Twin Cities OIC in Minneapolis is typical. Launched a year ago with 75 trainees, it raised $80,000 from business, now has 1,100 trainees and 300 already on jobs. Like other OICs, it devotes about half its training program to skills, office and shop work, and service trades—the other half to grooming, work habits, attitudes, and basic reading and arithmetic.

Other sources of help are community-wide groups that seek to reconcile disparate civic and racial organizations, moderate and militant alike, and to bring the jobless into contact with jobs.

Some of these groups—Cleveland's AIM-JOBS, St. Louis' Work Opportunities Unlimited, Los Angeles' Management Council—provide pre-job training, on-the-job counseling, and other aids. And they are getting results.

AIM has helped find jobs for some 600 applicants; WOU for 6,500; the Boston Community Development Corp. for 5,000; the Management Council for 18,000. And the new Detroit Committee, working with the Detroit Board of Trade, has spurred 20 companies into hiring 15,000 unskilled Negroes.

Such results call for special recruiting efforts. A few examples:

After the Watts riots in Los Angeles, some 50 companies sent recruiters directly into the district, and the Management Council induced the California Employment Commission to open a branch there.

In Rochester, N.Y., Kodak and other companies hold interviews at Negro neighborhood centers and take job referrals from 17 social agencies.

United Airlines sends Negro pilots, stewardesses, and ticket agents into the ghettos to talk with people. Says Daniel E. Kain, personnel director for field services: "These people have to taste it, feel it, see it. Otherwise it's a bunch of hot air."

You may have to relax your hiring standards and change your hiring practices. Most companies find they have to drop their hiring bars a bit or, if they are taking admittedly unqualified people, a lot. Intensive training projects like Whittaker Corp.'s "Instant Hiring" in Los Angeles ask for little except a will to work.

Warner & Swasey eliminated the usual hiring yardsticks, including testing. Pacific Telephone & Telegraph, along with other companies, has hired people with police records. Ohio Bell Telephone went back over its list of rejected applicants just to hire some who had been considered unqualified. And Lockheed Missiles went looking for high school dropouts—people with no marketable skills—for its VIP (Vocation Improvement Program). Of the first 100 applicants referred to the company by social agencies, only 11 were rejected.

Not everyone agrees, however, that lower hiring standards are a prerequisite. For instance, Chad McClellan of the Los Angeles Management Council tells companies: "Don't hire anyone who doesn't meet your standards. Don't lower your standards—raise theirs."

And while hiring requirements may be less stringent, there's no compromise on work performance. A Pacific Telephone & Telegraph executive speaks for most companies: "We would rather train than perpetuate the problems of unskilled labor."

You may also have to restructure some of your jobs to make them easier to master. Some companies have solved the work performance problem by redefining or restructuring jobs to bring them closer to the reach of unskilled people. Lockheed compares this to measures used to train wartime workers.

Buxton-Skinner in St. Louis established a category of "electrician's helper" one step below "electrical maintenance assistant" to provide niches for poorly skilled workers. To implement its nurse training project, the Kaiser Foundation in San Francisco created the job of "clinic assistant" to relieve nurses of such routine though important chores as weighing patients and taking temperatures.

But this approach may not appeal to every company. "McDonnell-Douglas in Los Angeles has never changed production procedures to fit trainees," says a company official. "We fit the trainees to our procedures."

McDonnell-Douglas doesn't think much of the war-period analogy, either. "The days of Rosie the Riveter are gone forever," its spokesman says. "The one-step assembly worker has given way to workers handling a series of operations on the line."

The key to success—and the toughest part of the whole problem—is the right kind of training. "The first question an executive must ask himself is: 'Are we ready to spend the extra time to prepare these employees?' Unless the answer is a flat yes, the program won't go."

This advice from an Emerson Electric executive in St. Louis is based on hard experience in training workers from scratch. It's more than a matter of teaching specific job skills. At the very least, companies must orient their trainees to a totally unfamiliar environment of shop or office. At the most, they must somehow plug up wide gaps in basic education. And they must grapple all along the line with problems of instilling motivation and a proper attitude.

It can be done. Business is already deep in the effort. Some 1,600 companies have contracts to offer training under the Manpower Training & Development Act, which turned out 140,000 trainees in the past fiscal year.

Westinghouse Electric is one large company that is training hard-core unemployed under a new Concentrated Employment Program. Raytheon is launching a special project at its Waltham (Mass.) plant for 100 hard-core people. Government is offering new lures to employers who will tackle the training of unskilled people. About $350 million in federal funds is available this fiscal year.

New training techniques are often needed. Emerson Electric, for example, uses closed-circuit TV to show clerical trainees their job operations in slow motion. Hoffmann-La Roche also uses audio-visual aids to train clerks in its Newark (N.J.) offices.

The results of a balanced program can be impressive. Of 111 in a Lockheed VIP training group, only four were fired—mostly for poor attendance—and 105 are working today. Lockheed bore down hard on teaching both skills and attitudes. "We overtrain," says Charles Rutledge, assistant to the president, "so the worker will be able to perform all his duties and get an immediate feeling of success."

The key to effective training is a job at the end of the training cycle. That's what community programs, however well-intentioned, cannot promise. Much of what passes for training in store-front settings has little relation to employers' needs. And trainees themselves sense this. "Training to be unemployed" is how one New York Negro put it.

Only business can provide both training and a job. What's more, most company training programs pay the trainee while he's learning.

Eugene Cox, who runs Whittaker Corp.'s "Instant Hiring" project, declares: "Nobody but business—not welfare, not the government, not charities—can offer green-power motivation."

Mayor Alfonso J. Cervantes of St. Louis notes that "private industry's training of the disadvantaged on the job is much more efficient than training by any public agency." And only industry, he adds, can give purpose to the training by providing a job at the end of the line.

But the mere existence of beginners' jobs is not enough. Trainees must also be able to see some chance to advance. Business, too, must count on an upgrading process. Unless trainees can advance, a Kodak executive points out, the bottom jobs will soon be clogged with unpromotable people.

Effective training isn't always limited to job skills—you may even have to teach the three Rs. Lee Gassler, industrial relations director at Kodak Park, points out: "The under-educated worker is often unable to get over even the first hurdle in getting a job. A simple application form holds terror for him if he can neither read the questions nor write the answers."

Gassler speaks from experience. In 1964 Kodak began an experimental project to hire unskilled people and bring them up to the entry level for skilled apprenticeship training. Even though classes were small—no more than 15 each—the company found that classroom instruction was not enough. So the instructors—skilled men pulled off regular jobs—wound up giving almost individual tutoring.

The basic problem: Trainees were seriously deficient in reading, writing, and arithmetic. "We were surprised at how retarded they were," says a training executive. Even prior schooling was no guarantee. One trainee who had attended three years at a Rochester high school was told to drill a series of holes a foot apart. "What's a foot?" he asked. Another was given a job requiring measurement with a ruler. When the instructor found the job undone, the embarrassed trainee admitted he didn't know how to use a ruler.

Kodak's experience is hardly unique: A Los Angeles bus company recruiting in a ghetto area found few people who could make change for a dollar.

Kodak took steps to solve the problem in 1966. In the midst of a bruising battle with a militant Rochester group called Fight, the company reorganized its training. It now limits instruction by Kodak personnel to on-the-job programs and brings in outside experts—the Board for Fundamental Education of Indianapolis—to teach reading, writing, and numbers. The unskilled are put in a job class and, if they need it, in a BFE class. One BFE section raises basic education to the fifth-grade level, another from fifth to eighth.

Effective training may also immerse you in the personal problems of your trainees. Sometimes, in fact, the line between training and therapy gets very thin indeed. Fear of failure, for example, is widespread.

"These kids are oriented to failure," says an Inland Steel vice-president, William G. Caples. For that reason, Kodak's BFE classes aim as much at instilling confidence as at teaching facts. Says an instructor: "Most of these people have failed everywhere—in school, at home, in jobs. So we try to put them in situations where they'll succeed."

Since they fear failure, many trainees resist responsibility—at least at the start.

"We start them off where they make no decisions," says Training Dept. Manager R. H. Hudson of Lockheed-Georgia. "Then we slowly let them take on responsibility."

First-line supervisors get involved in mundane problems. Stanley W. Hawkins, training coordinator at Lockheed Missiles, points out: "We help with problems, on shift and off—getting people into hospitals and out of jail, getting gas and electricity turned back on, towing cars off the freeway, fighting off finance companies, arguing with car dealers."

How do you cope with problems like these? One way is to put qualified Negroes into supervisory and managerial jobs.

"You can use some white guys, but there's a real need for the worker to identify with the top guys, the upper echelon," says Leon Woods, the 24-year-old Negro general manager of Watts Mfg. Co. in Los Angeles. This is the highly publicized company that Aerojet-General started in the riot-torn Watts area to provide jobs for Negroes in their own neighborhood. One of Aerojet's aims was to eliminate a prime cause of absenteeism—long trips between slums and plants, often without public transportation.

Sometimes the waters are murky—you may have trouble communicating with your trainees. "Most jobs are lost by attitudes, not inability to do the work," says the Rev. Leon Sullivan of the Opportunities Industrialization Centers. A Kodak executive agrees. But, he adds, "It's often hard to know what their attitude is."

Many workers are reluctant to admit they don't understand. Verbal confusions crop up. A newly hired Negro clerk at a St. Louis company wanted to quit because she was "bored." A bit miffed, her supervisor was ready to let her go until he found she really meant she was perplexed.

At Lockheed Missiles, one instructor tries to anticipate poor understanding. Every day he re-

views his material for "suspect words," then writes these on the blackboard and defines them whether anybody asks or not.

Clear communication is particularly important in the crucial process of motivating new workers. Training personnel tend to agree with Eugene Cox of Whittaker Corp. that motivation starts with showing people how they can get tangible rewards. "The best way to change attitudes about their future," he says, "is to show them what they can get if they apply themselves."

Frank Libby, vocational training supervisor at Kodak Park, puts it simply: "I try to get them addicted to the paycheck." And Frank S. Jabes, an employee relations executive at TRW in Cleveland, adds: "If you want to see some really motivated people, take a look at a guy who is having his first chance to make a living wage. You couldn't have a better employee."

This is no one-way street—you have to strike a balance between sympathy and firmness. Companies that hire hard-core unemployed minority people can expect them to behave differently from the corporate rank and file. Turnover is high—holding more than 50% of trainees is pretty good. Absenteeism, tardiness, a general lack of responsibility are common failings.

"Mondayitis is almost epidemic," says one supervisor.

"They have a tremendous number of grandmothers and grandfathers who keep dying month after month," another supervisor complains.

It doesn't help to be over-sympathetic, companies have found. In fact, a firm hand on the reins seems to work best.

A Kodak instructor, Frank Palmisano, explains why his company decided to take a firmer attitude toward absenteeism and tardiness in training classes: "We checked on former trainees and found that those with poor attendance records in training did no better on the job. So now we deal with absenteeism in training—ask the problem cases what's wrong and how we can help them. If they still goof up in spite of our efforts, we let them go."

Jack B. McCowan, vice-president of Firemen's Fund American Insurance in San Francisco, lets supervisors "spoonfeed" trainees for a while in work matters. But he makes it clear that he expects standards to be met on attendance and behavior.

A practical question: What will all this extra time and effort cost? It depends on what you have to start with—the background of your trainees—and on the level of skills you need from them. Experience indicates that the cost per trainee can range from a few hundred dollars to several thousands.

On the more modest level, IRC, Inc., a Philadelphia electronics company, spends between $300 and $400 per person; McDonnell Aircraft in St. Louis, $450. Leon Sullivan's OICs report an average $900 per trainee.

For harder cases and higher skills, the tab gets bigger. Lockheed-Georgia spends $700 of its own money plus $400 of government funds for each trainee. Humble Oil spends $1,200 per man. It cost Kaiser Engineering a total of $12,000 to train six draftsmen.

When you deal with badly underskilled people, you run into big money. Just how big is open to argument. And it's an argument that often involves the federal government, which pays part of the cost of these hard-case training programs.

Robert Scanlon, corporate training director at Whittaker Corp., says "Instant Hiring" costs two or three times as much as conventional industrial training.

Avco Corp. estimates it will cost $5,000 per man to train 230 hard-core unemployed, including ex-convicts, reformed drug addicts, and former alcoholics. The government will pick up two-thirds of the cost.

In the last analysis, are the extra training costs worth it? Most businessmen who have tackled the job problem think so. And Norman Nicholson of Kaiser Industries speaks for many of them when he says, "The costs of training are high. But riots and jails are also expensive."

Businessmen point out, however, that they are thinking primarily of long-range values rather than immediate pay-off. Kodak's Lee Gassler, for example, says his training program helps the company, the trainee, and the community, "but at the moment the trainee and the community are benefiting most."

More specifically, there are signs of real progress.

Says an auto company executive: "Some of the inner-city people we hired are working out better than the walk-ins."

Says Industrial Relations Manager Joe Flynn of Kaiser Aerospace & Electronics: "We've already upgraded 21 minority employees at our San Leandro plant. Our experience has been excellent."

Says the manager of a Philadelphia store that employs eight Philco-Ford trainees: "In the past we hired Negroes because we felt we had to. Now we feel these girls deserve to be hired on their own merits."

And that, of course, is the aim of every hiring and training program.

Housing

To government, the enormous need for city housing is a staggering problem. To business, that need represents a huge market—but only if some way can be found to make it profitable

The problem of supplying housing in the cores of cities is not a problem of logistics or construction technology. It is purely a problem of economics.

Under present taxation and finance practices, no one can supply the volume of housing needed. But if the rules that force these practices are changed—if some new form of government subsidy is accepted and if red tape is trimmed from federal housing programs—a staggering need can be turned into a profitable market.

Business' stake in changing the rules is pretty simple and direct. Just replacing the substandard housing in cities would involve more new construction than the total volume of housing starts over the past five years.

The 1960 housing census uncovered more than 4 million urban dwelling units that were completely dilapidated, some 3 million more that were badly deteriorated, and another 2 million with serious code violations or serious overcrowding. If that is not a bad enough problem—or a big enough market—recent Census studies indicate the 1960 figures may have underestimated the number of dilapidated units by as much as one-third.

What's more, revitalizing the cities would encourage the return of hundreds of thousands of families who have fled to the suburbs—and thus would generate new demand for middle- and upper-income housing.

So sitting right there in the city slums is a market for well over 7 million new and rehabilitated housing units and all the building products that go into them—everything from flooring and drywall to lighting and plumbing fixtures. And, points out Raymond H. Lapin, president of HUD's Federal National Mortgage Assn.: "The profit earned on a sheet of gypsum board is the same whether the board is used in a low-rent apartment or a $50,000 house."

Key problem: the gap between what housing costs and what low-income families can pay. New housing in multi-family buildings—the kind needed in most city slums—costs from $17,000 to $22,000 a unit, even with an urban renewal land write-down. Rehabilitated housing, in any volume and in the densities desirable, costs at least as much, and sometimes more.

This means the monthly rent for a $20,000 unit with one bedroom would be roughly $150. That figure would include (1) maintenance, (2) operating costs, (3) amortization and interest on a subsidized loan with interest a few points below market yields and a term up to 40 years, (4) partial realty-tax abatement (about 50%), and (5) a two-thirds write-down of the land cost.

Yet half the low-income families in the slums can afford to pay only $65 to $110 a month for rent. And the other half cannot afford more than $35 to $60 a month.

Government programs to fill the gap have been too small, under-financed, and over-complicated. Congress has created one program after another—FHA's Section 221d3 and public housing and urban renewal, for example—with enough visibility to persuade voters that something is being done. But most of these programs are too poorly funded to have any impact on urban problems. Many of them overlap and even conflict with earlier programs. So each new program adds chaos to the already chaotic machinery of federal, state, and local governments. In retrospect, it is easy to see why the programs tried so far have not worked:

- Until fairly recent years, the public housing idea was unacceptable to most Americans—"Why should I pay part of somebody else's rent?" Congressional authorizations for low-rent public housing have permitted only a fraction of what is needed. And, with some notable exceptions, the quality of public housing has been bad: monolithic, prison-like structures, stripped of such "frills" as doors on the closets. In short, superslums.
- Urban renewal has not solved the problem. Most localities have used renewal programs to broaden their tax base with new commercial development or upper-middle-income housing rather than to provide low- and middle-income housing.
- FHA's 221d3 program, greeted in 1961 as the answer to low-income housing, has virtually ground to a halt because of too-low mortgage limits ($17,500 in high-cost areas) and the fantastic red tape involved in getting projects through local FHA offices.

The 221d3 program was designed to provide new and old rehabilitated rental and co-op housing for low- and moderate-income families. In some cases it permits a below-the-market interest rate of only 3% on mortgages. But as Jason Nathan, head of New York City's Housing & Development Administration, pointed out last fall: "Six years after the program was started, it had provided only 4,350 rehabilitated apartments—and 1,500 of them are in New York City."

Most other FHA programs were never intended to provide low-income housing. In fact, the agency's original purpose in the 1930s was to get money moving again. Built into its legislative history is the requirement that mortgage insurance be placed only on economically sound properties. Since it is hard to argue that a slum area is economically sound, slum properties were automatically ruled out.

"FHA is the easy and popular target for all our frustrations," says New York City's Nathan. "But to blame FHA alone is not the whole truth. Their reluctance is not simply a matter of inertia. It also arises out of a schizophrenic Congress. One segment of Congress blasts FHA for failure to provide socially motivated housing. Another segment almost gleefully seeks out a few cases of mortgage defaults and scorches FHA for its radicalism and lack of sober conservatism."

But, Nathan adds, "Even if existing programs were adequately financed and enthusiastically administered, there would be enormous problems."

The myth that new technology can cut costs continues to confuse the issue. It is unrealistic to count on some magical breakthrough in technology to solve the cost problem.

It is unlikely that research will find new materials cheaper than wood and brick and cement and gypsum. It is equally unlikely that labor practices can be changed in any effective way. Yet industry leaders and government officials from HUD Secretary Robert Weaver on down keep calling for the breakthrough—thus delaying a commitment to solve the problem with the building tools already at hand.

For years one innovator after another—often aided by federal grants—has tried to put housing on the assembly line. And for years these attempts have failed to cut costs.

Reason: Most innovators have concentrated on the shell of the building—the bare walls, floor, and roof. And the shell is the cheapest part—if the walls were simply eliminated, the total price would be cut by less than 5%. The bulk of the cost is in land, financing, overhead, profit, interior finishes, and mechanical equipment.

Rehabilitation of slum housing is a highly publicized solution—but hardly a cure-all. It does indeed improve housing in what is usually a rather limited rehabilitation area. But, so far at least, it has fallen short on other counts.

Rehab has not added to the supply of housing units. Except in a few neighborhood-wide ventures, it has not performed the social function of rehabilitating a community. And, despite such rarities as New York City's 48-hour "Instant Rehab" (new units were dropped into the shells of gutted tenements), it has not solved the problem of relocating slum families while the job is being done.

In slum areas, where tenements brought up to a "safe and sanitary" standard are at best a minimum goal, rehab does buy time while better plans are made. But a big question remains: Is rehab housing really cheaper than new housing? Many experts do not feel it is—especially when the high costs of planning and managing a rehabilitation job are counted in.

What's more, there is still no evidence that rehab can be profitable. A number of major corporations—including Alcoa, Armstrong Cork, Rockwell Mfg., Reynolds, U.S. Steel, and Smith, Kline & French—have made small experimental forays into rehabilitation. On a larger scale, several companies in Pittsburgh—Westinghouse, National Gypsum, Pittsburgh Plate Glass, and others—have teamed up to form a limited-profit rehab corporation.

The best-known effort is U.S. Gypsum's rebuilding of several hundred units in New York City's Harlem and its plans for similar work in Chicago and Cleveland. But USG has yet to say how its venture is faring financially.

Whether a businessman sets out to fix up old apartments or build new ones, he faces two harsh realities:

Harsh reality No. 1: a shortage of money to finance low-rent city housing. There is no magic way to finance housing. Housing must draw on the same capital pool that business, industry, and the consumer draw on. Any investment in housing must match the market yield of other segments of the capital pool.

Ray Lapin of the Federal National Mortgage Assn. puts it this way: "Let's admit at the outset that there are no new sources of mortgage funds. There is no money tree—not the Federal Reserve, not the U.S. Treasury, not FNMA, and certainly not the treasuries of the nation's corporations."

Lapin points out that the traditional sources of mortgage money—life insurance companies, mutual savings banks, savings and loan associations, and, more recently, the commercial banks—have invested about as much as they can afford.

"From now on," he says, "the volume of mortgage lending by these institutions will be limited to the future course of savings—and to the choice between mortgages and other investments."

Harsh reality No. 2: the red tape that strangles government housing programs. Government-assistance programs won't work unless some way can be found to eliminate the time-consuming rules and procedures that confront—and frustrate—every prospective builder or developer.

In New York City it takes at least two years to process the average FHA 221d3 project—and by that time, costs have risen 10%. Furthermore, builders often run into delays before their proposals even reach FHA. A case in point: Late last year a 1,450-unit project, proposed by HRH Construction Co. in 1961, was still awaiting approval by the New York City Board of Estimate.

But, notes HRH Vice-President Richard Ravitch, there are signs that federal administrators are finally bending their rules and speeding up their procedures. Last fall, for example, HUD Assistant Secretary Philip N. Brownstein told his district directors: "Slash through red tape, indecision, and pussyfooting.... Set rigid time goals and see that they are met.... Be prudent as well as urgent, but be prepared to take the risks necessary to get the job done."

Brownstein's conclusion was most direct: "You should work at this task as though your job depended on it—because it may!"

Several ways to provide more mortgage money have been proposed. Three recent ones:

- FNMA's Lapin has suggested a government-backed mortgage market. He hopes such a market would offer the investor a competitive yield and give the mortgage borrower access to all parts of the savings pool—not just the "compartmented, specialized part of the capital market" now available.
- A group of 348 life insurance companies has pledged to invest $1 billion in new and rehabilitated slum housing within the next year. It should be noted, however, that these mortgages will carry the peak FHA rate of 6%. And to insure them, FHA must substitute a policy of social benefit for its traditional policy of economic soundness.
- A task force of the National League of Insured Savings & Loan Assns. has recommended that the S&Ls put $5 billion a year for the next 12 years into renewing the city slums. Bart Lytton, the task force chairman, says this can be done if the gov-

ernment permits a combination of federal loan guarantees, tax-free interest on investments in risky "improvement districts," and terms of up to 60 years to reduce monthly mortgage payments.

New federal programs may provide more money and loosen the stifling rules. Perhaps the most important—if it is adequately funded—is the Model Cities program. In the first round, it provides $11 million for planning and $300 million for construction (by paying 80% of what, under normal urban-renewal procedures, is the one-third local contribution to a project's cost).

Another program, launched in 1966 and now beginning to accelerate, is the so-called "Turnkey." Designed to involve private enterprise to a degree rare in government-sponsored work, this program gives a developer an almost-free hand to proceed as he would with a private project. It simplifies the approval process and permits the developer to build low-rent public housing on his own land, to his own plans and specifications, and then to sell the project to a local housing authority. Early experience leads government officials to believe that public housing built this way can be completed in two or three years' less time and at cost savings ranging from 10% to 15%.

In the wings is legislation that may involve business much more deeply in urban housing. Best known are the Percy and Kennedy proposals.

Sen. Charles Percy would set up a quasi-public agency capitalized with up to $2 billion in government-guaranteed debentures at market interest rates. The agency would offer 30-year mortgages to non-profit housing corporations at subsidized interest rates.

Sen. Robert Kennedy's proposal calls for a tax credit of up to 30% accelerated depreciation on a sliding scale (from 20 years down to 7 years) and an insurance fund to protect capital investment. For 100% equity in a project, an owner would get a 22% tax credit and 10-year depreciation.

Early this year President Johnson was expected to propose an omnibus housing bill, including requests to continue urban renewal, public housing, and other major programs through 1973. The Administration bill will probably overlap one proposed by Sen. John Sparkman and his housing subcommittee. The most significant change urged by the Sparkman committee is to raise the 6% statutory ceiling on interest rates for FHA and VA mortgages. This would stimulate the flow of money into construction, but, politically, it is a hot potato.

Do all the difficulties faced so far rule out adequate housing for slum families? Not if one idea —admittedly distasteful to some businessmen—is accepted:

Any solution to city housing problems must involve some form of government subsidy. Subsidies now look like the one way to span the gap between what low-income families can pay for housing and what private enterprise can supply at a reasonable profit.

The subsidy idea is hardly new. It was the aim, if not the result, of many existing federal housing programs. It is also the basic tool of the Kennedy and Percy proposals. What's more, many businesses—from farming and oil to autos and aerospace—benefit from subsidies, open or hidden. One example: The U.S. government finances irrigation projects for agriculture to the tune of $1 billion a year on 50-year, zero-interest loans.

Some of the required housing subsidy can continue in the form of below-the-market interest rates and long-term mortgages. But this alone is not enough. Bolder forms of subsidy will also be needed. The most obvious possibilities: total land write-down (in essence, state or municipal ownership of the land) and total tax abatement on dwelling units for at least as long as they are occupied by low-income families.

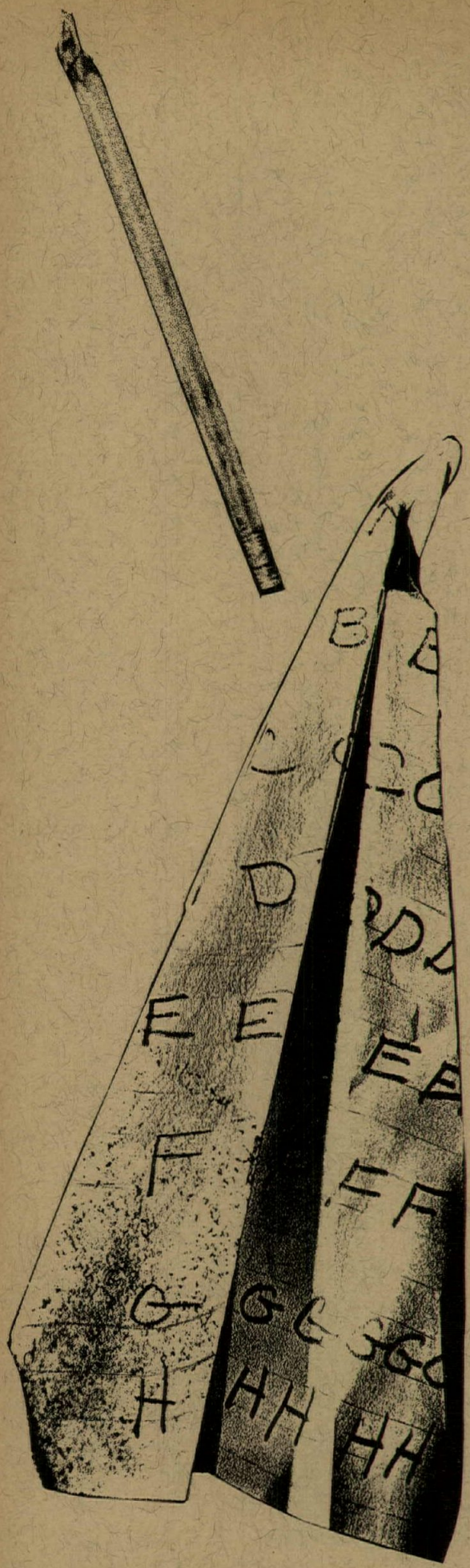
Yet no major city could afford to write down land entirely and lose all taxes on the property. This suggests the oft-mentioned possibility that the federal government relieve the cities of all welfare, health, and education costs, on the ground that these services are a national concern.

Whatever form the expanded subsidies take, the government must be prepared to provide them without insisting on over-complicated procedures. The government has a right to regulate what it subsidizes, but rules that keep every conceivable wrong-doer out of a program make it almost impossible for right-doers to get in.

Finally, as business and government work together on new rules to make the needed housing possible—by making it possible for private enterprise to earn a profit building it—one often-overlooked principle must be kept in mind:

While the most urgent need is to replace the slums, the cities also need the kind of housing that will attract and hold a middle class. It makes no sense simply to reinforce the ghettos, to freeze the trend that populates the cities only with the very rich and the very poor. Socially, politically, and economically, cities need a broader base of people.

This country is a long way from President Johnson's dream of "cities of spacious beauty." But if business and government face some hard facts, at least a start can be made.



Education

Traditionally, businessmen have left public education to the educators. But the professional educator is in trouble today in the city, and businessmen could help him find a way out

At the U.S. Office of Education, Commissioner Harold Howe II spells out the problem:

"There is a vast psychological gap between the clientele of today's city schools (students and parents) and the suppliers of education (teachers, administrators, and school board members)."

This gap is steadily widened by the spreading Negro ghettos, the flight of white families to the suburbs, and the mushrooming non-white population of city schools.

An example that scares everybody is Washington, D.C., where 93% of public-school pupils are Negroes and the percentage is still rising. Elsewhere, worried school administrators watch the trend and see their systems as "Washington minus five years" or "Washington minus three years." In Detroit, non-whites represent 57% of the school population; in Chicago, 54%; in Cleveland, 53%; in St. Louis, 62%.

When the Negro school population reaches such high levels, the quality of education suffers. Negro pupils begin to feel segregated and lose their motivation to learn. Teachers have to spend more time keeping order than teaching. So, not surprisingly, the most-experienced teachers tend to shun the very schools that most need them.

Total solution of the educational problem may not be possible. But ghetto schools can be vastly improved—if there are major changes in attitude and action not only among educators but also among businessmen.

Educators must become more flexible and more responsive to the pupils' needs. Critics claim that an entrenched bureaucracy, unmoving and unresponsive, has fought bitterly against changes in some cities.

"Our urban public school systems seem musclebound with tradition," says Dr. Kenneth B. Clarke, a Negro sociologist and president of the Metropolitan Applied Research Center. "They seem to represent the most rigid forms of bureaucracies, which are paradoxically most resilient in their ability to resist demands for change."

Bureaucracy strait-jackets not only some school systems but also many government officials. So businessmen emerge as one force that can bring about change.

Businessmen must understand education, support it, and even get directly involved. Specifically:

- Businessmen will have to alter their traditional opposition to more spending for schools, and face up to higher taxes. Almost every suggestion to improve the ghetto schools takes enormous sums of money. One federal act alone, authorized $6.1 billion for fiscal 1967 and 1968 to help elementary and secondary education; and the figure is over $9 billion for 1969 and 1970.

Some businessmen have already changed their stance on school spending. In Detroit last year the usually conservative Board of Trade raised $60,000 to campaign for higher school taxes that would bring in an additional $25 million a year.

- Businessmen will have to speak out on school improvements, many of which are controversial. In Pittsburgh, for example, businessmen have allied themselves with educators and civic and religious groups to support a revamped educational system that includes replacing all the city's high schools with five super high schools—a move to aid integration.
- Businessmen will have to work more with professional educators. When the Hartford (Conn.) Board of Education and Common Council reached an impasse on what should be done about the city's schools, the Chamber of Commerce persuaded both parties to bring in an outside consultant to recommend action. The New Detroit Committee, formed mainly of businessmen after last summer's rioting, is pressing Detroit's school system to adopt consultants' recommendations that had been ignored by the city's educators.
- More businessmen should also turn to education for a career. In Philadelphia, for example, an enlightened school administration has gone to business rather than traditional educational circles for two new associate superintendents. One, a former partner in a large accounting firm, is in charge of finance; the other a professional planner, heads the school system's planning.
- Finally, businessmen need to make one other contribution to education: Using skills perfected for business—such as marketing, engineering, and management—they can help frame creative proposals for new educational programs.

If educators and businessmen are to work together to upgrade the city schools, what changes and improvements should they seek? Here are five suggestions by men who have already been deeply involved in the problem:

1. Change the ghetto schools to gear them more closely to the right culture. Harold B. Gores, president of Educational Facilities Laboratories Inc., a nonprofit corporation established by the Ford Foundation, blames a lot of the schools' troubles on the existence of two cultures in the cities. And, he says, many schools are geared to the wrong one.

"That culture," Gores explains, "is white, middle-class, Anglo-Saxon, Protestant. The children attuned to it are success-oriented and have strong family ties. In contrast, the Negro child in a ghetto doesn't know or appreciate the standards, values, or morals of the middle-class family. He may have no father. His only close relative, his mother, may raise him to live for the pleasure of the moment. For such a child, there is no tomorrow to worry about or plan for."

Kenneth Mines, a Negro lawyer in Detroit, describes an added handicap: "Every Negro child realizes he is different, that there is something wrong with him. This builds an inferiority complex. Some children react negatively; some react violently; some just drift down and become inferior."

So the ghetto school has to be both school and family for many Negro pupils. That is the reasoning behind some of the compensatory programs that have been started.

The Preschool Project in Ypsilanti, Mich.—a program that included home visits, psychological consulting, medical services and a special task-oriented curriculum—produced a consistent jump in intellectual ability among disadvantaged Negro children—but at a cost of $1,500 per pupil.

Frustratingly, high cost doesn't guarantee success. Three years after New York City started the More Effective Schools program that raised instructional costs from $434 to $994 per pupil, The Center for Urban Education concluded: "The MES program has not had any significant... effect on children's performance in arithmetic... [nor has it] stopped the increasing retardation of children who began it in grades two or three."

The same charge of ineffectiveness has been leveled at Headstart, the Office of Economic Opportunity's $1.5-billion-a-year program for preschool children. Although it is still too early for a complete evaluation, critics maintain that the children lose their headstart soon after leaving the program. Apparently, the government sees some truth in the charge, because it is now adding a "Follow Through" program to continue up through the third grade.

2. Change the school curriculums to make them more realistic than they are now. Even if a young

Negro now makes it through early grades, he's likely to fall afoul of a curriculum that bears little resemblance to real life around him.

No part of the curriculum is held in lower regard by the average ghetto dweller than vocational training, which is supposed to turn out graduates ready to step into jobs in industry. Negroes claim that many vocational programs teach trades oriented to the '30s and '40s rather than the '60s. Negro students now want to learn telephone installing, business-machine repair, computer programming, and television maintenance instead of traditional woodworking, metal working and automobile repair.

Ghetto leaders hope that business, prompted by its need for better employees, will force a change to more useful training. In fact, only business can make vocational training more realistic, according to Robert Potts, of the Virginia Park Rehabilitation Citizens Committee, which is trying to rebuild the area where Detroit's 1967 riots started.

"Private industry will have to contribute people and equipment and help plan the curriculum," says Potts. "School administrators don't know what kinds of jobs industry has today."

Exactly what can industry do? Here is one example: Michigan Bell Telephone Co. adopted a heavily Negro Detroit high school whose students went on strike last year to oust the principal. The company sends its personnel people to the school to teach weekly classes on how to get a job—what to wear, how to act and what the interviewer is looking for.

"Only eight students showed up for the first class," says Michigan Bell President William Day, "but when the others heard via the grapevine that it was for real, more started to attend. Now the classes are jammed."

3. Consider a whole new approach to the design of school buildings. Too many city school buildings are old and outmoded. In Boston, for example, a third of the schools were built more than 100 years ago. Even worse in the minds of architects, most of today's school design still stems from a 120-year-old idea first applied at Boston's Quincy school, which is still in use. It treats a school as an egg crate that seals the pupils into compartments, each with a teacher.

"Today's schoolhouse is monastic, antiseptic, and unattractive," says Harold Gores of the Educational Facilities Laboratories. "Its only benefit is that it is nearly indestructible." More to Gores' liking are wide-open spaces, now starting to show up in suburban schools, that allow team teaching and greater flexibility.

4. Bring more Negro teachers and administrators into the city school systems. "Negro pupils would be more motivated to learn," says Ernest Brown, a personnel executive with the Michigan Consolidated Gas Co., "if they had models to look up to. Since the first person of stature a Negro child meets may well be his teacher, there should be more Negro teachers in ghetto classrooms."

That's easier said than done, according to many school officials. Not enough Negroes are qualified, and business often snaps up those who are.

True enough—but only to a degree. It's also true that some school systems have not been sympathetic to hiring Negroes, and others have simply not thought about it. In Detroit's system, for example, where enrollment is more than 50% Negro, there is not a single Negro athletic director.

5. Take a new look at the thorny question of integration. With the fast-rising Negro population in so many cities and the equally fast white exodus, the integrated school's ideal racial mix —70% white and 30% Negro—is no longer physically possible in more and more schools. Result: Some of the first integration efforts—busing, educational parks, and metropolitan schools—don't look so effective anymore.

Now the most promising efforts seem to be aimed at upgrading the city schools enough to lure whites back. That means adding a lot of educational services once considered frills: extensive counseling, extracurricular remedial programs, smaller classes, and higher salaries for teachers.

But integration is no longer the chief concern of militant Black leaders like James Del Rio, a Michigan state legislator.

"We don't want integration," he says bluntly. "We want to improve the education in our Black schools." Del Rio's goal is also the goal of some more-moderate Negroes and whites—at least as a realistic first step toward solving the problem.

For the long pull, however, the best solution still seems to be the old Horace Mann concept of a common school where the banker's daughter and the blacksmith's son attend classes together. In a well-publicized study (the so-called Coleman report), two Johns Hopkins professors found that mixing students of all classes and races was a more effective way to improve education in ghetto schools.

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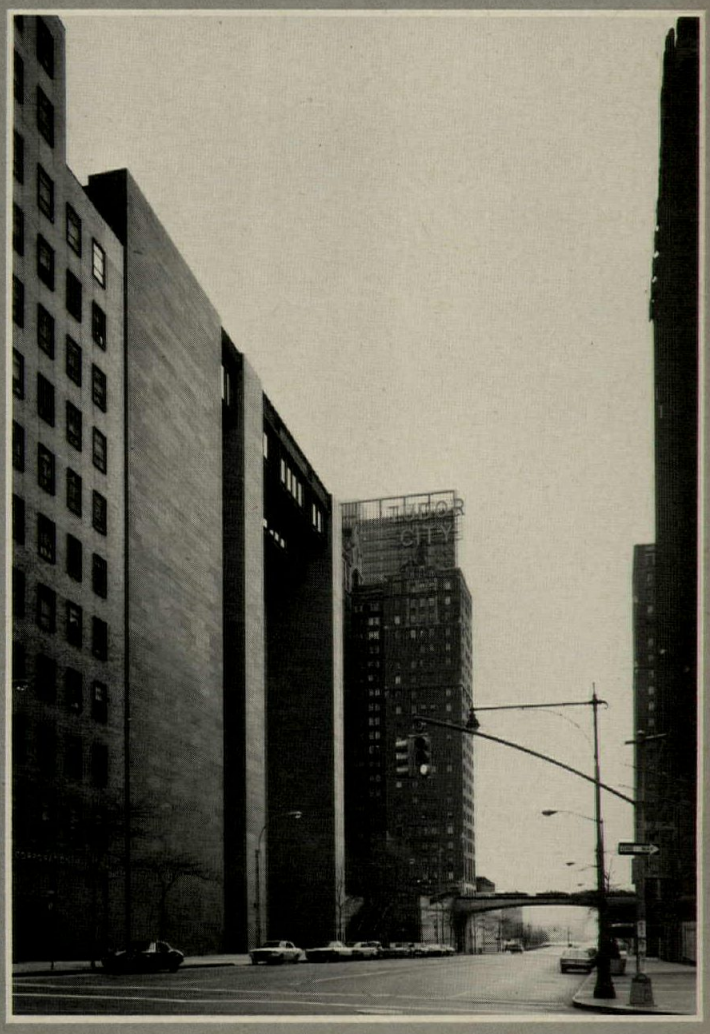
ARCHITECTURAL RECORD
FEBRUARY 1968

INNOVATION AND SYMBOLISM ON 42nd STREET

Kevin Roche's design for the new Ford Foundation headquarters is a unique symbolic expression that demonstrates a new kind of urban space

by Jonathan Barnett

To the casual passer-by the new Ford Foundation Building is enigmatic, practically invisible . . .



1

By enclosing a third of an acre garden in walls of glass twelve stories high, the architects of the Ford Foundation Building, Kevin Roche John Dinkeloo and Associates, have created a new kind of urban space that stands between the sealed environment of a modern office building and the increasingly harsh and uncontrolled urban landscape outside.

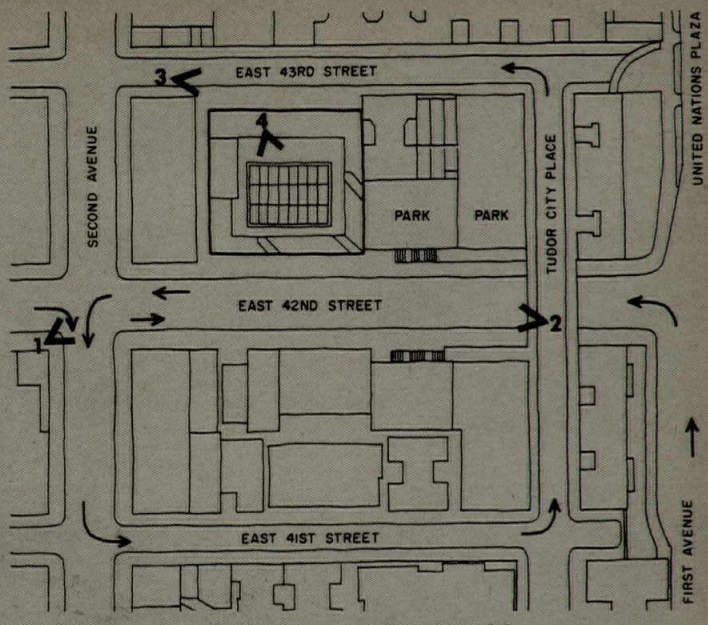
Original architectural ideas are rare and hard to come by; and, when they appear, they usually set off a train of related developments. While the Ford Foundation building is very much one of a kind, a special case, it is directly related to problems of the urban environment that architects and planners everywhere are trying to solve.

When architects come to visit the Ford Foundation Building, however, they are going to get a surprise. While the basic concept of the building may seem simple enough in drawings and photographs, in actuality it is tremendously complex and paradoxical. The design, which might be expected to produce a sense of informality, openness and candor, is actually highly charged with a symbolic content that invests the most ordinary aspects of the building's life with an almost ritualistic significance.

For example, a visitor does not simply drive up to the Ford Foundation, he approaches it by a carefully planned processional way, which turns the mundane requirements of a one-way street system into a ceremonial journey of surprise and discovery. Traffic regulations require that every car headed for the 43rd Street entrance to the Ford Foundation must first drive east on 41st Street, and turn left on to Tudor City Place, which crosses 42nd Street on a bridge, affording a highly interesting three-quarter view of the Foundation building. The building is not visible again until the car pulls into the entrance-way of the 43rd Street facade, a closed composition of granite and glass which affords no hint of the light and spacious garden court within.

This sequence, rather reminiscent of a slide lecture by Vincent Scully describing the approach to a Greek temple, is not an accident but conscious contrivance. In the same way, the Ford Foundation building itself is far more than office space for some 350 employees. It is a symbolic statement that seems to characterize the Foundation's relation to the world around it, and the relationship of its employees to each other.

Kevin Roche says that he was certain from the beginning that he should not create a typical New York office building, which he calls just



To the visitor arriving by automobile the building bursts into view suddenly at a turn in the tortuous one-way street system . . .

3

The main entrance, once reached, is dark and cave-like, then opens to a slowly unfolding vista of the lofty interior garden . . .

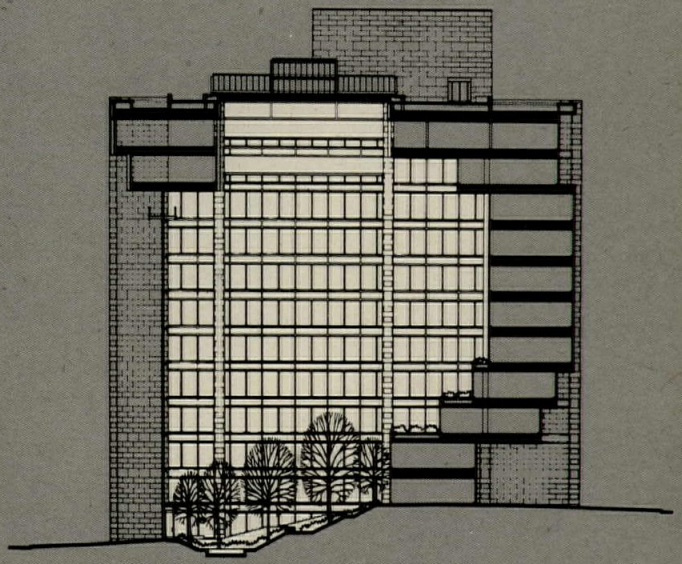
4

a multiplication of ground floor space. He also felt that the Foundation, which has grown very rapidly over the past 10 years, suffered from a lack of communication and needed to be housed in a building strongly expressive of relationship and the organization's personality.

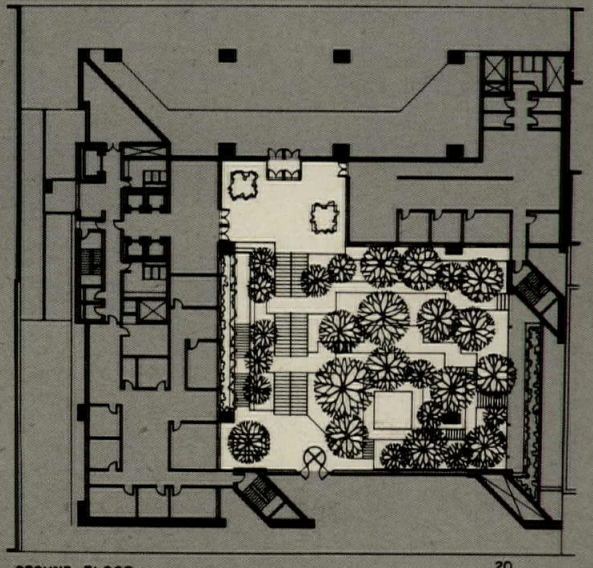
The site is an unusual one, near the United Nations Building, at the east end of 42nd Street, one of Manhattan's most prominent cross-town streets. The plot selected by the Foundation is not prominent in itself, however; it is not large and does not occupy a corner. The most salient characteristic of the location is its proximity to Tudor City, a self-contained group of apartment houses dating from around 1930, whose frosting of Elizabethan detail gives the complex its name. Tudor City's main level is more than a story above 42nd Street, and two parks at this upper level adjoin the Ford site's eastern edge.

Although Roche knew all along that a courtyard of some kind would be an important part of his design, his initial concept was an L-shaped building with a stepped section that terraced down to meet the space of the Tudor City parks. The decision to reach out and enclose the courtyard space established the basic concept, and the rest of the building follows logically from it. The courtyard still steps up an entire story from 42nd to 43rd Street, and several of the lower floors of the building still step back to create terraces; but the interior volume becomes a single space, and pulls the whole building together in a very powerful way. The court becomes a park, which is open to the public and is a tremendously generous gift to the city, as is the care and restraint with which the building's dimensions, proportions and colors have been related to its neighbors. The warm tones of the granite facing and the rust-surfaced steel harmonize particularly well with the red brick of Tudor City.

The offices are grouped around the court in such a way that it provides both a physical and visual transition between the office space and the world outside. The court serves as a giant return for the conditioned air supplied to the offices, and the offices and corridors that look out on the court have doors that can be opened and slid back. The court also provides a variety of outlook and a constant point of reference. Roche speaks of it as a "living room" for the whole Foundation that provides a sense of community for everyone who works there. The sense of community is certainly present, but the visitor is likely to find that "living room" is too domestic a term. In fact, the space is little short



The interior courtyard pulls the building together in a very powerful way and forms a new kind of urban experience, a park whose climate is controlled, and where flowers bloom all year around . . .



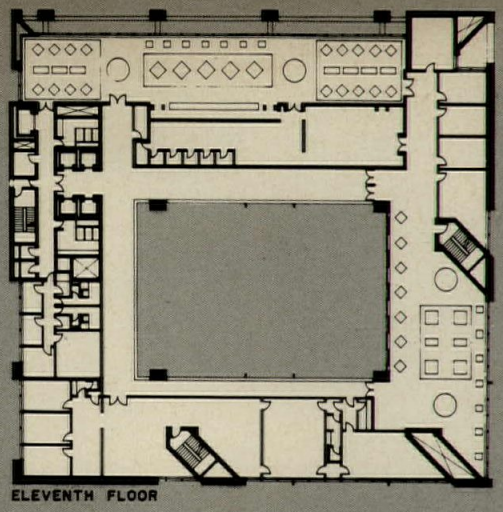
of awe-inspiring, and the sense of organization that is projected is one of ritual, hierarchy, and immense power.

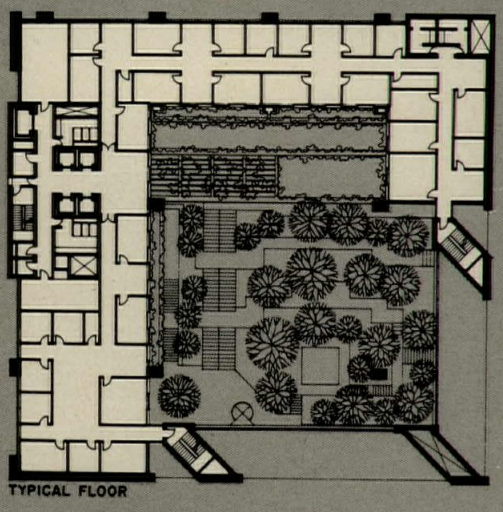
It is difficult to say exactly why this rather unexpected effect should have occurred. One reason may be that, by enclosing the court, Roche has made the entire building essentially four-square; that is the building's height, length and width are very similar. The four-square building with an interior court is a traditional symbolic representation of the universe, and as such is an ancient symbol of power, used in religious buildings and palaces. The palace of the king of kings, the temple of the New Jerusalem, the house of the world, are the concepts this shape connotes.

Whatever the reason, the most ordinary aspects of the Foundation building seem charged with special significance. For example, it is very typical corporate symbolism for the top floor to be the executive floor; so typical, in fact, that one ceases to think of this arrangement as symbolic. But, in the Ford Foundation building, the president is visibly above everyone else; one can look up and see him from virtually every point in the building. Not only that, but directly above *his* head is the office of the Chairman of the Board, whose office is the only one adjoining the court that does not look out on it. The two offices seem to become the visible and invisible manifestations of a mysterious power.

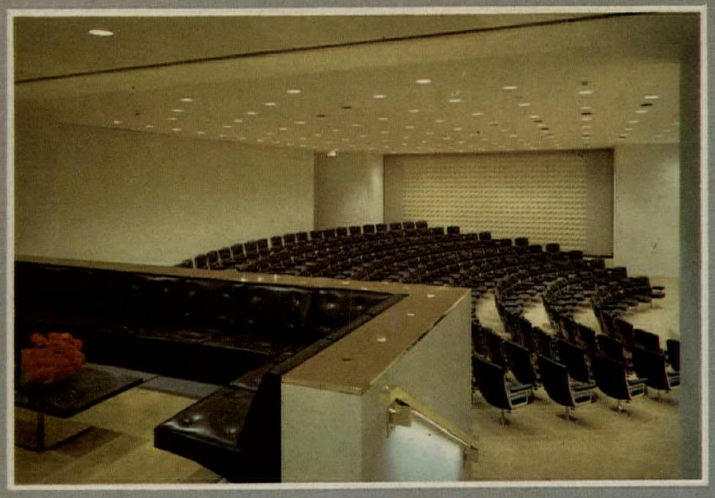
The mysterious effect is heightened by the consistency of interior detailing. The whole building is essentially a collection of executive suites, as the non-executive work of the Foundation is contracted out, through the medium of grants. Each office is done in the same rich palette of subdued natural materials. To the outsider, all the offices appear identical, and the activity of the occupants thus completely unintelligible. The visitor senses, however, that, to the initiate, the fine gradation of office location and sizes has a definite meaning; so that, seeing all, he knows he is excluded.

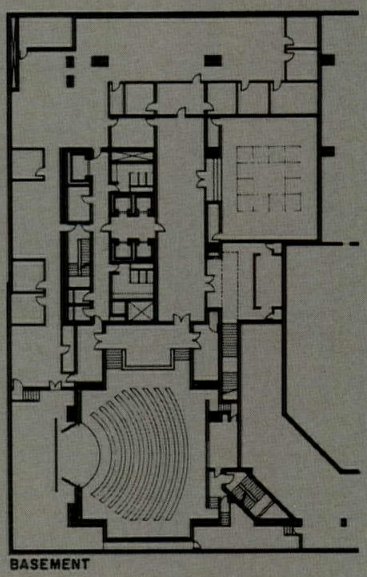
A final symbolic note is struck by the fact that almost all the metal trim in the building is brass; that is, one knows it is brass, but actually one thinks of it as solid gold, the ancient perquisite of priests and kings. The pervasiveness of gold elevates everything to the status of cult object. Telephones, filing cabinets, typewriter stands, door trim, stair rails, all appear to be of solid gold. Most striking of all are three golden brass doors that lie at the end of a precipitous descent into the basement.





All furnishings and interior fittings (opposite) are done in the same rich palette of subdued natural materials. All metal trim is brass, but seems to be solid gold. Straight and narrow stair (below) leads to conference and board rooms.





BASEMENT

Golden doors (below) lead to auditorium-conference room

If the building has acquired a symbolic life of its own, however, it is because the Ford Foundation gave its architects the freedom—and the money—to make the design a work of art. And if the result has the effect of picking out and over-emphasizing certain aspects of the Foundation's organizational character, it is because the design has a tremendous symbolic power that no one could have anticipated before it was built. It is, perhaps, the most important contribution of this building that it demonstrates that a space only modern technology makes possible can command an almost archaic significance.

The experience of the court is also an important one. The design of landscape architect, Dan Kiley, has made it a real garden, and not just a collection of potted plants. In a time of rapidly increasing urbanization, growing densities, and a more and more frenetic pace of life, a garden court of this kind becomes an oasis of tranquility and a point of balance in an uncertain world.

Thus, the design of the Ford Foundation Building, although unique, is also suggestive, and it will be interesting to see if it will have an influence on other buildings. One certainly hopes it will.

FORD FOUNDATION BUILDING, New York City. Architects: *Kevin Roche John Dinkeloo and Associates—associates: Eugene Festa, Philip Kinsella, and (for interior furnishings) Warren Plattner;* structural engineers: *Severud Associates;* mechanical engineers: *Cosentini Associates;* acoustical consultant: *Michael J. Kodaras;* landscape architect: *Dan Kiley;* general contractor: *Turner Construction Company.*

What went wrong with the dreams of a truly modern style in architecture which would express the realities of our age? Only, says a noted critic, that they came true: now we have discovered the limitations of the machine, and the time has come to develop

ARCHITECTURE AS A HOME FOR MAN

by Lewis Mumford

Not the least part of my architectural education came from my walks through New York's Lower East Side, whose tenements, in their congestion, their darkness, their foul interiors, fully equalled if they did not surpass those of Juvenal's Rome. The absence of space, order, intelligent design, even sunlight and fresh air—the sense of all the human qualities that were missing—taught me, by contrast, what to demand in every work of humane architecture.

These solitary walks were the foundation of my architectural education; and if I have had anything fresh to say about modern architecture or about city design, it is because I have continued these walks throughout my lifetime: not as a sightseer or tourist, looking for notable buildings worthy of three or at least two guidebook stars: but as a man who sought to take in visually and make the fullest possible use of the life about him. To quote Ulysses: "Much have I seen and known: cities of men and manners, climates, councils, governments." For in my ideal scheme of education, this mode of seeing and knowing must both precede and supplement the knowledge we receive from books, statistics, or computers.

Even the worst buildings one encounters in this fashion are still human documents; and as for the greatest, they are of the same stuff that poems and symphonies are made of, not merely vivifying one's limited experience, but uniting one with a tradition that goes back at least as far, architecturally speaking,

This article is excerpted from the paper given by Mr. Mumford on the occasion of his receiving the honorary degree of Doctor of Architecture at a special convocation of the University of Rome last year. As we go to press, it is announced that Mr. Mumford will receive the first Architectural Critic's Medal of the American Institute of Architects, established to recognize the distinguished accomplishments of a career in architectural criticism.

"... a world that dated not... from the beginnings of architecture... but from the birth of Charles Edouard Jeanneret and Frank Lloyd Wright..."

as the painted caves of Lascaux and Altamira—and probably, if we had any record of older cultures, much farther.

The art of becoming human and its relationship to architecture

In the end I have come to recognize only one supreme art, the art of becoming human: the art of expressing and intensifying one's own conscious humanity by appropriate acts, fantasies, thoughts, and works. So closely are esthetic form, moral character, and practical function united in my philosophy, that the absence of one or the other of these qualities in any work of architecture turns it for me into a hollow shell, a mere piece of scene-painting or technological exhibitionism, like Buckminster Fuller's tetrahedral domes—not a fully-dimensioned building that does justice to all the varied demands of life.

My architectural interest has never been primarily in the formal structure as such: if so, I would have spent much more time learning from Viollet-le-Duc, Guadet, and their successors. My interest has rather been in buildings as a many-sided expression of the human mind: not just its intelligence and practical mastery, but its feelings, its prophetic aspirations, its transcendent purposes. If you wish masterly technical criticism in architecture, you must seek it, not in my own work, but in that of my great American predecessor, Montgomery Schuyler, whose admirable critiques of Richardson, Roebling, Louis Sullivan, J. W. Root and Frank Lloyd Wright I had the privilege of making known to the present generation.*

Le Corbusier and the machine: at once "Cartesian" and "Baroque"

Now my career as architectural critic runs parallel, curiously, with another mind that was to exercise a much greater influence over the past generation, the late and much lamented Le Corbusier; for he, like myself, was something of an amateur, a term I use in no derogatory sense; and in the eyes of his first master, Auguste Perret, he remained an amateur to the end. Le Corbusier's walking tour through Europe played the same part in his architectural awakening that my peregrinations around New York did for me; and at the moment he and Ozenfant were formulating a new esthetic derived from the machine, I published, in 1921, an article on "Machinery and the Modern Style," based on the same premises.

But from the time I read the first edition of his *Vers une Architecture*, I knew that we were, by reason of our different temperaments and education, predestined enemies: he with his Cartesian clarity and his Cartesian elegance but also—alas!—with his Baroque insensitiveness to time, change, organic adaptation, functional fitness, ecological complexity; and, not least, with his sociological naivete, his economic ignorance, and his political indifference. These very deficiencies were, as it turned out, what made his City of the Future such a successful model for world-wide imitation: its form reflected perfectly the financial, bureaucratic, and technological limitations of the present age.

Even when Le Corbusier used the same urban concepts I had redefined and reestablished, such as the Garden City or the New Town, he did so without the least grasp of the social principles that they embodied. And yet, in the right-about-face that Le Corbusier made toward the end of his life, he deliberately turned his back on his original mechanical cliches and slogans, and sought expression in forms that emphasized not rationality but fantasy, not Cartesian order but emotional depth. Had these two aspects of Le Corbusier's mind been equally cultivated from the beginning, I should have been proud to be counted as his admirer and advocate.

Wright: another "victim of his own egotism and arrogance"

I have used the example of Le Corbusier, not to disparage his creative talents, but the better to define my own position during the decade when his vivid polemics, his marvelously suggestive sketches, and his esthetic innovations influenced, indeed dazzled and in fact overwhelmed, the younger generation.

You might gather from this that since I rejected Le Corbusier I accepted wholeheartedly his older rival and polar opposite, Frank Lloyd Wright. But that would oversimplify my position. Wright was for me, and still is, the outstanding architect of the past century: unrivalled for sheer exuberant creativity. And yet, like Le Corbusier, he was the victim of his own egotism and his arrogance. They lived in a world that dated not from the beginning of the Christian era, nor from the beginnings of architecture in Egypt and Sumer, but from the birth of Charles Edouard Jeanneret in the one case, Frank Lloyd Wright in the other.

An architectural generation absorbed in exploiting newness

In this, these architects were typical of their generation; and the principal fault I find in my own early set of ideas, even though I was better grounded in history, is that I, too, believed that modern science and technics had the happy task of wiping out the effete remains of past cultures, as a bulldozer slaughters the trees and levels the ground for a mass building operation, in order to found a new culture on rational purely scientific principles. I can speak freely about this aberration, since in my youth I was molded by the same positivist ideology. For me, only contemporary life had meaning. As a student I rebelled at the college requirement to learn even a smattering of first-year Latin. Like the elder writers who influenced our whole generation, Bernard Shaw and H. G. Wells, we identified the new with the good, and hailed the New Man, the New Woman, the New Politics, the New History, the New Science: in short, the New World. History, we thought, began and ended with ourselves, and we expected the new to last

*For a bibliography of Schuyler's articles in the RECORD (1891-1917), see January 1956, 284, 288.

"Up to now architecture, unlike music, painting, sculpture and the drama, has not successfully been turned into a 'happening'..."

forever, as if the will-to-change itself would remain forever unchanged.

Even before the Nineteen-twenties were over, I had modified many of these views: for as soon as I was married, I discovered that the New Woman was still the old Eve, and then that the New Baby was still full of the old Adam, no matter how much one had departed from the older generation's methods of child care.

Did victories over tradition serve the needs of human beings?

But in architecture, engineering and technics, we nonetheless hailed every departure from precedent or tradition as a victory for the modern spirit; and we did not suspect that many of our modern criteria or our modern forms were as inadequate from the standpoint of organic human needs as the stereotyped historic forms that the eclectic traditionalist half-heartedly imitated.

Yet the fact is that the first of the new experimental buildings, by their very contrast with the old, conveyed a sense of vital originality that they can no longer evoke after having been reproduced, with all their faults, a thousand times. Like the old Strada Nova in Genoa, they stood out magnificently, enhanced by the clutter of old buildings around them. There are still a few structures, like the classic Van Nelle factory near Rotterdam, that keep this freshness.

But during the past quarter century blight and confusion have fallen upon modern architecture, as they have fallen upon our whole civilization; and the principal causes of this blight have remained unexamined and uncorrected, chiefly because they are the result of forces and modes of thought which our contemporaries regard as unqualified goods: the expansion of the exact sciences, the socially explosive inventions of nuclear physics and electronics, the achievements of automation and cybernation. These massive transformations in every department of technics now seek to wipe out every human function or purpose that will not conform to the dominant ideology and support its expanding and inflating economy.

"Caprice and random happenings" as a "principle" of current design

Most of our contemporaries are unprepared to face the fact that our rapid scientific and technical progress has resulted in ecological deterioration and social regression: and that the disintegration of our civilization has been in good part caused by our fabulous success in displacing the human personality and denying its autonomy. Mechanical and electronic processes of integration have produced their astounding successes in mass production and mass communication by systematically breaking down ecological complexities and eliminating the human factor. Compulsory consumption, compulsory waste, compulsory direction, compulsory destruction are the marks of this age; and it would be strange if architecture were not threatened by these same forces. When half a century ago we demanded that modern architecture express "modern life," we were too innocent to guess what this demonstration would reveal.

Though the present cult of anti-life might plausibly be traced back to Marinetti and his Futurist following, the full meaning of this attack has become apparent only during the last 20 years. One of the possible responses to the over-mechanized and over-regimented world we have fabricated is becoming more obvious every day: the elevation of caprice and random happenings into the guiding principle of modern design. This, of course, is most conspicuous at the moment in the realm of clothing and costume. Who could have guessed that the effortful inanity of Quant and Twiggy clothes would come from a country that gave the world the utilitarian rationalism of Manchester which so stimulated the mind of Karl Frederick Schinkel?

Up to now architecture, unlike music, painting, sculpture and the drama, has not successfully been turned into a "happening," for the simple reason that a building constructed on such lines would not stay together long enough to be seen, much less lived in. But the effort will surely be made: either by scattering ephemeral plastic envelopes around an underground shelter, or by staging more elaborate architectural happenings under a geodesic dome—thus uniting the two main avant-garde movements in contemporary disintegration: the Hippies and the Buckies. In both movements, the desire to efface or completely replace the human image and the organic environment dominates its leaders. So those who are in retreat from all mechanization, all regimentation, indeed all order, can hardly be distinguished from those who worship and exalt the machine, and who are utilizing the most advanced technology—nuclear power, bulldozers, jet planes, rockets, computers—to achieve the same results even more effectively.

Today's architectural trends: disposable container, space capsule

Architecture today is thus tending to one or another extreme: either the disposable container or the space capsule. Both are designed for mass production, the first in limitless quantities, the second in units of limitless size, like the Mile High Skyscraper, that denial of his own organic architecture, which Frank Lloyd Wright played with toward the end of his life. Our present object of public worship and religious sacrifice, the space rocket, efficiently serves both as space-capsule *and* disposable container. Both extremes, by definition and by intention, are based on purely mechanical, not human, requirements as determined by systems analysis; and both modes are detached from the living past and the potential future: for they are focussed on a present from which the accumulations of past experience and the potentialities of the future have been rigorously excluded. Such architecture, devoid of human associations, is fit only for computers, not for men. To call these structures modern because of their extravagant technical and scientific equipment is to forget

"Man . . . is the maker and the molder of himself: and architecture must be the expression . . . of man's entire nature . . ."

all that biology and psychology, archaeology and history have now added to the naive Seventeenth Century picture of a purely physical cosmos. Machine-made man and his machine-made world are both obsolete.

What happens when the old dreams of modern architecture come true?

What, I have often asked myself, has gone wrong with our youthful dreams about a truly modern style in architecture, one which should express the realities of our own age? I have come to the conclusion that only one thing went wrong with those dreams: They came true! In our admiration for the entrancing constructive feats made possible by modern technics, we did not imagine what the world would look like if every part of it was made over into the exact image of the machine: with trees turning into metal rods, flowers that once bloomed and died achieving immortality in plastic forms, and men and women becoming so completely subservient to the machine that the space capsule, at least in the vulgar form of a motor car, would become their ideal habitat, for the sake of which they would ruin their landscapes, poison the air and the water, and destroy their cities. There is no need today for rocket flights to the moon: the face of our own planet will soon be equally sterile, equally hostile to living organisms. Has not Buckminster Fuller actually characterized the space capsule as the most perfect man-made environment? Why look further?

But we owe a debt to modern architecture: its disposable containers and its space capsules have revealed the real nature of our civilization: its compulsive irrationality, its mechanized barbarism, its psychedelic fantasies, subhuman or pre-human in their complete alienation from man's deep creative potentialities and formative achievements. Neither "instant buildings" nor "instant cities" are likely, on their own terms, to have a long life. The cult of power has made us impotent; and the cult of speed has created an environment so uniform that the faster one travels the less the scene changes.

A time for architecture which restores man to a central position

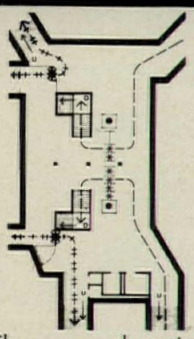
Our generation, which invented the term feedback, should be able to learn from and rectify the mistakes it has made in its one-sided exaltation of technology. We should at last understand that unless we preserve human continuity, and cultivate variety and balance throughout the human environment, our scientific and technical advances will be not merely menacing but meaningless. Primitive man learned, by a thousand magic tricks and games and rituals, to detach himself from nature without forfeiting the many gifts and advantages nature generously offered him. So now with modern man. He must stake out his own inviolable territory, essential to both his inner balance and his creative growth: so detaching himself from the machine as to make it serve his own purposes.

Instead of abasing himself before his electronic and mechanical gods, modern man must restore his own self-respect, his self-discipline, above all his capacity for selecting and achieving goals that conform, not only to economic and technological conditions, but to the needs of his own personality and community, enriched as they are by precious historic fibres that reach far back into his past. Man, as Pico della Mirandola well said, is the maker and the molder of himself. In that process, architecture has been one of the chief means, through symbolic expression and beautiful form, of transforming and making visible to later generations his ideal self: not just his capacity to think, but his capacity to dream, to love, to enjoy and to hope.

This, then, is the task for today and tomorrow: to restore and eventually to elevate even higher than ever before the organic and human components that are now missing in our compulsively dynamic and over-mechanized culture. The time has come for architecture to come back to earth and to make a new home for man.

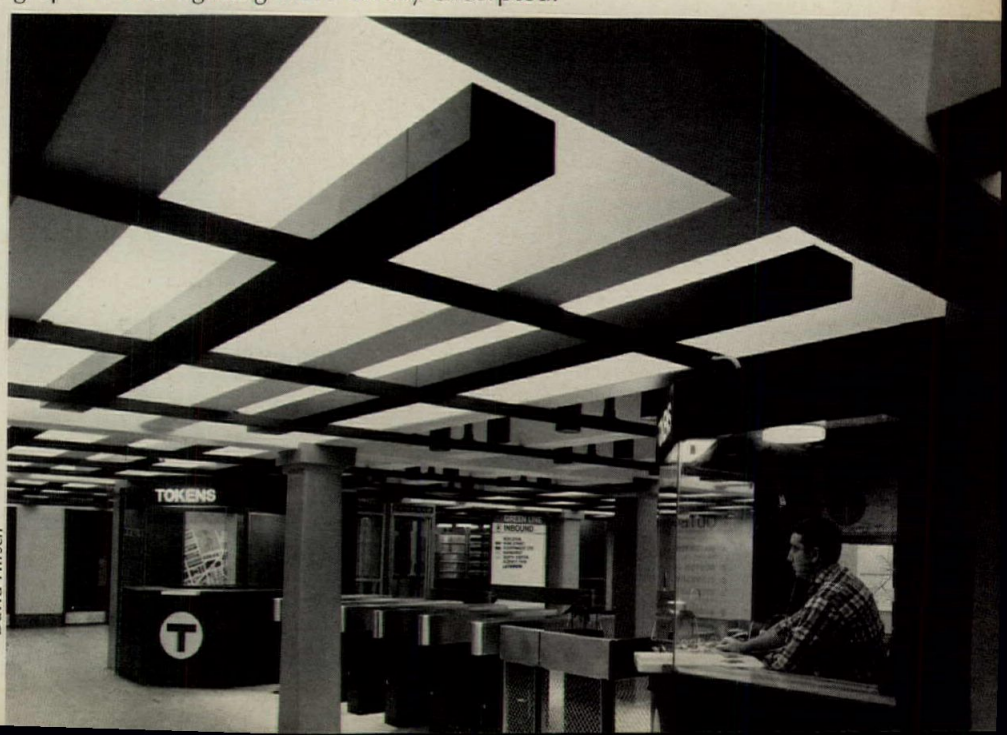
courtesy MBTA

BOSTON UPGRADES ITS UGLY SUBWAY—



SETTING NEW STANDARDS FOR TRANSIT DESIGN

The once chaotic entrance to Boston's Arlington Street Station (shown before remodeling in the photo and plan at top) had all the defects which still make the subway systems in U.S. cities unfit for people—gloomy lighting, foul air, atrocious noise, unpleasant temperatures and poor pedestrian circulation due to indifferently placed stairs, change booths, turnstiles and other elements. Worst of all, Boston's entire transit system, though more comprehensible than New York's, failed to give sufficient graphic information to allow persons unfamiliar with the system to immediately find their way. The Massachusetts Bay Transportation Authority, seeking to make mass transit enthusiasts out of those who ride the subway only as a last resort, was advised by the Civic Design Committee of the Boston Society of Architects to develop a comprehensive set of architectural and graphic design standards for the total subway environment including specific recommendations for 40 stations. Urban design and site planning criteria were to be developed for projected new stations, and lighting and all other forms of equipment were to be studied for the entire system. The Cambridge Seven Associates, Inc., engaged by the MBTA to implement this program, redesigned Arlington as a prototype (shown below and in the plan adjacent), and produced a four-volume Manual of Guidelines and Standards—an invaluable document—from which the following pages on graphics and lighting were briefly excerpted.

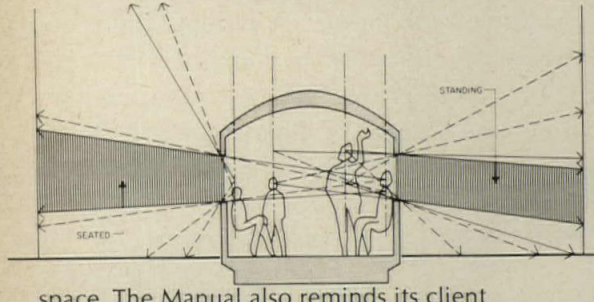


David Hirsch

Graphics

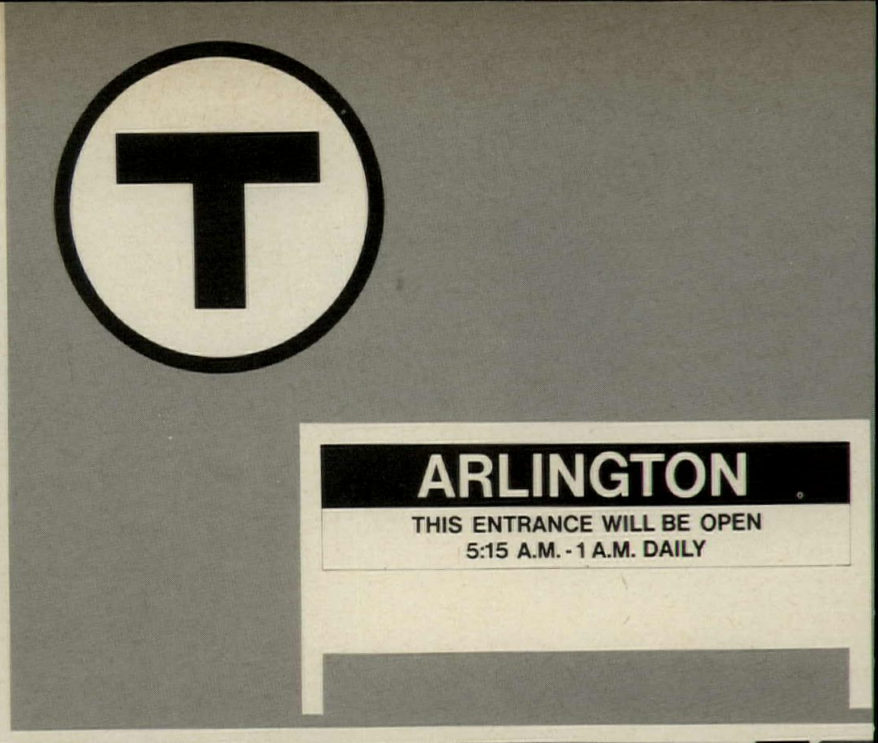
A non-French speaking tourist on his first day in Paris can use the Metro like a native—not because its signs are bilingual—but because they are simple, clear, well organized, and located at all points where the transit rider must make a decision. The non-English speaking tourist who boldly embarks on an unescorted subway ride on his first day in New York City is in for real trouble—not because there are no signs—but because there are too many of them, a chaotic situation now made even worse by the wildly complicated new Transit Authority maps recently installed in the trains. Boston is the first U.S. city to seriously attempt to make its subway *informative* and will one day catch up with the London Underground, Montreal Metro, Stockholm Tunel-Banan and Hamburg U-Bahn-Netz. According to Peter Chermayeff, one of the principals of Cambridge Seven Associates: "clear information became a guiding principle influencing design decisions at every scale . . . a concern for passenger orientation provides the design with a strong rationale . . ."

The Manual of Guidelines and Standards prepared by the Cambridge Seven team for the Massachusetts Bay Transportation Authority states that, since signs, maps and photomurals have an architectural impact on orientation and station environment, they must be integrated from the outset with structure and

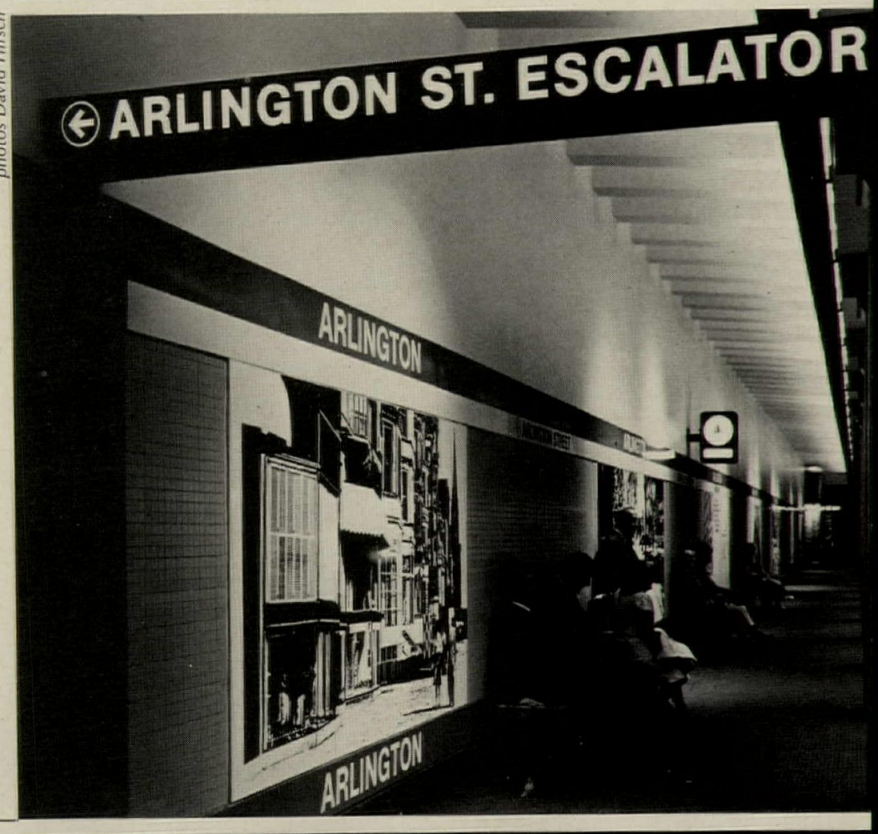


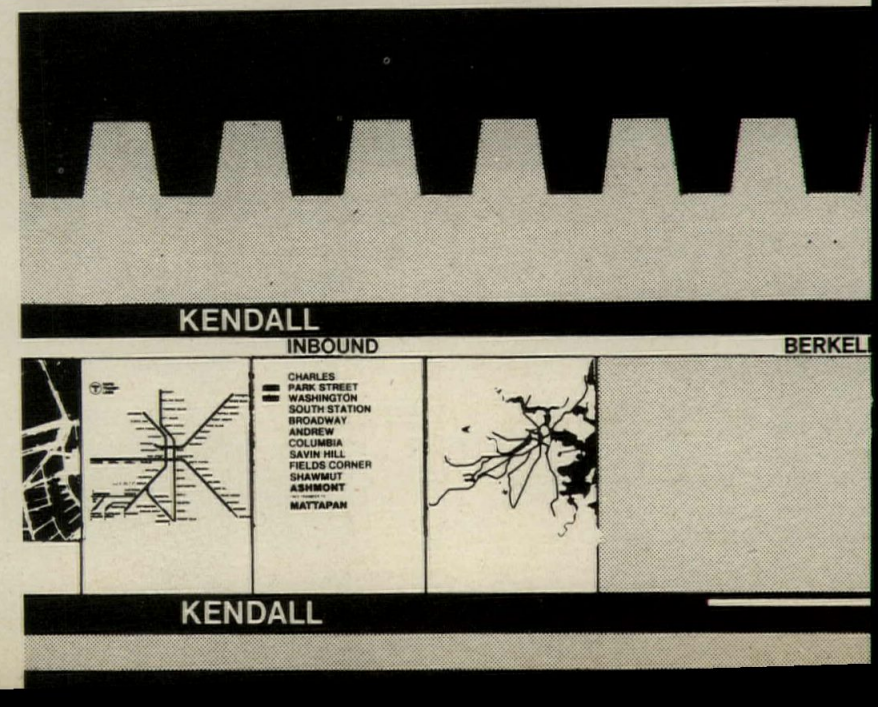
space. The Manual also reminds its client that consistent graphic quality will contribute to the MBTA's "image" and tells in great detail by what painstaking means the necessary precision and subtle visual relationships can be achieved. The Authority symbol and name, for example, must always appear in the Standard Alphabet-Helvetica Medium.

Advertising is located on panels between the tracks—so that it is seen last, after the transit rider has found his way to the proper platform and awaits his train. Thus, advertising graphics are easily seen from waiting areas, and information graphics, located on platform walls, are easily seen from the trains. The Manual urges that there be no advertising at critical decision-making points.

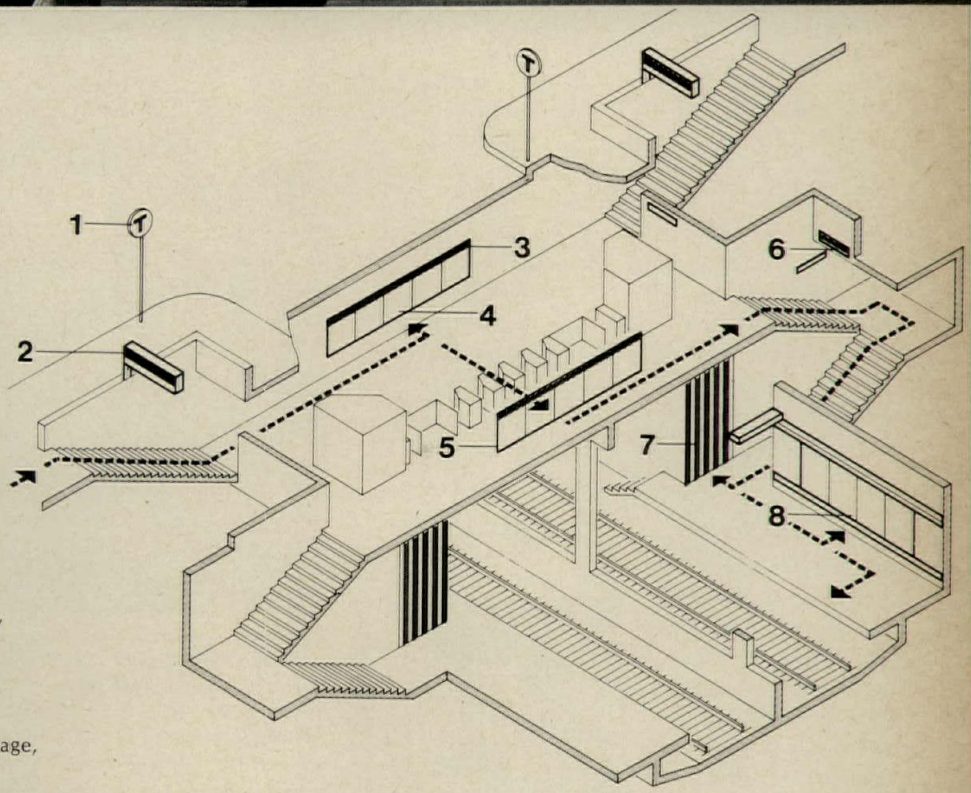


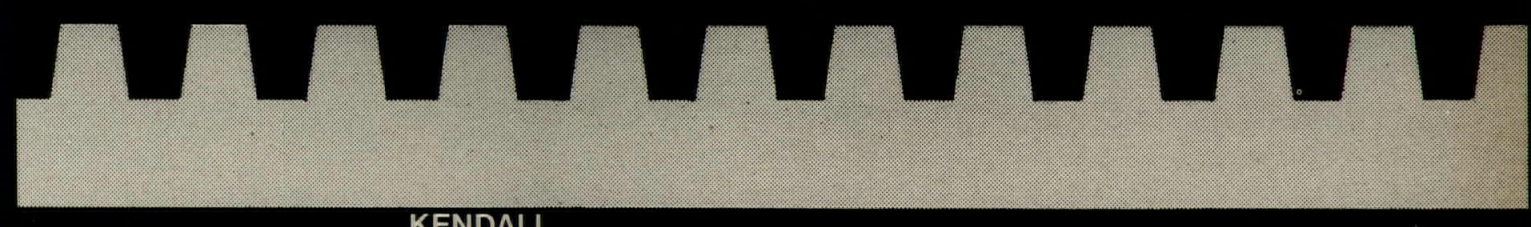
photos David Hirsch





The diagram at the right shows the major components of the graphic system: (1) an internally illuminated T sign (for "transit" or "transportation" or "travel" or "tunnel" or "tube") located at all surface entrance structures; (2) an illuminated station sign with a concealed downlight for the steps; (3)(4)(5) this combination of elements used at entrances and fare collection areas includes a greatly simplified four-color diagrammatic map showing the four lines of the transit system and a plan at a larger scale of the neighborhood surrounding the station; (6) a directional sign; (7) platform ends designated by striped panels; (8) elements on the platform wall designed to be seen from the train include large photomurals of well known landmarks permanently applied to the wall as part of a porcelain enamel glaze, and maps which show the subway routes in realistic skeletal form, complementing those which are diagrammatic, to give the transit rider a feeling for the shape of the city. A sightline analysis, shown on opposite page, established the angles of view of persons tall and short, seated and standing, for varying platform widths.



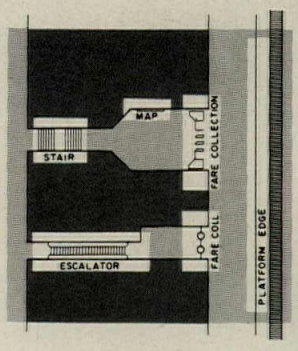


Ⓣ Lighting

Lighting works hand and hand with architectural objectives in the prototype design for the Boston subway system. Cambridge Seven and their lighting consultants, Sylvan R. Shemitz & Associates, wanted to create a "surface environment" underground—an inviting space where accents and shadows have a purpose related to form and function, where good design would erase the sensation of being sealed beneath the ground. Out of this developed the concept of carrying the illusion of daylight from the skylights into the main areas of traffic below.

Entering the stairwell during either the daytime or at night, the subway patron is made both comfortable and safe through use of carefully shielded luminaires lighting highly reflective wall surfaces. The long hallways feeding the mezzanines (where the change booths and turnstiles are located) are illuminated so as to expand the space and note changes in elevation. Attention is called to the booths and turnstiles by incandescent downlighting that punches out these areas for immediate identification. Directional signs are emphasized with strong patterns of light. Stairways and passages leading from the mezzanine to the platform level are lighted with the same luminaire used for passageways from the street.

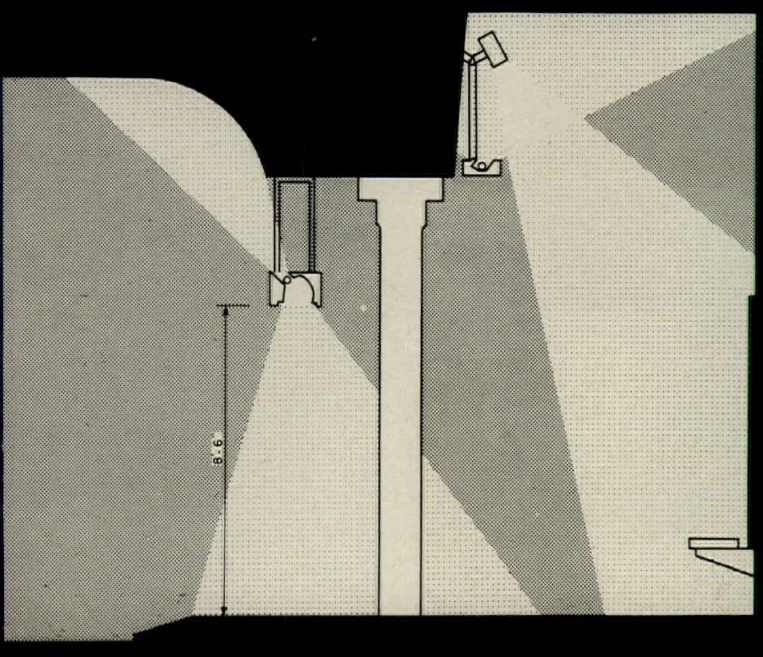
At platform level, light reveals the vaults, coffers and beams, thereby expanding the space and providing an ambience reminiscent of the daylight world. For interest and variety, advertising panels mid-way between sets of tracks are high-lighted and positioned to add a play of brightness to the otherwise unattractive train bed area. Incandescent spots call attention to murals and system maps on the platform walls. The platform floor is illuminated by the same special fixture that shines light on the ceiling vault. End walls of the platforms are colored in two distinctive striped patterns, brightly illuminated by wall washers, to identify the incoming and outgoing ends of the subway station.

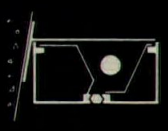


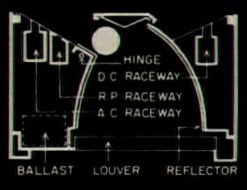
The lighting design required so many unusual, special features of the luminaires that the lighting consultants felt a whole new family of fixtures (including complete shop drawings for bidding purposes), should be developed with competition being open to a list of prequalified manufacturers and with de-

photos top and bottom, Phokion Karas; far right, David Hirsch

Lighting equipment forms an integral part of the over-all architectural treatment of this station. The new lighting equipment brightens all areas, making them pleasant and lively and dispelling the atmosphere of gloom, dirt and insecurity. Also, light helps organize circulation and aids identification of locale and destination. Careful design avoids clutter and busyness.







Fixtures form a vocabulary of lighting, suitable for use in all MBTA stations. They are robust to withstand vandalism, but easily replaceable in case of damage. They are designed to operate in a dirty atmosphere, but also to be easily cleaned. The platform level employs three different fixtures. The one nearest the tracks has an indirect component to light the vault over the tracks and a direct component to light the loading area of the platform. Behind the columns a different fixture indirectly illuminates the ceiling, with reflected light striking the wall and floor of the rear platform area. Maps and identification murals are accented by adjustable downlights.

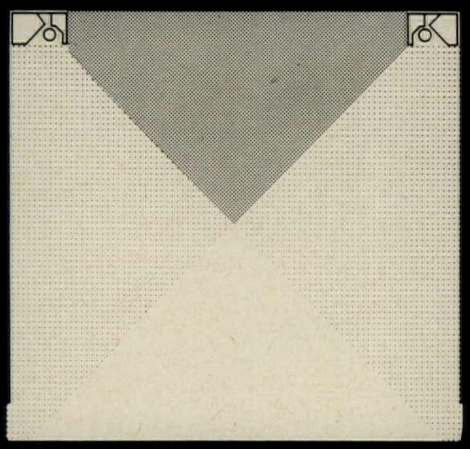
signs to remain the property of the MBTA. The only stock fixtures available which might have been used were "tunnel-type" units—glass- or plastic-enclosed fixtures with suit-case type latches. These, however, have been found difficult to keep clean in subway usage.

The carefully-thought-out functional aspects of the designs are exemplified by the luminaire which hangs from the ceiling near the subway tracks. A unique reflector system controls the upper component of light so as to eliminate excessive brightness wherever flat ceilings or soffits occur immediately above the unit, while at the same time directing light to the vault over the tracks. Its downlighting element places maximum illumination on the brightly painted platform edge, yet has a cutoff to keep light out of the train bed. Cross-baffling of the lower element of the luminaire shields brightness from the eyes of subway users and trainmen. Emergency lighting and speaker housings are integrated in the continuous runs of luminaires.

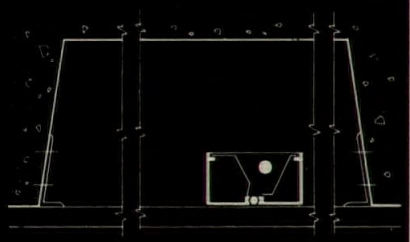
Versatility of the designs is illustrated by a fluorescent fixture which serves three different areas: at the rear of the platform for uplighting; in the mezzanine for uplighting; and for corridors, turned upside down to serve as a wall washer. Some of the fixture design parameters were: (1) to avoid clutter, fixtures were designed to conceal all wiring —for lamps, loudspeakers, subway system dc for emergency lighting, future television lines; (2) fixtures had to adapt to irregularities in walls and ceilings; (3) since there were long runs of fixtures, provisions for expansion and contraction were necessary; (4) fixtures are of a vented type to prevent accumulation of dirt (mainly metallic dust from wheels, combined with oil). Closed fixtures get dirty because "piston" action of the trains in tunnels forces the dust into them; (5) the fixtures had to be rugged to resist vandalism and to be easily replaced in case damage did occur. Also the fixtures had to be designed so they can be taken down without removing the wires which are in a continuous run with them.

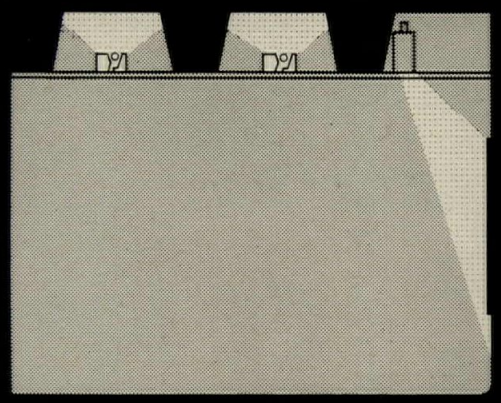
The fixtures are made of aluminum extrusions because they are non-corrosive, eliminate the oil-canning effect of sheet material, and are of a thickness to resist denting; concealed fastenings are used throughout. The lamps are covered with impact-resistant plastic tubes to keep the lamps at proper operating temperature in winter, while at the same time minimizing potential damage.

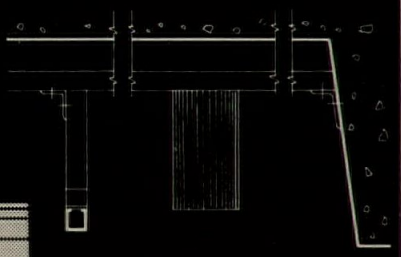
David Hirsch

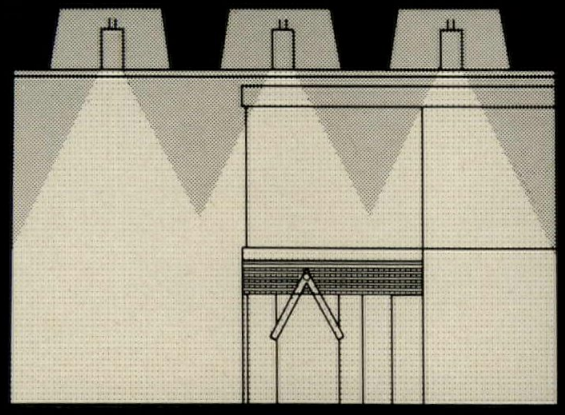


Ceilings, again, are uplighted in the mezzanine area to expand the space. Downlights define the turnstile area and a flood of light from wall washers (in downlight cans) calls attention to the subway maps and station listings. The indirect fixture in the coffers is the same type as used in the platform area. It is turned upside down and louvered to provide a wall washer along the passageways. Wireways for ceiling fixtures also serve as their structural support.









THREE SCHOOLS BOLDLY ADAPT

to different new teaching methods being tried across the nation

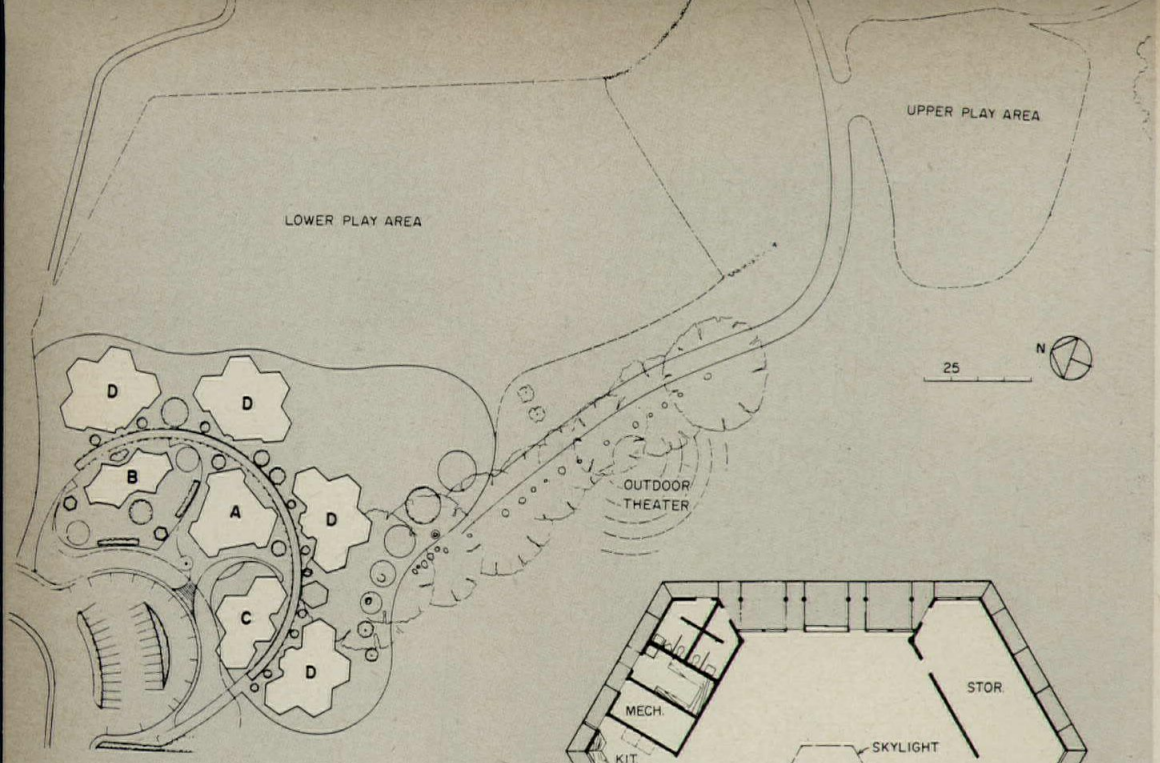
Rondal Partridge photos

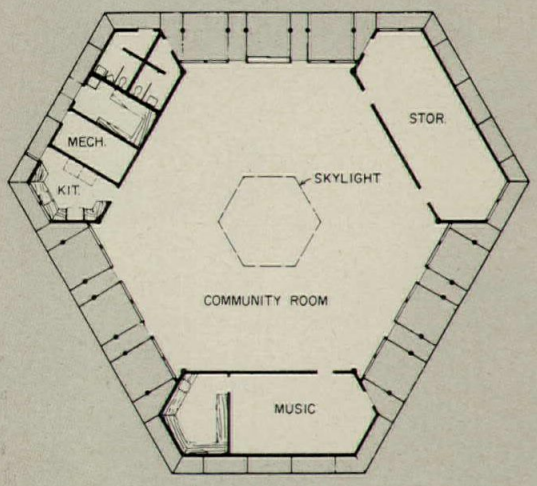
"EDUCATIONAL POD" CLUSTERS FORM NON-GRADED K-6 SCHOOL

A cellular network of open-plan units or "pods" form an interesting variant on partitionless planning in this vigorous little school. Built in two stages under the California State Aid program—and with a third addition yet to come—the units are linked by covered walks into a compound designed for non-graded team teaching, and for division of the children into multi-aged groups of 100 to 120. The school is also a center for teacher education and training.

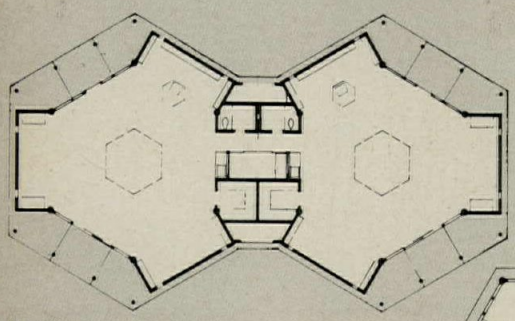
Each "pod" is a little cluster within itself, with four hexagonal teaching stations, of 960 square feet each, ranged around a central common area; the spaces are completely open to each other, and defined by the tent-like roofs and skylights over each of the five areas.

GRANADA COMMUNITY SCHOOL, Corte Madera, California. Architects: *Callister & Rosse—J. Martin Rosse, partner in charge;* engineers: *Gilbert-Forsberg-Diekman-Schmidt (structural); Yanow & Bauer (mechanical and electrical);* contractors: *Fostmeier Construction Co., Pacific Coast Builders.*

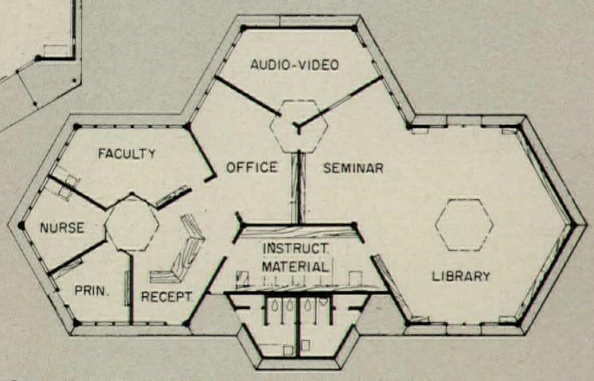




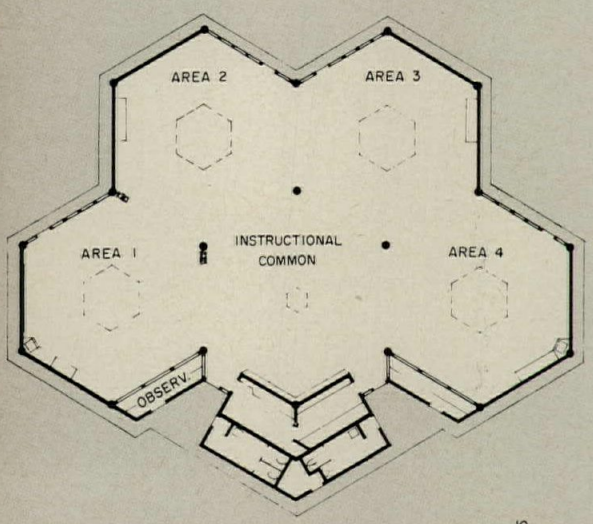
A. COMMUNITY ROOM



B. KINDERGARTEN POD



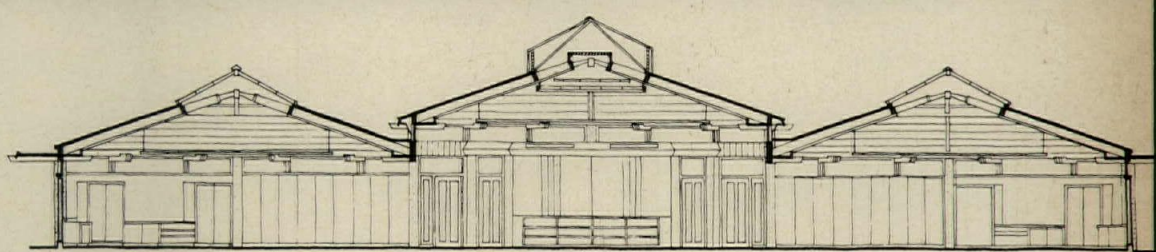
C. ADMINISTRATION, LIBRARY & TEACHER TRAINING CENTER

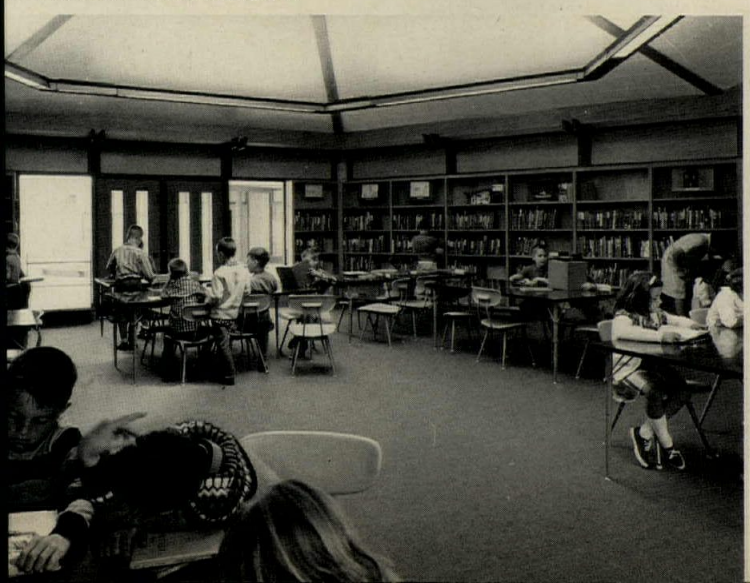


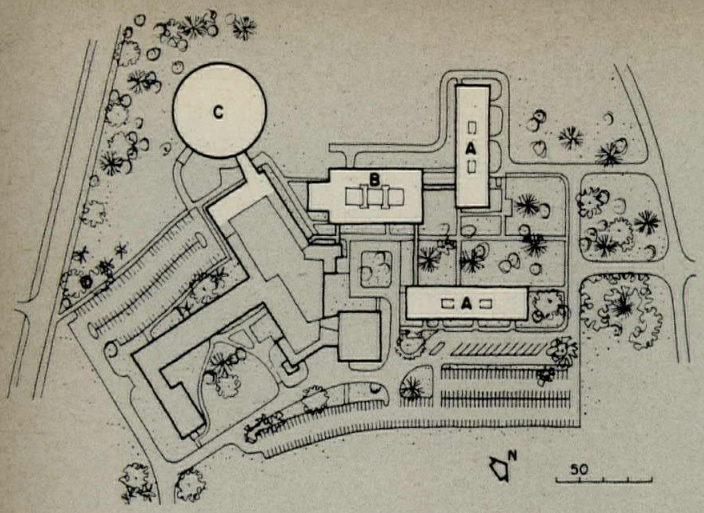
D. GAMMA CLUSTER

In addition to the three constructed "pod" clusters (D on site plan—a future fourth pod is also shown), the school has a two-room kindergarten cluster with its own play yard (B), a community building (A), and an administration-library unit (C). An integral part of the latter building is the teacher education center with seminar rooms for the Reed Union School District's training programs, a professional library for research and study carrels for the teachers. Closed circuit television is available throughout.

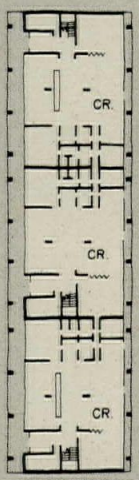
A typical educational cluster of the Granada Community School is shown in the photos above and at left, and in the section at right. Each of the four teaching stations has its own door to the exterior, its own sink, its own furnishings. All the classroom cabinets are movable. Carpeted floors, sound absorbing ceilings and the dome-like roofs localize noise. The library and community room are shown below.



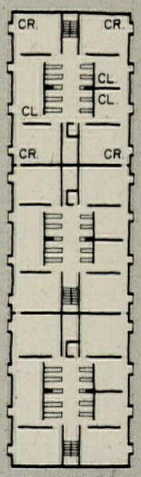




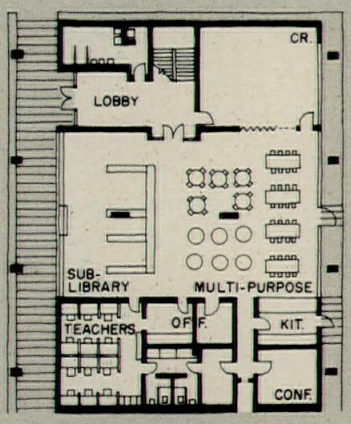
Hub of the revamped teaching program of the enlarged high school is a sort of litle school or house system. Three of these are in each wing of classrooms (two wings are new additions, one is in the existing building) to accommodate 900 pupils at the same grade level. The main floor of one of the houses is shown in the large plan below; the large open area serves for study, general activities, and as a cafeteria. Food is carted to the houses from an expanded kitchen in the original school.



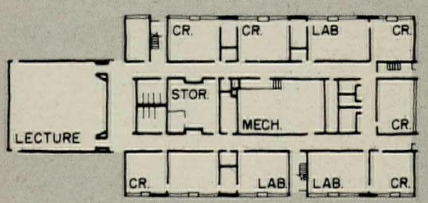
FIRST FLOOR
BUILDING A



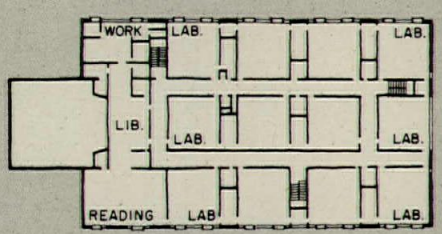
SECOND FLOOR
BUILDING A



TYPICAL CLASSROOM
BUILDING A



FIRST FLOOR
BUILDING B



SECOND FLOOR
BUILDING B

ADDITIONS REVAMP TOTAL PROGRAM OF EXISTING HIGH SCHOOL

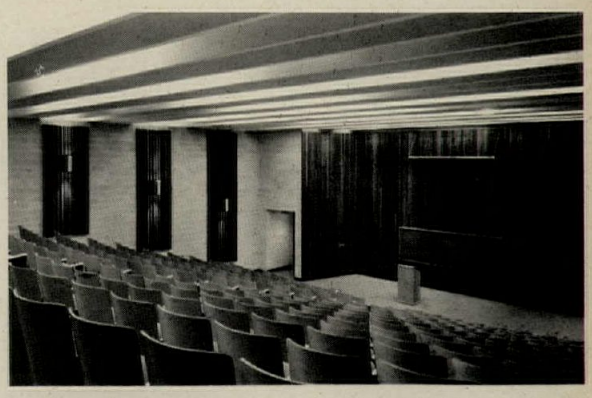
In addition to more than doubling an existing high school's capacity from 1,200 to 2,700 pupils, these four elegantly designed units completely revolutionalize the educational program into a team teaching, little school concept. Two identical classroom wings (A on plan) each contain three two-story "houses" for 300 students. One floor of each house is a flexible area with a multi-purpose space, a sub-library, a classroom and five staff rooms; the other floor has eight classrooms around a locker area. Another of the additions (B) centralizes science facilities, main library and lecture hall. The fourth new unit (C) is a field house adjoining locker rooms. The existing building has enlarged arts and business class facilities.

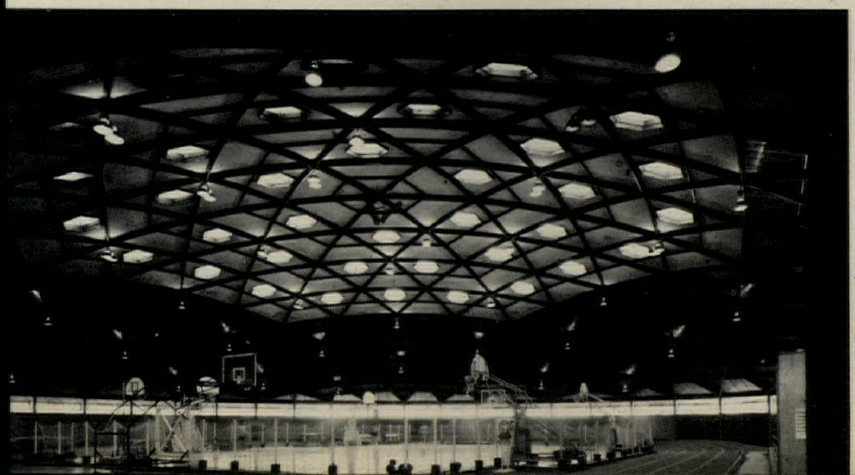
THE LEXINGTON HIGH SCHOOL, Lexington, Massachusetts. Architects: *The Architects Collaborative Inc.—John C. Harkness, principal in charge; job captains: Ernest Wright and Charles Hilgenhurst;* engineers: *Souza and True (structural); Fitzemeyer and Tocci (mechanical); Jack Maguire (electrical).*

Phokion Karas

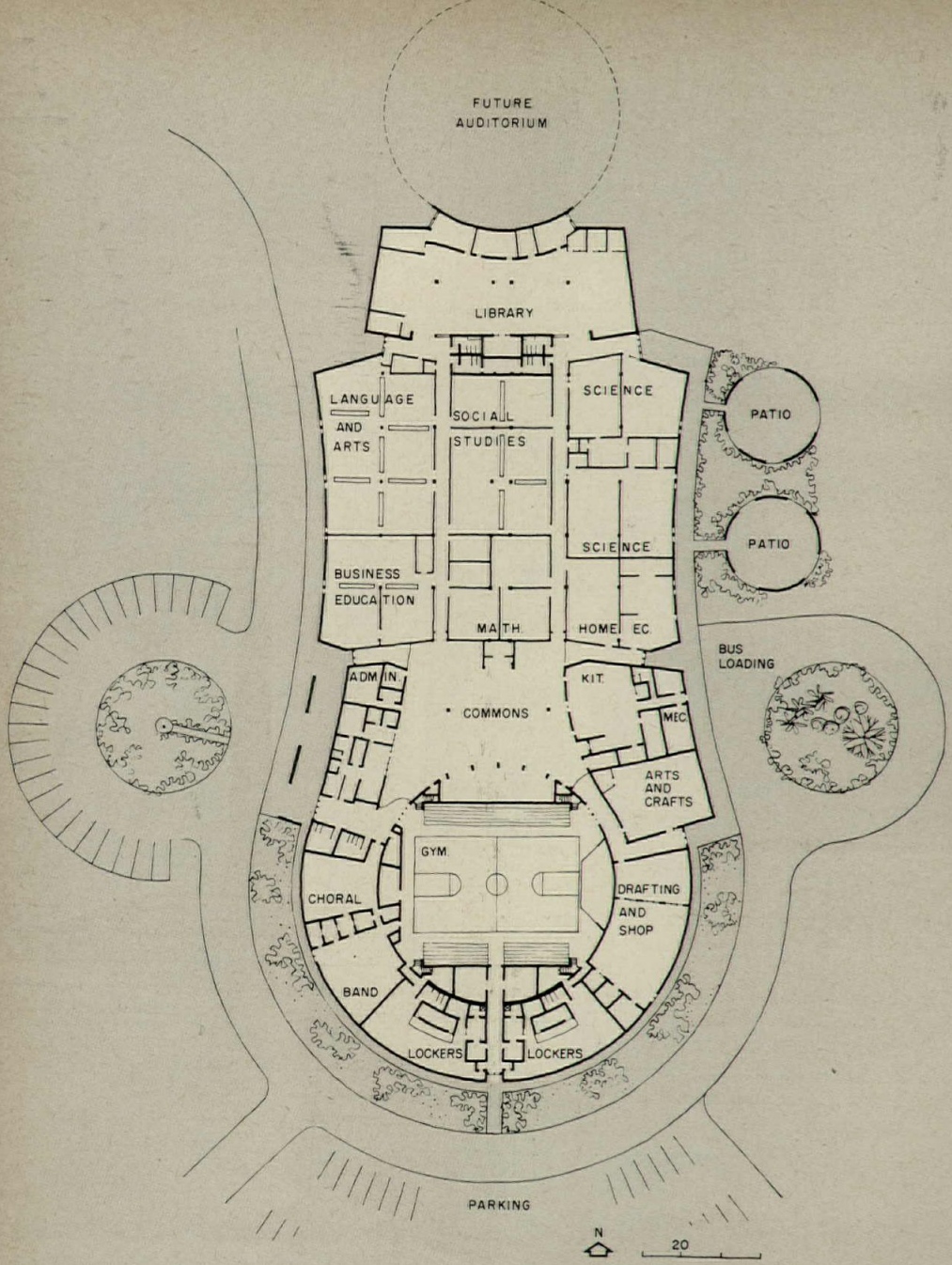
Phokion Karas

The brick-paneled, concrete-framed structures of the new wings are designed with TAC's usual quiet and sensitive aplomb. Sheltered walkways link all the various units. In the new, central building, a 300-seat assembly hall (right) provides facilities for large-group team teaching, films and lectures. The multi-purpose area in each house (below right) provides a similar set-up for medium-sized groups. Physical education is amply housed in a domed field house, as can be seen in the photo below.





Louis Reens photos



AMOEBA-SHAPED OPEN PLAN GIVES NEAR-OPTIMUM FLEXIBILITY

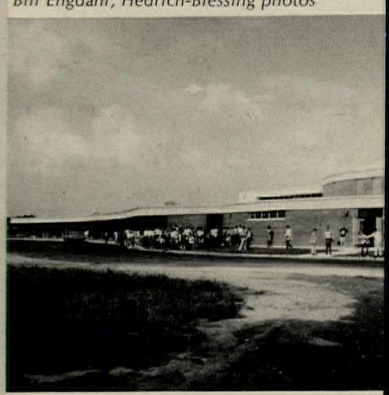
A compact, if somewhat unusual-shaped scheme for this new school packs in a plethora of the latest educational innovations: flexibility, variable block scheduling, team teaching, closed-campus lunch area, student and teacher resource centers, audio-visual facilities, spaces for large and small group instruction and spots for individual study.

The scheme gets its great flexibility from a structural system (bar joists, lamella dome) which requires relatively few interior bearing walls; all is carpeted, nearly doorless and nearly windowless. The entire building is air conditioned all year by electric heat pumps.

The cost of the school, fully equipped, was just under $14.70 per square foot for a total of 85,027 square feet. Classes will accommodate 1,200 students.

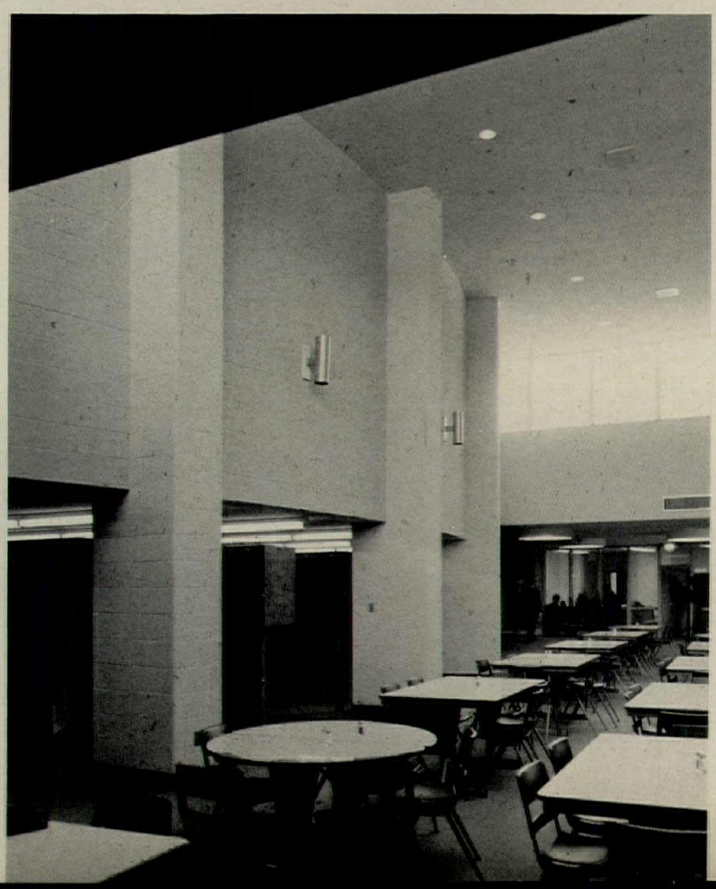
CHARLESTON HIGH SCHOOL, Charleston, Missouri. Architect: *Pearce and Pearce, Inc.*; engineers: *C. J. R. McClure & Assoc. (mechanical); Bergmeier & Siebold (structural); Wilbert E. Rath (electrical)*; contractor: *R. Clinton Construction Co.*

Bill Engdahl, Hedrich-Blessing photos

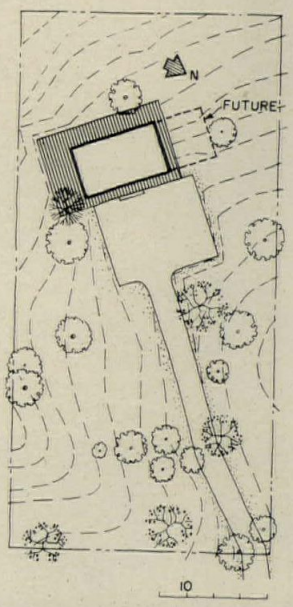


An exterior calm gives little indication of the sprightly interior arrangements of the building. Materials are durable ones throughout. The structure has concrete spread footings and foundations, with brick exterior bearing walls, bar joist construction and light weight concrete fill, exclusive of the lamella dome over the gymnasium. Terne metal is used as a decorative accent around the exterior roof fascia. Within the building, acoustical ceilings are two-hour rated mineral tile.

The Charleston, Missouri, High School provides a variety of different types of spaces in addition to the quite open instructional spaces. Above is shown the quiet reading area of the library, and the student commons and lunch area is shown at right. All the noisier instruction spaces (band, choral, shop, arts and crafts) are placed in a band surrounding the large central gymnasium. Teachers were thoroughly indoctrinated in the new school by six weeks of study climaxed by a conference led by educational authorities from across the country.



House in woods makes dramatic use of available sunlight



By strategic placement of three skylights in this house in the woods, architect Hugh Jacobsen has created—within a simple and disciplined exterior—an interior space in which the play of light flows naturally from vibrant to soporific. Two of the skylights are in the kitchen area where their light reflects off the wall, over and around the free-standing cabinets, into the living room. The other skylight, which can be seen in the photo below, caps a cylindrical staircase and lets light enter both levels of the house from above.

Additional visual excitement is evoked by the interplay of two primary forms—the cylinder and the rectangle—which stand as dramatic foils to the looser forms of the surrounding trees. Yet the vertical red-cypress siding identifies well with the site and adds a feeling of warmth to the exterior.

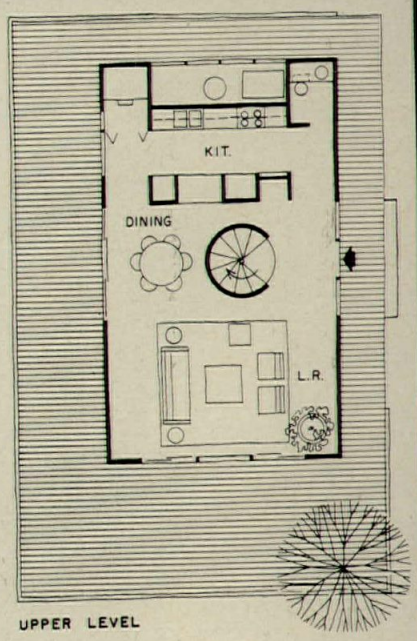
Photos by Robert C. Lautman

The architect used the natural slope to its best advantage by providing direct access to both levels. Inside, the two-story cylinder housing the pre-fabricated steel spiral stair is surfaced in white oak flooring, and forms a strong focal point on both levels. The small room behind the kitchen (see plan) contains the mechanical equipment and is entered from the outside.

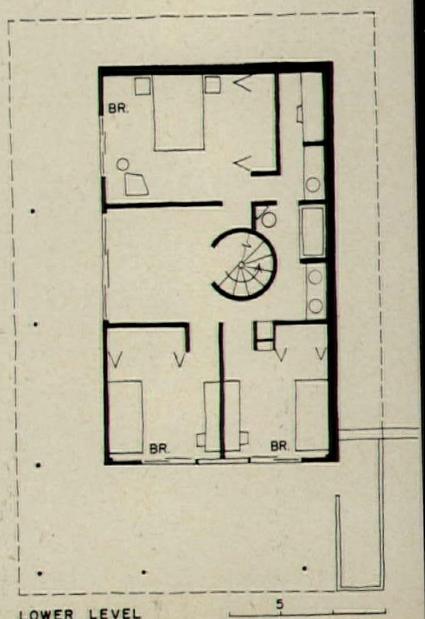
Under a program calling for a room for each of the Gainer's two children, a master bedroom and playroom, along with living room, dining room and kitchen, the architect produced a plan that allows the house to grow as does the family. Eventually, a master bedroom will be added on to the living room level (to the right of the entrance) along with a master bath. Then by removing the duct- and conduit-free partition, which now separates the playroom and the master bedroom, a much larger playroom will be obtained. An illusion of spaces greater than the actual dimensions of the house is achieved by using floor-to-ceiling glass, the open plan and overhead down-lighting.

On the exterior, the siding of 1- by 4-inch tongue and groove, butt-joint red cypress, is separated from the roof fascia by a 1-inch black slot. The fascia itself, in the same plane as the siding, is, in the architect's words, "the design's deliberate attempt to express a taut skin holding rather large spaces within". The roof is 5-ply built-up, and all sash is anodized black aluminum, sliding glass doors. The deck and rail (see above) are cypress, supported by black-painted, 1-inch-square steel posts. These posts and the mounted down-lights, whose shape echoes the stairwell cylinder, are the only surfaces requiring paint on the outside—the cypress siding was treated only with a clear wood-sealer to preserve its natural color.

GAINER RESIDENCE, Arlington, Virginia. Architect: *Hugh Newell Jacobsen;* mechanical engineer: *Carl Hansen;* contractor: *John Clayborne.*



UPPER LEVEL



LOWER LEVEL

Two plastic skylights in the kitchen ceiling bring a great deal of light to this area. The kitchen is separated from the dining area by an oak-finished cabinet which clears the ceiling by 18 inches, visually extending the space in the tradition of the open plan. All of the light fixtures inside are recessed or semi-recessed and are controlled by dimmers to aid in the manipulation of visual space. Flooring on the first floor is oak stained a darker shade than the oak walls, which are sanded and waxed. The lower floors are white vinyl. All other interior surfaces are painted dry-wall. Cost, excluding lot, landscaping and furnishings was $35,000.

Hospitals

Two great pressures for change in hospital design are the increasing need for cost reduction and an emerging insistence upon excellence of design. Conflicting forces? Not necessarily. This article describes an assault upon building costs that takes up new weapons of management rather than the paring knife. And the exhibits which follow speak for themselves in matters of esthetics, function, and the modern world.—William B. Foxhall

Design and management decisions reduce hospital costs by half

Problem: To construct a 300-bed suburban hospital at about half the normal budget for hospitals in its area.
Solution: Imaginative design, advanced hospital management, rigorous and informed control of costs and schedules at every phase of development.

Imagination, cooperation and control are the operative qualities that overcame an extremely limited budget and made possible the relocation of Baltimore's Franklin Square Hospital from outmoded quarters in the city to an 80-acre site they had acquired in fast-growing eastern Baltimore County.

In 1962, the management of Franklin Square presented architect David H. Wilson with the problem of designing a 300-bed general hospital within a projected budget of about $5 million for construction and fixed equipment. Considering that the program called for planned expansibility to 600 beds, an emergency department capable of handling 40,000 to 60,000 patients a year, outpatient clinics for about 26,000 visits a year, a 10-bed intensive care unit, six operating rooms, cystoscopy room, three delivery rooms with supporting facilities, post-graduate medical education program, and complete air conditioning, the proposed budget was on the order of half the normal per-bed cost in the area.

Inventive design and simple paring of construction cost items were obviously not enough to accomplish the required savings—especially since the client insisted on unabridged quality of medical services and architectural excellence befitting the site location adjacent to a community college and county health center.

The architect's approach had to start with alternatives in the hospital's operating policies and their possible effects on over-all design—for example, the effect of convenience food service on kitchen area and cost; the effect of outside laundry service, the effect of a computerized, single-dose pharmacy, and so on. Further, the architect had to be able to count on the utmost efficiency in development and progress of the project—a dim prospect in many hospital commissions where clamoring board members and empire-building department heads have been known to complicate the process.

One-voice communication proved the key to effective programing

Fortunately, the ground rules for design development at Franklin Square evolved from the well-earned confidence of the board of trustees in administrator Sanford Kotzen. He was given sole responsibility for design approvals. A single member of the medical staff was designated to act as its spokesman to the administrator in matters of policy and review of plans. A three-man building committee was selected to oversee the development while leaving details of design and construction to the administrator and the architect. Thus full involvement of the hospital's administrative, medical and other staff contributed to successful planning while retaining the efficiency of one-voice communication.

At the architect's request, Mr. Kotzen spent a great deal of time at the architect's office during the design phase. This, Mr. Wilson says, not only expedited design but gave the administration full insight into the background of all design decisions.

Efficient communication in matters of policy and execution permitted early resolution of operational problems affecting design—including the effect of computerization on space requirements. This factor alone generated shifts in the design approaches. Several of the people involved, including the architect, administrator, comptroller, and others, took intensive instruction from IBM on hospital computerization. The result was an informed analysis at all levels of decision as to the valid weighting of first cost versus operating costs.

Still, the feasibility of building within the budget remained in question. Therefore, within the first year (1962) the architect and administrator collaborated, in what was called a control design, developing the criteria described. This was, in effect, a preliminary design, firm and complete enough so that it could be reasonably estimated.

Cost consultants were considered essential to the project

One of the architect's stipulations from the outset was the continuous use of a construction consultant for cost analysis throughout all phases of design and construction. When the control design was completed, the architect and administrator called on consultants McKee-Berger-Mansueto for a preliminary check of feasibility.

MBM, familiar with hospital cost norms in the Baltimore area, were at first pessimistic about the possibility of building any hospital for $15,000 per bed in that area where the going rate was about double that figure. Close analysis, however, indicated that basic construction within the target cost per bed might be feasible provided the over-all economies assumed as resulting from advanced management systems were in fact attainable.

The Franklin Square board of trus-

tees thereupon agreed to proceed with architectural design, retaining MBM for continuous cost analysis and construction management.

Architect Wilson believes, for philosophical reasons as well as practical ones, the construction management consultant was properly retained as agent by the owner rather than by the architect. In this way, he says, the essential role of agency for both architect and consultant was not compromised.

The role of the consultant in this project was three-fold: first, to provide estimates and control suggestions for every phase from preliminaries to working drawings; second, to subject every step of development through construction to a continuing critical path analysis; third, to serve as the owner's field representative during construction.

Thus, if a proposed material or configuration seemed to threaten the cost structure, or a conflict in the scope of work appeared in drawings, it was brought to the attention of the architect, and means were immediately devised for bringing the design back in line. In each case, the architect weighed all recommendations and made the final decisions as to whether he would accept or reject them. The point is, he was able to do so immediately and avoid costly revisions later on. Further, through CPM he could see the effect of his decisions on the schedule.

As part of the bidding process, MBM agreed to pre-qualify contractors and review bids. They held a bid orientation whereat prospective contractors were given all pertinent information. They are convinced that this procedure results in realistic, competitive bids by generating confidence in full disclosure of the project—including realistic schedules of the CPM network.

"DITSYM for the HAP" will smooth transfer operation

A *dynamic - interfaced - total - systems - model* for the *hospital-administration-program* earned the above engaging acronym at MBM and conveys some of the complexity and scale of still another control indirectly affecting feasibility.

As does every owner, the hospital wishes to be fully operational as soon as possible after the day construction is completed. To assure this, the administrator asked MBM to help schedule preparations so that on moving day (next year) all equipment will be operational, services functional, supplies on hand, and all teams fully staffed and informed. This program, too, will be assisted by CPM which will relate at key points to the construction network—as every DITSYM for the HAP should do.

With strict cost control bids come in on the line

Effective cost control, says architect David Wilson, is an exacting discipline demanding of the architect a high degree of understanding, investigation of alternatives, and coordination. It also requires, Wilson emphasizes, the fullest cooperation of the owner.

Testimony to the effectiveness of procedures followed in the Franklin Square project occurred when bids on general construction came in within 6 per cent of estimates, and the low bid —at $4,619,000—was less than one-quarter of 1 per cent higher than the consultant's estimate. Total cost, including site work and separately-bid fixed equipment, will be about $5.3 million—$17,667 per bed.

The architect underscores a by-product advantage of having detailed cost analysis available during the design phase. He estimates that savings of more than $360,000 in re-design time, in schedule accuracy and in actual construction costs can be attributed to this factor alone. Of course, he points out, in order to achieve this saving a strong interaction must exist among architect, owner and consultants.

The design process responds to the complex new world

No written program of space needs was requested or accepted from the hospital staff, because the approach here was to be true unbiased study of actual space utilization for hospital commerce under conditions of operation unfamiliar to most staff members. Department conferences were two-way orientation sessions bringing the true role of each department into perspective as part of a single, integrated system—the whole hospital.

Two sub-systems of management emerged: patient care and facilities management. The former concerns itself with diagnosis and treatment; the latter provides money, manpower and materials *at the point of use* when needed. When medical and paramedical personnel are

Where and how savings were made

The many interdependent variables affecting cost make it impossible to establish an exact figure for any particular area of cost savings. Still, by taking a hypothetical 300-bed, 8-story general hospital built in the Baltimore area in 1964 at $30,000 per bed as a basis for comparison, architect David Wilson and consultants McKee-Berger-Mansueto were able to project an itemized estimate of approximate savings. Based on a per-bed area of 600 square feet for Franklin Square and a per bed area of 850 square feet (typical for Hill-Burton sponsored projects) for the comparative hospital, figures below show the relative weight of items contributing savings.

1.	*Through delegation of responsibility*	
	a. placing final decision on all matters affecting cost in the hands of the administrator only	2,400
2.	*Programming and planning:*	
	a. Close participation and cooperation between architect and administrator during programming and planning stages	2,400
	b. Combining rooms, multi-use of space, etc.	280
	c. Elimination of unnecessary mechanical facilities such as baths in single bed rooms	260
	d. Deferring construction of unnecessary facilities	120
	e. Efficiency of space layout	740
		3,800
3.	*Simplification of shape and reduction of height:*	
	a. Simplified, lighter, repetitious structural system	900
	b. Use of hydraulic elevators	290
	c. Reduction in no. of stories to reduce expensive exterior wall area	600
	d. Compacting of shape	980
	e. Elimination of roof and wall breaks, etc.	170
		2,940
4.	*Simplification of details and finishes:*	
	a. Simplification of Details	130
	b. Simplification of Finishes	200
		330
5.	*Kitchen and laundry:*	
	a. Kitchen reduction through use of frozen foods	830
	b. Elimination of Laundry	700
		1,530
6.	*Other savings:*	
	a. Reuse of Group I equip.	70
	b. Use of cost consultants during all phases of work	1,200
	c. Reduction in figure for "Costs other than Construction" through reuse of Group II and Group III equipment, exclusion of land cost, etc.	2,800
		4,070
	Total savings over comparative hospital	per bed $15,070

keeping records or delivering supplies or carrying messages, they are aggravating the shortage of personnel for patient care. Business people are more adept at business tasks. Design unencumbered by tradition implements the merger of these two systems in their common goal—patient care.

The approach at Franklin Square was to centralize control and responsibility for all supplies (food, linen, drugs, etc.) and for their scheduled deliveries to the point of use. To integrate the many sub-systems involved in hospital commerce, the computer was the natural if not the only implement that could reduce both first costs (for space and inventory) and operating costs (for personnel).

While full use of the computer obviously results in over-all reduction of space allocations for administration, records, warehousing, etc., it has a more profound effect on planning.

For example, layout of a typical nursing station was adapted to a new category of person called an accredited records technician. Schooled and certified in medical and drug terminology, secretarial skills and business machine operation, she transcribes doctors' orders, prepares drug, lab and diet requests, answers calls and controls data flow between the nursing unit and other parts of the hospital. Her presence permits doctors and nurses to improve patient care through conference and discussion rather than, as too often happens, being forced to depend on relayed messages.

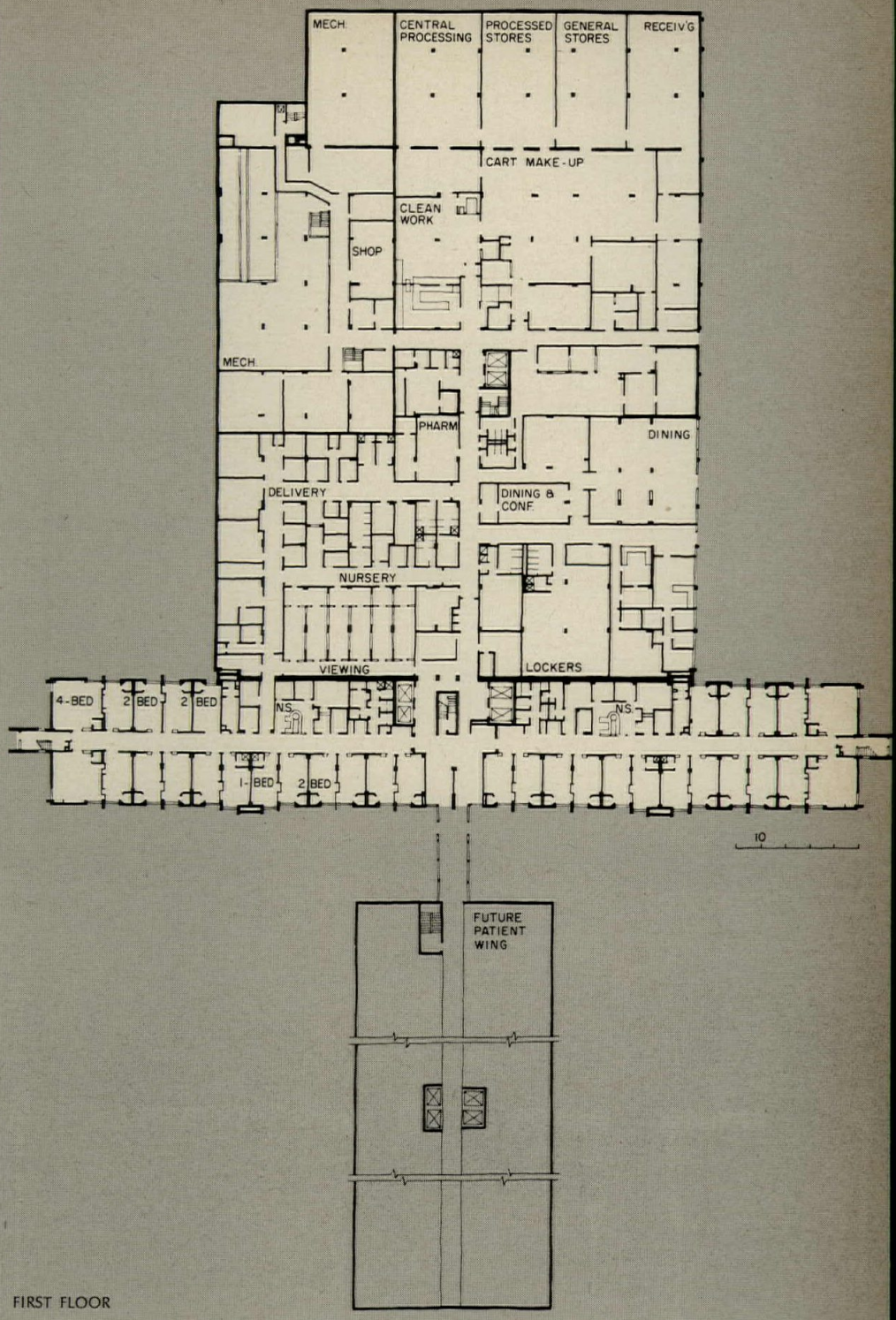
Hence, the nursing station became a U-shaped area for the records technician and her machines, including a computer input-output substation. The nurse-physician area became a curved counter outside the technician's U, and the charts which all three use are placed in a circular chart rack as shown in the drawing.

The architect's nursing consultant, Eva Louise Clark, in collaboration with the hospital's nursing staff, prepared new staffing patterns to meet the requirements of the proposed system. These patterns and shift-charts for each department gave the architect an accurate basis for design of nurses' facilities.

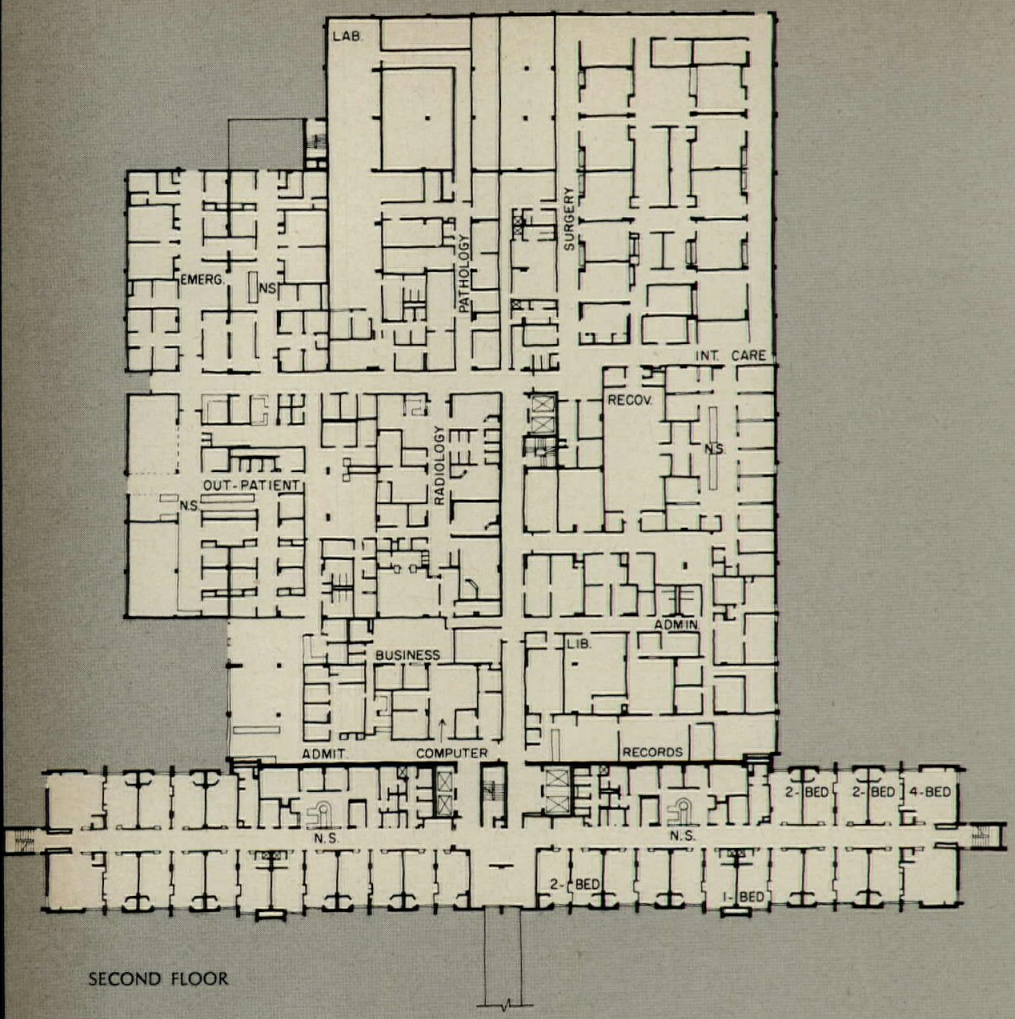
Design arithmetic probes the unconventional

In addition to conventional calculations for sizing various departments based on hospital records of use and occupancy, architect Wilson made studies in unusual depth to certify some of the economies designed into Franklin Square.

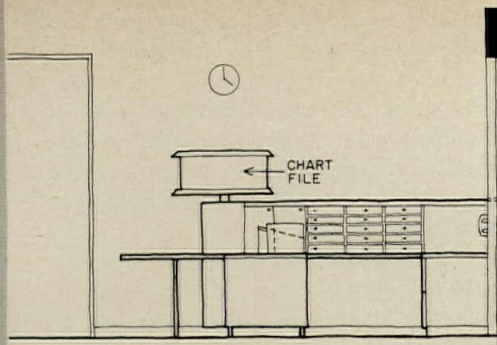
Shape studies, for example, equated the cost of various configurations to an

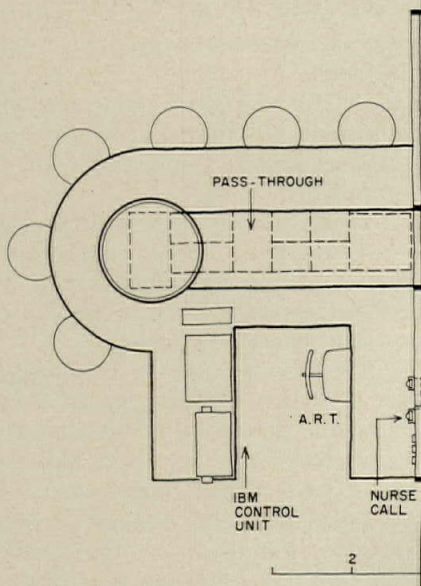


There is on-grade access at the rear of the first floor (right side above) for personnel, dining and separated receiving of refrigerated convenience foods and bulk storage materials. Main entrance, outpatient and emergency entrances are also on grade at the front of the floor above (see next page). Note ample central stores, moderate pharmacy and kitchen areas.



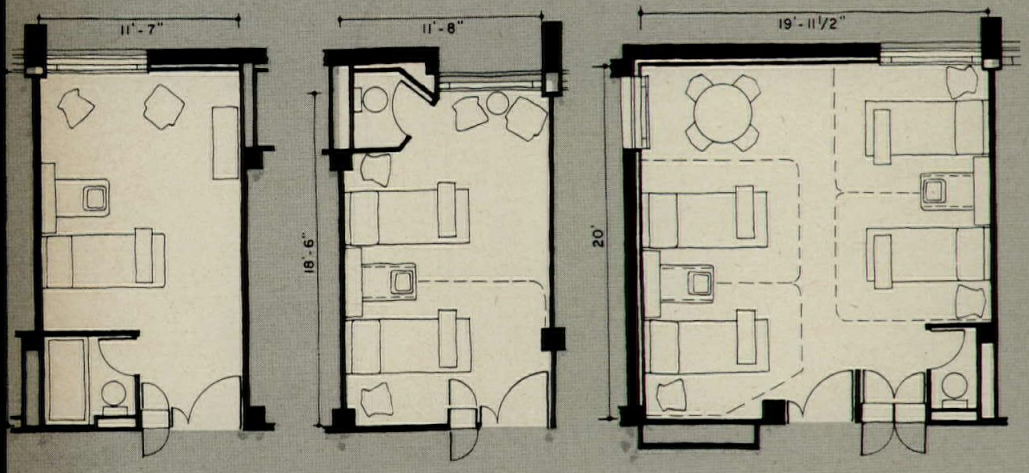
SECOND FLOOR





TYPICAL NURSING STATION

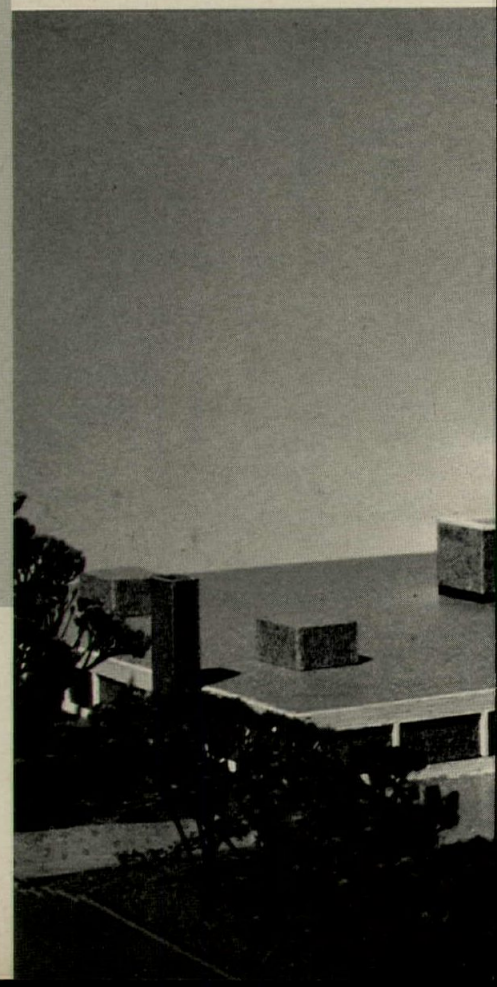
Computerization of all hospital sub systems generated design of th above nursing station at which a accredited records technician (A.R.T above) links medical staff with com merce.



ONE-BED ROOM

TYPICAL TWO-BED ROOM

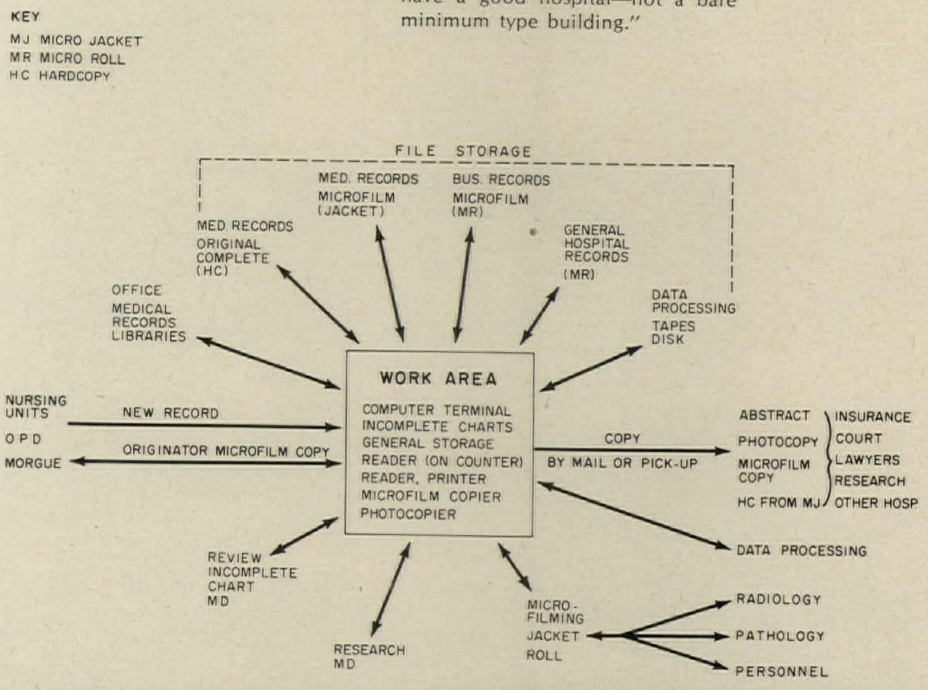
TYPICAL FOUR-BED ROOM



One of many flow diagrams used to work out traffic patterns and space allocations at Franklin Square is the diagram below showing related operations of a computerized records center. As the plan opposite shows, space for this center—near the computer hardware center—was moderate considering the extent of operation and variety of filed material.

Louis Block and Associates, Inc. reviewed schematics. "Although the design is compact," Dr. Block reported, "space assignments are equal to or better than in some recently built hospitals in this area. Most of the space savings have been achieved through the design itself. With the proposed finishes, you will have a good hospital—not a bare minimum type building."

CENTRAL RECORDS WORK FLOW CHART



involved formula in which such variables as gross floor area, number of floors, cost of elevators, heating and cooling system costs per square foot of roof, and many others were related to shape factors and corresponding circulation patterns. These studies were a major factor in determining the hospital's general configuration. Fortunately, the large site permitted an extensive ground floor area, resulting in substantial reduction in exterior wall area, circulation spaces, elevatoring and other items of construction cost.

Detailed flow studies were made for each department and its relationship to the various sub-systems of hospital commerce. This procedure in itself was not unusual in hospital design, but in some cases the demonstration of simplified processing and reduced personnel and space requirements (for example in the 100 per cent single-dose system vs. the traditional bulk-stock-and-bottle system) was indisputable. Similarly, a work flow diagram for contol records department (illustrated) helped solve unusual space requirements.

Outside services and disposables cut construction and operating costs

Detailed review of all functions which might benefit from the use of outside contracted services, disposables and prepackaged items (such as unit-dose medications, frozen meals, linen packs, etc.) brought under close scrutiny several items that would reduce the number of hospital-based personnel not directly involved in patient care—and, of course, the working and convenience areas for those personnel.

One result was the decision to have daily linen packs folded by a commercial laundry. Another is increased use of disposables. Perhaps the most dramatic decision involved the patient food service.

After a five-year study beginning in 1962, the architect and administrator concluded that, in spite of some difficulties primarily due to newness of the system, convenience food processors can now deliver a better patient food service at lower cost. The study indicated there would be saving in construction and equipment costs as well as in ancillary and parking space for personnel. Improvements in variety and freshness are expected, while sealed containers and disposable ware will reduce contamination.

"In our estimation," says Anthony Mansueto, "the close cooperation between all the parties involved in this project—but especially between David Wilson and the hospital board—was the key to the successful execution of an outstanding design."

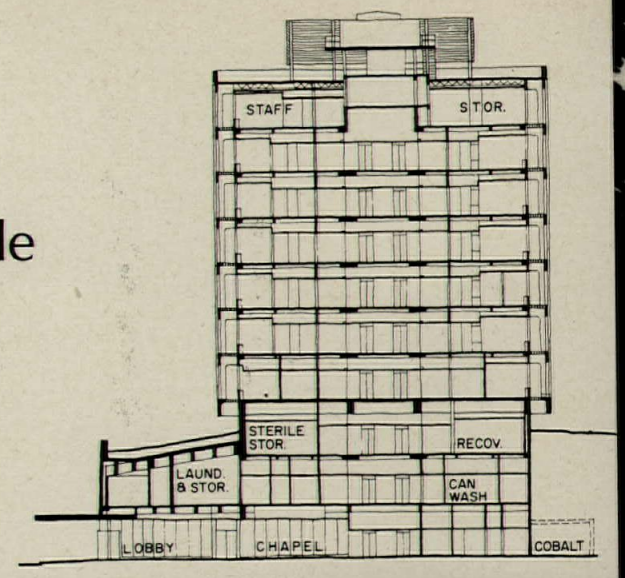
Precast system is structure and sunshade

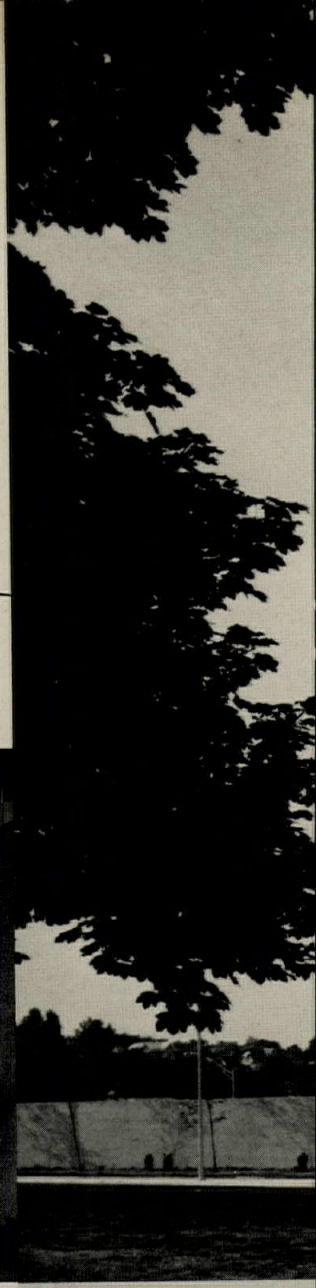
Developed as a 400-bed merger of two hospitals (Jefferson and Lewis Gale), Roanoke Community Hospital was programed to fit the limits of a rather steep site selected in downtown Roanoke. The consequent raising of some service areas (central supply, food service, laundry etc.) to the second and third floors of a three-story base has been turned to advantage in solving flow patterns.

Precast concrete columns and spandrels form an arcaded facade for the nursing tower with horizontal concrete grillage as sunshade at each floor.

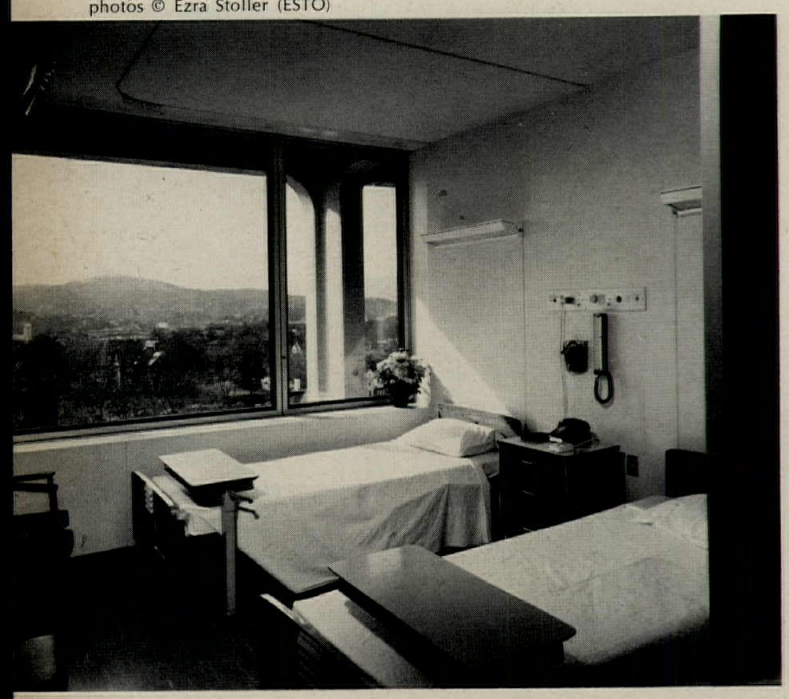
The hospital, says Roy O. Allen, SOM's partner in charge of design, "is clear confirmation that architecture in the esthetic sense as well as the functional sense can be and should be brought to bear on hospital design."

ROANOKE COMMUNITY HOSPITAL, Roanoke, Virginia. Architects and engineers: *Hayes, Seay, Mattern & Mattern,* with *Skidmore, Owings & Merrill*—project manager: *Harold Olson;* structural engineers: *Severud, Terrone, Strum, Conlin & Bandel;* mechanical engineers: *Syska & Hennesy Inc.;* contractor: *Basic Construction Co.*





photos © Ezra Stoller (ESTO)

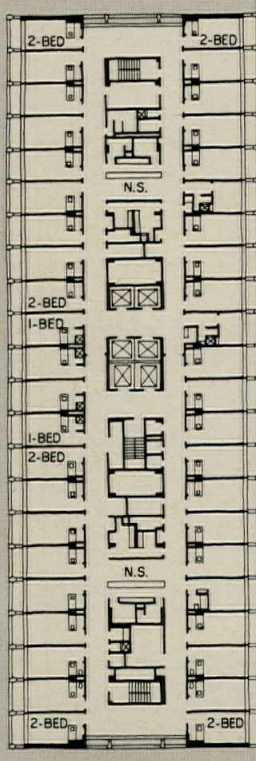


At the lower street level, the 40-foot-high base is faced with precast concrete panels which were tilted up into place. A brick wall at the street line and along access drives encloses parking areas near both the canopied main entrance and the nearby emergency-outpatient entrance. Facilities in the base were designed so that the 400-bed tower can be expanded to 600 beds by utilizing a now unfinished floor and by adding to the tower along the central axis (to the right in the photo at right).

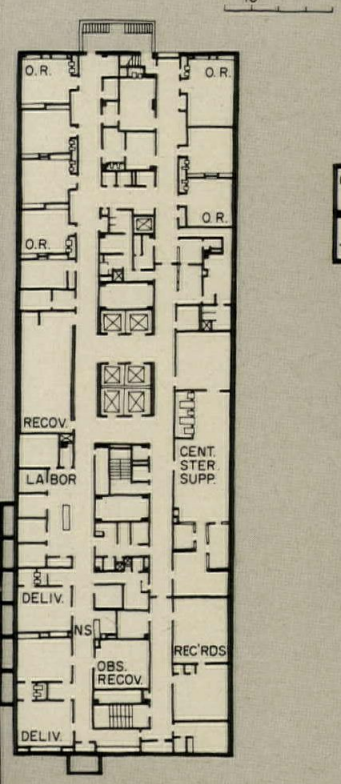
Double-corridor plan of a typical nursing floor provides two nursing stations each with about 40 beds in two-bed and one-bed rooms. Corridor lighting from recessed ceiling-troffers near each wall washes the walls in warm, diffused light.

Supplies are brought into the base through on-grade access at one end of the second floor where they can be stored or taken directly to the kitchen or other service areas. Expensive radiation shielding of the cobalt room was greatly reduced by recessing the room underground into the hill in the rear of the building. Extra-large steel doors to first-floor mechanical spaces will admit new boilers for future expansion.

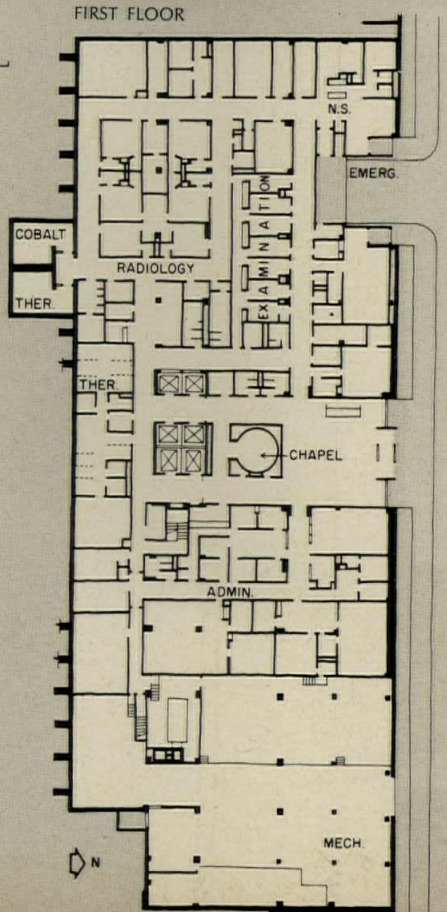
TYPICAL FLOOR

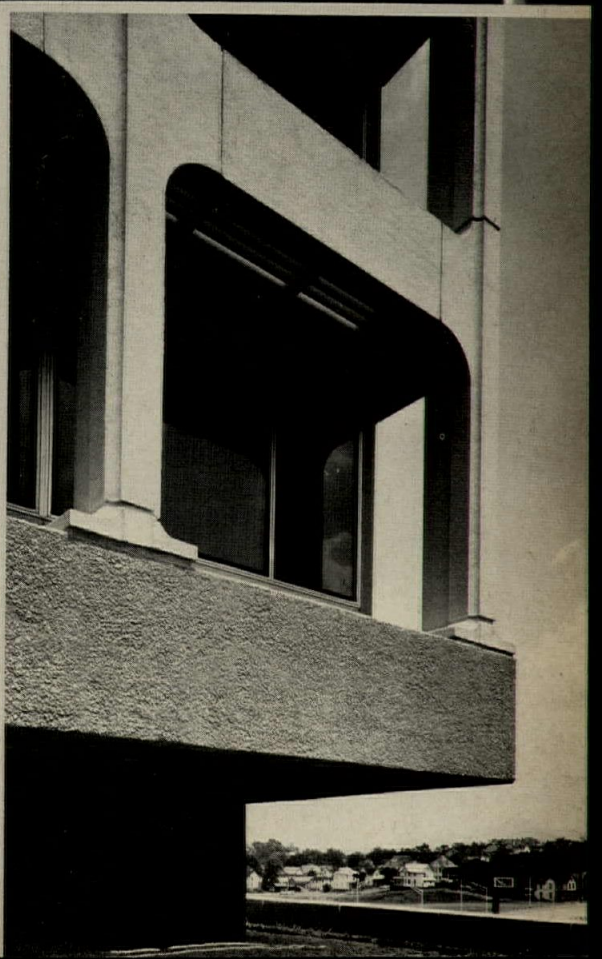


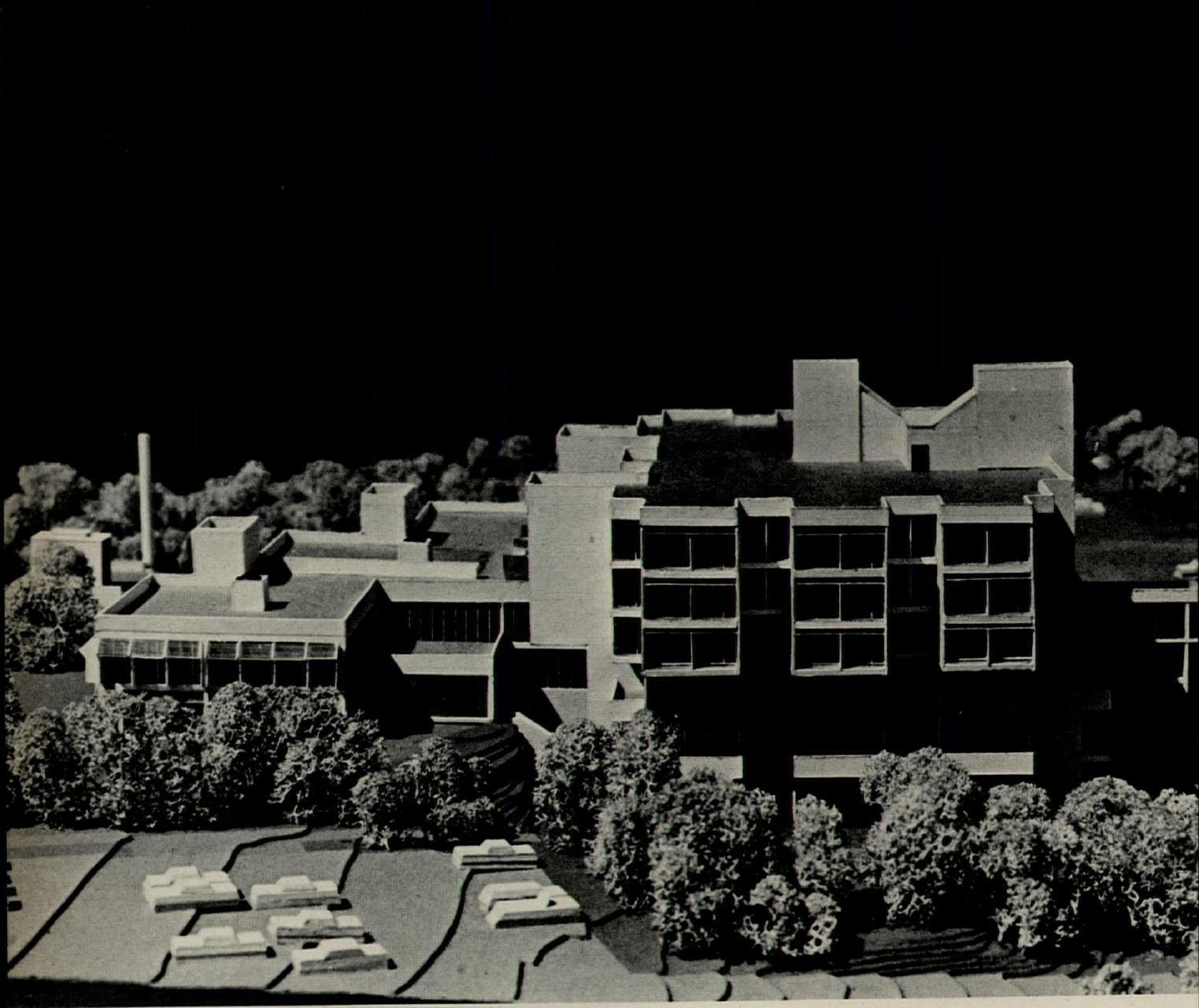
THIRD FLOOR

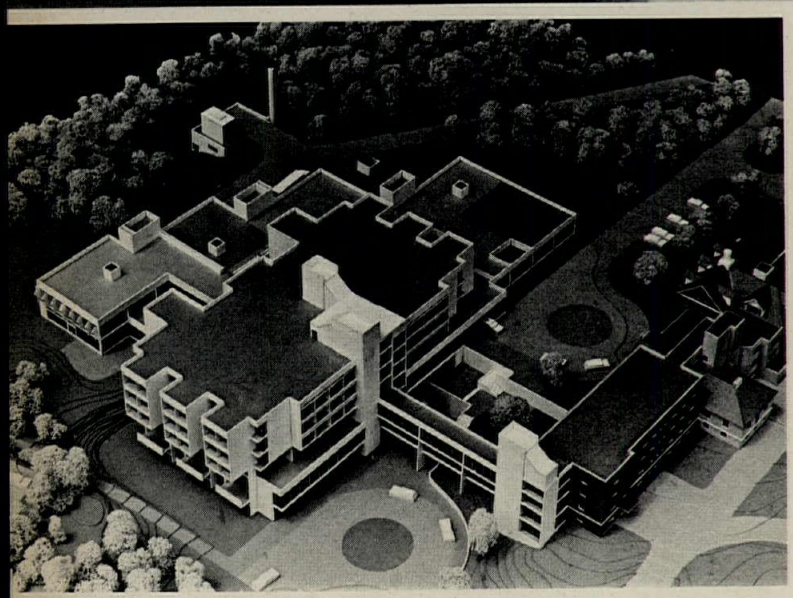


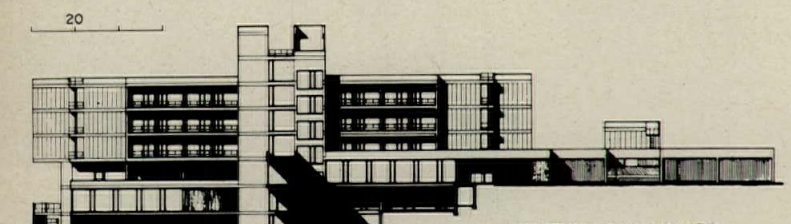
FIRST FLOOR











NORTHEAST ELEVATION

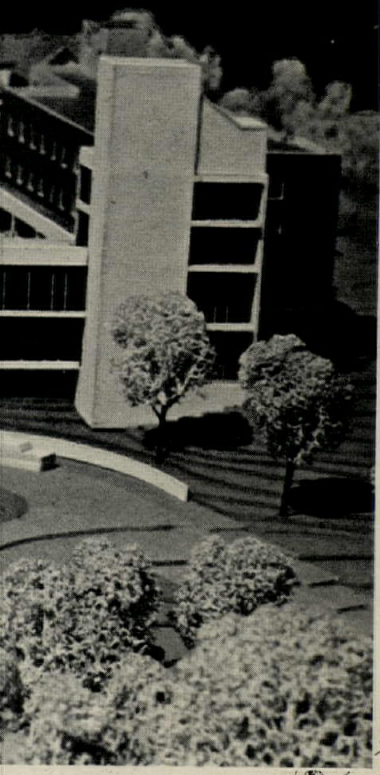
Design for a sloping site

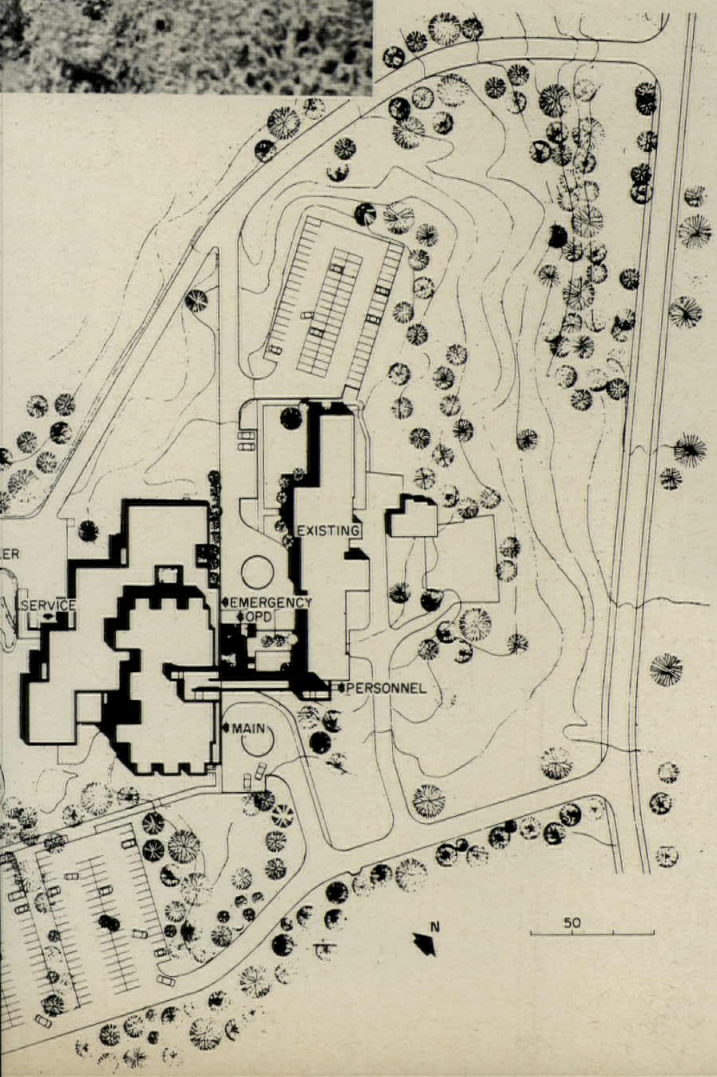
Replacement and expansion of preser facilities of an outmoded suburban hos pital on a 27-acre site in Natick, Massa chusetts, 30 minutes by car from Bosto took into account the presence in th central city of some of the foremost ho pitals and medical schools in the countr Rather than attempt to duplicate high specialized staff and services, Leonar Morse Hospital takes advantage of th skilled specialists who often live outsid the city and can affiliate with suburban a well as urban hospitals. Thus the subu ban hospital fills a capable general ro in a network of related regional facilitie

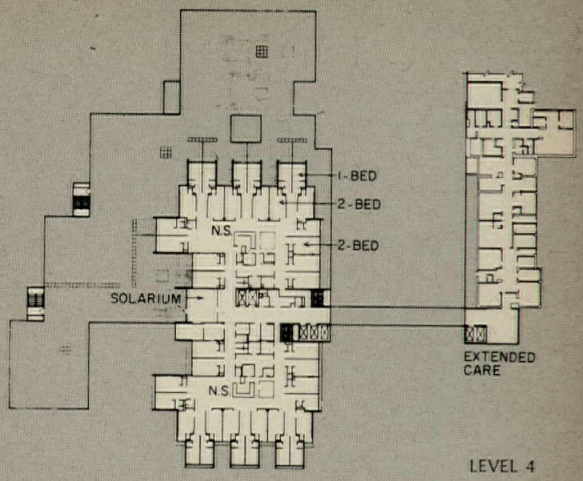
Leonard Morse was programed f a full range of general, intensive, reh bilitation and extended care facilities; local health center; and a full emergen service for the community.

LEONARD MORSE HOSPITAL, Natick, Ma sachusetts. Architects: *Markus & Nocka, In —Thomas M. Payette, partner-in-charg* structural engineer: *Arthur Choo;* gene contractor: *Franchi Construction Company*

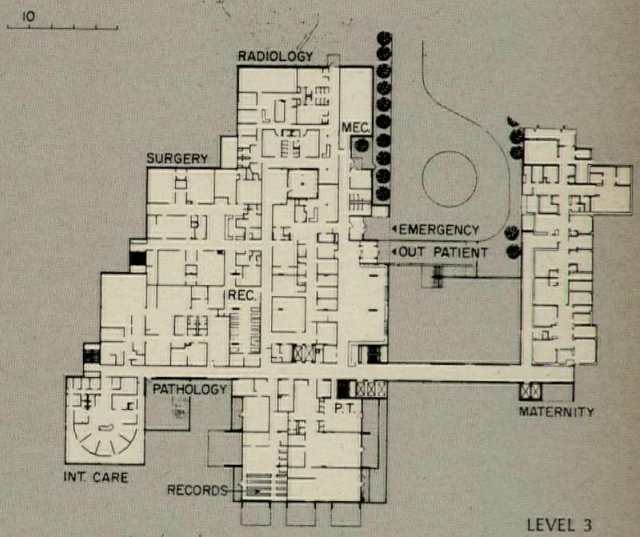
Hospital services are divided into functional units of dependent activities each of which was considered capable of independent growth. Units were arranged for horizontal and vertical circulation of both public and service traffic. Circulation spines were also considered extensible interconnections for zones of related activity. This organizational concept takes advantage of the sloping site permitting access of the various kinds of traffic at three different operational levels as shown in plans.



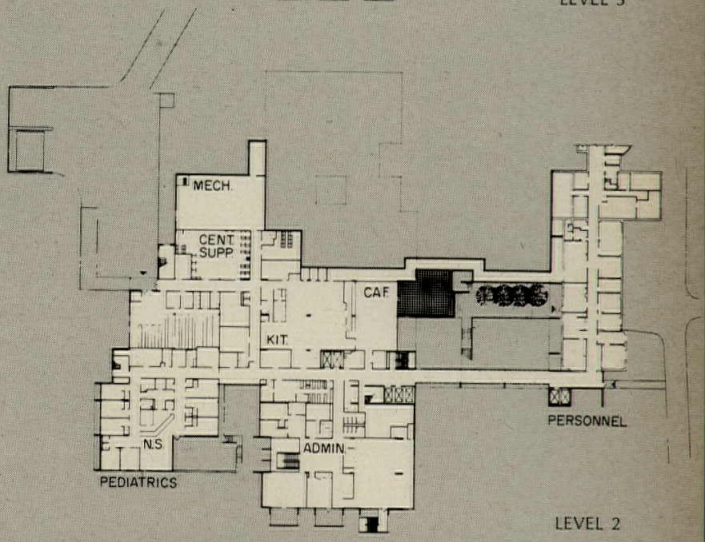




LEVEL 4

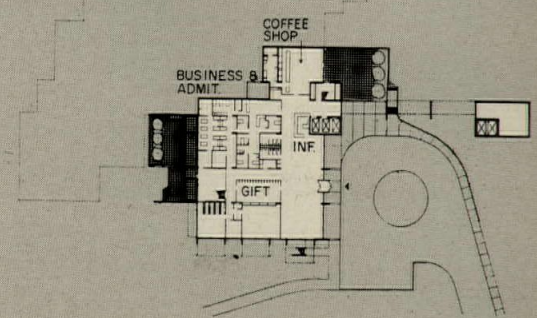


LEVEL 3



LEVEL 2

LEVEL 1



Expansible at constant scale

Crittenton Hospital in suburban Rochester, Michigan is designed as an expansible satellite—providing an initial 200 beds independent of the original base hospital in Detroit, with which it shares only laundry, purchasing and personnel services. The base structure containing the mechanical, diagnostic and administrative areas is designed to accommodate a second future nursing block for an eventual total of 400 beds without disruption in the operation of the hospital.

The now completed first phase of construction includes the power plant and the service base. It is so placed on the rolling 15-acre site that extension of the base and massing of the second tower will proceed with the same sense of scale and scope toward the final phase shown in the model at upper right.

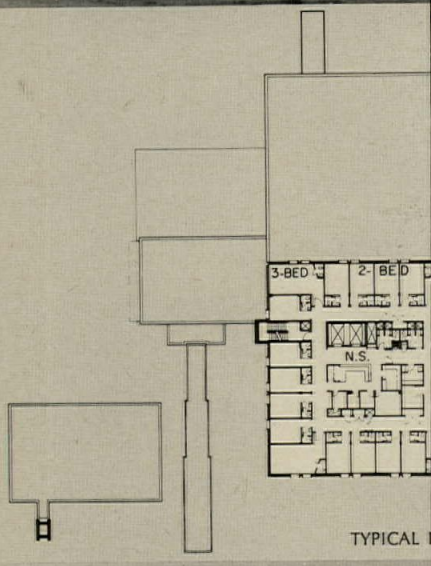
CRITTENTON HOSPITAL, ROCHESTER UNIT, Rochester, Michigan. Architects and engineers: *Smith, Hinchman & Grylls Associates, Inc.*; general contractor: *A. Z. Shmina & Sons Company*.

As can be seen in the ground floor plans, expansion of storage and emergency areas can occur readily to the south and west. With the advent of convenience foods it is not anticipated that expansion will be required in the dietary area.

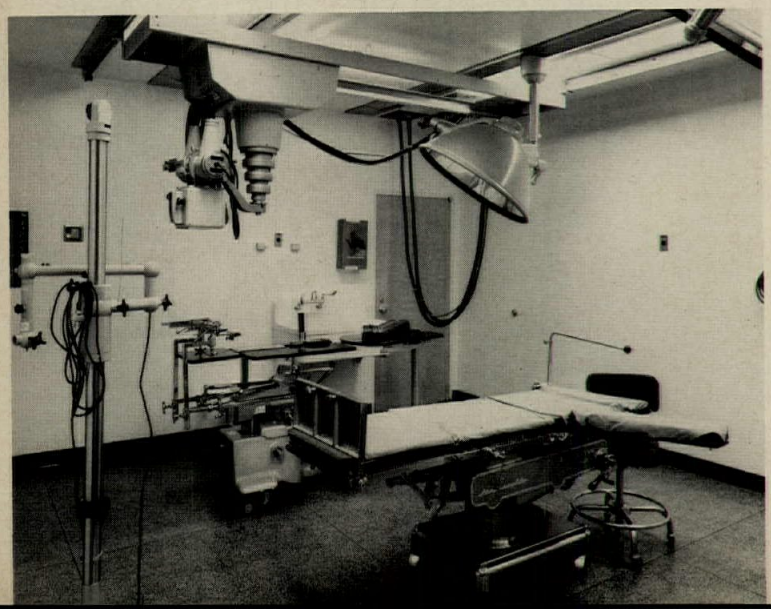
Grading is such that emergency, outpatient and service entrances are on the east and west of the ground floor while the visitors entrance is on grade at the north of the floor above, convenient to maternity and medical nursing services. This plan permits flexibility of occupancy between obstetrical and medical services whereby five beds in each service are interchangeable.

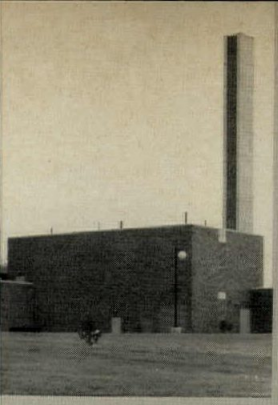
The typical nursing floor has a service core with 44 beds in peripheral rooms. This layout lends itself to the accommodation of intensive care or pediatric services with only slight modification.

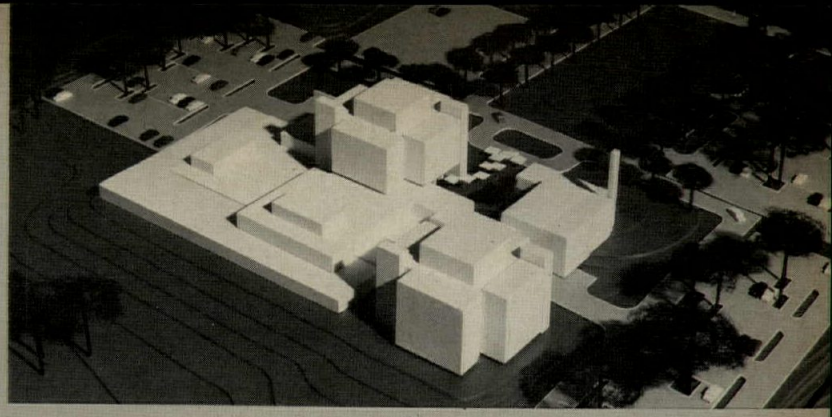
The nursing block is raised above the base structure by a recessed mechanical floor. Equipment on this floor serves the two lower levels while mechanical equipment in the penthouse serves the three nursing units.

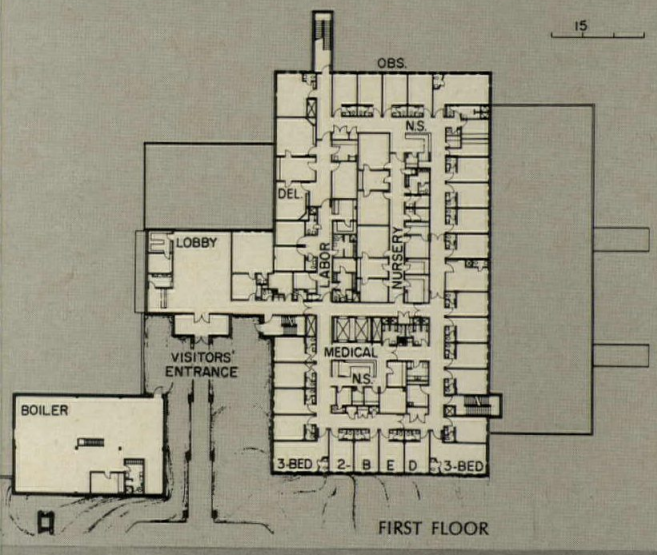


TYPICAL

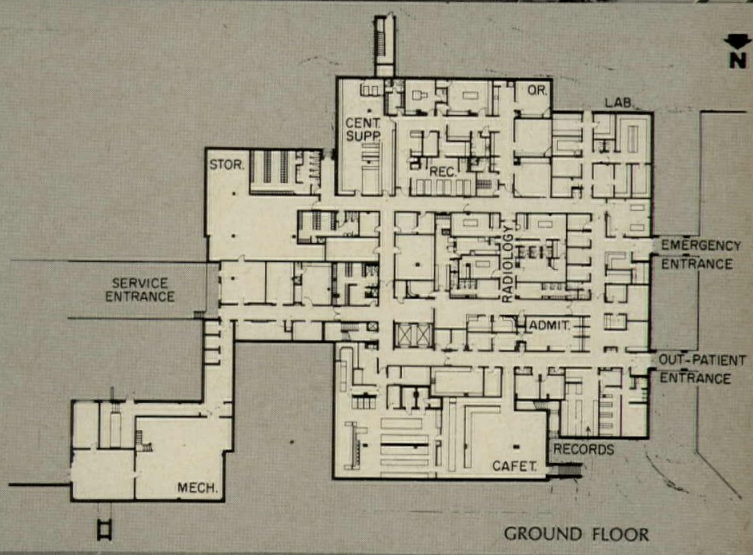




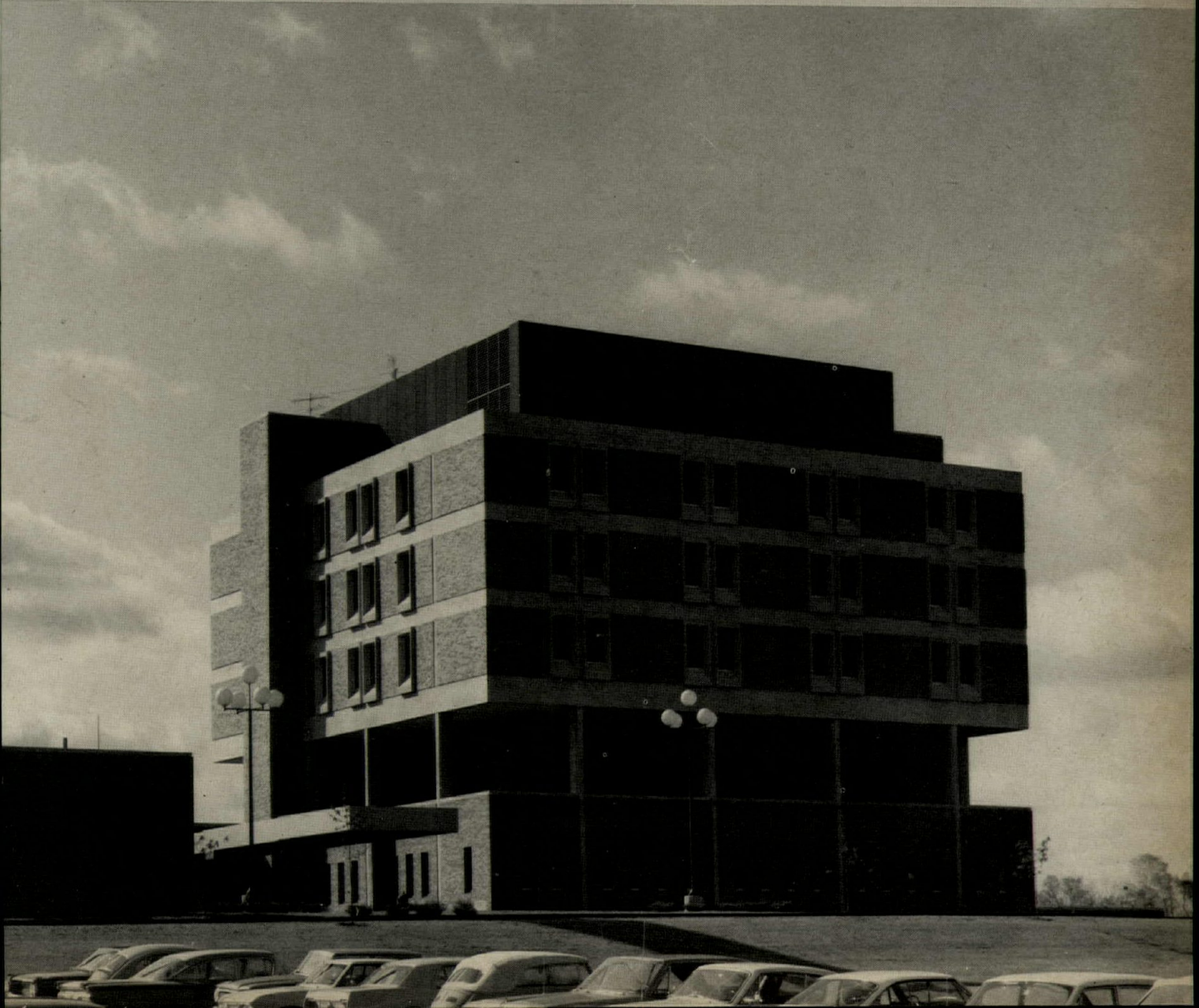




FIRST FLOOR



GROUND FLOOR



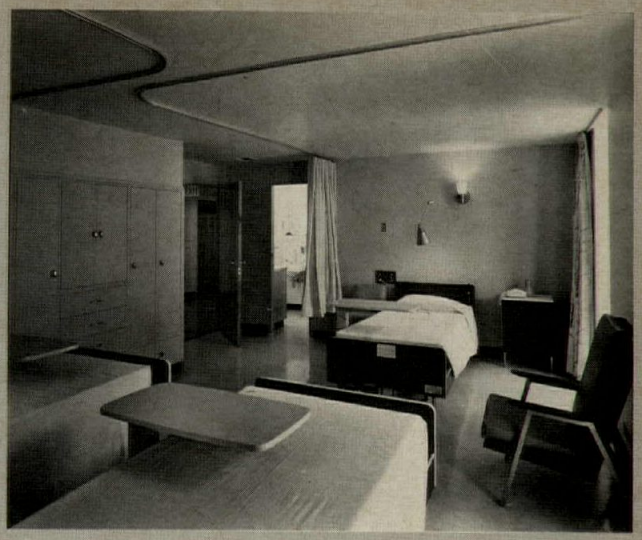
Suburban hospital planned for growth

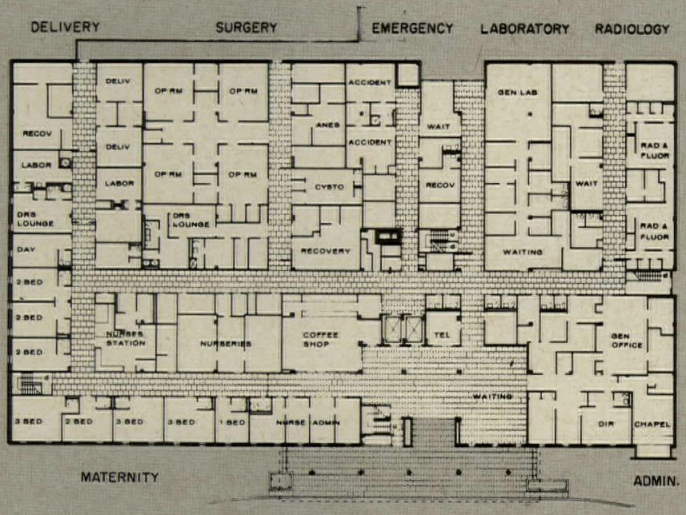
This small hospital in a growing community, Smithtown, Long Island, was planned with a primary requirement for non-institutional appearance combined with efficiency, economy, and expansibility. The first phase of construction, now completed, accommodates 163 beds, and is situated on the central high ground of the 74-acre sloping site.

The first floor, an extended podium for a three-floor nursing structure, uses the conventional emergency, radiology and administrative areas, and in addition contains the maternity and surgery suites. This permits full obstetrical care at one level and provides for future changes.

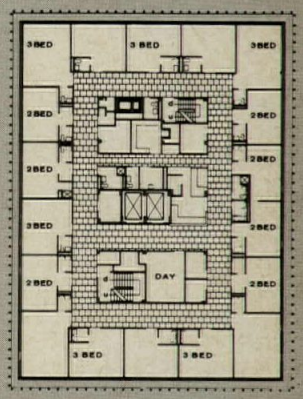
ST. JOHN'S SMITHTOWN HOSPITAL, Smithtown, New York. Architects: *Frost Associates, formerly Frederick G. Frost, Jr. & Associates—Nembhard N. Culin, associate-in-charge;* structural engineers: *Severud Associates;* mechanical engineer: *Cosentini Associates;* hospital consultant: *Otis N. Auer;* contractor: *John W. Ryan Construction Company.*

Joseph W. Molitor photos

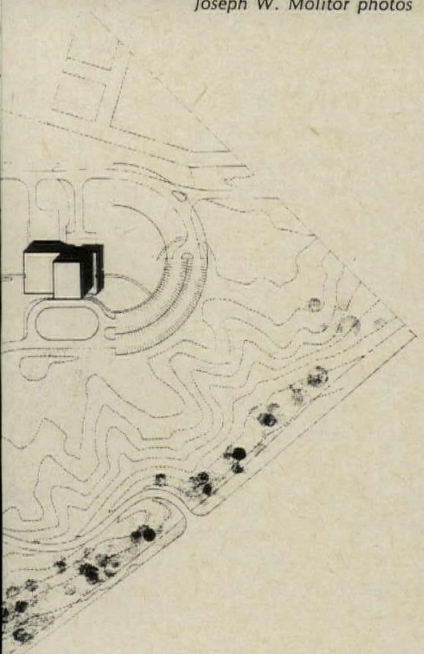


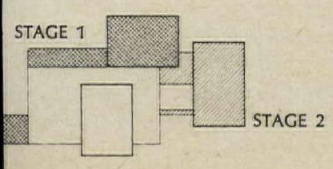


FIRST FLOOR



TYPICAL FLOOR





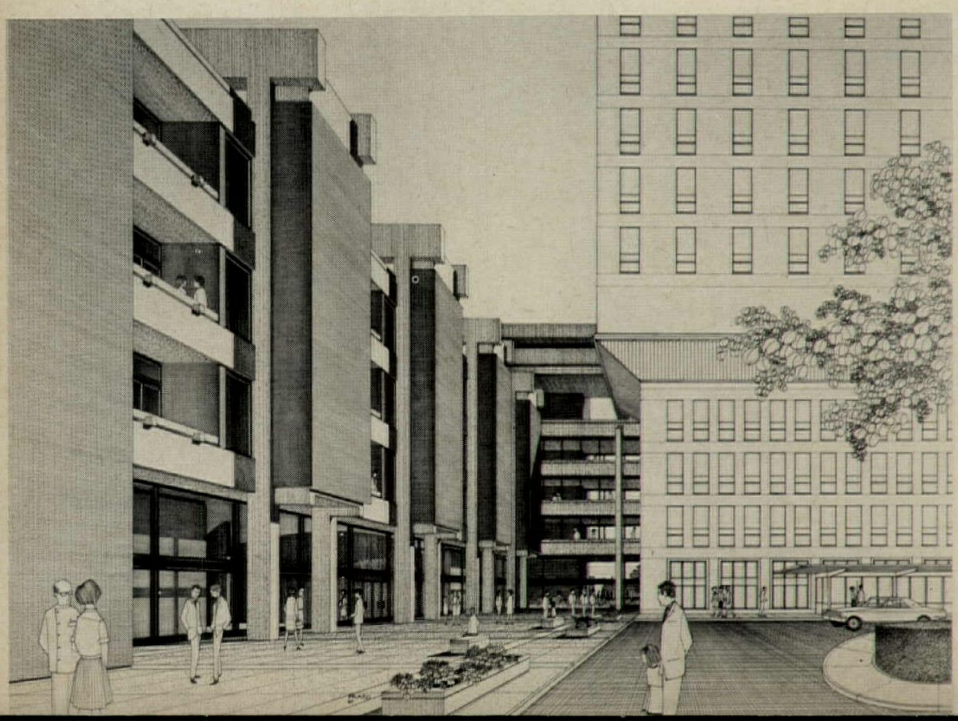
Nursing floors are planned with exterior rooms surrounding a service core and a central elevator bank. The hospital is fully air conditioned using a fan-coil convector system with exhaust through patients toilets.

The three-bed room, although contrary to recent trends toward privacy, presents an aspect of spaciousness as shown at top right. Private rooms are available on the top floor.

Exterior of the nursing floors is screened by a series of white arched arcades. The nursing block projects over the first floor service wing to provide a generous sheltered area at the main entrance.

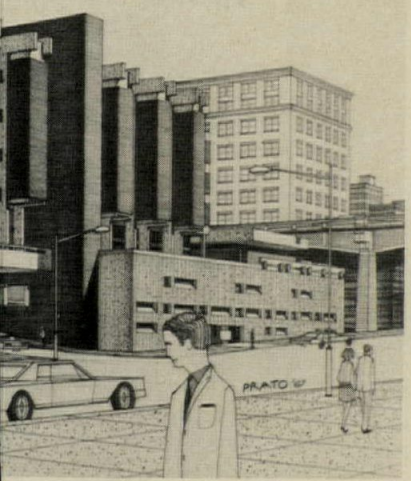
First-stage expansion calls for the addition of a second nursing pavilion and expansion of the maternity and surgical facilities. Laboratory and radiology departments will be expanded in the second stage as shown in the diagram at left.

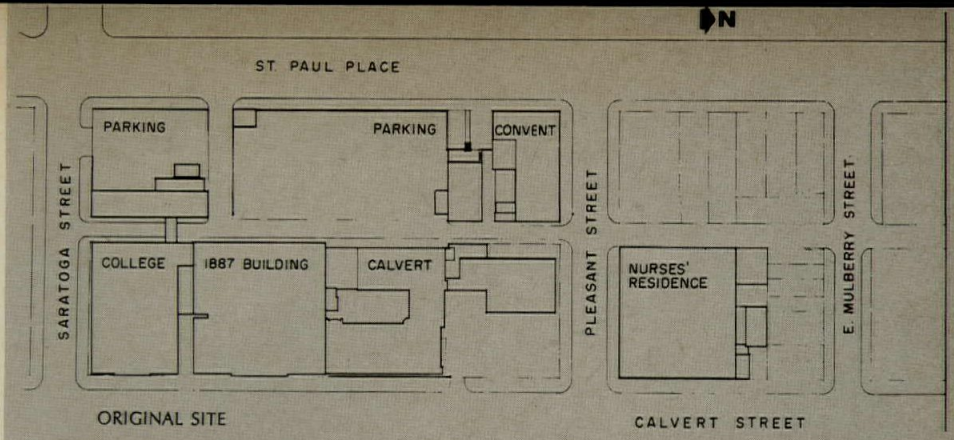
Total reconstruction on an urban site

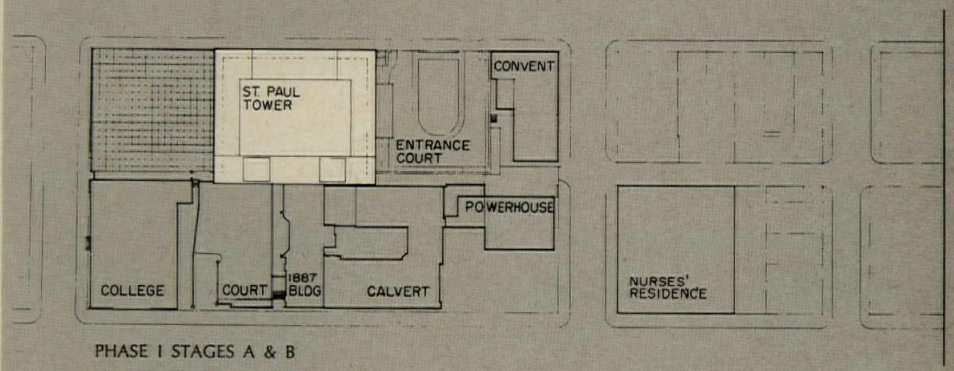


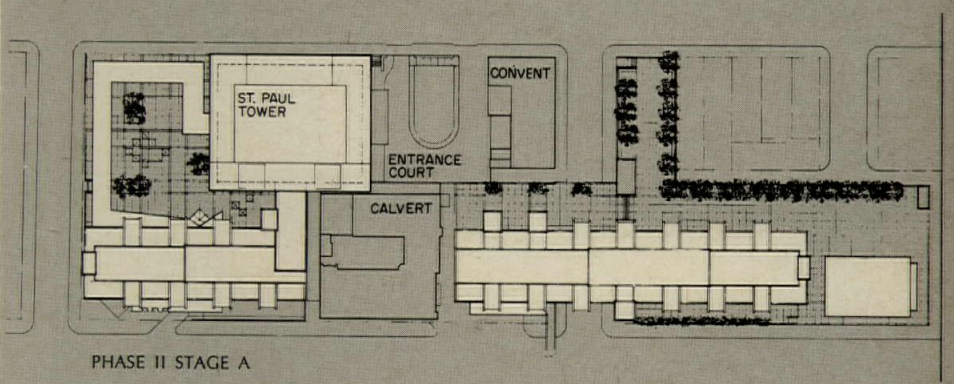
Nothing less than the eventual total replacement of existing facilities of the nearly century-old Mercy Hospital in downtown Baltimore would satisfy the standards of care and service that had been established over the years. An early decision by the Sisters of Mercy to remain in the downtown area meant a long-term change-over period. This would eventually involve removal of several buildings while maintaining active departments in certain important segments of those buildings. Although problems of phasing affected the form of new buildings (for example, nursing floors in the Tower, now completed, were cantilevered over old structures), the finished hospital will have architectural unity.

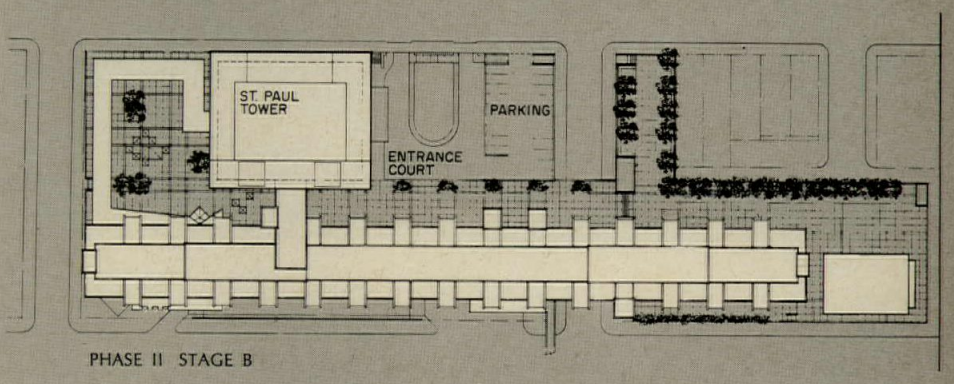
MERCY HOSPITAL, Baltimore, Maryland. Associated architects: *Taylor & Fisher with Helge Westermann & Richard Miller—Helge Westermann, partner-in-charge; Peter N. Da Silva, Jr., project architect;* structural engineer: *Van Rensselaer P. Saxe;* mechanical engineer: *Henry Adams, Inc.*





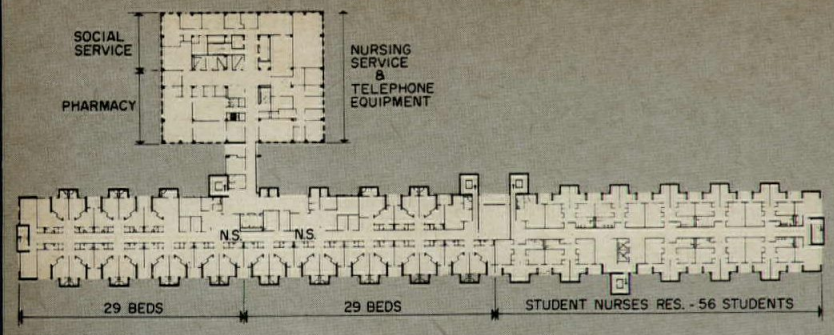




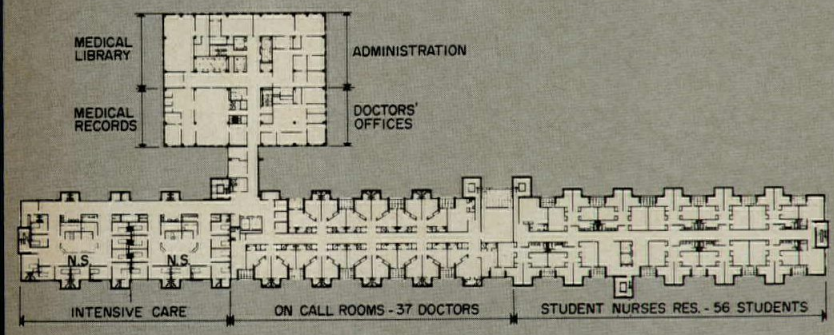


The first phase of construction, the Tower Building, was planned to occupy an original parking lot with a three-level extensible base which would eventually occupy the full one-block depth of the site. First phase of the tower was planned for 340 patients beds with supporting departments in the base. Two years after completion of the tower some of the unfinished shell spaces were occupied on schedule by clinics, laboratories, an outpatient department, etc.

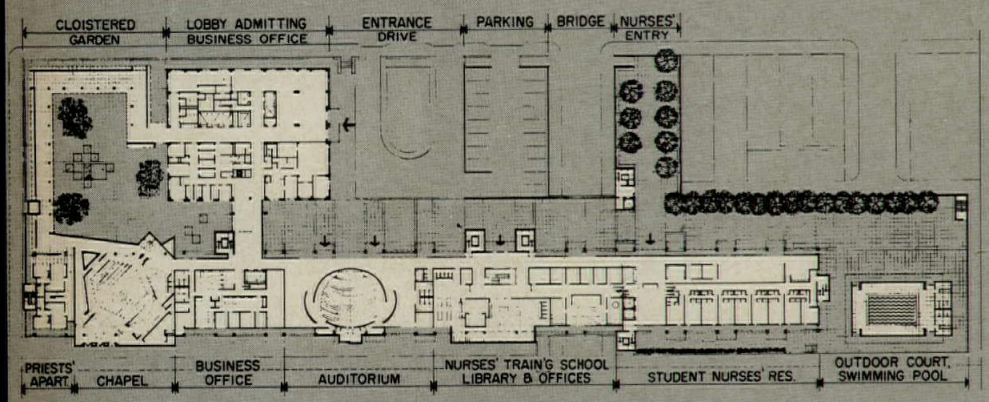
Phase two was initiated in June, 1965 to develop the property along Calvert Street. The two-stage construction was to be an extension of the base east to Calvert Street, the entire length between Saratoga and Pleasant Streets. The base is to be topped by a 115- by 612-foot-long four-story structure which projects northward, spanning Pleasant Street to a parking structure which will provide a base for the nursing residence as shown in plans at right above.



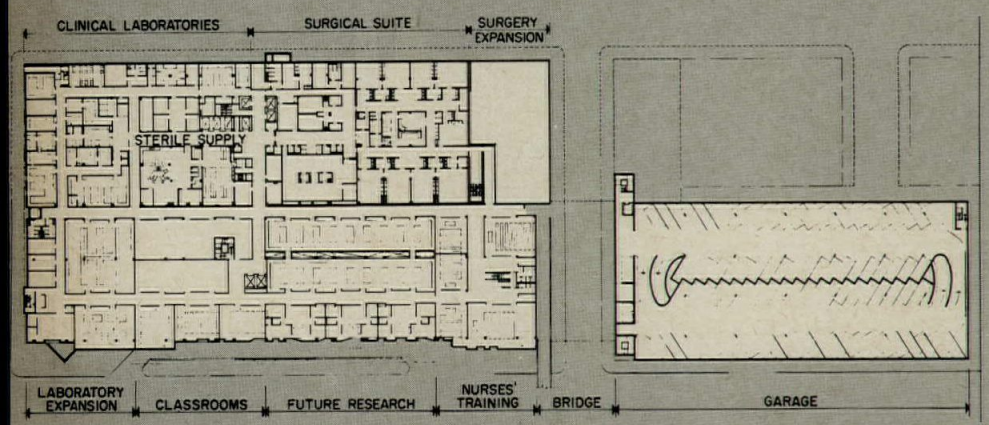
THIRD FLOOR



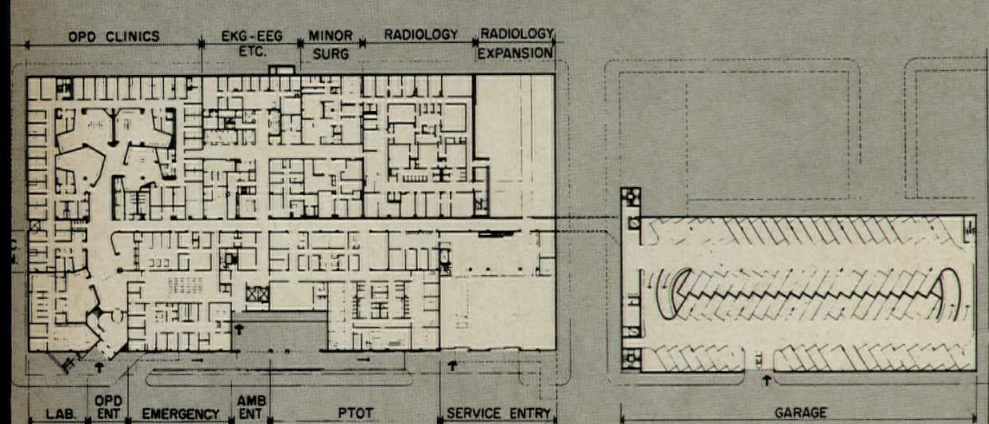
SECOND FLOOR



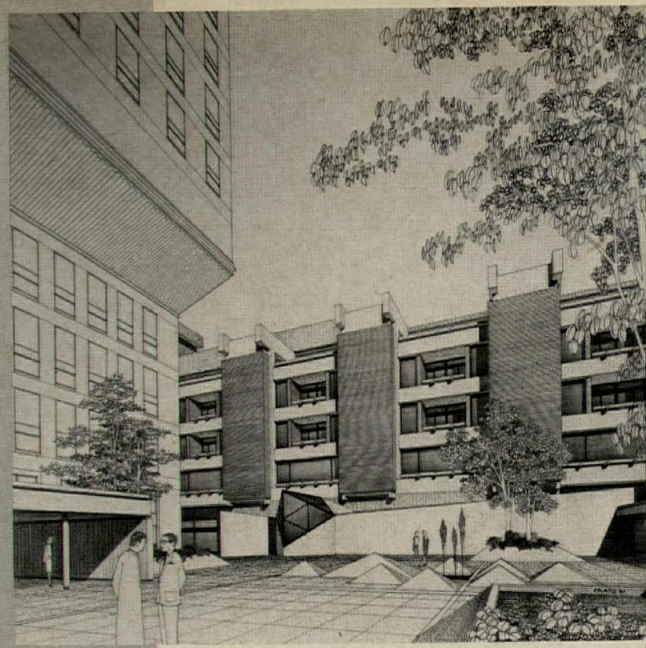
MAIN FLOOR



LOWER LEVEL 1

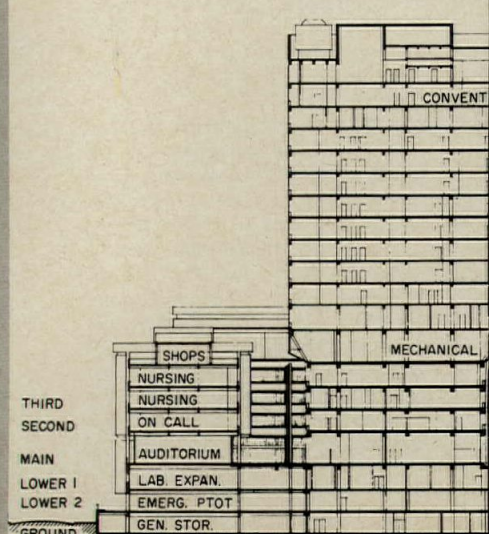


LOWER LEVEL 2



In the third and fourth floor nurs ing units, patients are grouped in 4-bed clusters designed to take up the linear length of 3 normal patien beds. This is accomplished by creat ing a sub-corridor into the cluste allowing access to the two outside bedrooms. Inside and outside room are divided by a diagonal service wall containing closets and vanities Each room is private and contain both toilet and shower. Second floo on-call staff and student nurses spaces are similarly deployed fo ready conversion if need be. Th main level houses functions of public or semi-public nature suc as auditorium, chapel and libraries Lower-level 1 provides reservoi space for future growth of researc areas. Lower-level 2 houses out patient, emergency and receivin areas. Traffic in OPD is directed t four separate waiting areas for ob pediatric, surgical and medical pa tients—each with access to radio ogy, pharmacy and consultatio suites. The ground floor, not shown contains storage and utility space

Trusses spanning 60 feet fro which the top three floors of th building are hung, allow uppe floors to be virtually column-fre This upper structural system allow large spans in base floors.



Engineers "reconstructing" collapsed bridge

The bits and pieces of Silver Bridge in Point Pleasant, West Virginia are being recovered and laid out in their pre-collapse position on a 25-acre field two miles downstream from the bridge site, in one of the efforts to try to determine why it failed. Thus investigators are taking a leaf from the book of authorities on airplane crashes.

As parts of the bridge are retrieved by divers from the Ohio River, they are labeled as to their position on the river bed, and then placed on a barge for the trip downriver. Not surprisingly, one of the Federal investigators is a former Air Force major who is an expert on air disasters, having been called off an investigation into the November airplane crash at Greater Cincinnati Airport.

The task force conducting the detective work at Point Pleasant was appointed, according to the publication National Observer, by a special Presidential commission, and includes, in addition to the Air Force officer, a former Coast Guard captain who is a specialist in marine accidents, and a retired rear admiral who headed the inquiry into the 1965 fire on the Yarmouth Castle.

In a separate effort, bridge designers Pardesty & Hanover have been hired by West Virginia to give a "microscopic" inspection of a sister bridge upstream which uses the same I-bar suspension system. The double steel I-bars, which were used in place of the originally recommended steel cables, were 2-in. thick and 12-in. wide, and hung from the tops of the two 131-ft-high towers for holding up the roadway while also serving as the top chord of the stiffening trusses in center and side spans. The investigation of the "sister" bridge is to check its current "state of health" and to perhaps find some clues as to possible failure of the 40-year-old Silver Bridge.

Miracles are not happening in rehab housing costs

Low-income housing via the slum-rehabilitation route doesn't stand a chance without some form of subsidy—that is the conclusion of some of the building product manufacturers and private foundations who have been involved. As an example, the Wall Street Journal recently pointed out that the Park Slope project in Brooklyn, which involves the rehabilitation of 17 four-story brownstones, is costing $18,000 a unit. Of the $18,000, $6,000 is said to go for building acquisition, financing and legal fees; labor cost is $8,000; this leaves $4,000 for building materials. If the project had been conventionally financed, rentals would have had to be $223 for a two-bedroom apartment. The project was financed under Section 221 (d) 3 of the National Housing Act, with a 40-year mortgage at 3 per cent interest. Also New York City is waiving real estate taxes. The rent is now scheduled to be $125.

The reason that refurbishing costs are higher than the developers and sponsors had hoped apparently is that much of the work is more fussy and time-consuming than had been anticipated—rotten wood framing; punky plaster walls that are difficult to reface with new drywall panels.

Despite the higher costs, advocates of the rehabilitation approach believe that these projects can, with private sponsors, be put in readiness much faster than new construction, which involves demolition, more massive relocation and time-consuming approvals from government agencies.

THIS MONTH'S AE SECTION

Automated mail service for a Houston tower

The nation's largest Vertical Improved Mail system is being installed in Houston's new 50-story One Shell Plaza. Guided by electronic controls from the mall-level mail room, conveyors operating within a building shaft automatically shunt off locked mail trays for the tenants on each floor.

Specifiers hope to set up a research foundation

As presently structured, the Construction Specifications Institute believes it does not have the financial capability to undertake significant studies in the area of automation of specifications and technology in construction. Thus—according to C.S.I.'s board of directors—a mechanism in the form of a research foundation is needed to attract grants in an amount somewhere in the range of $200,000 a year.

The research foundation proposal is an outgrowth of a recent study commissioned by C.S.I. and undertaken by Stanford Research Institute which resulted in a report issued late last year titled, "Sur-

vey of Current Automation Practice and the Use of Automated Techniques for Specifications and Detailing Practices." (See last month's Architectural Business section in AR, pages 93-94). C.S.I.'s president, John C. Anderson, has stated that the establishment of a foundation will not diminish the role of national and chapter technical committees, but that, on the contrary, their advice would be sought by those engaged in research foundation work. The foundation proposal envisions that the research work would be contracted, for the most part, with organizations outside C.S.I. having the appropriate technical expertise.

Bureau of Standards takes an overview of fire tests

A group of research associates at the National Bureau of Standards is looking for answers to: 1) whether the current fire test methods produce meaningful results; 2) whether the test methods affect the behavior of materials and systems under test; and 3) how well extrapolations can be made from tests to actual field conditions. The first project in the research effort, being sponsored by the Factory Mutual Engineering Corporation, is a model study of air convection induced by fire. Another investigation is aimed at understanding the dynamics of heat flow to and from a flame spreading along a combustible surface.

Results of the Bureau's studies are expected to have a bearing on future research to be conducted at Factory Mutual's own fire research center at West Gloucester, Rhode Island, the largest facility of its type in the world.

A study of tall stacks to reduce air pollution

A major new study of the usefulness of tall smoke stacks in dispersing pollution in the atmosphere has been launched by the National Center for Air Pollution of the Public Health Service. Purpose of the study is to determine, through actual measurements in the vicinity of three coal-burning electric power generating stations, the extent to which tall stacks serve to disperse pollutant gases released into the air, and the extent to which they contribute to ground-level concentrations of pollution. These measurements will supplement data already derived from smaller-scale studies and from mathematical models.

Attention will be focused primarily on sulfur oxides—an estimated 26-million tons of sulfur oxides are currently released each year, with most oxides coming from the burning of coal and residual fuel oil to produce heat and electric power.

The new study of tall stacks is part of an expanding research effort, most of which is focused on accelerating the development of ways to remove sulfur from fuels before they are burned, and to remove sulfur oxides from stack gases before they escape into the atmosphere.

Cooperating in the study are the Pennsylvania Electric Company and the Division of Air Pollution Control of the Pennsylvania State Department of Health.

Steel foil sandwich tested for electric snow melting

United State Steel's foil development laboratory has developed a steel foil sandwich—steel foil encased between layers of Mylar plastic film—which can be glued to sidewalks and roads with an adhesive. The panels will be tested by U.S. Steel on the up-down ramp serving the excavated area for the foundation of U.S. Steel's new Pittsburgh headquarters.

Architectural juries in Russia—a practical note

Surprisingly, in its comprehensive coverage of the 50-year anniversary of the Russian Revolution, The New York Times described a recent event that took place during a postgraduate architectural dissertation at which not only were faculty and students present, but some of the interested public. The event took place at Moscow's Architectural Institute, and the student in question was offering his thesis on urban planning in the Siberian Arctic. He proposed that mining towns be designed to protect residents from the devastating cold and blizzards of the Siberian wastes. As the Times story has it, "A spirited discussion ensued, revolving around the height of the buildings and the wisdom of covering the entire town with a plastic dome or linking structures by enclosed passages that would keep out the winter cold of 40 and 50 degrees below zero."

After the professors had commented, a representative of the State Institute for the Design of Nonferrous Metals Enterprises asked for the floor. This is the agency responsible for the development of the remote mineral sites—thus the would-be client. "I may be a little blunt," he is reported to have said, "but I feel you are talking in a vacuum. You act as if the principal problem . . . is to make it as cozy as possible for the housewife to go from her home to the grocery store. Our problem is not to attract people to settle [there] . . . We are looking forward not to the accommodation of miners under air-conditioned plastic domes, but to increasing mechanization and automation that will reduce the required manpower to the absolute minimum."

According to the Times story, the professor who supervised the thesis explained that the study was not concerned with issues of industrial planning and manpower distribution in Siberia but was an exercise in architectural design of a settlement under rigorous climatic conditions. Result: the student's thesis was approved, "purely on architectural merit."

How much can a dimension vary in a building?

Would you believe that some European countries have recommended standards covering deviations in building dimensions from those given in drawings and specifications? Reported in the Building Research Station Digest (England), West Germany has drafted standards covering everything from permitted deviations in brickwork to bow in concrete walls and columns, to variations in column or wall spacings. As an example of what happens, even with the use of carefully manufactured materials, the Digest cites the fact that wall spacings in buildings made of large precast concrete panels have been found to vary by plus or minus ⅞ in., which was attributed to inaccurate laying out of the building. Even in some English "system-built" schools, column spacings, plumbs and alignments varied by up to ⅜ in., requiring adjustments to maintain the plumb and alignment of factory-made wall panels.

A wider role suggested for unitary air conditioners

An increasing number of miniature central air-conditioning systems, employing matched unitary equipment packages, are likely to be used in a variety of building types—according to a prediction in a new monograph published by the National Electrical Contractors Association. Other topics covered in the 20-page booklet are: use of "waste space" or external mechanical cores for unitary equipment locations; packaged heat pumps as components of small central systems; factors that affect noise from unitary air conditioning equipment. This monograph, "Central Heating/Cooling with Electric Package Units," as well as two previous ones, "All-Electric Concepts for Architecture," and "Visual Aspects of the Electric Environment" are available to architects and engineers from NECA chapter offices throughout the country.

Electric heating cables melt snow in an eight-block-long shopping mall

Starting this winter, a redeveloped eight-block shopping area of downtown Minneapolis has offered pedestrians snow-free sidewalks via what is said to be the largest electric snow melting installation ever. The developers of the 3,500-ft-long Nicolett Mall decided to include this buyer-attracting amenity when a prominent section of Nicolett Street was "redesigned" by Lawrence Halprin & Associates into a pedestrian mall plus "Transitway." While there is still vehicular traffic through the area, this is limited to buses and taxis.

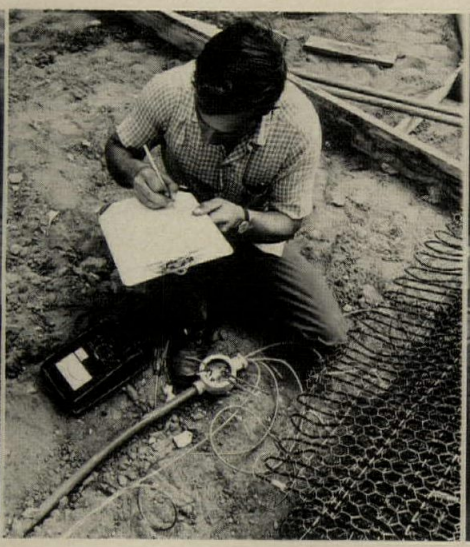
The snow melting equipment is comprised of 5,000 electric heating mats of various wattages, installed from 1½ to 3 in. below the sidewalk surface.

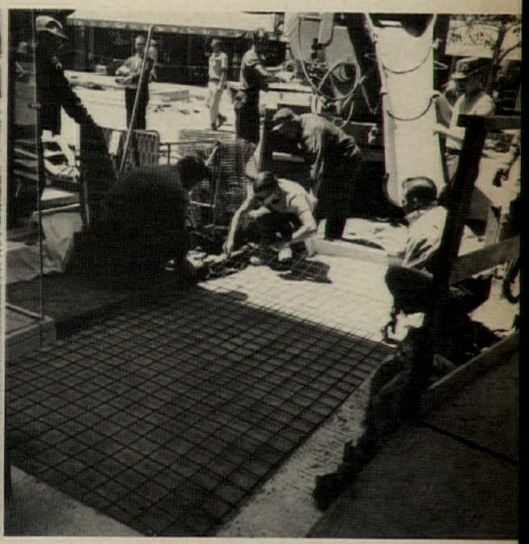
Sidewalk has different zones of snow-melting capacity

The mall is divided into two main snow melting zones—and one subsidiary zone at intersection corners—each of which utilizes equipment of a different wattage (or dissipation factor). The "basic" zone —the sidewalk area most used by pedestrian traffic—extends outwards from store fronts for a distance of 15 ft. To assure total snow melting performance here the complete zone (77,720 sq ft) has been equipped with mats dissipating 60 watts (205 Btuh) per sq ft. As an added protection to shoppers, on corners where intersecting roads cross the "Transitway" and unmelted snow could be carried over onto the mall sidewalk, 75 watt (256 Btuh) per sq ft mats have been installed.

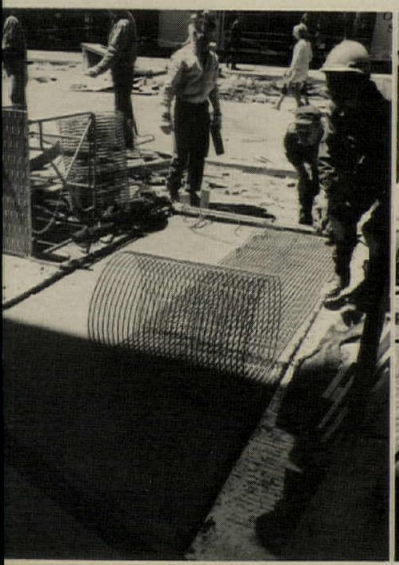
The "casual" zone—that area of sidewalk outside the 60 and 75 watt zones just described—is kept clear of snow by a mat installation dissipating 40 watts (136 Btuh) per sq ft. Because sidewalk widths fluctuate between 15 and 41 ft due to the serpentine course followed by the 24-ft-wide "Transitway", "casual" widths vary greatly along the length of the mall.

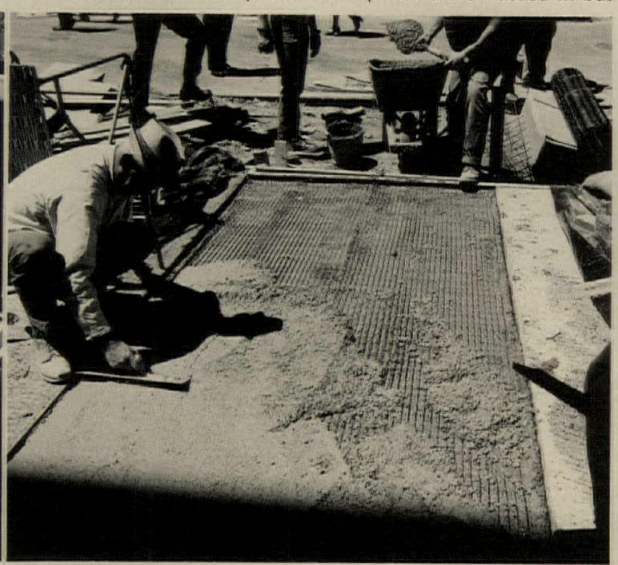
For construction purposes and in order to facilitate the installation of snow melting equipment both "basic" and "casual" areas in each city block were divided into panels, the shape, size and number of which depended on the amount of surface equipment planned for that area. No two snow melting panels are exactly the same because of decorative and functional elements built into the sidewalk: fountains, trees, lampstands, inspection grilles, weather stations and other items. Thus every one of the 5,000 snow melting mats had to be custom-made. Another factor affecting mat manufacture was the exacting tolerance standards specified by the consulting engineer. For example, to minimize possibility of ice ridges forming on the sidewalk surface between areas served by heating mats, the consulting engineer specified that heating cable be firmly set to within 1 in. of the wire-mesh mat edge. Also that the mat itself, when

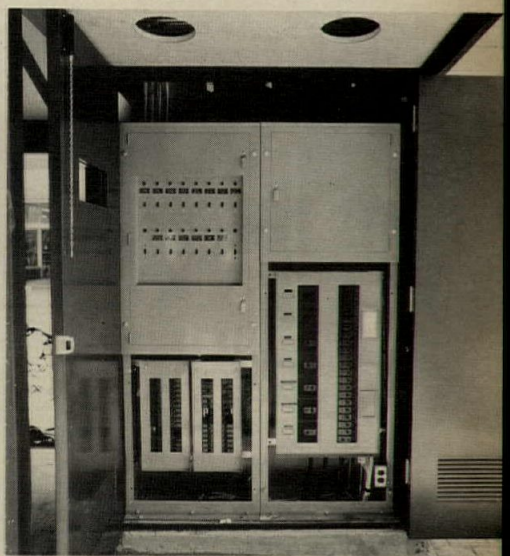




of various systems being tested, mat to far right (first photo) was ultimately specified. Electrician checks continuity of mat cold lead to splice box connections in sidewalk panel. Next, reinforcing mesh is laid for concrete pour. Mat, with connections intact, is embedded in concrete. Grout applied over installation will be surfaced in terrazzo. Control panels for all electrical components are housed in bus shelters along mall.







The terrazzo-surfaced mall is divided into snow melting zones, with high wattage mat installations located near stores and at corners for pedestrian crossings. Snow detector on top of bus shelter, right foreground, activate the melting equipment, set in panels 1½ to 2 in. below grade.

rolled out into the sidewalk panel, had to fit within 1 in. of the wooden frame enclosing the panel and to within 2 in. of any surface obstruction requiring a cutout in the snow melting mat. Intricate cutouts were consequently more of a rule than an exception and close liaison was maintained between the manufacturer (Easyheat of the Climate Control Division, The Singer Company) and site.

The procedures used for panel construction and mat installation were:

1. Snow melting cold leads were connected to splice-box terminals, and after ohm-meter testing the mat was rolled back out of the panel to make way for reinforcing steel wire-mesh and the first concrete pour.

2. The steel mesh was fitted into the panel and around the splice box; then concrete was poured to a depth of 4 in.

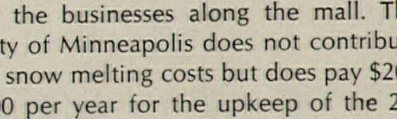
3. After the concrete had partially set, heating mats were rolled back over it and carefully worked into the surface.

4. Next, a thin layer of grout was spread over the mat and allowed to set. (Next step can be done before grout dries.)

5. Finally, either terrazzo or brick was applied for the wearing surface.

Bus shelters, positioned two per block, on either side of the road, are ideally placed to serve as electrical control centers for snow melting equipment. Automatic snow detector switches were installed on the top of the shelters to activate the heating mats automatically, when triggered by falling snow. The system is activated in November when snow may be expected. At this time whenever ambient temperature is below 35 F, the thermostat closes and activates the detector switch. It is then responsive to snowfall or even sleet or rain. Thus in ambient temperatures of 35 F or below the detector switch will still energize mats automatically in time to prevent the formation of ice. As the equipment is switched on ahead of the main snowfall both "basic" and "casual" areas reach a surface temperature high enough to prevent snow from settling. This system has the added advantage of not requiring extensive drainage facilities as much of the resultant snow water is removed by evaporation.

The Minneapolis winter season has been calculated at 3,624 hours per year, of which an estimated 250 hours may require the use of snow melting equipment. This figure has been calculated on the basis of hours per year when ambient temperatures settle between 25 and 30 F, and has been used to arrive at an estimate of 1,899,000 kwhr annually for the equipment. At the favorable rate of 1.5 cents per kwhr—2.4 cents was quoted for the mall without snow melting—this represents an annual expenditure of $28,498, more than half of the total anticipated expenditure of $42,990 on electricity for the mall itself. This amount, which is included in the maintenance total of $169,720 is met proportionately by the businesses along the mall. The City of Minneapolis does not contribute to snow melting costs but does pay $20.-000 per year for the upkeep of the 24-ft-wide "Transitway".



Resistance cable generally used in the manufacture of snow melting mats is comprised of a single conductor wire encased in 0.032-in. PVC which in turn is covered by a 0.003-in. nylon sheath and 18-gauge copper grounding braid. But to meet the specifications for Nicollet Mall an extra thickness of 0.020-in. PVC casing was added. It was felt that any slight fall-off in heat transferrin qualities would be more than offset b the easier handling qualities at the cor struction site.

All facilities designed for future expansion

Over-all planning and equipment desig at Nicollet Mall reflect the generally hel conviction that further growth and im provement is forthcoming. Power vaul are designed to carry a far greater loa than is presently required. Telephone fa cilities capable of handling a conside able increase in mall business have a ready been installed. Electrical condu throughout the complex is presently on 60 per cent filled. The main water syste —there are two serving the mall, one which is for street cleaning only—ru through a system of pipes designed f a greater flow of water than is needed this stage of mall development. Wate supply pipes are encased in a cast-iro sleeve which not only channels any lea age into the drainage system but als permits pipes to be drawn out throug the sleeve for repair without digging u the sidewalks or transitway.

Mall designers were Lawrence Ha prin & Associates of San Francisco, Ca fornia. Consulting Engineers for the m chanical and electrical design were t Minneapolis firm of Evans, Michau Cooley, Hallberg and Erickson. Init feasibility studies were performed Barton-Aschman Associates Inc., of Ch cago. The City of Minneapolis served general contractor with two-thirds of t work let out to sub-contractors.

The entire Nicollet Mall project h been directed for the City of Minneapo by Perry Duff Smith, P.E., of the Depa ment of Public Works. Electricity for t mall is supplied by Northern States Pow Company, Nicollet Mall, Minneapo Minnesota.

How much does noise bother apartment dwellers?

By Dean R. Prestemon, Department of Forestry, Iowa State University

Much has been said and written about noise problems in apartment buildings constructed recently. The causes have been identified and techniques developed for improving the sound-isolation characteristics of apartment construction in practical terms. There is much less documentation, however, on how seriously noise bothers people.

A very recent study on this aspect of noise is reported here. The study is based on a survey of 226 tenants and the managers of 12 garden apartments in the Midwest which asked: 1) whether or not the occupants were annoyed by noise; 2) to what extent they were annoyed; and 3) how much more rent they would be willing to pay for greater acoustical privacy. The study was conducted by the Department of Forestry of Iowa State University. Ed.

Poor sound isolation is reportedly one of the most frequent causes of complaints about post-war apartments, and has been blamed for rapid tenant turnover and excessive vacancies. The Federal Housing Administration has established regulations aimed at improving acoustical privacy in apartments. But by and large, the adequacy of these criteria as reflected by satisfaction of tenants has not been carefully evaluated.

Modifying conventional construction to provide some required or desired degree of sound isolation costs money. The architect and owner need answers to several questions before a decision can be made on the amount and type of sound insulation to be incorporated. How important is noise control to tenant satisfaction and the successful operation of apartments? How much sound insulation is needed? What types of noise are most objectionable? How can adequate noise control be achieved at minimum cost?

The results of a survey, recently conducted by the Department of Forestry, Iowa State University, provide preliminary answers to the first three questions for low-rise, garden apartments. How noise control can be achieved at the lowest cost is being investigated separately.

How the tenants rated their present and their former apartments

Twelve per cent of the respondents volunteered that "quietness" was a feature they particularly liked about their present apartment; on the other hand, 35 per cent volunteered an objection to the existing noise level. In answer to another open-ended question, 9 per cent volunteered "quieter" as a reason for satisfaction with their present apartment; slightly more than 3 per cent gave "noise" as a reason for dissatisfaction.

Twenty-three per cent of the tenants gave "too noisy" as one of the reasons for leaving their last apartment; 12 per cent ranked "too noisy" as the first, second or third most important reason. Twenty-three per cent of those interviewed gave "lack of privacy" as a reason for vacating their last apartment; 9 per cent ranked "lack of privacy" as the first, second or third most important reason.

"More quiet" was given by 30 per cent of the respondents as one of the reasons for selecting their present apartment; 6 per cent ranked it as the first, second or third most important reason. Similarly, 31 per cent of the tenants indicated "more privacy" as one of the reasons for selecting their current apartment; 9 per cent ranked "more privacy" as the first, second or third most important reason. Forty-three per cent of the respondents stated that their present apartment was quieter than their previous apartment, 29 per cent said it was noisier, and 28 per cent thought that it was about the same.

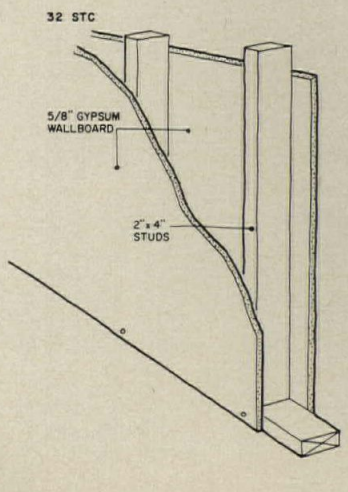
Forty per cent of all tenants interviewed rated the noise level in their present apartment as objectionable. Eight per cent of the tenants indicated a willingness to pay higher rent for an apartment free of the noises they found objectionable. The additional rent these people were willing to pay ranged from $2 to $50 per month, with an average additional rent of $18.18.

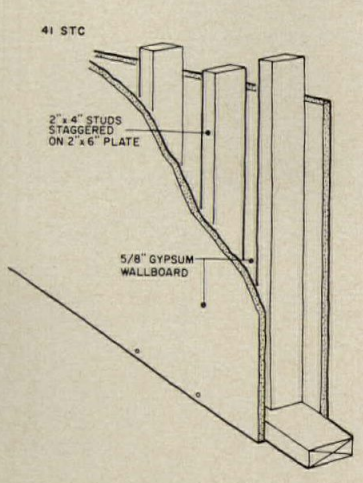
The proximity of the occupants' apartments to other apartments in the same building appeared to influence the proportion of tenants objecting to noise level or lack of privacy.

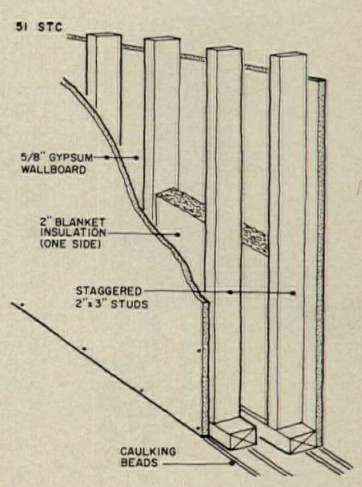
Approximately 53 per cent of the tenants interviewed occupying apartments with neighbors on both sides objected to the noise level or lack of privacy, and 37 per cent of the tenants with neighbors on only one side objected. A slightly higher percentage of tenants with an apartment overhead objected to the noise level, compared with people with an apartment below.

Surprisingly, a smaller percentage of tenants living alone objected to the noise level or lack of privacy in the developments than did couples and families; and a greater proportion of tenants with incomes of less than $6,000 per year voiced objection to the noise level or lack of privacy than did those with higher incomes.

Wall details on this and the following page are typical of those that can be used in garden apartments, but they are not necessarily the same as the walls in the apartment buildings surveyed.







Excessive noise was a cause of complaints in 11 of the 12 developments, but only three managers believed that vacancy rates or turnover were affected by excessive noise. According to the managers, only one tenant in all 12 developments left because of noise.

A smaller proportion of tenants in the different developments tended to complain about "radio, TV, record player" (airborne noises) as the combined estimated STC ratings of walls and floors increased. Similarly, a lower percentage of tenants objected to noise caused by "walking or running in apartment overhead" (impact noise) as the estimated IIC of the floors increased. The trends were by no means perfect, but some correlation appeared to exist.

Development Number	Number of Tenants Interviewed	Number of Tenants Objecting to Noise or Lack of Privacy	Estimated Sound Transmission Ratings: Sound Transmission Class (STC)*		Impact Insulation Class (IIC)**
			Walls	Floors	Floors
1	17	4	50	50	49
2	20	7	49	50	70
3	21	4	49	47	66
4	22	7	42	49	46
5	20	4	42	47	69
6	8	2	39	49	46
7	18	9	49	39	37
8	22	19	49	39	37
9	24	6	49	38	55
10	20	6	49	37	33
11	9	1	40	40	32
12	25	22	39	39	37

*** Sound Transmission Class (STC) is a single number rating system for transmission of airborne sound measured in accordance with procedures outlined in ASTM Standard E-90-61T. The higher the numerical rating, the more effective the assembly.**

**** Impact Insulation Class (IIC) is a single number rating system for transmission of impact noise. The higher the numerical rating, the more effective the assembly impact noise. The IIC value has been proposed by the National Bureau of Standards to replace the Impact Noise Rating (INR) currently in use. Values are roughly 50 points higher than corresponding INR numbers, which means that all IIC numbers have positive values.**

The kinds of noise sources that people complained about

The intruding noise sources bothering the largest number of people in their previous apartment were: 1) walking or running in the apartment overhead; 2) radio, television, record player; 3) loud talking, children playing in other apartments; 4) walking in halls, on hall steps or in adjacent apartments. Seventeen per cent of the respondents rated "radio, TV, record player" as most important, 15 per cent rated "walking or running in apartment overhead" as most important, and 9 per cent rated "plumbing noise from other apartments" as most important.

The features people found objectionable in their present apartment varied with development. "Plumbing noise in other apartments" was the most frequent kind of noise objected to by tenants when all developments were combined.

"Plumbing noise in other apartments" was rated as the most objectionable or second most objectionable feature by 16 per cent of all tenants; "walking or running in apartment overhead" was rated similarly by 15 per cent of the respondents.

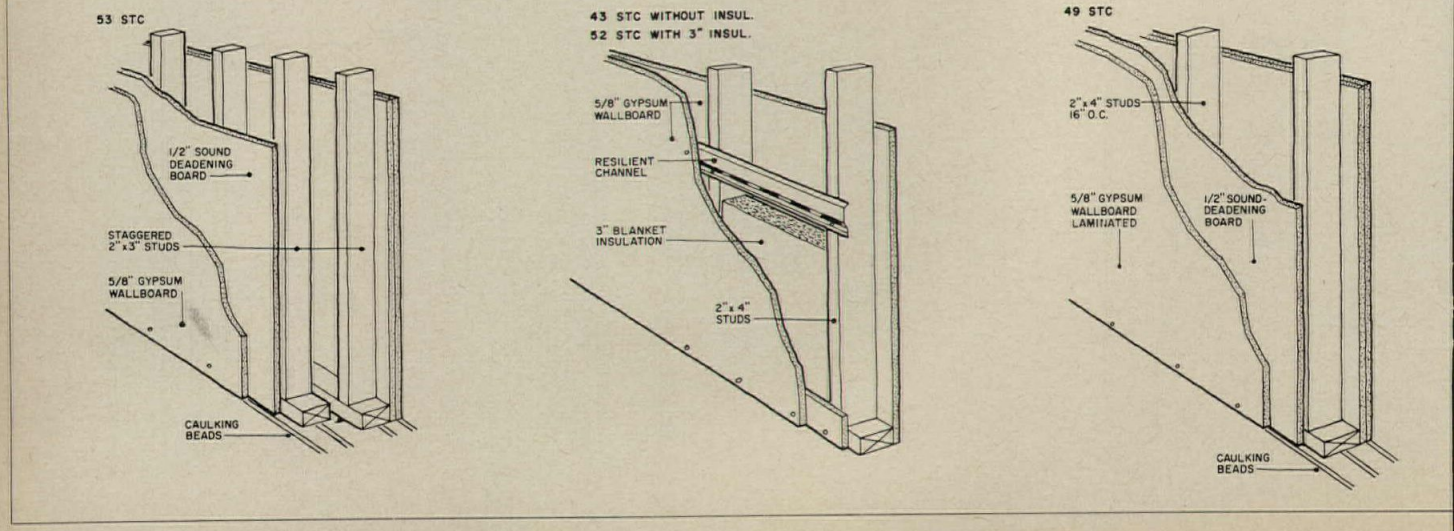
How the survey was conducted: profiles of the apartments and the occupants

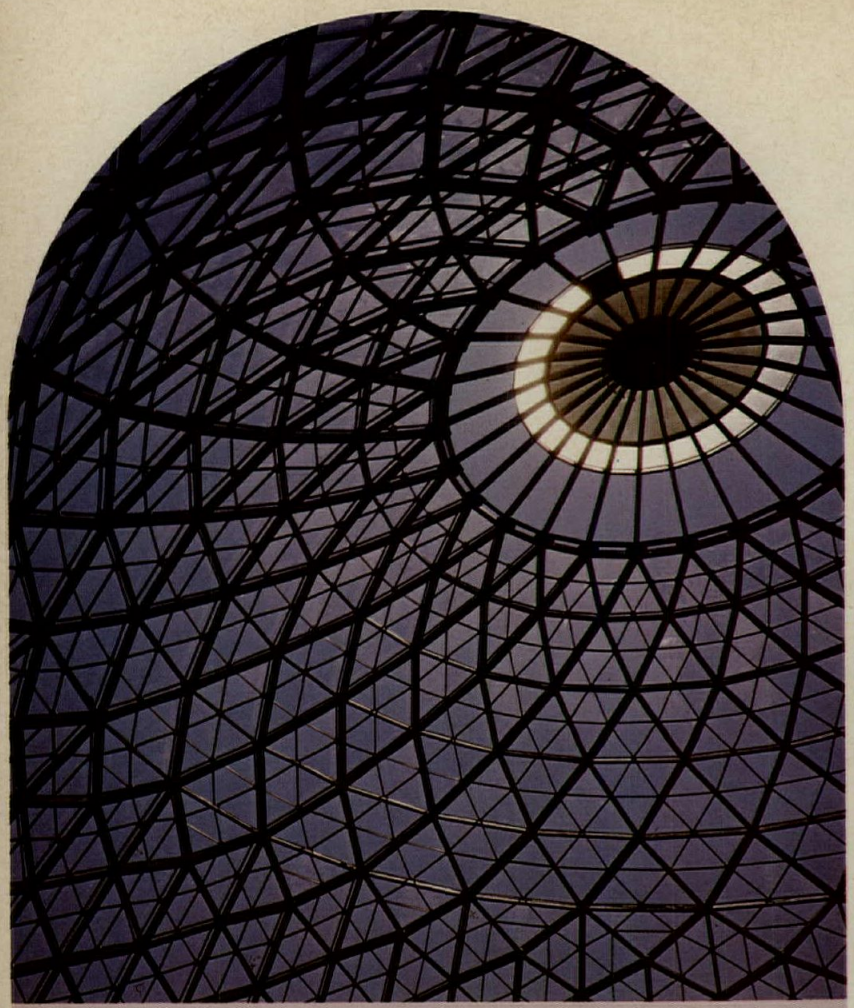
A total of 12 garden apartment developments located in St. Paul, Minnesota, Detroit, and Des Moines were studied. Of the apartments, nine were FHA insured and three were conventionally financed. The developments were from one to five years old and consisted of buildings two or three stories in height. The number of apartment units in each development ranged from 47 to 305. Only single-floor apartments were considered; no townhouse-type apartments were included in the survey.

The manager and a sample of current tenants were interviewed in each development by representatives of the Iowa State University Statistical Laboratory.

Most occupants interviewed in the sample apartments were either single persons or couples without children. The annual income of tenants in the sample apartments ranged from less than $6,000 to more than $16,000; an income between $6,000 and $9,000 was most common. The rental rates for apartments in the sample ranged from $87.50 to $195.00 per month, depending on the development and the size of the apartment. Most apartments sampled had other apartments on one side and above and or below; some had apartments on both side. More than 85 per cent of those interviewed indicated that they were better satisfied with their present apartment than with their previous apartment. The vacancy rate in the developments studied ranged from 0 to 17.5 per cent; the average length of tenancy varied from 11 to 36 months.

This article is published as Journal Paper No J-5828 of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa. Project No. 1161. The research was supported by the Forest Service, U.S. Department of Agriculture and by the Department of Forestry, Iowa Agriculture and Home Economics Experiment Station.





POLISHED MISCO

for clear vision with fire protection

Wherever fire control is part of built-in safety . . . in windows, doorways, walls, skylights . . . wire glass finds growing use in regular specifications. Yet, not all wire glass is listed by Underwriters' Laboratories, Inc. as fire retardant*. Mississippi Glass is one of only two sources for wire glass so listed.

When you design with fire control in mind, specify with confidence in the proved protection of Polished MISCO Wire Glass. It permits full vision and maximum light transmittance. The diamond-shaped netting is inconspicuous, yet protectively visible to alert floor traffic and avert danger from human impact.

*To qualify for this "Fire Retardant" listing, Mississippi Wire Glass had to withstand the furnace test given by Underwriters' Laboratories, Inc., Wire glass windows in a removable wall are placed in a gas-fired furnace. Temperature is raised to 1600° F. in 45 minutes and held at this point for 15 minutes. The wall is then removed and the glass is subjected to a 1⅛" stream from a fire hose at 35 to 40 lbs. of pressure. The glass must remain in the sash, substantially unchanged except for any cracking due to thermal shock. Actual test scenes are shown in our 30 minute film "Rolled Glass by Mississippi."

Underwriters' Laboratories, Inc.
INSPECTED
GLAZING FOR FIRE WINDOWS AND DOORS
ISSUE NO. 101
MISSISSIPPI GLASS CO.
MADE IN U.S.A.

MISSISSIPPI GLASS CO.

FULL-VIEW DOORS

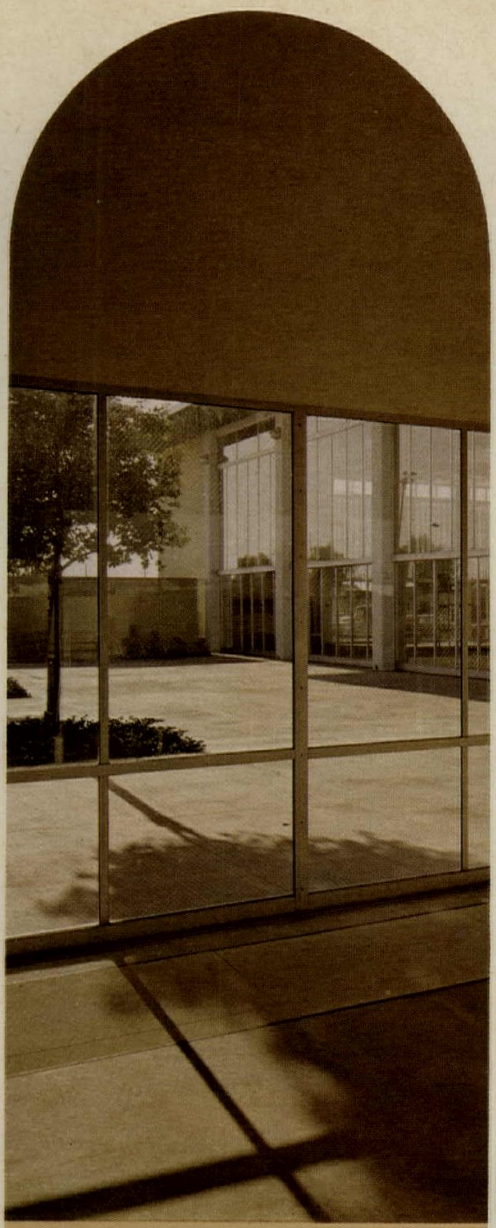
with fire retardant glass

Polished MISCO gives clear vision, so important to safety at busy doorways. It can take abuse and still stand by, ready to fulfill its complete fire retardant function. The way it holds against intense heat seals the doorway against drafts that speed through any openings and spread the smoke and flame. The wire webbing is unobtrusive yet it subtly blends with entrance areas so the glazing adds an interesting design feature as well as a safety function.

ATTRACTIVE WALL SECTIONS

with full-vision range

Give the "open" feel to interiors through walls that make full use of natural light. The smooth surface of Polished MISCO makes attractive wall sections that are easy to keep that way. The diamond-shaped mesh is inconspicuous . . . just visible enough to ward off floor traffic accidents from unawareness of glazed openings. Its basic fire retardant ability checks smoke and flame. The sturdy steel webbing holds glazing fast in its frame under prolonged heat exposure.



PROTECTIVE WINDOWS

that give clear view

Transmit natural daylight through windows that are glazed sentinels against fire, breakage, vandalism, and forced entry. Polished MISCO provides window areas with fire retardant protection, while maintaining clear vision and the sense of spaciousness that comes from greater light transmittance. Mississippi Wire Glass has been looked to by architects and engineers as the approved fire retardant glazing through more than 60 years.

SKYLIGHT GLAZING

dramatic and functional

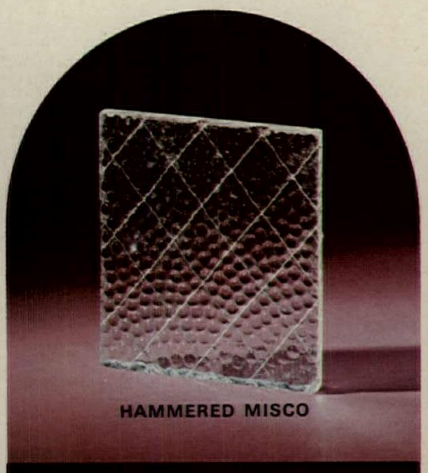
No need for protective screening above and below. MISCO's strong steel diamond-shaped webbing is already fused in where it not only protects against impact from above or below but also prevents shattering that releases ordinary glass for dangerous fall out. Listed "Fire Retardant" by Underwriters' Laboratories, Inc., Polished MISCO holds fast against fire spread under intense heat. Bring more light in from above safely, with fire retardant Polished MISCO.

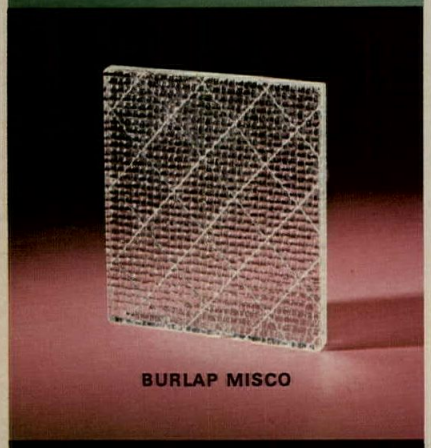
For more data, circle 69 on inquiry card

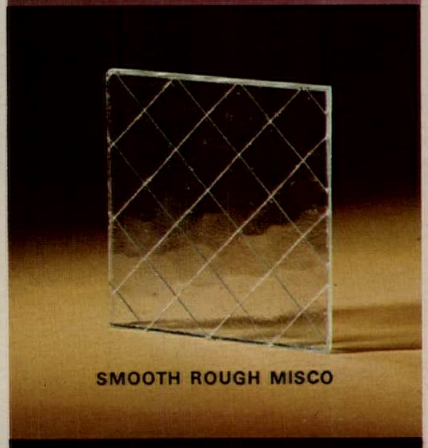
Patterned MISCO

Protection plus diffusion for controlled light direction and obscurity for varying degrees of privacy and heat absorption where required.

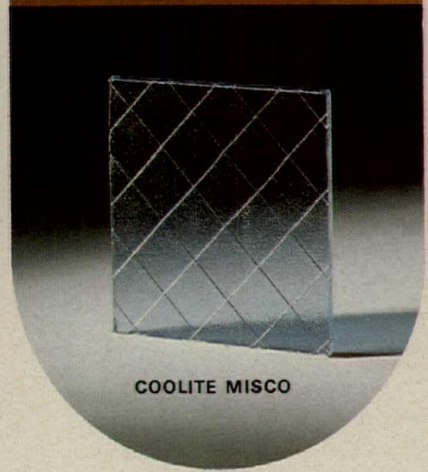

FACTROLITE MISCO


HAMMERED MISCO


BURLAP MISCO


SMOOTH ROUGH MISCO


SYENITE MISCO


COOLITE MISCO

All ¼" MISCO Patterned Wire Glass is listed by Underwriters' Laboratories, Inc.

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INSPECTED
GLAZING FOR
FIRE WINDOWS AND DOORS
ISSUE NO. 101
MISSISSIPPI GLASS CO.
MADE IN U.S.A.

Because of its long history in the manufacture of wire glass that has always met Underwriters' requirements, Mississippi Glass is a natural source for technical information on various requirements in glazing applications. Architects and engineers are urged to consult with our specialists for possibilities in dramatic use of glass and particularly on safety requirements. Mississippi Glass is available from most leading distributors of quality glass in the principal cities of the United States and in Canada from Canadian Pittsburgh Industries, Ltd., Hobbs Glass Division.

See our catalog in Sweet's Ⓢ

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For more data, circle 69 on inquiry card

Fluid polysulphide membrane simplifies deck waterproofing

The plywood and fir roof deck over a residential library was entirely waterproofed by a polysulfide based liquid. The two-part compound is mixed in buckets, poured onto the subdecking, and paddled on in the normal manner for spreading adhesives. The membrane was then covered with tongue-and-groove fir decking treated with creosote and caulked with white polysulfide. The house was designed by architects Micklewright and Montford.

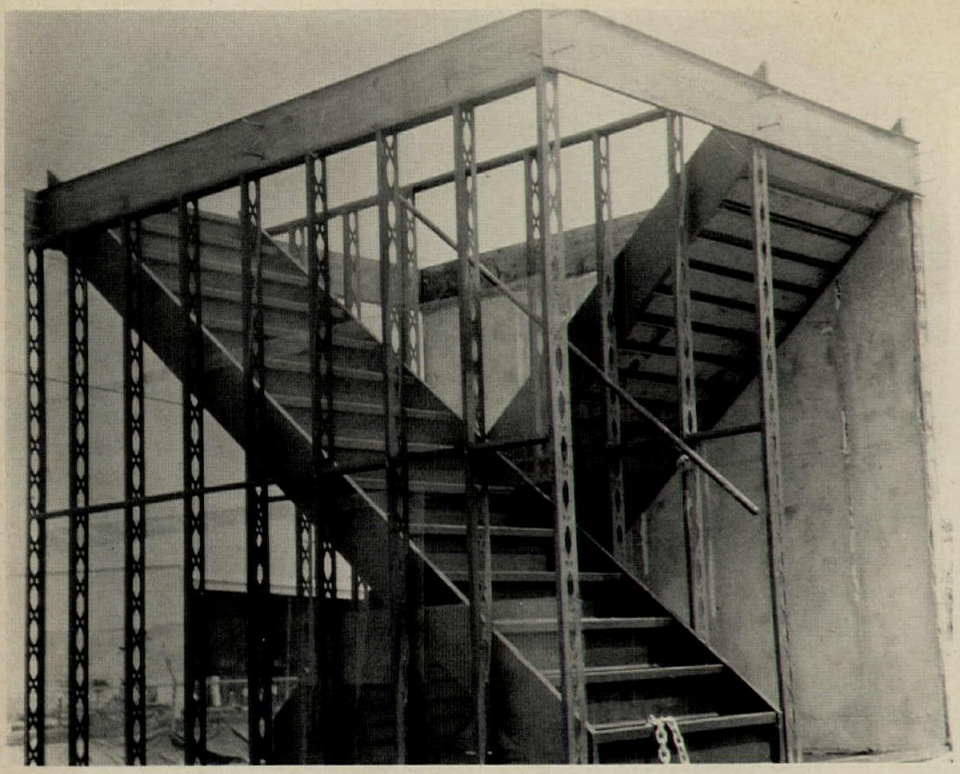
A promising new material developed to simplify fussy deck waterproofing techniques consists of a polysulfide liquid polymer, made by Thiokol Chemical Corporation, and coal tar compound which hardens to a homogeneous, adhesive membrane. Designed to serve in the same areas as traditional three-ply felt built-up membranes and synthetic rubber sheets and films, this new waterproofing can be applied to concrete, wood and a wide variety of surfaces and textures without pretreatment; is reputed to maintain its bond and flexibility under extreme temperatures; and eliminates complicated joining and splicing details, all special flashing, capstrips, tapes and caulking.

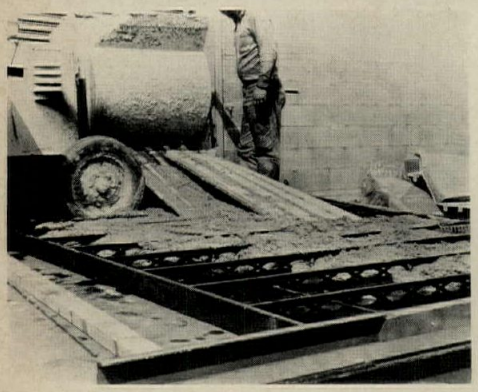
Because it is relatively free flowing, it can bridge construction joints and small cracks during application, self-seals joints between floor and curbs or walls, and can easily be applied around drain and service fittings. The surface need not be pretreated and may even be damp; the material, called Thiodeck, has been applied to damp concrete without losing any of its bonding characteristics. It adheres even to jagged surfaces that would puncture sheet waterproofing. Curing and priming of the concrete or other substrate is unnecessary, and special coating to ensure chemical compatibility is eliminated. The membrane is, moreover, immune to the effects of soil, chemicals, salts and fuels, which often impair conventional garage deck, factory and below-grade waterproofing.

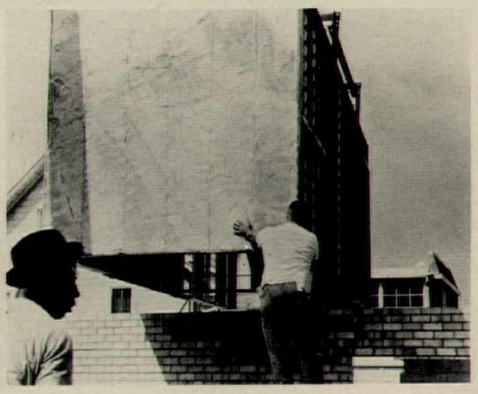
Although it has most often been used on two-course concrete slabs—for parking decks and bridges—Thiodeck is suited to a wide range of uses: below-grade waterproofing for foundations and cavity walls; above-grade for promenade deck systems and other areas exposed to weather and heavy traffic; for conventional terrazzo and quarry tile floors; or for wood roof decks such as on the building pictured to the left.

The compound was formulated and is distributed by Toch Brothers, Inc., of Paterson, New Jersey.

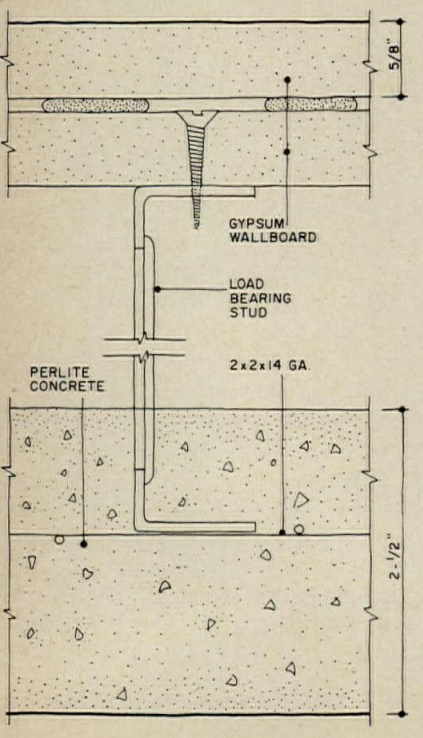
New prefab stair units include structural fire-resistant walls

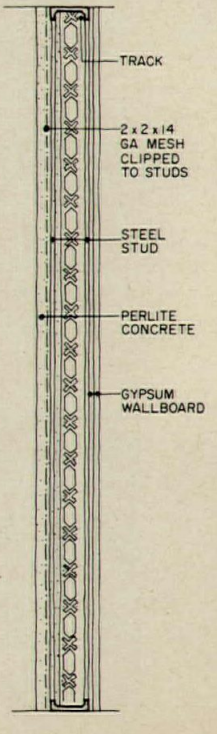






Perlite concrete is poured on ground into welded steel stud partition. Mock-up of the stair unit show structural studs with concrete in place on far wall. The fully enclosed unit is positioned by crane onto second floor of a typical apartment installation. Architect: Edmund W. Dreyfuss.





Prefab steel stairs are by now familiar to architects and for many buildings are favored over concrete or steel for their precision factory fabrication and cheap, speedy erection. Once stacked, however, the structural stair units have generally been enclosed by conventional masonry walls, a time-consuming on-site task.

Now prefabrication extends to the walls as well, employing perlite concrete as the principle fire-resistive medium: the new technique integrates walls, doorways and stairs in neat full-story loadbearing packages, fire-resistant and prefinished, which can be stacked story upon story as fast as the units can be crane-lifted into place. The cost of the new prewrapped stair system has been shown in actual construction to be 15 to 20 per cent lower than stairs of poured and formed concrete or steel stairs with on-site constructed enclosing walls.

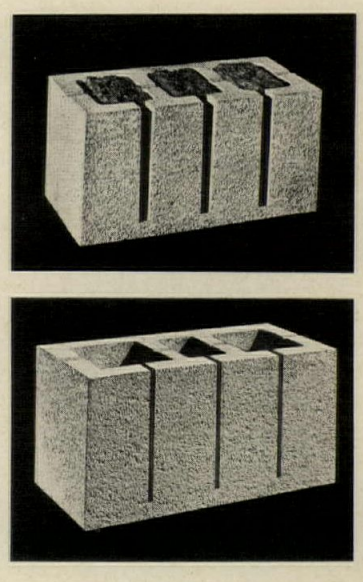
Replacing the structural corner posts of the conventional pre-erected stair unit is a cage of light-gage steel studs, which provide at once reinforcement for a lightweight expanded perlite wall and, on the opposite face, attachment for gypsum wall boards. A perlite concrete wall was chosen instead of lath and plaster wall, which could not have withstood transportation to the site. The wall section of a typical installation, such as in the walk-up apartment buildings pictured at left, includes 3⅝-in. light-gage steel studs and 2½-in. expanded perlite. The exposed wall surface, which can vary in treatment, is in this case marble aggregate. On the apartment wall side is a double layer of gypsum wallboard. The construction time for each of the four-story stair units was 50 man-hours. Comparable labor for cinder-block, face brick enclosed stairs was estimated at 500 man-hours.

The lightweight perlite concrete is poured into welded steel stud partitions, which are then erected to support and enclose steel stairs transported to the site. The unit is hoisted by crane into position where gypsum wallboard and stairlanding elements are attached. Pouring of the concrete can be done either at the factory or on-site.

The technique was jointly developed by Earl Mulitz of Potomac Iron Works, Inc., Dell Ewing of Inland Steel and James O'Brien of the Atlantic Perlite Co.

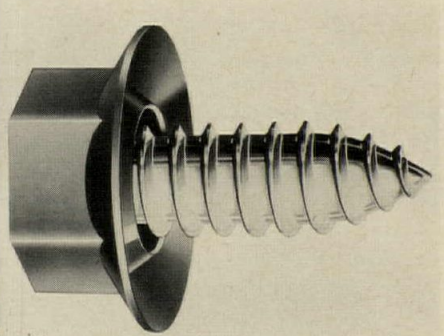
Architect of the walk-up apartment buildings, located near Washington, D.C., was Edmund W. Dreyfuss. The Mercury Construction Co. was contractor.

For more information circle selected item numbers on Reader Service Inquiry Card, pages 235-236



ACOUSTICAL BLOCKS / *Type AA* and *Type BB Soundblox* are 8 in. by 8 in. by 16 in. sound-absorbing masonry units with three cavities that are closed at the top and have three slots on the exposed face. The slots enable the cavities to act as damped resonators. *Type AA* has narrow slots and unfilled cavities. The cavities of the wider-slotted *BB* blocks contain incombustible fibrous filler elements. *Type AA* units offer a relatively smooth sound absorption curve with highest values below 500 cps. They are suggested for covering large wall areas without overtreatment of the high frequencies. *Type BB* units cover the range of 125 to 4,000 cps. ▪ The Proudfoot Company, Inc., Greenwich, Conn.

Circle 300 on inquiry card



NYLON-HEAD SHEETING SCREWS / Exceptional weatherability and color matching are major advantages of screws available in 11 basic colors. The nylon head is permanently joined to a hardened steel shank by injection molding. Special design of the shank is reported to prevent any turning of the head on the shank under torque forces. A tapered outer edge of the head and an inner ring molded on the recessed underside or face provide a double seal against moisture and other corrosive agents. ▪ Atlas Bolt & Screw Co., Cleveland.

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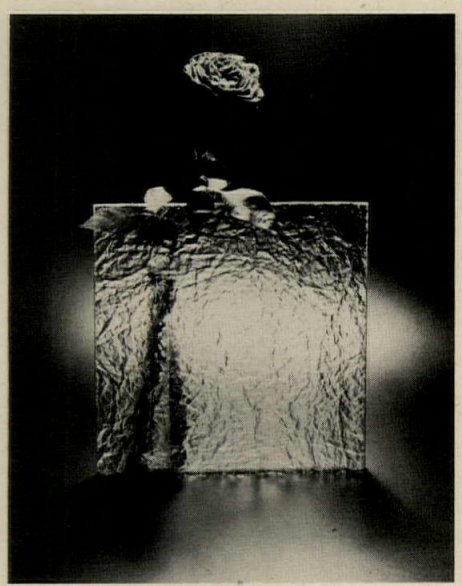

FIBERGLASS-REINFORCED PLASTIC / *Krinklglas* is transparent, translucent, or opaque and the color is permanent. It is virtually unbreakable; can be cut, drilled and worked by conventional carpentry tools. It can be factory-shaped or formed to any requirements, is rigid or flexible, and can be fire-retardent. *Krinklglas* offers many colors, can have an inlay pattern, picture or surface ornamentation or design, and it has a multi-faceted texture that draws and refracts the light in a three-dimensional effect. Suggested applications include entranceways, double-panelled curtain-walls, window treatments, church windows, partitions and room dividers. It has been used for desk and table tops, cabinets, and lamps. ▪ Dimensional Plastics Corporation, Hialeah, Fla.

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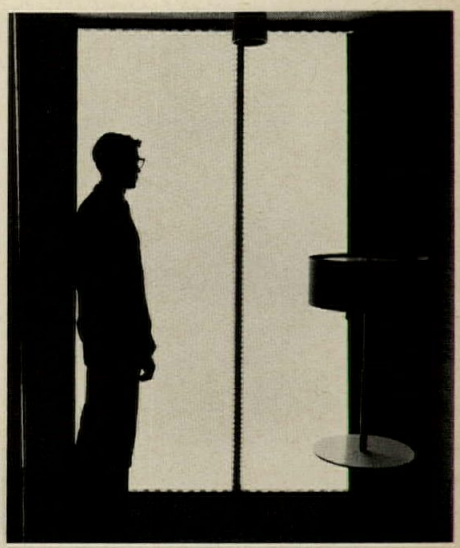
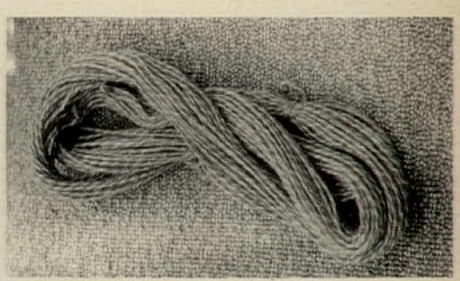


WALL PANELS / Translucent fiberglass-reinforced plastic wall panels at the Motel Utica (N.Y.) were fabricated from acrylic sheet and glass-reinforced polyester-resin encapsulated kraft paper honeycomb. Panel translucency allows light to enter rooms without sacrificing privacy in an area close to street traffic. For four years these panels have shown good insulating properties and have required little maintenance. ▪ Pittsburgh Plate Glass Company, Pittsburgh.

Circle 303 on inquiry card



SHOCK-FREE WOOL / A pile yarn of pure wool blended with a minute amount of *Brunsmet* (developed by Brunswick Corporation) stainless steel fiber makes carpet free of static sparks permanently. *Brunsmet,* drawn to a thinness of 8-microns, eliminates the static buildup by dissipating the charge evenly through the carpeting. ▪ Wool Bureau, New York City.

Circle 304 on inquiry card

more products on page 168

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 235-236

ALUMINUM / *Duranodic 300* is the subject of a 20-page, two-color booklet that describes the super-hard finishing technique in terms of its application in exterior architectural exposures. The finish is said to impart a tough aluminum oxide surface which is integral with the metal. The finishes contain no dyes or pigments; the colors are imparted by the alloy itself. Included in the booklet are seven color chips indicative of the range of hues—from light bronze to black—available on sheet or extruded sections. The booklet lists such recent applications as John Hancock Center, Chicago; Convention Hall, Cleveland; and Gateway Towers, Pittsburgh. ▪ Aluminum Company of America, Pittsburgh.*

Circle 400 on inquiry card

HOSPITAL INTERIORS / "Hospital Planning Guide Book" is an 8-page brochure that is meant to help "plan attractive, practical, and easy-to-maintain hospital interiors." Highlighted in the brochure are the special hygienic qualities of *Vicrtex* vinyl wallcoverings, which provide protection from bacteria. The book pictures examples of the more than 60 styles and hundreds of colors and combinations available ▪ L. E. Carpenter and Company, Inc., New York City.*

Circle 401 on inquiry card

HAND-CARVED DOORS / Wood doors designed for residences, restaurants or offices are featured in a 6-page brochure. The carved designs appliqued on 3 ft by 6 ft 8 in. solid core stock are for both interior and exterior use. ▪ Maderas de Santa Barbara, Santa Barbara, Calif.

Circle 402 on inquiry card

METAL BAR GRATING / A 24-page illustrated manual, which has been under development for several years by a committee that included representatives of the major producers of steel and aluminum gratings, reflects practices recommended by leading manufacturers. The "Metal Bar Grating Manual" is an up-to-date, authoritative technical reference. ▪ National Association of Architectural Metal Manufacturers, Chicago.

Circle 403 on inquiry card

SPEAKER SYSTEMS / Brochure describes systems for theaters, night clubs, auditoriums, arenas, stadiums, and churches. Components of the systems are illustrated. ▪ Altec Lansing, Anaheim, Calif.*

Circle 404 on inquiry card

HEATING-COOLING-VENTILATING / Bulletin explains graphically how Adapt-Aire roof-top units manufactured for school applications flexibly meet requirements regardless of architect's or engineer's design. ▪ Mammoth Industries, Inc., Minneapolis.

Circle 405 on inquiry card

CHURCH INTERIORS / "The Liturgical Elements of the Church Interior" is a 16-page folder telling how to comply with requirements enunciated by the Vatican in documents from Vatican Council II. ▪ Rambusch Company, New York City.*

Circle 406 on inquiry card

SINKS / A 47-page catalog presents stainless-steel units for residential, commercial, industrial and institutional installation. Featured are one-, two-, and three-compartment models, as well as matching trim, faucets and fittings. ▪ Elkay Manufacturing Company, Broadview, Ill.*

Circle 407 on inquiry card

**Additional product information in Sweet's Architectural File*

For more data, circle 70 on inquiry card

more literature on page 202

Bright idea

Wash fixtures that serve many and save money! Bradley Washfountains save an average of 25% on floor and wall space. You can choose from 54″ and 36″ diameter circular and semi-circular models, plus two-person Duos. So you can specify Washfountains that get maximum use out of every square inch of available space.

What's more, Washfountains serve up to 8 people with one set of plumbing connections, cutting installation costs as much as 80%. They require practically no maintenance. And they reduce water consumption from 45% to a whopping 80%.

Specify Washfountains for plants, commercial buildings, schools, institutions—wherever you want to handle large groups of people economically. The more Washfountains serve, the more they save. See your Bradley representative. And write for literature. Bradley Washfountain Co., 9109 Fountain Boulevard, Menomonee Falls, Wisconsin 53051.

from Bradley!

BRADLEY

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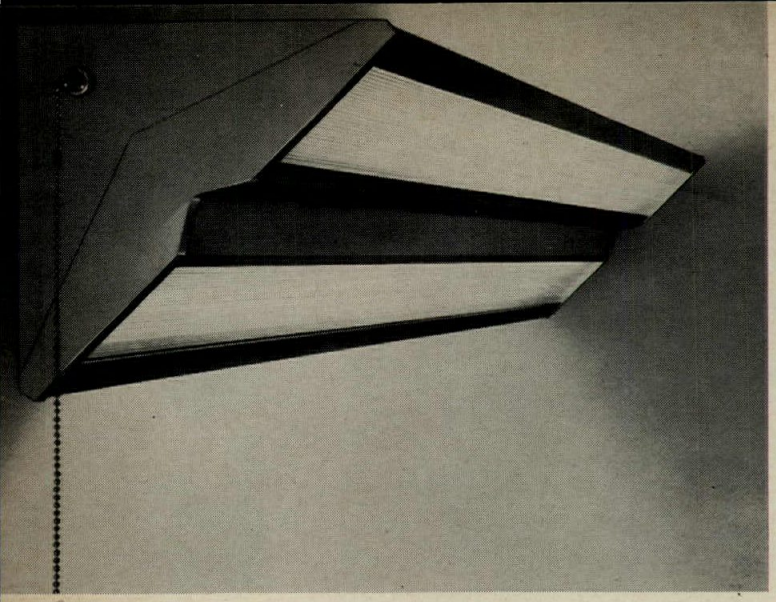
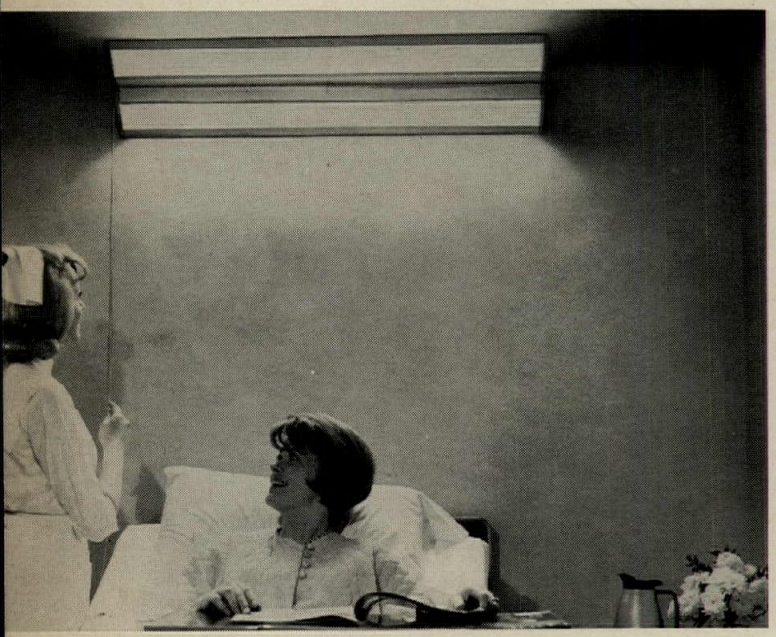
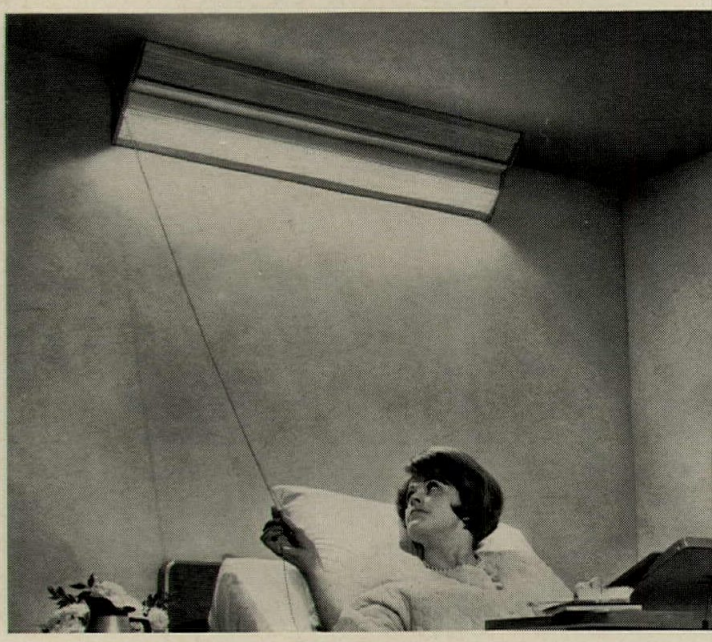






Who likes what in a hospital bed luminaire?

PATIENTS like the bottom light. Here's a soft fluorescent reading light for the patient's use. And this is one light that meets the IES-recommended hospital specification: 30 footcandles at the normal reading position in a patient's bed. Patient comfort means a lot, too. Mounted up by ceiling, any heat from this fixture is kept well above the patient's head.

NURSES AND DOCTORS like the top light. The top light functions as a routine examination light that can be controlled from a wall switch or a pull chain. LPI's new Serenity luminaire installs at the junction of the wall and ceiling. This puts it up and out of the way of patients, doctors, nurses and hospital personnel. Frees the wall behind the patient for things like a nurse call system or a traction apparatus.

ADMINISTRATORS like both lights. And why not? LPI's Serenity luminaire covers all of the concerns of the administrator. Like preventing objectionable spill light at adjacent beds with directional acrylic lenses. Or having the fixture up by the ceiling so that patients can't pull it down while trying to pull themselves up. And there's no housekeeping because there's no wall-projecting surface to catch dust. Administrators can also rest assured that maintenance men will hardly be aware of Serenity's existence, except for an easy relamping. And of course it's UL listed.

ARCHITECTS like its lighting efficiency, crisp design. With Serenity's three sharply controlled light patterns, an architect can put light where he wants it. And the clean, crisp lines of LPI's luminaire fit right in with good architectural design for new construction or for remodeling. Virtually the entire visible area of this fixture, excluding lenses, is anodized, extruded aluminum. And this can make the difference that counts with an architect. (Of course, many architects have become familiar over the years with LPI's tradition of quality fluorescent luminaires.)

Want to know more about the new Serenity fluorescent luminaire for hospital beds? Then contact an LPI representative, or write directly to us.

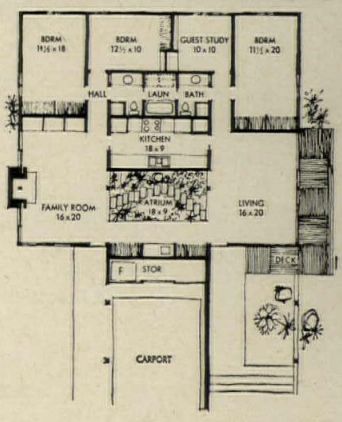
Answers that count with the people who count.

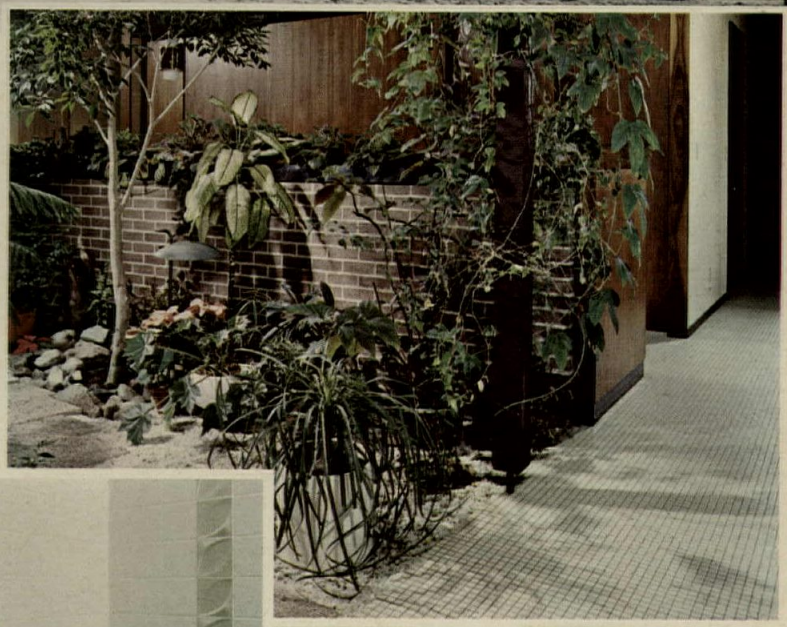
LPI FLUORESCENT LIGHTING

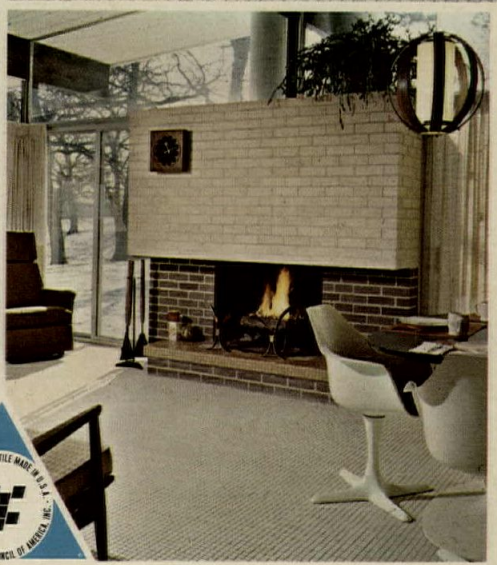
Lighting Products Inc., Highland Park, Illinois 60035

For more data, circle 72 on inquiry card

Moving nature indoors is easy... with trees, plants and ceramic tile.







The pleasures of an indoor garden are obvious. But, an atrium is often gained at the expense of convenience, or given a self-defeating "fish bowl" treatment.

Architect Ray Heuholt, A.I.A., solved this dilemma by combining living things and a natural material — ceramic tile — in this Des Moines, Iowa home. A ceramic mosaic floor surrounds the atrium and covers the family room, entranceway, kitchen, bath and halls. The atrium can be maintained simply, without worrying about water, soil, spilled gravel or falling leaves.

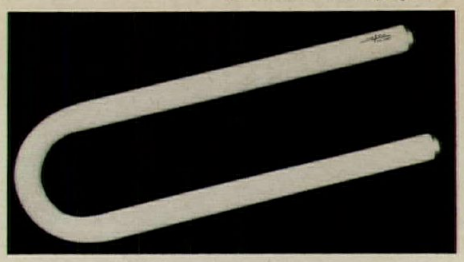
Ceramic wall tile and decorator tile are also used in the house for which Des Moines Marble & Mantle Co. served as tile contractor.

The colors, shapes, sizes, textures and patterns of American ceramic tile are endless. The seal at right on every carton of Certified Quality Tile is your assurance of tile that is regularly tested by an independent laboratory to meet the most rigid government specifications. For information write: Tile Council of America Inc., 800 Second Ave., New York, N.Y. 10017.

MEMBER COMPANIES: American Olean Tile Co., Inc. • Cambridge Tile Manufacturing Co. • Continental Ceramic Corporation • Florida Tile Industries, Inc. • Gulf States Ceramic Tile Co. • Keystone Ridgeway Company, Inc. • Lone Star Ceramics Co. • Ludowici-Celadon Company Marshall Tiles, Inc. • Mid-State Tile Company • Monarch Tile Manufacturing Inc. • Pomona Tile Manufacturing Co. • Sparta Ceramic Company • Summitville Tiles, Inc. • Texeramics Inc. • United States Ceramic Tile Co. • Wenczel Tile Company • Western States Ceramic Corp.

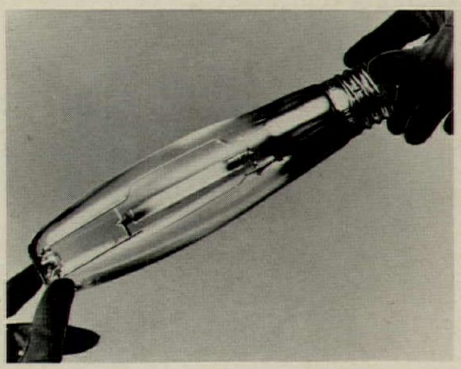
For more data, circle 73 on inquiry card

continued from page 163



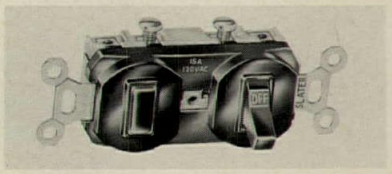
U-SHAPED LAMP / The 2-foot-long fluorescent lamp was developed to "assist architects and designers to obtain a 'square look' in outdoor and indoor lighting. It is said to be equal in light output to conventional straight-line, four-foot fluorescent lamps. ▪ Sylvania Lighting Center, Danvers, Mass.

Circle 305 on inquiry card



HIGH-INTENSITY LAMPS / The 275-watt *Lucalox* lamp is the second size in a growing line of high-intensity sodium discharge lamps. Its efficiency is 100 lumens per watt, only 5 lumens fewer than the 400-watt version. Since it gives a third more light than a 400-watt clear mercury lamp, it offers the benefits of more light and lower costs. It is the same physical size and has the same light-center length as the 400-watt lamp and can be operated effectively in many fixtures designed for the 400-watt size. ▪ General Electric Company, Cleveland, Ohio.

Circle 306 on inquiry card



SWITCH AND PILOT LIGHT / Single pole *AC Quiet Switch* with a light indicator can be wired as a night light or as a pilot light. Other features include oversize silver cadmium oxide contacts, and terminals that accept numbers 10, 12, and 14 wire. ▪ Slater Electric Inc., Glen Cove, New York.

Circle 307 on inquiry card

more products on page 172

The Hartford banks on Mo-Sai®

Hartford National Bank and Trust Company / Hartford, Connecticut / Architects: Welton Becket and Associates and Jeter and Cook / General Contractor: George A. Fuller

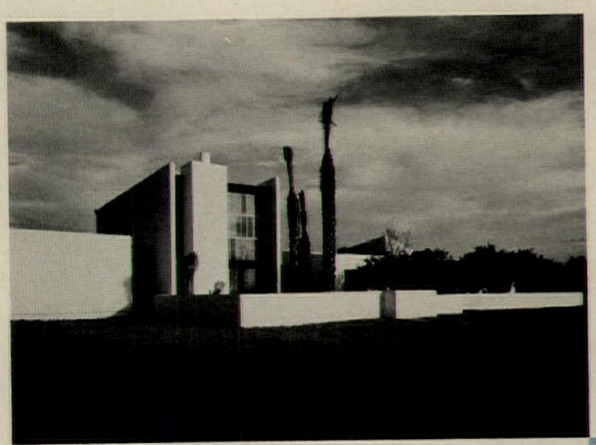
he textured Mo-Sai surface of exposed white quartz that provides the spark-
ng exterior also brightens the offices. Mo-Sai windowalls, two windows wide
nd one story high, form the complete wall unit. • Clip angles cast in the
lo-Sai are bolted to plates in the concrete floor slabs. Tinted glass windows
ounded both top and bottom were zippered with neoprene gaskets into grooves
ast in the Mo-Sai. The deeply sculptured windowalls accent the rounded win-
ows, giving the building its distinctive appearance. • Mo-Sai also covers
he tapered concrete buttresses and coping over the observation patios on the
op floor. Cut-off Mo-Sai mullions and half windows form the patio railing.

Mo-Sai®

PRECAST, PRESTRESSED CONCRETE
WITH EXPOSED AGGREGATE

For more data, circle 75 on inquiry card

1



2

3

FROM RECORD HOUSES OF 1967

1 Island Residence, Long Island Sound, New York. Architect: Ulrich Franzen & Associates. Photo by Robert Damora
2 Gonzales House, Paradise Valley, Arizona. Architect: Bennie M. Gonzales. Photo by Bill Sears
3 Private Residence, Connecticut. Architect: Edward Larrabee Barnes. Photo by Joseph W. Molitor
4 Woo House, Los Angeles. Architect: Young Woo. Photo by Leland Lee

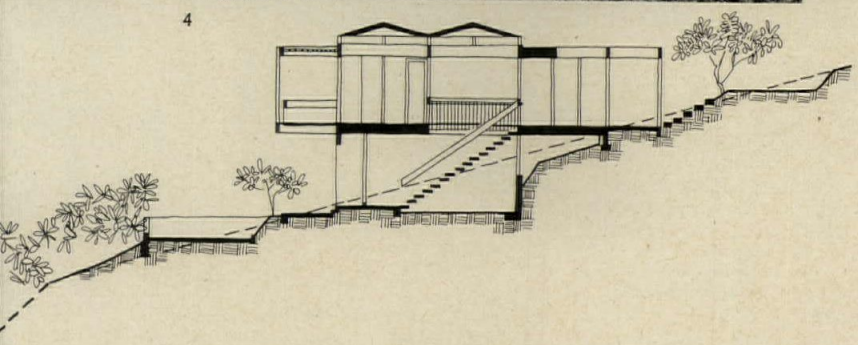
Coming in mid-May...

RECORD HOUSES OF 1968

Featuring...

The 20 Houses of the Year

4



A year in preparation, RECORD HOUSES OF 1968 will present the work of a wide variety of architects ranging from the well-known to talented unknown architects new to the ranks of major innovators. The houses will win for their architects and owners Architectural Record's coveted **Annual Award of Excellence for House Design.** All 20 award-winning houses are fully detailed with photographs (many in full color), plans and schematics. This highly visual presentation of each house, coupled with a clear statement of the problems and purposes behind its planning, will make RECORD HOUSES OF 1968 an ideal tool for opening your client's eyes to ways in which architecture can serve their individual needs, aspirations and way of life.

RECORD HOUSES OF 1968 comes to you as part of your subscription to Architectural Record. And again in 1968, RECORD HOUSES will be distributed to the nation's 23,000 foremost builders to accelerate the healthy trend toward greater architect-builder collaboration on tract housing. The house building and buying public will find it on sale at leading book stores.

ARCHITECTURAL RECORD

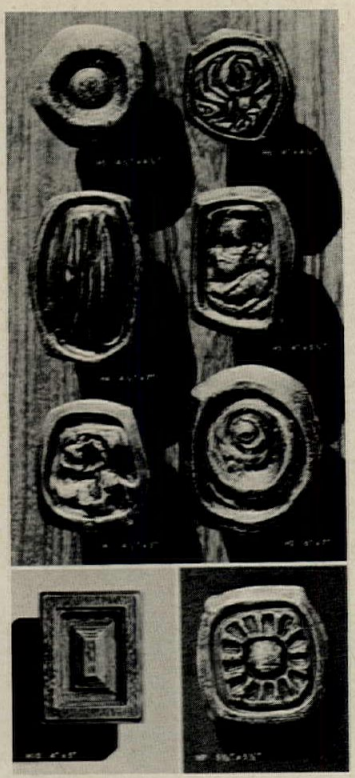
330 WEST 42ND STREET
NEW YORK, N.Y. 10036

A McGRAW-HILL MARKET-DIRECTED PUBLICATION

continued from page 168

COMMERCIAL CARPET / Technique for carpeting boasts the best features of soft- and hard-surface floor coverings. Jute-backed carpet with a tight, durable pile is installed without under-padding and cemented directly to a concrete floor or, in some instances, to previously installed asphalt tile. The carpet is recommended where there is heavy foot, chair, and cart movement, because, while it features warmth, decoration, a high degree of sound absorption, long wear, and easy maintenance, it has a surface firmness that permits easy movement of carts, trucks and chairs without special casters or mats. ▪ Jute Carpet Backing Council, Inc., New York City.

Circle 308 on inquiry card



UNUSUAL DOOR PULLS / Series o handcrafted pulls are original sculpture designs by three artists. One group is cas in aluminum and has an antique patina c black and natural aluminum. Another i cast in brass and has a verde finish. Forms & Surfaces, Santa Barbara, Cali

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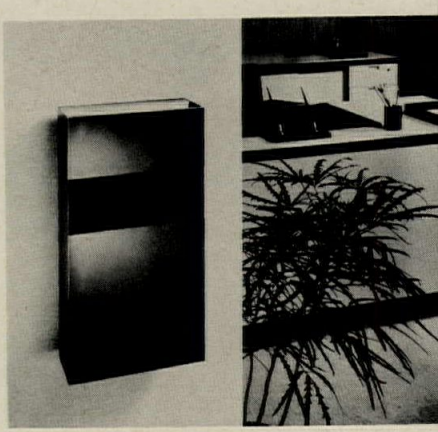

WASTE RECEPTACLES / Two ash receive waste receptacles (vertical and hor zontal) are readily mounted to any su face with adhesive or mechanical faste ers. Available in mirror or satin alum num, golden or statuary bronze, and *T Tone* brass finishes. ▪ Smith Metal Ar Company, Inc., Buffalo, N.Y.

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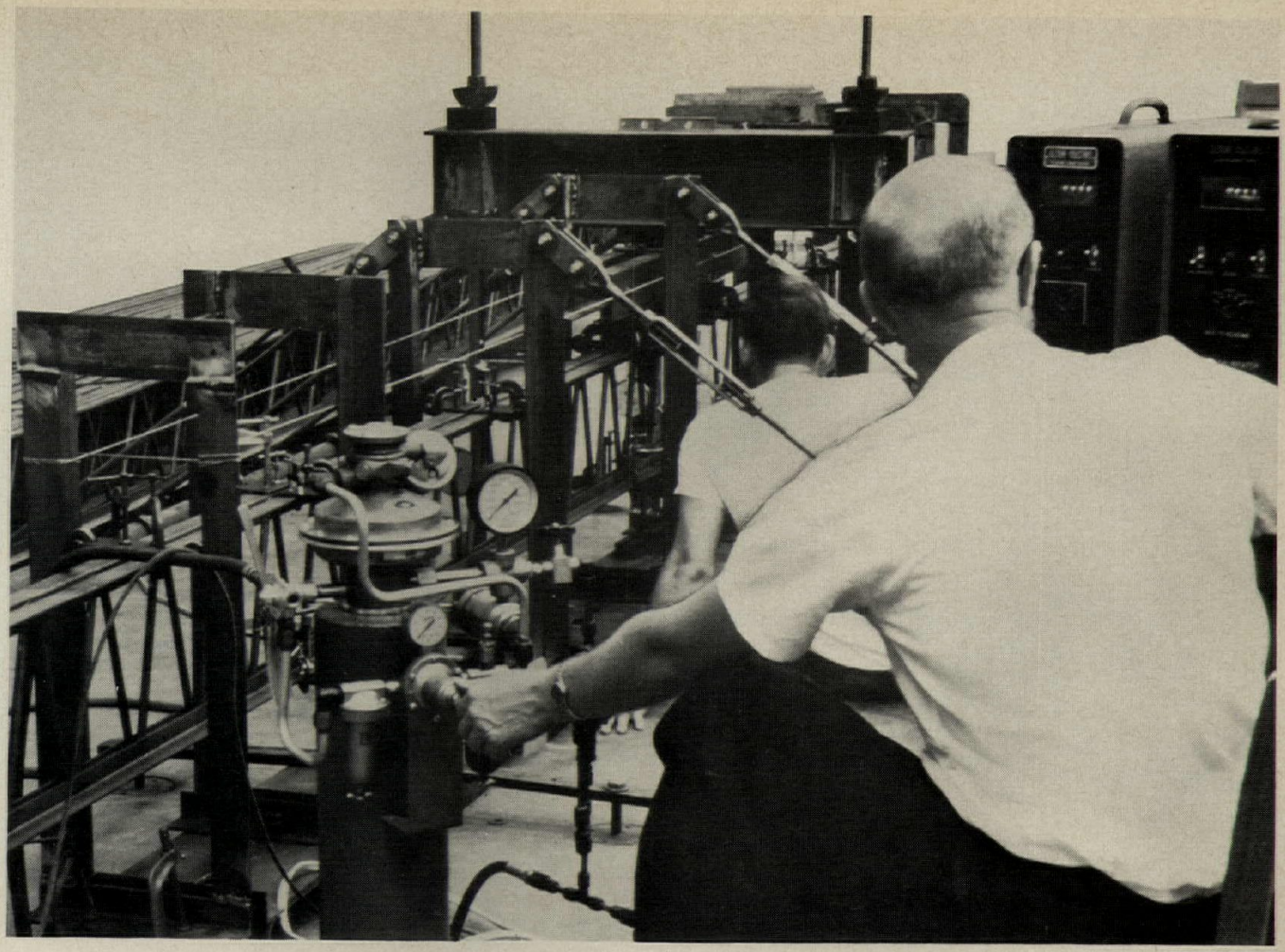
more products on page 1



"Fact Finding Sessions" Investigate Behavior of Open Web Steel Joists

This is the engineering-research laboratory at the University of Kansas. In process is a study on the behavior of the compression chords in variously designed open web steel joists under concentrated and uniform loading.

The Steel Joist Institute sponsors "fact finding sessions" like this in a number of university laboratories throughout the country. New ideas in joist materials and design, such as high-strength steels and the various methods of bridging, are checked out thoroughly before governing design criteria are established for steel joist standards. Manufacturers can also have investigations conducted on their J- and H-Series joist designs to determine conformance with SJI standards and specifications.

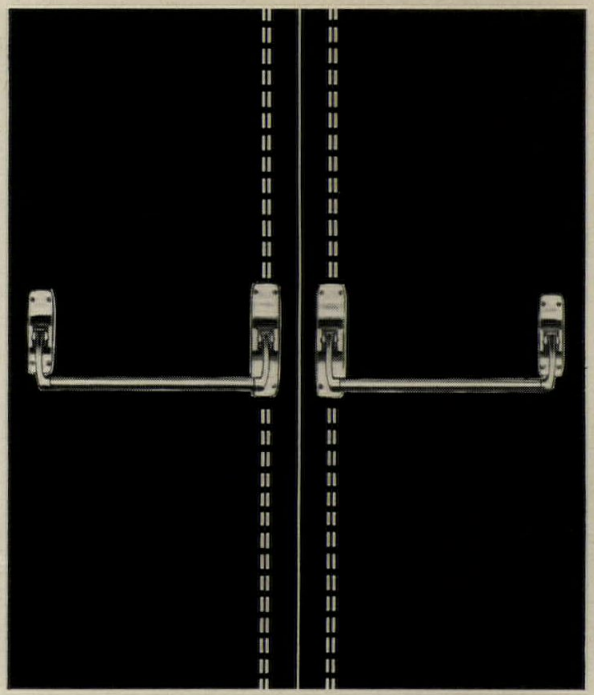
For complete information on open web steel joists and their practical application, write today for the SJI's Specifications and Load Tables. This complete working handbook is yours without charge.

STEEL JOIST INSTITUTE

DuPont Circle Bldg., Washington, D. C. 20036

8711

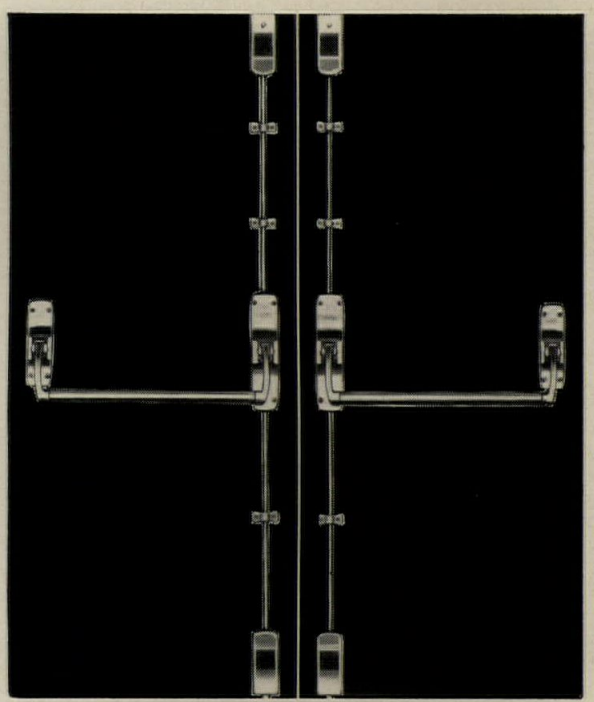
For more data, circle 85 on inquiry card



Concealed Fire Exit Hardware

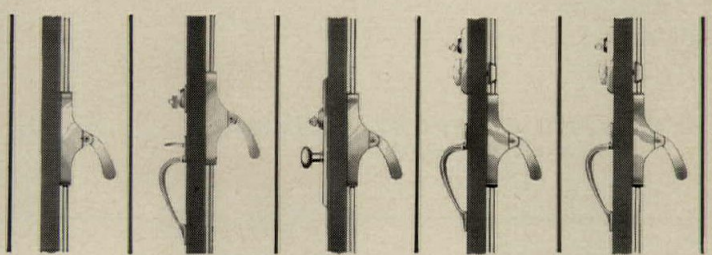
The Von Duprin concealed vertical rod Fire Exit Hardware is now listed by Underwriters' Laboratories for use on B, C, D and E label fire doors in openings up to 8′ by 8′. No astragal . . . no coordinator. Available with exit only function, or with outside (hinge side) lever operation. For complete details on this newly listed application of Fire Exit Hardware, write for Bulletin 676.

No Astragal · No Coordinator · B, C, D, E Label Fire Doors



Surface Mounted Fire Exit Hardware

Another major breakthrough by Von Duprin in Fire Exit Hardware listings at Underwriters' Laboratories! For the first time, you can now use a pair of vertical rod devices on B, C, D and E label fire doors. Without an astragal! Without a coordinator! And in openings up to 8′ by 8′. And you have a choice between surface applied devices, or the concealed devices above. Write for Bulletin 676.



8817 Exit only

8817TP Key locks thumbpiece

8813 Key locks knob

8819TL Thumbturn operates device except when locked by key

8817TL Thumbturn operates device only when key is used

Von Duprin®

the *only* complete line of Fire Exit Hardware

VON DUPRIN, INC. • 400 WEST MARYLAND STREET • INDIANAPOLIS, INDIANA 46225
VON DUPRIN LTD. • 903 SIMARD ST. • CHAMBLY, QUEBEC

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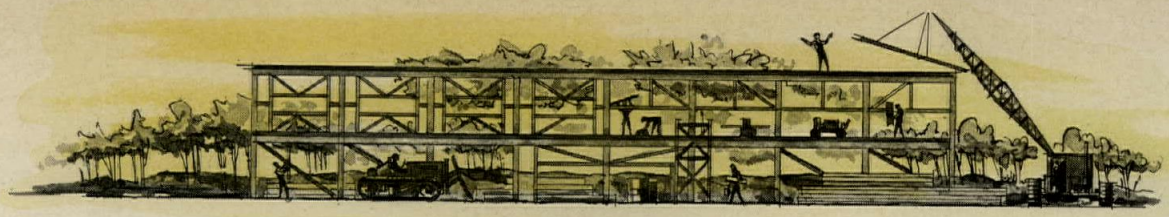
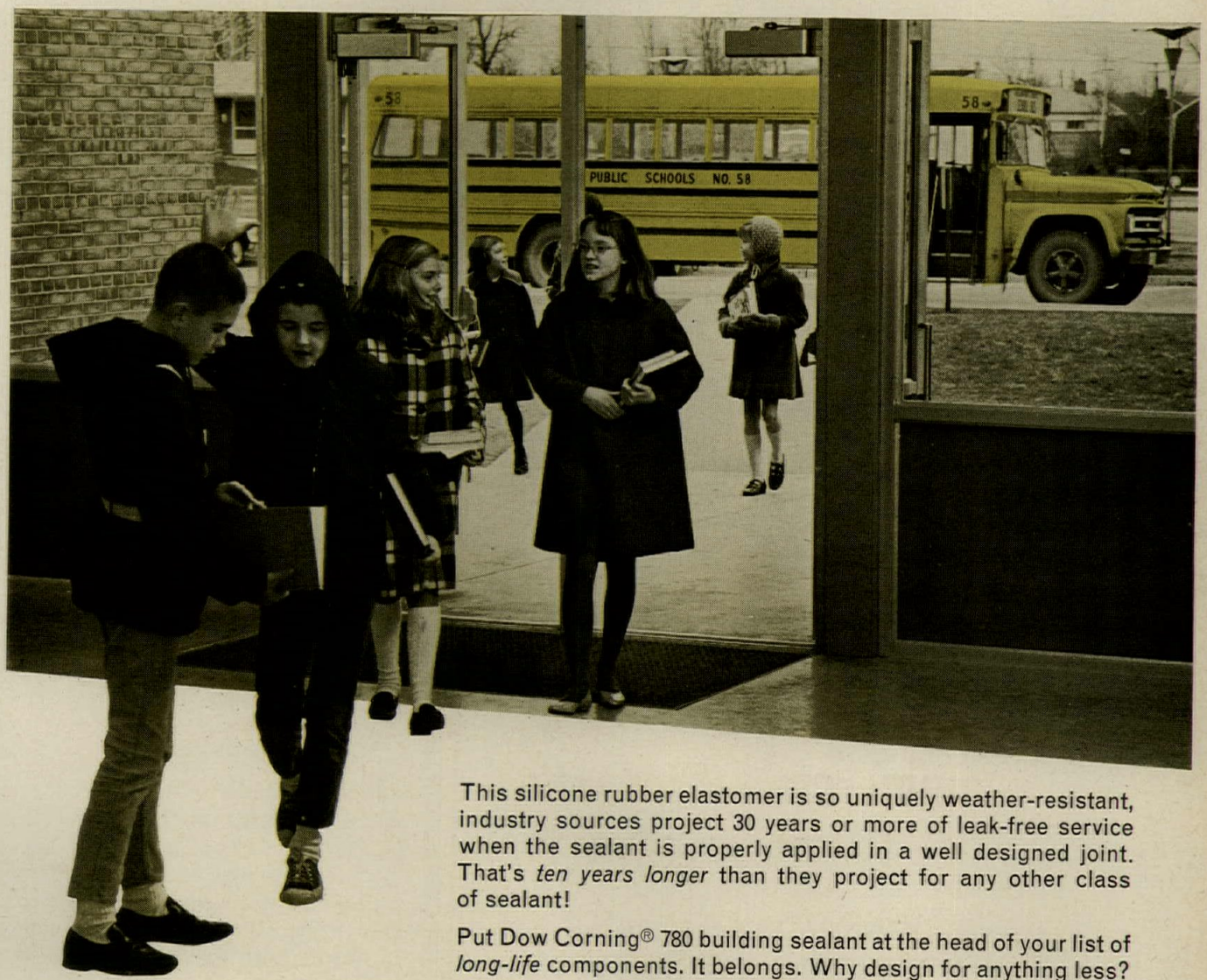


GOING UP

Another SCHOOL sealed with Dow Corning 780 building sealant

COMING UP

30 years of freedom from leaks!



This silicone rubber elastomer is so uniquely weather-resistant, industry sources project 30 years or more of leak-free service when the sealant is properly applied in a well designed joint. That's *ten years longer* than they project for any other class of sealant!

Put Dow Corning® 780 building sealant at the head of your list of *long-life* components. It belongs. Why design for anything less?

See Sweets for Dow Corning 780 building sealant and Terraseal 100® polyurethane sealant for horizontal traffic joints. They're both extra long life. Or drop us a line for FREE DEMONSTRATION SAMPLE and full particulars. Address Dow Corning Corporation, Dept. A 8410, Midland, Michigan 48640. Offer good only in U.S.A.

DOW CORNING DOW CORNING

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continued from page 202

WOOL CARPET / What is described as "the most comprehensive and objective comparison of carpet fibers" has been prepared in the form of a wall chart. The guide defines the performance features of quality carpet for residential and commercial areas and evaluates the major carpet fibers—wool, nylon, acrylic and polypropylene—describing how each meets the performance requirements. ▪ Wool Carpets of America, New York City.

Circle 412 on inquiry card

AIR MOVING STANDARDS / The Air Moving and Conditioning Association has adopted a new standards handbook which sets forth standard terminology and uniform means of specifying air moving devices. The 20-page handbook should be an aid in selecting the proper air-moving device for a particular need. ▪ Air Moving and Conditioning Association, Park Ridge, Ill.

Circle 413 on inquiry card

INSTITUTIONAL FLOOR COVERING / Reference catalog provides specification data on contract carpet. One section lists well-known hotels and motels, restaurants, schools, hospitals, country clubs, banks, office buildings, churches, stores, libraries and government buildings which use this carpeting. Catalog explains why 200 pitch instead of 216 pitch is used. ▪ Oxford Mills, Inc., Ware, Mass.

Circle 414 on inquiry card

MICROFILM SYSTEMS / An 8-page booklet answers typical questions about small document microfilm systems. The booklet describes alternative methods of microfilm storage and the advantages and disadvantages of each. ▪ Microsea Corporation, Skokie, Ill.

Circle 415 on inquiry card

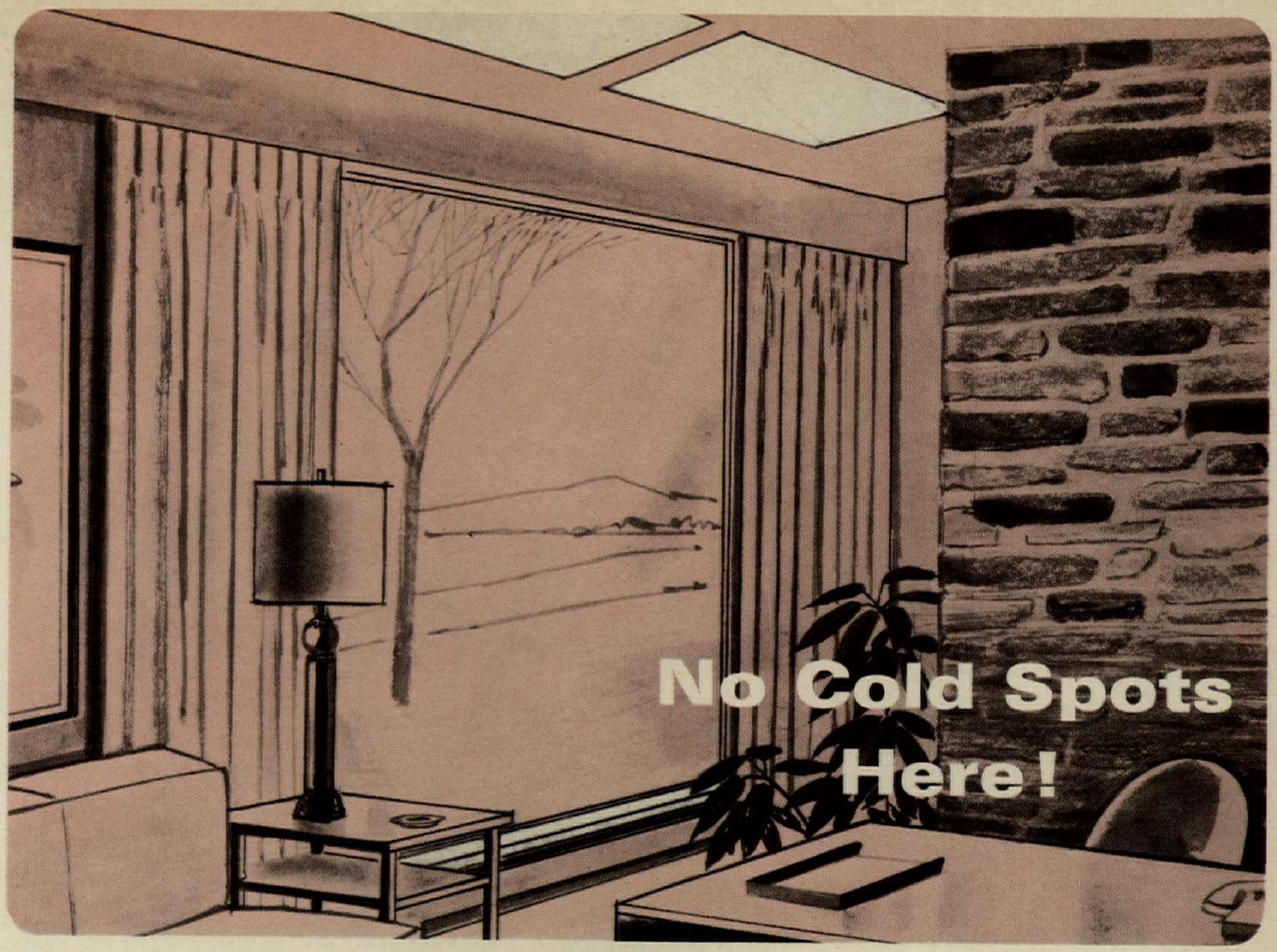
WASTE HEAT RECOVERY / A 16-page bulletin illustrates shell-, tube- and wate tube-type equipment. Bulletin shows some of the types built to meet specifi problems in individual applications. Henry Vogt Machine Co., Louisville, Ky

Circle 416 on inquiry card

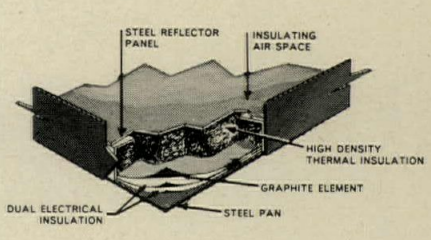
WALLS / A 12-page color booklet show various installations and describes many benefits, including changeability. A back pocket includes a selection guide, and elevation and detail sheets. ▪ Vaughan Walls, Los Angeles, Calif.

Circle 417 on inquiry card

**Additional product information in Sweet's Architectural File*

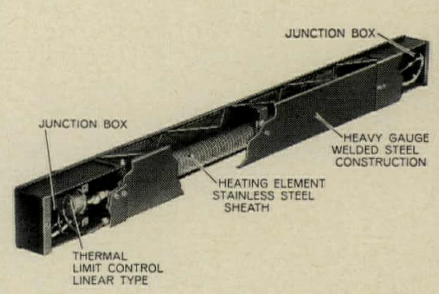


A warm gentle flow of air circulates without drafts . . . prevents cold spots . . . as supplemental or primary heat source. Makes new vistas possible with vast expanses of glass in homes, offices and commercial establishments.



electromode Radiant Heating Panels

Designed to complement any decor and provide comfort as the panels may be located wherever they are most needed . . . directly above the source of heat loss . . . windows, doorways, patio doors, entryways, etc. Locate on wall or ceiling. Each unit is controlled automatically by its own thermostat. Units are silent and attractively styled. These versatile panels may be used virtually anywhere in homes, schools, hospitals, motels, hotels . . . and a broad variety of public, commercial, private and other buildings.



electromode Built-in Draft Barrier Heater

Stops downdrafts from troublesome cold window surfaces before they can cause discomfort. Operates efficiently at low wattage and only as needed. Performs its function economically. Designed for incorporation within enclosures. May be mounted under or within the sill of a window or wall section where space dimensions permit. Thermal limit switch has heat sensing element through its entire length. Available with built-in tamper-proof thermostat for automatic operation. Also available in Surface Mounted models. Write today for full particulars on these new heaters! AR-28

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NEMA 5th Electric Heating & Comfort Conditioning Systems Conference and Exposition
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Visit Our Booths No. 46 and No. 58

SINGER
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or more data, circle 100 on inquiry card

Who first made news with insulating glass?

We're still doing it.

IN 1937, Thermopane® insulating glass was patented and introduced by L·O·F. The first insulating unit of its kind for general use.

It had a nonorganic, metal-to-glass seal.

It still does.

In 1958, L·O·F introduced a new lighter-weight insulating glass developed for use in movable sash. It was Thermopane with a GlasSeal® edge.

Again, no organic sealants were required.

The rounded edges are formed by fusing two panes of glass to produce a hermetically sealed air space.

IN 1967, L·O·F announced still another new kind of Thermopane insulating glass which controls transmission of daylight and sun heat. Economically.

How? By putting Vari-Tran,™ a chrome alloy film, on the air-space surface of the outboard pane.

By *continuous* vacuum-coating process.

It's our revolutionary new *StratoVac* process and it works like this: sheets of glass up to 10' x 12' are air-locked through a series of chambers to reach the vacuum astronauts find 125 miles straight up. Here in "outer space" we vaporize the chrome alloy coating material by electronic bombardment and direct atoms and molecules onto the glass with precision. So we can control the transparency or reflectivity of our glass at will. To block ultraviolet rays. Block infrared rays. To cut glare. To further reduce air-conditioning requirements.

We have so much confidence in our products we offer a 20-year no-leak warranty with each Thermopane unit.

For 20 years from date of manufacture, we guarantee to deliver without charge, to the shipping point nearest the installation, a replacement for any unit which develops material obstructions of vision between the interior glass surfaces. This guarantee does not apply to Thermopane units used in ships, vehicles or commercial refrigeration; to broken units; to units which have not been handled, installed or used in accordance with our instructions; to units used outside the continental United States; or to replacement units beyond the period covering the original unit. We make no other guarantee or warranty, express or implied, respecting this unit.

Only Thermopane offers this guarantee. Look for the name etched on the glass.

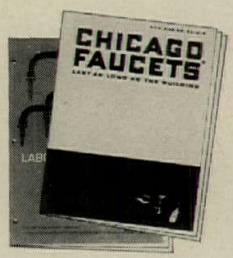
Libbey·Owens·Ford Glass Company
Toledo, Ohio 43624

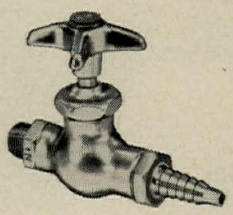
What's the Big Idea in Chicago Faucets?

It's simple really. The faucet body doesn't wear out. The parts that do wear are all in one replaceable unit. And today's unit still fits Chicago Faucets made as much as 50 years ago—completely renews the operating heart almost as easily as you'd change a light bulb.

No other faucet can offer you such assurance of long life expectancy, ease of maintenance, or honest economy. Keep the Chicago Faucet idea in mind for your next job.

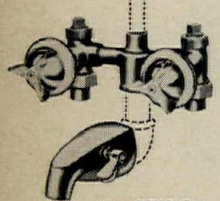
You can get this Big Idea in the biggest selection of faucets available—for residential, commercial, institutional and laboratory use. Write for catalogs.



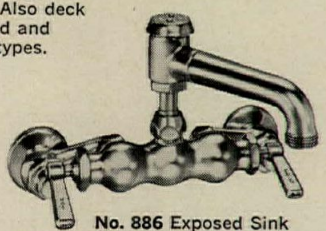


No. 937 Laboratory Table Fitting, Available for water, steam, gas or air service. Also deck mounted and turret types.

No. HC807 Push Button Lavatory Spout allows about 10 seconds flow, then closes automatically. Smart new answer for public or school washrooms.



No. 1749-6 Built-in Tub and Shower Fittings.



No. 886 Exposed Sink Faucet, with integral vacuum breaker. Other types with wall brace, pail hook, integral stops, etc.

PLUMBING BRASS INSTITUTE PBI

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CHICAGO FAUCETS®

LAST AS LONG AS THE BUILDING

THE CHICAGO FAUCET CO., 2100 S. Nuclear Drive, Des Plaines, Ill. 60018

(A Suburb of Chicago)

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*Thank you so much, Merton, Paisley & Brokaus, A.I.A.**

How did you know that a lot of us girls use tampons instead of sanitary napkins? Those of us who do, sure appreciate those nice built-in vending machines that hold *both*.
You can be sure if we ever hear of anyone who needs a good architect, we'll recommend you.

Sincerely,

Mary Sharp

Almost *half* the women who work use tampons rather than sanitary napkins. So next building you build, specify Bobrick's built-in *dual vend* machines for dispensing both Kotex® Napkins and Kotex Tampons. You may not win an award for it, but you'll sure win the hearts of a lot of gals. Send for our free catalogue of vending machines available. Or see Sweet's File No. $\frac{23a}{Ki}$ or Bobrick's File $\frac{25e}{Bo}$.

Kimberly-Clark Corporation
Commercial Department, Neenah, Wisconsin

*The names may be fictitious, but the gratitude isn't.

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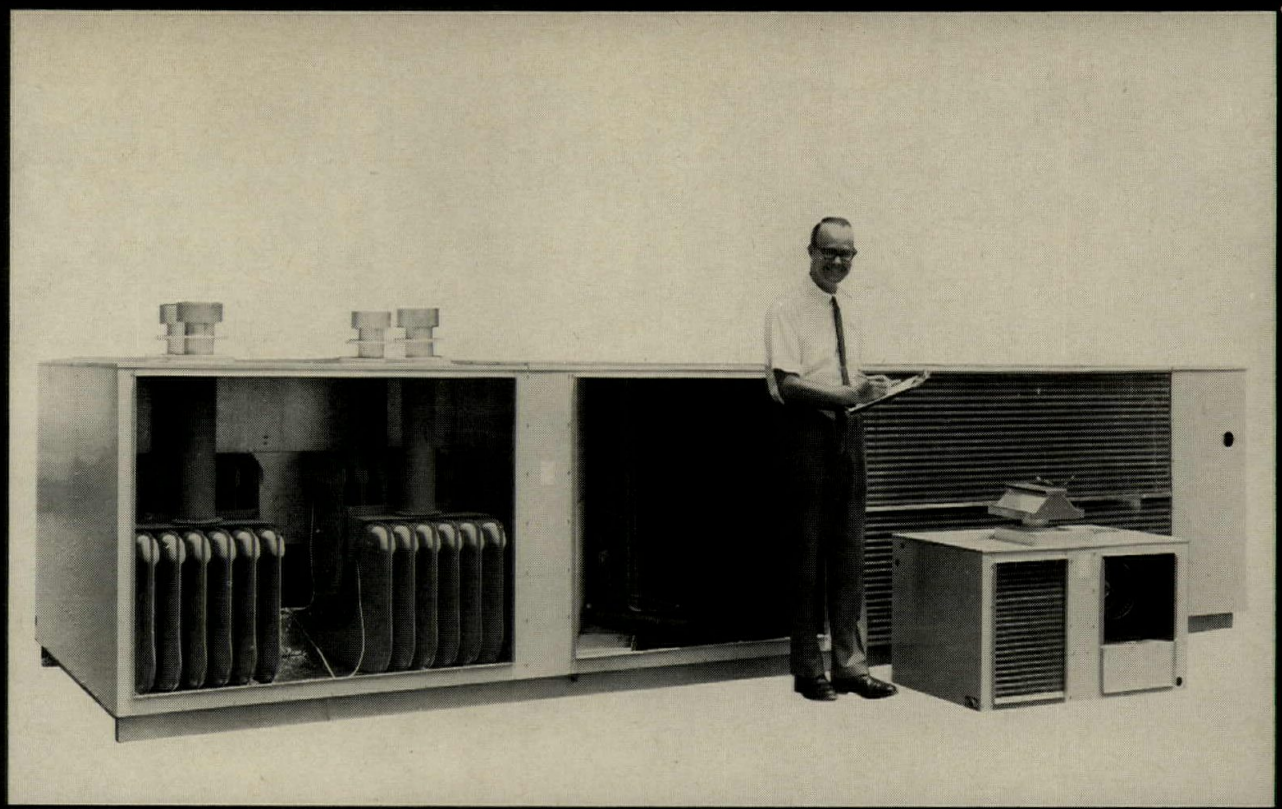
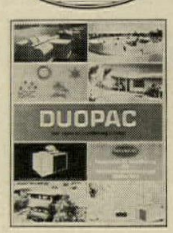


Meet our 30-ton baby.

It's just one of 15 basic models of our Duopac gas heating/electric air conditioning unit. It's neat. Compact. Light. Lies unobtrusively low on ground slab or rooftop. From 1½-ton to the new 30-ton with 2-stage, separate-circuit cooling variations, *Duopac runs quietly.* Under all kinds of climatic conditions. With varying heating/cooling ratios. With 2 high-quality cast iron compressors. And multiple units give zone control, individual operation and easy service. Well over 50,000 Duopacs are delivering these benefits in every state. Mail the coupon, and see how Duopac can fit into your plans perfectly—including a very big boost on final sale.



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AR-1

855 Anaheim-Puente Road
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Send your brochure on the Duopac product line plus complete information on Day & Night heating and air conditioning.

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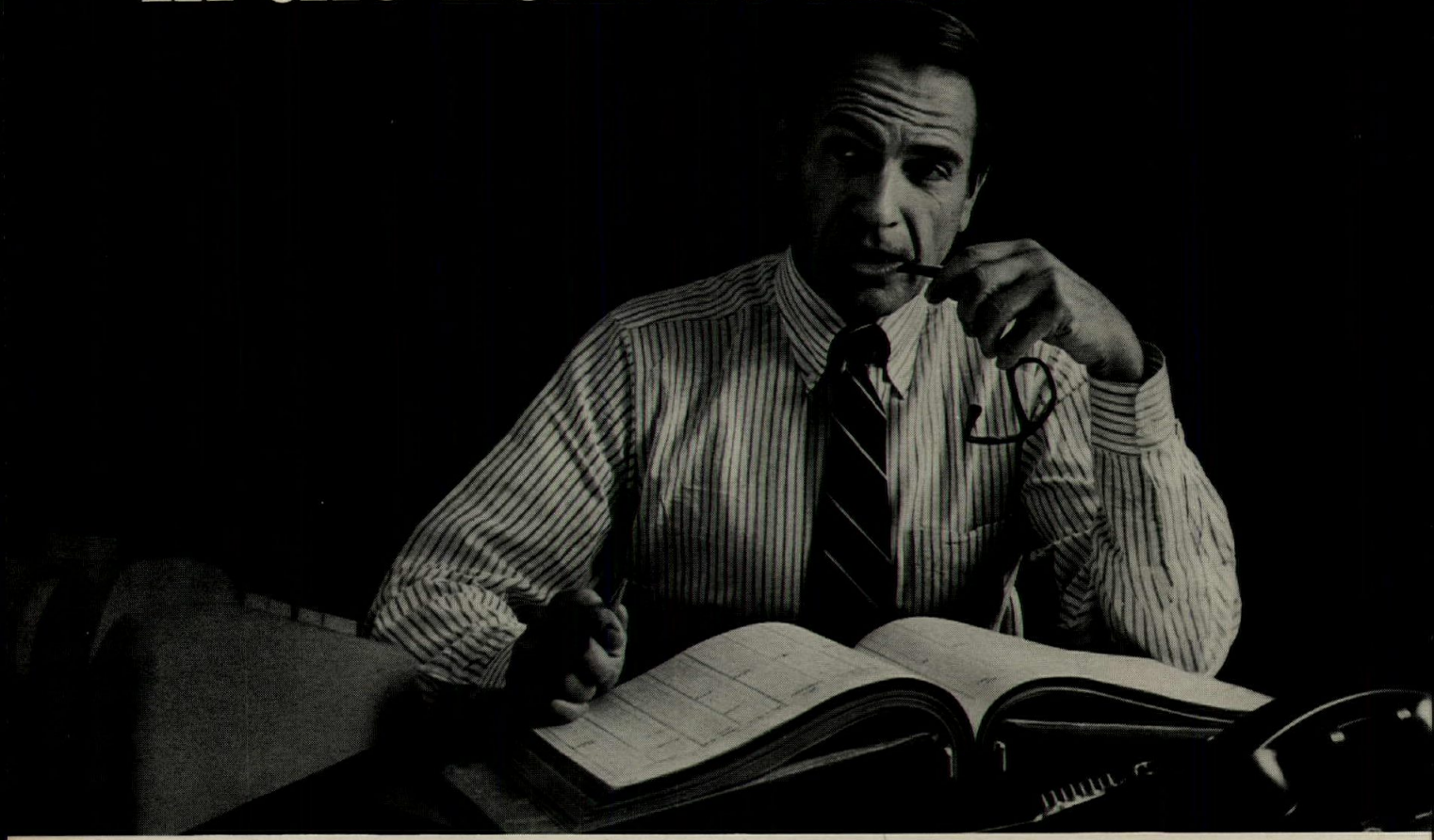
$1183 was spent to soundproof this office and you can hear a cough in the next room!



They forgot an Acoustilead plenum barrier.

Soundproof wall materials, plus expensive acoustical ceiling tiles, were specified to make this a noise-free office. These materials do the job . . . up to a point. That point is the plenum, the space between a partition top and the floor slab above it.

Sound waves flood over the partition virtually unimpeded if there is no acoustical plenum barrier. Ordinary sound barriers in a plenum are usually so full of leaks around ducts and pipes that noise still passes freely.

Gain Maximum Noise Reduction at Minimum Cost. The solution to this annoying problem is Asarco Acoustilead—sheet lead that's only 1/64-inch thick. Drape a curtain of Acoustilead from the floor slab above to the top of the partition and you stop penetration of all normal noise. There are no sound leaks because Acoustilead fits tightly around ducts and wires. It can be cut with scissors, easily bent by hand, and is installed in less time than other acoustical materials.

Acoustilead is the first material available for sound barriers in normal plenum areas, with an installed cost generally below $1.00 per square foot.

Help. Our brochure on Acoustilead shows why and how to install thin sheet lead. Send for it today. Sound Attenuation Department of Asarco.

Federated Metals Division
AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK, N. Y. 10005

ASARCO

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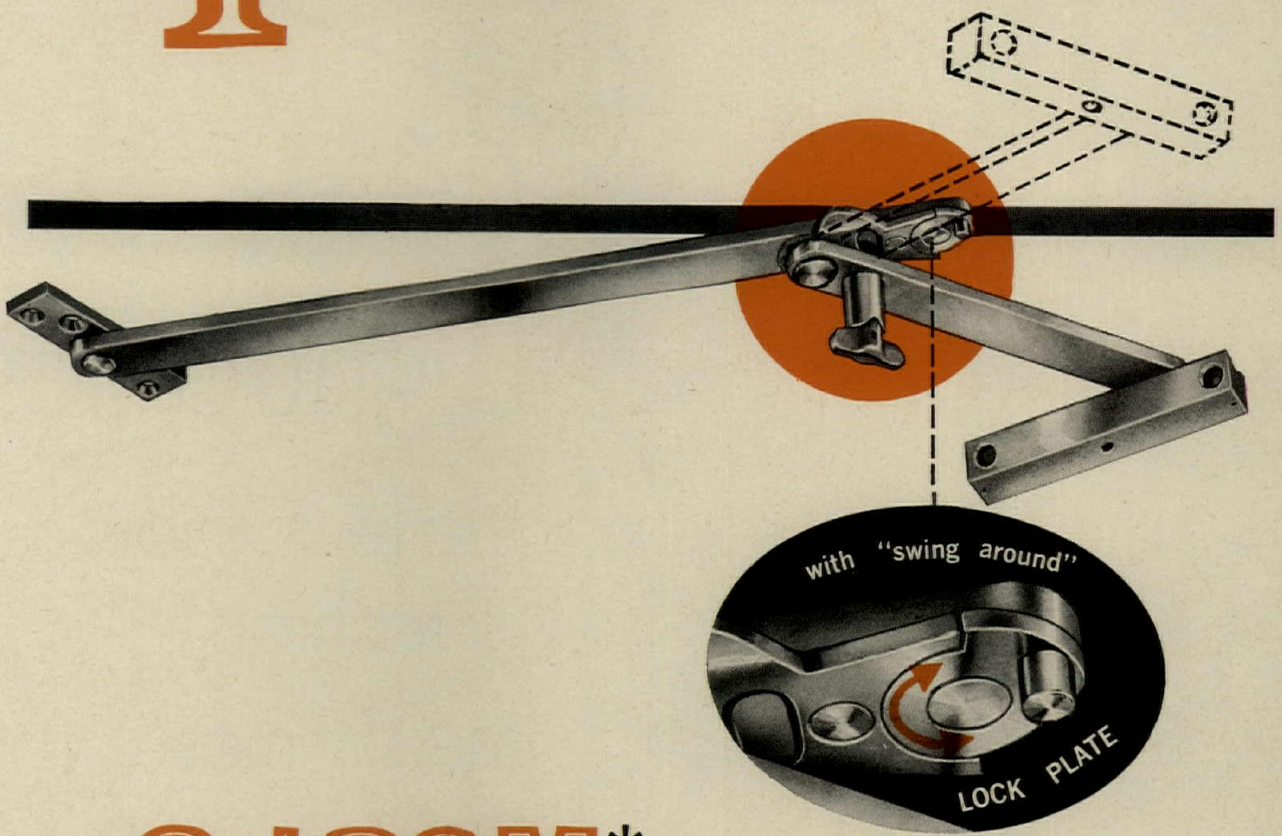
1 DOOR HOLDER suitable for either right or left hand doors



GJ 80M* non-handed
OVERHEAD DOOR HOLDER

for entrance, vestibule and heavy traffic interior doors

***M** as in Modernized

- No need to specify hand of door
- Extended arm reach plus longer spring increases shock absorbing efficiency
- Extruded bronze housing (choice of standard plated finishes)
- On-off hold-open—with safety release

GJ 80M HD *available for heavy duty use on interior and exterior doors*

Send for complete details

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Guth Lightronics®

the lean look of fashion— the slimmest price in town!

The styling is strictly slim, trim and terrific. *The lighting* is all-prismatic . . . with sparkling-clear lenses that really deliver footcandles. *The quality* is solid, inside and out. 20-gauge steel. Acrylic enamel. CBM/ETL ballasts, internally fused. Separable ends furnished. *The price* is strictly on the old-fashioned side of low.

It all adds up to the greatest new specification fixture that's come to light in a long time. Guth Lightronics. Now stocked by leading electrical distributors.

Trusted Name in Lighting since 1902

Guth

THE EDWIN F. GUTH COMPANY • P. O. BOX 7079 • ST. LOUIS, MISSOURI 63177

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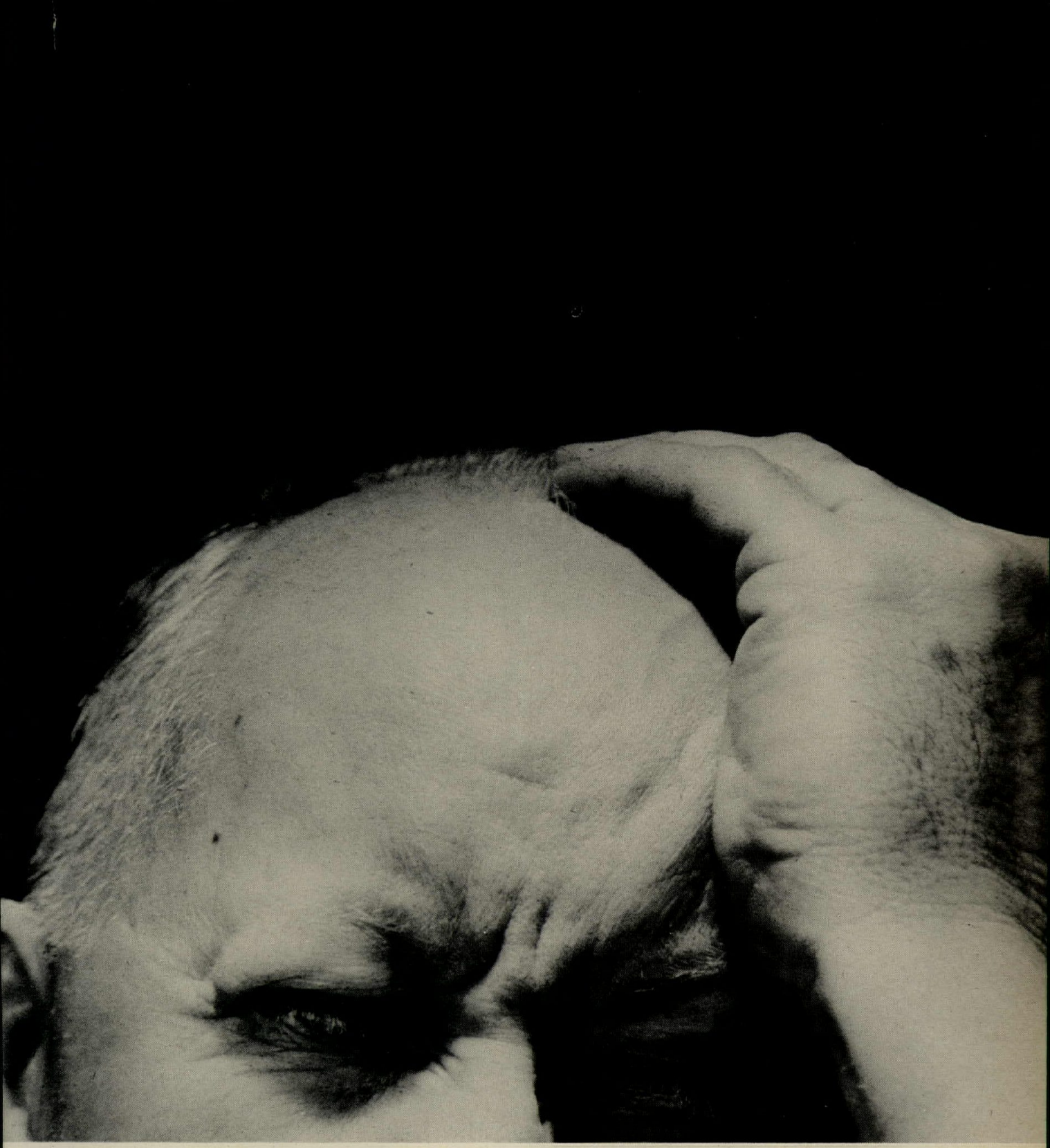

Laundry Quandary?

Mr. Architect, don't sweat it. Call us! American Laundry Machinery Industries. Whether you're planning an army-sized job or something a little smaller, we've got the people (we call them sales engineers, and rightly so—they really know how to set up a laundry). We've got the equipment, the know-how, experience and whatever else you need to set up your client's laundry the only way it should be: the right way. Another thing to keep in mind: American will help you *keep* your client's laundry in good working order. Parts, service and field engineering service for the life of the equipment is available anytime . . . anywhere in the country. So, if you're in a quandary about a laundry, whether planning a new one, or remodeling an older plant . . . call your local American office or drop us a line.
American Laundry Machinery Industries. 5050 Section Avenue, Cincinnati, Ohio 45212.

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American Laundry Machinery Industries
Division of McGraw Edison Company
5050 Section Avenue, Cincinnati, Ohio 45212

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Big heating problems

National-U.S. Gas Boilers are lower, narrower and lighter. Designed to solve any large heating problem. From a six-flat to high-rise apartments.

A full range of boilers give greater flexibility to the specifier. Reduce installation time and labor—and minimize maintenance.

The boilers are smaller for all 33 sizes. Yet, the new, smaller boilers are more rugged with water working pressure up to 80 psi. The smaller boiler sections can be easily handled by two men and hydraulic jacks reducing installation time.

Over a dozen design features make the new boilers easier and more efficient to specify or install.

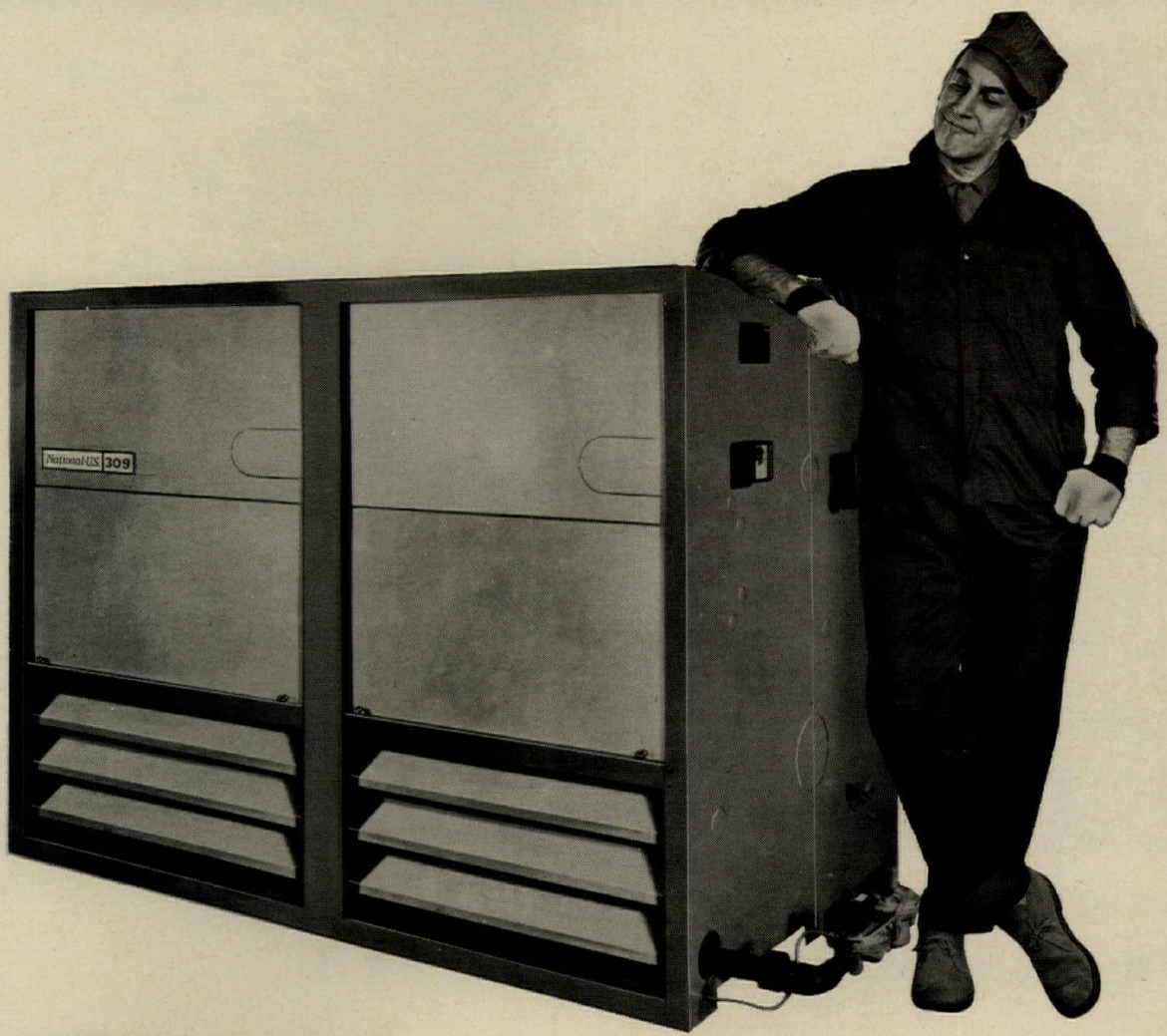
There's a choice of three ignition systems. The standard AGA-approved system—the electronic pilot type system—or the new ignition system which combines a unique *runner tube* with electronic controls.

The sturdy, cast iron sections are constructed with three nipples rather than just two. This allows uniform water flow within the boiler section for maximum heat transfer and economical operation.

All boiler sections have ground bead joints that are easier to install and make gas-tight.

Boiler sizes of 5 to 37 sections have AGA input ratings from 680 to 6120 MBh. A 170 MBh increment between sizes provides a greater number of boiler sizes to meet design requirements.

become smaller when the boiler is smaller.



Mail the coupon for complete details. We think you'll agree with the new design features: Commercial boilers that are smaller in dimension. Bigger in capacity. Have the best in ignition systems. And provide the trouble-free service of cast iron boiler sections and gas burners.

A.G.A. approved · I-B-R Rated
A.S.M.E. constructed
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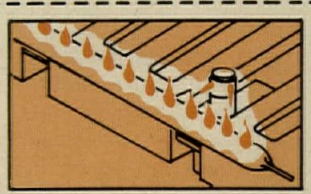

NEW PROVE-SAVE RUNNER TUBE *IGNITION SYSTEM*
Pilot must prove within 15 seconds after start-up or gas supply shuts off. Fast starts reduce gas consumption and eliminate puff backs.

Crane Co., Dept. 008 4100 So. Kedzie Ave., Chicago, Ill. 60632
☐ *Send Bulletin ADJ-1809 with complete details.*

Name_____

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City_____ State_____

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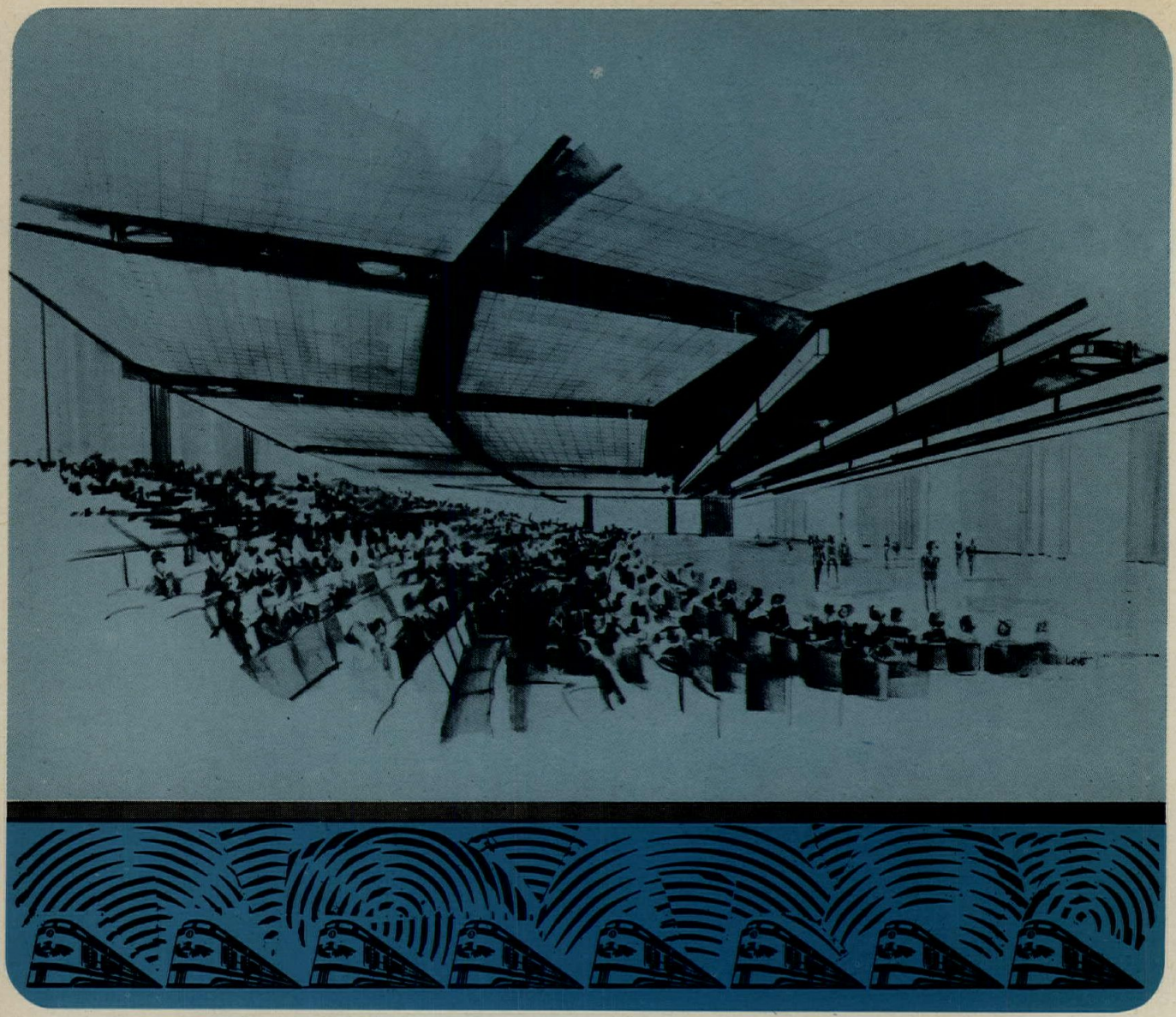
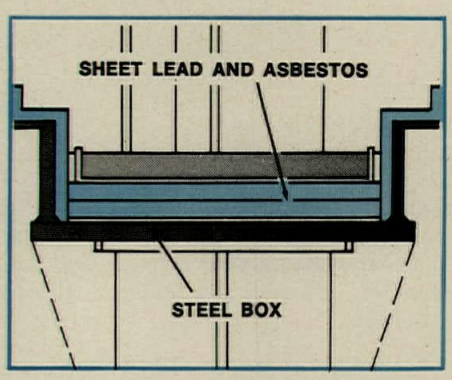


Lead-asbestos cushions let the Forum sit on Penn Station without feeling it

The rumble of trains rolling in and out of Penn Station directly below will never reach the audience in the Forum—an auditorium in New York's new Madison Square Garden Sports & Entertainment Center. They'll sit in vibrationless quiet because the entire amphitheatre is isolated from the rest of the building by lead-asbestos pads. □ These pads—alternating layers of sheet lead and asbestos—are confined in steel boxes affixed to the main flooring over the station and to the supporting perimeter columns of the main building. The beams and supporting columns of the Forum fit into these boxes and rest against the insulating pads, effectively separating the Forum from the vibration-carrying elements of the main building construction. □ Lead's limpness, density, mass, corrosion-resistance and versatility of form offer permanent answers to vibration and sound attenuation problems in buildings, aircraft, boats and machinery.



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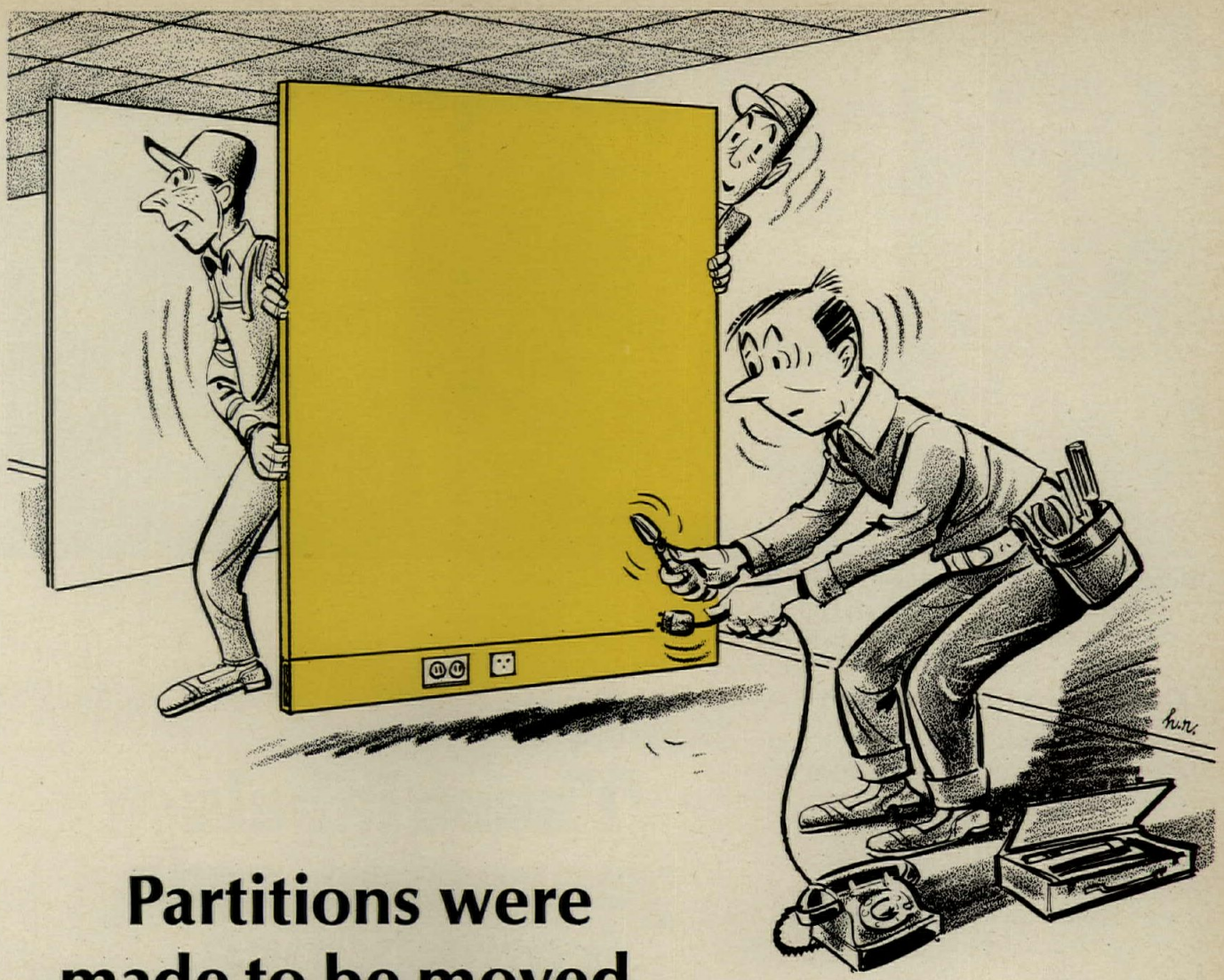

Partitions were made to be moved

And you can bet that your client will take advantage of that fact during the life of his building. That's why the wiring system you recommend is so important.

Take in-partition wiring for example. Each time a move is necessary, electricians and telephone men have a double task. One trip to remove or deactivate power and telephone cables; another trip to rewire after the new partitions are installed. Precious time and money go down the drain and you never get away from unsightly termination boxes hung on the partitions.

The real answer to effective wiring in a modern building is a PYRAMIDAL FEED* underfloor raceway system. It can carry heavy loads of power and communication cable to any location in the floor. And the Pyramidal Feed system allows you to plan the most beautiful floors, tiled or carpeted. Square D junction boxes and service fittings were designed with this in mind.

The Pyramidal Feed system saves money, both in the original installation and in countless changes in the building, while still offering unparalleled versatility. Find out more about it. Write Square D Company, Dept. SA, Lexington, Kentucky 40505.

*Trademark of Square D Company

SQUARE D COMPANY

Wherever Electricity is Distributed and Controlled

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Milcor Fire-Rated Access Doors are tested and approved.
Building codes require fire-rated doors for openings in all vertical shafts.* You can meet code requirements easily and safely. Specify the door with the Underwriters' Laboratories label—the Milcor Fire-Rated Access Door.

Why is it vital that every shaft opening, in every building, be properly covered to meet this code provision? The tragic 1963 Jacksonville Hotel fire provides one grim example of its importance. In that fire, which started in a utility shaft, killing smoke was forced out around the edges of inadequate closure panels... and 21 persons died needlessly.

These labels guarantee code compliance

Milcor Fire-Rated Access Doors latch securely to hold back smoke and flames. Tested and approved, they carry the Underwriters' Laboratories 1½-hour "B" label, 250° rating (temp. rise less than 250° in 30 minutes). They're completely framed; easily installed. You can specify them with confidence.

Milcor Metal Access Doors are also offered in other styles for all types of building conditions. See Sweet's, section 17L/InL, or write for catalog 210. Inland Steel Products Company, Dept. B, 4033 W. Burnham Street, Milwaukee, Wisconsin 53201.

MILCOR® Metal Access Doors

Inland Steel Products INLAND®

*See section 1706 of the Uniform Building Code or the appropriate section of the code you follow.

For more data, circle 113 on inquiry card

BOOKS RECEIVED

PLANNING 1967, *Selected Papers from the ASPO National Planning Conference. American Society of Planning Officials, 1313 East Sixtieth Street, Chicago, Illinois 60637. 305 pp., illus. $6.50.*

ARCHITECTURE IN MICHIGAN, *A Photographic Survey. By Wayne Andrews. Wayne State University Press, Detroit, Mich. 48202. 76 pp., illus. Hardbound, $6.95; Paperbound, $2.95.*

IMPRESSIONS OF JAPANESE ARCHITECTURE AND THE ALLIED ARTS. *By Ralph Adams Cram. Dover Publications, 180 Varick Street, New York, N.Y. 10014. 242 pp., illus. Paperbound, $2.00.*

TO GRANDFATHER'S HOUSE WE GO, *A Roadside Tour of American Homes. By Harry Devlin. Parents' Magazine Press, 52 Vanderbilt Avenue, New York, N.Y. 10017. 48 pp., illus. $3.95.*

HOUSING, PART I: PERSPECTIVES AND PROBLEMS. *Edited by Robinson O. Everett. Law and Contemporary Problems, Volume III, School of Law, Duke University, Duke Station, Durham, N.C. 370 pp. $3.00.*

COUNCIL OF PLANNING LIBRARIANS EXCHANGE BIBLIOGRAPHY 35, *Current Information Sources for Community Planning: Periodicals and Serials. Mrs. Mary Vance, Editor, Council of Planning Librarians Exchange Bibliographies, Post Office Box 229, Monticello, Illinois. 61856. 55 pp. $3.00.*

COUNCIL OF PLANNING LIBRARIANS EXCHANGE BIBLIOGRAPHY 36, *An Individual Review of Current Planning Literature. Mrs. Mary Vance, Editor, Council of Planning Librarians Exchange Bibliographies, Post Office Box 229, Monticello, Illinois. 61856. 15 pp. $2.00.*

PIPING HANDBOOK. *By Sabin Crocker. Fourth edition revised by Reno C. King. McGraw-Hill Book Company, 330 West 42 Street, New York, N.Y. 10036. 1616 pp., illus. $31.50.*

NEW TRENDS IN CHURCH ARCHITECTURE. *By Justus Dahinden. Universe Books, Inc., 381 Park Avenue South, New York, N.Y. 10016. 144 pp., illus. $10.00.*

ARCHITECTURAL ESSAYS FROM THE CHICAGO SCHOOL FROM 1900 to 1909, TALLMADGE, JENSEN, WRIGHT, *A Prairie School Press Reissue. The Prairie School Press, 117 Fir Street, Park Forest, Illinois. 18 pp. Paperbound, $2.50.*

THE NEW CITY: ARCHITECTURE AND URBAN RENEWAL. *By Elizabeth Kassler, Sidney Frigand and Arthur Drexler. The Museum of Modern Art, 11 West 53 Street, New York, N.Y. 10019. 42 pp., illus. Paperbound, $1.95.*

BAROQUE AND ROCOCO IN LATIN AMERICA. *By Pal Kelemen. Dover Publications, 180 Varick Street, New York, N.Y. 10014. Paperbound, (two volumes), $6.00.*

THE ENGINEER'S HANDBOOK ILLUSTRATED. *By Arthur Liebers. Padell Book & Magazine Co., 817 Broadway, New York, N.Y. 10003. 319 pp., illus. $5.95.*

ORNAMENTAL METALWORK. *By Franco Magnani. Universe Books, Inc., 381 Park Avenue South, New York, N.Y. 10016. 144 pp., illus. $12.50.*

SQUARE FOOTING TABLES. *By Michael S. McCormac. Stress Publications, Inc., 170 Rollins Avenue, Rockville, Md. 20852. Vol. I, 200 pp.; Vol. II, 210 pp. $4.50 per volume.*

HYDRA: A GREEK ISLAND TOWN, *Its Growth and Form. By Constantine E. Michaelides. The University of Chicago Press, 5750 Ellis Avenue, Chicago, Ill. 60637. 93 pp., illus. $10.50.*

THE HOUSING YEARBOOK, 1967. *Edited by Hugh L. Morris. National Housing Conference, 1250 Connecticut Avenue, NW, Washington, D.C. 20036. 120 pp., illus. Paperbound, $3.00.*

BUILDING LAW ILLUSTRATED: A GUIDE TO PRACTICE. *By B. G. Phillips. Barnes & Noble, Inc., 105*

continued on page 228

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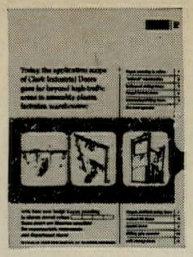

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A must for your files . . . this is the most comprehensive industrial door catalog ever issued! It contains descriptions, specifications and diagrams of power-operated and manual, single and double-horizontal sliding, bifold, vertical sliding and double-swinging and industrial doors for the control of traffic, handling of material and the elimination of drafts and noise. Write or call for your FREE copy now!

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NEW All you need to know about

Get your free copy! Describes, illustrates new type automatic tube systems featuring greater dependability, quieter operation. 12 pages. ***Standard Conveyor Co., 312-B Second St., North St. Paul, Minn. 55109.***

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Relax and think awhile...

ABOUT DESIGNING A SPENCER CENTRAL VACUUMING SYSTEM INTO YOUR NEXT PROJECT

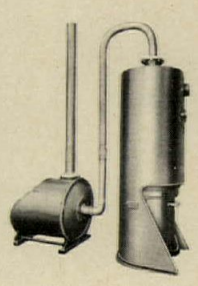
Think about the many advantages of a central system . . . vacuum facilities already installed, all the planning done ahead of time, a system tailor-made to the building's requirements. Think about the neatly packaged installation, no cumbersome equipment to drag around, the elimination of recirculating contaminated air.

Then, think about silent valve quietness in operation. Think about the health benefits to schools, hospitals, and nursing homes with germ-carrying dust control. Think about office after office in commercial buildings and room after room in hotels and motels with nothing exposed but a small wall fixture to handle acres and acres of carpeting.

Think about the flexibility of this system, about the special floor-mounted Vacuslot arrangement for hard surfaced floors.

Finally, if you think central vacuum systems, you must surely think Spencer. Who else has Spencer's experience? Who else has Spencer's know-how? Who else can boast Spencer's reputation for reliability, durability and service?

Now, available to architects at no cost is Spencer's new design manual entitled, *How to Design a Central Vacuum Cleaning System.* Write to Spencer for your free copy.



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SNOW CONTROL

An increasingly important factor in modern building construction.

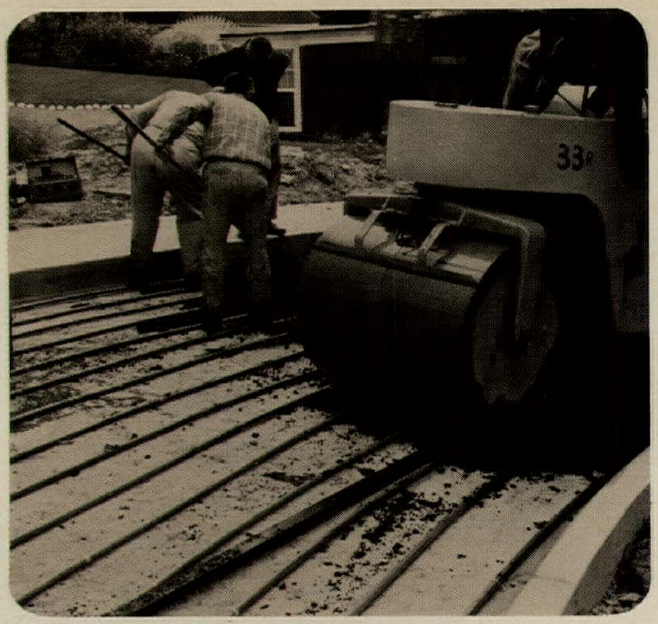
The economical answer is a snow melting system of

REVERE COPPER TUBE

No building being erected today, in areas where snow control is a problem, should be designed without giving serious consideration to snow removal from sidewalks, driveways, loading ramps, parking places and similar areas, around office buildings, hospitals, hotels, stores, banks, churches, theatres, warehouses, terminals, etc. Shovels, plows, salt and chemicals are not only out-of-date but are a nuisance, expensive and ineffective.

THIS SIDEWALK will be free of snow and ice no matter how hard it storms. The Revere Snow Melting System installed here is of sinuous coil construction.

An economical answer to this problem is a snow melting system of Revere Copper Tube. It saves building owners and operators time, labor and maintenance... eliminates "tracking-in", prevents accidents and resultant lawsuits. And, operating costs are only pennies a day on a square foot basis.



APPLYING BLACKTOP over Revere Copper Tube installed in a circular driveway of a hospital, leading to the Emergency Ward, where grade is steep. Proof indeed that Revere Copper Tube can take it.

NOT NEW

There's nothing new about a system that melts snow and ice before they pile up. Revere, the first to design a practical, workable copper snow melting system, has been at it for over 20 years... designing, testing and proving, in many locations and under every cold weather condition.

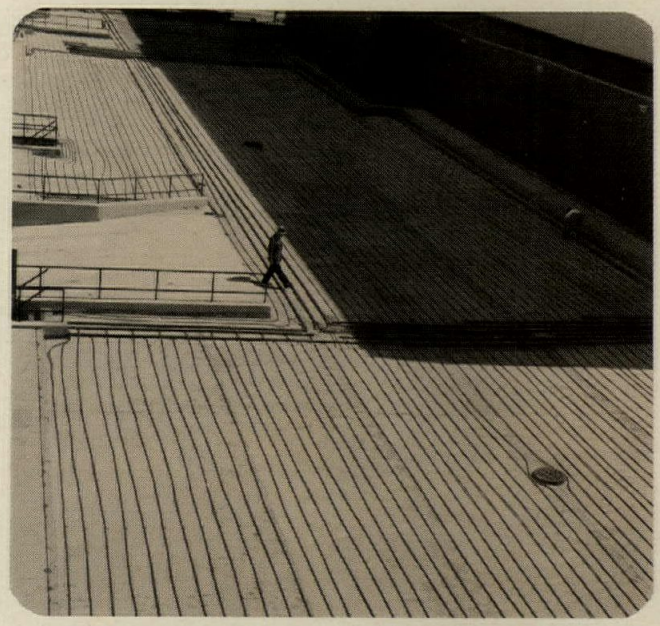
That's why Revere's Research and Development Department will be glad to help you with suggestions

IT SNOWED ITSELF A STORM all last night but steps and sidewalk in front of this building are as clear as a whistle, that's how a Revere Snow Melting System performs . . . no shoveling, plowing, salt or chemicals needed—ever!

regarding your design of snow melting systems. And, by using Revere Copper Tube, with its long lengths, choice of tempers, ease of installation and handling, installed costs can be kept at a minumum, in either concrete or blacktop.

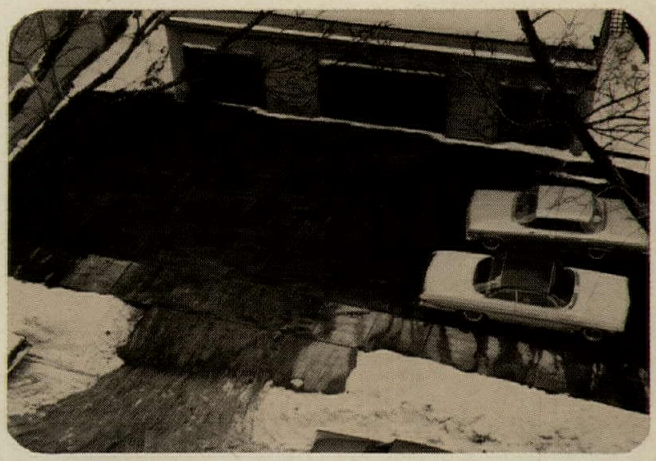
ACT NOW

Don't wait for a hard winter to make you wish you had included snow control in your specifications. It's easier and more economical to plan on it now. In planning on snow melting, our booklet, "Snow Melting Systems of Copper" can aid you considerably. Send for your FREE copy today. Or, if you have a snow melting problem let us know about it and we'll be glad to help.

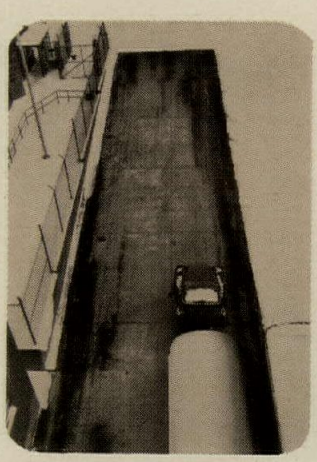


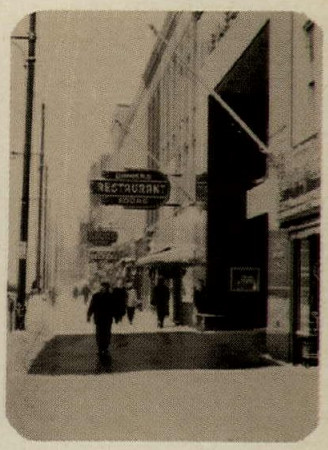
PARKING AREA BEFORE AND AFTER a Revere Snow Melting System has been installed. Imagine the mess here, trying to plow out so that cars can park. Photo with tube exposed shows grid-type installation.

BUILDING OWNERS AND OPERATORS —SAVE ON TIME...LABOR...MAINTENANCE..."TRACK-INS"...ACCIDENTS ...LAWSUITS.



DOCTOR'S PARKING LOT adjoining his office is kept safe and snow and ice-free by having a Revere Snow Melting System installed under the blacktop.





THIS LOADING DOCK DRIVEWAY (Above left) in the Buffalo area, although located on a sharp grade, assures the biggest trailer truck of a safe, fast entry and exit to and from the concrete loading platform, thanks to a Revere Snow Melting System. No skidding or delays here.

LET IT SNOW FOR DAYS, the sidewalk where a Revere Snow Melting System has been installed remains as free of snow and ice as on a day in summer. No "tracking-in" of dirty slush and snow.

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COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices: 230 Park Ave., New York, N. Y. 10017

First and Finest in Copper and Brass—Fully Integrated In Aluminum

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continued from page 223

Fifth Avenue, New York, N.Y. 10003. 249 pp., illus. $8.00.

PRINCIPLES OF SPECIFICATION WRITING. *By Harold J. Rosen. Reinhold Book Division, 430 Park Avenue, New York, N.Y. 10022. 216 pp., illus. $16.50.*

MATERIALS, A SCIENTIFIC AMERICAN BOOK. *W. H. Freeman and Company, 660 Market Street, San Francisco, Calif. 94104. 210 pp., illus. Hardbound, $5.00; Paperbound, $2.50.*

TRANSPORTATION AND PARKING FOR TOMORROW'S CITIES. *By Wilbur Smith and Associates. Automobile Manufacturers Association, Inc., 320 New Center Building, Detroit, Mich. 48202. 393 pp., illus. Paperbound, no charge.*

PARKING IN THE CITY CENTER. *By Wilbur Smith and Associates. Automobile Manufacturers Association, Inc., 320 New Center Building, Detroit, Mich. 48202. 141 pp. Paperbound, no charge.*

EDWARD DURELL STONE, RECENT AND FUTURE ARCHITECTURE. *By Edward Durell Stone. Horizon Press, 156 Fifth Avenue, New York, N.Y. 10010. 136 pp., illus. $25.00.*

VERTICAL TRANSPORTATION: ELEVATORS AND ESCALATORS. *By George R. Strakosch. John Wiley & Sons, Inc., 605 Third Avenue, New York, N.Y. 10016. 365 pp., illus. $15.00.*

THE SCIENCE LECTURE ROOM, A PLANNING STUDY. *By Jeremy Taylor. Cambridge University Press, 32 East 57 Street, New York, N.Y. 10022. 119 pp., illus. $12.00.*

A SUMMARY OF URBAN TRANSPORTATION DEMONSTRATION PROJECTS. *By the U.S. Dept. of Housing & Urban Development. Consumer Relations Services, 1626 K Street, NW, Washington, D.C. 20410. 62 pp. No charge.*

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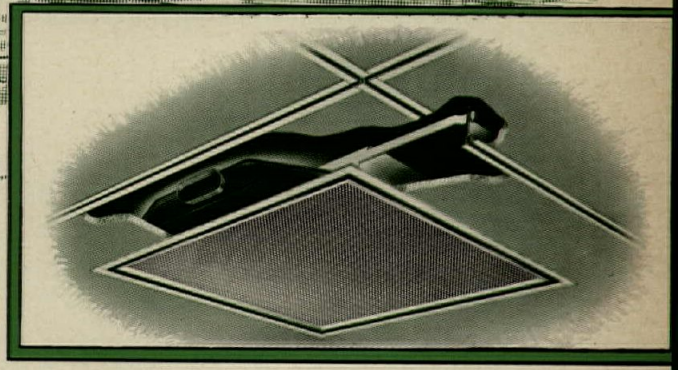
5′ Module?



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Sechrist has perfected and engineered a truly regressed, handsome fixture which offers new dimensions of aesthetic beauty for clean, crisp modern architectural design. The new 3′ x 3′ Air-Lite drops into a standard 5′ x 5′ module with no special engineering or difficult construction. It conceals all mechanical functions. It is precisely detailed with extruded aluminum doors and trim flanges. Each module has its own lighting, supply and return air systems. Its even margins enhance the overall architectural beauty of interior design, yet are truly functional in all aspects.

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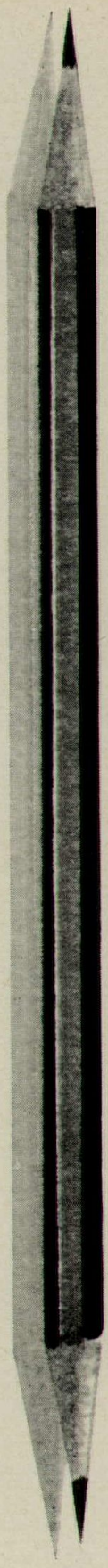
The college contribution



is a two-way street

There are two ways to look at it.

There's the contribution the colleges make to business.

That's crucial.

Business employs about 42% of all college educated people. It uses their brainpower and skill in developing new products and methods. It fills management posts.

In the other direction, there's the contribution business makes to colleges.

The colleges welcome it. They need all the funds they can get. They're helping to prepare leaders for management, but the cost of this preparation—the whole cost of education—is going up sharply.

If business wants college talent, it must keep colleges in business. It can help finance their need for classrooms, facilities and especially teachers.

In this light, your aid-to-education program is an aid to your company.

SPECIAL TO MANAGEMENT—A new booklet of particular interest if your company has not yet established an aid-to-education program.

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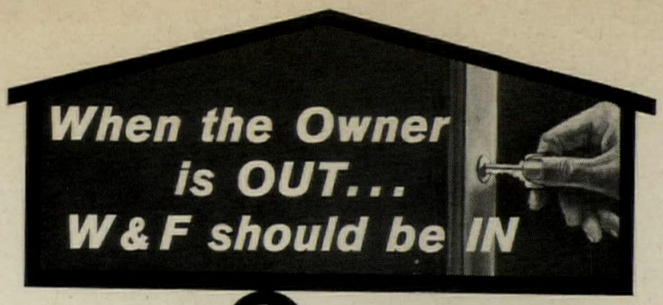

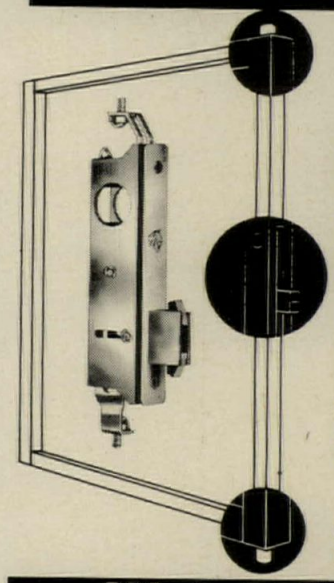

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Deadlock, provides your client's entrance with one, two or three SECURITY points.

Jamb bolts, along with header and threshold bolts are available in any combination . . . designed to meet your Specification requirements in VARIED situations.

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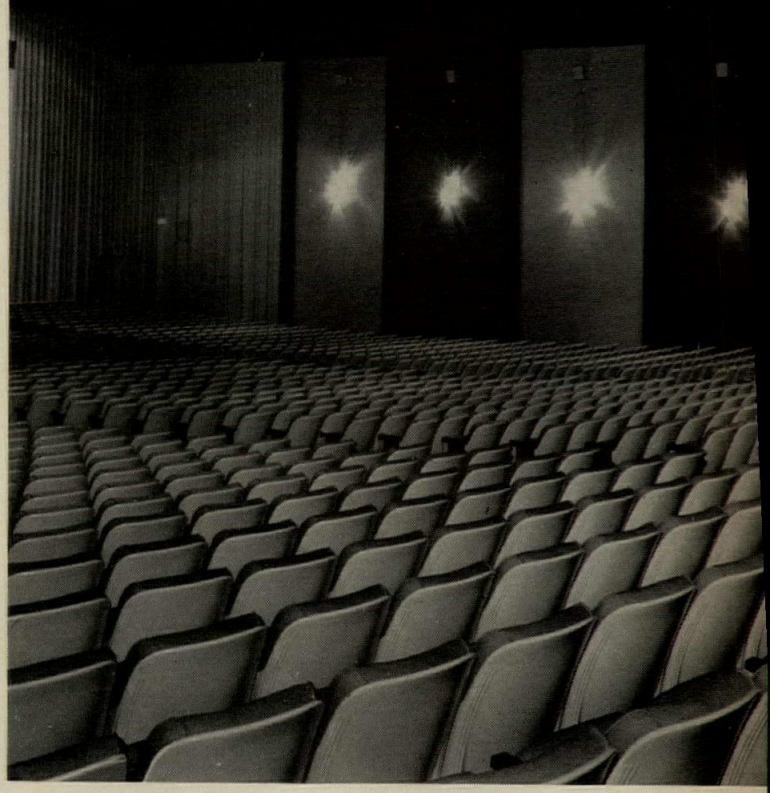
for Sound enjoyment

carpet the walls, too



Interior: Courtesy of Americana Theater—Detroit
Installation by: Grand Rapids Furniture Co.

Carpet the Action Areas

with Ludlow

SUN & SHADE

OUTDOOR-INDOOR CARPET

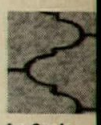
of 100% olefin fiber pile

Carpet on the walls not only pleases the eye but coddles the ear. Just as with this theater, people everywhere use their initiative to find new uses for outdoor-indoor carpet.

Ludlow Sun & Shade outdoor-indoor carpet provides maximum versatility for decorative application in embossed patterns as well as plain finish. Available colors adapt to nearly any scheme. And above all, it is easy to maintain.

So why not explore the many uses of Sun & Shade in your own backyard. Why not carpet the action areas in and around residential buildings, commercial structures, industrial buildings and recreational centers. All it takes is a little initiative.

Contact your local distributor



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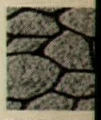

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ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1967 Sweet's Catalog File as follows.

A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)