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THE COMMUNITY COLLEGE: AN EMERGING BUILDING TYPE

For the first time next month, the RECORD will devote an entire Building Types Study on College Buildings to the "community college," that rapidly developing institution of higher education which provides two-year programs for (1) the high school graduate who intends to transfer to a four-year college or university; (2) technical or vocational training; and (3) continuing education. Unlike the old "junior college," the new community colleges are located "where the students are," and are more generally nonresidential. Some of the new problems, and a variety of master planning solutions, will be presented in the Study.

ARCHITECTURAL OPPORTUNITIES IN 1968

The F. W. Dodge Construction Outlook for 1968 will provide the annual forecast of activity in building as well as nonbuilding construction—a preview of next year's architectural business trends.


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ARCHITECTS AND DRAWINGS; WILL THERE BE A CHANGE?

My architect friend's charge—next page, two months ago—that "architects are trained to draw, but not to think," has bothered me a little. You may remember that I parried his thrust by saying that architects were trained to draw in order to encourage creative thinking. But there are certain aspects of his thought that lead to further speculation.

It is difficult to imagine an architect who was not trained to draw. I am sure my friend, himself an architect, had no such thought. What he obviously meant was that an architect tends to substitute drawing for thinking. Or, to put it even more sharply, he tends to start drawing too early, before the thinking is properly rounded out. Here is where the questions begin: and the possibility of change.

How about the computer, for one thing? We all have heard about computers which will do actual drawing of plans in two dimensions; will turn a two-dimensional drawing about and show you what the three-dimensional object drawn would look like from the other side; or will complete or refine a casual sketch. Or a computer might show you various alternatives, and cost them out for you. Or it might extend a drawing of some detail—like an egg-and-dart design—endlessly.

It seems obvious that, while these are present possibilities, they remain in the future for most architects' offices. But certainly one can expect that many of the reasons for the continual sketching or mechanical drawing will be obviated by computer techniques, or graphic developments of other kinds. It is difficult to imagine a complete set of working drawings made by a computer, or beautiful renderings, or presentation drawings, or what not. But mechanical devices will do—or already have done—many of the preliminary visual tasks while the scheme is in design.

It is difficult, in any case, if any mechanical gadget is ever going to dilute an architect's downright love of a good drawing. Whatever it be—perspective, isometric, plan, section, anything—an architect responds to a beautifully executed drawing. And my friend found a hazard here.

That fondness for drawings might tend to block mental processes. How many hours I have spent in architects' offices, through many years, looking at their wonderful drawings! An editor soon learns that his visit is the occasion for pulling out those handsome drawings. And that there is a ritual about it. Not that I regret it; that is what an editor calls on an architect for, to see what he is doing, so naturally he is soon looking at drawings. What I mean is that conversation takes some odd twists, when you must stop to admire drawing skill. It is like the conversational break when a grandmother pulls out the snapshots.

And the charge is that such breaks disturb the serious thinking processes about the design of a building. There is always the temptation to start drawing out some preliminary suggestion, which then tends to take on too much substance just because it is there in the drawings. When it becomes necessary to change something, the designer tends to save what he can of his drawings. Yes, we know all about that effort in an editorial office. I mean about writing. You get fond of anything you spend so much time over. You find yourself becoming committed, just by the act of setting it down. Reminds me of the lady chatterbox, who replied, when somebody asked her if she ever stopped to think, "How do I know what I think until I hear what I have to say?"

Architects have a block—I have complained about it before—on communication. They feel that communication is done with drawings; whereas what it amounts to is that you communicate by drawings with other architects, but not with clients. For clients you draw just to impress them, not to communicate with them. Try the telephone. And get things settled; then draw.

There is another fixation here: that you get paid for drawing. It is the making of drawings that takes time, and time is what you are selling. All very simple. True, you must draw when you get things agreed upon, but clients don't pay for drawings: they buy a building design.

What is different about it (neglecting the computer)? Why, it's the general speed-up in all communications. Clients have been wised up (or so they think) by reading or seeing or viewing pictures of everything around the globe. Your beautiful drawings are likely to be just one more example of today's graphic art, that is, unless they represent a real solution. It has been something more than 600 years since Giotto qualified himself as an architect simply by drawing a perfect circle in one grand swoop.

I hope architects will always do beautiful drawings—our magazine loves them—but it is a simple fact that their power to impress the world is shrinking.

—Emerson Goble
Please don't file me away; at least while I'm alive

The gruesome thought suggested by that headline has always been, in a way, a guiding principle for my wife and myself in any selection of living quarters. We haven't always been confirmed suburbianites, but from earliest days together we have always agreed that 'home' had to have something individual about it. And for all we have been hearing lately about megastructures and so on, one architect still believes in our theory.

He is Paul Rudolph, being interviewed by Art In America. He has this unique concept of an apartment house: “Most apartments are thought of in terms of packages into which everything is shoved. Indeed most buildings today are thought of as packages. I don't think of them that way. I think that traditional housing has always shown the individual living unit, and quite often the individual room, very clearly. And this has broken it down in scale and made it quite human. You are able to relate yourself to, well, where you live. You don't live in a box. So the intent [he is describing his proposed Stafford Village, in Virginia] is that one sees the individual living units, which are put together in a multiplicity of ways.”

Some architects still remember the word "scale," and still relate it to the word "human."

One-to-one-to-one windows and Mies is the only one

Still quoting Paul Rudolph, in Art In America, just for fun:

“We used to think in this country that the curtain wall, or the one-to-one-to-one-to-one arrangement of windows, which of course Mies van der Rohe has done better than anyone else, would become the vernacular of architecture, even the anonymous architecture. In point of fact, as far as I can see, only Mies has ever been able to handle it—almost no one else has. In a sense it becomes the most demanding of all systems, and even in Mies’ hands, when you come to such things as getting a garage door into the Seagram Building, it looks as if the whole building is having hiccups, because the door size for the automobile entrance is very different from anything else. So actually, curtain-wall architecture is really the opposite of vernacular architecture.”

It’s all very confusing, in the vernacular, that is.

Condominium sets new status for living—or so it says

We have a long release from a Los Angeles builder who tells us in solemn terms that “professional people, executives and business owners are moving into condominiums and town houses in greater numbers than other income groups.” Great, great news! It's like saying that people with more money spend more money.

The release is an obvious attempt to put condominium living on a status plane. It is billed as a joint study by the National Association of Home Builders and the Urban Land Institute, and they do seem to make a fact of the rising status of such developments, especially those complete with recreational facilities, and care-taking services.

One interesting point was that distance to work didn’t seem to be much of a factor. People go to the best condominium just like they go to the best suburbs.

New York to study spaces, but how about getting paid?

New York City is nicely snarled up over some determined efforts by the city administration to improve parks and other outdoor spaces. The city is planning a $55,000 study by Lawrence Halprin & Associates, of San Francisco, for which Mayor Lindsay announced the objectives:

“We have given new emphasis to the quality of living in New York by stressing the vital necessity for high-quality design. The careful placement of buildings, tree planting, lighting and ‘street furniture’ will create a more intimate and beautiful environment. The study will assist us in meeting these goals.”

The trouble is that the announcement was somewhat diluted by the City's controller's office, which refused to pay for previous services of Halprin, Marcel Breuer and Kenzo Tange. It seems two of them are not registered architects in New York. And that the silly fellows started work before the contracts were properly signed, and seem to expect to be paid for this early work. Or, maybe the Mayor's office just did not clear all the red tape with the controller's office.

If you just happen to smell a bit of politics around here somewhere, you are so right. And I personally am afraid my cynic's badge is again coming out of the drawer.

—E.C.
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ARCHITECTURAL RECORD October 1967 32-1
Union Bank Square, in Orange, California, is a dramatic example of the economy of All-Electric buildings.

The All-Electric Central Tower is a six story office building, steel curtain wall construction, with 84,000 sq. feet of gross space. It was completed in August of 1966.

Right next door is the North Tower, a non-All-Electric building of similar construction and the first building in the complex to be erected.

Calculated on a per-square-foot-basis, the combined overall initial, operating and maintenance costs for the All-Electric Central Tower are lower. Electric strip heaters in the ducts and refrigerated electric air conditioning accounted for significant savings in first cost.

Annual operating costs are just under 25 cents per sq. ft. per year. Maintenance time on the space conditioning system in the Central Tower is two thirds less than in the North Tower.

Canal-Randolph Corporation, owner and operator of Union Bank Square, has found that claims for All-Electric buildings are proven in practice. That's why the third building in the complex, the twelve story South Tower, will also be all electric. Scheduled completion date is July of 1968 and leasing operations for space in this luxury office building have already begun.

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and total annual cost

All-Electric Central Tower

Central Tower, Union Bank Square, Orange, California. A Canal-Randolph Property

**Building Profile**

<table>
<thead>
<tr>
<th>GENERAL DESCRIPTION</th>
<th>ELECTRIC LOAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Six-story building</td>
<td>Connected lighting and miscellaneous load — 250 KW</td>
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<tr>
<td>84,000 square feet office tower</td>
<td>Electric space conditioning equipment —</td>
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<tr>
<td>Steel curtain wall construction</td>
<td>Cooling — 300 Tons</td>
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<tr>
<td></td>
<td>Heating — 374 KW</td>
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<td></td>
<td>Electric Water Heating — 15 KW</td>
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<tr>
<th>OPERATING COSTS</th>
<th>SPACE CONDITIONING</th>
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<tr>
<td>Total electric Operating Costs — 25¢ per sq. ft. per year</td>
<td>Double-duct electric heating and cooling system</td>
</tr>
</tbody>
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32-4 ARCHITECTURAL RECORD October 1967
A distinct highlight of the new Oakland-Alameda sports coliseum complex is this unique suspended roof system used on the arena. The roof is comprised of ninety-six 2½" diameter steel cables radiating from a 45' diameter steel tension ring, at the center, to a 420' diameter concrete compression ring. Each cable supports a lightweight concrete stiffening rib manufactured with Basalite lightweight expanded shale aggregate. The ribs were precast in segments, lifted into place and joined with cast-in-place lightweight concrete closures.

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Insurance companies pledge $1 billion for capital investment in ghettos

Responding to a plea from President Lyndon Johnson urging that the private sector of the economy involve itself in helping to solve urban problems, the Institute of Life Insurance, a trade association of 348 companies, announced last month that it will make available through individual companies, on a pro rata basis relating to assets, $1 billion for capital investments to be used for "housing and getting industry into the hard-core ghetto areas of our country."

The funds will be used for capital investments that the insurance companies "would not otherwise be making" in housing, industrial enterprises and hard-core ghetto areas. The new money will be in addition to the normal investment of the insurance companies and, with FHA support, is intended for investment in "high risk areas."

The funds will be dispensed at the outset within existing programs, largely through FHA, with emphasis on rent supplement programs. The funds will be invested on a decentralized basis, with each insurance company working with each individual sponsor or project builder under such terms as section 221 (d) (3) and 221 (d) (4) of the housing act.

Just eight days after the insurance company participation was announced at the White House on September 13, the first 18 projects under the program were announced by Secretary Robert C. Weaver of the Department of Housing and Urban Development. The projects, selected because they were ready to start immediately, will include two in Cleveland, and one each in Pittsburgh; Pasco, Washington; Albuquerque, New Mexico; Jacksonville, Florida; Sumter, South Carolina; and Lake City, Florida. The insurance companies will buy the mortgages on these rent supplement projects, investing $7.7 million for 695 housing units. Review process has also begun on 30-odd other projects in 30 cities.

Architects receive grant to study "humane" urban design

Architects Paul Rudolph, Ulrich Franzen and I. M. Pei, as a result of a grant from the Ford Foundation, will each undertake "to explore the aesthetic and humane—as distinguished from the primarily technical—dimensions of a major—and actual—problem in urban design."

The two-year studies by Mr. Franzen and Mr. Rudolph, of two real areas in New York City, will be assisted by a Ford grant of $488,000 to the American Federation of Arts, Inc., while Mr. Pei's plans for his project are now under discussion with the Foundation. The purpose of the grants will be for the architects "to search out new concepts of physical form that are more livable and workable than those produced by traditional practice."

Mr. Franzen's project will be a study of the entire length of Lenox Avenue in Harlem, a 200-foot wide, 35-block-long boulevard which serves as a commercial and institutional focus for a large segment of the community. His purpose will be to seek ways of making it a more vital and integral part of the residential areas that adjoin it.

Mr. Rudolph will study the area along and adjacent to Canal Street, in Lower Manhattan, a proposed route for a Lower Manhattan Expressway. He will explore how such a highway, properly conceived, could complement and reinforce the quality of adjoining areas rather than having a blighting influence as is too often the case.

The bulk of the funds will go towards preparation of large-scale models, renderings, photographs and explanatory materials, which will be presented at an exhibition at the Whitney Museum of American Art in New York City, which will later be circulated for four years throughout the nation, and towards publication of the materials.

Potomac task force calls for unified conservation effort

A multi-disciplinary task force headed by Arthur Gould Odell, Jr., past president of the American Institute of Architects, has called for Congress to establish a Potomac Development Foundation. The Foundation, which would be funded by Congress over a five-year period at $50 million per year, would be responsible for restoration of the Potomac river basin in Washington, D.C., as a national treasure and as a model for the entire country.

The task force, assembled two years ago by the A.I.A. at the request of Secretary of the Interior Stewart L. Udall, urges that the entire valley and its resources be considered as a unified, living entity, rather than a "random grab-bag of distantly related values."

A method of design analysis, which considers suitable approaches to development of the river basin landscape, parcels the land into three distinct geological settings beginning at the river's edge. These settings are treated in depth to illustrate suitable visual characteristics, fundamental erosion, pollution and water conservation principles. The case is also developed for lands that should not be built upon.

RECORD HOUSES wins citation from printing industry

RECORD HOUSES of 1967, the mid-May issue of ARCHITECTURAL RECORD, has been presented a Certificate of Award in the Graphic Arts Awards Competition sponsored by Printing Industries of America. The award, in the category of "magazines and house organs," was accepted by Herbert L. Smith Jr., editor-in-charge of RECORD HOUSES, in ceremonies at the P. I. A. convention in Washington, D.C., on September 19. The award, for "outstanding design, quality of production and uniqueness of presentation" was given to McGraw-Hill, Inc. and Judd & Detweiler Inc., printers, for ARCHITECTURAL RECORD, and cited the following participants: Lanman Lithoplate Company; Jan White, designer; Alex H. Stillas, art director; Joseph R. Wunk, production manager; and James E. Boddorlf, advertising manager.

ARCHITECTURAL RECORD October 1967 35
Chicago’s Auditorium Theater will reopen after restoration

The Auditorium Theater in Chicago, designed by Dankmar Adler and Louis Sullivan and first opened in 1889, has undergone a restoration costing nearly $2 million, and will have a grand reopening on October 31 with a performance of “A Midsummer Night’s Dream” by George Balanchine’s New York City Ballet. This will be the first musical production performed in the Auditorium since 1941. The structure was then turned into a U.S.O. center, after which it fell into disuse.

Architects in charge of the restoration were Harry Weese and Associates (assisted by Crombie Taylor, architectural historian and George Izenour, theater consultant), whose aim was to restore the building “as closely as possible to the same condition it was on opening night, December 4, 1889.”

Restoration work included: much repainting, including ornamental plaster; new seats (cast from one of the original seats) installed on the main floor; electrical wiring updated; new carbon filament bulbs (as in original) throughout; new carpeting in foyers with reconstructed Sullivan pattern; new red aisle carpeting; new toilet facilities and lounges in basement; remodelling of dressing rooms; new ventilation in dressing rooms; new electric coils for heating with cooling cycle to be installed in the near future; and a new air supply and return system for the foyers area.

General contractor for the project was Sumner M. Sollitt.

RECORD senior editor will be honored with C.C.A.I.A. award

Elisabeth Kendall Thompson, senior editor of ARCHITECTURAL RECORD, who is based in San Francisco, will receive this year’s Public Information Award of the California Council, American Institute of Architects. The award, established in 1965 to recognize outstanding performance in the field of public information in the areas relating to or in the interest of the architectural profession in California, will be presented to Mrs. Thompson at the C.C.A.I.A.’s 22nd annual convention to be held from October 5-8 in San Diego.

In announcing the award, the California Council reported that her “many years of perceptive reporting and analysis of architecture and design and her valuable public service as a member of civic and professional committees concerned with improving man’s environment led to her selection.”

The citation will read: “To Elisabeth Kendall Thompson, editor, author and educator whose many years of knowledgeable architectural journalism and service to the profession have created understanding, for both architect and layman, of the heritage, goals and unlimited future potential of architecture.”

Obituaries

Irving W. Hadsell, former president of the F. W. Dodge Company, now a division of McGraw-Hill, Inc., died September 11 at age 74. After graduating from Columbia University in 1914, Mr. Hadsell joined F. W. Dodge as a copywriter for Sweet’s Catalog Services in Chicago in 1916 and later switched to sales. In 1929 he was named vice president in charge of F. W. Dodge’s Construction News & Statistics Division, and was named vice president of the company in 1953. Mr. Hadsell was named president of F. W. Dodge in 1959, and when the firm was acquired by McGraw-Hill, Inc. in 1961, he was elected to the Board of Directors of the parent company. He retired in May, 1963.

Dennis O’Harrow, executive director of the American Society of Planning Officials since 1954, died suddenly in Berlin on August 29 at age 58. Mr. O’Harrow was elected president of the International Federation of Housing and Planning in 1966, the second American elected to that office, and, at the time of his death, he was presiding over the International Congress of that organization. Mr. O’Harrow received a Bachelor of Science degree in civil engineering from Purdue University in 1931. He came to A.S.P.O. in 1948 as assistant director. He was one of two Americans ever to be named an honorary member of the Town Planning Institute of the United Kingdom. In 1965, Mr. O’Harrow received the American Institute of Planners’ Distinguished Service Award for “outstanding professional service to urban and regional communities through outstanding quality of practice of the art and science of planning.”

Henry Hodgman Saylor, first editor of the Journal of the American Institute of Architects and editor of several other professional architectural magazines in a career that spanned over half a century, died August 22 at age 87. Mr. Saylor, who completed a special course in architecture at the Massachusetts Institute of Technology in 1901, was associated with the following publications: editor of The Architectural Review, 1904-06; editor, Country Life in America, 1906-09; editor, Architectural Record, 1909; editor, House and Garden, 1909-11; editor, Architectural Record, 1926-36; associate editor, American Architect and Architecture, 1936-37; founder, editor and publisher, The Architect’s World, 1938; associate editor, Architectural Forum, 1938-41; and first editor of the A.I.A. Journal, 1944-56. Mr. Saylor joined the American Institute of Architects in 1926, was elected to Fellowship in 1952, and received the Kemper Award of the Institute for distinguished service by a member in 1954. Mr. Saylor participated in the planning of the present garden of the A.I.A.’s Octagon headquarters and was always thereafter its solicitous and creative curator. Following his retirement in 1956, he served the Institute as historian, preparing several reports on the history of the garden and the Octagon restorations.
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Architects propose new housing concepts to improve the quality of life in the city

A Graphic Arts Center proposed for a site on the Hudson River, New York City, designed by Paul Rudolph, is intended to utilize prefabrication techniques to create as a multifunctional, multi-use building complex. The scheme, intended to provide high-quality industrial space for New York’s legal and financial printers and color lithographers, would devote 12 levels to: a trucking-service floor; parking for 2,100 cars; a plaza level with elementary school; recreational facilities; five floors for use (starting at plaza level) by the color lithographers terraced back over the plaza; and seven floors for use by legal and financial printers. Total square footage for these functions would be 3,285,000.

This industrial complex is intended to serve as a “man-made hill” terraced for residential and commercial use above. Two office towers, one 31 stories and the other 17 stories, providing 1,455,000 gross square feet, would complete the concept.

The community would include 4,050 apartment units. This housing would be made of light-weight prefabricated units, similar in construction to those used in the mobile home industry. These units would be supported by cables hung from large trusses cantilevered from vertical towers. These cores are placed at right angles to each other, thereby allowing one to brace the next. The apartments would be arranged in an overlapping manner, so that the roof of the lower units would form a terrace for the units above.
The West Yard middle income apartment complex, New York City, designed by Philip Johnson with Samuel Paul & Seymour Jarmul, will consist of four apartment towers containing 1,600 units plus penthouses. Two of the towers will have 25 stories and the other two will have 38 stories. Apartment sizes will vary from one-room studios to three-bedroom units and penthouses. Balconies, available to 80 per cent of the apartments, will be placed “at random” with tenants specifying size and placement. Also included in the $60-million complex will be a five-level, 830-car underground garage, enclosed two-story shopping mall and a two-acre park.

New housing with a minimum of relocation has been proposed by Frederick G. Frost Jr. & Associates, Architects. In the Frost proposal, 30-story towers containing elevators, fire stairs and other facilities would be constructed on a block, with only two houses being initially demolished to make room for the towers. Once a tower is in place, manufactured modules containing the dwelling units would be suspended from carrying members attached to it. The modules, with all interior and exterior surfaces prefinished, would be equipped for lighting, heating, cooling, ventilation, plumbing and communications ready for connection to distribution lines in the towers. As each unit is installed, families in adjacent dwellings would move in, with the old houses being razed for space for support facilities. Inventor of the “Suspended Module Buildings” system used in the plan is Christian Frey, and Lev Zetlin & Associates is consulting engineer.

New concepts in mobile homes, designed by Dalton-Dalton Associates, Architects, under commission to the Jones & Laughlin Steel Corporation, are intended, say the architects, to “show that technology and materials used in mobile home manufacture can be applied to the solution of housing problems plaguing urban America.” The town house scheme, below, stacks steel-framed units atop and alongside each other in a preassembled stairway structure. The high-rise solution at left is a steel skeleton frame containing individual residence units which would be hoisted in place and plugged into a permanent core. The designs were first shown at the Mobile Homes Manufacturers Association Suppliers’s Show held last month in Chicago.
BUILDINGS IN THE NEWS

The master plan for Sands Point Fetsch College, Sands Point, New York, designed by Melvin Beacher, proposes construction in three phases for a projected enrollment of 1,200. The buildings, of reinforced concrete and concrete block construction, will be organized around an elevated ceremonial plaza. The first phase of construction will be rehabilitation of two existing buildings on the site and a new co-educational dormitory for 300 students. Other buildings will include administration, faculty lounge, maintenance, student union and dining, science, faculty housing, boathouse, library and visual arts center, classroom, gymnasium, chapel and six dormitories.

The Federal Bureau of Investigation Building, Washington, D.C., designed by C. F. Murphy Associates—Stanislaw Gladych, designer in charge—is the first major government building set to go under construction along the newly planned Pennsylvania Avenue (July, 1964, page 23). The FBI Building will be organized around a courtyard which will be open to the Avenue by a 78-foot wide aperture. Construction of the building, which will contain 2.3 million square feet, will be of reinforced poured-in-place and precast concrete. It will have 11 floors above grade and three levels below, including a 700-car garage.

The Cafeteria Building for California State College at Hayward, designed by Campbell & Wong & Associates, will be a two-story structure with basement which will serve as a temporary student union area. The main floor will be used for snack dining with the upper floor for full-course dining. Cooking preparation facilities will be in the basement with dishwashing facilities located adjacent to dining areas. All columns and 10-foot-wide channel slabs will be precast, prestressed concrete. Redwood slat grille treatment will be used in the spaces between the channel slabs and in the U-shaped columns, integrating lighting and acoustical treatment.

An industrial and office building for the Cicoil Corporation, Canoga Park, California, designed by Dorman/Munselli Associates, will include facilities for small electronic parts assembly, raw material processing, storage and main offices. The building will contain 24,000 square feet. Construction will be of precast concrete, with precast sunshields to give sun protection to second floor executive offices. The building provides for future expansion of 60,000 square feet. Construction is scheduled to begin this fall.
A rehabilitation center for Manhattan State Hospital, Ward's Island, New York City, designed by Caudill Rowlett Scott, will expand programs now under way at the mental hospital, preparing patients for their return to normal living. The building, with a capacity of 500 to 1,000 patients, will be composed of one-, two- and three-story elements developed down a sloping site. The white concrete structure will be exposed in all areas and will be integrated with mechanical and heating systems. Other exterior materials are dark buff colored brick and black gasketed curtain wall detailing. The $3-million project is being erected under the Mental Hygiene Facilities Improvement Fund.

Number One Corporate Center, the first in a complex of office buildings at Moorestown Corporate Center, Moorestown Township, New Jersey, designed by Tofani and Fox, will provide approximately 30,000 square feet of office space. Building materials will be brick and steel and windows will be deeply set to provide sun control. Developers of the project are Gross and Kowit.

The Library of Congress James Madison Memorial Building, Washington, D.C., designed for the Architect of the Capitol by Roscoe DeWitt, Alfred Easton Poor, Albert Homer Swanke, Jesse M. Shelton, and A. Pearson Almond, associate architects, will be a $75-million structure with six levels above grade and three below. After disclosure of the design, the Madison Memorial Library Committee of the American Institute of Architects issued a report calling for a new set of design requirements to be formulated by Congress as part of a new master plan for Capitol Hill, and calling the building "visually unsatisfying and functionally inadequate."

The Classroom, Laboratory & Office Building, University of Massachusetts, Amherst, designed by Coletti Brothers, will have a two-floor classroom section connected to a lecture hall section, both of poured-in-place concrete, topped by five floors of offices. The office floors will have no columns—prestressed concrete tees supported on the exterior by precast, post-tensioned concrete loadbearing panels form the floor and roof system.

The Psychology, Laboratory, Classroom & Office Building, University of Massachusetts, also designed by Coletti Brothers, is a six-level, $4-million project using the same type of structural system as the project at left. The upper three floors contain laboratories with offices on the periphery. The lower floors contain classrooms, teaching laboratories and clinic. Acoustical consultants are Bolt, Beranek and Newman, with doors, walls and floors to be acoustically treated.
A cultural and convention center for Norfolk, Virginia, designed by Williams and Tazewell & Associates with Pier Luigi Nervi and Antonio Nervi as architectural consultants, will contain a coliseum seating up to 12,000, a theater building with a main hall seating up to 2,500 and a rehearsal hall seating 400, an underground exhibition space of 80,000 square feet, and an underground garage for 600 cars. The coliseum will be covered by a dome 440 feet in diameter and 100 feet high supported by 24 V-shaped concrete buttresses. Construction on the $18-million complex is scheduled to start this fall.

The Annenberg School Center for Communication Arts and Science, University of Pennsylvania, Philadelphia, designed by Vincent G. Kling and Associates, will contain three major theaters and their support facilities. Included will be a main theater seating 950, with a proscenium variable in width from 30 to 60 feet, which also converts to a thrust stage; a laboratory theater seating 220; and a workshop theater seating 140. The four-level building, which will cost $4.1 million, will have as building materials deep-colored red brick, bronze-colored exposed roofing surfaces, bronze-colored window frames and trim and solar bronze glass.

The Coliseum and Convention Center, New Haven, designed by Kevin Roche John Dinkeloo and Associates, will have a four-story, 2,400-car garage structure located on the roof, providing the spanning structure for an arena. Below the garage will be the arena containing a 17,000-square-foot ice rink surrounded by four banks of seating for 9,000. The arena will seat 10,200 for basketball and 11,500 for conventions. Also contained in the structure will be an exhibition hall of 38,000 square feet, with an additional 30,000 square feet of exhibit space available by converting the arena. The $15-million building, located adjacent to the Knights of Columbus International Headquarters designed by the same architects (September, 1965, page 43), will have supporting columns of reinforced concrete covered with plum-colored tile similar to that used in the headquarters building. The garage will be constructed of a steel which will oxidize naturally to a dark cinnamon brown.
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A.I.A. headquarters: pros and cons

Regarding your comments on the new design for the headquarters building of the A.I.A. in Washington, I congratulate you on being bold enough to say publicly what many of us have thought privately. I liked especially your analogy of the "little old lady." Just what the A.I.A. can do now is anyone's guess, but if they do decide to start all over again with another competition, you have my vote as a member of the jury.

Henry Hardinge Menzies, A.I.A.
Boston

It is a mockery to the profession and an insult to its leaders that the Washington Fine Arts Commission disapproved the design for the A.I.A. headquarters that was selected through competition by the A.I.A. board of directors.

How can an agency or commission disapprove a product of a profession that was selected by the very governing body of that profession. By definition the A.I.A. headquarters in Washington represents the supreme decisions in the profession of architecture, the mother art. It is recommended that any architects on the Washington Fine Arts Commission who voted against this design be suspended from the Institute.

Wallace D. Jeong, A.I.A.
Los Angeles, California

Your voice, added to the Fine Arts Commission of Washington, slowly, but ever so surely portends the doom of fine architecture for Washington. The stylized Appian Way which was synthesised so beautifully in Washington is sad commentary on the state of American architecture. The neo-classic, the imitation classic and federal styles designed by architects and non-architects have too long prevailed on the Washington scene.

Truly, we have not done much to preserve our heritage, limited though it may be. However, a building such as the Octagon, which has represented the Gentlemen's Club architectural approach for all too many years, must be replaced with the Mitchell and Giurgola building. The M & G building may not be compatible with the garbage so prevalent on Washington's landscape, but it is a fine building nevertheless and the architectural publications and the A.I.A. must make a stand—a stand much overdue.

The day-to-day practice of architecture and the efforts to convince clients that we cannot rely on applied archaeology is difficult enough. However, when the architects design a building for themselves and it comes under the scrutiny of a body of people who can then qualify the architects, the profession is seriously damaged. I have never heard of a surgeon being criticized for his method of stitching if the patient lived, nor an attorney criticized for his methods in court if his client was acquitted.

Therefore, as a body, we must stand and let the public know that we are one as a unified group. Please stay with your comments which have been extremely well conceived over the past years and do not indulge in criticism again.

E. Abramen, A.I.A.
Fort Lauderdale, Florida

When you finally get round to saying it, you say it right. What you say about the A.I.A. Mitchell-Giurgola project needed saying exactly as you have done.

Roger Montgomery, Director
Urban Renewal Design Center
School of Architecture
Washington University
St. Louis

My congratulations on your "Behind the Record" editorial criticism concerning the A.I.A. office building. Your comments were well conceived, to the point, and well deserved by the architectural profession. Perhaps your fortitude will encourage others to take a more critical look at the aesthetic and planning (or lack of it) attributes of this solution for our national headquarters. Maybe some will even "see" the monster in the backyard?

Edward L. Verkler, A.I.A.
Associate Professor of Architecture
Texas Technological College
Lubbock

From mole hills: mountains

Your editorial and your statement in "Perspectives" in the May issue is to be commended. Anyone whose sole knowledge of architectural practice was derived from reading the professional publications would assume that only Taj Mahals and Lever office buildings are designed by architects. Unfortunately, this is the literature read by the architectural student, and this is the impression given by the architectural schools, so that the student enters an office with grandiose ideas and is ill-equipped psychologically and technically for the work he will have to do.

The tendency of architects to scoff at the small project is detrimental to the profession. From the point of view of public relations, it is catastrophic. On the one hand our professional organizations pressure the state legislature to restrict the practice to licensed individuals. On the other, we refuse small jobs, frustrating the small home owner. Many read the publicity statements we put out and have their appetites whetted for an architect's assistance. I have received many calls stating, "I have called four architects and they said this job is too small for them; do you handle small alterations like this?"

Alteration work is a tremendous field and the national manufacturers are just becoming aware of the potential. The number of private dwellings being increased in size or modernized is stupendous. The contractors are learning how helpful an architect's services can be and the home owner, too, is becoming more conscious of our professional ability. Their contacts, in turn, lead to many larger projects. This is also true of small house work as well as smaller industrial and commercial structures. The profession has an opportunity to alleviate the blight on our landscape created by builder-originated monstrosities and should not hesitate to accept its responsibility.

Leon Rosenthal, AIA
Babylon, N.Y.

One more consideration

On pages 87 and 88 of your July issue is an article by Lawrence C. Jaquith, economist, concerning imported building materials. His first paragraph gives an estimate of a half-billion dollars worth of imports going into construction of domestic projects in 1966. Although Mr. Jaquith points out the effect which foreign steel products,
"MONUMENTAL" — LARGE SCALE BORDEN DECOR PANEL

The aluminum facade shown on the eye-arresting Washington, D.C. building which houses Hennage Creative Printers is a special custom design, using Deca-Grid style Borden Decor Panel in one of Borden's bold new large-scale patterns known as "Monumental".

Using "T" bars for greater spans and greater strength, these large patterns allow as much flexibility in design as do the smaller versions of Deca-Grid, but add greater scope to the architect's creative design and provide strong visual impact at greater ranges.

The facade illustrated is the result of close cooperation between Mr. Joseph Hennage, head of the printing firm, and Borden's architectural department. This new design uses structural tees at 12" o.c. and large 7" reversing tabs which give approximately 80% closure to the screen. The resultant strong shading effect nearly eliminates vision of the building behind the screen.

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ceramic tile, lumber and glass have had on American industries, he then makes this statement at the bottom of page 87: "Competition in building materials from imports has a most obvious benefit to the architect and his client—lower costs." He goes on to say that domestic producers may regain their competitive position by "more intensive research" and "new productive methods."

This sounds plausible on the surface, but analysis reveals other factors which were not mentioned as affecting the price of building materials manufactured here vs. abroad. For example, labor costs in the U.S. are upwards of 40 per cent of the selling price for flat glass products. Labor and management costs for a domestic flat glass manufacturer are over 50 per cent of selling prices. Any economist should not ignore this simple fact: when labor and management costs abroad are from one-seventh to one-third of those in America, total operating costs for a foreign firm are approximately 58 per cent to 67 per cent of a U.S. manufacturer. Economists frequently are very facile in avoiding the powder keg issue of the higher wages which U.S. manufacturers have to pay in their factories than do their foreign competitors.

There is little likelihood they will ever be on a down escalator any more than taxes. While it behooves an architect to invest his clients' money wisely by specifying quality products at a favorable price, architects and their clients are still dependent on American purchasing power for their own future livelihood. Libbey-Owens-Ford's two window glass plants in Charleston, W. Va. and Shreveport, La. have operated at 47 per cent of capacity during the first six months of this year. We have 1,196 fewer hourly workers in these two factories than in 1956. Nine hundred of them live in Charleston which is in Appalachia where the past two administrations have spent vast sums and wept buckets of tears over the plight of the people. Getting down to basics and not theory, these 900 workers would have received over $7 million annually, based on the U.S. Chamber of Commerce statistics showing that for each 100 industrial jobs a community gains $803,000 more local income per year.

If architects continue to be a party to the wholesale exporting of jobs to foreign plants, there eventually will be no need for them to design new factories, office buildings, schools, churches, and other buildings, as the greatest country on earth and in history may become a vast Appalachia. They have the allegiance of our representatives who worked in the dark of the Geneva moon on the favorable-to-foreigners further tariff reductions.

Franklyn R. Hawkins
Advertising Manager
Libbey-Owens-Ford Glass Company
Toledo, Ohio.

The decision of whether to support foreign industry at the expense of our own industry is one that must be made by each architect and his client depending on all the quality and cost considerations that you suggest. I agree that "new productive methods" are an over-simplification of the possible solutions. We, as editors, do not underestimate the seriousness of the problem facing you and other manufacturers, but we do feel we must give our readers all the information possible with which to make their decisions.

—WW

Air conditioning and architecture
I have just finished re-reading the two parts of your excellent survey on air-conditioning, and I want to congratulate you on this really superior presentation. The text is clearly written and technically cor-

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GENERAL ELECTRIC

For more data, circle 28 on inquiry card
rect, and the illustrations are excellent. All in all, it is a first-rate job, and every architect could profit by a careful study of this material.

I lecture in the College of Architecture at Arizona State University, giving the course which is called Mechanical and Electrical Systems. Most of our first semester is taken up with air conditioning, and I would like very much to be able to use your articles as supplementary text material. They are far better than the textbook that we are currently using. My students are fourth-year architects, and a good proportion of them work part-time in the architectural offices here in the Phoenix area. I make a practice of giving copies of ARCHITECTURAL RECORD as prizes to my students when they do exceptionally well on quizzes, term projects, and examinations. The man who gets the highest score receives the current issue—but I do not want to give away the July and August editions, because this material is too important.

John I. Yellott, President
John Yellott Engineering Associates
Phoenix

Money: a point missed
I would say that the only point missed in an otherwise excellent article on Montgomery Village (July, pages 134-141) was the complications involved for the developer and his team in working under this town sector ordinance. These are not only technical but monetary. It is obvious that a great deal of front money for both design and development is necessary to achieve the desired goals under this procedure; more than under the normal development pattern.

You may want to go into this point, and I think it is an important issue, as many developers have had serious trouble getting into projects and not realizing the depth of the water.

In the July, 1965 zoning application document, this cost is partially spelled out. The investment in planning is not covered in the report, but on page nine of the Dewberry portion of the report, it indicates that 18 months went into preparation of the documents and exhibits. Naturally a substantial amount of time and money has been spent since then and only now is it evident that construction is underway.

George F. Koslitsky
Rogers, Taillferro, Kastritsky, Lamb
Baltimore, Maryland

More praise and so little space
Like other Canadian architects, I was pleased by RECORD's generous coverage of Expo '67 in the July issue and particularly flattered by the inclusion of the Ride Center and its buildings, representing the La Ronde Amusement Area.

Perhaps it could have been noted that La Ronde is much more than the Ride Center including such attractive projects as Fort Edmonton, an old west village; Children's World; the Carrefour, an international shopping bazaar; the Garden of Stars theater; Le Village, a beautifully scaled version of old Quebec; and more. It has been compared with Tivoli in Copenhagen, but it has an up-to-date bezaz all of its own. All of this work was planned and designed by private architectural firms, landscape architects, site planners and industrial designers with co-ordination by the chief architect's staff. It is unfortunate that in general reportage or even in the official Expo guide, little or no credit has been given for the work at La Ronde.

Like a number of popular magazines, RECORD photographed the Ride Center and its gateway as typifying the "fun" of La Ronde. You will therefore excuse my small display of chargin when I observed in relation to this photograph, the sole attribution to Mr. Sean Kenny and his
As you can see, Von Duprin 55 exit devices were designed with narrow stiles in mind. The cases are a mere 13/4" wide, for stiles as slim as 1/4". But they're ruggedly built, with walls fully 3/8" thick. Rim and concealed vertical rod devices, in stainless steel, bronze or aluminum. We invite you to write for Bulletin 675. And we urge you to compare the Von Duprin 55 rim and vertical rod series with any other narrow stile devices made. You'll see: no other narrow stile devices "measure up" to the style or strength in the 55 series.
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UNITED STATES GYPSUM


For more data, circle 164 on inquiry card
New Field House, University of California at Santa Cruz. Copper encloses the terminal chords of the two-way steel truss that spans the large main area of the building. Repetition of copper above an open stairway unites the design. The unusually prominent drip created at the eave gives strong definition to the roof.

The workability and rich color of sheet copper were used to good advantage by architects Callister, Payne and Rosse in the design of this college athletic building. Copper combined perfectly with the buff of the concrete and deep color of the redwood. A few years of weathering should make them harmonize even more beautifully. The ease of joining and forming sheet copper simplified the installation. And the enduring copper roofing, flashing and fascia should require no maintenance for many, many years.

Details of the roof eaves and upper roof fascia are shown above. For a new 96 page handbook of sheet copper fundamentals, design details and specifications, write for “Contemporary Copper”.

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And talk about wear. Powerbond is rugged and abrasion-resistant. Scuff marks won't scuff. Or mark. Spiked heels won't spike. And traffic patterns won't show.

**Maintenance is Last. And Least.** The super-dense cylindrical-shaped pile is so super-dense it holds spills, dust and dirt right on the surface. So they can be vacuumed or sponged off. Quickly, easily. Without special know-how or special cleaning aids. So maintenance takes less effort, time and money. Which will really floor your clients.

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ARCHITECTURAL RECORD October 1967 55
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LETTERS

Lounge and Reception Furniture

Some months ago, a friend of mine cleaned out the attic of an old house and came across a pile of RECORDS, dating from 1923 into the early 1930’s. I have enjoyed leafing through them and am beginning to feel that my attitudes towards architecture are developing a healthy perspective through these old magazines. Particularly interesting are the articles concerning “modern design.”

I noticed one illustration from the October 1930 issue (above left) of a handsome—and imaginative—design of an office building by Mies and was reminded of an apartment tower in Chicago (right) now under construction which is shown in a current issue of one of the concrete industry magazines. What is the saying about a prophet not being honored in his time?

Fielding L. Bowman, A.I.A.
New Canaan, Connecticut

P.S. RECORD is doing a fine job; each issue is interesting and informative.

Missile Systems Div. of Atlantic Research Corporation selects two Da-Lite® automatic projection screens.

The Atlantic Research Corporation’s Missile Systems Division, Costa Mesa, California, utilizes two projection systems for simulation training. Both are made by Da-Lite. Each picture is projected from behind a single Da-Lite screen which extends over the entire ceiling in the simulators. A single Da-Lite screen is installed for each projector. The Da-Lite screens are designed for easy installation on the wall, ceiling or floor. Electrically operated Da-Lite projection screens (4 models in all) are designed for easy installation on the wall, ceiling or floor. Electrically operated Da-Lite projection screens are designed for easy installation on the wall, ceiling or floor.

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Color, texture, form—these are the elements you design with. The lighting you specify must reveal them fully and faithfully. How well lighting performs this task determines the success or failure of any job. Here are some facts you should know about a lighting tool that brings out all the color, texture and form you put into your design—the Holophane prismatic CONTROLENS.

Controlling light

The Holophane Controlens, as its name indicates, is a lens designed to control light. Like a louver, frosted lobe or diffusing panel, it is placed between the raw light source and the eye. Unlike these other enclosures, however, the Controlens has a surface of prisms precision-engineered to direct light rays where they work most effectively to reveal texture, define form and enhance color.

How the Controlens reveals texture

Textured surface consists of peaks and valleys. Excessively directional illumination floods peaks with light, leaves valleys in dense shadow. Totally diffused light illuminates peaks and valleys equally. Definition is lost, appearance is bland and lifeless.

Holophane Controlens avoids these extremes. It delivers a balanced blend of directional and diffused light—controlled light that produces good highlights and just the right amount of shadow to bring out all the character and detail of the materials you design with.

How the Controlens defines form

Strictly directional light obscures form by overdefining it—lighted areas are too bright and shadows too dense to convey the shape and feel of an object. Completely diffused light, on the other hand, produces insufficient contrast and creates an uninteresting, one-dimensional uniformity.

Shape is completely defined (right) under light from Controlens. Highlights are good, shadows soft. Under improper lighting (left) highlights are missing, shadows excessively dense and harsh.

The Holophane Controlens delivers enough directional light to achieve shadow and definition, and enough diffused light to avoid harsh contrast. The forms in your design emerge fully modeled and defined.

How the Controlens enhances color

This same careful combining of directional and diffused light enables the Controlens to reduce the color-veiling effects of glare to a minimum. The result is balanced illumination that calls forth all the richness and drama of the colors you specify.

True, rich color (right) emerges when illuminated with light from Controlens. Excessively diffused light (left) veils true object color.

How to specify the Controlens

The Holophane Controlens comes in a broad range of sizes, shapes and styles—in both acrylic and glass—to satisfy all your requirements for fluorescent and incandescent lighting. Holophane manufactures the Controlens for more than 50 leading fixture manufacturers. You can specify a Controlens for practically any make or model of luminaire.

Write for Holophane's illustrated, 66-page Controlens catalog. It contains specifications and full data on the widest and most versatile line of prismatic lenses available. The booklet is free to designers, and there is no obligation.
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For more data, circle 36 on inquiry card
Prestressed concrete slabs go up at the rate of a-floor-a-week in high-rise Denver condominium

More than 500,000 square feet of prestressed concrete double tee slabs helped complete Denver's 22-story Polo Club Condominium a month ahead of time.

When crews were ready for these 8-foot-wide slabs, the slabs were there. On-time delivery from the prestressed concrete supplier, teamed with erection directly from flatbed transport trailers, resulted in slab placement averaging one floor a week.

The Polo Club is one of the tallest reinforced concrete bearing wall buildings in the area designed for both wind and seismic loads. It features a large, enclosed atrium, roofed with prestressed beams and fiberglass domes for year-round enjoyment.

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Architect: Roland Wilson & Associates, Denver, Colorado
Structural Engineer: Sallada and Hanson Consulting Engineers, Denver, Colorado
General Contractor: Craftsmen Construction Co., Inc., Denver, Colorado
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Congress reviews low-income housing plans

Congress is now examining the details of plans to help lower-income families buy their own homes.

Democratic Senator John Sparkman of Alabama and his housing subcommittee were taking a look at the so-called "Sparkman House" plan last month. Republican Senator Charles Percy of Illinois and his staff have been fighting for his "Home Ownership Foundation" idea. Other senators have joined the drive to create something which ghetto area residents can use to buy their own homes.

The powerful combination of the new ideas plus the summer riots has added urgency to congressional debate, although a final new program isn't expected to go to President Johnson for signature until almost Christmastime.

Three plans focus on interest subsidies

All of the ideas follow along one theme: partially subsidize the interest costs of a mortgage to bring the monthly payments down within reach of lower-income families.

- **Senator Sparkman's plan** would rely on private mortgage lending institutions to issue and hold these partially subsidized mortgages. The subsidy would go directly to the mortgage banker; if enacted, this would be the first time Congress went along with a "banker's subsidy" rewarding him for making the loan to a lower-income family.

- **Senator Percy's plan** is somewhat similar, although he prefers to avoid the existing bureaucracy by creating a new "Home Ownership Foundation." This foundation, quasi-private, would issue government-backed bonds to raise money. It would then go through local "home ownership" groups to finance mortgages for lower-income families.

- **Another plan**, after which the "Sparkman House" concept was patterned, would accomplish basically the same results—but the Federal National Mortgage Association would issue and hold mortgages instead of private firms doing the job. This is what happens, incidentally, to the 3 per cent mortgages insured by FHA under the moderate-income 221 D-3 program.

Johnson's quandary: to spend or not to spend

Whatever results, and at press time the eventual outcome of all the congressional interest was by no means certain, President Johnson has found himself in an intriguing political quandary. There are existing housing programs that can do similar jobs; and the new program would cost more money at a time when he's trying to persuade Congress to raise taxes by holding back on his budget.

This is why the President has publicly disavowed stories that his administration favors the "Sparkman House." Yet he can't oppose a new plan that would let ghetto residents buy their own homes.

True, his housing lieutenants helped the Alabama senator with the technical points, but the White House and Senator Sparkman insist this doesn't imply administration backing.

Subsidies ride on larger bill revising "701" planning aid

The lower-income home ownership plan, whichever one results, is only the tip of a huge omnibus housing bill being considered by Senator Sparkman's housing subcommittee last month. Many other changes—in all of the various housing laws under consideration—will be included in this one big bill.

Perhaps the most significant one, over the long run, involves the basic 701 Planning Assistance Program. The 701 idea, helping local planning bodies do their work by providing partial Federal aid, has been around since 1954, when it was first conceived.

Over the years, various changes have been made piecemeal; this year, Congress has revamped the entire program to recodify the law and add some new ideas.

Congress appears willing to go along with enlarging the 701 grant plan to include rural multi-county planning groups. Planning bodies representing "regions" and "districts"—both rural and urban—would become eligible for aid. State planning agencies could provide added assistance to interstate and intrastate planning groups including districts and regions.

The over-all authorization would be increased by $20 million, earmarked for the new "district" planning bodies. Further, an extra $10 million would be authorized for special pilot efforts to do comprehensive public facility planning on a regional or metropolitan basis.

While there's no specific change in the legislative language contemplated, the subcommittee was expected to make clear that private planning firms can participate in the 701 program.
A.I.A. paper proposes mode of working with Defense

The A.I.A.'s government liaison committee has published a "working relationship" statement, although A.I.A. hasn't endorsed the document.

The paper attempts to spell out just what architects should expect from Defense Department construction agencies which contract for design services, and what the contracting officers should expect from architects.

While filled with "jude" words such as "adequate" or "insofar as practicable," the document is more than just some bland generalizations or principles.

For instance, according to A.I.A.'s committee, an A/E firm should produce redesigns at his own cost if bids "exceed the budget established by the contracting officer and agreed to by the architect." There is a proviso, however, that "conditions beyond the reasonable control of the architect" must be assessed before he has to live up to that commitment.

Several engineering societies have come close to endorsing the document, although doubt remains about some of the wording. So far, however, none of the design professional groups have formally endorsed the statement.

And, on the flyleaf of its statement, the committee has acknowledged that the document is "only a bench mark and that further negotiations between the A/E community and the military services will be undertaken."

HEW group urges deeper studies to guide federal aid

The effects of the environment on the nation's health should become the focus of a massive research effort, says a top-level panel of experts.

HEW Secretary John Gardner asked a special task force on environmental health to draw up the blueprint for new programs, and the group picked out environmental design as one area of need. Says group chairman Ron Linton, former staff director for the Senate Public Works Committee:

"The task force recommends that, by 1973, the [HEW] Department develop, through research, basic data sufficient to establish human levels of tolerance for crowding, congestion, noise, odor, and specific human endurance data for general stress and accident threats, including traffic, home and recreation accidents."

Washington briefs

The Senate has gone along with President Johnson's request for $40 million to keep the rent supplement housing scheme moving; now the House, which denied all new funds, and Senate must work out differences.

President Johnson has ordered a new study of how to make use of surplus federal property as potential sites for more lower-income housing.

FHA and the Small Business Administration have worked out a deal so that ghetto area businesses can be located more easily in 221 D-3 housing projects, thereby serving the moderate-income families while providing added income to the non-profit housing owner to pass along to tenants in the form of reduced rents.

The "turnkey" method of constructing public housing got a boost from the White House recently; President Johnson ordered more such projects and asked further that private property management firms be contacted to provide services on contract to local public housing authorities. The National Association of Housing and Redevelopment officials promptly said more money and better administration of existing policies from Washington is needed more than another new idea from the White House.

Progress toward United States-British reciprocation practice is being made by NCARB and ARCUK, Britain's Architectural Registration Council. Both councils have now formally approved the proposal which would permit British registered architects and American architects holding the certificate of NCARB to engage in reciprocal practice once they have met any local requirements for examinations and practical experience.

The British council is now setting up a working party to work out details.

G.A.O. reviewed contract costs at two NASA space flight centers (Goddard and Marshall) to compare costs of the use of private A/E firms to the use of civilian service employees in A/E design. The review showed that due to elimination of many contractor supervisory and administrative personnel, an estimated annual saving of as much as $5.3 million could be achieved at the two centers if these services were performed by civilian service employees.

The VA is holding A/E firms to the 6 per cent fee limitation for all services (including travel), despite the fact that the General Accounting Office will not enforce the ruling pending congressional action. VA is the only agency to comply with the 6 per cent limitation ruling.
Aftermath of the credit squeeze

Last year's credit shortage was still having a depressing effect on building activity during the early months of 1967. As a result, total building contract value in the opening half of 1967 lagged 6 percent behind the year-earlier amount (see table below).

Residential building bore the brunt of the credit squeeze, of course. Losses in all regions forced national housing contract values down 13 percent. Nonresidential building values were held to a 1 percent gain.

Geographically, however, the impact of the scarcity of credit varied considerably. Only one area of the country, the Southwest, registered an increase in total building. Tight money conditions showed no visible effect on nonresidential contract values as they rose 26 percent. This increase more than balanced off a 10 percent decline in the residential category, boosting total building values 6 percent.

Four regions sustained losses in both building categories. In three of these areas, a decline in nonresidential values closely matched the decline in residential values.

The New England states suffered the greatest setback during the first half of 1967 as residential and nonresidential values both tumbled 19 percent. Total building contract values in the Southeast and North Central regions fell 5 and 6 percent respectively.

No such balance occurred in the West, however. While nonresidential values fell 2 percent from the year-ago six-month level, residential contracts dropped 15 percent. Though a lack of available funds undoubtedly contributed to this decline, the tail-end of a lengthy housing market depression in the West was also a significant factor.

The biggest decline in residential contracts during the period occurred in the Mid-Atlantic states where weaknesses in all parts of this building category dropped values 24 percent. However, total building fell only 9 percent as nonresidential values gained 5 percent on the strength of advances in educational, public and recreational facilities.

Total building values in the Ohio Valley almost approached the level set during the first half of 1966, trailing by only 1 percent. A surge of more than 40 percent in manufacturing and recreational buildings provided most of the gain in nonresidential building values. However, heavy losses in hotel and motel contracts lowered total residential values by an offsetting 12 percent.

In the only region to exhibit a pattern somewhat resembling that of the nation as a whole, the South Central area showed a loss of 4 percent in total building values. Despite a 4 percent rise in nonresidential values, residential contracts dipped 11 percent.

By mid-year, however, things were looking decidedly better. The Dodge Index (seasonally adjusted) was back in the vicinity of its previous high level, indicating that the hangover of last year's credit problem had been worked off during the sticky first half. The balance of 1967 is expected to show enough strength to produce a small gain for the year as a whole.
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The firm of Brewer & Mundy had good reason for specifying copper plumbing for this 29-story, 414,200 sq. ft. area building contributing new beauty to Atlanta's skyline. It is lighter, easier and faster to work with, so installation costs are less. Copper tube and the compact fittings can be placed in areas where other piping would be too bulky and cumbersome. This advantage, if used in the engineering stages, often results in construction economies and more useable space.

The engineering firm also pointed out that "dependability" was probably the most important reason for recommending copper. In multistory buildings, repairs to the plumbing system are difficult and costly work. Copper eliminates the possibility of rust-caused trouble in future years, and solder connections, tube to fittings, are superior to threaded joints for leak-proof joints.

Above is one of many majestic structures, completed or in progress, whose owners will benefit from copper plumbing. Their architects and engineers know that to effect speed, space and labor-saving economies, it pays in the early planning to specify copper... Anaconda copper.


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ARCHITECTURAL RECORD October 1967 85
Architects Dobiecki, Beattie and Colyer knew what they wanted for the handsome interiors of the Passenger Terminal at MacArthur Airport at Islip, Long Island, New York.

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We have some very convincing swatches and specifications brochures. We'd like to hear from you.
CPM: The earlier, the better

Each year Critical Path Method gains greater acceptance as a necessary technique of modern construction economics. And one fact is becoming increasingly apparent, though it has not gained widespread recognition—the earlier in the design stage CPM is introduced, the more useful it becomes. Those individuals who are aware of the possible applications of CPM to the whole construction process will quickly point out that the potential of this technique has not been realized, and when it is, the architect and owner will benefit most.

The primary value of CPM in the construction industry is as a vehicle for a more accurate and logical approach to the planning, scheduling and control of a project. But it has other uses. Its structure—a network of scheduled activities—implies much more than, say, a contractor's network. The activities can be conceptual, as in planning or design; mechanical, as in specific, easily quantifiable tasks; or both. This is why CPM has proven useful for planning and scheduling in other industries for completely different types of work. As long as a number of people are performing a number of tasks simultaneously, the only practical way to find the most efficient method of completion is via CPM—or something like it. In construction, the architect needs CPM since he is most frequently responsible for project control. And most advantages that he gains from efficient planning and management through CPM are pass on to the owner.

But again, the one period where the architect can most benefit from the use of CPM is the stage where it has been least used—during early design, in the pre-bid period, just as soon as the budget is set. Many CPM schedules are not drawn until after the bidding. Its effectiveness is substantially reduced when this happens.

Most criticism of CPM grows out of misuse

There have been various criticisms of CPM as it is presently applied to the construction process. It would be more appropriate to criticize the misuse of CPM, rather than the concept itself. One often heard criticism is that CPM is not responsive in the field. Yet in nearly every case where this supposed shortcoming has been observed, it is the result of inadequate preparation of the schedule or lack of proper monitoring.

Much of the dissatisfaction with CPM has been expressed by contractors. It should be pointed out that many contractors—especially the larger ones—prepare and use CPM themselves and have been quite successful with it. But the character of the industry is such that a great deal of CPM work is subcontracted. Since it is difficult to specify quality, many contractors shop for a CPM subcontract much as they would for anything else. More often than not they get what they pay for: low quality work that is not responsive in the field and does not give the architect the necessary information to meet problems when they occur.

Further, despite encouraging talk about a construction team composed of the architect, general contractor and subcontractor, secrecy and reticence often mark the relationship between the team members. Contractors have historically been reluctant to reveal their proposed plan of operations in full detail to the architect. They often feel that the architect may not understand their plan and may later hold them to expressed goals which might turn out to be unimportant to the progress of the project.

One procedure which has been devised to overcome all of the above difficulties is beginning to catch on with many architects, owners, and government agencies. This procedure takes fuller advantage of the capabilities of CPM for project control by getting architects and contractors involved early in the basic planning decisions.

Critical path is most critical in the early stages

The early weeks of any construction project are the most important for the development of a workable critical path schedule. Not only is it imperative to get the project off to a rational, well-informed start, but also during these early weeks the major subcontractors can give more attention to planning. Indeed subcontractors should understand their role in the over-all schedule even before a formal subcontract agreement is signed. Moreover, valuable time is frequently wasted because the CPM consultant is not engaged immediately after an award. He requires even more time to identify the major project features.

Once a CPM schedule is prepared and action is taken on it by the field forces, it must be correct. If it is not—if it has major weaknesses or hasn't considered key relationships between the contracting forces—it will invariably be abandoned. The critical path schedule ought to be a logical statement of the operative solution to a problem. Used properly, it requires that all of the contracting forces think through the various elements of the project. CPM is inherently a tell-tale technique. It not only exposes all facets of the project but, moreover, does so in an impartial manner.

The procedure for a successful application of CPM works like this: The architect develops his own network or engages a CPM consultant long before the job is advertised for bid. In addition to an understanding of network scheduling techniques, the CPM consultant must have a complete familiarity with construction methods. A preliminary critical path schedule is prepared based on available contract drawings. Since this schedule is a dynamic model of the project, valuable information can be obtained from it even before a contractor has been selected. The schedule will assist the architect in determining a realistic completion time for the project, the steps that must be taken if early completion is required, the critical interfaces or milestones for multi-phase projects, the possibility of early partial occupancy of certain project facilities, the effect of weather and season on key project dates, manpower requirements, and a host of similar data.

ARCHITECTURAL RECORD October 1967 87
A preliminary schedule greatly assists bidders

The preliminary CPM schedule, with explanatory data, should be made available to prospective bidders. The bidders should understand clearly that the schedule is supplied to them only for their information and assistance in preparing their bids, and that it does not prescribe a particular method for performing the work. Contractors supplied with such schedules during the preparation of their bids report that it is of great assistance to them. If potential contractor difficulties have been considered in determining completion dates or other project milestones, the CPM schedule will illustrate this. It can also indicate problems (or, hopefully, the lack of them) which might arise from manpower requirements, winter work, or long lead times on the delivery of materials. This enables contractors to evaluate the relative difficulty of achieving project goals much more accurately. It serves to eliminate many unknowns, and in turn leads to better bids.

Under this procedure, the CPM consultant is engaged not only to prepare the preliminary CPM and serve as construction scheduling advisor to the architect, but also to furnish technical CPM expertise through the construction phase.

The successful bidder can then revise the plan

When a general contractor is selected, his estimator and superintendent can sit down at once with the CPM consultant. Their revised CPM schedule then becomes the working plan and schedule of the general contractor. He then assumes responsibility. The plan is no longer the CPM consultant's concept of how the project should be executed but is instead the contractor's official schedule.

At first glance this would appear to pose some difficulties. It might seem that the contractor is obliged to consider, at least initially, the preconceived plan of the consultant. In experience, however, this difficulty seldom materializes. In fact, contractors find it to their advantage to begin planning with the assistance of a skeletal CPM network. CPM techniques almost invariably require an initial network which for one reason or another proves to be unsatisfactory. With a skeletal program already prepared this time consuming initial dry run is eliminated for the contractor and he can begin work at once on a sensible, informed plan.

It must be remembered that the architect, while gaining many advantages from CPM, also has certain obligations. For example, a proper schedule will tell him when he will receive shop drawings for various aspects of the work. In turn, it will tell the subcontractor when he may expect to receive the approval or comments of the architect with respect to these drawings.

Throughout the life of the project the contractor, architect, owner and others who have obligations to complete work or perform services, report the status of their activity to the CPM consultant on a periodic basis, usually monthly. The consultant then measures this progress against the schedule, and reports project status, existing difficulties, potential trouble areas, etc., to all parties.

The CPM schedule becomes what it should always have been—a dynamic tool used by all members of the construction team interested or responsible for project control. It also becomes an objective and more or less a public document reflecting accomplished fact in relation to a previously agreed upon plan.

More and more CPM networks are being drawn up in this manner—usually when working drawings are 60% to 70% complete. But there are two major reasons why an earlier starting point would be even more advantageous.

Early CPM analysis can save much expense

If CPM is introduced just as soon as the budget is set the probability of keeping the project within the requirements of time and cost increases. Specifically, more time is available for establishing optimum phasing and for pinpointing the timing of critical interfaces. Obviously the closer the drawings are to final completion, the more difficult it is to make any major adjustments for weather, manpower requirements, labor negotiations, the bidding market and other characteristics of the project locale, which would affect the cost and timing of construction.

Secondly, it theoretically permits the architect to simulate and evaluate the effect of each design detail on the rest of the project.

For example, the architect may be debating among several alternatives for a particular detail. Taken separately each detail might be more or less identical in cost. Yet in terms of its relationship to the rest of the project—one item might be much more or less expensive.

If a certain detail is more expensive than another in this sense, the architect has no way of spotting this fact without reference to a CPM schedule. By submitting each alternative to CPM analysis, he is simulating the actual impact on time and cost that would occur, if that detail were included in the project.

In actual practice, of course, examining each detail in this manner would be prohibitive. And on those items vital to the functional and aesthetic requirements of the building, time-cost tradeoffs are inappropriate. But they are appropriate for many items—especially those in the HVAC, electrical and plumbing systems in complex laboratories and hospitals. It has even been suggested that the consulting engineer submit a simple CPM showing the impingement of his basic system and alternative systems on construction time.

If the architect can make it clear to the owner that early CPM analysis can allow him to put money into the building that would otherwise go into temporary heat, overtime pay, and expensive equipment, he can convince him that it is a well justified expense, quite small compared to the potential saving.

LA airport to provide sound insulation for nearby homes

Los Angeles International Airport has become the first major commercial airport in the United States to launch a test program to reduce the effects of aircraft noise by acoustically treating homes in the vicinity of the airfield, according to Louis Warschaw, president of the Los Angeles Board of Airport Commissioners.

At its regular meeting, the Airport Commission gave preliminary approval for the negotiation of consulting contracts with Norman L. Pedersen, Los Angeles architect and structural engineer, and Wyle Laboratories of El Segundo for the development and implementation of such a program.

Dealing with residential properties in selected locations adjacent to Los Angeles International Airport, the contracts would involve two phases: (1) a study, not to exceed 30 days, which includes preparation of a plan for the program and selection of the residences, definition of objectives and methods to be used; and (2), actual insulating work on the homes and evaluation of results obtained, which will require an estimated four to six months for completion.

The Los Angeles Board of Airport Commissioners last June adopted a resolution authorizing the issuance of $75 million to finance a multi-million dollar master plan development. Bids were received September 27 for the purchase of $40 million in revenue bonds, and a second series of $35 million is scheduled for sale in mid-1968 Commission President Warschaw said.
OCTOBER 1967 BUILDING COST INDEXES

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

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 (8.0/10.0 = 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.

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

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ECONOMIC INDICATORS

BUIDING MATERIAL-PRICE INDEXES

BASE WAGE RATES $/HR

MONEY RATE & BOND YIELDS %

ARCHITECTURAL RECORD October 1967

The 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=100%=75%) or they are 25% lower in the second period.
Sometimes when you need more space inside it pays to put the walk-in outside...

Bally makes walk-in coolers, freezers and refrigerated warehouses for both places...

No room to expand the refrigerated storage space in the mass feeding facility or commissary you’re modernizing? Your problem is easily solved. Simply specify an outside installation of a Bally prefab. Available in all sizes from 6 x 6 to 600 x 600 feet, and engineered to provide maximum refrigeration efficiency in tropic heat, arctic cold, snow, rain, wind... every extreme of weather.

Outdoor or indoor, Bally prefabs do their job superlatively. Insulation is 4-inch urethane (equal to 8½" fiberglass) U.L. rated fire-retardant, ASTM Test 1692-59T. Bally “foamed-in-place” urethane develops great rigidity, eliminating the need of structural members. 100% of every panel is non-moisture-absorbant insulation that retains its efficiency permanently.

Increasing size is easy with Bally add-on sectional construction. Relocation is equally easy. When it comes to refrigeration efficiency and fewer service problems, your client benefits from the use of any one of Bally’s 76 self-contained refrigeration systems (½ to 7½ H.P.).

For both indoor and outdoor installations, look to Bally’s Engineering Department for answers to all questions about refrigeration capacity, temperature requirements, winterized systems, and outdoor foundations. Write for Bally’s 32-page booklet and urethane sample.

See our catalog in Sweet’s Architectural File, No. 23a/BaL.

Bally Case and Cooler, Inc.
Bally, Pennsylvania 19503

For more data, circle 57 on inquiry card
SAVE TIME

BEAR Vinyl Foam Sealant Tape installs 30% faster than calking. And we can prove it.

We asked an experienced crew to compare the time it took to calk floor plates and runner tracks, with the time needed to apply BEAR Vinyl Foam Sealant Tape.

Calking required 59 seconds for 8' floor plates . . . 57 seconds for metal (plus time for loading, clipping and starting their guns).

BEAR Vinyl Foam Tape took only 41 seconds for wood, 40 seconds for metal (including time for removing the liner and butting the tape).

Time saved: 30% for wood . . . 29% for metal.

Since BEAR Vinyl Foam Sealant Tape is also outstanding for sound control . . . needs no clean-up . . . no on-site preparation . . . no special tools . . .

Isn't it smart to save time . . . and money . . . with BEAR Vinyl Foam Sealant Tape? Mail the coupon for details.

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ARCHITECTURAL RECORD October 1967 91
DOOR CONTROL OF QUALITY
will last through the years in this modern school

Whether it's stopping the door, holding the door or cushioning the stop...you can specify GJ with the confidence of getting many years of trouble-free service. There is always a variety to choose from...meeting varied budget requirements as well as many different functional needs. As modern schools over the country have learned...

IT'S ALWAYS SAFE TO SPECIFY GJ.

GLYNN-JOHNSON CORPORATION / 4422 NORTH RAVENSWOOD AVE./ CHICAGO, ILLINOIS 60640

For more data, circle 59 on inquiry card
Texas firm adopts micro-records storage and retrieval

Caudill Rowlett Scott has solved the problem of information storage and retrieval by converting all of its records (visual and documentary) to a computerized microfilm file system. Information, including copies of drawings, renderings, specifications and photographs, can be located and retrieved in seconds. According to the firm, benefits accrued (including a complete duplicate set of security files) more than compensate for the system's cost, figured at less than $13,000 per year for the first five years. And that includes reduction to microfilm about a million pieces of past records now stored in warehouse, as well as all viewing and filing equipment with the exception of the IBM 1130 computer to which the system is adapted. (The firm has been expanding management and planning jobs for the in-house computer for about two years.)

Records must be permanent and readily accessible

Since there is no statute of limitations on the responsibility of architects in Texas, architects in that state must permanently retain their files. But the problem of information storage is compounded for CRS by a growing number of projects per year and increased quantities of file material per project. For about 160 currently active projects, the firm averages 1,200 items of record per project. Furthermore, according to C. Herbert Paseur, managing partner, CRS was aware that it was constantly redesigning many uniform construction features such as ships ladders, flashings and curbings. Still, the only alternative to redesigning was the even more time-consuming task of retrieving a particular drawing from the company's file of completed projects.

In the past this meant that a draftsman working on a particular feature, knowing that it had been done before by the firm, would go to his project manager. The project manager would try to recall what completed project drawing had the feature, and then send an office boy to search for it in the project's storage bin located in the warehouse across town. Usual results: frustrating failure. Finally the project manager, if he was determined, would go to the warehouse himself and find the correct drawing—"perhaps recognizing it by a coffee stain." Returning the drawing to the warehouse was equally chancy.

A million-piece file gets finger-tip control

With the new microfilm system, information can immediately be obtained in the 400-square-foot Information Storage and Retrieval Center (ISRC), staffed by a full-time clerk who is responsible for maintenance, operation, filming, and all filing of information. The Master Central File, the heart of the center, includes a micro-copy of all information on every project—the entire job history of the firm. Thus, the employee requiring specific information from a project drawing need only go to the center and obtain the appropriate aperture card or micro-jacket from the clerk, view it on the reader, and secure—within 20 seconds—either a hard copy enlarged back to original size from the viewer-printer, or a microfilm copy card for inclusion in a satellite file from the diazo copier. If specification sheets or correspondence are required, microfiche mountings may be obtained for viewing and copying. Since master file cards never leave the center, the old problem of lost or out-of-file situations is eliminated.

Security is another salient feature of the system. Should the complete office file be destroyed, duplicate cards stored in a bank vault are readily obtainable; and microfilm copies are acceptable as evidence in court, should a legal question arise.

But most important, the system provides more information in less turnaround time, permitting expensive personnel to capitalize on the firm's experience. Says Paseur: "The less time we have to devote to prosaic non-creative matters, the more we can give to approaching clients' needs in a way to meet those problems unique to his project."

Index locates any drawing in microfilm aperture card. Reader-printer makes full-size hard copy, or desk-top viewer gives instant reading.
Components of the computer-linked micro-records system include punched index card (top) used to locate aperture cards (center) with mounted films of drawings or renderings; or to find microfiche (bottom) which carries 16-mm mountings of pages of specifications, correspondence or other documents.
"People can work without plumbing. And they can work without air conditioning. But they just can’t work without telephones."

Fairchild Hiller Corporation's facilities manager, A. S. Damiani, knows what he's talking about.

He's seen buildings outgrow their communications capacities time and time again. He's tripped over exposed wires. Cables running across floors. Seen holes being drilled for telephone wires right after a building had been finished.

And he was determined this wasn't going to happen to the new Sherman Fairchild Technology Center near Washington, D. C.

That's why he called in a Bell System Architect and Builder Service Representative at the very beginning.

The result: not just the most modern telephone system possible, but a system which provides for every foreseeable communications need.

Data-Phone* service. TWX. Even closed circuit TV using Bell Telephone System lines.

All cabling is concealed... yet the installation still insures the owner easy access, painless movement and quick expansion.

To make sure your next building is as modern as modern communications can make it, simply call 212-393-4537 collect. We'll send you a complete list of our Architect and Builder Service Representatives.

For more data, circle 60 on inquiry card
How to divide and conquer noise...with Lead

Can you imagine trying to explain wrestling techniques to a class while a volley ball game is going on in the same gym? Instructors faced with this problem found it impossible even though the gym was visually partitioned by a heavy canvas curtain. The shouts and whistles were just too much competition. In Akron's new Harvey S. Firestone High School, the problem is eliminated by a leaded vinyl curtain which divides the large gym into two acoustically-separate units. The main curtain consists of two separate sheets with a 12 inch air space between them. Either or both can be raised or lowered electrically. Secondary curtains which move on overhead tracks like draperies close off the bleacher sections along the walls. All the curtain material is leaded vinyl coated on a durable fabric backing and was supplied by the Duracote Corp. of Ravenna, Ohio. A pleasing turquoise color and an embossed pattern give it an attractive appearance. Noise annoys everyone. It destroys privacy and impairs efficiency. Conquer it with lead.
You get off an elevator faster than you get on. With VIP it’s an advantage.

We timed people getting off elevators and getting on. There’s a difference. Which led us to a new engineering development exclusive with VIP elevating systems: door differential timing. If someone’s just getting off an elevator, our door timer knows, and responds accordingly. The time saved means faster service for everyone.

So many extras are standard with VIP
The place:  
The stately  
First National Bank of Mobile,  
Mobile, Alabama  

The man:  
Mr. Mark Lyons III, President,  
Gulf Flooring and Supply Co.,  
Mobile, Alabama  

The carpets:  
Bigelows.  
Specially created custom rug in the Board Room  
has colors and border design keyed to the two antique Chinese  
urns on either side of the fireplace.  

Why do people like Mark Lyons specify Bigelow?  
Because they know that for every hospital, hotel,  
motel, bank or other commercial building, Bigelow  
has or can custom-create the perfect carpet. We've  
done it since 1825. Our carpet counselors will give  
you all the help you need in solving any kind of  
carpet problem—at no charge. Simply call your  
nearest Bigelow sales office. Or for a colorful, free  
brochure on commercial carpets, write Dept. A,  
140 Madison Avenue, New York, N. Y. 10016.  
Find out for yourself why  
people who know buy Bigelow  

Bigelow sales offices are located in Atlanta, Boston, Chicago, Cleveland, Dallas, Denver, Detroit, Los Angeles, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, San Francisco, Seattle.  

For more data, circle 64 on inquiry card
One man operates the Honeywell Control Center that starts, stops, adjusts, reveals, alarms, monitors, analyzes, and checks almost everything in an industrial plant. Shown here: Two views of 57-acre Chrysler Corporation Sterling Stamping Plant, Detroit, Michigan. Architects and Engineers: Giffels and Rossetti, Inc., Detroit.

Now! Honeywell | 1-man | Control of an entire plant that pays a 33\% annual return

That's right, most plant owners save enough in operating costs to pay for Honeywell automated control in 3 years or less...a 33\% annual return on investment!

One man at the control center:
- reads and adjusts temperatures.
- starts, stops and adjusts equipment.
- protects an entire plant against fire and intrusion.

Five systems. Honeywell offers 5 different systems to fill your needs, and more fire and intrusion detectors than anyone else, so you can pick exactly the protection you need for each commercial building job.

Greatest reliability. Only Honeywell offers microelectronic circuitry for infinite life expectancy and reliability.

Personal follow-up. There's a field staff of Honeywell Building Automation Systems Engineers to help your clients get full payback.

In short, Honeywell can design, build, install, guarantee and service the complete temperature control and protection system you need for any commercial building you design.

Make us prove it. For examples of operating economies in other plants, just mail the coupon.

Honeywell automation systems help make people more productive

FREE BOOKLETS!
\[\text{\checkmark} \text{Send copies of Building Automation and Security Planning Guides.}\]
\[\text{\checkmark} \text{Have a Building Automation Systems Engineer call with examples of operating economies.}\]

Honeywell, Dept. AR 10-133
Minneapolis, Minn. 55408

Name
Title
Firm
Address
City State Zip

ARCHITECTURAL RECORD October 1967 101
Wenger
CORPORATION
58W WENGER BUILDING
OWATONNA, MINNESOTA 55060
507-451-3010

Designers and Builders of the Finest Acoustical Enclosures

For more data, circle 65 on inquiry card
Metal walls go up faster

...and last and last with finishes of Kynar® 500!

Metal walls go up nearly 10 times faster than brick or masonry walls, and cost $\frac{1}{5}$ to $\frac{1}{2}$ as much. They can be taken down quickly for easy access or plant expansion.

What's the best protection for the metal? Finishes of Kynar 500! They come in a wide selection of colors; assure perfect color match panel for panel. They're durable: won't crack or craze, take abrasion in stride. Accelerated tests by Pennsalt, plus years of exposure data project 30 years of maintenance-free life!

For your next industrial building, consider metal walls highlighted by a colorful finish of Kynar 500. For more information, contact Plastics Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia, Pa. 19102. (215) LO 4-4700.

Make your base specification Kynar 500! 

For more data, circle 66 on inquiry card
ON THE CALENDAR

NOVEMBER

2-4 Central States A.I.A. Regional Conference—Mayo Hotel, Tulsa, Okla.

5-7 Western Mountain States A.I.A. Regional Conference—Broadmoor Hotel, Colorado Springs, Colo.


15-17 Semi-annual meeting of Consulting Engineers Council of the United States—Olympic Hotel, Seattle.

30-December 1 Seminar on "Metallic Materials in Architectural and Structural Applications"—Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

30-December 2 International Conference on Masonry Structural Systems, conducted by the College of Engineering, University of Texas—University of Texas, Austin.

OFFICE NOTES

OFFICES OPENED

Don Brandenburger, A.I.A., announces the establishment of offices for the practice of architecture and planning, 251 Kearny Street, San Francisco.

Howard Francis Sims is now engaged in architectural practice with offices at 321 South Main Street, Ann Arbor, Mich.

Wiley & Wilson, consulting engineers and associated architects of Richmond and Lynchburg, Va., have opened North Carolina offices in Suite 1923, Wachovia Building, Winston-Salem.

Preston R. Luce is now engaged in the general practice of architecture with offices at the Woodbury Building, Hampton, New Hampshire.


Clark and Enersen—Olsen, Burroughs and Thomsen, a Lincoln, Nebraska firm of architects, engineers and planners, has opened a branch office at Grand Island, Nebraska. The new office is headed by architect Larry Westerbeck.

W. Kelly Oliver announces the opening of an office for the practice of architecture at 305 Detroit St., Denver.

NEW FIRMS, FIRM CHANGES

The firm Gertzoff, Nuckolls and Warfel, Inc. has been established at 207 East 37th St., New York City. The new lighting consultant firm will specialize in architectural and theatrical illumination.

Bradford Shaw has formed a partnership with Robert L. Hamill Jr., A.I.A. The new firm name is Hamill/Shaw Associates, located at 1120 Lewis St., Boise, Idaho.

John K. Harasciuk has been named senior planner in the firm of Morton Z. Levine and Associates, Inc., Architects, Engineers and Planners, Skokie, III.

Earl A. Freels and Robert S. Borders are now on the architectural staff of Linesch and Reynolds, environmental planners of Long Beach, Calif.

The architectural firm John Morse & Associates of Seattle has named James F. Hamilton an associate of the firm.

Clifford J. Ocheltree Jr. has joined P & W Engineers, Inc. of Chicago as chief mechanical engineer.

J. Streeter Wiatt Associates announce that the firm's name has been changed to Wiatt, Watson & Cole Architects. Their office is at 746 Adams Ave.,

continued on page 125

For more data, circle 67 on inquiry card

ARCHITECTURAL RECORD October 1967
George Nemeny (F.A.I.A.) tore down walls, installed skylights, window walls and white ceramic tile to update this Kings Point, N.Y., house designed by Stanford White at the turn of the century. He flooded the dark interior with light and centered on highlighting a magnificent view of Long Island Sound while retaining the spirit of the Classic Revival original.

Glazed ceramic tile for kitchen countertops and splash areas provides a sanitary, scratch-stain-burn-resistant and easy-to-clean surface for preparing food. The center island topped with tile offers an attractive cooking and snack spot with work and storage areas combined.

Unglazed ceramic tile gives a safe, non-slip, easy-to-clean surface for bathroom floors, walls and the step-up tub in the master bath. Floors in the kitchen, dining room, powder room and solarium are also ceramic tile. The builder for this rejuvenation was Laimons Birkmanis and Cramer Bros. of Cold Spring Harbor installed the tile.

For a long-lasting, carefree material that offers you unlimited design ideas for interior and exterior use in either new or remodeling projects, specify ceramic tile made in the U.S.A. The triangular mark at right appears on every carton of wall tile, ceramic mosaic tile and quarry tile when you select and install Certified Quality Tile. This seal is your assurance that tile is regularly sampled and tested by an independent laboratory to meet the most rigid government specifications (SPR 861-61 and SS-T-308b). For more data about Certified Quality Tile and tile installation see Sweets Architectural File or write: Tile Council of America Inc., 800 Second Avenue, 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. • Hoffman Tile Mfg. Co., Inc. • Huntington Tile, Inc. • Keystone Ridgeway Company, Inc. • Lone Star Ceramics Co. • Ludowici-Celador 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 68 on inquiry card

ARCHITECTURAL RECORD October 1967 105
This is our 4000 Series — the 4th design from the Alma Trend Program. Another reason why Alma is the world's leading manufacturer of wood office furniture. For catalogs showing this and the other Trend lines write on your letterhead to Alma Desk Company, Box 271, High Point, N. C. 27261.
William Bayley windows—both aluminum and steel—may be specified with the new Bayco finish. Unlike traditional paint, Bayco finish won’t crack, peel, blister—and it resists chemical attack. Big advantages are low cost color control by the architect, tough protective finish that lasts for years, and no field painting. Bayco finish is applied by a special process to fabricated windows only after super cleaning and super drying. And, of course, Bayley will join your team to achieve the color effect you want. Bayco finish is also available on Bayseal weather stripped steel windows. For details write The William Bayley Company, Springfield, Ohio 45501.

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Koroseal grass cloth comes in Pure White, Bone White, Tea Leaf Green, Eggshell, Ivory, Opal, Oriental Blue, Bamboo, Limed White, Natural, Hemp (a few shades darker than natural), Olive, Ming Red, Taiwan Tan, and Char Brown.


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For more data, circle 71 on inquiry card.
Air diffusers for the $33.5-million Music Center of Los Angeles County had to meet these primary criteria—blend with the elegant decor, deliver effective air flow patterns in huge halls as well as smaller areas, and be quiet enough not to disturb the sensitive ears of music lovers.

Several types of Anemostat diffusers were chosen for the trio of outstanding buildings. In the Dorothy Chandler Pavilion and Ahmanson Theatre, for example, Anemostat's ALD Architectural Linear Diffusers became unobtrusive elements of the interiors. These linear units distribute 250,000 CFM of air to the pavilion with no audible hisses or hums.

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For more data, circle 73 on inquiry card
This school's steelwork is "painting" itself


The exterior columns in Dos Pueblos High School, Santa Barbara, California, a 17-building complex, are made of the steel that "paints" itself—USS Cor-Ten Steel. As it weathers, USS Cor-Ten Steel develops a tight, dense oxide coating that seals out corrosion. If the oxide is scratched, it heals itself.

The architect chose Cor-Ten Steel for its rich, earthy color and texture, and to minimize maintenance. Steel which required painting would have cost less initially, but, in the long run, would cost considerably more than Cor-Ten Steel because of the need for periodic maintenance and repainting.

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United States Steel: where the big idea is innovation

ARCHITECTURAL RECORD October 1967
A bit heavy for the average living room, but just perfect for the 24,000 square-foot arena at the new Anaheim Convention Center. 21/2 tons of Altec "Voice of the Theatre"® speaker components make up a speaker system straight out of a concert hall. Just what the Center's arena needed to sound like one.

The giant cluster, covered with grille cloth, is suspended from the arena's dome. It provides speech and music reinforcement for events as diverse as boxing and ballet, musicals and mass meetings. Hence the need for concert hall quality. Hence Altec.

Altec sound equipment is used throughout the 15-million-dollar complex. Modern all-transistor amplifiers, control consoles, and a multitude of low and high-level speakers and speaker systems contribute to the perfection of the total environment designed into the Convention Center.

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For more data, circle 74 on inquiry card
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For more data, circle 79 on inquiry card
A single climate conditioning system would be fine if you had no outside rooms in your plans. But...
Ed Davies had to design for outside and inside room.

Chilled Water - Electric Heat

If Freedom High School in Bethlehem, Pennsylvania, had all interior classrooms, Ed Davies of Gilboy Associates could probably have called for a central system and been done with it.

But Freedom High wasn't designed that way. It has both perimeter and interior rooms, and no one system—unit or central—would do the best job for both situations.

So he designed a system for Freedom High using central equipment for interior zones and unit ventilators for peripheral classrooms. And every bit of that equipment came from one source: Nesbitt.

The system uses chilled water for cooling and electric resistance for heating. A central chiller feeds both the individual Nesbitt Unit Ventilators and the Nesbitt Central Station Units. This unusual combination resulted in the lowest installed tonnage of air conditioning. For heating, the unit ventilators use five-step electric heating elements, while the central station units use electric heating with terminal reheat.

(An interesting sidelight: the school was originally designed with a Nesbitt four-pipe all-hydraulic system. But the electric company offered a blanket one-cent energy rate, with no demand, applicable to both lighting and air conditioning, prompted this change to a chilled water cooling, electric heating system. Nesbitt could handle that one too with no trouble.)

The combination system at Freedom High provides full-time, room-by-room control even when spaces are subdivided or opened up. And all for $2.47 per square foot for year-round air conditioning—$41.15 for the complete air conditioning and electric contracts.

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Full description on request or see Sweet's 1967, Sec. 16e/Lc

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PHOTO: Auditorium Entrance, North Central High School, Indianapolis, Indiana; Everett I. Brown Company, Architects
you see so much more in carpeting when you call in Berven of California

The sharp pencil of a tight budget need not cross out the aesthetic contribution of Custom Carpeting. Question is: How tight is "tight"? For example, Berven Of California will custom-dye and custom-weave a wide selection of its custom qualities at a cost comparable to that of other's medium-priced stock broadloom. These are but the beginning of intriguing custom effects designed to give your project a rewarding touch of individuality. Should you decide, however, that the budget calls for stock broadloom, aesthetics still need not be overlooked. Turn to Berven Tufted Broadloom. Discover the fresh textural styling and sure use of color that spring from our Custom Carpet heritage. The pricing is most refreshing, too. May we call or send samples?

For more data, circle 82 on inquiry card
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A complete line for any school application

George W. Neff, Herman A. Hassinger and Gerald F. Schwam announce the affiliation of their architectural practices and the opening of an office under the name George W. Neff/Hassinger and Schwam, Architects-Planners. The new firm's offices are at 39 East Schoolhouse Lane, Philadelphia.

Anton Tedesco, D. Eng., formerly with Roberts and Schaefer Company, is now in private consulting engineering at 26 Brookside Circle, Bronxville, N.Y.

Albert Edwards Margetts, Jr., R.A.I.C., has joined the Detroit firm of Eberle M. Smith Associates, Inc., Architects and Engineers, as a staff architect. The firm is located at 950 West Fort Street, Detroit.

The architectural firm, Damon-Worley-Cady-Kirk & Associates of Cleveland and Youngstown, Ohio, has named Thomas W. Bode and Jack C. Wessenauer associates. They are based in the Youngstown office, 275 West Federal St.

Paul Kenyon, A.I.A., has joined Caudill Rowlett Scott, Houston architects, planners and engineers, as an associate.

Burns & McDonnell Engineering Company has admitted Walter R. Giese, A.I.A., to partnership. The firm is at 4600 East 63 St. Trafficway, Kansas City, Mo.

Wilton L. Ferguson, Louis N. Maloof, Edward F. Meneelee, Edward C. Wundram and John A. Wurz are now partners in the architectural and engineering firm of Heery and Heery.

Lester H. Seiler has been named a vice president of A. Epstein and Sons, Inc., architects and engineers of 2011 West Pershing Road, Chicago.

Everett D. Finney has joined the New York office of Charles Luckman Associates as project architect.

George E. Galayda has been named an associate of Smith, Hinchman and Grylls, Inc., Detroit-based architects, engineers and planners.

Swensson and Kott Architects, Inc., announce the opening of its new facilities at 2104 Sunset Place, Nashville, and the change of its name to Earl Swensson Architects Inc.


How many sandwiches can you count in this Expo 67 pavilion?

There are 264 triangular aluminum faced panels in the Austrian Pavilion. And every one is fabricated with Union Camp Honeycomb structural sandwich core.

Why Union Camp Honeycomb?
Most of the Expo 67 pavilions are built on newly filled land, and beefing up a foundation is expensive. But structural sandwich panels made with honeycomb keep weight to a minimum while maintaining maximum strength. In fact, honeycomb has the most favorable strength/weight ratio of any structural core material made. Yet honeycomb core density is only \( \frac{1}{2} \) lbs. per cubic inch.

Modular honeycomb panels require less time and labor than conventional construction. Floor, wall and roof sections are lighter and easier to handle. So if your building problems involve strength, weight or economy, maybe you should get to the core of the matter, too. With Union Camp Honeycomb.

Honeycomb, as manufactured by Union Camp, is a resin-impregnated kraft fibre structure fabricated as to form nested hexagonal shaped cells. This remarkable lightweight material is similar in appearance and principle to the honeycomb of bees—yet is as modern as the space-age. Honeycomb is manufactured in various grades and sizes and can be designed to meet the requirements of a variety of design problems. Honeycomb is especially effective when panels combining light weight and high structural strength are required.

Austrian pavilion's large modular structural units are made up of four separate panels. Each panel is filled with Union Camp kraft Honeycomb cores. These facings continuous support—eliminate need for rivets or spot welds that have to be finished off before painting.

Union Camp Corporation, 233 Broadway, New York, New York 10007
For more data, circle 86 on inquiry card
Ulrich Franzen believes that his buildings get their design energy through the successful resolution of problems posed by their environment. No advocate of universal flexible space, he asserts: "If you can move a building from the place for which it was designed to a different place, and it still looks good, it is a bad building."
The four current projects which follow reveal that in his reach for the ideal design for a particular program and setting, Franzen is well served by a design vocabulary made extensive by his strong understanding of modern as well as historic forms. This enlightened eclecticism caused his work to exhibit the principles of complexity and contradiction long before they were in fashion and codified by architect Robert Venturi—indeed at a time when the work of most architects still professed the virtues of simplicity and consistency. Now that almost every one has begun to play a more complicated esthetic game, adepts like Franzen deserve close study.
THE ELK GROVE UNITED PRESBYTERIAN CHURCH: A SKILLFUL ASSEMBLY OF ADAPTED FORMS

Lionel Freedman photos—except as indicated
Architect Ulrich Franzen is singularly able, as in this new church project, to produce an accomplished synthesis of assorted stylistic elements, each of which has been boldly stated and correctly used. This design makes no effort to conceal its debt to Frank Lloyd Wright, Le Corbusier, and their distinguished disciple Louis Kahn.

The plan, Wrightian in its geometry, neatly articulates the separation and contrast between the low-ceilinged, intimate quality of the teaching space and the vertical thrusts of the worship space. The latter is shaped by two great skylit shafts which come to Elk Grove by way of Chandigarh and Rochester. To be built of laminated wood arches and beams, they will be covered with aluminum on the exterior, and give an impression of lightness neatly juxtaposed against the church's heavy masonry base. The horizontal element has its own skylights, similar to forms which first gained widespread attention when they appeared as light sources for the chapels at Corbu's Monastery of La Tourette.

The church will rest upon an open flat plain and be surrounded by built-for-sale houses typical of mobile young middle-class families. Franzen strove to achieve a sense of place for this house of worship, by working with elements which suggest permanence and enclosure.

The solid appearing textured concrete block walls indicated in the rendering on page 133, and the carefully sculptured berms shown in the plot plan and model photograph at left, are designed in a manner to reconcile opposites. These forms help distinguish the church from its surroundings, and establish its separateness and importance—yet at the same time they reach out, invite and welcome the worshipper into the religious precinct, and then contain him within it.
BUILDING FOR THE NATIONAL PARK SERVICE: DESIGNED TO RESPECT AN HISTORIC SITE
The old town of Harpers Ferry—site of a major battle of the Civil War—is now in the process of restoration. Dramatically located at the confluence of the Shenandoah and Potomac Rivers, the town and its surrounding hills have long been a popular national park. Recently Harpers Ferry was selected as the location for a so-called Interpretive Facilities building to serve the entire national park system as the place where exhibits and displays would be designed and constructed. Because of the beauty and historic importance of this site, great care was taken in the program writing and in the final approval of this design.

The model photograph above shows Banzen's new building as it will appear on the brow of the hill, as seen from the opposite side of the Shenandoah River. The podium which supports the terrace is strongly assertive. Inspired by Roman aqueducts, it will consist of load-bearing brick arches. In contrast, the second and third floors recede from view beyond the edge of the terrace. Influenced by Corbu, these elements of the structure are supported by light rectilinear post-and-beam construction.

The side of the building facing the Shenandoah is freely asymmetric following the cliff edge. The facade which faces inward toward the symmetrical campus of Storr's College is quiet, orderly and subtly related to the classic pattern of the old grounds. The forecourt of the new building will become the focus of the complex. (The college no longer functions as such and its buildings have been taken over by the National Park Service.)

The structure will be entirely of reinforced concrete. Continuous flat labs will be supported by large columns set in bays 20 feet square. Except for the terrace podium, all exterior walls will be of local brick veneer on block backup with insulation in the cavity. They are non-load-bearing.
The basement level houses the shop areas and audio-visual facilities and the first floor main entry level houses the public spaces and head­quarters offices. On the top floor are small studios. The reception area is arranged to facilitate exhibitions. The floor of the coffee lounge has been raised to give it a separate setting and to improve the view over the terrace and valley. Glass areas are carefully related to func­tion: modest-size arcaded openings will be provided at the shop and audio-visual level. Maximum openings under overhangs are planned for the public areas. The top-floor studios have slotted openings to reduce heat load and glare, and central skylights to illuminate the interior spaces.

FACILITY FOR A RELIGIOUS SOCIETY: A VICTORY FOR NEIGHBORHOOD SCALE
The inclusion of three undistinguished 19th-century facades, behind which one half of this complex structure hides, might at first glance be dismissed as a quixotic attempt by Franzen to preserve the conditions of contradiction. In this case, however, the rules of the esthetic game were not established by the architect, but by New York City's Landmarks Preservation Commission. This body is empowered by the Landmarks Preservation Law to reject construction proposals which in its opinion will damage the appearance and quality of a so-called "Historic District." In turn the Commission is in a unique position to support construction which in its judgment helps maintain the character of the landmark neighborhood.

On December 1, 1965 the Commission designated Brooklyn Heights as New York City's first Historic District and earlier that year the Federal Government named it a national registered historic landmark. The Watchtower Bible and Tract Society, the official organization of the Jehovah's Witnesses movement, wished to build a 12-story dormitory and classroom building on the corner site which they presently own—shown in the photograph above opposite. A strong civic group, the Brooklyn Heights Association, supported by the New York City Commission, persuaded the Watch Tower officers to hire Ulrich Franzen to design a five-story structure more in scale with the residential quality of the old neighborhood. If the new building were to conform to present zoning codes, however, it would still be too high. The three facades are to be preserved therefore, not because anyone believes they have intrinsic architectural merit apart from their over-all scale, but because their preservation enforces a satisfactory height limitation on the adjacent structure, which is to be the first new project to be built in any officially designated landmarks district.
This residence hall for the University of New Hampshire has an unusually plastic facade for a building to be constructed by a state university within its predictably restrictive budgets. The trick here is in the room shape, shown overleaf, which gives each of the two students in a room a window, either vertical or square, which opens to his own restricted bit of turf. Further elements which complicate and enhance the exterior masses are the student study lounges, seminar rooms, more formal lounge spaces and house-director suites. These elements are bounded by exterior walls continuous within a single plane which contrast effectively with the concave and convex surfaces of the walls which form the exterior enclosure of the dormitory rooms.

The residence hall houses 450 stu-
students in groupings of 24 to 26 per floor. The smaller groupings minimize corridor lengths and reduce traffic and noise. The building masses are broken down into elements of varying heights ranging from three and four stories to ten. This helps foster a sense of identity between the students and the spaces they occupy within the larger complex. Research has shown that two students can better adapt to the extremely constricted quarters which have become standard in low-cost dormitory construction if they can study without having to look at each other. Franzen's scheme admirably performs this function within the minimum allowable space (see drawings, right).

The perspective drawing below shows the hall as it will appear from the central landscaped space, a natural raised clearing which will be kept free of cars. The perspective on the preceding page shows the approach up a handsome flight of stairs from the vehicular level. The site plan indicates future residence buildings and the location of the projected dining hall.
A BUILDING DESIGNED FOR SCENIC EFFECT

I. M. Pei’s National Center for Atmospheric Research is a direct response to a spectacular site and a highly philosophical program

By Jonathan Barnett

I. M. Pei’s National Center for Atmospheric Research would be a difficult design to understand if it were removed from its setting on a mountainside in Boulder, Colorado. The arrangement of the building on its site is clearly the key concept, and the internal relationships—while they work well enough—do not give the building its form.

Only a few years ago architects and critics were saying that buildings would no longer be designed in this way, from the outside in, as mass instead of space; and the Atmospheric Research Center does not possess the other supposedly indispensable characteristics of “Modern Architecture” either. Not only is it not a part of a uniform international style, but it is quite different from other work that Pei was designing and building at the same time; regularity and flexibility are hardly salient characteristics; the structure is not expressed; and the architect made a special effort to use indigenous materials as the aggregate for the concrete, a philosophy much more akin to those picturesque country houses built from stone quarried on the site than to modernist ideas about factory fabrication.

While we no longer expect such a building to produce a denunciation in some English architectural magazine (with the architect being excommunicated from the modern movement’s “main stream” and some general aspersions about American frivolousness and lack of seri-
ous architectural understanding) we are still having some trouble lining up architectural philosophies with what architects are actually doing. There has been much recent speculation that architecture is entering a “Mannerist” phase of complexity and contradiction. In evaluating this idea it is important to separate the complexities and contradictions which are actually architectural from those which exist only in the mind of the theorist. Much of what is happening today can be viewed as traditional, with architects trying to respond to important problems by discovering the essence of ideas that had produced successful solutions to such problems in the past.

The Atmospheric Research Center is a traditional building in that sense, and a direct response not only to the character of the site, but to the basic nature of the program as well.

The site was selected by the client well before the process of interviewing architects began. The client, a non-profit corporation that receives funds from the National Science Foundation but is owned by a consortium of universities, is a national center for inter-disciplinary research into all problems relating to the atmosphere. It could have been located in a great number of places. While there were clearly some practical considerations favoring the selection of Boulder—a university town at a relatively high elevation, close, but not too close, to a major city—the site was really chosen for its spectacular beauty.

It is a mesa on the side of one of the eastern-most ranges of the Rocky Mountains. It thus affords both a vista of mountain peaks and a panorama of the town and plains below. It is a setting with strong similarities to that of the Air Force Academy in Colorado Springs, some 100 miles to the south.

The client’s program was essentially a philosophical one: it concentrated on stating what was not wanted, rather than on setting stringent requirements. The view of research facilities that emerged was of places that
should be personal, idiosyncratic and possibly slightly shabby; definitely not uniform, shiny, or regimented.

Nor was there any clearly delineated series of functions that could, or should, be expressed. The type of research done generally required more thinking than concocting. The proportion of each was uncertain, however, and in any event likely to change, so that, as the servicing requirements were only moderate, there was no rationale for making a clear separation between offices and laboratories. The client did not mind if the resulting building was a confusing place to visit, as long as it was a good place to work.

In the end, the architect found that the program was philosophical because the function of the building was philosophical. It was to be a place to think, and the thinking would be done in abstruse realms along the fringes of human knowledge. Thus the forms that expressed the function must needs be philosophical as well.

Pei’s response, after considerable experimentation, was in effect to design a castle, and then remodel it into a laboratory. The castle was a response to the site and the “ivory tower” aspects of the program; the remodeling just set in motion a process of minor changes and arrangements that presumably will go on indefinitely.

The castle keep is a two-story building at the southern end of the site which contains elements like the meeting room, library, and dining room that everyone in the complex will use, along with certain support facilities.

Individual offices and laboratories occupy the towers, which are linked to the general-use building by bridge-like elements. The towers are grouped in pairs, also linked by bridges. In one pair, Building B, the smaller tower contains offices and the larger one laboratories. The other pair, Building A, contains only offices, although it looks quite similar to Building B.

A later stage will include another pair of towers, a long span building for types of research not possible in smaller laboratories, and a conference center.

It is the design of the towers which provides the key to this building’s highly successful relationship to
its site. In the towers, Pei deliberately suppresses the structural expression of the floor-to-floor height and fragments internal volumes in order to create scale-less masses that can hold their own against the surrounding mountain peaks. The hooded balconies at the top supply the place of battlements and give the towers form.

The fragmentation produced by the towers allows Pei to adjust his building to the sloping site, so that, in his words, "building and podium are one." Fragmentation and irregular disposition of the building's elements also insures that the observer never sees the full extent of the complex at one time, which prevents a final judgment on the building in relation to the mountains.

The comparison with the Air Force Academy is instructive. There, massive walls establish a podium, on which stand rectangular buildings whose extent is clearly defined and whose structural cage is clearly expressed. Pei says that the Air Force Academy design works because the large glass areas combine into a scale-less reflecting mirror, a solution that Pei was denied because of requirements for wall space and temperature control.

Actually, the Air Academy, from a distance, reads as an attempt to impose its geometric order on some particularly rugged scenery, while Pei's building—on the principle of "if you can't beat 'em, join 'em"—uses an aggregate of native rock to blend with its surroundings. The towers of Pei's building also have a scenographic effect of their own, which is particularly impressive from the masterfully designed approach road.

The two least satisfying qualities of the Atmospheric Research Center are its equivocal nature as a form and a certain disquieting thinness about some of the elements that one expects to be more massive.

The equivocal quality is the result of the building being neither a clearly defined object in the landscape nor a self-effacing element of the landscape. It is thus probably an inescapable consequence of the way the architect approached his design. Wright's "Falling Water," which also is neither object nor landscape element, produces a similar effect of not quite knowing where you are; but a quality which is piquant in a house can be disturbing in a large building.

The appearance of excessive thinness occurs whenever a cross section of the concrete wall is actually exposed to view, chiefly in a number of round-arched door openings and in the overhangs at the top of the towers. The concrete wall turns out to be a stiff, sheet-like element, where the deep window recesses had led you to expect something much more like masonry construction.

But, if the building's vocabulary does not cover all the potentialities of modern structural materials, it still shows a highly sophisticated ability to come to terms with what modern technology can do, without producing a polemic about what technology is. In common with several other important buildings of recent years, the Atmospheric Research Center shows that it is no longer necessary to think about "Modern Architecture," but simply about architecture. That ought to be enough.
Most of the interior spaces in the building have extensive scenic views, with the exception of the library, which is essentially an internal room. Photo at top is of the lounge, rather like a club in character; at left, the interior of the library with a circular stair leading to the carrels; and below, the top floor of one of the laboratory buildings.
Wall section of top floor laboratories shows the building's characteristic profile. The necessary reinforcing structure, is, of course, completely hidden. Window detail is typical of the way in which connections between poured-in-place and factory-made elements are made throughout the building.
These two projects—the Place by the Sea, an oceanfront resort complex, and Victoria Park apartments and townhouses—meet head-on two urgent contemporary problems: increasing density and reservation of human scale. They are also happy solutions to the personal challenge of design, especially in the matter of interior space, where architect William Morgan was especially concerned with achieving quality “worthy of the occupants.”

THE PLACE BY THE SEA AT ATLANTIC BEACH, FLORIDA, is a large resort development which will ultimately include motel units, cabanas, clubs and restaurants, a 600-foot pier extending into the Atlantic Ocean, and a 120-foot high tower with a bar at the top. Just completed is the first phase of its construction, 100 apartment units and two swimming pools. Over the next four years, the new buildings will replace buildings battered in storms. The completed apartment building is actually two buildings under one comprehensive roof. The apartment units are grouped around four landscaped courts, three of which offer protected outdoor space for sitting and swimming. The fourth court, open at ground level at both ends, is a through access to the beach. The well-ordered exterior design of the building derives directly from the interior space—and spatial quality is the essence of the architect's solution here. Of the apartment types, the most interesting are the two-bedroom units on the second floor where the living rooms are two stories in height, creating a “noble space,” with a view through full-height glass panels.

At night the two-story living rooms are clearly expressed as strong elements of the exterior (top). By day (right) they emphasize the particular spatial quality of these units in contrast to the other two types. Access to beach is through court (above).
The continuous line of the comprehensive roof over the apartment structures is broken only by firewall projections which define centers of each court.

One- and three-bedroom units are on ground floor with two-bedroom two-story units above. Grouping these types and a few four-bedroom penthouse units determined much of exterior design, yet retained integrity of individual units.
Ascending the stair at one end of the two-story living room provides changing views outward to ocean, inward to bedroom balcony, dining space below, and sheltered fireplace cove under balcony—a "controlled variety within an agreeable order." Entrance to two-story space is through low-ceiled foyer.

Materials are simple: second and third floors are wood framed; bearing walls are concrete brick; interior walls are plywood or gypsum board.
VICTORIA PARK APARTMENTS AND TOWN HOUSES, also at Atlantic Beach, not far from The Place By the Sea, are being built in two phases: phase one, now complete, consists of the two apartment buildings seen at the top of the perspective view above. Designed around courts, these one-bedroom units proved so successful that they were fully rented before construction was completed. The second phase, now under construction, combines apartments and townhouses. In the two-story, three-bedroom town house, however, the architect's emphasis on spatial design continues the exploration suggested in The Place by the Sea. The plan of this town house—a clear derivation from Wright's "Suntop" project at Ardmore, Pennsylvania—uses a 32- by 32-foot module for each town house which with its neighbors forms a 64- by 64-foot pinwheel. Each unit has its own private garden, but the ingenious connection of units provides entry courts and, at the center, a large open space with a community swimming pool. Upper floors overhang six-foot wide paved pedestrian ways around each unit.

VICTORIA PARK APARTMENTS, Phase One, Atlantic Beach, Florida. Architect: William Morgan; consulting structural engineers: Haley W. Kleister; Waitz and Frye; general contractor: Lomar Builders, Inc.
The first units completed at Victoria Park are apartment buildings with two-story one-bedroom units—actually, narrow townhouses. The entrance to one group of units, shown in the sketch above, makes a dramatic play of spaces and planes in the stair hall to the upper floor. Each unit has its own private garden.

Each unit is essentially a two-story townhouse, whose main rooms face a private garden. The major interior space is, as at Place by the Sea, a living room a portion of which is two stories high. This high space, along with the stair turret, defines the vertical dimension of the unit. The master bedroom balcony opens onto it. The buildings are of heavy timber construction on concrete slabs.
Some new directions in French architecture

Constraint sometimes makes for liberty. In France, since the World War II reconstruction period, social, economic and political restrictions seem not to have inhibited architectural development—but to have challenged it.

Visiting professional critics, even in the past few years, have generally felt that the most creative architecture in that country—aside from the work of Le Corbusier and Perret—was completed before this generation. But it can at least be argued that the number of individual architects working towards new techniques and vocabularies is increasing, and that the quality of their efforts is improving. What dynamics and development have taken place, have been accomplished in the face of considerable complacency and a considerable reluctance by officials—government and otherwise—to admit that living in an architectural past made it more and more difficult to live and function efficiently in the present.

What has been accomplished? By volume, perhaps not much. But new ideas and fresh designs seem to be growing out of four different developing movements:

The first includes architects who are strongly influenced by the work and teachings of Le Corbusier but who are forming their own vocabularies and thought as changing conditions and economic possibilities provide new bases for Corbu’s philosophies. Two examples of work in this direction are shown on the following pages.

A second movement includes architects who are basing their current projects and research on a visual articulation of existing social forms in man’s urban environment, who are working to improve the visual clarity of buildings. Two examples are on page 164.

A third group includes a growing number of architects who, refusing to accept any of the existing forms, are working towards fresh and personal conceptions of possible environments. Their viewpoints often radically oppose each other—their common link is fresh form. Two examples of this kind of work are on page 166.

A fourth group of architects continues to work with the idea that the most positive way to create an architecture is to use and further develop technology. An example of this line of thinking is shown on page 168.
Some of the new work in France is developing

One example of new work with its roots in Le Corbusier's teachings is this highly spirited and rationally planned vacation complex on the Cote d'Azur. Shown in the photos is one of a series of five linked communities on a 250-acre site; all of which contrast sharply with the random development of the surrounding area. In each of the villages, the tight spatial organization and consistent use of materials has resulted in a pleasing unity. Each village has been planned and built in the scale and character of a Mediterranean hill town.


Chateau Volterra will have 201 houses in five compact village spread along 250 acres of land overlooking the sea. The open land will be cooperatively owned, and will include a beach, boat house, a club with swimming pool, tennis, restaurant, shops, and supervised play areas for children. Outside the built-up or developed recreation area, the land will be left in its natural state. The photos show: 1. One of the interior passages, showing the protected inner courts and balconies of the upper floors. 2. View from one of the interior village squares looking toward the individual villas. 3. One of the interior courtyards providing outdoor living space. 4. A view from the seaside, showing the tight massing of the villas. 5. Plan of the village of Merlier. The sea is at bottom, parking is at the exterior of the village. Water, sewage, electrical, telephone and television transmission lines are underground. Materials used in the interiors include tretta cotta vaults and floors, whitewashed cement walls, and woodwork of Oregon pine. Exterior materials include unfinished concrete, lime stone plaster and varnished Oregon pine.
from Le Corbusier’s thinking and philosophy

Another example: This small children’s library in Clamart, to the south of Paris, which serves as both a cultural and visual center for the local community. The scale and concept effectively enliven the anonymous character of the surrounding apartment structures. The architectural language used in this play of cylinders relates effectively to a child’s scale of activity and interest. Open to the view from above, the library and multi-level terraces are enclosed at ground level by a low surrounding wall. Rough concrete, textured white cement and Oregon pine reinforce the freshness and lightness of the interior and exterior spaces.

A strong, but subtle, expression

In both of these apartment buildings—one in Grenoble (left) and one in Paris (below)—the sculptural effect grows directly and sensibly out of the staggered plan arrangements and resulting articulation of separate apartment units. Nonetheless, the pattern of light and shadow on the facades is independent of the individual levels and rooms, and presents to the viewer in the street below interesting and constantly changing patterns.

This newly proposed administration center for the city of Pantin to the north of Paris groups all public service activities for the community in one building. It is notable that each of the different departments—police, social security, tax service, weights and measures, professional orientation, archives, etc.—is articulated, though of course the pattern cannot be read from the exterior. The architects have physically and visually separated the services within the same building, assigning to each the position and space necessary for proper functioning.

Architects: J. Kalisz and J. Perrotel—Atelier d'Urbanisme et d'Architecture.

1., 2., 3. The strongly patterned exterior is varied and complex, but extensions and setbacks suggest the varied functions within the center.

4. The plan view shows the kitchen, restaurant and roof terrace. The canal and surrounding area will be treated to provide easy access to the center from all sides.
Another group of French architects

This church at Nevers represents one of the earliest manifestations of a new theory of experimental architecture: life on inclined planes, the expression of cantilever and seeming instability, a continuity of movement from interior action to exterior space. This structure is and means to be in bold opposition with its environment; the inclined interior and the suspended nave are conceived to give a new dynamism to religious life.


E. Leon photos

A. Weismehl photos
The shapes and forms of the church are bold and totally unrelated to the land or environment.

4. The interior of the nave looking toward the confessional. In the separation between the two shells is found the secondary accesses, one descending toward the reunion and catechism rooms, the other to the sacristy and the baptistry. In the center of the plan and in the photo above is seen the main stairway. The altar is in the east-west axis of the principal stairway. Since its inauguration a few months ago, the church has found an increasing number of active parishioners in addition to a host of visiting lay and professional people.

The massive but simple form of this proposed exhibition center at Charleville extends upward from its base over the Meuse River toward the opposite hill. It would act as a large public gathering place in providing the space necessary for an annual fair and the equipment necessary for two theaters, a banquet hall, a restaurant, a cafeteria and secondary services, in addition to serving as a public promenade area.

And technology is helping create rational and spirited designs

Technical research and structural refinement have been expressed in the design of this modern paper factory in Melun, southeast of Paris. In the manufacturing area, the architects chose to construct a vast covered space with few interior points of support (column spacing is 220 by 80 feet) as a result of two facts: the need for flexibility in machinery layout, and the use of some machines over 100 feet long. The structure, the internal organization and the site planning have been combined to produce a strong yet subtle total concept.


1. The exterior of the plant is simple and bold, but does not express the factory from the site entrance.
2. enormous spans of the interior.
3. A detail of the column-beam connection.
4. View of the interior of the factory.
5. The plan is simple. A is the commercial and administration building; B is the laboratories and lockers and restaurant for the personnel; C is the manufacturing area. The lower part of the factory is completed; the covered area represents future expansion, an eventual total of 225,000 square feet. For the principal fabrication of the printing and cutting of paper cartons, an important air-conditioning installation was required to provide a constant temperature and humidity. In the factory, the ceiling is hung from the superstructure, the triangular beams serving as skylights.
The impact of Medicare on nursing home design and construction has been extensive—although less dramatic than many had anticipated. Federal funding programs initiated in the National Housing Act of 1959 had already accelerated the construction of new and replacement facilities for the long-term, primarily custodial care of a rapidly growing population of infirm aged. Further, the Act had set up prerequisite standards of space (100 square feet minimum for a single bed room, etc.) and of “skilled” personnel that were making the old “white elephant” mansions run by retired nurses obsolete and unprofitable. The principal effect of Medicare on newer nursing homes has been to change the character of care to shorter stays for more acute illnesses and to emphasize geriatric rehabilitation in addition to, if not instead of, simple custodial care. This was brought about, of course, by the legal limit of 100 days subsidized care under Medicare.

So, while Medicare has increased the population from which admissions to nursing homes are generally drawn, it has generated a demand for so-called “extended care” facilities which may or may not be incorporated in nursing homes. In fact, the term itself implies an extension of conventional hospital facilities (rather than extended time of stay) and calls for a modified, less costly scale of care than is demanded of general hospitals. Many hospitals are providing such extended care facilities and are thus absorbing some of the load that was predicted for nursing homes.

Meanwhile, increasing social security and insurance programs combined with generally rising levels of income are making it possible for more and more families to provide conventional, long-term nursing home care for those who were formerly cared for by the family itself. New facilities, meeting today’s standards, are not the forbidding burdens on the family conscience that some older places were. As Rex Allen points out in the article which follows, the modern nursing home can be a pleasant refuge. The need for them is great and growing, and, as these exhibits show, it can be met effectively.
New concepts in nursing homes: the "custodial facility" gives way to design for active extended care

By Rex Whitaker Allen

The tragedy of nursing homes has been that too often they are nothing more than custodial facilities—places where society shucks off its responsibility and washes its collective hands of the nuisance of caring for the disabled, the infirm, the aged and the senile. Except that it may be closer to home, there is very little difference in social function and philosophy between such a custodial nursing home and the mammoth state mental hospital—an institution which is fortunately ceasing to be an accepted solution to the care of the mentally ill. So too, it could be hoped, the nursing home will give way to a new type of facility, an "extended care" facility which has an active treatment program and may have a close affiliation with a center of medical care. Such a facility is less complex than an acute hospital but provides a program of care centered on the concept of rehabilitation, of restoring patients to vital roles in the community.

A parallel trend is the development of communities for the elderly. Across the country these have taken different forms depending on their sponsorship. It would appear that the most successful have been those which have had a particular unifying force—either a religious affiliation or an ethnic association.

A common interest and varied facilities enrich programs for the elderly

It is conceivable that other social bonds could be equally successful—golf, literature, bridge, the drama, etc. Simply providing seclusion, or exclusion, is not enough. In fact, such developments appear to suffer from the same kind of stultification as the conventional nursing home.

Interestingly, combining an extended care facility with housing for the elderly enriches both. Instead of an isolated nursing home, the elderly are provided with a center for health care and the incapacitated are assured of close social contact with friends and neighbors. An example of such a combination is the Sequoias in Portola Valley, California (below). This community for senior citizens was established by the Presbyterian

Sequoia Health Center's new nursing home in Portola Valley, California, designed by architects Rex Whitaker Allen & Associates in association with John S. Bolles, provides extended care services for an existing clinic as well as conventional nursing home care as required in this 230-apartment community for the aged. The facility has 30 bedrooms, mostly two-bed units, each with toilet and basin. The home shares dietary and occupational therapy facilities with the clinic, accessible via covered walk.
church in 1965. It consists of 230 apartments in single-story buildings grouped around beautifully landscaped courtyards. It occupies a leveled hilltop in a secluded valley approximately six miles west of Palo Alto. Medical care was originally provided by a staff nurse and a doctor who visited a small clinic at Sequoias daily and by a contract with the Palo Alto Hospital.

Sequoias' expanded medical care gives residents reassurance

It was decided very soon that care could be improved by building a nursing home adjacent to the existing facility. It was felt that such a unit would keep the residents who need care closer to their friends, that by expanding treatment facilities an active program could be initiated not only to help those who became ill, but also to help keep other residents in good health, and that the examination and treatment services should be expanded. The new building was programmed to have 30 rooms (most of which were large enough to contain two beds), three examining rooms, a physical therapy room, day rooms, nurses' charting area, utility rooms, etc. Shops and studios for occupational activities were available in the main central building. Since it was reasonable that the dietary requirements of the new building be handled from the main central kitchen, it was obvious that a nearby site should be selected. At the same time, it was felt that the nursing building should be as inconspicuous as possible. This latter requirement meant that despite its completely different occupancy, the new building should conform to the design of the existing structure. The only site available near the main kitchen required extensive filling, the cost of which was justified because of operational savings. Since the kitchen was at a lower level than the main dining room and the other buildings, locating the new building at the same level minimized both its visual importance and the amount of fill required. The result has been a successful blending of services for hale and ailing residents which has benefited both.

Another example of a similar proposal is at the Aldersly Danish Home in San Rafael, California. This facility was started in 1921 by the Danish community in the San Francisco Bay Area. Because the original buildings no longer met current standards, it was decided in 1959 to master plan their gradual replacement. This included replacing the 13-bed infirmary with a 30-bed nursing home. Again in the design of the new buildings it was felt that there should be no violation of the scale of the residential units. The problem was compounded in this case by a steeply sloping site with its main approach from below. The solution was an unusual configuration for a nursing unit comprising half private and half two-bed rooms, staggered to shorten the corridor length and also to provide an opportunity to break the roof lines and thus reduce the scale of the structure.

Extended care through affiliation makes nursing homes more effective

Both of these buildings, one in operation, the other projected for the near future, have sites which encourage ambulation—Sequoias by a secluded courtyard as well as a view of bowling-on-the-green; Aldersly by a hillside that challenges all its residents and may be responsible for a mortality age level that is higher than any similar California community. Both are examples of nursing homes which by being affiliated with a residential community have extended the concept of care beyond mere custody. A type of affiliation which may have greater medical advantages, but less social value, is affiliation with a general hospital, and there may be other types yet to be explored; for example, combining child care with care for the elderly. Would this not also be to the enrichment of both? Both need care, a sense of security and a challenge. A combination could again change custodial nursing into an active program for care. Henry Sigerist in his “History of Medicine” insists that “medicine is not so much a natural as a social science.” Perhaps these extended care facilities (and the projects on the next pages) will prove his point.
Community hospital annex
shares services for extended care

This L-shaped annex to the existing Gibson Community Hospital provides a nursing home both for the long-term, primarily custodial nursing care of the aged; and the shorter-term, rehabilitation care—increasingly in demand under the provisions of Medicare. With full hospital services conveniently available, the need for separate, high-cost hospital facilities—lab, X-ray, surgery, etc.—is eliminated, and some administrative and food-preparation services can be shared. Thus, the nursing home is able to provide a wide variety of services while retaining as much as possible of the residential quality conducive to both privacy and group activities.

The nurses' station at the corner of the L overlooks the shorter corridor where the more intensive care patients are located. It is also in direct communication with the longer, light-care corridor and the lounge and visiting areas. A gabled roof over the lounge and dining areas permits clerestory daylighting at the north end of those areas, while south-facing glass in the lounge overlooks a terrace and landscaped grounds.

Patients' rooms are single- and double-bed rooms at first-floor level. Double rooms are divisible by curtain or folding partition and arranged so that a toilet serves two patients, a bathtub serves four. There are separate, central bathing facilities for those needing help in that activity. On the basement level are departments for physical and occupational therapy, group activity and storage. This hospital-nursing home combination has proved a financially and functionally practical arrangement.

Hotel-hospital-nursing home provides progressive care for elderly

Designed to include a residence for the healthy aged, a nursing home and a general hospital, the Regina complex offers progressive care to the aged without the necessity of transferring residents from one institution to another. The nursing home, less than 100 feet by enclosed corridor from the full-service hospital, provides adequate, but non-intrusive nursing care. Groups of three patients are housed in suites consisting of a water closet, a single and a double bedroom. Each room is provided with an intercom. Bathing facilities and rooms for non-ambulatory patients requiring special care are concentrated near the nursing service areas for maximum efficiency and control, and a registered therapist is available for those desiring or needing physical or occupational therapy. Noteworthy features of the home include a separate cafeteria, provisions for companionship in two dayrooms, a balcony overlooking the Mississippi Valley, and an interior courtyard which permits daylight to enter the occupational therapy area and the corridor in the basement.

All-weather corridors connect the nursing home to the residence area where healthy retirees enjoy a wide range of personal freedom including choice of room furnishings, unrestricted access to grounds, private dining room, cafeteria and residence kitchen for snacks. The chapel, for the use of nursing personnel, residence patients and visitors, gives distinctive architectural expression to the complex, emphasizing the religious motivation of the Sisters of Charity, who own and operate the institution.

Layered inner courts augment three levels of care

To provide a facility for progressive long-term care in a building independent of its changing neighborhood in Charleston, West Virginia, architects William Breger and Associates have created in the St. Francis Nursing Home a self-contained, inner-directed environment.

The nursing home is designed to accommodate 116 patients for an average stay of six months each, half in single-bed and half in double-bed rooms. Ground and basement levels provide service and activity areas. On the second floor—the intensive care area—splayed walls allow bed-ridden patients a view. The third- and fourth-floor internal courts are progressively larger, allowing light, air, and the experience of non-enclosure. Here, long-term ambulatory patients in need of behavioral or physical care have space for exercise and relaxation, while the nurses' stations close by retain control over their activities.

The structure attempts an economical resolution to the problem of cantilever construction. Its 8-inch flat slab construction is supported on concrete piers except for the concrete end walls, stair towers and precast mullion walls around the inner courts.

Ultimately, the St. Francis Nursing Home will be part of a complete medical community consisting of two 116-bed medical units and required service facilities, a nun's residence and chapel, and a housing unit for the elderly.

ST. FRANCIS EXTENDED CARE HOSPITAL, Charleston, West Virginia. Architects: William N. Breger and Associates; associate architects: Bowman & McKalip; mechanical engineers: Batlan & Osman; structural engineer: Paul Gugliotta; medical consultants: Dr. Michael Miller, Professor Harold Baumgarten.
Capistrano-by-the-Sea offers privacy with a view

Capistrano-by-the-Sea, in Dana Point, California, is in concept and execution a rural nursing home. The exceptionally beautiful setting is emphasized and highlighted by designers Ramberg & Lowrey to create a tranquil, nature-oriented living experience. Ocean, trees and rolling hills are everywhere visible—from the private patios, from the three solarium-terraces, from the large windows in the group living area and at the ends of the three bedroom wing corridors. The corridors also feature skylights which create a light and airy effect; and the nurses' station, main lounge, and dining areas are treated with exposed woods and stone to further the country atmosphere. Exterior building materials compliment the softness of the setting while the low-pitch gable roof and crisp line of the fascia provide refreshing contrast.

Interior design is as practical as it is pleasant. The single rooms, complete with private water closet, storage and patio facilities assure each patient the luxury of privacy. For small group gatherings, the solarium-terrace at the end of each wing is ideal, and the central location of main lounge, dining, and bathing areas unites the wings into a single community.

According to a projected master plan for the entire 20-acre site, a total of seven buildings similar to Capistrano, an existing neuropsychiatric hospital and a new central administrative building will ultimately offer patients full services.


Julius Shulman photos
Forbes Pavilion Nursing Home is in and of the city

Located on a commercial street in the center of a Pittsburgh medical district, the Forbes Pavilion Nursing Home creates a pleasant nursing home for patients who prefer an urban environment. From the spacious second-floor garden plaza, patients can freely survey the city, and, in addition, they can occasionally take supervised excursions to nearby museums, theaters, libraries, and concerts.

To provide a workable and meaningful internal environment, careful intermingling of convalescent and rehabilitation patients can be regulated in each of the four 25-room floor levels. Group identity, an important problem in such a large institution, is thus assured; while single isolated wings, still in proximity to all nursing and circulation services, are available for those patients whose condition demands separation from the community. The flexibility of the design thus permits the administrator to adapt to his patients' changing mental and physical needs. Privacy can be regulated by the patient himself in terms of access to the central day room, small lounge areas, and balconies.

The first and second levels provide two 1,764-square-foot units of rental space, a central lobby accessible from street and parking areas, and parking facilities for a total of 65 cars. "L" shaped reinforced concrete walls define the major areas within the structure. Structural walls are rough concrete, spandrels are the same color concrete rubbed smooth. Mullions project, defining each unit and acting as moderate shading for the gray tinted glass.

Some current answers for urban schools

The countless problems besetting urban schools throughout the nation are increasing in scope, and often in gravity, to the point that more often than not, they are treated as "front page" news by daily and weekly journals. The cities themselves, and a vast array of research and study groups, are pursuing massive programs to analyze and alleviate troubled conditions—many, though not all, of which have to do with the architectural and environmental conditions of the schools. As yet, final answers or perfect solutions have not been achieved for most of these critical areas. However, constant progress is being made, and a small group of schools which offer some advance in thinking has been assembled for this study.

What about all the new teaching methods? They need a great amount of observation and study... and the new P.S. 219 in New York City (left and overleaf) has been designed with specific facilities for just this purpose. How does one cope with the problems of increasing bigness in schools, and the perpetual need for individual concern and small community belonging? Two approaches toward reconciling these opposites that are being tried by the cities of Chicago and Detroit are exemplified by the Maine Township High School South, and the New Eastern Senior High School.

And all the while, as one thinks of new construction, the older facilities are becoming outmoded, often deteriorated. Two schemes, one a master plan for additions, and one a total renovation, point up ways that these facilities can be updated into serviceable teaching plants. Of course, all existing schools are not worth the effort or expense of renovation. Frederick G. Frost Jr. & Associates, architects of the modernization scheme for New York City's Joseph H. Wade Junior High School, stress a series of factors to be considered before proposing to renovate a given building instead of demolition and replacement: "the age of the building, the condition of structural and mechanical systems, community need for continued and uninterrupted use of functions performed by the building, adaptability to new and future functions, and above all, the cost of renovation versus the cost of replacement." The two schools shown in this study were deemed worthy of retention. And finally, for the more remote future, some ideas are presented for possible interrelated education facilities in tomorrow's new towns.
The one-room school returns as dome for team teaching

One of the most interesting of the new urban public schools is this domed structure which provides a teaching environment free of interior walls, and where 150 children from kindergarten to second grade will advance through an ungraded program of instruction based on team teaching. The building was planned as a “satellite unit” to complement a nearby existing building for 300 K-2 pupils, and one for 650 pupils in grades 3-6. It also serves as a permanent facility for teacher training and research projects under the direction of Queens College.

This return to the one-room school, which was achieved with some financial assistance by the Educational Facilities Laboratories, Inc., is proving a very workable scheme. The architects comment that, “with a sound absorption ceiling as well as carpeting, there is no problem of sound disturbing the various learning groups . . . the one big space with its surrounding ancillary spaces for viewing and listening has real merit, and the teachers like the environment.”

The structure has steel columns and a steel lamella-pattern dome with a fiber plank deck and concrete insulation, all exposed and painted. Exterior walls are face brick. Zoned air conditioning provides individual control, with air supplied through floor and sidewall grilles and registers; heating is by low-pressure steam supplied via a tunnel from outside.

THE PAUL KLAPPER SCHOOL (P.S. 219), Flushing, Queens, New York
Architect: Caudill Rowlett Scott; mechanical and structural engineers Wald & Zigas; acoustical engineers: Bolt, Beranek & Newman; contractor: Planet Construction Corp.
The big open space under the lamella dome in this satellite K-2 school can be sub-divided by informal dividers or class groups. All furniture is also movable for flexibility. Lead curtains are provided around the central "learning arena" for soundproofing when the area is used for noisy activities. Sound absorbing materials are also used on floors, ceiling and dividers. One-way windows let observers watch class instruction.
A big comprehensive high school uses a new "300" plan

The problem of providing adequate individual attention for students in the big public school has long been a major concern. This, of course, is coupled with the paradox that the big school can be more efficiently and economically equipped to offer a much more extensive and intensive curriculum. One of the newer ideas to try to reconcile the best qualities of smallness with the best features of largeness is the "300" plan, used here in the new Maine South High School.

The "300" plan divides the entire student body into groups of about 300. Each group has a home base (the guidance unit) adjacent to the library, which provides the following facilities: 1) office for counselor; 2) seats and tables for the entire group; 3) good atmosphere for individual study; 4) conference rooms for committee meetings and seminars; 5) separate entrance near unloading ramp; 6) storage for wraps and books; 7) facilities for students to meet to start the day; and 8) dining area served from a central kitchen. It is expected that a student may spend from 35 to 50 per cent of his time in this "house" area.

Maine Township (District 207), as so many other school districts around Chicago, is also wedded to the advantages of the large (eventually about 3,000 students) four-year school. Facilities for strong programs in five areas are provided: academic, science and business education; physical education; vocational training; performing arts; and student activities. The school size affords good equipment in each area.

MAINE TOWNSHIP HIGH SCHOOL SOUTH, Park Ridge, Illinois. Architects: Caudill Rowlett Scott; McCaughhey, Erickson, Kristmann & Stillwaugh Inc.—associate architects; contractor: Mayfair Construction Co.
Privacy and quiet highlight K-4 school for urban renewal

To provide the maximum protected playground area for this K-4 school in a densely populated residential and commercial redevelopment area in New Haven, it was decided to place the building close to the sidewalk and preserve a large open space at the back, away from the hazards of high-speed traffic. The resulting increase in the problems of privacy and city noise for the classrooms themselves led to the use of exterior walls formed by a series of flat, precast concrete panels, staggered eight inches apart. The openings left between the panels were filled by frosted glass panes set at right angles to the wall. Arthur De Salvo, Jr., of Eliot Noyes & Associates, comments that "the staggering provides natural protection for the glass, but still permits adequate light to enter the rooms. From the inside, there is always the sense of contact with the outdoors without any of the problems mentioned. The panels are white and treated on the exterior with a course aggregate. The interior is smooth matte white for maximum light reflectance. All classrooms also have a generous strip of clear glass above the corridor wardrobes to obtain exposure to a central glass-walled courtyard."

The school is totally air conditioned, with all mechanical services in the ceiling: one system delivers fresh conditioned air to ducts and diffusers, another has coils which radiate through perforated metal ceiling panels.
This neighborhood school is designed for 400 pupils, with 12 typical classrooms and two separate kindergarten rooms. In addition, there is a library-guidance area, a multi-purpose room, and an administrative suite. Eight of the classrooms can be converted into four large double rooms for special group teaching sessions. The kindergarten rooms are placed at one end of the building with their own outdoor court and two separate entrances.

At the center of the building is a large open courtyard, the size of seven classrooms, which provides good interior light, a private inner landscape, and a means of organizing the plan by clearly separating the functions and parts of the building. Special provision was made for safe sidewalk unloading by providing an extra service lane in front of the building.
Community action sets criteria for zoned high school

Detroit's new Eastern Senior High School was also planned and developed as part of an urban renewal area and—through support from the Ford Foundation—with maximum invited community participation. Two hundred citizens participated via various committees in developing the criteria for the new school: local social agencies, churches, individual citizens, business, industry, labor, Wayne State University, youth groups, city government, and the public school staff were all represented. The translation of citizen recommendations to educational specifications was achieved under the guidance of the School Housing Division of the Detroit Public Schools, and wound up as some 230 pages of criteria ranging from a social-ecological-economic analysis of the community to the specification of academic areas and functions for the new high school.

The architect found two elements of the program which became the basis for the physical expression of the building; these were function (the "house" concept) and compact site utilization. Although the program called for ultimately housing some 2,600 students, the desired close association between students, small groups, teachers, and counsellors suggested an organization of four "houses" of about 650 students each, with these individual pupils remaining together throughout their high school careers. The entire project is planned for two-stage construction, with the initial stage limited to 11 acres.
Each academic "house" is articulated in a separate building to clearly define its identity and to reduce the scale of the over-all project. The first floor areas have closer functional ties with the entire complex, with loop circulation connecting all elements. They house specialized teaching and service areas such as shop, homemaking, business and science. The second floor contains the regular and special classrooms of the house. These include study areas, counselling and teacher offices, conference space, and a dining-social area served by the central kitchen.

The first stage of construction, owned here, includes three of the houses, science rooms, audio-visual rooms, resource center, administration, gym and heating plant. A fourth "house" unit, pool, auditorium and arts and crafts wing will be added later.
A gym initiates master plan to expand an old school

Although this is a school serving a rural county, its expansion problems and trend towards more community use of its facilities are parallel to those of its urban counterparts. As architects Cross and Adreon comment, "existing on the site is 'Old Main', a hoary brick building of imposing mass, and three disorganized additive buildings. The gymnasium illustrated is the first element in a new master plan for expansion. It is placed to the rear, on axis, and at a distance from 'Old Main'. Future and existing buildings between will be organized and tied in by a 'Main Street' element. The heavy traffic on the fronting highway led to reversing the approach to the school, so that a new bus shelter flanking the gym focuses attention on what will eventually be a formal entrance court for the night use.

"As the building's concept anticipated much civic and recreational night use, effort went into making the gym festive and inviting; the building shifts from a solid in the daytime to a floating lantern at dusk, with its visible and illuminate occupants giving it extraordinary life. The daytime interior with patterns of light streaming in through the gray-glazed corners, is cheerful and bright enough to use with a minimum of artificial light." The frank, economical expression of this gym structure has produced an interesting architectural design it was recently given an award of excellence by the American Institute of Steel Construction.

WASHINGTON & LEE HIGH SCHOOL GYMNASIUM, Montross, Virginia
In the new master plan to expand the existing school, the gym is placed at the transition point between classrooms and playing fields. A slope in the ground level permits direct entrances to each floor of the building. It was designed as a small “coliseum” suitable for basketball tournaments, graduation exercises, dances, lectures—or any group community use but theater. The overhanging stands of fixed seats, reportedly built at one-fourth the cost of movable stands, gives the building its special character.

The steel structure has roof decking and interior walls of rough-sawn southern pine car decking; exterior roofing and siding are lerne, which recalls the metal roofing of the old school, while a brick plinth repeats the existing walls. Precast concrete planks support the gym floor.
New construction will enclose a court at the first floor and give needed extra space and better circulation between three sub-schools and common facilities. If budget permits, part of the site would have a concrete deck, and the exterior new window and spandrel arrangements. All mechanical systems are to be improved.

Renovation scheme adapts old school for future

Recent winner of a New York City competition for the conversion of Joseph H. Wade Junior High School (P.S. No. 117—Bronx) to house an up-to-date intermediate school, Frederick G. Frost Jr. and Associates came up with the highly innovative yet budget-conscious thinking in the scheme shown here. The competition was sponsored by the Board of Education of the City of New York, in cooperation with the Research Council of the Great Cities Program for School Improvement. In addition to a money award, the first prize included the architectural contract for the modernization project. The competition was held as part of the Great Cities' "New Life for Old Schools" study under a grant from the Educational Facilities Laboratories.

The existing school is of that typical solid, stolid building type, with a double-loaded classroom, U-shaped plan, that pervades our cities from coast-to-coast. In their approach to conversion, Frederick G. Frost Jr. & Associates came to a series of general and specific conclusions: "When a structure is designed for renovation, the extent of work to be done must, by necessity, become a matter of compromise between the ideal solution for the given set of requirements, and the funds available. A priority scale must be established; existing areas adapted for future use as much as possible; new construction added to be used for new types of spaces where increased areas can be justified. . . . The primary aim in renovating schools is to create conditions enabling future developments in the philosophy of teaching and study . . . and to permit flexibility of blocks of spaces free of shafts, stairs and toilets must be created, with movable partitions, furniture and storage units.
An entire wing of each floor will become a flexible space for study and teaching, surrounding a resource, guidance and planning center and will be subdivisible into a variety of areas for groups of 16 to 128 students. Movable storage units forming the spaces can be shifted as needed.
Schools can be interwoven into fabric of new towns

"If new towns are to be built from scratch, why should they be inhibited with old concepts of education?" This challenging question formed the basis for Rice Design Fete IV, a research-oriented work conference held in Houston in June.

From all over the U.S., six teams of architects, educators, consultants, and students of 12 schools of architecture came to design new systems of education and new facilities to house such systems. The project was sponsored by the Ford Foundation's Educational Facilities Laboratories, and held under the direction of Professor William T. Cannady. The six teams, each of which developed its own separate project, were headed by architects Charles Colbert, Paul Kennon, Niklaus Morgenthaler, Cedric Price, Robert Venturi and Thomas Vreeland.

The concepts developed by the different teams proved as uninhibited as the basic programatic question—which was augmented by such queries as "Why must new towns be bound to the formerly inviolable limits of education—to traditional and arbitrary delineations of elementary schools, junior and senior high schools, to education that is restricted by the framework of the school, the hour of the day, the age of the student?" The responses tended to weave education, more or less packaged lessons, into all facets of daily life, part of town, and time of day. Colbert's team developed a sort of space-helmet "shoulder carrel" to receive audio-visual communications; Price and Vreeland used portable and demountable units, signs and busses; the most architectural of the approaches (shown here) were those of Kennon, with "a mega-building", and Venturi, with "a mini-structure."
Robert Venturi's scheme for new education for a new town forms a sort of all-purpose shopping center trip—for goods or learning. The community is a series of small towns linked by a central expressway flanked by all schools, shops and offices. The schools, from "service stations" to "city centers" are described as "mini-versions" of commercial facilities.

**TLRC Town Learning Resource Center**

- J Meeting Room
- K Work Room
- L Lounge
- M Utility Core
- N Computer-based Learning Carrels

**LRC Neighborhood Learning Resource Center**

- Resource Check-in Area
- Big Alcoves
- Carrels
- Computer-assisted Learning Carrels for 1 to 3 Students
- Medium Alcoves
- TPC: Teachers' Planning and Conference Room
- Niches
- Education Arcade—open 24 hours
- Computer-assisted Adult Reading/listening Alcoves

**Small Shops, accessible both sides**

**Service for Shops**

**TLRC Town Learning Resource Center**
Paul Kennon also draws parallels from shopping centers for his scheme for learning in a new town, but from today’s “super shopping malls” instead of the shopping strip. All educational facilities, from child care centers through university and continuing adult education, are mixed together through scramble zoning with shops, factories and community facilities to form a highly ordered “mega-structure”. This grand mix would occupy the upper level of an “education concourse” spine meandering through the town. Services and transport access would be on a lower level—and even here one would be tempted to delve into a little learning. The use of small “computerized carrel cars” for transportation would “allow citizens of all ages to learn while in transit”, or gather at centers punctuating the concourse.
Noise control in architecture: more engineering than art

In the short span of 20 years, architectural acoustics has become an important discipline in the building field. And during that time one aspect of architectural acoustics—control of noise—has become significantly more important in the design of every type of building, from the small house to the tallest skyscraper.

Control of noise has become more important for a series of reasons: There are more noise sources. All of us are more conscious of noise. We are now in a position to do more about noise. The reason is that the problems of noise, compounded by the increasing complexities of interior space and the use of lighter-weight constructions, have caused physicists, acoustical engineers and psychologists to study which kinds of sounds are annoying, and how these sounds can most practically be reduced in level or isolated. Further, engineering studies have led to new tools for design which are much more accurate in predicting noise effects.

While most architects and engineers need not get involved in the very complex analyses of noise and its control, a basic grounding in the new concepts of noise control and the design techniques available will help them more readily anticipate noise problems, "design out" some of these problems in the very early stages, work more effectively with acoustical consultants, and—perhaps most important of all—help them work with clients in developing an acceptable standard of noise control to work towards in the building design. For, as in most things, the benefits of greater and greater noise control must be balanced against costs.

Noise is defined as any undesired sound. Sound is noise only when it disturbs or annoys people, or, in some cases, creates a physical hazard, and can range from the barely perceptible drip of a faucet to the roar of a jet engine. Most noise is not physically harmful in the sense of damage to the ears, causing loss of hearing. It is said that sound levels below 85 decibels (db) for long exposures should not cause deafness. But sound-pressure levels in excess of 135 db, even for short periods, may cause permanent impairment of hearing.

Obviously, noise has always been with us in some form or other. The difference between today and yesterday is that there are now many more sources of noise—such as mechanical equipment, business machines, etc.—and current construction practices—use of lighter-weight materials, for example—potentially make noise more audible.

Fortunately, we know what to do to control noise. The techniques and materials are available. If, for instance, the architect designing an apartment building follows good practice recommendations of acousticians in regard to wall and floor constructions and mechanical equipment and plumbing, and uses common-sense planning in regard to room layout and door and window location, he will have done his best to avoid tenant dissatisfaction.

But, by the same token, there are a good many aspects to noise control in commercial and institutional buildings—and analysis for noise control may not be simple. When it comes to a building...
"Unwanted sounds should be isolated by appropriate constructions; and background noise should not intrude"

Airborne noise can be attenuated by either heavy or lightweight constructions. 1. The heavier a homogenous wall, generally the more effective its sound isolation; however, doubling the weight increases transmission loss by only about 6 db. 2. Resilient construction helps reduce sound, such as resilient backing behind gypsum board or attachment by resilient clips or channels. 3. Discontinuous construction breaks the transmission path. 4. Sound-absorbing blankets plus spilt studs gives a 9 db improvement over a conventional stud and gypsum board partition.

Impact sound is attenuated by resilient materials and constructions. 5. Carpeting is most effective when underlaid with a felt pad. 6, 7. Resilient floor underlayment or attachment of gypsum board ceiling by means of resilient clips or channels. 3. Discontinuous construction breaks the transmission path. 4. Sound-absorbing blankets plus spilt studs gives a 9 db improvement over a conventional stud and gypsum board partition.

The beginnings of noise control: a study of reverberation
Noise control is fairly young as an engineering science. The transition from art to engineering science began just before World War II. In the beginning, and unfortunately even not too long ago, room acoustics was generally referred to as "acoustical correction," because this how it all started. Wallace Sabine, in his renowned work at the turn of the century in the lecture hall of the Fogg Museum at Harvard, developed his classic formula for sound absorption. The condition there was that the room was too "boomy" for speech and required sound absorption to reduce the reverberation time. Thus in the early days, absorptive materials were applied to large spaces such as lecture halls and courtrooms to reduce the reverberation so that people could hear better. (Frequently this was done to excess in the '30's.) Otherwise overlapping of speech sounds resulted in inferior intelligibility. After that, sound-absorptive materials (commonly referred to as acoustical materials) were employed to reduce noise levels within rooms—to take the edge off noise caused by voices, typewriters and footsteps.

First, design the room itself for good hearing conditions
The basic goal in room acoustics is to preserve the sounds we want to hear and to exclude those we don't want to hear. We will be concerned in this article with work and living spaces such as offices, classrooms and apartments—large auditoriums for lecture and music and factory spaces are special engineering problems beyond the scope of any single study.

Before any consideration is given to the possibility of intruding sources of noise, the designer must first concern himself with whether the room surfaces—and to some extent the room shape—comprise a suitable acoustic environment for the activities that will occur in the room. In other words, neglecting the possibility of external noise, will we have optimum hearing conditions for speech, music, or whatever sounds we wish to hear? As has been pointed out by New-
Typical examples of background noise levels from various noise sources. These are average ("single-number") sound levels obtained by A-scale readings on a sound-level meter. Generally it is safer to use sound-pressure levels of the noise measured by one-octave, half-octave or third-octave bands.

Permissible background criteria can be specified by means of these noise-criterion curves. They have been derived from field studies of speech-interference levels (represented by the NC numbers listed on the curves).

Source is stopped. Recording and broadcast studios for speech require the shortest reverberation times—0.5 seconds, on the average, for the mid-frequency range of 500-1,000 cps. Classrooms should have a Tr of no less than 0.5 sec. and no more than 1.0 sec. Lecture and conference rooms might take a minimum of 0.6 sec. and a maximum of 1.4 sec. Reverberation time is directly proportional to the volume of the room and inversely proportional to the absorption. The formula is: Tr=0.5 V/A, where V is the volume of the room in cubic feet and A is the absorption in sabins. A=the sum of S₁ₐ₁ + S₂ₐ₂ + S₃ₐ₃ . . . where S₁ is the area of the surface whose absorption coefficient is a₁, S₂ is the area of the surface whose absorption coefficient is a₂, etc.

In addition to reducing the reverberation time, absorptive materials are used to prevent echoes, if these cannot otherwise be avoided by proper shaping and disposition of surfaces and to prevent flutter in narrow rooms with parallel walls normally having hard surfaces.

Noise control in rooms for speech

Generally small rooms will be suitable for speech if the ceiling is treated with conventional acoustical materials, or if the room is carpeted or fitted with heavy drapes. For example, a 20 ft by 30 ft classroom will have an Tr of approximately 0.5 sec. if the ceiling is completely covered with an acoustical tile having a noise reduction coefficient of 0.75.

A common misunderstanding is that acoustical materials, themselves, reduce noise levels by a large amount. While one may get between 5 and 10 db of noise reduction by adding absorption to...
The range of sound-absorbing techniques is illustrated in the sections, with resulting performance in the graphs. Typical manufactured acoustical materials (tile and panels) have the characteristics shown for “thin porous material.” They are more effective at the higher frequencies. Providing an air space behind a thin porous material increases low-frequency absorption. A perforated facing in front of porous material (say 1 in. fiber glass) will reflect higher frequencies, but this depends dimensionally of the solid area. If the space between holes is 1 in., frequencies above 13,000 cps would be reflected. Large panels are good low frequency absorbers. The volume resonator shown has a narrow-band absorption. In a large conference room where only natural voice is to be used, it is good practice to leave the center of the ceiling hard to reflect the sounds of speaker voices.

In some rooms, such as long conference rooms and lecture rooms in which only natural voice is used, it is desirable to leave the center portion of the ceiling a hard surface so that it will reflect back down to listeners. Absorptive material could be used around the perimeter of the ceiling and at the tops of the walls. Additional absorption can be obtained through carpeting and drapes. In lecture rooms more than 40 ft long, the end wall should be treated with absorptive material to prevent the possibility of echoes.

If we assume that the room interior has been designed properly for good hearing conditions, then the two other conditions that have to be satisfied are: 1) the background noise level has to be low enough and of such character as to not interfere with desired sounds, and 2) the transmission of sound, either airborne or structure-borne from surrounding spaces, should not either interfere with the hearing of desired sounds or cause annoyance due to its informational content.

Background sounds such as distant traffic, the blur of voices, or the whoosh of an air diffuser may be acceptable background noises because they are not intruding sounds, unless they are loud enough to interfere with conversation or otherwise are unduly distracting. Diffuser noise may be objectionable if it interferes with speech, or if the noise has noticeable pure tones in its spectrum—a high-pitched whistle, for example, would be annoying.

The limitation on background noise for average conditions in typical spaces are prescribed by reference to a series of noise criterion curves developed by Leff and Beranek on the basis of statistical studies of office workers. Noise ratings made by office workers were plotted against speech interference levels and loudness levels. Spaces involved included executive offices and conference rooms on the one hand, and stenographic pools and large drafting rooms on the other. The resulting speech interference level and loudness level criteria were then translated into a series of noise-criterion curves, NC-20 to NC-70. These curves take into account both the sound pre...
Unwanted sounds can be shut out by means of sound barriers, and masked to varying degrees by background noise.”

Sure levels that interfere with speech and variation of ear response with frequency. A 20-db sound at 1,000 cps would be equal in loudness to a 40-db sound at 200 cps.

The NC numbers themselves represent speech-interference levels. The speech-interference level (SIL) is the arithmetic average of the readings in decibels in the three-octave frequency bands 600-1,200, 1,200-2,400, and 2,400-8,000. The resulting number in decibels thus a guide to the interference of noise on speech since in these represent the frequencies most important to speech articulation.

While it is feasible to exclude external sounds from a space to the extent that these sounds will be imperceptible to occupants, this degree of sound isolation generally is not only impractical, but also unnecessary. For example, most of the time speech sounds do not need to be reduced to inaudibility, but rather to the extent that, say, only 5 per cent or less of the words are understandable. In addition to the attenuation of sound through the room enclosure, there is the room background noise which will help mask speech sounds that do get through.

What kinds of sound do other people hear? In acoustical environment can be designed far more precisely for a machine than for a human being. Parameters for machine, such as sound levels and vibration, can be accurately specified. Not so for people, although statistical sampling allows prediction of degree of satisfaction fairly reliably in some areas if use—rooms for speech, for example. In the one hand, people want to be able to converse comfortably in the room they occupy. On the other hand they don’t want to hear what people in adjacent rooms are saying (and they don’t want people in adjacent rooms to hear what they are saying).

Much of the time it is the intelligence that sounds convey that is bothersome to people. This may range from the intelligibility of neighbors voices, to the noise of a flushing toilet, to the particular clicking noise of an identifiable person’s heels. Thus, the most difficult aspect of acoustical design for noise control is in anticipating and determining what kind of sounds are most likely to be annoying and what degree of satisfaction is demanded by the client.

Design for good hearing conditions in ordinary rooms is straightforward and easily accomplished if several parameters can be pinned down—such as the noise levels of activities in adjacent spaces and the background noise level to be anticipated in the room itself—which ordinarily will be that due to traffic, air diffusers, lighting ballasts and the like.

Background noise can have plus values

Much of the time it is desirable to have a steady background noise to mask distracting sounds originating in the room. Background noise is useful in still another respect—it can mask sounds transmitted through the room enclosure. In effect, this means that, with a permissible level of background noise, the room-enclosing elements can be less effective as sound isolators by the amount of background noise allowed. Thus: If the minimum background noise to be expected in a space is 35 db at 500 cps and the activity in the adjacent room is producing 77 db at 500 cps, the wall separating the two spaces need have a transmission loss of not less than 77 minus 35 or 42 db at 500 cps.

Sound between spaces follows the “weakest link”

All routes that sound might take to enter one room from another must present the same or more resistance to the passage of sound than the principal route. The alternate routes are called “flanking” paths. Thus if the partition between two rooms must have a transmission loss of 40 db at a given frequency, then the path through the ceiling of the room which has the sound generator down through the ceiling of the room which is the sound receiver must also have a transmission loss of no less than 40 db if the partition is not be short-circuited.

The above examples do not actually give the true noise reduction (NR) between two spaces because the absorption of the receiving room has not been taken into account. If the rooms in question were, say, 20 ft by 30 ft classrooms, chances are the noise reduction (NR) between the classrooms employing a 40-db partition would be about 42 db.

How valid is the attempt to reduce TL values to single-number ratings?

As has already been mentioned, noise levels can be reduced by enclosing the noise source with sound-attenuating materials—in effect placing it in a separate room.
Mass law "says" that transmission loss should vary directly with frequency. But coincidence dips (when sound wave in air reinforces bending wave in the panel) result in more sound passing through at certain frequencies than is indicated by reference to the mass law curve.

The one-number rating system for transmission loss is found by means of the standard curve shown here. The TL curve cannot be more than 8 db below the standard at any one point; the total deficiency cannot exceed 32 db. The resulting number (opposite arrow) is the transmission class.

Flanking paths around, over and under a partition can diminish its effectiveness as a sound barrier. Partitions should be kept tight by gasket or caulking and the joints should be sealed to prevent sound from leaking through cracks. Short-circuiting also is caused by sound leaks through ducts and through suspended ceilings. Acoustical lining of ducts will limit sound there. Ceiling transmission can be reduced by impervious sheet above tile, blanket insulation over it or by barriers from partition to under side of slab.

The error in using one-number transmission loss ratings based on the average of nine frequencies is shown. Although both curves will give an average TL of 30 db, curve 2 deep has a coincidence dip, giving it an STC of only 19, whereas curve 1 has an STC of 30 (see previous page for definition).
The standard test for sound transmission loss of building partitions, ASTM 90—66T, requires that the minimum range of measurements be a series of contiguous third-octave bands with center frequencies from 125 to 4,000 cps. The reason for this is that these are the primary frequencies contributing to speech articulation. Actually frequencies below 200 cps have virtually no importance relative to speech.

Until a few years ago, test laboratories reported transmission loss of barriers as single numbers, being comprised on an average of the transmission losses in half-octave intervals from 125 cps to 4,000 cps. More recently, the 1,414 and 2,828 cps bands were omitted giving a “nine-frequency” average.

Even though a single-number rating obviously is much easier to deal with, a frequency-averaging approach has a serious defect: it is possible for two different constructions to have the same average TL loss even though one of the constructions may have poor performance at certain critical frequencies.

The reason for this is that stiff constructions—i.e., those with little internal damping—suffer significant dips in transmission loss at some frequency ranges. This dip for a given construction occurs at the same frequency range as the potentially offending noise, the construction will probably be a poor choice.

In general, the transmission loss of a given wall increases as the frequency of the impinging sound increases. Also, in general, materials of greater mass provide greater isolation than lighter materials. Stiffness of the more massive materials may offset the weight advantage due to dips in the TL curve.

The reason that some materials do not follow transmission loss indicated by basic law theory is there may be frequency dips due to a phenomenon known as coincidence. The explanation follows: The velocity of sound in a homogeneous solid material increases with frequency. The velocity of sound in air at room temperature is constant. Hence the velocity of sound in the solid coincides with the velocity of the sound wave. Therefore, there is a coincidence dip. In effect, the sound wave in air and the sound wave of the panel reinforce one another, causing a dip in transmission which diminishes panel efficacy.

With certain types of materials, coincidence dip is mitigated by a principle known as “sound shear.” An example is one type of laminated glass having two or more thin layers of glass laminated to interlayers of soft plastic. Because the stiffness of the laminated glass is considerably reduced from the same thickness of solid glass, the velocity of sound in the laminated glass may never reach the velocity of sound in air. Thus if the sound waves do not coincide, there is no coincidence dip.

In order to avoid misleading information in one-number ratings, a procedure has been developed which classifies a partition according to a sound transmission class (STC). This procedure takes account of frequency dips. This is done by comparing the measured sound transmission loss curve for a construction with a hypothetical transmission loss curve of a shape roughly similar to the inverse of a noise criterion (NC) curve. In rating a particular construction the STC contour is shifted vertically relative to the test curve until the measured TL values fall below the STC contour to the extent that the sum of the deviations is not greater than 32 db and the maximum deviation is not more than 8 db.

The use of STC numbers for selecting constructions to resist airborne sound is probably acceptable when the potentially offending noise is speech. Obviously it is risky to employ this procedure if the sound is a musical instrument or a hi-fi set, since the frequency content of these sounds will be above 4,000 cps.

In the old days sound isolation was provided by the massive construction in common use. Some of the lightweight constructions used today are very poor for sound isolation—for example, the standard wood stud and gypsum board partition. But the sound-isolation proper-

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The second and third graphs show ratings for typical floor constructions. The second graph shows a standard wood floor which has an impact noise rating (INR) of —17. The third graph is of a wood joist floor covered by carpet and a foam pad. This improvement raises the floor to a +5 rating.
ties can be improved somewhat by merely staggering the studs so that there is no through path from wall face to wall face. The partition can be improved even further by weaving a fibrous insulation blanket between the staggered studs. Use resilient board behind the gypsum board provides a very good sound-isolating partition.

The whole is only as good as the sum of all the parts

The efficacy of a wall for sound attenuation can be considerably compromised if it is built sloppily or if it has a number of components such as doors and windows of lesser TL performance. For example, if a door occupies 20 per cent of a given wall and the door is 15 db lower in value than the wall, the effective TL of the composite wall will be reduced by 8 db. A hole has 0-db TL loss, thus a small opening can seriously deteriorate the value of a wall. An ½-in. crack in the length of a 20-ft wall 10 ft high would deteriorate a 50-db wall by 20 db. While this might at first seem to be extreme, it is borne out by field experience. For example, United States Gypsum Company has shown that a partition installed carefully in the field will have an STC on the order of 5 db below laboratory test values; a partition installed routinely will have an STC from 10 to 15 db below laboratory test values.

Absorption vs. attenuation

Earlier, factors were mentioned that aided sound attenuation through building panels. Strangely enough, many people still believe that a material good as a sound absorber is effective as a sound attenuator; whereas, in fact, the two characteristics are contradictory. A good sound absorber is generally porous, so that sound can move in and out of the material and lose some of its energy to friction, the energy being dissipated as heat. A sound attenuator, on the other hand, works either by being immobile—i.e., resisting the vibration of air by virtue of its mass—or by flexing and taking energy out of the vibrating air by damping (friction loss within the material itself) so that little vibrational energy is transmitted to contiguous components of the panel. Energy which is conducted can be further diminished by attaching sheet materials to structural supports by means of resilient clips or channels.

Porous sound absorptive materials are effective at medium to high frequencies, but not at low frequencies. Therefore, if low-frequency sound absorption is required it may be obtained by a vibrating panel or a volume resonator. This does not mean that a vibrating panel used as a partition by itself would be a good sound attenuator because the vibration of the panel induced by a sound source on one side can create sound waves on the receiving side due to movement of the panel.

While a porous sound-absorptive material applied to the surface of a partition does not provide much added sound attenuation, sound absorptive material placed within the partition can improve transmission loss of a partition appreciably when the partition faces are reasonably separated from one another. For example, a couple of inches of blanket insulation added to a staggered stud partition can improve the sound transmission class of this partition by about 5 db.

The importance of realistic testing for TL values

Laboratory transmission loss data for building components—such as fixed and movable partitions—may be misleading unless the installation of the sample being tested represents field conditions as closely as possible. Laboratory tests of small panel samples will generally give higher TL values than will be obtained in the field. Also if the sample is rigidly mounted in the lab, when the full-size unit is to be only semi-rigidly or resiliently mounted, as for example a door on a movable partition, the TL values, again will be higher than can be obtained in the field. Beyond this, all of the components that are to comprise the partition should be included in the test, not just a portion of the partition, including structural components and gasketing. In addition, some acoustical engineers believe that NR values should be specified rather than TL values, because the NR value is what actually will be experienced in the listening room, even though the NR's will seldom be more than ± 5 different than the TL's.

A comprehensive method, and a show method for selecting building components which would yield a predetermined degree of speech privacy. This study was sponsored by Owens-Corning Fiberglas and published as the Speech Privacy Analyzer. Basically, the Analyzer comprised a method for selecting room enclosure.
In the broad effort to fight noise, more attention is being given noise involved with air conditioning.

components given: 1) a particular size of room; 2) relative loudness of speech; 3) background noise rating of the adjacent room; and 4) the relative privacy requirement. The basic elements of the speech privacy study can be used to predesign room components for a desired degree of satisfaction, or to determine probable satisfaction based on an already existing situation—no matter what the construction—as long as the transmission loss data of enclosure components is available from 200 cps to 4,000 cps and as long as sound pressure level data is available on adjacent room background noise whether it be from traffic, the air-conditioning system or the "buzz" of people and equipment in general office space.

While the Speech Privacy Analyzer in its final form was easy to use, its day-to-day utility was diminished by the fact that data for partitions and air-conditioning apparatus was limited in scope. Nonetheless, it is still possible to employ the basic approach as outlined in, "Speech Privacy in Buildings," Journal of the Acoustical Society of America.∗

The basic steps in determining speech privacy according to the BBN method are shown in the illustrations on page 197. The two important things to determine from acoustical data are: 1) the noise reduction of the partition (or bil ing) in question; and 2) the noise ting of the background noise. The first of these two is determined by laying a field of dots on a transparent sheet representing speech articulation over the transmission loss data. The curve is read so that only 10 dots show above the curve, which represents 0.05 speech articulation. The "N" number is then read at the arrow at the left.

The background noise, in this case a diffuser, is determined by placing transparent overlay containing four basic curves for N (normal), L (low), M (mid-frequency) or H (high). The background noise is fitted to the nearest duplicate of these curves and the N number read at the arrow at the left.

Values are selected for source room or area, speech use and privacy requirement. These figures are all added together and the total indicates that there will probably be mild dissatisfaction. A less-involved, less-comprehensive approach has been made for speech privacy in office buildings. Acoustical engineer Robert W. Young has shown that the sum of the NR of a partition and the background noise level, as measured on the A scale of a sound-level meter, gives a direct measure of speech privacy. Roger Benasutti and Hale J. Sabine extended this approach even further via a field survey of sound transmission between 15 pairs of occupied offices. These authors concluded that when speech power is of a conversational level, a figure of STC + dbA = 70 appears adequate to provide complete speech inaudibility and a figure of 60 adequate to limit intelligibility to isolated words. For a raised voice, it was suggested that these figures be raised to 80 and 70, respectively. Benasutti and Sabine also concluded that a noise reduction of 35 STC is the highest that is obtained in typical office constructions, using drywall or metal partitions, suspended integral acoustical ceilings with continuous plenum, and ventilation slots opening directly into the plenum. Higher noise reductions up to 40 STC are obtained with plenum barriers, with absorptive blankets over the acoustical ceiling, or with ducted ceiling openings which are either acoustically lined or are long and circuitous.

With floors, the attention has turned to impact noise. In an apartment building it is hard to say what sources of noise create the greatest annoyance—air-borne noise such as conversation, structure-borne noise such as that induced by a vibrating fan in direct contact with a floor, or the impact noise caused by objects, such as shoe heels, hitting the floor. Earliest attention was given to the first two sources. More recently, considerable publicity has been given, and study devoted, to the problem of impact noise. Actually the problem itself is readily solved, in a physical sense.

The seriousness of this problem is indicated by the fact that FHA has included recommended impact-noise performance ratings in its Minimum Property Standards. These impact noise ratings are arrived at by utilizing as an impact noise source a "standard" hammer machine approved by the International Standards Organization. This machine utilizes five drop hammers, each weighing 500 g, and each dropping 4 cm twice per second, giving an over-all impact rate of 10 per day utility was diminished by the fact that data for partitions and air-conditioning apparatus was limited in scope. Nonetheless, it is still possible to employ the basic approach as outlined in, "Speech Privacy in Buildings," Journal of the Acoustical Society of America.∗

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†R. W. Young is with the U. S. Naval Electronics Laboratory. Roger Benasutti and Hale J. Sabine are with Owens-Corning Fiberglas.
"The new techniques for sound isolation are being rapidly assimilated."

sec. The FHA impact noise rating (INR) is determined by comparing the sound pressure level of the impact noise in the room below with a specified requirement curve.

The difficulty is that the ISO impact hammer device is by no means universally accepted by acousticians as the proper approach to measuring impact noise. Some acousticians, among them Tom Mariner of Armstrong Cork Company, state that the ISO tapping machine does not come close to simulating the impact noise produced by a woman's sharp heels striking the floor. To prove it, Mariner and his associates compared computed loudness of transmitted walking noise with impact noise ratings of floors, based on the ISO standard tapping machine. They showed that, "a particular loudness of footfall noise can be obtained from floors differing by 11.5 units in INR; or, conversely, floors having the same INR may differ in loudness by a factor of almost four. Mariner believes that impact-noise-rating methods based on a hammer machine will fail to represent the relative merits of floor-ceiling systems for two reasons: 1) the impact produced by the hammer machine is much more severe than that of footfalls; and 2) many floor-ceiling systems are mechanically non-linear in response, i.e., it is not possible generally to compute the unknown response of a floor to walking from the known response of the hammer machine. Actually, the hammer machine was first used for subjective evaluation of noise produced by impact. But then in the late 30's, when a German standard on impact noise was issued, it was necessary to have hammer impacts loud enough to produce an easily measurable continuous noise. Also, harder impacts were used to get readings under "good" floors. But now better instrumentation is available such that the need for hard impacts from the tapping machine would seem to be no longer needed.

Thus for the last two years Armstrong Cork Company has been sponsoring research by Bolt, Beranek and Newman, Inc. which is expected to "lead to a test method which more accurately duplicated the sounds of actual footsteps."

Check the air-conditioning system for potential noise problems
The tremendous expansion of mechanical equipment to serve the needs of air conditioning has brought with it its share of noise control problems, both air-borne...
and structure-borne. Some of these are relatively simply solved; others demand a rather sophisticated degree of engineering knowledge, particularly in the area of vibration isolation.

The prime sources of air-borne noise in air-conditioning systems are fans, duct turbulence, air control devices and outlets. Other components such as pumps, compressors, refrigeration machines and cooling towers also produce air-borne noise. For all but the latter, vibration will ordinarily be more of a problem than air-borne noise, because these components are generally housed in an equipment room that has fairly massive walls.

Duct-borne fan noise can be reduced—if natural losses are not sufficient—by employing a duct lining of absorptive material or through the use of packaged duct mufflers.

Turbulence noise in ducts results from high air velocities and sharp changes in air flow direction. Velocities in the neighborhood of 3,000 fpm can create serious noise problems if the ductwork is run directly above a lightweight ceiling; and velocities of 2,000 fpm can cause noise if turns in the duct run are too sharp, or if turns into branch ducts from risers are too sharp. High-velocity ducts as well as noisy parts of low-velocity ducts should be located in non-critical areas.

Noise of air outlets such as diffusers and grilles is kept within bound by not allowing velocity of the emerging air stream to exceed 400 fpm for slots of ½ in. width.

Mixing boxes and other air control devices frequently generate some middle- and high-frequency noise, which, in many cases, may be desirable to mask intruding sounds.

Fans and refrigeration compressors are major sources of vibration. While small fans and high-speed fans may require only conventional rubber-in-shear vibration isolators, large, slower fans will require steel springs used in series with ribbed rubber pads (to avoid transfer of the high frequency noise of the fan through the spring itself). A really large fan may require in addition the use of a concrete inertia block to increase the total mass.

One facet of vibration that would seem to bear further study is in connection with the interaction between equipment and building structures particularly those of light weight which have little resistance to vibrational effects.

**SOME USEFUL REFERENCES ON NOISE CONTROL**


Solution to Noise Control Problems in the Construction of Houses, Apartments, Motels and Hotels, Owens-Corning Fiberglas Corporation, New York.

GLOSSARY OF NOISE CONTROL TERMS

A-SCALE SOUND LEVEL (dBA)—The A-scale sound level is a quantity, in decibels, read from a standard sound-level meter switched to the weighting scale labeled "A". The A-scale discriminates against the lower frequencies to approximate the auditory sensitivity of the human ear at moderate sound levels.

ARTICULATION INDEX (AI)—The articulation index is a numerically calculated measure of the intelligibility of speech. It takes into account the limitations of the transmission path and the background noise. It can range in magnitude between 0 and 1.0.

BACKGROUND NOISE—Background noise is the total of all noise independent of the presence of the desired signal. For example, in a living room the desired signal may consist of speech from conversation or a television set. The background noise may come from room air conditioning, outside traffic, conversations in adjacent rooms, or other sources.

DAMPING—Damping is the dissipation of energy with time or distance. The term is generally applied to the attenuation of sound in a structure owing to the internal sound-dissipative materials.

DEAD ROOM—A dead room is a room that is characterized by an unusually large amount of sound absorption.

DECIBEL—The decibel is a logarithmic unit of measure of sound pressure (or power) calculated according to a formula. Zero on the decibel scale corresponds to a standardized reference pressure (0.0002 microbar) or sound power (10^{-12} watt).

FREQUENCY—The frequency of a sine wave is the number of times it repeats itself in each second. In acoustics, the unit of frequency is the cycle per second. In most European countries the cycle per second is called the hertz (Hz), and this term has recently been adopted in the United States.

LEVEL—In acoustics, the level of a quantity is the logarithm of the ratio of that quantity to a reference quantity of the same kind. The base of the logarithm is commonly 10. The reference quantity and the kind of level must be specified. The unit is generally the decibel. Sound pressure level in decibels uses a reference level of 2.0 X 10^{-4} microbar, which is the threshold of hearing. Zero level occurs when the sound pressure equals the reference pressure.

LIVE ROOM—A live room is a room that is characterized by an unusually small amount of sound absorption.

LOUDNESS—Loudness is the intensive attribute of an auditory sensation, in terms of which sounds may be ordered on a scale extending from "soft" to "loud".

LOUDNESS LEVEL—The loudness level of a sound, in phons, is numerically equal to the average sound-pressure level, in decibels, of a free-progressive sound wave of frequency 1,000 Hz, that, in a number of trials, is judged by listeners to be equally loud. Generally the sounds are presented to the listeners while they are facing the source.

MASKING—Masking is the process by which the threshold of audibility for one sound is raised by the presence of another (masking) sound.

NC-CURVES (NOISE CRITERION CURVES) and NCA CURVES (NOISE-CRITERION-ALTERNATE CURVES)—The NC curves are a series of criterion curves that portray sound-pressure levels for background noises which generally should not be exceeded in various human environments. The NCA curves permit higher sound-pressure levels at low frequencies than the NC curves, and are used generally only where a compromise caused by economic factors is necessary.

NOISE REDUCTION—The noise reduction of a structural configuration is the difference in the sound-pressure levels, expressed in decibels, on either side of the configuration. Noise reduction is often the quantity of practical engineering interest, while transmission loss is a more basic quantity associated with the physical construction of the structure.

OCTAVE BAND—An octave band is a frequency band with lower and upper cut-off frequencies having a ratio of 2. The cut-off frequencies of 707 Hz (cps) and 1414 Hz define an octave band in common use.

OVERALL SOUND-PRESSURE LEVEL—The over-all sound-pressure level is the sound-pressure level measured in a broad frequency band covering the frequency range of interest. This band is often taken to extend from 25 Hz (cps) to 10,000 Hz.

PHON—The phon is the sound-pressure level of a 1,000 cps tone that sounds equal to the sound or noise being rated.

REVERBERATION TIME—The reverberation time of a room at a particular frequency is the time that would be required for the mean-square sound-pressure level, originally in a steady state, to decrease by 60 decibels after the source is stopped.

SOUND-ABSORPTION COEFFICIENT (ABSORPTION COEFFICIENT)—The sound-absorbing ability of a surface is given in terms of a sound-absorption coefficient, designated by the symbol α. This coefficient is defined as the fraction of incident sound energy absorbed or otherwise not reflected by the surface.

SOUND-POWER LEVEL—The sound-power level of a source, in decibels, is 10 times the logarithm to the base 10 of the ratio of the sound power radiated by the source to a standardized reference sound power. The reference power must be explicitly stated. (The international standard reference sound power is 10^{-12} watt.)

SOUND-PRESSURE LEVEL—The sound-pressure level, in decibels, of a sound is 20 times the logarithm to the base ten of the ratio of the pressure of this sound to the reference pressure. The common reference pressure for acoustics in air is 2.0 X 10^{-4} microbar.

SOUND TRANSMISSION COEFFICIENT—The sound transmission coefficient of a structural configuration is the fraction of incident sound energy transmitted through it.

SOUND TRANSMISSION LOSS (TRANSMISSION LOSS) (TL)—The sound transmission loss of a structural configuration is a measure of sound isolation. Expressed in decibels, it is 10 times the logarithm to the base ten of the reciprocal of the sound transmission coefficient of the configuration.

SPEECH-INTERFERENCE LEVEL (SIL)—The speech-interference level of a noise is a calculated quantity providing a guide to the effect of a noise on speech. The speech-interference level is that arithmetic average of the octave-band sound-pressure levels of the noise in the most important part of the speech frequency range. The levels in the three octave-frequency bands of 600-1,200 Hz (cps), 1,200-2,400 Hz and 2,400-4,800 Hz are commonly averaged to determine the speech-interference level.

THIRD-OCTAVE BAND—A third-octave band is a frequency band whose cut-off frequencies have a ratio of 2 1/3, which is approximately 1.26. The cut-off frequencies of 891 Hz (cps) and 1,123 Hz define a third-octave band in common use.

These terms have been adapted from, "Glossary of Terms Frequently Used Concerning Noise Pollution," compiled by Peter A. Franken, published by the American Institute of Physics.
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Shown left to right are: A serigraph in red, black, and white by Brian Rice, who has had several one-man shows and has done illustrations for many magazines in England; a black and white etching entitled St. Marys Leeds by Norman Ackroyd, who has instructed at several universities and colleges; and a colored lithograph with wild movement by Brian Elliott, who instructs, has had one man shows, and who has prints in the Victoria and Albert Museum in London. • London Arts, Inc., New York City.

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CIRCULAR STEEL FRAMING / A 35-page technical report explains general principles in planning and design, and provides a design example including data and drawings for a high-rise structure. United States Steel Corporation, Pittsburgh.*

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ELECTRIC DUCT HEATERS / The first half of a 24-page catalog provides a glossary, a description of uses and applications, code requirements, wiring diagrams, installation pointers and a sample specification. Remaining pages describe four series of duct heaters in a new line. H. W. Tuttle & Company, Tecumseh, Mich.

Circle 408 on inquiry card

FIREPLACES / A 100-page book entitled "Successful Fireplaces—How to Build Them" contains over 400 photos, drawings and plans which illustrate contemporary, traditional, corner, three-way and see-through types and styles. Included also are recommendations for the prevention of common problems. $1.00. Building Products Division, The Donley Brothers Company, 13900 Miles Avenue, Cleveland, Ohio 44105.*

Circle 409 on inquiry card

MOVABLE COMPONENT CLASSROOMS / A 10-page brochure presents a system for combining double demountable and operable retractable steel walls demonstrating sound control performance, mechanical function and cost. Color photographs show how the walls incorporate instructional classroom tools. The E. F. Hauserman Company, Cleveland.*

Circle 410 on inquiry card

AIR CONDITIONING / Self-contained rooftop multi-zone packaged air conditioners designed for cooling from 15 to 30 tons, heating from 300 to 600 MBH and handling air from 4,000 to 13,500 CFM are described and illustrated in a 28-page engineering manual. Also included are a psychrometric chart, total heat table, unit operation sequence and controls. Acme Industries, Inc., Jackson, Mich.

Circle 411 on inquiry card

ACOUSTICS / An 8-page technical publication describes the controlled acoustic environment at Colorado State University's Speech and Hearing Clinic, and emphasizes adaptable design features. Information on the sound suites, audiometric testing area, and reverberation chambers are provided. Industrial Acoustics Company, Inc., Bronx, N.Y.

Circle 412 on inquiry card

CONCRETE / An 8-page progress report depicts the dramatic growth in use of concrete, both as an engineering and architectural material. Many design examples of the last decade are pictured. Master Builders, Cleveland.*

Circle 413 on inquiry card

HARDBOARD SIDING / A 24-page illustrated catalog shows 13 siding types and styles. Finishing and workability data and other hardboard products are listed as well. Masonite, Chicago.*

Circle 414 on inquiry card

LATERAL FILES / The theme of a 12-page brochure is the "simplification of floor planning, using Broadside's basic 42-in. wide by 18-in.-deep module in 2-, 3-, 4- and 5-opening cabinets." Steelcase Inc., Grand Rapids, Mich.*

Circle 415 on inquiry card

ARCHITECTURAL LOUVERS / A 36-page catalog describes an extensive line of aluminum louvers for many air-handling requirements. Construction Specialties, Inc., Cranford, N.J.*

Circle 416 on inquiry card

*Additional product information in Sweet's Architectural File.
Specify Pliolite based paints. The reasons are elementary.

Insist on masonry paint with a durable Pliolite® binder. And neither rain, snow, sleet, sun, salt, nor industrial fumes will ever cost your client a premature repaint job.

Pliolite synthetic resins are chemically inert. They resist alkalis in masonry that cause some paints to fail. Paints based on Pliolite resins have proven their durability from the Norwegian subarctic to the Texas oil fields to a lighthouse in Maine. Our first test buildings are still going strong after 12 years on the Florida coast.

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Goodyear, Chemical Data Center, Dept. J-84, Box 9115, Akron, Ohio 44305.

For more data, circle 90 on inquiry card.
That’s a lot of Lighting!

16 sq. ft. of sparkling K-15—the bold new KSH prismatic lens

For king-size lighting, K-15 is the really new idea. It comes in 3 x 3 and 4 x 4. A strong .200” thick. With bold-look prisms ¾” square. Obviously, this new prismatic beauty makes those old dull pans passe. It costs less, too. So specify K-15 in polystyrene, Tedlar® PVF or acrylic.

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K-S-H, INC. • 10091 Manchester • St. Louis, MO. 63122

*DuPont TM for PVF Film
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Vaughan Movable Walls Corp. — our licensed contractor in Chicago, located at 4500 West Armitage — has built over 15 lineal miles of Vaughan Walls in the buildings shown above. They have developed an enviable reputation for quality, service and integrity obtained from working closely with leading architects and building owners.

A key member of a network of Vaughan Walls Licensed Contractors, Vaughan Movable Walls Corp. of Chicago has been selected and trained for quality craftsmanship in Vaughan's specialized methods. With locally stocked aluminum components and the United States Gypsum Company's plants strategically located throughout the U.S.A. and Canada, Vaughan Walls are ready for your partition needs tomorrow.

For a new full color brochure about interior walls write:

VAUGHAN WALLS
11681 San Vicente Blvd.
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For more data, circle 92 on inquiry card.
Every Modine unit ventilator gets whisper-tested

We make sure Modine Valedictorians won’t be noisy intruders in schoolrooms.

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As a four-season unit ventilator, Valedictorian performs the full air conditioning function—or any part of it. Heating, cooling, ventilating, dehumidifying and filtering the air—it’s as quiet in a classroom or library as it was back at the factory.

No hissing, humming, and groaning from Modine unit ventilators. Slow, smooth-running motors are cushioned on resilient mountings. Blowers gently circulate fresh air. And thick insulation further deadens sound.

A built-in “weather center” controls Modine’s unique full damper system. Sensitively alert to comfort needs, it responds instantly with fresh, filtered air at exactly the right temperature.

Not ready for complete air conditioning? Install Valedictorians for heating and ventilating only. Then add cooling later without spending a dime to convert the unit ventilators.

Either way, take a close look at Modine. And listen, too. Call your Modine representative or write: 1510 DeKoven Ave., Racine, Wis. 53401.
most compact
drink in town

Compare it! Haws wall-mounted HWTA is the neatest, most compact cooler on the market. You choose from Mist Gray baked enamel finish, or tan or gray vinyl cover panels. Perfect on any wall—any place. Write today for the colorful Haws Water Cooler Catalog.

Haws Drinking Faucet Company, 1441 Fourth Street, Berkeley, California 94710.

SQUARE LUMINAIRE / The H series consists of exterior units available from 100-watt to 1000-watt mercury and in either single or multiple head groups on 4-in. or 6½-in. poles. All hardware is corrosion-resistant aluminum or stainless steel, completely sealed and fully gasketed.

- Quad Lighting, Inc., Chicago.

Circle 304 on inquiry card

NON-WARP DOOR / The Ever-Straight door promises not to stick, leak, or crack, and the high degree of insulation of the solid Dylite foam core keeps the metal door warm to the touch in cold weather. The door is especially recommended for remodeling. It comes prehung in a special adapter frame and the complete unit slips into the existing door opening.

- Pease Woodwork Company, Hamilton, Ohio.

Circle 305 on inquiry card

For more data, circle 94 on inquiry card

drinking fountains and faucets, emergency eyewash fountains and drench showers, dental fountain/cuspidors and lab faucets

WATER COOLERS

For more products on page 22
The reason we’re introducing The Lobby Carpets.

Every foot that comes into an office has to go through the lobby. That’s why we call our new carpets The Lobby Carpets. They can take even the busiest lobby and show less soil, less dirt, less wear than you’d believe possible. So they’re not just for lobbies, but for offices, corridors, public rooms—anywhere a carpet has to take real punishment.

The reason The Lobby Carpets can take it is that they’re all made with a pile of 100% Antron® nylon by DuPont. Antron is a kind of super-nylon. It’s as tough as regular nylon. But far more soil resistant. Which means it shows far less dirt than any carpet fiber around.

And since it doesn’t get dirty as fast, it needs cleaning less often. Which makes it more economical.

And because we really believe in The Lobby Carpets, we’ve introduced a whole line of them. Different pile heights. Different designs. Different colors. But they all have one thing in common. They’re all priced right.

The Lobby Carpets by Lees—for places where anything else would be a dirty shame.

Any questions? A Lees contract carpet specialist will be glad to help. Just write Lees Carpets, Section 10B, Bridgeport, Pa. 19405.

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For more data, circle 95 on inquiry card
Peekaboo Parlor.

Peekaboo Portico.

Peekaboo Panorama.
We’re always asking if you’ve looked at Wheeling lately.

Today’s question: Have you looked through Wheeling lately? Please do.

Observe the possibilities of Wheeling expanded steel mesh. This is eye-opening stuff. It’s the paintable, bronzeable, lacquerable, galvanizable, rubber-or-plastic-coatable steel of the future. You can see how all those perforations add versatility and visual appeal. What you can’t see is how the same perforations make it lighter per foot, stronger per pound, and even more rigid than the original sheet of solid steel. But we’ll be glad to explain. Write us for a comprehensive expanded steel catalog.

You’ll find there’s more to our mesh than meets the eye.

(Who’d have thought the next breakthrough in steel would be the hole?)

Have you looked at Wheeling lately?

Wheeling

For more data, circle 96 on inquiry card

ARCHITECTURAL RECORD October 1967 219
Easy installation begins with roof-mounting frame to be flashed in place. All ducts pierce the roof within the frame.

New single-zone system heats, cools, ventilates. Long-life aluminized steel heat exchanger; non-corroding.

Optional POWER SAVER™ cools free with outside air below 57°F. Commercial quality, factory-assembled; prewired and precharge.
from "hole-in-the-roof" to start-up (same day!)

New Single-zone Lennox Comfort System goes hand-in-hand with Multiple-zone DMS

A compact, factory-assembled system, the new Lennox GCS3 is designed for ducted heating, cooling and ventilation of high-occupancy areas.

GCS3 combines gas heating with electric cooling, is available from 8 through 22 tons cooling and up to 500,000 Btuh heating. It can ventilate with 100% outside air when desired.

The GCS3 is an all-weather system, with a foolproof electric pilot and electronic safety controls.

Normally roof-mounted, with bottom air discharge, the GCS3 converts quickly to side discharge for grade-level installation.

Here is Lennox single-source responsibility, in a complete factory-assembled system of commercial quality.

Where both single-zone and multiple-zone comfort control requirements exist, the new GCS3 can be combined with the Lennox DMS (Direct Multizone System).

Whatever your building — office, school, restaurant, plant, clinic, laboratory, apartment or other high-occupancy space — Lennox has the system (or combination of systems) for it.

For details, write Lennox Industries Inc., 105 S. 12th Avenue, Marshalltown, Iowa.
the beautiful world of reinforced concrete is looking up

Twenty years ago, reinforced concrete building construction literally hugged the ground. Not any more. It's on the rise, reaching for the clouds. And the trend to taller, more beautiful buildings in reinforced concrete has just begun. Look at what has happened in just the past ten years.

One of the major reasons for this spectacular breakthrough is the new Grade 60 reinforcing steel. It has 50% greater yield strength. Helps designers achieve slimmer columns. Greater usable floor space. Reduced overall construction costs. Gives construction a material as versatile as the men's minds that design, engineer, and build with it. Beauty, utility, economy are all a part of the package.

If you have a building that's going up, ask your consulting engineer about the many benefits high-strength reinforcing steels offer in modern concrete building design. Do it soon.
1967
Lake Point Tower
Chicago
645 ft.

1969
Shell Oil Bldg.
Houston
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RUBBER MEMBRANE SPECIFIED FOR ANOTHER TOUGH WATERPROOFING JOB

A leak-free, under-plaza garage was demanded to accommodate the tenants at New York University Village Towers. Carlisle Sure-Seal Rubber Membrane was specified because it follows structural movement without damage... it is tear and abrasion resistant... it resists high hydrostatic pressure... it is immune to damage by soil chemicals, bacteria and aging... and, of course, it has excellent water impermeability. But this is not new for Carlisle Sure-Seal Rubber Membrane. For over ten years it has been meeting rugged waterproofing demands.

TECHNICAL AND FIELD SERVICE

This is Dick Kelley, one of the Carlisle team that lends practical assistance in the field. Dick is not a theoretical lab technician, but a waterproofing installer with many years of practical experience.

Technical and field assistance from design through estimating and installation is provided by Carlisle. For good results take advantage of this service, from start to finish.

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For more data, circle 98 on inquiry card

WALL PANELING / This antiqued reproduction of wormy chestnut planks is deeply embossed to provide a rugged, rough-textured, three-dimensional surface. The panels are available in 4-ft by 8-ft panels and are 5/8-in. thick. Panels are random-grooved vertically. • Armstrong Cork Company, Lancaster, Pa.

Circle 306 on inquiry card

REDWOOD / Prestained, rough textured redwood siding is available in a choice of patterns, color tones and textures (may be medium texture for interior and exterior applications, or extra coarse with better wearing characteristics in extreme climates). Factrisawn sidings require no job-site finishing: one side is machined smooth and the other is rough sawn for reversible surfacing. • Union Lumber Co., San Francisco.

Circle 307 on inquiry card

BUILDING PANELS / Reicote, made of a quality hardboard substrate and coated with a vitreous-hard, polyester gel finish is tough, corrosion and weather resistant, and is suited for both interior and exterior applications. Surface finish on the panel is non-porous and unaffected by such substances as bleaches, coffee, lipstick, ink, and alcohol. The panel is available in a wide range of non-fading colors. • Reinforced Plastics Division Reichhold Chemicals, Inc., Cleveland.

Circle 308 on inquiry card

more products on page 22
Day & Night air conditioning fits into your plans... as naturally as Night follows Day. Inside, outside, high-rise or low, Day & Night air conditioning gives you a free choice—and a good solution to any environmental plan. Capacities from 1½ to 15 tons. Split systems, all-electric heat pumps, combination heating/cooling, gas-electric Duopacs or Packaged units. Units that fit wherever appearance, support and convenience indicate. Day & Night spans the plans, residential and commercial, with complete capability for comfort conditioning.
CORNING INTRODUCES THE BONDED-FRAME GLASS LIGHTING PANEL
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. 8510, Corning Glass Works, Corning, N.Y. 14830.

CORNING
BUILDING PRODUCTS

For more data, circle 100 on inquiry card
SPA BATH / A built-in whirlpool, tub the Beauty Spa, furnishes therapeutic water action and fits into the same area required for any five-foot recess tub. The tub, which comes factory assembled, includes four self-cleaning jets, circulating pump and drain and overflow which are connected ready for installation. Briggs Manufacturing Co., Warren, Mich. Circle 309 on inquiry card.

ONE-PIECE BATHTUB AND WALLS / This fiberglass unit features a full-width, five-foot recessed bathtub, 14½ in. high with scultured curve design on the tub front, and a back-wall vertical recess that houses a grab bar and soap dish. Universal-Rundle Corporation, Chicago. Circle 310 on inquiry card.

HICKMAN Safeguard EXPANSION JOINT FASCIA AND WATER DAM SYSTEM (pat.)

Water leakage at the expansion joint is prevented as shown by this cross section. A butyl rubber strip at bottom, from one roof section to the other, and a second strip from top of the cant, fastened into the cover section, move with the building to form positive, continuous seals. The extruded aluminum sides and related components, being free-floating, are independent of the thermal reaction between the galvanized water dam and felts; this construction also insures that electrolytic action is negligible. All materials and parts are furnished: from end plugs to silicone sealant, from #10 cover plate screws to the tool for clamping rubber strip into cover section. Transitions for eaves and junctions are factory fabricated to insure accurate matching of adjacent components of the fascia and expansion joint system.

TO STOP ROOF LEAKS AT EAVES AND EXPANSION JOINTS See SWEET'S 21G-Hi

ROOF LEAKS! They happen most at the eaves and expansion joints. They mean trouble for your owners—time consuming annoyances for you. To prevent roof leaks at these points, refer to the 8 pages of Hickman in Sweet's and you will understand how thermal cycling between the roofing felts and the metal water dams—the main cause of these leaks—is neutralized and cracked felts avoided; also you will see why tar dripping and wall stains are averted.

This is a photo of a probable calamity for some client; it could have been prevented... The Hickman safeguard System stops felts from cracking because of thermal reaction, thus giving positive control of roof water at eaves and expansion joints, if any. Please remember too, you have a selection of extruded aluminum fascia profiles in Kalcolors; Porcelain and Baked enamel (all with concealed cover plates), it is easy to combine utility and beauty.

* Other than galvanized steel which has a thermal coefficient compatible with roofing felts when installed in 10' lengths to react independently

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For more data, circle 101 on inquiry card.
What hospital operation cuts out noise?

(The installation of Stevens Gulistan Carpet, of course.)

The Mercy Hospital of San Diego, California, chose Stevens Gulistan® Carpet with good reason. The more than 7000 yards of New Charter Oak, a Stevens Gulistan commercial deep loop pile quality of Acrilan® acrylic pile, provides many benefits. It cushions steps and hushes sounds, provides the peace and quiet and home-like comfort so welcome to patients and personnel. It provides non-slip safety. All this plus easy care and low maintenance costs. Ask for the complete Stevens Gulistan story, and see our catalogue in Sweet's Architectural File #11L, A.I.A. File 28.

Stevens Gulistan Carpet

At Mercy Hospital, Stevens Gulistan Carpet of Acrilan offers many advantages. Architect Frank L. Hope & Associates, A.I.A., Contractor, Broadway Linoleum & Carpet. Carpet shown is 70% Acrilan acrylic, 30% modacrylic.

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Please send me the whole story on how Stevens Gulistan Carpet contributes quiet, warmth, comfort and beauty at less cost to hospitals. Include free samples of Stevens Gulistan Carpet.

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Masonry wall reinforcement is the kind of product that’s no good “on order”—you need it on the job and on time.

Dur-O-wal® truss masonry wall reinforcement is nationally distributed and is the most widely used.

And Dur-O-wal® truss is the most versatile. You get a selection of more shapes and sizes applicable to single wythe, composite or cavity walls. Our eleven manufacturing plants are backed up by a network of thousands of dealers.

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Don’t risk holding up jobs waiting for an off brand of reinforcement. Dur-O-wal® got to be first in this business by being on hand and on time with the best. Write us for a bulletin of all our shapes, sizes and applications. Dur-O-wal®, P. O. Box 368, Cedar Rapids, Iowa 52406.

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THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN

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For more data, circle 103 on inquiry card
FIXED SEATING / In addition to increasing the seating capacity of a room, these units are said to reduce floor maintenance time and cost. The slim base makes vacuuming or sweeping possible without moving the seating. Available in four types of mountings and three types of seating units. • Brunswick Corporation, Kalamazoo, Mich.

Circle 313 on inquiry card

DORMITORY FURNITURE / A complete range of free-standing and built-in component units have incorporated specially-designed features for a variety of dormitory needs. Special paneling material, Fiber-x, resists liquids, burns and scratches. All parts are removable and replaceable. • Royalmetal Corporation, New York City.

Circle 314 on inquiry card

"Ty-Seal gaskets saved me more than 500 man hours on this job"

THE MAN: Robert E. Layton, Jr., Professional Mechanical Engineer and President of Layton Engineering Company, Tyler, Texas.

THE PROJECT: A recently finished 2 million dollar high school. Mr. Layton’s firm installed the entire waste and drainage system. "I furnished Ty-Seal joint gaskets with Tyler pipe and fittings because I could actually reduce costs without cutting quality. I estimate Ty-Seal gaskets saved me more than 500 man hours on this job. This, coupled with the 50-year guarantee backing each gasket against failure, make Ty-Seal an outstanding product in my opinion." No wonder more and more architects and engineers are specifying Ty-Seal. Why not join them?

Circle 315 on inquiry card

SELF-ALIGNING SHINGLE / This double surfaced Jet shingle measures 12 in. by 36 in. and weighs approximately 238 lbs per square. The elimination of cut-outs provides unbroken continuity across the entire roof. The shingle includes thermostatic dots to insure self-sealing and factory-embossed at random along the exposed five-inch portion, producing vertical shadow lines. • Bird & Son East Walpole, Mass.

Circle 316 on inquiry card

ROOF-EXIT SADDLES / Aluminum bullhead saddles in stock widths telescope or widen to fit all sill widths. Either plate may be specified to widths from 6 in. to 20 in. • Zero Weather Stripping Company, Inc., Bronx, N.Y.

Circle 317 on inquiry card

ICE REMOVAL / A system called Iceless may be used to keep ice and snow from forming on roofs and cornices. When temperature or humidity reach preset control points, electric heating cables or mats are automatically turned on. Automotive Information Service, Inc., Woodmere, N.Y.

Circle 318 on inquiry card

For more data, circle 104 on inquiry card

232 ARCHITECTURAL RECORD October 1967
In one of the largest facility comfort conditioning applications using industrial gas turbines, six Solar 1100 hp Saturn® turbines will provide air-conditioning, heat and process steam for the State of California Capitol at Sacramento and 14 other major State office buildings.

Economy of operation was a major factor in the State’s decision to build a central air-conditioning plant using gas turbines. The Saturn gas turbines will be mounted in dual-engine mechanical-drive packages, each providing 2200 hp through a single gearbox. Each package will drive a refrigeration compressor with a capacity of 2100 tons. Since exhaust heat from the turbines will produce steam to drive an additional compressor, extremely high thermal efficiencies are expected. Contributing to further economies are: greatly reduced cost of installation because of light weight and small size . . . low cost of natural gas fuel . . . and minimal maintenance and operational manpower requirements.

If you need horsepower — for air conditioning, heating, lighting, or total energy—you are urged to get the facts on how Solar industrial gas turbines can save you money. Hundreds of Solar Saturn gas turbines have proven their reliability during more than 2½ million hours of operation.

For further information, write: Solar, Department P-353, San Diego, California 92112.
THE ARCHITECTS IN THE OFFICE OF ALFRED EASTON POOR WANTED A WINDOW COVERING THAT WOULD PRESERVE THE NEAT UNIFORMITY OF THE FACADE, AS WELL AS CONTROL LIGHT AND HEAT. THEY SPECIFIED THE 1-INCH-WIDE SLATS OF LEVOLOR RIVIERA VENETIAN BLINDS.
THE INTERIOR DESIGNERS WANTED A WINDOW COVERING THAT WOULD BLEND UNOBTRUSIVELY WITH BOTH CONTEMPORARY AND TRADITIONAL OFFICE DECOR. THEY INSISTED ON THE "INVISIBLE" LADDERS AND MAGIC WAND TILTERS OF LEVOLOR RIVIERA VENETIAN BLINDS.

VEN THE BUILDING MANAGER GOT INTO THE DISCUSSION. HE WANTED TO SAVE TIME, MONEY AND EFFORT ON THE INSTALLATION, SO HE HAD LIGHTWEIGHT RIVIERAS GLUED INTO PLACE INSTEAD OF USING CONVENTIONAL HARDWARE. NOT ONE HAS FALLEN.

FOR COMPLETE DETAILS ABOUT THE BLIND ARCHITECTS AND DESIGNERS AGREE ON, RITE LEVOLOR LORENTZEN, INC., 720 MONROE STREET, HOBOKEN, N.J. 07030
soundmaster 480 operable wall provides more sound control than a 4" concrete block wall

Engineering assistance, detail tracing drawings, and precise installed cost data are available upon request from your local Modernfold Man ... or write for the new Soundmaster 480 performance specifications brochure §1445.

SURFACE TOPPING / Poradek looks like carpeting, is said to outwear concrete, and is recommended for commercial, institutional and residential buildings. This indoor-outdoor topping, a combination of colorful stone aggregates and epoxy, is impervious to wind, water, ice, extreme temperatures, sunlight, and all common corrosive chemicals. Suggested uses include walkways, patios, driveways, loading platforms, garages, pools and locker rooms, lobbies and entrances, and service and utility areas. — Poraflo, Inc., Woodside, N.Y.

Circle 318 on inquiry card

STEEL PANELS / Vinylife vinyl-coated galvanized steel panels are designed for roofing and siding on steel mills, factories, warehouses, chemical plants, paper mills, and commercial buildings. Panels are available in ten different configurations and in almost any color combination. Production procedures permit coating of metal panels after forming thereby insuring coated edges and uniform surface coating undamaged by reformings. Vinylife is reported to have demonstrated perfect flexibility and adhesion through extreme temperature changes and superior resistance to impact, abrasion, staining, weathering and salt spray. — Glaros Products Inc., Pittsburgh.

Circle 319 on inquiry card

For more data, circle 107 on inquiry card
Planning an on-the-go office building? Specify a Recordlift

VERTICAL MAIL CONVEYOR BY

Standard Conveyor

The ultra-modern office buildings seen here differ greatly in architectural style—yet they do have one thing in common to give them remarkable functional efficiency.

It's a Standard Conveyor Recordlift Vertical Mail Conveyor System, schematically illustrated at the left.

By providing fast, selective distribution of inter-floor mail and supplies, a Recordlift cuts operating costs by saving 100's of mailboy and messenger man-hours daily. Operation is completely automatic...all you do is load the container, set the address and Recordlift delivers. Automatically.

It's the proven way to solve office building distribution problems! Ideal for hospital use, too!


For more data, circle 118 on inquiry card

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Great spreading arches that form an outer structure around a circular wall of stained glass distinguish the new B’nai David Synagogue in Southfield, Mich., a suburb of Detroit.

The recently completed synagogue is unique, not only from an appearance and historical standpoint, but also because of the unusual design concepts employed in its construction.

The design of the completely column-free sanctuary was made possible by a structural steel framing system devised by the project architect, Mr. Sidney Eisenshtat of Los Angeles, Calif., associate architects Havis-Glovinsky Associates of Detroit, and the structural engineering firm of McWilliam and Keckonen of Birmingham, Mich.

Four curved steel trusses, each 124 feet long and 44 feet high on the ends, form the four exterior arches of the new synagogue. The trusses are tied together by four main plate girders, two of which are 142 feet long and 7 feet deep. The ceiling and interior plaster walls hang from this truss system.

The deep steel trusses rise above the pitched roof of the sanctuary. The roof slope provides drainage. The trusses were shipped knocked down and then assembled by field bolts at the site. The main truss members are 10-inch, wide-flange beams. The structural loads are distributed to concrete pedestals at the foot of each arch.
The four rising points of the arches provide an allusion to the four horns of the altar of the original sanctuary in Jerusalem. While the outer arched walls form a diamond pattern, the sanctuary itself is circular in shape, with the seats placed in a horseshoe pattern around the bimah (altar area). This places worshippers in the last row of the 1,050-seat sanctuary never more than 17 rows, or 64 feet, away from the pulpit, creating an atmosphere of intimacy.

Circular glass wall, enclosing the sanctuary, consists of 70 windows whose colors bridge symbolically the path from Earth to Heaven.

Like giant arms reaching out from the altar two curved innerwalls rise to the ceiling which floats within them.

SCHOOL WIRING / Compiled for use as a permanent reference and wiring specification guide for the school market, a 22-page brochure has an index tab readable from either side, and is three-hole punched for filing in standard binders. • Harvey Hubbell, Incorporated, Bridgeport, Conn. Circle 415 on inquiry card

MASONRY WALL REINFORCEMENT / An 11-page bulletin reviews an investigation of continuous metal ties in masonry wall construction conducted at the IIT Research Institute. • Dur-o-wal National, Incorporated, Cedar Rapids, Iowa.* Circle 416 on inquiry card

SUB-FLOORS / Steel cellular sub-floors and open beam sub-floor sections are described and graphically illustrated in a revised, 20-page technical bulletin. The booklet highlights their application versatility and adaptability in meeting a broad range of building requirements. • The R. C. Mahon Company, Detroit.* Circle 417 on inquiry card

PLYWOOD GRADES / A guide describes briefly and gives examples of the most common uses of exterior and interior grades. Synopses of the principal changes from three old manufacturing standards to the new consolidated Product Standard PS 1-66 for Softwood plywood are included. • American Plywood Association, Tacoma, Wash.* Circle 418 on inquiry card

CEDAR / “Cedar’s In Business” is an 8-page color booklet showing architectural examples of western red cedar in commercial structures. Included are examples of low-rise office buildings, apartment and town houses, convalescent centers, and retail and office buildings. • Western Red Cedar Lumber Assoc., Portland.* Circle 419 on inquiry card

PLUMBING / “New Fashion Ideas for Bathrooms” are described in a 31-page catalog illustrating design, layout and color schemes. Kitchen sink designs are also included in the full color catalog. • American Standard, New York City.* Circle 420 on inquiry card

GLAZED STRUCTURES AND SKYLIGHTS / A 12-page booklet provides three basic design systems for glass and acrylic overhead structures, flat and curved. • Ickes-Braun Glasshouses, Inc., Aptakisic, Ill. Circle 421 on inquiry card

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STEEL CABLES / “Tentative Criteria for Structural Applications of Steel Cables for Buildings,” a 16-page brochure, and “A Bibliography of Selected Articles on Steel Cable in Building Design” are available. • American Iron and Steel Institute, New York City. Circle 423 on inquiry card

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Additional product information in Sweet’s Architectural File

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continued from page 254

STORAGE SYSTEMS / A 16-page booklet is designed as a reference for storage systems planners. Over 60 illustrations show steel shelving, cabinets, bins, lockers, and shop equipment in various installations. • Penco Products, Inc., Oaks, Pa.*

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LIGHTING / A revised 36-page brochure describes a complete line of exterior mercury, fluorescent, filament, and quartz-iodine lamps. Other information covers ballasts, controls, adapters, brackets and poles. • General Electric Company, Schenectady, N.Y.*

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ARCHITECTURAL RECORD October 1967 259
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Indian memorial wins Army Engineers' award

The Indian Memorial at Ice Harbor Dam, near Pasco, Washington, has been selected from among 25 entries to receive the Army Chief of Engineers' Distinguished Architectural Achievement Award for 1967. The awards program was begun in 1965 to promote greater functional and esthetic qualities in the Corps of Engineers design.

Focal point of the memorial is a large boulder bearing ancient Indian inscriptions, which was taken from Snake River Canyon. The memorial commemorates the tribal burial grounds of five different Snake River Indian groups. It was designed by the staff of the Walla Walla Army Engineer District with technical assistance by Dr. Erna Gunther, anthropologist from the University of Washington.

Jury members were architects Roy F. Larson, Charles M. Nes, Jr. and George F. Pierce, Jr.

Candidates sought for Brunner Scholarship Grant

The annual competition for the $6,000 Brunner Scholarship Grant has been announced by the New York Chapter of the American Institute of Architects.

The competition is open to any citizen of the United States engaged in the profession of architecture and its related fields "who has a professional background more advanced and broader in scope by actual experience than is generally implied by four or five years of architectural school training."

The award is given "for advanced study in some special field of architectural investigation which will most effectively contribute to the practice, teaching or knowledge of the art and science of architecture."

Proposals will be reviewed until January 15, 1968, and applications can be obtained by writing the Chapter headquarters, 115 East 40th Street, New York City.
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Square D products play prominent role in spectacular new hotel

The new Regency Hyatt House in Atlanta can be described only in superlatives. Built around a 3 million cubic foot atrium which extends the full 22 stories of the structure, the Regency Hyatt House is a blaze of color and motion. Two men work full time at keeping the nearly 3,000 plants cleaned and watered. Glass elevators (above right), rising at 700 feet a minute, provide a breathtaking panoramic view. Built on a 5-level parking garage and capped by a revolving restaurant, the Regency Hyatt House is truly an epitome of elegance.

All of the electrical distribution and control equipment for this new hotel was supplied by Square D Company. On duty throughout are such products as the 12,000-ampere main switchboard, lighting panelboards, motor starters, safety switches and busways, including the elevator busway riser.

For more data, circle 150 on inquiry card
The planning critique


On the September 25 editorial page, New York Times architectural critic Ada Louise Huxtable discussed the recent transfer of Robert Simon's Reston to Gulf Oil Company. Gulf, already in for $15 million, has sent a specialist to "see if [he] can make this thing work."

Fair to the big corporation, Mrs. Huxtable quotes the specialist's statement that Gulf has "patient" money; but she seems stung that he also says Gulf does not think Reston (or Gulf-Reston, Inc., as it should now be known) a particularly good investment. She lists the qualities Reston has and has sought to implement: "... a sensitive and extremely handsome small world and a way of life formed and molded with high art and sophistication by some of the country's best talents ... town houses, cluster zoning, communal open land and amenity programs [achieved by] hard crusading for local reforms and bitter battles for financing."

The Community Builders and The Levittowners provide a background for understanding the event Mrs. Huxtable records and laments. Architects especially might ask what happened, since, as Mrs. Huxtable catalogues, Reston began with great architectural involvement and more of a design approach toward overcoming undesirable suburban characteristics than most new towns. On what grounds, then, did planning and design fail; or in strictest terms, did they fail at all?

The Community Builders and The Levittowners, perhaps to a great extent, answer that question. They both respond to the urban-development critique that has been heard from some time with a planning critique. It is interesting that this latest insistence on a critique of city planning is being mounted by planners. Herbert Gans of Columbia University, who wrote The Levittowners, has a Ph.D. in city planning from the University of Pennsylvania. Marshall Kaplan has M.A. degrees in political science and planning. Edward Eichler has many credits, his latest as vice president of Reston, Inc.

Their books are appropriately reviewed together. Their data are complementary (Gans, sociological, northeastern; Eichler/Kaplan, financial, southwestern emphases, respectively). Nonetheless it is hard on these excellent books to be "lumped" and it must be made clear that they contain more and different things than this review can cover.

Eichler and Kaplan, authors of The Community Builders, stress that the new towns are springing from the urban-development critique. Physically, the critique of conventional subdivisions cites land waste and inadequate facilities; socially, it condemns the suburban mass man, saturated with pointless suburban activities, entertained by television, over-commuted and other-directed.

Eichler and Kaplan show, in their portraits of Robert Simon of Reston and James Rouse of Columbia, how two enlightened men interpreted the critique and sought to do something about it. The answer of Simon and Rouse, and others, was that of the architect and planner—a total, planned environment.

Though Eichler and Kaplan and Gans have different points of departure, their books converge to nearly identical conclusions: They feel that new town planning does not correspond with the demand for suburban housing as it exists, and that such planning may, if practiced widely, ultimately interfere with democratic concept by limiting choice of life styles and imposing the views of the educated planner and the upper-middle-class person on others.

Both books supply evidence that these "others"—the "average" homebuyers—may make a life-or-death financial difference to the survival of new towns. From Eichler and Kaplan's analysis of the new town market and financial problems, it becomes clear that this important segment of the potential population of new towns was not adequately planned for. That is: The aspirations of these people were not sufficiently taken into account; leading planners and founders of new towns into basic assumptions that they did not test before committing large amounts of money.

According to Eichler and Kaplan, the two basic financial assumptions of the planners and founders are: 1) that rising incomes mean that a large enough segment of "average" homebuyers will pay more for a house in a planned, new-town environment, or even that 2) they will understand, and indirectly pay for, planning. Gans names the missing group of people—the "others"—as the lower-middle class.

Eichler and Kaplan show that the biggest demand for housing in 1965 (on which most of their research was done in 1964-5) was in the $17,000 to $23,000 range, and that the lowest income at which such homes was about $8,000. But most new towns started out to have homes in the $23,000 and above range.

Gans and Eichler and Kaplan, together, show that the desire of people in this lower-middle-income bracket for the house. They buy its space and accommodations, not the community and its amenities or lack of them. (Gans, re-searching in 1958-60, recorded an increase of at least $6,500 to buy a Levitt home between $11,000 and $15,000—so given the five or seven years gap in research, groups discussed by the three are probably more similar than not.) Thus, Levitt's simple maxim of "the most for the money" is vindicated for his mark.

This house-centered group saw planning, according to Eichler and Kaplan, a device for enhancing and protecting the "class image" of their new town location, and for controlling house value. Continued on page 301.

For more data, circle 151 on inquiry card.
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Specially significant is the fact that, since January 1966, architects have voted Architectural Record "preferred" in fifteen out of fifteen studies. Here are the results:

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Equally significant is the fact that the Record's margin of leadership over the second place magazine has widened at the same time. In 1965 the margin of preference for the record over the second place magazine was 19 per cent. In 1966, it was thirty-five per cent. In three recent independent readership studies, the Record's leadership over the second place magazine has widened to more than fifty per cent. Here are the results of these studies, in response to the question, "Which architectural magazine do you find most helpful in your work?"

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Tell all your building products to architects and engineers in the magazine they prefer...more building product manufacturers do.
Many said they planned to make little use of the facilities. Gans did not find that the "planning" that Levitt did incorporate into his effort had affected Levittowners' lives at all—for example, few identified with the school that was placed at the center of their neighborhoods.

Children-centered and house-centered, these young couples desire mostly an easy neighborly sociability. Gans finds. (Also see Clarence Stein's discussion of Radburn in Toward New Towns for America, published by M.I.T.) These families also do not like row houses, research by the authors reveals. They maintain a preference for the single-family home above all. Further, they interpret the attempts of the community builder to place industry, garden apartments, row housing, stores, or even park-like office structures anywhere near them as a threat to their status—and will fight against such measures, which Eichler and Kaplan list as vital to help new towns financially.

Eichler and Kaplan further worry that, if the community builder of new towns seems to be breaking his apparent early promise to higher-paying residents by later incorporating lower-income housing and industry, the builder will lose word-of-mouth advertising, the best kind. He might gain adverse word-of-mouth advertising.

In short, the list of qualities published by the Times critic matters to architects and planners, who are cosmopolitans; but not to a large segment of buyers—called locals by Gans—whose aspirations and needs were not consulted by planners. They may merely buy elsewhere other than in new towns endangering the entire new town idea. Mrs. Huxtable quotes the Gulf representative's aim as "good planning and design with economic feasibility" and says "to date the two are irreconcilable." Maybe Gulf Oil will have an answer. —Sidney Abbott

Palladio

PALLADIO'S VILLAS. By James S. Ackerman, J. J. Augustin, Inc., Publisher, Locust Valley, New York. 79 pp., $5.00.

Palladio’s Villas, originally written as a lecture by James Ackerman for New York University’s Walter W. S. Cook Alumni Lecture series, is a welcome addition to the literature of one of Renaissance Italy’s most well remembered architects. The book is a scholarly treatise with minutiae of scholarship appearing in the appendix, but the lecture itself makes lively and informative reading for the Palladio admiring layman as well.

Andrea Palladio sublimated his personality in aloof, serenely elegant buildings. The Palladian vogue swept into 17th Century England like fresh Mediterranean air. Inigo Jones, and in the next century Lord Burlington, returned from Italy with Palladio’s treatises and drawings in hand. Grand tours of his villas became de rigueur, and for those who could not make the trip his Quattro Libri became the ersatz Baedeker to genteel domestic design. Indeed, in explaining Palladio’s tremendous popularity, the author makes a crucial and McLuhanesque point: Palladio’s architecture—modular, planar—was communicable, indeed enhanced, in print and line. Baroque—fluid, dynamic, affirmative and possessive of space—would have been distorted by two dimensional reproduction, and was thus unexportable.

In the U.S. the Palladian style seems to fit the bill for housing the plantation owner. Jefferson’s visit to La Rotunda Palladio’s most famous villa, influence Monticello’s design. The style has survived to this day. At its worst, it has dried

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A bibliography on modern architecture

SOURCES OF MODERN ARCHITECTURE. Edited by Dennis Sharp. George Wittenbom Inc., 1018 Madison Avenue, New York, N.Y. 10021. 36 pp., illus. Paperbound, $4.75.

This bibliography is perhaps the most comprehensive one to date on the sources of modern architecture, including the architects, painters and critics. It will undoubtedly serve as an essential reference to the literature of the Modern Movement.

The bibliography first appeared in the Architectural Association Journal and its expanded form now has neat cross-reference along with some biography. More important though, is the fact that it is a selective list of more than 1,000 books and magazine articles concerned with the development of the Modern Movement. The entries are placed under sections devoted to either biography, subject—theory, Bauhaus, Art Nouveau, etc., or nation. However much a bibliography can reflect the personal taste of the author, this one does; however, it goes beyond the mere listing of the general works on modern architecture and theory.

Books Received

BUILDING STRUCTURES PRIMER. By James E. Ambrose. John Wiley & Sons, Inc., 605 Third Avenue, New York, N.Y. 10016. 127 pp., illus. $7.95.


A FUTURE FOR THE AGED. By Frances Merchant Carpenter. University of Texas Press, Austin, Texas. 267 pp., illus. $6.50.

NATURAL RESOURCES: QUALITY AND QUANTITY. Edited by S. V. Cinca-Wooton and James E. Parsons. University of California Press, Berkeley, Calif. 277 pp., illus. $6.50.

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GRAPHIC HISTORY OF ARCHITECTURE. By John Mansbridge. The Viking Press, Inc., 625 Madison Avenue, New York, N.Y. 10022. 192 pp., illus. $9.95.


PERSPECTIVES FOR ARCHITECTURE. By Georg Schawacher. Frederick A. Praeger, 111 Fourth Avenue, New York, N.Y. 10003. 119 pp., illus. $10.00.


CRANE HANDBOOK. Whiting Corporation, 15700 Lathrop Avenue, Harvey, Ill. 60426. 206 pp., illus. $7.50.


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