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QUIET ARCHITECTURE OF HIGH DISTINCTION

New buildings at Phillips Academy, Andover, Mass., will be featured in a 16-page presentation of special interest not only for the considerable technical innovation of its architecture but also for its sensitive and sympathetic relationship to the older buildings on an old and beautiful campus.

BUILDING TYPES STUDY: APARTMENT BUILDINGS

With activity in the apartment building field rising toward another record year, according to F. W. Dodge records on contracts awarded, next month's Building Types Study will offer a review of trends and architectural accomplishments in the design of apartment buildings. Some interesting indications of new architectural approaches to the factors of increasing land cost and new attitudes on the question of density.
There’s educational significance in the circular shape of the Science Building at LaReine High School. Combined laboratory and lecture rooms, with amphitheatre-type seating in the lecture area, are ideal for science instruction. Triangular rooms, then, are most appropriate. This, in turn, suggests a circular building.

Strength and symmetry were achieved with exposed precast concrete columns and arched roof beams. 112 precast concrete slabs are supported by the beams to form the domed roof, 105 feet in diameter and covering 7,450 square feet of column-free interior.

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KENTILE FLOORS
Behind the Record

Give 'em Hell

This little admonition reduces to plain English what a great many architects compulsively urge upon editors. Normally I am not so ready to respond as I seem lately to be; I have twice devoted this page to some remarks on the general topic of giving 'em hell. Perhaps it was the naked intent of the last expression of it that makes me rise this time.

It came from an architect friend, who had cornered me for a spouting of spiteful recriminations against the bold and innovative and egocentric architects whose work we "put in the magazines." He was plainly saying that the old architecture was better, the new a lot of nonsense, and that my duty was plain—he put it in those simple words, "give 'em hell."

There was no delicacy, as there usually is, in the demand on an editor for criticism. Usually the plea is couched in expressions of noble intent: and normally, I believe, there is sincere belief in the idea that published criticism advances the art, that frank and penetrating evaluation keeps the stormy petrels to some course that satisfies some particular critic. So is the bold mariner prevented from misleading his faithful followers. Or so is the fearless leader deified should he in truth be about to discover the new land.

My friend washed it all aside. He was not asking for any picking and choosing among the innovators or their ideas. He was generalizing against them all. Give 'em hell. My duty was obvious—turn the guns on them and destroy them. Them and their crazy ideas.

Well, I shouldn’t bother with it, except that it gives the chance to quote from a recent speech of Pietro Belluschi’s, in which he recalled the positive search in the modern movement, and stated it so well:

“Our own modern movement began as a protest: the men responsible for its development meant to free architecture from forms which seemed to have spent themselves and become hollow. Tradition had become a collection of shells upon the beach of time, from which a non-creative society in a hurry could draw or borrow with impunity. The word Beauty itself was comprised by external images of ideas long dead; the obelisk, the Egyptian religious symbol, transmuted into the Washington Monument, finally prostituted into the Minneapolis Foshay Tower; the Greek Temple and its perverted image on Wall Street. It took great courage to redefine Beauty as an intrinsic quality and not an embalmed image of things past; it took courage to rediscover that Tradition, the word so often brandished by building committees, never meant to stand unchanged.

“Tradition, in fact, was found to be change, evolution, search. Human affairs have never been stagnant, and architecture in all great societies has had to come to terms with change. It was found that to stand still and copy, or to be awed by past symbols, was to weaken our own spiritual resources and to condemn our creative gifts to impotence—that the present, infinitely challenging, demands the utmost effort from each of us—and that opportunities for thought and action exist all around us.”

In justice to Belluschi it should be added that this quotation is out of context; he was talking about church design (see ARCHITECTURAL RECORD, July issue), and he was really warning against letting this challenging search over-stimulate—“However, with his [man’s] right to fashion his own symbols goes the duty to develop a strong inner discipline. It is all too easy to delude oneself into thinking of architecture as an exercise in cleverness.”

But in or out of context, it is good to have in his words the call of our times. It expresses the reason we do not turn the guns on the innovators and destroy them. We shall urge the petrels into further flights, confident that their fellows will know when to follow, when to doubt. And let me say to my friend that I know he was just blowing off; he doesn’t really want us to show eclectic architecture. I hate to think what he’d give us if we did.

—Emerson Goble
On May 28, the President's Special Consultant on the Arts, August Heckscher, submitted his report on "The Arts and the National Government." The occasion was unusual not only because of Mr. Heckscher's assignment, which the President, in thanking him, termed "a new function in the Executive Office," but also because of the content of the report, a rare effort to determine the extent and effect of the Government's participation in the arts.

What Mr. Heckscher found was more government participation than is generally recognized, though much of it is willy-nilly and not faced as an esthetic issue. "Government in the normal course of its operations acquires by purchase of commission a considerable number of works of art... Memorials, statues, murals, fountains, historic and decorative paintings—as well as works of art for public museums—are among the objects which government in some degree or other makes its own... In addition, in a number of often unrecognized ways the Government is constantly 'acquiring' art—by purchase, commission or creation by its own designers and producers. Examples of such activities are the commissioning of official portraits, the photographic and film projects of a number of Federal agencies... and the continuing art projects of the Air Force and the Navy.

The report suggests that advisory committees on the arts could be useful in departments without such committees, and could be improved upon in other departments. It recommended particularly the work of the State Department's architectural advisors on overseas building. (At the same time, the Report expressed the regret that "In the last several years, the value of this achievement has not been fully recognized. The foreign building program of the State Department has received inadequate support and has been cut back.")

Architecture, as a major area of government participation in the arts, receives proper attention in the report. It relies heavily on the Administration's official statement of last year, "Guiding Principles of Federal Architecture," and termed the implementation of that statement "of the first importance." In the section on public buildings, the Report says, "A basic assumption of this Report is that good design is not an added embellishment or an unnecessary extravagance."

To improve the architectural standards of government buildings, the Report suggests an extension of the advisory committee principle recommended for other areas: "An over-all panel on architectural policy might help assure that the standards achieved in our best Federal buildings, such as those hitherto constructed abroad, could be made to prevail in what is built at home for all the various purposes which government serves." The Report's concern with environment also covered the national parks, urban renewal, historic preservation and public housing.

While recognizing that, under American conditions, the role of government in the arts "must always be marginal," Mr. Heckscher nonetheless had some very specific recommendations for a broad policy and for its implementation. For administration, he suggested (1) the permanent inclusion of a Special Consultant on the Arts in the Executive Office; (2) the appointment of an Advisory Council whose functions would be "to continue and fill out the work of study and gathering information begun with the limited resources of the Special Consultant; to review Federal policies and make recommendations for improving design; to recommend long-range programs; and to assure the active participation of the artistic community in the Government effort"; and (3) the establishment of a National Arts Foundations, modeled on existing science and health foundations, to administer grants-in-aid to states and institutions.

Simultaneously with his Report, Mr. Heckscher submitted his resignation as the President's Special Consultant; he remains in the position, however, until the President appoints a successor.

FHA INVITES ENTRIES IN DESIGN AWARDS PROGRAM

Stating its purpose to be "to give recognition to superior design in homes, apartment buildings and subdivisions, to promote wider understanding of the principles of good design, and to carry out the National Housing Act objective of encouraging improvement in housing standards and conditions," the Federal Housing Administration has announced its 1963 honors program for residential design. These are the first FHA awards for designs undertaken under FHA commitments.

Awards will be made in the categories of single-family houses, multifamily projects, and nursing homes and housing for the elderly completed since Jan. 1, 1958. Entries may be submitted by architects, landscape architects, designers, builders or owners. The basis of judgment will be excellence of design and execution, as well as relation to environment.

Award certificates will be presented by the Commissioner at a ceremony in Washington. Further advantages promised include publicity in magazines and newspapers, and an FHA-prepared touring exhibition of the winners.

Registration cards are due August 10; entries must be mailed by September 1. Inquiries should be directed to Director, Architectural Standards Division, Federal Housing Administration, 811 Vermont Ave., N.W., Washington 25, D.C.
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- Pueblo, Colo., 29th and Court St.
- Phoenix, Ariz., P.O. Box 49
- Aurora, III., 269 S. Highland Ave.
- Seattle, Wash., 3310 Wallingford Ave.
- Minneapolis, Minn., 2653 37th Ave. So.
- Hamilton, Ont., Canada, 789 Woodward Ave.

For more data, circle 5 on Inquiry Card
Mayor Wagner has announced New York City's long-range North River Development Plan, a plan which in 40 years would transform the city's North (Hudson) River waterfront from the Battery to West 72nd St.

The plan is based on the "recovery" of land now underwater, and it is calculated that this new land will add about 640 acres to the area of the island. The estimated cost of the development is $670 million.

The plan divides the waterfront into nine areas.

Area I, extending from the Battery to Chambers Street, will restore residences and hotel facilities to the downtown district. Area II, from Chambers to Morton Street, and Area III, from Morton to Gansevoort Street, will compose a Downtown Distribution Center, with cargo terminals. Area IV, from Gansevoort to Little West 12th Street, will contain municipal services and open wharfage. Area V, from Little West 12th to West 37th Street, will constitute the Midtown Distribution Center. Area VI, from West 37th to West 43rd, is to be a sightseeing and convention center, providing terminals (docks and helistops) for both sightseeing and commuting; this plan also calls for a convention hall to seat 23,000. Area VII, from West 43rd to West 54th, will have three new passenger terminals, with a consolidated customs shed; the Mayor has given this area priority. Area VIII, from West 54th to West 59th, will provide docks for various city services—the Sanitation and Fire Departments, and utilities. Area IX, from West 59th to West 72nd, is called a transportation-recreation center.

Members of the 18-month study group which developed the plan were Ebasco Services Incorporated, management consultants; Moran, Proctor, Mueser & Rutledge, consulting engineers; and Eggers and Higgins, architects.
Experimental School in New York

New York's Board of Education has announced plans for a demonstration school, P.S. 219, to provide facilities both for teaching observation and for research. The domed satellite will house 176 early primary students in a flexible plan utilizing movable partitions; Educational Facilities Laboratories have given a grant for the special acoustical requirements. An adjacent building, rather more conventional, will house 892 elementary pupils. Caudill, Rowlett & Scott are the architects.

575 Technology Square

Technology Square is an urban renewal development undertaken jointly by Massachusetts Institute of Technology and Cabot, Cabot & Forbes Co. 575 Technology Square, shown here, is the second of four projected buildings, the first of which (twin to 575) has been completed. Structure is precast concrete with gray glass windows. The building was designed by Cabot, Cabot & Forbes Associates, Inc.; general contractors are Aberthaw Construction Co.

Los Angeles Office for IBM

Architect Eliot Noyes has designed this seven-story building as a centralized office for IBM's Southwestern aerospace operations. Structure is steel frame with a clear span from central core to exterior walls, providing each floor with 15,000 sq ft of column-free space. Curtain wall is precast concrete, each panel containing six small windows; each office will have at least nine of these windows. Associate architects are Jones & Emmons; George A. Fuller is the general contractor.

Continental Square

To be built across from Philadelphia's City Hall, Continental Square will comprise two 33-story office buildings. Curtain wall will be gray solar glass, with outside structural members sheathed with a "velvet black" material, vertical mullions finished with a reflective black material. An exhibition building will be located in the landscaped plaza. Architects are Milton Schwartz & Associates, with Skidmore, Owings & Merrill as consulting architects.
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ARCHITECTURAL RECORD August 1968 15
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'63 CONSTRUCTION—ON TARGET AT MID-YEAR

By George A. Christie, Senior Economist, F. W. Dodge Corporation

With five months' experience in the books, it's time to see how well 1963 is measuring up to expectations. The Dodge forecast—quite a bit more optimistic than most—called for a 4½ per cent expansion in general business activity and a somewhat better gain of 5 per cent in the value of construction contracts.

So far, the year's results show both these measures just a shade ahead of the predictions, but a slightly slower rate of expansion in the second half ought to put the 12-month totals at $582 billion for Gross National Product (up 4.8 per cent) and $43.5 billion for construction (a 5.3 per cent gain). But while the forecast of total construction is standing up well, there have been a few surprises within the individual categories, and it's a good time to adjust the pieces to fit the whole.

Homebuilding certainly exceeded expectations during the first half as the strong demand for rental units continued unchecked. Through May, contracts for apartments led 1962 by no less than 17 per cent, with the West and Southwest showing the greatest gains. Vacancy rates, at least through the first quarter, gave no indication of saturation.

The housing market should continue to be strong through the balance of 1963, though below the extremely high current rate. Total starts of 1,550,000 (just over 1.5 million on a private, non-farm basis) with about 35 per cent of them apartments, should produce a contract value of $19 billion—5½ per cent over last year's record volume.

Nonresidential building was ahead in total contract value by 7 per cent through five months of 1963 and is a safe bet to maintain this lead for the balance of the year. The many diverse building types within the nonresidential group will show their typical wide range of activity. Commercial building, a shade behind last year to date, should pick up a bit in the second half to post a one per cent gain. Manufacturing, originally one of the doubtful categories, is responding to the general strengthening in plant and equipment outlays and will show a gain of about ten per cent for the year. Schoolbuilding is holding about even with last year in terms of square footage, but will be up about three per cent in value. The college market is becoming more and more important here. Hospitals and public buildings are both booming in 1963. Unusually heavy volume in the early months indicates full-year gains of 25 per cent or more. With religious building about even with last year, and social and recreational building up seven per cent, total nonresidential contract value for the year will amount to just under $14 billion.

The six per cent gain this year in total building—both residential and nonresidential—implies a slightly slower rate of contract activity in the second half compared to the red-hot pace of the months just past. Even so, the balance of 1963 will be substantially above the record-breaking 1962 levels.

Unlike the two building categories, non-building (public works and utilities) construction was behind the previous year's total at the five-month mark, though a sharp gain in May very nearly closed the gap. Both public works and utilities should show a brisker pace in the months ahead, but for the year, utilities contracts will barely equal the 1962 total. Public works, on the other hand, should end the year about four per cent ahead.

Altogether, 1963 is turning out just a bit better than anticipated. Total contract value will amount to $43.5 billion, putting the Dodge index at a new high of 126.

Revised Estimates of 1963 Dollar Volume of F. W. Dodge Construction Contracts

(All states: figures in millions of dollars)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Year 1962 Actual</th>
<th>Year 1963 Estimate</th>
<th>Percentage Change</th>
</tr>
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<tbody>
<tr>
<td>RESIDENTIAL BUILDING</td>
<td>18,040</td>
<td>19,000</td>
<td>+ 5.3%</td>
</tr>
<tr>
<td>NONRESIDENTIAL BUILDING</td>
<td>13,100</td>
<td>13,950</td>
<td>+ 7.0%</td>
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<tr>
<td>Commercial</td>
<td>4,220</td>
<td>4,250</td>
<td>+ 1%</td>
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<td>Manufacturing</td>
<td>2,090</td>
<td>2,300</td>
<td>+10%</td>
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<tr>
<td>Educational &amp; Science</td>
<td>3,060</td>
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<td>Hospitals &amp; Institutions</td>
<td>1,080</td>
<td>1,350</td>
<td>+25%</td>
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<tr>
<td>Public Buildings</td>
<td>680</td>
<td>900</td>
<td>+32%</td>
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<tr>
<td>Religious Buildings</td>
<td>810</td>
<td>800</td>
<td>-1%</td>
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<tr>
<td>Social &amp; Recreational</td>
<td>700</td>
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<tr>
<td>Miscellaneous</td>
<td>350</td>
<td>450</td>
<td>+18%</td>
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<td>TOTAL BUILDING</td>
<td>31,050</td>
<td>32,950</td>
<td>+ 6.1%</td>
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<td>NONBUILDING CONSTRUCTION</td>
<td>10,270</td>
<td>10,550</td>
<td>+ 2.9%</td>
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<td>Public Works</td>
<td>7,900</td>
<td>8,200</td>
<td>+ 4%</td>
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<td>Utilities</td>
<td>2,350</td>
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<td>41,300</td>
<td>43,500</td>
<td>+ 5.3%</td>
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<td>DODGE INDEX (1957-59—100)</td>
<td>119.7</td>
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</table>
BORDEN ARCHITECTURAL DECOR PANELS

Now Borden brings a new building component to the architect—durable light-weight aluminum panels which can be custom-styled in an infinite variety of forms and designs. For example, the extruded type shown here can be had with design punchings of squares, circles, ovals or combinations of curves and straight lines.

The new Architectural Decor Panels by Borden are an extremely flexible medium, allowing the architect a rare freedom of expression in designing facades to blend with the nature of the building, its setting, and the preferences of his client. The dramatic effects achieved with this new material are being discovered daily; additionally, these panels are unexcelled for sturdiness, economy, ease of handling and installation, and ventilation.

Not limited to facades, the Borden Architectural Decor Panels are used as interior partitions, grilles, window guards, stair rails, doors, entryways, sunshades, and are especially adaptable in the refacing of existing buildings.

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PLANTS AT: LEEDS, ALABAMA; UNION, NEW JERSEY; CONROE, TEXAS

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Building Construction Costs

By Myron L. Matthews
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

The information presented here permits quick approximations of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). The tables and charts can be used independently, or in combination as a system of complementary cost indicators. Information is included on past and present costs, and future cost can be projected by analysis of cost trends.

A. CURRENT BUILDING COST INDEXES—JULY 1963

<table>
<thead>
<tr>
<th>Metropolitan Area</th>
<th>U.S. AVERAGE—21 Cities</th>
<th>Cost Differential</th>
<th>Current Dow Index</th>
<th>Residential</th>
<th>Nonresidential</th>
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<td></td>
<td>21 Cities</td>
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<td></td>
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**B. HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES**

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<td>407.1</td>
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</table>

**HOW TO USE TABLES AND CHARTS:** Building costs may be directly compared to costs in the 1941 base year in tables A and B; an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2,563 times 1941 costs, an increase of 156.3% over 1941 costs.

**TABLE A.** 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) equals that of a second (8.0) equals 125%, then costs in first city are 25% higher than those in the second city. Also, costs in second city are 80% of those in the first (8.0 + 10.0 = 85%) or 20% lower in the second city.
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ILLINOIS FOUND NEW SCHOOL OF ARCHITECTURE, APPOINTS LEONARD CURRIE AS ITS FIRST DEAN

Illinois has gained a new architectural school with the establishment of the College of Architecture and Art at the University of Illinois in Chicago. Its dean is Leonard Currie, formerly head of the Department of Architecture at Virginia Polytechnic Institute, and before that director of the Inter-American Housing Center in Bogota, Colombia.

The new school is a direct result of the University's development of its Chicago campus into a full university. Although students until now have been able to take three years of architectural training in Chicago, the program will be expanded to four years by the fall of 1964, and to a full curriculum when the college moves from the Navy Pier to the new campus at Congress Circle (pages 117-124). Though the program has been dependent for its direction on the College of Architecture and Art at Urbana-Champaign, it is now autonomous. The college has at present two departments—the department of architecture and the department of art; Dean Currie has said that other departments are hoped for in the future.

Harvard
Benjamin Thompson has been appointed chairman of Harvard's Department of Architecture, it has been announced by Jose Louis Sert, dean of the university's School of Design. Mr. Thompson, who simultaneously becomes Professor of Architecture, is a partner in The Architects Collaborative, with whom he has practiced since 1946. His recent professional services to Harvard have included the conversion of Boylston Hall into a language center and the renovation of some of the older dormitories in Harvard Yard.

Southern Cal
The University of Southern California has announced the appointment of Eric Pawley as Professor of Architecture and as director of its program in architectural research. Professor Pawley has been Research Secretary of the American Institute of Architect with the headquarters staff in Washington, and has served with many of the Institute's research committees, and as technical editor of the A.I.A. Journal.

Dean Samuel T. Hurst said of Professor Pawley's appointment to the post, "We have made the first and most significant step toward the establishment of a program of research in architecture. Professor Pawley will work directly with students at all levels, developing research attitudes and methods necessary for the orderly investigation and solution of architectural problems, and will co-ordinate the research interests and capabilities of our teaching departments."

The appointment was made possible by the Architectural Guild, professional support group of the University's School of Architecture and Fine Arts.
"FLIGHT" IS FIRMLY IN PLACE IN PAN AM LOBBY

For two months, visitors to the new Pan Am Building in New York stopped to watch Richard Lippold at work on his giant-sized sculpture, Flight. Mr. Lippold has departed now, leaving the gold and stainless steel sculpture in place. Visitors are greeted by a structure three stories high and 80 feet wide, symbolizing the world altered by air travel. It is visible from both the street level and the balcony level and, outside the building, from 45th Street and from the Park Avenue auto ramp which by-passes the building on the west.

J. Alex Langley

CANADIAN ARCHITECTS CONVENE IN ONTARIO

At their 56th Annual Assembly, more than 200 members of the Royal Architectural Institute of Canada met at the Sheraton-Connaught Hotel in Hamilton, Ontario, for a four-day session beginning May 15. The theme, "Architecture in a Changing World," was introduced by Thomas Creighton, F.R.A.I.A., at the keynote luncheon. One of the convention's two major seminars also carried the theme title; the moderator, architect R. T. Affleck of Montreal, was joined by Powell Smily, public relations counsel to the Ontario Association of Architects, who viewed the architect's current public image; W. D. S. Morden, barrister and solicitor to the O.A.A., whose approach was that of the legal profession; Eric Harrington, engineer and president of Anglin Norcross Ltd., who took the general contractor's position; and E. A. Gardner, retired Chief architect to the Department of Public Works, who took the view of the client.

The second major seminar, "Rebuilding the Central City," was moderated by Humphrey Carver, head of the advisory group, Central Mortgage & Housing Corporation. Panelists were architect Guy Desbarats, Douglas Shadbolt, Director of the School of Architecture at Nova Scotia Technical College, Halifax, and Murray Jones, former Planning Commissioner for Metropolitan Toronto.

Other speakers included engineer Alexander Tarics of San Francisco, who spoke at a dinner sponsored by the Steel Industries Advisory Council; Angus McClaskey, president of Don Mills Development Limited, who spoke at a lunch given by the O.A.A.; Peter Stokes, consulting restoration architect, who spoke at the Product Literature Awards Lunch; and Harvey McCullough, Q.C., who spoke at the annual dinner.

New Officers
KENNEDY RECEIVES A.I.A. CITATION FOR POLICIES ON ARCHITECTURE, ART

The American Institute of Architects has presented a citation to President John F. Kennedy in recognition of his actions and policies related to architecture and the fine arts. The award, voted by the A.I.A. board of directors, marks the first time a U.S. President has been cited by the 106-year-old national professional organization.

In presenting the citation, A.I.A. president J. Roy Carroll, F.A.I.A., said Mr. Kennedy was "... the first President of the United States—except possibly the first and third ones—who has had a vision of what architecture and its allied arts can mean to the people of the nation. . . . But you have not just had this vision, you have actively set forth policies to ensure that the architecture of Government buildings will be an architecture of vitality and leadership, and you have thrown the full weight of your great personal prestige behind the cause of good architecture and sound planning."

The citation recognizes President Kennedy's "appointment of a Special Presidential Consultant on Arts; his adoption of a policy, recommended by a special Cabinet Committee of his appointing, calling for the finest contemporary American architectural thought in the creation of federal buildings; his selection of a qualified advisory committee for the development of an appropriate expression of architecture and landscape architecture in the transformation of Pennsylvania Avenue in the Capital.

"All of these actions emphasize his awareness of the basic need of beauty in man's physical environment, the vital role of architecture in its development, and his readiness to employ the presidential power in achieving this goal."

Accompanying Mr. Carroll to the presentation ceremony were: first vice president Arthur Gould Odell Jr., F.A.I.A., Charlotte, N.C.; board member Charles M. Nes Jr., F.A.I.A., Baltimore, Md.; executive director William H. Scheick, A.I.A.; and Institute director of public services Kenneth C. Landry, A.I.A.


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<table>
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<th>&quot;B&quot; label</th>
<th>&quot;C&quot; label</th>
<th>&quot;D&quot; label</th>
<th>&quot;E&quot; label</th>
<th>Choice of crossbar assemblies</th>
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<td>3 hour</td>
<td>1 1/2 hour</td>
<td>3/4 hour</td>
<td>1 1/2 hour</td>
<td>3/4 hour</td>
<td>NC, 66, 77, 88</td>
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<td>DBL 8' wide x 7' high</td>
<td>—</td>
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<td>1 1/2 hour</td>
<td>3/4 hour</td>
<td>NC, 66, 77, 88</td>
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</tbody>
</table>

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Doors are to open...
Fuller


If the specialized 20th century can be imagined to have a Universal Man, Bucky Fuller fits the description. The universality, rather than being humanistically oriented as in the Renaissance, is, to be sure, technologically oriented. Within the comprehensive (Fuller's word) span of his thinking, he includes, besides engineering, transportation, communication, economics domestic and international, geography, politics, health—all notable preoccupations of the 20th century. If his optimism concerning the capacities of science, his dream of Everyman's Utopia achieved through technology, seem a trifle outdated to those sickened by the recent achievements of scientists and technicians, it can be answered that Fuller's vision has no place for these accomplishments. Indeed, he would argue that a science dedicated to armaments, abetted by businessmen and politicians, is simply an impediment to serious work. (This is not to suggest that Fuller's political thought is developed here; like most technologically oriented thinkers, he appears to find politics beside the point. His aim is the material improvement of man's living conditions.)

Fuller's "autobiographical disclosure" is on the order of Sullivan's "Autobiography of an Idea." Although he has led an enormously varied and peripatetic life, and could drop names with the best of them, it is essentially the interior life which interests him. In his first two chapters, he does describe the experiences of his youth which formed his ideas: a boyhood spent with boats on the coast of Maine, a tour of duty with the Navy in World War I, an apprenticeship to a group of cotton mill machine fitters. He also tells of the illnesses and death of his four-year-old daughter, which he blames on poor housing, and of the birth of another daughter, which strengthened his resolve to look for a total solution to the problem. Otherwise, he writes only of the development of his thought: on housing; on domes; on efficient building systems; on cartography and navigation; on data gathering, and on design synthesis. All of this, it should be said, is expressed in Fuller's unique semantics. But however unconventional the language, or some of the associations it describes, the content is itself a unique reflection of the more commanding factors of 20th century life.

Urban Design


The authors see the metropolis as divided into three parts, each of which, on the design level, intimately affects the others. First, there is the Center City, until recently in a state of decay, but currently in an apparent state of recovery, thanks to large scale, even wholesale, planning. Second, there is the Middle City, still partly warehouse, partly slum, partly non-slam but debilitated housing, and ripe for housing projects, light industry, research and charitable institutions. And finally, the Outer City, with detached housing and new office buildings, and where the design problems, though relatively few, include transportation and the preservation of open space (especially for Outer City's recreation).

The book was written, and priced, in hopes of stimulating "a wider and more sophisticated public interest in urban design and architecture." It is, having this end in mind, a collection of recent and relatively recent designs for central redevelopment, as in Boston's Back Bay Center, or for individual buildings with broad effect on the surroundings, as in New York's Chase Manhattan Bank, or Hartford's Connecticut General. Because the collection is intended to show the possibilities and effects (not always favorable) of urban design, the organization may seem rather loose to architects and planners. There is nonetheless something to be gained in viewing these projects, in a comparative context and in so large a collection.

more books on page 58
Here are designs that help you use door-ware *imaginatively*. And behind the good looks is good lockmaking. For these are Russwin Uniloc® Locksets..."unit construction" at its best. Completely factory-assembled (they "go on the door as they come out of the box"), Russwin Uniloc Locksets are built to last for the life of your building. See your Russwin supplier. Or write for literature to Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.

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Carpeted offices are a sign of the times. They’re modern, they’re sophisticated. They’re good business.
They rent faster, they attract more desirable tenants who take pride in how their offices look. They boost employee morale, they cut down on noise.
A good choice for office carpeting is carpet made with Acrilan® acrylic fiber in the pile.
Acrilan is a man-made fiber. Because of its nature, it is extra-resistant to soil and stain, it has no cleaning

For “Start-to-Finish” responsibility, specify

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Standard Conveyor takes full responsibility for your automatic tube system from start to finish. Standard Conveyor has over 40 years of experience in the pneumatic tube business.

Call your local Standard Conveyor representative... he’s listed in the Yellow Pages of major cities under PNEUMATIC TUBES. Or, call our main office listed below for information.
If you decide yes to carpet your office space, do this. Write to Contract Carpet Dept., Chemstrand, 350 Fifth Avenue, New York 1, and ask about Acrilan.

Turn the page to see another interesting installation of Cabin Crafts carpet made with 80% Acrilan acrylic, 20% modacrylic pile.
Cabin Crafts carpet with Acrilan looks luxurious in Alderman Studios' new offices, provides the quiet atmosphere essential to good working conditions.

Alderman Studios, specialists in home furnishings photography,

Alderman Studios' new 3-acre plant in High Point, North Carolina.
pick carpet by Cabin Crafts—specialists in carpets with Acrilan

Outside of Hollywood, there's nothing to compare with Alderman Studios. Their new 3-acre studio in High Point, North Carolina, is so vast that golf carts are used to cover the distances. Famous for photography in the home furnishings field, they think nothing of building a whole house right in the studio. And they have a full-time staff of twelve interior designers.

Small wonder, with their experience, that the people at Alderman know what's what in carpets! And what they want! Choice for their spacious new office area: Cabin Crafts handsome carpet with Acrilan acrylic and modacrylic pile.

Custom-colored to their specifications, it presents visitors and clients with an impressive expanse of wall-to-wall luxury. It has Acrilan's resilience to keep it looking new despite heavy traffic—Acrilan's remarkable cleanability to cut down maintenance—plus all the advantages of Cabin Crafts knowledgeable handling of Acrilan. For carpets geared to the requirements of your special projects, contact the Contract Department, Cabin Crafts. Inc., Dalton, Georgia.

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Visions

THE ARCHITECTURE OF FANTASY: Utopian Building and Planning in Modern Times. By Ulrich Conrads and Hans G. Sperlich; trans., ed. and expanded by Christine Crasemann Collins and George R. Collins. Frederick A. Praeger, Publisher, 61* University Place, New York 3. 187 pp., illus. $16.

Placing fantastic architecture into an organization perceptible to the reader is, to put it mildly, a very difficult task, since both the source and the results are very personal to each designer. Messrs. Conrads and Sperlich have included in this collection work as far out as the Palais Ideal, rising from the singular vision and after-hours labor of a French postman, to a space frame designed by Konrad Wachsman, rising from his preoccupation with the mystique of the structural joint. Men have been prompted to design and to build these fantasies because of their own highly individual sense of order, because of utopian ideals (esthetic and social), or because a casually found stone has struck a purely personal reservoir of creativity. The results have here been gathered into rough categories of the plastic, the framed, the geometric (plane and solid), the transparent, the Utopian.

But the authors have not intended a mere collection of curiosities. For one thing, the visionary architecture of today often develops, in some version, into the accepted buildings of tomorrow—witness Mies's early projects for glass skyscrapers. More importantly, as the authors point out in their introduction, visionary architecture can reveal facets of the human imagination not revealed in the more commonly recognized fine arts. No painter, nor even sculptor, would be likely to have these dreams.

Aging


The first book listed here offers advice to groups—private, fraternal and public—considering building homes for the aged. Better than half of the book includes examples of housing, individual and congregate, selected both for general design worth and for efforts made to de-institutionalize the institution. This section is amplified with a piece by Swedish architect Bo Boustedt, an old hand at de-institutionalization. The remainder contains examples from several European countries.
new, Kent Line partitions
by **ASi**
cut materials and
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Not every new product is news... but this one is. The new Kent Line catalog tells you why.

Kent Line installed costs are substantially below 70% of the movable partitions on the market today. Architectural System's use of standard gypsum board panels with no laminating is one of the reasons why this is possible. Economical joinery channels, roll-formed from 20-gauge electro-galvanized steel, are another. And quick, easy assembly on the job, plus simplified lay-in wiring, drops installations costs. At the same time, these ASi partitions have an excellent sound rating because of their double thickness of gypsum board with entrapped air space between. And all Kent Line materials are either incombustible or highly fire-resistant.

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**Architectural Record** August 1963 59
A. C. HORN

Keeping water out from the ground up at Washington Water Power service center

DAREX HORN

Since as far back as McKinley's administration, A. C. Horn has been another way of saying quality and dependability in construction and maintenance products.

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There are more than 200 time-tested and performance-proven products available from Horn. Chances are you will find one specifically designed to meet your particular construction or maintenance requirements. The man from Horn is ready to work with you — contact him through the nearest regional office listed below.
This $7,500,000 super service center of the Washington Water Power Company at Spokane marks an eloquent A. C. Horn testimonial. Inside and out, above and below-ground, eleven Horn products were used in construction, including three different waterproofing agents. Horn Dehydratine #4 was called on to provide a lasting barrier against water infiltration on exterior, below-grade masonry walls. This heavy-bodied asphalt coating develops maximum bond to “green” masonry...dries to a hard, elastic film unaffected by lime in cement. Dehydratine #22 silicone water-repellent was used to waterseal above-grade masonry, stop efflorescence and minimize staining and spalling. It also helps to keep interior dampness out. Hydratite Plus water-repellent admixture was specified to reduce mortar shrinkage and help assure tighter joints. General Contractors: Johnson, Busboom, Rauh. Architects: Kenneth W. Brooks & Bruce H. Walker. Structural Engineers: Wm. W. Wilson.

For more data, circle 31 on Inquiry Card.

GRACE DEWEY AND ALMY CHEMICAL DIVISION, W. R. GRACE & CO.

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In the fabrication of certain components for sliding doors, J&L 300 series stainless undergoes 26 progressive forming operations. The drawing above shows the intricate designs involved in this application. The metal is roll formed to close tolerances without distortion or burnishing. The high strength/weight ratio of J&L 300 stainless permits the use of light gauges without sacrificing durability. Additional qualities which make this versatile design material popular with both architects and fabricators are: an attractive surface finish, good corrosion resistance, uniformity of formed parts, and adaptability to assembly by modern welding methods. Virtually all of these qualities lend added sales appeal to the finished product.

J&L 300 series stainless is proving itself as adaptable for textured finishing as for roll forming. An already durable and attractive surface can be given distinctive eye-appeal and greater scuff-resistance by the addition of any one of more than 60 varied patterns. These patterns are available up to 48" in width—from textures .001" to .270" in depth—in natural finish or in color. Designs vary from directional (fluted and ribbed) to non-directional, from geometric to abstract. Textured J&L 300 series stainless is being used in a number of architectural applications, such as curtain walls, interior wall surfaces, building foyers, elevators, kitchens, cafeterias, stores, and for wainscoting, revolving doors, stair treads, walkways, and counter fronts.

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Here's Dorm Line versatility in action. Three floor plans, three different arrangements—all for the same size room. Dorm Line furniture lets you start with rooms of standard shape and size, yet achieve warmth and individuality. (Even existing odd-sized rooms benefit from Dorm Line's ability to make effective use of floor and wall space.)

Consider the flexibility of Dorm Line built-in units. Use them as corner elements, wall units or wall partitions. You can recess beds, desks and dressers, place them side by side or back to back, or separate them for semiprivacy.

Now add Dorm Line colors, finishes and upholstered fabrics for the final touch of home. Result: the Dorm Line look—functional beauty that lasts.

Next time you plan, plan with Dorm Line by Simmons, your wisest investment now and for the future. Write us for literature and see Dorm Line furniture soon.

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Compare the low thermal conductivity of Barrett urethane roof insulation with equal thicknesses of other roof insulation.

Barrett urethane roof insulation provides maximum thermal efficiency while reducing air conditioning equipment space and costs.

**BARRETT URETHANE ROOF INSULATION CUTS APPLICATION**

Save duct and enclosure space, reduce air conditioning equipment size, and provide a more efficient heat and cooling system for your client. You can do this with Barrett urethane roof insulation, a new foamed plastic insulation panel containing billions of tiny, closed cells sandwiched between two layers of a tough roofing membrane. This assembly provides a unique combination of properties which make it a superior roof insulation—particularly for air conditioned or electrically heated buildings, and other structures designed for optimum comfort. Barrett urethane roof insulation has a K factor of 0.13 as compared to a range of 0.27 to 0.40 for commonly used roof insulations. This means you can design a roof that is half as thick, and still maintain maximum thermal efficiency.

Barrett urethane roof insulation is specifically designed to insulate built-up roofs. It will not bend, buckle or melt when mopped with hot pitch or asphalt. It has a rugged, work-on,
AND EQUIPMENT COSTS IN AIR CONDITIONED BUILDINGS

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Free offer: Send today for a free copy of Barrett’s heat transfer calculator, the fast, easy way to determine the thickness of Barrett urethane roof insulation for any insulation value.

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MEN'S DORMITORY, DRAKE UNIVERSITY
Des Moines, Iowa
Harry Weese and Associates, Architects
Ringland-Johnson, Inc., General Contractors

Windows with a three-directional view add space and daylight to the rooms and provide an inviting atmosphere for study and relaxation. Window seats warmed by heating convectors and ventilated by casement windows assure comfort in any season. Truly a modern application of the Bay Window.

More than 180 of these prefabricated bay windows were furnished by Hope's for this building. They were manufactured from galvanized sheet steel precision cut, formed and welded into one-piece units, and fully insulated between the inner and outer skins. Galvanized hot-rolled steel casements with roto hardware and screens were factory installed. The bays were mounted on heavy gauge formed steel frames fabricated by Hope's and built in as the masonry work progressed. These structural frames provided a template and a lintel for the masonry work and greatly reduced field labor.

The building clearly demonstrates the freedom of design afforded by Hope's complete engineering and manufacturing facilities. We at Hope's are proud of our part in executing the challenging design conceived by this distinguished architectural office.
in the pavilions illustrated: ELEVATORS that herald space age living. ESCAL-AIRE* and TRAV-L-AIRE* transportation that opens up a new universe of materials and colors. Again, leadership by OTIS!!
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Premiere
1. Fiberglass reinforcing mat. In ordinary panels, the fiber ends often extend to the surface, where they absorb moisture through capillary action—thus leading to deterioration of the panel.

2. Monofilament surfacing mats hold internal fibers in place, prevent "blooming"—give panel longer life!

3. Specially formulated resins saturate the fiberglass. This resin-rich "sandwich" is then carefully cured under heat and pressure.

Sample of Alsynite Superglaze with only one half processed with resin to show "sandwich" construction.

Here’s why Alsynite can offer the only fiberglass panel with a 20-year guarantee

First: Alsynite Superglaze panels contain two monofilament fiberglass surface mats that hold in the fibers of the core reinforcing mat.

Second: Alsynite saturates this "sandwich" with superior acrylic modified resins specially formulated to resist every extreme of weather and sun, including the severe deteriorating action of ultraviolet light. This combination of 100% fiberglass "sandwich"—specially formulated resins—and manufacturing cure, results in a panel that is highly resistant to "blooming."

Blooming takes place in ordinary panels when surface erosion exposes fiberglass ends and water penetrates the panel through capillary action. Rapid deterioration follows.

Bylicking this problem with the Superglaze process, Alsynite panels have proved to last 2 to 3 times longer by ASTM testing procedures. Alsynite Superglaze panels are available for industrial daylighting and sidelighting in high light transmission grades, or with the Filtron 25 resin formulation that blocks up to 93% of the sun's heat, where this protection is important.


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For complete technical data, write address below, Department AR18.

ALSYNITE
The Original Translucent Panel
Division of Reichhold Chemicals, Inc.
RCI Building, White Plains, N.Y.

For more data, circle 40 on Inquiry Card

For more data, circle 41 on Inquiry Card
250,000 Kicks... and Still Swinging Smoothly!

Abuse centers on the hinges of all toilet compartment doors. And Mills laboratory tests prove conclusively that after more than 250,000 slam cycles — or "kicks"— Mills toilet compartment doors still swing smoothly, because they're supported by Mills super-strong, wear-resistant, corrosion-proof fittings —

Mills Top Hinges — sturdy stainless steel pintle — rigidly supported at 3 points, locked to a channel reinforcement, welded to inside of door. Suspension arm of hinge bracket rides on this shaft, protected by pressure-fitted, life-time Molybdenum Nylon bushing.

Mills Lower Hinges — cam-to-follower true gravity type; adjustable; factory-installed: concealed within door. Top follower: square-locked, secured to welded steel reinforcement. Lower cam: molded to knurled, hardened stainless steel shaft which axially aligns cam and follower. Both are naturally-lubricated, life-time Molybdenum Nylon.

All exposed parts of Mills hinges are non-ferrous, polished, and chrome-plated. All working parts are stainless steel; or corrosion-proof Molybdenum Nylon — heat-resistant and almost friction-free — eliminating the troublesome periodic adjustment required by miniature metal cams, rollers and bearings, and springs.

Mills Company toilet compartments are available in 20 decorator colors; in porcelain and baked-on enamel finishes, and plastic laminate.

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We suggest you consider Alcoa® Duranodic® 300 finishes for monumental buildings. For outside surfaces that can’t or won’t be maintained. For strong color accents—in panels, solar screens, windows, mullions, trim and framing. For places where people step, grab or push—entrances, store fronts and kick plates, railings and push bars. If you’re not concerned about wear and upkeep, then don’t use Duranodic 300 finishes.

WHAT’S SO SPECIAL ABOUT DURANODIC 300 FINISHES? For one thing, they contain no dyes or pigments. The color you see—masculine bronzes, gray and black—is integral with the metal. The tones come about through electrochemical treatment of various architectural aluminum alloys. This extremely hard oxide coating is light-fast and permanent.

DURANODIC 300 FINISHES SHINE IN CORROSIVE ATMOSPHERES. Duranodic 300 finishes are pre-eminently suitable for outdoor use in highly corrosive areas. This comes about through the nature of aluminum and the hard-coating Duranodic process. In 52 years, pitting of untreated architectural aluminum alloys in industrial environments averages only three mils deep. With Duranodic treatment, it is virtually unmeasurable.

THE FLOP EFFECT. We would be remiss if we didn’t call your attention to what the finishing people call the “flop effect.” Place two pieces of metal from the same anodizing bath side by side, deviate one ever so slightly from the same plane, and you’ll notice a subtle difference in intensity or hue. You can see why we don’t encourage the butting of Duranodic-finished panels against each other.

There is room for disagreement about our attitude, however. Some say the minute variation in color isn’t detrimental to good design. There are those who consider the result pleasing to the eye because it breaks up an unrelieved surface. Feel free to indulge your own taste.

A WORD ABOUT SUPPLIERS. The Duranodic 300 process is licensed by Alcoa under written contracts with processors who pay royalties for use of the invention.

Tell us your name and we’ll tell you the names of your nearest suppliers. Call your nearby Alcoa sales office or write Aluminum Company of America, 1785-H Alcoa Building, Pittsburgh 19, Pennsylvania.

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Round concrete columns add classic, graceful beauty while performing a support function. Specify forming with Sonotube Fibre Forms to save the contractor time, labor and money.

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No longer need you compromise contemporary design in order to employ cabinet air conditioners where you know you need them. Motels, apartments, offices, schools, hospitals, and similar structures definitely call for room-by-room control of the indoor thermal environment. But you don’t like the looks of conventional “fan-coil units” and a duct system, though hidden, would be inflexible and more costly. So what is your answer? A Nesbitt Roommate in every room.

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... dramatic new concept in year-round air conditioners
ACCREDITING BOARD ISSUES REVISED LIST OF SCHOOLS

The 1963-1964 List of Accredited Schools of Architecture, published by the National Architectural Accrediting Board, shows a gain of one school for the year—from a total of 52 to 53. The gainers are states of Arizona, where the University of Arizona has for the first time been entered on a provisional basis, and Texas, where William Marsh Rice University in Houston has also been provisionally entered. Arizona State University, first listed provisionally in 1961-1962, has been fully accredited on the current listing. Among other changes, Western Reserve University's architectural program, listed provisionally over the past five years, has been dropped. Kansas State University and the University of Oregon, fully accredited last year, are now listed provisionally.

Most of the schools offer degrees of B.Arch. upon completion of the professional curricula, except for the University of Cincinnati and Rhode Island School of Design, which offer a B.S. in Arch., and Rice, which offers a B.S. Arch. Princeton remains the only school which offers only a graduate degree for its architecture course: M.F.A. in Arch.

The schools included on the current list are: The University of Arizona (provisional), Tucson, B.Arch.; Arizona State University, Tempe, B.Arch.; University of Arkansas, Fayetteville, B.Arch.; Auburn University, Auburn, Ala., B. Arch.; University of California, Berkeley, B.Arch.; Carnegie Institute of Technology, Pittsburgh, B.Arch.; Catholic University, Washington, D.C., B.Arch.; University of Cincinnati B.S. in Arch.; Clemson A&M. College, Clemson, S.C., B. Arch.; Columbia University, New York City, B.Arch.; Cornell University, Ithaca, N.Y., B.Arch.; University of Florida, Gainesville, B.Arch.; Georgia Institute of Technology, Atlanta, B.Arch.; Harvard University, Cambridge, Mass., B.Arch.; University of Houston, B. Arch.; Howard University, Washington, D.C., B. Arch.; Illinois Institute of Technology, Chicago, B.Arch.; University of Illinois, Urbana, B. Arch.; Iowa State University, Ames, B.Arch.; Kansas State University, Kansas, B.Arch.; Kent State University, Kent, Ohio, B.Arch.; Louisiana State University, Baton Rouge, B.Arch.; Massachusetts Institute of Technology, Cambridge, B.Arch.; University of Michigan, Ann Arbor, B.Arch.; University of Minnesota, Minneapolis, B.Arch.; Montana State College, Bozeman, B.Arch.; University of Nebraska, Lincoln, B.Arch.; North Carolina State College, Raleigh, B.Arch.; University of Notre Dame, Notre Dame, Ind., B.Arch.; Ohio State University, Columbus, B.Arch.; Oklahoma State University, Stillwater, B.Arch.; University of Oklahoma, Norman, B.Arch.; University of Oregon (provisional), Eugene, B.Arch.; University of Pennsylvania, Philadelphia, B.Arch.; Pratt Institute, Brooklyn, B.Arch.; Princeton University, Princeton, N.J., M.F.A. in Arch.; Rensselaer Polytechnic Institute, Troy, N.Y., B.Arch.; Rhode Island School of Design, Providence, B.S. in Arch.; University of Southern California, Los Angeles, B.Arch.; Syracuse University, Syracuse, N.Y., B.Arch.; Texas A&M. College, College Station, B.Arch.; Texas Technological College, Lubbock, B.Arch.; University of Texas, Austin, B.Arch.; Tulane University, New Orleans, B.Arch.; University of Utah, Salt Lake City, B.Arch.; Virginia Polytechnic Institute, Blacksburg, B.Arch.; University of Virginia, Charlottesville, B.Arch.; Washington University, St. Louis, Mo., B.Arch.; University of Washington, Seattle, B.Arch.; William Marsh Rice University (provisional), Houston, B.Arch.; Yale University, New Haven, Conn., B.Arch.
Modern Door Control by LCN
Closer concealed-in-door

Library, Bennington College
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LCN CLOSERS, PRINCETON, ILLINOIS
Installation Details on Opposite Page
The trim, modern lines of this Ambassador mortise lock are fully matched by Lockwood's built-in rugged security and trouble free performance.

No holes mar the escutcheon plate which conceals the screw attachment underneath. Every inch of the Ambassador spells life-time appeal and dependable service, which explains why Lockwood makes the world's finest mortise lock.

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Mortise Lock

**LOCK UP WITH LOCKWOOD**

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LOCKWOOD HARDWARE MANUFACTURING COMPANY, FITCHBURG, MASS.
A TROPICAL (and topical) GLANCE AT TERNE . . .

Architects throughout America are rediscovering this time-tested roofing metal, are finding it almost uniquely adapted to the special idiom of contemporary design. For terne allows form and color to become an integral part of the visually significant roof. But while this is its most notable characteristic, terne has various supplemental advantages in relationship to specific environments. As in subtropical and tropical climates, for example, where its reflectivity is such that a white terne roof will absorb less than twenty-five percent of solar heat. And terne is virtually immune to salt-water corrosion, is normally unaffected by winds of hurricane velocity. May we send you the substantiating evidence?
Stylish Electromode low-level baseboard units, installed in the 80 modern apartments of this dormitory, have completed their freshman year . . . and passed with honors. Entrance tests, a complete analysis of all economic and safety factors affecting the installation, placed Electromode at the head of the class. On the final examination, at the end of the heating season, Electromode scored higher than was thought possible. Actual operating cost for an above normal heating season demand was amazing . . . $1,000 LESS THAN THE LOWEST PROFESSIONAL ESTIMATE !!!

In addition to cost, safety was a major consideration in the installation of Electromode, since married students and their young children would occupy the dormitory. Electromode passed this test easily, by presenting its exclusive, patented Safety-Grid. Within the Safety-Grid, the heating element is imbedded and completely sealed in a finned aluminum casting. The old hazards of exposed “hot” wires just don’t exist with Electromode.

Completely safe and incredibly economical performance, as well as trim, space-saving good looks, have made Electromode an honor student at Northern Illinois University.
Incandescent or Fluorescent—
glass makes good light last

See how glass works pleasingly, efficiently, and permanently with two kinds of light in this executive office reception area.

Prismatic Pyrex® brand Lenslites in the incandescent fixtures yield controlled light that’s comfortable. The lenses are made of borosilicate glass that ignores the heat from incandescent bulbs.

Over the secretaries’ desks, a unique glass shielding gives the efficient light of a prismatic panel, yet softens and warms the light, too.

This glass is our Crystopal™ Pattern #71—crystal glass with low-brightness prisms for light control and with just enough opal glass added to provide diffused softness.

Simply because both the lenses and the panels are glass, they will never distort the light, or discolor, or warp, or sag, or burn.

Specify permanent, pleasing, efficient light from any source in your buildings—with glass by Corning. Building Products Dept., Corning Glass Works, 8508 Crystal Street, Corning, New York.
Up to five microphones can be used at once from any of three zones in the school Cafeteria-All Purpose Room. Five-way microphone connection is ideal for panel discussions or roving microphone use.

All it takes is a small closet to house the sound system equipment for the Cafeteria-All Purpose Room... Microphones and cable, amplifier, controls, and record player that provides background music during meals and social functions.

Control Station in each central office is connected to 102 room stations in building. Phone handset assures privacy of caller. Office can carry on conversations with each room or page all rooms simultaneously.

Wall-recessed room station blends perfectly with modern room decor. Light and chime announce incoming call. Privacy assured by talk button which must be depressed to complete the connection.

DORMITORIES AND DINING HALLS ERECTED BY
DORMITORY AUTHORITY OF THE STATE OF NEW YORK

ARCHITECTS
DORMITORY: HART-BENVENGA ASSOCIATES
DINING HALL: URBAN, BRAYTON, BURROWS
STUDENTS GET THE MESSAGE FAST at the New Paltz State University College

Executone intercom systems in four new buildings make 350 double rooms instantly available to central offices for messages, paging, emergency alarms and instructions.

Up-to-the-minute control and convenience in communications is an outstanding feature of the multimillion dollar building expansion at the State University College, New Paltz, N. Y. Exacting communication and sound requirements were met by two Executone systems: the dormitory intercom, and a flexible sound system for the combination Cafeteria-All Purpose Room.

Office personnel and students are saved considerable time and trouble by the Executone dormitory intercom system. No jam-up, no costly confusion at the central office. Messages are relayed immediately—simply by speaking over the system. Less chance of messages getting lost... for “message reminder” light in room stays on until the call is answered. Students may originate calls to the office at any time. The system can also be used to alert students and give instructions during fire, air raid alerts and other emergencies.

In the Cafeteria-All Purpose Room the sound system serves as a facility for background music as well as public address. Zone-type installation permits the use of five microphones at the same time from any or all of three separate areas in the room. This is ideal for panel discussions where several microphones are needed at once, and for meetings where “roving” microphones are desirable.

Avail yourself of Executone’s wide experience in the college and university field when planning your sound and communication system. Have an Executone communications man go over your needs—recommend a system—estimate the cost—without any obligation. For full details write to Executone, Inc., Dept. F-9, Austell Place, Long Island City 1, N. Y. In Canada, 331 Bartlett Avenue, Toronto.
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Introducing a new concept in Rolling Grilles, Cookson now offers complete flexibility that allows the architect to design these practical interior-exterior closures to the specific need, with an exceptional combination of architectural compatibility and utility. All the important features are here: strength, security, high visibility, free ventilation. There is no finer closure for banks, garages, store fronts, school corridors, stairways—wherever open grille-work plus maximum security is required. Specify in steel, aluminum, or stainless steel. Select from five types of operation, from manual to smooth-acting push-button automatic. Cookson Grilles can mean the difference between the ordinary and the unusual. Write for full information, or see Sweet’s.

NEW YORK A.I.A. SPONSORS ANNUAL COMPETITION

The New York Chapter of the American Institute of Architects is sponsoring a third annual house competition to “stimulate an appreciation of attractive and efficient house design and to arouse the general public to the importance of good architectural design in daily living.”

Awards will be made for the best design submitted in each of three categories: new houses; alterations to houses; and groups of houses, new or altered. The designs may be of buildings already standing or to be constructed in the near future.

The competition is open to any architect registered in the United States or its possessions who has designed a building in any of the three categories for construction in New York City. Designs for houses built anywhere in the United States or its possessions will be accepted from registered architects practicing in New York City.


N.I.A.E. HOLDS COMPETITION FOR GRAPHIC DESIGN

Graphic designers and other designers working or studying in New York City are invited to participate in a competition sponsored by the National Institute for Architectural Education. The problem is to design an Architectural Design Honor Award Certificate to be awarded for excellence in architectural design to winners of prizes in N.I.A.E. competitions. The prize is $250.

Each designer may submit not more than two entries. No registration fee is required.

Submissions are due by Sept. 30, 1963. Selection will be made in October. For copies of the program, write the N.I.A.E. at 115 East 40th St., New York 16, N.Y.
Over 100 fire tests have been run on prestressed concrete assemblies in the United States. In addition to this extensive testing program the performance of prestressed concrete in actual fires has been excellent. ■ Two-hour Underwriters’ Laboratories label service on commonly used prestressed concrete members gives practical, measurable assurance of protection for personnel and property. *

■ Beyond this is a long line of practical benefits: Should a fire occur, prestressed concrete’s retardation of heat and flame enables damage to be localized and minimized. Chances are, operations can be resumed immediately—avoiding costly shut-downs. ■ Type of construction is a key factor in the determination of insurance rates. Low insurance premiums for buildings framed in prestressed concrete result in continuing savings. ■ Need for fireproofing, painting and other maintenance is eliminated for further permanent economies. ■ A wide range of architectural and structural shapes are available for virtually every type of permanent quality structure. ■ For these and other reasons—longer spans with shallow depth, construction speed, flexibility in design and low initial cost—consider prestressed concrete.

*Three-hour UL service on lightweight single Tec’s.

WRITE FOR “An Interpretation of Results of Fire Tests of Prestressed Concrete Building Components” — and for information on PCI Professional Membership.
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cuts cost two ways

Some unit ventilators are valve controlled. Lower cost is just one of many reasons why Herman Nelson also offers damper controlled units. Lower *first cost* because you don't need expensive flow control valves. Lower *maintenance cost* because there are fewer things that can go wrong. It's one of the reasons we're able to offer a full five-year written warranty on our units—one that covers both parts and labor. Herman Nelson School Products Department, American Air Filter Company, Inc., 215 Central Ave., Louisville, Ky.

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SCHOOL PRODUCTS DEPARTMENT

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Why “trust to luck” with door specs based on lowest price . . . when BARCOL justifies your decision with documented door performance. Surveys of industrial and commercial installations from coast to coast prove BARCOL OVERdoors are superior in quality and operating efficiency. When compared in terms of continuous service . . .

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Important buildings, large or small, deserve the best in lighting. At the new Bell Telephone Company building in Philadelphia, lighting of the highest quality is obtained through 13,000 control lenses injection molded of crystal-clear Plexiglas® acrylic plastic. The precisely designed optical elements direct light to the required areas with minimal surface brightness. Because the lenses are made of Plexiglas, they are strong and rigid. And they will remain free from discoloration through many years of use.

We will be pleased to send you literature, and the names of manufacturers of lighting equipment which includes control lenses of Plexiglas, for lighting that stands out and stands up.
IN 1957, ONE COAT OF WEST CONCRETE FLOOR TREATMENT WAS USED AT THE TUBESALES PLANT IN LOS ANGELES. IN 1963 ... NO CHANGE!

SEE WHAT 6 YEARS OF HEAVY TRAFFIC HAVE DONE TO THIS FLOOR!

(PRACTICALLY NOTHING.)

West Concrete Floor Treatment is the one product that cures, hardens, seals and dustproofs new concrete floors with a single application! Goes on right after troweling!

Just one coat of West Concrete Floor Treatment seals concrete and helps minimize staining from acids, oils, and greases during the early construction phases. Protects surface from plaster, paint, mud and abrasive traffic during final construction period. No removal of West Concrete Floor Treatment is necessary prior to the installation of composition tile or other material.

This remarkable time-and-labor saving treatment is effective on all concrete surfaces. It enables concrete to retain over 95% of its moisture. Permits a gradual and even release of moisture so that the curing, hardening and sealing processes occur simultaneously. And it meets ASTM specifications C-156 and C-309-58.

Why not contact the man to help you with specifications and additional information: your West representative. Look him up in your Yellow Pages, or write West Chemical Products, Inc., Construction Division, 42-16 West Street, Long Island City, New York.

For more data, circle 102 on Inquiry Card
MISTEX — Misceramic’s genuine ceramic, crystalline wall tile with the new soft look. Complete range of colors. Available in 4 1/2” squares and 3” hex. Full line of matching trim. Call your nearest Misceramic distributor, in the yellow pages, for samples, catalog and information today.

Misceramic Tile
CLEVELAND, MISSISSIPPI

A SOFT LOOK IN CERAMIC TILE...
I DON'T BELIEVE IT!

DON'T TAKE MY WORD FOR IT—CALL MISCERAMIC FOR A SAMPLE TODAY!
Sculptured in tenzaloy aluminum

More than a useful fountain, this new Haws twin bubbler unit, cast in Tenzaloy Aluminum, adds sculptured outdoor emphasis to architectural design. Model 36-DY echoes modern lines with bold form and imparts a quiet richness of color with its muted bronze, hard anodized finish. The surface resists scuffs, scratches and corrosion, the tough body wards off dents and nicks. Clients will appreciate Model 36-DY's vandal-proof features: Simple, push-button valves, locked-on bubblers, and under-plate to safeguard trim. For architectural beauty that lasts to the client's satisfaction, specify 36-DY.

Write today for complete specifications:

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**ELECTIONS AND APPOINTMENTS**

President Kennedy has appointed Paul A. Thiry, F.A.I.A., to serve on the National Capital Planning Commission. Mr. Thiry's background for this service includes the chairmanship of the American Institute of Architects' Committee on the National Capital, where he has served since 1960. His term is for six years.

Mr. Thiry succeeds Alexander C. Robinson, III, F.A.I.A., as one of the 13-member commission, and as one of the five members appointed by the President.

Edgar I. Williams, F.A.I.A., is president of the National Academy of Design for 1963. He was elected at the annual Meeting of Academicians held in mid-March.

Elected to Academicianship were architects Philip C. Johnson, New York; Roy F. Larson, Radnor, Pa.; and Alfred Easton Poor, New York.

Kurt F. Wendt, dean of the College of Engineering, University of Wisconsin, is the newly elected president of the American Society for Engineering Education. He will serve ASEE for one year, until July 1, 1964.

Elected vice presidents and members of the board of directors are: Cornelius Wandmacher, dean, College of Engineering, University of Cincinnati; and J. Stuart Johnson, dean, College of Engineering, Wayne State University. George D. Lobingier, director of the educational department, Westinghouse Electric Corp., Pittsburgh, has been renamed treasurer.

A. M. Young, Toledo, Ohio, manager of marketing for Libbey-Owens-Ford Glass Company, has assumed the presidency of Producers' Council, Inc., national organization of quality building products manufacturers. Mr. Young succeeds Don A. Proudfoot who recently resigned the Council presidency as a result of his resignation from the Barrett Division of Allied Chemical Corporation.
Minneapolis embraces progress in new buildings such as the home of the Northwestern National Life Insurance Company, to be completed in the fall of 1964. Reinforced and precast concrete, the structure will be a dramatic contribution to civic beauty. Rows of slender precast, prestressed concrete columns with flaring capitals soar 80 feet high, and extend beyond the building to create an impressive portico. For full development of the arched colonnade effect, the columns are brilliant white, achieved with quartz and white portland cement. Additional accent is provided by dark green walls of faceted panels flanked with gray glass. Concrete offers endless opportunity for striking departures from prosaic design in structures of every purpose.

Zonolite prototype building #2: A Grammar School

TEACHING AIDS
SPECIAL CLASSES
MULTI-PURPOSE
SPECIAL CLASSES
KINDERGARTEN
NURSERY
PRE-NURSERY

ARCHITECTURAL RECORD  August 1963
This organic, yet classically ordered K-6 school is made eminently functional because Zonolite Masonry Fill Insulation is in the cavities

This grammar school was commissioned by Zonolite, designed by Stanley Tigerman of Tigerman & Koglin, Chicago architects, and engineered by Norman Migdal, Chicago consulting engineer.

It demonstrates the different ways that Zonolite Masonry Fill Insulation contribute to the economy and comfort of a brick cavity building, some rather unexpected.

The initial cost of the building is reduced in two respects by filling the cavities with this product.

First, the interior surfaces of the walls can remain unfinished, because conventional insulation on the inside is not necessary for comfort. And second, the cost of the heating plant can be reduced somewhat because a smaller boiler (see chart) can be used.

The heating costs are reduced 17.6%; a savings amounting to over $600 annually.

Comfort is increased to a considerable degree. Note the difference in surface temperatures of the interior walls.

The water repellent nature of the material keeps interior walls dry as well as warm.

Another aspect of comfort derives from the sound dampening capability of the material...it reduces the loudness of sound transmitted through the walls 20% to 31%.

Contrast all these advantages with the approximate installed costs of the material for this cavity size; approximately 10¢ per square foot.

The installed costs are low for two reasons. One, the initial cost is low. Two, installation is easy and fast. The material just pours out of the bag into the cavity. For more information about this remarkable insulation, write Department AR-83 for Bulletin MF-68, Zonolite Division, 135 South LaSalle Street, Chicago 3, Ill.

**ZONOLITE**

<table>
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<tr>
<th>DESIGN CONDITIONS</th>
<th>WINTER HEAT LOSS IN Btu/HR ASSUMING 70°F INDOOR -10°F OUTDOOR</th>
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<tr>
<td>WITHOUT MASONRY FILL</td>
<td>WITH MASONRY FILL</td>
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<tr>
<td>TRANSMISSION LOSSES</td>
<td>2&quot; EDGE INSULATION DOUBLE PLATE GLASS 8&quot; CONC. ROOF WITH 2½&quot; INSULATION</td>
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<tr>
<td>VENTILATION &amp; INFILTRATION</td>
<td>7840 CFM</td>
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<tr>
<td>WALL</td>
<td>4&quot; FACE BRICK 2½&quot; AIR SPACE 4&quot; FACE BRICK</td>
</tr>
<tr>
<td>TOTALS</td>
<td>—</td>
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<tr>
<td>SAVINGS WITH MASONRY FILL</td>
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</tbody>
</table>

1. Higher wall surface temperature reduces body radiant heat exchange, and minimizes wall surface downdrafts. (See chart at left for wall surface temperatures.)

2. Operating costs are reduced by over $600.00 per year.* First cost of insulation (11210.00) can be paid off in less than 1½ years.

*Based on six 113 degree days, 10 cents per ther. gas boiler. 16 hrs./week ventilation system operation.
New Thru Chip Vinyl Asbestos by Ruberoid for heavy heavy traffic!

Now—Ruberoid's Thru Chip gives the multi-color beauty of terrazzo in practical, easy-to-maintain, long wearing, low-cost vinyl asbestos. Created especially for heavy traffic, it's the ideal floor tile. Through and through chip patterning maintains a strikingly fresh appearance through the years. Highly resistant to spilled foods, most greases, acids and detergents. Available in 12 colors in 1/16" thickness, 9 x 9. It's another step ahead for Ruberoid. A multi-million dollar investment in continuing plant and product improvement assures high standards of quality and style in all Ruberoid Floor Tile. Call your Ruberoid representative.

Keep your eye on RUBEROID!
The New Edwardsville Campus, Southern Illinois University

BUILDING TYPES STUDY 323

COLLEGE BUILDINGS

Two completely new campus plans—one for an expansive country site, and one for a limited big city plot—and new buildings to expand existing college facilities
NEW UNIVERSITY CAMPUS
IS PRE-PLANNED FOR CHANGE

The “acceptance of change as the order of the day” formed the
challenging nucleus of the architectural—and educational—concepts
for this big, brand-new campus for Southern Illinois University.
Part of this need for change was implicit in the expected quick
growth of the campus, both in student population and in the educational
programs offered. But a larger part stemmed from the desire
to provide, in advance, for the inevitable turnover in teaching ideas
and personnel that the coming years will bring. Maximum flexi-
bility and convertibility for the entire campus thus became the first
“functional” requirements. The resulting campus plan and build-
ings, whose designs are shown here and on the following pages, ap-
pear to solve these needs in a singularly simple and handsome
manner.

The site selected for the development of this campus is a beautiful
one: 2600 acres of gently rolling farm land and wooded valleys
along the bluffs flanking the Mississippi River. Its location might
best be described as urban-rural, for within easy driving distance
is a network of cities and towns comprising the second largest met-
ropolitan concentration (next to the city of Chicago) in the State
of Illinois. The first stages of the campus are planned for the entire
student body and faculty to commute by automobile from the ad-
joining towns. All of the original $25 million available from a State
of Illinois bond issue will be used for academic buildings, site work
and utilities, and none at the outset for student housing. Dormitor-
ies and other facilities will possibly be added in the future expansion.

This campus at Edwardsville will supplement the University’s
big and still expanding division at Carbondale, and the near-by
facilities at East St. Louis and Alton. All are under the direction of
S.I.U.’s President Delyte W. Morris.

Master planning sessions for the new campus began in May 1960,
with meetings of the architects, President Morris, and university
staff architects Charles Pulley and John D. Randall. The first dis-
cussions centered on the general framework and objectives of the
new institution, which is primarily intended to serve the needs of
the people in the surrounding Illinois towns rather than also near-
by, urban St. Louis. In view of this, the natural rural setting was
to be preserved where possible, and the buildings quietly adapted
to it. These weekly sessions led to a concept providing for educa-
tional spaces based on, and grouped according to function, rather
than the usual departmental set-up.

Through a grant from the Ford Foundation’s Educational Fa-
cilities Laboratories, Inc., the architects were next able to call a
series of seminars with educators from all over the country to ex-
plain the best new educational methods and thinking. From this re-
search, which extended over a period of about six months, developed
an initial curriculum consisting of four divisions: liberal arts core;
business of commerce; education; and technical subjects, such as
engineering and nursing, to fill the needs of the area.

Five buildings, following the functional grouping idea, were de-
decided on to begin such a program within the budget: 1. non-specialized classrooms; 2. specialized rooms and laboratories; 3. a library; 4. a communications building (with television, FM radio and film production, and a theater); and 5. general service offices. In addition, a student center was to be built with funds from Federal Aid. Space requirements and relationships for each of these buildings were carefully studied at this stage.

The next planning phase was a series of studies on how best to integrate traffic access, parking spaces and the disposition of present and future buildings on the site. Highways from all centers of population to the new campus were established, and plans for future highways coordinated in cooperation with highway officials. An outer loop road around the site was plotted to connect the highways. An area of about 200 acres was then set apart on high ground in the center of the site as the main (and initial) academic core, with an inner loop road for access. As can be noted on the diagram (page 110), the entire site was then "zoned" for future development of all facilities, and lakes were planned for three valleys on the site for recreational and utility use (for details on the utility plans, see page 162).

Parking requirements were considerable for such a commuter college: studies showed the need for spaces for 3,000 cars initially, and up to 12,000 cars in the future. From the outset, it was desired to keep a clear separation between automobiles and the "pedestrian campus" area. Innumerable schemes were studied to achieve this, and to preserve the natural setting. A series of little wooded valleys, which led off the central academic area, led to the investigation of a scheme where the buildings would radiate from a central mall in a series of "fingers", with parking between. One phase of this scheme is shown in the small plot diagram on page 110. A major objection to such a "finger" expansion idea was soon obvious: the last additions would have very tenuous relationships to their "parent" buildings by the central mall. Also, such a strung-out series of parking areas would obscure a great amount of the landscape. It was decided that looped clusters extending from the original center would be more workable.

At this point in the planning, a special seminar called EPEC (Environmental Planning Edwardsville Campus) was sponsored by EFL and the Maremont Foundation, and all the studies that had been made were re-
viewed. The seminar included such people as city planner Ed Bacon, landscape architect Sasaki, Buckminster Fuller, Earl Bolton of the University of California, and sculptor-architect Paolo Soleri. One of the major developments from this session was the decision to consolidate all parking into two large landscaped areas, and restrict the central campus entirely to pedestrians. Only special service vehicles will ever be allowed into the area. The final master plan, shown on page 109, was subsequently developed and accepted by the Board of the University, and the architects were commissioned to design the individual buildings.

To give the required allowance for change in each structure, all fixed, static areas, such as stairs, toilets, elevators and mechanical rooms were placed on the periphery of the plan, and expressed by solid brick towers. The rest of the spaces in the buildings have wide spans or large bay systems, and are based on a five foot module to allow easy changes of lighting, air conditioning and metal interior partitions. Occasional changes in vertical heights, and the use of skylights, add spatial interest to the big loft spaces—as can be noted in the cross sections shown. On the exteriors, these adaptable areas are expressed by precast concrete panels with a rose quartz aggregate, and panels of gray glass in dark anodized aluminum frames. Each structure rests on a sort of brick podium, designed to fit the natural land contours.

The library building is designed as an open stack scheme, with control points at two major entrances. It was planned so that stacks, reading area, offices and carrells could be placed anywhere in the building. A 30 by 30 foot waffle-pan, reinforced concrete frame was established as the most economical and largest bay for a load of 150 pounds per square foot. Walls were staggered to block direct east and west light, but admit ample north and (shielded) south light. A space is left above the ceiling, and another in the basement for future electronic equipment and conduit. The building has three floors and a basement, and the structure is planned so that four more stories can be added for vertical expansion.

The science building houses interchangeable laboratories for all the science disciplines. It connects with a wing housing science lecture halls, and another for science faculty offices. The great flexibility of this building is analyzed on page 169.

The communications center houses all the present electronic equipment available for
College Buildings: Southern Illinois—Edwardsville Campus

Instructional purposes, including eight TV studios for closed-circuit programs. A utility tunnel connects it with the library for easy transmission of audio-visual materials. An auditorium for 1500 students will be added.

The administration building houses all main offices for the campus. There is a large two-story lobby-garden where visitors will first enter the campus, and where students will register each semester.

The general classroom building houses all non-specialized teaching spaces. Partitions can be easily moved to create spaces for 12 to 200 students. An equally flexible wing houses faculty offices. The entrance area to this building group contains lounges.

President Morris, who radiates pleasure when discussing the new campus, has stated that "the real secret (of good new campus planning) is that one must have flexibility in his architect as well as in the buildings . . . it is extraordinary how ours has been able to think broadly."
CHICAGO CAMPUS FOR THE UNIVERSITY OF ILLINOIS

The scheme for the new Chicago campus of the University of Illinois departs boldly from tradition, and brings together in compact pattern—appropriate to its city setting—a group of buildings each designed to serve a function rather than an academic discipline. Unlike a typical campus arrangement—in which the chemistry building houses chemistry classes, laboratories for chemistry study and research, plus offices for departmental faculty and administrators—this plan revolves about the idea of housing various educational activities in buildings of a type that will serve most efficiently and economically for the particular purpose involved. Thus, in addition to the more conventional structures, there will be a number of classroom buildings disposed in clusters, a lecture center comprising a group of 21 variously sized lecture halls, a laboratory building for the sciences and engineering, and a high-rise staff and administration office building. Classrooms generate mass movements of students in the short periods between classes, so that such rooms can be appropriately housed in three- or four-story build-
University of Illinois in Chicago

ARCHITECTS-ENGINEERS:
Skidmore, Owings & Merrill
Campus planners, detailed site planning, library, classroom buildings, lecture center, engineering and science laboratories, staff and administration offices

LANDSCAPE CONSULTANTS: Sasaki, Walker & Associates

ACOUSTICAL CONSULTANTS: Bolt, Beranek & Newman, Inc.

Student Union Building
ARCHITECTS & ENGINEERS: C. F. Murphy Associates

Physical Plant Building
ENGINEERS AND ARCHITECTS: A. Epstein & Sons,

Boiler plant
ARCHITECTS: Skidmore, Owings & Merrill
ENGINEERS: Sargent and Lundy

ings that do not require elevators. Laboratories will also be in low-rise buildings, but separated from classrooms, since such a separation will effect construction economies. Laboratories require 12-foot ceilings; classrooms only 9-foot ceilings. This design concept makes classrooms, lecture halls, and laboratories usable for various kinds of courses, resulting in interdisciplinary contacts that will help bring about a desirable closer relationship and understanding between the various academic divisions. Offices and seminar rooms, used by smaller groups and generating more evenly distributed traffic, will occupy high-rise, elevator-served buildings that will make maximum use of the land.

The architects faced the problem of providing a physical plant for 9,000 students in three years, designed so it could readily be expanded to serve 20,000 students within another five years. These facilities to be located on a 106-acre site located at the confluence of two expressways and a rapid transit line in the heart of Chicago just west of the Loop. This site, finally settled upon after considering (and making master plans for) four others, will be known as Congress Circle and is situated south and west of the junction of the North-South and Congress expressways. Its location will afford students and staff convenient access to the Loop, Opera House, Orchestra Hall, Medical Center, Art Institute and other cultural advantages.

The architects' master plan, which is both bold and imaginative, relates the campus to its surrounding urban environment in pleasing and workable fashion; provides a coherent grouping of buildings set in a series of necessarily restricted but attractively handled open spaces; and takes care of the flow of traffic to the campus and within the campus. One should note that there will be no resident students or staff; thus enlarging the problems of library and student union, and eliminating the problem of dormitories.

The arrangement of the buildings is shown by the photos of the architects' model. The high-rise buildings are disposed on the outer areas of the campus with relatively large open spaces between. This disposition provides maximum visual impact upon the surrounding city, offers a visual "border" to the inner campus, and establishes the university architecturally as an urban institution. The low-rise buildings are grouped in a more compact pattern at
Left and above: Bird's-eye and ground level views of the Great Court and lecture center beneath. The four raised squares of the court—actually the roofs of four lecture hall buildings below—will have exedrae providing areas for lounging and reading in good weather. Some face inward, some outward; different textures of concrete are used for their construction; areas between the squares are of granite supported on concrete columns. A total of 21 lecture halls ranging from a capacity of 45 to 500 will comprise the lecture hall center.

Bottom left: The Student Union consists of a low-rise element housing all food service facilities, a theater, the bookstore and recreational areas; and a high-rise element containing lounges, activity rooms, offices and meeting rooms. The original Hull House mansion (left foreground) will be restored, and together with its adjacent garden will form an appropriate memorial to Jane Addams.

The core of the campus, surrounding the great court, giving the entire complex great cohesion and a fine feeling of unity.

Traffic to and away from the campus—which will be almost equally divided between those in cars and those riding the rapid transit line—will touch the campus at four main points, all on the periphery of the plan. These consist of two parking lots and the two ends of an express walkway through the heart of the campus that extends from the rapid transit station at the north to several access points at the south. Traffic within the campus thus becomes purely pedestrian, except for service and emergency vehicles.

The express walkway and the central court are interesting features of the master plan that lend the campus an individual architectural character. The walkway is elevated and level with the second floor of most of the buildings, providing split-level access to the three- and four-story classroom, laboratory, library and student union buildings. Its elevation provides direct access and at the same time conserves limited open space for gardens and informal sitting areas. Areas beneath the walkway will be paved and will provide covered pedestrian ways during inclement weather. The elevated walk is divided into two 20-foot widths with a 10-foot division at the center for access stairs and occasional areas for seating. Considerations of low maintenance, durability, and resistance to salting action and snow removal led to the selection of granite slabs for the walkway. These slabs will be 10-by-20-feet in area and 1-foot thick; will be supported by concrete columns with butterfly capitals. The outside rails will be granite, while inside rails along access areas will be of bollard and chain.

At the center of the campus—its focal point and academic core.
the north and south express walkways are echoed by two similar ones leading east to the student union and west to the library. All the walks converge upon the 450- by 300-foot Great Court, elevated slightly above the express walkway. The court is actually the roof of the four square lecture hall buildings beneath—expressed above by four exedrae providing a variety of seating arrangements. The Great Court centers on an amphitheater which can accommodate 2,500 persons.

As befits an urban university, the new campus is relatively dense in character, with construction covering 33 per cent of the 106-acre plot. However, a notable lack of crowding has been achieved, and open spaces are skilfully handled. The central academic core occupies 40 acres. In considering the eventual enrollment of 20,000, one can justifiably describe the new Congress Circle campus as one of the most intensively developed in the nation. Yet it manages to achieve good scale, convenience, efficiency, and pleasant open areas free of the automobile. Its design makes an important mark in the development of the urban university.

The architects and a university committee considered various concepts on the way, and even developed master plans for four other sites before Congress Circle became available. They considered grouping by colleges, by curricula, by building type (finally adopted), by college and enrollment, the idea of a large single or twin-enclosure, and the totally high-rise campus; schematic plans were made, and then the process of elimination led to the final concept. The architects set up these general criteria: relate the campus to inner individual environment and outer urban environment; establish integrated pedestrian circulation; assure convenient access from public transportation or car; establish a coherent, orderly design with a readily apparent relationship between each element and the whole; stress economy. The architects were further influenced by three principles that served as guidelines in their thinking and became “musts” as the design developed: buildings must be expandable to provide for orderly growth; they must be flexible and must be interchangeable in order to accommodate new teaching techniques and provide a closer interrelationship between the various academic groups.

The university will be built in three stages, as follows: stage one, permitting occupancy and use by 9,000 students in 1965, will con-
The 28-story staff and administration building will certainly become a campus landmark, and may be one for Chicago's near west side as well. The building will have an exposed reinforced concrete structure. To obviate increasing the size of columns or adding more steel—from the roof to the ground—more columns were added, thus diminishing the bay size and its proportionate cantilever. Without the additional upper floor area, six more floors and two elevators would have been required. Heavy transfer girders at the second floor carry loads to the ground through the foundation for the building.
SOME BASICS OF CAMPUS PLANNING

By James Morisseau

The extent to which a campus contributes to the institution's purposes, the efficiency and economy with which it functions, often are more the result of planning than of the design of individual buildings. Planning a college or university is a far more complex process than most persons, even those directly involved, realize.

"A college or university today provides in its complexity most of the elements, frustrations, and confusion of an urban society," commented Walter A. Netsch Jr., of Skidmore, Owings & Merrill, who has had an opportunity to confront the problem of campus planning in a number of places. The campus is like a city because it is the focus of the lives of those around it. A great variety of people on or near it work, play, visit, eat, acquire goods and services, and drive cars to the campus. In short, it has none of the nice simple qualities of single-purpose developments like suburbs and industrial parks. Lawrence Lackey, a California planner, observed that an enrollment of 25,000 plus faculty and staff and their families, plus the population needed to serve a community of this size, produces a total population in and around the campus of about 92,000.

In short, the campus administration must concern itself with all of the city's myriad problems on a smaller scale—transit, traffic, housing, zoning, utilities, health and sanitation, law enforcement, recreation, and, of course, the development of the surrounding area. And all this must be done from the framework of the college as a cultural and intellectual center of our society.

Planning for Change

The lifetime of a college and university "must be measured in centuries and you must expect change," according to Herbert H. Swinburne. Mr. Swinburne, who is handling the expansion plan at Temple University, maintains that the planner must look back 20 years and forward no less than 30. Some of his colleagues hold out for a plan ranging from any-where from 20 to 50 years ahead. But Mr. Swinburne and his colleagues stress that detailed planning be limited to the first 10 years or so. Beyond that the future ought to be sketched out in broad strokes rather than in specifics.

One obvious answer is to design campus buildings to allow for changes in function over the years. Experience shows us that such changes occur in any event. Ohio State found this out when it recently converted office space into classrooms in a building that started out 50 years before as a chemistry laboratory. Building on such examples, many of the architects and planners now working on campuses are planning buildings to make transitions simpler, less painful, and less expensive. Planning for change is even more important now in an era of rapid transition and growth. Four-year liberal arts colleges are showing a tendency to grow into complex universities, with a broad range of departmental and research activities. Teachers colleges are being converted into liberal arts colleges. Two-year community colleges, intended in part to satisfy some of the demand for vocational and technical training, have proliferated. But many of them have been forced to neglect vocational programs to handle the flood of students who plan to transfer to four-year institutions for liberal arts degrees. Others have changed character entirely and have evolved into four-year institutions themselves. At least one has become a full-fledged university.

And, of course, the changing nature of American society itself places additional burdens on the campus planner. One of the most troublesome is the commuting student and his automobile. As Mr. Netsch put the latter problem: "Campuses originally pedestrian in nature now resemble urban parking lots with buildings."

Long-range planning would seem to be the only hope if chaos is to be avoided on the campus. Many educators have reached this conclusion and acted accordingly. But the evidence is that the majority are not planning either comprehensively enough or far enough into the future to meet the needs of their institutions or of the nation.

Planning is a complex and an expensive process. Southern Illinois University, for example, paid the St. Louis architectural firm of Hellmuth, Obata and Kassabaum $100,000 to create a master plan for its new center at Edwardsville. Months of conferences with leading educators and cultural experts, and with the faculty and administration, took place before a single line was drawn on paper. Similar expenditures of time and money went into other planning jobs investigated in preparation for this report. What was accomplished; just what goes into a master plan?

Educators maintain that the institution must first

JAMES MORRISSEAU's article is a condensation of his chapter "The Campus", from the forthcoming book on college buildings, "Bricks and Mortarboards," published by the Ford Foundation's Educational Facilities Laboratories, Inc., 477 Madison Avenue, New York, New York. Mr. Morrisseau is editorial associate of EFL. The book will be available free of charge on request in October.

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College Building: Some Basics of Campus Planning

arrive at its own understanding of the overall goals of higher education in terms of educational philosophy and national needs. Then, it must determine its role in the total picture.

The educational objectives then are translated into specific programs. The academic planners spell out what degrees will be offered and the courses of study leading to them. Then the academic organization is established as a coherent system of schools, colleges, departments (if there are to be such), research units, institutes, and service organizations. The academic calendar—the semester plan, trimester or quarter system—is adopted, and the length of the academic week and day established.

At this stage, projections are made of the enrollment expected (in the case of institutions required to take all comers) or desired at each stage of development. The analysis indicates the enrollments at each academic level and, if possible, a breakdown by sex and marital status.

The next step is to outline the facilities required at each stage of development based on enrollment and staff projections. The requirements are broken down by function: instructional; general, including administration, auditorium, chapel, stadium, and the like; auxiliary, including the student union, cafeteria, and infirmary; research; residential; and site, including outdoor recreation spaces, parking, utilities, and general landscaping.

Here, the physical dimensions of the campus begin to become apparent. In the instructional area, the average college or university has about 175 square feet of space per student. But it has been suggested that, with more efficient utilization, 125 square feet should be adequate.

Walter Netsch calls for the allocation of 150 square feet per undergraduate student, 200 square feet per graduate student, 235 square feet of housing for each resident student (substantially more for married students), and 300 square feet of parking and maneuvering area per auto permitted on campus. Others suggest that the library ought to seat half the student body at one time.

Figures such as these can be translated into total floor area requirements. From these findings, rough cost estimates can be made.

The Preliminary Master Plan

Once determined, these dimensions can be translated into a graphic presentation, a schematic, preliminary master plan. This plan, on which the elements of the campus are laid out in hypothetical fashion, helps the planners to identify what buildings are needed in first-stage construction and to come up with rough predictions of the buildings involved in later stages and their timing. At the same time, cost estimates can be made for each stage. It also helps determine the general nature of a site that would be adequate for development of the campus.

Size is the most obvious requirement in choosing a site, but even that is a relative question. The University of California has set 1,000 acres as the minimum for its new 27,500-student campuses, all of which are in more or less rural settings.

In contrast, the new University of Illinois campus in Chicago will encompass only 106 acres, and its academic core, only 40 acres.

The planners must be concerned with the shape of the site, the nature of the terrain, subsoil conditions, and natural hazards such as floods and earthquakes. The climate and even the microclimate, can be decisive. Official site selection criteria for the new University of California campuses require planners to avoid locations in the path of known "smog rivers."

The campus must be reasonably accessible by auto, bus, rail, air, and, in some cases rapid transit. On the other hand, it should obviously not be bisected by a railroad or heavily travelled highway. The University of Arkansas has such a severe transportation problem it has purchased its own aircraft to shuttle university officials to and from campus on business trips. Water, sewage disposal and utilities must be provided for.

The site should not be surrounded by urban blight, heavy industry, or as the University of California has found, under or near an airport approach path. In studying all these problems, planners prepare detailed circulation and access maps, land-use maps, and diagrams of utility lines for each proposed site.

When a site is selected, careful plans are drawn to fix the circulation patterns for automobiles and pedestrians, the location of utilities, and the types of buildings that will be placed on different parts of the campus.

Then there is the question of zoning. How shall the various elements of the campus be put together? The tendency has been to designate one zone as the academic core, restricted to the instructional process and contact between students and faculty. Another zone is set aside for residential purposes and limited pretty much to students. The last is the "activity" zone, where the student, the faculty, and the public come together for athletic and cultural events or as part of the administrative process. In some cases separate zones, and even separate "campuses," are designated for varsity athletics, research, and other facilities. Whether the development of such separate zones is beneficial to the institution's aims is a debatable question.

Landscape architecture—the placement of roads, walks, parking lots, and play fields, and the creation of large and small outdoor spaces between buildings—is as important in establishing a campus atmosphere as the exterior design and interior arrangement of buildings.
New Plans for Old Campuses

At this point, it seems appropriate to look at the planning process on existing campuses. There are no basic differences in principle. The objectives—a well-ordered, efficient plant and an atmosphere conducive to the academic process—are the same. But an existing institution embarking on an expansion plan has a different set of problems.

In the planning process these factors must be taken into account. The first step usually is to create a planning committee representing the administration, faculty, heads of specialized units and the trustees. The committee attempts to set directions in which all or a majority of interested parties will concur. But final decisions must be left to a single authority, usually the president and sometimes the business officer, subject to approval by the trustees if policy matters are involved.

Planners and consultants then undertake an intensive analysis (usually in map form) of the existing plant, grounds, circulation elements, utilities, and the neighborhood surrounding the campus to determine their adequacy for the new program. Buildings are studied to determine whether they require replacement or renovation or if their location blocks effective planning for expansion.

A new master plan then is drawn, setting forth by stages the new buildings required, necessary renovation, and other improvements.

Expansion need not be limited to the old campus. It may even involve its abandonment. It is pointed out that expansion can take four forms: an increase in the type of facilities already there; duplication through the addition of separate graduate or professional schools on the campus; duplication through the creation of a co-ordinate or satellite campus; or relocation, the creation of an entirely new campus on another site.

Formal or Informal

Most planners have concluded that the informal campus plans have survived better than the monumental, rigidly formal designs. Walter Netsch cited Harvard as an example of the informal and successful, and the University of Virginia as a case of the formal and less successful. Most of today’s planners have taken the cue and lean toward the informal in their campus layouts.

However, they will tend toward rigid zoning in an effort to separate the academic, “activity,” and residential areas of the campus. The effort now is to plan the campus so that each function can expand within its own zone. One solution to this problem is the system of “through-site campus zones” developed by Caudill, Rowlett and Scott. However, some observers have suggested that this insistence on rigid zoning may be among the many preconceptions upon which planners have proceeded that do not in fact prove to be true. It is possible, it was argued, to intermix facilities successfully on small campuses and on those which plan little growth without creating problems. Such intermixture may very well contribute to the creation of a far more integrated campus culture than the careful zoning of various aspects of collegiate life into neat planning packages. Harvard was cited as a case where various facilities have been intermixed with success.

The campus is beginning to lose its excessively open character through both design and necessity. Some planners have heeded those critics of city planning who argue that a variety of comparatively small, open spaces between buildings are perhaps more desirable than large spaces that create excessive distances between buildings and a disconnected, suburban-type campus. Intensive development of the site is no longer regarded as something to be shunned by all but big city institutions.

“Full Employment” for the Campus

In assigning space by function and striving for convertibility, the planners are attempting to insure that new buildings or new campuses will be better utilized than most existing facilities. Nor are efforts to step up efficiency on existing campuses being ignored.

Computers have been put to work on the problem at M.I.T. In a project supported by a grant from E.F.L., the 7090 computer has been used to simulate a college—its students, faculty, instructional program, and available facilities. Last fall, it was used to schedule 20 different programs for each of 1,000 entering freshmen at M.I.T. Data preparation took three days but the actual scheduling job was done in eight minutes flat, at a total cost of less than 20 cents a student. Normal time for the job is eight man-weeks at a cost of nearly $1.60 per student.

But the real advantages in the project, whimsically entitled GASP (for Generalized Academic Simulation Programs) may be in its potential use in testing the effects of program changes without subjecting the college to the risks and disruptions involved in trial runs. A change designed to improve utilization can be fed into the computer and placed in simulated operation. The actual effects of the change, including unforeseen problems, may be determined beforehand.

The trend to year-round programs or at least to a longer academic year has been followed by a growing acceptance of air conditioning as a necessary element in the design of college buildings.

Mr. Obata defended the use of air conditioning at the new Southern Illinois campus:

“Certainly it costs more to air condition. But this university is designed for year-round use from 7 in the morning to 10 at night. You just have to air
condition in the (summer) weather we get.”

The University of California has adopted a statewide policy under which air conditioning is permitted if the “effective” temperature passes the discomfort point for the average person more than a certain number of days a year. The policy is liberal enough that 70 per cent of the building space at Irvine will be air conditioned.

The State College system in California has gone a step further, authorizing air conditioning in “core-type” buildings—those in which economy is achieved by keeping perimeter walls to a minimum and having a good deal of interior, windowless space. Harry Harmon, chief of college facilities planning for the system, said that savings resulting from the core or block design of buildings justify the cost of air conditioning.

For some of the same reasons, the planners are increasingly concerned with the problem of solar heat transmission through glass. Planners and architects have had to cope with the problem of what to do about older buildings having too much glass in the wrong exposures: i.e., on the south and west sides of a building. One answer has been to erect screens or sunshades of metal or concrete. Some new buildings have been designed with such screening, notably a new student union at USLA. And a new dormitory at Temple University, designed by Nolen and Swinburne, has what amounts to a second wall of glass hung a few feet out from the side of the building.

Heat-absorbent gray glass is used in both the windows of the building and the screen. The result is that 60 to 75 per cent of heat and glare from the sun are dissipated.

The Villain with Wheels

The war on the automobile and the effort to retain the pedestrian campus have imposed their own new patterns of campus design. Most common is the pattern of highway loops, one running the perimeter of the campus and, usually, a second circling the academic core. The loops and an accompanying system of perimeter parking lots reflect the planners’ efforts to keep cars out of the academic core, thus achieving horizontal separation of auto and pedestrian traffic.

But, particularly in urban campuses, there is an effort to achieve vertical separation of the two types of traffic, something that long has been advocated for cities but never seriously tried. In Chicago, for example, Mr. Netsch has laid out a system of elevated pedestrian walkways running to the perimeter of the campus in four directions and converging at the plaza covering the lecture center. Limited truck and auto traffic then can be permitted into the campus at street level for deliveries and business purposes.

At Foothill College, Ernest Kump has taken advantage of hilly terrain to achieve vertical separation. All campus buildings are on two hilltops. All roads and parking areas are in the valleys, off the campus proper and out of sight.

An extreme answer was arrived at in Albany. There, Edward Stone placed the entire academic complex on a podium one story off the ground. All pedestrian circulation is on the podium. All auto and truck traffic stops at the edges of the academic complex. Deliveries of supplies and equipment are handled by electric trucks in a tunnel system running under the podium.

At other points on the Ohio State University campus, development plans call for the gradual creation of podium-type pedestrian plazas that will permit the movement and parking of autos below. The Ohio State University plan is indicative of the near-insolubility of the parking problem on many campuses. Parking will be provided there in huge, open lots, in ramp-type parking garages, under buildings and elevated plazas, and underground. Nevertheless, the planner could find room for only 23,000 cars, the number estimated to be needed when the enrollment reaches 34,500 students. The projected top enrollment is 43,000, at which point 27,800 parking spaces will be needed.

Caudill, Rowlett and Scott pointed out that, to provide 27,800 spaces, 191 acres of open lots, or 10.4 million square feet of floor area in garages would be needed. The garage area would be the equivalent of converting all existing campus buildings for parking and adding another 2.9 million square feet. The cost of providing garage-type space, they added, would come to $50 million. They closed their argument on a hopeful note: better rapid transit might head off the need for 27,800 spaces.

It might be noted here that the University Facilities Research Center at the University of Wisconsin conducted a study of parking facilities under an E.F.L. grant. The results indicated that, when the value of campus land reaches $3.50 to $4.50 a square foot, “it becomes advisable to consider construction of multi-level facilities rather than additional parking lots.”

In some campuses, parking facilities are located so far from the academic core that transportation from parking lot to campus is required. Shuttle buses have been placed in service for this purpose on the University of Wisconsin campus. And the use of “elephant trains” has been suggested at other campuses. These are strings of passenger trailers hauled by small tractors, such as were used at both the New York and Seattle World’s Fairs. They can be moved safely through pedestrian areas.

Elephant trains also have been suggested for use within the academic core at Ohio State University, but the proposal has not yet been accepted by the university.
AN ART GALLERY FOR A UNIVERSITY CAMPUS

Sheldon Memorial Art Gallery
University of Nebraska
Lincoln, Nebraska

ARCHITECTS:
Philip Johnson Associates

STRUCTURAL ENGINEERS:
Leo Zettin & Associates

MECHANICAL ENGINEERS:
Jaros Baun & Bolles

SUPERVISING ARCHITECTS:
Hazcn & Robinson

CONTRACTOR:
Olson Construction Company

As a vital addition to its facilities for teaching the arts and humanities, this boldly elegant museum was designed to house the University of Nebraska’s growing collection of contemporary American art. In addition to two floors of various-sized galleries, the building contains a 300-seat amphitheater with projection room and small stage, general offices, and a basement containing special storage and viewing rooms for students and specialists, as well as mechanical and service areas. The building is completely wired for television transmission, and has a television control room in the basement.

A series of tapered and curving piers, standing 16 feet apart, dominate the largely windowless exterior. The focal point for the structure is the central, 30-foot-high Great Hall, which is glazed at both sides and doubles as entrance and sculpture gallery. The building has a concrete frame with travertine used as surfacing for the exterior and the interior of the main hall. The arch system is carried into this area, and has ceiling divisions separated and emphasized by large circular recessed panels, covered with gold leaf. A bronze-faced, bridge stairway connects the second levels.
"The essence of the exterior design," Philip Johnson has commented about the Sheldon Memorial Art Gallery, "is, of course, the splayed column. I don't know where I got it. But the idea of these curving columns, curving up from their bases and then into the arch itself—that is the fascination of them. The rhythm of the columns makes the design. Also, the columns stand out from the building and any motion of one's head moves them further out. This creates a third dimension so lacking recently in modern architecture."

This gently plastic, variable quality is carried through the building, down to such faint echoes as the quiet variations in the travertine surfaces, and in the unusual but practical wall covering for the exhibition rooms—cotton pile carpeting of biscuit color. As a display surface, the carpet provides a soft, stipple-textured background for the paintings, and permits insertion or removal of nails at any point without marring the surface.
STUDENTS FINANCE AN ACTIVITIES CENTER

The clients for this college activities center were the students themselves. The architect was hired by them, and the structure was financed by them (through HHFA) via self-voted fees. Only the land was paid for by the state. The program called for facilities for a variety of functions, mainly social and recreational: spaces for between-class lounging, snacks, dances, meetings, ping-pong, billiards, cards, etc. In addition rooms were required for student government offices, student publications and a barber shop. The budget was set at about $485,000 for construction purposes. Outdoor areas were also desired to take advantage of a fine view to the west.

To give needed independence to these varied functions, the architects made full use of a sloping site to gain entrances to the building at four different levels. Thus portions of the building can be used as required in evening hours.

The structure is reinforced concrete frame, with pan-joist floors, prestressed beams, and combination precast and cast-in-place roof construction. Exterior walls are brick and stucco, interiors are mainly plaster. Flooring is magnesite and magnesite terrazzo on the stairs and in the lobby; pressed wood tile is used in the main lounge, which is used also for dances; vinyl asbestos tile is used elsewhere. The publications area has an acoustical tile hung ceiling with fluorescent lights.
The focal point for the Student Housing section of the new 838 acre St. Andrews College campus is this open glass-walled student union. As a social center, its design was conceived to contrast with the more enclosed study areas in the other buildings, and to afford views of the adjoining lake and the rest of the campus.

Academic and administrative buildings are on the opposite side of the 65 acre central lake, and connect with the housing and recreational section via a landscaped pedestrian causeway.

The student union building uses a slope in the land to permit direct entry from ground level for both floors. The top floor contains the college store, snack bar, mail room and lounges. The lower level is devoted to kitchen and student dining facilities, faculty and private dining rooms, and student activity areas.

The simple column and slab structure provides glare protection for glass walls by wide roof overhangs and a second-level balcony. The roof is made of pyramidal concrete forms topped with skylights. Interior walls are walnut, floors are vinyl asbestos.
NEW FACILITY PROVIDES FIVE DINING ROOMS

When expanding enrollments at the City University of New York's Queens College outmoded the old cafeteria, it was decided to replace it with a combined facility for students and faculty. Analysis proved that five types of dining spaces were needed. As most of the students live at home and may bring lunches, a prime requirement was a lunch room with a snack bar. For speedy service, a large room seating 700 and with three checkout centers, was provided. A large outdoor terrace extends from this room and is planned for outdoor lunches in pleasant weather. Wheeled serving carts with food items service the terrace.

For students desiring a complete meal, a dining room for 400, with two checkouts, was placed off a joint lobby for the students. In both dining and lunch rooms, students take their trays and soiled dishes to conveyor belts serving the dishwasher rooms.

The faculty dining room (below) can serve 160, and 40 more can be served in three small dining rooms opening off it. In addition, there are two auxiliary dining rooms for luncheons, teas, receptions and special meetings. Each will hold about 60 diners and one is furnished as a lounge. It is converted to dining use by folding tables.
NEW SCIENCE CENTER ADDED AT LAKE FOREST

A complex of three buildings, forming a complete undergraduate center, is part of a current program to expand facilities at this 106-year-old liberal arts college. The new center houses the departments of chemistry, physics, mathematics, astronomy, geology and psychology. The architects recommended the division into three connected units (teaching laboratories, classrooms, and science library) as it was felt that a single structure would be too large to adapt itself to the physical setting of the campus. The largest unit has a floor each for laboratories for physics, biology and chemistry. Each level also has a 40-seat tiered demonstration-lecture room backed up to a large storage and preparation area. This unit connects with the classroom building by a glass-enclosed corridor at the second level, and with the library at the lower level. The classroom unit has three levels, with the bottom floor devoted to a 196-seat lecture hall and auditorium.

Most dramatic of the three buildings is the circular science library. Its unusual roof is of laminated wood decking supported by laminated ribs, which rise from the concrete base and spring outward toward the glass exterior walls. A central core contains air-conditioning ducts, conduits, and roof drains.

The library has two levels. The first floor contains stacks, work areas, conference rooms and seventeen study carrels. The second floor forms a sort of "free-floating" mezzanine for reading and study. The entrance from the campus is at a mid-point between the two floors. The stacks have a capacity of 10,000 volumes.
The library interior (top left) has a very open quality in contrast with the windowless lecture hall (left) and a typical tiered lecture room (above).

The cost for these three very specialized science buildings was $1,700,000.

Exterior walls are brick and curtain walls of aluminum and glass. Interior partitions are concrete block. All classrooms have acoustical tile ceilings and fluorescent lighting.
LOGIC AND SIMPLICITY GIVE LIVABILITY ON A BUDGET

John Desmond coordinates complex site and program needs into a handsomely simple house.
This modest-appearing house packs in an unusual amount of living space—zoned to fit the owners' requirements—for a budget of $25,000. The program had clearly stated requirements for: a "parents' wing," containing a large master bedroom, quiet living area and formal dining area; "a children's wing," with three bedrooms and a playroom (with bedrooms to be converted into a large space as the children grow up); and a central area containing all common and informal living, dining and service spaces. A guest bedroom and a work room were also required.

The plan at right shows how all these needs were very adequately provided in a simple, workable arrangement. The zoning requirements were respected, with the kitchen placed at the crossing as a control center and activity focus, looking down through the screen porch into the play yard and in the other direction into the combination work and guest room. All areas have convenient access to the outdoors.

Living and play areas flank all four sides of the "control center," and can be used separately or all together for large parties. Low partitions, and a ceiling following the roof-line, increase the air of spaciousness. An added emphasis is given to the central space by the high ceiling created by the intersection of the gabled wings.

The site is a pleasant, sloping and wooded one, and it was desired to preserve this quality in future landscaping. Building materials were also chosen to further contribute to this quality. Exterior walls are of bleached cedar, and ceilings are natural finish hemlock. The roof is gray-beige asphalt shingles. Interior walls are pre-finished plywood and floors are oak, vinyl asbestos or ceramic tile. The house has year-round air conditioning.

Residence for Robert Duncan
Covington, Louisiana
ARCHITECT: John Desmond
ASSOCIATE: Ralph Clampitt
CONTRACTOR: W. W. C. Oud
The structure of the Robert Duncan house was designed to solve several problems in the simplest manner possible. It was desired to preserve the existing slope of the site, as well as the fine trees. The architects and owners also wished the structural frame to help define room spaces within the house, and to carry the loads of both the main floor and the roof. As finally developed, the structure is made up of a series of WF steel rigid frames, painted white, and accomplishes all of these objectives. Spot footings leave the ground undisturbed.
SWIMMING AND TENNIS CLUB IN CALIFORNIA
The Hills Swimming and Tennis Club
Oakland, California
OWNERS: The Hills Corporation
DESIGNER AND LANDSCAPE ARCHITECT: John Vogley
CONTRACTOR: C. E. Steidtman
LANDSCAPE CONTRACTOR: A. L. Neu

BEACH PAVILION ON FLORIDA COAST
Beach Facility for Sarasota County
Siesta Key, Sarasota, Florida
ARCHITECT: Edward J. Seibert
LANDSCAPE DESIGNER: L. H. V. Smith
STRUCTURAL ENGINEER: E. C. Seibert
CONSULTANT: E. M. Fearnley, Architect

SUMMER PAVILION ON A MOUNTAIN LAKE
Summer Pavilion for Mr. and Mrs. M. Philip Davis
Lake Arrowhead, California
ARCHITECT: David L. Fowler
BUILDER: M. Philip Davis

PLAY PAVILION FOR AT-HOME RECREATION
Recreation Pavilion for Dr. and Mrs. Ben Mirman
Arcadia, California
ARCHITECTS: Buff, Straub & Hensman & Associates
CONTRACTOR: Floyd Mathews
The hilly site of this 500-member private swimming and tennis club in the hills above Oakland has been used to provide an unusually handsome recreational area. The buildings—an existing residence remodeled as a clubhouse, and an office and locker building—are at the street side of the property and act as a wind shield for the terrace. At the other side is a magnificent view east to Mount Diablo in Contra Costa County. At this level also are a large swimming pool and a wading pool. Forty feet below, on a shelf in the hillside, are tennis courts; on yet another level are picnic areas. A dance pavilion on the north and a teenage center on the south are planned for the future; these, too, will be on shelves in the hill. Stables are planned for construction in the parkland at the bottom of the hill, with trails to connect them with the crest of the hill. The hills have been disturbed as little as possible—even parking is on several levels to avoid cutting the hills—and as many trees as possible were saved. To emphasize the natural beauty of the location, the designer used wood, stucco and earth colors, and more lawn (for sitting and for games) than paved area.
BEACH PAVILION ON FLORIDA COAST

Sarasota County Beach Facility
Siesta Key, Sarasota, Florida
ARCHITECT: Edward J. Seibert

Designed to give shade as well as to provide necessary shower and toilet facilities for a public beach, this low-upkeep beach pavilion is not only useful during daytime hours but during the evening—especially on moonlight nights—for square dances and picnics. The structures are of reinforced concrete and concrete block throughout, an appropriate and easy-to-maintain material for this salt-air location. Only the wood doors require painting. Columns were precast on the ground and hoisted into position. Beams were then formed and poured in place. Double-tee joists, precast and prestressed, laid across the frame, form the roof to the shade pavilion. Column connections to bases were precast in the bottoms of the columns. Since the site is exposed and vulnerable to tropical storm winds and water, an underground concrete bulkhead wall was put in for protection of the facility against storm waters. Some showers are located in the bath house; others are out-of-doors in the recesses of the wall to the east of the shade pavilion. At the end of this wall is a pump and storage house. A paved patio on the west side makes a sheltered place for sunbathing. The entire facility was built on a $50,000 budget.
A SUMMER PAVILION ON A MOUNTAIN LAKE

Mr. and Mrs. M. Philip Davis, Owners
Lake Arrowhead, California
ARCHITECT: David L. Fowler

This gay little pavilion, overlooking the shore of an arm of a lake in the San Bernardino Mountains of Southern California, achieves with complete simplicity its purpose of being a modern gazebo and a lakeside shelter from sun, wind and occasional storm. Designed as a supplement to the main house on the hill above, it is both open and enclosed: glass walls on four sides afford views in all directions and protection from winds, but louvered panels permit cross ventilation; the shingled roof, whose diagonals are turned 45 degrees from those of the floor, is left open at its peak allowing a glimpse of the trees above, but does not project beyond its straight edges to cover the wall corners; the floor is made up of 2 by 6 inch redwood decking, spaced \( \frac{3}{8} \) inch apart to drain the small amount of rain and snow which enters through the open corners and roof peak. The roof is supported on four masonry piers independent of the walls. Smoke and heat from the fire pit, used for wiener and marshmallow roasts, are drawn out through the open roof peak. A dressing room, storage cabinets, sink and a refrigerator extend the usefulness of the shelter. Unfinished redwood is used throughout, and the masonry walls of natural sand-colored concrete block are left unpainted.
A PLAY PAVILION FOR AT-HOME RECREATION

Dr. and Mrs. Ben Mirman
Arcadia, California

ARCHITECTS: Buff, Straub & Hensman & Associates

Although this recreation pavilion is just a short distance from its owners' year-round residence, its environment is so completely different, and its facilities for entertainment and play so inclusive, that it might well be a vacation house in a quite dissimilar situation. It is in fact, an at-home vacation house in a city, designed to give all ages of the family so attractive a variety of recreational occupations that they would want to spend their time using its facilities. The pavilion is a simple post and beam structure, almost entirely open to the playing courts and garden. A food preparation area, fireplace, barbecue and bar make an entertaining center for a wide range of occasions. Surrounding it are several game areas, including a multi-game court (for badminton, basketball, volleyball, etc.), shuffleboard court and a ping pong table. Nearby, but adjacent to the main house, is a swimming pool. In one of the large trees on the site is a children's tree house. A raised platform along one side of the pavilion doubles as spectator seating for games on the badminton court and as built-in seating for entertaining. Materials are simple: the frame is Douglas fir, stained; the ceiling is also fir, unstained; such walls as are used are of brick or plywood; the floor is brick.
FIRST CULLEN CENTER UNITS OPENED

Located in downtown Houston, the first two units of Cullen Center—a planned six block commercial development—are completed and open. These are the 500 Jefferson Building, a 21-story office tower, and the 12-story, 325-room Hotel America. Both of these structures follow the concept for the entire center, and have their main lobbies at second floor level where they are joined by an air-conditioned pedestrian concourse bridging the street between them. Their ground level enclosures are recessed in order to make possible more extensive plaza areas about the structures. The tower and hotel are served by an adjacent five-level parking building that will handle 370 cars. It is shown at left in the photographs above and below. The tower features a pre-glazed, precast concrete curtain wall.
The plan for the six-block Cullen center is shown at left. Primary pedestrian traffic has been lifted one level above grade, where each structure has its main lobby, retail shops, and services. An enclosed, air-conditioned concourse bridges intervening streets and connects all the buildings at second floor level. Vehicular traffic continues on the existing street pattern and has immediate access to off-street parking in large parking decks. The total complex will include three office buildings, a hotel, two apartment buildings, and parking facilities.

The 500 Jefferson Building—pictures at right, plans below—has an unusual curtain wall of precast, quartz-aggregate units. Each frame (below, left) is four feet eight inches wide and one floor high. The units were designed to be pre-glazed in the casting yard, the glass held in place by a neoprene gasket. When erected, the frames serve as both exterior and interior finish. The window glass is gray, the spandrel glass is black, and they are set back 13 inches from the outer face. As a result, the pattern of the wall is unusually delicate.
Above: The ground floor lobby of the 500 Jefferson Building is joined by an electric stairway to the second floor, which is in actuality the main lobby and primary pedestrian area. Below: A view at second floor level (refer to plans, page 155) looking from an elevator lobby through the enclosed, air-conditioned bridge which links the Hotel America with the office building.

Parking for both buildings is provided in an adjacent five-level structure. To avoid the usual traffic congestion attendant upon parking, loading and unloading, a private two-way drive was extended through the block between the office building and the garage. The use of prestressed beams for the garage made 64-foot clear spans possible; vertical movement of cars is speeded by a pair of circular ramps.
How Does Thermal Comfort Affect Learning?

Will school children in a model thermal environment learn better than those in a marginal one? This was the question which professors at The Iowa Center for Research in School Administration (University of Iowa, Iowa City) set out to answer early in 1961. Part of their research has been completed, and one of the interesting discoveries was that the learning efficiency of high-ability students was more positively affected by a model environment than was that of low-ability students.

The model environment had equipment which maintained temperature from 70 to 74°F, relative humidity 40 to 60 per cent, and air movement 20 to 40 fpm. The only thermal control possible in the marginal room was that performed by the teacher in changing the heater thermostat or opening the windows. The experiment was conducted in a research school in Des Moines built in 1956 for Lennox Industries, Inc. The test school, designed by Perkins and Will, consists of two classrooms and an equipment room.

During the nearly two months' study (March to May 1962) heating was required only three per cent of the occupied time in the model room. Ventilation and mechanical cooling were required whenever the outdoor temperature rose above 50°F.

In this study two groups of students of equal ability, family background and school experience were used. Forty-four matched pairs of fourth-grade students were divided into two equal groups. Tests were conducted on reasoning, clerical and new concept tasks. At the beginning of the experiment both groups performed about the same. But at the conclusion, students in the model environment did much better than those in the marginal environment.

The first study is summarized in a report, "Thermal Environment and Learning," by the Iowa Center for Research in School Administration. A more complete presentation is available in a thesis digest, "The Effects of Thermal Environment on Learning," by Charles Peccolo ($2.00).

Now a Prestressed Wooden Beam

Research on laminated wooden beams was selected as one of the 10 highlights of 1962 at the U. S. Forest Products Laboratory by its director, Edward G. Locke, in the organization's annual report just issued. Studies showed that not only can the prestressed beams carry larger loads than non-prestressed beams, but also a more reliable prediction of ultimate load can be made for a prestressed beam. Prestressing was accomplished by tensioning steel strands inserted in prepared holes in the tension portion of the beam. Research is being continued with the possibility that methods of design for commercial prestressed laminated beams may be developed.

Research on Lead and Zinc for Building

In an effort to increase markets for zinc and lead materials in applications varying from galvanized steel automobile bodies to lead roofing for buildings, member companies of the American Zinc Institute and the Lead Industries Association have in the last several years supported what is termed an Expanded Research Program which during the six-months period from October 1962 to April 1963 involved 72 active research projects. Typical among these is the acoustical testing for sound attenuation of lead in combination with panels of wood, fiberboard, steel and aluminum. Aiding the cost picture for this application is a new machine which permits the continuous casting of thin lead sheet directly from molten metal in a thickness as low as .010 in. Other examples include rolled zinc alloy for rainwater goods and zinc galvanized prestressing strand for concrete members.

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CENTRAL HEATING AND COOLING FOR COLLEGE CAMPUSES, p. 162.
THE ROLE OF THE COMPUTER
IN ENGINEERING PRACTICE

By Matthys P. Levy, Associate; Paul Weidlinger, Consulting Engineer
and Charles P. Lecht, Director, Advanced Computer Techniques, Inc.

Like the nonsense line from Lewis Carroll, "... For the Snark was a Boojum, you see," the electronic computer arouses the imagination while raising many questions of meaning and effect. The architect may fear that his artistic interpretation is put in jeopardy, while the engineer feels that his calculated judgment is being subordinated to a less personal logic. The question is raised: "Is such a fate within the realm of possibility, or is it so much nonsense?"

In order to explore this question three areas of interest. The present state and potential of computer applications in architectural structures, the effect of computerization on the organization of an architectural engineering office, and the effect on the individual engineer or architect.

A wide variety of computing devices exist today (i.e.: special and general purpose analog or digital computers). Many of the remarks to follow are applicable to engineering offices either maintaining or desirous of maintaining any type of medium to large-scale computer. Primary emphasis, however, will be placed on the utilization of a medium to large-scale electronic digital computer.

The Computer's Real Role
The computer has a definite place in engineering practice, and it is bound to have an ever-enlarging role. But the engineer must carefully examine proposed applications lest they prove impractical in relation to conventional procedures. Some myths concerning automation have achieved such status that the engineer may expect too much. It is not enough to state what the computer "can do," but both the ease with which a task may be automated and the cost of automation also must be given.

The following five facts should be kept in mind when a computer application is being considered:
1. Computers or use of same can cost a lot of money
2. Not everything should be computerized (e.g. a simple, nonrepetitive problem)
3. Many computer salesmen have never prepared a substantial engineering problem for a computer
4. Some activities are not ready for automation
5. Faith in the "state of the art" statements about what computers can do may lead to overconfidence in their potential.

Background
During the past ten years, computer utilization in engineering design has matured to the point that many engineering offices currently make regular use of computers. Some maintain a computer "in-house," while numerous others use them at various service locations. Applications range from those concerned with difficult analytical techniques to actual design of structural members. The design tables in everyday use by engineers have in many cases been obtained through the use of a computer; increasingly complex analytical problems may now be solved; optimization of structures is now feasible. In fact, techniques in producing computer-prepared architectural drawings, mechanical drawings, etc., have been developed sufficiently to enable the definite prediction of substantially reduced draftsmen's activities in the next decade. This remark also has far-reaching implications in the blueprint and general reproduction areas. Once computer technology establishes the modus operandi by which drawings can be produced with sufficient precision and clarity, the reproduction of these drawings at high speeds via further use of high-speed plotting or drawing devices is a foregone conclusion.

Effect of the Computer
on an Engineering Staff
It is of importance to trace the manner in which individual engineering offices become acquainted with computers. The typical first problem is in the field of analysis. The consulting engineer finds himself faced with a difficult analytical problem. He investigates and finds out that by utilizing a computer to solve the problem, he can save valuable time in his office. Since personnel trained in programming disciplines are usually not available on his own staff, he goes elsewhere for help, usually to a consulting firm.

If the problem is successfully processed and accurate rapid results are achieved, it may be the start of computer activities within his firm which will grow at a rapid rate. The initial brush with the computer will leave blueprinted impressions of the potential uses of the machine in his own work. If over the years the firm finds that more and more problems lend themselves to computer solutions, it may well start to prepare itself for the demands which computerized operations will place on the firm's facilities and staff.

It becomes apparent that the organization with chief engineers, project engineers, engineers and draftsmen must now be supplemented by a computer section operating parallel to the project engineers. Even without having actual possession of a computer, someone in the firm must be completely familiar with methods of programming, coding, efficient usage of the computer and methods of analyzing data. This individual may be a mathematician or an engineer, but he must be a specialist trained in computer technology.

The next step, once justified by the volume of work, is the acquisition of a digital computer. These courses of action are open: purchase, rental, cooperative rental with other firms. Purchase is not usually feasible because the cost, which runs over $100,000 for a small solid state computer, can not be justified in terms of possible obsolescence and long-term depreciation. Rental is the usual answer. Here again, cost is a vital consideration. A computer such as an I.B.M. 1620 rents at the equivalent of three and a half engineers per
SPEED COMPARISON MAN vs. COMPUTER

<table>
<thead>
<tr>
<th></th>
<th>Input</th>
<th>Operation</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>2</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Computer</td>
<td>40</td>
<td>50,000</td>
<td>150</td>
</tr>
</tbody>
</table>

Read: words per second | Perform a simple arithmetic operation: number per second | Print: words per second

STEPS IN COMPUTER ANALYSIS OF AN ENGINEERING PROBLEM

1. Analysis of the problem in engineering terms
2. Formulation
   a. Mathematical statement
   b. Suggested computer methodology
3. Programming
   a. Flow Charting. (This technique schematically shows the steps which the computer must take to produce the answers required by the problem.)
   b. Coding. (In this step the mathematical statement is written into computer “language” in series of instructions which the computer can accept.)
   c. Compiling. (The coded instructions are translated into still another form by the computer which becomes the computer “program” enabling the computer to give answers to the problem.
   d. Checkout. (At this point any errors in the foregoing steps are detected and corrected.)
   e. Documentation. (All the foregoing steps are written down for reference purposes.)
4. Input Preparation
   a. Questions to be answered by the computer are placed on punched cards, paper or magnetic tape
5. Process Program
   a. Input is run through computer
6. Obtain results
   a. Computer prints answers in form to be used by the engineer
7. Interpretation of results

DIVISION OF TIME REQUIRED FOR PROGRAMING

- Documentation: 13%
- Flow Chart: 30%
- Debugging: 30%
- Coding: 25%
- Compiling: 2%

50 simultaneous equations of the form shown below were written in order to determine deflections at 50 points

\[ \begin{align*}
Ax_{11} + Bx_{1m} + Cx_{mn} + \ldots + K_1 &= 0 \\
Ax_{1m} + Bx_{mn} + Cx_{nm} + \ldots + K_m &= 0 \\
Ax_{mn} + Bx_{nm} + Cx_{m} + \ldots + K_n &= 0 \\
Ax_{nm} + Bx_{mn} + Cx_{mn} + \ldots + K_{mn} &= 0 
\end{align*} \]

Two-way concrete plate floor slab of the C.B.S. Building by Eero Saarinen and Associates was analyzed by computer for moments to determine optimum reinforcement. Moment diagrams are shown shaded on the floor plan. Circled numbers indicate moments given by code solution.
Role of the Computer

The slab solution was proved by the computer service. Many applications of electronic computers have evolved:

1. Repetitive structures which involve routine but time-consuming calculations can be solved quickly and more accurately by computers. An instance of this is a floor slab in a tower building. In the case of Saarinen’s C.B.S. Building the economy of the slab solution was proved by the computer analysis. The structure was designed by Paul Weidlinger, consulting engineer.

2. The analysis of complex structures such as elastic plates and grids, space frames, thin shells, multi-bay rigid frames. These involve the solution of numerous simultaneous equations or require a lengthy iterative process, if no exact mathematical solution exists. This type of problem was in the past either considered too complicated or required the use of gross approximation. The analysis of a multistory frame for wind is a typical example of this type of problem. One such problem recently solved is the multilevel Vierendeel trusses forming the exterior frame of the Beinecke Rare Book and Manuscript Library at Yale. This is a highly indeterminate problem for which stresses were obtained by the solution of a set of equations by computer. Architects are Skidmore, Owings & Merrill; structural engineer, Paul Weidlinger.

3. Comparative design of alternate structural solutions and optimization of a structure. The preliminary phase of any project requires a study of various structural schemes using either steel, concrete or a combination of the two. The “right” scheme is usually the most economical. Such a study requires rather complete designs in order to be meaningful and to present an accurate comparison. Naturally, complete designs require a certain amount of time which is usually not available since the client (architect or owner) is always anxious for results. The time saving in analysis of the structure and design of members afforded by the computer gives a real advantage.

4. Job organization and construction scheduling by the Critical Path Method. The use of CPM in scheduling the construction phase of a project is now well established for both large and small projects. The same procedure is now recognized as serving a similar function in organizing the project within the architect’s office. The major aspect of CPM is that it allows the user full control of a project not only in determining which items of work lie on the critical path, that is, which may cause delay, but also in controlling costs where a time schedule is fully defined.

5. Data to finished product—the ultimate use of the computer is directed at the problem of the complete structural design. By feeding raw data such as span, number of bays in each direction, number of floors, loading, the computer can take over the analysis of the structure, the design of all component members and by use of a plotter the final working drawings can be obtained. This type of system is now being developed and when perfected will surely revolutionize the prevailing practice of the consulting engineer.

The rules of the game as defined by the codes specifying the design of construction materials can be programmed to provide the basic methods for design of such elements as beams and columns by comput-

Stresses due to wind in steel Vierendeel trusses of the Yale Rare Book and Manuscript Library were determined by computer.
er. This can be extended to the design of rigid frames by the introduction of an analytical program. Many buildings can be completely designed with just these elements and in fact many industrial structures such as power plants and mill buildings have been so designed.

6. Mechanical Systems—a program for the complete analysis of ventilating and air-conditioning requirements of a building is being developed. This means that given the basic exposure and load data, air requirement, duct sizes and cooling load will be obtained rapidly and efficiently.

7. Increased concern with dynamic problems such as the aerodynamic effect of wind on light elastic structures and blast effects on structures call for more complicated analysis. These are ideally suited to computer solution since they usually involve step solutions in time of the response of a structure.

Programing

There is a new discipline which has invaded the total scientific and business fields in the past 12 years, and has imposed itself as a bona fide field in its own right. This field is that of "computer programing," the task of preparing applications, architectural or otherwise, for computer solution. As stated earlier, computer applications and use of computers can be quite costly. This cost, however, can be minimized by effective and well-organized computer programing effort.

One of the greatest misconceptions in the computer applications field is that of conceiving of the computer program as starting and ending with the computer.

Each application must be conceived and acted upon as a man-machine-environment system if it is to be successful. In the structural design problem, it would be folly to consider a "computerized routine" to design beams or columns without considering the demands placed on this routine by city codes, laws, etc. The professional programer working along with the engineer, if cognizant of this fact, can guarantee success in any application to be effected on a computer if it meets the requirements of formalization for computer solution; such formalization obviously excludes esthetic judgments.

Currently, because of the many months an application may take to be automated, there are only three reasons of an economic nature which could justify a computer program of any magnitude in architectural engineering: (1) To dispense with a simple but highly repetitive task; (2) to process great quantities of data; (3) to solve a complex problem which is not feasibly done otherwise. The examples given earlier fall into these categories.

A survey kept on programers for over two years during a well-organized scientific programing effort is summed up in the "pie" chart. This chart shows the programer's activities on an average task to be automated. It provides an insight to the architectural engineer staffing his firm with computer programers as to a reasonable breakdown of the programer's task.

Preparation of any specific computer program may involve days, months, or years. It may involve very few instructions or many thousands of instructions to the computer. If the task is well organized from the precise mathematical formulation to the preparation of detailed final documentation of how it works, the how in architectural engineering computer applications will have been answered.

Conclusion

The computer will follow any logical process which man can devise. Once the rules have been decided upon, where does the designer fit in if the machine can presumably do his job? We have only to remember that we operate today under a set of rules and codes which 50 years ago were accused of stifling creativity. We have learned to live within the rules and have developed outstanding designers who have led the way in showing us how to use the rules to best advantage. The same is possible in dealing with the Boojum called computer.
CENTRAL HEATING AND COOLING OF COLLEGE CAMPUSES

Three recent cost analyses favor central systems for both new and old campuses.

Three recent analyses of engineering and economic feasibility have led to acceptance of designs for central heating, cooling and/or utility systems at three U.S. campuses:

1. Heating, air conditioning and electric power will be supplied to all buildings of the new Edwardsville campus of Southern Illinois University (see this month's Building Type Study).

2. An updated central boiler plant and new refrigeration plant at Yale University will provide heating and air conditioning for the Pierson Sage Square section of the campus comprising a projected total of about 18,000,000 cu ft.

3. A central refrigeration plant at Princeton University will supply chilled water for an ultimate total diversified load of 7,836 tons of air conditioning.

Each of the reports analyzed owning and operating costs for a considerable variety of systems. Tables 1 and 2 demonstrate the kinds of information that enter into selection of the ultimate schemes. It should be noted that the actual dollar figures shown cannot be translated into general bases for comparing one system with another except under the particular conditions at each job. Similarly, selection of one system or another cannot be interpreted as a quality endorsement other than within the framework of job criteria.

S.I.U.

The report on heating, air conditioning and electric power for the Edwardsville campus of Southern Illinois University was prepared by Warren and Van Praag, Inc., consulting engineers.

Of the more than twenty schemes analyzed for this campus, eleven which received most serious consideration are listed in Table 1: and of those, Plan No. 1 is the one recommended for construction.

This plan consists of a power plant located near and using the cooling
water of an 80-acre artificial lake (constructed here at less cost than equivalent cooling towers) about ¾ mile from the campus center. The plant will generate electric power for the campus and will provide both high temperature water and chilled water to be circulated to each building. Use of boiler steam for drives and turbine exhaust for h.t.w. accumulator and absorption stage of cooling makes for high efficiency.

Compilation of cost data pertinent to the study for S.I.U. involved some interesting extrapolations. Initial enrollment for the fall of 1963 is fairly firmly pegged at about 5,000 commuter students. Enumeration of elementary and high school students within commuting distance indicates an enrollment potential of 18,000 commuter students by 1970. A three-phase building program is geared to that expansion plus limited housing, after 1970, for faculty and graduate students.

To predict peak loads and annual cost of utilities, the 8760 hours of the year were divided into ten typical operating periods on a basis of both seasonal and diurnal variation (winter nights, summer mornings, etc.). Thus peak demands as well as cumulative totals for the year could be estimated.

From a study of operating records of central heating plants at two other Southern Illinois campuses (Carbondale and Charleston), a load factor of 2.8 Btu per degree day per cubic foot of heated space was derived. Similarly, a ratio of average hourly heat demand to peak one-hour demand was determined to be 0.45.

Cooling load estimates were based on published data for structures similar to those in the master plan adjusted for known particular conditions. Thus, a loading value of one ton per 200 sq ft of conditioned space was adopted. This seemingly generous factor was somewhat modified by applying it to 75 per cent of the gross area of buildings; and central plant loading was determined by applying a diversity factor of 70 per cent.

Yale
The report on a central boiler and refrigeration plant for the Pierson Sage Square section of Yale University was prepared by Meyer, Strong and Jones, consulting engineers. Here the problem was to take utmost practical advantage of an existing boiler plant (built in 1915) and steam distribution system in recommendations for additional boiler capacity and a new refrigeration plant to serve both existing and future air conditioning systems.

The existing plant had four boilers totaling 27,000 lb per hr steam generated at 30 psig. Already overloaded at peak conditions, existing boilers would be incapable of handling any addition of proposed new buildings. There is also a small low-pressure plant in the Peabody Museum con-

TABLE 1.—COST ANALYSIS, VARIOUS S.I.U. SCHEMES

<table>
<thead>
<tr>
<th>PLAN NO.</th>
<th>TYPE OF HEATING</th>
<th>BOILER OUTLET COND. PRESSURE/TEMPERATURE</th>
<th>ELECTRIC POWER</th>
<th>REFRIGERATION EQUIPMENT</th>
<th>CONSTRUCTION COST</th>
<th>ANNUAL BUDGET</th>
<th>OWNING AND OPERATING COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High Temp. 300 F</td>
<td>400 psig/600 F</td>
<td>Generator</td>
<td>Central: Centrifugal + Absorption</td>
<td>$8,230,000</td>
<td>$980,000</td>
<td>$51,860,000</td>
</tr>
<tr>
<td>2</td>
<td>High Temp. 300 F</td>
<td>400 psig/600 F</td>
<td>Generator</td>
<td>Subcentral: Centrifugal</td>
<td>9,048,000</td>
<td>1,160,000</td>
<td>177,775</td>
</tr>
<tr>
<td>3</td>
<td>High Temp. 300 F</td>
<td>400 psig/600 F</td>
<td>Generator</td>
<td>Packaged Chillers</td>
<td>34,152,000</td>
<td>1,798,000</td>
<td>2,580,000</td>
</tr>
<tr>
<td>4</td>
<td>High Temp. 300 F</td>
<td>150 psig/180 F</td>
<td>Purchase</td>
<td>Central: Absorption</td>
<td>3,565,000</td>
<td>1,360,000</td>
<td>1,541,200</td>
</tr>
<tr>
<td>5</td>
<td>High Temp. 300 F</td>
<td>150 psig/180 F</td>
<td>Purchase</td>
<td>Subcentral: Centrifugal</td>
<td>5,791,000</td>
<td>1,750,000</td>
<td>1,724,173</td>
</tr>
<tr>
<td>6</td>
<td>Steam 300 F</td>
<td>150 psig/90 F</td>
<td>Purchase</td>
<td>Central: Centrifugal + Absorption</td>
<td>6,546,000</td>
<td>3,110,000</td>
<td>1,724,954</td>
</tr>
<tr>
<td>7</td>
<td>Steam 300 F</td>
<td>150 psig/90 F</td>
<td>Purchase</td>
<td>Central: Centrifugal + Absorption</td>
<td>9,418,000</td>
<td>3,152,000</td>
<td>1,699,335</td>
</tr>
<tr>
<td>8</td>
<td>High Temp. 300 F</td>
<td>150 psig/180 F</td>
<td>Purchase</td>
<td>Packaged Chillers</td>
<td>10,175,000</td>
<td>5,025,000</td>
<td>2,617,656</td>
</tr>
<tr>
<td>9</td>
<td>Electric by Heat Pump 300 F</td>
<td>150 psig/600 F</td>
<td>Generator</td>
<td>Absorption</td>
<td>21,610,000</td>
<td>1,205,000</td>
<td>2,410,000</td>
</tr>
<tr>
<td>10</td>
<td>Electric by Heat Pump 300 F</td>
<td>150 psig/600 F</td>
<td>Purchase</td>
<td>Central: Centrifugal</td>
<td>9,318,000</td>
<td>1,461,000</td>
<td>2,205,000</td>
</tr>
<tr>
<td>11</td>
<td>Electric Resistance</td>
<td>Subcentral</td>
<td>Purchase</td>
<td>Centrifugal</td>
<td>7,865,000</td>
<td>2,967,000</td>
<td>3,307,000</td>
</tr>
</tbody>
</table>

* Heating provided at individual buildings

Pierson Sage section of Yale University Campus showing new refrigeration plant and piping distribution
taining two boilers with total capacity of 8,000 lb per hr. This plant serves both Peabody and the nearby Oceanographic building, a total load of about 6,000 lb per hr.

Existing steam piping is run through tunnels and basements, is designed for 125 psig and appears to be in good condition.

Estimates of present and future steam loads in pounds per hour were: for existing load on the Pierson Sage plant, 37,000; on Peabody boilers, 6,300 for three new buildings now under design, 17,500; for other future buildings 47,120; a total ultimate load of 108,000 lb per hr heating about 18,000,000 cu ft.

Princeton campus plan showing three locations analyzed for new refrigeration plant finally located near boiler plant at location (1)

### Table 2.—Cost Analysis, Princeton Refrigeration Plant

<table>
<thead>
<tr>
<th></th>
<th>Electric Drive</th>
<th>Turbine Drive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Future</td>
</tr>
<tr>
<td><strong>Mechanical Work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant</td>
<td>$556,840</td>
<td>$1,378,350</td>
</tr>
<tr>
<td>Steam Piping</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underground</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Chilled Water Piping</td>
<td>368,170</td>
<td>368,170</td>
</tr>
<tr>
<td>Electrical Work</td>
<td>131,700</td>
<td>265,700</td>
</tr>
<tr>
<td>Plant</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Steam Piping</td>
<td>368,170</td>
<td>368,170</td>
</tr>
<tr>
<td>Plant</td>
<td>131,700</td>
<td>265,700</td>
</tr>
<tr>
<td><strong>Total Mechanical &amp; Electrical</strong></td>
<td>$1,419,210</td>
<td>$3,058,070</td>
</tr>
<tr>
<td><strong>Building</strong></td>
<td>$1,239,860</td>
<td>$2,488,470</td>
</tr>
<tr>
<td><strong>Total Ultimate Cost</strong></td>
<td>$3,659,070</td>
<td>$5,546,540</td>
</tr>
<tr>
<td><strong>Annual Operating Cost</strong></td>
<td>$80,675</td>
<td>$162,235</td>
</tr>
<tr>
<td><strong>Annual Fixed Charges</strong></td>
<td>$84,480</td>
<td>$97,900</td>
</tr>
<tr>
<td><strong>Total Annual Costs</strong></td>
<td>$165,155</td>
<td>$259,135</td>
</tr>
<tr>
<td><strong>Total Ultimate Annual Costs</strong></td>
<td>$322,410</td>
<td>$427,480</td>
</tr>
</tbody>
</table>

1. Turbine drive was selected on the basis of similar analyses of five other systems including electric drive, absorption and various combinations.

Estimates of refrigeration loads total 2,206 tons for existing buildings; 1,500 tons for three buildings in design; 3,000 tons for future buildings; an ultimate total of 6,700 tons.

Recommendation of the report was that the original boiler house be enlarged to accommodate three new 30,000 lb per hr boilers. Two of these are to be installed initially; then two old boilers removed. This would establish, with one new boiler as spare, adequate capacity (43,500 lb) for all existing buildings. Adding one more new boiler, boosting pressure to 125 psig, then removing two remaining old boilers, provides 90,000 lb capacity, enough to take over the Peabody plant loading with one boiler spare. There would then be space in the Sage plant for two more new boilers; one for buildings now in design and one to handle ultimate load.

Extension of the boiler plant to accommodate refrigeration machines was a cost advantage since centrifugal refrigeration machines will be driven by steam turbines.

Estimated construction cost for the complete project is about $3 million; annual owning and operating cost will approach $442,000.

**Princeton**

The report on a central refrigeration plant for air conditioning various groups of buildings at Princeton University was also prepared by Meyer, Strong and Jones. It analyzed costs of various factors for three different plant locations and for six different primary drive arrangements. Table 2 shows the kinds of data assembled and actual figures for the selected system using turbine drive in a central plant located near the existing boiler plant. Location near the generator plant (2 in plan), a slight cost advantage, posed architectural and campus planning problems.

The new plant has a capacity of 2,700 tons and is designed for expansion to 6,300 tons. Estimated construction cost of the initial stage of plant and piping system is $1,364,350. Initial owning and operating cost will be $180,355; ultimately to be $322,180 annually.

In addition to the central system, there will continue to be several small systems serving individual buildings; largest separate system will be a 312-ton plant to serve the engineering quadrangle, now under construction.
High on a Hill in Bel Air

...Designer tile of everlasting beauty

Fire scarred residential area surrounds unscathed home roofed with fire resistant Ludowici tile.

*"THE TILE ROOF SAVED IT"

During the recent disastrous fire in the Bel Air section of Los Angeles, this Ludowici-Celadon roofed home, on the east side of Chantilly Road, was the only house left standing on its block. As one fire official stated, "It is commonly known that tile roofs just do not burn or melt."

Although inherent fire resistance qualities of Ludowici tile saved this home, tile was originally chosen for its unique texture, color and beauty.

A multitude of colors, sizes, styles and textures are at your disposal. Write for the name of our consultant in your area, he's ready and willing to serve you.

*From Variety, Nov. 8, 1961

* LUDOWICI-CELADON CO. 75 East Wacker Drive, Chicago 1, Illinois

For more data, circle 60 on Inquiry Card
Pittsburgh Corning products offer unique solutions to some of building's most critical problems

Take the problem of a wall requiring three trades, three materials, three costs

Stop and consider what it takes to finish a building wall, inside and out. No matter what the basic wall material might be, you can count on several materials and several trades. Especially in the screen wall has this been true — until now.

Now Pittsburgh Corning offers a new practicality to the screen wall. One new material, INTAGLIO, an all-glass unit available in four patterns, gives an insulating design wall in one construction operation. Intaglio serves as grill and weather wall, in one. Finished wall, inside and out.

On both faces of all units (three units measure...
Other PC solutions for building problems

- Problem: eliminate the need for two materials in a screen wall. INTAGLIO all-glass wall units combine glass and grill effects in a single material.
  For more data, circle 61 on Inquiry Card

- Problem: end frequent replacement of roof insulation. FOAMGLAS®: Moisture-proof cellular glass insures constant insulating value. In blocks 12" x 18" and 18" x 24" or in 2' x 4' FOAMGLAS BOARD® roof units, in 1½" thickness. Now guaranteed for 20 years.
  For more data, circle 62 on Inquiry Card

- Problem: Curtail wall insulation that softens and delaminates. FOAMGLAS Curtain Wall Insulation is incombustible, dimensionally stable and has an extremely high melting point.
  For more data, circle 63 on Inquiry Card

- Problem: reduce pipe/equipment insulation maintenance. FOAMGLAS insulation—impervious to moisture, fire and acids—for operating temperatures ranging from —450° to +800° F.
  For more data, circle 64 on Inquiry Card

- Problem: prevent high temp pipe insulation breakage. UNIBESTOS®—the long fibered Amosite asbestos insulation rugged enough for toughest applications at operating temperatures to 1200° F.
  For more data, circle 65 on Inquiry Card

- Problem: find a structural insulation for cold rooms. FOAMGLAS for freezers, coolers and low temp storage spaces—permanent insulating value with extra strength and rigidity for such cost-cutting innovations as freestanding insulating walls and partitions.
  For more data, circle 66 on Inquiry Card

- Problem: fix a room's acoustics without rebuilding it. GEOACUSTIC® units for acoustical correction—the only material for application on existing room surfaces to permit fast, effective, low cost correction.
  For more data, circle 67 on Inquiry Card

Pittsburgh Corning Corporation
Dept. AR-83, One Gateway Center, Pittsburgh 22, Pa.

Please send me descriptive literature for the products I have checked.

Name __________________________ Title __________________________
Company __________________________
Address __________________________
City __________________________ Zone ______ State ______

...one trade, one material, one cost: now glass and grill are one

8" x 8" x 4", one 4" x 8" x 4"), artfully antiqued glass and a fired ceramic, masonry-textured coating blend to form rhythmic patterns of the grill, in a single material with the visual, thermal and acoustical properties of double glazing. One trade installs it.

Mail the coupon opposite for complete details.
WAVES
UPON WAVES
UPON WAVES

...and underneath, the strength of Laclede reinforcement

St. Louis Priory Church in St. Louis County is not for the traditionalist. Here is a bold and imaginative step into ecclesiastical architecture. Here is where the heritage of a centuries-old faith joins hands with the dynamic concepts of the Atomic Age.

Priory Church has been lauded and applauded. It has seized imaginations and awards throughout the architectural world, including the Design in Steel Award of the A.I.S.I. The thorough planning and intricate form and reinforcement system devised by the contractor, McCarthy Bros. Construction Company satisfied the unusual design requirements established by Hellmuth, Obata and Kassabaum architects of St. Louis.

Underlying the three-inch undulating thin concrete shells and other areas of the startling structure are Laclede welded wire fabric and many tons of Laclede steel reinforcing bars.

Modern designers are traditional about one thing: the quality of the materials they use. That's why they turn, time and time again, to the reliable strength of Laclede steel reinforcement.
CONVERTIBLE LABORATORY FURNITURE

Components developed for new science building at Southern Illinois University can be rearranged as student load varies, science program changes

ARCHITECTS: Hellmuth, Obata & Kassabaum, Inc. CONSULTANTS: Laboratory Planning Consultants

What is a laboratory workbench for general chemistry one semester could be a workbench for physics or biology the next in the science laboratories designed for the new Southern Illinois University campus at Edwardsville. This has been made possible through the development of a new concept in laboratory furniture—convertible, modular components. The basic component around which workbenches are created is a utility cabinet which provides enclosure for wet or dry services and storage. The other components include metal frames and work tops, wet and dry utility outlet boxes, distillation rack for chemistry, and portable equipment container. These components can be arranged in various combinations to accommodate chemistry, physics, botany, biology and zoology disciplines.

In contrast to the usual programming approach of providing a separate building for each scientific discipline, all of these disciplines are grouped within a single structure, in accordance with requirements set forth by Southern Illinois' president Delyte W. Morris. These requirements were based on his conviction that "departmentalized" architecture fosters "departmentalized" education.

It was determined that the design approach should exploit the similarities of each discipline particularly with respect to: (1) provision of equal laboratory spaces for all disciplines in order that little or no change of the building would be necessary when a change in discipline is required; and (2) provision of equipment that, where necessary, can be readily changed from one configuration to another to perform a specific function in a minimum of time and with a maximum of reused equipment components.

The structure of the building was designed to allow for relocation or alteration of utilities by utilizing perimeter towers, which permit vertical distribution of utilities without interfering with open interior spaces. Laboratories are grouped adjacent to each tower about the perimeter of the building. The quantity of utilities decreases in density away from the towers so that the internal rooms with fewest services are utilized as lecture rooms, classrooms and preparation rooms.

The laboratory room is square in plan to permit options in student orientation. Room dimensions of 35 by 35 ft were regarded as optimum since this allows a maximum of 24 students to be furnished with a 2- by 4-ft work space exclusive of service sink. This work space, in conjunction with adequate aisles, permitted the utilization of each of the four walls for storage, demonstration or supplementary student work space. One laboratory size, satisfactory for all scientific disciplines, reduces or eliminates the need to change walls to accommodate a change in disciplines.

The floor structure consists of long-span joists. This removes columns from the interior of the laboratory rooms and permits utilities to emerge through the floor 2 ft 6 in. on center the entire length of the room.

An analysis of each of the disciplines indicated that four basic types of workbench plans would full...
Vertical distribution of utilities is run in perimeter towers.

Three rows of lab benches provide 24 students with 2- by 4-ft work spaces.

Left: To avoid need of various sizes of drawers at workbenches, students are provided with portable equipment containers stored in cabinets along the walls. Below: Four workbench arrangements show how components can be adapted to any of the science disciplines. Basic to all are the service/storage utility cabinets: (1) general chemistry; (2) organic and physical chemistry; (3) advanced physics (continuous work top); (4) biology, physics and zoology (center aisle aids supervision by laboratory instructor).
Above: Details of the center utility cabinet showing provisions for wet services. When this cabinet is a dry unit the wet utility box on top is removed and dry services are provided on the front of the unit as shown in dashed lines on the elevation. For the dry unit the sinks are covered. Right: Arrangement of services supplied to “wet” and “dry” center tables.
fill all science requirements. It was determined that three rows of benches, with two utility supply openings each, would provide each student and each discipline with direct and immediate utility access.

Floor openings will be of sufficient size to accommodate dry and wet utilities with all connections concealed within the utility cabinet. This cabinet, large enough to conceal the floor opening, would include an optional sink and control panels for all utilities. The utility cabinet location is intended to remain in a constant location in each of the four laboratory bench variations, but can, of course, be relocated if necessary.

The research leading to the development of the laboratory furniture was supported, in part, by funds from the Educational Facilities Laboratories, Inc.

Patent procedures covering the equipment have been initiated by Southern Illinois University.

*Left, above:* As many as five fume hoods can be grouped along one wall of the laboratory with exhaust to the tower

*Left and below:* Walls separating laboratories have steel struts to support partitioning material and utilities. Cabinets with a work top are shoved against the wall but not attached
ELECTRIC CURRENT IN TRACER-STRIP FOR HEATING INDUSTRIAL PIPELINES

A new way of heating industrial pipelines utilizes a heavy-duty electrical tracer-strip called Electro-Wrap. Heating current is carried by a rugged silica-graphite layer inside two layers of flexible glass asbestos fiber. The sheet is insulated with Allied Chemical's Aclar plastic film to give a 300 deg F continuous rating. Aclar will not react with most chemicals, with the exceptions of alkali metals and organic amines.

Heat output is spread evenly over the wide surface. Low heat density of 1 w per sq in. eliminates cooking or spoilage due to hot-spots or overheating. It operates on 115 v, a-c or d-c. Heating current flows across Electro-Wrap, so no splicing is required. The strip is applied lengthwise on the pipe, not spiraled. Installation is simple.

Each 100 ft of pipe length requires its own circuit with thermostat. A flexible connector of DuPont's Teflon and aluminum (or stainless steel) and amp terminals are available from the manufacturer. Thermostat bulb is taped to top of strip, and standard insulation is used. Electro-Trace Corp., Nash Bldg., 285 Riverside Ave., Westport, Conn.

CIRCLE 300 ON INQUIRY CARD

COOLING TOWERS WITH TILE FILL CAN HAVE ANY FACADE

A high degree of design freedom for large buildings is provided by Ceramic Cooling Towers which leave structural and facade features up to the architect. The interior fill is chemically inert Perma-Grid vitrified clay tile which does not deteriorate.

A membrane of polyester resin reinforced with glass fiber sheets is securely anchored to interior walls, to prevent seepage to exterior walls. Reinforced glass fiber eliminators stop water carry-over and allow installation anywhere. Thus the cooling tower can be put near parking areas or can be an integral part of the building itself. Acme Brick Co., Ceramic Cooling Tower Division, P.O. Box 425, Fort Worth, Tex.

CIRCLE 301 ON INQUIRY CARD

more products on page 176
VENTILATING PRODUCTS
(A.I.A. 39-B) Two six-page folders give details and specifications for Lo-Tone mineral acoustical ventilating tile and ceiling board and Lo-Tone F/R (fire-rated) tile and board. Wood Conversion Co., First National Bank Bldg., St. Paul 1, Minn.*
CIRCLE 400 ON INQUIRY CARD

CERAMIC TILE
“New Handbook for Ceramic Tile Installation” is designed to give architects and specification writers a summary of the latest methods of ceramic tile installation. Tile Council of America, Inc., 800 Second Ave., New York 17, N.Y.*
CIRCLE 401 ON INQUIRY CARD

COLD STORAGE DOORS
Separate booklets give details on electric horizontal sliding doors for coolers and freezers. One discusses bi-parting doors; the other, single leaf doors. Jamison Cold Storage Co., Hagerstown, Md.*
CIRCLE 402 ON INQUIRY CARD

LIGHTING FIXTURES
Lighting fixtures are described and illustrated in 16-page booklet. Included are renderings showing suggested uses in restaurants, air terminals, office buildings, museums and hospitals. Sunbeam Lighting Co., 777 E. 14th Place, Los Angeles 21, Calif.*
CIRCLE 403 ON INQUIRY CARD

KITCHEN VENTILATORS
(A.I.A. 35-C-11) Commercial kitchen ventilators are illustrated in eight-page booklet, which includes a quick sizing guide. Farr Co., Box 90187, Airport Station, Los Angeles 9, Calif.
CIRCLE 404 ON INQUIRY CARD

EPOXY COATING
Data sheets describe a catalyzed epoxy coating which offers good resistance to alkalies, acids, water and solvents. David E. Long Corp., 133-20 91st Ave., Jamaica 18, N.Y.
CIRCLE 405 ON INQUIRY CARD

WINDOWS, CURTAINWALLS
Information about curtainwall systems, aluminum windows and steel windows is given in three booklets. Each booklet has product and installation pictures, as well as detail drawings, design data and specifications. Ceco Steel Products Corp., 5601 W. 26th St., Chicago 50, Ill.*
CIRCLE 406 ON INQUIRY CARD

“CLEAN ROOM” PANELS
Folder gives information on Superlite panels with a baked-on melamine surface for “clean room” walls and ceilings. Superior Wall Products Co., 4401 N. American St., Philadelphia 40, Pa.
CIRCLE 407 ON INQUIRY CARD

OFFICE INTERIORS
Photographs of Lehigh furniture used in recent office buildings illustrate a 16-page booklet. A price and specification list is included. Lehigh Furniture Corp., 16 E. 53d St., New York 22, N.Y.
CIRCLE 408 ON INQUIRY CARD

WINDOW IDEAS
Full-color installation pictures of various Pella wood residential windows are shown in a 24-page booklet. Specification details are included. Rotascreen Co., Pella, Iowa.*
CIRCLE 409 ON INQUIRY CARD

CONCRETE COMPOUNDS
Data charts for concrete admixtures, quick-sets, sealants and surface treatments are given in 12-page illustrated brochure. Sika Chemical Corp., 35 Gregory Ave., Passaic, N.J.*
CIRCLE 410 ON INQUIRY CARD

METAL BUILDING DESIGN
The latest revision of the “Recommended Design Practices Manual” has 28 pages of engineering data useful in designing pre-engineered metal buildings. Metal Building Manufacturers Ass’n, 2180 Keith Bldg., Cleveland 15, Ohio
CIRCLE 411 ON INQUIRY CARD

CHURCH LIGHTING
(A.I.A. 31-F-2) Ornamental and functional church lighting fixtures are described and illustrated in 68-page catalog. Price list is included. Gruber Brothers, Inc., 90 S. First Street, Brooklyn 11, N.Y.
CIRCLE 412 ON INQUIRY CARD

STEEL JOISTS
Two booklets give technical data on LA-, LS- and LH-Series longspan steel joists and J- and H-Series hot rolled and cold formed steel joists. Load tables, dimensions, properties, accessories and specifications are included. Sheffield Div., Armco Steel Corp., Kansas City 25, Mo.*
CIRCLE 413 ON INQUIRY CARD

MONOLITHIC TERRAZZO
Engineering data on four types of monolithic terrazzo is given in data sheet. The Camp Co., Inc., 9300 Sangamon St., Chicago 20, Ill.
CIRCLE 414 ON INQUIRY CARD

NURSE CALL SYSTEMS
Two series of nurse call systems are described and illustrated in folder. Notifier Corp., 3700 N. 56th St. Lincoln 4, Neb.*
CIRCLE 415 ON INQUIRY CARD

STEEL DOORS
Specifications guide for steel doors and frames show elevation drawings and available sizes. Amweld Building Products, 100 Plant St., Niles, Ohio*
CIRCLE 416 ON INQUIRY CARD

ARCHITECTURAL ALUMINUM
Booklet tells about a quality certification program for aluminum prime windows, sliding glass doors and curtain walls that will become effective Oct. 1, 1963. Architectural Aluminum Manufacturers Ass’n, 35 E. Wacker Dr., Chicago 1, Ill.
CIRCLE 417 ON INQUIRY CARD

*Additional product information in Sweet’s Architectural File
more literature on page 216
Beauty comes naturally to Red Cedar Shingles

This is a versatile material, one that adapts itself to many moods. Warm color, interesting texture, strong line are only part of the value of Red Cedar Shingles. They're also rugged, long-lasting, maintenance free, and they offer good insulation. Best of all, Cedar Shingles age gracefully, gaining beauty and character with the years. For further information about specifications and application, write, wire or call: Red Cedar Shingle Bureau, 5510 White Building, Seattle 1, Washington. (In Canada: 550 Burrard Street, Vancouver 1, B.C.) RED CEDAR SHINGLES
VINYL FLOOR COVERING
Vinylstep floor covering offers resistance to golfers' shoes spikes and high heels. It is also recommended for pool decks, locker rooms and patios because of its slip-resistant properties. Kessler Products Co., Inc., 4521 Lake Park Road, Youngstown, Ohio

CIRCLE 302 ON INQUIRY CARD

PORCELAIN ENAMEL CURTAIN WALL SYSTEM
Flexibility is a main feature of Erveen porcelain enamel wall system that has steel pilasters as well as steel panels so each panel is used as a structural member, eliminating horizontal mullions. Panels and sash are sealed to pilasters with extruded butyl sealants, and polysulfide sealants are used in all horizontal joints. Erveen Corp., 4000 W. Ridge Rd., Erie, Pa.

CIRCLE 303 ON INQUIRY CARD

What Rusco does to steel makes the difference in Rusco windows!

RUSCO STEEL IS TRIPLE-PROTECTED
first by hot dip galvanizing, then by bonderizing and finishing with a factory-applied, baked-on epoxy finish... available in any of 19 colors that won't chip, peel, crack, blister or fade. This is why Rusco Windows maintain their original beauty years longer than other windows.

Send for A.I.A. File showing full details.

RUSCO USES TUBULAR STEEL FRAME CONSTRUCTION
Underneath that epoxy finish is a framework of tubular steel that is so well designed and constructed that Rusco guarantees ease-of-operation for 20 years! This design and construction affords maximum rigidity, minimum weight and provides dead air space for greater insulation.

RUSCO DIVISION • Rusco Industries, Inc. • 1409 Lakeside Ave. • Cleveland 14, Ohio

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LOUNGE SEATING

CIRCLE 304 ON INQUIRY CARD

CENTRIFUGAL CHILLER
Sentry hermetic centrifugal liquid chiller, featuring complete factory assembly and factory running test, is offered in sizes from 125 to 600 nominal tons. Delivered completely charged and tested, the compact chiller requires only water and power connections to put into service. Worthington Corp., Harrison, N.J.

CIRCLE 305 ON INQUIRY CARD

BUILDING PANELS WITH URETHANE FOAM CORES
Butler F-103 building panels have a nominal thickness of 1 in. and a maximum thickness of 2 1/2 in. Insulation is provided by poured-in-place polyurethane foam. Exterior faces are 26-gage galvanized steel with factory-applied finishes; interior faces are 26-gage cold-rolled steel with factory-applied bone white finish. Plastic Z-members act as a thermal break between the faces. The panels are made in units 3 ft wide, up to 32 ft long. U-factor is .10. Butler Mfg. Co., 7400 E. 13th St., Kansas City 26, Mo.

CIRCLE 306 ON INQUIRY CARD

For more data, circle 71 on Inquiry Card

For more data, circle 70 on Inquiry Card
remarkable beauty, new economy of installation!
...a major breakthrough in closet door design.

NEW Homeshield PRE-HUNG FOLDING DOORS
Ideal for Apartments, Homes, Motels, Offices

Unlike any other folding doors... new Homeshield pre-hung folding doors achieve a striking focal point of interest in any decor... providing broader scope, greater latitude for developing interiors of higher interest and utility.

Four distinctive patterns available: Created from rigid, durable polymers artfully formed into four stunning designs.

Homeshield pre-hung folding doors can be installed in less than 10 minutes! They are pre-hung in a pre-finished aluminum frame, complete with all hardware in place. Delivered as one integral unit ready for immediate installation.

Quiet, positive operation: Specially designed, and patented spring hardware assures quiet operation, prevents sagging, holds doors in positive closed or open position. Enables doors to fold flat against wall for full access to closet opening.

Doors have been fully tested and proved to withstand abuse, humidity and temperature extremes.*

No painting necessary: Oyster White matte finish can be left as is, or painted to match or contrast with walls.

Investigate the many advantages of these new pre-hung folding doors by HOMESHIELD today. Write for full specifications and details on four designed panels and sizes.

* (Actual test report sent on request.)

AMERICAN SCREEN PRODUCTS COMPANY
Chatsworth, Illinois • Dept. AR-8
Roofmate FR is the most dependable insulation since Styrofoam®.
Like father, like son.

We extrude both from the same polystyrene, by the same exclusive process. Just like Styrofoam wall insulation, Roofmate® FR roof insulation stays dry permanently; keeps the insulating efficiency you specified. It also ends worries about roof blistering and cracking caused by waterlogged insulation.

Competitive in price as a material, Roofmate FR saves on installation: as much as one dollar a square! It's lightweight (less than 25 lbs. to the bundle) but tough. We give it a high-density skin top and bottom to take the beating a roof insulation gets. Roofmate FR is pleasant to handle; easy for roofers to fabricate, fit and install. Roofmate FR comes in thicknesses to meet standard "C" factor requirements. Want more data and specifications? Just see our insert in Sweet's Architectural File, or write us: The Dow Chemical Company, Plastics Sales Dept. 1001N8, Midland, Michigan.

For more data, circle 72 on Inquiry Card
Product Reports
continued from page 176

ATTIC ROOF VENTILATOR
An attic roof louver made of U.S. Rubber's Royalite thermoplastic is claimed to be almost indestructible. The ventilator nails in place without pilot holes, is not susceptible to bending or denting and is hail proof. Home Comfort Products Co., Box 68, Princeville, Ill.
CIRCLE 307 ON INQUIRY CARD

FINISH "FLAME-PROOFS" COTTON AND RAYON
A durable fire retardant for cotton and rayon fabrics is provided by Hooker's THPC. The chemical leaves the material pliable and survives cleaning for the life of the fabric. Material treated is rot- and mildew-resistant. Possible uses include tent and awning fabric, cloth window shades and drapery material. Hooker Chemical Corp., Niagara Falls, N.Y.
CIRCLE 308 ON INQUIRY CARD

WHY SPECIFY SEDGWICK DUMB WAITERS AND DOORS?
- Maximum safety and ultimate economy
- Long-lasting, trouble-free service
- Wide range of equipment to suit all service needs
- Dumb waiters and dumb-waiter doors from a single source
- Electric and manual types
- Automatic control features tailored to specific needs
- Flexible location of machine
- Minimum space requirements
- Free engineering service: specifications, recommendations
- Nationwide service
- Quality manufacturing since 1893
- Sedgwick — THE FIRST NAME IN LIFTS — IS YOUR ASSURANCE OF DEPENDABILITY. WRITE FOR CATALOG AND NAME OF NEAREST REPRESENTATIVE.
- Other Sedgwick products: Sidewalk elevators, freight waiters, residence elevators, stair-chairs.
Sedgwick MACHINE WORKS
84 Eighth Ave., New York 11, New York

FLANNEL "FLAME-PROOFS" COTTON AND RAYON
A durable fire retardant for cotton and rayon fabrics is provided by Hooker's THPC. The chemical leaves the material pliable and survives cleaning for the life of the fabric. Material treated is rot- and mildew-resistant. Possible uses include tent and awning fabric, cloth window shades and drapery material. Hooker Chemical Corp., Niagara Falls, N.Y.
CIRCLE 308 ON INQUIRY CARD

PLANTERS
Rectangular planters with a walnut and Formica finish are available in five sizes. All have galvanized iron liners which are coated on both sides with vinyl. Also available are four sizes of circular planters made of aluminum polished to a satin luster. McDonald Products Corp., 261 Dukit Bldg., Buffalo 10, N.Y.
CIRCLE 309 ON INQUIRY CARD

PRECAST AGGREGATE PANELS
Ar-Lite precast aggregate panels use natural aggregates imbedded in a copolymer thermosetting resin to produce a textured surface. Three types of panels are currently produced: facing panels, 5/8 to 1 in. thick; insulated panels, 2 to 4 in. thick, using a foamed glass of polyurethane core; cast-in panels, 5/8 to 3 in. thick, with a cement asbestos back. Architectural Research Corp., Ar-Lite Panel Div., Detroit 39, Mich.
CIRCLE 310 ON INQUIRY CARD

MICROFILM FILING SYSTEM
Docuform miniaturized filing system permits more than 100 pages of standard-size documents to be stored and reproduced from each 5 by 8 in. film unit. Color-coded tabs permit speedy retrieval for viewing or reproduction on most microfilm reader-printer equipment. A Docuform filing cabinet about the size of a shoebox is said to be equivalent to 200 standard-size filing cabinets. Documentation Inc., 4833 Rugby Ave., Bethesda, Md.
CIRCLE 311 ON INQUIRY CARD

DUST-RESISTANT LIGHTING FIXTURES
A line of dust- and moisture-resistant lighting fixtures is mounted flat against the ceiling, with the entire lamp assembly protected by an acrylic enclosure and a positive seal gasket. The Miller Co., Meriden, Conn.
CIRCLE 312 ON INQUIRY CARD

For more data, circle 312 on Inquiry Card
more products on page 185
Plant engineers have practical experience with the many products used in their plants. They have installed them; maintained them; cursed them; and blessed them. When ordering products for a new plant or plant expansion, they know exactly what they want. Specifications coming out of plant engineering departments are always well written and very complete. A typical "spec" will provide all of the pertinent data on the coating. This will include the catalog number and name of the manufacturer. If they would stop at this point, life would be a lot easier for a lot of people. However, just to make sure everyone will be happy, some plant engineers add "or equal" to the specification.

Those two apparently peaceful words guarantee trouble. Many contractors interpret "or equal" to really mean "or cheaper" and submit their bids based on the use of inferior products. Even reputable contractors are forced to consider cheaper materials to stay in the bidding. Distributors and manufacturers are also caught in this squeeze with insistent demands for cheaper materials that only look something like the item specified.

Adding "or equal" is a fine and noble gesture. It proves you have good intentions and an open mind. However, in practice it leads to emphasis on cheaper materials and low priced jobs. It is high time we took a hard look at "or equal" and cut it out of American engineering language.

When you write your next specification, instead of "or equal" try "NO SUBSTITUTIONS." Your bids will be more realistic and you will have less trouble now and in the future. When you specify a product based on past experience, stick to it. After all, you will have to live with it for a long time.

Does a firm specification restrict competition? It sure does. It protects the manufacturer building a quality product. Without this protection, sales will be lost unless he is willing to lower the quality of his product. Should you restrict competition? You bet your life you should. You can force the supplier of inferior products to make improvements to meet your needs. This is certainly more constructive than forcing quality products to lower standards.

If you want long life, reliable operation, and lowest over-all cost . . . find the best product, specify it, and allow "NO SUBSTITUTIONS."

---Adapted in part from PLANT ENGINEERING, DECEMBER, 1962

P.S. Rust-Oleum emphatically endorses the above editorial and its philosophy. We know that there is no substitute for Rust-Oleum. We take pride in being the industry leader in rust preventive coatings with over 40 years of industry proof! Why "or equal" when there is only one Rust-Oleum?

There is only one Rust-Oleum. Distinctive as your own fingerprint.

--- ATTACH TO YOUR LETTERHEAD ---

Rust-Oleum Corporation
2506 Oakton Street— Evanston, Illinois

Gentlemen: At no cost or obligation, please send me the following:

- 24-Page "Long Life Facts" Brochure.
- 36-Page New Color Horizons Catalog.
- Specification Charts for Coating Structural Steel and Steel Components.
- 40-Page "101 Rust-Stopping Tips" Booklet.

For more data, circle 74 on Inquiry Card
some feats are impossible without steel

Steel has the most favorable strength-weight-cost combination of any building material. Because of its strength, flexibility of fabrication methods, and wide range of available structural shapes, steel makes possible esthetic and space-saving achievements unattainable with other materials. Steel can be designed as a beam, rigid frame, continuously, compositely, plastically, orthotropically. Steel can be erected in any season, can be handled more roughly than other material. Because there are so many grades of structural steel of varying strength levels, it is never necessary to over-design.

Only steel columns could bear the load. The 30-story Michigan Consolidated Gas Company Building in Detroit is the world’s tallest all-welded building for a reason: integrated architectural design prohibited use of columns larger than 2 ft., 4 inches square. Reinforced concrete columns that size couldn’t carry the required 6½ million pounds. Connections were welded to eliminate bulkiness and achieve smooth right angles between beams and columns. Heavy columns for lower stories are four plates welded into a rectangular box section. Where extra strength was needed a fifth interior plate was added. Lighter upper columns are regular rolled sections. The field-welded wind-resisting system contains the equivalent of 40 miles of %0-inch fillet welds. American Bridge Division fabricated and erected 5,700 tons of steel, inspected welds by radiographic and dry powder magnetic particle techniques. Architects: Minoru Yamasaki—Smith, Hinchman & Grylls, Associated Architects & Engineers. Contractor: Bryant & Detwiler Co.

Steel dome saves Syracuse University $193,500. Fabricated and erected by American Bridge, the low-profile dome of the Syracuse University field house has a rise of only 32 ft. and a diameter of 300 ft. Because there are no interior supports, all of the 80,000-sq.-ft. floor is usable. Seating capacity is over 4,000 with room enough for basketball, track and field meets, or a 70-yd. football practice field. There are over 700 tons of structural steel in the dome and canopy. In a competitive bid with the alternate concrete design, steel saved $193,500. Architect: King and King. Engineer: Eckerlin and Kleper. Contractor: R. A. Culotti Construction Company.

High-rise truss walls—now possible with unique design and the “combination of steels.” Through a new building design concept using four different steels of varying strengths, designers trimmed 200 tons of steel (and saved $300,000) from the skeleton of Pittsburgh’s IBM Building, first high-rise building with truss walls. External framework is a diagonal, criss-crossing truss system. Only interior vertical supports are the six columns of the central service core. Outer truss walls direct all wind, wall and most floor loads down to two ground contacts on each side of the building. Using different strength steels (from 33,000 to 100,000 psi) engineers accommodated stress levels much as bridge designers have done in the past. This principle also kept truss members a near-uniform size from top to bottom regardless of stresses, and permitted American Bridge use of time-saving modular fabrication and erection.


For more data, circle 75 on Inquiry Card
UNITED CALIFORNIA BANK BUILDING, WILSHIRE BLVD., at Camden Drive, Beverly Hills, California

FIVE HAUGHTON ELEVATORS HELP FULFILL A CREED..."Building as it Should Be"

This exciting new building of glass and marble is the largest in Beverly Hills...and the eleventh major office building to be built by the Kreedman organization. Its superb blending of functional beauty, comfort and convenience clearly expresses the Kreedman creed—"building as it should be." For example: Five Haughton elevators under fully-automated electronic control answer calls with uncanny speed and efficiency. A new, advanced-design computer created by Haughton Elevonics® constantly monitors traffic demand, and responds instantly to match elevator service with the need. Include Haughton elevators in your plans for building or modernization. Ask your Haughton sales office (listed in the Yellow Pages) for details, or write to us. Haughton Elevator Company, Division of Toledo Scale Corporation, Toledo 9, Ohio.

S. Jon Kreedman & Co., Beverly Hills, Calif., an investment building firm. Owner—Builder

Charles Luckman Associates, Architects, Los Angeles, Calif.

* Haughton's advanced program in systems research and engineering with specific emphasis on the creative application of electronic devices and instrumentation for betterment of systems design and performance. Reg. in U. S. Patent Office.
Product Reports
continued from page 180

HOME SWIMMING POOL
WITH SANDWICH PANELS
A below-ground swimming pool, 16 by 32 ft, has two-inch thick aluminum sandwich panels which serve as insulation from ground frost. The panels have two sheets of Alcoa aluminum with a core of Koppers' expanded polystyrene. The pool, with filtration system and vinyl liner costs $2,000. Trojan Pools, Inc., Troy, N.Y.
CIRCLE 313 ON INQUIRY CARD

EPOXY MATRIX FOR
FACETED SLAB GLASS
A matrix based on Union Carbide's Bakelite epoxy resins is used for windows of faceted slab glass, consisting of small chunks of hand-chipped colored glass arranged in a pattern. The slab glass setting compound is strong and adheres well to glass. The compound can be made in different colors and textures. Benesco Co., 3326 S. 7th St., St. Louis 18, Mo.
CIRCLE 314 ON INQUIRY CARD

FUME HOOD
A fume hood 70 in. wide is designed with a double hung sash that eliminates a centerpost. The hood has a working surface 30 in. deep, double-strength safety glass and a top blower enclosure. Browne-Morse Co., Muskegon, Mich.
CIRCLE 315 ON INQUIRY CARD

ROOFING, FLOORING
IS SPRAY-APPLIED
Urapol 823A is a two-component urethane elastomer for roofing and flooring which can be sprayed in any thickness over wood, metal, asphalt and concrete surfaces. The resilient material also provides a seamless surface that will bridge concrete cracks. Poly Resins, Sun Valley, Calif.
CIRCLE 316 ON INQUIRY CARD

DOORS
ARK DOORS, FIRE DOORS
INDUSTRIAL DOORS, STEEL
DOORS, COMMERCIAL DOORS
RADIATION DOORS, WOOD
DOORS, ALUMINUM DOORS
STRAIGHT DOORS, CURVED
DOORS, TIN-CLAD DOORS
SMALL DOORS, LARGE DOORS
BLAST DOORS, HANGAR DOORS

TO MEET YOUR OWN DESIGN REQUIREMENTS
ESTHETICALLY—FUNCTIONALLY—ECONOMICALLY

When you want more than just a standard door—or when you run into a tough door opening to fill, please keep in mind that the design and construction of custom industrial and commercial doors to meet your esthetic and functional requirement is a specialty with Richards-Wilcox. In addition, R-W can supply all of the necessary hardware and heavy-duty electric operators where required...doors, hardware and operators that are "custom-fitted" to each other to assure trouble-free installation and service. The use of custom-fit doors can also provide greater economy than rebuilding openings to accommodate standard doors in remodeling projects.

Your local R-W APPLICATION-ENGINEER is a specialist in this field—he would appreciate the opportunity of consulting with you in regard to your door problems.

YOU DESIGN THE OPENING—R-W WILL FILL IT!

Richards-Wilcox
MANUFACTURING COMPANY
116 THIRD STREET/AURORA, ILL.
BRANCHES IN PRINCIPAL CITIES

ARCHITECTURAL RECORD August 1963 185
INDIVIDUAL ROOM
Seasonmaker
AIR CONDITIONING UNITS FOR

Whisper quiet but loud in performance describes McQuay's individual room Seasonmaker air conditioning units, designed to best meet every conceivable requirement. These are the air conditioners so quiet you never know they're in the room—except for their good looks and the year-around comfort they afford. Along with this whisper quiet operation, though, the Seasonmaker line fairly shouts performance—lasting performance that has become synonymous with the name McQuay.

When you choose Seasonmaker, you get all the plus benefits of McQuay's many years of engineering and production know-how with fan coil air conditioning equipment—all designed to deliver full rated capacity. You also get the extra high efficiency of famous rippled fin Hi-F coils, in the biggest selection of styles and sizes ever available. Seasonmakers give you greater economy, too, not only at the time of purchase but the greater economy of installation and operation as well. To top it all off, you get the largest unit selection—five basic lines, 13 models, a total of 63 sizes—which means you choose, without compromise, the Seasonmaker exactly right for your requirements. The Seasonmaker lines are—

Thin-Line Seasonmakers—Real space savers, Thin-Line Seasonmakers feature ultra-thin design (only 8 1/2 inches) and a full range of models for complete installation flexibility. Floor and basic models are available each in seven sizes—220 to 1240 cfm; ceiling and hideaway models are supplied each in five sizes, 220 to 640 cfm. All models are equipped with three-speed fan control.

Lo-Line Seasonmakers—Designed to offer a low-silhouette and maximum versatility in modern building design, the compactly built Lo-Line Seasonmakers are available in free standing, flush wall, and concealed models each in six sizes from 200 to 1200 cfm, with tandem installation offering greater capacity. Three-speed motor control is featured on all models.

Wall-Line Seasonmakers—The Wall-Line Seasonmaker, popularly known as the Seasonmaker Junior, is available in recessed and free standing models each in two sizes—150 and 300 cfm. A rheostat-type slide bar control permits modulation of air volume from 50 to 100 per cent capacity.

Apartment Seasonmakers—The Apartment Seasonmaker is a single, compact unit designed to silently condition an entire multi-room apartment. Direct drive, vertical models are available in sizes of 800, 1200, 1600, and 2000 cfm with five step speed control.

Large Capacity Seasonmakers—Large Capacity Seasonmakers are heavy-duty units designed for ceiling or hideaway installation. The belt driven ceiling model is available in five sizes—500 to 3200 cfm; direct drive ceiling and hideaway models are available in four sizes—800 to 2,000 cfm.

Your McQuay representative, with complete information on all the Seasonmaker models, will be happy to help in your selection of the units best suited to your needs. Or write McQuay, Inc., 1605 Broadway N.E., Minneapolis 13, Minnesota.
Hideaway For Study—This Overly carrel at the University of Southern Illinois, Carbondale, Illinois, gives the student an uncluttered, private world in which to do research and general study. Crafted in enamel-coated steel, it will resist the wear and tear of endless years.

This is an Overly enclosure. The one shown above, and 94 others like it, are installed in a university library to provide private study areas for students doing research. They are known in use as carrels. Overly encloses all manner of things. Our telephone booths offer attractive cubicles that permit you to carry on normal conversations in the noisiest areas. Other Overly enclosures provide acoustical chambers for audiometric testing, industrial control booths, test vehicles, engines, turbines and noisy apparatus of all types. They are known by many names.

METAL ENCLOSURES FROM OVERLY

Researchers in science and industry use Overly enclosures for environmental test chambers to carry on bacteriological testing. Our “clean rooms” provide controlled atmospheres that are completely dust-free. Overly convector enclosures quietly control and direct the flow of heated or chilled air in office buildings. We fabricate all types of enclosures that silently perform their designed function. Specify Overly for enclosing people, space, sound, engines or controlled environments.

Overly
Greensburg, Pennsylvania

For more data, circle 94 on Inquiry Card

ARCHITECTURAL RECORD August 1963 215
One Day Pour

120 Lineal Feet
By Ganging Symons Forms
With Haunch Forms

Faced with the construction of a 6" haunch along 540' of foundation wall on the Coon Rapids High School job, Gunnar Johnson & Sons of Minneapolis added Syroms steel haunch brackets and plywood to ganged sections of Symons Steel-Ply Forms, accomplishing a pour of 120 lineal feet of wall in one day.

To form the gang haunches, % plywood was tacked to the haunch brackets, which lock with standard Steel-Ply Forms. 2' x 6' panels formed the base; the 3' haunch form was attached with one-piece wedge-bolt connecting hardware, completing the required 9' height. Three 20' x 9' sections were stripped, oiled, and erected in 45 minutes.

Once the haunch forming was completed, the same ganged sections, with haunch forms removed, were used to set 240 lineal feet in an 8-hour period.

Write for the complete illustrated story. Symons Steel-Ply Forms can be rented with purchase option.

Office Literature

continued from page 174

Contract Furniture

Beds, desks, chairs, tables and chests for nursing homes, dormitories and motels are illustrated in eight-page booklet. Both free-standing and built-in models are available. Carrom Industries, Ludington, Mich.

Circle 418 on Inquiry Card

Prepainted Metal Strip

Six-page folder gives details on Colorstrip prepainted metal strip—galvanized and cold rolled steel and aluminum up to 52 in. wide and .62 in. thick. Marwais Steel Co., 6348 Gayhart St., Los Angeles 22, Calif.

Circle 419 on Inquiry Card

Air Conditioner


Circle 420 on Inquiry Card

Fire-Resistant Plaster

(A.I.A. 21-C-1) Fire resistant, insulating and high sound absorption qualities of Vonco plaster are given in folder. Vonco Corp., Inc., Box 423, Iola, Kan.

Circle 421 on Inquiry Card

Cooling Towers

Brochure lists engineering data and capacities for Series HC cooling towers with nominal capacities from 100 to 600 tons. Marley Co., 222 W. Gregory, Kansas City, Mo.*

Circle 422 on Inquiry Card

Electric Heaters

Packaged electric supplemental duct heaters for use with heat pumps, air conditioners, electric furnaces and forced air systems are described in a 24-page loose leaf handbook. Included are performance data, dimensions, wiring diagrams and installation instructions. H. W. Tuttle & Co., 808 Evans St., Tecumseh, Mich.

Circle 423 on Inquiry Card

* Additional product information in Sweet's Architectural File

For more savings from Symons

For more data, circle 98 on Inquiry Card

Vermon t Marble Co.

Panel Wall

is a pre-assembled unitized section. Can be locked together for large panel-wall areas, or easily adapted to curtain-wall systems. On the Blair Building installation in Chicago, the architectural firm of C. F. Murphy Associates created its own special design constructed by Maul-Macotta Corp., Detroit, utilizing Vermon t Verde Antique Marble slabs finished to ½".

We have a large variety of ½" marbles suitable for panel-wall and curtain-wall installations. Any thickness over ¼" can be supplied on order. For information, contact our nearest branch office or write: Vermont Marble Company, Proctor, Vermont.

* Additional product information in Sweets' Architectural File

For more data, circle 95 on Inquiry Card

For more literature on page 224

For more data, circle 98 on Inquiry Card
PROVED IN USE ON CHICAGO'S "MAGNIFICENT MILE"...

VERMARCO MARBLE CO.
PROCTOR VERMONT

Vermont Verde Antique Marble provide the distinctive feature of this building.

Only 2" thick overall, these panels are made from an insulated core which is sandwiched between two asbestos cement sheets, then bonded to the marble slab. The unit is held in an aluminum frame by a vinyl weather-stop/ expansion seal.

These space-saving walls have proved their utility through Chicago's summer heat and winter winds. And the beauty of this care-free Vermarco Marble will last the life of the building.

MARKWA MARBLE TILE

MARKWA thin MARBLE TILE
As displayed at the Owens-Corning Fiberglas Center, New York City, in a Jane Ashley, A.I.D., interior. MARKWA is available in 15 colors, all 1/8" thick, high gloss or satin finish, 8" x 8", 8" x 12" and 12" x 12" size tiles, with matching trim, caps and corners.
Pipe coating process to make direct use of turbine exhaust from Solar EFL Energy System

Standard Pipeprotection, Inc. will install two Solar T-350 EFL Energy System Packages at its new plant in Houston, Texas. The turbines will drive 60 cycle, 200 kw generators that will supply electrical power used in the plant. The most newsworthy feature of this installation, however, is that the exhaust heat from the turbines will be used directly without any processing in the plant's pipe drying operations.

This is possible because the exhaust of Solar gas turbine engines supplies large quantities of clean, dry air heated to as much as 1000°F. The new plant will provide plastic coatings for steel pipe used in underground installations. Coatings are applied to prevent external corrosion of the metal underground.

Heat from Solar gas turbines can be used directly without processing as will be done at Standard Pipeprotection, or it can be recovered in exhaust heat boilers. When converted to steam, it can be used for heating, absorption air conditioning or in numerous industrial processes. These systems using both the shaft horsepower and the exhaust heat of a Solar gas turbine engine are known as EFL Energy Systems. They reach thermal efficiencies of over 70% in a variety of commercial, industrial and marine applications, resulting in savings over competitive power almost anywhere in the United States.

Heart of Solar's standard 300 hp EFL Energy System being used in this application is the new T-350 gas turbine engine which has been designed specifically for heavy duty industrial service. The turbine and the driven equipment are mounted in a standardized enclosure. Single or multiple units can meet virtually any load. New T-350 EFL packages are also being installed by Washington Natural Gas Company, Lone Star Gas Company and Northern Natural Gas Company. Solar already has several EFL Energy Systems installed and in regular use in the 1100 hp, 800 kw range, using the Solar Saturn turbine.

Write for More Information. For additional technical data on how Solar EFL packages can be tailored to your requirements to save you money over competitive power, write Solar, Dept. L-138, San Diego 12, California.

Pipe coating process at Standard Pipeprotection, Inc. which will use Solar EFL Energy System to supply electrical power and dry coating on pipe.
...AND ON THE INSIDE,
YEARS-AHEAD PLANNING FOR ONE OF TODAY'S MOST PRECEDENT-SETTING COMMERCIAL STRUCTURES...

Complete flexibility with E=3ir and lighting: To save space, to give maximum design freedom, to provide draftless air distribution and efficient lighting, over 4000 Anemostat® CLD diffusers are hidden from view on the sides of Westinghouse Airliner Mark II lighting troffers.

IZ3HV all-air high velocity mechanical constant volume mixing boxes are the most advanced dual duct temperature and volume control units available today. Factory balanced and calibrated. No maintenance. PD-1 perforated diffusers unobtrusively blend with ceiling design.

About one mile of stainless steel Diffus-A-Curb provides peripheral air diffusion throughout, permits complete climate control for constantly changing loads. In this case, air to the Diffus-A-Curb is supplied by HVE mechanical constant volume units.

Space limitations, design freedom and air distribution requirements of Pittsburgh's new IBM building call for adaptability and control which only all-air dual duct high velocity equipment can provide. To achieve complete climate control under all conditions, Anemostat high velocity equipment and diffusers were selected for this 700 ton job. Want new ideas for your building? Call in your Anemostat representative or write for new literature to:

ANEMOSTAT CORPORATION OF AMERICA
SCRANTON, PENNSYLVANIA
A SUBSIDIARY OF
DYNAMICS CORPORATION OF AMERICA

Pittsburgh IBM Building | Owner: Equitable Life Assurance Society—Architect: Curtis & Davis—Mechanical & electrical engineers: Cary B. Gamble & Associates
General contractors: George A. Fuller & Company—Mechanical contractors: Limbach Company

For more data, circle 101 on Inquiry Card

ARCHITECTURAL RECORD August 1968 219
A new, dynamic, sensible approach to the integration of highly versatile, adaptable and efficient air distribution into modular ceiling systems.

MODULinear
Ceiling Diffusers
New MODULinear—combines modern architectural design, superior air diffusion and true flexibility to the highest degree ever achieved in a linear diffuser!

- **FOR NEARLY ALL TYPES OF CEILINGS**—special extruded aluminum design of MODULinears permits them to be incorporated into the modular unit of most ceiling systems—including plaster.

- **INGENIOUS, SIMPLIFIED DESIGN PERMITS AIR PATTERN & AIR FLOW RATE CONTROL FROM SAME SET OF VANES**—vanes are quickly, easily positioned from diffuser face, to adjust air pattern a full 180° (horizontal discharge, left or right, a vertical discharge, or any pattern in between)—and to set air flow rate desired. Both air pattern and flow rate can be set at any time before, during, or after installation . . . EITHER CAN BE ADJUSTED WITHOUT DISTURBING THE OTHER.

- **THE ULTIMATE IN EFFICIENT AIR DIFFUSION**—MODULinear can be furnished with special Diffuser Inlet Assembly which provides precisely the chamber necessary for spread and superior air diffusion. Also provides the extra flexibility needed to adapt air distribution to the requirements as dictated by changes in occupancy. Inactive sections of diffusers can be quickly, easily activated (and vice versa.)

- **FAST, EASY INSTALLATION**—furnished with support clips for quick fastening to ceiling suspension system or Tee Bars.

- **SINGLE SLOT & MULTIPLE SLOT MODELS**—available in one-piece lengths up to 8 foot. Sections butt closely together for use in continuous lengths.

### The correct air pattern for any installation

**INDIVIDUAL-SLOT PATTERN ADJUSTMENT**

- Horizontal—Left
- Horizontal—Right
- Dampered Horizontal
- Vertical
- Blank-Off

For ¼" slot, specify Series ML-3400. For ½" slot, specify Series ML-3500.

**MULTIPLE-SLOT PATTERN ADJUSTMENT**

- Opposed
- One-Way
- Opposed Unequal Flow (one slot dampered)

- Vertical & Horizontal

Mail Coupon for New MODULinear CATALOG

TITUS MANUFACTURING CORPORATION, Waterloo, Iowa

- Please send NEW MODULinear Ceiling Diffuser Catalog.
- Have Titus Representative call on me.

NAME ________________________________
TITLE ________________________________
COMPANY ________________________________
ADDRESS ________________________________

For more data, circle 103 on Inquiry Card
NEW! BAR AND MATCHING STOOL

NEW! COFFEE OR DINING TABLE

NEW! LOUNGE SEAT

correlated furnishings throughout all your interiors by...

CHICAGO HARDWARE FOUNDRY CO.
NORTH CHICAGO, ILLINOIS

quality control insurance with the complete quality line of

PLUMBING SPECIALTIES

Picking the right fixture for the right spot in an industrial or institutional building plan makes the plumbing installation operate the way you designed it. T&S offers the widest range of quality plumbing specialties to choose from for every job in the building... and all the working tools architects and specifiers need to make plans easy, foolproof, quality controlled.

Complete Line Of Fixtures. The T&S complete line of "streamlined" plumbing specialties simplifies the planner's task of unit integration and quality controlled performance throughout his specifications. A full complement of quality-built T&S fixtures and service outlets for every purpose helps him to select the most suitable units for each location... Food Service, Drinking and Filling, Sanitation and Maintenance, Laboratories, and other specialized areas. When you specify T&S, you have positive insurance of reliability and service harmony "all-through-the-house".

Complete Set Of Planning Guides. T&S offers a two-volume library of specification manuals to the planner. They are fully detailed with exact specs and dimensional drawings of all stock fixtures and service outlets with variations to custom design every layout. Personalized, registered manuals of "Plumbing Specialties" and "Lab-flo Laboratory Service Fixtures" are available on request.

Quality Plumbing Specialties Exclusively Since 1947

Refer to 1963 Sweet's Catalog, Code: 35b

For more data, circle 104 on Inquiry Card

ARCHITECTURAL RECORD August 1963
Another sealing challenge mastered by

Structsureseal

Six thousand gallons of STRUCSURESEAL, in specially formulated bronze color, were used to "seal in" these intricate story-high panels of the world's largest office building... Pan American. Here is just one more example of the high regard architects and builders have for this proven polysulfide base sealant.

Other well-known buildings permanently weather-sealed by STRUCSURESEAL include Seagrams, Pepsi-Cola, Cobo Hall, Crown Zellerbach, First City National Bank (New York), First National Bank (Ft. Worth), St. Louis Municipal Airport, Tishman (Los Angeles), and St. Paul Fire and Marine Insurance.

Knowledge of this sealant's reliable performance through the years in such major constructions has vastly increased architect acceptance and preference for STRUCSURESEAL among all the polysulfides. Its wide range of colors complies fully with requirements of ASA Spec. A116.1, as tested by independent laboratories. Outstanding "gunability" makes it the contractors' choice, too.

Do you have our latest sealant data file? It contains full details on our complete line of polysulfides, butyl caulks, rubber rod stock, and wide range of sealing tapes. Write or call Presttite, 39th and Chouteau, St. Louis 10, Mo., MOhawk 4-6000.

For more data, circle 105 on Inquiry Card
Now... a complete line of Refreshment Bars TAYLOR-MADE for you

In a jiffy you get up to sixty cups of hot beverages every hour... instant hot water for coffee, tea, chocolate, soups, etc. And in addition, all the cold refreshing water you need for office use.

Halsey Taylor makes three models, every refreshment bar being factory-installed... and in thirteen different capacities. It's a complete line, featuring traditional Halsey Taylor quality and service.

The Halsey W. Taylor Co., Warren, Ohio

WATER LEVEL DECK POOLS
(A.I.A. 35-F-2) Typical installations and fittings used in swimming pools filled to deck level are described in folder. Overflow gutter is in the deck surrounding the pool. Plumbing and Drainage Institute, 1018 N. Austin Blvd., Oak Park, Ill.

CIRCLE 424 ON INQUIRY CARD

LIGHTING FIXTURES
(A.I.A. 31-F-2) Separate catalogs give details on Marksmen ultra-thin fluorescent unit; Clymatron lighting and air flow unit; exit signs and general fluorescent fixtures. Emerson Electric, Day-Brite Div., 6260 N. Broadway, St. Louis 15, Mo.*

CIRCLE 425 ON INQUIRY CARD

METAL GRATINGS

CIRCLE 426 ON INQUIRY CARD

CURTAIN WALLS
Curtain wall panels with Mutane foamed-in-place urethane core insulation are described in folder. Mesker, Curtain Wall Div., 6002 N. Lindbergh, Hazelwood, Mo.*

CIRCLE 427 ON INQUIRY CARD

METAL TABLE BASES
New style concepts in metal table bases are illustrated in brochure which shows 17 bases and tables. The Chicago Hardware Foundry Co., 2500 N. Commonwealth Ave., North Chicago, Ill.

CIRCLE 428 ON INQUIRY CARD

ACCENT LIGHTING
Recessed adjustable and rigid stem lighting fixtures are designed to accommodate General Electric's Cool Beam lamps. The aluminum units have a satin finish and will accommodate all PAR 56 and PAR 38 lamps. Data sheets give details. Sievelier Co., 50 Irving Pl., New York 3, N.Y.*

CIRCLE 429 ON INQUIRY CARD

* Additional product information in Sweet's Architectural File
Here's your answer to lighting, corrosion resistance, fire resistance, and quick remodeling. New Monsanto LUSTRA-SPAN panels were designed for lasting service and structural adaptability. Check these features.

Non-Corrosive: Monsanto LUSTRA-SPAN panels will last indefinitely. They're virtually immune to industrial fumes, solvents, and weather. Won't chip, blister, or peel.

Non-Combustible: Tested by Underwriters' Laboratories, listed by Factory Mutual Engineering Standards as non-combustible. LUSTRA-SPAN panels feed no more fuel to a fire than asbestos cement!

Strong: Will withstand maximum wind and snow loads in temperature extremes; properly fastened, will stay in place in winds of 100 miles per hour. A 4' x 8' panel, edge-supported, holds over a ton.

Formable: You can wrap LUSTRA-SPAN panels around right-angle corners, bend them length-wise on a 100 inch radius. They're easy as thin plywood to drill, saw, or file with ordinary carpenter tools.

Light-Weight: For easily supported partitions, canopies, and suspended ceilings.

Translucent: Give soft, diffused daylight; controls solar glare in sky lighting and vertical glazing.

Low cost—as material and in installation — each Monsanto LUSTRA-SPAN panel covers 4' widths; 8', 12', and 16' lengths. Order them in either translucent or opaque; choice of colors, in varied corrugations and flat sheets.

This coupon will bring you full information. Fill it out and mail today.
HOW YOU CAN USE NEW
MONSANTO LUSTRA-SPAN
Vinyl Panels for
...daylighting
...fire-resistance
...beauty that lasts
ALL AT NO EXTRA COST!

Flexibility to fit arched roofs...even wrap-around right angle corners.

Virtually immune to industrial fumes, solvents, and sun.

Soft, diffused daylighting beauty for sidelighting and suspended ceilings.

Gentlemen: Please supply information on Lustra-Span as per instructions below.

☐ Send product data and general installation guide on Lustra-Span.
☐ Ask your representative to call...I would like to discuss Lustra-Span with him.

Name
Organization	Title
Street Address

City	Zone	State

Up to 80% direct light transmission—no breakage, no panel replacement.

Mail this coupon for booklet on Monsanto LUSTRA-SPAN Vinyl Panel specifications and installation recommendations.
Baptist Hospital of Miami
designed by
Sherlock Smith and Adams,
chose Remco Casework
- for its long life
- functional design
- good looks
- and they liked the job-site services that the Remco people always give.

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WHEN A SCHOOL CLASSROOM...

A BALLET CLASS AND A FOOTBALL TEAM
ENJOY A COMMON DENOMINATOR...

IT'S CERTAIN TO BE THEIR
SCHOOL SOUND SYSTEM BY ALTEC

Regardless of the extent or type of sound services required, an Altec school sound system can be tailored to fit the specific needs of any school. Because Altec sound systems perform any or all of the primary service functions that are required by most modern schools and universities.

Broadly, these functions cover educational, administrative, emergency, and extra-curricular services. Altec performs all of these functions superbly because an Altec school sound system consists of highly specialized audio components that are selected and assembled to perform specific, diversified, and in many cases, exclusive services.

For example, powerful Altec multichannel horns are used for centralized sound coverage of vast outdoor areas such as stadiums and coliseums. Here, and in gymnasiums, shops, or wherever noise levels vary, Altec "NOALA" automatically adjusts the system's volume level to compensate for these changing noise levels.

In school auditoriums and chapels, assembly halls and theatre arts buildings, Altec's famed "Voice of the Theatre" speaker systems provide clarity of voice reproduction and concert-hall realism for music. For efficient intercommunication to any number of classrooms, "Altalk" systems can be assembled to provide coverage of personnel and students either on a selective or all-call basis. These systems also provide from one to three communication channels as well as monophonic and stereophonic program distribution.

WE'LL BE PLEASED TO TELL YOU MORE...Specific detailed information about Altec sound systems for schools is contained in our new brochure, "SOUND SYSTEMS FOR MODERN EDUCATIONAL INSTITUTIONS". For your copy, please call the Altec Sound Contractor in your area (See Yellow Pages) or write Dept. AR8.

On the Calendar

August
5-9 Engineering Foundation Research Conference on Technology and Civilian Economy—Proctor Academy, Andover, N.H.
12-16 Engineering Foundation Research Conference on Communion—Proctor Academy, Andover, N.H.
19-23 Engineering Foundation Research Conference on Engineering in Medicine—Proctor Academy, Andover, N.H.
25-29 Joint International Conference on Creep, sponsored by the Institution of Mechanical Engineers, the American Society for Testing Materials and the American Society of Mechanical Engineers—Biltmore Hotel, New York City.
26-30 Engineering Foundation Research Conference on Urban Transportation Research—Proctor Academy, Andover, N.H.

September
9-12 International Conference on Production Engineering Research—Carnegie Institute of Technology, Webster Hall Hotel, Pittsburgh
17-20 1963 annual meeting, Producers' Council—Shoreham Hotel, Washington, D.C.
29ff VII Congress, Union Internationale des Architectes, theme, "Architecture in Developing Countries"; through Oct. 3—Havana
29ff 1963 National Planning Conference, Community Planning Association of Canada; through Oct. 2—Chateau Frontenac Hotel, Quebec City
30ff National fall meeting, American Welding Society; through Oct. 3—Statler Hilton Hotel, Boston

October
5-11 Prestressed Concrete Institute Annual Convention; joint technical sessions with American Society of Civil Engineers—San Francisco; further sessions, Oct. 14-18—Honolulu
8-12 International Symposium on Architecture, sponsored by the International Union of Architects—Mexico City
12-18 Second Pacific Rim Architectural Conference; 18th Annual Convention, California Council, American Institute of Architects; Fifth California Regional A.I.A. Meeting; continued on page 234

For more data, circle 110 on Inquiry Card

ARCHITECTURAL RECORD August 1968
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NOT 32 WEEKS!

UNCLE BILL'S DISCOUNT STORE
CLEVELAND, OHIO

deHamel Construction
Company, Contractors,
Raymond A. Davies,
Architect, Cleveland, Ohio

(*60 days in this case, from ground-breaking to grand opening)

... because V-LOK interlocks!

Macomber's V-LOK Steel Framing System is engineered to reduce construction costs, advance occupancy. All interlocking connections are seated with a hammer blow . . . provide unequaled framing rigidity and strength. And exclusive V-Section chords are nailable for faster decking. Result: You get a stronger, more rigid frame faster . . . lower your building cost per square foot. Practical, too. The V-LOK system includes room to grow . . . permits wide design latitude for loading, clear heights, roof type, bay areas. And V-LOK is compatible with modern finishing materials and techniques.

For FREE 48-page design manual, return this coupon today.
Holzer Hospital and Clinic, Gallipolis, Ohio, has this to say about this Van custom-made stainless steel conveyor: "We have been able to serve our heaviest meal in 20 minutes from the time the assembly line begins moving until the dietitian has checked all trays and they have started on their way to the floors . . . "

VAN Conveyor
Can help you save your client's money

You will be surprised what Van can help you accomplish in speeding up food service and soiled dish return of your projects with a conveyor tailor-made for each set of special needs. Not only will it make the operations faster . . . it will enable you to help your clients save money on help. Fabricated entirely of stainless steel . . . sturdy . . . easy to keep clean . . . flexible . . . can be made with any length or turn desired. Stainless steel slider pan, and drum, take-up and idler rollers, framing. Parts in contact with belt rust-free. Maintenance-free nylon bearings. Safety switches.

better food service
You can depend on Van's century of experience to design, fabricate and supervise installation of a conveyor system that will amortize its cost within a reasonable period. When you write, ask us how V. H. P. . . . our Hot Plate system assures service of hot meals to all hospital patients. THE JOHN VAN RANGE CO., 429 Culvert Street, Cincinnati 2, Ohio . . . dependable source since 1847.

"... look of luxury at low cost..."
says Howard Rivenburg of Builders and Developers—owners of Kent-Lincolnia Apartments in Alexandria, Va.

"We wanted both safety and beauty for our balconies in the Kent-Lincolnia Apartments. Anchor's All-Aluminum Picket Railing provided the positive protection we needed, plus a look of luxury at low cost—and I'm speaking of initial cost. We don't expect to spend a cent on maintenance."

Anchor's All-Aluminum Picket Railing can make balconies, walkways, or other similar areas, more desirable. Bright, rust-proof Reynolds Aluminum pickets, posts, and handrails promise longer life. Anchor's national network of skilled erectors assures fast and efficient installation.

For detailed information, call your local Anchor office or write: ANCHOR POST PRODUCTS, INC., 6687 Eastern Avenue, Baltimore 24, Maryland.
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in distinctive store fixtures and equipment is assured when you work with "American". Our unlimited versatility gained through fifty years of wide and varied experience is your assurance that every detail will be beautifully executed.

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For more data, circle 114 on Inquiry Card
Attractive, spacious Sprain Brook Branch Library is an excellent example of how architectural ingenuity can overcome a formidable site problem.

Designed to augment the overtaxed facilities of the existing library of the City of Yonkers, the new building was logically located in the center of a new community growth area. The site, however, consisted of sharp dips and rises into and out of a wide marshy area. The task: to blend full library facilities, community service facilities and adequate parking space into this land.

To meet these requirements fully, yet retain the parklike atmosphere of the site, Architect Eli Rabineau developed this "open," multi-level design. Readers' service rooms are conveniently placed at street level, community service rooms on the lower level, and parking spaces cleverly tucked into the surrounding landscape.

"Reliance on the Dodge Reporter," says Architect Rabineau, "was a major part of our initial planning. We kept him supplied with details of the project as they were developed. In this way we were able to communicate our needs to interested contractors and suppliers. He certainly smoothed out the bidding time and traffic for us.

"In addition, he helped us review the work loads of available contractors, so we could schedule bid dates with a minimum of conflict. We feel that the Dodge Reporter definitely contributed to the success of our branch library project."

Sprain Brook Branch Library
City of Yonkers, New York
Architect: Eli Rabineau
General Construction: Chiappinelli-Marx, Inc.

This artfully designed building is a reinforced concrete structure throughout. The vaulting of the main wing answers the need for a clear span that creates an interesting form on the exterior and is also attractive from the interior. A unique feature of the exterior is a sun control screen to shade the large glass areas of the reading room. The screen is formed of porcelain enamel panels that control direct sunlight and diffuse it into the interior.
The mellow charm of brick

Silaneal® protects it from
dirt, efflorescence, leakage

Brick — for texture and richness — was the architect's choice for this dormitory. Set among the warm tones of Bennett College, Carroll Hall's antique white brick enriches the campus complex. Specification of brick factory-treated with Silaneal assures lasting protection against unsightly discoloration from water-borne dirt . . . efflorescence . . . leakage.

Keeps Brick Clean Many brick, particularly light and pastel shades, have high suction rates and offer little resistance to water penetration. Water carries dirt into the brick, causing discoloration; water leaches soluble salts out of the brick, causing efflorescence. Factory-applied Silaneal makes brick water repellent so dirt stays on the outside, where it's easily washed away by rain, and efflorescence due to water leaching is minimized.

Controls Water Absorption High suction brick absorb water from fresh mortar so rapidly that improper hydration and mortar shrinkage may occur. As a result of poor bond between brick and mortar, hairline cracks may develop to allow leakage. But Silaneal controls water absorption; proper hydration of mortar is assured for maximum bond, less leakage.

Proven By Tests Hundreds of transverse pressure tests — and tests simulating wind-driven rain — have demonstrated that wall sections built of Silaneal-treated high suction brick prove stronger and resist leakage better than similar untreated brick.

For brochure and list of sources, address your letterhead to Dept. C420, Chemical Products Division, Dow Corning Corporation, Midland, Michigan.

Dow Corning
On the Calendar
continued from page 228
13th Annual Meeting of the Women's
Architectural League of California—Maria Isabel Hotel, Mexico City
12-23 Decoration & Design 1963, sponsored by the New York Chapter
of the American Institute of Decorators, the Resources Council and the
New York Herald Tribune—Seventh Regiment Armory, New York City
16-18 13th Annual Gulf States Re­
gional Conference, American Insti­
tute of Architects—Dauphin Island,
Mobile, Ala.
30ff Semi-annual meeting, Consult­
ing Engineers Council; through
Nov. 1—Disneyland Hotel, Anaheim,
Calif.

Office Notes
Offices Opened
John Graham and Company, archi­
tectural and engineering firm of Se­
attle and New York, has opened an
office at 120 Montgomery St., San
Francisco.
Bernard Rothzeit, A.I.A., has
opened an office for the practice of
architecture and planning at 114 E.
40th St., New York 16.
John A. Fayko, formerly in charge
of the Rochester office of Victor
Gruen Associates, has announced
the opening of his own firm, John
A. Fayko, Architect, at 300 Midtown
Tower, Rochester, N.Y.
Peter Munselle has announced the
establishment of Peter Munselle As­
sociates, which will practice archi­
tecture and planning; offices are at
315 South Beverly Drive, Beverly
Hills, Calif.

New Firms, Firm Changes
Gordon W. Jones, with the archi­
tectural firm of Fenno-Reynolds-Mc
Neil, 2000 Sheridan Drive, Buffalo,
N.Y., has been admitted as a partner.
The firm's new name is Fenno-Reyn­
olds-Jones.
J. C. Williams Jr. has been ap­
pointed project administrator in the
firm of Sanders & Thomas, Inc., con­
sulting engineers. He will work out
of the Philadelphia office.
Philip R. Cohen has been made a
partner in the firm of I. M. Cohen,
Architects, 26 So. State St., Chicago.
Andrew A. Halacsy, Ph.D., has
joined the corporation of George S.
Erskin and Associates, Inc., Engin­
eers and Architects, 3205 Middlefield
Road, Menlo Park, Calif., in the po­
sition of executive vice president.
A new architectural firm, MST
Architects and Planners Associates,
has been formed by Rolf Myller,
Richard W. Snibbe and Edgar Tafel.
Offices are located at 200 E. 37th
St., New York City.
Lawrence Braverman has been
named a partner of Leo Kornblath
Associates, New York architectural
and interior design firm. He had been
chief designer since its founding
three years ago.
E. Ray Schlick, partner in the firm
of Lane and Schlick, Architects,
A.I.A., 15840 Ventura Blvd., Encino,
Calif., has retired. The firm is now
Howard R. Lane, A.I.A. Senior staff
member Nathaniel Abrahms is now
director of production.
Malcolm Graeme Duncan, A.I.A.,
has joined the staff of J. Russell
Bailey, A.I.A., Orange, Va.
Eggers and Higgins, Architects, con­tinued on page 242

For more data, circle 117 on Inquiry Card

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12 WAYS BEST FOR CLOSET AND STORAGE AREA
INSTALLATIONS—LOW COST AND VERSATILE

1. Costs less installed than conventional wood shelving & rods.
2. Strong welded steel—won't sag—unlimited life.
3. Durable Vinyl "Colorfuse" finish—blends with any decor.
4. No maintenance—won't collect dust nor trap dirt.
5. Single unit combines shelf and clothes hanger rod.
7. Available any length and various widths—versatile.
8. "See through" visibility—no blind spots.
10. Divided clothes hanging—garments not crushed.
11. Light flows through rack—no dark corners.
12. All installation hardware furnished—anchors and screws. (Coat and pant hangers available).

INSTALLATION SHOWING PEMCO
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TION WITH PEMCO GENERAL
STORAGE RACK, NOTE EXCEL­
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Send Representative with samples and Complete Catalog.

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For more data, circle 118 on Inquiry Card
This limits your client to a stiff grade of toilet tissue

This gives him a free choice

Given a vote in the matter, most people would choose a soft, absorbent toilet tissue—like Scott. But you never find such a high grade tissue in a wall cabinet.

Know why? Because cabinet tissue must sacrifice softness and absorbency so it will be stiff enough to dispense properly from the box.

You can give your client a free choice. Specify roll tissue dispensers in your washroom plans. Then your client can decide for himself what quality of tissue he wants to use.

Scott's line of single and dual roll holders will handle any grade of tissue. Look for our 16-page booklet in the Washroom Equipment section of Sweet's Catalog. Or write, and we'll send you a copy. Scott Paper Company, Philadelphia 13, Pennsylvania.

SCOTT MAKES IT BETTER FOR YOU
Du Pont TEDLAR® is a tough film-finish that keeps roofing and

Advantages of a film-finish

Unlike a liquid or a spray, TEDLAR® PVF film is a tough, new exterior finish of plastic film. Extensive testing by Du Pont shows it resists chipping, cracking, blistering, peeling, fading and chalking to a remarkable degree.

TEDLAR is factory-bonded to building products, using special Du Pont adhesives. Bonded in this way, TEDLAR becomes an inseparable part of the material it protects.

A surface of TEDLAR gives long-term protection without refinishing. How long is long-term? We frankly don’t know because we haven’t been able to wear it out yet. But, properly bonded to a stable material, we predict TEDLAR will last up to 25 years... perhaps even longer.

Surface any shape roof

This school library has a built-up roof containing only two plies: a base sheet plus a top membrane surfaced with TEDLAR. Applied with conventional techniques, roofing surfaced with TEDLAR will cover any shape from folded plate to compound curves.

Because TEDLAR retains its original high reflectivity, air-conditioning loads are reduced.

Whether the climate is drenched with humidity or baked dry, TEDLAR lives a long and beautiful life.
sidings looking new for up to 25 years.

Sandblasting tests prove durability
The siding on the left, surfaced with TEDLAR, was subjected to a punishing sandblasting test—and came through unharmed. The same test ripped apart the conventional finish on the other siding. This durability of TEDLAR makes it virtually impervious to heat, cold and ultraviolet light. Weather, good or bad, doesn't affect it.

No ordinary hazard—like rust, tars, acids, alkalis—will harm TEDLAR, either. This finish, available in a range of colors, is perfectly smooth, with no pinholes to let in moisture. Atmospheric corrosion can't harm it. And howling sandstorms may leave a layer of dust, but that's all.

Stays new-looking without refinishing
These building panels surfaced with TEDLAR will retain their original appearance for up to 25 years or more. Over the long run, TEDLAR, with its unusual durability, is probably the most economical finish available for exteriors.

Already many building products are surfaced with TEDLAR. They include siding, roofing, insulation jacketing, trim and accessories. TEDLAR can be bonded to aluminum and other metals, plywood, asbestos-cement, wood and reinforced plastics.

For a list of these products or any other information about TEDLAR, write the Du Pont Co., Film Dept., Building Materials Sales Division, Box 55, Wilmington 98, Delaware.

*Du Pont registered trademark
If concrete were free to deform, normal volume changes would be of little consequence, but since concrete is usually restrained by foundations, spandrels, reinforcement or connectors, significant stresses may develop. This is particularly true when tension is developed; thus restrained contractions causing tensile stresses in concrete are usually more important than restrained expansions which cause compressive stresses.

The adjoining details illustrate an excellent jointing method which allows for movement after the units are placed. The double bearing plates at the floor line and the 2-way slotted connectors at the spandrels insure free movement.

Thermal expansion and contraction of concrete vary with factors such as aggregate type, richness of mix, water-cement ratio, temperature range, concrete age and relative humidity. Write for additional free information. (U.S. and Canada only.)

Some helpful criteria to reduce volume changes

1. Limit the water content of concrete to the minimum required for proper placement.
2. Avoid conditions that increase the water demand of concrete such as high slumps and high concrete temperatures.
3. Use the largest total amount of aggregate in the mix that is practical.
4. Use the largest maximum size coarse aggregate to fit the job conditions.
5. Use fine and coarse aggregates that exhibit low shrinkage characteristics when used in concrete.
6. Avoid use of aggregates that contain an excessive amount of clay.
7. Use steam curing when applicable.
CATCH IT!
BEFORE IT RUINS
YOUR CLIENT’S ROOF

Picture it. The roof’s down on your client’s building. A workman carrying bricks for further construction above it drops one from a ladder or scaffold. Wham! It punctures the roofing. What happens to the insulation the next time it rains?

It depends. If it’s FOAMGLAS®, there’s nothing to worry about. The insulation value won’t change. And we guarantee this kind of security for 20 years, in writing, without charge to your client.

You see, FOAMGLAS stays dry indefinitely. Its sealed glass cells can’t absorb moisture. That’s pretty comforting when you consider the 101 human errors that can damage a roof. Things like ladders, wheels, heels, knives, tools, and pipe can all cause punctures that go undetected until it’s too late. Next thing you know the insulation’s wet. You may have to replace the whole roofing system.

Considering the added value of constant thermal efficiency in reducing the investment in air conditioning equipment and in cutting operating costs, you’ll do your client a service that lasts the life of the building if you specify FOAMGLAS Roof Insulation.

Write today for your sample of the FOAMGLAS guarantee. Remember, it will be like money in the bank when we’re asked to sign it.

Write to Pittsburgh Corning Corporation, Box B-83, One Gateway Center, Pittsburgh 22, Pa.

For more data, circle 119 on Inquiry Card
We designed this aluminum window to be **STURDIER**

Cuples new "Series 30"
double-hung aluminum window was designed especially for architects and owners who want a better-operating, stronger, sturdier window for use in Apartments, Hotels, Motels and College Dormitories.

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Cuples new "Series 30"
double-hung aluminum window was designed especially for architects and owners who want a better-operating, stronger, sturdier window for use in Apartments, Hotels, Motels and College Dormitories.

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CUPPLES SERIES 1100 SLIDING GLASS DOORS
For rooms leading to balcony or terrace. Beautiful Alumilite finish. Extra strong, sturdy construction with tubular vertical rails. Adjustable ball bearing rollers. Interlocking meeting rails plus double wool pile and vinyl weatherstripping. In 2, 3 and 4 door units from 6 ft. to 20 ft. width. Sliding screens available.

**CUPPLES SERIES 30**

Couples new "Series 30"
double-hung aluminum window was designed especially for architects and owners who want a better-operating, stronger, sturdier window for use in Apartments, Hotels, Motels and College Dormitories.

**CUPPLES SERIES 30**

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**CUPPLES SERIES 30**

Couples new "Series 30"
double-hung aluminum window was designed especially for architects and owners who want a better-operating, stronger, sturdier window for use in Apartments, Hotels, Motels and College Dormitories.
...NOT CHEAPER!

Instead of taking metal out, and designing the Cupples “300” window downward to a price, or to fool bargain hunters, we beefed up the sections to make it stronger and sturdier. We used double width wool pile weatherstrip all around the window and at the meeting rail to keep out dust and dirt as well as rain and cold drafts. We made the “300” a foolproof, easy-operating window that will give satisfactory, maintenance-free performance for many years to come. It’s a window you should specify for any apartment house or for the hard, rough usage of hotels and college dormitories.

Sure the Cupples “Series 300” costs a few dollars more (approximately $3 to $4) than lightweight minimum standard residential windows, but its heavier sections, better weather-tightness and foolproof operating qualities make it a worthwhile investment that will pay handsome dividends in lower maintenance and tenant satisfaction.

Before you specify or order aluminum windows for your next job be sure you investigate the Cupples “300.” Remember, too, that when you deal with Cupples you get Dependability of product, quality, service, delivery and a well-established Company behind the product (Cupples is a division of Alcoa). Our representative in your area will be glad to consult with you at your convenience. Write for full size details and complete information. Address Dept. AR-638

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FOR USE IN APARTMENTS, HOTELS, MOTELS AND DORMITORIES

CUPPLES SERIES 600 PROJECTED WINDOWS
These strong, sturdy projected windows will take usage for many years. All horizontal rails in frame and sash are tubular for extra rigidity and strength. Adjustable, patented 4-bar operator mechanism. White bronze hardware. '/"" glass rabbit. Interior or exterior metal snap-in bead glazing optional.

CUPPLES ALUMI-COUSTIC CEILING GRID
For luminous or acoustical ceilings in the lobby, in kitchens and bathrooms. Inexpensive. Easy to hang aluminum grid. Holds 2' x 2' or 2' x 4' panels.

CUPPLES ENTRANCE DOORS
New "40 LINE" of stock units combine beauty with flexibility of design and simplified installation. Choice of hardware locks and door closers.

For more data, circle 120 on Inquiry Card.
100 E. 42nd St., New York City, have announced the admission of two new partners, C. Gates Beckwith, A.I.A., and Gustave R. Keane, A.I.A.; both have been associate members of the firm since 1957.

Fordyce & Hamby Associates, Architects, 717 Fifth Ave., New York 22, have admitted architect Lloyd H. Slomanson as an associate.

Charles Luckman Associates, 680 Fifth Ave., New York 19, and 9220 Sunset Boulevard, Los Angeles 69, have appointed Harry Greene, architect as director of production.

Perkins & Will, Architects, 309 W. Jackson Blvd., Chicago 6, have named as senior associates Wesley S. Wieting and Hem C. Gupta of the Chicago office, and Wesley V. Pipper, of the firm's White Plains, N.Y., office; appointed at the same time as associates are Eugene W. Barish, Frank Abatangelo and David L. Grummun, Chicago, Friedrich W. Capelle, Pierre Paul Childs, Paul Heimlich and H. Allen Tuttle, of White Plains, and James D. Stillwell, in the firm's Washington office.

Howard H. Perry and David B. V. Travers, Architects, have announced the dissolution of their partnership; Howard H. Perry, Architect, will practice at 10 Leonard St., West Haven, Conn., and David B. V. Travers, Architect, will continue to practice at 7 River St., Milford, Conn.

Sasaki, Walker and Associates, Inc., of Cambridge, have appointed as principals in the firm Stuart O. Dawson, Kenneth DeMay, Paul Gardescu and Masao Kinoshita, as associates John Adelberg, Katherine DeMay, J. E. Robinson and Richard H. Rogers.

Ronald E. Sattelberg, A.I.A., has been made a partner in the firm of Barrows, Parks, Morin, Hall and Brannan, Rochester, N.Y.

Laramey White, A.I.A., Architects, is a new firm resulting from the merger of the offices of Robert Dean Laramey of Denver and Ken White and Associates of Aurora, Colo.; offices are in the Bank of Aurora Building, 9000 E. Colfax Ave., Aurora, Colo.

ZERO meets all your needs for

- WEATHER STRIPPING
- SOUND-PROOFING
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Architects agree, weatherstripping can be the most significant detail of a structure's success. For 4 decades Zero has been creating and manufacturing to meet changing needs.

Non-Trip Saddles
For out-opening doors in schools and hospitals where safety is important. Available in extruded bronze or aluminum.

Write for ZERO's new catalog today. Contains full size details, 142 drawings of insulating and related products, for:
- doors
- sliding doors
- saddles
- windows
- expansion joints

For more data, circle 121 on Inquiry Card

CAPTURES THE SPARKLING FRESHNESS OF A SUNLIT SEA!

Shilshole Bay Marina, Seattle, is a glowing example of the way Mo-Sai precast concrete exposed aggregate panels will enhance the beauty of any building set in naturally lovely surroundings. The cool glitter of the white quartz aggregate reflects the gaiety and sparkle of the bustling sunshine-bathed Shilshole Bay Marina.

Approximately 7,000 square feet of 7' x 15' x 4" panels of white quartz aggregate, set in a tan and buff cement matrix, were used to give this gracious structure dignity and distinctive charm.

Mo-Sai Institute, Inc.
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Richmond 7, Virginia

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The soaring canopy of this church demonstrates again how modern plywood technology can turn a sophisticated design into practical reality. Perhaps the most complex plywood space plane yet built, it is actually a variation of the folded plate. The roof becomes self-supporting by the interaction of inclined diaphragms—in this case 42 triangular stressed skin plywood panels. It shelters 5,000 sq. ft. and rises to 35 ft. at two points. Plywood's size, strength and adaptability to precise fabrication made it possible to execute the design within a tight budget, and to erect the entire roof in seven working days. For more information on plywood folded plate systems, write (USA only) Douglas Fir Plywood Association, Tacoma 2, Wash.
ANNEX FOR LOUIS SULLIVAN'S AUDITORIUM

Roosevelt University, now owner and occupant of the Chicago Auditorium Theater designed by Adler and Sullivan, has announced plans for a new addition to the building and for general renovation and repair of the old building.

The new building, scheduled for construction sometime within the next seven years, was designed by Perkins & Will, Architects. The lower ten floors will contain science laboratories, a library and classroom; the top ten floors will contain dormitories to house the university's increasing out-of-state and foreign student body. It will be located on a site north of the auditorium acquired by the school last year.

Plans for the old building, which the university acquired in 1947, include major rehabilitation, repair and air conditioning. Funds for this work are being raised in part independently by a private group, the Auditorium Theater Council. The university has until now been hampered by lack of funds in improving a building which it recognizes as a landmark.

Both of these building projects are major aims in the university's Quarter Century Plan, to be completed by 1970, the 25th anniversary of the school's establishment. The $16.5 million which it hopes to raise will be applied, in addition to the new building, to increasing faculty salaries and scholarships, recruitment of faculty and students, expansion of the adult education program, and the establishment of a cultural center by developing programs for the Auditorium Theater.
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Where reliable door closer performance is important, specify Sargent—your single source of responsibility for quality closers, locksets, exit devices and other safety hardware. See your Sargent hardware supplier, or write Sargent & Company, New Haven 9, Connecticut.

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1 Cast iron case holds greater pressure, assures longer life
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Most university student unions and dormitories have dealt with the problem of summer educational conferences, and many new college buildings have been designed with this secondary function in mind. The University of Nebraska, recognizing the demand of adult professional and youth groups for noncommercial conference space, faced the situation as permanent and separate from ordinary university duties. With the help of the Kellogg Foundation, it has established the Center for Continuing Education at Lincoln.

A nine-story Adult Education Wing provides conference rooms, a 700-seat auditorium and dining facilities for 1000; the top seven floors of the building contain sleeping accommodations in the form of double rooms with bath.

A three-story Youth Wing contains conference rooms, cafeteria with access to the central kitchen, and 16-bed dormitories.

The site, which can be reached only by automobile, is provided with off-street parking.

Selmer A. Solheim & Associates, Inc., were the architects and engineers, with Welton Becket & Associates as consulting architects. General contractor was Parsons Construction Co. of Omaha.

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Engineer Wm. Lattanze designed a cost-saving 2800-kw connected-load electrical system for Leonard Polis' Iroquois Apartments. The system, worked out in cooperation with General Electric and the Philadelphia Electric Company, keeps the 132 Gold Medallion units well supplied with power for total-electric living. Architect: L. Levin, A.I.A.
Two 60-story towers housing 896 families, recreation and shopping facilities and a 700-boat marina—this is Chicago's Marina City, sponsored by the Marina City Building Corp., Wm. L. McFetridge, President. All of Marina City's apartment services are supplied by an electric line and one cold water line. Architect: Bertrand Goldberg, A.I.A.

From its infra-red ceiling heaters in baths to its 330 C-E kitchens, Coral Ridge Towers is total-electric. Adm. J. S. Hunt's second co-op apartment, Coral Ridge Towers, North, will be completed this winter. Rentals are being accepted on his third total-electric high-rise apartment, Royal Admiral. Architect: C. F. McKirahan, A.I.A.

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NEW ARCHITECTURE COLLEGE COMPLEX FOR U. OF FLORIDA

Construction of the College of Architecture and Fine Arts of the University of Florida has now begun, 15 years after the building complex was first proposed. The units are to accommodate classes in architecture, building construction and art.

Included in the complex are a four-story classroom and drafting room building (rear), an architectural library and administrative offices (right), and two small lecture halls and an art gallery (left).

Architects are Kemp, Bunch and Jackson; contractor is Tassinani Construction Co.

SANTA BARBARA CLASSROOM TOWER FOR ENGINEERING

Plans have been approved for a five-story School of Engineering building for the Santa Barbara campus of the University of California. It will tie in with other, smaller structures through the use of the same exterior materials—exposed concrete and plain and patterned concrete block. Each window area will have a folded concrete plate sunscreen overhang. One story extending beyond the tower area will include a computer room and a 200-seat lecture-demonstration room. Target date for completion of the $2.5 million building is the summer of 1965. Architect is Charles Luckman Associates.

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This new concept fits perfectly into the growing trend to more flexible design in school buildings. "Off-the-wall" thermostat location permits complete freedom in room partitioning. Walls and panel dividers can be moved without altering the temperature control system. What's more, it cuts the cost of future building expansion. "Packaged" controls can be installed independently of all other controls in the building.

Barber-Colman now offers "Dynamic Sensing" for use in practically all types of heating, cooling, ventilating and year-round air conditioning systems. For complete details on the important benefits of this new development in temperature sensing, contact your nearest Barber-Colman Automatic Controls field office.

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Now you can design spans in the 50-ft. range... in monolithic reinforced concrete waffle flat-slabs... using Ceco's new 16" or 20" Deep Steeldomes. Combined with Ceco's regular depths, these Deep Steeldomes offer architects and engineers a complete range of standard Steeldomes to meet the needs of any project.

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Waffle flat-slabs formed with Ceco Steeldomes make the most efficient use of concrete and steel—reduce deadload over comparable systems—give additional savings throughout the structure in beams, girders, columns and footings.

Ceco Steeldome Service is backed by more than 500 million square feet of Steelform experience. Among currentlet projects using Ceco's Deep Steeldomes are Technical classroom building, M.I.T. campus, Cambridge, Mass.; Residential hall, Illinois State Normal University, Normal, Ill.; and Mormon Temple Plaza parking garage, Salt Lake City, Utah.
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- nonresidential coverage | 89 ★ | n.a. | n.a. |
- residential coverage | 93 ★ | n.a. | n.a. |

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Exclusive advertisers—1962 | 189 ★ | 108 | 93 |
Advertising pages—1962 | 2,333 ★ | 1,303 | 1,583 |
Advertising pages—6 months 1963 | 1,300 ★ | 638 | 755 |
Gain or loss from year ago | +98 ★ | -24 | -27 |

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Circulation figures and renewal rates: ABC Publishers' statements.
Preference studies: Summary of 101 studies among architects and engineers sponsored by building product manufacturers and advertising agencies.
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