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GROPUS SALUTES ARCHITECTURE

From the vantage-point of a long lifetime spent teaching and wor
in the service of architecture, Walter Gropius has recently tak
searching look at the architectural principles by which he has l
and their relevance to the present and future of architecture. H
say, which amounts to a ringing re-declaration of his faith in
functionalism as the modern architect's creed, will be published
series of three articles beginning next month.

DESIGN FOR THE CAMPUS EXPANDS ARCHITECT'S ROLE

Expansion is the order of the campus these days, and architect
increasingly involved in planning for (rapid) expansion of exis
campuses and for whole new campus complexes as well as for th
sign of individual buildings and building groups. The Building T
Study next month will review some major developments in all
activities, including New York State's bold and imaginative pro

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What’s Missing in Housing?

In a really great series of articles (page 169) Albert Mayer, with an assist from Clarence Stein, gives some much needed directions for planning the great expansion of our cities, or their renewal, that is ahead of us. He has important things to say, and we have not influenced his statements, but here on this page permit me a couple of subjective reactions.

What has been missing in urban housing? Mayer’s article in this issue deals with public housing, and begins with a very frank statement of what has been wrong with it. His basic position is that public housing, in its early years, was ruined by its enemies. Private enterprise spokesmen raised such a fuss in Washington, goes the argument, that Federal and local authorities, and their architects, were forced into a posture of spartan and sterile economy. No “amenity values,” no commercial enterprises that might have introduced some life, no “architecture,” certainly no art. Nothing to stir a note of pride. Nothingness.

Well, everybody will agree that “nothingness” is a pretty good picture of what’s wrong. But if public housing’s enemies were responsible, then who is responsible for the dismal quality of post offices, or Federal office buildings, or police stations, or fire houses? Somehow government equates always with mediocrity, with sterile utility. Why, in general, does FHA housing come out little better, why does even luxury housing so often look just like public housing, except that the open areas are missing in the luxury developments?

What’s missing in public housing is just what’s missing in private housing. And you can simplify the answer in one three-letter word—ART.

Early in the rush of postwar housing Vi Hudnut (Dean Hudnut, then of Harvard) remarked that no modern plumbing or electric refrigerator ever warmed a human heart—it could be done, however, with a window box of flowers. Let Vi Hudnut relate art to housing (“The Post-Modern House,” ARCHITECTURAL RECORD, May, 1945) with a touch of his own art:

“There is a way of working, sometimes called art, which gives to things made by man qualities of form beyond those demanded by economic, social or ethical expedience; a way of working which brings into harmony with ourselves some part of our environment created by us; which makes that environment, through education, a universal experience; which transforms the science of building into architecture.

“If a dinner is to be served it is art which dresses the meat, determines the order of serving, prepares and arranges the table, establishes and directs the whole with that ceremony which, long before Lady Macbeth explained it to us, was the best of all possible sauces. If a story is to be told it is art which gives the events proportion and climax, fortifies them with contrast, tension, and the salient word, colors them with metaphor and allusion and so makes them cognate and kindling to the heart. If a prayer is made, it is art which sets it to music, surrounds it with ancient observances, guards it under the solemn canopies of great cathedrals.

“The shapes of things made by man are determined by their functions, by the laws of materials and the laws of energies, by marketability (sometimes) and the terms of manufacture; but these shapes may also be determined by the need, more ancient and more imperious than your present techniques, for some assurance of importance and worth in those things which encompass humanity.”

How terrible it was for the housing authorities and their architects to forget those “things that encompass humanity” in public housing! How terrible it was for FHA and private builders and their architects to forget them. How terrible ever to build any housing anywhere, and let “enemies,” or utility, or economy, or plain politics, override that “need, more ancient and more imperious ... for some assurance of importance and worth. ...”

—Emerson Goble
August Heckscher, who was President Kennedy's Special Consultant on the Arts, recently urged President Johnson to carry on the work begun by his predecessor in the area of government and the arts.

As special consultant, Mr. Heckscher submitted a report to President Kennedy which recommended the establishment of an Advisory Council on the Arts, within the White House organization, and the formation of a National Arts Foundation. He also suggested that the post of Special Consultant to the President on the arts be made a full-time job.

"An Earnest Plea"

Mr. Heckscher, speaking last month before the Federation of Protestant Welfare Agencies, said: "I cannot re­frain on this occasion . . . from making an earnest plea that the start which was made shall not now be abandoned, that the hopes which were aroused shall not be disap­pointed, that the energies massed in this good cause shall not be dissipat­ed." While suggesting that the President might want to review the report and to deal with it in his own way, nevertheless, Mr. Heckscher continued: "I would stress the urgency of establishing the post of the President's Special Consultant on the Arts upon a firm, continuing basis, mak­ing it henceforth a recognized and permanent part of the governmental structure."

Of the direction and importance which the program should assume, Mr. Heckscher said: "There has been some disposition to think of this as an interest so closely identified with President Kennedy that it can scarce­ly be prolonged in other conditions. There has been a tendency, again, to think of it as exclusively concerned with the performing arts, or with new and exciting Kennedy Center in Washington. But I am convinced work should be more broadly received. It concerns all the arts—literature, architecture, painting, music, the dance, crafts, the movies all these as well as the theatre that touches the arts as they affect communities across the land, and as help determine whether the environment in which we live shall be truly habitable, or ugly and planned. The person who holds this post must be ready to deal on a day-to-day basis with the depart­ments and agencies of the Federal govern­ment, must be in contact with everyone being made in this sphere by the U.S. of the states and cities, must be able to take initiatives by the Congress."

"Thus conceived and carried forward, we should hope to have with the executive branch an Office for the Arts supported by a broadly re­presentative council, administered as a national cultural program as comprehensive and well-defined as the international program now ad­ministered by the Assistant Secretary of State specifically charged with that function. In so doing, the U.S. States will be doing no more than what is today being done by every country, every nation that affirms the full range of man's interests and ultimate value of the creative.

**ADVISORY COMMITTEE APPOINTED FOR KENNEDY LIBRARY**

At the invitation of Mrs. Jacqueline Kennedy, 18 architects and artists will serve on the Advisory Committee on Arts and Architecture for the John Fitzgerald Kennedy Library. The committee will establish an architectural program for the project, to be built on a site selected by the late President at Harvard University. The building will contain the President's papers, a memorial, a museum and an institute. The Committee will also advise on art, sculpture and display of mementoes.

The chairman of the committee is William Walton, artist and Chairman of the Fine Arts Commission. The committee members include eight American architects—Pietro Belluschi, Louis Kahn, I. M. Pei, Mies van der Rohe, Hugh Stubbins, Paul Thiry, Benjamin Thompson and John Carl Warnecke—and six foreign architects—Alvar Aalto of Finland, Franco Albini of Italy, Lucio Costa of Brazil, Sven Markelius of Sweden, Sir Basil Spence of England, and Kenzo Tange of Japan.

In addition, the committee includes Hideo Sasaki, landscape architect, and Henry Dreyfuss, George Nelson, designers.

Eugene Black is chairman of the Library Board of Trustees.

The committee will hold its first meeting in Boston on April 11.

The library, to be built with funds donated by the public, will cost an estimated $10 million, $8 million of which will be spent on building equipment. Funds collected so far total $4.4 million.
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SECOND PROGRAM OF LIBRARY AWARDS CITES THREE FOR TOP HONORS

First Honor Award: Beinecke Rare Book & Manuscript Library, Yale University, New Haven, Conn.; Skidmore, Owings & Merrill, architects. Jury comment: "The total design presents with clarity the unique function of the building . . . The plan is pristinely simple, the interior monumental, and the exterior an elegant statement and dramatization of the fact that the building contains great treasures."

First Honor Award: Flora H. Tenzler Memorial Library, Tacoma, Washington; Russell N. Garrison, architect. Jury comment: "This community library building designed to serve as a unit in a county library system, is a striking example of creative design which succeeds in being functional and effective for public library purposes."

Three libraries were cited for top honors in the Library Buildings Award Program sponsored jointly by the American Institute of Architects, the American Library Association and the National Book Committee. First Honor Awards were selected in the college category and one in the public category (see photographs). The Awards of Merit included three in the school category.


Merit Awards were given to the following architects: Gasner, Nathan; Browne; Shepley Bulfinch Rich; Abbott; Schubert & Friedman; Watson, Deutsch; Kruse; Vincent G. Kling; Durham, Anderson and Eli Rabineau; Joseph Stein; Cass Gilbert Jr. & F. Keally, Associated Architects; T. Trip Russell & Associates; Fred Keeble & George Rhoda, Architects; Cope & Gromme & Ralph B. Priestly; and Cope & Lippincott.
New York's Newest Museum

Washington Hartford's Gallery of Modern Art opened March 1st, perhaps in sympathy with his client's dedication to a reared historical awareness of 19th- and 20th-century art, Edward D. Stone looked to "the architecture of Byzantium" for inspiration. His problem was to create a vertical museum on a restricted site. The circulation pattern—ascent by elevator, descent by stairways—led Stone to describe the building as a "circular staircase, with the galleries serving as landings."

Research Building for MIT

The $3 million Grover M. Hermann Building on the M.I.T. campus will provide research facilities for the departments of management and social sciences. Exterior walls of the upper two floors will be structural precast panels. The second floor wall, a poured-in-place concrete girder, will transmit the weight of the upper stories to the first floor columns. Architects are Professor Eduardo F. Catalano in association with Robert C. Brannen and Paul S. Shimamoto.

New Hotel for Chicago

Bertrand Goldberg's $4 million Astor Tower Hotel in Chicago was originally proposed in 1958 and served as a prototype for Marina City. The hotel's central utility core was erected in a period of three weeks by slip-form concreting. Raised on 30-foot-high steel columns, the 30 floors are built around the 300-foot-high shaft. Specially treated steel louvers, adjustable from inside, provide an exterior protection. General contractor: Goethe Building Corporation.
Practically all of the prize-winning schemes (shown these pages) for the Boston Architectural Center competition were designed by architects under 40 years of age. Professional adviser Walter F. Bogner of the Graduate School of Design of Harvard University happily commented that the competition "gave an opportunity for the young and so far hidden talent to rise to the surface and display its architectural skill."

The task set before the competitors was a challenging one—to design a building of 30,000 square feet housing the educational, social and organizational activities of the architects of Boston offered by the Center under a maximum cost allowance of $550,000. Judging was based only on the fitness of the design to the small corner of the need for structural simplicity and flexibility of form and economy, but also on the hope that the building "play a role in the city's new spirited renaissance."

On the jury were: Pietro Belluschi, dean of the School of Architecture and Planning, M.I.T., chairman; José Luís Sert, dean of the Harvard Graduate School of Design; Ralph R. Rapson, dean of the School of Architecture, University of Minnesota; Arcangelo Cascieri, dean of the B.A.C. School; James Lawrence Jr., former president of the Boston Society of Architects; Lawrence B. Andre, chairman of the Department of Architecture, M.I.T.; and Benjamin Thompson, chairman of the Department of Architecture, Harvard Graduate School of Design. William LeMessurier, consulting engineer, was technical adviser.

First Prize: $5,000; Ashley & Myer, with associates I. O'Nell, Richard Krauss, Robert Goodman and William LeMessurier. Jury comment: "The best worked-out plan. The structural solution offers a logical system, using prefabricated modules. Also admired was the plan for recognizing the wall as logical location for all the services."
Prize: $3,000: Chapman & Goyette, with associates Ihiko Maki and John Bennetts. Jury comment: "... found the jury to have great merit. It has a clean plan and a fired and simple exterior. The central service core, which is key to a sound structural solution, unfortunately limits the flexibility of the plan."

Prize: $1,000: Robert Herman, with Peter Woytuk for progressive Design Associates. Jury comment: "It is indeed the most interesting of all entries... mostly because of brilliancy of its concept and presentation. The jury found the designer had applied the same care and enthusiasm in the fashioning of the sculptural expression of his design to the functional planning. Evidently the designer chose to regard the fact that this is a small site; he played features against each other at the expense of sound use."

Honorable Mention: Johnson, Notkin & Welke. Jury comment: "The design follows an interesting approach. The outwardly too many complications and features for the comparatively small size of the building. However, the construction is fairly simple and economical."

Honorable Mention: Joseph J. Schiffer, Erwin Y. Galanter & Henry A. Millon. Jury comment: "... logical structure, skilful use of existing foundations and an appealing section. Regrettably, the handling of space, particularly the meeting hall area, does not favor the requirements of the program. The design also suffers from fragmentation of functions."

ARCHITECTURAL RECORD  April 1964  15
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Barrett Urethane Insulation flexes its muscles on the "deep dish" restaurant of at Chicago's O'Hare Airport!

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AIA HOLDS COMPETITION FOR HEADQUARTERS

Over the years, the American Institute of Architects has held that one of the most desirable ways of achieving excellence in the solution of major architectural tasks is through the holding of design competitions. Now, with the problem of providing a new, expanded location for its national headquarters in Washington, D.C., the A.I.A. will select a design through a competition held under its own auspices.

The Committee on Institute Headquarters hopes that the competition will produce a design for a National Headquarters Building that "will satisfy both physical and spiritual functions—a building of special architectural significance, establishing a symbol of the creative genius of our time yet complimenting, protecting and preserving a cherished symbol of another time, the historic Octagon House."

Only the Octagon House and its rear terraced garden are considered to be inviolate elements on the existing site. To preserve and enhance this complex with a new structure is the crux of the program. The Octagon will continue to serve the Institute for receptions, meetings, and special small exhibits, but, above all, as a historic museum.

The new building, which may occupy all or any part of the site to the north and east of the garden terraced wall (see plan), must provide approximately 50,000 square feet of gross floor area. The building is to be planned to accommodate Institute activities and to provide some space for tenants at an estimated construction cost of $1,450,000.

The competition is open to all corporate members of firms of members of the A.I.A. The professional adviser is A. Stanley McGaughan, A.I.A.


Registration for the competition ended on March 15. Winners of the first stage, based on drawings submitted before May 18, will be announced on July 1 and the six selected competitors will each receive a $5,000 award. They will then enter the final stage, submitting drawings and a model. Announcement of the winning design to be employed by the A.I.A. will be on November 1. The architect will receive a $100,000 advance on his fee. More important of course, is that his design is likely to be executed. Unlike many progenitors of infamous competitions of the past, the A.I.A. no doubt take the chance to practice what it has preached.

The Octagon House, built by Dr. William Thornton for Col. John Tayloe, 1798-1800

Left: Looking across the garden to the smokehouse and the library
Right: View of the library facade, originally the old stable
EAKERS ANNOUNCED FOR A.I.A. ANNUAL MEETING

ers at the 1964 Convention of American Institute of Architects among them prominent figures in Federal, state, and city government, law, religion, medicine and architecture. Drawn from varied fields of activity, they will explore problems that confront architects in their role of creating a viable social, cultural, and spiritual environment for man civilization. They will attempt to shed new light on the forces shaping our communities in the framework of the professional program's theme—"The City Visible and Invisible."

The list of speakers includes:

- Joseph I. Williams, Senator from Jersey; John Anderson, Governor of Kansas; Dr. Luther L. Terry, General, U.S. Public Health Service; Raymond Tucker, Mayor of Austin; Thomas H. Eliot, Chancellor of Washington University, St. Louis; Dr. J. J. Pelikan Jr., Director of Graduate Studies, Department of Bus Studies, Yale University; and T. Hurst, A.I.A., Dean of the School of Architecture and Fine University of Southern California; Albert Mayer, F.A.I.A., New York City; and Francis D. Lethbridge, A.I.A., Architect, Washington, D.C.

The two-day forum, beginning on Wednesday morning, June 17, will be moderated by Dean Hurst. The first session will open with a keynote address by Chancellor Eliot on the subject of "The Structure of Law and Justice in the City." The over-all topic of this session, "The Invisible City," will cover the psychological, legal, historical, cultural, family and spiritual elements of urban civilization. Dr. Terry will discuss "Health and Psychological Aspects of the City," and Dr. Pelikan will speak about "The Family and the Spirit of the City."

Wednesday afternoon, the second session will get underway with a discussion of "The City and the Body Politic," dealing with the effects of Federal, state and local governments on community problems such as air and water pollution, open space, local and regional planning, zoning, land use pattern, urban renewal, mass transportation, taxation and economics. Senator Williams' talk will be concerned mainly with "Federal Relationships with the City," Governor Anderson's with "State Relationships," and Mayor Tucker's with "Local Relationships."

On Thursday morning, the last session will move from the realm of the "invisible" to that of the "Visible City." Albert Mayer and Francis D. Lethbridge will contribute their views on the subject. To wrap up the entire program, Chancellor Eliot will deliver a summary address.

Four members of the A.I.A. Board of Directors have helped to plan the events of the professional program: Angus McCallum, A.I.A., Kansas City, chairman; R. Lloyd Snedaker, A.I.A., Salt Lake City; Robert H. Levison, A.I.A., Clearwater, Florida; and Charles M. Nes Jr., F.A.I.A., Baltimore.

On Tuesday night, June 16, the St. Louis Chapter of the A.I.A. has planned an "Evening on the Mississippi" aboard the S.S. Admiral. The Host Committee has also planned tours of old and new St. Louis, a ladies' brunch and the annual dinner. Members of the committee are: Joseph D. Murphy, F.A.I.A., chairman; Rex L. Becker, A.I.A.; Betty Lou Custer, A.I.A.; George E. Kassabaum, A.I.A.; and John D. Sweeney, A.I.A.
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WASCOFLEX ADHESIVE — in the same test series* — proved itself just as tough as Wascoflex elastic roof flashing. This new, one-step adhesive not only bonds the flashing to itself, but to other materials as well. It holds tight when other adhesives won't, and spreads over twice the area, for real economy.

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In 1963, contract value of hospital and other health care buildings in the U.S. totaled almost $1.5 billion, 40 per cent higher than 1962's level. This impressive increase followed gains of 18 per cent in 1961, and 9 per cent in 1960. Nearly an 80 per cent rise in three years! What's more, the hospital building type began this year with strength. Contract value in January was nearly 30 per cent higher than January 1965's level.

The volume of hospital construction depends on the demand for hospital services and there are several factors which explain why the demand for hospital services has and still is so vigorous: population growth, technological conditions, and social or cultural factors.

- The mere increase in population obviously exerts pressure to increase hospital capacity. On top of this fact, the results of improved medical care (lengthened average span) has added disproportionately to this pressure by the sharply rising 65-and-over age group is estimated to eat hospital space at twice the rate of younger persons.

- Additions to the fund of medical knowledge and a growing technology have considerably improved the diagnosis of illnesses and given impetus to hospital ing. Practically every new piece of diagnostic or therapy equipment developed in this century must be housed in a hospital. Not only is most of this apparatus too expensive for each doctor to own, much of it simply isn't practical. These improvements in the "state of the art" have twofold impact: first, more patients are sent to hospital diagnosis; and second, because diagnosis is more effective, more people either remain in hospitals or are sent to hospitals for treatment.

- Since World War II, there have been two factors which have helped alleviate the burden of rapidly rising medical expenses, thereby enabling more people to utilize hospital care. The first of course, has been the improvement in the technology of personal income per family has risen sharply and, even more important, the number of persons covered by hospital insurance has soared from less than one out of every ten persons in 1940 to about three out of every four in 1962.

- Finally, there are social or cultural factors which have helped swell the demand for hospitals. For instance, the biggest changes during the last 40 to 50 years have been in maternity care. Fifty years ago, very few women gave birth to their children in hospitals; by the end of the 1940s, more registered births took place in hospitals than at home. Today, how many babies are born outside hospitals? This trend becomes even more impressive when the post World War II baby boom is taken into account.

With all these demand factors expected to remain strong and with the aid of construction grants to medical facilities under the various Federal programs, hospital construction should remain healthy in the years ahead. However, there is one question mark: will there be enough people, particularly trained nurses, to adequately staff the nation's hospitals without skyrocketing operating costs? If the number of nurses graduating from nursing and medical schools does not pick up, the lack of trained personnel could become a major problem on hospital construction.

Henry C. F. Arnold, Editor
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Building Construction Costs

By Myron L. Matthews
Manager-Editor, Dow Building Cost Calculator,
on 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—MARCH 1964

1961 Average for each city = 100.0

<table>
<thead>
<tr>
<th>Metropolitan Area</th>
<th>Cost Differential</th>
<th>Current Dow Index</th>
<th>Per Cent Change Year Ago</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. AVERAGE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 Cities</td>
<td>8.5</td>
<td>263.5</td>
<td>290.7</td>
</tr>
<tr>
<td>Atlanta</td>
<td>7.1</td>
<td>295.1</td>
<td>318.0</td>
</tr>
<tr>
<td>Baltimore</td>
<td>8.0</td>
<td>266.5</td>
<td>288.5</td>
</tr>
<tr>
<td>Birmingham</td>
<td>7.4</td>
<td>244.2</td>
<td>262.6</td>
</tr>
<tr>
<td>Boston</td>
<td>8.4</td>
<td>264.6</td>
<td>276.2</td>
</tr>
<tr>
<td>Chiengo</td>
<td>8.8</td>
<td>293.6</td>
<td>308.9</td>
</tr>
<tr>
<td>Cincinnati</td>
<td>8.8</td>
<td>284.5</td>
<td>376.5</td>
</tr>
<tr>
<td>Cleveland</td>
<td>9.3</td>
<td>266.2</td>
<td>283.0</td>
</tr>
<tr>
<td>Dallas</td>
<td>7.8</td>
<td>259.2</td>
<td>258.3</td>
</tr>
<tr>
<td>Denver</td>
<td>8.8</td>
<td>271.9</td>
<td>329.9</td>
</tr>
<tr>
<td>Detroit</td>
<td>8.9</td>
<td>268.6</td>
<td>276.5</td>
</tr>
<tr>
<td>Kansas City</td>
<td>8.3</td>
<td>240.9</td>
<td>254.0</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>8.4</td>
<td>267.0</td>
<td>292.2</td>
</tr>
<tr>
<td>Miami</td>
<td>8.4</td>
<td>267.2</td>
<td>276.7</td>
</tr>
<tr>
<td>Minneapolis</td>
<td>8.9</td>
<td>294.5</td>
<td>261.6</td>
</tr>
<tr>
<td>New Orleans</td>
<td>7.9</td>
<td>240.2</td>
<td>345.4</td>
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<tr>
<td>New York</td>
<td>10.6</td>
<td>271.7</td>
<td>292.2</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>8.7</td>
<td>264.3</td>
<td>277.5</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>9.1</td>
<td>248.5</td>
<td>264.1</td>
</tr>
<tr>
<td>St. Louis</td>
<td>8.9</td>
<td>234.8</td>
<td>270.0</td>
</tr>
<tr>
<td>San Francisco</td>
<td>8.5</td>
<td>253.1</td>
<td>346.5</td>
</tr>
<tr>
<td>Seattle</td>
<td>8.5</td>
<td>242.1</td>
<td>270.6</td>
</tr>
</tbody>
</table>

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

1961 average for each city

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. AVERAGE</td>
<td>105.9</td>
<td>218.5</td>
<td>244.1</td>
<td>248.9</td>
<td>255.9</td>
<td>259.2</td>
</tr>
</tbody>
</table>

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

1. BUILDING MATERIAL PRICE INDEXES

<table>
<thead>
<tr>
<th>Period</th>
<th>1st (1941)</th>
<th>2nd (1942)</th>
<th>3rd (1943)</th>
<th>4th (1944)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>265.1</td>
<td>265.9</td>
<td>267.4</td>
<td>268.7</td>
</tr>
<tr>
<td>1963</td>
<td>269.4</td>
<td>270.3</td>
<td>271.0</td>
<td>272.6</td>
</tr>
</tbody>
</table>

2. BASE WAGE RATES $/HR.

<table>
<thead>
<tr>
<th>City</th>
<th>1st (1962)</th>
<th>2nd (1963)</th>
<th>3rd (1964)</th>
<th>4th (1965)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>265.4</td>
<td>265.6</td>
<td>265.9</td>
<td>266.0</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>269.0</td>
<td>259.9</td>
<td>259.1</td>
<td>259.3</td>
</tr>
<tr>
<td>Pittsburgh</td>
<td>264.5</td>
<td>265.2</td>
<td>265.5</td>
<td>265.7</td>
</tr>
</tbody>
</table>

3. MONEY RATE & BOND YIELDS %

<table>
<thead>
<tr>
<th>Period</th>
<th>Rate</th>
<th>Bond Yields</th>
</tr>
</thead>
<tbody>
<tr>
<td>1962</td>
<td>265.1</td>
<td>270.3</td>
</tr>
<tr>
<td>1963</td>
<td>269.4</td>
<td>270.3</td>
</tr>
</tbody>
</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 unskilled labor has remained fairly constant. CHART 2. BUILDING TRADES-21-CITY AVERAGE. PRIME COM. PRICES. BONDS INDICES. BUILDING TRADES-21-CITY AVERAGE. MUNICIPALS. I. BUILDING MATERIAL PRICE INDEXES. 1941 TO 2001, CIVIL AVENUE. PRIME COM. PRICES. BONDS INDICES. BUILDING TRADES-21-CITY AVERAGE. MUNICIPALS.
American Society of Civil Engineers awarded its "Outstanding Civil Engineering Achievement Award" for the year to Glen Canyon Dam, Power and Water Plant. The complex, now nearing completion, spans the Colorado River near the Arizona-Utah border. It is a project of the United States Bureau of Reclamation.

The award is made yearly by the American Society of Civil Engineers (A.S.C.E.) to "the engineering project demonstrating the greatest contribution to civil engineering and kind."

Glen Canyon Dam is the second highest in the country after Hoover Dam. In bulk—2,000 cubic yards—it ranks second in the country. Water storage has already begun in the reservoir, which is called Glen Canyon Bridge is the highest steel arch in the country; the deck is 700 feet above the river.

Recommendation for the award was made to the board of A.S.C.E. by a panel of engineering editors: Robert L. Byrne, Western Construction; J. Roland Carr, Engineering News-Record; Robert E. Fischer, Architectural Record; William S. Foster, American City; Robert M. Pope, Water Works and Wastes Engineering; Robert G. Wiedyke, Journal, American Concrete Institute; and Hal W. Hunt (chairman), Civil Engineering.

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ARCHITECTURAL RECORD April 1964 53
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That comes to about $1-a-foot savings. He's planning another warehouse — 100,000 sq. ft. — where he expects to save $250,000 over the 50-year life of the building.

This case history is typical of the way Acrylite skydomes are cutting costs in industrial, commercial and educational buildings all over the country. Acrylite skydomes are made of tough acrylic plastic and durable aluminum. They're weatherproof, water-tight, shatter-resistant and virtually maintenance-free.

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For more data, circle 59 on Inquiry Card

ARCHITECTURAL RECORD April 1964 59
WALL-LESS FOOD PLANTS SEEN FOR THE FUTURE

The factory of the future, suggests architect Frank L. Whitney, will be a structure without walls, containing automated equipment, and operated remotely from great distances. Mr. Whitney designed the well-known wall-less Bluebonnet Plant for the Corn Product Refining Company in 1949.

Speaking at the Food Industry Science School last November, Mr. Whitney was referring particularly to the food processing industry, but his remarks could by little extension have implications for any industry requiring continuous processes amenable to automation. Basic to the envisioned plant is equipment which is self-contained, obviating the need for walls, and automated, permitting remote control.

Some of the advantages of the wall-less plant cited by Mr. Whitney would be economic. Most obvious is the elimination of the structural cost of the walls, whose expense is often increased in food processing plants by the need to provide corrosion-resistant materials. Most food plants also require large mechanical plants for environmental control. Both initial and operating costs, suggests Mr. Whitney, are exaggerated when volumes far larger than those required for the manufacturing process itself must be air-conditioned and heated.

The second advantage indicated by Mr. Whitney is human. He pointed out that the basic occupant of any modern plant is equipment, and that men working in the plant must adjust to the conditions required for the machinery. By sealing off the equipment, employees are freed to work in buildings, complete with windows and comfortable temperatures, designed to house people. A corollary advantage for the architect is that "the designer doesn't have to compromise. He doesn't have to plan one facility that must house both men and machines."

Having separated men and machines, Mr. Whitney sees as the logical conclusion putting the plants, manned only by small maintenance crews, in remote areas, while the operating staff may work in central cities, controlling the manufacturing process in one or more plants.

Wall-less food plant, projected by architect Frank L. Whitney, would place equipment, partly exposed, on open platforms, personnel in windowed central shaft, warehousing on ground floor.
Acousti-Celotex ceiling products mean the world's most experience in solving sound control problems

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COMPETITIONS:
A FOUNTAIN
FOR PHILADELPHIA

A national competition for a monumental fountain to be built on Philadelphia’s Benjamin Franklin Parkway has been announced by its sponsor, The Fairmount Park Art Association. Franklin Parkway is a mile-long avenue extending from the Art Museum in Fairmount Park to City Hall and Penn Center.

First prize in the competition is $12,500, and recommendation of the design for commission. Other prizes will be for $7,500, $5,000, $3,000 and $2,000, as well as $1,000 for each of five honorable mentions.

Members of the jury include architects I. M. Pei and Paul Rudolph, sculptors Jacques Lipschitz and Theodore Roszak, and Philip Price, president of the Fairmount Park Association.

The final date for registering is June 15, and all entries must be mailed by October 30. Information about the competition, which has a prize of $12,500 from the American Institute of Architects, is available from N. Rice, A.I.A., Professional Engineer, Fountain Competition, P. O. Box 8366, Philadelphia, Pa., 19101.

The American Institute of Steel Construction has announced that, for the fifth time, it will conduct its Architectural Awards of Excellence program. The competition is open to any architect practicing in the United States, and to any building completed since January 1, 1973. A jury will consider entries for their creative use of structural steel. Submissions are due by June 1. Information is available from A.I.S.C., 101 Park Avenue, New York 17.

The Committee of Stainless Steel Producers, American Iron and Steel Institute, is sponsoring its annual design competition. The subject this year is a prefabricated observation cabin.

Intermediate and advanced architectural students and draftsmen under the age of 30 are eligible to compete. Three prizes, of $800, $500, and $200 each, will be awarded in addition. Students may compete individually or in teams of any number. They are asked to design the cabin’s structural design and the height of the observation space, and to submit specifications and an estimate of cost. Submissions are due May 3.

Information is available from National Institute for Education, 40th St., New York, N.Y. 10018.

Pittsburgh Plate Glass Company is sponsoring four student competitions on the subject of glass, and carrying one prize of $500, with $200 for second place, $100 for third place, and a prize of $50 for fourth place, all in cash. The other three competitions are carrying one prize of $500, with $200 for second place, $100 for third place, and a prize of $50 for fourth place, in cash. The other three competitions are carrying one prize of $500, with $200 for second place, $100 for third place, and a prize of $50 for fourth place, in cash. The other three competitions are carrying one prize of $500, with $200 for second place, $100 for third place, and a prize of $50 for fourth place, in cash. The other three competitions are carrying one prize of $500, with $200 for second place, $100 for third place, and a prize of $50 for fourth place, in cash.

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For more data, circle 71 on Inquiry Card.

For more data, circle 70 on Inquiry Card.
Doors are to accent...
Award

Robert Branner has received the 1964 Annual Book Award of the Society of Architectural Historians for his study "La cathédrale de Bourges et sa place dans l'architecture Gothique," based on his excavations at Bourges. The book was published by Tardy Frères of Paris, and is distributed in this country by Wittenborn and Company, 1018 Madison Avenue, New York 21. It is available only in a French-language edition.

Structure Sans Math


Structural concepts have always been exciting to architects, but their interest has been more pervasive in the last 15 years or so because of the variety of new structural systems made available by structural engineers and the proliferation of new materials. In fact, structure has played a significant and frequently dominant role in the aesthetic of our new buildings.

It would be hard to prove, however, declares the author, that esthetics are essentially dependent on structure. Some "incorrect" structures are pleasing to the eye, while some "correct" ones are unsatisfying. Correctness of structure most of the time is a necessary condition for beauty but not a guarantee.

Apart from the form-giving aspects, structure has made important contributions to freeing interior space, to integration with mechanical elements and to economy.

But the flow of forces and the nature of stresses in the new structures cannot be grasped as easily or intuitively as simple column and beam framing, arches and trusses. Thus today's architect is not in as favorable a position to evaluate the "correctness" of a structural system for a particular building application. But even as complex as structural design can be nowadays, the architect still feels more comfortable assessing structure than the other technical disciplines. Thus we have seen several books of late that are designed to give the architect and student a fuller understanding of how various structural shapes perform under load, and how shape itself can be an important factor in efficient utilization of structure.

Mario Salvadori, who is Professor of Civil Engineering and Architecture at Columbia University, has written a book without mathematics on structural behavior which should broaden tremendously the reader's knowledge of how various structural elements—beams, frames and arches, tension and compression structures, grids and plates, and thin shells—resist the forces of nature.

Professor Salvadori first discusses the types of loads that are imposed, the nature of structural materials and the structural requirements—ranging from technical considerations through function, economy and esthetics. Then he turns to the individual elements and describes their behavior in some detail through text and accompanying illustrations which visually portray the response of these elements to the loads imposed. Thus this is a book of structural principles unfettered by abstract equations and engineering analysis which, while necessary in engineering design to obtain quantitative values for stresses, fail to give physical meaning as to how building structures really work. Professor Salvadori does not attempt to categorize or suggest the suitability or practicality of different kinds of structures for particular building types. Nor does he, except in a few instances, discuss the structures of specific buildings.

Pier Luigi Nervi states the true importance of the Salvadori book in his foreword when he says, "... theory must find in intuition a force capable of making formulas more alive, more human and understanding, and of lessening their impersonal technical brittleness. On the other hand, formulas must give us the exact results necessary to obtain the most with the least." Through always clear and, at times, most elementary examples, Professor Salvadori's book tends to unify these two viewpoints (I was almost going to say, these two mentalities), which must be cast into a unique synthesis if they are to give birth to the essential unity of all great structures.

—Robert E. Fischer

College Planning


Comprehensive is probably single word description of book on campus planning. Proliferation of illustrations—photographs—offer the reader a tour of many university campuses, old and new, and make the book volume is designed for planners, administrators at any level of administration, and anyone who is interested in campus planning.
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Or and textural interest are given the roof fascia, perimeter columns and slab edges through use of precast sections of white cement concrete, etched to expose the pale gray granite aggregate. Concrete adds new dimensions to architecture...a freedom of form possible with no other material. (Write for a free copy of "Concrete Profiles for Industry." U.S. and Canada only.)

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THE BEST IDEAS ARE MORE EXCITING IN CONCRETE

Required Reading

continued from page 60

tors. The book's pages have a busy, crowded look: in this business-like production, a praiseworthy quality.

The material is organized into three sections, each having its particular kind of arrangement. In the first, the author points out the crisis nature of the problem of providing adequate space and faculty for the years directly ahead, sets the problem, and then dips into history to survey the evolution of the American college as a design form. The second section deals with the elements that make up the college—classrooms, labs, libraries, housing, etc.—and for each of the author's nine types sets forth considerations of programing, planning modules and cost. The third and last part of the book might be described as the "how to do it" and "how it has been done" section, and shows many types of plans for a variety of geographical areas. Heartily recommended.

—James S. Hornbeck

Greenough

HORATIO GREENOUGH. By Nathalia Wright. The University of Pennsylvania Press, 3436 Walnut St., Philadelphia 4, Pa. 382 pp., illus. $8.50.

This first full-length biography of Horatio Greenough sets forth his devotion to the classical tradition in sculpture and describes his concept of functionalism in architecture.

His life is examined in a detailed, historical manner. The accounts of Greenough as an artist in Italy, of his dealings with the United States government in the execution of his public works, and of his associations with James Fenimore Cooper and Ralph Waldo Emerson are particularly informative. In addition, Greenough as an artist, at last, as a moral philosopher have been assessed. Considerable use is made of quotations, many previously unpublished.

There are 50 plates with 78 individual illustrations. These include photographs or drawings of all of Greenough's original statues, groups, and bas-reliefs which are known to continued on page 106

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Required Reading

continued from page 94

exist or of which depictions are available, and typical specimens of male, female and children’s port-busts, and his “ideal” busts, many of these published for the first time.

—Mary Aren

Art in America

CREATIVE AMERICA. Published for National Cultural Center by Ridge Press Inc., 551 Fifth Ave, New York. 128 pp., illus. $5.95.

An introduction by the late President Kennedy and a magnificent collection of Magnum photographs, it aims to present a picture of the creative impulse behind all forms of artistic expression. The text consists of contributions by nine distinguished Americans, among them Dwight D. Eisenhower and Harry S Truman. Two poems are included by Robert Frost and John Ciardi.

Although this work cannot be a profound study of “creative arts,” it does succeed in presenting quite a vivid impression of heights and depths experienced by artists in their struggle to give expression to their thoughts and ideas.

—Susan Braybrooke

Ruskin


By providing this collection of excerpts from Ruskin’s writings, Rosenberg hopes to overcome the reluctance of the general reader to tackle the writer’s overstuffed volumes and the distortion which views have suffered from too many quotations. To selections from “Modern Painters,” “The Seven Lamps of Architecture,” and “The Stones of Venice,” as well as from Ruskin’s social-philosophic writings, the editor has added notes putting Ruskin into the context of his own life and the Victorian age.
Third in a series of presentation details of significant architecture by master architects

The word "details" means different things to different architects. It is obvious that a Brunelleschi pilaster capital is of a different order from the twist or taper of a Breuer concrete column. One is a decoration to cause richness, shadow and delight, helpful to the architecture. The other is merely the shape of a necessary structural piece.

Mies van der Rohe says, "God lies in the details."

Paul Rudolph says, "There are no details." There is of course a generational distinction, but also a semantic one.

Can we ever speak meaningfully of details today? The most obvious example of shift of emphasis is in the work of Frank Lloyd Wright. The Robie House of the 1900's is full of beautifully worked out "details." The Guggenheim Museum of the 1950's has none, not even a stair rail. Details today are hardly more than enlarged structural connections and corners.

The collection that follows contains many kinds of "details." Window enframements (Miesian or even Perretesque), geometric calculations as in the Roofless Church, decorative grills as in the stair rails, arbitrary steel curves as in the Museum of Modern Art's East Wing, a single building section as in the Dumbarton Oaks Museum. Varied as they are in type, they may sometimes all be called, I suppose, "details."

Philip Johnson
MASONRY WALL DETAILS

3"x1-0"
MINISTRATION BUILDING
FOR SCHLUMBERGER
ROGEFIELD, CONNECTICUT

Of the buildings in this group, this example
strong Miesian influence in the handling of
columns, roof fascia, window frames, and interior sills.
The steel painted black; the glazing is 1/4-inch
ed plate glass; interior and exterior exposed
brick is glazed black and white iron-spot brick;
lining is blown-on asbestos; the floor is vinyl tile
THE ROBERT WILEY HOUSE
NEW CANAAN, CONNECTICUT

This house is notable for the manner in which its elements, structure, and materials are beautifully articulated. The Miesian influence is apparent here, but has been interestingly translated into a wood structure. Columns and beams are of stained, laminated wood; window frames, roof fascias and sills are of stained white pine; windows are glazed with 1/4-inch plate glass; the ceiling is plaster with acoustical tile; the floor and peripheral grills of stained maple; exterior wall panels and soffits are of plywood painted white; the foundation and roof terrace deck are of slate; the foundation is fieldstone.
ROOFLESS CHURCH
NEW HARMONY, INDIANA, 1960

This shrine, unusual in concept, form and use of material, features a dome-like form, covered with cedar shakes, which rises from six points. The interior shows the wood construction, which is painted red—laminated columns, arches, ribs and plywood sheathing. The column shoes and dome cap are of statuary bronze; the sanctuary paving is granite; the courtyard paving, column pedestals, masonry coping and trim are of limestone; the courtyard wall is of red brick; the main gate to the courtyard is of steel painted black.
AMON CARTER MUSEUM
OF WESTERN ART
FORT WORTH, TEXAS, 1961

Typical of this museum is a highly sophisticated
elegance and refinement, and again, a studied
articulation of materials and surfaces. Columns,
arches, exterior and interior walls, gallery ceil­
ing and exterior soffits are of Texas shellstone;
exterior and interior paving, stairs, foundation
walls and retaining walls are of pink-gray gran­
ite; all exposed metal work and floor grills are
of statuary bronze; wall paneling is of teak or
pandanus covered plywood; ceiling paneling is
of plywood lacquered pale gray; glazing is ¾-
inches tinted plate glass.
INTERIOR WALL

ARCHITECTURAL RECORD  April 1964  145
WING FOR BLISS COLLECTION
OF PRE-COLUMBIAN ART
DUMBARTON OAKS, WASHINGTON, D.C.

This is the example, according to architect Johnson, in which a section of a building becomes a detail. The columns, base soffits are of agatan-veined marble; the window frames, fascia, light cove, and floor grills are of statuary bronze; domed vault is of plaster painted white; the floor is of teak with a border of verde antique marble.
KLINE SCIENCE CENTER
YALE UNIVERSITY
NEW HAVEN, CONNECTICUT
To be completed in 1965

This building makes use of structural columns as mechanical stacks, and interestingly interprets that use in architectural form. The columns will be clad in iron-spot brick; the free-standing spandrels will be of brownstone; window frames, interior window trim, and floor grills will be of anodized aluminum; floors will be finished with vinyl asbestos tile; hung ceilings will consist of cloth-faced panels of glass fiber; interior walls will be concrete and block, painted
PLAN AT SPANDREL
3/4" = 1'-0"
MUSEUM OF MODERN ART, EAST WING
NEW YORK CITY, NEW YORK
To be completed in 1964

The design of this museum addition has excited considerable interest, since it adjoins Edward D. Stone's famous example of the International Style, and because it calls for the redesign of the old entrance and curving canopy. The new facade—which appropriately enough looks better than the old—is a reinterpretation of the Miesian steel and glass wall. Johnson's design, which is carried out with style and refinement, the wall and spandrel panels are set in curved steel frames. The construction of the entire wall can be seen in the architect's sectional isometric on the right. Note that provision is made for air circulation over the inside face of the wall to prevent fogging. The steel will be painted black; the windows will be tinted plate glass; the spandrels will be of tinted rough plate glass, painted black on the exterior face only.

PLAN AT WINDOW
3/4" = 1'-0"

PLAN AT SPANDREL
3/4" = 1'-0"
STAIRWAY, MUSEUM OF ART
MUNSON-WILLIAMS-PROCTOR INSTITUTE
UTICA, NEW YORK, 1960

This stairway is one in which the delicate, lacy grillwork of the balustrade panels becomes decoration. Brushed stainless steel was used for the handrail and posts, the panel frames and clips, the tension rods and stringer cap piece. Stringer plates and soffit base are of aluminum painted black; the treads are of travertine; the soffits are of smooth plaster painted white.
Architects often influence each other in matters of form and technique, but Sweden's Markelius is one of the few to exert a widespread influence over what might be called the context of architecture: that is, the manner in which a building is used and its relationship to the surrounding environment. At the RECORD's request, Professor Markelius described his convictions about architecture and responsibility of the architect in a statement which is quoted here as the introduction to a review of some of his work.

The new architecture which during the twenties with a petrified traditionalism was not just a playing with new shapes, not just a weariness with old and accustomed forms. It had accepted a technology and a new social outlook, taking technically and humanly the consequences of a revolutionary new situation. It is important to keep this in mind: esthetically and humanly. Esthetically, in king the existing conflict between form and function, between form and function, between form technique. Humanly, through its earnest aim to architecture in the service of man, of his comfort and well-being.

I still believe in the truth and durability of this on the problems of architecture in our time. If times I cannot help joining the criticism which ibes the architecture of the thirties as ugly, and inhuman, may I add the conviction that criticism originates in a widely-held misconception that emphasizes one-sidedly the technical and aesthetic aspects of the architectural problem. Our are disfigured by the evidence that many artists were, and still are, happy in the conviction the "new style" is not expected to pay any at- tion to beauty.

The situation of today offers many problems so that we simply cannot master them. The important reason for our failures is that the of our rapid and wide-spread technical progress have possible an enormous rise in the standard living, but unfortunately this is the case only in n spheres. It is beginning to be more and more recognized that in many respects technical progress has by no means led to better conditions, rather to a deterioration. We have to be continu medical that the aim of science and technology serve humanity. At the same time, we should t "the human" become a misused slogan in building and social planning; the reality behind the word is often merely a reactionary formalism, a romantic hunt for motifs in the surroundings of the past, beautified by our imaginations.

Our aim must be towards a structure of society, and of cities, that promotes the health and happiness of the citizen. Here our major task should be to find new and better ways of planning our cities, as well as of replanning those existing ones which are no longer workable as instruments for good life.

Somebody has said that there are three items which necessarily should be considered in the planning or replanning of cities today. These items are safety, silence and privacy. It is evident that these conditions can be fulfilled only by exempting sufficiently large and well-planned areas from motor traffic, from its noise and dangers, its smells and poisonous exhausts. Modern planning can calm down high-strung nerves and let us enjoy healthy walking in pleasant surroundings, in park lanes and shopping centers, in nicely-shaped streets and plazas. Beautiful architecture will have a new meaning when we are able to look at our fine buildings without the risk of being run over.

Admitting that our greatest and most difficult problem is the planning of our cities—our external environment and its organization and shaping according to man's material demands and spiritual values—we must not overlook the important and often disregarded problems which concern our closer environment, the planning and shaping of buildings.

It is astonishing how often we encounter blunders that unnecessarily create discomfort and irritation in our daily life. Everywhere we are able to state the need for regenerating our way of thinking, the necessity of attacking the problems over and over again.

We do not create a human environment by trying to stop the course of time and returning in imagination to the "good old days," but by using well, in the service of mankind, the enormous resources which are today put at our disposal. There was once a belief that architecture had to carry certain external attributes to be regarded as "modern." We do not need a "modern style." We need an architecture which is faithful to its purpose and which is true to its own time: to its needs, its inherent forces and its possibilities.

—Sven Markelius

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BUILDINGS THAT CONTROL ENVIRONMENT

Professor Markelius first became internationally known for his Swedish Pavilion at the New York World's Fair of 1939. In a setting where individual exhibits were vying with each other for attention, the Swedish Pavilion was an oasis, a place where the exhausted fair-goer could pause, rest and recuperate. The visitor became a participant in the architectural experience, and not just a spectator of primarily visual effects. Markelius was at that time chief of the planning section of the Royal Board of Building. In 1945 he became the Stockholm City Planning director, a post he retained over the next 10 years. Under his administration the Stockholm City Plan was drawn up: Vallingby, the first of the satellite towns, was established; two other towns, Färsta and Nördhåshagen, were planned; and the redevelopment of the commercial center of Stockholm was begun. The sign of this new central business district carried planning concepts that were already present in a housing development.
The Work of Sven Markelius


Right: Block model showing redevelopment of Stockholm central business district, which was planned under Markelius's direction. Below: Model of unrealized housing project designed in 1930.
The redevelopment of the Stockholm central business district. Its planning was carried out under the direction of Sven Markelius from 1945 to 1955 and Göran Sidenbladh from 1955 to date. Others working on the project were the architects, C. F. Ahlberg, David Hellden, Holger Blom and Torsten Westman; and the engineers, Ake Hedtjärn, Bo Hertzmann-Ericsson, P. O. Klevemark and C. H. af Klercker. Architects for the five office buildings were David Hellden, Anders Tengbom, Sven Markelius, L-E Lallerstedt, and Backstrom and Reinius.
The Work of Sven Markelius

An early, unrealized project by Markelius dating from 1930

Offices for the Stockholm Building Society completed in 1937

E BUILDING IN THE CITYSCAPE

Markelius has always seemed keenly conscious of the scale and the relationship of the building to its context. Even in his earliest work, such as an unrealized project of an office building of 1930 and the Stockholm Building Society offices of 1936-1937, questions of scale and the relationship of the building to its site were important aspects of the design. In recent buildings, urbanistic considerations almost be said to dominate. The Trade Union Center at Linköping is really a large and complex building; but the offices have been separated from the apartments and the auditorium and conference rooms, breaking down the scale of the group so that it would not compete with the adjacent cathedral. The office building for the Swedish Forest Industries was also broken down in scale to conform to its location in a residential district.

The Trade Union Center in Stockholm, a large complex that is being built in several stages, will eventually create several courtyards. The entrance under the building shown leads to a small courtyard that is used for parking.
The Work of Sven Markelius

A portion of the Trades Union Headquarters at Lynköping of 1954

Offices of the Swedish Forest Industries in Stockholm, 1956

A unit of the Trades Union Headquarters, Stockholm, completed 1960
FORM DEFINED BY USE

Concert Hall at Hälsingborg completed in 1932 one of the earliest of such buildings to take its form directly from its use. There is no reference to classical tradition, not even those elements of it had been present in the design with which Marckelius won the competition for this building in 1925. The design of the auditorium was based upon stational considerations and the outer lobbies em¬ the sequence in which the arriving concert-goer his ticket and hangs up his coat, as well as the b traditional social promenade. A study of the on of the Stockholm Trades Union Center will y further developments of the same approach in

the design of the conference auditorium and the theater. The project for the Stockholm City Theater uses movable seating in banks to convert from arena to proscenium staging, with numerous variations in between. Marckelius says of theater design: “New theaters very often are built even in these days according to antiquated ideals, sometimes superficially disguised in the costume of ‘modern style.’ But the individual of the audience in a democratic time—sharing the possibilities of television and radio—is not happy to pay for a seat in which he is not comfortable and from which he cannot see and hear well.”

ARCHITECTURAL RECORD April 1964 159
Section through a portion of the Trades Union Center at Stockholm. The conference hall is shown in the photograph at right and the theater in the photograph at bottom. Compare sequence of public spaces to that of concert hall on previous page.
Studies for the Stockholm City Theater. The auditorium is designed to convert from arena to proscenium staging, with numerous variations in between.
HOUSING AS A SOCIAL PROBLEM

Housing is the field in which Markelius feels the architect can most directly make his voice felt on social problems. His latest project is a development for 12,000 inhabitants in the Ör area of Sundbyberg, one of Stockholm's satellite towns. The central portion consists of six- to eight-story apartment blocks surrounding a large open park area containing playgrounds, schools and kindergartens. What distinguishes this project from others of its kind, however, is that half the population will be housed in single-family dwellings located on either side of central area. These single family houses provide accommodation not dissimilar to Markelius's house of 1929, but they are interlocked in an ingenious manner and built out over the connecting stairs and walkways to achieve a density far higher than conventional row housing. This design marks a step towards the hitherto elusive goal of providing large numbers of private houses in high density developments.
Single-family units for mass housing. Half of the new town in the "år" area of Sundbyberg (model photo at top of page) will be composed of single-family units like these.
The Work of Sven Markelius

Left: Single-family units at ground level showing separation of automobile and pedestrian traffic. Right: Plan at second floor. Below: Plans and sections of two-bedroom unit.
This arrangement of two buildings—one high, the other low and spreading—offers a neat solution to the common problem of adding density to a campus without giving it an overcrowded look. These two buildings, that comprise the new physics and astronomy center at the University of Michigan, are disposed at right angles to each other, and placed so they form the two joining sides of an open quadrangle. Such a plan gives emphasis and definition to the open space, which is oriented to the central campus. The bold, continuous precast band at second floor level and the stepping back of the wall under this band serve to create a strong horizontality that ties both buildings together and gives the entire complex fine scale. A glass-enclosed bridge at second floor level connects the two buildings at the level of maximum intramural traffic.

Traffic volume appears almost as a graded tone, with the minimum at the top and maximum at the ground. Astronomy occupies the top three floors in the high-rise classroom, office-lab unit; physics the lower seven. Two large lecture rooms with shared library above are housed in the low building.
The plan shows how the two units are juxtaposed to form two sides of a courtyard. Spaces were planned so the heaviest traffic occurs at ground level and on the lower floors above. To this end, the large classrooms and elementary labs occupy the lower three floors of the high-rise unit. The largest classrooms are located at ground level, the added required depth obtained by off-setting the corridor from the floors above, creating at the same time a protective overhang for exterior circulation. A similar overhang occurs along the corridor and ends of the low-rise lecture room element to permit protected exterior circulation across the plot in both directions.

The 3-foot-wide fenestration of the high-rise unit is centered in each 11-foot 4-inch structural bay, and consists of gray glass lights with black glass spandrels completing the verticals.
The principal areas of the 81- by 127-foot, two-story low-rise building are shown on this page: the joint departmental library for physics and astronomy and one of the two similar amphitheater-type lecture halls, seating 250.

Materials and finishes for the two air-conditioned buildings: exterior walls of face brick to match existing buildings nearby; precast quartz aggregate panels at second floor level; interior walls of painted plaster; partitions of lightweight block; concrete floors covered with vinyl asbestos tile or sheet rubber; ceilings of acoustical plaster or metal pans; fixed sash of aluminum
ARCHITECTURE AS TOTAL COMMUNITY: THE CHALLENGE AHEAD

A series of seven articles examining the contemporary crisis in human environment and presenting strong, frequently controversial, convictions on planned development as guiding principles for community order with diversity, beauty and humanity

By ALBERT MAYER
in consultation with CLARENCE STEIN

PUBLIC HOUSING AS COMMUNITY

PUBLIC HOUSING AS COMMUNITY

The housing, and particularly the principles and elements underlying it, are the key and of any satisfactory urban and regional development program. They are not just an unpleasant hangover residual present necessity incidental to pernicious relocation of those displaced by new high public works and urban renewal.

The unorthodox thesis is that the country's solemn commitment to achieve proper housing communities for all Americans cannot be carried without the ingredient of a greatly expanded much broader subsidized housing program, only to provide better housing for citizens of very low and middle income, but to open the to proper community development in terms of the neighborhood spectrum.

The tortured history of public housing, its straitened, unadventurous, non-evolving character, its de-imposed and accepted penury of spiritual ok, its involuntary isolation: these might at first make the proposal of such an enhanced seem absurd. But consider the factors in great accounting for the past and present state of housing.

Quite lately it has been the prisoner of its nial opponents and detractors, its character to unbelievable extent determined by them. They resorted to attach a stigma to the program and to sanitize public housing into a position apart the main stream of things. Both of these circumstances have had a traumatizing influence on housing and have greatly affected its livability and its architecture. These influences have not, until lately, been thrown off to any serious extent.

Housing officials, Federal and local, have always been excessively on the defensive. They sought to escape attack by being undeniably "virtuous": penurious, inoffensive, practicing stark economies, squeezing down space, minimizing community facilities, squeezing down architects' fees. There was great competition to achieve this kind of virtue. It was a source of pride to the housing authority that discovered closet doors could be eliminated! The generally depressing results aroused no enthusiasm anywhere among the general public—and in fact alienated support. One may add that the specific legislative handicaps such as prohibition against commercial facilities in housing developments, and the requirement that families had to move out whose incomes had increased beyond rather narrow limits, had sharply deteriorating social effects.

Symbol of a Shabby Past

Public housing has been the butt of critiques whose targets are really the assorted ills and shortcomings of our urban society and policy, which the circumscribed public housing effort alone couldn't begin to overcome. But as a major visual landmark, it became the easy symbol.

It has been associated, for example, with local, economic, and color ghettos which are the imposed result of white middle-class unwillingness to permit diffusion-integration, i.e., insistence on retaining its own exclusive general white preserves.
Public Housing as Community

The actuality of public housing, its often, pretty general, ugly and unimaginative character, its inert physical identifiability and label, resolved spiritual and social difficulties, were evidence and justification for criticism. Too typical of the past: the illustrations here and on the opposite page.

For example again: it has been identified with more extreme juvenile delinquency and vandalism, mainly because physically more identifiable. We know that this is not statistically verified, we now know that delinquency and vandalism are widespread even unto high economic and social levels, a society-wide social-economic-educational problem particularly characteristic of our own time. Dramatically epitomizing this observation is the recent headline in the Christian Science Monitor: “Affluent Hoodlums Test Rye, N.Y.”—Rye being a wealthy and highly exclusive suburb in Westchester, New York’s upper-class suburban area. The first sentence of the Monitor article reads: “Privileged children of upper-income homes, who amuse themselves with petty thefts, vandalism and party-crashing, are the object of a city-wide clean-up drive.” Similar experiences in upper-middle-class suburbia are noted in newspapers all over the country.

Combined with these elements, we have a strong reaction from the excessive original youthful hopes and expectations of the friends and proponents of public housing, a number of whom have been excessively disappointed. We all naively thought that if we could eliminate the very bad physical dwellings and surroundings of the slums, the new physical and sanitized conditions would almost per se cure the social ills. We know better now, and we will in a moment see what public housing, lately stung and roused by the findings, has in the last few years begun to do about it creatively.

There is no intention here to whitewash largely shabby performance of public housing; we indeed have to face it and remedy it. The actuality of public housing, its often, or even prettily general, ugly and unimaginative character, its physical identifiability and label, its unresolved spiritual and social difficulties, were actual evidence and justification for criticism. And it is also true for years Public Housing Administration policy, in design, in program, in administration and in management was wooden, unimaginative, excessively rigid and barnacled.

But these criticisms deal with the past accumulation of stereotype, still in considerable degree justified, it is true. And meantime, under hard and harsh ground, and particularly in the few years, we have a number of new growth attitudes, visible new progress, not adequate, but with the power of the idea whose time is coming or is coming. Finally, PHA Commissioner McGuire’s buoyant determination is giving to beginnings a sustained lift and drive.

Hope for a Human Future

For example: public housing as renewal, as community and civic asset, not just shelter; as hope and focus, as neighborhood enhancement. On
Illustration is Miami, where on sites within an all city area of over a square mile, the Miami Housing Authority programmed 900 units of low-income housing—three 200-unit developments whose unity spaces working with adjacent schools significantly to the usability of these facilities, the remaining units in scattered vacant areas, oups as small sometimes as only a couple of es, thus removing the moth-eaten, litter-spotted eter of the general area, and encouraging ad- t improvement. The result will be both a visual social impact and an upgrading of a substan- art of town, a notable and suitable piece of ur- renewal as well as of needed housing.

Another new kind of approach in a number of notably Cleveland, where it started some five ago: the community-recreational facility ed and built by the housing authority for its elderly is sized for and actively used by the generally, regardless of income, from a large s quite beyond the development. In small cities, often the only such available resource, and it is and experience available to the housing au- y that have initiated and carried it through. Another type of example of out-reach into community beyond: in New York’s Jefferson es, there is the East Harlem Plaza, a multi-pur- outdoor asset, a fiesta design and atmosphere, used by those in the development itself for y and group recreation, but also reaching out into the whole East Harlem sub-city with its concerts, festivals, art shows by local part-time artists. Membership on its managing committee of 25 comes from all over the area; in its third year of operation, it has 700 patrons from the area who pay one dollar a year to qualify. Audiences vary from just parents and teachers at a local school show, to hundreds and

1 For example, a recent study by the Family Court in Chicago shows significantly lower actual crime rate in public housing than in adjacent areas. For another example, I have recently seen figures on the notoriously publicized Pruitt-Igoe-Vaugh public housing complex in St. Louis. Police department figures on index crimes for the period 1959 to mid-1963 show considerably lower incidence per 100,000 there than for the city as a whole, and far less than half that for the Fourth District in which it is located. And significantly, the rate in Pruitt-Igoe-Vaughn has in this period gone down by over 50 per cent while the other two rates are practically stationary

2 Less spectacularly—or is it more spectacularly?—in San José, California, the high school has been suffering broken windows and other damages of vandalism. The malefactors are the children of well-paid industrial workers in the $7,000-$8,000 bracket who own their own homes in local subdivisions

3 I was fascinated by reading the Public Housing Administration’s “Senior Citizens Centers—Coordinating Community Interest” (published in April 1963), a guide winding step by step through the problem of arousing interest, conducting surveys, the formation of citizens’ committee, augmenting funds by finding private contributions and other city funds; later, organization of the operating committees of the elderly themselves. A real contribution, simple and direct, omitting nothing, to effective citizen action and physical-social result. It is based on, among others, a successful consummation of the process in Temple, a small town in Texas

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Architectural response to new spirit is already visible in such public housing developments as Hugh Moore's project in Easton, Pennsylvania (above) and (across-page) the project in Marin City, California, by Aaron Green and John Carl Warnecke.

even sometimes thousands for abbreviated opera.

Pushed and self-pushed into it in the last years, some public housing bodies have become engaged in genuine social analysis, in path-finding, in imaginative programs, and, finally, achievement, in terms of social action. A few specific cases, from cities of various sizes, will illustrate the trend.

Role of Leadership

The Chicago Housing Authority has sought out and has systematically encouraged leadership—in its larger projects, please note, as well as the smaller. In its Rockwell development, as an example, there are nine building presidents, forming a council. Floor members are elected in each building group. Apartments have been leased to the council presidents, operating as newspaper office, teen lounges, meeting rooms, etc. Under the presidents, tenant committees control laundry room use, playground supervision, gallery and elevator use, in some cases with rotating monitorships. They are independent, and in Rockwell specifically, the organization has survived three changes of manager and changes in staff of other agencies. Thus, an urban grass-roots burgeoning of active democracy and responsibility.

In Knoxville, the local authority's low-rent Western Heights was a cop's headache until about two years ago. Captain Huskisson, head of the city's prevention bureau, is quoted: "Almost nightly get a call on broken windows, smashed street garbage cans set afire. But we haven't had a there in over 18 months, maybe two years." Analysis and parents' mass meetings produced a Scout troop and a junior police department. Selected junior policemen were issued identification cards and honored by being encouraged to "in" with the Knoxville Police.* It is, of course, possible that such activities may become paternalistic in my limited observation there was this tendency at the start, but there is now generally independence.

Another fairly recent avenue of social expression and social effort by local housing authority has been the emphasis on competitive achievement and the incentive to pride in creation and excellence and in its maintenance: at its least as a dote to vandalism, at its best as enhancing the acter of environment, and as human growth.

One set of efforts in particular is typical, aomatic epitome and a reversal of cliché. It has decades been a rule and almost an axiom that s, flowering shrubs, blossoming trees are "out public housing landscape design, because they inevitably plucked or destroyed. Yet, sparke the experience of the Chicago Housing Authori is precisely here that the assumptions have turned upside down. Even previously, there
ow-rental developments—of which I have pho-
there flowers were almost as prevalent and
luous as in the middle-class suburbs. But the
ly competitive stage flourishes—of all places
he big cities of Chicago and latterly New
and others, where prizes are offered and wide-
pted for in two classes: in public areas by
ed public or project effort, and by innumer-
ants in their own small front and back
AND very often, no protective fences! Public
and determination are the social equivalent
ces.

ation" as a Tool

ng much further, in this contagious and
idespread flower movement, this facet of en-
ent and vitalization of physical environment,
ment just beyond its beginning which we
lling juvenation. Two things are becoming
ounced. Visual appearance and space cre-
ave an important positive psychological and
effect in pride and identification, which the
st clean-up, paint-up campaigns can't attain
 at the same time their plus results are not
tic, and may be quite ephemeral or negligible
eating, and may fortify cynicism, unless
eced by, and synchronized with, social
 and participation. This is just what is now
ning to take place. The East Harlem Plaza pro-
ject previously noted, and several others in New
York, Washington and elsewhere illustrate this
fresh dynamic combination of architectural quality
and social eagerness.

*We may even generalize on this kind of undertaking and experience. Thomas E. Harris, executive director of the Hunter Point Boys' Club in San Francisco, has noted that 150 boys' clubs have been set up within or near public housing projects, in many cases in physical quarters made available by housing authorities. He mentions specifically that housing authorities in Seattle, Portland and Los Angeles have helped to set them up. Ray W. Sweazy, director of the Urban Relationships Service of the National Council of Boy Scouts, delivered a paper in October 1963 before the National Social Welfare Assembly, in which he noted the initiative of Miss Marion Neprud of the Public Housing Administration, starting in early 1962, which has flowered into close cooperation between Housing Authorities and Boy Scouts. This has since produced 200 scouting units in Chicago Housing Projects, over 50 in Dallas, etc. In many instances, he says, boys who live in the developments participate in Scout units and other activities outside of the housing complex itself.

... In a recent issue of the Scout Executive, the experience is cited of Nickerson Gardens, a development of 1,800 families in Los Angeles. There, the sponsorship of scouting rests with a central committee—a tenant organization which coordinates all youth activities, such as Girl Scouts, Boy Scouts, Little League. Sixty adults are involved as unit committeemen, unit leaders, den mothers. In another issue of Scouting Magazine, I found a detailed case history of the growth of leadership in operation of the Quinnipiac Council's Troop 105 in New Haven's Public Housing, in an ethnically integrated troop... Thus, and summarizing, the initially tough conditions in the center of the urban problem, have produced a massive reaction of the most positive social character, on a scale and of a quality that can only be considered a major contribution to urban social technique and potential.
Public Housing as Community

Self-Criticism as a Spur

Public housing certainly has very far to go still, to accomplish what it must accomplish in urban society. The point is that it is self-critical, that it is no longer static but has in recent years taken important new strides and is evolving. Anything in these descriptions that implied complacency or painted any over-optimistic picture would be both a misunderstanding and an extreme disservice. In fact, one must call sharp attention to the disturbing fact that the bad image of public housing is prevalent not only among the real estate people and the middle-class public but among those for whom it is meant. A study by Chester Hartman in the West End of Boston reports that only 17 per cent of the slum inhabitants in the nation who had to be relocated moved into public housing. In the specific area studied, 74 per cent of the sample said they would not want to move into public housing.*

We are just beyond the beginning of sensitive creative policy and operation. But that we are definitely and encouragingly beyond, I have no doubt. Even in architectural appearance, I have been surprised, in visits around the country within the last year, by how many pleasant developments there are, and to find indeed that there are some brilliant ones. Certainly the great bulk are still grim, dull, drab, discouraging (though not the great bulk of recent ones). But this low state is generally true of our middle-class housing and of our luxury housing.

My impression is that there are proportionately fine low-rental developments, and finer ones, at the other levels.

In Easton, Pennsylvania, Hugh Moore has a little-known, jeweled and sensitive project on difficult terrain; Aaron Green's magnificent Marin City is better known. Emanuel Turano has done a delightful one for the aged in Green Meathe and Kessler's single homes and row in Mt. Clemens, Michigan, like the other mentioned, are by far the best work in the city. T. Amisano and Wells have done a large-scale document on challenging topography which is the complex of domestic architecture in Atlanta, as the model I saw of Warshauer and Feldman's document, now getting under way at Mt. Kisco, deliberately casual idiom of grouping, a reference in low-rental housing and in group housing together.

All these are fairly recent, certainly the best the earliest FWA days over 25 years ago, and deal more venturesome. Looking at these I think that no one, casual visitor or discerning critic, react with "Public Housing!"—nor would fail to recognize a special synthesis as among architectural client-authority, in-dweller and site.

All of this progress in social and architectural terms encourages me. It has all been recent part of a new ferment, a new outlook and
and has been accomplished in an uncongenial, verbally limiting framework and against a background of generally denigrating public opinion, including my own. What I have seen and in the last year has definitely reconverted the view that there is new accomplishmentalist promise.

of a New Approach

Further the tremendous factor, beginning to be felt and put to use, of the modification and relief of negative pressures and rules on low-income housing:

- Rising of the income-rent ratios, permitting families to stay who have raised their incomes: responsibility of retention of local leadership.

No single measure is more important than the one of the blackest marks against public housing is becoming more and more confined to low- and "the other America." This does not have to be inherently necessary. But an enormous sustained effort must be undertaken and supported to reverse the trend.

Permission to include commercial facilities, shopping centers: not only a release from the inconveniences and even hardships of having to go a distance for every little item, but a levener on the tempo of living and congregating.

In Europe such facilities have always been allowed and quite normally included. I have been told that revenue there is often substantial, and can appreciably reduce subsidy otherwise required.

Adding all the above together, we have building up a whole change of outlook and body of sympathy, skill, research and performance which will soon be seen to be a priceless community asset, while most people not aware of it are tilted at crumbling targets. Jettisoning public housing five years ago in its then form and outlook might conceivably have made sense; as of now, it would be social folly and waste. For there just is no comparable body to do the job that local housing authorities have in many instances begun. Situated at the heart of things—the home and the family—they are in a very special position to bring together the agencies and the departments to act not departmentally but as catalyst for the whole man, the whole family. What is needed is sustained strong criticism in positive directions, but in an encouraging and expectant tone: creative, vigilant criticism, not a dismissing shrug.

All sorts of alternatives are proposed: private enterprise, new private development with subsidy, rehabilitation, rent certificates. Of course rehabilita-

*For the reasons, and other important indicators, see this illuminating study, "THE LIMITATIONS OF PUBLIC HOUSING—Relocation Choices in a Working-Class Community," in Journal of American Institute of Planners, November 1968.
New efforts to create community through tenant leadership and participation in social and civic activities within projects have met enthusiastic response—from flower-planting and how-to-do-it through performing-arts groups and tenant councils to plan them and participate in project management in public housing projects around the country.

Outdoor space designed as a vital element in two public housing projects in New York. Above: East Harlem Plaza, designed by Mayer, Whittlesey & Gilgal community meeting and mix within Jefferson Houses (Brown and other, Architects); church and school are brought into the scheme and playground areas for children (P) and tennis (TP) are provided. Across-door space at Franklin Plaza is planned as an internal ‘Main Street’—a central area with side-branches which together form what is called an ‘internal Main Street’—a combination of open space for active play and quiet reading for all ages. Architects: Holden, Egson & Corser; designer of open space is Robert Mayer of Mayer, Whittlesey & Gilgal.

New Role for Private Enterprise

There is a special ingenious effort to involve private enterprise which should have a trial. The purpose is to de-stratify. This is: to place income families in private ‘middle-income’ housing, with public individual subsidy to make up the rent difference. It was specified in the President’s housing message to Congress in January and previously proposed in New York State, in somewhat different form which required a Constitutional amendment, it was turned down by the Federal Housing Administration. There is one forceful illustration that if we mean business here, there has got to be a renewal and surge of political purpose and action and determination. And certainly this particular idea should be allowed a trial run on a trial scale.

It is one thing to take the position that low-rent housing should be a continuing enterprise and even increased in quantity, quite another to assert that it is, as I maintain here, key to urban development. Why, and how?

The why has been fairly touched on, in turn...
The need, for social health, of appreciably greater economic spread of tenant income within developments or in closely related developments. Pilot projects should be expedited. Cooperative sales should be allowed—as objective constantly in mind—to tenants who can begin to afford it.

In the direction of social health, there is no question of the need and the proved value of social scientists and social workers, both for sensitive diagnosis and creative operation, and for the injection of their pulses and practice than in the hallowed and healthy but limited home ownership equation.

The creative side of public housing, as contrasted with the stereotype of the anonymous rabbit hole to Urban Development

the how of public housing as a key to urban development, we need to go seriously further in legislation to improve the situation. The two important innovations already noted: the new higher incomes available for remaining in public housing, and the possibility of shopping-liveliness as needed in the individual situation. Let us now determine to add the following elements, to further put together the housing statement: Housing as Community, and as stimulus to the larger community.

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insights into the planning and design process. While in one way or another various housing bodies have managed to employ a meager sprinkling of such professionals, my understanding is that new specific authorization is needed to make such counsel available to housing authorities on a fruitful scale. There is, in fact, a vast and pressing need for the insights of social science and the skills of social work in relating people effectively to their fast-changing—and often suddenly changing—environment.\(^1\)

Housing developments of varying sizes can be strategically deployed as urban renewal and community development, as in the Miami approach noted earlier. This is not subscribing to the thesis of universal "vest-pocket" policy of housing tucked away unnoticed, but might be thought of as the civic statesmanship of low-rental housing, with some developments large enough to make striking impact and improve the community atmosphere and facilities, adding to the resources of a large ambient area; and others helping to cure the moth-eaten, leap-frogging gaps of our blighted areas.

We must deal with the population explosion and with industrial decentralization. As of now, low-income workers are still by and large confined to the inner city because of the availability only, or chiefly, of slum rents or public housing which they can afford. Private enterprise is building "new towns" or fringe developments, the one-class communities which have at best only a thin layer of economic variation, and which accentuate and intensify all the imbalance of transit and lengthened journey-to-work, because it cannot afford to build to accommodate decentralized industry's workers. The needed ingredient here is subsidized housing in these new developments, as in the English New Towns. Thus, public housing must not be chained to the inner city, and mainly to slum areas therein, but must contribute also to the integrated development of these new undertakings.\(^2\) This may well mean new legislation. The President's recent message has partially proposed this.

It has become clear to me in the course of my investigations that it is one's duty as a citizen to freshly re-examine the last few years' actuality and the tendency-potential in public-subsidized housing, as it is emerging now; to check for one's self that public housing has a versatile ingredient in the context of varied communities of the city and region. It should be given the chance; and performance must be equated with its potential with the urgent need.

\(^1\) The need is pressing in both Public Housing and Urban More will be said on this in the next article

\(^2\) Thirty years ago, i.e., in the early beginnings, Lewis Henry Wright and I wrote a series of articles in the New devoted mainly to urging the thesis that Public Housing be equated with central slum clearance, should also and mainly be done on vacant land, in-lying and out-lying. The number of reasons besides those noted here, but we were to influence the course of events. This issue is desperate re-arguing as even more applicable now. But there is no spirit adequately here. One can just repeat that the crucial added supply and not replacement; and that unless there is greater locational choice available within the cities and metropolitan areas, the ghettos and the excessive journey-centralized industry will continue
CROSS-SHAPED HILLTOP HOUSE PROVIDES WIDE VARIETY OF OUTLOOK

Jacob Robbins clusters six pavilions for a two-level family house
Paramount among the program requirements for this comfortable house were the needs for unusually good lighting, good zoning, and economical space for a family of five.

The special emphasis on lighting resulted from the problem of providing a home easily maintained by a housewife with extremely limited vision, and to create an ideal seeing environment of high level, glare-free light.

To achieve this, major rooms and the master bedroom suite were placed on one level, and arranged in a cross-shaped plan of six bays or "pavilions" (the living area occupies two bays) with circulation between areas in straight lines around a bath-storage-stair core. The six bays are separated by light-diffusing plastic skylights, and have their structures tied together through the skylights by beams to 10 plywood shear panels. Overhead light is thus provided over all circulation areas, storage areas, work areas and the living room seating area. Large glass areas to balance the skylights were oriented to glare-free greenery of trees and planted banks. This upper level is accessible by car, and has a front entrance reached by stairs climbing through the trees. Family entrance is via a patio and the dining room.

Quarters for three teen-age sons were placed on a lower level set into the hillside, and includes a separate living-play room and outside entrance. This portion of the house is designed to be adapted as a rental apartment. The structure of this level is of reinforced concrete block, with wood framing above. The lower level ceiling is furred for ducts and pipes, and for sound separation between the levels. Exterior walls are cedar, stained gray with dark gray trim.
Residence for Mr. and Mrs. James F. King
Berkeley, California
ARCHITECT: Jacob Robbins
ENGINEER: Nicholas Forell
CONTRACTOR: Carlson & Maier
LANDSCAPE ARCHITECT: Tito Patri
INTERIOR DESIGNER: Emily King
A variety of views and outdoor spaces were created for both levels of the King house: all rooms have direct access to either decks or patios. The lot is a deep, steeply sloping one, overlooking San Francisco Bay on the west and adjacent to a wooded creek bed on the north. Access is from a public street below, with a front entrance via stairs (top left) and a family entrance through the dining patio (top right). The master bedroom (above) is flanked by a deck.
Criteria for design of proprietary nursing homes based on study of patients' needs

An advanced concept for nonprofit residence and care for the aging (page 189)

Metropolitan hospitals redesigned for teaching and research (page 194)

Clinics, rehabilitation and medical centers

Nursing Home Criteria Based on Patients' Needs

Planning of nursing homes is getting new re-attention. Detailed analyses of patients' cases and needs are being translated into architectural forms. Increasingly successful applications of rehabilitation techniques—physical, mental and social—to nursing home patients are changing the image of custodial care facilities and calling for new space allocations. One research project that has already affected the design of new nursing homes is reported here.

In order to develop a correlation between patient needs and architectural form, Dr. Michael B. Miller and architect William N. Breger analyzed the care required by the patient population of the Rockland Nursing Home and Cottages in Garnerville, New York, an institution primarily for the mentally ill aged. Dr. Miller is proprietor and director of the Rockland home and of the Miller Center for Nursing Care in White Plains, New York, also assistant clinical professor of rehabilitative medicine at Albert Einstein College of Medicine. Breger is professor of architecture and chairman of the Department of Architectural Design at Pratt Institute. Both are members of the board of trustees for the Research Institute for the Care of Prolonged Illness, now in its third year of development in Warsaw, Indiana.

The White Plains establishment (page 185), designed by Mr. Breger and opened in December 1963, was the first application of principles examined by the Rockland study. A second evolutionary step in the design application of those principles is being developed in plans for a new building at the Rockland site embracing all the functions of both intensive care and cottage facilities. Current stage of this design is the round building shown on page 187.

Basic data of the study consisted of individual diagnoses of 90 patients at the Rockland Nursing Home and Cottages. This institution consists of four separate structures on approximately nine acres of semi-rural land 40 miles from New York City. An intensive care facility houses 41 patients while three separate cottages are assigned to patients capable of substantial self-care. The study covered all patients' records from January through June 1962 and included all new admissions, deaths and discharges.
Although the statistical sample is not large, Miller and Breger point out that the diversity of diagnoses is quite typical of similar institutions. At Rockland there were 63 females and 27 males with an average age of 75. There were 13 patients under 65 (youngest, 34) and eight patients over 90. Major medical and nursing management problems concerned the physical and behavioral manifestations of arterial diseases of the brain and/or the heart. Although 31 per cent of patients were admitted with other kinds of impairment (arthritis, cerebral palsy, sensory deficits, etc.) which were of diagnostic importance, they formed no single major group of medical management significance. Heart disease was significant in 38.8 per cent of the population while brain involvement, manifested either in the behavior typical of senility or in the disabilities typical of the stroke patient, was seen in 84.4 per cent of the patients. This overlap is typical of the multiple organic involvement of nursing home patients.

The analytical procedure was to assess physical and mental disabilities of each patient using arbitrary scales of gradation from 0 to 4 in each category. Grades were related to the degree of medical and nursing care required. In the mental or behavioral category, 0 denotes little or no impairment of judgment, memory, orientation or social relations. The scale proceeds with increasing degrees of impairment up to grade 4 indicating a memory content of less than 5 seconds, severe impairment of judgment, confusion, disorientation and anti-social behavior. In this mental scale, it was found that only 13 patients (14.4 per cent of the whole population) could be classified as in the relatively unimpaired 0 or 1 categories. The remaining 85.6 per cent required significant degrees of medical and nursing supervision. More than half of all patients showed brain damage.

Similarly, a grade analysis from 0 to 4 was made of the abilities of patients to perform the physical activities of daily living such as feeding, dressing, locomotion, bathing, etc. It was found that 32.1 per cent of all patients could be classified as having grade 0 to 1 impairment; that is they were substantially self-sufficient physically. The rest required substantial or total nursing care for physical deficits.

Charting the combined physical and behavioral assessments of each patient showed that groups could be assembled reflecting various degrees of nursing and supervisory requirement. It was found that four such groups would divide the Rockland population into workable units for which various architectural arrangements might logically serve the various engagements of staff for intensive or custodial nursing, physical or occupational therapy, social and family counseling, etc.

Group distribution at the start and finish of Rockland observations is shown in Table 1 with an indication of the amount of time average individuals in each group are engaged in the various categories of medical including physical and occupational therapy. About 25 per cent or less of nursing care devoted to bedside custodial techniques of feeding, dressing, shaving, etc. The balance, representing more than half of nursing and medical activity, was related to social and behavioral supervision and family counseling.

### Table 1 — Distribution and Care Patterns of Therapy Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Impairment Rating</th>
<th>Percent of Patients at:</th>
<th>Per cent of individuals' time spent:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phys.</td>
<td>Mental</td>
<td>Start</td>
</tr>
<tr>
<td>1</td>
<td>0-2</td>
<td>0-2</td>
<td>27.8</td>
</tr>
<tr>
<td>2</td>
<td>3-4</td>
<td>0-2</td>
<td>14.4</td>
</tr>
<tr>
<td>3</td>
<td>3-4</td>
<td>3-4</td>
<td>37.8</td>
</tr>
<tr>
<td>4</td>
<td>0-2</td>
<td>3-4</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Some Space Criteria

**Bedrooms:** Dr. Miller, in approaching the question of single bedrooms versus double or multiple rooms, points out that the present study, as we have seen, indicates an over-all preference for the double bedroom. Patients experience social location upon admission to a nursing home, and double or multi-bed rooms provide some stimulus against withdrawal. Also, for reasons of safety, patients who are 75 or over should not be housed in single rooms. Certainly, he says, patients in the behavioral categories 3 and 4 should never be in single rooms. Conceivably patients who are in the physical and emotional categories 0 to 2 (group 1 in study) could function well in private rooms. They should also be single rooms for contagious isolation and terminal care.

Since the severely handicapped require medical aids for movement, the area per bed should be greater for the physically disabled than is necessary for the physically intact.

**Storage space in patients rooms** is of two types, vertical space for outer clothing and horizontal dressing space for other clothing, personal effects and nursing accessories. Patients in the physically handicapped group require an increased amount of horizontal storage space for indoor clothing and nursing. Patients with severe behavioral handicaps require proportionately more storage space both vertically.
iller Center for Nursing Care, William N. Breger architect, is a facility for the chronically disabled. On a corner site in an residential area close to shopping and to five other medical facilities, it houses 66 patients about equally divided between needing intensive medical care (first floor) and those who can use small-group day rooms and therapy spaces on the second floor.

Photos (below right) show day room with adjacent bedroom, also multi-purpose day and community room near lobby.

Wash Basins in or near patients' rooms provide a hygienic measure for staff and patients. Even the severely handicapped can use a basin where it is accessible from a wheelchair. For patients with little or no physical disability, basins can be located in toilet areas where accessibility is no problem. In bedrooms for patients with organic brain diseases, consideration might be given to placement of the basin in an exposed area where supervision is easier.

Toilet facilities: Although patients in the 3 and 4 ranges on physical and behavioral scales have considerable difficulty in reaching and using toilet facilities, many in this group are trainable in the use of standard facilities when they are easily accessible.
Since the group as a whole comprises more than 35 per cent of the total population, it is recommended that two types of toilet and lavatory facilities be considered for quarters assigned to groups 2 and 3. About \( \frac{3}{5} \) to \( \frac{1}{2} \) the accommodations for these groups should be provided with a wall-hung bedside flush water closet with adjoining lavatory. The remaining patients should be provided with standard wall hung closet and lavatory in an adjacent room.

Toilet facilities for patients in group 4 who are physically intact but with organic brain disease (about 20 per cent of the total population) can be similar to those for group 1, since most of the patients in this category are trainable in the use of standard facilities.

Dr. Miller says: "In the highly important area of toilet function, related to the needs of a chronic care facility for the aged, our concern has been to provide: (1) freedom and accessibility for patients capable of using toilet facilities; (2) design of toilet facilities and of equipment for the severely handicapped with intent to virtually abolish the need for bed pans and commodes. The bedside flush toilet may represent an important advance in this direction for extreme physical disability."

**Bathing facilities**: Although patients in group 1 are both physically and mentally intact and conceivably could wash and bathe in an unsupervised facility, no nursing home patient should at any time shower or bathe unattended. This is a conclusion based on accident experience, administrative and medical-legal considerations. Supervised bathing facilities, then, can be located to accommodate staff efficiency rather than in close proximity to patient quarters. Patients with severe physical and mental disability require double or triple the nursing personnel to accomplish the bathing functions. It is recommended, therefore, that per patient bathing facilities for these groups be increased as compared to those for group 1.

Bathing and toilet facilities for all patients should include safety measures such as grab bars, elimination of shower bases, water controls removed from patient access, etc. Bathing facilities for physically disabled patients should include wide tubs with mechanical lifting devices, preferably of the quiet hydraulic type rather than noisy apparatus that can induce apprehension. There should also be an arrangement suitable for use of water-proof wheelchairs, shower facilities.

**Community rooms**: Since 65 to 90 per cent of day patient care is represented by functions of the therapeutic community rather than medical-nursing procedures, major planning emphasis should be placed on the inter-personal environment as well as on physical environment. Hence, the architectural qualities of community rooms should simulate living areas but with variety accommodating various group functions and control problems. Location of community rooms where supervision is readily provided especially important for ambulatory patients in agitated or confused behavioral groups. The totally intact require less supervision and should have direct access to outside walks, lawns and sitting areas as well as direct access to bedroom areas where personal effects are stored. An auxiliary pantry should be provided with full access to group 1 patients.

For group 2, community rooms may be required to serve additional functions for physical or occupational therapy. Hence, they should be somewhat larger or have adjacent specialized space for therapy. The allocation of space for community room dining for this group may be somewhat less because of a certain amount of bedroom dining. Pantry facilities for this group should be under nursing supervision because of physical difficulty in managing pantry facilities.

Supervisory control of the community rooms for groups 3 and 4 is important, especially for group 4 because the rooms are used for procedures in supervision. Since group 4 is ambulatory and requires close nursing supervision, the community room, bedrooms, and access to the outdoors shall be under close control from the nurses station.

Only groups 2 and 3, the physically disabled, have any substantial space allocation for utility room, nursing and medical functions.

Although the conventional nursing duties for groups 1 and 4 are a minimum and may require nursing station space than might be allocated for groups 2 and 3, there should be space for records charts and for minor medical and first aid treatment.

General storage space for linen, wheelchairs, and medical supplies is important. Supervised or under close control from the nurses station.

Method of relating space allocation to patient capacities and nursing care requirements demonstrated for groups 1, 2, and 3 at Rockland. Legend: F. — family therapy or counseling; S. A. — storage area, general; C. E. — controlled environment; others obvious. Physical mental ratings (2P, 2M, etc.) of groups are members' maximum impairment ratings on a scale from 0, no significant impairment; to 4, near total disability.
thers, braces and housekeeping supplies is allo-
on a rational basis. Group 2, for example, d require approximately twice the space for and dirty linen as group 1. Group 3 would re-
the greatest storage space for all groups be-
of heavier linen usage as well as dependence wheelchairs and other appliances.

Instrument rooms are not required for extensive pro-
res, since most examinations in a nursing home conducted in patient bedrooms. They would not arily be required for groups 1 and 4, but may lly be provided for the physically handicapped ps, preferably near the nurses stations.

Family counseling is an important function of the ssional staff in a chronic disease facility. Fam-
ounseling is conducted either jointly with the red patient and family or separately with a y in conference with a psychiatrist, social er or family physician. It is important to pro-
adequate space for family counseling as a fea-
of the nursing unit and near the nurses station.

Group space: The total community gains ther-
cue value when opportunity is provided for interes-
 activities in addition to all the spaces assos-
with groups and their nursing stations. Space e activities as religion, entertainment or joint y experience should be provided, preferably ccess to the outside community so that lec-
demonstrations and volunteer functions may ried on.

Schematic guide to space allocations and con-
in accordance with the Miller and Breger cri-
outlined above is suggested by box diagrams for s 1, 2 and 3 at the bottom of the opposite page.

Architectural Translation

The Miller Center for Nursing Care shown on page nd the new Rockland Nursing Home shown at both designed by Mr. Breger, represent the tility of vocabulary through which some of the ples underscored by the Rockland observations e translated into architectural form. In com-
ng on his approach to the design of chronic facilities, Mr. Breger says:

may surely be accused (even by myself upon on) of a dreadful cultural lag in that I still be-
that form follows function. I think, however, are two modifications of this proposition that e mentioned: (1) it is not really that there is rm stipulated by a functional analysis but a f forms. It is the designer's choice that consti-
the architectural manifestation; (2) the func-
of a building are more than structural or utili-
The designer must choose what emotive func-
are meaningful. But this depends on its social

The new building to be erected on the spacious rural site of the Rockland Nursing Home and Cottages is a round, two-level design by William N. Breger to house about 90 patients in three care-related space types. Upper level, with off-center open court glazed for full view of floor from nursing station, houses intensive medical cases near station and general medical or behavior problems near the court. Lower level has sleeping, living and community rooms for patients who can use out-of-doors
purpose. Thus, a church's main function might be the emotive experience. In a chronic care facility, I believe this is quite secondary.

"The contents of nursing homes are sui generis. The values and formal expression should be as well. The new Rockland building is a circle, perhaps the most coercive formal pattern we know. Yet it was arrived at from Dr. Miller’s and my own analysis of behavioral patterns of patients, medical care, social environment and economy. Many forms may have solved these functions, but I chose this one.”

The Rockland building, on a rural setting, will house a population spatially divisible into three types requiring: (1) intensive medical care (about 20 per cent comprising group 2 and some of group 3); (2) general medical care but intensive observation for behavioral difficulties (about 50 per cent assigned from groups 3 and 4); (3) limited medical or behavioral problems requiring mainly custodial care (about 30 per cent, group 1).

In contrast, the White Plains establishment is on a small site in an urban residential area with nearby shopping and hospital facilities. It houses 66 patients, half requiring intensive care for serious disabilities, the other half needing a minimum of bedside nursing care. Both of these patient categories derive special benefit from the location and character of the building. Those in the first-floor intensive care section, although served by in-house laboratory and X-ray facilities, have the additional advantage of special and consulting services from five convenient medical, mental and rehabilitation institutions. More active patients on the second floor relate readily to each other in multiple activity rooms and to community outside through balconies and outside walks, general purpose space near the reception area, occasional shopping trips, and full-time social family counseling personnel.

The Rockland research, then, limited though sampling is acknowledged to be, has documented principles which the researchers are putting to test. Both Dr. Miller and architect Breger underscore the need for broader and deeper studies of many-faceted problems confronting nursing architects, physicians, staff and patients.

More Research

One step in the direction of further study of nursing home problems is the Research Institute for the Care of Prolonged Illness, now in effectuating stage, financing and organization in Warsaw, Indiana. The institute is a nonprofit endeavor separate from both the Murphy Medical Center. Both Mr. Breger and Dr. Miller are on the board of trustees. It will be housed in the two-floor building shown below, designed by Mr. Breger as a completely flexible space in which various physical arrangements for nursing care can be tested in conjunction with medical and nursing research.

William N. Breger's building for the Research Institute for the care of Prolonged Illness in Warsaw, Indiana, is a two-level scheme with offices, class rooms, storage and food service on the first floor, and a column-free second floor for which vierendeel frame above and suspended ceiling below provide complete flexibility of utility supply serving experimental layouts of nursing floors (above). Plan 1: (a) open room; (b) single room; (c) service; (d) 3-bed room. Plan 2: (a) open ward; (b) service; (c) radial nursing unit.
NEW CONCEPT IN HOUSING AND NURSING SPACES

Bellevue House is the first limited-profit housing project, combining dwelling apartments for the active elderly in the same building with nursing home facilities, to be financed with New York State aid. Architect Joseph W. Weiss developed plans for this 17-story building in such a way that occupants of the two categories of space can enter and leave the premises and live their separate lives without interfering with or even encountering one another. It represents the culmination of a long and thoughtful development by the architect, who is chairman of the A. National Committee on Housing the Aged, the sponsors, the Isabella Home for the Aged, a limited-profit nursing home founded in 1875.

Commissioner James W. Gaynor of the New York City Division of Housing and Community Renewal said: "We are proud to participate in this pioneering project . . . We hope it will serve as an example by showing feasibility of providing living for the aging in a setting where medical and institutional care are available if needed."

The new structure will occupy a 1.6-acre site adjacent and connected by passageway to the original Isabella Home on 190th Street in New York City. The older building will provide community center spaces for apartment dwellers and will continue to serve its present patients, but with added medical facilities in the new structure.

Essence of the plan, says, Mr. Weiss, exploits the fact that the land around the building is one story below street level. This permits street access for apartment dwellers and basement access from garden level for nursing home occupants and services. Two separate elevator systems permit development of the two occupancies virtually independent of one another.

Apartment dwellers will enter at the street or first floor level which contains lobby, community room and central dining room. A doctor's office suite of conventional layout for convenience of the active elderly. Also on the first floor are three residence apartments for nurses who are employed to serve nursing home facilities but are housed near the apartment lobby so that tenants can ask them for occasional minor services.

Only the basement, first and second floors have access from both elevator systems. Elevators to apart-
s are entered from the first floor lounge, bypassing the third, fourth and fifth floors where nursing quarters are established, and providing service apartments on the sixth floor and above. These torors provide convenient access to the basement where there is a canteen, tenant storage and a small laundry-sitting room for neighborly exercise. They also open to the clinics, shops and offices on the second floor which can provide services to the categories of occupants.

The basement floor provides vehicular access to a parking garage for nursing home traffic. From here, elevators provide service to the nursing home floors, two through five, with access also from the first floor for personnel.

Patients' quarters on the third, fourth and fifth floors have double and single rooms for nursing home occupancy. Each floor has its dayrooms and dining rooms. A few rooms on the fifth floor are equipped with full toilet and bathtub facilities for occupancy by patients with adequate physical capacities and/or private nursing attendants. Other rooms on these floors have toilet and wash facilities with a central bathing area for supervised tub and shower bathing.

Apartments on the 6th to 10th floors are mostly single room efficiency residences. There are two lounges with adjacent kitchenette or home laundry facilities on each of these floors for occasional socializing, but all residents contract to eat regular meals in the main dining room on the first floor. There are two-room apartments on the 11th to 16th floors. These apartments have their own kitchenettes but residents are also expected to eat regular meals in the main dining room.

Apparent in the design of both nursing home and apartment floors is unlimited flexibility for conversion from one type to another with minimum structural or utility rearrangement.
In this one-story building, open courts and spacious dayrooms provide a residential character which gives positive support to an active rehabilitation program for 210 aged mental patients. The building, in fact, has performed so well that rehabilitation has acquired an increasing emphasis over five or six years of its operation.

In framing the program, Dr. Hyman Pleasure, director of the hospital, said: “We wanted a building which would express the new permissive therapeutic activity and optimistic attitude toward the patient which help get him back to his family and society. We believe that a dynamic approach should be as successful with geriatric cases as it has been with other types of mental illness. That premise is proving true in this building where we have achieved a discharge rate of over 50 per cent for selected patients of good prognosis.”

The building is made up of four dormitory units in two H-shaped wings connected to a square central unit built around a planted patio. Off-white brick is used on the central unit and for the long walls of the dormitories. The connecting corridors and the end walls of the dormitories are done in red brick, forming a pleasant contrast. Long window walls open up units and provide excellent lighting and cross-ventilation. Windows are framed in aluminum, and fascia is the same material.

The dormitory units, each with two 25-bed slinng rooms, are further divided into six-bed space partitions. The central part of each dormitory is a large, well-furnished dayroom which can be supervised easily from a nurse’s station. All rooms look onto well-kept lawns and wooded hills.

Crosspieces of the dormitory H’s contain rooms for bathing, storage space for linens and clothes, and two or three small bedrooms for any who come ill.

Lobby and reception areas are in the central adjacent to a large assembly space used for visits during the day and entertainment in the evening. Dining space in the central unit is planned as areas to give homelike scale and facilitate serving. Food is prepared in a central kitchen in and building and brought via connecting corridor serving area in the central unit.
Geriatric Building, Middletown State Hospital
Middletown, New York

ARCHITECTS: Ketchum, Gind & Sharp
Morris Ketchum Jr., partner in charge

ASSOCIATE ARCHITECT: Addison Erdman

STATE ARCHITECT: Cornelius J. White

LANDSCAPE ARCHITECT: Robert Zion

STRUCTURAL ENGINEERS:
Severud-Elstad-Krueger

MECHANICAL & ELECTRICAL ENGINEER:
John D. Dillon
The new Bellevue Hospital in New York City will be a single, block-type structure of 2,000-bed capacity replacing all of the eight pavilions currently used for patient care. Although Bellevue is perhaps unique in size and scope, having teaching and research facilities for three universities in addition to serving as city hospital for an extremely large population, it embodies solutions to problems which are confronting many growing metropolitan areas.

The single-building concept grew out of an urgent need to improve the efficiency of operation of the complex and to integrate teaching and research functions with large hospital operation for the better advancement of the professions and better care of patients. Horizontal, inter-building traffic patterns at Bellevue had reached a degree of complexity that imposed extremely high costs in personnel and maintenance. By taking advantage of advanced systems of vertical transport and a variety of conveyor systems for distribution of food and supplies on each floor, the new 25-floor structure is expected to amortize its construction cost in 10 years of annual savings in the operating budget.

The floor size of approximately 65,000 square feet per floor was determined by the space needs for 180 bed patients together with all their necessary medical, research, teaching, food service and administration spaces. Inquiry among those responsible for research at the three participating universities (Columbia, Cornell and New York University) determined that 180 beds would provide a workable load in each of the general categories of research. Since an establishment of 180 beds constitutes an economically operable hospital in itself, each was designed to contain its own supporting services including X-ray, radiation laboratory, administration, kitchen, etc. This arrangement will make possible to keep patients on one floor for all diagnostic and treatment procedures except major surgery and radiation therapy. Thus, elevator travel by patients will be kept to a minimum while conveyor systems reduce the need for both vertical and horizontal travel by personnel.

Since daylight is of major importance only to patients while supporting functions can be carried on as well if not better in artificial light, patient rooms are arranged along outside walls and supporting services are located in the central area of each floor. This deployment sets the need for complete air conditioning, and efficiency of the arrangement justifies the expense.

The Bellevue site is confined to four blocks...
2ND FLOOR: O.P.D.

ARCHITECTURAL RECORD April 1964
Bellevue Hospital Center
New York City, New York
OWNER:
The Department of Hospitals, City of New York, Hon. Ray E. Trussell, Commissioner; Project Supervision, Department of Public Works, Bureau of Engineering Construction; Albert B. E. Berne, Commissioner; Alexander W. Berens, Architect-Hospitals; Nathan G. Gottesman, Architect
ARCHITECTS:
Pomerance & Breines; Katz Water Straus—Joseph Blumenkrantz; Timoney; Lewis Alan Berne, Administrator
LANDSCAPE ARCHITECT:
Robert S. Malkin
MECHANICAL ENGINEERS:
Syska & Hennessy, Inc.
PLUMBING AND ELECTRICAL ENGINEERS:
Guy B. Panero, Inc.
ACoustics:
Michael J. Kodaras, Inc.
FOOD SERVICE:
Howard L. Post Associates
About 22 acres on the eastern shore of Manhattan Island. It is separated from the East River by Franklin Delano Roosevelt Drive and is bounded west by First Avenue. Existing buildings are planned that only the present parking lot is available for new construction, a site of approximately acres adjoining the FDR Drive. This location permits construction and occupancy of the new hospital before demolition of the old buildings is required. The present land occupancy of nearly 43 per cent will then drop to 34 per cent.

Specific traffic patterns will allow complete separation of trucking and passenger traffic. Trucking and discharge will be to a covered service at cellar level, fully concealed from above-view, allowing isolation of noise and screening of handling of refuse.

Passenger access by ambulance or automobile will ground level close to related functional divisions of the new structure. A helicopter landing area of the new building will make possible the transportation of accident victims to the emergency treatment station. Pedestrian access and circulation will remain at First Avenue from which a new garage and parking facilities. The new building will be a multi-level, self-parking, open-face garage, first stage of which has already been built (1964, pages 164-166) to replace the parking area being used to construct the new hospital. Patient areas and Day rooms are placed peripherally around a continuous corridor. There is no rigid concept of fixed nursing units. Patient areas are served from nursing posts, each of which consists of a nurses' station, a doctors' station, a treatment room and utility room. Variable numbers of patients can be assigned to these posts on the basis of degree of care required. Hence, a progressive care section can be instituted on each floor as required.

The center of each in-patient floor contains two elevator lobbies. One of these will have 10 elevators for staff, personnel and visitors. The other will have six elevators for in-patients and for service. Outpatients will be served separately by four elevators.

The identical shape of each floor plan permits easy adaptability to fluctuations in case loading for various categories of patients: acute, long-term, psychiatric, etc. Similarly, on-out-patient floors, the peripheral arrangement of examination and treatment rooms around contiguous waiting areas permits flexibility in the number of treatment stations assigned to specific clinical loads.

The loft-like structure, without wings or setbacks, although primarily based on efficiency of patient care, has other important economic advantages. A uniform structural system of steel and concrete in 24-foot bays with walls of precast, exposed aggregate concrete provides a low-cost structure. Cubic shape gives a low ratio of wall to content, with consequent savings in heating and cooling costs. Starkness of the concrete cube is offset by the textured rhythm of orderly variation in sill and floor heights.
Program assignment for this institution was to integrate functions of a 315-bed hospital, a diagnostic clinic, the Olin Culberson Research Center, the Temple Division of the University of Texas Post-Graduate School of Medicine and the Scott and White School of Nursing. All of these were to be drawn together from some 31 scattered buildings and meshed as an operating whole in a single new building on a suburban site of about 300 acres.

Basic plan of the building is a two-story tee at the base of which a clover leaf of three octagonal towers rises five additional stories. Stem of the clover leaf is a rectangular tower housing elevators and ancillary spaces which serve radial nursing units on each octagonal tower floor. Spine and head of the tee carry a third story of obstetrical and pediatric facilities. The basement level extends as a wing above the down-sloping grade at the rear of the tower section. It houses mechanical and utility spaces, emergency reception, medical library, radiation and hydrotherapy, doctors quarters, etc.

The two main floors are devoted principally to diagnostic clinics, and consultation and examining rooms for 65 staff specialists, and 40 intern and resident physicians who function in group practice. Administration offices are in the glass-walled main entrance level, and the major portion of the 15th floor above it is devoted to surgical and related services.

Evolution of the radial nursing unit began at the Methodist Hospital and Mayo Clinic in Rochester about seven years ago as a quest for means of meeting the need for 24-hour special duty nursing. A radial unit with central nursing station permits constant observation of patients to be handled in active hours of the day by ward nurses. All the Scott and White towers comprise the large application of radial units to date, Ellerbe Architects who participated in the Rochester program, cite subsequent experience with radial units at some 20 hospitals. The radial ward, they point out, has resulted in a marked reduction of distances walked by nurses during a one-day shift. Also, contrary to early expectation, patients are actually visited by nurses frequently because patients can see when a nurse is free and call her without interrupting other duties.
White Memorial Hospital and
Wood and Brindley Foundation, Temple, Texas

ENGINEER: Wyatt C. Hedrick
ARCHITECTS: Ellerbe Architects
CONTRACTORS: H. A. Lott, Inc., with Drake and Piper
RETRAINING CENTER EXPLOITS A SLOPING SITE

The Caruth Center provides all types of physical rehabilitation with special emphasis on vocational retraining. It is on a four-acre sloping site which permits a two level arrangement separating the basic functions of the center. Administration and living spaces are on the upper level while therapy and vocational training spaces are on the lower level, each with a separate main entrance. Two passenger elevators and one service elevator provide vertical circulation.

Initial construction provides 28 beds for in-patients with therapy spaces sized for an extensive outpatient program in physical therapy, occupational therapy and hydrotherapy. Each patient's program at the center is individually evaluated at prescribed intervals during a time which may last from several weeks to several months.

An outdoor area serves the therapeutic program through variations in paving and slope for training in handling wheel chairs and other locomotion devices. The area contains a typical street cross-section. Other training areas include rooms devoted to activities of daily living and typical home situations. Most of these training spaces are on the ground where they are readily accessible to all.

The module of design was the wheel chair. Doors, doors, lavatories, and furniture are sized and spaced to accommodate wheel chair patients. An exterior concrete ramp is provided as an escape at the north end of the nursing wing.

Structure is reinforced concrete frame with a way dome slabs exposed in the major rooms. They are on 12-foot modules with a two-way concrete system. Walls are cavity masonry.

The entire building is air conditioned with a central hot and cold water system serving fan-coil units in interior zones. Structural planning provides for future expansion to more than double the present area.
Memorial Rehabilitation Center, Dallas, Texas

Dallas Rehabilitation Institute

Architect: Howard R. Meyer

Civil Engineer: Frank W. Chappell

Structural Engineers: Leo L. Lundum & Associates

Mechanical Engineers: Hunt and Joiner, Inc.

Consultants: Mason-Johnston & Associates

Contractor: T. C. Bateson Construction Co.

General Contractor: Natkin & Company

Contractor: Hall-Fisk Electric Co., Inc.

1. Recreation court
2. Ramp down
3. 6-bed room
4. Bath women
5. 2-bed room
6. Bath men
7. Nurses station
8. 3-bed room
9. 1-bed room
10. Living room
11. Television room
12. Activity room
13. Porch
14. Doctors offices
15. Examination rooms
16. Staff lounges
17. Snack bar
18. Kitchen
19. Conference room
20. Office
21. Cafeteria and auditorium
22. Speech and hearing space
23. Reception and waiting
24. Administration

Physical therapy
2. Physical therapy office
3. Day students lounge
4. Day students lounge
5. Brace fitting room
6. Testing & O.T. student lounge
7. Hydrotherapy
8. Occupational therapy
9. Activities of daily living
10. Occupational therapy office
11. Mechanical equipment
12. Central supply
13. Pharmacy
14. Office
15. Brace shop
16. Storage
17. Ground floor entrance
18. Service entrance
19. Clean linen
20. Laundry supply
21. Visual education
22. Vocational training office
23. Upholstery shop
24. Prevocational testing
25. Kitchen supply
26. General shop
27. Industrial training classroom
28. Electrical shop
29. Arts and crafts
30. Business administration classroom
31. Unfinished
COURTS AND CLASSROOMS AID REHABILITATION

This is a full scale rehabilitation center offering a wide variety of therapeutic and educational services for all ages. It provides a 72-bed facility of 57,639 square feet on a single floor replacing a 25-year-old establishment formerly at Chino, California. Site for the new building is 10 acres, formerly an orange grove. Separate structures for laundry and garage comprise an additional 4,500 square feet.

A system of arcades and courts provides orderly separation of nursing, educational, administration and therapy spaces with a unifying relationship to the out-of-doors. Outdoor privacy is assured by plantings and walls between parking and exterior courts.

Services include programs in physical therapy, occupational therapy, prevocational testing, speech and hearing analysis, psychological services, complete school curriculum for grades 1 through 12, which is carried out through the cooperation of the Pomona school district.

Spaces for therapy and education are sized to accommodate an extensive out-patient program. The hydrotherapy wing is especially equipped with hydromassage tanks, whirlpool baths and a large therapeutic swimming pool equipped with special devices.

Construction is of reinforced concrete with exterior walls, slab floor, wood and plaster in partitions except in the hydrotherapy wing which is framed in steel. The building is completely air conditioned by a 14-zone system of chilled and hot water piping to air-handling units in each zone.
Casa Colina Rehabilitation Center, Inc.
Pomona, California

ARCHITECTS:
Henry L. Eggers and Walter W. Wilkman

LANDSCAPE ARCHITECT:
Victor H. Pickney Jr.

CIVIL ENGINEER:
H. C. Vanden Bossche

STRUCTURAL ENGINEER:
Donald Douglas

MECHANICAL ENGINEER:
Thomas H. Perry

ELECTRICAL ENGINEER:
Stuart B. Eddy

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A TWO-LEVEL CLINIC FOR COMMUNITY SERVICE

The Fairmont Clinic is an out-patient facility, open to the public but charged primarily with providing full medical services for United Mine Workers members and their families. There is no overnight care.

Offices and examining rooms are provided for surgeons, internists, ear, nose and throat specialists, eye specialists, obstetricians, pediatricians, dentists, psychiatrists and social workers. The 16 doctors' offices are grouped together on an upper level of the building, serviced by both stairs and elevators.

On the ground level are facilities for emergency, minor surgery, radiology, physical therapy, laboratory and reception.

In the rear wing, which because of the site conditions is actually the upper level, are located administrative facilities and such staff facilities as a library, conference room and a lounge.

The building is located on 2½ acres fronting on a narrow but heavily traveled highway directly across from the Fairmont General Hospital. While some of the patients will come by bus, most will arrive by automobile. This indicated that three types of parking were necessary: (1) convenient entrance parking for patients; (2) in-and-out parking for doctors; (3) all-day parking for supporting staff.

Because of the site contours which are relatively flat across the front and to a depth of less than 30 feet, but rise steeply over 30 feet higher than the road to the rear of the property, it seemed appropriate to provide for patients and doctors high-level parking and the staff at the upper level, accessible by a minor street at the rear. To accommodate an adequate number of cars, it was necessary to use the roof of the rear wing-deck parking facility from which a stair deck leads to the upper level of the building.

Because the building can be observed both from the highway and from above on the hillside, the roof was developed for the main building with overhangs to reduce solar heat gain. The attic created is used for air-conditioning equipment and elevator machinery. The building is a steel structure with precast panels on the ground floor and steel wall panels on the second floor.
Medical Facilities

Mont Clinic, Fairmont, West Virginia

Architects: The Monongahela Valley Association of Health Centers

Engineers: E. Todd Wheeler and The Perkins & Will Partnership

Architectural Record

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CLINICS AND OFFICES FOR A COUNTY CENTER

The Topeka-Shawnee County Health Center is an adjunct of a county health complex which includes a general hospital and a nursing school. The site is centrally located in the city, and the building is intergrated into a medical facilities program being developed to serve an ultimate population of 170,000 persons.

The building consists of a one-story clinic wing attached through lobby space to a two-story wing housing offices and classrooms. A large lecture hall at one end of this wing is two-stories high, acoustically treated and divisible by folding partitions into two separate rooms. Public health nurses and dietitians have office space on the second floor of office wing. A multi-use food service area on the floor will be a demonstration and education facility for food handlers. Regular meals will be served through automatic food dispensing machines in the dining room.

The clinic was planned to allow one physician to serve three examining rooms. An underground tunnel connects the health center to the nearby general hospital which will provide supporting laboratory and certain treatment services.
Architectural Engineering

“Built Environment”

Instead of separate and partial approaches to what is essentially an integrated set of problems, the time has come to study all research problems of “built environment” in relation to each other. This thinking of The Royal Institute of British Architects has led to its call for the setting up of a research council to cover physical planning, architecture and construction. Building technology in Britain is at present served by the Building Research Station, a part of the Department of Scientific and Industrial Research; and it is the Institute’s view that this organization should now become part of this proposed research council. A budget of at least $14 million a year was suggested for the council.

“Flexibility For What?”

What is flexibility and how much of it is really valid in a new college science building? This question is examined by Bernard Asbell in an article on college laboratories appearing in “Bricks and Mortarboards,” a new Educational Facilities Laboratories publication. One architect who advocates a careful interpretation of the current architectural catchword flexibility, is William W. Caudill. The following illustrative incident is described by Mr. Asbell. Mr. Caudill was being interviewed, along with other architects, for the assignment of a proposed 1.5 million dollar structure. The interviewing faculty committee at Colorado College had already fixed upon the guiding design principle of flexibility. At each mention of the word “flexibility,” Mr. Caudill asked, “What do you mean by that?” Jotting down the various attributes of flexibility elicited from various committee members, Mr. Caudill showed them that the list contained contradictions, solutions to problems they did not face, and solutions that concealed other problems. Furthermore, the cost of each “solution” was itemized, and the ideas far outran the budget. “It’s obvious,” he said, “that flexibility is a big word that means many more things than you, perhaps any college, can buy. In fact, it means more things than you need. I suggest we start all over again and ask, ‘Flexibility for what?’” Later, Mr. Caudill (who got the job), had the committee dissect the word flexibility into all the major things it may mean. These include expandibility; changes in the relative demand for physics, chemistry and biology space, or for merging these spaces for biochemistry, biophysics or physical chemistry; and providing each discipline with services it does not now need but may need later, such as air conditioning or various electrical currents.

High-Pressure Oxygen Chambers

A million-dollar hyperbaric or high-pressure oxygen facility has been designed by a Borg-Warner Corporation research team for Lutheran General Hospital at Park Ridge, Illinois. Hyperbaric oxygen research and therapy involves a relatively new procedure. In such treatment, a patient is placed in a pressure chamber and subjected to as much as three times normal air pressure by means of air compression. The patient is then given pure oxygen to breathe through an oxygen mask. Under these conditions, the patient’s blood carries 15 times the oxygen that it normally does. Research in this technique indicates potential value in patients with impaired circulation such as “blue babies,” for sufferers of shock, burns and strokes, and other bodily disorders. The Park Ridge system consists of three horizontal cylindrical steel chambers. The largest of these chambers is 41 ft long and 10 ft in diameter and serves as an intensive medical care center with a six-bed capacity. The second, smaller chamber is a surgical chamber, designed to accommodate two simultaneous operations, in organ transplants. The third chamber, 24 ft long and 10 ft in diameter, is a recompression and research room.

This Month’s AE Section

TROPICAL CLIMATE CONTROL TECHNIQUES

Sunshading and natural ventilation methods show prominently in five buildings in India

By Benjamin Polk, A.I.A.

Southwest orientation of Star Paper Mills in Saharanpur required a combination of horizontal and vertical surfaces to exclude unwanted sun but let in the daylight.

Evaporator house at same plant gets natural ventilation through vertical slots. Machinery is enclosed, so facade gives only minimum protection against sun and rain.

Building design techniques for coping with the adversities of tropical climates can emerge naturally from the basic functional requirements rather than be merely an ornamental applique. This point, we believe, has been made in a number of buildings our firm has designed in India, both in hot-dry and hot-wet areas of which are illustrated in this article.

These buildings have been designed to shut out fierce sun, soon rains, wind-driven dust; to provide comfortable daylighting; to take advantage of breezes to reduce interior heat and humidity. Natural techniques have been combined with structural and economic considerations and offer an id basis for esthetic design of buildings.

Star Paper Mills, Saharanpur, India
Climate: Very hot in summer (115°F for about six months) and severe dust storms.

Problem: The manufacturing processes required complete enclosures for paper machines and finishing processes against dust. Maximum light was desired in the finishing house, but no direct sun rays were permissible because this would interfere with inspection of the paper. A similar requirement for the paper machine house, but it was necessary to exclude all sun.

The evaporator house needed protection against occasional severe rains and against the blaze of the sun; the process is protected against weather by the machine itself.

Solution: Structure for the machine house and finishing house is reinforced concrete using long barrel shells for the roof. To shut out unwanted sun, L-shaped U-shaped concrete surrounds are used at windows. Openings in

Benjamin Polk is partner in the architectural and engineering firm of Chad and Polk, New York and Calcutta.
Winds have exhaust fans. Windows main open all the time except during dust storms or driving rains. The main plant had to be oriented in a southwest direction, sun requiring a combination of horizontal and vertical louvers. Staggered V-louvers were used on the flying house to exclude all direct rays, while the L-shaped louvers are on the paper house. Circumferential louvers were provided in the roofs for exhaust fans and skylights. Glass in the skylights is bent wired glass, so the sun’s rays are well diffused. The scale of the design is controlled and marked by horizontal and vertical louvers, which are rainproof. Daylight comes from other sources as extensions of column and wall glazing.

Glass Ltd., Calcutta, India
Warm in winter, hot and humid in summer; no dust. Horizontal rains during the monsoon, June to September.

Provide louvers for natural ventilation which are rainproof. Horizontal bands of staggered V-louvers in precast concrete extend around the building at levels and just below the eaves. Interlocking louvers are as a sloping plane surface and outward over the gables. Space between shell roofs lets daylight and air into S. F. Products plant, Calcutta, and provides space for an integrally cast rainwater disposal trough as well as extensions of column and wall glazing.

Lipton Tea factory and warehouse in Calcutta needed maximum ventilation to prevent mildewing of their product. Interlocking louvers make sure rain is shut out.

Tea Factory and Warehouse, Calcutta, India
Hot-wet.
To prevent tea from developing mildew, it was necessary to always be maximum natural ventilation with protection from the rain.
No windows were needed for warehouse areas, but the manufacturing mezzanine was a ventilated space by raising the barrel shells up to a higher level, dividing Z-type interlocking Z-type interlocking in the face of each gable. Bent glass skylights are provided for the shells which can be retrieved with mechanical exhaust fans need arises.
Rainwater is collected in integrally cast concrete gutters which run between the shells.

S. F. Products, Calcutta, India

**Climate:** Hot-wet.

**Problem:** Constant ventilation, with protection against driving rains.

**Solution:** Independent hyperbolic paraboloid shells allow both lighting and ventilation while facilitating rainwater disposal. Six bays were possible approximately square in plan and this suggests a hyperbolic paraboloid roof system for maximum economy, durability, daylighting and natural ventilation. The structural requirement for beams in this type of hyperbolic paraboloid shell and a break between individual shells creates a succession of gable ends which were sized for a combination of fixed louver, ordinary glazing and exhaust fans. The distinguishing feature of the design was the integration of the rainwater disposal troughs with daylighting wells right through the center of the building; breaks also accommodate shell expansion joint requirements. Drainage troughs are combined with daylighting wells via separation of shells. Offering mutual protection against driving rains, the pairs of exterior facing gables have open louvered windows which are located so that there is no short-circuiting of exhaust fans. The compelling need for continuous air movement was the driving design in hot-wet climate to control excessive humidity.

**Times of India Press and Building, New Delhi, India**

**Climate:** Hot-dry.

**Problem:** Long direction of a linear plot faced west and east, so that the sun would hit the major facades head on. Both excessive solar heat and light had to be controlled.

**Solution:** There are no glass facades on the interior facing gables; there are also no glass street-side observation windows. Screened daylight and natural ventilation is provided for the west facade by having all glass face in a ziggurat pattern.
P.M.: WHAT FACTORS DETERMINE ITS SUCCESS?

The reasons have been deduced from a study of 22 case histories (Part 1)


Critical Path Method (C.P.M.) has been used and misused extensively, has produced excellent results in many applications but it has fallen of its mark in others. Why does it work successfully for some projects but for others? Who should use it? Independent consultant, architect, or contractor? How should it be applied? How should it be used to best advantage? Is it worth the effort? These are a few of the questions we will attempt to answer and at the same time reveal a pattern of successful C.P.M. applications for future guidance.

Uses of C.P.M.


Critical Path Method begins with a visual analysis of the over-all design or construction project in which arrows representing specific jobs are arranged in the order of their relative interdependence and show the time of each job. Some jobs are critical because a delay in any of them would delay the entire project. Critical jobs have no slack time ("float"). Time required for the job exactly equals the time available. All other jobs are non-critical because they have spare time. If the float of a non-critical job is used up, however, it then becomes critical. Throughout any project there are always one or more continuous critical chains—paths of critical jobs running from start to finish. This is the Critical Path.

With an arrow diagram the Critical Path can be seen at a glance. The Earliest Event Times (earliest possible starts) are in the boxes. The Latest Event Times (latest permissible starts) are in the circles. When these times are identical there is no slack for these events.

Now examine Job 4-5. The Earliest and Latest Event Times for this job's start and finish are the same. There is no leeway on either end—the time available for this job is exactly equal to the job's duration. Job 4-5, therefore, is critical. Jobs 0-1, 1-3, 3-4 and 5-7 also are critical. The shaded line shows the continuous chain of critical jobs which is the Critical Path.
Critical Path Method

HOW C.P.M. FITS IN A DESIGN FIRM

Horizontal Organization

Vertical Organization

Horizontal Advantages
1. Central planning always available without cost of specialists on one's own staff.
2. Projects are better controlled by engineers thoroughly trained in planning techniques.
3. Crossing departmental boundaries expedites planning.
4. More accurate over-all planning picture available to top management.
5. Maintains common planning language throughout the architectural firm.

Vertical Advantages
1. Planning engineers have a better understanding of the project if they are part of the department.
2. The network system is more thoroughly implemented throughout the department.
3. Project managers do not assume the Network System is just another top management spy system.
4. Innovations are possible to "custom tailor" the network system to one's own needs.
5. More wholehearted and enthusiastic cooperation results if the system is generated "from within."

3. Training and orientation of project personnel who will work the system such as architects, engineers, administrators, superintendents, subcontractors, procurement personnel, etc.
4. Arrangement for the computing equipment required to do the planning.
5. Establishing the proper organization within the architect's and contractor's offices to conduct network planning and control.

Orientation of Top Client Management. Unless your client is convinced of its value in controlling building construction, the chances of implementing C.P.M. for construction planning are extremely low. If he can see the concept, he will support it and also appreciate the results of network controlled project.

Training of Key Personnel. "From within." Unless your client is convinced of its value in controlling building construction, the chances of implementing C.P.M. for construction planning are extremely low. If he can see the concept, he will support it and also appreciate the results of network controlled project.

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control diagram for construction of a high school. Essentially it is a much simplified arrow diagram

The planning network system. This planning might logically fall under the administrative department head. Persons in the planning group function as consultants and the managers.

The procedure would be to have a consultant assigned to each project. The consultant works as an adviser to the project manager, assists him in developing his arrow diagrams for design construction. The network consultant collects input data, updates diagrams, obtains computer printouts, analyzes the output and advises the project manager in the project manager's status of the project. The project manager makes final decisions on a project to be taken.

The size of the C.P.M. planning group employed is a function of the number of projects to be planned and controlled. It has been found in practice that one C.P.M. consultant can handle three to five networks—each network containing about 1,500 activities.

Two systems can be used to properly implement a network system: the "Horizontal Method" or the "Vertical Method." The "Horizontal Method," (shown on facing page) has a separate project operations group as part of the administration department. The group then serves as plant consultants to the entire firm.

It is important in establishing such a group to place it on a middle management level. For a very large architectural firm, a section level might be adequate. For a small firm, it could become a separate department. At least middle management level is necessary to place the consultants and the project operations head on an even level with the people with whom they are dealing. Network system operation is not for part-time experts or neophytes.

The other way to organize is the "Vertical Method." As the name implies, the vertical approach integrates planning groups at every level within a design group. The structural engineering department would have their own network planning people, mechanical engineering would have their own, construction supervision would have their own, etc. In addition, within each department various levels of network planning would be employed—each more sophisticated.

A typical example of a computer printout giving three possible start and finish dates for construction jobs; critical job is circled.
ed as the management level rises.

For example, at the squad and section level, small diagrams would be used that can be hand calculated. At the project management level larger diagrams dealing with completion dates and coded sorts would be used requiring a computer. At the department level large diagrams with manpower allocations, cost expediting, and cost control would be employed. At the partner or vice presidential level, inter-project planning and master control diagrams would be used.

Implementing C.P.M. Control of Design. Whether you use the vertical or horizontal method, the following procedure usually will produce excellent results in project control of the design phase:

1. Develop arrow diagrams using the logic of the project manager and key project engineers. Take time to do this accurately and in considerable detail.
2. Implement C.P.M. from an initial computer run as the only schedule to be used for the project. Bar charts are redundant and unnecessary.
3. Update the schedule regularly every two weeks with new computer runs.
4. Hold regular planning meetings with key engineers to discuss the new computer printout and scope of work for the next week or two-week period. Each new printout should be coded for each major engineering area (mechanical, electrical, etc.).
5. Stick to the logic of the arrow diagram. If revisions become absolutely necessary, change the logic of the diagram and obtain a new computer run and new schedule. Force the design work to follow the diagram rather than the diagram following the design work.

Architects and engineers must assume a greater role in management of the construction phase of the project.

In the eyes of the client the responsibility for completing the project on schedule cannot be delegated.

Implementing C.P.M. Control of Construction. The following procedure has proven its value in producing building construction on time, within the minimum of scheduling headaches.

1. Develop a Master Control Diagram (previous page) and computer printout which become part of the specifications and the bid package.
2. Contractors must submit bids on the basis of meeting the overall project duration time established for meeting milestone dates for construction jobs.
This is Day & Zimmermann's actual arrow diagram for the design of a manufacturing plant. The critical path is indicated by the shaded line.
Critical Path Method

OPTIMUM COST CONTROL FOR DESIGN OF MANUFACTURING PLANT

PLAN A - 11 WEEKS (NORMAL)

PLAN B - 10 WEEKS

PLAN C - 9 WEEKS

PLAN D - 8 WEEKS (CRASH)

LIST OF JOBS REQUIRED TO DESIGN THE PLANT & THEIR COSTS

<table>
<thead>
<tr>
<th>Job</th>
<th>Normal Weeks</th>
<th>Normal Cost</th>
<th>Crash Weeks</th>
<th>Crash Cost</th>
<th>Cost of crashing dollars per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process design</td>
<td>3</td>
<td>$1,400</td>
<td>2</td>
<td>$2,100</td>
<td>$700</td>
</tr>
<tr>
<td>Struct. design</td>
<td>6</td>
<td>2,150</td>
<td>5</td>
<td>2,750</td>
<td>600</td>
</tr>
<tr>
<td>Exterior arch. design</td>
<td>2</td>
<td>1,600</td>
<td>1</td>
<td>2,400</td>
<td>800</td>
</tr>
<tr>
<td>Htg. &amp; air-cond. design</td>
<td>4</td>
<td>1,300</td>
<td>3</td>
<td>1,800</td>
<td>500</td>
</tr>
<tr>
<td>Process piping dwgs.</td>
<td>2</td>
<td>1,700</td>
<td>1</td>
<td>2,500</td>
<td>800</td>
</tr>
<tr>
<td>Elect. design &amp; dwgs.</td>
<td>7</td>
<td>1,650</td>
<td>4</td>
<td>2,850</td>
<td>400</td>
</tr>
<tr>
<td>Plumbing, htg., &amp; air-cond. dwgs.</td>
<td>4</td>
<td>2,100</td>
<td>3</td>
<td>2,900</td>
<td>800</td>
</tr>
<tr>
<td>Interior arch. design</td>
<td>3</td>
<td>1,100</td>
<td>2</td>
<td>1,600</td>
<td>500</td>
</tr>
</tbody>
</table>

TOTAL $13,000 $18,900

9 WEEKS (PLAN C) HAS LEAST COST TO CLIENT

Plan | Duration (weeks) | Direct cost (arch. & eng. work) | Indirect cost 1,100/wk. (Arch. & clients) | Total cost | Optimun
--- | ---------------- | --------------------------------- | ---------------------------------------- | ----------- | ----
A   | 11              | $13,000                           | $12,100                                  | $25,100    |     
B   | 10              | $13,500                           | $11,000                                  | $24,500    |     
C   | 9               | $14,500                           | $9,990                                   | $24,490    |     

Note also that if we "crash" jobs producing the project weeks, it would be considerably expensive than the least cost 8 plan, Plan D. Putting all jobs project on overtime is a wasteful money. If a project is to be expedited past its crash point, only those affecting the over-all project completion should be accelerated.

The fundamental problem in the above example is to determine the absolute least cost for any given schedule. With the help of the computer, the multitude of calculations necessary to produce the possible project cost can be accomplished quickly and economically.

(To be concluded next month)
the security supervisor of a major public utility company. For years, the security of these buildings had been taken for granted, as the company had always specified quality hardware in all construction work. A security survey for the entrance doors of 45 of the firm's buildings exposed, however, the fallacy that cast bronze screwless shank knobs and trim were synonymous with security since mechanical functions of the lock must also be considered. Using wire coat hangers and celluloid rulers during the survey, the security supervisor was able to surreptitiously enter 31 of the 45 buildings, as many of the impressive-looking locks were found to be improper for the purpose. They did not possess automatic deadlatch features to prevent "case knifing" of the latch, and in some cases the deadlatch did not operate due to malfunction. The glaring deficiency of these locks would no doubt have been magnified if certain other tests had been made to attempt to defeat them.

Methods of Increasing Lock Cylinder Security
1. The complexities of master keying can best be resolved by a competent hardware consultant who many times will confer with the client's locksmith, who is often familiar with the special problems of the business. Security in master keyed lock systems may be maintained by sound planning with the client, who often should be discouraged from insisting on "single key" performance for executive personnel. This single master key to fit "everything" in complex systems advocated by some suppliers results in much cross keying and resulting loss of security.
2. If removable core cylinders are used, the architect should emphasize the importance of tight control of the core removal key, as this key, in effect, is a grand master key, providing access to the inner mechanism of...
all of the locks. This fact is often un-
known or overlooked.
3. Inasmuch as key blanks for the
many special sectional key types are
usually not readily available from
lock supply sources, provisions
should be made in advance to have
the building occupant's locksmith
supplied with the proper types of key
blanks in sufficient quantities to take
care of the demands for additional
keys. Failure to make this advance
provision often results in the duplica-
tion of keys on master section key
blanks, which breaks down the cylin-
der security, as such keys become
sub-master keys which will pass
many of the locks for which they are
not intended.

The fact that security starts with
key control cannot be overempha-
sized. It is within the power of the
hardware specification writer to in-
sure security for the future of a
building or project by the manner in
which he specifies key control. Re-
gardless of the size of a building, a
key control system is a necessary
part of the security story. The sys-
tem should be a complete type, in-
cluding key gathering and identifi-
cation envelopes, proper pattern key
markers, temporary markers, signa-
ture receipt forms and cross index
records. The storage cabinet should
be secured by a tamper-resistant
combination (safe type) lock of the
built-in type, as this lock becomes
the guardian of the complete lock
system.

Additional Lock Security
Measures
Armored face plates should be speci-
fied to prevent the advance loos-
ening of cylinder set screws by bur-
glars planning a later entry.
Automatic dead latches should be
specified on all locks not having a
dead bolt function, as a protection
against release of the latch with a
"case knife."
Double cylinder locks should be
used whenever possible. When fire
codes or convenience consideration
requires an emergency handle or
push-bar release from the inside, it
becomes possible for a burglar to re-
lease the lock from the outside by
"hooking" the handle or bar with a
wire coat hanger through the space
between pairs of doors, mail slots,
transoms or other openings. There-
fore, auxiliary double cylinder locks
should be specified for protection
during the "unoccupied" hours. When
such added protection is not
possible, an automatic astragal may
be used to close the opening between
pairs of doors.

Cylinder protector rings should be
specified to prevent "pulling" of lock
 cylinders, which is very common in
some areas. This simple process of
removal of the cylinder by burglars,
permitting release of the lock with a
finger, is rapidly increasing in
scope. Some manufacturers now sup-
ply hardened, non-pullable cylinder
protection rings for their locks as an
added security feature.
Extra long lock bolts are required
to meet the growing burglary tech-
nique of spreading of the door jamb
to by-pass the lock bolt. Bolts, 1-in.
long and longer, with hardened steel
inserts are available. An additional
vertical bolt which locks into the
threshold, provides added protection.

Reinforced strike plate mountings
are required, especially on metal
frames, to prevent ripping of the
metal around the strike plate. This
recently identified burglary tech-
nique was developed to circumvent
the secure types of locks now avail-
able for narrow style metal doors. A
section of steel angle or channel in-
serted in the area of the strike plate
will prevent the peeling or ripping of
the soft metal, and properly anchor
the strike. On wood jambs a sub-base
of plywood under the door frame in
the area of the strike plate and
hinges will supply proper anchor
facility for the full length of the
wood screws. This reinforcing will
also serve to prevent spreading of
the door jamb. The extensive use of
hollow metal doors and frames has
resulted in the use of metal too light
for security purposes on entrance
doors. Such doors should be of 16
gauge construction and frames, of 14
gauge construction. When possible,
channel iron or structural steel frames
should be used.

Locks for Safety Control
In addition to locks designed to keep
burglars out, there are the more in-
triguing types of locks developed for
safety, especially concerning the in-
visible dangers of the "atomic age."
Research and developmental labora-
tories require personnel safety locks
which will allow emergency entrance
and exit, and simultaneously alert
the control office, and prevent entry
into danger areas, even by persons
possessing a key, until a control
system authorizes such entry by re-
electrical means. Such functions
are incorporated in single unit elec-
tromechanical locks with "cheat-proof
protection features. Closed-circuit
television and intercom systems can
be used with such locks to create
ultimate in remote control and
supervision.

Data processing areas, labor-
atories and dark rooms require air-
and light-lock doors. The increas-
demand for such interlock devices
has created certain mechanical
safety problems. The all-import-
ante factor is safety, and therefore
interlocks should incorporate a "saf-
e" feature to prevent trapping
personnel due to power failures
sulting from emergencies.

Safes and Vaults
Location of safes and vaults for
proper lighting of them is an im-
portant part of interior planning. Pr-
vision of such equipment within
obstructed view from public sta-
is an important factor in discred-
boring burglars. Not one, but a pass-
light assures an internal source of light for the safe area.

While on the subject of safes,
well to point out the misunderstan-
garding the difference between
insulated vault doors and fire de-
fires. Fire doors are essentially non-
bustible doors intended primarily
to prevent the spread of flames.
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bustible doors intended primarily
to prevent the spread of flames.
General Electric is introducing a number of new lamps at the New World's Fair. *Multi-Vapor* lamps will be used for the first time in installation to illuminate the water in the Pool of Industry. The new lamp uses metallic additives in mercury vapor to produce white light more easily than previously possible, reports. The lamp can produce such as 40,000 candlepower and a light of better color quality than mercury sources. The 400-watt *Multi-Vapor* lamp is being commercially available this month.

Eating the kaleidoscopic lighting on the dome of the G-E Pavilion over 2,000 colored spot lamps, these lamps are part of G. E.'s new 150-watt, sealed-beam dichroic PAR-38 spots which have a 1-layer interference film on the surface of the cover lens to emit desired colors of higher intensity and greater saturation than been obtainable heretofore. G. E. says the peak beam candlepower of these lamps is from three to five times that of conventional color PARs.

**R-Q**, a new sealed-beam projector and flood lamps. A 500-watt, volt quartz-iodine filament tube mounted at the focal point of the reflector. Featuring high efficiency, better maintenance of light output, and ability to control light gale, these lamps are useful to light the tower of the 7-Up Pa
t. General Electric, Nela Park, Cleveland, Ohio.

**Semi-indirect lighting**, or indirect lighting tempered with sufficient downlighting to add dimension and character to objects at the school and office working level, is provided by Smithcraft Corporation's new PowerBeam fluorescent fixture. The fixture is available with a two-level ballast: the second level of lighting is approximately 20 per cent of full level and is particularly suitable for use during visual aids presentations.

Polished specular anodized aluminum reflectors provide uniformly distributed lighting, and convection currents through the unit assure cool operation and maximum lamp output. The lamp housing and baffles are of etched and anodized satin aluminum. Available lengths range from 5 ft 10 in. to 17 ft 10 in. Width of the fixture is 6 in. and total height is 7 in. Smithcraft Corp., Chelsea, Mass., 02150.

A continuously adjustable intensity control has been introduced by Lighting Services, Inc. The PARcontrol, an electronic dimmer module, can be supplied with any of the firm's sealed-beam display spotlights ranging from 150 to 500 watts. Utilization of PARcontrol will increase lamp life and reduce power consumption, LSI reports. Lighting Services, Inc., 77 Park Ave., New York, N.Y., 10016.
METAL RACEWAYS
A new 160-page catalog and wiring guide, number 23 in the series, covers the company’s line of surface metal raceways and fittings, multi-outlet assemblies, tools and lighting equipment. Among the new products listed are the Plugmold G-6000, said to be the largest commercially available multi-outlet system; telephone hardware for pre-wiring of high-rise apartments; and 20A fluorescent lighting units. The catalog is replete with product and installation photographs and tabular material, including over 180 illustrations. The Wiremold Co., Hartford, Conn.* CIRCLE 400 ON INQUIRY CARD

HIGH VELOCITY AIR HANDLING SYSTEMS
A 24-page design manual for high velocity air handling systems includes data on branch energy losses of divided flow fittings and combinations of fittings for dual duct crossover or change of branch elevation. The manual’s 35 tables and charts include complete design and performance data covering energy losses of fittings, duct, elbows and reducers. The Pipe Division, United Sheet Metal Co., Inc., 200 E. Broadway, Westerville, Ohio CIRCLE 401 ON INQUIRY CARD

WOOD BUILDING PRODUCTS
The new edition of “Building and Industrial Products,” an indexed color catalog, covers major specialty building products manufactured by the forest industry, ranging from decorative hardwood wall paneling to colorful synthetic rubber overlaid exteriors. A. W. Petrey, Georgia-Pacific, P.O. Box 311, Portland, Ore., 97207 CIRCLE 402 ON INQUIRY CARD

AIR-CONDITIONING PRODUCTS
The Westinghouse line of air-conditioning and heating products is presented in a 20-page brochure. Chillers, heat pumps, humidifiers and rooftop heating and cooling units are among those described. Westinghouse, Air Conditioning Division, Staunton, Va. CIRCLE 403 ON INQUIRY CARD

STAGE-LIGHTING CONTROL SYSTEM
The Solitrol Controlette, a packaged electronic preset stage-lighting control system for small theaters, is described in a four-page bulletin (74SC). Engineering data and specifications are included in a separate bulletin (74SC-S66). Ward Leonard Electric Co., Control and Dimmer Division, 34 South St., Mt. Vernon, N.Y. CIRCLE 404 ON INQUIRY CARD

TORQUE/TENSION DESIGN MANUAL
Torque/Tension Design Manual No. 6101 is offered as an aid to obtaining reliable and correctly stressed bolted connections. This 18-page booklet includes 12 tables listing specific recommended installation torque values for thin and standard height UNC and UNF hex type red nylon insert elastic stop nuts. Additional information includes: points to consider in selecting suitable tightening torques; use of lubricants with fasteners; tabular data covering elastic stop nut tensile stressing areas and standard bolt strengths. Dept. 3161, Elastic Stop Nut Corp. of America, 2330 Vauhall, Union, N.J. CIRCLE 405 ON INQUIRY CARD

LABORATORY FUME HOODS
A new 68-page catalog illustrates and describes Kewaunee’s complete line of laboratory fume hoods. Mechanical service roughing-in drawings and duct location drawings accompany all fume hoods cataloged. Fume hood superstructures, auxiliary-air attachments and fume hood accessories are included as well. Kewaunee Mfg. Co., 5046 S. Center St., Adrian, Mich. CIRCLE 406 ON INQUIRY CARD

PLASTIC DUCTING
Plastruct, a new lightweight plastic ducting, is described in two new technical bulletins. Bulletin PD1 contains general information, including air flow, weights, dimensional data and suggested applications. Bulletin PD2 lists physical and chemical properties. Dayton Corp., 333 W. First St., Dayton, Ohio, 45401 CIRCLE 407 ON INQUIRY CARD

TRANSLUCENT PANELS
Rippolite, a fiber-glass reinforced acrylic modified polyester transom panel for skylights, glazing and similar uses, is dealt with in a four-page folder. Choices of finish colors, thicknesses, grades and configurations are explained. Technical data is presented in chart form. Rippolite Plastics Products, 321 Hasset St., Burbank, Calif., 91505 CIRCLE 408 ON INQUIRY CARD

PERLITE AGGREGATES
“Perlite Concrete Aggregate” P1 74 contains specifications for lightweight perlite insulating concrete for roof decks, floor fills and stairs on grade. Insulating uses available with silicone treated perlite loose fill insulation are included. “Perlite Plaster Aggregate” PI 64 contains design data, retardant ratings, weight savings and application techniques for perlite plaster. Data on the use of perlite-Portland cement plaster for tain wall back-up systems is included also. Perlite Institute, 45 W. 45 St., New York, N.Y. CIRCLE 409 ON INQUIRY CARD

INTERIOR FIRE EQUIPMENT
The Fy-Tyre Company’s 1964 Interior Fire Fighting Equipment Catalog" includes illustrations and specifications for the company’s entire line. The Fy-Tyre Co., Customer Services Dept., 221 Cran. Dayton 1, Ohio CIRCLE 410 ON INQUIRY CARD

STAGE LIGHTING
In catalog No. 13 over 450 pages devoted to lighting fixtures, light control equipment and access for the stage, television and photography. Two suggested lighting plans for a small and a large stage are given. Times Square Lighting Co., Inc., 349 W. 47 New York 36, N.Y. CIRCLE 411 ON INQUIRY CARD

* Additional product information in Sweet’s Architectural File
OK. Now forget it.

When a roof has been insulated with Styrofoam® RM brand roof insulation, you won't have to worry about that insulation again. After all, it can't soak up water. An insulation that serves as its own vapor barrier. An insulation that won't rot, mold, deteriorate—ever.

To help you remember Styrofoam, we've included some information in Sweet's Architectural File 10a/Dow and 8a/Dow. Or you can write to us. The Dow Chemical Company, Plastics Sales Department 1310N4, Midland, Michigan.

Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes . . . look for this trademark on all Styrofoam brand insulation boards.

For more data, circle 139 on Inquiry Card.
Some people call them —
ROLLING DOORS
SHUTTERS
COIL UP DOORS
SLAT DOORS
ROLLER DOORS
ROLL UP DOORS
but most people call them —

Kinnear

And this is true the world over! Kinnear originated the interlocking metal slat curtain more than 65 years ago — for the first time making the efficiency of a metal coiling door practical. As a result, the name KINNEAR is synonymous with doors of this coil-up operating principle.

To specify KINNEAR — and to INSIST ON THE GENUINE — means more than the selection of a door of more efficient design. It's also your assurance of a product of the highest quality — rugged construction that has stood the test of time under every condition of use — and backed by a nationwide sales and service organization, as well as "Registered" Life extension service. Write TODAY for complete, detailed information on Kinnear Doors.

KINNEAR®

Saving Ways in Doorways

The KINNEAR Manufacturing Co. and Subsidiaries

1860-80 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Avenue, San Francisco 24, Calif.
3683 Dundas Street West, Toronto, Ont., Canada

For more data, circle 140 on Inquiry Card

Product Reports
continued from page 222

KEY CUTTING BY CODE
A new system cuts keys accurately by code instead of by tracing a traditional original or duplicate key on a conventional key machine. The machine occupies 2½ sq ft of space, has coded discs. One disc gives the size or distance between each cut on the key. The second disc is for indicating the depth of each cut. The numbers on this disc coincide with numbers found on the bow of the key. With Ilco's improved system, original keys are cut each time. Moreover, the only inventory required is a stock of key blanks for the type of lock on that building, in contrast to the conventional, elaborate filing system of extra original keys for each lock in the building. LOCKSMITH PRODUCTS DIVISION, INDEPENDENT LOCK CO., Fitchburg, Mass.
CIRCLE 304 ON INQUIRY

WHITE-ROOM FILTERING UNIT
A new filtering unit which the manufacturer says provides absolute filtration for entire walls or ceilings at low cost has been designed for white rooms or laboratories. FLANDERS FILTERS, INC., River Vale, N.J.
CIRCLE 305 ON INQUIRY

For more data, circle 138 on Inquiry Card
New Cofar® shear connectors reduce the cost of composite construction utilizing new AISC specification

Important savings in materials, space and money begin with Cofar composite construction. Cofar—now available with shear connectors (Pat. Pend.). When field-welded to the beams, these “J”-shaped pieces of steel make the slab work as an integral part of the supporting members; thus beam sizes may be reduced.

The main benefit of Cofar composite construction is the substantial reduction in steel tonnage because you get equivalent strength with lighter beams. Additional benefits are gained by: (1) Longer spans (2) More usable space with the same building cubage (3) Increased beam stiffness (4) Less deflection (5) Reduced building height.

Cofar’s economy has been well established in the building industry. Cofar is the 4-in-1 product—form, working deck, bottom reinforcing steel and temperature steel for a structural concrete slab. Construction is fast—proven—economical. Now with the development of the Cofar shear connector, even greater economies are yours by using Cofar composite design.

For more information, write for Catalog No. 103-B-62: GRANCO STEEL PRODUCTS COMPANY, 6506 North Broadway, St. Louis 15, Missouri. A subsidiary of Granite City Steel Co. Our catalogs are filed in Sweet’s.

Illustrated at right: 16-story Pierre Laclede Building, now under construction, Clayton, Missouri, which utilizes Cofar composite construction.
TROY®
equips the new 580-bed
V.A. Hospital in Atlanta for
HIGH-PRODUCTION LAUNDRY

Laundry layout at the new Atlanta
V.A. Hospital includes four Troy
WX® Washer-Extractors, an 8-roll
Troy Speedline® Ironer, Troy Flex-
imatic® Air-Jet® Folder plus tum­
blers, presses and other equipment
from the complete Troy line.

At Atlanta's new veterans' hospital
now under construction laundry fa­
cilities will be completely Troy-
equipped. Architect Wilfred J.
Gregson states:

"Troy Laundry Machinery was very energetic in meeting the laundry require­
ments for this modern hospital. The layout represents the last word in sanitary
handling of hospital laundry and streamlined processing. The specifications
for the equipment were very rigid to assure the highest, most efficient
laundry output."

For your next hospital or other institution requiring dependable laundry facilities,
contact your Troy Representative or write for complete information and service from
the world's oldest manufacturer of power laundry equipment.

TROY LAUNDRY MACHINERY
A DIVISION OF AMETEK, INC.
EAST MOLINE, ILLINOIS

For more data, circle 142 on Inquiry Card

Product Reports
continued from page 20A

COFFEE TABLE
A new "surfboard-shaped" coffee with upturned ends has been designed by Folke Ohlsson. The vertically planked in teak or with sycamore splayed. Matching tables are also available. Dux 1633 Adrian Rd., Burlingame, CIRCLE 306 ON INQUIRY

LIGHT DIMMER
The new 1,200-watt Li/Trol dimmer has been introduced. The unit, like the smaller 600-watt unit marketed earlier this year, operates positive on-off switch and provides full range dimming control through an electronic circuit. The device is a U. L. approved printed circuit board which employs four silicon rectifiers for full wave dimming. The dimmer may be used to modify lighting effects in restaurants, showrooms and large residential installations. Federal Pacific Electric Co., 50 St., Newark 1, N.J.
CIRCLE 307 ON INQUIRY

CONCRETE AND MASONRY PRESERVATIVE FINISH
A newly-developed concrete and masonry preservative finish stops the seepage and dampness in new and existing construction, the manufacturer states. The product, GRP Northwall, is available clear or in different colors. It is formulated for use on above-grade construction such as monolithic concrete, precast concrete panels, glazed tile masonry and sand-cement stucco. It can be applied with pressure spray, brush or roller. Northwall meets U.S. Federal Specification SS-W-110b. In color, it satisfies Federal Specification TT-P-001. Leslie-Rogers-Pyatt Co., Inc., 4 St., New York 5, N.Y.
CIRCLE 308 ON INQUIRY

For more data, circle 143 on Inquiry Card
Yes,

Carrier

...and Carrier has the service to back it up!

For information about components for any apartment job—or any other air conditioning project—call your Carrier representative. Or write Carrier Air Conditioning Company, Syracuse 1, New York. In Canada: Carrier Air Conditioning (Canada) Ltd., Toronto 18.

For more data, circle 151 on Inquiry Card
CUT CONSTRUCTION COSTS
ON HANGARS, OTHER BIG OPENINGS
WITH COOKSON BI-PARTING STEEL SIDE COILING DOORS

Here is the economical, practical answer to closing off big openings: Side Coiling Steel Rolling Doors by Cookson, leading designer of commercial and industrial doors for all purposes. Note how these doors avoid the need for large stacking areas normally associated with sliding doors. Curtains are coiled out of the way to the sides in relatively small box housings for a completely unimpaired opening. With lighter weight curtains, the truss loading is reduced with resulting economies. Design is simple, installation is quick and easy. Door operation is smooth, highly efficient and trouble-free, whether by hand crank or electric motor. Ideal for large openings, either single or bi-parting, and designed for a 20 pound wind load. For the best doors at less cost in overall construction, specify Cookson. Write for full information, or see Sweet's.

"BEST WAY TO CLOSE AN OPENING"

COOKSON
The Cookson Company • 700 Pennsylvania Avenue
San Francisco 7, California

ROLLING DOORS • FIRE DOORS • GRILLES • COUNTER DOORS • COILING PARTITIONS

For more data, circle 152 on Inquiry Card

Product Report
continued from page 23

CLASSROOM VENTILATION

A complete individual classroom ventilation system for use with the acoustical ceiling heating has been announced by Jacobson and Company. The heart of the E.C.D. Room Ventilating System is a compact ventilating unit mounted on the ceiling. The unit draws in quantities of fresh air through outside wall louver and blends with recirculated air obtained from two modular ceiling return air.
Because the architects, Sommerich and Wood, estimated installation cost savings of $1800 and maintenance savings of 40% with Andersen Casement Windows in the Brown Suburban Hotel, Louisville, Kentucky.

They took a long, hard look at the extensive use of glass in their design... considered all window types... and came up with a choice that met their design needs, but saved the owner's money in the process.

Since factory-assembled, stock Andersen sash windows could be installed by the regular crew, instead of hiring specialists required to install steel windows, they were able to save about $7 per window on installation costs! A total of more than $300 saved!

The architects went a step further and predicted a long-range maintenance saving advantage of 40% with Andersen units.

The economic advantages coupled with the architects' (and the owners') desire to eliminate exterior sweating of sash and frame members made Andersen Casements a logical specification. A pretty compelling story. But there are other reasons for specifying Andersen Wood Windows.

There's the Andersen line that permits complete creative freedom in meeting any design problems. Seven different styles... 30 different sizes... over 600 cataloged sizes.

Or Andersen's extra weathertightness to 4 times tighter than industry standards for wood windows). This means you can design extra-large glass areas without sacrificing insulating effectiveness. And, owners can save substantially on heating and cooling costs.

Check Sweet's File. Or, contact your local Andersen distributor for a Tracing Detail File. Andersen Windows are available throughout the United States and Canada.

Andersen Windowwalls

American's Most Wanted Windows

ANDERSEN CORPORATION - BAYPORT, MINNESOTA
The doors will swing on McKinney Moderne Hinges at the new Space Technology Center Valley Forge, Pennsylvania

McKinney Moderne hinges were selected for the new General Electric Space Technology Center now nearing completion at Valley Forge, Pennsylvania, because they’re as modern and as handsome as the building itself. Their slim lines and the quality of stainless steel pins, stainless steel oil-impregnated bearings, plus McKinney craftsmanship provide hinges which can “take it” on high frequency doors.

On your next job go Moderne. Specify McKinney Moderne... choice of quality-conscious consultants.

McKinney SCRAPTON, PENNSYLVANIA 18505 / IN CANADA: MCKINNEY-SKILLCRAFT LTD., TORONTO 3, ONT.

Project: General Electric Space Technology Center Valley Forge, Pennsylvania

For more data, circle 154 on Inquiry Card

Product Reports, continued from page 21

WARM AIR CURTAIN
The Thermal Curtain system of self-contained, direct-fire burners to be hung above doors to blanket the cold floor draft and then discharge it downward. The system can be used in factories and warehouses. Cam Engineering, Inc., 1330 N. Robb Rd., St. Louis, Mo. 63124

CIRCLE 311 ON INQUIRY CARD

COMMERCIAL DECORATOR CLOCKS
Edwards Company’s complete new line of clocks for offices, transportation terminals, lobbies, banks is now available. Units of size from 6 to 24 in. Among the special-purpose clocks are explosion-proof, weather-proof and vapor-proof models; elapsed time indicate hospitals and laboratories; and 10–24 in. face globe models. Dept. 973 Edwards Co., Inc., Norwalk, Conn.

CIRCLE 312 ON INQUIRY CARD

For more data, circle 155 on Inquiry Card
Interior steel panels and effective perimeter seals give Soundmaster 480 the speech privacy of a 4” cinder block wall, painted both sides. The 480 earned a Sound Transmission Class of 40 at Geiger & Hamme Laboratories. This full scale test rating is particularly significant since it was made, simulating field conditions, in a 14’ x 9’ opening.

**Add beauty and durability + by 480**

New heavy duty vinyls, in a myriad of texture, color and pattern combinations, are produced in Modernfold’s own plant to meet the exacting requirements of operable walls. Me-proven engineering and design, plus the use of quality materials throughout, permit you to specify with confidence assurance of outstanding performance and client satisfaction.

**Multiply applications + by 480**

Because of its sound characteristics and construction features, the new 480 can solve many division problems never before possible with operable walls. See details in wit’s file or consult your nearby Modernfold distributor, it is a partitioning specialist.

For mathematics that solve space division problems... use

**new Soundmaster 480 operable walls of silence**
If you've tried other vapor seals and they failed... isn't it time to switch to the very best?*

As a conscientious architect or contractor you have undoubtedly specified and used various types of vapor seals many, many times. If you have never had a vapor seal failure or complaint, read no farther — you're already using PREMOULDED MEMBRANE Vapor Seal. If, however, you have found that the vapor seal you used did not stop the ravages of excessive moisture, then we believe this message will be of interest to you. It's an academic fact that 80% of the moisture that enters a structure originates in the site. It makes little difference where the site is placed. Somewhere below the site water exists and vapor will infiltrate the structure. Dampness, condensation, insulation failures, cracked plaster, dank smells, blistering and peeling paint, fungal or bacterial attack on construction and furnishings and masonry efflorescence soon follow.

YOU KNOW THE PROBLEM...

While the building industry has recognized the need to install a vapor seal between the structure and the site there has been a promiscuous use of permeable materials as vapor barriers. The only sure way to permanently eliminate moisture migration into the structure is to install true inviolate, impermeable vapor seal during the original construction. The following chart graphically illustrates that saturated felts, building and duplex papers, and plastic films are highly permeable and should not be considered as effective vapor seals.

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>WATER-VAPOR TRANSMISSION*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duplex Paper (coated both sides with reflector material, reinforced)</td>
<td>.347</td>
</tr>
<tr>
<td>Polyethylene Film (.006 in. thick)</td>
<td>.17</td>
</tr>
<tr>
<td>55-pound roll roofing</td>
<td>.081</td>
</tr>
<tr>
<td>PREMOULDED MEMBRANE Vapor Seal</td>
<td>.0048</td>
</tr>
</tbody>
</table>

*grains/per square foot per hour as measured in accordance with ASTM Designation E96-57T, Procedure A.

WE HAVE THE ANSWER...

In addition to an almost nil water-vapor transmission rating, PREMOULDED MEMBRANE with PLASMATIC Core offers many other important and exclusive qualities. It is durable, flexible, and strong... will not rupture or tear under normal installation, traffic, and handling. Monolithic when installed to expand and contract in direct ratio with the concrete without breaking bond. Available in 4'x8' sheets and rolls 4' wide to 50' long. It is lightweight, easy to handle and install.

PREMOULDED MEMBRANE Vapor Seal with PLASMATIC Core provides a practical, permanent method of waterproofing both vertical and horizontal surfaces in all types of construction; including slab-on-grade, basement and crawl space. For complete information request Catalog No. 753.

W. R. MEADOWS, INC.
4 KIMBALL STREET • ELGIN, ILLINOIS 60122

W. R. MEADOWS OF GEORGIA, INC.
4765 FREDERICK DRIVE, S.W. ATLANTA, GA. 30331

W. R. MEADOWS OF CANADA, LTD.
130 TORONTO DRIVE WESTON, ONTARIO, CANADA

For more data, circle 157 on Inquiry Card

FOLDING PARTITION

The new Hufcor 900 Woodworking partition is designed specifically for industrial and commercial use. The partition combines wood veneer panels in a variety of wood species with a unique connecting system and uses the track and carrier system. Manufacturing Corp., Janesville, Wis.

CIRCLE 313 ON INQUIRY CARD

GYPSUM WALL PANEL LOOKS LIKE WOOD

Ultrawall, a gypsum wall panel, has the appearance of wood paneling. It will not warp, shrink or split according to the manufacturer. States Gypsum Company, 100 Wacker Drive, Chicago 6, Ill.

CIRCLE 314 ON INQUIRY CARD

CAULK-SEALING COMPOUND

A new caulking-sealing-glazing compound called Polylastic will seal joints, seams and openings in such surfaces as glass, metal, stone, plastic, concrete, aluminum, and masonry, according to the manufacturer. It is also said to be totally impervious to weather, gas, moisture, and to have high adhesion strength. Polylastic is made from a non-staining grade of Enjay rubber, rubber plasticizers and pigments. It is recommended for fronts, flashings, large areas of mullions, building panels, expansion and control joints, and as a glass auxiliary glazing compound in connection with glass and glass to wood installations. Avadan Corp., 29 E. St., Nutley, N.J.

CIRCLE 315 ON INQUIRY CARD

For more products on page 256.
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

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!

write today for complete information request Catalog No. A-410.

HUPP CORPORATION
RICHARDS-WILCOX DIVISION
116 THIRD STREET • AURORA, ILLINOIS 60507

For more data, circle 161 on Inquiry Card

ARCHITECTURAL RECORD  April 1964  261
Safety Switches for Normal and Hazardous Locations
Industrial Circuit Breakers for Normal and Hazardous Locations
Load Centers—Circuit Breaker and Fusible

Drum Switches

SQUARE D MANUFACTURES A

Fusible and Circuit Breaker Lighting and Power Panelboards
Power Distribution Switchboards and Switchgear

Plug-In Duct

Motor Control Centers

Synchronous Motor Starters

High Voltage Starters

I-Line Busways

ON DUTY WHEREVER ELECTRICITY IS

Square-Duct Wireways

Underfloor Duct

Special-Purpose Control

Resistors

Magnetic Brakes

ARCHITECTURAL RECORD April 1964
Control Relays  Timing Relays  Manual and Magnetic Starters

Complete LINE OF EQUIPMENT

Limit Switches  Push Buttons  Combination Starters  Starters for Hazardous Locations  Static Logic Control Components and Systems  Voltage Testers  Float Switches

Reduced Voltage Starters  Welder Control  Lifting Magnets  Pressure Switches, Float Switches

DISTRIBUTED & CONTROLLED

Crane and Mill Control  Adjustable Speed Drives

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

For more data, circle 162 on Inquiry Card
When buying a home, one of the two rooms with the greatest attraction for Mrs. Housewife—and usually for the man of the house, too—is the bathroom! And in many transactions, it is the unusual touches to the bathrooms—the things that others don't have—that help sell homes. Below are a few of Hall-Mack's finest quality bathroom accessories—every one a real home-seller! By making bathrooms more attractive and convenient, Hall-Mack specialties help to clinch many a sale for smart builders and contractors everywhere.

CONCEAL-A-ROLL HAS RECESSED COMPARTMENT FOR SPARE ROLL No. 375
RECESSED TISSUE HOLDER TAKES LARGE PACKAGE No. 175 - No. 137
DOLPHIN & SHELL TOWEL RINGS AND PLEASING TOUCHES No. 125 - No. 127
COMBINATION SURFACE VANITY SHELF WITH MIRROR No. 346 WM

RELAXATION UNIT FOR LUXURIOUS BATHROOM TARRYING No. 302
REMOVING PANEL CONCEALS SOAP TUMBLETS, TOOTHBRUSH No. 319
STIRRUP SHAPED LUCITE TOWEL RING WITH CHROME BASE No. 316
RECESSED MIRROR SHELF FOR TOILETRIES No. 305

TOWEL RACK TELESCOPES INTO WALL—EXTENDS 14' No. 310
STURDY GRAB BARS PREVENT MANY INJURIES IN TUB AND SHOWER No. 350/1/2

LADDER OF TOWELS WITH A FULL 60' OF RUNG SPACE No. 395
RECESSED SCALE OPENS DOWN WEIGHS ACCURATELY No. 350

EVERY BATHROOM A SALESMAKER!

Just mail the coupon today! A new color brochure—"Accent on Accessories"—offers a wide choice of original designs, new ideas and exclusive features.

Sold by leading plumbing, tile and hardware dealers everywhere.

For more data, circle 163 on Inquiry Card

Office Literature continued from page 223

VERTICAL TRANSPORTATION

Ehrsam's diversified line of industrial and commercial vertical transportation products is described in a 10-page brochure. Contents include electric and oil hydraulic elevators, belt conveyors, hydraulic elevator drives and traction machinery. The J. B. Ehrsam & Sons Co., Elevator Division, Entry, Kan.

Circle 412 on Inquiry

MOBIL PARTITIONS


Circle 413 on Inquiry

HIGH STRENGTH, LOW ALLOY STEELS

A new 20-page booklet describes high-strength low-alloy steels and basic information necessary for most effective use of these steels, strengthened by the addition of amounts of columbium, copper, molybdenum, zirconium, titanium and other elements. The new booklet divides the various trade-named steels into three major groups according to similarities of characteristics. Typical uses of these steels are listed. Bethlehem Steel Corp., Committee of Hot Rolled and Rolled Sheet and Strip Products, American Iron and Steel Inst., 633 Third Ave., New York 17.

Circle 414 on Inquiry

EXTRUDED QUARRY TILE

A full line of quarry, textured quarry and frostproof glazed quarry tile is detailed in Summitville's latest page color catalog. The brochure includes patterns and trim unit specifications and installation tails, and two pages of color charts. Summitville Tiles Inc., Summit, Ohio.

Circle 415 on Inquiry

*Additional product information available in Sweet's Architectural File.
Lytespan is the first lighting distribution track designed as an integrated, architectural lighting system. It is the first track which can be recessed, or mounted on surface or stems.

**LYTESPOT FLEXIBILITY FEATURES**

**Direction.** Lytespots rotate horizontally, pivot to any angle vertically. Pivot mountings are permanently tensioned and include a built-in 360° stop.

**Position.** Lytespots can be quickly clipped on and slid along the electrified track to any point desired. Thumbscrew rigidly secures unit, prevents sag or droop. Most Lytespots have individual switches. Spots can be stored on track when not in use.

**Intensity.** Lytespots accommodate a variety of R and PAR lamps ranging from 30 to 300 watts. Dramalux Lytespot with Intensitrol dimmer provides continuous intensity control from zero to 32,000 candlepower. Heat filters are available where high lighting levels at close range make display temperature critical.

**Beam Spread.** Ranges from a "pin spot" of 5½° to a flood of light at 110°. The flexibility in the throw of light ranges from two feet to twenty-seven feet (for 100 foot-candles).

**Beam Shape.** Round or elliptical. An adjustable beam monitor permits changes in orientation of elliptical beams from horizontal to vertical. A spread lens alters the shape of any light beam, making it tall and narrow, or short and wide. Stippled lens design eliminates filament image and softens the beam-edge.

**Color.** Using basic hues of the spectrum, a vast variety of shades is achieved by blending colored beams of light. One-piece color filters are made of borosilicate (heat-resistant) glass. Optical stippling eliminates filament image. Intensitrol dimmer controls intensity of any hue.

**LYTESPAN BY LIGHTOLIER!**

Write to LIGHTOLIER, Jersey City, N.J. for Brochure No. 40. Or see the Yellow Pages for your nearest Lightolier distributor. Showrooms: 11E. 36 St., New York; 1267 Merchandise Mart, Chicago; 2515 S. Broadway, Los Angeles; 1718 Hi-Line Drive, Dallas.
BULB TEE ROOF DECKS
ECONOMICAL, VERSATILE, FIRE-RESISTANT

Connors bulb tees are specially designed sections for roof deck applications. Rolled from A-440 steel, they provide an economical savings in weight and design versatility. Application data, properties and architectural specifications are contained in a descriptive brochure. Add this useful data to your AIA File ... send the coupon to P. O. Box 118, Huntington, West Virginia.

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H. K. PORTER COMPANY, INC.

Please send application and design data covering Connors Bulb Tee Sections for Roof Decks

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City State

For more data, circle 166 on Inquiry Card

Office Literature
continued from page 264

ALUMINUM FENESTRATION SYSTEM; PROJECTED WINDOW
The Geyser Grid System is shown 12 pages that contain project photodetails in 3-in. scale, engineer data, information on finishseating, costs and specifications. The catalog also describes the Geyser Load-Bearing Grid System with aullions of tubular steel 2 by 2 to 4 by 10 in. in size.

The "Projected Ventilators" catalog describes in four pages the construcion of Geyser's window of extruded aluminum with rounded, conformed corners. E. K. Geyser Co.
915 Mc Ardle Roadway, Pittsburg Pa., 15203

CIRCLE 416 ON INQUIRY CARD

LIGHT CONSTRUCTION GLASS
Mississippi Glass Company, manufacturers of rolled, figured and wglass for light construction, has leased its new 16-page catalog, 64, covering its complete line of patterns for installation in industrial, commercial, school, church, institutionel and residential sture.

Illustrated with typical installations, the catalog also contains photographs of individual patterns accompanied by light distribution charts and transmission data. Mississippi Glass Co., 88 Angelica St. Louis, Mo., 63117

CIRCLE 417 ON INQUIRY CARD

INCINERATORS
Goder's complete line of incinerators is featured in a revised 16-page illustrated catalog. Joseph Goder Incinulators, 4211 N. Honore St., Chicag Ill., 60613

CIRCLE 418 ON INQUIRY CARD

TOILET SEATS
A new 94-page reference manual for Beneke's entire line of toilet seats. Requests for the manual should be made on business letterhead.


CIRCLE 419 ON INQUIRY CARD

*Additional product information available from Sweet's Architectural File

For more products, circle 416 on Inquiry Card
The industry we represent has undergone some big changes in recent years. Our old name no longer fits. Instead of making plywood only from Douglas fir—and only on the West Coast—the industry now makes a wide range of products from some 20 different species of wood—and in plants in many parts of the country.

The new name reflects our members' growth and progress.

Even though the name is new, you can still specify DFPA plywood. These familiar letters still stand for quality in plywood certified by the association and you'll continue to see them in our grade trademarks. Instead of Douglas Fir Plywood Association, though, they now stand for Division For Product Approval.

And we're still headquarters for all kinds of plywood information. Write us at Tacoma, Wash. 98401.
NEW DESIGN VERSATILITY

in a prestige enclosure for perimeter heating featuring continuous anodized aluminum grilles

Contemporary architecture calls for the use of dramatic colors and clean, concise lines to create a pleasing environment. Building interiors are enhanced by this strikingly slim package of single or alternating color panels accented with distinctive anodized aluminum trim. You can actually achieve a custom appearance with standard components. But Architrend is much more than a bold new enclosure; it is perimeter radiation at its best... for hot water or steam heating systems! Have your secretary write for Bulletin 4200 today so your files will be up-to-date on what's really new in sill fin radiation.

FEATURES INCLUDE:

COLOR: Choice of 12 baked enamel colors.
ENCLOSURE SIZES: Standard lengths of 2', 3', 4', 6' x 4 1/2" to 54 1/2" depth and 15 1/4", 20 1/4" and 25" height. TOP GRILLE: Heavy duty extruded aluminum with anodized finish in continuous lengths up to 16' 6". Tamperproof construction.
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ALSO: Thirty choices of enclosure and element, and matching accessories.

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design with the freedom of WOOD

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environment and an exterior most compatible with neighboring
buildings. Reid, Rockwell, Banwell & Tarics, architects and engineers.

NICOM MANUALS 1 & 2: "Design Principles" (122 pages) and
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NICOM method of house construction, are available at nominal
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Wood Information Center, 1619 Massachusetts Ave., N.W., Washington, D.C. 20036

find the better way with wood

For more data, circle 176 on Inquiry Card
On the Calendar

April
5-9 30th Annual National Planning Conference, American Society of Planning Officials—Statler Hilton Hotel, Boston
7-9 25th National Conference on Church Architecture, sponsored jointly by the Church Architectural Guild of America and the Department of Church Building and Architecture of the National Council of Churches of Christ in the United States of America; theme, “Faith and Form in Church Design”—Sheraton-Dallas Hotel, Dallas
21-23 1964 Spring Conferences, Building Research Institute—Shoreham Hotel, Washington, D.C.

May
26-28 First National Convention of Consulting Engineers Co.—Denver, Colorado
31ff International Conference Office Administration Executives sponsored by the National Management Association; theme, “Today’s Yesterday’s or Tomorrow”—Barbizon-Plaza Hotel, New York
31ff International Conference Office Administration Executives sponsored by the National Management Association; theme, “The City—Visible and invisible”—Chase-Park Plaza St. Louis
21-25 57th Annual Meeting, Pollution Control Association—Chase-Park Plaza St. Louis
21-26 Annual Meeting and Exhibit, American Society of Landscape Architects; through July 1—Hotel Dallas

June
8-11 Systems Engineering Education and Conference—New York Hilton, New York City
8-19 First World Congress of Craftsmen, sponsored by the International Craftsmen’s Council—Co-Op University, New York City
14-18 96th Annual Convention of American Institute of Architects; through July 1—Hotel Dallas

Office Notes

It's a coincidence you should ask about the advantages of Keywall. You can see from the tight pattern that it gives you more mortar locks with block (and/or brick), which in turn controls shrinkage and thermal movement better, resulting in greater crack resistance. And because Keywall comes in rolls, masons lay Keywall in place more easily and quickly. You might think that you would have to pay more for a masonry reinforcement with such advantages. Not so.
Office Notes
continued from page 290

Richard Sawicki, Architect, A.I.A., has opened an office offering architectural design, interior design and site planning services, at 881 Long Ridge Rd., Stamford, Conn.

New Firms, Firm Changes
The firm of Richard J. Chorlton, located in Princeton, N.J., has named Matthew L. Rue as director of its new International Division.

Albert J. Schmidt has been appointed a partner in the firm of Crow, Lewis & Wick, Architects & Engineers, 200 Fifth Ave., New York City.

Arthur Lawrence Associates has admitted a new partner, James F. Hawver. Address is 1900 Euclid Ave., Cleveland 15, Ohio.

Young & Steinbeigle, Architects, is the firm name of the recent partnership of Martin Ray Young and Raymond L. Steinbeigle. Office are located at 50 South Udal, Mesa, Ariz.

Perry Coke Smith, Benjamin F. Smith, Charles Haines, Robert Lundberg and Frank J. Waehler continue their architectural practice under the new firm name of Smith Haines Lundberg & Waehler, succeeding Voorhees Walker Smith & Haines, Stephen F. Voorhees and Ralph Walker will continue as consultants to the firm, now located at 101 Park Ave., New York 17, N.Y.


Sverdrup & Parcel and Associates, Inc., Engineers-Architects, Louis, Mo., have announced the following changes in the firm's organization. L. J. Sverdrup was elected chairman of the board. Bridge Smith was elected president, D. Wolfe was elected executive vice president and Eugene J. Peers was elected senior vice president. Mr. Peers was also made a member of the board of directors. Brice R. Seiter Jr. was elected treasurer. In addition, Warren F. Knapp has taken over as comptroller and James Clancy, Jr., is now chief accountant. Robert C. West has succeeded Lorran Foster as head of the structural section.

Shepley Bulfinch Richards Abbott, announced the appointment of Daniel J. Coolidge as an associate of the firm.


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This could be a color ad of our fabric as parabola, fence, chair covers, blinds and canopy. But there are 25 Sunbrella colors and patterns available, so you'd rather you used your imagination. Woven of 100% Acrilan* acrylic fiber, tests prove Sunbrella astounding. Plus colorfastness, it's mildew and rot proof. Retains its strength. Excellent porosity. Lightweight. Same color underneath as on top. Leave it up safely year 'round. Soft, non-glare finish. Increases efficiency of air-conditioning equipment up to 75%! Write for Sunbrella information and free new design idea booklet. Glen Raven Mills, Inc., Glen Raven, North Carolina.

For more data, circle 180 on Inquiry Card

Addendum

The RECORD regrets that the name of the architectural engineers for Patrick Henry High School (March 1964, page 158) was incorrect. The correct name of the firm is Sowers, Rodes & White Engineers.
Experts on store interiors knew DEVOE paints were exactly right for the new Gimbels

Copeland, Novak and Israel — architects noted for their great talent with retail store interiors — designed the new Gimbels in Eastland Shopping Plaza, McKeesport, Penna., and did an outstanding job of wedding first-rate architectural style and customer comfort. They achieved this happy union with the help of coordinated color schemes throughout.

The MAN FROM DEVOE helps designers in many ways. He supplies data on paint performance and costs, weather resistance, light reflectivity—even special formulations for industrial plants. There's no charge for any of his assistance, naturally—not even for his services right at the building site, where he will supervise deliveries and do other follow-up jobs. Call him in on your next job, and save time and money. Just write or phone the nearest Devoe office to reach him.

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COLUMBIA SCHOOL OF ENGINEERING MARKS 100TH YEAR

Highlighting the program of events scheduled to commemorate the 100th anniversary of the Columbia University School of Engineering and Applied Science will be a Conference at Arden House, Harriman, N.Y., dealing with the School's "Combined Plan" and a "Symposium on the Future" at the United Engineering Center in New York City.

Some hundred and fifty presidents, deans and professors of colleges and universities associated with the Engineering School's "Combined Plan" will attend the conference, to be held on October 25-27. The plan enables students at associated schools to do undergraduate work in liberal arts for three years, when they are guaranteed admission to Columbia's School of Engineering and Applied Science. After two years of study at Columbia, they receive a B.A. degree from their former schools and a B.S. degree in engineering from Columbia.

The "Symposium on the Future," to be held on November 17 and 18, will bring together a group of international experts to deliver papers previewing developments in engineering and science in the next 100 years.

Centennial events will also include an International Conference on Technological Science and Engineering to be co-sponsored by the U.S. Air Force April 27-May 1 at the Alcan Hotel; the Fourth International Conference on Strata Control Rock Mechanics at the Statler Hotel May 4-8; the Monell Dinner at the Library on May 12; and Engineering Class Day on June 1. Plans for these events have been coordinated by Dean A. V. Smith, chairman of the Centennial Executive Committee.

The entire program will pay tribute to the long and pioneering history of Columbia's School of Engineering. One of the two or three oldest engineering schools in the country, when founded in 1864, the School of Mines in the Western Hemisphere, by the turn of the century, Columbia offered its students a broader curriculum that incorporated the various other engineering disciplines.

Among the lengthy list of graduates, professors and former students of the school who have made significant contributions in engineering and science are: Dr. John Dunning, present dean, who in 1939 was the first man in the Western Hemisphere to split the uranium atom; Admiral Hyman G. Rickover, father of the U.S. nuclear navy; Donald B. Burmister, professor emeritus of civil engineering; James Renwick, designer and builder of the Panama Canal and father of the noted architect; Alfred M. Fruedenthal, professor of civil engineering and a renowned consultant and expert on metal fatigue; Mario G. Salvito, professor of civil engineering and authority on thin-shell structures; General William B. Parsons, designer and builder of the New York subway system; Daniel E. Menniest, dean of American foundation engineers and consultant on the foundation work of many New York skyscrapers; and H. P. Gillette, developer of early cost data for the construction industry.

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For more complete information and specificalional data on the fully guaranteed line of Hunt Electronic Dimming Controls and Systems, contact your local Electrical Distributor or the Hunt Representative in your area listed on the back cover of our Sweet's Catalogue... or write the people who bring you the Brightest Ideas in Dimming:

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MUMFORD NARRATES
SIX-FILM SERIES
ON THE CITY

The notable talents of Lewis Mumford and the National Film Board of Canada have combined in a six-part documentary film, "Lewis Mumford on the City."

The series is based on Mr. Mumford's book, "The City in History." Mr. Mumford appears on film at some length. To illustrate his points, and those of film-writer Ian MacNeill, the Film Board researchers have assembled a collection of prints and photographs: ancient art, 19th-century engravings, and contemporary stills and movies. These illustrate the good and charming qualities of the city: hospitals, courts, universities, theaters, festivals, trade. They also illustrate some of the less attractive functions which, generally speaking, only the city accommodates: riots, slums, alarm fires, book burning.

All of this film is intended to demonstrate Mr. Mumford's statement that "only in the city can the cast of characters for the human drama be assembled." It also, more seriously, is intended as a consideration of the city and as a guide to its preservation and improvement.

Part 1, "The City—Heaven or Hell," describes the city in history and outlines some of the contemporary forces shaping the city. "The City—Cars or People?" covers the old, if worsening, problem of urban transportation and congestion. "The City and Its Region" studies the relationship of city to country. "The Heart of the City" considers the increasing vitality and variety of the city. "The City as Man's Home" discusses city slums and suburban housing. The last film, "The City in the Future," suggests some emerging patterns—the regional shopping center, the university-centered city, New Towns. Each part runs about half an hour.

The films are distributed in the country by Walter Reade-Stirling Inc., and are intended primarily for sale to public and university libraries. Prices are $135 for each film and $750 for the series.

HILL AND BURTON HONORED BY A.I.A.

The American Institute of Architects has presented special citations to Senator Lister Hill and Harold Burton, former Associate Justices of the Supreme Court, commending their "vision and leadership in the field of public health." While Burton was still a U.S. Senator, the two co-authored the Hospital Survey and Construction Act, better known as the Hill-Burton Act.

Since the program's enactment in 1946, 7,015 hospitals and health centers have been approved for Federal aid. In addition, construction standards and design guides devised in the program have achieved wide circulation abroad and among private hospitals here. The President recently asked the Congress for a five-year extension of the act.
WHO'S AFRAID OF THE BIG BOLD ROOF?

Certainly no architect who's up to date on roofing materi-al. Quite the contrary. Progressive architects across the country are creating bold and beautiful new landmarks in roof design—more easily than you might think.

How? With the help of reliable roofing manufacturers, competent contractors and fluid roofing systems made from Du Pont Neoprene and HYPALON®. This combination made possible all ten roofs shown in this ad. Systems manufactured from Du Pont Neoprene and HYPALON synthetic rubber can be applied to concrete or plywood decks. Cure quickly to a permanently bonded film. Remain watertight and give trouble-free protection for years. Resist heat, cold, sun, abrasion, ozone, chemicals. Surprisingly wide range of colors.

Thanks to material like this and the men who make it, you can turn bold new ideas into breathtaking realities. See for yourself... soon. E. I. du Pont de Nemours & Co. (Inc.), Elastomer Chemicals Dept. AR-4-HL, Wilmington, Delaware 19898. In Canada, Du Pont of Canada Ltd., 85 Eglinton Ave., E., Toronto 12, Ont.

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B.R.I. PLANS
SPRING MEETINGS
The Building Research Institute has scheduled two days of its four-day spring meeting to a conference on Periodic Maintenance Inspection. Sessions on this subject will cover case examples of inspection programs, the functions of public and private inspectors, and the evaluation and effect of reports. The meetings will also include sessions on the critical path method, on the integration of mechanical, electrical and structural systems, and on the use and performance of various materials. A special panel will discuss the Jefferson Memorial Arch.
Information on the meeting, which will be held in Washington April 21-23, is available from Milton C. Coon, B.R.I., 1725 De Sales Street, N.W., Washington, D.C., 20036

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ROOF GARDEN TO APARTMENT HOUSE
A roof garden has been planned for an apartment house now under construction for Crawford Realty, Inc. in Bridgeport, Connecticut.
Architect William Mileto has designed the top two floors as a double overhanging penthouse for 29 units. The steel structure will be faced with exposed concrete apartment bricks or precast concrete. Total estimated cost is $895,000.

APARTMENT HOUSE RISES 40 STORIES
Denver's first downtown apartment house since the war will be a 40-story building containing 432 units. Harry Roth and Sons are the architects.
Bay windows, balconies and bedrooms with floor-to-ceiling glass are designed to afford the tenants a view of the Rocky Mountains. The study base will have a swimming pool and sun deck on its roof. Exterior facing is concrete and aluminum.
Total Elevator Automation at Philadelphia's Newest Prestige Apartment...Hopkinson House

A remarkable new automatic computer-control system, created by Haughton Electronics, constantly monitors traffic demand... and relays service instantly to the computer-control system in the elevator machine room. Response is immediate. Thus, elevator service is never more than just a few seconds away on any of Hopkinson House's 34 floors. What's more, the ride is a revelation in velvety smoothness and quiet comfort.

Include Haughton Total Elevator Automation in your plans for building or modernization. Ask your Haughton Sales Office (listed in the Yellow Pages) to consult with you, or write to us.

*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. Registered in U.S. Patent Office.
SHOW HOUSE DESIGNED FOR PUBLIC EXHIBIT

The rare occasion of designing a house with no specific resident in mind has given the architect, Fred S. Toguchi, an opportunity to express his own approach to the problem. Built for the public by the Home Builders Association of Greater Cleveland and chosen for this honor by the Cleveland Chapter of the American Institute of Architects, the so-called "21st Century House in the Round" was featured in the 21st annual Cleveland Home and Flower Show.

The house, designed for a family of four to six, is planned around a central outdoor garden patio, the peristyle, which in turn is enclosed by a glass-enclosed gallery area serves as both the main entrance and as a passageway. One section of the house to another.

Private "capsules" and grouping areas alternate around this separating what the architect considers areas of space and social space from those of privacy and security. The private sections are insulated with walls and ceilings of white ter, a minimal window area and peted floor. Ceiling heights range from 6 feet at the perimeter to 8 feet at the gallery wall. By concentrating those of the living and dining room, the ceiling slant to a height of 12 1/2 feet, group areas of glass and cedar flow freely from the peristyle open onto landscaped gardens.

HARVARD TO HOLD FORUM ON RENEWAL

On May 1 and 2, Harvard’s Graduate School of Design will conduct a conference in Cambridge, Massachusetts on "The Role of Government in Form and Animation of the Urban Core." The keynote speaker will be Robert Weaver, head of the Housing and Home Finance Agency. The conference will use Boston’s renewal program as a case study, which to base general conclusion Federally supported urban renewal programs.

NEW TALK-A-PHONE
ALL-TRANSISTOR HOME INTERCOM-RADIO SYSTEM

Everyone in the family will enjoy the comfort, convenience, and peace of mind this system provides. From any room in the house you can ...

- Listen-in on baby, children, or sick room.
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For more data, circle 189 on Inquiry Card
Marlite paneling is used throughout the new Akron Orthopedic Clinic designed by Wagner and Luxmore. The corridor features beige Plank; treatment rooms are paneled in various colors of Marlite Plank.

Specify Marlite for clean, modern interiors ... it’s practically maintenance-free!

Any interior takes on a beautiful new look — and stays that way for years — when Marlite paneling is installed on the walls. That's because Marlite's soilproof baked finish resists heat, moisture, stains, dents. Marlite goes up fast, never needs painting or further protection ... and most important, it wipes clean with a damp cloth ... pushes maintenance costs to a new low! And Marlite gives your clients a wide choice of distinctive colors, patterns and authentic Trendwood® reproductions for creating beautiful wash-and-wear interiors—anywhere. For complete information, see your building materials dealer, consult Sweet’s Files, or write Marlite Division of Masonite Corporation, Dept. 405, Dover, Ohio.
NEW YORK OFFICES TO TOP FDR POST OFFICE

Simultaneously facing the imperatives of urban real estate and complying with President Johnson’s frugality campaign, the Post Office Department has announced plans for a combined postal station and office building in New York City.

The new building will be constructed under the department’s Lease Construction Program. Under this program, the post office selects the lowest bidder to construct and own the building, which the department leases back. Here, the department would lease four lower floors and two basement floors for its Franklin Delano Roosevelt Station. The owner would probably rent the 38 remaining floors to private tenants.

The design, by the Office of Max O. Urbahn, calls for windowless post office floors faced with gray brick and aluminum. The office tower will be faced with precast concrete panels. On the Third Avenue side, the building will be set back from the street to provide a landscaped plaza.

Progress in Concrete

Concrete subcontractor, Alanson, Inc., North Brunswick, New Jersey, averaged 56 lineal feet of high, 12 inch thick basement wall including two projecting concrete pilasters each working day. The job was a two-story and basement department store (260 by 560 ft.) in Woodbridge, New Jersey, shopping center.

Both Forms and Steel Ganged

Alanson ganged both Symons Steel Forms and steel mesh, and cast heavily reinforced walls in repet, each 28 ft. by 18 ft., divided by unreinforced concrete pilasters, 4 in. wide and projecting 1 ft. from inside wall face.

Ingenious Stripping

For quick stripping of Symons Steel Forms, Alanson used the stationary crane in the crane’s cab. A steel hook attached to the stationary drum, hooked onto the second line of wood in the gang form. After carpenters moved the top of the gang away from the concrete the crane finishes stripping in motion by pulling upward with the hitch and outward at same time.

Complete information furnished upon request, also information about Symons Steel rental purchase plan.

For more data, circle 215 on Inquiry Card

For more data, circle 216 on Inquiry Card

For more data, circle 217 on Inquiry Card
Senior Vice President Harold A. Ashbrook (left) and Sales Vice President Eugene C. Munro are top men at Ware Aluminum Windows of Miami. With a competent staff, a quality product, and a real interest in their customers' problems, they have made their company one of the most respected names in the aluminum-window and curtain-wall business.

You can talk to the top men at Ware Aluminum Windows, Inc.

When you talk to Mr. Ashbrook or Mr. Munro or any one at Ware, you'll know your order is getting the kind of personal attention you want . . . whether it's from the main office in Miami or from one of the branch offices in Houston, Chicago, Atlanta or Washington, D.C. That's the kind of attention available from an independent aluminum fabricator . . . the kind of attention that supervised fabrication of windows and curtain wall for the beautiful Charlotte Memorial Hospital, Charlotte, North Carolina.

This new building demonstrates a number of the advantages of using aluminum. For one thing, it will stay beautiful with low maintenance. Because aluminum curtain walls require less space than other materials, the hospital will have more usable space inside. And aluminum sections are easy to work with, saving construction time and costs.

Like many independent aluminum fabricators, Ware insists on top-quality aluminum . . . aluminum alloys made and supplied by ALCAN®. For Aluminium Limited backs its product and the independent fabricators it supplies with quality control and research that's second to none in the world of aluminum.
DALLAS BANK ADDS TOWER

With the addition of its new 50-story tower, the Republic National Bank of Dallas will be the largest combined bank and office building in the South.

The multi-million dollar, 900,000-square-foot structure will use an all-welded steel frame faced with aluminum curtain walls. Associated architects are: Harrell & Hamilton; Thomas, James & Merrill; and Grayson Gill, Inc.

COLUMNS, WALLS FUSE IN NEW BANK

The plans for the downtown office of the Mutual Savings Building of Pasadena feature a nine-story office and banking building combined with a five-level parking structure.

The $4.2 million building will contain about 175,000 square feet and will be constructed of poured-in-place concrete walls with integrated structural columns. Welton Becket and Associates are the architects. Completion is scheduled this fall.


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Current Competitions
continued from page 70

An international competition is under­way for three houses to be built in Mount Olympus development at Hollywood, California. The sponsors, the Mount Olympus Project, a division of the Russ Vincent Realty Co., offer three first prizes of $10,000 each, plus $5,000 for a grand prize among the first place winners. Other prizes include three second prizes at $2,500 each, three third prizes at $1,000, six fourth prizes at $500, and 15 fifth prizes at $100.

Registration was due April 1, and submissions are due by September 26. The professional adviser is George Vernon Russell, F.A.I.A.

The University of Illinois is receiv­ing applications for its Kate Neal Kinley Memorial Fellowship. The fel­lowship awards $2,000 to be used for advanced study in architecture, mu­sic or art here or abroad. Informa­tion is available from Dean Allen S. Weller, College of Fine and Applied Arts, Room 110, Architecture Building, University of Illinois, Urbana, 61803.


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