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PUBLISHER'S NOTE

Time Inc.'s Architectural Forum: 1932-1964

As explained here last month, this is to be the last issue of ARCHI-TECTURAL FORUM in its present form. But this is not the last you will hear about architecture from FORUM's editors or from Time Inc.

Next month, FORTUNE, its staff augmented by FORUM editors, will begin reporting more fully on architecture and building around the world.

• Every month, TIME and LIFE will continue their lively reporting of architecture and the shape and character of the American community.

Time Inc.'s book division, with the help of FORUM staff members, is considering publishing an annual review of the year's architectural accomplishments.

And—who knows—others among FORUM's undaunted staff may one of these days apply their journalistic skills to creating a new magazine on architecture.

Thus, this special double issue of FORUM—which reviews three decades of architectural development, appraises the current state of the art, and looks speculatively into the future—is by no means the last word on the subject. It is rather the last chapter in the 72year history of one particular magazine.



That history began in January, 1892 with publication of Volume 1, Number 1 of *The Brickbuilder*, a thin, staid journal of 15 pages, whose gray text and precise drawings recorded the fanciest brickwork of the times. Not until 1917

was the more appropriate name Architectural Forum adopted.

Wider in scope than the old Brickbuilder, FORUM was still edited strictly for architects. Then in 1932 Time Inc. purchased the magazine and assigned its editors a new mission: "to bring together around the central art and science of architecture all the major influences which will build America in the decades ahead." This



ARCHITECTURAL DESIGN

change from a professional journal to an industry magazine broadened FORUM's audience and its sphere of influence to include the builders, financiers, and owners of buildings as well as the designers. During the next three decades the magazine's readership increased tenfold, to 64,000—a gain that, unfortunately, did not provide an economic success.

More significant than circulation growth, however, were FORUM's far-reaching editorial accomplishments during those decades. These accomplishments you will find woven into Douglas Haskell's review of the period (p. 73). Six of them in particular have left lasting marks on architecture and the American scene. They are recorded briefly here, along with the names of the men who left lasting marks on the magazine.

1. An architectural revolution. Under the inspiring leadership of Publisher Howard Myers, FORUM's editorial staff in the late 1930s continued on page 5

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PUBLISHER'S NOTE (continued)

joined battle with the entrenched architectural eclectics and helped establish a contemporary architecture befitting the building technology of the times. Few would now dispute that FORUM in those days was a great influence on the new commercial, industrial, and institutional architecture which emerged almost full-blown after the war, and on the new residential architecture still emerging.



Behind this revolution was the ability of Howard Myers to recognize and encourage real talent among the young (and sometimes older) architects who were then kicking over the traces of traditionalism—men who have since become the profession's shakers and doers. Many of them have generously acknowledged the impetus FORUM and Howard Myers gave their early rise to architectural prominence.

2. A revolutionary architect. Particularly grateful for the editors' early recognition of him, and for their faith in his future, was Frank Lloyd Wright. FORUM first recognized his greatness by devoting the entire January 1938 issue



to his work. Thereafter, Wright insisted that FORUM be the first to publish any of his new work. His designs were featured in countless FORUM articles and in two other special issues of the magazine which, like the first, quickly became collectors' items. Wright served as editor of two of those special issues, and his name and his controversial fame rubbed off on FORUM. Indeed, FORUM for many readers was known as the magazine of Frank Lloyd Wright —an obvious overstatement we were not overly anxious to correct.

3. A housing industry. Throughout the late 1940s, FORUM's editors devoted increasing attention to the needs of the booming but disjointed housing industry. But a single magazine could not do justice to home building and big



building alike-a fact first recognized by Perry Prentice, who became FORUM's publisher and editor following the death of Howard Myers, and who in January 1952 created out of FORUM a separate magazine for the housing industry: House & Home. It quickly assumed the role of spokesman and conscience for the home builders and did much to help them catch up with the industrial revolution which had long since left them behind. It also tried consistently to raise the level of housing design which the architectural profession has always been quick to criticize but slow to do anything about. For its efforts, HOUSE & HOME gained an audience of 140,000 loyal subscribers. (House & HOME was sold to McGraw-Hill Inc. in July after Time Inc. decided to withdraw from the business-paper publishing field.)

4. A focus on urban renewal. Meanwhile, having won the battle of the architectural styles, FORUM's editors undertook a new campaign: to focus their readers' attention on the need for urban renewal and on the challenge of this problem to the profession and to the industry. Since one of FORUM's editorial consultants first coined the phrase "urban renewal" some 15 years ago, the editors have covered the subject in almost every issue. It is in part because of their long-standing interest that urban renewal today is the subject of everyday conversation and the beneficiary of a federally aided building program involving 700 U.S. cities. More than anyone else, Douglas Haskell, editor of FORUM from 1954 until his retirement in June, has been responsible for



FORUM's deep and outspoken interest in the architectural and economic future of our cities.

5. An enlightened clientele. Not content to write to architects about architecture, FORUM has considered it important to write to architects' clients about architectural excellence. In so doing the editors attracted an audience of more than 20,000 client-subscribers in the industrial, commercial, and institutional fields, a record which attests to the logic of FORUM's publishing concept and the success of the editors' efforts. *continued on page 8*







Swinging with a steel club. Old Orchard Country Club, Mt. Prospect, Illinois, is a short drive and a chip shot away from Chicago's city limits. Overlooking an 18-hole golf course, this public club has a private atmosphere that appeals to hard-working urbanites. The low, sleek, scrupulously detailed clubhouse includes a restaurant, cocktail lounge, and a downstairs theater. The structure is steel, with all exposed steel painted dark gray. Exterior columns are H-beams. Interior supports are fire rated, prefabricated steel columns. Soffits and canopies are corrugated steel. For information on the complete line of USS Construction Products, contact our Construction Marketing Representative at the nearest USS office or write United States Steel, 525 William Penn Place, Room 7480, Pittsburgh, Pa. 15230.





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PUBLISHER'S NOTE (continued)

This widening of the base of architectural appreciation was prosecuted most vigorously under the direction of Ralph D. Paine Jr., publisher of FORUM from 1954 to 1964 as well as publisher of FOR-



TUNE. (FORUM's unique concern for promoting architectural quality outside the profession is now entrusted to FORTUNE, whose circulation among potential clients is many times greater than FORUM'S.)

6. A record of excellence. Disdaining the temptation to try to please all of its readers all of the time, FORUM's editors have always selected material for publication solely on the basis of its quality and its contribution to the evolving art of architecture. In the early days of the contemporary movement, their choice of buildings for publication was relatively easy-there were few outstanding examples. But, as the volume of good work multiplied, the task of selection became increasingly difficult. FORUM's discrimination in architectural reporting can be judged by comparison, for example, with the buildings selected last June by the American Institute of Architects as the best of 1963-11 of the 15 buildings had



been previously published in FORUM.

In recent years credit for such astute choices goes to Managing Editor Peter Blake, FORUM's arbiter of taste since 1961, and to his 25 editorial associates listed on the magazine's masthead (p. 71). One of these associates in particular has also been responsible for another phase of FORUM's editorial excellence—the architecture of the magazine itself. He is Paul Grotz, for 30 years art director of what we immodestly be-



lieve to be one of America's handsomest magazines.

Such are some of the achievements of FORUM: we hope the publication of this final issue, devoted as much to looking ahead as to looking backward, will prove a suitable capstone to FORUM's editorial performance. And, speaking for Time Inc., we salute a talented editorial staff which has set excellence as its own standard as well as the standard for the works of others. Dedicated to the building of a better America, the editors can take justifiable pride in their contributions to that end.-I.C.H. JR.

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Architect: Lundgren & Maurer, Austin, Texas. Engineer: Edward E. Evans & Associates, Baton Rouge, La. General Contractor: Batson-Cook Company, Atlanta, Ga.



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Montgomery Ward store, Apache Plaza Shopping Center, St. Anthony Village, Minn. Architects: Thorsen & Thorshov, Inc., Minneapolis, Minn.





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Parke-Davis & Company building, Cherry Hill, N.J. Architects: Alexander Ewing & Associates, Philadelphia, Pa.

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• For general information on telephone planning, see Sweet's Architectural File, 33a/Be.





Federal Building United States Court House: San Francisco, Calif., Architects: (Joint venture) Blanchard & Maher; Alfred F. Roller; Stone, Marraccini & Patterson; John C. Warnecke. Contractors: (Joint venture) Roscoe-Ajax Construction, Inc. and Knickerbocker Construction Corp. Custom Curtain Wall Supplier-Erector and Kalcolor Applicator: Kawneer. Custom curtain wall includes over 800,000 pounds of Kawneer colored aluminum: black mullions and horizontals; gold framing for windows and granite columns and amber stops, muntins and louvres.



Security First National Bank: Los Angeles, Calif. Architect: Welton Becket and Associates, Los Angeles. General Contractor: Del E. Webb Corp., Phoenix-Los Angeles. Glazing Contractor: Olson Glass, Torrance. A uniquely designed, circular building rising from a sunken plaza, highlighted by bronze muntins and black aluminum mullions.



Waterloo Trust Office Building: Kitchener, Ontario. Architect: Webb, Zerafa, Menkes, Toronto. General Contractor: Yolles & Rotenberg, Ltd., Toronto. Wall Systems Contractor: Pilkington Glass, Ltd., Kitchener, 50,000 sq. ft. of clear float glass is utilized in a curtain wall system featuring Permanodic black column cladding and entrance and accent mullions.

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First Christian Church: Omaha, Nebraska. Architect: Burrill and McNett, Omaha, Nebraska. General Contractor: Peterson Bros., Omaha. Glazing Contractor: Cook Paint and Varnish, Omaha. An interesting use of Kawneer Core with Alumilite finish and stained glass—that saved \$2,000 over the cost of competitive materials.



Tennessee Building: Houston, Texas. Architect-Engineer: Skidmore, Owings and Merrill—San Francisco, Calif. General Contractor: W. S. Bellows Construction Corporation–Houston, Texas. Custom Curtain Wall Supplier-Erector and Kalcolor Applicator: Kawneer, More than 2,000,000 pounds of Kalcolor

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Architect

TRIBUTES TO FORUM

Since the announcement was made that this issue of FORUM would be its last as a separate Time Inc. publication, we have received a great many letters and telegrams deploring the news, expressing a sense of loss, and pleading for continued publication of the magazine. Many of the letters also included generous remarks about FORUM's importance, its influence, and its quality. It seems appropriate to record in this final issue excerpts from these testimonials to FORUM's place in architectural journalism.-ED.

Forum: At this time in the history of the American building industry, when a great new period of development is clearly underway, we feel that the devotion to excellence, alertness to technology, and concern for journalism of the highest quality exemplified by FORUM are of great importance. It would be ironic indeed if, on the eve of the rebuilding and expansion of most of America's great urban areas, FORUM should disappear. We feel it plays a key role in keeping the business and professional worlds alert to excellence in architecture and is a strongly beneficial factor in the architectural profession itself.

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| St. | 1.0 | 11.25 | |

GYO OBATA Architect

Architect

Forum: Your magazine has been of immeasurable importance to our profession, both as a source of information on leading architectural work in the U.S. and as a forum for serious architectural criticism.

I thank Time Inc. for having made it possible for the FORUM to be published in spite of its financial losses through the years. JAN HIRD POKORNY

New York City

Forum: Is it possible that you who have done such a magnificent job of architectural publishing for our profession and the whole industry do not fully realize FORUM's importance to us? You were among the first properly to relate fine architectural design with clear, logical thinking. FORUM has been a big help in dispelling the notion that the architect's main function is merely adding window dressing to someone else's layout.

| | HERVEY | PARKE | CLARK |
|---------------|-----------|-------|-------|
| San Francisco | Architect | | |

Forum: The FORUM is valued by both the profession and an enlightened public as the best chronicle of contemporary architecture. KITCHEN AND HUNT San Francisco Architects

Architectural Forum / August-September 1964

Forum: [You] have been an erudite spokesman on urban design.

Washington, D.C. WILLIAM L. SLAYTON Urban Renewal Commissioner

Forum: . . . the only magazine of international reputation in the country. HENRIK BULL

San Francisco

Los Angeles

Architect

Forum: . . . the finest of all architectural publications.

St. Louis VAN A. DENISON, President Associated General Contractors of St. Louis

Forum: . . . a force of increasing strength in its efforts to improve the physical environment of this country. Now more than ever we need this strong force to help those who are building to understand the importance of planning and the necessity for creating the best possible places for people to work, live, learn, and worship. FORUM fills a need in this ever important area of architecture that no other publication attempts.

A. QUINCY JONES Architect

Forum: Forum provides me as a businessman with a valuable link to current thinking in the architectural world, and affects my judgment in the many problems involving architecture and planning with our customers.

Miami HARRY HOOD BASSETT President, First National Bank of Miami

Forum: Because of the high character of FORUM we are not losing just one architectural magazine but in a sense the only one. America will be the only country in the civilized world without a critical architects' magazine.

PHILIP JOHNSON New York City

Architect

FORUM: It is a grave loss to the entire building profession that FORUM will no longer exist. Through the years that I have read this publication, it has consistently represented the highest editorial standards and has exercised a definite influence on matters requiring both foresight and courage. For these reasons, we used FORUM as a major medium to carry our advertising message. FORUM's service will be sorely missed, and I know that our industry will be left the poorer.

RICHARD M. BRANHAM Director of Marketing Arlington, Va. National Concrete Masonry Association

Forum: Inasmuch as FORUM has been the only critical publication at a time in architectural development when strong, objective editorial leadership is vital, it is pitiful to think it cannot be continued.

GEORGE DANFORTH Professor, Department of Architecture Chicago Illinois Institute of Technology Forum: . . . more than the best U.S. architectural journal-it is a national asset. CRAIG ELLWOOD

Los Angeles

Forum: FORUM is one magazine in this field that has not hesitated to take a strong stand in favor of good architecture. For the U.S. to lose this important magazine is a tragedy. DONALD A. LEBOLD

Chicago

Arthur Rubloff & Co.

THE NEW YORK TIMES, MONDAY, JUNE 8, 1964.

Blow to Better Building

When a professional periodical fails, it may be of considerable concern to specialists, but it seldom has much impact on the world at large. The demise of The Architectural Forum, a publication directed at all who build or are interested in building, is a different matter, however, since it played an influential and broadly beneficial role that went higher and deeper than most people realized.

The Architectural Forum's special Washington issue reached the top of President Kennedy's reading pile and was followed by Presidential directives for improving the capital's building. At many decision-making management meetings, the magazine tipped the scale to distinguished design in vast corporate construction programs. When cities are being rebuilt and wilderness in-vaded, the end of a force for better building is dismaying. We are all a captive audience of our physical environment, and we need every means possible to shape it to better ends.

Forum: . . . the only recognized voice guiding the development of man-made America.

In an era when we have finally achieved mastery of the economical and political tools required to rebuild urban America toward an environment suitable for the second half of the 20th century, the discontinuation of FORUM occurs indeed at a critical moment.

| | | | ULRICH | FRANZEN |
|-----|------|------|--------|-----------|
| New | York | City | | Architect |

Forum: No architectural magazine has ever assembled a staff of such incomparable strength and quality.

San Francisco

ERNEST BORN Architect

Forum: The demise of FORUM has come as a major blow to the profession of architecture. This, the most eloquent voice for our field, has become a part of our cultural myth. The years of dedicated devotion to standards of excellence have affirmed this myth in the public eye. We the professionals and the public will find the discontinuance of FORUM a great loss.

VICTOR CHRIST-JANER New Canaan, Conn. Architect

Forum: . . . one of the few voices in America which says that neither art, architecture, nor any other human endeavor is an isolated phenomenon; that the welfare, poscontinued on page 22









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sibly the peace, of mankind depend on just such dedication as that of FORUM to a dignified surrounding for man.

ROBERT LANIER New York City

Forum: Your distinguished magazine is an essential cultural bond between America and the world. It has set architectural and critical standards.

Chicago

CHARLES B. GENTHER Architect

Forum: Your magazine is not only the main source of current information in my professional practice but also furnishes a teaching aid at the various levels of design in my classes. It is surprising how many organizations depend on FORUM for information, both as to current activity and design in architecture and to building materials and methods of construction shown in the ads.

MICHAEL GOODMAN Professor, Department of Architecture Berkeley University of California

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Chicago

HAROLD HAYDON Associate Professor of Art University of Chicago

Forum: Be assured that in the eyes of *all* segments of the construction industry FORUM is considered the prestige publication devoted to architecture.

San Francisco

WILLIAM CORLETT Architect

Forum: The FORUM has contributed immeasurably to the quality of our buildings and our cities. If our future environment is to be more comfortable, safe, and beautiful, we urgently need its continued fair presentation and constructive criticism.

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Forum: I know of no other publication that encompasses the areas of lively interests that FORUM has penetrated. As a subscriber of eight years, I have found its columns of new developments abreast of the times, its major articles authoritative, its editorial style lucid, and its recent critical essays a valuable addition in a long-neglected field.

To lose such voices as these at the very



LETTERS

continued from page 23

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other magazines may render will ever quite fill the void left by this brilliantly edited forum for the setting forth of new buildings, new forms, and new concepts of man's living together.

I suppose this should be a note of congratulation to Time, Inc. upon all the magazine has been and meant. But the decision to end it now—just when building is entering upon a great phase in our civilization leaves me with no words except those of regret.

New York City AUGUST HECKSCHER Director, The Twentieth Century Fund

Forum: Along with the many other school districts in the St. Louis area, we find FORUM a most enlightening and valuable publication.

ROBERT O. LITTLE Director of Building Construction Chesterfield, Mo. Parkway School District

Forum: I have not missed reading a single issue from cover to cover since my first year as a student. The role of FORUM in architectural journalism cannot be easily filled. We thank you for the many years of stimulating leadership.

Toronto

JOHN C. PARKIN Architect

FORUM has not only recorded architectural history as it is written but, in fact, has influenced it significantly during periods of critical change.

Chicago

PHILIP WILL, JR. Architect

Forum: All of us at Westinghouse Elevator were shocked to learn that a great magazine is about to be shelved. You people were "first class" in everything you did, and it is somewhat ironical to see it all ending this way.

New York City A. H. MONITTO Advertising & Sales Promotion Manager Elevator Div., Westinghouse Electric Corp.

Forum: Most important is the great idea to absorb part of FORUM into FORTUNE. We believe that this is where the emphasis on architecture belongs—in the hands of those who need the services as opposed to architects themselves.

Pasadena, Calif.

Chicago

JOHN F. GALBRAITH Architect

Forum: I deeply regret that publication of FORUM is to be terminated. Such an action will remove from the field the most important medium of intercommunication in architecture and planning when lucidity and forthright opinion are desperately needed.

JOHN ENTENZA, Director Graham Foundation

Forum: We lose important and articulate leadership at a time when Americans are continued on page 36

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Forum: I was absolutely appalled. It was so encouraging to countries limping after the U.S. to feel that the major American architectural journal was addressed to builders and clients as well as architects and engineers. Here are the makings of a seed-bed for civilization.

COLIN BOYNE, Executive Editor The Architects Journal London

Forum: I feel like I have lost a good friend. For as long as I have been associated with architecture, FORUM has always been in my mind the "top of the line." In this critical



time when economics seem to be prevailing over culture at every level, FORUM was a beacon in the dark.

Santa Barbara, Calif.

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Forum: Much improvement in the quality and recognition of good architecture has recently been evidenced, and FORUM can take pride in having played a major role in bringing this about.

Los Angeles J. H. BLITZER, JR., President Integrated Ceilings & Grilleworks, Inc.

Forum: The compensating grace of the change is that your audience will be much larger than before. . . . It will be quite a challenge for FORTUNE to equal or better the performance of FORUM in satisfying the curiosity of the profession and public about significant developments in architecture.

Forum: All of us in the profession are going

to miss FORUM. It's like losing an old friend.

We congratulate all who have done such a magnificent job through the years and wish

them all the best for the years ahead.

Pittsburgh

Philadelphia

DAHLEN K. RITCHEY Architect

GEORGE SIMPSON KOYL

Architect

Forum: Though no architectural magazine in the field today is completely "right" for every architect-obviously, such a magazine would have to reflect his own opinions-FORUM came closest to a consensus of the group. Congratulations for the years of FORUM as the leader in architectural commentary; regrets that all that is now history. Best wishes for the future of FORUM's staff. JUSTIN HENSHELL Architect

New York City

continued on page 45

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1. St. Sophia's eastern end. Under the big dome is seen the roof of the large eastern half-dome; under that, the smaller half-dome of the apse.

ST. SOPHIA'S STRUCTURE

A new assessment of the half-domes

FORUM: Will you let me correct certain misconceptions concerning the structural role of St. Sophia's semidomes which were put forward in my preliminary account in your magazine (May, 1963) of a survey now approaching publication? Its implications were first rightly questioned by Dr. John Fitchen, Chairman of the Department of Fine Arts, Colgate University. Dr. Mario G. Salvadori, Professor of Engineering and Architecture, Columbia University, has been good enough to advise with regard to the matter. And Mr. Rowland J. Mainstone, M. Eng., Principal Scientific Officer, The Building Research Station, Garston, England, has not only written at length clarifying many aspects of the question but has kindly permitted his letters to be quoted. -ROBERT L. VAN NICE

FORUM is delighted to find a man who not only accepts correction but turns up new evidence to substantiate it, in so important a matter.-ED.

BY ROBERT L. VAN NICE

The singular space effect achieved by the enclosure of St. Sophia's immense nave by means of arches and half-domes, rising from piers which form a square beneath its central dome, led Choisy, a French engineer of the last century, to describe the structure as one of the most powerful creations in architecture.

Unique interest attaches to the action of the forces in it, not only on account of its unprecedented scale but also because of two quite dissimilar systems employed for containing the lateral thrusts of the dome (Figure 2). Along both *sides* of the square that supports the central dome are pairs of arches (at A, A' in Figure 2) which have, as Choisy pointed out, only a restricted stability, so that, later on, there had to be erected big projecting buttresses at their springings. The transverse *end* arches, on the contrary, are backed (B, C) by half-domes giving ample assurance of equilibrium.

Choisy was not the first to credit the half-domes that form the two ends of the nave with a buttressing action, nor was this ever doubted until it was found, in the course of the present survey, that their true thicknesses, in some cases, were only one-third of the dimension given them in the purely conventional representations which had been depended on. Because the crowns of some were found generally no thicker than vaults performing only local functions, and because of this author's dismissal—unwarranted in theory—of the horizontal forces exerted at their crowns as "ineffective," the statement was put forward, among others, that the half-domes were incorporated in the original design not as functional, buttressing elements, but only in



2. Plan shows the dual buttressing system. Projecting buttresses brace both pairs of arches marked A, A'; half-domes brace arches B, C. The broken lines show how arches have been deflected from a straight plane by the half-domes.



3. Diagram of variation in forces acting tangentially to horizontal parallels or rings in a half-dome: a, meridional compression—almost constant, crown to base; b, horizontal compression; c, line of zero force; d, horizontal tension at base only, found only in shallow domes.

order to enhance the nave in its form. The objective conditions revealed by the survey were correctly reported, but both for theoretical reasons and because of new evidence, these conclusions must be withdrawn.

That the half-domes do indeed engage in a buttressing action is indicated by distortions recently measured in the arches and recorded in their reflected plans, recently correlated. The arches at the open faces of all seven half-domes, large or small, consistently curve *inward* over much of their length in the direction of the nave interior, a direction opposite, that is, to the *outward* lateral thrusts generated by the main dome, but one following the distribution of forces at work in the adjacent shells. (See the dotted lines in Figure 2.)

These deformations conform with the relevant principles cited by Mr. Mainstone in correcting the author's earlier theoretical error:

For a dome or half-dome like those of St. Sophia [he writes] the pattern of internal compression and tension resembles that which I have sketched [in Figure 3, here adapted from Mr. Mainstone's drawings]. This sketch, with the dome sliced in two along a meridian, shows the variation in forces acting tangentially to the horizontal parallels or rings. While it is true that the bursting stresses do not develop until well down from the crown, it is far from true that there are no horizontal forces in the upper part. The tendency of the crown and the whole upper part to fall downward inevitably leads to some horizontal contraction of each ring...and this means that there must be compressive horizontal forces at all upper levels. Indeed, it is precisely because of these horizontal forces, both compressive and tensile, that the continuous structure of a dome is so much stronger than a hypothetical geometrically similar ring of independent vertical arches. For it must be considered at the same time as a series of horizontal arches in the upper part and tie-rings lower down. And, to come now to the vital point, the compressive forces in the upper part of the St. Sophia half-domes must (like the analogous thrusts of a lot of horizontal arches) exert considerable inward pressure on the upper parts of the great transverse arches against which they abut. Thereby they must help largely to balance the opposing thrusts of the main dome.

Elasticity, movement, and deformation

These distortions arise out of the capacity of typical Byzantine brickwork, with joints of natural lime mortar thicker than the bricks embedded in them, to adjust and readjust by progressive distortions to changing conditions of pressure, both during initial construction and settlement, and during later reconstructions at widely separated points in time. As told in the earlier story, the eastern one of the four main arches (at C in Figure 2) failed within 20 years of completion, carrying the first dome with it; so a second, higher dome was built with a gentler outward thrust. The western arch (at B) gave way in the 10th century, and the eastern one came down in the 14th century for a second time, so that extensive repairs were required to the main dome and to the larger half-domes on each occasion. The processes of adjustment and readjustment by which a fabric with different elements created at different dates under different conditions reaches a state of equilibrium are highly complex, as Mr. Mainstone makes clear. For a description of how these plastic forces work, again Mainstone:

The distortion which balances the opposed forces will always be an elastic one, which would disappear if some of the forces producing it disappeared in a partial collapse. But as long as the mortar remains plastic it will continually yield, destroying the elastic resistance and calling for fresh elastic distortion to maintain the equilibrium. One has, finally, in a structure like St. Sophia, distortions that are the cumulative result of continued elastic movement but that are, in large measure, the inert freezing of these elastic movements in the setting mortar, so that their total magnitude depends a good deal on the sequence and speed of construction and on the rate at which the mortar hardens in different places.



 South edge of the dome-base bulges outward, being braced only at its ends -by projecting buttresses. North edge acts similarly.

5. East edge of the dome-base (below) has an inward bend caused by the thrust of its buttressing half-dome. West edge acts similarly.





6. In section above, apse shell (right) has a thin crown; it abuts only against a thin arch, not against the higher barrel vault. Vault in turn is tilted downward by pressure from the eastern half-dome (above and left). 7. Right: A straight-up photo shows how the apse shell has bent its abutted thin arch forward, symmetrically over its springing line.

The internal arches longitudinal to the nave (A, A in Figure 2) show little deformation because their faces were somehow straightened during the construction of the second dome. But the shorter and thicker *external* arches (A', A'), which have never fallen, bend *outward* half a meter in curves approximated along the sides of the dome-base above (Figure 4). These bulges were caused by thrusts of the domelargely of the first dome-acting on the arches while their mortar slowly stiffened.

In contrast to the outward bulge parallel with the sides of the nave, where there are no half-domes to exert a buttressing action, the rebuilt ends of the dome-base bend *inward* nearly half a meter, above the western half-dome of the 10th century (not shown) and the eastern half-dome of the 14th century (Figure 5). These inward distortions, so striking on the exterior, correspond to curves which are less obvious, in the interior faces of the great arches (B and C), but are characteristic of them and of the curves of the smaller half-domes as well.

Among the smaller half-domes, if we start with the special case of



the apse (D in Figure 2), its shell is found to have a thickness equal only to the length of one side of a sixth-century brick. (See section, Figure 6.) This apse shell seems not to have been designed as a functional element, for its crown, instead of abutting the barrel vault in front of it, abuts a relatively thin arch rising *beneath* the edge of the vault. Although the crown of the barrel vault itself has been tilted down to a maximum of some 0.36m. by the pressure of the large semidome (see section), the associated inclination of the piers of the apse away from the nave is slight—because these piers are buttressed by projecting walls surrounding the apse. In these circumstances the thin arch, which provides the only resistance at the crown of the shell, has bent forward symmetrically to a distance of 0.40m. over its spring line (Figure 7).

As to the shells of the four *exedrae*, two at each end of the nave, these abut arches carrying one-third of the loads generated by the larger half-domes, and yet they have the same minimal thickness at



8. Section above shows how the reflected plan of the eastern main arch (C), rebuilt after 800 years, deviates in a double curve from a straight line drawn between its springings. 9. Section showing the slight forward inclination of the southeast exedra arch (E) at its open face, which is abutted by the thin shell of the half-dome.

their crowns not only as the shell of the apse, but also as the vault of the gallery below. (Section, Figure 9, and E in Figure 2).

The arches at the open faces of the eastern pair start backward from the piers and then come forward symmetrically to their centers; those of the western pair (as F) also begin from the main piers with reverse curves before coming forward at their crowns, but they continue unsymmetrically to the western secondary piers which, lacking buttressing comparable to those of the apse, have tipped away from the nave and caused a corresponding increase in the spans of the half-domes; still, the load-bearing arches standing before all four exedrae bend forward to some degree in relation to a line drawn between their springings.

Both the great arches, B and C, reconstructed centuries after major settlement of the piers had ceased, show remarkably symmetrical distortions. The reflected plan of the eastern arch (Figure 8), for example, curves slightly backward from the main piers and then forward until its crown projects 0.29m. in front of a straight line joining its springings.

The inward curvatures of these immense rebuilt arches and of the smaller original ones before the exedrae and apse (if allowances are made for different degrees of deformation in their supports and for numerous other variables affecting them) conform surprisingly closely to the theoretical pattern of forces at work in their half-domes. Despite an interval of 800 vears between the dates of construction of the existing principal arches, their inward distortions are due (as indicated in Mr. Mainstone's observations) to the same cause. There was action, not only during the initial construction but during each repair, of forces in the half-domes on newly built arches while the new mortar was still plastic.

In such deformations, of a character and extent not recorded in detail until recently. the structure itself, however, preserves the most convincing testimony of the effectiveness of the half-domes in the system of support for the central dome. The structure also proves that even if the architects of St. Sophia were unable to use the advanced calculation expected in modern times, to balance the forces set in action by their immense, unusual, and complex structure, still they did have profound intuitive understanding of the structural potentialities of the half-domes, and took the best advantage of these in designing their extraordinary space. END

The best informed architects are those who subscribe to

THE ARCHITECTURAL REVIEW has often been described as. the best architectural magazine in the world, and even as one of the best magazines of any kind. Edited in London, it is a magazine of international standing which every leading architect, wherever he practises, and indeed everyone interested in architecture, should take; and it has a particular appeal to American architects. For example, its features by Gordon Cullen and others on townscape and the visual aspects of planning, a REVIEW speciality, show a rare imagination in dealing with urgent issues concerning architecture's contribution to the total environment, matters rapidly becoming of vital importance to America.

The REVIEW has always had a special regard for architecture and planning in the United States. It has devoted two closely-studied issues to this subject ('Man Made America,' followed by 'Machine Made America') and in a series of articles over recent years by British contributors, Cullen again, Ian McCallum, Ian Nairn, Reyner Banham and others, and by US authors such as Ada Louise Huxtable, it has maintained a watching brief on the problems and achievements of the American city. It publishes a steady flow of comment and criticism on the work of American architects, and many distinguished American writers appear in its pages, including Henry-Russell Hitchcock, Philip Johnson, James Marston Fitch, Vincent Scully, William Jordy and James Ackerman.

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SILENCE

continued from page 21

time when we are speaking of building a new America as large again as that which we have built up to now, and when the issues of urban renewal and design are so terribly urgent, is an appalling misfortune.

GEORGE MC CUE Art News Editor St. Louis Post-Dispatch

Forum: . . . a real journal of considerable social and cultural significance. Were the progress of recent years to continue it could easily become the foremost magazine in the world. Thus it seems doubly tragic that the

St. Louis

magazine is cut off at just this moment. JOSEPH ESHERICK San Francisco Architect

Forum: I know you have stockholders who demand you present them with dividends several times a year, and, judging from the ad linage, FORUM probably doesn't contribute much to this demand. But, you have other stockholders as well, and, as one of them, I can honestly say that ever since I saw my first FORUM in a public library 25 years or so ago, I have received monthly dividends from you. I am sure many architects feel the same way.

JOHN BYRON HACKLER Peoria, Ill. Architect

Forum: ARCHITECTURAL FORUM has been a positive influence and creative force in American life for many years. It has been one of the principal contributors to the developing building culture in America, and it has always stood for excellence in achieving a better environment for all of the people of the U. S.

Architectural education will grieve over the loss of FORUM. We have always considered the magazine a potent ally and contributor to our interests.

HENRY L. KAMPHOEFNER, President Association of Collegiate Schools of Raleigh, N.C. Architecture

Forum: If FORUM is really to go, it will leave a hole that simply cannot be filled, and this will have serious results for the present and the future in architecture and planning in this country. At a moment when we are all concerned about the general architectural and design mess that we seem to be creating, it is of almost inexpressible importance not to lose the strongest voice we have had in helping to see our way through this mess and to provide both the forum for discussion (which is its name) and the editorial leadership and directiongiving which has always been its policy.

New Canaan, Conn.

ELIOT NOYES Architect

Forum: The magazine has been of incalculable service to a wide community—far wider than those who are interested in architecture alone. I feel that nothing can take its place—that no service which your continued on page 28



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Lone Star goes to LOUISIANA STATE UNIVERSITY

Brilliant use of concrete featured in new Student Union Building



STUDENT UNION BUILDING Louisiana State University, Baton Rouge, La. Architects: MATHES, BERGMAN & ASSOCIATES, New Orleans WILSON & SANDIFER, Shreveport JOHN J. DESMOND, Hammond Engineer ALFRED G. RAYNER, Baton Rouge General Contractor: R. P. FARNSWORTH & CO., INC., New Orleans Precast Concrete: ARCHITECTURAL STONE CO., New Orleans Exposed - Aggregate Panels: GRANT-LEHR CORPORATION, Baton Rouge Ready Mixed Concrete: ALTEX READY MIXED CONCRETE CORP., Baton Rouge



A student union building traditionally serves as a campus "family room"—a place for relaxation and recreation. Its design should be informal, even light-hearted in spirit, esthetically interesting. On the other hand, it should be in keeping with the existing campus atmosphere—in this case, dominated by a repeated use of arches.

To meet all these requirements, the planners of Louisiana State University's new \$4,300,000 Student Union Building chose to design in concrete, the basic construction material offering plasticity and freedom of form. The photographs here show the success of their efforts.

Of special interest is the orderly, exposed structural system, with tall columns flared in four directions to support the overhead beams on a 12-foot grid. This design results in continuity of stress flow from beams to columns.

Preparation of reusable wooden forms for the columns required skillful planning and supervision by the contractor, but no special forming personnel were required.

Precast, exposed-aggregate concrete units included rails and balusters for the exterior balustrades, all stair treads and risers, and copings and roof facias. A matching effect was obtained on the exterior concrete walls through the application of prefabricated exposed-aggregate panels. These were asbestos-cement panels, to which aggregate had been applied in an epoxy binder.

It is a matter of great pride that Lone Star Portland Cement was selected for use throughout this significant and beautiful structure.



Central lobby

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ARCHITECTURE IN TRANSITION

Growth, achievement, change: so it is with people, with architecture, and with magazines. And as one road appears to end, another opens up.

So perhaps it is appropriate that with this special issue FORUM, in transition, looks at architecture, in transition: the recent growth, the achievements, and the changes that lie ahead. We begin with an insider's view of history by Douglas Haskell (overleaf), followed by an uninhibited "scrapbook" of ideas that architecture grows on, by Peter Blake (page 81). On pages 115-170 other editors and contributors serve up the main fare, a robust sampling of current "new style" buildings from the U.S. and abroad. And finally, starting on page 171, still others take a provocative, and sobering, look at the "new scale" and the urban emergency that challenges not only architecture but civilization itself.

If there is any one conclusion that can be drawn from these stories, of course, it is that the possibilities, and responsibilities, of architecture have just begun to open up. And this can be said of architectural journalism, too.—ogden TANNER



75 YEARS OF CHANGE-MOSTLY UNPREDICTED

BY DOUGLAS HASKELL

Let's start with the past. Three-quarters of a century—almost—has gone by since FORUM was born, and it has been like a thousand years in its transformations. Never before, 75 years of such change—and FORUM lived through 72 years of them. The magazine was started as *The Brickbuilder* in January 1892. Just three years earlier, in 1889, Gustave Eiffel had built his tower in Paris to symbolize the new sky-seeking epoch.

Those years never ran off like clockwork. It was ever a gamble whether the vast productivity and new design were going to make mankind feel any happier inside because of what architecture was giving him to experience, or whether, in exchange for realizing his dreams, he was going to wake up robbed of older treasures. "Unforeseeable" results and still bigger problems often crept in when the forward-looking man wasn't looking all around him and behind him, and they might show up from inside the building enterprise or from outside it. The biggest shifts were due to the transfer of sovereignty over taste from an aristocratic elite to the people, and to the growth of science.

Prediction in the modern world became difficult at best, and it was a good thing—as events speeded up—that architecture began to supplement the prophetic vision of the few genius architects and fewer genius critics with better periodicals, as a sort of "intelligence and prognostication service."

For those 75 years, the statistics and achievements are so immense that they are almost boring. —How the population grew in the U.S. not by one-third but three times (what do people mean by the population explosion "ahead of us?") —How there grew up the unprecedented modern "vertical city," and then the idea of a multilevel base spread under it.—How the concept developed of "controlled conditions" in the light, sound, and climate that pervade the very atmosphere of a building or project. —How the idea of architecture itself went "total," even before Hitler contrived the idea of "total war." Not only building but all means of transmuting the complete surroundings into a "controlled environment" would be a part of architecture. Meanwhile, "endless towns" came along (all hung on roads, of course), and finally outer-planet exploration, even while an expert said shelter on earth averaged worse than in the Stone Age.

The late nineteen hundreds: the quick skyscraper and the chance skyline

Every decade seemed to bring major change. In the 1890s it was to be skyscrapers, based on the 1885 steel-frame office building designed by Major LeBaron Jenney in Chicago. Within seven years Louis Sullivan and John Wellborn Root had worked out a splendid architecture for the tall office buildings and created masterpieces. Yet *The Brickbuilder*, started in 1892 in Boston, paid almost no attention. Its editors concentrated on habitual themes such as full-page plates of "Boston doors" and "Boston windows." Habit is the sickness of professions and of strictly professional publications, until someone bumps them.

Meanwhile the "skyscraper" multiplied to bring about the "skyline," which was an unanticipated effect, of a higher order of magnitude. Concerning the Manhattan skyline, the critic Montgomery Schuyler declared in *Harper's Weekly*, as early as 1894, that it was no "architectural vision" at all but just an overwhelming "raw aggregation." For this chaos, architecture was unprepared; Burnham's "City Beautiful" concepts in Beaux-Arts style were simply irrelevant.

In regard to the next two decades, 1900-1920, it has been the habit of some historians to exalt the masterpieces of the Beaux-Arts, and of others to trumpet the rising "machine age" and its "machine esthetics."

Yet we have to be careful about accepting the "machine esthetics" idea as the chief engine of change; it was not pure form that gave the machine ideal its victory but a vast popular liberation. Significantly, the machines most admired by artists and people alike were the new instruments of transportation. They



The Prudential Building in Buffalo (seen on the opposite page) illustrates the "skyscraper" style which Architect Louis Sullivan had already mastered by 1892, the year when **The Brickbuilder** was started in Boston. But the magazine gave such distant, unfamiliar events scant attention. The New York "skyline" of 1903 shown on this page illustrates how early the point of no return was reached in the chaos which Montgomery Schuyler, the critic, discerned in 1894 as the unpremeditated outcome of the tall-building style which Sullivan had rendered so expressive.





gave the people as a whole their new power over speed and motion, their new command over taste, and their access to new land, upsetting all planning patterns.

The railroads came first. Thus in May 1900, Editor Arthur D. Rogers of *The Brickbuilder* brought back from a Chicago convention of young architectural rebels all manner of manifestos, including a "Song of Steel and Steam" in youthful verse by a 30-year-old Frank Lloyd Wright, in adoration of the locomotive:

"... The crank-throws give the double-bass, the feed-pump sobs and heaves; And now the main eccentrics start quarrel on the sheaves..." all serving deep principles of "Interdependence absolute, foreseen, ordained, decreed."

And the railroads did more than stir esthetic admiration for their locomotives. At urban scale a railroad tycoon, the younger Vanderbilt, achieved the first, and thus far the only, demonstration at precinct scale of the Futurist City. Behind his Grand Central Terminal in New York (justly admired for Whitney Warren's noble concourse but with an indifferent Beaux-Arts jacket), the architects Reed & Stem, with the engineer Colonel William J. Wilgus, used the "yard" and its tracks under Park Avenue as the basis of a fantastic interweave. This embraced half a mile of over-and-under trackage, of platforms, bridge streets, ramps, elevateds, and subways pedestrian and vehicular. But only the Italian Futurists emulated it, as when Sant'Elia in 1912 drew his proposed, never built, station for Milan and stole all the Futurist credit. New York, for lack of steady reminders, forgot about carrying any further its sudden invention in smooth, high-density urban movement, and to this day goes in for daily tie-ups, frustration, lost tempers, and violence, running everything pre-Columbian style on a base mostly at one level, which tries to serve buildings that may soon reach to 200 floors.

The early twentieth century: how Henry Ford murdered both Charles Follen McKim and Louis Sullivan—quite by accident

Then came Ford. Despite early machine-age poetry, had anybody told either Charles Follen McKim or Louis Sullivan that his world would be knocked out by a half-educated mechanic, either would have snorted. Yet by 1916, three years after Vanderbilt finished his Futurist terminal (begun in 1902), Henry Ford was producing half a million Model T gasoline buggies annually, and something very different from early machine-age romanticism was set rolling.

Ford's Model T, far from being beautiful, was just about the ugliest machine ever built, and the most popular, and at first seemed to have nothing to do with any skyline. But the use of the Model T was sexy. Ford's men, having been paid unprecedented wages, in order that they might buy back their own "luxury" product, went ecstatic over such control of movement, distance, speed, and with so voluptuous a feel of power. Their families shared this feeling. It made them new people. Never again would the millions of Ford purchasers be peasants or proletarians. One mile behind the wheel of the family Ford was worth more than endless miles of Marxist promises.

By the same token, and with far more extensive effect, Ford led in making an emperor of mass taste. He did this in company with the movies, "Monky Ward" and Sears, and prepared foods, later to be followed by radio and TV. Luxury items now mass-produced included household appliances, and thereafter mass-produced "houses like Fords" were inevitable.

Gone ever since, with only the beginning signs of a return, has been aristocratic dominance over the whole of architecture or culture; gone the general respect for what was choice; gone humility in the presence of long-pursued perfection, which architecture in the hands of either the Roman McKim or the romanticist of nature and democracy, Sullivan, had stood for. Architecture came to be produced for special occasions while new happy *hoi polloi* took charge of the scene in general. They were full of blind confidence, crudity, innocence, and invention, with comfort, conformity, and exhibitionism as their aim. Ford had murdered at a single blow both McKim and Sullivan, by undermining the aristocratic standard supporting both; but this was quite accidental and guiltless. Probably Ford, the revolutionary, never knew either man.

Then, too, Henry Ford's Model T set off another unexpected revolution-in city patterns. Much earlier the railroads had created the suburbs which, in



Beaux-Arts dominance of the 20th century's first two decades is illustrated by McKim, Mead & White's Racquet Club in New York, as shown on the opposite page. These formal compositions were preferred by influential clients above Sullivan's and Wright's machine-age romanticisms. Model T Fords, seen above, in front of Louis Sullivan's Prudential Building, demonstrate the destruction by a highly popular machine-age product of the sophisticated air which architecture was intended to generate. Thus Ford upset the aristocratic ideal of both Sullivan and McKim.



1898, the Englishman Ebenezer Howard proposed to work into a Garden City satellite system. But it was the Model T which settled it that instead of the cities shaping the roads, as ever before, now the roads would first wreck, and thereafter reshape, the cities. And the game also came to involve the skyways.

The architectural role of the U.S. in the 1920s was not significant. It was in Europe that peoples whose emperors had forced them to fight for obsolescence, and who had lost to the more democratized and Fordized allies, now got rid of their emperors, and decided to discard stale sentiment out of their architecture also. They went "modern." Only the U.S. hung back, the relaxed "winner of the war," still entranced with the afterglow of the Beaux-Arts.

By 1927, the remarkable Dr. Michael Mikkelsen, publisher-editor of Architectural Record, brought Frank Lloyd Wright back into prominence by paying him some thousands of dollars for a series of articles. Mikkelsen had grown up with the Record in the early days when it was a general magazine for cultivated readers, and published good critics such as Russell Sturgis and Montgomery Schuyler. But by the 1920s architectural magazines in general had settled into being narrowly professional and uncreative.

In 1917 *The Brickbuilder*, however, had taken a forward step in the opposite, broadening direction: it declared that now it would be in name, as it had already become in fact, an ARCHITECTURAL FORUM.

The Depression thirties: despair and a fresh start

The story of the Depression has often been told, but rarely from the standpoint that in architecture it was an era of abundant creation.

People had to think, and act on their thoughts, to seek a "way out." It was during the Depression that Wright drew some of his finest work, including the famous Fallingwater house and the Johnson Wax Administration Building; that Gropius brought the new continental ideas to Hudnut's Harvard; that Mies van der Rohe arrived. Rockefeller Center took shape as America's only central-city urban design of three decades; and the Greenbelt towns were tried as the first satellite cities (though not successful ones) since the Radburn of the late 1920s. And then, all at once, the Tennessee Valley raised to a new plateau the complete realm of architectural understanding and purpose.

"In the Valley," as I described it in *The Nation* for May 17, 1941, "architecture has taken hold of an area of 40,000 square miles, inhabited by 2 million people, based on 650 miles of the all-important river. . . The glimpse that is given is of man working upon the *whole* of his environment to put it into habitable, workable, agreeable, and friendly shape. As a concept, architecture today can be no less." The TVA idea overrode all faults of execution.

But architecture needed more than stunning exceptions and special cases in order to get back on its feet. One kind of help came from Howard Myers, editor and publisher of ARCHITECTURAL FORUM. He broke the rules.

Magazines were supposed to stick to art reporting and esthetic discussion fringed by news and technological research. But Howard Myers acted as if architecture were not only an art but a cause, one in need of constantly overhauled strategies, in which a magazine's job was to give all possible aid. And the means were put in his hands in 1932, when he brought his magazine to Henry R. Luce and Time Inc. Together they made FORUM a new instrument.

Thus, for example, a new Building Money department was added to FORUM to air those problems which in the Depression were giving architecture its worst block. The areas of greatest possible breakthrough into new creation and production were to be found by well-planned research (which had the added advantage of employing and feeding idle architects). The very recognition of hidden architects who were doing significant work was advanced by humanly written "profiles" explaining what these men were "all about." And, finally, the news, far from being construed as random events, was treated in terms of situations, and with astute analysis, backed by editorial support for forward-looking actions.

The effects were electric. Readership jumped in just two Depression years from about 7,000 in 1934 to over 30,000 in 1936; never again was FORUM anything but first among the world's paid-circulation architectural magazines,



The Depression, a creative architectural age, witnessed emergence of a "total architecture" in the TVA development (illustrated on the opposite page); 40,000 square miles of landscape were treated as a single project of environmental art. During the Depression there also emerged a new kind of magazine, FORUM, as a means of industry-wide dissemination of architectural ideals. The issue pictured above dealt with forwardlooking research into problems of the future.



with a total of more than 70,000 in 1951. And along with the big increase of architect readers came new participation by the architect's allies: engineers, contractors, lenders and owners, too. By this means the new instrument had leadership built in, and breadth.

Yet the central position was still the architect's, and Myers loved especially those who were bold and their lives heavy with fate. The two famous Frank Lloyd Wright issues of January 1938 and January 1948 put Wright before an audience larger and more influential than any that had been available in earlier years, and behind these special issues went continued explicit support. To the end Wright was Howard Myers' fast friend, and to the end Wright put FORUM first. Yet every hard-working, promising young architect got personal support in the magazine, so that most who had made their mark by the 1950s had Howard to thank for first help toward a start. He was repaid with love, and to this day his picture hangs in countless offices.

Postwar, prewhat?-1945 to 1964

As the Second World War lifted, after effectively prolonging the building depression to a total of 15 years, it lifted upon a new "one-town world," as Buckminster Fuller calls it, but a world tragically rent down the middle by an invisible wall, lined on both sides with weapons of total destruction.

Nevertheless, people went about their daily work. So the first evident outcome was the triumph—gradually to become world-wide—of modern architecture, by common consent. And common consent, made effective through new aristocratic patron-clients rising up out of industry, gave the five or six "modern" pioneer architects the role of stars. And the world being now incurably multiplex, these leaders set up not "a" style but "six main currents," as Eero Saarinen, writing for FORUM in July 1953, was to describe them.

For some years Mies was the most potent leader (and it was to him alone that Saarinen gave the title of "form-giver" which was to become such a cliché). Mies's rationalism could be taught, and could be carried out at impressive scale, by those of the upcoming generation who were running a new kind of enterprise: the big office, the architectural "bureaucracy." But a new kind of genius was needed in these offices, a Skidmore and an Owings who could tease and compel a big organization to keep such high-quality work fresh. That the influence of Mies later declined was no fault of his but resulted from the ease with which he was parodied by a new class of builder-scroungers manipulating the income tax.

Of course, artists being so individualistic and competitive, the pioneer leaders were soon challenged by a group of "younger men" reaching their fifties, and these had to have a new art and style. So history was brought back, and some eclecticism came back, and fantasy came in, and primitivism, and a great welcome to the new plasticity of concrete, and restlessness and fantasy everywhere, of perhaps a *fin-de-siècle* if not a *fin-du-monde* kind. And then still younger men brought along "action architecture," jazz, and pop. It all enriched the scene. But even as these generals and colonels struggled with one another to come up into the brightest light, there was much to be done for the troops.

Thus a magazine conceived as an active aid to architectural leadership was now involved in more than showing the finest exceptional results. It had to run interference against encroachments directed against architecture as such, and against subversions of every kind. From exposing the hidden censorship of FHA ruling out modern houses, to attacking the clichés of existing school planning, to arguing for a wider use of curtain walls, to fighting outmoded codes, to restoring contact between home builders and the architects (who had lost all effective control over the design of U.S. homes), the magazine in the early 1950s had its hands full of "crusades." (It still has crusades in 1964.)

But FORUM's biggest new venture was yet to come. For whatever else the years of depression and war had done, it became obvious soon that they had left a woeful problem unattended: cities and slums. So FORUM became the first architectural publication to be heavily concerned with urban redevelopment, and the first editorial voice anywhere to ask insistently what was to be done about city patterns for "60 million more Americans and 50 million more automobiles."



"HOTO (OPP.) : DOUGLAS HASKELL

The Southwest area of Washington, D.C., an entire new residential district in the national capital, attests to the new urban scale of architecture in the U.S. (opposite). But around the world, rehousing of the underprivileged lags. Architecture has reached extremes: above is seen part of America's \$3 billion effort to put "a house on the moon," whereas most of mankind still lives in squalor worse than the early Stone Age. Such are the urgent problems of total architecture. The subsequent major battle for some kind of a rational habitation pattern became quite an eye-opener, revealing the new, larger-scale problems for the architects, not only of this nation but of the world. For whereas Henry Ford had incomparably widened architecture's problems (and opportunities) by making arbiters of taste out of the millions of the new American middle class, now architecture world-wide had to be concerned with the billions of the poor for whom mere planless building could not cover a desperate need.

For the sake of convenience, one can divide all architecture in two. First there is the splendid architecture, the glorious architecture, the star architecture which mankind needs so badly, for the nourishment of his soul, and this he cannot live without. But this kind of architecture has been, is, and ever will be done with wealth for wealth. Wealth created the cathedrals in the Middle Ages, as today it creates such worldly monasteries of architecture as the campus of Yale. It is this costly architecture, too, which nourishes most of the critics.

Beyond the wealthy patrons, however, we find the vast, underdeveloped though affluent, middle class with its overwhelming land-shaping and landscapedestroying activities and its untutored taste; and then we have the poor, who were never so conspicuous as today, be they Negroes in hundreds of American Harlems or be they Indians or Africans barely alive. Serviceable and magnanimous architecture is the second kind, and it has to be far more widely spread.

For architecture, the fight has just begun

Accordingly if we are to have a "total" architecture and a world-wide architecture—and it is too late now to retreat—the operation will have to be conducted by all nations including our own, and at many different levels, and with the manifold duties and tactics of big armies. And these must be assembled with a wide variety of weapons and personnel, for missions that are diverse.

The reference to an army is far-fetched only in part. As in an army, despite jealousies among branches of the service, the work must mesh. Thus engineering today must be able to relate its highways to building sites, and in future will have to combine the right-of-way and the building site. As Architect Louis Kahn declares, in every settled place the "street wants to be a room." Even on a college campus, architecture means more if it sets an example to towns, and, as for housing, the competitive ineffectualness of expensive U.S. aid abroad thus far means that industry must rouse itself to provide another advance in technology. Unless we can give up fancy stuff and deliver healthful shelter at "little above the cost of mud," fostering self-help and self-regard, other less advanced nations than ourselves will beat us out in underdeveloped countries. It is a black mark against the American building industry that at home it cannot produce *new* construction for incomes below the upper middle class, and has not yet devised a systematic rotation of the sort by which the automotive industry supplies people of lesser means with usable secondhand cars.

Despite all of the activities in architecture that need correlating, however, there is no correlated "army" command. Nor can there be, or private enterprise and individual initiative and imagination would be lost. We depend on understanding, on consensus, on common purpose, on adaptability, and on shared good will.

Such, then, are the concerns of those who deal with architecture day by day, not alone as contemporary "art history" but also as the contemporary history of an art; who are interested in current architectural criticism, yes, but also in architectural statesmanship; who are looking toward the future on both counts.

Now that FORUM must step out of its special role in America—that of speaking not to the architectural and engineering professionals alone but to all who are involved—others must be found to pick this role up. For despite the pettinesses and parochialisms of those who can exalt only their own part, history has already made architecture the art of all man-made surroundings. Architecture is everyone's concern. And it is a glorious thing that, whether to humanize a former slum or to create a high place on earth or to seek a habitat on the moon, the man with the magic, to whom so many have given a helping hand, can bring inert materials to life and occasionally make the very stones sing. END



The pictures and comments on the next 30-odd pages are a kind of dossier assembled by one casual observer, the undersigned, over a period of several years. The prey stalked was modern architecture, plus various seemingly irrelevant matters tangential to it.

The purpose of assembling this dossier was never clearly defined: it was certainly **not** historical research (there are too many "Histories of Modern Architecture" as it is). Nor was it historical one-upmanship: Nobody was trying to prove what—or who—came first. Least of all was there an attempt to limit the dossier to modern architecture, though most of the exhibits included do seem to have some vague bearing upon what's cooking nowadays.

If the resulting scrapbook seems a bit ragged, that may be its principal—perhaps its only—charm. Its purpose was merely to satisfy the author's secret vice: a passion for that tiny part of our world that is shaped by buildings, and an irrational fascination with some of the things and people that shape them.

Here it is: available for the first time, unexpurgated, fully illustrated, and in the original translation! —PETER BLAKE



Buildings are shaped in many ways, by many different kinds of

INDIVIDUALS

ranging from supermen of the sort pictured on the cover of the latest British architectural magazine, Amazing Archigram (1), to bathing beauties; from judges to amphibious critics; from architects to Presidents. Here, in no particular order, we see Messrs. Le Corbusier and Mies van der Rohe (2) in animated conversation in Stuttgart, in 1926; Frank Lloyd Wright sharpening an abrasive pencil at Taliesin West (3); Señor Antoni Gaudí i Cornet holding a votive candle at Barcelona, in 1924 (4); Architects Serge Chermayeff and Philip Johnson in restrained rapport at Yale, in 1963 (5), and Professors Marcel Breuer and Walter Gropius in complete rapport at Harvard, in the late 1930s (6).

Then there are the critics: Dr. Reyner Banham, ever self-confident, attempted to walk across the waters of a swimming pool at Aspen, Colo. during a recent design conference at that well-known intellectual summit. He failed (7). A more successful panel of critics, the distinguished Justices













of the New York State Court of Appeals (8), decided—at almost the moment when Dr. Banham was coming up for air—that the Seagram Building should be taxed for being beautiful. (After all, ours is a Puritan nation.) If the decision handed down by Justices (left to right) Scileppi, Van Voorhis, Dye, Desmond, Fuld, Burke, and Bergan is allowed to stand, all of us may soon have to come up for air.

Another sort of value-judgment in the arts was handed down recently by a professor of art at Cornell University, who smeared strawberry jam all over the hood of his car, and then had the jam licked off the hood by a bevy of girl students (9). Note to the distinguished Justices: You can have your art and eat it, too!

Meanwhile in England, home of the Amazing Archigram, the lively art of advertising has undergone a spectacular revival—a radical switch from the dour ads for building products of a mere three years ago (10), to the new look of the post-Christine-Keeler era (11). (Just wait till those judges catch up with topless acoustics!)

Finally, we have a snapshot of Fine Arts Commission Chairman William Walton, talking with his late friend (12). Sometimes the cause and the course of architecture can be dramatically changed for the better because right men are in the right place at the right time. We will forever mourn the loss of Commissioner Walton's friend-the loss of perhaps the only Chief of State who ever had the nerve to tell artists to stand up "against an intrusive society and an officious state"-but we will, for a long time, rejoice that an abstract painter, of all people, was chosen to give a new direction to architecture in the capital of the United States.







AT LAST– FULLY ACCESSIBLE TRAVERTONE CEILING



10

Armstrong

Just introduced by Afrastrong—a metal suspension system for 24° x 12° Travertone acoustic tiles that allows each separate tile to be removed immediately, easily and without tools or skilled labour. Access panels—and the extra cost they entall—are unnecessary as this new advance in acoustic colling suspension gives complete access to all services. The decourtie appearance of Travertone tiles is not affected, and the cost is only fractionally more than present metal suspension systems. Please write for tull details.

Armstrong ACOUSTICS



For reasons that may become clear in a moment, the arts of

LOCOMOTION

have always held a special fascination for modern U.S. architects. For one thing, in so vast a country as this one, the arts of transportation (and communication) are constantly being pushed to their limits-for without them, the country would disintegrate. From Alexander Graham Bell's circular kite of the turn of the century (13) and the equally handsome Ferris Wheel (14) at Chicago's Columbian Exposition of 1893, to the sleek jet engines of advanced aeronautics (15), there has been developed a marvelous vocabulary of structures that make much of contemporary architecture look a trifle antediluvian.

Indeed, it may be quite possible to tell the story of modern U.S. architecture in terms of the wonderful railroad trestles, like this iron viaduct of 1877 (16); in terms of the great 19thcentury railroad sheds, like the old Grand Central (17); designed by John B. Snook and Isaac C. Buckhout, and built 1869-71; in terms of such gadgets as Hale's Duplex Water Elevator (18), patented in the 1870s; in terms of the steel frames of the old battleship "Maine" (19), shown here under construction in the Brooklyn Navy Yard, in 1889; and in terms of the Wright Brothers' wiry 1903 plane (20) taking off from Kitty Hawk.

One could tell the story of modern U.S. architecture in those terms, but we won't: "If you were born to walk the ground," Hilaire Belloc once wrote, "remain there-do not fool around!" Still, it is intriguing to note that a real cool type like Buckminster Fuller came into building from a stint in the Navy, where he picked up some basic truths about structures; and that Le Corbusier and Pierre Jeanneret designed a car in 1928 (21) that antedated the Volkswagen (and similar bugs) by about ten years. Walter Gropius' best piece of industrial design, in all likelihood, was his 1930 Adler (22)—as handsome a job as any Rolls of the period. Our favorite hotrodder, at the moment, is a young French architect called Francois Dallegret - who, like some of his illustrious professional predecessors, is fascinated by all modes of transportationterrestrial and otherwise. One of his finest designs, surely, is this classic voiture (23), which is only a few (backward) steps removed from Gropius' Adler.



14

CILBERT GROSVENOR () NATL, CEOC, SOCI





15


One of the numerous intriguing facts about steel is its strength in

TENSION

and this single technological fact may have done more to change the look of architecture over the past several decades than any other. Steel in tension was most spectacularly dramatized, in the beginning, in suspension bridges; and one of the most astonishing of these was the Pont Transbordeur (24), built in 1902 to span the entrance to the Old Port of Marseilles. This bridge served a rather peculiar function: on its main deck, a kind of trolley shuttled back and forth; cables attached to this trolley carried a ferry platform, suspended just a couple of feet above the water. The ferry served to carry passengers from one side of the Old Port to the other.

The fantastic (and wonderfully ridiculous) structure so infuriated the German commandant of Marseilles during World War II that he had it demolished and melted down. The designers of the Pont Transbordeur were Ferdinand Arnodin and G. Leinekugel le Coq (no wonder!), and their mad genius is further demonstrated in the spiral stair (25) within the bridge towers. This stair consisted, in its entirety, of steel treads suspended within a system of cables! Few stair-crazy modernists have matched that design since.

No report on suspension bridges would be complete without a mention of the Roeblings' Brooklyn Bridge (26), begun in 1869. Although the bridge has recently been disfigured by the Authorities in Charge of Disfiguring Bridges with Double Decks, its web of steel cables forms the most beautiful boulevard in New York. By comparison, the handsome Golden Gate Bridge (27), designed by Joseph B. Strauss and built in 1933-37, may seem just a trifle prosaic; but there is nothing prosaic about the great suspension roof of Eero Saarinen's Dulles Airport (28), shown here under construction, when most things look their best. (Buildings under destructioni.e., ruins-run a close second, as Frank Lloyd Wright well knew.)









28

PROF. HANS BRECHBUHLER



Meanwhile, down on lower Broadway, the very latest thing was

CAST IRON

It began with that slightly unbelievable inventor, James Bogardus, who patented a process of building with prefabricated iron columns, beams, spandrels, and glass, in 1850 (29), and was soon busy constructing warehouses, factories (30), and various kinds of towers, including a lighthouse for Santo Domingo (31), which was prefabricated in the U.S. in 1853 and shipped down to the Dominican Republic to be assembled on a site at the mouth of the Ozama River. Actually, the lighthouse was simply an adaptation of some standard fire-alarm belltowers Bogardus had manufactured for the City of New York. What a man!

Bogardus' system was adopted by others who built some of the most delicate metal-and-glass facades ever constructed anywhere—more glass per square foot than the Seagram facade! Most of these remarkable examples of early inventive genius have been torn down to make way for so-called improvements; but, here and there, some firstrate structures remain—like the store at Broadway and Broome Street, in Manhattan, designed by J. P. Gaynor in 1857 (32).

In Chicago, toward the end of the 19th century, the iron facade reappeared briefly. S. S. Beman's Studebaker Building still stands (33)—but not entirely unscarred: just look at what some exterior decorator has done to its lower extremities (34)! Note to Seventh Avenue: we now have bottomless buildings, too. . .

Elsewhere the cast-iron style is in similar (or worse) trouble: unless somebody can convince André Malraux that Les Halles (35) are a cultural monument to be taken very seriously by the French Republic, the great market started in 1853 by Architect Victor Baltard will be improved out of existence shortly. The Bradbury Building in Los Angeles (36) by George Herbert Wyman, built in 1893, is not yet down but its existence is constantly threatened.













With many stronger and lighter materials (and plenty of nerve),

BIG SPANS

have become easier to build than ever before. The first of these light, sophisticated structures were vast greenhouses, like the Winter Garden built in Paris, in 1847, by Hector Horeau (37). Its structure was still of iron, with glass fill-in.

Yet, there is not much more than a small leap-well, a medium-sized leap, anyway-from the Winter Garden to Buckminster Fuller's aluminum-framed, plasticcovered domes (38), and to the brilliant tent structures developed by that genius, Frei Otto (39). These particular tents are a huge exhibition pavilion constructed in Hamburg in 1963. What makes Frei Otto so much more than a "mere" engineer is that he is able to "relate" his swooping structures visually to the ground. (Most domes and tents look as if they had just been plunked down somewhere and left to their own ungainly devices. Frei Otto's tents, on the other hand, are as delicately balanced on their supports as a Brancusi sculpture.) Eduardo Catalano's fantasy in hyperbolic paraboloids (40)though quite different in structural terms-has that same elegance. Won't someone build it?

One man who has been struggling with the problem of how to build a dome so it rests in peace is Robert McMillan, an American architect practicing in Rome, where he may have had a chance to observe a few earlier, successful solutions to the problem. His very pretty project for a mosque in Dar es Salaam, Tanganyika (41), is now under construction. Meanwhile, at the New York World's Fair, where there's been a lot of architectural smoke lately and practically no fire, Philip Johnson did come up with one rather amazing piece of structural acrobatics for the New York State Pavilion: an oval "Stonehenge" slip-formed in concrete, and supporting a featherlight suspension roof of steel and plastic engineered by Lev Zetlin (42). Form follows Philip. (Or is it vice versa?)











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Some of our very best friends have long suffered from chronic

JOINTITIS

a harmless affliction that is not without certain charms—though it is also highly contagious. Gustave Eiffel may have been one of the first to have caught the bug (43) in 1889—but his was a mild case, considering what happened later on. Alexander Graham Bell, in designing his wonderful tetrahedral structures, succumbed to the same disease (44) in the first decade of this century; and since that time, Jointitis has swept the globe.

In recent years, Jointitis has become less of an affliction and more of a passionate addiction, like Chinese Puzzling. The High Priest of the cult is Konrad Wachsmann, whose enchanting joint system for General Panel's wooden prefab of the early 1940s (45) was modern man's answer to a more primitive, traditional joint-i.e., the nail. Wachsmann's more recent bouts with Jointitis have produced a three-part universal connector (46), shown here stacked up en masse to form a kind of steel totem pole; this particular connector can be used to form continuous tetrahedral structures (47) using only a very few standard, interchangeable parts. Wachsmann's famous airplane hangar was designed to be built on this structural system.

The truth about Konrad Wachsmann, however, is revealed in his fantastic design for a dynamic, multistory structure (48), made up almost entirely of identical, three-legged, wishbone-like elements that intertwine along in a spiral path. The thing is a complete giveaway, and the giveaway, of course, is this: Jointitis is an art form, and men like Wachsmann are not engineers, but superlatively good artists. Whether or not they also make practical sense no one can say. After all, they laughed when Leonardo designed a flying machine.









Hard on Wachsmann's heels (or, maybe, on his toes) came Buckminster Fuller and his joints. Bucky's joints tend to be means to an end, i.e., domes (49), whereas Wachsmann's joints are often at their handsomest when left unjoined. Recently there has been some evidence that Mr. Fuller is becoming disenchanted with joints: his latest "tensegrity" structures (50) make a point of having no joints at all! In fact, Bucky now predicts that there will soon be whole domes consisting of nothing at all (they'll be made of radiation, or something like that). We'd like to show a picture of one, but we can't. What we can show a picture of is a dome that, for a short while, was nothing but joints: this (51) is the fantastic scaffolding used to support the forms that were then used to support the concrete that held the reinforcing rods in the great, shell-shaped exhibition hall built by Architects Zehrfuss, de Mailly, and Camelot and Engineer Pier Lugi Nervi several years ago just outside of Paris. Alas, one day the scaffolding was removed and the place looks pretty dreary now. Finally, we would like to present one of the very latest developments in the field of Jointitis: the German Mero System (52), used to build scaffolds from the Rhine to the Elbe. Herr Mero (if there is such a man), meet Dr. Bell!









Since skin-and-bones architecture (and all that) is pretty old hat,

ANIMALISM

is likely to be revived, for animalistic architecture has been around for quite some time. The finest example, without a shadow of doubt on our part, anyway, is the multistory elephant (53) designed in 1758 by C. F. Ribart to stand on the Place de l'Etoile, in Paris, in the spot now occupied by the Arc de Triomphe. The elephant (shown here in elevation and section) was to have been a Grand Kiosque à la Gloire du Roi; the superstructure was a throne room, and the inside of the elephant proper was divided, in split-level fashion, to contain a ballroom, dining room, kitchen, and bath. The trunk served as a spout that emptied cascades of water into an adjoining pool.

For some absurd reason the beast was never built (French Revolution, or something like that). But more than a hundred years later, on December 5th, 1882, a gentleman named James V. Lafferty was granted U.S. Patent No. 268,503 for an Elephant House (54); one was erected, as a real estate office, in the following year near Atlantic City. It was a modest structure, as elephant houses go: just a couple of stories high, with a widow's walk on top. The entrance was by way of a spiral stair up one of the rear legs, which seems ingenious enough, but not terribly dignified, especially for formal occasions. The Lafferty job contained one large main hall, plus a few bedrooms on a lower level. The only trouble with the design was its fenestration, which was unsolved. Incredibly, the beast is still standing and is a great tourist attraction. A similar structure at Coney Island burned down in 1896.

The only building we know that even approaches the elephant houses in symbolic impact is a 11/2-story duck near Riverhead, Long Island (55). In it are sold ducks. Of course there are plenty of parts of buildings that are vaguely animalistic-or, in any case, fetishistic: for foot-fetishists, we wish to present the "Silver Slipper" (56) of Las Vegas. (We don't know if anybody lives inside it, but one obviously could and, one, possibly, should.) And thanks to the Japanese architectural magazine Kentiku, we are now equipped with a suitable modulor scale to solve all basic problems of animalistic design (57).









Like animalistic architecture, the architecture of utterly undiluted

FANTASY

has been with us for a long time. Revived by Gaudi in the late 19th century (58), it proved to be a major influence on the surrealist painters and sculptors, rather than the architects. One artist smitten with Fantastic Architecture was the Dadaist painter and sculptor, Kurt Schwitters, whose Merz-Bau (59) was constructed by him in his own home in Hannover. The thing started modestly enough around 1924; after a while, however, the Merz-Bau proceeded to occupy more and more of his house, and living space became somewhat limited. The name Merz-Bau was invented by Schwitters in a rather odd way: in one of his collage paintings, he used a part of a newspaper clipping snipped from the ad of a Kommerz Bank (commercial bank). So the picture became known as a Merz picture, and his subsequent structures-including this rather astonishing jungle gym-became Merz buildings. All perfectly reasonable.

Rudolf Steiner's Goetheanum (60) looks, by comparison, almost a bit "square." Yet it is one of the most fabulous of all recent exercises in architectural fantasy, and antedates Le Corbusier's plastic béton brut by 30 years or more. The original Goetheanum was begun in 1913, in Dornach near Basel, Switzerland. It was built entirely of wood, yet it was just as "plastic" a building as the concrete structure that survives today. The wooden Goetheanum burned down in 1922, and Steiner began to replace it with the present reinforced concrete structure in 1924. (In case anyone asks, the Goetheanum housed a part of Steiner's experiment in progressive education.)

59

Gaudi's Casa Milá, done in 1905-10 in Barcelona (61), contains some elements similar to those found in the Goetheanumbut Steiner's building, at least in its details, could well be a 1964 exercise in brutalism and plasticism, whereas Gaudi's could not. The great-nephew of the Milá who commissioned Gaudí more than half a century ago, and who played in the Casa as a child, is a talented young Barcelona architect called Alfonso Milá; this factory (62), designed by Milá and Federico Correa a couple of years ago, is part of a mounting body of evidence that modern Spanish architecture is no longer fantastic-nor dead.













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One artist who also knows his Gaudi, Steiner, Schwitters, and bubble gum is the Frenchman André Bloc-an amazing fellow who is an architect, painter, sculptor, engineer, and publisher of the lively L'architecture d'aujourd'hui to boot. In his spare time he builds things like this giant stucco passion pit (63) in his garden outside Paris. This particular piece of walk-in sculpture measures about 20 feet square (if that's the word) and about 16 feet high; it looks a bit like the inside of somebody's subconscious, and can be used for orgies and other garden parties. The interior-exterior protuberances are big enough to climb around in and recline on. Steiner probably would not have approved.

Bloc's passion pit may seem frivolous to the Anglo-Saxon mind; but a practical application of some of its principles to the design of prefabricated apartments, by the French architect Chanéac (64), should make all the pure-in-heart feel a great deal better. By the same token, while some of us may take a dim view of Schwitters' Merz-Bau, the great, multicolored concrete obelisks by the Mexican sculptor, Mathias Goeritz (65), which form an entrance "gate" to a satellite town just outside Mexico City, certainly serve a very useful function: they give the town a "sense of place"-something not found in many U.S. towns, alas!

One U.S. structure that does give you a "sense of place"—and how!—is this 60-year-old mausoleum somewhere in Brooklyn (66), with its monument of an index finger pointing heavenward, a very comforting thought. Not just a "sense of place," but a sense of hope as well!

The only trouble with Fantastic Architecture is that it stays fantastic for just so long-and then cold reality catches up with it. Who would have thought that Antonio Sant'Elia's 1912 proposal for a multilevel city (67) would become a shattering reality in Detroit a mere 50 years later (68)? Certainly not Sant'Elia, we'd bet! And certainly not Henry Ford, whose pious hope was that he would "build a motor car for the great multitude . . . so low in price that no man . . . will be unable to own one-and enjoy with his family the blessing of hours of pleasure in God's great open spaces."















ELLIOT ERWITT-MAGNUM



For centuries, no building was really architecture unless made of

MASONRY

That does not mean, however, that all masonry was, ipso facto, "architecture": the hundreds of miles of marvelous, dry stone walls that give the mountains of Catalonia their pattern of annual rings (69) are great masonry though not, perhaps, great architecture in the academic sense.

The massive, 14th-century brick cathedral at Albi (70) most certainly is great architectureas our friend Mr. Paul Rudolph should be happy to acknowledge any day now (71). The shafts at Albi, of course, were acts of homage to the Almighty; the shafts at Rudolph's Massachusetts Health, Education & Welfare Service Center in Boston (which contain stacks of comfort stations) will be acts of homage to sanitation. In the shadow of Albi's soaring piers Le Corbusier's ancestors, as well as Toulouse-Lautrec, were born; in the shadow of soaring toilets-who knows?

Certainly when Burnham & Root designed the Monadnock Building in 1891 (72), they weren't worried about the validity (in symbolic terms) of making a commercial package look like a "God-box." A view of the base of the Monadnock Building (73) shows, rather dramatically, the contrast between what was and what is-the "what is" being Mies van der Rohe's new steeland-glass Federal Building now going up diagonally across the street from Monadnock. Having Monadnock and Mies jowl by cheek, as it were, will add much to Chicago's lively streetscape.

Though Mies, himself, has had his bouts with masonry, he has never used it as sculpturally as it could be used in another time. Leaning daringly over the parapets of the 16th-century Château at Blois, for example (74), one sees a few of those marvelous ramps, terraces, and steps that were commonplace in days long past, when people talked less about articulating exterior spaces, and did more. Closer to home stands the great Pyramid of the Sun at Teocihuacán, in Mexico (75), which articulated space (and form, and man's faith). Note the gradual flattening out, over the centuries, of ascending planes in reverse proportion to the rising curve of the cholesterol content in man's arteries. Everybody wonders how those pre-Columbians got those pyramids up; what seems more pertinent is how those pre-Columbians got up there in the second place.















Monadnock vs. Mies, quite naturally, brings up the birth of the

CURTAIN WALL

—an event surrounded with as much genealogical mumbo-jumbo as the precise ancestry of Anasstasia. We decline to take a stand, except to state that a well-known architect, who has been quoted frequently as applauding the "decline and fall of the curtain wall" should, perhaps, be quoted less frequently.

In any event, that lovely allglass-and-romance facade of the Hallidie Building (76) in San Francisco, done by Willis Polk in 1918, looked better than ever last month; that serene all-glassand-logic facade of the Fagus Works in Ahlfeld, Germany, done by Walter Gropius in 1911, looked better than ever when this picture (77) was taken a year ago; and that shimmering all-glass-and-guts facade of the Ministry of Light Industry, on the Ulitza Kirova in Moscow, done by Le Corbusier in 1928, was still by far the best modern building in the Soviet capital (78) just before our photographer came in from the cold in 1959.

The trouble with the curtain wall, nowadays, is that nobody designs it any more—at least nobody except some gent called Mr. Sweet. At one time—in 1903, to be precise—glass-and-metal curtain walls were designed by people like Monsieur P. Chedanne. His wonderful facade at 124 Rue Réaumur, in Paris (79), still braves M. Réaumur's infuriating temperatures.

Here and there people not called Mr. Sweet continue to design and build curtain walls in the great tradition of Chédanne and Gropius and Polk: Arne Jacobsen's new chocolate factory (80) in Denmark has walls of glass and ceramic tile facing north, east, and south, as well as west; the walls are sun-controlled, the building is air conditioned, and that'll teach Réaumur!

The office tower on Manhattan Island (81) is too well-known to require identification. We herewith include a great photograph because, oddly enough, it has never before been published in the U.S.; it was taken especially for a magazine called AMERIKA, put out by the U.S. Information Agency, and distributed in the USSR. After six years, this tower remains the building against which all other new New York structures are measured. Why do New York architects continue to challenge the Seagram? "Because," as someone said about Everest, "it is there."













"The play of reflections," Mies once pointed out about walls of

GLASS

"is the all-important thing." Reflected here are Paul Rudolph's Yale School of Art and Architecture (82) in Louis Kahn's Yale Art Gallery (no cracks in the glass so far); and a rain-swept street in Vienna, in a block-long facade of glass without mullions (83). Or at least, without metal mullions: for in Europe and elsewhere, it is now common practice to clip and glue together large sheets of tempered glass, and to brace those sheets with stiffeners, also of tempered glass, set at right angles to the facade. And reflected here, also, is the landscape surrounding Mr. Philip Johnson's 1949 residence in New Canaan, Conn. (84), with the architect visible in silhouette and in reverie. This "Portrait of the Architect as a Purist" points to some novel directions in architectural photography and photographic characterization.

One of the many lost arts, these days, is the art of using mirrors. The mirror effect that turns the prosaic facade of the U.N. Secretariat into sheer poetry (85) is probably purely coincidental. When mirrors are used intentionally today to create an illusion of greater (and more beautiful) space, their use seems almost primitive compared to uses common in the 18th and 19th centuries. One man who has tried, valiantly, to recapture illusion by reflection is Richard Neutra (86)-but he has barely scratched the surface.

Some considerable distance below that surface lies a world of illusionist space currently on view at the Triennale in Milan (87). That exposition this year includes a room about 35 feet wide and about 70 feet long. Its interior side and end walls are much like those of an A-frame house-i.e., they are angled, and meet in a ridge along the top. Because the walls are made of mirrors, the visitor finds himself inside of what appears to be a long, hexagonal tube-only it isn't really hexagonal, because each side (real as well as reflected) is mirrored again and again, ad infinitum. To set the joint really jumping, the designer, Vittorio Gregotti, has concealed several movie projectors in a slot along the ridge, and these project images on the floor, the sides, and the visitor-which images are, of course, in turn mirrored into infinity. What happens to the visitor inside this madhouse shouldn't happen to Dr. Caligari.















There is nothing very new about sculptural architecture; in fact,

PLASTICITY

antedates reinforced concrete by thousands of years. At Mykonos (88), plasticity was achieved by covering ordinary masonry with layers of stucco and whitewash.

But plasticity has been made awfully easy with the advent of modern concrete-possibly too easy. No one knows better than Le Corbusier that you must have a ton of self-restraint for every ounce of plastic concrete: the splash-basin (89), situated beneath a scupper spouting rain water from the roof of his Palace of Justice at Chandigarh, is an excercise in pure, precise, geometry, casting sharp-edged shadows. Next to Le Corbusier's equally geometric, reinforced concrete apartment block at Marseilles is a little power plant (90) that is much less restrained (and rarely photographed); Le Corbusier denies that he designed it. Indeed, whenever he has gone wildly plastic (as at Ronchamp), he has claimed that the forms were determined, entirely, by the strict laws of conics. Perhaps so; in any case, plasticity seems, at the moment, to be too serious a game to be left to most architects. Even with a great artist like Giovanni Michelucci things can get out of control (91).

One of the dangers lies in what happens next door. In the case of Michelucci's Church of the Autostrada, "next door" includes a gas station, a shopping center, and a Los Angeles-style motel. This motley little assemblage of buildings is surrounded by a mad highway cloverleaf designed for Ferraris. Too bad, one suspects, for autostrada safety: anyone coming suddenly, at 150 chilometri-per-ora, upon Michelucci's church, is likely to be in desperate need of prayer. One wonders just how well Pierre Jeanneret's charming little Ghandi Memorial at Chandigarh (92) would have looked on Wilshire Boulevard, say.

That is one reason bridges look so good-they are bound to be surrounded by an awful lot of space. Paolo Soleri's 1948 project for a very plastic reinforced concrete bridge (93) would probably look magnificent anywherebut the fact that it was planned to sail across a great bay (rather than through the industrial badlands of Hackensack, N.J., for example) obviously helps. Why this bridge remains unbuilt is a mystery: "the unfolding tube" structure is, quite clearly, the most brilliant concept of bridge design since Maillart.







ROBERT DAMORA

The one great restraining influence on architects playing with

CONCRETE

is, of course, the discipline of structural engineering. Still, almost anything can be made to stand up, nowadays. And not just nowadays, either: this extraordinary hotel at Cerbère, on the Franco-Spanish border (94), was designed of reinforced concrete by some unknown genius, about 50 or 60 years ago, for an absolutely impossible site-a triangle between a railroad track and a highway. Next time there happens to be a vacant triangular lot available (let's say on the promontory of Santa Maria della Salute), we wish that the architect would keep this building in mind.

To say that anything can be made to stand up is to say that the tyranny of poor engineering is approaching its end. The decision, henceforth, will be made as much by artistic sensibility as by engineering "necessity"-and bad architects will lose their last excuse. There is, probably, an infinite number of ways of designing an ugly bridge in reinforced concrete, but a great artist -Riccardo Morandi-chose a beautiful way when he built this incredibly graceful gazelle of a bridge (95) over the Fiumarella River in Calabria, Italy in 1960. And there is an infinite number of ways of designing an ugly exhibition hall; but when Morandi designed this exhibition hall at Turin (96), in 1959, he made a decisive choice. Which is why it (and he) will be remembered.

Not all architects are artists, and some engineers are. Matteo Trucco, who designed the spiral ramp in the Fiat factory in Turin, Italy, built 1919-1922—and the concrete rib structure supporting it (97)—was among the latter. Looking at this truly "organic" affair, one wonders a bit about the Guggenheim Museum—and one wonders, too, if a generation that produced this engineer, and that designer of the strange hotel at Cerbère, should not, perhaps, be honored more frequently.

The sort of "organic," plantform engineering typical of Morandi, Maillart, and Nervi may not be the answer to every problem in reinforced concrete. Indeed, Le Corbusier, who has called concrete "reconstituted stone," often uses the material the way the Greeks used real stone after they had graduated from wood. And why not? There is as much grace, of a special sort, in this detail from the Brazilian Pavilion in Paris (98), as there is in Morandi's most delicate foliage.









What we need today is "the shaping imagination, the liberating

IDEA

Barbara Ward said recently about the future of our cities. Herewith, then, two examples of the shaping imagination, of the liberating idea: first, "Plug-in City" (99), as tossed out for our consideration by our friends of the Amazing Archigram (see page 83); second, Urbino, a hill town 25 miles due south of Rimini, an idea tossed out, over the centuries, by our friends the Etruscans, the Romans, the Middle-Aged, and Federico de Montefeltro, Duke of Urbino, who made it all jell in the 15th Century.

"Plug-in City" is a symbolsketch of what is being built, right now, in such places as Cumbernauld, Scotland; Le Mirail, France; and West Berlin, Germany. The liberating idea, in this case, is to consider the city as a single building, with a skeleton (if that's the word we're groping for) of transportation and communication arteries, and of utilities. This skeleton would shape the city; the actual buildings would be "rooms" that might be old or new, permanent or temporary, residential, commercial, or industrial-plugged in where and when needed.

"Plug-in City's" fundamental idea-the city considered as a single, organic entity-is as old as Urbino (100). For here, too, the city was above all a skeleton of open spaces (passages, steps, streets, piazzas) which held things together. There was a center, of course (Federico's marvelous palace, identifiable by its interior and peripheral piazzas), and there was a peripheral wall. Today, Urbino is being restored, and added to, by a young Milanese architect, Giancarlo de Carli, and his exceedingly "modern" dormitories for the local university are astonishingly like the old city itself, in form and in content.

Why bother with the city? Why not give up and suburbanize? Urbino provides one answer: in this town, within one brief span of time, there worked such men as Raphael, Piero della Francesca, Bramante, and Giorgio Martini. They were there because this was a place of civilization, and it has remained a place of civilization ever since: of its 15,000 presentday inhabitants, 7,000 are students. The latter, and many others, are drawn to this inaccessible mountain top every year because it continues to be a shining example of "the shaping imagination, the liberating idea"-of civilization and of architecture. END



NEW WORK-A NEW STYLE?

Architecture changes very fast these years. During the past decade, for example, architects have become much less preoccupied with making buildings appear weightless. Those tensely graceful façades and spiderwebs of the postwar period suddenly have yielded in a massive return to solidity, almost pyramid-building. Delicacy is Out; mightiness is In. Finishes have switched from sleek to abrasive, from sheet metal and glass to concrete and stone. Is this wave of change permanent—or merely as lasting as the style of a lady's permanent wave?

On the following 54 pages, the reader can study a number of the more provocative new buildings here and abroad and decide for himself. The reassuring thing about today's new-style architects and their architecture is that there seems to be little cynicism. Instead, the profession rolls with intense personal efforts to be heard (and felt, too—textures are rough); with immense ambition in the use of space in building design; with both logical and sculptural approaches to the expression of function, with a glee for form that is now and then even a little embarrassing.

In short, the newest architecture has zest as well as heft. There is an optimism in it that makes architects rise above their gloomier peers in painting and sculpture. The airy axiom that buildings today should be built for only short lives, soon to be demolished and replaced, has been shot down, at least temporarily. Going up are strong buildings and confident ones, built to last.—WALTER MCQUADE.

Except as noted otherwise, articles in the following section were written by MARY ELIZABETH ALLISON, MARSHALL BURCHARD, and JAN RAHM.

Eero Saarinen's CBS building, now nearing completion on Manhattan's Avenue of the Americas, has the force and solidity which characterize much of the newest architecture in this country and abroad. Its big, angular concrete columns clad in dark granite, and darkwindowed (not window-walled like so many of its neighbors), the building will add a stalwart, soaring blockfront to the city scene.





THE WORD IN BRITAIN: "CHARACTER"

BY REYNER BANHAM

One of the most powerful pieces of British architecture in recent years is the new group of teaching laboratories for the Department of Engineering at Leicester University, by Architects Stirling & Gowan. To comment on its significance, FORUM asked Critic Reyner Banham, of The Architectural Review.

A warm debate has been going on in Britain ever since the Leicester labs were finished and their architectural character became public property. The words have been long and recondite, of course, but the argument always comes back to the proposition that if a workshop looks so much like a good building, there must be something wrong with it. In fact, the university got such good architecture that the process of teaching is always threatened with interruption by architectural rubbernecks. Laboratories -even teaching laboratories-are not expected to turn out to be good buildings.

Underneath all this, of course, lies the simple fact that our sophisticates have lost the courage to be functionalists. After some two or three decades in which architects lazily figured that if you got the functions right the appearance could be left to look after itself, we have now flipped over into the preferred belief that anything that looks like good architecture must be at least "out of character" with the functions it shelters, if not physically hostile to them. It seems much easier to accept Kahn's labs in Philadelphia ("All right, so they don't work, but what the hell?") than Stirling & Gowan's labs at Leicester to which no serious functional objections have emerged.

It may be true, as some small, frightened men insist, that Stirling & Gowan have bent some of the functions for the sake of the architecture. But the example usually offered is the size of the circulation spaces, and it is difficult to see this as a serious objection, or a very relevant one. A cheese-paring square footage for circulation is a neurosis transferred from speculative office



NT 14179-070110

Above Leicester's glassy workshops rise towers for offices (right) and labs (left), linked by stair-elevator cores (massing is shown below).



Main entrance (below) is beneath the cantilever of a large lecture hall, which late-comers can reach by spiral stair (seen in color photo opposite).





building, and from the cut-price standards enforced in school design during the panic years after the war. It has left England littered with buildings whose circulation is psychologically inadequate for maximum occupancy and emergencies. (For me, when that fire bell goes, I hope to see clear floor all the way from here to the exit.)

What looks like the most willful piece of function-bendingthe north-light roofs lying diagonally across the lower blockis nothing of the sort. The only way to cram the required amount of single-story lab space as well as everything else into that corner of the university grounds, and still leave the necessary circulation spaces, access ways, and even a little greenery, was to fill out pretty well the exact polygon the plan now occupies. True north lights-another client requirement -laid across such a plan give almost exactly the geometry of the present roof. The result, given some astute engineering by Frank Newby, is one of the most spectacular aspects of the design, a crystalline sea flooding across the top of the heavy lab area and erupting in diamond breakers over the solid walls on every side of the podium (photos, left and right).

Similarly, one could say that there has to be a simpler way of getting a 100-foot head of water for the hydraulics department, and that putting the tank on top of the office tower (sketches, right) is just a way of satisfying the architect's insatiable lust for towers (just as everyone seems to prefer Kahn's explanation of the Richards labs in terms of the San Gimignano image to any attempted functional justifications). But there are good technical reasons for preferring to hold up that head of water by gravity rather than booster pumps, and tucking the office spaces between the legs of the resultant tower achieves a reasonable economy of forms and structure.

The only real functional query here has to do with some unforeseeable consequences of dropping water nearly 100 feet through straight, large-bore pipes. Somewhere in the system was a constriction or bend that triggered an organ-pipe effect, and as the hydraulics lab came up to full flow, a note of pure and unearthly beauty would be heard in the stair tower, building up through a perfect scale, but—unfortunately—getting louder as well, so that when it hit the octave it was more than the human ear could bear. It has been de-tuned now, but—talk about architecture as frozen music—I was with Jim Stirling the first time he heard it and his face was a study in baffled delight; Muzak was never like this!

Good architecture, cheap

It used to be self-evident that modern architecture was inexpensive (all right, then: cheap), and this cheerful assumption has left the world littered with rotting white plaster, rusting pipe handrails, and powdering tile floors. It seems safer now to say "Oh well, let's face it, good architecture was always expensive in any style." But Leicester shows that good architecture does not have to be expensive if the right style is chosen and worked through to its conclusions.

The labs are extensively clad in red tiles because the clients were dead set against exposed concrete, and the architects were determined that any facing material used, however cheap, must be as near self-maintaining as possible. The use of identical tiles on all surfaces, horizontal, vertical, topsides or bottoms, worries some purists who believe that floor tiles must be different from wall tiles. They fail to remember that all of these are in the first instance cladding tiles, and that if the tiles themselves are identical, the manner of using them is not. All pedestrian surfaces, and the skirtings round the bases of walls, have a very neat set of draining and guttering details, devised ad hoc out of standard catalogued tiles intended for men's rooms and the like, but here made eloquent.

The glazing, comparably cheap and equally off-the-peg, gets us into another dimension of architecture altogether. Straightforward industrial patent-glazing for factories and greenhouses, its use here is unaffectedly crude-and unaffected crudity is a very difficult pose in which to balance in the present period when Brutalism has been screwed up into the kinkiest school of elegance that architecture affords. But Stirling & Gowan took their glazing as they found it, and left it to detail itself, by and large. Some fairly crummy things happen as a con-



Architects' design sketch shows wellarticulated separation of functions, including circulation between them.



Section: office tower-lecture hall, low workshops, higher aerodynamics lab (seen closeup in photo, opposite).

Skylights, shown glowing at night, have reinforced "plyglass" on north faces, are opaque toward southern sun.




sequence—flashings that flash right out of the frame, panes that have gaps at the edge, nuts and bolts put in back to front—but they all average out in the end, chiefly because the architects have nowhere asked the glazing to do what it cannot do, such as pretend to be a precision material. But the things it can do, they have pushed to the limit.

The hanging cascade of glass that descends between the cluster of stair towers (photo, left) would have been virtually impossible in any glazing system that required accurate fitting and precision shopwork off-site because it would have required an unreasonable amount of both. But the extruded aluminum sections at Leicester were cut and carpentered to fit on the scaffold, trimmed and fiddled until they answered to the outlines drawn on the surrounding tilework and gave form to the original, and rather approximate, sketch that Stirling supplied to the contractors.

Crafty though the use of this glazing system may have been, it is clear that some of the visual fringe benefits that accompanied it struck the architects with as much surprise as did the musical effects. In daylight, the sundry sloping surfaces of glass pick up reflections and reflected reflections from all over. Strangers are seen staggering about the landings (photo, above) with their heads craned right back, trying to work out which side of what is reflected the other way up in how many different panes of glass.

By night, the matter is a little easier to decipher because local reflections are warm and red from tungsten lamps playing directly on the tiled walls, while more distant reflections are cool and bluish from the fluorescent light escaping through the north lights. But at this hour you should go down into the adjoining park and view the labs through the trees (photo, right). The red gash of the lit stairwell and the hard gleam of the lights in the offices and research tower are seen against a sea of cool, low-intensity luminosity from the whole roof of the workshops, and the same gentle, ghostly light spreads over the surrounding buildings and the grass at your feet. It is one of the most extraordinary spectacles contemporary architecture has to offer. But, then, it is a pretty extraordinary piece of contemporary

architecture, the first world-class



Daylighted landings unite the complex of office and lab towers and three stair-elevator cores (see exterior, left).

Night view of the labs across Victoria Park: "One of contemporary architecture's most extraordinary spectacles."



building to be put up in England for a great many years. It doesn't mess around being "English" like London Airport, or "artistic" like Coventry cathedral, or "traditional" like Churchill College. Yet the virtues that make it unmistakably a world-class building are just as unmistakably those of a work of art in the English tradition: it combines extremism (its geometry) with reasonableness (its plan); a strong personal vision with objectivity (about the site); esthetic determination with the ability to exploit happy accidents; good Augustan taste with raw Hogarthian honesty; and-in the best 18th-century manner-agrees with Alexander Pope that there is something "prior even to taste, 'tis sense."

At Leicester, the more you dig into the design the more you see how that character of "a good workshop" emerges from the functional needs, the budget, the site, the materials, and the determination of the architects to do it in the way that these exigencies seemed to enforce.

In the last resort, it is not a design you can take apart. It resists (mercifully for us all) the kind of historical style-spotting that passes for criticism in architectural circles nowadays. Critics who have seen "obvious influences" from Sant'Elia Città Nuova sketches or Wright's Johnson Wax Building may or may not be on the beam, but they all have either to admit that the proposition is tentative, or to shout very loud to cover the fact that they are on shaky ground. The fact is that S & G know their recent architectural history so well that they are long past cribbing, and Stirling in particular gets a great kick out of embarrassing critics by challenging them to name the influences.

History and style don't bother men like these any more; both are disenchanted with the "white architecture of the '30s," which they regard as little more than a styling gimmick. Yet, as everybody notices, the Leicester labs are the first design for decades that has anything of the zip, clarity, and freshness, the nonchalance, of the pioneer machine-esthetic buildings of the 1920s. It's as though they had invented modern architecture all over again, and one can only wish that other architects would have the wit, sophistication, sense, taste, bloody-mindedness-and, in a word, character-to do it, too.

Right: the towers' "cascade of glass," seen from the second-floor landing. Below: the north-lights' "diamond breakers," at the workshop's edge.







ALL PHOTOS: GEORGE CSERNA

CONNECTICUT PRAYER TENT

Rising out of a New England meadow like a large tent on spiky stanchions, the new church for the First Unitarian Congregational Society of Hartford stands nearly finished. The tent look is entirely intentional: Architect Victor Lundy wanted the building to be alive rather than static. And indeed, the sweeping roofs, hung on spiderlike strands of steel, do move between the stable concrete walls.

Key to the planning of the church was the congregation's request for a closed sanctuary, which Lundy has placed in the middle under a peaked roof of its own hung by cables from the spires of the radial walls (see plan). Between the sanctuary tent and the roofs slung over the outer sections will be clerestories of gray plastic to light the peripheral spaces while keeping the center of the sanctuary comparatively dark (photo overleaf). As the roofs deflect, these hanging plastic sheets will slide up and down in slots along the partitions inside.

Lundy's reputation was made in wood, and here he demonstrates his skill with it again (along with a feel for appropriate uses of concrete and steel). He uses sticks of it laid on edge for roof decking in a pattern of irregular, overlapping planes, which will be left unfinished inside and covered with an elastomeric coating outside. The sanctuary roof is also made up of sticks, but these are laid in a regular pattern.

Inside, the peripheral space is divided into rooms by the radial walls, which are set at uneven distances from each other and separated from the sanctuary by an ambulatory corridor. These rooms may be entered from any point on the exterior as well as through the main entrance, which channels traffic into the ambulatory. They are mostly meeting rooms, with a sprinkling of offices and work rooms. A lower floor has a large fellowship hall in the center, with additional meeting, storage, and mechanical spaces.











Spires (top, left) are tips of the radial walls, which separate peripheral rooms, then cantilever up to support the sanctuary roof (seen in lower photo, left, and section, right). The space between the inner and outer roofs (photo above) is a clerestory, to be filled with plastic sheets. Both section and floor plan of the cable-hung structure look strikingly, and appropriately, like a spider web.

SECTION A-A

GLASS





FUNCTIONAL GRID IN JAPAN

The strong, articulate façade at left, recently completed in suburban Tokyo, actually got its start in a Greenwich Village brownstone—an indication of how international today's "new style" of architecture can be.

Shinzo Ohya, president of Teijin Ltd., a Japanese chemicals manufacturer, was on the final leg of a round-the-world trip to look at buildings and interview architects for a new polymer chemistry laboratory he planned to build in Toyoda. He admired the remodeled brownstone belonging to his Manhattan host, asked the name of the architect, and then invited the latter to spend two weeks in Japan discussing the project with Teijin and its architect-contractor, the Kajima Construction Co. And that is how a young American architect, James Stewart Polshek, scarcely known in his own country, happened to design his first major building, and his first laboratory, in Japan.

Teijin's new central research facility is approached from the north, where the ranks of individual laboratories face controlled daylight (photo, left). Exterior escape corridors and columns for air and water exhaust crisscross this side of the tower slab in a veritable tapestry of services, giving the building a strong sense of function as well as scale. The south side, far more massive (below and page 135), faces across the railroad to the mountains and the sun: offices have splendid views of Mount Fujiyama, and are protected from glare by deep sunshades.

The tower is open at ground level except for stair and elevator cores, a conference room, and locker rooms. Here employees remove their shoes and put on slippers before proceeding upstairs an old Japanese custom especially suitable for keeping laboratories clean and for indicating a measure of architectural respect.



KAWASUM

TT





Lobby pavilion (left) connects the administrative wings across a courtyard garden (seen in plan and photos, right). All of the lobby furniture is built in: the island at left is the receptionist's desk; the curve in the foreground is the rim of a visitors' conversation pit. The other islands are flower and plant containers.











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TYPICAL LAB FLOOR

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BALANCE ROOM

SECTION CHIEFS RESEARCHERS

Escape corridors (top photo) run outside four laboratory floors on the north side. Researchers' offices (left) are in the big service towers on the south side, recessed and protected by integral sunshades (see photo, right). Completing the unusually high allotment of service spaces are balance and refrigerator storage rooms in the center tower (see plan).







SHELLS SOAR

Two pairs of swooping concrete shells, separated by narrow bands of glass, enclose the new Luce Memorial Chapel at Formosa's Tunghai University. Architect I. M. Pei's irregular hexagonal plan and curved walls make the 450seat interior a soaring, yet intimate, space (photo below). Adding to the drama inside are the raw concrete walls, whose diamond-shaped cross ribs grow in thickness from top to bottomreflecting the complex pattern of stresses which increase toward the base of each conoidal shell.

The shells covering the altar end are 75 feet high and span 100 feet at the widest point. Goldenyellow glazed tiles with decorative studs protect the concrete exterior from weather while lending it texture and scale (left).

Because of its pyramidal profile, the chapel is resistant to both wind and earthquakes. The funnel-shaped interior provides natural circulation of air, which is admitted through louvers in the glass walls at the front and rear and exhausted through skylight vents.



The original design (FORUM, March '57) called for wood construction, but poured-in-place reinforced concrete was finally chosen for its resistance to termites and humidity.

Associated with Pei were Chi-Kwan Chen, resident architect; and Heou-San Fong and Roberts & Schaefer Co., engineers.







The billowing shape of the warped shells is shown in this view of the west or altar end (left). The altar receives sun during morning services from the side windows between the overlapping shells and from the east entrance wall. The four shells, seen on their massive foundations in the isometric diagram below, rise and almost touch (photo right), separated only by a few bow-tie-shaped concrete hinges cast into the high ridge beams.





A"FORTRESS" FOR SEATTLE

A boldly undulating pattern of window bays creates an unorthodox but highly functional plan for Haggett Hall, a new coeducational dormitory for 800 students at the University of Washington in Seattle. The building, which makes dramatic use of its steep hillside site, is thoroughly modern without clashing with the Gothic-style buildings that comprise most of the campus.

The eight-story twin towers, one for each sex, are built of reinforced concrete faced with precast, exposed-aggregate panels. Between the towers are a joint lobby, library, and lounge, surrounded by an open observation deck (photo, left).

Instead of facing directly out on the tower across the way, student rooms are hexagonal in shape, with windows angling out toward views of Lake Washington to the east and the campus to the west. The hexagonal scheme also allows cross-ventilation, without loss of privacy, through smaller, louvered openings across from the window in each room (typical plan below). On the west half of each tower, facing the campus, Architects Kirk, Wallace, McKinley & Associates have alternated the large windows and small louvered openings, linking them visually by recesses in the panels (photo, right). The façade pattern is sharply interrupted in the center of each tower to provide large window areas for informal, twostory lounges, each serving 100 students (floor plan, right).



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| TYPICAL FLOOR FLAN | |



TYPICAL ROOM PLAN





SOLID TASTE

When Philip Morris executives called for Ulrich Franzen to design their new administration building in Richmond, they got an architect noted for having the taste that's right. But Franzen's tastes, like those of other architects, have been changing, as the resulting building shows. The controlled, formal organization is there, but so is a new, almost classical, solidity.

In the rear view, above, a windowless podium containing mechanical and other service spaces anchors the building firmly to the ground; at the center of the lower level a cafeteria faces out through deep-set bays. From this base, pier-like steel columns clad in brick reach up to support the overhanging second floor and the roof, which carries an oversize concrete fascia.

Trim offices occupy the upper two floors (see photo, right). The main floor is recessed, providing a handsome colonnade that shades the glass window-walls and provides a platform for window-washing. On the top floor, vertical concrete fins do the sunshading.



SECOND FLOOR

20' 40'FT.







SINEWY DRUM

Diplomacy and architecture are not always brought together in official buildings abroad, but the new U.S. Embassy in Dublin blends the two in a sinewy, sculptural structure that is highly distinctive, and apparently appeals to Irish sensibilities as well.

Early in the designing, Architect John M. Johansen decided to bypass the English Georgian influence prevalent in Dublin and delve into early Irish history for inspiration. His structural pattern of precast concrete units (left) captures the interlacing motif of Celtic carvings and jewelry; the building's basic shape goes all the way back to the ninth- and tenthcentury round towers built to fend off marauders from the sca.

The site, a pie-shaped wedge bounded by intersecting streets, is in Ballsbridge, a residential area about a mile from the center of town. With its circular shape, the embassy does not bulk unduly in the midst of low neighbors, and it can be seen equally well from any angle. The building was set well back, saving a number of fine trees on the site, and the corner was turned into a broad, paved terrace (photo, right). Entrances to the embassy are bridges spanning a landscaped moat.

The curving precast sections which form the outer wall also enhance a three-story interior rotunda (overleaf). While these elements required exacting workmanship on the site, the greatest precision was essential in the casting, done in the Netherlands by Schokbeton (a variation of 1/8 inch in dimensions of one element, multiplied over the building, would have produced an over-all error of 31/2 feet). Fortunately, the pieces fitted perfectly. The embassy's progress, in fact, was the talk of local building circles. The Irish Times called the system "the nearest that automation has come to the building industry in Dublin."

Perhaps the greatest compliment to Architect Johansen, however, came from an eminent Irish architect, who felt that the completed embassy stood on its own distinctive merits; it didn't need the rationale of Celtic motifs, or round towers—or anything else —to make it thoroughly at home in Dublin.







The embassy's rotunda (above and right) is 50 feet in diameter and 60 feet high. Light comes from a round clerestory on the roof supported by three stair and elevator towers (see plan). On the main floor is the embassy's reception area circled by consular offices. Second and third floors house embassy offices, including that of the ambassador (photo, below).









BIG CAMPUS FOR CHICAGO

All the architectural activity seen at left may seem a far cry from Skidmore, Owings & Merrill's classically serene style. But in fact, this great new downtown Chicago campus for the University of Illinois simply represents a further, and much freer, development of ideas which Chicago Partner Walter A. Netsch Jr. had begun to probe in SOM's Air Force Academy design: ideas of scale, levels, and structures appropriate to urban form.

Large buildings around the perimeter of the 34-acre site are on the grand scale of the city skyline and expressway interchanges nearby: Administration (1 in plan below), Library (2), Engineering and Science (3), Student Union (4), and future Arts Center (5). These buildings in turn set the framework for intimate, tightly grouped classroom precincts (6), whose smaller scale is more suited to perambulating students. Buildings are ticd together by raised pedestrian ways, creating an interplay of levels, and are focused on a one-story lectureroom building with a circular amphitheater cut into the middle of it (7, and left in photo). The roof of this building is treated as an elevated plaza, with one "exedra" (a sort of outdoor conversation pit) atop each quadrant.

Structurally, the buildings are pragmatic, with no single system imposed on all elements of the campus. This is evident in the column capitals (foreground) which will carry the granite slab roof around the lecture building, as well as in the tapered columns (background) which support the roof of the monumental engineering and science building. Structure is most dramatically expressed, however, in the 26-story administration building (overleaf).





Administration building (right) is a virile concrete structure which is wider at the top than at the bottom; its framework doubles, then redoubles, as it picks up loads on the way to the ground. Closely spaced precast mullions and narrow vertical bands of dark glass will provide a high degree of sun protection. Boxes on blank wall are for air intake and exhaust.

SOM Partner Walter A. Netsch, Jr. inspects tapered columns and shearhead capitals which support granite slabs in the central lecture building. In the background can be seen one of the two-story classroom buildings.



Muscular library building integrates structure and mechanical services in a sophisticated blend of concrete elements. Precast transverse beams are set into notches in the long girders, which were poured in pairs bracketing the columns. These beams, together with the precast slabs, form a floor-truss system through which the services will be threaded.





CALIFORNIA: MIGHTY PIERS

Nestled in a deep valley and half hidden by trees, the Greek Orthodox Church of the Holy Trinity in San Francisco displays its strength only in closeup (left), where towering vaults and massive piers make their power felt. The space that they enclose is impressive: the piers soar 70 feet to meet the roof vaults, and a steel-framed dome spans the 60foot center. The design, by Architects and Engineers Reid, Rockwell, Banwell and Tarics, makes good use of traditional forms in a contemporary manner. Most of the interior appointments, unhappily, are not so successful.

Construction of the mighty piers was remarkably fast, taking less than a week to complete the circle of 12. They were slipformed, using ten hydraulic jacks at each pier to raise the forms as the pouring progressed. At the base, the piers are hollow rectangles large enough (10 by 20 fcet) to contain confessionals, stairs, and washrooms. The pier walls are 7 inches thick and slope slightly inward; a concrete slab atop each pier supports the roof vaults, which were poured in wedges complete with strengthening ribs (seen in photo, left). While casting an inner compression ring to hold the vaults permanently in place, the contractor, Harrod & Williams, Inc., supported them temporarily by threading a single high-strength steel strand from the vault through a coupling on the pier, a seemingly precarious balance for wedges that weighed 34 tons each. The final step in the construction process was to hoist the steel framework for the dome into place, cover it with wood decking and copper roofing, and top it with a 20-foot gold cross.

True to the Greek Orthodox tradition of worshippers circling the pews and filing in from the periphery, seating extends all the way across the nave (see plan). Tunnels through the piers form a circular walkway around the nave.

In addition to the Sundayschool rooms, the lower floor contains mechanical and administrative spaces and a small kitchen. The scalloped main entrance (right) faces a large playground; children have their own entrance directly underneath the adults'.





GEOMETRY IN NEW MEXICO

Architect Herbert Bayer's subtly curved, slightly asymmetrical design for a private chapel in New Mexico suggests that the new geometry can be eminently compatible with ages past. Located on Robert O. Anderson's ranch in Hondo Valley, the building incorporates a portal and bell tower from a 17th-century Mexican church, and other art objects.

The plaster-covered adobe walls and the plaster ceiling curve inward, separated by vertical glass slits at each corner. Further illumination comes from a hooded skylight (top in photo, right) directed at a 12th-century Flemish Madonna and Child above the altar, which is an old Spanish chest. The baptismal font and the reed chairs are also Spanish; the rug was designed by Bayer.

Outside, a low adobe wall defines a paved entrance patio containing flowering crab apple trees. The chapel was built for meditation and as a setting for weddings and christenings (the Andersons have seven children).









BOLD MASSES

Architect Kunio Mayekawa's new library for Gakushuin University in Tokyo combines a confident massing of structure with precision detailing. Like an earlier Mayekawa academic group nearby (FORUM, Abroad, Feb. '61), the new building uses both textured raw concrete inside and out, and small balconies reached by sliding glass doors. The previous buildings, however, are supported by pilotis with open staircases and eccentric fenestration à la Corbusier. Here the staircase is enclosed in a massive block, windows are regular, and there are no pilotis.

In plan, the building is divided into three 50-foot squares which impinge on the slightly larger square of the lobby. Long balconies rim this central block. The block housing the stacks is four stories tall; reading rooms, offices, and service areas occupy three floors. An open-air recreation area and a glass-enclosed reading room are on the roof of the threestory blocks. The first-floor reading room, whose interior is shown below, at right, leads out to the paved east garden shown in the photo above. A similar garden on the west side leads to the main entrance (photo, left).

Prestressed concrete floor slabs reinforced by concrete beams provide long spans that permit unobstructed space for open stacks and give some degree of flexibility. Distinct formwork patterns set off the different elements: the large balconies have horizontal lines; the small ones, vertical stripes; and the walls, a bricklike pattern






CLEAN SWEEP

When the 1964 Olympic Games open in Tokyo next month, both spectators and athletes will be treated to a veritable city of shapely new sports facilities, built especially for the occasion. Almost certainly, however, the architectural gold medals will be swept by Kenzo Tange's breathtaking National Gymnasium and Annex, the only Olympic structures which are intended to be permanent.

The main gymnasium (bottom in photos) and smaller annex (top) will display two of the boldest and most elegantly sculptural suspension roofs in the world. Their shapes are frequently compared to seashells, a high tribute to the seeming naturalness of their form.

The main building seats 13,000 people for swimming and diving, 16,000 when the pools are floored over for judo matches. Its roof is slung in twin catenary curves from two 14-inch-thick steel cables which are stretched between two great concrete masts and anchored by massive blocks at each end of the building. Light steel bents, curving down from the main cables to the cantilevered rise of the stands, support a roof of welded steel plates. A tier of horizontal louvers running along the peak of the roof admits daylight to the vast interior (258,000 square feet), and also serves as an air vent. The offsetting of the building's two halves (photo, left) provides entrances at each end.

On the other side of a broad, raised pedestrian promenade bisecting the site, the smaller annex seats 4,000 spectators for basketball, 5,400 for boxing. Its single mast, with the roof spiraling down around it, gives it the look of a giant maypole. The single main cable (actually composed of seven 6-inch steel cables) is held out from the mast by a rigid spiral truss (top in photo, right). Roof decking is carried on bents between the cable and the perimeter wall; as in the gymnasium, standing seams express the structure beneath. Structural engineer was Yoshikatsu Tsuboi.





Diving platforms in the main gymnasium consist of a series of handsome concrete pedestals (left). Above them, daylight will filter down into the great space from a louvered skylight at the peak of the roof. Right: curving steel beams support the roof decking of welded steel plates.





LIGHT, FORM, AND POWER: NEW WORK OF LOUIS KAHN

BY VINCENT SCULLY

"Nature does not make Art. She works by circumstance and law. Only man makes Art. Because man chooses. He invents. He can make the doors smaller than people and the skies black in the daytime if he wants to. He assembles. He can bring together the mountain, the serpent, and the child."

—Kahn, in conversation, March 1964

Mr. Scully, Professor of Art History at Yale, and a well-known architectural critic, is the author of *Louis I. Kahn* (Braziller, 1962). Louis I. Kahn's recent work by no means represents a rejection of circumstance and law. Indeed, it demonstrates Kahn's desire to use both.

First among nature's circumstances is her light, and it is upon the use of light—the reception, the celebration, the embodiment of light—that almost all of Kahn's new projects have hinged. But underlying the whole process and, in fact, initiating it, lies Kahn's sense of form—his own human choices, his "black skies." His "form" is his first concept, the first shape that suggests itself to him for any new project. Often such shapes derive from the forms he has seen elsewhere, from Hadrian's Villa or a hollow castle wall. They are his equipment, his memory, his predilections, and his loves. As such they are only the beginning of any new design. Kahn continually tests his forms against the particular functions which the new project offers. Under the pressure of such requirements — perceived as inspirations rather than drawbacks—the forms begin to change, to deform, to develop, to become particular.

This is the process Kahn calls "design." It is an intense procedure, and often a protracted one. It can be hard on clients, and only those with comparable imagina-



tion, persistence, and courage can stick it out: Dr. Jonas Salk, for example, and Rochester's Unitarians, and the authorities at Bryn Mawr. They are now being joined by many others, whose projects are in various stages of study: the long-standing scheme for Mikveh Israel Synagogue in Philadelphia; a second capital for Pakistan, at Dacca; an Indian School of Management in Ahmedabad; a cultural center for Fort Wayne, Indiana; an Oceanographic Museum for Yale.

It was at Yale, in 1951-53, that Kahn's work began to come to maturity. In his Art Gallery there (FORUM, June '53) he began to

shape space through a monumentally conceived structure, in which utilities were integrally housed. That process was carried further in the hollow-piered bath house for the Jewish Community Center in Trenton (FORUM, Oct. '57). The project for the Center as a whole worked out the organization of "served" and "servant" spaces in a large and structurally potent architectural complex. Kahn then went on to study jointed, precast, concrete structure, as in his great project for a space-frame skyscraper (FORUM, March '58). This has since proved the inspiration for a number of designs by other architects, most of them rather

superficial, none of them so wholly three dimensional and unified in structure and space.

The union of the servant-served concept with that of the precast skeleton occurred in the Richards Medical Laboratories at the University of Pennsylvania, Kahn's masterpiece up to that time (above). During 1962-64 the Biology Laboratories were added (left in photo) and the structure simplified by eliminating cross members at the sixths of the slabs. The drama of cantilevered supports, brick screen walls, and glassed voids was further increased. The final service tower at the west end of the complex (far

left) is also highly dramatic in conception, although the elimination of such a brick shaft between the two new laboratory clusters tends to make them visually wobble a little on their legs.

The Biology Laboratories are in all ways looser and freer than the Medical Laboratories which preceded them. A certain rigor is lost. The projecting "carrel" units which crown the top floors of the new buildings—using large fixed panes of glass, with smaller units below—were in fact developed as appropriate to the library carrels which had been included in the original building program. Though the library was dropped, these















windows were retained as equally appropriate to the study-laboratory function which was to be characteristic of the upper floors. There was some straining of logic here, but the shapes do terminate the building forcefully; also, their window type had begun by now to play a large part in Kahn's creative struggle with the problem of light—a problem which had otherwise been almost



entirely ignored in the design of the laboratories themselves.

The Tribune Review Building of 1959-62 (photo, above) had begun to show the way: a large pane above to light the volume and show the sky, a small one below for lateral view and to light the floor. Glare was thus reduced, and the volume of interior space was at once clearly defined by walls, non-claustrophobic and filled with light.

The Esherick House (photo 3, left) shows what such windows can do. They can fill a volume up to the rim with light, so that the house is a cup, highshouldered to contain air like a substance-a brimming chalice of light. And it is light that the Unitarian Church at Rochester (1) is designed to receive and contain. The meeting hall in the center (2) is lighted by high scoops or hoods at each of its four corners. Up toward these luminous voids the slab of the ceiling slants in a cross shape, supported by a strong, big-knuckled system of concrete piers and girders.

This hall, stern and splendid, is Kahn's finest interior space to date. In it, plain concrete and cinder block glow with pale silver fire, because what they mold is light. Tapestries are to be hung on the walls, but are hardly necessary to finish this mighty room.

Around it, classrooms, library, kitchen, all find shapes appropriate to their functions and are lighted by walls which become active through light. Window seats push out in bays at the ground floor where little windows cast a quiet pool of light on one's lap; window slots are set between the bays on both floors, protected by them and by the elevation of their projecting walls to the second floor, where they are coped by terra-cotta slabs,

From the hoods and the bays the solemn plasticity of the building's massing derives. It is most effective probably at the entrance side, where the hard red planes interlock like abstracted cliffs cut by dark ravines. In pure profile the four hoods of the roof swing generously back; from any angle they thicken out to complete the chunky compactness of the massing as a whole. It is perhaps only to be regretted that the building was not lifted slightly on a ramped-up platform of earth, above the parked automobiles whose gaseous humps conceal its weighty pressure on the ground and confuse the clarity of its shapes.

Otherwise, the building seems admirably sited, as most certainly are the dormitories now nearing completion at Bryn Mawr (4, and plan). There, too, the major spaces in the center of each square are lighted by high hoods at the corners, while the exterior walls are plastic with room bays.

In the Rochester church the "form" conception had been a symmetrical one, which was then modified by the design process into the present active forms. But the original conception changed very little at Bryn Mawr. The three squares-turned as lozenges and joined at their corners in what seems in plan the weakest and most arbitrary of ways-always retained their shapes and their positioning and now turn out, in actuality, not to be rigid or badly joined at all. The siting is everything, wherein the three squares can never be read as such but always as an advancing and retreating wall, above which the lighting lanterns flare.

The wall possesses what can only be called a certain Florentine elegance. The central core of each square is of poured concrete; the outer walls are merely 12-inch cinder block furred out and plastered within. Outside, however, the building is clad in finely proportioned slabs of dark gray slate, bound and framed in thin, white precast concrete sections, used as trim but also somewhat stiffening the structure of the wall. All the profiles are linear and taut (though that of the vertical element at the bay corners may be a little too thick, which makes it look a bit like a column), and the effect recalls the hard dark green and white geometry of the Tuscan mode.

Kahn's most important project |plan especially recalling details now under construction is the laboratory group for Dr. Jonas Salk at La Jolla, Calif. (drawings, this page). Here the scheme is a horizontal one, with three levels of open laboratory spanned by huge, concrete Vierendeel trusses which contain the utilities and are large enough to walk through for maintenance (section, 1). Studies open off the inner sides of the two laboratory buildings, communicate with a garden, and give a view of the sea. Kahn's process of form-todesign was characteristic here. The first scheme for the studies derived directly from a typically Roman pattern. But when a specific function was then brought to bear upon the shape-the desire for a view of the sea-it took on a new and more appropriate form.

The housing at the Salk Institute has never been fully designed. The Meeting House (2) has lain fallow since 1962, but is now about to be restudied and built. The problem of light has always been



a major form-maker in this project. One recalls the stage of window shape Kahn had reached in the Tribune Review Building and the Esherick House. In his project for the Fleisher House (not shown here) he had gone further, creating light-filled volumes with arcuated tops, the "key-hole" outline which surely recalled his experience of Ostia, Tivoli, and Rome. For his projected U.S. Consulate in Luanda, Angola (sketch above), Kahn had imagined flat planes of wall perforated in this way and standing forward of the window wall to protect the glass from glare. "Wrapping ruins around buildings," he called it.

In the early schemes for the Salk Meeting House he had made those ruins more plastic and, indeed, self-supporting, by curving them outside square rooms and boxing them around circles (model photo and plan). The effect was again very Roman, the

from Piranesi's plans of the Flavian palace on the Palatine, and the elevation various drawings by Piranesi of Hadrian's Villa. When the scheme is reworked, one wonders if it will not simplify itself as the study rooms have already done; an extra wall, while splendid and probably justifiable in this case, is perhaps neither economical nor entirely integral as a general rule.

It is obvious that Kahn recognizes the problem. In his project for Mikveh Israel (3, opposite page), on the boards since 1962, Kahn had already made the curved walls integral parts of the building: cylinders, bottles of light, admitting daylight through their exterior windows and filtering it into the synagogue proper through their matching interior perforations. That baroque interior effect of a wall curving forward and back, perforated on the convex plane, again recalls both Hadrian and Piranesi, specifically the latter's drawing of the Small Baths in the former's villa.

In the school building attached to Mikveh Israel, however, Kahn went a step further toward a solution which the Romans had never imagined. The wall was curved back into the building (dotted circles) with part of the outer face of the resultant cylinder left open. Light was now biting deep into the volume of the structure. A problem would seem to arise if the hollow were to remain cylindrical, since this demands that the enclosing wall ends come down into points. The interior curve is also a problem.

The present projects for the Indian School of Management (plan below) clearly consider these and related problems. Some of the rooms are lighted by cylinders, but others reverse the method, push outward, and are lighted through windows which slant back toward the main wall of the building. Here again, light is changing architecture in Kahn's hands.

Yet for Kahn as an individual the beginning is also in the forms he knows. For Kahn, as probably













for everyone, the most unlikely sources can lead to the most unexpected results. Kahn's studies of Rome and Piranesi, his recent perusal of books on European gardens, are all obvious enough, but it is one of the special mysteries of the creative mind that so much can come to him out of the holes in the walls of his beloved Scottish castles (seen in plan below). Most of the first form shapes of Kahn's "viaduct" architecture, for example, derived from the circular and triangular voids in the walls of Comlongan Castle. Kahn's design process never really took place here, since the project was a study for the Graham Foundation and was carried no further.



But at Dacca (1, opposite page) much the same shapes are beginning to move and change. The conception is a broad one: government on the right, people on the left. On the government side are an assembly hall and a court of justice, connected, or separated, by a mosque. Around these elements two diagonals of housing and two palatial official residences are deployed. Across the way lie a stadium, baths, and schools of science and art. Beyond that complex a city will one day spread out across the ravines. Below is a hospital; above, an airport. All these shapes are slowly becoming more specific in siting and structure. The government center has already been turned to present its assembly complex to the people, while the housing around it is losing its symmetrical form. The Assembly Building (2, this page) was first lighted by a dome, purely a "form" solution, an obvious act of memory. But now light will come down into this shapein whose triangles and cylinders the whole sequence we have traced can also be seen-through perforated hoods that recall those of Rochester and Bryn Mawr, but which are here opened and penetrated with a more richly conceived receptivity to light.

Kahn's process of design has al-



ready produced many studies for the Fort Wayne cultural center (models, above). At least five stages can be traced. In the beginning (1) the Scottish shapes were as obvious as they have been anywhere. They were seen as big in scale: Philharmonic Hall (a), theater (b), historical museum (c), school of art (d), dormitory (e), the Art Alliance (f), parking garage (g). Then the individual functions of each unit began to be studied (2): the theater received two auditoriums; a school of music and ballet (h) thrust its way in. Then (3) that school found a place behind the Philharmonic. The school of art shifted out to the right; in its place a new block housed the historical museum and the Art Alliance. The dormitory and garage were dropped. Next (4), the Art Alliance reasserted itself at the bottom. Then every shape started to dance, to twinkle with activity. Finally (5), the Philharmonic straightened up and received a satellite hall for music and ballet; the theater became compact and an amphitheater (i) was added; the museum doubled to include history and art; the school of art retrenched. As if space now had a decisive say, courts achieved clear form to order and unify the whole. The active masses quieted down, their sparkle held in by rectangular shapes and axes, though the old castle wall still winked a little. Yet even that is not the final form, since the historical museum is to come out of the program. The process is therefore not yet complete.

Most important is the fact that Kahn has also studied the general urban setting for his center, seeking to protect the heart of Fort Wayne from automobile blight (model, right). Now the parking garage which was once imposed upon the center itself would find its proper position in relation to the city as a whole. Here Kahn's "wall against decay" and his parking towers for Philadelphia begin to come into a specific design situation. If the over-all scheme were to be adopted, they, too, would develop further and Kahn's process of form and design would finally achieve its proper program, the modern city center as a whole. This is surely the program in which Kahn most passionately believes and which he will defend against nomadism as long as possible.

It seems clear that during the past two years Kahn's architecture has grown in command and power and its formal vocabulary has been immeasurably enriched. True, it has generally retained its severe geometric and structural discipline, its primitive force, and its archaic poetry-its link with "the mountain, the serpent, and the child." But now it is opulently varied as well, spacious, serenely sited, effortless, and grand. There are some critics who do not applaud this development but who preferred Kahn when he had no work to do and was wrestling in agonized concentration with the most fundamental problems of structural assembly. Those were heroic years, no doubt; their memory still lends dignity to the profession of architecture in America. But these are great years, too, greater than those. These are the years of a great architect in his prime, from whom forms now flow in a generous flood. END



CITIES-THE NEW SCALE

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Architecture's most significant recent transition, transcending even the emergence of any "new style," has been the acceptance of a new scale. In part, it is a new scale of architectural practice: the renewal of cities has presented increased opportunities to create buildings in complexes, rather than singly, and both the profession and the professional schools are placing new emphasis on urban design. But primarily it is a new scale of architectural concern, taking in nothing less than the entire urban environment.

The breadth of this concern is bringing significant changes. It is giving rise to a creeping humility among architects, a willingness to admit the limited relevance of the single noble building surrounded by endless decay and disorder. It is bringing architects into meaningful alliance with other groups—politicians, planners, conservationists, social scientists—whose view of the environment is quite different, but no less valid, than their own. And it is revealing some severe limitations in the process of architecture when faced with problems of the complexity which those of the city present.

For the problems of urban environment themselves are reaching a new scale of complexity and urgency. If defined, as they must be, in human as well as physical terms, they constitute a major, world-wide crisis. That crisis, and the beginnings of architecture's response, are examined on the next 34 pages.



ARCHITECTURE AND THE URBAN EMERGENCY

BY DONALD CANTY

The architecture of the city begins with the people on these pages, the people of the city. If architecture has to assume a new scale, as is being proclaimed, it is not merely to create shining, competitive new civic centers, or to clean up a littered landscape. It is because city life itself is assuming a new scale one which if not ordered, if not designed, will reduce these people to the stunting frustration of insignificance.

The city, in fact, is facing a crisis of scale, compounded by human, as well as physical, neglect and decay. Listen carefully to some recent statements of that crisis:

By the World Health Organization: "The tremendous increase in urban population clearly justifies the warning that, after the question of keeping world peace, metropolitan planning is probably the most serious single problem faced by man in the second half of the 20th century.

By Economist Barbara Ward: "Irretrievably, inescapably, we are heading toward an urban world. But, on present showing, it may not be a world worth living in."

By Developer James Rouse: "The nation's population growth is projected at roughly 70 million over the next 20 years, with all of this increase expected to occur in our metropolitan areas. Yet there is evidence at every hand that our cities are already oppressively out of scale with people. It would be very difficult indeed to claim that our urban society, as we know it today in America, is a healthy soil for the growth of our civilization."

And by President Lyndon Johnson: "In the next 40 years we must rebuild the entire urban United States. It is harder and harder to live the good life in American cities. There is the decay of the centers and the despoiling of the suburbs. . . . Open land is vanishing and old landmarks are violated. Worst of all, expansion is eroding the precious and time-honored values of community with neighbors and communion with nature. Our society will never be great until our cities are great."

What are the prospects that the coming urban expansion will produce urban greatness? As Rouse sees it, they are shockingly bad: "In our American cities today, we do not have prepared or in process plans that will account for the orderly growth of our population over the next 20 years. If we did have the plans, we would lack the powers to enforce them. If we had the plans and the powers, we would lack architects and urban designers with the sensitive concern, the people-centered attitude, required to fulfill their hope."

Closed-door suburbs and the culture of despair

This is the urban emergency. To meet it will require two major lines of mobilization: the reconstruction of the city itself as a mechanism of civilization, and the devising of new patterns for development of the remaining land outside the city's boundaries. Both call for new commitments of will and resources. But more important—and more difficult—both call for a drastic reversal of some of the basic forces and attitudes by which the nation's urban centers have been shaped.

The visible symptoms of the city's sickness are age and decay. The careless buildings of the recent past have been piled onto a vast accumulation of debris left by 19th Century individualism, by the flowering of the industrial revolution and the ensuing







age of immigration. The debris remains as a fruit of neglect, caused by preoccupation with war, then prosperity, then depression, then war again, and finally an explosive prosperity accompanied by a new form of war. Of the most recent interval, Senator J. W. Fulbright has this to say: "While the attention and industry of our public policy have been focused through the postwar years on crises in Berlin, in Cuba, and in the Far East, America almost behind our backs has been more and more taking on the physical appearance and cultural atmosphere of a honky-tonk of continental proportions."

In the process, the nation's great cities have become the capitals of what Author Michael Harrington has called "The Other America"—an invisible land wherein dwell 40 to 50 million persons "maimed in body and spirit, existing at levels beneath those necessary for human decency." Here are "the unskilled workers, the aged, the minorities, and all the others who live in the economic underworld." As the middle class has fled to the suburbs, the poor have inherited the city.

The poor, as a class, are not strangers to the city. They have always sought shelter in urban decay, but in the past it has been temporary shelter. The city historically has taken hold of the poor, trained them in the skills of its complex civilization, given them aspiration and the chance of success.

The primary reason for the stagnation of the city today is not desertion by the middle class. It is the failure of the city to produce a middle class out of the human ore of the poor. This failure threatens not just the city's health, but the very civilization which the city has, in great part, created.

The crucial difference between this generation of the urban poor and its predecessors, of course, is color. Racial discrimination has put the lid on the urban ghetto. It has denied the urban poor the means to escape. By putting opportunity in inverse ratio to need, it has closed the safety valve of hope, and allowed the pressures inside to mount to the point of explosion.

Almost unnoticed, America's urban culture is undergoing a dangerous polarization. The white middle class goes about its business without ever really seeing the poor. Partly this is because the poor do not live along the paths from center city to suburbs, but increasingly this social blindness is deliberate. The culture of the suburbs is becoming a culture of the closed door.

The ghetto, meanwhile, is developing a culture of its own. It is cut off from the life of the rest of the city, and therefore cut off from its values and its restraints. The culture of the ghetto is a culture of despair—and of resentment. The riots of this summer have demonstrated what such a culture can produce if alienation is allowed to erupt into rebellion.

Urban renewal: a dangerous inversion of priorities

There is not much in the 15-year history of urban renewal in America that points the way to the restoration of the city's civilizing function. Urban renewal has been used to increase the city's tax base, to "stabilize" the city's population, to beautify the city's face, to polish the city's image. It has not often been used to help those people of the city who need help most.

For the poor, in fact, urban renewal in America has amounted to an involuntary game of musical chairs. They have been considered, if not expendable, at least portable. Their needs have taken a distinct and distant second place to the other public purposes of renewal; the rehousing of those uprooted has been an operational appendage to the program rather than a central goal. As such it has suffered from a certain lack of enthusiasm. Relocation of renewal's displaced persons, the British sociologist Peter Marriss found, "has provided only marginally better housing, in very similar neighborhoods, at higher rents, and has done as much to worsen as to solve the social problems of the families concerned."

One result of this inversion of priorities has been to put the urban renewal program in jeopardy. Conservatives who object to use of federal money to solve "local" problems have been joined in the attack by liberals protesting the mistreatment of the displaced. It would be tragic if this odd cross-fire were allowed to kill or cripple the program precisely at the moment it is needed most.

Urban renewal must be expanded, not cut back, but it must be expanded in its objectives as well as its extent. It must be directed at the rehabilitation of the urban poor, particularly the urban minorities, as well as the redevelopment of their dwellings.

Urban renewal clearly cannot solve all the human problems of the city. But it can be planned to ease rather than worsen them. It can be undertaken in tandem with social programs that strike at the root problems of jobs, of health, of family life. Federal Housing Administrator Robert C. Weaver has been consistently preaching the linkage of social and physical renewal. Cities such as New Haven and Baltimore have shown that, while it is far from easy, it can be made to work.

Such a change in direction is not merely desirable. It is necessary for the city's survival. Without it, renewal's other goals are self-defeating. Civic beautification is a noble undertaking, but not if it goes only skin deep, striking at symptoms rather than the disease. Revitalization of the city's economy is an essential objective, but evidence of widespread despair and unrest attract neither new capital nor new consumers. The city's image can be improved by a bright new downtown, but it can be shattered by one night of violence bursting from the urban ghetto.

The uncontrol of land in something called "metropolis"

The city itself, no matter how energetically rebuilt or overbuilt, obviously cannot bear the full brunt of the population influx. Many, perhaps most, of the new urban immigrants must be accommodated outside the core, in the oozing outer limits of metropolis. Metropolis has but one crucial resource to use in shaping this growth: the resource of undeveloped land. If a sharp change of direction is an imperative for the meaningful renewal of the core city, no less sweeping a change is required in the tools and attitudes which control the use of land.

The land problem, in the words of California's Governor's Commission on Housing Problems, "is the key to the future environment, to industrial location, to city development, and to housing." Yet metropolis is very nearly powerless to work out a solution, for reasons which are depressingly familiar.

One reason is that metropolis is more a concept than reality. American cities are surrounded by a web of tiny governmental entities united only by mutual suspicion. Another is that the tax structure encourages speculators to keep vast holdings of land off the market until its price is pushed sky high by the pressures of growth. Placement of the primary tax burden on land instead of improvements would discourage such speculation (and, back in the city, take some of the profit out of slums), but American communities have chosen to do it the other way around.

The third, and most fundamental, reason for the impotence of metropolis is that Americans have been reluctant to grant any public body very much influence over the use of private land. Something deep in the nation's traditions, something a good many politicians and private interests are highly skilled at calling forth, rebels against restrictions on what a man may do with his real property. Those restrictions that are permitted,





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such as zoning laws and subdivision ordinances, are essentially local devices often used for local purposes that are at variance with the most pressing needs of metropolis.

And so metropolis helplessly watches its precious land being developed in ways which, as the California commission put it, "swallow up land which should be left open, extend the journey to work, aggravate the transportation problem, unnecessarily create class hostilities, complicate city and suburban relations, and snarl sensible regional development." These were some of the things which President Kennedy had in mind when he said, shortly after his inauguration, that "the present patterns of haphazard development are contributing to a tragic waste in the use of a vital resource now being consumed at an alarming rate."

New towns: a fresh start beyond the close-in chaos

The sources of these two statements are in themselves significant. For given the chaos of local governments in metropolis, responsibility for decisive action devolves to the state and to the nation. At the state level, development planning has been moribund since the 1930s; the California commission's expert study and Hawaii's experiment with state-wide zoning hopefully indicate a reawakening of interest that legislative reapportionment might encourage. And at the federal level, the Kennedy statement signaled the beginning of a major movement toward development of national policies and programs for the uses of metropolitan land. The Kennedy Administration increased Federal planning grants, introduced the bill for mass transit aid that was passed this year, instituted the open land program, and unsuccessfully tried to get Congress to provide federal loans with which cities would acquire land reserves to be held for future planned and controlled development.

The Johnson Administration has followed with an even bolder proposal, perhaps the boldest ever to appear in federal housing legislation. It calls for FHA insurance of land development loans up to \$50 million, at 6 per cent interest, for the creation of new towns—towns which would have "all public services, all the industry and commerce needed to provide jobs, and sufficient housing and cultural and recreational facilities for moderate and low-income families as well as for the well-to-do." Plans for such towns would have to be approved by local and federal agencies before the loans were made. And local governments would be lent funds for advance purchase of land or easements for public utilities in the new towns, with amortization deferred until construction began.

The proposal, contained in the current housing bill, is a remarkable, even startling, display of governmental foresight and leadership—a good deal too startling for some. A spokesman for the National Association of Real Estate Boards branded it "a giant step toward federalization of land," adding ominously that "the nationalization of land . . . is the harbinger of the socialist state." The National Association of Home Builders, many of whose members are cheerfully misapplying the sobriquet "new town" to the larger of their single-class subdivisions, also announced opposition. The proposal was removed from the bill in committee (on grounds that it was too large a concept for hurried digestion), but key Congressional leaders in the housing field have promised to give it more careful consideration if it is resubmitted in 1965.

In the long run, the pressures of the urban emergency will require fundamental reorganization of the present patterns of metropolitan development, including tax reform, metropolitan planning, perhaps even metropolitan government. The public interest must assert itself in the disposition and use of land, just as earlier social upheavals brought other forms of wealth under meaningful but limited public control. Such changes take time, however. The significance of the new-town legislation is that it can be of immense help immediately, while these fundamental changes are taking place.

The development of new towns would jump the economic and political tangle of the close-in suburbs. It would, under the terms of Johnson's bill, give low-income families some place to go besides the urban slums. (The fact that many of them would be Negroes has not been lost on the bill's opponents.) It would, as HHFA's Weaver has pointed out, "provide a significant laboratory for demonstrating how zoning, subdivision, and building codes can be improved."

And it would be an enormous challenge to America's planning and design professions to practice what they have been preaching, a challenge for which they might find themselves to be poorly prepared.

Breakdown in the program for an urban architecture

Near the end of a recent conference on cities, it came time for a teacher of architecture to speak. "I cannot grasp all the implications of the problem," he said. "I can't see it as a whole. I can't make an image of it." He spoke for his profession, but he also spoke for all those engaged in the architecture of the city.

To speak of the city as a work of architecture is more than metaphor. The city is a giant construction presenting problems of function, of scale, of mass, of space, of circulation, all analagous to those involved in design of a building. To say this, of course, is not to say that the city falls within the purview of architectural practice. Urban design, as those architects who have engaged in it can testify, is a joint undertaking of all those involved in urban development, not the exclusive province of a single profession.

But the city does fall within the purview of the *process* of architecture. It is a process (or should be) of analyzing the problem at hand, identifying the elements of the problem, then synthesizing the solutions into a whole that is both useful and beautiful. It is the only process that can bring order to urban development, because it is the only process containing a built-in concern for the quality of the end product.

Some architects are fond of saying that urban design suffers from a lack of a controlling image of sufficient order and beauty. In reality, the breakdown is at the other end of the process. Those engaged in urban design have been only too willing to substitute images and intuition for information. There has been a massive neglect of the programming phase of the architecture of the city.

In part, this neglect has been a defense against complexity. Each element of an urban design problem, says the architectmathematician Christopher Alexander, "is itself a vast problem, and the pattern of their interactions is vastly complicated." Faced with such vastness, says Alexander, the designer "relies more and more on his position as an 'artist,' on catch words, personal idiom, and intuition—for all these relieve him of some of the burden of decision, and make his cognitive problems manageable... In this atmosphere the designer's greatest gift, his intuitive ability to organize physical form, is being reduced to nothing by the size of the task in front of him."

Alexander and others convincingly argue that the design process must be overhauled to deal with, rather than dodge, complexity. Modern mathematics and its electronic handmaiden, the computer, are rapidly developing the means to structure and solve problems at least as complex as many of those which face the urban designer. Architecture, says Alexander, "must face

the fact that we are on the brink of times when man may be able to magnify his intellectual and inventive capability, just as in the 19th century he used machines to magnify his physical capacity."

One source of complexity, Alexander notes, is the "growing body of information and specialist experience" bearing on problems of urban design. "This information is hard to handle; it is widespread, diffuse, unorganized," he says. "The various specialists who retail it are narrow and unfamiliar with the designer's peculiar problems, so that it is never clear quite how the designer should best consult them."

All of this is particularly and distressingly true of information about the clients of the urban designer, the people of the city. Few of those who make decisions about urban development have made any deep effort to find out what the real wants and needs of these clients are. Instead, they have relied on romanticism, on a smattering of statistics, on abstractions from the realities of urban life. The result is a crucial gap in the program for an urban architecture.

Those few who have tried to go deeper, moreover, have found it a frustrating experience. The social and behavioral sciences are the logical sources for facts of urban life, but they have, for the most part, been otherwise occupied. What work they have done in the field has been reported in the most forbidding jargon, as if they were deathly afraid the fruits of their researches might be put to actual use.

Recently there have been hopeful signs of change, both in this attitude and in the volume of scientific inquiry into the interaction of people and cities. Somehow such work must be encouraged, to the point where a new urban school of social and behavioral scientists emerges, generating the kind of crossstimulation necessary for any form of scientific growth. And somehow a bridge must be built between them and the architects of the city. Only then will the design professions be adequately prepared for the building of a new urban order.

Needed: awareness, money, and a sense of urgency

The chaos of the urban environment, like the hopelessness of the urban poor, has been cloaked in a peculiar invisibility. The city has, until now, been the nation's blind spot. The removal of this invisibility must be the first step toward meeting the urban emergency.

Planner Melvin M. Webber, in an essay on the state of his profession, takes a hopeful view. "The problems of urbanization are attracting the attention of men from all the arts, humanities, and social sciences," says Webber. "They are allying themselves with the urban-policy professions in what is fast becoming a saturation of talent." The need now is to bring more businessmen, more politicians, more plain citizens into the alliance of the concerned.

From this must follow a greatly increased commitment of the nation's resources to the problems of the city. The current rate of expenditures for planning, for housing, for urban renewal, for prevention and cure of the city's social ills falls well behind the pace of deterioration. The war on urban poverty must be greatly intensified, and accompanied by a war of similar scope against urban blight and the waste of metropolitan land.

The final requisite for meeting the crisis of urban concentration is a sense of urgency. The city and the civilization which it nourishes do not have much time to mobilize. What follows is a report on the state of preparedness in three key areas: the city core, in the process of renewal; the new town, in the process of formation; and the mind of the urban designer.







PHILADELPHIA: HOW FAR CAN RENEWAL GO?

BY PHILIP HERRERA

At a recent conference on urban problems, one housing expert turned to his colleagues and asked: "What city do you think has made the most progress under urban renewal?" When Philadelphia was nominated, almost everyone murmured assent. One man, however, clutched his head and groaned: "My God! I live there, and I know what's going on . . . it's not nearly enough."

Paradoxically, Philadelphia has what is generally accepted as the most rounded, well-coordinated renewal program in the U.S. Yct, to many Philadelphians, progress seems painfully slow. Such a landmark as the Society Hill apartment towers (left) took six years to build; many other projects just get talked about; and most neighborhoods appear virtually unchanged.

If the pace has seemed slow since Philadelphia began pioneering in renewal in 1952, it has also been steady. The program has proceeded on a front whose breadth is shown by the city's 103-page Comprehensive Plan, which defines guidelines for physical development through 1980. It has been piloted by a 64-man city planning staff which, under Edmund N. Bacon, has shown a persistent architectural bent, coupled recently with a determination to systematize renewal procedures.

To guarantee the program's momentum, the municipality fits specific projects into a six-year capital budget, revised annually. Roughly 50 per cent goes to residential projects (to attack the decay shown in the map below, graduated from stable areas in lightest gray to those needing major rebuilding in black), 23 per cent to Center City, 18 per cent to industry, and 9 per cent to institutions. In committing itself to using *all* federal renewal credits, Philadelphia has given renewal priority in the city's budget.

Moreover, the people of Philadelphia have accepted renewal. They have learned to ask the Redevelopment Authority for help in their neighborhoods; in Center City they form committees and nonprofit organizations to aid redevelopment. Leading businessmen, for their part, have supported renewal in many ways: some have kept industries from leaving the city by helping them relocate on new sites opened up by renewal; others act as unpaid real estate consultants to the city. In short, Philadelphia has made renewal an institution, and has subsidized it as a part of city life, like education or commuter trains.

Renewal in Philadelphia thus operates under almost ideal conditions: sophisticated planning coupled with practical tools of implementation; a willingness to experiment and a backlog of experience; strong political and public acceptance. The following pages examine what Philadelphia, prime laboratory of U.S. renewal, has accomplished so far.



JRGE CBI

Through planning, downtown is developing a striking new image —but will the shoppers buy it?

At the very core of downtown Philadelphia, where Broad and Market Streets intersect, stands the wonderfully baroque 1881 City Hall, symbol of old Philadelphia. It is crowned, appropriately, with a statue of William Penn, the city's founder and optimistic original planner. (He described his plan as "a great and good contrivance"—and then left it for others to accomplish.)

Big things are happening all around City Hall. Biggest and most striking, of course, is Penn Center, an almost-completed nine-building complex running along Kennedy Boulevard for some 12 blocks toward the Schuylkill River. Started in 1952 to revitalize the administrative and commerical hub of downtown, Penn Center has come close to accomplishing this. It not only eliminated the "Chinese Wall" eyesore of the Pennsylvania Railroad's elevated tracks; it also gave downtown the boost of a \$100 million investment and proved that old Philadelphia could absorb 2.6 million square feet of modern office space. (More new office buildings are planned on Independence Mall.)

As an example of urban design, Penn Center achieves some success in its massing, in its procession of open spaces, and its vertical separation of people and vehicles—which reflects the design touch of the City Planning Commission staff. Its individual buildings, however, are as bland as blocks on a study model which reflects the architectural insensitivity of the Center's developers and the desperate wish of the city to get the project built.

Architecture fared better in the city's plans for Penn Center's newest neighbor to the east, the cruciform Municipal Services Building (photo, right). Designed by Architect Vincent Kling, it represents the only postwar building in downtown Philadelphia that has taken a cue from the strength of City Hall and the other sturdy monuments of Philadelphia's past.

On the other side of City Hall, along the north side of Market Street, Philadelphia's most ambitious new project is still under study. Market East has been planned by the City Planning Commission to solve the problem that bedevils downtowns everywhere: enticing suburban shoppers back into town.

The project will become, in effect, a gigantic terminal linking all methods of transportation in one eight-block-long building. These will include facilities for the Reading and Pennsylvania Railroads' commuter trains, the subway, a bus depot, and a 3,000car parking garage.

Once shoppers arrive, they will walk along multilevel pedestrian concourses lined with shops. Overhead bridges will connect Market East with the major department stores on the south side of Market Street.

The convenience of Market East represents half the battle to capture shoppers from the suburbs. The other half involves beautifying downtown so that it can compete with outlying shopping centers by accenting the excitement, variety, and flavor of the big city. Accordingly, the other main shopping street, Chestnut (which parallels Market Street), will be refurbished. Sidewalks will be widened for pleasant strolling; a small, fast trolley will carry passengers the whole length of Chestnut Street between the Delaware and Schuylkill Rivers. When the Market and Chestnut projects are completed (by 1976), the city will have a unique linear shopping spine as the center of its new downtown.

With the notable exception of Market East's estimated \$200 million cost (to be shared by the city, federal government, and private developers), Philadelphia's broad solution to the problem of retailing involves relatively little expense. The main reason is that the existing stores will remain where they are. The big question, of course, is: once built, will it work? Says R. Damon Childs, chief of Renewal Planning: "A lot of office buildings were built downtown because of imaginative planning: We think the same phenomenon will occur with stores."



The eight-block-long Market East project is seen stretching away from City Hall to Independence Mall in the drawing at top. Section (above) shows its many levels of pedestrian concourses, garage space, and rail and subway lines. Together with refurbished Chestnut Street to the south, Market East will form Philadelphia's vital new linear shopping core.

Architect Vincent Kling calls his almost-completed Municipal Services Building (below) "omnidirectional." Rising 18 stories in cruciform shape above a spacious surrounding plaza, it does much to unite visually the old downtown landmarks, like City Hall and the Benjamin Franklin Parkway, and the new forms at Penn Center (photo, right).





Close-in living: how can central Philadelphia compete successfully with its own residential suburbs?

The most elegant additions to Philadelphia's new skyline are the three 34-story Society Hill apartment towers by Architect I. M. Pei. Located on the 56 acres east of Washington Square that once comprised the Dock Street food market area, they do everything they were intended to do when they were designed in 1958 -with one notable exception.

They provide 720 apartments (at rents between \$110 and \$300 a month); they fit into the City Planning Commission's over-all scheme for the central city while having a strong site plan of their own. They are, moreover, the best architecture Philadelphia's renewal program has yet produced.

Nonetheless, after six months of being open for public inspection, they are renting very, very, slowly. And Pei's distinguished town houses, completed last year for the same project, are selling at a similar pace (at \$46,000 each). To date, at least, while Society Hill and adjoining renewed areas have polished the image of the city, they have not brought the middle class flocking back to live downtown.

The problem is by no means unique to Philadelphia, but the city's planners have attacked it in their usual thorough way. They have tried to create the kind of atmosphere and amenities that should make urban living appealing. In addition to a generally more attractive downtown, citizens' group are promoting a new cultural center near the Academy of Music on south Broad Street. Around Society Hill and Washington Square, heading north, there is an already well-known system of green walkways linking historic landmarks with Independence Hall's parks. Fine old houses nearby are being conserved as part of Philadelphia's massive rehabilitation program, preserving the area's special, graceful charm.

Results, however, have been disappointing. The people who buy the old houses (for \$6,000 to \$35,000) and fix them up (for \$5 to \$50 per square foot) are for the most part people who have always lived in the city.

Not far from Society Hill on

Washington Square, another notable apartment tower, Hopkinson House (architects: Stonorov & Haws) reflects another aspect of the same problem. After a year of rentable life, it is only 80 per cent full. Apparently, existing city dwellers are simply playing musical chairs, and the incoming trickle of the affluent and the childless does not add enough more people to fill the 3,610 rental apartments built in the central city since 1960.

One gloomy opinion was put forth by Economist Chester Rapkin last year: If no more apartments are built, he said, the present supply will still not be occupied for several years. But developers have more faith than Rapkin in the eventual inflow of the middle class; at least they continue to project and build new apartment houses. The developers are apparently gambling on two things to sway the middle class: 1) that the area will get good schools, which it now lacks due to the Republican-controlled Board of Education's almost complete independence from Democratic City Hall; and 2) that the inescapable spots of decay amid the growing elegance are slated for eventual eradication.

Another potential help lies in the Penn's Landing project for the Delaware River water front. Replacing warehouses and other old buildings just east of Society Hill will be a handsome development planned by the architectural firm of Geddes, Brecher, Qualls, Cunningham. To contain a park, a boat basin, a Port Tower, passenger wharves, and other buildings, Penn's Landing has the strong backing of Mayor James Tate and the powerful Old Philadelphia Development Corp. The project is intended to upgrade adjacent property, to produce new revenue for the city, and to support central Philadelphia's image by beautifying the water front.

How much Penn's Landing will help fill Society Hill is anyone's guess. Philadelphia is creating the largest stock of prestigious close-in housing of any U.S. city-but so far it has not found enough pioneers among the middle class.







Central Philadelphia's prestigious housing supply includes many salvageable old houses which someone is always remodeling (1). Open land among these houses is kept for system of small parks and walkways (2) connecting historic landmarks from Independence Mall to Washington Square. Over the latter looms the 33-story apartment building called Hopkinson House, designed by Architects Stonorov & Haws (3). New town houses are also being built. In keeping with the old neighborhood, some of them at Society Hill are quasi-historic (4); others, by I.M. Pei, are strikingly contemporary (at right, in photo 5).







University City: institutions get together to boost the city's economy and to renew their surroundings

In West Philadelphia, just over the Schuylkill River from downtown, lies the city's great cluster of institutions. With the exception of scattered new buildings of widely varying quality, the area looks neglected—as if the institutions really didn't care. But in actuality, the renewal district known as University City has become Philadelphia's "new frontier," both in inspiring new thought about neighborhoods and as an area of economic growth.

Basis for the boom is the growing importance of "brain industries." Five of University City's institutions alone brought to Philadelphia last year some \$35 million in research and development contracts—the University of Pennsylvania, Drexel Institute of Technology, the Presbyterian Hospital of Philadelphia, the College of Pharmacy and Science, and the Philadelphia General Hospital.

In 1959, the five institutions recognized their needs-and potentials-and banded together to form the West Philadelphia Corp. The WPC had four principal objectives: 1) to provide for the orderly physical expansion of its member institutions; 2) to build a new kind of research center to appeal to the electronics, bio-medical, and similar industries; 3) to enter into the life and problems of the surrounding residential community; and 4) to upgrade the community in every possible way, particularly by improving local schools.

Under the leadership of Dr. Gaylord P. Harnwell, President of the University of Pennsylvania, and Leo Molinaro, a former ACTION Inc. urban expert, WPC has accomplished what must seem like miracles to other Philadelphians. The middle class, spearheaded by an influx of faculty members and professional men, is returning to the University City area from the suburbs. Land values have gone up by 15 per cent over the normal rate of increase. Some 4,500 new jobs have come into being as a result of increased student enrollment and the new contracts. And the whole community has benefited from WPC's specialized help in solving local problems.

The next stage of WPC's effort is symbolized by the \$50 million Science Center, which it hopes will become the nucleus of a largescale concentration of research and development industries in University City. Such glamor industries, exploiting Philadelphia's considerable pool of brainpower, would help make up for the manufacturing which has left the city.

Strung along west Market Street (photo opposite), the Science Center will consist of interconnected research, conference, and office buildings designed by Geddes, Brecher, Qualls, Cunningham. It is one of the first renewal projects in the U.S. to take into account the interval between conception and execution. Realizing that the precise manner of execution cannot (and probably should not) be preordained, Robert Geddes attempted to design a framework strong enough to contain whatever kind of building the individual firms construct. The framework includes the street itself, widened and lined by trees, balustrades, and special lighting standards (see rendering). It also includes strips of garages, with space for shops and showrooms fronting on the street (1 in plan), and "gateway" buildings to be constructed by WPC, including a conference center which spans the street (2). Individual firms who wish to build in the area will buy air rights over the garages. Height limits and other forms of design control probably will be applied; but Geddes is putting his faith in the framework to give the completed Science Center (3) order and identity. At its edges the Center will trail off into the scale of the surrounding community.

The Science Center symbolizes, as perhaps no other project does, the close ties between Philadelphia's institutions and its political and business communities. The institutions, with all their brains and wealth, form a working part of the renewal program. No other city has been able to achieve this close partnership. Says Leo Molinaro: "It is Philadelphia's greatest accomplishment. When the main gears are synchronized, progress really begins."







Formula for the neighborhoods: a lot of rehabilitation, a slight dose of clearance, and some local pride

Most of Philadelphia's housing stock looks like the street scene shown at right. Some 75 per cent of the 649,000 existing dwelling units within the city limits are over 30 years old; 66 per cent of them are classified as "attached" (row houses). They have a surprisingly low mean value: 63 per cent are worth less than \$10,000. Put these statistics together, add the fact that 40 per cent of the city's labor force works in manufacturing, and the logic of the late realtor Robert A. Futterman's statement becomes apparent: "Philadelphia suffers the drabness of the blue-collar city. Even when the redevelopment projects are completed, very large parts of the city will be only habitable rather than joyously livable."

The indictment is perhaps too harsh. The controlling idea behind the Redevelopment Authority's 15 neighborhood projects (which go all the way from Eastwick's 482 acres down to Mount Olive's 2.7 acres) is to upgrade communities—and help the people make them "livable."

At first, Philadelphia tried demolishing its worst slums. In the early 1950s a section of East Poplar was leveled. The houses that replaced those torn down (photo below, right) were neither distinguished nor particularly cheap (carrying charge: about \$86 per month). What is more, the bulldozer technique did not solve anything. Reported Philadelphia's gifted Development Coordinator William Rafsky in 1957: The thought was that " 'the island of good' would favorably affect 'the swamp of bad' immediately surrounding it. Unfortunately, the reverse proved true." Once displaced, East Poplar's original residents crowded into housing at the edges of the project area and recreated the blight they had just left.

At the same time, conservation and rehabilitation were tried in the area by the Friends Neighborhood Guild and the American Friends Service Committee. Some 114 dwelling units were reduced to 88 remodeled units in more attractive surroundings, including small parks. While this demonstrated the potentialities of rehabilitation, it also pointed up a frustrating fact: none of the original families could afford the improved residences.

So Philadelphia turned away from the severely blighted areas to concentrate on deteriorating, but savable, neighborhoods. Showpiece of this conservation and rehabilitation program at present is Morton, in the north Philadelphian community of Germantown. Though it was an area of lowermiddle-income groups (average annual earnings: \$5,000), Morton had become decayed in spots and was developing a bad reputation.

To improve the neighborhood, civic leaders asked the Redevelopment Authority for financial and planning help. Result: the development of new public housing units on cleared sites scattered in small groups throughout the area (see photo below, opposite). These units have been designed to blend in with the existing houses, many of which have been nicely rehabilitated, and new open spaces have been created. Significantly, neighborhood pride in the project is high-and all central Germantown has been stimulated.

In most cases, the neighborhood projects now under way started with community leaders coming to the Redevelopment Authority asking for help. Thus were launched projects all over Philadelphia, in places with names like Haddington, Whitman, Strawberry Mansion, Poweltown, Nicetown, and West Mill Creek.

In Poweltown, some 600 homes were marked for rehabilitation with help from FHA's Section 220. Of them, 75 are using the federal aids; 125 are being rehabilitated privately—reflecting the desire of aroused home owners to improve their property.

What is happening in Philadelphia's neighborhood program is, in its own way, every bit as exciting as the Center City plan. Slowly, people are voluntarily joining the renewal process, housing is improving, and a pattern is forming of small new parks. Philadelphia may not have erased its "drabness," but by involving the home owners themselves it has made an important start.









Long, bleak streets lined with row houses (1) characterize most of Philadelphia's older neighborhoods, but changes are being made. In the East Poplar redevelopment project (2), new row houses by Architect Joseph L. Burke are set back behind front yards. At Eastwick, some 250 houses have been built by Reynolds Metals Company for middle-income families (3). These units (designed by Doxiadis Associates and Wright, Andrade, Amenta & Gane) vary in height and number of rooms, are sited largely on cul-de-sacs. At Morton (4), new public housing units by Hatfield, Martin & White blend naturally with the old neighborhood.



Philadelphia is pioneering new ways to house the poor, but the problem is still quantity

Philadelphia, like all U.S. cities, is plagued by the problem of housing low-income families, including those displaced by renewal. But it is conducting some significant experiments in an attempt to find new solutions.

In the Morton conservation area, the solution involved integrating scattered, new low-rise public housing units into the community. In other neighborhoods, the Philadelphia Housing Authority started the new, and much-copied, "used house" program.

Under it, the Authority buys old houses in decent communities, rehabilitates them for public housing, and turns them over to poor families. The stigma of massive projects is thus avoided, for the houses are not differentiated in any way from their neighbors. The program also provides enough space for large families-a problem in Philadelphia as elsewhere. And the "used house" program is economical: in the Haddington area, for example, the cost of buying and rehabilitating a house averages \$8,850; in a typical highrise project, one unit costs \$18,000. Despite these, and other, advantages, the program has only recently begun to pick up steam; the Housing Authority plans to add 700 houses to its present stock of 200.

Even where Philadelphia builds public housing in the conventional mold of big projects, it has tried to upgrade them by using top architects. This is perhaps best illustrated by the Mill Creek public housing projects in West Philadelphia (photo, right). Last year saw completion of Architect Louis I. Kahn's newest red brick houses (opposite); behind these are older towers and houses designed by Kahn, with Louis McAllister and Kenneth Day, for the project in 1954.

The site plan is typically Philadelphian: two streets have been converted into pedestrian paths, tree-lined fingers of a greenway system linking community buildings. The detailing is characteristic of Kahn—e.g., the sturdy precast concrete sunshades. But the buildings themselves are typical of public housing, which is to say minimum. Take away the Kahn touches and they are the same little boxes which mininum public housing budgets produce, short of both space and amenities.

Scheduled for a site a few blocks away, in the West Mill Creek renewal area, is a more adventurous attempt in terms of both strategy and environment. On four blocks slated for clearance will eventually rise a project intended only for poor families not as public housing, but for sale.

Architects Geddes, Brecher, Qualls, Cunningham began by studying how to keep costs down by using new construction methods and materials. They soon discovered that this approach would disrupt the traditional ways of builders in Philadelphia and perhaps even increase construction problems. So they switched their focus to finding out what lowincome families really wanted in their houses.

The results were surprising. Poor families did not want the privacy afforded by conventional Philadelphia row houses. In their eyes, the customary secluded backyard was more of a storage area than a retreat. The front stoop, on the other hand, was for socializing. So Geddes turned the houses around: the kitchen looks out to the street over an enlarged front yard with its own parking space. For visual variety on the street, Geddes staggered the houses instead of lining them up.

The cost to the developers, a far-sighted, non-profit group headed by Joseph Singer and Richard Fox, can be cut by raising the net density from the more usual 23.3 dwelling units per acre to 28.2 with the loss of only 60 square feet in average lot size. Also of help will be use of Section 221(d)3, FHA's program of below-the-market interest rates.

Yet, despite the new thinking at West Mill Creek, the emphasis on design at Mill Creek, and the program, Philadelphia's low-income housing problem has not been solved. The quality of those attempts must be combined with sheer quantity if Philadelphia is even to keep up with decay.





To encourage front-stoop neighborhood socializing, the West Mill Creek low-income housing project will have narrowed streets (site plan) made pleasant with off-street parking and trees (sketch). The project is still under study—as can be seen in the alternate ways of siting back-toback row houses. Pedestrian paths lead to the community facilities.

Using red brick as the basic material, Architect Louis I. Kahn embellished the recently completed Mill Creek two- and three-story public housing units with such details as concrete sunshades (below). The photo opposite shows a portion of the project: row of houses (left), freestanding (semidetached) living units, and the three 16-story towers built in 1954.





After 12 years, Philadelphia still is pioneering. The next step: renewal of renewal itself

The drawing at right shows Philadelphia in 1976, 200 years after the signing of the Declaration of Independence, poised hopefully for a World's Fair in which the city itself would be the main display (with special fair buildings in the biggest parks). All along the main axis of Market Street, projects now under study or construction are finished: Penn's Landing on the Delaware River (bottom of sketch), Society Hill's three towers (left) and new office buildings along the cross-axis of Independence Mall. From the Mall, the buildings of Market East lead up to City Hall, the cruciform Municipal Services Building, and Penn Center beyond; across the Schuylkill River, stretch the Science Center and other development it has stimulated. But for all this new building-and all the rehabilitation not shown-will Philadelphia have done enough to meet the real crises of urban living?

Architecturally, at least, Philadelphia promises much. The city's architects, especially the group known as the "Philadelphia School" (Kahn, Geddes, Louis Sauer, Romaldo Giurgola, etc.), have been seasoned by their city's dozen years of rebuilding. Working with Philadelphia's design-minded planners, they have learned to think in terms that go beyond the single project at hand.

The bright young men of Ed Bacon's city planning staff, for their part, have also been tempered by experience. They began in the 1950s by adding architectural thinking to the planner's usual skills, and now they have gone on to take an even larger view.

In the Community Renewal Program, the planners have banded together with some ten city agencies ranging from the Housing Authority to the Commission on Human Relations, to develop new ways to accomplish the objectives set forth in the 1960-80 Comprehensive Plan. These will be outlined later this year in a CRP technical report, which will suggest ways, for example, to forge closer links between renewal and the schools; to set up a nonprofit institution to finance more low-income housing; to use the renewal process to create more employment.

While the architects and planners are broadening their horizons, private and quasi-public groups, concerned with the impact on the city, are seeking their goals in new ways. The nonprofit Old Philadelphia Development Corp., under ex-Development Coordinator William Rafsky, for instance, has undertaken to encourage Center City living by sponsoring, with local realtors, an advertising campaign aimed at suburbanites, and to look in other cities for tenants to fill the projected Independence Mall office complex.

Meanwhile, the social problems of renewal are being studied by the Philadelphia Council for Community Advancement, an organization consisting of city agencies, citizens' groups, and institutions, with financial help from the Ford Foundation and the President's Committee on Juvenile Delinquency and Youth Crime. PCCA's objective is a "global attack on the human problems of the city"-i.e., everything from changing young people's negative attitudes toward the law to developing "leadership organizations" within communities that can express those communities' needs and know where to ask for help. At present, the furthest advanced efforts are a nursery-school program for culturally deprived children and a youth employment program aim at 400 school dropouts.

In brief, Philadelphia has pushed urban renewal about as far as it can go. But it has also demonstrated that urban renewal, as it has been conceived to date, cannot go far enough.

Philadelphia's renewal program began in the early 1950s with massive physical blight and political corruption. The corruption has been cleaned up, but for the most part, the blight has been removed from one neighborhood only to appear in another.

Philadelphia is thus due for another period of pioneering. This time its challenge is to aim renewal at the fundamental human and economic problems by which physical blight is produced.








A NEW APPROACH TO NEW-TOWN PLANNING

James Rouse of Baltimore, as the quotations on page 173 indicate, is a most unusual developer. In addition to being one of America's leading mortgage bankers and builders of shopping centers, he is both an evangelist of urban renewal and a gadfly of urban design.

It was to be expected, therefore, that when Rouse's firm, Community Research and Development Inc., decided to build a new town in partnership with other investors, it would be something more than a glorifled subdivision: it would be a community. But CRD has gone one step further in planning its as-yetunnamed community of 125,000 between Washington and Baltimore. It has set out to construct the framework of a society, based on the best information it can find about the wants and needs of people.

The venture is, quite literally, unprecedented. So CRD is almost daily setting new precedents in financing, in land assembly, and—perhaps of greatest longrange importance—in the very process of urban design.

CRD established its first precedent by starting with the idea of building the new town, then going out to find the land in much the same way it would seek the site of a new shopping center. The search ranged the entire eastern seaboard, then focused on the Washington-Baltimore corridor—and on the eastern section of rural Howard County, Maryland (photo, left).

It was a strategic location. Washington-Baltimore is the fastest growing metropolitan area in the east, and the Howard County land sits just 35 minutes driving time from the centers of both cities (see map). In nine months, CRD assembled 14,100 acres (another 1,100 have since been added) in 140 separate parcels at an average price of \$1,450 per acre.

The money for land purchase and other advance costs came from financing that was, again, without precedent. Rouse obtained more than \$20 million from Connecticut General Life Insurance Co. The company agreed to defer repayment until actual development began, thus providing precious time to plan.

Rouse's previous experience in urban problems had led him to a depressing conclusion, which he recently expressed in these words: "There is absolutely no dialogue in the U.S. today between the people who have developed knowledge about people —the teachers, the ministers, psychiatrists, sociologists—and the people who are designing and building our cities." We are not asking the right questions, said Rouse, and so we are not getting the right answers.



Both the site and the planning "dialogue" pointed to the idea of a three-level community

Rouse and the CRD new town staff-headed by William E. Finley, former director of the National Capital Planning Commission, as vice president in charge of the project and Morton Hoppenfeld of NCPC as chief planner -decided to set up precisely this kind of dialogue. On one side were the CRD planners, and on the other a unique "work group" of 15 experts in such fields as sociology, government, recreation, economics, education, health, housing, transportation, and communication, with a social psychologist, Donald N. Michael, as coordinator. From last October until February, the work group met every two weeks (for two days and a night) with Rouse and his staff. The first step was for all to agree on the definition of general goals.

There was, for one important example, the matter of the new town's self-sufficiency. The group accepted the inevitability of some commuting both to and from the town, but made it a goal to provide a job for each of its employable residents and a place to live for each of its workersfrom company presidents to janitors. It determined, moreover, that high- and low-priced housing should be mixed to whatever extent the market allowed, and that the low as well as the high should have "amenities that encourage self-respect and growth."

An antigeometric site

The output of the dialogue which followed became raw material for a twofold program: a program for the structure and operation of the town's institutions, and a program for its physical planning and design. Planning had started concurrently with the work group discussions. Well before they were concluded, the new town had begun to take conceptual shape.

The shape was greatly influenced by the nature of the site. CRD's holdings stretch a verdant 9 miles across rolling hills and stream valleys. But there are fairly large islands of land which CRD does not hold, some of them farms and others

fairly new subdivisions.

The existence of these islands "precluded any geometric or homogeneous solution," Hoppenfeld points out without noticeable regret. This and other characteristics of the land-its beauties, its irregularities, the location of its buildable areas-began to indicate the breaking up of the town into a series of subcommunities distributed about the site.

This concept meshed neatly with the direction of the work group's thought. From several points of view-the optimum size of institutions, the creation of a sense of community-the work group had begun to think of the town in terms of three entities, each with its own nucleus of services and facilities. The three were the "neighborhood," of 300 to 500 families; the "village," of 3,000 to 5,000 families; and the town as a whole.

The neighborhood and village, whose nuclei are shown at right, would be strongly focused on education. The neighborhood center would be built around a primary school, the village center around secondary schools. In each case, community activities would be integrally linked to the schools.

The work group considered the neighborhood center to be the prime device for drawing residents into the life of the community. The village center-containing special facilities for adolescents, for the elderly, for family service, for information on community affairs-would increase this participation. The neighborhood, especially as time went on, probably would be relatively homogeneous in terms of incomes and shared interests. The village would be the place where the mixture of the town's population occurred in the most meaningful ways.

The villages would be joined by public transportation (and possibly by closed-circuit television, carrying special community programs), focusing on the town center. In this largest nucleus would be the college, the hospital, and all the varied activities and attractions of an



Above: the neighborhood center, its scale determined by the distance a young child can walk, is closely organized around the primary school (which may be either K-4 or K-6). The sketch shows the ruins of an old farm building put to use as the centerpiece of a recreation area be-tween the school (at left) and store.

Below: the village center has secondary schools and shopping as its focal points, joined by facilities used by both the students and the community. In the first village plan (at right), pedestrian ways link the neighborhoods, and residental streets wind along the contours of the site. Note the wide range of housing types.



VILLAGE CENTER DIAGRAM 3000-4000 F



The town's eight villages will be joined by a double loop of transportation and apartments

urban core (diagram, below right).

These and other such concepts became the basis for the working site plan on the opposite page. It is now being projected into the three dimensions of design.

The plan places the town center beside Highway 29 (which is about to be widened from two lanes to six), beyond one of several lakes to be constructed on the site. Special rights of way for buses join the village centers with each other and with the town center in a loose Figure 8.

High-density housing follows the Figure 8, creating a curvilinear spine, and flanks the commercial areas at the town center. Within the villages, densities are highest near the centers; each village contains a full range of dwelling types, from clusters of single-family houses, to town houses, to garden apartments.

Uniquely, nearly every element of this plan will be designed. The entire town will be, in a sense, a work of architecture but architecture concerned more with the experiences of people than the creation of images.

An example is Hoppenfeld's concept of the town center, at present in the process of design. Its focal point would be an informal park faced by a library, a colorful assortment of shops, and "community service center." Below the park, along the lakefront, would be restaurants, a band shell, a concert hall, and the new town's equivalent of Copenhagen's Tivoli Gardens.

Opening from the park would be the main shopping district, conceived as an expanded version of an enclosed-mall shopping center—"a combination of the Milan Galeria and CRD's Cherry Hill in New Jersey," as Hoppenfeld puts it. Behind this retail core would be office buildings and high-density—but not high-rise housing. At present, the only tall buildings planned are a pair of apartments across the highway from the town center.

To many architects, a town of widespread low-rise buildings with a shopping center at its heart may not seem to possess the look of urbanity. To Hoppenfeld, however, urbanity is less a matter of building height or form than "of an optimum range of choices, of awareness, of mobility," all of which he is determined to design into the new town. At the same time, through the neighborhood and village centers, he is seeking "the benefits of participation in the community, the comfort of small scale" which are not normally part of urban life. He is seeking, in sum, the best of two worlds for the residents of the new town, and he and CRD may very well achieve it.

A nonutopian pace

Rouse and his staff have become extremely sensitive to being labeled utopians for their troubles. In reality, the entire planning process has shown evidence of the hard-headedness that befits a public corporation engaged in a profit-making venture. A precise accounting system was set up early in the game to project the cost of every major design decision. A good many decisions have been modified as a result.

The same practicality is being applied to the pace of development, which will be guided by continuing market studies. The present estimate is for construction of some 3,000 dwelling units a year. CRD already is in full chase of industry.

CRD does not plan to build any of the houses, but will develop the shopping core, many of the apartments, and probably some of the office buildings. CRD also will put up the first of the schools and other community facilities, with reimbursement to come when an assessable tax base exists.

In all, the building of the new town will take upward of 15 years. Only then will Rouse and his staff really know whether their effort at people-centered planning has been worthwhile. For now, they are convinced of the value of the effort, and confident of the results—within decidedly non-utopian limits. "We're not trying to build the perfect community," says Rouse, "just a better one." —D.C.



Above: a conceptual diagram of the new town. The neighborhoods are the "petals" of the eight villages, which form two loops joined to the town center. The working site plan (right) shows this concept adjusted to the desired mix of development, and to the natural characteristics of the rolling land. Below: the town center is a compact mix of shops, offices, apartments, and a wide variety of cultural and entertainment facilities. Most of the community's gathering places front either on the town park (shown in sketch), or on a lake which CRD intends to build as a buffer between the town center and busy Highway 29.









THE CITY AS A SINGLE STRUCTURE

While better social and esthetic solutions are being sought for communities (preceding pages), another urgent goal of architecture today is a viable structural framework for the city itself. For today's cities—whose old, one-level patterns of streets and services have been overwhelmed by buildings, people, and cars—are failing in their physical, as well as human functions.

To make the city work, urban designers are exploring big new multilevel frameworks which combine concentration, separation, and flexibility. Some of the concepts behind such "macrostructures" are evident in this winning redevelopment scheme (among 24 entries) for the center of Turin, Italy. The "towers-in-a-park" look recalls Le Corbusier's famous early vision of the city. But the difference here is high concentration, and a studied handling of transportation: the towers spring from a terraced, multilevel base which sorts out many things, including people and cars.

The project consists of three "nodes": an apartment, hotel, and convention center (top of plan), which is linked across a park by a moving pedestrian walk to a vast "executive center"—a skyscraper complex of offices, restaurants, theaters, and shops (middle). This center, in turn, flows over an expressway into a government center (bottom).

Beneath the towers and their terraced base, seven underground levels contain mechanical services, bus and subway terminals, and parking for no less than 30,000 cars. But the real excitement takes place above ground and stars the pedestrian, who will be provided with elevators, escalators, and five interconnecting levels of landscaped terraces, together with overpasses on major streets. The artificial "hill" thus created in the otherwise flat city center led the nine architects under Ludovico Quaroni to call their solution "Akropolis 9."

The competition was sponsored by the city of Turin, which awarded a \$5,000 first prize. The actual project will not be started before 1968-1970.





Frankfurt: a big, threedimensional grid for varied, flexible growth

"The city expresses life; it is a living, changing organism." So say the architects of this competition entry for redeveloping a bombed-out sector in the center of Frankfurt, Germany (seen below, left). Their objective, therefore, was to create a system which has a built-in potential for growth and change.

The system they have devised consists of a multilevel "distribution grid" of mechanical services, integrated with a circulation net of horizontal and inclined walkways. A secondary structural grid for actual buildings is inserted, or "plugged into," this main grid, which is composed of squares 110 feet on a side, bordered by 12-foot-wide rights-ofway. Within this network, the structural grid is based on smaller rectangular bays 25 feet, 5 inches by 15 feet, 81/2 inches. The single, continuous "building" which results can be built in separate sections or "rooms" where and when needed, and added to or rearranged. Unlike other, winning, entries - which generally proposed open spacesthis scheme calls for a dense "city within a city" that re-establishes the scale and spaces of the old town in a modern way.

An underground service level feeds stores and offices above, providing storage space as well as direct access for trucks. Also underground is the core of the mechanical system, which circulates upward through a network of horizontal and vertical ducts, forming the main distribution grid.

The four above-ground levels of this three-dimensional jigsaw puzzle house all the diverse activities one would expect in a small city: offices, shops, libraries, galleries, museum, music school, youth center, cinema, restaurants, exhibit spaces, cafés as well as private dwellings. Roofs are treated as garden terraces, some public, some private. Abundant daylight filters to all levels through large, open courts.

The architectural team which designed the project was led by Georges Candilis, Alexis Josic, and Shadrach Woods.





Boston: offices, shops, and apartments hung on a treelike "spine"

The idea of the dense, continuous, multipurpose building takes a different form in this dramatic (if admittedly hypothetical) proposal for Boston by Harvard students Eduardo E. Lozano and Koichi Nagashima. The main objective of their studio project was the development of a large-scale physical framework in which a variety of urban functions — transportation facilities and offices, dwellings and shops—could be housed together for maximum efficiency.

Their scheme, which they call the "South Cove Infrastructure," would house shops, offices, and apartments in a gently curving wall of buildings along one side of the Boston Common, linked by a plaza to a communications and transportation center (top left in model photo).

In section, the wall-or spine, as its designers call it -is shaped like a great inverted funnel (left). Underground areas are devoted to a subway and to a big parking garage, which is fed from the street by six access "mouths" (circles in plan, left). At ground level, a pedestrian shopping "galeria" runs the length of the building spine and is connected by pedestrian bridges to the Common and other adjacent areas of the city. Rising above this, supported by huge two-way cantilevers, are tiers of offices, surmounted by luxury apartments. The spine, which provides the basic structure and services, is divided into sections which can be developed gradually by individual entrepreneurs and their designers (unfinished portions are symbolized by gaps in the model's façade).

The four large columns of the communications tower—which is no less than 525 feet tall support an airlines terminal and rooftop heliport, as well as radio and TV offices and studios lower down. At the base is a bus terminal with direct access to an extension of the Massachusetts Turnpike, which runs through the site between the columns (plan, left). Flanking the expressway on the far side is a multilevel garage, railroad station, and truck terminal.





Cumbernauld: a citadel of many levels for both men and machines

On a windy hill in western Scotland, the first buildings are rising for the town center of Cumbernauld, the latest of Britain's famed New Towns. When completed, the center will consist essentially of a single building structure nearly half a mile long and over 200 yards wide, built over a spine road up to a height of eight stories, and containing all the commercial and civic services required by the city's ultimate population of 70,000. This gigantic linear structure, largely enclosed against Scotland's weather, will be built in stages, the first of which is pictured in the model photo opposite.

Like other urban projects shown on these pages, the Cumbernauld town center calls for realistic acceptance of the automobile; it is, in fact, a giant, allpurpose drive-in, perched atop its ridge like an old Italian hill town.

Vehicular traffic will be confined to two lower levels where parking facilities, bus terminals, loading docks, and gas stations open off the main spine road and off two parallel loop roads at the edges. Escalators, elevators, ramps, and stairs move people and goods to the upper levels, which are reserved for pedestrians.

Within the main structure will be packed the library, community center, medical services, offices, stores, a hotel, banks, and other commercial activities. Penthouse apartments will top the complex. In the first-phase model photo, these can be seen crowning the main building, with banking facilities, a hotel, and the clustered spires of a church in front.

At one end of the center (right in drawing, opposite) will be a civic square overlooked by three tall apartment towers; at the other end, a large entertainment center and, rising above it, a boomerang-shaped, 11-story office building. The center terraces down the hill toward a long "housing wall" behind which lie Cumbernauld's row housing and industrial plants, now largely completed.

Architects: The Cumbernauld Development Corporation, with L. Hugh Wilson, D. R. Leaker, and Geoffrey Copcutt.

Megacity: can tomorrow's architecture create a workable city of man?

Our grandchildren may no longer be able to decide whether they want to live in cities or not; there may be no other place to live-Wolf Schneider, in Babylon is Everywhere.

As we are often reminded-perhaps not often enough --- the most critical fact of life today is the proliferation of life itself: the world's population is now over 3 billion-and doubling every 40 years. One prophet figured recently that if the rate went unchecked, the already staggering present densities of Manhattan Island could blanket every square mile of the land, ice, and water surface of the globe in less than 500 years.

Civilization, of course, would have fallen apart long before then. But, as U.S. city life today all too vividly demonstrates, civilization (at least in its sense of civicness and civility) is falling apart right now.

So, with the problems of future "megacities" in mind, it is not entirely astonishing that three architectural students at Manhattan's Cooper Union - Roland Dick, John Koster, and Barry Elbasani-recently proposed as their solution to a design-class problem the quintupling of their city's upper East Side densities. Their solution is a stupendous, three-dimensional grid-structure reaching as high as 800 feet, on which various buildings could be "hung" (right). The huge columns supporting the grid enclose elevators and service trunks; massive horizontal trusses carry pedestrian walkways and plazas linking no less than 280 city blocks at 20, 40, 60 stories in the air.

Technically, these and even more fantastic "macrostructures" probably could be built, and they could be powerful architecture indeed. The question, of course, is whether a civilization could thrive within them.

For urban architecture, at whatever scale, must seek not only the order and efficiency that can make the city work. It must also seek the variety, the delight, and the human understanding that can liberate the city, and make it the city of man. END





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(Names of the architectural and engineering firms responsible for the projects named above will gladly be furnished on request.) BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. Export Sales: BETHLEHEM STEEL EXPORT CORPORATION

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From the STANLEY MAGIC-DOOR® DESIGN PORTFOLIO

Automatic entrances: functional, yet so elegant they symbolize sophisticated hospitality.

Automatically operated hotel and public entrance doors add an extra touch of suave and gracious service. An automatic door is always attended to ease guests in, courteously escort them out.

This hotel entrance design shows how to achieve the benefits of automatic doors with exceptional good taste. What it doesn't show are other Stanley operators serving public rooms and controlling the heavy traffic flow from kitchen to dining room.

Why not recommend Stanley to your clients? Stanley Magic-Door operating equipment has been proved most dependable through the years . . . so service-free that only Stanley can offer the new "Magic-Door Maintenance Program." (It tells your client in advance exactly how low his annual cost-ofowning will be.)

Automatic doors can easily be integrated with dramatic entrance designs, when you call in your Stanley Magic-Door Distributor early in the planning stage. He's trained to help you select just the right type and model from the complete Stanley line of hydraulic, electric and pneumatic operators. He can match your job requirements and your design standards.

Write for the name of your nearest Magic-Door Distributor, and your FREE copy of the new Stanley Magic-Door Design Portfolio and Specification Guide. No obligation, of course.

The complete line for design flexibility



STANLEY DOOR OPERATING EQUIPMENT Division of The Stanley Works, Lake Street, New Britain, Connecticut



CBS Laboratories^{*} chooses THE Armstrong LUMINAIRE CEILING SYSTEM

The first ceiling system that illuminates, cools, heats and quiets will be installed at this large new addition to the CBS Laboratories Research Center.

Here at the CBS Laboratories headquarters in Stamford, Conn., the Armstrong Luminaire Ceiling System will deliver draft-free conditioned air year round. It also will illuminate the large, windowless research areas, control noise, and provide a visually stimulating ceiling.

The first totally integrated ceiling system simplifies ceiling and plenum design. It eliminates all diffusers and most ductwork. Each 50" module is a self-contained air- and light-distribution source. 1,652 modules will be installed throughout this 31,600-sq.-ft. building.

Here, one-lamp, shielded fixtures will illuminate to 95 footcandles . . . ideal for precise instrument reading. The system provides light that is even, yet visually interesting. (The system is available with one-, two-, and three-lamp fixtures. Light levels can vary from 50 to over 200 footcandles, depending on requirements.)

The system's ventilating function will deliver 1.3 cfm/sq. ft. of conditioned air. Exact temperature control and uniform air distribution, necessary for the delicate instruments, are assured.

All Luminaire components are available from one supplier. All components are supported by one grid. Installation is fast. Plenum and ballast are instantly accessible from below. Lamp replacement, even with shielded fixtures, is fast and uncomplicated. Compared with independent lighting, air-distribution and acoustical systems, initial savings of 30ϕ to 50ϕ per square foot are common.

Horizontal ceiling panels allow the system's adaptation to any size or shape room. Specially designed to accommodate ceiling-high partitions, the system offers limitless layout flexibility. Further design variation is possible with the new B-48 modification. This system achieves an open, folded-plate effect, creates continuous bands of light. For complete information on both systems, write to Armstrong, 4208 Rooney St., Lancaster, Pa,

*CBS Laboratories, a Division of Columbia Broadcasting System, Inc., Stamford, Conn.

Architect: Sherwood, Mills & Smith, Stamford, Conn. Consulting Engineer: Werner-Jensen & Korst, Stamford, Conn. General Contractor: Deluca Const. Co., Stamford, Conn. Ceiling Systems Contractor: James A. Phillips, Inc., New York, N.Y.

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In the illustration above, the 12-story building was designed into an 11-storybuilding height. A-E Floor's shallow air plenum and electrical cells (see detail right) sandwiched between structural slab and finished floor reduced over-all floor depth 25%...saving enough space for an extra story!

Saving space is just one benefit. For more information on how the A-E Floor system permits continuous grills under floor-to-ceiling windows, luminous or exposed ceilings, full services for cantilevered floors, write for new A-E Floor catalog AE-641, Granco Steel Products Company, 6506 North Broadway, St. Louis, Missouri 63147. A subsidiary of Granite City Steel Company.





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