Architectural Forum / the magazine of building / May 1957

We hurried on the work at great expense, fearing lest God should justly complain of us 'thine eyes did see my substance being yet imperfect'

FORUM

Only primitive sources

supply the energy for a long career

...An architect who is consulted on a public work. He should be first informed what it is that is wanted

ABBÉ SUGER

I ask a simple question, an architectural question: what will become of the cities, New York, London, Paris, gigantic, stretched to the breaking point, full of mistakes and scorched by the hot breath of the machine age? Tomorrow must provide the answer BENJAMIN H. LATROBE

Architects are as great pedants as critics or heralds 0

0

0

VIOLLET-LE-DUC

0

It is certain that the members of a piece of architecture obey the same laws that the members of the human body obey

MICHELANGELO

LE CORBUSIER

SIR CHRISTOPHER WREN

A new century in architecture from an old point of view-p. 127



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108 City of glass

The new buildings in Corning, N.Y., are all glass but only half window. They demonstrate a new kind of big window: tall and narrow to let in light and view but to keep out heat and cold.

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Architect Yamasaki explores the possibilities of modern, machine-made ornament for the Detroit sales office of Reynolds Metals. Result: a lacy sunscreen of sawed-off pipe sections around a building of great distinction.

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Exposed Tufcor ceiling in Baltimore warehouse. Attractive galvanized Tufcor requires no field painting, assures building permanence.

roof system for new warehouses



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Washington budget battle: President favors

renewal program; bill lifts college loan rate

In the particularly confusing budget battle in Washington, it was still uncertain how various building or construction aid programs would finally fare.

But the gyrations of Congress and the administration as they both tried to "economize," yet not curb any "essential" or beneficial programs, took some strange twists last month, marked, as the *Christian Science Monitor* observed, by "some tragedy and not a little comedy." The convolutions affecting some of the most important programs: *Urban renewal*—President Eisenhower gave very strong backing to the principle of renewal—but simultaneously seemed to suggest that new appropriations for such work nonetheless could be trimmed.

"I am very heartily in favor of the urban renewal program," said the President. But in reply to a question about the \$75 million urban renewal reduction in the administration's housing bill, he seemed to favor reduced appropriations: "There is already established a reserve fund [\$100 million that can be released at the discretion of the President] in this field that could be used . . . [and] the new appropriations authority could be reduced to that degree."

In any event, when the House banking committee reported out the housing bill it provided for the full \$250 million for the next fiscal year the President had originally proposed in his budget message, and in the Senate this month Committee Chairman John Sparkman (D, Ala.) was going to lead the drive for a full \$250 million appropriation.

College housing—The bill reported by the House committee provided for only \$150 million of new funds requested by Cole—\$25 million under the President's budget message recommendation. But the interest rate would be raised to $3\frac{1}{2}\%$, instead of the current $2\frac{7}{8}\%$ rate which results in a net loss to the Treasury.

Capitol—Rep. Edgar W. Hiestand (R, Calif.) introduced a bill to repeal previous appropriations for the \$42 million of alterations to the Capitol, including more than \$17 million to extend its East front. Minority Leader Joseph W. Martin also favored postponing this controversial project as long as Congress is "asking everybody else to tighten their belts to hold down government spending." Four other Republican representatives introduced "economy" bills to postpone construction of the new \$64 million House office building—currently in the excavation stage.

Sewage Plants—A House committee cut \$50 million in US grants to help communities build sewage plants from Health, Welfare and Education Dept. legislation, but the full House, 231-to-185, restored the funds in the bill.

Steiner heads URA; W. Mason to HHFA post

Three top US housing and renewal positions were filled last month.

HHFAdministrator Cole appointed methodical and deliberate Richard L. Steiner as commissioner of the Urban Renewal Adminis-



STEINER

tration. URA's new boss (deputy commissioner since 1954, and acting commissioner since James Follin resigned last August), said Cole, "is recognized nationally as one of the ablest profes-

sional men in the field of city planning and urban renewal." He was graduated from Yale in civil engineering, from M.I.T. in city planning, and later studied traffic engineering at Harvard, real estate at Johns Hopkins. From 1946 to 1954 he was director of the Baltimore redevelopment commission. Cole's seven months delay in advancing Steiner recalled a story of Steiner's own refusal to be hasty rather than thorough: offered a position with the old USHA in the job-drought thirties, unemployed Steiner amazed friends and agency officials alike when he did not accept it immediately, but replied, "I'll think about it a week and let you know." (After a week, he accepted.)

One of Steiner's first actions as com-

missioner was the appointment of Sid Jagger as assistant commissioner for operations, primarily liaison between URA Washington headquarters and its six regional offices. Jagger, a former Kansas legislator, joined HHFA's Ft. Worth office in Feb. '55, since August that year has been a special assistant to Cole on diversified operational matters, including renewal.

As HHFA deputy administrator, HHFA's No. 2 position, vacant since the appointment of Frank J. Meistrell as Flood Indemnity Administrator last October, Cole named Walker Mason, 59, Providence business and civic leader. Mason was Boston regional director for the War Production Board; from 1946 to 1950 was executive vice president of the Narragansett Electric Co., and formerly was chairman of the Providence Community Fund.

GSA plans building beside White House park

PUBLIC BUILDING

GSA released last month a "preliminary sketch study" of the way it proposed to change the Jackson Place blockfront on the left (west) side of Lafayette Park, which is the square or "President's Park" right in front of the White House (see cut).

On the north end of the block (r) historic Decatur house would be retained, and on the south a new counterpart structure built to give "balance" to the block. In between GSA would set a low, monumental four-story and penthouse government building, with a massive seven-story section in the rear that would front on 17th St.

GSA has approval to erect a government office building on this block to cost up to \$27.4 million under the lease-purchase program, but that was suspended three months ago by GSAdministrator Franklin G. Floete to help curb "inflation." In the meantime, however, GSA intends to commission a private architectural office to prepare designs. Also undoubtedly ahead are torrents of debate on the appropriateness of such a façade for Lafayette Park, and whether that should be preserved as a residential atmosphere "forecourt for the White House," or become mainly a "light court" for huge government buildings —see editorial, p. 105.

In the block immediately west of the White House, Robert Heller & Associates, of Cleveland, special consultants on White House office space needs, proposed a \$25.5 million Executive Office building that would replace the grim old former State-War-Navy building. This would be linked to the White House by tunnel, and would allow the White House to become primarily a residential structure once more. No authorizations or appropriations for such a building have been voted yet. The first step would be a report on the Heller proposal by the Advisory Commission on Presidential Office Space, scheduled next month.

Civic group doubles bid for St. Louis land

URBAN RENEWAL

In St. Louis, the Urban Redevelopment Corp., organized by a large number of the city's business and civic leaders, bowed to Washington headquarters of the Urban Renewal Administration and more than doubled its offer for 6.6 acres of choice Memorial Plaza redevelopment land just a few



SCHEMATIC DESIGN FOR JACKSON PLACE BUILDING CONTEMPLATED BY GSA

blocks from the heart of the city's central business area (AF, Dec. '56).

Besides raising its bid from \$450,000 to \$920,000, the corporation came up with an unusual twist for financing its acquisition of the site in today's tight money market. As an ordinary corporation it would obtain, in effect, what the *Post-Dispatch* described as "a government loan [US] to cover the \$920,-000 purchase price with interest not to exceed $3\frac{1}{4}$ %."

This was one of four "conditions" the corporation attached to its new offer. Technically, there was no authority for a federal agency to make such a loan to the corporation. But quite adroitly all the benefits of such a loan covering the full purchase price would be achieved indirectly.

The city's Land Clearance for Redevelopment Authority would borrow \$920,000 from URA as a "temporary" five-year loan at the current federal long-term borrowing rate of 31/4% (longer "definitive" loans from URA cost an extra 1%, or currently 41/4%). In effect, the local agency would use this sum to "buy" the land from itself, and while it retained title it would lease the property to the building corporation on condition that it purchase it for \$920,000 as soon as construction on it was completed, or at least within five years. The rent would be 5% of \$920,000, but on taking title 35% of all the rent would be applied retroactively to the purchase price, thus cutting net costs to the corporation for all its interim benefits from this federal loan to only 31/4%.

Under the corporation's other three "conditions," all approved by Washington and being drafted into formal contract form last month, the corporation would be permitted to add a large office tower to the 1,100-unit \$17 million apartment project, or it could withdraw from the whole deal if it was unable to obtain an FHA commitment, or find "satisfactory" financing for the housing within an unspecified period.

Sidelight: apparently overlooking the parable of the laborers in the vineyard, two churches left on the project site that agreed to pay \$3.75 and \$3.20 per sq. ft. for parcels that would enlarge their settings were requesting reconsideration of these prices by the Land Clearance for Redevelopment Authority. Criticizing the agency as having been "rather ungenerous" in dealing with the churches, one pastor said: "We were put in the same class as those who would use the land for commercial profit."



ARCHITECTURE

Spaniards win \$25,000 Reynolds Award

Young Madrid Architect Rafael de la Joya, 35, his younger partner, Manuel Barbero-Rebelledo, 32, and his youthful brother-in-law, Architect Cesar Ortiz Echagüe, 31, last month won the first annual \$25,000 R. S. Reynolds Memorial Award for the "most significant contribution to the use of aluminum in the building field."

The prize-winning architecture consists of dining and lounge facilities for 2,000 executives, office and factory workers of the SEAT auto plant at Barcelona—including space adaptable for use as an exhibition hall or cocktail and reception room for visitors (see cuts). SEAT's president (Echagüe's father) specified that the structure take into account that "lunchtime should be for physical and spiritual relaxation of workmen engaged . . . in humdrum assembly-line production," also should be light, to avoid expensive filled-land foundations, inexpensive to maintain.

To preclude "anonymous crowding," the architects designed five separate halls (plus kitchen) combined with six gardens and courts, all unified through a series of covered walks. For weight reduction and corrosion resistance they used aluminum for frame and roof, glass and brick for walls. "Aluminum and brick were treated austerely, without any plastering or coating to impair their esthetic value, and always independently without mingling."

Despite their youth, Joya and Barbero (both Madrid University '50) head the largest architectural office in Spain, with a staff of 75 licensed designers. Their work has included US air and naval base buildings, a 13-story Madrid office for the Instituto de Construcciones de Cemendo. On the boards: a mammoth new Madrid suburb to house 100,-000 persons when completed.

The jury: Architects George Bain Cummings, Willem M. Dudok, Percival Goodman, Ludwig Mies van der Rohe and Edgar I. Williams.





POOL ADDS INTEREST to biggest garden courtyard, flanked by clerical dining hall (I), workers' mess (background).

YOUTHFUL PRIZE WINNERS (I to r): Cesar Ortiz Echagüe, 31, and the classmates and partners Rafael de la Joya, 35, and Manuel Barbero-Rebolledo, 32.

AIR VIEW shows factory (foreground), executive and clerical buildings (I), three workers' halls, kitchen (background).



NEWS continued on p. 9



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News



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FERMI MEMORIAL PRIZE DESIGN

From 355 entries in the design competition for an Enrico Fermi Memorial Pavilion in Chicago, jurors selected for the \$5,000 first award this plan by Reginald Caywood Knight, 35, of Coral Gables, Fla., on leave from the M.I.T. architecture department. Knight proposed a glass-walled auditorium in the round, its roof. serving as a plaza for a group of institutional office buildings-part of the proposed Fort Dearborn Redevelopment and designed by Architects Skidmore, Owings & Merrill and promoted by Arthur Rubloff and a committee of Chicago businessmen. At night the translucent white marble plaza would glow from lights in the auditorium below. Jutting 80' into the air: three sets of tubular carillons. Through these, said Knight, "architecture will be able to reach out and touch the lives of many more people than would be possible through vision alone."

Saarinen receives Howard Myers Memorial award

The third presentation of the Howard Myers Memorial Award of \$500 for the "best written, most progressive, most influential and original writing about architecture" was made last month to Eero Saarinen for his article in FORUM, July '53-"The Six Broad Currents of Modern Architecture." This award was established in 1949 in memory of FORUM's former publisher by a group of his friends headed by Architect Wallace K. Harrison. The awards committee of the Architectural League of New York, which holds the award funds, were jurors for the most recent presentation. They considered articles that appeared in 30 different publications in 1953 to '55. (Previous winners: Walter Gropius, 1951, and Lewis Mumford, 1953.)

Planners meet to discuss solutions to renewal, highway, suburban problems

At a moment when they are in great demand to solve the physical problems of sprawling American cities, 1,500 of the nation's top planners and officials got a new call to duty: "Mere" physical planning—sometimes sneeringly referred to as "project planning"—is not enough, they were told by a succession of authoritative speakers.

COMMUNITY PLANNING

Suggestions varied. But the general tenor of many proposed at the San Francisco convention of the American Society of Planning Officials was this: you must plan for spiritual as well as physical needs; for improving the total environment, not just structures; for "multiple use" of highway rightsof-way, not just moving traffic; for urban renewal in a wider sense, rather than a dab of Uncle Sam's Sec. 221 formula here, and a shot from his Sec. 220 needle over there.

Proclaimed repeatedly was the warning that cities must "unite or die." Advocates of metropolitan government, regional city federations and such nebulæ had their innings. As one shrewder observer summed it up: "After a five-year romance with 'urban renewal' as the sure cure for what's ailing American cities, the experts are back where they started years ago, talking about metropolitan planning."

Most stirring call for action beyond the planner's usual line of duty came from young, handsome Sarah Lawrence College president, Harold Taylor, Bronxville, N.Y.:

"The planner who thinks of the spiritual needs of the people he serves will create a physical environment with rich social and psychological dimensions. . . A community planned to bring together people of different races, color, ideas, religion, ages and income will give a richness to life which is impossible to achieve in the communities whose central philosophy is one of isolation of the like-minded, the well-to-do, the white and the Christian, from the rest of the human race."

Plans for "isolation of the likeminded, or to use an uglier word, segregation of social classes" will cause America to lose its place in world affairs, Taylor said. He urged the planner, together with the intellectual, to "think and talk, write and paint, design and plan as hard as he can, secure in the faith that in the community of scholars, thinkers, artists and citizens, his integrity will finally be known."

Timid planning has no place in America, Taylor said, calling TVA "the greatest single accomplishment of the US, perhaps even of the world, in combining science with democracy." And he lamented the lack of adventure so that now, even mentioning TVA "is considered close to advocating the overthrow of the capitalist system."

Ranking with Taylor as one of the most warmly received speakers was Dr. William A. Robson, professor of public administration at the London School of Economics and Political Science, now visiting lecturer at the University of California, Berkeley. Said Robson:

"Traditional areas and units of local government have become obsolete and irrelevant in the metropolitan area. They seldom, if ever, correspond to the facts of population, wealth or territory.

"Popular interest in government of the great city suffers from the divided allegiance of many citizens between place of work and residential areas. Many people who live in one place and earn a living in another suffer from a kind of political schizophrenia which prevents them from taking a wholehearted interest in either."

Regional controls needed

Robson advocated "two-tiered" government: an over-all metropolitan government to do the big jobs requiring regional coordination, leaving "purely local functions" to be carried out by minor local elected authorities. "The top-tier authority should be elected at large, for the whole metropolis. Only thus can we insure that it will be guided by regionally minded representatives."

If metropolitan problems are not solved by democratic methods, they will be solved by undemocratic methods, Robson warned. "The specially created utility, road or other district has obvious attractions as a quick cut to the solution of particular problems. . . . But it is undemocratic and politically irresponsible. . . The removal of basic functions weakens the general structure of local government . . . [and the specontinued on p. 12



ROBBINS MAKES FLOORING NEWS

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ROBBINS METALTONE VINYL TILE, in bronze, was used in this section of Standard-Vacuum's executive dining room to achieve contrast in the over-all decor.

DESIGNER ACHIEVES VARIETY AND UNITY IN SPITE OF VAST FLOOR SPACE

Achieving both variety and unity in a floor area covering 250,000 square feet is not an easy job for even the most versatile designer. Yet this was the problem Mrs. Helen O'Connell, interior designer for Eggers and Higgins, Architects, faced and solved in decorating Standard-Vacuum Oil Company's new international headquarters at White Plains, New York. Mrs. O'Connell utilized celadon

green and terra cotta as key colors on the corridor walls to achieve color harmony throughout the building. This decor was enhanced by a special beige tone vinyl floor tile specified by Mrs. O'Connell and made to her directions by Robbins Floor Products.

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News cont'd

cial district] tends to embark on empire building."

Other broad-gauge planning advocates criticized flaws in the new federal highway program and lambasted Congress for its failure to insist on comprehensive planning to fit new roads into city and county networks.

Predicted John T. Howard, M.I.T. associate professor of planning and former president of American Institute of Planners:

"In the course of the next 20 years, the highways built under this act will have more effect upon the form and pattern of growth, and therefore upon the character and structure, of our metropolitan areas, than all the metropolitan planning done by any city planners in this country since 1945."

Washington also has lagged in recognizing metropolitan planning as a national problem, Howard said. He called the HHFA assistance program



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ADDRESS

"a feeble gesture in the right direction . . . currently siphoning our limited reserve of planning talent into myriad little jobs of rewriting suburban zoning ordinances while the big job of metropolitan development coordination goes undone."

A nonplanner, Louisville Courier-Journal Real Estate Editor Grady Clay called the "planning provisions" of the federal highway act "toothless" efforts at "shutting the barn door after the horse is stolen." Both Clay and Howard talked bitterly about singleminded highway departments. Said Clay: many state "highwaymen" are treating city planners and property owners as "the enemy" to be kept in the dark about road locations until the last minute.

Too many new highways, said Clay, are being laid out to "follow lines of least resistance, cheapest land, or a politician's rush for glory." His recommendation: that new rights-of-way be considered as multiple-purpose routes for many ends: highways, mass transit, utilities, parks, drainage improvements, watershed projects, etc.

For moments at the ASPO meeting, urban renewal appeared somewhat as the wonder boy who has arrived at pimply adolescence: unruly, changeable, with a host of unpredictable complications.

Julian H. Levi, executive director of the Southeast Chicago Commission, got the biggest reaction with his out-ofthe-side-of-the-mouth "re-examination" of urban renewal. It turned into an analysis of all the irregular motives behind renewal. Sample: "In many cases, the whole concept of urban renewal represents the revolt of the urban middle class who see themselves crushed in modern city living between public housing on the one hand and high-cost luxury accommodations on the other, with the only alternative being the monoclass suburb."

Levi espoused the "tear 'em down" view, saying that "meaningful urban renewal cannot operate without the removal of all kinds of structures in any one project area irrespective of condition." But he also had some words of caution: "No urban renewal authority or even planner can play God. . . . At best you stimulate the dynamics of community development in a given direction." He spoke of "totality of approach," urged more "homework and research," plus a cut in acquisition costs of slum properties by aggressive code enforcement. The latter, he said, can "reduce the market value of slum properties by as much as a third."

A.I. A. Award Winning Wyeth Laboratories Building Radnor, Penna. Architects: Skidmore, Owings & Merrill New York City Builder: George A. Fuller Co.

NEW GEYSER Oluminum Bar CURTAIN WALL SYSTEM



SMOOTH is the exterior without bulky, projecting mullions. The interior finishes flush, too.

E.K.

Even before its announcement, the Geyser Aluminum Bar Curtain Wall System has been *proved* in the construction of the new Wyeth Laboratories building, Radnor, Pa., and others. This is a mullion-free framing system that trims flush both interior and exterior, accepts glass, panels or ventilators, interchangeably anywhere in the grid, gives the clean, continuous sight lines so vital to good contemporary design. No joints, no exposed fasteners, no bulky projections. Price-wise, too, the Geyser Curtain Wall System reduces building costs substantially.

Write for the new Geyser Curtain Wall specifications and details today.



PITTSBURGH 3, PENNA.



10 pastel colors harmonize with modern décor No. 606.....Granite No. 651.....Pearl No. 615..... Emerald No. 658.....Jade No. 649..... No. 627.... .Opal No. 641.....Agate No. 647.....Gold No. 656..... Turquoise No. 657.....Sapphire

New Johns-Manville Terraflex® Tile gives added beauty to floors

meet prospects' preferences for soft-

textured tones. Size 9" x 9". Thick-

Terraflex tile will outwear other

types of resilient floorings of the

same thickness two to one. Home-

makers favor Terraflex because of

its resistance to greases, oils, and

alkaline moisture, ease and economy

of maintenance, and wear resistance.

harmonizes with the décor of any

There's a Terraflex pattern that

ness 1/16".

THIS NEW TERRAZZO PATTERN, lat-est addition to the line of J-M Terraflex Vinyl Asbestos Tile, has made a sensational impact on home buyers-everywhere. Women prospects for new homes are quick to realize here is a rich, luxuriant flooring that combines beauty and wear with a minimum of care.

Many architects and builders are specifying the Terraflex Terrazzo pattern because it is color-keyed to



Johns-Manville congratulates the American Institute of Architects on its 100th Anniversary.

- Consult an architect-use quality materials.



home you plan or build. The 1/16" thickness for residential areas, is available in 10 terrazzo colors ... 17 marbleized colors . . . 7 mottled colors . . . 3 cork-type colors. The $\frac{1}{8}$ " thickness for heavy traffic areas comes in 17 marbleized colors.

.Coral

Get complete information about the new Terrazzo pattern and colors, as well as the entire Terraflex line. Write: Johns-Manville, Box 158, New York 16, N.Y.

Alodized green globe atop Carnegie Institute symbolizes the world of knowledge below. Crafted by Overly in heavy sheet aluminum.

on the famous Carnegie Institute...

> covers a world of learning

verly



From the "world" on down, Overly has roofed Pittsburgh's famed treasure house of antiquity— Carnegie Institute and Library. Replacement of the badly leaking old roof was necessitated by continuing, costly damage to interior finish. Overly was awarded the project because of the architect's knowledge that our guaranteed weather-tight roof and skylight system would handle the job on a permanent basis. • Installed were almost four acres of Overly-Goodwin batten type aluminum roofing and puttyless skylights; skylights alone amounted to 44,500 sq. ft. An outstanding feat was the removal of 93,000 sq. ft. of original skylight and its replacement with new skylight, or deck and roofing. This was done without damage to glass ceiling lights beneath, and without interruption to building's activities. The new roof reduced load on supporting structure by 1,370,000 pounds. Aluminum is finished in attractive Alodine green, which eliminates glare and softens appearance of massive roof area. • Overly's experience and financial ability to carry a job of this scope uniquely qualify us to handle roofing requirements of largest size. Get the complete Overly story into your files; write us today for catalog 16b-Ov.

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Widest possible range of shapes and forms . . . making possible unlimited patterns and combinations. Widest possible choice of diffusers . . . polystyrene louvers . . . plain formed acrylic . . . corning low brightness . . . curved corning lens . . . curved alba-lite . . . corning twinlens . . . flat alba-lite . . . metal louver . . . pattern formed acrylic . . . pattern formed vinyl. Space variations . . . $2\frac{7}{8}$ " "Thin," where ceiling economy is critical . . . $4\frac{3}{4}$ " "Shallow," when limited space is available . . . $7\frac{3}{8}$ " deep, when normal recessing depth is possible.

Workmanship . . . highest possible quality material, formed and assembled under unmatched inspection standards by top skilled craftsmen.

Sensible pricing . . . if quality luminaires could be produced and sold for less, LPI would be the one to do it.

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Don't just take our word for it! Convince yourself that LPI has the widest, most complete line of TROFFERS. There is an LPI TROFFER-combination to

solve any problem concerned with esthetics, space, light control and distribution, construction quality or sensible price.

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Plan with the new HerNel-Cool II INSTALL IT NOW—AIR CONDITION LATER

Nearly every school would benefit from air conditioning now—as have offices, theaters, hospitals and homes. Unfortunately, the money to provide it isn't always in the current school budget. The HerNel-Cool II year 'round unit ventilator solves that problem.

These units can be installed now so that the school enjoys all the usual benefits of the famous Herman Nelson DRAFT|STOP system—heating, ventilating, natural cooling (with outside air), and control of window downdrafts. Only the addition of a chiller in the boiler room is needed for complete hot weather air conditioning. It can be provided initially or at any future time. When it is wanted, air conditioning can be secured without disruption . . . and without expensive alteration and installation charges.

HOW THE SYSTEM WORKS

HerNel-Cool II units provide individual temperature control for each room, automatically. Most of the year they provide heat, ventilation, or natural cooling (with outside air) as the room requires. When a chiller is installed in the boiler room, HerNel-Cool II units also function as air conditioners. In hot weather, the units switch automatically to mechanical cooling, with chilled water circulating in the same piping that carries hot water during cold weather. The cost is far less than separate heating and air conditioning systems—both for installation and operation.

Would you like more information? Just write to Herman Nelson Unit Ventilator Products, American Air Filter Company, Inc., Louisville 8, Kentucky.



ANY FUEL, ANY CLIMATE—There is a Herman Nelson Unit Specifically Designed to Give You More Classroom Comfort Per Dollar richer-looking . . . longer-wearing **TOLEX**[®] supported vinyl . . . reinforced with fiber glass

... the favorite of

TOLEX, fiber glass reinforced vinyl covering material on Holcomb&Hoke's fine line of FOLDOORS, assures you of finest quality. Tolex is more durable ... withstands years of normal flexing and folding without cracking or peeling. Tolex is more beautiful ... offers dozens of truly authentic patterns and effects in a wide range of smart decorator colors, all easily kept clean with an occasional swish of a damp cloth. And remember, Tolex is fire resistant, an important feature in the institutional field.

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THE SMARTEST THING IN DOO

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When specifying folding doors and partitions, be sure they are covered in TOLEX.



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214



how long can you afford to wait for your next building?

buildings start quicker... are completed sooner with

REINFORCED CONCRETE

Reinforced concrete structures start quicker because all the necessary materials are readily available from local stocks. These faster starts, made possible with reinforced concrete, save months of delay . . . months which will mean reduced interest charges . . . earlier occupancy and extra rental income which could amount to many thousands of dollars.

Whatever your next building may be—hotel, hospital, apartment, or office—reinforced concrete can provide a better structure for less money. It assures rugged strength that is highly resistant to wind, shock, and quake, and is firesafe without extra treatment. No other method of construction provides so great a flexibility of design. On your next job ... avoid costly delays—design for reinforced concrete!

Compare . . . YOU'LL SAVE WITH REINFORCED CONCRETE





First National Bank Building*

Southeastern Construction Co.

Jackson, Mississippi

Associated Architects:

N. W. Overstreet and James T. Canizaro

Jackson, Mississippi

Structural Engineers: Post & Witty

Jackson, Mississippi

Contractor:

Charlotte, N. C. * Reinforced Concrete Frame with R/C

Duct Floors



By reducing glare, a deterrent to comfort and efficiency, AMERICAN LUSTRAGRAY provides a greater field for design expression. Functionally, it enables progressive architects to specify larger amounts of glass per installation on any building exposure—for office buildings, banks, schools, hos-

*SOLAR ENERGY TRANSMISSION					
	D.S.	3/16"	752''	1/4**	
Total Visible Light	71.1%	61.8%	58.8%	55.0%	
Ultraviolet	68.4%	63.7%	63.0%	61.0%	
Infrared	79.2%	73.4%	71.7%	68.5%	
Total Solar Radiation	75.5%	68.3%	66.3%	62.6%	

• Maximum Size: 6' x 10'

pitals, apartment houses, homes, etc.

As a bonus benefit, AMERICAN LUSTRAGRAY —while not classified as a heat absorbing glass —provides a significant reduction in the transmission of solar energy.

True economy comes from LUSTRAGRAY features: moderate first cost; non-fading; no special installation handling; shades and blinds optional.

For technical literature on LUSTRAGRAY, write our Architectural Consulting Department today.





IT STANDS ALONE

New 5-Star "Constellation" Bank Vault Entrance by Herring-Hall-Marvin is Daringly Different in Design — and the ONLY Bank Vault Entrance with

PUSHBUTTON CONTROL!

This is an actual photo of the equipment — the magnificent climax of our pioneering in the field of automatic operation of the bank vault entrance. Pushing a button actuates a mechanism which swings the massive door open over an arc of 180 degrees.

All mechanism, inside and out, is completely concealed by the shimmering Stainless Steel sheathing. The fluted architrave can be furnished in any width specified by the architect. Important new functional features include: a single combination dial which selectively operates two combination locks; protective plates of newly developed metals to resist attack by carbide-tipped drills and the oxy-acetylene torch; an improved burglar alarm which affords protection against early-morning holdups and all forms of attack on the door.

Available with doors of all standard thicknesses from $3\frac{1}{2}$ " to 25". Full details on request.

H·H·M

HERRING HALL MARVIN SAFE COMPANY

Hamilton, Ohio . BUILDERS OF THE U. S. SILVER STORAGE VAULTS AT WEST POINT

An answer...

to the requirements of modern educational leaders. A school design that provides:

- ... space for the core or block curriculum plan
- ... space for research, co-operative planning and the development of skills
- ... space with extreme flexibility
- ... space with an excellent visual environment



a

Key to the school's unusual flexibility and visual environment is this Toplite Panel which brings daylight in through the roof. Continuous strips of these panels permit excellent light distribution *without* solar heat gain or glare.

2 2 2 2



OWENS-ILLINOIS TOPLITES bring daylight to large interior spaces of new intermediate school. Four teen-age "neighborhoods," each formed by a cluster of academic classrooms focused around an activities core, branch out from a central special activities unit containing the gymnasium, pool, band and choir rooms, etc. Building designed by SMITH, TARA-PATA, MACMAHON, INC. of Birmingham, Michigan.

TOPLITE ROOF PANELS AN () PRODUCT **OWENS-ILLINOIS** GENERAL OFFICES · TOLE DO 1, OHIO





NORTHERN HARD

Surely one may accept as valid the earnest advice of coaches and physical education authorities, regarding gymnasium and multi-purpose floors. That's why we polled hundreds of them. Practically unanimously, they said: "Maple, by all means!" Their reasons? Maple is resilient-has a "live" rather than "dead" feel underfoot. It is bright, scuff-resistant, splinter-free. Painted court lines contrast clearly, greatly aiding players' peripheral vision. Its tight grain repels dirt; smoothness minimizes floor-burns and infections. "Shin splints" (bane of trainers!) are far fewer. And-MAPLE ENDURES! With simple maintenance it will outlast the building, since "there's always a new floor underneath." The MFMA mill mark guarantees dimension, grade, seasoning, species. Specify it confidently.

MAPLE FLOORING MANUFACTURERS ASSOCIATION Suite 564, Pure Oil Bldg., 35 E. Wacker Drive, Chicago 1, III.

Above:

Hyde Park School, Waukegan, Illinois. Architects, Ganster & Hennighausen, Waukegan. Photo by Bill Hedrich, Hedrich-Blessing, Chicago.

Below:

Commercial High School, North Chicago, III. Architect, Warren S. Holmes Co., Lansing, Mich. Photo by Hube Henry, Hedrich-Blessing, Chicago.

PLAY SAFE

with your school dollars ... with your pupils



MAPLE

See for Sweet's and MFA

(Arch. 13j-MA) for full technical data. Write for AIA File Folder and newest official MFMA listing of floor-finishing systems and materials.



A vast variety of beautiful decorative effects easily obtained in Maple—in blocks and patterned designs as well as the conventional strip of various widths. Readily laid in mastic, over concrete or softwood sub-flooring.



Independent sound laboratory engineer checks decibel readings in one of many New York executive offices tested.



Sound level meter readings were also taken while elevators were traveling from floor to floor in normal operation.

Tests Prove Westinghouse Elevators are as Quiet as Executive Offices

Westinghouse Engineering rids elevators of noise...increases passengers' comfort

Comparative sound meter tests performed recently throughout the New York Metropolitan area prove that you enjoy the same quiet atmosphere in today's Westinghouse Elevator as that found in the finest top-executive offices. Yes, noise has been successfully engineered out of elevators by the perfection of a scientifically sound deadened system. Noise isn't "masked" in a Westinghouse elevator—it just isn't there to begin with.

If you are planning a new building—or thinking of modernizing an existing one why not experience a "proof of performance" test for yourself—and take your own decibel readings in a Westinghouse Elevator. Call the Westinghouse office nearest you to make arrangements for this eyeopening demonstration and also learn how you can save up to \$7000 per car per year with operatorless elevators.

Westinghouse elevator installations are the embodiment of prestige . . . highest achievement in comfort, safety and efficiency for you and your tenants. Made possible by Westinghouse automation in elevatoring which produced: 1. Selectomatic for master supervisory control

2. Synchro-Glide for accurate, smooth, soft landings

3. Traffic Sentinel[®] for safe, courteous yet time-saving passenger handling

4. Automatic Traffic Pattern for Traffic Controlled Elevatoring

5. Shuntless Relays and Electric-Driven Selectors for reliable operation



YOU CAN BE SURE ... IF IT'S Westinghouse

J-98727BA

Stran-Steel offers a complete lightweightjoists, studs, columns, decking

Stran-Steel now offers a complete structural system with fully integrated components—nailable joists and studs, structural columns and beams, roof decking and the beautiful new metal curtain wall panels with *Stran-Satin* finish.

Stran-Steel's complete structural system brings these advantages to the architect and owner:

VERSATILITY—Many structural variations are possible with this versatile system in the design of walls, roofs, partitions, canopies, floors, even entire buildings. A few are illustrated below.

ECONOMY—Savings in the use of steel architectural products mean more economical construction, resulting in lower bids to fit budget limitations.



Eight-story luxury-type apartment building, New York City. Builder: Alfred Levitt.

NAILABLE JOISTS AND STUDS—Stran-Steel joists are light gage steel members formed from strip steel and welded back to back to form the special nailing groove. They provide a non-combustible, economical and permanent framing system to which collateral materials can be quickly and easily applied. Available in 6", 8", 9", 10" and 12" depths and in gages of 12, 13, 14 and 16. This range of depths and gages satisfies almost any load requirement.

The distinctive nailing groove permits rapid installation of collateral materials. Ordinary nails can be used and tightly clinched in a grip of steel, yet can be readily removed with a claw hammer.



New Maximilite-designed Northeast Elementary School, Findlay, Ohio. Design by: John Auferoth.

STRUCTURAL COLUMNS AND BEAMS — Stran-Steel cold formed members are "C" section shapes and are available in special steel having a yield of 40,000 p.s.i. These sections are manufactured in a variety of sizes and can be used in many combinations as structural columns and beams. Stran-Steel cold formed sections are strong and durable, yet provide weight-saving and cost-saving economies. They are available in 8", 10", 12" and 14" sizes and gages ranging from 6 to 14.

NEW WIDE FLANGE STRUCTURAL SHAPES—Eight choices of wide flange I-section structural shapes are now available: Two with 6" flange, 8.62" and 9.62" in depth; six with 8" flange, ranging from 8.75" to 12.75" in depth.



Here's where to obtain more information:

Atlanta 3, Ga., 206 Volunteer Bidg.; Chicage 6, III., 205 W. Wacker Dr.; Cleveland 16, Ohio, 20950 Center Ridge Rd.; Detroit 29, Mich., Tecumseh Rd.; Houston 5, Texas, 2444 Times Blvd.; Kansas City, Mo., 6 East 11th St.; Minneapolis 4, Minn., 708 S. 10th St.; New York 17, N.Y., 405 Lexington Ave.; San Francisco 3, Cal., 1707 Central Tower Bidg.; Washington 6, D.C., 1025 Connecticut Ave., N. W.

structural system – and curtain wall

STRENGTH—Stran-Steel nailable joists, for example, have a yield point of 40,000 p.s.i., approximately 20% higher than that of most commercial mild steel. This extra-strength weight advantage prevails throughout the range of these products.

Stran-Steel products are ideal for schools, apartments, shopping centers and industrial plants.





Cleveland's Parkland, \$50,000,000 residential and shopping community. Project developer: Don Loftus. Architect: Wm. E. Harris.

RIBBED ROOF DECK—Stran-Steel galvanized ribbed deck is designed primarily for use with Stran-Steel joists. However it is also useful as sidewall skin in certain applications. Two types are available:

- Lightweight, nailable roof deck with ribs on 4" centers. Available in 22, 24 and 26 gage, live load carrying capacities range from 32 to 206 p.s.f., depending on gage, with spans from 2' to 4'.
- Heavier roof deck for longer spans has ribs on 6" centers. Available in 18, 20 and 22 gage. Live load carrying capacities range from 12 to 267 p.s.f., depending on gage, with spans from 3' to 9'6".





Large, modern warehouse, Oakland, California. Owner: Bigge Drayage Co. Engineers: D. Y. Long Co.

CURTAIN WALL—Stran-Steel curtain wall, made of exclusive *Stran-Satin* panels, combines a satin-smooth surface free of bright spangles along with the permanent protection of a non-corrosive zinc coating. It provides the low cost of steel with the eye appeal of far more expensive materials.

Stran-Steel curtain wall consists of two basic panels, insulation and concealed fasteners. This wall is quickly assembled on the job simply by using a button punch. Panels are never pierced or marred by bolts, screws, rivets or holes. Curtain wall panels are available in 18, 20, and 24-gage steel, in lengths up to 54 feet.

Please send me you	r new Structural Systems Catalog
Please have your rep	presentative contact me
Name	Title
Company	
Address	
City	Zone State
57-55-18A	



You can Bank on this Unusual Bank Lighting to be Glare-Free -It's by LITECONTROL!

INSTALLATION: The Philadelphia Saving Fund Society 3 Penn Center Plaza, Philadelphia, Penna. AREA: Banking Floor ARCHITECT: J. Zyberk Plater, Philadelphia, Penna. CONSULTING ARCHITECT: George Howe, Philadelphia, Penna. ENGINEER: John Kistner Company, Philadelphia, Penna. ELECTRICAL CONTRACTOR: Harry F. Ortlip. Company Philadelphia, Penna.

Philadelphia, Penna. DISTRIBUTOR: Graybar Electric Co., Inc., Philadelphia, Penna. CELLING HEIGHT. Approximately 12 feet. FIXTURE SPACING: 3 feet on centers. FIXTURE: Litecontrol No. 3214RS 1 lamp 4 foot recessed fixture, using Holophane No. 9015 low brightness ler INTENSITY: Average 60 foot-candles in service.

You're looking at the first floor quarters of The Philadelphia Saving Fund Society, 3 Penn Center Plaza, Philadelphia - a new 20story office building and the first to be built in about 20 years.

The decor leaves nothing to be desired - nor does the lighting, including efficiency at sensible cost! This installation differs from our usual Litecontrol job in that a 1lamp recessed troffer was used with

Holophane low brightness lenses, spaced only three feet on centers. RESULT : BRIGHTNESS IS CONTROLLED TO AN ABSOLUTE MINIMUM.

If you like the look of this bank lighting, remember that LITECONTROL is doing this type of thing practically every day with a wide variety of standard fixtures. Consider this fact on your next bank, store, office, library or industrial lighting project.



DESIGNERS, ENGINEERS AND MANUFACTURERS OF FLUORESCENT LIGHTING EQUIPMENT DISTRIBUTED ONLY THROUGH ACCREDITED WHOLESALERS

Projects

A roundup of recent and significant proposals



GIANT SAUCER ROOF FOR JET-AGE AIR TERMINAL

An elliptical four-acre prestressed concrete roof (530' on its longest axis) will project 110' beyond the walls on Pan American's new \$8 million terminal at New York's Idlewild Airport. This roof will shelter passengers as they board and leave planes via "on-the-level" gangplanks from the secondfloor waiting rooms. Departing passengers will enter the terminal from an elevated roadway; incoming passengers will

10

leave it from ground level. Radial steel girders tied back by cables will support the roof. Architects-Engineers: Tippetts-Abbett-McCarthy-Stratton; associate architects, Ives, Turano & Gardner.

US PAVILION AT POZNAN

"Made in USA" will be the theme of the first American trade-fair exhibit behind the Iron Curtain. New York Architect Reino Aarnio designed this dome-and-tower pavilion for the Poznan International Trade Fair next month. The geodesic style dome and the 100' tower will be fabricated in the US, erected on the site.

CARNEGIE TECH LIBRARY

As part of a \$24.3 million building and development program, announced last month, Carnegie Institute of Technology, Pittsburgh, plans the library shown at right. Designed by Carnegie alumni Lawrie & Green of Harrisburg, it will also have space for seminars, film and record libraries.







FRANK LOTZ MILLER

TULANE CENTER HOUSING BALLROOM, POOL, CAFETERIA

By 1959, lucky Tulane students will be able to swim, dance, eat, read, have a haircut and bowl, all under the same roof. Their center for all these activities, to cost \$2.5 million, was designed by Curtis & Davis, New Orleans.





STONE-GLASS TEMPLE

The rectangular design by A. W. Geller for Temple Beth-El, North Bellmore, New York, will provide space for a sanctuary and social hall seating 850, a dining area for 455, and 14 classrooms.

ALL-GLASS HARLEM SCHOOL

"Suburban" features for this elementary school in the heart of New York's Harlem by Architects Perkins & Will include expansive glass areas, four-room "cluster" towers.





STUDENT-FAMILY QUARTERS

An HHFA loan of \$2.3 million to Tulane University will finance an eight-story apartment building (1) to house married students and faculty. Architects: Goldstein, Parham & Labouisse, associated with Dreyfous, Seiferth & Gibert, all of New Orleans.

NEW YORK INSURANCE TOWER

Teachers Insurance & Annuity Assn. instead of being the owner, as originally contemplated, will be the main tenant, with eventual option to buy, in this 27-story and penthouse New York tower designed by Carson & Lundin. Structural engineers: Severud-Elstad-Krueger.

AIRLINE SERVICE BUILDING

Braniff International Airways' \$6.3 million maintenance and operations base at Love Field, Dallas, was designed by Pereira & Luckman. Flight motif is suggested by butterfly roofs on hangar and office building.



Projects cont'd



MID-AIRPORT CONTROL TOWER

To afford maximum visibility of two active runways, the New York Port Authority will build a 150' control tower right in the center of Newark Airport. The radome on top, 17' in diameter, will enclose a rotating radar antenna. Cost: \$1 million.



KANSAS CITY PARKING AND OFFICE STRUCTURE

Two thousand AT&T long lines division employees will work in this seven-story Kansas City Northside redevelop-

This midblock four-story office building to be erected in Van Nuys, Calif., from plans

will have a walkway and auto-

a large rear parking area. Main entrance, and elevators, also will be in the rear.

ment project office building on top of a five-story and basement garage. Architects: Keene, Simpson & Murphy.



MEDICAL ARTS CENTER

Under construction in Los Angeles, this six-story, \$1.8 million Wilshire Medical Arts building, designed by Welton Becket & Associates, will be sheathed with mosaic tile spandrels and porcelain enamel steel panels, have concrete sun control "eyebrows," and be especially sound-conditioned.



LARGE IN-CITY MOTOR HOTEL FOR SAN ANTONIO

New Orleans Architects Charles R. Colbert & Mark Lowrey designed this 240-unit motel for midtown San Antonio. Three-storied sections of

the "Casa Frontera" will face a quadrangle with a swimming pool and children's play area. Each unit will have a parking area underneath. Units will be

concrete frame, with fire-resistant masonry and tile walls. A special meeting room will be provided for convention visitors. Cost: about \$7,000 per unit.

Why those who want the finest in



Modine Hinditioners

Popular fan-coil units for cooling with chilled water, heating with hot water—from a central source. For year-round air conditioning in multi-room installations. Offered in console, ceiling and concealed overhead and in-the-wall types. Four sizes range from 2/3 to 2 tons of refrigeration. Ask for Bulletin 757.



Thatine CABINET UNITS

An extremely versatile line of heating and ventilating units providing quiet, positive distribution of heated air with or without ductwork. Models for cooling with chilled water. Seven distinct enclosure types, plus a variety of accessories, permit matching practically any installation or performance requirement. Capacities from 120 to 640 Edr. Write for Catalog 557.

heating and air conditioning say ... make mine M

A MONG building professionals and owners, the high quality of Modine heating and air conditioning equipment has long been recognized. Careful examination proves it to be a tangible value which benefits those who specify, install and use Modine products. This quality is a direct result of a company policy which is briefly expressed as follows-

"Modine products, while not premium-priced, are produced to meet those high standards of mechanical construction and performance excellence which long experience has proved essential to complete user satisfaction."

Thadine GAS UNIT HEATERS

Beautifully styled units feature light weight for easy, low-cost installation . . . stainless steel burners and stainless or aluminized steel heat exchangers for longer life . . . advanced engineering design for outstanding heating performance. Eight sizes from 25,000 to 310,000 Btu. Catalog 656-A.



Thadine DUCT

Ideal for use with cooling package or for straight heating. Stainless steel burner and heat exchanger resist rust and corrosion caused by moisture-laden air or condensation.

FURNACES

Btu. Bulletin 855.



Attractive appearance and sturdy construction characterize the Modine line of convector radiation. Offered in 30 types and 8,000 sizes for every building need. Choice of standard or heavy-gauge enclosures. Catalog 257.

UR-1353





TLODINE STEAM AND HOT WATER UNIT HEATERS

Widest line available - includes horizontal and vertical delivery types plus Power-Throw models for use where extremely long "throw" is needed. All types are available in HCR models designed for application where severe internal corrosion is a problem. Bulletin 157.





1507 DeKoven Ave., Racine, Wis. In Canada: Sarco, Ltd., Toronto

Boston, Chicago, Dallas, Detroit, Miami, San Francisco, Washington, Toronto

#775 high stool, Eero Saarinen design.



#765 secretarial chair shows adjustable seat and back mechanism.

Versatile high stool for drafting rooms, studios, banks and other applications. Adjustable back support and seat height. Cast aluminum swivel base. Foam rubber cushioned seat and back. Dimensions: 18"W x 20"D x 34" min. to 41"H max. Write for further information.

KNOLL ASSOCIATES, INC., 575 MADISON AVE., N. Y. 22
Trends

Construction firms, 11% of nation's business concerns, vie for "biggest industry" title

Construction's important role in the total economy as one of the largest—possibly *the* largest—producing industries was shown in a recent Commerce Dept. study of principal characteristics of the building business.

At the close of 1955, latest year for which data are available, the industry had 475,000 contract construction firms, or 11% of all the business concerns in the country. These firms accounted for 60 to 80% of the \$60 billion current annual total of construction activity, including maintenance and repair. At the 80% rate, these contract construction firms would rank first among all producing industries, or even at the 60% rate would trail only food, machinery and transportation equipment producers in dollar value of output.

Based on 446,000 firms in business on Jan. 1, the 69,000 firms that entered the business during 1955 gave it a net expansion of 15%, compared with a 9%

(mutions of doudies)				
		First	three	
		mo	nths	
	Mar '5	7 1957	1956	%土
PRIVATE BUILDING				
Residential (nonfarm)	.1,013	2,956	3,194	- 7
Nonresidential	. 709	2,135	1,953	+ 9
Industrial	. 269	808	674	+20
Commercial	. 249	735	760	- 3
Offices; lofts;				
warehouses	118	356	303	+17
Stores; restau-				
rants; garages	131	379	457	-17
Religious	63	195	166	+17
Educational	40	124	120	+ 3
Hospital; institution	ns 36	103	76	+36
Public utilites	. 419	1,162	1,048	+11
			-	-
*PRIVATE TOTAL		6,581	6,524	+1

SPENDING BY BUILDING TYPES

PUBLIC BUILDIN

(millions of dollars)

FUBLIC DUILDING				
Residential	30	87	60	+45
Nonresidential	345	980	878	+12
Industrial	42	117	100	+17
Educational	215	620	572	+ 8
Hospital; institutions	26	71	62	+15
Military	95	274	258	+ 6
Highways	240	665	640	+ 4
Sewer; water	104	297	251	+18
*PUBLIC TOTAL	913	2,576	2,315	+11
				-
*GRAND TOTAL	,172	9,157	8,839	+ 4
* Minor components not sum of parts.	show	n, so t	total es	cceeds

net increase for all types of industry. In the same year, 40,000 firms left the industry, and 12,000 were merged or reorganized. Building's high mortality rate, 9% net, which normally characterizes a field with a large number of new firms, was also higher than the mortality rate for all types of industry, which was 7% that year. In construction, however, to a larger extent than in other fields, large numbers of its "new" and "discontinued" businesses are accounted for by firms organized to handle a single project, and then disbanded.

Construction is characterized by small firms. Latest data, for 1951, shows that less than 0.1% of its concerns employed more than 500 workers, although these firms accounted for 13% of all contract construction employment. Representing 40% of the industry's employment, 95% of its firms had less than 20 employees each.

New firms, however, showed a somewhat larger proportion of bigger firms (20 or more employees) than all industries taken together—1.4%, compared with 1.1%.

Completely reliable statistics do not exist on the industry's consumption of materials, according to this Commerce Dept. study, but available data indicates that total construction activity uses roughly \$20 billion worth of materials a year at factory prices.

Expenditures increase 4% in first quarter of '57

BUILDING ACTIVITY

New construction expenditures in the first quarter of 1957 totaled \$9,157 million, a \$318 million, or 4% gain over \$8,839 million in the same 1956 quarter, according to Commerce and Labor estimates.

Despite the deepening sag in homebuilding, private outlays increased \$57 million, or 1%, while public expenditures rose \$261 million, or 11% (see chart and table).

In private construction, the big \$238 continued on p. 47



TOTAL EXPENDITURES for new construction in March were \$3,172 million, compared with \$3,071 million a year earlier, according to Commerce and Labor estimates. This \$101 million gain resulted from an advance of \$102 million in public outlays, and a decline of \$1 million in private spending.

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Trends

million (10%) decline in new nonfarm housing was partially offset by a 20% improvement in nonhousekeeping residential construction, an 8% gain in residential additions and alterations, and by the healthy \$182 million (9%) gain in nonresidential building.

Industrial construction, up \$134 million or 20%, accounted for the greatest portion of the first-quarter gain in private nonresidential work. Commercial projects showed a 3% decline, with a 17% decrease in store, restaurant and garage construction more than offsetting a similar percentage gain in warehouse, office and loft construction.

To bolster the weak FHA section of the homebuilding market (through one "mortgage crisis" after another the conventional market shows hardly any perceptible change), Washington lifted its "anti-inflation" 2% extra downpayment requirement on FHA loans. But it was an idle gesture. While Congress refused to allow an increase in the $4\frac{1}{2}\%$ VA mortgage interest rate, and the FHA ceiling remained at 5%, at these "price-fixed" mortgage rates in the current tight money market, lenders were primarily interested in higher, not smaller equity payments.

Cement prices upped 5%; steel rise coming

BUILDING MATERIALS

Cement prices were boosted 15ϕ a barrel, or roughly 5%, by eastern producers last month, on top of a similar hike last October. At the same time, speculation was starting on the extent of the price rise for steel (in a range



BUILDING MATERIALS PRICES remained unchanged in March at 130.5 on the BLS Index of average wholesale prices. This index has not changed since it declined to this figure in December (from 130.8 in November). from \$5 to \$12 a ton) that can be expected in another two months, after mill workers receive another contract wage increase July 1.

Structural steel shipments in February (278,453 tons) exceeded bookings (265,894 tons) for the first time since Dec. '54. Combined January and February shipments were 540,630 tons, a 1% gain over 1956, but the backlog of unfilled orders on March 1 fell only a shade below its February peak of 3,-475,000 tons (see chart). (For the long-range outlook for structural steel, see p. 154.)

Although it would probably soon head upward again, the BLS index of average wholesale prices for all building materials showed remarkable stability through the first quarter of 1957, never changing from its December index figure, 130.5, exactly where it stood in March '56, (see chart).

BUILDING MONEY



STRUCTURAL STEEL orders unfilled on March 1 stood at 3,436,000 tons, the first check in their steady increase since last July. Orders scheduled for fabrication from March through June totaled 1,321,496 tons, or more than 330,000 tons a month. (Record for monthly shipments: 306,760 tons, March '56.)

AT&T and PHA both pay record interest rates; tight money's effects on realty values

Amid some signs that the current "tight money" crisis may have passed its peak, other signs last month indicated it was still hovering close to its crest:

▶ Blue chip AT&T sold \$250 million of 28-year $4\frac{3}{8}$ % debentures at a net cost of 4.34%, the highest borrowing rate it has had to pay since 1930.

Also at the highest rate ever for such financing, PHA sold six issues of taxexempt local housing authority bonds totaling \$36 million at an interest cost of 2.88%, compared with a February flotation at 2.77%.

▶ But as a lender, PHA was going to charge almost twice its own borrowing rate. In the New York *Times* financial columns it advertised three projects for sale this month on 18-, 20- and 25-year mortgages at 5.5% interest, after down payments of 10 and 15%. (With no sign of consistency, in the real estate columns of the same issue, sister agency FHA advertised eight projects for sale on 38-year mortgages—at only 4.5% after down payments of 5 to 10%).

▶ A third HHFA constituent, Fanny May, sold a debenture issue in December at a record interest rate of 4.125%, floated another in February for 4%, but last month went back up to 4.1% again to sell another 11-month, \$200 million issue.

Investment implications

In an illuminating talk for the N.Y. State Society of Real Estate Appraisers, John R. White, of the N.Y.U. School of Commerce, Accounts & Finance and the Brown, Harris, Stevens realty organization, predicted that mortgage funds would continue tight, and interest rates high for an extended period, even if there was some easing from the present "crisis." To offset current low equity yields and added expense of continued tight money and high interest rates over the long pull, he pointed out, it would now seem advisable for appraisers to begin raising their capitalization rates (or, conversely, reducing their calculations of value).

Highlights of White's talk:

"A very contradictory condition has gradually arisen in our real estate market. Over the last five years, rising mortgage rates and declining equity returns have reduced the spread between these two yields to an abnormally slim margin. A similar long-term narrowing of the spread between bond and stock yields contributed to the recent significant downturn in the stock market. [But at least four reasons seem to preclude any comparable real estate down-

Trends



Mary Josita Hall, Clarke College, Dubuque, Iowa Architects: Barry & Kay, Chicago, Illinois

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 turn, or increase in equity returns, in the immediate future]:

"1. The entrance of the small investor into real estate, through syndication of large and small properties, has flooded the market with equity capital. This has forced up prices and lowered equity yields.

"2. Concurrently, rising land costs (again influenced by syndication) and rising, inflationary construction costs have necessitated higher rentals. Rentals and original construction costs of buildings completed a few years ago now seem moderate by comparison. The contrast has been particularly bold in the last two years. Thus, stable or declining equity returns are partially a reflection of higher construction costs.

"3. The past year's relative mortgage shortage brought supply and demand forces in existing properties into closer equilibrium. It forced postponement of a significant supply of new construction, particularly apartments. Rents firmed, and vacancies in new buildings were virtually eliminated, thus giving the market new stability, and helping to keep equity rates low.

"4. On the supply side, there is relatively little choice investment real estate for sale. Present owners are reluctant to sell because of the absence of better alternative investments. When real estate is offered, the price is bid up by the eager buying public, with a corresponding decrease in yield. . .

"To see equity rates at such low levels as today during a relative peak in our cycle defies every logic."

Rains proposes new FHA rental housing plan

In 1950, when long-term US bonds paid 2.5% interest, Congress enacted an FHA "yield insurance" program intended to encourage mortgage investments in rental projects by pension trusts, college endowments and similar conservative long-term investors. Lenders were guaranteed a $23/_4$ % yield, but owners were required to use half of any net earnings between $31/_2$ and 5%, and all net income over 5%, to accelerate amortization. Despite FHA efforts to promote it, not a single mortgage was ever written under this program. Last month, still trying to develop

a form of investment that will steer continued on p. 50



Precast Concrete Electrified Floors In New Research Building



Wiring drops from header duct into cell at handhole junction.



To install outlet: drill hole at outlet location.

ALABAMA, Birmingham 1 The Alabama Cement Tile Co. COLORADO, Denver 1, PO 366 Flexicore Company of Colorado FLORIDA, Tampa, PO 2189 Universal Concrete Pipe Div. ILLINOIS, Chicago, Franklin Pk. Mid-West Flexicore INDIANA, E. Chicago, PO 539 Calumet Flexicore Corporation MICHIGAN, Livonia, PO 2006 Price Brothers Company MINNESOTA, St. Paul E-4 Molin Concrete Products Co. MISSOURI, E. St. Louis Flexicore Inc.



Wiring then runs either way through cell to floor outlet.



Last, attach electric or telephone outlet box.

This new engineering and research building for the National Cash Register Company in Dayton, Ohio has Flexicore electrified floors.

The steel frame structure was designed for either concrete or steel cellular floors. Concrete was selected because no fireproofing was required on the ceiling and because of other cost and time saving advantages.

In the construction picture above you can see the hollow cells in the exposed ends of the precast floors. These cells are used as electrical raceways, and electrical outlets can be installed in the floor at any point along a cell. Cells are spaced 51/3'' on centers with the 6 x 16 Flexicore unit used on this job. Conduftor electrical fittings were used to provide complete underfloor electrical distribution.

For a copy of the new 32-page Office Building Manual on Flexicore Electrified Floors, write or phone the nearest Flexicore manufacturer listed below, or The Flexicore Co., Inc., Dayton 1, Ohio.



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ENTERPRISE ENGINE & MACHINERY CO. Subsidiary of General Metals Corporation 18th and Florida Sts., San Francisco 10, California burgeoning pension trust funds and other long-term investment money into rental housing, Rep. Albert Rains (D, Ala.), housing subcommittee chairman, introduced a draft bill in the House for an "insured debenture" financing plan.

Trends

Because conservative trust investors often prefer bonds, his bill provided for FHA insurance for "a similar form of investment," a security "better suited than a real estate mortgage to the needs" of this type of investor. For technical assistance in drafting the proposed legislation, which would replace "yield insurance" as a new Title VII in the National Housing Act, Rains had enlisted the aid of Washington Attorney B. T. Fitzpatrick, former counsel and deputy HHFAdministrator.

Main provisions of Rains' proposal, certain to evoke considerable discussion among apartment builders and mortgage lenders in the months ahead:) FHA would guarantee both principal and interest annually on serial debentures up to 90% of the "estimated" completed value of projects (95% on co-ops occupied by 50% or more veterans; 100% on Title VIII-type armed services housing).

Debentures could run as long as 40 years, and pay up to 5% interest.

Premiums could not exceed $\frac{1}{2}$ of $\frac{1}{6}$ on outstanding unpaid principal.

Debentures would be a first lien on project net income (after required FHA reserves), and whenever income was insufficient, FHA would make up the difference for all interest and principal payments. All such obligations would be "fully and unconditionally guaranteed by the US," even if FHA's own funds ran out.

FHA could take over a project whenever its deficiency payoffs equalled or exceeded 10% of its total value, but this would in no way affect FHA's continuing obligation to holders of the original debentures. (Thus debenture holders would never have to be concerned with foreclosure expenses or headaches: one of the main reasons the proposed program was expected to appeal to "strictly coupon" investors.) Rent schedules would be subject to FHA supervision, but would have to allow "a reasonable return to the developer" after all operating expenses and debenture payments. Unlike the never used "yield insurance" program, however, builders would be allowed to retain all surplus earnings, instead of diverting all income over 5% to amortization. This was expected to give builders a real incentive to undertake projects under the proposed program.





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Letters

... heritage ... land ... conoids ... taste

PRESERVE ROBIE

Forum:

Concerning your April editorial-it would be a real calamity to America's cultural heritage if the Robie House by Frank Lloyd Wright were destroyed.

> KARL KAMRATH Mackie & Kamrath Houston, Tex.

Forum:

Such really great works as the Robie House occur maybe once in a generation. Are they not worthy for our government to preserve? And what about the outstanding American homes comprising the "shingle style" of the 1880s in New England? What of the railroad stations and libraries of Richardson, the banks and office buildings of Sullivan, the fascinating West Coast structures of Maybeck and Greene & Greene? Many of these buildings have come to be recognized as the best in our small but vital modern American architectural inheritance. Today we can visit most of them and if we are lucky we may be allowed to go through some of them, but more important of all, we have the opportunity to study and admire them at first hand. But what of the next generation; will they have such a chance?

SANFORD T. MEECH, architect Syracuse, N.Y.

THE COVERS

Forum:

I'd like to congratulate you on the imaginative covers of January and February-I'm happy to say I found the contents most stimulating as well.

One slightly dissident note, however: the photograph of the "landshaped" Los Angeles hillside (mutilated to accommodate a number of new tract houses) should not have been printed without editorial comment. It is one of the most ghastly things that ever happened to California scenery. I feel it is the responsibility of a magazine such as yours to give this sort of thing serious consideration and if necessary, critical appraisal.

> JOHN CARDEN CAMPBELL Campbell & Wong, architects San Francisco, Calif.

FORUM gave the scene serious consideration, reasoned that the photograph possessed an eloquence all of its own.-ED.

I am positively enthralled with the February cover of FORUM! Would it be possible to get a copy suitable for framing? MARGARET K. CANTOR Waban, Mass.

FORUM regrets that it must disappoint Reader Cantor and the many others who have requested copies of the FORUM cover for framing. None is available. However, she and the others may take some comfort in the fact that their appreciation of the cover is shared by the Art Directors Club of New York, which gave FORUM'S Associate Art Director Ray Komai an Award of Distinctive Merit for his design .- ED.

DO SOMETHING ABOUT LAND

Forum:

I read your editorial "Our Surplus Land" (AF, March '57) with great interest. The viewpoint expressed matches our policy: the great future of real estate opportunity lies in "low-grade" urban land.

We believe that the population "explosion" which has taken place is telling us a very important story. We must heed it and do something about it.

The solution seems to lie in greatly strengthening urban redevelopment by:

1. Strong emphasis on verticalization, better transportation and communications and landscaping within the city area.

2. Rigid control of the periphery.

3. A new look at rural areas for completely new city concepts in areas where the economic pattern indicates an adequate potential for such venture.

WILLIAM ZECKENDORF, president Webb & Knapp, Inc. New York, N.Y.

SEMPER PARABOLOID

Forum .

As consulting engineers on the Formosa Church (AF, Feb. '57), we should point out that the surface is not a hyperbolic paraboloid; it's a conoid. Conoid: a ruled surface that is generated by a straight line running at the origin on a straight line and at the other extreme on a line of second order, like a circle or a parabola.

GIORGIO BARONI

Roberts and Schaefer Co., engineers New York, N.Y.

FORUM, taking a second look at its wellthumbed geometry book, finds Reader Baroni right, but discovers happily that conoids belong to the hyperbolic paraboloid family .- ED. continued on p. 94



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MORE ON TASTE

Forum:

I deeply appreciate the article on popular taste (AF, Feb. '57). You clarify my own thoughts and lend moral support in an area where I find little agreement.

RICHARD U. BASHOR, president Modern Design, Inc. Chevy Chase, Md.

Forum .

I enjoyed your article on "Popular Taste" very much. After all that Pollyanna pap about the alleged improvement of popular taste in the US, it is a breath of fresh air.

But the conclusion seems overly optimistic. I don't think that giving the architects a free hand would help much. Most Americans are slobs without taste: most architects are slobs without a license and without taste.

JOHN MAASS Philadelphia, Pa.

P.S. As you may have guessed, I am not an architect.

ERRATUM

In a table of square-foot costs for postwar New York office towers (AF, March '57), FORUM erred in listing 425 Park Ave. as costing \$13.04 per sq. ft. of rentable area. This figure was calculated from the original building permit estimate of \$6 million for the structure. Based on a revised permit figure of \$10 million, the cost was roughly \$21.75, or using the \$15 million quoted by the owner at one point, \$32.60.

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People

Winthrop Rockefeller plans a shopping center; Town Planner Sir Patrick Abercrombie dies



ROCKEFELLER



BENSON

A new species of Rockefeller construction was in prospect in Albuquerque last month. Genial, extrovert Winthrop Rockefeller, 44, offered to lease 160 acres of University of New Mexico land in the fast-developing northeast section of the city, adjacent to a forthcoming freeway, provided it was rezoned for commercial use. If everything worked out right, he would pay an annual rent equal to 5% of the appraised value of the land, plus an unstated percentage of net profits from a \$7 million shopping center he proposed to build on the property. For \$10,000 the Harland Bartholomew organization in St. Louis had prepared alternate preliminary plans for the project with different site arrangements for a shopping core, office building, drive-in bank, motel-restaurant complex, and large parking areas. Four years ago, Winthrop deserted Manhattan for Arkansas. There he took a serious interest in spurring the industrial growth of that hard-bitten, unwealthy state, and for the last two years has headed its very efficient Arkansas Industrial Development Commission, credited with creating 12,521 new jobs in 194 new or expanded plants in 1956 alone.

CELEBRATING SWEDE

An immigrant Swede who started work as a \$5-a-week bricklayer's apprentice, but rose to become the head of an engineering and construction firm that handled \$80 million of contracts last year, dreamed for many years of the day when he could show his "gratitude" to those who had helped him along the way. Last month 250-lb. Ragnar Benson, 57, fulfilled his dream in the grand manner. In a big, chartered Scandinavian Airlines System plane, he flew 33 of his key employees, 33 relatives, and a minister and his wife, from Chicago to Sweden on a festive 20day success celebration junket, including a visit to his birthplace, the town of Almhult. Benson was 12 and spoke only Swedish when he came to the US in 1911. After working as a bricklayer's helper he became a masonry foreman, and in 1922 started his own business as a masonry contractor. As he prospered he won General Motors, the University of Pittsburgh, Youngstown Sheet & Tube, Montgomery Ward and other top firms as regular customers. Today his Chicago industrial construction firm has 1,200 emloyees, or "working partners," as he calls them. The bonus they shared last Christmas: \$800,000.

OLD HANDS GET NEW JOBS

Civil Engineer William J. Bierach, 63, who was superintendent for construction of four of the original Rockefeller Center buildings in New York, was called out of retirement and appointed the coordinator for engineering, costs and all other phases of construction of the \$5 million US pavilion for the 1958 Brussels World's Fair (AF, Feb. '57). Appointed coordinator of the fine arts program for the US exhibit, which will include an architectural display with special emphasis on city planning and housing: George W. Staempfli, painter, and since 1955 curator of the Houston, Tex. Museum of Fine Arts.



BIERACH



In Los Angeles, John E. Roberts was appointed director of the City Planning Dept., after serving as acting director since the resignation of Charles Bennett in Jan. '55. Roberts, 18 years in the department, formerly was president of the Southern California Planning Congress, and he placed first in a recent civil service test of candidates for the \$17,500 job.

NAMED: Dr. Paul J. Misner, outgoing president of the American Association of School Administrators, as president of the School Facilities Council of Architecture, *continued on p. 99*

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Education and Industry, succeeding Minneapolis-Honeywell's Zephyrin A. Marsh; Pratt Institute Architecture Dean Olindo Grossi, as president of the Architectural League of New York; San Francisco Architect Henry L. Wright, as first chairman of the newly formed Architects and Engineers Conference Committee of California: Associate Professor Ian McHarg, in charge of the University of Pennsylvania's landscape architecture course, as director of a survey of modern landscape architecture in America to be made by the university under a \$12,000 grant from the Rockefeller Foundation; Pittsburgh Architect Paul Schell, and former ASHAE President John E. Haines, of Minneapolis, as co-chairmen of a new AIA-ASHAE joint committee for greater cooperation between consulting engineers, architects and the air-conditioning industry; Charleston, W. Va. Architect Cyrus E. Silling, as chairman of Committee A62, modular coordination, of the American Standards Assn.; David Watstein, as chief of the structural engineering section in the building technology division of the National Bureau of Standards (advanced from acting chief).

RESIGNATION REJECTED

In February, under doctor's orders to slow down because of a heart ailment, Lee F. Johnson submitted his resignation as executive vice president of the National Housing Conference (AF, March '57), and told friends he could not be persuaded to change his mind. But he underestimated the persuasiveness and determination of Board Chairman Ira S. Robbins and other conference directors. On March 11 the board voted unanimously against accepting Johnson's resignation. Instead it voted to raise funds to increase his staff, so he can be relieved of many administrative details and concentrate exclusively on legislative matters. Last month Johnson said he would remain at least until the present session of Congress ends, and most likely much longer.

HONORS AND AWARDS

"For outstanding service to the society and the profession," the Michigan Society of Architects awarded honorary membership to Electrical Contractor and Civic Leader C. Allen Harlan, of Birmingham, Mich., chairman of the Governor's (Mich.) St. Lawrence Seaway Commission. It gave its 1957 Gold Medal to Emil Lorch, FAIA, 86, retired dean of the University of Michigan school of architecture.

First Honor Award winner in the bien-

nial competition of the Wisconsin Architects Assn.: Theodore H. Irion and Leonard H. Reinke, of Oshkosh, for their Dartmoor motor court at Fond du Lac.

People

For his cover story in TIME on Architect **Eero Saarinen**, Associate Editor **Cranston Jones** was awarded the magazine division \$500 first prize in AIA's annual journalism competition; the newspaper first prize went to **Frank Beckman**, of Detroit's *Free Press*. An honorable mention in the newspaper division was awarded to Architect **Richard A. Miller** for a series on planning in the Elyria (Ohio) *Chronicle-Telegram*. Miller is now an associate editor of FORUM.

Recipient of one of the nine 1957 Rockefeller Public Service Awards: John R. Searles, executive director of the Washington (D.C.) Redevelopment Land Agency and former redevelopment section chairman of NAHRO, who will study European redevelopment for 9 months.

ABERCROMBIE DIES

Architect and Town Planner Sir (Leslie) Patrick Abercrombie, 77, recipient of the Royal Gold Medal for Architecture (1946) and the Gold Medal of the AIA (1950), highest regular honor of the US organization, died March 23 at his home in Aston Tirrold, England. World famous for his designing and city planning, Sir Patrick filled commissions in such contrasting cities as Leningrad and Haifa, Addis Ababa and Hong Kong, Dublin and Colombo. His greatest fame came from his plans for rebuilding London after the destruction of World War II, which brought him popular acclaim as "the modern Wren." He also had a leading role in reconstruction planning for Plymouth, Hull, Bath and other cities. After six years in an architect's office (he could never remember wanting to be anything but an architect), he served as professor of civic design at the University of Liverpool, source of many of Britain's leading architects and planners, from 1915 to 1935, and in 1923 was commissioned with his brother Lascelles to plan the preservation of Stratford-on-Avon. From 1935 until a few years ago he was professor of town planning in the Bartlett School of Architecture, University of London.



ABERCROMBIE



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New Orleans City Hall Building

New Orleans, La.

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28 large central air conditioning units and 1,122 small air handling units were needed for the new $7\frac{1}{2}$ million New Orleans City Hall. Because of the high pressure (5,000 fpm at 8" water pressure) of the air to be carried in this system, specifications called for a "standing S joint" to hold the two edges of a formed piece of ductwork together.

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Definitions of terms used in the fire alarm industry. F249 is uniquely arranged for quick reference and will be supplemented on a periodic basis with additional data on fire alarm systems.





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Editorial

Architecture's new century

Next week as members of the American Institute of Architects take to the air, the rails and the highways for Washington and their Centennial Meeting, we hope they will take a careful look at America. What they will see, if they have eyes for it, will be a sobering introduction for the theme of the convention, "A New Century Beckons."

The over-all impression will be that of a new America—a man-made America—spread like a dark shadow across the land of our dreams and our youth. Out of the total fabric of this new America, only an infinitesimal amount of the building is worthy of the name architecture. In the context of the total impression of man-made America, the individual work of architecture shrinks to insignificance.

Man does not live by bread alone, and we like to think this is particularly true of architects. We think that no architect, free for a few days from the cares of office practice, can fail to be impressed by the importance and magnitude of the task facing the future of architecture.

Without demeaning in the slightest the achievements of the AIA in the century past, we believe that the fundamental reason for the new dignity, importance and recognition which has come to the profession is the product of the unexpressed but almost desperate need for architecture in an environment increasingly devoid of what Walt Whitman called "the primal sanities of nature."

In the face of this need, the leadership so long sought by the architectural profession is now thrust upon it. The question today is not how the profession achieves leadership, but how leadership is exercised once it is achieved.

For many architects, the problem will be that in the fight for attention and recognition they may have forgotten what they wanted the attention for. They will have to retrace, almost painfully, their own lives, back to those wonderful stirrings in their youth that made them want to be architects. They will have to learn to dream again, to think again of the meaning of their lives, to speak with blunt honesty, and to stand for the ultimate right against the expedient wrong.

Washington's past

While the architects are in Washington this month they should take a look at the White House from Lafayette Square. It may be their last chance to see the first house of the land in anything resembling a residential setting. The General Services Administration recently announced plans for a federal office

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Unlike Wright's Robie house in Chicago, discussed in these pages last month, the Washington houses would probably remain, but they would be surrounded by a bulky structure of federal neuter architecture. While the houses are historically valuable and worth saving at all costs, the important thing is Lafayette Square—should it remain a forecourt in scale and spirit for the White House or should it become a deadly dull light court for government office buildings?

The White House itself will probably fare better. The recently released Heller report on housing the executive branch of the government tackled with care the difficulties in the combined office-residence character of the White House. And its suggestion that the old State-War-Navy building be pulled down for an executive office building makes good sense. At least it has the sensitivity of preserving the White House itself as a residence for the Chief Executive. The question now is what is to be done with the proposal architecturally.

But it does seem absurd that as soon as one proposal assures the preservation of the residential nature of the White House, another should destroy its residential environment.

Perhaps the houses remaining between Decatur house and Blair house could be redeveloped something like London's Downing St.—as office-secretariat and residential quarters for the cabinet—backed by a new structure in the half of the block facing 17th St. away from the Square. Fundamentally, however, what is needed is a thoughtful master plan for the White House neighborhood, not a stop-gap or a piecemeal solution to problems one at a time.

The General Services Administration's proposal is just another example of the way Washington is being despoiled by the insensitive and impractical boondoggling of the people in charge of federal building programs. It is a losing battle to shout fire about the fate of architectural Washington month after month, year after year. Regardless of how many minor skirmishes are won that way, Washington will become a city neither noble nor humane but a city of "fascist classic" facades which swallow and disgorge grav-faced government clerks, a city where the AIS's precious Octagon house will be a thing in splendid isolation, a symbolic mockery of the centennial theme of the environment which gives shape to architecture.

In this centennial year, could AIA do anything more appropriate than to revive national interest in the architectural fate of Washington and itself take active interest in the shape of the nation's first city?

Scenery, safety

and selling

In mid-March Commerce Secretary Weeks threw the Administration's weight behind Senator Richard Neuberger's proposal to keep our new 41,000 mi. interstate highway system free of billboards. But pushing the other way is a formidable force that may again succeed in killing any such "esthetic plot" (as it did last year).

Armed with impressive quantities of money and passion, this counterforce is also endowed with the strength of America's advertising genius. The advocates of bigger and more frequent billboards across the face of the nation carefully avoid any suggestion that they are acting in behalf of their own interests. They cry: "We've really got the interest of the *motorist* at heart—don't you know that lack of billboards induces road fatigue?" This is ridiculous. Highway hypnosis is a very real problem, but architects, engineers and psychologists are certainly better qualified to solve it than are advertising men.

Secretary Weeks has a good idea: try to get the cooperation of the states on an incentive basis. From federal funds he would grant the states only 85% rather than the available 90% of the highway construction costs if they were *un*willing to cooperate. Cooperation would involve acquiring a 750' protective, billboard-proof strip along either side of the proposed highways.

But even if Secretary Weeks's scheme is approved and if the wellconceived (though slightly worldweary) Neuberger Bill is passed into legislation, we will still see many states not strong enough to resist the internal efforts of the billboarders. Some may simply not get around to cooperating with the federal authorities (thereby losing an additional 5% of available funds). Others may declare new districts as "commercially zoned," thereby exempting additional mileage from the anti-billboard intent of the bill. Still others may take so long to get rid of the "grandfather clauses" (long-term provisions) of existing billboard leases that their efforts may die of exhaustion before reaching fulfillment.

We are sufficiently concerned with this boarding over of American scenery to feel that compromise with the opposition would be downright dishonest. But of course it is compromise that will prevail, following Plato's conclusion that democracy is "a charming form of government, full of variety and disorder, dispensing a sort of equality to equals and unequals alike." Our hope then, is that it may be the best compromise, the compromise that will give the traveling public the best possible combination of safety and scenery.

A slim, tall-windowed office slab dressed in jet black, blue and silver is added to Corning's famed glass center



Black opaque glass, set in black anodized aluminum grid, and blue heat-absorbent plate glass, set in tall natural aluminum frames, make up the allglass curtain wall of the new office building. (Neither kind of glass is a Corning product.) Reversible windows are easily washed from inside, and walls have needed no cleaning since they were washed after completion last year.



City of glass

Across the river from the glassworks in Corning, N.Y., a sleek new tower rises above the scatter of small-town suburbs. From a distance its pattern of tall, closely spaced windows brings to mind the rhythmic façades of the long, dark-brick spinning mills that still line many a New York and New England riverbank. But Corning's new research-administrative center is actually a fresh, sophisticated statement of modern office building design. Its tall, reversible windows, striking in exterior appearance, give a pleasing sense of light, view and space inside, without creating a fishbowl feeling or an excessive heating-cooling problem. Their splayed jambs also soften the usual harsh contrast between outside sky glare and the dark silhouette of the inside wall (see p. 111). The building's narrow (42' x 222') floor plan gives almost every worker a window and a view and dignifies a relatively small building (92,000 gross sq. ft.) with the slim height of a tower. These graceful proportions cost money: outside wall area is about 30% greater than for a square tower, and the corridors and other service areas repeated nine times reduce net usable space to 52,000 sq. ft., only 61% of gross.

Just as important as pure economy, however, the new office building and the new research, laboratory and cafeteria buildings below it are fitting neighbors for the older glass center nearby (AF, Aug. '51). Last year the center, with its exhibit halls, auditorium, library and glass-blowing displays, drew over 400,000 visitors to this out-of-the-way factory town. This year the new buildings themselves are part of the show.





Bridge sheathed in an unusual Corning product—black photosensitive glass—connects research building at right with upstairs offices of pilot lab building. Latter has decorative wall pattern of glass block 6" and 12" square, painted opaque on inside.

Office wall, with its rhythm of vertical windows on a 5' module, rises behind a bridge of Corning's own Pyrex tubing linking exhibit hall (glass block wall at right) with Steuben factory, whose big ventilator has an imaginative dash of red paint in its jaws.







Office corridor is relieved by varying jogs and colors, focal group of directory panel and bench. Typical floor (right) is only 42' wide, giving nearly all offices a view of the Chemung valley. Low partitions, painted in muted reds and blues, give the few inside office areas a sense of space and view. Narrowness of plan reduced net usable floor space to 61% of gross square footage.





RESEARCH AND ADMINISTRATION CENTER, Corning Glass Works, Corning, N.Y. ARCHITECTS: Harrison, Abramovitz & Abbe INTERIOR DESIGNER: Maria Bergson Associates ENGINEERS: Severud, Elstad & Krueger (structural) Jaros, Baum & Bolles (mechanical) Edward E. Ashley (electrical) LANDSCAPE ARCHITECTS: Clarke & Rapuano GENERAL CONTRACTOR: George A. Fuller Co.





Entrance lobby linking office and research buildings and cafeteria has curving roof on concrete bents pierced with curcular holes to relieve bulk. Entrance to office building is in background of upper photo; entrance to cafeteria is at left in lower photo. Interior Designer Bergson used light and dark bands of terrazzo to help shorten and widen the long space.



112





New building group, seen from main approach on the east; older glass center building is just out of picture to left. With its service core slightly off center and an empty shaft available for a fourth automatic elevator, office building can theoretically expand 50%, adding to near end wall where high windows mark offices of top officers.



For eight years the Texas-Oklahoma firm of Caudill, Rowlett, Scott has been amazingly prolific in good design ideas—a scrutiny of their evolution

Tomorrow's school today



Classrooms in "school of tomorrow" have teaching panels suspended at will from ceiling and a center floor area that can be lowered (as shown here), leveled or raised.



Plan of rooms under umbrella can take great variety of groupings. Small circles indicate 'hydraulic lifts which, with utility connections, determine potential classroom positions. Large room is for assemblies, or other special purposes. Rooms can be dismantled and the whole area under shelter cleared for big rallies, fairs or community parties. "School Executive" commissioned design. Back in 1941, Texas A.&M. issued an unpretentious-looking pamphlet called *Space for Teaching*. The author, one William Wayne Caudill, a 26year-old architecture instructor, was unknown, the pamphlet apparently just another engineering bulletin. But gradually word percolated that here was something special indeed. Today the pamphlet is ranked (along with famous Crow Island School) as one of the two great influences to shape the modern elementary school.

The revolutionary central idea of that pamphlet —that schools should be designed for children is everybody's doctrine today. But the author's firm, Caudill, Rowlett, Scott & Associates, keeps out there in front, a perennial pioneer at ways of embodying the doctrine. This year, with 150 schools behind them (plus clinics, churches, housing, office buildings and one of the best courthouses extant), the firm of CRS worked out another dream for tomorrow—a school that fingers out into the community, with a great concrete umbrella sheltering movable classrooms, and a service core below ground feeding the classrooms.

This tomorrow's school is a dream to be respected because CRS dreams have an awesome history of coming true. But it is notable for a more immediate reason too: it happens to dramatize five principles (umbrella shelter, plan flexibility, space flow, many-dutied surfaces, subtly controlled environment) which also shape the trail-breaking CRS schools of today. The evolution of these treatments is discussed on the pages following.

TTE


Port

28%

Umbrella of shell concrete for "school of tomorrow" is permanent; facilities beneath adapt widely to circumstance and need.

Section shows service core under slab, with hydraulic lifts which convey teaching materials, form part of room floor.

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CANOPY

FRIENDSHIP PROMENADE LEVEL

CENTRAL SERVICE LEVEL



1. A roof grows to an umbrella, Port Arthur, Tex.



2. The umbrella raises over the roof, Liberty, Tex.





4. It stands as an umbrella alone, Port Neches, Tex.

3. It gets a transparent enclosure, Tyler, Tex.

The sheltering umbrella idea gives leeway to planning



"I suppose our philosophy is not so much 'form follows function' as it is 'form allows function,' " says Tom Bullock, one of the CRS partners, "and that is why we keep using the umbrella. It allows freedom, almost casually, for all sorts of space."

The first CRS umbrella (1) was literally an umbrella: it went over two classroom clusters and the space around and between them to keep off the Gulf Coast rain. It was continuous with the roof over the classrooms; the space it created between "buildings" was immensely useful and popular. Later (2)the umbrella was used like a tent fly,

raised above the roofed buildings beneath for insulation from the sun, also forming a parasol for an unenclosed, sunken-floored playroom between enclosed units. Built low to the ground on east-west exposures, the umbrella was glazed high at its ends (3) for a junior high gym, and it is to be left open (4) for a new senior high gym. In the "school of tomorrow" the umbrella shelters buildings, even takes glazing, but like the latest version (4) it is an entity itself-the landmark, the thing that gives permanency (nonobsolescing, infinitely flexible, therefore solid permanency) to the plant.



5. Groups in same grade connect, Odem, Tex.







7. Courts link groups, Odem





- 8. Five in a nest, Jacksonville, Tex.
- 9. Court checkers, Liberty, Tex.
- 10. Hillside cluster, Roanoke, Va.



11. Expansion cluster,

Bartlesville, Okla.



12. Air-conditioned circle, San Angelo, Tex.

... and the leeway is used to achieve a flexible plan



The first CRS school was a finger plan, because that seemed the obvious way to manage light and air. But planning determined by light and air was at odds with the CRS belief that planning should be primarily responsive to learning and teaching needs, that the mechanics should be servants to the scheme, not masters. Today CRS is perhaps best known for its ingenious devices to control the elements, a matter dealt with on p. 120. The point of all this ingenuity, in harmony with the value seized from the umbrella idea, has been to break out of the rigid row of classroom boxes, into a realm of

possibilities for logical, interacting groupings indoors (5, 6) and for little and big, sheltered and open, charmingly surprising spaces outdoors (7). By now CRS has vanquished so many of the factors which limit plan, that examples of its schools already exhibit (8-12) almost the whole range of grouping possibilities which are afforded by the parchees-men classrooms of the "school of tomorrow." These schemes are by no means virtuosity for its own sake. Just as an example, a hillside cluster (10) answers the problem of four classrooms with common area, the whole works to share in a choice panoramic view.



13. Space flows in window, through school, Guymon, Okla.



14. Space flows up and out, Industry, Tex.

15. Visual flow, interior room, Norman, Okla.





Space flows in, out, over and around enclosures . . .



That ghostly arrow through corridor and classrooms (13) is not a symbol of moving air. It is a "map" of visual space flow, and not the same path the air takes at all. But curiously enough, it was an unexpected by-product of a ventilation scheme. In this school, CRS wanted to move outdoor breeze under grouped classrooms and across the corridor, so classrooms were raised and the corridor given a balcony. The visual result of this scheme was a bonanza, and ever since seeing its effect on that school's atmosphere, CRS has consciously made space flow a major element in design (14). Once its possibilities were

really exploited, CRS found this bestowed a new freedom: the possibility of making very pleasant interior rooms. Thus a classroom (15) can be completely surrounded by indoor school, but, because it opens visually, there is no feeling of constraint. This classroom's glass wall faces a solid brick wall across a corridor, but the combination of this little vista, plus a ceiling visually floating over space, gives the room the quality of a porch rather than of a cell. Look back at a court (7) to see how the CRS exploitation of space flow extends outdoors. In the "school of tomorrow" space flow is of the essence,



16. Teaching panel walls, Laredo, Tex.



17. Interchangeable panels, College Sta., Tex.



19. Floor levels put to work, Alvin, Tex.

... and the walls, ceiling and floor all do a teaching job



There can never be too much scope for use of teaching materials, CRS is convinced, and never too much flexibility in their application. Why stick instructional panels to a lazy wall; why not make the wall itself do the job? The first time (16), the panels were made interchangeable only with carpentry. Later detailing (17) demands only removal of a stop strip. CRS finds children and teachers accept the multiduty idea and enthusiastically carry it further. On a recent revisit (16) a CRS partner found classroom panes painted with the weather map and hooks in the ceiling for a class-made planatarium. (Future

ULRIC

CRS schools will come with ceiling hooks.) Another ceiling use (18) is to store hinged instructional panels which, let down, form partitions. Nor is the CRS floor just a place to stand on. In one multipurpose room (19), big casts of performers go on the big stage. With narrow stage in use, the rear audience is raised; or performers can use the middle like a theater-in-theround. Eating is done in three groups. In a new CRS primary school, the steps and upper level are tiled; the lower level is experimentally carpeted. All these devices are put to work in the "school of tomorrow."





SKY, VAULT

21. Nature sorted out, San Angelo, Tex.



20. Pressure wall to bend breeze, Elk City, Okla.



22. Niches to fox the sun, San Angelo, Tex.

10 20 300

Light, air and heat get into harness and obey



CRS uses walls the way nature uses mountains: to bend the wind. The firm's first pressure wall (20), diverting the breeze into the classrooms, made possible the abandonment of the finger plan even on hot plains where the prevailing wind is vital. Harnessing the elements has led to sorting them (21), dealing with each separately. When this classroom is darkened for mechanical visual aids, for instance, there is no interference with the view wall or natural ventilation. The open door shows the difference between the glare-reducing view glass and the raw light. For an air-conditioned campus high school,

windows in classroom buildings (22) tuck into niches where sun heat cannot get at them. CRS deliberately avoids attempts at uniform treatment of adjoining classrooms as dispiriting and preclusive to a sense of distinct classroom "place." Plumbing has come in for its share of ingenious economy too, as in cored clusters (11) and back-to-back schemes. In the "school of tomorrow," permanent fixtures on the umbrella underside light the plastic-ceilinged classrooms; water supply, drainage lines and air-conditioning ducts run on the service core's ceiling, can be plugged into at dozens of points.



CRS pioneering also covers the way they work

Three CRS principals discuss the site plan for a new college: left to right, William W. Caudill, John Rowlett, Thomas Bullock.

"In the beginning, when we started this firm," says Caudill, "we were all trying to be little Wrights or Mieses or Corbus. We finally had to realize we were all kind of average guys, not a Mies among us, but maybe with each others' help we could make a contribution of our own by tackling the solving of problems. We don't try to make new 'designs; we just try to solve new problems."

Caudill thinks the firm's location in Texas was great good fortune for carrying out this aim because of four reasons: "First, the climate, being generally warm, is not a rigidly limiting factor and yet it poses all kinds of provocative problems of sun, wind and light. Second, there is a tremendous range here in communities' pocketbooks. For the same number of high school kids, one community will have ten times the valuation of another. Giving each of them their full money's worth for what they can spend is a real exercise. Third, Texas does not have old, frozen state school laws that thwart new attempts at problem solving. Fourth, the Texas A & M engineering experiment station, so close by, is a fountain of ideas.' (Caudill himself started the architectural research division of the station, when he taught at A & M.)

The firm's Texas and Oklahoma background in problem solving (the office opened in Bryan, Tex. in '48 established a second base in Oklahoma City in '52), and the reputation this work gained for the firm, has led lately to a whole new range of stimulating problems. Now commissions come in from all over, ranging from Wisconsin and Michigan to Virginia and Mexico.

Most of the distant jobs, and a lot of those nearer home, come to CRS from other architects who want to associate* with them on a job. CRS likes this arrangement and frequently gets the association under way with what they call "the squatters' thing."

The squatters' thing has been a CRS institution since the firm got its very first school, 400 mi. from home base. Anywhere from four to eight members of the firm hie themselves to the site of the problem. (Nowadays they fly there in the firm's three little planes piloted by Partners Caudill, Rowlett, Scott, Bullock or some of the flying associates.)

Once there, they squat in a back room at the school superintendent's office, or in the office of the associated architect if there is one, or-in a pinch-in a hotel room. They work day and night, over sandwiches and containers of coffee, for anywhere from four to ten days, with everybody concerned looking over their shoulders or participating. At the end of this squatting they have a fully worked out preliminary, in which every step and reason is familiar to client, associated architects, and frequently to numbers of teachers and parents, and which often embodies their ideas too.

In an association, sometimes the other architectural firm does both working drawings and supervision, sometimes supervision alone. In either case, CRS works intimately with it from the start. "How could we trust a design to a supervisor who doesn't understand everything about it!" says Caudill, in horror at the notion.

Supervision, the CRS partners are convinced, is the most neglected realm in architecture, and one of the most important. "This is the time, when the building is going up, that the client always remembers; this is the time his whole feeling about the building and the architect jell. Furthermore, this is the architect's best opportunity to find where he went wrong, or what could be done better." The firm puts top men on supervision, gets from them a detailed report, documented by snapshots, on every point from which useful tips, pro or con, can be learned for the future.

Useful ideas from school jobs are always being put to work on nonschool commissions too. Thus the familiar movable-cabinet partitions solved the problem of a courthouse dormitory to accommodate fluctuating ratios of men and women jurors; an Oklahoma City office building, now in construction, makes a prime feature of its sun control; several clinics have benefited from the space flow techniques.

Always on the lookout for good men (the office now has about 40 members including the six principals and ten profit-sharing associates), the firm has as its main, but by no means exclusive, source of supply the A & M architectural department where at least one member of the firm always teaches. The latest associate to join the firm is an experienced city planner—an indication of how far CRS has come in less than ten years and of the growing complexity of architectural problem solving.

The other three principals plan a squatters' trip (see text) in a CRS plane: Edward Nye, Wallie Scott, William Peña.



^{*} Associates on schools shown here: J. Earle Neff (1); Bruce & Russell (3); Carroll V. Tanner (5-7); Smithey & Boynton (10); Donald R. Goss (12); Perkins & Will (15); A. A. Leyendecker (16); Royal Dana (21); Max Lovett (22).



Art Nouveau –new again

Today's search for a richer architecture puts new light on the prophetic work of a Belgian architect who mixed delight with design -by EDGAR KAUFMANN Jr.



... space caught in a web of tensile strength

Fluid curves of corner entrance to La maison du peuple (left) characterise Horta's work. Elaborate carving expresses transfer of forces from steel to stone. In the top floor assembly hall (above), steelwebbed arches flow continuously from base to concave span. Vertical rods carry the balcony between spans, leave an open floor below. Building was built in 1895 as headquarters of a working-class movement that formed around the new steel and glass industries and the coal fields that stimulated their growth. A new freedom is becoming evident in modern architecture. Sculptural shaping of interior space, dramatic elaboration of structural detail and intricate enrichment of surface are characteristics of important new buildings of all kinds in all parts of the world. (For example, see p. 135 —ED.) Interestingly enough, close parallels to these attributes characterize a neglected antecedant of modern architecture: the architecture of the Art Nouveau.

With the perspective of half a century to help us, we can now see that the designers and architects of the Art Nouveau evinced a new concern for structure, space and light, and thus were the direct progenitors of modern architectural ideals. One of the first of these innovators in time and importance was the late Architect Victor Horta.

Just as Art Nouveau has until lately been dismissed as mere stylishness, so Horta has been considered hardly more than an off-beat ornamentalist who, as a juror of the League of Nations Design Competition in 1927, voted decisively against the progressive entries—in short, a modernist manqué turned reactionary.

But his work, pictured here, reveals another side of the story. Here is a courageous innovator who made metal a natural component of architecture. Horta took the new materials of the nineteenth century (metal and glass) and the accompanying new engineering and raised them to an expressive art form. His inspiration came from the admired structures of the nineteenthcentury's engineers—such as Paxton's 1851 Crystal Palace in London. But Horta was determined that this new potential serve the art in architecture.

Architecture, in his hands, became an art whose first obligation, unlike that of engineering, is to human life and its aspirations.

Soberly keyed to their surroundings without, Horta's buildings are, within, among the first in modern architecture to welcome floods of light, to catch light in a strong rhythmic network of metal—filtering it through or reflecting it from warm, glowing surfaces. Everywhere curves define volumes of space: space charged with the energy that leaps in every arch and clings to every vault. But the curves reflect back always to the observer as the seat of control.

The three buildings pictured on these pages show that Horta, however daring, remained master of what he had to say; a man who could vie with the best of his contemporaries in Europe and America and one whose accomplishments are having an important delayed-action effect on today's revival of architectural enrichment.

The author acknowledges the assistance of Architect M. Jean Delhaye, secretary of Brussels' *Comité Horta*, who arranged the tour of the buildings and provided valuable information. Photos by Paul Mayen.



... a grid of steel and glass juxtaposed by curves

Rectilinear pattern of tilemosaic panels and double-hung windows in a grid of steel on the façade of the Van Eetvelde house (above) gives way but lightly to the soft curve at the head of the first-floor windows. The forthright expression of exposed steel I beams and the bolts that join plate to beam and beam to bracket (right) is juxtaposed by the almost muscular sculpture of the brackets themselves. The apparently separate houses right and left were actually additions by Horta to the center house.







... exuberance bathed in a flood of light

Intricate vaulting describes a balcony revolving around a great dome in the steel and glass central hall of the Van Eetvelde house (right and above). The almost quavering enrichment of the balcony rail, and the tracery in the overhead dome and vault, typify Horta's interiors. This house was built in 1895 for Baron Van Eetvelde, foreign minister for the fabulously rich Belgian Congo, then the private domain of King Leopold II, and the source of much of the nation's wealth and power at the height of the Art Nouveau movement.



... frail forms woven into a powerful façade

Ornate balcony and overhead bay project over sidewalk in Horta's own house built in 1898. Studio building next door (right) has a more open face. Horta's graceful ironwork looks as if it had been designed without lifting his hand from the drawing board. In his hand, the Art Nouveau more eloquent vocabulary.

movement showed an exuberant promise, but as others diluted it to a mere mood, Horta returned to the historic revivals he first challenged. Now, the principles he pioneered and abandoned are being restudied as modern architecture strives to develop a



I shall live in the hope that the day will come when an opportunity will be given to you of finishing the first temple dedicated to the sovereignty of the people, embellishing with Athenian taste the course of a nation looking far beyond the range of Athenian destinies.

A new century beckons

Upon this theme the American Institute of Architects' centennial convention will meet in Washington this month. In honor of that occasion, FORUM, as may be seen on the following fold-out pages, decided to have a little fun.

During the six-day convention, the profession that mothers the mother art will be alternately praised and exhorted by some of America's profoundest thinkers. The weighty subject matter and the splendid manner in which it will be presented will richly satisfy the profession's appetite for serious food.

So FORUM's salute to the architects is a lighthearted one: a spoofing panorama of the new century in architecture by Artist Jerome Snyder.

Simplicity and repose are qualities that measure the true value of any work of art

"Make no little plans; they have no magic to stir men's blood...

-80

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DANIEL BURNHAM

Mechanics have outrun the social and aesthetic forms, the philosophy and ideas of yesterday

FRANK LLOYD WRICHT

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'Form follows function' until you realize the form and function are one

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The things I want most to design are a grain elevator and the interior of a great river-steamboat

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While they last, additional copies of this cartoon-suitable for framing-may be obtained by writing the publisher, Ralph D. Paine Jr., Architectural Forum, 9 Rockefeller Plaza, New York 20, N. Y.



A lacy sunscreen and a sparkling skylight suggest new elegance for a common metal, and new possibilities for modern, machine-made ornament

An aluminum pavilion

In this lightweight, festive scheme for a Reynolds Metals sales office outside Detroit, Architect Minoru Yamasaki has brought back—in a distinctly modern way—some of the richness of façade and roof line that went out when the modern movement came in.

Reynolds wanted a building that would, among other things, sell aluminum, and it had a corner site on a well-traveled highway across from Detroit's huge Northland Shopping Center. In exploring his client's site and his client's product, Yamasaki hit upon several unexpectedly beautiful ways to demonstrate the versatility of a material still largely tied in the public mind to pots, pans and storefronts.

The most striking of these, of course, is the golden screen that girds the building above its open display floor—a double pattern of 10" diameter rings cut from ordinary extruded aluminum pipe, set in 5' x 13' panels and anodized a gold color in black frames. As an expression of ornament by machine, it could stimulate many other experiments. As a sun-control device, it should also pay for itself in lower cooling costs.

Handsome contrast accents for the gold screen are the black anodized aluminum covers with a slim silver stripe that clad the columns supporting screen and building, tapering in toward the top until they appear as thin spires against the sky. Crowning the building is a tall, glittering skylight, a space frame of aluminum members in pyramidal shapes like a cluster of diamonds.

As might be expected, aluminum will also appear in some of its more familiar roles: as window sash, partitions, ducts, grilles, conduit, doors, railings, flashing, furniture and in a luminous honeycomb for office ceilings (p. 138).





Great court at center of building is completely open on all sides through glass walls at main-floor level, which reveal indoor and outdoor displays, reception area and inside garden. Crystalline skylight also brightens corridors and secretary's desks on balconies above. Floor will be white terrazzo, column covers black anodized aluminum with silver stripe up the middle. GREAT LAKES REGIONAL SALES OFFICE, Reynolds Metals Co., Detroit, Mich. ARCHITECTS: Yamasaki, Leinweber & Associates ENGINEERS: Ammann & Whitney (structural) Cass Wadowski (mechanical) Henry Guthard (electrical)

Ground floor reception and display areas (plan right) are broken only by two service cores. Glass wall toward main road has an outside niche large enough to display an automobile or small boat, which represent important potential markets for aluminum. Office floors (plan above) show rooms arranged on 5' module. For visibility, the building is elevated 4' above cars in street and parking lot, still low enough to show the sunscreen mirrored in the moat.







Novel floor system uses concrete waffle slabs on a 5' square module, to which a cellular aluminum ceiling is attached directly, giving an over-all luminous ceiling for about the price of standard acoustical ceilings with spot or strip fixtures. (From the exterior the over-all luminescence will silhouette the sunscreen more clearly, too.) Movable aluminum partitions fit anywhere into the grid of ceiling channels. Air conditioning (plan right) is divided into inner and outer zones served by separate mixing boxes. Ducts for outside zone lead to a cellular sheet-metal floor slab which distributes the air evenly to slots under the full width of windows and acts as a radiant floor to help heat, cool offices.







Sunscreen is made of aluminum rings 2" deep cut from 10" extruded aluminum pipe and interlocked in an overlapping pattern. Above eye level the rings become $10\frac{1}{2}$ " deep tubes to act as a sunstop; studies show this system will keep direct sun out of offices except in winter, allowing considerable reduction in air - conditioning requirements. The screen is expected to soften sky glare, yet when office workers look straight out it will block less total visibility than an ordinary insect screen. Aluminum extrusions, lighter in weight and appearance and more easily worked than masonry or iron grillwork, could be made in a variety of other shapes such as squares, diamonds, I's or T's. In this screen the 5' x 13' panels were anodized a gold color, the most colorfast hue yet developed, and certainly one of the richest. Black, also high in colorfastness, will be used for screen frames and column covers. All anodized members were designed to be removable should reanodizing of the metal ever become necessary.



On trial for 20 years, a great reform effort has failed to outgrow its weaknesses. Now, one of its most influential proponents presents a critical reassessment and the argument for a fresh start

The dreary deadlock of

by CATHERINE BAUER

Low-rent public housing has not followed the normal pattern for reform movements in modern democratic countries. Every social experiment starts off as an abstract idea, frequently in an atmosphere of violent theoretical debate. But after it has been tried out for a while, one of two things usually happens. Either it dies off, an acknowledged failure, or it "takes" and is accepted as an integral part of the ordinary scheme of things. The original theories, meantime, become modified and adapted to actual conditions. In the US, public attitudes about social security, collective bargaining and national economic controls have all followed the classic steps outlined years ago by George Bernard Shaw: 1) it's impossible; 2) it's against the Bible; 3) it's too expensive; and 4) we knew it all the time. But public housing, after more than two decades, still drags along in a kind of limbo, continuously controversial, not dead but never more than half alive

No obituary is yet in order for the US Housing Act of 1937 "as successively [but only in minor respects] amended." It is more a case of premature ossification. The bare bones of oversimplified New Deal theory have never been decently covered with the solid flesh of presentday reality. Even among public housing's most tireless defenders, many would welcome a fresh start if they did not fear that in the process any program at all might get lost.

If the dreary deadlock is to be broken, it is first necessary to figure out what really ails the program. If it is purely a matter of selfish reactionary obstruction, we who want to rehouse slum-dwellers will just have to go on fighting until we win. But if there are inner weaknesses as well, it is high time we faced up to them.

Is the real estate lobby to blame?

Unquestionably private builders, lenders and property owners have been increasing in political power ever since the mid-thirties, when Uncle Sam rescued them from ruin. And it is equally obvious that they have been all-out in their opposition to public housing.

In general, however, their tactics have been so arrogant, and most of their claims so wild, that they have often tended to backfire. In recent years, moreover, some of the National Association of Real Estate Boards' allies (notably the National Association of Home Builders) have become more sophisticated about the slum problem, and highly vocal about the need to remedy it. The current slogans are "renewal" and "rehabilitation." But gradually it becomes clearer that Operation Fix-Up is no cure-all, and that outright clearance and redevelopment bring relocation problems that cannot be glossed over. The great national spread of antislum propaganda by ACTION (The American Council to Improve Our Neighborhoods) probably tends to favor the cause of public housing, however inadvertently.

The most serious effect of all the controversy has been more subtle. Public housing officials, federal and local, have been kept continuously on the defensive, and the neuroses that come from chronic fright and



Catherine Bauer, now lecturer in city planning at the University of California, writes of housing out of long and intimate knowledge. Her work for organizations promoting public housing, her book, Modern Housing, and her advisory services all played an influential part in the establishment of federal public housing. During its formative period, she served as the US Housing Authority's director of research and information, has been in the thick of housing problems ever since as lecturer, energetic member of innumerable committees and organizations concerned with the problem, and governmental consultant, most recently as a members of Housing and Home Finance Agency's Slum Clearance Advisory Committee. She is the wife of Architect William Wurster.

public housing

insecurity are translated into excessive caution, administrative rigidity and lack of creative initiative. Everybody tends to sit tight, clinging desperately to the beleaguered formula, instead of trying to improve it in the light of experience and public attitudes. Sporadic efforts to broaden or modify the program have usually met with as much opposition from professional public housers from opponents of public housing. Moreover, the hostility has probably tightened management controls, making "project" housing more and more institutional.

But even so, despite the millions they have spent in a vain effort to kill it, the real estate interests can hardly be held wholly responsible for the program's failure to take hold.

Solid support is lacking

If the public housing program in its present form had managed to achieve real popularity with the general run of ordinary citizens and their leaders, and above all with the people who live in slum and blighted areas, the real estate opposition would by now have lost its political force. The idea of public housing would be taken for granted, like oldage pensions or FHA mortgage insurance.

But this has not happened. The program has never called forth the kind of pervasive and persuasive popular support that oils the wheels of change in democratic countries. The lot of public housing tenants has undoubtedly been improved in many ways. But the fact remains that only a small proportion of the people eligible for occupancy (by legal definition, low-income families living in substandard homes) actually apply for low-rent dwellings in public housing projects. And of those who do, most appear to be desperate for shelter of any kind: minority families about to be thrown on the street by clearance operations, "problem" families sent by welfare agencies, and so on.

Moreover, general local support by civic-minded groups, such as one might reasonably have expected for such a program, has seldom developed. The US Housing Act has been kept alive by the earnest annual efforts of the Washington offices of national labor, welfare, veteran, municipal, civic and religious organizations, held together by the National Housing Conference and sparked by the genius and devotion of its executive vice president, Lee Johnson. But despite considerable prodding, the local branches and members of these organizations have on the whole been apathetic, sometimes lending their names in a crisis but rarely showing much continuing interest. Where there are established citizens' housing organizations, they tend to be kept going by a few devoted individuals with little general backing.

Why isn't the program popular?

This question has never been seriously investigated, but in general terms, the answer seems quite clear. Life in the usual public housing project just is not the way most American families want to live. Nor does it reflect our accepted values as to the way people should live.

In part the weaknesses are in-

herent in the physical design. As Architect Henry Whitney (see also p. 148) said in the first (and still one of the best) critiques by an experienced housing official: "The typical publicly subsidized dwelling is deficient in interior space, in outdoor privacy, and in true American residential character. . . . Families with children generally want to live in individual homes. . . . A yard, a porch or a terrace is almost universally desired." While everybody who had any choice was moving into a onestory home, the housing authorities were busily erecting high-density high-rise apartments, with no private outdoor space whatever. Significantly, perhaps, public housing is most accepted in the one American city where apartment living is also most taken for granted-New York. But even there, opinion surveys show that most tenants would prefer ground-level living if they could get it.

There are also more subtle social reasons for the lack of enthusiastic acceptance. Public housing projects tend to be very large and highly standardized in their design. Visually they may be no more monotonous than a typical suburban tract, but their density makes them seem much more institutional, like veterans' hospitals or old-fashioned orphan asylums. The fact that they are usually designed as islands-"community units" turning their backs to the surrounding neighborhood which looks entirely different -only adds to this institutional quality. Any charity stigma that attaches to subsidized housing is thus reinforced. Each project proclaims,

visually, that it serves the "lowest income group."

The resulting degree of rigid social segregation is difficult to align with traditional American ideas. And in addition, if a tenant manages to increase his income beyond a certain point, out he goes, a restriction which also results in the continuous loss of natural leadership among the tenants themselves, and a trend toward problem families as the permanent core of occupants.

On the other side of the ledger has been the considerable success of nondiscrimination and mixed racial occupancy in northern public housing projects. But even this great gain is being lost. Owing to the preponderance of minority families in the lowest income group, and in the areas slated for clearance and relocation, the proportion of minority occupancy tends to rise above the line where mixture is successful, and more and more projects become virtually all-Negro.

And finally, there is the question of management policy and practice in itself. Because of legal requirements, high densities, problem families and sensitivity to continuous political attack, local authority landlordship tends to be rigid and heavyhanded, with all kinds of rules and regulations unknown in ordinary private rental management and unthinkable in a pattern of individual ownership. Sometimes special welfare services are provided which, under these peculiar conditions, may be admirable and necessary. But even at its best, this type of concern by one's landlord seems paternalistic in American terms, and hardly adds to the popularity of project living for normal families.

These are the issues that keep coming up in critical analyses by housers, in conversations with all kinds of people all over the country, and in the few random studies by social scientists. And alongside these criticisms is the patent fact that, with all its drawbacks, the program is so expensive. I doubt that the fact of subsidy in itself is very important in the general public reaction, or in any stigma that may attach to public housing occupancy at present. With all their profound and welljustified faith in private enterprise, Americans have never been purists

in the matter of accepting public aid where necessary to achieve something they want. The idea of subsidy is part of the American system, whether for shipping or public education, irrigation projects, redevelopment schemes or housing. Had we not enjoyed a steadily rising market, the FHA-VA system of mortgage aid would have cost the taxpayers far more than the most tremendous public housing program ever envisioned. And certainly no stigma attached to accepting the costly aid of HOLC. But subsidies must look reasonably sensible in terms of value received. And the fact that high-rise apartments (which no one likes very much anyway), erected by local housing authorities, tend to cost more than the price of a modest FHA-insured tract house, even allowing for a substantial speculative profit, just does not look sensible on the face of it. So the unattractive aspects of the program cannot even be justified on the grounds of economy.

And finally, with all the hullabaloo and all the expense, the program still does not meet even the most obvious immediate need of families displaced by clearance or renewal operations, let alone the need in outlying areas for families whom FHA cannot serve. The legal income limits are so low and the other limitations so rigorous, including the territorial jurisdiction of municipal housing authorities, that only a small portion of the need can be met through public housing aid.

Premises: true or false?

How do the assumptions that shaped the public housing program stand up today under quite different economic conditions and in the light of more than twenty years of experience?

Clearly the basic premises are as sound today as they were then. Even after a long period of high prosperity, there are just about as many insanitary, congested and dilapidated homes in the US as there were in the middle of the depression —probably with more people living in them! And today almost everyone recognizes their existence, and admits that these conditions must somehow be remedied. It is also as *continued on p. 219*



1. A showroom by Laverne-finished with surprise and subtle sales appeal

Two artful interiors

2. An apartment by Lustig-remodeled with invention and delicate craftsmanship



1. The showroom—an artful place for selling

The corridors of Chicago's Merchandise Mart are the Midwest wholesale buyer's mammoth "downtown"—the biggest "shopping center" in the world. The need to provide an enticing sales atmosphere is as strong here as it is on Main Street, Anywhere. To these corridors recently came a showroom stretched in space between a white floor and a white ceiling, marking the entry into the Midwest market of Laverne's prestige line of wall coverings, fabrics and contemporary furniture.

The white floor and ceiling, combined

with low-level incandescent lighting, give the room a quality of suffused warmth and light—in itself the basic design device. The open sweep of the room is deflected first on the right, just inside the entrance, by a chrome-bound plane of clear glass; then on the left by a beaded curtain overlaying a blue-gray wall (photo right, below).

At the rear, the space gives way to a Piranesi vision of Rome (photo, below) —the *pièce-de-résistance* of the room and an enticing glimpse of the line of wall coverings it displays.



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White curtain of clay beads (far left) conceals fabric display on adjacent wall, reveals blue-gray wall behind. Office and conference space is behind this wall. Piranesi wall mural at rear of showroom is one of two in Laverne line. In the foreground is the sculptured back of a Laverne chair.

Sliding panels display wall coverings in large areas, allow customers to see how they would look on a wall and to compare several possibilities. "Trapeze" in ceiling pulls down for fabric display. Photo is taken from blue-gray rear wall looking toward glass panel and receptionist's desk at entrance.



Wall coverings and fabrics in Laverne line are commissioned from designers such as Gyorgy Kepes (above) and Alexander Calder (right). The firm was founded in 1934 by Designers Estelle and Erwin Laverne, who designed the new Chicago showroom.





Fabrics stretched on folded planes provide a convenient index to line, and an interesting wall pattern as well. Furniture display is used by customers selecting fabrics and wall coverings.



2. The apartment—an artful place for living

The blindness that marked the last year of Designer Alvin Lustig's brief and brilliant career was surely the ultimate test of his genius and courage. The Wilheim apartment in New York, shown here, is one result of that test.

Lustig saw the apartment only once before he undertook the job. That view was so discouraging he recommended that his clients look for another apartment, but the lease was already signed. So he redesigned the space in his mind's eye, using his wife's trained hands to help him put the concept on paper.

The crucial aspect of his design problem was that the apartment was a collection of separate, old-fashioned rooms. None of the partitions could be removed; no structural changes could be made. The pictures show how he transformed these separate rooms into free, flowing, modern space, using color and texture, artful design and sensitive craftsmanship.



 Study features a eighten factors
 fantastic Persian

study features a fantastic eighteenth - century Persian family rug, woven over a period of 100 years with the visages of its leaders. Framing of steel bar-stock bookshelves is extended across ceiling, filled with white-painted expanded mesh to obscure cut-up ceiling.

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Focal point of the entire apartment is a sculptural arrangement of four joined segments of polished brass, attenuated between a teak base and a ceiling spotlight in the foyer. It also marks the corner of the dining space (right) in what would otherwise be a typically amorphous diningfoyer. Insert strips in white vinyl floor are made of alternate pieces of gray and black.

In the living room, slim steel bar-stock frames a support for a teak bench. It is integrated with a shielded striplight and capped by an opal glass globe. Thin slices of steel tubing are stacked in a steel frame beyond to separate lightly the living room from dining-foyer. This picture is taken from in front of the fireplace (see p. 143).



PHOTOS: (ABOVE) LOUIS REENS; (OTHERS) ALEXANDRE GEORGES

Wall light over bar cabinet in living room (left), like a child's wind-blown pinwheel, typifies Lustig's playful inventiveness. Long line of shelf and light in bedroom (right) enlarges room visually. Luxurious texture of rug is amplified by simplicity of room as a whole. Despite the interest of Lustig's details, they never overwhelm the whole.







You don't need to sweat the land to work it

This photo, taken across an alley in Baltimore, shows precisely why row housing has a bad name. It also raises the question of why people in Baltimore-and elsewhere-can conceivably prefer the monotonous row house, with all its other usual faults, to a light, efficient apartment. A second glance at the photo helps answer that question too: the obviously pampered rose bushes, the awning-shaded back stoops, the place to hang clothes, the fences themselves which imply a chunk of independence, however tiny.

Row housing has a deservedly bad reputation because it

lends itself so readily to the vice of sweating the land, as in the scene above. But like many vices, this one is an exaggeration of a virtue: row housing, kept on the good side of exploitation, is ideal for working the land (as suggested in the sketch at the left). Few parks, few playgrounds, certainly no landscaped lawns, count for so much to the city family or are used so intensively as the row-house yard. No other city land serves such a fantastic variety of digging, gardening, repairing, playing, chattering and plain sitting, or can be so subtly responsive to the needs of children and





neighborhood as the row-house yard.

Where is the dividing line between working and sweating the land? With ingenuity, densities for row houses or mixed row and high rise can be greater than often supposed. A table by Architect Henry Whitney pegs feasible maximum densities for various combination schemes (PHA room sizes):

% units in	No. units per
high rise	net acre
0	28
40	42.5
50	50
60	57
65	63

A much misused and architecturally neglected building type begins a respectable comeback because it promises new answers to urban decay

Row houses for cities

Off and on during the past 20 years, row housing has been fiddled with by good designers, but usually with an inherent implication that row houses are something for which to apologize. Thus alternate houses and their dooryards have been checkerboarded back and forward to negate the row; or for superblock schemes, the whole row has been set edgewise to the street instead of bordering it. Meantime the people who build and buy row houses have stuck almost unanimously to the old formula: a solid row of more or less identical houses up against the street with a yard behind and an alley behind that.

Maybe they have something there. The designers of the schemes on the following pages, along with such other first-rate urban designers as Oskar Stonorov and I. M. Pei, think the old basic formula-greatly improved functionally and visuallydoes indeed have something important for city families and cities themselves. The big rediscovery is that a basic scheme dating from pedestrian days in Pompeii and carriage days in Philadelphia, turns out to be an excellent answer to the automobile. If the row houses are placed close along the street (or along an enlargement of the street for parking), and all vehicles are kept to the street side, then all the land for yards, garden and play can be concentrated on the other side of the houses, and the old vehicular alley can be converted to a pedestrian walk or commons. This pattern effectively segregates vehicles, protects other activities and creates a kind of walled space with delightful possibilities. One of the great advances in new row-house planning is recognition of what this principle means to floor plan (pp. 150-153).

Some of the other basic advantages now coming in for appreciation are summed up by Architect Henry Whitney: "This has been the classic house for people living in groups because it contains more essentials and fewer extravagances and superficialities than any other type. As against the detached development house, it cuts frontage a third and therefore the costs that run with land-utilities, pavement, services. This can mean the margin between municipal solvency and bankruptcy, and it also means that residents can live a third nearer the center of town. The middle-income flight to the suburbs results primarily from a simple human necessity-the need for closer relationship between the indoors where the mother is doing the housework and the outdoors where her children and the neighbors' are playing. Highrise apartments cannot do this; row housing can. The tragedy is that it has done it so badly in the old city."

Noting that a 16', three-bedroom row house in Philadelphia costs about \$12,000 against \$18,000 for an equivalent detached house, both on 100'-deep lots, a Baltimore redevelopment official comments: "Redevelopment means getting stable middle-income families back in the city. Stable families are those with children. They want yards. Redevelopment cannot get far, or mean much, without that market. After the highrise cream of the first projects is skimmed, it will be obvious in many cities that the big redevelopment job is row housing."





Block plan interlocks vehicular cul-desacs and interior gardens which are formed from small dooryards and larger play common. Houses fronting on street are split level, have raised rear terraces as in view above. If houses indicated by shading are omitted, block has central greenway, as in sketch below. Outsize houses at row ends are small-family double houses, for owner and tenant. Net density of plot plan shown is 21 units per acre; with greenway, 18.7; houses are 18' wide.






Expandable attic scheme with 27' front has room for carport or garage at front.

Row houses for private builders in city redevelopment

The schemes here, and a great variety of others, have been developed by Architects Wright, Andrade & Amenta* for the Philadelphia Redevelopment Authority, as guides to private builders in the ambitious Eastwick project (AF, Sept '54). Behind these studies is also a great deal of policy and site thinking by Architect Henry Churchill and Harris-Dechant Associates, and the Philadelphia Planning Commission. Builders, encouraged by the planning commission, are already using a plot plan similar to that shown here in private developments at the city fringe.

All the Eastwick schemes illustrate well the mark of a good row house: close relationship of interior planning to exterior land use. Probably the most versatile scheme is the 18' x 33' split level that is suitable to densely built-up streets, includes garage, gives excellent supervision of yard from kitchen, and is a triumph of economical planning. In the scheme with the expandable attic under a steep pitched roof, the extra cost of site improvements because of the 27' frontage is largely offset by the economical minimum-masonry wall construction and rough-finished additional bedroom space. For the back-to-back houses, a traditional low-cost Philadelphia row type, with dark, unventilated interior rooms, has been completely rethought; every room but bath has outside exposure and, with the help of an exhaust fan, decent ventilation. This 20' x 28' unit should be very economical to build and maintain.

The complete Eastwick row-house study will shortly be published in book form by the Philadelphia Redevelopment Authority; it is almost an encyclopedia of what can be done with the modern row house.



Back-to-back scheme with three party walls is lowest cost, most compact; it needs exhaust fan for summer.

^{*} Associated with Robert Geddes and Kenneth Day, architects; and Ian McHarg, landscape architect.





Row houses for low-income public housing

This scheme, a research study prepared for the Baltimore Housing Authority by Architect Henry Whitney of Tippetts-Abbett-McCarthy-Stratton, engineers, represents some of the freshest and most constructive thinking about public housing design in many a year. The object was to lessen, rather than repeat, usual public housing faults (see p. 140). Of the 559 units proposed for the site, almost two-thirds are row houses with individual, fenced yards. This eliminates most of the indoor and outdoor common areas which make the servicing, maintenance and policing of public housing so expensive and paternalistic. Socially, it gives tenants the status and responsibilities of normal householders, does not set them off in outlandishly different quarters from their nonproject neighbors. The scheme also permits flexibility in site planning." Net density for the site studied is 35 units per acre, against 51 for an orthodox scheme with 83% of units in highrise buildings. The apparent greater "efficiency" of a high-rise scheme, dear to the hearts of PHA statisticians, could be obtained only at the expense of eliminating good existing housing and ignoring dilapidated fractional blocks because of inherent high-rise inflexibility.

The floor plans for the scheme, ranging from one- to five-bedroom units, are most ingenious. Note, for instance, that the corners on the garden side, which fall heir to the largest yards, house the big, five-bedroom families. Corners on the street side, least favored by the outdoors, are shared by a two-bedroom unit with porch and fenced play plot and a one-bedroom flat with balcony. In the two high-rise buildings, 75% of units are one-bedroom; families with school children would be on the ground



Serpentine scheme puts parking courts off street, pedestrian-linked yards on interior, gives biggest families biggest yards.



Row houses for pockets of blight

For the proposed Old Northtown renewal project in Chicago, Architect Harry Weese has designed a variety of row housing to go into the neighborhood's pockets of dilapidation and blight. The house at the top is a "double maisonette"-one duplex atop another, a scheme very successful in England but little known here. Access to upper duplexes is along a gallery with stairs at ends of the row. The house is 21' x 30', would sell at about \$21,000 per unit. Two-story, three-bedroom row houses are now the backbone of the row-house market; this singularly attractive version is 17' x 32', would sell for about \$20,000. Both these types appear in the portion of the neighborhood model shown below. A third version, not shown, is an elegant three-bedroom. three-story, 14' x 44' with the garage on the ground floor.

The project's sponsor, Arthur Rubloff, expects this to be the first area renewed under Chicago's unique Neighborhood Redevelopment Corp. law which provides no land cost write-down but grants powers of eminent domain if a plan is approved by owners of 60% of the property in a redevelopment district. Existing apartments at rear in photo below, now owned by Rubloff, represent 1931 pioneer renewal experiment by Marshall Field. They have helped the old inner-city neighborhood hold its own until recently.

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PHOTOS: HEDRICH-BLESSING
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Duplexes, a double (above), a single (below), provide two degrees of density in Chicago renewal project.









Easing steel

Shifting factors have appeared which presage an easier supply of structural steel for the last half of the year



DEMAND FOR STRUCTURALS

Key to the tightness of the structural steel market is reflected in last year's 75% jump over past 12-months' average backlog while shipments were rising only 8%.



To meet the burgeoning demand for shapes, steelmakers have boosted capacity fast in the past year, and more is yet to come. Now, the rate of growth of structural capacity is running far ahead of increase in new ingot production facilities.

For the first time in two years, the construction industry has begun to sense a break in what has been one of the most obstinate shortages ever to appear in an economy of abundance: the chronic and at times critical scarcity of structural steel. Intermittently tight since 1950, persistently so since 1954, structural supplies have long been a rub to US building, and as late as the start of this year the prospect was for little relief and no real catch-up on orders much before 1959. But in the last few months an unexpected turn has become noticeable in steel, one that already has revised some of construction's plans for the future. Gradually, but unmistakably, structurals have started to ease.

In six key cities, where FORUM talked with leading contractors last month, it found an all but unanimous verdict on structural supplies: whether in large or small tonnages, heavy structural shapes are now decidedly easier to get than they were six months ago. Among fabricators the report was much the same. Individual companies, which were quoting time lags of up to 15 months on large tonnages a year ago, are now offering deliveries in eight to nine months.

As yet, none of this makes a strong enough case to suggest an end to the steel shortage (only one builder of the many interviewed saw any chance at all that the pinch might be over this year). Nevertheless, it does point to a revision of some of the more pessimistic forecasts that were made last fall. Barring a marked speed-up in the federal highway program, which appears unlikely, there now seems a good chance that structural supplies will continue to ease over the third and fourth guarters, and that by year-end the fabricating industry's backlog of orders-3,436,042 tons on March 1-may be substantially whittled. And while this is not likely to mean any sizable upturn in construction volume - cancelations may more than outweigh any increase caused by projects getting underway ahead of schedule-it does indicate a more comfortable and flexible supply situation than seemed possible a few months ago.

What has caused the turn? The forces behind the easing of struc-

tural steel actually stem from a number of shifts that have been taking place on both the supply and demand sides of the market. Of key significance in the immediate picture is the fact that output of the domestic fabricating industry has gradually been rising. Despite the steel strike last year, shipments of fabricated structurals in 1956 finally moved above the 3 million ton mark to an all-time high of 3.2 million tons. Meanwhile, imports of structural steel, some of it fabricated, skyrocketed last year to almost 500,-000 tons. All this has been happening while demand, to some extent, has been tapering off, reflecting an actual drop in volume in some construction categories, notably stores, restaurants and garages, and a shift in others from steel to reinforced concrete or other materials.

Along with these factors, two longer range forces have been making themselves felt. And though these two forces—one involving a rise in steel-making capacity itself and the other an initial lag in the federal highway program—so far have had only limited impact on the market situation, they are of overriding importance in the brighter outlook that now seems in store for the rest of this year.

Boosting capacity

There is no question that the bottleneck in structural steel supplies has never been at the fabricating level, but at the steel mill itself, in the basic capacity for rolling structural shapes. Whatever the reason for this-and the industry hotly denies that the low profit margin on structurals has anything to do with it-structural facilities were all but passed over in the industry's expansion through the early fifties. Rated capacity for heavy structural shapes, which stood at 5.85 million net tons in 1951, actually declined by the start of 1955 to 5.78 million tons. Against this, steel's total rated capacity for ingots and castings shot up 20%, in the same period, and its plant for all hot-rolled finished products increased 15% between 1951 and 1954.

Though there was some gain in structural capacity in 1955, it was not until last year that a marked change began to show in this area.

Sparked by an addition of 840,000 tons at Bethlehem Steel's Saucon Division, capacity climbed to an estimated 7 million net tons as of the start of this year. This radically changed the outlook for steel shipments. On the basis of capacity already in-and the expectation that additional tonnage will be available before midyear at US Steel's South Works in Chicago and at other plants-estimates of this year's volume of heavy structural shipments from the mills climbed as high as 6.5 million net tons, compared with 5.3 million tons shipped in 1956. (So far the cutback of steel operations, which by early April had produced a declining production rate for five straight weeks, appears to have had no major impact on structurals, either in terms of decreasing output or diverting more ingots to the structural mills.)

At the start of this year, the American Institute of Steel Construction, which speaks for the fabricating industry, estimated that out of this new capacity shipments of fabricated structural steel for the construction industry should rise to more than 3.8 million tons in 1957. (Historically, about 63% of steelmill shipments of heavy structural shapes has wound up as fabricated steel shipped to builders.) Although this forecast seems high, it need not go much beyond 3.5 million tons to meet the needs of this year's building as forecast by FORUM last September. Computed on the basis of anticipated hikes in plant construction, highways, offices and warehouses which together use about 80% of all structural steel, requirements should come to about 3.5 million tons for 1957*. Any shipments above that should trim the backlog.

But when FORUM made its estimate of 1957 construction, it figured on a 16.5% rise in the volume of new highway work. Though it is still too early to make definite revisions in these figures, it seems quite clear that the federal road program, which was counted on to spark much of the rise, is not going to pick up speed at the rate it was supposed to. The Bureau of Public Roads had estimated that the federal program would take about 1.8 million tons of structural steel this year on top of normal highway work. But if this figure is reached now, it will be a surprise. At the moment, it seems likely that the rest of construction will be picking up large parts of the tonnage, and that the backlog will be smaller for it.

A matter of degree

How much the diversion from roadbuilding and the general catching up of supply with demand effects individual builders varies in different parts of the country. Signs of the ease in structurals are noticeable in most big cities, but not in the same degree. In Houston, for instance, builders still report jobs being held up because of the stortages in shapes, and say deliveries on large shapes run 12 to 15 months, compared to six to nine months for most other cities. Imports of foreign shapes at Houston were up 60% last year over 1955, according to one authority, and there is an active gray market for badly needed structurals. But one of the city's biggest builders notes that "the shortage isn't so bad as it was six months ago . . . and it will probably be over in another six months."

In Chicago and Cleveland, the shortage has hurt, but now Windy City builders have noted definite signs of ease, and one Cleveland contractor says the market for many shapes has improved in the past six months. In both cities, as well as in Denver, where delivery of wideflange beams is now only five months compared to a year not long ago. there is strong feeling that how much the structural market eases for the rest of the year depends on the auto industry. If auto production goes strong through the summer and fall, the pinch in structurals could still hurt, because steel makers will concentrate on higherprofit sheets.

In Pittsburgh itself, the structural shortage is symbolized by the reinforced concrete construction of the new Hilton hotel there. Steel executives themselves have to look further ahead for any real signs of a substantial easing in structurals: "In 1959," says one steelmaker, "we'll have to get out and really sell steel —we'll start 1959 meeting every demand we can anticipate now."

^{*} Based on an equation developed by Nathan H. Schein of the US Dept. of Commerce.

Technology

The new adhesives

Pioneered in the air, they have a vital part in modern architecture. Their potential has only begun to be recognized

HONEYCOMB SECTIONS of B-58 are bonded within picture-frame panels by high-strength adhesive. Skin is adhesive-bonded to panels.



During the past year, adhesives have made dramatic news in the aircraft industry. The most significant announcement came last summer, when Convair proclaimed "what may be the greatest major development in airplane construction since the all-metal airplane": use of sandwich panel construction in the primary structure of the B-58, the first supersonic bomber. The secret was two new adhesives developed by the Shell Development Co. and by B. F. Goodrich Co. to reduce bolting and riveting. A plane's primary structure comprises areas which carry heavy loads, where panel failure would endanger the aircraft. The B-58, which has been flying since November, weighs less than a comparable plane of riveted construction - easily 500,000 rivets were replaced by the adhesives-and has at least four times the fatigue resistance of a riveted plane, according to the engineers.

In building, adhesives have brought many changes during the past six years. And for the future, there seems to be great building potential for these products of chemistry. On the basis of current trends in two kindred industries—aircraft and automotive—whose technological shifts in the past have proved to be building bellwethers, the future of the adhesive-bonded panel looks quite promising, for both these industries have become great adhesives users, particularly within the past three or four years.

The adhesives are a prolific family of substances, some mineral, some vegetable and some animal, which are so unlike one another as to command the most comprehensive genealogy. There are adhesives derived from natural gas, others from natural rubber, and occasionally, though of less importance since the recent rush of the synthetic compounds, there is the adhesive whose



IN FLIGHT, adhesives actually increase fatigue resistance of plane. At least 500,000 rivets were eliminated by B-58's designers.

progenitor was a heavy-footed horse.

The major producers of adhesives, by their own diverse origins, testify to the disorganized way in which this industry has developed. Of the three largest firms, one specialized in the production of sandpaper, and still does; another, linoleum; another, rubber. Each, in the beginning, produced a material which had to be made to stick to something. Since there was no adhesives industry to speak of, each went about producing its own adhesive compounds. Minnesota Mining & Mfg. Co., largest company in the field today-and still a major producer of sandpaper-made its first commercial adhesive product for the automotive industry: a masking tape which was used to cover certain areas of the auto body during paint spraying. Armstrong Cork Co., with its line of flooring and ceiling materials, still is its own best adhesives customer. B. F. Goodrich Co. became a producer when it had to develop a substance which would stick rubber pads to automobile running boards.

But the complete story of the adhesives' evolution must include still another element, the restless, sprawling, inventive chemical industry, which has introduced the vast variety of raw materials-with long, complicated names: the polysulfides, the chloroprenes and phenolics, the elastomers-which happen to want to stick to things. Often, these chemicals were developed for a purpose quite different from that of adhering. Many, in fact, were not used as adhesive compounds until many years after their development. But today there are scores of them making up the very fiber of the adhesives industry. And each year come new ones which blend with those which already exist to spawn still more compounds.

With all of the research that has gone into the development of these

hundreds of new adhesive compounds. yielding an ever increasing procession of chemicals that will stick to an almost endless variety of materials, there still remains an unanswered and quite basic question: what makes things stick together? There is no firm answer, only a trio of possible answers. One theory holds that the action is chemical, that strong chemical bonds provide the link. Another holds that the action is electrical, that the molecules of the adhesive exert an electrical force which creates the intermolecular bond. The third theory is that the adhesive compound flows into the tiny pores of the material to be bonded and that a mechanical interlocking takes place when the adhesive hardens.

Sticky controversy

In the building industry, where the adhesives now rank with riveting, welding and fastening, there is controversy concerning this newest joining method. There is controversy over which adhesives stick best and, indeed, whether the adhesives should be used at all in such building components as the curtain wall panel.

For the modern sandwich wall, where adhesives have the important assignment of integrating metal facing and insulating core, there are dozens of available materials, each with different properties. For curtain wall assembly, where metal and glass must butt together, there are still other adhesive compounds, quite different in character, which will grip tightly to metal, glass or rubber gasket.

There are new adhesives, for example, like the epoxy resin compounds, with exceptionally high shear strengths—as high as 7,000 lb. per sq. in.—and great resistance to temperature—from -40° F. to 500° F. And there are others, like certain of the contact-bonding neoprenes, which have more modest properties. (For some, the shear strength of 400 psi. dwindles to 100 psi. at around 180° F.) In between, there are adhesives by the dozen which are inferior to the epoxies in strength, but superior in another way; superior to the neoprenes in heat resistance, but inferior in another way.

Which are the superior adhesives? There is no adhesive, unfortunately, which is truly superior to all others, although the search for an all-purpose adhesive has been carried on for some time. The use to which the adhesive is put will determine the properties which it should have: its bond strength, its aging characteristics, its resistance to ozone and oxygen, its resistance to heat, its resistance to water, and a number of other properties. It is the relative importance of each of these properties that is one part of the debate: which adhesive is proper, which is not? For just about any installation, there can be as many as a dozen different adhesive compounds which must be considered. The selection of the proper one can be as vital to the success of a building as the proper selection of the materials to be bonded, for the wrong design, or a faulty installation, can make even the properly chosen adhesive compound misbehave.

These are facts which have been learned, often by bitter experience, since 1948 when adhesives began to be used in curtain wall assembly. One of the first buildings of the General Motors Technical Center used some of the earliest adhesive-bonded panels, and because of limited experience in this type of construction, some of those panels failed. The core material in the Tech Center panels turned out to be moisture-absorbent. In a short time, the adhesive-bonded core pulled away from the panel face and many panels had to

CURTAIN WALL ADHESIVES

Туре	NEOPRENE-RUBBER	VINYL-PHENOLIC	NITRILE RUBBER	EPOXY RESIN
Description & method of application	Elastomeric type, made of synthetic rubber, resins, and other compounds in a solv- ent medium. Thermoplastic with some thermosetting character- istics, if cured. Applied by spraying or roll- coating. Usually heat-sealed through pinch rolls or presses. Occasionally heat cured.	Phenolic resin base modified with vinyl resins. Must be heat cured.	Both thermosetting and thermoplastic types. Usually heat cured, sometimes cata- lyzed to cure at room tem- perature. But heat curing is needed to get same quality as with neoprene-based ad- hesives.	Base is thermosetting resin. Need catalyst for curing. Must be handled very carefully because some cata lysts can cause skin irritation. Cer tain types will give a thermosetting bond at room temperatures withou heat. Heat curing gives off no gase ous by-products which frequently result when other types are heat cured.
Tensile-shear strength	400-1200 psi.	2500-5000 psi.	Up to 4000 psi. if thermo- setting; 400-600 psi. if ther- moplastic.	1,000-7,000 psi.
Heat resistance	Retains 100-400 psi strength up to 180° F.	Satisfactory up to 180°-200° F.	Thermoplastic: 140-200° F. depending on load Thermosetting: up to 500° F.	100-1250 psi. at 180° F. depending or compounding and curing conditions
Water resistance	Excellent	Good	Good	Excellent if heat cured and com pounded with phenolics. Medium to poor if only air cured
Peel strength	20-50 lb. range	10 lb. range	50-100 lb. range	5-35 lb., depending on compounding
Creep: resistance to movement	Fair	Good	Good	Good to poor, depending on com- pounding.
Most common uses	Aluminum to paper honey- comb Aluminum to plywood Porcelain enamel to foam glass Porcelain enamel to fiber- board Steel to paper honeycomb Plywood to steel structures Gypsum board to steel	Aluminum to alumi- num honeycomb Aluminum to paper honeycomb Magnesium to alu- minum honeycomb Magnesium to paper honeycomb	Aluminum to paper honey- comb Porcelain enamel to fiber- board Porcelain enamel to paper honeycomb Polyester skins to metal honeycomb	Metal to metal, including: Aluminum skins to aluminum hon- eycomb Aluminum skins on paper honey- comb



ALUMINUM HONEYCOMB PANELS, adhesive-bonded, are tested under quarter-point load. Test measures deflection versus load.

be replaced. The immediate effect was to damage the reputation of laminated panel wall construction. Because of the Tech Center experience, and similar experiences in other buildings, some architects and panel makers contend that panels should be mechanically assembled-that is, panels should be attached to panel core by welding, bolting or another fastening method rather than by adhesive bond. Which paneling system is better is still somewhat conjectural. Good panels, and bad, have been made both ways. However, a number of water-resistant adhesives have recently been developed, especially for

curtain wall construction. Also, the sharp swing to adhesive bonding in the aircraft and automotive industries should influence the trend in building.

The adhesives family

With hundreds of compounds to choose from in bonding panel face to insulating core, how does the nonchemist, whether he be architect, engineer or panel maker, make a good choice? He begins, most likely, by learning that there are four basic types.

Neoprene rubber base. The most widely used curtain wall adhesive has a neoprene rubber base. It is the easiest to apply and, usually, the most economical. Also, it provides a more flexible bond than the other adhesives, an important consideration where vibration and shock are involved. It is capable

EDGEWISE COMPRESSION TEST indicates strength of skin, core and adhesive. Machine can apply 120,000 lb. in compression.



of bonding a wide variety of porous and nonporous surfaces: aluminum to plywood or to paper honeycomb; porcelain enameled metal to foam glass, fiberboard or cement asbestos board; stainless steel to paper honeycomb; plywood or gypsum board to -steel frame. Its limitations: creep strength is low; heat resistance is only fair, though adequate for many building applications.

Vinyl phenolics. Probably the major use of these adhesives in building is in the bonding of aluminum sheet to paper honeycomb. Generally, the tensile shear strength of a vinyl phenolic bond is quite high, 2500 psi. to 5000 psi., which gives good load-bearing properties to a panel. The presence of the tough but brittle phenolic in the compound gives it this strength; the vinyl is added to temper this brittleness, adding necessary flexibility. The most serious limitation: strength is high only up to 180° F.

Nitrile rubber base. Adhesives of this type have not been widely used in the building field, mainly because they are relatively costly to apply. To achieve the same properties as one of the neoprene-based compounds, a nitrile adhe-



STRENGTH OF ADHESIVE is measured by peeling panel skin away from core. As skin wraps around drum, peeling force is recorded.

sive must be heat cured under pressure after application. Like the vinyl phenolics, its most important use in building is in bonding aluminum to paper honeycomb. It is also used to bond stainlesssteel veneer to steel in elevator doors.

The epoxy resin compounds. These are the newest, most versatile and most expensive of the adhesives. Because they can bond to a wide variety of metals, including the standard building skin types as well as many of the aircraft metals, such as titanium and magnesium, they are regarded as the most promising of the adhesive compounds. Also, the epoxies are excellent adhesives for bonding metal to a honeycomb core, whether the core is aluminum or paper, because they readily form a bead of adhesive on the edges of each core cell, thus increasing the contact area between core and facing. However, there are limitations. Their cost is high -\$20 per gallon, four or five times that of a standard neoprene adhesive; however the epoxy compound is almost 100% usable because, unlike some of the other adhesives, there is no volatile solvent to be eliminated or lost. The epoxies are more difficult to apply-a catalyst, which usually irritates the skin, must be mixed with the epoxy before it is applied.

The sealants

In addition to the question of which adhesive to apply to a panel as-

sembly, there is the equally important question: how to seal the building face. The sealants are a smaller group of compounds, though there is one general type which has had a vital part in establishing the acceptability of the metalglass curtain wall. This is a class of chemicals known as the polysulfide liquid polymer sealants, discovered quite by accident in the twenties when a Kansas City chemist was experimenting to find a cheaper antifreeze solution. In the building industry, where the polysulfide liquid polymers have been used for about four years, they are commonly known as the Thiokols. (Thiokol Chemical Corp. is sole producer of the basic chemical.) To produce a calking compound, the chemical must be blended with a second ingredient, such as carbon black; at the site, an accelerator is added. At normal temperature, it changes composition, usually within 24 hours, from a viscous liquid to a rubbery substance which adheres to glass, wood, metal and several other materials, and is little affected by ozone, sunlight, oxidization, weathering. As a curtain wall sealant, the polysulfide liquid polymers are generally regarded as extremely able materials. They have limitations, of course: tear resistance is only fair; abrasion resistance is poor; pot life is short, usually averages 6 to 8 hours; it is difficult to apply. Futhermore, there is now a rather extensive variety of Thiokol compounds, produced by a dozen-or-so companies, with properties which show sufficient variance to indicate that caution must be taken in selecting the proper one.

The traditional curtain wall sealant, which can be one of a number of vegetable oil based compounds, is still dominant, of course, because of its relatively low cost, including installation cost about one-sixth the cost of one of the polysulfides—and, too, because it is perfectly suitable for many installations. In time, of course, if it is exposed to the atmosphere, it dries out. Thus, it must be used in quantity if it is to have acceptable aging characteristics.

The polybutene tapes are another type of sealant—superior to the vegetable oils in that they do not dry out—



SEALING THE WINDOW: conventional technique (left) uses low-cost compound with more effective polysulfide for a critical point, but

water still gets in. Better technique (center) combines three sealants. At right, neoprene gasket and pressure stops replace compound. which derive from the synthetic rubber compounds. The chief limitation is the fact that the sealant retains its stickiness in air, thus making it an annoying dirt collector. Also, the fact that the tape is of predetermined size limits its effectiveness, because tolerances within the channel must be held within narrow bounds if the tape is to provide a satisfactory seal. Often, all three of these sealant types are used in combination, providing a sealant system which uses each to advantage.

On a number of recent curtain wall installations, the architects have used neoprene-rubber gasketing, rather than one of the sealant combinations. The main advantage is that glazing is faster —no gunning required—and cleaner. However, pressure stops at all points must be held within limited tolerances, for the gasket is of fixed dimensions; if tolerances are exceeded, trouble could occur.

For the future, chemists at General Electric and Dow Corning are experimenting with a silicone rubber calking compound for exterior building construction. At present, it is not known whether this new sealant will have properties which are superior to those which already exist.

One point concerning all types of sealants: the sealing system which is finally used must be determined early in design, for the joint detail will be determined in large measure by the type of sealant, or sealants, to be used.

Trouble at the joint

The development in modern architecture of the thin curtain wall has accentuated the importance of these new chemical compounds and, equally, the importance of their proper application in building design. Looking back just a few years, to the first of the "allglass" buildings-such as Lever House and the United Nations Secretariatwe see how far our architecture has come in solving one of the major problems of contemporary design. The problem, of course, is the leaky joint, a troublesome consideration in virtually every design-old or new-but particularly troublesome to the architect who chooses glass and metal for his wall, rather than brick and mortar.

The new compounds have not entirely solved the problem, but their very availability has given the architect a means by which he can begin to find a solution. To use these new sealants and adhesives in a proper way, the architect now finds that he must become part chemist, in addition to part engineer, part psychologist, part biologist, and all of the other parts which total to make a good architect. An old bonding technique using new adhesives is moving wood back into major buildings

Laminated timbers

Under the impact of steel shortages and high prices, glue-laminated timber construction has had a phenomenal rise of close to 500% in the past two years. Catching on during the Korean war mainly in church construction—where some 75% of all new building is now of the huge, warm-textured wooden arch-and-beam typelaminated timber is moving rapidly into larger and larger buildings: sports arenas, warehouses, airports and other commercial and industrial structures of imposing size.

In the last year alone over 100 million bd. ft. of lumber went into laminated product, made up by well over a dozen major fabricators. In the same year nearly a dozen large laminated timber structures went up, ranging from a Canadian highway bridge with two continuously laminated girders each 103' long to the Westchester County Airport with three huge timber bowstring trusses set end to end to form a hangar 750' in length. Perhaps the most spectacular of these struc-

SPORTS ARENA at Commack, L.I., is supported by 12 arches 240' long, spanning 17,000 sq. ft., to house ice rink bigger than Madison Square Garden's, putting it among world's largest clear-span wood structures. Architect: James Van Alst. Timbers: Unit Structures, Inc.



tures, some of which are shown on these pages, are two sports arenas which are almost neck and neck for the title of being the largest clear-span, wooden-timbered structures in the world. One is a jai alai court at West Palm Beach, Fla., supported by 12 timber arches with a span of 242' and a rise of 74'; the other is an arena at Hempstead, L.I., formed by ten timber arches with a span of 250'. The arches, laminated by Timber Structures, Inc., probably the largest fabricator in the field, are 9" wide, 26" to 56" deep, weigh about 15 tons each and required 12 flatcars to move them to the site.

Glue-laminated timber, which differs from plywood in being made up of short cut lumber of varying grades bonded



FIELDHOUSE for Montana State College is surmounted by huge web dome of laminated timber arches and purlins, 90' high at center,

spanning a clear 300'. Architects: Willson & Berg, Bozeman, Mont. Timbers: Timber Structures, Inc., Portland, Ore.



together in parallel ply, has been known in Europe since 1904. Its renaissance in the US is due mainly to development of more stable, waterproof adhesives (p. 156) and new bonding and mechanical fastening methods which allow design of ever larger members. Laminated beams equal in strength to steel are only slightly larger in cross-sections. The main deterrent to their wider use is outdated building codes that fail to recognize that wood in such heavy cross-sections is extremely fireresistant and deforms much less than steel at high temperatures. Architecturally, however, the laminated timber offers such freedom of design, being practically unlimited as to size or shape, and beauty of finish, that it now seems destined to grow ever bigger.



WAREHOUSE for Potash Co. of America at Carlsbad, N.M., is a 580' long, laminated timber, bent-arch structure built over potash in

open storage. The ends of the long structure, as seen above, are enclosed semicircular buttresses 180' in diameter.



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A new combination of building materials, the Structur-Acoustic roof system eliminates suspended ceilings, offers one-third more roof for your dollar than conventional school roofs with similar features. Heart of the system is Structur-Acoustic—a galvanized, corrugated, *perforated* steel sheet that weighs only 2 psf. Strong but lightweight, these hightensile, tough-temper steel units are easy to handle and place, form a firm structural deck for the ceiling-roof assembly. Entire system can be assembled by local labor—no bulky prefabricated assemblies to ship long distances at high freight rates. For schools, one-story offices, factories, stores—wherever sound control is desirable. For more information, contact Granco home or district office, ATTN: Dept. F-75.



Brief accounts of noteworthy developments

ELECTRIC HEAT

In an all-electric air-conditioning and heating symposium, the first of its kind in the country, held recently in Roanoke, Va., a spotlight was thrown on the rising interest in electric space heating, especially for schools. The symposium was sponsored by Appalachian Electric Power Co., in cooperation with eight leading equipment manufacturers. A session on electric heating led by R. E. Pequignot, vice president of Electromode Div., Commercial Controls Corp., made these points:

The reason for growth in electric heating is that about 1950, according to US Dept. of Commerce statistics on percentage changes in fuel costs, electric power crossed over for the first time to a position below gas, oil and coal. Whereas the other fuels have increased in cost as much as 230%, electricity has actually declined 1.8% in ten years, mainly through ever increasing efficiency in generation. By 1960, electricity is expected to better its position. While electricity is still costlier on the whole than other fuels, the gap is closing to a point where its efficiencies and conveniences begin to take effect.

As the utilities' summer air-conditioning loads steadily rise, they are finding it advantageous to encourage electric heating to take up the winter's slack in peak-load capacity. Facilities for serving 1 hp of air conditioning can also serve 2 to 21/2 kw of electric resistance heating.

While commercial electric space heating has been growing steadily in churches, motels, hospitals and elsewhere, its most immediate attractiveness is for schools. Schools offer an ideal situation for electric heat: low rate of occupancy (about 30% of a given month); maximum heating at off-peak night rates; low installation costs (no boiler room and facilities); low maintenance (no furnace tenders required); heat delivered automatically and controlled in individual rooms per occupancy (always at 100% of efficiency, even on partial loads); lower initial costs leading to lower indebtedness and tax savings.

A compilation of data on the first year's operation of the Parkside School. Hartford City, Ind. (eight classrooms

and kindergarten), one of the first allelectric heated schools, shows the following. Estimate of first-cost savings on initial construction: \$40,000 to \$60,000. Projected estimate of operating costs for heating season: \$2,000 to \$2,450 per year, about \$500 to \$1,000 more than estimated costs for oil. Actual submetered costs for 1955-56 season: \$2,669.60, due to construction going on, incompleteness of control system. Indicated operating costs for present season based on heating use from Sept., '56, through Jan., '57: \$1,975, well under the original estimate. > Largest of electric heating systems now going into schools in many states from New York to California is in the \$3.5 million Penn Township High School in Indiana. Competitive bids on the lighting, power and heating system showed the all-electric at 18.95% of total construction cost, conventional heating systems 4.55 to 8.42% higher.

NOISE IN THE OFFICE

A basic unfilled need in the science of noise control has been a proper yardstick for measuring the effectiveness of treatment. Many devices have been tried, such as measuring the productivity of workers in a controlled noisy environment, then in a controlled quiet one.

The newest, and possibly the most straightforward, measuring technique is one developed by Leo Beranek of acoustical consultants Bolt, Beranek & Newman, Inc. Instead of trying to make a quantitative determination of the effects of noise on office worker efficiency, Beranek determines the maximum noise level at which workers feel they can do their jobs efficiently. Says Beranek: "We start with the assumption that if a person believes that his work is being affected adversely by some outside influence such as noise, it probably is."

With this as a base, 300 workers in four industries were subjected to varieties of noises. From their reactions, Beranek has devised a series of charts by which desirable noise levels can be predetermined. To the architect and prospective building owner, these conclusions by Beranek are pertinent:

Sources of noise and appropriate cri-

teria for control should be taken into account when a building is on the drafting boards. Through the setting up of criteria, it is now possible to predict in advance whether or not noise from ventilating and air-conditioning systems, traffic or aircraft are going to be detrimental to the purposes of an architectural structure.

Different amounts of background noise are permissible in different locations. Noise level in each location (office, concert hall, studio, etc.) must be low enough, however, so that its loudness level and its speech interference level (as measured by acoustical instruments) do not exceed the criteria values set up.

For design purposes, the acoustical or air-conditioning engineer must make eight measurements with an octave band analyzer, in order to determine whether the criteria values are exceeded. For good design, loudness level and speech interference level should not differ by more than 22 units, as measured by the octave band analyzer.

FIRE RESEARCH

At the National Bureau of Standards, Washington, D.C., where fire protection technologists have studied the problems of fire for the past 43 years, a program is now in progress to determine the rate at which fires grow within a building.

Because the cost and effort which must be expended on full-scale fires are quite high, the bureau has developed a laboratory flame-spread test method for the evaluation of surface flammability of building materials. With this method, ignition is forced at the top of an inclined specimen surface. As the fire progresses, the combustible gases and flames rise away from the specimen, while the flame front on the specimen surface progresses down the incline. The rate of flame travel and the rate of heat release are observed and their numerical values are combined in a specially devised equation which gives a flame spread index for the material.

The bureau hopes that the new test method will prove to be a reproductible means of determining flammability on a small scale.

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ARCHITECT-Kahn & Jacobs

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Structural plastic ... shallow luminous ceiling ... two-faced partition a review of new developments

PRE-ENGINEERED PLASTIC acts as own bond in sandwich panel

Scotchply, the unique sheet epoxy reinforced with glass filaments, has found a use that takes advantage of both its inherent strength and adhesive properties. When first introduced (AF, June '55) the engineered laminate showed great promise as a structural material: its reinforcing is not a random matt but a predesigned unidirectional, cross ply, or isotropic arrangement of glass strands. It can be supplied with whatever tensile or compressive strengths almost any ap-





plication could call for. The laminate weighs less than aluminum sheet of the same thickness, yet, depending on the reinforcing pattern, can better the strength of carbon steel. On top of everything, Scotchply is in itself a glue. The plastic's construction potential is so vast that it took its own manufacturer, Minnesota Mining and Mfg., to pin it down in this panel application for railroad transportation. And so 3M now has an important structural material and the knowledge to make a building sandwich out of it. The lightweight Convert-A-Frate refrigerated cargo units for the Rock Island Lines R. R. are significant to the building industry not only because of their high strength-to-weight ratio but also because the Scotchply faces doubled as stress skins and their own bonding agent. To make the panel, uncured sheets of the isotropic reinforced epoxy were sandwiched around a 5"-thick balsa wood core and put in a press at 25 lb. psi and cured at 330° for 35 min. The 8' x 18' unseamed size, too, goes beyond any standard panel dimension on the construction materials market. Panels can be made on the press in any thickness with cores of such materials as foamed plastic, balsa, or paper



honeycomb. For many sandwich applications where the panel is nonload-bearing, *Scotchply* skins can be used as thin as .010" without any interband or back-up sheet. Natural color of the material is soft green but it can be pigmented any color. Because of its adhesive qualities, other surface materials can be laminated to it easily.

Manufacturer: Minnesota Mining and Manufacturing Co., 900 Bush Ave., St. Paul 6, Minn.

ENAMELING ALUMINUM produced in extrusions and sheet

Strong, nontemperamental alloys of magnesium-silicide aluminum have been formulated by Alcoa especially to take on porcelain enamel. The new materials, available in sheet and extruded shapes, are said to behave uniformly during the firing process, require less fussy control over surface preparation than earlier enamel stock, and improve the adherence of color coats. The process is reported to cost substantially *continued on p. 172*

5 miles of Gold Seal[®] Floors exclusively for Maine State Office



Aerial view of the new Maine State Office Building with the Capitol building at the rear.

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Here's an interior view showing a small part of the installation of Gold Seal Inlaid Linoleum. Actually, about 3½ acres of floor space are covered with this ½" burlap-backed "Veltone."

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Originated by Gold Seal, "Veltone" provides an attractive, long-wearing, all-over decoration for use in all public buildings, schools, hospitals, offices, etc. Veltone's excellent resiliency provides quiet and comfort under foot. The unique design of this Inlaid Linoleum literally hides foot marks...it's exceptionally easy to clean and keep clean because of its density and surface smoothness. This ease of maintenance naturally reduces the expense of building service and upkeep. For those who prefer the modern textured look in Inlaid Linoleum, Gold Seal offers Sequin[®]- $\frac{1}{8}$ " thick—with all the advantages of "Veltone."

Gold Seal Vinylbest* Tile and Gold Seal Asphalt Tile were also used in special areas such as the food and photo laboratories.

Specifications—Gold Seal Veltone: 6' wide yard goods, ½" gauge, burlap-backed. Install over suspended wood, or suspended concrete under-floors. Available in 8 colors—Pompeian Grey, Heather Tan, Spicewood, Bermuda Grey, Light Tan, Grey, Brown, Surf Green. Also made in standard gauge for residential use—in 9 colors.

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Products

less than anodizing (which runs $35 \notin$ to $50 \notin$ a sq. ft.). Tested for wear- and weatherresistance the new enameled alloys may be used as faces for curtain panels and in structural applications for mullions and partition framing. One firm in Danbury, Conn., Halbrick, Inc. already is filling custom orders for porcelain enameled aluminum window frames.

Manufacturer: (of alloys) Aluminum Co. of America, Alcoa Bldg., Pittsburgh 19, Pa.

TWO FACED PARTITIONS keep up with interior office changes

Responding to designers' demands for more individuality and maneuverability in an interior wall system, E. F. Hauserman Co. has developed a new standard partition with many chameleon talents. Engineered within a 4" modular framework (maximum panel spacing is 5'), the Hori-



zon wall integrates any shape post or joint with panels of patterned glass or steel faced with numerous surfacing materials-wood veneer, plastic, fabric or baked enamel. The system accommodates floor-to-ceiling installations, compensating for slight variations along the bottom, top or sides. Also, floating screens of glass can be mounted without baseboards or top filler sections. Solid 4"-thick wall panels are actually two halves which can be lifted off and changed independently. The square, round or fluted post covers are also split for flexibility. Utility lines can be run through the base and vertical members. Any core insulation material

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A 22-station Lamson Automatic Airtube[®] System speeds communication of patients' records, drugs, diet tickets, prescriptions, mail, X-ray requests and similar articles through the Fairview Park Hospital in Cleveland, Ohio. By interconnecting all nurses' desks, service departments and administrative offices, Fairview Park is combatting the increased costs of operation without lowering its rigid standards.

First of all, the Airtube System allows nurses and their aides to devote their full time and energies to the care of their patients by saving them literally thousands of steps a day. Second, Airtubes provide faster service at lower cost than can be performed manually. Third, Airtubes establish a "level workload" – a steady and uniform amount of work throughout the day, eliminating peaks and valleys.

Your hospital, too, will benefit from the speedy, reliable operation of a Lamson Automatic Airtube System. Just dial the number of the station to which the Lamson carrier is being sent and the carrier will automatically select the right way to it. Moderate initial expense and very low maintenance costs add to the attractiveness of Lamson installations.









may be selected. At present the first mockup partition has an asbestos honeycomb core and weighs 6 to 8 lb. per sq. ft. Glass panels are set on the job with neoprene beads. *Horizon* wall is expected to install for about \$36 to \$42 a running ft., depending on materials selected.

Manufacturer: E. F. Hauserman Co., Cleveland, Ohio.

OFFSET PLASTIC GRID reduces depth of luminous ceiling

In the *Paragrid* light diffuser, J. A. Wilson Lighting Co. got more than it designed for. Conceived as simple shapes for injection molding a ¹/₂" celled patcontinued on p. 176



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Guarantee Mutual Life Co., Omaha, Nebraska. Architect: Leo A. Daly Co. Contractor: Peter Kiewit Sons' Co.



Geigy Chemical Co., Greenburg, N. Y. Architect: Skidmore, Owings & Merrill. Contractor: Vermilya Brown Co.



Equitable Life Building, San Francisco, California. Architect: Loubet & Glynn. Contractor: Dinwiddle Construction Company.

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tern, the interlocking polystyrene bars are proving to be an important factor in cutting down building volume. With lamps above running parallel to the bottom rungs on the *Paragrid* the old two-to-one depth spacing rule for a luminous ceiling can be tightened up to three to one. On an office installation requiring 70 foot-candles with lamps 2' apart, for instance, the grid can be placed 8" below the tubes instead of 1'. A 100' foot-candle reading can be obtained with lamps 18" apart and the grid just 6" away. Because of



their biplane setting, the louvers provide better shielding than a flat grid without giving up any illumination efficiency or revealing a splotchy tube brightness from



below. The grids are each 16" square and span between %"-wide U tracks in one direction only. Each section is lifted up and rested on the adjoining grid. Cost of the plastic louvers and suspension members is about \$1.35 per sq. ft. plus lighting fixtures and installation. One drawback affecting the use of *Paragrid* for an entire ceiling in cities with codes such as New York's is that the plastic is rated as slow burning. However, Wilson currently is experimenting with *Paragrids* molded of nylon which is self-extinguishing.

Manufacturer: J. A. Wilson Lighting & Display Inc., 260 Delaware Ave., Buffalo 2, N.Y.

WALL DIMMER SWITCH cuts light and power to four levels

Varying room illumination from candle quality to full brightness, the *Dim-A-Lite* is a convenient device for achieving different incandescent lighting effects in stores, churches, cafés and homes. As easy to install as to regulate, the transformer is contained in a wall-recessed 4"-square rough-in box; no extra wiring or relays are needed. It is rated at 475 w. and works on 115 v. Unlike resistance dimmers, the *Dim-A-Lite* uses only as much current as the light percentage it is set for: 6% for dim; 38% for soft illumination; 68% for moderate; or 100%. A circuit breaker built



into the conduit box shuts off the lights if the line's capacity is exceeded and resets automatically when part of the load is taken off.

The dimmer's clear acrylic face can be backed up with an insert of color or patterned paper to match the wall. List price of the controller is \$27.95 a circuit. *Manufacturer:* Minneapolis Honeywell Regulator Co., Minneapolis 8, Minn.

EXPANDED METAL made in miniature mesh patterns

A utility building material that has gained design favor in everything from furniture to solar louvers, expanded metal is now available in tiny refined patterns. The new *Micromesh* comes with diamond openings *continued on p. 180*





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B&G Hydro-Flo Forced Hot Water Heating offers all the superior comfort advantages of *radiant* heat. Sunny warmth so smoothly controlled that every change in the weather is met with a corresponding change in the heat supply. No over heating—no under heating—no drafts —no fuel waste! And a year 'round supply of hot faucet water—always plenty for automatic washing appliances.

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Builders of homes in every price bracket are capitalizing on the distinction offered by the B&G *Hydro-Flo* System. Write for the new 4-color booklet which shows why "Only Water Offers All Five."



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Products

as small as 1/16'' and in gauges down to 0.008" in ridged and flattened sheets. Suitable for hung ceilings, appliance enclosures and screening, the slotted material can be ordered in pieces up to 3' x 8'. Retail prices range from about 12ϕ to 40ϕ per sq. ft. for *Micromesh* in carbon steel. (The smaller holed patterns consume more metal and so are the higher priced.) Aluminum, brass and copper runs about 17ϕ to \$1.08. Stainless steel is slightly more.

Manufacturer: Designers Metal Corp., 469 E. 159 St., Harvey, Ill.

SAFETY GLASS has gay print sandwiched in middle

Monsanto and Industrial Designers George Nelson Associates have come up with a new and logical way of capitalizing on the vinyl film laminated inside safety glass. Through research with a printing firm,



Walter Whittum, Inc., the chemical company's Plastics Division developed inks and a silk screen technique for patterning the smooth, transparent film. Nelson's team designed several experimental patterns for their decorative and screening effect. The



print pictured, appropriately reminiscent of a glass bead curtain, is used in the first commercial installation of the glass laminate at the Georgia Center for Continuing Education. Two layers of 1/4" plate

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are sandwiched around the film. Price is expected to be somewhat higher than unadorned safety glass.

Manufacturer: (of film) Monsanto Chemical Co., Springfield, Mass.

Laminator: Libbey Owens Ford Glass Co., 608 Madison Ave., Toledo 3, Ohio.

GLASS BLOCK fired with ceramic color faces

Long recognized as a scientific daylight lens for schools and industry, glass block has more recently made a place for itself in curtain-wall construction. (Perhaps the most dignified, tasteful example to date is in the Corning Research Center—AF, Sept. '54.) Glass block already matches cost with prefabricated metal panels in place, it runs about \$2.50 to \$4 a sq. ft. depending on size, pattern and local labor.

Now, to make glass block competitive with porcelain enamel in decorative poten-



tial, Pittsburgh Corning is producing 8" units with colored frit (glass granules) applied on one side. Baked in a lehr at 1,060° F. for 21/2 hours the 3 mil thick ceramic surface is said to be as resistant to wear and chemicals as glass itself. The color spray is controlled so that about 20% of the light can pass through. At different times of the day and with varying interior light the colored blocks in a wall create a translucent or bright opaque front. Made at present with green, coral, yellow and blue faces, the block will sell for about \$1.32 each-about twice the price of clear-but are suggested primarily as accents with standard clear and patterned units. The possibilities of using panels incorporating block of different colors will undoubtedly appeal to many designers. The moderate cost of glass block construction, still one of the material's potent selling features, is largely the result of a single trade, the masons, handling the entire job.

Manufacturer: Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh, Pa.



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is necessary, and sills are set tight! I certainly recommend the Stud Driver to any contractor!"

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THE NEW LANDSCAPE IN ART AND SCIENCE. By Gyorgy Kepes. Published by Paul Theobold and Co., 5 N. Wabash Ave., Chicago 2, III. 384 pp. 81/2" x 11". Illus. \$15.50

Gyorgy Kepes is eventually going to tell us what he means, even if it takes several more visual classics to accomplish his purpose. In the current volume, a superb, king-sized picture story, he has communicative assistance in the form of some 452 illustrations and 17 tightly written essays by, to name a few, Walter Gropius, Norbert Wiener, Richard Wilbur, Fernand Leger, S. Giedion and S. I. Hayakawa.

It is worth debating whether these many parts succeed in expressing the author's (and other advanced estheticians') total concept of the harmony of art and science. But there is no doubt of his success in supporting his life-long conviction that the relationship between art and science must be explored, that answers must be tried to the many questions their relationship poses. One of the most immediate questions: what has tempted modern artists like Paul Klee to conjure up soulful fantasies that resemble scientific phenomena of which they could not be consciously aware?

For the past ten years Kepes has been Professor of Visual Design at MIT. A readership that has now reached impressive proportions first learned of his experiments with symbols, optics, scientific photography and natural philology when his *Language of Vision* was published in 1944.

And, fortunately, those who have not yet comprehended the applicability of his theories or the lesson to be learned from his visual examples (such as No. 246, "Portrait of an Alternating Current") will soon be able to watch him getting down to work on the specifics of the world around us: at present he is working on a major study of the perceptual form of our urban environment.

NEW GERMAN ARCHITECTURE. Edited by Gerd Hatje, Hubert Hoffman and Karl Kaspar. Introduction by Hubert Hoffman. Published by Frederick A. Praeger, Inc., 150 E. 52nd St., New York 22, N.Y. 220 pp. $7/_2'' \times 10/_2''$. Illus. \$11.50

Those who like their architectural collections larded with glamorous photography and laced with creamy prose would be well advised not to sample (or pay \$11.50 for) this unsweetened mixture. But those who like their presentations untreacled can be grateful to the editors for an honest serving, the first illustrated survey of post-1945 German architecture.

A question that fascinates the editors is: was the wartime "period of intellectual isolation" followed by a reunion with international architecture (so much of which had been German-inspired) or by a growth of truly indigenous creativity? Perhaps by their very disingenuousness the editors have "tilted" the game, and perhaps the answer cannot be found within the range of these selections.

But if it can, it appears to be that modern German architecture shows signs of a modest uniqueness, a refusal to settle down into the glass-wrapped reality or the *brise-soleil* whimsy, a constant willingness to experiment. For this reason the collection (organized into 13 sections by building types) deserves good, clear-headed perusal.

WORK PLACE FOR LEARNING. By Lawrence B. Perkins. Published by Reinhold Publishing Corp., 430 Park Ave., New York, N.Y. 62 pp. 11" x 11". Illus. \$4

A kind of apple for US teachers from US architects, this book is also a wellscrubbed promise of good behavior.

In it Author-Architect Perkins, a man who has learned the teacher's weakness, demonstrates that he, for one, intends to design his schools around her needs. And by analyzing certain features of his schools across the country, he shows others who would follow his practiced designs the several ways to her heart.

HANDBUCH MODERNER ARCHI-TEKTUR. Edited and published by Safari Press, Berlin, Germany. Distributed in USA by George Wittenborn, Inc., 1018 Madison Ave., New York 21, N.Y. 959 pp. 8" x 11". Illus. \$25

As handbooks go, this one is a crusher. Wrapping up 5 lb. of commentary on modern architecture within one coverform, it binds together a dozen fully illustrated chapters by a task force of Germanoriented architects (including Scharoun on "Structure in Space and Time," Niemeyer on "Water Routes and Power Works, Bridges, Railroads, Streets and Highways," and Elsaesser on "Schools, Universities, Kindergartens and Youth Hostels"). Although it is too bulging to be goodlooking (and too hasty to allow one a full appreciation of many of the buildings discussed), it is nevertheless an admirable attempt to digest the several worlds of modern architecture. We wish the translator (it's all in German) Godspeed.

AMERICAN HOUSING AND ITS USE: The Demand for Shelter Space. By Louis Winnick. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N.Y. 143 pp. 6" x 9". \$5.50

Because this little volume contains brilliant, hidden facts about the uses of shelter, it would be a pity if its formidable armament of statistics deterred any reader. Author Winnick, who has broad experience in the whole area of zoning and housing, has taken figures from the 1950 census (as well as more recent data) to bulwark such arguments as: housing standards in the US really haven't improved much since 1900; the most important factor that has actually determined the shelter space of US families is not the family's income, nor the cost of shelter, but the family's size; the average dwelling unit has been shrinking in size for "many decades," but has been increasing since 1950.

Winnick also puts some statistical steam behind concepts that people have pushed around unaided for a long time. One of these is the belief that "our investment in housing capital has been disappointingly small in view of the tripling of per capita income during this period. . . . There is evidence of a decided shift away from shelter toward other and newer consumer durables . . . a shift much greater than in

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The American Laundry Machinery Company, Cincinnati 12, Ohio

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the case of other necessities, such as food and clothing."

The book is an extremely significant addition to the still sparse knowledge of shelter, its market and make-up.

ABC's OF URBAN RENEWAL. Compiled and published by Sears, Roebuck & Co., Chicago, III. 24 pp. 81/2" x 11". Illus. Copies available upon request

Sears, Roebuck & Co. drew up this commendable booklet, they tell us, "to give Sears' executives a better understanding of the basic facts . . . of blight and decay in their local communities." The presupposition that Sears executives are going to get involved in the not-always-rewarding business of urban renewal is almost as encouraging as is the brochure itself.

We look forward to meeting some of these gentlemen at the next public meeting of the local Planning and Zoning Commission. In the meantime, we will hope that active citizens everywhere will avail themselves of the opportunity to look at this smooth presentation of the classic renewal program.

Our only question to the Sears' people, at the meeting and after congratulations are given, will be: "Why no mention of the architect?"

TECHNICAL PUBLICATIONS

A selection of new handbooks, textbooks, technical reports, brochures and commercial leaflets, noteworthy for their information content or pictorial format or both

MICARTA MANUAL. Published by US Plywood Corp., 55 W. 44th St., New York 36, N.Y. 64 pp. Color illus.

A comprehensive architectural manual on this high-pressure plastic laminating material. Six sections cover material and manufacturing information, technical data on all grades, architectural uses, suggested applications, specifications, and a color chart on 87 types.

DIFFUSER SELECTION MANUAL No. 60. Published by Anemostat Corp. of America, 2 Park Ave., New York 16, N.Y. 80 pp. Illus.

A guide and catalogue to Anemostat's full line of air diffusers, with diagrams, tables and photographs to aid in the correct selection of diffusers and accessories for both high-velocity and conventional air-conditioning systems and units.

VERTICAL TRANSPORTATION and OTIS ELECTRIC DUMBWAITERS. Published by Otis Elevator Co., 260 11th Ave., New York 1, N.Y. 31 pp. and 8 pp. respectively. Illus.

Well-designed and informative guide to Otis' complete line of passenger and freight elevators for light and heavy traffic, escalators and dumbwaiters.

continued on p. 194

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ENGINEERING ENROLLMENT IN THE US. By Norman N. Barish, Published by the New York University Press, Washington Square, New York 3, N.Y. 226 pp. $6'' \ge 91/2''$. \$7,50

Financed by the Thomas Alva Edison Foundation, this book sets out to present and analyze statistics on enrollment trends in US engineering education. It concludes with a rather ominous chapter entitled "Engineering Training in Russia," which is written by M. H. Trytten, director of the office of scientific personnel, National Research Council. As might be suspected from the layout, the book is full of fear that our engineering studies are not churning ahead at the rate they should.

Architects may be most inclined to accept this thesis when they come upon the chart which traces the percentage growth of undergraduates enrolled as architectural engineers: the academic year 1955-1956 was the third lowest since the study began in 1930.

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> ELEMENTARY SCHOOL, ALMA, KANSAS ARCHITECT: Thos. W. Williamson, Victor H. Loebsack & Associates, Topeka, Kansas



SPECIFICATIONS FOR METAL LATHING AND FURRING. Published by the Metal Lath Manufacturers Assn., Engineers Building, Cleveland 14, Ohio. 20 pp. illus.

A concise, informative model of what a technical handbook should be, winner of a Certificate of Merit in the 1957 Building Products Literature Competition. Covers all phases of and specifications for metal lath construction.

ELECTRIC HEATERS AND HEATING DEVICES: 1957. Bulletin GEC-1005H. Published by General Electric Co., Schenectady 5, N.Y. 72 pp. Illus.

Complete catalogue of GE spot and zone heaters, mainly for industrial plants, covering immersion, strip, cartridge, tubular, finned tubular and unit heaters of many special types. Includes power requirement section showing short and long form calculations for heating applications.

INFINITY FABRICS. Published by Edwin Raphael Co., Inc., Holland, Mich. 24 pp. Illus. and color swatches

Brochure describing an interesting line of specially designed and constructed fireproof fabrics—translucent, acoustical-diffusion, contract and silk-screen print types —for controlling heat, glare and ventilation over large glass areas.

CERAMIC TILE. Booklet 207. Published by American-Olean Tile Co., 1000 Cannon Ave., Landsdale, Pa. 26 pp. Color illus.

Catalogue describing this company's full line of glazed and unglazed wall and floor tile and ceramic accessories, with illustrations of typical design applications, including new outdoor mosaic applications.

FACT BOOK ON CERTIFIED LIGHTING for Stores, Industry, Offices, Schools. Published by National Lighting Bureau, 155 E. 44th St., New York, N.Y. 7 pp. each category. Illus.

Recommended practices for the aid of electrical contractors and clients on the installation of proper industrial and commercial lighting for various occupational environments.

SHOPPING CENTERS RESTUDIED. Part I: Emerging Patterns. Urban Land Institute Technical Bulletin No. 30. Published by the Urban Land Institute, 1200 18th St., N.W., Washington 6, D.C. 80 pp. Illus. \$5 to nonmembers

An exhaustive survey of hundreds of shopping centers, their types and community patterns, their developmental and running economics, their planning and design trends. Details the pitfalls of poor location, design and leasing policies.

INCANDESCENT LIGHTING GUIDE BOOK and FLUORESCENT LIGHTING GUIDE BOOK. Published by Sylvania Electric Products, Inc., 60 Boston St., Salem, Mass. 22 pp. each. Illus.

Combination guidebooks and catalogues of Sylvania's full line of light sources, with recommended uses and performance data, accessories.

81

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Square types KP and KPT, for flush ceiling mounting. In two smart de-signs: Type KP, overlap design for plaster ceilings; Type KPT, to snap into T-bar grid of acoustical tile ceilings. Both engineered to assure com-plete, dependable diffusion. Write for Bulletin K-27.



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Type KDA with built-in light fixture. Combines attractive lighting and con-trolled air diffusion. Solves many in-stallation problems. In design and application, this functional diffuser has all the features of the standard type KDA shown at left. Write for Bulletin K-20A.



Type SPKR, combination speaker-air Type SPKR, combination speaker-air diffuser. For P.A. or piped music sys-tems. Provides same central location for both sound and air diffusion. Ac-commodates any extended range 8" speaker. Specifications are same as those of standard Kno-Draft types described in Bulletin K 20A described in Bulletin K-20A.



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CLIP THIS PAGE-

Type KDA, for butting against walls or columns. Half-round design for use where standard diffusers would not be suitable. Features include Kno-Draft precision air pattern ad-

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justment and sleeve-type damper (optional). Spun aluminum construc-tion. Write for Bulletin K-31.

DANBURY, CONNECTICUT

What other people are saying

Atoms to humanity

Thinking of the AIA's centennial slogan, "A New Century Beckons," Edwin B. Morris Jr. scouts the range of future architectural targets. Morris, whose full article appeared in the January Journal of the AIA, is assistant to the AIA's executive director

As we look toward the future we must consider many things; we must consider simultaneously man's physical environment in relation to his new social aspirations and spiritual needs; his relation to a host of new contrivances which afford him new comfort and leisure time; we must consider new problems of traffic flow, land use and urban congestion; even the problem of shielding him not from the elements alone. but from the hazards of the world whose skill at making weapons has outstripped its ability to live without them. In making sure that our profession is able to meet these expanded needs of the future, architects must not only develop a new ideology of design and concept, but must be prepared to expand their services to include all those services which the client will require and insist upon in the changing world to come.

As we look upon the architectural practice of the past and project our thinking to the architectural practice of the future, as we reflect upon what our society has been and what it seems destined to become, we realize to some extent the enormity of the task we face. Our vast new knowledge of the nature of matter must be matched by an equivalent understanding of the nature of man. The architect can and must contribute to a closure of this gap in knowledge.

Artist as researcher

A place on industry's team is found for the artist by Paul Smith-vice president of Calkins & Holden. advertising -speaking at a recent luncheon in New York sponsored by the Museum of Modern Art

Artists are the basic researchers in what can be called applied art, or design. They are the men who are operating the laboratories, who are creating what is going to happen tomorrow. The reason we choose to honor the artist is that he has the vision, or more properly, the prevision, to sense what tomorrow's esthetics are going to look like, and to put them on canvas, or in sculpture, or in architecture for the world to see.

Typographers and architects don't copy

Mondrian. Mondrian, by a stunning act of prevision, saw what mass production techniques and the impact of new materials would inevitably do to the appearance of the world. Silverware manufacturers don't imitate Brancusi, Brancusi simply foresaw what forms were inevitable in a modern, mechanized, mass-produced manufacturing culture.

Sin by filigree

A happy man today would be turn-ofthe-century Viennese Architect Adolf Loos, author (in 1908) of Ornament and Crime. His pungent blast against decoration of the body and the building was exhumed and published in the February issue of the Architectural Review

The urge to ornament everything within reach is the father of pictorial art. It is the baby talk of painting. I have evolved the following maxim, and present it to the world: the evolution of culture marches with the elimination of ornament from useful objects.

Then I said: Weep not. Behold the true greatness of our age, that it can no longer bring forth ornament. We have vanquished decoration and broken through into an ornamentless world. Behold. The time is at hand and fulfillment awaits us. Soon the pavements of our cities shall glisten like marble, like Zion, the holy city, the Capital of Heaven.

Penalty for leadership

Last fall Leonard C. Howitt, city architect of Manchester, England, asked a dread question: shouldn't architects' fees include the cost of consultation with specialists? Howitt's talk was recently reprinted in The Builder

We rightly claim to be the leaders of the building team, for the other members are employed in one way or another in the process for which I can find no better description than "materializing the architect's conceptions." It is obvious that the architect cannot lead the building team if he is the paid servant of the builder; on the other hand, we might recognize that leadership involves taking responsibility and our claim would be even more justified if we modified our attitude toward the contribution of specialists.

I have reason to believe that the client prefers an inclusive fee and a single chancontinued on p. 202



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temporary class rooms, to "build" cloak rooms,

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nel of contact in dealing with his building operations; this simplicity is indeed one of the best selling points of the contractors who offer an all-in service. My view is that the architect as the leader must come to accept over-all responsibility for the work of the team he leads. At the outset he must decide whether the project is one which he can undertake completely or whether he will require the assistance of consultants in structural engineering, heating and ventilation and electrical engineering, and the fee he quotes should cover the comprehensive service, including quantity surveying. The choice of these specialists should be entirely his concern and he would select them with regard to the fact that he has to carry the full responsibility for what they do or do not do. The acceptance of that responsibility is in my humble opinion the price we must pay if we are to maintain our leadership.

Excerpts

Who's a robber?

In the midst of general satisfaction that the highway program may be carried out, several reasonable-sounding but destructive voices are heard raised in protest—here's one from an editorial in the winter issue of Landscape

We hope that the American public will soon find time to appraise the new Federal Highway Program. The public has in fact commissioned a department of the federal government, the Dept. of Commerce, in conjunction with the highway commissioners of the various states, not only to transform a large part of the American landscape, but to alter the economy and character of innumerable communities, large and small—and these agencies are at present responsible to no one.

The highway program, backed by Democratic and Republican congressmen alike, threatens to destroy literally thousands of small family-sized enterprises and to penalize every farmer and rancher who has the misfortune to live near one of the superhighways. Whose voice has been raised on behalf of these victims?

The local apologists for the program have repeatedly told us that all progress entails certain hardships. The same old eggs, the same old omelette. Obviously some compromise will have to be worked out. But it cannot be worked out unless both sides of the questions are given a hearing; and it seems to us the duty of every group interested in efficient planning, in the preservation of the American landscape, in protecting the rights of small farming or business enterprises, and in resisting the encroachments of an irresponsible bureaucracy, state as well as federal, to see that the highway program is subjected to a rigorous examination before it is allowed to proceed.

continued on p. 204

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The new geography

A geographical revolution is taking place before our very eyes. Marvin J. Barloon, professor of economics at Western Reserve University, recently drafted a communiqué from the barricades for Harper's Magazine

Excerpts

The American community builds itself around its transportation system. For the first three centuries of our history, our biggest cities were deep-water ports, and our major inland cities, with few exceptions, grew up at the head of navigation, as Minneapolis and Chicago did; or they grew at major waterway junctions as did Buffalo, Pittsburgh and St. Louis. Because the railroad lines were built first into the major centers of commerce and population, they contributed to the further growth of these centers, but at the same time the railroads modified our geography fundamentally in the differential growth of certain cities, such as Chicago, in the emergence of nonwaterway cities, such as Dallas, Indianapolis and Denver, and in the settlement of extensive inland regions remote from water transportation. Our commerce and our populations became essentially railroad-oriented and grew far beyond the capacity of the waterways to keep them alive.

Similarly, we are now regrouping our communities about the highway system. Since World War II, new industrial plants have been going up in the open country along the highways, with access to a single railroad line in the case of the largest establishments, but often with no rail access at all. Land is cheap, and the new factories are often single-story structures sprawled across wide acreages. Trucking is suburbanizing the industries.

The growth of industry along the waterways, while more specialized, is fully as startling in its proportions. In 1955, waterside sites were selected for \$6.5 billion worth of new manufacturing and electric power plants, 41% of the national total. Navigation is only one of the attractions of waterway locations. An abundant supply of water and hydroelectric power are also important influences. But even in the supply of that key attraction, cheap electric power, water-borne fuels play a part far greater than that of the hydroelectric developments.

Just as the expanding industries of the preceding century committed themselves to the railroad system, so those of the present generation, step by step, are staking their future with the highways and the waterways. We cannot go back. The history of the US is the record of the unification of the continent and of the consolidation of the national community. The revolution now underway in the technologies of transportation is opening a new chapter in this history.



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Brickmason Ted Ehman, working on the Russellville, Indiana High School, likes the way Key-Wall can be lapped without interfering with embedment or adding thickness to the joint. This is particularly important at corners. With Key-Wall, masons find it just as easy to reinforce corners as on straight runs.

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It's so easy to lay up face brick the way Mr. Hand does it. With Key-Wall on the top course of 12" foundation units, a better mortar bed for the brick is obtained, as well as reinforcement.

Another reason Mr. Hand rates Key-Wall the best is because it is so easy to tie in curtain walls. On this job, an 8" block was tied into the outer wall, with Key-Wall being used as reinforcement at every joint. Short lengths are used for convenience. Mr. Ehman finds that mortar flows in, under and around Key-Wall to give exceptional bonding and provide full mortar embedment. Key-Wall is galvanized for protection against weather, assuring a strong bond. It is easy to store on the job. 200-ft. rolls are compact, and can be carried with ease.

I sure like **KEY-WALL** galvanized masonry reinforcement

says Lamoin Hand, Jr., partner in the Cutshall Construction Company of Akron, Ind. "As a contractor and journeyman bricklayer, I like Key-Wall the best. The rolls are easy to handle. They can be stored any place without rusting. They take very little space on the job. Besides, I can put Key-Wall in every other joint instead of every third or fourth joint and build a better wall. For example, on the Russellville, Indiana High School, we used Key-Wall on every other course rather than every third course as specified for other reinforcements. I like Key-Wall, and so do my men."

AND HERE ARE OTHER ADVANTAGES OF KEY-WALL:

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Why do architects and engineers select M-Floors?... here are some of the reasons: Mahon M-Floor Cel-Beam Sections are designed to give you a better Section from a structural standpoint, an electrical standpoint, and from a general utility standpoint. The flat Top Plate of the Mahon Section reduces both the amount and weight of concrete topping to a minimum the flat plate sub-floor surface also reduces cracking as the concrete cures. The Cel-Beam Members of Mahon M-Floor Sections are 6" wide with perpendicular beam-webs. This permits greater latitude in the installation of Floor Service Fittings . . . it also permits 4" diameter access hand-holes between Header Ducts and Cel-Beam Raceways. The 6" wide Cel-Beam Members further provide evenly distributed beam-web supports for the flat Top Plate at not more than 6" on centers . . . this is important, in that it eliminates the possibility of collapse of the Top Plate during construction, and the consequent difficulties to be encountered later in the installation of Electrical Floor Service Fittings.

Compare these points, one by one, with any other Cellular Steel Sub-Floor available today, and you, too, will be convinced that the basic functional requisites of a Cellular Steel Sub-Floor have been more fully realized in the design of Mahon M-Floor Cel-Beam Sections.

See Sweet's Files for information, or write for Catalogue M-57.

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THE BLAUVELT SCHOOL STORY ...

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PUBLIC HOUSING continued from p. 142

true as ever (if more reluctantly recognized) that you cannot get rid of slums just by tearing them down, or fixing them up. Somewhere, in reasonably suitable location, there must be better homes available to the slum occupants, at prices they can afford to pay. And although prosperity, FHA, VA and more efficient homebuilding techniques have expanded the effective market for new private housing, it is still true that practically no slum dwellers can afford new, privately built homes, and the few who can are often minority familes who would not be accepted. There is some "filtering up," now that the postwar shortage at middle and upper price levels has been relieved. And if there were no vast backlog of outright slums, and little or no urban growth, and no racial discrimination, then a strong program of enforcement and rehabilitation might actually do the job of housing lowincome families adequately. But the situation is far different. Millions of existing slum dwellings should be torn down as soon as possible; millions of additional low-income families are certain to migrate to urban centers (a large proportion of them Negroes). And in the light of this, how can filtration possibly be expected to solve the slum problem, now or in a thousand years! Even a slight stepping-up of the process, if it is not merely to produce a lot of new slums by stuffing several families into a dwelling intended for one, would mean a rate of devaluating decent older property that would disrupt the real estate market more than any amount of public housing. FHA financing, also, is geared to steady or rising values for the life of the house, not a reduction in monthly payments that would permit it to "filter down," however gradually.

Apparently it is still as true as it ever was that we need some new housing within reach of families now outside the effective private market. Prosperity only makes the continuance of slum living conditions less excusable, the need for effective solutions more urgent. And the rising significance of the racial aspects of the housing problem adds to the urgency. So does the relocation problem growing from the desire to revitalize central blighted areas and from the tremendous displacement of homes for freeways and other public works.

The basic problem we tried to tackle in the US Housing Act is still with us. What was wrong with our efforts to solve it?

In the light of 1957 conditions, it now seems there were two fundamental fallacies in the original approach, one a matter of basic policy formulation and administration, the other a matter of physical planning and design. The 1937 approach was natural, valid and even necessary at the time, and it represented progress in relation to what had gone before. But it jelled too soon, became too rigid, without allowing for flexible adaptation to American values and conditions.

Two-headed housing policy

The most questionable assumption was the notion that slum rehousing should be established permanently as an independent program, with its own separate legislation and administrative machinery at both federal and local levels, quite apart from other housing policies and the over-all housing picture. This insured the segregation of the low-income slum-dweller, and fortified his isolation as a special charity case by permitting only public initiative and public landlordship, with narrow rules of eligibility, for any form of subsidized housing that might be needed. This also contributed to the segregation of upperincome families in FHA schemes, and to that lily-white suburbia that now presents such a critical problem. And it is just as much public housing's responsibility as the National Association of Home Builders that there is such a vast gap between the two narrow, entirely separate types of federal housing policy, with no real responsibility at any level of government to determine over-all housing needswhether on a national basis or for any given community—and to see that policies are adjusted to meet those needs.

This came about because federal housing aids were all initiated on an ad hoc emergency basis during the depression, with little thought for long-term needs or goals. But depression - mindedness continued too long: it was a fallacious element in much postwar planning, particularly housing. Vested interests grew up and were institutionalized around each separate fragmentary program, with the result that all three major groups-lenders, builders and public housers-have been about equally opposed to the kind of coordination that would permit more flexibility and realism in meeting the full range of local needs.

Similarly, while the early crusade on behalf of local initiative and responsibility was fine, and the establishment of local housing authorities (or something of the kind) was a necessary step, their permanent role should never have been defined and jelled so narrowly. We now have a proliferation of special-purpose local agencies concerned with slums and housing, with no responsibility anywhere to view the housing picture as a whole, least of all at the metropolitan level where this is most essential. The result is a few expensive, high-density, overcontrolled municipal projects, mostly on central sites, and a vast chaotic flood of middle-cass individual homes in the suburbs. With all our complicated housing machinery we cannot solve either the relocation problem in central areas or the equally urgent problem of balanced development out on the fringe.

Viewed in retrospect, it would have been worth-while, for the sake of better integrated, more flexible tools, to make some real concessions. Not the priniciple of subsidy, for this is absolutely essential to any solution of the slum problem. But if necessary, public landlordship might have been given up and in any case it should have been possible to subsidize various forms of private housing enterprise, including suburban tracts for individual ownership, in order to meet a wider range of need and popular decontinued on p. 221

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PUBLIC HOUSING cont'd.

sire (and, incidentally, to bring some private building interests over to advocacy of public housing).

Misapplied "community planning"

Having established machinery that could only produce a type of residential development quite alien to any American ideal of community, we then proceeded to dramatize this extreme form of paternalistic class-segregation architecturally, in the name of "modern community planning."

The basic ideas that stemmed from the British garden city planners, and were rationalized by the Bauhaus school of modern architects, contributed vital concepts to American housing. The reaction against chaotic individualism and the wasteful crudity of the ubiquitous gridiron street pattern was long overdue. But in grasping for modern principles of large-scale community design, we embraced too wholeheartedly functionalist and collectivist architectural theories that tended to ignore certain subtler esthetic values and basic social needs. To experiment in this direction was healthy and necessary. The mistake, again, was to jell both policy and practice in rigid formulas that prevented further experimentation to adapt and humanize these principles in suitable terms for the American scene.

The public housing project therefore continues to be laid out as a "community unit," as large as possible and entirely divorced from its neighborhood surroundings, even though this only dramatizes the segregation of charity-case families. Standardization is emphasized rather than alleviated in project design, as a glorification of efficient production methods and an expression of the goal of "decent, safe and sanitary" housing for all. But the bleak symbols of productive efficiency and "minimum standards" are hardly an adequate or satisfactory expression of the values associated with American home life. And all this is, in addition, often embodied in the skyscraper, whose refined

technology gladdens the hearts of technocratic architectural sculptors but pushes its occupants into a highly organized, beehive type of community life for which most American families have no desire and little aptitude.

There is no room in such schemes for individual deviation, for personal initiative and responsibility, for outdoor freedom and privacy, for the type of small-scale business enterprise that plays such an important social role in most slum areas. Management domination is built in, a necessary corollary of architectural form.

How to reform the reformers?

A fresh start is badly needed to bring this frustrated effort to effective maturity. And the time may at last be ripe. Until recently there were only a few lonely critics within the ranks of the "housers" themselves. But now some local housing authorities are beginning to question the old formulas. The big push for redevelopment and renewal has also performed an important service in forcing all kinds of civic groups and agencies, including real estate interests and local housing authorities, to face up to hitherto insoluable problems and get together to find solutions. In some areas local and metropolitan planning agencies are beginning to assume some responsibility for determining overall housing needs, and for fitting the bits and pieces of federal aid and private and public initiative together. In several cities, the mayors have appointed housing coordinators for this purpose. And alongside central redevelopment, a new issue is just coming over the horizon officially in fast-growing regions such as California: how to encourage better balanced communities with a wider variety of homes in the fringe areas, to meet the needs of the lower-income and minority families who are more and more likely to find their employment in outlying plants and offices.

All this broader-based civic effort and sharper awareness tends to

make the weaknesses in narrow, overcompartmentalized federal housing policy more apparent. Sooner or later there will be a grass-roots demand for greater flexibility and better coordination, strong enough to overcome the special-interest lobbies, each trying to maintain its own little preserve. And this is the only effective and healthy way to bring about the necessary changes. For it is only when cities and metropolitan areas know what they need and want in terms of federal housing aid that greater flexibility will be justified.

It is not a matter of substituting a new legal-administrative formula for the old one. Under certain conditions the old formula is still the best answer, perhaps the only possible solution. But what is primarily needed, not only for low-income slum dwellers and minority groups but for the great mass of middleincome families in all their infinite variety of taste and need, is more choice in location, dwelling type and neighborhood character. The kind of home best suited to a given American family can never be decided by officials. Their highest responsibility, rather, is to make sure that public policies keep the "effective market" broad enough to provide some real selection at all economic and social levels.

Freedom and flexibility are probably the hardest things to achieve with public policy. But a country that can devise the insured mortgage (in all its different forms), Fannie May, the modernization loan, the annual contribution, the local authority bond, redevelopment and renewal grants, and ingenious methods for local governments to contribute their share, should certainly be able to find some way to make these excellent tools work more freely and more effectively.

FORUM has asked a group of local leaders and officials, architects and social scientists who know public housing best "out on the firing line" for their suggestions for specific changes in housing policy and practice. Next month FORUM will publish these suggestions, along with Catherine Bauer's proposal for an HHFA experimental pilot program. --ED.



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Sam Houston Elementary School, Port Arthur, Texas, features Fenestra Intermediate Steel Windows. This outstanding school demonstrates the functional beauty of their slim, modern design and the pleasant classroom atmosphere created by their better daylighting and ventilation. Associated Architects: Caudill, Rowlett, Scott & Associates, Bryan, Texas; Oklahoma City, and J. Earle Neff, Port Arthur, Texas. Contractor: Schneider Construction Co., Houston, Texas.



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Architect: Earl C. Morris, Denver, Colorado. Contractor: Mead & Mount Construction Co., Denver, Colorado.



Fenestra SCHOOL DESIGN NEWS

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STATISTICS.



Used on all sides of these cheery offices of W. P. Fuller & Co., San Francisco, lustrous Mississippi Broadlite glass wraps them in a wall of living light . . . floods adjoining areas with richer, softer illumination. Sliding doors of Broadlite complete the bright, modern look.

-

Architects: H. F. Everett & Associates. Contractor: Coopersmith Bros., Inc. Glazier: Pittsburgh Plate Glass Co.

Even the students farthest from the windows enjoy the benefits of conditioned daylight in the Quakerstown High School, Quakerstown, Pennsylvania. Installed in the upper two rows of sash, figured glass transmits eye-easy, natural illumination deep within the rooms. Note absence of sharp, shadows and harsh cantrasts.

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Architects: Smith, Powell & Morgridge

The property of light diffusion in figured glass is one of the most useful tools available to the architect and engineer. By its means rooms can be adequately daylighted far from windows, small skylight areas can cover a large expanse of floor with shadowless daylight, privacy can be secured, light can be controlled. Achieve better daylighting with translucent, light diffusing glass by Mississippi. Available through leading distributors in a wide variety of patterns and surface finishes to meet every requirement. Installed in top hinged windows, heat absorbing, glare reducing glass floods this factory with conditioned daylight. Diffusing light deep into the plant, it reduces contrasts that tend to cause costly visual errors, absorbs up to 50% of solar heat rays to keep interiors more comfortable. Employees see better, feel better, work better.

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Smoke Box Photos Prove Light Distribution Qualities of MISSISSIPPI GLASS



CLEAR GLASS — Actual photograph of "smoke box room" with its window glazed with clear glass. Note high concentration of light near window.

DIFFUSING GLASS — Smoke box photo — window glazed with diffusing glass. Note uniformity of lighting and its distribution to far side of room.

In these photographs the box is built to a scale of 1'' = 1' to represent a room 12' high, 12' wide and 24' deep. The "window", centered in one end, is 4' square, 3' above the floor.







New Ador screen is built to take a beating from children and pets. The new strong, easy-to-operate screen beautifully complements the lines of the door and is actually an integral part of the Ador sliding glass door unit.

Now-a trouble-free screen for sliding glass doors



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Ador screens incorporate finger-tip latch device.





WALLS OF WEATHERTIGHT



Ready for the Lupton Windows. Completed installation of outer mullions before erection of Lupton Windows. Notice outstanding simplicity the windows themselves become the walls in this all-Lupton installation.



Fast, clean installation. Lupton Metal Windows are delivered ready for immediate placement. With mullions in place, workmen put up Lupton window sections from within building-fast, inexpensively.



Adjustable ventilation. Projected in at bottom or out at top, these Lupton Windows provide immediate controlled ventilation with maximum light, are tight-fitting and rattle-free.



KELLOGG HIGH SCHOOL, Kellogg, Idaho. Architects: Culler, Galo, Martell & Norrie, Spokane, Wash.; Perkins & Will, Chicago, Ill. Contractor: Johnson-Busboom-Rauh, Spokane, Wash. Photograph by Hedrick-Blessing.

LUPTON METAL WINDOWS BRING MAXIMUM LIGHT AND AIR TO KELLOGG HIGH SCHOOL

With this ultra-modern consolidation school the community of Kellogg, Idaho, voices its pride and civic-mindedness. Thanks to these walls of LUPTON engineered metal windows, bountiful ventilation and light are made available throughout the building.

Working together with school authorities to typify community solidarity, the architects conceived this building design which embodies a continuous wall of windows. Bright yellow-painted steel mullions and red muntins provide a joyful frame to the impressive view through the 513 LUPTON Steel Architectural Projected Windows.

Certain extreme climatic conditions (wind and dust storms; smoke from nearby Bunker Hill smelter; a wide variance in atmospheric temperatures) made the selection of materials unusually important. Ruggedness and simplicity characterize the construction, and are epitomized in the modern, precisely-engineered walls of tight-fitting LUPTON windows.

The Kellogg High School project reflects a growing movement towards the use of entire walls comprised of LUPTON windows in schools, hospitals, and other modern buildings. LUPTON'S 75 years' experience in metal-window and curtain-wall manufacture merits your complete investigation—look first in the Architectural File (Sweet's) for the Michael Flynn Catalog, and then consult the Yellow Pages under "Windows—Metal." Or write for specific additional information on LUPTON Metal Windows and Aluminum Curtain-Wall Systems.

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METAL WINDOWS AND CURTAIN WALLS

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Robbins Hard Maple Floor in Skateland Roller Rink, Memphis, Tenn. Architect: Windrom, Haglund & Venable, Memphis, Installer: Dellinger Floor Co., Memphis.

BRING THE CROWDS TO SKATELAND

This Robbins Hard Maple Floor is a major drawing card at Memphis' Skateland, the largest roller rink in the Mid-South. Its beautiful smoothness, uniform resiliency and tight-grained splinter resistance offer the finest skating surface possible. And the amazing part of it is - this hard maple floor will still have all these remarkable features after years of abuse by thousands of speeding skates.

Robbins approved floor contractors are specialists in skating rink installations. Their long experience in this field can help you with specifications and correct

installation procedure. And they'll be glad to fully explain why Robbins Hard Maple floors are chosen for the nation's finest skating rinks, gymnasiums, classrooms, workshops and plants. For the name of your nearest authorized installer, write Robbins Flooring Company, Reed City, Michigan. Attn. Dept. AF-557.

For an extra assurance of long life, Robbins floors are now available Dri-Vac treated with Woodlife for protection against moisture absorption, swelling, shrinking, checking, cupping and grain raising as well as termite and fungi attack.



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Abroad

A continuing review of international building





PRECARIOUS IN PFORZHEIM

February, 1945 brought destruction to the small Black Forest city of Pforzheim. Piecing their lives back together, the city's Protestants agreed on the impermanence of earthly shelter; they also agreed on the need for a new building for St. Matthew's Church. Architect Egon Eiermann was called in to interpret their agreement, produced a careful patchwork of concrete blocks and colored glass inserts. Inside, the light is filtered through the riddled walls. Above the altar a purposely crude cross leans precariously forward.

TIMELESS IN BOGOTA

Although famed Engineer Guillermo Gonzales used the most advanced structural techniques of concrete vaulting in carrying out the design for his recently completed Chapel of Fatima, the result (right) achieves a composure and balance more often associated with less pressured eras of church building. Juvenal Moya is the architect; a busy street in Bogotá, Colombia is the site.





PHOTOS: Y. ISHIMOTO

MEMORIAL AT HIROSHIMA

In the middle of Hiroshima's desert a peace center of three contemporary buildings (assembly hall, memorial museum and auditorium) offers a constructive framework for unavoidable thoughts of the world's first nuclear explosion. Designed by Architects Kenzo Tange, Takaski Asada & Sac-

hio Otani, the stilt-supported buildings stand above but not apart from the symbolic sculptures of several Japanese artists. Leading through the grounds, among the sculptures and nearby tombstones, are the traditional pathways of Japanese landscaping, directional yet conducive to contemplation.





DUTCH LUNCH AT THE STATION

Luncheon in the restaurants of Europe's railroad stations is often remembered as a dank, subterranean affair. And getting to the station in the first place was rarely easy, being complicated by the coming together of all transportation, public and private, at one bottlenecked

entrance. By avoiding these twin evils and by showing off many new ideas for modern station-goers, Architect K. van der Gaast's terminal at Eindhoven succeeds in being truly inviting. Among the new ideas: excellent lighting throughout, full use of the building's height

(offices are double-decked above the ticket counters) and portholes for curious diners. But those who might miss the cavelike atmosphere of former times also get adividend: there is a tunnel moling below ground to the adjacent bus and trolley platforms.



Abroad cont'd



ORANGE BOWL IN ITALY

Between the sea and the mountains near Formia the Italian government recently finished a training camp for track athletes. Its brightly hued focal' point is a lightweight, reinforced concrete gymnasium, a dynamic amalgam of tensions, spans and angles. Appropriate as a home for runners, vaulters and leapers, Architect A. Vitellozzi's design broad jumps across some 116', touching solid

ground at only the four corners. The span is made possible by two huge steel trusses, roofed over by folded concrete slabs. Other features of the camp are a stadium which seats 2,000 people (and is called, for local, agricultural reasons, "The Orange Bowl"), a six-lane, 400-meter track, public buildings and accommodations for four dozen sunbaked athletes.







ASKANCE IN INDIA

As if to glance at a rapidly passing client, the façade of the New India Assurance building in Bombay is turned "eyes right." The architects, Master, Sathe & Bhuta, provide a more static explanation: the building had to face west, toward the blistering afternoon sun, the blasting monsoon and, occasionally, the cooling sea breeze. To draw in the best of the Indian elements and to exclude the worst, a reinforced concrete grid of surprising depth (5') and severe angle (45°) was devised. And the westerly drafts bounce in, the owners say, with a new-found vitality and cooling.





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