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N CHICAGO'S GO

Chicago's "Gold Coast," overlooking Lake Michigan, a \$25-million, 6-building apartment enterprise is rapidly nearing completion. These 28 and 29 story towers will be the tallest flat-slab reinforced concrete structures in the U.S. and possibly the world. Prefabricated skin frames of aluminum, each a story high, will hold crystal walls of gray tinted, heat retarding plate glass. All of the 1238 apartments (6108 and SLOAN Act-O-Matic SHOWER HEADS.

• On the two largest unoccupied building sites on rooms) will be summer and winter air-conditioned and equipped with individual room controls. All will feature maximum soundproofing for quiet privacy. All will be served by high speed, electronically teamed elevators and all corridors will be pressurized. In a project of such fabulous designing nothing less than the best would suffice, hence all towers are to be equipped throughout with SLOAN Quiet Flush VALVES



Urban renewal allotted \$250 million this year; closer ties between public housing and urban renewal may be required

> Urban renewal won a victory for at least the current fiscal year, which started July 1, over officials of the Budget Bureau, the Treasury and the President's Council of Economic Advisers, who would have drastically trimmed and eventually terminated federal aid to slum-wracked cities.

> HHFAdministrator Cole disclosed that the Urban Renewal Administration will be allowed to make new capital grants reservations this year for up to \$250 million out of the \$350 million additional authorization in the new housing law. And if this turns out to be insufficient to maintain vigorous progress, he added, the administration will consider releasing more of the extra \$100 million authorization.

> The \$250 million for this year is the rate President Eisenhower originally recommended in his January budget message, although Cole himself, in support of a subsequent White House economy drive, had requested only \$175 million from Congress for this year. (At that time he had said that \$175 million would be enough "to support a vigorous campaign.")

> The American Municipal Assn. had a large hand in winning the release of this year's \$250 million. Its executive committee, headed by Nashville Mayor Ben West, sent the President a telegram urging him to reassert his "repeated expressions of support" for a strong renewal program.

> Just two weeks later, Cole wrote to Mayor West:

> "The President has asked that I reply to your telegram. . . . As you know, the present broadened concept of urban renewal was one of the first major recommendations of President Eisenhower in the broad field of housing and urban affairs. . . . I want you to know that it has and will have the firm support of this Administration."

> Although there is need for over-all economizing in national spending, Cole added, "there is no conflict between this general necessity and our recognition of the specific necessity for pressing forward with a vigorous and effective renewal program."

But if the renewal aid battle for the

current year was won, there were still many other problems that would also need to be solved to assure continuation and improvement of the program in the years beyond. Under White House directives, in fact, the housing and renewal agencies in Washington are already broadly restudying all their various programs and policies.

What recommendations may be exnected?

"It is no secret," reports one qualified Capital observer, "that Eisenhower does not like the way housing has been limping along. White House aides are particulary miffed at all the criticism public housing has been getting.

"One good hint is that any revamped housing program will tie public housing and urban redevelopment operations closer together.

"It is a good guess that any further public housing, to the extent the Administration may be willing to stand for any more of it at all, might be restricted to urban renewal areas, and possibly even limited solely to 'displacees' who were compelled to move to make way for various public works improvements."

PUBLIC HOUSING

Vinton leaves PHA, will work to better program

US Public Housing Chief Charles E. Slusser let go last month one of PHA's ablest executives and policy advisers.



VINTON

nearly 23 years in the federal government's housing activities." One of Vinton's unusual distinctions: because of his broad, special experience he was kept as a "holdover"

in his high PHA position for more

He formally accepted

the resignation of

Assistant Commis-

sioner Warren Jay

Vinton "after a dis-

tinguished career of

than $4\frac{1}{2}$ years after the Republican administration came into office. His resignation was not voluntary.

Soft-spoken Phi Beta Kappa Vinton, now 67, has been known best in recent years for his success in directing the PHA financing program. More than anyone else he is credited with putting over the plan for private, rather than Treasury financing of public housing projects-by means of the US guarantee on local housing agency bonds, sold conventionally. Since 1953, PHA borrowing from the Treasury has been reduced \$899 million (down from \$940 million to \$41 million) by this type of refinancing, with corresponding reduction in the national debt. This conversion was not something that "just happened." Winning the confidence and acceptance of the nation's top banking and investment offices for this new type of local agency bonds took considerable education or "selling" before they caught on-largely a personal achievement by Vinton.

Recently elected a councilman in Somerset, Md., Vinton feels "public housing is at the crossroads," and he expects to remain in the Washington area—help frame legislation for an improved program from outside of the agency in which he held office so long.

Other housing developments:

Because of difficulty in finding suitable sites for new projects, the National Capital Housing Authority asked Washington, D.C. commissioners for permission to buy an existing 103-unit FHA-608 project. Builders and property owners have protested, claiming that reductions in real estate taxes and failure to clear slums would make this a bad precedent. At month's end the commissioners still mulled the problem. (The only other instance of the purchase of an existing structure by a local housing authority occurred in Montgomery, Ala., and involved a foreclosed 608 project sold off by FHA.) In San Diego, the PHA turned over the management of a 500-unit Lanham Act (war housing) project to a private real estate organization, which promptly put its former government-employee managers on the firm's private payroll. Technically, PHA had insufficient funds it was legally authorized to spend for managing the project, and there was no local agency to take it off its hands. But lawyers found that under the circumstances it would be legal to contract for private management, with fees deductible from rent collectionsa procedure PHA itself could not use. PUBLIC BUILDING

GSA left high and dry on lease-purchase

When Congress quit and went home it left the GSA in a first-rate mess on its lease-purchase construction program, and gave it no substitute for any program of public buildings construction by any other method.

Bluntly stated, Congress allowed the lease-purchase law to expire in July, and enacted no alternative. Technically, 98 GSA projects, and 50 Post Office jobs that already have congressional sanction could proceed. But the hitch on these is that increased costs would now make virtually any bids on them exceed authorized ceiling prices. Nor does GSA consider it feasible to try to trim existing plans for individual projects—all of them already checked, rechecked and squeezed to the limit half a dozen times.

Here's a summary of the Congressional byplay that frustrated GSA and left the nation with no effective federal public buildings program—and no substantial volume of new facilities erected since 1940:

In vain, the Senate adopted a bill to continue lease-purchase and allow GSA

MILITARY BUILDING

Pentagon rapped on frills for affluent soldiers

Air-conditioned housing for military families, and "a creeping tendency toward increased use of higher quality and costlier materials and refinements of architectural treatment" for other military construction, drew sharp fire last month from the House appropriations committee.

A committee report criticized the Defense Dept. for issuing too many waivers to its general prohibition against air conditioning for so-called Capehart housing at military bases to date 16 instances for the Air Force, two for the Navy, none for the Army. Balancing initial costs and operating expenses, it also specifically hit the Air Force for buying a heat pump system instead of a combination gas and electric cooling system at one base.

Answering the criticisms, Brig. Gen. Joseph E. Gill explained that air conditioning often saves money in the long run: if the airman buys his own unit to accept bids that were no more than 7% higher than original cost limits set for each building already approved. But the House public works committee would approve no comparable measure. In fact it unanimously recommended a bill that would even kill lease-purchase projects previously approved but not yet started (except for District of Columbia projects). Committee Chairman Robert E. Jones (D, Ala.) cited a General Accounting Office report that estimated that the first 148 pending projects would cost an extra \$170 million by being bought "on time" rather than by direct appropriations.

▶ Under the (unenacted) bill fathered by Jones, an appropriation of \$1.5 billion would have been authorized to pay cash on the barrelhead to erect all previously sanctioned lease-purchase buildings and other needed structures. But to seasoned Washington observers, getting any such appropriation adopted (instead of merely "authorized") during the current and prospective 1958 budget crises was strictly a legislative pipe dream.

GSA has awarded architectural contracts for 52 of its first 98 approved lease-purchase projects, but last month was debating whether it was even worth letting design contracts for any of the others at present.

the Air Force has to pay not only for its electricity but the cost of shipping it for him when he is transferred. "For 10ϕ a day they will buy an air conditioner," added Gill. "If we do not provide air conditioning for these houses we take on a much bigger bill."

In rapping the Defense Dept. for fancy construction, instead of the "relatively austere concept" that members felt more appropriate and more traditional for military buildings, the committee report included these raps:

"Many clubs are provided with brick fireplaces and chimneys, the cost of which ranges up to \$1,500. In some clubs, the dance-floor areas have maple rather than asphalt tile floors.

"Many of the barracks and bachelor officers' quarters are being provided with concrete canopies over the windows.... The Engineer Corps estimates that these cost about \$2.75 per lin. ft., \$6,476 for a typical barracks. RENTAL HOUSING

Windfall case compromise lifts tenants' rents

There was a wry twist for the tenants of the 2,596-unit Farragut Gardens apartments in Brooklyn, N. Y., last month, after the Justice Dept. victoriously announced a \$2 million settlement on its efforts to recover an alleged \$3,158,000 "windfall" profit from the builder-owners.

One of the conditions for settling all the cross litigation on this FHA 608 project provided for a readjustment "review" of the rents. But because of increased operating expenses since the job was finished in 1949, this readjustment turned out to be a rent hike for everyone averaging about 8%—rather than a reduction. Another condition was full payment of recent mortgage default amounts with part of the \$2 million returned to the project's treasury.

Both sides had compromised a bit for their mutual advantage. The owners yielded some, and got their rent increase; the government yielded some, and avoided the threat of eventually having to take over the project, raise the rents, manage and dispose of it as a distress property—if greater defaults had accrued.

Box score

Altogether the Justice Dept. was handed 32 large "windfall" cases. In addition to Farragut Gardens, it settled out of court for \$400,000 on a \$550,000 claim against a Wilmington, Del. project. It also won in court a full \$762,000 judgment against the Beverly Manor development in Columbus, Ohio. The remaining 29 cases total about \$17 million, but optimistic Justice sources say they have settlement offers from most, and doubt if more than six more windfall cases will ever be brought to trial. FHA on its own has settled about 500 cases for a total of "more than \$20 mil-

lion," or an average of about \$40,000 each, and has about 100 more lesser cases still outstanding.

COMMUNITY PLANNING

Mayor, Council unite on Cleveland civic center plan; Zeckendorf interest in it stirs frenzy

Last month two Cleveland political factions composed their differences after a public fight over the merits of two rival civic center redevelopment plans.

While the squabble lasted, until both sides made peace and joined forces to promote the so-called Outcalt Plan for a comprehensive lake-front project including a large new hotel and an office tower, the city's newspapers overflowed with redevelopment news and editorials. Headlines were as hot as the August weather.

As the city ran a high fever over the need to revitalize its downtown core, smiling Realtor-Developer William Zeckendorf made a flying visit with a staff of his Webb & Knapp redevelopment experts. An apprehensive, unwealthy middle-aged widow never welcomed a visit from a millionaire bachelor more fervently, nor hung more attentively on his every word that was not a rebuff. But before consummation of any Cleveland-Zeckendorf wedding, several practical matters would still have to be settled: 1) City Planning Commission approval of the site and plan favored by Zeckendorf and the political faction headed by his SponsorHost Mayor Anthony J. Celebrezze, and, 2) approval, in bleak November, of a \$15 million bond issue for the city's portion of the project by an economyminded citizenry that might prefer some more civic services and amenities for itself before providing more glittering attractions for convention trade visitors. (Only last January the Urban Renewal Administration was threatening to withhold further assistance from Cleveland until city finances and certain community services in some areas were improved.)

The background

After a steady decline for some 20 years in the influence and importance of Cleveland's downtown core, its City Hall caught "revitalization fever" last year. At the request of Mayor Celebrezze, Architect R. Franklin Outcalt, of Outcalt, Guenther & Assoc., prepared some speculative, schematic sketches of a vast, bold "Mall Center" development that would enlarge and supplement the 30-year-old Public Auditorium facilities that now bring the city an estimated \$20 million-a-year convention and exhibition trade. (Recently it has lost *continued on p. 9*



OUTCALT PLAN looking south from lakefront. Exhibition and parking facilities would be mainly under north-south plaza. Rear of City Hall is just to right of office tower; 9th St. divides hotel and offices.



ROBERT LITTLE PLAN looking northwest across 9th St. (r) would have consisted of exhibition hall with roof parking, enlarged hotel (tower), and would have connected with auditorium (left background).



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some conventions to cities with more modern auditorium and exhibition facilities. Up-to-date, more flexible facilities, coupled with extensive parking, a new, modern hotel, etc., presumably could halt this loss, create a \$10 million annual increase in convention spending in Cleveland.)

Presentation of Outcalt's rough plans last fall to a selected group of top civic and business leaders won enthusiastic approval. The upshot was a \$50,000 City Council appropriation to have him make further studies and more detailed plans. These (see cut) were unveiled a month ago to another blue chip audience. Also present were invited representatives of Zeckendorf, the Hilton Hotels organization, Realtor-Developer John Galbreath of Columbus, Ohio and other potential redevelopers.

As now conceived, the Outcalt plan would cost roughly \$100 million and would create a Rockefeller Center plaza type development off the end of the city's well-known mall, between the City Hall and Court House, and south and east of Cleveland Stadium, overlooking Lake Erie. Mostly it would be erected over the Pennsylvania and New York Central railroad tracks from about E. 3d to W. 9th Sts., where these tracks are at the foot of a 50' bluff. In addition to an extra 320,000 sq. ft. of convention-exhibition space, and a 5,300-car garage the Outcalt center would include at the 9th St. end a 12or 14-story T-shaped hotel, a 34-story office tower, shops, restaurants, and a science and industry center.

Without signing any formal or binding agreements with anyone, Zeckendorf during a gallant, whirlwind visit to the city last month, said he would "sponsor" the entire private section of the Outcalt development—provided the city would build the convention and parking facilities. But this was only "the basic decision," he did caution his frenzied, fluttering, overjoyed hosts. "Working out the details will take time —months, possibly years," he added.

Opposition to the Outcalt plan was headed by City Council President Jack P. Russell, who would be happy to succeed Celebrezze, and several other council members. They favored a less elaborate project that would be built closer to the existing downtown center in the block beside the present Auditorium (between it and 9th St.), rather than beyond the Auditorium and City Hall.

Russell said plans for this were prepared at his request and expense by Robert A. Little & Assoc. as an alternative to the plans promoted by the Mayor. The Russell-Little proposal (see cut) would have cost only about \$16 million. It contemplated a basement and single-story exhibition hall that would have been linked to the Auditorium and increased the city's convention hall space from 250,000 to 630,000 sq. ft. The roof would have parked 500 cars.

Some observers felt that the long 9th St. side of Little's hall might choke off a natural redevelopment of that street that is now starting to take place between the downtown core from Euclid Ave. to the lakefront, which is one of Cleveland's most effective assets that is now too little noticed.

Last month, as the city awaited the recommendations in a special civic center site study being made by Planning Consultants Walter Blucher and John T. Howard, MIT city planning professor and former Cleveland planning director, the political fighting became quite heated. Once, when Russell proposed a "peace conference" of all interests to form a "united front" for Cleveland progress, Mayor Celebrezze refused even to discuss his proposal. When Board Chairman John Greene, of the Ohio Bell Co., was asked to accept the chairmanship of a campaign committee for the \$15 million public bond issue, he declined, at least until the controversy over the site and scope of the proposed project is ended.

A few days later, however, after it was learned that Howard and Blucher were going to recommend the Outcalt Plan site, the Russell forces teamed up with the mayor. Simultaneously, Greene accepted the bond campaign chairmanship, and the mayor instructed Urban Renewal Director James Lister to "cooperate" fully with the Zeckendorf staff in whatever planning can be done now, with a view to obtaining some formal commitments from him, provided the bond issue is adopted in November.

METROPOLITAN PROBLEMS

Miami begins to organize metropolitan rule

Miami and the rest of Dade County were settling down to the long task of setting up the metropolitan (county) government they approved by referendum last May.

Selected for the key post of County Manager at a salary of \$35,000 a year: O. W. Campbell, city manager of San Diego since 1949. Campbell knows he has a long, tough assignment ahead, points out that mere adoption of the charter did not bring full-fledged metropolitan government into being. Asked why he accepted the appointment after a divided three-to-two vote by the present five-man board of county commissioners that forms the nucleus of the new area-wide government, Campbell said: "The experimental nature of the job. It's an opportunity to create and build something different to handle the broader metropolitan problems."

Quake hits Mexico City; architect hangs self

DESIGN

Mexico City's severe July earthquake (rated between 7 and 8 on the Mercalli scale of 12) demonstrated once more that properly designed and constructed buildings can withstand major seismic shock without difficulty—while inadequate ones invite damage and disaster.

The 44-story Latino-Americana Tower, the city's tallest, swayed 12" at its peak, but suffered not even one cracked pane of glass. Mexican Architect-Engineer Felix Candela reported that not one of his structures with their concrete hyperbolic paraboloid roofs and other unusual design features suffered *continued on p. 12*

LIFE: J. GUZMAN



MEXICO CITY tower with quake-shattered masonry end wall, but not so extensive breakage suffered across front window wall.

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so much as a crack.

In a nonprofessional but informative report to FORUM, Los Angeles Architectural Photographer Julius Shulman, who was in Mexico City during the quake, said most press reports of damage were greatly exaggerated—although a number of sizeable structures did collapse, and nearly 100 of all different types had to be condemned or closed as unsafe. [First reports referred to "a huge crack" that "split open" the side of the 15-story Continental Hilton from street to penthouse. Actually this "crack" occurred where a section of Architect Fernando Parra Hernandez' building had been added to the existing structure, and an expansion joint was provided to allow for possible settling.]

"The afternoon after the quake, I spent several hours at the University of Mexico, and on close inspection could find no damage," wrote Shulman.

Of Mexico City's 71 quake deaths, 33



• Explains what this colorful, infinitely durable glass-hard surfacing is composed of, and how it is used for New and Existing walls-interior or exterior, bare or painted, concrete, masonry units, stucco, plaster or hardboard.

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 Shows how CEMENT ENAMEL saves up to two full inches of floor area as compared with ordinary wall surfacing materials.

 Added Feature: page of recommended Architect's Specifications. Complete and detailed—just clip it and use it.



occurred in the collapse of a single sixstory apartment. The builder and owner of this were both jailed, and charged with the victims' deaths because of alleged use of poor concrete and negligence in construction. Later the architect, Teodoro Vega Garnica, 49, architectural teacher in a vocational school. surrendered himself to the authorities, after first sending them a statement that he had signed blueprints presented to him by the builder without looking at them. He also said he knew the builder had added an extra story not included in the original plans. Four days later, using his belt, Architect Garnica hanged himself in his jail cell.

MISCELLANY

FHA helps convert hotel into housing for aged

HHFAdministrator Albert M. Cole journeyed to Detroit last month to give a personal boost to FHA's new program for housing for the elderly, authorized in the 1956 housing law.

At a ceremony in the 12-story former Hotel Detroiter, scarcely five blocks from the downtown center, Cole gave the Catholic Carmelite Sisters the FHA commitment to insure a \$4 million loan for the conversion of the structure into a home for the aging. This is the largest loan to date under the program, and the first covering the rehabilitation and redesign of an existing structure for this purpose. Under this program loans as high as 90% of cost can be obtained for projects sponsored by nonprofit, religious fraternal or labor groups.

Most of the extensive renovation of the hotel, now called Carmel Hall, has already been completed, and the proceeds of the FHA-insured loan will replenish working funds of the owners, allow them to carry out additional projects. Acquisition and conversion, planned by Leo M. Bauer & Associates, architects, cost a total of \$5 million, including alterations to provide a new chapel, infirmary, theater, recreation rooms, rewiring, modernized plumbing and heating. Bishop John A. Donovan called the project a bargain, because erection of comparable new facilities would have cost about one-third more. Cole declared he was "immensely impressed" by the project, and hoped it would stimulate and encourage many similar projects in all parts of the country.



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130,000 square feet of manufacturing plant completed seven months after ground-breaking! And Brown & Grist played an important part in this fast-moving project.

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New Penncrest Senior High School at Lima, Pennsylvania, matches bold design with maximum light and air



ventilation, deflect drafts, and provide various degrees of open-ing. Simplicity of hardware makes them easy to use, inexpensive to maintain.

A brilliant illustration of the harmony of fresh and forceful design with functional need is shown in the modern Penncrest Senior High School at Lima, Pennsylvania.

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Connecticut General Life Insurance Company, Bloomfield. Skidmore, Owings & Merrill, architects, New York; Turner Construction Campany, contractors, New York; Syska & Hennessy, mechanical engineers, New York.

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School furniture by courtesy of American Seating Company, Grand Rapids, Michigan. Flooring J-M Terraflex Tiles: Thrush Brown No. 944, Sandpiper Tan No. 923, Dove Gray No. 911.

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711 Third Avenue, New York City. Architect: William Lescaze

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> Model by Pratt Institute students Stuart Cohen, Stanley Kogan, Frank Marcellino





On behalf of architects working with civic building committees

The advertisement on the opposite page appears in the August issue of *Fortune* magazine. It is part of a continuing program to inform your clients about the benefits of Alcoa® Aluminum curtain walls in color, and many other uses of aluminum in architecture. In this instance we are particularly concerned with reaching those business executives who participate on building committees for civic, educational and community structures.

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The new dimension of color added to the many practical and esthetic values of Alcoa Aluminum in architecture continues to make its mark across the skylines of America. And there is available for you at your nearest Alcoa sales office complete data and details to assist in the use of this versatile building material. Write ALUMINUM COMPANY OF AMERICA, 1887-J Alcoa Building, Pittsburgh 19, Pennsylvania.

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ALTERNATE COST DATA

Summary of installed costs per M sq. ft. Based on actual suppliers' quotations and time records where available and on Walker's Estimator's Handbook where not:

- 1. As built, with clips, eliminating blocking at panel edges. Includes cost of new plywood and 50% of
- initial cost of exterior plywood sal-. \$169* vaged from forms . . . 2. Estimated cost as built but using
- all new sheathing with no salvage from concrete forms \$187
- 3. Estimated cost all new sheathing with 2 x 4 blocking at panel edges . \$206
- 4. Estimated cost 2 x 6 T & G decking . \$291
- *169.00 per M "as built" cost represents \$122.00 per M savings over estimated cost of 2x6 T&G decking. On this basis, savings on entire job total \$3,300.00.

To eliminate 2 x 4 blocking, metal "H" clips were used at unsupported panel edges. Two clips were used for each span. (Clips were responsible for approx. \$20 per M of savings; see table above).



AN EXCELLENT EXAMPLE of how fir plywood roof decking sharply cuts costs as well as provides markedly superior construction is this new U-shaped, 1-story reinforced concrete school.

The contractor estimates $\frac{3}{4}$ " fir plywood saved a total of \$3,300.00 on the job; \$2,800.00 in actual installed cost, plus an additional \$500.00 by amortizing costs of some of the panels previously used for forms. A total of 27,000 sq. ft. were used on the job. Design calculations by the architects show plywood superior in resisting racking forces such as wind loads and earthquakes.

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JAMES SALES ELEMENTARY SCHOOL; Tacoma, Washington ARCHITECTS: Lea, Pearson and Richards

CONTRACTOR: Nelson Construction Company STRUCTURAL ENGINEERS: Smith and Murray

5 ways Fir Plywood builds better schools



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resistant paneling and wainscoting.





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The public or main area utilizes Litecontrol No. 6142TS-66 fixtures on 8-foot spacing, in a grid type ceiling. Note the even quality of the lighting — only a suggestion of a shadow appears under the checkwriting desks. (Note, especially the long, right-hand desk, designed by the architect. It has no visible support except the lally columns.)

The adaptability or flexibility of this system is apparent. Note how the inverted aluminum T-bars run across the main ceiling down the side of the soffit over the Tellers' counters, and continue to the wall as an integral part of the *Luminous* Ceiling. This is a bank installation, but the concept makes a good, modern system for almost any interior.

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FIGURED GLASS MAKES





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.

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w	0	R	L	D	•	s	L	A	R	G	E	s	т			м	A	N	U	F	A	с	т	U	R	E	R		c	F	F


Architects: Smith, Powell & Morgridge

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> Send for catalog 57-G. Address Department 6.



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.



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THESE moisture eliminator blades for industrial air conditioners are now made of Geon rigid polyvinyl chloride compound – to end frequent replacement of formed sheet metal blades.

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"Keywall exclusively!" That's the decision of Victor DeSantis (right), vice president of The R. S. Ursprung Company. Vito DeSantis (left), job superintendent on the new Retread Plant of Firestone Tire & Rubber Company, agrees, as they inspect the job with Bob Scheurer, president, Lakewood Supply Company, local distributor of Keywall. Keywall preferred by The Sam W. Emerson Co., Cleveland, for the Museum of Natural History, Cleveland. Approved by Garfield, Harris, Flynn & Williams, architects.

Cleveland goes "all out" for





Keywall used exclusively in this large retail store of the May Co., Cleveland. Victor Gruen & Associates, Detroit, architect. Jack A. Bialosky, Cleveland, associate architect. The Sam W. Emerson Co., Cleveland, general contractor.

On this Warner & Swasey Co. warehouse, Keywall was used in alternate courses. Pilasters were on 16 ft. centers with expansion joints. Walls—18'-0" high. Joseph Ceruti and Associates, architect. The Leonard H. Krill Co., general contractor.



Typical Cleveland specification—Keywall in alternate courses. Olmstead Falls High School. Mellenbrook, Foley & Scott, architect, Berea. Barber, Magee & Hoffman, structural engineer. The Hoelzl-Martini Construction Co., general contractor.

Keywall takes over. On the Lamson & Sessions Factory, Keywall was tested against another masonry reinforcement. On the office addition, Keywall is being used. The George S. Rider Co., engineers. The Sam W. Emerson Co., general contractor.





Keywall was used in every course in the Continental Transportation Warehouse. Arnold A. Peterson, architect. Industrial Construction Co., Inc., general contractor.

Contractors prefer... architects approve ... new type masonry reinforcement

Visit the better masonry jobs around Cleveland. Go on the scaffolds. Talk to the bricklayers. Talk to the superintendents. Never before a reinforcement like Keywall, these men agree. Architects like it because they know that when masons like a product, they'll use it, and use it right.

Here are a few of the current jobs where Keywall is adding strength, reducing shrinkage cracks and giving greater value.

KEYSTONE STEEL & WIRE COMPANY Peoria 7, Illinois

Keywall exclusively. Dairy Pak, Inc., factory. Wyatt C. Hed-rick, architect, Cleveland and Ft. Worth. Henry C. Beck Co., general contractor, Cleveland and Atlanta. William A. Rhodes Construction Co., mason contractor, Cleveland.

inch brick walls, Keywall was used in every sixth course. Nicholas Lipaj, architect. Leo W. Schmidt, general contractor.

An exclusive Keywall job. Lakeshore Hotel Cabanas and Pool. Snyder & Tekushan, architect. The West-wood Construction Co., general contractor.







(Top) Keywall preferred and used." Westlake Christian Church. Travis Gower Walsh & Associates, architect. R. L. Williams, associate architect. Dunlap & Johnston Inc., general contractor.

Keywall used in alternate courses. Vermillion-on-the-Lake High School. Outcalt Guenther & Associates, architect. Tom Hume, general contractor.





And in Idaho -FUTURE OF FAULTLESS SERVICE

KELLOGG HIGH SCHOOL Kellogg, Idaho CULLER, GALE, MARTELL & NORRIE and PERKINS & WILL architects LYLE MARQUE & ASSOCIATES mechanical engineers DETWEILER BROTHERS, INC. or Manical contractor GRINNELL CO. INC. wholesale distributor AMERICAN RADIATOR & STANDARD SANITARY CORP plumbing fixtures manufacturer

Suter, Hedrich-Blessing

Stimulating the civic pride of a mining area in the mountainous panhandle of Idaho, this soundly planned and spectacular DELANY installation has been widely publicized . . . and justly so. A difficult 70 acre site, known as Jacob's Gulch, offered little level land but a solution was neatly achieved by bridging Jackass Creek with the two story classroom wing. This same flair for the dramatic coupled with the practical is shown in the detailing of the structure. Among the worthwhile decisions here was the sensible selection of DELANY diaphragm type flush valves . . . as rugged and durable as the rocky hills that surround the project. In schools of prominence, throughout all forty eight states,

the trend is to DELANY-"the fastest growing name in flush valves!"



This new "HAND BOOK and CATALOG No. 53" is the most comprehensive of its kind-designed for everyday reference . . . 19 pages of installation details for exposed, concealed and special FLUSH VALVE installations . . . over 75 blue prints . . . cut away views . . . many pages of charts, formulae, piping details . . . sent free, 1 requested on firm letterhead.



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Projects

A roundup of recent and significant proposals





WASHINGTON GIANT

Realtor Morris Cafritz plans an \$8 million office building (above) with a surprising space ratio — two-thirds for cars, one-third for people. Designer of this park-at-yourdesk building: LeRoy Werner.

COOL CUMMERBUND

Directors of the Harris Trust & Savings Bank, Chicago, will lunch where the air conditioning might have been. Skidmore, Owings & Merrill centered mechanical equipment on middle floors of this skyscraper.

EXURBAN SHOPPING CENTER

Nestling between the new Connecticut Turnpike (top of cut) and the Boston Post Road:

\$25 to \$30 million project designed by Lathrop Douglass. Owner Sol G. Atlas plans 85 Conn-Post Shopping Center, a stores, 5,500 parking spaces.





SUBURBAN NEIGHBOR

On a 28-acre site in Montgomery County, Maryland (just outside Washington), the Government Employees Insurance Co. will build a \$5 million operations office close to residential and shopping areas. Philadelphia Architect Vincent G. Kling designed the fourstory building of reinforced concrete.





SEATTLE NEWCOMER

Rising from a four-story base on a sloping site, Seattle's first new office building in 25 years will have a landscaped plaza at the entrance level. The base itself will have space to park 200 cars. Tinted gray glass set in vertical aluminum frames will enclose 16 office floors. Architects: Jones & Bindon of Seattle; Skidmore, Owings & Merrill, San Francisco office. Three rectangular apartment houses in Ann Arbor will be faced with glass sandwich panels and rimmed with 7' balconies on each floor. Between the ten-story buildings by Architects King & Lewis: terraced courts, fountain gardens.





Finished in yellow, lavender and blue, these three apartment buildings for 2,004 families will add a dash of color to a rather drab section of New York City. They were designed by S. J. Kessler & Son for a Greenwich Village Title I site covering six blocks just south of Washington Square. Strips of landscaped area will separate the housing towers.





FLORIDA STATE OFFICE BUILDING

Fourteen state agencies in Winter Park, Fla., will be under one X-shaped roof designed by Broleman & Rapp of Orlando. Overhanging second story makes a covered walk.

SOAP AND FOOD PRODUCTS TECHNICAL CENTER

For a hilly site north of Cincinnati, Architects Schmidt, Garden & Erikson of Chicago have planned a campus technical center for Procter & Gamble, to be completed in 1959.





Projects





COMMUNITY CHURCH IN CLUSTERS

For the White Plains (N.Y.) Community Church, Architect Jules Gregory drew tangent prisms (1), then geometric shapes for the Sunday school classrooms and fellowship hall.

The resulting cluster, Gregory says, gives a sense of individuality and eliminates the expense and inconvenience of walkways. Construction: laminated wood trusses and frames.

PHILADELPHIA COLLEGE OF OSTEOPATHY

Architects Nolen & Swinburne and George M. Ewing Co. drew plans for a \$12 to \$15 million College of Osteopathy in Philadelphia. At right in drawing are two hospitals for 600 patients, connected by ancillary - outpatient - admission building. At left: dormitory, faculty and nurses' residences.

DOCTORS' CO-OP

About 55 doctors and dentists will share ownership of this \$1.25 million professional building in Tulsa. Architects Murray-Jones-Murray, also of Tulsa, spent a year researching and developing plans to insure their professional clients the latest and most practical building design. Special features: basement for radiology, air conditioning and mechanical equipment; ground-floor pharmacy; specially engineered plumbing, electrical and acoustical systems.

CITY BLOCK MOTEL

A triple-threat motel—close to the airport, downtown, and a new expressway—will be built on a full city block of redeveloped land in Kansas City. Planned for 132 guests, the \$1 million Prom Motel (below) was designed by Architects Windrom, Haglund & Venable of Memphis; Manuel Morris of Kansas City, associate.



Music-lovers returning to Manhattan in 1960 may be in for a shock. Replacing Carnegie Hall, they may find a 44-story tower rising out of a landscaped sunken plaza. Vermilion porcelain steel panels and gold-tinted windows would create a checkerboard. Architects: Pomerance & Breines.







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For over two years Robbins has been auditing colors in a vast program of color research. This master plan has been a well-kept secret. It was directed by New York's foremost color consultants, Colorhelm, Inc., and American Color Trends, Inc., whose experts broke down the spectrum as never before. They lived color, analyzed color from every aspect of modern life, directed running of thousands of experimental samples, plotted color trends far into the future.

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Trends

Construction up 8.2%—except for home building; cement strike causes \$150 million setback

With the exception of private home building, which has greatly distorted the over-all picture, construction has enjoyed a banner growth this year.

If this distortion is taken out of the picture, by excluding homebuilding from the data compiled by the Commerce and Labor Depts., the rest of the construction field shows a substantial 8.2% increase in spending through July this year, compared with 1956 (see comparative charts).

Total outlays for public construction, including highway work, have been running 9% ahead of 1956 (see table), while total private construction spending for the first seven months is down 1%. But when homebuilding is excluded, private construction shows an over-all 7.1% gain for this period, instead of a loss. Private expenditures for nonresidential buildings (excluding public utility, farm and other projects that are not classified as buildings) have increased 6% in the January-July period.

Government construction officials delayed almost three weeks in releasing their July spending estimates, while they made a special survey of some 900 general contractors to gauge how much work was curtailed by the cement shortages caused by the month-long production workers' strikes in 71 plants.



TOTAL SPENDING EXCEPT HOUSING, new nonfarm dwelling units, has run 8.2% ahead of comparable 1956 spending during the first seven months of this year, indicating the strength of nonresidential construction markets. Excluding the hobbled homebuilding market, the 1957 spending through July totaled \$19.2 billion, a \$1.5 billion gain over the 1956 seven-month total of \$17.7 billion.

Their estimate that actual volume of work put in place totaled \$4,403,000,000 in July indicated loss of work costing almost \$150,000,000, or a 3.2% drop from normal expectation. These loss figures are based on the assumption that a continuation of the average 3% increase in total construction recorded through the first six months of the year would have resulted in a volume of roughly \$4,553,000,000 in July-3% above July 1956. Instead, the \$4,403,-000.000 estimate represented: 1) a slight contraseasonal slide from the \$4,347,000,000 in June; 2) a slight dip below the \$4,420,000,000 in comparable July, 1956, and 3) a missed opportunity for beating the all-time monthly record of \$4,474,000,000 set in Aug., 1956.

The decline seemed to be only temporary, however. Observers felt that almost all setbacks from the cement strikes would be made up before the end of the year.

SPENDING BY BUILDING TYPES

(in millions of dollars)				
		First	7 mon	ths
J	uly '57	1957	1956	%±
PRIVATE BUILDING				
Residential (nonfarm).	1,556	9,144	9,857	-7
Nonresidential	774	5,155	4,871	+6
Industrial	262	1,881	1,701	+11
Commercial	307	1,956	2,048	-4
Offices; lofts;				
warehouses	152	997	903	+10
Stores; restau-				
rants; garages	155	959	1,145	-16
Religious	75	475	404	+18
Educational	42	288	296	—3
Hospital; institutions	41	265	175	+51
Public utilities	534	3,081	2,780	+11
				-
*PRIVATE TOTAL.	3,047	18,358	18,468	-1
PUBLIC BUILDING				
and the second sec	40	239	151	+58
Residential	394	2.548	2,262	+13
Nonresidential	41	2,548	2,202	+13
Industrial	249	1,594	1,445	+10
Educational	249	1,594	1,445	100.000
Hospital; institutions	-		750	+24
Military	117	681		-9
Highways	545	2,520	2,320	+9
Sewer; water	120	767	699	+10
*PUBLIC TOTAL	1,356	7,528	6,883	+9
GRAND TOTAL	4,403	25,886	25,351	+2

 Minor components not shown, so total exceeds sum of parts.

TRENDS continued on p. 49

4.5 4.0 3.5 1957 3.0 2.5 J F M A M J J A S O N D

TOTAL SPENDING for all new construction has run only an almost imperceptible 2% ahead of 1956 expenditures, according to the latest, revised data of the Commerce and Labor Depts. In July cement shortages, caused by the production workers' strike, held total outlays to \$4.4 billion, or just a shade under the total for July, 1956.

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Trends

BUILDING MONEY

Rates still upward; FHA OK's participations

Interest rates—the charges for building, or buying, or running a business with someone else's money—kept going up for everyone.

Occasionally there was a touch of irony. Under pressure from the homebuilding industry, the administration's inflation-fighting fiscal managers yielded to FHA, and, coupled with a $\frac{1}{4}\%$ boost in the interest rate (to $5\frac{1}{4}\%$) they allowed the promulgation of the lower FHA home-purchase down payment schedules authorized in the new housing act. But before the week was over, commercial banks throughout the nation had raised the "prime rate" (their charge for loans to very top credit corporations) from 4 to 41/2%, and most of the district Federal Reserve Banks had boosted their discount rates (the charges on their loans to member banks) from 3 to 31/2%.

There were other rate hikes as the widespread scramble for credit for all types of commercial and business operations continued apace:

▶ To refinance \$24 billion of maturing securities, the US Treasury, the nation's biggest borrower, paid the highest rates in a quarter of a century: $35_8\%$ on four-month certificates; 4%on one-year certificates (compared with only $23_4\%$ just a year earlier), and also 4% on four-year certificates that can be redeemed at the buyer's option after two years.

The Dow-Jones index of municipal bond yields, covering 20 representative *tax exempt* 20-year securities, rose to 3.58%, the highest since 1935.

▶ To sell a \$165 million debenture issue, to cover its secondary market purchases of FHA and VA mortgages, Fanny May last month paid a record $4\frac{3}{8}$ %, compared with $4\frac{1}{4}$ % in June.

FHA participations

Optimistically, Commissioner Norman P. Mason revised FHA's regulations so owners of FHA-insured mortgages will now be permitted to sell partial interests in them by the issuance of notes or certificates backed by the mortgages (but without any FHA or other government backing for the participation securities).

The first organization to operate under the new regulations will be Instlcorp, Inc., of New York, which is owned jointly by all the New York mutual savings banks through their Institutional Securities Corp. Instlcorp expects to sell collateral notes, backed by FHA mortgages placed in a trust, to pension trust funds (or others), which will thus be able to obtain the bulk of the earnings possible from such mortgages without having to service them, or have the unpopular role of a principal in the event of foreclosure.

Apartment and home builders and FHA officials are hopeful of tapping a much bigger share of the estimated \$40 billion to \$60 billion held by large pension funds through this kind of mortgage "participation" operation. Last spring Mason also suggested that certificates might be issued in denominations as low as \$1,000, which would also allow thousands of small individual investors, as well as other types of investment organizations, to share indirectly in making FHA-insured loans and earning more on their savings.

Remembering the mortgage certificate collapses and scandals of the thirties—which stemmed from abuses in administration, rather than from

BUILDING MATERIALS



BUILDING COSTS for nonresidential structures rose 0.8% in July on the index of E. H. Boeckh & Assoc. The jump of 1.2 points in this index figure, up from 142.9 in June to 144.1 in July, was its biggest increase since a 1.1 point rise in May 1956.

any defects in the participation system—FHA acted with the utmost caution before approving the new plan. Two of its greatest concerns: to make sure certificate buyers will *not* be led to believe that participation certificates have any government guarantee; also to make sure there can be no abuses in the issuance of certificates that might reflect unfavorably in any way on FHA programs.

Higher prices likely for cement, aluminum items; heavy glass sheets reduced 7 to 16%

Building material prices were being affected last month by marked cross currents causing both increases and decreases.

After seven months in which it had varied only 0.2 points, however, the



BUILDING MATERIALS PRICES registered a major increase of 0.5% in July on the BLS index of composite average wholesale prices. After remaining steady at 130.5 from December through March, and at 130.7 during April, May, and June, this index rose to 131.4 in July. BLS index of composite average wholesale prices jumped 0.7 points, or 0.5%, in July (see chart). At its new mark of 131.4 it was only a whisker below its all-time record of 131.5 in Aug. 1956, before its subsequent decline to 130.5 last December.

The July increase over June in the composite index reflected a 4.9% boost in average prices for structural steel, a 3.4% increase for metal doors, sash and trim, and other increases for concrete ingredients and prepared paints. Collectively, these more than offset a continued decline in average prices for lumber and wood products.

Among the forces that might push the composite BLS index to a new high in the months ahead:

Another round of 15ϕ per barrel increases for cement—to cover the wage increases that were granted to end the production workers' strikes at 71 plants that halted supplies and seriously delayed thousands of construction jobs in many areas throughout July and early August (p. 47). This would be

Trends

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A 4% increase last month in the price for primary aluminum (raised from 25ϕ to 26ϕ per lb.). In July, aluminum sheets in the BLS building materials index stood at 158.6, or 4.6% higher than July 1956, just before a 1956 increase in primary aluminum prices from 24ϕ to 25ϕ per lb.

▶ The new railroad freight rate increases (4% in the South, 7% elsewhere) approved last month by ICC.

Among the factors that may help hold average composite prices in check:

A reduction last month in prices for heavy sheet glass. Libbey-Owens-Ford announced it was cutting its prices about 7%. Next, Pittsburgh Plate and American Window Glass said they were reducing their prices between 7% and 16%. (Announcements to distributors from American Window Glass called these competitive price changes both "uneconomic" and "unrealistic," because they "will not stimulate glass consumption, nor accomplish their announced objective" of meeting imported-glass competition. Earlier, AWG President Otto G. Schwenk had declared that a price increase for flat glass was "urgent," to offset higher raw material costs and impending wage boosts.)

• Continued softening in the prices for primary copper, and consequent reductions in prices for brass and wire mill products. Last month refined copper had slipped to $271/_4 \phi$ per lb., compared with a postwar peak of 46ϕ at the start of 1956.



STRUCTURAL STEEL unfilled orders on July 1 were 197,000 tons below the June 1 backlog, mainly because of a decline in orders during June, while shipments continued at a peak rate. The American Institute of Steel Construction said the 3,220,000 tons in the July 1 backlog included 1,277,000 tons scheduled for fabrication by Oct. 31.

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(Top) VANDERCOOK HALL Ferris Institute Big Rapids, Michigan Architects: ROGER ALLEN & ASSOCIATES Contractors: MILLER-DAVIS CONSTRUCTION CO. (Bottom) ENTRANCE TO SCIENCE HALL Ferris Institute Big Rapids, Michigan Architects: ROGER ALLEN & ASSOCIATES Contractors: BARNES CONSTRUCTION CO.



LEMLAR adjustable louvers (type VJ-24) were chosen to dramatize this new home of the Raleigh (N. Carolina) NEWS and OBSERVER and The Raleigh TIMES.

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Left—Wiley house, New Canaan, Conn. Philip C. Johnson, Architect. Photo by Ezra Stoller, N. Y.

> Right—Storage area in a Chicago factory build-ing, floored 90 years ago in Northern Hard Maple.

Left -- Multi-purpose gymnasium, Chambers-burg, Pa., Senior High School, designed to serve six school districts. Lawrie and Green, Architects.

> Right-Lounge room, Country Club, Raleigh, N. C., Maple-floored throughout. Architect, Wm. Henley Deitrick, Inc.

Left - Spinning Room, Greenwood Textile Mills, Greenwood, S. C., Floor, Northern Hard Maple.

> Right - Langendorf United Bakeries, Inc., Seattle, Wash. Ultramodern throughout-and maple-floored, naturally!





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The wide spans, economical design and freedom of treatment make these truss-type Armco Buildings ideal for applications such as auditoriums, gymnasiums, manufacturing plants, warehouses and wherever else you need clear, unobstructed floor space. Write us for details including facts about smaller Armco Steel Buildings, featuring frameless and rigid frame design. Armco Drainage & Metal Products, Inc., 5277 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



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NOTE how Solatex Silver is crinkled for maximum efficiency

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Rendering at right shows how a non-technical receptionist, even while taking calls and receiving visitors, can oversee comfort in a building when Supervisory DataCenter is installed. A similar installation is in operation at the Hillyard Chemical Co., St. Joseph, Mo. DataCenter there designed by: Turnbull-Novak, Inc., Consulting Engineers. Project supervised by Harlen E. Rathbun, AIA, Architect.



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as wood doors. Slightly greater initial cost is offset by the savings in maintenance! The gleaming anodized finish, inside and out, is permanent—never needs paint. Keyway construction permits easy replacement of components if damaged. For details of construction, sizes, special features, see pages 38-39, Sweet's Architectural Catalog $\frac{16i}{Ov}$ or write us for 56-page hard-bound catalog with traceable drawings.

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1957 A. I. A. Prize-Winning Design—Middlesex Mutual Trust Building at Waltham, Massachusetts, uses this special flush aluminum "OVERHEAD DOOR."Door shown opens into the receiving room of the insurance company's office building. Another door is in the basement garage.





Merchants National Bank at Mobile, Alabama, provides drive-in facilities with the addition of a new Motor Branch and Parking Building. Two aluminum "OVERHEAD DOORS," with bottom sections louvered to permit escape of exhaust fumes, give an attractive "store front" appearance to the building. The larger door, 26'9" wide, is matched by a door of the same size and design on the entrance side of the building.



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(Above) Demonstrating with a large sample section, Pennsylvania Bell Telephone Company School instructor explains to technician-students the basic principles of Q-Floor wiring. (Right) Members of the Q-Floor class become familiar with the product's advantages by wiring an actual installation in the classroom.

Q-Floor... a Required Subject at this School

Every year, an estimated 1,600 Bell Telephone Company of Pennsylvania technicians attend a special school near Harrisburg, Pa. to learn the latest practice in line and equipment installation. Bell feels that cellular steel subflooring is so important that an entire classroom is devoted to the subject of Q-Floor wiring. Here the students learn by working with an actual Q-Floor installation that wires can be pulled and telephone or electrical outlets established often in a matter of minutes, and that every six-inch area of the entire floor is available for outlet use. This flexibility, so graphically pointed out to Bell students, plus substantial savings in construction time and money has influenced owners and architects all over America to provide for the future by building with Q-Floor today. Use the coupon to write for literature.



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Herman Nelson Vertical Unit Heaters are mounted on high ceiling locations at Solar's Des Moines Plant to direct warm air vertically downward or at an angle near loading docks, doorways, other areas to guard against heat loss.

Architects & Engineers—Brooks-Borg, Des Moines; Mech. Contractor—M. A. Wolin Plumbing & Heating, Des Moines; Gen. Contractor—The Weitz Company, Inc., Des Moines.

From the vast Herman Nelson line, it was easy for Solar Aircraft Company to choose just the *right* units, in the *right* capacities, needed to solve all heating problems at its huge Des Moines plant. Solar, with headquarters at San Diego, California, is a major supplier of heat resistant alloys to the aircraft industry. It is typical of the many top-flight manufacturers that look to Herman Nelson for precision performance, guaranteed results in heating and ventilating.

Herman Nelson Industrial Heaters are used throughout Solar Aircraft Company's Des Moines plant for basic heating needs, providing quiet operation with even heat distribution over large areas. Units are mounted in cluster arrangements on various "pent house" locations.

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M-DECKS Open the Way

This Cross Sectional View shows another application of Mahon Long Span M-Deck in which the M-Deck Section provides the Structural Unit, the Roof Deck, and the finished Acoustical Ceiling—all in one package. Mahon Troffer Sections are included here for Recessed Lighting.

Abave is One Type of Application of Mahon Long Span M-Dack in the Construction of an Unusual Roof on the New Practice Session Field House for Ohio State University, Columbus, Ohio. Howard Dwight Smith, Architect, State of Ohio. Borber & Magee, Structural Engineers. Joseph Skilken & Co., Gen. Contrs.



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Suburban Park Elementary School, Norfolk, Virginia. Architects-Oliver and Smith

The School Board Demanded Modern Design

-But Insisted on Economy...

Ceramic Tile Gave Both

Tremendous progress in creative school design has kept pace with rapid advances in educational theories and practices. School boards are demanding physical designs which fulfill these theories—and fit their budgets. Here's how ceramic tile is contributing to modern school design and budget needs.

Take the Suburban Park Elementary School in Norfolk, Virginia. Designed by Oliver and Smith, it was built at a cost of \$10.62 a square foot—a figure at the lower end of the national square foot school building cost scale.

Fitting in with the need for economy, Oliver and Smith used a new, approved method of ceramic tile installation. They specified tile installed by the newly developed thin-set method — *directly on cinder block*. The resulting economies permitted extensive use of tile in corridors, washrooms, cafeteria and the gymnasium.

Besides the obvious benefits of durability, beauty and design scope (aided by a size gamut from one-inch to foot-square and larger units), tile gave this school a lifetime of maintenance-free economy in key areas. Just how much this means is brought home graphically in the chart based on statisticsfrom Modern Sanitation Magazine.

Whether your next project is institutional, commercial or residential, be sure to consider the durability, design and economy factors of modern ceramic tile installations.

Cost of Cleaning A Square Yard of Surface

6¢
7¢
9¢
11¢
12¢
13¢

SOURCE: Modern Sanitation Magazine



The Modern Style is

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Surf green

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Letters

... government ... traffic ... art ... housing

GOOD SOLUTION

Forum:

Thank you very much for your editorial on the "Capitol Solution" (AF, July '57). I thought it was excellent!

PRESCOTT BUSH US Senate Washington, D.C.

Forum:

. . . Unfortunately, I find that we members of Congress have little to say about the improvement of the Capitol and the construction of the House Office Building.

This we discovered this year when we tried to stop some of the work to which the government (by parliamentary maneuver) had already committed some \$100 million.

J. ARTHUR YOUNGER House of Representatives Washington, D.C.

BAFFLING PROGRAM

Forum:

My compliments for the excellent article in the July FORUM, "FHA in the City." Unfortunately, however, the story ends simply by emphasizing the need for imagination in creating a new rental housing program. As is almost invariably the case in discussions of this baffling subject, there are no suggestions.

Here's my suggestion: look into the tax impact upon the individual or corporate investors in rental housing.

HERBERT S. COLTON Colton & Gray Washington, D.C.

" We will .--- ED.

MASSIVE CAMPAIGN

Forum:

Reading your editorial "Art for Engineers" (AF, June '57), I seem to see for the first time in a prominent place a most cogent thought: high school and college students are taught to read but they are not taught, through visual arts, to see.

There is no more time to lose in instituting a massive campaign to make integral in all our educational systems throughout the nation an appreciation of the visual world and of the things man can do to it. This appreciation should be no less broad and deep than that which the system offers to every growing American in connection with letters and numbers and words and ideas. And I would wish not only FORUM and TIME Inc., not only the AIA, but each and every instrument and medium of culture worthy of that name, would join in thus filling this vacuum in our total edueation.

LANDIS GORES, architect Canaan, Conn.

SPEECH

Forum:

I have received a copy of Mr. Henry R. Luce's speech to the centennial convention of the AIA. I certainly enjoyed reading it.

Particularly admirable is Mr. Luce's success in correlating modern-day architecture with democracy, economics, government, art, politics, and other important phases of our twentieth-century living. I heartily agree with him that government should set a high standard toward effecting this Architectural Revolution.

ORVAL E. FAUBUS, governor State of Arkansas Forum:

. . . I would certainly agree with Mr. Luce that there is a significance in architecture that has been largely missing from the common planning we have undertaken in either public or private projects. I would also hope that the "conviction that architecture is essential to the physical and spiritual health of this nation" will grow.

ALBERT D. ROSELLINI, governor State of Washington Forum:

. . . I had it reprinted in the Congressional Record on May 27.

HENRY S. REUSS House of Representatives Washington, D.C.

The AIA speech of FORUM's Editor-in-Chief has been reprinted in limited quantity, can be ordered by writing FORUM, 9 Rockefeller Plaza, New York 20.-ED.

BANISHING AUTOMOBILES

Forum:

Your "Crisis in City Transit" (AF, June '57) presents a timely discussion of the nationwide problem posed by the automobile. Your study deals with traffic congestion-one of the two major problems caused by the automobile. The otherand greater-problem is automobile accidents, which are currently bringing death to 40,000 Americans and injury to 2.3 million a year.

If the auto industry is to keep on pouring out millions of huge cars, with the emphasis on "larger," "longer," "wider," continued on p. 96



NOW! A SKYLIGHT that can't leak, costs little to install

More free daylight is needed in this day of broad, flat roofs. The trouble-free skylight that fills this need is CONSOLITE. It can't leak because it is molded of fiberglass in ONE PIECE. Because it is self-flashing, easy, fast installation is made in minutes.

Consolite is double-domed, too, providing a U factor of only 0.5, and that serves to minimize condensation.



Consolite Skylights fastened down over first layer of roofing membrane, ready for felt stripping and pitch.

Because of its molded one-piece fiberglass construction, Consolite eliminates the need for sash, painting and costly replacement due to breakage. They are approved for use in bonded roofs by major roofing manufacturers. They are ideal for use in metal deck or pre-stressed concrete roofs.



How Consolite looks in section, showing its double-dome and its integral flashing fastened and bonded with the roofing membrane.



Consolite installation amounts to mere fastening and stripping with pitch and roofing felt.

Consolites are available in self-flashing, curb and bond types and in squares, rectangles and rounds. Where prevention of condensation is not important, single-dome models are also available.

Please write for complete information.

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Letters

cont'd

it is indeed doubtful if roads can be built fast enough, or cities rebuilt speedily enough to prevent traffic strangulation, to say nothing of automobile accidents.

> ARTHUR W. STEVENS, president Automobile Safety Assn. Boston, Mass.

FIGHTING PLANNERS

Forum:

The articles in the June issue of the FORUM on City Transit and Public Housing get to the heart of the matter.

Problems of city planning and renewal will be solved effectively only when city planners throughout the country realize that they must fight for the legislation which affects planning and renewal. While the American Institute of Architects, The National Association of Housing and Renewal Officials and others have given positive and effective support to such legislation, the planners, for the most part, have been silent.

I hope that the planners throughout the country will soon wake up to the fact that they must take the leadership in the efforts to secure the legislation necessary for the building and renewing of our nation.

T. BROOKS BRADEMAS, senior city planner City of Detroit Office of City Plan Commission Detroit, Mich.

SUBSEQUENT HOUSING

Forum:

To continue the housing debate (AF, June '57 and subsequent issues): Public housing, as now practiced, is not in the public interest—not in the real sense of eradicating slums. But it could be. We need a political showdown to locate sites according to a sensible plan (dispersion to employment sources and to low cost land); we need design for protective coloration on *small* sites evolving to private ownership under a revolving fund concept; and we need a broadened program to include higher income families.

We should subsidize conversion and rehabilitation, to extend the life of declining areas for use by lowest income families. Then we should make prime slum sites available for highest and best use.

Public housing should be used as an instrument of urban renewal. It might be well if its name were changed and it were merged *into* renewal.

HARRY WEESE Chicago, Ill.

Forum:

I thought it highly irregular that FORUM, consulting all those people on public housing in the June issue, did not get the *continued on p. 98*



You don't have to look far to see changes-revolutionary changes-in the architectural scene today. From striking new ideas and concepts and remarkable new building materials, the architectural face of the future is already taking shape.

Today, curtain wall construction, for example, is proving its utility all over America. Tomorrow it will be in even greater use. Curtain walls are only one of the new architectural developments that employ versatile extruded aluminum structural and decorative members that will retain their beauty and color for generations. Bridgeport Aluminum Extrusions are helping to make these new, modern structures a practical reality today... and tomorrow.

Whether you're an architect, fabricator or construction engineer, it will pay you to consider using Bridgeport Aluminum Extrusions in your plans for today. They are available in a wide range of standard architectural shapes and can be furnished in "made-to-order" shapes to meet special requirements.

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Write on your firm's letterhead for a copy of this 130-page handbook on aluminum extrusions. It has complete sections on aluminum extrusions in architecture-suggested construction, helpful data, etc., plus full-size drawings of Bridgeport's complete line of standard architectural shapes.





architectural FORUM / September 1957



won't pull loose from door or jamb

When door holders or door closers plus heavy traffic impose extra strain on doors, jambs, and hinges, specify new McKinney Anchor Hinges. On schools, hospitals, stores, on all public buildings . . . for wood or metal, McKinney Anchor Hinges and screws stay put—*permanently* because jamb leaf mortises into the header and door leaf into the top of the door. These extra mortises, extra arms and screws hold fast no matter how much strain is imposed by other hardware, heavy wind, or careless door operation.

Made in 5" x $4\frac{1}{2}$ " size, extra heavy with four oilite or ball bearings, for all doors $1\frac{3}{4}$ " to $2\frac{1}{4}$ " thick. In types for use with concealed or surface holders and closers. Wrought steel, solid brass or bronze in complete line of finishes. Sold only in sets with one pair of 5" x $4\frac{1}{2}$ " extra heavy mortise butts.



views of at least one homebuilder. But after I read all the opinions included, I was highly gratified by the conclusions.

Letters

It is high time that we all worked together to do something about the slums. It seems to me that the whole housing industry and everyone concerned with it should be racing to make those slum houses economically unsound for their owners.

In contrast, one of the worst effects of public housing has been to support property values and population densities in central cities. Many slum buildings are long-lived, lucrative investments until they are finally bought at inflated values for high rise public housing. "High rise" is necessary because the slum ground is too valuable for anything else.

I submit that one of the quickest ways to get out of the slums is to encourage new construction. Why do we assume that the city as we know it today must be saved or is even worthy of saving and that population densities must be maintained **?** EDWARD F. FISCHER, homebuilder St. Louis, Mo.

▶ Will the homebuilders please tell us what to provide, other than public housing, for those social groups for whom they never or almost never built?—ED.

ERRATA

• FORUM, red-faced, must report that an impressive number of readers spotted the misspelling of Stanford University's fair name in the July issue.—ED.

• FORUM'S printer, similarly reddened, regrets the error in the August issue (p. 139) suffered by Wurdeman & Becket.--ED.

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Flashing the intersection of structural expansion joints requires a design that will permit freedom of movement during the expansion or contraction of the structure – and yet will provide a weatherproof covering at these intersections.

Cornice temper copper in 16-oz. or 20-oz. weight is recommended for expansion-joint flashing, and the drawing above suggests a method for flashing at intersections. Note that the flashing for each of the 4 expansion joints is cut back on the center line of the expansion fold for a distance of about 18" to form a tapered opening. This break in the long, straight run of metal limits the effect of expansion and contraction on the flashing to the distance between intersections.

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People

Julian Zimmerman made general counsel for HHFA; Arthur Brown Jr., Capitol consultant, dies



ZIMMERMAN



RYAN

pointed a new general counsel for HHFA last month. He is tall, 40-year-old Julian H. Zimmerman, of Wichita, Kan., who joined the agency last April as deputy general counsel. Lawyer Zimmerman served in Army Intelligence during World War II (reaching the rank of Lt. Col.) and later was executive secretary to former Kansas Governor Edward F. Arn. He succeeds A. Oakley Hunter, 41, former FBI agent (1940-44), and two-term member of the House of Representatives from California (1950-54), who lame-ducked into the job in January, 1955, after he was defeated for a third term. Hunter resigned because of poor health, and will return to his former home in Fresno, Calif., where he will resume private law practice.

HHFAdministrator Albert M. Cole ap-

REGIONAL SELF-HELP PLANS

The Committee for Economic Development, originally formed to help reduce unemployment difficulties in the transition from a wartime to a peacetime economy, has embarked on a new nationwide "area development" program to help communities and regions endeavoring to strengthen their economic and industrial positions.

Mainly, the new program hopes to demonstrate methods that free enterprise could utilize to solve problems like urban blight and a loss of local industries through economic growth, rather than federal aid programs, says CED Board Chairman Donald K. David, former dean of the Harvard School of Business Administration.

Director of the new program: Realtor Robert H. Ryan, until recently vice president of Cabot, Cabot & Forbes, Boston industrial development specialists. In 1952 Ryan was executive director of the committee that recruited 28 new plants for the industrially debilitated Lawrence, Mass., area, and in 1954 was appointed head of the Massachusetts Business Development Corp., established to help business that could not obtain financing through ordinary channels.

PARKING VS. OFFICES

Last spring a group of New York civic leaders established The Committee on Lower Manhattan "to foster, promote and support the physical improvement and sound redevelopment of lower Manhattan south of Chambers St.," including provision for adequate transportation, parking facilities and preservation of historic sites. Elected as board chairman of the group: David Rockefeller, vice-chairman of the Chase Manhattan Bank. Named as its president last month: Manhattan-born Vice Admiral John B. Moss (ret.), who served four three-year tours of duty assigned to the Bureau of Yards and Docks or otherwise connected with the planning, construction, and reconstruction of shore facilities. One disappointing setback in the program to provide more parking facilities for this area that the committee would have to offset: plans for a new 38-story, 950,000 sq. ft. office building on the full block bounded by Maiden Lane and Pine, Pearl and Water Sts. announced a month ago by Builder Samuel Rudin, from plans by Emery Roth & Sons. This was the block on which the Chase Manhattan Bank originally announced it was going to erect a 1,000-car garage to be coordinated with its huge new \$100 million headquarters tower now under construction one block farther west (AF, Jan. '56).

BUILDING PHILANTHROPISTS

As an expression of his "respect and gratitude" for Dutch aid to the victims of Nazi terror, Nathan Straus, former US Housing Authority Administrator (1937-42), housing author, philanthropist, and now president of N.Y. radio station WMCA, gave \$10,000 this summer to a student housing foundation for the Technical High School of Delft, Holland. With the funds, the foundation has restored a nearby threestory building that has been named Nathan Straus Huis. Straus disclosed that one reason for his gift was his close personal friendship with Otto Frank, his Heidelberg *continued on p. 103*



STRAUS



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University classmate in 1907 and 1908 and the father of the teen-age girl whose *Diary* of *Anne Frank* became that noted drama detailing the Nazi minority persecutions.

With the formal filing of estate documents recently, it was disclosed that the late Albert P. Greensfelder, for many years head of Fruin-Colnon Co., large St. Louis construction firm, left trust and endowment funds in excess of \$1.5 million for educational and civic purposes. Civil Engineer Greensfelder, national AGC president in 1931, died in April, '55. For years he was a leader in city and county park and recreation work, and one of the trusts he established, currently valued at \$350,000, is known as the St. Louis Regional Recreation and Conservation Foundation. A second, with current assets of about \$928,000, is the St. Louis Regional Planning and Construction Foundation. Income and principal from this will be available to expedite development or construction of civic projects within a 100 mi. radius of St. Louis City Hall, and to aid professional and industrial programs for education, planning or research in engineering, construction, or planning. A third endowment of about \$300,000 went to the civil engineering department of Washington University, St. Louis.

NAMED: William Demarest, formerly with NAHB and modular coordinator for the AIA in Washington, as director, plastics in construction, by the Manufacturing Chemists' Assn., Inc.; Robert C. Turner, who had been eastern representative of the Facing Tile Institute, Washington, D.C., as the institute's director; Richard J. O'Heir, promoted from technical director to secretary-treasurer of the Perlite Institute, New York; Architect E. Todd Wheeler, as an architectural and engineering hospital, medical and health education facilities consultant associated with Perkins & Will, Chicago, in which he was formerly a partner (Perkins, Wheeler & Will) from 1936 to 1944; Associate Editor Walter McQuade, on leave from ARCHITEC-TURAL FORUM, as editor of a special book on school buildings to be published next year under grants from Alcoa.

ELECTED: Fred O. Rippel, president of Rippel Architectural Metals, Chicago, as first president of the newly organized Metal Curtain Wall Division of the National Association of Architectural Metal Manufacturers, and Louis F. Fontana, re-elected president of the parent organization; redevelopment Builder James H. Scheuer, as president of Citizens' Housing and Planning Council of New York.

ARTHUR BROWN JR. DIES

People

San Francisco Architect Arthur Brown Jr., 83, one of the three consultants reviewing the plans for the proposed rebuilding of the east front of the Capitol in Washington, died July 7 in Burlingame, Calif. He had suffered a heart attack six weeks earlier, on returning from a trip to Washington on the Capitol assignment.

A dean of the Bay Area architects, Brown's work included San Francisco's Coit Tower, its War Memorial Opera House, and with his partner John Bakewell, its huge domed City Hall that topped the Capitol itself by almost 17'. For Wash-



BROWN

ington Brown designed the ICC and the Labor Department buildings, for Stanford University the Hoover Tower and other structures. Many years ago he taught architecture at Harvard and at the University of California, and was supervising architect of the latter's Berkeley campus from 1938 to 1948. Recently Brown was outspoken in his criticism of "careless" urban development and the "defacement" of many vistas that will result from freeway construction within the city. Close associates also reported that he had looked with disfavor on the proposed Capitol changes, preferred other possible solutions that could leave the historic east front intact in its present form.

Paul Starrett, 90, builder of the Empire State building and many of New York's other most notable skyscrapers, the last survivor of the five famous Starrett brothers, died July 5 at his home in Greenwich, Conn.

When he was 20 years old, Paul went to work as a stenographer in the Chicago office of Burnham & Root, and was soon advised by Daniel Burnham that he had a "genius for organization" and ought to go into business for himself. But he stayed with Burnham & Root for ten years, while he continued his education, and then joined George A. Fuller Co., which he headed from 1905 to 1922. In that year he and his brothers established Starrett Brothers, later Starrett Brothers & Eken. During the 17 years Starrett headed the Fuller Co., its contracts exceeded \$368 million, and in some years it erected almost 80% of Manhattan's new commercial buildings.



How you can know

EVERYONE knows that there is more than one grade of architectural porcelain. The thing is, how do you tell them apart? We think you are entitled to know. For that reason, we've gathered together the important facts about good porcelain.

As an introduction, there are five classes or grades of porcelain, starting with "AA" and "A"-obviously the best grades. (Davidson Architectural Porcelain meets specifications for these grades-never less.) The remaining grades, proceeding down the scale, are "B", "C", and "D". How the distinction is made can be seen in the flow-chart opposite-but be sure

also to read the facts about other qualities that mean good architectural porcelain.

Save these pages as a reference - so as to be sure that the porcelain you get is the quality you specify.

Two methods of testing architectural porcelain are recommended by the Quality Development Committee of the Porcelain Enamel Institute - the "commercial" test, most easily applied and most commonly used, is described below. The "umpire" test is the second method and is a laboratory-type test, used to decide borderline cases. Both require that the panels pass a series of etching and marking tests, as indicated in the "Classification Table" below.



National Bureau of Standards state: "No noticeable fading of enamels of Class AA or Class A acid resistance occurred." Davidson Architectural Porcelain meets or exceeds specifications for these classes.

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Facing Panel, with double return flanges - furnished with stainless steel screws and clips.

TYPE 2 AT FAR RIGHT ...

Facing Panel, with double return flanges - furnished with exclusive Davidson Vitrock backing. Furnished with stainless steel screws and clips.



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METAL—HOW THICK? Just as there is an optimum thickness for porcelain enamel coating, there is an ideal thickness for the steel, (a special grade, called "enameling iron") that forms the panel. Inves-



tigation and long experience has shown this to be 16-gage, (or, .0625", U.S.S. gage) and this is the thickness dimension of all Davidson Panels. Advantages: strength, to stay flat and support formed shapes — excellent response to enameling heat, to assure complete fusion of enameling materials with the metal.



SMOOTH, SEALED COR-NERS: Panel quality shows up in such details as smoothly formed panel edges and perfectly squared corners — which, in Davidson Panels are welded closed and ground

to a smooth finish before enameling.



ENAMEL-HOW THICK? Extra thick coating is no criterion of quality—and may actually bring risk of chipping, cracking, and crazing. Optimum thickness is .003" per thory control assures this

coat — and laboratory control assures this coverage on all Davidson Panels, not only on panel faces, but on all critical edges, corners, and curves.

PANELS ENAMEL-PROTECTED,

FRONT AND BACK: Quoting from the National Bureau of Standards 15-year exposure test "Corrosion of panels incompletely covered by enamel caused failure of attachment lugs and in

caused failure of attachment lugs and in some cases failure of enamel on the face. Specimens with a second coat of enamel on the back were not affected in this way." All Davidson Panels are completely enamel coated — protected front and back and on all edges. Even holes to be provided for sign mounting, etc., are drilled by the factory, **before** enameling, so as to protect hole edges.

STAINLESS STEEL "HARDWARE": In Davidson Types 1 and 2 Facing Panels, stainless steel clips

and 2 Facing Panels, stainless steel clips and various types of non - ferrous screws are used to mechanically fasten the

panels to building structure. No loosening or detaching of panels as the result of corrosion!



MECHANICAL FAS-TENING: Stainless steel clips used for mechanical fastening of Davidson Panels to building structure are attached to the panels with stainless steel screws — not

welded. This is an important advantage, inasmuch as bending of the clip, either for purposes of fitting or by accident, does not cause the porcelain panel to be chipped. Where clips are welded to panels, bending of the clip inevitably results in cracking or chipping of the porcelain, thereby exposing area to corrosion.

HOW FLAT IS FLAT? A flat panel should be rulerflat . . . and extreme care is taken in Davidson Panel production to assure this. Where panel size

is so large that metal naturally billows or "oil-cans", panels are placed on an electromagnetic table which holds them ruler-flat while Davidson's exclusive Vitrock backing is cast integral with the panel. Clips previously welded to the back of the panel become imbedded in the backing and lock it in position, insuring a permanently flat panel.

PROCESS QUALITY CONTROL AND IN-SPECTION : Every Davidson Panel is subjected to four major inspections: by the engineering department, to establish production sequence and technique according to specified design

-by production quality control, after fabrication, to assure correct size and shapebefore enameling, to group specific orders for simultaneous processing – and by color specialists, for color match and coverage before shipment. Each inspection is a 100% inspection-every panel!

> ENAMEL QUALITY AND COLOR: Laboratory control and formula-compounding of porcelain enamel "frit" assures absolute uniformity of Davidson Panel colors

and finishes. Application of "frit"—a precise mixture of glass and coloring in minute particles—is carefully controlled for complete, uniform coverage. On re-orders, exact match is made from a permanent "actual sample" file.







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M-65A

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Editorial

Back to work

Signs appear on every hand that federal policies toward housing, and toward city renewal, are due for major overhaul, probably in the congressional session of 1958.

Momentarily the cities of America are the helpless victims of the drive against inflation. President Eisenhower last month wished their problem off on the governors (AF, Aug., p. 5). Nobody thinks Eisenhower liked to do this. He had come out for urban renewal himself earlier; but retrenchment in budget spending was the great drive overrunning everything. The cities happened to be still in the way. The automobile industry had already received its \$33 billion gift of the highway program. Nobody dreamt of slowing down FHA aid to suburban homebuilding, which had been liberalized in the expectation that it would cost the government no cash but only credit within the foreseeable future. So this new suburban building, competitive to the cities, continued to be federally supported. But the cities, with no concentrated single interest backing them, were easier to drop.

To be sure, funds for urban renewal were not simply cut off completely. Congress passed a bill, and the President signed it, allowing \$350 millions in capital grant *authorizations*, to be made within the fiscal year 1957-58 and limited to that year. This was of course far from appropriating the actual money. How fast the authorized funds would be allocated or disbursed was going to be up to the administration, i.e. up to the President. And signs were many that the administration would go slow. This was the kind of bill that Congress could pass and the White House could in effect nullify if it so decided.

For that matter, there were already \$900 million in "authorizations" even before the \$350 million were added. Practically none of this has been spent yet, though nearly all is allocated. Apparently only two urban renewal projects have been closed out entirely in all these years —one in Baltimore and one in Philadelphia. If he wishes, the President can delay further allocations and disbursements indefinitely.

Does this mean that the cities have been sent to the dogs? Is America resigned to letting five million families (nearly 25 million people) keep on living in slums that are growing faster than we remove them? Are 175,000 city families to be thrown into the street by highway programs, federally aided, that tear down their homes?

Not necessarily. There are three avenues of action open. One is the speeding of existing machinery as the pressure for a more balanced living program offsets the singleminded economy drive. One is a concerted exploration of what can be done locally without federal aid. And one is the speeding of study how to overhaul the federal govern-

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ment's whole complicated, messedup, and misfiring machinery for housing and urban renewal. Indeed one reason why certain Congressmen and Senators were so ready to accept the one-year limitation on URA authorizations was that they confidently expected to propose a complete overhaul in the 1958 session. Representative Albert Rains (D., Ala.) just about said so.

If this happens, there will be no time for lengthy researches on America's comprehensive need in housing and city rebuilding. But in expectation that the drive for major revisions might rapidly accumulate, FORUM early this year started a series of objective reports on the elements of the current confusion. (See p. 160 for FHA in the Suburbs.) We hope these reports will stimulate some fresh thinking.

Chicago's chance

The Chicago business community has the chance of a century to do something big for America, charitable, generous, and virtually without cost-if not indeed at a profitand that is to save the Robie House. In Chicago are the headquarters of some of the most powerful corporations in the US, and any such corporation in modern times works closely with university people. The Robie House stands in the midst of the University of Chicago, its site unexcelled and surrounded by growing beauty. Here the people of industry and those of learning could confer in small productive groups in the most beautiful surroundings. Chicago's leaders need only lease or purchase the Robie House from its harassed owner, the Chicago Seminary, and help the Seminary find another land solution for its own needs. We don't ask Chicago to do this for the editors of papers from Switzerland to Finland who have asked preservation of a world masterpiece by Chicago's own worldleading architect, Frank Lloyd Wright. We ask it for America. Now is the last chance. Ask the AIA chapter for details.

Virgins & Hussies

"I see," said Professor Thrugg, "that lots of clients don't know how to find the right architect, just because architects don't advertise; but it's at least as easy as finding a wife. Any architect studying how to get a job has probably studied how a woman gets a husband. Here he stands, a pure professional man in the great roaring world of business. But the job has to propose to the architect, not the architect to the job. So, like the gal in a 'pursuit.' the architect is better off if he seems to be running away from the job all the time but is being miraculously overtaken.

"This is why architects are always talking about their public relations. Loud cries of 'hussy' arise when the great majority of architects in a town, whose work is of course sober and practical and unnoticed, catch one of the brotherhood decking out one of his jobs in war paint and lowering the neckline to get her picture in the paper.

"I see that the AIA has lately been getting out elaborate rules governing how an architect may send around tearsheets of a magazine that has just surprised him no end by coming out with a 'presentation' of an achievement he was connected with. The etiquette is complicated. The gist is that the architect must not let it be *his* fault if the material chances into the hands of some client who has been dating with another architect."

"What will the better architects do?" asked a student.

"I'm sure they'll obey," said Thrugg.

"But won't it hurt them a lot if they do good work and can't call it to the attention of anybody?" persisted the student.

"Did you ever see a successful effort to keep a pretty girl hidden behind the curtains?" asked the Professor. "Can you stop a determined woman bent on marriage? And was it not the social code that made such devilish clever creatures of our pure young women also?"





Connecticut General in Hartford unveils its correlation of business planning, realty acumen, building technology and, not least, gracious architecture

Insurance sets a pattern

Hartford used to be the insurance city, but the last two decades have changed that. Today 41 insurance companies still live there, employing 22,000 people, but a single airplane plant, Pratt & Whitney, carries a payroll of 32,000. This shift in Hartford's economy, however, has been fogged recently by a purely physical move; Connecticut General, one of the city's oldest underwriters, has walked out of its fluorescent-flooded, Colonialtrimmed, filing case on Elm St. Its new headquarters site is a hilltop farm out in the rural beauty of Bloomfield, surrounded by the aura of real age, the English kind of countryside that Constable painted and Thomas Hardy wrote about: ancient, thrilling oaks, meadows, rows of ridge lines rising like wave crests from shallow misty valleys.

And in the middle of it all is a building for the completely insured air age. Large, beautifully crafted in design, new, with new dignity, it is grasped by the eye complete only from the air. Below, on the ground, as you approach and enter, it glitters but evades-giving way before you as architecture, opening up its walls amiably but elusively to become series of receptive geometrical spaces, each one merging into the next. The main block, one end of which is shown (left), contains 400,000 sq. ft. of floor space unbroken by a structural column. From one end juts a cafeteria, cantilevered out 15' over a pool. At the other end of this long stretch of loft space is a special department wing, across a glass bridge. Inside the inside of the great central block, you are surprisingly outside again, contemplating the building's navel, a set of big interior courtyards as oriental in spirit as the countryside is English.

Glass-walled, the building is a trap for daylight, but its details can stand inspection in any kind of illumination. Architects Skidmore, Owings & Merrill have again demonstrated that given time, money, and full-size mockups they still can discover facets to be newly ground



PHOTOS: W. EUGENE SMITH-MAGNUM

in forming the hard gem that is modern industrial architecture. Connecticut General, in detail as well as in immensity, is a highly original building, a masterpiece of sumptuousness, out of an esthetic system whose historical purpose was financial and artistic economy.

It is significant that an insurance company lives here, for insurance companies—second only to royalty—are the world's biggest dealers in symbols. They have to be: their product is an intangible, security. How do you go about looking secure? The usual way is through masonry, heaviness—a stolid, firm, rock-of-ages air. But Connecticut General is the least masonry building in its neighborhood, perhaps in the world; its steel even disdains the usual shell fireproofing (Conn. General picked up its own \$15 million mortgage). On the desk of the president is an Indian relic found on the site, but the desk is a Knoll desk, and the window panes are 8' x 11'-6", impressive dimensions. For American families, security may have become the ability to borrow from the bank and live well, surrounded by things and children. In architecture security is symbolized no longer by a massive arch, but by a long free span.

Connecticut General's own employees are living incredibly well at work, swaddled in space, surrounded by art and conveniences: bowling alleys, tennis courts, a shop, a magnificent eating place. This has its business point too. The population of workers is mostly young girls eagerly courted by many companies in the area. and the building already has begun to weigh well as an added attraction. Director of Personnel Henry Dawes expects to save \$500,000 a year in hiring and turnover costs. Important in this allure is the new building's unexpected lack of giantism. A high executive who participated deeply in the long, actuarial planning of the move says: "I see people now I haven't seen for years. I drop in on meetings. The thing that amazed me was that this turned out to be a really intimate building. The separations are melted."

Rounded art, edged architecture

Visual transition from 280 acres of softly rolling landscape to the perfectly linear building itself is not stark, but gradual.

At some distance from the building, on a knoll beside a curved swan pond, Noguchi's sculpture of the family (left: child, father, and mother), projects the agricultural reticence of the landscape itself in its druidlike expression. (Incidentally, this pond is not purely ornamental. With its 3.8 million-gallon water capacity, it receives water hotter than 90° from the air-conditioning system and cools it again without even disturbing the wild life of the pond.)

Close to the building, a carefully designed terrace is the moat between technology and nature. Here the diffuse expression of the fields is gathered and put into an abstract pattern, in precise beds of gravel and carefully placed trees, with smaller sculptures preserving the curves.

The building is ultimately organized, born and bred in a factory. Its wall of glass and aluminum panels and stainless steel trim is self-effacing, serving as a frame for reflections of nature. But the quality of precision is never effaced.







CONNECTICUT GENERAL LIFE INSURANCE CO., Bloomfield, Conn. ARCHITECTS: Skidmore, Owings & Merrill INTERIOR DESIGNER: Knoll Associates, Inc. ENGINEERS: Weiskopf & Pickworth (structural)

Syska & Hennessy, Inc. (mechanical, electrical) CONSULTANT—BUILDING METHODS & MATERIALS: Walter C. Voss ACOUSTICAL CONSULTANT: Bolt, Beranek & Newman SCULPTURE: Isamu Noguchi GENERAL CONTRACTOR: Turner Construction Co.

			1
			1
		0 76	50'

Inside, complete control

Daylight pervades Connecticut General except in such secluded areas as the theater buried beneath the main block.

Smaller office (left), in administration wing, is $12' \ge 12'$ (module throughout entire buildings is 6'). View is along main block and looks across one of the two canopies to the bus stop and parking space. Electric lighting throughout the building is from an overhead grid; the newly designed movable partition system locks into it.

Theater is a glowing switch from the generally cool daylight quality in the coloring of the building and its furnishing (abetted by green glarekilling glazing). Ceiling is cherry panels, installed, as is all woodwork, with skill worthy of cabinet-making.

Open office area (left) is organized and partitioned by trim, bright partitions. To the right of this photograph is one of the four interior courts. Nobody sits more than 30' from a courtyard or exterior wall; spans are 60' clear. (For further notes on ceiling, partitions, and vertical blinds, see pp. 124 and 125.)







A monumental experience in togetherness: in more than 500 conferences with their client, the architects, builders and consultants planned a building easy to use and easy to look at

"There are two kinds of clients." said one of the SOM men who worked on Connecticut General. "the kind who signs a contract and then goes abroad and the kind who signs a contract, takes off his coat, and sits down." Frazer Wilde, president of Connecticut General, and his associates are decidedly the second kind. One way of trying to convey some idea of how thoroughly this building was analyzed, studied, detailed, and developed is to say it took 41/2 years of intensive planning; another way is to say it required more than 500 hard-working conferences (not counting innumerable more



PHOTOS : ROBERT B. FICK



casual exchanges) between Connecticut General people and the team of architects, builders, and consultants.

This monumental experience in togetherness was a success: 1) the resulting building is superlative; 2) the people involved still respect each other. How the process worked, and what was important in its workings, can be much better explained by pictures of people working together than by detailed accounts of what was decided when after who said what.

In the first picture we have Gordon Bunshaft, partner in charge of design at SOM, expounding the scheme to the assembled executive building committee, consisting of the president and vice presidents of Connecticut General. Next comes the subsequent cogitation. Wilde, the plump man at left, has probably already made up his mind, because he has all the decisiveness you expect of a man who became president of his company at 41 and has presided over a growth in assets from \$200 million to \$1.6 billion. Wilde's decisions kept the conferences from running too long. Three hours was typical.

Before these scheme scenes, however, SOM had spent half a year working out a program and concurrently analyzing a dozen possible sites. The best was a 280-acre tract Connecticut General had already bought a year before-for investment if it didn't prove best for building. Then SOM spent three months translating the program into proposed schemes. During these two steps, their closest companions were the members of the building subcommittee, whom we observe in the picture debating the lay of the land. The chairman, the only full-time

Inside the inside

The large bulk of office space is perforated by courtyards carefully composed by Sculptor Noguchi in gravel, grass, water, stone, and trees. This one was photographed from the wide passage in the central part of the ground floor, looking across to the social rooms adjoining the cafeteria. A closer view in the same direction, photographed from this same court, is on the cover.



building-committee man in the company, was a real estate expert, Bruce Hayden (center). He was also secretary to the executive building committee: good, tight organization. Hayden's committee was part and parcel of the process from beginning to end; everything got threshed out with it first, and it was splendid at supplying information to SOM. The architects had two other main helpers from the start: Turner Construction Co., who got the job on a costplus contract at the same time SOM was chosen in Nov. 1952: and Walter Voss, MIT professor emeritus, who was consultant on materials. The Voss appointment-made even before an architect was picked-shows how dead serious Wilde was when he said he wanted a building with the nearest thing to no maintenance costs for 50 years and preferably 75.

The important early information was about company operations and personnel. This was distilled down from complex tabulations to less complicated graphs, and finally into an essence: a bar chart that showed the company needed just two main kinds of working space, a large amount for operations that expand in fairly direct ratio to the growth of company business, and a small amount for operations (mostly management) that expand little or none as the company grows. The bar chart is lost now, but it looked something like this:

NON EXPANDING	WITHTIYTA
FXPANDING	NS##1978
EMPLOYEE FACILITE	a Minita
BUILDING SERVICE	st North

The top two bars, in fact, are almost a diagram of the finished building: little wing for the nonexpanding *continued on p. 212*



INTINENTAL AIR VIEWS

Precision in pastorale; the vast plan avoids permanent partitions, which involve commitments—and mistakes









Cafeteria (right) stems out from the three-story office pool. Projecting from the other end of the building is the special departments wing—in the background of the photo below. The partner-in-charge of this big job for Skidmore, Owings & Merrill was William S. Brown. The other general partners on it were Gordon Bunshaft (SOM's design chief) and Edward J. Matthews. Project manager was Allan Labie; Joanna C. Diman was landscape designer.





Horizontals, long ones

Penthouse is given over to a suite for the board of directors of the insurance company. The lounge windows command an almost total coverage of the Connecticut countryside. All the delicacies of the design, such as the mullions, are made even more precise up here in the rare corporate air.

Employees' view is more personal, but just as serene. Their cafeteria (right) gazes out over wide lawns, pools, trees. Its supporting columns are pulled back into the building to keep the view complete.

PHOTOS: (BELOW) EUCENE SMITH-MAGNUM; (OTHERS) © EZRA STULLER



Escalator banks at both ends of the central building fill and empty the building fast, unfuriously. This great central block can be expanded by simply extending its east end horizontally.

Employees' lounge, with built-in refreshment dispensers and games, is on the path to and from lunch in the cafeteria (visible through the window walls).







How the facets were cut











Structural mullions are used (detail above) without fireproofing to frame the upper floors. Designers also took on the problem of butting a partition into glass: a filler strip (left) takes the partition up to the window head, and makes steady contact with the glass by means of a plastic strip. The night photo (right) shows the effect from the outside in upper right window. **Blinds** are vertical and made of aluminum sheet to avoid rippling in the updraft from air-conditioning outlets under the windows. The blinds adjust easily, stack slimly, and handle the daylight so beautifully that an order of fabric hangings has been canceled.

Open grid seen directly overhead reveals the fascinating play of ducts and services up above, but on a long view produces a simple-looking ribbed ceiling. The ballasts of the exposed fluorescents were modified to reduce their output from 80 to 50 foot-candles and eliminate glare. The grid acts as acoustical absorber, airconditioning plenum, and terminal for movable partitions.



Photos: © Ezra Stoller



Connecticut General:

an architectural summing up

Form has been following function for so many years in architecture that, inevitably, formalism is not far behind. When you drive up to Connecticut General for the first time, and see it sitting temple-like on its hilltop in all its compact, controlled hugeness, this thought crosses your mind.

It is when you go inside the metal and glass walls, and look closely at two things—the detail, and the creation and joining of three-dimensional spaces—that the architecture comes alive and begins to breathe. In detailing, the designers refused to be satisfied with what went before as refinement and perfection; they still pushed forward. In space, there is a denial of barriers that is unique in this type of building.

For this reason the transparent façades are not of major importance, nor are they the best part of the design. They sometimes don't seem a deep enough architectural statement to match the softly insidious force of the surrounding countryside. The green cast of their glarereducing glass is trivial in contrast with nature's green; this may have a lot to do with it. But façades are not the building, because you look into and beyond them as soon as you come up within comprehending distance. Then, inside the walls, no one office, not even the president's office, really contains you finally; you always have long landscapes or floorscapes opening up before you, or interior courtyards diverting you. The gleam and stylishness of the inte-



riors have made the young girls doing clerical work—the building's main population—dress up, their superiors say. On the long open floors, men are occasional, angular figures, sternly silhouetted, against the petticoated skirts.

The entire building is *designed*, and there are no cracks showing between the approach to the over-all plan and the corners of the wood paneling. It is pervasively complete; the patterns of rectangles—everything is rectangles—range from the minute to the mammoth, but they are all so subtly related that the architect renders himself almost invisible. When you look to find him, or his mark, in one particular spot, you find instead a view of the countryside, neatly framed; or if you stare down the long run of the large general office block, you don't see him there, but instead, diversions a tree in a court, a bright foil wall set for your gaze to bounce from, but not fasten upon. Like the upstairs servants in an old manor house, this architect does not let himself get caught doing the job; if necessary he hides behind the door until the guest passes. The beds seem to make themselves.

There is one evident flaw, but it is beyond the building, not of it: the parking spaces. The nicely proportioned, precise metal and glass walls of this architecture are embarrassed by the big lots crammed with Detroit's suave, bulbous auto bodies. They are incongruous for any metal worker to stand up to, from Bunshaft back to Cellini. A new car makes an old barn look good; a parking lot full of tractors would be fairer to Connecticut General.

But the flashy cars are what the careful people who use the building come in, and it is significant that they drive over and show it to their friends and families even after working hours. The building's lean gleam will outlast the car's fat shine.



Perkins & Will, whose school fees top \$2 million a year, are now preparing for a bigger general practice—a look at the business end of a professional office

-by FRANK FOGARTY

Architecture at a profit

This could be an eventful year for Chicago's Perkins & Will, a year when possibly the biggest and best known school architects in the country stop being thought of as just school architects. Long the contented specialist, Perkins & Will in its middle age is showing a decided restlessness for new fields. In past months, it has begun expanding into hospitals, office buildings and shopping centers; it has enlarged its partnership, added to its space and staff and today is weighing a move that may carry its name to the West Coast. All told, it has worked a considerable change on itself, and this year it is really beginning to show. For the first time since the thirties, Perkins & Will is becoming in fact what it has always been in theory, a general architectural practice.

Surprisingly, until a year or so ago, P&W seemed to have little taste for expansion. To be sure, its fees kept rising—from \$1.1 million in fiscal 1951-52 to \$2.2 million in 1955-56. But almost all of this business was in schools, and, for the moment, schools seemed about all it wanted. ("The noblest work of God," says Cofounder Lawrence B. Perkins, quoting Mark Twain, "is the bird in hand.") In 1952, Perkins had proclaimed a five-year plan, to grow "architecturally not volumetrically," and the preoccupation of the partners from then on was not new fields and expansion, but "the improving of our design and the proving to ourselves and

Deliberation marks face of Lawrence Perkins (below) in policy meeting



to the world that we are good architects as well as big ones." However this era was labeled—and the partners' word for it was consolidation—it was unquestionably one of conflict, of the age-old clash between bigness and virtuosity.

What ended it, ahead of schedule, is not completely clear. Probably, it was a combination of forces -a realization that too much consolidation could also mean atrophy; a fear that its competitors were catching up, which they were; or simply a resignation to the fact that in an economy of bigness and technological complexity, bigness in architecture is almost essential to do the challenging jobs. Whatever the cause, Perkins & Will in early 1955 began to stir again, mainly at the prodding of Philip Will Jr. It started talks with Hospital Consultant E. Todd Wheeler, one of the original partners in the firm, which

led this June to Wheeler's return (though not as partner) to develop hospital commissions. In 1956, it added six new "operating" partners, decided to take more office space and gradually began to court, though not aggressively, jobs in nonschool fields. And though it would be naïve to assume that it shook all its doubts about bigness -Perkins & Will, if it is nothing else, is a peculiarly introspective operation-it apparently arrived at a conclusion that what it really wanted for the future was what it sought in its school designs, a skillful blending of the advantages of both bigness and smallness.

Actually, Perkins & Will, in its internal structure, is a good bit like a school today. Its design teams are its classrooms, and these small work units are grouped around a core of staff and management in an arrangement which, if not unique, is

with Cofounder Philip Will Jr. and other partners on West Coast expansion.



nevertheless highly effective. Staff provides services—structural, mechanical and electrical; landscaping; interior design and furnishings. Management is the partners, and they supply the supervision.

All told, there are 11 partners in the firm, five of whom are the general, or senior, partners, and six who are "operating" partners (the six, admitted last year in what was frankly an incentive move for the younger second string, get only 20% of the profits). Of the five at the top, three partners are architects: Perkins, aged 50, who until recently was the main front man for the firm (he is now concentrating more on market development, particularly in the college field); Will, 51, whose area is long-range policy, design, and relations with the American Institute of Architects (he is now AIA's second vice president); and F. Lee Cochran, 41, the last of the general partners to be admitted (1951) and now the overseer of programming and production. John C. Goodall, 55, who manages the financial and administrative side of the firm, is a lawyer and one-time real estate executive for Marshall Field. John E. Starrett, 50, in charge of field supervision, is a structural and mechanical engineer, the son of one of the late, bigbuilding Starrett Brothers. Both came in in 1946.

Except for Goodall, all 11 partners act, at one time or another, as project managers in charge of a particular job (often one they lined up). Thus the line from the core to the individual design team is direct. The partner who has made the initial contact on the job will almost always handle its programming-i.e., the establishing of the over-all design requirements, size, and cost limitations, manpower needs-and will direct the making of preliminary drawings, usually working with one designer. Once the preliminaries are out of the way, the design team comes into being, with the partner normally staying on as project manager, and the designer taking over as job captain. This is the beginning of the basic design phase, in which the team will draw on the structural and mechanical services of the central core. Later come the working



Construction chief John Starrett had 19 years in building before becoming partner.



Youngest of general partners, Lee Cochran, 41, heads design production.



Financial manager is partner John Goodall, a lawyer and ex-Marshall Field man.

drawings, or blueprints, the opening of the job to bid by contractors and, finally, construction supervision by John Starrett and crew.

Though the number of design teams will vary depending on the work load, the Chicago office will normally have about 18 in operation throughout the year. And out of a total of 137 employees in Chicago (another 52 staff a White Plains, N.Y., branch) about 80% will be directly involved in production.

Counting all production hands, Perkins & Will's gross fees of \$2.9 million last year figured out to about \$19,000 per production head. Just how much profit this resulted in no one but the partners can say (and they'd rather not). However, Will has mentioned in speeches that ratio of overhead, partners' draw and profit to gross fees has been about 55%. Unless overhead is badly out of line, and there is no sign that it is, this would suggest a comfortable return, indeed. Possibly, it has been better than comfortable, since a total of \$890,000 in invested capital, and another \$861,-000 in cash and outside investments, had been plowed back into the business as of last March.

Obviously, no firm could have acquired so neat a financial tan as this by being so tentative about growth as Perkins & Will was in its middle years. There would have to be an aggressive youth, and for P&W there was. For the first ten years of its existence, it worked for one thing only—to build a name. When it had the name, it turned the next five years into an intensive campaign to build volume.

Perkins & Will began, in fact, as a practice in 1935. But in every other sense, it did not begin to exist until 1939 when it designed with Eliel and Eero Saarinen the famed Crow Island School in Winnetka, a building that was destined to revolutionize school planning.

Lawrence Perkins had met Philip Will in the late twenties when they were both studying architecture at Cornell University. Perkins, who was the son of a renowned architect, Dwight Heald Perkins, and Author Lucy Fitch Perkins (she wrote the best-selling Twins series of juveniles), thinks that even then he expected to have his own practice some time. Will, very early, became a part of his planning, for the two, in many ways, seemed an ideal combination to each other. While Perkins had a definite forte for seizing the broad design concept of a project, and was a gifted and persuasive mixer, he was not a particularly adroit executor or analyst of detail. Will, on the other hand, was both a skillful designer, an excellent executor, and a perfectionist. ("He would rearrange the sunset" Perkins says.) Perhaps more important, though, the two shared a humanistic approach to design (good architecture is not mathematics and algebra, "but a concern for people's emotional as

well as physical needs"), and were, and still are, intimate friends.

Together with E. Todd Wheeler. a high school chum of Perkins who had a degree in architectural engineering, Perkins, Wheeler & Will opened for business behind a fire exit door on North Michigan Ave. because, Will says, "if we couldn't work for anybody else at the time, we could at least work for ourselves." Given Perkins' family connections in education, and his father's name, which was carried on the letterhead as a consultant, schools naturally seemed the field to cultivate, and Perkins was picked to do it.

The buildup

"Most of our investment in those days went into Larry," Will says. "He was going to be the animated flag for the firm. He was sent to school conventions, pushed onto platforms, made to write, and we gave everything to try and establish in the eyes of the world that Perkins knew something." But until Crow Island, the world seemed unimpressed; the best the firm could do was to limp along on the residential commissions it could findand to hope. Had it not been for Eliel Saarinen, P&W might have had to hope for a long, long time.

The Perkins name was well enough known in Winnetka — Dwight Perkins had done three schools there; Perkins, Wheeler & Will some houses. But the firm was

not one of the 18 that were asked for ideas on how to carry out in elementary school the a new then startlingly progressive concepts about education that were making Winnetka nationally famous. "So," Perkins says, "we asked them. But all I got from Superintendent Carleton Washburne was that they wanted an architect 'who could see what we are doing here and not only build around it, but bring design to it,' and that they wanted a name. Saarinen was one of the ones mentioned. When I heard that, I couldn't resist. I said I could deliver Saarinen, and that the two of us could do the job together."

Perkins confesses now, that for all his seeming assurance at the time, he hadn't the slightest idea of whether he could produce Eliel Saarinen. He knew him, he had worked on plans for a church with him, and that was all. But Saarinen, though he at first seemed doubtful about a public school commission, agreed when he heard what Winnetka wanted to do and that he would have a free rein in doing it. The two shook hands, agreed on a 50-50 split of the fee, and after the school board was shown Saarinen's Cranbrooke Academy near Detroit, the job was theirs.

In many ways, it was a perfect collaboration. Saarinen supplied the over-all esthetics, the design of details for the exterior and interior, and acted as critic. Perkins, Wheeler & Will, after weeks of school-going for Perkins, translated what it took to be Washburne's concepts into a workable physical plan. As it emerged, in 1940, the school was truly astonishing. It was probably the very first to be organized with a "community center" and classroom wings, instead of a classroom center and dispersed activities. It was also the first to zone by age groups. Whatever else it was, it was a house to fit modern elementary education, and the ideas, large and small, that have been borrowed from it since simply attest to how good a fit it was.

Perkins and Will both knew full well what they had in Crow Island. Not only was it the first olive out of the bottle for the firm, but it was a nearly perfect specimen at that. To see that it got the attention they felt it deserved, they set about publicizing and promoting it just as hard as ethics would allow. They hired public relations counsel, then a relatively radical step in the profession; traipsed to meetings of the National Education Assn. and the American Association of School Administrators; talked to PTA and community groups; rang schoolboard doorbells. And it paid off—but not until five years later.

The war just about killed off school building, and it just about killed Perkins & Will, too. Between 1941 and 1946, it did less than \$1.5 million worth of building, and about the only work it succeeded in getting was a collection of houses and small commercial jobs. In 1943, the firm came perilously close to breaking up altogether, and Wheeler eventually did leave for a job at the University of Illinois.

Will remembers driving home with Perkins one night late in 1945, musing about the future and carrying on what had been a weeks-long discussion about what the firm should do. "Somewhere, we stopped for a light," he recalls, "and then Larry said it: 'Phil, if we want to be big, let's be.' " Strangely, Will says today, that seemed to do it. "From then on, we shook off the depression of the war years and started to move. We borrowed \$25,000 from the bank; asked Booz, Allen & Hamilton, the management consultants, to give us some help on organization; moved to a bigger office and, in the spring, expanded the partnership. And then, of course, the country, and fortunately we, started to build schools."

Actually, the help that P&W got from Booz, Allen & Hamilton was mainly in the form of a catalyst. With an almost nonexistent bank account, Perkins & Will could hardly have afforded the cost of a fulldress management survey. What it did get, though, was a list of 25 questions—What are the responsibilities assigned to each person or position in your organization? What volume of business would you like to do? What capital, staff and space continued on p. 214

PERKINS & WILL'S GROWING ALBUM



Crow Island School, firm's first, was finished in 1940, made P&W famous.



Keokuk High School, 1953, followed move into secondary field, won award.



Heathcote School, Scarsdale, N.Y., pioneered the hexagonal classroom (1953).



Lutheran Brotherhood Building, Minneapolis, was first big office project (1956).

Office center for International Minerals & Chemical, due 1958, typifies new work.







PHOTOS: (ABOVE) FRITZ MONSHOUWER; (OPP. P.) CERRIT BURG



Site of new store is between a newly widened boulevard in central Rotterdam and pedestrian-malled Lijnbaan center.

Sculpture in front of building is by Naum Gabo. Also used (but not shown) are works by Henry Moore and Theo Van Doesburg. Marked by a monumental sculpture this new department store is the climax of a city's reconstruction

Rotterdam's beehive

The sculptured construction of tautstretched steel which stands building high in front of Rotterdam's new De Bijenkorf department store seems to express the resurgent strength of the city itself. Although nearly 60% of the central city was destroyed in the Nazi incendiary raids of 1940, it is almost completely rebuilt today.

One of the unique features of the reconstruction is the Lijnbaan (AF, Sept. '56)—a district of small shops organized around a pedestrian mall. Since developments of this kind are usually built only in outlying areas, the district has been looked on as a laboratory for testing the feasibility of pedestrian centers in central areas. But until the completion of the new De Bijenkorf on an adjoining plot (map left), the district lacked a department store—consistently considered an essential ingredient for shopping-center success.

It was appropriate that the owners of De Bijenkorf should accept the challenge of this pioneering situation. Their prewar store (by Architect Willem Dudok) was the most advanced department store in Europe on its completion in 1930. However, the new situation required pioneering without precedent in Europe. So, advised by A. Elzas, their Dutch architect, the owners turned DE BIJENKORF DEPARTMENT STORE, Rotterdam, Holland ARCHITECTS: Marcel Breuer and A. Elzas CONSULTANT: Daniel Schwartzman



GERRIT



FRITZ MONSHOUWER

Exhibition pavilion is onestory structure reaching toward shopping district. The catenary-curved roof is hung from cantilever beams exposed topside and resting on four central columns. Long stripe of glass on top floor marks the store's executive offices. Suave interiors are in teak against gray, white and some blue, and have exposed concrete columns spaced 40' apart. Schwartzman, an over-all consultant with store experience, was codesigner of teak and aluminum fixturing. Floor space: 385,000 sq. ft.

to America and famed Architect Marcel Breuer.

Breuer's solution was a simple prism, sheathed in travertine and set on a rim of granite columns. (The hexagonal shape of the marble slabs used on the façade produces a honeycomb pattern that may seem symbolic-De Bijenkorf means "The Beehive.") The travertine is opened in the third-floor restaurant and the fifth-floor offices to reveal a sense of the wide-bayed structure within. On the boulevard side, Naum Gabo's sculpture marks the building from far down the avenue. On the Lijnbaan side, a glassy exhibition gallery ties the solid block of the store to the buildings of the center.



Cityscape of rebuilt central Rotterdam sets a lively scene for the perforated prism of the store (at center). Mass and shape of buildings was prescribed in the over-all city

plan. Gabo's treelike sculpture (placed at right corner of store after photo was taken) substituted for a projection in the building at the corner which was prescribed in the city plan.







Chapel of the air

Here, in drawings and a color photo of the model, is the muchdiscussed design for the US Air Force Academy chapel at Colorado Springs. Planned as a tall, cathedral-like structure to echo the sharp silhouette of its Rocky Mountain backdrop, the chapel will stand on high ground, its 19 spires rising 150' above grade in contrast to the low, flat-roofed buildings around it. The tent shape, poised on pointed concrete buttresses sheathed in granite, is actually much like the aluminum-skinned air frames the Academy's cadets will some day fly. Its sloping sides are folded into tetrahedral forms made of steel pipes covered with insulated panels of anodized aluminum. Glass set in between these tetrahedrons will emphasize their shapes and admit a play of colored light to the tall interior. The upper floor, a thin, prestressed cantilevered slab, will stand free of the walls within the big tent form and a half level above ground (see sections above). Nine hundred can be seated here for Protestant worship, another 100 in a gallery above. A half level below grade, between the handsome buttresses, will be a Catholic chapel for 500, and a circular room seating 100 for Jewish worship (plan, right). According to the Air Force's architectural consultants, unanimous in their enthusiasm, such a public building could mark "a milestone in our architectural development." Designers for Skidmore, Owings & Merrill are Gordon Bunshaft and Walter Netsch; structural designer, Kenneth Nashlund.



DANNY WANN

At Lake Erie College: a free-form plan for adding contemporary buildings to an existing campus-in-a-park



Two colleges, one a century-old Ohio girls' school, the other the youngest unit in the far-flung University of California system, are currently engaged in building programs based on thorough-going master plans. But, judging by appearances, the similarity between Ohio's Lake Erie College and California's Santa Barbara College ends right there:

Lake Erie's buildings are separately set in a rangy way on the grass and amid the trees. Santa Barbara's are interconnected by a geometric arrangement of courts and malls.

▶ Lake Erie's buildings are varied in form and without obvious relationship in material and detail—either between old buildings and new or new buildings among one another. Santa Barbara's are closely related by a standard vocabulary of materials and details.

• Lake Erie's buildings are not preplanned in the master plan, nor are they scheduled for construction on a definite time table. Santa Barbara's are carefully "blocked out" in advance, and all construction is definitely staged and budgeted in the initial master plan itself.

Actually, these apparent differences are matched by a pattern of similarities that makes them both typical of American colleges and makes a general interest in their two stories. Both building programs, for example, share today's characteristic aim-that of campus coherence. This is much more than a simple matter of buildings that look well together. In both cases the physical plan and form is the logical outgrowth of the development program and educational goals of the college. The wide difference in appearance springs from different programs and goals which create different plans.

Two kinds of

Consider the difference in preplanning and staged development: Santa Barbara, as part of a state institution depending on public funds for its building program, has to provide a close schedule and a fitting budget for legislative scrutiny. Lake Erie, on the other hand, as a privately endowed college, has to keep its program flexible to meet the vagaries of private fund raising.

Or consider the contrast in overall form: Lake Erie is the kind of


ERWIN LANG

campus coherence

college with an existing collection of sound campus buildings widely varied in style and a "settled" site holding a tall stand of trees and a gently rolling terrain. To impose a geometric pattern or repeated materials and details on the new buildings would destroy the natural character of the campus and make the old buildings stand out like "sore thumbs."

The Santa Barbara campus (notwithstanding a beautifully situated ocean site) was devoid of any natural features save a few treerows on the flat plateau of the peninsula itself. Although existing wood-frame buildings were useful as temporary housing while the new buildings were being built, they were of no permanent value. So once the tree-rows were considered (all planted to an earlier geometric pattern), the slate was clean. And like the trees, the new buildings were logically "planted" in rows to act as man-made windbreaks.

A close look at the plans reveals other similarities. Basically, both plans are a careful allocation of a site into functional zones of residence, academic, and nonacademic categories. Logically for a small girl's college, the focus of these zones at Lake Erie is a single commons building. At Santa Barbara, expressing the diversity of a coeducational state college, the focus is the library.

At Lake Erie, "breathing room" for changes or unanticipated expansion is found in the informal plan itself, which sets up a dynamic diversity of relationships among the buildings so that another building would simply mean another creative opportunity. At Santa Barbara, the density of building in the mazelike geometry can always be increased or new groups of buildings can be located around the periphery off of "open-ends" in the plan.

However, each plan carries dangers as well as opportunities in its augmentation. In either case, if creative imagination fails, the plan fails—Lake Erie's campus would collapse in formlessness, Santa Barbara's in stultifying rigidity. But at each college, the continuing service of competent architects is solid protection against such a failure. At Santa Barbara College: a geometric plan of courts and malls with buildings built to a consistent theme



Master plan for Santa Barbara is organized around a large central court. Buildings are arranged in areas by general type. Academic buildings are grouped close to the library; student housing is close to the lagoon and ocean. Nonacademic buildings (auditorium, union, and athletic) are to one side.

SANTA

-

HARBARA ->

\rightarrow

Interior court of the music building is designed for use as a small outdoor theater. The two-story section contains class and rehearsal rooms; the low wing (right) encloses a court and provides a bank of faculty offices. All rooms in the building are entered from outdoor corridors.

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Maximum density plan illustrates possibilities for campus expansion beyond the contemplated growth. Each section of the campus can expand into peripheral open space.

Dining commons with future union wing on the left will face the lagoon. The rendering shows how design elements and materials are repeated throughout the campus.

SANTA BARBARA CAMPUS, UNIVERSITY OF CALIFORNIA, Goleta, Calif. SUPERVISING ARCHITECTS: Pereira & Luckman BUILDING ARCHITECTS: Chester Carjola, A. Quincy Jones & Frederick E. Emmons, Pereira & Luckman, Smith, Powell & Morgridge, Soule & Murphy LANDSCAPE ARCHITECT: Eric Armstrong

OCEAN

GENERAL CONTRACTORS: Carl N. Swenson, Williams & Burroughs

20

EXISTING

PLANNED

PROPOSED

ATHLETICS

11

UNION

TBRAR



8



Santa Barbara: a geometric campus of courts and malls

STUDIO BLUE PRINT CO.



One of the problems Pereira & Luckman had to resolve at Santa Barbara was purely emotional: the local predilection for Spanish Mission architecture. But instead of adopting the substantive look of the style, the architects chose to employ the general attributes of lowpitched tile roofs, courts, and open colonnades. The site itself carried two additional problems. For one, the Santa Barbara airport was right next door, and avigational easements sliced off much of the periphery of the site from the buildable area. For the other, heady winds swept over the site from the ocean, requiring careful placement of the buildings. The wind problem affected all planning, from the location of perforated wind screens along the colonnades to the orientation of the courts.



Patterned block wall in the dormitory lounge extends the design coherence to interior space.



Piers, wide-spaced at the dormitory porch, are a repeated device in the unified campus design.

Vocabulary of Santa Barbara's campus design sets up a pattern of repeated materials and elements. Vocabulary "book," started by Periera & Luckman, is being expanded by new elements as added buildings are designed by several participating architects. Materials like 12" square block, concrete spandrels, tile roofs are used consistently.



ENTRANCE INTO CLASS COM SHOWING BLOCK TO T'-O" GLASS ABOVE



Wind screen in the music building passage is an essential feature of the windswept ocean campus.

HOTOS: ERWIN LANC



Spandrel and pier treatment pictured in the classroom building help unify the campus buildings.





CONCRETE BLOCK COLUMNS FOR TWO STORY . STRUCTURES - SPACING APPROX 24-0" O.C.



Lake Erie: a free-form campus-in-a-park



Contrast of Lake Erie's venerable College Hall (left) and the new dormitory building is pleasing in the context of an informal campus plan. Unlike the all-new Santa Barbara campus, Lake Erie's campus will develop more slowly and retain the sound older buildings. When Victor Christ-Janer looked over the "bones of unrealized rigid plans" for Lake Erie and calculated their effect on the college, he resolved he would not leave his successors a similar package. Working closely with the college program of President Paul Weaver, Christ-Janer plans his buildings step by step, controlled only by over-all objectives. Unconcerned about architectural unity, he banks on a continuity of good architecture to hold the campus together. As for geometric plans, Christ-Janer believes they always hamper the expression of college needs: "College needs develop naturally and spontaneously out of their own dynamic processes. An administration needs economic flexibility and programming freedom reflected in its physical plans."

TWO KINDS OF CAMPUS COHERENCE



1869



1909



1927

1948

Master plan for Lake Erie had to include heterogeneous buildings done under earlier master plans (or none). The first building was College Hall. By 1909 an unplanned group of buildings had started a "campus." In 1925, '27, and '48, new master plans were started with single buildings and then abandoned. The commons building, soon to go up, will be the fourth building based on the master plan, which has already been modified-as was anticipated. It is intended as the focus of the campus (see the new dormitories to its left and the academic building group to its right in the plan below).

LAKE ERIE COLLEGE: Painesville, Ohio ARCHITECTS: Victor Christ-Janer Associates ENGINEERS: Ipel (structural: dormitories) Henry Pfisterer (structural: commons) Fred Dubin Associates (mechanical)







HOTOS: (BELOW & RICHT) DANNY WANN; (ABOVE) VICTOR CHRIST-JANER



architectural FORUM / September 1957

Dormitories accommodate 70 girls each in double rooms. The center core (below) contains stair, lounges and baths, reduces the building's expensive perimeter. Balconies connected by stairs (above) make the open interior well and single center stair (below) possible. Terraced bank lowers the buildings to the ground, provides simplified foundations and allows easy escape from the balcony in case of fire.



Commons building will be the central focus of the campus. A multifaceted glass curtain wall will impart a feminine character suitable for a girl's college and a nondirectional character befitting the nongeometric campus layout.



Stail or i

MKIL ROOM



Corner detail (above) shows the two-story glass curtain wall. Steel tube framing 3" x 8" is made up by shop-welding on a jig. Two sizes will outfit the entire building. The glass is set with neoprene gaskets. The composite section (right above) shows the clerestory in the center of top floor dining room, an open interior stair well, and "lily pad" en-trances to second and third floors projected off the retaining wall. Building will be steel framed in 18' square bays. The window frames are hung from cantilevered beams before the slabs and angled spandrels are poured, thus providing a jig and support for concrete formwork.

Ground floor (plan, left) will be shaped by free curved walls into intimate rooms for music activities, TV watching, and "dates." Outside, circular brickpaved terraces under the trees (sketch, left) will link the interior space to natural landscape.





A typical older city suddenly gives birth to a litter of new buildings, an energetic slum campaign, and plans for a whole new downtown center. And now it is beginning to think about broader problems

Newark wakes up



Big asset to Newark is its position as an eastern transport hub served by two superhighways, five railroads, a vast bus system, its own airport, seaport and truck terminal. Proposed freeways (dotted) would serve and by-pass the business center. Air view (left) shows the three major areas of downtown renewal.

PHOTO (TOP OPP. P.) : FAIRCHILD AERIAL SURVEYS, INC.

The story of Newark, N.J. is hardly the story of a master-stroke in city planning. Newark, so far, has no Fort Worth Plan, no sweeping transit proposal, no Golden Triangle or Penn Center or Courthouse Square. But it does have a whole miscellany of planning and building projects that begin to add up to a city on the move again.

For an old city like Newark, this much is big news. Five years ago the city felt, and looked, on the skids. Nothing worth talking about had been built downtown for 25 years. On all sides the business district fell off into a collar of slums, among the most medieval in the country. Business and leadership were packing up and heading for the greener suburban pastures of Orange, Maplewood, Millburn, Short Hills. Government rivaled Jersey City in its prime—only Newark had five bosses instead of one.

Today, Newarkers have several new reasons for confidence. The town's two big insurance companies, Prudential and Mutual Benefit Life, have canceled options on suburban sites and are building downtown. Newark's first middle-income "walk to work" housing and its first neighborhood renewal project are starting, supplementing an older and active public housing program. There is talk of new hotel facilities, and there are detailed plans for a 1,000car municipal garage under Military Park. Businessmen are pushing the commercial redevelopment of 70 acres between Broad St. and the Pennsylvania Railroad Station, a slum at the city's front door that has already been partially cleared for interim duty as parking lots. Committees are beating drums to lure new office tenants and industry. Newark, long in the shadow of New

York 10 mi. away, now realizes that it has something of its own to sell: one of the broadest webs of transportation in the world (map, left).

Civic leaders are also aware that, in percentages, Newark is the least lived-in, most commuted-to major municipality in the US. Every day its population jumps from under 500,000 residents to nearly a million -100%, compared to an increase within Pittsburgh of 49% and only 13% in New York. To have homes near its jobs and shoppers for its stores, Newark is trying to get still more middle-income housing. Cut off politically and financially from the towns that constitute its suburbs, it is also asking for some kind of regional plan to deal with longrange problems of land use and transportation.

First move: new government

Newark's slow, painful downward spiral showed its first signs of reversing in 1953, when the city finally threw out the archaic commission form of government that had plagued it for 36 years and put in another, more modern form available to it under state law: a mayor, business administrator, and council. The new mayor, Leo Carlin, an exlabor leader who had backed the citizens' charter study as one of the five former commissioners, made a second move forward by appointing a committee of 18 business and labor leaders to work with him on longneglected problems. A third move was made when the city got, at long last, a full-time professional planner to work with Newark's volunteer planning board and the new business administrator. In the days of the "five mayors," any comprehensive or effective planning had been virtually impossible, and little had





Insurance center for Mutual Benefit Life includes a new home office beside an old church (left), two rental office buildings (above), a three-level, 1,000-car garage in back (see photo below). Architects are Eggers & Higgins, Frank Grad & Sons. Across Washington Park a new Rutgers law library will be built on a vacant lot next to the city museum. View down Broad St. (right) shows older downtown buildings behind a church in nearby Military Park.



FORUM STAFF PHOTOS



been done about the 1947 report the city had received from Harland Bartholomew & Associates. The city's new planning officer, Robert Hoover, is now tackling a five-year capital expenditures budget.

Heartened by the change in government and the open-door policy at city hall, business is investing again downtown. The first big move was made by Mutual Benefit Life, whose solid-looking, \$10 million headquarters of white limestone and bluegreen glass is scheduled to open this month on north Broad St. and Washington Park (see photos, left). Mutual Benefit, which first opened for business in 1845 in the back of Ben Miller's grocery store on Market St., had been occupying a vast neoclassic temple on the northern outskirts near the former president's home. It was thinking of moving all the way out to a golf course in Orange, when it took stock of the new political climate and the traditional advantages of the city (which for Mutual Benefit also meant a big clerical pool of high school graduates and a more predictable tax picture). Besides its own headquarters building, the company has invested in two rental office buildings and an adjacent 1,000car garage, and is working on further investments in the area.

Next to break ground downtown was Newark's giant, the Prudential, which had built five new regional headquarters around the country (AF, Dec. '55) and was threatening to move part of its vast home office out to suburban Millburn. The Pru is now excavating for a \$20 million office center for itself and Fidelity Union Trust, on the site of its original fortress (photo, right).

The biggest news of all, however, has yet to be made. Behind the whole Broad St. business center lies what city leaders call the "core of the city's future," a former skid row of flophouses and saloons which they visualize as "Newark Plaza"-a big new downtown addition of office buildings, hotels, department stores, parking garages, and restaurants. An attempt to make this nonresidential project eligible for federal aid ran into trouble from housingminded House conferees, but the mayor and his new commmittee plan to resubmit their proposal in the future. In the meantime they are studying ways to clear and sell property at an attractive write down through city bonds or state aid. Among the come-ons listed by the project's boosters are a 3-minute walk to the present center of town, a 10-minute drive to Newark Airport, a 15-minute train ride to midtown Manhattan. Architectural observers only hope that Newark Plaza will realize its potential through bold architectural concepts and coordinated planning.

Newark's machinery

The catalyst for Newark Plaza, and for other coordinated efforts in renewal, is the mayor's Economic Development Committee, headed by H. Bruce Palmer, youngish president of Mutual Benefit Life, assisted by Prudential Vice President and Secretary Frederick H. Groel. The members, who include active executives of the city's major banks, department stores, utilities, labor unions, real estate and legal firms, made their first major outing a trip to Pittsburgh to study redevelopment methods and results. Meeting with the mayor once a month at city hall, the committee hears reports from subcommittees on transportation, highways, parking, industrial sites, finance, taxation, promotion, and Newark Plaza. Interlocking with this group in membership and function is business' own Greater Newark Development Council, a group of 18 senior executives who consult on Newark's over-all business and cultural problems. A third component is Newark's Bureau of Municipal Research, set up by business in 1932 and available for fact-finding to these and other civic groups and institutions.

Business has also lent the city occasional staff services. Prudential has surveyed the city's purchasing department. Public Service Electric & Gas has studied the efficiency of city motor pools. Mutual Benefit has analyzed the city's building maintenance, finance, and accounting. A five-man finance subcommittee headed by Prudential President Carrol Shanks advises the city on when to sell its bonds and at what rates. (Since the new regime, Moody's has raised Newark to an "A" rating.) The Economic Development Committee, as its energetic young legman, Paul Busse, points out, has been successful in bringing business, government, and labor together, and in applying corporate techniques to the financing, building, and selling of a community. All have agreed to discuss problems on the basis of three common goals for Newark: to get rid of obsolescent plant, to bring in new ratables, to create employment.

The new neighborhoods

Only a few blocks out from the problems of downtown business, other leaders are taking on the city's slum collar in bigger and bigger bites. Per capita, Newark's public housing program, costing some \$75 million since 1941, is among the largest of any major city. Twelve projects totaling 7,385 apartments

> Prudential tower, on Broad St. at the other end of Military Park, will front the company's older structures, between Bamberger's and Kresge department stores. Architects: Voorhees, Walker, Smith & Smith.



have replaced 150 slum acres, yet Newark's blighted dwellings still outnumber its modern low-rent housing three to one.

Sites for needed middle-income housing within the city's built-up limits had been almost nonexistent until the Newark Housing Authority, doubling as the city's redevelopment agency, cleared acreage on either side of its newest public housing project and sold it to private developers (photos, right). Here Newark will get apartments at a little over \$35 a room within easy walking distance of downtown. And from both projects it will get taxes of close to \$600,000 annually, compared with \$178,000 before redevelopment.

As its next big job, the housing authority is tackling the blighted "100-block" area of the Central Ward. First move is to clear four blocks for 1,206 public housing units to accommodate families displaced by redevelopment. Eventually New-



Pilot project to upgrade marginal Clinton Hill area will convert a weedy lot into a city park, tear down old houses for entrances, parking lots near stores. "Greenway" walk will link the park to a nearby public school, blocking through traffic in the area (as will low diagonal curbs across two other intersections). Home owners will be offered FHA loans to keep up properties. ark plans to turn 40 blocks to light industrial use, rehabilitate or spotclear and rebuild 60 into middleand low-income housing, schools, playgrounds, stores, parks, and parking.

Newark also has a militant slum prevention program, which centers around a Commission for Neighborhood Conservation and Rehabilitation, set up by Mayor Carlin at the suggestion of the Real Estate Board under its president, Agnes Coleman. This group, grown to 17 members with staff and budget now supplied by the city, has helped consolidate the city's housing courts, centralization of city inspection services, condemnation legislation, some 17 new city housing ordinances, and helped spread its gospel by sponsoring the ACTION-LIFE magazine show, "Our Living Future," attended by 800odd citizen leaders last fall.

The Commission's first pilot demonstration, and one of the first of its kind in the country, is the \$500,000 upgrading of a 14-block area in Clinton Hill, just south of the blighted 100-block section. With the cooperation of a new Clinton Hill Council and voluntary street and block associations, the Commission has bought up a vacant, weedy lot running down the center of one wider-than-average block and plans to turn it into a city park and playground linked by a new landscaped walkway to a nearby school, which will use and supervise it. Through traffic will be eliminated and new off-street parking for 340 cars will be created for neighborhood shoppers during the day, residents at night. Property owners will be urged to fix up their homes with FHA "220" loans. Forty Clinton Hill leaders have already traveled to Philadelphia to inspect rehabilitation projects, their trip paid for out of funds collected at the ACTION show.

The highway headache

Newark's great asset—its transportation web—is also becoming one of its greatest headaches as it moves in on the city itself. At present, surveys show that three of every four cars downtown are going through the city. Because Market St. is the only east-west street that cuts straight through Newark without jogs, almost all through traffic is forced to the intersection of Market and Broad, making it one of the busiest corners in the world. Some 40,000 vehicles (and 125,000 pedestrians) pass this one spot every day.

In its struggle with traffic, Newark has turned more and more of its narrower streets one way and has banned standing at the curb on main arteries during rush hours. On some streets, traffic is reversed according to rush-hour demands, and all-important buses (in which about half of Newarkers commute) are given sole use of two center lanes.

For the future, Newark is pinning hopes on a system of loop freeways around the city core (map, p. 149), but routes and effects on over-all redevelopment are still up in the air. The state, for instance, proposes a straight-line freeway across one of Newark's better southern sections to relieve old Route No. 22, one of the most heavily traveled roads in the country. Newark argues that the state's marksmanship would 1) destroy one of its few remaining good neighborhoods and considerable tax ratables, 2) deposit commuters' and shoppers' cars so far from downtown that they would overload already congested streets to reach their desination, 3) completely ignore what Newark plans to do under its big slum clearance program. Says Newark's Mayor Carlin, echoing sentiment in other cities: "Why should one federal agency aid cities in urban renewal while another, through the states, spends money for highways not tied in with urban renewal?" Says another municipal observer: "The state highwaymen are still back in the days when they were getting the farmers out of the mud. But they are beginning to realize the havoc they can create when they get to cities."

Newark has asked the state to develop a master plan on a truly metropolitan scale, embracing not only highways, but land use, urban renewal and all other aspects of planning for northern New Jersey. Says Ross Nichols, one of the Development Committee's experts on transportation: "The major determinant of all future planning will be the highway system. Unless this is controlled by over-all planning objectives, the remainder of the planning effort could be largely in vain."



A big chunk of 46 acres is being cut out of one of Newark's worst tenement slums in the North Ward near Branch Brook Park (photo, below). Finished last year were the clean, airy, yet slightly formidable towers of Christopher Columbus Homes, a 1,556-unit public housing project (photo, right). Flanking these are sites cleared by the Newark Housing Authority and sold at writedown to private developers who plan 14-story middle-income apartments for 1,166 more families, plus stores, parking and offices. Farther north is the white temple of Mutual Benefit Life, built in 1927 near officers' homes but far from the downtown stimulus Mutual now desires. At lower left, across the Lackawanna tracks and new east-west freeway link, are low garden apartments of 1941 public housing, built before high costs forced housing up.



FAIRCHILD AERIAL SURVEYS, INC.





Gallery

An architect with a camera explores Thailand's rich traditions, designs a US Embassy worthy of its neighbors

American in Thailand

When Architect John Warnecke went to Thailand to undertake a new US Embassy building, happily, he packed a camera. Photographing with an architect's eye, he discovered not only the glittering riches of native palaces and temples, but also the later and less beautiful fashions of the Colonial Renaissance, the International Style, and nativemodern public architecture. Warnecke and his project assistant, Denis Beatty, also found, hidden away here and there, some lesser-known buildings that seemed to hold more sensible answers. From these, and from the hot, rich, watery climate itself, he conjured the main elements of his design (pp. 158-9).

A demon in dazzling native dress guards the temples of Wat Phra Keo in Bangkok's royal compound. Above lesser spires rises the great shrine tiled in glowing gold. As the breeze blows, the eaves of the colored roofs come alive with little bells. At the summer palace of Bang Pa-In.

40 mi. upriver from the city, a royal pavilion rises from the water like the headdress of a Siamese dancer. The steeply overlapping, almost Gothic, roofs also reminded Warnecke of Norway's stave churches.





Colors brilliant and refined adorn Bangkok's Chapel of the Emerald Buddha. Serpentine gargoyles, gilded carvings, delicate inlays all proclaim the full flowering of the ancient Siamese arts.



PHOTOS : J. C. WARNECKE

The Marble Palace, which many Thai architects consider the most beautiful building in the city, is almost Japanese in its simple sweep. The octagonal pattern of the marble courtyard, polished to mirror smoothness, suggested the floors, screens, and railings for the embassy.

Invasions of foreign styles offered valuable lessons. First Colonialism imposed its Renaissance forms on Siam's royal palace.



Then the revolt of the International Style brought a plain severitywhich slowly blotched with mildew.



Public architecture now calls for a blend of old and new; in Bangkok's police building, this resulted in precast concretewith a stripped-down temple roof.



Thailand's new embassy: a white pavilion on the water

In embarking on his embassy design, Warnecke rejected foreign-born styles as impractical and inappropriate, felt he could use only small elements of sacred native architecture. But in backtracking to some of Bangkok's lesser-known buildings of 25 to 50 years ago, he came across structures like the old hospital shown below, where the ground floor had been raised above moisture and opened up to the cooling breeze, where deep balconies decorated with grillwork rails sheltered the interiors from sun and rain, and the wall surfaces from mildew. Blending these sensible ideas with the spreading roofs, the graceful white columns and the marble floors he had admired in older temples, Warnecke visualized a white, wide, open pavilion on a small new lake or klong carved from the typical waterways that wander through the embassy compound. The earth moved will be used as fill for a future embassy annex, medical-commissary build-



ing warehouse and needed parking lots. (In Bangkok, a city almost afloat, you literally have to dredge up building sites out of bottom mud.) The chancery building itself (model opposite) will be reached from either side of the *klong* by vehicular causeways, and from the annex in back by a covered walk. An open ground floor provides a large covered area for loading and unloading automobiles in hot or rainy weather. Behind a gold mosaic screen, at the rear of an entrance hall paved in marble octagons, two octagonal elevators rise to three floors of air-conditioned offices which are partitioned on a 1-meter grid system (plan, right). The tapered, slightly curving floor slabs, decorated with precast concrete railings, again in an octagonal pattern, shade the offices and reduce air-conditioning loads with deep overhangs.





Side-view section shows offices on tapered, deeply overhanging floor slabs, and a central well lighted by clerestory windows. Visitors enter by car bridges from either side (model below), can stroll out on open pier at right. Arched pilings echo the royal water pavilion Warnecke admired (p. 155).



FHA's home mortgage insurance has helped remake the face of America. But its very success raises questions about the federal housing program's balance and its ability to meet the future's challenge

FHA in suburbia

Try to imagine an invention in government that would create a new private-enterprise industry, that would change the whole pattern of cities, and that would create major change in American habits of living. It need not be imagined, it exists already in the FHA. So spectacular have been the "side effects" of this governmental adventure that many people have been confused by it altogether. They have thought of FHA-land as a new paradise, blightproof, slumproof, entirely invulnerable. They have thought that we need only extend the FHA a little further to solve any and every homebuilding problem America may have. Only a very sober review can place the brilliant achievement of FHA in proper perspective.

A new mortgage market

The idea of FHA developed out of the President's Conference on Homebuilding and Home Ownership called by Hoover in 1931. FHA was created two years later in the National Housing Act, which was a bill to "improve housing standards," as well as to establish a mutual mortgage insurance system. The emphasis of the 1931 conference had been on the inadequate flow of mortgage capital and on poor building standards, and these were key considerations in setting up FHA. It was a curious mixture of short- and long-term thinking, with the New Deal most anxious to get mortgage credits flowing again-and incidentally boost construction employment -but still hopeful that better houses could be built for more people.

Under Section 203 of the NHA, the new agency developed an extremely efficient mortgage insurance system for home mortgages. It established a proficient staff of underwriters and appraisers in offices throughout the country, and drummed up business with builders and lenders who had been moribund for three years or more.

Through this gradual pickup in FHA-insured activity, a really new phase of American homebuilding began. The industry not only revived, it took on a new look. What FHA insurance had actually achieved was to establish a national mortgage market. This seems simple now; but at the time, mortgages, unlike stocks or bonds, were a purely local commodity bound to the vicissitudes of local markets. The FHA-insured mortgage was the first such instrument that was marketable, transferable on a nationwide scale. Such a mortgage, whether insured in New York or Oshkosh, had certain characteristics that would be the same no matter where it was sold-and it had the all-important backing of the federal government. After 1938, when the Federal National Mortgage Assn. ("Fanny May") was created to provide a formal secondary mortgage market for FHA mortgages, mortgage capital became more fluid than ever before, and it was to become even more so after the war.

A new process

Again, the new nationwide financing market was coupled with something else: a simpler mortgage process. This helped create the vast new market for homes. Before FHA, few middle-income families could afford to buy a new home without two or three mortgages. The depression, with defaults running into the billions, proved the unsoundness of this elaborate system. FHA, with its concepts of low down payments, high loan-to-value ratios on single-paper mortgages, and terms longer than ever seen before, virtually killed the junior liens on lowand middle-priced housing. It pointed its arsenal of new home-buying inducements squarely where it would have the greatest impact—at the middle-income mass market that had barely been tapped.

A new industry

This was what got the humble carpenter builder out of his blue jeans into a business suit and this was what converted the citizen who had been a house-renter into a wholly new kind of a "home owner" who was actually a lessee taking title to his dwelling at the end of his lease, if he stayed that long. Being in debt for your house lost all its sting. The builders became national figures, so that a "Levittown" could become a new city of 80,000 in itself. New kinds of quantity production developed. The dispute between prefabricators who had set up factories for complete unit houses and big builders who had set up standardized fabrication at the site was resolved when builders used both. Neither one had existed or could have existed before FHA. From a sporadic, halt-and-start speculation, homebuilding developed into a bulwark of the national economy.

All this is well known. FHA has generated over 3.5 million houses in the last 23 years, enough housing to equal three new cities of Chicago; and its younger partner, the Veterans' Administration, came in as an emergency agency in the postwar years since 1945 to guarantee 2.2 million more homes. The difference is that VA (still thought of as an emergency system) was never set up with the same elaborate divisions for maintaining housing standards, land planning, and evaluation that characterized FHA.

A new class

Quite suddenly, sociologists and journalists alike discovered that the new FHA-land had something beyond volume; it had a new pattern too. It was the New Suburbia. Whatever else they said, observers agreed that it was mammoth, that it spread over vast areas formerly in farms, it was occupied by people who looked alike in being young married couples with young children, people who were from the same income group, had pretty much the same tastes, the same ambitions, the same favorite games. There was virtually a new class in America—the FHA class.

A new pattern

Not quite so noticeable at first were certain negative characteristics of FHA Suburbia-things missing. Harper's Magazine came out in 1954 with a posthumous article by its brilliant editor, Frederick Lewis Allen (known as author of Only Yesterday). The suburbs, Allen darkly hinted, were potentially our new slums: they often had fewer schools than the big cities; they possessed no parks and no place to put them; they were in many ways poorer places for children, who had always been considered their chief beneficiaries. And they were beginning to be tough places in which to park cars (cynics have declared that parking space might be the chief lure drawing people to the "country").

Allen's discovery of missing things did not in any way slow FHA construction. To this day, FHA's friends can point proudly to a foreclosure rate of only 7/10 of 1%.

Nevertheless, Allen's criticisms have penetrated by now into the consciousness of builders, among whom the most advanced are already aware that the success of big undertakings will depend increasingly on creating rounded communities.

This carries remembrance back to the early days, when Seward H. Mott assembled some of the top land-planning talent of the country to serve FHA, and his division had final say whether a plan was desirable—and therefore a good longrun risk. Those were the days when FHA set the highest standard yet known for the new surroundings of millions of Americans.

With time, the appraisal and underwriting division won an internal battle, and since 1940, when Mott quit, land planning has been advisory only. Appraisers could pay heed to their land-planning advisers or not. Result: ever lower standards, great developments underwritten regardless whether they carried in them the possibility of full community life, or not.

This planning deficiency is one that FHA can correct, under the prodding of intelligent builders and citizen leaders, just as with time it overcame the objections of appraisers against contemporary architecture. With time FHA must back planning, or the profit of builders and lenders will be jeopardized. No longer is housing built against a deficit caused by depression and war: and as some shrewd FHA people are aware, the bulk of what they have insured is far from having yet run its 30-year course. It could still come down on their heads.

Meanwhile there are other minuses in the homebuilding program that FHA can scarcely cure of itself. FHA homebuilding is kept from being the one all-inclusive answer to middle-income housing by the fact that it is still almost all in suburbs, not in town; it is still nearly all for one race, not others; it is still attractive mainly to one age, that of the young family, and not many others; it is still all in a single homogenized income group devoid of the richness of contrast needed for democratic A fantastically successful life. achievement, it has its limits, and failure to recognize them keeps the total housing picture, as seen in Washington, confused.

Concrete battles its weight

Technology





EXPANDED AGGREGATE: Under intense heat, certain materials bloat to ten times original size, forming a hard-shell aggregate for concrete.

ON THE SCALES: Light aggregate in concrete greatly reduces a building's over-all weight. For example, the Dallas Statler Hilton used 16,500 cu. yd. of expanded shale concrete plus 130,000 lightweight masonry units, reducing structure's weight by 14,500 tons.

A whole family of lightweight aggregates is just beginning to invade structural concrete, trimming building weights by as much as a third

Within the past ten years, a diverse family of materials called the lightweight aggregates, used in lightweight plaster and concrete, has spurred an important development in building design. The Statler Hilton Hotel (opposite) in Dallas, by Architect William Tabler, points up the significance of the change: lighter-weight structural members, new economies in use of structural materials. If the hotel had been designed with conventional materials, it would have weighed an additional 14,500 tons. It is one of the lowest-cost hotels built in the US in recent years (\$9.350 per room, as compared to the national average of \$15,500).

Other buildings have begun to arise, too, using some of these new materials. Another example: Eero Saarinen's new War Memorial in Milwaukee, designed in collaboration with Ammann & Whitney, which uses lightweight concrete in large cantilevered sections, saving nearly 40% in weight and 12% in structural volume.

Savings like these have created such a demand for lightweight aggregates that the industry turning them out is currently in one of the greatest booms of the era. More than half of all concrete block produced in the US today contains one or another of the lightweight aggregates, instead of heavier sand and gravel. More than half of all base-coat plaster contains one of the nonstructural, ultra-lightweight aggregates, such as vermiculite or perlite.

Yet this boom is only at a beginning, for so far it has barely touched structural concrete. Such buildings as the Dallas Statler Hilton or the Chicago Prudential building, which trimmed its dead load about 30% by using lightweight concrete, are still the exception rather than the rule. Of the estimated 50 million cu. yd. of cast-in-place concrete poured in the US this year, less than 5% will be lightweight. In part this lag is caused by the fact that all the new materials cost more than sand and gravel, and only recently have designers begun to see that it is not always economical to reach for the cheapest material, that savings in weight can often make deep savings in total cost. In part, too, it is caused by the aggregate industry's inability to expand fast enough to meet sudden demand. And in part it is caused by the fact that, up

to two or three years ago, very little precise knowledge or engineering data was available.

The basic types

What are the lightweight aggregates? They are a broad range of materials, some found in the earth, others in the hot wastes of the steel industry's blast furnaces, some with little more weight or strength than popcorn, others with ten times the weight and easily 100 times the strength. Their only common denominator is their ability to take the place of heavier materials without sacrificing strength. There are five basic types:

▶ Expanded shales, clays, and slates: These are products of the earth which are crushed, then heated at high temperatures (around 2,000° F.) until they bloat to several times their original size. The product is a pellet with a strong outer shell, encasing a gas which caused the expansion. Aggregates of this type are capable of forming structural concrete (3,000 lb. per sq. in. compressive strength) which weighs only 85 to 110 lb. per cu. ft. as against ordinary concrete's 146 lb. per cu. ft.

▶ Expanded slags: These are by-products of the blast furnace, produced when small amounts of water are shot at molten slag as it comes from the furnace. The resulting aggregates are harsher than most of the above, requiring more air in the concrete mix to achieve proper workability. Also, a slag concrete requires more cement in the mix to reach equal strength. But slag is cheaper: about \$2.35 per cu. yd., f.o.b. plant, as compared with \$4 to \$5 for the shales, clays, and slates. (Sand and gravel costs only \$2 per cu. yd.)

▶ Pumice: This is a lower-strength material, a volcanic glass, used principally in insulation concrete, masonry block and roof fill, rather than as aggregate in structural concrete. Pumice concrete weighs only about 70 lb. per cu. ft.

> Perlite: This is an ultra-lightweight aggregate, with insufficient strength for columns, beams, or floor slabs. The strongest perlite concrete has a compressive strength of only about 1,000 lb. per sq. in. It is used chiefly as in-

CONCRETE BATTLES ITS WEIGHT cont'd.

sulation: for fire protection, base-coat plaster, pipe insulation. Like pumice, perlite is a volcanic material; it bloats to frothlike pellets under high temperature-around 1,800° F.

Vermiculite: This is an expanded mica which, like perlite, is an ultralightweight insulation material not strong enough for structural concrete. Its uses closely parallel those of perlite. At present, both perlite and vermiculite are finding expanding use in such areas as roof-deck and honeycomb-sandwich construction.

Explosive growth

In ten years lightweight aggregate production has swelled almost as remarkably as its materials. Volume in expanded slags has increased more than ten times since 1945, up to nearly 5 million cu. yd., while plants have gone from six to 18. Expanded shales, clays, and slates have had an even greater rise, from seven plants to 35, producing some 4 million cu. yd. Meanwhile, perlite and vermiculite have boomed from virtually nothing in the immediate postwar years to a production for perlite last year of almost 2 million cu. yd. from more than 80 plants, and for vermiculite, 300,000 cu. yd. from over 40 plants.

The next ten years should see even more spectacular gains, particularly in the structural aggregates, for many of the largest markets are still untouched. Chicago, for example, has never had a supply of expanded shale, clay, and slate. Its first expanded shale plant will begin production later this year, a \$31/2 million plant at Ottawa, Ill., for Henry Crown's Material Service Corp., now a major supplier of sand, gravel, and ready-mix concrete. And on the West Coast, where there never has been a supply of expanded slag, a new plant will be in operation in the next six months near Los Angeles, with a capacity of 225,000 tons annually.

Another indication that structural

lightweight aggregates will be in more plentiful supply is the industry's own rising interest in the cast-in-place field. In earlier years, instead of trying for this market, most aggregate producers turned instead to making lightweight block. It was a natural preference. There was a ready market for block, but none for lightweight aggregate in structural concrete. Further, so little research had been done on structural applications that producers would have faced the futile prospect of attempting to promote untested materials.

In the past two or three years, considerable study has gone into these structural applications by producers, industry associations, and a number of universities. The result is that the engineer now has reliable property data on many of the lightweight concretes. which makes it possible for him to use these new materials with the same assurance as he does conventional concrete. Says Frank Erskine, director of the Expanded Shale, Clay and Slate Institute: "Five years ago we were 20 or 30 years behind conventional reinforced concrete in what we knew about our materials. Today, we have about caught up."

Data catches up

Erskine's organization, set up by a group of 12 aggregate producers only five years ago, has spent much of its time learning the structural properlies of the many aggregates produced in the US, i.e., how the products of the various manufacturers behave in concrete, covering such data as compressive strength, modulus of elasticity, bond strength. A counterpart organization, the National Slag Assn., has done similar work on slag, beginning with a program at Mellon Institute during the thirties and early forties. Today, Edward Bauman, managing director of the association, says that slag aggregates of a given weight and specific grade will have the same concretemaking properties, no matter where the aggregate comes from.



lightweight concrete hanger, designed by Ammann & Whitney for Mohawk Airlines. Span of 120' with conventional concrete would have been possible only if engineers had used different design, requiring 23% more steel.

Another organization which has developed new technical information for various kinds of structural aggregate is the Portland Cement Assn. At present. PCA's Research & Development division has just completed four years of study of the various types of lightweight aggregate concrete. In an analysis of eight types, selected as representative of US production, PCA's Joseph J. Shideler reports that structural-grade concrete was obtained from all eight-five shales, a slate, a clay, and a slag. The heaviest concretes, an expanded slag and an expanded shale, weighed about 107 lb. per cu. ft.; the lightest, two expanded shales, weighed a fraction more than 88 lb. per cu. ft. Shideler found, as have others before him, that the various lightweight aggregates require a wide range of cement contents to produce concretes of similar strength: from 4.4 sacks per cu. yd. of concrete for the expanded clay, to 6.7 sacks for the expanded slag and 6.4 sacks for the 107 lb. shale. (This particular shale is produced by a sintering process; the others were produced in a rotary kiln.)

In field applications, experiences such as Shideler encountered have often caused difficulties for the engineer. Mix proportioning, as the University of Florida's Ralph W. Kluge points out, "is strictly a trial and error procedure with a few guides to assist in the process." It is not uncommon for the engineer to find that his lightweight concrete must weigh 110 lb. per cu. ft., rather than the 100 lb. he had originally hoped for, because an extra 10 lb. in sand must be added at the site to bring it up to required strength.

Even among aggregates of a similar type, wide differences in characteristics can exist, depending on the source of raw material and its manufacture. Thus, it is risky to generalize: A new, untried aggregate whose unit weight, crushing strength, and physical appearance compare identically with another aggregate of known performance will not necessarily perform identically in concrete. Sometimes such performance differences necessitate last-minute modifications in structural design. This design problem is due largely to the lack of standard test procedure. Lightweight concretes have been used in structural design for such a relatively short time that standard testing is still to be worked out. Kluge traces the "unfortunate" lack of information to the fact that certain tests are costly to perform. In his report on the PCA tests,

Properties of lightweight aggregate concrete

Uses	Aggregate	Cement† content sacks/cu. yd.	Compressive strength, psi	Unit weight Ib./cu. ft.		Modulus of elasticity	Shrinkage	Conductivity BTU/Hr. Ft ²
				Plastic	Oven dry	psi (millions)	%	(Deg. F/in.)
Structural concrete:	in Page 19 Mar	24.2.2. 2.1.7	Phone in the					
In dams, buildings,	Sand and gravel	4	2500-3500	143-153	133-143	2.5-3.5	0.04-0.08	8.0-12.0
highways, where	or	6	4000-6000	143-153	133-143	3.5-5.0	0.04-0.08	8.0-12.0
light weight is not necessary	crushed stone	8	5000-8000+	143-153	133-143	4.0-6.0	0.04-0.08	8.0-12.0
	Exp. shale.	4	1000-3000	75-100	65-95	1.4-2.0	0.02-0.08	2.0-3.3
	slate and	6	3000-5000	80-110	70-100	1.7-2.4	0.02-0.08	2.0-4.0
Structural and nsulation concrete:	clay	8	4000-6500+	85-112	85-102	2.1-3.0	0.02-0.08	2.5-4.0
n structural members,							and the all	
pridge decks, roof fill,		4	750-1000	75-100	65-80	0.5-1.5	0.04-0.10	3.0-4.6
loor fill, fire protec-	Expanded slag	6	1500-2500	80-110	70-100	1.5-3.0	0.04-0.40	3.0-4.6
tion over steel, where light weight is desirable		8	3000-4000+	85-115	75-100	1.5-3.0	0.04-0.40	2.5-5.0
		4	500 - 1500*	70-95	55-80	0.2-1.0	0.1+	1.5-2.5
	Pumice	6	1500-2500	75-98	60-83	0.5-1.6	0.1+	
		8	2000-3000	83-100	68-85	0.8-2.0	0.1+	2.0-2.8
For roof fill, fire pro-		4	75-150	35-40	20-25	0.07-0.1	0.1+	0.7-0.8
ection over steel,	Perlite	6	150-500	40-55	25-40		0.1+	
vhere structural trength concrete is		8	250-1000	50-75	35-60	0.10-0.3	0.1+	1.0-1.7
not necessary		4	50-200	35-50	20-30	0.04-0.15	0.2+	0.4-0.9
	Vermiculite	6	200-300	50-60	25-35		0.2+	
		8	300-500	60-70	30-45	0.10-0.20	0.2+	0.6-1.3

+At 2" to 4" slump

*Lower unit weights and compressive strength are commonly used for roof fill.

Shideler says that of the lightweight aggregates he studied, "rather wide variations were obtained in structural properties." He recommends that producers of structural lightweight aggregates conduct investigations to provide reliable design data on performance characteristics.

Research ahead

This culpable data lag reflects the rather unscientific history of the industry. The expanded clay industry, for example, had a kind of back-yard business genesis, beginning more than 40 years ago, when a Kansas City ceramic engineer named Stephen Hayde discovered that certain clays will bloat under intense heat. Years later, manufacturers of concrete masonry products, anxious to produce lighter-weight components, discovered by trial and error that they could produce lightweight aggregate by Hayde's method and thereby reduce the weight of their products. Of course, since then a great amount of work has gone into evaluating those aggregates which have become commercially available, including a notable study sponsored by the Housing and Home Finance Agency some eight years ago. But against this type of research, there has been only a mild and rather academic interest in the very nature of the phenomenon of expansion itself. What is it that occurs within a heated particle which causes it to bloat like popcorn? Why do certain particles bloat while others do not?

Far from being merely an interesting, though abstract exercise, such questions, a few scientists believe, must be answered before the lightweight aggregate industry will realize its ultimate potential in building. One organization which is currently probing into such questions, following work done in the past by the Bureau of Mines and others, is the Engineering Experiment Station of Ohio State University. To date, Mineralogist Ernest Ehlers has analyzed just six samples of bloated clay. In future analysis-altogether, he will examine some 60 different aggregates-Ehlers will study other factors in the bloating process, possibly find the chemical basis for certain minerals' superiority over others and a way to make better use of available but so far unpromising clay deposits in the state. To many cities of Ohio this would be a boon, for there is a short supply of expanded shale, clay, and slate in certain parts of the state. Expanded slag helps to take up the slack, with four Ohio plants.

Indeed, there is a growing recognition that the lightweight aggregate industry must make two immediate advances. The supply of good aggregate must be increased; and the wide gap must be filled between the ultra-lightweight aggregates, perlite and vermiculite, and the middleweight types, such as the clays, shales, slates, and

slags. This means that entirely new aggregates must be developed to fill the gap between the featherweights, at about 10 lb. a cu. ft. (and \$60 to \$75 a ton), and the middlweights, at 45 to 70 lb. a cu. ft. (and \$3 to \$7 a ton). A number of research groups are working on this problem, including the scientists at Ohio State, who hope to develop an expanded clay aggregate which will perform like perlite or vermiculite as insulation material, but cost less to produce. In England, Marcel Gallai-Hatchard has recently developed a process for producing an ultra-lightweight slag aggregate (about 15 lb. per cu. ft.) which could be used in base-coat plaster. So far, his problem is high production costs-higher than either perlite or vermiculite.

One possibility which has just begun to be considered as a way to fill the gap is a blend of middleweight and featherweight aggregates in a single mix. The slag industry is investigating this, considering a blend of expanded slag and vermiculite, to make possible a new insulation concrete which would be heavier (and stronger) than vermiculite or perlite by themselves, yet lighter than expanded slag concrete. For too long, all of these aggregates have been considered as independent, competitive materials, when actually they are a family, albeit a diverse heterogeneous family, capable of supplementing one another to meet the broad demands of building.



HOTOS: (ABOVE & BOT. OPP, P.) ROLAND CHATHAM



SMOKE in the Texas Engineering Experiment Station wind tunnel shows air pattern around building. Separate components are diagrammed at left.



In wind tunnel tests it is discovered that architectural shapes can have large effects on the climatology of structures

Air flow around buildings

Primitive builders used many devices to take advantage of or protect themselves from prevailing winds. Eskimos placed igloo entrances downwind to keep out arctic drafts. Southerners oriented breezeways and courts to make the most of cooling air currents. And from time immemorial farmers have planted dense rows of trees as windbreakers. Until recently, there was little or no scientific study of these matters in relation to modern buildings.

Now, however, natural air flow

around buildings is the subject of a research report by Ben H. Evans, assistant research architect at the Texas Engineering Experiment Station, based upon extensive wind-tunnel model studies. Evans, a graduate of Texas A & M's Division of Architecture, is here extending the pioneer studies of William W. Caudill, under whom he has worked, on natural air flow inside buildings (AF, May 1951). Some studies of air flow around buildings have been made elsewhere, both on scale



HEIGHT of basic building block increases low-pressure, turbulent downwind eddy, as shown in test above. The larger this lowpressure eddy area is, the less air swirls around the building's walls, and vice versa. DEPTH of building block even more sharply affects size of eddy area, as shown in this test in which height remains constant. Largest eddy area and greatest protection from wind is afforded by the thinnest mass. LENGTH of building block, height and depth remaining constant, also deeply affects size of eddy area. As length increases, length and depth of eddy grows. Tall, thin slab is not ideal where maximum breeze is desirable.





PATTERN of air over a building does not change with height, only the eddy area deepens, throwing air farther away from building. Basic dimensions and flow of air around wind-tunnel models is shown, left.

models and full-scale structures, mainly to solve air-pollution problems. But this is the first rounded attempt to get some basic understanding of what might be called the aerodynamics of buildings.

For these studies, air movement was made visible by the introduction of a chemical smoke in the air stream of a low-speed wind tunnel, and measurements were made by pressure gages. To simplify the tests, seven basic building shapes were selected, including flat, gable, and shed roof types, all based on a cube module. Over 200 variations of the basic shapes were tested and measured. Measurements were directed at finding: 1) the general air pattern around a building; 2) the general distribution of air pressure; and 3) the dimensions of the eddy area built up on the downwind side of the building by the difference in pressure between the side getting the brunt of the wind and its opposite.

The size and shape of the downwind eddy was the principle concern, for this comparatively still, low-pressure area is a major key to the climatology of a building. The larger the eddy, the lower the volume of air around the building as a whole, and vice versa. Thus in cold climates, building shapes and orientations that maximize eddy areas offer the greatest protection from wind; while in hot, humid climates, configurations that give the smallest eddy area possible allow a maximum of cooling air to flow around and through the structure.

ILCH

It was found that some large variables in building shapes, such as height, have almost no effect on air pattern over a building, though height considerably increases eddy area. At the same time, many minor variations, such as the direction and pitch of shed roofs, resulted in very large changes in air flow. As a generalization, it might be observed that the tall, thin slab building, whose large eddy area makes it quite efficient in the north for protection from winds, does not appear to be ideal for hot climates, where the maximum of breezes around a building is desirable.

Only tests which resulted in considerable changes in air flow-a few of which are shown on these pages-are considered in the report. The conclusion is inescapable that in the design of building shapes, orientations, openings, overhangs, and other architectural features there are many subtle variables that can have profound effects on the air flow around buildings and by simple extension on the interior environment. Since that environment is being more and more closely controlled for comfort and health, and awareness of microclimatology in building is growing, a more thorough knowledge of the principles of air flow around buildings is needed. Small design changes in the shape of the building itself may well effect heating and air-conditioning costs, by changing thermal conditions in outer walls, as well as increasing comfort in non-airconditioned buildings.

The report recognizes that tests on standard, single building shapes can give no more than an indication of general principles. Evans is currently working on a more significant followup which will show air patterns around several buildings simultaneously, of interest to planners of building groups. But specific single buildings or groups will still present individual problems in which site variations, landscape features, and local climate idiosyncrasies will have to be taken into account. Wind-tunnel model studies can help toward more precise answers. The Texas program so far is unique in providing such studies for architects by architects in the three elements of air, light, and sound simultaneously.







ORIENTATION of a building also causes sizeable changes in pattern and volume of air flow around it. For these tests, four basic building configurations (upper left) were placed at various angles in wind tunnel. Note that for each type there is an orientation that provides a minimum of downwind eddy area, another that provides a maximum. This can be important for orienting buildings in hot humid climates, where a minimum of eddy area is desirable, or in cold climates, where a maximum affords protection from cold winds.



"I got 5 years of service from a valve I expected to last only 90 days"



Mr. C. L. Worthington, Chief Engineer for E. L. Bruce Co., Little Rock, Arkansas plant, standing near a Walworth No. 225P Bronze Globe Value with "500 Brinell" stainless steel seats and discs that was installed in severe boiler blowdown service. Hardened seats and discs are especially resistant to wire drawing, steam catting, or galling.

Some time ago Mr. C. L. Worthington, Chief Engineer for E. L. Bruce Co. plant at Little Rock, Arkansas, was having valve trouble on some newly installed boilers. The first boiler to go in service generated 600 hp operating at 200-pounds pressure. The water was so bad that a hot lime and soda ash water softener treatment had to be used, and it was necessary to add other chemicals to this solution from time to time. Mr. Worthington wanted to use a continuous blowdown to skim off the worst part of the scum on the water. He installed a small blow pipe about an inch below the normal water level in the boiler. This worked well, except that the one-inch valve on the line



A Walworth No. 225P Bronze Globe Valve that gave perfect performance for four years and 362 days in a severe boiler blowdown service where the Chief Engineer said he had never been able to keep a valve more than 60 to 90 days. could only be partially opened and let a small part of the scum be blown off at one time. If the valve was widely opened, it would not take long to lower the water level in the boiler and run the steam pressure down. This service gave Mr. Worthington lots of valve trouble, as can well be imagined, because of the extreme wire drawing that occurred.

One day the Walworth representatives in that area, called upon Mr. Worthington and demonstrated the outstanding features of the Walworth No. 225P Bronze Globe Valve. This valve, which has a working steam pressure rating of 350-pounds at 550°F, has a plug-type stainless seat and disc which has been heat treated to a minimum hardness of 500 Brinell. After listening to the Walworth men and examining a 225P valve, Mr. Worthington agreed that he would try one in the severe service described. He said if it lasted 90 days, he would consider that it had done a good job.

The valve went into service and came out within three days of being in service five years under very severe operating conditions. The valve was used 24 hours a day from early in the morning on Monday until Saturday night, when it was closed until the following Monday morning. It was never opened more than three-quarters of a turn, and most of the time it was opened only one-half to one-quarter of a turn. For the life of the valve, nearly five years, it never failed to give a 100% closure when shut on Saturday night until opened Monday morning.

When another 600 hp 200-pound pressure boiler went into service, it also was equipped with a one-inch Walworth No. 225P Bronze Globe Valve on the same service.

In view of the severe service and the wire drawing to which this valve was subjected, it is interesting to note that the original valve (which was taken out of service almost five years after it had been installed) was removed - not because the seat and disc were wire drawn - but because the turbulence of the steam had finally caused a small hole to occur in the wall of the body of the valve. Needless to say, the valve that was taken out of service was replaced immediately by another one-inch Walworth No. 225P Bronze Globe Valve, positive assurance that Mr. Worthington is satisfied that this valve has "done a good job."

Other Walworth products include complete lines of Gate, Globe, Angle, Check and Lubricated Plug Valves in bronze, iron, steel, stainless steel and special alloys. Complete information and literature will be furnished upon request.



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Brief accounts of noteworthy developments



WOOD CANTILEVER

In this unusual field house and gymnasium for the San Francisco Park Dept., glue-laminated timber beams 96' and 35' long form a double-cantilevered roof unconnected at the top except by a long clerestory window. The long beams are anchored by steel rods (protected by "boy catchers" to keep small fry off the roof) to a 200-ton concrete deadman underground. Architect: Donald B. Kirby.

SOLAR POWER AND LIGHT

At a recent conference of the Illuminating Engineering Society, Dr. Samuel G. Hibben, past president, one-time associate of Thomas Edison and long-time consultant to the Holophane Co., lighting engineers, predicted: "Twenty per cent more people in the US will be using lighting three times brighter than today's illumination by 1967, and they'll be using it 10% longer than we do now. As a result, the nation will be using four times as much light as we are using today."

As to where this vast increase in illumination is coming from, Dr. Hibben had a further prediction: "Soon we shall see another and perhaps greater miracle than did Edison when he created electric light by heating a filament in a vacuum. This will be the twin process of extracting or transforming sunlight into electricity and then converting that electricity directly into light through a magic dance of electrons known as electroluminescence."

The references here are to the silicon solar battery, discovered in the Bell Telephone Laboratories, which converts sunlight directly into electric current by means of an electronic transistor effect, and to the electroluminescent light panel (AF, Jan. '57), which creates a continuous light source in a thin layer of phosphors sandwiched between conductive films. Both devices are in active development.

Coincidentally, a recent comprehensive survey of solar energy by the General Electric Research Laboratory found that of all possible ways of getting electricity from sunlight the solarbattery type of conversion is technically the most feasible and nearest to practical use. But it is still some distance off: storage batteries needed to hold power overnight and on sunless days will first have to be reduced to 1/6th of present costs, solar cells to one 1/100th. The latter will be easier to do than the former because solar cells are only at the beginning of development. In detail, the study figures that a south-wall solar plant, making maximum use of glass, mirrors, and lenses to produce about 5 kw-h a sq. ft. per vear at 4¢ a kw-h, will become feasible when it can be built for about \$2 a sq. ft. It will first be feasible for individual houses and buildings because there are no presently foreseeable advantages in central-station solar plants. many possible cost advantages in eliminating power transmission entirely. The survey concludes that there is enough solar energy available to buildings in nearly all parts of the US to supply all of their power needs without excessive equipment.

SOLION

A new electronic device is predicted by its developers to bring new speed and accuracy to the operation of heat controls, furnace regulators, fire and burglar alarms and other electrical building controls. This is a tiny transistorlike device, called a "solion," developed by the US Naval Ordnance Laboratory. Like the transistor, the solion operates by controlling the movement of electrons through a material, but in this instance through a liquid solution (potassium iodide) rather than a solid metal, and hundreds of times faster than the transistor. Solions can be made so sensitive that the faintest ray of light or the approach of a burning cigarette causes them to pass a current. They are one of a growing number of new devices that may supplant the vacuum tube and even the transistor in simplifying electronic circuits, all operating on microscopic amounts of power. Thus they may fit into the development of solar energy (see above).

PARKING BELT

As symptom of the fierce parking problem, even in Europe these days, a big highlight of the Hanover Fair this summer was a huge mechanical "parking belt" developed and offered for sale by Krupp of Essen. With typical German ponderousness, it consists of a long chain-and-sprocket endless conveyor on which are mounted free-rolling trays large enough for each to accommodate a single car. The car drives into the lower side of the conveyor on one of the crosswise trays; a push button moves the contraption along until eventually the cars are swung up on the top belt somewhat like ferris-wheel gondolas. In effect, the machine allows double-stacked parking, with any car available at the push of a button. This machine parks 60 cars, but there is no limit to which it may go.



STEEL CANTILEVER

In this sports arena for Evansville, Ind., eight arched and center-pinned 80-ton steel trusses are anchored to 14ton triangular base members to give a free span of 267'. The whole structure, including trusses to triangles, is welded. Architect: Ralph Legeman. America's Finest Aluminum Windows

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Adams & Westlake



Building: Immaculate Conception School and Convent, Portage, Wisc. Architect: John J. Flad & Assoc., Madison, Wisc. Contractor: T. S. Willis, Janesville, Wisc.
Products

Glowing walls . . . ceramic panels . . . wide-span deck . . .

TRANSLUCENT SANDWICH used as wall or load-bearing roof

Kalwall plastic-faced panels literally throw some light into prefabricated sandwich construction. Comprised of two flat translucent skins of fiber-reinforced polyester resin over a grid of aluminum Ishaped extrusions, the lightweight insulating building units transmit soft, glarefree daylight. The 4' x 8' x 2%" thick units have been used as wall panels on buildings in New Hampshire for five years, but within the next few months a very notable installation will take advantage of the load-bearing potential of the plastic-aluminum sandwich. The US pavilion by Architect Edward D. Stone for the 1958 World's Fair in Brussels, Belgium will sport 2,100 Kalwall units in its unique 341' diameter circular roof. Weighing about 11/2 lb. a sq. ft., the light-transmitting panels will be part of a tension









structure similar to a spoked bicycle wheel. The building's outer rim of reinforced concrete is tied to an inner metal ring by concentric steel cables. These are tightened by turnbuckles and held in tension by the weight of an inner ring which frames the open air dome in the center of the roof. The joining system worked out by the architect and the manufacturer is made up of H beam purlins crossing the cables at 10' intervals. Aluminum T's between the plastic panels are connected by clips and bolted to the purlins (see drawing, left). Sponge neoprene and mastic are used to waterproof the connections and allow for any movements over the enormous pinwheel.

Now in mass production, Kalwall panels will be available this fall for wall and roof construction in this country. They are made in four sizes up to $4' \ge 20'$ and in six colors. One man can handle a $4' \ge 20'$ 10' panel which weighs only 64 lb., and the aluminum extrusions comprising the grid also act as a solid edge banding for window and door frames. The polyester skins have an established reputation for weather, impact, and chemical resistance. Price is about \$3.90 to \$4.90 a sq. ft. *Manufacturer:* Kalwall Corp., Manchester, N.H.

CERAMIC TILE PANELS prefabricated for exterior walls

Probably the oldest man-made building material, ceramic has been initiated into the growing fraternity of factory-made curtain walls. *Romany-Spartan RS* panels take on a variety of colorful faces. The manufacturer carries a standard tile line *continued on p. 176*





44 Kinnear Steel Rolling Doors Speed Service at S&W Fine Foods —



house of S & W Fine Foods, Inc., is a monument to functional efficiency. And here are some of the ways in which 44 Kinnear Rolling Doors* play an important part in this up-tothe-minute operation:

They open straight upward... coil smoothly out of the way above the opening... clear the entire doorway quickly — from jamb to jamb and from floor to lintel.

They stay out of reach of damage by wind or vehicles.

All floor and wall areas around the doorway are *always* fully usable.

Ceiling space around openings remains clear at *all times*. There's never any interference with cranes, hoists, conveyors, lighting, or other overhead equipment. Goods can be stacked "clear to the rafters" inside or outside the opening.

The tough, flexible, all-steel curtain of interlocking slats assures long



service, *low* maintenance costs, and *extra* protection against fire, wind, intrusion, and vandalism.

Heavy galvanizing—1.25 ounces of pure zinc per square foot of metal (ASTM Standards) — gives added resistance to weather, wear, and corrosion.

Kinnear Rolling Doors are built any size, for old or new buildings, with motor or manual control. Write for information, or for recommendations on your door needs.

*33 Kinnear Steel Rolling Doors 18'9" wide by 10' high, ten doors 10' wide and 10' high, and one door 6' wide by 7' high.

The KINNEAR Mfg. Co. FACTORIES: 1640-60 Fields Ave., Columbus, Ohio 1742 Yosemite Ave., San Francisco 24, Calif. Offices and Agents in All Principal Cities

Products

cont'd

of about 60 different shades and surface textures in several sizes, and these can be ordered in one color or combined in any pattern. The inner construction of the panels, too, can be adapted to particular building conditions. One of the most intriguing types technically—and the least expensive—is the *Series 1500*. This monolithic panel has its ceramic tile face cast directly into the lightweight reinforced concrete that makes up the thin structural web. Foamed styrene cores are also cast in the panel in the initial fabrication to keep weight down and insulation value



high. A 134" thick Series 1500 panel has a U value of .28; 33%" thick panel, .12. The panels weigh between 8 and 9.3 lb. per sq. ft., according to thickness. Series 1600. 1700, and 1800 are all sandwich construction, and have skins of aluminum or galvanized steel with insulating cores of Styrofoam, Foamglas or aluminum or paper honeycomb. Their U values range from .27 for a 1" panel with honeycomb core to .08 for a 3" thick unit with plastic foam. Maximum standard size in the laminated panels is 5' x 10'. The 1500 can be heavied up with reinforcement and precast in sizes up to 5' x 15'. Cost of the RSwall units with exterior tile facing runs from about \$2.75 to \$4.50 a sq. ft., according to type of panel and edge conditions called for. Inside surfaces can be furnished with tile applied for additional cost of about \$1.30 a sq. ft., or just left unadorned and painted. All types of the new curtain



walls have been weather-tested extensively by independent laboratories and in actual installations. To compensate for building movement and the expansions and contractions caused by temperature changes, the tile facings are grouted with flexible waterproof latex. The ceramic itself is classed as "vitreous, frostproof" and its moisture absorption is less than ½%. *Manufacturer:* Ceramic Tile Panels, Inc., 217 Fourth St., N. E., Canton 2, Ohio

BIG ACRYLIC SHEETS cast high, wide, and corrugated

Panels of colored and clear Plexiglas RL acrylic are now being produced in sizes up to 8'-6" x 10'. Developed primarily for the illuminated sign market, the large flat and corrugated plastic sheets also have a wide-open field in commercial interior partitioning, which seems to be outgrowing the 4' girdle put on it by most building materials. Decorative exterior fencing might be another use for the chemical- and weather-resistant sheet. Resin-Producer Rohm & Haas makes the RL acrylic sheet in thicknesses of .187 and .250" in flat form in any color and degree of translucency. In orders of 3,000 sq. ft. or more, price runs from \$1.27 to \$1.80 per sq. ft. Amplex, a fabricating company, has installed a large oven and press to corrugate RL acrylic. The Amplex panels are formed with ripples 3%" deep and 1" apart, 1" deep, 21/2" on center, and cost \$4.20 to \$6.60 a sq. ft. Wasco continued on p. 178



At last, authoritative research shows the way to

Predict and Reduce Fan Noise!



DeBothezat now offers this new 50 page book on noise control... anyone can use it to predict and reduce ventilating fan noise in every installation.

You NEED this new book, "Controlling Ventilation Noises," if you ever have anything to do with specifying or installing fans. This book simplifies the unfamiliar, specialized terminology of the acoustical engineer — as well as the methods for solving noise problems — so that the entire data can be put to practical use in the plant. It covers installations indoors as well as outdoors.

This data is entirely new. Nothing like it has ever before been available to the industry. The book is a result of noise control research recently completed by the acoustics staff of the Armour Research Foundation of Illinois Institute of Technology.

To supplement the research performed at Armour Research Foundation, which was sponsored by the DeBothezat Fans Division, De-Bothezat has constructed its own noise-evaluation laboratories. These include reverberation rooms designed and calibrated for DeBothezat by Armour.

The entire noise evaluation project was sponsored by DeBothezat as a contribution to industry. It was accomplished at a cost of over \$20,000 including the research at Armour and the facilities installed in DeBothezat's laboratories.



DeBothezat's facilities are now being used (1) to obtain accurate sound-output data on fan units, (2) to develop new fans with lower noise levels, and (3) to allow publishing of reliable soundoutput data. In fact, DeBothezat fans are now rated for noise on both the inlet and outlet sides. These ratings are expressed in decibels and give the average sound pressure levels in each of 8 octave bands of frequencies, measured separately. This information is available on all DeBothezat

DeBothezat Centrifugal Roof Ventilator undergoing standard noise source calibration tests at Armour Research Foundation's acoustical laboratories.



Exterior view air outlet end of DeBothezat noise evaluation reverberation test rooms. Mock-up engine cooling test equipment in the foreground.

tion is available on *all* DeBothezat fan units. They are the only fan units in the industry so rated.

The helpful 50-page book "Controlling Ventilation Noises," is available for just \$2.00 prepaid to help defray costs of printing and handling. With it, anyone can predict and reduce ventilating fan noise in every installation. Request your copy of this 50-page book on your business letterhead and attach check or two one-dollar bills.

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Industrial Sales Div., Dept. AF-9 Remington Arms Company, Inc. Bridgeport 2, Conn.



Please send me your free booklet which shows how I can speed the job and save with the Stud Driver.

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Address	
City	State

Products

is another firm which will cast large flat sheets of acrylic resin up to $8'-6'' \ge 10'$ on custom orders. The Wasco *Acrylite* panels have attractive embedments of woven materials, flora and fauna such as those used in smaller pane's introduced last year (AF, June '56). Price: \$1.50 to \$4 a sq. ft.

Manufacturers: (flat sheet) Rohm & Haas Co., Washington Sq., Philadelphia 5, Pa. (corrugated panels) Amplex Manufacturing Co., 2325 Fairmont, Philadelphia, Pa. (plain sheets and embedments) Wasco Products Co., Bay State Rd., Cambridge 38, Mass.

SIX-WAY FITTING cast of aluminum in one piece

Serving as a crisscross and up-and-down connector for tubing or pipe, the aluminum alloy *Hosking 300* is a strong convenient fitting for building scaffolding towers, catwalks, racks and other permanent or demountable tubular structures. Cast in one piece, the inexpensive supporting joint is reported to be stronger than steel pipe. Without any additional bracing, four of the *300*'s will support 20,000 lb. The fitting is simply slipped on the pipe or tubing and its tapered diamond-set screw tightened with a turn of a hex wrench. It also can be detached easily for reuse. By eliminating welding or threading, the new fitting is said to cut



about 30% off labor time. Prices to the building trade run from \$1.98 a fitting to accommodate $\frac{34}{4}$ " standard iron pipe up to \$4.64 for the size designed for 1.%" aluminum and steel tubing.

Manufacturer: John H. Hosking Co., 1704 Howland Ave., Cincinnati 23, Ohio

NONPIERCING CLIPS attach insulation to roof deck

Because every tiny break made by a fastener in a roof is an invitation to water and vapor trouble, Tinnerman developed these winged grippers to attach insulation board securely without piercing through the metal deck. Tested in laboratories and on actual jobs in Canada, these GAT-Dek clips have sharp serrations at each end which bite into the sides of the deck flute when hammered into place with a simple accessory tool. Once in place, the clip will resist a pull-out pressure of over 200 lb. Each GAT-Dek fastener has opposing tabs so that sections of insulation



board can be butted one against the other with the clip acting as common anchor. GAT-Deks are designed for a nominal 2½"-deep flute. For a roof engineered for a 30 lb. per sq. ft. uplift, 25 fasteners are recommended per square; and 50 per square for a 60 lb. pressure. The clips sell through roof deck manufacturers for about 10¢ each.

Manufacturer: Geo. A. Tinnerman Corp., 19900 off Detroit Rd., Cleveland 16, Ohio

VINYL WALL COVERING has precious look of woven silk

Japanese silk's delicate mien is faithfully reproduced in Vicrtex, a wall covering tough enough to slough off hard wear and grime. The surface of the attractive material is a layer of vinyl imprinted with the woven texture and fused electronically to a cloth backing. Vicrtex comes 54" wide in 14 colors pigmented through the thickness of the plastic. Its resilient topcoat resists snags and scuffs and can be kept clean with an occasional wiping. The Imperial Silk pattern sells to architects for about \$4 a running yd., or $13\frac{1}{2}$ ¢ a sq. ft. Another wall covering introduced recently continued on p. 180





instead of this



High bay lighting with Abolite is easier on the eyes

• In high bay lighting, Abolite open-top units eliminate uncomfortable contrast of bright lamps against dark background. 18% of the light is directed upward through Abolite's open top, washes out the deep shadows, gives lamps a soft background. 35° shielding of the lamp practically eliminates glare.

Open-top design also gives Abolite high bay units a selfcleaning action. Air circulates through the fixture, sweeps the reflecting surface clean, reduces lamp operating temperatures. As a result, lighting efficiency remains high, lamps last longer.

There are three Abolite uplight units for high bay lighting: 18" and 24" diameter Alzak fixtures for use with 400 and 1000 watt mercury lamps and 18" Alzak fixtures for 500 watt incandescent lamps (ideal for gymnasium lighting). For full details, write Abolite Lighting Division, The Jones Metal Products Co., West Lafayette, Ohio.





Stromberg's new Electronic Time System tops the field with...

Here are some

(just a few)

of the many

PLUS features

• Jewelled Master Clock movement with automatically wound 72-hour spring power reserve.

• Secondary Clocks standard with hourly and 12-hour supervision — correction cycles completed in *only 60 seconds*.

• Program Unit, capable of 1440 signals daily on each circuit, immediately resets following power interruption.

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• Seven-channel transmitter — one for clock supervision, six for program signals.

• Installation and maintenance service available throughout U.S.A. and Canada.

A product of the laboratories of one of the largest clock manufacturers in the world—YOUR GUARANTEE of performance, quality and dependability.



Products

cont'd

by the same manufacturer is a vinyl sheet on which flat patterns are translated into what appears to be deeply sculpted basrelief but are actually shallow textures. Company trademarks, crests, and original designs can be engraved to order on the sheeting by means of this unique process. *Manufacturer:* L. E. Carpenter & Co., Inc., Empire State building, New York 1, N.Y.

SHALLOW ARC DECK spans 150' without trusses

Wonder never ceases making wider and wider trussless roofs. The latest model engineered by the Chicago manufacturer of industrial steel buildings spans 150' without any purlin, post, or pillar. Tests conducted at the firm's plant site indicate that the big curve of cross-corrugated 14-ga. steel sheets can withstand hurri-





cane winds of over 120 mph and can support loads of 32 lb. per sq. ft. The new wide-span roof is practical for hangars, arenas, and convention halls and other structures requiring an obstruction-free interior. Wonder's steel deck is reported to cost about 30% less than conventional site-built roofs.

Manufacturer: Wonder Building Corp. of America, Chicago, Ill.

MUGWUMP AIR CONDITIONER Installs through wall like room unit

A complete heating and cooling system for small construction developed experimentally by Frigidaire may shift thinking on utility core layouts from center to perimeter. All components in this yearround package are factory assembled in a single group. The gas furnace and cooling coil are located on a plenum along an outside wall with the preconnected condensing unit left outdoors. The costly and complicated installation of refrigerant connections between a centralized coil and outside condenser is unnecessary, and the





entire conditioning system can be shipped with all the wiring except final connections complete and the condenser sealed, clean and tested.

The experimental system will be used first in a six-room NAHR Research house with a gas furnace having a 105,000 BTU input capacting, a 2 T. air-cooled condenser and 2 T. cooling coil.

Manufacturer: Frigidaire Div., General Motors Corp., Dayton 1, Ohio

PAINT ROLLER wraps itself around pipe

Pipe, poles, and other cylindrical objects that usually consume considerable painting time can be coated quickly with the contoured $E \ Z \ Paintr$. A slight squeeze on the spring-fitted handle of the applicator pulls its five rollers together on a U frame to fit against a large area of pipe or column surface. When the pres-



sure is released the rollers realign for easy loading in a paint tray. Price of the large pipe painter with five rollers is \$7.95; extra set of roller covers, \$2.95. A small two-roller tool costs \$2.95; additional covers are \$1.29.

Manufacturer: E Z Paintr Corp., 4051 S. Iowa, Milwaukee, Wis.

continued on p. 182

HEADACHES?

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Products

cont'd

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30-TON CONDITIONERS use no water for cooling

Well satisfied with the performance and consumer acceptance of waterless air conditioning, Chrysler engineers have passed the operating advantages of small aircooled units on to systems of 10- to 30-ton capacity. Instead of cooling towers, these new commercial conditioner packages use two or more remote air-cooled condensers. Operating on outside air temperature of 0° to 120°, the condensers are designed to use a very small refrigerant charge. Price of the conditioner-condenser is expected to be about the same or less than comparable systems with water tower-within a range of \$350 to \$450 per ton of cooling. Installation costs should be somewhat lower because no water piping is necessary. The new condensers also can be used to convert existing conditioners to air cooling.

Manufacturer: Airtemp Div., Chrysler Corp., 1600 Webster St., Dayton 1, Ohio

ORNAMENTAL GLASS imported in two geometric patterns

Reminiscent of old European windows, these two rolled glass patterns with their large circles and diamonds have a neat softness appropriate for many modern restaurants, shops, and churches. Imported from Germany in amber and pale green tints as well as clear, the textured glass lights install for about 85ϕ to \$1.20 a sq. ft., depending on the type of calk or bead





used. The circular motif measures 2''in diameter; the diamond is 3'' high. Both the *Roundel* and *Lozenge* patterns are rolled into one face only, leaving one side flat for easy cutting. Maximum sheet size is 4' x 8'-6". Distributor: Mondial United Corp., 625 Madison Ave., New York 22, N.Y.



CONCEALED LATCH dresses off toilet compartment

Hardware conscious and conscientious, Sanymetal has replaced the loud slide bolt familiar on most toilet compartments with a simple quiet latch. Joining the manufacturer's other recent design improvements (flush pilasters, ceiling mountings, U wall brackets) the 8800 latch is mounted flush with the door with all mechanism concealed except for the diamond shaped handle. The new hardware is said to be fitted in a fraction of the time required for slide-type latches and to be tamperproof. Its bolt is stainless steel and exposed parts are chromium plated. The latch requires no lubrication.

Manufacturer: Sanymetal Products Co., Inc., 1687 Urbana Rd., Cleveland 12, Ohio

BUTTERFLY JOINT seals block and concrete walls

Extruded of durable synthetic rubber, X-shaped Titewall sealer affords excellent protection against water leaks at joints in concrete and masonry block construction. To apply the resilient strip between block, the wings on one side are pinched together and inserted in the groove to expand snugly against the sides. Servicised, Titewall's manufacturer, also produces a molded joint filler Kork-Pak and a cold sealing compound pigmented a neutral gray, both suitable for use with the new butterfly control joint. Titewall is available in 8", 2', 4', and 10' lengths at prices ranging from 65¢ to 75¢ a lin. ft.

Manufacturer: Servicised Products Corp., 6051 W. 65 St., Chicago, Ill.



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New Catalog for Architects and Engineers

Here's an advanced, easy-to-use technical digest on the design, application and specification of interior fire alarm systems. It features a new building-block concept based on Gamewell experience in signaling and communications. F249 includes suggested systems and layouts, gives you a complete one-source reference for planning the best possible protection against the hazards of fire.



THE GAMEWELL COMPANY Newton Upper Falls 64, Mass.

The Modern Alarm Circuits Approach (one or more) to Fire Non-Code Boxes 0 and Automatic Protection Fire Detectors FLEXALARM Ø (one or more loops) Automatic Fire Alarm Trouble Bell Systems . . . Hexalista. Power Source



Here's a "wall" that rolls up electrically for big-truck access to a fully sheltered loading platform . . . closes tight-electrically-in seconds.

It's a popular, efficiency-boosting design for buildings with heavy traffic. A design that calls for the rugged construction, smooth performance and appealing lines of Ro-Way overhead type doors.

Ro-way commercial doors are built to last with seasoned lumber and Masonite[®] Dorlux[®] panels. Mortise and tenon joints both glued and steel doweled for extra strength. Seal-A-Matic hinges, Taper-Tite track and ball bearing rollers to assure smooth, trouble-free operation and snug fit. Big, properly tensioned Power-Metered springs for easy action. Electric operators for fast, efficient service. Heavy gauge hardware both Parkerized and painted to prevent rust and the corrosion of salt air and industrial fumes.

Check into the Ro-Way line . . . you'll like their wonderful features. Models for commercial, industrial and residential buildings . . . standard and special sizes to meet any design problem.



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A lesson in beauty and efficiency with economy



Shawano High School, Shawano, Wisconsin

Architect: Edgar A. Stubenrauch & Associates Sheboygan, Wisconsin

General Contractor: Palisades Construction Co. Appleton, Wisconsin

Materials:

Reynoside* 8" Rib (.051 thickness) with 11/2" glass fiber insulation and back-up sheet of .032" flat-embossed Reynolds Aluminum. How to achieve efficiency and beauty economically is a lesson well taught by this magnificent high school...a lesson that applies to all modern industrial building. Economy starts with the rapid, low-cost erection of the wall. Not merely beautiful, its two highly heat-reflective aluminum surfaces combine with glass fiber insulation between to assure significant winter fuel savings as well as cooler classrooms in hot weather. Aluminum slashes maintenance costs, too. Rustproof and highly corrosion-resistant, it withstands weather and time without painting...ever. Thus low applied cost is paired with low upkeep for all-around economy!

A complete installation service is available. For name of your nearest Jobber-Erector, call the Reynolds Office listed under "Building Materials" in classified phone books of principal cities. For literature, write Reynolds Metals Company, Building Products Division, Louisville 1, Kentucky.

See "Circus Boy", Sundays, NBC-TV. Watch for Reynolds on "Disneyland", ABC-TV Nutwork.

*Reynoside standard types are 4" rib, .032" thick; 8" rib, .032" and .040" thick. Embossed finish. Lengths from 5' to 22'5" in 6" increments. Nominal width coverage is 40".

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From JOSAM, leader and pioneer of plumbing drainage products, comes a great new development — Josam UNITRON Chair Carriers and Closet Fittings.

The Josam UNITRON Closet Carrier is so designed that

ONE CARRIER fits all wall-hung water closet bowls and women's urinals. This eliminates using a different carrier for every blow-out or syphon jet closet bowl or women's urinal, or a different carrier for each manufacturer of such fixtures.

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Books

... sun control ... functionalism ... Corbu



Alvar Aalto, Sanatorium for tubercular patients, Paimio, Finland.

SOLAR CONTROL AND SHADING DE-VICES. By Olgyay & Olgyay. Published by Princeton University Press, Princeton, N.J. 201 pp. Illus. 9" x 11". \$12.50

The twin brothers Olgyay have, appropriately enough, a double-barreled interest in sun control. One interest is the problem itself, technologically and in terms of design it fascinates them; the other is the general question of climactic influence on regional architecture. And when they say "regional," they mean throughout the world.

As well as applauding this work, we can look forward happily to the publication of the monster regional study which has been occupying the Olgyays for some years. The volume at hand indicates that their ability to think technically while writing intelligibly is outstanding and their skill at finding illustrations to back up their points is artful indeed.

Particularly commendable is the section of the book which compares the economics of air conditioning with the economics of sun-shading. Their conclusion: that shade devices can make substantial savings in air-conditioned spaces *if* the sun shades are designed correctly. And, of course, correct design of the shades is intimately related to the entire concept of the building—which way it faces, which masses predominate, etc.

Whether one's interests are primarily economic, technological, or esthetic, this is the place to start reading about the sunny side of building.

ORIGINS OF FUNCTIONALIST THEORY.

By Edward Robert De Zurko. Published by Columbia University Press, 2960 Broadway, New York 27, N.Y. 265 pp. $63_4'' \ge 91_2'''$. \$5

Architectural freshmen and a confused public have long shared the desire for a well-told history of functionalism. They're not quite satisfied with the belief that someone (was it Frank Lloyd Wright?) one day decreed: "Form follows function!" and suddenly, unexpectedly, a totally new kind of architecture was off to the races. Reports of anyone who thought "functionally" or "organically" before the Civil War tend to be completely obscure.

Author De Zurko, associate professor of architecture at the Rice Institute, has sought to clear up this obscurity by subjecting a roster of historical figures (from Socrates to Horatio Greenough) to a kind of litmus paper test. Functionalist or no?

His method might work if it were not for his overabundant quality of mercy. The author admits that he has not the heart to proceed with his investigation, saying: "It is not my intention to add to the hostility between advocates of functionalism and those persons who may be described as anti-functionalists." The book therefore turns into a kind of pleasant journey through the artistic nether-world in which the shades of almost every artist worth meeting come forward to repeat their most functional utterances.

Entertaining, but not as edifying as it might be.

LE CORBUSIER: OEUVRE COMPLETE,

1952-1957. Published by W. Boesiger, available through Wittenborn & Co., 1018 Madison Ave., New York 21, N.Y. 223 pp. Illus. 9" x 11". \$13.50

This sixth volume in "The Complete Works" includes, among other recent accomplishments, the Ronchamp chapel and much of the building at Chandigarh. It is therefore enormously valuable, even to laggards who did not begin to collect these well-illustrated volumes some years ago.

It also contains a fair share of Corbu's present, ill-humored tone. Witness his introduction: "Thus is the harvest in the autumn of one's life—to be abused more than necessary, particularly by the Gentlemen of Art, and even by ever fresh youth, here and there, who find such a course already too complicated."

Despite the occasional appearance of manias and phantoms, it is a privilege to observe the master in his workshop.

continued on p. 192

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TECHNICAL PUBLICATIONS

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

THE WELDWOOD CATALOG. Published by US Plywood Corp., 55 W. 44th St., New York 36, N.Y. 47 pp. Illus.

This colorful catalog, not too well or-

ganized, exhibits US Plywood's complete line of wallboard products, with many illustrations of applications. Well worth looking into.

ELECTRONIC CONTROL CENTERS. Published by Barber-Colman Co., 1101 Rock St., Rockford, III, 8 pp. Illus,

A technical bulletin (F 8031) on a new centralized automatic control system for heating and air conditioning, with details of functions, uses, and advantages of cen-



Architect . JOHN HARGRAVE

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HEATING VENTILATING AIR CONDITIONING GUIDE: 1957. Published by the American Society of Heating and Air-Conditioning Engineers, Inc., 62 Worth St., New York 13, N.Y. 520 pp. Illus. \$12

The 35th edition of this Bible of the climatic environment control industry and profession contains a larger Technical Data Section than ever before and many revised chapters and rewritten passages to keep abreast of a fast-moving field. Among the new features: a complete revision and enlargement of U-value tables for building construction, a rewritten chapter on sound control, a new chapter on the industrial environment, a new step-by-step procedure for designing panel heating systems.

ALUMINUM IN SCHOOL CONSTRUCTION. Published by Kaiser Aluminum & Chemical Sales, Inc., 919 N. Michigan Ave., Chicago 11, III. 64 pp. Illus.

A generously illustrated review, based on a national survey of school architects and building supply manufacturers, of recent architectural advances in the use of aluminum in school construction. Free only to school officials, architects, manufacturers.

POWDER ACTUATED TOOLS. Uniform State Code Relating to. Published by Powder Actuated Tool Manufacturers' Institute, 250 E. 43rd St., New York 17, N.Y. 8 pp.

An industry-suggested code for insuring greater safety in the increasing use of explosive operating tools for setting studs, pins and fasteners.

MASONITE PRODUCTS. Published by Masonite Corp., 111 W. Washington St., Chicago 2, III. 19 pp. Illus.

Complete, compactly organized catalog of this company's line of Presdwood panels, with many diagrams and specifications for proper use.

KAWNEER METAL WALL for curtain-wall construction. Published by the Kawneer Co., Niles, Mich. 14 pp. Illus.

A tasteful brochure, with many architectural detail drawings, showing ten recent curtain-wall projects engineered and fabricated by this company in association with architects on the job.

RCA SOUND IN INDUSTRY. Published by the Radio Corp. of America, Camden, N.J. 12 pp. Illus.

This booklet details central sound reinforcing, public address and music distribution systems in industrial plants, with illustrations of typical equipment locations and installations.

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Algonquin School, Des Plaines, Illinois. Childs and Smith, Chicago, Ill. - architects

Wellesley Senior High School Addition, Wellesley, Mass. Perry Shaw Hepburn & Dean, Boston, Mass. - architects

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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

This module helps more people afford architectural services

Imagine the basic building itself available as an economic module. Imagine that module furnished in such a comprehensive range of widths, bay lengths, side-wall heights, code specifications even roof pitch ratios — that you can incorporate the module in almost any single-story plan. That would relieve you of a vast amount of routine engineering on basic structures.

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Pittsburgh offices of Davey Tree Experts Company illustrates unusual "flying buttress" application of Butler rigid frames.



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What other people are saying

Tax oppression

No friend of the Administration's current tight money policy, New York State Comptroller Arthur Levitt pointed out some of the policy's effects for a June issue of the Commercial and Financial Chronicle

It is clear the scarcity and high cost of credit is creating an undue hardship.

Many municipalities, particularly school districts, have encountered great difficulty in obtaining temporary financing. Others have rejected bids on bond issues because the cost was excessive. Some even have deferred their construction plans. The Investment Bankers Assn., in its Oct. '56 statistical bulletin, reported that a minimum of \$350 million of municipal issues were postponed or withdrawn from the market in the third quarter of 1956 because of credit conditions.

I believe that a considerable body of evidence exists to suggest that the Federal Reserve's policy of general credit restraint is imposing its most severe burden on state and local units of government.

Certainly it will cause undue pressure on the already high burden of local taxes. In New York, we are now experiencing a quiet but effective taxpayer revolt against the continued rise in local taxes. Since the first of this year more than 35% of the school bond issues submitted to the voters have been rejected. Last year less than 10% were voted down. School budgets are also being rejected with recommendations for curtailment of expenditures.

In the last ten years local tax levies in New York State, including realty taxes, nonproperty taxes and assessments, have increased 125%. Local taxes for the support of schools alone have risen 152%. Yet, we must continue to build schools. We cannot afford to wait for a more favorable investment climate—not when we expect school enrollment in the state

Silent victory

I think it would be unfortunate if people conducting urban renewal programs got down in the mouth about not having converted their old mossback mayor into a fighting urban renewalite. Maybe you're making good progress when you have finally gotten him to keep quiet.—George Duggar, bureau of public administration, University of California, before the San Francisco Conference of the American Society of Planning Officials. to increase by over 200,000 in the next two years.

In view of this situation, I question whether our reliance on monetary policy to curb inflation is not raising serious obstacles to the maintenance of economic growth by ignoring the serious nature of individual situations.

Design for greatness

Conservative Washingtonians came away as shocked as ever by William Zeckendorf's new-old proposal, delivered at the annual meeting of the Washington Housing Assn. This was the perennial shocker:

I am suggesting a new look for Washington. We should find out if there isn't some means by which we can have more open space and less lot coverage without losing intensity of use. And we shouldn't worry too much about the fact that perhaps the height limitation which was fine when it was conceived is no longer a 1957 solution for the nation's capital. This city has become the capital of the greatest nation in the world.

Architecture and freedom

The architect as a sort of personal and civic psychiatrist was pictured by August Heckscher, director of the 20th Century Fund, at the AIA centennial dinner in New York last April

The architect in an era of change such as our own enters from the beginning into a unique relationship with his client. "You want a house, my friend? Very well then; tell me what you believe. I shall design you a house if you can state the first and last things of your life." Few men or women know what they believe, but the process of trying to sort out the relevant from the irrelevant can be a highly educative one, and can contribute mightily to a happy architectural result. When we go beyond the individual, into those areas where the architect touches the common life of the community, we see essentially the same questions being posed. What does the city hold dear? Such contrasting values as privacy and neighborliness, serenity and tension, spaciousness and bounded distances, are among those which the architect must bring into harmony and to which he must give a scope that accords with the community's deep sense of right.

The architect cannot dictate to his client; he certainly would be unwise to try continued on p. 198



Excerpts

to dictate to the community. This process of evoking buried strains of belief and value, of constantly reshaping the outward design so as to avoid doing violence to the inner life, is the essence of democracy. It is my own belief, indeed, that an age of great building can be an age of true freedom—that the next stage of liberalism in America will be the liberalism born of common efforts to manifest in architectural forms the quality of life which the people treasures for its own. The architect will have to be infinitely patient, he will have to listen for those signs and voices that are not yet in the fashion, and he will have to maintain while he works his own clear sense of taste and style. We shall have beauty, but not beauty in the abstract; beauty, rather, that springs from the strivings of a selfconfident and diverse people, from their life together, their dreams and their hopes.

A hotel laundry planning service for architects

Consulting American at the *beginning* of a hotel project will relieve your organization of much costly, time-consuming detail work. The American Laundry Machinery Co. offers a comprehensive planning service to help architects easily determine the size, layout and cost of hotel laundry facilities. Our survey engineers, furnished only minimum information, will provide the answers you need to integrate the laundry with the remaining elements of your hotel design.

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The American Laundry Machinery Company, Cincinnati 12, Ohio



Economics of prefabrication

The European Productivity Agency took a look at the world-wide building picture last spring. A particularly significant report was turned in by two Danish builders, R. A. Larsen and Vagn Ussine

Does prefabrication pay?

Here is the crucial question and there are many ways of answering it. One pointer is that prefabrication is expanding everywhere and new industrial plants are springing up all over the world. It seems here to stay and will expand as quickly as capital becomes available.

There is, too, the interesting trend in the building costs of Danish flats. During 1955 to '56, in spite of rising labor and material costs, prices fell 5%, due to extensive re-thinking and the gradual industrialization of part, at least, of the production process.

More than 50% of the industrial construction jobs in Denmark today contain a certain amount of prefabrication in the design.

These points, however, only indicate a trend—let us look at housing. Costs of traditionally built houses in Denmark are divided as follows:

Materials	57%
Labor	
General expenditure,	
risk and profit	14%

Where building is based on prefabrication, the costs are divided as follows:

Materials	
Labor	20%
General expenditure,	
risk and profit	30%

Thus a reduction in labor demand is the first result of an industrialized approach. This does not necessarily lead to higher productivity; the investment needed to obtain the saving may be so heavy and the demand for investments so great that there is a reduction in over-all productivity. The facts, however, point to a necessary investment of 21/2 times the yearly wage of the workers; and with a turnover of five times the wages paid, the capital must be turned over twice a year. Hence the labor needed to offset depreciation of plant, machines, etc., comes to 10% of the yearly wages, or the total labor consumption becomes 22%, instead of 29%, on present traditional methods. The saving of 7%, or the increase in production of 7% with the same labor force, is highly significant at this early stage in development, when mechanization is still slight and industrial organization only in its infancy.



CANADA HOUSE 680 Fifth Avenue, New York City

Designs by Eggers and Higgins, Architects, and Severud-Elstad-Krueger, Engineers General Contractor: Walsh Construction Company Steelwork Fabricated and Erected by American Bridge



knee braces help carry wind loads on 27-story skyscraper!

S TEEL KNEE BRACES along exterior walls and in elevator walls carry a substantial share of the wind loads on the 27-story Canada House, a new office building in New York City.

Limited by architectural and mechanical considerations to shallow 14-in. steel floor beams which were incapable of carrying the load through ordinary wind connections, designers turned to knee braces to stiffen the walls. The braces were angled steeply at the lower junctions of spandrel beams and columns to prevent interference with windows.

The building has setbacks at two levels. Shear from the upper portions of the building is transferred to the outer columns of the lower portion by horizontal bracing in the floors at these levels.

American Bridge fabricated and erected 2,300 tons of structural steel for the framework of this modern building which measures $100' \times 120'$. Field connections were made with high-strength and ordinary bolts.

Canada House is the most recent of many outstanding steel frame buildings erected in the heart of New York City by American Bridge. If your plans call for new construction in congested areas, let us put our specialized experience to work for you.

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11:27:30 DOORS OPEN QUICKLY AT FLOOR LEVEL



11:27:45 DOORS DON'T MOVE UNTIL ALL ARE IN CAR



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AT TRUETT MEMORIAL UNIT OF BAYLOR UNIVERSITY HOS-PITAL, DALLAS, TEXAS, where above photos were taken, come and see operatorless Westinghouse Elevators equipped with Traffic Sentinel Doors.

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Hospital personnel, patients and visitors ride with complete confidence and safety in Westinghouse Operatorless Elevators in Truett Memorial Unit of Baylor University Hospital. That's because these elevators are equipped with Westinghouse Traffic Sentinel Doors. Once the doors open, Traffic Sentinel keeps them wide open until all are inside the car. No threats of premature closing. No frightening YOU CAN BE SURE ... IF IT'S "snapping action" as if doors were about to close. Yet an instant after the last passenger is safe inside the car, these magic Westinghouse doors close

quietly, surely and safely. These elevators save time, lower the over-all cost of vertical transportation, provide the ultimate in passenger convenience and service. Ask your nearest Westinghouse Elevator Representative for details.



HANLEY

BRICI

A dynamic new silhouette on Toronto's skyline is the Anglo-Canada Fire and Insurance Company office—a building whose drama stems from the interplay of colors and textures.

The solid shaft of green Hanley Duramic Brick No. 718 balances and complements the glass-and-steel column and contrasts with the plane of black Hanley Duramic Brick No. 702, laid in a fretwork design. Another blending component of this spectacular building is the neutral expanse of that long-time favorite, Hanley buff face brick.

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Trenching: Smith-Nesbitt Co., Pueblo, Colo. Pipe Installation: Moore Pipeline Construction Co., Lubbock, Tex.

COLORADO SPRINGS, COLO. The sanitary sewer installation at the new "West Point of the Air" calls for nearly 10 miles of pipe—and Vitrified Clay is in the specifications for the entire system.

When building for the future, quality and permanence are the top considerations. That's why large important projects call for Clay Pipe. When Vitrified Clay goes in, it is a well accepted fact the pipe will last. It is the only pipe that's absolutely safe against all forms of chemical deterioration. It does not rust; sewer gases do not corrode it; acids and alkalies do not soften it. And for final proof of quality, Clay Pipe is sold with a written guarantee—a vote of confidence matched by no other pipe manufacturers. The next time you plan and install new sewerage lines, specify Vitrified Clay. It never wears out.

THE PUBLIC

Citrified GLAY DIPE Area-lighting system of many moods welcomes office visitors at the New England Mutual Life Insurance Company

New



by Sylvania





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(2)



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It's no wonder that this modern ceramic unit is specified in building after building with the assurance that the first cost is the last cost.

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CONNECTICUT GENERAL

continued from p. 120

spaces, big wing for the expanding ones. SOM turned out six alternate preliminary schemes and presented them all at once, along with their bar chart. The scheme they recommended was remarkably like the finished building, something that speaks well for the basic analysis because never was a "preliminary" more thoroughly dissected. One of the alternates—a vertical scheme was carried along for months, mostly as a control for evaluating the horizontal scheme.

Up in the august reaches of the company, beyond the executive building committee, there was, of course, a board of directors. Its powers of decision were ultimate, but they were never appealed to until everything had been analyzed and ironed out in the executive committee, just as the executive committee was never asked for decisions until subcommittee and building team had a meeting of minds. Aside from questions of budget, four presentations were made to the board of directors: one each on the basic program, on the basic design, on materials and on furnishings. The directors liked what they saw.

A few months after the directors' approval in June 1954 of the basic scheme, a two-story, 60' x 72' mockup of a section of the building went into construction alongside the foundation excavations of the big building, and SOM brought in Knoll Associates as interior consultants. Henceforth the building conferences moved into the mock-up, quite a change from the old conference room. The meetings got more mobile too, because everybody was scrutinizing things, like the sample of flooring being scrutinized in this pic-

VICTOR JORGENSEN



ture. Particularly, they scrutinized the ceiling, whose reflectorless fluorescent tubes in an open grid kept making people uneasy, but not uneasy enough to want to junk its advantages. This problem was finally solved by reducing the brightness from 80 foot-candles to 55. Wonderful. Everybody saw just as well, but there was no longer any glare. Shows how useful a mock-up is. All the exterior and interior materials were tried out on the mock-up too, along with partitions and other de-Experiments with rooms tails. showed that some could be scaled down, a fact which helped pay the cost of the mock-up. Mediocre furnishings looked so crass in the nice mock-up that much argument was dispensed with. The mock-up stayed useful all through construction. Turner used it constantly to show subcontractors what was wanted, in the flesh, so to speak.

Eventually, with those great flexible floors abuilding, equipped with utterly flexible partitioning systems, there arose a new planning problem : where to draw the fine line between flexibility and anarchy. Can you put enclosed offices anywhere in a flexible floor? Can you put screen dividers anywhere? Do you just spread current personnel loosely through space intended for ten-year expansion? No, not unless you want vast, flexible confusion. To get this point across, among others, Florence Knoll



made a model of a portion of the floor and Connecticut General found this such a help that it ordered for itself $\frac{1}{4}$ "-scale models of the two main working floors and thousands

of little wood desks and other miniature accoutrements. This is where the layout planning was done, and somebody in the picture is now thinking about shifting a planting box. In the future, too, all rearrangements of departments will be worked out in advance on these durable models.

SOM and Knoll followed the tried and true recipe for togetherness at Connecticut General; they came to a meeting of minds before *their* ideas went further. And if, in the next picture, Florence Knoll gives the impression that she has the matter of executive office furnishings well in hand, that is accurate. It is also quite an achievement because nearly all the executives, including Wilde, dearly love Georgian and Colonial furniture.



From beginning to end of this $41/_2$ -year process, one gradual, inexorable change affected the meetings. Everybody got educated. Everybody got insights and opinions on fields of knowledge that had once been *terra incognita*. So at the end, any old question—say, what kind of ropes for the window blinds—got very talky treatment.

But neither this nor anything else interfered with a time schedule which had been set back in 1947 when Wilde had a study made of the company's long-term space requirements. That study showed the company could eke out in its old offices in downtown Hartford, by dint of renting supplementary nearby space, for a maximum of ten years. Ten years later, on the button, it had its new quarters, with space for ten more years of healthy growth built in, and an expansion plan to take care of another half-century. "Most clients are very impatient," remarks SOM's Bunshaft. "But these Connecticut General people love planning. They go at it with the actuarial approach."



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This manual on Flexicore Electrified Floors is for architects, engineers and contractors.

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It shows the electrical contractor the step-bystep installation of Conduflor electrical fittings with photos. These fittings are obtained by the electrical contractor from the Conduflor Corp., 3338-G Warren Road, Cleveland 11, Ohio.

For a copy of this manual, write or phone your nearest Flexicore manufacturer or The Flexicore Co., Inc., Dayton 1, Ohio.



Wiring drops from header duct into cell at handhole junction.

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Wiring then runs either way through cell to floor outlet.



To install outlet: drill hole at outlet location.



Next, install fitting in floor and fish wire.



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PERKINS & WILL continued from p. 131

do you need to treble your present volume?—and some help, mainly over the lunch table, in answering them. Out of this came its first clear realization of what it was, what it could be and what would have to be done, structurally, to get it there.

Most of what was done was the doing of John Goodall. As manager of the Merchandise Mart. Goodall had been P&W's landlord before they moved on to bigger space. When, after their self-analysis, the partners became painfully aware that one of the firm's glaring deficiencies was administration and cost control (the other, field supervision, was solved by bringing in John Starrett), they offered Goodall a partnership. The idea then was that he would function both as a sort of executive officer-overseeing the economic side of the operation and making some order out of itand through his contacts, do some selling for Perkins & Will in the commercial field.

Internal revolution

Though, as it turned out, Goodall cornered few clients, he did work a financial revolution in the firm. Proceeding on the assumption that "the business can make more net profit than has been its experience," and that the staff needed to understand "the relation of architectural skills to the operation of a business venture," he managed over a period of two years to 1) set up the firm's first real cost accounting system; 2) fix a minimum draw against profits of \$7,500 a year for the partners; 3) establish a time budget for all jobs based on a subtraction of profit and overhead from the gross fee to arrive at, in dollars, and then in hours, the amount of time that could be spent on drawings; 4) write a manual of office organization; 5) put into effect a new cost-estimating system for bidding on jobs; and 6) build up the first substantial cash cushion the firm had ever had (between 1946 and 1948, cash increased from \$5,210 to \$40,595).

Of course, not all of it worked, and almost none of it did at once. Goodall felt that the first year of

the new regime was "a failure in relating architectural efforts to the over-all goal of operating a successful enterprise," and he cited, particularly, overdesign, indecision and waste. Several years later. Will, too, was complaining about "too much overlapping of responsibility, too much time spent on preliminary work." But these were small points; the overriding fact was that the practice was booming, and whatever fears there had been about expansion had all but vanished. Between 1946 and 1952, gross fees shot up from \$125,285 to just over \$1 million. By the end of 1952, the firm could point to a total of 85 completed school projects. With Barrington, Ill., High School, finished in 1949, it had successfuly moved into the bigger, more lucrative secondary classroom field; it had branched out to an eastern office which, though off to a faltering start, showed promise: and it had achieved not just volume, but a creditable amount of design distinction. Blythe Park School, Riverside, Ill., was a notable success, combining a West Coast use of light with an East Coast feeling of warmth and intimacy; the Clyde L. Lvon School in Glenview, Ill., was a truly superior effort; so were Heathcote in Scarsdale, N.Y., a fresh and imaginative departure, and Keokuk Senior High School in Keokuk, Iowa, which rejuvenated the old four-story school plan and combined it with a highly imaginative use of site.

Yet at exactly this point, Perkins & Will decided to back off, to shift from expansion to consolidation. Why did it do it?

There is undoubtedly a pendulum that swings through man's attitudes, and it is just possible that the change reflected no more than a natural urge to move in the opposite direction after moving so consistently in the other. Or it may have been the result of a genuine fear about further growth or that design was slipping. Whatever the precise cause, its manifestation was a heightened concern for quality at the expense of quantity, a definite softening of the hard effort to get jobs, and an almost nostalgic yearning for the virtues of a small office as opposed to the riches of a big one. Perkins himself set the key when he confessed to the partners that, "more and bigger, of themselves, do not . . . represent my current ambitions," and that he doubted seriously whether building the firm to a gross of \$3 million would be "much more fun, if as much, as it was to get it up to \$1 million."

To Perkins, "the next frontier" was quality-the winning and holding of good young designers ("Phil and I are more apt to recognize great design than we are ever apt to be able to do it ourselves"), the recapturing of the firm's position as "idea boys," and a better physical system for design and production. Volume could wait, or at least he felt it could, and it was not until 1955 when Will proposed a rethinking-"do we go ahead, or stagnate" -that the consolidation temper began to wane, and the pendulum started to swing back in its old direction.

Early returns

Up till now, the results of the new expansion policy have been mainly preliminary. Even so, it has already produced a marked upswing in the volume of commercial building projects on the firm's books. The first big office building, for the Lutheran Brotherhood in Minneapolis, has led to commissions for International Minerals & Chemical Corp. and Pure Oil Co; the firm has done a substantial part of the Mayfair Shopping Center in Milwaukee, and all told has put into production or finished about \$35 million worth of commercial and office work during 1956-1957. Meanwhile, the weighing of the West Coast expansion has reached the stage of choosing methods-merger, purchase of an existing firm, or a new branch.

And there is some air of assurance. Perkins today, though he is not without reservations, seems to have dispelled many of his qualms about quality. "Even our ordinary stuff," he says, "where we have been repeating parts of ourselves, has been better than most." And as for bigness? "Well," he says, "we will be just as big as we have to be to get the interesting jobs we want." STAINLESS STEEL MAKES THE DIFFERENCE ...its effect on modern living

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Milner Office Building and Annex, Jackson, Mississippi. E. L. Malvaney, architect; W. H. Lambeth, consulting engineer; Davis Plumbing Company, mechanical contractor, main building; Central Plumbing and Heating Company, mechanical contractor, annex; all of Jackson, Mississippi.



In the Milner Office Building and Annex, Jackson, Mississippi, a system of Johnson Pneumatic Temperature Control assures efficient year 'round operation of the building's air conditioning systems and provides maximum comfort for all occupants.

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NEW YORK LIFE INSURANCE COMPANY. Records, storage and service building, New Providence, N.J. Architects: Frank Grad & Sons, Newark, N.J.



DOW CORNING CORPORATION. Manufacturing facilities for Silicone Specialties Division, Greensboro, N. C. Architect: Charles C. Hartman of Greensboro, N. C.





Pleasing window proportions create rhythmic design here

Here, the architect selected PELLA CASEMENTS with 24" x 36" glass size and combined them into proportions that contribute to the over-all design pattern. The vertical shapes of the individual window units...the horizontals of the window groups... both are pleasing rectangles repeated within the rectangle of the elevation itself.



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EXECUTIVE — an all-steel louvered unit; shallow with illuminated, tapered sides. Provides 30° x 45° shielding.









View of the Booth Hill School shows basic Module No. 1 to which Module No. 3 is being added (photo at right). School construction costs average \$12.01 per square foot as compared with \$17.00 to \$18.00 for schools in this area of conventional design and materials. Architect: Jesse James Hamblin, Bridgeport, Conn. Contractor: (Module No. 1) The Frouge Construction Co., Bridgeport, Conn.

How modular planning

helps Trumbull, Conn., schools

HOLD DOWN CONSTRUCTION COSTS

As in so many communities today, the Trumbull, Connecticut, school system is literally bursting its britches.

Fortunately, however, the farsighted school board selected a modular concept of design easily adaptable to various sites. This permits economical construction and expansion of school buildings, despite constantly increasing building costs.

The building system includes a basic school unit, Module No. 1, consisting of six classrooms, administrative offices and a large multipurpose room (with kitchen) which can be used as a cafeteria, recreation and assembly area. To this basic unit can be added other modules of six classrooms each as the need arises, at a minimum of expense.

The secret of the system is in the use of standard building material components. For instance, the roof and ceiling construction of each module classroom unit is built of modular Fenestra* Acoustical-Structural Building Panels.

These lightweight, high-strength steel panels combine structural roof and finished interior ceiling with built-in acoustical treatment in one compact easy-tohandle package. They replace five different materials —usually requiring extra labor and cost—with one metal building unit, erected in one operation, by one trade. In addition, the Trumbull, Connecticut, schools are designed to utilize the panel cells as ducts for ventilation, with exhaust fans mounted on the roof. Another Fenestra plus!

The flat bottom surface of the panels is perforated for the acoustical ceiling. An exclusive Fenestra preformed, arched, sound-absorbing batt † is enclosed *inside the panels* to provide noise reduction coefficients up to 80%. And because the ceiling plate is a part of the structural panel, it is made of 16-gauge steel—4 times thicker than usual metal-pan ceilings. This assures extra resistance to damage by objects thrown against the ceiling or other impacts—an especially important feature for gymnasiums, corridors, etc.

The compact construction, $7\frac{1}{2}$ inches in depth, provides a reduced height in the building—thereby eliminating several brick courses throughout.

Cellular in design, Fenestra Building Panels combine light weight with great strength. Under normal roof loads they span up to 31 feet. Their width, 24 inches, fits perfectly with modular design techniques. This speeds up construction and eliminates cutting and fitting of panels and other materials on the job.

If you are now planning a new school building or addition, you should get complete details on Fenestra Acoustical-Structural Building Panels. Mail coupon at right for your FREE copy, or call your Fenestra representative. *Trademark †Patent Pending



Fenestra Acoustical Building Panels provide a platform for workmen, speed roofing operation, get classrooms under cover fast for quicker starting of interior work. Contractor: (Module No.3) The Monaco Construction Co., Bridgeport, Conn.



The Fenestra Acoustical "D" Panels, which span the classroom below, can be washed or painted whenever needed without affecting the acoustical qualities of the ceiling. Width -24"; Depths $-1\frac{1}{2}$ ", 3", $4\frac{1}{2}$ ", 6" and $7\frac{1}{2}$ ".



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Twist! Here the "beast" (a jack) forces one corner of the door off the table until the insides begin to snap. The Fenestra Door took 240 lbs. of twisting pressure with-out damage! One *competitive* door snapped at 90 lbs., another at 130.

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The side panels are of steel or plastic. The steel panels are permanently attached. The polystyrene plastic panels are readily removable without the use of tools. Eight foot units utilize both side panels and louvers that give an uninterrupted continuity of design. Louvers have a special snap-in catch and are suspended from the channel by safety chains for ease of relamping and maintenance. All metal parts are finished in high reflectance baked white enamel over a phosphatized surface.

The New DAYSTAR is completely described and illustrated in color bulletin No. 1503.



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provides maximum comfort

for schools

The Anemostat All-Air High Velocity system of draftless air distribution offers many important advantages for heating and ventilating schools. • High velocity units, used with smaller than conventional ducts, save space and money. They substantially reduce sheet metal required, can be installed faster, at less cost. Since there are no coils in All-Air HV units, clogging and odors are eliminated. • Anemostat All-Air HV operate entirely with air processed in the main equipment room; there is, therefore, no need to break through the walls of the building for prime air make-up. The Anemostat All-Air HV units eliminate fans, filters, and electric motors in the school rooms. Units are quiet, need a minimum of maintenance from custodians. • On these pages are typical installations in which the Anemostat All-Air High Velocity system has been used successfully. Application data on your specific school heating, ventilating or air conditioning problem is available from Anemostat representatives or from the home office.

Architectsattention please:

Anemostat round, square and straight line diffusers with high velocity units are adaptable to a wide variety of architectural designs.




In this schoolroom Anemostat Type E Square Air Diffusers are installed in the ceiling.



Here Anemostat SLW Straightline Air Diffusers on the high sidewall provide draftless comfort.







Anemostat UTW Straightline Air Diffusers: are placed under the windows in this school laboratory.





Write on your business letterhead for your copy of

New Anemostat Selection Manual 60

to Anemostat Corporation of America, 10 East 39th Street, New York 16, N.Y.

ANEMOSTAT: The Pioneer of All-Air High Velocity Systems



This luminous ceiling solved many problems. The room was made to seem larger by the curved shape. Outlets for concealed air conditioning system were provided in the wide dividing strips, while return air plenums are located at the sides. Note evenness of lighting. Designed by Eleanor LeMaire for Manufacturers Trust Company, both of New York City. Manufactured by Luminous Ceilings, Inc., Chicago 47, Ill.



Striking solution for a modernization problem! Irregularity of walls and windows would have required an elaborate fitting job. By "floating" a luminous ceiling between the walls, standard units in a standard module could be used.

The ceiling is constructed with panels made of BAKELITE Brand Rigid Vinyl Sheet, their light weight being of great importance in the installation of this high ceiling. In themselves, the panels require little attention, being resistant to moisture, corrosion, cracking and warping.

Now ... find out more about illuminated ceilings with translucent panels of BAKELITE Rigid Vinyl Sheet. In new construction or remodeling, it throws new light on lighting problems. Write Dept. ZM-2. PLASTICS UNION CARBIDE

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High praise is due the contractor-Louisiana Bridge Company, a joint venture of Brown & Root, Inc. of Houston, and T. L. James & Company, Inc. of Ruston, Louisiana-and Palmer and Baker, Inc. of Mobile, consulting engineers.

The Lake Pontchartrain Causeway and its use of precast, prestressed concrete demonstrates a practical solution to all similar bridge construction problems where beauty, completion schedules, freedom from maintenance, economy, and the ready availability of materials are important.



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Abroad

Berlin's Interbau: cheerful, colorful, and chaotic

The biggest architectural freefor-all of the century opened in West Berlin on July 6th. Name: Interbau (for International Building Exposition). Scope: some 75 buildings, big and small, designed by more than 60 architects and landscape architects from a dozen countries, and constructed in Berlin's bomb-flattened Hansa section. Result: a charming, thoroughly uninhibited fun-fair of modern architecture, colorful but almost completely devoid of any major design innovations. City planning significance: zero.

Interbau's biggest asset is also its greatest shortcoming. In permitting the participating architects a democratic free hand (which makes *Interbau* a welcome change from Hitler's and Stalin's grim monuments), the organizers of the exhibition produced an almost totally unrelated hodgepodge of architectural self-expressions, sadly failed to cope with one of our time's most pressing problems —i.e., how to combine separate buildings into coherent groups.

Still, Interbau is plenty of good, clean fun—including chair lifts and similar high jinks for visitors (right), and excellent special pavilions constructed of demountable spaceframes (below) made with Germany's new MERO tinkertoy system.



PHOTOS: (BELOW) JOACHIM DIEDERICHS; (ABOVE) WIMMER





SWEDISH BUILDING (left and below) is most graceful Interbau structure completed to date, uses long access balconies on every floor to give each apartment its cross-ventilation and private front door. Blue and red color accents in balconies are cheerful, and detailing of stair-towers is elegant. Sole failing: balconies are too shallow, and circulation pattern along access balconies was complicated by Berlin's code. Nonetheless, this building is the favorite of the show.



PHOTOS: (ABOVE) FOTO-KESSLER; (OTHERS) FRITZ ESCHEN



GROPIUS & T.A.C. apartments (left) have balcony soffits painted in bright colors, flower boxes behind curved sheetmetal balustrades. Floor plan is flexible, includes apartments of different sizes. Four freestanding stair - and - elevator towers in rear of building serve two apartments on each floor. In layout, detail and over-all execution, this is *Interbau*'s most self-assured, mature building yet.

TALL APARTMENTS dominate Interbau area, include slightly curved structure by America's Walter Gropius (above, left; and right), abstractly painted buildings on stilts by France's Pierre Vago, gridlike slab by Sweden's Jaenecke and Samuelson (above, right). These buildings and about half the others planned for the Hansa section are now finished, contain some apartments specially furnished by top designers. The rest of the Interbau area is still under construction, thus giving visitors a behind-thescenes peek at Germany's latest building methods.

Vago's façades (above, center), with their arbitrary subdivision into fields of bright color, are one of the few deviations from the modern norm. As compositions they are not so successful as those of a good painter.







ALVAR AALTO'S apartment building (left) is oddly monumental, yet informal in its sawtooth plan. Carried by its walls (not columns) this structure contains six different apartment types, all of them delightful. Most of them would be impossible by conventional planning standards (some living rooms have as many as six doors leading into them), seem better suited to Finnish bathing than to US living—however relaxed.

BACHELOR APARTMENTS

(right) are contained in 17story tower by Berlin Architects Mueller-Rehm and Siegman. Typical of some of the heavier postwar German architecture, the building is one of *Interbau*'s tallest—topped only by the cross of the Protestant Church, whose congregation demanded the highest structure.

WALK-UP APARTMENT building by Prof. Guenther Gottwald of Berlin (right) is among most elegantly detailed structures in *Interbau*, uses vertical louvers and asbestos-panel railings to create façade in depth. Several similar walk-ups are now under construction nearby.



Abroad





FOTO-KESSLER

INTERBAU SITE PLAN (above) shows traces of original city planning discipline which was lost in execution. Part of *Interbau* exposition are Le Corbusier's apartment house, similar to his Nantes project, and Hugh Stubbins' Congress Hall. The "Corbu" stands on a spacious site three miles to the west, and Stubbin's building challenges the Soviet Sector one mile to the east.

THE CONGRESS HALL (right) is a gift from the German-American *Benjamin Franklin Foundation* to the City of Berlin. Beautifully sited on an elevated platform overlooking the River Spree, it is by far the most striking and imaginative *Interbau* structure. The Congress Hall will be opened formally on Sept. 19th.

*Berlin sobriquet: "pregnant oyster."





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