RCHITECTURAL REC R

BUILDING TYPES STUDY

MULTI-FAMILY HOUSING

237

UGUST 1956

A GIMBE S
in the Southgate Shopping Center...

unobtrusive, dependable

GRINNELL SPRINKLERS

Architects: Grassold-Johnson Associates
Welton Becket & Associates

Grinnell Ceiling-Type Spray Sprinklers

Grinnell Quartzoid Bulb Spray Sprinklers

Distinctive, modern design, inside and out, plus effective store planning make Gimbels Southgate an attractive addition to Milwaukee's first suburban shopping center. The spacious, uncluttered interior was designed for shopping ease and comfort . . . as well as to make the most effective use of merchandising areas.

The Grinnell Sprinkler System, specified by the architects at the planning stage, also has been made a functional part of interiors. Notice particularly how the Grinnell Ceiling-Type Sprinklers are almost invisible; extend but a scant inch and a quarter from the ceiling — not marring the interior decor. The end-result is an unobtrusive, smartly planned fire protection system that fits so well into the store design. Yet, should fire strike, Grinnell Sprinklers stand ready to operate quickly — effectively, day or night, to stop fire at its source.

Call in a Grinnell Fire Protection Engineer when you design your next project. He can advise you on the best system to suit your requirements. There is a Grinnell System for every type of fire hazard. Write for literature. Grinnell Company, Inc., 269 West Exchange Street, Providence, Rhode Island.

GRINNELL

PROTECTION AGAINST EVERY FIRE HAZARD

Manufacturing, Engineering, and Installation of Fire Protection Systems Since 1870

ARCHITECTURAL RECORD (Vol. 120, No. 2, August 1956) is published monthly, except May 1956 when semi-monthly, by F. W. Dodge Corporation, 10 Ferry Street, Concord, N. H. **Editorial and executive offices: 119 West 40th Street, New York 18, New York.**
(Regular Edition)
$5.50 per year in U. S., U. S. Possessions and Canada. *Second-class mail privileges authorized at Concord, N. H.*

ARCHITECTURAL RECORD

August 1956 Vol. 120 No. 2

 ARCHITECTURAL RECORD (combined with AMERICAN ARCHITECT and ARCHITECTURE) is published monthly, except May 1956 when semimonthly, by F. W. Dodge Corporation, 10 Ferry Street, Concord, New Hampshire. **Editorial and executive offices: 119 West 40th Street, New York 18, New York.** Western editorial office, 2877 Shasta Road, Berkeley 8, California.

TABLE OF CONTENTS

Cover: Architecture building at Illinois Institute of Technology; Mies van der Rohe, Architect; Hedrich-Blessing photo

Continued on next page

Continued from page 5

OFFICERS OF THE F. W. DODGE CORPORATION

James McV. Breed, *Chairman of the Board;* **Paul Abbott and Thomas S. Holden:** *Vice Chairmen of the Board;* **Howard Barringer**, *President;* **Irving W. Hadsell. Chauncey L. Williams:** *Executive Vice Presidents;* **Howard M. Thompson**, *Vice President and Treasurer;* **Julius T. Little, Robert F. Marshall, T. Oliver Morgan, O. O. Paulsell, H. Judd Payne, George Cline Smith:** *Vice Presidents;* **Carl S. Bennett, Clinton C. Bennett, Ralph M. Hairston, Roy J. Hard, Richard H. Ray, John M. Williams:** *Regional Vice Presidents;* **Edwin H. Freed**, *Assistant Vice President and Comptroller;* **Walter F. DeSaix, Clifford G. Dunnells, Jr., Clyde Shute, Marc Wayne:** *Assistant Vice Presidents;* **Sanford D. Stockton, Jr.**, *Secretary;* **William C. Breed, Jr., George W. Morgan, Jr.:** *Assistant Secretaries;* **Irving B. Satin**, *Assistant Treasurer.*

OTHER F. W. DODGE SERVICES

Dodge Reports — Dodge Statistical Research Services — Sweet's Catalog Services — Dodge Books — Dodge Mailing Service — Chicago Construction News — Daily Pacific Builder — Denver Daily Journal — Real Estate Record & Builders' Guide.

Members of Audit Bureau of Circulations and Associated Business Publications. Architectural Record is indexed in Art Index, Industrial Arts Index and Engineering Index.

Every effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.

Subscription prices: Published monthly except May 1956 when semi-monthly. U. S., U. S. Possessions and Canada: $5.50 per year; other Western Hemisphere countries, Philippines and Spain, to those who by title are architects and engineers, $6.50 per year. Single copy price except Mid-May 1956 issue $2.00; Mid-May 1956 issue $2.95. Beyond Western Hemisphere, excluding Philippines and Spain, to those who by title are architects and engineers, $6.50 per year for 12 monthly issues not including Mid-May 1956 issue. Subscriptions from all others outside U. S., U. S. Possessions and Canada for 12 monthly issues, not including Mid-May issue, $20 per year. Change of address: subscribers are requested to furnish both old and new addresses, sending if possible stencil impression from magazine wrapper; allow four weeks for change.

THE RECORD REPORTS

PERSPECTIVES

Some testimony from One Who Renders — Hugh Ferriss — as given before an (mightily amused) audience at the Architectural League of New York earlier this year

THIS ESSAY is based on the realization that this gathering includes three kinds of people: (1) Renderers; (2) young people who want to be Renderers; (3) older people who are pleased that they are not Renderers.

To begin with, we need a definition of the word "Render." This is taken care of by Webster's New International which heads its list with the following two items: "RENDER. 1-a. To melt down; to extract by melting; as, to render lard. 1-b. To treat so as to extract the fat; as, to render garbage."

Now, as to the history of the word. Its earliest appearance is in a MSS. 1900 years old in the line, "Render unto Caesar the things that are Caesar's." The meaning here is obscure; you have to work it out for yourself.

To come down to the term "Architectural Rendering" as commonly understood today. An Architectural Rendering is when an Architect has a job, or thinks he has a job, and he has handed his client some blueprints of sketch plans and elevations for which, in accordance with A.I.A rules on sketches, he hopes to be paid some day; but unfortunately his client can't read blueprints so the Architect decides to give him a pretty picture in perspective showing how the building is going to look, or how it ought to be going to look; and the Architect could readily draw this picture himself because all Architects can draw beautifully in perspective; but unfortunately Architects are too busy to do any sort of architectural drawing, so he 'phones a party known as a "Renderer" ("One who, or that which, renders; a vessel for rendering lard") and he says to this Renderer, "Am sending over some blueprints; please deliver Rendering tomorrow first thing in the morning."

It is unnecessary for the Architect to ask the Renderer if he *wants* to render the particular subject because all designs by members of the A.I.A. are extremely beautiful and it is a privilege to render them; but from another angle things are not so hot. Money being the silent partner in artistic transactions, it is bad taste to speak of it out loud; but I deem it my duty to advise the young people present who want to become Renderers that however exciting the thing may be artistically, there is little chance of your rendering to an Architect a very exciting Bill. For the Renderer knows that the Architect knows all there is to know about Rendering; no use pretending the job is anything complicated or difficult. He realizes that to an Architect a Rendering is a sort of Valentine to give the client and that the Architect would toss it off himself if he had the time. Also, the practicing Architect is probably a personal friend.

In this situation the Renderer, at some point in his career, begins to ask himself some searching questions. Is an Architectural Rendering necessarily a Rendering made for an Architect? How about making it directly for the client? Suppose the client is Ford, G. E., G.M. or one of those outfits and they are promoting an X-million dollar building program; who is going to make more money out of those buildings, the big promoting corporation or their hard-working Architects? So why shouldn't the big promoting corporation pay for the pictures that aid in the promotion? Why should Architects expend hard-earned money on artistic gifts to well-heeled clients?

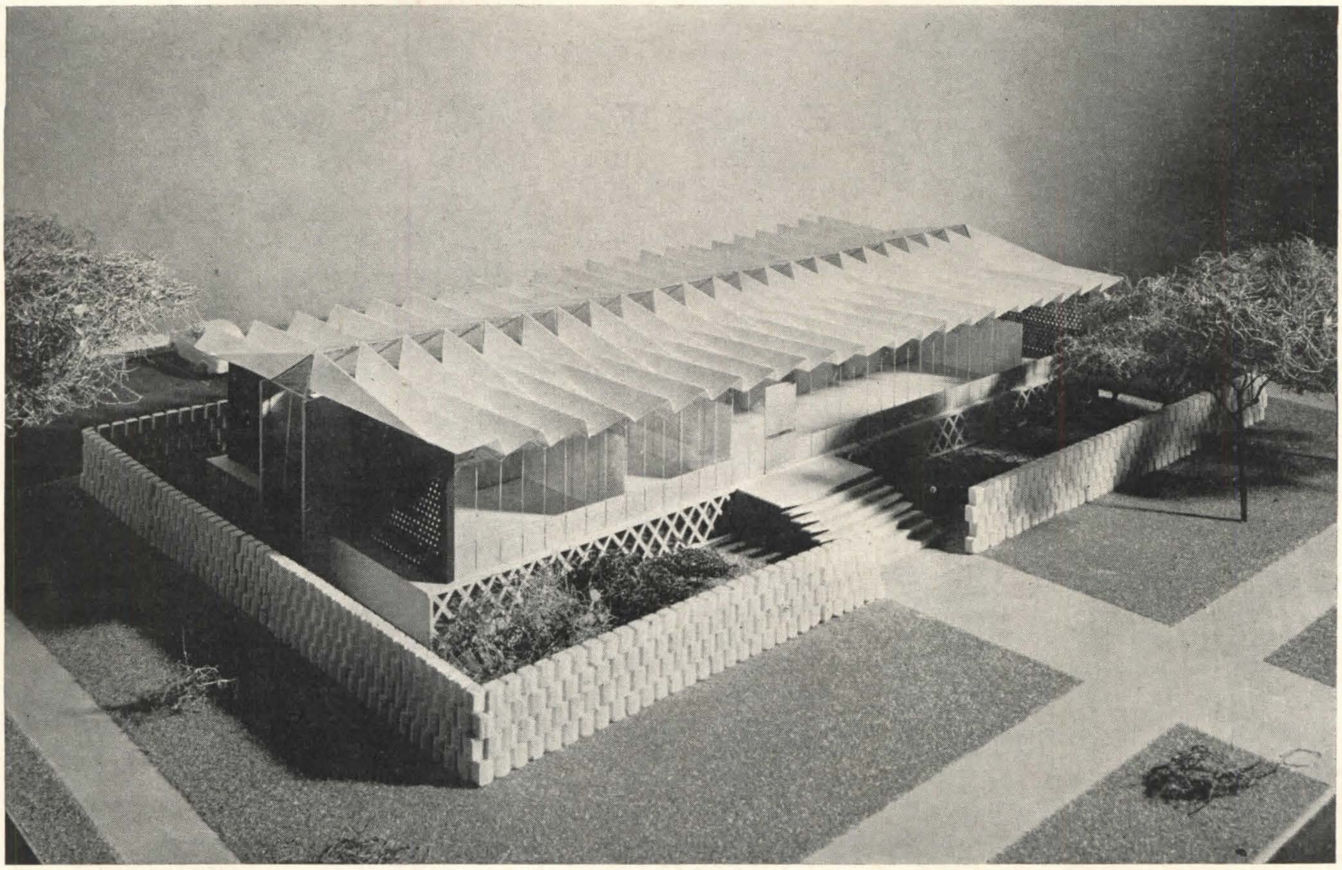
Also, hasn't the corporation got the Public Relations and Promotion departments which, in their hard-boiled way, damn well know the promotional value of well-made illustrations? And haven't they the ample budgets for just such items?

Besides, there's the Element of Mystery. I can vouch for the fact that not a single member of General Motors' Board of Directors knows how to make an Architectural Rendering; to them, the very idea of portraying something that doesn't exist has an element of mystery. The point is, you charge for the mystery.

Of course, even if the aspiring young Renderer meets, at the right club, the Corporation's 3rd Vice-President who, after his 3rd Vice Martini signs up for X-thousand dollars worth of mysterious Renderings, you probably will still have to deal, sooner or later, with the corporation's Architects of Record. It is very cultural to deal with Architects of Record but they have a bad habit of dropping into the studio "first thing in the morning" to explain to you how to make the Rendering. So my final advice on this phase is to make your Renderings in situations where no practicing Architects are even remotely involved. You can then make the building look like anything you want it to look like. And leave it to the client to find in due time some architectural firm that can make the building look like the Rendering.

Renderers are frequently asked to name their most amusing experience in the Rendering field. This is difficult because all experiences in the Rendering field are quite amusing. One day a small man resembling a jockey came into my studio, laid a brand new $100 bill on the drafting board

(Continued on page 312)



CONCRETE INSTITUTE PLANS A NEW (CONCRETE) HEADQUARTERS BUILDING

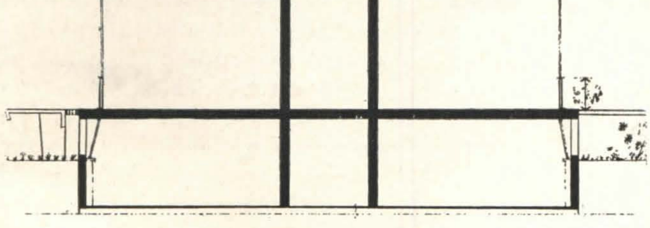
One of the requests made of architect Minoru Yamasaki by the American Concrete Institute was, not surprisingly, "to use concrete imaginatively" in designing a new headquarters for the institute.

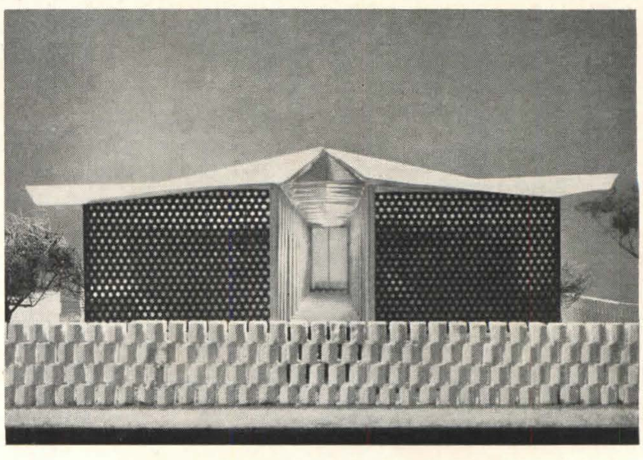
As projected, the building will have a folded-plate reinforced concrete roof cantilevered front and back from interior corridor walls, which will also be concrete. The roof will extend over the exterior walls to act as sun shields.

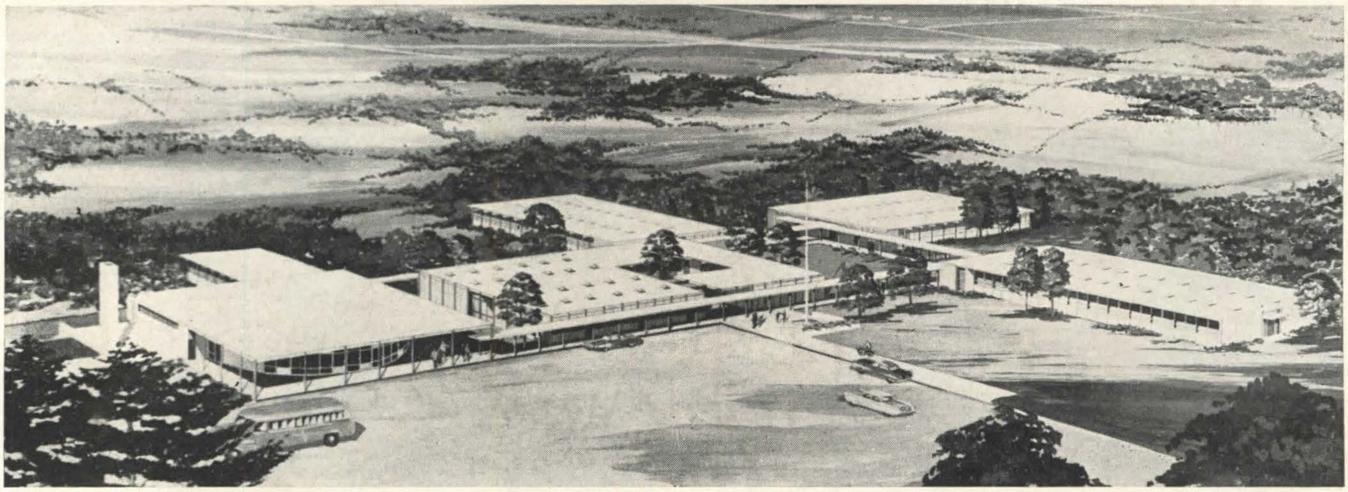
The exterior walls will be precast concrete panels and glass on the sides, while the end walls will have perforated screens made of colored pipe sections.

Inside, the building will house offices for the institute's secretary-treasurer, its technical director and its editorial staff, as well as facilities for getting out the organization's publications. The corridor will be illuminated naturally by a system of triangular skylights.

The building, which will be located in Detroit, is scheduled to get under construction in early 1957. It will cost an estimated $275,000.







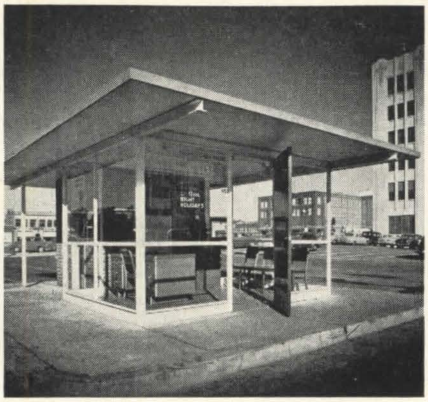
Award of Merit with Special Commendation: Wilson Jr. High School, Mecklenburg County, N. C.; A. G. Odell Jr. and Associates, Architects, Charlotte, N. C.

HONOR AWARDS PRESENTED AT A.I.A. SOUTH ATLANTIC REGIONAL CONFERENCE

The Honor Awards Exhibit held in conjunction with the Regional Conference of the South Atlantic District of the American Institute of Architects was not, the program stressed, a competition. Entries were judged on their individual merits, and were honored for the "excellence of the architect's solution of problems encountered." At a luncheon held as part of the conference in April, certificates of award were presented to the owners, architects and general contractors of the buildings honored.

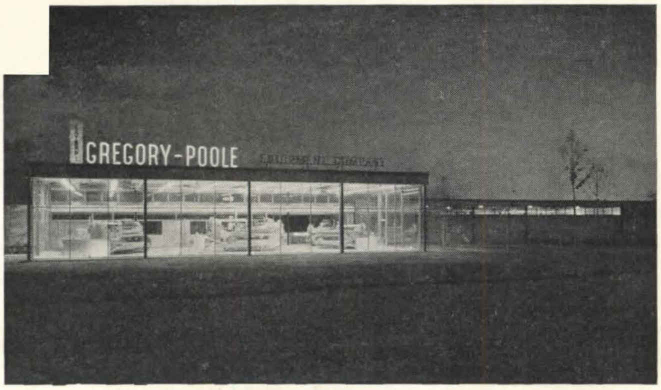
Serving as members of the jury were John Ekin Dinwiddie, A.I.A., Dean and Professor of Architectural Design at Tulane University in New Orleans; Charles M. Goodman, A.I.A., of Washington, D. C.; and Frank G. Lopez, A.I.A., senior editor of ARCHITECTURAL RECORD.

Award of Merit: Fraternal Order of Eagles Building, Atlanta; John Portman, architect, Atlanta



Citation: Parking Lot Office, Oklahoma City, Okla.; Joseph N. Boaz, architect, Raleigh, N. C.

Award of Merit: Venice-Nokomis Presbyterian Church, Venice, Fla.; Victor A. Lundy, architect, Sarasota



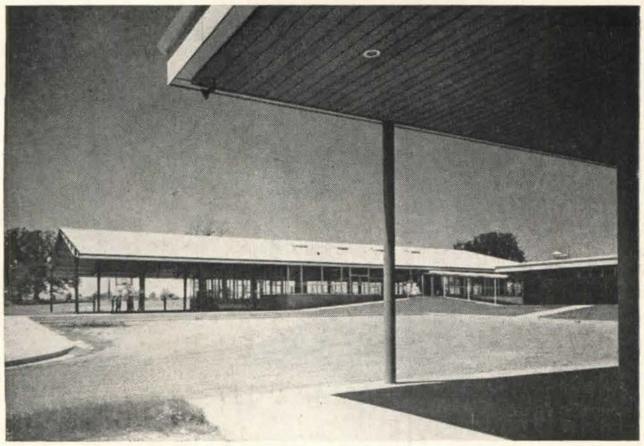
Award of Merit: Gregory-Poole Equipment Co., Raleigh, N. C.; G. Milton Small, George Matsumoto, architects, Raleigh, N. C.

Award of Merit: Samuel T. Lemer residence, Atlanta; John A. Portman, architect, Atlanta

(Continued on page 12)

BUILDINGS IN THE NEWS

(Continued from page 11)

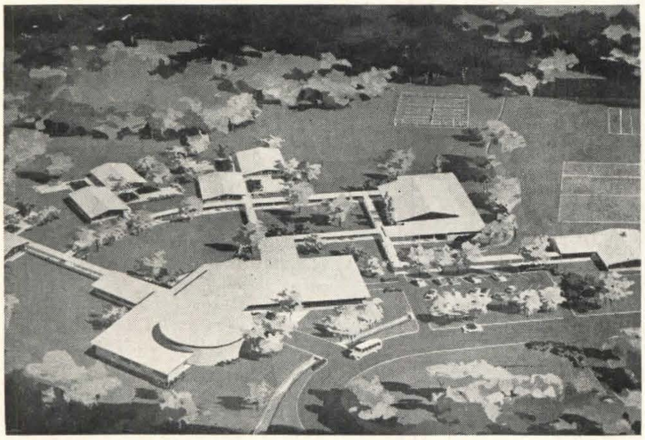


1

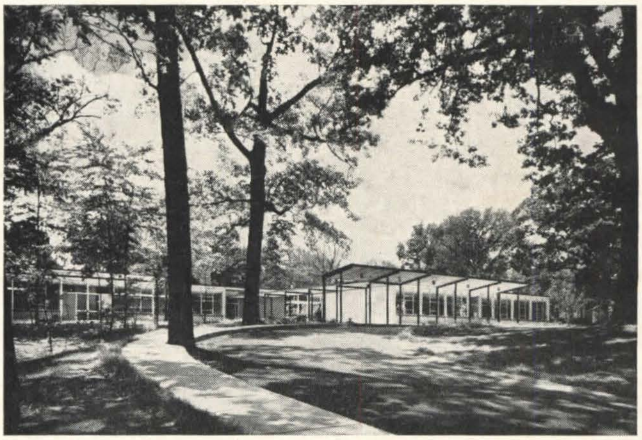
2

3

1. J. R. Moore Junior High School, Tyler, Tex.; Caudill, Rowlett, Scott and Associates, Architects. 2. Wilbert Snow Elementary School, Middletown, Conn.; Warren H. Ashley, Architect. 3. Kissam Lane Elementary School, Sea Cliff, N. Y.; Vincent G. Kling, Architect. 4. Hanover Park Regional High School, East Hanover Township, N. J.; Jay C. Van Nuys and Associates, Architects. 5. Bristol Primary School, Webster Groves, Mo.; Hellmuth Obata and Kassabaum, Architects



4



5

SCHOOL EXECUTIVE NAMES WINNERS IN ANNUAL COMPETITION

Five top winners, eight honorable mention citations for general excellence of design and seven "special feature citations" in its fifth annual competition for better school design have been announced by the magazine *The School Executive*. The top winners are shown on this page.

Architect Kenneth Gibbons of New York was professional adviser for the competition. The five-man jury included three architects, Samuel E. Homsey of Wilmington, Del. (chairman), Carl Guenther of Cleveland and Peter Tarapata of Detroit; and two educators, John E. Marshall of the Massachusetts School Building Assistance Commission, Boston, and Robert D. Murray, superintendent of Schools of Schenectady.

Honorable mention citations went to Hellmuth, Obata and Kassabaum, St. Louis; The Architects Collaborative, Cambridge; A. M. Kinney Associates, Charles Burchard, architect, Cincinnati; McLeod and Ferrara, Washington, D. C.; Caudill, Rowlett, Scott and Associates, Bryan, Tex.; O'Dell, Hewlett & Luchenbach Associates, Birmingham, Mich.; and (two) John Lyon Reid and Partners, San Francisco.

Recipients of "special feature" citations were Howard and Murphy, Butler, Pa.; John Carl Warnecke, San Francisco; Chapman, Evans and Delhanty, New York; Perkins and Will, White Plains; Daniel, Mann, Johnson and Mendenhall, Los Angeles; Vincent G. Kling, Philadelphia; and Douglas and Heims, Portland.

(More News on page 16)

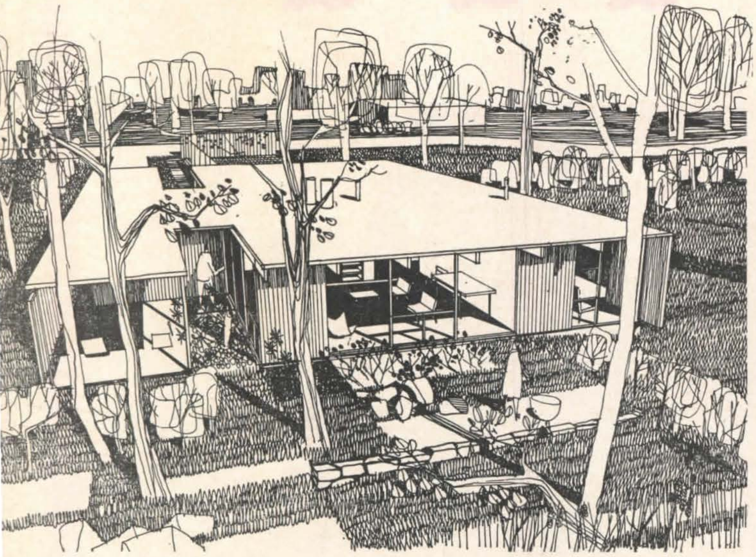
FIVE WINNERS NAMED IN ARBORETUM HOUSE COMPETITION

The Morton Arboretum has chosen five winners in its search for architects to design living quarters for its technical and maintenance staff. Houses resulting from the competition, which was undertaken "to stimulate and demonstrate original thinking in the relationship between the interior and exterior of houses," will be built as a "permanent exhibit of residential landscape planting." Situated on an 1100-acre site at Lisle, Ill., the Arboretum was established in 1922 for horticultural and arboricultual research.

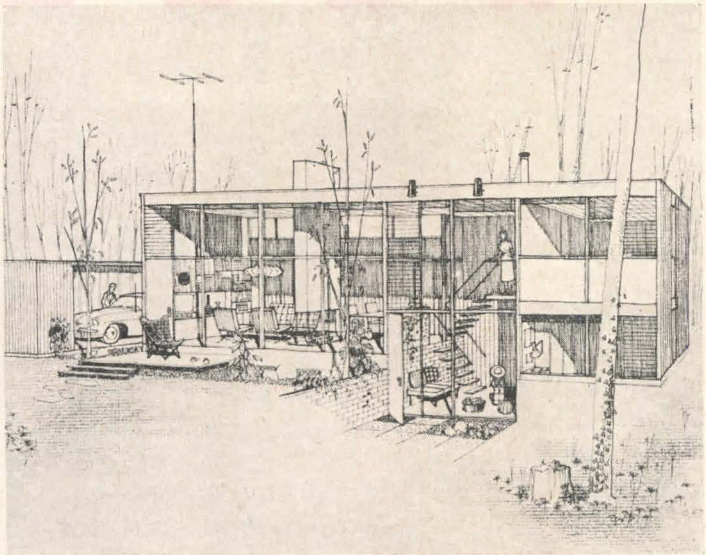
The competition, open to architects, architectural draftsmen and students here and abroad, called for two- and three-bedroom houses, to be of contemporary design. Winner of the $1000 grand prize was a two-bedroom house entered by architect Gardner Ertman of Cambridge, Mass. Although the program offered six first prizes of $500 each, the jury awarded only five of these. Recipients included John O. Cotton, Minneapolis; Charles Sax, a student at Harvard University; and Hayahika Takase, a student at North Carolina State College; besides winning a first prize for his grand prize-winning design, Mr. Ertman also took a first prize for his entry in the three-bedroom category.

The Jury awarded seven $100 second prizes out of a possible ten, and 25 honorable mentions, each worth $50.

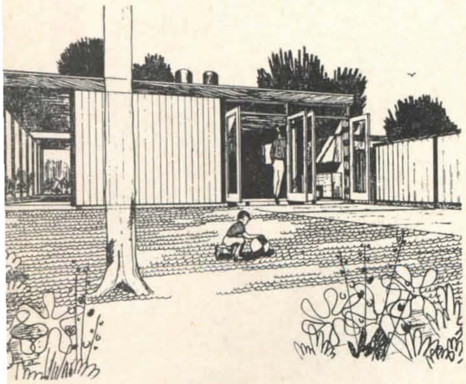
Architect Howard T. Fisher, of Chicago, served as the architectural advisor to the competition. Members of the jury included Douglas Haskell, editor of *Architectural Forum;* James T. Lendrum, director of the Small Homes Council of the University of Illinois; Joseph Mason, executive editor of *American Builder* (acting as technical consultant to the jury); John Normile, building editor of *Better Homes and Gardens;* and architects Philip Will Jr. and L. Morgan Yost.



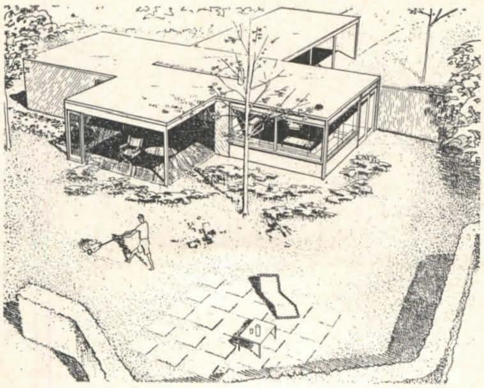
Grand Prize Winner, and First Prize Winner in Class I for two-bedroom houses, by architect Gardner Ertman, impressed jury with its "directness and lack of involved structure"



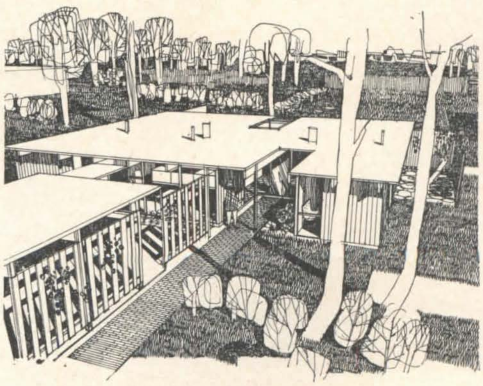
First Prize in Class II, for three-bedroom houses, went to the entry of student Hayahiko Takase; jury thought "it will be delightful to move into and through this house"



First Prize in Class I went to John Oliver Cotton; the jury praised the design as "an outstanding example of fine interrelation of indoor and outdoor areas"



First Prize in Class I was awarded to Charles Sax; jury liked the screened living area extending almost equally inside and outside the main lines of the structure"



First Prize in Class II, also awarded to Mr. Ertman, was commended by the jury for its excellent zoning, its "basic simplicity of structure and wide overhangs"

(More news on page 21)

T ILET COMPARTMENTS

New! *LIFE-LINE* TOP HINGE

"Zytel", the wonder nylon resin developed by DuPont, is the bearing surface for the stainless steel pintle of this new top hinge that absolutely will not corrode . . . that simply can't wear out. In temperatures up to 450° F., "Zytel" nylon is unaffected by fungus, insects, soaps, alkalis, lubricating oils and most acids. Because of these properties, neither the bushing nor the stainless steel pintle and bushing mount will rust or deteriorate under conditions common to a toilet room. As "Zytel" is self-lubricating, the hinge operates smoothly and quietly with never a squeak or a slam.

New! *LIFE-LINE* SLIDE BOLT

This ingenious slide bolt and keeper-bumper is the result of years of experience in the shower and toilet compartment field. Designed by Reino Aarnio, S.I.D. Its simplicity is sensational and conforms to the smooth, modern, "years ahead" design typical of the entire FIAT compartment line. Enduring strength provided by special, heavy steel reinforcing inside door panel. Easily mounted with theft proof screws.

New! *LIFE-LINE* GRAVITY HINGE

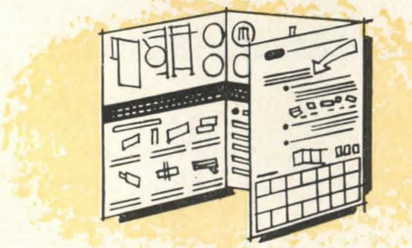
Here, at last, is a true gravity hinge that has a complete load bearing and cam action surface of "Zytel" nylon. Its unique and simple design of two molded, mating cams of "Zytel" make it completely foolproof. Concealed in the door for a smooth, modern appearance, there are no bulky springs to break in fatigue or ball bearings made undersized due to door width limitations. Due to the extremely low coefficient of friction, and because "Zytel" nylon is self-lubricating, the hinge requires a minimum rise and fall for positive operation. Complete hinge is factory installed except for bracket and pintle.

* FIAT TRADE-MARK ** DUPONT TRADE-MARK

Commerce Clearing House, Inc.
(Office Building and Plant)
Architects: Skidmore, Owings & Merrill
Contractor: J. Emil Anderson & Son

FIAT compartments have the modern design and wide range of smart colors to complement your finest toilet room plans. Rugged, yes, so rugged because of extra, exclusive pilaster bracing—stronger, welded doors and "years ahead" *Life-Line* hardware. New, *Polycon** finish (silicon fortified poly plastic) developed specifically to withstand toilet room conditions—assures longer life, lower maintenance, better appearance FIAT offers a range of models to meet most budget probem. From the exclusive wood core *Aristo* model through the conventional quality *Duro* model to the economical *Permo* panel type . . . FIAT design means more quality, grade for grade, than obtainable elsewhere. Safeguard your reputation—check FIAT before you specify.

FIELD INSTRUCTIONS



5. PICTURE STORY of slide bolt and keeper-bumper installation makes it easy for anyone . . with or without experience.

CLIP AND MAIL COUPON BELOW FOR NEW LITERATURE

FOUR COMPLETE PLANTS STRATEGICALLY LOCATED FOR BETTER SERVICE—LOWER COST

Long Island City 1 New York	Franklin Park Illinois	Los Angeles 63 California	Orillia, Ontario Canada

FIAT

Manufacturing Quality Showers and Compartments since 1922

FIAT METAL MFG. COMPANY
9319 Belmont Ave., Franklin Park, Illinois

☐ Please list my name to receive new literature as soon as it is off the press.
☐ Please have your representative call.

Firm____________________

Address____________________

City__________ Zone_____ State________

Individual____________________

MEETINGS AND MISCELLANY

(Continued from page 24)

Arts and the Union

The National Council of the Arts and Government, an organization founded last year to promote "sound legislation affecting the arts," recently adopted a "statement of principles and purposes" to guide its future activities. "In view of the increasing importance of the arts in our national life," the statement said, "we believe that they deserve adequate recognition by the Federal Government of the United States, by the States, and by municipalities." The statement also urged that the arts "be fully utilized in international cultural exchanges." "We believe," it concluded, "that the Federal Government, the States and municipalities, in their activities connected with the arts, should draw upon the best professional knowledge and judgment; that any advisory bodies for the arts should be professional rather than political; and that the various fields of the arts should be represented on such bodies relating to their field and should have a voice in nominating the members of such bodies." The council, of which Clarence Derwent is the chairman, was formed, independently of the government, as a result of the President's 1955 State of the Union message, in which he requested more governmental recognition of the arts. The membership, consisting mostly of "professional practitioners" of the arts, totals 39 at the present, including architects Pietro Belluschi, John Wellborn Root, Ralph Walker and William W. Wurster, but vice chairman Harold Weston indicates that the council does not consider its membership complete yet. Currently, the council is concentrating on promoting three bills now before Congress proposing the formation of a Federal Advisory Commission on the Arts. To that end, the Council last month sent to Congress a petition signed by 318 artists, among them 37 architects.

For the Centennial

Early plans for the 1957 celebration of the American Institute of Architects' 100th anniversary include an architectural exhibition at the National Gallery of Art. The exhibition, which will open May 14 as the A.I.A. meets in Washington for its national convention, will be the first on architecture in the gallery's history. Alexander S. Cochrane, A.I.A., Baltimore, is chairman of the exhibition committee, and Frederick Gutheim, A.I.A., has been retained to direct it. The exhibit, Mr. Gutheim says, will "stress the element of continuity in American architecture. . . . Themes to be developed in the exhibition include the roots of American architecture in the engineering works and constituent architecture of the 19th century as well as in the tradition of the fine arts. . . ."

With the A.I.A.

Two appointments to the headquarters staff of the American Institute of Architects have been announced by the Octagon. Reporting at the beginning of July: Joseph Watterson, A.I.A., of Mineola, Long Island, to serve as director of publications; and Theodore W. Dominick, A.I.A., Washington, D. C., to assist Walter A. Taylor, director of education and research. Mr. Dominick will be concerned wholly with general research.

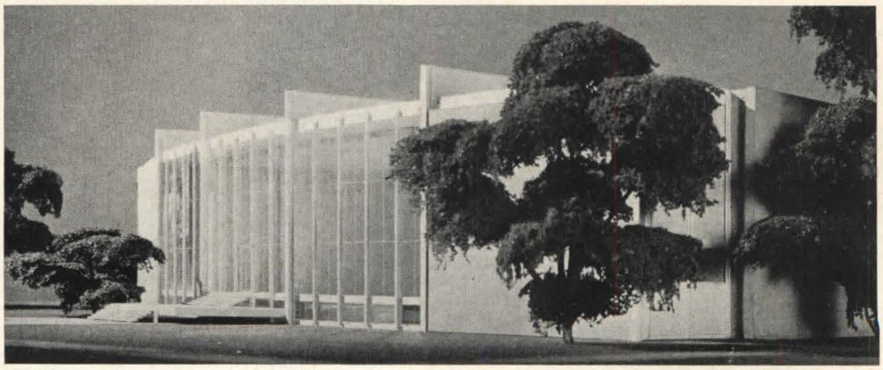
The Institute has also announced plans for its second exhibition of architectural photography. All professional photographers are eligible to submit entries, which are due at the A.I.A. Gallery on October 16. Information can be obtained from Mrs. Alice G. Korff, Curator of Gallery, The American Institute of Architects, 1735 New York Avenue N.W., Washington 6, D. C.

Designs for Living

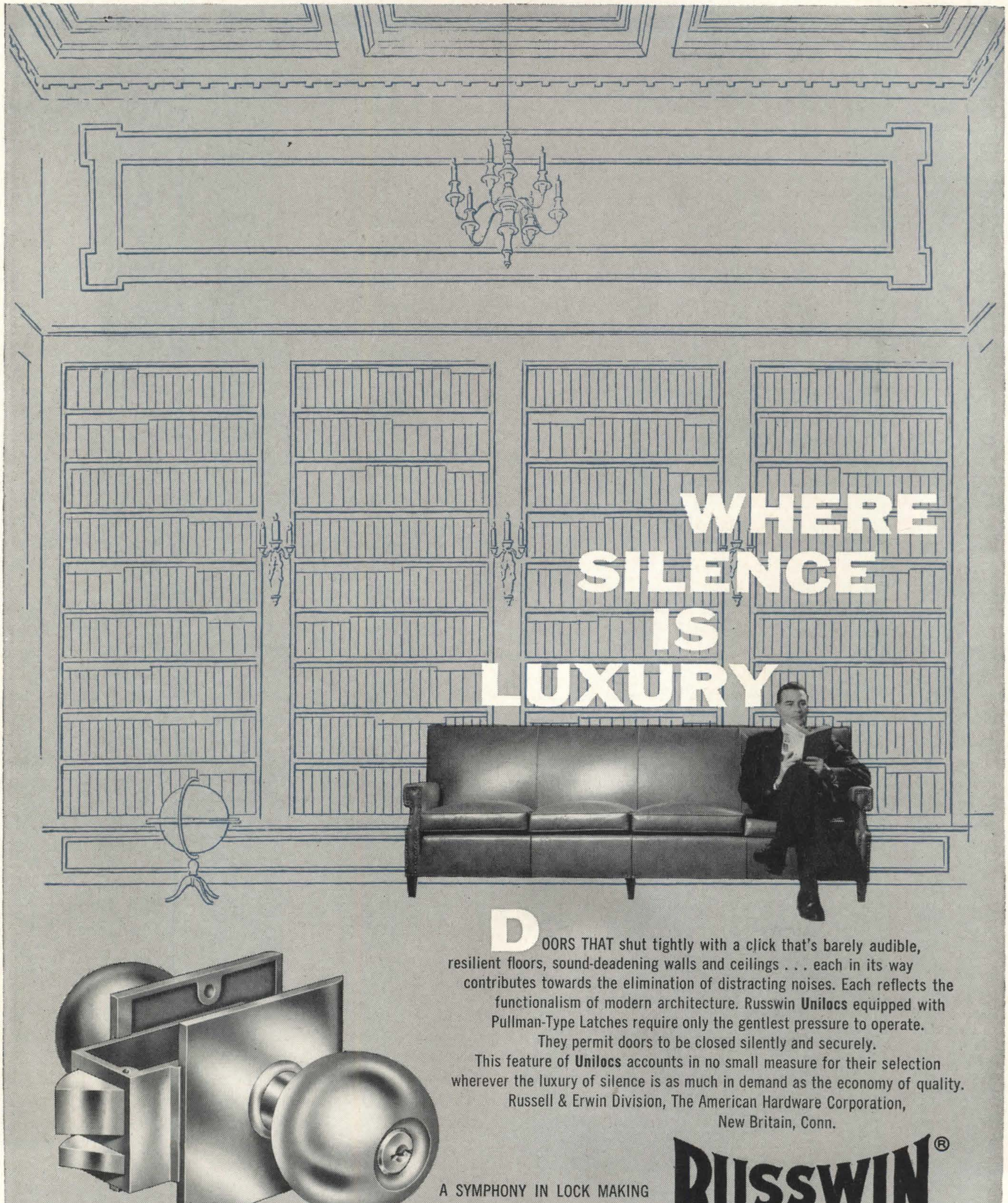
A group of more than 25 architect-designed builder houses has been commissioned by the magazine *Living for Young Homemakers* in what is described as the largest magazine-sponsored building promotion ever undertaken. The "Electri-Living" home program, co-sponsored by utility companies and home builders locally, will be shown in the September issue of *Living*. A key requirement of the program, on which *Living* had the advice of an architectural panel including four deans of architecture, is for houses designed to reflect regional influences as well as the cost bracket most readily marketable in their respective areas. All must meet "living conditioning" standards set up by *Living* "for sight, sound, safety, space, color and climate." For *Living*, according to editor-in-chief Edith Brazwell Evans, this year's program is another round in the magazine's long-term effort to educate readers and builders in the values of good design. With builders, Mrs. Evans believes the battle has been won; if architects would learn as much about builder problems, she implies, a very much larger proportion of houses would be architect-designed and the general level of house design would be a good deal higher. Readers also have responded to the magazine's consistent emphasis on design, and on the architect as designer (Mrs. Evans guesses that ten per cent of reader mail asks for names of local architects). But Mrs. Evans also observes a recent trend of reader interest toward "traditional" design; this she sees as reaction to what she calls the "static" state of contemporary design. With programs like the current one, Mrs. Evans hopes to encourage emergence of varied regional expressions of better designs for living.

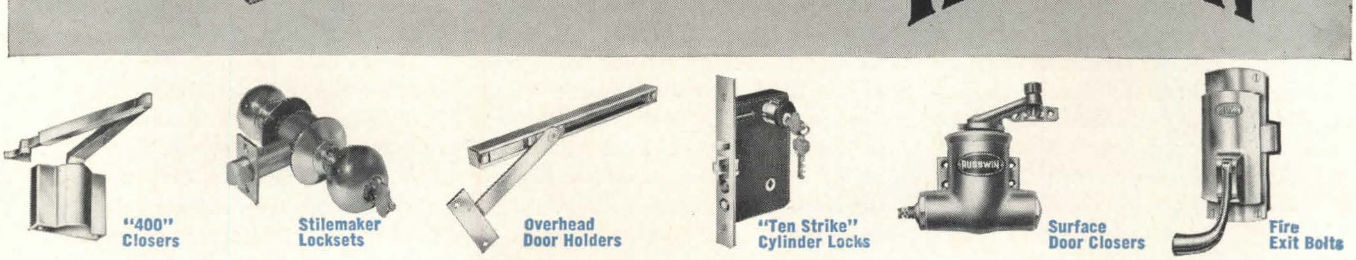
(More news on page 32)

MIES VAN DER ROHE DESIGNS A MUSEUM FOR HOUSTON



For the Cullinan Hall addition to the Houston Museum of Fine Arts, needed by the museum to expand its exhibition space, architect Ludwig Mies van der Rohe, in a solution that is bound to recall the new Crown Hall at Illinois Institute of Technology (see cover and pp. 133–139), offers 10,000 sq ft of unobstructed display space. The roof will hang from four steel girders; floors and basement will be reinforced concrete, walls brick and gray-tinted glass. Studios for the museum's school, as well as storage and working space, will be located below the main floor. Yes, the facade is curved!


WHERE
SILENCE
IS
LUXURY
DOORS THAT shut tightly with a click that's barely audible, resilient floors, sound-deadening walls and ceilings . . . each in its way contributes towards the elimination of distracting noises. Each reflects the functionalism of modern architecture. Russwin **Unilocs** equipped with Pullman-Type Latches require only the gentlest pressure to operate. They permit doors to be closed silently and securely. This feature of **Unilocs** accounts in no small measure for their selection wherever the luxury of silence is as much in demand as the economy of quality.
Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.
A SYMPHONY IN LOCK MAKING
RUSSWIN®


"400" Closers
Stilemaker Locksets
Overhead Door Holders
"Ten Strike" Cylinder Locks
Surface Door Closers
Fire Exit Bolts

SCHOOL PLANNING GETS NEW AID

By CYRIL G. SARGENT *Professor of Education and Director, Center for Field Studies, Harvard University*

School Planning Handbook. By Engelhardt, Engelhardt and Leggett. F. W. Dodge Corp. (119 W. 40th St., N.Y.C.) 1956. 600 pp.

From School Program to School Plant. By John H. Herrick, Ralph D. McLeary, Wilfred F. Clapp and Walter F. Bogner. Henry Holt & Co. (383 Madison Ave., N.Y.C.) 1956. 482 pp, illus. $5.50

These are times of tremendous ferment and change in public education. Children crowd the schoolhouses nearly everywhere and entirely new communities spring up almost overnight creating further building needs. Teachers are hard to find for these expanding enrollments since almost 10 per cent of the teaching staff leaves the classroom every year, a large part of the classrooms are and will be staffed by "green" teachers under present patterns of personnel utilization. Financial support becomes difficult to secure even in an expanding economy as more teachers are added and salary schedules are revised upwards to enable education to compete more successfully with other fields of professional service.

Yet in the midst of these quantitative concerns, it is essential not to neglect problems of quality. Better schools, better programs of secondary education, better training for the sciences, better use of personnel, all are being asked for and expected of the schools. Indeed, we will have failed in our task if we do not respond to the White House Conference's reaffirmation of America's faith in education and its goals for the schools in areas of social and ethical conduct as well as in intellectual training. In a very real sense, we must both solve our quantitative questions and at the same time continue and intensify our quest for ways of more effectively pursuing our central goal — how to release the human mind and spirit for ever higher levels of aspiration and attainment. It is this that makes education exciting and it is in contributing to this that school architecture can also find its challenge and its measure, for surely the school building has a significant effect on the atmosphere, the tone and the spirit of education.

How to raise the sights of boards of education, how to recognize the good and beautiful from the tawdry and the cheap, how to keep to the fore the issues of quality when pressed on every side with problems of quantity and technical detail, is perhaps the most difficult task that anyone, school administrator, educational consultant and architect alike are confronted with.

The authors of the *School Planning Handbook* have many examples of success to their credit in this endeavor. In the present book they address themselves almost exclusively to the quantitative and technical aspects of the problem of planning school buildings. From their broad range of experience they have drawn together a series of checklists, schedules, case studies, and contract forms for all phases of the school building process from the initial survey to the opening of the school.

Each chapter has one to four collaborators, each a significant figure, which is at once a strength and a weakness of the material. With so many persons contributing, it is but natural that some overlapping, redundancy and unevenness in the presentation are present. At the same time to be able to examine the practice of architects and administrators as to steps and sequence, to observe the procedural detail of bureacratic planning in San Francisco, to have brought together in one book much of the material that architects and engineers regularly use, is both instructive and

(Continued on page 60)

1956 HOUSES SHOW NEW TRENDS ARE HEALTHY

By JOHN H. CALLENDER

Record Houses of 1956. By the editors of Architectural Record. F. W. Dodge Corp. (119 W. 40th St., N.Y.C.) 1956. 316 pp., $2.95

Record houses of 1956 presents 29 new houses selected by the editors of Architectural Record. Since houses from all parts of the country are included, the book affords an interesting cross section of the best current residential design. Generalizations are therefore in order. Judging by the sampling presented here, American architecture is in fine health. Here are no great masterpieces, but a remarkably high level of accomplishment and a rich variety of design. Some readers may be struck by the fundamental similarities between the houses, the aesthetic unity that pervades all of them regardless of region or architect. Others may be impressed by the considerable differences between one design and another, sometimes indicating the persistence of a healthy regionalism, more often demonstrating the wide variety of personal expression that is possible within the contemporary style.

Among the 27 architects represented are many well-known names. There is also a considerable sprinkling of new names and these are responsible for some of the most interesting houses in the book, a circumstance which argues well for the future. One of the houses in this group furnished the handsome cover of the book and another is the subject of an unusual opening study.

The house in Rye, New York, designed by Ulrich Franzen for his own family's use, is presented in considerable detail (16 pages) in the opening section of the book. In addition to the usual architectural photographs and drawings, there are also photographs showing the family living in the house — children playing, the wife preparing a meal, guests being entertained — along with comment by Lawrence Kocher on this house and on modern houses in general. The Franzen house is one of the most successful examples of that type of design in which an unusual structural system is employed and this structure determines the appearance of the house. Such architecture is barely distinguish-

(Continued on page 320)

REQUIRED READING

(Continued from page 56)

SCHOOL PLANNING

valuable. Moreover, the book raises by indirection many questions which would seem to be rather central in the problem of building better schools.

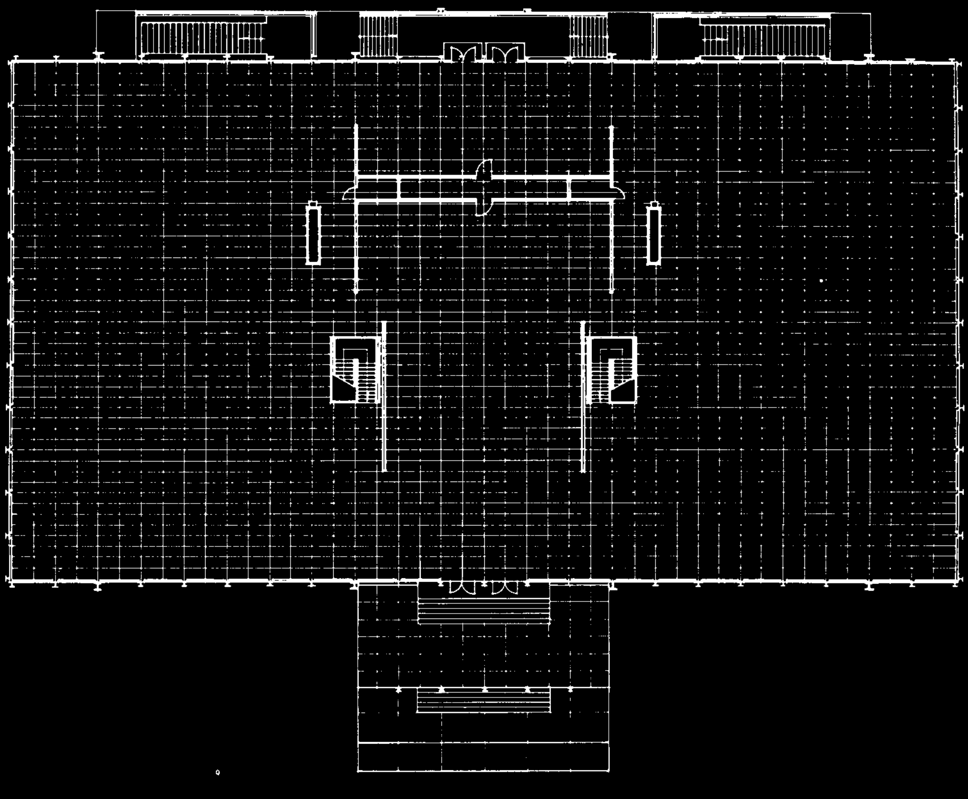
Architects, engineers and educators alike will find much of use to them in the present *Handbook*. The material is presented without critical comment so that one might infer that it represents good practice throughout. This is not necessarily so and the reader will have to make his own analysis of the appropriateness of the multitude of suggestions for his own particular needs.

In part and for a more limited audience — school administrator, educational consultant, and graduate student — *From School Program to School Plant* does address itself to some of the major policy questions which have implications for building design and facilities. It is strongest when it is discussing these issues and when it is describing the functions of the architect and the phases of his work. When it is concerned with contracts, bidding and specifications it is generally descriptive and lacks the definitive detail of the *School Planning Handbook*. However, for the school administrator who is to embark on a building program there are comments about a variety of space problems — size, location, and multiple use — which should be of assistance to him in developing his program.

Both books are helpful contributions to the rapidly growing literature on school building. The *Handbook*, particularly, is part of a continuing development of a technical series. It is to be fervently hoped that, in the hands of boards of education, creative design will not be stifled by an acquired psuedo-technical expertness on the part of those whose role is centrally that of policy development and formulation. We need board members and administrators who are concerned with the broad issues of education because these issues are, in fact, those of our society itself, and who will rely on the competence of their technical staffs and consultants for the myriad details of technical study, analysis and operation.

For the laymen — board members, PTA groups and citizens' advisory committees — the book on school design remains to be written. But perhaps it cannot be written. Words may be inadequate to communicate what essentially must be experienced.

MIES VAN DER ROHE



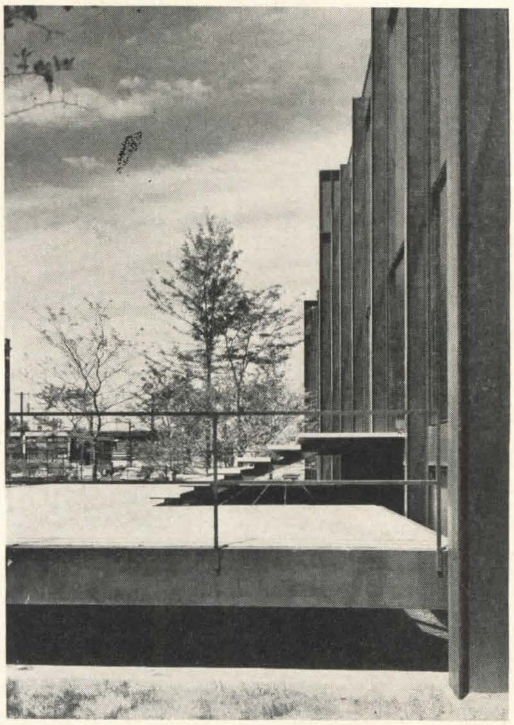
MIES VAN DER ROHE has contributed his latest — though not final — building for the Illinois Institute of Technology. The S. R. Crown Hall is not quite finished but its recent dedication and the undeniable importance of its architect may persuade editorial coverage from even that part of the architectural press which recently implied disapproval of early reporting.

Arriving from downtown Chicago or from many parts of the campus one comes first to the north — or rear — of the building and passes around it into what was W. 34th St. but has been transformed into a grassy, tree-planted forecourt; a welcome area on this checkerboard campus in which many of the squares are still occupied by derelict buildings awaiting eventual destruction.

The south front seen from this green foreground is an arresting, handsome statement of what the world has come to expect from Mies: a simple steel and glass volume, finely proportioned, well scaled, highly organized and carefully made. The four great girders from which the roof is hung provide dramatic interruptions in the quiet silhouette.

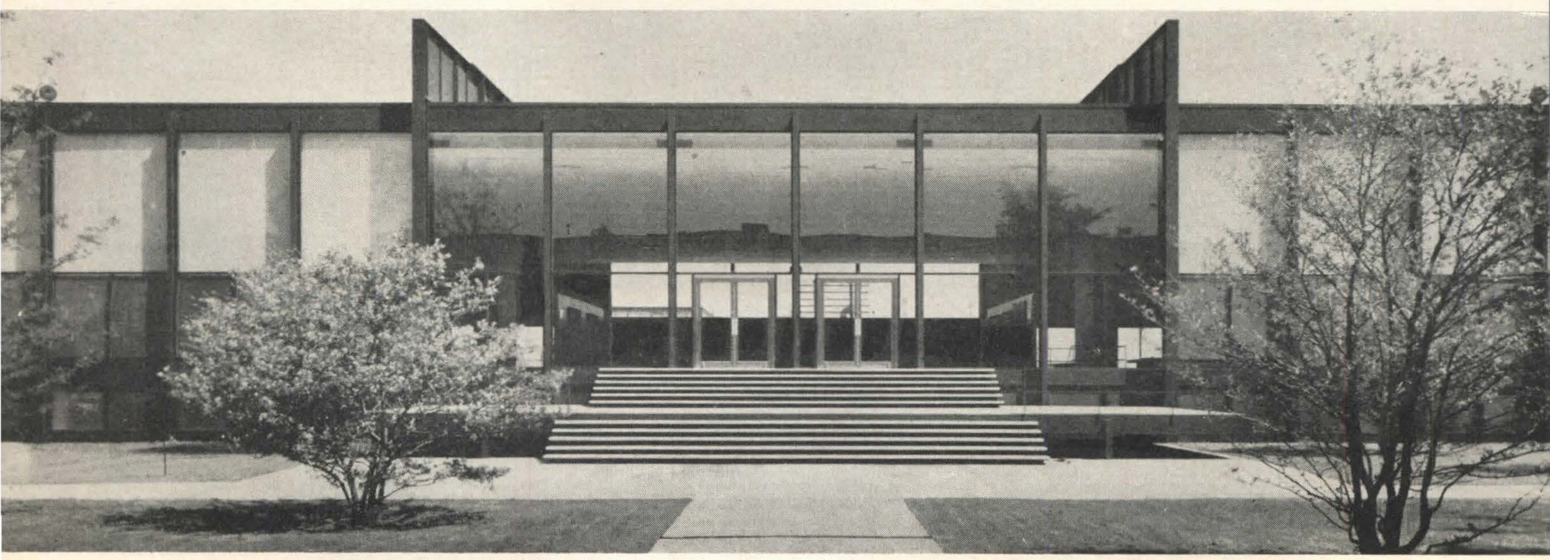
The steps and the entrance platform are completely comfortable and pleasantly poised. This whole method of gaining elevation — as in Mies' Farnsworth house and for that matter in primitive platform constructions all over the world — is a delight, as well, to the mind which recognizes that the steps belong specifically to neither the ground nor the wall plane and appreciates their not clogging the intersection. Although the large, low, lightly floating platform makes difficult the removal of leaves and windblown trash this seems a small price to pay for the satisfactions gained.

The entrance doors are easily found but are unsheltered — presumably in the interest of not interrupting the wall plane. Once through them one is immediately in the big room. There is no vestibule but whatever slush and grime is tracked in during Chicago's winter will show little against the dark gray and white flecked terrazzo floor. The walls consist of 10 ft glass bays — 22 along the north and south and 11 along the east and west. These are identical except that the 6 center ones on the north and south contain clear glass below

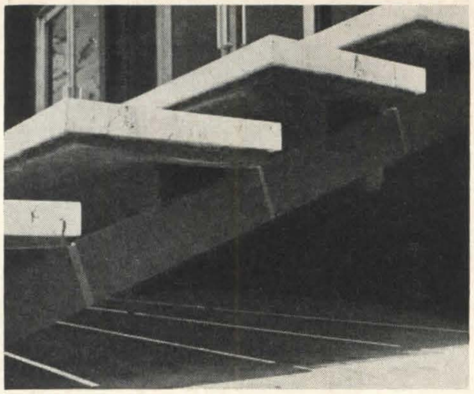


Chicago Architectural Photographing Company

Twelve steps up

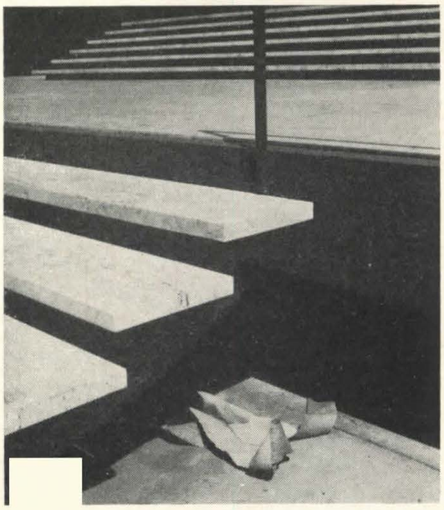


Chicago Architectural Photographing Company



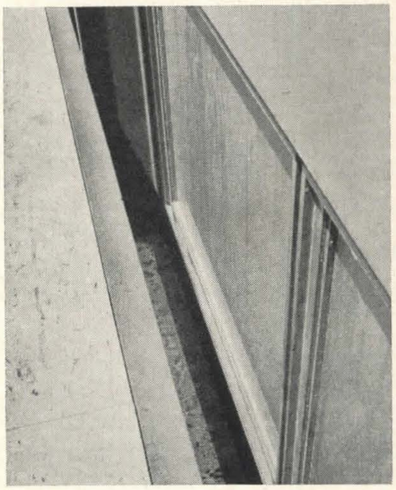
AR

Light and logical



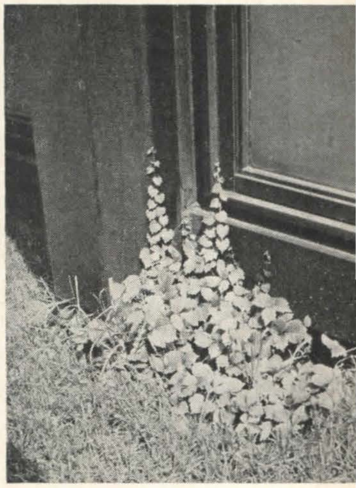
AR

A small price

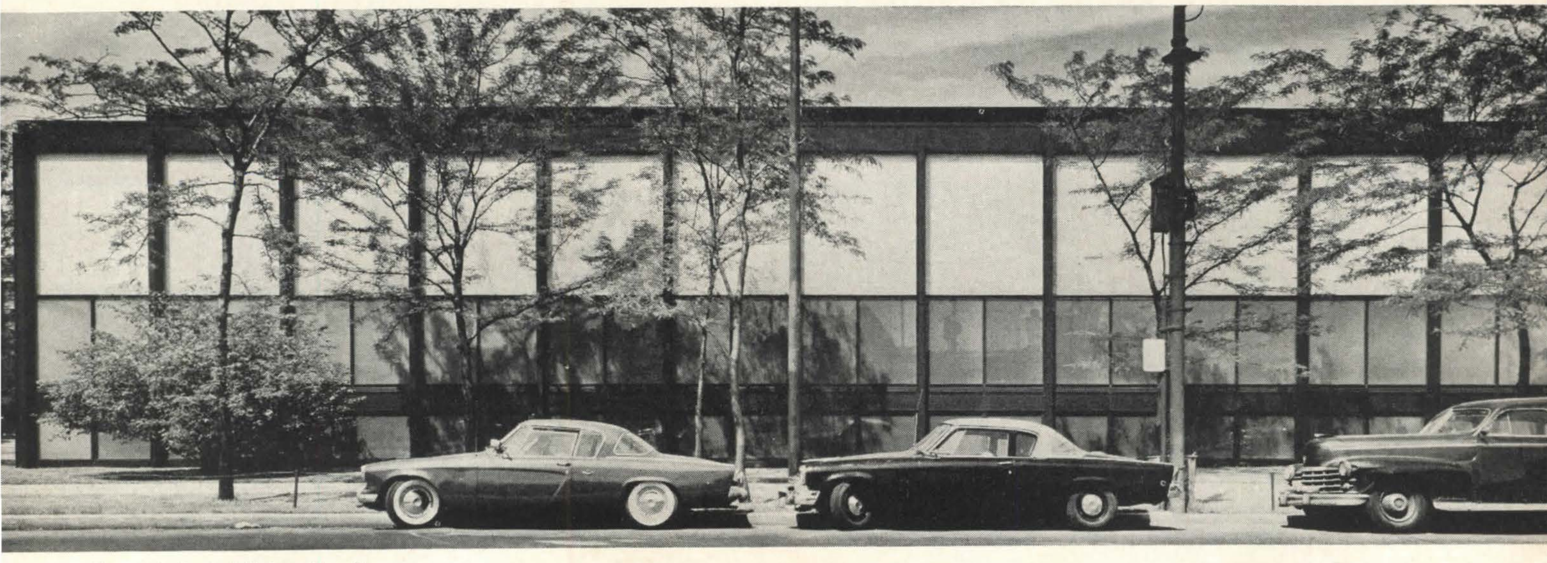


AR

An unclogged intersection



Steel, glass and ivy



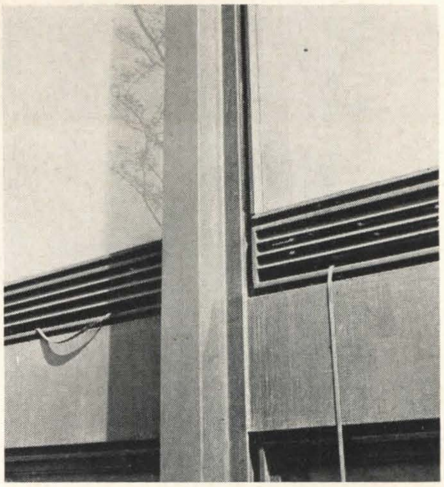
Chicago Architectural Photographing Company

the door head mullion line and do not have the louvered ventilators at the sill. Elsewhere the lower portions are sandblasted glass with Venetian blinds above.

The regularity of the bay system has nowhere been interrupted and is refreshing in contrast to the hasty expediency or simple lack of concern which characterizes so many buildings. Against this regularity the tracery of the locust leaf shadow patterns is a subtle overlying texture. The walls are finely conceived and beautifully done. The ceiling falls something short. The irregularly fissured acoustic tiles are carefully interrupted by the flush, egg crate louvered fixtures which — in groups of four — are organized along with the air diffusers and sprinkler heads in strict relationship to the bays but still produce a busy effect which most will find in sharp contrast to the other surfaces.

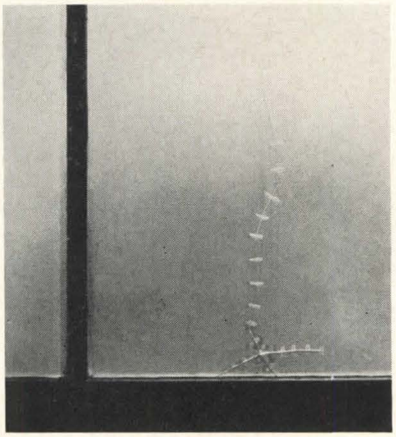
As for the space itself: it is big. It is big and it is empty in a way which has nothing to do with furniture or inhabitants but derives from a sense of the vague, generalized purpose of the room. The evidence of intended occupancy and specific use is slight. One has the feeling that it is only incidentally a school of architecture and design — though that *is* its assigned purpose — and that in some more prosperous tomorrow the administration will rid it of this temporary, cluttering function and allow it at last to serve as a pavilion where all the students and faculty of engineering and the sciences may gather quietly for tea and a pipe and thoughtful talk of fission and the future. At any rate the Chicago fire inspector was in some doubt about the building's function. It is reported by a member of the school administration that as the building neared completion it was classed not as a school but as an industrial building and was in consequence required to have the sprinkler system which somewhat complicated the ceiling — at this stage — at a cost of around $30,000.

But for the present the great room is I.I.T.'s department of architecture and the Mies-designed drafting tables (without drawers) bear solitary witness to the fact. These are in each end of the room in areas slightly separated from the center by low oak plywood partitions. At right angles to these and about 8 ft apart two



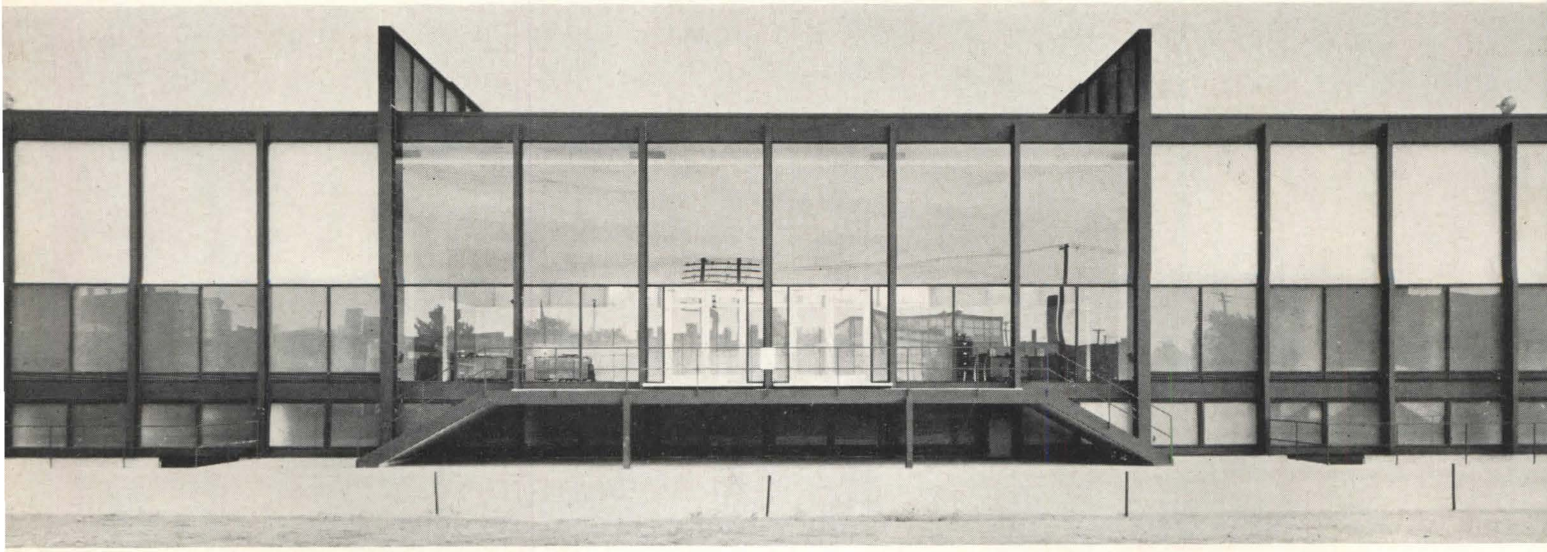
AR

Against this flawlessness

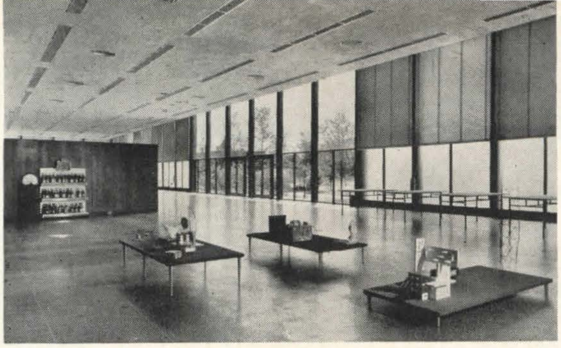


AR

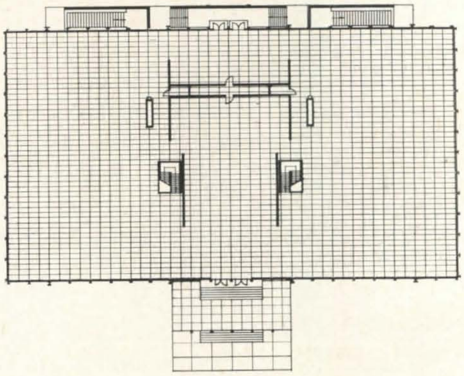
One in one hundred and eight

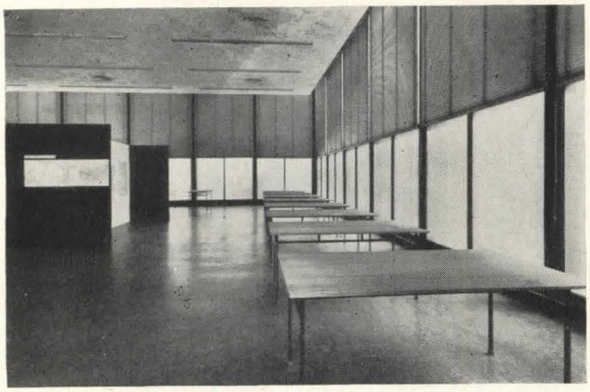


Chicago Architectural Photographing Company

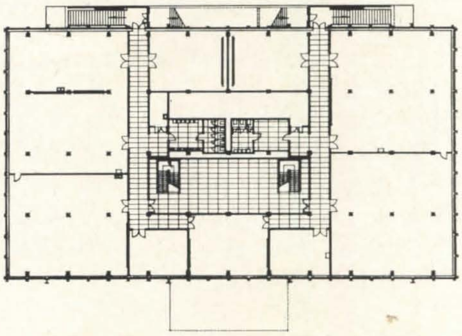

Chicago Architectural Photographing Company

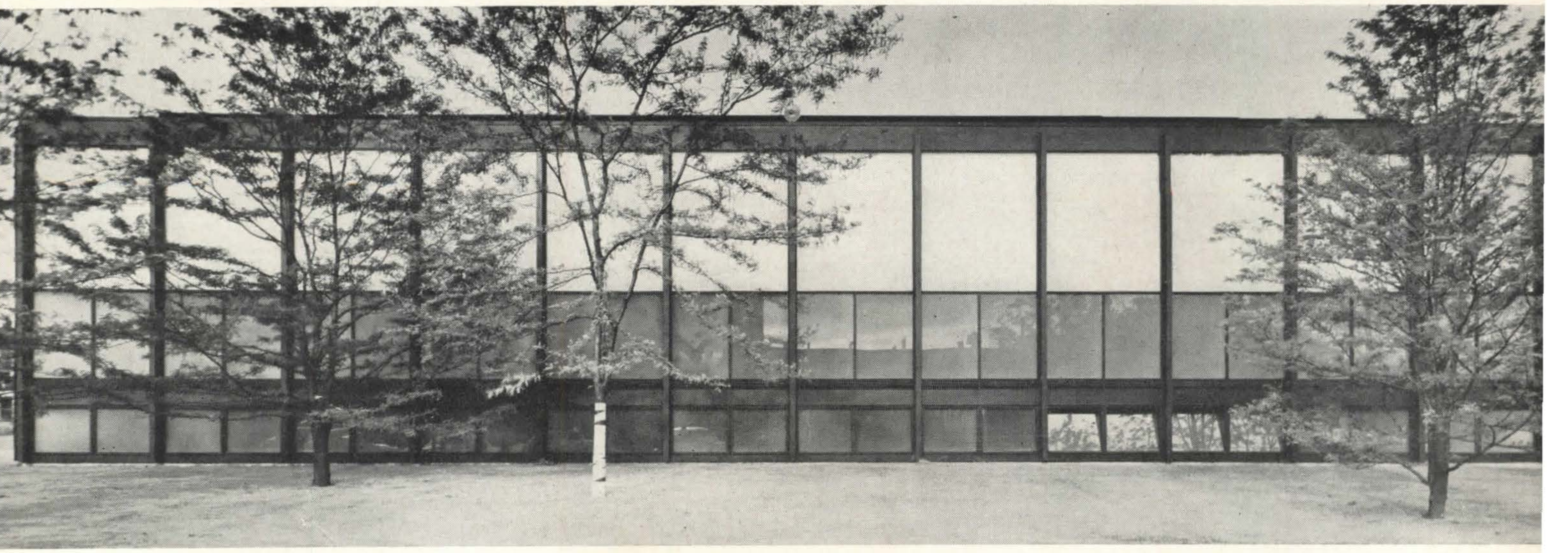
Out to the forecourt




Chicago Architectural Photographing Company

Evidence of use



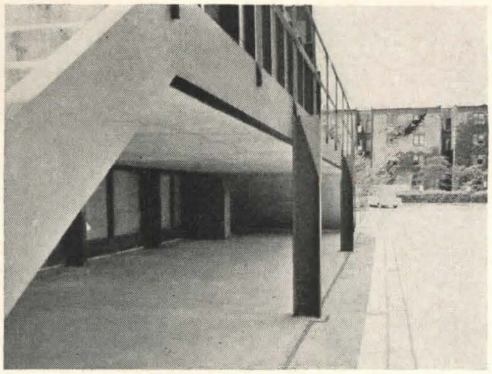

Chicago Architectural Photographing Company

more low walls form the only storage area in the room and separate the space of the north lobby area in which are located the desks of the architecture and design directors and their secretaries from the space opposite the south entrance which is variously assigned to exhibition, assembly or reading. On each side of this area are the duct and mechanical shafts and the stairways to the basement.

There, on each side of the unfinished student lounge, north-south corridors give access to the toilet and machinery rooms and to the quarters of the design department. Except for a single room furnished informally as a lecture space largely for art education classes and another smaller one housing desks and files of five or six teachers, the basement is divided into workshops for the photography, visual, shelter and product design programs.

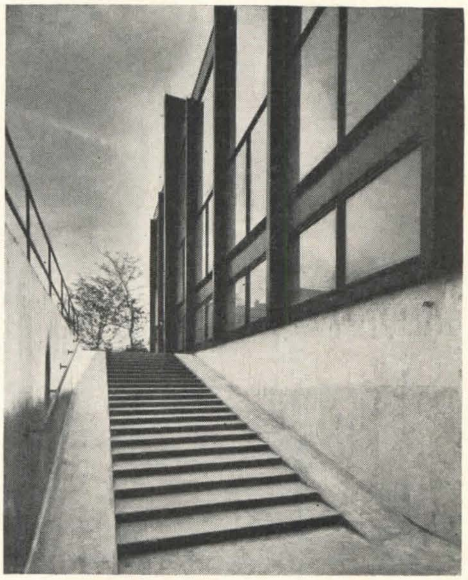
Unlike the drafting spaces the workshops are furnished with sinks and although there is no integrally organized storage space on either floor the design students have constructed their own cabinets and shelves. Perhaps the architecture students will be permitted to follow suit. On the other hand the storage of drafting paraphernalia, models and drawings may be just as unnecessary as the private offices, lecture rooms, sinks and blackboards appear to be in this particular architectural curriculum. Certainly it would be mistaken to allow this to weigh *too* heavily in evaluating the building. And in the same vein, the cracked glass, the dangling weather-stripping, the fallen ceiling tiles — which can happen anywhere — must not, because they so stand out here against the general flawlessness, be seen as anything except a welcome sign that the building *is* really being used by real people.

For no matter how much our time needs palpable images of ideals beyond the threshold of the purely functional, the images will have significance only if they can be discovered to have had their point of departure in the humble as well as the heroic realities. Measured against this standard it may be fair to suggest that this building is at once both more *and* less than a school of architecture, planning and design.



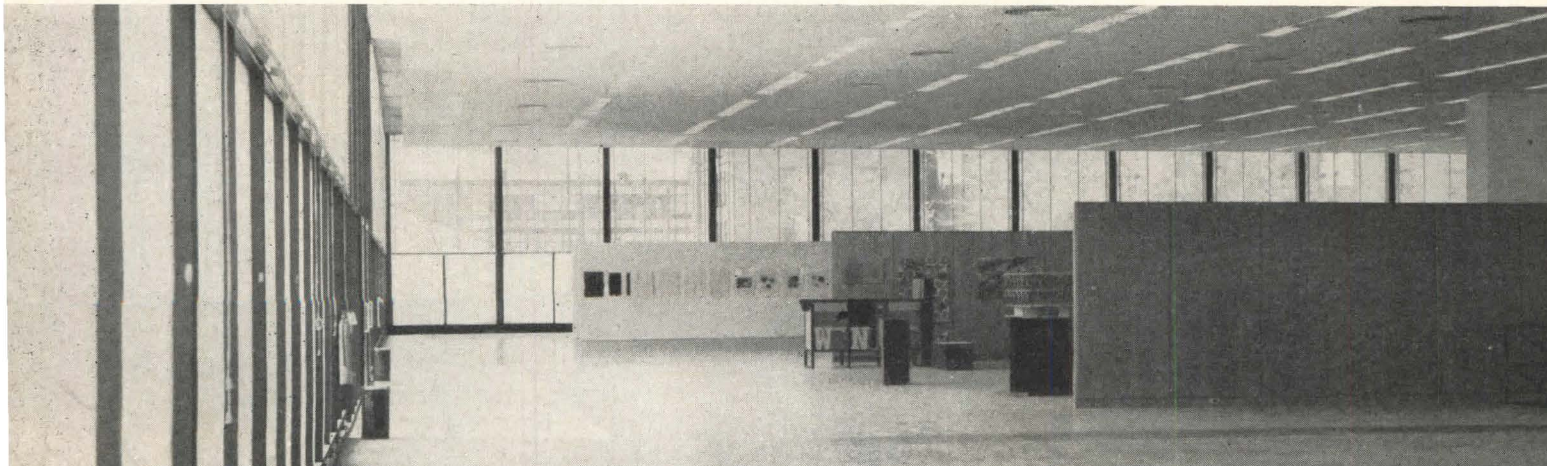
AR

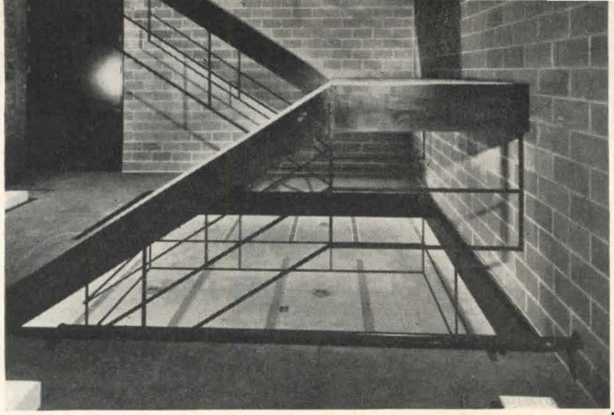
A miscellaneous shelter



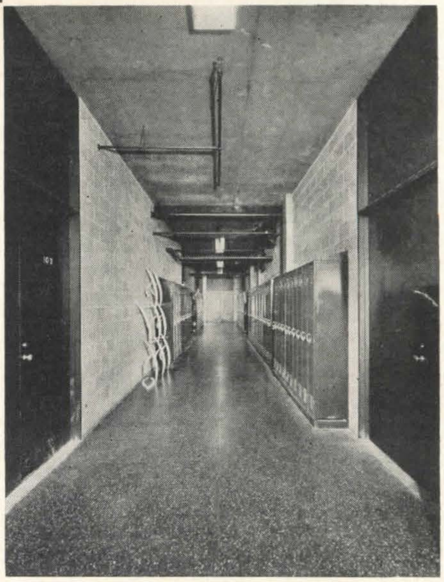
Chicago Architectural Photographing Company

For deliveries



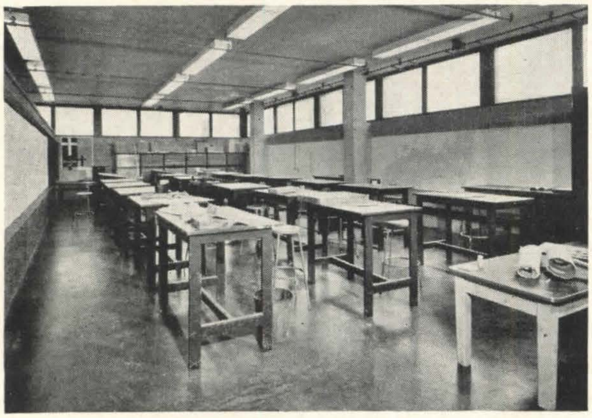


Up from the lounge



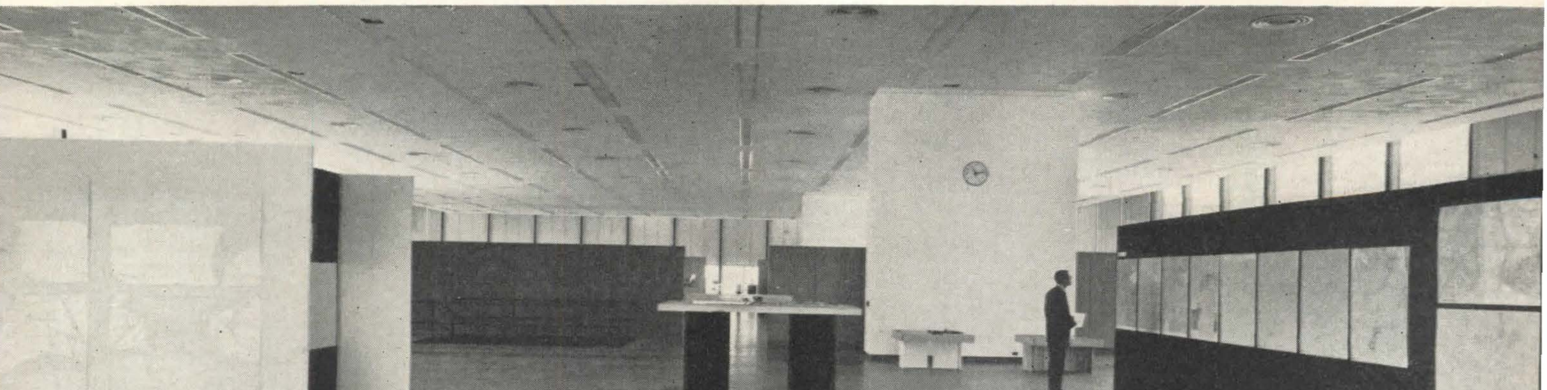
Chicago Architectural Photographing Company

A corridor to Design

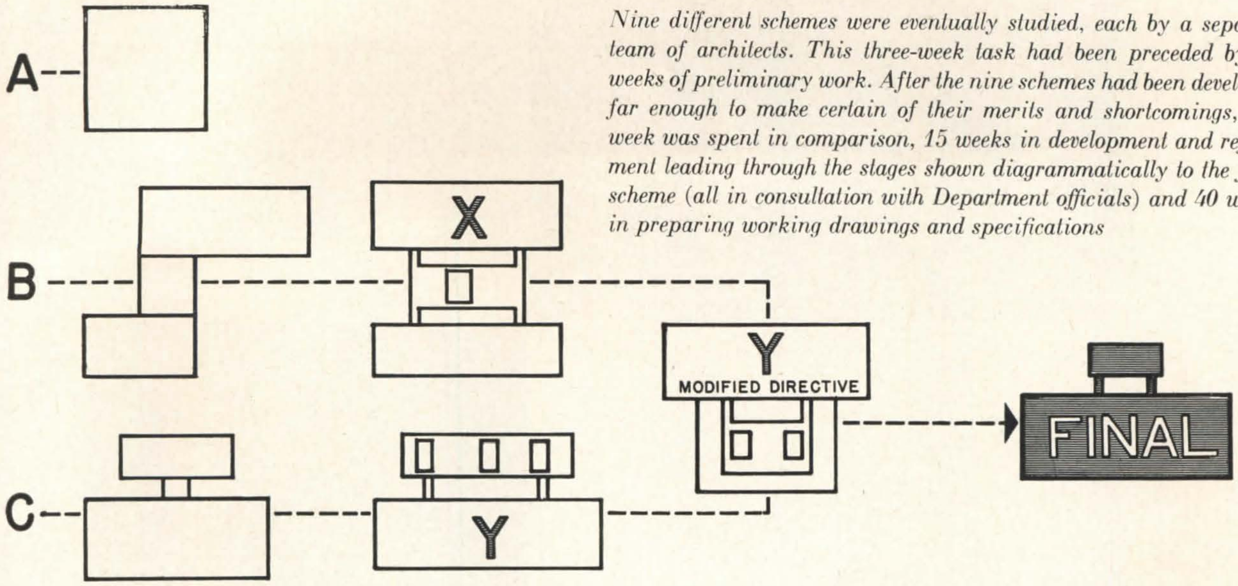


Chicago Architectural Photographing Company

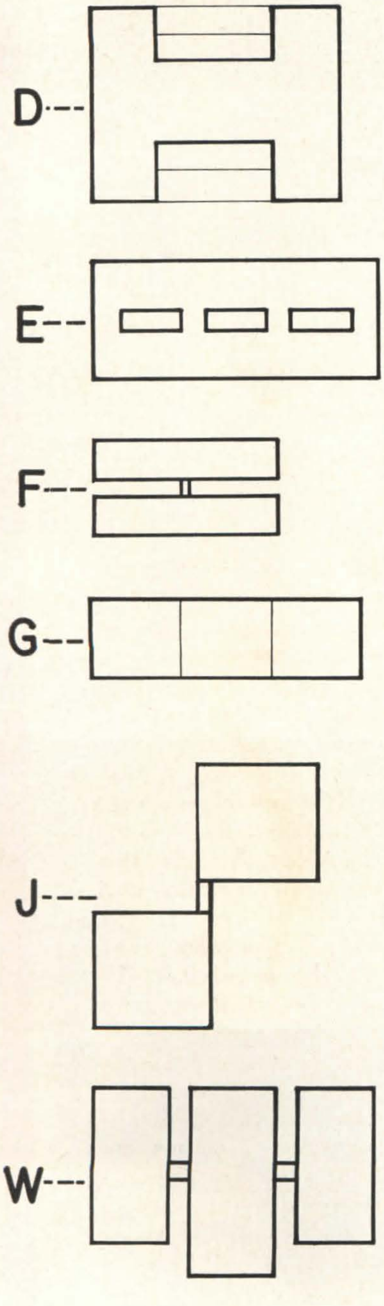
Typical design workshop



Chicago Architectural Photographing Company



Nine different schemes were eventually studied, each by a separate team of architects. This three-week task had been preceded by 16 weeks of preliminary work. After the nine schemes had been developed far enough to make certain of their merits and shortcomings, one week was spent in comparison, 15 weeks in development and refinement leading through the stages shown diagrammatically to the final scheme (all in consultation with Department officials) and 40 weeks in preparing working drawings and specifications



PROGRAMMING AND DESIGN OF THE

St. Louis, Missouri

ASSOCIATED ARCHITECTS & ENGINEERS:

Hellmuth, Yamasaki & Leinweber
Predecessors to Hellmuth, Obata & Kassabaum, Inc.

Wm. C. E. Becker
Structural

John D. Falvey
Mechanical, Electrical

F. T. Hilleker & Associates
Kitchen Consultant

DEPARTMENT OF DEFENSE PLANNING, CONSTRUCTION:

Col. M. O. Billbe, USA
Project Officer

Col. E. C. Adams, USA
District Engineer
Kansas City District, Corps of Engineers

Mr. Louis G. Feil
Chief, Engineering Div.
Kansas City District, Corps of Engineers

Mr. William Wall
Chief Architectural Div.
Kansas City District, Corps of Engineers

Mr. Charles Henderson
Director
Naval Records Management

THE DEPARTMENT of Defense wanted a central facility for personnel records. Like many problems which architects are called upon to solve, this one had a deceptively simple sound; but in 1951 when St. Louis architects Hellmuth, Yamasaki & Leinweber (now Hellmuth, Obata & Kassabaum, Inc.; the new firm was set up in 1955) were selected to design such a building, they were aware that finding a solution would be a highly complex process calling for a great degree of organization. The importance of this process is emphasized by the fact that the end result was better than had been expected — and it cost almost $7 million less than had been anticipated.

The process started with a statement of the problem, which took the form of a long, detailed directive prepared by the Department of Defense. It was soon clear that the exact nature of the problem was not contained in a list of the needs. For example, the question arose as to the basic function of the building. Was it a warehouse, as seemed to be implied by the Department's approach to it? Was it an office building? It was known that more than 38 million individual service records were to be filed in the building, and that they would require space in warehouse quantities. Only after detailed study could it be

Max Mazuki

U. S. MILITARY PERSONNEL RECORDS CENTER

determined just how often these files were active and therefore how accessible, and to whom and for what, they must be.

The answer to these and many other questions lay in a thorough grasp of the functions of the building. So the first step was for the architects to examine the directive with care and to raise all the questions about it that seemed relevant. Then a conference was held with the officials of the Department who were concerned with the construction and use of the building. This conference answered some of the architects' questions, but it also emphasized areas where there were no answers. It became clear that the different Services — Army, Navy, Marines and Air Force — had differing needs. The Army keeps its files in metal file cabinets, the Navy in boxes on open shelves. The more the architects looked into the problem, the more they became convinced that if the new Center was to be satisfactory, an efficient functional system for the handling of records must first be evolved and *then* enclosed in a building. This was the only way they could be sure that the building would really serve its purpose.

The architects then inquired into methods of handling records. They talked to appropriate officials, visited existing facilities, investigated records handling by other organizations. They found that there did not then exist anywhere a really satisfactory system for efficiently processing records in the quantity here dealt with. They found no system to use as a pattern, but they did make an invaluable collection of data about what such a system must do.

To reduce this data to a workable form was the next step. The architects prepared an extensive study of the requirements: diagrammatic and statistical analyses of each part of the process, in terms of space required, of personnel, of exact functions to be performed, and of circulation of people and materials. Basic functional patterns became clear as this study progressed: The raw material for the files would enter through the Mail Room at the rate of 55 to 60 mail sacks containing 56,000 separate pieces per day. This incoming material would have to be accurately sorted and routed to appropriate offices. Speed was here essential to keep the entire process from getting bogged down at the start. The function also had to operate properly in reverse, to accommodate an equal flow of outgoing mail. Each incoming piece would undergo certain processes, varying with the nature of the item. Most of these processes were designed to be performed in successive steps, which necessitated a logical organization of the locations in which they were to be performed. Each item would ultimately end up in a permanent file. These permanent files must be accessible for the 56,000 daily references.

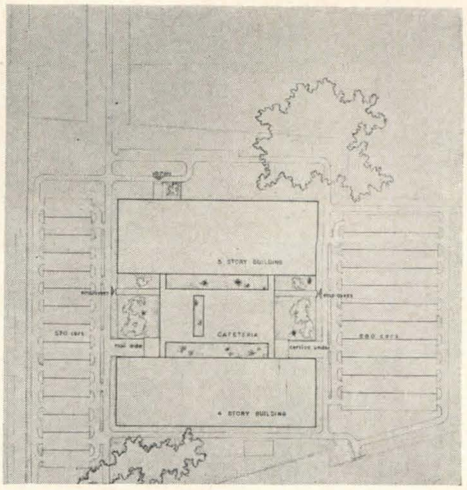
To these operational requirements had to be added the working and human requirements of the approximately 4,000 people who would ultimately staff the Center. Working conditions which would cut down the amount of walking through rows of cabinets, and would increase the efficiency of workers through good use of light and air, were obvious requirements. A cafeteria, rest rooms, access to parking and transportation — all had to be included and studied in relation to each other and to the operation as a whole.

Out of this detailed program, which was developed in close consultation with the many groups and individuals in the different Services who were to use the building, came a statement by the architects of just how they saw the Department's needs. This was checked in detail with Department officers and revised to insure that it expressed a mutual understanding of these needs.

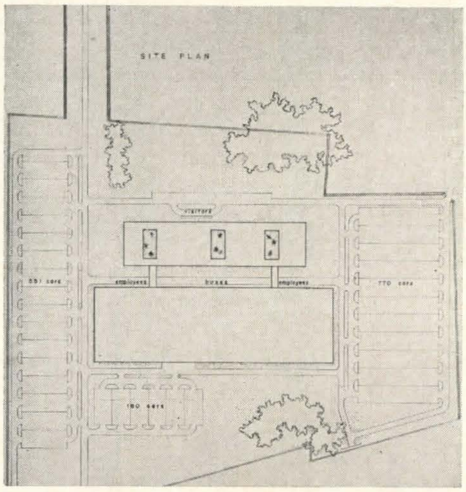
All this was done before building design was started. It had to be to establish the exact dimensions of the problem. For example, it made plain the fact that what was needed was not just a warehouse for storing records, but an efficient office mechanism for "working" the records.

One other simpler step was necessary before design could be started. The conditions within which the solution was to be worked out were stated in the Department's directive. Budget limitations, site, general specifications, and Department policies and regulations there set forth were discussed and clarified.

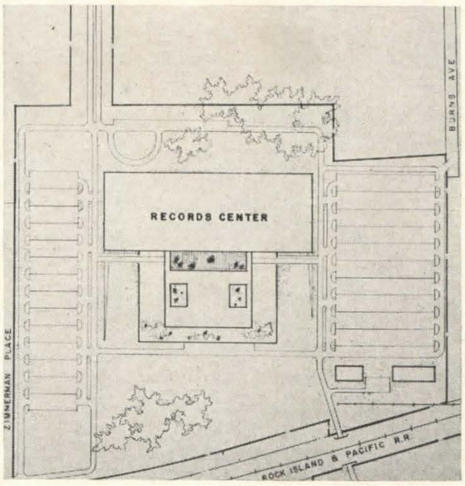
The all-important groundwork done, the architects could embark on the design phase. Even though some ideas as to possible solutions had naturally come to mind as needs were studied — others had been ruled out — there were still many different architectural answers which seemed to have certain value. The decision was made to take nine different possible plans and to develop each independently of the others to a stage which would permit its strong and weak points to merge clearly. To take one example of this process, the square six-story-and-basement building originally envisioned by the Department was explored in all its variations, and the architects eventually concluded that the main advantage was (to quote from their report) "the maximum floor area was enclosed by the minimum perimeter, which permits certain economies." But they also found serious disadvantages: ". . . The primary basis for the decision to eliminate this scheme from further consideration was the impossibility of providing each department with its area requirements as set forth in (the study of needs) and still maintain the necessary functional relationship with other departments which formed the very basis for the construction of the project." Other disadvantages, such as the dark center inherent in the square shape and the



SCHEME X *was one of two principal developments resulting from study of nine original schemes. At about the time it was developed, it was decided to use standard bays throughout rather than special sizes for each Service*

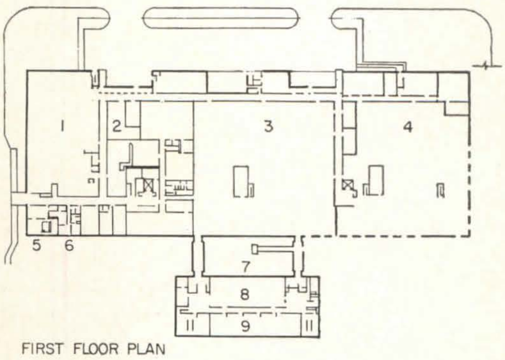


SCHEME Y *was the other principal early development. Here space for all Services is in one structure, with administration, cafeteria and recreation in the smaller, lower unit*

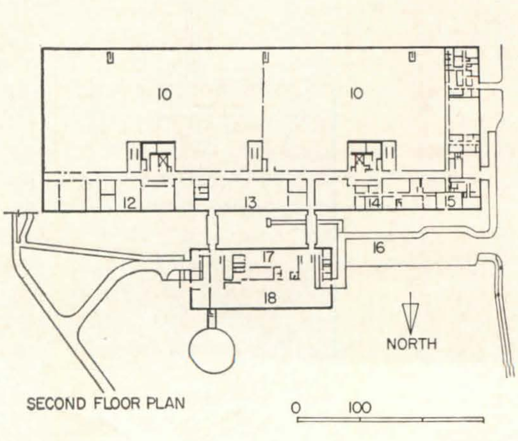


SCHEME Y, MODIFIED DIRECTIVE, *resulted from comparative study of Schemes X and Y, was the basis for modification of the Department's original design directive*

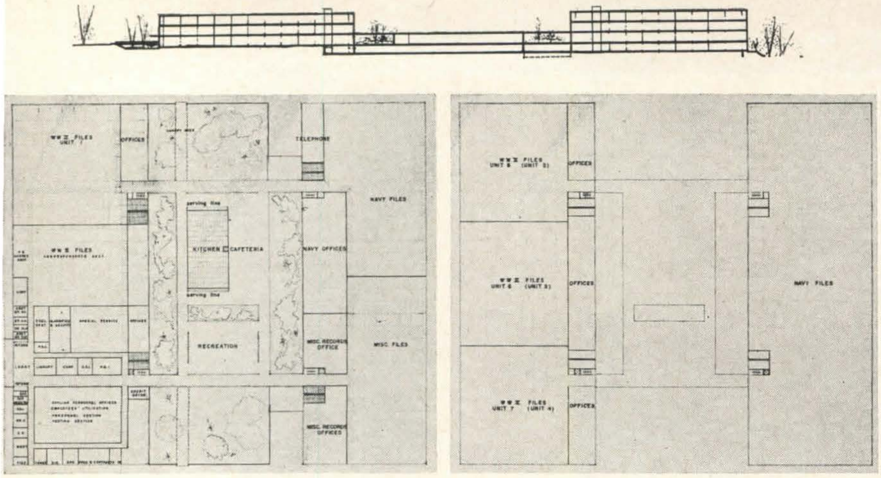
FINAL SCHEME *got into working drawings 15 weeks after the nine original schemes had been jointly studied. Note modular bays, files directly accessible to clerical workers, easy expansibility*

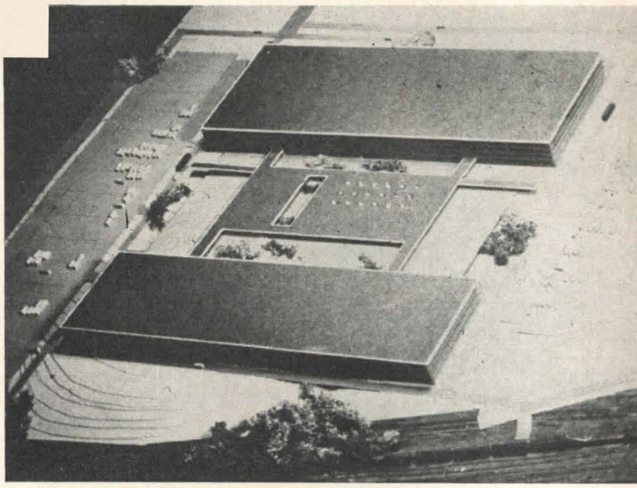


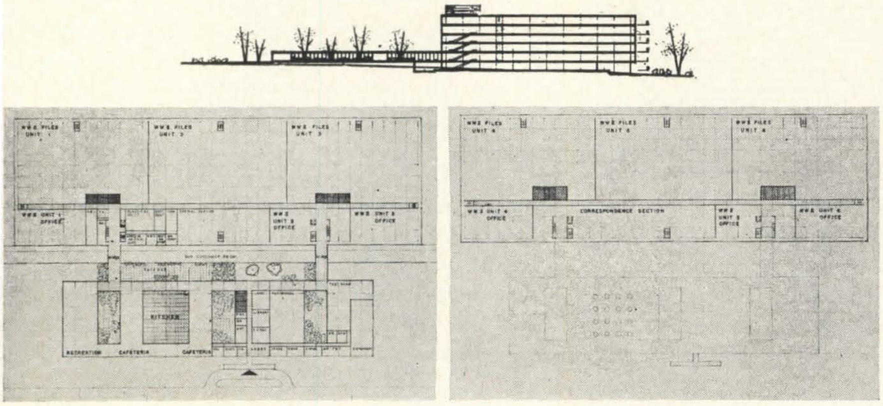
FIRST FLOOR PLAN

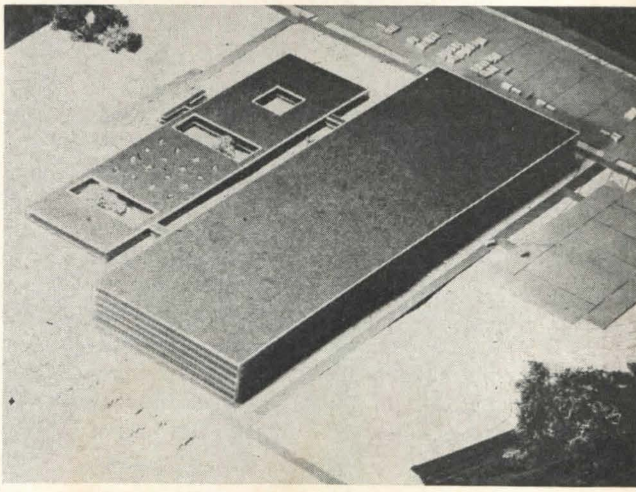


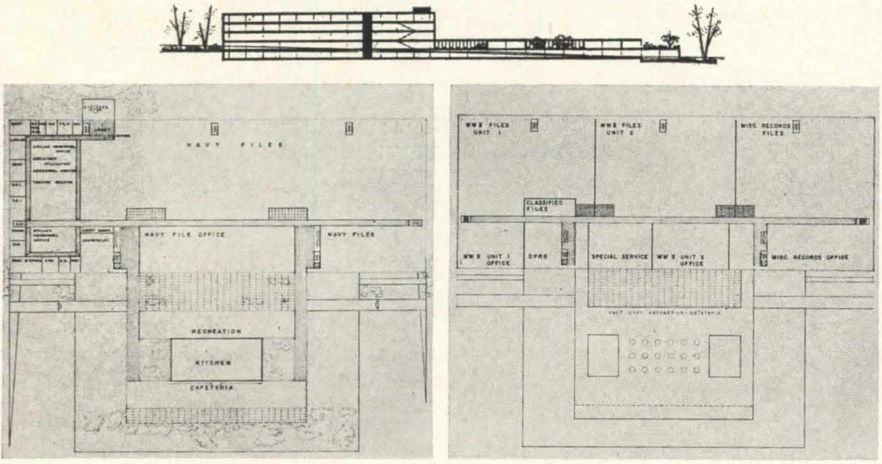
SECOND FLOOR PLAN

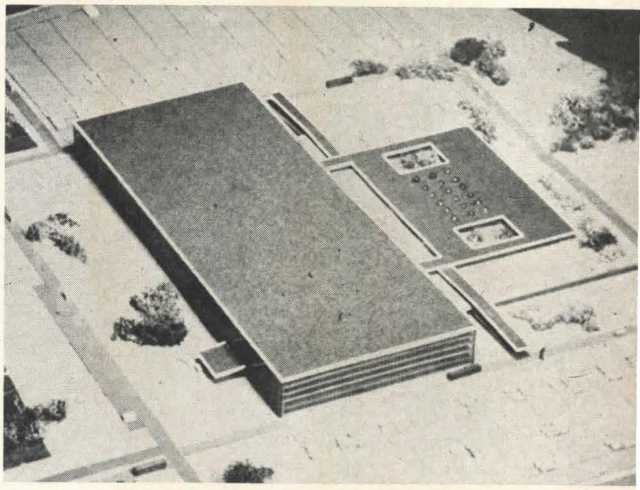




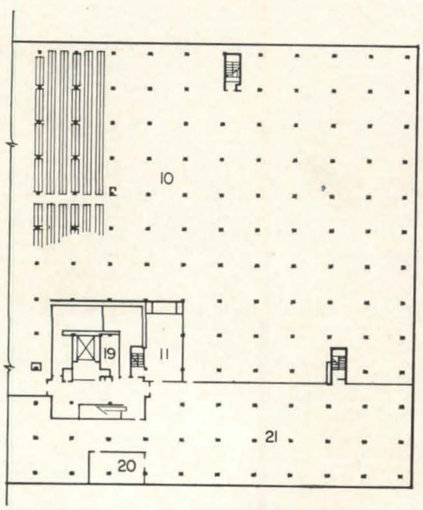


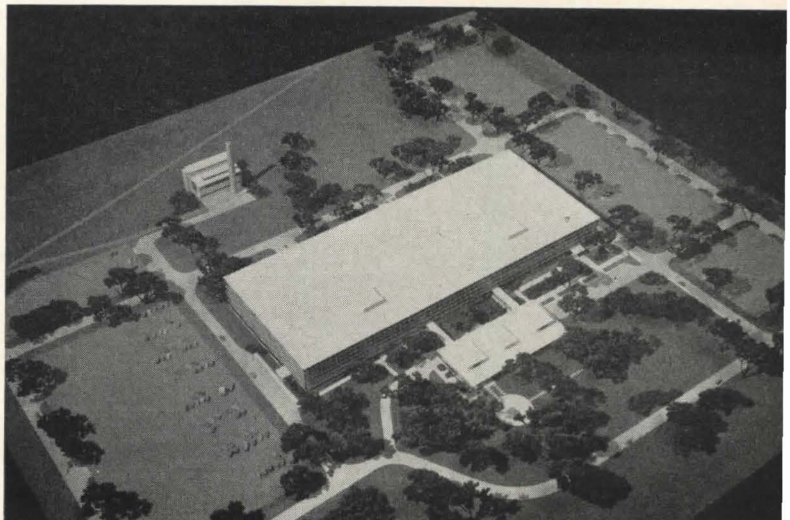






1. Mail and Message
2. Salvage
3. Records, Staging and Storage
4. Post Property Supply & Warehouse
5. Labor
6. Custodial
7. Court
8. Assembly
9. Meeting Rooms
10. Navy Files
11. Mechanical Equipment
12. Civilian Personnel
13. Navy Offices
14. Central Headquarters
15. Guard
16. Visitors Parking
17. Kitchen
18. Cafeteria
19. Store Room
20. Office
21. General Office



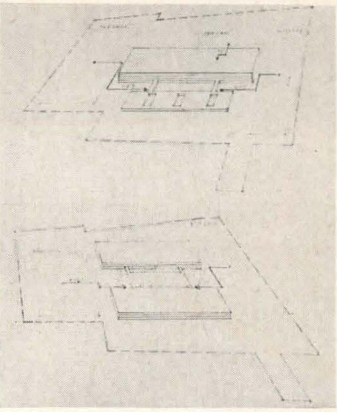


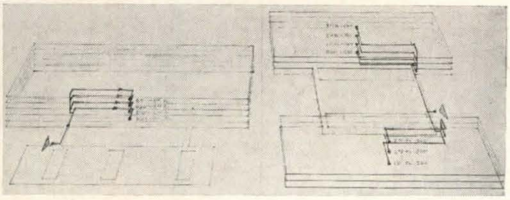
need for multiple vertical transportation, were also noted.

Some of the schemes studied emphasized one aspect of the problem, some another. One, based on the fact that dimensions of a standard structural bay for storage areas was different for the different Services, presupposed a plan in which the structure would be closely adapted to the exact needs of each. When developed far enough, this scheme, too, was found to have serious shortcomings: the individually adapted bays prevented efficient over-all operation of the system, made expansion almost impossible and resulted in a building poorly suited to the site. Studying all these schemes led to a decision to standardize space requirements for the Army and Navy to permit using one common bay spacing, which would produce substantial economies.

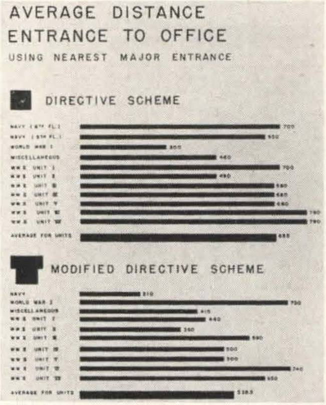
This was accomplished in the next phase of the process, that of comparing the various schemes after they had been developed, and studying their advantages and disadvantages jointly. Each team of architects which had been working on each of the nine schemes presented its findings as persuasively as possible, and each absorbed the work of the others. A report on this study phase was prepared and submitted to the Department. It was discussed in detail, and one scheme, or rather a combination of two, was selected as most promising. After an additional conference in Washington to alter the original directive to permit the type of building selected, the decision was made to proceed with development of the plans.

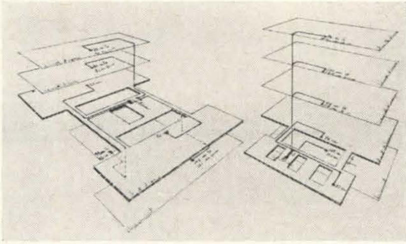
Relying on their detailed study and keeping constantly in mind the many inter-related factors of function, circulation and space, the architects worked out and submitted further refinements of the basic scheme. These were criticized in consultation with Department officials, and as a result of this collabora-



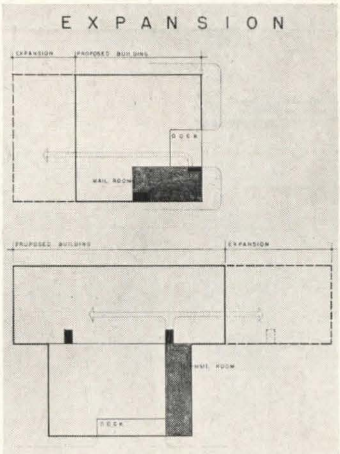


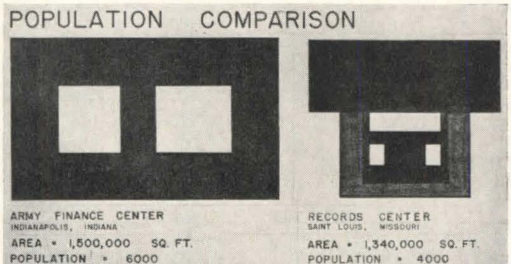
Eight weeks were required for diagrammatic and statistical studies preceding development of any of the nine preliminary schemes previously shown. Above, analyses of walking distances were among similar studies occupying the final refinement period; left, from average parked car to entrance; right, entrance to average office





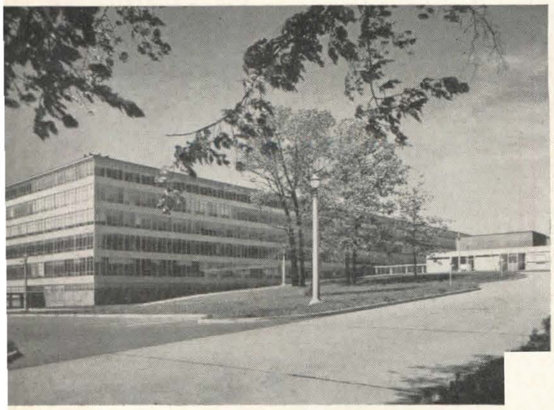
Comparison of distances, left above, between square plan required by original directive and scheme of modified directive plan, was used to demonstrate advantages to Department officials. Right, vertical travel compared, schemes X and Y





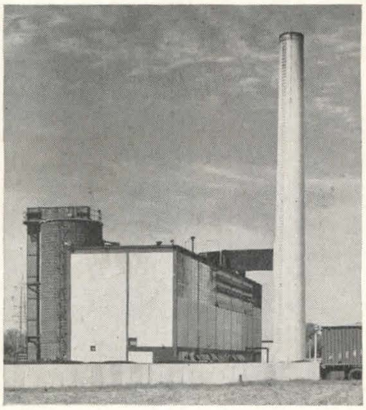
Left, comparative expansibility, directive and modified directive schemes; right, comparison, area per person, modified directive scheme and Army Finance Center

Entrance facade



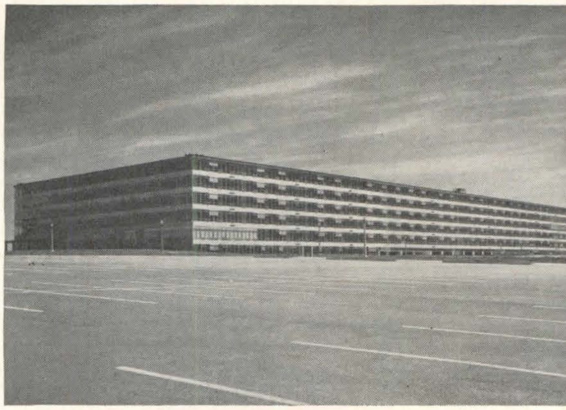
Mac Mazuki

Boiler plant



Mac Mazuki

Ample parking

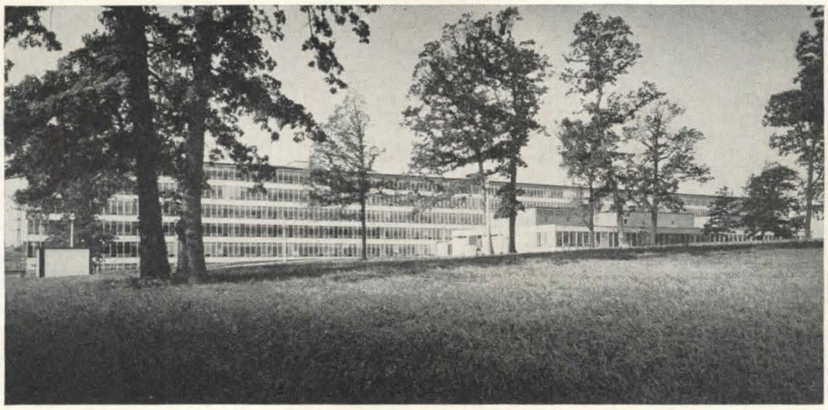


Mac Mazuki

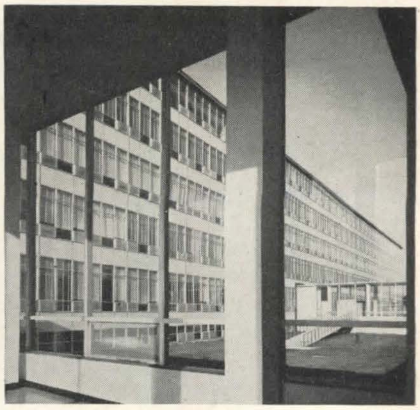
© Ezra Stoller

The six-story building that was eventually constructed went up rapidly as a result of thorough programming and equally careful attention to all details during development of design and working drawings. The structure has a reinforced concrete frame and floors, concrete block exterior walls, aluminum windows

Adaptation to site



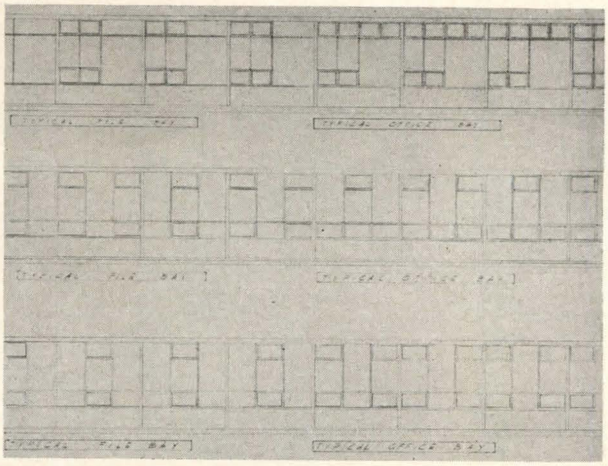
Corridors connect buildings

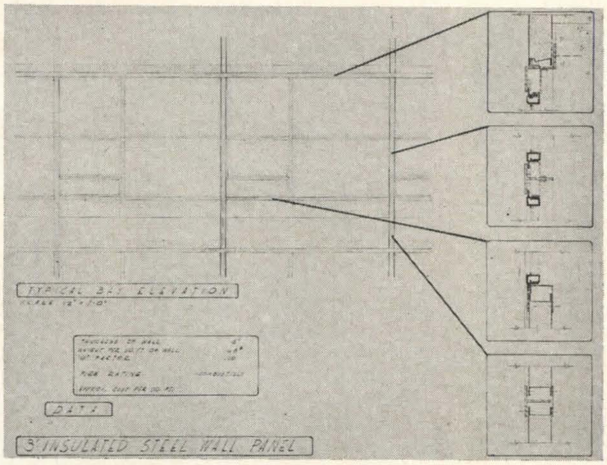


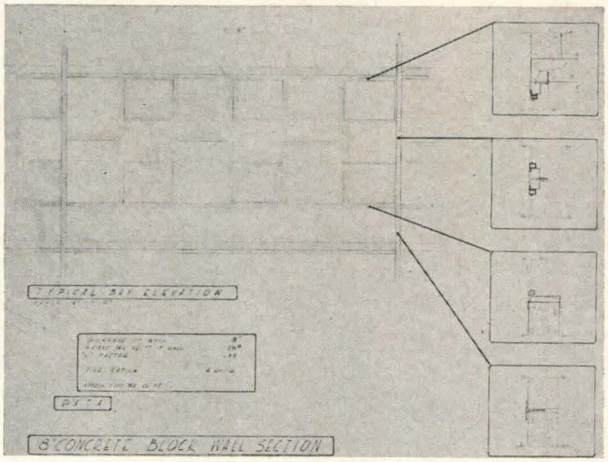
tion the final design emerged as a logical product of the needs of the using Services, the standards of the Department, and the goals of the architects.

The preliminary study had so organized the requirements as to make it possible to assign them priorities. The primary fact was that the relationship of the file and office areas was of the utmost importance, for the "working" of the files was seen as the most frequent, most central operation. All other functions could be ranged around this one and their relationships worked out to insure maximum efficiency. If the functional scheme itself is the heart of the job, no less important once that scheme is in hand is detailed design of every component of the building. It was natural for the architects who insisted upon such a thorough study of needs also to insist upon supervising each detail of design. Wall faces, doorways, window sash — all details for these came from the architects' drafting room where, again, the many possibilities were thoroughly canvassed to insure selection of those most consistent with the building's function and those most economical.

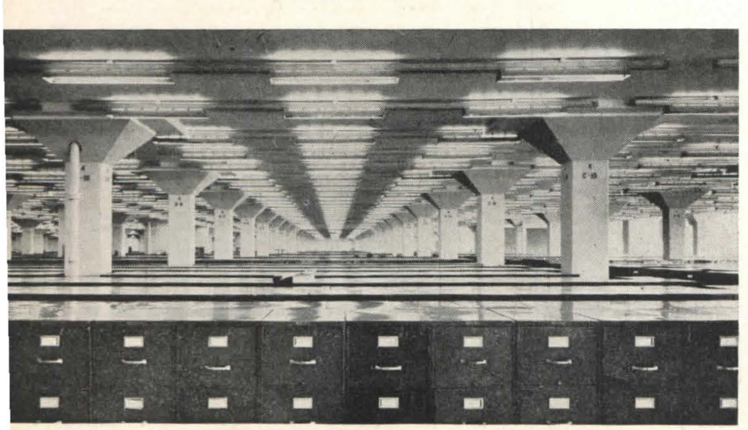
At the start of the project, Department of Defense officials gave the architects a budget figure of \$19 million for the building itself. The final structure, including such additions (to what had initially been included) as increased air conditioning, was built for approximately \$12½ million. This was not because the original budget was high — the Records Center is one of the 20 largest buildings in the world; it has 1,349,148 square feet of usable floor area; the Empire State Building has 2,690,383. The saving was due to the fact that the process described here resulted in a building which does the exact job required of it, and in which every aspect of the project is precisely related to its part in doing that job.







Of the number of fenestration studies made once the final scheme had been determined, only one (top right) is shown here. Similarly, wall materials studies were made in quantity, analyzing merits and shortcomings of several materials; insulated steel panels (discarded) and concrete block (accepted) studies are shown at right. Note continuous aluminum Tees which are both window mullions and controls for shrinkage of the block



Vast file areas are immediately accessible to appropriate clerical offices with minimum difficulty of "working" the files. The time-table for the programming and design work necessary to arrive at an optimum for this prime function of the building was:

1. *Study of Department directive, conferences & discussions of needs with Department officials. . 2 weeks*

2. *Research and study of other facilities, travel, etc. . . . . . 4 weeks*

3. *Detailed preparation and study of survey — diagrammatic & statistical analyses. . . . . 8 weeks*

4. *Further conferences and discussions . . . . 2 weeks*

5. *Development of nine different schemes by separate teams of architects. . . . . 3 weeks*

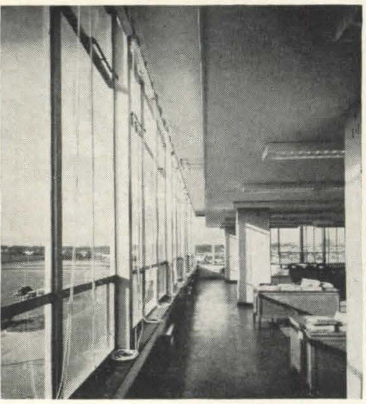
6. *Joint study of all schemes . . . . 1 week*

7. *(After decision of final scheme) Development and refinement of final scheme, in consultation with Department officials. . . . . 15 weeks*

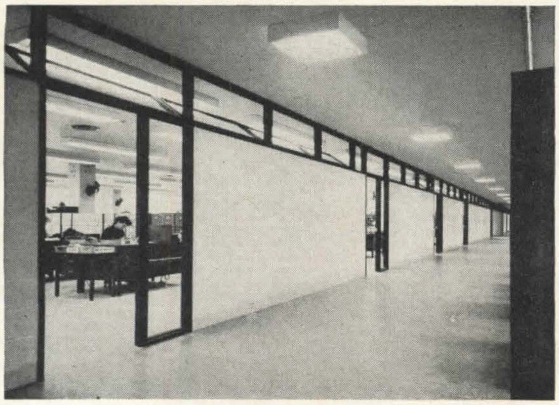
8. *Working drawings. . . 40 weeks*

The Records Center has about 1,340,000 sq ft of floor area. Flooring in offices is asphalt tile; in file areas, cement finish; in a few areas, terrazzo. Heating is low-pressure steam; the building is air conditioned. There are two freight elevators and one small passenger elevator; escalators to all floors handle most of the circulation. Windows are washed from a carriage suspended from the roof on rails. Eventually 4000 people are expected to work in the Center

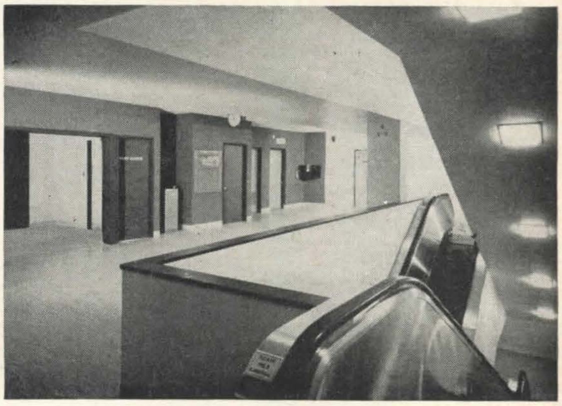
Ample daylight



Wide corridors



Moving stairways



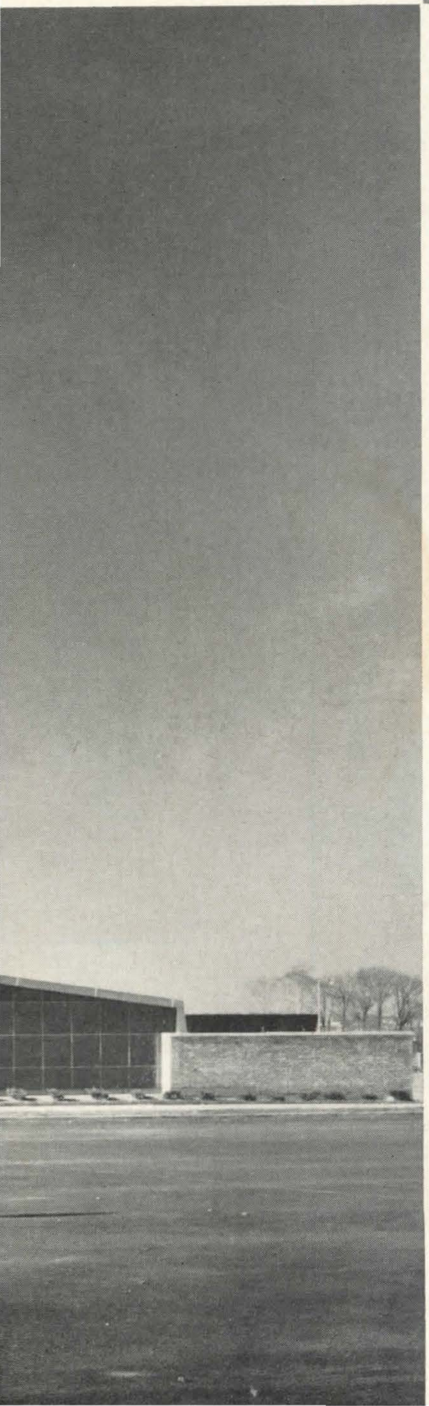
A BUILDING FOR BOWLING

Facilities for one of the country's fastest growing sports rarely enjoy the kind of site, programming, and design which produced this building.

As part of an overall recreation scheme for the planned town of Fairless Hills, Pennsylvania, the building was assigned a site which permitted its development as a free-standing structure. Further the program did not demand a building capable of convertibility to other uses. It did, however, ask for an environment which would promote family participation in bowling; reflect the steel manufacturing orientation of the community; and be easily maintained.

Spatially the public service and control areas including the spectator promenade open completely into

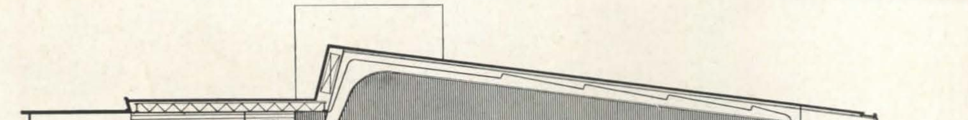
Joseph Molitor



"Fairlanes," Fairless Hills, Pennsylvania

Tully and Hobbs and John R. Diehl, Architects

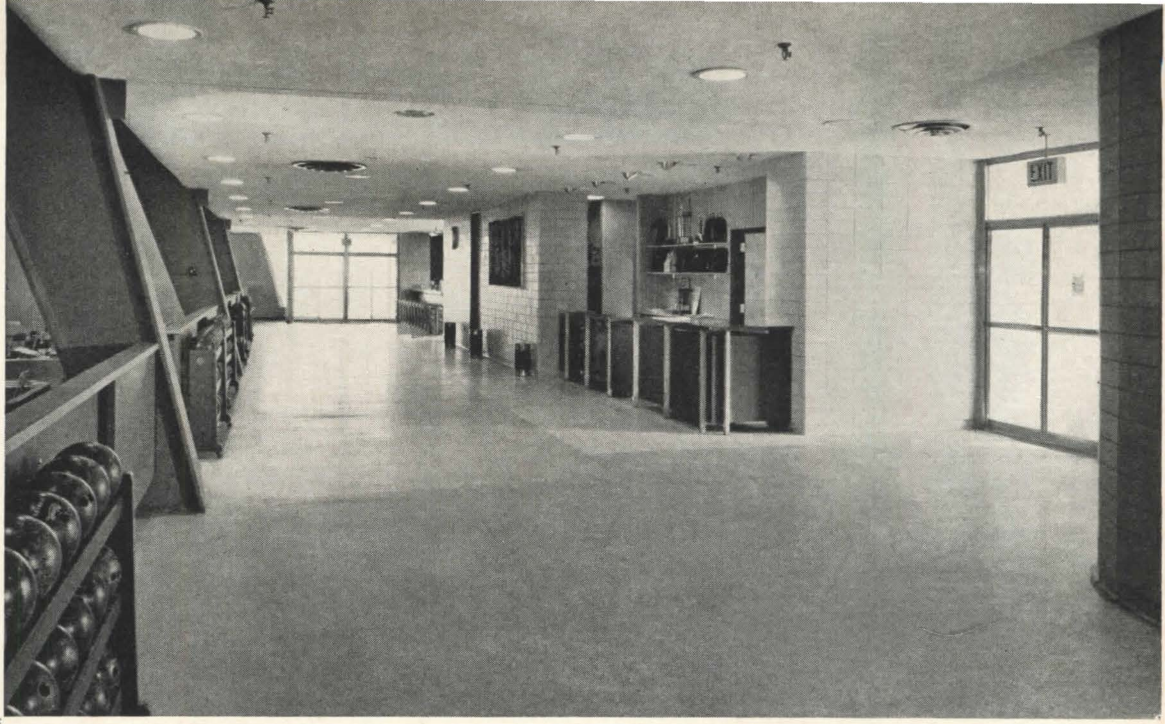
A. Ernest D'Ambly, Consulting Mechanical Engineers
Marion V. Packard, Landscape Architect
Turner Construction Co., General Contractor

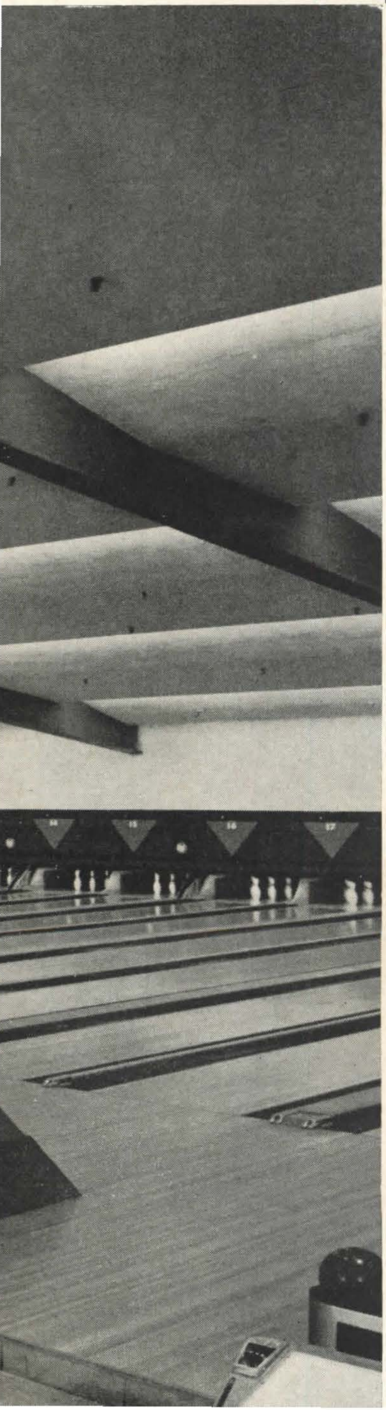


the bowling area where 24 alleys are 2 ft 6 in. lower. With human occupancy concentrated at one end the great roof has been carried down on four rigid steel frames of bright vermillion to a low ceiling at the rear, affording a change from the scale of men to the scale of bowling pins. Planes of acoustical plaster hide continuous fluorescent lighting strip and control the noise level throughout the bowling area.

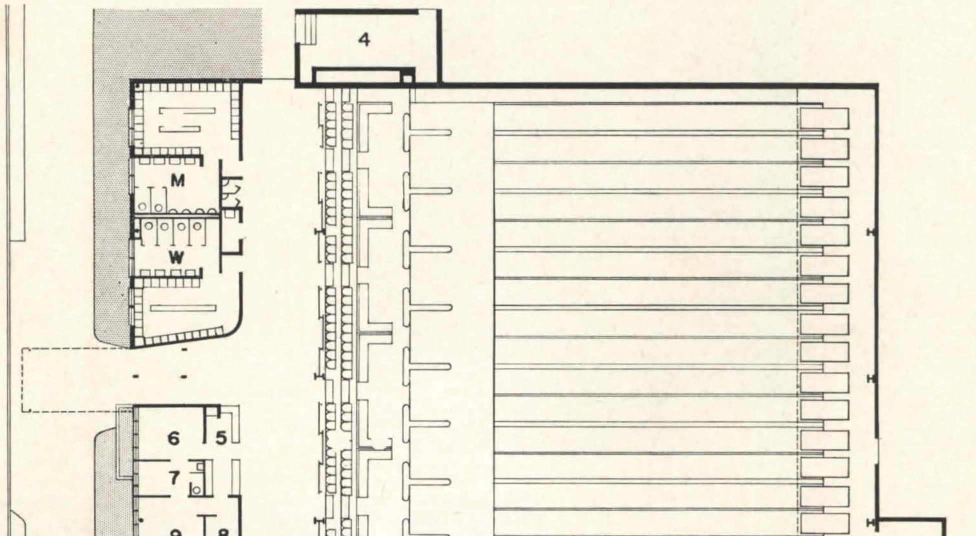
Heating, ventilating, cooling, electric and water service equipment are efficiently stacked in the 3-level mechanical tower.

Interior walls are ceramic glazed structural tile, grooved plywood; floors are terrazzo. Exterior walls are white brick and porcelain enameled metal.

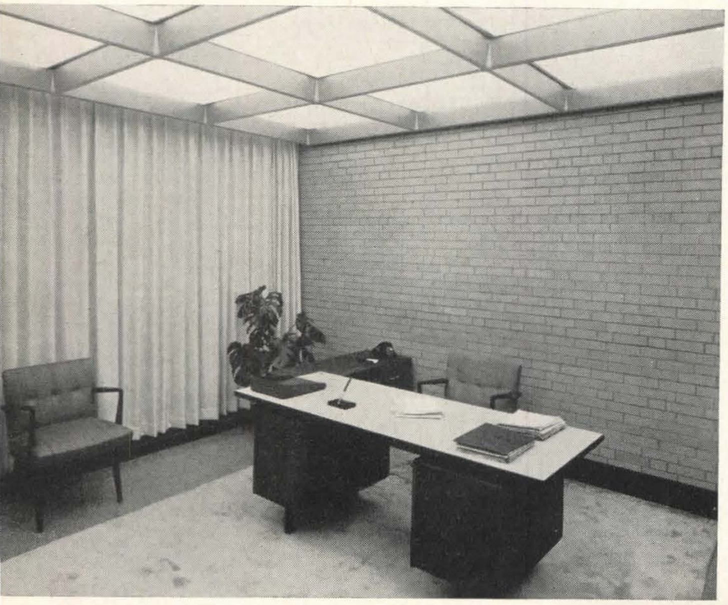




Joseph Molitor



1 mechanics toilet	4 mechanical	7 employees	10 conference
2 pin storage	5 control tower	8 coats	11 luncheonette
3 pin refinishing	6 manager	9 storage	12 kitchen



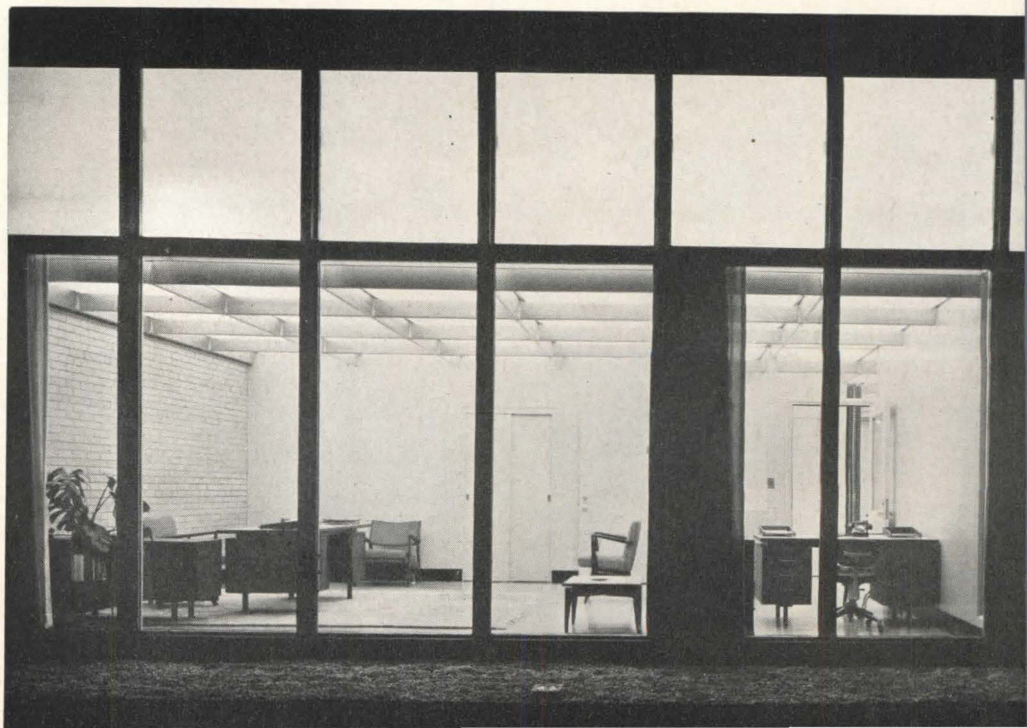
Addition to The Wakefield Co. Plant
Vermilion, Ohio

Outcalt-Guenther & Associates
Architects

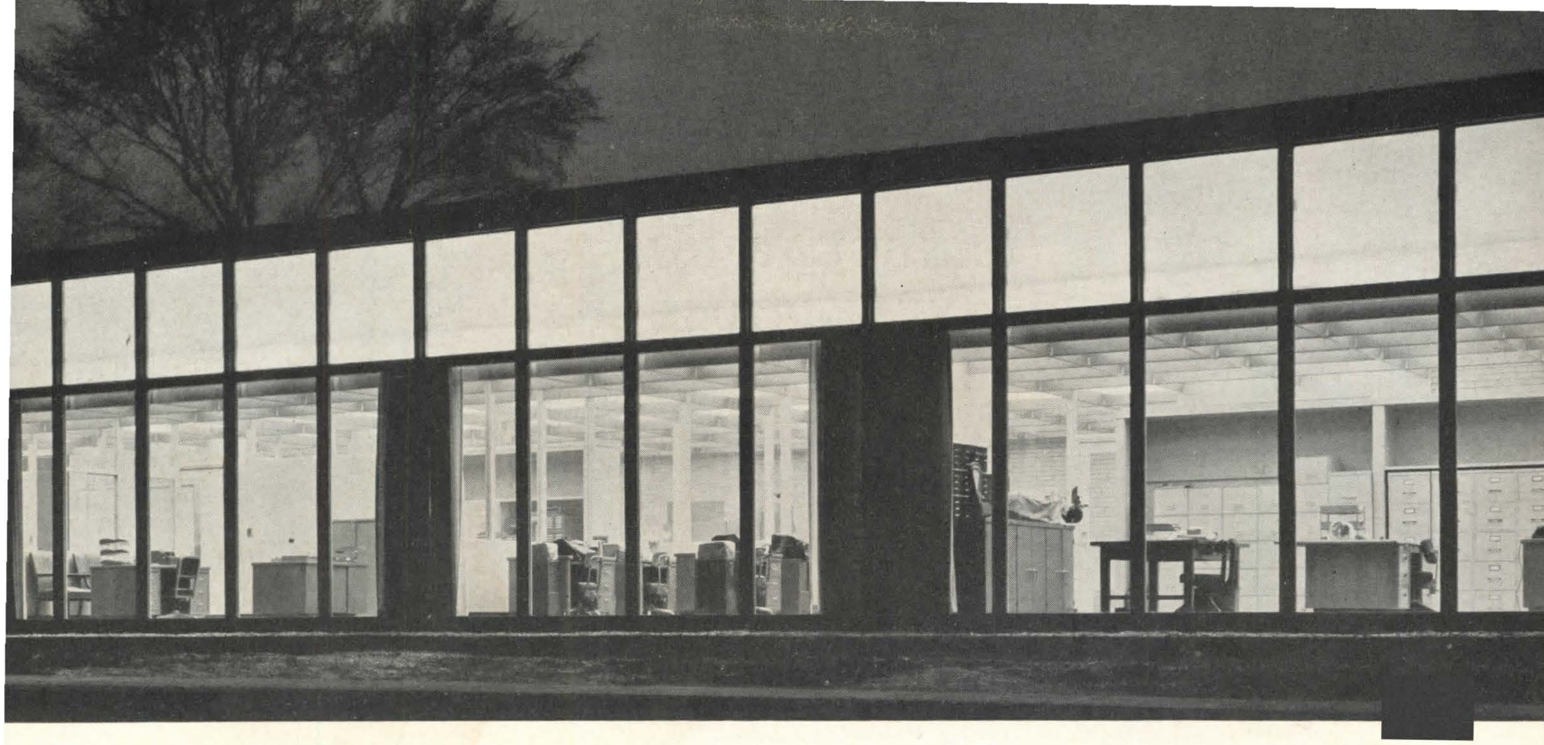
Howard Bennett & Associates
Mechanical Engineers

Mehnert & Reid
Electrical Engineers

Elmer Hume, Inc.
General Contractor



Photos courtesy GE Lamp Division

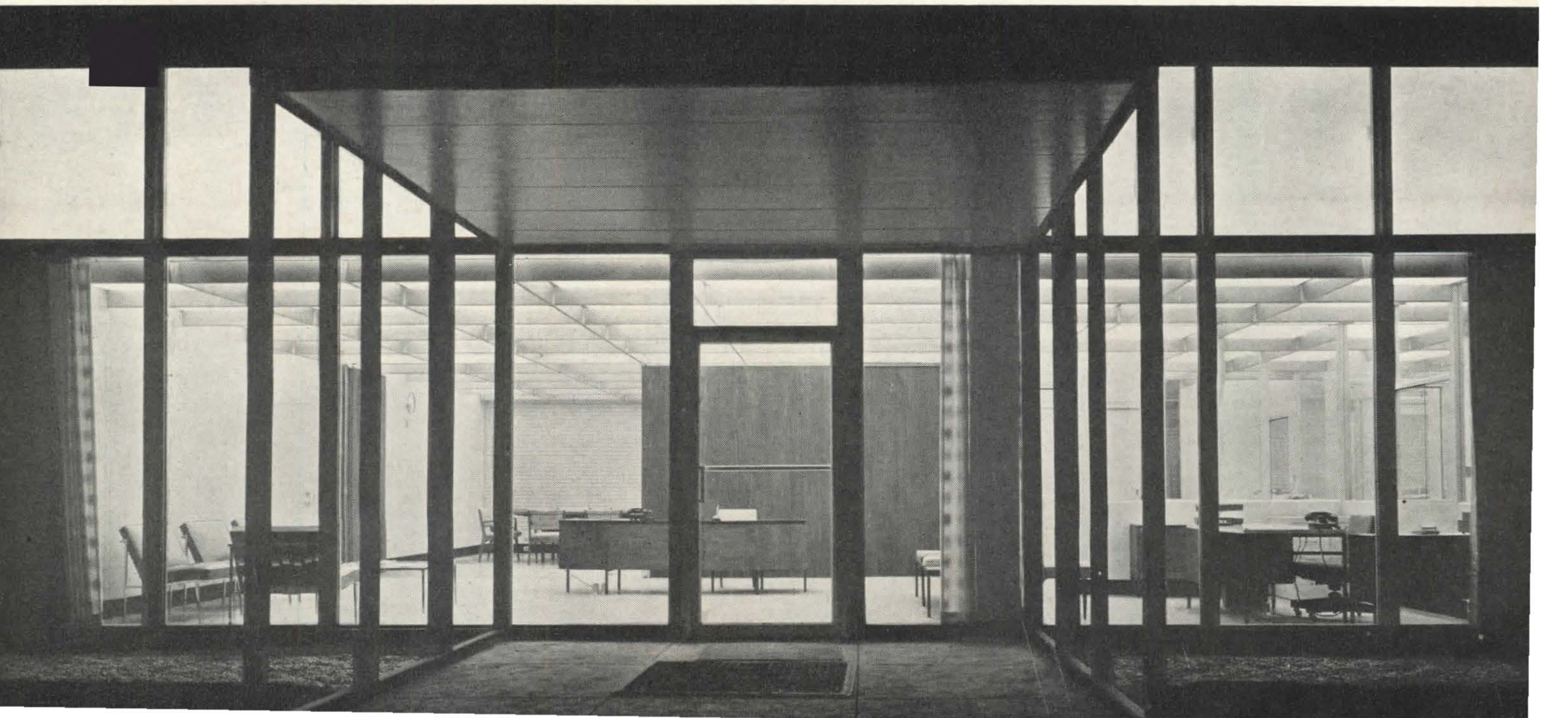


OFFICE-SHOWCASE FOR MANUFACTURER

In accommodating the expanding activities of this lighting equipment maker, the architectural problem was two-fold: first, to provide flexible office space; next, a full size, in-service demonstration of the modular ceiling-partition-wall system developed by the owner in conjunction with architect Saarinen and installed in the General Motors Technical Center. The suspended ceiling, now a standard product, is modular on a 4 ft. grid and incorporates lighting, sprinkler heads, air-conditioning diffusers, acoustical baffles, and channels to receive the tops of movable partitions.

The lobby — marked by the entrance canopy — divides the 40 by 120 ft. area into two parts: executive offices to the left; spaces for accounting, purchasing, filing, mailing, etc. to the right. A folding wood screen (see below) separates lobby and conference room. The rear (west) wall, of tan brick, is devoid of openings in order to screen out an unpleasant view, cut down excessive heat load, and demonstrate the effect of the lighting system in the absence of natural daylight.

The structure consists of tubular steel uprights and bar joists, spaced on the 4 ft. ceiling module.



INFORMAL LANDSCAPING KEYNOTES A NEW HOUSE

Residence for Mrs. Jackson Burke
Oyster Bay, Long Island, N. Y.

The Architects Collaborative
Architects and Landscape Architects

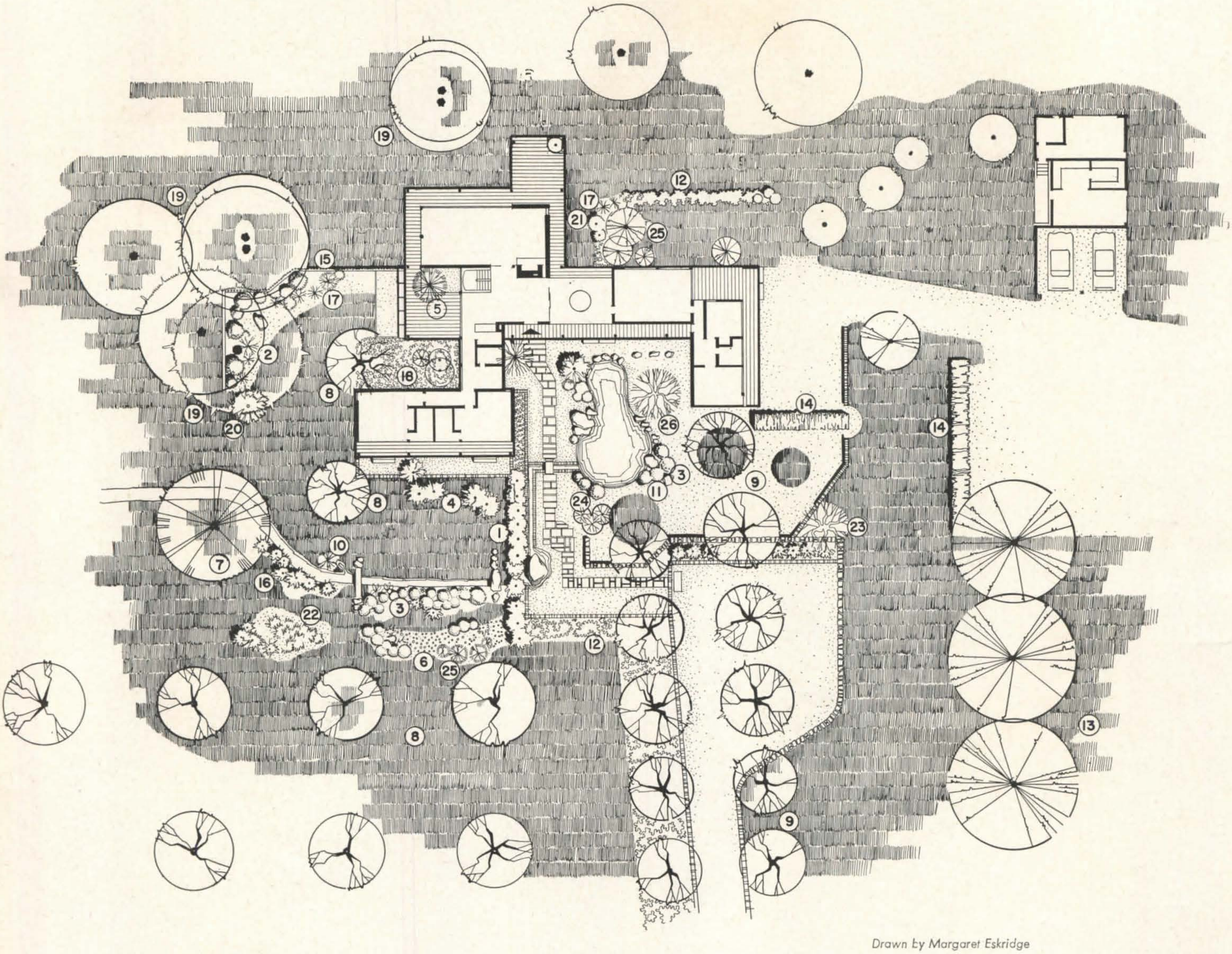
A BEAUTIFUL SITE with a distant view of Long Island Sound was an important factor in the design of this house. "We have sought," the architects explain, "to develop pleasant vistas from various vantage points in the house, and to emphasize the semi-enclosed courts created by the shape of the house by a series of informal gardens. This informal landscaping includes water as a focus for the entrance court, large hemlock hedges as space dividers, and large areas of gravel and lawn to define various functions." That they were successful is obvious: what more "pleasant vista" could one wish than the tranquil bedroom garden shown in the large photo at the right?

The house was originally designed for summer use only but was modified for year-round occupancy. Its three levels were planned (see pages 158 and 160)for entertaining without loss of privacy, and certain parts of the house —the master bedroom and study on the upper floor, for example — can be shut off completely if desired.

Construction is wood frame on a concrete block foundation. Exterior walls are largely red cedar T & G with a natural finish; interior walls are generally plaster board, painted. Furnishings are by Design Research, Inc., Cambridge, Mass.

All photos © Ezra Stoller

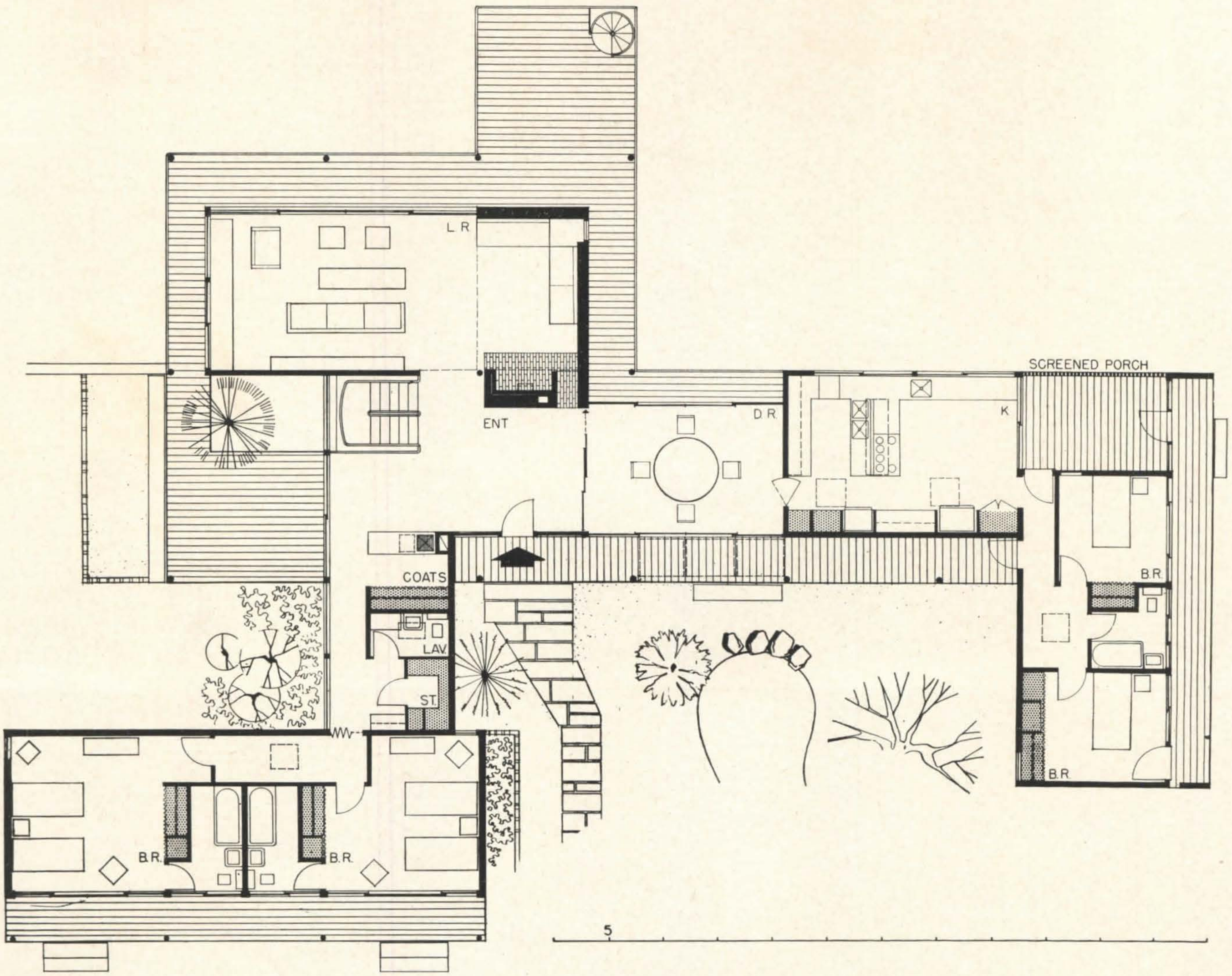
BURKE RESIDENCE



Drawn by Margaret Eskridge

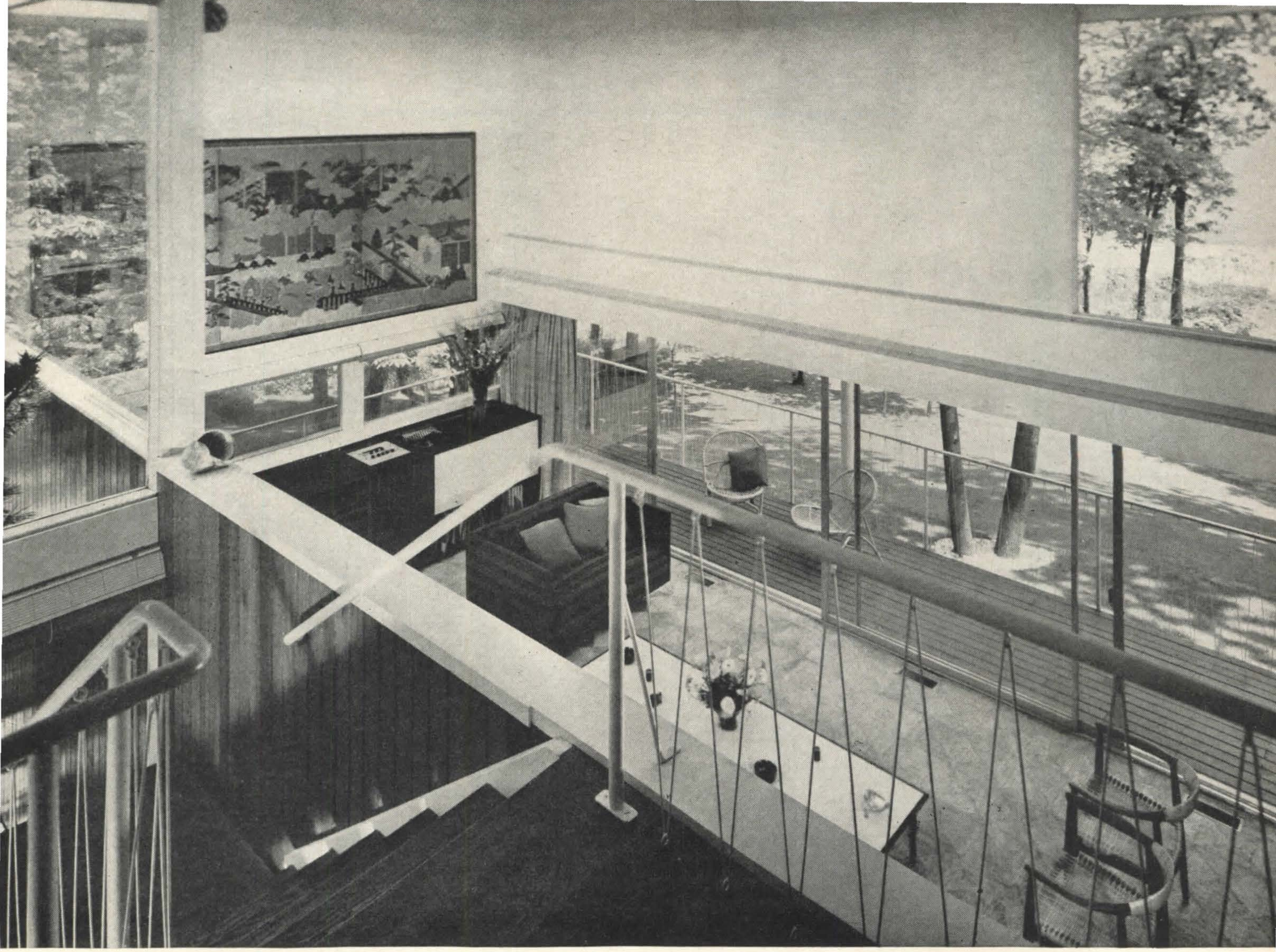
KEY TO LANDSCAPE PLAN

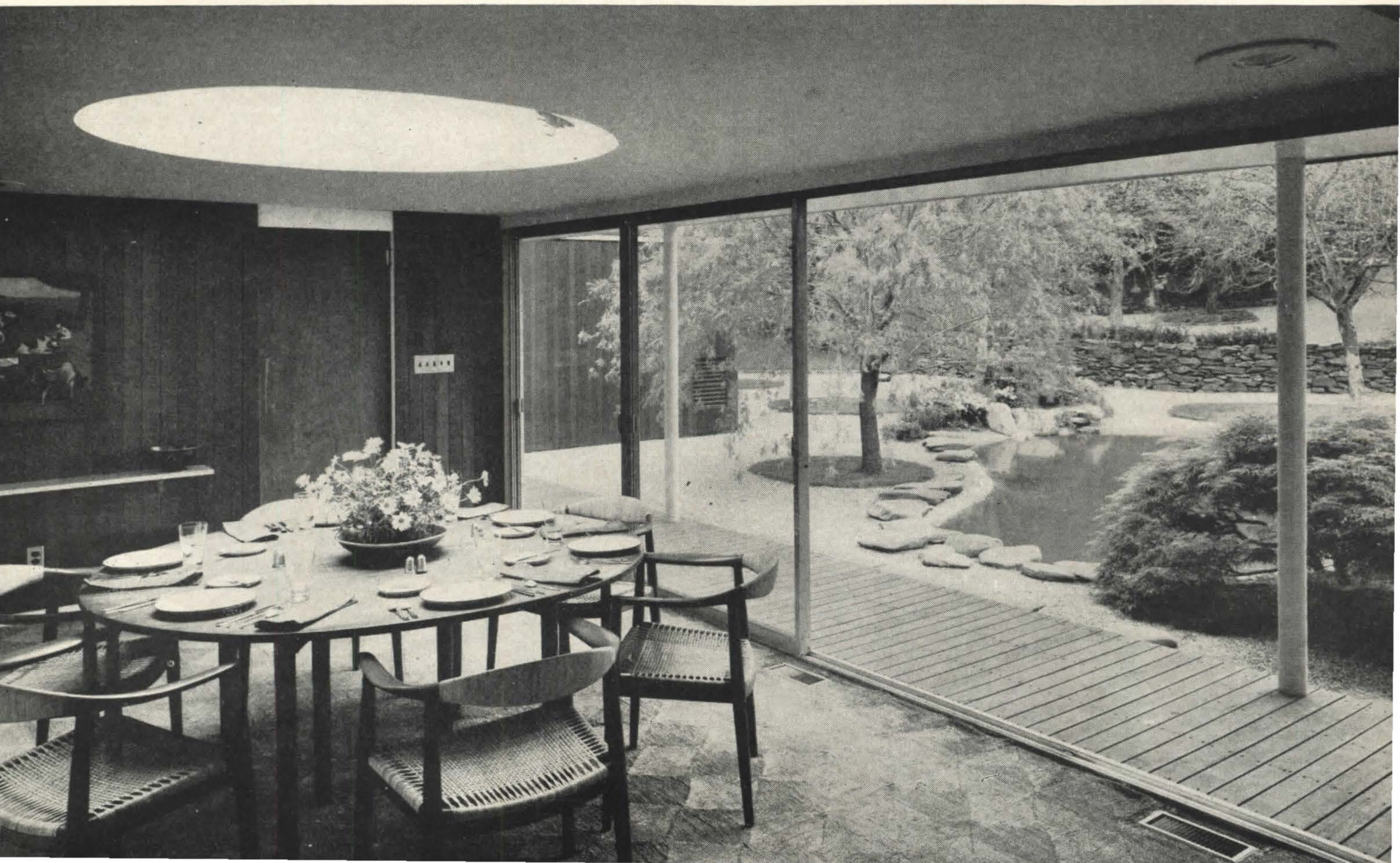
1. American Holly
2. Andromeda
3. Azaleas
4. Black Locust
5. Black Pine
6. Cat-O-Nine Tails
7. Copper Beech
8. Crab Apple
9. Dogwood
10. Dwarf Hemlock
11. Dwarf Pine
12. English Ivy
13. Hemlock
14. Hicks Yew
15. Inkberry
16. Juniper
17. Laurel
18. Pachysandra
19. Pin Oaks
20. Red Maple
21. Rhododendron
22. Roses
23. Weeping Cherry
24. White Birch
25. White Pine
26. Willow

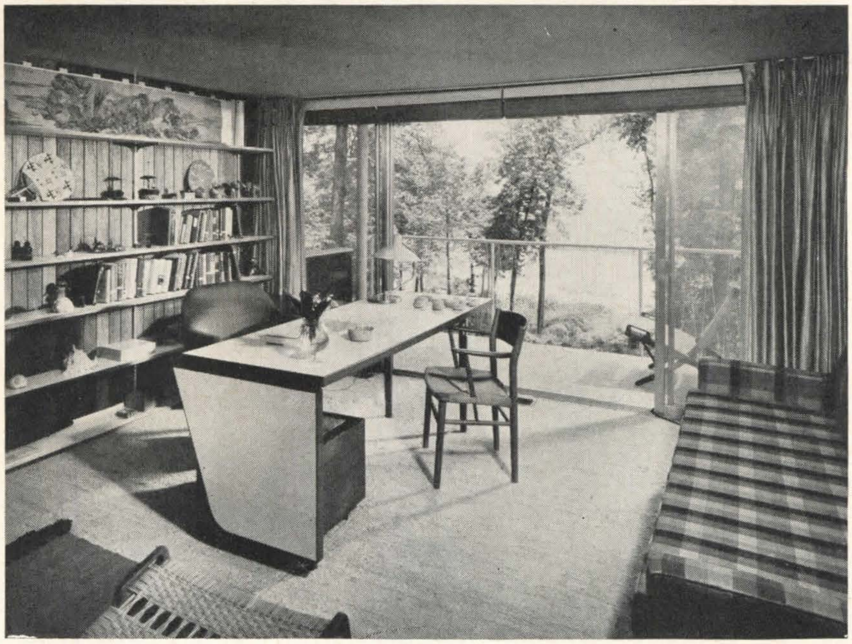


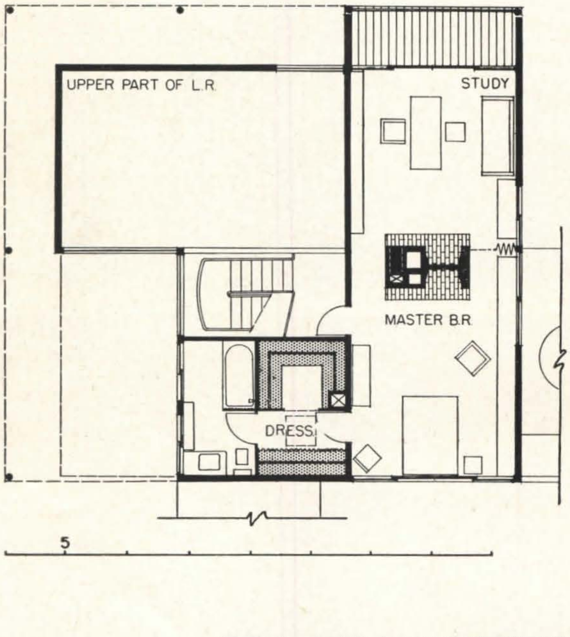
Main Floor

The unusual shape of this house, to which the architects call attention (see page 154), resulted in excellent circulation and zoning as well as the series of individual gardens or courts. Entrance hall, living and dining rooms, with their porches and gardens, form a spacious area for entertaining well away from the bedroom wing. At the opposite end of the house, not overlooking any of the main outdoor living areas, are two maids' rooms and bath, and a generous porch, part of it screened. There is a separate apartment for chauffeur or gardener behind the two-car garage to the rear of the lot. "Certain spots in the house have received a good deal of special detail," the architects write, "such as a secluded, dark-painted brick fireplace alcove in the living room, the large plexiglas dome lighting over the dining table giving a view of sky and trees, and a completely equipped TV-HiFi cabinet at one end of the living room. Flooring on this level is oak, covered with hemp squares; ceilings and walls are plaster board except for the brick fireplace alcove. High window in living room gives an interesting framed-picture effect from stair landing



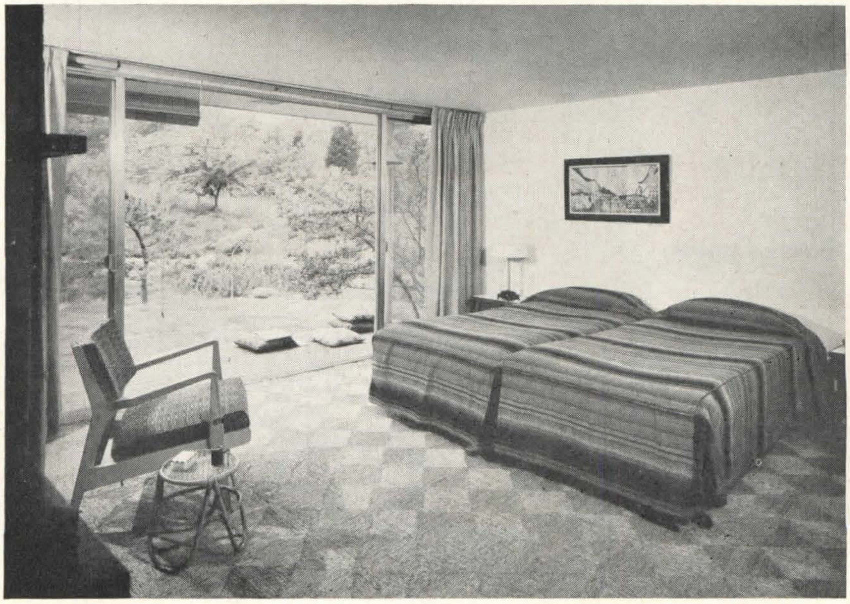






Upper Floor

The upper floor contains, in addition to the owner's study and bedroom, a large storage area. The study, above, has good bookshelf space and a balcony. Bedroom shown below is not the owner's but one of the two on the main level, very similar in character. The lower level, not shown either in plan or pictorially in these pages, has a large playroom and bath as well as heater and storage rooms; floors there are concrete slab. The house was completed in the fall of 1955; contractors were Rossworm-Pellation Inc. and Charles Mullon and Co., Inc.



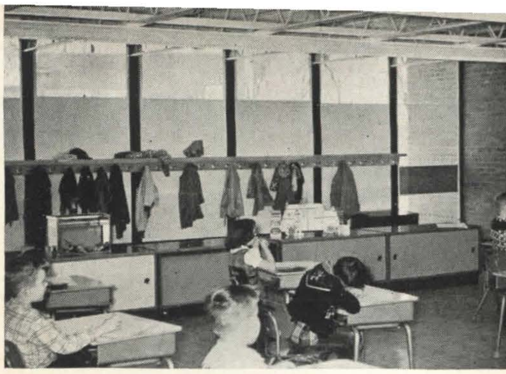
STRUCTURAL COMPONENTS FOR SCHOOL BUILDINGS

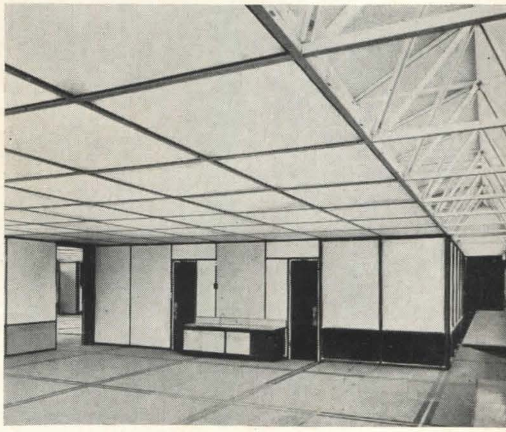
Structural elements large in size, precision manufactured away from the site, offer the advantages of mass production without the restrictions imposed by prefabrication of complete rooms or buildings

Last February, ARCHITECTURAL RECORD published an article on American and British versions of prefabrication and proprietary designs for school buildings. The conclusion then drawn was that use of any predesigned building would necessarily impose, on a particular situation and condition for which a school was to be built, an arbitrary solution, a Procrustean bed of a building; and value for value it was evident that some — though not all — such American examples were, to be blunt, barely able to give a school board its money's worth. The statement was also made that American architects neither feared nor forswore the principles or the objectives of mass production of school building materials; that they would in fact welcome any rational system which, while attaining the advantages of assembly line manufacturing (uniformity, precision, high quality, superior finish, ease of installation, etc.) would at the same time afford the designer liberty to create buildings that would exactly fit the particularities of each situation — including reasonable cost.

It did not take very long to substantiate that statement. The illustrations on this and subsequent pages are only a small portion of the evidence. Building materials manufacturers everywhere are producing the elements of such systems, in the form of structural components quite large in dimension. One might call these "sub-assemblies," these standardized, repetitive, generally accepted elements, ranging from structural framing systems with interchangeable parts available in a variety of sizes and strengths, to wall panels, entire room walls, roof and floor units, and even to some radically experimental developments.

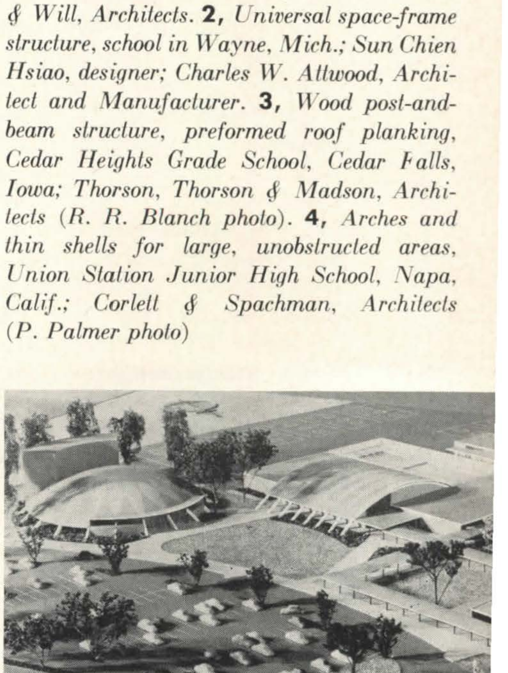
In them are reflected the demands that architects have made as a result of their analyses of building requirements. These are surprisingly uniform in essence, though in form the demands may take on a local or regional complexion. They boil down to such familiar phrases as the need for flexibility; reduction of on-site labor; quality along with low first cost and low maintenance charges; making a single item accomplish several ends at once; general availability; acceptability to local labor and clients; guarantees; and so on. Some of the examples are evidence of direct interaction between the architectural profession and the business of manufacturing — for instance, the Unistrut system, whose manufacturer is also an architect; or the

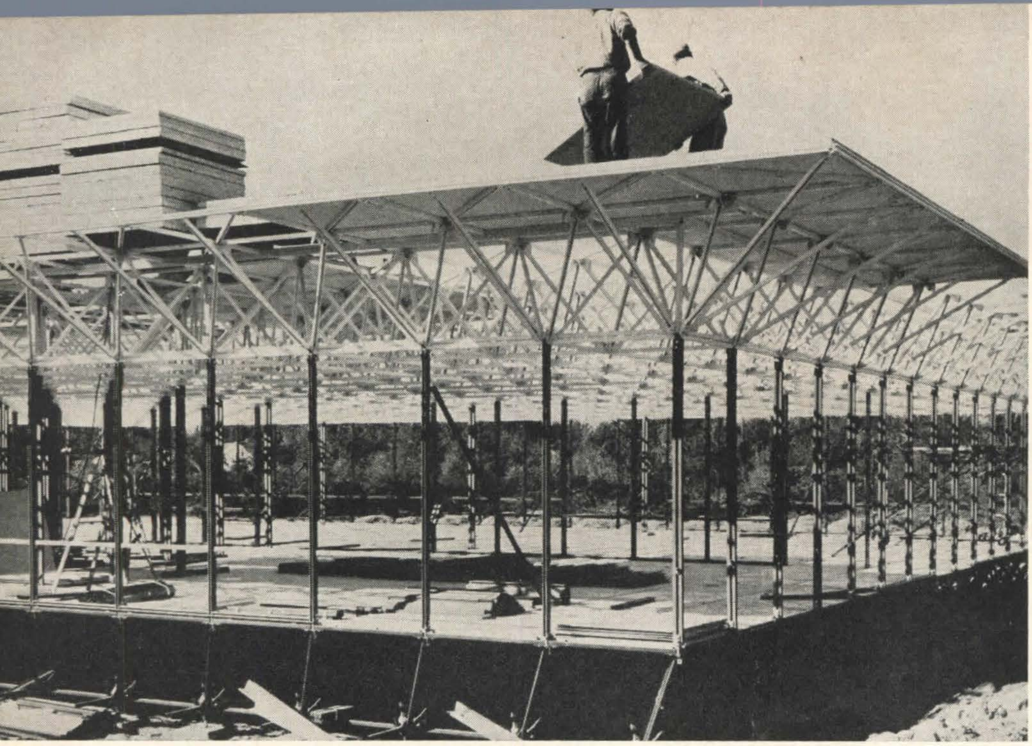
1


2


3


1, *Macomber's standardized framing elements with simplified connections, West Cedar Elementary School, Waverly, Iowa; Perkins & Will, Architects.* **2**, *Universal space-frame structure, school in Wayne, Mich.; Sun Chien Hsiao, designer; Charles W. Attwood, Architect and Manufacturer.* **3**, *Wood post-and-beam structure, preformed roof planking, Cedar Heights Grade School, Cedar Falls, Iowa; Thorson, Thorson & Madson, Architects (R. R. Blanch photo).* **4**, *Arches and thin shells for large, unobstructed areas, Union Station Junior High School, Napa, Calif.; Corlett & Spachman, Architects (P. Palmer photo)*

4




5: *Space-frame*

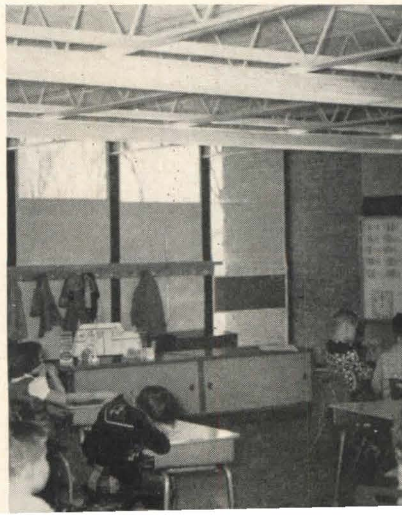
5, *Hoover School, Wayne, Mich., completed in about 3 months at low cost without sacrificing quality, is a demountable Unistrut space-frame structure, can be enlarged or disassembled and moved.* **6, 7,** *San Jacinto Elementary School, Liberty, Tex. (Caudill-Rowlett-Scott & Assoc., Archts.; Meisel photos), employs standard structural steel shapes in limited number of sizes and with standardized connections, savings were substantial; relatively small bay size meant smaller steel sections, required careful planning around columns to prevent interference with room function.* **8,** *Versatile wood framing can easily combine with other materials; appropriate modules are also suitable for repetitive window-wall units.* **9,** *Modules (this example devised by Ronald Senseman, A.I.A.) can be developed in three-dimensional form to meet requirements of structural frame, wall assemblies, roofing materials, pre-built casework, and room sizes.* **10, 11,** *Concrete frame accommodates large window assemblies, repetitive concrete pan floor and roof units (West Miami Jr. High School, Miami, Fla.; W. H. Merriam, Archt.; Wm. Amick, photos).* **12, 13, 14,** *Waverly, Iowa School illustrates adaptability of standard Macomber structural elements, only a few of which are here employed*

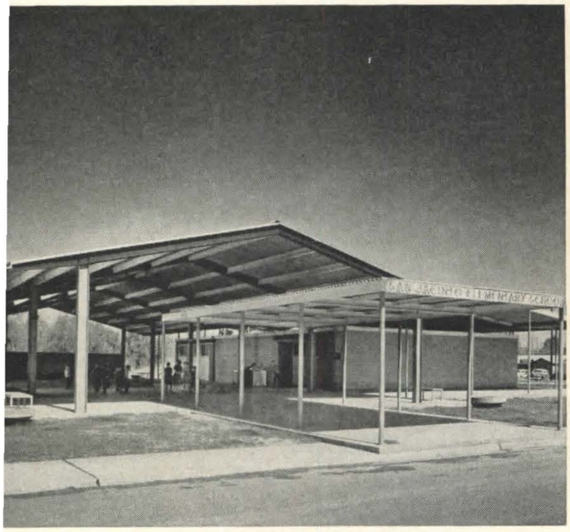
experimental aluminum roof in Tucson that was developed by architects and engineers in collaboration with Reynolds Metals; or the varied uses of porcelain enamel displayed in the West Hartford school.

Some of these examples are experimental, but most are standard products widely available on the open market. Only a few even approach being "new"; most have been available for some time. That means they have been sold in large enough quantities to be profitable, or potentially so, or they would have been discontinued or replaced by better products. Yet there are enough new materials — again, the illustrations are only a sampling — to indicate how important to industry, architects and their clients is the continuing search for improved materials and techniques.

Of the framing materials available today Macomber's "V-Lok" system, a range of standardized columns, joists and trusses with simple lock-joints, and including every necessary item, bearing plates and the like, and Unistrut's "space frame" system are both excellent instances of the new developments. Unistrut has a long history which seems about to produce tangible results. The Michigan school shown, occupied this past school year, was erected quickly despite its unfamiliarity. The result of the efforts of many individuals, it requires only a reasonably level excavation because its lower members rest on jacks set on bearing plates and exact leveling is easy to accomplish; the uniform tension members that make up its alternated tetrahedrons are secured to uniform connector plates with bolts drawn tight by power wrenches. In both "V-Lok" and Unistrut, the simplicity of the joints is an important, striking feature.

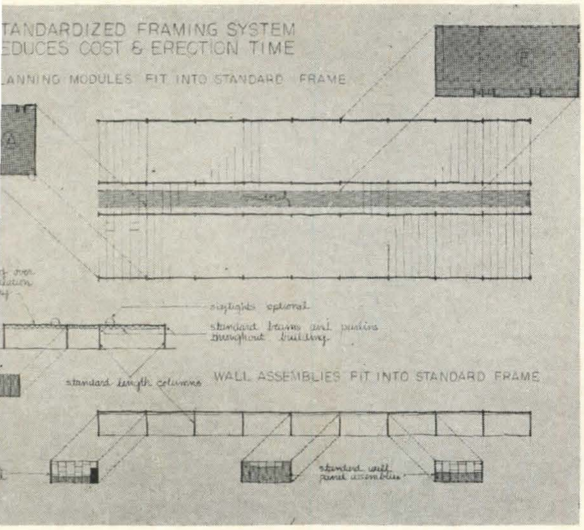
While this article is not primarily concerned with mechanical or electrical systems, it is true that we can no longer afford merely to design a shell of a building and then drop some heating equipment into it. That procedure, which used to be common, is today too expensive. We have come to expect materials to do double or triple duty. Hence the concern with a roof slab's insulating and acoustical properties, and hence too in part, the continued use of some time-honored materials. In certain situations one cannot find a material superior to concrete block or glazed structural tile or, often, brick; other like examples are easy to name. But such factors as weight or mass, precision, quality control and simplicity of assembly are more carefully pondered today than they were a few years ago, because it has been proved to many people many times that excess weight, lack of precision or of quality, and complexity of construction

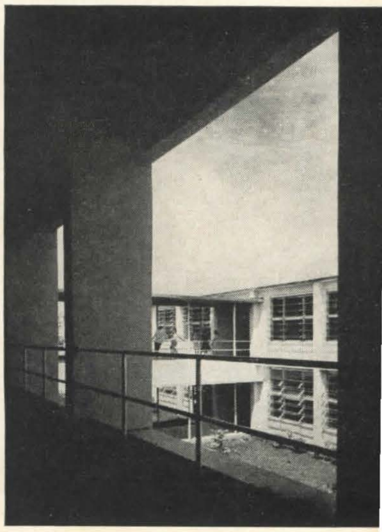




6, 7: *Modular structural steel framing*

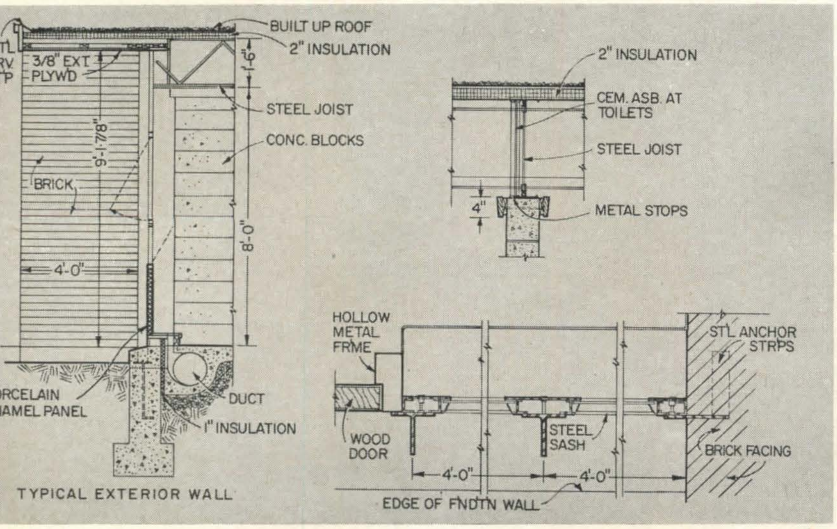
8: *Wood and steel*

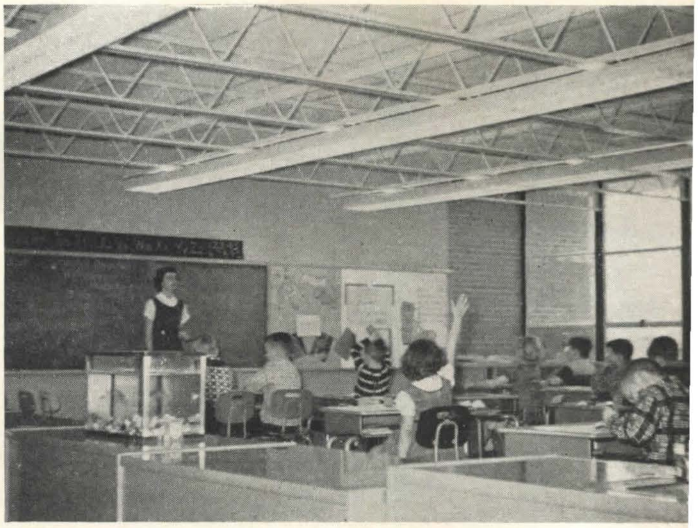




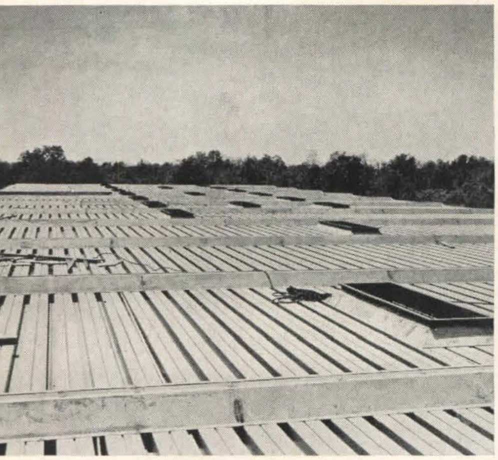
9: *Development of a module*

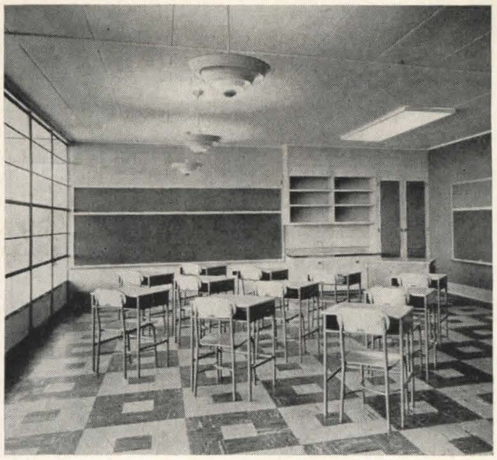
10, 11: *Reinforced concrete*

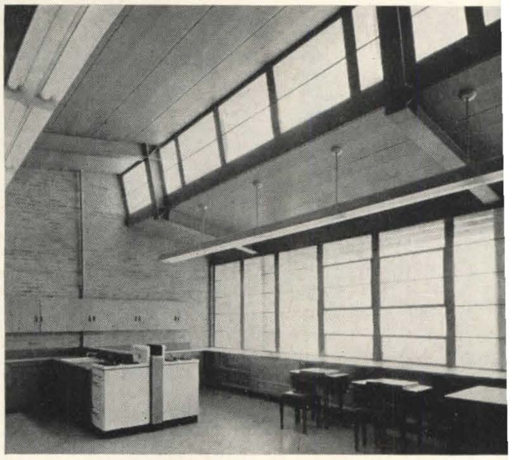




12, 13, 14: *Lightweight steel bar joists, columns, roof decking*

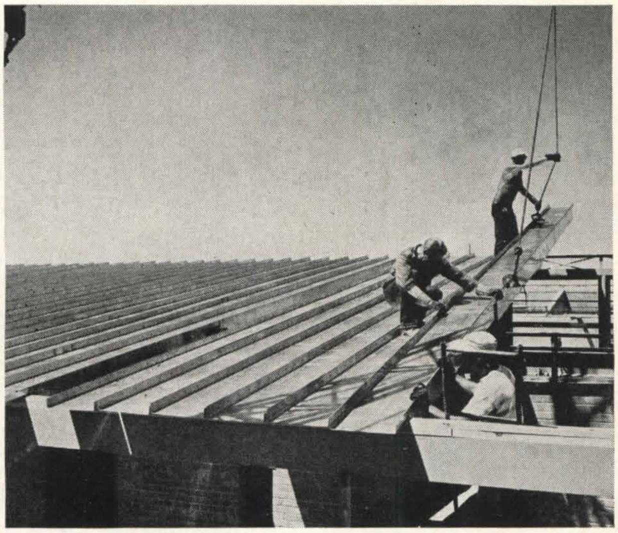






15, 16, 17, 18: *Various applications, Fenestra steel roof decking; structure plus acoustical purposes*

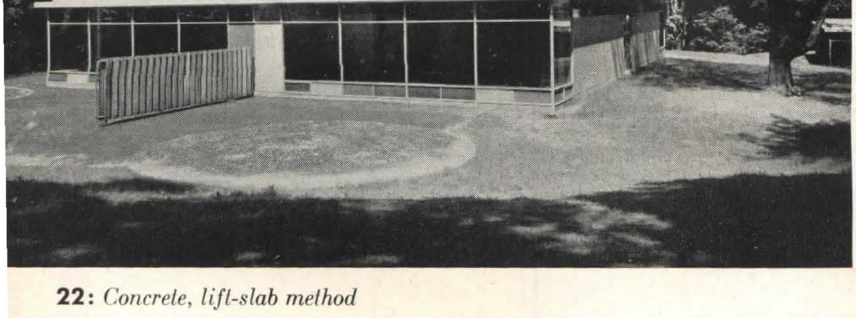
Western Ways



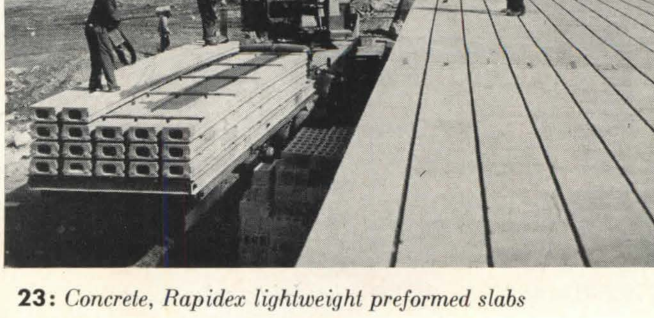
Western Ways

19, 20, 21: *Hollow decking of heavy-gauge aluminum; structure plus solar heating and reflective insulation*

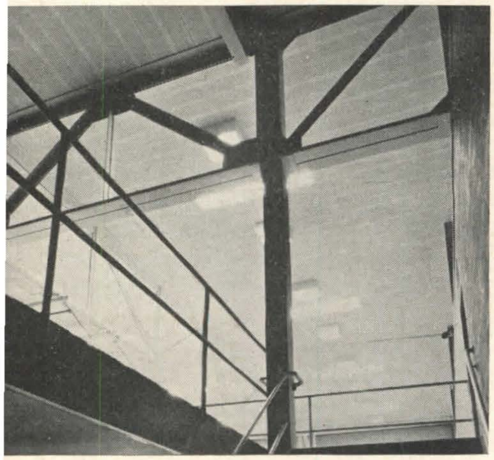
Joseph W. Molitor



22: *Concrete, lift-slab method*



23: *Concrete, Rapidex lightweight preformed slabs*

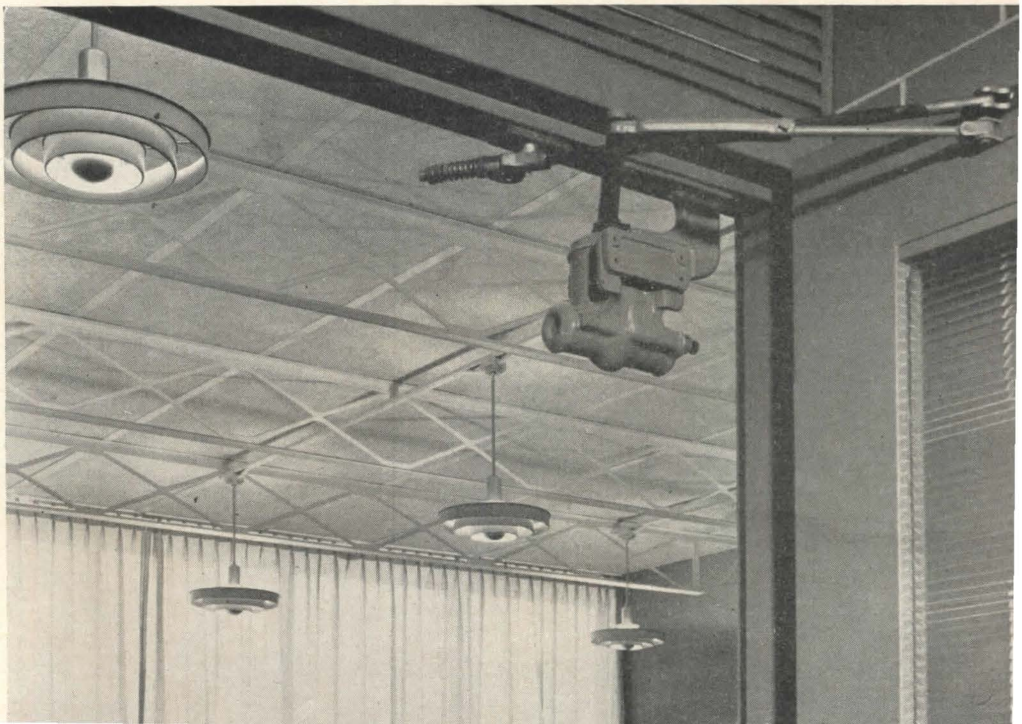


are all exceedingly expensive. There is seldom enough money for school building construction, and so these factors have a special importance here. The relatively low rise in school construction cost in comparison to that of other types of buildings demonstrates just how much attention such factors have received.

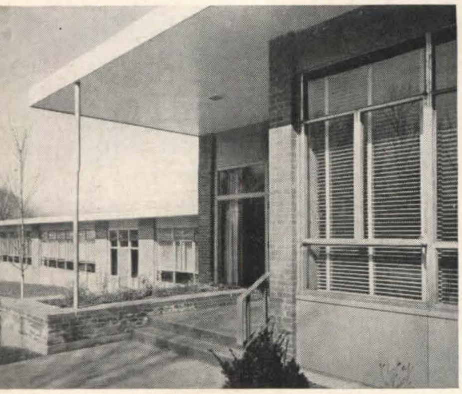
On the other hand, mass alone is a guarantee of many things: of durability, or low maintenance; of strength; of imperviousness to the passage of heat and cold and sound. So in our search for ways to lighten and simplify school structures we begin to defeat our ends, for the prime purpose of shelter is shelter, protection from these elements whose passage mass itself prohibits. Consequently we are building into our structures increasing quantities of mechanical and electrical equipment, adding to them acoustical materials as substitutes for the mass we have subtracted from them. In a way our progress is almost circular, like the route of a dog chasing his tail. There are at least three important practical differences, however: we are today producing educational buildings that function differently than schools did a century ago; our present structures provide a better educational environment than they used to;

15, 16, *light cellular steel decking resting on bottom flanges of beams gives flush acoustic ceilings; cant strips and roofing carried over upper flanges (schools in Missouri; Glen Drew, Archt.)* **17,** *same decking on top of rigid steel framing (Window Rock Indian School, Arizona; E. L. Varney, Archt.)* **18,** *same decking on bearing walls and conventional steel framing (High School, Seymour Wis.; L. Monberg & Assoc., Archts.) All examples take full advantage of acoustic properties of the perforated, sound-absorbent-backed decking.* **19, 20, 21,** *Rose School, Tucson, Ariz., has roofs of heavy-gauge aluminum in cellular structural units to take advantage of Tucson's clear sunny days; sun-heated air within cellular units is drawn off at ridge to heat classrooms, returned at eaves; reflective properties and air motion prevent too much heat from being re-radiated into rooms by the ceiling (Arthur T. Brown, Archt.)* **22,** *lift-slab concrete roof, Wilbert Snow School, Middletown, Conn. (see AR July 1956) has lighting troffers cast in as slab is poured (Warren Ashley, Archt.)* **23,** *lightweight slabs 10 or 12 in. wide, 6 or 8 in. deep, preformed to required length of small units with post-tensioned reinforcing; at present often used in Midwest schools, probably to become available generally as franchises are licensed.* **24,** *wood fiber decking, structural, insulating and acoustically absorbent, supported on tees and steel framing in North Carolina school (R. H. Longstreet, Archt.) and* **25,** *in Ohio high school (Joseph A. Baker & Assoc., Archts.)*

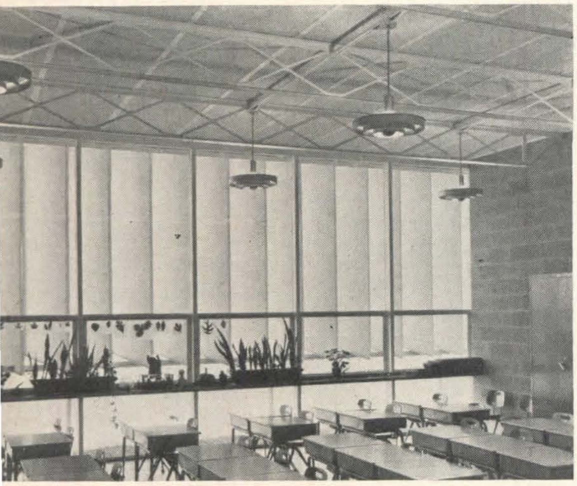
Fred E. Pickens



24, 25: *Tectum wood-fiber roof decking*



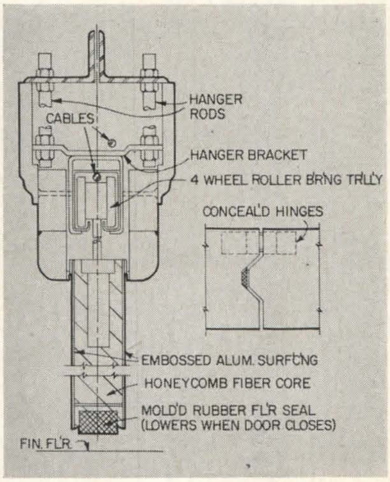
26, 27: *Porcelain enamel wall panels, fascias, acoustic (perforated) and plain interior surfaces, sculpture, light fixtures*



28: *Metal sash, metal brise-soleil outside glass wall*

26, 27, *porcelain enamel used in many ways, including plywood-backed spandrels and easy-to-maintain covers for truss members (Whiting Lane Elem. School, W. Hartford, Conn; Moore & Salsbury, Archts.; see AR July 1956; Molitor photos) among many pioneer developments of Boettinger Corp.* **28,** *Hope's steel sash, long a standard product, plus multiple exterior louvers of 1/8 in. steel plate for sun control (Benjamin Franklin High School, Newark, Ohio; Jos. A. Baker, Archt.)* **29,** *drapes are used in most classrooms of Whiting Lane Elem. School to separate areas.* **30,** *honeycomb core, aluminum surfaces, rubber seals, contribute to acoustic and insulating properties of Schieber-Haws folding partitions.*

Joseph W. Molitor

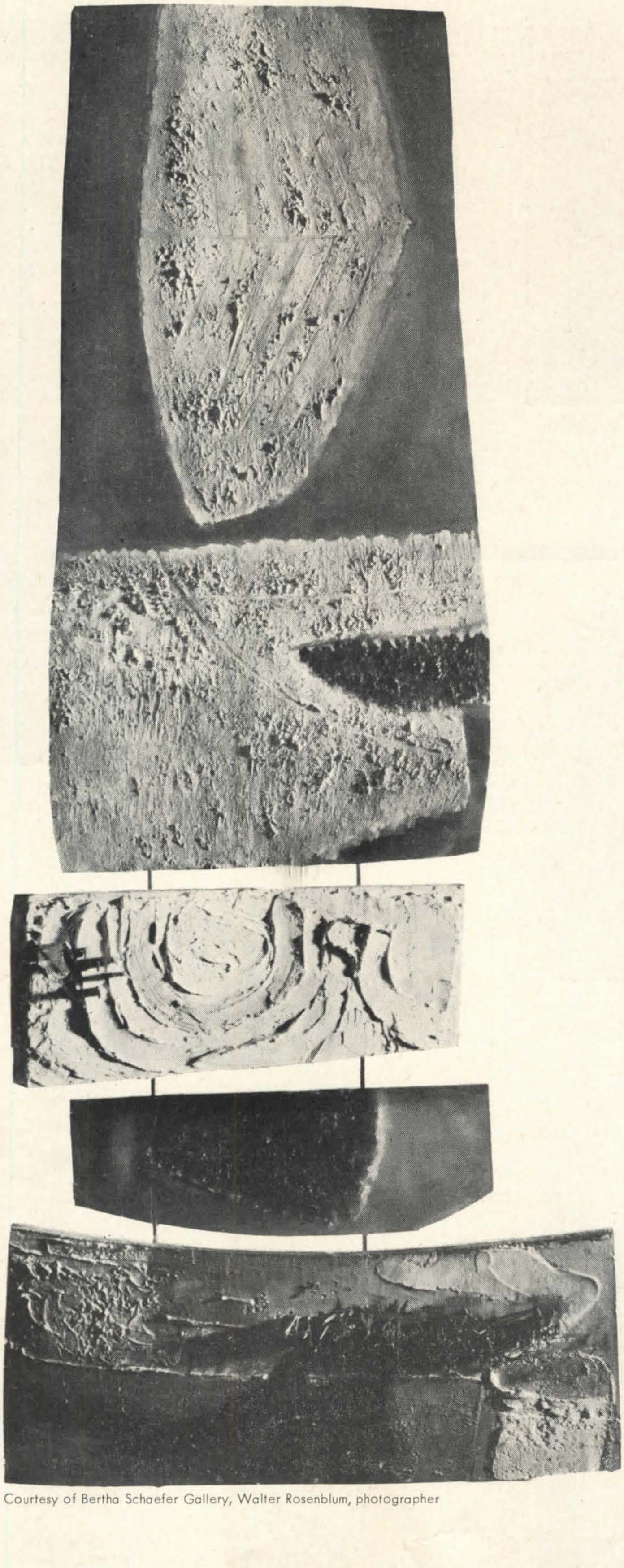


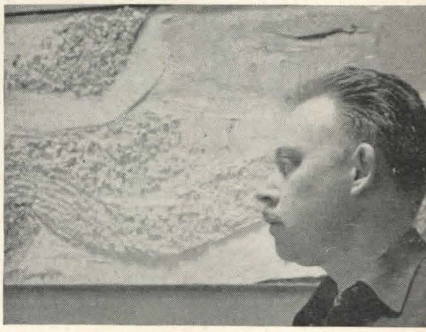
29: *Instead of fixed partitions, curtains; and* **30:** *honey-comb-core folding panels*

and we build them at the cost of less physical labor, which is the most expensive component of all.

As the trend toward transferring production of building units from the site to the factory increases — the signs indicate that it will grow — some other factors come to have great importance. One of these is the need for manufacturers and architects to agree as groups and among themselves on fundamental dimensional standards. Otherwise not only will architects have insuperable difficulties in getting bids on comparable products (competitive bidding seems secure as a means of keeping costs in line) but also, it will be impossible to make related but non-competitive products (panels and framing, for example) fit together without waste; in either case, the reputations of all concerned are bound to suffer. The more precisely a panel is manufactured to a dimension, the more exactly must doors, windows and structural supports be sized and aligned when erected. One of the virtues of plaster is its ability to smooth out the inequalities of structure, to cover up the deficiencies of labor.

Quite a fancy name has been given to one means of making sure that things fit together simply with little waste: modular coordination. Unfortunately this simple concept has many ramifications, and some have been scared by them. Whatever the effort, however, modular coordination, or making things to fit, or whatever one chooses to call the idea, appears to be essential if the mass production of large-sized components for school buildings is to succeed as completely as one could wish. Look back over the illustrations in this article, and see if the concept is absent from any. Many are obviously modular; in some the modularity is less evident. And many of the modules are quite different from one another. That isn't incorrect, either, as long as there exists a common denominator. The planning module can easily be a large unit, 4 or 8 or 12 ft on a side, say; or larger in one dimension than another; provided it accommodates the modules to which are made the materials that will go into its building. The essence of building construction, a prime ingredient of building design, is knowing how to make things fit. Modularly dimensioned structural components help both the architect and the builder. Non-modular components hamper them both.



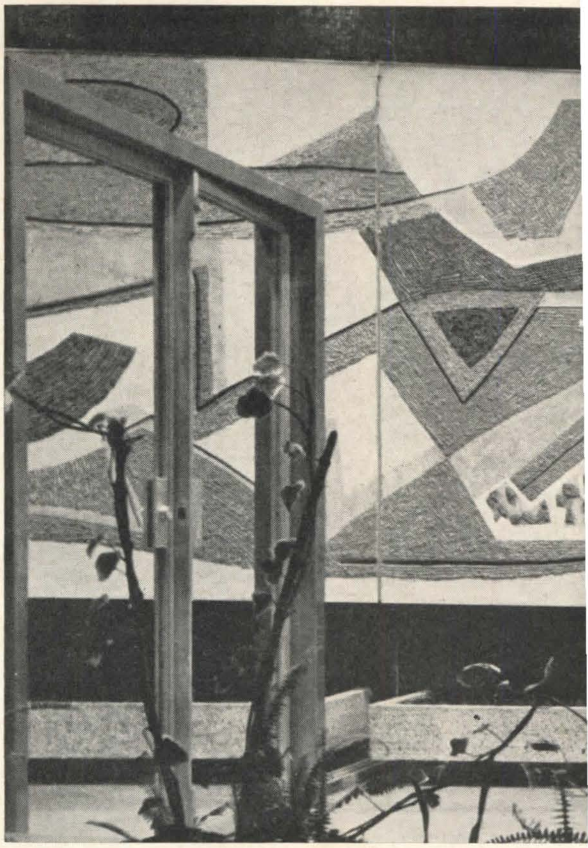


Courtesy of Bertha Schaefer Gallery, Walter Rosenblum, photographer

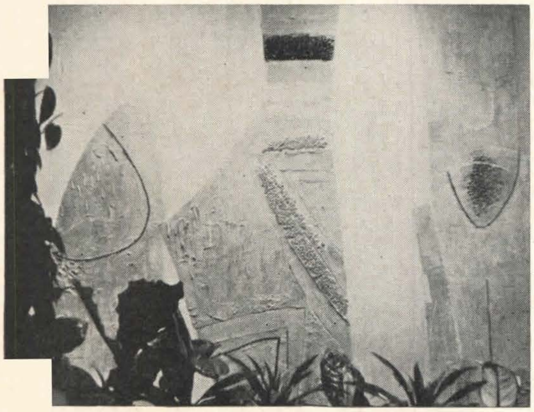
WALLS AND PANELS BY HUGH WILEY

Courtes of Bertha Schaefer Gallery. Walter Rosenblum ,photographer

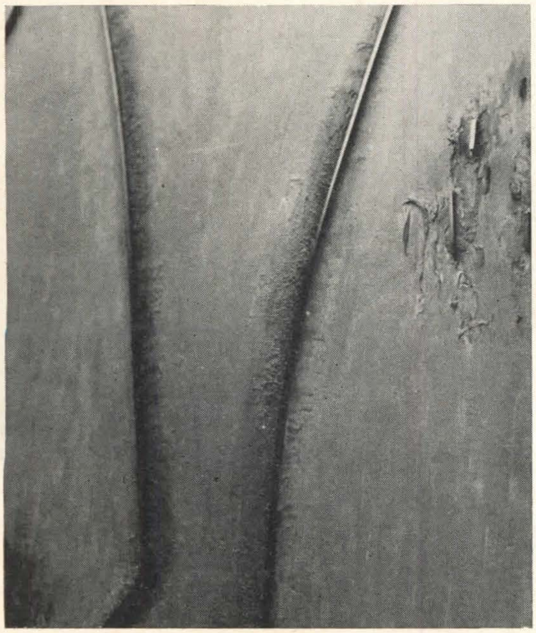
Panel group 9 ft high and 6 ft deep for meditation room in religious building. Gold, white and black paint, textured Swedish putty



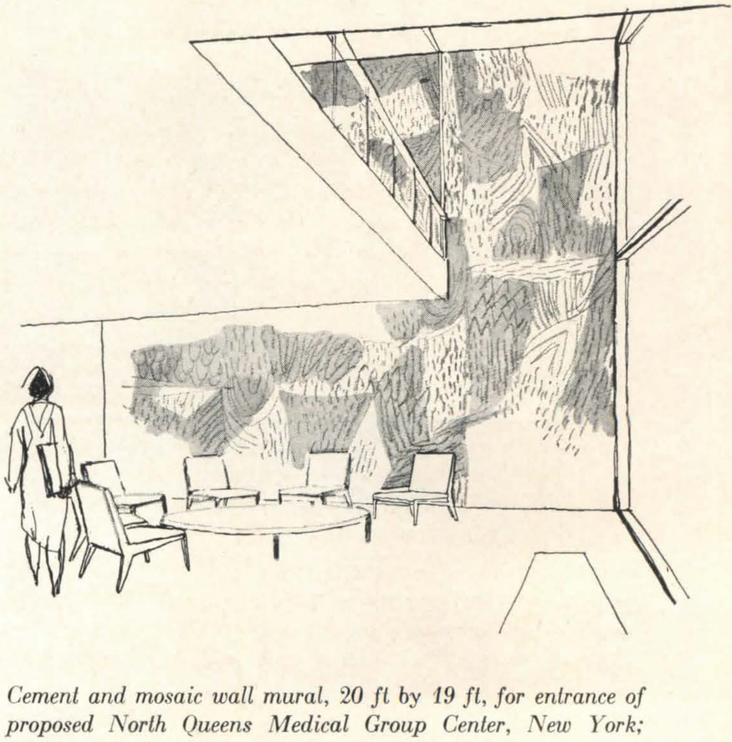
Mosaic and silicate mural on textured cement . . . .



Black, gray, brown and blue right-angled wall in Washington, D.C. house. Swedish putty with mosaics and brass rods. 10 ft by 22 ft

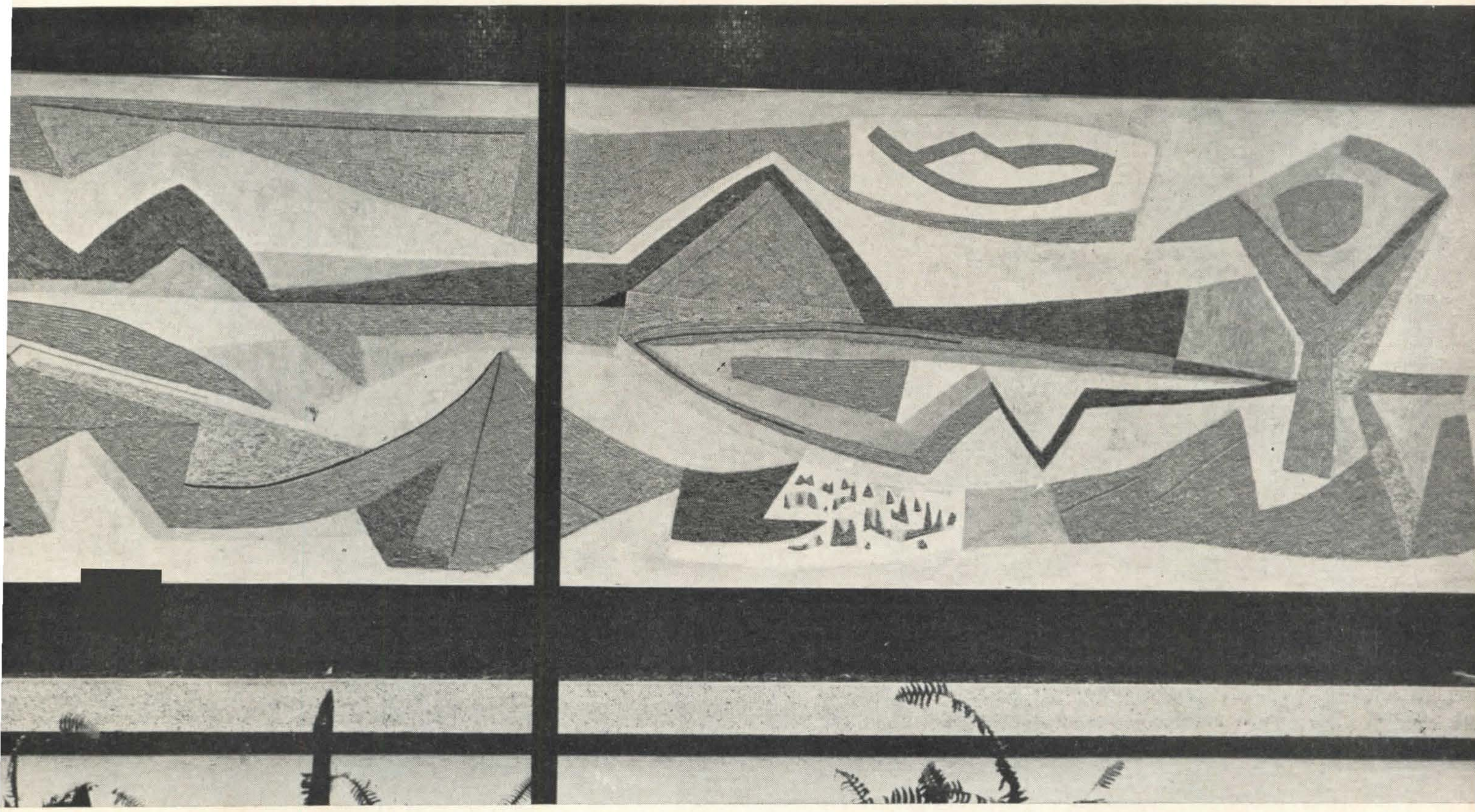


Detail of brass strips outlining areas in mural



Cement and mosaic wall mural, 20 ft by 19 ft, for entrance of proposed North Queens Medical Group Center, New York; Abraham Geller, architect. Red, orange and blue

Marilu Pease



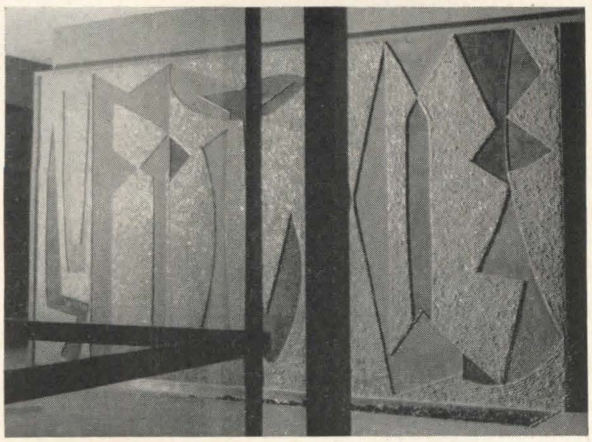
. . . . in entrance lobby of a Mexico City office building; architect, Juan Robles-Gil. Colors are black, browns, ochres. 7½ ft by 36 ft

Mosaics and murals are undergoing experimentation. Now designed in varying techniques, and with new materials, they are re-appearing as original and sympathetic allied art forms in architecture. The flat wall mural is giving way to a three dimensional one, and more possibilities are opening for the muralist and architect with the advent of the non-load-bearing wall. Free-standing panels can be planned by artist and architect in such a way that paintings can truly become part of the total structure.

The work of mural painter Hugh Wiley is an example of this trend, as he does not merely color the walls he works on. Using textured mosaics, cement and silicate mediums, Wiley has developed a personal approach that is striking in design and execution, and unusually luminous in color. According to the individual architectural problem he uses flat wall surfaces, adjoining corner walls or entire mural panels. Always probing for new ways of expression he now hopes to execute screen walls, or a series of panels, that would allow the spectator to "enter" the enclosed space of the painting. He prefers to cooperate fully with the architect from the beginning of the project.

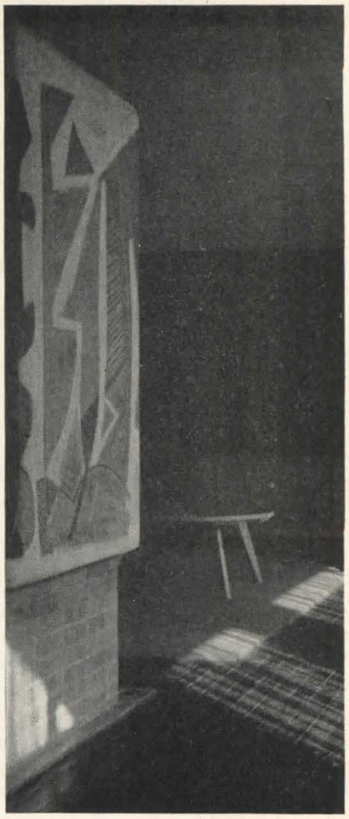
To achieve this end Wiley utilizes materials for what they can offer in contrasting textures — for texture is of primary importance to him in creating a spatial concept. In the large abstract shapes and forms he has derived from nature, some areas shine and sparkle with mosaics. Other parts are rough-surfaced painted masses, often defined by brass strips (see below left). He feels that a mural should never be considered static, but should be a moving, flowing thing, as in the example above, done for an office building by architect Juan Robles-Gil. In this horizontally planned mural, movement and space are achieved not only with texture, but with changing, powerful forms from Mexican landscape.

Ever since his student days at the Pennsylvania Academy of Fine Arts, Indiana born Hugh Wiley has been interested in murals. On a Cresson traveling scholarship he went to Mexico City, saw the projects being done, and later returned in 1950 to study and work for three years. As can be seen in the examples of his work



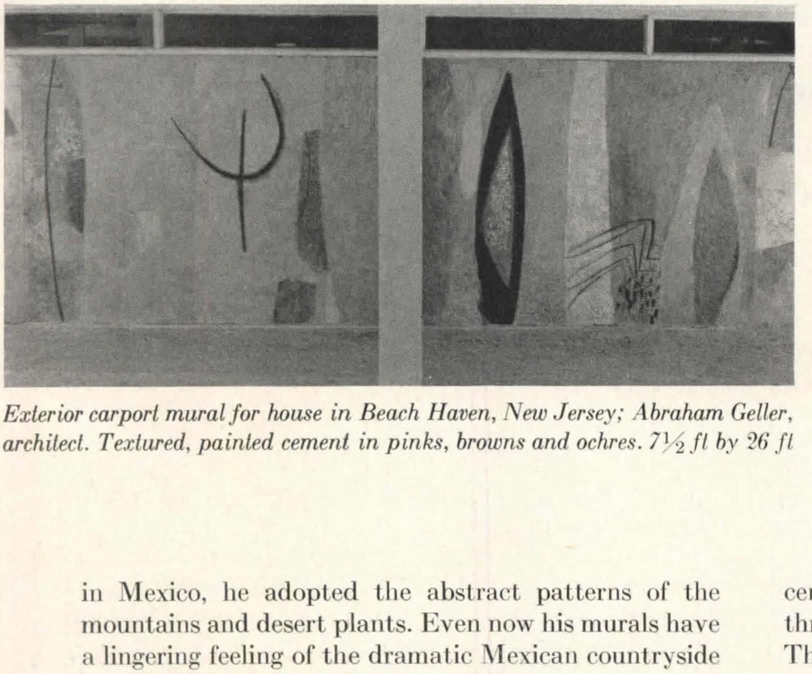
Marilu Pease

Mural wall in passage way of house by Juan Robles-Gil. Ochres and two shades of deep gray. 7½ ft by 14 ft



Marilu Pease

Double fireplace with mural dividing living room of Robles-Gil house. Rough-textured surface of silicate on cement in rose-beige, gold, off-whites and brown tones



Exterior carport mural for house in Beach Haven, New Jersey; Abraham Geller, architect. Textured, painted cement in pinks, browns and ochres. 7½ ft by 26 ft

in Mexico, he adopted the abstract patterns of the mountains and desert plants. Even now his murals have a lingering feeling of the dramatic Mexican countryside and its warm earthy colors.

One of Wiley's first commissions on returning to the United States in 1953 was an exterior wall mural running the length of the carport of a beach house designed by Abraham Geller. The pinks, browns and ochres of the mural are punctuated with an occasional bold black shape — all moving in a vibrant, defined manner across the surface. Wiley is now living near New York City and is again working with architect Geller. In a looser and more plastic technique, he is doing a wall mural two stories high for the entrance of a proposed group medical clinic (see sketch on preceding page). The mural, intended to be a symbol of the cooperative spirit in the clinic, is predominately red and orange with a large, leafy tree-form in varying shades of blue rising in the center. Another project — a long pool — will meander through a shopping and civic center on Long Island. This shallow pool with arms reaching out in different directions will be designed with violet, green and blue mosaics.

In these many ways Hugh Wiley demonstrates that the conception of a mural should be a part of architectural space, and should grow and change with the planning of the building. As he is constantly searching for new means of expressing a need, he has recently done wall panel studies such as the small one on page 167 and the full scale model for a meditation room on page 168. The small study, executed with oil paint and cement on brass and copper sheets, is an experiment for a series of wall panels. As free-standing walls these murals could take an even greater part in spatial definition: they would project and the forms would expand in three dimensions — literally a walk-in painting.

NWRIGHT BUILDING, St. Louis
Louis Sullivan
ISON PIRIE SCOTT STORE, Chicago
Louis Sullivan
:KEFELLER CENTER BUILDINGS, New York
Reinhard & Hofmeister; Corbett, Harrison & MacMurray; Hood & Fouilhoux
'ER HOUSE, New York
Skidmore, Owings & Merrill
NITY CHURCH, Boston
H. H. Richardson
LADELPHIA SAVINGS FUND SOCIETY BUILDING, Philadelphia
Howe & Lescaze
NERAL MOTORS TECHNICAL CENTER, Detroit
Saarinen & Saarinen
E SHORE DRIVE APARTMENTS, Chicago
Mies van der Rohe
:. JOHNSON & SON, INC., ADMIN. BLDG., Racine
Frank Lloyd Wright
NADNOCK BLOCK, Chicago
Burnham & Root
ILY NEWS BUILDING, New York
Hood & Howells
A NORRIS DAM & POWER HOUSE, Tennessee
Roland Wank, Architect-in-charge
STON PUBLIC LIBRARY, Boston
McKim, Mead & White
OCK PAVILION, Raleigh
Nowicki & Deitrick
IRISTIAN SCIENCE CHURCH, Berkeley
Bernard Maybeck
OOLWORTH BUILDING, New York
Cass Gilbert
ROW ISLAND SCHOOL, Illinois
Saarinen & Saarinen, with Perkins, Wheeler & Will
ANUFACTURERS TRUST BUILDING, New York
Skidmore, Owings & Merrill
NITY CHURCH, Oak Park
Frank Lloyd Wright
EBRASKA STATE CAPITOL, Lincoln
Bertram G. Goodhue
C. JOHNSON & SON, INC.; LABORATORY, Racine
Frank Lloyd Wright
NITED NATIONS SECRETARIAT, New York
Wallace K. Harrison & Consultants
INCOLN MEMORIAL, Washington
Henry Bacon
.I.T. AUDITORIUM, Cambridge
Eero Saarinen
QUITABLE BUILDING, Portland
Pietro Belluschi
LLEGHENY COUNTY BUILDINGS, Pittsburgh
H. H. Richardson
NIVERSITY CLUB, New York
McKim, Mead & White
RANBROOK SCHOOLS, Michigan
Eliel Saarinen
IINERALS & METALS RESEARCH BLDG., I.I.T., Chicago
Mies van der Rohe
LCOA BUILDING, Pittsburgh
Harrison & Abramovitz
IUSEUM OF MODERN ART, New York
Goodwin & Stone
ENNSYLVANIA STATION, New York
McKim, Mead & White
XPERIMENTAL SCHOOL, Los Angeles
Richard Neutra
ODGE TRUCK PLANT, Detroit
Albert Kahn
0 MEMORIAL DRIVE APARTMENTS, Cambridge
Kennedy, Koch, DeMars, Rapson & Brown
ENTRAL LUTHERAN CHURCH, Portland
Pietro Belluschi

OUSES

C. ROBIE, Chicago
Frank Lloyd Wright
J. KAUFMANN, Pennsylvania
Frank Lloyd Wright
LIESIN WEST, Arizona
Frank Lloyd Wright
ENRY VILLARD, New York
McKim, Mead & White
ATTS SHERMAN, Newport
H. H. Richardson
'ERY COONLEY, Illinois
Frank Lloyd Wright
. W. WILLITTS, Illinois
Frank Lloyd Wright
R. GAMBLE, Pasadena
Greene and Greene
IILIP JOHNSON, New Canaan
Philip Johnson
ALKER GUEST HOUSE, Florida
Paul Rudolph
LEN SCRIPPS, La Jolla
Irving Gill
ESTON HAVENS, Berkeley
Harwell Hamilton Harris
VELL "HEALTH HOUSE", Los Angeles
Richard Neutra
IITH FARNSWORTH, Chicago
Mies van der Rohe

3: APARTMENT HOUSES

ONLY TWO APARTMENT HOUSES (as compared with eleven office buildings) were nominated to the list of the fifty most significant buildings in the 100-year period which ARCHITECTURAL RECORD's panel of architects and scholars was asked to consider.

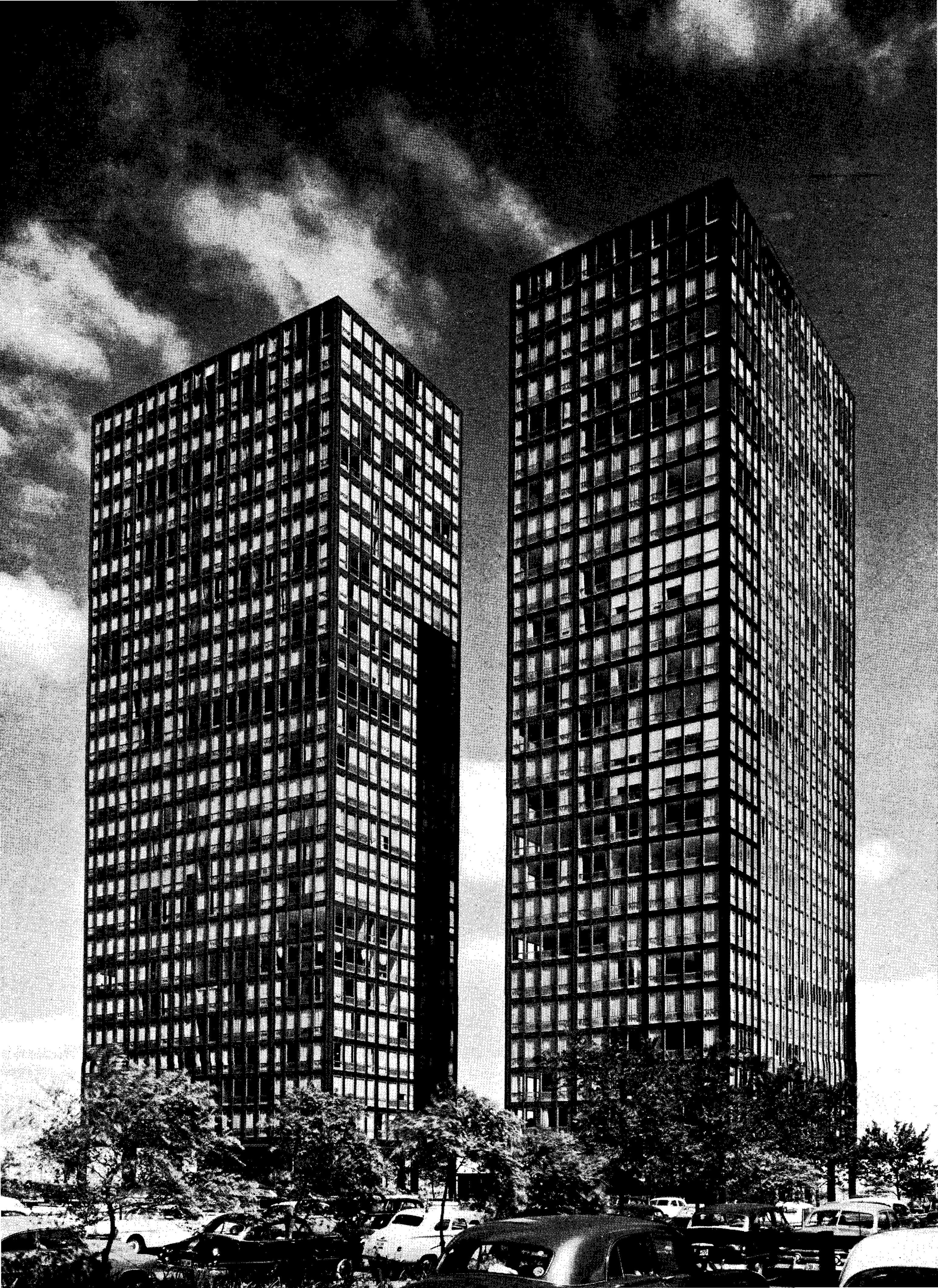
Both buildings were completed in this decade and both overlook magnificent waterscapes. Beyond this, and their basic programs, they have few points of similarity. The 100 Memorial Drive Apartments were designed by a team of architects whose principal stimuli were found, obviously, in the nature of people and the way in which they use buildings.

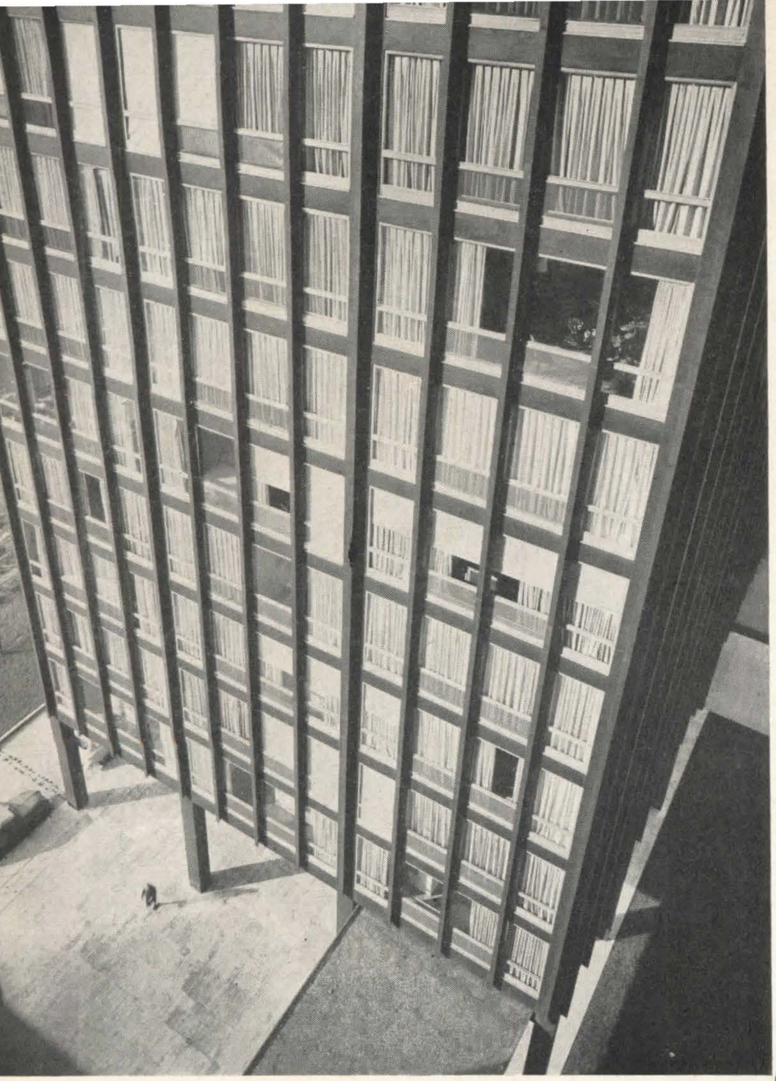
The Lake Shore Drive Apartments were designed by a single architect whose dominant source of stimuli has always been — and very evidently here — the generalized processes and materials of building itself.

Though widely different in intention, and in the situations provided, each of these buildings is a significant achievement.

Panel member John Burchard writes: "If posterity judges this aspect of modern aesthetics to have been an important one, it can hardly fail to assign preeminence to 860 Lake Shore Drive as the example par excellence of the attainment of a classic position. It is perfect in its proportions, serene in its stand. It states beyond contradiction that modern architecture has found functionalism not enough, for it denies functionalism both in the requirements it makes on living and in the admission as the new units will assert that to reveal a steel structure as being different from a concrete structure is not necessarily the highest aspiration of art. The questions 860 Lake Shore Drive asks are something like this: What more can be expected within this vocabulary? When will we learn to give such buildings their due by giving them a sufficiently complete setting, a question better worked out, if not better understood, in Rockefeller Center? How is a building so ordered to allow the individual tenant the freedoms he has a right to expect without the sacrifice of the overall dignity? This is of course a fundamental problem for society too but as yet at any rate our society will in such situations prefer individual chaos to communal order. Eight-sixty Lake Shore Drive reminds us again of this question. Its aesthetic brilliance transcends the expedient. It is a masterpiece then in more ways than one, and like a great piece of poetry has several levels of meaning."

Photographs on next two pages are Lake Shore Drive Apartments (Hedrich-Blessing), left, and 100 Memorial Drive Apartments (© Ezra Stoller), right





Hedrich-Blessing

Lake Shore Drive Apartments, Chicago, 1951, Mies van der Rohe. (*Seventh*)

"The Lake Shore Drive Apartments are significant as a successful esthetic spatial study of two multiple-story buildings on an American-sized square block. This includes the study of the ground level aspect and approaches to the site and the site itself. In addition this group is important as a concept of a thin outer wall construction (glass) on a steel frame embodying typical physical requirements. In some practical aspects the building has glaring faults, as many significant works of art do have. Within the limitations imposed by the law and other agencies necessary to its construction, these buildings represent an initial achievement of importance to architecture." ***George Fred Keck***

"I must frankly admit that I am not an unbiased person when expressing myself about Mr. Mies. I have admired him when hardly anyone knew him or wanted to do so. The Lake Shore Drive Towers appeared like the wonderful conclusion of a lifelong aspiring formation of ideas. It is a moral force which sets the Miesian production apart; it is not mere formal abstraction. Young, and growing older, I knew and know more and more, it is the man behind the work who is the true impact to be esteemed." ***Richard J. Neutra***

© Ezra Stoller

100 Memorial Drive Apartments, Cambridge, 1950, Kennedy, Koch, DeMars, Rapson & Brown. (***Tied for twentieth***)

"100 Memorial Drive sets a high standard of excellence from almost every point of view. It was designed for people to live in and appears to be delightfully habitable. The building takes full advantage of its site's major asset, view. With an ingenious plan, imaginative though simple handling of materials, mass, openings, etc., it becomes a well-integrated whole. It has also, I understand, been a successful venture for the client. This building is an asset to the community and a beautiful demonstration of good architecture. As is usually the case in a successful building, credit is due to the architects and to an enlightened and understanding client." ***Hugh Stubbins***

MULTI-FAMILY HOUSING

BUILDING TYPES® STUDY NUMBER 237

COMMUNITIES FOR THE GOOD LIFE

By Clarence S. Stein *

THE GOOD LIFE! Never before have so many people had so much time to enjoy a good life. But with what feeble results! The trouble is that there are so many buildings and highways all jammed together that there is not space to enjoy our opportunities. The 20th century technological revolution makes possible — in fact, it demands — leisure for all. This is in complete contrast to the 19th century industrial revolution which glorified labor and crowded its slum dwellings tight around its temples of industry.

In the movie "A Nous la Liberte" Rene Clair foretold this change 25 years ago. He showed the schoolroom of the 19th century with children taught as though it were a religion — "One *must* work." Adults who loafed were jailed, while those who labored did so in jail-like factories. And then mechanization took command. Ultimately it produced without human aid. Man at last had realized his fondest ambition — freedom from drudgery. And what did the workers do with their permanent holiday? In "A Nous la Liberte" everyone went fishing or dancing. Rene Clair a quarter of a century ago wrote this as a fantastic wish — like Jules Verne's tales. And now it is being realized. For the first time in man's history there is leisure — an ever-increasing leisure for more and more people — here in America. And there is every prospect that it is going to increase immeasurably.

Never before has the world or its architects been faced with this problem. Leisure, yes; but it has been leisure of the selected few: Hadrian's Villa, Versailles, hunting enclosures, the Riviera. The architect — you and I — face the task of setting the stage for a completely new production.

Leisure occupations for all require above all SPACE, much open space, convenient open space, verdant space. And the whole landscape has been cluttered with crowded, unrelated disorder. We are hemmed in by dangerous, nerve-wracking motor-ways. Open green places are engulfed and destroyed as the obsolete city pattern rolls out. Much of the time we have gained by shorter working hours and longer weekends is squandered in tiresome, jerky journeys in search of open spaces. Fields and woods and wilderness grow constantly more distant, as more and more open countryside is bulldozed into dreary checkerboard monotony. No matter how many billions are spent on our new thoroughway program, it cannot keep up with the increasing problem of more people going further and further to find less and less space.

So before our highway engineers flood most of our landscape under a sea of pavement, we architects must develop a saner plan for using leisure. We must bring the peaceful quiet and the beauty and the sense of great openness into every part of all our communities, as near as possible to where people live and work. Just outside everyone's own private garden or balcony there must be spacious open commons; plentiful green places attractive for leisurely loafing in the sun, or under a great tree, with lots of room for children to play freely and safely near home. Above all we need flexible space that can be used for various purposes as the neighbors get new ideas of how to spend their spare time, together or by themselves. Not in just playing games or sitting around talking and thinking, but in constructive action such as building a little community workshop or a nursery.

A moderate sized well-designed area can give a sense of spaciousness and of mysterious distance just beyond the corner. This is apparent in the exquisite gardens in Soochow, China, and in those of Japan. Here in America in a quite different way Thomas Church is making much of little, as Marjorie Cautlie did for me at Radburn and elsewhere. For utility as well as beauty open spaces are the basic element of design. Chinese artists and philosophers have long recognized this. Twenty-five hundred years ago Loa-Tzu said, "Clay is moulded into a vessel; the utility of the vessel depends on the hollow interior." To permanently augment the value of houses, group them around an attractive empty space. Harmony and melody, essential to the good life, dwell in spaciousness, not in congestion. Great Chinese painters composed the empty areas so that they delighted the soul even more than the subject of their pictures. And so, we are coming to understand that the all embracing view is more essential to good living than the finest interior.

For peaceful living the open spaces on which all houses face must be insulated from the racket, the odors, the deathly danger of through traffic ways. Therefore

---

** Paper presented by Mr. Stein at the annual dinner of the American Institute of Architects' recent convention in Los Angeles, when he was awarded the Institute's Gold Medal.*

they should be built into the center of the blocks, separated from the highways. At the same time the homes and other buildings that surround them must be directly accessible to motor machines.

This kind of practical modern planning is possible only if we completely eliminate the conventional street layout and build a framework and substance that grows out of our needs of both living a leisurely life and being in convenient touch with work places and stores. The heart and arterial system is the tranquil chain of parks toward which the buildings face and through which the local life of the community flows. The highways become servants, not masters, of the community life. The main streams of traffic flow as freely and steadily as on a parkway or throughway. Buildings and grounds open only on subordinate roads. All parking is off street parking.

This means that homes and other structures face in two directions at the same time, one toward peaceful green spaciousness, and the other toward roads and services. Thus there are two separate frameworks for the modern communities. One is for motors, the other for pedestrians. The one is gray, the other green. They fit together like the fingers of two hands, but they never overlap or interfere with each other's functions.

In the contemporary city the green openness will go far beyond the built-in-parks, flowing through and connecting the super-blocks. Not only will every building open on views of fine old trees or distant hills, but broad green belts will be close by for agriculture or forests, for great sport fields or hiking, boating, fishing, swimming, skating, or just for solitude in the peaceful valleys or the wilds.

This is the kind of beautiful and healthful city that can be built in various parts of the United States if we start from the ground up. When they are seen and lived in I am sure that those who remain in the archaic cities will insist that redevelopment must also start from the ground up; that is must also clear away all signs of the 19th century pattern. Thus we can build truly green modern cities on the sites of the old stony deserts. The regional cities which are destined to replace our mad metropolitan monstrosities will consist of a constellation of such moderate-sized communities set against a great green background of fields, forests and wilderness.

Such communities cannot be secured by the ordinary piece-meal process of city planning. A beautiful and livable urban environment cannot be boxed into cubbyholes bounded by fixed and dominating streets and lot lines. It must be created as an entity, embracing the site, the mass of buildings and their relation to each other and to the natural setting; in short, to all the visual surroundings.

You may say that this is not a problem of architecture, it is a question of securing adequate land and planning it for leisure-time use where it is needed. But the fact is, the two must go hand in hand, the design of building and outdoor spaces for the new life and the allocation of adequate and proper land where and when it is needed.

The architect must take the leadership in this job. For it *is* architecture, but architecture in a broader and ever-broadening field.

What we need is an architectural attack on problems much more comprehensive than the individual building. The architect must deal with the whole environment in which his building is an essential, harmonious part — and without which the architect's work is impotent. The community may merely be a small group of interdependent structures, it may — most likely will be — a neighborhood, an urban district, a whole town or city, or even a region.

The procedure of a community architect parallels the practice of realistic contemporary architectural offices. This is illustrated by the design of a high school, which has many community relations similar to those of a small community. These include a campus free of auto traffic, surrounded by inter-related buildings both for families or classes and for community assembly, recreation, work, dining, administration. Interiors open on out-door rooms and courts. There are even schools within schools just as there are communities within neighborhoods, neighborhoods within towns, towns within regional cities. In the creation of a community, as of a school, the effective architect actively participates in the whole process of development from conception to realization. In association with the municipal administrator he coordinates the functional, operational and physical requirements of the expert practitioners in many fields. This so that his design will properly relate, harmonize and translate them into a unified structural entity that will be thoroughly practical and pleasing. Thus a town is created that works efficiently, effectively, and economically from the beginning, as a setting for good living — good modern living.

The architect in the new and changing world must accept this broader field of architectural practice because only so can he protect the buildings he creates. Their appearance is dependent far more on their setting than on their mass or the design of their facades. Their usefulness is limited by surrounding structures — and even more by the movement of traffic in the streets. The most efficient steady flow of material through an industrial plant can be completely negated by blocked traffic outside its doors. The causes of the congestion, decay, blight that surround your work may have its roots in defective, obsolete arrangement of highways and structures many miles away. And so, if only for self-setting — and city — and region in which his contemporary building can play its modern role. But the primary reason why all of us must parallel our practice as architects of buildings with the broader practice of community architecture is less selfish than this. It is because America's greatest peace need is modern cities — cities that really work, that bear a sane and constructive relation to living here and now.

Many such cities must be built here if America is to hold its leadership among modern progressive nations. The architectural profession must fill the same position in design of modern cities as it has in design of buildings. It is a duty — but a very pleasant one — a field for adventure, exploration, discovery — glorious attainments.

Note that I suggest COMMUNITY ARCHITECTURE, not CITY PLANNING, as a fitting, an essential practice for our profession. The two fields are basically different.

City planning deals with two-dimensional diagramming, with a city's framework for circulation, and its subdivision into block and lots. Its specifications are negative regulations and generalized limitations, such as zoning. They are not positive, specific, constructive requirements as those for a particular building. Thus the detailed form and mass of a city is not designed, but is merely limited.

I recognize and admire the able public-spirited work that city planning administrators are doing. It is essential under present limitations, but these make it impossible to accomplish the purpose of the constructive rebuilding of America that we need so badly. For what is called city planning does not create solid realities; it outlines phantom cities. It does not determine the bulk, the solid body of a city. It is not positive, creative, as is architecture. It produces skeletons, framework for marketable lots, not vibrant communities of homes and working places for realistic and pleasant living and doing here and now in the 20th century. The ultimate shape and appearance of these cities is a chaotic accident. It is the summation of the haphazard, antagonistic whims of many self-centered, ill-advised individuals. Under these conditions people have little freedom of choice. They can fit their building into one of the cubbyholes outlined by a plot plan, or fit their family's life into the monotonous repetitive patterns stamped out by the builder's machine. Los at Los Angeles!

It shows, as do most American metropolitan areas that the only way to get modern cities and to keep them modern is by all inclusive architecturally planned city building, followed by permanent dynamic administration to keep their purpose and form alive.

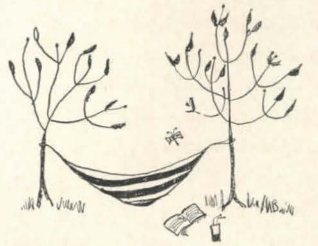
That zoning or similar restrictive methods will not serve this purpose is apparent in the present development of the San Fernando Valley. The City Planning Department of Los Angeles made a far sighted planto prevent the continuous sprawl of population over the 212 square miles of the Valley. They separated the moderate sized communities from each other by green belts zoned as agricultural open areas. This has come to naught. For the practical house developers have had the green belts erased where most needed, that is between the growing communities. Zoning is only a temporary barrier or protection. It cannot stand up against the

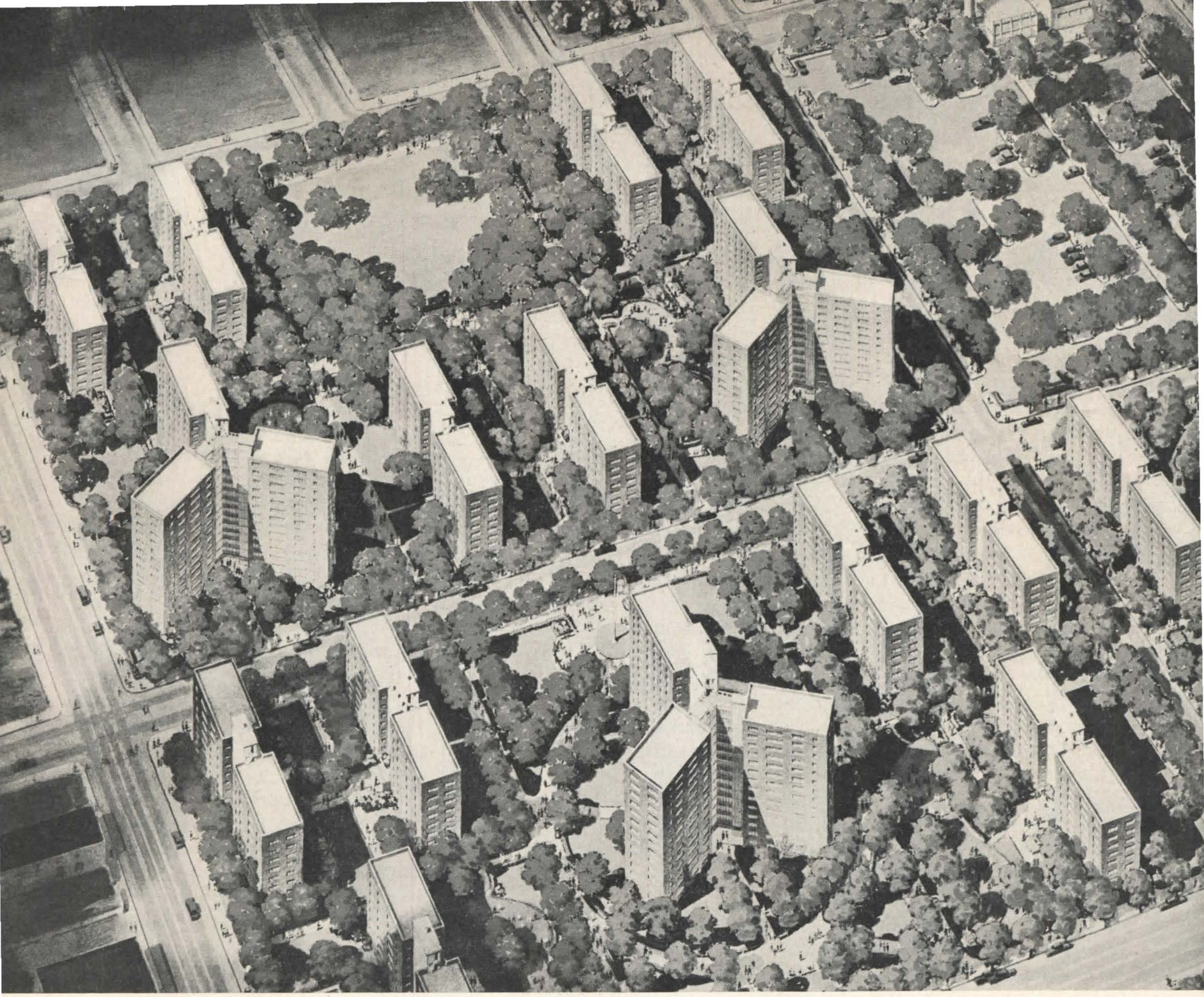
flood of monotonous commonplace or the greed of land subdividers. To permanently preserve green belts and keep modern green towns green and modern requires constructive, purposeful development and operation. Positive action must replace negative regulation for cities as well as buildings. That is why I am convinced that architects must be community architects.

In the development of a new culture, certain physical expressions of a civilization are affected much more slowly by technical, social and economic change. For example our cities have lagged far behind our buildings. The Technological Revolution has given us a fresh contemporary architecture. Look at our schools, our hospitals, our factories. They reflect a new way of living and doing, new understanding, new conceptions. The architects of America are beginning to develop an architecture that is thoroughly contemporary. We may even be on the threshold of a golden period of American architecture. Architects are free to mold and model their works to express their purpose and their feeling.

But our architecture is by no means fully free, for in our cities our buildings have no where to go. The golden period of American architecture will have to wait until our lagging cities recognize that this is the mid-twentieth century.

Modern architecture demands a modern setting, a place where it can be properly viewed and enjoyed, a site where it can open up and stretch and change. As community architects we must create cities and buildings as a single entity, completely inter-related in design and structures. These new communities should remain continuously youthful. Therefore they must be both spacious and flexible enough to take new form with changing ways of living, laboring and loafing. We must replace dying cities with communities that fit and foster the activities and aspirations of the present time. We must build new cities as a stage — a joyful setting for the good life here and now.



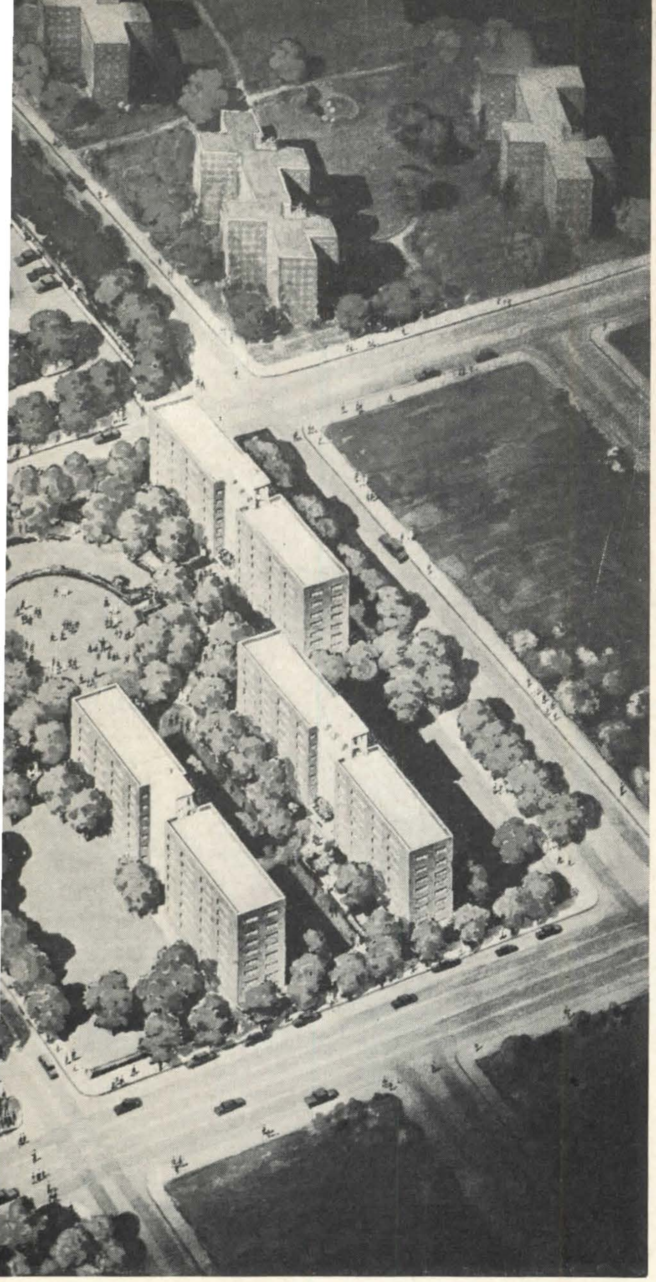


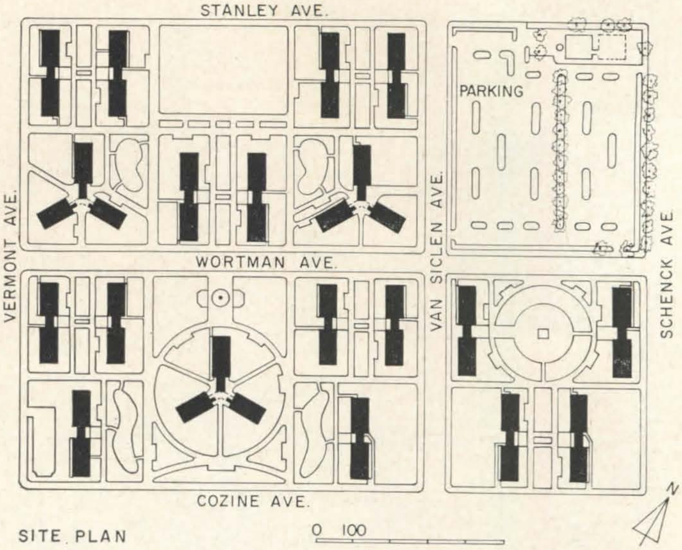
PLANNED FOR THE GOOD LIFE IN BROOKLYN

For large-city apartment dwellings architects struggle ceaselessly against the hard facts of city patterns and land and building costs, always in an effort to achieve some progress toward the better life. This project, one of the most recent of New York City's middle-income public housing developments, marks recent innovations in the search for ideas. If it doesn't reach the ultimate goals outlined by Clarence Stein's paper (page 175), it is a good illustration of what is reachable today in Brooklyn.

The rendering above shows two streets cutting through the site, in place of six in the original street pattern. It shows lawn, park, playground and off-street parking areas, plus low percentage of land coverage. Only 12 per cent of the land will be covered with buildings, the remaining 88 per cent devoted to the outdoor amenities so stressed by Mr. Stein. There should be good measures of enjoyment, convenience and safety in this scheme.

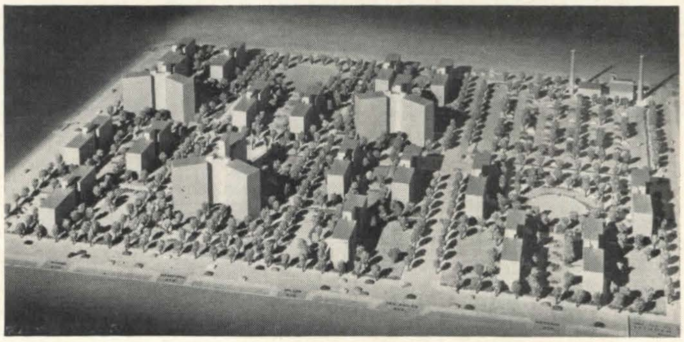
Visible also are the architects' efforts to alleviate in some degree the filed-away feeling that New Yorkers get in large developments of high-rise buildings. The buildings are cut into two or three segments to make groups of adjacent apartments small, to keep the corridor lengths short, and generally minimize the institutional aspects. The central elevator cores that





SITE PLAN

Site plan closes four of six cross streets, develops extensive open areas for playgrounds and lawns and parking. Buildings will cover 12 per cent of ground. Model photograph (below) is in effect a sun and shadow diagram, showing placement of buildings to avoid shading


ouis Checkman

Linden Houses, Brooklyn, N. Y.

For the New York City Housing Authority

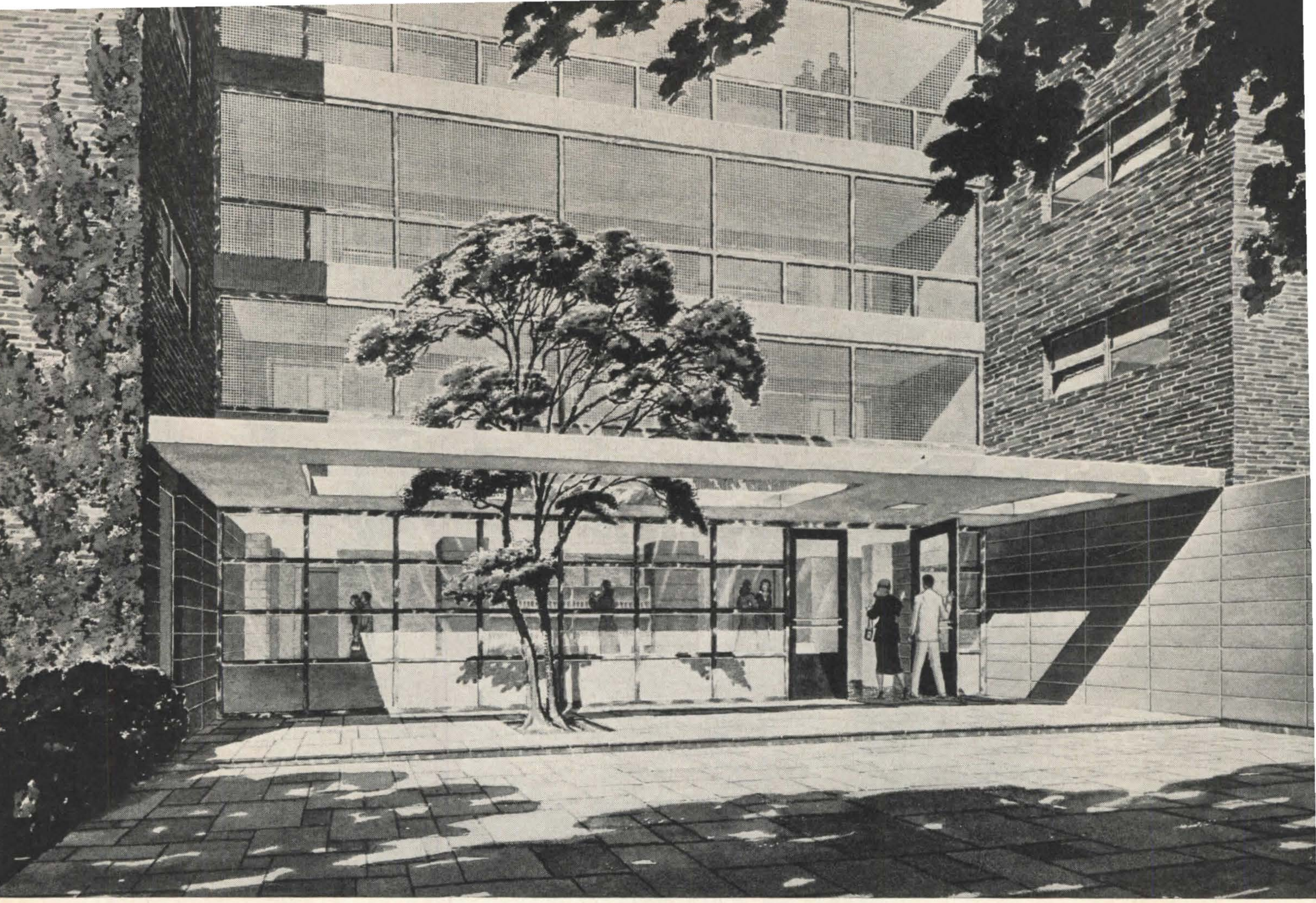
Seymour Joseph and Wm. Charney Vladek, Architects

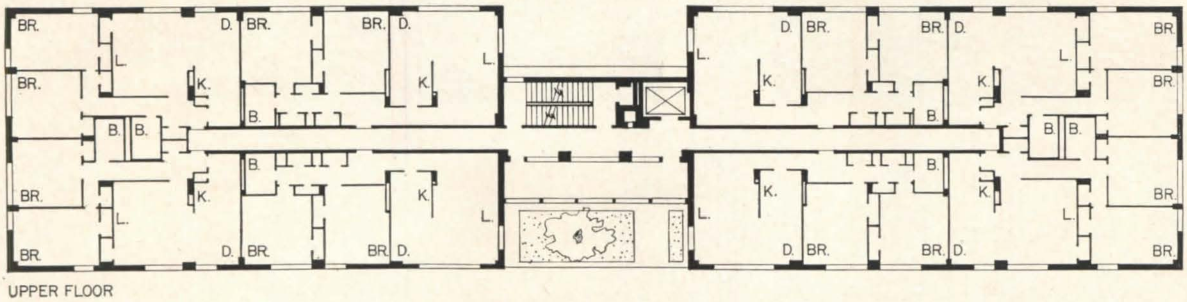
serve the two or three sections visually seem to separate the buildings rather than join them. The glass-enclosed passages from elevators to apartment corridors are designed to heighten the sense of separation, also, of course, to afford open views of the landscaping from upper floors. Each of these core sections has a large terrace, protected to full height by steel mesh to serve as an outdoor living area for tenants. Perhaps tenants may get acquainted there in the evening; certainly the terraces will be heavily used as sunning areas for small children; it is easy to envision an effective if informal nursery developing on each floor as mothers get together.

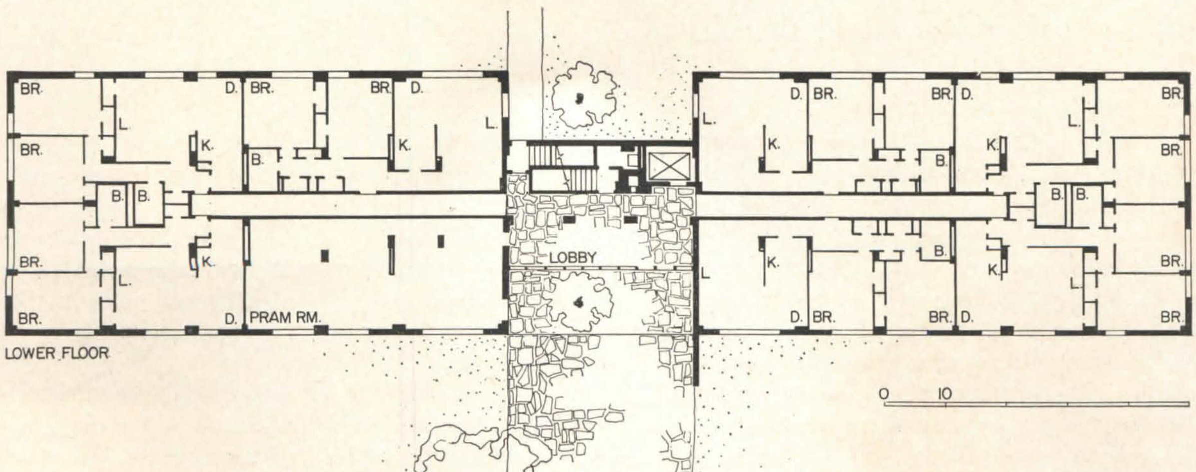
At the ground floor these core sections will be as open as possible, with flagstone flooring extending through to outdoor terraces. There will be large pram rooms on each ground floor.

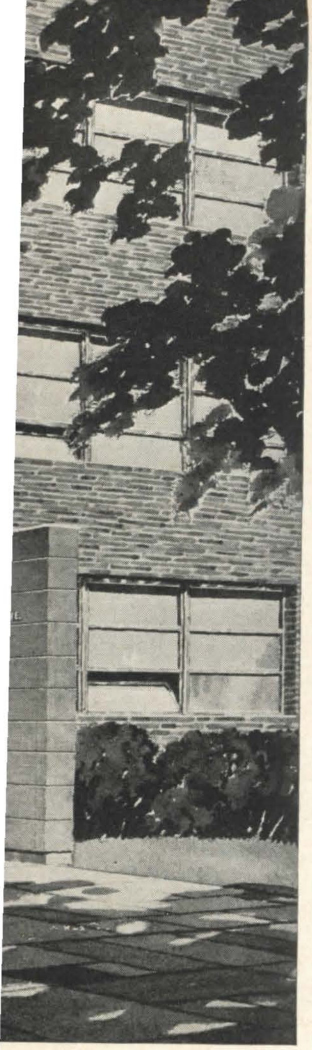
Except for one section in each of the three Y-shaped buildings, all wings contain only four apartments on each floor. Except for the one-bedroom units in these wings, each apartment will have corner exposures with cross ventilation.

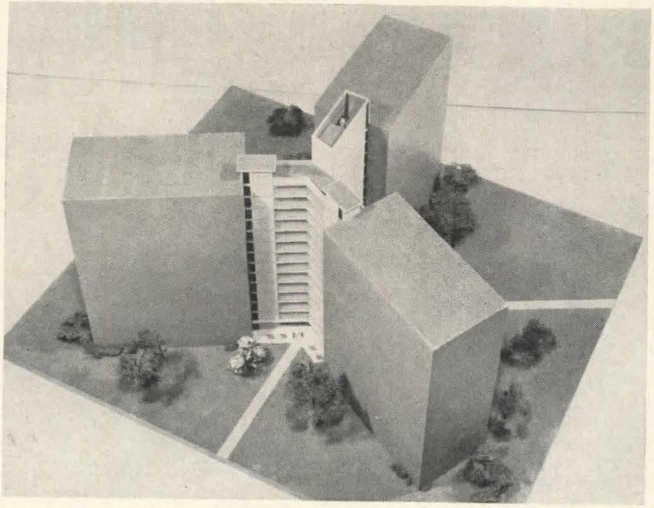
Planned primarily for families with children, Linden Houses will contain 1092 four-and-a-half room apartments and 336 five-and-a-half room units. There will also be 336 units of three and a half rooms. Rents will average $20 to $22 per room per month.

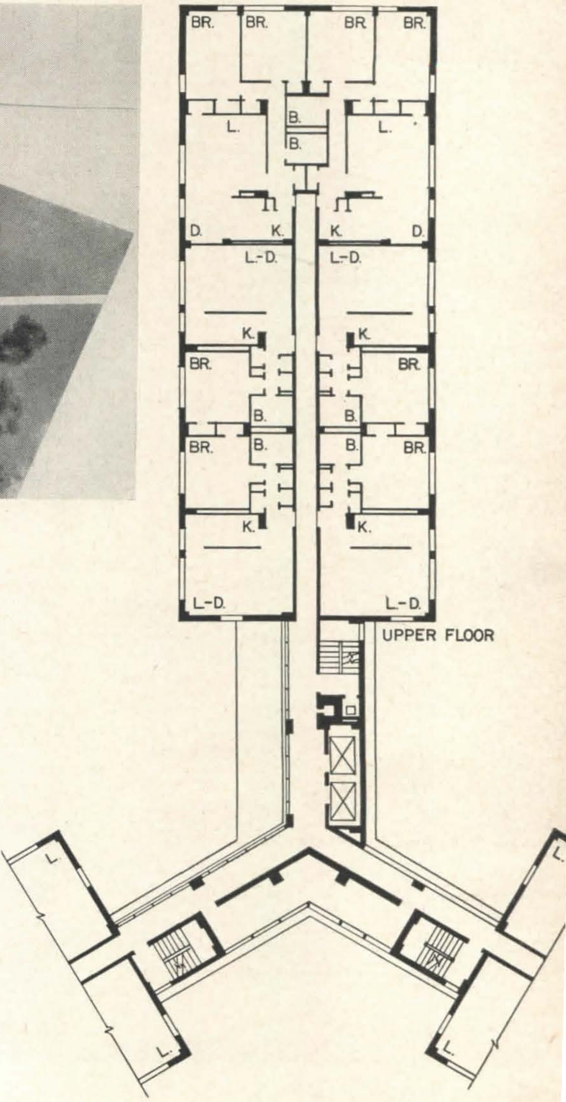


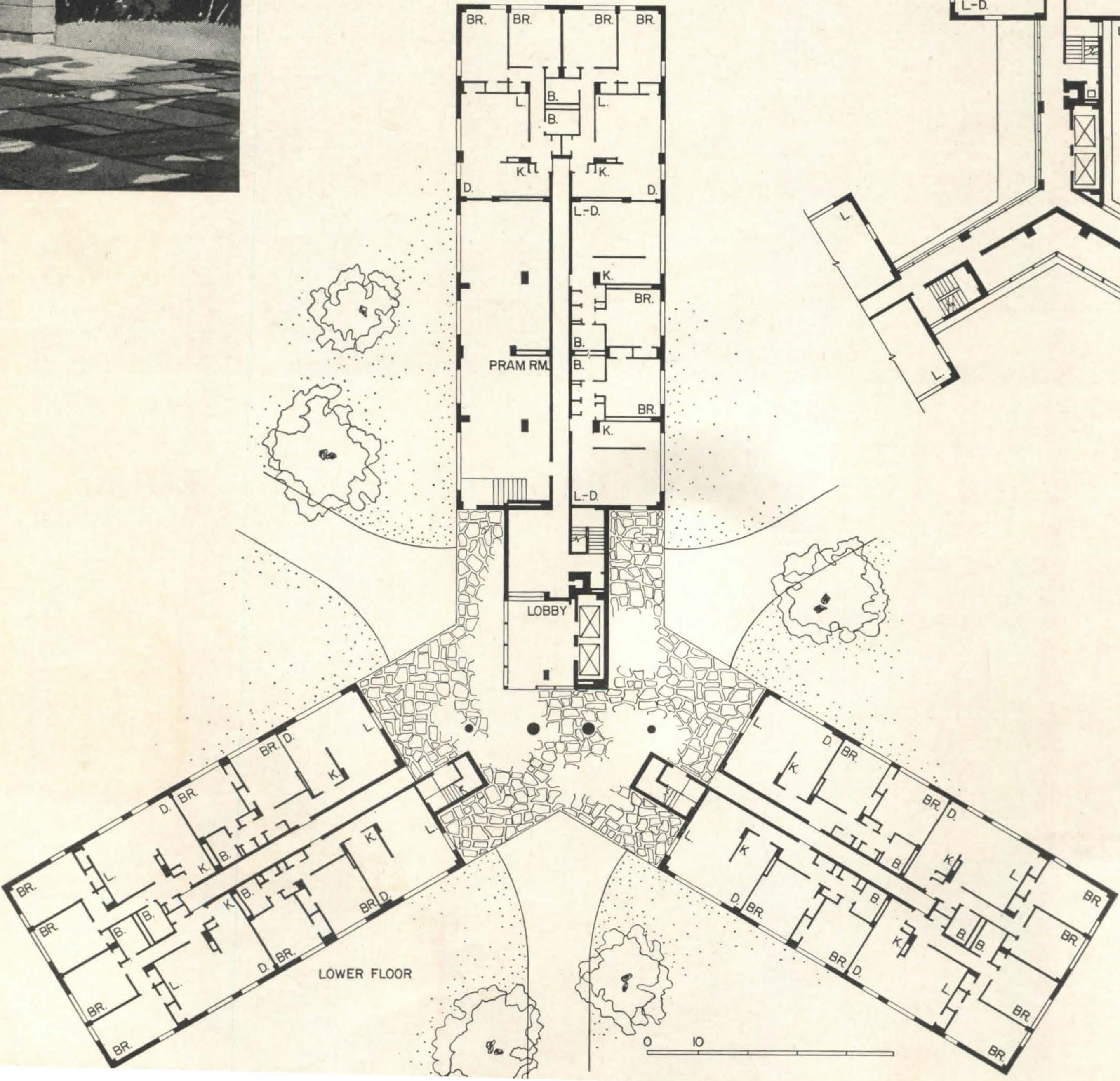

BR.
D.
BR.
BR.
D.
L.
K.
B.
L.
UPPER FLOOR


BR
D.
BR.
L.
K.
B.
LOBBY
PRAM RM.
LOWER FLOOR
0
10






UPPER FLOOR
BR.
L.
B.
K.
D.
L.-D.


LOWER FLOOR
PRAM RM.
LOBBY
BR.
L.
B.
K.
D.
L.-D.
0
10

FOUR VAST HOUSING PROJECTS FOR ST. LOUIS

Mac Mizuki

Hellmuth, Obata & Kassabaum, Inc., Architects

FOR M–1–4
John D. Falvey, Mechanical and Electrical Engineer

FOR M–1–5
William C. E. Becker, Structural Engineer

FOR M–1–6
Horner & Shifrin, Utility Engineers
Harland Bartholomew & Assoc., Landscape Architects

FOR M–1–7
John D. Falvey, Mechanical and Electrical Engineer
William C. E. Becker, Structural Engineer
Robert Joyce, Utility Engineer
Emmet Layton, Landscape Architect

ST. LOUIS HAS BEEN ATTACKING its blighted areas with vast public housing projects which, since 1943, have been remaking the face of a large downtown section of the city. Completed, under construction or planned are a total of almost 7500 dwelling units, which will house approximately 30,000 persons, in seven coordinated projects. Of these, three earlier projects have been published, and one, the John J. Cochran Garden Apartments, designated as M-1-3, was awarded two architectural prizes (ARCHITECTURAL RECORD, June, 1954).

Architects Hellmuth, Obata & Kassabaum, Inc. (formerly Hellmuth, Yamasaki & Leinweber) have profited from the experience gained in that project, and have introduced several new concepts in the planning for the four projects covered in this report. These projects are designated as M-1-4, called the Wendell O. Pruitt Homes, M-1-5, called the William L. Igoe Apartments, M-1-6, as yet unnamed, and M-1-7, called the Joseph M. Darst Apartments.

Since all of these are, under federal legislation, combined low-rent housing and slum-clearance projects, located near the heart of the city, a high-rise, high-density solution was inescapable, and the problem was how to plan a high-rise project on a huge scale, and still provide, to the greatest extent possible under present legislation, communities with individual scale and character which would avoid the "project" atmosphere so often criticized.

Each of these projects has individual differences from the others, as a result of the natural evolution of the design as the architects worked with it. No one plan is thought of as the definitive solution, and future projects will no doubt also vary from the present designs. But some basic principles, which have been worked out in connection with all of these four projects, would seem to have general application.

The first, and probably the most important from the standpoint of the sharp budgetary restrictions and regulations of public housing work, is the establishment of the basic dwelling unit plan. All four projects can be seen as varying combinations of the two or three basic dwelling units. These have been worked out with such care and study that they assure fulfillment of regulatory provisions in many combinations, and the architects are then free to give the main emphasis to the overall plan of the buildings and the projects.

Another principle is the use of some device — gallery, large balcony, skip-stop elevators, restricted horizontal circulation — or combination of devices, to achieve that essential smallness of scale within the huge context of the project which alone will preserve conditions in which human beings can live comfortably and retain all that is possible of the small neighborhood.

A further principle is the use of varying colors and building materials to prevent an overwhelming, monolithic character in the projects. This again contributes to a human environment for people to live in.

Occupancy of the projects is proceeding according to the following schedule: M-1-4: completed and occupied in March 1955 (Negro); M-1-5: partially occupied Nov. 1955, full occupancy in July, 1956 (racially integrated); M-1-6: to be completed and occupied in early 1957 (racially integrated); M-1-7: occupancy to start in Sept., 1956 (racially integrated).

M-1-6 (unnamed)

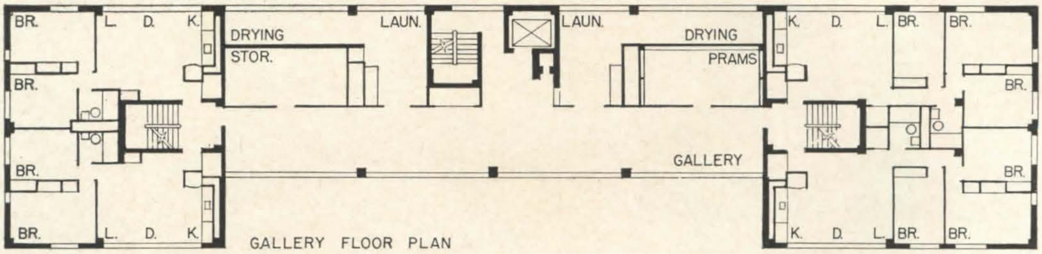
M-1-7, JOSEPH L. DARST APARTMENTS

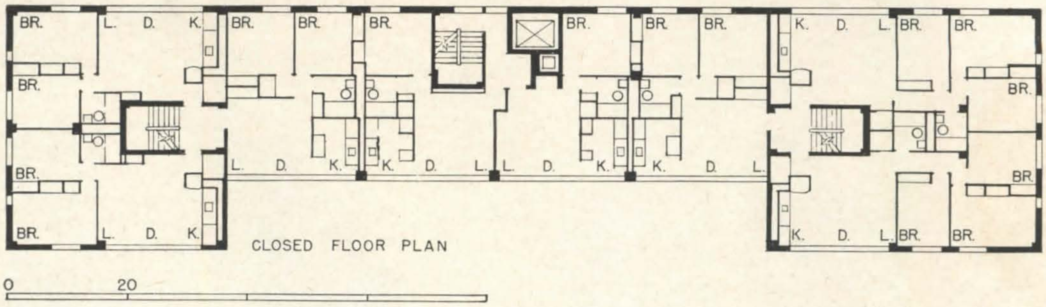
In these two projects, the galleries have evolved into spacious balconies on each floor, which serve as connecting links between the different modules of each building complex.

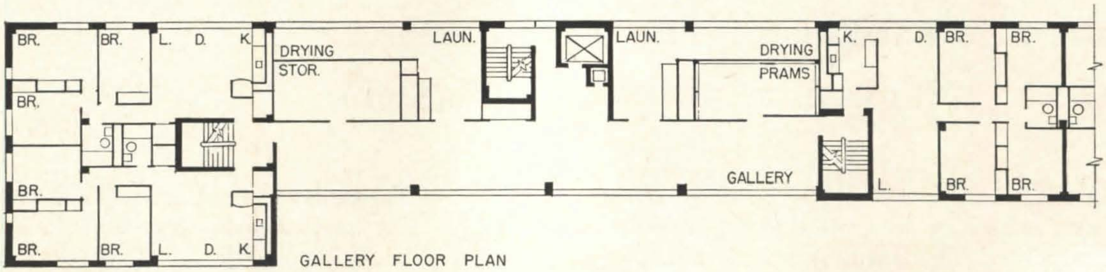
The skip-stop elevator plan is used for economy both of money and space. On each elevator floor are located laundry and drying rooms, and storage space.

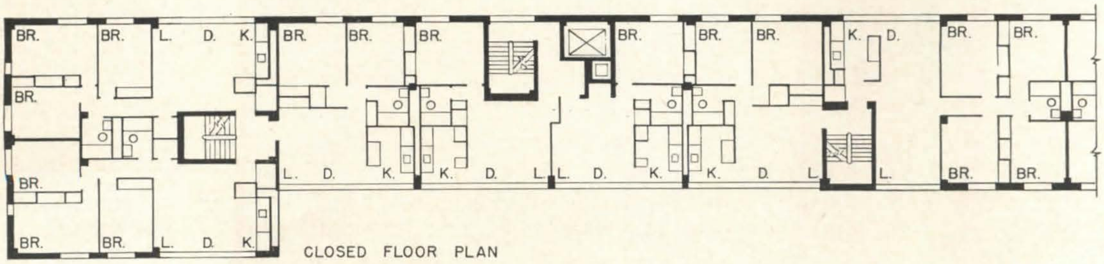
Residents of the buildings will naturally gather into small "neighborhoods" about the stop floors, with balconies forming centers of smaller sub-neighborhoods shared by three or four families.

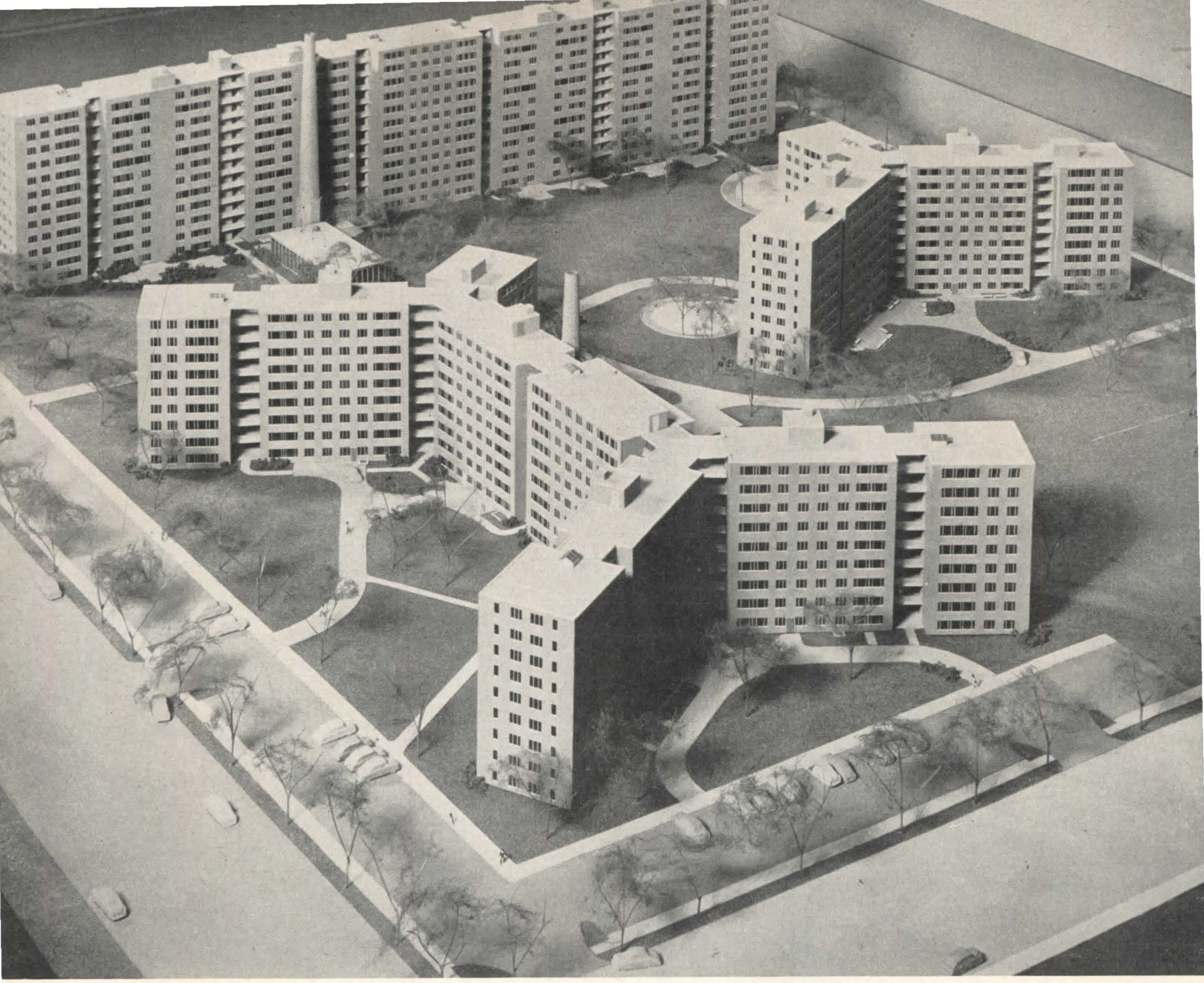
This plan makes possible the arrangement of the buildings on the site in any way that suits the practical and esthetic conditions. Long "slabs" of several building modules built end-to-end, or various combinations of "Y"s and crosses are equally feasible. Thus a visual line which is broken at irregular intervals avoids the regimented look of many projects. The fact that at the balcony joining points one can "see through" the buildings creates vistas of visual interest, of which the buildings are an integral part, rather than a necessary obstruction.


BR.
L. D. K.
DRYING
STOR.
LAUN.
LAUN.
DRYING
PRAMS
GALLERY
GALLERY FLOOR PLAN


BR.
L. D. K.
CLOSED FLOOR PLAN
0
20


BR.
L. D. K.
DRYING
STOR.
LAUN.
LAUN.
DRYING
PRAMS
GALLERY
GALLERY FLOOR PLAN


BR.
L. D. K.
CLOSED FLOOR PLAN



Mac Mizuki

M-1-4, WENDELL O. PRUITT HOMES

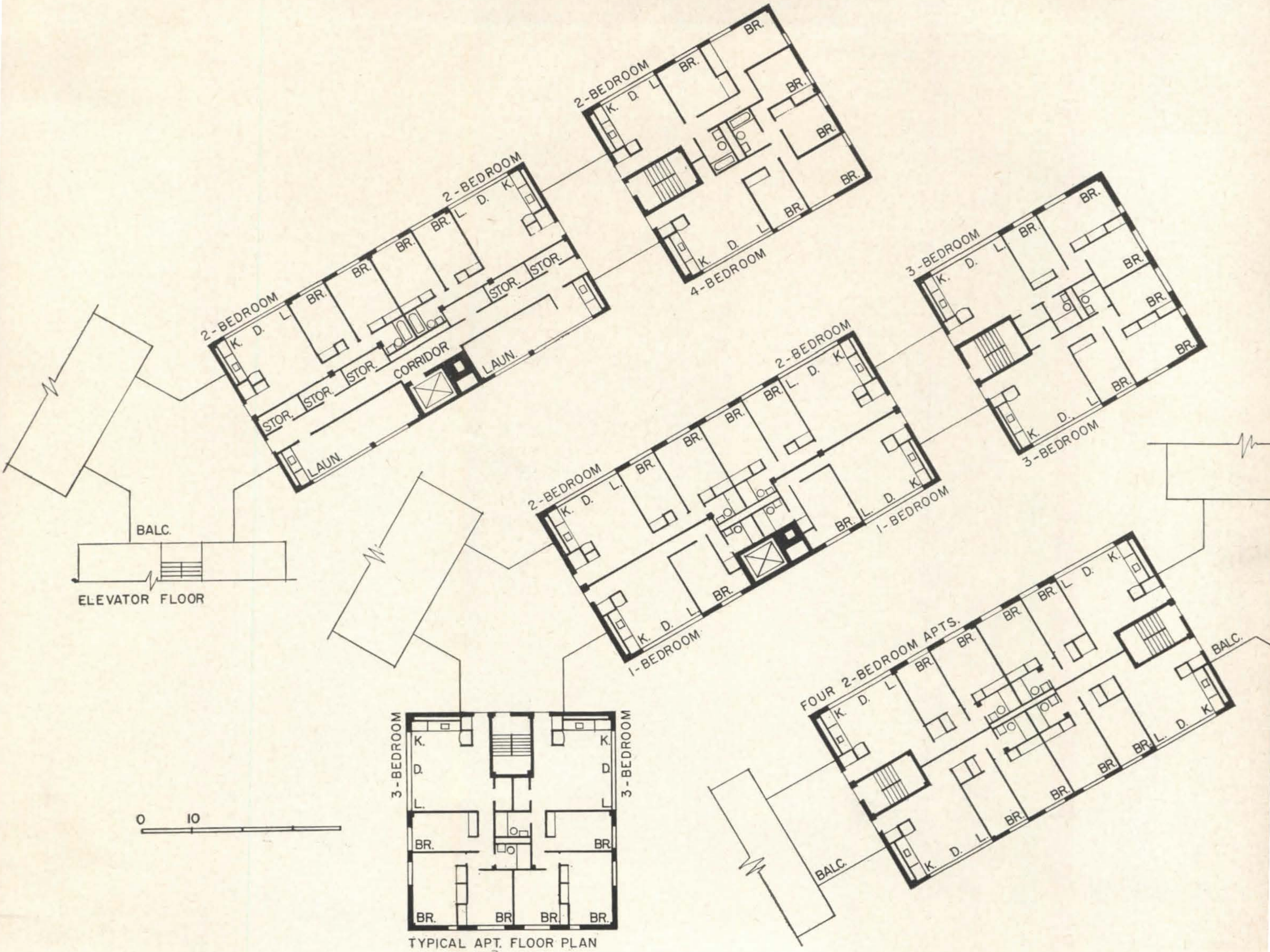
M-1-5, WILLIAM L. IGOE APARTMENTS

The glazed gallery, combined with the skip-stop elevator plan, results in the economical creation of individual "neighborhoods" within the buildings.

Elevators stop only at every third floor, so that residents of other floors walk either up or down one story. The stop floors contain long (85 ft. and 11 ft. wide) galleries which serve as the main hallways, with stairs acting as vertical hallways. Space used only for circulation is thus almost eliminated, since some fire stairs would be necessary, even if elevators stopped on each floor. The galleries are both community gathering places and safe enclosed play yards for small children, and keep the scale down to human size. Opening off the galleries are laundry and storage rooms, with space for wheeled toys. A mother can do her laundry with her child playing in sight and still be near enough to her apartment to keep an eye on the stove. Many a high-rent city apartment dweller would envy the storage area just off the elevator, instead of in the basement.

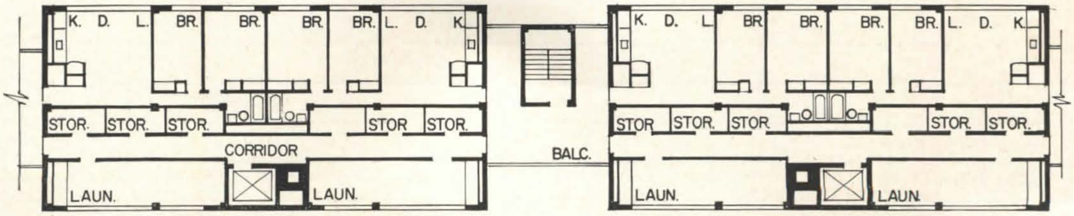
There is no horizontal circulation in the long, slab shaped buildings. Each gallery-centered unit is treated as an individual building, and if a building is to be increased, another stack of apartments, with its own galleries and elevators, would be added on the end.

Thus the small "neighborhoods" are preserved, and the units can be combined in any way that fits the site.

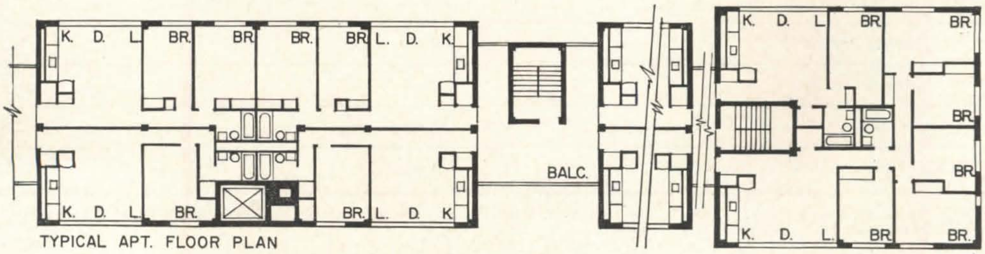


ELEVATOR FLOOR

TYPICAL APT. FLOOR PLAN



TYPICAL ELEVATOR FLOOR PLAN



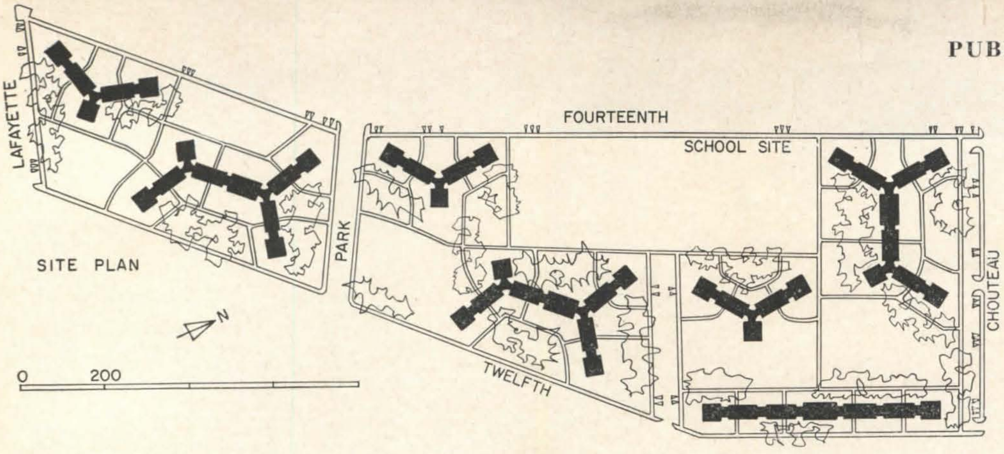
TYPICAL APT. FLOOR PLAN

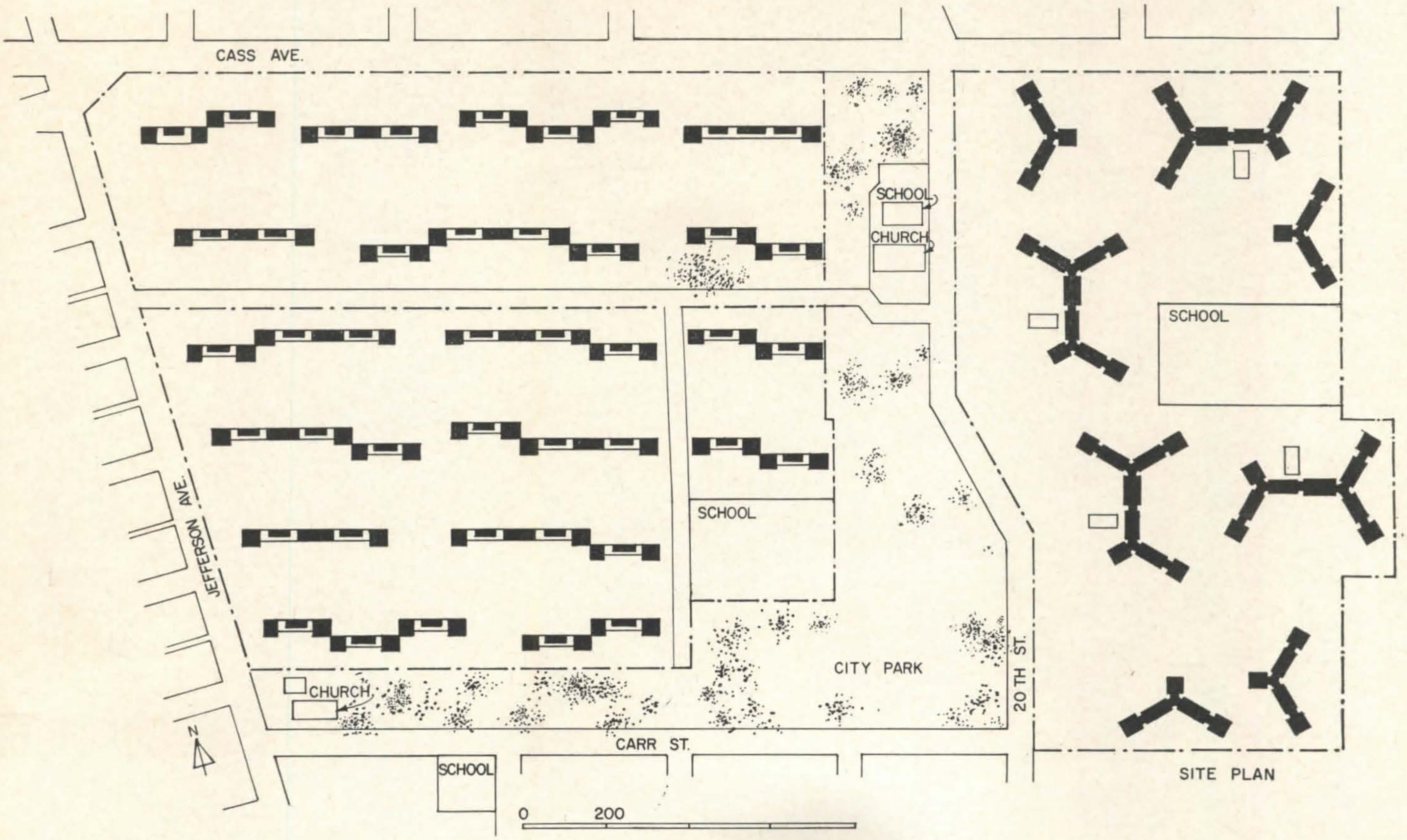
Mac Mizuki

COSTS, by project

	M-1-4	M-1-5	M-1-6	M-1-7
UNITS	1,736	1,132	1,320	1,238
COST	$17,839,500	$11,420,015	$6,512,073*	$6,162,266*
COST (per room)	2,143.15	2,115.31	2,115.68	2,155.76
COST (per sq ft)	10.63	10.36	10.45	9.89
AREA-SITE (acres)	26.3	17.9	25.7	28.5
AREA-BUILDING (sq ft)	1,678,075	1,102,604	623,308*	623,308*
PERSONS	6,932	4,556	5,025	4,624
DENSITY (persons per acre)	274	271	196	162
DENSITY (units per acre)	69.3	63.2	51.3	43.4
ROOMS	8,324	5,446	6,156	5,717
LAND COVERAGE	13%	11%	12.8%	13%

* These figures apply to the completed first half of these projects. Total figures may be approximated by multiplying by 2, but such total may well be affected by changes in plans to include units for aged persons in these projects.

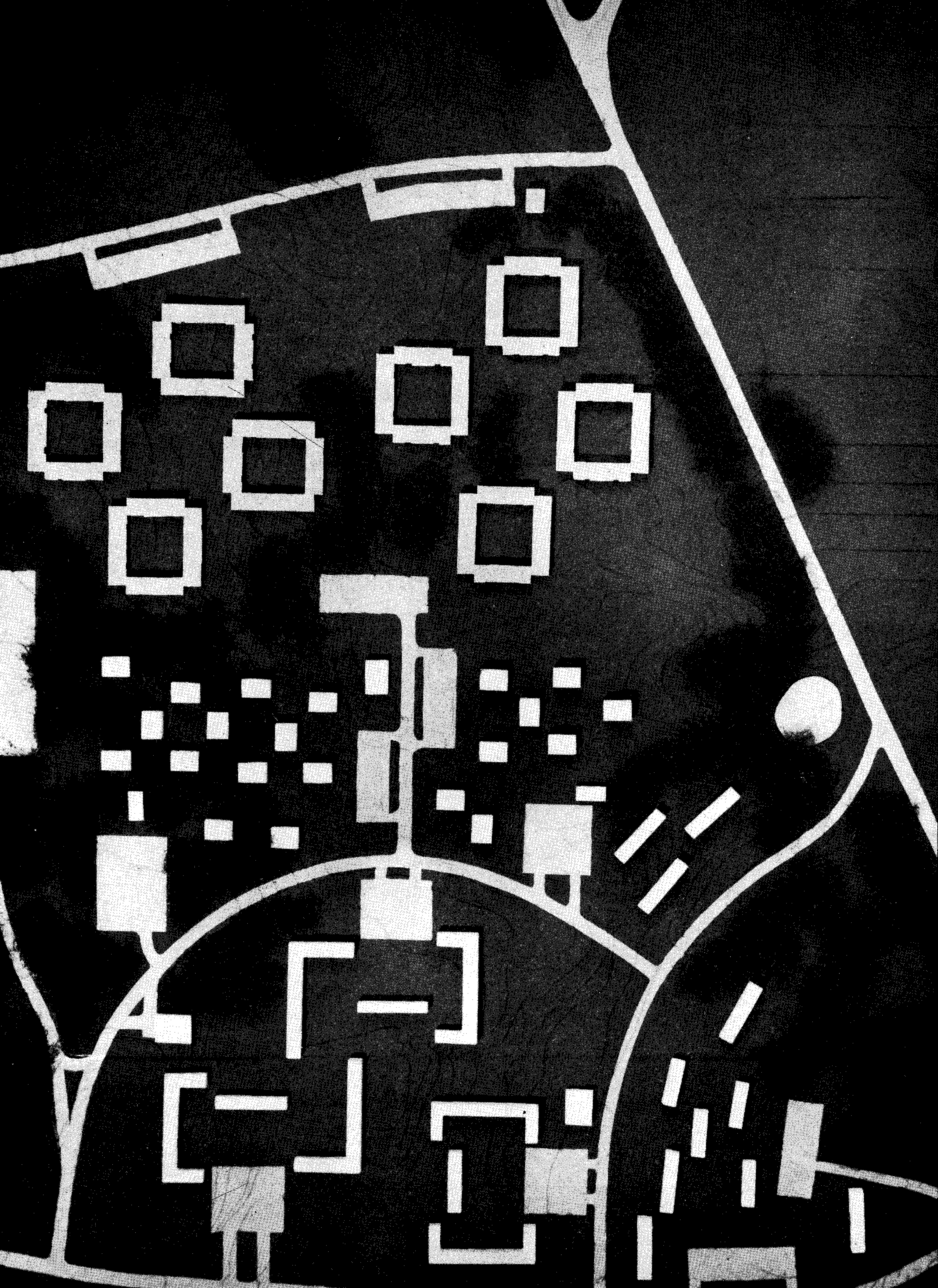


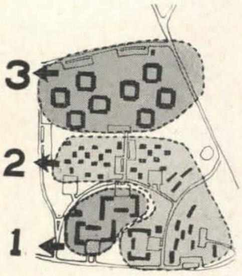


SUMMATION

Totals and averages for all four projects together

TOTAL DWELLING UNITS	5,426	Of these, 1,279 are *planned,* figure may vary
TOTAL PERSONS	21,137	Of these, 4,824 are *planned,* figure may vary
TOTAL ACRES OF SITE	98.4	
TOTAL ROOMS	25,643	Of these, 6,436 are *planned,* figure may vary
TOTAL SQUARE FEET	5,273,914	Of these, 1,246,616 are *planned,* figure may vary
TOTAL COST	$54,608,193	Of this, $12,674,349 is for construction planned, figure may vary
AVERAGE DENSITY (dwelling units per acre)	56.8	
AVERAGE DENSITY (persons per acre)	251	
AVERAGE LAND COVERAGE	12.9%	
AVERAGE COST (per sq ft)	$10.33	
AVERAGE COST (per room)	$2,129.55	





Hedrich-Blessing

CAMPUS HOUSING IN NEW AND VARIED PATTERNS

Northwood Apartment Group, University of Michigan, Ann Arbor, Mich.

Yamasaki, Leinweber and Associates, Architects and Engineers

As ARCHITECTS work always toward more human values in housing developments, particularly when designing large groups, they push always farther into the realm of innovative ideas or find new combinations of old ideas. The site plan photograph on the opposite page shows schematic variations these architects have used for a large group of housing units for the University of Michigan. Though there are other efforts not visible in the site plan, it is still clear that the different types of buildings indicated will obviate the institutional atmosphere of "public housing" which could easily have crept into so large a project.

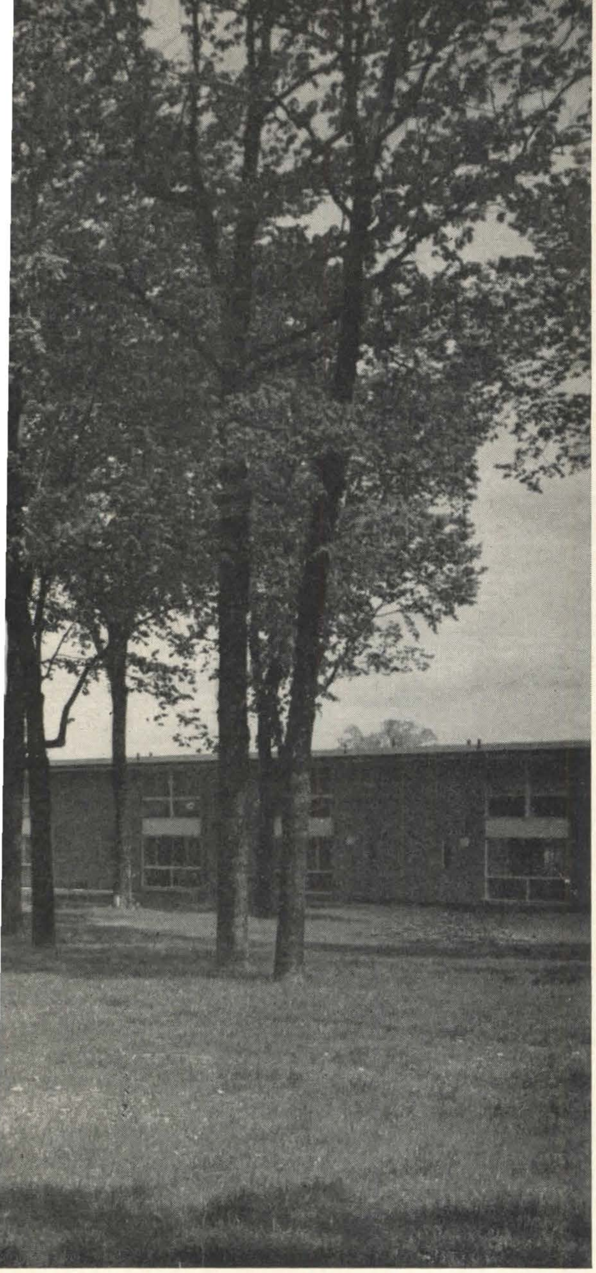
The architects explain that this is but a preliminary scheme — already there have been refinements of the third group of buildings indicated at the top of the photograph. As the small diagram shows, the project is being done in three groups, the third group still existing only on paper.

The first group was built on the highest, flattest part of a beautiful site with gently rolling contours. The architects, wanting to break with the more formal lines of the main campus, used the U and L type buildings to delineate informal and varied courts. The pattern changes in the second group, using a compact rowhouse scheme; these are also informally placed, pretty much as dictated by the natural contours of the land. In this group there is still another pattern; in this four small apartment units are placed back to back on each floor of compact rectangular buildings. In this type of building the porches are eliminated, so that this group is more economical by that much.

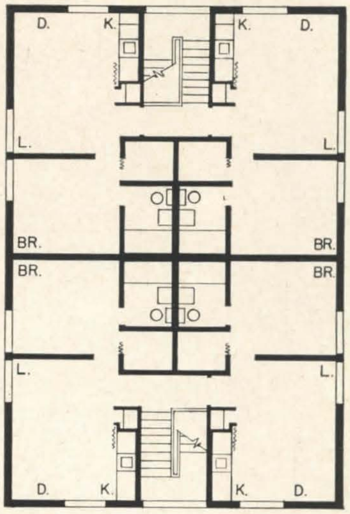
The third group, as now proposed, uses a slightly more formal, enclosed court; this scheme would use quite similar plans but would give the buildings a different character. The separate buildings are disposed in a thoroughly informal pattern.

Various differences in design and materials also contribute to a visual change of pace. The architects have chosen different shades of the same type of brick for the several types of buildings.

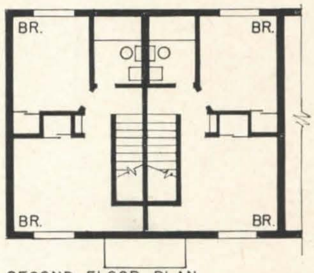
UNIVERSITY OF MICHIGAN HOUSING



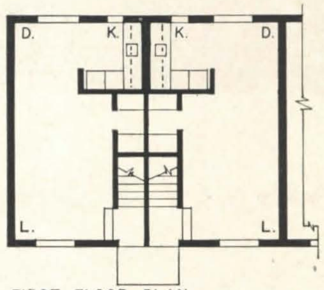
Hedrich-Blessing



SECOND FLOOR PLAN

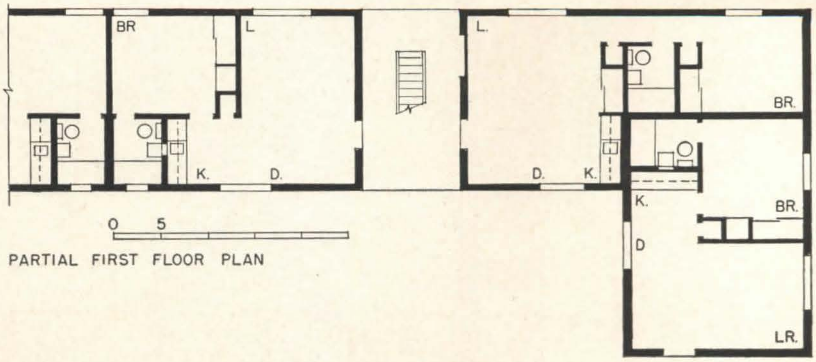


SECOND FLOOR PLAN



FIRST FLOOR PLAN

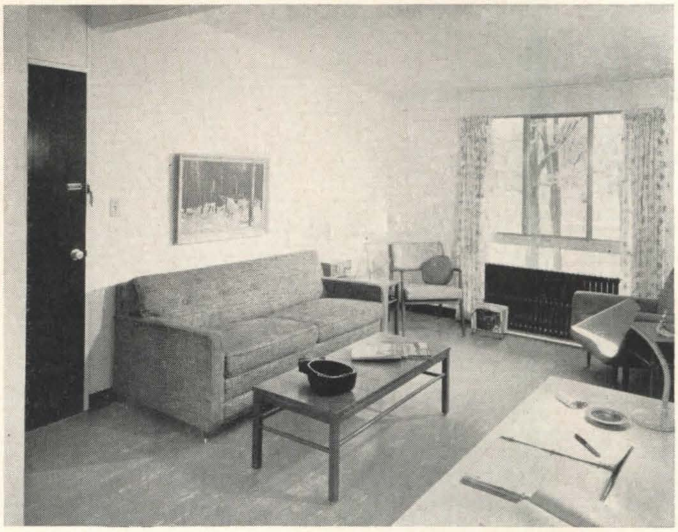
A beautiful site with gentle contours and large trees, which were saved, contributed heavily toward the final environment that the architects sought. Open sections for entrances and stairs break up the rows of apartments and provide a see-through openness, not to mention covered porches beside each apartment. Plans are various combinations of row houses, and one-bedroom units

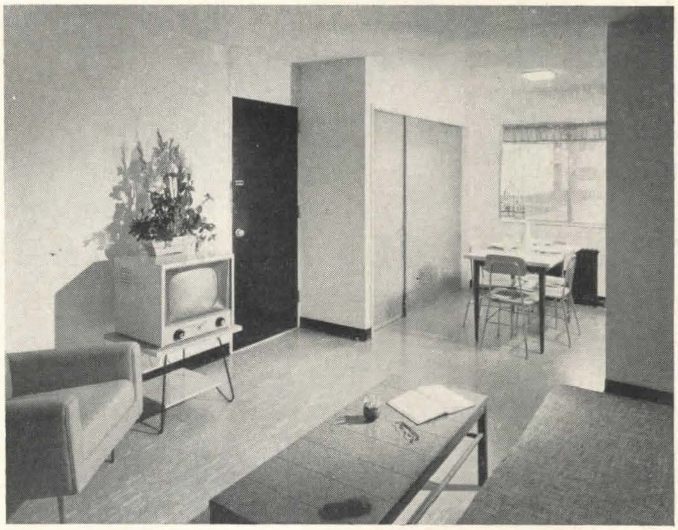


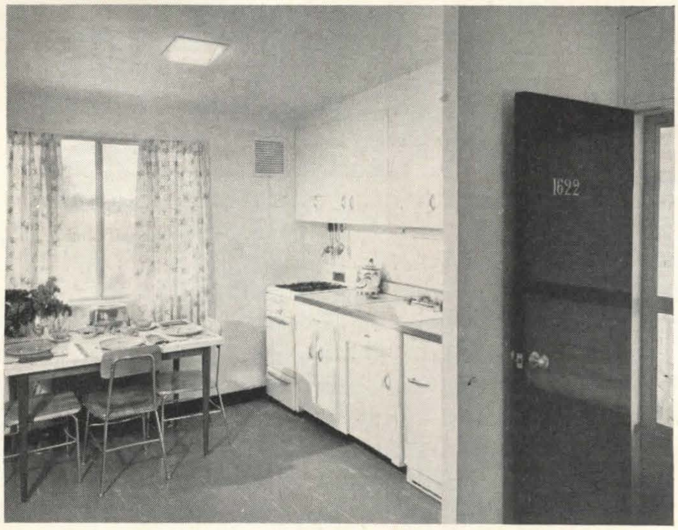
PARTIAL FIRST FLOOR PLAN

UNIVERSITY OF MICHIGAN HOUSING

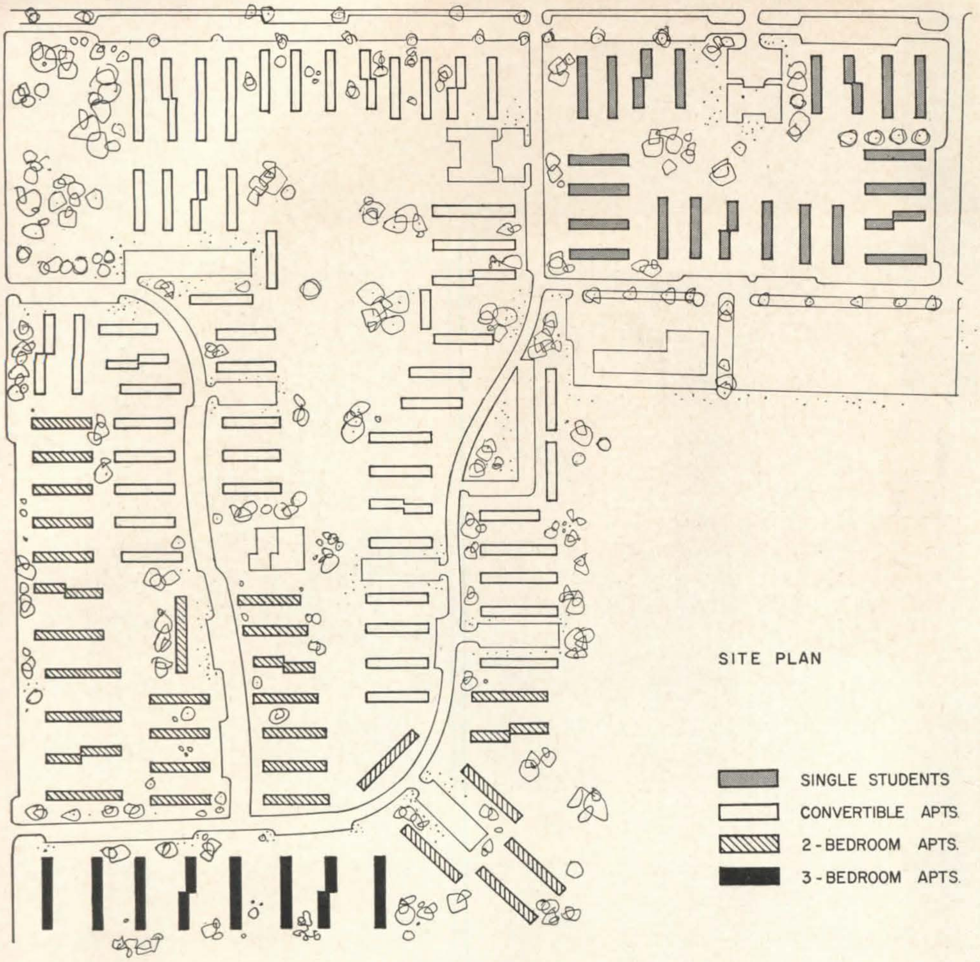
Hedrich-Blessing







Interiors generally manage a simple and informal elegance and a feeling of openness. Windows are arranged in large groups to provide a maximum of light and view but to give also plenty of wall space within for efficient furniture arrangement. Wherever possible the living-dining spaces are kept open right through the building. Exteriors were deliberately varied in fenestration as well as in brick colors, as part of the whole effort to avoid monotony



Housing for Single and Married Students

Purdue University, Lafayette, Ind.

John W. Galbreath & Co., Developer

John R. Diehl, Architect

Richard L. Tully and Frederick H. Hobbs, Consulting Architects

Marion V. Packard, Landscape Architect

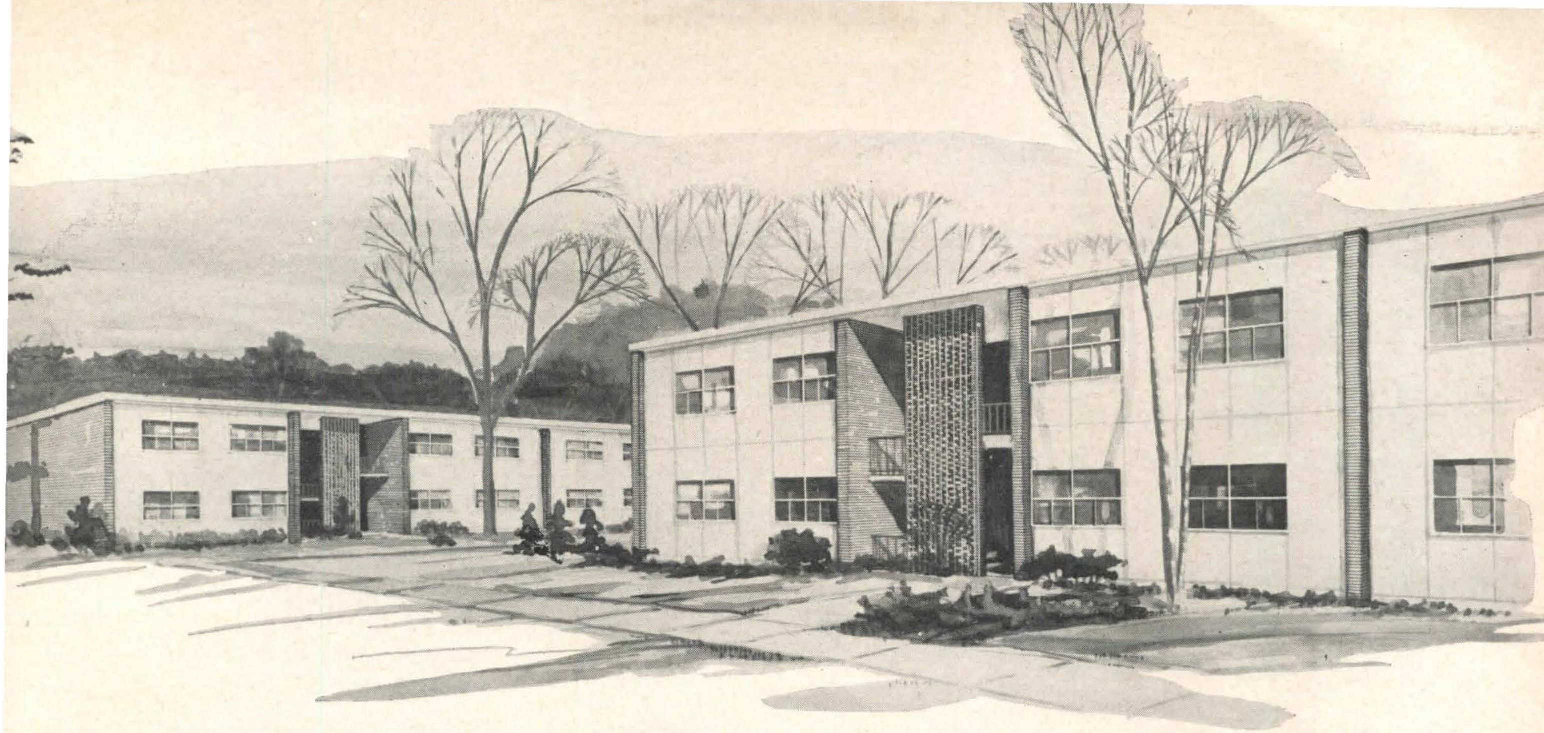
CAMPUS HOUSING: CONTEMPORARY VERSION

Purdue university has been tackling the problem of housing for married students, now an established if not necessarily permanent fixture on college campuses. The time has gone for the temporary structures with which this need was first met, the heavy enrollments of early postwar years have not slackened and now promise to go upward rather than downward. Construction costs have not diminished either. All in all, there is a great housing problem on campuses, for single and married students alike, calling for some new concepts of housing, also of land use.

Purdue has decided against the traditional types of dormitory buildings, has already proved that informal and more intimate court-type developments are both more economical and more acceptable to students. Land for such buildings is not, of course, unlimited, so this project aims at the informal two-story buildings.

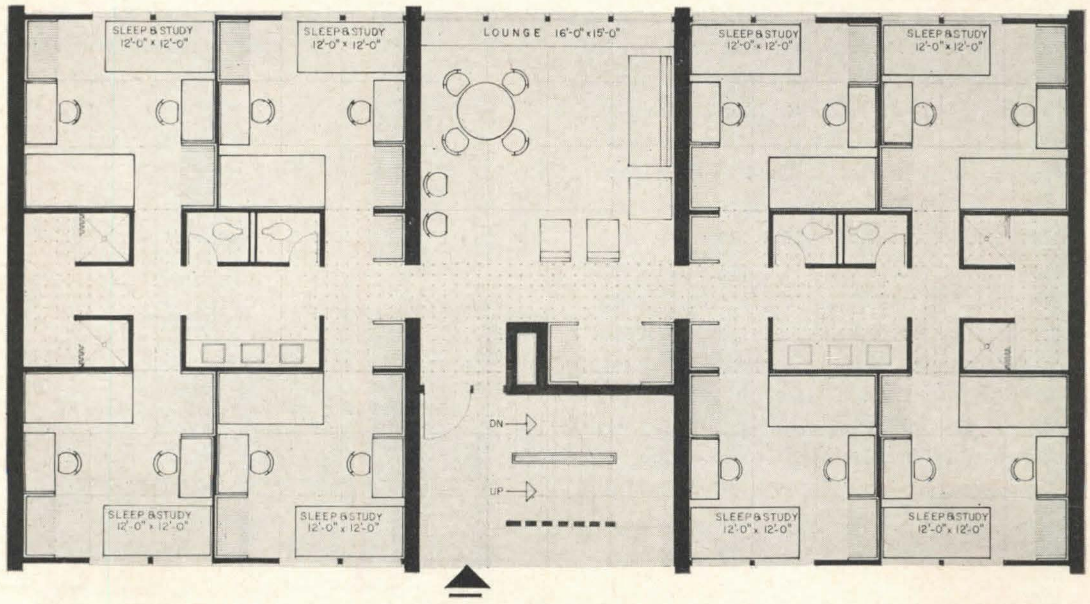
As for married students, the scheme proposes buildings of one-, two- or three-bedroom apartments, by far the largest number having one bedroom. These are designed to be convertible to single rooms for single students, just in case the trend reverses at some future time and the proportion of married students declines. Thus an area planned for two one-bedroom apartments could be rearranged for four double rooms for single students, with two bathrooms and a communal lounge for the four rooms. The two-story buildings, however long, are divided by masonry walls into small units, to obviate as far as possible the large groupings of the older dormitory buildings.

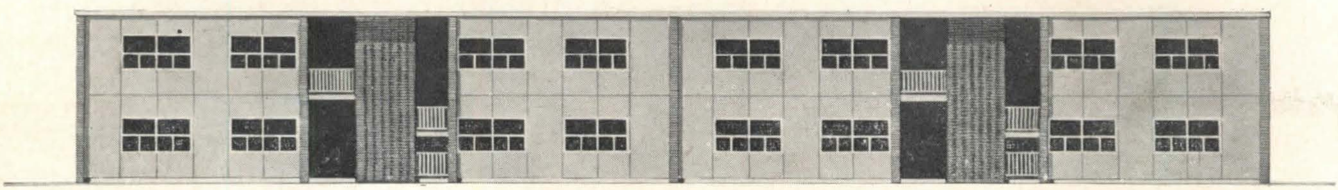
The site is a relatively flat, L-shaped tract of some 80 acres, adjacent to the main campus and now partially occupied by temporary buildings. The original scheme calls for buildings for single students closest to the campus, those for families with children farthest away. The site plan provides a studied arrangement of buildings, open spaces and streets accommodating adequate vehicular traffic and off-street parking, but produces little internal traffic and permits the complete separation of pedestrian circulation. The larger groups of buildings share a common park area to which all have easy access; in general, two buildings share a common court through which all students therein approach; 16 to 32 single students share an entrance; 8 to 16 share a floor and common lounge room; 4 to 8 share a bath or toilet area; and 2 share a sleep-study room in all cases.

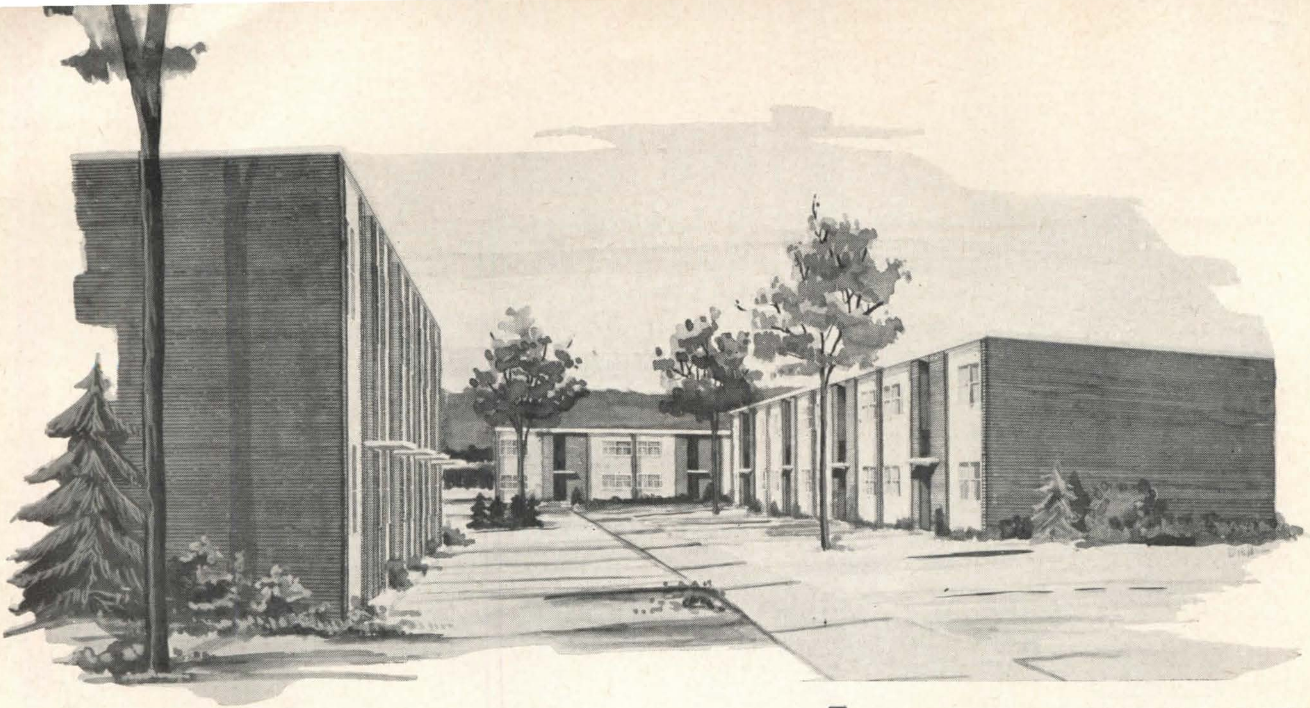


SINGLE STUDENTS' BUILDINGS

In buildings designed for single students the rooms are arranged in groups for 16 students, with a lounge area and two bath and toilet areas. Each sleep-study room, for two students, measures 12 by 12 ft. There is laundry and storage space in the basement. Each building section then houses 32 (two floors). Says the architect, "Building grouping provides opportunity for supervision while maintaining intimacy and privacy for the occupants."

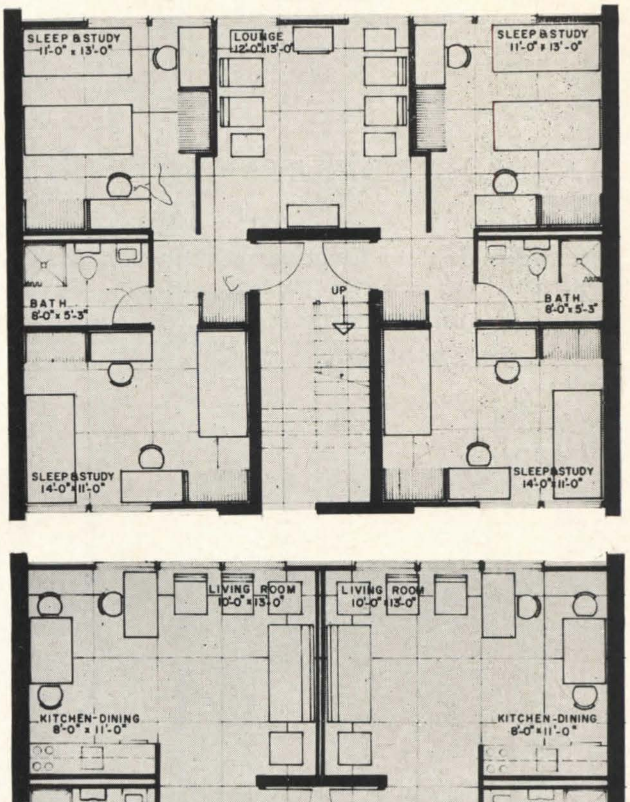




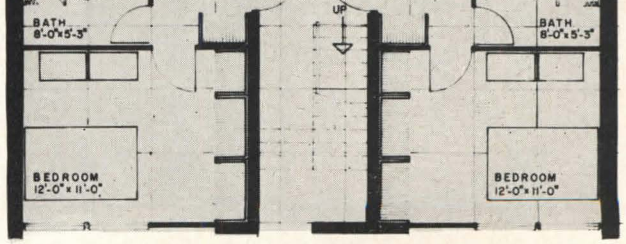


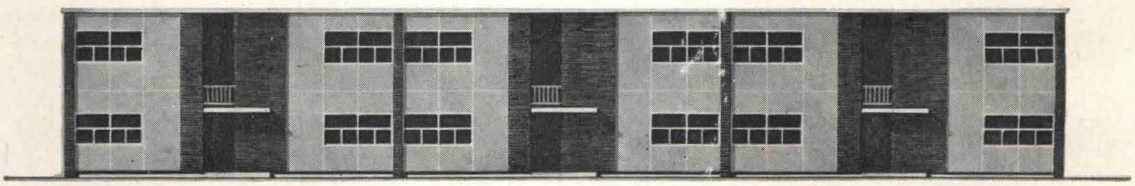
STUDENT HOUSING: PURDUE

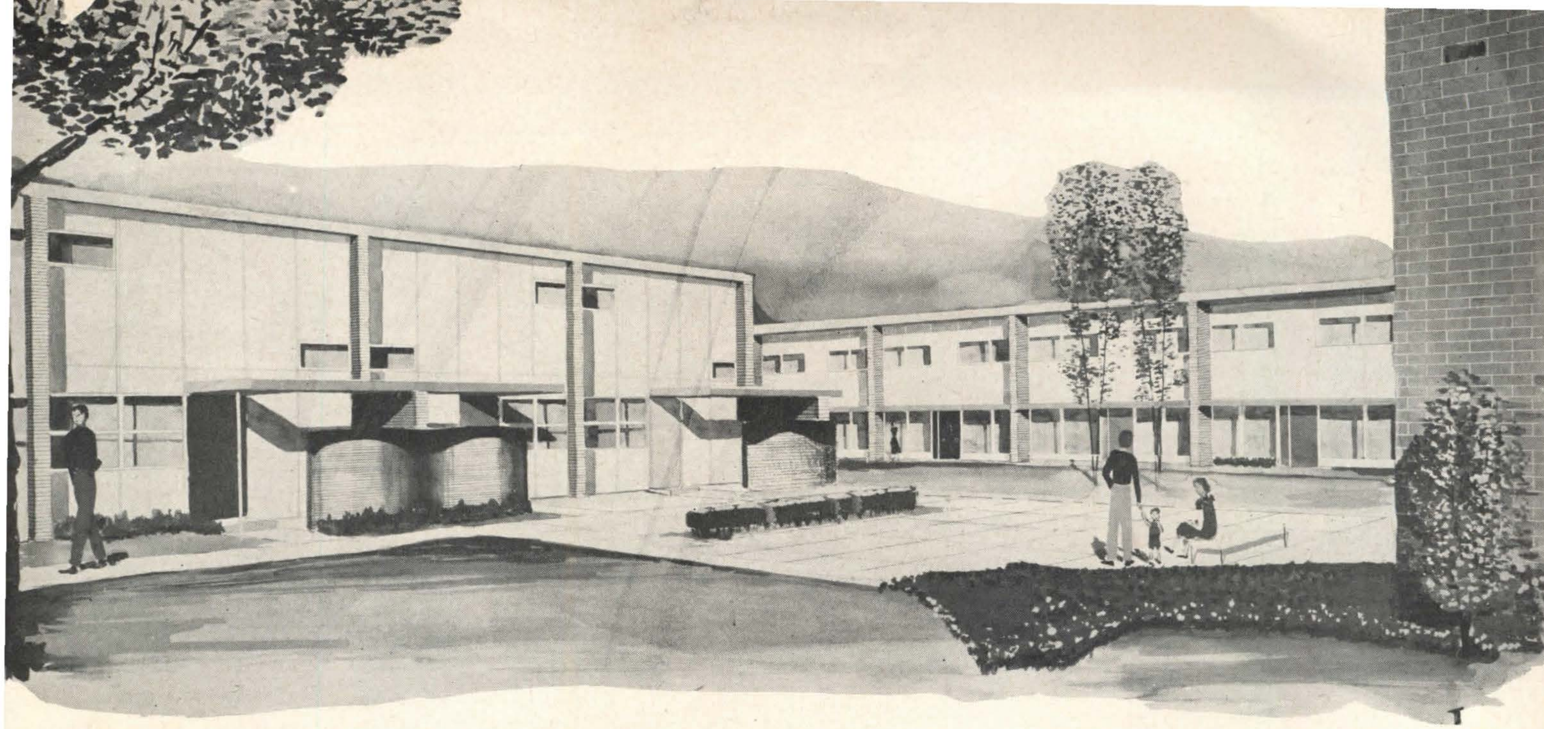
CONVERTIBLE ONE-BEDROOM APARTMENTS



Buildings of this type are designed for original occupancy by married students, with two one-bedroom apartments on each floor of each building section. But in case the number of married students should decline in another swing of the pendulum, the two apartments may be arranged for single students, as in the second plan. The change would involve the removal of the package kitchen units, the partition change indicated, and the rearrangement of closet space, to make a lounge and two sleep-study rooms out of the space occupied by two living-dining spaces. The bathrooms would stay as is, being shared by four students each. This type in the original scheme was to be the most prevalent, with 700 one-bedroom units planned.

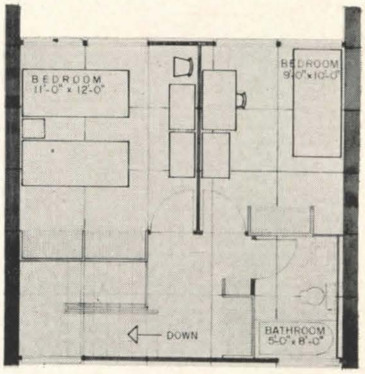


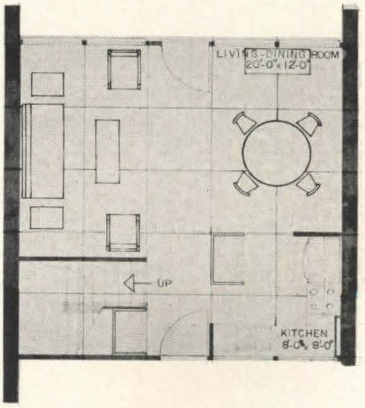


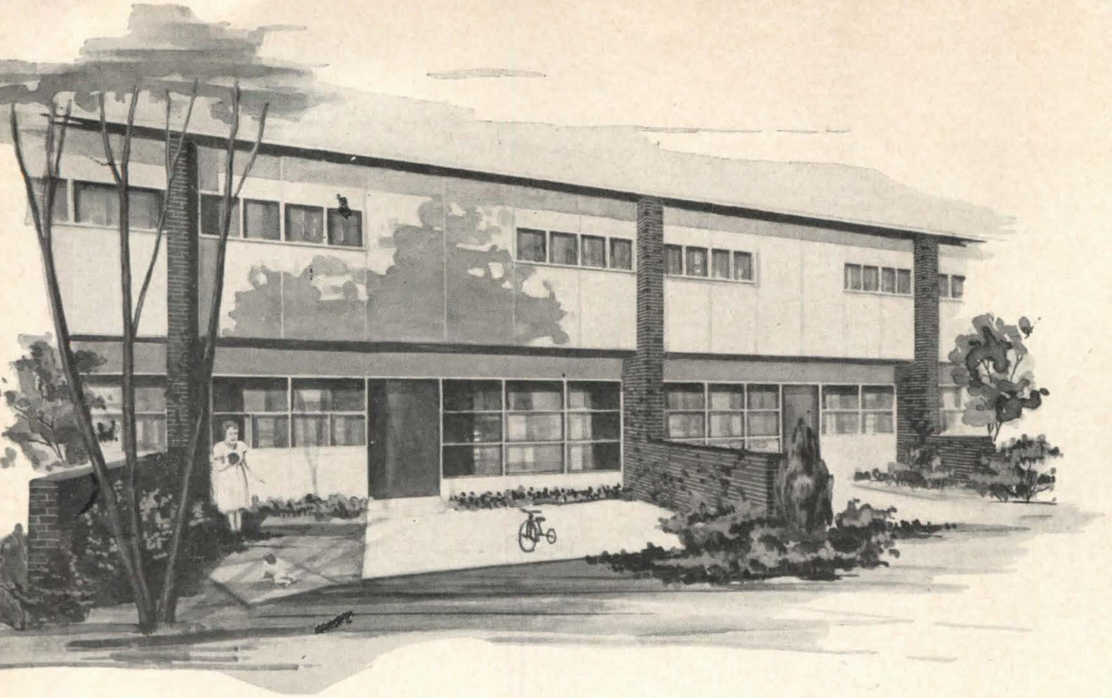


TWO-BEDROOM APARTMENTS

For married students with one child, the scheme contemplates two-bedroom apartments, in a generally row-house plan. In the site plan these are shown farther removed from the campus than the buildings for single students or for married ones without children. The total scheme proposes kindergarten and nursery school, children's play areas, parks and neighborhood shopping facilities. The proposal calls for 250 of these two-bedroom apartments; these would not, of course, be easily converted for single students, and are intended to remain as permanent for married students. One presumes, however, that they would never go begging even should the married student population decrease, for the faculty members would probably be glad to take over, at any time.



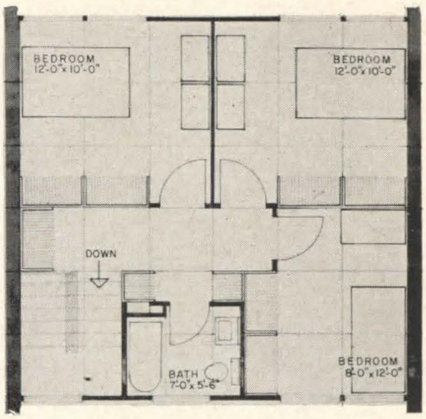


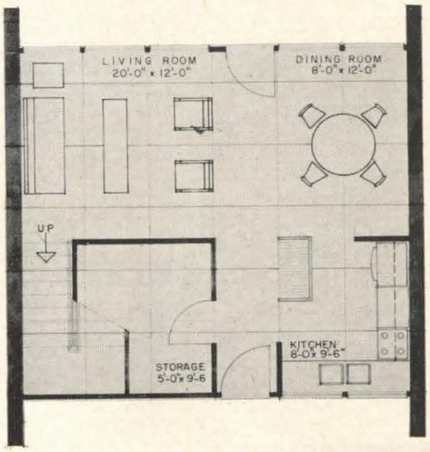


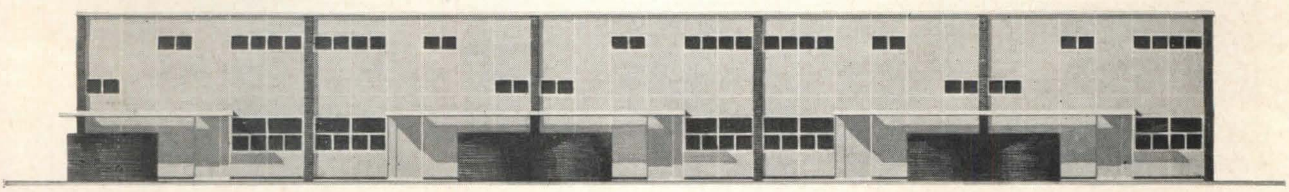
STUDENT HOUSING: PURDUE

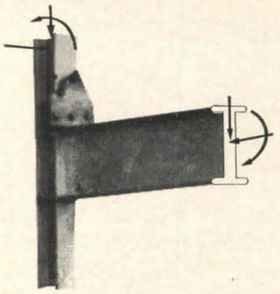
THREE-BEDROOM APARTMENTS

For the married students with still more parental responsibilities, three-bedroom apartments are also contemplated. These would be the smallest group, with some 50 of these units planned. The generally row-house scheme is maintained, each unit being six 4-foot modules in each direction, instead of the five for the two-bedroom buildings. And the three-bedroom apartment buildings would naturally occupy the part of the site farthest removed from the campus. Each of these units has about 1100 sq ft, with eight units in the typical building.









A CHANGE AHEAD FOR STRUCTURAL DESIGN

Plastic Theory, Ultimate and Limit Design

Article 1: Background and Implications

By Edward Cohen, Associate, Ammann and Whitney, Consulting Engineers, New York

UNTIL MODERN TIMES all structures were built to support the dead weight plus the superimposed live loads without collapse. Factors of safety and stresses, as such, had no meaning to the designer since no rational methods of computation were available. It is interesting to note that the structures of ancient Egypt, Greece, Rome and Renaissance Europe were achieved without the advantage of any reliable scientific theory or mathematical formulas. Structures were built by trial and error. Failures were common and it was not unusual to rebuild structures such as the Roman arches several times before achieving the final results which survive today.

Slowly, rough rules for judging the approximate strength of beams, columns, arches and domes were developed. It was not until the 16th century that Galileo began the solution of the problem of bending and not until the middle of the 17th century that Robert Hooke formulated "Hooke's Law," the proportional relationship of stress and strain in the elastic range. In the following centuries, this law was elaborated to provide rational methods of analysis and design to replace the previous methods based on experience and experiment.

In reinforced concrete design which started at the end of the 19th century, ultimate strength methods based on nonlinear compressive stress-strain diagrams (stress no longer proportional to strain) for concrete were proposed along with the straight-line method. In view of the limited experience and laboratory tests at that time, the straight-line method won acceptance because of its relatively simple mathematics and adequate safety. It was incorporated in the first American code of reinforced concrete in 1909.

However, this was not the end of ultimate strength and in 1937 C. S. Whitney presented a practical, adequately documented method of design based on an inelastic or "plastic" stress-strain relationship. In 1951 the ACI approved an ultimate strength method for the design of reinforced concrete arches, and, this year, has incorporated an *ultimate strength* method as part of the basic building code for all reinforced concrete structures. *Ultimate strength design* has been used for several years in Brazil, Russia and other European countries. Last year an *ultimate strength* code was also adopted in Great Britain.

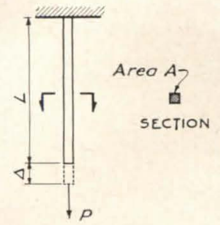
The first application of limit or *plastic* analysis to structural design was made by G. V. Kazinczy in Hungary in 1914. Later, plastic design for steel structures was proposed by N. C. Kist in Holland in 1920, by J. A. Van den Broek in the United States in 1940, and by J. F. Baker in Great Britain in 1948.

In recent years extensive testing of individual members and full scale structures and research on practical design methods have been conducted at Lehigh University in cooperation with the American Institute of Steel Construction and the Welding Research Council. Although an American code for *plastic* design in steel has not yet been formulated, *plastic* design has been incorporated in the Standard British specifications as an acceptable design method.

One of our oldest building materials, timber, has always been designed on the basis of strength although in recent years the terminology of stress has been adopted. Thus, it appears engineers have been more prone to retain or adopt plastic or ultimate strength methods for the design of those materials which are least amenable to "accurate" analysis.

In discussing ultimate strength today no one proposes returning to the wasteful and often dangerous procedures of previous times. Rather it means carrying forward the analysis of structures into the region where stress is no longer proportional to strain and which the early engineers and mathematicians avoided, partly because either it did not lend itself to the available concepts and methods of analysis, or because many of the common materials of their time were not sufficiently ductile to be trusted far beyond the yield point. It is also true that one phase of ultimate strength methods — redistribution of moments, thrusts, etc., from overstressed points to those originally understressed — is applicable primarily to statically indeterminate structures which have become practical only in recent years with the advent of reinforced concrete and welding.

Although structural engineers have placed great reliance on elastic stress analysis for purposes of analyzing and designing structures, they have not accepted the results without a "grain of salt" based on experience and laboratory tests. For example ductile steel plates with rivet holes are designed for tension on the basis of the average stress on the net section whereas the theoretical elastic stress at the hole may be as high as three times the average. Circular steel sections and pins are allowed higher working stresses in flexure than rectangular or WF members. Continuous WF beams and rigid frame columns are allowed higher working stresses at points of maximum moment than simple beams. Shallow timber beams are allowed higher stresses than deep narrow beams. In those instances where tests and experience showed a flexural strength



HOOKE'S LAW

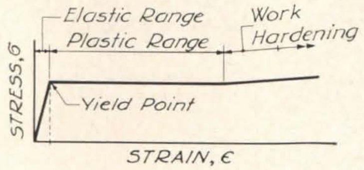
Stress is linearly proportional to strain, thus:

$\sigma = E\varepsilon$, *where*

$\sigma = \dfrac{P}{A}$ = *stress or force per unit area*

E = *modulus of elasticity*

ε = *strain* $= \dfrac{\Delta}{L}$



Theoretical Stress-Strain Diagram for Steel in Tension

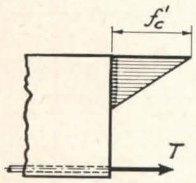
YIELD POINT

The values of stress and strain after which strain increases without increase in stress

WORK HARDENING

The increase in strength after substantial yielding has taken place

---

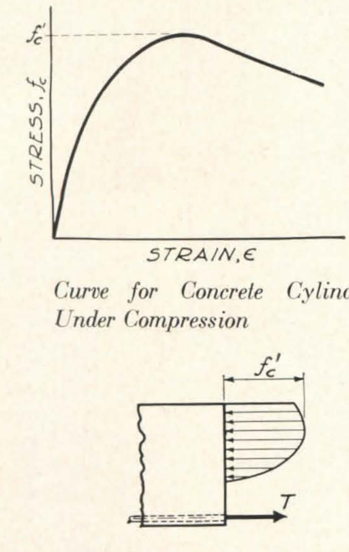


Straight-Line or Elastic Stress Distribution for a Reinforced Concrete Beam

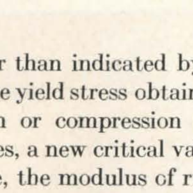
STRAIGHT LINE METHOD

Analysis of reinforced concrete sections on the assumption that stress is proportional to strain. Since concrete has no tensile strength, stress distribution is shown only for the section in compression, for which stresses are assumed to vary from zero at the neutral axis to maximum compression at the top fiber

---



Curve for Concrete Cylinder Under Compression



Plastic Stress Distribution for a Reinforced Concrete Beam

PLASTIC THEORY

(Reinforced Concrete)

Application of the actual non-linear stress-strain curve of concrete to design. The stress distribution curve (lower left) more nearly gives the true condition in a concrete beam under load

greater than indicated by elastic theory and the yield stress obtained from simple tension or compression tests on small samples, a new critical value of stress for flexure, the modulus of rupture, was arbitrarily used. This stress, introduced into the equations of elasticity, gives a reliable value of bending strength.

The strengths of tier buildings for lateral loads caused by wind or earthquake are normally computed by limit design. Retaining walls are designed not only to limit the soil bearing stress but also for a given factor of safety against overturning. Although it is only in recent years that a rational theory has been evolved for columns, the design of such members in both structural steel and reinforced concrete has long been on an ultimate strength basis. Allowances for inelastic action, moment and stress redistribution are not new to building codes.

What is new is the development (and acceptance in reinforced concrete design) of rational and consistent design methods for beams, columns and frames of both reinforced concrete and structural steel which will give a uniformly reliable estimate of their strength. It may come as something of a shock to some that while the present allowable "elastic stress" design methods are adequate and safe, the actual factors of safety are highly variable, though generally on the side of excess safety.

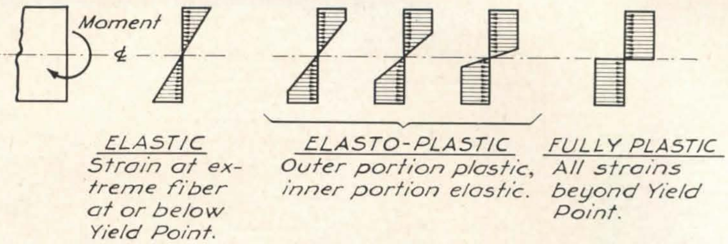
An urgent need for calculating the actual strength of structures beyond the point of initial yield which arose during World War II in the design of shelters, ships, etc., against high explosives brought attention to earlier investigations on the ultimate strength of structures. Further impetus was given this field of research following the war when the government embarked on an extensive program to develop basic data and design methods which could give a reasonably accurate prediction of the effects of atomic bomb blast pressures on structures. In order to make such predictions, an accurate method of strength computation was required and only those methods which considered plasticity and moment redistribution were found adequate. These methods have also been applied to the rational design of structures subjected to other types of dynamic loading such as earthquakes. It is now, partially as a secondary but beneficial result of that program, that the advantages of such methods for normal building design are being presented. Engineers are interested in these methods as new and better tools for proportioning structures to achieve uniformly adequate but not excessive strength.

In general, certain economies can be expected as a result of eliminating excess material required by the methods of elastic stress or frame analysis. These savings are most definite in the case of all-welded, rigid frame structures made of standard rolled steel shapes and reinforced concrete arches and rigid frames. Where controlling design conditions are the result of temperature, shrinkage, settlement, etc. additional economies are possible because the moments and thrusts due to the above are also reduced as the sections become lighter and shallower, thus decreasing the moments of inertia and increasing the flexibility. Economy is an important by-product of using these new and more reliable and rational methods of design.

Therefore it is not surprising that architects have begun to hear frequent references to *ultimate strength* and *plastic* design from their civil engineering associates, although often without very much explanation and with very little in the way of apparent practical results. To some architects *ultimate strength* design has brought visions of collapsing structures, and plastic design, pictures of tired, sagging beams. Such premonitions have no relationship to actuality. Under working loads, structures which are properly designed by *ultimate strength* or *plastic* methods are still primarily in the elastic range and deflections are kept within allowable limits. It provides a method of keeping factors of safety close to their intended value. It avoids making portions of some structures unnecessarily strong relative to established standards.

Ultimate strength is a term which has come to be most closely identified with reinforced concrete design of sections for flexure and flexure plus direct stress on the basis of a non-linear stress-strain relationship which has been incorporated in the current American Concrete Institute Building Code. Within these terms of reference, ultimate strength design refers to the design of structural members at all sections by plastic theory for thrusts and moments determined from elastic frame analysis for the assumed design loads multiplied by specified load (safety) factors. It is not design for failure but for predetermined factors of safety against the actual ultimate strength of each section. These factors of safety are established on the basis of experience and laboratory tests to avoid excessive cracking of the concrete under working load and allow a margin of safety against overload which is consistent with the intentions of previous practice. Because reinforced concrete structures are designed and detailed for the forces acting on each section, the question of allowing plastic redistribution of moments and thrusts is not important except for special structures or for loads other than considered in the initial design. The retention of elastic frame analysis is the result of such considerations and not because reinforced concrete is not a ductile material. Properly detailed reinforced concrete structures can undergo extremely large plastic deformations without loss of strength. The main differences between members designed by *ultimate strength* and those designed by conventional methods come about because these methods greatly underestimate the strength of many commonly used sections.

Although the basic objective of plastic design in steel is the same as in the ultimate strength design of reinforced concrete — the achievement of a uniform factor of safety against overload — the approach is quite different in its details. As in the ACI *ultimate strength* code for reinforced concrete there is at present no intention of reducing the minimum factor of safety provided in the present AISC code. On the other hand it could be



Stages in the Development of Plastic Stress Distribution on a Homogeneous Member

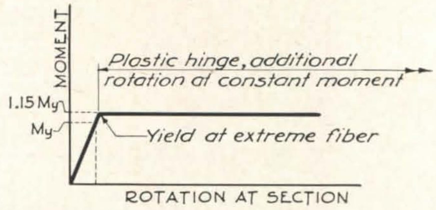
PLASTIC STRESS DISTRIBUTION (Structural Steel)

Distribution of stress over the cross section of a beam when it has reached its full moment capacity and the strains at all locations are past the yield point

---

PLASTIC HINGE

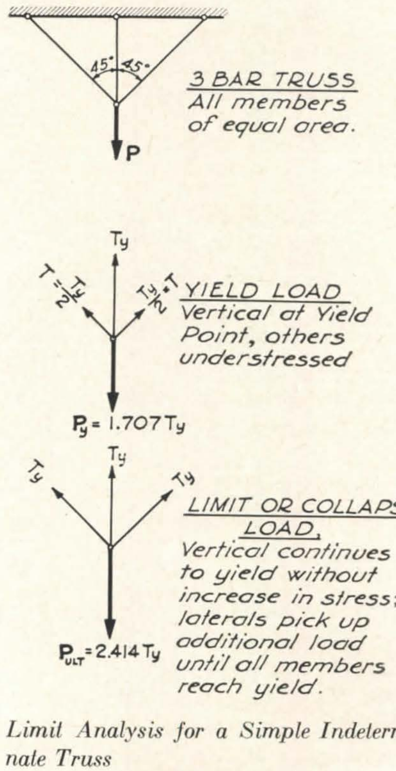
A section which has reached its full capacity and can continue to rotate without change in moment



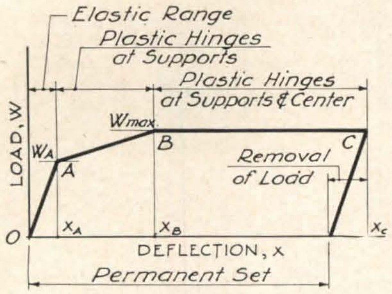
Moment-Rotation Diagram for WF Beam

REDISTRIBUTION OF THRUSTS (Limit Analysis)

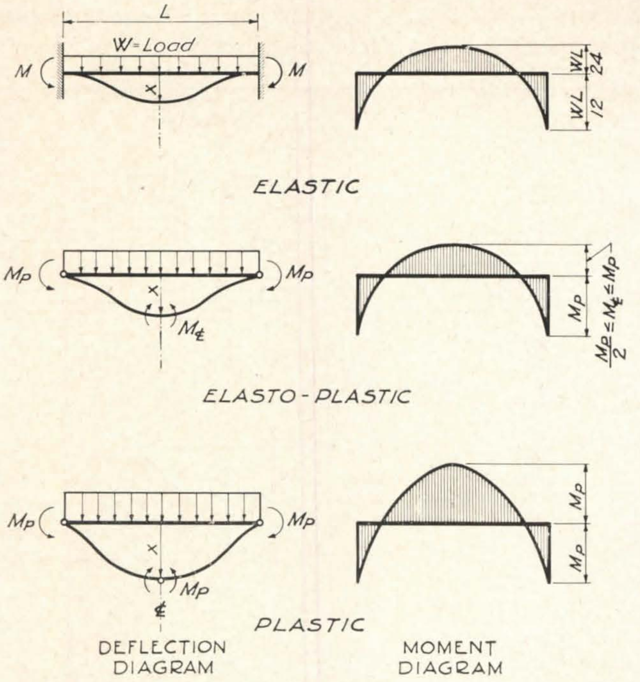
The process whereby internal forces are transferred from members which are already stressed to their full capacity, to those having reserve strength, as the external load is increased



Limit Analysis for a Simple Indeterminate Truss



Load-Deflection Diagram



Redistribution of Moments for Fixed End Beams

REDISTRIBUTION OF MOMENTS (Limit Analysis)

The process whereby internal forces are transferred from sections (plastic hinges) already stressed to their full capacity, to those having reserve strength, as the external load is increased. Note what happens in the moment diagrams. In the elastic range the bending moment in the center is half that at the fixed ends; in the elasto-plastic range, the moment may be from over half to nearly equal that at the fixed ends; in the plastic range moments at the center and fixed ends are equal

reworded to state that the factor of safety in flexure could be defined as 1.88 on the plastic strength rather than 1.65 against the yield stress. Thus simple beams, columns and trusses, designed by either present methods or plastic theory would be practically the same.

Flexural members of round or square section for which a plastic stress distribution gives the greatest increase in strength are rare and uneconomical in building construction.

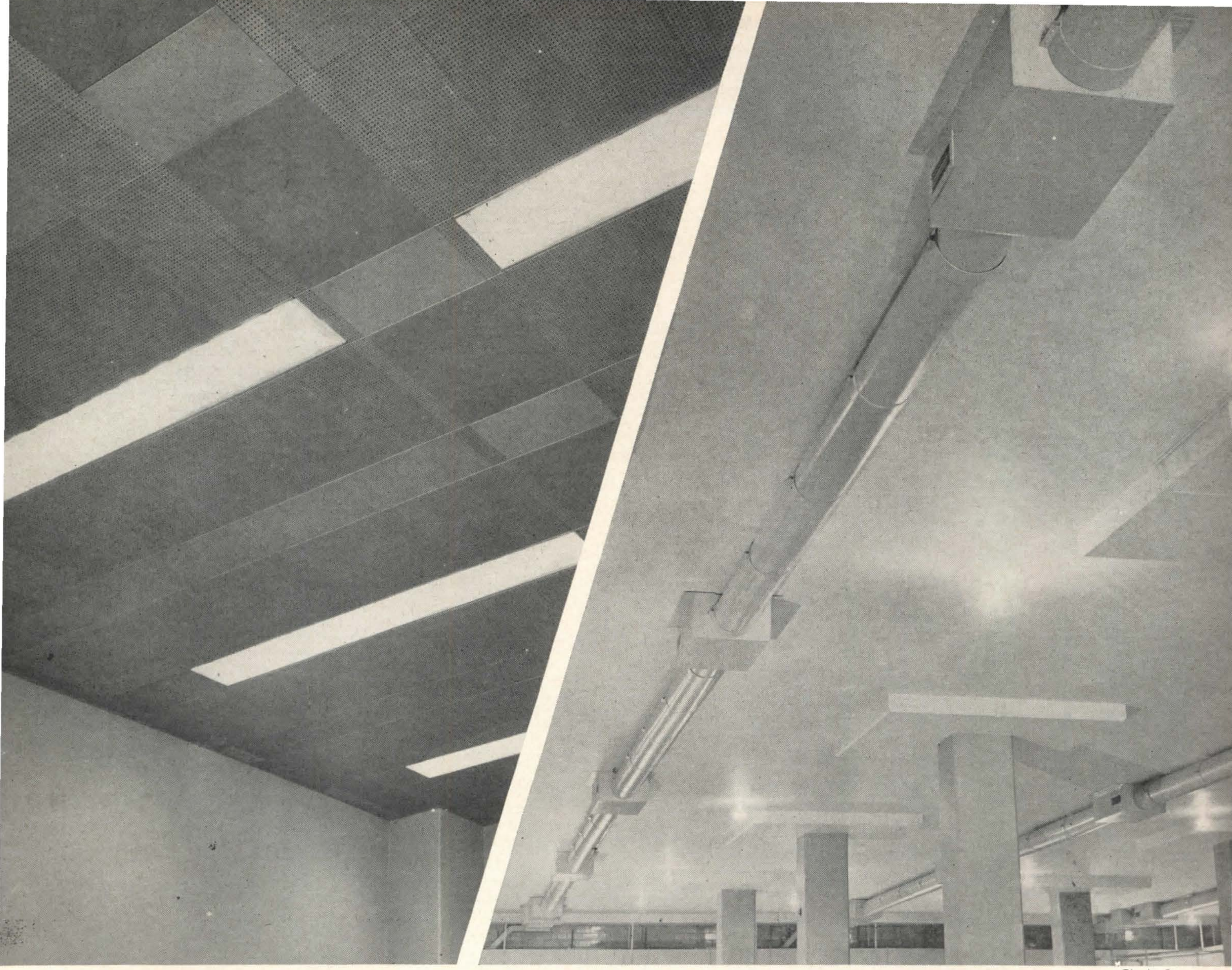
The primary economies possible in the plastic design of structural steel building frames result from the redistribution of moments and thrusts in frames of uniform rolled sections. Because in many cases economic considerations make the use of uniform rolled sections desirable, greater emphasis has been placed on departure from elastic frame analysis as well as elastic stress analysis by using the plastic moment-thrust capacity in combination with limit design to obtain the true collapse load of the whole structure. Thus, by allowing sections with high elastic moments to be strained beyond yield and develop into plastic hinges, the overload moments are redistributed to sections with low elastic moments until these sections also are brought to their maximum capacity. Final moments at critical sections of a uniform, fixed-end beam under uniform load become the same at failure.

Although similar *savings in weight* can be obtained with current design methods by varying the cross-sections, by tapering or haunching members or by the addition of coverplates — that is, designing the members section by section — the fabrication costs are high and, except for long span members, bridges and certain special cases, the final *dollar cost* is increased. For this reason moment redistribution, or limit design plays a role of much greater importance in plastic design of structural steel where uniform sections are desirable, than for reinforced concrete where the reinforcement at each section of a beam is proportioned according to the variations of the moment diagram.

Ultimate strength design in reinforced concrete will soon make its effects known as more designers become familiar with the new appendix to the ACI code and learn to use this simplified but more accurate approach to reduce the computational work of design. It can be expected that as time goes by the tendency will be toward shallower, more heavily reinforced members and slenderer structures in general. At present, plastic design in steel will continue to be used in this country for the design of special structures outside the control of building codes and for investigation of existing structures for unusual loads. When a complete standard specification for plastic design in steel is written and accepted it can be expected that a great impetus will be given to the all-welded rigid frame type of construction where important economies will be possible.

It should not be inferred that the ultimate strength methods will completely replace elastic stress calculations. In many cases the elastic methods are still preferable at present, for example in the design of suspension bridges, thin shells, structures subject to fatigue type loads, brittle materials, etc.

There will not be drastic changes in either steel or reinforced concrete construction as a result of these new design methods. The most glaring deficiencies of elastic stress methods have already been overcome by empirical corrections in current design practice. The appearance of buildings, the methods of framing, etc. will be little affected. These new design methods are new and more effective tools for the structural engineer, but they do not eliminate the fundamental requirements for imagination, good judgment and intelligently evaluated experience on which good and creative design is always based.



Charles Payne

AIR COOLING FOR EQUIPMENT AND PEOPLE

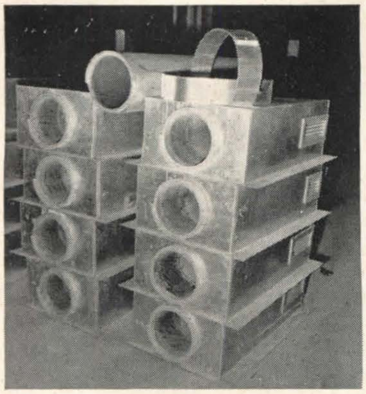
Two duct systems satisfy widely different requirements in a telephone building, from normal office air conditioning to equipment cooling, which may change at a later date, with loads ranging from 10 even up to 140 watts per square foot

Most new buildings have air conditioning for people's comfort, and in this electrical age, more and more will have to provide air cooling for proper operation of communications equipment, electronic brains and similar apparatus. For example, heat given off by the equipment in the new Long Distance Switching Center in Wayne, Pa. for the American Telephone and Telegraph Company varies from 10 watts per sq ft to a staggering figure of over ten times that amount — 140 watts per sq ft — whereas in an average office building the total electrical load is only about 8 watts per sq ft. This newly completed, five-story building, designed by Lorimer and Rose, Architects and Engineers, is completely air conditioned: the first three floors are designed to accommodate the equipment and the top two are for office personnel. While such a large scale cooling problem as this might not be encountered too often, there are some ideas to be gained from the way the problem was handled here, where the emphasis was on flexibility, simplicity and ease of construction and appearance.

In this switching center, Richard P. Goemann developed for William A. Rose Associates, Consulting Engineers, a completely new modular, round duct system for the equipment floors, and designed an air radiant-convection system for the office floors.

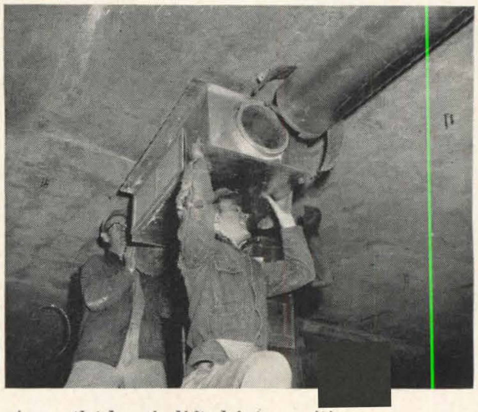
What were the physical requirements that made these systems logical solutions? Taking the equipment floors first, a cooling system was desired — for most of the area — that could handle cooling loads from 10 to 40 watts per sq ft, that would be flexible enough to handle a completely different cooling load pattern as equipment is added or changed without complicated and expensive

ROUND DUCT SYSTEM

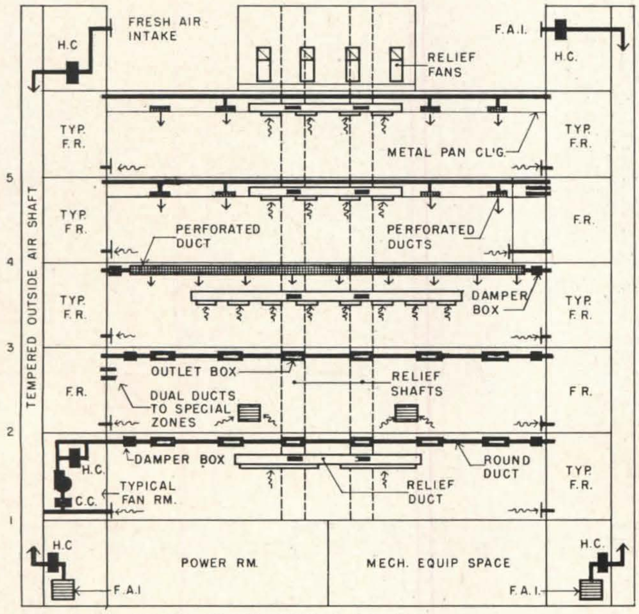


A duct, outlet boxes and strap

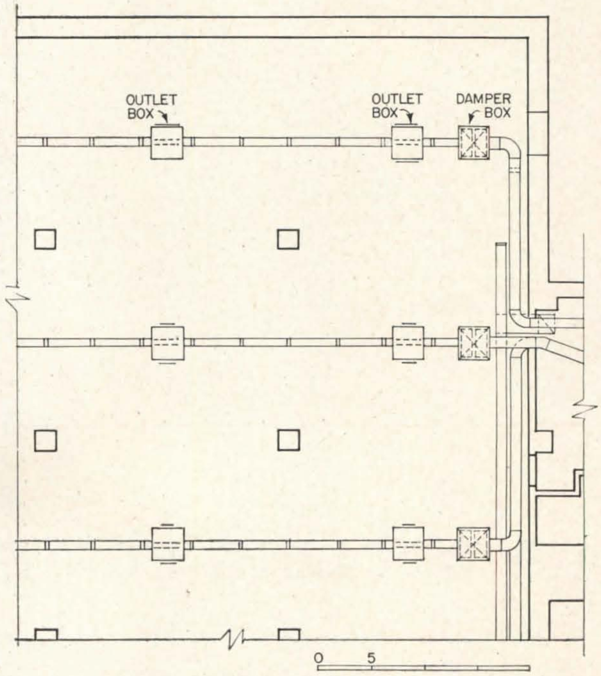
Metal gasket-straps are fastened to inserts in concrete slab



An outlet box is lifted into position

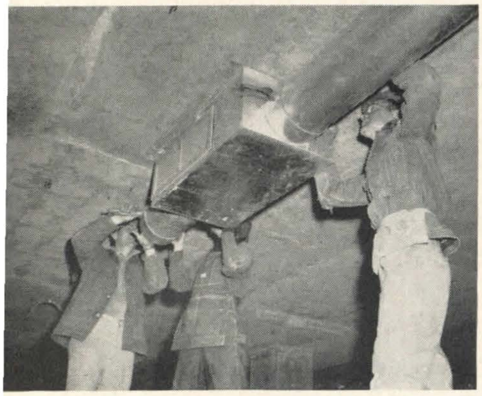


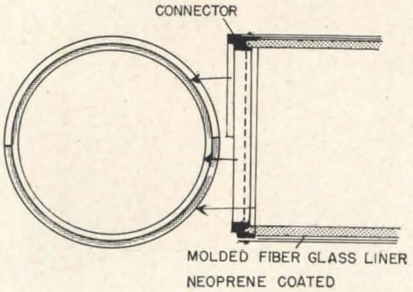
2nd & 3rd FL SYSTEMS COMBINE ROUND & FLAT PERF DUCTS



changes in ducts, that would have a duct network providing a neat appearance when left exposed, that could be fed from two separate cooling sources so that in case one failed temporarily, there still would be partial cooling provided by the other.

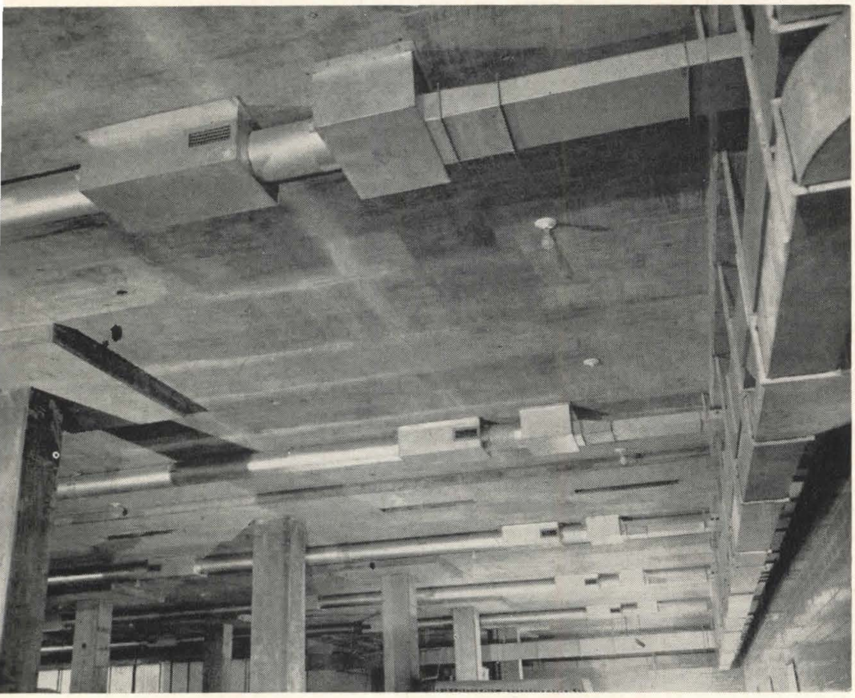
The system that was developed consists of a series of 11-in. o.d. round ducts, five sections per 22-ft, 3-in. bay, carrying air at a velocity of 3500 ft per minute. The air is fed from standard, rectangular ducts on two sides of the room round ducts which are connected to outlet boxes in each bay. Each outlet box supplies one bay, from two openings on opposite sides. Dampers within the box permit the two openings to be adjusted separately so that there might be, say, 350 cfm from one side and 100 cfm from the other. The ducts are sheet metal, covering ⅝-in. molded fibrous glass liners for acoustical and thermal insulation. They were given a smooth coat on the inside for treatment against the effects of high velocity air. One feature seal and flush joints for minimum frictional resistance, and at the same time makes rapid installation possible (see detail). The ducts are tied to each other and suspended from the concrete floor slab above by means of metal strap gasket-hangars. No special duct construction is required on the job and the work can be handled by a two-man crew. At any time an outlet box can be dropped out or added because of the connector detail and strap hangar arrangement.

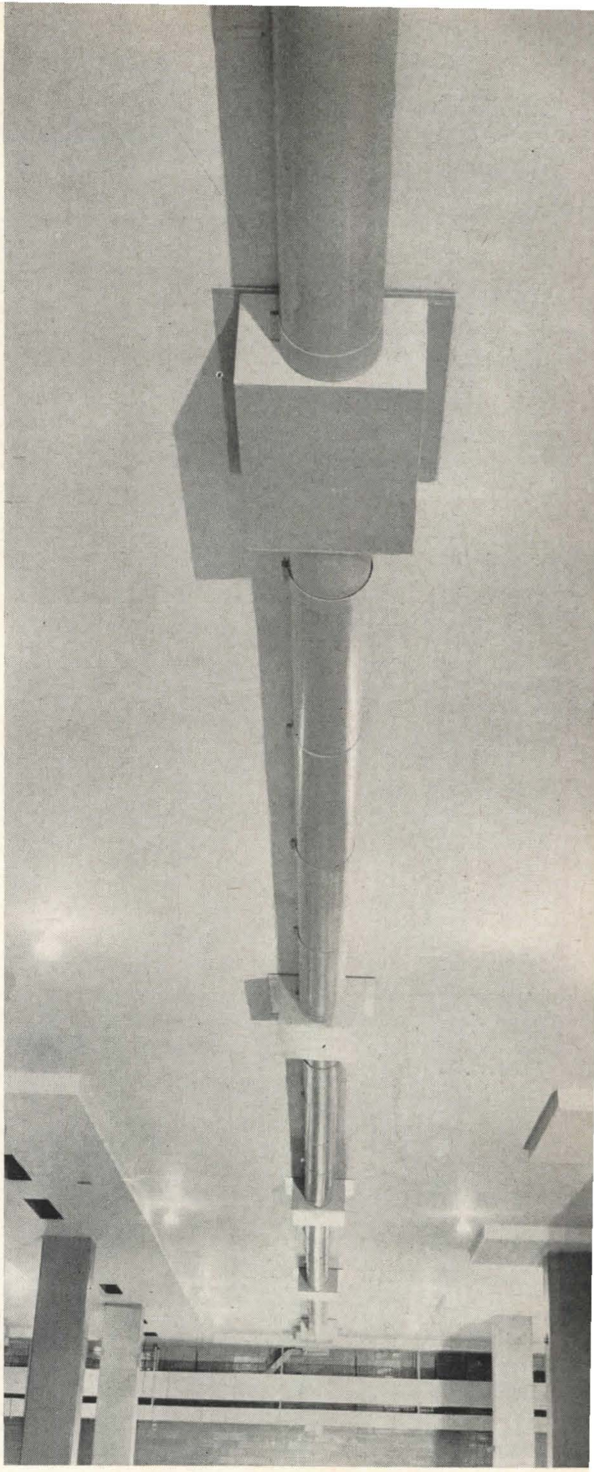




Airtight fit is made between outlet box and duct by connectors and strap

Charles Payne Photos





a uniform size of duct throughout, for ease of assembly and clean-cut appearance, due to the wide range of control provided by the outlet boxes. (In fact, when used in other types of buildings, a hung ceiling would not be necessary.) Even at the end of a duct run there is still a greater volume of air available than there would be with gradually reduced-in-size rectangular ducts, designed this way so as to give uniform supply at each outlet.

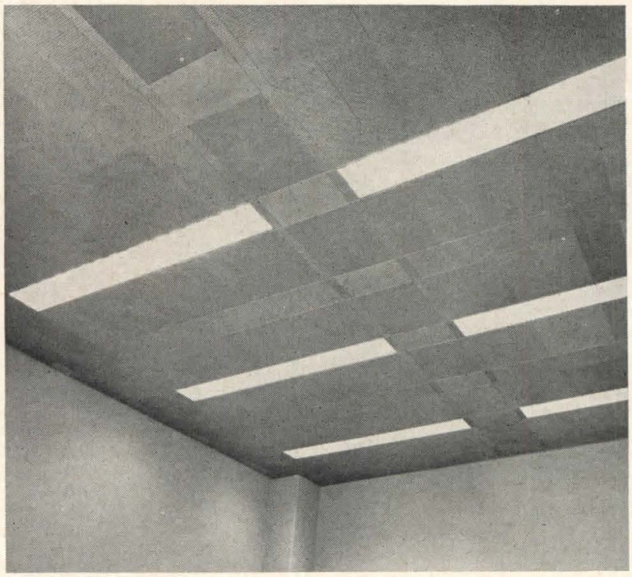
In addition, by having a multiplicity of outlets over the floor area, draftless distribution is achieved.

The designer points out that the outlet box in this particular building should be considered a utility model, and that other shapes would be feasible if the system were to be used in commercial space.

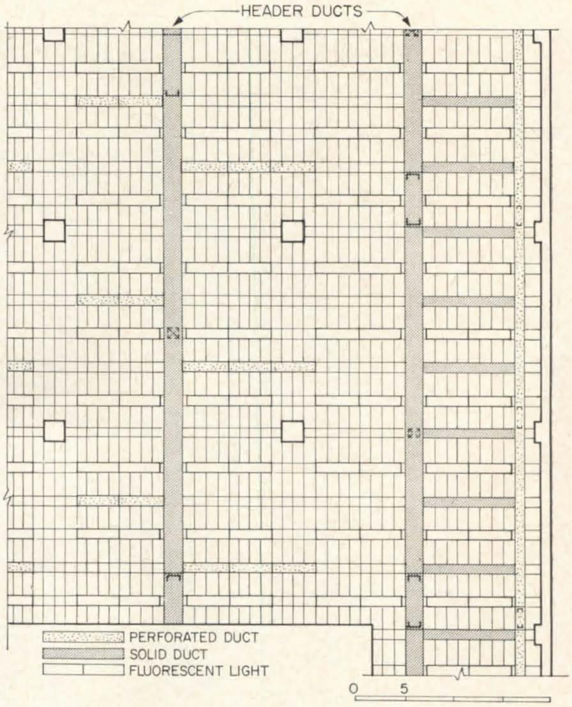
The first floor of the building is air conditioned completely by means of the round duct system. On the second and third floors there are some high-cooling load areas (140 w/sq ft) which are cooled by flat ducts, 24- and 26-in wide having perforated pans on the bottom. (On the second floor there is one 36- by 10-in. duct, the middle third of which has the perforated bottoms. On the third floor there are five 24- by 10-in. ducts 130-ft long with perforated pans the whole length.) Also there are some smaller rectangular ducts serving special areas. On the equipment floors, 100 per cent exhaust and fresh air can be employed at times during the winter to furnish all the cooling that is needed. Relief ducts at the front of equipment floors connected to a relief air shaft remove the waste air.

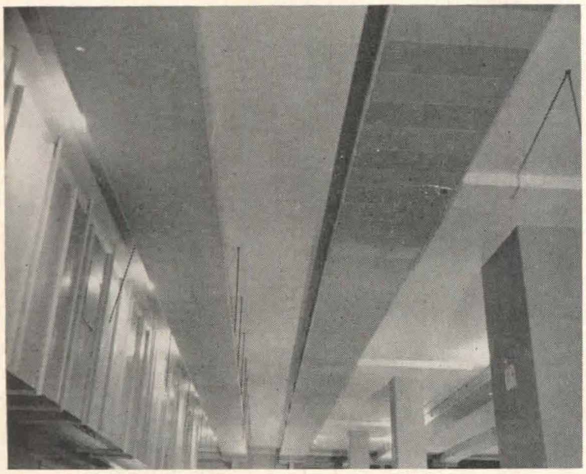
On the office floors a different approach was called for. Here in addition to comfort cooling there had to be a

METAL PAN SYSTEM



Air for conditioning office areas is distributed through header ducts with solid metal pan bottoms to branch ducts with perforated pans, admitting air to the room. In high load areas, long ducts (below) either 24- or 36-in. wide, and with perforated pans handle loads up to 140 w/sq ft





fairly high level, but glare-free, lighting system and sound-absorbent acoustical treatment. All of these features could be integrated in a metal pan ceiling by using strips of perforated panels either for air diffusion or backed by batt insulation for sound absorption, and with spaces left for recessed fluorescent fixtures having parabolic shaped reflectors. Here's the way it works: Solid-bottom metal pans topped by inverted "U" shaped covers form headers which supply other branch ceiling ducts which have tion in the ceiling, depending on the particular cooling load.

Advantages of this ceiling system include the following:

1. The ducts form part of the ceiling, either with solid or perforated bottom.

2. Various degrees of cooling load can be handled merely by providing more panels in the form of ducts.

3. The ceiling appearance is not affected in the slightest when more duct area is needed.

4. Some panel heating and cooling

5. Perforated panels can be interchanged with solid panels, allowing a wide range of flexibility in air distribution.

6. The panels may be removed easily for service.

Even where there may be small areas with high cooling load, this can be handled by substituting a ceiling register for a perforated panel.

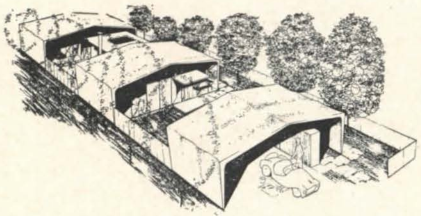
The metal ceiling system had its first large application in the A. T. & T. Long Lines Switching Center in White Plains

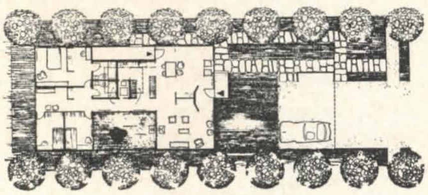
PLASTICS — SHAPING TOMORROW'S HOUSES?

A SLIGHT ALTERATION in the subject theme of the Seventh National Plastics Exposition — which should actually read "Plastics — Shaping Tomorrow's Products" — mirrors the concentration at the show on plastics in residential construction. The biggest plastics show ever — and held at the big New York City Coliseum — it attracted well over 330 informative exhibits and thousands of visitors. Residential highlights of the Exposition were the announcement of the winners of the SPI Plastics House Competition and unveiling of the Monsanto model "House of Tomorrow."

PLASTICS HOUSE COMPETITION WINNERS

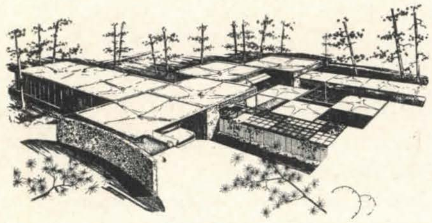
Thirteen prize winners were named in the Plastics House Competition sponsored by The Society of the Plastics Industry, Inc. Awards were made in categories ranging from over-all design for small homes not more than 1600 sq ft in area to designs for featured living spaces such as bathrooms, playrooms, outdoor living or porch areas. The jury consisted of architects John N. Highland, Jr. of Buffalo and Paul M. Rudolph of Sarasota, Fla., and editor Hiram McCann of *Modern Plastics*. Professional advisor was James T. Lendrum, AIA, of the Small Homes Council.

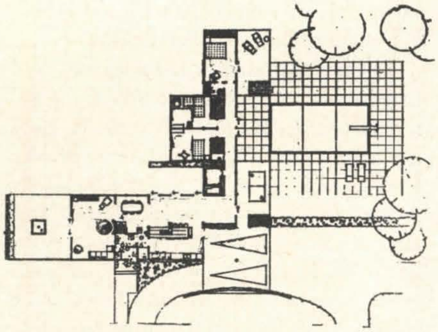




First Prize — William Goodwin, M.I.T. Architecture Student

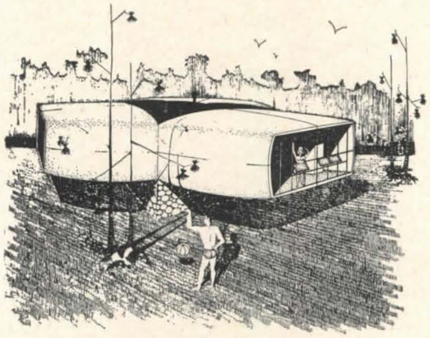
Fiberglas-reinforced polyester bents are joined in the middle with steel bolts and neoprene gasketing. After being fastened the bents form the structural support of the house and span 34 ft without interior support. The bents can be nested for easy shipment. The plastic shell is completed with foamed polystyrene insulation sandwiched between hard, scratch-resistant surfaces which contain electric radiant-heating coils. Stressed-skin panels of reinforced polyester skin and polystyrene web span 16 ft in the central utility core between the living and sleeping areas. Other plastic features include lightweight molded kitchen cabinets in 2-ft modular units and molded bathroom fixtures.

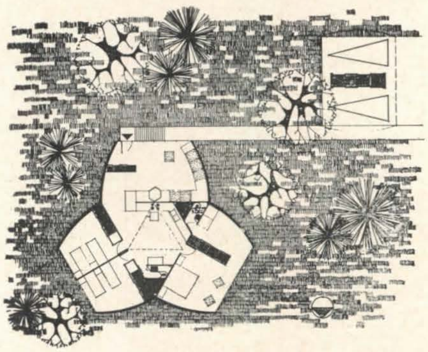




Second Prize — Hermes & Colucci, Cincinnati Architectural Firm

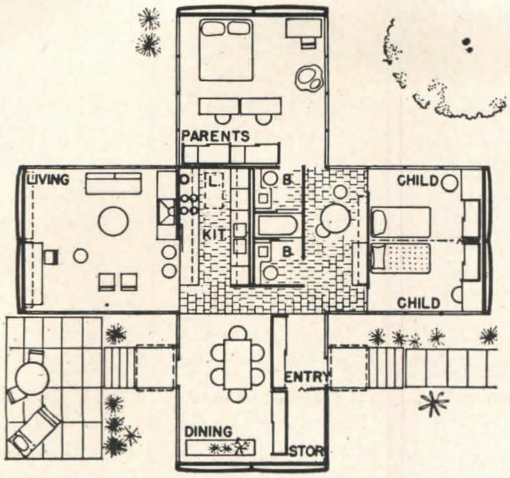
Four identical hyperbolic paraboloid roof units of $\frac{1}{8}$-in.-thick fiberglas-reinforced polyester are joined to form one 20- by 20-ft span which can be supported by a single column or by other roof units. Supporting column incorporates a central roof drain. The units can be arranged in a variety of combinations. Automatically operated louvers made of a reinforced plastic skin over a foam core are located under the roof units. These adjustable louvers reflect summer sun and open to admit winter sun. Plastic sandwich panels are used for walls. Plastic panels enclose the pool and patio for year-round use. Hyperbolic paraboloid roof units over the pool slide on nylon rollers to provide shade areas.

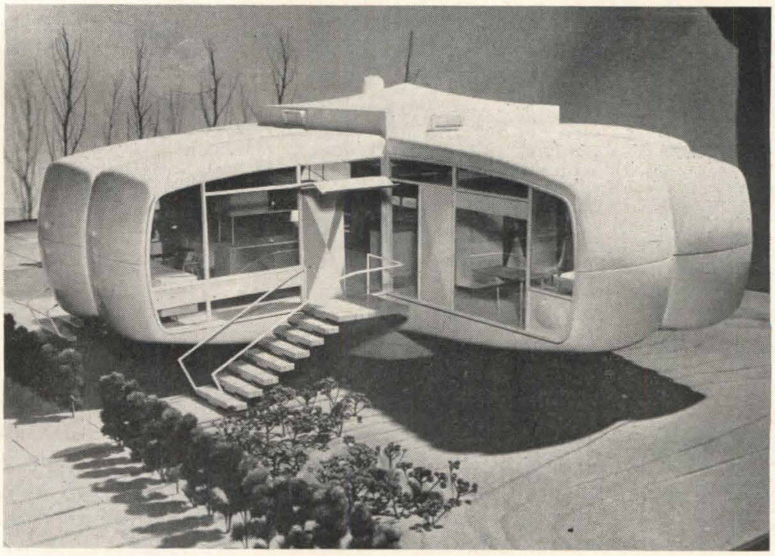




Third Prize — John Dyal, M.I.T. Architecture Student

Each of three cantilevered wings consists of four L-bents of reinforced plastic around isocyanate foam which are joined together and to the adjacent wings. The seam joint on top is held by a tension triangle of reinforced plastic around the perimeter of the central triangular core of the house. This is lighted from above by four triangular translucent plastic domes. The wings are cantilevered out from a foundation which can be of native stone, concrete, brick or block. A featured area of the house is a one-piece molded plastic bathroom. Reinforced plastics are used for interior partitions, doors, fixtures and furniture as far as it is consistent with the nature of the material.





HOUSE OF TOMORROW

A dramatic moment at the Exposition was the unveiling, by Walt Disney, of a model of the Monsanto Plastics House (AR, Jan. '56, p. 205). Designed by architect Marvin Goody as part of a plastics research project under the direction of Richard Hamilton and sponsored by Monsanto at M.I.T., the "House of Tomorrow" will be built at Disneyland in Anaheim, Calif. Construction will start late this year. Following is a structural evaluation of the house which was prepared by Albert G. H. Dietz, F. J. McGarry and F. J. Heger of M.I.T.

Design of a "House of Tomorrow," embodying the maximum use of plastics, has been undertaken to see how plastics can most advantageously be employed in a house designed from the outset to utilize plastics as plastics rather than as substitutes for other materials. Architectural and engineering design have been closely related from the beginning to attain this objective. A major consideration is the fact that plastics can be formed rather readily into large compound curves, that such curves are structurally efficient and that structure and enclosure can be combined to allow plastics to perform a double function, thereby making the material perform to its utmost.

The house has a cross-shaped plan consisting of a 16-ft-square central area and four 16-ft-square wings. The central area is supported by four columns resting on a foundation. The wings are cantilevered from the central section.

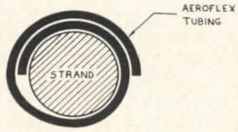
To meet shipping restrictions, the roof and floor are made of 8-ft by 16-ft molded reinforced plastics sections. Both are hollow shells whose exterior portions are identical in shape and are therefore all made on the same mold. Sixteen such sections are required. The floor itself forms the inner portion of the floor shell, and is a sandwich with reinforced plastics faces and either a honeycomb or foamed polyisocyanate core. Floor and roof shells are made deep enough to develop the necessary stiffness. The ceiling or inner portion of the roof shell is curved for best lighting as well as for structural efficiency in resisting compressive buckling stresses.

In the central section direct tensile and compressive stresses have to be transmitted from wing to wing, and bending stresses must also be resisted because of floor loading. Two sandwiches form the structure of the central section. An upper one carries floor loads in bending plus direct tensile stresses from the wings. A lower one resists the compressive thrusts from the wings. Similar structural sandwiches in the roof of the central section carry the tensile and compressive thrusts from the roof shells. A series of spandrels and intermediate ribs helps to support the loads and to provide stiffness. The load analysis required a study of dead loads alone, live loads over-all, live loads distributed over individual wings, wind loads uniform on entire house, wind loads unequally distributed because of differences in exposure, and earthquake.

Design throughout was concerned more with stiffness than with strength. If deflections were held within generally accepted bounds for building, stresses were usually well within allowable limits. By tying wings and central sections together, and by connecting the outboard ends of roof and floor shells, maximum resistance to deflection and torsion was obtained.

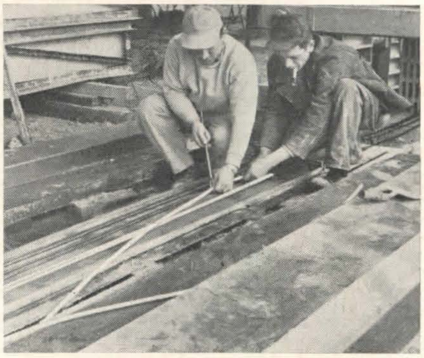
Columns, which carry only direct downward or uplift loads and can therefore be made slender, are sunk down to a reinforced concrete foundation slab and stiffened in the foundation area by large gussets made integral with the floor spandrels.

A "House of Today" was on display at the B. F. Goodrich Chemical Co. booth in a full-scale cutaway showing a living room, kitchen, utility room, patio and ... Designed by Cleveland architect J. Trevor Guy, AIA, the house exhibited a variety of residential applications of vinyl products. ... the elements in the house, including piping, ductwork, window frames, gutters and downspouts, lighting panels,

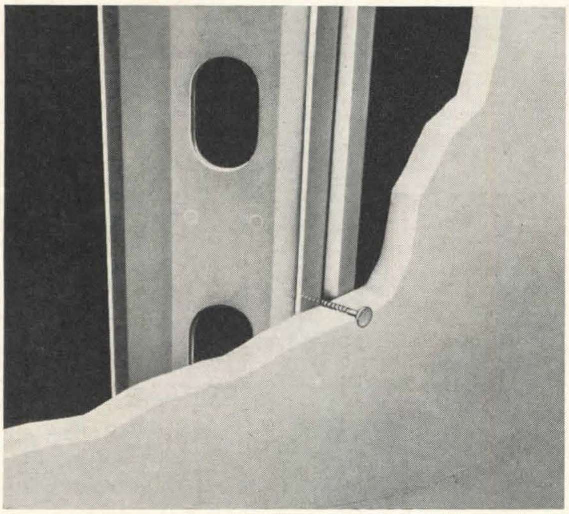


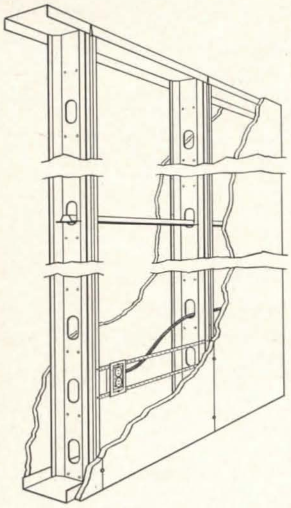
PLASTIC TUBING FOR PRESTRESSING STRANDS

AEROFLEX PLASTIC TUBING has been developed to prevent bond in certain prestressing strands in concrete structures. Desired stress distribution pattern is attained by partial covering of several strand sections. Partial covering prevents excessive stress in that part of the beam close to the anchorage and support points of the structure, while permitting maximum stress in the center of the structure. The tubing, shown in cross section above, is an open tube with an overlap of about one-half the circumference. It is applied over the strands by opening it and walking it along the strand, as shown in the photo at right. The overlap, which is installed with the outside end pointing downward, prevents the ingress of concrete and water. No taping or tying is required to hold the tube in place on the strands. *Anchor Plastics Co., 36–36 36th St., Long Island City 6, N. Y.*



STEEL STUDS AND TRACKS SECURE PANELS OF NON-BEARING PARTITIONS





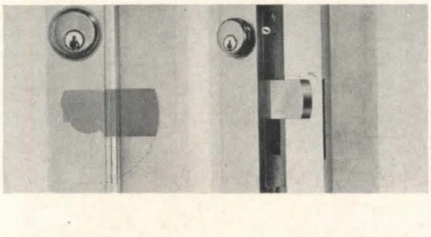
PERMALOK SYSTEM for low-cost erection of non-bearing partitions consists of nailable steel studs, track and bridging to which such collateral materials as metal or gypsum or almost any type of panel can be secured by nails or screws. The studs are made in two sizes, 2½ and 3⅝ in. The larger size is punched with openings for the passage of pipe and conduit and the attachment of bridging members, as shown at left. Bridging members are furnished in two lengths, for stud spacings of 16 and 24 in. Track sections are sized to fit over the flanges of the studs. *Penn Metal Co., Inc., 205 East 42nd St., New York, N Y.*

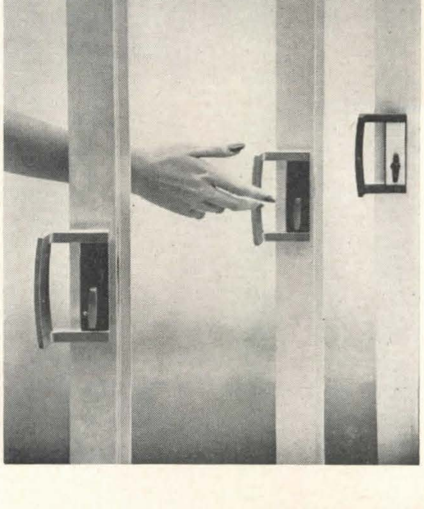
NEW HARDWARE AVAILABLE FOR GLASS DOORS

MAXIMUM SECURITY 1850 is a compact narrow-stile deadlock devised for use in swinging glass doors. It is said to overcome all the weaknesses of narrow-stile construction caused by play in the hinges, flexible channels and jambs and inaccurate installation. It does this by retaining as much bolt within the lock stile as is projected. From a backset of only ⅞ in., the bolt throw is 1⅜ in. *Adams-Rite Mfg. Co., 540 West Chevy Chase Dr., Glendale 4, Calif.*

DESIGNED EXCLUSIVELY for Arcadia steel- and aluminum-framed sliding glass doors, the new door pulls shown at far right are available in dull chrome, dull bronze and dull black. Patterned metal inserts are available in Alumilite finish or black. *Arcadia Metal Products, 801 S. Acacia Ave., Fullerton, Calif.*

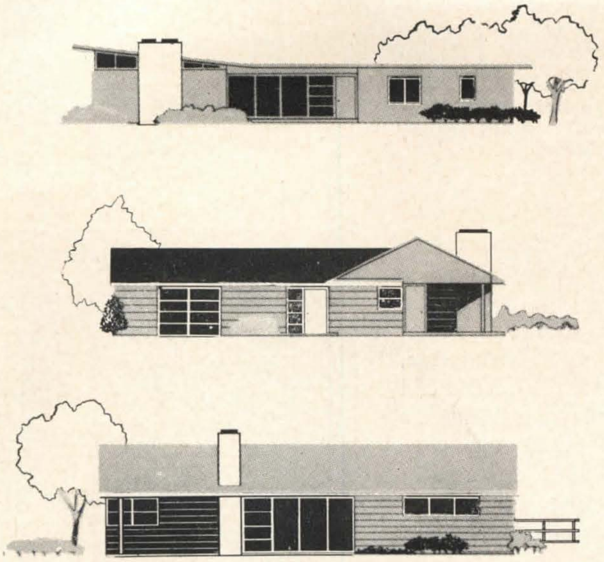
(More Products on page 232)





LITERATURE

Catalogs • Brochures • Booklets



CONTEMPORARY FARMHOUSES

Flexiplan 71204 is a guide to planning farmhouses which resulted from research by the Illinois Experiment Station under project NC-9 of the North Central Region. Organized in a spiral binder, it discusses the factors involved in planning farmhouses under the following headings: The House and Its Surroundings, The House on the Farm, Construction, Deciding on a Basement, Footings and Foundations, Wall Construction, Roof Construction, Interior Construction and Finish, Household Storage, Window Selection and Placement, Outside Construction, Ventilating, Air Conditioning and Heating, Central Heating, Utilities and Equipment, Lighting and Wiring, Outdoor Planning and Planting. Perhaps the most valuable section of the book is the Flexiplan, in which are presented 24 divided sheets of plan sections for combination in any variety. A total of 576 house-plan combinations is available, with still more variations possible in alternative choices of basements, garages and porches. Prepared by M. R. Hodgell under the direction of the Farmhouse Technical Committee NC-9 of the North Central Region and published by *The University of Illinois Press, Urbana, Ill.*

Garden Lighting Equipment

Bulletin 135-56 describes the *Floralite* line of garden and play area equipment, including portable and permanently mounted types. 4 pp. *Sleber Mfg. Co., Broadview, Ill.*

Weisway Cabinet Showers

(AIA 35-H-6) Describes the complete line of Weisway cabinet showers, with a full section devoted to built-in models. *Henry Weis Mfg. Co., Inc., Elkhart, Ind.**

Interior Masonry Walls (AIA 25-C)

File folder contains descriptive sheets on *Primafil* simultaneous priming and filling for concrete, cinder and other aggregate block. *Pratt & Lambert, Inc., Architectural Service Dept., 75 Tonawanda St., Buffalo 7, N. Y.**

School Lighting Plan

An ideal school lighting and floor plan, showing a room-by-room breakdown of the school and the proper lighting for each room, is available from *The Art Metal Co., Cleveland 3.**

Attic Fans

Bulletin 7514 presents the new Model CA Ventura attic fans for residential cooling. 4 pp. *American Blower Corp., Detroit 32, Mich.**

Contact Metal Lath Ceilings

(AIA 20-B-1) Technical Bulletin 17 discusses metal lath as it is attached directly to the underside of concrete,

Simplex Ceiling

Introduces *Soft-tone* color anodized aluminum acoustical ceiling panel. Contains details of suspension, installation and integration with recessed lighting. 4 pp. *Simplex Ceiling Corp., 552 W. 52nd St., New York 19.**

Glass

Illustrates the use of carved and sandblasted glass in fenestration of public buildings, churches, schools, restaurants, hotels and ships. 8 pp. *Rambusch, 40 West 13th St., New York 11, N. Y.*

Glazing and Sealing Problems

(AIA 26-B-2) Examines the problems of glazing and sealing lights of glass as large as 66 by 112½ in. Lists 14 necessary precautions. 8 pp. *The Tremco Mfg. Co., 8701 Kinsman Rd., Cleveland 4, Ohio.**

Color Engineering Service

Describes professional color engineering service available to architects and shows how scientific selection of colors promotes efficiency, safety and economical maintenance in buildings. 6 pp. *Cook Paint and Varnish Co., Color Engineering Service, P.O. Box 389, Kansas City 41, Mo.**

America's Most Desired Kitchen

Spiral-bound catalog features sink cabinets, wall cabinets, utility cabinets, base cabinets, counter tops, accessories and specialty cabinets. *Harrison Steel*

Refrigerators (AIA 30-F-6)

File folder includes a variety of brochures describing commercial refrigerators manufactured by *The C. Schmidt Co., 1712 John St., Cincinnati 14, Ohio.*

Hospital Laundries

Spiral-bound notebook gives basic background and planning information for setting up laundries for hospitals. Includes general layouts for hospitals from 25 to 300 beds. 32 pp plus layouts. *The Prosperity Co., Inc., Syracuse, N. Y.*

Water Hammer (AIA 29-D-8)

Manual S describes water hammer, presents methods for eliminating it and gives data on shock absorbers. Manual LV presents adjustable top floor and roof drains. *Josam Mfg. Co., Michigan City, Ind.**

Creative Playthings

Shows a variety of creative equipment for children and lists consultants in a number of specialty fields. 8 pp. Catalog of play sculptures also available from *Creative Playthings, Inc., Herndon, Pa.*

Perforated Metals

Catalog 62 presents information about sheet sizes, type and gauge of metal and per cent of open area for industrial and decorative perforated metals. Patterns are illustrated at actual size. 6 pp. *The Harrington & King Perforating Co., Inc., 5624 Fillmore St., Chicago 44, Ill.**

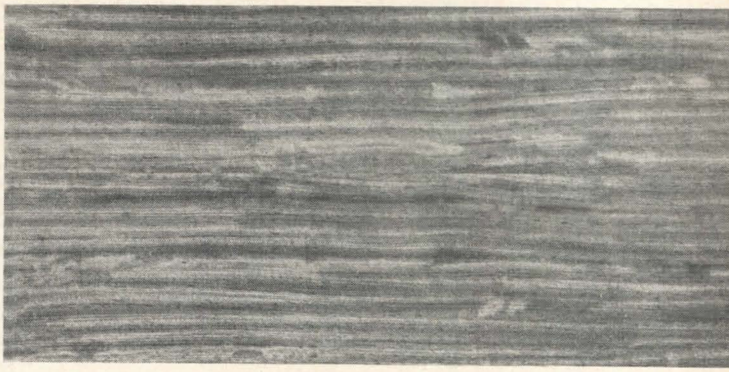
**Other product information in Sweet's Archi-*

FINE HARDWOODS FOR ARCHITECTURAL USES — 7

By Burdett Green, Executive Vice President, Fine Hardwoods Association and James Arkin, A.I.A., Consultant, Architectural Woodwork Institute

BUBINGA *(Guibourtia demeusii)*—African Rosewood, Akume, Kewazinga

Source: West Africa
Color: Red with streaks or lines of ornamental dark purple
Pattern: From a rather plain stripe to a heavy mottle which occurs in the quarter-cut wood. Occasionally cut sliced and half-round
Characteristics: Very hard. While described as having a close grain, it has conspicuous and fairly large pores. Capable of being worked into fine cabinetry
Uses: General cabinetry
Availability: Plentiful in the form of veneers. Largely produced as longwood, but occasionally as crotches and swirls
Price Range: Medium to costly

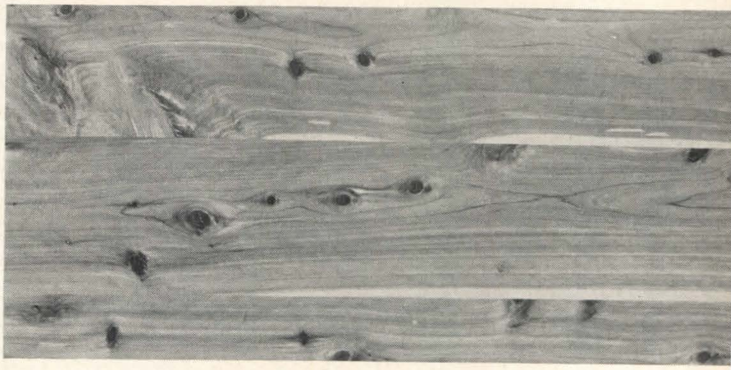


Bubinga, quartered (2 pieces, book-matched)

CEDAR, AROMATIC RED *(Juniperus virginiana)*—Eastern Red Cedar, Juniper, Pencil Cedar, Red Cedar, Southern Red Cedar, Tennessee Red Cedar

Although Cedar is not one of the hardwoods, since it is a coniferous or needle-bearing tree rather than a "broad-leaf," which generally depicts hardwoods, this species is commonly produced by the hardwood industry. It is a very fine-textured wood which is used extensively along with hardwoods by the cedar chest industry and also for lining interiors of closets and cabinetry to be used for storage.

Source: Occurs over most of the eastern two-thirds of United States. Largest production in Southeastern and South Central States
Color: Light red with streaks of light sapwood
Pattern: Knotty, with other natural characteristics always present
Characteristics: Although brittle, it is regarded as a fine wood to work
Uses: Cedar storage chests; linings of closets and chests; small articles of woodenware
Availability: Veneer (sawn or sliced) plentiful; lumber plentiful, both in rather small sizes
Price Range: Medium

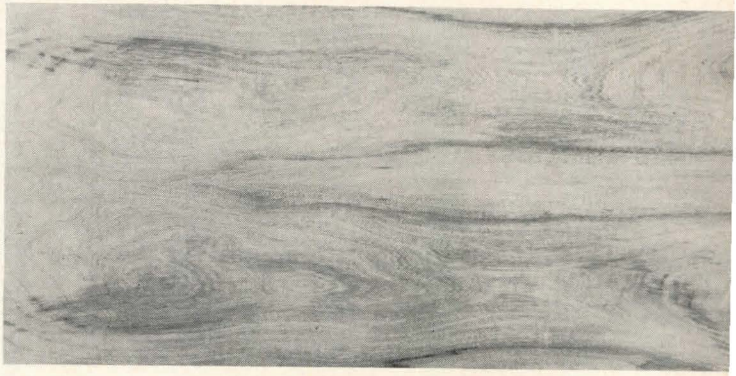


Cedar, Aromatic Red (3 pieces, unmatched)

ELM, AMERICAN *(Ulmus americana)*—Soft Elm, Water Elm, White Elm

Although there are several varieties of Elm that vary but slightly in character, the two commonly available types are Northern Brown Elm and Southern Elm.

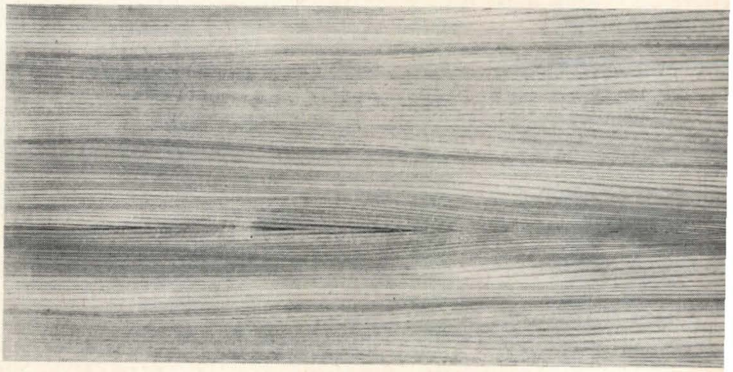
Source: United States, east of the Rockies
Color: Light brownish
Pattern: Conspicuous growth pattern, like Ash
Characteristics: Heavy; hard; strong; tough; difficult to split; coarse-grained; bends exceedingly well
Uses: Widely used as veneers for containers; some for furniture. Although for years the most widely used wood for berry baskets and other containers, less of it is used for that purpose today and more of it is cut into veneers and lumber for both architectural plywood and fine furniture
Availability: Veneer (quartered, sliced, rotary) plentiful. Lumber available
Price Range: Medium



Elm, Northern Brown, flat cut (2 pieces, book-matched)

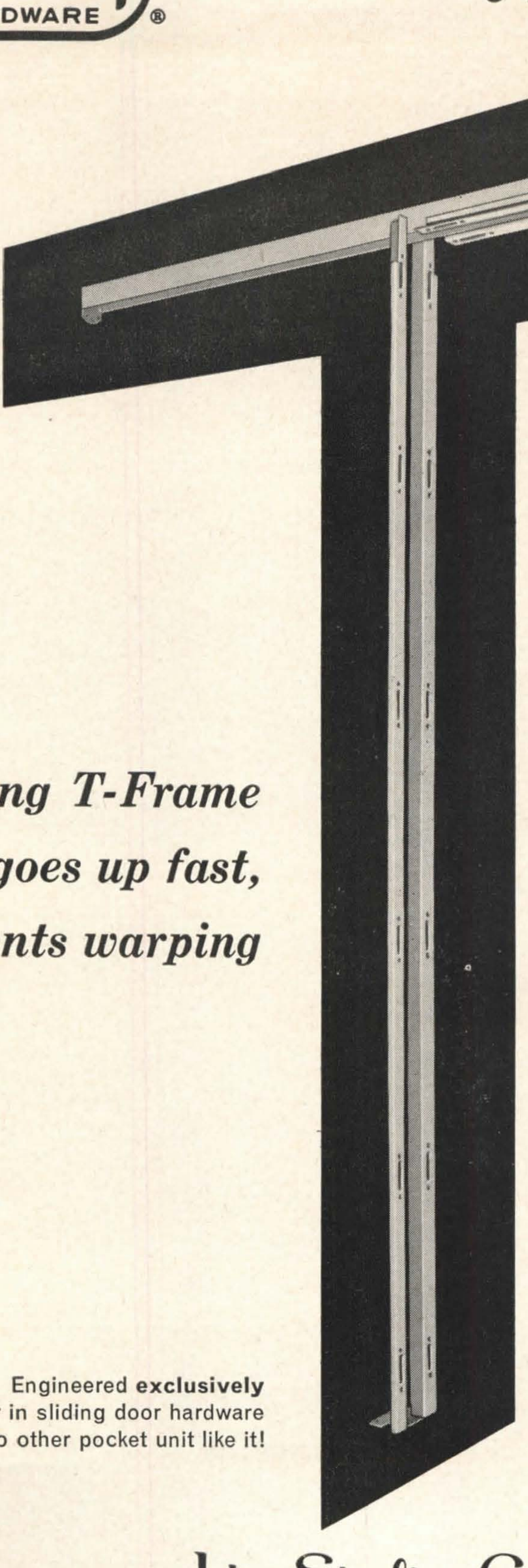
ELM, CARPATHIAN BURL *(Ulmus campestris)*—English Elm

Although not pictured here, it is a type of true Elm described as Carpathian Elm Burl and was rather widely used in the furniture and fixture trade during the 1920's. Although an especially highly figured burl, it is usually quite defective and is rarely used today.



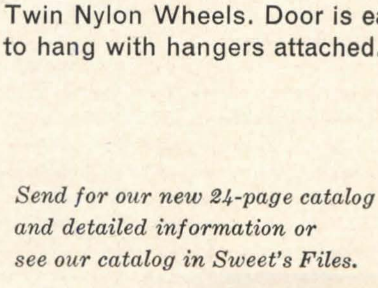
Elm, American, quartered (3 pieces, book-matched)

Sterling HARDWARE® *for better sliding pocket doors*



Sterling T-Frame goes up fast, prevents warping

Simple in design – ***low in cost***
Steel header and steel split jambs are easily and quickly set into rough opening.



Aluminum Track and Adjustable Hangers with Twin Nylon Wheels. Door is easy to hang with hangers attached.

Engineered **exclusively** by the leader in sliding door hardware —no other pocket unit like it!

Send for our new 24-page catalog and detailed information or see our catalog in Sweet's Files.

John Sterling Corporation

FORMERLY STERLING HARDWARE MFG. CO. • CHICAGO 18, ILLINOIS

FINE HARDWOODS FOR ARCHITECTURAL USES — 8

*By Burdett Green, Executive Vice President, Fine Hardwoods Association
and James Arkin, A.I.A., Consultant, Architectural Woodwork Institute*

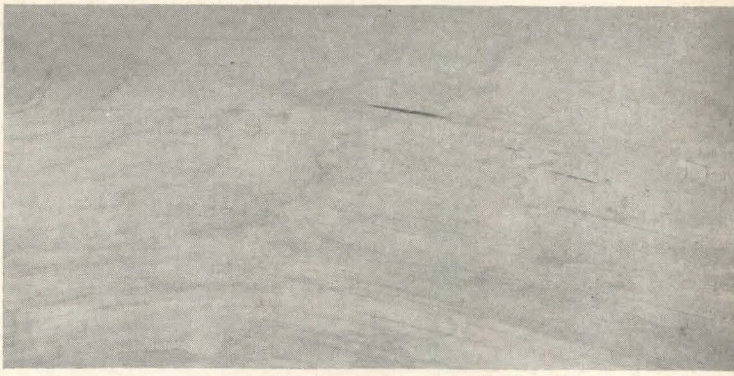
GUMWOOD *(Liquidambar styraciflua)*

For years Gumwood has been one of the most widely used hardwoods in the furniture and woodworking industries. For many years it was extensively used for interior trim and woodwork, especially in areas to be painted. In certain sections of the country it was commonly finished natural. Today Sap Gum is most frequently used in a lumber form for the structural parts of furniture carrying plywood surfaces of other woods. Sap Gum, too, is widely used for the inner plies of "bonded" or plywood construction. Heartwood and sapwood are sold separately as Red Gum and Sap Gum.

Gum, Red, figured (2 pieces, book-matched)

GUM, RED *(Heartwood)* —Hazelwood, Southern Gum, Sweet Gum

Source: Wide range in the United States, but commercial production largely from lower Mississippi Valley
Color: Reddish-brown
Pattern: Dark streaks
Characteristics: Moderately heavy; hard; straight; close-grained; not exceedingly strong. Often selected for its attractive figure
Uses: Outside and inside finish of houses; cabinetry
Availability: Veneer (sliced, rotary) plentiful. Lumber available
Price Range: Medium



Gum, Sapwood (1 piece)

GUM, SAP *(Sapwood)*

Source: Same as Red Gum
Color: Pinkish-white, often blued by sap stains
Pattern: Plain but not strong; usually watery
Characteristics: Same as Red Gum except not as durable
Uses: Plywood (interiors) and lumber for furniture; architectural woodwork for paint; most widely used species for veneers in the United States
Availability: Veneer (rotary) abundant. Lumber abundant
Price Range: Inexpensive

HAREWOOD, ENGLISH GRAY *(Acer pseudoplatanus)*—Sycamore

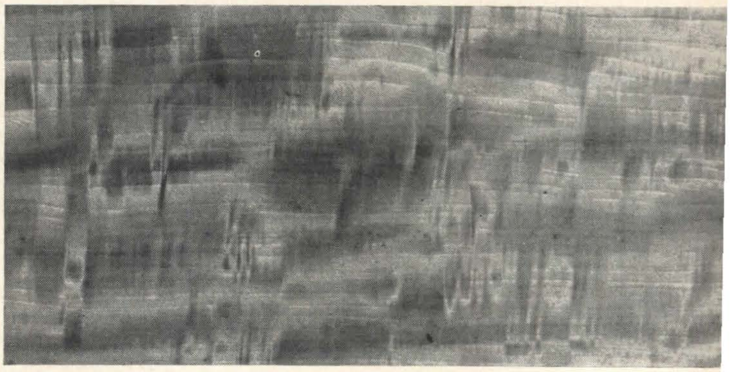
The name "Sycamore" is normally applied to this species in its country of origin, England. As noted by its botanical name, *Acer*, it is a true maple, and it is a great deal like our Northern Hard Maple. *Pseudoplatanus* further indicates that it is a false *platanus*, which is the botanical name of plane-tree or sycamore.

Harewood, English Gray, figured (1 piece)

Source: England
Color: Natural white. Called English white before dyeing. Usually dyed silver gray
Pattern: Both plain and figured
Characteristics: Same as Maple
Uses: Marquetry; inlay; paneling
Availability: Veneer (quartered, sliced) scarce. Lumber available
Price Range: Costly

IREME *(Terminalia ivorensis)*—African Teak, Black Afara, Emeri, Framerie, Idigbo, Iroko

In the European trade this is a very valuable timber of a light grayish-brown color. The grain is firm and hard and the wood machines well. It has been used for many years in England and France, and limited quantities have been brought into the United States.



Ireme, mottled (1 piece)

Source: Africa, Gold Coast
Color: Pale yellow to light brown
Pattern: Faint ribbon stripe with intermediate grain and noticeable rays
Uses: Panels and cabinetwork
Availability: Plentiful as veneers
Price Range: Moderate

CEILING OVER 40,000 FEET!

Convair's F-102A flies higher – faster – because HEXCEL aluminum honeycomb, used as core material in sandwich construction, lightens its load, smooths its contours, and raises its overall efficiency with the highest strength-to-weight ratio yet developed!

NATIONAL HOUSING CENTER   AUBINOE, EDWARDS & BARRY, A.I.A.   KLUCKHUHN, COBB & MCDAVID, ENGINEERING CONSULTANTS   WALTER TRULAND CORP., LIGHTING CONSULTANT

HONEYLITE, the versatile new lighting material, was selected to cover over 40,000 square feet of ceiling area in Washington, D. C.'s National Housing Center because it met all requirements – beautifully. Made of HEXCEL aluminum honeycomb, **HONEYLITE** diffuses light so efficiently and so evenly that, without first checking with a light meter, many people couldn't believe the level of illumination was as high as 75 foot candles.* The second requirement – a louverall ceiling that would not interfere with air conditioning outlets located above it – was made to order for the unique nature of **HONEYLITE**'s hollow-celled construction. For these reasons, and for more listed below, specify **HONEYLITE** for your next lighting installation – it's the most beautiful, most functional, luminous ceiling you can find anywhere!

- 45° and/or 60° light cut-off provides effective shielding
- Non-flammable and UL approved
- Weighs less than three ounces per square foot
- Free circulation of air prolongs life of light units
- Provides lowest surface brightness obtainable
- Non-static and dust resistant
- May be cleaned with ordinary vacuum brush attachment

* See LIGHTING – December 1955

HONEYLITE
(shown at right actual size) installation is simple, inexpensive. For full ceilings,

HONEYLITE®

FINE HARDWOODS FOR ARCHITECTURAL USES — 9

(To be continued in a later issue)

By Burdett Green, Executive Vice President, Fine Hardwoods Association
and James Arkin, A.I.A., Consultant, Architectural Woodwork Institute

LAUAN or PHILIPPINE HARDWOODS

The Philippine Islands are the source of a great variety of hardwoods only a few of which are imported into the United States. The greatest volume comes from a group sold commercially as "Philippine Mahogany," although it is not related to the true mahoganies. Several fine hardwoods from the Philippine Islands and that part of the world are known and marketed under their own names, such as Narra, Almon, Bella-Rosa, Sonora and Paldao. Those classified and sold as Philippine Mahogany are quite varied in color and texture. They include the softer species of *Shorea*, which are light-colored to reddish-brown in color, and the species of *Parashorea* and *Pentacme*. This group is divided into two classes, as follows: (1) Red Lauan *(Shorea negrosensis)*, Tanquile *(Shorea polysperma)* and Tiaong *(Shorea spp.)*; (2) Almon *(Shorea almon)*, White Lauan *(Pentacme contorta)*, Bagtikan *(Parashorea picata)* and Mayapis *(Shorea squamata)*. In general, these woods, as compared with the Tropical American and African Mahoganies, are more coarse-grained and stringy. They require a greater amount of sanding to produce a finishing surface and are much less stable under atmospheric (moisture) changes. Pictured here are the less common type of Red Lauan showing butterfly pattern and the run-of-mine type of Lauan that is reaching this country today, which has a mild ribbon stripe and is nearly all quartered.

LAUAN, RED *(Shorea negrosensis)*

Also called "Philippine Mahogany." Sold as Philippine Hardwoods.

Source: Philippine Islands
Color: Red to brown
Pattern: Ribbon stripe; interlocking grain
Characteristics: Coarse texture; large pores
Uses: Furniture; doors; cabinetry
Availability: Veneer (quartered, sliced, rotary) abundant. Lumber available
Price Range: Medium to inexpensive

LAUAN, WHITE (Pentacome contorta)

Same as above but for color.

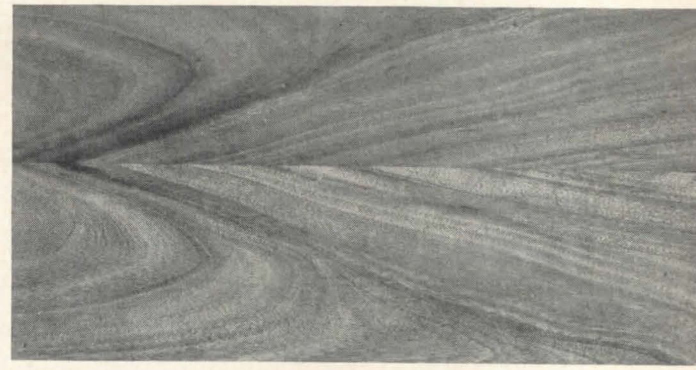
NARRA *(Pterocarpus indicus, Pterocarpus echinatus)*—Angsena, Sena

Although this wood is another one of the Philippine Hardwoods, it has properties distinctly superior to those described above.

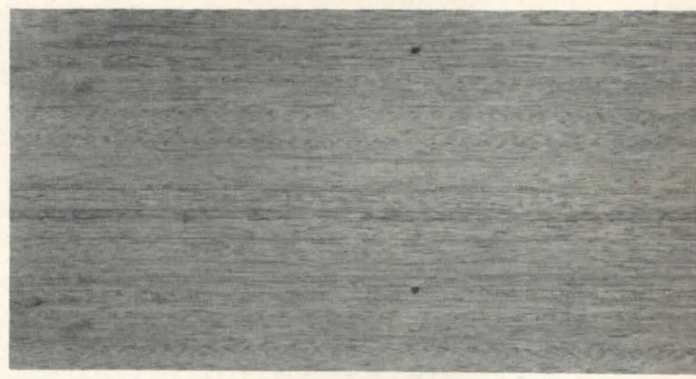
Source: Dutch East Indies, Philippines
Color: Rose to deep red. Some are golden yellow
Pattern: Distinct grain character; some ripple
Characteristics: Heavy and hard; not strong; durable
Uses: High-grade furniture; interior finish of ships and vehicles
Availability: Veneer (quartered) rare
Price Range: Costly

MAKORI *(Mimusops heckelii)*—African "Cherry," Baku, Cherry "Mahogany," Makore

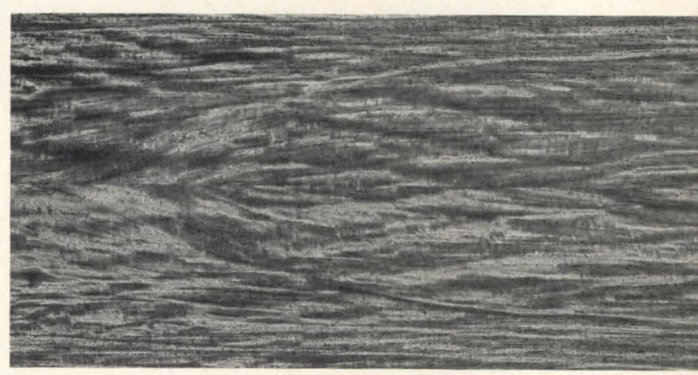
Source: African Gold Coast, Nigeria
Color: Pinkish-brown to blood red or red-brown
Pattern: Somewhat similar to a close-grained Mahogany, but with dark red growth lines and smaller pores, as found in Cherry. Some logs are straight-grained and show figure like African Mahogany stripes; others have a striking, checkered figure sometimes streaked with darker color
Characteristics: Finer textured than true mahoganies, and denser, harder and heavier; tough; stiff; large sizes; strong; gummy and lustrous; glues well; works fairly easily
Uses: Furniture and cabinetry
Availability: Veneer (quartered, sliced) plentiful
Price Range: Medium



Lauan, Red, flat cut (2 pieces, book-matched)



Lauan, White (2 pieces, slip-matched)



Narra, semi-figured (2 pieces, book-matched)

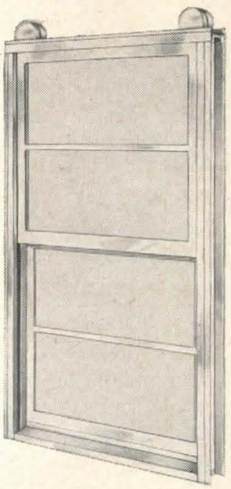
Makori, quartered, mottled (1 piece)

WINDOW TREATMENT IN A HOSPITAL

...BUILDS PATIENT MORALE

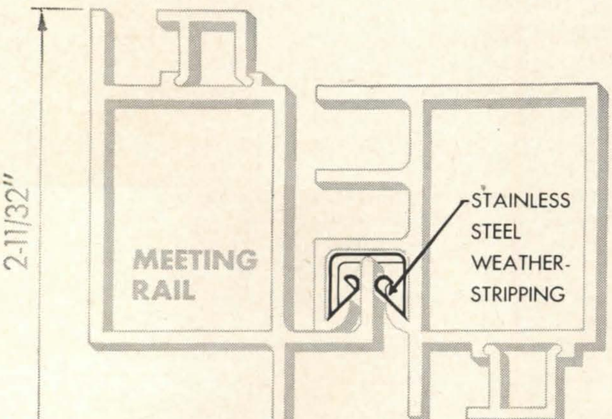
ONE WHOLE WALL OF EVERY ROOM IS MADE INTO A PICTURE WINDOW BY COMBINING CECO-STERLING ALUMINUM DOUBLE-HUNG AND FIXED WINDOWS . . .

The therapeutic value of sunshine and view had much to do in guiding Pereira & Luckman, planners, architects and engineers of Los Angeles and New York City, in designing the Grossmont District Hospital. To give patients a better outlook they made the whole side of each room into a wall of glass—a picture window bringing in sunshine and acres of view. Ceco-Sterling Aluminum Double-Hung and Fixed Windows accomplished the desired effect. Maximum glass was possible because of slender sleeving mullions and narrow sash sections. And important, too, was the tight weather-seal provided by Ceco Windows. On your next building project, consult Ceco Engineers. They will help you make effective use of metal building products.

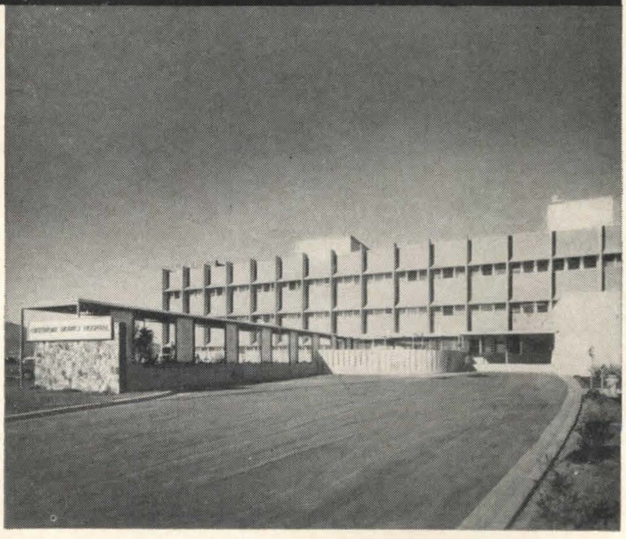


There's minimum air infiltration with the use of Ceco-Sterling Double-Hung Monumental and Commercial Windows, Series 200-B. That's because the sash float on stainless steel weather stripping, assuring tight, freely operating, vertical sliding windows. They operate silently, so necessary in hospital windows.

Front elevation of Grossmont District Hospital, San Diego, California presents interesting pattern of light and shade, with Ceco-Sterling Aluminum Double-Hung and Fixed Windows and Screens providing echo accents for the main motif. Pereira & Luckman, planners, architects and engineers.



Note the heavy extruded box sections for rugged performance, and the double-contact stainless steel weather stripping for tightness. Similar weather strip at jambs provides a spring cushion contact, holds sash clear of frame for easy sliding.



The sweep and pattern of the window treatment lend stately drama to Grossmont. Visors over the windows and right-angle fins control glare while admitting abundant light.

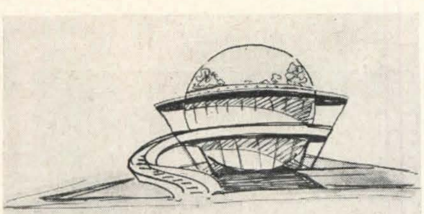
TECHNICAL ROUNDUP

(Continued from page 210)

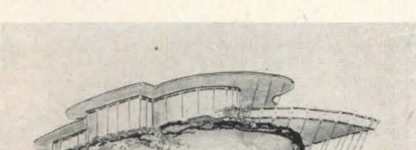
. . . AND BEYOND TOMORROW

Architect Robert Fitch Smith of Miami dreamed far into the future with his predictions of the part plastics will play in shaping tomorrow's houses. Displaying full-color sketches of the houses pictured below, Mr. Smith expounded:

"Designers have always tried to follow nature's forms. Architects have found it difficult because of materials and construction methods, so we have made use of rectangles, squares and conventional patterns. The caveman found his scale of living in the simplest way, adapting himself to surrounding material. The tent and tepee are scaled to man's use. So is the South Seas thatched shelter. Today, with the use of this new modern material, the architect's dreams come true. For example, let us design a house; let us take a typical building lot, a lot 75 by 120 ft . . . On our drawing pad we will with one color trace the probable footsteps of the mother throughout the house during her average day. With another color we will trace the father's footsteps, then the children's. This gives us a composite pattern of the activities of all and forms a floor plan shape on the lot showing the outline around which we will wrap the clothing walls of the house. This plan shape will be related to the lot, its characteristics, the trees, the neighbors and all. A new free form is born, with no waste corners, enclosed in a new, beautiful, translucent, colorful clothing. The roof design will follow the shape of the plan with its new shape in plastics. The roof may be rounded, spiraled, a bonnet, or may take many other adaptable plastic forms."



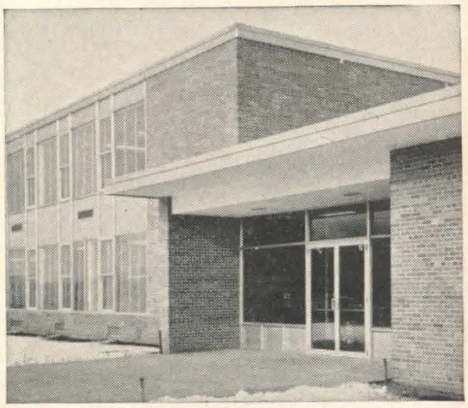
Plastic sphere would contain living areas in center section, all-year gardens above and utilities below. Approached by a winding drive which would take the driver directly to the living area, the sphere would be anchored with struts which could be unfastened quickly in event of earthquake or other disaster so that the sphere could be partially filled with glass and floated above the area of disaster (while remaining anchored, of course, to the earth). Another less extreme design by Mr. Smith utilizes free-floating plastic shapes resting on structural plastic walls



Building Products Exhibition

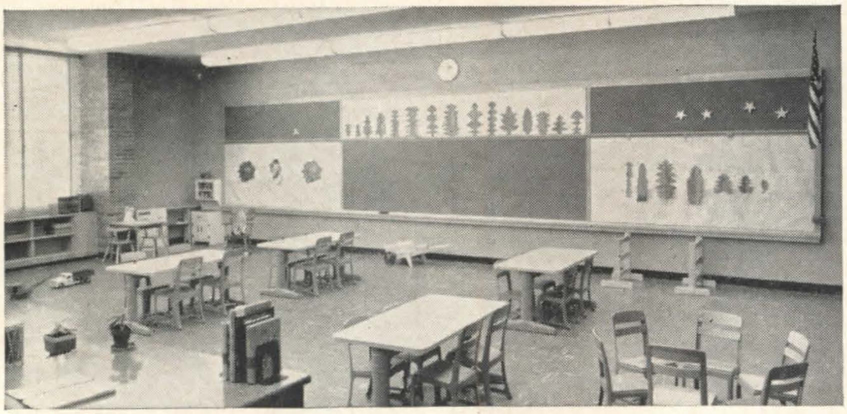
Plans for a $200,000 traveling building products exhibition have been announced by Producers' Council. To be known as "the Home Building Caravan," it will be viewed by residential architects, builders and sub-contractors. According to William Gillett, Council president, "The Caravan will travel over 25,000 miles and will be shown in 38 major cities . . . The premiere is scheduled for Washington, D. C., on August 30." Other scheduled dates are

(More Roundup on page 226)



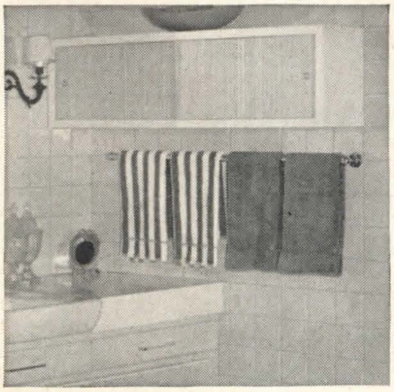
2

durable latex paint provides beautiful finish economically in new elementary school



In the modern Parkdale Elementary School in Midland, Michigan, latex paint proves it can provide a beautiful finish and excellent light reflection even on rough concrete block! And its easy application and the simple equipment clean-up cut time and labor costs substantially. Long-lasting client satisfaction is assured, too, because latex paint dries quickly to a tough, durable film that's scrubbable and will not alkali-stain.

Dow is America's leading supplier of latex to paint manufacturers. Ask your supplier about these paints, available in a wide color range, or write to Dow.



3 *Styron plastic wall tile*

...so good it's guaranteed!

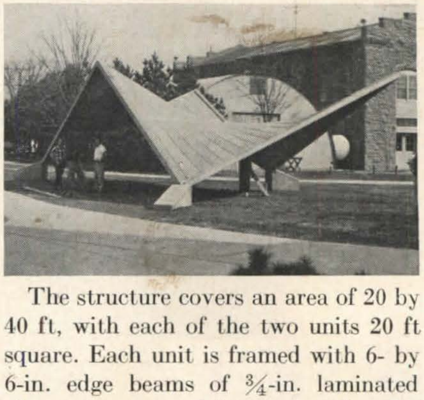
Architects and builders with new ideas can add the luxury look to walls like this for very little additional cost. Guaranteed Styron® plastic wall tile, so durable, so beautiful, so inexpensive to apply, makes it possible. All through the house, Styron is as natural and casual as today's trend to modern architecture . . . in the bath, kitchen, recreation room, laundry, nursery, on stairway walls. Remember, Styron plastic wall tile is *guaranteed* by your certified dealer to conform to Department of Commerce and FHA standards. It will pay you to make Dow plastics a part of every home you build! THE DOW CHEMICAL COMPANY, Midland, Michigan.

you can depend on DOW PLASTICS DOW

as follows: Pittsburgh, Sept. 6; Toledo, Sept. 11; Cleveland, Sept. 26; Buffalo, Oct. 2; Boston, Oct. 5; New York (Garden City), Oct. 9; Newark, Oct. 12; Philadelphia, Oct. 16; Baltimore, Oct. 22; Columbus, Oct. 25; Detroit, Oct. 30; Cincinnati, Nov. 2; Indianapolis, Nov. 6; Louisville, Nov. 9; Charleston, Nov. 13; Charlotte, Nov. 16; Miami, Nov. 20; New Orleans, Nov. 26; Jacksonville, Nov. 29; Atlanta, Dec. 5; Birmingham, Dec. 10.

KANSAS UNIVERSITY STUDENTS MAKE HYPERBOLIC PARABOLOID

Students in the Department of Architecture and Architectural Engineering at Kansas University have constructed a double-unit hyperbolic paraboloid which served as their display in the University's Engineering Exposition last spring and which will be used for testing roof coverings for a period of one year.



The structure covers an area of 20 by 40 ft, with each of the two units 20 ft square. Each unit is framed with 6- by 6-in. edge beams of ¾-in. laminated plywood supported in concrete foundation piers. The center diagonal beam serves both units. The roof membrane is formed of two layers of 12-in.-wide ¼-in. plywood strips laid perpendicularly. These strips are straight and required only a slight twist to conform to the slope of the beams. The structure is believed to be the first of its kind with straight generators. Members were glued and nailed.

During a year of research planned for the structure a number of roof coverings will be applied to the plywood membrane for testing. Structural action of the paraboloid will also be investigated under conditions of concentrated and unsymmetrical loading.

The project is under the direction of Prof. Willard Strode of the Department of Architecture and Architectural En-