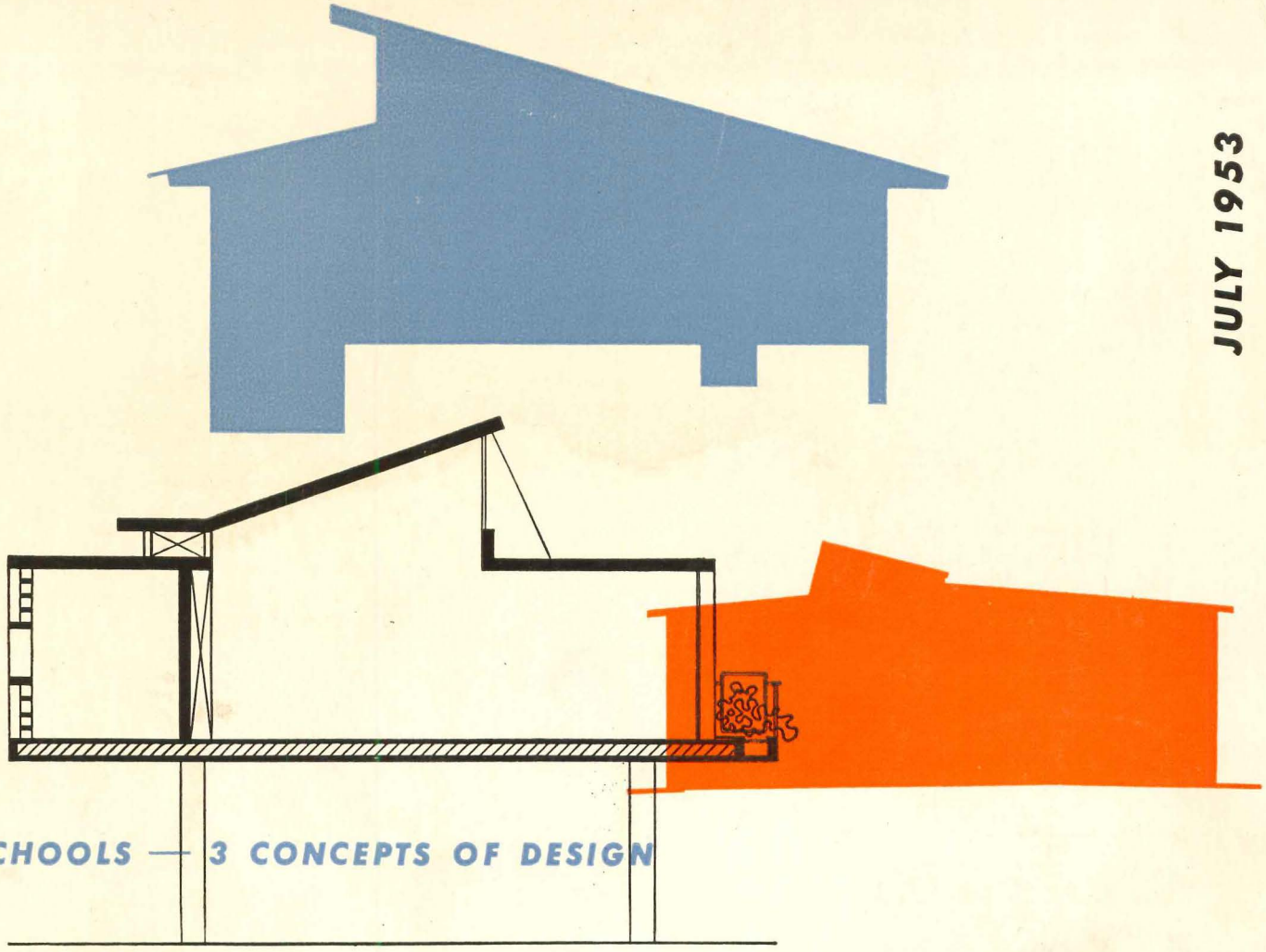
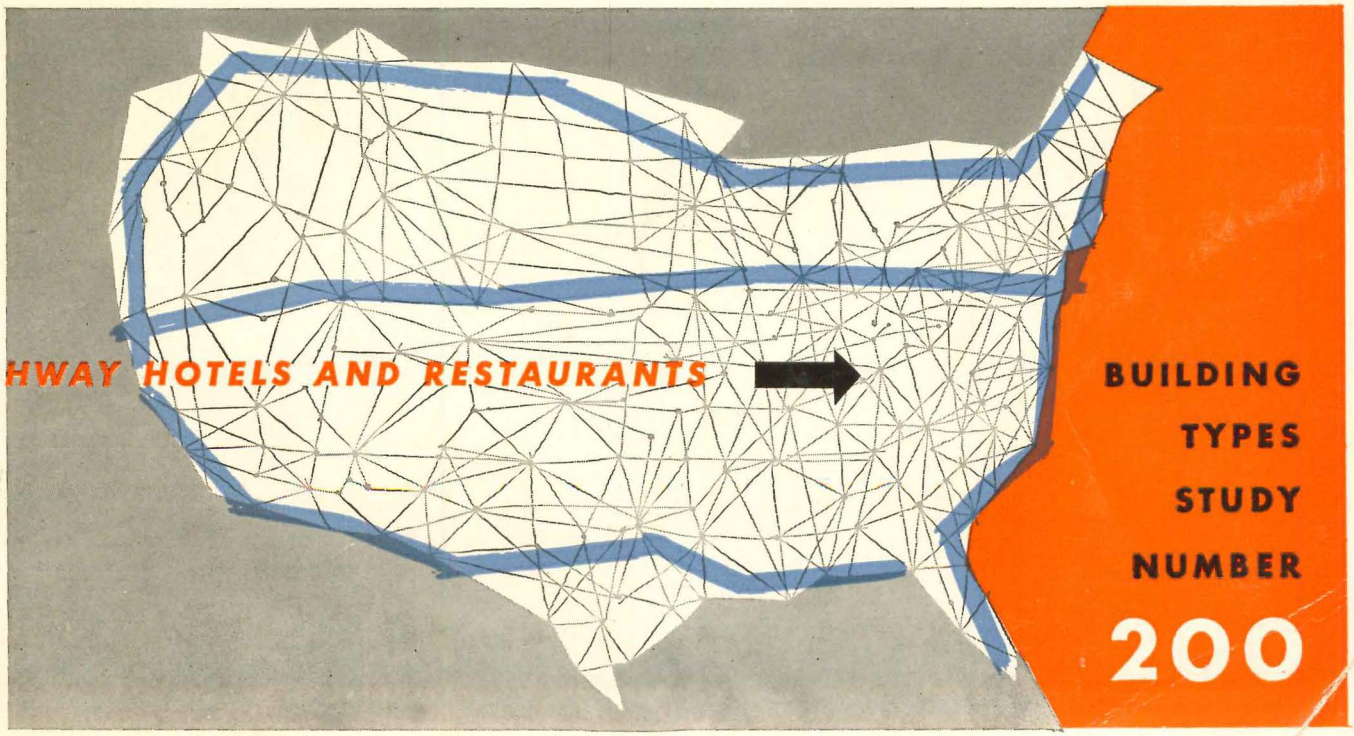


JULY 1953

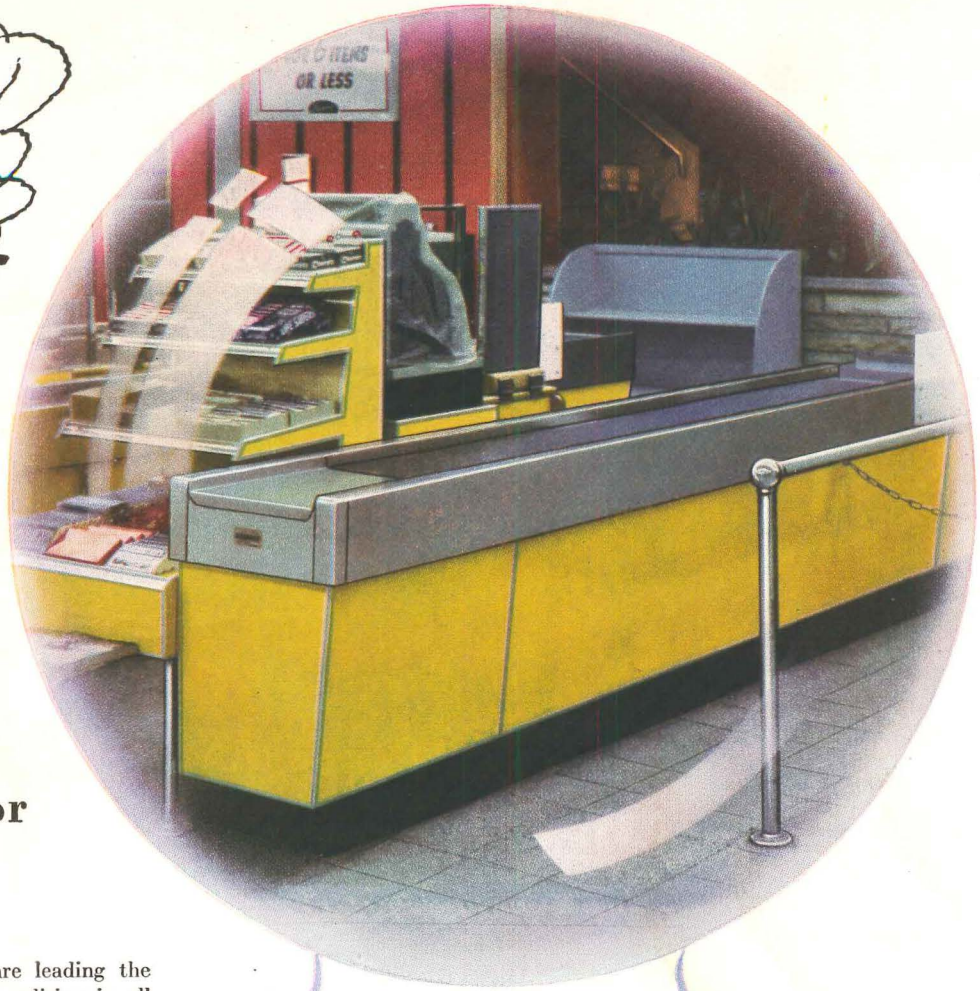
3 SCHOOLS — 3 CONCEPTS OF DESIGN

ARCHITECTURAL RECORD



HIGHWAY HOTELS AND RESTAURANTS

BUILDING TYPES STUDY NUMBER 200



Handsome checkout counters are faced with easy-to-clean Formica in yellow Skylark pattern.

Prediction: More FORMICA Reg. U. S. Pat. Off. in "Store" for Supermarkets

Supermarkets for grocery selling are leading the stampede toward self-service merchandising in all phases of retailing.

Formica is a growing part of this revolution.

Elimination of personal contact between salesperson and customer puts greater emphasis on color, beauty and rugged wearing quality of the sales setting.

Formica radiates a warm invitation to masses of people and, having attracted them, is "wear conditioned" against careless use.

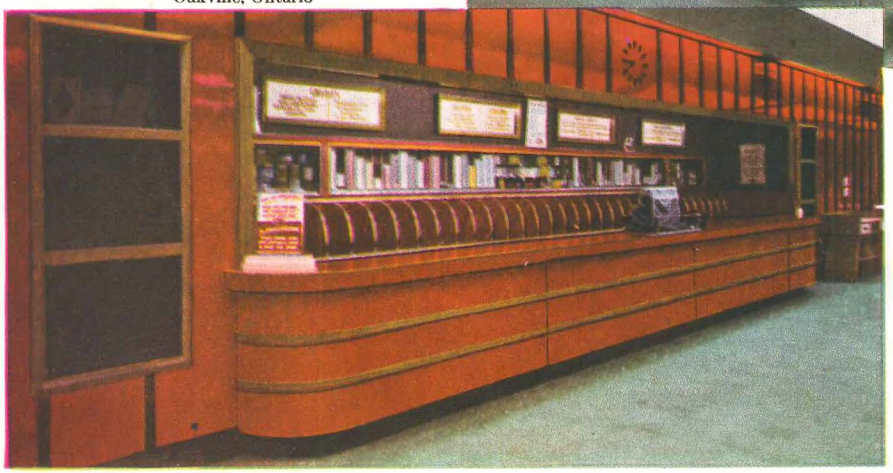
For more Formica information see Sweets File $\frac{13a}{FO}$ or write:

FORMICA 4632 Spring Grove Ave., Cincinnati 32, Ohio

In Canada: Arnold Banfield & Co., Ltd., Oakville, Ontario

Illustrated Store: Steinberg's Ltd. at Henry Morgan and Co., Montreal, Canada

Color keyed with Formica. The green counters are for regular use—the yellow are express counters.



Terra Cotta Skylark Formica is used on this entire wall which includes the service counter and elevators.

Beauty Bonded FORMICA Reg. U. S. Pat. Off. Pays in Performance

Guaranteed by Good Housekeeping — Replacement or Refund of Money if Not as Advertised Therein

ARCHITECTURAL RECORD (Vol. 114, No. 1, July, 1953) is published monthly by F. W. Dodge Corp., 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $4.50 per year; Foreign, $6.50.
(Regular Edition)

Entered as second-class matter at the Post Office, Concord, N. H., March 16, 1946, under the Act of March 3, 1879.

Vol. 114 • No. 1 *July 1953*

ARCHITECTURAL RECORD

Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 West 40th Street, New York 18, N. Y. Western editorial office, 2877 Shasta Road, Berkeley 8, Calif.

Chairman of the board, James McV. Breed; vice chairman of the board, Paul Abbott; president, Thomas S. Holden; vice president and treasurer, Howard Barringer secretary, Sanford D. Stockton, Jr.; vice presidents: Irving W. Hadsell, Chauncey L. Williams, H. Judd Payne, T. Oliver Morgan; assistant secretaries: George W. Morgan, Jr., William C. Breed, Jr.; assistant vice presidents: Clyde Shute, Clifford G. Dunnells, Jr., Howard M. Thompson, Marc Wayne, Robert F. Marshall; assistant treasurers: Walter F. DeSaix, Edwin H. Freed, Irving B. Satin; regional vice presidents: Carl S. Bennett, Ralph M. Hairston, Julius T. Little, Richard H. Ray.

Subscription rates: United States and possessions, Canada, Cuba, Mexico, Central and South America, and Spain, $4.50 a year, $7.50 for two years, $9 for three years; elsewhere, $6.50 a year, $11.50 for two years, $15 for three years. Single copy $2. Circulation manager, Marshall T. Ginn.

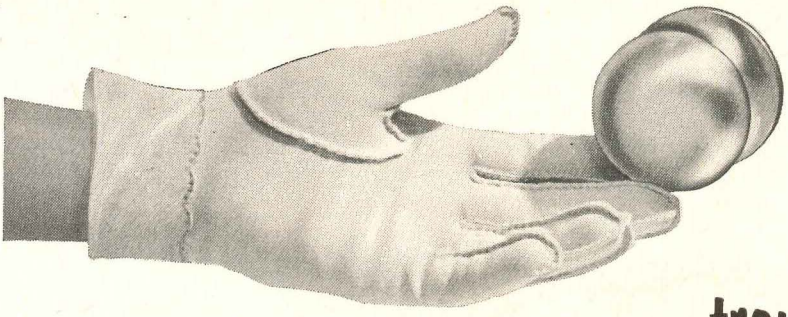
Member of Audit Bureau of Circulations and Associated Business Publications. Architectural Record is indexed in Readers' Guide to Periodical Literature, Art Index, Industrial Arts Index and Engineering Index.

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.

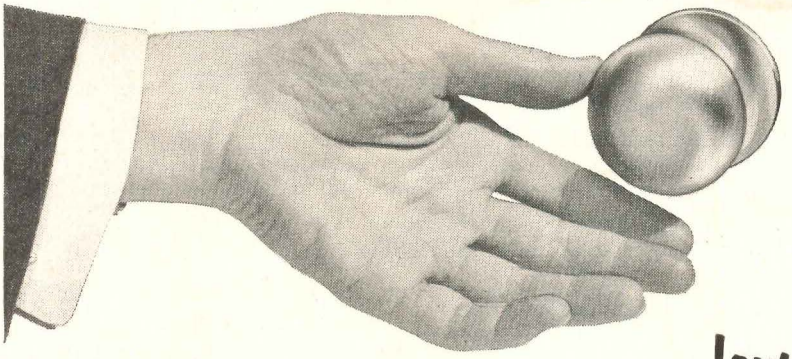
Other Dodge services: Dodge Reports and Dodge Statistical Research Service, Sweet's Files, Home Owners' Catalogs, Chicago Construction News, Daily Pacific Builder, Denver Daily Journal Real Estate Record & Builders' Guide

Cover: Above, section drawings of three schools by Mogens Leth. Below, map drawn by Tom Ballinger

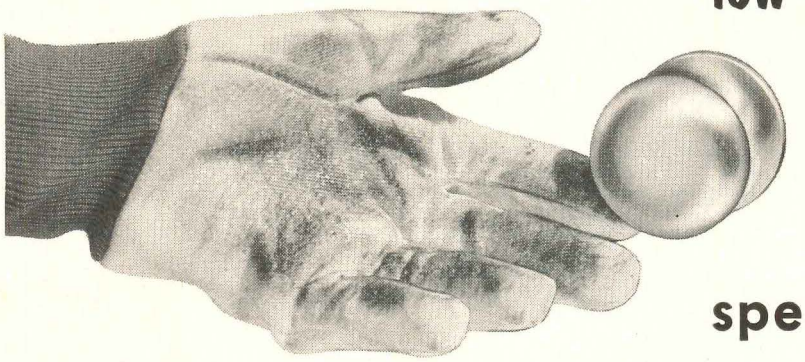
for lasting beauty...



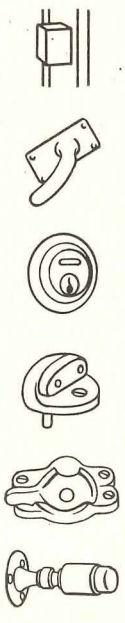
trouble-free operation...



low-cost maintenance...



specify YALE* ALUMINUM HARDWARE



Beauty? Yale Aluminum blends perfectly with today's color schemes and materials! Performance? Yale Aluminum combines rugged construction with the extra durability of this modern alloy assuring years of trouble-free operation! Maintenance? Yale Aluminum has a soft lustre that is scratch-resistant, tarnish-proof and difficult to soil! For detailed information, write for folders to: Yale & Towne Mfg. Co., Lock & Hardware Div., Stamford, Conn.

*Registered in U. S. Patent Office

YALE & TOWNE

Free folders show benefits of Yale Aluminum for hospitals, schools and other types of buildings

PERSPECTIVES

BEAUTY AND THE QUEEN: The Coronation on June 2 of Elizabeth II brought to the British throne a young woman whose views on the relationship of utility and beauty were notably expressed in a speech delivered in 1947 — at the depths of postwar "austerity" — before the Royal Society of Art and reprinted in the Coronation issue of the British journal *The Architectural Review*. Her Majesty said, in part:

"It may well be long years before we can again afford to devote such leisure and energy as did our forefathers to things purely decorative. But we should be defeatist and unimaginative indeed if we concluded that because nearly everything we produce today must be severely practical, it must also be without taste or beauty . . .

"A nation whose level of good sense in art was once reflected in the furniture of Chippendale and Hepplewhite, and in the domestic architecture of the eighteenth and early nineteenth centuries, cannot rest content with slavish imitations of foreign styles or with a simple faith in the virtue of streamlining . . .

"If we are destined to live in an austere age it is for us to establish that beauty is as essential to utility as it proverbially is to truth."

ART AND POLITICS: Her Majesty's first minister, Sir Winston Churchill, has more recently — before the 1953 annual dinner of the Royal Academy — noted two likenesses in fields in which he is a noted practitioner: "The first is the controversial differences of opinion among those who are engaged in them. . . . The second element which art and politics have in common is the search for truth. In that we have but only so far been partly successful."

IKE AND ART: At the same Royal Academy dinner, President Eisenhower was quoted by British Defense Minister Lord Alexander as having told him during a discussion of painting that "one must be perfectly honest with oneself, not so much to paint what one saw but what one believed and felt." The President, perhaps seeing all too clearly the similarities pointed out by Sir Winston, has so far refused all pleas for information about Dwight Eisenhower the Sunday painter; and his comments on the UN buildings and the famous Bobby Jones portrait have been to date the only clues to the Presidential attitudes on the arts.

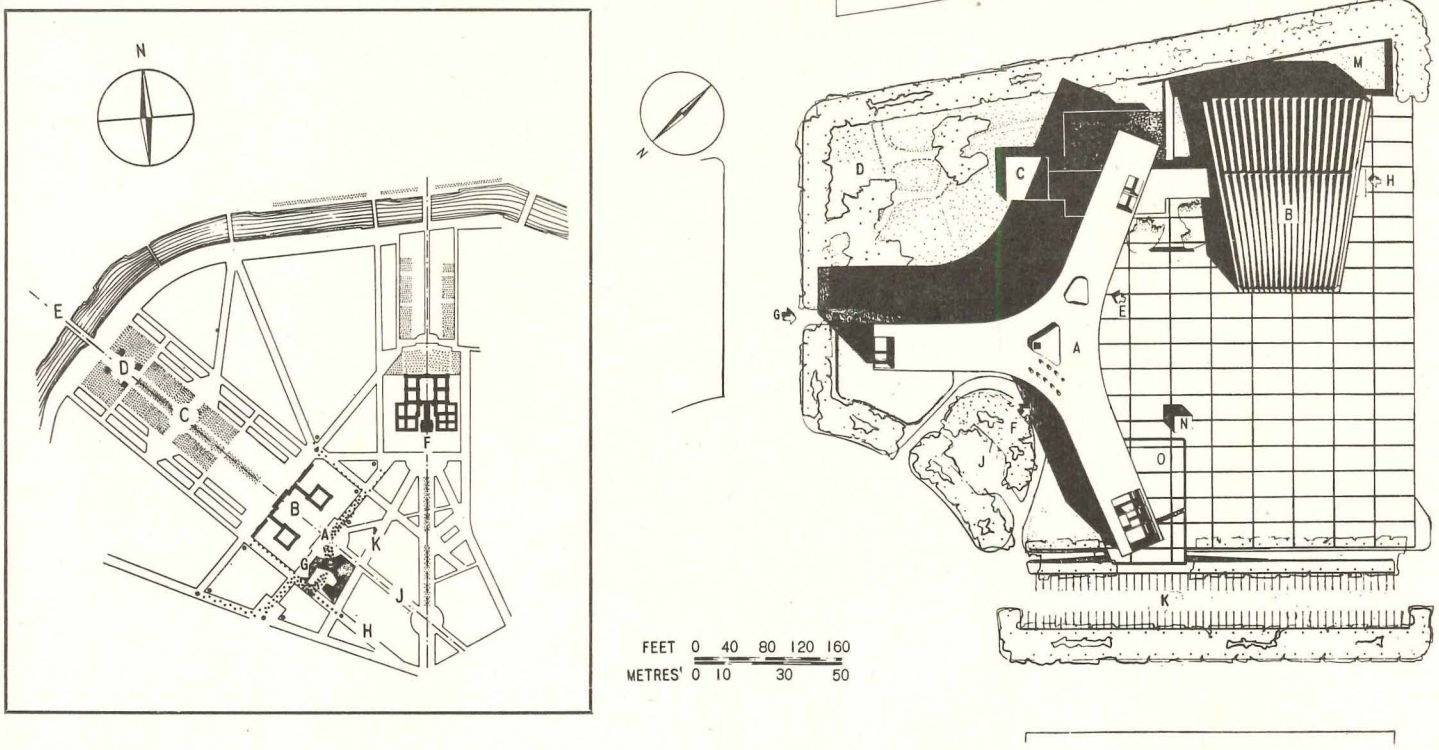
845 TV COMMISSIONS? Within "a few years," according to David Sarnoff, chairman of the board of directors of the Radio Corporation of America and the National Broadcasting Company, there will be 1000 television stations in operation in the U. S. Total today: about 155.

WONDERS OF NEW YORK: Seven "engineering wonders" of New York City named in a recent vote of the Metropolitan Section of the American Society of Civil Engineers (in order of votes received): George Washington Bridge, Brooklyn Bridge, Empire State Building, the city subway system, the city water system, Holland Tunnel, Brooklyn-Battery Tunnel.

"DISCOVERER AND TRADITIONALIST": Charles Edouard Jeanneret of France — Le Corbusier — has received the Royal Gold Medal for 1953 of the Royal Institute of British Architects. Le Corbusier, who has never been able to say anything which could be heard over the echoes of his early description of the house as a "machine for living," observed at the presentation ceremonies in London that he was awarded the Medal only "because I have been a cab-horse for forty years," receiving "like a true cab-horse, many blows with a whip" without altering his outlook or changing his aims: ". . . It is always the human being, Man, that I have sought to study, not as a professional architect but as a discoverer, and also as a traditionalist. I have always had my feet in the past, and my head in the past too. My roots are in the past, though not in the Dark Ages of the academies. At the same time, I have tried to take a step towards the future. It has been my object always to be simple and direct, to be both an engineer and a poet."

"MR. WRIGHT COMES TO TOWN": The title of a *Herald Tribune* editorial on the occasion of Frank Lloyd Wright's recent visit to New York to receive the 1953 Gold Medal for Architecture of the National Institute of Arts and Letters (see page 16) was a simple statement of an event which got more attention (all free) from newspapers, radio and TV than any architectural event in memory, including the 1952 A.I.A. convention and Mr. Wright's own previous visits. As he said himself, "They want me on ten programs a day and I only have time for three." Well, Mr. Wright is very wrapped up in battling the International Style ("I've lost patience with them") and does not appear to have changed his well-known views on the men generally associated with it ("they're not architects — they're all talented amateurs"). He speaks with special contempt of last winter's "Postwar Architecture" exhibit at New York's Museum of Modern Art — an exhibit in which he was represented by four buildings, more than any other single architect ("I told them to take my buildings out and they wouldn't do it"). Does Mr. Wright have any hope, then, for the organic architecture he has been preaching so long? — "Hope! — of course I do; it's all around you now; we have the idea and they can't stop it."

ARCHITECTURE AND PUBLIC RELATIONS: Lever House drew more than 50,000 visitors for conducted tours during its first year.



New location (left above) is in southwest of Paris, very near Ecole Militaire (B). Site is bounded by Place de Fontenoy (A) and Avenue de Saxe (J), Avenue de Lowendal (G), Avenue de Suffren (H) and Avenue de Segur (K). Sketch also shows relationship to Tour Eiffel (D), Champ-de-Mars (C), Palais de Chaillot (E) and Les Invalides (F). Site plan (right above) shows Secretariat (A) with entrance at (E) and Conference Building (B) with entrance at (H); Executive Board (C), near site for expansion (D); sunken garden (M); sculpture (N); pool (O); motorists' entrance (F); parking (J) and (K); service ramp (G)

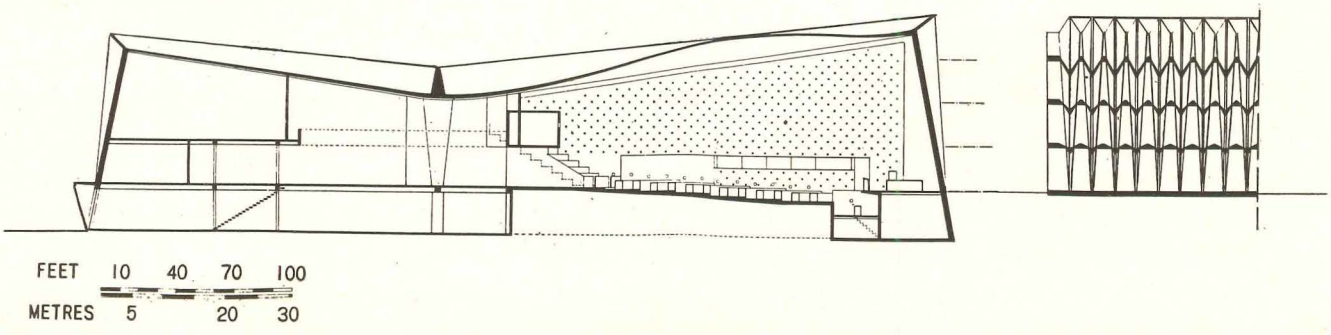
UNESCO CONSIDERS STILL ANOTHER HEADQUARTERS SCHEME

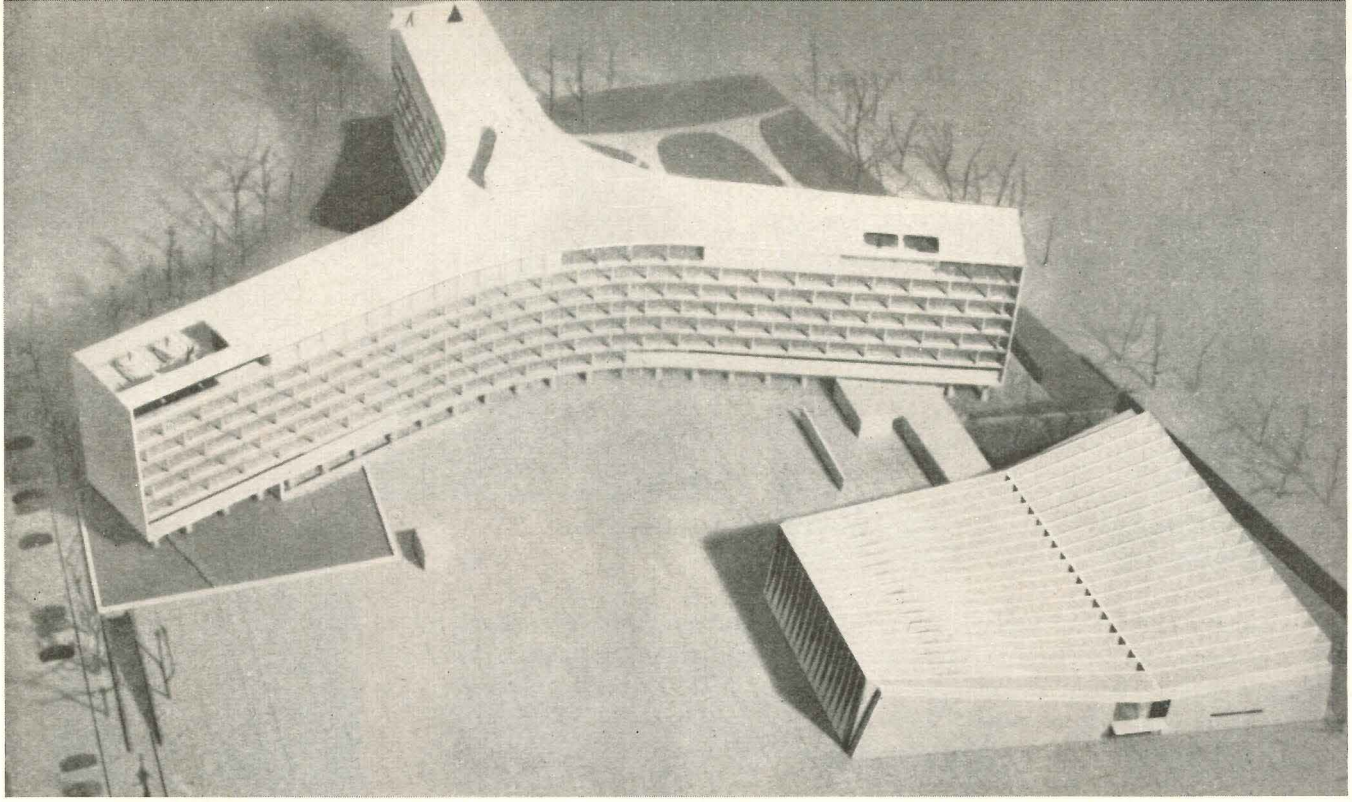
THE THIRD PROPOSAL for a Paris headquarters for the United Nations Educational, Social and Cultural Organization was to be presented to a UNESCO general conference July 1. The new scheme, planned for the same Place de Fontenoy site which was rejected as "unsuitable" after French Architect Ernest Beaudouin prepared the first headquarters plans commissioned by UNESCO, was designed by Architect Marcel Breuer of the United States, Architect Bernard Zehrfuss of France and Engineer Pier Luigi Nervi of Italy — the same trio whose 16-story scheme for a Bois de Boulogne site (ARCHITECTURAL RECORD, Dec. 1952, pages 11–14) was rejected last fall by Paris officials because it would "interfere with the view of l'Arc de Triomphe" (the designers said it would not) and looked, moreover, "like a Notre Dame built of radiators."

With the two-fold aim of "respecting the past while turning towards the future," the present scheme places the buildings on the site so they complete the "planned composition" of the Ecole Militaire area and then lets the Secretariat's widest façade, the great Piazza and the Conference Building look towards the Suffren-Grenelle district — an area expected to be subject to large-scale replanning which may develop it as a link between the cultural center of the Left Bank and the expanding districts of Passy and Auteuil. The initial reaction from Paris officials and press was enthusiastic.

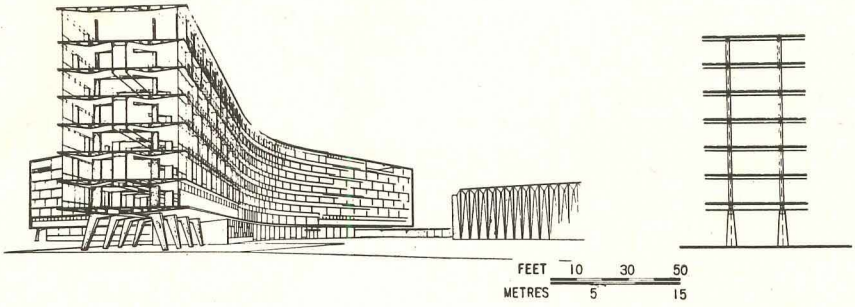
Stone mosaic of light texture and color will be used for exteriors, rubble stone masonry for retaining walls and bush hammered concrete with special aggregates for exposed parts of structure. Murals and sculpture are envisioned as part of the design. Estimated cost: $6 million.

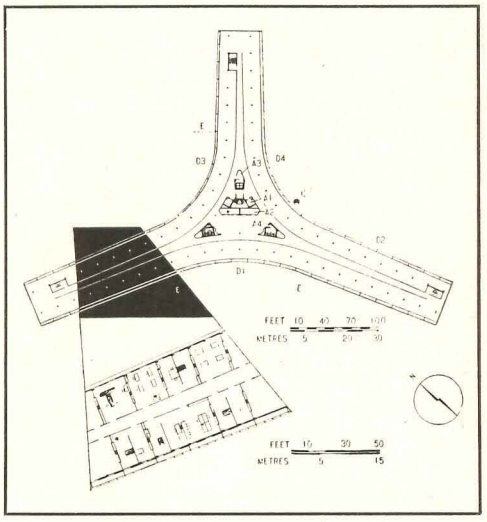
Conference Building: longitudinal section and details of end walls, which furnish part of roof support



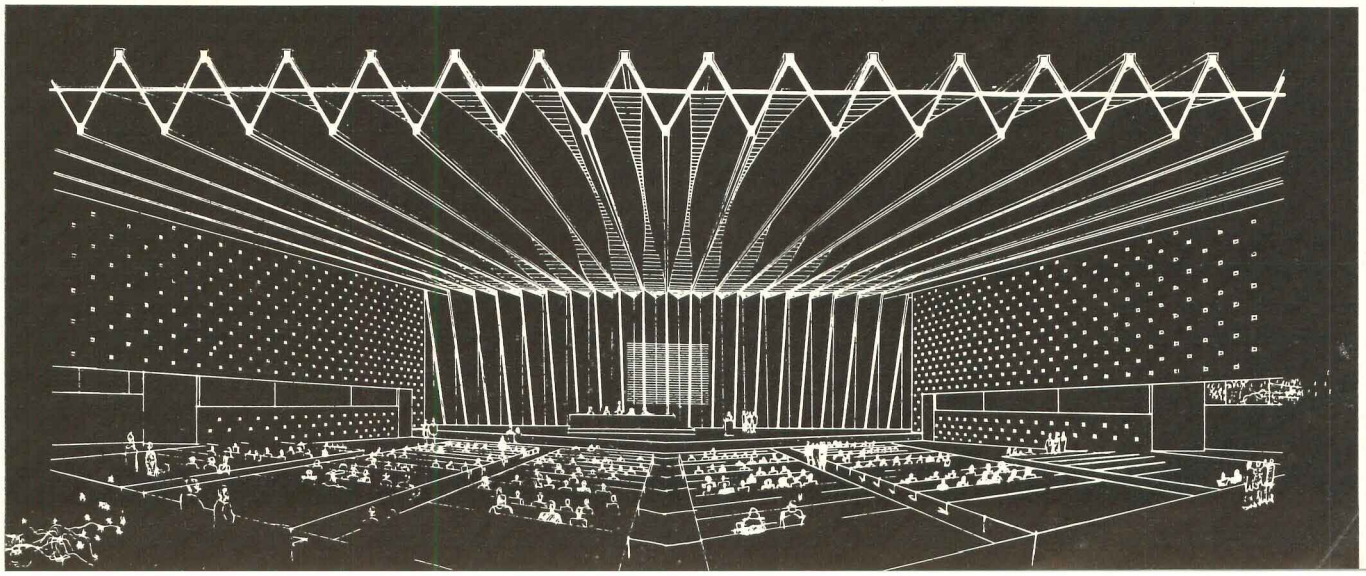


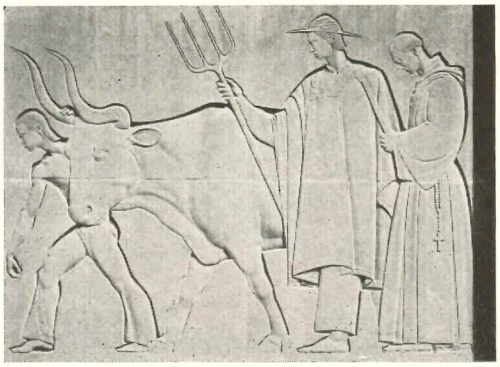
Above: photo of model. Below: cross-section of Secretariat and typical floor plan; inset shows typical furnishing. (D) indicates façades—(D1) southwest: 32-in. projecting floor, horizontal glass sun and partition slabs, solar glass, horizontal sun filters; (D2) east: 32-in. projecting floor and partition slabs; (D3) north: 24-in. projecting floor and partition slabs; (D4) southeast: 32-in. projecting floor, slabs, solar glass, vertical sun filters



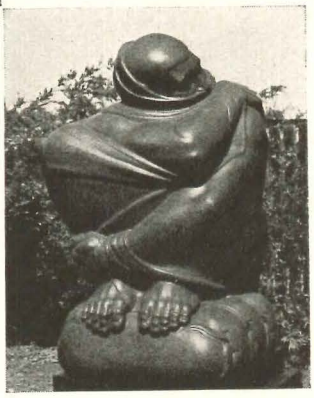


Below: Conference Building—interior view of two-story plenary session hall. Exposed structural ceiling and end wall (behind stage) aid acoustics; perforated surfaces of side walls are both acoustical treatment and lighting design. "Corrugated" concrete structure of building is continuous in roof (to be copper-covered) and end walls; roof, braced by slab of varying thickness, rests on end walls and row of columns. It may be prestressed concrete





Photos by Homer Dana



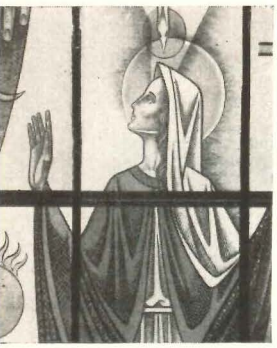
Sculptor Donal Hord works in many materials; examples shown here include Indiana limestone, diorite and jade, all carved directly. Above left: one of 6- by 8-ft panels "Legend of California" in Coronada, Calif., High School library. Center: "Guardian of Water," 23-ft fountain for San Diego Civic Center. Top right: "Thunder," 20-in. jade figure in San Diego Fine Arts Gallery. Right: "Spring Stirring," 46-in. black diorite

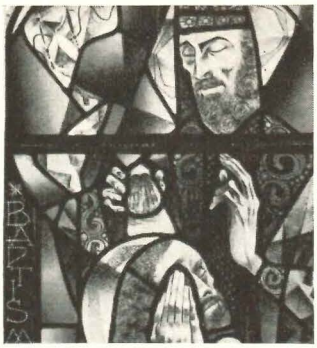
1953 A.I.A. AWARDS TO ALLIED ARTS

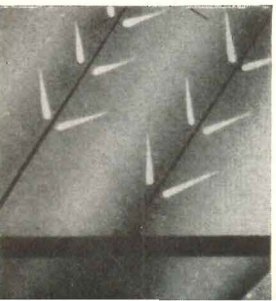
THE FINE ARTS MEDAL of the American Institute of Architects was established in 1919 and the Craftsmanship Medal in 1915 to provide a means of recognizing outstanding achievement in fields closely allied with architecture. This year's awards, scheduled for presentation at the A.I.A. national convention at Seattle last month, went to men widely known among architects.

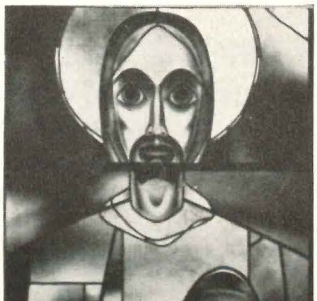
Donal Hord, the San Diego sculptor who received the Fine Arts Medal, has works in many public buildings, including — besides those shown above — San Diego State College, Hoover, Calif., High School and Balboa Park in San Diego; these in diorite, marble and limestone. In museums and private collections are pieces in a wide range of materials — rosewood, lignum vitae, mahogany, bronze, marble, diorite, obsidian, jade, porcelain and terra cotta. His previous honors include a $1000 award from the American Academy of Arts and Letters in 1942 and the Gold Medal of Merit with $1000 from that Academy in 1948. As for his artistic philosophy, he says: "My work has been based on interpretation of my own locale. But I am at a loss to express a pertinent philosophy regarding sculpture and architecture that would sound sage, even within the boundaries of San Diego County itself. I like good craftsmanship and design, and I am skeptical of any art work that needs a literary explanation; if it requires an interpretation, it didn't come off."

The fourth stained glass artisan to receive the Craftsmanship Award, Emil Frei of St. Louis, has pioneered in the development of a contemporary expression in an art which had been largely static since the Middle Ages. His experiments with textural variety — using both clear and stained glass in some panels — and with combinations of opaque wood and prismatic glass have helped to give his field new techniques as well. Commissions at Emil Frei Inc., the group of designers and craftsmen headed by Mr. Frei, are handled as group projects under the supervision of one of the group members.









Emil Frei says the Craftsmanship Award "actually was given for the work of those who are with me" and selects this group of details (and one sample section) from larger windows to represent the group (designer's name given first, then building of installation, then architect):

(Top row) Milton Frenzel—Cenacle Retreat House, St. Louis, Maguolo & Quick, architects; Robert Harmon—SS. Peter and Paul Church, Pierre, S.D., Barry Byrnes, architect; Siegfried Reinhardt—Church of the Annunziata, Ladue, Mo., Maguolo & Quick, architects. (Bottom row) Robert Frei—Jesuit Tertianship House, Decatur, Ill. (old building, architect not known); William Schickel—a sample section; Francis Deck—St. Peter's Church, Kirkwood, Mo., Murphy & Mackey, architects

MEETINGS AND MISCELLANY

Hill-Burton Cuts Opposed

ARCHITECTS have been expressing their concern over cuts in funds for the Hill-Burton hospital program; and at least one firm was circularizing all members of the American Institute of Architects in an effort to alert them to the implications of the cuts. It was hoped the Senate might reverse the action of the House of Representatives, which slashed hospital construction funds for fiscal 1954 to $50 million, $10 million under the Administration request and $25 million under the Truman budget figure.

As it stood, there would be "very few" new projects started and going projects in at least 14 states would have to be curtailed, perhaps in some cases stopped. More than that, personnel cuts amounting to 37.5 per cent of the staff of 185 in the Hospital Facilities Division of the U. S. Public Health Service would affect the extent of technical aid to architects in the planning and design of facilities constructed under the program. It was expected that two regional offices would have to be closed entirely.

The $50 million appropriation, matched by state and local funds, would provide approximately 6250 beds—against the existing deficit of 850,000 beds, and the annual need for 30,000 beds to replace obsolete facilities and keep up with a 2,000,000 increase in population each year.

F. W. Dodge Elects

HOWARD W. BARRINGER, who entered the financial division of F. W. Dodge Corporation in 1920 and has served in recent years as vice president and treasurer, has been elected president of the corporation. Irving W. Hadsell and Chauncey L. Williams, formerly vice presidents of the corporation, have been named executive vice presidents. Thomas S. Holden, president of F. W. Dodge since 1941, has been named a vice chairman of the board of directors; he will continue the research and public relations activities which have been under his direction for many years.

Robert F. Marshall, general manager of the Dodge ARCHITECTURAL RECORD magazine and book division, has been named a vice president of the corporation, as have Julius T. Little of the Philadelphia office, in charge of the Eastern region of the Dodge Construction News Division, and Howard M. Thompson, assistant general manager of the Dodge Sweet's Catalog Service Division.

Tops in Product Literature

THIRTY BUILDING PRODUCTS manufacturers received awards in the 1953 edition of the annual Building Products Literature Competition sponsored jointly by the Producers' Council and the American Institute of Architects. The awards, announced at the Council's semi-annual meeting June 15 by Richard M. Bennett, F.A.I.A., of Chicago, chairman of the jury of five architects who judged 150 entries, were as follows:

Class I (Manuals, Handbooks, Basic Information)
Certificate of Exceptional Merit: Open Web Steel Joist Construction—Steel Joist Institute.
Certificate of Merit: Stainless Steels for Store Fronts and Building Entrances—American Iron and Steel Institute, Committee of Stainless Steel Producers; Thin Setting Bed Methods and Materials—Tile Council of America; Handbook of Concrete Construction—Universal Atlas Cement Company.
Honorable Mention: Technical Service Data, #1, #2—The Celotex Corporation; Specifications Recommended to Secure Dry Brick Walls—Louisville Cement Company, Inc.; Characteristics of Modern Woods—Roddis Plywood Corporation.

Class II (Literature Concerned with Particular Products)
Certificate of Merit: American Standard Radiator Heating Catalog R52—American Radiator and Standard Sanitary Corporation; Anemostat, Selection Manual 45—The Anemostat Corporation of America; Armstrong's Floors and Walls—Armstrong Cork Company; Crane Hospital

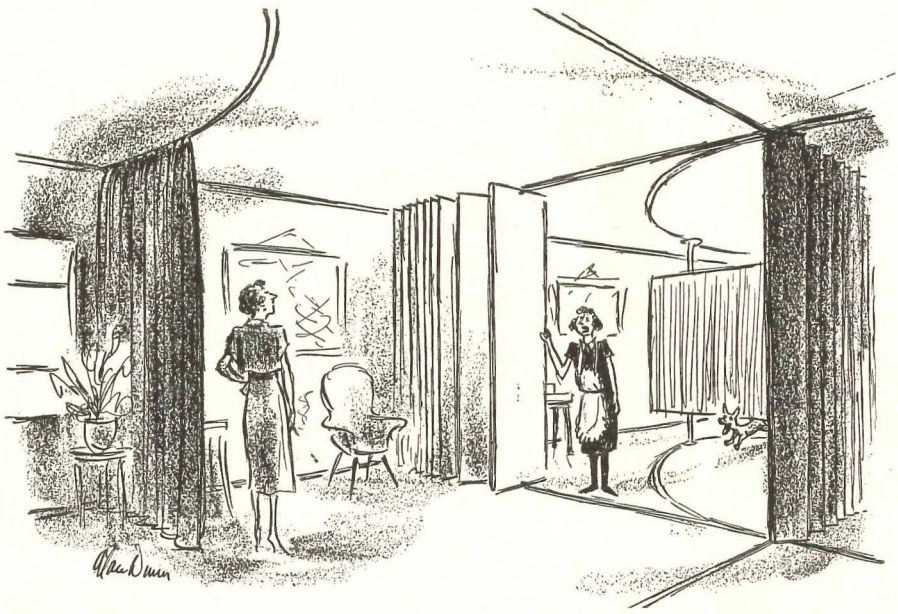
(Continued on page 16)

Boston Center Plans Under Way

THE "BOSTON CENTER ARCHITECTS" are hard at work and preliminary plans are expected to be ready soon for the Stevens Development Company's $75 million Boston Center to be built on the 28-acre site of the Boston and Albany Railroad yards in the Back Bay area. An agreement for the purchase of the site was signed in February by the company, which is headed by Roger L. Stevens of New York.

Architects for the project, named in May, are Pietro Belluschi, Walter Gropius and The Architects Collaborative, Walter F. Bogner, Carl Koch and Associates, Hugh Stubbins, Jr.

The project, which will be built on an area twice the size of the area of New York's Rockefeller Center, is expected to include more than a million sq ft of office space and 850,000 sq ft of store space. It is also expected that a hotel of 750 rooms and a convention hall will be built in conjunction with the project.



—Drawn for the RECORD *by Alan Dunn*
"Good morning, ma'am—where do you want the walls today?"

(*Continued from page 15*)

Service—Crane Company; Josam Catalog K—Josam Manufacturing Company; Zero Weatherstripping Catalog 53—The Zero Weatherstripping Company, Inc.

Honorable Mention: Acme Sliding Door Hardware—Acme Appliance Manufacturing Company; Aluminum in Architecture—Aluminum Company of America; Andersen Detail Catalog No. 531—Andersen Corporation; Hauserman Data Manual 53—The E. F. Hauserman Company; L.O.F. Glass for Construction—Libbey-Owens-Ford Glass Company; Control Systems for the Modern School—Minneapolis-Honeywell Regulator Company; This is Mosaic Tile—The Mosaic Tile Company; Stanley Hinge Guide—The Stanley Works.

Class III (General Promotional Literature)

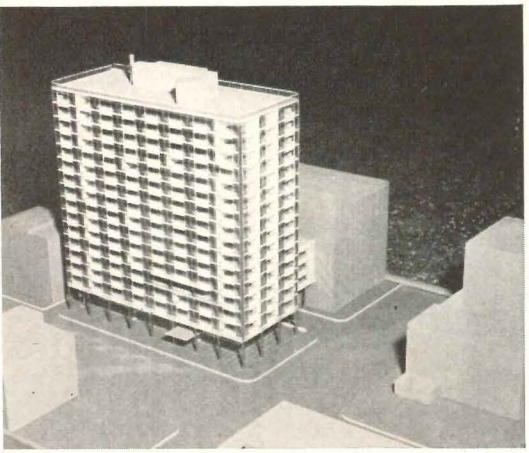
Certificate of Exceptional Merit: Overly *Fire Doorater* and Swing Guide—Overly Manufacturing Company.

Certificate of Merit: Malvern Plant—Acme Brick Company; Brick Shapes—Glen-Gery Shale Brick Corporation.

Honorable Mention: Armstrong's Insulcolor—Armstrong Cork Company; Let's Face It . . . With Ceramic Veneer—Gladding, McBean and Company; Whether It's Traditional or Modern—Glen-Gery Shale Brick Corporation; Color-bestos Siding Sheets—Johns-Manville; Kawneer Prize B.A.I.D.—The Kawneer Company; Proof that Marble Costs Less, Wears Better, Lasts Longer—Marble Institute of America; Design of the Month Series—Pittsburgh Plate Glass Company; Ranch Craft—The Stanley Works.

Class IV (Space Advertising Directed to Architects)

Honorable Mention: Acoustical Materials Series—Armstrong Cork Company; Flooring Materials Series—Armstrong Cork Company; Roof Insulations Series—Armstrong Cork Company; Floor Products Series—Kentile, Inc.; Marble Series—Marble Institute of America.



Model of 18-story skyscraper designed by The Architects' Collaborative, Gropius' Cambridge firm, and Arthur Myhrum associated, to be built in Chicago this year, was included in Illinois Tech Exhibit

50 Years With One Firm

THE New York architectural firm of Voorhees, Walker, Foley and Smith had a big occasion in May, when Andrew Weggenman marked his fiftieth anniversary with the firm. Mr. Weggenman, who has been project architect on some of their most important buildings, was honored by 220 employes of the firm, led by Stephen F. Voorhees, senior partner, at a dinner at the Hotel Biltmore in New York May 11.

Pickens Leaves Tulane

BUFORD L. PICKENS, director of the College of Architecture at Tulane University since 1950 and a faculty member since 1946, has been named professor of architecture and dean of the School of Architecture at Washington University, St. Louis. He succeeds Kenneth E. Hudson, dean of the School of Fine Arts who has been serving for the past year as dean of architecture as well.

Tulane has named a 1944 architecture graduate, John W. Lawrence, as acting director of its College of Architecture.

Gropius is 70

THE FOUNDER OF THE BAUHAUS and former head of the department of architecture at Harvard's School of Design reached three score years and ten on May 18; and some 200 architects, former students and other friends gathered at Chicago's Blackstone Hotel to honor Walter Gropius at a luncheon sponsored by Illinois Institute of Technology. Gropius himself was the main speaker, introduced by the Institute's director of architecture, Ludwig Mies van der Rohe, and he made his enunciation of his philosophy of architecture a specific denial of the view that Bauhaus principles have been, or ever from their nature could be, frozen into any arbitrary "style."

The retrospective exhibition of Gropius' work organized by Boston's Institute of Contemporary Art in collaboration with Harvard University and the Massachusetts Institute of Technology opened at Illinois Tech the same day.

Fuel for Future Fires?

CONSTRUCTION got under way last month on buildings for a new design school at Ulm, Germany, known as the NEW BAUHAUS. Max Bill of Zurich, architect and editor of the recently published book, *Form*, is architect of the buildings and rector of the school.

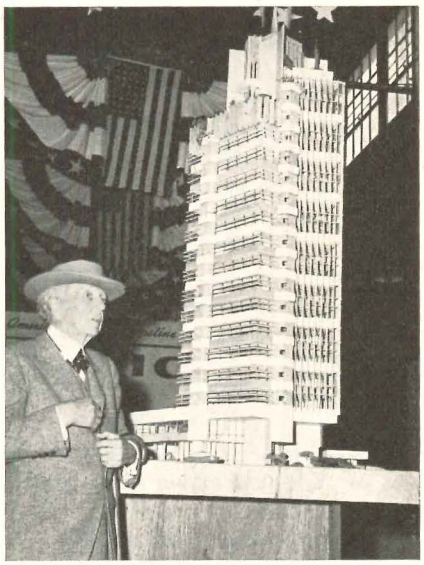
Support for the new school comes from a foundation established by Inge Scholl.

Clair W. Ditchy Heads A.I.A.

The 85th annual convention of the American Institute of Architects, just closing as this issue goes to press, elected Clair W. Ditchy of Detroit to succeed Glenn L. Stanton of Portland, Ore., as president. The rest of the new slate: first vice president—Norman J. Schlossman, Chicago; second vice president—Howard Eichenbaum, Little Rock; secretary—George Bain Cummings, Binghamton, N. Y.; treasurer—Maurice J. Sullivan, Houston; regional directors—Waldo B. Christenson, Seattle; Raymond S. Kastendieck, Gary, Ind.; Clyde C. Pearson, Montgomery, Ala.; Marcellus Wright Jr., Richmond, Va. A full report on the convention will be published next month.

Another Gold Medal for Wright

FRANK LLOYD WRIGHT at 83 appears to be holding his own in the perilous position of a prophet with honor even in his own country. When he received the 1953 Gold Medal for Architecture of the National Institute of Arts and Letters at a ceremony in New York on May 27, he remarked that he had once expected his lustre to increase as gold medals came to him but that he finds in fact they cause a sort of shadow to fall on his natural arrogance and can almost detect the approach of "that disease called humility." More characteristically, he called for the development in American architecture of a philosophy in place of the mere esthetic he feels dominates so much of contemporary architecture; for the growth in America of a culture which is more than mere civilization. Without such growth, he said, the architect who is also a poet will not be truly understood; and, he added, the architect who is not a poet is nothing.



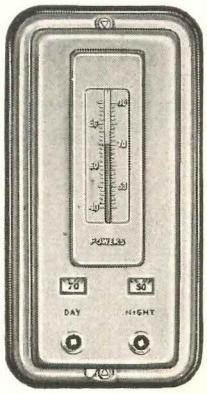
Mr. Wright and the model of his building for H. C. Price Co., Bartlesville, Okla.: on the prairie, "where skyscrapers belong"

Public Schools Equipped with

POWERS

PNEUMATIC SYSTEMS OF

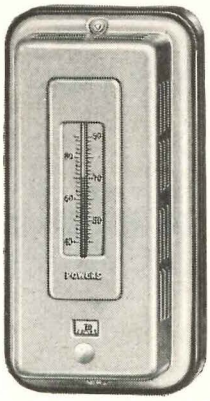
Temperature Control



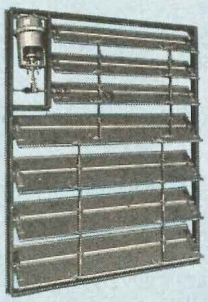
Airstream Thermostat for Unit Ventilators

Insures comfort in classrooms by holding accurate Unit Ventilator discharge temperatures. Requires no auxiliary devices. Has adjustable sensitivity.

POWERS ROOM THERMOSTATS
Unsurpassed for maintaining comfortable room temperature. Noted for their many years of dependable operation without repairs.



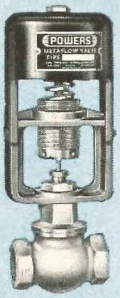
UTMOST COMFORT and EFFICIENCY of STUDENTS and TEACHERS is assured in POWERS controlled schools. Because Powers control requires so little attention, operating personnel can devote more time to other duties. Many schools report 25 to 40 Years of Dependable Operation with astonishingly low operating cost. With today's higher heating cost, Fuel Savings gained by Powers prevention of OVER-heating, are larger than ever before.



Complete Line of Modern Dampers

POWERS **PACKLESS** VALVES

. . . eliminate packing maintenance, leakage of water, steam or loss of vacuum. Made in a variety of styles and sizes for all requirements. Now standard with Powers Control systems.



METAFLOW Control Valve

When you want automatic temperature control with the important advantages cited above . . . install POWERS. No other system gives so many years of dependable service at such low cost.

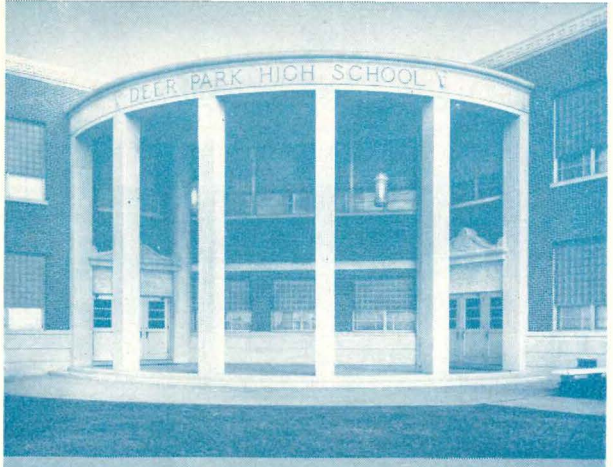
THE POWERS REGULATOR CO.

Skokie, Ill. • Offices in Over 50 Cities in the U.S.A., Canada and Mexico

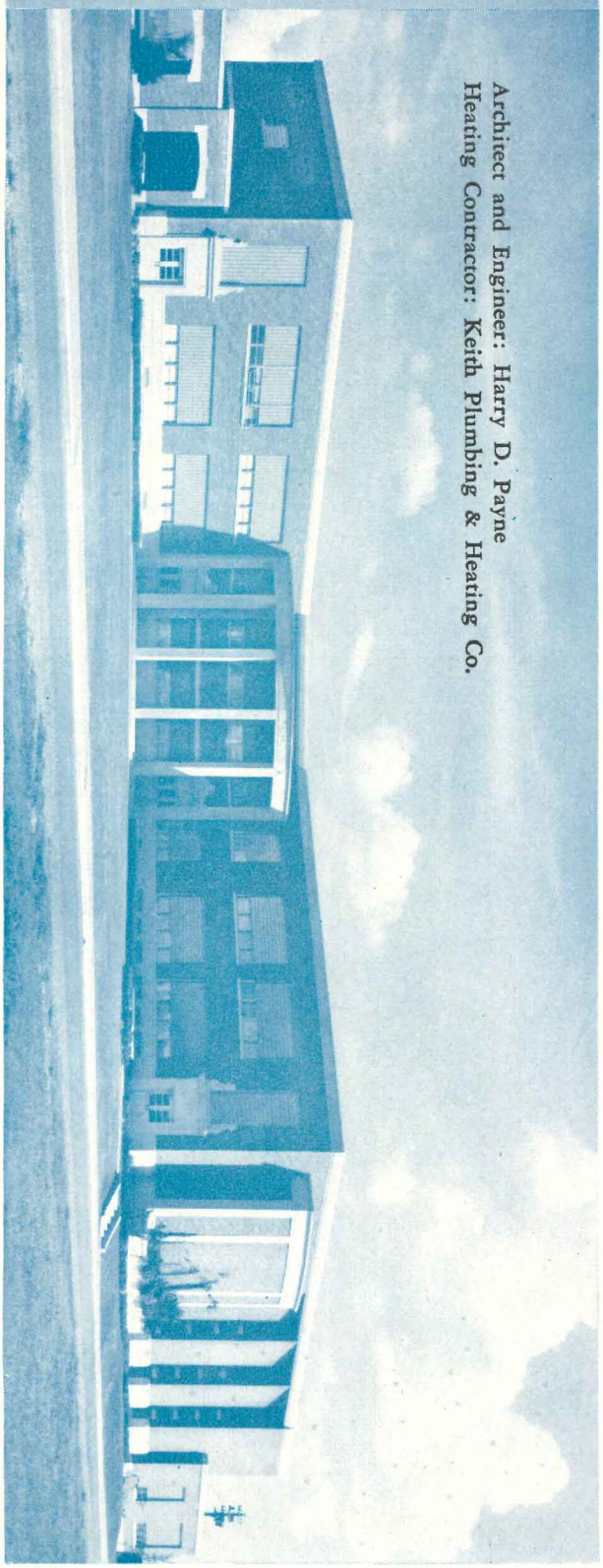
See Your Phone Book

OVER 60 YEARS OF AUTOMATIC TEMPERATURE CONTROL

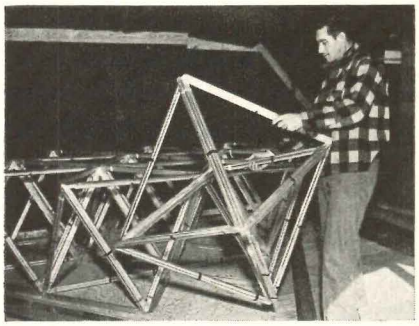
(b9)

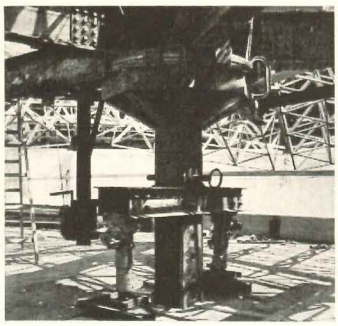


DEER PARK, TEXAS, HIGH SCHOOL



Architect and Engineer: Harry D. Payne
Heating Contractor: Keith Plumbing & Heating Co.



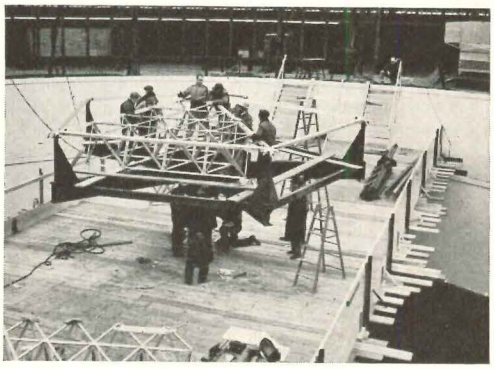


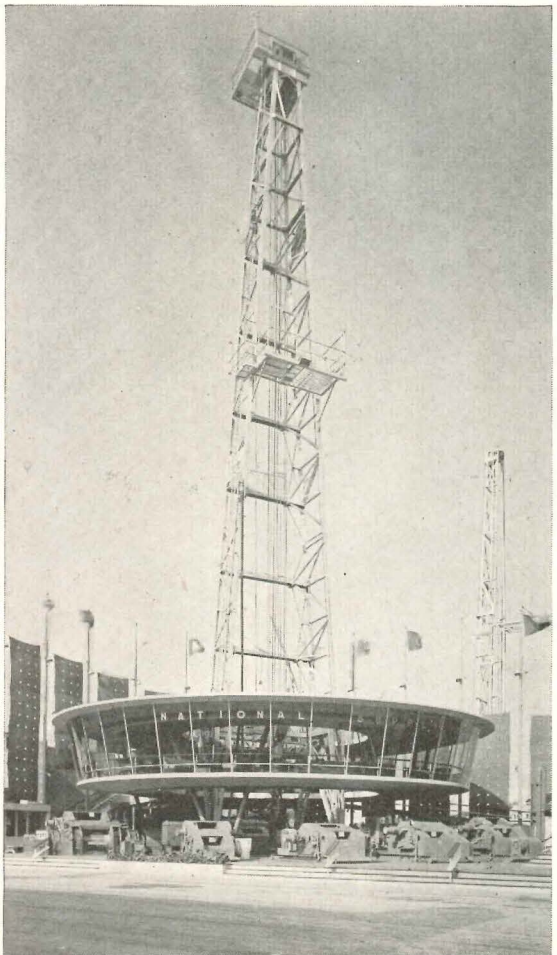
Octahedron (left); mast head and jacking system used for erection

FORD MOTOR COMPANY BUILDS FULLER'S DOME

The first commercial application of a structural principle developed by the far-ranging engineering imagination of R. Buckminster Fuller has been made in the remodeling of the Ford Rotunda in Dearborn, Mich., to resume its career as an exhibition building. The old building couldn't take the 162½ tons of steel needed to span its 93-ft inner court, so it got an 8½-ton aluminum dome, built to get structural strength from tension as well as compression. Guided by colored tapes stuck to prefabricated members, workmen made 19,680 spars into triangles, triangles into octahedrons, octahedrons into trusses (160 of them) and trusses into geodesic dome in 30 working days. Completed structure is covered with triangles of thin but tough plastic skin

Truss being positioned on scaffolding mast (left); mast was jacked up as trusses were added

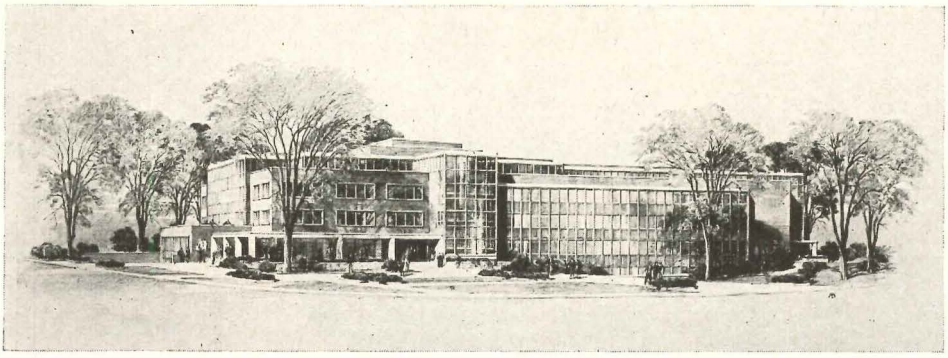




ROTORAMA, OR DRILL SHOPPING MADE EASY

National Supply Company's glass, steel and concrete exhibit building at the 1953 International Petroleum Exhibition at Tulsa put spectators inside showcase, merchandise outside. "Rotorama" was built around a 140-ft drilling mast and its air conditioned gallery looked down on machinery display. Structural supports are inverted tripods attached to steel pipes which join to make circular roof support 66 ft in diameter. Designer: Henry Dreyfuss, with Tulsa architects McCune & McCune; engineer, Fred Severud

Hopkins Photography Co.



The new library will provide space for a million volumes, have 200 stack carrels and 103 study rooms. Ralph R. Calder of Detroit is the architect

PLANS ARE COMPLETED FOR NEW LIBRARY BUILDING AT MICHIGAN STATE COLLEGE

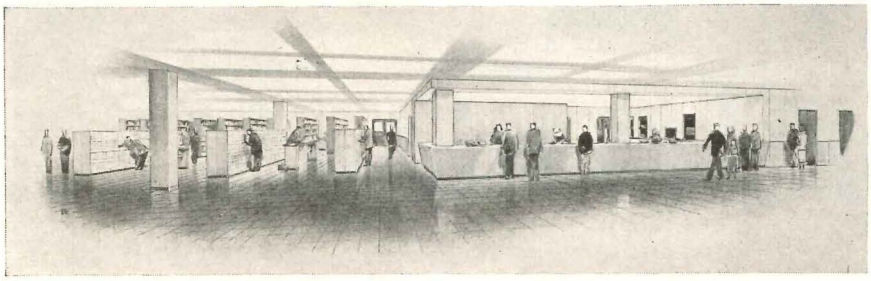
THE PROPOSED LIBRARY for Michigan State College at Lansing, Mich., will provide space for a million books and seating space for 3000 students, according to plans completed by Ralph R. Calder, architect, of Detroit. There will be 200 stack carrels and 103 study rooms.

The building is planned on a module 22 ft-6 in. sq with five rows of stacks 4 ft-6 in. on center. The columns consist of four heavy angles held together by ¼-in. steel batten plates and fire-proofed with 5 in. of vermiculite concrete. The hollow core of the columns is used for fresh air supply ducts. Each module becomes self-sufficient, permitting a flexible plan which will allow future rearrangements of space as library methods change.

The floor structure is mainly flat slab, using the smooth ceilings system to avoid drop heads and capitals. The exterior curtain wall consists of double glazing and porcelain enamel panels, both in an insulated aluminum frame.

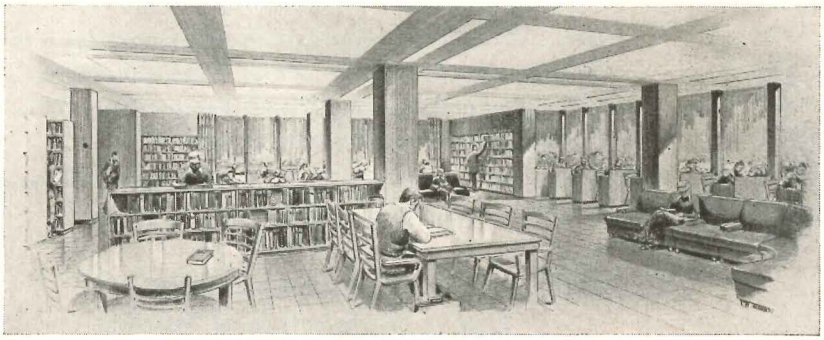
The ceilings throughout are 8-in.-sq aluminum louvered lighting panels, four per bay, in a perforated metal acoustical tile field. Fluorescent lighting tubes are hung below the painted concrete slab.

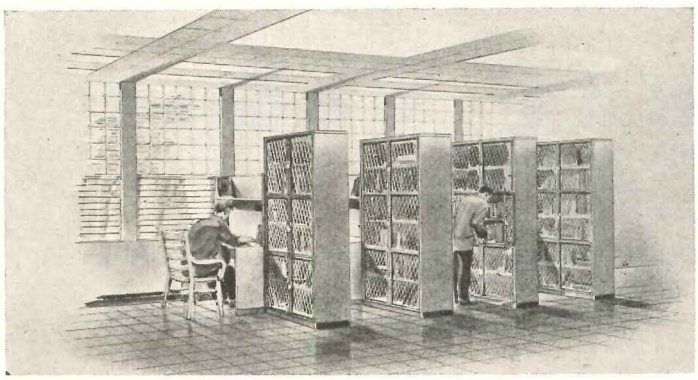
The warm air heating and ventilating system provides for future cooling.



Left: main charging desk and catalog. Flexible plan for public areas will permit future rearrangement of space as needs dictate

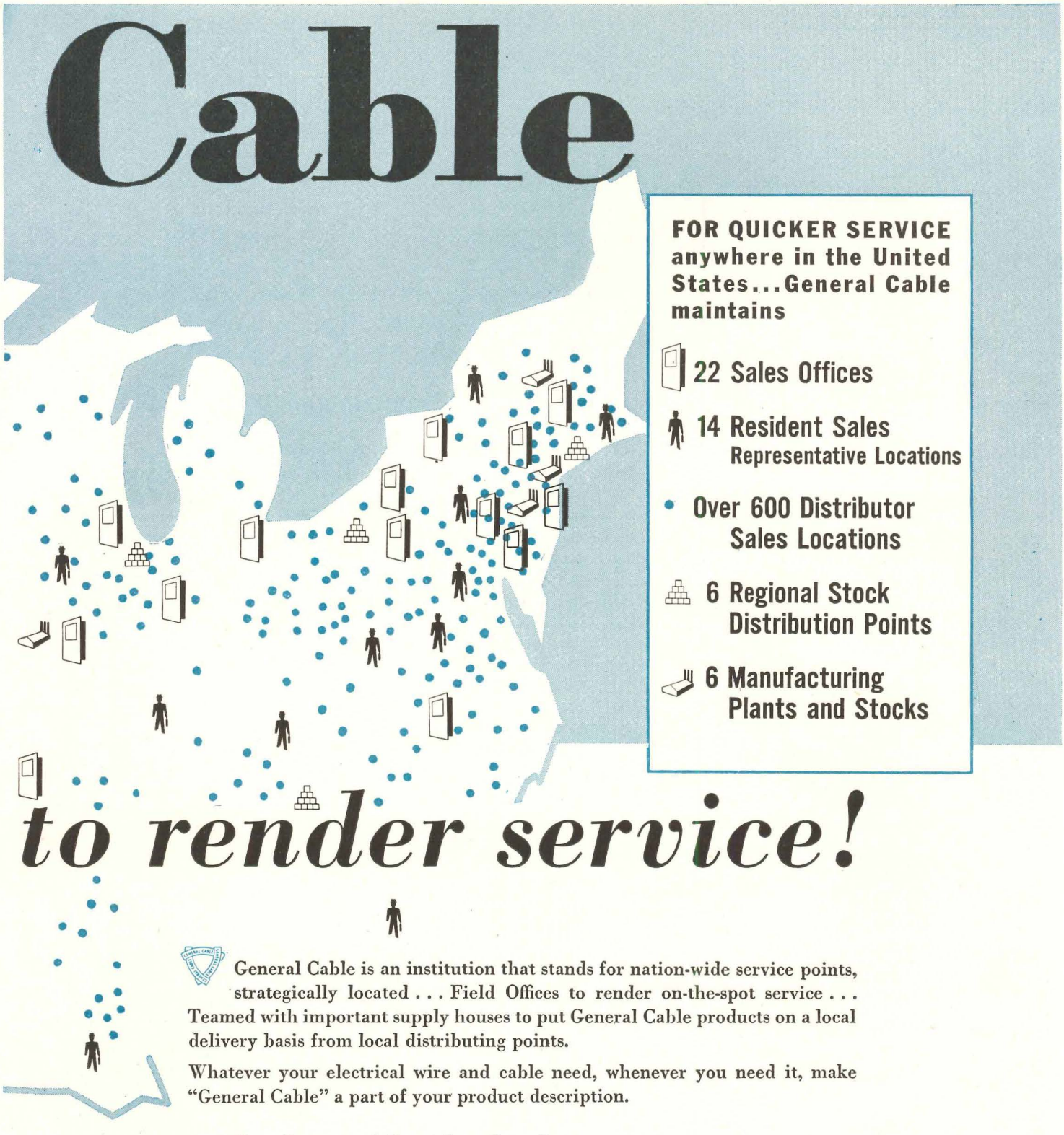
Right: social science and literature reading room. Mullions of curtain wall are 4 ft-6 in. on center to line up with the spacing of individual study tables placed on the outside walls of all reading rooms





Left: detail of stack carrels, lined up between mullions on outside of stack rooms. There will be 200

Cable



FOR QUICKER SERVICE anywhere in the United States... General Cable maintains

- 22 Sales Offices
- 14 Resident Sales Representative Locations
- Over 600 Distributor Sales Locations
- 6 Regional Stock Distribution Points
- 6 Manufacturing Plants and Stocks

to render service!

General Cable is an institution that stands for nation-wide service points, strategically located . . . Field Offices to render on-the-spot service . . . Teamed with important supply houses to put General Cable products on a local delivery basis from local distributing points.

Whatever your electrical wire and cable need, whenever you need it, make "General Cable" a part of your product description.

One Source of Complete Supply
One Completeness of Service
One Standard of Quality

GENERAL CABLE
CORPORATION

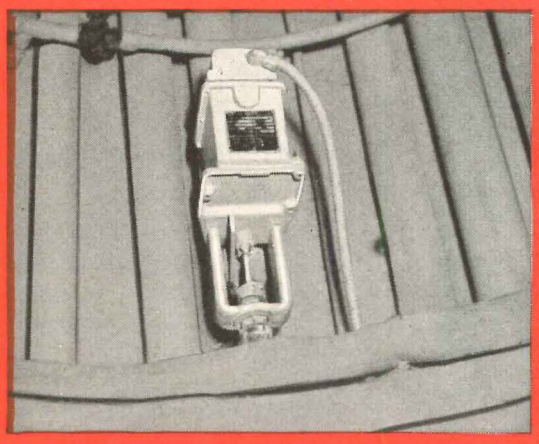
Executive Offices: 420 Lexington Avenue, New York 17, N. Y. Sales Offices in Principal Cities in the United States.

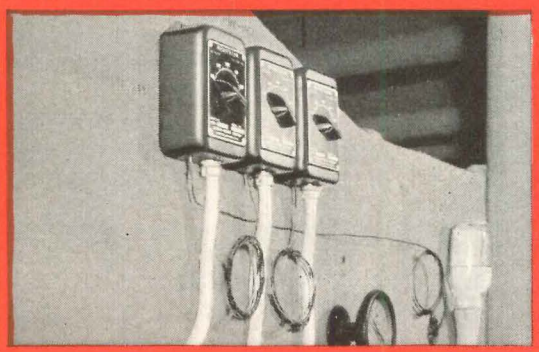
Satisfaction with a seven-zone electric control system in the modern Administration Building (completed in 1939) led Johnson engineers to specify Barber-Colman "Control Center" systems in the famed Research Tower (dedicated in 1950). Today, electric control systems for both structures are operating reliably with a minimum of maintenance and service supervision.

An extraordinary example of contemporary architecture, the Research Tower required as advanced thinking on heating, ventilating and air conditioning problems as on the cantilever principle of construction. Six static pressure controllers operate a series of exhaust dampers through electronic relays to maintain a slight pressure within the building to reduce infiltration.

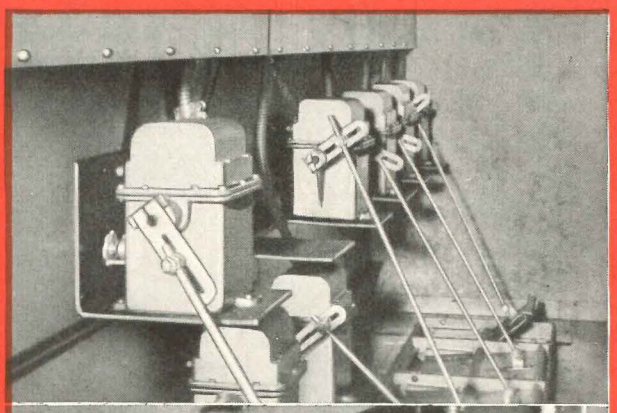
Laboratories calling for constant temperature and humidity required motor-operated proportioning valves ranging in maximum capacity from as low as 15 to as high as 1800 pounds of steam per hour. Special timers and program motors provided low temperatures and automatic coil defrosting. A total of over 400 control components was installed, wired directly to 17 "Control Centers" for handling heating, ventilating, and air conditioning requirements.

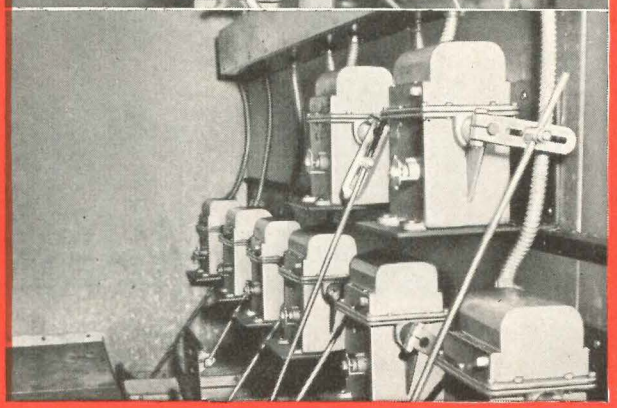
How you can benefit similarly from the timesaving, cost-cutting, advanced engineering techniques resulting from modern electric "Control Center" systems is told in a new booklet "How You Can Simplify Control Problems and Save Money with 'Control Centers'." Phone your nearby Barber-Colman field office or send coupon below for your free copy.





Motor-operated valves (above) and remote bulb thermostats (below)—typical of the over 400 Barber-Colman electric components used for temperature control in Research Tower.





Banks of Proportioning Control Motors—Job included one motor which contained a 37000 to 1 gear reduction, also quantities of two-position and reversing control motors.

BARBER COLMAN

ELECTRIC

Control Center

Automatic Controls • Air Distribution Products • Industrial Instruments
Aircraft Controls • Small Motors • OVERdoors and Operators • Molded Products • Metal Cutting Tools • Machine Tools • Textile Machinery

BARBER-COLMAN COMPANY, ROCKFORD, ILL., U.S.A.
Dept. G, 1304 Rock St. • Field offices in principal cities

☐ Send free copy new booklet "How You Can Simplify Control Problems and Save Money with 'Control Centers'."

*Name*_____

*Firm Name*_____

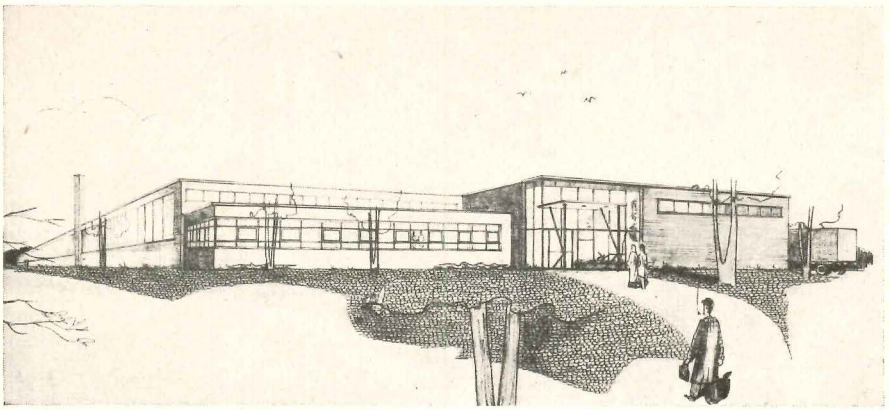
*Address*_____

*City*_____ *State*_____

THE RECORD REPORTS

CANADA

(*Continued from page 26*)



New plant for Inner-Spring Mattress Company Limited, Toronto, covers 31,000 sq ft. The work of Irving Boigon, Toronto architect, it is located in a newly opened industrial area of York Township. Frame is steel with continuous steel sash. Floor is reinforced concrete

of an average house, five to six per cent of the cost of an institutional building, with hospitals alone enjoying a blanket exemption from the tax. Since federal public works are a large part of taxed construction, he claimed that in this category much money only goes from one government pocket to another. The C.C.A., he said, is redoubling its efforts to have the sales tax removed from all building materials.

Construction Wage Hike Close to Average

Wage rates in industry generally increased by an average of 8.1 per cent during the 12-month period preceding October 1, 1952. Construction wage hikes were close to this average, with an 8.2 per cent rise.

The information, from a preliminary index just released by Hon. Milton F. Gregg, Minister of Labor, shows a slowing of the upward trend in wage rates. This can be seen in comparing the new average increase rate with that of the preceding 12-month period, which was 12.8 per cent.

Percentage changes in various industries between the last two survey dates are shown on the following table:

Industry	Per Cent Increase
Logging	19.3
Transportation and Communication	10.3
Mining	8.3
Construction	8.2
GENERAL AVERAGE	8.1
Service (laundries)	7.9
Manufacturing	6.5

The index is based on the annual survey of wage rates and salaries for selected occupations in most industries. The survey was conducted by the Department of Labor's Economics & Research Branch, and covers the last normal pay period preceding October 1, 1952.

(*Continued on page 32*)

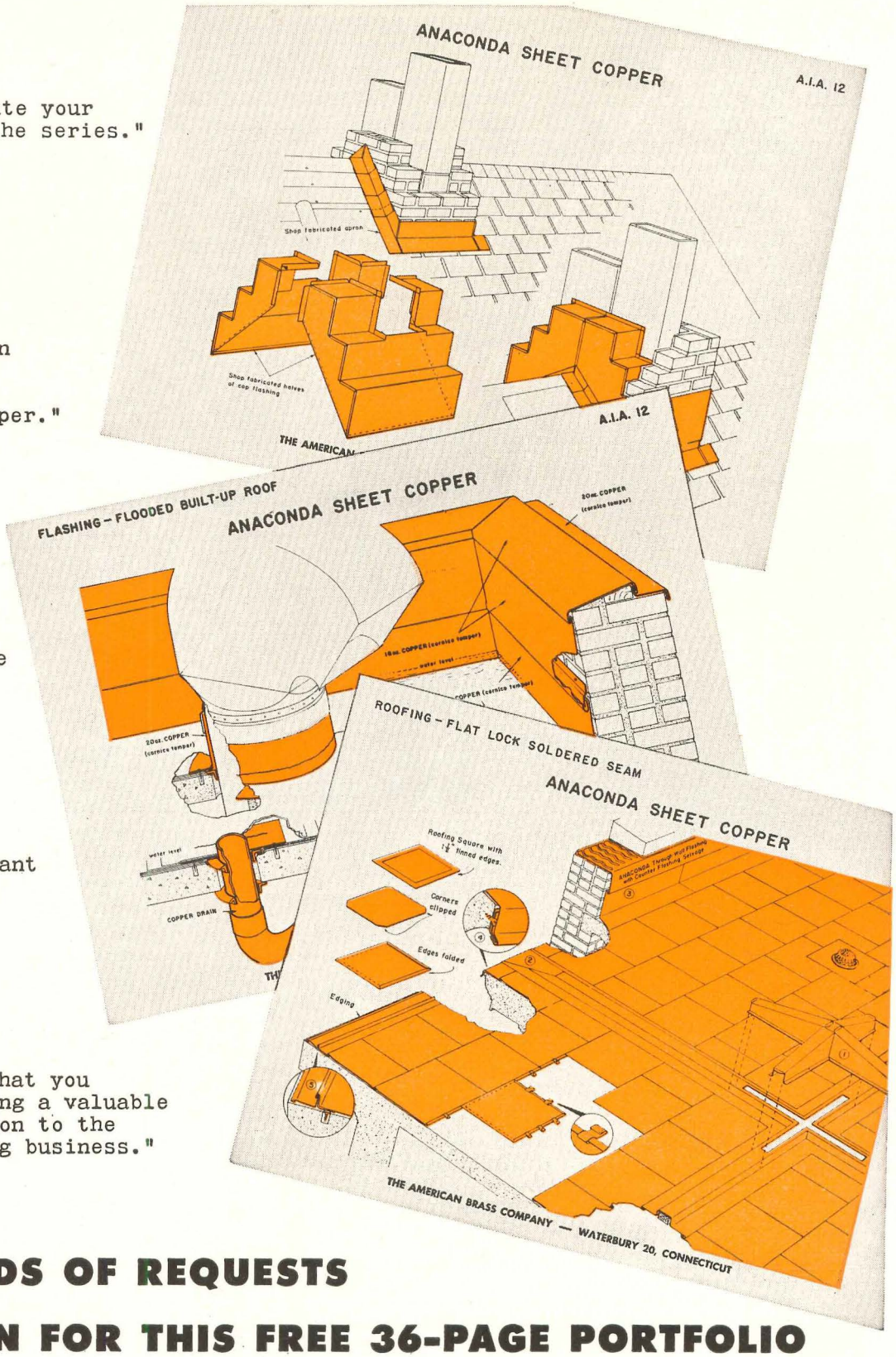
"Will appreciate your continuing the series."

"Invaluable in detailing my own work involving copper."

"We feel these drawings are a constructive service."

"We make constant use of your details."

"We feel that you are making a valuable contribution to the building business."



THOUSANDS OF REQUESTS POURED IN FOR THIS FREE 36-PAGE PORTFOLIO

Thousands of architects and sheet metal contractors have asked that we send them the Anaconda portfolio of detail drawings suggesting new designs and installation methods for all types of sheet copper work. The comments above are typical of hundreds of letters we have received telling us how helpful these drawings have been.

If you haven't a set of these drawings, we should like to send you one with our compliments. Simply write us on your company letterhead and ask for Portfolio S. We are sure that you, too, will find these drawings great timesavers and a short cut to sound design and good workmanship. *The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.* 5343

for better sheet metal work—

use

ANACONDA®

COPPER

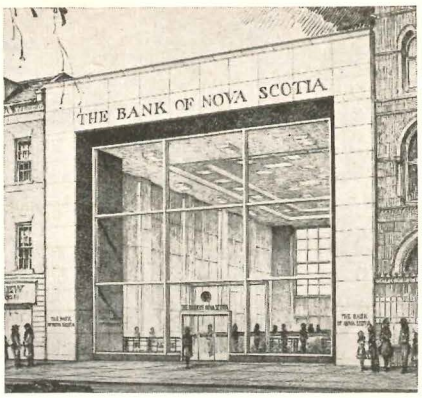
THE RECORD REPORTS

CANADA
(*Continued from page 30*)

Loan Approvals Provide 40,750 Dwelling Units

Loans for the construction of new dwellings continued to dominate the field last year, accounting for some 64 per cent of all loans as compared with 60 per cent for 1951. According to the annual report of the Dominion Mortgage & Investments Association, gross loan approvals by their members for $274,300,000 provided 27,500 single dwellings and some 13,250 units in multiple dwellings.

The report also shows that life insurance, loan and trust company members of the association channeled 51 per cent of their increase in Canadian assets into mortgages. The member companies, both on their own account and for the Central Mortgage & Housing Corporation, approved gross mortgage loans on real estate in Canada for some $428,600,000. This was an increase of 17 per cent over 1951's gross approval figure.



New building for the Hamilton, Ont., branch of the Bank of Nova Scotia features open glass façade to deemphasize "aloofness." Finished in stainless steel, oak paneling and marble, it is by McDonnell & Lenz, architects, Hamilton

Loans Average Higher

The average loan on a new single dwelling in 1952 rose to $7783 compared with $5140 in 1948. This reflects a smaller equity requirement combined with the higher cost of a house to the purchaser. In these circumstances a given amount of money cannot provide as many homes. Fewer people can obtain loans but those who do get bigger ones.

Member loan companies now have 72.6 per cent of their assets invested in mortgages in Canada, compared with 70.6 per cent at the end of 1939. The company and guaranteed accounts of member trust companies have approximately 34 per cent so invested. Of their assets in Canada, member life insurance companies have some 30 per cent invested in mortgages on real estate in Canada.

Construction Outlay Rises

The national accounts have estimated capital expenditures for the construction of new housing in 1953 at $981,000,000, compared to $850,000,000 spent in 1952. The estimate is made on the expectation that 1953 will show a substantial increase in the number of completions plus a larger number of starts than those in 1952.

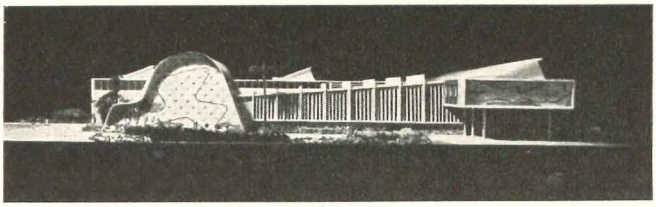
Housing construction expenditures thus forecast represent 18 per cent of

(*Continued on page 36*)

ARCHITECTURAL RECORD

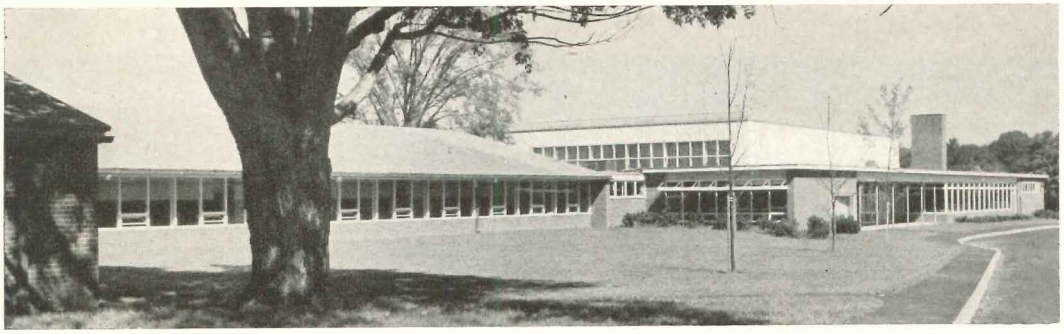
When elements become standardized and purposes

commonly understood the architect



Rio de Janeiro, Brazil

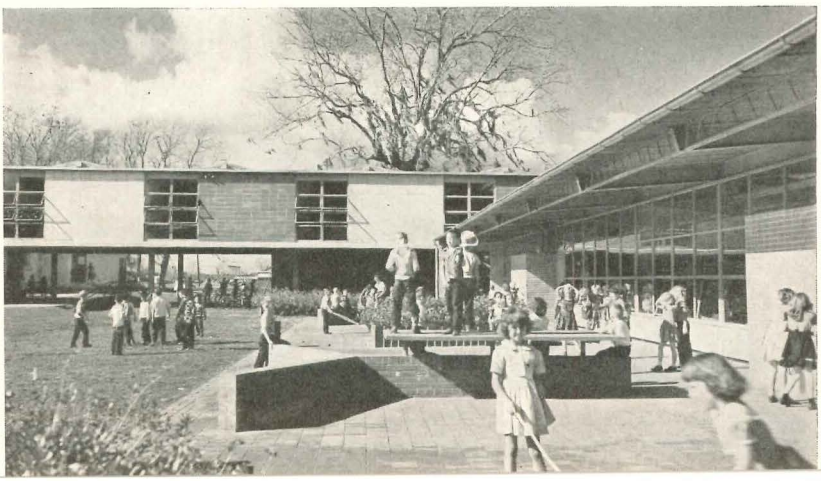
can create freely, imaginatively and idiomatically.



Manchester, Massachusetts

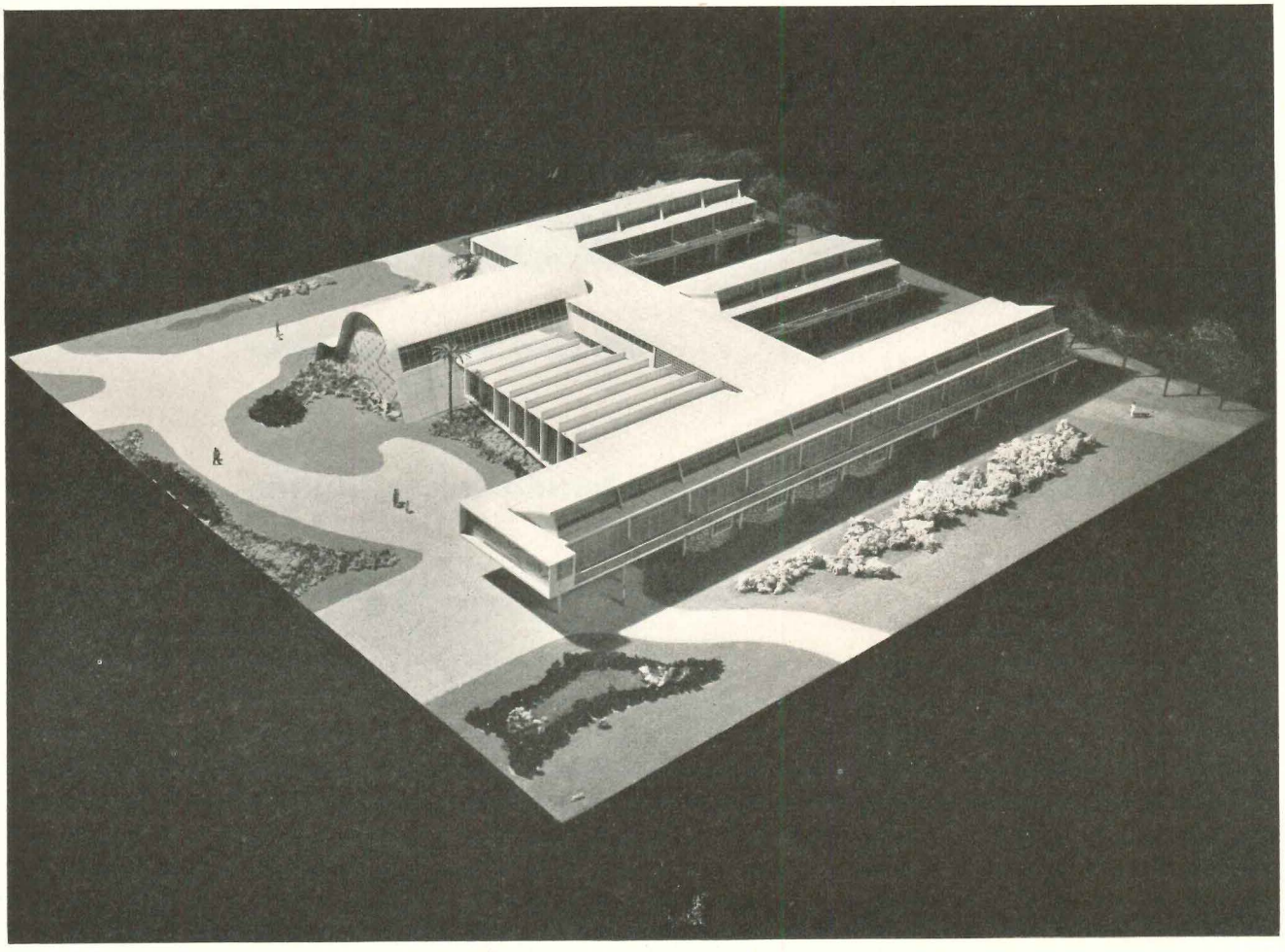
We are approaching

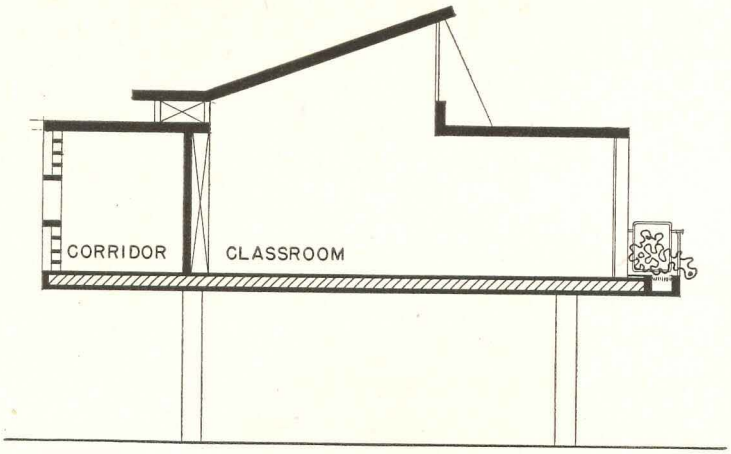
that goal in designing elementary schools.



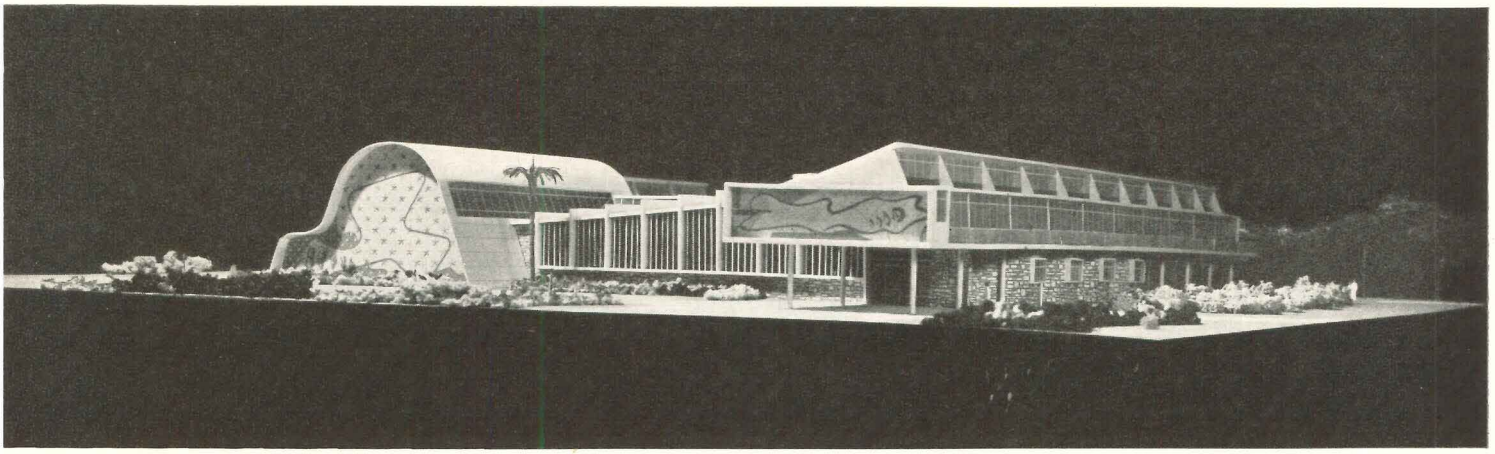
Sweeny, Texas

WE PRESENT THESE THREE SCHOOLS, one in Brazil and two in widely separated parts of the United States, primarily as architecture. All three are elementary schools, and for this type of building for this age group there seems to be unanimity as to requirements in most of the countries of the Western world. While not every elementary school has a gymnasium and auditorium, the classroom — the fundamental element — is fairly constant. With minor exceptions so are curricula and spatial requirements, building techniques, equipment and furnishings. Everybody expects roughly the same results from the buildings. Here, then, are three very different resolutions of a common problem. Each is characteristic of the best of its region. Each has the character that results when a capable architect, recognizing fully the importance of such standardized concepts as classrooms, lighting, temperature control, ventilation and acoustics, gratefully and knowingly exploits them to produce architecture appropriate to its purpose, time and place. The first example, one of 140 schools of different types and sizes programmed for its municipality, is a **New Elementary School in Rio de Janeiro, Brazil. Eneas Silva, Architect.**

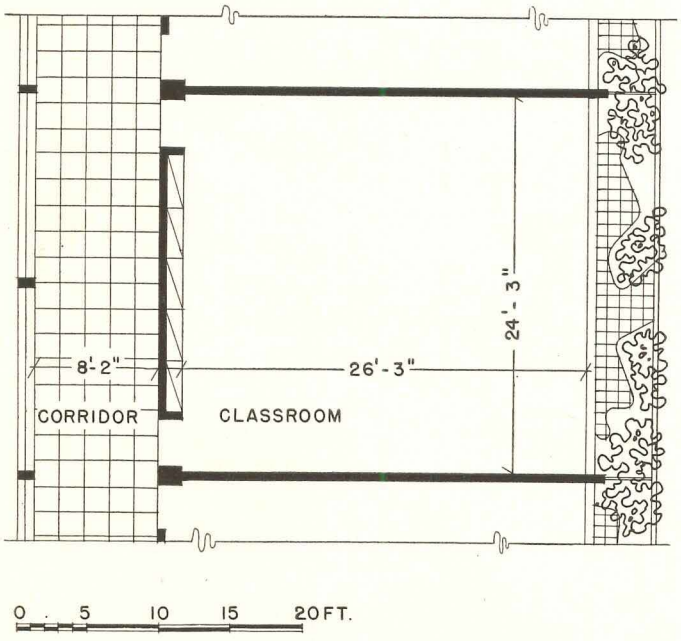




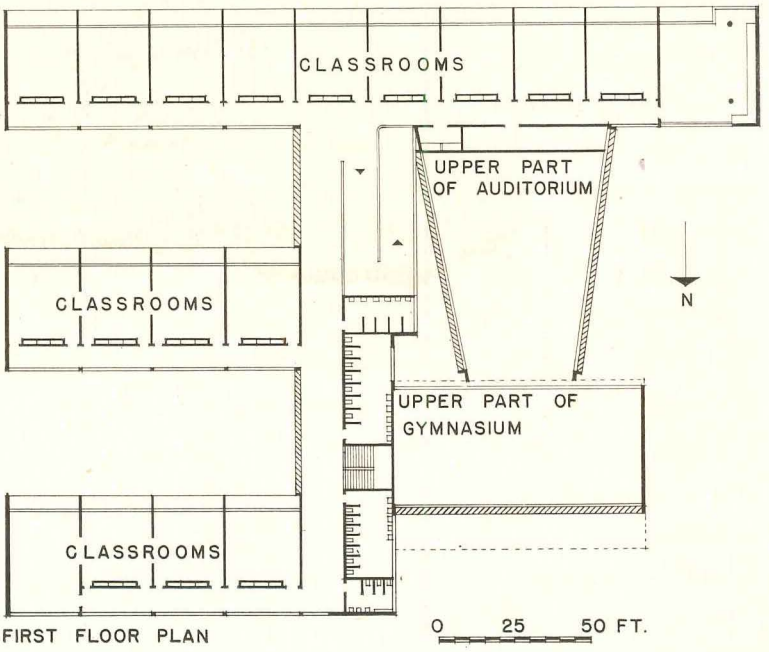
SECTION



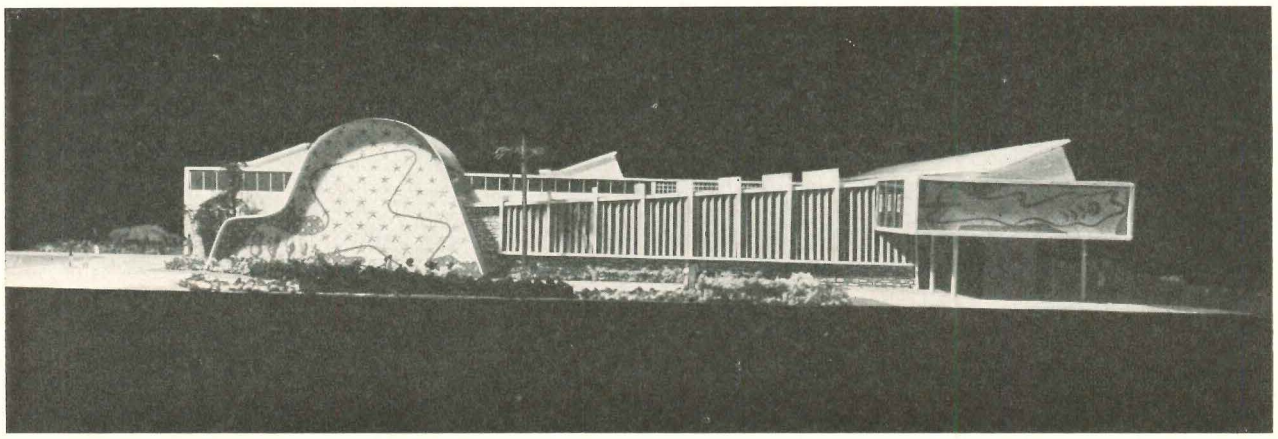
Jerry



Except for such slight differences as class size and area, and the fact that in Rio de Janeiro the hot sun comes from the north, this might well be the plan (and at top of page, the section) of a classroom in a school in the U.S.A. It is top-lit by a clerestory; its ceiling follows the roof line; it is oriented with terra-cotta-walled corridors on its north side to block the sun and glazed walls to admit cool south light, both direct and indirect. The two entrances are for the purpose of improving ventilation across the semi-open corridor. Raising the classroom wings provides cool ground-level patios for play on a somewhat limited site

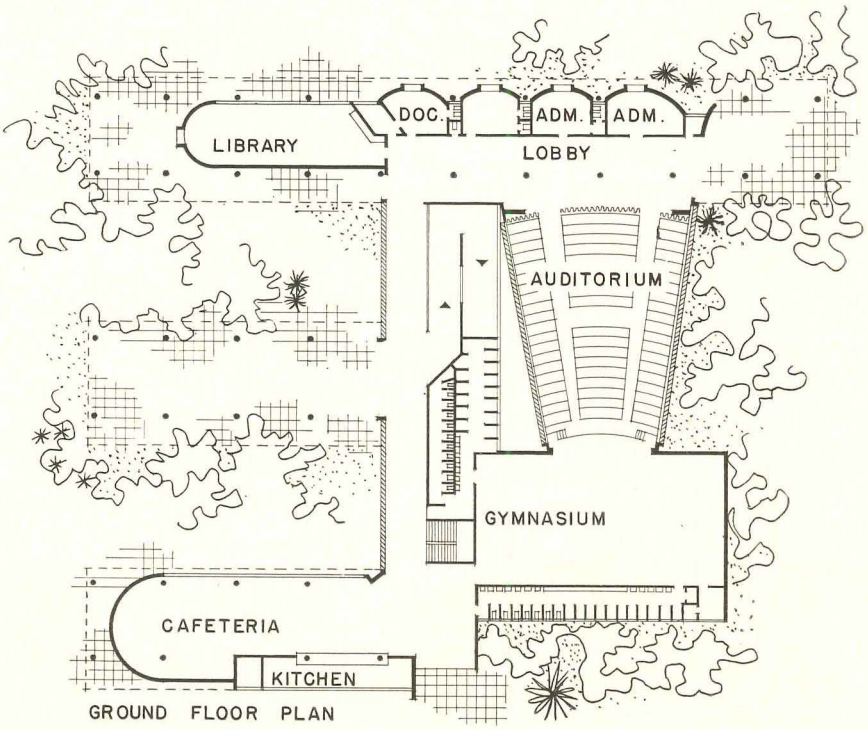


FIRST FLOOR PLAN



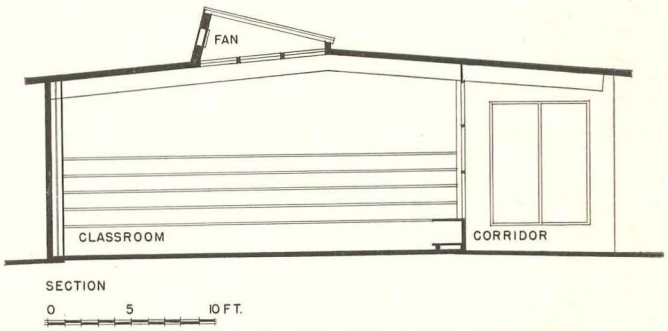
Jerry

Above, main facade; pivoting louvers or brise-soleils in auditorium wall provide interior light or darkness as desired, protect against direct sunlight

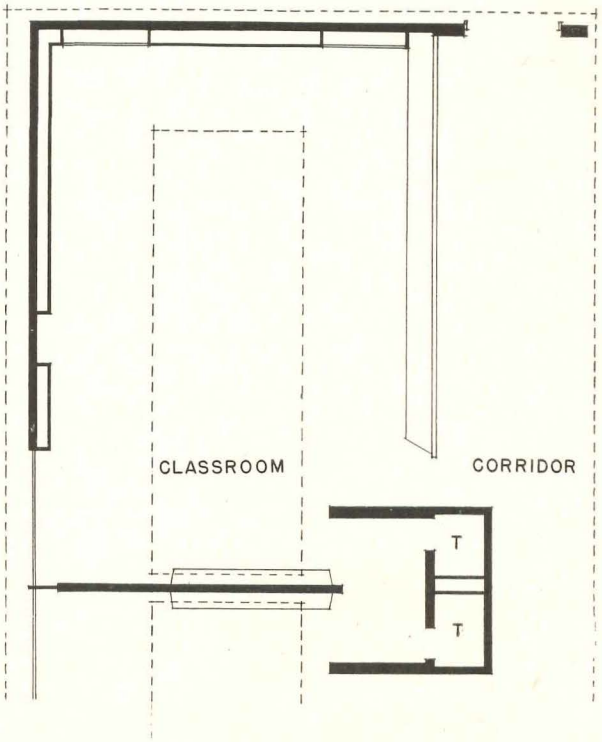


GROUND FLOOR PLAN

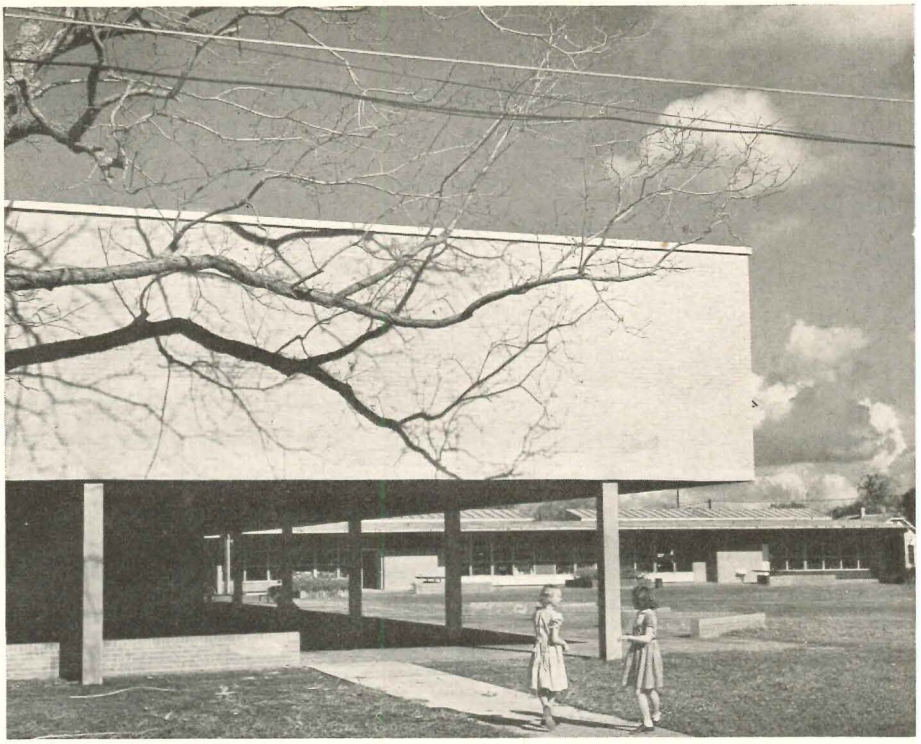
Elementary School, Sweeny, Texas. Architects: Donald Barthelme & Associates. Engineers: Structural, Walter P. Moore; Electrical, I. A. Naman; Mechanical, Charles Chennault. Sweeny is a typical small town of about 3000 people, whose school problems were almost exactly like those in every such town. On the available, none-too-large site was a 22-year-old brick building with three of its nine rooms in a floored-over auditorium. This was remodeled into administrative offices and a "common" room and two classroom wings were added, with space for a third. But to state the bare facts in this fashion, and merely to acknowledge the technical competence of the lighting, ventilation, structure, equipment, etc., would be to miss the essence of the architects' intent. Here the structure is quite visible, but every effort has been made to render it unobtrusive, to make the "architecture" of walls, voids and masses (or sculpture), or of planes and patterns (painting) disappear. The primary concern is to produce a series of environments for activities, to help contain and implement those activities without imposing on them an overly arbitrary architectural direction.

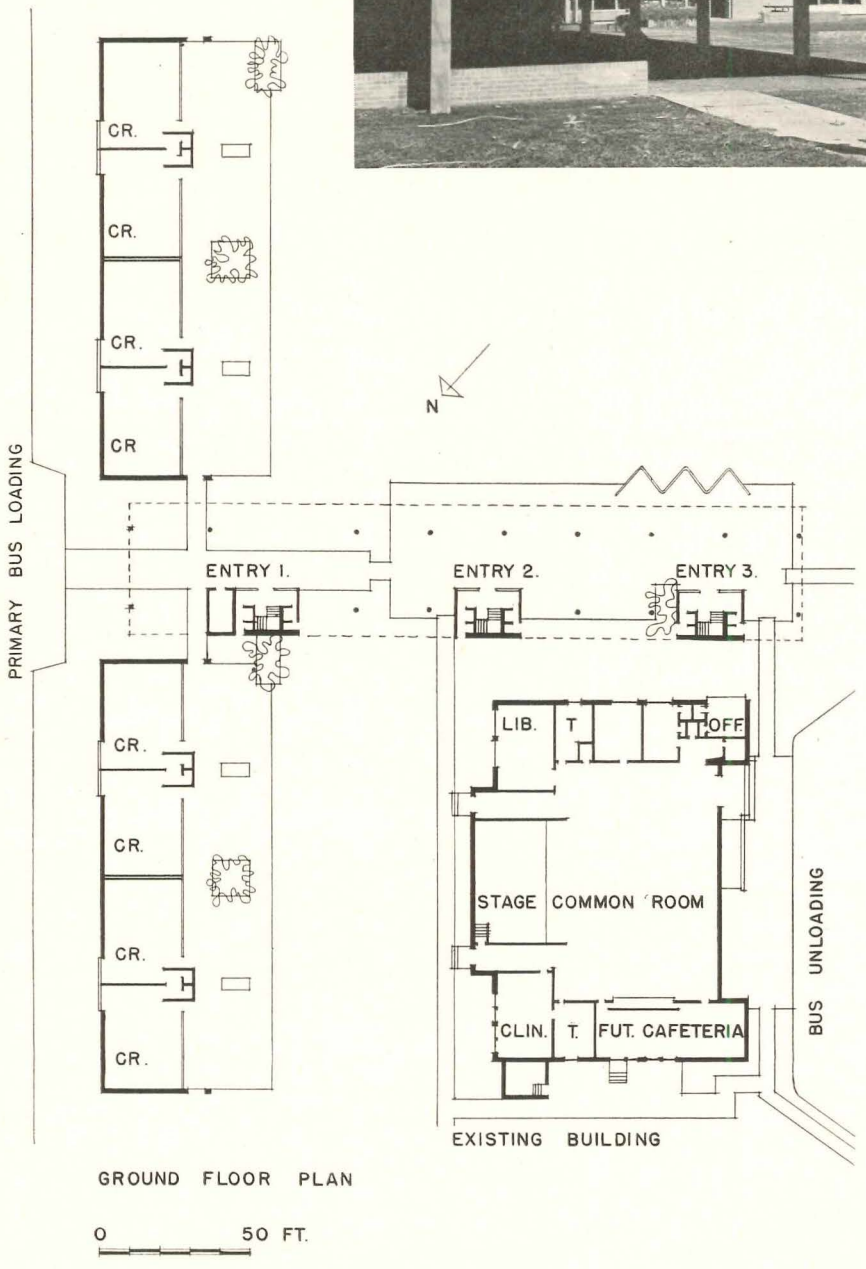


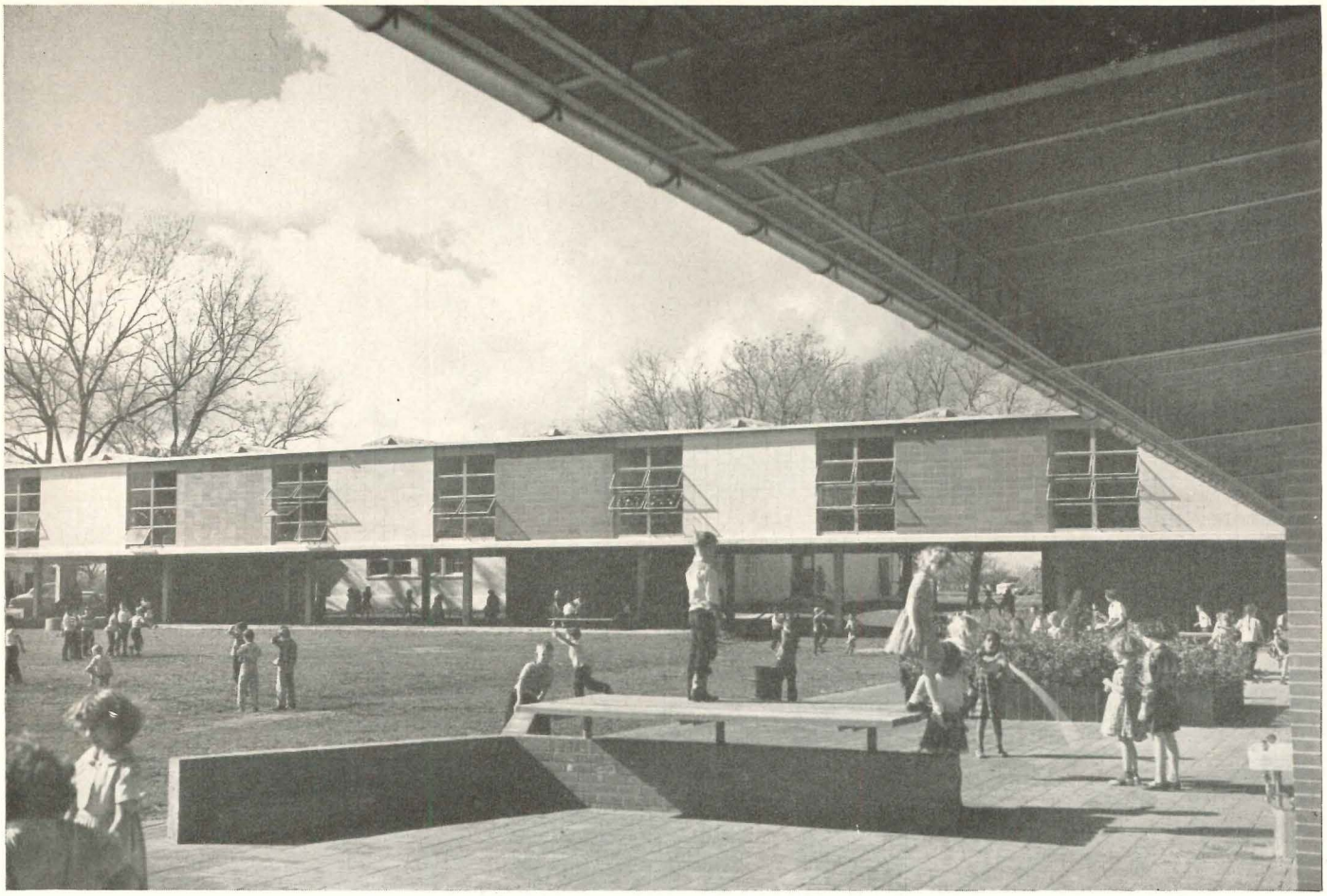
All classrooms are top-lit by skylights shielded with a variant of the Venetian blind. This permits free orientation of rooms, approaches the diffusion of natural daylight, is relatively unobtrusive. Artificial light sources are also unobtrusive. Walls are off-white both for reflectivity and to help make them less perceptible; against them float redwood wainscots which are tack space, conceal cupboards, shelving, etc.

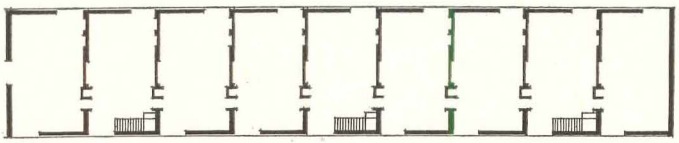


One present wing of the Sweeny, Texas, school is elevated, partly because the site was limited and outdoor space was thus preserved, partly for shaded play area. Under this wing are three entries with stairs and toilets, a bicycle rack, brick-paved space, a playful bridge over a surface drainage ditch, and a low serpentine wall for sitting. Plan shows location of future elevated wing, at northwest end of present buildings



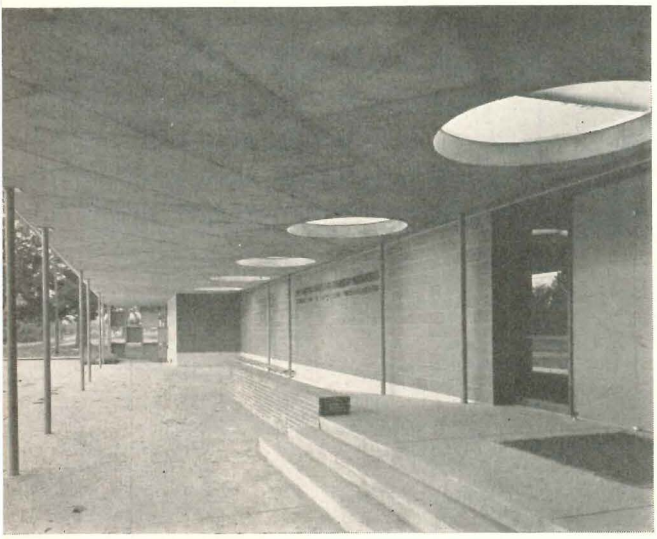


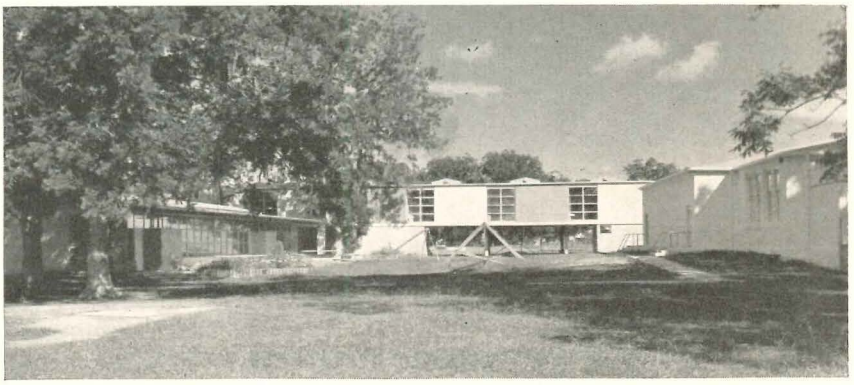




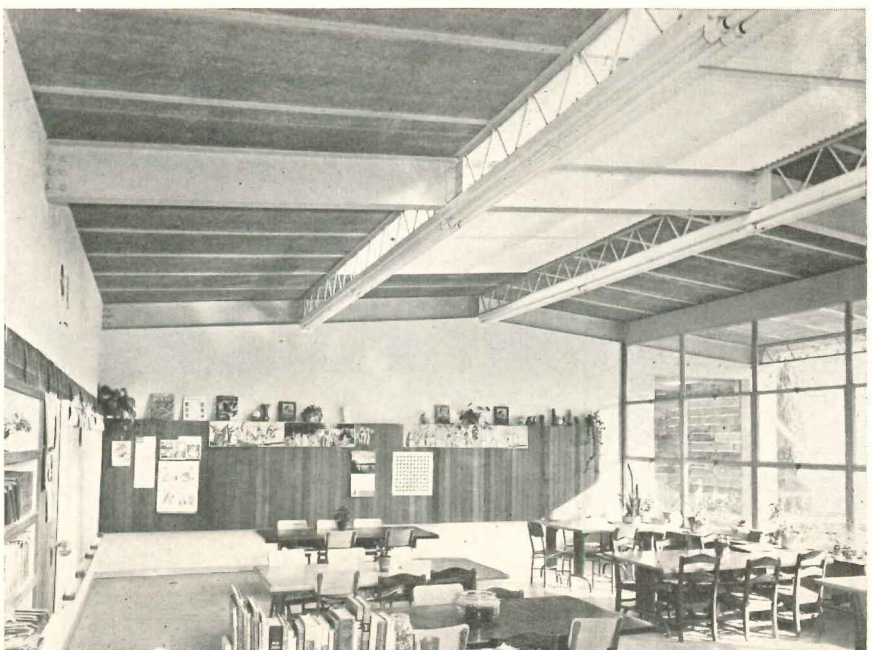
High wing has nine different-colored terra cotta panels separated by floor-to-ceiling windows which cross-ventilate and admit sunlight to one corner of each classroom all day. In low wing (foreground, above) structure is satisfyingly apparent; brick sitting-walls, tables, sand-boxes and planting boxes suggest separation of outdoor area for each classroom. Below the sash in this wing, walls are plastic panels in red, blue and yellow. Remodeled old building is just visible beneath high wing in photo below

Classrooms in Sweeny school, top and bottom of page, are similar in high and low wings (low wing rooms shown). Skylighting is even, diffused, baffled by fixed Venetian blind slats. Continuous fluorescent tubes are fastened to exposed bar joists

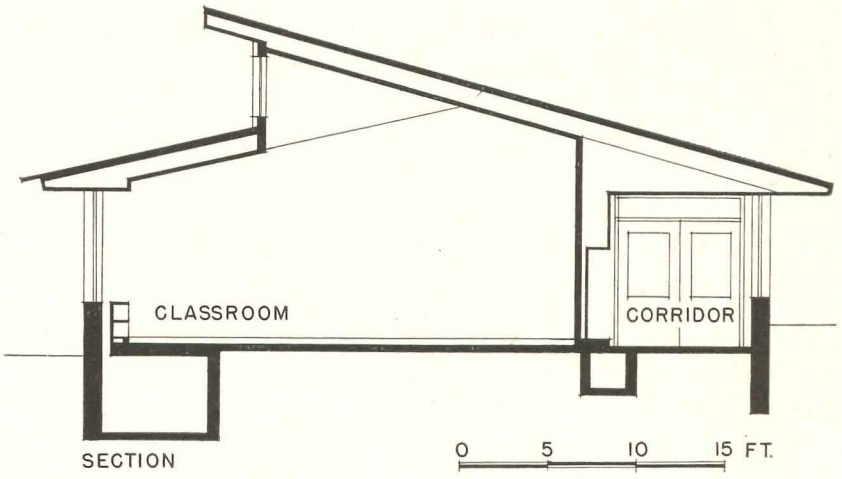




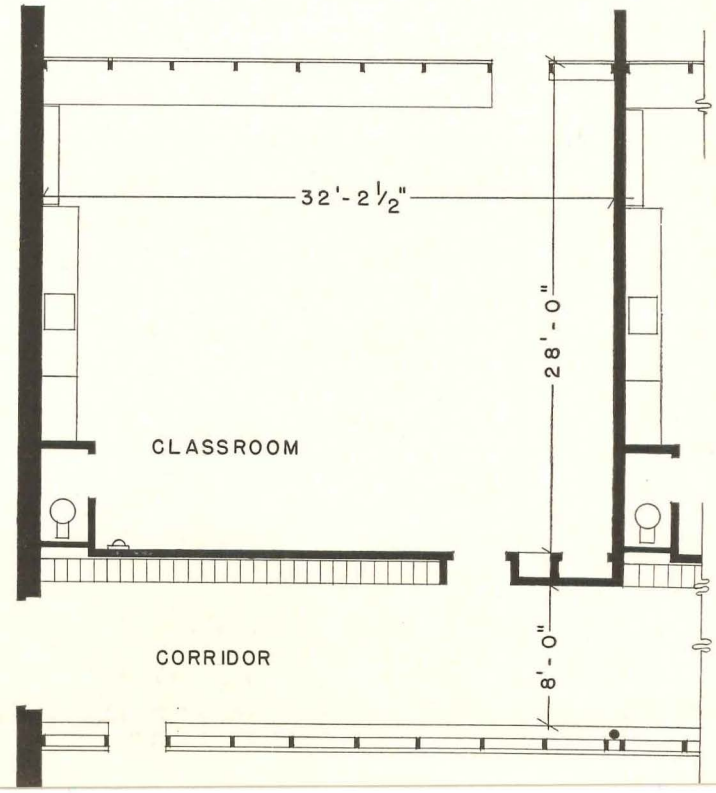
Left, bus waiting space in front of existing building was roofed, provides covered circulation between wings. Above, old building, right, virtually unchanged on exterior except for raising grade, simplifying roof, patching walls and painting a light pink

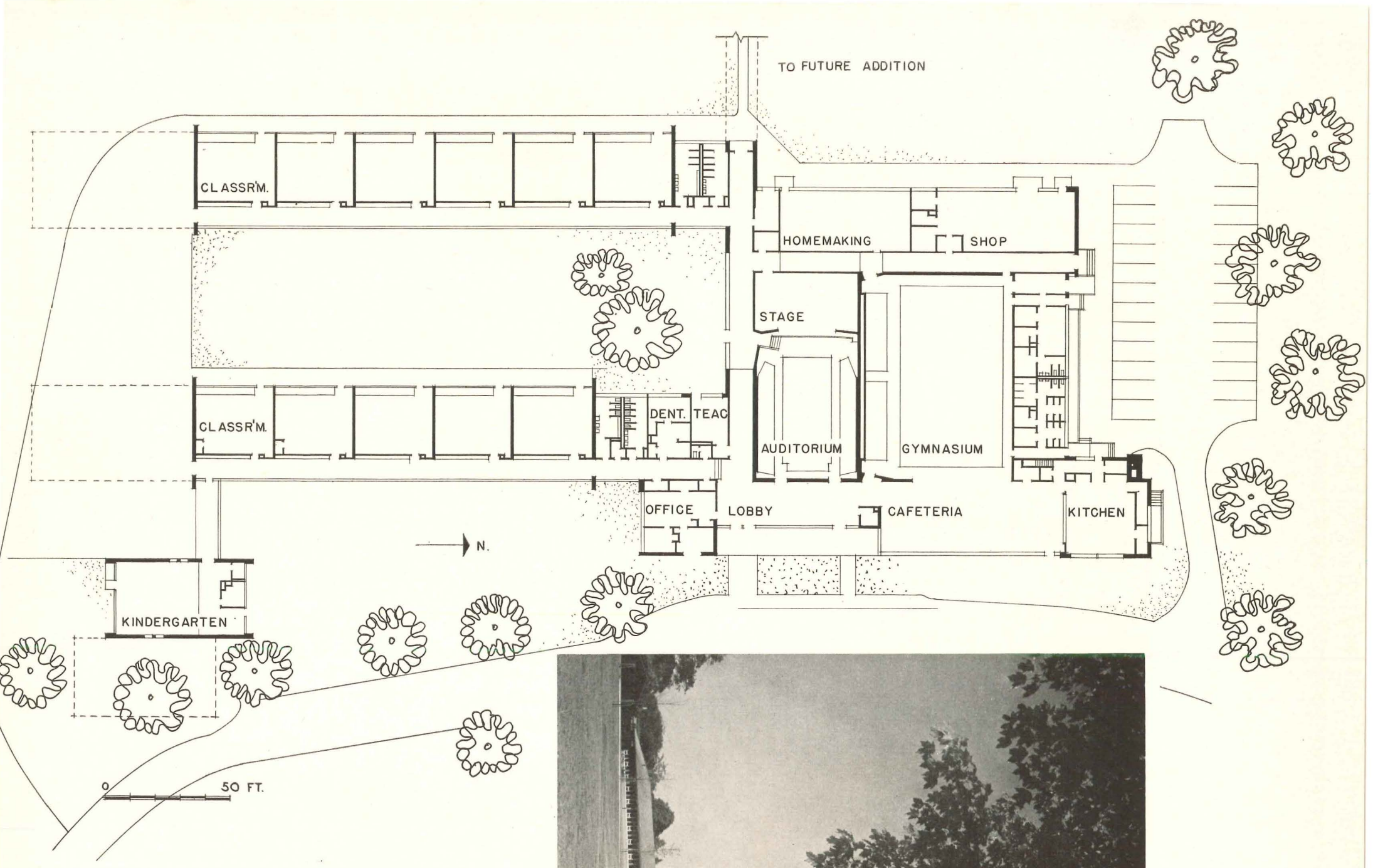


Manchester Memorial School, Manchester, Mass. Architects: Shepley Bulfinch Richardson and Abbot. Acoustics: Boldt, Beranek & Newman. Electrical and Daylighting Engineers: Thompson Engineering Co. Heating: R. D. Kimball Co. Landscape Architects: Shurcliff & Shurcliff. Quite conventional materials — chiefly brick, wood and steel — are combined with advanced engineering techniques and equipment to produce a school building which is both in tune with its intimate New England setting and contemporary in feeling. Classrooms face west, which might be dubious practice elsewhere but suits the Massachusetts climate; orientation also permits classrooms to face away from the entrance drive and toward existing town playgrounds. The building, shown in detail on following pages, also serves for municipal functions. It has a noteworthy variety of interest, ranging from the gay kindergarten at one end to more imposing semi-public areas at the other, without sacrificing unity.

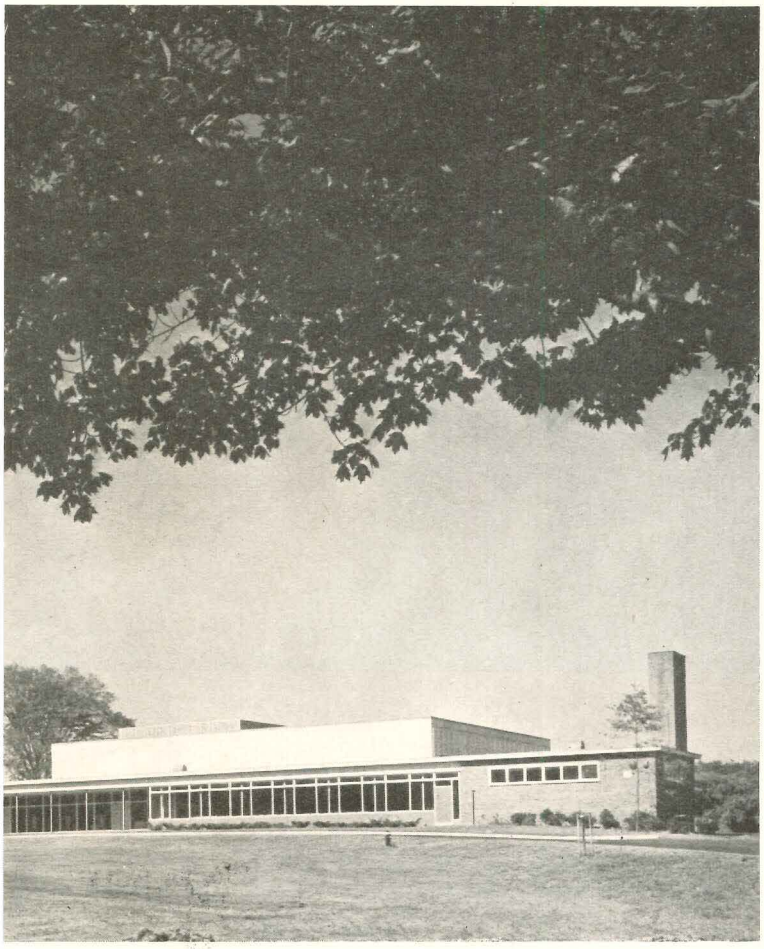


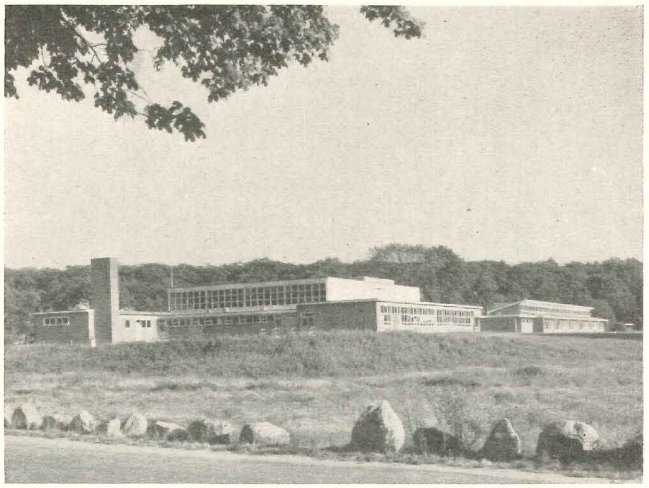
Classroom clerestory cross section with interior and exterior baffles was developed from precision daylighting studies. Upper walls and baffles, but not ceiling, are acoustically treated. Floors are radiant heated slabs; central ventilating system has individual room controls



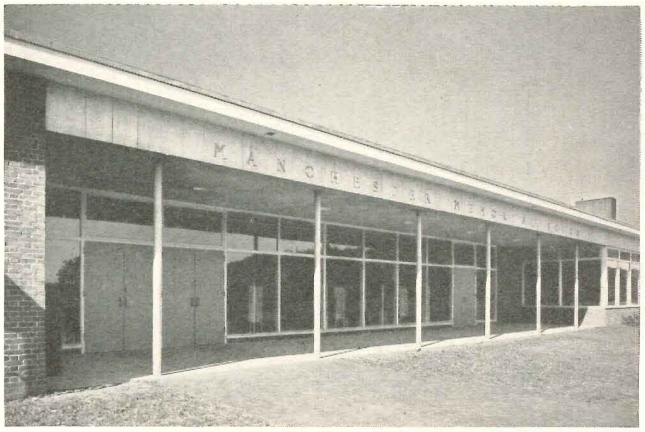

TO FUTURE ADDITION
CLASSR'M.
CLASSR'M.
HOMEMAKING
SHOP
STAGE
DENT.
TEAC
AUDITORIUM
GYMNASIUM
OFFICE
LOBBY
CAFETERIA
KITCHEN
N.
KINDERGARTEN
0
50 FT.

Cushing

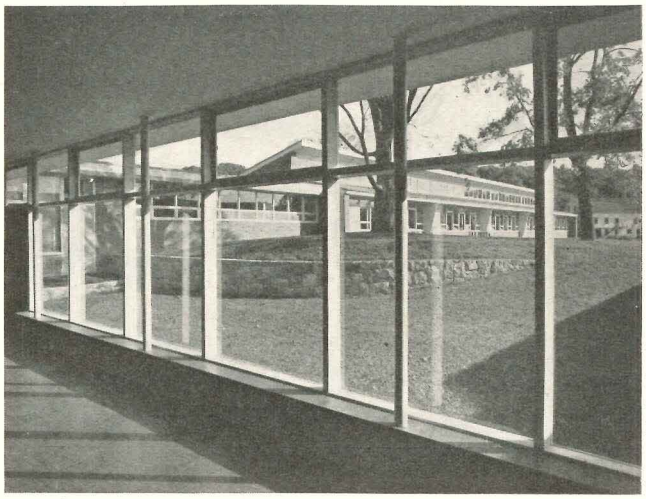




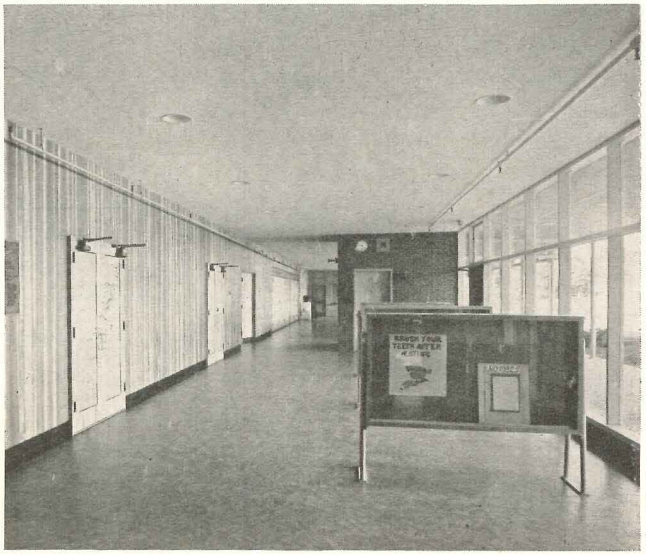
Cushing



Harvey



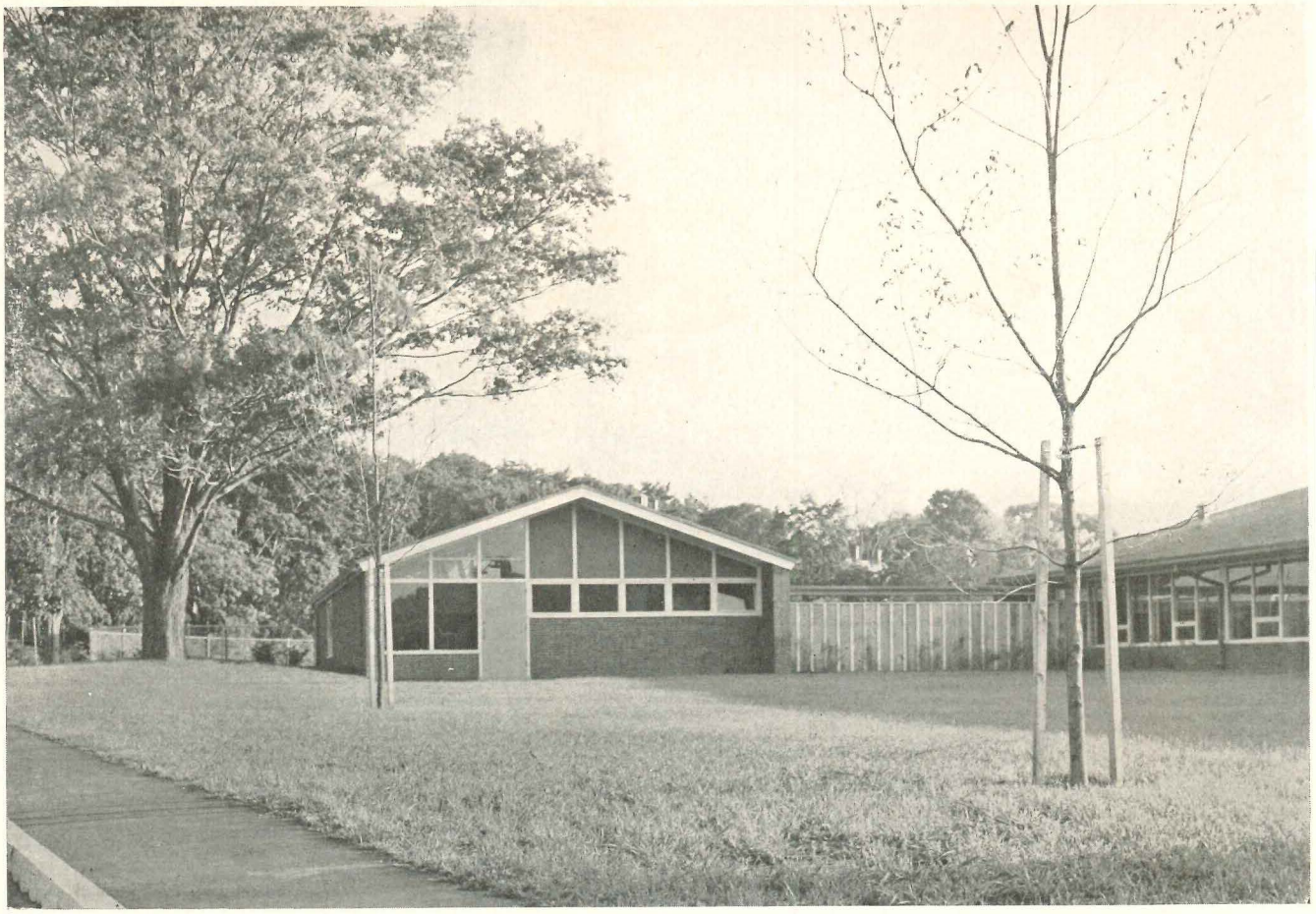
George M. Cushing, Jr.



Robert D. Harvey

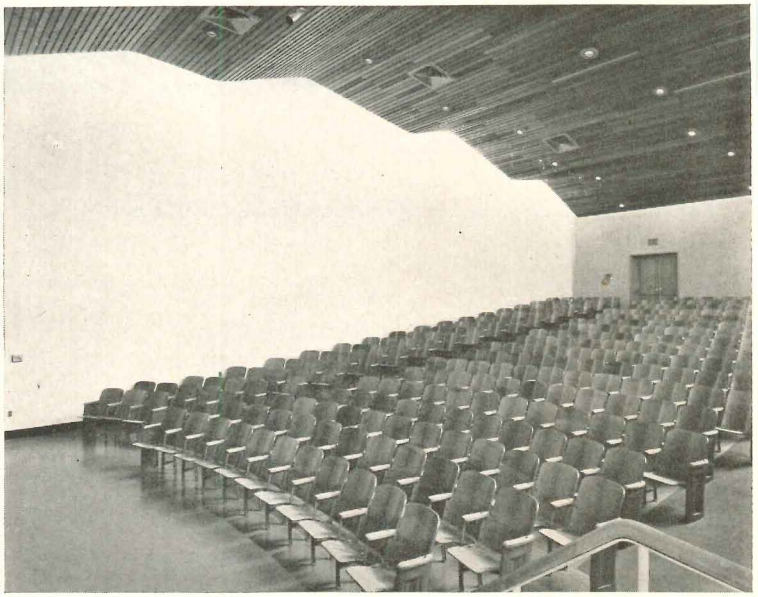
THREE SCHOOLS: MASSACHUSETTS

Photos: above, entrance faces a side street. Right, top to bottom: view from southwest; detail of main entrance; auditorium corridor; main lobby. In plan, areas for noisy activities and for public use are grouped to the north; classroom wings can be expanded southward. Incorporating two slight changes of level in plan reduced site work and saved several fine trees. Gymnasium, separated from 350-seat auditorium by double masonry wall (soundproof), has folding doors opening to cafeteria, making space for seating 1000 for town meetings. Entire school, for 360 pupils, cost slightly more than $810,000; has 48,000 sq ft at $16.88. Cost per student was $2250.00



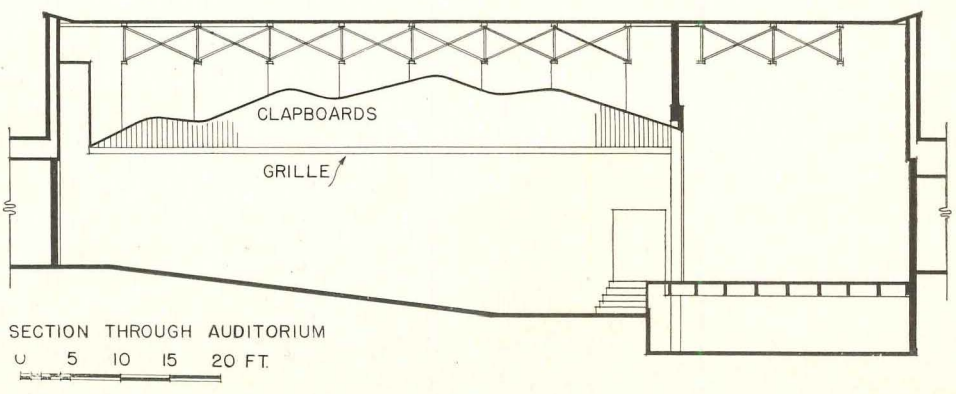
Cushing

Harvey



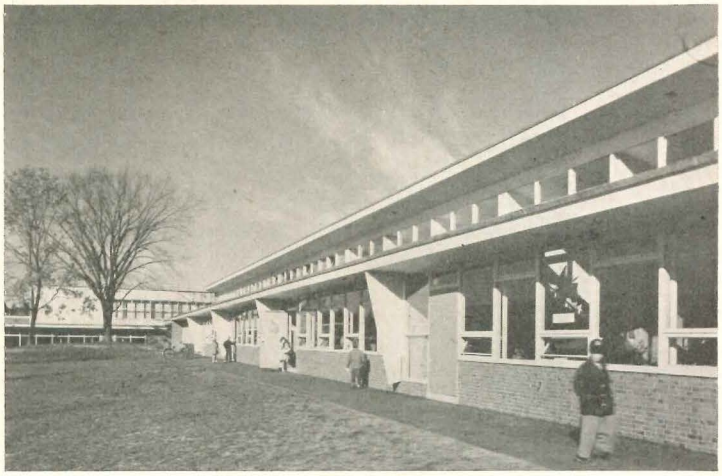
Cushing

Above, looking from court to auditorium; right and below, auditorium interior. Here the form, determined by acoustical needs, conceals the structure. In gymnasium (not shown) steel trusses are exposed

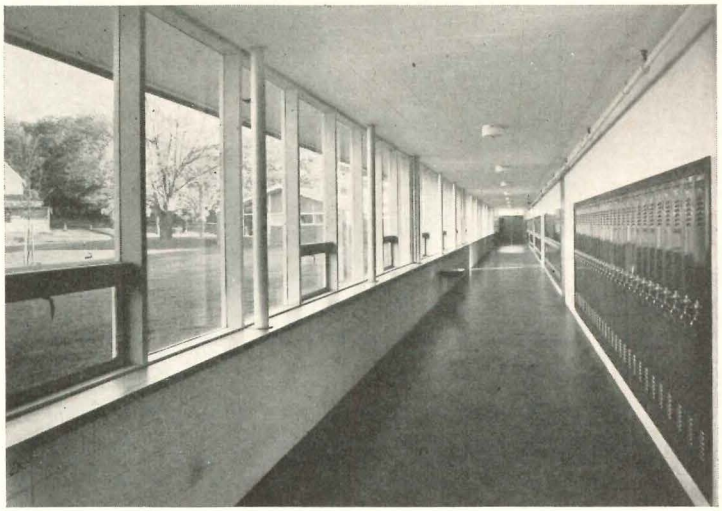


Left and below, kindergarten, which can be doubled in size. Structural elements, colorfully treated, supply the visual interest

Cushing

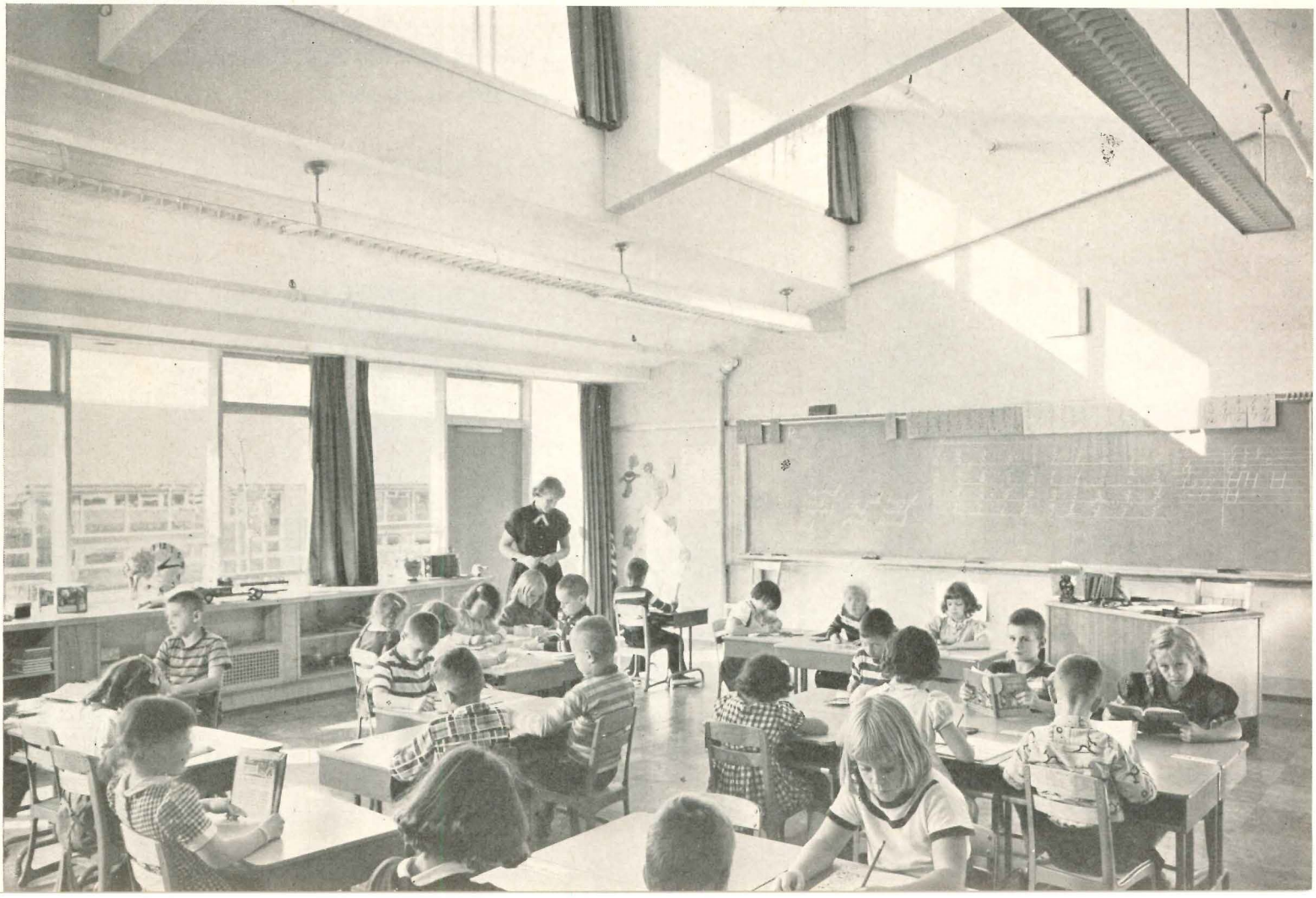


Right, corridors are to east of each classroom wing. Classrooms (below) face west — desirable in this climate — and were carefully studied with respect to lighting, acoustics, heating, ventilation (see text)



R. D. Harvey

George M. Cushing, Jr.

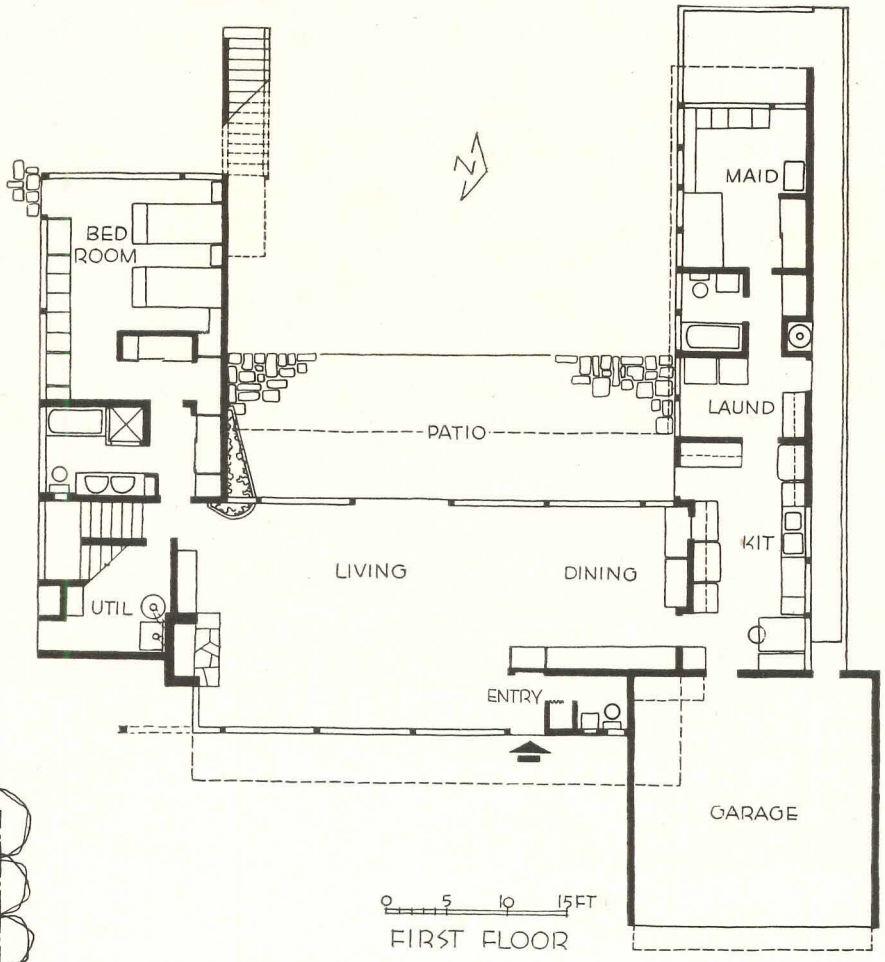


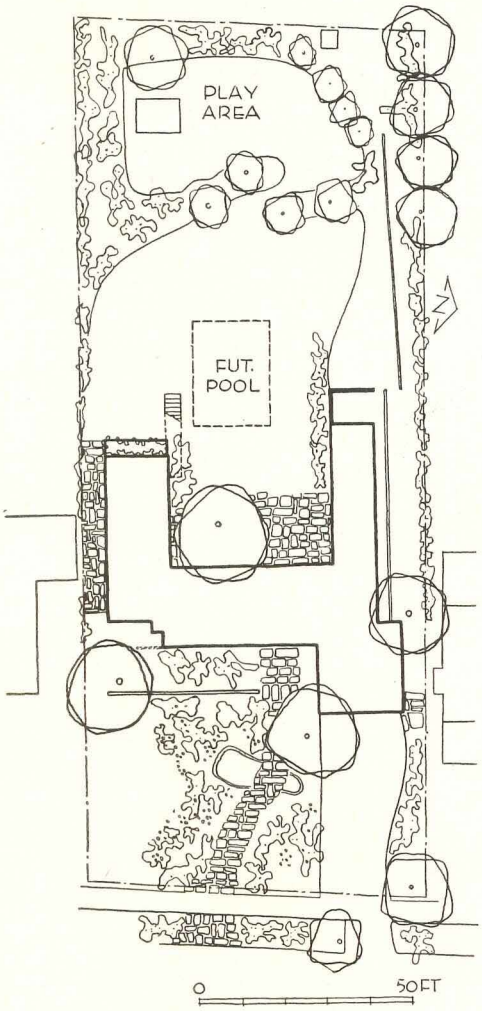
Julius Shulman

HOUSE FOR TWO EXPANDS FOR GUESTS

Residence of Mr. and Mrs. Maurice L. Heller
Beverly Hills, California

Richard J. Neutra, Architect





THIS SOUTHERN CALIFORNIA HOUSE was planned for a couple whose children were already married and had youngsters of their own. The house was not to be a large one, since it would be occupied most of the time by only two persons; it must be so designed, however, that visiting children and grandchildren could be accommodated for fairly long visits both comfortably and with a minimum of friction between generations. What the owners wanted, in other words, was a house which could be expanded or contracted at will. They also very much wanted as much privacy as could be achieved on a narrow lot closely hemmed in by neighboring houses.

The solution was a U-shaped house straddling the lot and enclosing a patio. A two-story bedroom wing provides a guest suite (plan on page 150) which can be closed off when not occupied; the maid's room and bath, at one end of the northern wing, can be similarly shut off when not in use — or could be pressed into service as an extra guest room if required (it has its own small patio and entrance). The rest of the house is not too large for a family of two, and is easily cared for.

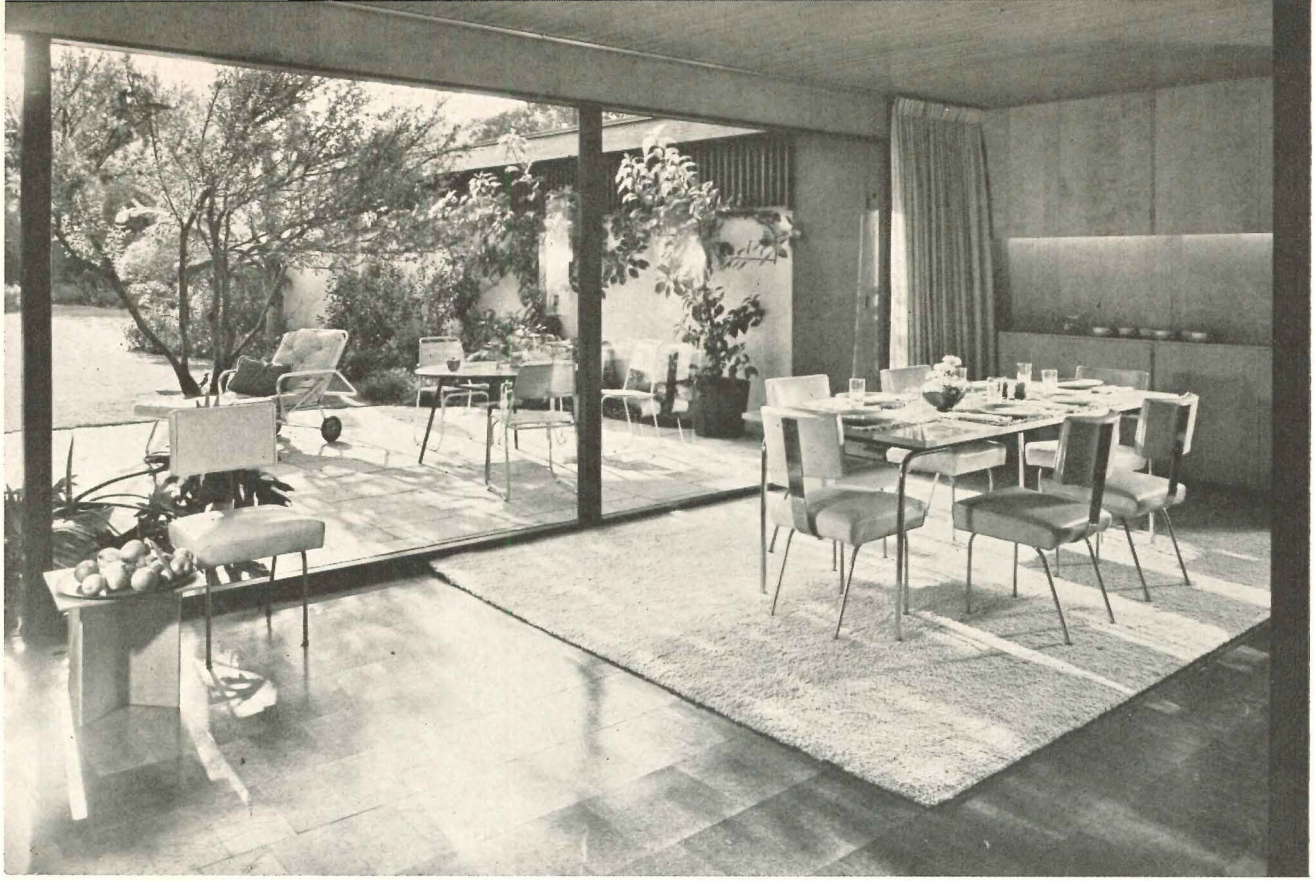
HOUSE FOR TWO EXPANDS FOR GUESTS

Remarkable privacy was secured for every part of both house and gardens. The front is protected from the street by trees and bushes through which winds a stepped walk leading to the main entrance. Planting and high windows shelter the two side wings, which in turn protect the patio. A broad lawn edged by planting stretches from the flagstone terrace outside the living room wing all the way to the rear of the lot where the play area is almost out of sight and sound.

The location of the play area is typical of the care with which the house and grounds were zoned to keep one age group from disturbing another. The second

floor guest suite can be reached directly from the lawn, and the children's bunk room is over the utility room at the opposite end of the bedroom wing from the master suite. Living room and patio are far enough from the bunk room to permit late entertaining without risk of disturbing visiting grandchildren.

Just as much care went into simplifying housekeeping in the main part of the house. Much of the furniture is built in. The kitchen is all-electric, compact and planned in close cooperation with the owners; a door connects it with the garage putting the family car within a few feet of kitchen counters.

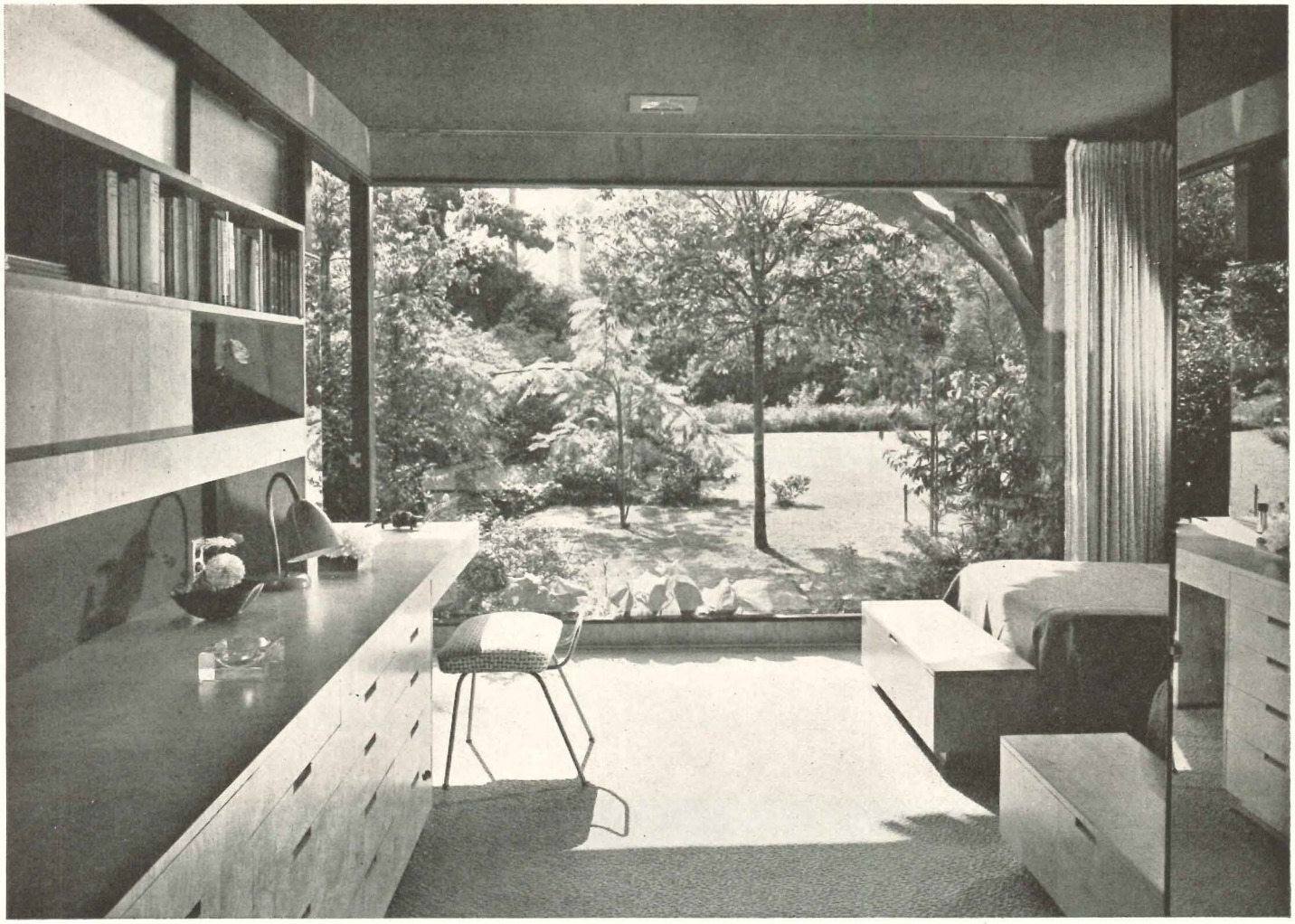


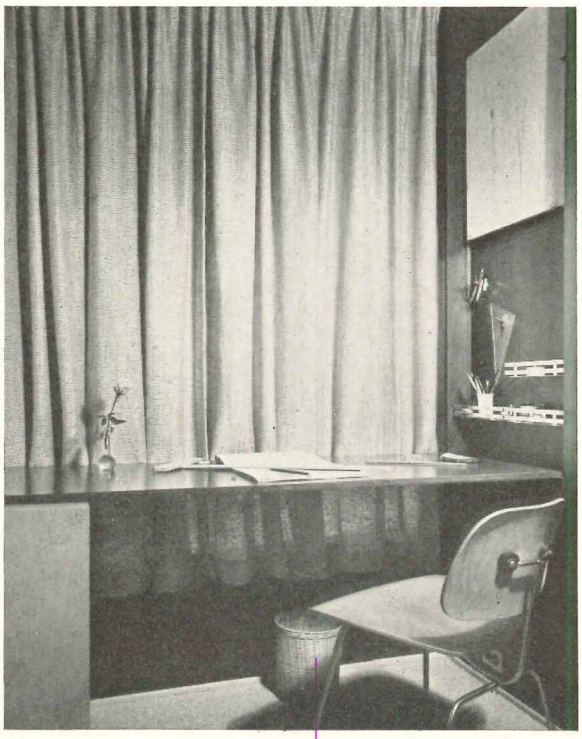
Julius Shulman

Western wall of living-dining wing is a series of flcor-tc-ceiling glass panels, some sliding to open area to flagstone terrace and patio. Dining room table, designed by architect, can be lowered in few seconds to coffee-table height (below) to incorporate dining area into living room. Built-in settee on east wall of living room is below bank of high windows with mitered glass corner planned for view of tall old fir tree. Fireplace is Arizona flagstone, built-in buffet and other furniture are birch. Large mirror above buffet brings garden view to everyone at dining table

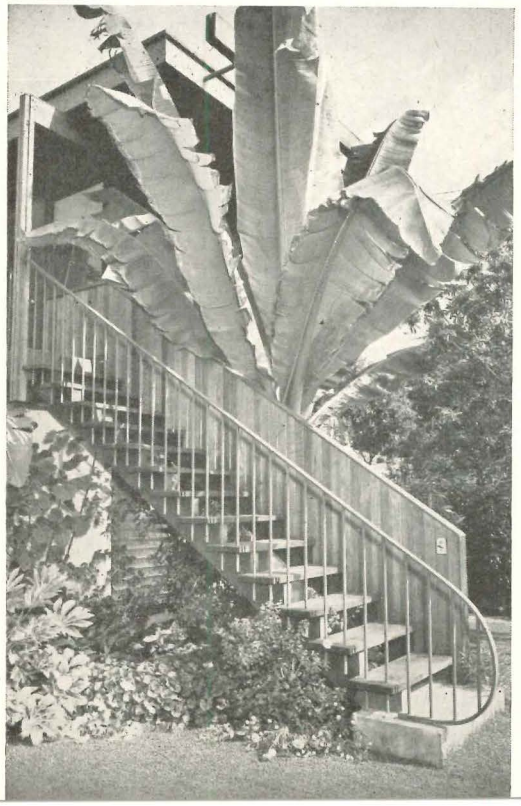
Master bedroom achieves maximum privacy by solid wall on patio side, high windows on opposite; end wall facing rear lawn, however, is glass from floor to ceiling. All furniture is built in. Owner's fold-down drafting table (bottom of page) is on second floor, at door to roof terrace

Julius Shulman

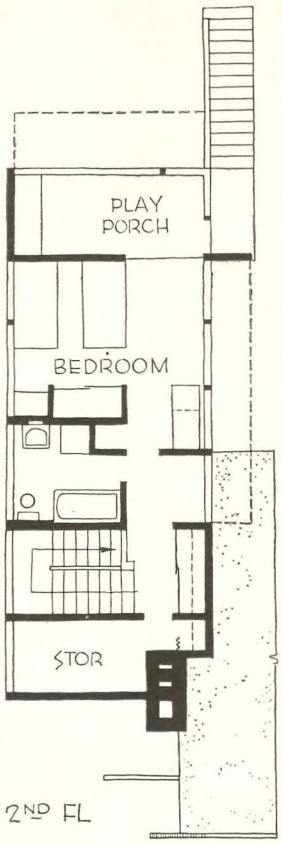




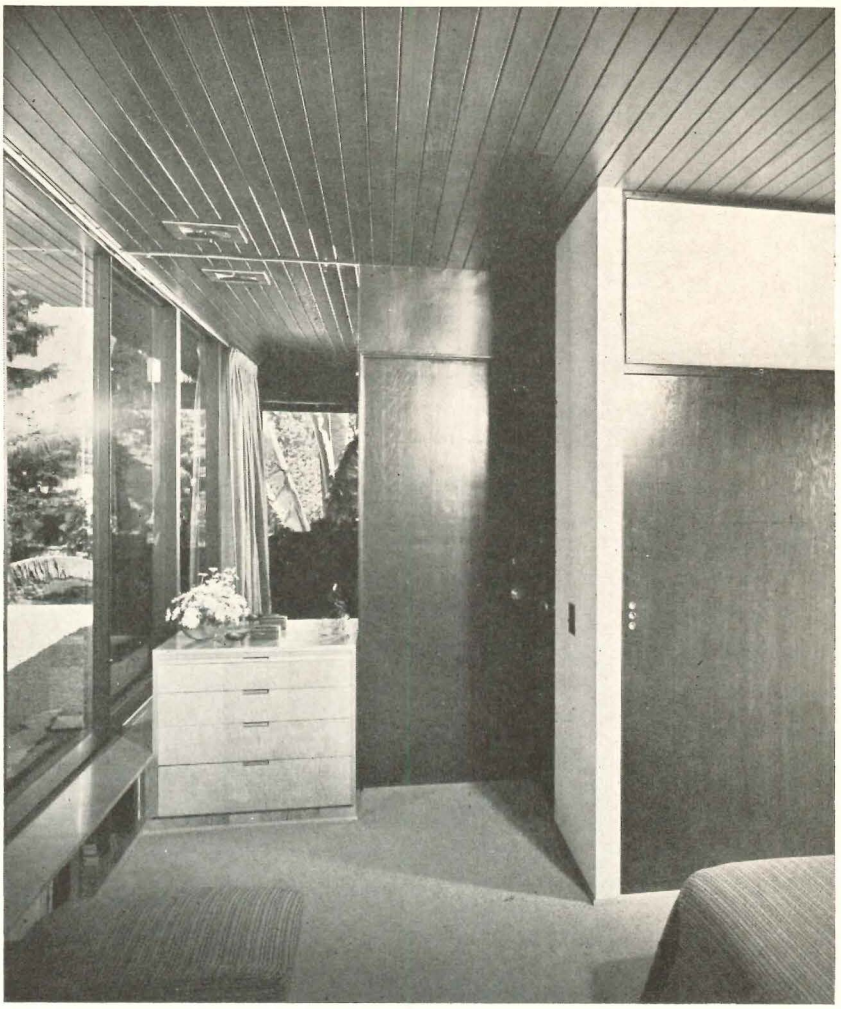
Above: living-dining area is undivided, and separated from patio only by glass walls; floors are cork, ceiling 1 by 4 T & G. Below: upper-floor guest suite is connected with patio by outdoor stairs with open risers, protective railings



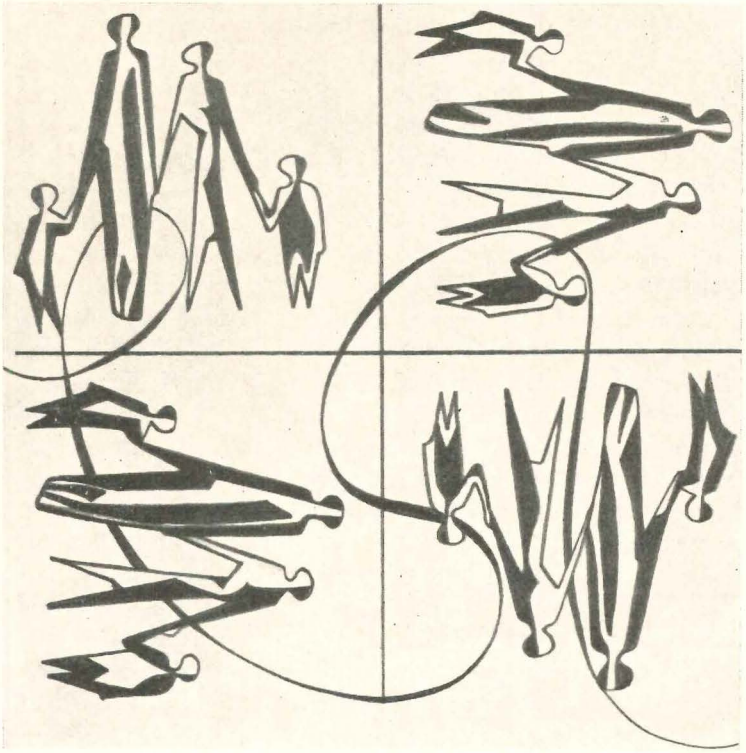
HOUSE FOR TWO EXPANDS FOR GUESTS



Julius Shulman



Second-floor guest suite overlooks patio except for children's bunk room-storage room, which is at far end of wing, above utility room. Porch is partly glassed in, partly screened; it doubles as bad weather playroom and guest sitting room. Stair landing (above) is enlivened by translucent window framing gnarled vine which is silhouetted at night by exterior



THE THREE LAMPS OF MODERN ARCHITECTURE

*JOSEPH V. HUDNUT**

III. | THE LAMP OF DEMOCRACY

WHEN THE SCIENTIFIC THEORY of evolution won acceptance in the nineteenth century, it was already identified with a philosophical doctrine of progress. The origin and development of species was postulated not merely as a process of change but as one of change for the better, the consequence of an impulse existing in the universe, not for creating merely but for upbuilding and improvement. Nature is not a mechanism but a continuity of organic variations in which new species of living things come into being in an ascending scale of excellence; and whether this progressive creativity is guided, as Aristotle believed, by some purposeful and final cause or whether, as Darwin suggests, it proceeds from a wasteful and cruel struggle for existence, reality is governed nevertheless by a law of organic development.

Comte was one of the first to suggest that this law might govern not the evolution of organic forms in nature merely but also the evolution of cultural institutions. Society also progresses, and the good of society is being gradually achieved either by the operation of some ultimate and universal force or by painful adaptations to ever-changing circumstance. From this basis Spencer developed his concept of society as itself an organism. Society, he tells us, has organs — organs of nutrition, circulation, co-ordination, and reproduction — very much like those of the men who are its components; these organs develop, becoming more complex as they acquire an increasing mutual dependence; and this development, from family to clan, from clan to tribe and state and nation, is accompanied by a greater and greater integration and perfection of operation. Religion, economic life, science, education, and art — every aspect of social phenomena — are thus co-ordi-

**Last of three lectures at the College of Architecture and Design, University of Michigan.*

nated into the complex social organisms which today, like a vast mosaic, cover the surface of the globe.

The theory of Spencer gained a wide currency among those architects confident of progress in human affairs, who, like Louis Sullivan, had already conceived buildings as organic structures comparable to the structures of nature. Having discovered the secret of architectural beauty in nature's supreme artistry and being persuaded that architectures are also elements in civilizations, they found it not difficult to believe that the laws of architecture might be integral both to nature and civilizations, since these are parts of one and the same thing. If societies are living organisms, so are buildings, and buildings, which are significant of societies, ought to be in harmony with the phenomena of societies — among these phenomena, organic order. Thus, the esthetic doctrine, *organic expression*, was widened to include not only a natural consistency of form to structure in buildings but a consistency of form and structure to social purpose and relationship.

This theory gained a rapid currency since it offered a philosophical explanation of a popular prejudice already firmly established. The romanticists in the period following the French Revolution had taught us to recognize the spiritual splendor of thirteenth-century France which is built into Amiens and the degradation of ancient Rome built into the Thermae of Caracalla. If we are sometimes unaware that these judgments rest upon our own notions of right and wrong, and, of course, upon our interpretation of history and event, that innocence has not shattered the initial promise. Nothing today could persuade us of grandeur in the new architecture of Moscow or of dignity in the gilded vista of Ochre Court: not that these do not express social ideas but rather that they express ideas unworthy of expression.

The theory of organic expression did not change a habit of judgment so congenial to popular prejudice, but it did give it new vitality and direction. The relation between a society and its architecture, a relation which had received a romantic and sometimes a mystical interpretation, was now made a theme of social philosophy. Into the doctrine of naturalism which identified architectures with the single great organism of the universe there was now intermingled the doctrine that identified architectures with social law and social evolution. Architectures were to stand in society not as the costumes or stage settings which might clarify or intensify the action on the stage or as the magical embodiments of the spirit of an era, but as actual participants in social progressions. Society does not merely environ and condition architecture. Architecture is as much a part of the social organism as law, religion, and the material processes of manufacture and consumption.

If then we desire an architecture which, participating in the society of our day, will lend its strength to vitality and truth in society, we must consciously shape our buildings to accord with whatever principle of progress and betterment animates our society. That principle is democracy. What is needed, said Louis Sullivan, "is an art of and for democracy, an art of and for the American people of our own time" — and he noted, incidentally, that the capital of democracy is Chicago. All other architectures of his day he found to be "viciously undemocratic," since they stood apart, in classic snobbishness, not only from the stubborn facts of steel construction but from the usages of a democratic way of life. Architecture being a manifestation of a specific character in society and the practice of architecture being essentially a social service, the architects who persisted in the traditions of the Renaissance could not be regarded as good citizens.

An American architect, in other words, must lend his art, willy-nilly, to democratic influence and process. He is to participate in democratic thought and action and subordinate his genius to the expression of the democratic ideals. Whatever individuality of idea and feeling may be his is to be made consistent with this harmonizing faith; for although the dignity and worth of the individual are everywhere essentials in American democracy and although the highest possible expression of the individual is one of its ideals, nevertheless there is a certain principle, the basis of our social organism, which is also seeking expression; and an architect's utmost freedom of expression is not to be extended to include, for example, either the aristocratic formulae of Palladio or the hierarchal traditions of Amiens. "Arrange your architecture for democracy," said Louis Sullivan.

To assist the evaluation of this principle, I shall now propose three guides to architectural criticism. I propose these, not as dogma or even as principles, but as yardsticks which at this moment appear to me to be valid. They are, as will be seen, somewhat negative in character; but I have already affirmed, in the two previous papers, the positive basis of my creed. I am concerned at this moment with the defense of my creed against a concept which, however salutary in its destruction of old idols, has too often defeated the unique ministry of architecture — even in a democratic society.

Expression in architecture is not description. The appearances of buildings often exhibit their functions, and they may do so as clearly as if these functions had been described in words upon their façades. The characteristic shapes of classrooms, assembly halls, and gymnasia tell us, for example, that aggregations of these are schools. No guidebook is required to tell us that a marquee covered with neon lights announces a motion-picture theater. Our skyscrapers confess their true characters by removing their clothings; and we have unmasked even our railroad stations. These are descriptions. They are means whereby the characters of buildings are explicitly made known.

It is possible to call such a consistency of appearance and purpose expression. Certain facts are revealed, certain associations insisted upon, and in that way "expressed" in much the same way that a Martini cocktail expresses gin and vermouth. Nevertheless, I hope, at least at this moment, to exclude such factual

(*Continued on page 246*)

Postscript to "THE THREE LAMPS OF MODERN ARCHITECTURE"

By JOSEPH V. HUDNUT

We have invented a new style of architecture. The vocabulary of that new architecture and the principles of its design have been determined for us, in part by a philosophy of history, in part by a hypothesis of science, and in part by a religion of society. The architect, willy-nilly, must practice his art within limits set by these ideas. We are called upon to express our time, our technologies, our democracy — no one of which, except by association, can be expressed by the initiative and conscious will of an architect. Our era is in our buildings because our buildings are in our era; our technologies are in our buildings because we cannot do without them; and our democracy, so far as it exists, is there by the same involition. And while we follow the diverse and intriguing paths which these lamps illumine we turn away from that broad avenue, unique to our practice and our tradition, which leads to a vital and eloquent expression. I mean, of course, the avenue to form.

I do not suggest that new inventions and new modes of planning may not be elements of form, or that a frank confession of structural fact may not be as important to form as an abstraction; nor would I prohibit a democratic simplicity and uniformity whenever such qualities invade the mood of a designer. I mean that, considered as elements of expression, these are of value only as they are also elements of form. Concrete, aluminum, plate glass, and mechanical contrivance can participate in a formal order; steel and concrete construction have each its specific geometry in no essential way hostile either to proportion or rhythmical disposition; and there are few democratic austerities which could not be made to give emphasis and new value to form. But we allow these, the materials of our art, to subdue its spirit. They imprison us; hold us too closely to the stream of our interests, our anticipations, and our memories; stand between us and the free exercise of our unique genius.

Scientific and philosophical concepts are intermingled with artistic intention in every important work of architecture. In the noblest masterpieces — in the Parthenon, in the Dome of Florence, in *Notre Dame de Paris* — these are combined and fused. There are always in buildings cognitive circumstances, facts made known by the intelligence, which demand our attention or invite our research and analysis: the relation to time and climate, to the energies of the structural pattern, to the utilities in the social scheme. Always the existence of these and their natures can be, in part, demonstrated. They can be defined and given each an actuality independent of the others. There are also the reshapings of the imagination, the felt qualities imposed on stone and steel, on column, arch, and walls of glass, avenues of truth not dependent upon reasoning or understanding. Architecture is compounded of these two kinds of knowledge, entangled in a common fabric. Each may be known independently, but they exist together.

Benedetto Croce has shown us how these two kinds of knowledge, factual or cognitive knowledge and that more immediate knowledge which he calls intuitive, may be mingled not in buildings only but in all things made by man. Only in the most simple aspects of art — in a musical motive "tender" or "energetic," in the painting of moonlight on a river — is our awareness of that which the artist meant to express free from the complexities of artifice in which it is embodied. Alberti said that he could "contrive in his imagination the perfect form of a building entirely separate from matter," but even he had no formulae, other than those afforded by the techniques of construction, to convey his fantasy to his fellowmen. Idea and feeling must come to us in architecture, through the screen of material intricacies.

To this evident circumstance Croce adds an observation infinitely more important and conclusive to the cause of architecture. When we apprehend a building as a work of art — that is to say, as an expressive object — the factual or logical concepts which are mingled and fused with its expressive qualities cease to exist. In so far as they are mingled and fused they have lost all independence and autonomy. "They have been concepts, but have now become single elements of intuition." And when, on the other hand, we apprehend a building as a scientific or logical work it remains scientific or logical even though it is overflowing with ornament and harmonious orderings.

Somewhat to my surprise I have found that my own experience seems to confirm the observation of Croce. I can be aware of technological circumstance and artistic fashionings existing together in a building, but I cannot hold the building in my mind as a scientific object and at the same time hold it there as a work of art. If it exists as scientific object (or historical or social document) the artistic elements become mere accessories to cognitive fact; if it exists as a work of art, the elements created by science must either exist also as elements of the artistic form or by some means be erased from my consciousness. Whether thus erased or thus merged into expressive pattern they cease to exist as fact and science.

Have we not here a guidepost which points the path our architecture ought to follow? Our materials, our technological devices, our rational (or at least reasoned) preferences in character and symbol can be so reshaped and rearranged — and without violence to the logic peculiar to each — as to become elements of form: of a form, concerned not with academic law and precedent, but with the free translation of idea and feeling beyond that possible to structures shaped by necessity.

It is not my desire that buildings should cease to be progressive or rational or, if people are pleased to give them such an attribute, democratic. But I think it is a great pity that we should place such values on these characteristics as to make them the measures of excellence in design. I would have the architect free, so far as that may be practicable, to command in the name of form every detail of his building, and, if I had my way, he should be wholly uninhibited by dogma imposed upon his art by philosophies alien to architecture.

It is my wish not to defeat modern architecture or stay its triumphant advance, but to exalt modern architecture by bringing it within the channel of a greater tradition.

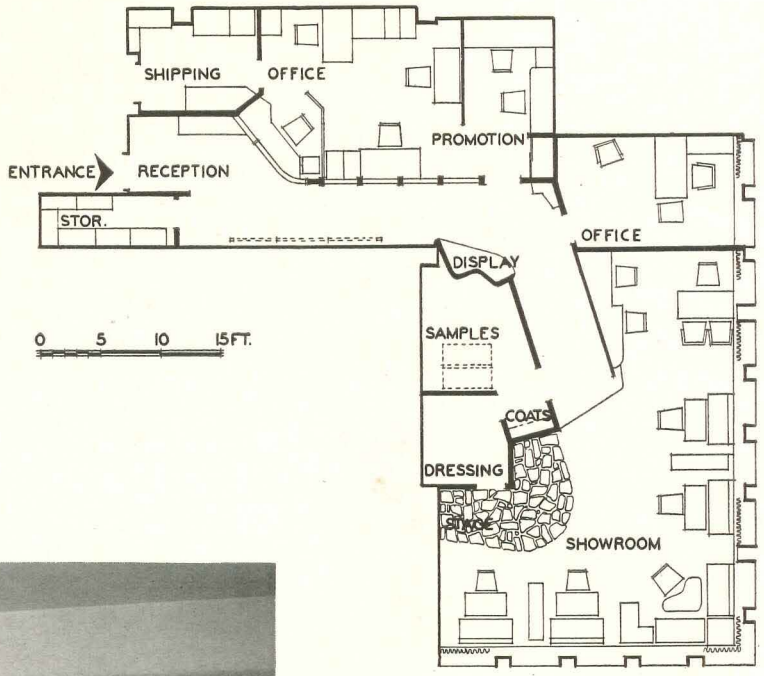
EASTERN SHOWROOM FOR CALIFORNIA MAKER

The reception area, above left, is defined by the lighting cove and the floor treatment; is separated from the sales area proper by a wood screen against the back of which, right page, are built two sales desks of natural white birch with plastic work surface

Gerhard E. Karplus

Architect

OF SWIMMING SUITS



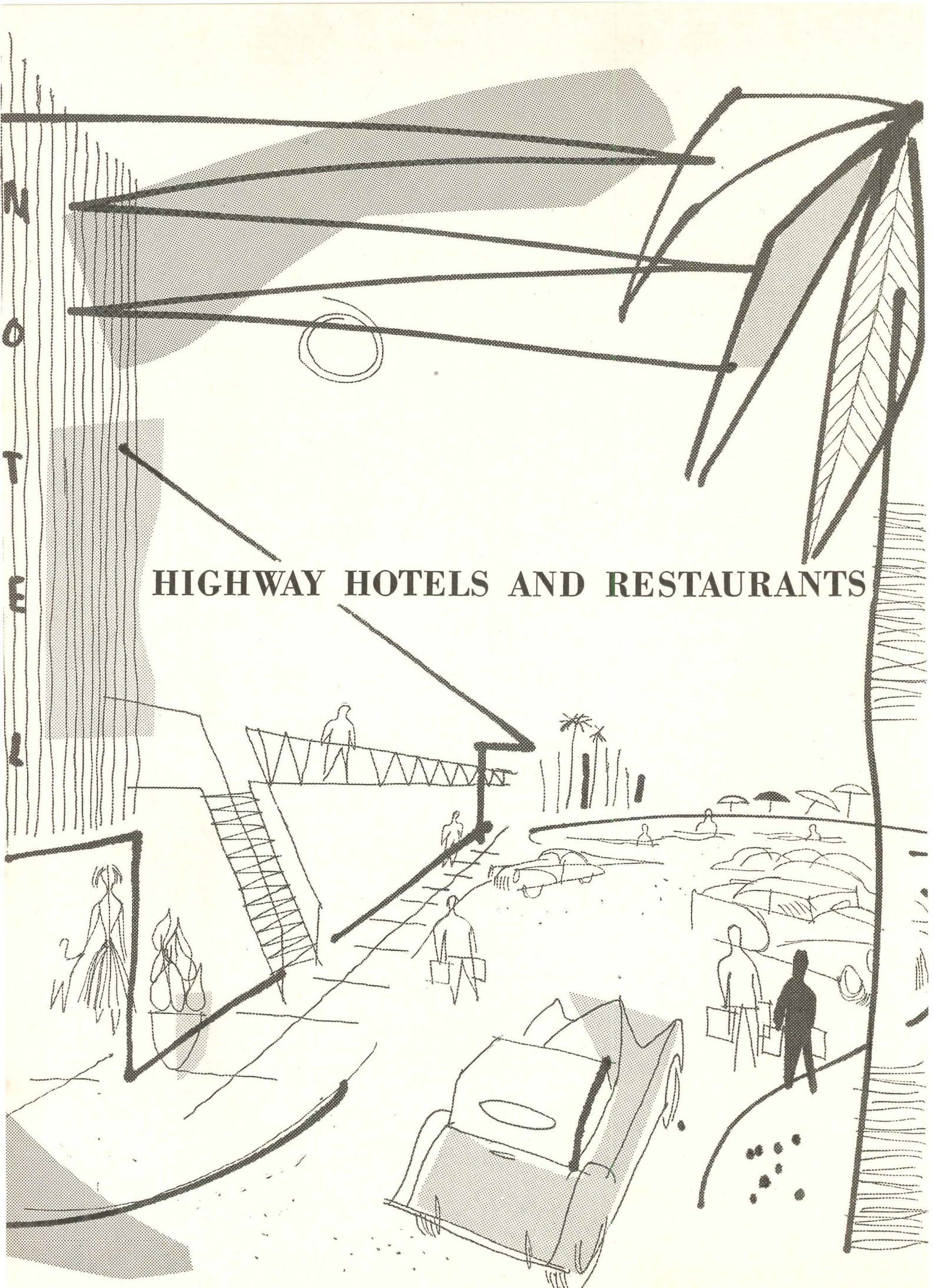
Ben Schnall

THE ARCHITECT for this Broadway showroom had two main problems to tackle in designing the interiors pictured. The owner, Rose Marie Reid, a California manufacturer of beachwear, wanted a large showroom containing five sales booths and desks for two salesmen as well as the necessary ancillary spaces; a private office; a publicity department; and a shipping room — all incorporated into a relatively small area of irregular shape. Another requirement was to capture as much as possible of the light and colorful atmosphere attributed to California. These problems were met by a rather free plan; the attempt to achieve as much of a sense of openness as possible by the use of screens free of floor and ceiling and the selection of net and semi-transparent hangings; and by employing a wide range of delicate colors in high key.

Typical dividers for sales booths consist of an upper display easel formed of perforated metal painted light gray and a lower cabinet for sample storage built of white birch in natural finish. Tables and chairs are mostly of stock design, except for the corner units, which are architect designed

Note the platform for modelling, above and left, which is paved in vari-colored flagstone. Typical window hangings, left and above, are a lightweight black print on white, and are suspended from a continuous track in the recess between ceiling and piers

Ben Schnall



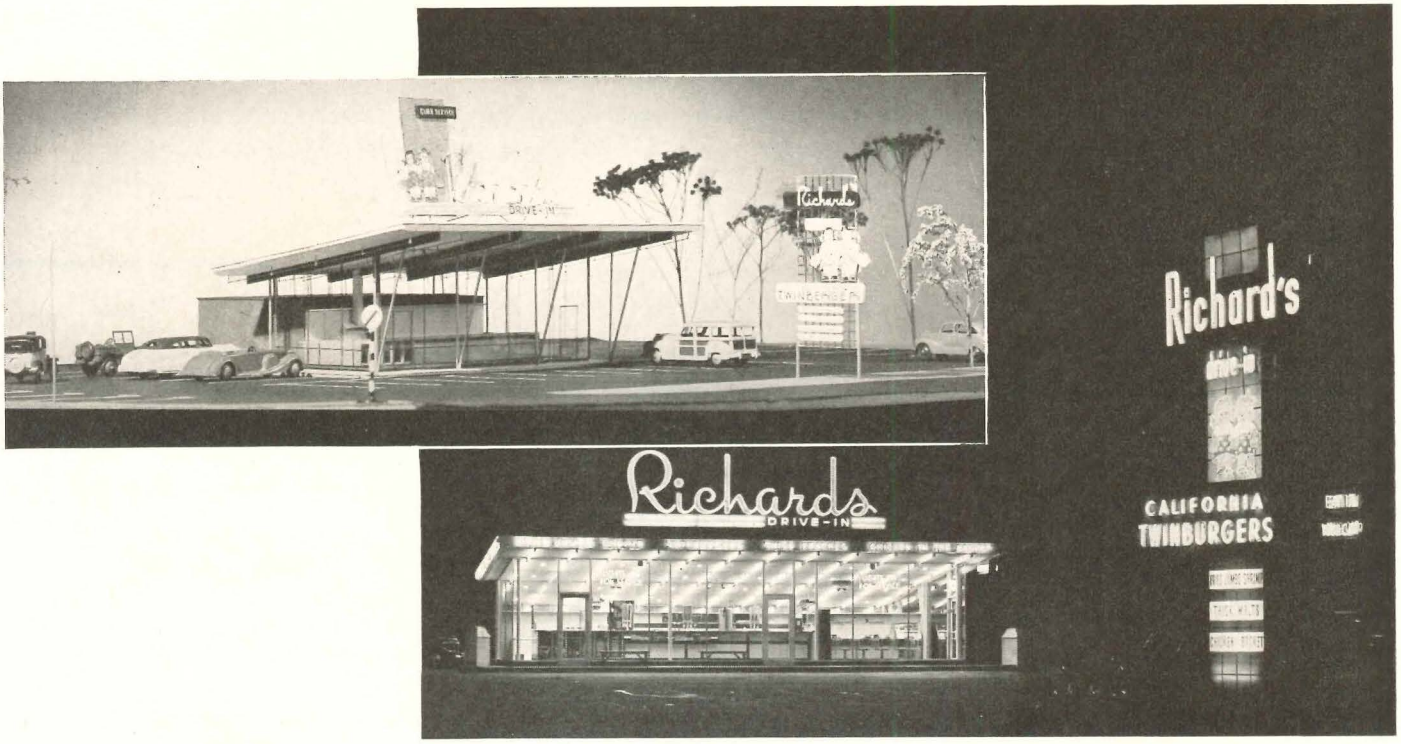
HIGHWAY HOTELS AND RESTAURANTS

For its 200th consecutive Building Types Study, ARCHITECTURAL RECORD has collaborated with the editors of *Hotel Management* magazine to provide a client's-eye view of the changing conditions encountered in the motel field by owners and operators throughout the country.

1. Richard's Drive-In Restaurant, Boston, Mass.
2. O'Boyle's Drive-In Restaurant, Bucks Co., Pa.
3. Red Horse Motor Inn, Dayton, Ohio
4. Motel for Max Alpert, Richmond, Va.
5. Casa Mañana Motel, San Antonio, Tex.
6. Springer Motel, New Orleans, La.
7. El Patio Motel, Denver, Colo.
8. The Shalimar Motel, Miami, Fla.
9. Juno Ranch Motel, Juno Beach, Fla.
10. Caribe Motel, Miami Beach, Fla.
11. Terrace Motor Motel, Austin, Tex.
12. Motel for Charles C. Wilmore, Denver, Colo.
13. Jack Tar Motel, Galveston, Tex.
14. Town House Motor Motel, New Orleans, La.

THE NAME "GOLD COAST" has been applied to many locales, and for as many social and economic reasons through the years. The current version in Miami Beach, however, is a fashionable strip of land bristling with motels. The progeny of the stripped-down cabins of the depression years have acquired an elaborate respectability and moved up into the ranks of Big Business — in volume, capital investment and net profits. Florida's motel-building boom, for example, is reportedly spurred on by new licenses issued at the rate of three a day, and with no signs of tapering off. Indications are that a similar, though more moderate, boom is taking place in many other parts of the country. United Motor Courts, an industry association, has stated that twenty motor courts a day are being completed this year as compared with eleven a day in 1952. Today there are some 50,000 highway hotels representing a six billion dollar investment. All this activity has probably been brought about by reports of the phenomenal success of some of the older motels, and the attraction of a constantly widening range of clientele. The capture of a good percentage of the business and commercial traveler trade has been a tremendous boost to offset the traditional off-season slack periods. It was estimated that more than 86 per cent of all travelers in the U. S. went by car in 1952, and this year, some guessers predict that about 40,000,000 people, two-thirds of all those traveling by car, will stop at motels.

A pertinent point in the midst of these facts and speculations is the marked change in character of most of the new motels — both in design and operation — which should create a bumper business for architects in the field. Competition and public demand have forced motel owners to become more conscious of the high sales value of good clean design and planned efficiency. Services and extra features have been increased in some instances to the point that there is little to distinguish a motel from a hotel except its horizontal structure and the identifying sign. There is at least one case where a good sized suburban hotel, regarded as one of the white elephants left over from the late nineteen-twenties, has been refurbished a bit, equipped with a big motel sign, and currently enjoys a thriving tourist business. A number of hotel operators, conscious of the trend, have flanked their establishments with motel units which get hotel service.



George M. Cushing, Jr.

A drive-in type of restaurant is favored by some motel operators to increase revenue. This particular example is a prototype design for Richard's Drive-In Restaurant chain by William Riseman Associates, Architects. The basic model (inset photo) will be adapted for 18 units in the Midwest and East. The photo is of one in Boston, Mass.

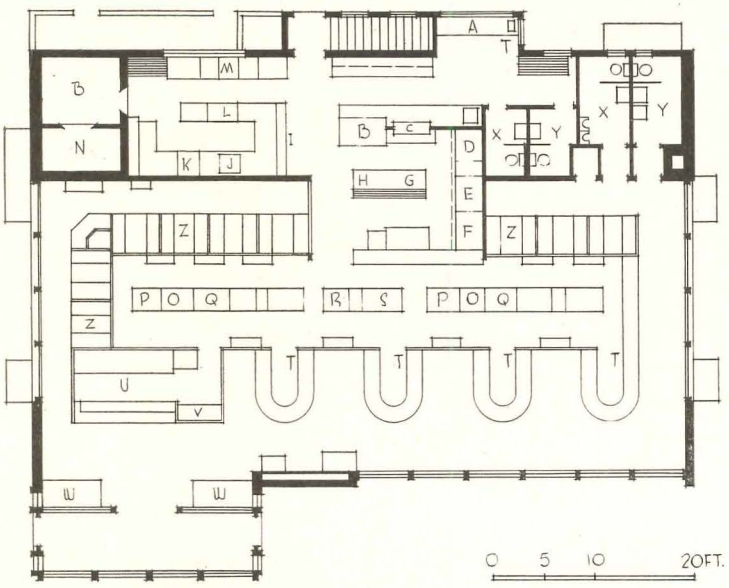
1 RICHARD'S DRIVE-IN RESTAURANT, BOSTON, MASS.

THE PLANNING ASPECTS of this changing concept for a motel will require the services of many more specialized professions than was the case a short while ago, when most motor courts were planned and operated by a husband-and-wife team of manager-owners. The extensive planning data for motels published in the March 1950 issue of ARCHITECTURAL RECORD are generally still quite valid as desirable factors. However, the success of many motels in apparently unfavorable locations has led to a review of a number of the points.

CONSIDERATIONS ON SITE PLANNING AND SELECTION

In the past, and in general still, it has been considered fairly disastrous to build a motel on the wrong side of a highway, with less than 500 ft frontage, on hilly sites which require expensive grading, or in a location near a number of other motor courts. Yet motels have been built and have thrived in each of these situations. The answers seem to depend on a number of factors, some local, some national. A crisply attractive, fairly priced motel, on the wrong side of a highway for the heaviest traffic, can exert a very strong pull in a shabby area of less desirable motor courts. Motels catering largely to commercial travelers can sometimes gain profit from a fairly restricted site easily accessible to the business district; and in a popular resort area, a 200-ft strip of beach can be a bonanza. Or, as a new approach, one large industrial corporation has recently built, and operates, a pleasant motel near one of its small town factories for visiting business contacts.

The increasing cooperation between better motels, and the activities of



LEGEND

A. "Self-Service" Pass through
B. Ref.
C. Pass through
D. Range
E. Fryers
F. Griddle
G. Sink
H. Steam Table
I. Soiled Dishes
J. Prewash Sink
K. Dishwasher
L. Glass Washer
M. Veg. & Pot Sinks
N. Freeze
O. Mixer
P. Orange Drink
Q. Milk
R. Coffee Urns
S. Desserts
T. Water
U. Ice Cream
V. Cashier
W. Display
X. Men's Toilet
Y. Women's Toilet
Z. Booths

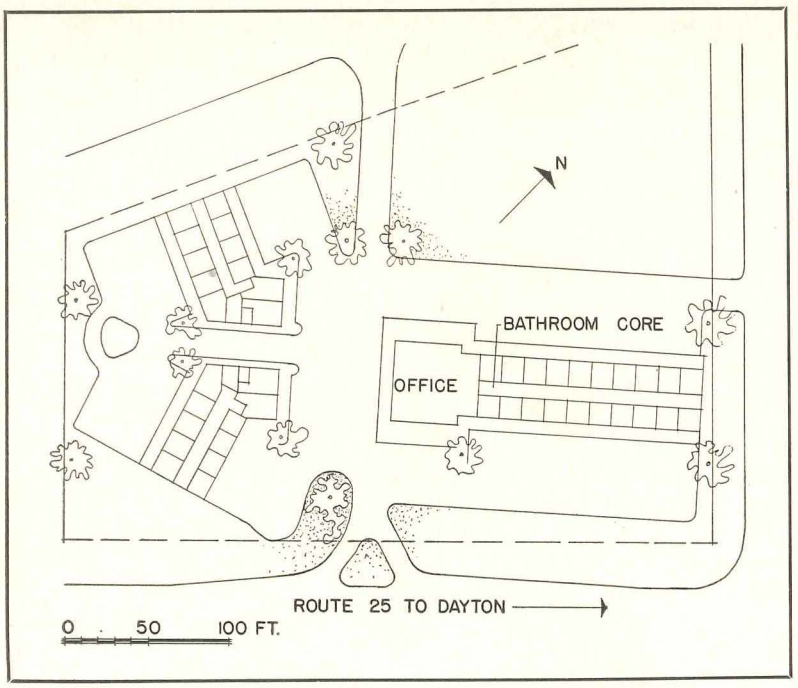
A self-service drive-in feature which eliminates car hops is an idea planned for this restaurant which might be adapted to motels. Besides regular counter and booth service, a service window is at the rear (letter A on plan) for motorists who want to eat in their cars. The restaurant, now nearing completion, was designed by Joseph J. Morgan and A. J. Varnas, Architects

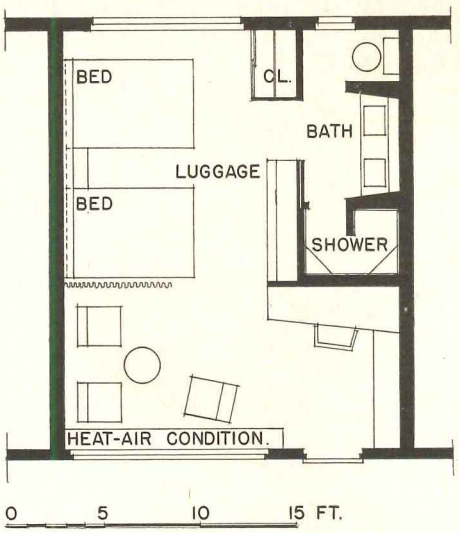
2 O'BOYLE'S DRIVE-IN RESTAURANT, BUCKS CO., PA.

national motel groups have, no doubt, been responsible for the success of many improbable sites. National publicity, recommended lists, and ratings by the American Automobile Association are fostering the custom of contacting specific motels in advance for reservations, instead of the old stop-where-you-can-when-you're-tired attitude. Several national motel chains have also been established which offer more or less standardized accommodations and services, and strive to keep patrons within their own or affiliated orbits. The influence of air travel is also having its effect in some localities; resort vacationists and businessmen arrive by air, rent a car and drive to a motel where they have reserved rooms. All these items will probably gain in significance, and should be as carefully considered in choosing a site that is both economical and productive, as the now prevalent and prudent customs of checking traffic density, ease of accessibility, drainage conditions, etc.

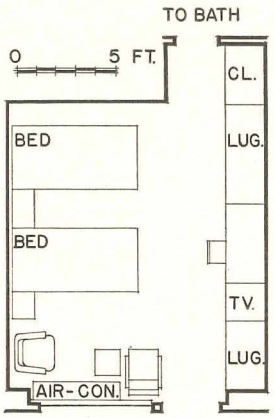
RESTAURANTS, CONCESSIONS AND RECREATION FACILITIES

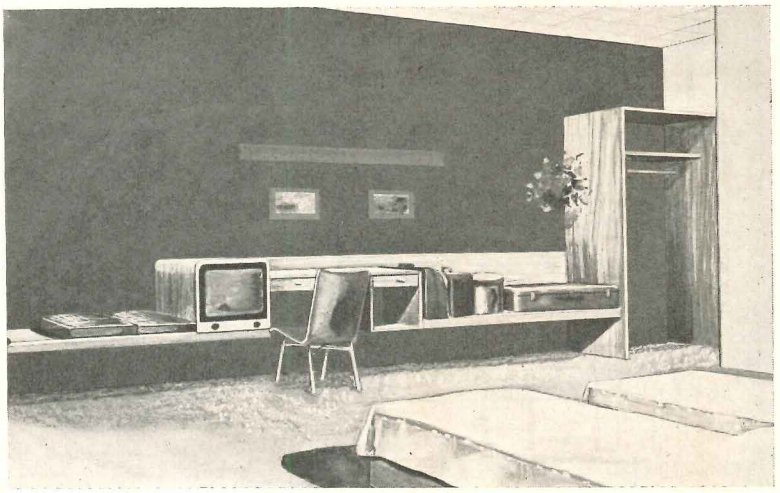
The previously held opinion that restaurants were not paying propositions in connection with motels is being reversed by many operators. The appreciation expressed by patrons who can obtain at least a quick breakfast before a day's journey has even led some motels to offer a continental breakfast free of charge. The exact type of facilities provided must still depend on local conditions, but the following arrangements have been noted: a small serving pantry for serving a light breakfast in the lobby, or in the guest rooms; more extensive use of vending machines; a small snack bar or restaurant kept open only through the lunch hour; drive-in service; and





Interior layouts have been carefully studied in this project for the Red Horse Motor Inn, by Joseph J. Roberto, Architect, and Caroline Kane, Interior Designer. The plan and sketch at right show the basic low-cost room unit, with casework designed for the job. TV units would be supplied on rental basis. The designers' plan for a luxury unit is at upper right



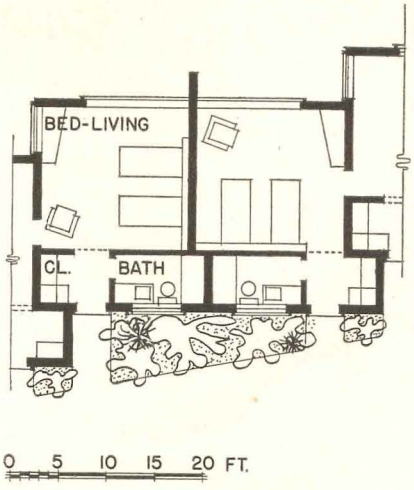


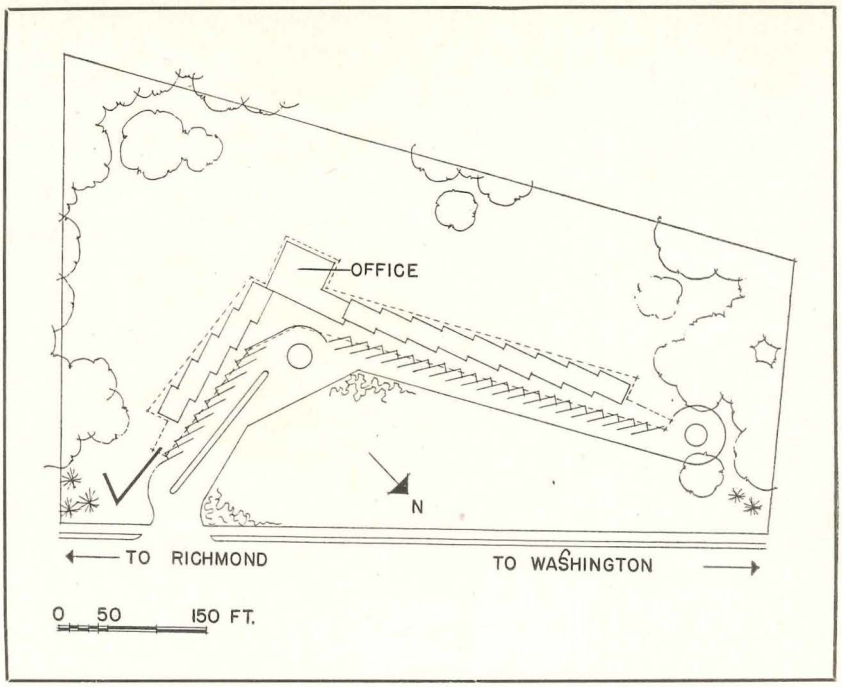
3 RED HORSE MOTOR INN, DAYTON, OHIO

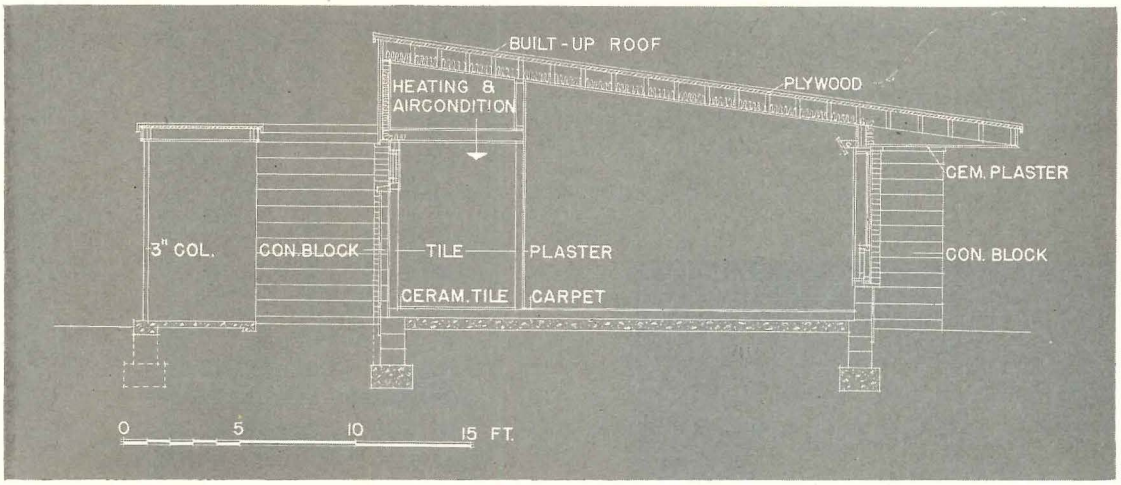
full-scale restaurants. The last two types, sometimes leased as a concession, might be an added source of revenue in off-seasons when there is sufficient patronage from the adjoining community. The seasonal aspects of the business, especially in resort areas, has led some owners to include facilities for small conventions, club meetings, and display rooms for salesmen to help boost year-round activity. These are matched with such hotel services as laundry and cleaning, either on the premises or by contract with a commercial laundry, private phones and switchboard service, television and radio, bars and package liquor stores, free ice cubes, and in a few cases even room service. The extent of recreational facilities provided seems to depend largely on that offered by close competition. Filling stations are still not considered desirable unless the motel is in an isolated location.

GENERAL PLANNING AND EQUIPMENT

Flexibility in the arrangement of rooms and suites has become more important with the growing variety of patronage. Commercial and resort visitors tend to prefer rooms with convertible sofa beds that serve as living rooms by day, while transient tourists prefer the standard bedroom arrange-







Privacy for room occupants has been stressed in this project by Caleb Hornbostel, Architect. Noise and lights of a car driving up and being unpacked are baffled by placing entry, closets and baths on side adjoining parking space. Adequate insulation blocks noise between units. Planned only for one-night stops, office area includes all-purpose lounge, breakfast bar

4 MOTEL FOR MAX ALPERT, RICHMOND, VA.

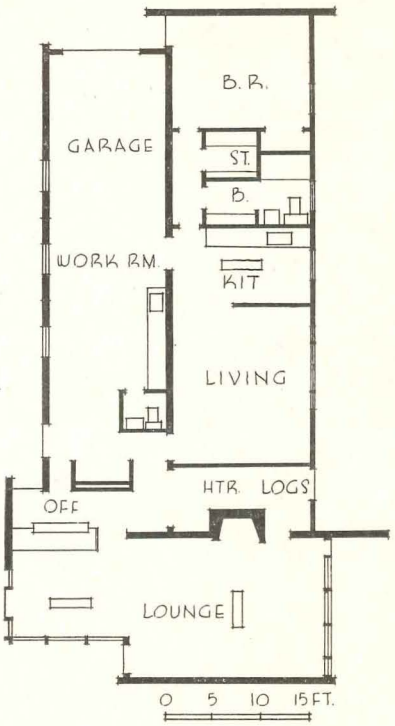
ment. Families with children often shop for motels with kitchenette facilities and have caused some owners to overlook the previous objections to increased upkeep. More and more motels are approaching hotel standards in interior furnishings, with carpeting, many lamps, fine mattresses and tile baths. Unit air conditioning and heating equipment in each room has become fairly standard in many regions as it permits easy cut-off of unrented sections. Provision of noise control, adequate privacy, and protection from the glare of headlights and electric signs are vital. However, fewer motels provide garages or carports, especially in the warmer climates.

In the midst of the rosy glow surrounding the motel business, at least one word of warning has been sounded, and a point of view that might incidentally help architects to rule out some of the more chi-chi ideas forced on them. In an article for *Hotel Management* magazine, C. Vernon Kane, partner of Horwath & Horwath, accountants, points out the present attitude of insurance and mortgage companies, who have become very cautious with regard to motels: "The more luxurious motor court may be handicapped by its better appearance. The economy-minded traveler of the future may drive into a plainer motor court in the hope of getting lower rates."

EXPANDING MOTEL:

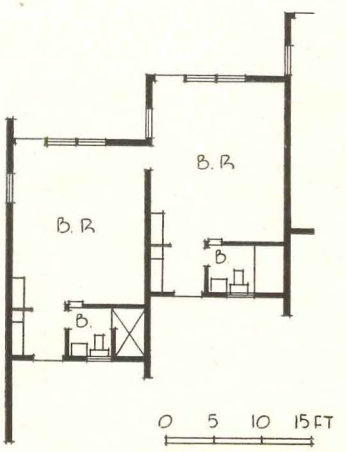
Addis E. Noonan Associates, Architects & Engineers

The motel utilizes water pumped from a deep well on the property, has its own sewage disposal system. Water system is oversized to augment fire extinguishing equipment



5 CASA MAÑANA MOTEL, SAN ANTONIO, TEX.

Each unit (typical plans at right) has individual window A.C. unit, thermostatically controlled gas wall heater. Office (above right) has PBX board, 5-ton A.C. unit

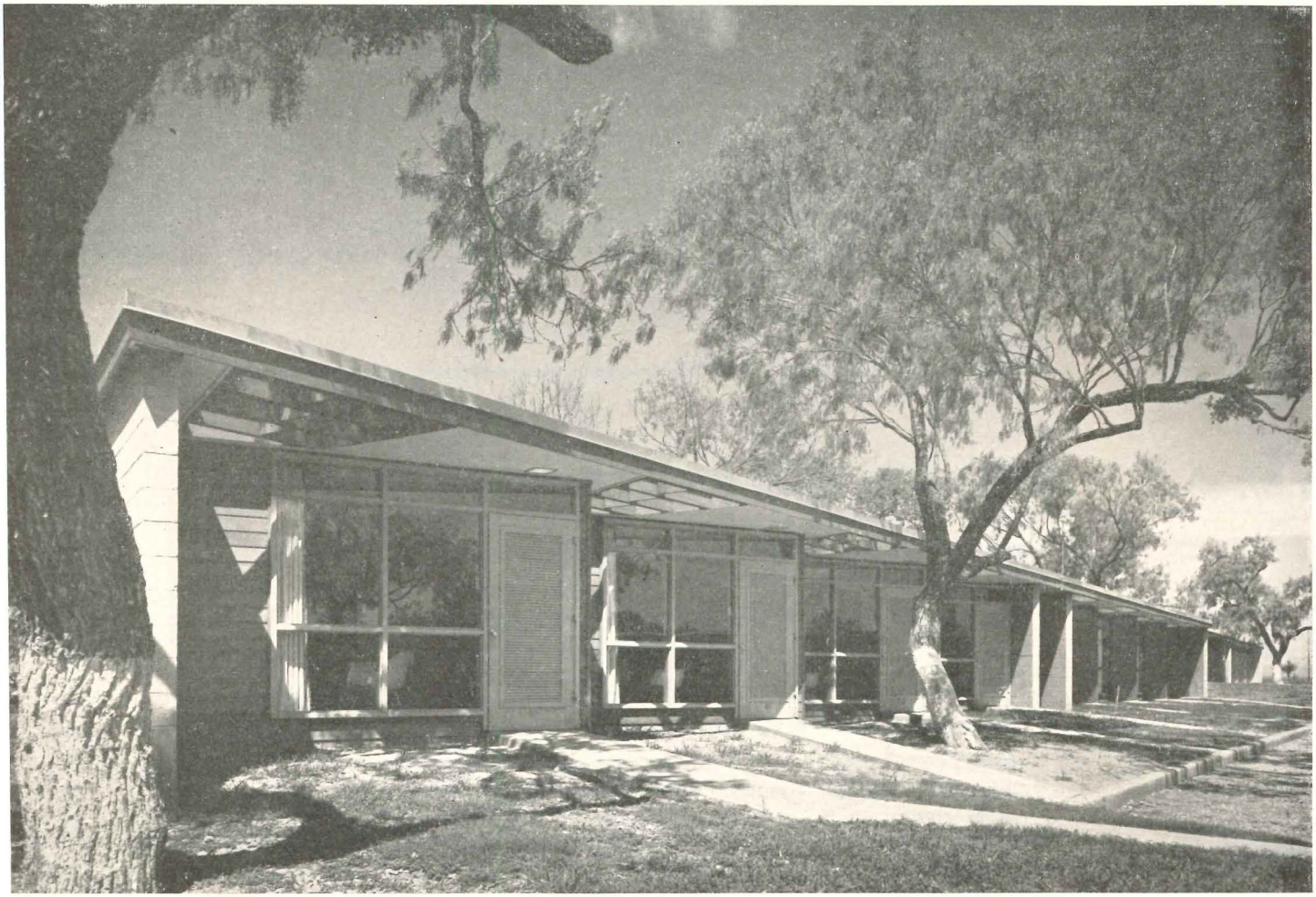


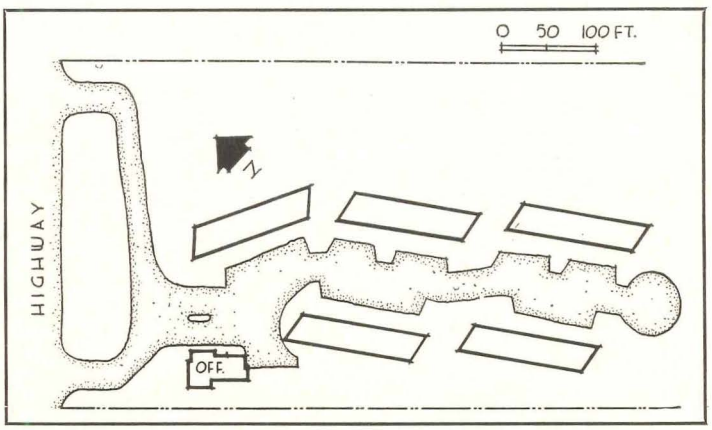
STAGE ONE

Thomas B. Thompson, Architect

CASA MAÑANA MOTEL is perhaps adroitly named, for these six crisp new buildings form the nucleus for a larger motel slated to include an impressive variety of recreational and sales facilities. Adjoining properties, which also belong to the owners, will be developed with a cafe-lounge, a drive-in, a liquor store and a service station. It is also proposed to provide a swimming pool, a small golf course, picnic grounds and similar facilities along a small creek on the property. The present rental units are placed on high ground with an open vista across a valley. Each building has eight units, angled for greater privacy. End division walls between units are lightweight concrete block and serve as acoustical insulation; staggered baths are also planned to reduce noise transmission. Other walls have redwood siding. Future plans include 24 more units and development of terraces and sitting areas outside all rooms. Furnishings, color schemes and site planning are all being done by the architects.

Ulric Moisel

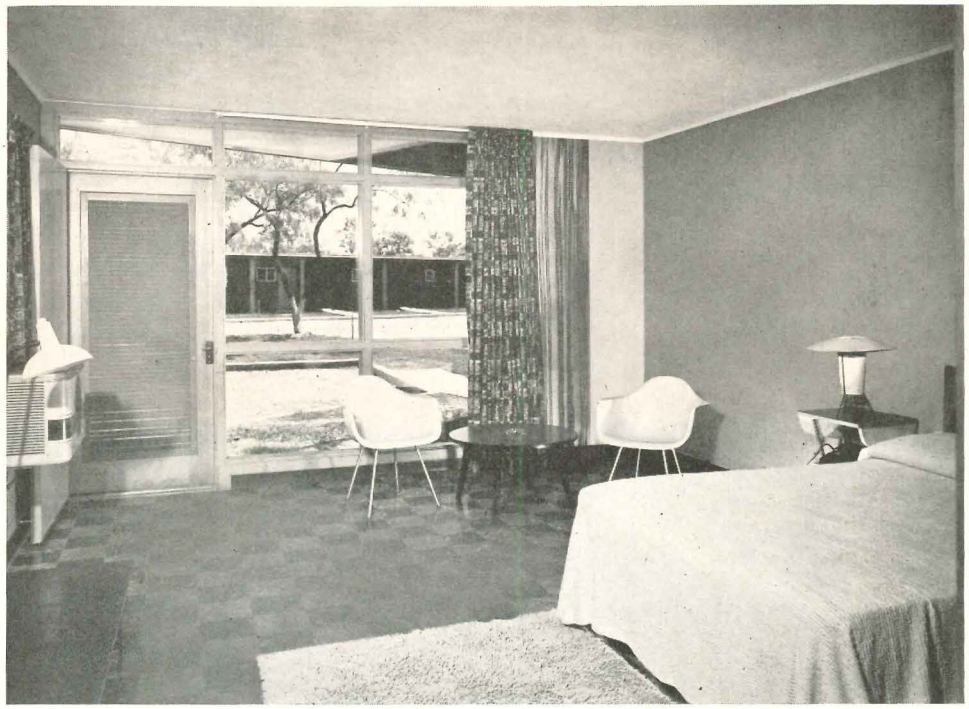




Each 8-unit building has central water heater. All units have showers, eight have tubs. Foundations are "floating" reinforced concrete slabs with 8- by 16-in. perimeter beams

5 CASA MAÑANA MOTEL, SAN ANTONIO, TEX.

Ulric Meisel



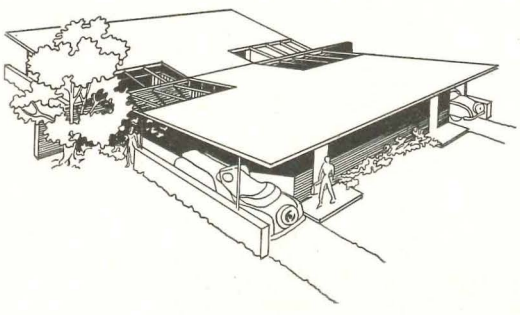
Casa Mañana interiors are also kept crisp and simple. Concrete end walls are waterproofed and painted. Other walls and doors are natural-finish gum plywood. Ceilings are painted wallboard, insulated with glass wool blankets. Floors are colored cement tile. All baths have ceramic tile floors and wainscots

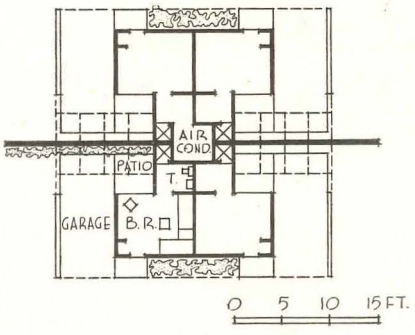
6 SPRINGER MOTEL, NEW ORLEANS, LA.

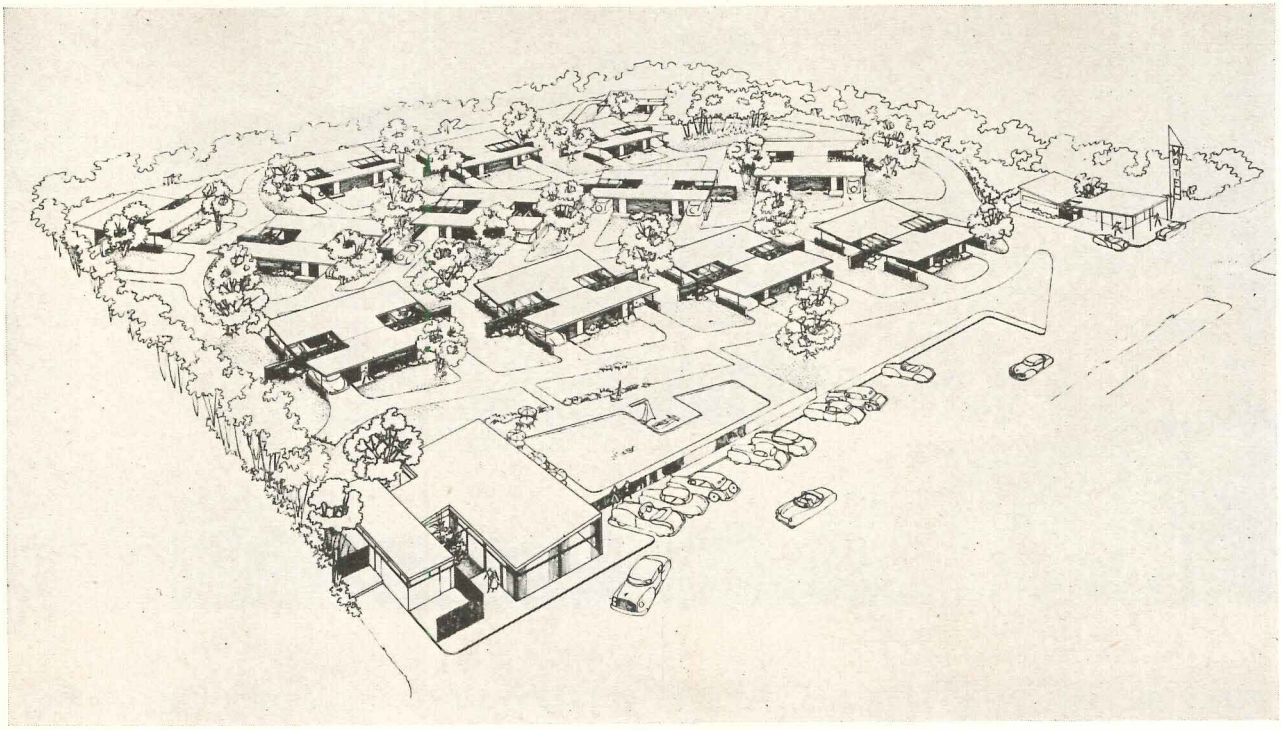
REVISED PROJECT: HIGHER DENSITY FOR HIGHER RETURNS

Ricciuti, Stoffle & Associates, Architects

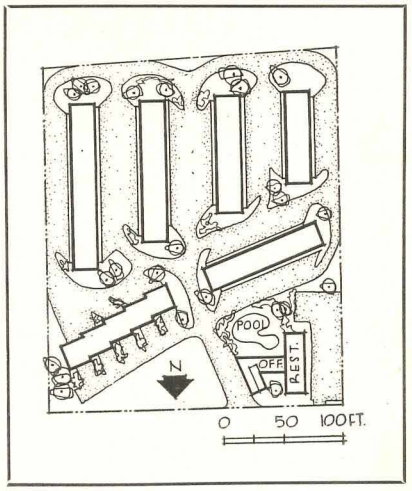
THE ROLE OF FINANCES in the designing of motels is plainly indicated in the development of this project to be built near New Orleans. The site, a plot 360 ft wide by 440 ft deep, had several drawbacks: it was on the wrong side of the highway for incoming traffic to the city, and was in an area with a high density of sub-standard motels. The original scheme was planned to create enough appeal to offset these factors by an informal arrangement of basic 4-unit cottages. Each unit was given a high degree of privacy by the use of small patios; elimination of windows in the front also shielded units from auto headlights. The need to provide more units eventually forced the adoption of more conventional row-type units, eliminating garages and combining recreation and office areas into one building.

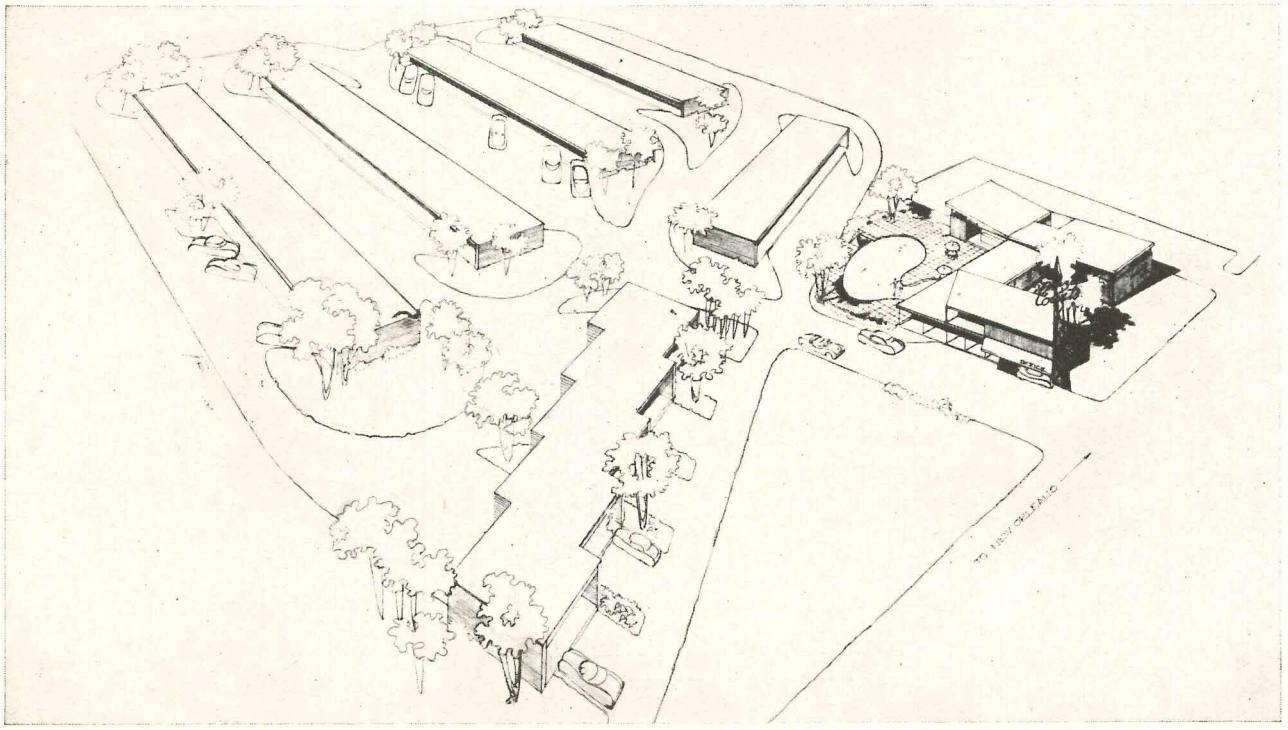






The original motel scheme (above) includes 50 units in 4-unit cottages (bottom opposite page), and separate restaurant-recreation and office-administration buildings. The revised scheme (right and below) increases capacity to 128 units, eliminates garages and patios. An effort was made to preserve an appearance of openness from the highway by using a triangular shaped lawn to give incoming traffic a full view of the combined administration-recreation building and the pool. Exterior finishes will be brick and redwood or cypress





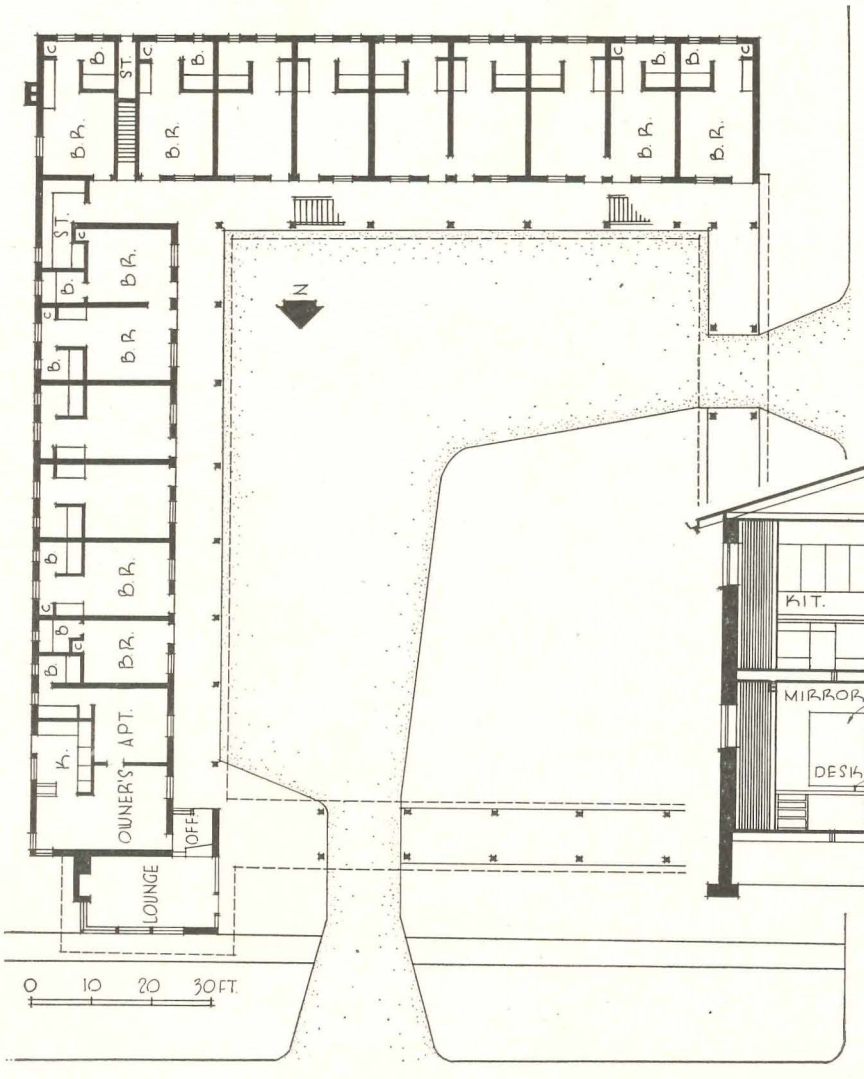
6 SPRINGER MOTEL, NEW ORLEANS, LA.

Marshall Brooks

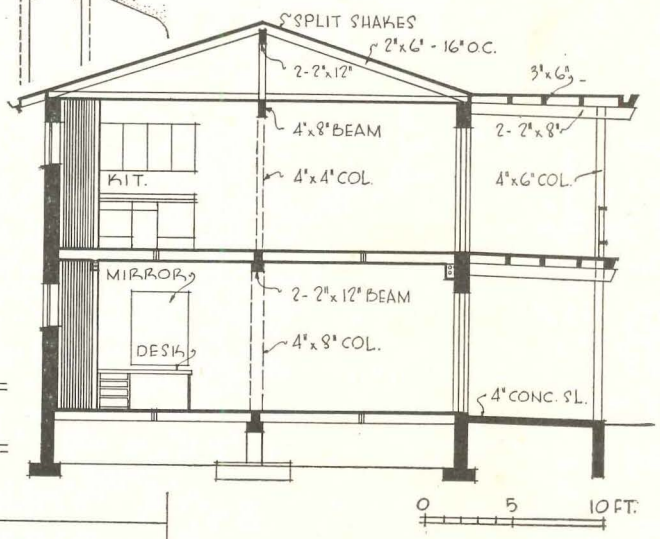
SECOND STORY ENLARGES COMPACT MOTEL SCHEME

Charles Sink, Architect

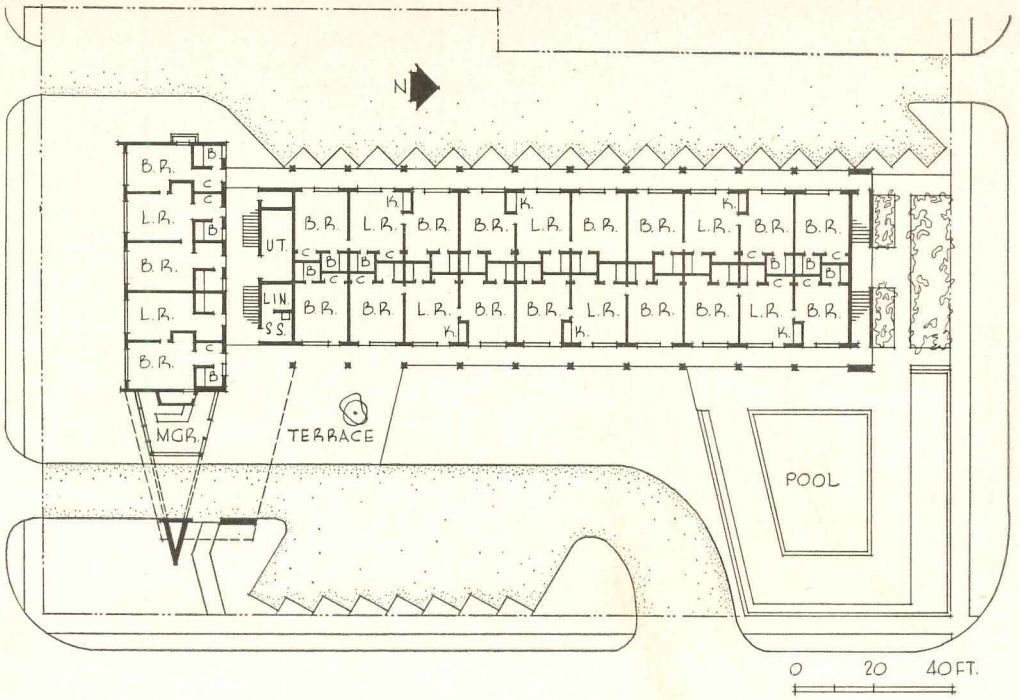
EXTRA rental units were added and parking space preserved on the restricted site of this motel by the use of a two-story wing at the back. Sheltered access to rooms from all parts of the parking lot is provided by cloister-like covered walkways, open galleries and three stairways. A service room is at juncture of the wings.



Lighting along front and in the lounge of the motel gives good visibility from the highway at night (above). Alternate rooms as shown in the section below, have kitchens or large built-in desks, and are designed to be combined as suites if desired



7 EL PATIO MOTEL, DENVER, COLO.



50-ROOM MOTEL PLANNED FOR LONGER STOPS

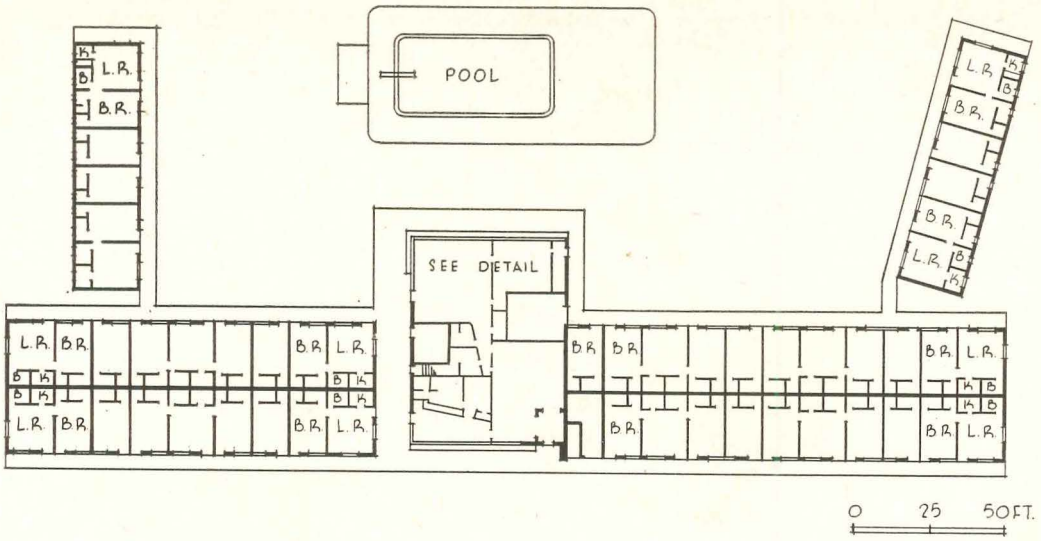
The Edwin T. Reeder Associates, Architects

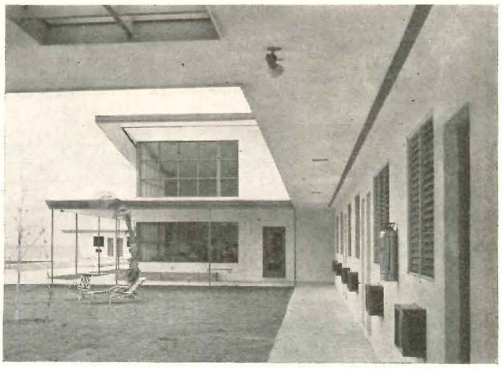
THE wide range of types of tourists that can be expected in the Miami area have been taken into account in the planning of this two-story motel. Rooms are arranged so that they may be combined into apartments of one, two or three rooms to accommodate overnight guests, commercial travelers or families on a holiday. All rooms flank a bathroom core running the length of the building, and open on either the front or the rear parking lot. The second floor is identical to the first. Stairs are placed behind fins at the north end, and adjoining the service rooms. The original scheme for the front terrace and pool shown on the plan above have not yet been carried out.

Ernest Graham

8 THE SHALIMAR MOTEL, MIAMI, FLA.

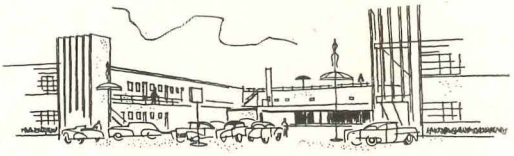
9 JUNO RANCH MOTEL, JUNO BEACH, FLA.





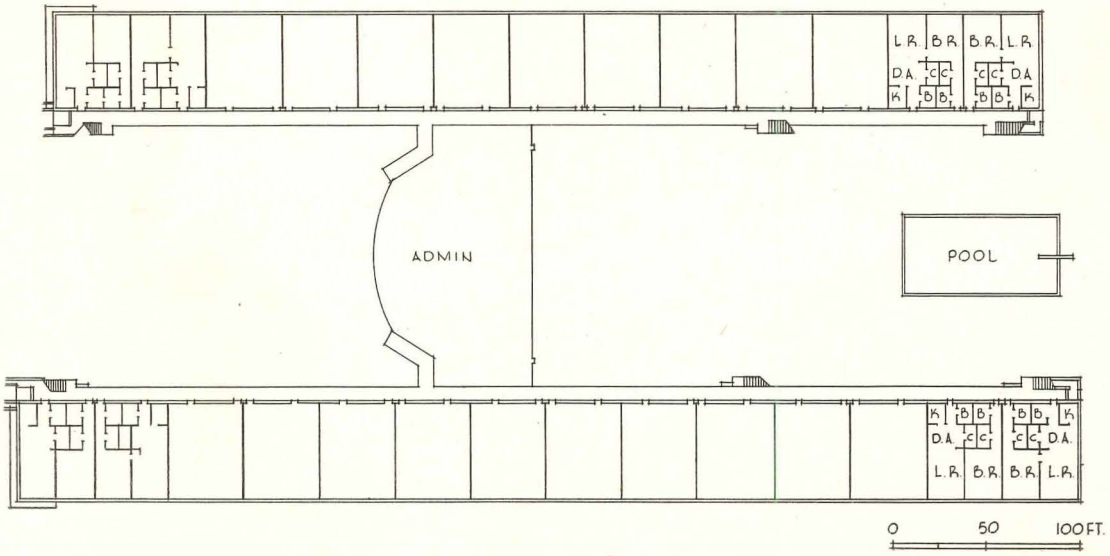
THE resort trade is being cultivated by motels in many areas by the added inducements of such luxuries as running ice water in the rooms, large lobbies, cocktail lounges, coffee shops, television, swimming pools and an enormous variety of recreation facilities. This one-story scheme for the Juno Ranch Motel also features double louvered windows — redwood slats outside, glass inside — individual A.C. units, covered walks around building.

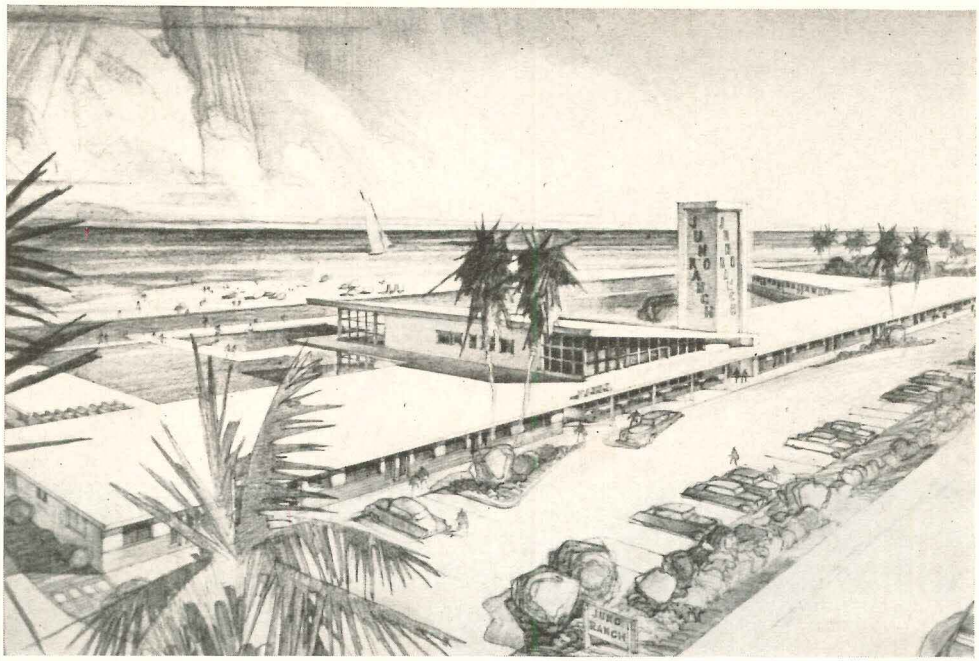
TWO OCEAN FRONT RESORT MOTELS



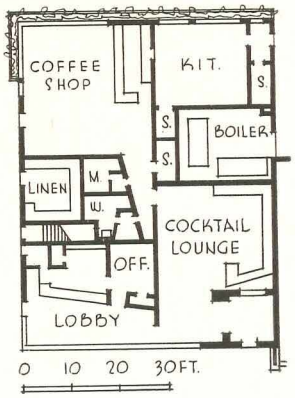
THE Gold Coast motel strip of Miami Beach has had a phenomenal growth in the past three years. The Caribe Motel (below and right) is typically planned for a holiday atmosphere, and caters to guests who often stay for a three month vacation period. The narrow, deep site was developed with an H plan; parking area faces road in front.

10 CARIBE MOTEL, MIAMI BEACH, FLA.





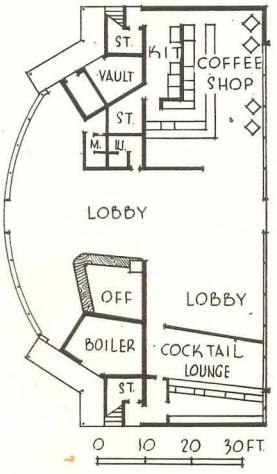
The one-story Juno Ranch Motel has tall clerestory over public areas (plan below). Structure is stuccoed concrete block. Kitchen and coffee shop have access to beach



Norman M. Giller, Architect

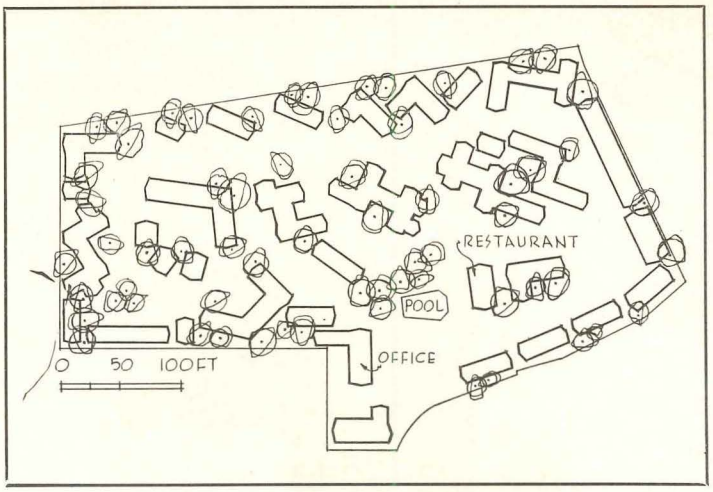
FOR THE FLORIDA COAST

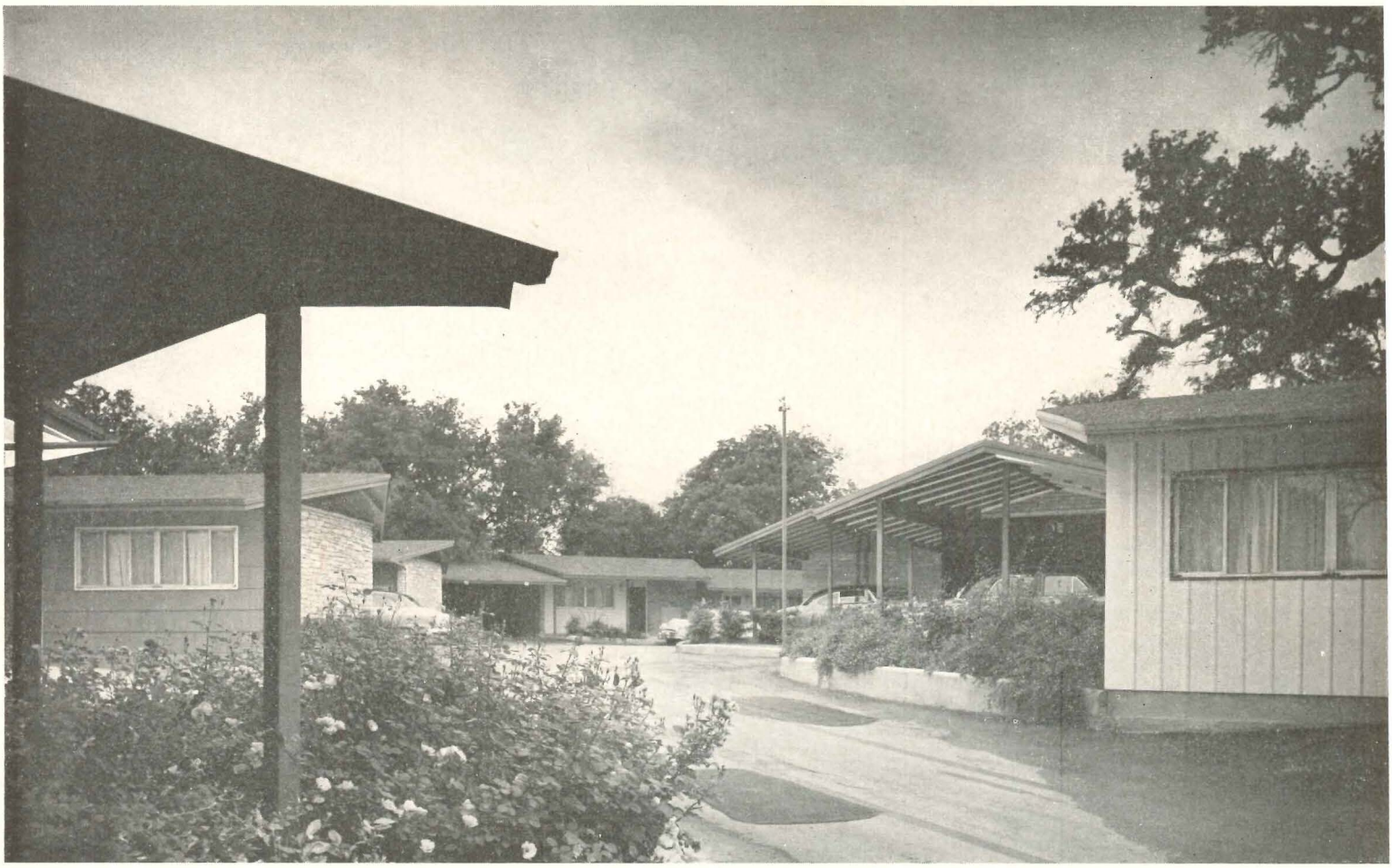
Klara Farkas



The Caribe Motel has elaborate lounges (plan above, photo above left). Wings are one room deep, have balconies on one side facing pool (photo left)

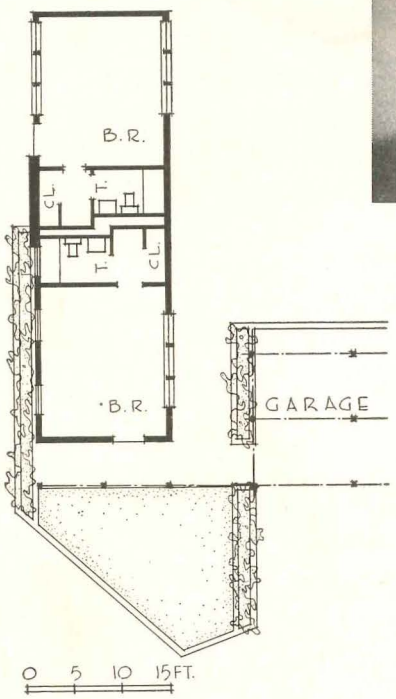
11 TERRACE MOTOR HOTEL, AUSTIN, TEX.

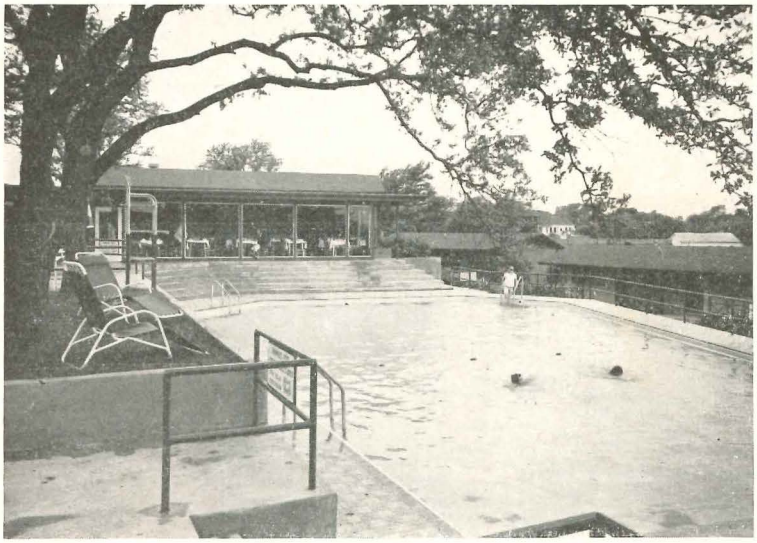




LANDSCAPING AND VARIETY KEYNOTE TEXAS MOTEL

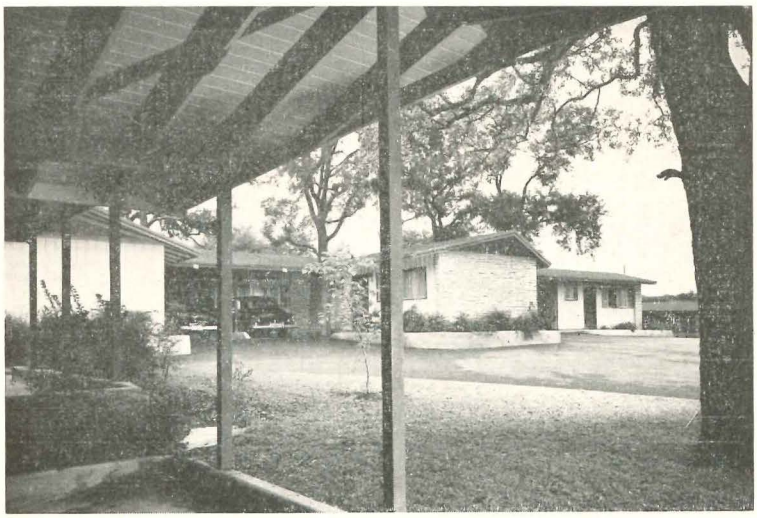
GREAT ADVANTAGE was made of the rolling, wooded character of the site to produce this extremely pleasant, well landscaped and informal motel. The 102 units, no two of which are alike, are arranged in various sized groups made up of the basic unit plan shown on the opposite page. The units are fairly large, with separate dressing room and bath combinations and individual carports. Exteriors include combinations of the following materials: white and pink stone, red brick, vertical boards, rough or smooth boards and bats, horizontal siding, colored wood shakes and corrugated transite. Roofs are built-up with crushed red brick topping. Each building is insulated, and heated or cooled by individual units.



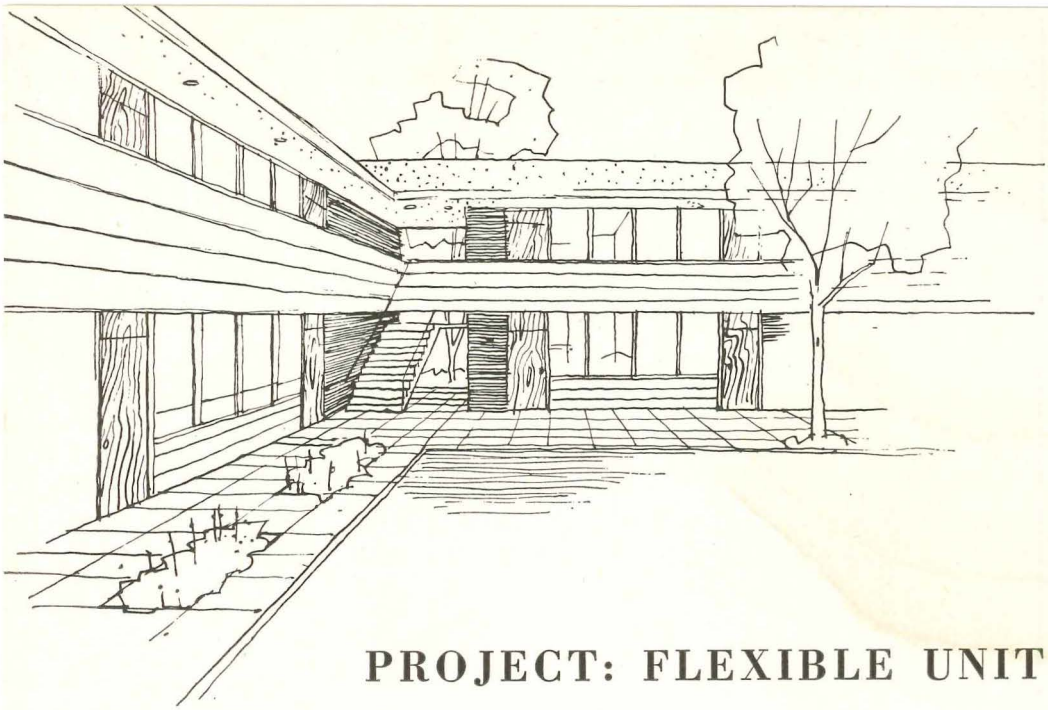


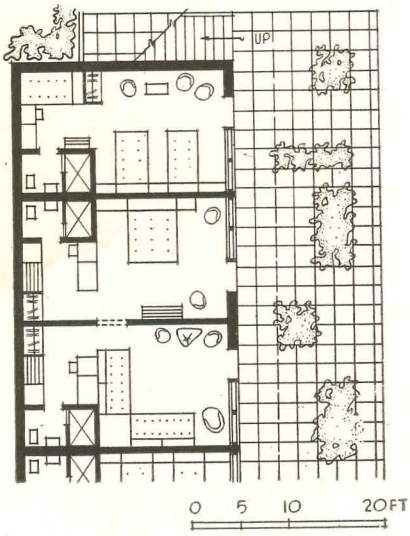
All interiors were also designed by the architects. Wall surfaces include combinations of plaster and vertical boards, plywood, hand-blocked wallpapers, and wainscot. Floors are carpeted

Niggli & Gustafson, Architects



Ulric Meisel

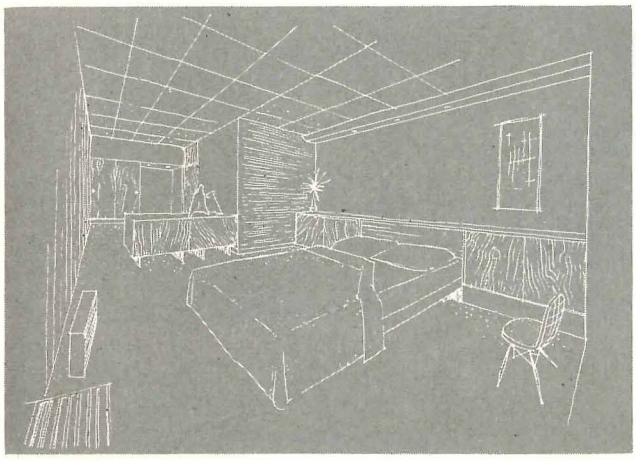




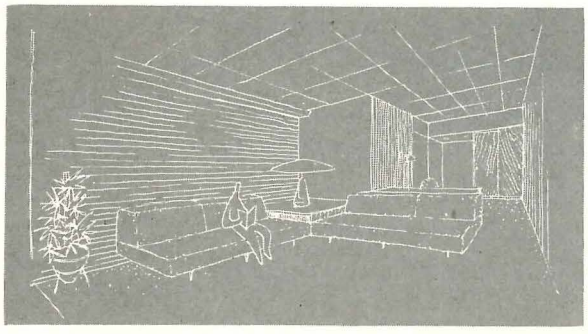
PROJECT: FLEXIBLE UNITS

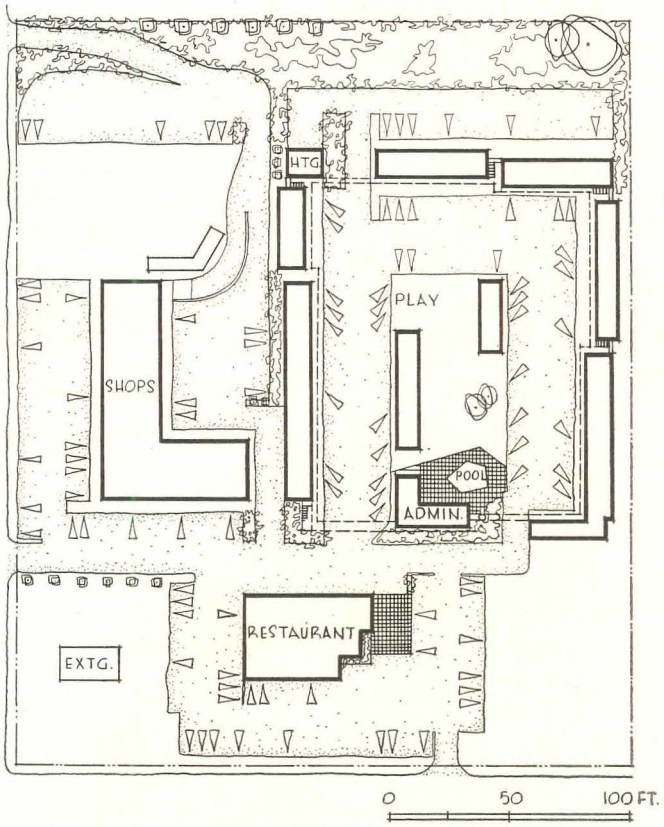
Norton Polivnick, Architect

The increasing trend to automobile travel for business or pleasure trips and family vacations poses a relatively new problem for motel designers and operators to meet the varying demands for types of room arrangements. The architect of this motel project has devised an economical solution by providing a basic unit that lends itself to a variety of furniture layouts. The units have been combined into a well organized design that also includes a restaurant, a group of shops and recreation facilities. An existing service station occupies a corner of the site adjoining the restaurant.

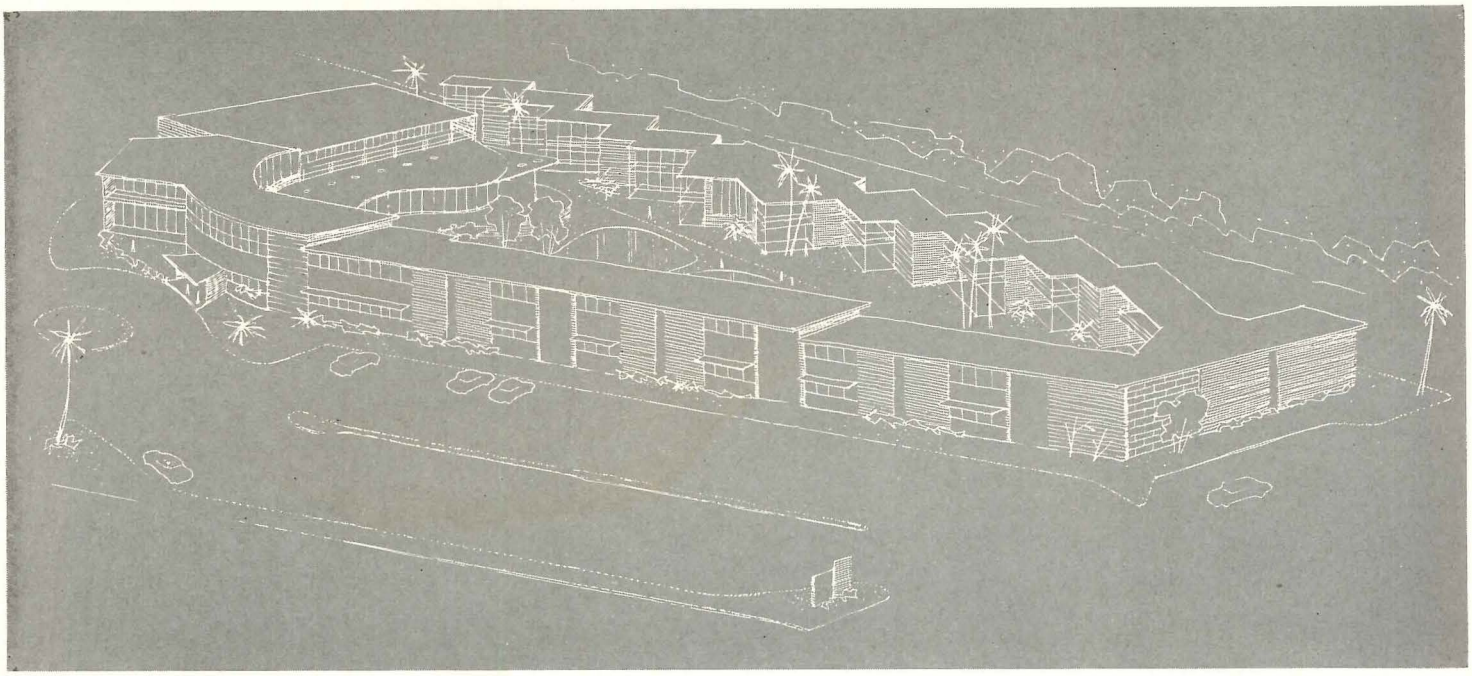


The two sketches shown here illustrate the adaptability of the basic unit to different arrangements: a sitting room with sofa beds (below), a unit with double bed (above)





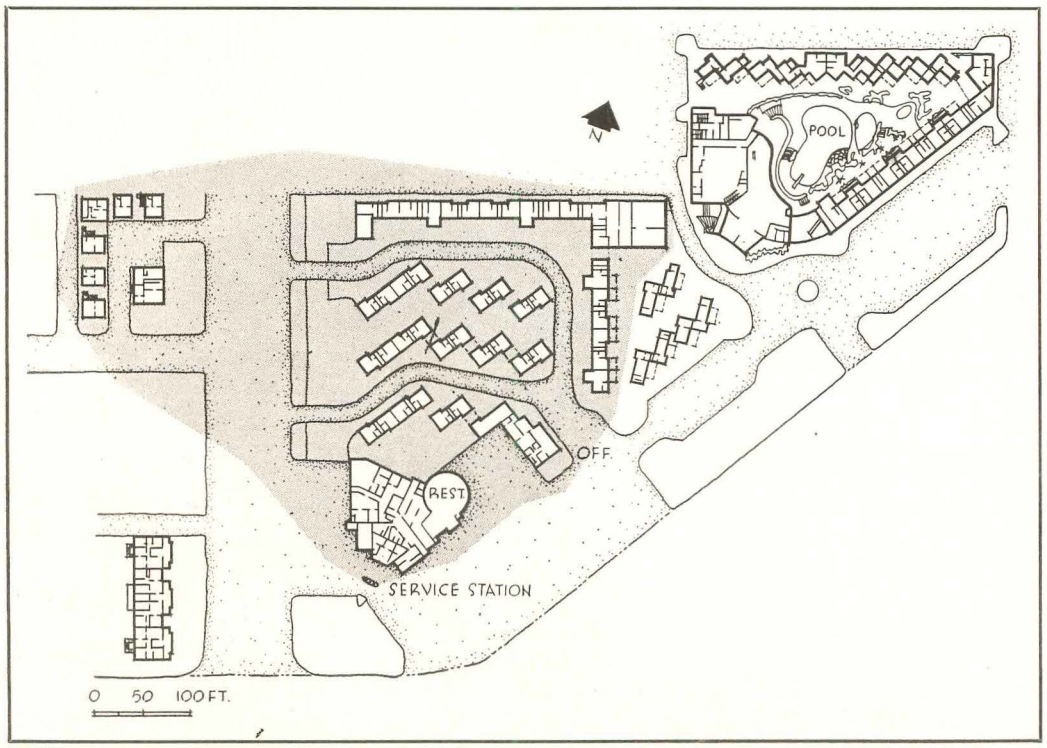
12 MOTEL FOR CHARLES C. WILMORE, DENVER, COLO.

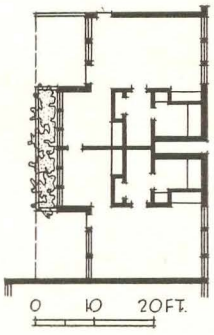


EXPANSION TO BOOST YEAR-ROUND OCCUPANCY

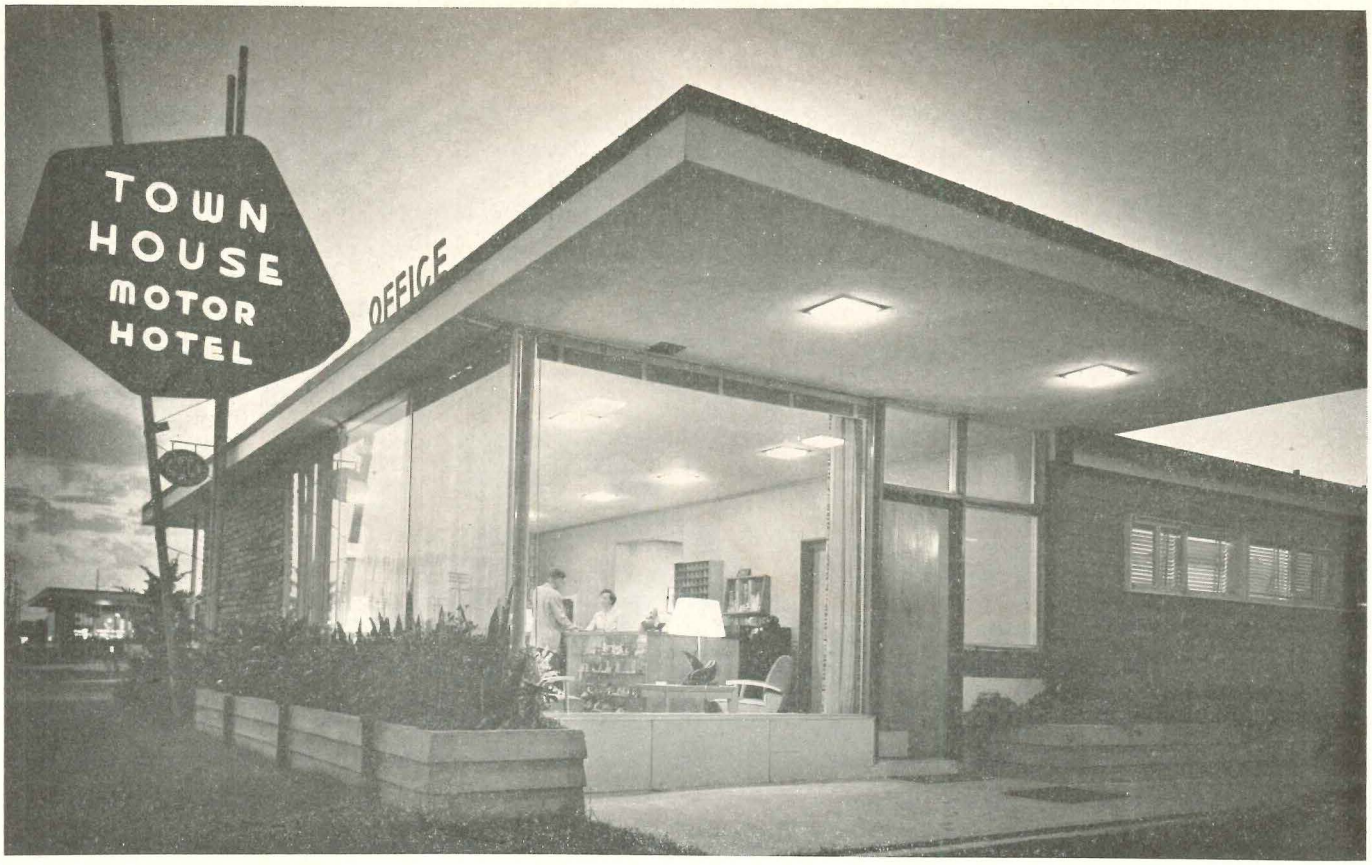
Thomas M. Price, Architect

The relatively short duration of the popular vacation season in many areas — in Galveston it is from May to September — can leave a resort operation with a lengthy and unprofitable slack season. Although the original portion of the Jack Tar Hotel, built in 1940 (shaded area on plan below), has had an overall success, the owners have sought a way to keep occupancy high during the off-season. The result is an addition (sketch above) designed to attract small conventions, sales meetings and club activities. The original property has 100 units; the addition has 60 suites, and expansion of restaurant and meeting room facilities.



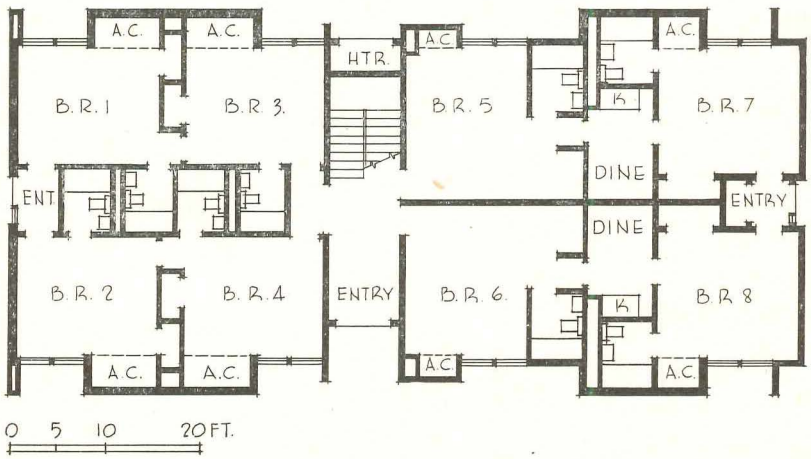


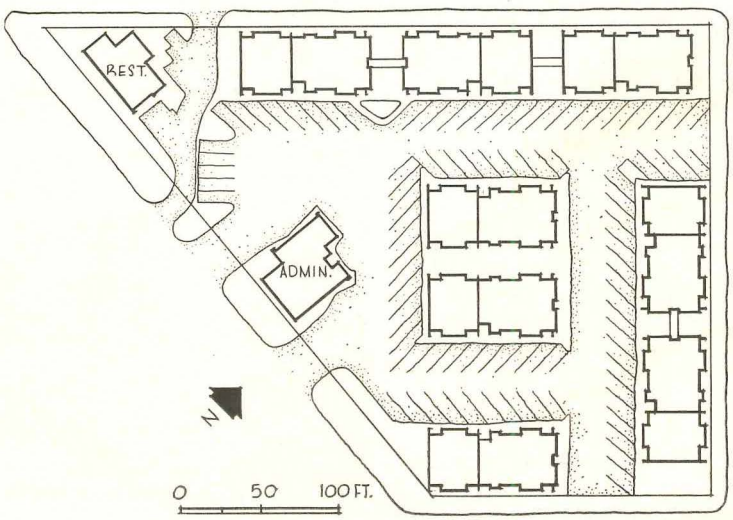
13 JACK TAR HOTEL, GALVESTON, TEX.

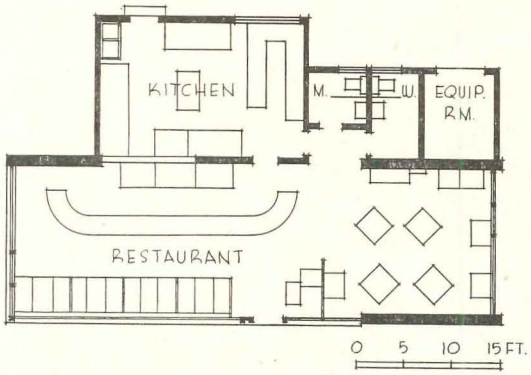


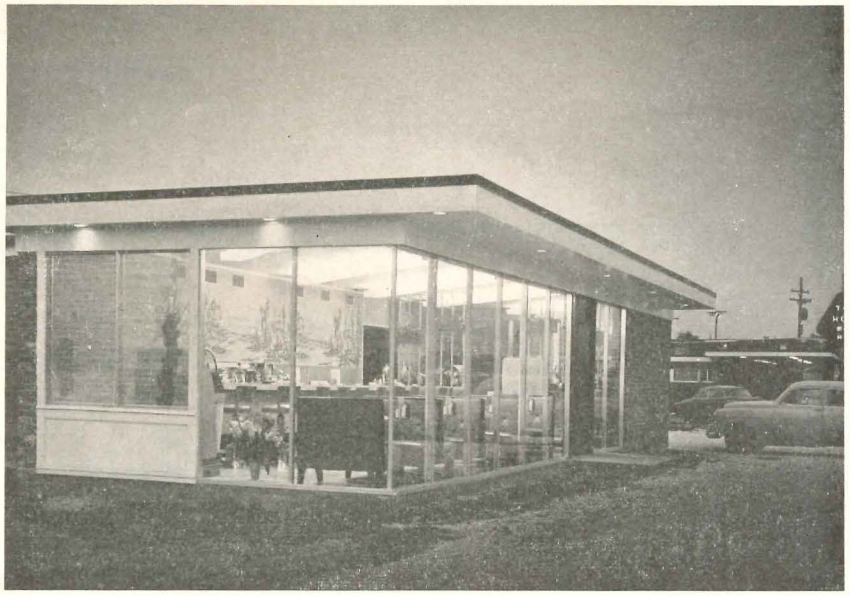
APARTMENT HOTEL COUNTERPART

14 TOWN HOUSE MOTOR HOTEL,
NEW ORLEANS, LA.







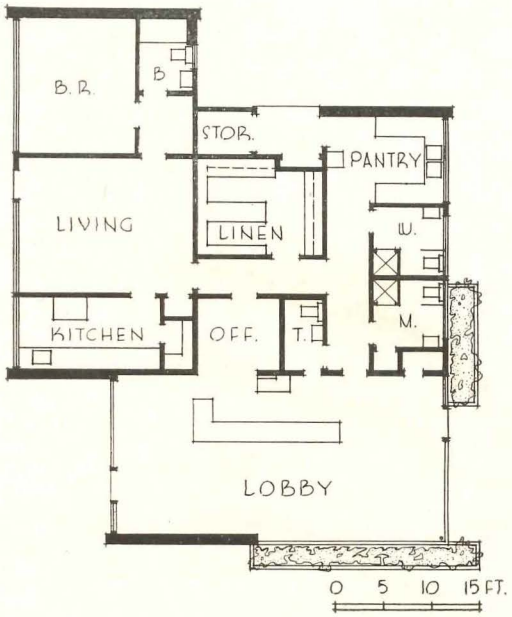


FOR MOTORISTS

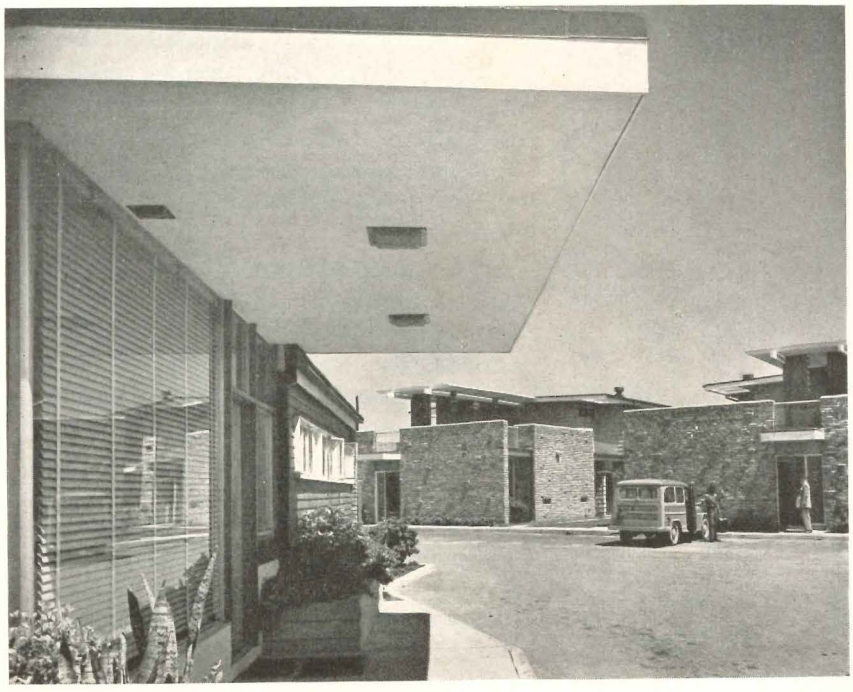
Curtis and Davis, Architects

An unusually adaptable arrangement of rooms has been worked out for this New Orleans motel to permit rental as apartments of one to four or more rooms. The rental units are grouped into eight identical buildings, which feature such items as second floor sun decks, a ¾-ton unit air conditioner in each room, and central forced circulation hot water heating. All the buildings in the project are constructed on concrete slabs on gravel fill, with wood frames, and exteriors finished with brick veneer and cedar shingles. Interiors are finished with plywood and plaster walls and plaster ceilings. Floors are asphalt tile or carpeted. All baths have ceramic tile floors and wainscots, and are equipped with bathtubs and showers.

The restaurant (above) has been located in a corner of the site adjoining a street intersection, where it will attract regular drive-in trade, as well as draw from the motel guests. A small serving pantry has also been included in the administration building (below).



Frank Lotz Miller



PART I

WATER VAPOR CAN DAMAGE BUILT-UP ROOFS

It blisters improperly constructed ones — so good design and workmanship are stressed

1. Air and Water Vapor
2. Economics of Insulation
3. Effect of Solar Heat on Roof Temperature
4. How Materials Absorb Moisture
5. The Importance of a Vapor Seal

Expansion of air and water vapor stretches roofing, forms blisters

By C. E. Lund
Professor of Mechanical Engineering
University of Minnesota

THE MAJORITY OF BUILT-UP ROOFS, insulated or non-insulated, have given satisfactory service. Failures due to blistering are very low (less than 5 per cent of total installations, according to some surveys). But recent investigations have shown that the principal cause is the expansion of water vapor and air, trapped within the roofing, when the sun beats down on it.

This article describes some of the findings of five years of research on roofs at the University of Minnesota Engineering Experiment station, in cooperation with the Insulation Board Institute. The program included, in part: effects of air, moisture and heat upon roof performance; moisture migration within roof structures; and the economic value of insulation.

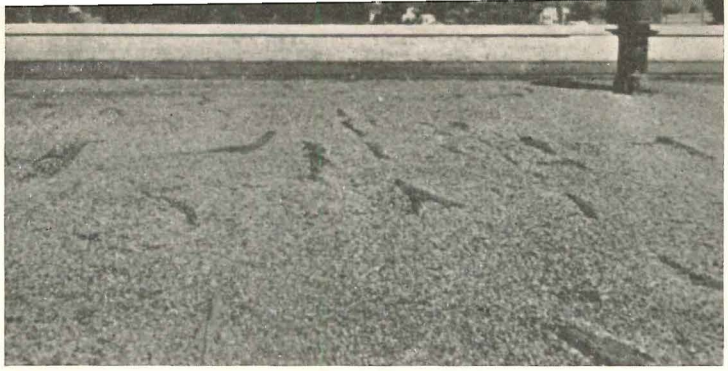
Where good adhesion between the plies of built-up roofing is not attained with the bitumen, some air and water vapor will be trapped. Also, moisture can enter insulation and roofing due to difference in vapor pressure between inside and outside air. Upon a rise in air temperature and exposure to solar heat, the roof temperature may be increased by as much as 80 F. This rise in air temperature produces a corresponding increase in pressure, where air and moisture are trapped.

How are blisters caused by this increased pressure? Air pressure alone is sufficient to raise the weight of a 4-ply roof, but not sufficient to cause separation of the plies in tension. But where moisture is present, say in insulated roofs, the bond may be reduced between roofing and insulation and between plies of roofing, where there is not good adhesion.

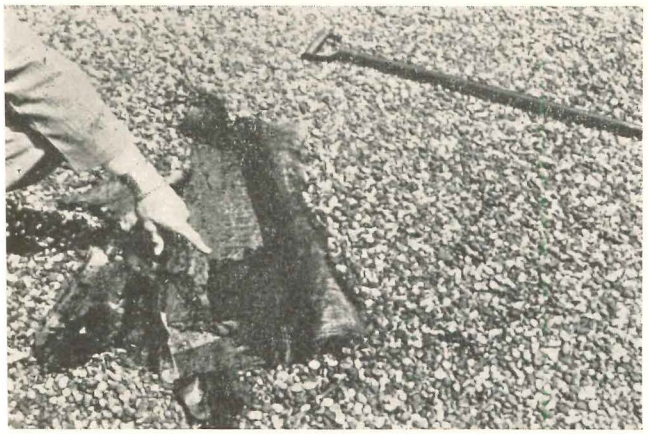
Where there is incomplete adhesion between plies, the trapped air or moisture or both tend to separate the plies along the line of adhesion by a shearing action as well as direct pressure. Once a separation of plies has started, there is a progressive action of stretching of the felts which may eventually produce "alligator" ridges, causing wearing and even failure of the roof. It is apparent that leaks will then appear. Pressures may be channeled from 8 to 10 ft from the source of trouble to the point of rupture.

Where abnormally high humidities are anticipated in a building, a vapor seal (barrier) must be used. In areas of low outside temperatures, a vapor seal is necessary even if inside temperatures and humidities are reasonable.

Concrete decks, regardless of location or use of the building require a vapor seal to prevent residual moisture of the drying concrete from escaping into insulation or roofing.



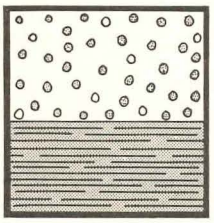
Continuous stretching, contraction of roofing results in "alligator" ridges



Water was found between roofing felts upon opening of a blister

1. PRESSURES DEVELOPED BY WATER VAPOR, AIR

Moisture or air trapped within a roof will cause a considerable pressure when solar heat produces a high roof temperature. Pressures caused by both moisture and air must be considered in the blistering of a roof covering

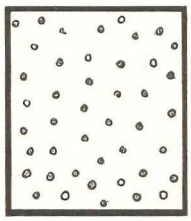


VAPOR PRESSURE

Temperature, F	Pressure, Psi
40	0.122
80	0.507
120	1.692
150	3.716

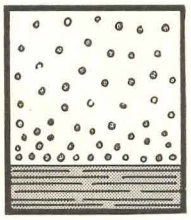
AIR PRESSURE

Temperature, F	Pressure, Psi
40	14.70
80	15.88
120	17.05
150	17.93



AIR AND VAPOR

Temp, F	RH, %	Pressure, Psi Air	Vapor	Total
40	100	14.58	0.122	14.70
80	22	15.75	0.122	15.87
120	7	16.91	0.122	17.03
150	3	17.79	0.122	17.91



AIR VAPOR AND LIQUID

Temp, F	RH, %	Pressure, Psi Air	Vapor	Total
40	100	14.58	0.122	14.70
80	100	15.75	0.549	16.26
120	100	16.91	1.692	18.60
150	100	17.79	3.716	21.51

BEFORE we can fully discuss the overall performance of built-up roofs, a complete understanding of the physical properties of air, water vapor and heat is necessary. These properties account for many of the moisture problems due to condensation upon the inside surfaces of a building and within the walls or roof.

In the following discussion, the fundamental characteristics of air, moisture, and heat, and the relationships existing between them will be discussed. It is apparent that these three elements are capable of causing damage within a roof structure when existing in certain combinations. A roof may be subjected to high air temperatures and solar radiation during much of the year without any apparent damage. However, if in addition to this heat, there is air and moisture present within the roof, the pressures generated by the combination of these elements are apt to cause roof failures.

Air, Water Vapor and Heat

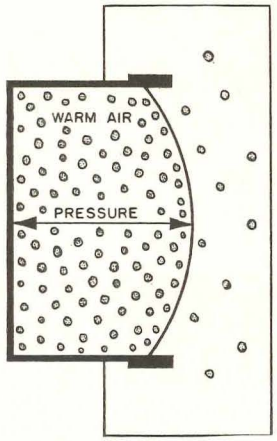
The atmosphere consists of a mixture of air and water vapor. Water vapor is low pressure steam and exerts a pressure which is dependent upon the temperature and the quantity of moisture present. Generally this vapor is invisible, as normally the atmosphere is not saturated or does not contain the maximum quantity of moisture it can hold.

The total quantity of vapor that air can hold is dependent upon its temperature under atmospheric pressure. For example, at 103 F it can hold approximately three times more water vapor than air at 70 F. Air at 70 F can hold five times more water vapor or moisture than air at 28 F. Air at 51 F and 100 per cent Rh contains the same quantity of vapor as air at 70 and 50 per cent Rh.

At low temperatures, outside air can be readily used for ventilating inside spaces having a high humidity or moisture condition.

Consider an indoor space at 70 F and 60 per cent Rh when the outdoor temperature is 0 F. The introduction of outside air and heating it to 70 F will result in air at only 5 per cent Rh which will replace the inside air of high moisture content.

When air is heated from 70 F to 150 F, a pressure increase of 2.2 psi or 317 lb per sq ft will occur if no expansion takes place. If expansion does occur, the volume must increase 11.5 per cent over the original volume if the pressure remains constant.



Vapor Pressure Drop, Psi			
Inside Temp, F	Outside Temp, F		
	10	0	−10
150	3.69	3.70	3.71
100	0.92	0.93	0.94
80	0.48	0.49	0.50

1. EFFECT OF VAPOR PRESSURE

Difference in vapor pressure from the warm side of a confined space to the cold side is the motivating force for passage of moisture through a material. If there is no vapor barrier (in roofs called vapor seal) condensation may occur

2. ECONOMICS OF INSULATION

The left-hand graph indicates the reduction in heat loss through various types of roof decks when using different thicknesses of insulation board. It can be seen that the law of diminishing returns will govern the economical thickness. The right-hand graph shows the maximum inside relative humidity which may be maintained at 70 F (outside air temperature of −20F) without surface condensation for decks having different thicknesses of insulation board

Water vapor will exert its own pressure independent of the air. The magnitude of this pressure is dependent upon the temperature and the quantity of moisture present to produce these pressures. Vapor in air at 70 F and 100 per cent Rh exerts a pressure of 3.72 psi. Air and water vapor increasing from 70 F and 100 per cent Rh to 150 F and 100 per cent Rh will cause a total pressure increase of 5.6 psi providing no expansion takes place. If expansion does occur with no change in pressure, a volume change of 15.6 times the original must take place. This indicates the importance of the presence of moisture and vapor within a confined space (under roofing, for example) and its effect on increasing the volume where expandable materials are involved.

Solar Radiation

Often ignored is the magnitude of the heat given off by the sun and its ultimate effect upon increasing roof surface temperatures. Roof surfaces, due to their black color, commonly attain temperatures far greater than the surrounding air temperatures during periods of exposure to the sun's rays. The quantity of heat absorbed from the sun on any surface is dependent upon the angle of the sun's rays and the color of the surface.

The temperature of a dark colored or black surface may rise 70 F to 80 F above the outside air temperature, whereas the temperature of a light colored surface may rise only 20 F to 30 F. During the summer months, black roof surfaces attain temperatures of 150 F to 170 F. The effect of solar radiation magnifies the problem of increasing pressure and volume within a confined space by increasing the temperature.

Economic Value of Insulation

From an economic standpoint, the return on the initial investment for installation of insulation is probably greater than for any other single material in the building industry.

A roof is generally the largest single area of uninterrupted surface of a building and is the location where insulation can be most effective. Many types of structural insulation boards have been developed with specific physical properties for use in the insulation of roof decks. These specific properties are rigidity, strength and insulating value. These materials have also been especially treated to resist absorption of moisture under ordinary atmospheric conditions and to retain this characteristic during and following the construction of a roof. However, care must be taken in order to prevent the insulation from being damp or wet at the time of construction. Likewise, if acceptable design is not followed in the construction of a roof, failure of the roofing may occur, together with the loss of the insulating value of the insulation. However, these problems can be overcome by proper field control.

In many cases a full return upon the initial investment for insulation may be realized within three to four years. To illustrate this principle, a graphical analysis is shown in Fig 1 to indicate the reduction in heat loss or flow through various types of decks when using different thicknesses of insulation board. Because of the close similarity in heat loss for certain types of uninsulated decks, only two curves are shown. Steel and concrete decks have been classified into one single group and gypsum, wood, and lightweight aggregate and other

FIG 1

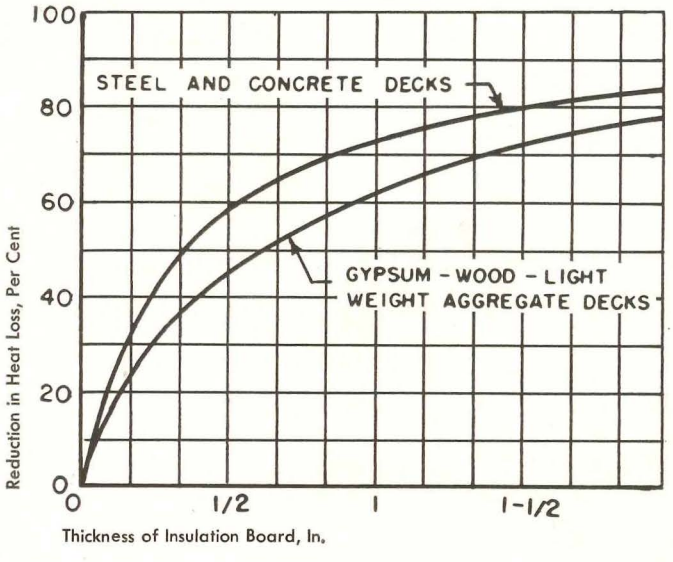
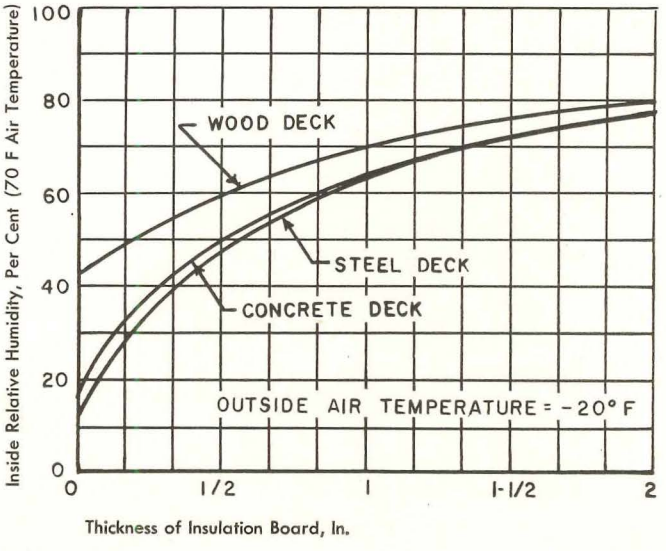
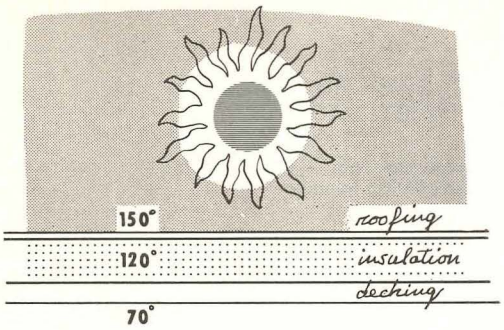


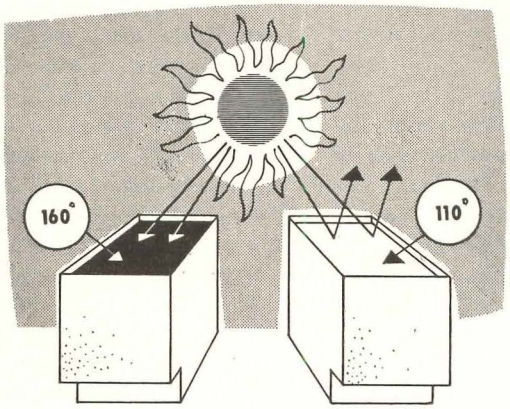
FIG 2

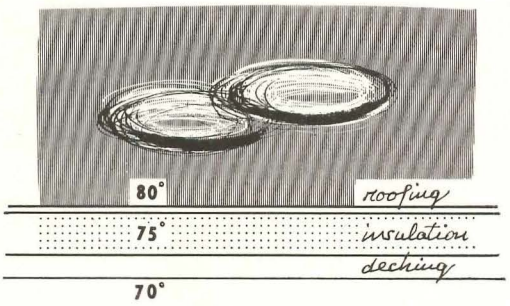


3. EFFECT OF SOLAR HEAT ON ROOF TEMPERATURES

During the summer months, black roof surfaces sometimes attain temperatures of 150 to 170 F, but light roofs reflect some of the solar radiation and cut the heat. If moisture and air are trapped within roofing, the effect of the sun's heat may cause blisters to form. The sketches at right show what roof temperatures could be expected on a sunny and a cloudy day with an outside air temperature of 80 F







well insulated decks are classified into another group.

From this graph it may be seen that the possible heat saving and reduction in heat loss through a roof deck will vary from 46 per cent with the use of ½ in. of insulation to 84 per cent with the use of 2 in. of insulation, depending upon the insulation thickness and the type of deck. Obviously, the law of diminishing returns will govern the economical thickness of insulation.

In serving as a barrier against heat loss, roof insulation serves another extremely important purpose in preventing surface condensation on the interior surfaces of the ceilings. Without this safeguard, cold weather would undoubtedly bring about condensation in buildings maintaining high humidity conditions as a result of industrial processing or ordinary human occupancy where minimum ventilation exists.

If adequate provisions are not made to insulate the roof, materials, equipment and furniture may be seriously damaged as a result of water dripping from excessive surface condensation. The effect of insulation in a typical roof deck upon the relative humidity of the inside air that may be maintained without condensation is shown in Fig 2. Obviously, the outside air temperature has an effect on the maximum humidity which may be maintained within a structure.

The type of deck has a bearing on the heat flow through a section. Steel and concrete decks have approximately the same resistance to heat flow whereas less heat is transmitted through wood, gypsum and lightweight aggregate decks because of their better insulating qualities.

The preceding discussion was concerned primarily with the economic value of insulation. No consideration has as yet been given to the performance of insulation under varying temperature and humidity conditions.

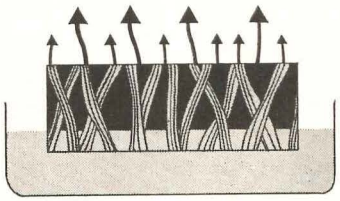
Vapor Barriers

The terms vapor barrier and vapor seal course are synonymous and refer to materials possessing identical characteristics and are generally used interchangeably. However, the term vapor barrier has been in use many years and usually designates materials having high vapor resistance when applied to interior surfaces of insulated walls.

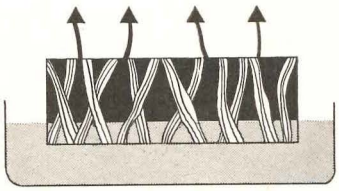
The term vapor seal course is generally used to designate similar materials installed on the under-side of insulated roof structures. The effectiveness of a vapor barrier or vapor seal course is expressed as the quantity of vapor transmitted through the material in grains (7000 gr = 1 lb) per sq ft per hr per in. of mercury vapor pressure difference across a material.

The rate at which vapor will be transmitted through a material is partly dependent upon the vapor pressure existing upon the two sides of the material. If a material is subjected to 150 F and 100 per cent Rh on the cold side, the vapor pressure drop across the material would be 7.52 in. of mercury of 3.7 lb psi. This vapor pressure acts independently of

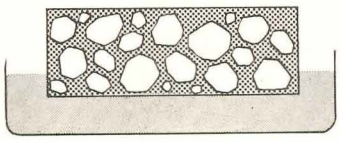
4. HOW MATERIALS ABSORB MOISTURE



HYGROSCOPIC, PERMEABLE



NON-HYGROSCOPIC, PERMEABLE

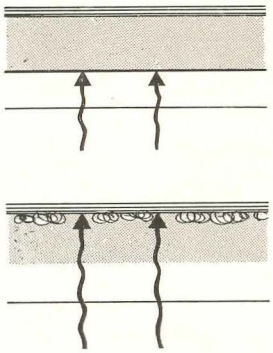


NON-HYGROSCOPIC, IMPERMEABLE

Moisture gets into materials mainly by absorption and diffusion. In hygroscopic materials vapor is absorbed by the fibers, transformed into liquid and re-evaporated; also some moisture passes through in a vapor state by diffusion. In non-hygroscopic materials, vapor is transmitted by diffusion through the interstices only; if there is free water, it may be transmitted by capillary action

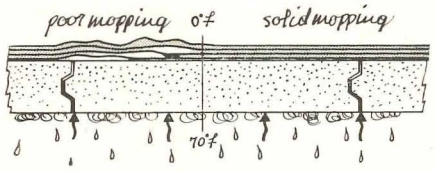
5. THE IMPORTANCE OF A VAPOR SEAL

VAPOR SEAL VS. NO VAPOR SEAL IN INSULATED ROOFS

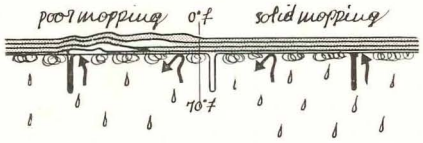


In areas of low outside temperatures, in buildings having high inside humidities, and in buildings constructed with concrete roof decks, a vapor seal is essential. A vapor seal generally consists of two plies of felt solidly mopped with asphalt, and is applied over the roof deck. When the roof deck is insulated, as above, the temperature under the roofing is lowered and condensation may occur if there is no vapor seal

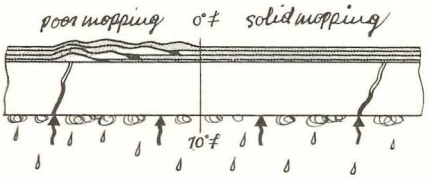
EFFECT OF POOR ASPHALT MOPPING FOR NON-INSULATED ROOF DECKS



Plank Decks



Steel Decks



Poured Decks

Various types of decks, themselves, keep out some moisture, especially steel, but it still can enter through the cracks and joints. The above sketches demonstrate what happens with poor mopping

any other pressure and therefore is the motivating force causing the vapor to flow. The quantity of vapor which will pass through a specific type of material is dependent upon the area and the time during which this condition exists. Thus, different types of materials may be rated for resistance to passage of water vapor in terms of grains per sq ft per hr per in. of mercury vapor pressure difference.

The criterion for an acceptable vapor barrier is that the vapor flow does not exceed 1.0 grain per sq ft per hr per in. of mercury vapor pressure difference. This is usually designated as one "perm."

Four types of vapor seal courses which are representative of the types being applied in the field were selected for test and constructed according to commercial specifications at the University of Minnesota Engineering Experiment Station. Asphalt coatings were used for three of the panels and coal tar pitch for the fourth specimen.

All four types of vapor seal courses showed a zero permeability or that they were impervious to the passage of water vapor. Results of tests indicated that the laps had no effect on a vapor permeability of either the roofing or the vapor seal courses.

Vapor permeability determinations were conducted on five typical types of ten-year built-up roofing. Originally, 15- and 20-year types of roofing were also considered. However, these were omitted when it was found that the 10-year types were impermeable to vapor transmission and therefore it was assumed that the 15- and 20-year types would be equally as impermeable. All types of built-up roofing subjected to 45 days of test or more were found to have a zero permeability rate indicating that built-up roofing is highly effective as a seal against a transfer of vapor.

The results of the investigation definitely established that both the vapor seal courses and the built-up roofing were impermeable to the passage of vapor. It should be emphasized that all vapor seal courses and built-up roofing specimens were solidly mopped with either asphalt or pitch. Tests have shown that 15- or 30-lb felt is not impervious to vapor. Thus, it is apparent that it is the solid mopping of the bitumen which provides the vapor seal. Two of the vapor seal courses consisted of a single ply of felt mopped on one surface and they both were impermeable to the transfer of water vapor.

The permeability of different types of roofing materials is relatively high as compared with materials having vapor seal characteristics. The average rate for one inch of insulation generally used in built-up roofing is 35 to 40 grains per sq ft per hr per in., of mercury vapor pressure difference. Thus, the insulation has a rate of 35 times that of a good vapor seal which is less than 1.0 grains.

As the insulation thickness is increased, the vapor permeability is decreased proportionately. For example, 2 in. of insulation will have one-half the permeability rate of 1 in. of insulation. For all practical purposes, the resistance of the insulation to the transfer of vapor is negligible and thus permits the water vapor to permeate to the cold side when a vapor seal course is omitted.

To obtain a good vapor seal it is necessary that the felts be solidly mopped. Spot or strip mopping of a vapor seal course will permit the vapor to be transmitted through the dry felts, and therefore only a partial vapor seal is obtained.

Likewise in the application of the roofing, spot or strip mopping will permit the vapor to penetrate through the successive layers of the felt until it reaches the cold side. However, in order to obtain a waterproof surface, the final mopping is usually solid and very heavy. This provides a vapor barrier on the exterior side adjacent to the top surface. For strip or spot mopping, vapor is permitted to penetrate through the various plies and condense on the underside of the final layer of felt. This condensation will be either in the form of frost, ice or water depending upon the outside air temperatures. Insulation, in itself, has a very low resistance to the transfer of vapor and thus must be ignored in so far as resisting the transfer of moisture from the warm side to the cold side is concerned.

A clear understanding of the fundamentals of the movement of vapor through different types of materials provides a basis for solving many of the difficulties which are encountered in built-up roof construction. Although all problems appear to be different, they are basically the same.

Nature of Moisture Absoption

A roof consists of several types of materials which may be classified as hygroscopic and non-hygroscopic. Hygroscopic materials readily absorb water. Such a material is untreated wood. The non-hygroscopic materials do not absorb moisture. Such a material is a mineral or glass.

(Continued on page 260)

PRESTRESSING IN TWO SIMILAR STRUCTURES

1 PRECAST BASEBALL STADIUM FOR CITY OF SHERBROOKE, QUEBEC

Architects: Audet, Tremblay & Audet
Consulting Engineers: Crépeau, Côté & Lemieux
Prestressing: The Preload Co. of Canada, Ltd.

2 CAST-IN-PLACE GRANDSTAND FOR JAMAICA TURF CLUB, KINGSTON, JAMAICA, B.W.I.

Architect: Wilson Chong
Consulting Engineers: Concrete Products Co.
E. Winch, Engineer

UP UNTIL A FEW YEARS AGO, all prestressed concrete work, except for circular concrete tanks, was being done in Europe. The Walnut Lane Bridge in Philadelphia and a small highway bridge in Tennessee heralded the beginning of linear prestressing (that is, beams and girders) in the United States.

Then at the start of the Korean war, with the demand for new buildings at an all-time high, architects were faced with a steel shortage, and they began to turn more to concrete, and to explore the potentialities of prestressing.

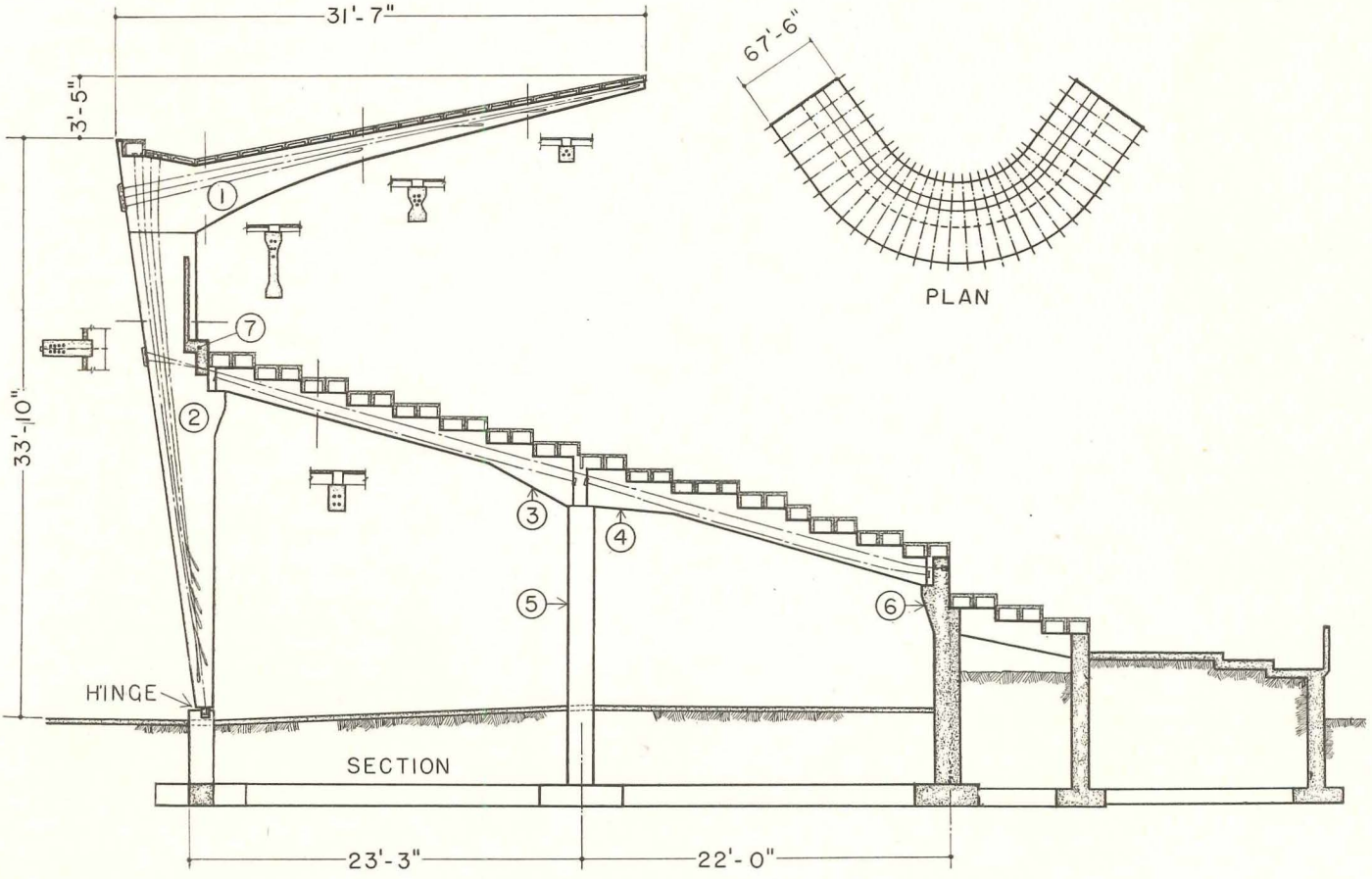
Even though some of these prestressed concrete applications merely substituted concrete for steel in a set of predetermined plans, and hence perhaps did not exploit prestressing as much as if the structure had been conceived in prestressed concrete, there were cases of actual savings in cost.

The motivation for the use of prestressing for the stadium and grandstand, both in the Western hemisphere, was the same as for many structures — to save steel. But an added quotient in both cases is the direct approach in the use of the material, taking advantage of concrete members having no tensile stresses because the tensioning of the steel eliminates them.

Stadium and Grandstand: A Comparison

The stadium is shaped like a boomerang to follow the contour of the baseball

The Sherbrooke Stadium has four main precast parts: a tapered column (2) with a hinge; a cantilevered roof beam (1) and two bleacher beams (3) and (4). Beams (3) and (4) are partially prestressed for handling, then finally prestressed to tie them rigidly to column (2). Column (2) is not prestressed until cantilever (1) is set on top, then tied to frame. The footings are tied with a concrete beam for lateral thrust. Beam (7) is poured in place and joins frames. Joints are concreted



field and has a total exterior length of 406 ft. The grandstand is rectangular and 120 ft long. In section the dimensions are quite comparable. The horizontal projection of the stadium roof cantilever is 31 ft 7 in.; the grandstand, 38 ft. The stadium is 33 ft 10 in. high; the grandstand, 33 ft 2 in.

Structurally the stadium and grandstand are quite different. The principal parts of the 30 stadium frames consist of four pieces, all precast in a casting yard close to the site. A tapered column is prestressed after erection; a roof cantilever is fully prestressed at the yard; and two bleacher beams are partially prestressed in the yard and fully prestressed after erection. All these parts are made continuous by the means of prestressing cables. The components are, in effect, strung together by the wire cables.

The nine frames of the grandstand, on the other hand, are cast in place two at a time, and connected by means of tie beams. An interesting aspect of the construction is that the various high-stress-carrying members, including the 40 ft cantilever, reduce the bending moments in each other to a great extent, giving small sections.

1. Sherbrooke Baseball Stadium

The stadium is the first of its kind to be built in Canada, making use of both methods of prestressing: pre-tensioning and post-tensioning.

Sherbrooke's original stadium, of wood, was costly to maintain, so when it burned down in 1951 they decided to rebuild in reinforced concrete. At the time it was to be built, restrictions on steel for this type of structure precluded its construction in reinforced concrete, and the architect, Jean-Paul Tremblay, felt that prestressed concrete was the answer.

The structure is comprised essentially of a series of 30 frames, identically spaced at 14 ft 6 in. on the exterior, supporting the bleachers and roof.

The frames are prestressed by post-tensioning (the wire cables are tensioned after the set of the concrete, the transfer of the forces being made through end anchorages).

Bleacher and roof slabs are pre-tensioned with parallel wires which are stretched on a long bench before the concrete is poured. After the concrete has hardened, the wires are cut and the tensioning force is transferred to the slab through the bond of the wires to the concrete and through the wedge effect of the ends of the cut wires (the ends become fatter since they are no longer being stretched).

G. M. Demarque, chief engineer of the Preload Co. of Canada, Ltd., describes the action of the frame as follows*: Each frame consists of four precast elements: (1) a 28-ft tapered column with a hinged base weighing 6 tons; (2) a 31-ft cantilever roof beam held to the column by prestressing, weighing 4½ tons; (3) and (4) two 23-ft bleacher beams weighing 3 tons each.

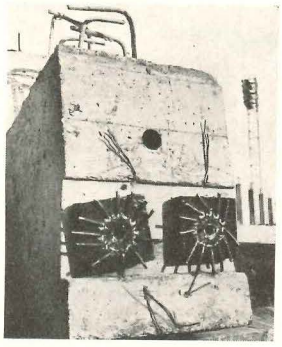
The tapered column is erected before prestressing, and has enough mild steel reinforcing to permit handling.

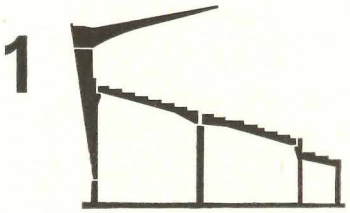
The two bleacher beams are partially prestressed in the casting yard so that they can withstand their own weight and the dead load of the bleachers as independent beams.

The cantilever roof beam is fully prestressed at the yard. It is set on top of the column and the cables of the column are threaded through holes in the end of the cantilever. When tensioned by a jack from the top part of the cantilever, these cables prestress the column and fasten the cantilever to it. Cables were sheathed in cardboard forms to prevent bonding to the concrete. Preload anchor plates were used.

The joint between the two bleacher beams above the intermediate column is poured in place, and initially the joint between the top bleacher beam is left open and is poured after the roof and bleacher slabs are set. The cables threaded through the tops of both bleacher beams and anchored outside the column and the abutment wall are tensioned to provide continuity. The entire structure, says Mr. Demarque, then becomes a rigid frame to take all live loads.

* *Excerpts from an article in the* Canadian Builder, *August, 1952.*





Tapered column, with unstressed cables projecting

Bleachers beams resting on intermediate column; end above

The Jamaica grandstand, in contrast to the Sherbrooke Stadium, is poured-in-place, and then prestressed. Bleachers are precast of ordinary reinforced concrete and the asbestos-sheet roof is supported by the tie beams. There are nine frames 15 ft apart

The stands and the roof are made of U-shaped slabs, 16 in. and less in width, 1¼ in. thick, and about 10 in. high for the stands and 4 in. high for the roof. The joints are filled with a special plastic.

2. Grandstand at Marlie, Old Harbor, Jamaica, B.W.I.

Prestressed concrete was selected for a number of reasons, listed by the architect as follows:

(1) The use of higher working stresses with prestressing permitted the design of smaller sections which was used to advantage to give structure a light, sweeping effect. This would have been very difficult in ordinary reinforced concrete.

(2) Since the West Indies is an area of severe hurricanes and earthquakes, the architect felt that a structure that had some "give" would be best suited to resist such forces. A sudden force might crack a section of a member, but the section should return to its original position once the force was removed. An analogy would be the case of a person catching a ball. The hand would have to move with the ball to nullify the impact.

(3) Since prestressed concrete is not affected by joints, only two frame forms were made to pour nine frames. Shrinkage cracks, in other words, would have no effect. These forms required three weeks to make and erect, and after that each frame required a week to pour, strip and prestress. Precast concrete risers and treads were cast on a concrete slab at the site.

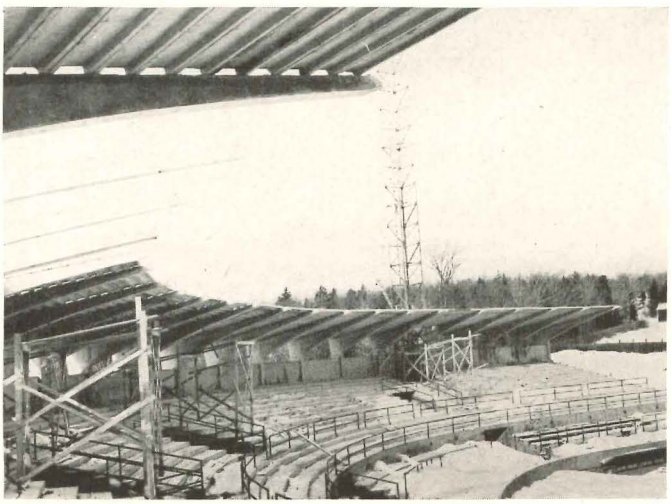
(4) A cantilever of similar length in reinforced concrete would contain a maze of reinforcing which would have made pouring difficult and unpredictable.

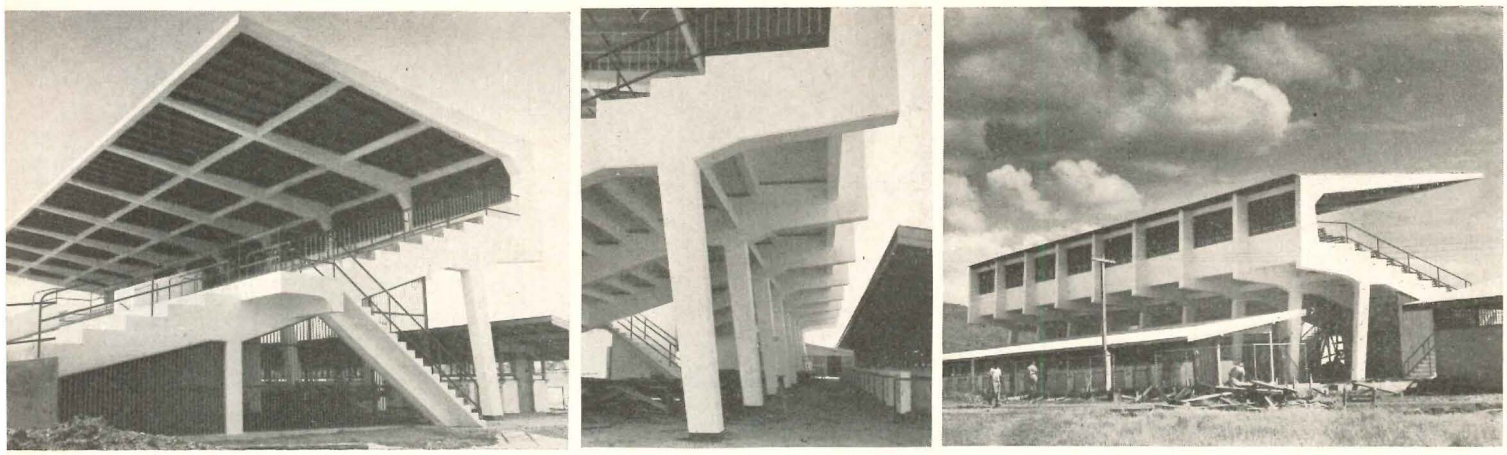
(5) The scarcity of steel in British countries makes the use of prestressed concrete for certain types of structures more competitive.

Cantilevered roof beam being lowered into place

Progress photos follow the erection of the framing members which were precast close to the site and erected by a crane. Also shown are the precast bleacher and roof slabs which were pre-tensioned (wires prestressed before concrete pour) in a nearby factory

Stadium with precast, prestressed bleacher slabs and roof slabs spanning frames





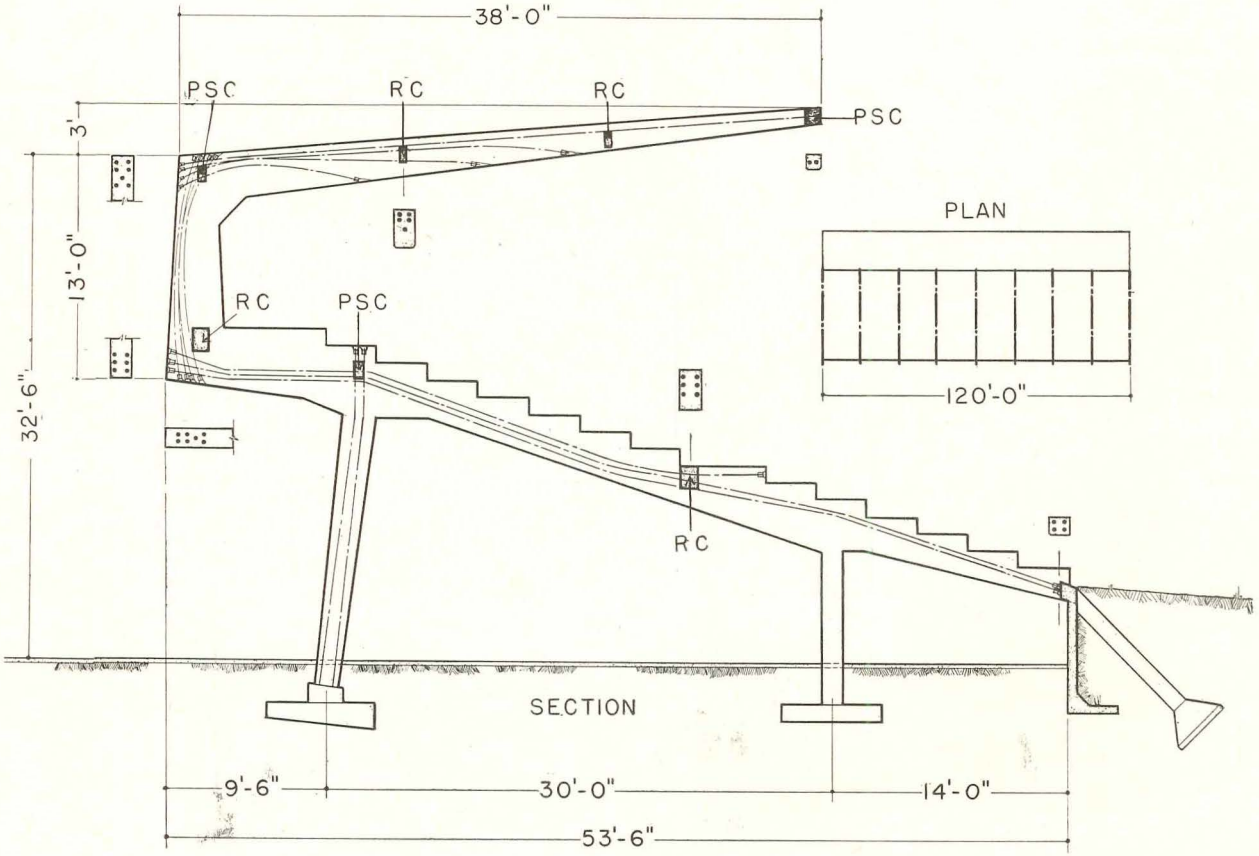
The Jamaica grandstand is designed strong enough for hurricane winds

(6) Cost, appearance, speed of construction and utility convinced the architect that the prestressed concrete was most suitable for all the main members.

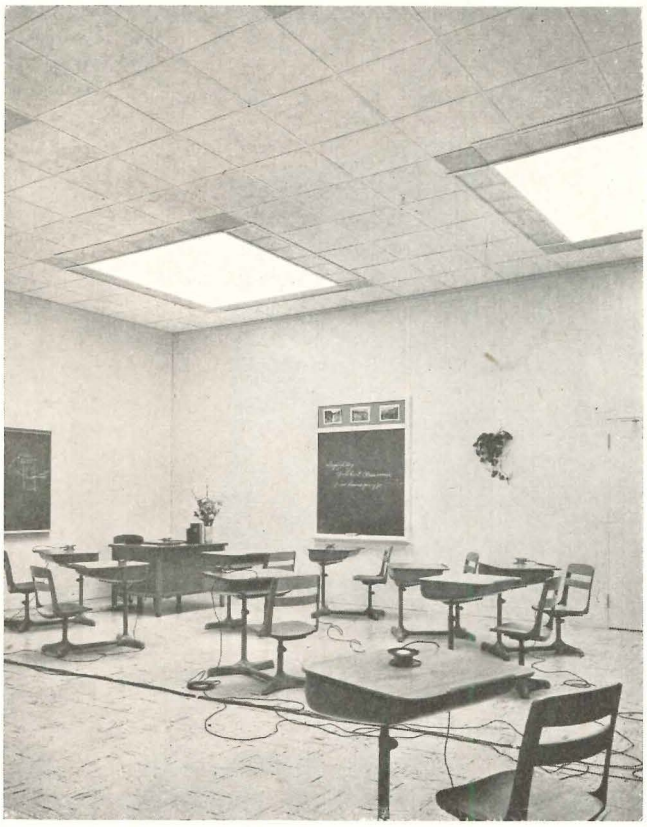
There are nine frames and eight bays, the frames being connected by seven tie beams, three prestressed and four reinforced concrete. When the frames were stripped of formwork and shoring, the reinforced concrete held the frames together. The prestressed ties were provided with holes, and these ties were not stressed until all frames were completed. The cables in the prestressed ties extend the entire length of the building and are stressed in one operation.

Since the framing members were post-tensioned, it was necessary to insert inflatable rubber hoses in the forms around which the concrete was cast. When these hoses were deflated and removed, holes were left through which the cables were later strung and then tensioned. The Freyssinet system of anchorages was used.

The nine monolithic frames are tied together by seven beams, three prestressed and four reinforced. Due to the overhanging arm and roof cantilever, bending moments are reduced, resulting in small sections. The thrust of the frame is taken by counterfort columns in contrast to the Sherbrooke Stadium where the abutment walls resist this load



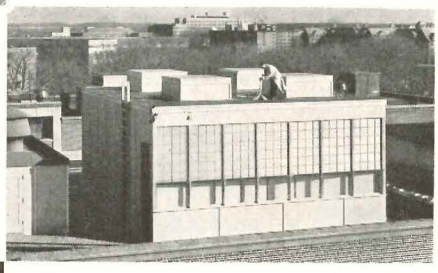
PRISMATIC GLASS PANEL SKYLIGHT CUTS GLARE, SOLAR HEAT



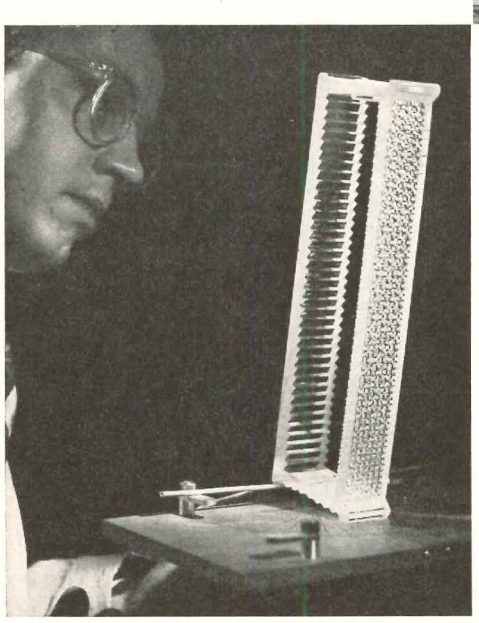
Cooperation between an architect, a manufacturer and a university research department facilitated the development of a new system for glass-unit toplighting of schools, industrial and commercial buildings and other structures. The architect was John Lyon Reid; the manufacturer, Kimble Glass Company; the research department, University of Michigan's daylighting laboratory, directed by Dr. Robert A. Boyd. The result of their joint efforts was the development of the "Kimble Toplite System," a skylight construction system which employs prismatic glass panel units in a factory-fabricated aluminum grid framework.

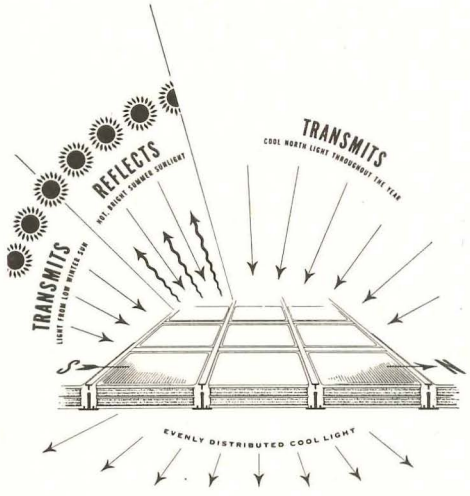
Dr. Boyd was already experimenting with skylighting units which were to result eventually in the new toplight system, when architect Reid stopped in at the daylighting laboratory to discuss methods for roof-lighting a school building. Their talk and subsequent cor-

(*Continued on page 198*)



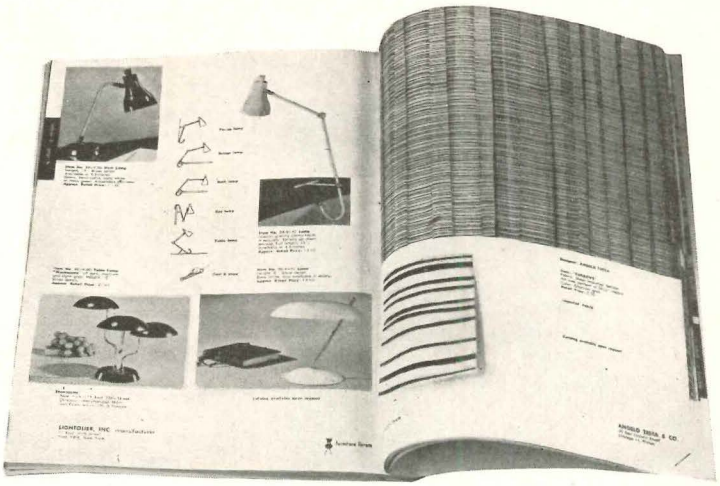
Above: interior of mock-up classroom used to test toplight. Right; exterior of classroom. Wells do not have to be this deep. Below: section of glass unit, showing prismed upper part, light-directing lower part. Bottom right: diagram illustrates how toplight reflects and transmits light during various seasons of the year





LITERATURE for the Office

SOURCE REFERENCE FOR CONTEMPORARY FURNITURE



Inside pages illustrate the various types of furnishings, such as these which show some contemporary lighting units and a detailed photograph of a fabric pattern, accompanied by actual swatch of material

Furniture Forum. This attractive handbook, published quarterly, is a source reference catalog of selected home furnishings. Consisting of new designs in contemporary appointments for the home, the handbook is designed for architect, interior designer or layman. Biographical sketches of participating designers serve as an introduction to the sections which follow. These include furniture, lighting, fabrics, accessories and floor coverings. Photographs of the various items are accompanied by a brief description of the article, dimensions, name of the designer, source of the item and retail prices. The fabrics section includes sample swatches of some materials, so that the actual scale, color and texture can be seen. Latest selections from the Museum of Modern Art — Merchandise Mart Good Design Exhibitions are included in the volumes. The handbook is so designed that the quarterly editions may be compiled into one annual reference book. Illus. One year subscription, $4.50; Annual Bound Vol., $5.00. Pub. by Phillip L. Pritchard, Depot Sq. Bldg., Englewood, N. J.

* ***Other product information in Sweet's Architectural File, 1953.***

Wood Preservation

Handyman's Guide to Home Wood Preservation. This booklet is full of practical information for anyone who must use untreated wood for any purpose. It outlines the company's overall program to acquaint people with the value and economy of treated wood, or "built-in" termite and rot protection. Step by step application of water-repellent wood preservatives containing pentachlorophenol is given. 14 pp., illus. The Dow Chemical Company, Midland, Mich.*

Roof Insulation

Fiberglas Roof Insulation Preferred. Folder contains data on thermal conductance and application specifications. Some 40 photographs of installations in buildings throughout the United States point out the various types of buildings in which the material may be used. Following the illustrations is a list of 350 additional jobs, along with the names of architects, general contractors and roofing contractors. Folded into a convenient 8½- by 11-in. size, the brochure is actually a 33- by 25-in. sheet. Illus. Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

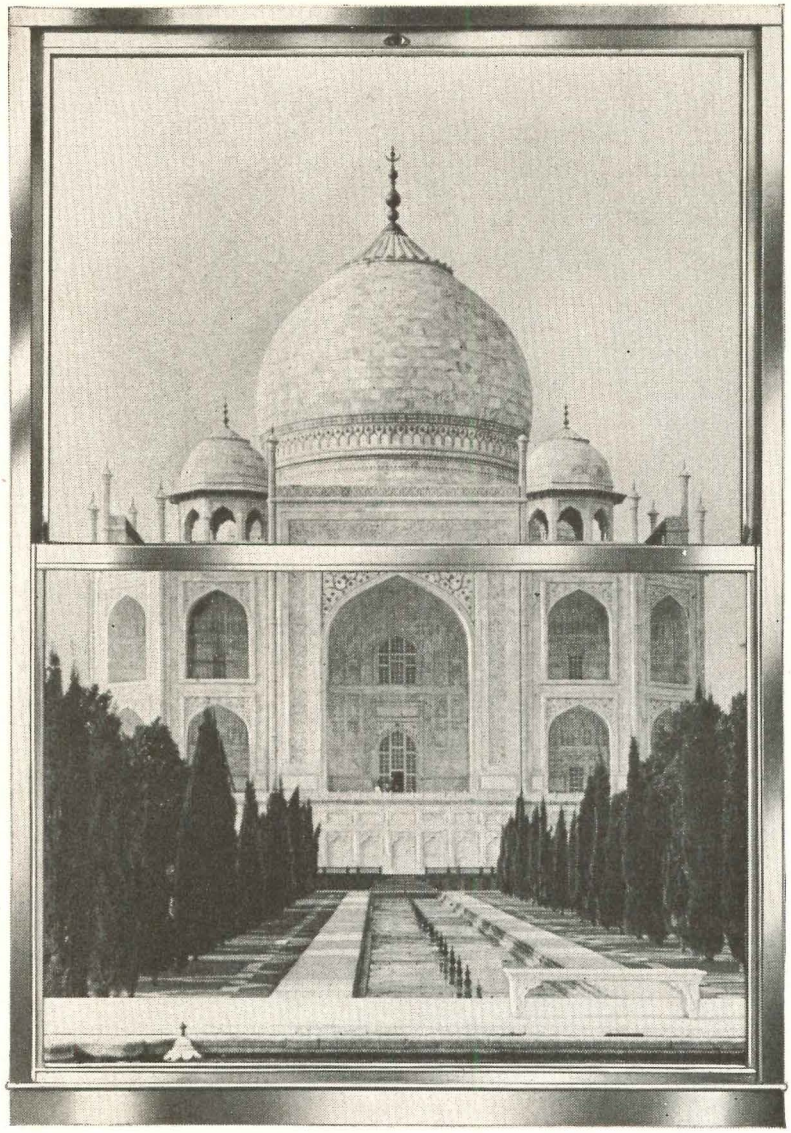
Heating in Classrooms

Five Ways Teachers Can Improve Learning. The basic premise of this booklet is that overheating in schools makes students drowsy and difficult to instruct. Suggestions on how to solve this problem are based on research by Dr. D. B. Harmon, psychophysicist and Minneapolis-Honeywell school consultant. They cover such points as effects of solar energy, danger of post-luncheon "blackouts," adjustment of classroom temperatures for high or low activity, etc. 5 pp. Minneapolis-Honeywell Regulator Company, 2743 Fourth Ave. S., Minneapolis 8, Minn.*

Air Filters

Continental Automatic Self-Cleaning Air Filters. Brochure features automatic capacity table plus engineering and performance data. Descriptions and diagrams of filter media, "ferris wheel action" and "self-cleaning action" are also included. Complete technical data kit available on request. 3 pp., illus. Continental Air Filters, Inc., Louisville, Ky.

(*Continued on page 232*)



What?

Adlake windows in the Taj Mahal?

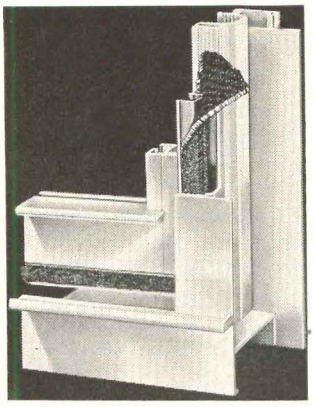
Unfortunately, Shah Jahan didn't have access to ADLAKE Aluminum Windows when he began the Taj in 1632...but we believe that, *had* ADLAKE Windows been installed, they would still be in perfect operating condition today!

...for, with no maintenance whatever,

Adlake Aluminum Windows will last longer than the building!

Every ADLAKE Window gives these "PLUS" features

- **Woven-pile Weather Stripping and Exclusive Patented Serrated Guides**
- **Minimum Air Infiltration**
- **Finger-tip Control**
- **No Painting or Maintenance**
- **No Warp, Rot, Rattle, Stick or Swell**



ADLAKE Windows pay for themselves by eliminating all maintenance costs except routine washing. Once installed, they'll keep their good looks and easy operation for the life of the building, with no painting, scraping or other maintenance whatever! What's more, their woven-pile weather stripping and patented serrated guides give an everlasting weather seal!

ADLAKE Aluminum Windows assure lifetime value, beauty and efficiency. Write for full details...you'll find ADLAKE representatives in most major cities.

Adlake 96th year of serving the transportation and building industries

THE Adams & Westlake COMPANY

Established 1857 • ELKHART, INDIANA • New York • Chicago

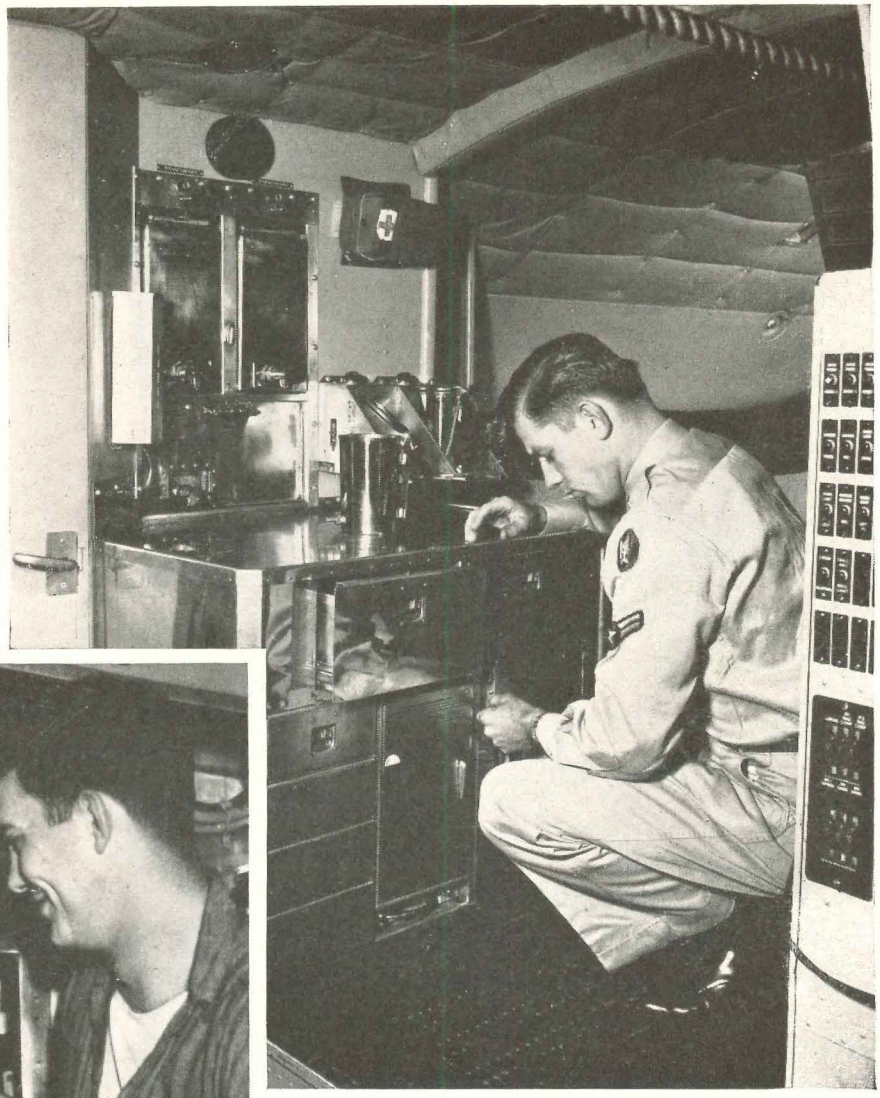
Also Manufacturers of ADLAKE Mercury Relays and ADLAKE Equipment for the Transportation Industry

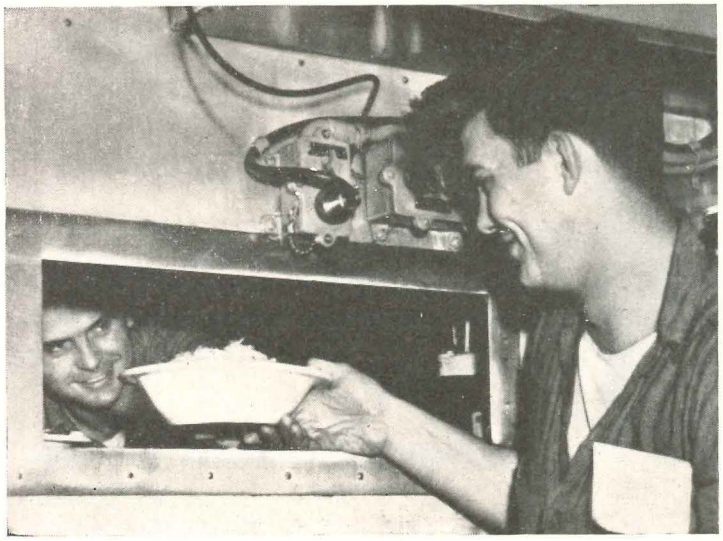
Sky-High

or

Fathoms

Deep





It's always STAINLESS STEEL

where

Food is

Concerned

From airplanes to subs and all points between, stainless steel is the one metal most associated with the preparing and serving of food. Why? Because it's the one metal that best combines *all* the desired virtues: beauty, strength, hardness, cleanliness, long life, low maintenance, easy fabrication, and high resistance to corrosion and heat. ● Now those are qualities to conjure with! Where can *you* use them? Where can you employ Allegheny Metal to improve your product or reduce costs in your equipment—and how can we help you? *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

You can make it **BETTER** with

Allegheny Metal

AL

TIME-TESTED STAINLESS STEEL

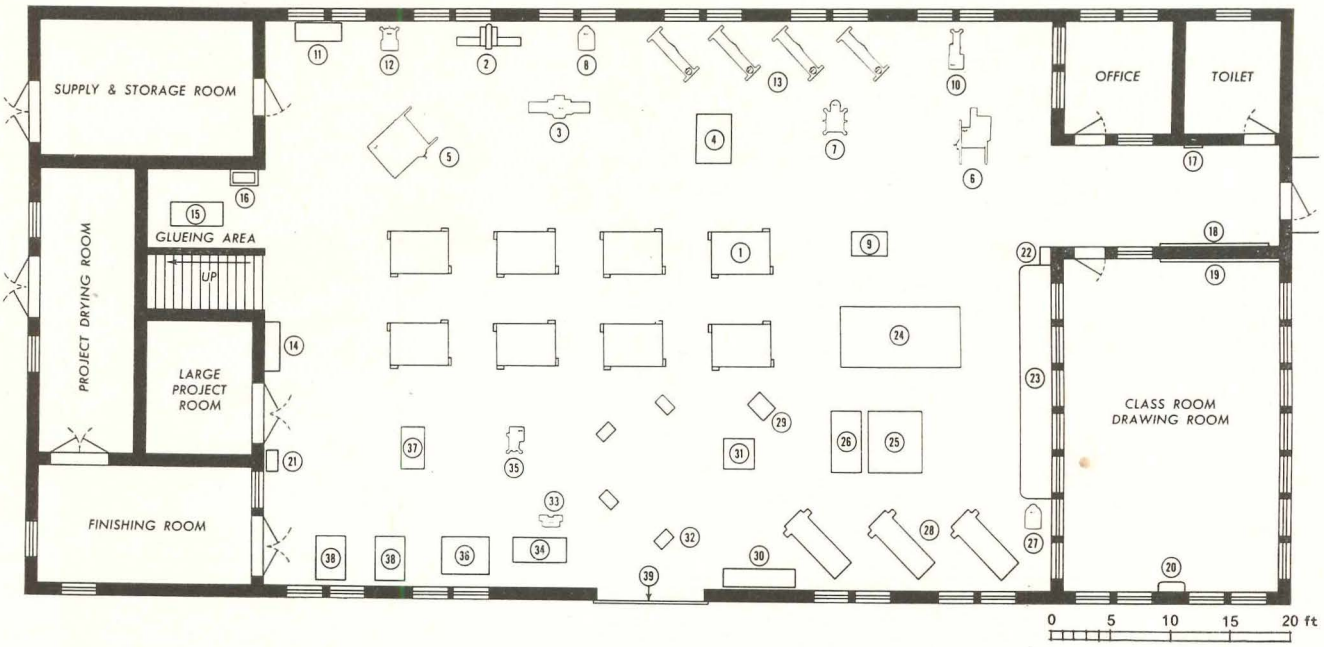
Warehouse stocks carried by all Ryerson plants

W&D 4553 B

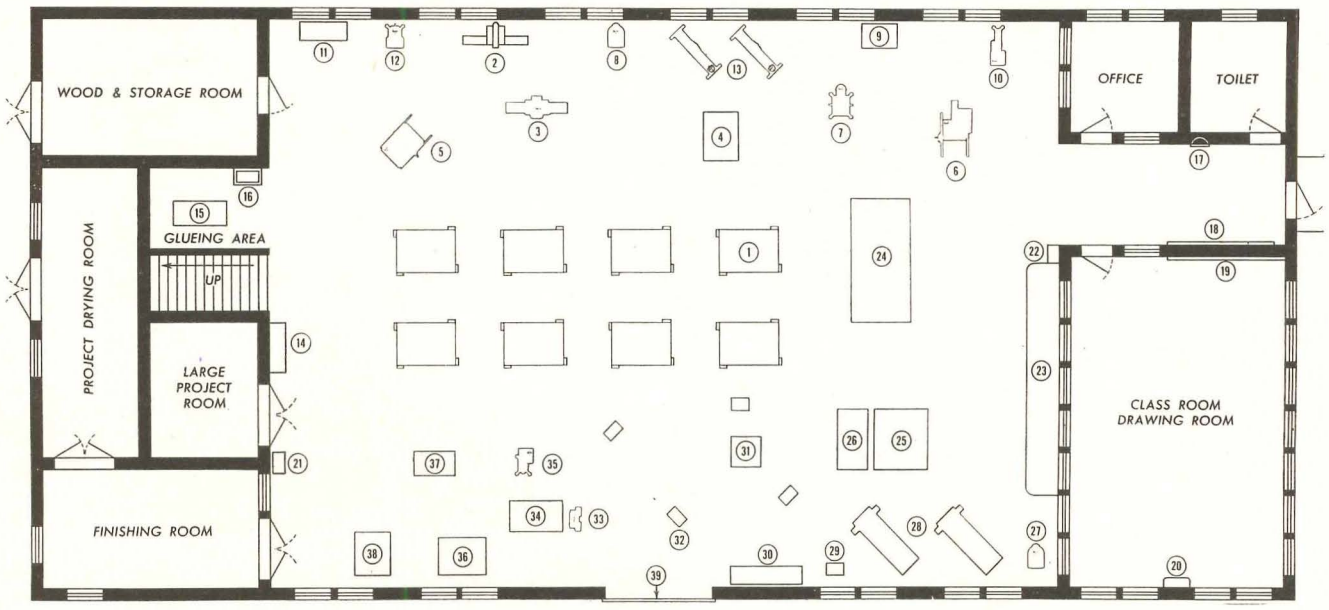
SCHOOL SHOP PLANNING: 1

The following sheets on school shop planning present the award winners for a recent international contest, held at the American Vocational Association Convention, and sponsored by the Delta Power Tool Division of The Rockwell Manufacturing Co. Using the theme "School shops for today and tomorrow," the contest was developed to gather current thinking in the field of shop planning for vocational schools in each of six age-levels of instruction.

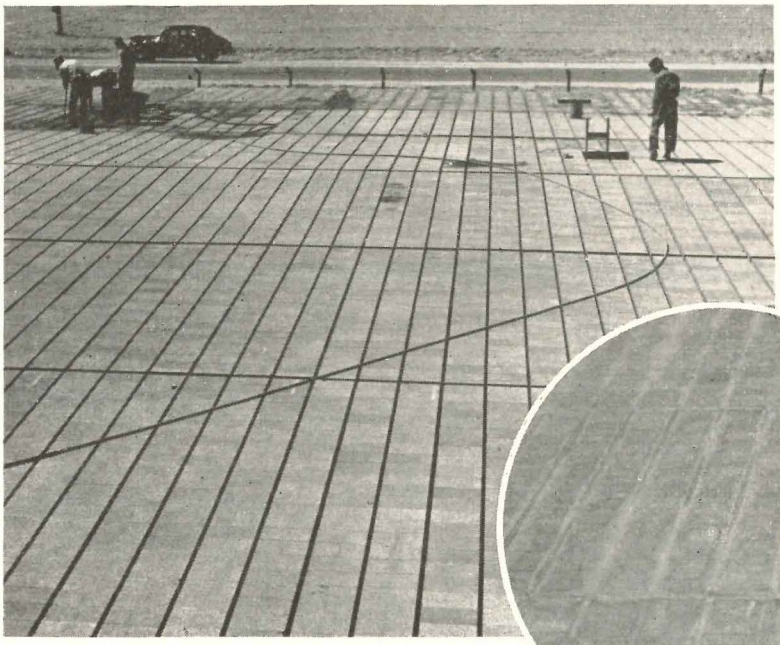
Six divisional awards were made, plus a grand award for the plans on this sheet by Anton M. Sevcik, Industrial Arts instructor, El Campo High School, El Campo, Tex. It is a General Shop plan for Senior High School grades 10–12. It is designed for one teacher and simultaneous activities in woodworking, sheet metal, general metal work, electricity and machine shop. Plan at bottom is for 24 pupils, the top one is expanded for 30 or more. Six project storage rooms are on a balcony.

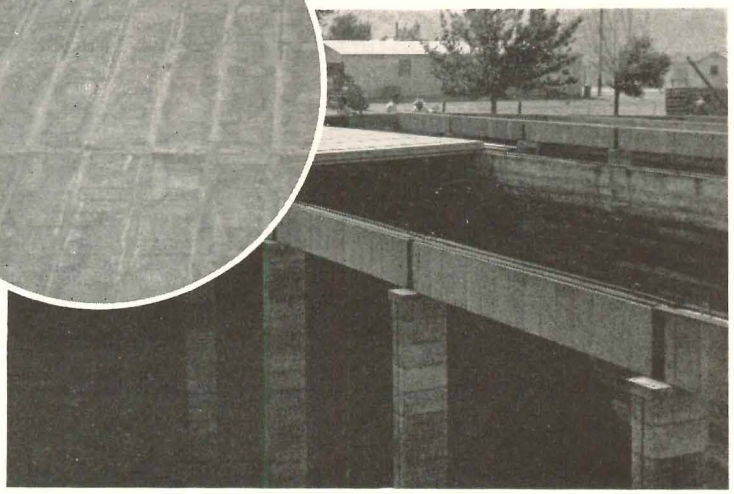


1. 4-Student Work Benches
2. Cut-off Saw (Radial Arm—12″)
3. 8″ Jointer
4. 30″ Planer
5. 10″ Tilting Arbor Saw
6. 20″ Band Saw
7. Shaper
8. 14″ Drill Press
9. Mortising Machine
10. 24″ Jigsaw
11. Belt Sander
12. Disk Sander
13. 12″ Wood Lathe
14. Woodworking Tool Cabinet
15. Gluing Table
16. Janitor's Sink
17. Drinking Fountain Recessed in Wall
18. Bulletin Board
19. Blackboard
20. Washstand
21. Grinder—Slow Speed (Wet)
22. Electrical Panel (Master)
23. Electrical Work Bench
24. Sheet Metal Bench
25. 4′ Sheet Metal Shear
26. 4′ Sheet Metal Break
27. 14″ Drill Press
28. 13″ Metal Lathes
29. Arbor Press
30. Metalworking Tool Cabinet
31. Drill Press (Radial)
32. Anvils
33. Grinder
34. Welding Booth
35. Metal Cutting Bend Saw
36. Milling Machine
37. Power Hack Saw
38. Shaper (Metal)
39. Sliding Door



TIME AND AGAIN... CASE HISTORIES PROVE Strestcrete a means of SUPERIOR CONSTRUCTION rapidly accomplished





The Job:

Replacement of wood roof structure on water reservoir.

Location:

Biggs Air Force Base, Texas.

The Material:

8400 square feet of 6" STRESTCRETE* slabs and 270 lineal feet of STRESTCRETE beams.

The Elapsed Time:

Here is what the contractor had to say: "Speed was of the essence on this job. Since the water supply from this reservoir could only be out of service a very short time, STRESTCRETE provided the ideal material, because it permits permanent construction to be rapidly accomplished. The total elapsed time for wrecking and salvaging the old wood structure and erecting STRESTCRETE columns and roof slabs was only 14 days!"

Time required for setting 8400 square ft. of 6" STRESTCRETE slab and 270 lineal ft. of STRESTCRETE beams: **14 HOURS!**

• For detailed information—consult the STRESTCRETE Licensee nearest you. Planning assistance if desired.

STRESTCRETE LICENSEES

- **ADAMS CONCRETE PRODUCTS CO.**
  1418 Ecorse Road, Ypsilanti, Michigan
- **ANCHOR CONCRETE PRODUCTS, INC.**
  Wabash Ave. at 2450 William St., Buffalo 6, New York
- **ATLAS BUILDING PRODUCTS CO.**
  P. O. Box 601, El Paso, Texas
- **BASALT ROCK CO., INC.**
  8th and River Streets, Napa, California
- **CLEVELAND BUILDERS SUPPLY COMPANY**
  1276 West Third Street, Cleveland 13, Ohio
- **ILLINOIS BRICK COMPANY**
  228 North La Salle Street, Chicago 1, Illinois
- **LA BRIQUE DU NORD, LIMITEE**
  Rouyn, Quebec, Canada
- **PLASTICRETE CORPORATION**
  College Highway, Hamden 14, Connecticut
- **ROCKLITE PRODUCTS**
  Ventura Boulevard, Ventura, California

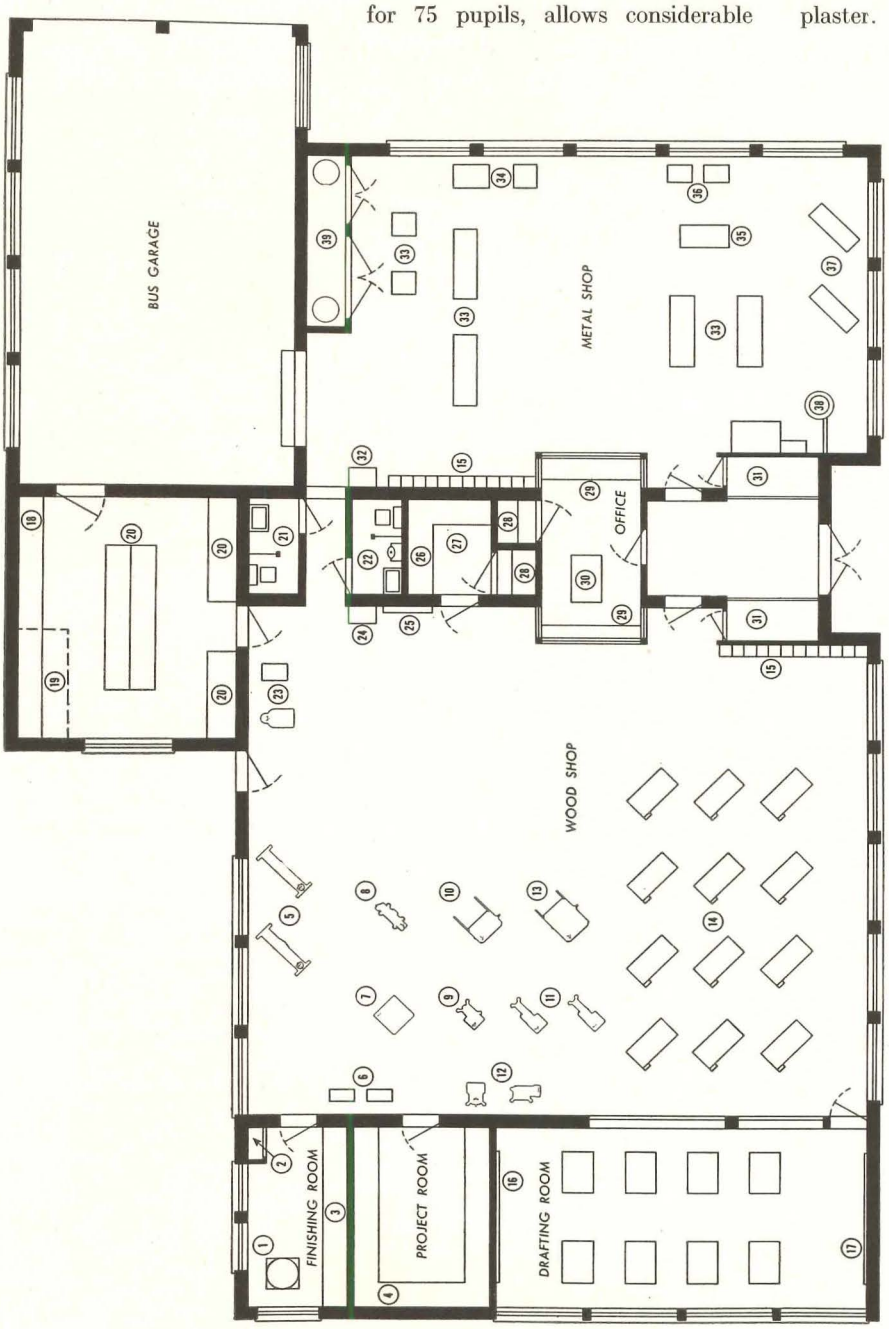
STRESTCRETE

Licensed under U. S. Patent
*Trade Mark Reg.

FLOOR and ROOF SLABS

SCHOOL SHOP PLANNING: 2

This divided shop arrangement, designed by E. A. Miller, Instructor of Industrial Arts, Jal Public Schools, Jal, N. M., was given the award for the high school shop division, grades 9–12. The layout provides for woodwork, welding, drafting, crafts and machine shop courses. It was planned for 75 pupils, allows considerable room for expansion. Interior dimensions of the wood shop are 39 by 50 ft; the metal shop is 25 by 42 ft. The shops were designed to occupy a fireproof brick building, with inner walls of lightweight concrete blocks. Floors are concrete, roof is steel decking and the ceiling is of an acoustic type of plaster.

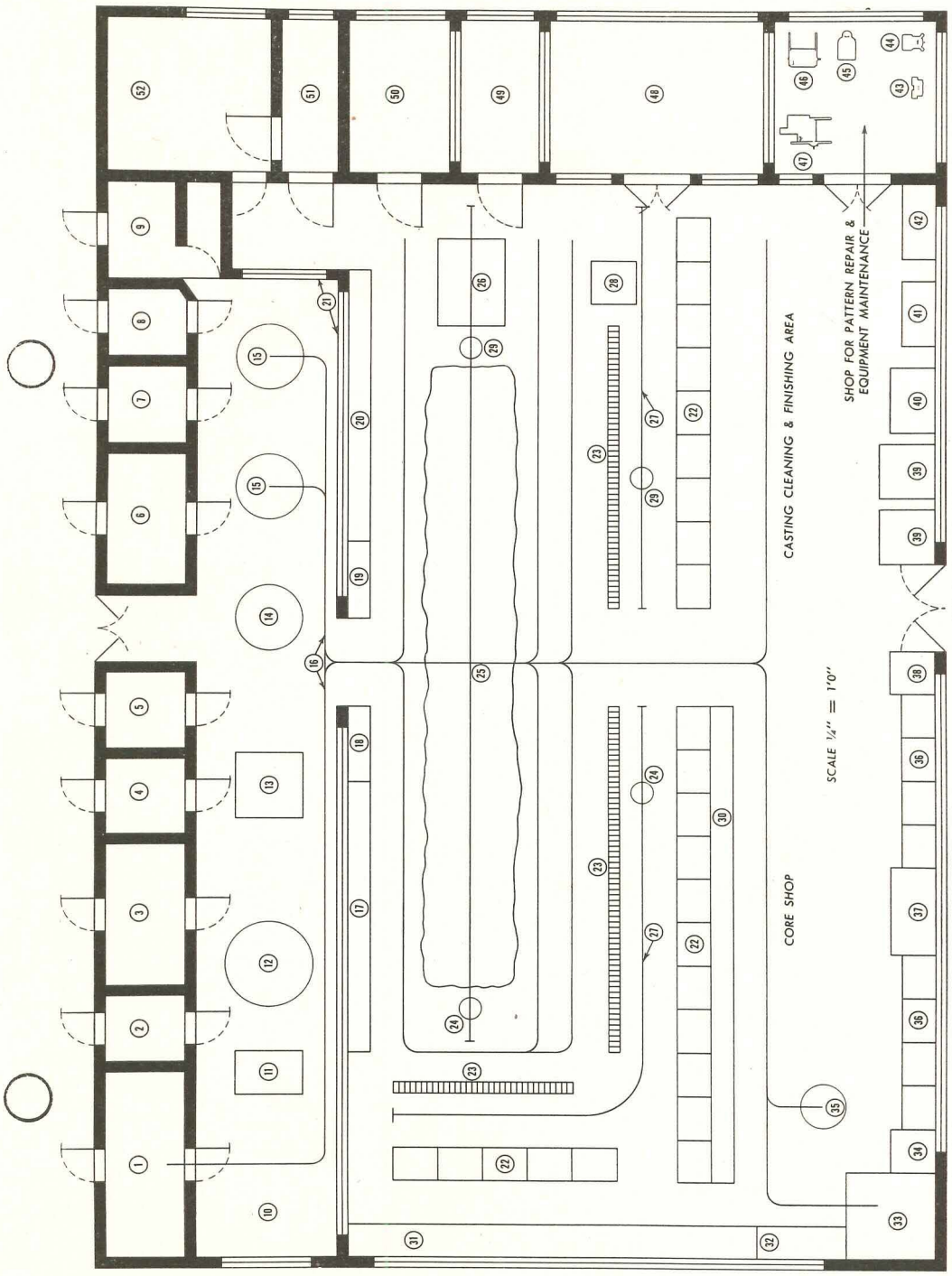


1. Finish Table
2. Cabinet
3. Drying Table
4. Project Storage
5. 12″ Lathes
6. Grinders
7. Shaper
8. 6″ Jointer
9. Band Saw
10. Tilting Table Circular Saw
11. Scroll Saws
12. Band Sanders
13. Tilting Arbor Circular Saw
14. Shop Desk
15. Lockers
16. Blackboard
17. Bulletin Board
18. Wood Storage Rack
19. Overhead Plywood Storage
20. Wood Storage
21. Girls' Rest Room
22. Boys' Rest Room
23. Drill Presses
24. Wash Sink
25. Clamp Rack
26. Tool Panel
27. Tool Storage
28. Shelves
29. Book Storage
30. Desk
31. Project Display Cases
32. Wash Sink
33. Metal Desk
34. Arc Welder
35. Drill Press
36. Grinders
37. Metal Lathes
38. Foundry
39. Generator Room

SCHOOL SHOP PLANNING: 3

The award for the technical and vocational high school division was given for this plan for a foundry practice shop, grades 9–14, by Edward Saks, Instructor of foundry practice, Murrell Dobbins Voc. School, Philadelphia, Pa. It was planned for 50 pupils. The plan places all melting units behind a brick and glass wall, and in an area that, while exposed to the instructor's view, confines fumes where they can be readily exhausted. A monorail system serves the entire shop area. Shower and locker rooms are also provided.

The contest jury included: Gilbert G. Weaver, Director of Training for the Bureau of Vocational Curriculum of the N. Y. State Education Dept.; William W. Theissen, Asst. Superintendent, Milwaukee Public Schools; Dr. C. H. Groneman, Head, Industrial Education Dept., Texas A. & M.; Dr. C. C. Caveny, Dean, Chicago campus, Univ. of Ill.; and Hans W. Schmidt, School Building Planning Consultant.



1. Albany Sand Storage
2. Red Clay Storage
3. Coke Storage
4. Limestone Storage
5. Pig Iron Storage
6. Scrap Iron & Steel Storage
7. Fire Brick
8. Non-Ferrous Metals
9. Core Oil, Parting, etc.
10. Storage Space & Work Area for Lining Ladles
11. Annealing Furnace
12. Electric Steel Furnace
13. Electric Induction Furnace
14. Cupola
15. Gas Fired Crucible Furnaces
16. Monorail System for Handling Molten Metal, Flasks and Sand
17. Floor Flask Storage
18. Clamp Rack
19. Gagger Bin
20. Flask Storage
21. Glass above Masonry Base
22. Molding Benches
23. Roller Conveyor
24. Riddle
25. Sand Heap & Floor Molding Area
26. Jolt Rollover
27. Rail for Riddle
28. Squeezer
29. Gyratory Riddle
30. Core Storage, Core Plates, Core Rods
31. Pattern Storage Racks
32. Core Boxes
33. Core Sand Storage
34. Core Blower
35. Core Sand Muller
36. Core Benches
37. Core Ovens
38. Stock Core Machine
39. Sand Blast Equipment
40. Cut-Off Saw
41. Grinder
42. Bench
43. Grinder
44. 12″ Disc Sander
45. 17″ Drill Press
46. 10″ Tilting Table Circular Saw
47. 20″ Band Saw
48. Library, Study, Lecture and Visual Aid Rooms
49. Sand Testing Laboratory & Physical Testing
50. Tool Crib
51. Lavatory
52. Shower & Locker Room

"Bigelow Cushionlok for Cluett,

J. STANLEY SHARP of the well-known architectural firm of Ketchum, Gina and Sharp, planned this distinctive modern interior for the new Cluett, Peabody showroom at 2 Park Avenue, New York City.

Here's what Mr. Sharp says about the Bigelow carpet he installed:

"For the Cluett, Peabody showroom, we wanted to create pleasant, quiet surroundings that would be conducive to the sale of merchandise.

"We selected Bigelow's Cushionlok carpet because we felt it did an outstanding job in this and other respects.

"Cushionlok absorbs noise and hushes the clatter of voices, giving the quiet surroundings essential in a showroom where hundreds of people are coming and going all day.

"Attractive Cushionlok holds up under heavy

THE RECORD REPORTS

(*Continued from page 296*)

PERIODICAL REPORT

France in Architecture

An exploration of France's contribution to the evolution of architecture is begun in the February issue of *L'Architecture d'Aujourd'hui*, this number being devoted principally to habitation. By way of introduction to the study, André Bloc, the magazine's director, contributes an essay on "An Era of French Architecture," in which he traces the growth of modern building in the country. Important works by such architects and engineers as Labrouste, Jourdain, Eiffel, Perret, Freyssinet, Le Corbusier, Lurçat, Beaudoin & Lods and others are illustrated and discussed. This article is followed by a tribute to Auguste Perret, written by Pierre Dalloz, and an extensive presentation of Le Corbusier's *Unité d'Habitation* in Marseilles. The latter is illustrated with both color and black-and-white photographs of the structure. The remainder of the issue is devoted to presentations of other post-Liberation buildings for habitation, including large projects and collective housing structures, apartment buildings (among these a large group of buildings in the Paris region), individual houses, and buildings in the colonies.

L'Architecture d'Aujourd'hui

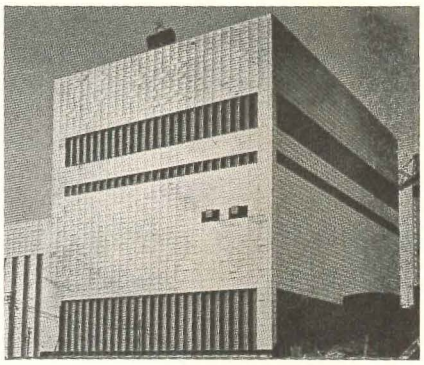
Le Corbusier's famous and controversial Unité d'Habitation in Marseilles

Electricity and Architecture

Techniques & Architecture in its No. 5–6 issue turns its attention to problems of production and distribution of electrical energy, especially as these affect architects and engineers who are called upon to design buildings to house such facilities. The entire issue is devoted to a concise investigation of the subject. The first section deals with sources of energy and equipment, the second with thermal equipment, the third with hydroelectric equipment. In each of these a general introduction is followed by classifications and descriptions of equip-

(*Continued on page 302*)

Techniques & Architecture



French power station, Nantes-Cheviré