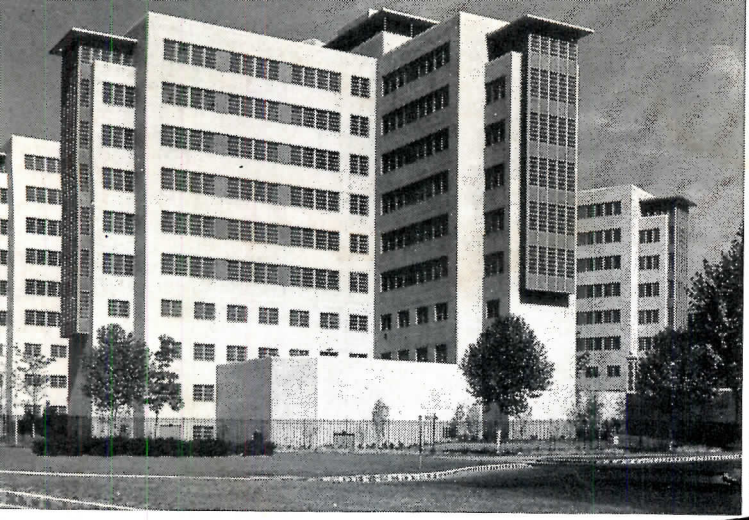
ARCHITECTURAL RECORD

JULY 1954

BUILDING TYPES STUDY NUMBER 212

BUILDINGS FOR INDUSTRY



General Hospital Neurological Building, Philadelphia, Penna. Archt.—Harbeson, Hough, Livingston & Larson; Contr.—McCloskey & Co., Inc.—both of Philadelphia. Pozzolith Ready-Mixed Concrete supplied by The Warner Co., Philadelphia.

St. Joseph's Hospital Addition, Burbank, Calif. Archt.—John W. Maloney, Seattle, Wash.; Contr.—Pozzo Construction Co., Los Angeles. Pozzolith Ready-Mixed Concrete supplied by Jewel City Ready-Mix Co., Beverly Hills.

hospitals

Permanente Foundation Hospital, Los Angeles, Calif. Archt.—Wolff and Phillips, Portland, Oregon; Contr.—C. L. Peck, Los Angeles. Pozzolith Ready-Mixed Concrete supplied by Graham Brothers Co., Los Angeles.

Veteran's Hospital, New Orleans, La. Archts.—Favrot, Reed, Mathes & Bergman, New Orleans; Faulkner, Kingsbury & Stenhouse, Washington, D. C.; Contr.—Robert E. McKee, Dallas, Tex. Pozzolith Concrete batched at job site.

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*See Bureau of Reclamation's current Concrete Manual, Page 130.

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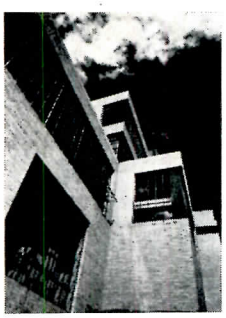

Maxwell House Coffee Building, Hoboken, N. J.; The H. K. Ferguson Co., Engineers and Builders. Photo © by Ben Schnall

Building Types Study Number 212 — Buildings for Industry

Architectural Engineering

Thin shell structures, once considered almost an engineering curiosity, have been the subject of intensive study in recent years. Their suitability for long spans is not the only reason; they are intriguing for esthetic possibilities, material savings, and their almost limitless functional applications. Their engineering has been codified and simplified, and is simply described in a series of three articles.

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PERSPECTIVES

ARCHITECTURAL PHILOSOPHY department: "The reality of a room is not in four walls, but in the enclosed space." — Lao-tze, 600 B.C. (The editors of the Buffalo-Western-New York A.I.A. Chapter Bulletin quote this one.)

THE SPIRIT OF INQUIRY: Egyptian archaeologists last month appeared to be most deeply concerned about who-does-what. The 34-year-old architect who discovered and identified the funerary solar boat built by the Pharaoh Cheops nearly 5000 years ago was in trouble because he wasn't an "Egyptologist." Kamal el-Malakh not only *is* an architect, but, as director of works for the Giza Pyramids and Lower Egypt, he is *classified* by the Egyptian Government's Department of Antiquities as an architect. Ten days after his big discovery, the Department of Antiquities named a five-member committee of three Egyptologists and two architects to control future investigations, with el-Malakh as its lowest-ranking member — a development reportedly climaxing a week of conflict between the department's architects and technical staff and its Egyptologists, who apparently regarded El-Malakh's invasion of their territory as something of an impertinence. El-Malakh has been trained as an Egyptologist as well as an architect, and he is writing a thesis on ancient Egyptian architecture for a doctorate in Egyptology — all of which would, however, seem to be beside the point that he has made what some "real" Egyptologists have called the archaeological discovery of the century.

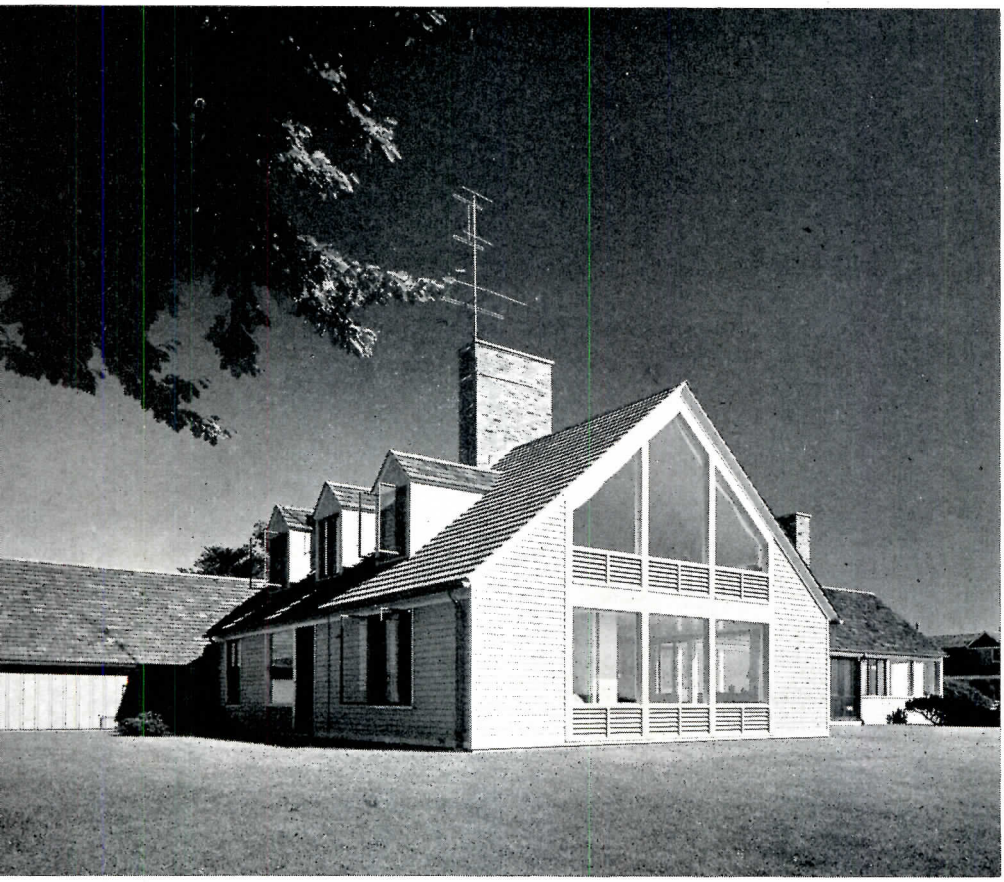
NO STORY ABOUT A BUILDING IS COMPLETE WITHOUT THE NAME OF THE ARCHITECTS, says (in red letters) the first page of a little folded notesheet sent out by the public relations committee of the Virginia A.I.A. Chapter to editors (like this one) who fail to credit the architect in any mention of a building. The one that came to the RECORD had a simple note typed inside, and signed by the chapter's public relations chairman, which said that the architect for the First and Merchants branch banks in Richmond mentioned in a *Perspective* on drive-ins was Carl M. Lindner, A.I.A., of Richmond. On the back page, for easy reference, is printed a list of names and addresses of public relations committee members.

SOLAR ENERGY FOR HEATING is not so far off, according to John E. Haines, first vice president of the American Society of Heating and Ventilating Engineers and a vice president of Minneapolis-Honeywell Regulator Company. By 1963, Mr. Haines told a recent meeting of A.S.H.V.E.'s Golden Gate Chapter, "the heat from the sun will take its place as one of our common fuels." He noted that basic data to aid in the design of solar energy heating systems is emerging from research being conducted by A.S.H.V.E. in cooperation with the University of Minnesota.

SOME KIND OF MOTOR-BANK SERVICE will be included by one of every three banks reporting construction projects in the offing in a recent questionnaire survey addressed to the 17,000 members of the American Bankers Association by *Banking*, the Association's journal. Most of these facilities (289 of 363) will be integral parts of the building; of 45 reporting plans for separate drive-in facilities, 16 will be connected with the main banking quarters by an overpass, 19 by underground tunnel and 10 by a pneumatic tube system. "Walk-up" teller windows will be provided by 92 banks reporting — some in conjunction with drive-in facilities, some as "sidewalk" windows for pedestrian traffic; 19 banks will have "snorkel" or curb-teller type of operation. Well over 50 per cent of the responding banks will provide either drive-in or parking facilities. As to type of building, a large majority (435) of those responding to this question said their structures would be exclusively for banking purposes; 113 plan to include facilities for store-office tenants. On the now-scarcely-tepid question of modern-vs.-traditional architecture, 564 checked "modern," 369 (mostly remodeling jobs) checked "traditional" and 88 checked a separate category yclept "Colonial." Most of the new buildings will be two stories or less in height; a majority will be both sound-conditioned and air-conditioned. Low, "friendly" tellers' counters of open design, both on the customer's side and on the operating side, will predominate. Another friendly note: 149 of the new buildings will include "community" rooms for use of social and civic groups.

MAN ALSO HAS DREAMS: the founder of the Bauhaus, at São Paulo in January to receive the 1954 São Paulo Prize, biennial international architecture award given by the Andrea and Virginia Matarazzo Foundation of São Paulo, had some things to say in his acceptance speech about the function of architecture. "The leading architects and planners," Gropius declared, "have today recognized their broad task, namely to help to re-balance the community life and to humanize the impact of the machine. No doubt final success of modern architecture and planning will depend on our determination to let the human element become dominant. . . . In every design, *Man* must be the focus, then it shall be truly functional. But functionalism in architecture has been erroneously interpreted as being mechanistic and following practical, rational considerations only. That is a misconception. In fact, the pioneers of modern architecture have early realized that man also has dreams, and that the function of our psyche is just as real as that of our body. The functional approach in architecture and design has, therefore, to fulfill the psychological requirements of man as well as the practical ones, in order to reach the organic."

BOSTON ARTS FESTIVAL EXHIBIT: 12 EXAMPLES



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Above: "Most outstanding architectural project built in New England within the past five years": Gordon Gibbs Residence, on Buzzard's Bay in Marion, Mass., won the Festival's top award for George W. W. Brewster of Boston, although at latest reports there appeared to be some disagreement between the architectural jury and the Festival as to whether the jury had selected the house as the top award-winner or only as one of the 12 projects to be exhibited

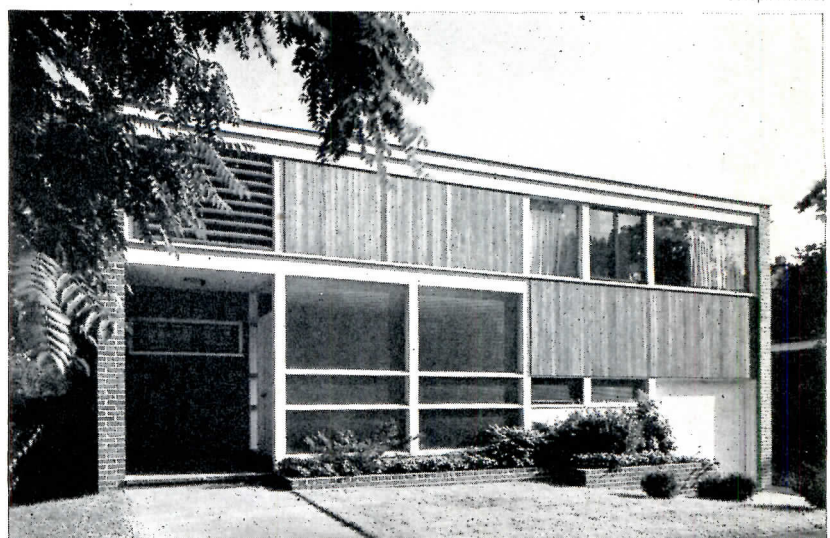
AN ARCHITECTURAL EXHIBIT sheltered by one of R. Buckminster Fuller's geodesic domes was part of this year's Boston Arts Festival, held June 6–20 in the Boston Public Garden.

Twelve buildings from eight architectural offices, none of them farther from Boston than Lexington, were chosen for the exhibit from 96 submissions in the first annual architectural competition sponsored by the Festival in cooperation with the American Institute of Architects. The competition was open to architects throughout New England; any project constructed within the past five years was eligible.

George W. W. Brewster of Boston received the 1954 Boston Arts Festival Architectural Award; the other seven firms received honorary awards. All 12 of the buildings in the exhibit are shown on this and the following pages.

Members of the competition jury were Dean José Luis Sert of Harvard's Graduate School of Design; George Howe, F.A.I.A., of Philadelphia; and Burnham Kelly, A.I.A., associate professor of city planning, Massachusetts Institute of Technology. Charles R. Strickland headed the A.I.A. committee in charge.

Joseph Molitor

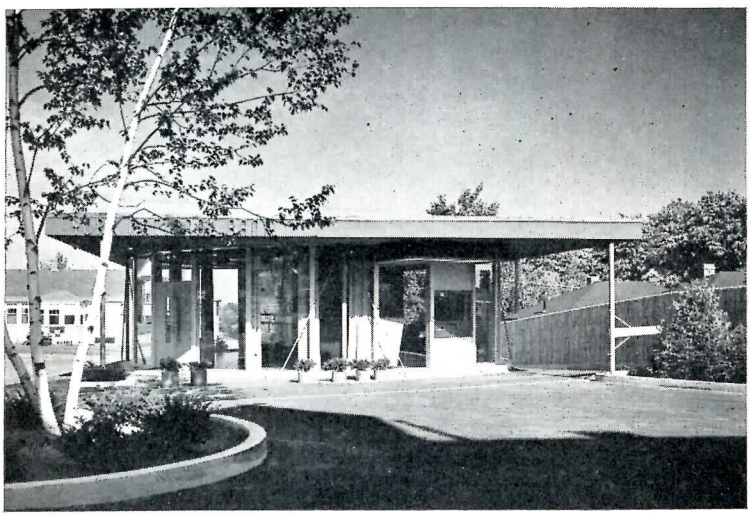


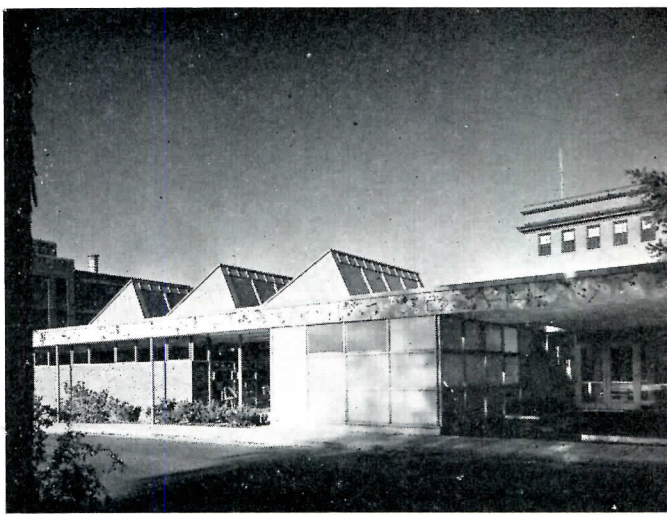
Right: Residence for himself, by Carleton Richmond Jr. of Cambridge (ARCHITECTURAL RECORD, *April 1954*)

David F. Lawlor

The Fuller dome erected to house the exhibit was 20 ft high and 30 ft in diameter; a project of University of Minnesota students, it was bought by the Festival, dissassembled and shipped to Boston to be reassembled in the Public Garden by student volunteers from M.I.T. Wood structural members were tied together with a specially-designed hemp covered with insulating material

OF TODAY'S NEW ENGLAND ARCHITECTURE





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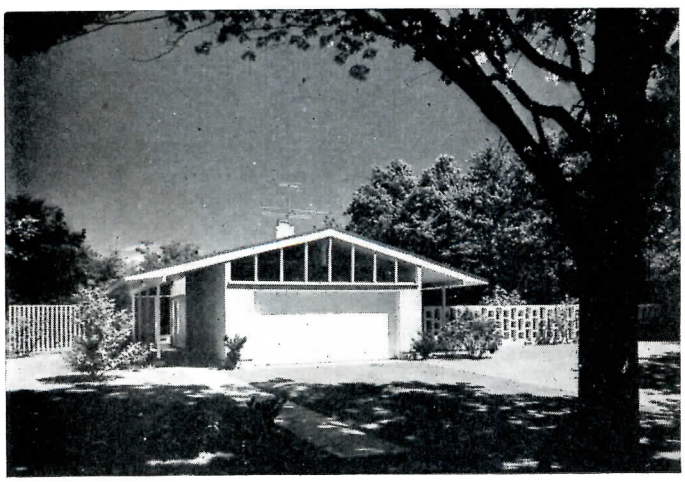
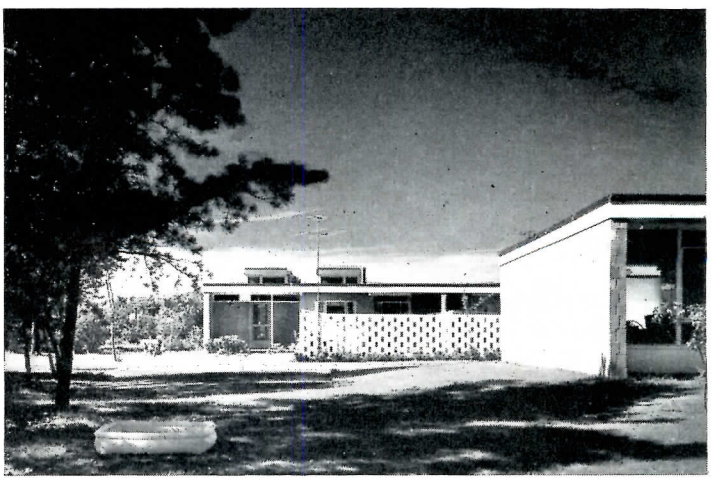
Above: two projects by Carl Koch and Associates of Cambridge. Left: York National Bank of Saco at Old Orchard, Maine; right: the less familiar view of the Fitchburg Youth Library, Fitchburg, Mass.





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Another pair of projects came from the office of Hugh Stubbins Associates of Lexington. Left: Maurice Segal Residence, Brookline, Mass.; right: Wellesley Veterans' Housing Project, Wellesley, Mass.

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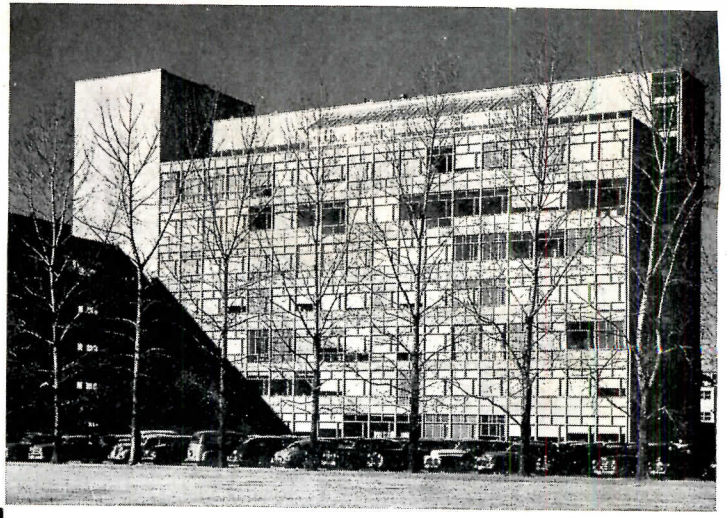
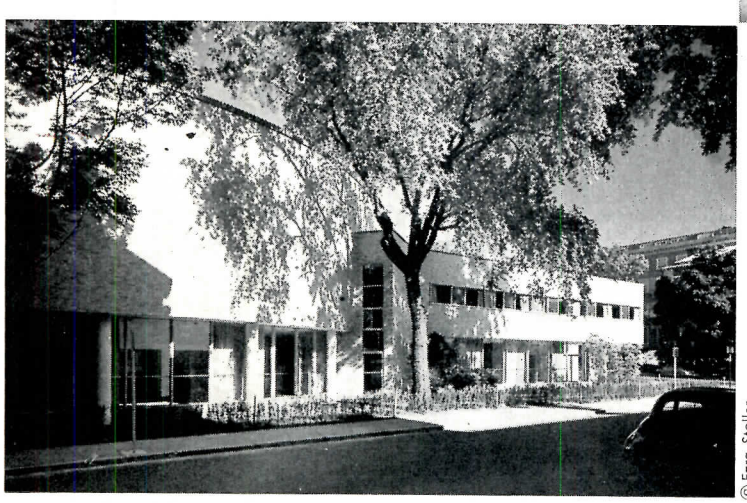
NEW ENGLAND ARCHITECTURE EXHIBIT

Right: Dorrance Laboratory, Massachusetts Institute of Technology, Cambridge; Anderson and Beckwith of Boston, Architects





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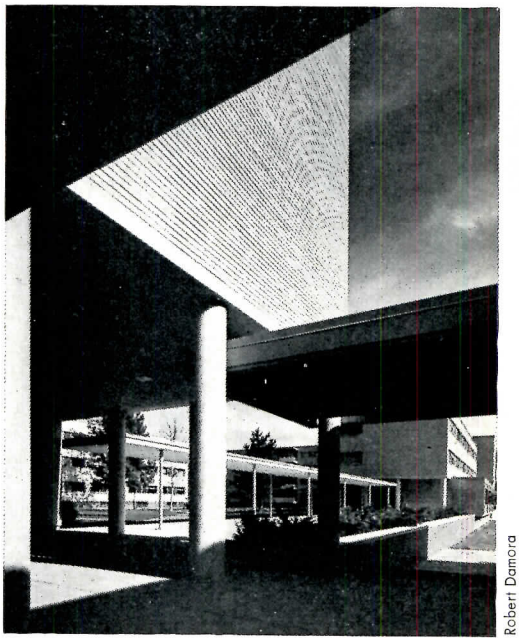
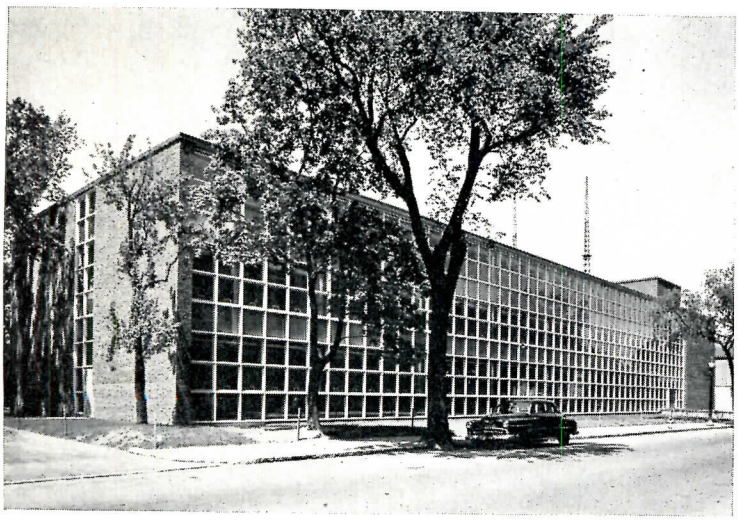
Two buildings by Shepley, Bulfinch, Richardson and Abbott of Boston. Above, Allston Burr Lecture Hall, and below, McKay Science Laboratory, both at Harvard University, Cambridge



Robert Damora

The Architects Collaborative of Cambridge was represented by two buildings—the Harvard Graduate Center, Cambridge (above), and (below) the Junior High School in Attleboro, Mass.



Below: Eastgate Apartments, Cambridge. Architects—William Hoskins Brown (liaison), Carl Koch, Vernon DeMars, Ralph Rapson, Robert Woods Kennedy (Architectural Record, Feb. 1949)

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WIDE RANGE OF TOPICS COVERED AT BRI MEETING

AT THEIR THIRD annual meeting in Hershey, Pa., May 23, 24 and 25, the Building Research Institute (a partner of BRAB) launched a completely new type of program, as part of their expanded activities, designed to reflect the interests of the whole building industry. Some 140 members and guests heard panel discussions ranging from explorations of the home improvement market (methods of creative selling and distribution), through reports on research activities of the National Association of Home Builders, air conditioning in large buildings, changes in architecture and their meaning for the building industry, cost and performance of building components, and industrial acoustics.

Members of the architectural panel had a number of views on just what is shaping the architecture of the future, and how it should be done. Architects will have to anticipate and solve new problems in designing large buildings that are being financed for purposes of speculation, several panelists averred. Lower building costs through mass-production methods and developments in metals now enable the architect to spend more of the cost for elegance, was another opinion. The young architect came in for his share of the discussion in the remark that more knowledge should be obtained of how building components fit together — problems of detailing, etc. Still another view was that often the client has too firmly fixed ideas on the planning of large structures such as schools and hospitals. The panel included: Douglas Haskell, *Magazine of Building;* Wells Bennett, University of Michigan; H. R. Dowswell, Shreve, Lamb & Harmon Associates; Harold D. Hauf, A.I.A. staff; I. M. Pei, Webb & Knapp, Inc.; and E. X. Tuttle, Giffels & Vallet, Inc.

The air conditioning panelists felt that there was room for improvements in equipment and systems to cut down loss of floor area, to integrate the equipment with the structure, to cut operating and maintenance costs. At the same time, it was also predicted that developments in the immediate future will be mainly improvements in detail, techniques, and gadgetry rather than any radical deviation from present methods.

The panel on cost and performance of building components focused its attention on the growing need for proper cost analysis and estimation of building projects, with mechanical items now taking almost 40 per cent of the construction cost.

More attention will have to be paid to industrial noise problems, another panel stated, particularly since some cities have already passed ordinances limiting noise near residential areas.

— Drawn for the RECORD by Alan Dunn

"And then I found that the latest cliché was to avoid all clichés—"

Who's Who

In the A.I.A.: Robert S. Hutchins F.A.I.A., of Moore and Hutchins, has succeeded Hugh Ferriss as president of the New York Chapter. . . . Alfred S. Alschuler Jr., of Friedman, Alschuler and Sincere, is the new president of the Chicago Chapter. He succeeds Philip Will Jr., F.A.I.A. . . . **With the engineers:** Clarence T. Shoch of Allentown, Pa., has been elected to head the National Society of Professional Engineers; his predecessor was T. Carr Forrest Jr. . . . Nelson S. Hibschman of Brooklyn has succeeded H. H. Henline of Scarsdale, N. Y., as secretary of the American Institute of Electrical Engineers. . . . Joseph B. Jewell of Pontiac, Mich., is the new president of the Michigan Engineering Society. . . . **In the schools:** Allen S. Weller, scholar and art historian and member of the University of Illinois art faculty since 1947, will become the second dean of the College of Fine and Applied Arts September 1, when Dean Rexford Newcomb retires. In another change at Illinois, Prof. Alan K. Laing has been named chairman of the Department of Architecture, a new post; the department had formerly been organized with a head. The appointment followed on Prof. Turpin C. Bannister's request to be relieved of his administrative duties . . . Ralph Rapson, assistant professo of architecture at Massachusetts Institute of Technology and former head of the Department of Architecture at the Institute of Design in Chicago, has been appointed head of the University of Minnesota School of Architecture. He succeeds Roy C. Jones, who retired in June 1953. . . . Carnegie Institute of Technology announces the appointment of Norman Lewis Rice as dean of the College of Fine Arts effective July 1. . . . Prof. Karl B. Lohmann, a member of the University of Illinois faculty since 1921, has been designated to succeed Prof. Otto G. Schaffer as head of the Department of City Planning and Landscape Architecture when Professor Schaffer retires September 1. . . . Prof. Olindo Grossi, chairman of the department of architecture of the Pratt Institute art school, becomes a dean with the establishment of a School of Architecture as a separate unit of the Institute effective July 1. In addition to the present five-year program for the Bachelor of Architecture degree, a sixth

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year, leading to the degree of Master of Architecture, will be offered beginning next September. Also at Pratt, Sibyl Moholy-Nagy has been promoted to the rank of assistant professor. . . . **Diverse items:** T. Seddon Duke, president of Star Sprinkler Corporation, Philadelphia, is the new president of the National Fire Protection Association, which held its annual meeting in Washington late in May. . . . The Steel Joist Institute has elected Walter H. Stewart, vice president of the Virginia Steel Company, Richmond, as president. . . . Gen. John J. O'Brien, president of United States Steel Homes, Inc., the housing subsidiary of the United States Steel Corporation, has been named president of the Prefabricated Home Manufacturers Institute. . . . C. George Dandrow, vice president of Johns-Manville, has been reelected president of the New York Building Congress. Max Abramovitz of the architectural firm of Harrison & Abramovitz, is among the vice presidents.

"No Slums By '60"?

THE NEW GOAL of the National Association of Real Estate Boards in its drive on violations of city ordinances on minimum housing standards commits the nation's realtors to work for elimination of all housing code violations in cities across the U. S. by 1960. Fritz B. Burns of Los Angeles, chairman of N.A.R.E.B.'s Build America Better Council, has called this goal "practical and attainable." Acceptance of the six-year deadline, Mr. Burns noted, "will not mean, of course, that every phase of the Build America Better program will have been realized, or that the job will be finished. Complete elimination of code violations still leaves much to be done in bettering the quality of the neighborhood environment that we need for a better America. The job of preventing neighborhood deterioration and preserving good livability is never done." The Council's six-point program of neighborhood conservation is set forth in detail in a 40-page booklet, "Blueprint for Neighborhood Conservation," available from N.A.R.E.B., 1737 K Street N.W., Washington 6, D. C.

Weather in the Home

THE MECHANICAL, FINANCIAL AND human problems involved in the use of year-round "weather control" in the average home will be studied in "the world's first completely air conditioned village" — a 22-house development built in the northwestern suburbs of Austin to serve as a "research village" for air conditioning. The houses, of carefully varied design and structure, are each equipped with a different type of year-round air-conditioning and heating system. Each of the 22 families to occupy them bought its house for approximately $12,000, plus land costs, under special agreements providing for their cooperation in the research studies. The one-year project, launched June 2, is sponsored by the National Association of Home Builders in cooperation with more than 50 other organizations.

Left to right: R.I.B.A. President, Howard Robertson, talking to Pembroke Wicks (center), registrar of the Statutory Register of Architects, and Thomas E. Scott (left), hon. treasurer of the R.I.B.A.; C. H. Aslin, R.I.B.A. president-elect, and the two lecturers, William Allen (center) and Edward Mills; at the garden party, the A.I.A.'s official representatives, Mr. and Mrs. John Stetson of Florida, and Prof. Leslie Wilkinson of Sydney, Australia

BRITISH ARCHITECTS HOLD CONFERENCE AT TORQUAY

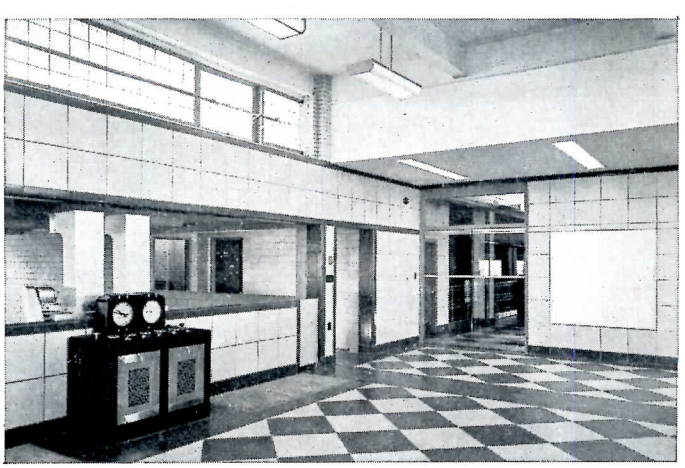
By Eric Bird, Editor
R.I.B.A. Journal

THE BRITISH ARCHITECTS' Conference differs from the Annual Convention of the A.I.A. because the small size of Great Britain allows much of the business which occupies the A.I.A. at its Convention to be performed at monthly meetings in London. The British Architects' Conference has three purposes which can be put in order of importance according to taste. It is a social occasion at which architects discover that other architects are, like themselves, nice fellows. It affords publicity for the local architects, occupying much space in the local press and causing local mayors and other big shots to be suitably entertained. It is an occasion when one or two topics of current interest are discussed.

This year the architects of South-West England were the hosts and the venue was the seaside resort of Torquay — a place of hotels, villas, yachts and with so mild a climate that palm trees actually grow there. The conference headquarters was a Georgian mansion built in the ruins of a 14th century abbey and now owned by the Torquay Corporation and used as a museum and conference center. Between the official functions and entertainments the conference members visited rebuilding works in the two blitzed cities of Plymouth and Exeter and some of the many beautiful old buildings in the district. Howard Robertson, President of the R.I.B.A., now in the last few weeks of his two years' term of office, and his charming architect wife guided the proceedings and did official hand-shaking.

Materials and Techniques was the title of a monumental paper discussed at the two meetings. This was the joint effort of Canadian-born William Allen,

(*Continued on page 234*)



CHEMICAL & FILTER BUILDING

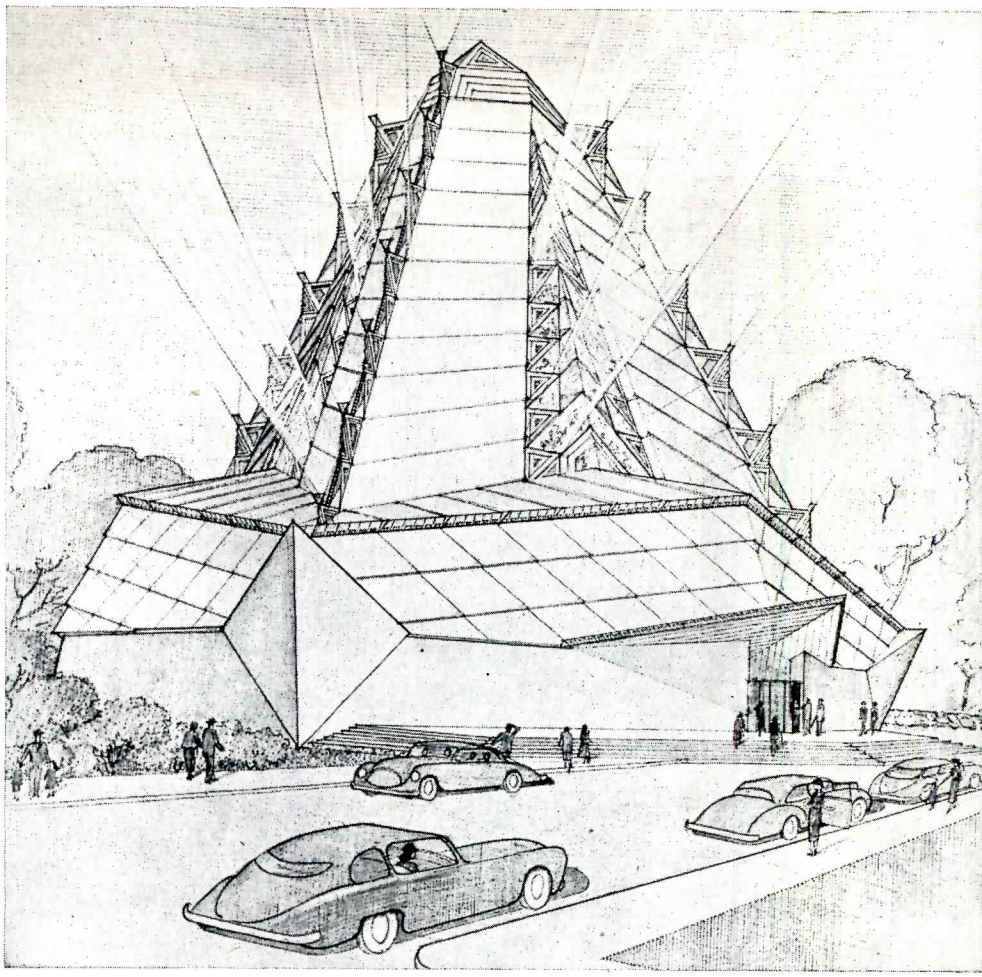
Porter Rapid Sand Filter Plant
WILMINGTON, DELAWARE

Metcalf and Eddy
Engineers

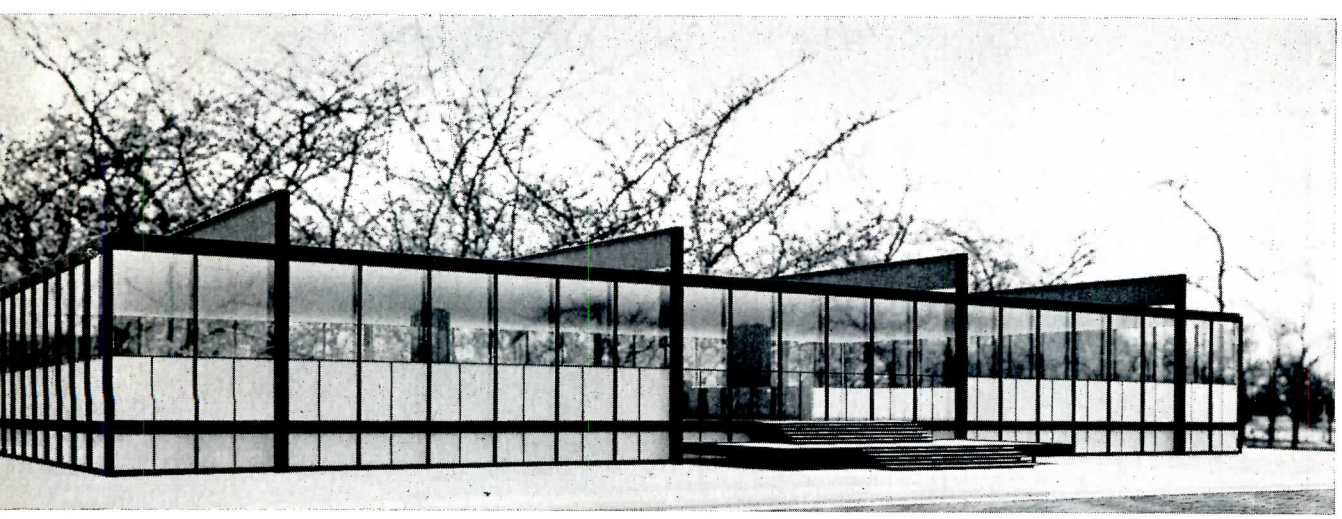
Baton Construction Co.
General Contractors

C. O. Struse & Sons
Masonry Contractors

Architectural Terra Cotta units 16" x 16" in two shades of green where specified for main entry, main gallery, operating gallery and two open areas.



FRANK LLOYD WRIGHT has designed his first synagogue, a project for Beth Sholom Congregation in Philadelphia. The congregation last month embarked on a campaign to raise $750,000 to erect it "on a grassy mount" at York Road and Foxcroft Road in suburban Elkins Park. The building will be a hexagon surmounted by a triangular sphere of white-wired glass underlaid with blue-tinted plastic; structural members will be green copper. Along each of three ridges from the large pointed concrete bastions at the base of the triangle to the copper cap will be lighted lamps, replicas of the Menorah in the ancient Tabernacle. The apostle of "honest arrogance," now 85 years old, submitted his drawings to Rabbi Mortimer J. Cohen with the comment, "Herewith the promised 'hosannah' —a temple that is truly a religious tribute to the living God." The Rabbi calls it "a replica of Mount Sinai—that small mountain of jagged, massive slabs of stone, where Israel encountered God"



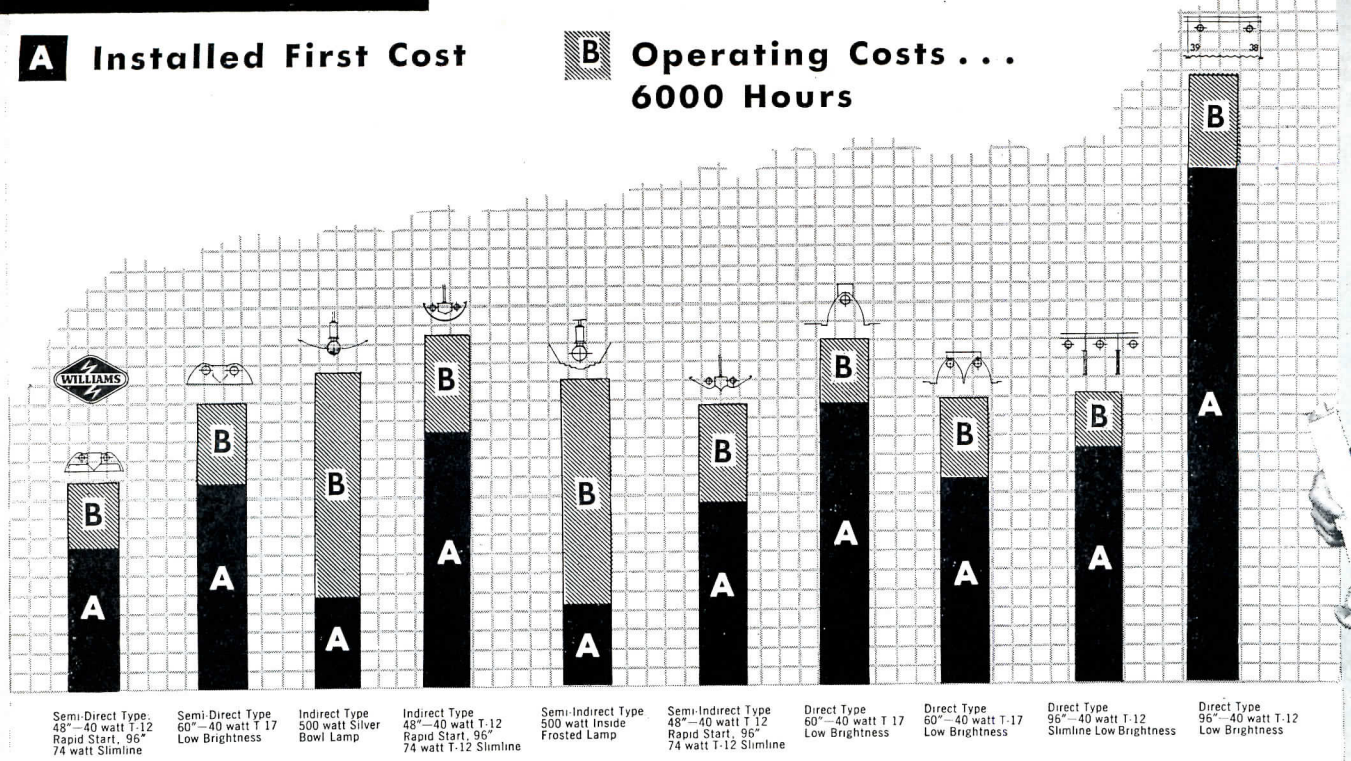
Hedrich-Blessing

LUDWIG MIES VAN DER ROHE has designed another building for Illinois Institute of Technology's Chicago campus—this one for the architecture department, which he heads, the industrial design department, and a soon-to-be-established department of urban and regional planning. A drive to raise $600,000 to finance the project was launched by the Institute last month. The building, 120 x 220 ft, to be enclosed entirely in plate glass (the lower sections opaque), will have a welded steel structure and a concrete roof suspended from four exposed steel girders. Space use within the column-free main hall, 28 ft high, will be defined by low, free-standing wood walls. The floor of the hall will be five ft above ground to admit natural light and ventilation into a full basement containing more teaching and study as well as service facilities

LIGHT-FOR-ALERTNESS Chart Compares 10 Leading Types of Luminaires

A Installed First Cost

B Operating Costs . . . 6000 Hours



Williams Series 7000 Type Is Easily "Number One"...

The above bar chart is adapted from the table "Ten Systems for Lighting Classrooms", ILLUMINATING ENGINEERING*, June, 1953, page 308. The Williams Series 7000 type fixture is represented by the bar at extreme left. Types are compared as to (A) total installed cost and (B) cost of electricity (at 3c per kw. hr.), cleaning and maintenance for 6000 hours (approximately 6 years) of operation.

The official publication of the Illuminating Engineering Society

. . . AT *LOWEST COMBINED* FIRST AND OPERATING COSTS!

The new Williams Series 7000 Luminaire helps solve two important school cost problems . . . and at the same time provides ideal light for classrooms.

Lowest In Combined First and Operating Costs . . .

The chart above presents impartial and conclusive laboratory cost findings. The Williams 7000 type, at extreme left, won easily in *combined* first cost and operating cost, as you can see.

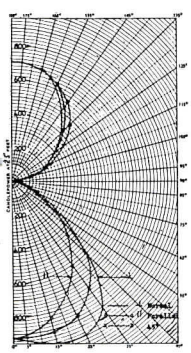
Your initial investment is low, your repeated annual savings in operating costs are high.

Quality Illumination Provides Classroom "Light-For-Alertness"...

The Williams 7000 provides the kind of quality illumination that promotes both attention and alertness in classrooms . . . genuine "Light-For-Alertness" aids teachers and students in achieving improved classroom results.

See briefed-down data at right. Use the coupon, "our invitation to you", for full specifications, complete E.T.L. report and prices. Perhaps, too, the school bond promotion example will be helpful to your board.

No obligation, of course, we'll be glad to hear from you.



Here Are Sample Features:

- Available in 2-lamp, 40-watt standard and Rapid Start; 2-lamp, 96" Slimline and 4-lamp tandem-mounted 40-watt units.
- General diffuse type luminaire—46% up, 54% down.
- 35° crosswise shielding; 25° or 45° lengthwise shielding.
- Extremely high efficiency—82%.
- Equipped with General Electric Ballasts.
- Underwriters' approved; union made—I.B.E.W.
- Available with Alumalite finished louvers and sides.
- Reflectance factor of enameled finish a high 89%.
- Available with plastic sides.

Two Offers in This Invitation. Mail the invitation coupon below for full E.T.L. report, specifications and also prices.

And, if you have a school bond election coming up, we'll send you a sample of the outstanding bond promotion of recent years. No obligation, of course! Just mail coupon—sending letterhead, too, if convenient.

Yours for the Asking . . .

- ***Full information . . . specifications . . . laboratory data***

  We'll be glad to send you full specifications and reports of independent laboratory tests on both costs and lighting quality. Just use coupon, attaching letterhead if one is handy.

- ***Bond election ahead?***

  Just check coupon, and we'll also send a sample of the bond promotion material that helped do one of the most effective public relations jobs by any school board in recent years. It may suggest an idea or two!

WILLIAMS

OUR INVITATION TO YOU...

H. E. WILLIAMS PRODUCTS CO.
241 S. Main St., Carthage, Mo.

☐ Please send me the full facts and test data your new Series 7000 fixtures.

☐ I'd like the bond election material mention above.

(No cost or obligation, of course)

Name_____

Arch. ☐; **Sch. Bd. Member** ☐; **Sch. Admin.**

School District_____

Your Address_____

Town_____ **State**_____

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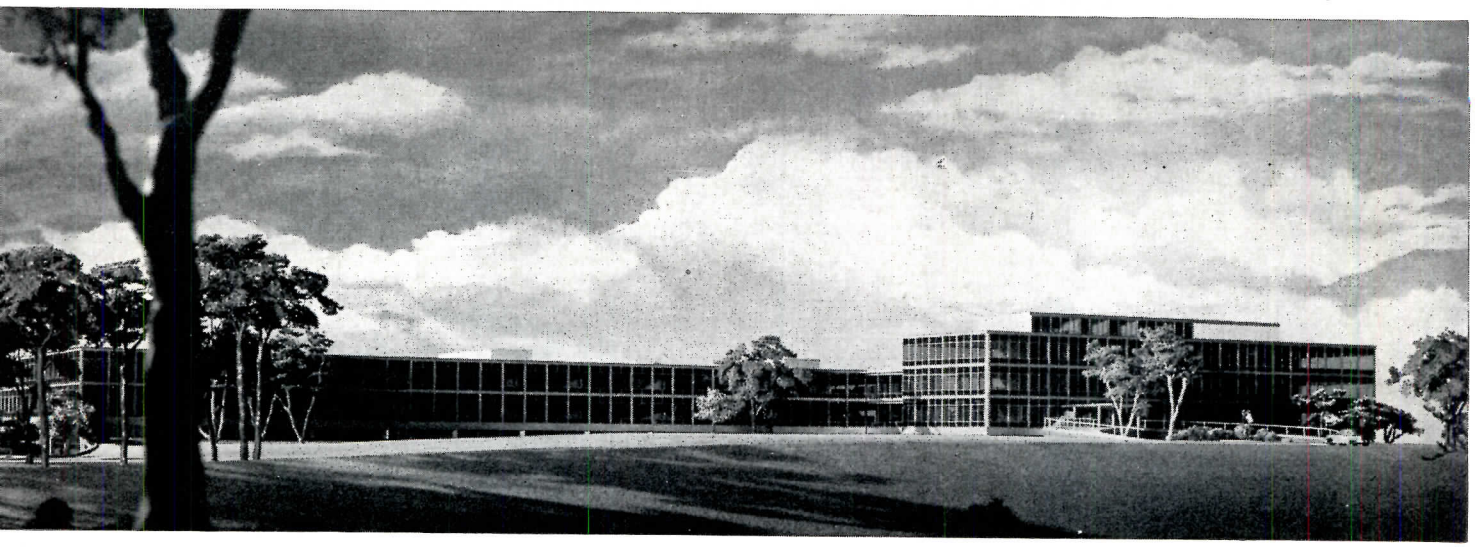


CONNECTICUT GENERAL VOTES FOR THE COUNTRY

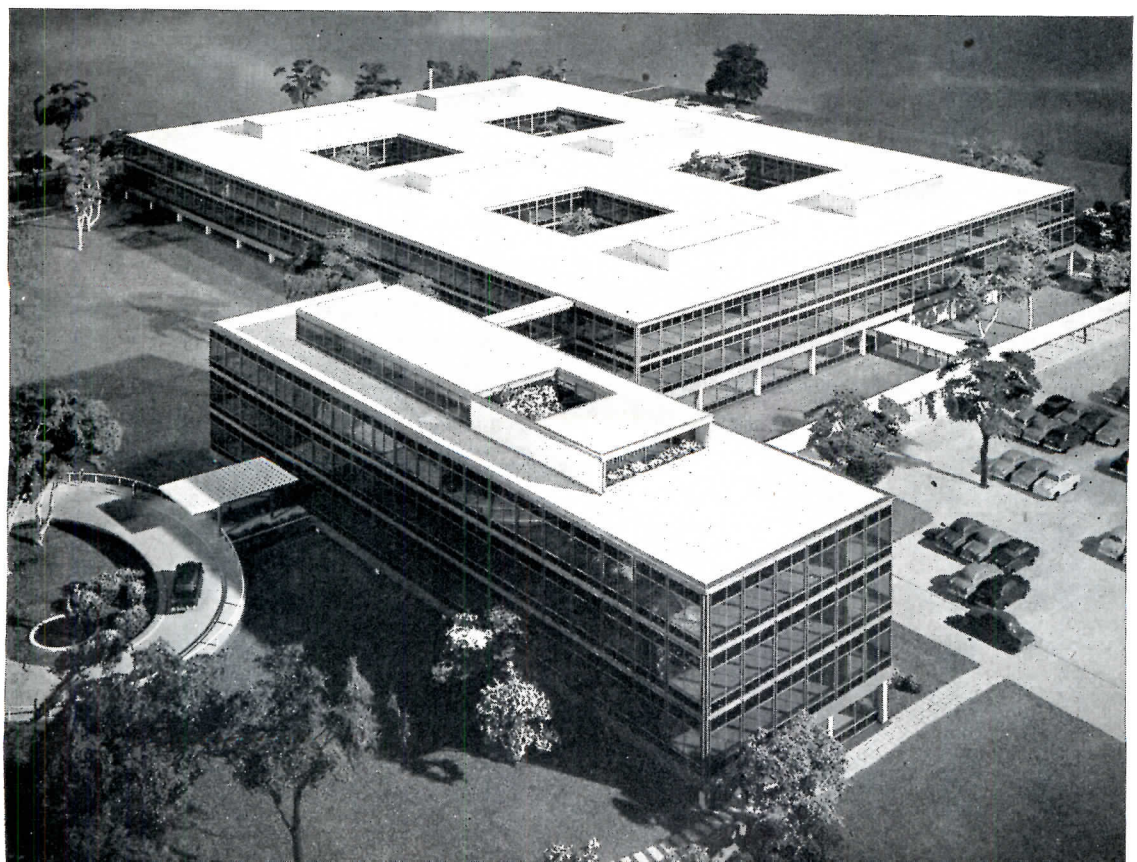
THE NEW HOME OFFICE BUILDING of Connecticut General Life Insurance Company of Hartford will be erected on a 268-acre site in suburban Bloomfield, Conn., five miles northwest of the center of Hartford. The building, scheduled for completion in 1956 at an estimated cost of $10 million, will provide some 500,000 sq ft of floor space to replace the company's 27-year-old headquarters at 55 Elm Street, Hartford, and in three other locations in the city. Skidmore, Owings and Merrill are the architects.

The three-story main section of the building will be constructed around four interior garden quadrangles. There will be two smaller connecting units: a one-story cafeteria with a capacity of 800 and a four-story structure containing most of the administrative offices and special departments. More than half the wall surfaces will be heat-absorbent glass; the rest mostly porcelain-enameled steel.

Interiors, with acoustically-treated ceilings and floors, will be largely without fixed partitions; movable colored screens will be used to divide office areas. Escalators will handle passenger traffic between floors, with some elevators provided, principally for freight service. There will be an electrical conveyor system throughout to carry files and papers. The building will be completely air conditioned.

Employe facilities will include a lounge and game rooms and outdoor facilities for picnics, tennis, croquet and other recreation.

Turner Construction Company is the builder.



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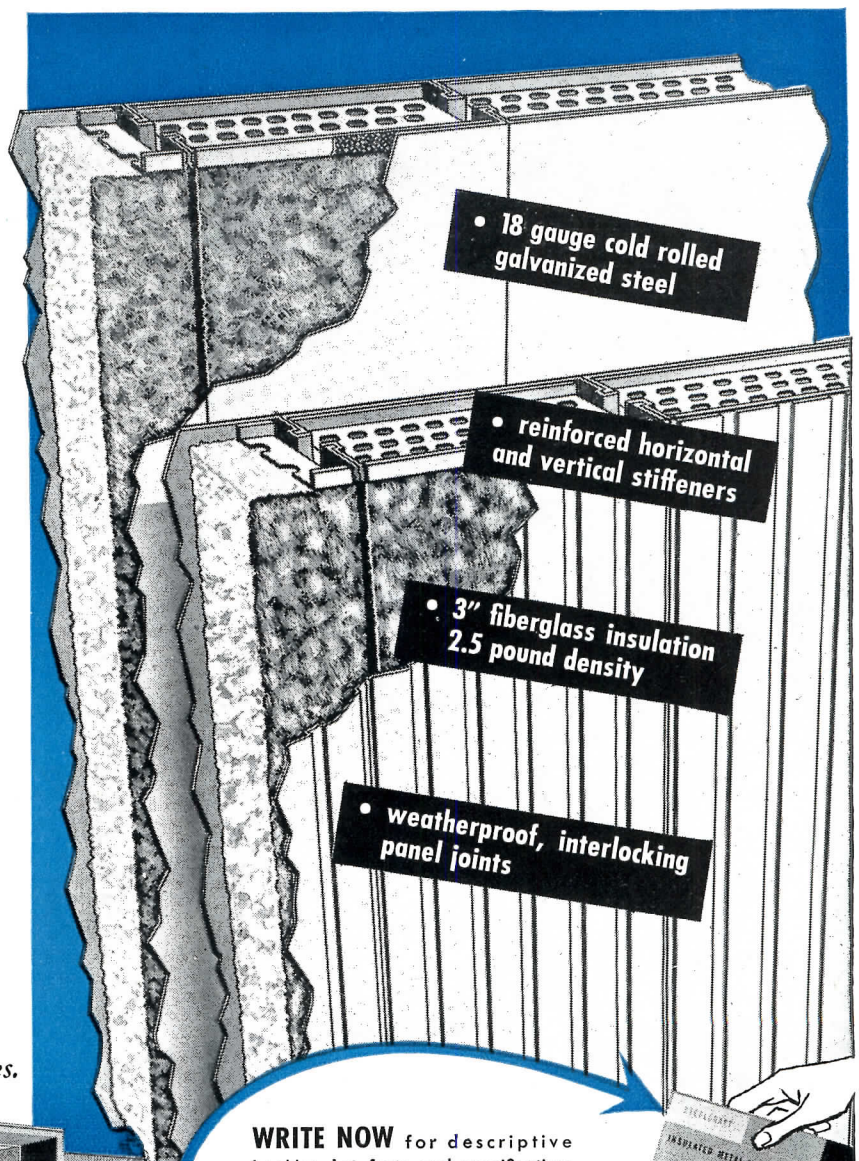
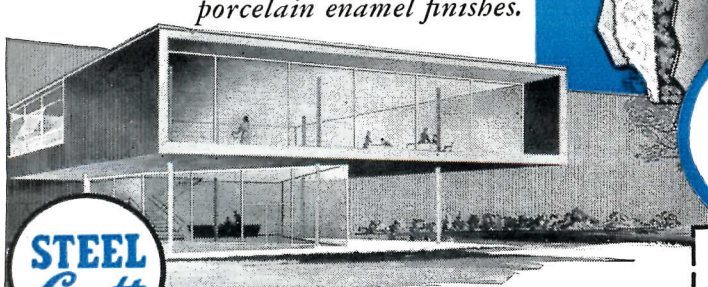
Steelcraft Insulated Metal Wall Panels are factory assembled for quick, easy erection. These lightweight, fiberglass insulated panels cut commercial or industrial building costs through savings in time, labor, and in structural framing and foundations *resulting in much greater interior area.*

Fabricated to rigid specifications, Steelcraft Wall Panels have higher than normal load bearing qualities. Interlocking panel joints are weatherproof and watertight. Flush or fluted exterior panels form a continuous wall that harmonizes perfectly with modern architectural design.

Galvanized steel, aluminum or stainless steel wall panels are available in various colors and textures.* Furnished in lengths up to 20′, with a standard width of 24″, panels may be applied horizontally or vertically and still remain flexible for simplified expansion or remodeling at a future date.

**Also available in porcelain enamel finishes.*





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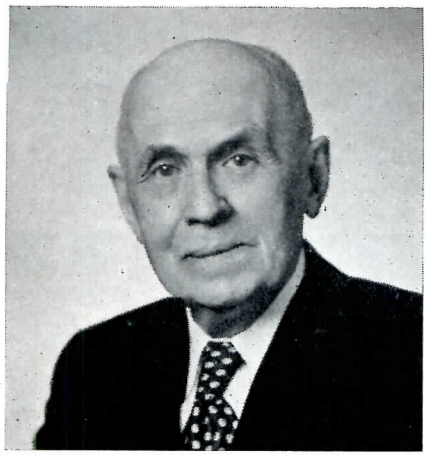
NEWS FROM CANADA *By John Caulfield Smith*



A. J. C. Paine, F.R.A.I.C., of Montreal, was elected the new president of the R.A.I.C.

New Fellows and their officers sit for a portrait. Left to right, seated: Stan E. Storey; Maxwell C. Dewar; Pierre Amos, former Dean of College of Fellows; Forsey Page, former Chancellor of the College; Bruce Ridell, former Dean of the College; Earl L. Sheppard; John Stormont Porter. Standing: Arthur Hunter Eadie; George E. de Varennes; John Bland; Henry K. Black; Gordon Sinclair Adamson; W. Wallace Alward; Jean Baptiste Soucy

Left to right, at the annual dinner: Msgr. Maureault, Director, University of Montreal; Mrs. R. Schofield Morris; F. Johnson, Chairman of the Board, Bell Telephone Company of Canada; Clair Ditchy, the speaker, president of American Institute of Architects; Hon. Jean Lesage, Minister of Northern Affairs and Natural Resources; Mrs. Johnson; and Mr. Morris, retiring president of R.A.I.C.

Forsey Page, 1953 Chancellor of the College of Fellows, investing Mr. Ditchy as an honorary fellow of the institute

R.A.I.C. MEMBERS GATHER IN MONTREAL

CANADIAN ARCHITECTS gathered in Montreal for the 47th Annual Assembly of the Royal Architectural Institute of Canada, which was held May 11–14 at the Mount Royal Hotel.

Members elected A. J. C. Paine of Montreal to the presidency; Mr. Paine is head of the architecture department for the Sun Life Assurance Company of Canada. Other officers elected were: W. Bruce Riddell, Hamilton — first vice president; A. E. Priest, Halifax — second vice president; Maurice Payette, Montreal — honorary secretary; and Douglas E. Kertland, Toronto — honorary treasurer.

A "confidential" report dealing with the relationship of the profession to federal and provincial governments and with the increasing competition architects are reporting from engineers was read by outgoing president R. Schofield Morris and led into a lengthy discussion of these matters by the delegates. Heavily lamented during the debate was the infiltration of "package deals." Blame for the growth of this practice was placed on several sets of shoulders — one member suggested that architects are themselves responsible for the situation because in many cases they require too much "outside help" in solving specific design problems. Another member argued that architectural schools do not succeed in teaching students enough about the "practical problems" of building.

Delegates also deplored the lack of coöperation which they say they receive from provincial governments. Some speakers described the attitude of governments toward architects as "open hostility." Quebec architects were the only speakers to deny any strain in their relationship with the government.

Three Seminars Conducted

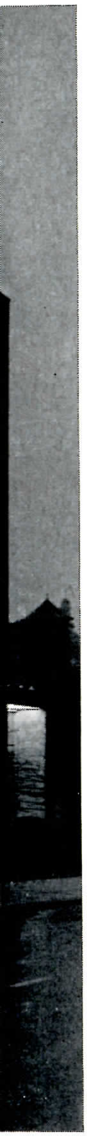
Members attended three seminars during the assembly: "Acoustics," "Condensation" and "Modern Developments in Building Materials and Their Effect on Design."

Dr. T. D. Northwood, speaking at the acoustics seminar, chided apartment building owners for not providing adequate acoustical insulation for their tenants, a service, he said, which would cost very little. Other participants in the seminar, which was led by John

(*Continued on page 30*)

● Under the roof of an ultra-modern newspaper plant, the famous Baltimore Sunpapers are written, edited, and set in type by the light of 3,000 Day-Brite parabolic troffers.

DEPENDS ON DAY-BRITE LIGHTING



● This is an out-of-the-ordinary lighting installation, one that merits your attention because it may suggest a similar treatment for your projects.

LOW-BRIGHTNESS LIGHTING IN ALL AREAS

● Too often, a distinction is made in lighting office space and production areas. Not in this case. The men at the Linotype machines in the composing room enjoy the same advantages of super-comfortable illumination from Day-Brite parabolic troffers that the editorial and office staffs do.

DAY-BRITE A LEADER

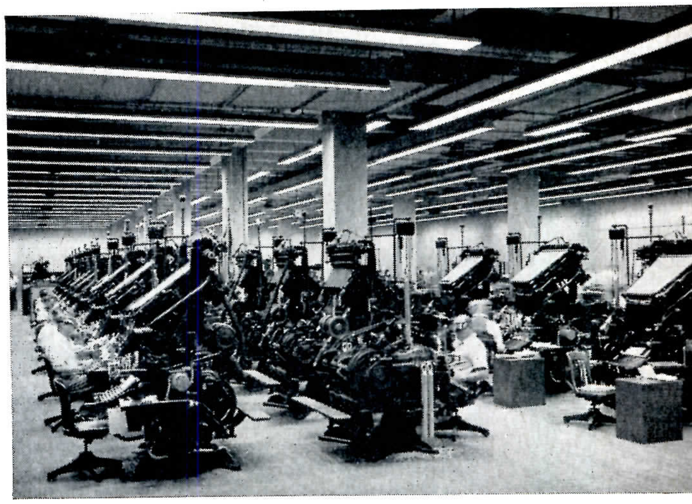
● Among fixture manufacturers, Day-Brite has been a leader in advocating increased visual comfort for industry. We believe it is sound lighting practice and a profitable investment for industry's management. We have engineered and built Day-Brite fixtures to conform with our belief.

● It is encouraging to see such a pronounced trend toward better production lighting. It is significant, too, that a great many of today's most advanced industrial installations were carried out with Day-Brite fixtures.

LOOK AT DAY-BRITE

● However you choose to upgrade production lighting for your own projects—with recessed troffers as in the Sunpapers plant, with pendant or surface mounted louvered fixtures, with up-ward-component heavy duty industrials—look at Day-Brite . . . *feel* the difference . . . before you specify.

● We think you'll find the "extra something" you need to make your lighting installation the finest you've ever done.



THE SUN'S COMPOSING ROOM. Even without the acoustical ceiling which is still to be installed, the Day-Brite Alzak parabolic troffers here transform this room into an extra comfortable working area, comparable to the finest office space. A sensible approach, too, because mistakes and inaccuracies are just as costly here as in the office.

THE EVENING SUN'S EDITORIAL ROOM. Quiet now, but full of active, fast-working people before press time. And the light they work by *helps* them get the job done right, never hinders them. The fixtures are Day-Brite's Alzak parabolic troffers. The parabolic design and diffuse Alzak aluminum provide accurate control of light distribution and an excellent low-brightness ratio.

LIGHT FOR FREEDOM · LIGHT'S DIAMOND JUBILEE · POWER FOR PROGRESS

FEEL THE DIFFERENCE . . . BEFORE YOU SPECIFY

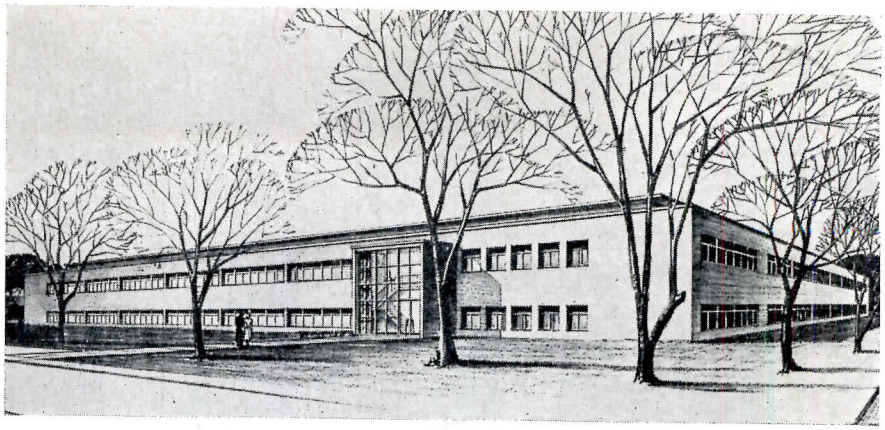
Call or write your nearest Day-Brite Representative

CANADA

(*Continued from page 26*)

Schofield, O.B.E., were W. R. Oates Jr. and Paul Washburn.

Lessing W. Williams, New York architect, conducted the session on modern building materials. Mr. Williams discussed the complexity of the architect's job in view of the many types of materials and structural systems from which he must make a choice.



Quality control laboratory for the Imperial Oil Co., Ltd., was designed by Toronto architect Gordon S. Adamson. The building, which is located at Sarnia, Ont., has been under construction since last October

Raymond Brunet, O.B.E., addressed the delegates at the assembly's opening luncheon. Mr. Brunet, who is president of the Canadian Construction Association, spoke of the relations of the contractor to the architect. Like the architects, he expressed concern at the prevalence of the "package deal" and at the reluctance of local governments to consult architects in their planning programs.

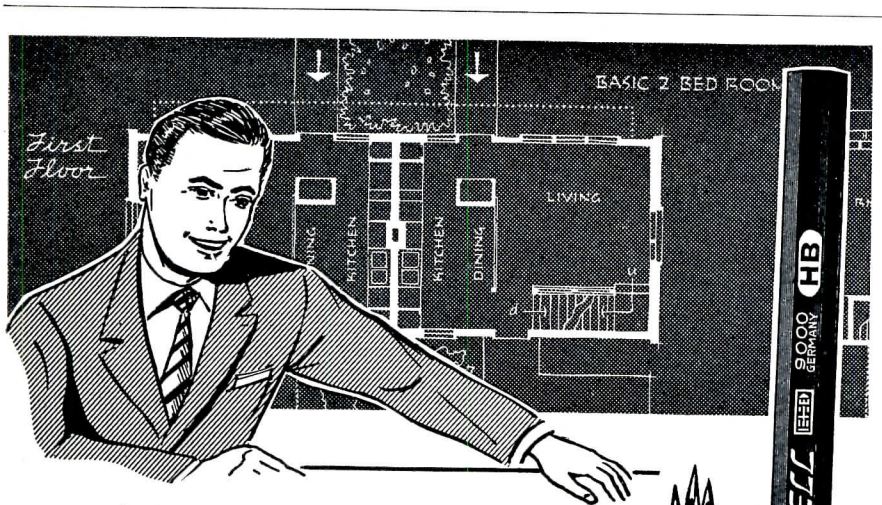
NATIONAL BUILDING CODE DISCUSSED AT MEETING

More than 100 building officials and construction men recently met in Ottawa for the fifth annual Building Officials Conference, sponsored by the Associate Committee on the National Building Code. Delegates came to get a preview of the new National Building Code and to discuss problems of its adoption and administration.

After hearing a report from Robert F. Legget, chairman of the committee, on the actual work of revision, senior provincial officials reported their intention to implement the code and joined municipal building inspectors in discussing its adoption. Over 500 municipalities, it was reported, had developed regulations based to some extent on the 1941 edition of the code.

Other questions reviewed concerned the liaison between building, fire and health officials, and the responsibility of the building official with regard to the completion of a building.

(*Continued on page 32*)



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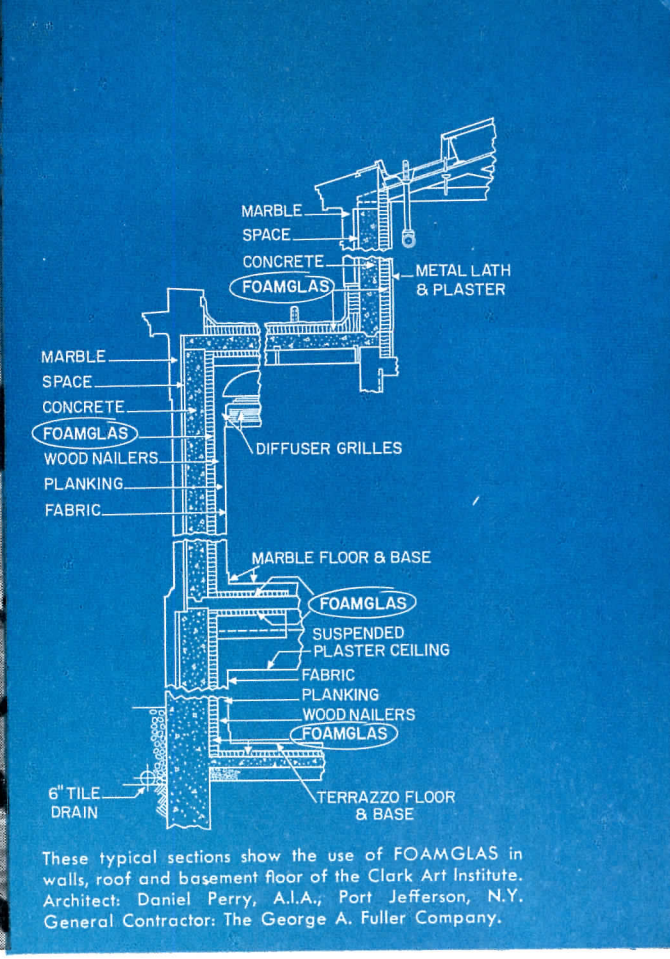
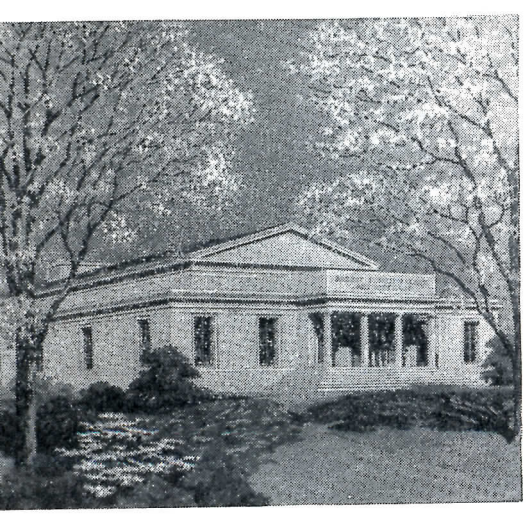
Photograph shows workmen applying asphalt seal to joints of FOAMGLAS laid on forms for boiler room ceiling slab. Clips shown will anchor FOAMGLAS to concrete when poured.



These typical sections show the use of FOAMGLAS in walls, roof and basement floor of the Clark Art Institute. Architect: Daniel Perry, A.I.A., Port Jefferson, N.Y. General Contractor: The George A. Fuller Company.

"Insulating with FOAMGLAS solved a vital temperature-humidity control problem for us!"

reports Sterling and Francine Clark Art Institute



Here is the Architect's rendering of the beautiful new Sterling and Francine Clark Art Institute, Williamstown, Massachusetts. FOAMGLAS insulates the roof slab, all exterior walls and the basement floor.

"The *moisture-proof* insulating protection of FOAMGLAS was an important factor in solving our vital temperature and humidity control problem," reports the Sterling and Francine Clark Art Institute, Williamstown, Massachusetts. "Precise control of temperature and humidity in all seasons is essential to proper protection of the art treasures to be displayed in our new building. That called for an insulation combining high insulating performance with *moisture-protection*. FOAMGLAS solved this problem because its sealed glass cells cannot absorb or transmit moisture. Here's our Architect's report on the selection of FOAMGLAS:

"'We insulate with FOAMGLAS because it combines permanent thermal insulating and vapor sealing qualities with freedom from maintenance. Also, its rigid structure permits us to apply metal lath plaster without anchoring to the structure proper.'"

It will pay *you* to investigate the important advantages of insulating with FOAMGLAS. See our catalog in Sweets, or send for a free sample and our booklets describing the use of FOAMGLAS to insulate: 1) walls, floors, roofs and ceilings of normal temperature buildings; 2) cold storage space; or 3) piping, tanks and other equipment. Write, indicating your specific interest.

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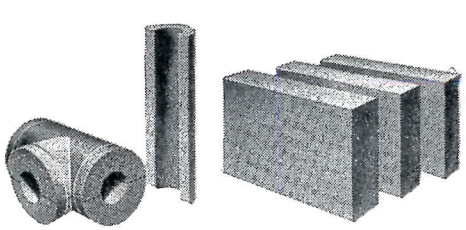

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Pittsburgh Corning also makes PC Glass Blocks

CANADA (*Continued from page 30*)

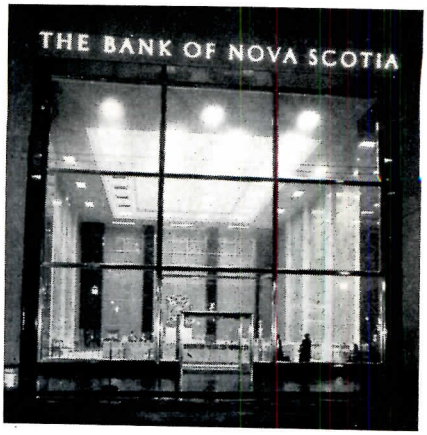
VISITING FIREMEN STUDY CANADIAN CONSTRUCTION

Two building teams from abroad recently came to Canada to take a look at the country's construction industry and its organizational and building methods.

The first group to arrive included 40 German contractors, building machinery and supply manufacturers, who visited Toronto and Montreal. After making a special inspection of the Ontario Hydro project at Niagara Falls, they conferred with Toronto contractors and watched construction in progress. They also observed, in Montreal, the apprenticeship program at the Building Trades Apprentice Training Center.

Later 21 members of an Australian productivity team came to Toronto. The group, which includes architects, engineers, contractors and manufacturers, is circling the world under the sponsorship of the Building Industry Congress of Melbourne.

The Australians were interested in studying production methods and new materials, and ways and means of reducing construction costs. Special attention was also paid to site organization and scheduling, modern plant and equipment use, training of superintendents and tradesmen and the effect of mortgage insurance on housing volume.



Dominant feature of the newly built Hamilton, Ont., Branch of the Bank of Nova Scotia is the plate glass window which measures 42 by 36 ft. Panes are supported by structural steel which is covered with stainless steel. Designers of the bank were McDonnell & Lenz, Hamilton architects

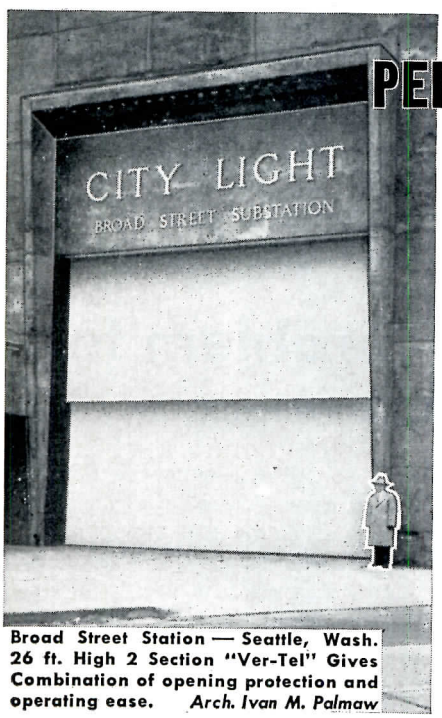
TOWN PLANNING OBSERVED FROM THREE VIEWPOINTS

The Toronto Chapter of the Ontario Association of Architects recently entertained members of the Toronto Metropolitan Council. Purpose of the meeting, according to chapter chairman G. Everett Wilson, was three-fold: to pay tribute to the members of the Metropolitan Council, to draw attention

(*Continued on page 36*)

SIZE Is Not the Measure of a DOOR *but* **PERFORMANCE IS Security DOORS LARGE or SMALL are nationally measured by...**

1. stronger construction for...
2. longer life with...
3. less maintenance cost plus
4. easy, quiet operation!



Broad Street Station — Seattle, Wash. 26 ft. High 2 Section "Ver-Tel" Gives Combination of opening protection and operating ease. *Arch. Ivan M. Palmaw*

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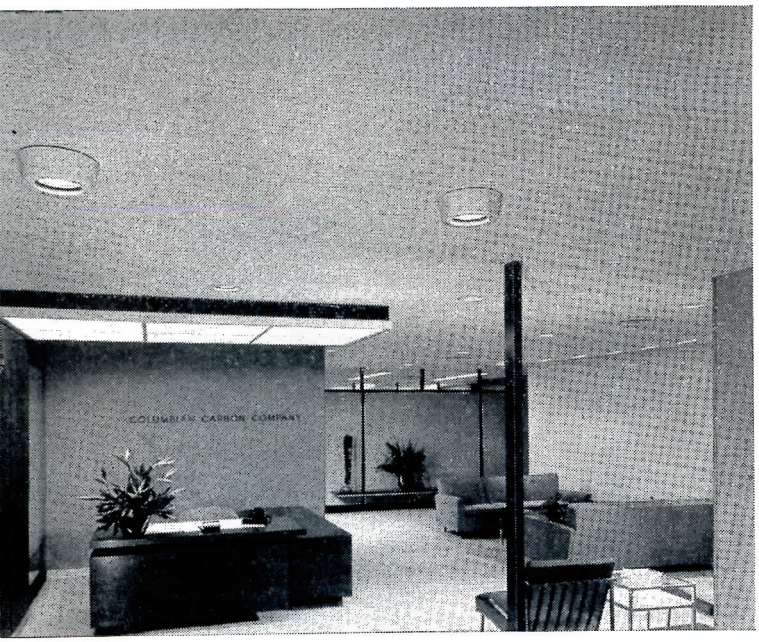
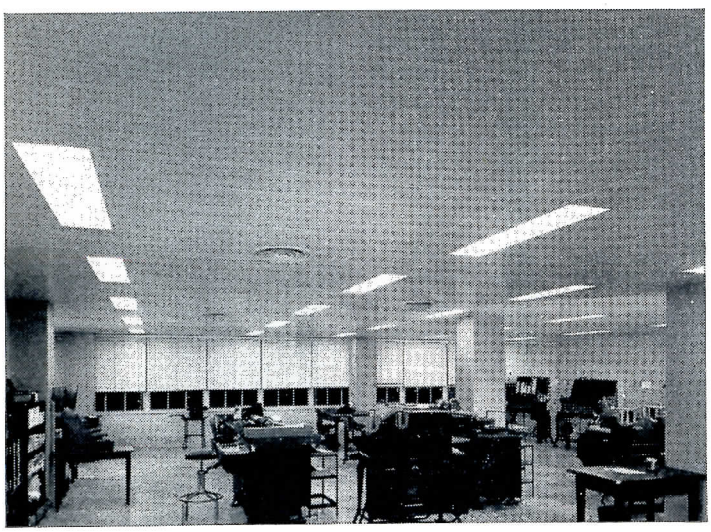


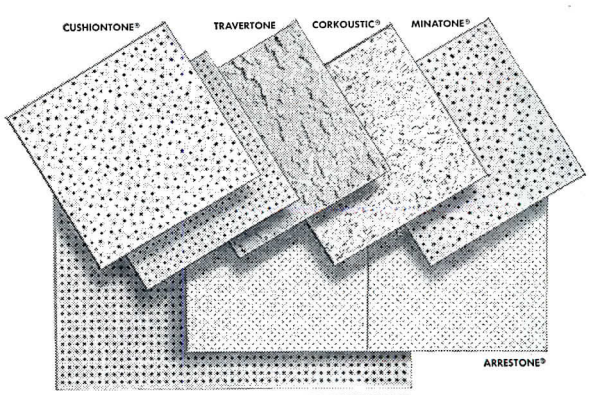
Visitors are welcomed to the Columbian Carbon Company by beautiful, restful surroundings. The noise-absorbing ceiling of Travertone contributes to this atmosphere, blends well with the up-to-date décor.



Sound conditioning this punchcard accounting machine room required an efficient acoustical material. Armstrong's Arrestone was chosen for its high noise-absorbing qualities as well as its easy maintenance.

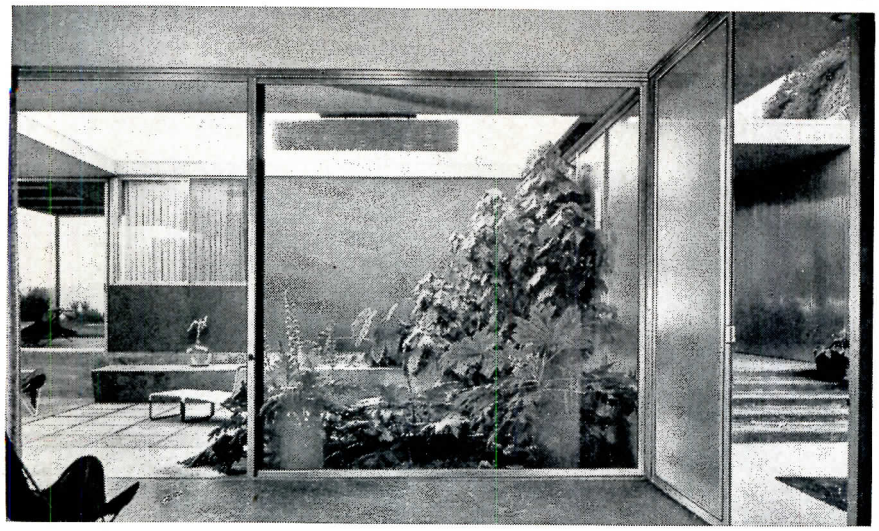
Dignity, beauty, and quiet are provided the president's office by the Travertone ceiling. This material will stay smart looking and clean for years with an occasional washing or repainting.

Glass partitions in the executive's secretarial area help promote a feeling of spaciousness. This "open" feeling is further carried out by the monolithic appearance of the square-edged Travertone ceiling.



ARMSTRONG'S ACOUSTICAL MATERIALS

Aluminum SLIDING DOORS & WINDOWS



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BUILDERS

Panaview offers the widest range of stock sizes permitting maximum flexibility of design for all types of construction.

Heavy gauge extruded aluminum of highest quality . . . never needs painting.

100% weather-proofed.

All window sash can be lifted out for easy cleaning and maintenance.

All hardware is flush allowing doors to by-pass one another.

Nylon rollers in windows for ease of operation.

. . . and remember . . . the best costs no more!

• **Write for FREE catalog, giving complete technical data on Panaview aluminum sliding doors and windows.**

PANAVIEW

ALUMINUM SLIDING DOORS AND WINDOWS

13424 Raymer Street, North Hollywood, California

THE RECORD REPORTS

CANADA

(*Continued from page 32*)

to the work of the chapter's Advisory Committee on Civic Design, and to stimulate interest in the civic programs of other cities.

Professor Charles E. Hendry, director of the School of Social Work at the University of Toronto, was the first of three speakers. Expressing the humanist's view, he stated that his studies of Scandinavian cities revealed a close relationship between physical planning and social planning.

Professor Anthony Adamson, professor of town planning at the School of Architecture, University of Toronto, took the planner's approach. For particular praise he singled out Zurich, Switzerland, and said "Europe teaches us that a high standard of urban beauty and environment is possible, if we will pay for it, and are willing to give up something for it."

Lex Schrag, staff writer of a Toronto daily newspaper, represented the laymen. Mr. Schrag suggested various local improvements, and called for a revitalization of planning and development procedures on both the municipal and provincial levels.

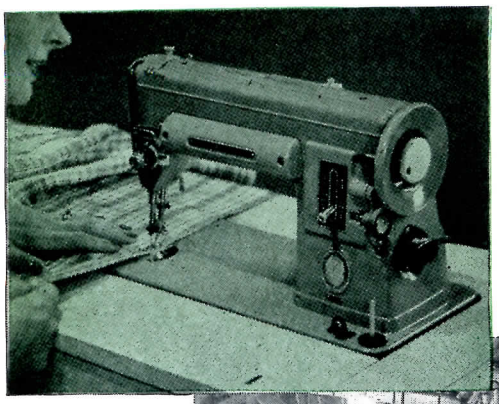
The remarks of the three speakers were summarized by Norman H. McMurrich, past president of the chapter. It had been demonstrated, he said, that Canadian standards of city planning were too low, but that it was possible to improve the situation with political courage and public willingness to pay.

MONTREAL ARCHITECT WAS WITH WORKS DEPARTMENT

C. Gustave Brault, A.R.I.B.A., F.R.A.I.C., for many years chief architect of the Department of Public Works in Ottawa, died recently. Mr. Brault was awarded the King's Coronation Medal in 1937.

Born in Montreal, Mr. Brault was educated at Mount St. Louis College in that city and at Cornell University. As chief architect in the Public Works Department, he was responsible for the design and construction of many federal government buildings. He was also in charge of construction of military hospitals during both world wars. Since his retirement from public service he had been practicing in Montreal.

(*More news on page 38*)

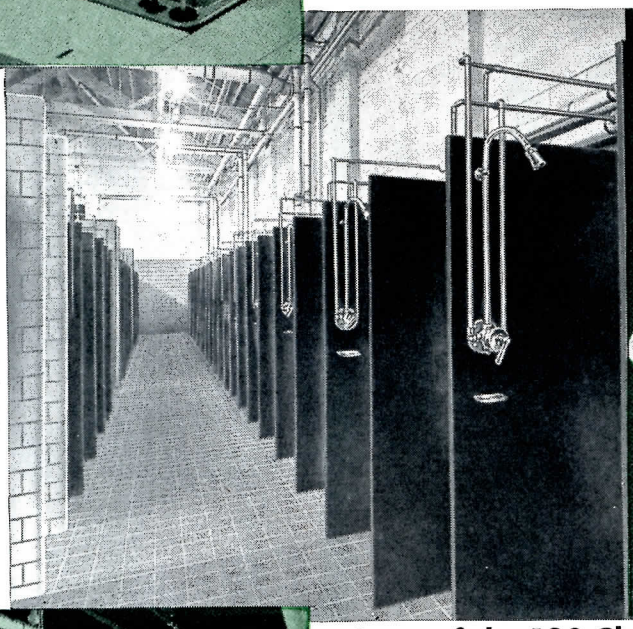


Workers Sing in the Showers
Regulated by POWERS
at The SINGER MANUFACTURING CO.
Plant in Elizabethport, New Jersey

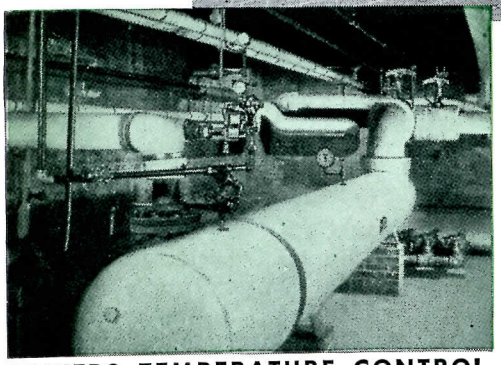
Above:
A magnificient new model in the already world-famous line of SINGER Sewing Machines

•

Right:
One of Singer's Shower rooms has 98 showers, another 58 and there are several smaller ones for individual groups.



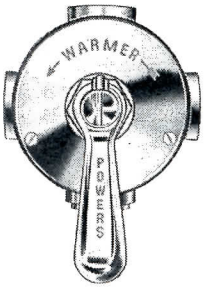
Some of the 190 Clean, Modern Showers at The Singer Mfg. Co. Each shower is individually controlled by a



POWERS TEMPERATURE CONTROL on HOT WATER GENERATORS

serving the various shower rooms is shown above. For this type of service a Powers ACCRITEM Regulator and FLOWRITE Valve are often used.

When You Have Problems of Water Temperature Control contact Powers nearest office. With over 60 years experience and a most complete line of controls we are well qualified to help you.



Mixer for Exposed Piping

POWERS

Thermostatic WATER MIXER

The Best Showers that money can buy — is only one of the many reasons why employees remain almost twice as long with SINGER as the national average.

Mr. F. H. Gummick, Plant Engineer for this famous 100 year old firm, says "The Singer Mfg. Co. has provided employees with the best shower room equipment obtainable. We consider it an investment in good employee relations."

Powers Temperature regulators on each individual shower as well as on the hot water generators serving the showers is the best insurance for a SAFE, COMFORTABLE shower.

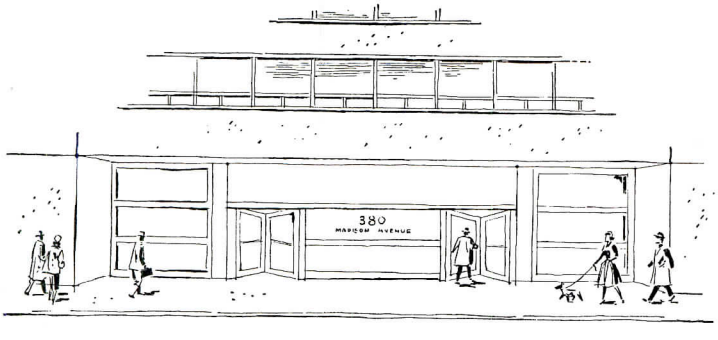
No Unexpected "Shots" of icy cold or scalding water here. Powers *thermostatic* water mixers always keep the water temperature just right — regardless of **pressure** or **temperature** changes in water supply lines. **See Powers catalog in SWEETS, section 24b**

(b14a) • **Only ONE Shower Accident Can Cost Many Times More Than POWERS Water Mixers** •

Established in 1891 • THE POWERS REGULATOR COMPANY • SKOKIE, ILL. • Offices in Over 50 Cities

A semi-circular conference table contributes an unusual note to the modern décor of the board room. The fissured, white-painted ceiling of Armstrong's Travertone adds beauty besides promoting quiet.

Sound conditioning basic in open planned offices



Columbian Carbon Company,
New York, N. Y.

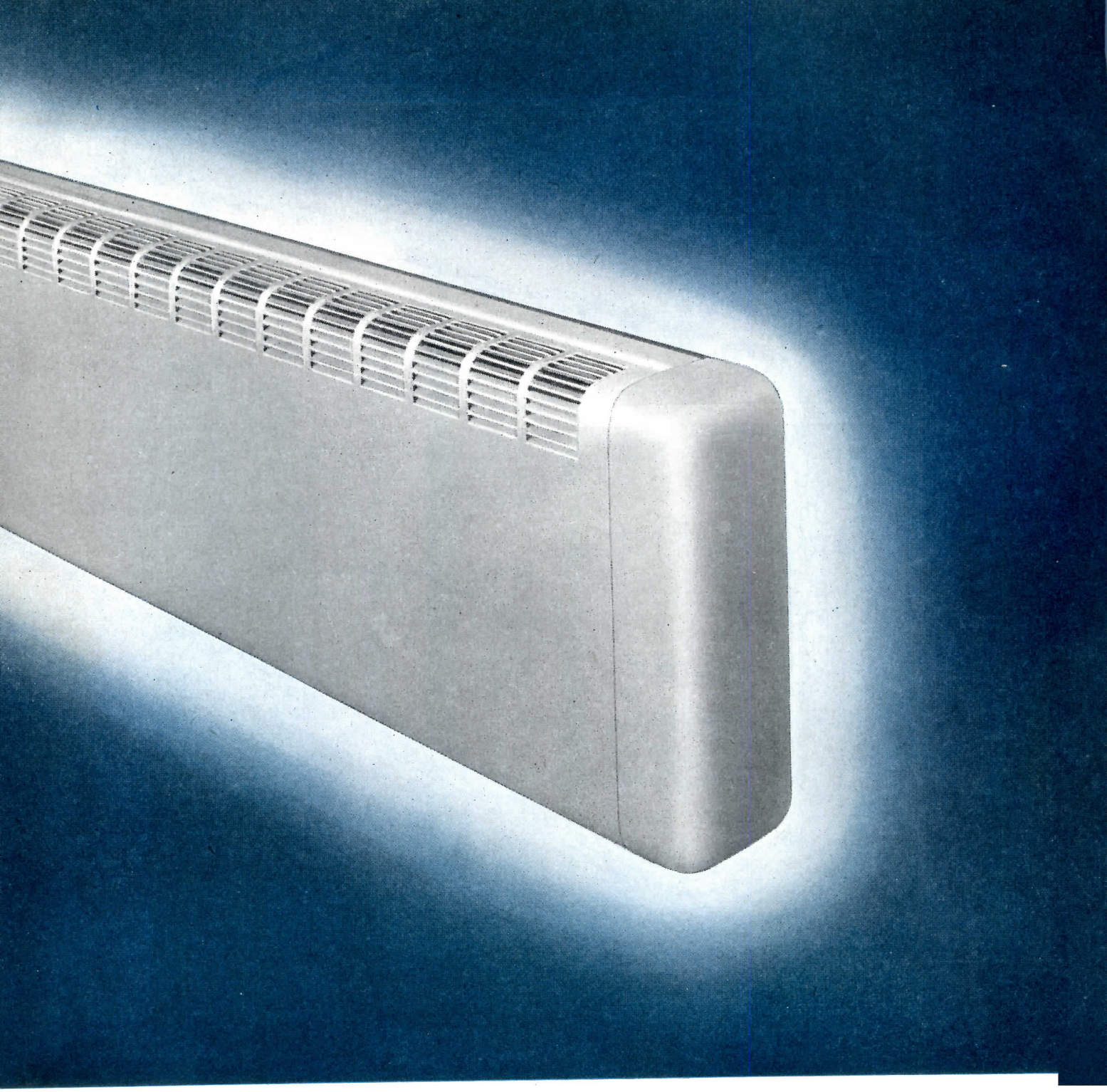
Architect: *J. Gordon Carr*
General Contractor: *Cauldwell-Wingate Co.*
Acoustical Contractor:
William J. Scully Acoustics Corp.

Today's modern office is a far cry from most of its pre-war counterparts. Open planning, an extensive use of room dividers, and other features of contemporary design as exemplified in the Columbian Carbon Company's new executive offices provide spaciousness, comfort, and beauty without any sacrifice of functionalism.

To make these modern interiors practical, architects recognize the need for proper acoustical treatment. To provide the quiet, beauty, and extra fire safety required for Columbian Carbon's two floors of office space, the architect selected ceilings of Armstrong's Travertone and Arrestone®.

Travertone's high acoustical efficiency soaks up as much as 80% of distracting noise and helps maintain a pleasantly quiet atmosphere despite the hustle and bustle of a busy working day. Travertone's handsomely fissured, white-painted surface also adds beauty to the décor, and its mineral wool composition contributes to fire safety.

In the machine accounting areas, where noise absorption is especially important, Armstrong's Arrestone has been installed. This perforated metal-pan material is unusually efficient, has a noise-reduction coefficient of 0.85. Get full details on Travertone, Arrestone, and Armstrong's other sound-conditioning materials from your local Armstrong Acoustical Contractor. For the free booklet, "How to Select an Acoustical Material," write Armstrong Cork Company, 4207 Rock Street, Lancaster, Penna.



DESIGNED FOR MODERN HEATING

Sill-line will heat the New Pavilion, Jefferson Hospital, Philadelphia, Pa.

Vincent G. Kling, Architect
A. E. D'Ambly, Engineer
W. M. Anderson Co., Htg. Contractor

Nesbitt Sill-line offers you all the benefits of high-capacity wall-fin radiation in the first enclosure expressly styled to harmonize with contemporary building design. Here's quick, uniform, under-the-window perimeter heating that provides economy of operation, ease of installation, and wide flexibility; *plus* an entirely new concept of enclosure styling so desirable for today's institutional and commercial buildings. If you desire further information on this new product, send for Nesbitt Publication 271.

NESBITT SILL-LINE RADIATION

Made and sold by John J. Nesbitt, Inc., Philadelphia 36, Pa

By Ernest Mickel

NEW CONCEPT OF PUBLIC WORKS ADVANCE PLANNING SEEKS TO STIMULATE STATE AND LOCAL PROGRAMS

STATES AND LOCAL COMMUNITIES are being urged by the President's Council of Economic Advisers to step up their advance planning programs. This could mean more work in the near future for architects and engineers, depending upon the extent to which the local officials respond to this prodding by the Federal government.

The plan is part of an overall program of inventorying public works plans of all sorts wherever they might exist.

The task of encouraging this build-up of preliminary public works plans falls to the new coordinator of public works planning, Major General John S. Bragdon, U. S. A. (ret.). With a small staff, and $35,000 in supplemental appropriations, he is setting about the job of stimulating an accumulation of preliminary drawings that could be converted to complete sets of plans and specifications in a relatively short time. He reports directly to Dr. Arthur F. Burns, economic adviser to the President.

The Council looks upon this newest endeavor less as an anti-cyclical measure than as a means of encouraging desirable long-range planning on the part of states and their local subdivisions. At this stage the Bragdon staff is attempting to find out just how much work is planned up to the working drawing stage, and how much is already in the category of planned public works, complete with detailed specifications.

The Council would like to see the states with long-range budgets of their own, with substantial cash reserves and

(*Continued on page 242*)

How Jenn-Air LOW CONTOUR exhausters cut costs 35%

Ft. Worth International Airport

Architect, Preston Geren; Consulting Engineer, Yendell-Cowan-Love; Mechanical Contractor, General Engineering Corp.

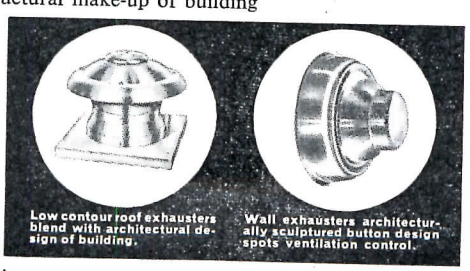
PROBLEM: To ventilate office, restroom and locker areas, holding costs at a minimum, conserving inside space, providing spot ventilation in building segments and blending equipment into beauty of structure.

SOLUTION: The adapting of two types of exhausters throughout structure . . . wall exhausters where structural make-up of building prevented going to the roof . . . roof exhausters where they could be spotted immediately over areas to be ventilated.
Result: a saving of 35% in labor and material.

WHY JENN-AIR? Only Jenn-Air could offer the diversification and adaptability of two types of exhausters, fitting ventilation to building need, instead of the building conforming to the ventilation problem.

Low contour Jenn-Air Exhausters, made of ageless spun aluminum, are non-rusting—provide strength without weight. Next time consult Jenn-Air Ventilating Specialists on your ventilating problems.

JENN-AIR PRODUCTS COMPANY, INC.
Architects & Builders Bldg.
Indianapolis 4, Ind.



Low contour roof exhausters blend with architectural design of building.

Wall exhausters architecturally sculptured button design spots ventilation control.

Jenn-Air Products Company, Inc.
Architects & Builders Building, Indianapolis 4, Ind.

Please send me your free catalog 53B.

name_____

title_____

company_____

address_____

city_____ state_____ AR

A.I.A. Lauds Hill-Burton

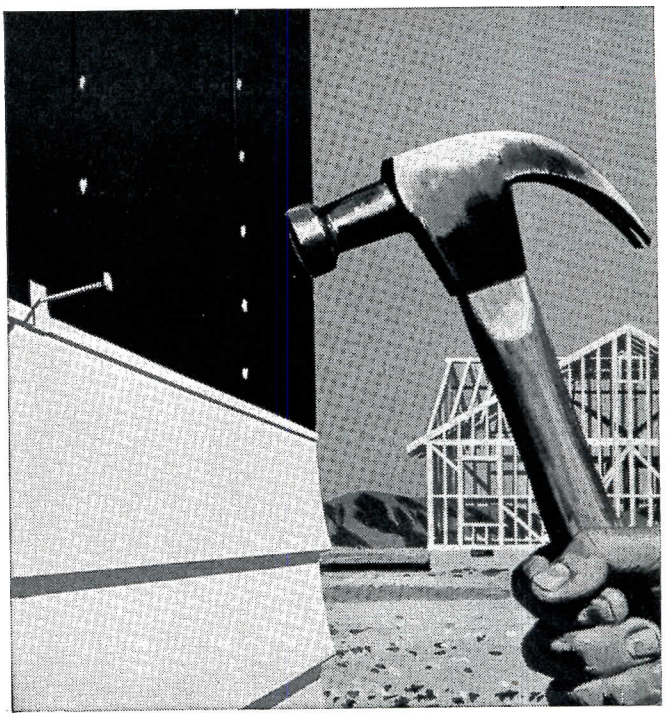
THE HOSPITAL FACILITIES DIVISION of the U. S. Public Health Service came in for high praise in the testimony of the American Institute of Architects' secretary, George Bain Cummings of Binghamton, before the House of Representatives subcommittee which held hearings on the Health, Education and Welfare department appropriations measure containing $75 million for hospital construction under the Hill-Burton Hospital Act.

"To us," said Mr. Cummings, "this act and its administration represents an outstanding example of how cooperation between a Federal agency and private enterprise may be satisfactorily achieved, particularly in relation to the private practice of the architectural profession."

Without the leadership of the small headquarters and field staff of the Office of Technical Services headed by Marshall Shaffer, hospital architecture would suffer seriously, Mr. Cummings declared. He noted that administrative cost of PHS technical services is put at less than one tenth of one per cent of the total valuation of work placed under contract.

with ALUMINUM PRODUCTS!

Aluminum shingle roofing adds value because it can't rust or rot, keeps its modern good looks for a "housetime." Needs no paint or maintenance. Provides weathertight insulation against heat and cold.



Aluminum nails add value because they can never deface building exteriors with ugly rust stains, can never "rot out" . . . thus help assure *permanent* beauty.

WHEN YOU SPECIFY aluminum products for your customers, your construction will have *greater sales appeal* —because aluminum provides a combination of advantages that no other material can match.

Among these advantages are light weight, strength, corrosion resistance, economy, and modern beauty.

Today, there is a plentiful supply of building products . . . due in great part to our vast expansion. We now have the capacity to produce 30% of all the primary aluminum made in this country.

You will find that aluminum's great versatility makes it easier for architects and builders to develop the valuable new ideas you often have for future construction. This versatility also permits you to adapt aluminum to applications now calling for materials with fewer advantages.

Engineering assistance is available from our qualified aluminum engineers. Or for name of building products manufacturers who will be glad to work with you, contact any Kaiser Aluminum office listed in your telephone directory. Kaiser Aluminum & Chemical Sales, Inc., General Sales Office, Palmolive Bldg., Chicago 11, Ill.; Executive Office, Kaiser Bldg., Oakland 12, Calif.

Kaiser Aluminum

setting the pace—in growth, quality and service

CONSTRUCTION COST INDEXES

Labor and Materials **U. S. average 1926–1929 = 100**

Presented by Clyde Shute, manager, Statistical and Research Division, F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assocs., Inc.

NEW YORK

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1930	127.0	126.7	124.1	128.0	123.6
1935	93.8	91.3	104.7	108.5	105.5
1939	123.5	122.4	130.7	133.4	130.1
1940	126.3	125.1	132.2	135.1	131.4
1946	181.8	182.4	177.2	179.0	174.8
1947	219.3	222.0	207.6	207.5	203.8
1948	250.1	251.6	239.4	242.2	235.6
1949	243.7	240.8	242.8	246.4	240.0
1950	256.2	254.5	249.5	251.5	248.0
1951	273.2	271.3	263.7	265.2	262.2
1952	278.2	274.8	271.9	274.9	271.8
1953	281.3	277.2	281.0	286.0	282.0
Feb. 1954	284.1	278.2	291.6	297.7	294.2
Mar. 1954	284.2	278.4	291.4	297.5	294.1
Apr. 1954	283.1	277.1	290.8	297.0	293.5
	% increase over 1939				
Apr. 1954	129.2	126.4	122.5	122.6	125.6

ATLANTA

Period	Residential Brick	Residential Frame	Apts., Hotels Office Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Concr.	Commercial and Factory Bldgs. Brick and Steel
1930	82.1	80.9	84.5	86.1	83.6
1935	72.3	67.9	84.0	87.1	85.1
1939	86.3	83.1	95.1	97.4	94.7
1940	91.0	89.0	96.9	98.5	97.5
1946	148.1	149.2	136.8	136.4	135.1
1947	180.4	184.0	158.1	157.1	158.0
1948	199.2	202.5	178.8	178.8	178.8
1949	189.3	189.9	180.6	180.8	177.5
1950	194.3	196.2	185.4	183.7	185.0
1951	212.8	214.6	204.2	202.8	205.0
1952	218.8	221.0	212.8	210.1	214.3
1953	223.3	224.6	221.3	221.8	223.0
Feb. 1954	220.0	219.7	223.3	224.8	224.4
Mar. 1954	219.8	219.5	223.1	224.7	224.8
Apr. 1954	218.7	218.2	222.5	224.3	224.4
	% increase over 1939				
Apr. 1954	153.4	162.6	134.0	130.3	137.0

ST. LOUIS

1930	108.9	108.3	112.4	115.3	111.3
1935	95.1	90.1	104.1	108.3	105.4
1939	110.2	107.0	118.7	119.8	119.0
1940	112.6	110.1	119.3	120.3	119.4
1946	167.1	167.4	159.1	161.1	158.1
1947	202.4	203.8	183.9	184.2	184.0
1948	227.9	231.2	207.7	210.0	208.1
1949	221.4	220.7	212.8	215.7	213.6
1950	232.8	230.7	221.9	225.3	222.8
1951	252.0	248.3	238.5	240.9	239.0
1952	259.1	253.2	249.7	255.0	249.6
1953	263.4	256.4	259.0	267.6	259.2
Feb. 1954	262.0	255.8	260.7	270.0	262.5
Mar. 1954	262.1	256.0	260.5	269.8	262.4
Apr. 1954	263.5	256.3	263.3	272.9	265.0
	% increase over 1939				
Apr. 1954	139.1	139.5	121.8	127.8	122.7

SAN FRANCISCO

1930	90.8	86.8	100.4	104.9	100.4
1935	89.5	84.5	96.4	103.7	99.7
1939	105.6	99.3	117.4	121.9	116.5
1940	106.4	101.2	116.3	120.1	115.5
1946	159.7	157.5	157.9	159.3	160.0
1947	193.1	191.6	183.7	186.8	186.9
1948	218.9	216.6	208.3	214.7	211.1
1949	213.0	207.1	214.0	219.8	216.1
1950	227.0	223.1	222.4	224.5	222.6
1951	245.2	240.4	239.6	243.1	243.1
1952	250.2	245.0	245.6	248.7	249.6
1953	255.2	257.2	256.6	261.6	259.7
Feb. 1954	254.0	245.6	261.5	269.0	263.9
Mar. 1954	254.5	246.3	261.3	268.9	263.9
Apr. 1954	253.6	244.6	262.2	270.4	264.8
	% increase over 1939				
Apr. 1954	140.2	146.3	123.3	121.8	127.3

The index numbers shown are for combined material and labor costs. The indexes for each separate type of construction relate to the United States average for 1926–29 for that particular type — considered 100.

Cost comparisons, as percentage differences for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.:

index for city A = 110
index for city B = 95
(both indexes must be for the same type of construction).
Then: costs in A are approximately 16 per cent higher than in B.

$$\frac{110-95}{95} = 0.158$$

Conversely: costs in B are approximately 14 per cent lower than in A.

$$\frac{110-95}{110} = 0.136$$

Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926–29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.

These index numbers will appear regularly on this page.

YOUR BLUEPRINTS ALLOW FOR A PLUG-IN THIS BIG?

DO THE PLANS of the houses you design call for *wiring systems* big enough to power an ever-growing number of modern appliances? Do they specify *large enough wires* to carry full loads of current; *Plenty of circuits* for both small and large appliances; *Sufficient outlets* to feed current to every spot where it's needed?

Those are the things that must be "blueprinted" if the electrically-minded homebuilders of today are to be satisfied. They are the features that mean extra convenience, comfort and safety in electrical living. They mean *truly modern* homes . . . *fully-powered* not only for today, but also for *tomorrow!*

To plan such wiring naturally takes extra care and foresight on the part of the architect. But it's well worth any additional effort. Because nothing is more evident than the operation of a household electrical system . . . nothing goes so far to point out the excellence of the functional planning of the home that houses it!

So . . . plan your homes with a critical eye on the layouts and specifications of their wiring systems. You'll find that it pays! Kennecott Copper Corporation, 161 East 42nd Street, New York 17, N. Y.

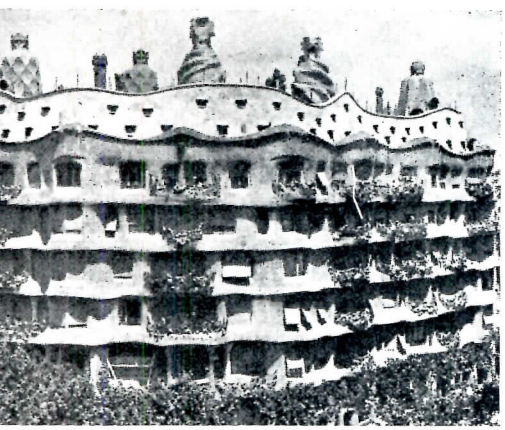
IMPORTANT NOTE: Kennecott is sponsoring an extensive national advertising campaign to tell the story of adequate wiring to American homeowners. Watch for it in the SATURDAY EVENING POST and THIS WEEK magazines.

Kennecott
COPPER CORPORATION

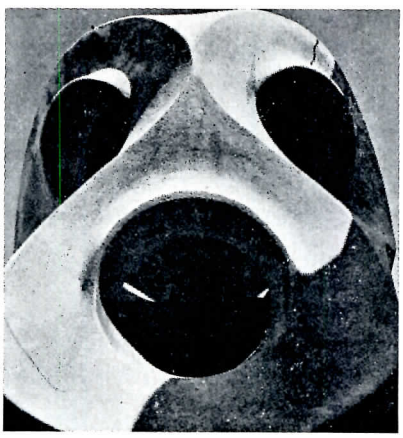
Fabricating Subsidiaries: CHASE BRASS & COPPER CO. KENNECOTT WIRE & CABLE CO.

THE STRANGE WORK OF

ANTONIO GAUDI

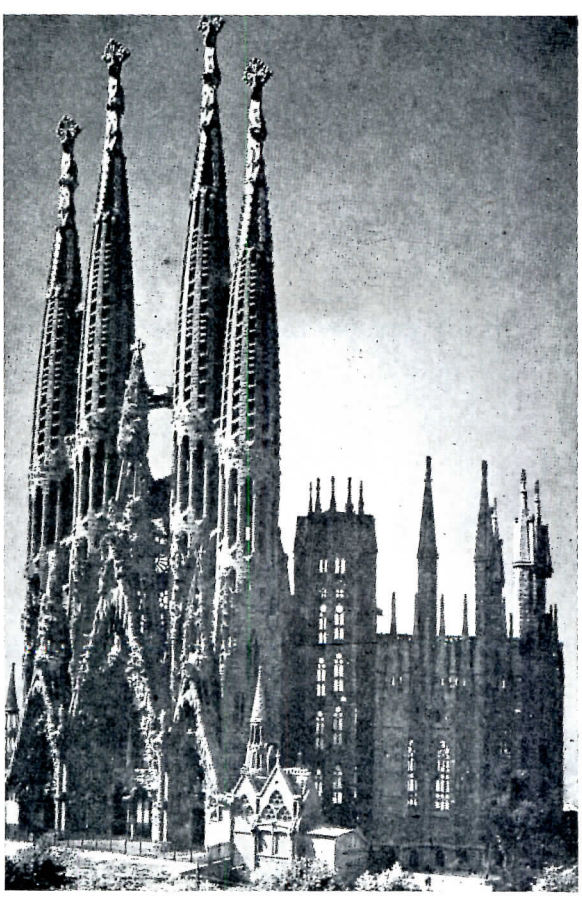


Casa Milá, Barcelona

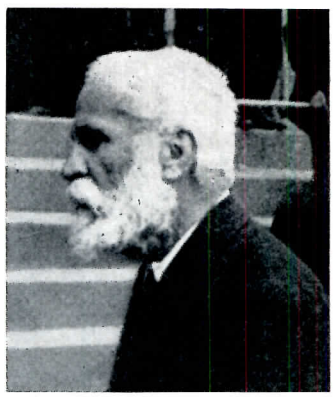


Sculpture atop Casa Milá

Two scenes in Parque Güell



La Sagrada Familia



El Arte de Gaudí. By Juan Eduard Cirlot. Ediciones Omega, S.A. (Casanova, 220, Barcelona) 1952. Distributed by Wittenborn and Co. (38 E. 57 St., New York, N. Y.) 7¼ by 9½ in. 86 pp., illus. $2.50.

La Sagrada Familia de Antonio Gaudí. By A. Cirici-Pellicer, photographs by Joaquin Gomis. Ediciones Omega, S.A. 1952. Distributed by Wittenborn and Co. 7¼ by 9½ in. 86 pp., illus. $2.50.

El Templo de la Sagrada Familia: Sintesis del Arte de Gaudí. By I. Puig Boada. Ediciones Omega, S.A. 1952. Distributed by Wittenborn and Co. 7 by 9½ in. 190 pp., illus. $3.75.

Antonio Gaudí (1852–1926), creator of the writhing forms of the Casa Milá, Parque Güell and La Sagrada Familia, was a product of the Medievalist revival resulting from the strong nationalist movement in Catalonia against the oppressive Central Government.

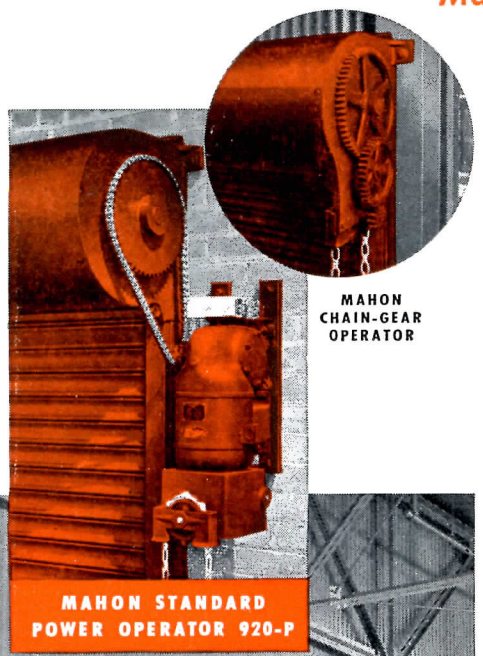
With this strong political feeling Gaudí combined an obsession for natural forms. The result is a curious mixture of Gothic and Ar Noveau governed by the vigorous, eccentric imagination and the fervently religious personality of the architect. Strange as the work seems, it is sympathetic with the rugged Catalonian landscape and temperament.

Gaudí, who felt himself the developer of a living Medieval tradition, designed and supervised every detail of his work including the furniture. Since the type of labor required to build his architecture was not akin to the modern system, he set up a workshop system for the la-

(*Continued on page 48*)

Rolling Steel Doors

Manually, Mechanically, or Electrically Operated



MAHON CHAIN-GEAR OPERATOR

MAHON STANDARD POWER OPERATOR 920-P

In pier storage buildings, and warehouses of world ports, rolling steel doors play an important role in providing access and protection for off-loaded and on-loading cargoes. For this particular purpose, no other type of door so fully meets today's requirements . . . because, Rolling Steel Doors occupy no usable space either inside or outside the door opening . . . their vertical roll-up action permits cargoes to be stacked within a few inches of the door curtain on either side. And, there are no overhead tracks or other obstructions to interfere with crane handling adjacent to door openings. A Mahon electrically operated, quick-opening, quick-closing Rolling Steel Door will save valuable space and valuable time in any type of opening. In addition, Mahon Rolling Steel Doors are permanent—their all-metal construction assures a lifetime of trouble-free service and maximum protection against intrusion and fire. When you select a Rolling Steel Door, check specifications carefully . . . you will find extra-value features in Mahon doors—for instance, the galvanized steel material, from which the interlocking curtain slats are rolled, is chemically cleaned, phosphated, and treated with a chromic acid solution to provide paint bond, and the protective coating of synthetic enamel is baked on at 350° F. prior to roll-forming. You will find other quality materials and design features in Mahon doors that add up to a greater over-all dollar value. See Sweet's Files for complete information including Specifications, or write for Catalog G-54.

THE R. C. MAHON COMPANY

Detroit 34, Michigan • Chicago 4, Illinois • Representatives in all Principal Cities

Manufacturers of Rolling Steel Doors, Grilles, and Automatic Closing Underwriters' Labeled Rolling Steel Doors and Fire Shutters; Insulated Metal Walls and Wall Panels; Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

Four of Thirty Mahon Rolling Steel Doors installed in the Napoleon Avenue Wharf Shed built by the Board of Harbor Commissioners, Port of New Orleans, Louisiana.

MAHON

Well worth noting:

Use a FLINTKOTE Coating for years of heavy-duty protection

Flintkote makes you a *complete line* of spray, brush or trowel applied coatings for water, dampness and corrosion control . . . each designed for *specific* protection requirements, inside and out.

One of these products, and a good name to remember, is Flintkote HYDRALT® . . . multi-purpose industrial asphalt emulsion coatings, fibrated and non-fibrated.

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REQUIRED READING

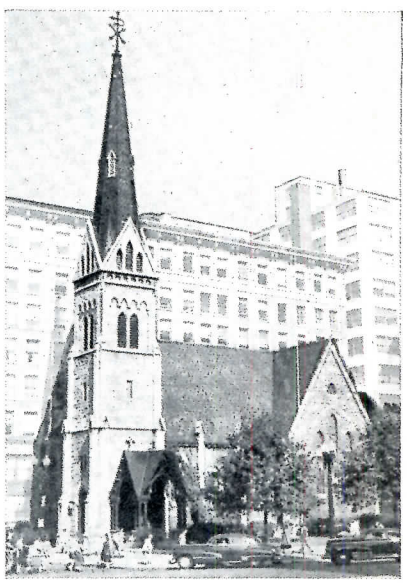
(*Continued from page 46*)

borers. When funds were cut off on building La Sagrada Familia and workers left, it is said that Gaudí lived in the workers' tool shed and, incited by increasing piety, worked unceasingly on the mad forms that compose this immense cathedral. While crossing the street to observe his work from afar, the architect was struck by a street car, bringing to an end the life of an architect whose work remains a mystery to most.

Gaudí was accepted by the Catalans and had his followers. His roof-top sculpture and façade details bear interesting resemblance to the forms of Joan Miro — fellow Catalan.

Although the text of these three books is written in Spanish, its many fine photographs, details and drawings describe Gaudí's work adequately.

AN AMERICAN ARCHITECT IN THE VICTORIAN AGE



Victorian Architect: The Life and Work of William Tinsley. By J. D. Forbes. Indiana University press, Bloomington, 1953. 153 pp.; illus. $5.00

Mr. Forbes has written here a brief and sympathetic biography of an Irish immigrant who eventually settled and practiced in the American Midwest. Though Tinsley could hardly be called more than a competent architect, competent he certainly was. Neither his

(*Continued on page 288*)

A NEW ECONOMY IN SCHOOL CONSTRUCTION

GRID WALL SYSTEM
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KNAPP METAL MODULAR UNIT WALL PANELS

Knapp unit wall panels are furnished complete with factory installed insulated panels and sash, ready for field glazing. Insulated metal panels are available in various finishes including porcelain enamel in a wide range of colors. The nominal thickness of these panels provides extra usable floor area.

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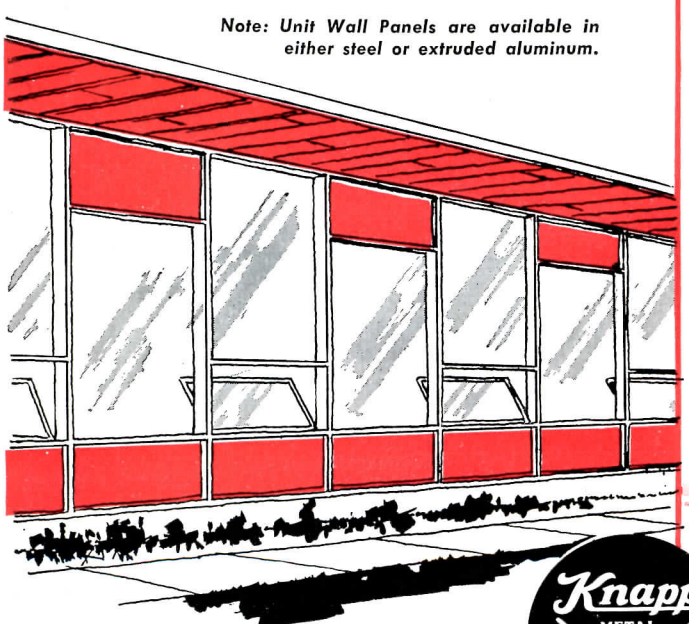
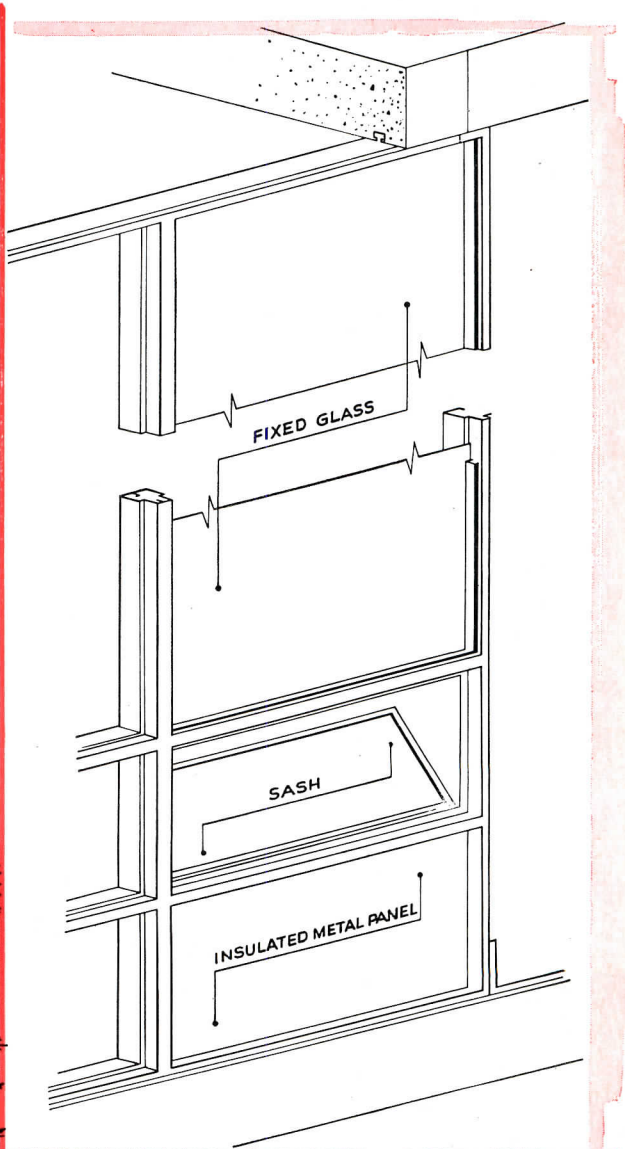
Note: Unit Wall Panels are available in either steel or extruded aluminum.



Pictured above are but a few of the many combinations of insulated panels, sash and fixed glass. This grid wall system can be varied to meet functional and appearance requirements.



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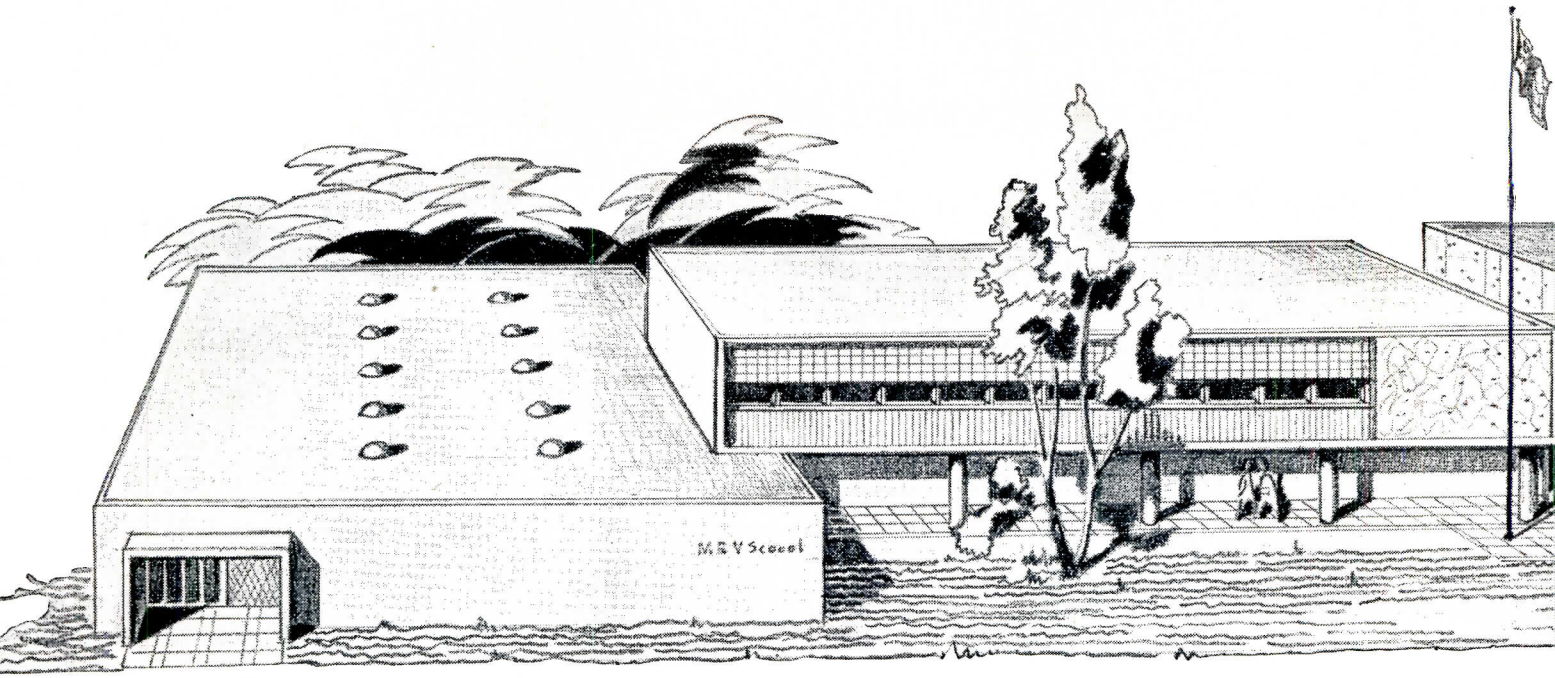

IT TAKES MORE THAN MODERN DESIGN TO KEEP SCHOOL BOARDS HAPPY

We're talking about modern electrical practices that complement modern design and directly effect a majority of the functions a building must perform.

We're talking about the kind of controlled lighting and power facilities it takes to provide:

completely adequate and dependable power for the many electrically operated building services;

safe, positive power control through modern, automatic protective devices;

electrical flexibility to meet future expansion programs easily and economically.

Those are things modern electrical practices mean. Certainly, they are an integral part of the building that should be weighed heavily in the study stage and developed as a part of your design planning.

If carried out properly, this objective is automatically realized: You have matched the electrical facilities to the standards you've set for design. And, you'll be giving the school board a better building—one that provides for the maximum comfort, safety and well-being of its students.

A call to your nearby Westinghouse Office will bring a construction application engineer ready to help you integrate modern electrical practices into your next school design. Get in touch with him during the study stage. Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. DP-5005-A

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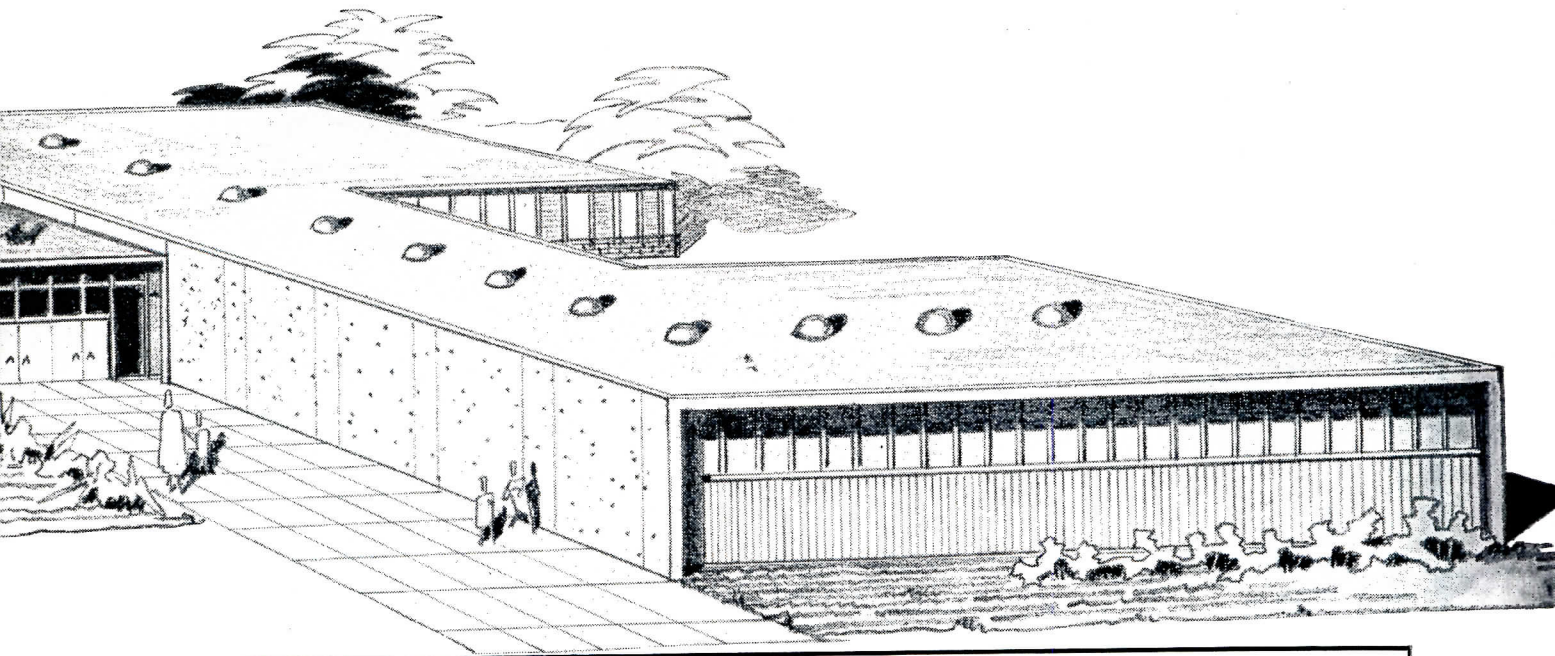
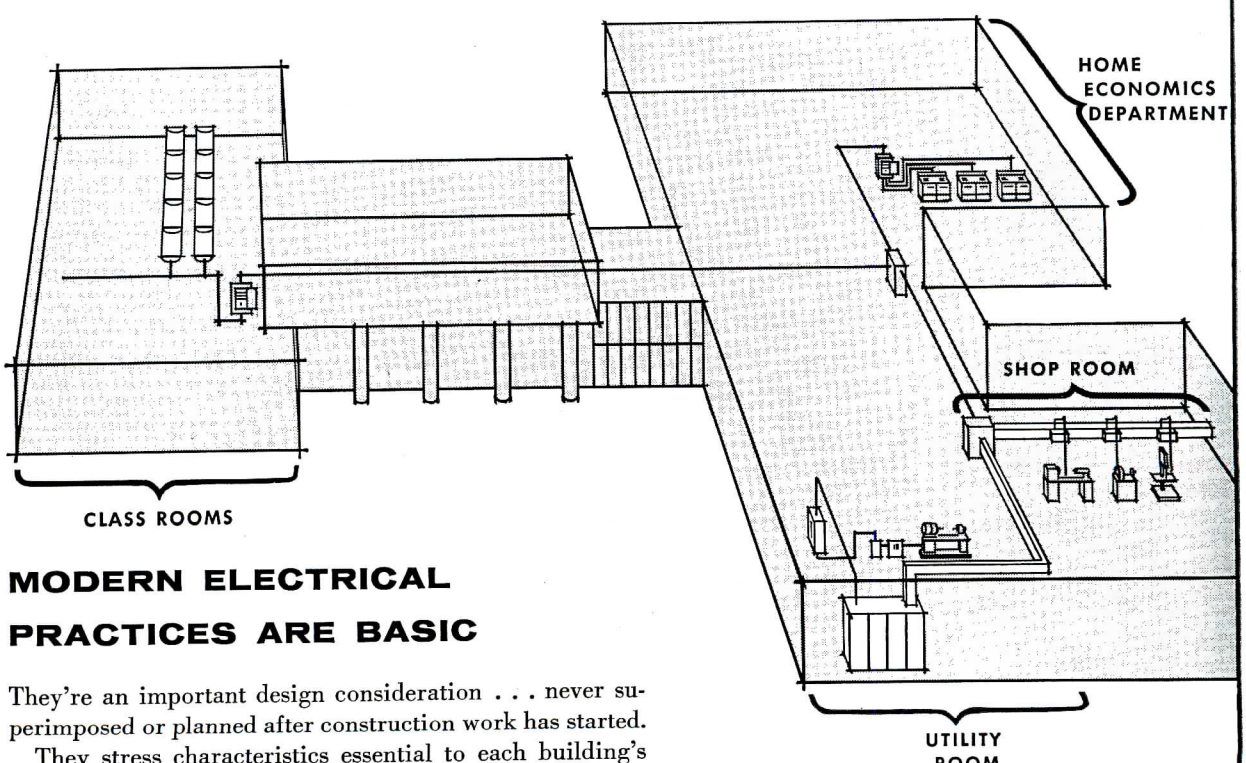


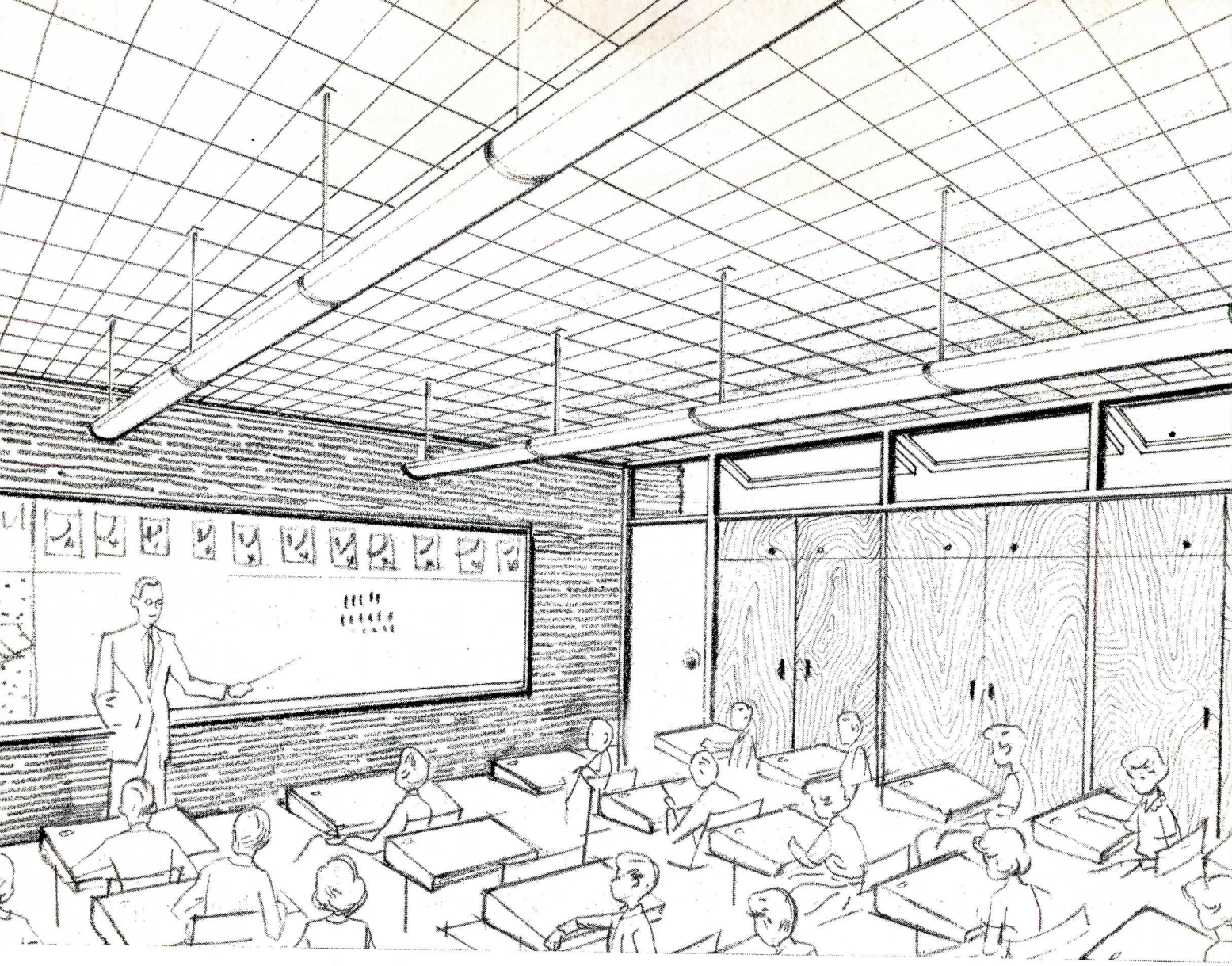


MODERN ELECTRICAL PRACTICES ARE BASIC

They're an important design consideration . . . never superimposed or planned after construction work has started.

They stress characteristics essential to each building's functions. And they are designed around modern equipment—electrical "blocks" that build electrical reliability, safety and convenience... and have the inherent versatility to handle changing power loads easily and economically.

Specific examples of modern electrical practices as well as the "blocks" that serve as their foundation are shown on the next four pages.



CONTROLLED LIGHTING SYSTEMS . . .
a prime consideration

Where practical, we all realize the desirability of taking full advantage of natural light. As a primary lighting source, however, it has these disadvantages:

It cannot cover the entire classroom adequately. On bright days, it is uncomfortable—unless you block out the glare. On dark days, it is inadequate—far below the required lighting level.

And the trend to lower ceiling heights and larger classrooms is further eliminating daylight as a principal lighting means.

Therefore, it is a basic architectural assignment to provide adequate *controlled* lighting systems . . . for day-in, day-out use . . . in all parts of the room.

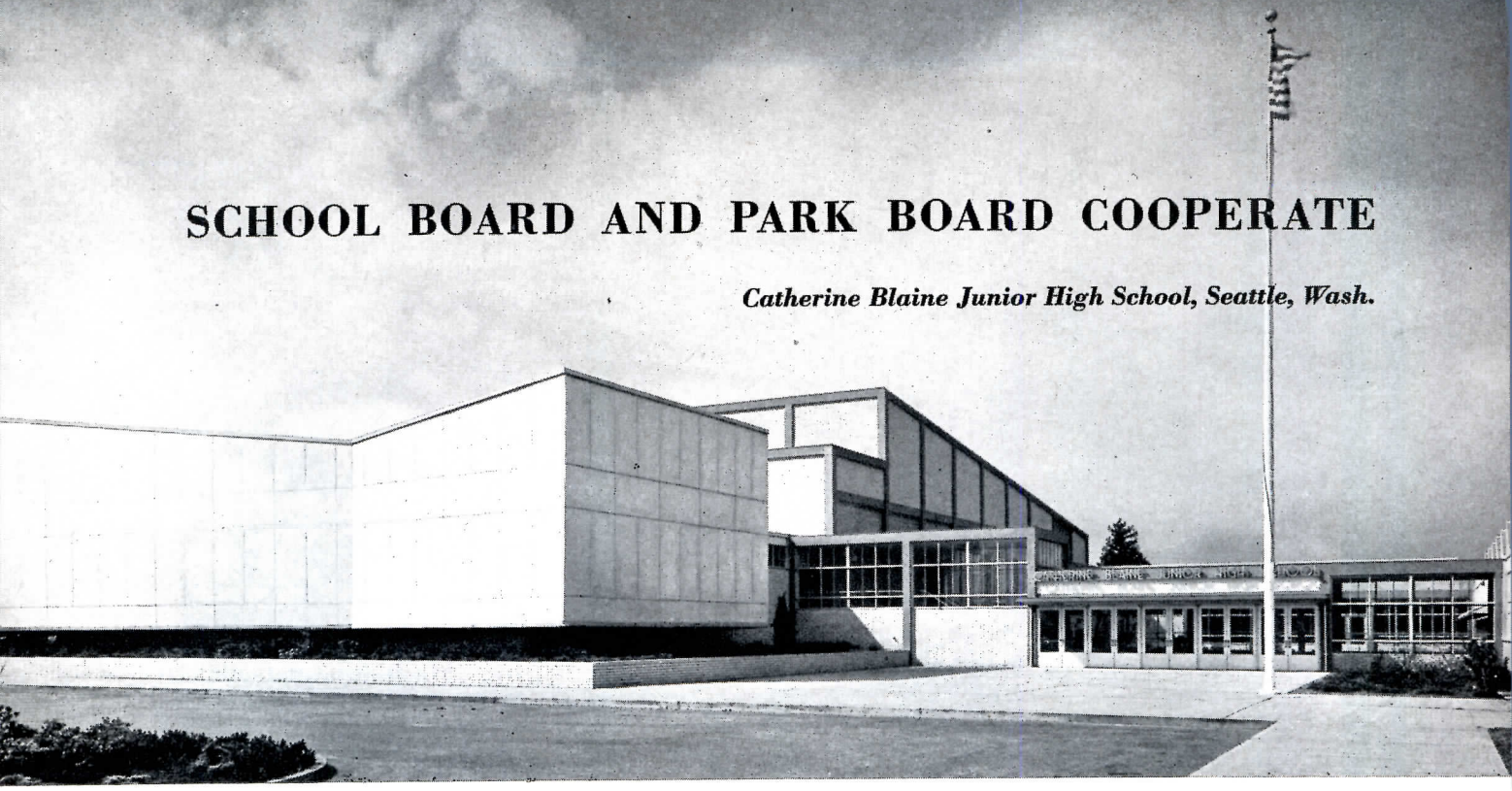
The two basic sources—incandescent and fluorescent —shown on these pages are completely modern and blend well with building design.

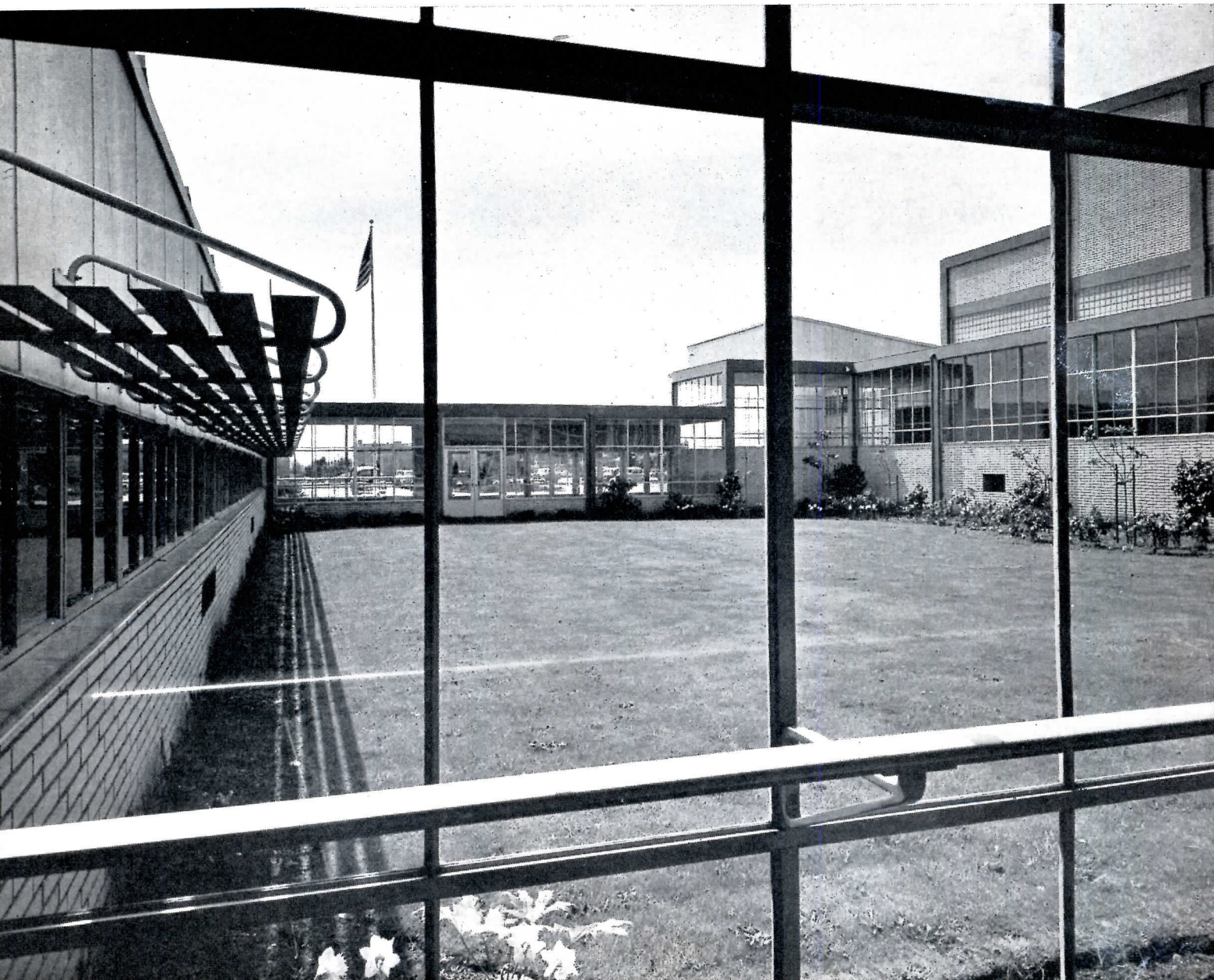
Economically, incandescent would seem to be less expensive. But that's only from an initial cost standpoint. Over-all, your client will find fluorescent systems less expensive to operate and maintain.

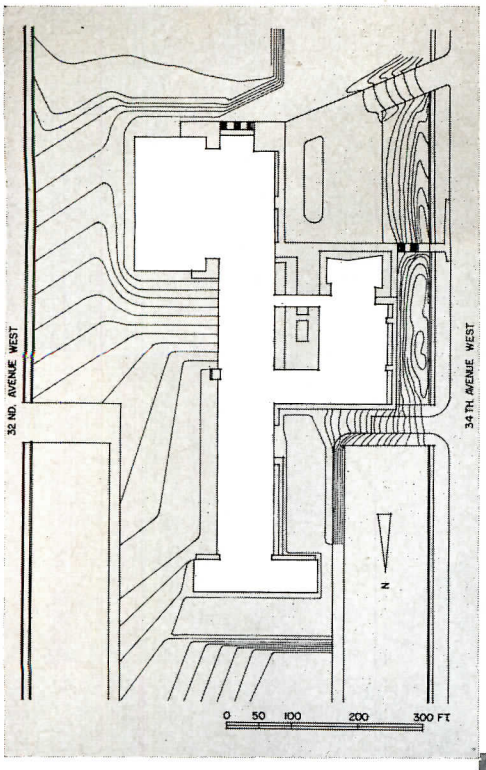
Regardless of the system you design, *if done well* it will provide adequate wiring for future lighting improvements. Proper installation of an incandescent system today means that a change-over to higher level fluorescent lighting can be made tomorrow without a need for rewiring. DP-5005-B

SCHOOL BOARD AND PARK BOARD COOPERATE

Catherine Blaine Junior High School, Seattle, Wash.







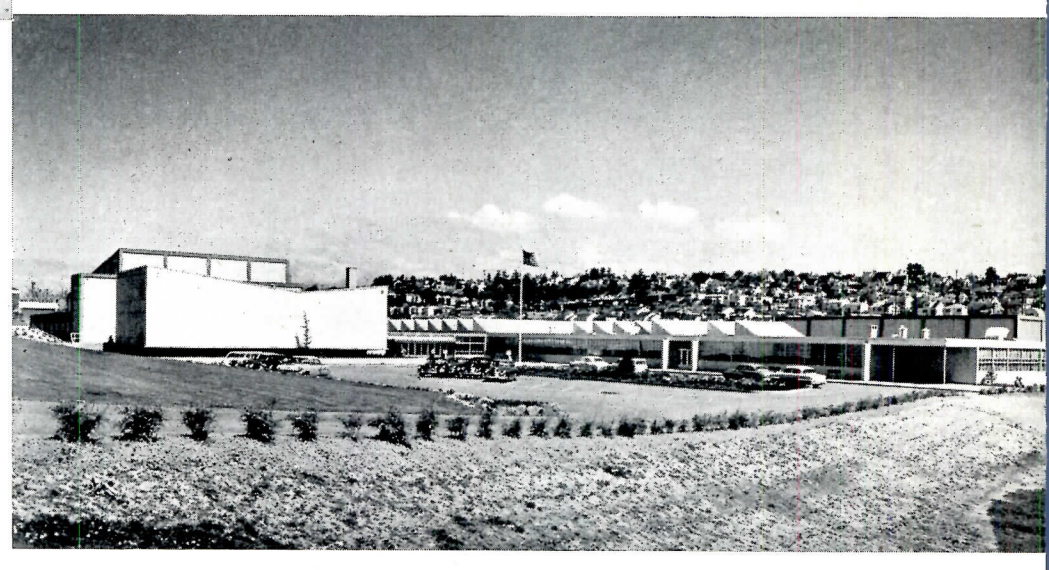
THE STORY of Catherine Blaine Junior High School is really the story of the venture of two municipal departments in consolidating their resources for one common aim — better school and recreational facilities for one of Seattle's numerous neighborhood communities. The debate engendered by such a break with established procedure developed an unusually strong public interest in the project — in its form, in the relation of its various elements (school, gym, playfields, social rooms) to site use, in the value of additional land acquisition, in overall need for acreage for community use. As the architect (a former president of the Seattle Planning Commission) says, the proposal was "a gauntlet laid down to city planning — and the structure was an important element in proving the validity of the project."

J. Lister Holmes & Associates, Architects

Robert H. Dietz & Charles Graham MacDonald, Architects, Associates

Stevenson & Rubens, Structural Engineers

Bouillon & Griffith, Mechanical Engineers



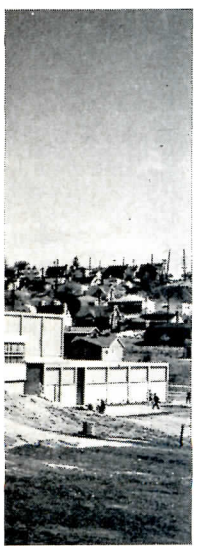
All photos by Charles R. Pearson

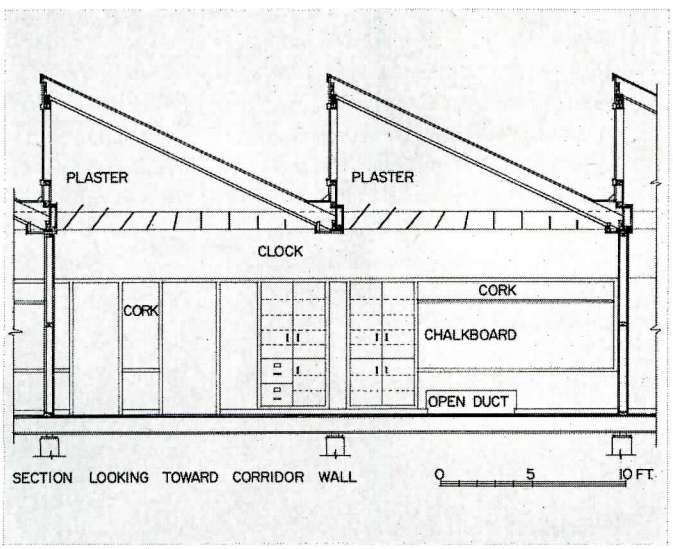
By pooling resources, both departments (neither of which admitted to other than selfish objectives) gained advantages not otherwise possible. The Park Department got larger and better gym facilities and other features for neighborhood use not customarily included in the city's field houses; the School Department got a larger outdoor area than the usual school plant affords and — again to quote the architect — "unordained love through pupil association and use of the building for other than school purposes."

Each of these departments already owned land in the Magnolia district at the time that the consolidation proposal was made. The School Department had 5.9 acres for the junior high that had been promised for that area and, one block away, the Park Department had 12.83 acres on which it intended to build a Class A field house. After a thorough study of the Magnolia area, the Planning

Commission proposed the purchase of a corridor of land to connect the two parcels of land. Once this was done (at a cost of $60,000 for the 5.4 acres involved) and an exchange of leases, required because of the separate ownership of parts of the combined property, was effected by the joint committee of the two departments, the project could proceed. Originally, the junior high was to be built in 1952, but part of the consolidation plan was that the building program would be moved up, and as a result the junior high was completed and occupied in 1952.

Site use was more than usually important in the basic plan because of the various elements to be considered and because of the dual use of the site. Recognition of 34th Avenue West as the main approach was logical; so was the location of the academic wing away from the noisy elements — streets, playfield, and gym. Segregation of gym, auditorium-lunchroom and music and choral wings was indicated as a means of containing fireproof elements within themselves.

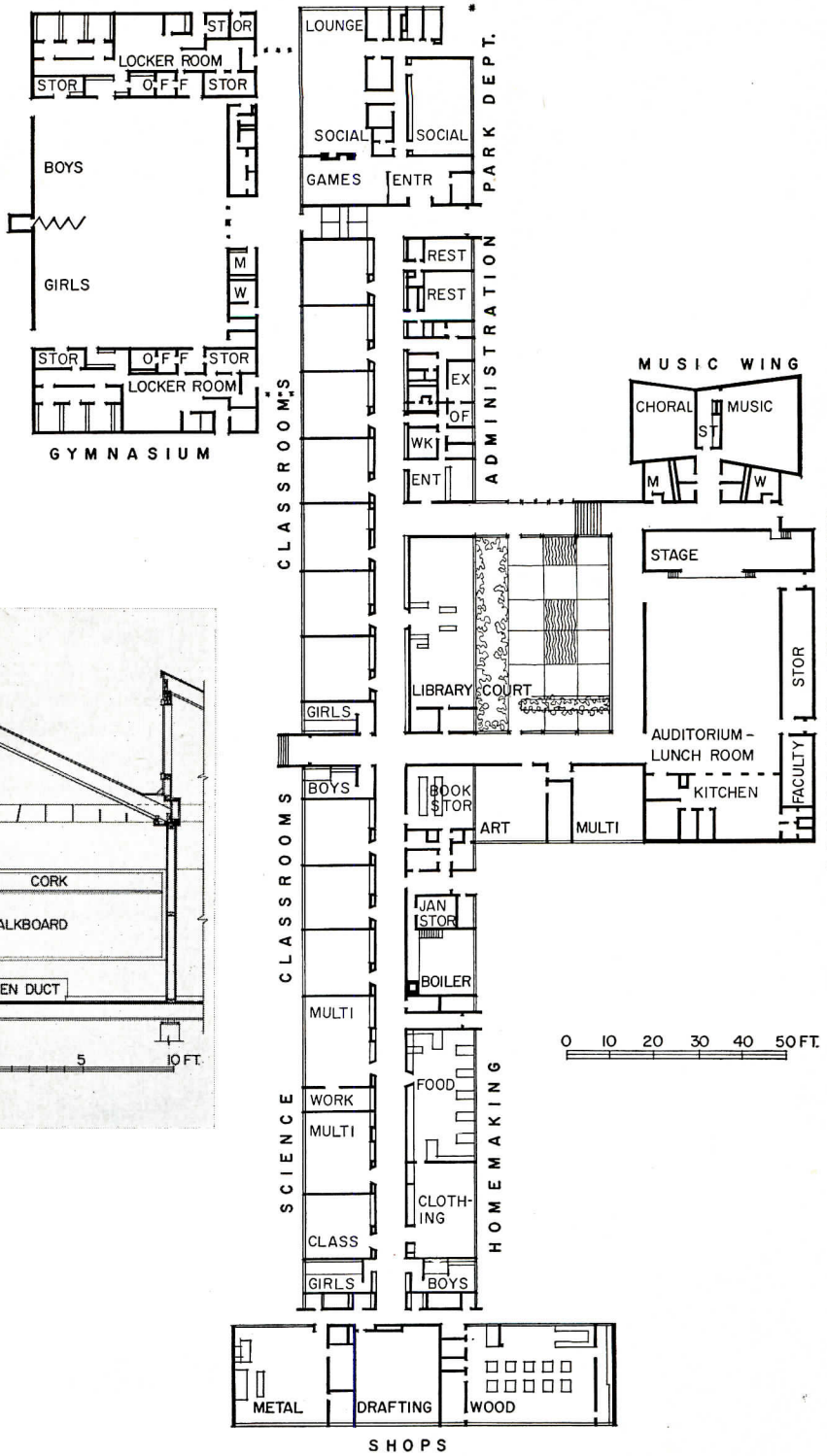




The structure is unhesitatingly direct, the special demands — for acoustics, lighting, ventilation — determining the frame within which are set the various departments. Framing materials are steel and wood; filler walls are surfaced with brick and asbestos cement board.

Color use is equally direct and logical, and is aimed at esthetic satisfaction as well. Structural concrete is deep grey-blue; brick is buff yellow; asbestos cement board is waterproofed but left its natural color. Sash and trim are aluminum.

Total cost of the structure was $1,794,000, of which the Park Department's share was $152,000, far less than it would have spent on a field house.



Park Department has separate entrance for access to its social rooms and offices, and also for direct access to the gym. Additional entrance to gym serves playfield (see plot plan, left). Auditorium is used by community as well as school and was located for easy access from street. Like many such rooms, its use must be dual: during noon hour it serves as lunchroom, with cafeteria service from counters off kitchen

2

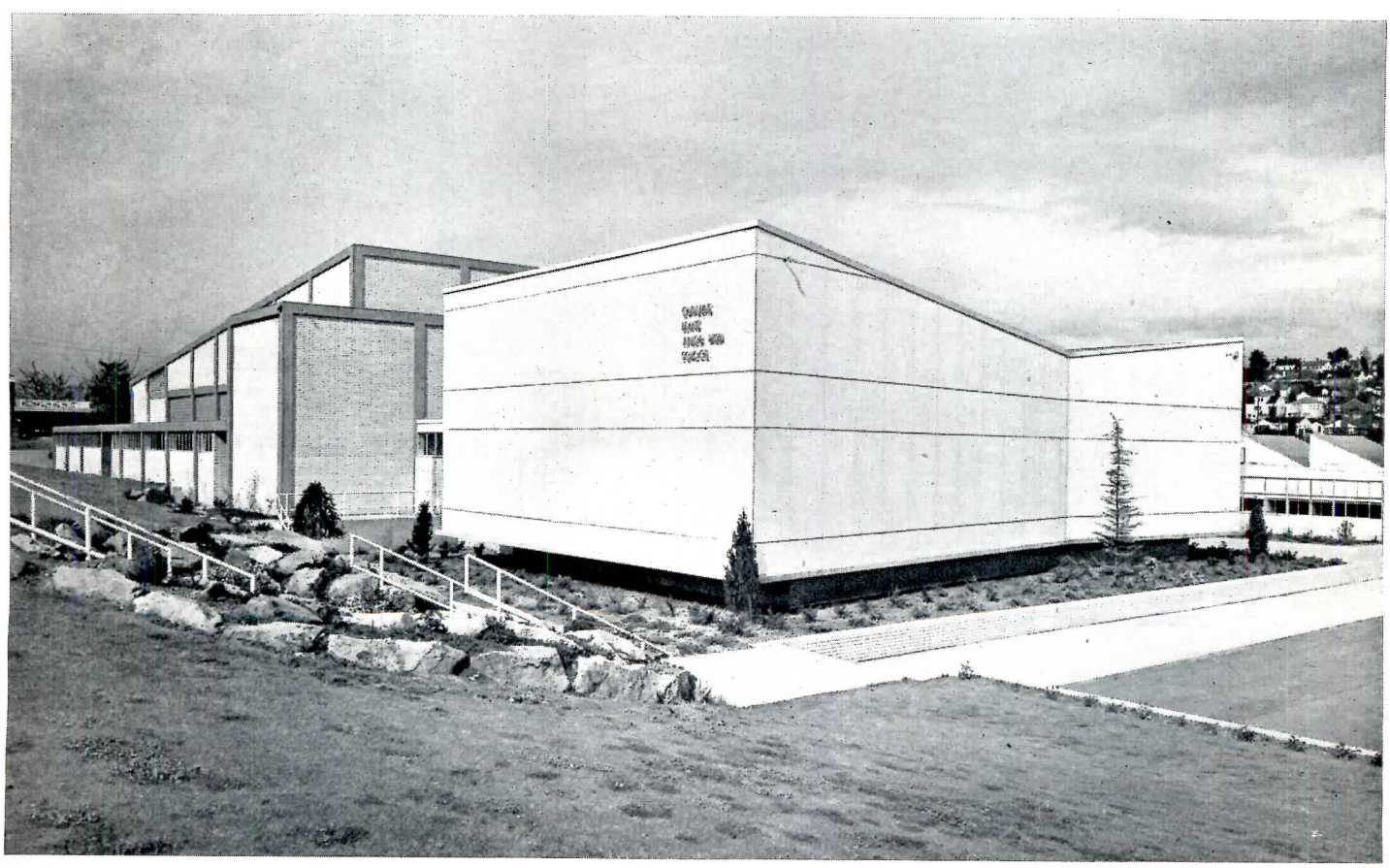
3

CATHERINE BLAINE JUNIOR HIGH SCHOOL—RECREATION PROJECT

1 and 2. *Splayed walls and butterfly roof of music building were determined by the acoustical demands of function. Exterior facing of asbestos cement board is waterproofed but otherwise untreated. Rooms for music are surfaced with acoustic tile to minimize sound transmission and with birch plywood to keep rooms "alive"*

3. *Gym is larger than junior high standard or city's field house gyms (90 by 120 in contrast to standard 90 by 104 or field house 60 by 120) and is divided by folding partition for boys' and girls' use*

1



Charles K. Pearson

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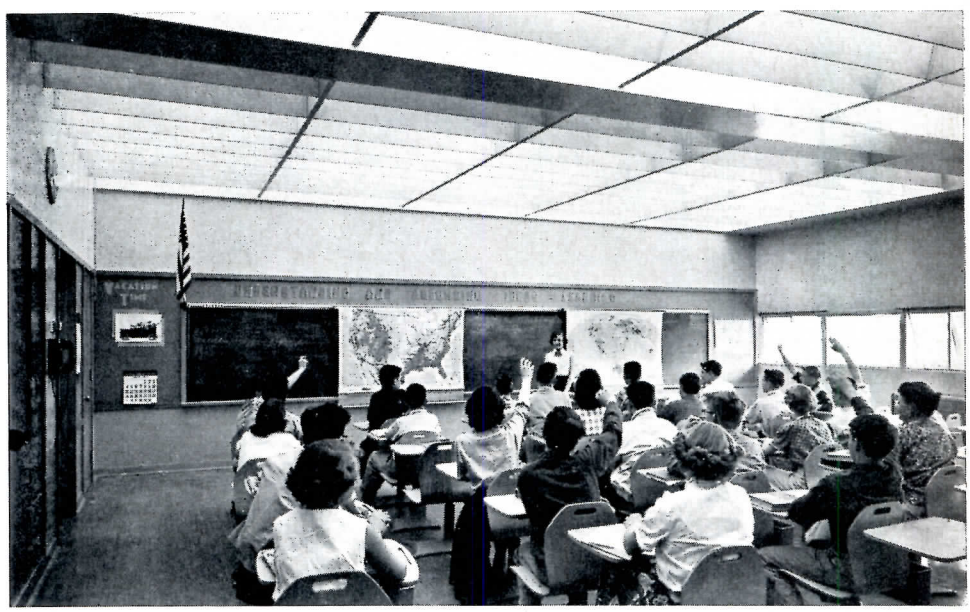

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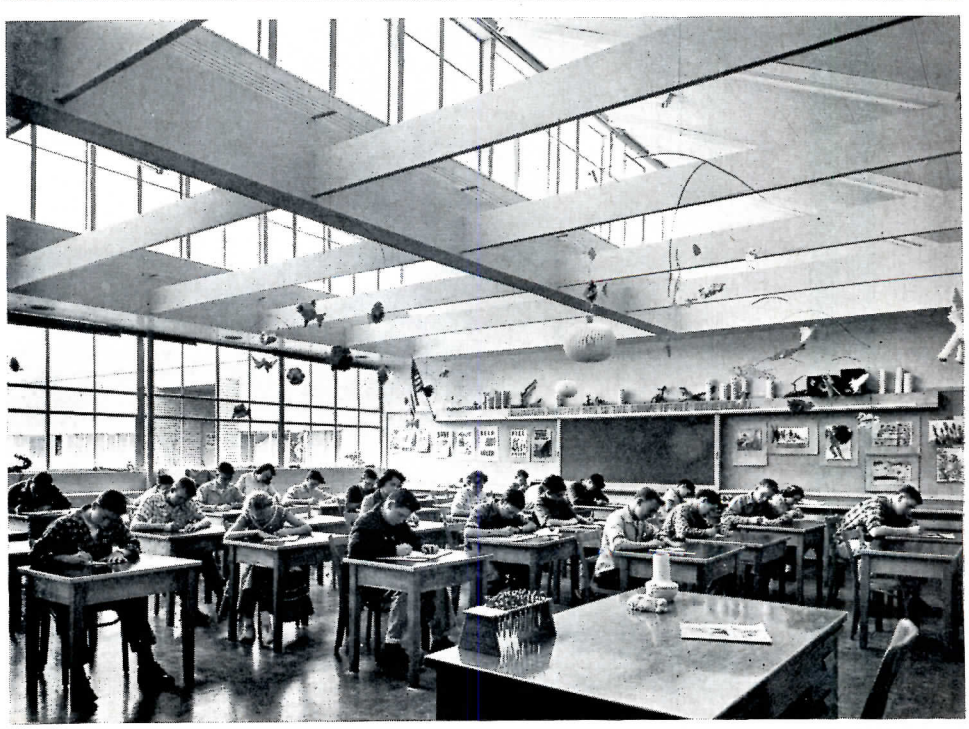


7

4. *Kitchen setups in food laboratory approximate normal home conditions for the preparation and serving of food*

5. *Laboratories for art, homemaking and shop classes are located at end of academic wing for noise isolation. Direct monitor daylighting (see detail, page 103) is supplemented by fluorescent strips in shops*

6. *Classroom and library daylighting, derived from studies with a test model, is from monitors and is diffused by louvers set at various angles in order to obtain uniformity at all points in the room*

7. *Art unit consists of classroom, right, and adjacent work and multipurpose rooms for other forms of art instruction*

The Life, The Teaching and The Architecture of Matthew Nowicki

By Lewis Mumford

Part II MATTHEW NOWICKI AS AN EDUCATOR

Diagrammatic outline of Nowicki's proposed curricula for architectural education at North Carolina State College

Study Periods	ORGANIZATION OF STUDIES						
	CHAIRS	**Landscape Design**	**Architectural Design**	**Structures**	**Descriptive Drawing**	**Humanities and History**	**City Planning**	**Unrelated Subjects**
5		Landscape Design V, VI, VII	Arch. Design VII, VIII, IX Instructional Assistance	Foundations Building Codes Office Procedure	Drawing XI, XII	Philosophy of Design	City Planning I, II, III	Elective
4		Landscape Design II, III, IV Landscape Construction Planting Design	Arch. Design IV, V, VI	Architectural Structures Building Products Office Procedure	Drawing IX, X	History of Architecture IV Human Behavior Urban Sociology		American or English Literature; Or Advanced Military Elective
3		Landscape Design I Plant, Materials, Nursery Practice Landscape Construction	Architectural Design I, II, III	Construction Drawings I, II, Design of Structures, Sanitary, Electrical, Heating, Air Conditioning, Equipments of Bldg.	Drawing VI, VII, VIII	History of Architecture I, II, III		Modern Language; Or Advanced Military
2			Design IV, V, VI	Topographics Materials Structures Statistics Strength of Materials Material Testing	Drawing III, IV, V	History of Landscape Architecture		Military Science Sport Activities
1			Design I, II, III	Mathematics	Drawing I, II	Contemporary Civilization Contemporary Science		English Composition Military Science Fundamental Activities Hygiene

MATTHEW NOWICKI, the architect whose Arena already stands forth as one of the monuments of modern form in America, had just reached the age of thirty-five when he came to America. His education, his apprenticeship in architecture, his ordeal as a Polish citizen under the Nazi occupation and its Russian successor, were now behind him. He stood at that Dantean midpoint where the energies are at highest level and the human shape, spiritually even more than physically, has taken form. More than six feet tall, with a long face whose slightly rounded outline contrasted with the firm, lean lines of his body, usually dressed in light gray tweeds, he was a man to attract attention. Gay, affable, scrupulously polite to the point of formality, he was at home in every kind of society. Without rigorous discipline, the affability might have been too indulgent, the sensitiveness might have been too fragile or painful, the politeness might have sacrificed truth to sociability; but in fact, none of these things happened, for an underlying gravity of purpose and an immense capacity for work kept every part of his being focused on architecture.

Nowicki was as far as possible away from the Renaissance ideal of the dilletante, the gifted amateur too enamored of balance to give his last ounce of energy to any specialized profession. But the fact was that

"Perhaps the very essence of Nowicki's contribution as an architect lay in the fact that he began and ended with the human being to whose purposes he gave structural order and symbolic expression."

Nowicki achieved balance by a reversed process: so concentrated was he on the problems of architecture and city planning, so central was this interest, that it rayed out into every other department of life and brought every other human need or aptitude intuitively to bear on it. In that sense he would describe architecture as "a way of life more than a profession."

No matter where one might begin in conversation, I cannot remember half an hour in his company when the talk did not go back to architecture: yet what always impressed one, was not so much the wealth of architectural perceptions and ideas, as the humanity that accompanied them. No one could have demanded higher standards of work from his students: following his example they would habitually work far into the night, at some sacrifice of sleep and perhaps health; but what he asked from them he demanded of himself, and the impression that he left on them was not of hardness and rigor and discipline, but of his quick, warm responses as a human being.

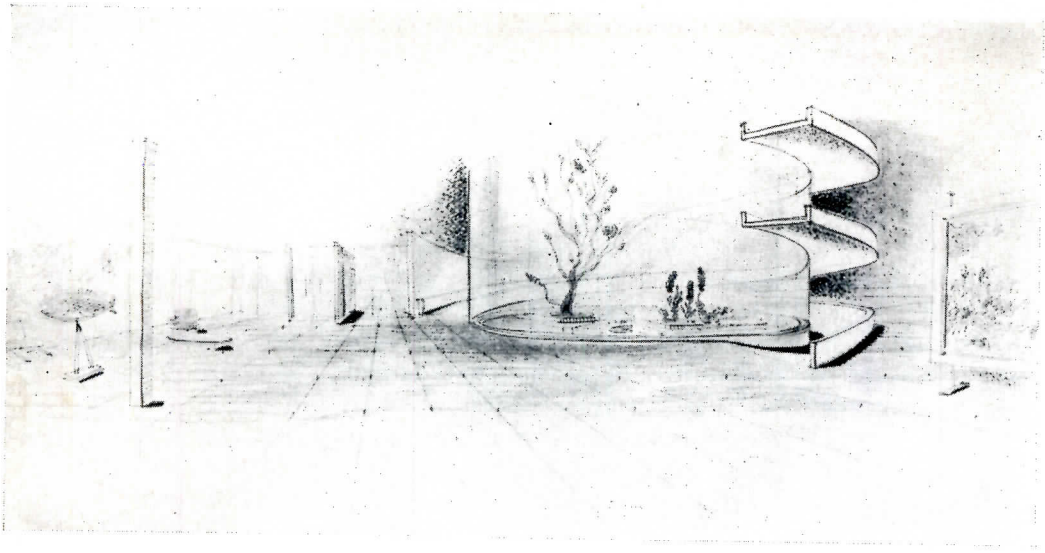
This tension of opposites, this alternation of expression and inhibition, of releasing passion and restraining intellect, is, I am sure, one of the stigmata of genius; and Nowicki showed it in the highest degree, and was sufficiently conscious of its meaning to give that tension and interplay a place in his educational philosophy. With lack of form in every sense — lack of moral standards, lack of taste, lack of intellectual backbone, lack of a sense of the occasion — he was impatient to the point of contempt. He had no use for the bohemianism that masquerades as freedom, for the puerile self-indulgence that equates the bizarre with the original. Finally, the quality that pervades all one's impressions and memories of Nowicki is the quality of a deep joy, a joy in work, a joy in action, a joy in thought, a joy in friendship.

Nowicki's almost compulsive concentration upon work, even in a plane or on a hospital bed, would perhaps have been disturbing if it had not been perpetually accompanied by this inner joy, and relieved by the warmth of his response to the people around him. None rejected that warmth except those who enviously felt overshadowed by his genius; for, as Albert Mayer has recorded, "his bubbling humanity never failed him in even the most distressing and frustrating situations." At thirty-five, then, Nowicki had achieved a rare union of talent and character. He was ready at last for a rounded lifetime of work; and in five short years he indicated in outline what that lifetime might have brought forth.

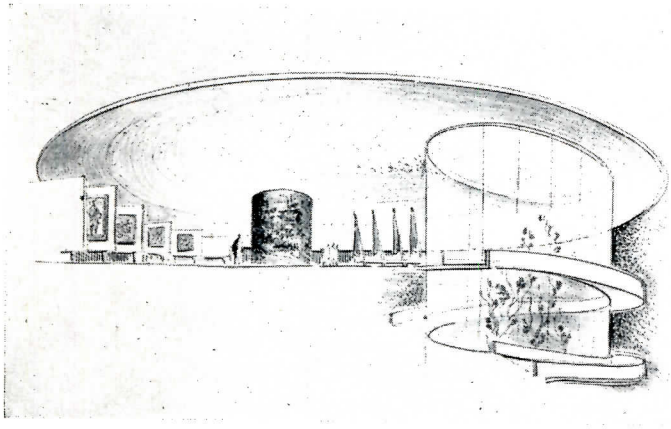
The New Teacher and The New Curriculum

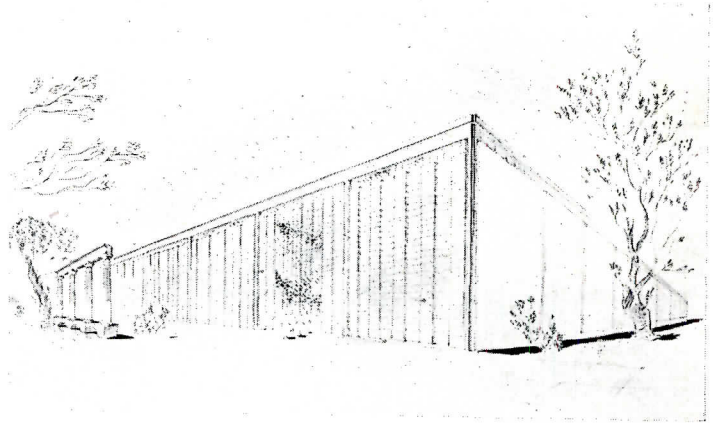
These first few years in America, so important in giving Nowicki afresh the feel of his adopted country, had one serious defect: they gave him no chance to practice his art on his own. This did not prevent him in his spare moments from designing imaginary buildings, like the charming little church (herewith illustrated) with its roof set on two mushroom columns, completely detached from the outside walls. Nor did it prevent him, in the winter of 1947–48 from serving as visiting critic in Pratt Institute. By this time the Communist coup in Poland had revealed to him the impossibility of going back to his native country; and since the era of organized suspicion and inquisitorial demoralization had only begun to darken the American horizon, he was attracted without reserve by the old and seemingly solid virtues of our country: its democratic manners, its social egalitarianism, its respect for human variety, its spirit of adventure. The decision to apply for American cit-

A brochure for School of Design, North Carolina State College; text and format by Mr. and Mrs. Nowicki



Some heretofore unpublished drawings by Nowicki for a State Museum for North Carolina (this project was held in abeyance and probably will not be built). One problem was to design a museum that would not clash with the Capitol (by Ithiel Towne), which would indeed leave the capitol as the dominant structure. Accordingly the facade was designed as an unbroken mass

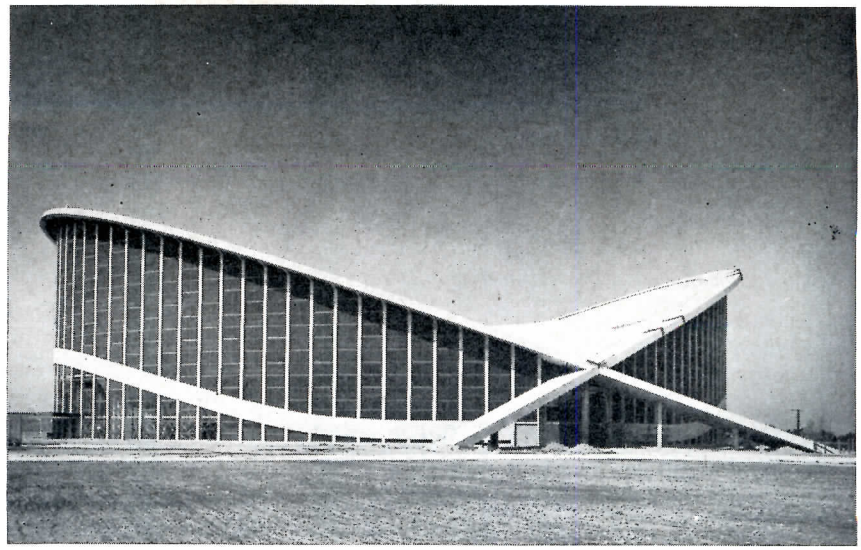


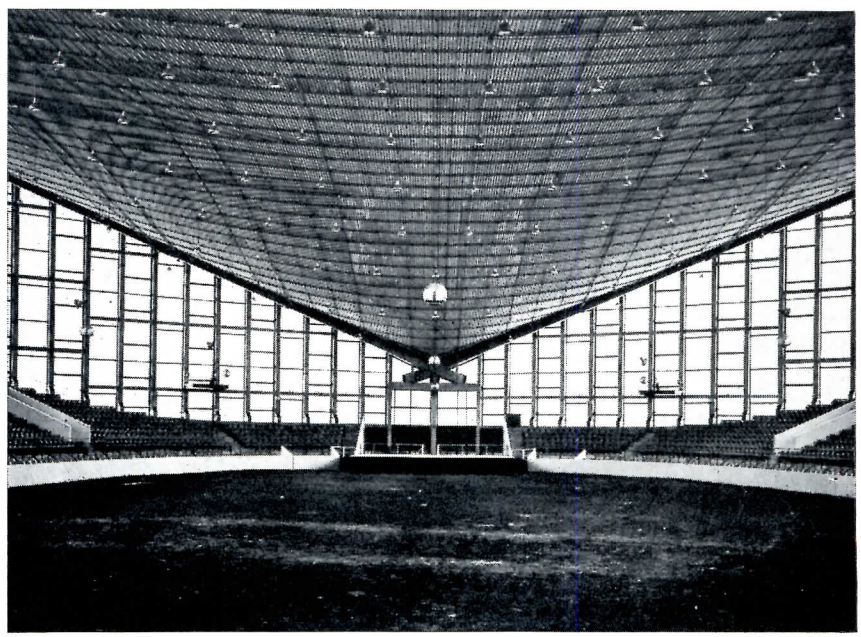


izenship coincided with his call to the School of Design at North Carolina State College in Raleigh: a happy stroke of Dean Henry Kamphoefner's, then in the act of renovating a sadly run-down institution. In the two brief years he spent there, beginning September 1948 — all that remained of his life — he made a powerful impression upon his students and upon the people of Raleigh, and was rising on a floodtide of varied architectural activity. With his architectural work, during this period — work that ranged from Brandeis University to Chandigarh — I shall deal in another article.

Here I propose to examine Nowicki's contribution as teacher; for, though his ideas never fully prevailed at the School of Design, the proposals he made for a new curriculum there go far toward stating the problems of architectural education today. In one sense, they complete the revolution that has been taking place; but in another, they offer constructive proposals for overcoming the weaknesses that have disclosed themselves, and restoring, in a new form, some of the elements that had proved their value in the past.

Architecture, for Matthew Nowicki, must itself be taken as Plato described it — as a pedagogical art. "The architect," he observed, "is continuously instructing others by means of his words or designs how to create architecture . . . An architect must be an interpreter and promoter of new ideas beneficial to the life of men," and in this process, he emphasized, the client had a part to play hardly less important than that of the architect; indeed, he sometimes went so far as to say that no great work of architecture was ever created without a great client. This meant that the architect, though a teacher, also must be capable of learning: "the humility of the truly great must be part of his professional ethics," and even if Nowicki made tolerant exceptions for wayward genius, he kept that ideal for himself. This does not mean, it goes without saying, that Nowicki had anything but impatience for those callow bumptious clients — there was one such official at Chapel Hill — who approach the architect with their own drawings of the desired building and ask him, as their grandfathers might have asked a menial servant,





The now-famous Arena at the North Carolina State Fair, done in association with WilliamHenley Deitrick

merely to add the practical details. Nor did it mean that he abdicated the responsibilities of leadership in favor of some pseudodemocratic solution by "compromise in committee" or by majority vote. On matters of taste, judgment, creative insight, he exercized no Pecksniffian humility; he knew that his own professional qualifications demanded the full respect of his clients, as surely as their human needs and preferences in turn demanded his own acceptance.

Nowicki's approach to this fundamental matter, the relation of architecture to the client and the community, comes out very well in his attitude toward one of North Carolina's cherished monuments, the excellent Capitol designed by Ithiel Towne. In association with William Henley Deitrick, he was given the task of designing a monumental state museum, to be placed within the general ambit of the capitol grounds. Knowing that the people of North Carolina would want, if possible, to keep the Capitol a dominating structure that would set the tone for the neighborhood, he conceived the façade of the museum in scale with the State House, and in stone. And since the new structure could not, as a modern building, honestly keep to the classic system of fenestration, he designed the wall as an unbroken mass of stone, and relied on artificial lighting and ventilation to serve the building's uses. Respect for the client did not demand that he should design a sham-classic structure; but respect for modern principles of design did not demand, either, that he distract attention from the central monument by great expanses of glass or by a surface treatment in violent contrast in form or texture to the beloved building. That kind of understanding won friends both for modern architecture and for the School of Design, during those early years when the principles of contemporary form were as yet neither understood nor accepted by any large number of people in the South.

In conceiving the role of the School of Design, Nowicki had two large but related ends in view: the introduction of humanism and regionalism into the architectural curriculum, to counterbalance the detached and impersonal requirements of the scientific and technical

approach, even when interpreted with esthetic sensitiveness by a Le Corbusier of a Mies van der Rohe. In outlining the new curriculum, he put first and foremost:

"Man —
"The creator and the final reason for human creation
"The unchanging module of scale and proportion in art
"As unchanging since the beginning of his race as are his emotions, instincts, and basic needs, and
"Man —
"The promotor of constant change, different in every century, decade and year, reflecting the varying ways of his individual and social life in the ever-changing forms of his creation."

Next to man — and note that this reverses the order in which Frank Lloyd Wright has cast the processes of architecture — comes

"Nature —
"The source and the medium of creation — demanding subordination and granting freedom of its expression
"The birthplace of all structure
"An unchanging message for constantly changing interpretation

and finally

"Time —
"The yardstick of human memory and the module of space
"The bridge to the beneficial experience accumulated by the generations."

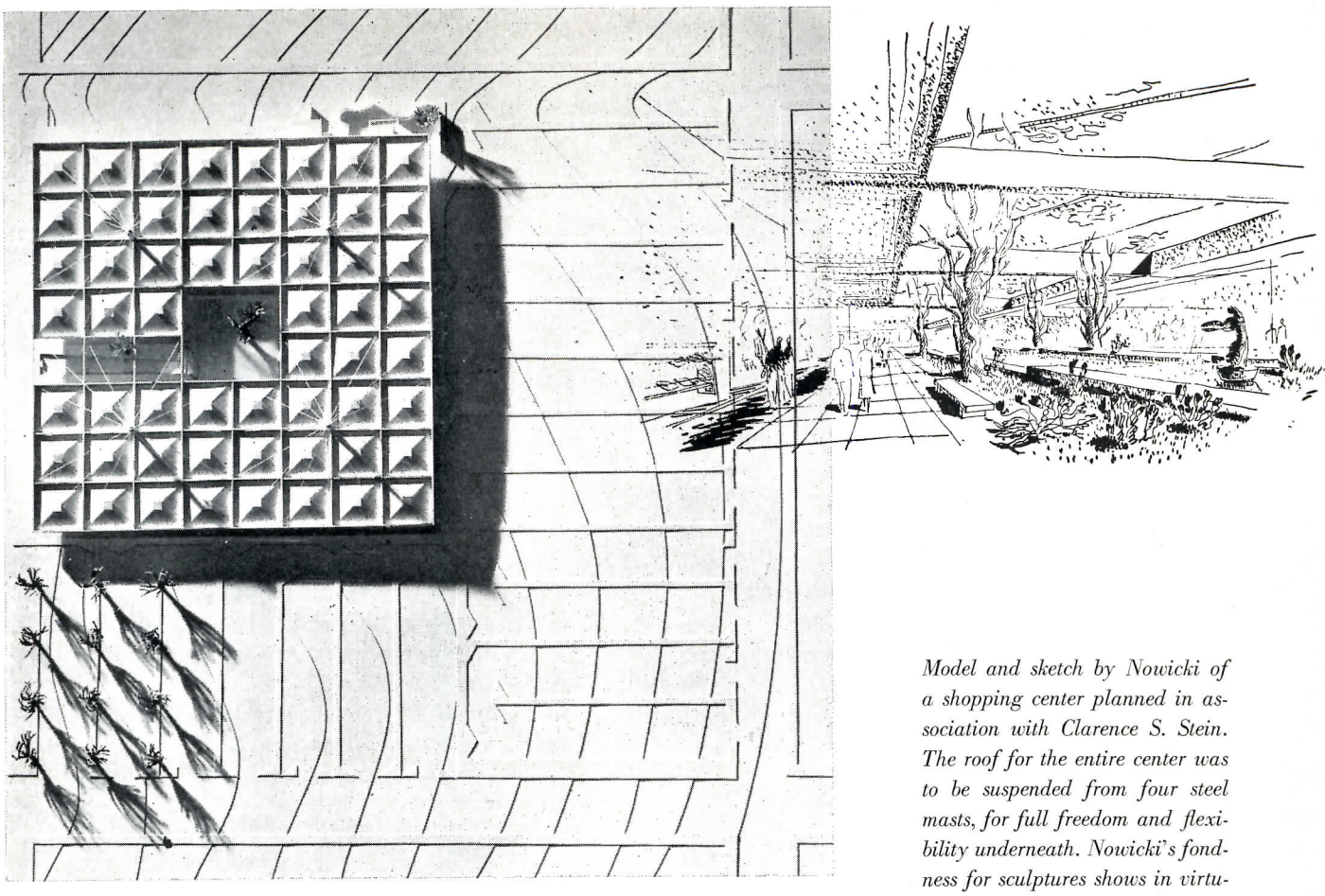
With these postulates as a basis, Nowicki goes on to point out that "the concept of organizing life through the mechanical and technical control of its environment, the School considers as no longer sufficient for the growing maturity of our period." And "as maturity differs from the days of early youth, providing a new set of sometimes unexpected values, so have we changed many of our concepts" in the field of architecture . . . "The study of the well-being of contemporary man, which has been introduced into the language of architecture continues to be the inspiration for our work but this time the quality of this well-being is differently analyzed. It is no longer 'the machine to live in' that stirs our imagination. It is the eternal feeling of a shelter to which we subordinate our creative ideas. It seems to us that as much as every architecture is and has always been art of an abstract form, with hardly a formal precedent in nature, so its allegiance to nature has been and still might be expressed through the use of a symbol. The school feels that those symbolic values were underestimated by the philosophy of the passing period, and the conscious revival of their importance, in the new form to be created, is aimed at in the educational program of the school. . . . As much as the mechanized concept of values has been the outcome of the mechanized life of a metropolis, so the coming chapter of our culture might be inspired by the regional approach to life."

To do justice to the variety and fullness of human needs, Nowicki proposed to unite architecture, landscape architecture, and city planning — and in due time all the other related arts of design — into a "single frame for the changing picture of the life of man." This led him to propose a fourfold division of the curriculum: a chair of design, a chair of structures and technical subjects, a chair of descriptive drawing, and a chair of humanities, history and regional studies. In that curriculum the chair of design would have the task of ideological synthesis and practical integration. "In terms of philosophy, it tends to impress the student with the humanistic approach to all problems of his profession. Even the elements of form such as scale and proportion extend their further significance into the field of professional ethics. Composition defined as the sense of order in space and life is integrated in the design problem. A habit of methodical thinking is formed."

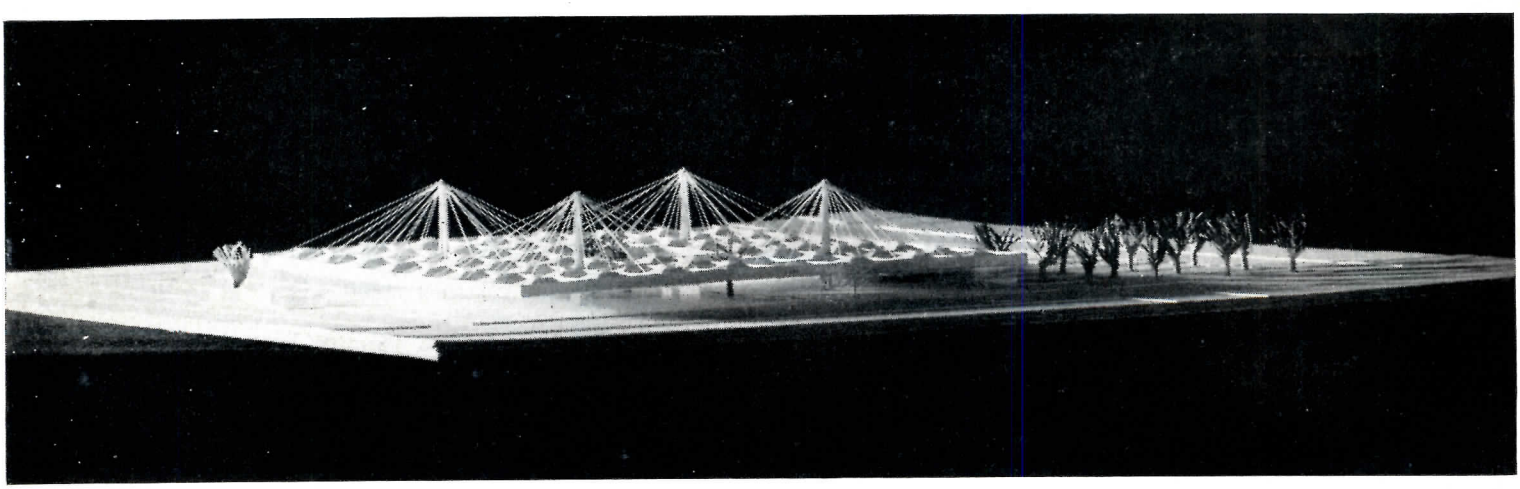
At a time when most architectural schools, in their abandonment of older academic models, begrudge the time needed for even architectural history, Nowicki's proposals for the chair of humanities are particularly significant. "Starting with a course on contemporary civilization," he observed, "it develops into a course on contemporary science. Physics, biology, chemistry are studied here, not from their technical but for their humanistic value as the basic components of our period. The history of the development of human thought in each of these channels is compared here to give the student a broad approach to his profession. Since his professional studies are not related in a strictly technical way to physics, biology and chemistry, it was considered as more advisable to approach these subjects in the chair of humanities, emphasizing the basic laws involved in their intellectual structure rather than the purely technical formulas."

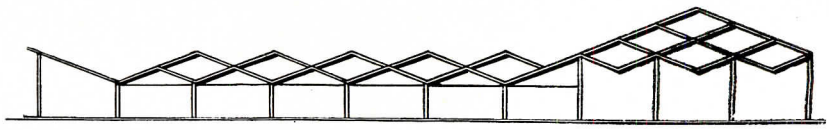
Similarly, it is through history that Nowicki proposed to deal with the organized landscape, from the garden outward into the region, in order to give the student insight into the human meaning of these transformations. Architectural form he likewise approached in the same fashion, as itself a document in interpreting the social relationships characteristic of every period: this serves as a preparation for an advanced course in sociology and economics. Was that not characteristic of a teacher who, as one of his students, George Qualls, has observed, "gave the impression of a man intent upon completely describing the character of our civilization in terms of architecture." Finally, in the fifth year, he proposed to invite a distinguished scholar to give a course that would synthesize these various studies, and integrate them into a viable philosophy. Doubtless this capstone of the curriculum was the one that needed most reflection and most experimental effort; but the fact that Nowicki treated it as a coordinate department shows the importance he attached to psychology. It was in the final year, incidentally, that Nowicki proposed to institute a course in city planning, as an integral part of architectural education; but in practice it turned out that there was a place for planning and group design — indeed a necessity for it — at an even earlier stage.

Beneath these proposals, which Nowicki had outlined



Model and sketch by Nowicki of a shopping center planned in association with Clarence S. Stein. The roof for the entire center was to be suspended from four steel masts, for full freedom and flexibility underneath. Nowicki's fondness for sculptures shows in virtually all of his renderings





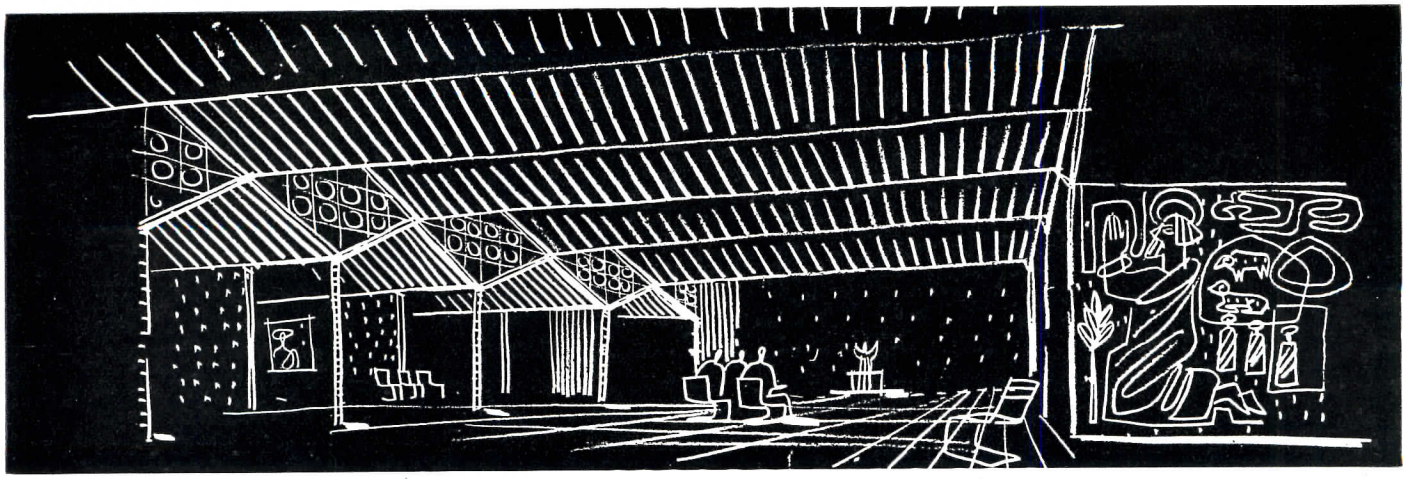
in detail, were still other assumptions that derived from his own training and education. One of them was the conviction that no one could be an effective professor of architecture without being engaged in active practice or research. Since this might occasionally lead to absences from school that conflicted with the American academic routine, still another premise that went along with this was the belief, derived from his own education, that a student should be encouraged to greater independence and self-help; so that his work would not depend upon the constant overseership of his professor. The first part of his program had the active cooperation of Dean Kamphoefner, who, in effect, seeded this barren ground with able young practitioners of modern architecture, and, by lending one of his faculty to the State as a one-man reviewing board, succeeded in demonstrating the virtues of a non-traditional approach, in terms of economy as well as unity and order, in carrying through a great building program. Though some of the local architects may have feared this competition, the final result was to bring more work to the local members of the profession since their clients were less tempted to step over their heads to bring in a more glamorous name — too often only a name — from New York or Chicago. But freedom from academic routine is hard to mesh into the cogwheels of administration. Despite the Dean's tolerance, the fact that Nowicki might work with his students till two in the morning did not offset his unreadiness to punch the time clock, so to say, during the academic week, even if the professional work he was engaged in greatly enriched the student on his return. Though architectural schools keep less rigid hours than other academic departments, there is still room for greater flexibility here to free both teacher and student, if Nowicki's premises are worth building upon.

The best of curricula, worked out on paper, is still only a half-formed thing. Before it can come to life it needs the assistance of a group of teachers who understand and sympathize with its main aims; and then it needs further working out detail by detail in each cooperating course, shaped and re-shaped in the act of teaching, tested out by the effects it produces — or fails to produce — on the student. This is a long and difficult process even if there is no current of opposition, no effort to overlay the plan with a radically different set of interests and purposes. After five years, one can perhaps make further decisions as to what courses must be dropped or taught differently for lack of suitable teachers; what courses are out of harmony with the equipment and training and purposes of the students; and what courses promise with whatever further modification, to succeed.

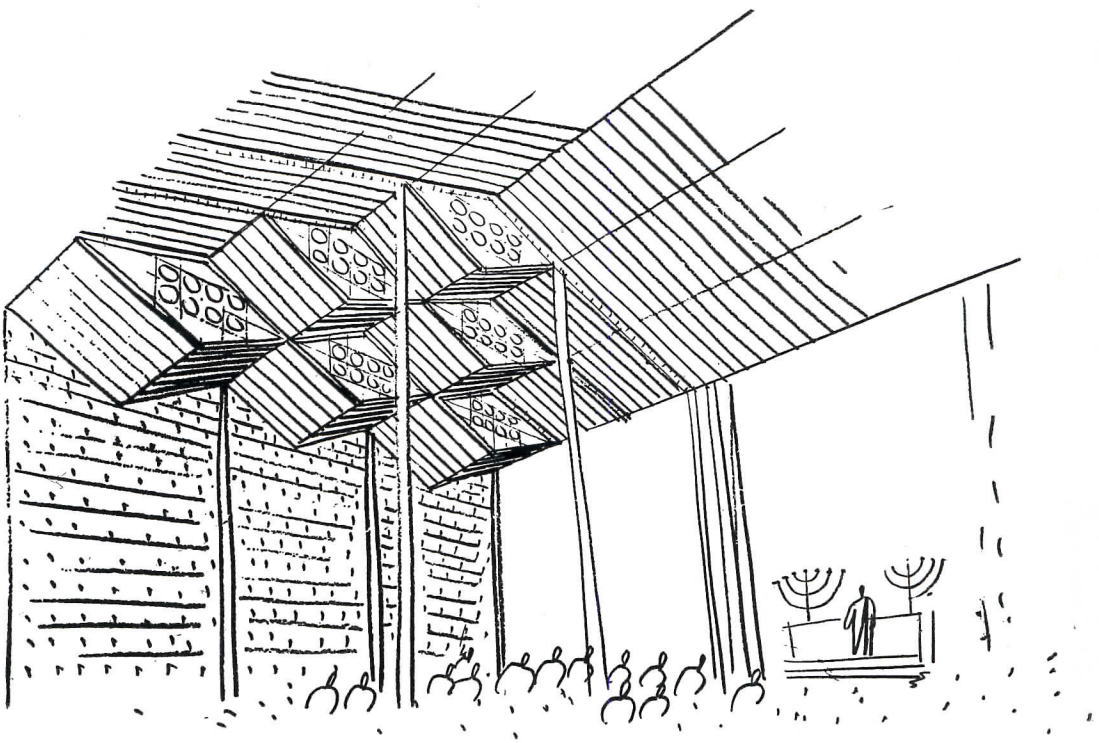
In music, the notes do not give one the composer's form without an able player, and the player indeed plays in vain unless the audience, by its participation and response, completes the effort. So in teaching. In the form outlined in the first new catalog of the School, the vision and interpretation were Nowicki's own: they did not yet represent the philosophy of the component members of his department. With sufficient time for experiment, for persuasion, and for bringing in more sympathetic colleagues, Nowicki's new curriculum might have become a reality. The professor who understood his ideas and purposes most intimately succeeded with Nowicki's aid in shaping a new course in basic design that has already begun to serve as a model in other institutions; and so, by friendly intercourse and a continued sharing of ideas Nowicki might have hoped, in the course of time, to infuse the School of Design with some of the discipline and the love of adventure that his own life-experience and education had given him.

What was perhaps most difficult for contemporary Americans to accept in Nowicki's architectural philosophy, as expressed in this curriculum, is precisely what was most characteristic in his work, and most vital for a rehabilitation of our civic and educational life: the union of law and order with adventure and freedom. Repeating some words of Herbert Read's to the effect that "law and art are forces of culture, which unite men as individuals in independence and freedom," Nowicki observed: "Independence, freedom, law, and art seem to be the goals of our life. Creating a climate for their growth might be considered as the aim of contemporary education." The intellectual confusion "that often replaces freedom and the rigid academicism when order degenerates to formula" he considered equally dangerous for education.

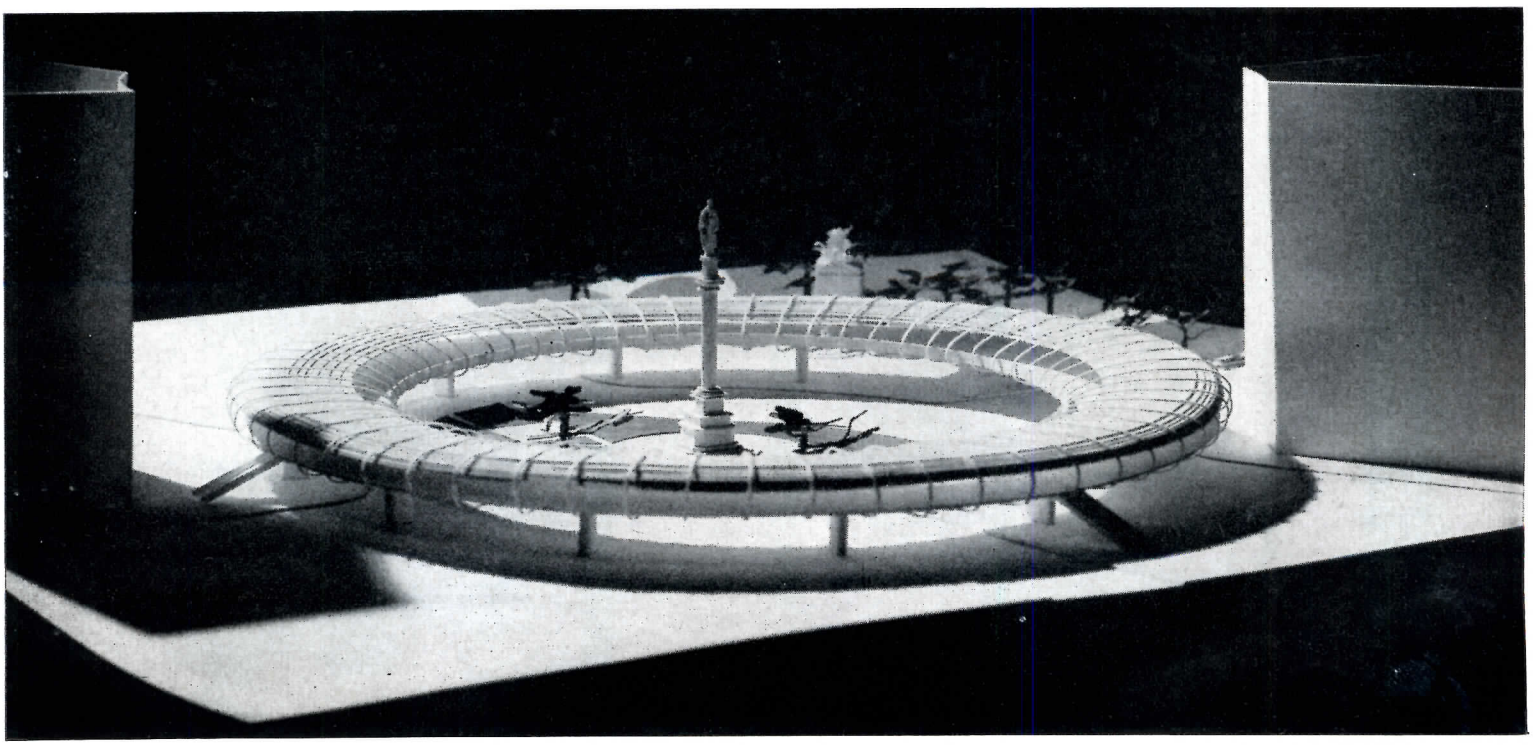
For Nowicki discipline, "self-consciousness, law and order" are the supplements we need to freedom and experiment. This dynamic union of opposites in method was similar to his bringing together of the technologies and the humanities, of the regional and the universal elements, in projecting the goals of architecture. In his own work this reconciliation and union, this productive marriage, had, in fact, already taken place. To Nowicki it was clear that the romantic and the classic, the dionysian and the apollonian, the experimental and the historic are the permanent components of anything that can be called civilization, or high creative achievement. Once that perception becomes general, a new curriculum on the lines that Nowicki proposed will, perhaps, with whatever modifications experience and practice may bring with it, become the foundation for architectural education. Since it was, in effect, the translation into more general pedagogical terms of his own education, enriched by his own growth as a man and his own experience as an architect, it had a special merit: it had already produced one outstanding student.



Nowicki's interest in structural ideas and forms produced a wide variety of designs, many of them complicated and daring. One of the simpler schemes was this design for a synagogue



Perhaps an important element in his structural innovations was daring. Nowhere is that quality so apparent as in this scheme for a shopping center for Columbus Circle, New York, a great doughnut set up above the traffic at a busy intersection, where pedestrians would appreciate a new route



BUILDINGS FOR

THE FACTS OF THE MATTER

Compiled by GEORGE CLINE SMITH, assistant vice-president and economist, F. W. Dodge Corp.

Source: Fact Book on Aging, Federal Security Agency

NUMBER OF OLDER PERSONS

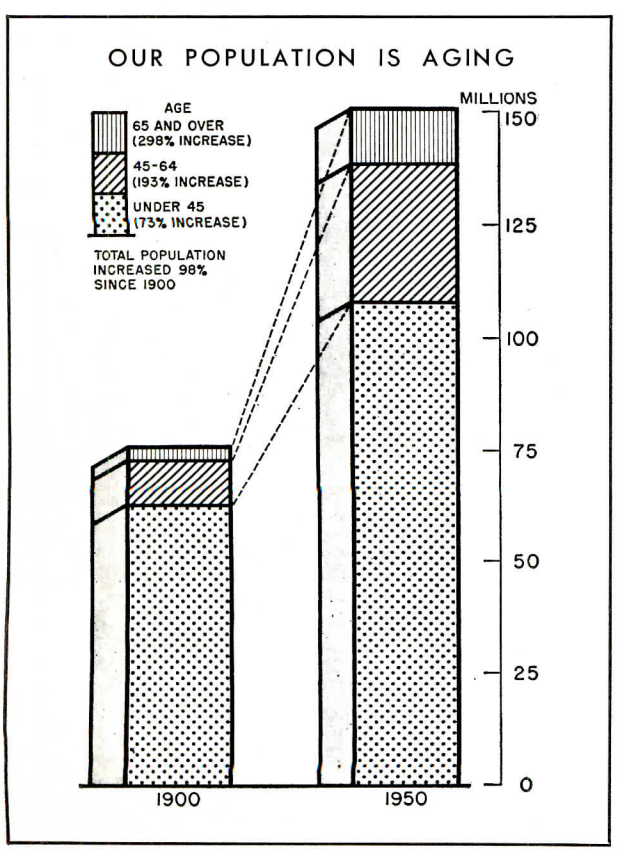
Since 1900, the population of the United States has doubled, but the number of persons 45 to 64 years has tripled, while the number 65 years and older has quadrupled.

In spite of the pronounced baby boom of the 1940's, the child population (under 10 years) increased by only 63 per cent between 1900 and 1950. The number of persons over 65, during the same period, grew by a whopping 298 per cent — nearly five times as fast.

There are (early 1952) 13 million men and women 65 years of age and over. This number is increasing currently at the rate of about 400,000 a year.

Between 1940 and 1950 the country's population 65 years and over went up 36 per cent.

One in every 12 persons in the country is 65 years and over.



ARCHITECTS are going to be focusing their attention increasingly on the special problems of older people. The 65-plus age group is rapidly growing, and recognition of this social fact will affect building design in many respects, whether the design contemplates a building to house old people or merely a normal house or apartment building. Or any other kind of building, for that matter, for more and more older people will be appearing in libraries, museums, theaters, churches, public buildings, shops, even in schools and factories, as well as in hospitals.

With increasing frequency one hears the generalization that the principles of design for the comfort and safety and happiness of older people should be formulated, and that those principles should then be applied to virtually all buildings; the resulting measures would be beneficial to the young and healthy as well as the old and decrepit. Is there anybody who really likes to climb stairs?

What is currently important is the spreading recognition of the situation, gradually amounting to effective demand for new buildings, at one end of the scale, ranging downward to modification of design, in many minor items, in normal types of buildings. Many groups, both public and private — including the President — are contributing to this demand, whether they are documenting the need with statistics or actually commissioning buildings to house old people. This article, first of a series of presentations in ARCHITECTURAL RECORD, is addressed to broader outlines of a problem which has seemingly endless ramifications. A problem, too, which has many statistical pitfalls and much misunderstanding. A problem certainly, which will assert itself at the drawing board.

New Buildings for the Aged

Despite the unpleasant associations of the term "old people's home," the need for some such is ever more apparent. It should certainly be true that a powerful and prosperous nation can arrange better accommodations and environment than in the past. But the most positive statistic is that an increasing proportion of people survive to enter the 65-plus group. Another fact is that older people are increasingly a displaced group — displaced from job and from family — and therefore need housing. They also need interests and friendship. And maybe rehabilitation and employment. And, sooner or later, medical care.

Building programs for the older group are widely varied, and no doubt will continue to differ. For housing programs spring from a wide variety of organizations — from local government to charity groups of one kind or

THE AGED

By EMERSON GOBLE

another, religious organizations, lodges, labor unions, veterans' groups and so on. The factor of fund sources is important to housing programs, and each organized group tends to develop different methods of taking care of their own. There are also, of course, proprietary nursing homes, and a great variety of hotel or club accommodations catering to old people with some means.

Probably all such diverse types of accommodations will be built in increasing numbers, as the old-age group presses for attention. The fact is that, in spite of new governmental interest in the old-age group, there is no unified program; housing will continue to be provided by many different types of organization.

Building programs will also be accompanied by a good deal of academic debate as to how old folks should be housed, and we may expect new studies of environmental requirements, activities, medical care, rehabilitation, occupational therapy, psychology, sociology. All of this ahead of, or along with, study of architectural and building matters.

The debate really starts with the question of whether old people are best cared for in the home, rather than something institutional. There is a considerable body of opinion that holds to the idea that old people are a family responsibility, as in the past, and that for the majority of them the home is the answer. On economic grounds the argument probably finds its strongest point; if, as figures seem to indicate, 80 per cent of people over 65 cannot afford to maintain their own households, the obvious step is to move them in with their children's families. On human grounds this solution still has some support, in that the old folks cling to their families, are frequently useful and happy with them. To cut them off brings problems.

As everybody knows, however, three generations under one roof bring a host of other problems, and each generation is called on to work pretty hard at adjustments. Perhaps old people, generally speaking, are happiest with people of like age and interests.

In any case, psychological aspects may soon disappear in more serious problems of health and required care. With private living housing accommodations ever getting smaller, with more mothers working, it frequently becomes a simple impossibility to care for the older generation. Many organizations, including government, push the view that nursing care in the home should be provided to keep the old person with his family as long as possible. Indeed, a concept strongly held is that many of the problems of old people — both psychological and physical — will yield to scientific rehabilitation efforts, and that a larger proportion than commonly realized can, with this attention, be kept active and

LIVING ARRANGEMENTS

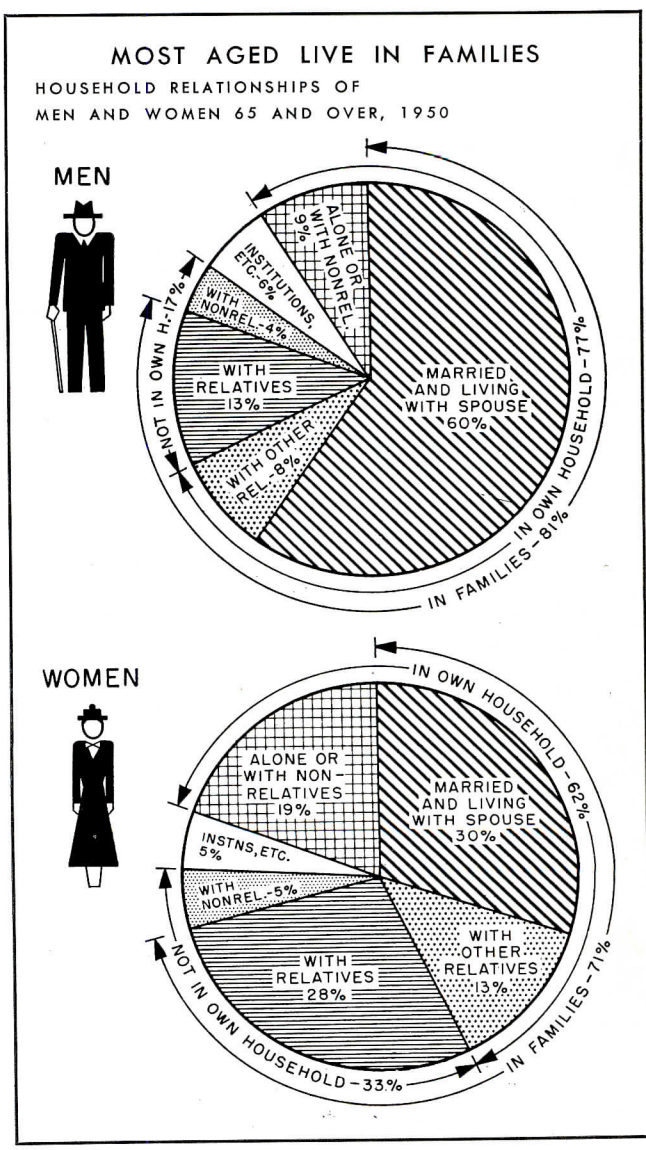
Of the 13 million persons 65 years and over in the United States at the end of 1951:

Nine million, or 7 in 10, lived in their own households, of whom all but nearly 2 million had a wife, husband or some other relative living with them.

About 2¾ million others, or about 2 in 10, were living in the homes of relatives; 3 out of 4 in this group were women.

A little over half a million were roomers or boarders in families not related to them.

A little over 700,000 were living in institutions, hotels or large rooming houses.



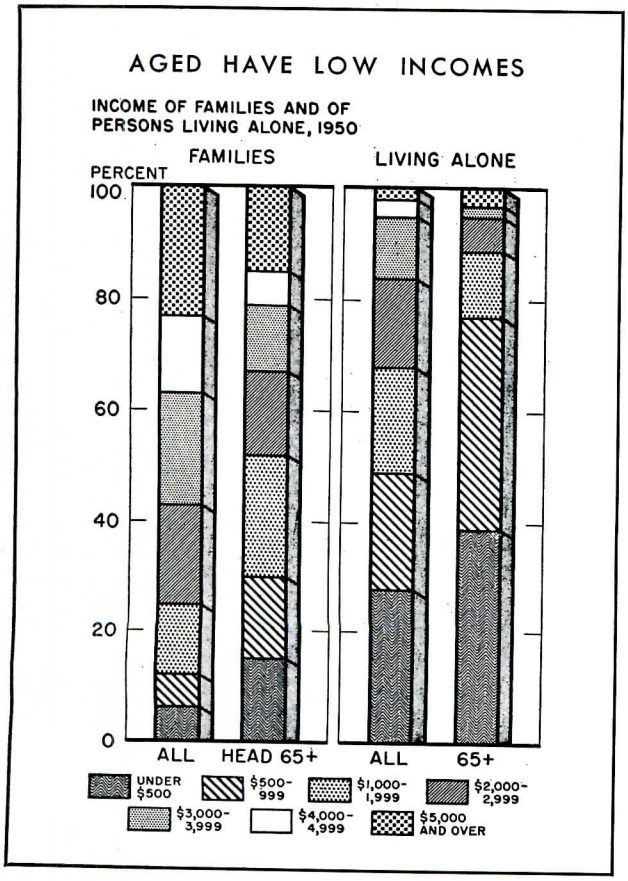
FINANCIAL STATUS

In 1950 forty-three per cent of the families headed by a person 65 years of age or over had a cash income of less than $1,500. Thirty per cent had under $1,000. Fifteen per cent had less than $500.

In the same year, more than three-fourths of all persons 65 years and over living alone or with nonrelatives had a cash income of less than $1,000. Nearly 40 per cent had less than $500.

At the end of 1951, less than 1 in every 3 persons 65 years and over was receiving income from employment either as an earner or the wife of an earner. About 1 in 4 was in receipt of old-age and survivors' insurance benefits; another 8 per cent were getting benefits from the special retirement systems for railroad and government workers or from the veterans' program. One person in every 5 was an old-age assistance. Between 2 and 3 in every 10 aged persons were living solely on other types of income (investments, commercial annuities, industrial pensions, etc.) or were being supported completely by relatives.

Nearly 2 out of 3 families with a head 65 years and over own their own homes as against a little over half in the general population. Total indebtedness, including mortgage, tends to be smaller in families with an aged head, while total assets and net worth tend to be larger.



happy and in a measure self-supporting. That, moreover, this is the kindest attention that can be given them.

In spite of all the theorizing, however, it is still true that the number of old people requiring separate housing is ever growing. In building for them, nevertheless, the activity theory is still important. In other words, good housing for the aged, with cheerful environment conducive to activity, is a modern need. Maybe a sort of old folks' club, for the displaced older person who has many healthful years ahead, provided he can be kept occupied. It might be a downtown type of building, designed for old people's needs and desires, from which he can walk to work. Presumably this sort of building would be for those able to pay fairly well, though one can visualize an eleemosynary institution working on this general idea also.

One of the generalizations about older ones, by the way, is that they rarely want the quiet country-side; they don't like the thought that they are just to pick daisies. They want to participate as much as possible; they want new activities. One might go on to guess that they don't insist on colonial architecture or Victorian trappings, either, that they might "go for" modern architecture.

The safest generalization, however, would be that generalization is dangerous. Older people cannot be thought of as any set group, to be analyzed and ticketed, then banished to standard arrangements or accommodations.

One unfortunate generalization that seems necessary, nevertheless, is that sooner or later medical care enters into their needs. Many groups, again both private and public, assert the view that homes for the aged should have definite relationship to good medical facilities. Perhaps the home should be on a hospital campus, close to facilities, doctors and nurses.

This concept is strong in the new medical program, suggested by President Eisenhower, now before Congress, which proposes that federal funds be earmarked for helping local governments build nursing homes or chronic hospitals. From the point of view of a medical program this suggestion has much to recommend it. A sizable proportion of beds in general hospitals is occupied by chronic or senile patients (pretty much lumped together in this thinking), and these could be housed more economically in domiciliary type buildings associated in some way with the hospital. The federal government's concern is the health of the people as well as their illness, so the President's proposal contemplates health centers, diagnostic clinics, rehabilitation facilities, as well as hospitals (both general and chronic) and nursing homes. All with the thought, of course, of keeping people out of hospitals as well as in them.

While this program is not primarily directed at old-age groups, the philosophy of preventive care operates effectively with old people. Medical care, as proposed

for homes for the aged, includes preventive measures and rehabilitation, in both psychiatric and physical matters. Many troubles of the aging, of course, do not yield to such attention, but many of them do. The tragedy of insufficient attention is that old people deteriorate rapidly when they decide they are losing their grip, whether it is medical attention they need or merely activity.

Old People in All Buildings

The phenomenal increases in the number of 65-plus persons indicates that their influence will be increasingly felt in building programs of all kinds. Enlightened attention to their welfare will tend to keep older people in active circulation, no matter how they are housed. Surely it is an old-fashioned notion that old people stay home in the rocking chair; they will want to travel, to shop, to "eat out," to participate in virtually all manner of amusements and leisure activities. They will be active in civic programs and uplift movements. Needless to say, buildings thoughtfully designed for their needs will facilitate their participation.

Fortunately the special requirements are not complicated or expensive. The architect need only recognize a few general facts and most of the necessary measures will be obvious. Moreover, most of those measures will be conducive to good design for any age group.

The slow decline of biological and psychological functions of older people points to some extra attention to safety, energy conservation and comfort. There is, in addition, a special premium on those somewhat more subjective factors: the positive feelings of warmth and security, of stimulation at the right time, or repose at other times, and the reduction of fatigues caused by "glare, flare and blare." A considerable volume of literature is already available, and individual items will be presented in later studies in ARCHITECTURAL RECORD.

The rather apparent infirmities of older persons point toward a great many things that can be done for their convenience and pleasure, all working toward more comfortable living, easier housekeeping, more pleasant environment generally. Some of the possibilities and problems have already been researched in considerable detail and there are some surprises in the findings.

Suffice it to say here that the special problems of the older-age group have occasioned a great deal of research into environmental factors which are really normal to architectural practice. In other words, study of the needs of old folks has sharpened the attention to details of planning. It is gradually forcing an improvement in standards of safety in buildings, a closer inspection of normal tolerances in lighting and mechanical systems, a new evaluation of a hundred common assumptions. All of which promises to enrich the literature of architecture, and to improve the buildings in which all people, old and young alike, live happily ever afterward.

EMPLOYMENT

The proportion of men 65 years and over in the labor force declined from 68 per cent in 1890 to 41 per cent in 1952. Few changes have taken place, on the other hand, in the relative number of men 45–65 years in the labor force, while the labor force participation rates of older women have gone up.

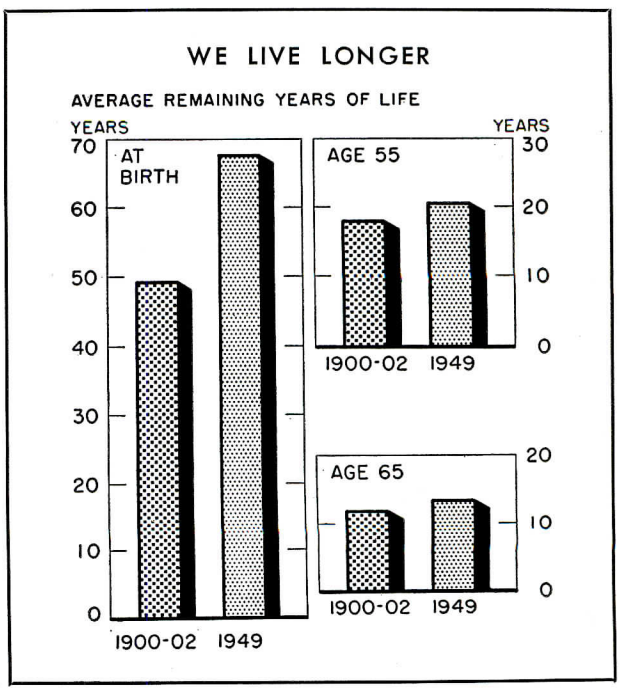
Coupled with a parallel increase in longevity, the drop in work opportunities for older workers has made for a larger span of years in retirement. Between 1900 and 1940 the expected years in retirement for a man of 40 increased from 3 to 6 years.

HEALTH

Life expectancy at birth increased from 49 to 68 years between 1901 and 1949. The biggest improvement has occurred in the early years of life and becomes progressively smaller in the later years.

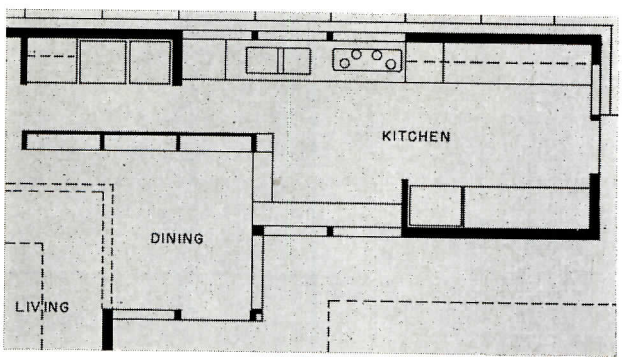
On a given day, 14 in every 100 persons 65 years and over are unable to perform their regular duties because of disability, as compared with 5 per 100 in the general population.

Most elderly persons cannot finance adequate medical care without outside help. In 1950 only 1 out of 4 had hospitalization insurance.



PLANNING THE OPEN KITCHEN

TODAY'S HOUSEWIFE may want to see what is going on while she gets dinner, but she also wants a well-defined work area and a certain amount of privacy. Her kitchen must be pleasant to look at, too — particularly that portion of it which can be seen from the dining or living room. The seven kitchens shown here, ranging from the almost-enclosed to the completely open, suggest various ways of meeting the problem.



architect: *Aaron Resnick*

owners: *Mr. and Mrs. Al Liss*

location: *Middletown, New York*

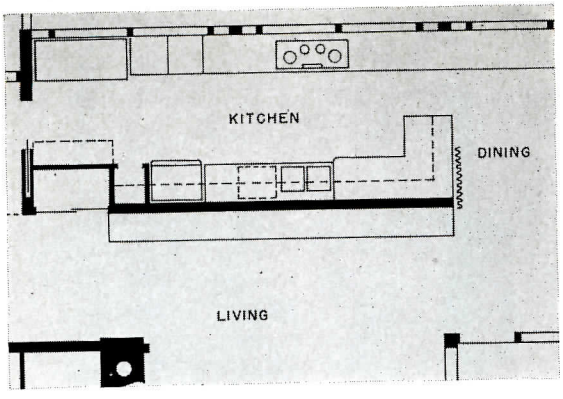
Built-in cabinets keep stove and sink out of sight, but most of kitchen is open to both dining and living rooms. Hinged shelf at dining entrance increases serving area and doubles as traffic barrier when needed

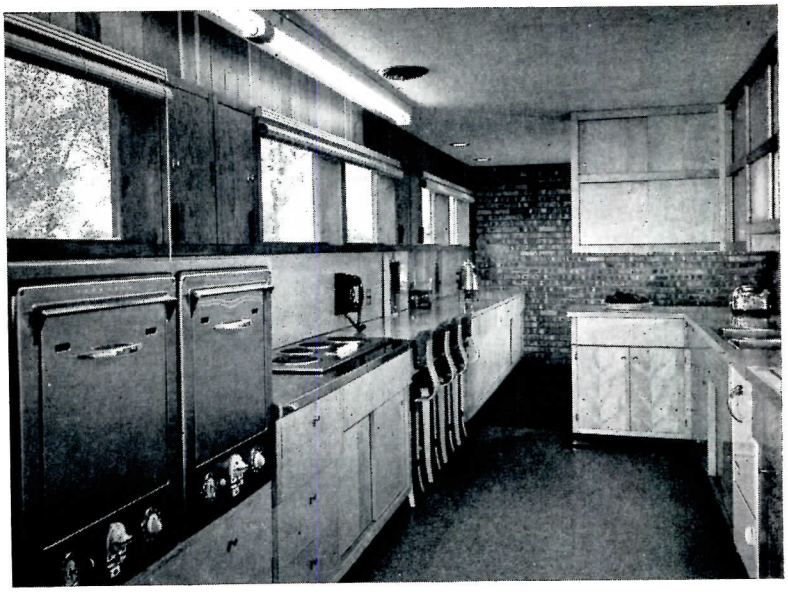
Joseph W. Molitor

architects: *George Fred Keck and William Keck*

owners: *Mr. and Mrs. Arthur M. Gordon*

location: *Chicago, Illinois*





Hedrich-Blessing

This kitchen cannot be seen from living room although opening to it through dining area. Counter under windows projects into dining room to form buffet. Breakfast bar at end of work area avoids traffic problems without sacrificing serving convenience

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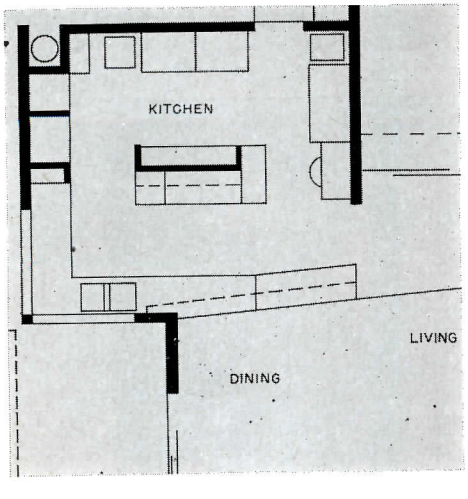
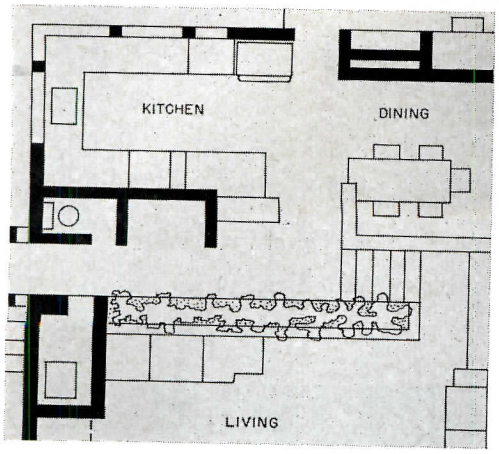
Kitchen and laundry are combined here in one large area wholly open on living-dining room side. Space is divided by a central "island" formed by range and cabinets. Breakfast bar doubles as serving counter and also closes in kitchen and laundry area



architect: *Chalfant Head*

owners: *Mr. and Mrs. Fred G. Bryce*

location: *Fillmore, California*

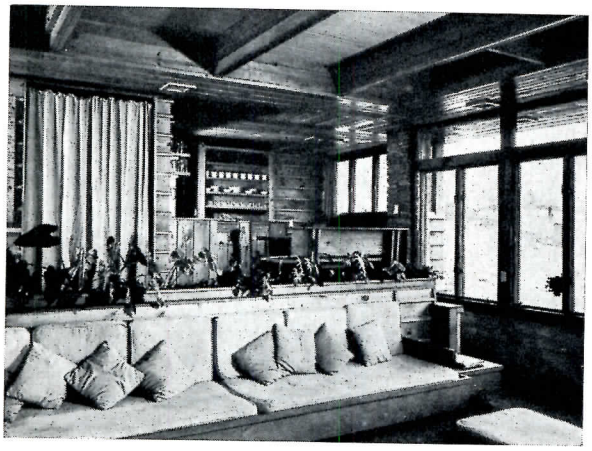


architect: *Gordon Ingraham*

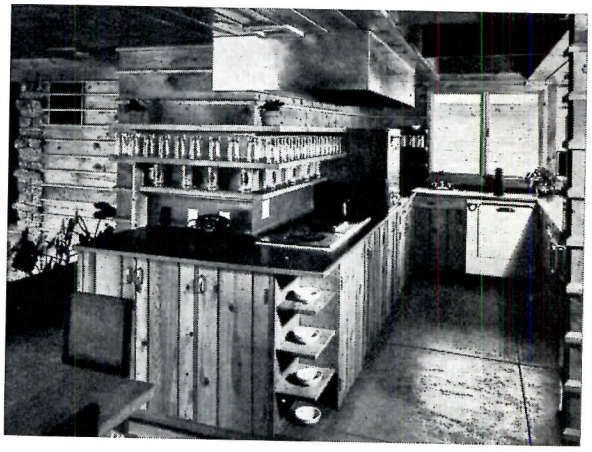
owners: *Mr. and Mrs. Hugh Andersen*

location: *Cascade, Colorado*

Kitchen and dining area here are several steps up from living room. Placement of steps and solid railing form natural dining bay off main kitchen axis. Serving counter is handily next to kitchen range



Guy Burgess



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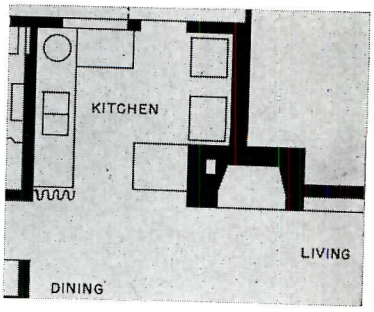
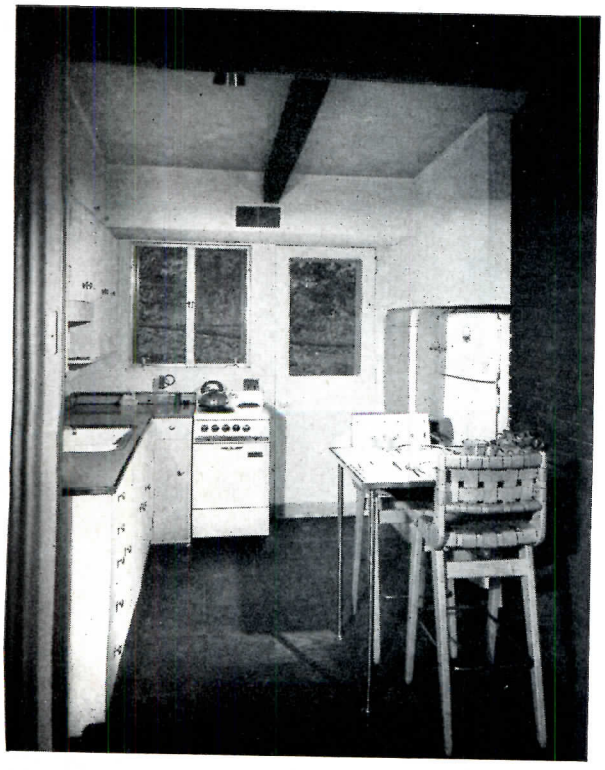
architect: *John Hancock Callender*

owners: *Mr. and Mrs. V. Lada-Mocarski*

location: *Westchester County, New York*

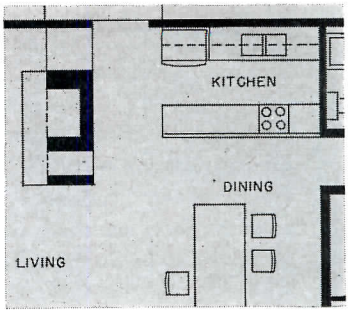


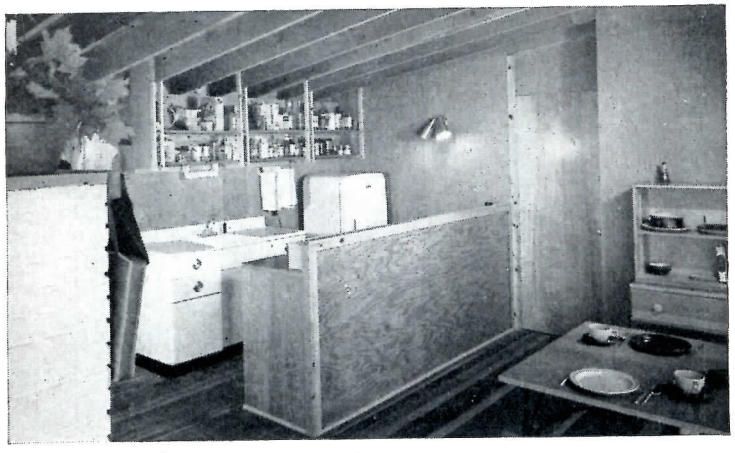


This compact little kitchen includes not only the house heating unit but space for a breakfast table. It can be completely shut off from the living room by an accordion door painted to match kitchen and blend with the living room

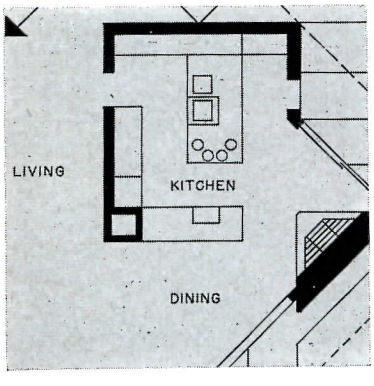
architect: *Bernard Kessler*
owners: *Dr. and Mrs. Curtis M. Flory*
location: *Lake George, New York*

In the average weekend or vacation house, informality is the rule and a kitchen such as this is adequate. A stove, storage and work unit forms the divider between kitchen and dining-living room; supply shelves are open, cabinet space is held to an absolute minimum





Joseph W. Molitor



This kitchen is part of large glass-enclosed living and dining area. Built-in buffet at one end is of tropical hardwood, has hinged extension to provide additional seating space, and includes checkerboard inlaid in white wood. Barbecue adjoins work area

architects: *Sumner Spaulding — John Rex*
owners: *Mr. and Mrs. Arch Ekdale*
location: *San Pedro, California*

Julius Shulman

BUILDING TYPES STUDY NUMBER 212

BUILDINGS FOR INDUSTRY

THIS SECTION'S CONTENTS:

RESEARCH FACILITIES

Hedrich-Blessing Studios

RESEARCH AND TESTING LABORATORIES

Magney, Tusler & Setter,

Architects & Engineers;

Stowell P. Leach, Partner in Charge

FOR HEAT EXCHANGE

THE TRANE CO., LA CROSSE, WISC.

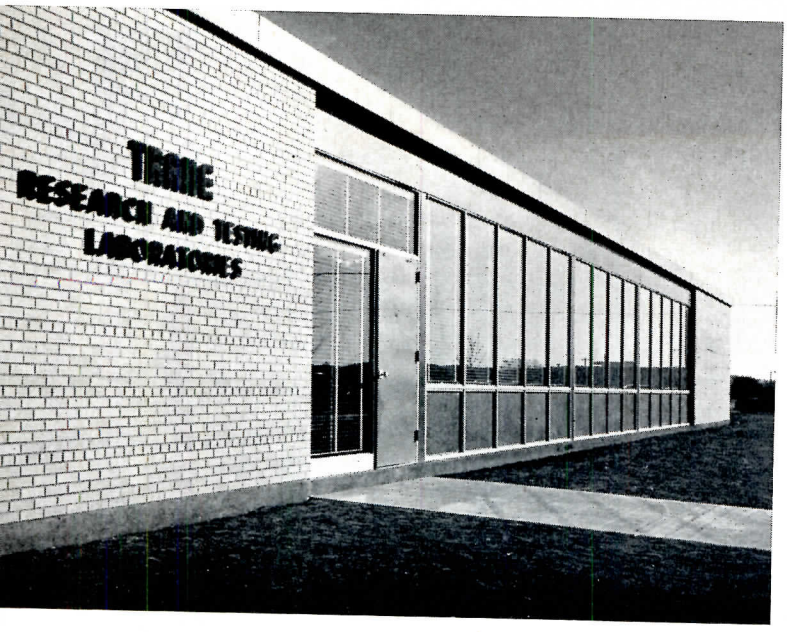
The Trane Co.: President, D. C. Minard; Chairman of the Board, Frank Hood; Vice President and Treasurer, Wayne Hood; Building Committee, R. E. Lucey (Chairman and Vice Pres. in charge of engineering), O. A. Labus, H. C. Rooks, M. W. Miller, A. O. Anderson, E. T. Neubauer, A. G. Moody, R. G. Miner, C. L. Ringquist, J. R. Davis, D. H. Krans (Lab. Director)

In 1950 the Trane Company's research, product development and testing program was ready to burst out of the 10,000 sq ft it occupied in the rear of Trane Plant No. 1. A new laboratory designed for the purpose (in contrast to the converted space then in use), planned comprehensively enough to meet foreseeable needs for 10 years, became a necessity. The company's engineering staff and development committee began programming requirements.

This was not simple. The new laboratory was to be one of the few in the United States devoted principally to the science of heat exchange, which is fundamental to the fields of air-conditioning, heating and ventilating. The company's products are designed for all kinds of buildings — residential, educational, institutional, commercial and industrial — and are made in a complete range of types and sizes. Heat exchange is important to innumerable industrial problems, where some process temperatures are trending higher and higher while others may demand −300 or −350° F. In addition, the company is working on military and Atomic Energy Commission projects such as cooling guided missiles in flight, heat transfer in jet air-craft, and the peacetime application of atomic energy to industrial purposes. At the same time, there are surprising gaps in even the basic data relating to heat exchange, which is a relatively new science.

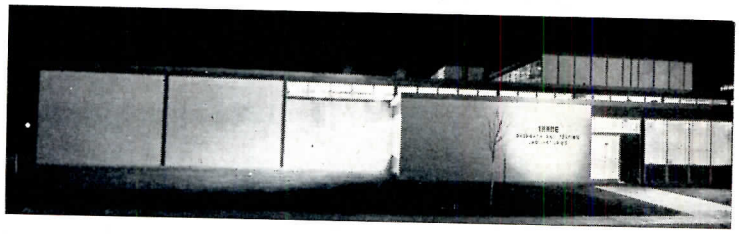
The firm's development committee, which has about a dozen permanent members but to which may be added any official or engineer with a developmental problem, began studying probable needs, scope, projects which expanded facilities would make possible, and the physical facilities themselves. A laboratory building committee was formed, and on Sept. 10, 1951, submitted a preliminary outline proposing a building of about 26,000 sq ft, to be the first unit of a complete new administration group. The company's engineers visited several types of existing laboratories but found little to suit their particular needs. Planning, then, for the functions and equipment currently required, plus modest room for increased activity, and with the proviso that each of the main laboratory sections should be so laid out that its portion of the building could be expanded independently if need be, the building committee eventually determined on 30,000 sq ft plus 5000 sq ft for work on restricted government projects.

At about this time a contract was signed with Magney, Tusler & Setter, Architects and Engineers. Trane provided general requirements for electric, steam, water and sewer services, drawings of major testing equipment and models of laboratory apparatus for layout planning. Their physical requirements included a craneway two stories high, 40 ft wide and 120 ft long, which could also serve for research on projection unit heaters; space for a dozen or more wind tunnels; a sound test chamber; an isolated convector test room; two cold rooms; a model shop; chemistry and metallurgical labs; instrument storage and calibration facilities; office space and record vault.



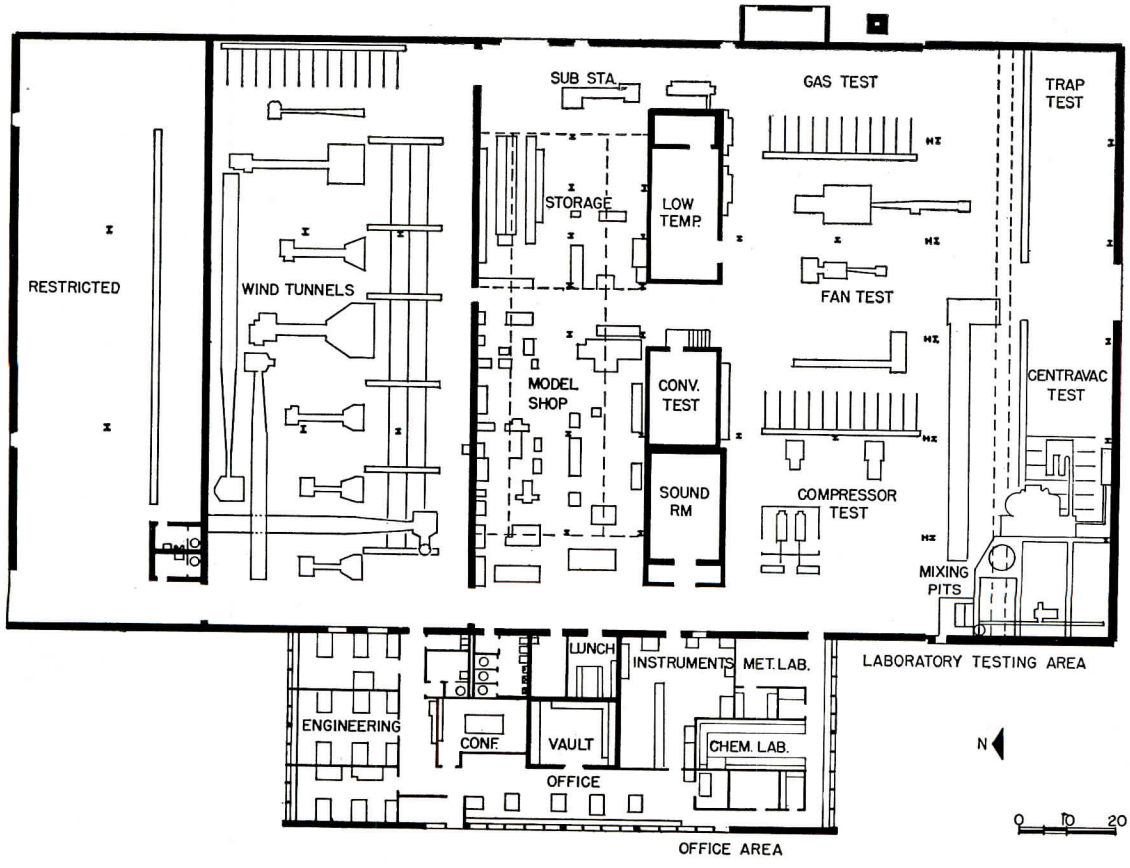
Hedrich-Blessing Studios

Deceptively simple though it now appears, organizing space requirements in the Trane Laboratories was the subject of intensive, long-continuing study. Resolu-

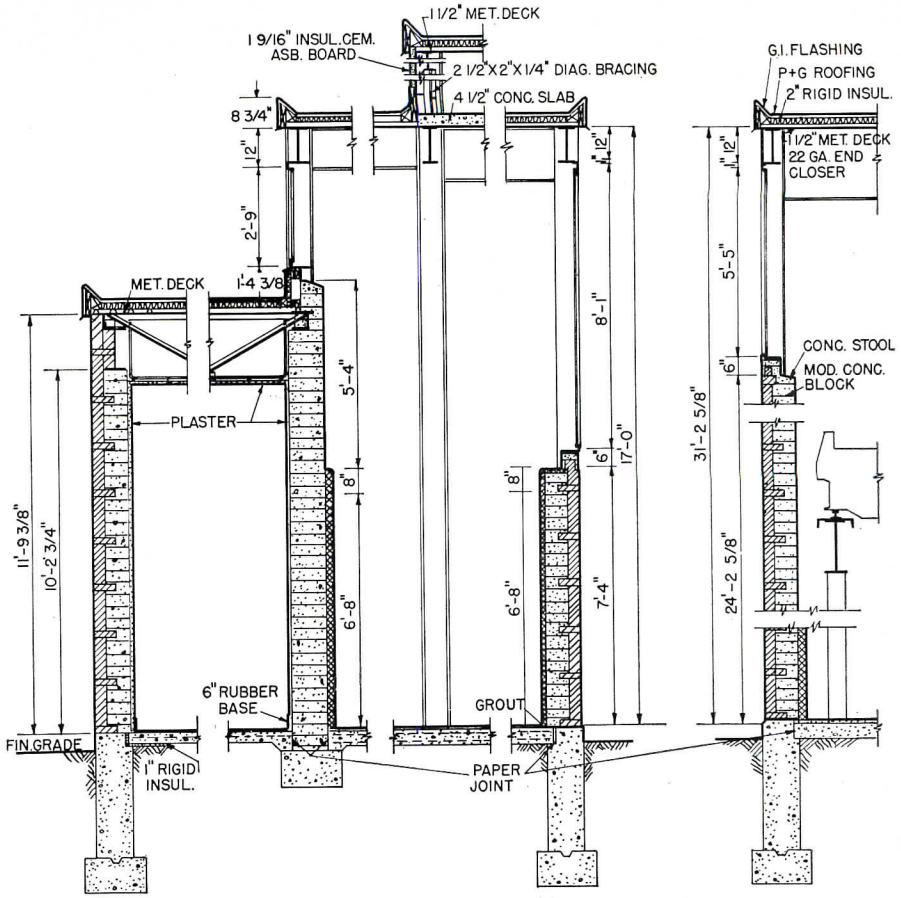


tion of the problems of varying needs and future expansion was division of the plan into parallel segments, each expansible independently at one end should need arise, all served by a common office block at the other end. Over model shop (where products under test can be modified) is a penthouse containing air conditioning equipment for office block; penthouse walls are glazed to admit light to central areas beneath

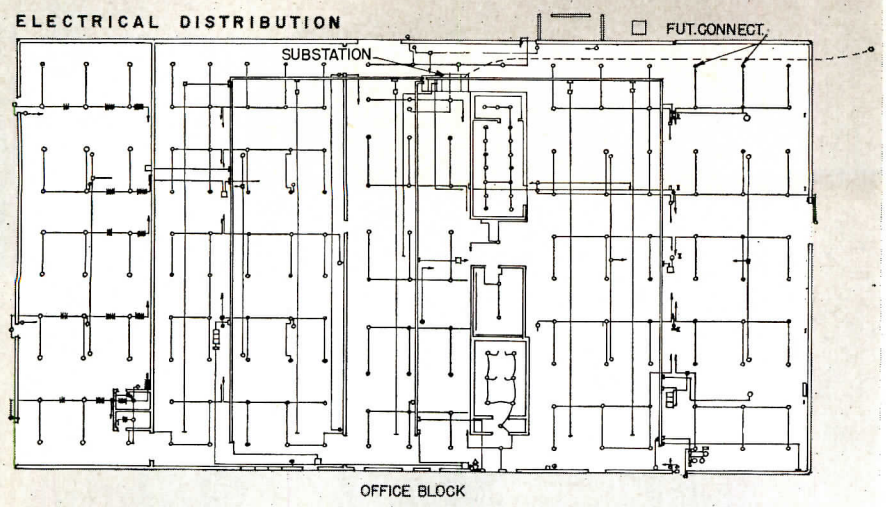
TRANE LABORATORIES

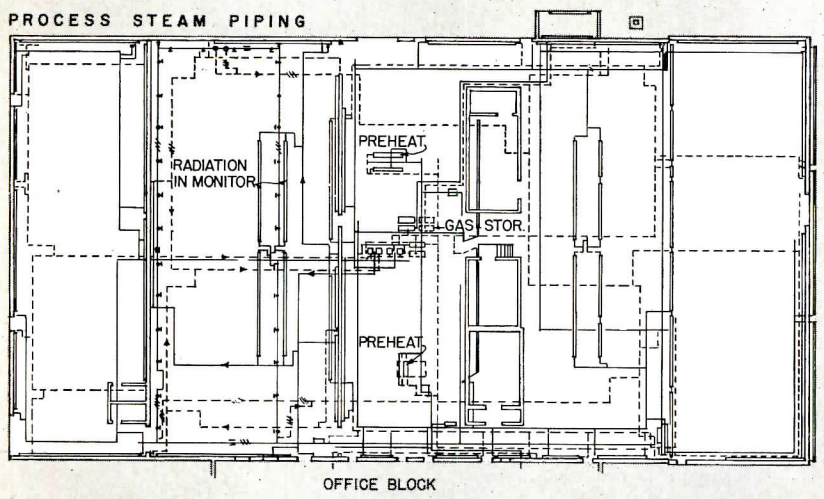


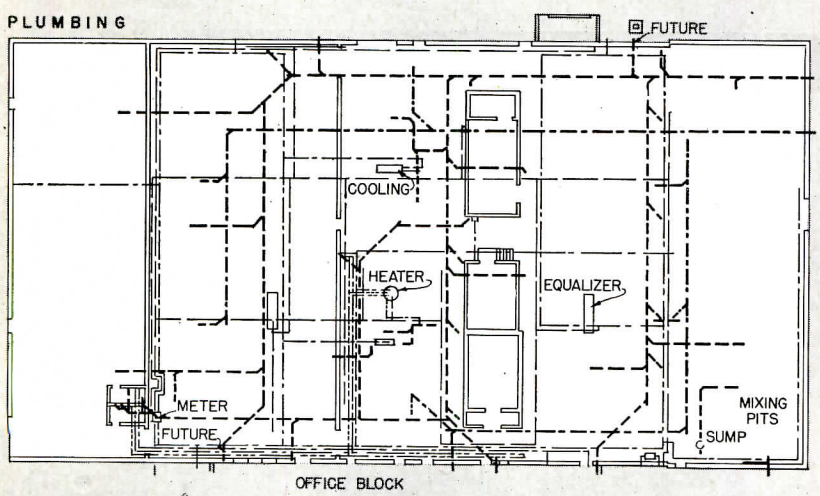
Walls are masonry between steel columns whose flanges are exposed inside and out; this device breaks the masonry into panels small enough to prevent expansion cracks, eliminates expansion joints

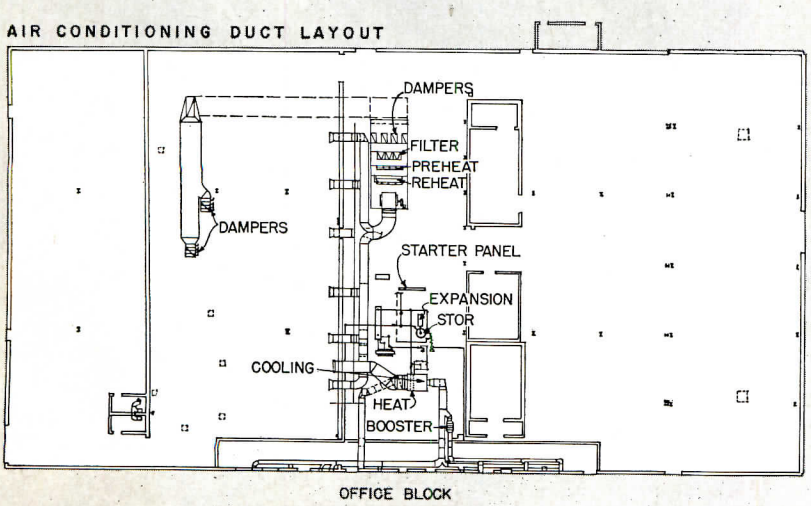


WALL SECTIONS THROUGH LABORATORY TESTING AREA

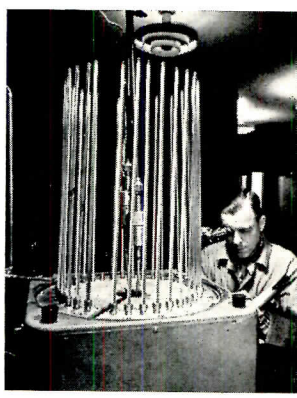




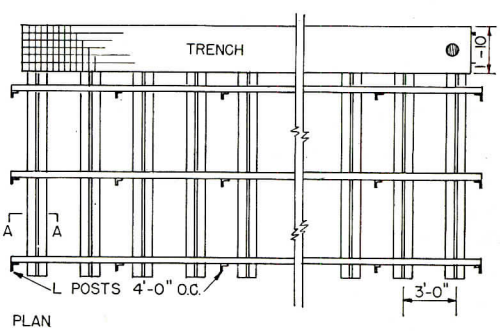




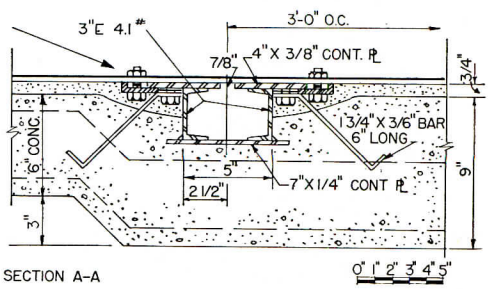
Another difficult problem concerned laboratory services. According to Mr. Lucey, chairman of the company's building committee, "Most important was to arrange electric service and piping for steam, water, air and gas so as to have perfect flexibility for the unpredictable test arrangements. We developed a plan to run loops of piping around each bay, with valved openings every 10 ft for water, steam, air and gas. . . . We followed the same principle by installing loops of bus duct so we can plug into power at any point." These service loops are all sized to permit future extension, bay by bay.



Don Berg Photos



PLAN

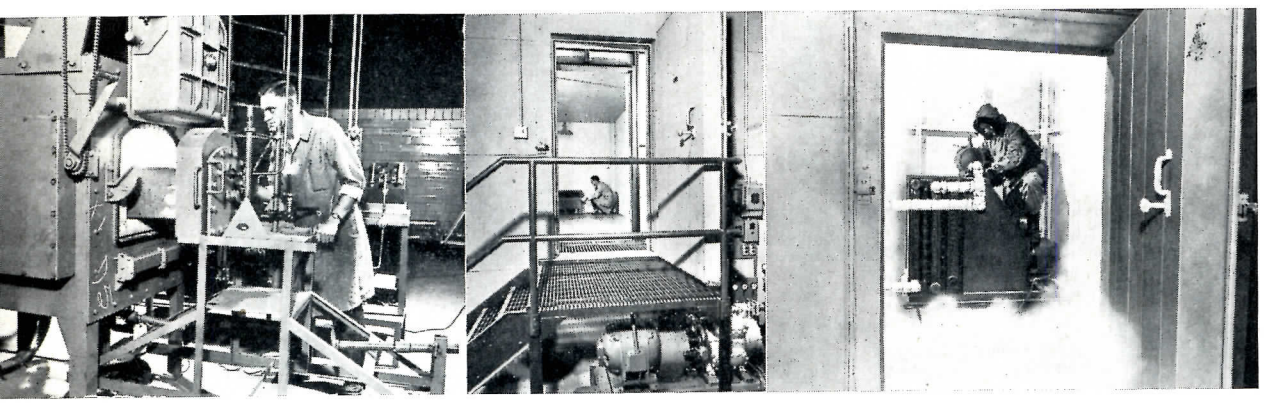


SECTION A-A

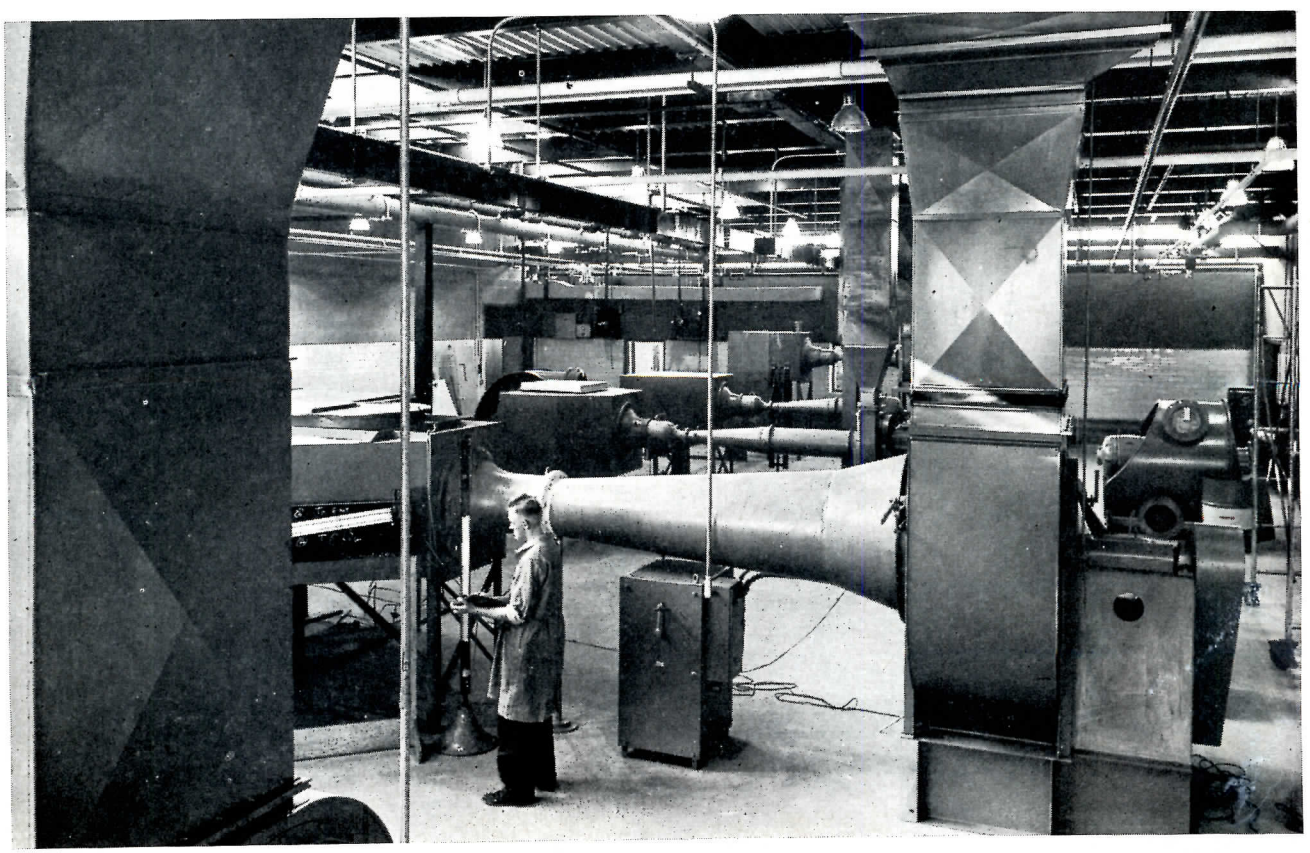
Each bay also has trenches for water drainage; coolant and operating water are mixed in floor pits to any temperature desired for re-use. Test machinery required an absolutely level, dense floor. Soil beneath is sandy, partly fill, and so was highly compacted before pouring the slab. Equipment mounts (see detail below), specially detailed, were machined true and set with surveying instruments; they served also as screens for floor finish. Though moderately costly, the mounts are expected to save time and money when test equipment is relocated.

Hedrich-Blessing

TRANE LABORATORIES

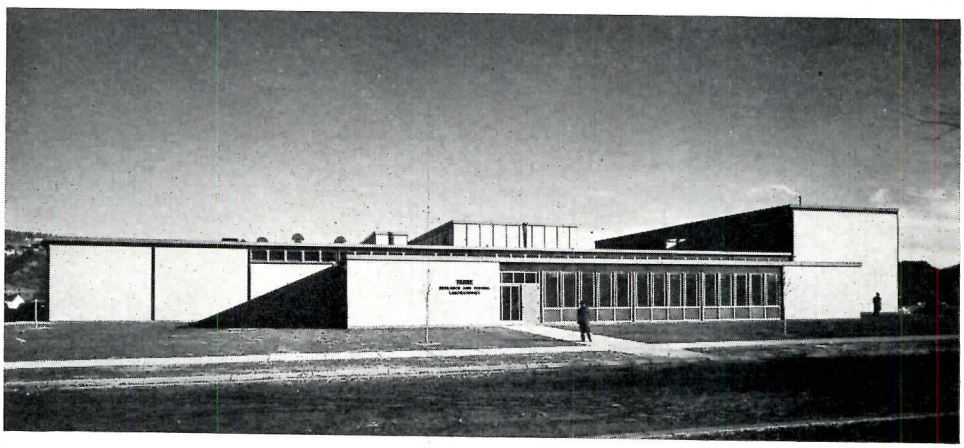


Left to right: calibrating thermometers; controlled atmosphere furnace (2500° F) for experimental brazing of heat exchangers; double-shelled test room for heating equipment (air at any temperature circulates between shells, produces desired "outdoor" temperature); super-cold room simulates Arctic conditions. Below: Air tunnels for testing fans

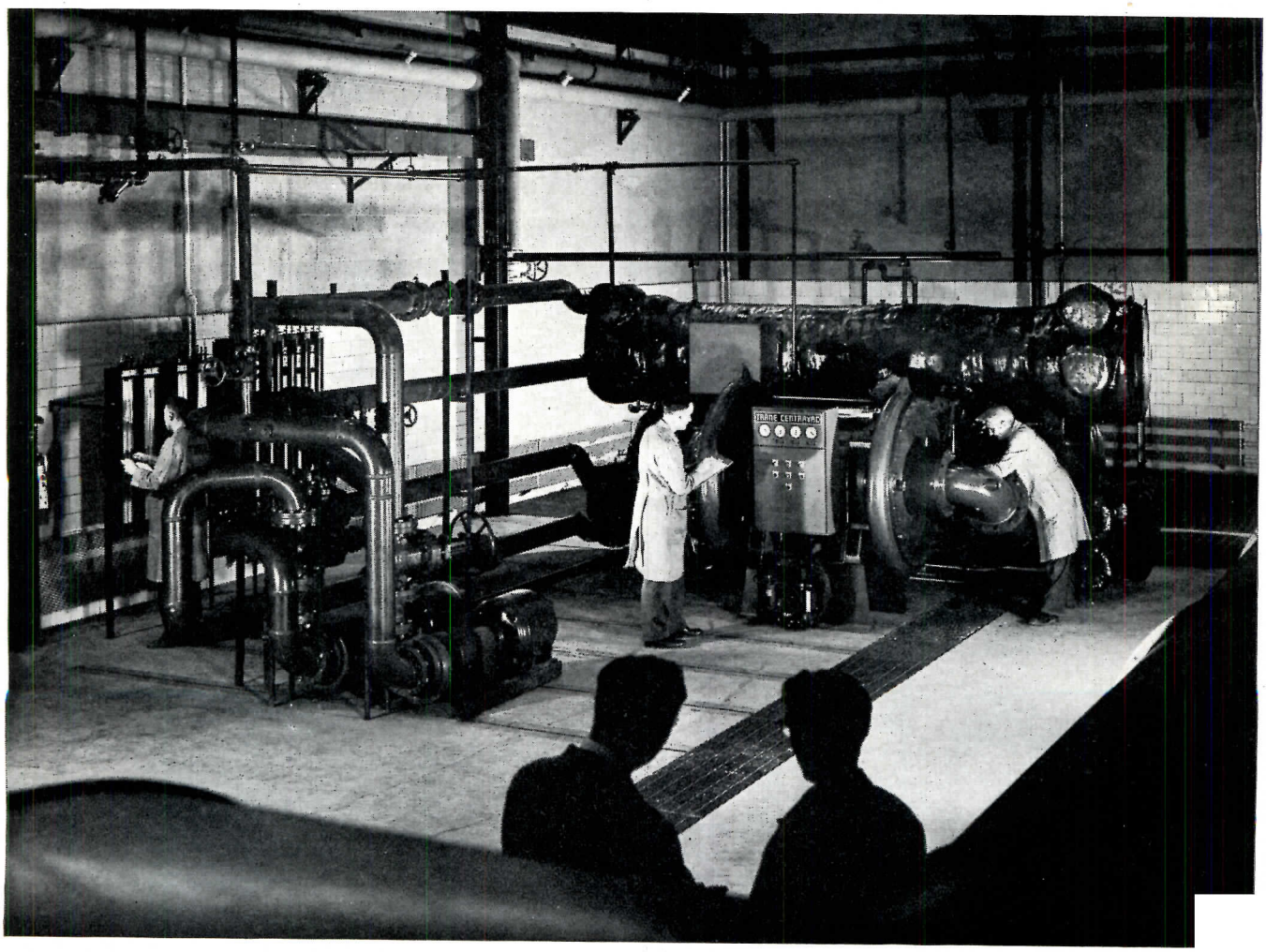


Don Berg

The laboratories were dedicated late in May of this year, at which time Robert Le Baron, Assistant to the U. S. Secretary of Defense for atomic energy, emphasized in his dedicatory speech the development of peace-time applications for atomic energy. Appropriate architecturally and industrially for such a high purpose, the building is colorfully pleasant and — as far as the nature of its functions permits — atmospherically comfortable. The A.S.M.E. color code is followed in painting the piping, and from this an entire interior color scheme was evolved. Offices and some lab areas are air conditioned; in large test areas, volume and variability of air movement resulting from tests made air conditioning impracticable. However, some test air is re-used through a ceiling plenum for winter heating. Total cost was approximately $1,000,000 for the 35,000 sq ft of area



Hedrich-Blessing Studios



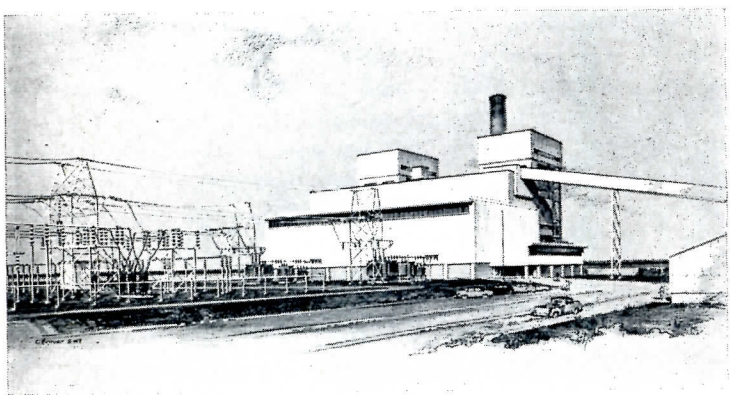
FACTORS AFFECTING INDUSTRIAL BUILDING DESIGN

IN APRIL of this year the Society of Industrial Realtors, a division of the National Association of Real Estate Boards, surveyed the national market for industrial buildings and sites. Their findings indicate certain strong owner preferences which show how economic and social pressures can affect industrial building design, and demonstrate a steady demand for good industrial locations coupled with a growing scarcity of prime industrial land. Society members reported on current activity in comparison with that of the previous six months.

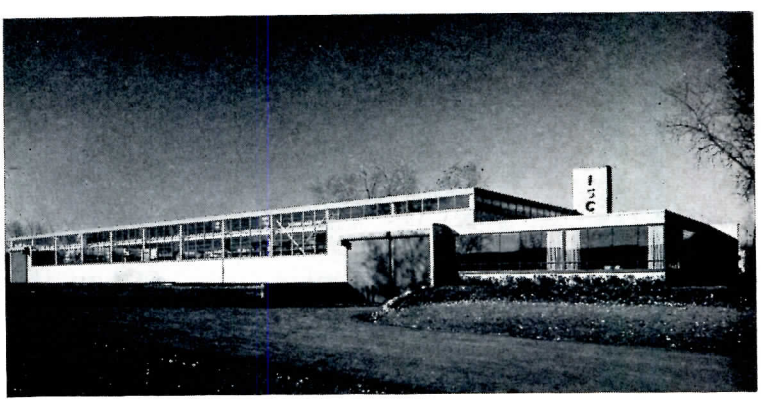
The market for industrial sites showed an increased dollar volume of sales and price increases ranging from 10 to 20 per cent for improved land (5 to 25 per cent for unimproved) wherever change was noted, with very few reports of lower volume or costs. As to type of buildings, a continuing heavy demand for one-story buildings existed, with prices and volume of sales stable. On the other hand, multi-story plants were beginning to be a drug on the market, with more offered for sale, fewer buyers, and prices weakening.

These are not direct architectural and engineering design determinants;

Left, Kansas City Power and Light Co., Hawthorne Station: height and volume determined by mechanical space requirements within



Ebasco Services, Inc., Designers



Barancik, Conte & Assoc., Architects; Hedrich-Blessing Photo

Above, Interstate Steel Warehouse and Office, Evanston, Ill.: rigid steel framing for a one-floor plant makes floor beams carry the load

no generality can cover each specific owner's case; but there does appear to be a clear implication that the low, spread-out plant, which requires a generous site found in suburban or rural areas and not within city limits, has proved economically sound. Another significant trend was discovered: more small plants (less than 50,000 sq ft) were being bought than large structures (over 50,000 sq ft) although only a slight change in prices for either was noted; and warehousing was in about equal demand with manufacturing space. These trends have seemed to continue since the survey was made.

Against this background of industrial development the Los Angeles Chamber of Commerce held an Institute on Industrial Plant Design early in March. Previously — late in 1953 — the National Industrial Zoning Committee (whose membership includes development, planning, transportation, engineering, realty and state governmental agencies in the industrial field) issued a preliminary report on the characteristics

of recently built industrial plants in a search for bases for adequate, workable industrial zoning codes. While the Committee's sampling so far is not large enough for accurate evaluation, its tentative findings closely parallel the recommendations independently made at the Los Angeles Institute. On these principal sources, plus comment from informed individuals, the following discussion is based.

W. T. Herzog, Archt.; Bob Natkin Photo

Bert Mills Corp., St. Charles, Ill.; manufacturers of coffee vending machines; plant carefully designed against fire hazard. Paint spray room, above, is sprinklered, has explosion-type windows; is surrounded by firewall

Small plant for Dresser Manufacturing Co. is one story, like Interstate Warehouse on preceding page

Hedrich-Blessing Photo

Sound Programming Is Essential

The program prepared before an industrial plant — or laboratory or headquarters building — is designed almost always determines the success or failure of the undertaking. What is a good program like? What is the programming process? In essence it is merely a statement of needs; but the needs are so complex that several years may be required to formulate them clearly to relate their numerous categories and sub-categories properly and thus ensure an economical, efficiently functioning, attractive plant. For one thing, architects and engineers belong in the picture early; as early as possible. There are numerous advantages in starting an intimate owner-architect-engineer collaboration as soon as the decision to build becomes definite. The paramount reason is that, since these members of the design professions are trained above all to coordinate the many diverse elements of building programs and structures, which range from petty personal prejudices to the characteristics and behavior of materials and equipment, they can save an owner much precious time — which is to say, money. There are all too many instances of misdirected energy, of time wasted by owners on structural matters or space organization, which are the designers' functions. The designers' independent, experienced viewpoint is indispensable at the time that preliminary discussions are undertaken and when tentative decisions are made.

The owner has important, definite functions, too: he specifies what the plant is to produce, the volume of production for which space and facilities are to be provided, the manufacturing or processing procedure, and the probable need for future expansion — all parts of the analysis of the fundamental problem. He provides his architects and engineers with data, and very likely sketches, showing the desired floor pattern, area, facility and process requirements; he determines the need for driveways, rail spurs, parking, employe amenities and environmental control. He provides machine layouts and initiates the study of efficient handling and routing of materials through his proposed process. At this stage the capable architect or engineer says nothing; he listens. Next, equipment suppliers are consulted, individual spaces and clearances begin to be studied, and the designers' work gets under way.

Preliminary studies — whose importance is tremendous because, as the first crystallizations of ideas, they influence all later work — now begin to come from the architect. Ideally, the required spaces are related not only to each other but also to a site's topography, which means that at this time a certain site is being considered (see below). In these early studies appear general layout and land use; flow of operations; approximate dimensions and in general terms the type of expansion; rail, highway or water transportation facilities, parking, etc. These can determine the desirable site size; and in the building itself, column spacing, headroom, location of toilets and other such facilities. The next step is to determine upon a type of construction, the appropriate kinds of materials, extent and nature of mechanical and electrical systems. After this — and everything up to this point, in the ideal case, has been produced by the collaborating owner-architect-engineer team — the final preliminaries should come from the architect, be thoroughly discussed and changed if necessary; and at last the project is ready for working drawings and specifications to start.

The Site Influences the Program

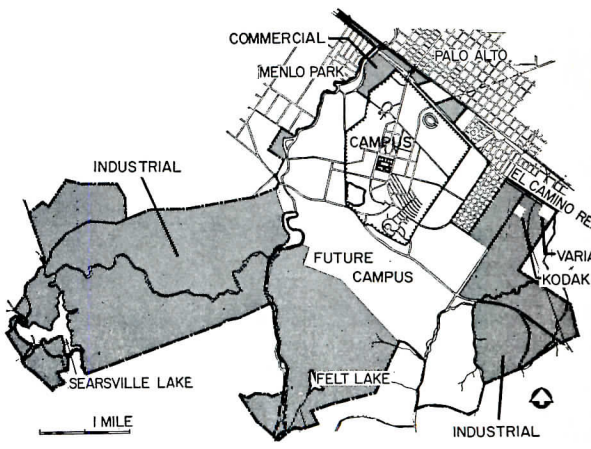
To a larger degree than is apparent the site has a direct influence on the ultimate efficiency of the plant through the effects of site factors on plant design and construction. The architect knows what these are; when full use is made of his abilities he is consulted in site selection. Some of the general determinants of a site's value are: geographic location, proximity of competitors (for one industry it may be good to be among competitors, for another, harmful); sources and availability of raw materials; relation to suppliers of components, accessories, etc.; local climate (prevailing winds, sun heat load, humidity — does the process require dust-free atmosphere? high or low operating temperature?); local power and fuel sources; industrial and fire protection water (domestic water is rarely a problem); sewage and waste disposal possibilities; tax rates; labor force (how much parking will be needed?); transport facilities. After these general factors are considered come the specifics: land contours (existing or easily modified contours may actually simplify solution of traffic, loading dock, or multi-level processing problems); soil strength (affects column spacing, internal plant layout, foundations, height of building); hidden rock, springs or potential flood conditions. All these bear investigation by a reliable engineer, who can also advise on width of land and gradient required for a rail spur; ground water level; frostline; subsidence tendencies.

In comparing an urban with a rural or suburban location, it should be borne in mind that the value of a "central" location is sometimes exaggerated; in regard to the distance labor will have to travel, for instance, time is a more accurate measure of satisfaction than the actual distance in miles. Employe parking for *all* employes is a must; one cannot get by today with less. Regarding smaller communities, the impact of a plant on local road problems, sewers, schools and the labor market must be considered. The attractive plant creates good will; the ugly one breeds ill feeling. Suburban labor has proved to be more stable than urban.

Automation Affects Design

Automation has been defined as "*automatic performance by machine instead of by hand of many production operations simultaneously or in sequence, to reduce human operation and get a better product at lower cost in less time.*" In a study undertaken by David G. Osborn for the Department of Geography of the University of Chicago, automation was found to affect program requirements (and hence plant design) in definite ways. In a number of instances automation tended to free the process from dependence on a large labor supply. More important was the availability of some semi-skilled labor, with high school education plus 2 years' technical training. Designing the production equipment, its controls and the plant to house them, however, was found to be a more complex problem, and buildings for automatic processes were found to be uniformly smaller in area by from 12 to 94 per cent, with the number of employes reduced by from 13 to 92 per cent. This lessens the requirements for employe facilities (toilets, cafeteria, parking, etc.) substantially. Automation also reduces employe density, or in other words increases the space per employe, by an average of 28 per cent, while increasing output, on the average, some 380 per cent. In terms of building area required, the amount per unit of product was reduced by an average of 59 per cent — automation, then, may cut floor area requirements in half. The lower employe density and smaller building size also change the nature of the impact of a plant on a community's transit system, housing, schools, services, parks, etc., and reduce the required site area. In some instances automatic plants have been built far away from an established "mother" plant to avoid antagonizing an existing labor force.

STANFORD UNIVERSITY INDUSTRIAL DEVELOPMENT, *Palo Alto, Calif. The last large tract of undeveloped land on the peninsula south of San Francisco is 5500 acres owned by Stanford University. This is a little more than half the original holdings, and under the terms of its grant cannot be sold. Two years ago Stanford started leasing land for residential, commercial and light industrial use, engaging Skidmore, Owings & Merrill as master planners for over-all development. Within this framework a $15 million shopping center (Welton Becket & Assoc., Archts.-Engrs.) is to be built in the commercial area, a small residential subdivision has been opened, and with less publicity light industry has started to come in. One plant is completed (Varian Associates; Eric Mendelsohn, Michael Gallis, Associated Archts.) and is shown in detail on following pages. Another for Eastman Kodak is almost complete. Stanford favors no special*



types of industries, judges each individually, applies stiff restrictions. Plant operation must be clean, quiet, odorless; site must be landscaped; offstreet parking is required; no stacks, water tanks or advertising display are permitted; minimum set-back is 50 ft; Palo Alto zoning ordinance applies; Stanford must approve design. Lot size is not predetermined. A rural, parklike character is being effectively maintained. The master plan is a governing policy rather than a design implemented by precise drawings

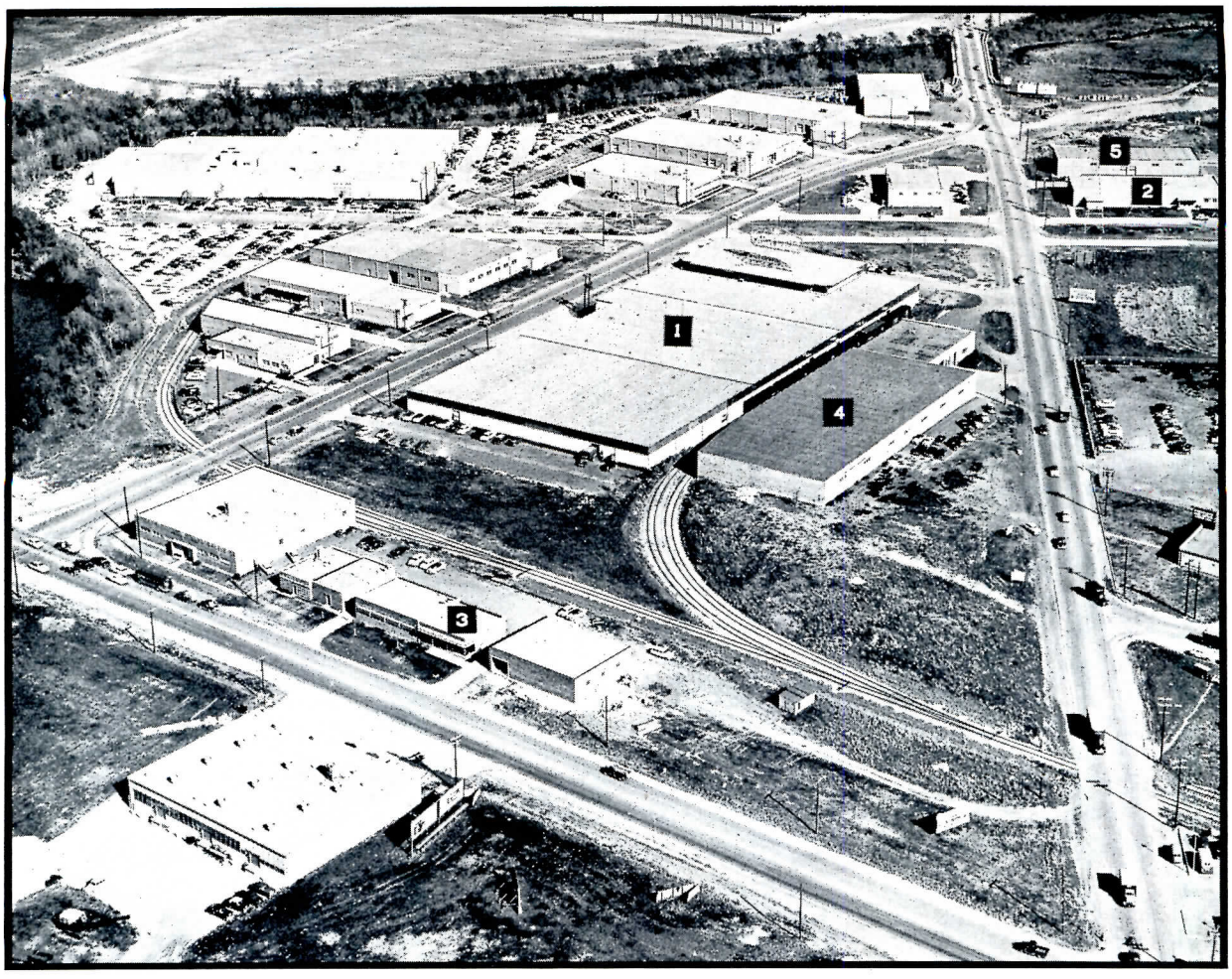
Environmental Control

Modification of internal environment to improve working conditions and production is not a new story, although the arguments pro and con a totally controlled atmosphere continue to crop up. In some cases, for instance in the Varian laboratories shown in the following pages, atmospheric control is rendered essential by the nature of the process; in this case the air conditioning equipment exerted strong influence on the roof design, to the extent of forcing the architects to use a form which they might not otherwise have considered. In the Puerto Rican Consolidated Cigar Plant atmospheric requirements were even more stringent. Here raw materials and finished products alike are seriously affected by temperature and humidity; and the machinery is largely automatic, the workers unskilled, emotional and from rural surroundings, the climate violent and public relations important. In addition to the need for air conditioning, these factors resulted in careful design of lighting for the windowless plant, pleasing use of strong color to relieve monotony, and acoustical correction in certain areas, while at the same time they made integration with the site, heavy thermal insulation and provision of recreational and cafeteria facilities imperative. In these and the other examples the full range of requirements is evident.

1

2

TRINITY INDUSTRIAL PARK, DALLAS, TEX.; *Jacob E. Anderson, Archt. Twenty-five years ago Dallas gained a Levee District, created by building 30-ft levees and a new channel for the Trinity River. On this land Trinity Industrial District was developed as a planned, restricted area served by 3 main-line railroads; it is now a center for motor freight service. In 1950, Trammell Crow, Dallas builder and investor, began development of Trinity Industrial Park on part of the District land. The Park, too, is restricted; devoted to light industries and distribution facilities in what is to become a park-like environment, its leases require landscaping, architect-designed buildings, wide setbacks, homogeneous materials and similarity of scale. Street parking is excluded as far as possible, with parking lots, rail spurs and truck docking for each building. All present buildings have salmon brick walls except the Goodrich building, which has buff tile. Walls are load-bearing brick and lightweight block, roofs rest on steel joists; all buildings are heated, air conditioned, with asphalt or rubber tile floors and acoustical ceilings. Orientation required overhangs to shade southern and western glass (western windows are eliminated where possible); roofs are heavily insulated. Streets are wide, usually depressed (so are tracks), with building floor slabs cast on grade at truck or car dock level — a substantial saving. Photos: bottom air view, entire District; top air view, Trinity Park. Buildings:* 1, *B. F. Goodrich Warehouse;* 2, *General Electric X-ray Division and Harris-Seybold Building;* 3, *Black & Decker;* 4, *Clampitt Paper Co.;* 5, *General Cable Corp.*



Air views, Squire Haskins; other photos, Ulric Meisel

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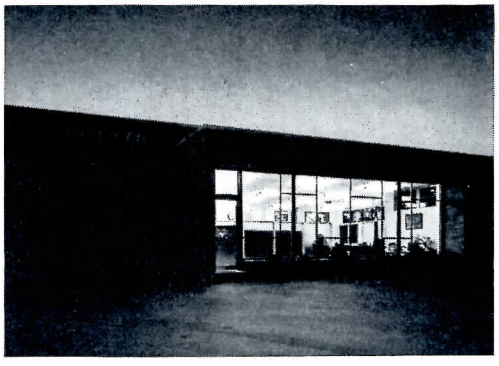

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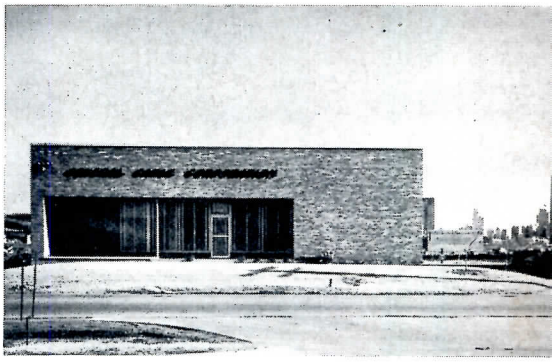
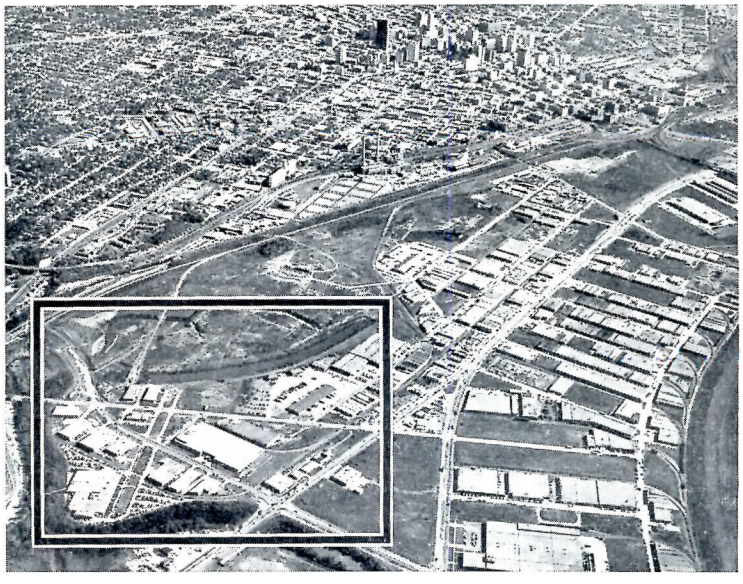
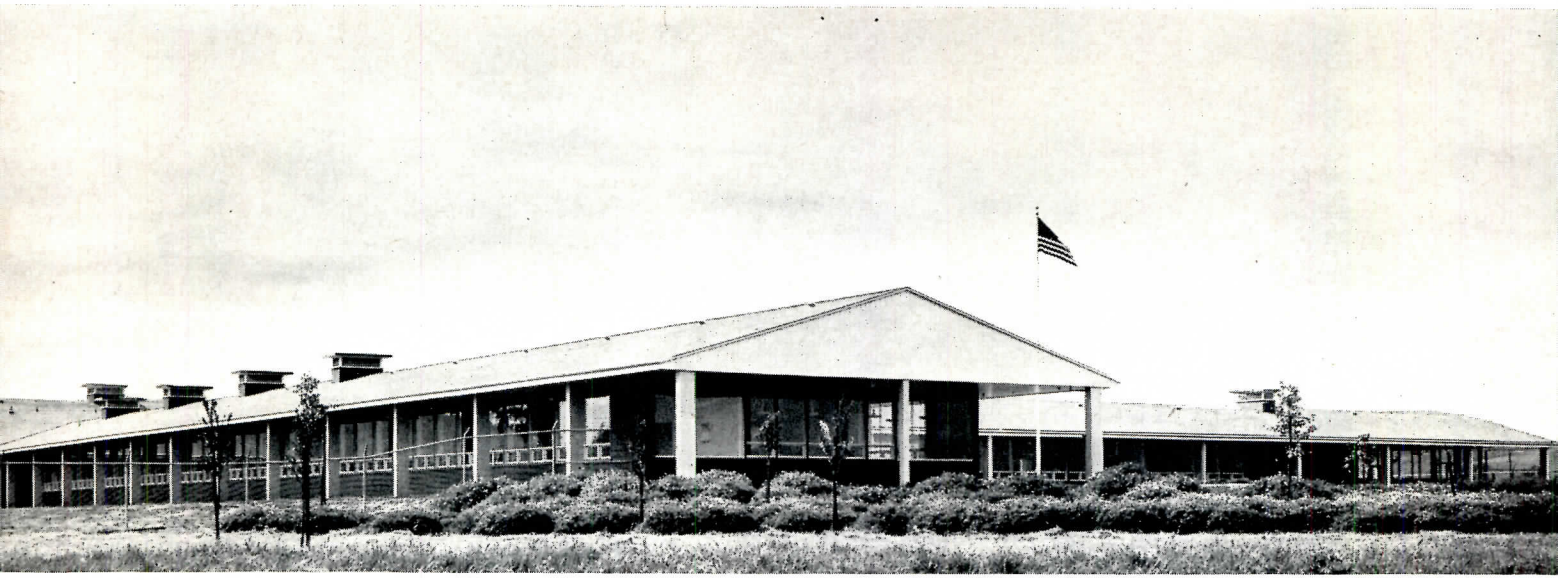




FOR ELECTRONIC RESEARCH AND DEVELOPMENT

VARIAN ASSOCIATES, PALO ALTO, CALIF.



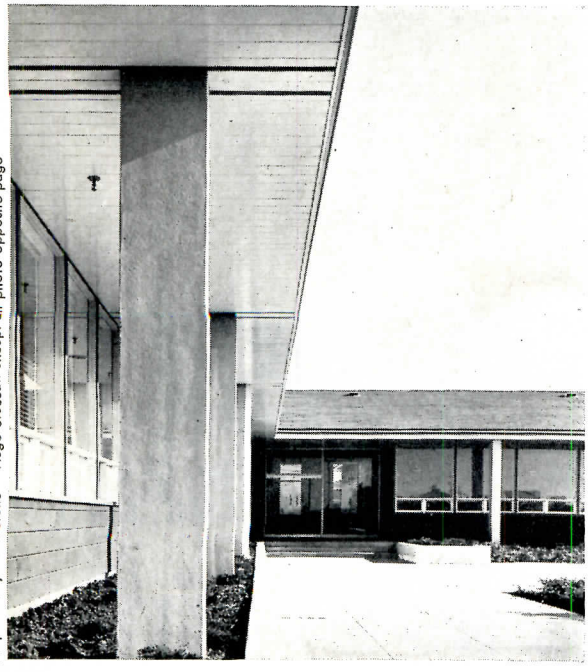
Eric Mendelsohn, Architect

Michael A. Gallis, Associate Architect

Isadore Thompson, Structural Engineer

Clyde Bentley, Mechanical Engineer

Concrete columns stand free of wood walls. Entrance and lobby at center, accounting at right. Soffits, gable ends, columns are white, trim white with brown accents



All photos by Dean Stone — Hugo Steccati except air photo opposite page

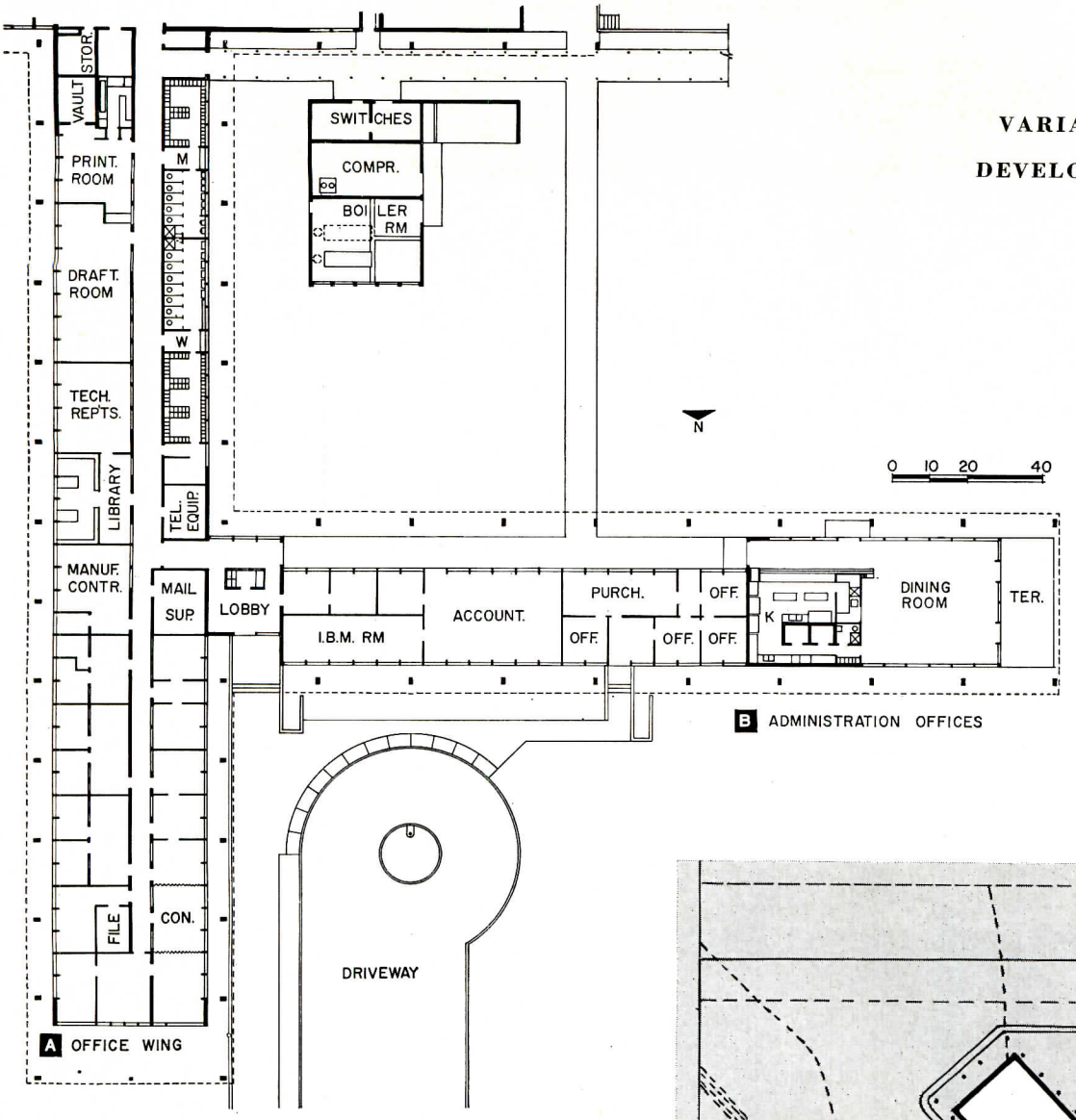
THIS BUILDING — one of the last to come from the office of Eric Mendelsohn — houses administrative offices and research and development laboratories of Varian Associates, inventors and developers of the klystron tube and other electronic devices. Although most of the company's manufacturing is carried on at its San Carlos, Calif., plant, there is a pilot plant in this Palo Alto site. Three factors dominated design: the impossibility of setting up definite space requirements for a new industry in the fast-changing field of electronics; the unusually large amount of mechanical equipment needed to provide in the laboratory an atmosphere as nearly dust-free as possible; and a limited budget. Site, orientation and the clients' request that the building should not have an industrial character also affected design.

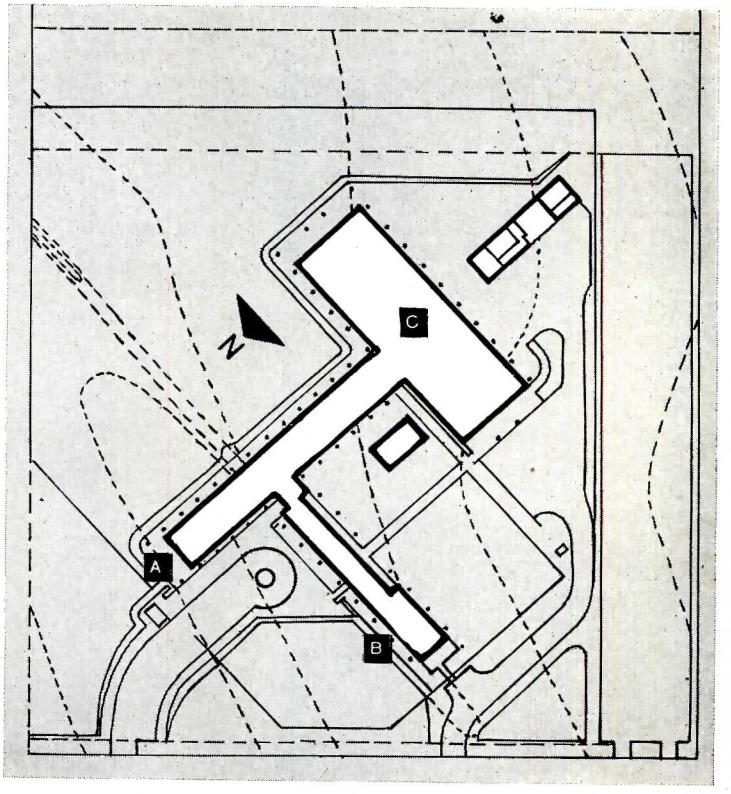
A combination of esthetics and economy resulted from analysis of these factors. Because of the indefinite program, the only solution was to provide enough space for immediate needs in a structure which would permit complete flexibility in arrangement and future expansion. The space beneath the roof and within the peripheral columns is independent of the building's structure. Curtain walls enclose it; movable hung partitions divide it. The budget determined the length of the wings, which could have been longer or shorter by one or more bays without affecting the structure or the overall design. When expansion becomes necessary, it will be no problem structurally.

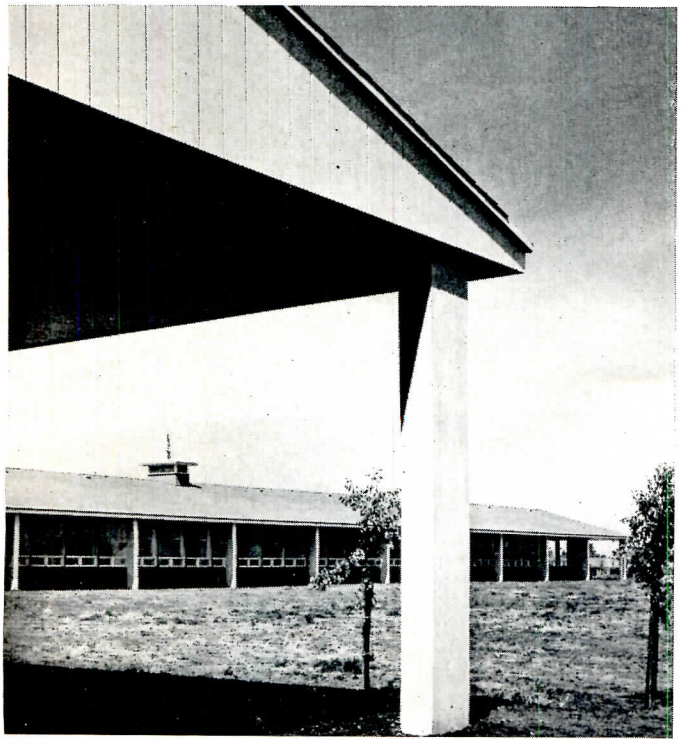
The architectural qualities of serenity and repose — somewhat forgotten in today's stress on dynamics and drama — which the rhythmic pattern of the structural

17-acre site is in New Stanford University light-industry area near campus; university intends to maintain open, semi-rural character of tract, expects it to resemble "park-apartment" development when completed

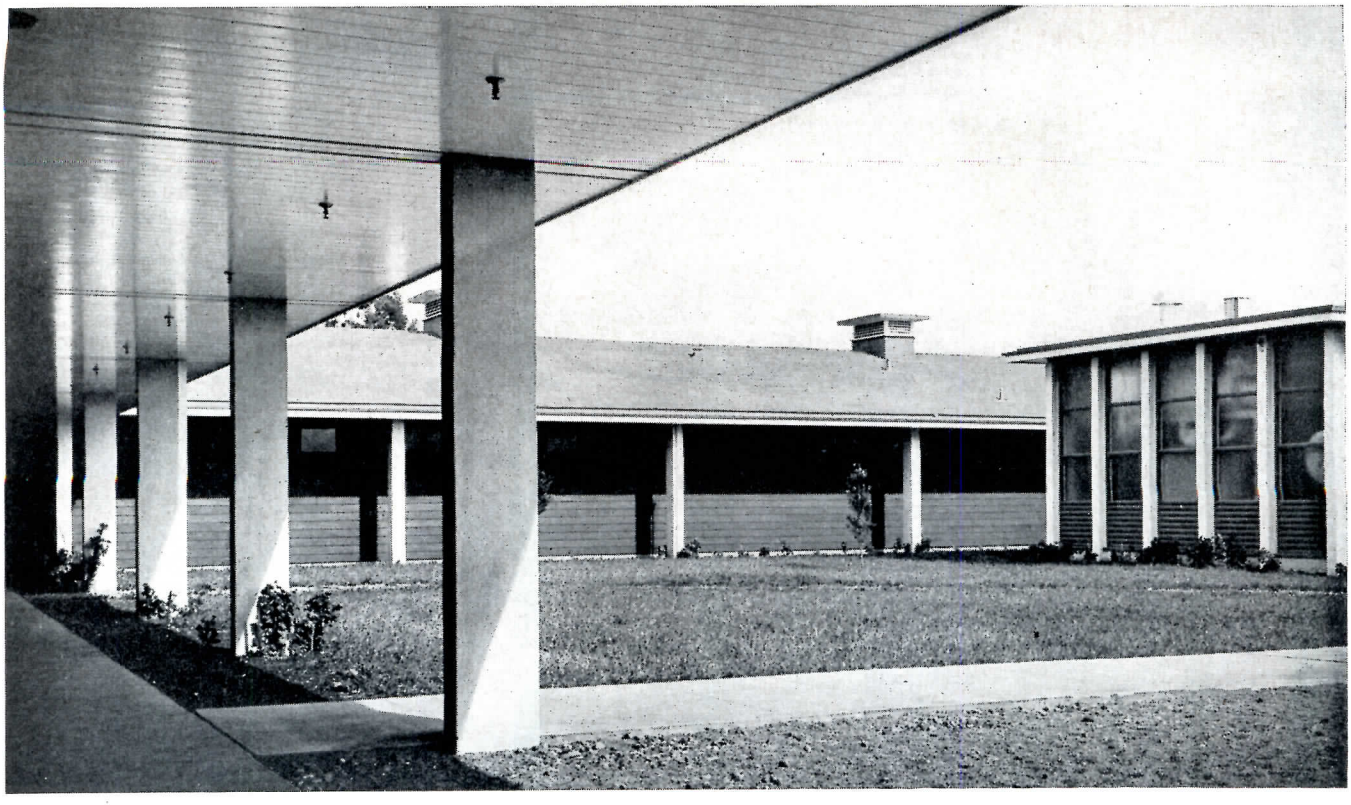
VARIAN RESEARCH AND DEVELOPMENT BUILDING



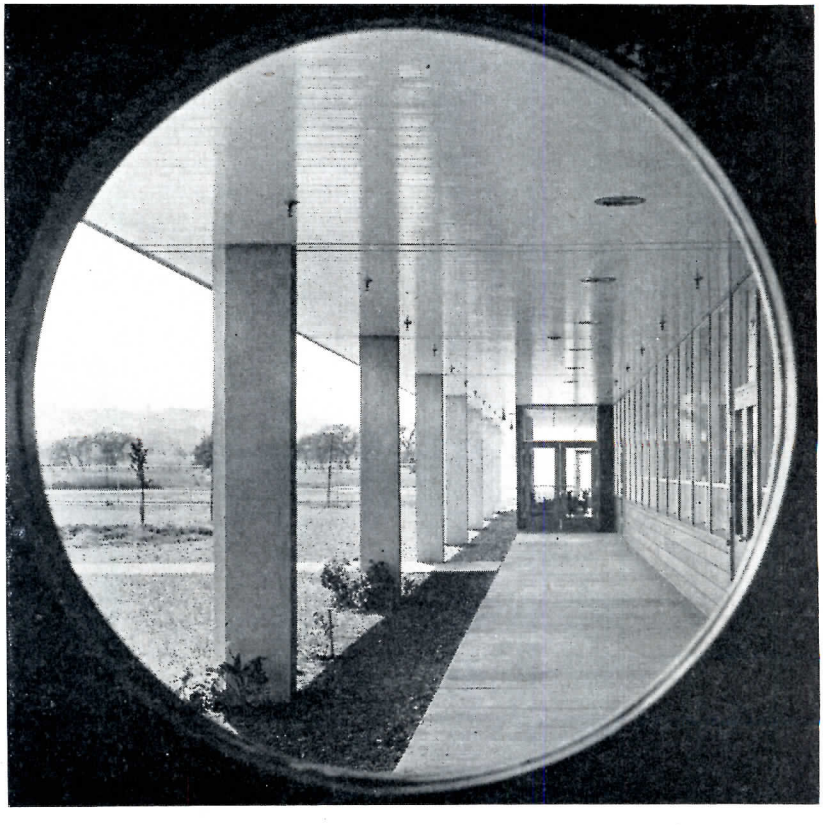




Plot plan, above: Security regulations require guard houses on access roads from thoroughfare — El Camino Real — 200 ft from east property line. Two parking areas are provided since Stanford requires off-street parking



columns gives to the building, have a special appropriateness in the more or less rural area in which the building is situated (Stanford's light-industrial tract). The un-Mendelssohnian roofs are a purely functional, sensibly economical solution to the problem of housing the building's mechanical equipment which, in the laboratory wing particularly, is unusually extensive. The simplest, least expensive place for it was on top of the building, and the most suitable method of sheltering it was the pitched roof.



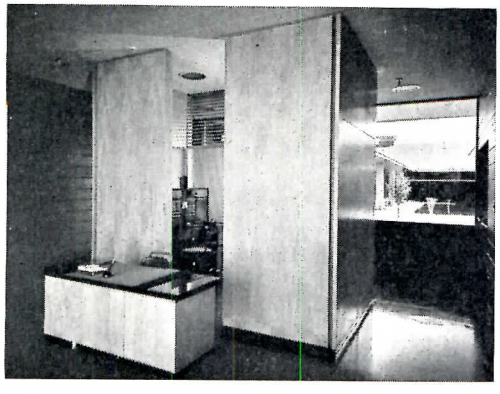
Dean Stone — Hugo Steccati

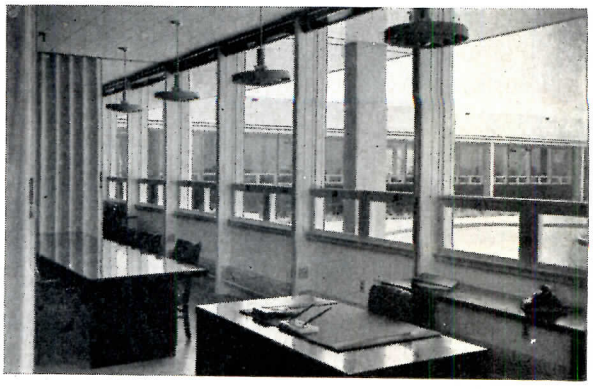
Except for the concrete columns the building is of wood frame construction. Column spacing varies from 20 to 24 ft. Roof trusses, however, are not carried directly by these columns; they rest on steel beams which run the length of the wings (see detail). Truss spacing is 7 ft 6 in. The wood construction required sprinkler protection throughout, including attic, open corridor and covered walkway.

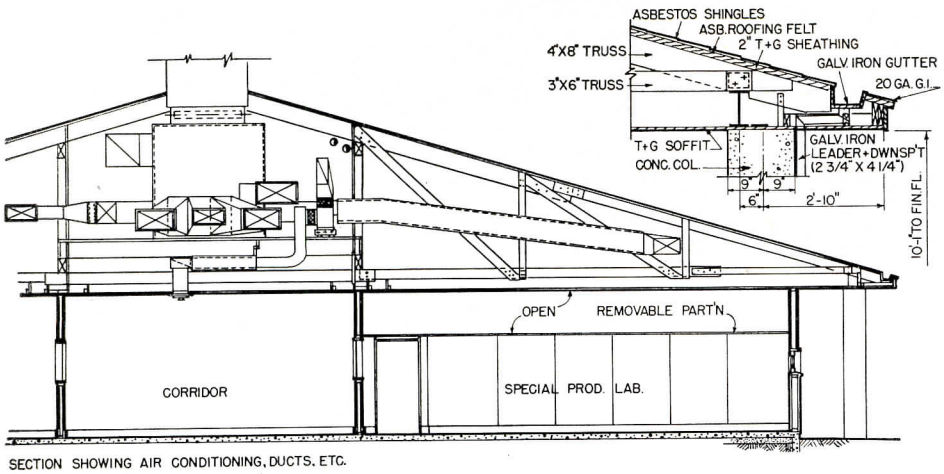
The plan divides into three wings, each for a particular function. Most accessible are the administration, accounting and personnel departments on either side of the lobby. Behind these and without direct access from the lobby are the laboratories, assembly room and shops. The segregation of these was intentional: some of the products developed in this wing are subject to security regulations, and all of the operations leading to their production must be carried on in a pollutant-free atmosphere. The laboratory and assembly areas were designed to be kept under static pressure for this reason; exterior walls in this wing are insulated and window panels are fixed as a further protection.

Total cost of the building, including mechanical equipment, grading, parking, site improvements, roadways and utilities, was $720,000. Exclusive of mechanical equipment, the cost was $400,000 or $9.50 per sq ft for the 42,000 sq ft of enclosed space.

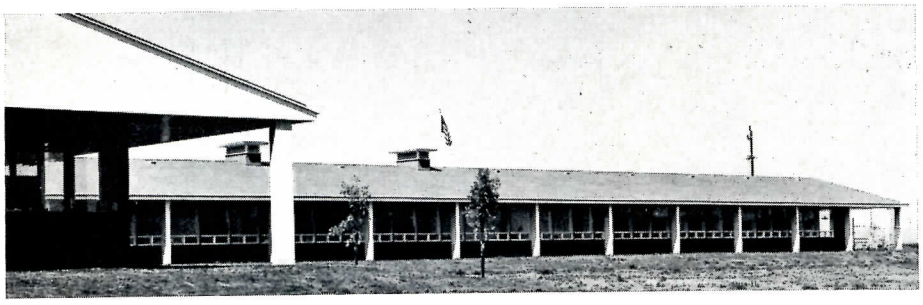
VARIAN RESEARCH AND DEVELOPMENT BUILDING



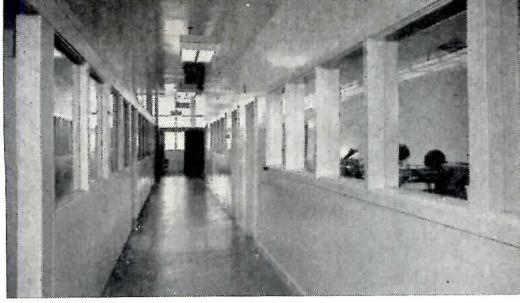


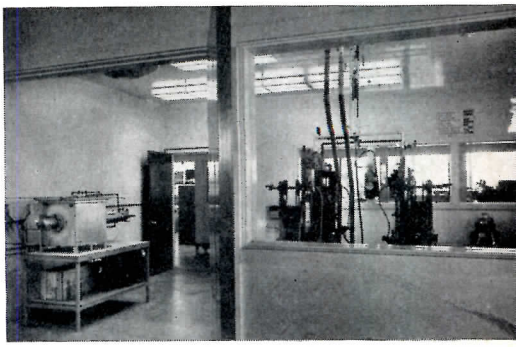


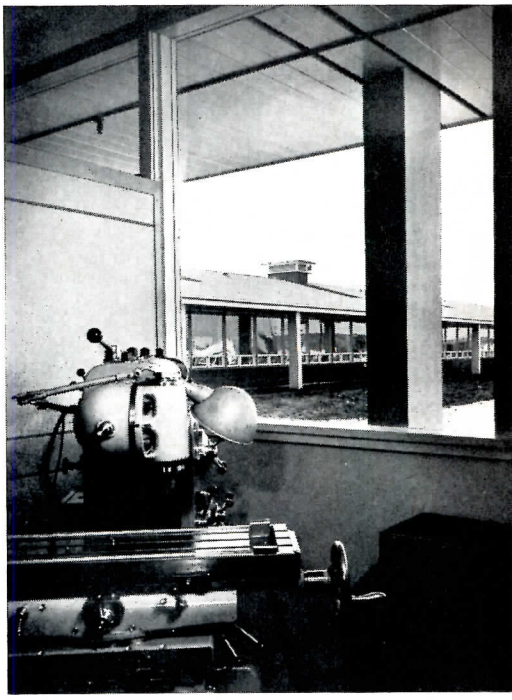
SECTION SHOWING AIR CONDITIONING, DUCTS, ETC.



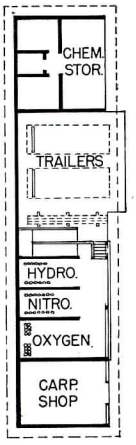
Dean Stone — Hugo Steccati



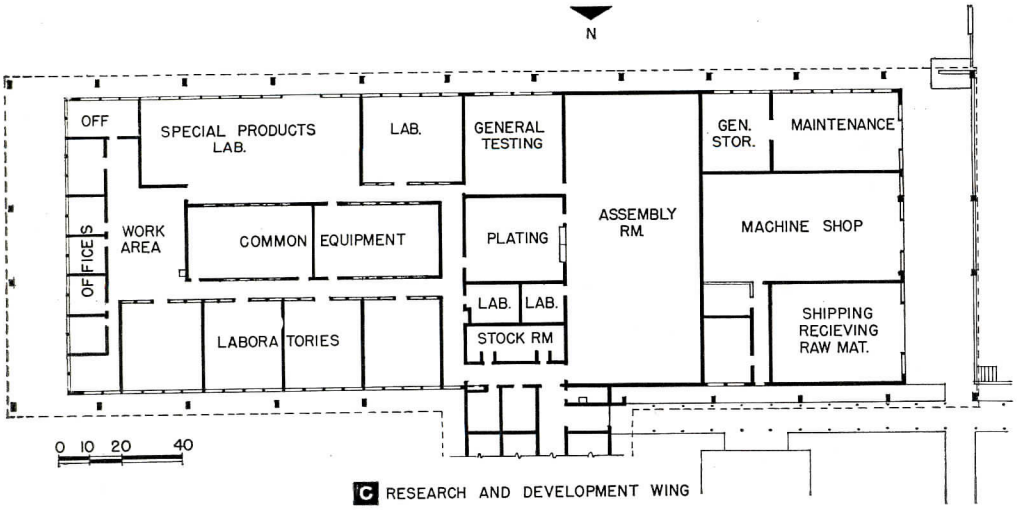




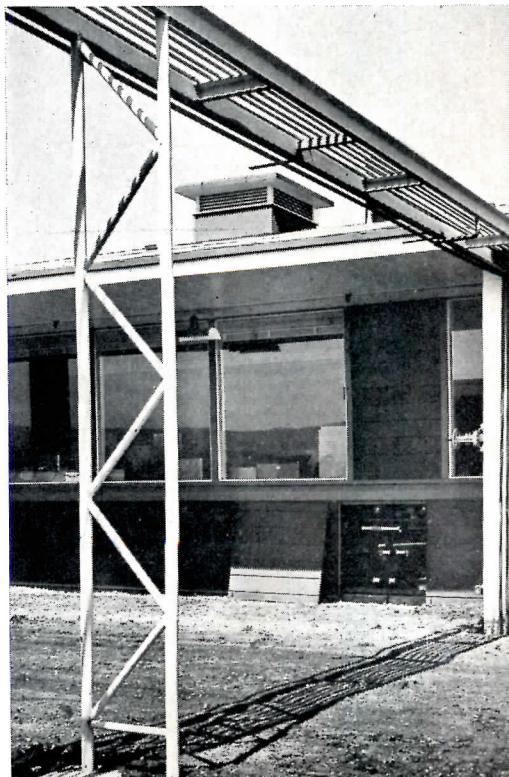
Photos opposite page: cafeteria, outdoor dining terrace beyond; lobby; office. Photos at right, top to bottom: windows along corridor give lab-to-lab visibility across building, research labs at left, common equipment room at right; lab interior; fixed sash in lab wing

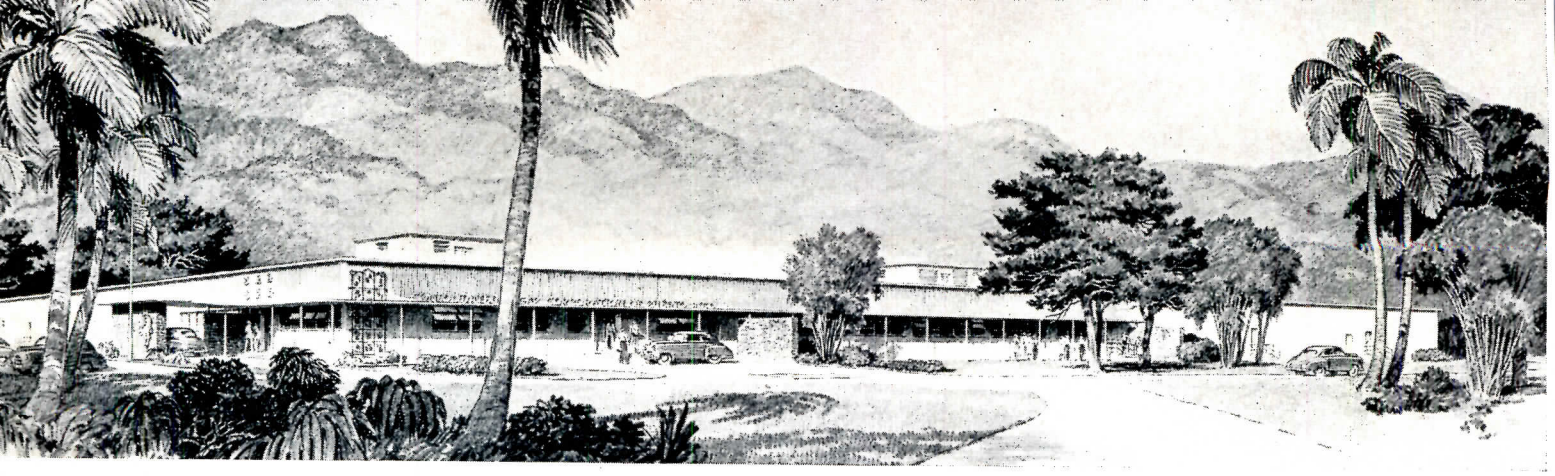


to maintain interior air pressure. Electric and telephone lines, heating supplies and returns in administration and accounting wing, feed from walls or ceiling; gases (oxygen, nitrogen, etc.) reach labs via trellis, feed into building wall for tapping where needed

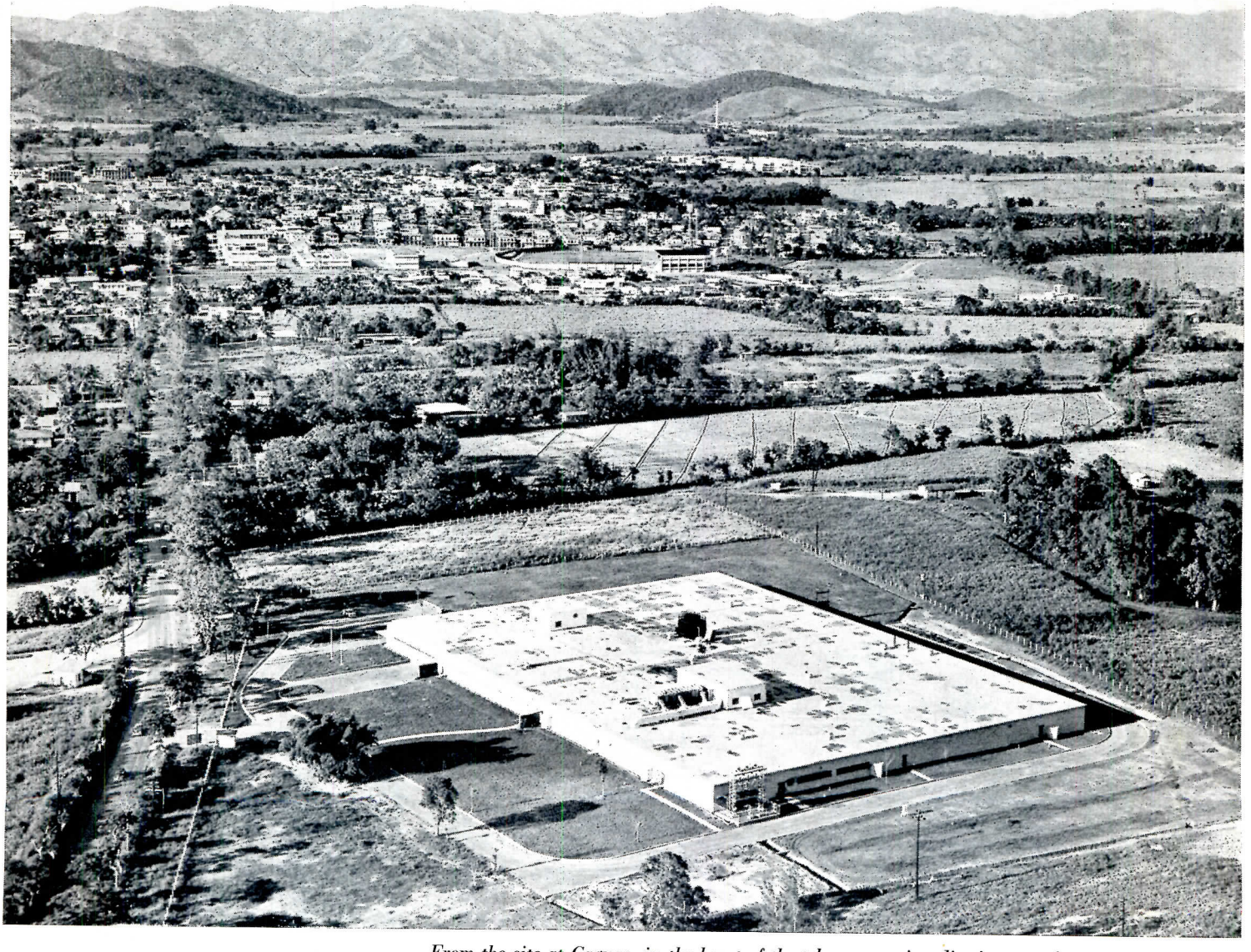


C RESEARCH AND DEVELOPMENT WING





FACTORY FOR CONSOLIDATED CIGAR



From the site at Caguas, in the heart of the tobacco-growing district, a main paved highway connects with San Juan, 40 minutes by truck; the labor force, of high quality, comes from Caguas itself and from neighboring villages

Hamilton Wright

CORPORATION OF PUERTO RICO

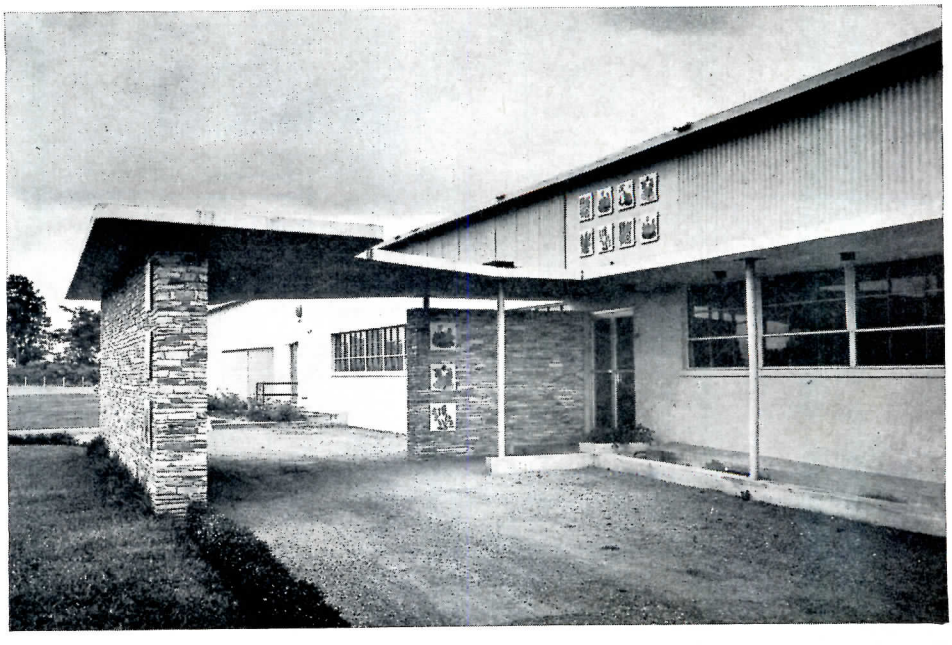
Caguas, Puerto Rico

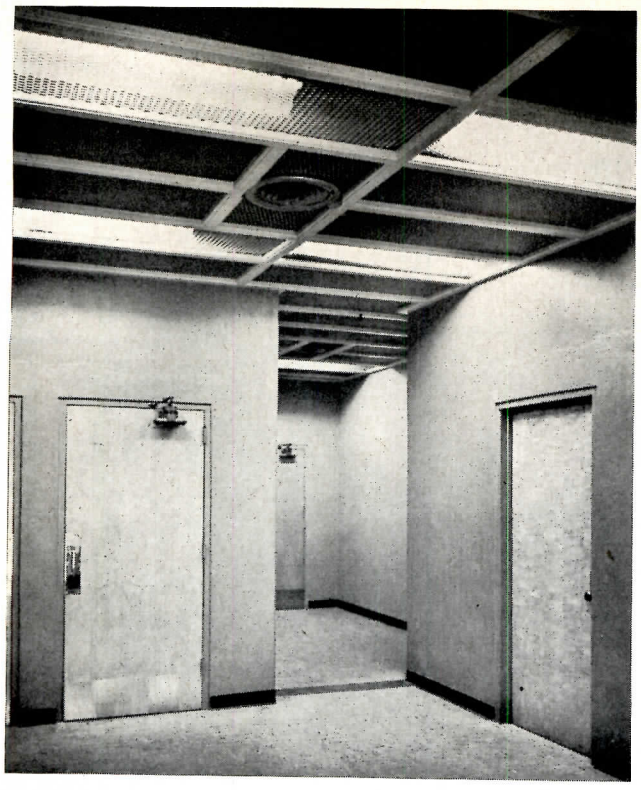
IN SELECTING THIS SITE, the architect worked with the client from the inception of the project, surveying many locations with the assistance of the Puerto Rico Industrial Development Company, a governmental agency. In addition to factors noted on the opposite page, criteria for final selection included the following: Bus transportation existed on the highways visible in the aerial view, to carry personnel to the factory; each of the intersecting highways had water mains (eliminating the need for a sprinkler water tower); sanitary sewers and high tension lines were available; an organized fire department was located ½ mile away (which reduced insurance rates); the land is a high plateau with well drained, level ground.

The building had to meet certain requirements. Cigar manufacture has changed in recent years from a hand operation to a highly mechanized, automatic one. Tobacco is very hygroscopic, so complete air conditioning is essential, particularly in Puerto Rico's extremely variable climate. Each step in the manufacturing process has different temperature and humidity requirements, and comfort air conditioning in non-manufacturing areas is mandatory. The solution was found in a plant without interior corridors, with layout governed by production flow (see next page); intense sun load and efficient operation combined to dictate a windowless manufacturing area.

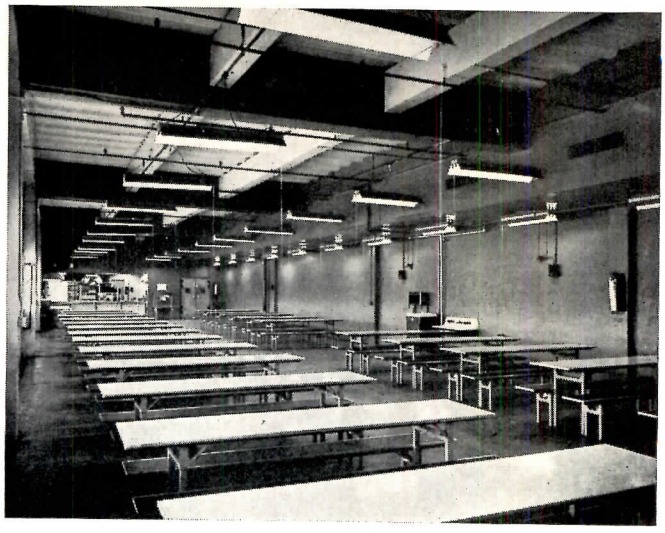
On the other hand, the labor force comes from a hitherto agricultural, tropical area; and so the interior of the carefully lighted plant is vividly colored, the building's grounds are expensively landscaped and game areas are to be laid out around it. Instead of being a cheerless working place, the plant is pleasant and far from monotonous. The exterior has coral walls, orange-color native flagstone and blue corrugated asbestos board over the main elevation. Colorful enameled copper plaques, displaying various phases of tobacco culture, emphasize the entrance. Structurally, the building is designed to resist earthquakes and hurricanes, with shutters for the few openings.

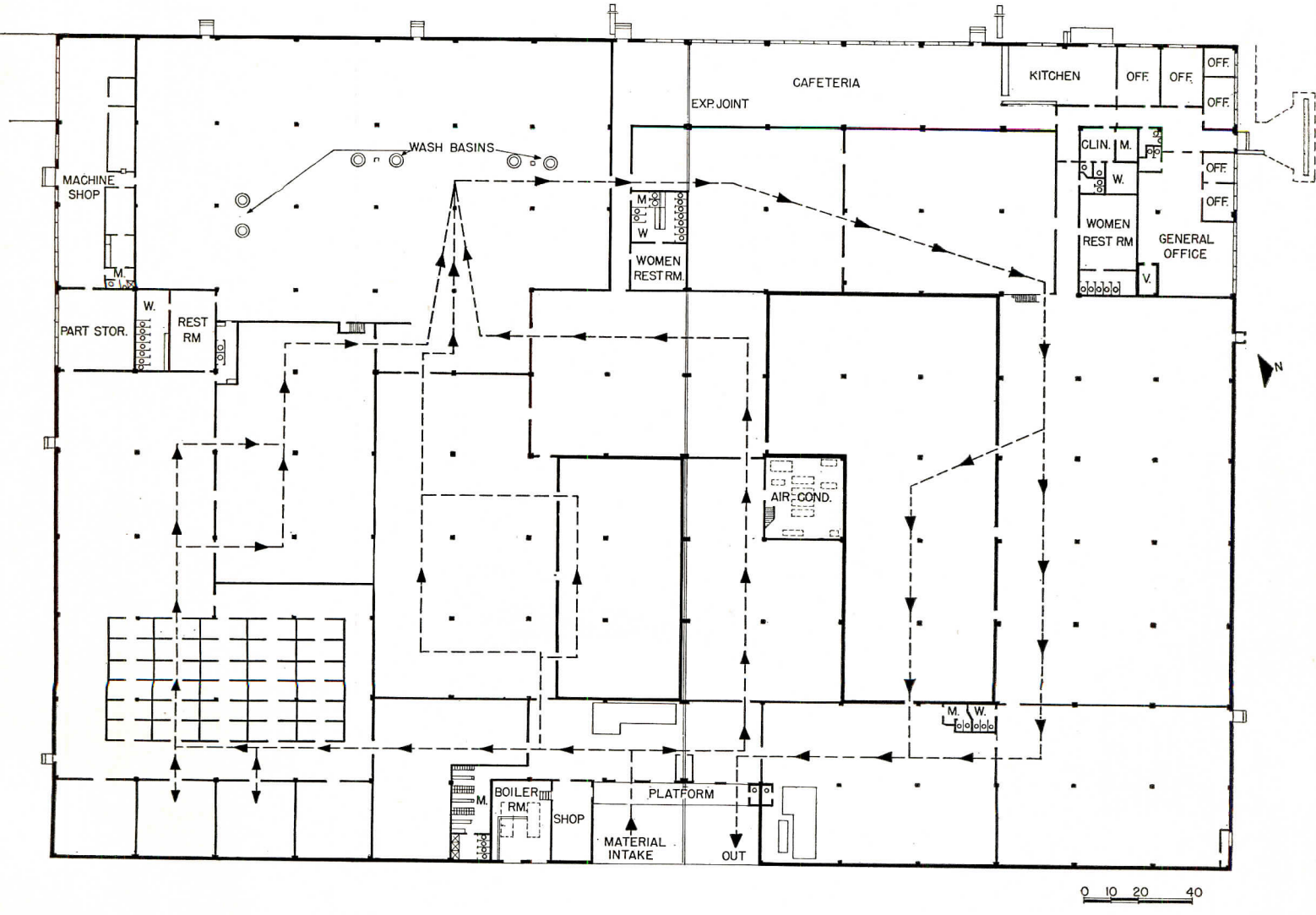
Joseph Douglas Weiss,
Architect

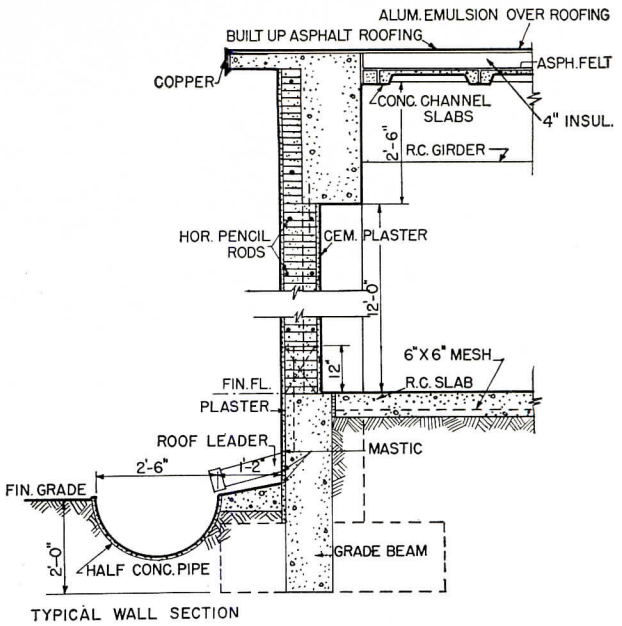




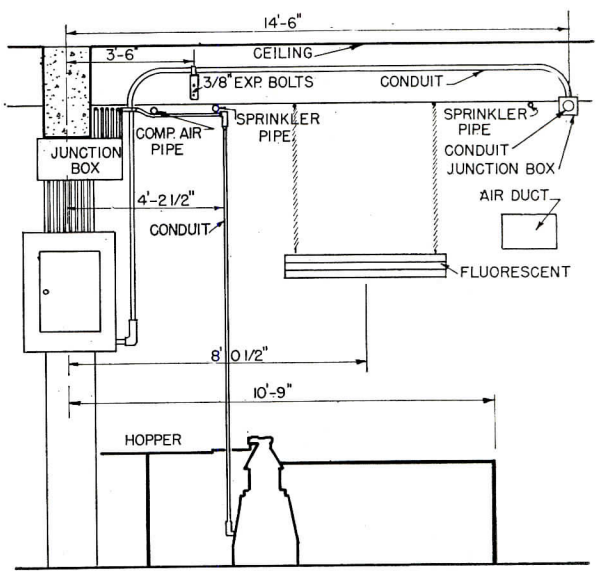
Hamilton Wright



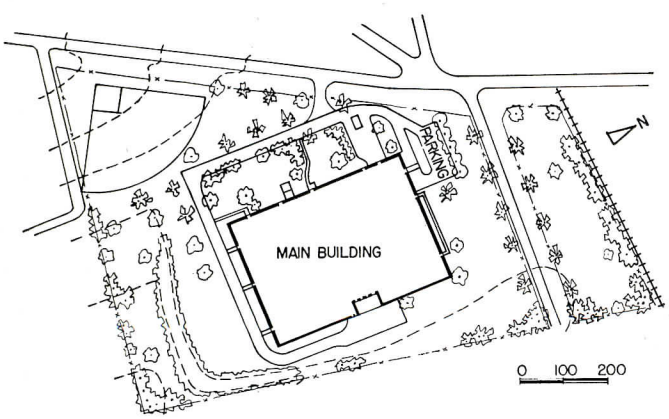




TYPICAL WALL SECTION



Photos: above, entrance lobby, cafeteria, view window so public can watch process from lobby; right, manufacturing areas. In detail above, right, rain spouts spill water from tropical downpours, too much for practicable sizes of leaders, into open gutter at grade which completely surrounds plant and feeds into adjacent drainage.



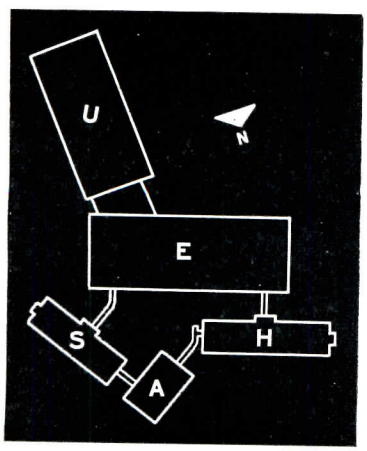
Detail of cigar machine services shows extreme care with which industrial fluorescent lighting units are positioned to prevent casting shadows on automatic machinery. Note also painstaking coordination of all service lines. Plot plan, above, shows eventual development of site

NEW OFFICES AND LABORATORIES FOR RCA

RADIO CORPORATION OF AMERICA — CHERRY HILL PROJECT

RCA Service Company, RCA Victor Home Instrument Division

RCA Facilities Administration: Frank Sleeter, Vice President; Robert F. McCaw, Manager, Planning Division



Architect: Vincent G. Kling

Architectural Consultant: I. M. Pei

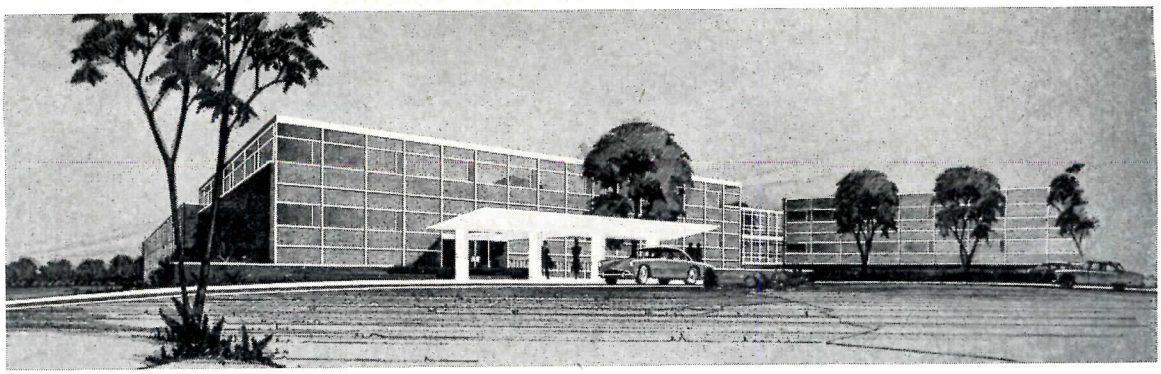
Structural Engineers: Severud-Elstad-Krueger

Consulting Structural Engineers: Sauter & Castor

Consulting Electrical Engineer: Dr. I. M. Fawcett

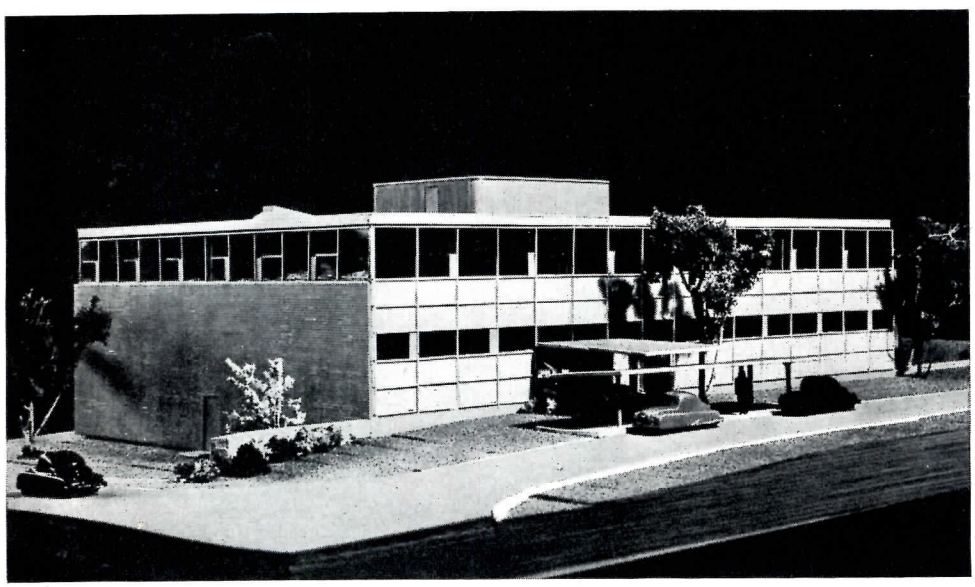
Mechanical Design: Heating, Air Conditioning, R. J. Sigel; Electrical and Plumbing, L. T. Klauder

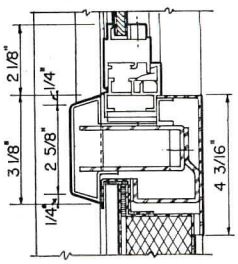
General Contractor: Turner Construction Co.



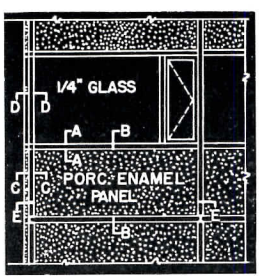
Lawrence S. Williams

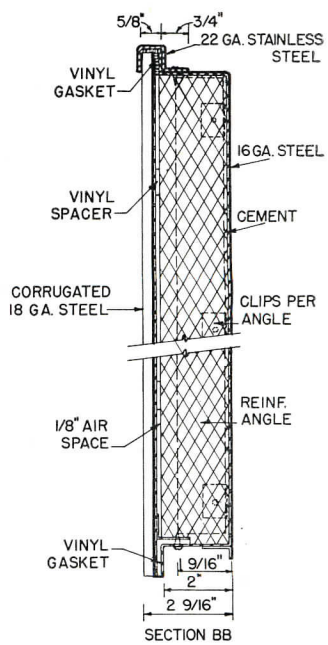
Photos: Building A, Administration Building. Details: exterior walls of insulated porcelain enamel panels and glass in stainless steel frame





SECTION AA

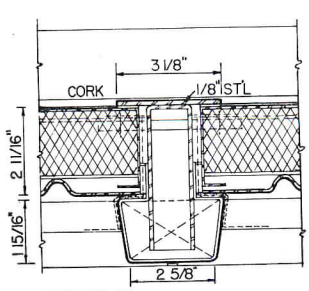




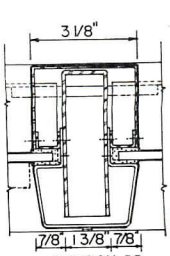
SECTION BB

WHEN THEY ARE COMPLETED this fall the five interconnected buildings that compose RCA's Cherry Hill project will become the headquarters and laboratories of the RCA Victor Home Instrument Division (now in Camden) and the RCA Service Company (now at Gloucester, N. J.). The 58-acre site, five miles from downtown Camden, on a state highway, is gently rolling land, part of a diversified industrial and commercial development. The buildings, carefully fitted to the contours and hence limited to one, two and three stories in height, are to be up-to-date in every respect that RCA and the architect could determine.

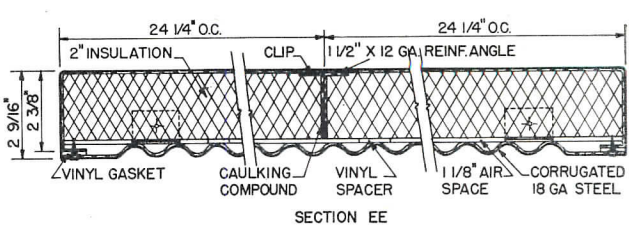
In part this determination to employ advanced construction techniques resulted naturally from company policy; at the same time, the strictly limited budget made imperative contemporary design and technical decisions which would reduce construction time and cost, enclose maximum space with a minimum of materials, and cost little to maintain. Four of the buildings are of lift-slab construction with walls of insulated, pre-



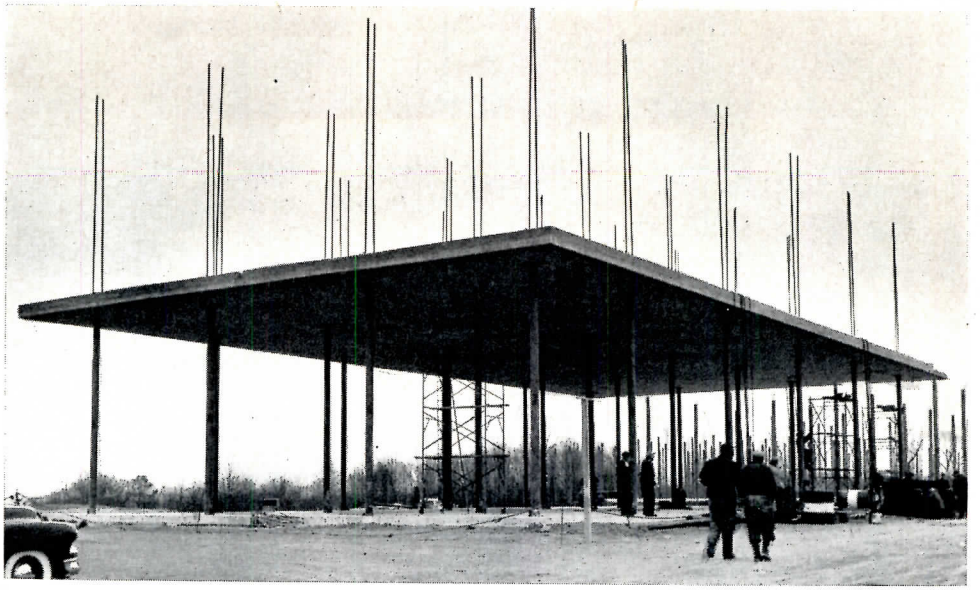
SECTION CC



SECTION DD



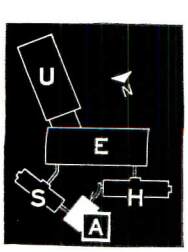
SECTION EE

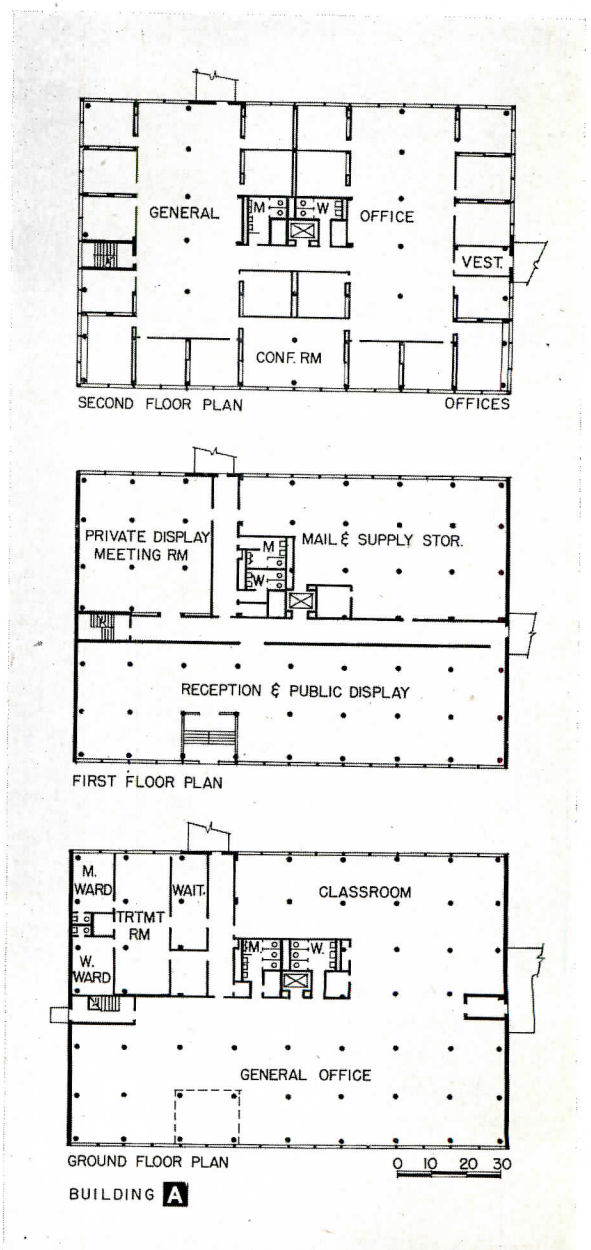


Lawrence S. Williams

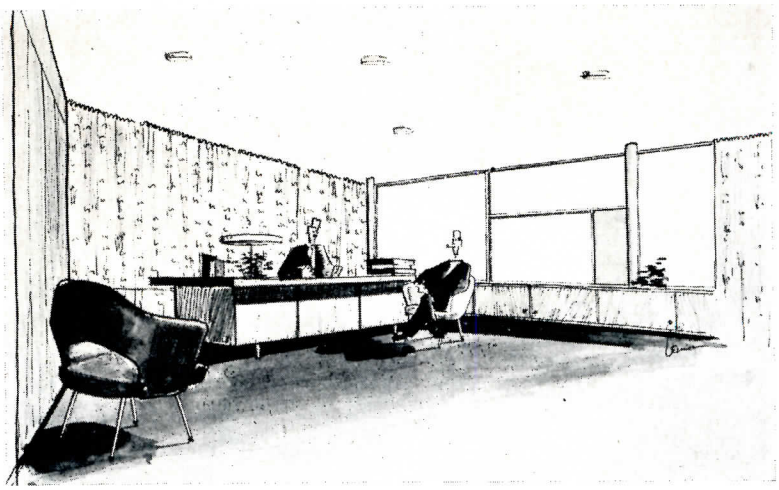
fabricated porcelain enamel panels and glass set in stainless steel frames, plus brick in some portions; the fifth, the Utility (shop) Building has a prefabricated, standardized steel structural frame. The total floor area provided is 320,000 sq ft, or work space for 1400 employes — the equivalent, RCA estimates, of an average 35-story conventional office building.

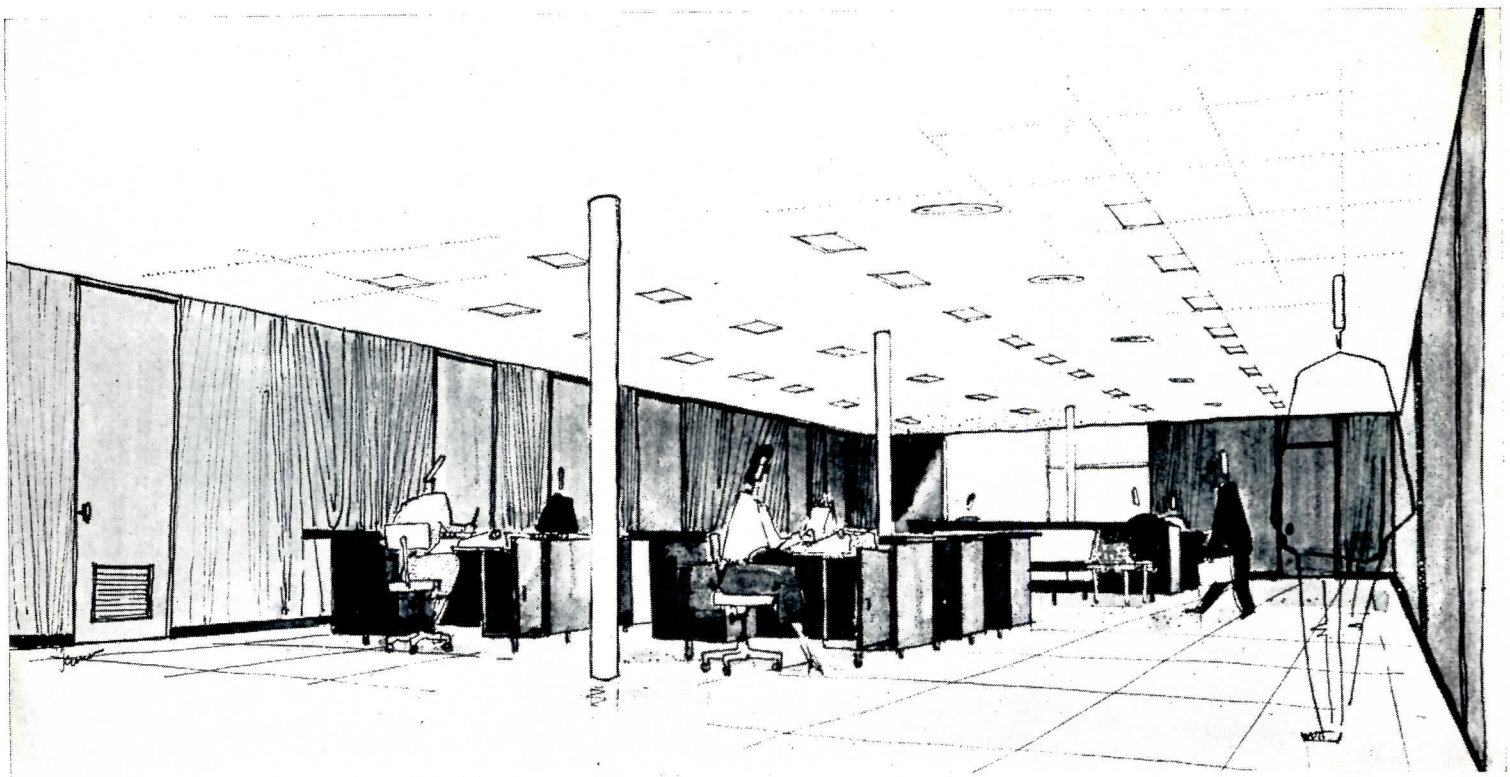
Behind the reality now taking form lies over two years of intensive research into its own needs, investigation of construction methods, and organization of divisional requirements into spaces which could be constructed economically and well, all undertaken by RCA's Facilities Administration which has charge of company building activities. From this came a series of firm directives for the architect: lift-slab construction, non-structural exterior skin and demountable interior partitions, square footage requirements and departmental organization; an insistence on high quality of construction and equipment; a series of interconnected, low buildings logically arranged in relation to each other and internally, even to stair and toilet locations, to reduce employe travel time to a minimum. Another important set of goals was to stay within the minimum budget, to enable the



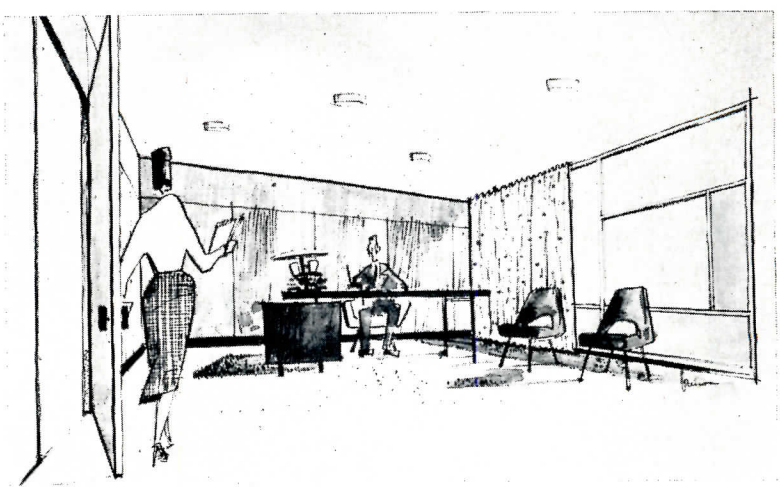


Top of page: slab being raised. Plans at right show layout of Administration Building ("A" on site plan). Interior partitioning is completely flexible. Stairs and passages to other buildings are located to reduce travel time to minimum





Renderings on this page show private offices and stenographic area. In general offices (not shown) layout is arranged with greatest possible number of desks around outside walls to give employes light and air. Artificial lighting is fluorescent, designed to reduce glare. All floors contain small conference rooms for use by several people

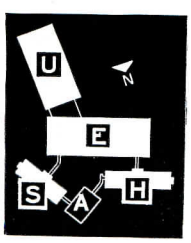


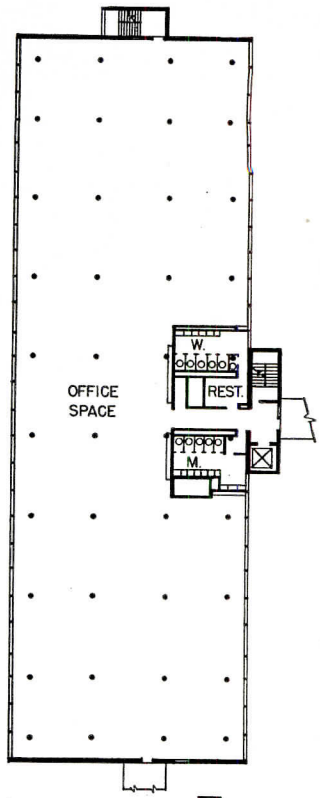
company to occupy the premises in the shortest possible time, and to obtain a building which would be both a comfortable, efficient place to work and a credit to its developing community — and therefore an asset in both employe and public relations.

While not new, the Youtz-Slick lift-slab construction system is here being employed for the first time in the Middle Atlantic states. In spite of the fact that, for this reason, contractors and labor force were unfamiliar with the technique, the lift-slab structure in combination with the curtain walls, etc., promises to cut construction time by 20 per cent and lower costs appreciably. The porcelain enamel panels and stainless steel framing (detailed on preceding pages) were developed by the architect and the panel and frame fabricators after numerous trials and thorough testing in a wind tunnel, where full-sized, two-story sections were subjected to a heavy artificial rain driven by a simulated 100-mph gale — a test more severe than nature is likely to provide.

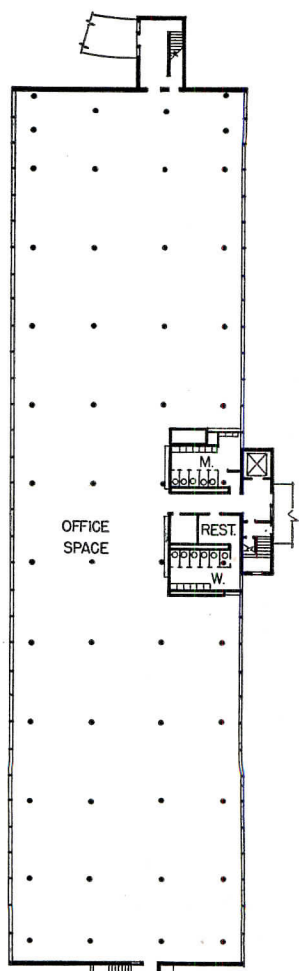
The large panels evolved from these tests have porcelain enamel surfaces, corrugated on their exterior faces to prevent buckling due to outdoor temperature changes, and flat on the interior where, since the buildings are to be uniformly air conditioned, temperatures will remain relatively constant. The surfaces are not mechanically bonded; rigid foam insulation is cemented to the inside panel. The total thickness is $2\frac{11}{16}$ in., which substantially increases the usable floor area in comparison with what could have been obtained had conventional brick spandrels been used. Both the large fixed glass areas and smaller venting sections have glare-reducing glass, and all ceilings are acoustically treated.

Mechanical equipment is contained in penthouses on the roofs, which is efficient for this type of low building and wastes no floor space. There are 600 tons of chilled water, year-round air conditioning and two 400 H.P. packaged boilers for heating. The public address system has speakers in all areas and is interconnected to RCA plants at Camden, Moorestown and Gloucester. An RCA TV antenna system serves all buildings. Low-voltage underfloor duct is cast into the slabs; the high voltage electrical system has a 4160-volt primary,



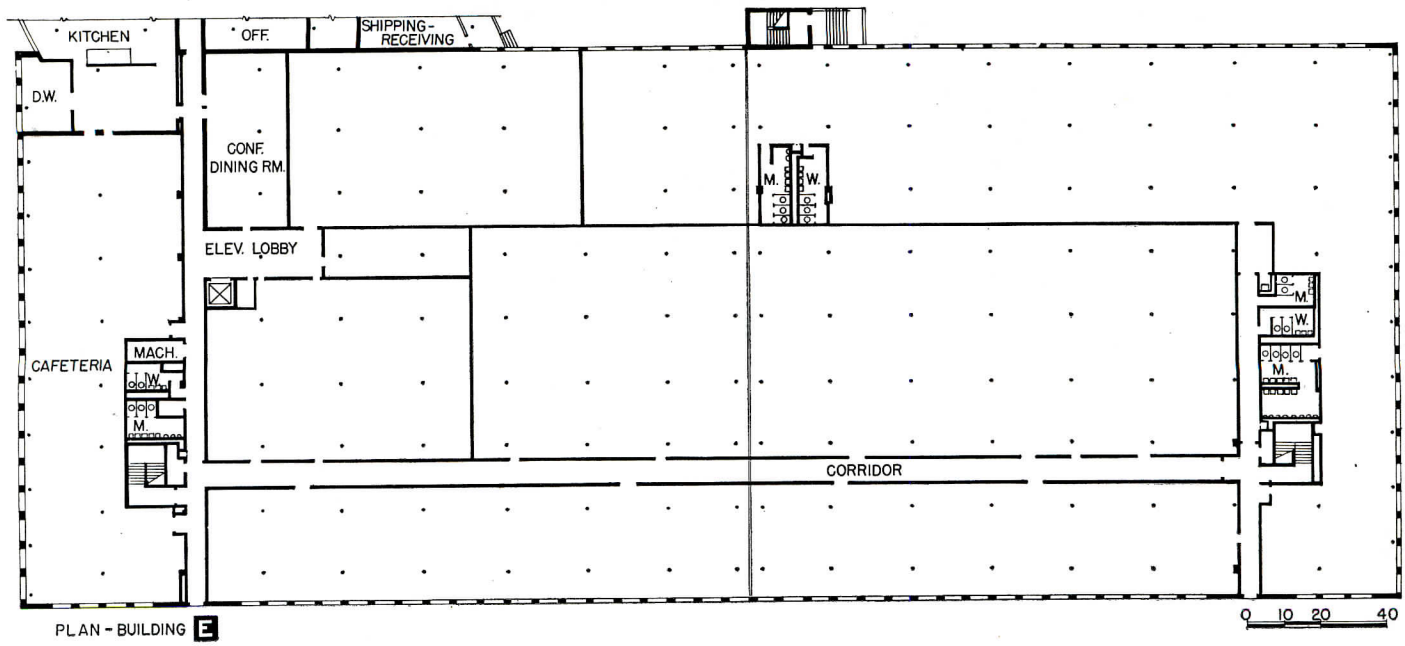


FIRST FLOOR-BUILDING S

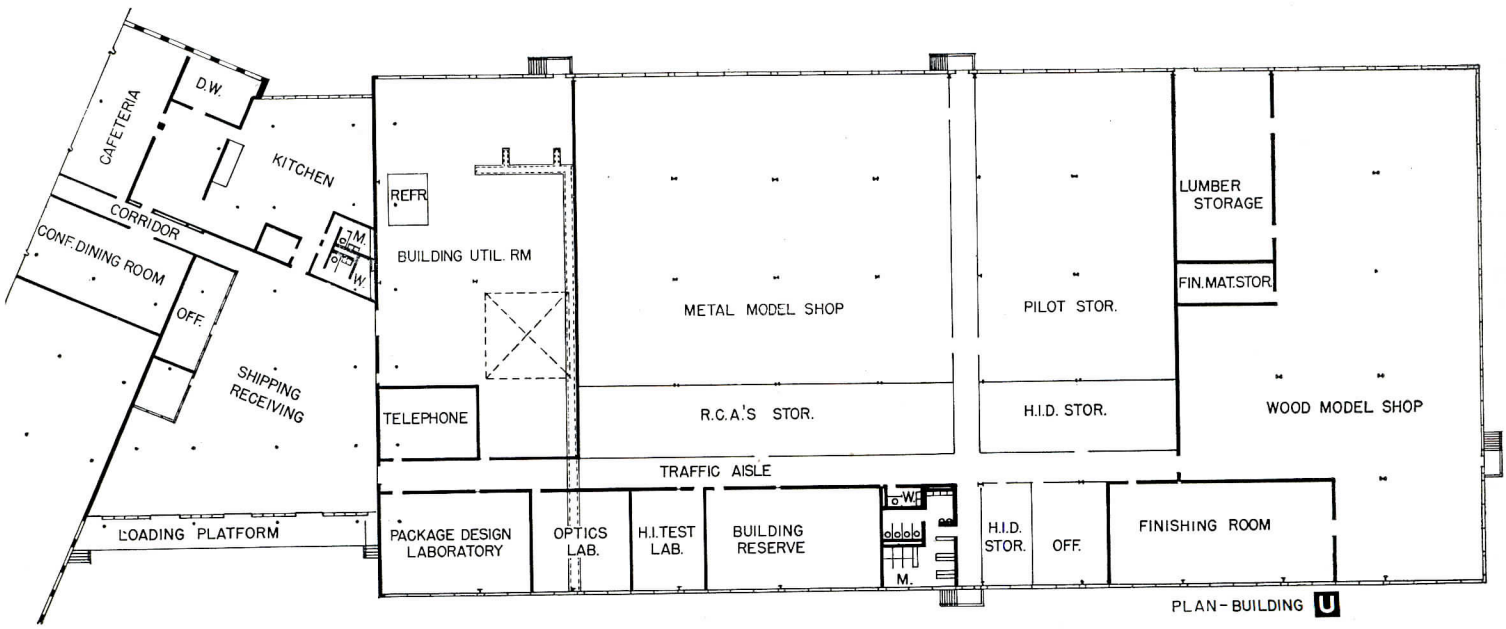


FIRST FLOOR - BUILDING H

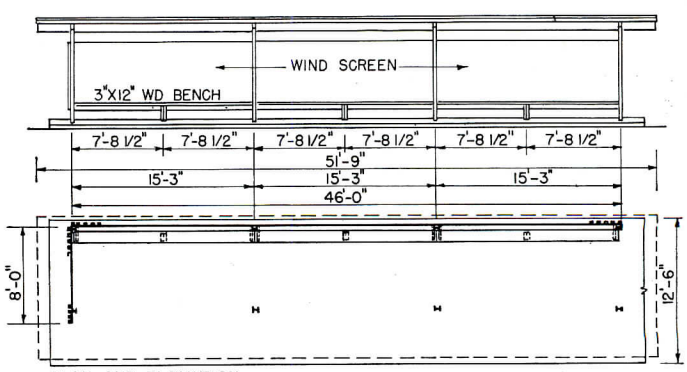
Typical floors of two buildings are shown at right: above, RCA Service Company offices, a 3-story building; below, RCA Victor Home Instrument Division offices, 2 stories high. Like the Administration Building on previous pages, these are lift-slab, curtain wall, air conditioned, fluorescent lighted, efficiently laid out. In all there are 320,000 sq ft of floor space, 250,000 of it lift-slab requiring 20 million lb of concrete



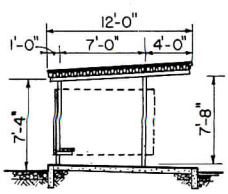
PLAN - BUILDING E



PLAN - BUILDING U



PLAN AND ELEVATION

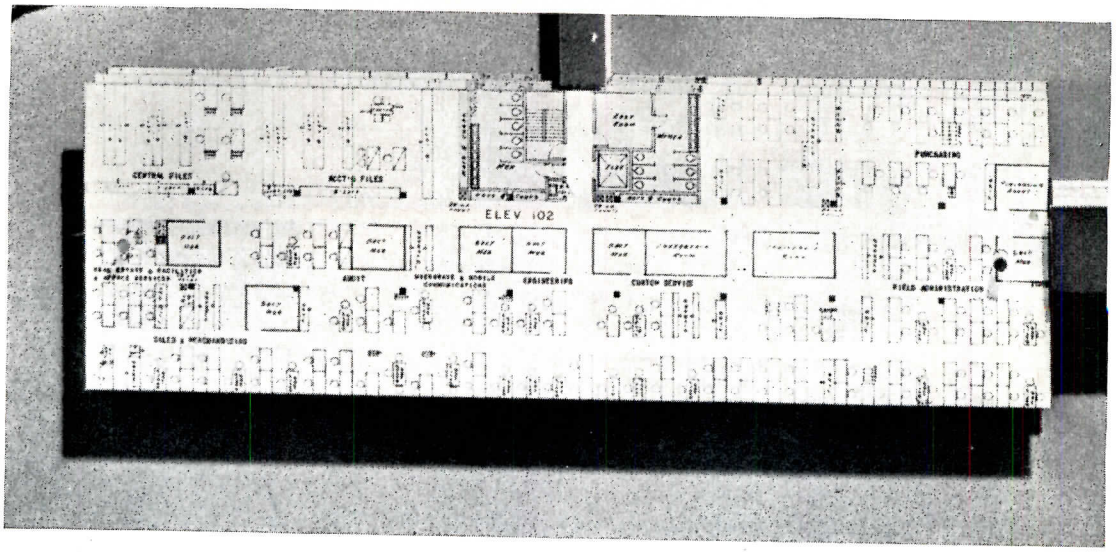


SECTION

BUS SHELTERS

0 5 10

At top of page: typical plan of Engineering Building, "E" on site plan. Center: typical Utility (shop) Building floor, "U" on site plan. In all buildings, air conditioning equipment, filters, fans, heating and cooling coils, electrical transformers, hot water heaters, are located in penthouses for efficient operation and to save valuable floor space. Utility Building, steel framed, is only one not typical lift-slab

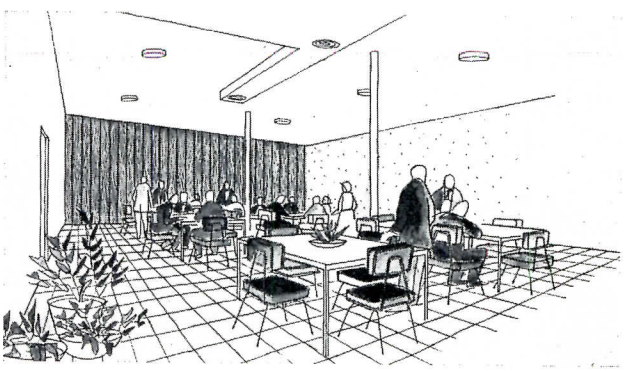


Lawrence S. Williams

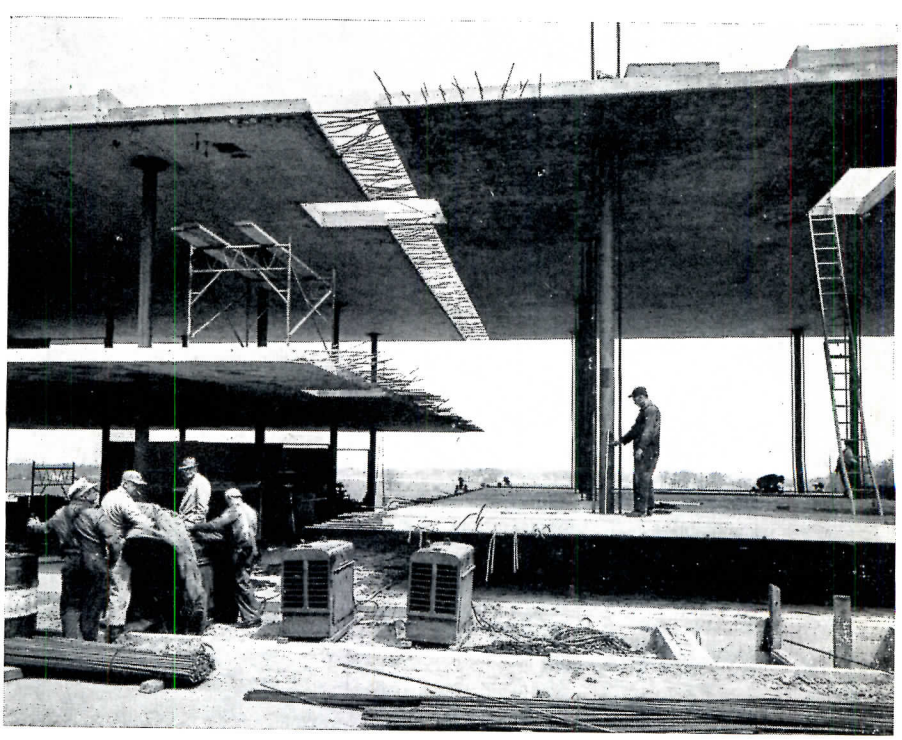
Above, model, roof removed, showing office layout (Shaw-Walker, consultants) which was lengthily studied before design started. Below, cafeteria-auditorium

115/208-volt secondary, 3-phase, 4-wire. All multi-story buildings have elevators, and a fire-alarm system also serves all buildings; sprinklers are provided in Engineering and Utility Buildings.

Extensive employe facilities are being provided: cafeteria and dining room to seat 1500 people (in shifts), and recreational facilities including tennis courts, softball diamond, and recreation room. The cafeteria will have a stage at one end so it can be used as an auditorium. Since many employes will drive to work there is to be ample parking space.

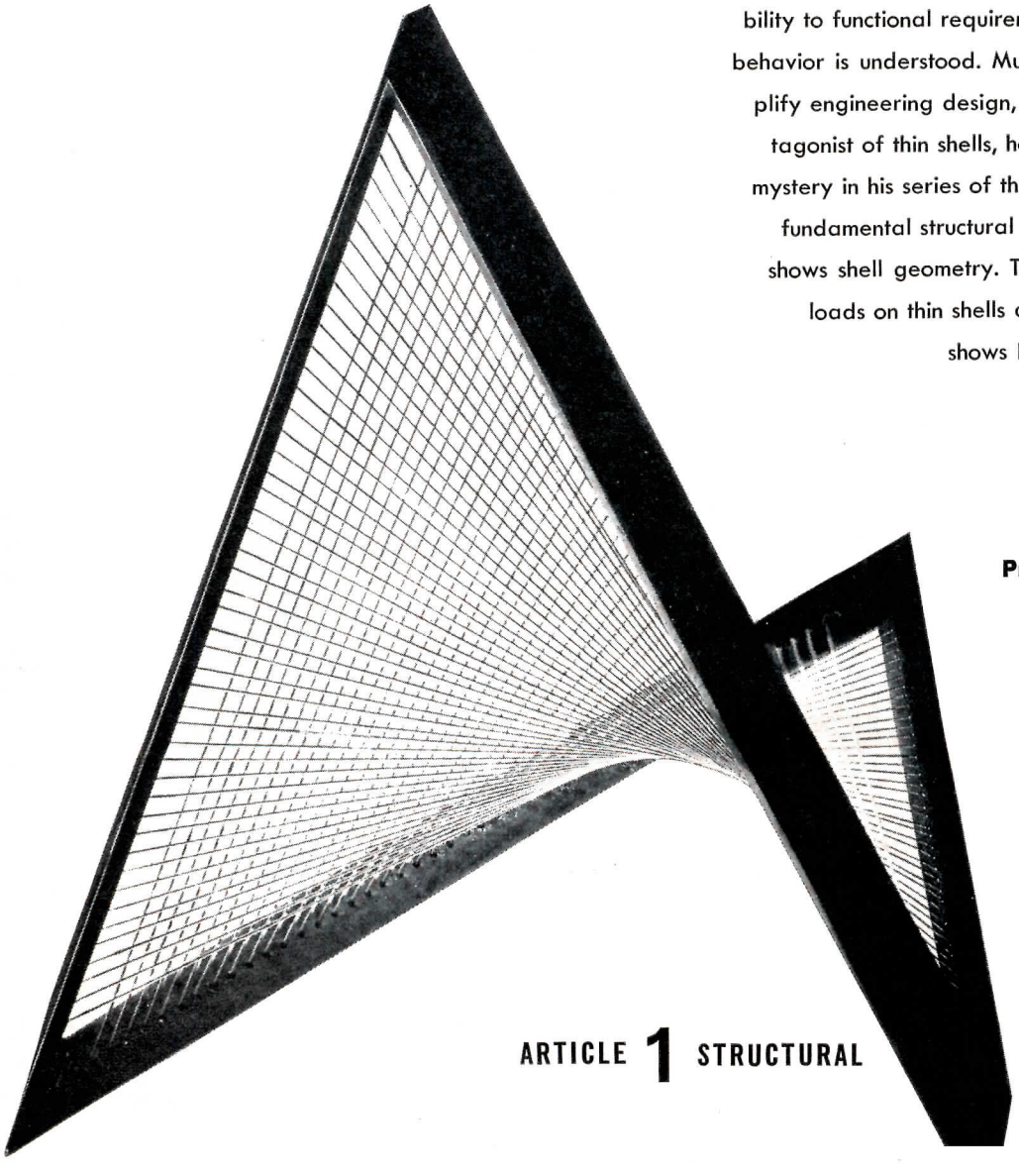


Photos, left: positioning reinforcing and underfloor duct before slab is poured. Right: raising slabs; note roofing material carried up as slab rises



THIN SHELLS

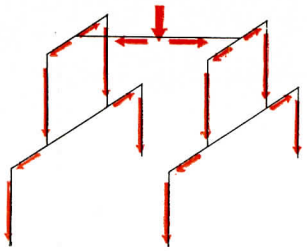
Thin shells offer many of the attributes that architects and engineers are looking for in an ideal structure. They can span several hundred feet, while being only a few inches thick, and their geometrical forms, singly and in combination, are practically numberless. Shells are thin because they are curved in such a fashion as to keep bending stresses at a minimum. The extent of their acceptance will depend on, among other things, economics, value of esthetic effect, suitability to functional requirements, and how well their structural behavior is understood. Much has been done recently to simplify engineering design, and the author, a well-known protagonist of thin shells, hopes to remove some more of their mystery in his series of three articles. The first introduces the fundamental structural ideas behind shell construction and shows shell geometry. The second is a study of forces and loads on thin shells and the stress distribution. The third shows both typical and unusual examples.



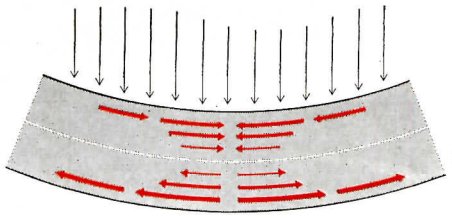
By Mario G. Salvador
Professor of Civil Engineering,
Columbia University

The author acknowledges the assistance of Mr. Ali Raafat in assembling illustrations for the three articles.

ARTICLE 1 STRUCTURAL BEHAVIOR AND FORMS ▶



Beam load carried down to the ground through other beams and columns



Bending stresses in a beam—maximum at top and bottom, zero at neutral axis

ARCHITECTS AND ENGINEERS design structures principally to enclose space and span distances. Thin shells have been used successfully and in increasing numbers during the last 30 to 40 years for these two purposes. Constructed so far of reinforced concrete and, sometimes, in steel or aluminum, they offer new solutions to old problems with economy of materials and freedom of forms, and have revolutionized many structural conceptions in the mind of the designer.

The wide possibilities of thin shells have been only slightly tapped, particularly in the United States where, until recently, there has been little incentive for architects and engineers to get involved in their design and construction problems. But interest is growing. There's no doubt that they have esthetic appeal and create intellectual excitement. This would not mean much, though, if thin shells were not also competitive with other structures. So it behooves the American designer to get acquainted with this type of structure and its most efficient forms.

This can be done on a purely intuitive basis with the aid of simple arithmetic even though the detailed analysis of such structures is by its own nature highly mathematical. This survey on thin shells will take into account both the architectural aspects of form and the engineering problems of strength, and will endeavor to make shell behavior understood in the simple terms while also discussing some of the fine points of theory and practice. It is hoped that the survey will encourage the reader to use this kind of structure in a variety of expressions where it has been shunned mostly because of lack of understanding of its inherent characteristics and possibilities.

STRUCTURAL BEHAVIOR

As soon as a structure is to be built, the designer is confronted with the age-long problem of carrying loads down to the earth. The earth is responsible for the pull of gravity and the earth is the agent eventually carrying the loads due to its own pull as well as other physical causes, like blowing winds or temperature changes. If we focus our attention on a vertical load — for example, the load due to the weight of a beam which is to be supported somewhere in space — we see that this load might be carried by resting the beam at its ends on two other beams. The weight of this composite element might then be carried by four columns, which could rest on two or more beams (if we wanted open space) and this process of load transfer could go on until the foundation were reached and the total weight carried to the ground.

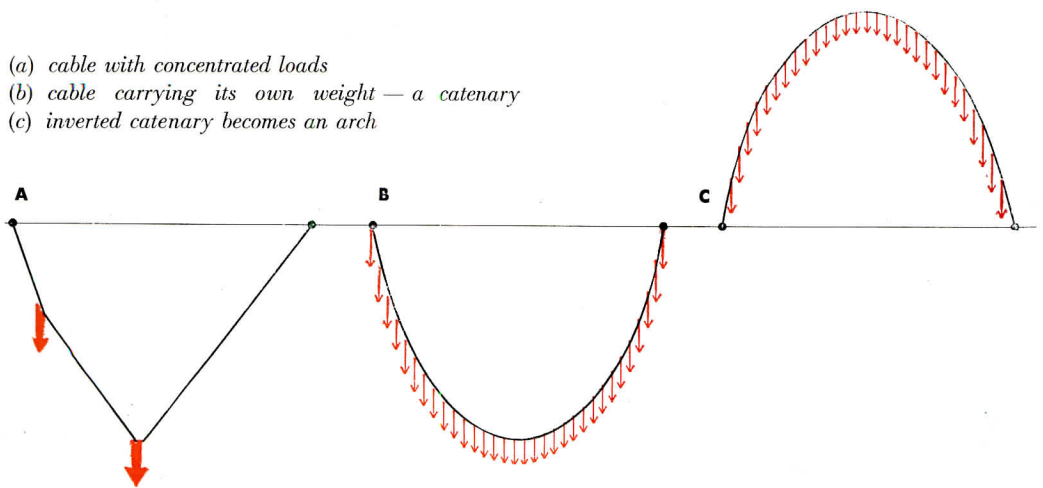
One may challenge this load transfer for not being either the most efficient or the most logical way of doing the job: Dr. E. F. Masur of the Illinois Institute of Technology has aptly criticized this process for being "as economical as if three men carrying a piano would perform their task by climbing on each other's shoulders with the top man actually holding up the piano."

But moreover one could, and perhaps should, even challenge the process by which a single beam carries loads to its supports. By projecting this thinking, one may find the fundamental reason behind the economy and efficiency of thin shell construction.

A beam is a tough resisting element which gives in only slightly under load and whose fibers are differently stressed. The bending stresses, which are maximum at the top and bottom of the beam, vanish at its axis, so that the beam material could well be said to be used at the most with a *local* efficiency of 50 per cent.

Now compare this kind of structural behavior with the way in which a cable carries its own weight. The cable, hanging from two fixed points, cannot carry its own weight if it must remain absolutely straight, since the stress in the cable would then be infinitely high and the cable would snap. But if the cable is allowed to give in and sag, it will support its own weight and additional loads, by means of tensile stresses identical at each point of a cross-section. The material is thus utilized with what might be called 100 per cent *local* efficiency. It is well known that the shape assumed by the cable under the action of its own weight is a curve called a catenary, and that the stress in the

(*a*) *cable with concentrated loads*
(*b*) *cable carrying its own weight — a catenary*
(*c*) *inverted catenary becomes an arch*



cable can be computed easily at any cross-section. Of course, it should also be noticed that the stress in the catenary changes from point to point — being minimum at the lowest point and highest at the supports — so that the *over-all* efficiency of the catenary cannot be said to be 100 per cent.

Let us now imagine that the cable is frozen in a catenary shape, so that its form cannot change, and turn the cable upside down, keeping the loads unchanged and the point supports fixed. The cable shape is called in this case an "inverted catenary," and it is easy to realize that the stresses in the inverted cable are of the same magnitude as before, but are now *compressive* instead of tensile. Apart from the freezing of the cable, such a structure capable of sustaining its own weight in the form of an inverted catenary, or of sustaining given concentrated loads in the shape of a polygon (called an *anti-funicular*), can be actually realized by means of a very thin arch capable of withstanding compressive stresses, provided the structure be made stable by supporting it laterally so that it will not buckle out of its vertical plane.

The essential point about the behavior of the cable or of the inverted catenary arch is that its strength does not depend so much on thickness or depth as on shape. The straight beam needs depth to withstand the loads; the curved cable or arch resists the loads because of its form. Thus *purely geometrical form may be used to create strength:* a form well adapted to the loads to be carried will constitute the most efficient solution of the structural problem with the least amount of material.

The preceding analysis arises from the knowledge of the local inefficiency of the beam behavior and shows one of the many ways in which this handicap can be met. The following analysis will now show how an answer may be found to the challenge of the load transfer process inherent in a beam-column structure.

The beam, the cable and the thin arch are one-dimensional structures, ideally represented by a line — their geometrical axis. Most structures built in the recent past were of this kind and a "one-dimensional" mentality has pervaded structural and architectural design, essentially because of the "handbook" easiness with which such structures can be analyzed. But the advent of the airplane has pushed into the limelight so-called stressed-skin structures and it is in this direction that we must point to grasp the behavior of a thin shell.

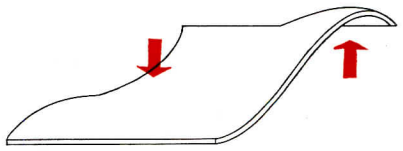
The two-dimensional equivalent of the beam is the flat slab, a structural element resisting loads mainly by bending and twisting, and whose *local* efficiency is again 50 per cent. But the *over-all* efficiency of a slab is far superior to that of a grid of beams covering the same area because of two new essential factors:

1) The two-dimensional behavior of the slab introduces twisting, and hence participation of a large portion of a slab in supporting concentrated loads;

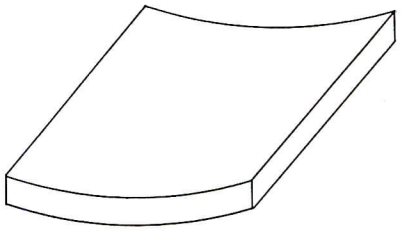
2) As soon as the flat slab deflects, its middle surface stretches and the material in its middle surface tries to resist the deflection and becomes stressed. (It is only in particular cases that this increase of stiffness does not occur; for example, if a slab is bent by the applied loads into a cylindrical shape, its middle surface is not stretched, in which case its stiffness is practically identical with the stiffness of a series of beams set one parallel to the other.)

In flat slabs under common loads, bending stresses are much higher than stresses due to stretching and hence the local slab efficiency is, to all practical purposes, the same as the efficiency of a series of beams, although its over-all efficiency is higher. But if the slab is made thinner and thinner, its flexibility increases and the stretching of its middle surface becomes the essential phenomenon. In this case we say that the flat slab becomes a membrane and that its membrane stresses become high as compared to its bending or plate stresses. In the limit — that is, for a very thin sheet of material — the plate stresses vanish and the slab becomes a pure membrane. A physical membrane can be obtained by attaching a piece of cloth to a frame, as in a camping tent or an umbrella. An extremely thin membrane often used to perform experiments on membrane stresses is obtained by stretching a soap solution (or soap bubble) over a whole cutout of a plate.

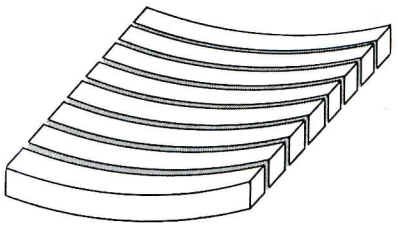
It is intuitive that just as the cable could not carry loads, not even its own weight, unless allowed to sag, the thin membrane can only carry its own weight or additional loads *if it is either allowed to sag naturally or if it is stretched*, before the loads are applied. Both principles may be theoretically used in a membrane structure. Pretensioning could be applied to a metal membrane, for exam-

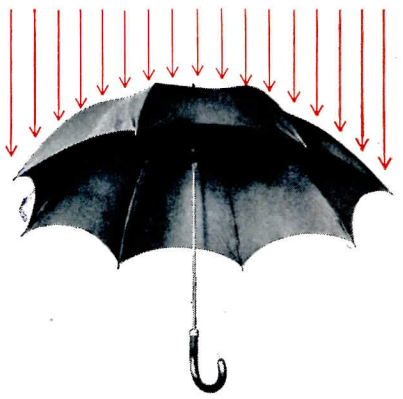


Flat slab resists loads mainly by bending and twisting action

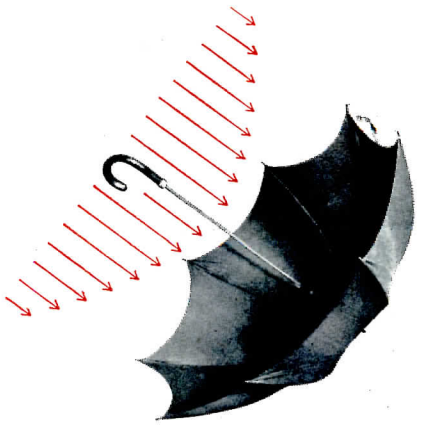


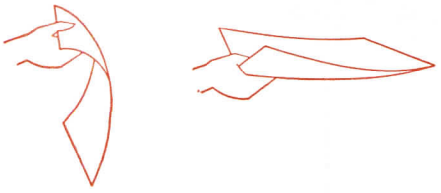
A slab bent into cylindrical shape is practically the same as a series of beams



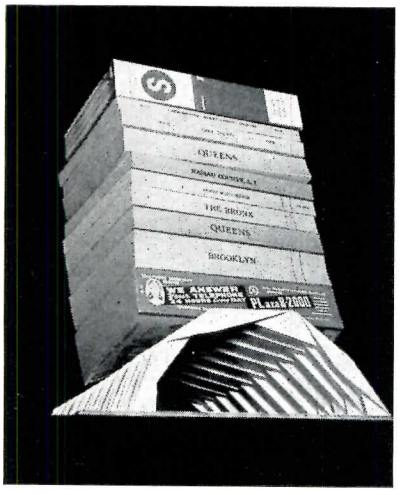


An umbrella is a "stiffened" membrane which takes loads upright or inverted

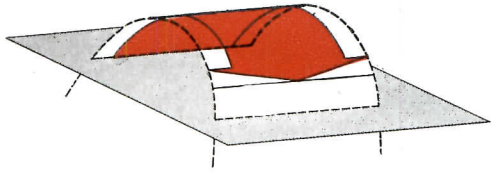




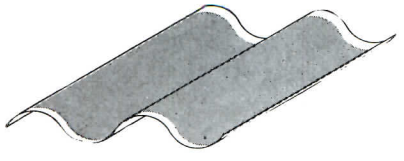
Curvature gives a piece of paper structural strength enabling it to resist bending



This paper shell, only 1/100-in. thick, has a ratio of span to thickness = 1200



A horizontal line slid along a vertical curve becomes a cylinder



Half-cylinders form corrugated shells

ple. But, the most commonly encountered procedure is to allow the membrane to sag, thus creating strength in the membrane by means of form. But now the two-dimensionality of the structure brings a new state of affairs, as far as stresses are concerned. While the catenary was entirely under tension, the membrane could under certain loads develop tensile stresses in one direction and compressive stresses in another, at the same point. If we assume, as is often the case, that the membrane will be in tension in all directions over most of its area, and if the membrane material is well suited to tensile stresses, the local efficiency of the membrane may now be said to be 100 per cent, although the stress will change from point to point in the membrane and hence its over-all efficiency, in general, will be less than that.

Let us now do to the membrane, assumed to be mostly in tension, what we did to the all-tension cable. The membrane is frozen under the given loads and turned upside down, while the loads on the membrane keep acting in the same direction, as is necessarily the case for its dead load. It is obvious that the stresses in the membrane, while remaining identical in magnitude, will change from tensile to compressive and from compressive to tensile. A two-dimensional equivalent of the inverted catenary is thus obtained and, if the membrane material is well suited to sustain compressive as well as tensile stresses, we have created a structure with a 100 per cent local efficiency capable of carrying loads by means of membrane stresses, which are mostly compressive, if the stresses in the original membrane were mostly tensile.

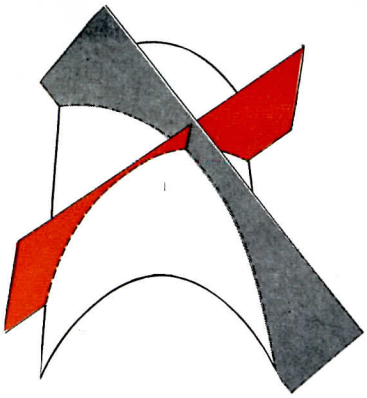
An inverted membrane is a *thin shell:* a structure capable of supporting loads, including its own weight, by means of direct stresses, tensile or compressive, but incapable of developing bending or twisting moments, i.e., plate stresses because of its extremely small thickness. In practice, of course, whether the material used be steel sheet, reinforced concrete or a plastic, it is impossible to build a structural shell so thin as not to have bending or twisting stresses at all; but as soon as the thickness of a shell is less that 1/50 to 1/100 of its span, the ratio of plate to membrane stresses becomes so small that plate stresses may be neglected everywhere, *provided the shell is loaded and supported so that membrane stresses are balanced and displacements developed by the applied loads are allowed to occur.* The stresses arising from an inconsistency between actual and "membrane required" conditions will be discussed in detail later.

It is easy to realize that a very thin *curved* sheet can carry loads because of its curvature and that, once more, form rather than amount of material may create strength. An elementary experiment can be performed to get a physical grasp of this result. A thin sheet of paper, grabbed by the short side, bends limply and is incapable of carrying its own weight, but if, by a light pressure of the hand, one gives the sheet of paper a slight curvature upwards, the sheet can be cantilevered out and is stiff enough to sustain additional loads plus its own weight. From the viewpoint of strength of materials, one could well expect this result by noticing that the curved sheet can now behave as a beam of curved cross-section with a greatly increased moment of inertia over the flat sheet. An application of this principle is shown in the photograph where a thin shell built with a piece of creased paper only 1/100 in. thick and spanning 12 in. (ratio of span to thickness = 1200) is shown loaded with a heavy stack of books. Apart from the interesting forms obtainable by this method, the figure shows the tremendous strength obtainable by means of form and illustrates a type of corrugated construction which has been successfully applied to very large shells by the famous Italian engineer Pier Luigi Nervi.

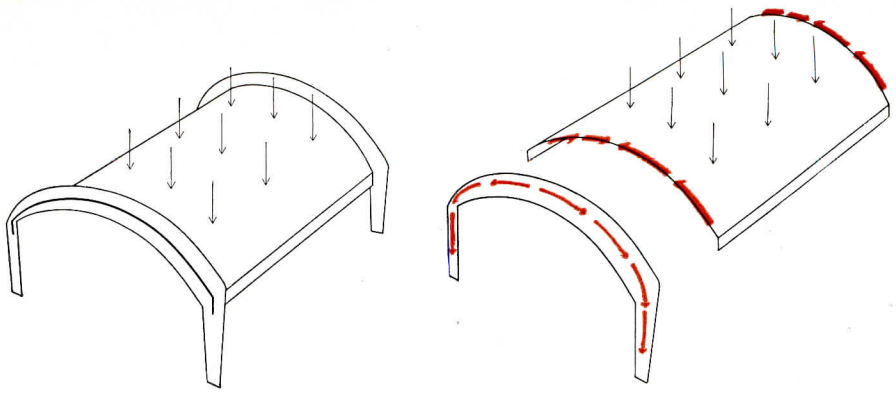
The transfer of loads from plate to beams, from beams to columns, from columns to other beams and so on to the foundation is totally absent in pure thin shell construction: the loads are channeled through the shell directly and by means of lines of tension and compression are carried to the ground. In mixed types of shell construction the thin shell is used as an element channeling the loads to other structural elements, usually arches or trusses or walls, which in turn carry the loads to the ground. But it is important to realize that in most cases even these other elements are mostly under direct stress; for example, the stresses in arches carrying a thin cylindrical shell can be almost entirely direct stresses, thus giving a high efficiency to the complete structural system.

This high efficiency, coupled with the freedom of form inherent in a spatial, continuous structure makes a thin shell one of the most interesting and practical solutions to the modern challenge of large spans.

The essential influence of form on the



Curvatures of a cylindrical shell



Cylindrical shell channels loads to end stiffeners

strength of thin shells indicates the importance of familiarity with the shapes currently employed in shell construction and with those that could be profitably used. Therefore, it is practical to divide shells into various categories, mainly according to their curvatures, in order to have a clear idea of the various types of behavior to be expected structurally.

FORMS

Cylindrical shells. Cylindrical surfaces may be obtained by sliding a horizontal straight line (generator) along a vertical curve (directrix) at right angles to it. The sliding curve is often a circle, but may be an ellipse, a parabola or any other kind of curve, having in most cases a downward curvature. Moreover, cylinders with curvatures up and down may be joined by the edges to obtain corrugated shells, and cylinders with curvatures up only are used at times.

If a cylinder is cut by means of planes with different orientations, but all passing through normal (perpendicular) to the surface at the same point, it will be found that the curvature of the sections thus obtained vary between a minimum (equal to zero) in the direction of the axis of the cylinder, and a maximum curvature at right angles to it, that is, in the plane of the directrix. The maximum and minimum curvatures of a surface at a point are called its *principal curvatures* at that point. In the case of the cylinder it is seen that the curvature of any cut has the same sign (is in the same direction) as that of the directrix, except for the curvature in the direction of the generator, which equals zero.

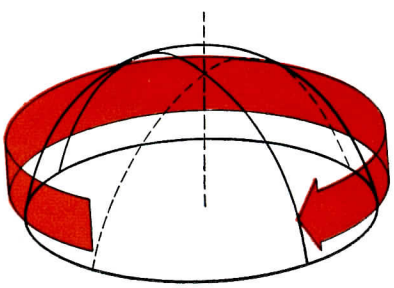
Cylindrical shells can be supported in a variety of ways and their behavior varies depending upon their support conditions. If a cylindrical shell is supported directly on the ground it will behave like a "frozen inverted catenary" only for a given set of loads, for example, its own weight; but it will not be capable of sustaining other loads without developing a certain amount of bending and twisting stresses. In fact, a cylindrical shell supported directly on the ground behaves very much like a series of arches, one parallel to the other, and hence develops large bending stresses for all loads except the particular loading condition for which it is originally designed. For this reason, thin cylindrical shells are not usually supported directly on the ground.

If instead, a cylindrical shell is *hung* from two end arches, usually called "stiffeners," it is capable of supporting a variety of loads by means of membrane stresses only. This means that the loads are channeled by the shell to the end stiffeners, and that the stiffeners transfer the loads to the ground by means of direct and bending stresses. A typical example of this kind of behavior is found in the covered wagon of pioneer days, where the hoops act as stiffeners, and the cover, although made of thin cloth incapable of taking bending, can resist very high wind loads by means of purely tensile stresses. It is, therefore, important to realize that a cylindrical shell with stiffeners does not act as an arch, but *as a thin piece of material hanging from stiffeners.* A cylindrical shell of reinforced concrete or steel is capable of taking both tensile and compressive stresses. Differing in this from the wagon cover, it can sustain, as a membrane, loads of different character, like dead, live and wind loads. It is only in the neighborhood of the longitudinal edges and at the intersection with the stiffeners that direct stresses may not be capable of sustaining the load, as will be seen in detail in Article 2 in which the influence of the boundary conditions will be taken into account.

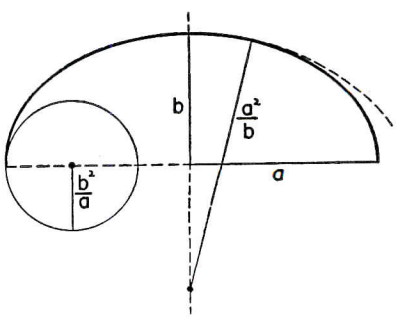
Interesting cylindrical shells are obtained by intersecting cylinders at right angles: these roofs were classical in the middle ages, but a renewed interest in them is now apparent. Modern intersection roofs are typified by their low rise and could not be built except in reinforced concrete in view of the high stresses developed in them and of the high value of their thrust which must be taken by tensile ties, or buttresses.

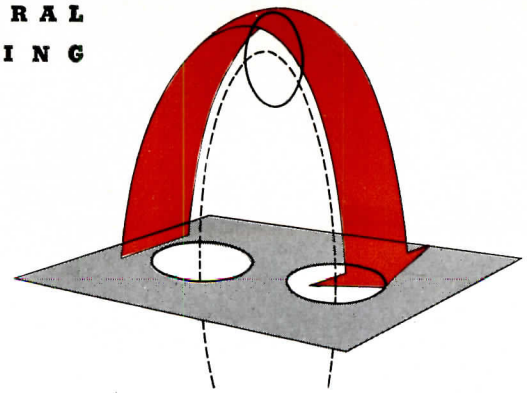
Shells of revolution. These surfaces are obtained by rotating a plane curve of given shape (a meridian) around a fixed vertical axis. When the meridian is a half-circle and is rotated about its vertical diameter, the classical spherical dome results, but a variety of forms can be obtained by rotating around the

Meridian turned around a vertical axis forms a shell of revolution

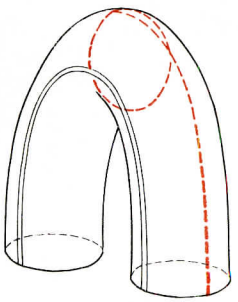


Principal curvatures of an elliptical rotational shell





Formation of a torus



Principal curvatures of a torus

vertical axis a circular arch subtending less than 180°, a half-ellipse, a parabolic sector or any other kind of curve. Because their horizontal sections are all circles (parallels) these shells are often referred to as circular shells. Usually the meridian curve has a curvature downward (variable or constant), so that the rotational surface has downward curvature whatever the direction of plane with which the surface is cut. In surfaces of revolution it is found that one of the principal curvatures at a point lies in the meridional plane, i.e., is the curvature of the meridian at that point, while the other principal curvature is in a plane at right angles to the meridian. The principal radius of curvature at right angles to the meridian is thus the distance from the point of the shell to the axis of rotation measured along the perpendicular to the meridian. For example, in an elliptical rotational shell, whose meridian has semiaxes a and b, the two principal radii of curvature at the equator are respectively b^2/a in the meridian plane and a at right angles to it, and at the top of the shell a^2/b in both the meridian plane and at right angles to it.

Surfaces of revolution have been used for centuries to cover big halls and temples, but in view of the materials employed they were necessarily thick shells. With the type of materials available today it is possible instead to consider extremely thin shells which will support all kinds of loads by means of direct stresses only, provided suitable supports are provided. If the supports are not of the right kind, bending stresses will again unavoidably appear, as is the case for domes stiffened by a ring at the equator and supported by masonry, or for shells of revolution supported by vertical cylinders into which they merge. In most cases such shells will develop both tensile and compressive stresses, and must therefore be built of materials capable of resisting both types of stress. The domes built by the Romans were limited in shape since these masonry structures could only resist very small tensile stresses and had to be subjected essentially to compression.

When the meridian curve is rotated around a vertical axis either tangent to it or outside it, we obtain a torus which presents interesting possibilities of application.

When the curve describing the rotational shell is a straight line, the shell becomes a cone. Cones can be used structurally in a variety of ways. With a vertical axis they may be used as roofs, when their vertex is up, or as bottoms of storage tanks when the vertex is down. Half cones with a horizontal axis may be used as cantilever roofs, and, when coupled so as to have curvatures in opposite direction, create an interesting circular corrugated roof that can be supported either by a central column or by an external wall.

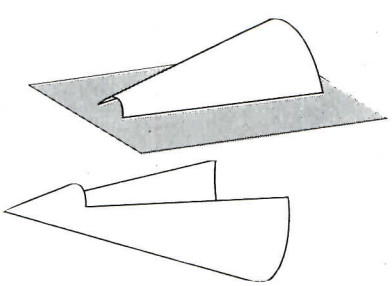
Just as the cylinder can be used as a structural element to channel loads to other structural elements, portions of rotational shells can be used to transfer loads to arches or trusses. The umbrella is a classical example of a shell of revolution stiffened by arches. The vault of a gothic cathedral is a shell carrying loads to stiffening ribs and constituting in this manner a complex structural system whose components are mostly under direct stress.

Translational surfaces. A translational surface is obtained by moving a vertical curve parallel to itself along another vertical curve, usually in a plane at right angles to the plane of the sliding curve. This kind of surface, often used in Europe to cover a rectangular area, may be obtained by sliding a vertical arc of circle of radius a along another vertical arc of circle of radius b. The cylinder is a translational surface in which one of the curves, the generator, is a straight line.

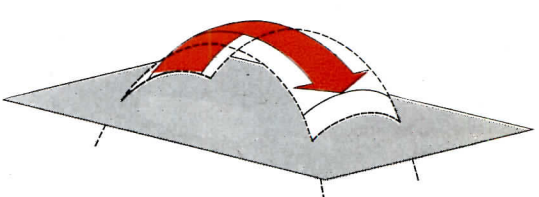
One of the forms best adapted for a variety of reasons to thin shell use is a translational surface called the *hyperbolic paraboloid*. This surface is obtained by sliding a vertical parabola with upward curvature on another parabola with downward curvature in a plane at right angles to the plane of the first.

In the hyperbolic paraboloid, curvatures of two sections at right angles are in opposite directions, up in one and down in the other, and the surface is often called a "saddle surface" because in a horse saddle the curvature along

Section of a cone — often used as a cantilever roof when the axis is horizontal



Vertical curve following another curve forms a translational surface



the axis of the horse is up, while it is down across the middle of the horse.

Another saddle surface can simply be obtained by sliding an arc of circle with curvature up on another arc of circle at right angles with curvature down, but such a surface is actually more difficult to build in practice than a hyperbolic paraboloid. It will be noticed later in Article 2 that saddle surfaces, in general, have extremely interesting structural properties, which have made them most popular in thin shell construction.

Saddle surfaces can be supported in a variety of ways and are usually designed with small rises, so as to produce fairly flat roofs. If cut by planes parallel to the sliding and fixed parabolas, the edges of the hyperboloid are parabolas and hence its supporting elements must be parabolic arches. It is most interesting to notice that the hyperbolic paraboloid is capable of transmitting its own dead load to the parabolic arches by direct stresses lying in their plane so that the arches are only subjected to forces lying in their own plane and not to normal forces, tending to tip them over.

Ruled surfaces. A ruled surface is described by a straight line segment which moves so that its ends lie on two fixed curves. The cylinder is a lined surface described by a horizontal line segment whose ends slide on two identical vertical curves (the directricses) and which remains always at right angles to them. Consider now the lined surface obtained by having one end of a line segment slide on a vertical curve while the other slides on a horizontal line. Most often the curve is a half circle (or a smaller arc of circle) and the horizontal line is parallel to the circle's diameter. Such surfaces are called "conoids" and have curvatures of opposite sign, i.e., are saddle surfaces.

The cone is the limiting case of a conoid in which one end of the segment is kept at a fixed point rather than being slid on a line segment.

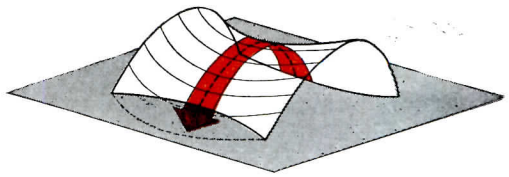
Amazing as this may seem, the hyperbolic paraboloid is also a lined surface; in fact, it may also be described by a straight line segment one of whose ends moves along a horizontal line while the other moves along an inclined straight line.

Hyperbolic paraboloid surfaces may be used to cover a rectangular area and may be supported on four vertical boundary trusses; only forces in a vertical plane are produced in the trusses. This fact and the fact that forms for the erection of such shells can be built of straight planks make ruled surfaces very practical in thin shell design. Of course, any combination of surfaces may also be used to create new shell forms.

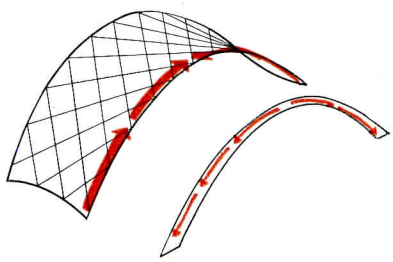
Only the most elementary forms have been used, so far, in the design of thin shell structures. Even within the limited field of shapes mentioned above, a wide variety of applications is possible if one keeps in mind on one hand composite shells and on the other methods of support. It would be difficult to conceive all the new forms that could be evolved in the future if the modern architect should decide to explore this field.

It must be pointed out that, although the mathematical difficulties inherent to the stress analysis of thin shells may appear at first staggering whenever a rigorous solution is required, approximate methods can always be employed to find out whether a form is well adapted to the solution of a given structural problem. In fact, the architect should not feel limited by the existing mathematical solutions and should rely essentially on his imagination and physical intuition in designing new forms. The engineer who is familiar with shell behavior will always find it possible to investigate the strength of a proposed form. It might be wise to point out that it is not always possible to do the engineering design through theoretical analysis alone. For example, the Saarinen shell at M.I.T. is simply a section of spherical shell, but the existence of wide cut-outs on three sides makes the analysis of this structure arduous by standard mathematical methods; it was only by means of a combination of mathematical analysis model experiments and physical intuition that such an unusual structure could be designed.

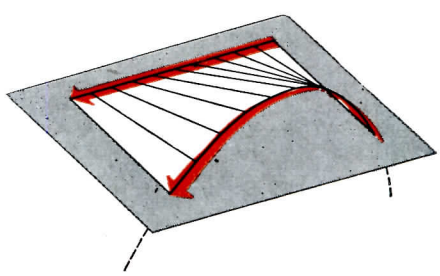
On the other hand the more commonly encountered types of shells can be easily studied by standard procedures which are not inherently more difficult than the procedures used in arch or frame design. In fact, quite often shell analysis is simpler than the analysis of other types of commonly encountered structures and it is only their novelty that, in certain cases, prevents their adoption on the part of designing engineering offices. As shall be apparent from the material in the next article, enough tested knowledge is available in the field of shell design to warrant for this type of structure the same popularity afforded any other type of standard structure.



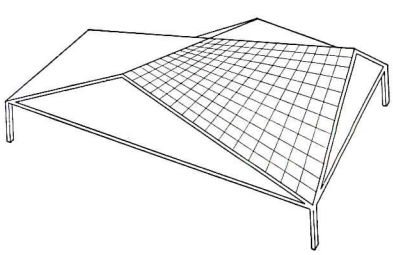
A vertical parabola with curvature up following a vertical parabola with curvature down, and at right angles to it, forms a hyperbolic paraboloid



Loads on a hyperbolic paraboloid surface are transferred to end stiffners through stresses in the plane of the stiffner



A conoid is a ruled surface formed by one end of a line sliding on a vertical curve while the other end slides on a horizontal line



Hyperbolic paraboloids may be used to cover rectangular areas

A SURVEY OF INDUSTRIAL LIGHTING EQUIPMENT

AN ECONOMICAL LIGHTING SYSTEM with highest possible efficiency is demanded by industry in its modern plants. Large output and high production costs require a lighting system which is an integral part of the plant operation. The architect wants to be sure that the light fixtures are spaced properly, that they are at the correct height from the floor and that the right number of footcandles is produced. But he is interested in answers to some other questions too. How many men and how much time will the plant manager have to allocate for cleaning the fixtures? How much of a job is it going to be to relamp? How will the fixture help the lamp to produce the highest quality light distribution?

Maintenance of the lighting system is a problem of great concern to industry. The efficiency of light output affects, to a large extent, the economical operation of the plant. As a result, manufacturers have perfected the maintenance factor in their lighting fixtures to the highest possible degree.

Cleanliness of fixtures has been improved by two factors: (1) design, so that there are no dirt-collecting troughs; (2) apertures at the top of the fixture, so that a draft is created by the heat of the light to prevent settling of dirt and dust on lamps and reflecting surfaces. These two factors contribute immeasurably to high efficiency of light distribution. The ventilation factor serves a double purpose, in that it lowers the temperature at the fixture by dispersing much of the heat generated by the lamp.

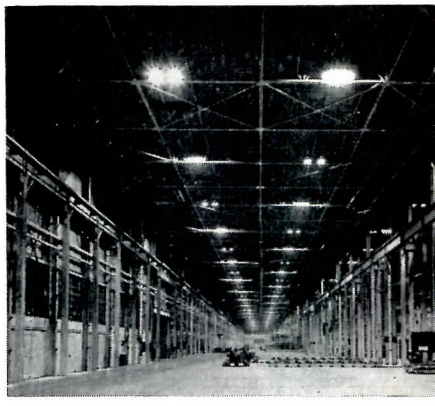
Accessibility is featured in the fixtures of many manufacturers, both for cleaning and for relamping. In most trough-type fixtures, reflectors are either hinged or easily removable so that they can be cleaned quickly and thoroughly. A trend is evident toward fixtures which can be lowered to the floor for cleaning and relamping, thus saving the time and expense of above-ground maintenance. Lamp guides and safety devices in many fixtures insure simple insertion and removal and secure fastening of lamps.

Glare has been responsible in many plants for accidents, low production and employe fatigue. In order to reduce glare to a minimum, two methods are employed:

1. Where it is feasible, ceilings, walls and even machinery are painted with light, high-reflectance colors. Fixtures are designed to give uplight as well as downlight, so that an even, diffuse light is spread throughout the plant. Glare and brightness ratio are kept to a minimum.

2. In plants which do not lend themselves to light painting because of the nature of the operation or because of high bays, light fixtures should be speci-

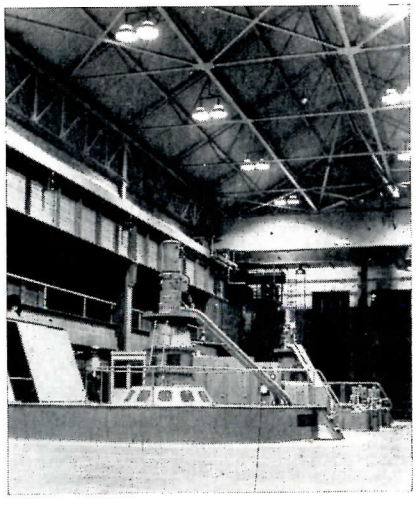
FIXTURE	Benjamin "Task-Master"	Guth "Black-Top" ALZAK High-Bay	Electro Silv-A-King RLM Industrial Uplight
DESCRIPTION	Shielded, open-trough, ventilated luminaire	Aluminum-covered industrial downlight with ventilated socket	Shielded, open-trough, ventilated luminaire
CONSTRUCTION	20-gauge steel; white porcelain enamel reflecting surfaces	Heavy-gauge aluminum; ventilated socket cover finished in black Alumilite inside and outside	20-gauge steel; finished in baked or porcelain enamel, gray channel and white reflectors
MOUNTING	Continuous or single Chain, conduit or sliding hanger suspension	Single or twin Suspension	Continuous or single Cable, chain, rod or conduit, or slide grip hanger
LIGHT DISTRIBUTION	25% up, 75% down	100% down	9% up, 91% down
LAMPS	2 per unit 48″ or 96″ Slimline T12	400W or 1000W mercury vapor 300W to 1500W incandescent	2 or 4 per unit 96″ Rapid Start (40W) 48″, 96″ Slimline (38W, 75W)
MAINTENANCE	Hinged, removable reflectors Ballast and terminal block accessible	No disassembly for cleaning Shock-absorbing sockets available	"Lock-Latch" frees reflector from channel Spring-loaded plunger-type socket
DIMENSIONS	Length: 4′ 7¼″, 8′ 7¼″ Width: 16⁹⁄₁₆″ Height: 5¹¹⁄₁₆″ Shielding: 35%	Diameter: 16″, 18″ Height: 14″–18″	Length: 4′, 8′
MANUFACTURER	Benjamin Electric Mfg. Co. Des Plaines, Ill.	Edwin F. Guth Company 2615 Washington Blvd. St. Louis 3, Mo.	Electro Silv-A-King 1535 So. Paulina St. Chicago 8, Ill.



fied which have been designed to limit the brightness in the glare zone (60°–90°) to as little as possible. Uplight is of little value in such plants. A carefully selected, diffuse downlight will give adequate, glare-free light.

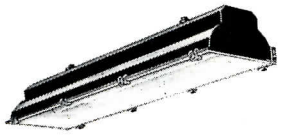
Fluorescent fixtures, the most widely used in low-bay units, are designed for standard length fluorescent lamps and the longer length Slimline lamps. In high-bay plants, mercury vapor and incandescent lamps are often used for 100% downlight, and some fixtures are designed to hold both.

On these and following pages, The RECORD presents a survey of the industrial lighting fixture field. Illustrations and data are given for standard fixtures which meet the economical requirements of modern plants. Commercial fixtures are not included because of the different lighting problems to be met, nor is outdoor industrial lighting covered.



Three typical industrial lighting installations: (Upper left) Wakefield plant in Vermilion, Ohio, tests Wakefield Industrial Pacemakers against fixtures with no uplight in dark-painted area in background. (Lower left) High-bay downlighting in New England Public Service Co. plant in Wilder, Vt., uses Holophane HIBAY reflectors in pairs. (Above) ALCOA mill at Davenport, Iowa, staggers Guth High-Bay fixtures and Guth High-Bay Reflectors

More Industrial Lighting Equipment on Page 192

			
Holophane HIBAY	**Miller Porceliner**	**Thompson Disconnecting and Lowering Hanger**	**Smithcraft A.L.S.**
Metal-covered prismatic reflector with ventilated socket and cover	Shielded, glass-enclosed, vapor-tight luminaire	Aluminum-covered reflector for high-bay lighting	Shielded, open-trough, ventilated luminaire
Prismatic reflector of Hi-Stress glass protected by sealed-on metal cover; unit supported from below by hanging tripod	20-gauge steel, Bonderized, reflecting surfaces finished in white porcelain enamel with minimum reflectance of 82%	Aluminum alloy canopy suspended from chain for lowering	20-gauge steel; reflecting surfaces finished in white baked enamel with reflectance of 86%
Single or group Suspension	Continuous or single Suspension	Single or cluster Overhead- or pole-mounted; cable, rope or chain pulleys lower unit	Continuous or single Rod, conduit, stem set, chain, cable
100% down	100% down	100% down	20.2% up, 79.8% down
4000W mercury vapor	2 or 3 per unit 48″ Rapid Start or Slimline T12	Incandescent, fluorescent, mercury vapor, cold cathode and mercury vapor-incandescent	2 per unit 48″, 72″, 96″ Slimline T12
No disassembly for cleaning	Clamps unlatch, door swings free Wiring and ballast access plate removable	Luminaires lowered to ground level for cleaning and replacement, "dead" at floor	Reflectors removed by pressing release buttons Ballasts and wiring accessible
Diameter: 21¾″ Height: 25¼″	Length: 49¼″ Width: 13 17/32″ Height: 6⅞″	Vary	Length: 4′, 6′, 8′ Width: 16½″ Shielding: 30%
Holophane Company, Inc. 342 Madison Ave. New York 17, N. Y.	The Miller Company Meriden, Conn.	The Thompson Electric Company 1100 Power Ave. Cleveland 14, Ohio	Smithcraft Lighting Division Chelsea 50, Mass.

SOME NEW LIGHTING LITERATURE

• Some lighting catalogs recently available for other than the industrial lighting applications covered in the Product Reports are listed below. These catalogs present such information as construction, installation, dimensions, wattages, shipping data, distribution curves, coefficients of utilization and hanging information.

The C-I Board, describing all-electronic system for stage lighting control. 12 pp, illus. *Domelights for Evenly Distributed, Glareless Lighting.* 4 pp, illus. *Stage Lighting Facilities for the School and Community Theatre.* 8 pp, illus. *Architectural Lighting, Theatrical Lighting, Television Studio Lighting, Light Control Systems.* 8 pp, illus. *Century Lighting, Inc., 521 W. 43rd St., New York 36, N. Y.*

Binder Index and new catalog pages covering *Recessed Units. Day-Brite Lighting, Inc., 5411 Bulwer, St. Louis 7, Mo.**

Lighting, divided by index tabs into four sections: commercial, troffers, fluorescent industrial, and incandescent industrial and floodlighting. 37 pp, illus. *Electro Silv-A-King Corp., 2000 W. Fulton St., Chicago 12, Ill.**

The GrateLite Story, describing a new plastic grid. 8 pp, illus. *The Edwin F. Guth Co., St. Louis 3, Mo.**

Octa-Tube Lighting, for streets, highways and bridges. 12 pp, illus. *Millerbernd Mfg. Co., Winsted, Minn.*

Bulletin 721, for the "Modernizer" group of "Milestone" fluorescent fixtures for drugstores, chain stores and large commercial installations. *Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago, Ill.*

Asymmetric Permaflectors for show windows, perimeter lighting, general lighting and indirect lighting. 12 pp, illus. *Symmetric Permaflectors* for general lighting, commercial, institutional and industrial interiors. 20 pp, illus. *Pittsburgh Permaflector Lighting Equipment* for incandescent floodlights, dual units and industrial equipment. 8 pp, illus. *Pittsburgh Reflector Co., 402 Oliver Bldg., Pittsburgh 22, Pa.**

Recessed Series (12 pp) and *Surface Series and Portable Lamps* (8 pp), illus. *Prescolite Mfg. Corp., 2229 4th St., Berkeley 10, Calif.**

Lighting, for commercial lighting fixtures used primarily in hospitals, office buildings, railroad stations and banks. *The Safety Car Heating and Lighting Co., Inc., P. O. Box 904, New Haven 4, Conn.*

Puritan and *Plymouth*, folders describing two new fluorescent fixtures. 4 pp each, illus. *Smithcraft Lighting Division, 233 Everett Ave., Chelsea, Mass.**

Sports and Industrial Floodlights and *Gymnasium Fixtures*, Bulletins 127–53 and 137–53, respectively. 4 pp each, illus. *Steber Mfg. Co., Broadview, Ill.*

Ceiling Lighting Systems, including some facts on acoustical effectiveness of baffles and use of plenums as air diffusers. 8 pp, illus. *The F. W. Wakefield Brass Co., Vermillion, Ohio.**

PRE-ASSEMBLED WALL PANELS

• *Homes from Pre-assembled Wall Panels* presents plans for five homes which can be built using a new wall panel system developed by the University of Illinois Small Homes Council. Also included is a step-by-step outline of erection of homes from the panels, which can be completely assembled by lumber dealers or builders and trucked to the site. 16 pp, illus., $1. *Small Homes Council, University of Illinois, Mumford House, Urbana, Ill.*

CONCRETE

• *Vibro-Foil*, a concrete in which shrinkage is said to be compensated by a metallic aggregate combined with a plasterizing material, is used for non-shrink resurfacing of concrete floors, floor patching, bonding of concrete surfaces, grouting under machinery and tile-grouting. The booklet covering its properties includes specifications and suggestions on preparation of foundations for heavy equipment. 8 pp, illus. *A. C. Horn Co., Inc., Long Island City 1, N. Y.*

• *Design Data for Reinforced Concrete Columns and Sonotube Technical Data* presents data on 16 sizes of round reinforced columns ranging from 8-in. diameter to 36-in. diameter. The 21-page booklet, consisting mostly of charts, was compiled by Clemson Engineering Experiment Station, Clemson College, Clemson, S. C. *Sonoco Products Co., Garwood, N. J.*

• *Manual CM-1 Calcium Chloride in Concrete* presents charts and illustrations referring to the various aspects of calcium chloride as it is used in modern concrete construction. The manual includes data on initial and final set, early strength, ultimate strength, integral curing, workability and density, resistance to surface wear, cold weather protection, air-entrained concrete and high early strength cement. 40 pp, illus. *Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.*

BUILDING PRODUCTS DIRECTORY

• The Producers' Council has published *Bulletin 69, Building Products Directory*, presenting information about the products of the member companies. Many of these products, and others, were on display at the Building Products Exhibition, organized by the A.I.A. and the Producers' Council at the Annual A.I.A. Convention in Boston last month. 92 pp, illus. *Producers' Council, Inc., 1001 15th St. N. W., Washington 5, D. C.*

FLOORING

• The Flintkote Co. makes available three booklets of information about their products:

Flooring Products contains product data sheets giving descriptions, specifications and use of cold laid asphalt mastic, underlayments and flooring specialities.

Industrial Products contains product data sheets on their construction, maintenance and processing materials, such as heavy duty mastic floorings, waterproofing and damp-proofing materials and industrial adhesives and cementing compounds.

Industrial Products Digest presents briefly the essential characteristics and many of the uses of Flintkote products. 23 pp, illus. *The Flintkote Co., 30 Rockefeller Plaza, New York 20, N. Y.**

ANTHRACITE EQUIPMENT

• *Automatic Anthracite Equipment for the Home* gives examples of how modern automatic anthracite home heating equipment is meeting the requirements of homeowners. Tables of capacity for various units are included. *Anthracite Information Bureau, 380 Madison Ave., New York 17, N. Y.*

(*Continued on page 222*)

Other product information in Sweet's Architectural File, 1954

NORTH AMERICAN BUILDING STONES — 8

Presented through the cooperation of the International Cut Stone Contractors' and Quarrymen's Association

INDEX OF 62 BUILDING STONES

14 CONCO LANNON STONE

Company Name: Conco Building Products, Inc.
Quarry Location: Lannon, Wis.
Geological Designation: Dolomitic Limestone
Texture: Fine-grained
Color: Ivory and gray, bedface color, buff
Chemical Composition: Silicon dioxide — North: 7.04%, South: 5.06%, Deep: 6.98%; aluminum oxide —North: 0.39%, South: 0.34%, Deep: 0.30%; sodium oxide—North: 0.19%, South: 0.17%, Deep: 0.15%; potassium oxide—North: 0.12%, South: 0.14%, Deep: 0.12%; calcium oxide—North: 28.58%, South: 29.06%, Deep: 28.72%; magnesium oxide—19.29%, South: 19.90%, Deep: 19.35%; iron oxide—North: 0.52%, South: 0.46%, Deep: 0.44%; carbon dioxide —43.54%, South: 44.45%, Deep: 43.60%
Physical Tests: Absorption—North: 0.73%, South: 0.85%, Deep: 0.80%; bulk specific gravity—North: 2.81, South: 2.75, Deep: 2.75; sodium sulphate soundness test loss—North: 0.2%, South: 0.3%, Deep: 0.2%; freezing and thawing—no sign of failure after 10 cycles in any sample; deval abrasion test—2.3% wear
Strength: Compression, parallel, dry—North: 21,000 psi, South: 20,500 psi, Deep: 17,100 psi; parallel, wet—North: 18,800 psi, South: 17,900 psi, Deep: 16,900 psi; perpendicular, dry—North: 22,200 psi, South: 18,700 psi, Deep: 19,000 psi; perpendicular, wet—North: 6300 psi, South: 19,100 psi, Deep: 20,100 psi; modulus of rupture, parallel, dry—Deep: 2953 psi; parallel, wet—Deep: 2708 psi; perpendicular, dry—North: 5163 psi, South: 5209 psi, Deep: 4546 psi, perpendicular, wet—North: 1856 psi, South: 3056 psi, Deep: 2010 psi
Furnished As: Dimensional, Splitface, Ledgestone. Heights: 1″–12″ Splitface. Lengths: 8″–40″
Surface Coverage: 40 sq ft per ton

15 CORDOVA CREAM STONE

Company Name: Texas Quarries, Inc.
Quarry Location: Austin, Tex.
Geological Designation: Oolitic Limestone
Texture: Fine, close grain
Color: Cream
Chemical Composition: Silica—0.32%; iron and aluminum oxide—0.38%; calcium oxide—55.88%; sulphuric anhydride—0.16%; loss on ignition—43.75%
Physical Tests: Saturation coefficient—0.86; bulk specific gravity—2.109; dry density—128.3 pcf; loss by magnesium sulphate—1%
Strength: Ultimate tensile strength, parallel to bedding plane—398 psi, perpendicular to bedding plane—243 psi; ultimate compressive strength, parallel to bedding plane, dry—2517 psi, wet—2130 psi, perpendicular to bedding plane, dry—2070 psi, wet—2004 psi; ultimate shearing strength, parallel to bedding plane—434 psi, perpendicular to bedding plane—381 psi; modulus of elasticity in compression, parallel to bedding plane—2.73×10^6 psi, perpendicular to bedding plane—1.69×10^6 psi; modulus of elasticity in flexure, parallel to bedding plane—9.44×10^6 psi, perpendicular to bedding plane—5.40×10^6 psi; modulus of rupture, parallel to bedding plane—491 psi, perpendicular to bedding plane—383 psi
Furnished As: Dimensional, Splitface. Heights—2¼″, 5″, 7¾″, 10½″, 3″, 6½″. Lengths—random
Surface Coverage: 48–50 sq ft per ton

16 CORDOVA TRAVERTONE STONE

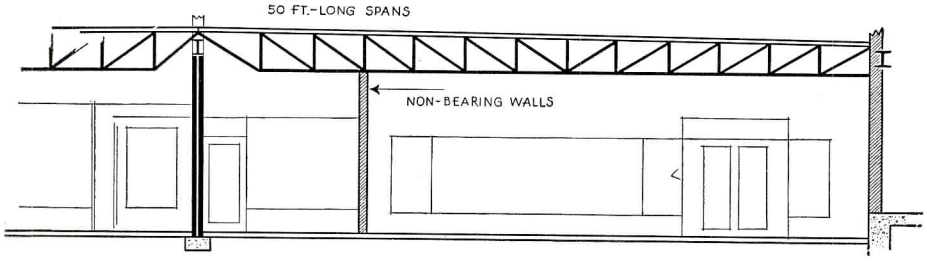
This is the traditional stone deposit between Cordova Cream and Cordova Shell and may be judged by the facts developed on Cream and Shell

17 CORDOVA SHELL STONE

Texture: Shelly
Color: Light golden
Chemical Composition: Silica—0.25%; iron and aluminum oxide—0.42%; calcium oxide—56.08%; sulphuric anhydride—0.13%; loss on ignition—43.88%
Physical Tests: Saturation coefficient—0.74; bulk specific gravity—1.985; dry density—122.3 pcf; loss by magnesium sulphate—0.3%
Strength: Ultimate tensile strength, parallel to bedding plane—388 psi, perpendicular to bedding plane—308 psi; ultimate compressive strength, parallel to bedding plane, dry—1629 psi, wet—1783 psi, perpendicular to bedding plane, dry—2005 psi, wet —1130 psi; ultimate shearing strength, parallel to bedding plane—606 psi, perpendicular to bedding plane—462 psi; modulus of elasticity in compression, parallel to bedding plane—4.05×10^4 psi, perpendicular to bedding plane—3.76×10^6 psi; modulus of elasticity in flexure, parallel to bedding plane—6.49×10^5 psi, perpendicular to bedding plane—7.43×10^5 psi; modulus of rupture, parallel to bedding plane—710 psi, perpendicular to bedding plane—456 psi
Furnished As: Dimensional, Splitface. Heights—2¼″, 5″, 7¾″, 10½″, 3″, 6½″. Lengths—random
Surface Coverage: 48–50 sq ft per ton

18 CRAB ORCHARD STONE

Company Name: Crab Orchard Stone Co., Inc.
Quarry Location: Crossville, Tenn.
Geological Designation: Quartzite
Texture: Fine-grained, dense
Color: Pink, buff, tan, sky blue, gray and variegated
Chemical Composition: Alumina—2.74%; iron oxide—0.86%; titanium oxide—0.20%; calcium oxide—0.10%; magnesium oxide—0.05%; alkalies —0.28%; loss on ignition—0.90%; silica (by difference)—94.87%
Physical Tests: Specific gravity—2.57; abrasive hardness—35.3; absorption of moisture—1.5%
Strength: Compression against grain—19,060 lb; compression with grain—20,650 lb; modulus of rupture, full section—522 psi; modulus of rupture, one stone—1100 psi
Weight: 162 pcf
Furnished As: Dimensional, Splitface, Ledgestone. Heights—1″–8″. Lengths—12″–48″
Surface Coverage: 36–42 sq ft per ton
Other Facts: Non-slip, impervious, non-fading



The Boulevard Shopping Center, in Philadelphia, was designed by Sweet and Schwartz, *Architects.* Contractor, John McShain, Inc.; *Structural Engineer,* Dorfman and Bloom; Owner, Boulevard Center, Inc.—all of Philadelphia.

Detail showing partitioning of three smaller stores beneath one 50-ft Longspan Joist.

LONGSPAN JOISTS IN ROOF ALLOW FLEXIBILITY IN WALL PLACEMENT

To Northeast Philadelphia shoppers, the Boulevard Shopping Center at Roosevelt Blvd. and Magee Ave. means "downtown" stores with suburban park-and-shop convenience. The Center has more than forty retail outlets, most of them air-conditioned, offering every type of merchandise and service. Free parking lots for 1000 cars are located for easy entrance and exit in any direction.

The planners of the Boulevard Center, in addition to stressing shopper convenience, built with both present and future store tenants in mind. Bethlehem Longspan Steel Joists, with 50-ft spans, were used in the roof structure, and a fire wall placed every 100 ft. In between, non-bearing store walls are erected according to the number of feet of frontage desired by the individual tenants. In the future, these non-bearing walls can easily be moved to accommodate larger or smaller stores.

Also, by using Bethlehem Longspans, flexibility in the arrangement of counters, aisles and merchandise displays in the larger stores was obtained, as well as maximum column-free space for freedom in the planning of smaller stores. These joists saved construction time, too, because they reached the job-site completely fabricated, clearly marked and ready for placing.

Bethlehem Longspans are good joists to remember in planning any type of building where the efficient use of column-free floor space is a paramount consideration. The nearest Bethlehem sales office will be glad to furnish complete information. Or write to us at Bethlehem, Pa.

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BETHLEHEM LONGSPAN JOISTS

BETHLEHEM STEEL

NORTH AMERICAN BUILDING STONES — 9

Presented through the cooperation of the International Cut Stone Contractors' and Quarrymen's Association

INDEX OF 62 BUILDING STONES

19 DUNBAR STONE

Company Name: Dunbar Stone Co.

Quarry Location: Ashfork, Ariz.

Geological Designation: Sandstone

Color: Grand Canyon colors

Chemical Composition: Tests not completed

Physical Tests: Tests not completed

Strength: Tests not completed

Furnished As: Building Stone Veneer: Heights—4″–8″, Lengths—8″–48″. Ledgestone Veneer: Heights—½″–3¾″, Lengths—8″–48″. Flagstone Sheets: ½″–1½″ thick

Surface Coverage: Building Stone Veneer—125 sq ft per ton. Ledgestone Veneer—50 sq ft per ton

20 FOND DU LAC STONE

Company Name: Fond du Lac Stone Co., Inc.

Quarry Location: 5 miles south of Fond du Lac, Wis.

Geological Designation: Dolomitic Limestone (Niagara Ledge)

Texture: Fine-grained

Color: Broken: white, gray, blue. Surface: gray, rose, yellow, tan, brown

Chemical Composition: Silicon oxide—2.12%; aluminum oxide, iron oxide—0.59%; calcium carbonate—53.51%; magnesium carbonate—43.54%

Physical Tests: Specific gravity—2.85; absorption of moisture—0.27%

Strength: Crushing strength on bed—42.78 psi

Weight: 180 pcf

Furnished As: Dimensional, Splitface, Ledgestone, Flagging. Heights—½″–24″. Lengths—As specified.

Surface Coverage: 40 sq ft per ton

Other Facts: A variety of different grained stone at different points and levels have recently been developed at this quarry. Tests of these finds are now under way

21 HALQUIST LANNON STONE

Company Name: Halquist Lannon Stone Co.

Quarry Location: Sussex, Wis.

Geological Designation: Dolomitic Limestone (Niagara Ledge)

Color: White to cream, with discolorations ranging from buff to deep rust, intermingled with blues and grays

Chemical Composition: Silica—3.96%; iron oxide, aluminum oxide—1.68%; calcium carbonate—52.29%; magnesium carbonate—42.27%

Physical Tests: Specific gravity—2.814; absorption of moisture—1.36%; porosity—3.17%

Strength: Crushing strength—31,936 psi on the bed, 33,485 psi on the edge

Furnished As: Ashlar in Splitface, Rockface, Bedface and Seamface combinations

22 HARMONY LEDGESTONE

Company Name: The Texas Ledge Stone Co.

Quarry Location: Logan County, Ark.

Geological Designation: Sandstone

Texture: Fine-grained

Color: Light pinks, browns, grays

Chemical Composition: Largely silicon. No tests made

Physical Tests: Absorption of moisture—1.2%

Strength: Crushing strength—13,667 psi

Weight: 159.36 pcf

Furnished As: Ledgestone, Natural Stratified. Heights—1″–5″. Lengths—10″ and up

Surface Coverage: 40 sq ft per ton

Other Facts: Uncut and tooled stone

23 INDIANA LIMESTONE

Company Name: The Bloomington Limestone Corp.

Quarry Location: Maple Hill, Bloomington, Ind.

Geological Designation: Oolitic Limestone

Texture: Fine to medium

Color: Buff, gray, variegated

Chemical Composition: Carbonate of lime—97.39%; carbonate of magnesia—1.20%; silica—0.69%; alumina—0.44%; iron oxide—0.18%; water and loss—0.10%

Physical Tests: Absorption of moisture—4.0%

Strength: Crushing strength—5000 psf

Weight: 146 pcf

Furnished As: Dimensional

24 INDIANA LIMESTONE

Company Name: Empire Stone Co.

Quarry Location: Bloomington, Ind.

Geological Designation: Oolitic Limestone

Texture: Fine to medium

Color: Buff, gray, variegated

Chemical Composition: *Buff:* Same as for No. 23 above. *Gray:* Carbonate of lime—97.07%; carbonate of magnesia—1.20%; silica—0.80%; alumina—0.68%; iron oxide—0.12%; water and loss—0.13%

Physical Tests: Absorption of moisture—3.60–5.52%

Strength: Crushing strength (seasoned stone)—4000 psi; tensile strength—300–715 psi; modulus of rupture—900–1600 psi

Weight: 135 pcf

Furnished As: Dimensional, Splitface

Surface Coverage: 40–50 sq ft per ton

25 INDIANA LIMESTONE

Company Name: The Carl Furst Co.

Quarry Location: Bedford, Ind.

Geological Designation: Oolitic Limestone

Texture: Fine to medium

Color: Buff, gray, variegated

Chemical Composition: Same as No. 24

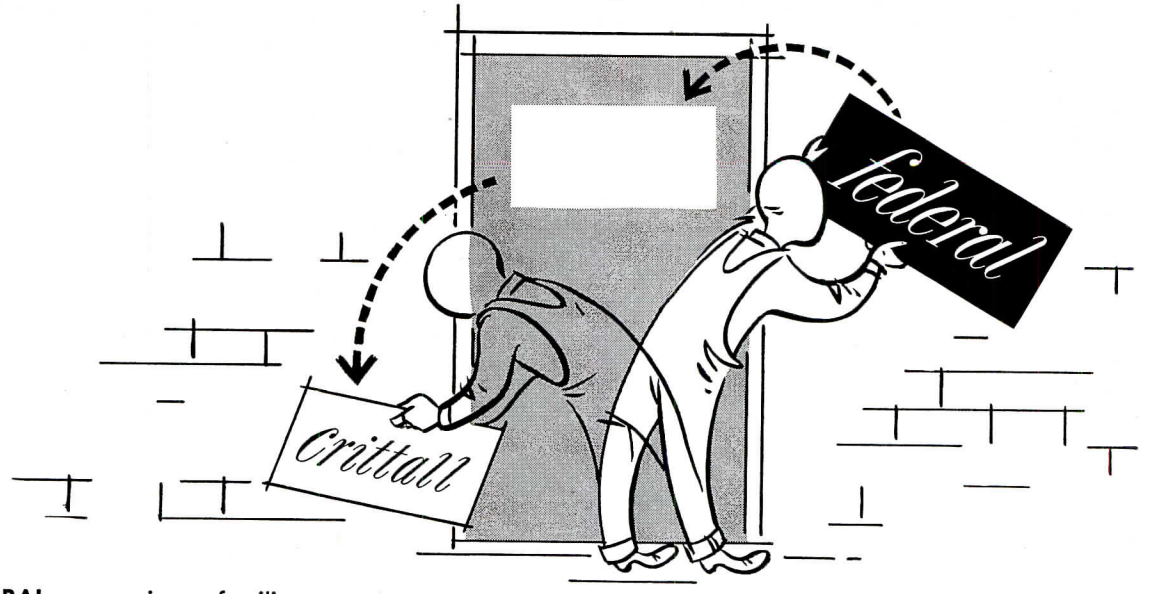
Physical Tests: Same as No. 24

Strength: Same as No. 24

Weight: Same as No. 24

Furnished As: Dimensional

Look We've Changed Our Name



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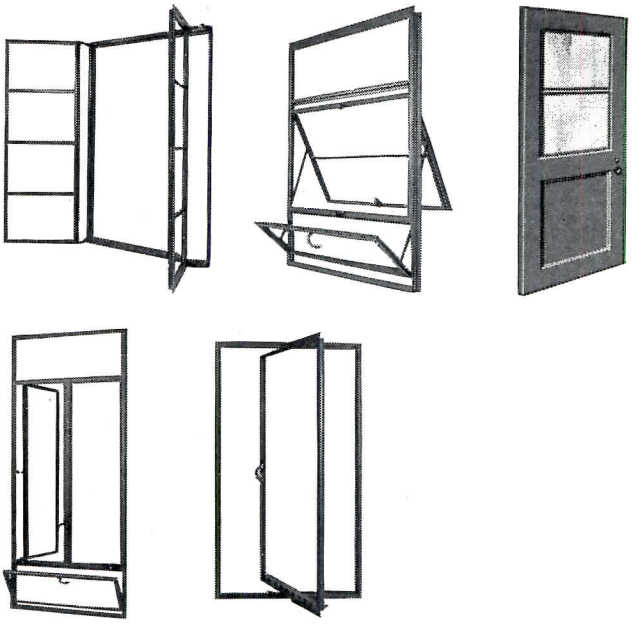

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NORTH AMERICAN BUILDING STONES—10

Presented through the cooperation of the International Cut Stone Contractors' and Quarrymen's Association

INDEX OF 62 BUILDING STONES—(To be continued in a later issue)

26 INDIANA LIMESTONE
Company Name: B. G. Hoadley Quarries, Inc.
Quarry Location: 1 mile NW of Bloomington, Ind.
Geological Designation: Oolitic Limestone
Texture: Fine to medium
Color: Buff, gray, variegated
Chemical Composition: Calcium carbonate—98.93%; magnesium carbonate—0.0233%
Physical Tests: Specific gravity—2.42; absorption of moisture—5.1%
Strength: Crushing strength—8675 psi; modulus of rupture—1355 psi; shearing test 6.48 in. (average shearing area)
Weight: 150 pcf
Furnished As: Dimensional

27 INDIANA LIMESTONE
Company Name: Indiana Limestone Co.
Quarry Location: Bedford, Ind.
Geological Designation: Oolitic Limestone
Texture: Fine to medium
Color: Buff, gray, variegated
Chemical Composition: Carbonate of lime—97.23%; carbonate of magnesia—1.20%; silica—0.74%; alumina—0.56%; iron oxide—0.15%; water and loss—0.12%
Strength: Crushing strength—5,000–10,000 psi
Weight: 144 pcf
Furnished As: Dimensional, Split and Sawed Face Veneers
Surface Coverage: Splitface—45 sq ft per ton; Sawed—40 and 50 sq ft per ton depending on width

28 INDIANA LIMESTONE
Company Name: The McNeely Stone Co., Inc.
Quarry Location: Elletsville, Ind.
Geological Designation: Oolitic Limestone
Texture: Fine to medium
Color: Buff, gray, variegated
Physical Tests: Absorption of moisture—4.60%
Strength: Crushing strength—2500 psi
Weight: 144 pcf
Furnished As: Dimensional, Split and Sawed Face Veneers
Surface Coverage: Splitface—40 sq ft per ton

29 INDIANA LIMESTONE
Company Name: Victor Oolitic Stone Co.
Quarry Location: Bloomington, Ind.
Geological Designation: Oolitic Limestone
Texture: Fine to medium
Color: Buff only
Chemical Composition: Calcium carbonate—98.00%; magnesium carbonate, silica, iron oxide—2.00%
Strength: Crushing strength—6000 psi
Weight: 180 pcf
Furnished As: Dimensional, Splitface, Rockface, Sill Stock. Splitface heights—2¼", 5", 7¾". Rockface heights—10½", 13¼", 16". Lengths—random
Surface Coverage: Splitface—40 sq ft per ton; Rockface—36 sq ft per ton
Other Facts: See other stone under trade name "Victor"

30 JUNCTION CITY STONE
Company Name: Walker Cut Stone Co.
Quarry Location: Fort Riley Ledge at Junction City, Kan.
Geological Designation: Oolitic Limestone
Texture: Fine-grained, soft, with porous markings
Color: Buff
Chemical Composition: Calcium carbonate—95%
Physical Tests: Specific gravity: dry—2.07, saturated—2.25; absorption of moisture—8.87%
Strength: Crushing strength—633,600 psf; freeze and thaw ratio—96; abrasive hardness, Los Angeles (wear)—44%; modulus of rupture—670 psi
Weight: 130 pcf
Furnished As: Dimensional, Splitface. Heights and lengths as specified
Surface Coverage: 50 sq ft per ton
Other Facts: Buildings of this stone have been exposed to outside weathering for a century with very little signs of weathering in the Kansas area

31 KAIBAB ARIZONA STONE
Company Name: Western States Stone Co.
Quarry Location: Ashfork, Ariz.
Geological Designation: Sandstone
Texture: Medium coarse
Color: Buff, buckskin, pink, tan, red, yellow, variegated
Chemical Composition: Silica—96.54%; iron oxide—1.04%; lime—1.52%; loss on ignition—0.90%
Physical Tests: Absorption of moisture—3.54% of dry weight
Strength: Compressive strength perpendicular to stratification—13,610 psi; ultimate compressive strength parallel to stratification—11,600 psi
Furnished As: Dimensional, Splitface, Ledgestone. Heights—1"–6". Lengths—12"–48"
Surface Coverage: Strataface (sheets)—140 sq ft per ton; Ashlar—45–50 sq ft per ton

32 KAIBAB NEVA STONE
Company Name: Western States Stone Co.
Quarry Location: Jean, Nev.
Geological Designation: Sandstone
Texture: Medium coarse
Color: Red, white, brown, yellow, purple and variegated
Chemical Composition: Silica—91.50%; iron oxide—2.74%; calcium—1.18%; alumina—3.68%; loss on ignition—0.92%
Physical Tests: Moisture—Nil at 100°C
Strength: Compressive strength on average of 3 cubes—18,069 psi
Furnished As: Dimensional, Splitface, Ledgestone. Heights—1"–8". Lengths—12"–48"
Surface Coverage: Strataface (sheets)—130 sq ft per ton; Ashlar—40–45 sq ft per ton

Why architect

Max O. Urbahn is a member of the well-known New York architectural firm of Reisner, Urbahn, Brayton & Burrows. To its credit, the firm has many famous jobs in North and South America in which particular attention has been paid to fine interiors.

Concerning his reasons for specifying Bigelow carpets, Mr. Urbahn has this to say:

"The wear formula of Bigelow carpet helps us select and recommend it for heavy traffic areas. Thus we can allow for the shock the carpet will receive from hundreds of occupants using the space every day.

"We feel there is real dollar value in the right patterns and colors that create the environment best suited for those who are to use the interior.

"The Bigelow people have always offered us a wide range of design, and in our experience, their carpet offers a combination of beauty and utility."

If you're planning an installation, you'll find it well worth your while to call upon the experience of Bigelow experts as early in your planning as possible.

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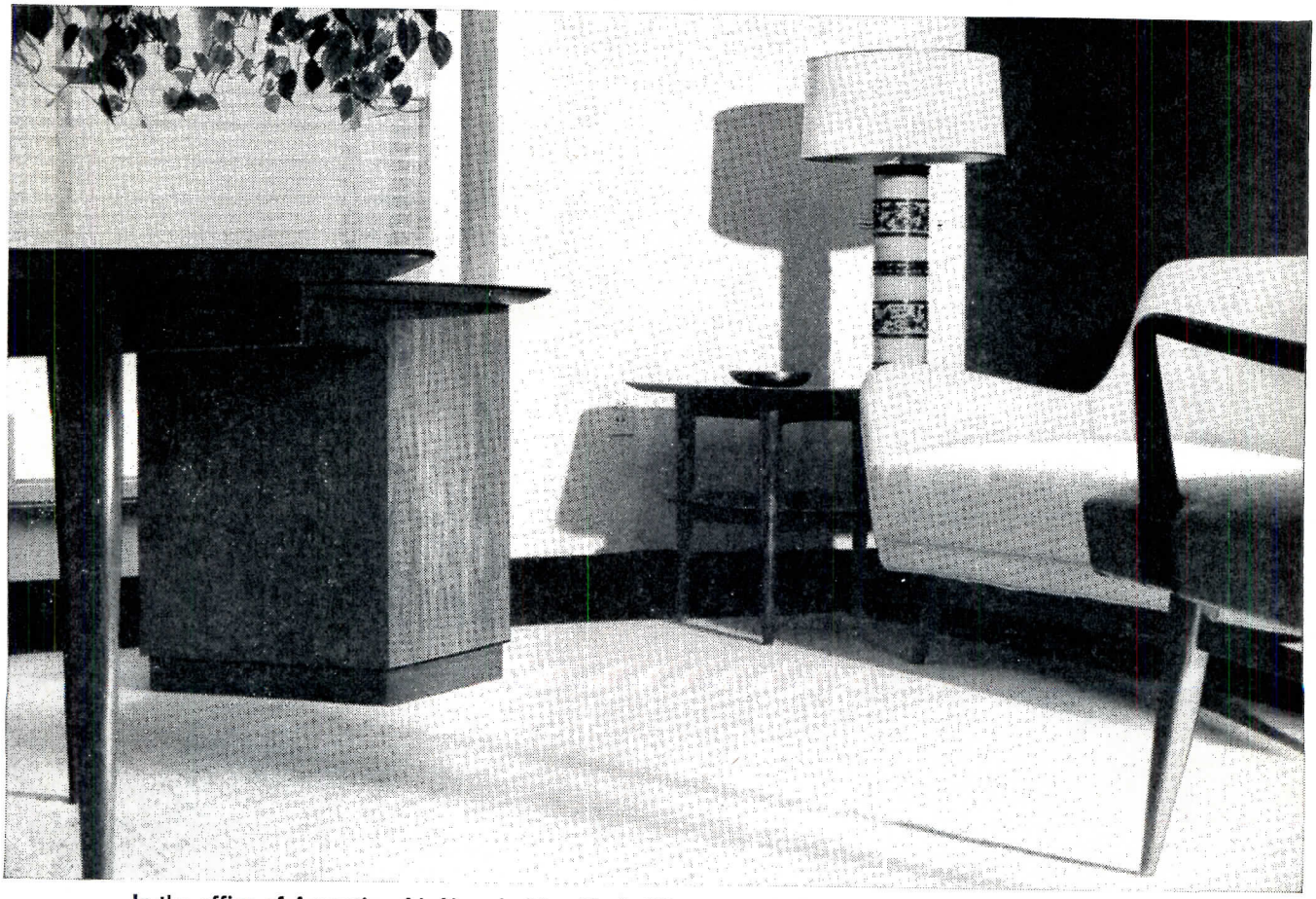
Simply write to one of the below-listed sales offices for information or carpet samples.



In the office of Argentine Air Lines in New York City, acoustical, tough-wearing Bigelow carpet is the foundation for a bright Latin décor done in the modern manner.

Max O. Urbahn specifies Bigelow carpet

(and chooses it for his own office)

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Detroit News Warehouse

Tremendous Paper Tonnages Speedily Handled With Help of Byrne Vertical Lift Doors!

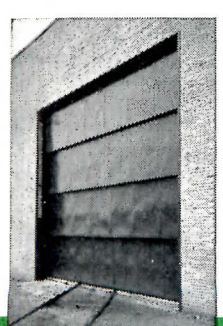
Harley, Ellington & Day, Inc.
Architects, Detroit, Michigan

Darin & Armstrong, Inc.
General Contractors, Detroit, Michigan

AT THE Detroit News Warehouse large rolls of newsprint are delivered by ship, rail and truck. Speedy handling of tremendous paper tonnages is a must in order to supply newsprint to this Detroit newspaper.

With gantry cranes on the river side of the warehouse, bridge cranes and fork lift trucks on the interior . . . fast action, custom doors were considered a prime requisite to act in conjunction with the special material handling equipment. That's why custom vertical lift doors by Byrne were selected. Truck well doors are in two sections . . . 35′ wide by 14′ high and are motor operated. The railway entrance door, as pictured, is a four section door 26′ wide by 22′ 6″ high and also motor operated. Situated at the truck wells, railroad entrance and dock entrances these doors serve in all weather conditions with ease, economy and rapid action.

Byrne vertical lift doors can be furnished without limitation in width or height. Depending on the head room available, they are built in one, two, three or four sections.



Due to the basic simplicity of the Byrne vertical lift door it is one of the first choices with architects and engineers whenever clearances permit its installation. Byrne vertical lift doors are used for railroad entrances, bus terminals, warehouses, piers and a variety of industrial purposes.

For information regarding Byrne doors and facilities you may consult Sweet's Catalog or write direct for our brochure.

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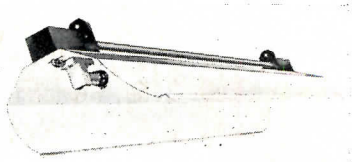
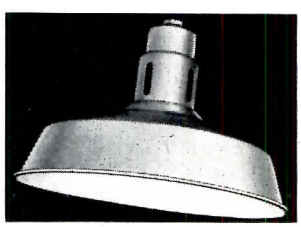
AH PRODUCTS

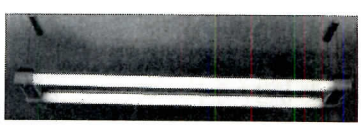
(Continued from page 181)



Fixture: *Westinghouse MercuryLuminaire*
Description: *Shielded, open-trough luminaire*
Construction: *Porcelain-enameled steel, with reflectance of 82% on reflecting surfaces*
Mounting: *Rigid conduit, chain suspension or bracket*
Lamps: *3000W A-H9 mercury*
Maintenance: *Reflector removable for cleaning*
Dimensions: *Length—63¾″*
Width—13¾″
Height—9⅝″
Shielding—30°
Manufacturer: *Westinghouse Electric Corp., Lighting Division, Cleveland, Ohio*



Fixture: *Abolite RLM Reflector*
Description: *Ventilated reflector, all-white reflecting surface*
Mounting: *Single*
Light Distribution: *7% up, 93% down*
Lamps: *Incandescent*
Maintenance: *All surfaces accessible for cleaning*
Manufacturer: *Abolite Lighting Division, The Jones Metal Products Co., West Lafayette, Ohio*



Fixture: *Ainsworth De Luxe Budgetlite*
Description: *Uncovered fluorescent luminaire*
Construction: *Aluminum tubes and wireways*
Mounting: *Single; suspension*
Light Distribution: *Uplight and downlight*
Lamps: *2 per unit; fluorescent*
Manufacturer: *Ainsworth Lighting Inc., 38–10 29th St., Long Island City 1, N. Y.*

(More Industrial Lighting on page 196)

finer ALUMINUM WINDOWS than Ceco-Sterling . . .

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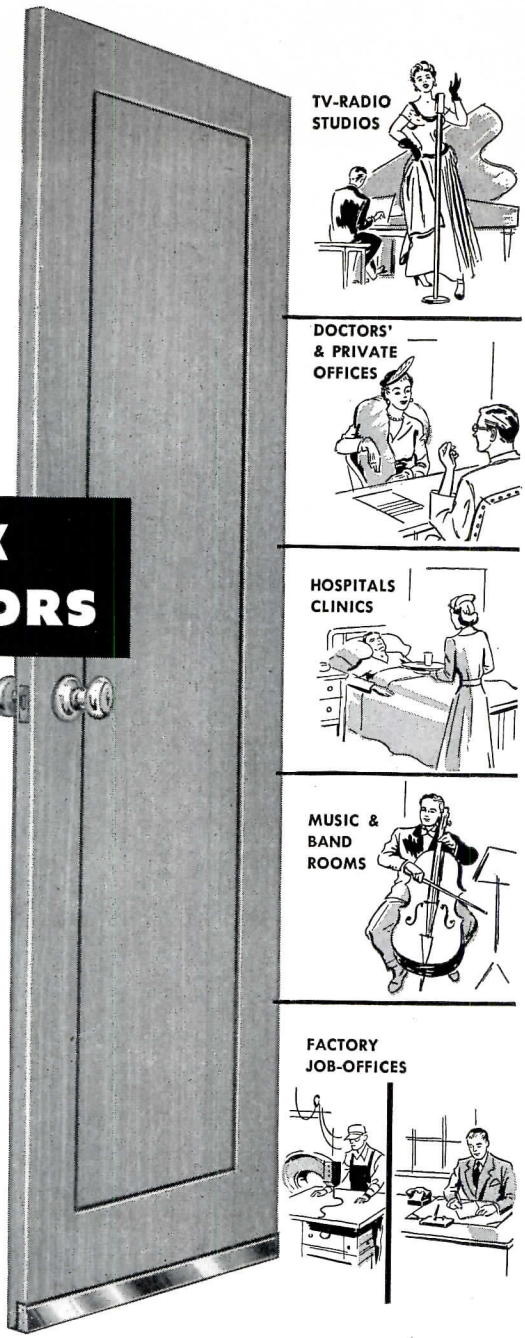

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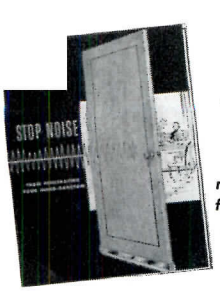

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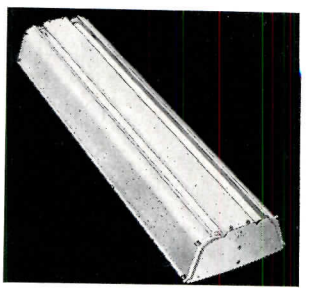
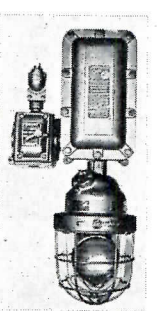
A-H PRODUCTS

(*Continued from page 192*)

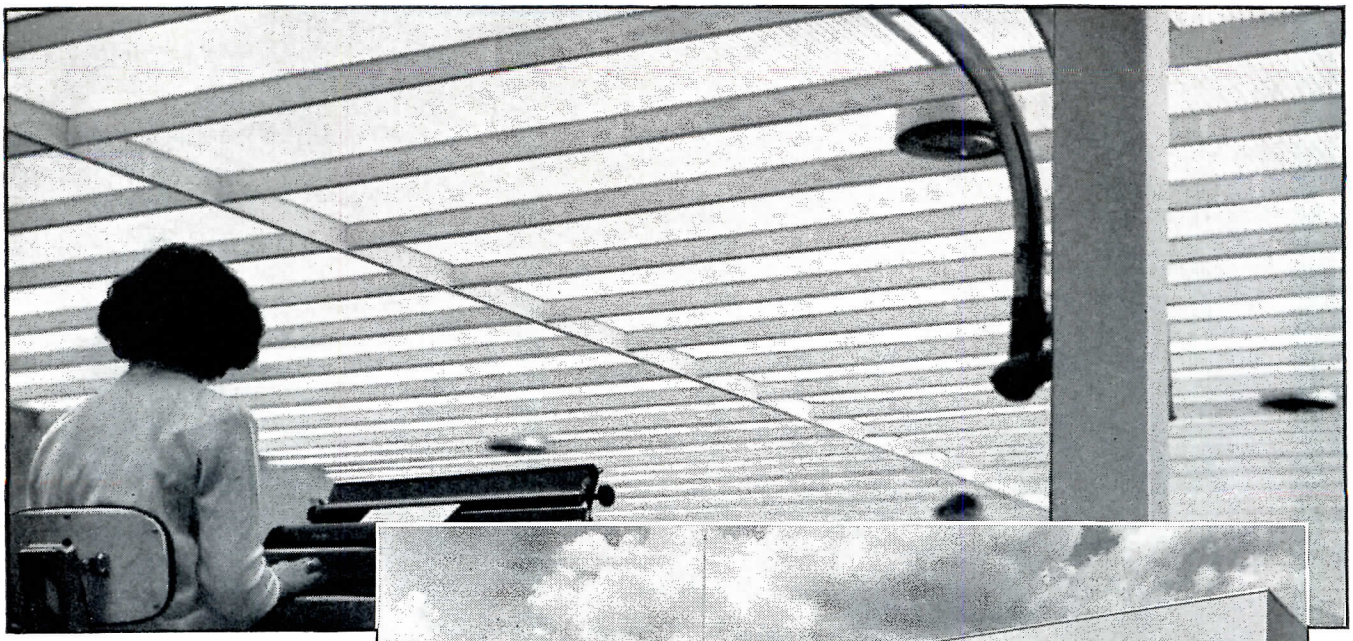


Fixture: *Wakefield Industrial Pacemaker*
Description: *Shielded, open-trough luminaire*
Construction: *Heavy-gauge steel, porcelain-enameled for all major reflecting surfaces*
Mounting: *Continuous or single; chain suspension any distance from ceiling*
Light Distribution: *25% up, 75% down*
Lamps: *2 or 4 per unit; 40W and 85W preheat, 40W rapid start, 72W Slimline*
Maintenance: *Removable side panels unhook and hinge downward*
Dimensions: *Length—4′, 5′, 8′*
Fixture Depth—5⅛″
Manufacturer: *The F. W. Wakefield Brass Co., Wakefield, Ohio*



Fixture: *Carpenter Automatic Emergency Light*
Description: *Self-contained, explosion-proof fixture for use with 110–120 volt, 50–60 cycle A.C.*
Construction: *Sealed-beam lamp inside heavy wire guard, suspended from explosion-proof cast aluminum housing containing battery, automatic relay and lamp switch*
Mounting: *Wall*
Lamps: *35W sealed-beam lamp, directionally adjustable, inside impact-resisting Pyrex globe*
Manufacturer: *Carpenter Mfg. Co., Boston 45, Mass.*

(*More Industrial Lighting on page 200*)



Above: Over 51,000 Square Feet of Acusti-Luminus Ceiling are installed in the new modern plant of Davis & Geck, Inc., subsidiary of American Cyanamid Co., Danbury, Conn. This solid "ceiling of light" illuminates general and private offices, laboratories, and critical production areas.

Architect: Caproni Associates, New Haven, Connecticut.

Now You Can Specify Acusti-luminus ceilings . . . An Architect's Dream . . . on a Builder's Budget!

Installed by Leading Firms Coast to Coast!

Here are a few of over 2800 installations in 37 states—in factories, offices, drafting rooms, critical work areas, stores, banks, schools, libraries, utilities, and public buildings:

American Airlines, Inc.
American Broadcasting Co.
American Cyanamid Co.
Boston Edison Co.
Chattanooga Power Co.
CBS (Television City)
Consolidated Vultee Aircraft Corp.
John Deere Co.
Douglas Aircraft Co., Inc.
Filene's of Boston
General Motors Corp.
National Broadcasting Co.
Republic Aviation Corp.
Trans World Airlines, Inc.
Union Carbide and Carbon Corp.
Zellerbach Paper Company

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Here's the ceiling you've dreamed about—

A modern Acusti-Luminus Ceiling is a beautiful structural unit. And it gives you integrated control of LIGHT, SOUND, and AIR FLOW—*at a cost within the budget!*

It gives LIGHT superior to daylight! Evenly diffused by lightweight corrugated sheets of Lumi-Plastic. No shadow! No glare! Low brightness. Any intensity.

It absorbs SOUND efficiently! Optional noise-absorbing Acusti-Louvers project at intervals below the Lumi-Plastic.

It provides low velocity AIR FLOW! The plenum above Acusti-Luminus Ceiling provides extremely low velocity distribution of conditioned air—without the cost of grilles or diffusers.

Ideal for new construction OR remodeling! In new construction, it offers unlimited design possibilities—eliminates expensive finishing operations. In remodeling, it hides pipes, cracks, all other eyesores. Labelled by Underwriters' Laboratories for installation *under* sprinkler systems!

Costs surprisingly little! Both initial cost and maintenance costs are less than for conventional ceilings with the same illumination and sound correction. Mail coupon for FREE booklet giving more information.

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Please rush me a copy of FREE illustrated booklet about Acusti-Luminus Ceilings.

NAME_____ TITLE_____

FIRM_____

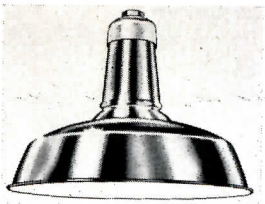
ADDRESS_____

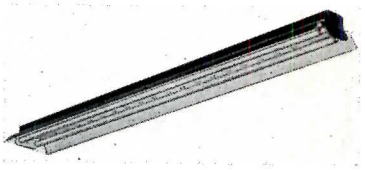
CITY_____ ZONE_____ STATE_____

(*Continued from page 196*)

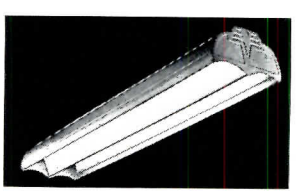
Fixture: *Sunbeam RLM Industrial*
Description: *Shielded, open-trough, ventilated luminaire*
Construction: *Steel with enameled reflecting surfaces; translucent plastic end baffles*
Mounting: *Continuous or single; chain suspension*
Light Distribution: *10% up, 90% down*
Lamps: *2 per unit; 48" fluorescent*
Manufacturer: *Sunbeam Lighting Co., 777 East 14th Pl., Los Angeles 21, Calif.*

Fixture: *Wheeler Solid Neck Reflector*
Description: *One-piece reflector*
Mounting: *Single; pendant, side outlet or outlet box*
Lamps: *Incandescent*
Maintenance: *No disassembly necessary for cleaning*
Manufacturer: *Wheeler Reflector Co., Boston, Mass.*



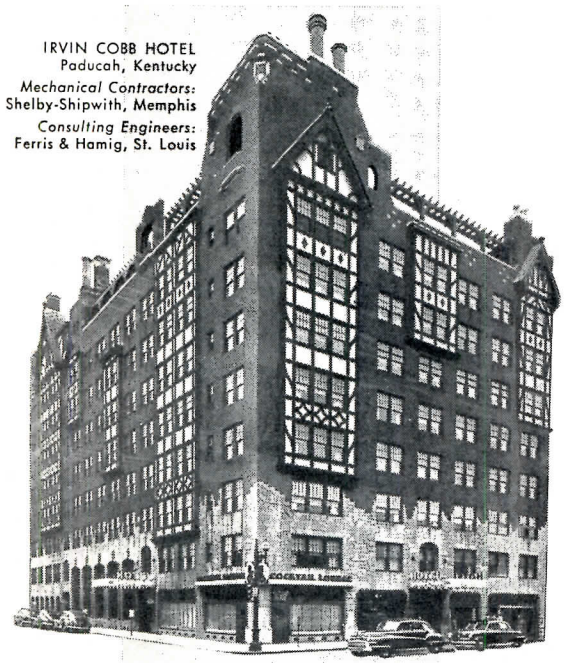


Fixture: *Sun-Lite "Airlux"*
Description: *Shielded, open-trough, ventilated luminaire*
Construction: *Steel reflecting surfaces finished in white porcelain enamel*
Mounting: *Continuous or single; chain or clamp-type hanger suspension*
Light Distribution: *Uplight and downlight*
Lamps: *2 per unit; 40W or 90W fluorescent, Slimline*
Maintenance: *"Saftee End" provides socket protection, easy removal of lamps for cleaning*
Manufacturer: *Sun-Lite Mfg. Co., 2501–2555 Bellevue Ave., Detroit 7, Mich.*



Fixture: *Solarlite "Dean"—1260*
Description: *Shielded, open-trough, ventilated luminaire*
Construction: *Heavy-gauge steel; reflecting surfaces finished in white baked enamel*
Mounting: *Single or continuous; suspension, surface mounting, recessed*
Lamps: *2 per unit; 40W fluorescent*
Dimensions: *Length—60⅛"*
Width—12"
Height—6⅝", 6⅞", 8"
Shielding—40°
Manufacturer: *Solar Light Manufacturing Co., 1357 S. Jefferson St., Chicago 7, Ill.*

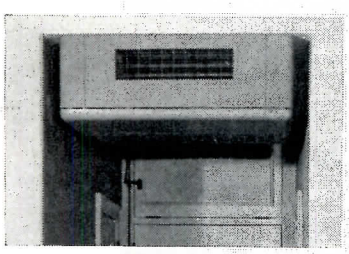
(*More Industrial Lighting on page 204*)



IRVIN COBB HOTEL
Paducah, Kentucky
Mechanical Contractors:
Shelby-Shipwith, Memphis
Consulting Engineers:
Ferris & Hamig, St. Louis

All Guests Enjoy Special "Room Service" at the Famous Irvin Cobb Hotel

Air Conditioned Comfort with Marlo Seazonaire Units



There are many reasons for the popularity of the Irvin Cobb Hotel in Paducah, Kentucky: a pleasant welcoming atmosphere, handsomely appointed surroundings, fine food—and the wonderful comfort of Marlo air conditioning.
In every suite, a Marlo Seazonaire Remote Room Unit provides summer coolness and winter warmth *controlled by the guest himself* to suit his individual preference.
Quiet operating Seazonaire units, easy and economical to install with simple piping and without elaborate ductwork, provide a modern, effective answer to air conditioning problems.
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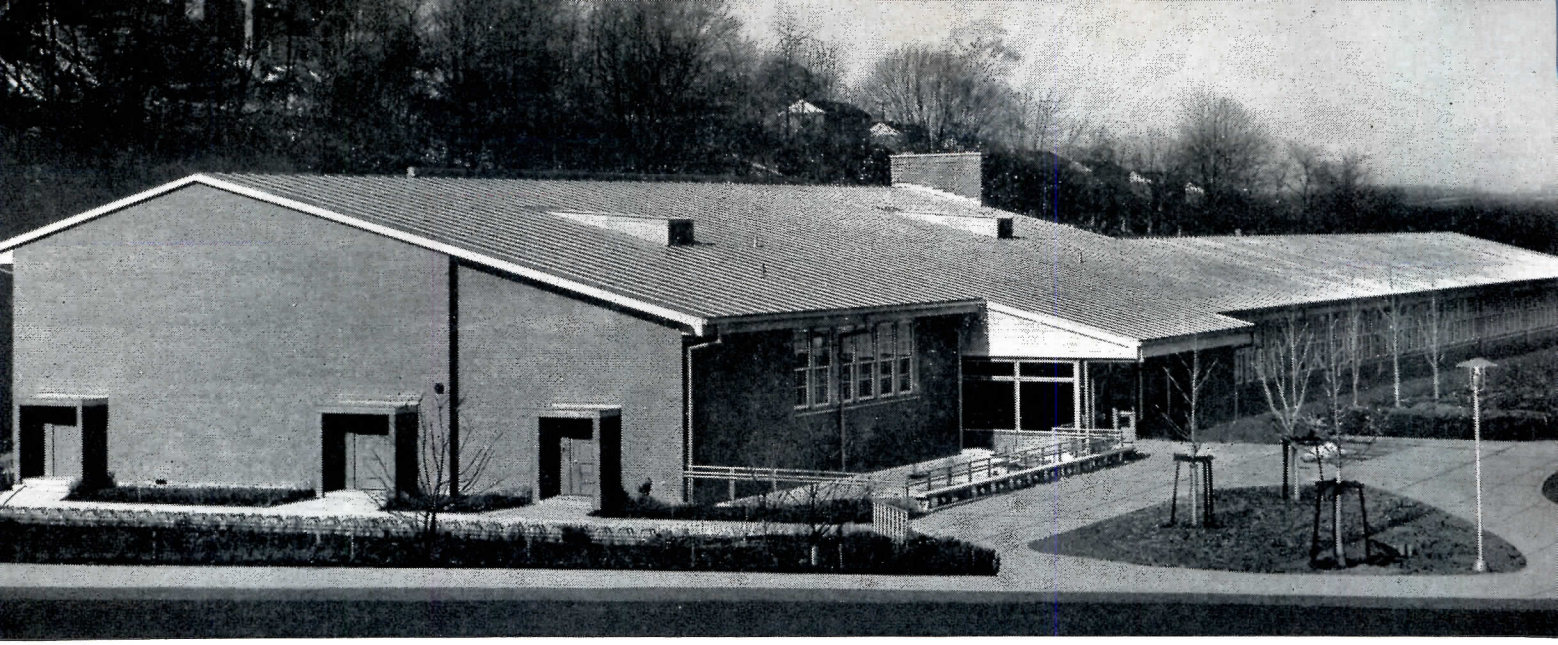

THE ROOF of the new Walnut Grove School, West Mifflin Borough, Allegheny County, Pa., is USS Stainless Steel. Architects: Button and McLean, Pittsburgh, Pa. Contractor: Nicholas LeDonne, Clairton, Pa. Roofing contractor: Limbach Company, Pittsburgh.

New Walnut Grove School has a maintenance-free roof of Stainless Steel

● The school board of West Mifflin Borough, Allegheny County, Pennsylvania, took care of roof maintenance almost permanently when the new Walnut Grove School was built. They did it by specifying a roof of long-lasting USS Stainless Steel.

The roof is approximately 385 feet long and 75 feet wide. The Stainless Steel roofing panels have a satin-type architectural finish. They are of 26-gage material fabricated into a standing seam panel 27⅜" wide by 12 feet long.

Stainless Steel's superior corrosion resistance, combined with its almost complete freedom from maintenance, fits it for years and years of satisfactory service. It has excellent reflective properties, and features needed strength with light weight.

The Stainless Steel roofing sheets are laid on double-coated, 35 pound asbestos felt. Each cross seam is caulked and the roofing is locked into the Stainless Steel gutter. Gutters and downspouts are of 22-gage Stainless Steel, architectural finish.

In addition, all attachments, supports, hanger bars, bolts and screws are Stainless Steel.

Stainless Steel is finding wide favor with school architects, not only for roofing, but for exterior walls as well, when used in the form of insulated panels. Of course, its wonderful possibilities for interior trim are also being used to advantage.

If you have a new school in the planning stage, now is the time to think in terms of Stainless Steel and its many benefits. And think in terms of perfected, service-tested USS Stainless Steel. For more information, mail the coupon below. If you like, we will be pleased to have one of our representatives call.

INSTALLING the standing-seam USS Stainless Steel roof on the new Walnut Grove School. The roof was laid on double-coated asbestos felt with each cross seam carefully caulked before the upper sheet was installed.

United States Steel Corporation
Room 4368, 525 William Penn Place
Pittsburgh 30, Pa.

Please send me information on architectural use of Stainless Steel.

Name.....Title.....

Address.....

City.....State.....

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USS STAINLESS STEEL

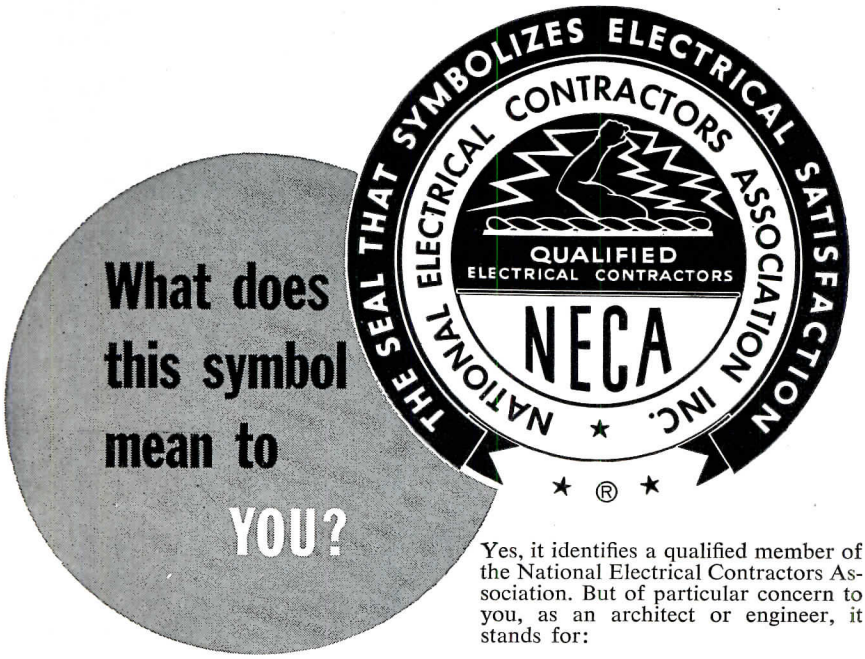
SHEETS • STRIP • PLATES • BARS • BILLETS USS TRADE MARK PIPE • TUBES • WIRE • SPECIAL SECTIONS

4-1069

UNITED STATES STEEL

(*Continued from page 200*)

Fixture: *Acusti-Luminus Ceiling*
Description: *Corrugated plastic sheets suspended below lamp level*
Mounting: *Sheets rest on narrow runways*
Lamps: *48" and 96" Slimline T12*
Maintenance: *Sheets removable for cleaning and for access to lamps*
Manufacturer: *Luminous Ceilings Inc., 2500 W. North Ave., Chicago 47, Ill.*



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2. **INTERPRETIVE ENGINEERING,** to interpret your plans accurately on the job, produce the results you plan for.
3. **TRAINED MANPOWER,** an adequate pool of craftsmen, thoroughly trained from apprenticeship up, for any size job.
4. **COMPETENT SUPERVISION,** by men who know electrical products, practices, standards and codes.

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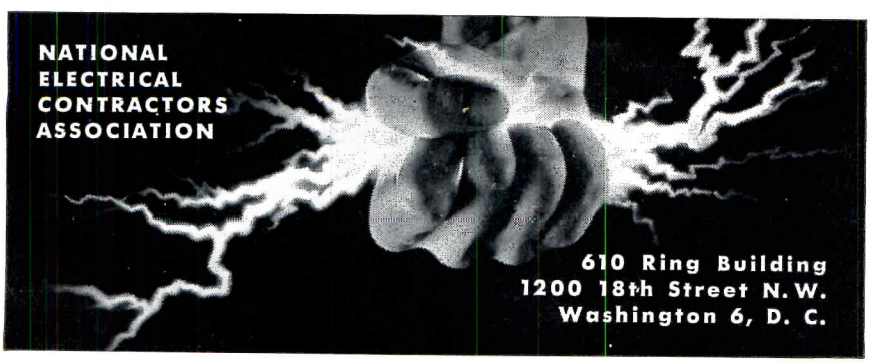
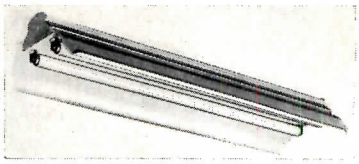
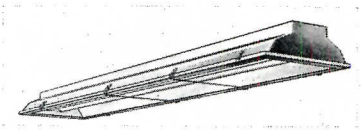
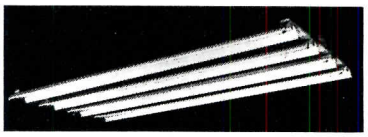




Fixture: *Great Northern Model IT-240*
Description: *Shielded, open-trough luminaire*
Construction: *20-gauge steel; reflecting surfaces finished with white baked enamel with reflectance of 89%*
Mounting: *Continuous or single; surface or suspension*
Lamps: *2, 3 or 4 per unit; 40W or 85W fluorescent*
Maintenance: *Drop reflector removable for cleaning; knockouts in reflector for third lamp*
Dimensions: *Length—49½", 62¼"*
Width—14", 16"
Height—7", 8⅛"
Manufacturer: *Great Northern Mfg. Corp., 1056–8 N. Wood St., Chicago 22, Ill.*



Fixture: *Solux "Vapor-Tite" Industrial Unit*
Description: *Shielded, glass-enclosed, vapor-tight luminaire*
Construction: *Steel reflecting surfaces finished in porcelain enamel*
Mounting: *Surface or suspension*
Lamps: *Rapid start, Slimline or standard fluorescent*
Maintenance: *Glass plate can be unclamped for cleaning*
Manufacturer: *Solux Corp., 1338 Inwood Ave., New York 52, N. Y.*

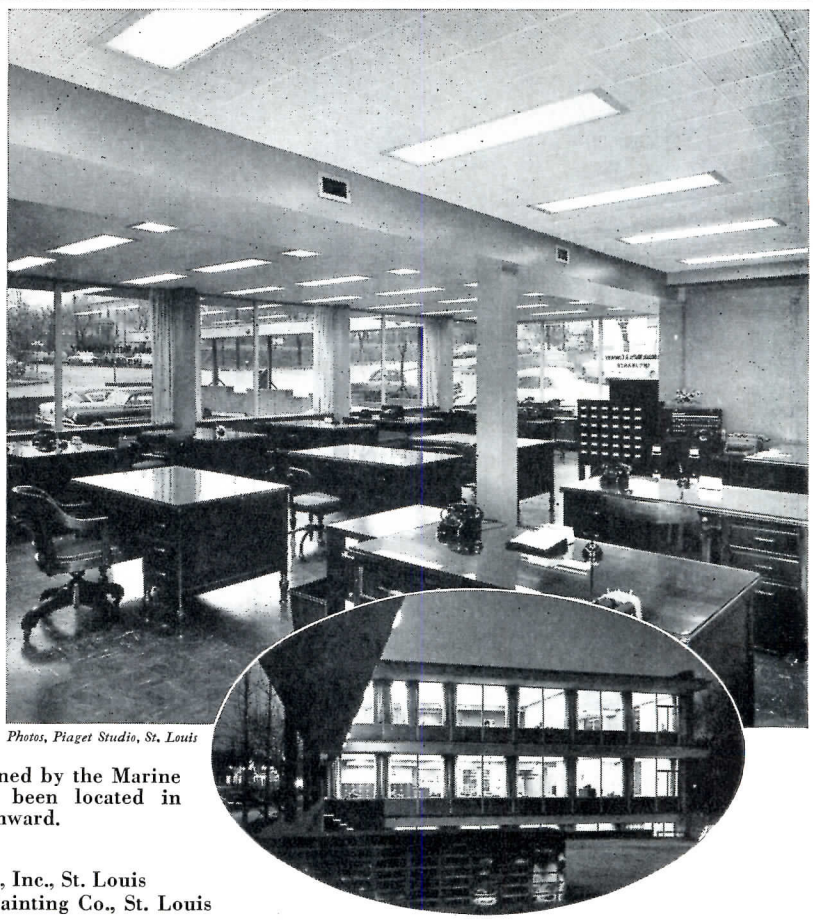


Fixture: *Supreme Industrial Fixture*
Description: *Shielded, open-trough, multi-reflector luminaire*
Construction: *White reflecting surfaces in groups of four per unit*
Mounting: *Continuous or single; surface or chain, cable or rod suspension*
Lamps: *2 or 4 per unit; fluorescent*
Dimensions: *Length—4', 6' and 8'*
Manufacturer: *Supreme Lighting Co., 600 E. Turner St., Los Angeles 12, Calif.*

(*General Products on page 208*)

PRATT & LAMBERT PAINT

in a "Country Home" for a City Business



Photos, Piaget Studio, St. Louis

The Ploeser-Watts Building, Clayton, Mo., owned by the Marine Underwriters Corporation which had long been located in downtown St. Louis before moving suburbanward.

ARCHITECT: Hari Van Hoefen, St. Louis
GENERAL CONTRACTOR: H. B. Deal & Co., Inc., St. Louis
PAINTING CONTRACTOR: L. E. Pauling Painting Co., St. Louis

Here is a fine example of the spacious, open existence a busy office can enjoy when it forsakes the city's congestion and moves to the suburbs. It's a fine example, too, of the part that Pratt & Lambert is playing in supplying an artistic and durable finishing touch for modern construction — whether industrial, commercial, institutional or residential.

The recognized quality of Pratt & Lambert Paints, Varnishes, Stains and Enamels is your assurance of trouble-free satisfaction whenever you specify them. Your nearest P&L Architectural Service Department is always on call to help you select appropriate P&L products for your specific needs—and to assist in color planning if you desire this additional co-operation.

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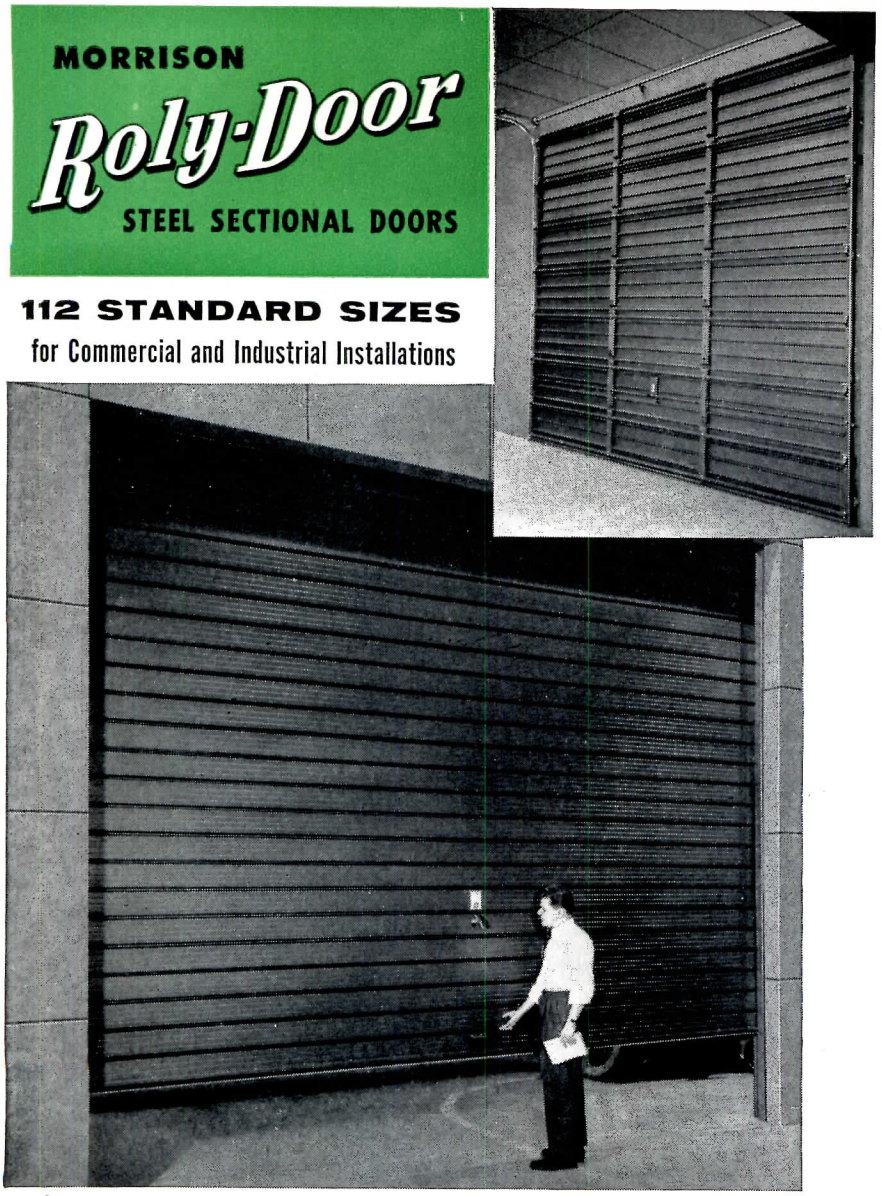
112 STANDARD SIZES
for Commercial and Industrial Installations



You can confidently specify Roly-Doors for every commercial or industrial building you design. Their clean, modern, distinctively simple lines blend with any style of architecture . . . their functional design ensures safe, easy, trouble-free installation and operation (manual or electrical) . . . and their all-steel construction provides a durability that defies weather and years of hard use. Available in 112 standard sizes, there's a Roly-Door for every overhead door requirement.

And, Roly-Doors cost no more than ordinary wood or metal doors for the same purpose.

WRITE TODAY for the Roly-Door Technical Data File. It will give you complete information on all Roly-Doors' unique features . . . their sectional design and construction . . . the reasons for their durability and ease of operation . . . Morrison's nation-wide sales and service organization . . . and the many other features that will enable you to fit Roly-Doors into *any* of your plans. For commercial or industrial buildings, specify Roly-Doors.

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AIA PRODUCTS

(*Continued from page 204*)

AIR CONDITIONERS

• The *Modine Airditioner* is available in three sizes with nominal cooling capacities of ⅔, 1¼ and 2 tons. With square edges at junctions of top and sides, the unit can be either fully exposed or recessed up to 5 in., with less than 6 in. protruding into the room. Chilled water is used for cooling, hot water for heating. Each unit is served by only three pipes: water supply, water return and drain. *Modine Manufacturing Co., 1802 Junction Ave., Racine, Wis.*

• The *Worthington Year-Round Home Air Conditioner* provides heating, cooling, humidification, filtering, dehumidification, ventilation and air circulation, with control from one centrally located thermostat. Offered in both 2- and 3-ton sizes with either oil- or gas-fired furnaces, the new unit requires only 8½ sq ft of floor space and can pass through a standard 30-in. doorway. It can be installed in a garage, in a basement or in a utility closet for homes without basements, and it can also be installed in an older house equipped with a warm-air heating system for utilizing the existing ductwork. *Worthington Corp., Harrison, N. J.*

• The *Yorkaire Sealed Circuit Conditioner*, with hermetically sealed refrigerating system, can be used in conjunction with a forced warm-air heating plant. Designed to meet the needs of most types of residential installation, this air conditioner can be used with new or existing duct systems. *York Corp., York, Pa.*

• The *Broadway Maintenance Corp. Rental Plan* offers a rental contract for installation and maintenance of an air-conditioning and/or heating system for a fixed charge over a 5-year period. Since the customer has an option of either rental or outright ownership, there is no incentive, according to the supplier, to underbid an installation for profit only to lose it on high maintenance costs if the customer should elect the rental plan. *Broadway Maintenance Corp., Long Island City, N. Y.*

(*Continued on page 210*)

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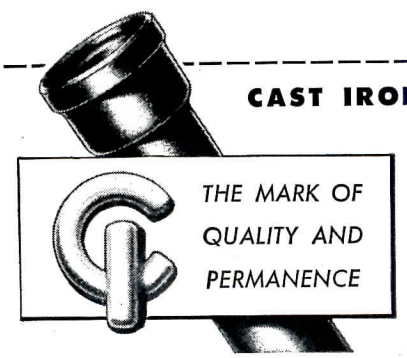
FOR ARCHITECTS WHO RECOMMEND BETTER MATERIALS

Here is a 12-page, 8½ by 11 booklet that shows in photographs and printed facts exactly how **Cast Iron Soil Pipe** contributes to lasting satisfaction when used for soil, waste and vent lines and for house sewers. What can happen to non-metallic materials is also shown in picture and authenticated captions. Here is printed salesmanship to back up the quality and permanence story you are constantly telling your clients. Use the coupon at the right to order your advance copy immediately.



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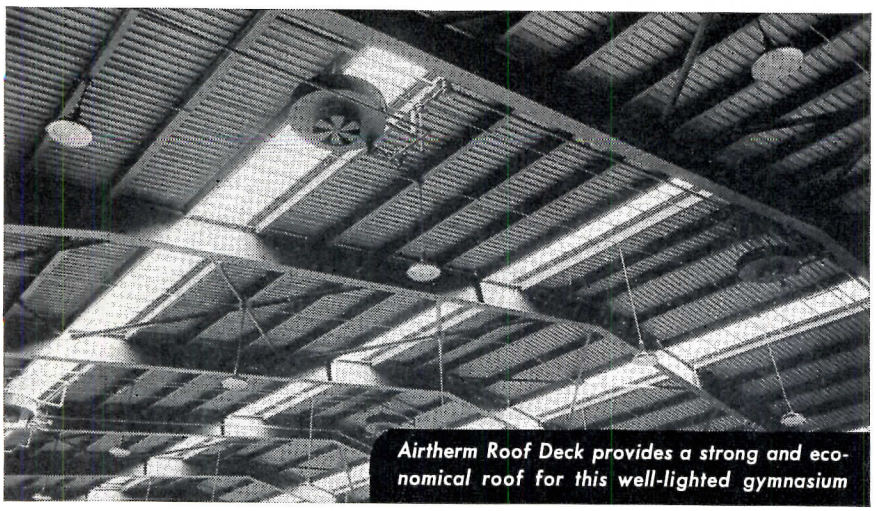
USE PERMANENT CAST IRON SOIL PIPE AND FITTINGS

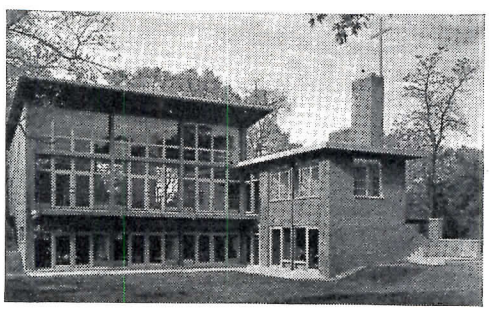
WIDER
Airtherm ROOF DECK



Airtherm Roof Deck provides a strong and economical roof for this well-lighted gymnasium

designed for a wide range of applications

Airtherm Steel Deck Sheets are furnished in 30″ widths (the widest in the industry) with five ribs spaced on 6″ centers. These ribs, 1⅝″ deep, have a bearing surface of ⅝″ and a top opening of only ¾″ wide. These wider, self-aligning sheets mean fewer longitudinal laps with resultant savings in construction time and costs.



In this church the attractive appearance of painted Airtherm Roof Deck adds functional beauty to the clean design

Airtherm Decking provides a strong, safe and durable steel roof in flat, pitched or arched construction. It has been proved in installations as side walls, partitions, canopies, and as a sub-base for concrete or aggregate flooring. This versatility, plus its attractive appearance, has led to many unique applications in a wide range of structures.

18-GAUGE AIRTHERM ROOF DECK	PROPERTIES
Section Modulus (in.) 3	.220
Moment of Inertia (in.) 4	.263
Resisting Moment (in lbs.)	3960

To care for all contingencies relative to geographical areas and various purlin spacing, Airtherm Decking is also manufactured in No. 22 Gauge and No. 20 Gauge metal thicknesses.

FABRICATED PRODUCTS DIVISION
Airtherm MANUFACTURING COMPANY
747 South Spring Avenue
St. Louis 10, Missouri

See our catalog in S or write for copy

For more complete information consult our catalog in Sweet's 2dAi, or write . . .

Member: Metal Roof Deck Technical Institute

AIH PRODUCTS

(*Continued from page 208*)

HEATERS

• The *Reznor twin-fan gas-fired unit heater*, operating from a single heavy-duty ¼-hp motor, moves 3200 cfm with an air throw of 83 ft. The smaller fans provide more effective air distribution at a much lower noise level than can be obtained with a single larger fan, says the manufacturer. The cabinet of the new heater is 36 in. wide and 24⅝ in. deep, with free access through the bottom. *Reznor Manufacturing Co., Mercer, Pa.*

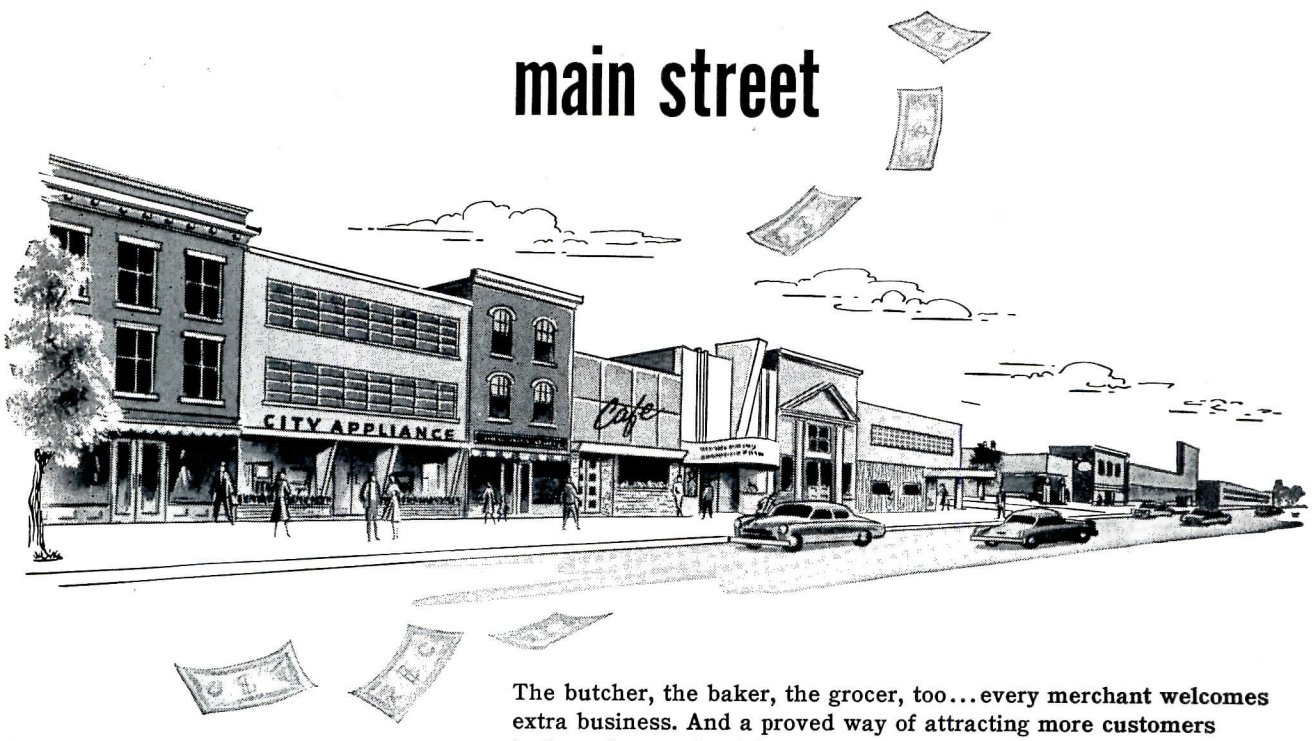
• The *Vacuum Ashaway*, which removes anthracite ash automatically by means of a vacuum principle, eliminates, according to a statement from the Coal Consumers Protective Assn., "the last barrier to the completely automatic use of hard coal." The system breaks the anthracite ash into tiny particles and siphons it through a sealed tube to a container outside the house. A motor-driven vacuum turbine located at the outside ash receptacle provides vacuum which draws ash from the boiler. It can be used in both automatic and hand-fired furnaces. *The Lehigh Valley Coal Sales Co., 90 West St., New York, N. Y.*

• *Steam-Pakette*, a low cost steam generator for small commercial applications, comes in sizes ranging from 15 to 30 hp for high pressure (125 lb) steam application. It can be used with light fuel oil, gas or combination firing of either oil or gas. The change from one fuel to the other is accomplished by throwing a single switch. The units, are 40 in. wide, 58⅝ in. high and 85⅜ in. long. *York-Shipley, Inc., York, Pa.*

• *CB*, a new self-contained boiler for processing or heating, steam or hot water use, is claimed to give more boiler use in the space normally required for boilers with long burner frames. The silent operating unit burns gas and oils and is easily converted from one fuel to the other. Now available in sizes of from 15 to 80 hp, the manufacturer expects to produce the units in 50- to 80-hp sizes shortly. *Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee, Wis.*

(*Continued on page 214*)

there's money in modernizing on main street



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The butcher, the baker, the grocer, too... every merchant welcomes extra business. And a proved way of attracting more customers is through a modernizing program.

And, you can sell more remodeling jobs when you use Masonite Presdwood. This modern material enables you to achieve better results at lower cost. There are 33 types and thicknesses of this famous hardboard, and you can get just the one you want for practically any modernization problem.

We have just prepared a series of plans that show how eleven different types of stores can be made attractively modern with Presdwood®.

May we send you this set at no obligation? It will be helpful in talking to your prospects. Just send the coupon.

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"Masonite" signifies that Masonite Corporation is the source of the product

I'm interested. Please send me your set of eleven folders on Commercial Modernization.

Name.....

Firm.....

Address.....

Town.....Zone.....

County.....State.....

(*Continued from page 210*)

DIFFUSER

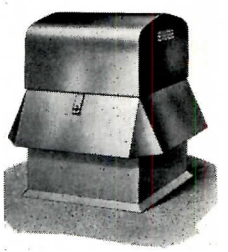
• A new air diffuser, the *Linear Multi-Vent* panel features out-of-sight installation, smudge-free operation and low-cost installation. Designed for use in *the Acousti-Line* ceilings, the panels are supplied with flexible, compressible tubing, which reportedly eliminates close-fitting sheet metal work. *The Pyle-National Co., 1334 N. Kostner Ave., Chicago 5, Ill.*

COOLING TOWER

• A line of propeller-fan type cooling towers for residential and commercial air conditioning applications is available in a capacity range from 2 to 15 tons. The towers are covered with special coatings which the manufacturers claim assure all-weather protection. Standard motors are 110 volt, single phase, 60 cycle. Motors, fans and drives are of sufficient capacity to handle average ductwork for indoor installation if desired. *Bush Manufacturing Co., West Hartford, Conn.*

ROOF VENTILATOR

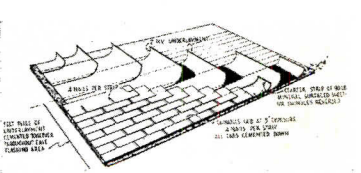
• The *Ejectair Power Roof Ventilator* is belt-driven and has a blower wheel which, according to the manufacturer, cannot be overloaded regardless of length or curves in the duct or variation in design. All ventilators are tested according to Plate IV of the NAFM code for centrifugal and axial flow fans to assure capacity ratings. With weatherproof, corrosion-resistant housing, the unit can be installed by mounting on built-up curb on roof. *Hayes Furnace Manufacturing & Supply Co., 2929 S. Fairfax Ave., Los Angeles 16, Calif.*



Power roof ventilator is belt-driven

SHINGLES ON LOW-SLOPE ROOFS

• An application method for asphalt strip shingles on roof decks with slopes as low as 2 in. per ft has resulted from 18 months of research by the Asphalt Roofing Industry Bureau. Application of 3-tab, square-butt asphalt shingles to roof decks having slopes of less than 4 in. per ft but not less than 2 in. per ft calls for an underlayment of two full layers of No. 15 asphalt saturated felt over the entire roof deck. In low-temperature areas, the two layers of felt underlay are cemented together along the eaves to form a flashing strip. Four nails are specified for each strip shingle, and all shingle tabs are cemented down.



Shingles are applied over double underlay on low-slope roof deck

For slopes of 4 in. or more, previous specifications apply. Complete specifications may be obtained from the *Asphalt Roofing Industry Bureau, 2 W. 45th St., New York 36, N. Y.*

(*Continued on page 218*)

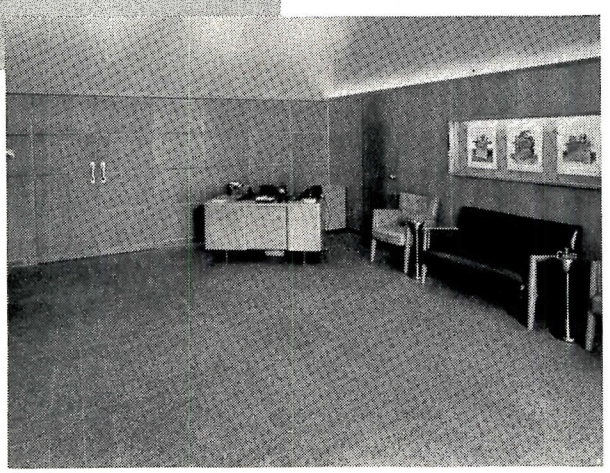
Make Your Walking Surfaces *Safe*

NON-SLIP, WET OR DRY

IN THE OFFICE

ALUNDUM® AGGREGATE in Terrazzo

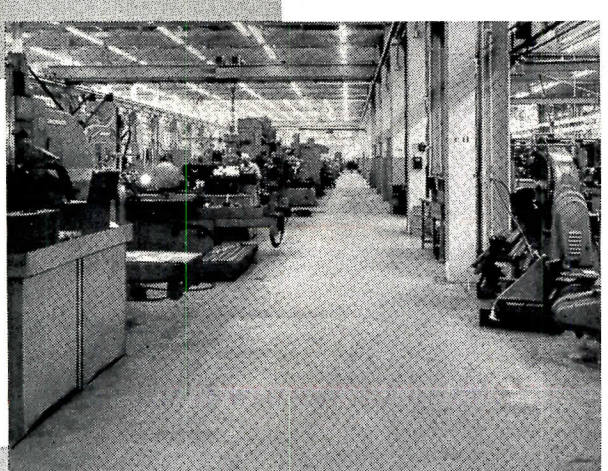
Provide attractive appearance as well as safety — throughout the office — in all areas where ordinary floors would be slippery, especially when wet. Use terrazzo made non-slip by ALUNDUM® Aggregate in the entrance lobby, in hallways, stairs, washroom, cafeterias and countless other places.



IN THE PLANT

ALUNDUM® AGGREGATE in Cement

Give your factory floors maximum resistance to wear as well as a surface that is non-slip wet or dry. ALUNDUM® (C.F.) Aggregate in cement is ideal for floors, stairs and ramps wherever there is heavy traffic — foot or truck. Ideal for use in areas where water would make ordinary floors slippery.



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CINCINNATI, OHIO
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CLEVELAND, OHIO
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C. W. Hutchinson, Inc.,
Mr. C. W. Hutchinson

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Mr. O. H. Fateley

JACKSON, MISSISSIPPI
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Mr. T. J. Kainz

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Walton Viking Co.,
Mr. J. E. Johnson

LOS ANGELES, CALIF.
California Viking Sprinkler Co.,
Mr. R. L. Thorsdale, Jr.

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Mr. L. D. McCraw

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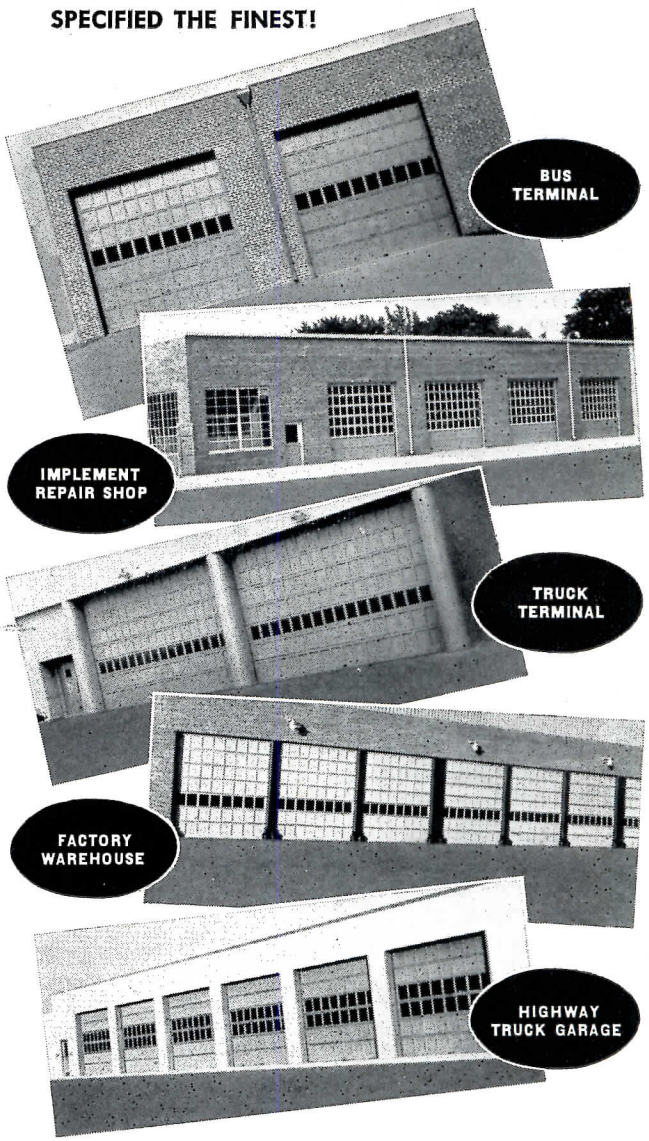
OF KNOWING YOU HAVE SPECIFIED THE FINEST!



Raynor engineering and exclusive Raynor design combine to produce a door "tailor-made" for the installation. Springs, hardware, sections—all are designed and fabricated to produce the ultimate in lasting door satisfaction and beauty.

As complete as it is efficient—the Raynor line of residential, commercial and industrial doors stands ready to fulfill your every door requirement.

We invite you to check your telephone directory or write direct for the name of your nearest Raynor representative.

SEE OUR CATALOG IN SWEETS

RAYNOR MANUFACTURING COMPANY, DIXON, ILL.

Builders of a Complete Line of Wood Sectional Overhead Doors

(*Continued from page 214*)

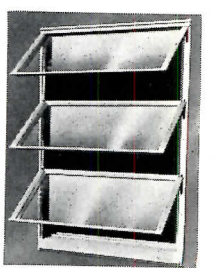
PREFABRICATED BRICK PANELS

• *Silbrico Brick Panels*, factory-made panels containing steel reinforcement, are delivered in sections and set from a truck on the foundation with facilities provided by the manufacturer. The brick panels have a diversity of applications, such as for cavity walls, load bearing walls, and curtain walls. The manufacturer reports that a test wall made of these panels — 8 ft 2 in. high by 2½ in. thick by 3 ft wide — withstood a load of 100,000 lb or 50 tons in compression. *Silbrico Corp., 5901 W. 66th St., Chicago 38, Ill.*

Pre-cast brick panels are stacked on truck and delivered to the job site

WINDOWS

• The *Gale City Aluminum Awning Window*, factory-glazed for delivery as a complete unit, features completely enclosed hardware and aluminum strip glazing. Compensating sash hardware automatically adjusts each sash for tight closure and prevents warping. The unit is completely weatherstripped with vinyl at jambs, sill and meeting rails. A hidden fixed hinge prevents rain from splashing in over the top vent when open. The manufacturer has announced that an electrically operated aluminum window will follow this crank-operated model. *Gale City Sash & Door Co., 15 S.W. Third Ave., P.O. Box 901, Fort Lauderdale, Fla.*



Aluminum awning window is factory-glazed for delivery as complete unit

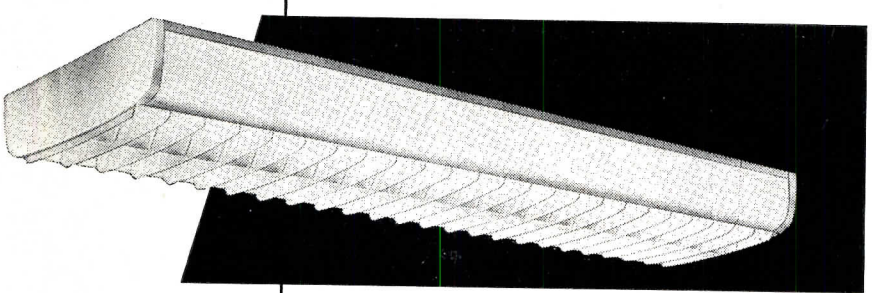
FREQUENCY CONVERTER

• A 5-kw *static frequency converter* that provides 360-cycle square-wave current at 600 volts for high-frequency operation of fluorescent lamps is available from the General Electric Co. Specialty Transformer Dept. Designed particularly for such applications as experimental and commercial plant growth rooms, television and radio stations, luminous ceilings and libraries, the converter increases light output and assists in lowering heat loss. Noise is reduced because the converter can be located remotely. The converter is 31 in. wide, 25½ in. deep, 55 in. high and weighs 1350 lb. A power factor correcting unit with the converter measures 14½ by 25½ by 13 in. and weighs 125 lb. *General Electric Co., Schenectady 5, N. Y.*

PIANO

• The *Steinway Centenary Grand Piano*, 5 ft 7 in. long, was designed by Walter Dorwin Teague. The lyre and leg caps are satin-finished brass and the finish is natural mahogany. *Steinway and Sons, 109 W. 57th St., New York, N. Y.*

it's new! it's shallow!



"The Garfield"
A&B 13000 SERIES

4 & 8 FT. LUMINAIRES FOR INDIVIDUAL OR END-TO-END MOUNTING

- The 2-lamp Garfield is a gracefully styled luminaire with long, low lines that give it a "built-in" look. Its 3⅞" depth makes it ideal for surface mounting on low ceilings—yet it is equally handsome when pendant mounted.
- Diffusing polystyrene side panels and 35° x 35° louver bottom result in a desirable brightness pattern. Closure type reflector with baked-on white finish assures highest efficiency.
- Open chassis construction makes the unit easy to install and maintain. Side panels slip into position; hinged louver opens or removes quickly.
- Unit is wired complete, ready to install in line or individually. Finished in all-white. U.L. listed.

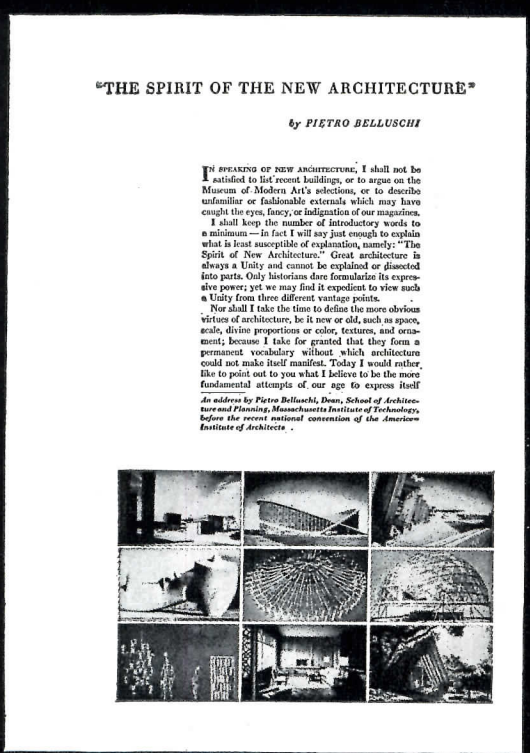
Write for Bulletin N
It gives complete specifications, dimensional drawings and engineering data for the Garfield.

PITTSBURGH REFLECTOR COMPANY
402 OLIVER BUILDING, PITTSBURGH 22, PA.

FLUORESCENT "Pittsburgh" Permaflector INCANDESCENT
Lighting

REPRESENTATIVES IN PRINCIPAL CITIES • WHOLESALERS EVERYWHERE

RECORD IN AMERICAN INSTITUTE COMPETITION



"THE SPIRIT OF THE NEW ARCHITECTURE"

by PIETRO BELLUSCHI

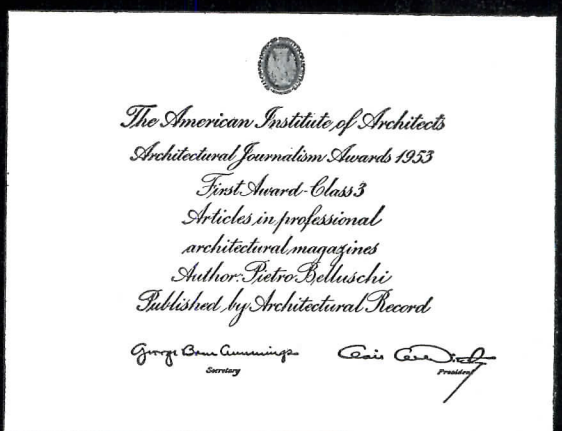
IN SPEAKING OF NEW ARCHITECTURE, I shall not be satisfied to list recent buildings, or to argue on the Museum of Modern Art's selections, or to describe unfamiliar or fashionable externals which may have caught the eyes, fancy, or indignation of our magazines.

I shall keep the number of introductory words to a minimum—in fact I will say just enough to explain what is least susceptible of explanation, namely: "The Spirit of New Architecture." Great architecture is always a Unity and cannot be explained or dissected into parts. Only historians dare formularize its expressive powers; yet we may find it expedient to view such a Unity from three different vantage points.

Nor shall I take the time to define the more obvious virtues of architecture, be it new or old, such as space, scale, divine proportions or color, textures, and ornament; because I take for granted that they form a permanent vocabulary without which architecture could not make itself manifest. Today I would rather like to point out to you what I believe to be the more fundamental attempts of our age to express itself

An address by Pietro Belluschi, Dean, School of Architecture and Planning, Massachusetts Institute of Technology, before the recent national convention of the American Institute of Architects.

FIRST AWARD
"Best article in a professional architectural magazine."



The American Institute of Architects
Architectural Journalism Awards 1953
First Award-Class 3
Articles in professional architectural magazines
Author: Pietro Belluschi
Published by Architectural Record

George Bain Cummings, Secretary — Clair W. Ditchy, President

WITH these two latest awards by a jury representing an audience which all architectural magazines are edited to serve, Architectural Record has now won a total of *twenty-nine awards for editorial excellence.*

More important—editorial excellence has won for Architectural Record and its advertisers the readership of the largest audience of architects and engineers ever assembled by an architectural magazine.

Architects and engineers consistently have voted Architectural Record their preferred magazine in **56 OUT OF 63 READERSHIP STUDIES SPONSORED BY BUILDING PRODUCT MANUFACTURERS AND ADVERTISING AGENCIES.**

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Architectural Record

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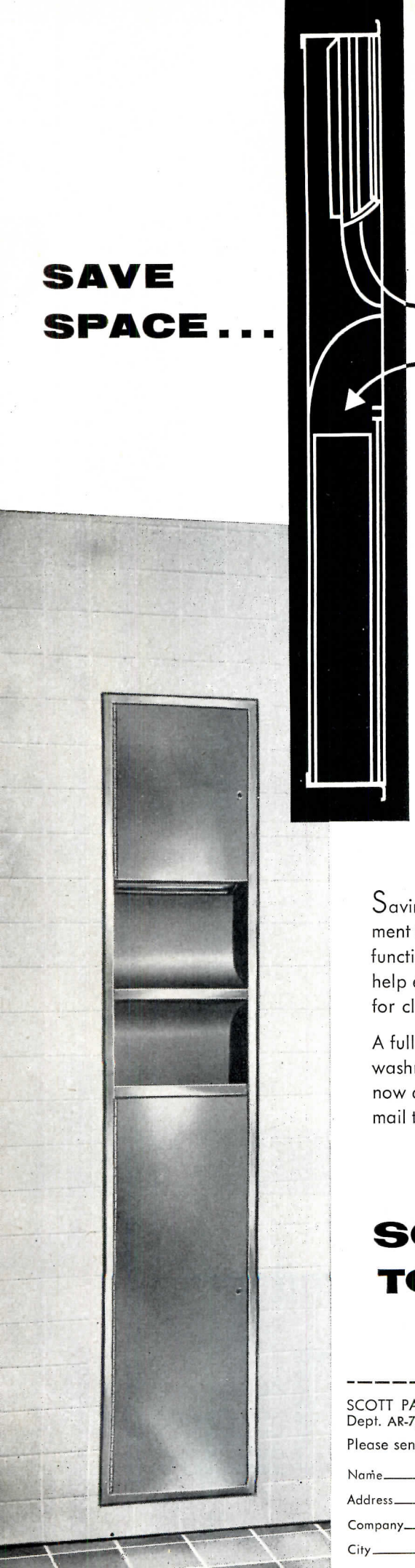

Saving space is an important element in washroom design. Modern, functional, Scott-designed Fixtures help eliminate traffic-jams—make for cleaner, easier maintenance.

A full-color booklet on functional washroom design and planning is now available. For your free copy, mail this coupon today.

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Symbol of the right kind of washroom

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Address_____

Company_____

City_____ State_____

AH LITERATURE

(*Continued from page 182*)

FURNISHINGS AND EQUIPMENT

• Bronze, aluminum and wrought iron church furnishings of contemporary design are illustrated in the *1954 Metal Furnishing Catalog*. 32 pp, illus. *Church Supply and Service Co., 25th at Division St., Melrose Park, Ill.*

• *Catalog EC-2, The Educational Laboratory* shows standard sectional units for school laboratories and a variety of specialized units and table top materials. Included is a "Multi-Purpose Table" of wall base cabinets and storage units, both closed and open types, for maximum student accommodations within available floor and wall spaces. A complete line of service fixtures is described. 16 pp, illus. *Metalab Equipment Corp., 214 Duffy Ave., Hicksville, L. I., N. Y.*

• *Salterini Catalog No. 38* describes a line of furniture featuring *Neva-Rust* for dining room, living room, outdoor living and bedrooms. Actual swatches of the materials used for upholstering and samples of the finishes available are included in the back of the book. 41 pp, illus. *John B. Salterini Co., Inc., 510 E. 72 St., New York 21, N. Y.*

ACOUSTICAL CEILINGS

• *Acusti-Luminus Ceilings* includes five easy steps for luminous ceiling layout, a table of coefficients of utilization and formulas, a diagram of air conditioning and heating with the product, as well as diagrams and instructions for the installation of Acusti-Luminous Ceilings. 4 pp, illus. *Luminous Ceilings, Inc., 2500 W. North Ave., Chicago 47, Ill.*

• *Loxit Acoustical Systems, Catalog A.C. 1954* illustrates and gives typical specifications for three *Loxit Victory* acoustical suspension systems. Also included is an explanation of Loxit Acoustical Wall Trim (AC-380). 4 pp, illus. *Loxit Systems, Inc., 1217 W. Washington Blvd., Chicago 7, Ill.*

• *Simplex Radiant Panel Acoustical Ceilings* covers materials, finish, layouts and work required for installation of ceilings combining air conditioning and noise softening. 4 pp, illus. *Simplex Ceiling Corp., 552 West 52nd St., New York 19, N. Y.*

(*Continued on page 226*)

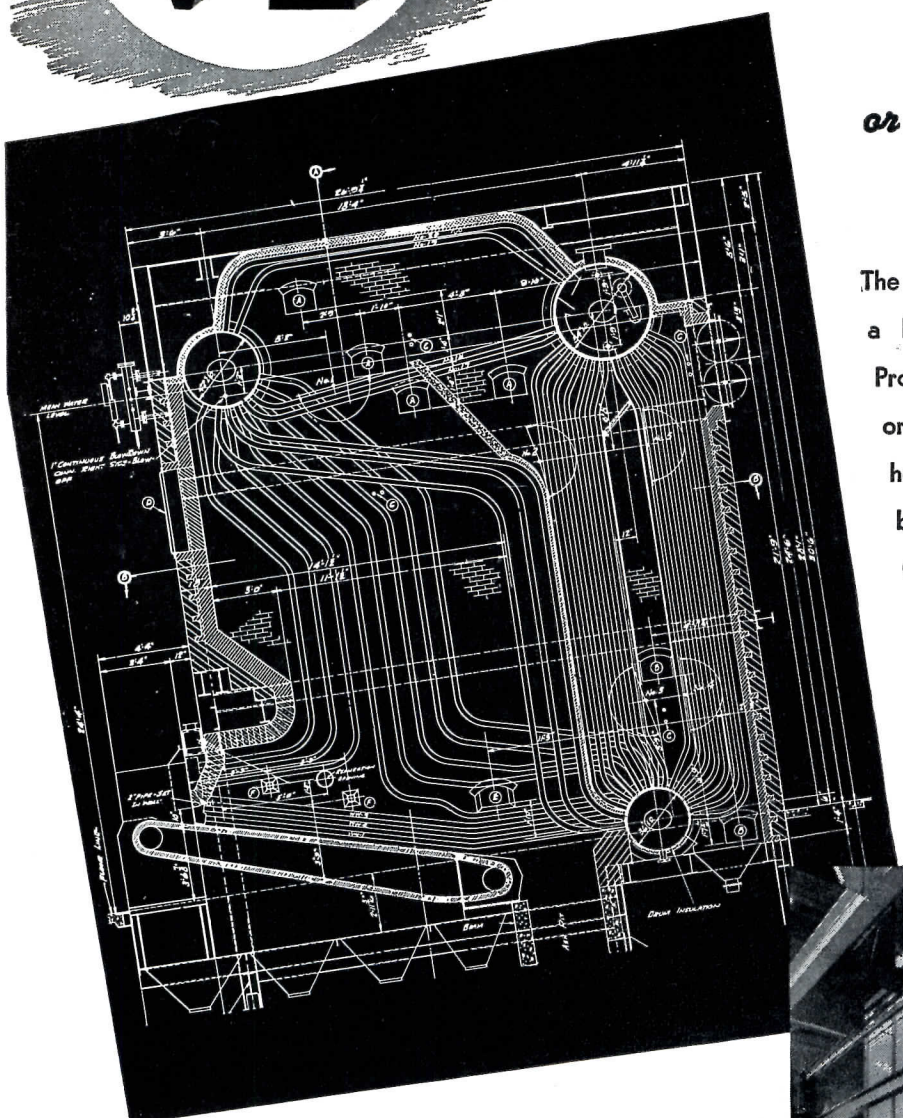
CLASS VL

Vogt

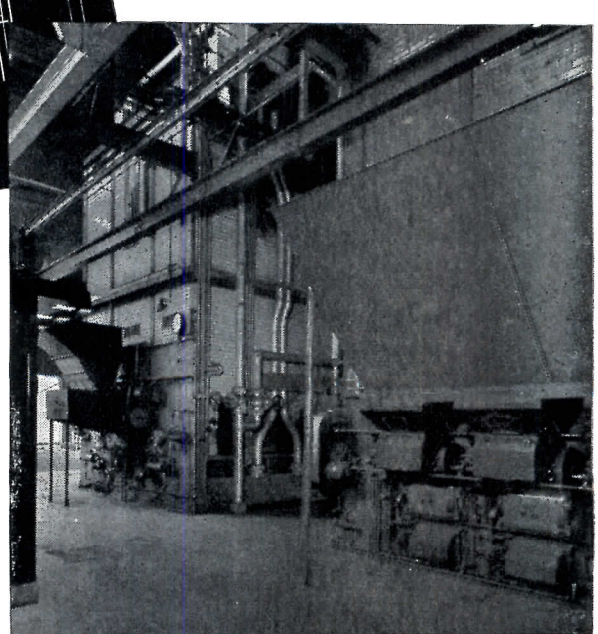
Steam Generating Units

for POWER *or* PROCESSING LOADS, *and* HEATING

The design provides large furnace volume and a high ratio of radiant heating surface. Proper combustion is assured with any fuel or method of firing. Superheaters, air preheaters, economizers, water walls, and soot blowers can be readily incorporated. Vogt Class VL Steam generating units are giving satisfactory service in Hotels, Sugar Refineries, Steel Mills, Furniture Factories, Distilleries, Oil Refineries, and related industries. A bulletin showing typical installations will be sent upon request.



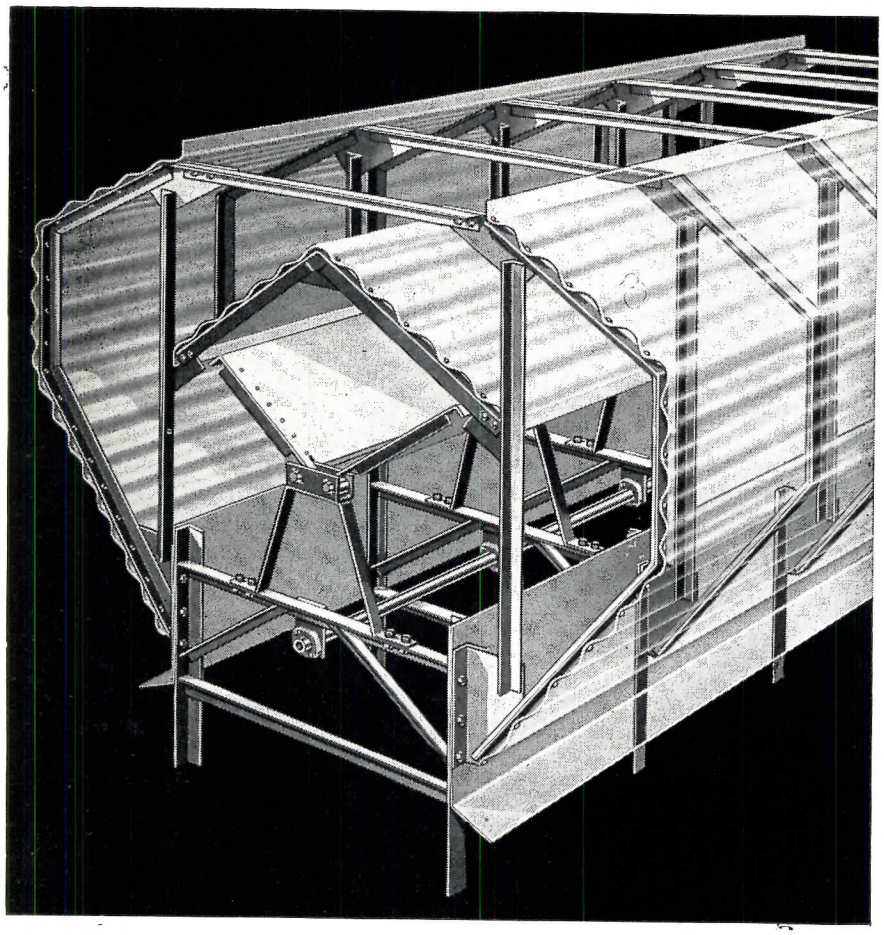
Above:
This 90,000 lbs. steam per hour unit, designed for 475 lbs. pressure, serves the Mansfield Tire & Rubber Co., Mansfield, Ohio.



Right:
Two 515 H.P. units installed in Brown-Forman Distillers Corporation, Louisville, Ky. Plant.

HENRY VOGT MACHINE CO. • 1000 W. Ormsby St., Louisville 10, Ky.
Branch Offices: New York, Philadelphia, Cleveland, Chicago, St. Louis, Dallas

WHERE HIGH HEAT OR FUMES REQUIRE LARGE EXHAUST VOLUME GET MOST AIR PER DOLLAR WITH



BURT MONOVENT

The Burt Monovent Continuous Ridge Ventilator converts the entire roof ridge to a gigantic, quick-acting air valve. It exhausts air at the highest point for greatest efficiency. It vents air uniformly along the entire length of the building. Its appearance is pleasing and its simple, heavy construction assures long, trouble-free life with little maintenance. Standard sizes from 4″ to 96″ handle practically any structure. See Sweet's for complete data or write for Burt Monovent Bulletin SPV-6.

FAN & GRAVITY VENTILATORS • LOUVERS • SHEET METAL SPECIALTIES

The Burt Manufacturing Company

48 East South Street, Akron 11, Ohio

MEMBER POWER FAN MANUFACTURERS ASSOCIATION

A.I.A. LITERATURE

(*Continued from page 222*)

CLAY PRODUCTS

• A pocket size, spiral-bound catalog has been prepared by the *Superior Clay Corp.* to describe its complete line of vitrified clay pipes, fittings, flue lining, wall coping, septic tanks, liner plates, chimney tops and related clay products. Completely illustrated, the catalog is indexed for reference. 62 pp, illus. *S. G. McClave, Superior Clay Corp., Uhrichsville, Ohio.*

WALL TRIM AND COVERINGS

• *Drywall Trim's Big "4"* describes square hemmed edge guard, square wrap-around edge guard and round edge guard for window and door casings and corner guard for external wallboard corners. 4 pp, illus. *Drywall Trim, Inc., 2408 N. Farwell Ave., Milwaukee 11, Wis.*

• *Bolta-Wall, A.I.A. File No. 28-C* is a file folder in which are included several folders describing Bolta-Wall coverings, their uses, specifications, report of tests and a list of retail stores in the U. S. and Canada that carry the product. Samples of colors and patterns are enclosed in the folder. *Bolta Products Sales, Inc., Building Materials Div., Lawrence, Mass.*

WALL SYSTEMS

• Alcoa's *Architectural Achievement Series* has been started with four file folders giving specifications and details of the wall systems used in the 99 Park Ave. Building, New York; the Wyatt Building, Washington, D. C.; Bradford Hospital, Bradford, Penna.; and the Fort Couch School, Allegheny County, Penna. A new folder will be available every month featuring a project, completed or under construction, that makes use of aluminum. *Aluminum Company of America, Pittsburgh 19, Penna.*

DISPLACEMENT CAISSONS

• *Franki Foundation Company* describes Franki Displacement Caissons, which are defined as a means of pressure-injecting spread footings into soil. Installation methods, requirements for design, tests and results at various job locations throughout the world are covered in this 12 pp, illus. booklet. *Franki Foundation Co., 114 E. 40th St., New York 16, N. Y.*

(*Continued on page 230*)

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on the
BIG TRUTH
about boilers

Out of 86 years of experience in designing and building quality steam generating equipment comes one of the most revealing reports ever written on boilers. We at Kewanee make that statement because these findings are based on fact and truth . . . on careful search and engineering exploration. In it we present:

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RESERVE PLUS RATING

Here you will discover a way to judge boilers so you can be sure of the lowest operating cost—highest efficiency —greatest dependability—maximum flexibility—longer boiler life. You will learn how to eliminate confusion in considering boilers . . . know how to compare like examples and not be misled by vague technical claims. You can be SURE you have made the best buy when you know the BIG TRUTH about boilers . . . and you will choose Kewanee boilers because you know you will save on fuel—get greater efficiency—cut repair bills.

YOU can depend on KEWANEE engineering

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REPORT **TELLS ALL . . .**

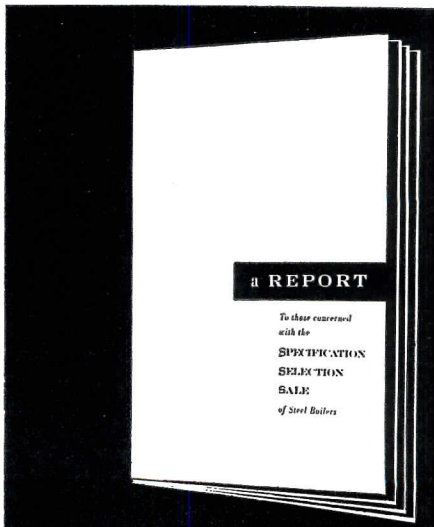
How to cut fuel costs.

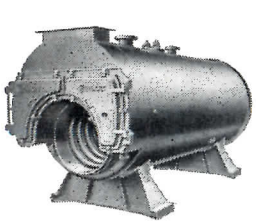
Data on "cruising speed" savings.

Facts on "nominal capacity" operation.

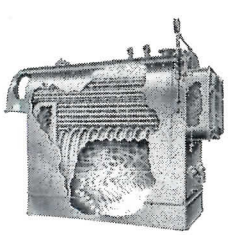
Why Kewanee Reserve Plus is the safe way to rate steel boilers.

Facts on fallacy of buying on "maximum capacity."





KEWANEE
M-800 SERIES



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AR

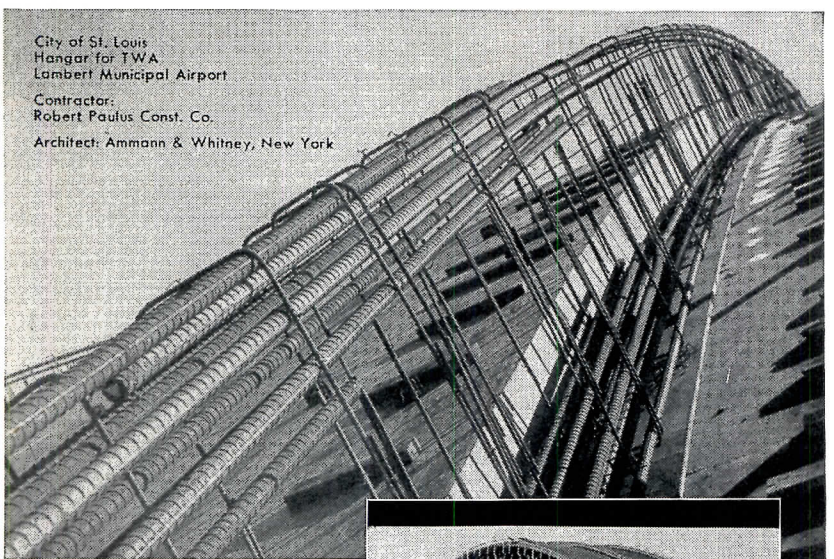
(*Continued from page 226*)

SOIL TESTING

• *Subsoil Investigations* discusses the need for and results of investigation of the soil under a building site, analyzes procedures of drilling and sampling of underlying strata, and describes laboratory tests to define characteristics of the soil. 20 pp, illus. *Soil Testing Services, Inc., 3521 N. Cicero Ave., Chicago 41, Ill.*

CHURCHES

• *Pointing to God* is a general presentation, profusely illustrated with photographs and line drawings of steepled churches and cathedrals. The book has been produced with the idea of stimulating those concerned in church architecture and construction to thinking about applications of modern methods of fabrication and design in aluminum, copper, stainless steel, monel metal and other alloys. 28 pp. *Overly Mfg. Co., Greensburg, Penna.*



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WINDOWS AND DOORS

• Sectional drawings are used throughout *New Ideas on Panel-Wall Window Arrangements* to diagram Bayley aluminum projected windows and projected ribbon windows. Installation details supplement information on sections and constructions, ventilators, mullions, screening, operating hardware, anchors and clips, finish and glazing. 20 pp, illus. *The William Bayley Co., Springfield, Ohio.*

• *Hollow Core, Solid Core Flush Doors* gives specifications and also covers panel and door construction, frames and cores for flush doors of both core types. A table of approximate door weights is included. 4 pp, illus. *General Plywood Corp., Louisville 12, Ky.*

MANLIFT ELEVATORS

• *Humphrey Manlift Elevators*, for use in multi-story buildings where there is vertical processing of products or where frequent quick inspection of machinery on different levels is required, offers comprehensive product data on the four standard models plus information on special equipment. 8 pp, illus. *Humphrey Elevator Co., Inc., Faribault, Minn.*

STOKERS

• *Technical Combustioneer Stoker Manual* arranges under index tabs for each stoker size the following information: full stoker specification data, layout drawings, dead plate sizes, standard control setup, required headroom above tuyeres, available worm lengths and suggested specification forms, illus. *Combustioneer Division, The Steel Products Engineering Co., Springfield, Ohio.*

BRASS PLUMBING FIXTURES

• *Calaprice A-54* describes, illustrates and gives the prices of brass faucets, fixtures and valves. 25 pp, illus. *The Central Brass Mfg. Co., 2950 E. 55 St., Cleveland 27, Ohio.*

TOILET COMPARTMENTS

• *Stallpack Prefabricated Marble Toilet Compartments* gives specifications and details of the toilet units, including hardware and a list of materials. 8 pp, illus. *Carthage Marble Corp., Carthage, Miss.*

LITERATURE REQUESTED

Ing. Carlos Huerta Arguelles, Margaritas 45, Esquina con Aida, San Angel Inn 20, D. F., Mexico

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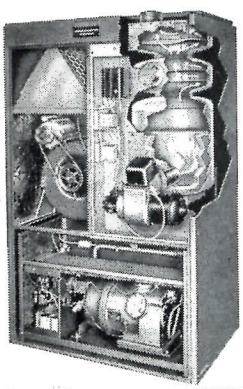

WHISPER-QUIET OPERATION. Smooth-running compressor is hermetically sealed and shock-mounted. Vibration-free blower is permanently lubricated and dynamically balanced. Ceramic-coated heat exchanger muffles burner noise.

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It's a completely modern forced-air heating and cooling unit; so good looking it can be installed in a playroom; so compact it can fit into a closet. We designed this unit for easy installation in any type of home.

Home-owners have their choice of gas- or oil-fired heating. Either way, they get economical, balanced heat. And the hermetically sealed cooling unit has a five-year warranty.

Take a long look at some of its "years ahead" features shown in the photos. Then see your nearest Worthington distributor for more facts and figures. Ask for our new folder, "What Every Builder Should Know", C-1100-B54, or write Worthington Corporation, Air Conditioning and Refrigeration Division, Harrison, N.J. A.4.58

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*TRADE MARK

THE RECORD REPORTS

(*Continued from page 16*)

Chief Architect of the government's Building Research Station, and Edward Mills, who has a large practice in industrial buildings, offices and schools. They performed a kind of double act which kept the full audiences keenly interested and amused and which evoked lengthy discussions noteworthy for the fact that there was not one dull or boring speech. They ranged over the effects of the so-called British climate, cladding and curtain walling, brick techniques, floor finishes, the use of glass, prefabrication, sound insulation and a host of matters which are of great concern in modern architecture.

It happens that both had recently visited the United States, Allen on an official tour of large industrial plants and Mills on a Research Fellowship to study the weathering of modern buildings. The U. N. Building and Lever Building came in for a good deal of discussion, which brought to his feet Mr. John Stetson of Florida, who was representing the A.I.A., as, he said, "the attorney for the defense." Mr. Stetson said they also had weather in the U. S. and proceeded to describe a Florida hurricane, to which Allen replied that our climate was more insidious, being permanently damp, and got through the fabric of the building ultimately and did unpleasant things to it with moisture movement and chemical changes.

There was much discussion on joints in curtain walling. Allen raised a laugh by dropping a piece of so-called flexible mastic on to the table which it hit with a hard clatter. It was agreed that architects were in the hands of mastic makers and that there was no such thing as a mastic with a reasonable expectation of life. The two speakers advocated wider use of British "patent" glazing which in principle drains joints instead of sealing them and which, they said, appears to be unknown in the U. S.

Perhaps the most interesting development discussed was the making of bricks with 85 per cent pulverized fuel ash from power stations and 15 per cent clay. Much experimental work on this had been done by the Building Research Station and the bricks promised well. Great Britain produces two million tons of fuel ash per annum which would make a thousand million bricks. A pilot plant is now being laid down at a power sta-

(*Continued on page 238*)

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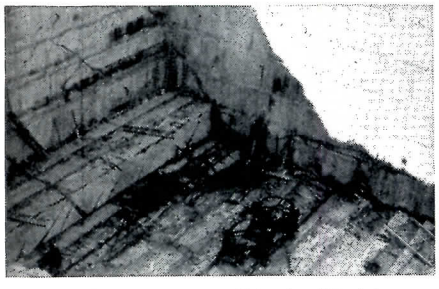
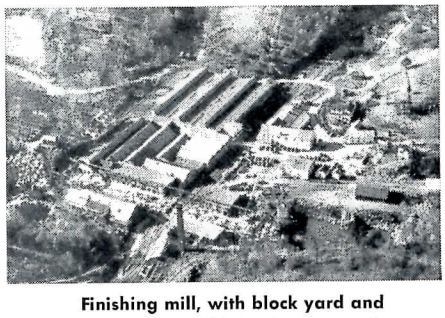
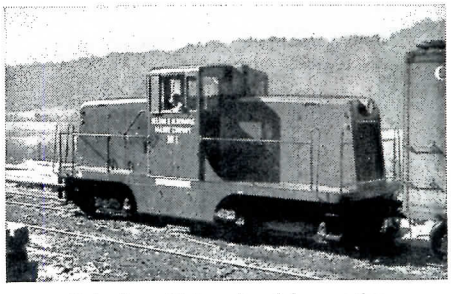


Number 2 Quarry at Schuyler, Virginia: Regular Grade Alberene Stone.

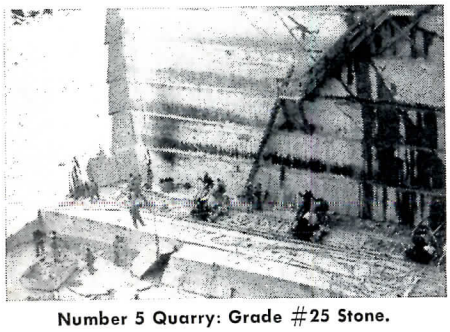


Finishing mill, with block yard and gang-saw mill in foreground.



Main line, 44-ton diesel locomotive.

Number 3 Quarry: also Regular Grade.



Number 5 Quarry: Grade #25 Stone.

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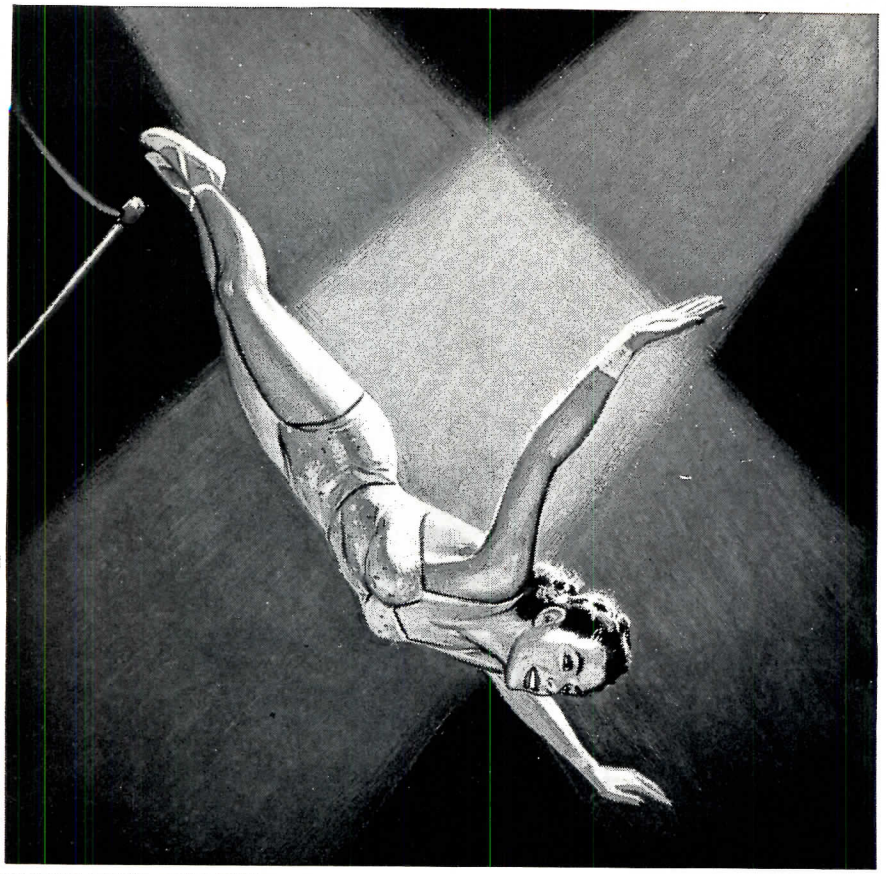

This aerialist spinning high over the center ring *knows* she's taking a risk—but training warns her to be careful. However, every day workmen are killed or hurt falling on slippery floors that *look* safe but are treacherous underfoot. Best inexpensive insurance against these accidents is A.W. SUPER-DIAMOND—the floor plate with 40 slip-stopping traction points in every step. SUPER-DIAMOND is tough, rolled steel, with an exclusive raised-diamond surface that takes rugged wear and gives maximum foot safety in return. Specify SUPER-DIAMOND when you want the best buy in low-cost accident prevention. Easy to install. Simple to maintain. Write today for the new, free SUPER-DIAMOND Booklet SD-19.

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THE RECORD REPORTS

(*Continued from page 234*)

tion, it being cheaper to bring the clay to the ash than vice versa.

One member said that, after a visit to the Building Research Station, where failures were investigated, he felt frightened to build with any material whatever! To this Mills replied that architects did not report their successes often enough and suggested that there should be a "Success Department" at the Station.

Underlying the discussions was a feeling that architects were trying to press forward on a broad front but that manufacturers, and to some extent contractors, were not animated by the same urge. Because in Great Britain manufacturers were enjoying a full demand for their products they were not driven to develop new materials and methods. There was also a great need for much better training of technicians in the building industry. Most existing technicians had been trained in the old handcrafts and were slow at grasping new techniques or even unable to do so.

The Conference ended with a dinner at which Howard Robertson, always an amusing and interesting speaker, was in special form. After saying how glad he was to see at the Conference Mr. and Mrs. Stetson, Mr. William M. Bray, representing the Southern California Chapter of the A.I.A. and Mrs. Bray, and Mr. and Mrs. Ross Gordon Montgomery, also from the U. S. A., he went on to a typical Howard Robertsonian sample of humor, which is perhaps worth quoting. For the annual R.I.B.A. elections one of the architectural papers had recently issued a questionnaire to candidates asking their views on policy. This, he said, was wrong; what we wanted to know was the kind of men they were. He suggested that the questionnaire should have been framed as follows: (1) Can you draw? (2) Do you design your own elevations? (3) Can you keep a secret, or do you tell your wife? (4) Do you ever read (a) the Council agenda (b) the R.I.B.A. Journal? (5) Name three good modern buildings in London (6) What do you understand by neo-Georgian? (7) Have you ever said in your career "Why doesn't the R.I.B.A. do something about it"? (8) And finally a sample general knowledge test — What do you understand by: (a) the new brutalism; (b) insensitive detail; (c) cliché?

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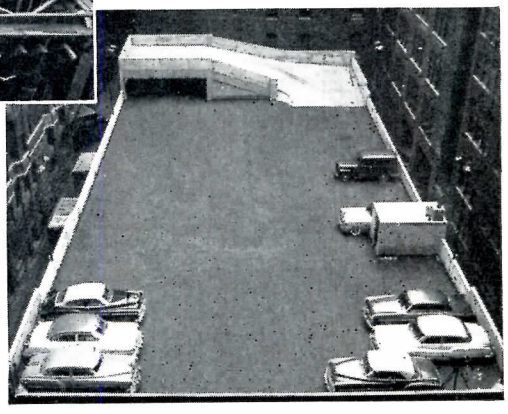
ARCHITECT: Albert Hauser
ENGINEER: Emanuel Feinstein



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FLOOR and ROOF SLABS

WASHINGTON (*Cont. from p. 38*)

borrowing capacity, and of course with reservoirs of pre-planned public works.

To spread the available money farther, the new thesis calls for halting planning work at the completion of the preliminary sketch and single line drawing. This differs from the practice under the two advance planning programs of the Federal government (1944 and 1949) where planning was often carried through the final specification stage before the blueprints were shelved. In these earlier programs Federal advances covered the cost of preparing plans for 7700 projects with total estimated construction cost of $3660 million. Planning advances requested totaled about $64 million.

A provision of the current housing bill calls for an outlay of $10 million in Federal funds to renew these advance planning programs. It will be administered by the Commissioner of Community Facilities, John Hazeltine, who operates in the Housing and Home Finance Agency.

The Administration estimates that the new "shotgun" approach to the planning of public works will enable the $10 million to assist communities and states in the preparation of preliminary plans for some 2200 projects costing an average of $300,000 each, or $660 million in the aggregate. The average Federal advance per project would come to around $4500, or approximately 28 per cent of the average cost of obtaining fully completed plans as was done under the earlier programs.

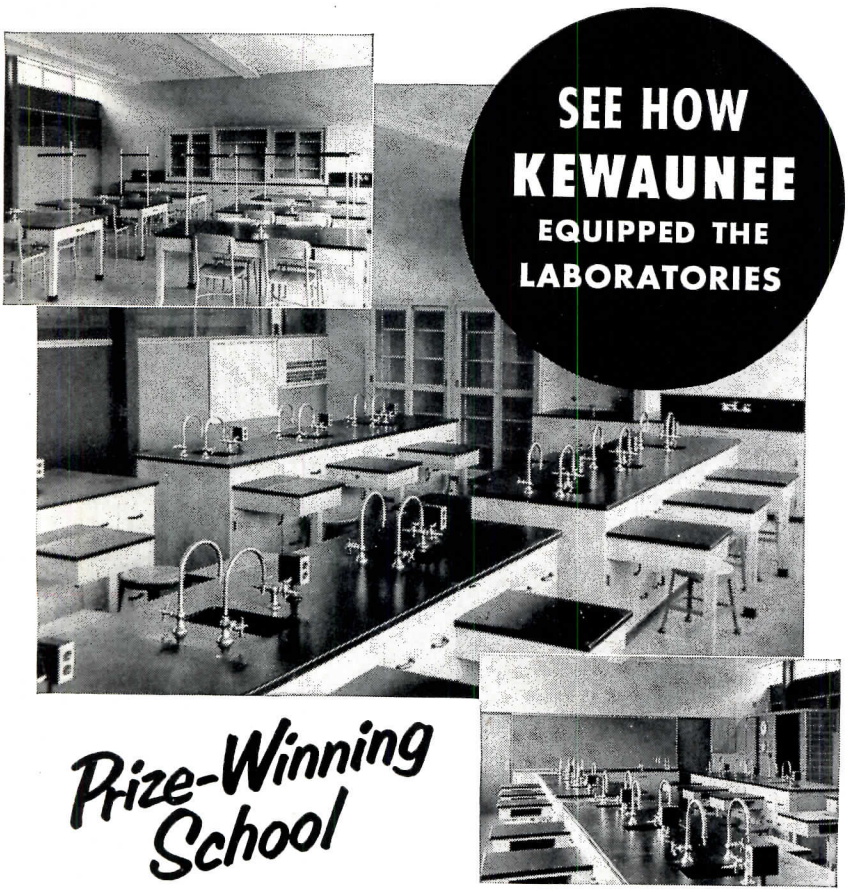
Housing Administrator Albert M. Cole gave the essence of the new plan when he told the House Banking and Currency committee recently:

"The advance planning of such public works has long been recognized as a valuable tool in establishing and maintaining a high level of operation in the construction industry, which is an important factor in the maintenance of a healthy national economy. A substantial volume of planned state and local public works could be very useful in helping to stabilize the construction industry and, in turn, economic activity in general. It is, in my judgment, a sensible and economic form of insurance which will enable the states and their local public bodies to proceed promptly to expand the volume of the construction of worthwhile public works in the event that economic conditions should, at any time, make such action desirable.

"In order to achieve the maximum benefit from such funds (the $10 million) we expect to confine, to the greatest extent possible, the use of the Federal advances to the preparation of preliminary plans for specific public works in lieu of fully completed plans. Obsolescence of plans will be materially reduced by emphasis on preliminary planning and completion of detailed planning at the time of construction." General Bragdon explains that such preliminary planning would include acquisition of real estate and rights-of-way, investigations, topographic surveys, preliminary sketches and single line drawings — in short, everything prior to preparation of detailed plans and specifications.

Presently, the Council's coordinator of public works planning is getting his message over to states and local bodies through the trade organizations most logically concerned with their opera-

(*Continued on page 248*)



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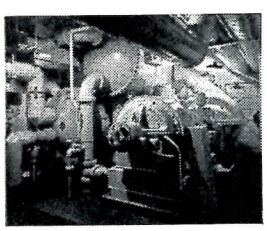

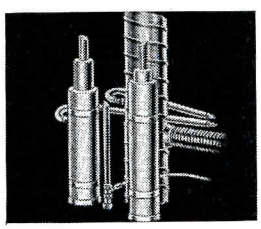

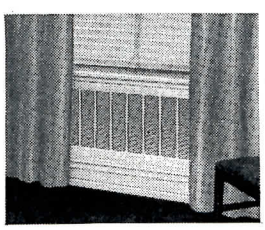

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HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

WASHINGTON (*Cont. from p. 242*)

tions. These include the American Municipal Association, the U. S. Conference of Mayors, state official and county engineer organizations. The immediate objective is more state activity at the pre-planning level.

Tangent to the Council's efforts along these lines is an activity looking toward creation of a complete catalogue of state and local planned public works projects. General Bragdon said such a catalogue would show eventually each project contemplated by type, and by region and section. The categories would read: waterworks, sewers, hospitals, schools, streets, highways, etc. He emphasized that only "needed and useful" works would be the concern of the Council in carrying out its new effort.

As a start, the coordinator surveyed states and local communities by questionnaire but the response was not too encouraging, he said. A subsequent question sheet will be mailed out to supplement information received from the first.

It is much easier for General Bragdon's office to accumulate data on Federal public works planning. This is spelled out to some extent in authorizing legislation for the various department and agency programs; furthermore, agencies must make annual reports to the Budget of the Bureau on their planning progress. These, of course, are available to the Council.

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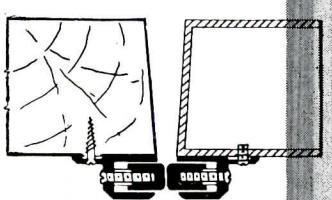
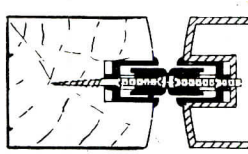
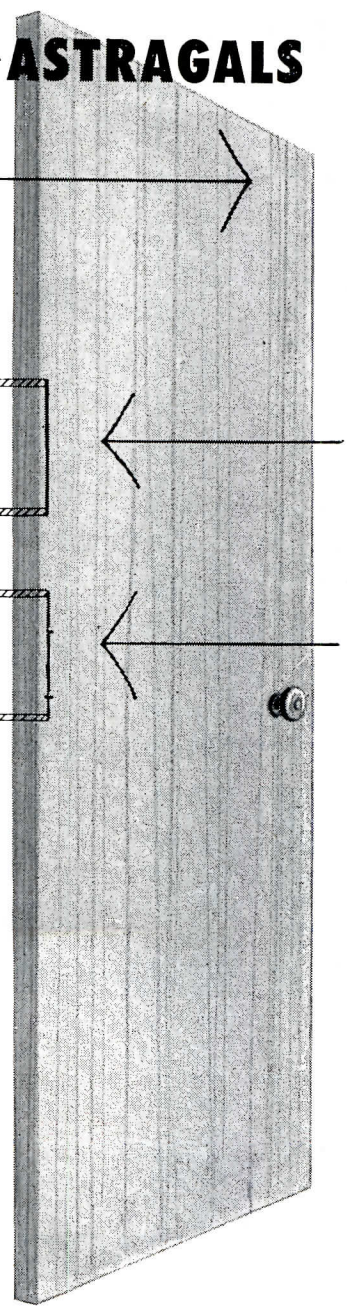


Type E
is for bullnose hollow metal or wood doors (double acting).





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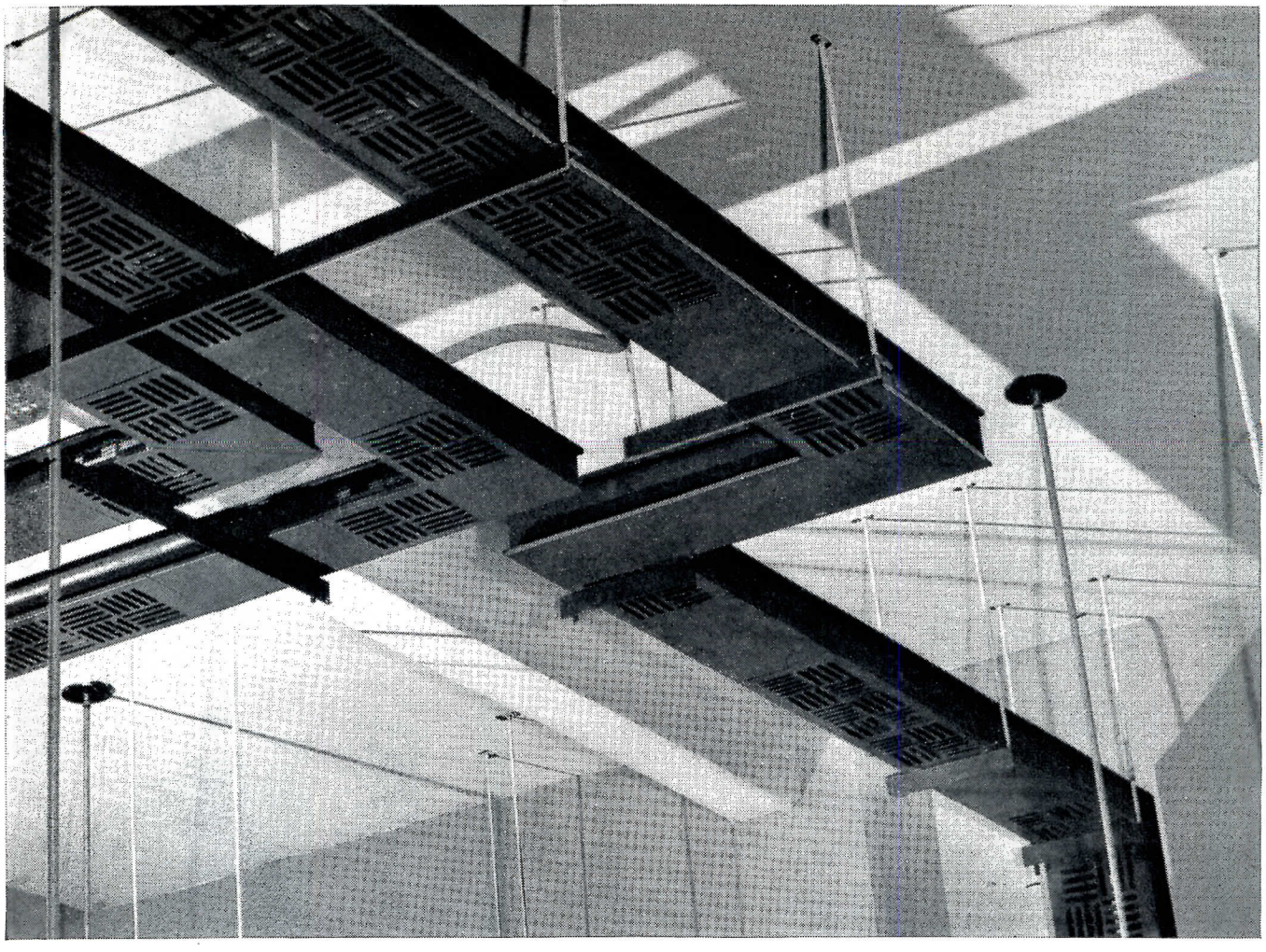
ROUNDUP

THE LAST GREAT OBSTACLE in the way of the St. Lawrence Seaway appeared to have been removed by last month's United States Supreme Court decision sustaining the validity of a license granted by the Federal Power Commission to join with the Ontario Hydro-Electric Commission of Canada, a government agency, in construction of a $600 million power plant in the International Rapids section of the St. Lawrence. A group of property owners, the Lake Ontario Land Development and Beach Protection Association, Inc., had asked the Supreme Court to set aside a Federal Court of Appeals ruling that sustained the authority of the commission to license New York to share in building the project.

THE "PEACEFUL" ATOM was frequently in the news. . . . Stone and Webster Engineering Corporation, Boston, was selected to perform architect-engineering services associated with the design of the nuclear portion of the pressurized water reactor (PWR) project to be constructed at a site near Shippingport, Pa., the Atomic Energy Commission announced. Stone and Webster will be a subcontractor under the Westinghouse Electric Corporation, which is responsible for development, design and construction of the nuclear portion of the PWR project; the turbine-generator portion of the PWR plant will be designed and constructed by the Duquesne Light Company of Pittsburgh. . . . Invitations to bid on the AEC's project for design and fabrication of a prototype "package" nuclear power plant for military use may be issued to "qualified firms" by the middle of this month. AEC established a list of qualified firms from among those replying to its invitation of last March to engineering firms and equipment manufacturers to submit proposals

(*Continued on page 252*)



New Westinghouse Aluminum bus duct

...LIGHT WEIGHT FOR SIMPLIFIED BUILDING DESIGN

FLEXIBLE...MORE POWER IN LESS SPACE

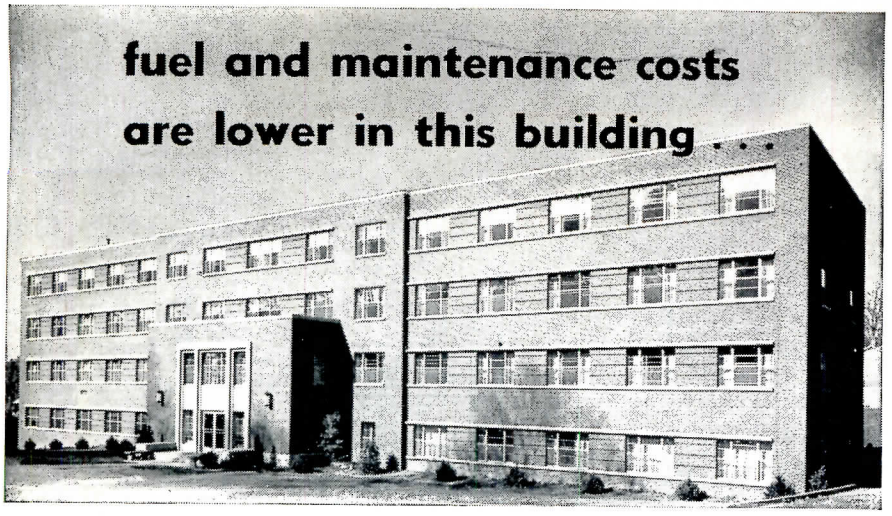
Tight building layouts and lightweight structural members cause no problem for planning power distribution with new Westinghouse Aluminum Bus Duct. Incorporating all the conveniences and design values of Westinghouse Bus Duct engineering, new aluminum bus duct is *one-third* lighter . . . permitting greater freedom in structural design.

Up to 5000 amperes, Westinghouse Aluminum Bus Duct has greater current carrying capacity, pound for pound, than cable or conduit. It is prefabricated in standard sections . . . installs easily and quickly in any layout, around any obstruction. It fits comfortably into elevator shafts and wireways. When exposed, its modern appearance blends well with interior design.

For detailed information, write for B-6385, Westinghouse Electric Corp., 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa.

J-94024

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



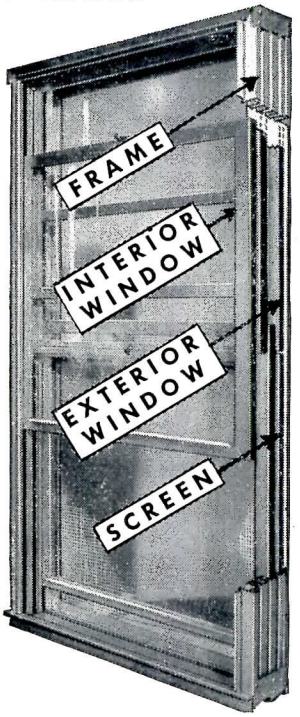
. . . with

Nurses' Home, Meadville, Pa.
Architects: Wilbur Watson Associates
Cleveland, Ohio

Fleetlite

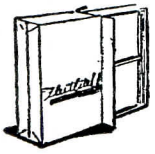
YEAR-'ROUND ALUMINUM DOUBLE, DOUBLE-HUNG WINDOW UNITS

NO STORAGE PROBLEMS
FREE FROM DRAFT AND STORMS
EASY CLEANING FROM WITHIN



In Meadville, Pennsylvania, Spencer Hospital Nurses' Home installed *over 300* Fleetlite Aluminum Window units more than three years ago. Mr. Noel Poux, President of the Board of Trustees, says, "We . . . find the windows entirely satisfactory, both in appearance and operation and are specifying them in a new addition to the hospital which is now being planned." Other hospital administrators, inspecting the Fleetlite installations at Spencer Hospital, were "very favorably impressed and expressed appreciation of the advantages" of Fleetlite Windows. Storm sash and screens are self-stored in each unit and are cleaned from inside. Double-window protection keeps out cold and exterior noise, lowers fuel costs by tight insulation. Sash can be adjusted for draft-free ventilation. Aluminum construction means no painting or puttying required.

For full information and detailed literature on how Fleetlite Windows can keep building expenses down, WRITE TODAY.



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AMERICA'S Finest WINDOW

Made by . . .

Territories open for representatives and dealers.

FLEET OF AMERICA, INC. 407 Dun Building, Buffalo 2, New York

THE RECORD REPORTS

WASHINGTON

(*Continued from page 248*)

for participating in the project on a lump-sum, competitive-bid basis. Interest of private industry was so high that the closing date for submitting proposals of March 20 was eventually extended to June 7. . . . The Administration's bill to set up a private nuclear energy industry hit a snag that threatened to become a roadblock in the hearings of the Joint Congressional Committee on Atomic Energy as the hassle over the AEC chairman's role took the center of the stage. . . . Robert Le Baron, assistant to Secretary of Defense Charles E. Wilson and chairman of the military liaison committee to AEC, told the annual convention of the Edison Electric Institute in Atlantic City that atomic weapons and nuclear power are not rivals but "partners in our struggle for survival." Mr. Le Baron said the U. S. needs them both now and can have them "if our American system of free enterprise can be organized and stimulated to carry out the job." . . .

ARCHITECTS AND ENGINEERS are among nearly 10 million professionals and others brought under Social Security coverage for the first time by the Administration bill which the House passed last month.

THE HOUSING BILL passed the Senate, complete with authority for the President to build the 140,000 units of public housing he asked for in the next four years and in most particulars conforming to Administration wishes. As it went to joint conference for reconciliation with the House version, passed before the FHA "scandals" broke, there were differences in nearly every title, reflecting the efforts of the Senate's Banking Committee headed by Senator Homer Capehart to write a "scandal-proof" bill. Another major difference: the House version carried no authority for new public housing.

THE HOUSE SELECT COMMITTEE on Small Business has directed the Small Business Administration to determine what can be done immediately to speed up its handling of long-term credit loans. This is considered by Congress to be the most important function of the year-old agency. Yet the activity is dragging to

(*Continued on page 254*)

C & D Batteries, Inc., plant at Conshohocken, Pa.
Building Contractors: Lloyd F. Kershner, Inc., Norristown, Pa.

C & D Batteries, Inc., Specifies CERTAIN-TEED GYPSTEEL PLANK ROOF DECK for Fast, Fire-Resistant Construction

Last fall a serious fire destroyed the main building roof and walls on one side of the C & D Batteries, Inc., plant at Conshohocken, Pa. Some 60,000 square feet of floor space was left exposed to the elements. Production had to be temporarily shifted to two other plants in the area.

When rebuilding started, construction speed and simplicity—plus protection against fire—were considered of primary importance. Says Mr. Frank S. Carlile, Vice President and Treasurer of C & D Batteries:

"I suggested Gypsteel Plank because of the speed of installation . . . we have a very heavy production schedule to maintain. By using Gypsteel Plank we will save at least 50% of the construction time needed for this phase of building."

Adds Mr. Quillman Kershner, construction engineer in charge of the project:

"I've been working with Gypsteel Plank for about eight years. I like to use it because it is fire resistant and lends itself to easy installation. The tongue-and-groove steel frame is an excellent principle. It makes for a much tighter 'decking' job."

These are just a few of the advantages Gypsteel Plank offers architects, builders and building owners. Certain-teed Gypsteel Plank is a pre-cast gypsum roof deck reinforced with steel. It is light, strong, fire resistant and provides good thermal insulation. Planks (2″ x 15″ x 10′) are tongued and grooved for quick, easy assembly.

Next time your plans call for roof decking, we'd like to show you how well Gypsteel Plank can meet *your* requirements. Write for complete information now.

Certain-teed
REG. U.S. PAT. OFF.
Quality made Certain . . . Satisfaction Guaranteed

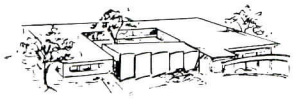
Certain-teed BUILDING PRODUCTS 50th YEAR

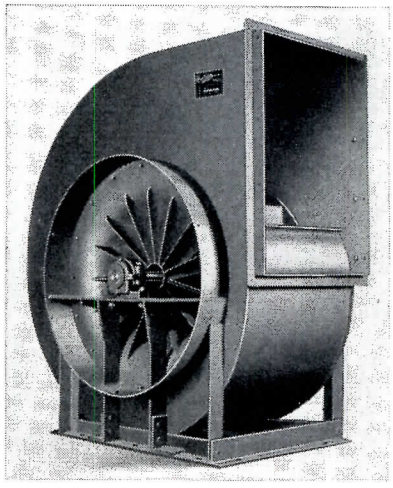
CERTAIN-TEED PRODUCTS CORPORATION
ARDMORE, PENNSYLVANIA
EXPORT DEPARTMENT: 100 EAST 42ND ST., NEW YORK 17, N.Y.

ASPHALT ROOFING • SHINGLES • SIDINGS • ASBESTOS CEMENT ROOFING AND SIDING SHINGLES
GYPSUM PLASTER • LATH • WALLBOARD • SHEATHING • ROOF DECKS • FIBERGLAS BUILDING AND ROOF INSULATIONS AND SIDING CUSHION

Sh-h-h

GET YOUR AIR NOISE LEVEL DOWN WITH "HUSH-A-BYE" QUIET "BUFFALO" TYPE "BL" FANS





One way to reduce your noise level is to select quiet fans. And now, as never before, you can enjoy almost unbelievable quiet with the new "Buffalo" Type "BL" Fan. Streamlined air movement through "Buffalo's" fixed inlet vanes and new backward curved blade wheel results in high efficiency, superb smoothness and quietness.

It's another example of the "Q" Factor* which has long made "Buffalo" your best fan buy. Why not investigate this superbly performing fan today? Write for Bulletin F-100.

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**The "Q" Factor — The built-in Quality which provides trouble-free satisfaction and long life.*

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VENTILATING EXHAUSTING AIR CLEANING FORCED DRAFT AIR TEMPERING COOLING HEATING INDUCED DRAFT PRESSURE BLOWING

THE RECORD REPORTS

WASHINGTON

(*Continued from page 252*)

such an extent that reports from all over the country are critical of SBA for taking so long to process applications. A new report from the committee has said there was "considerable dissatisfaction and resentment" concerning the agency's loan program. These loans can be used for construction purposes.

SECRETARY OF COMMERCE Sinclair Weeks has expressed real alarm over the shortage of trained manpower in scientific and technological areas and the potential danger of this situation to future research in this country. He noted that the number of engineering graduates has declined steadily since the 1949–1950 peak of 52,000, and will reach a low of approximately 19,000 students in the academic year 1953–1954. After that, the number will gradually rise to 34,000 in 1957. He stated that while about 19,000 American engineers will be graduated this year, some 43,000 Russian engineers were graduated in 1953, more than twice the U. S. output.

THE FEDERAL HOUSING ADMINISTRATION on May 29 dropped its interest rate on debentures one fourth of one per cent "to keep them in line with current rates on other government securities." For all 10-year debentures, the rate was reduced from 2¾ per cent to 2½ per cent, and for all debentures with terms in excess of 10 years, the rate dropped from three per cent to 2¾ per cent. It was the first downward adjustment in these rates since May 15, 1950. The National Housing Act provides for the issuance of debentures to lending institutions in exchange for foreclosed properties tendered to the Commissioner under FHA mortgage insurance contracts. The debentures are registered securities, fully guaranteed as to principal and interest by the U. S. government, and may be used to pay insurance premiums on mortgages insured.

THERE WAS, IN GENERAL, a negative response from architects in the field when they were queried by the American Institute of Architects on the possible influence of the Supreme Court's segregation decision on schoolhouse construction. A.I.A. said that five of seven

(*Continued on page 256*)

how much light for a dollar?

In lighting, first costs are not real costs! Real costs are the sum of the first costs including installation *and operating and maintenance expenses during the life of the system.*

Time and again, fewer Smithcraft lighting units are required to produce recommended lighting results. Because fewer Smithcraft units are required, your first cost is lower, but your really big savings are in the lower power costs and lower maintenance costs that go with fewer units.

On a typical factory installation lighting 20,000 square feet of floor space, for example, the Smithcraft A. L. S. Factory Lighting Unit will save roughly $8,000 over a ten-year period, when compared with a typical industrial fixture with 6-10% up-lighting (design and performance conforming with RLM standards). So, it's possible to enjoy the benefits of the finest lighting that money can buy and effect really substantial savings at the same time, simply by buying the right fixture.

Ask us to send you our A. L. S. Factory Lighting Folder.

PHOTOGRAPH SHOWS INSTALLATION OF 4450 SMITHCRAFT A. L. S. UNITS LIGHTING 397,000 SQ. FT. TO 75 FOOTCANDLES.

BUY LIGHTING — NOT FIXTURES. **INVEST** IN AMERICA'S FINEST FLUORESCENT LIGHTING by **Smithcraft**

LIGHTING DIVISION

CHELSEA 50, MASSACHUSETTS

For Industrial Roofing & Siding

specify **Grade-Marked**

Galvanized Sheets

for PEAK PERFORMANCE

Engineers and designers of industrial and commercial buildings know galvanized sheets to be superior building material for this type of construction—particularly for roofing and siding. They know that time-tested galvanized sheets offer:

- **SHORT-TERM *plus* LONG-TERM ECONOMY**
  Low *initial* cost, low *application* cost, low *per-year* cost
- **STRENGTH OF STEEL; RUST-PROTECTION OF ZINC**
  Withstand rough treatment, add structural strength and are fireproof

All galvanized sheets give years of useful service. But the *heavier* the zinc coating, the *longer* the life of the base sheet. Because various weights of zinc coating look alike on the surface, it pays to *specify a grade-marked sheet* . . . Get the heaviest coating you can buy!

ZINC INSTITUTE 2 OZ. COATING REG. U.S. PAT. OFF. SEAL OF QUALITY

IT'S THE ZINC THAT STOPS THE RUST

For long, rust-free service, specify a heavy duty sheet such as the "Seal of Quality" with a zinc coating of *2 ounces per square foot.* For heavier coatings order according to ASTM Specification A 93.

ATTENTION: MAINTENANCE DEPTS.

Get the facts on MZP (Metallic Zinc Paint) for structural steel and galvanized surfaces. Also, zinc for cathodic protection and grounding electrodes. Check coupon below.

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THE RECORD REPORTS

WASHINGTON

(*Continued from page 254*)

regions surveyed responded in the negative, expressing the belief that the anti-segregation ruling would have little or no affect on plans for present school programs. In some areas school planners have projected their building programs in anticipation of the high court's action — some have been building with this in mind for years, A.I.A. said.

ACTING COMMISSIONER NORMAN P. MASON of the Federal Housing Administration promised more headlines in the investigation of irregularities within that agency. Speaking to a meeting of the National Retail Lumber Dealers Association, the organization he once headed, he said he wished he could assure all employees that everything was settled. He regretted, however, that there still was a small handful of people identified with the situation and said that there "undoubtedly will be more." Thus, the anticipated additional headlines before FHA shakes off its association with "scandals."

THE U. S. NAVY remains too much in the paint manufacturing business. So says a Congressional subcommittee studying government competition with private industry. A report from the Intergovernmental Relations Subcommitte said the Navy alone, of all government agencies, finds it necessary to manufacture paint. All but a few plastic paint items could be produced commercially. Though still very much in the business, Navy has cut back its "line" from 150 to 28 different types of paint, the subcommittee stated.

LATEST SEMIANNUAL SURVEY of real estate markets showed that prices of new homes stayed about the same during the six months period ending in May, the National Association of Real Estate Boards reported. "The continued huge output of more than a million new houses a year has had the expected impact on existing dwellings, easing prices downward during the last six months," said N.A.R.E.B. President Ronald J. Chinnock. The association anticipates an active residential real estate market, and expects if financing further improves, the volume of business may substantially expand.

(*Continued on page 258*)

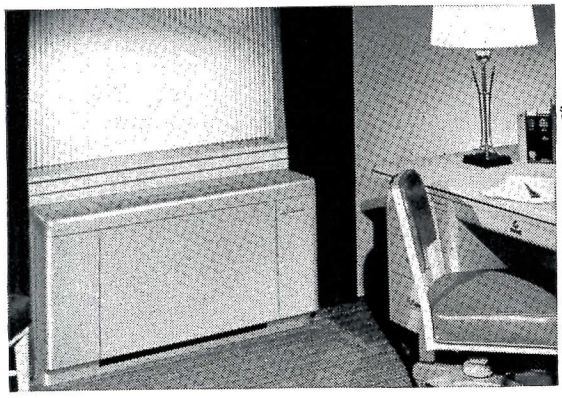
FOR COOLING · HEATING · VENTILATING...

new Modine Airditioner outpoints them all!

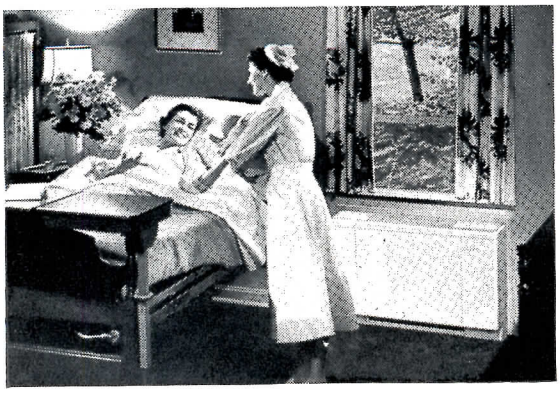
FEATURE	MODINE AIRDITIONER †	CONDITIONER A	CONDITIONER B	CONDITIONER C	CONDITIONER D
Available in 4 types? (Console, *concealed*, overhead and deluxe ceiling models.)	YES	NO	NO	NO	NO
Number of fan speeds	4	3	3	2	2
Can end panels be removed to facilitate piping?	YES	YES	NO	YES	NO
Is ample space provided for piping?	YES	YES	NO	YES	NO
Is coil easily reversible for right or left-hand piping?	YES	NO	NO	YES	NO
Does design prevent condensate from dripping into fan casing?	YES	NO	NO	YES	YES
Is coil protected from objects dropped thru upper grille?	YES	NO	NO	YES	YES
Are motors lifetime lubricated?	YES	YES	NO	NO	YES
Can power assembly be easily removed?	YES	NO	NO	YES	YES
Is internal wiring done at the factory?	YES	YES	NO	YES	YES
Is front small and easy to remove?	YES	NO	NO	NO	NO
Is offset for toe space provided?	YES	NO	YES	YES	NO
Are two access doors provided?	YES	NO	NO	NO	NO
Are corners square for ease of recessing?	YES	NO	NO	NO	YES
Projection into room when recessed to full depth	6"	Not recessable	7½"	8½"	6"

† *Trademark*

THE QUALITY CHART TELLS THE STORY. Only Modine AIRditioners have all the extra quality features that mean superior cooling and heating . . . longer life . . . quieter operation. For all the facts, see the Modine representative listed in your classified phone book or mail the handy coupon below . . . today!



LOOK! AIRditioner is styled by Jean Otis Reinecke, leading industrial designer. Attractive marine green primer is often used as finish coat. Console model is shown recessed.



LISTEN! You can enter a room in which an AIRditioner is running and hardly be able to tell it is operating. Quiet operation certified by decibel ratings.

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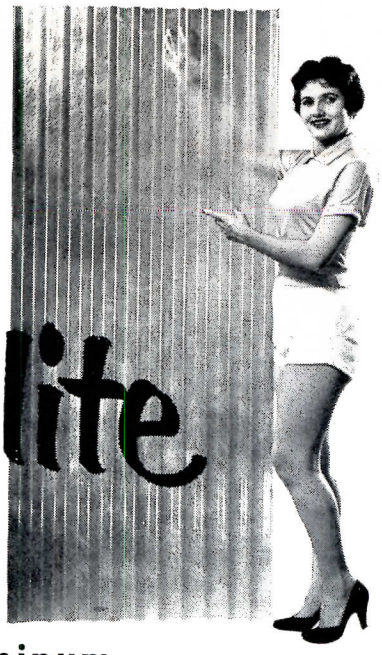
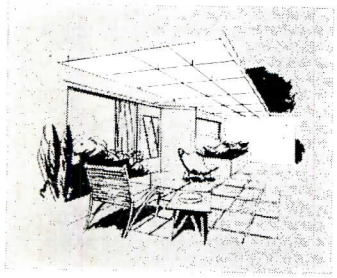
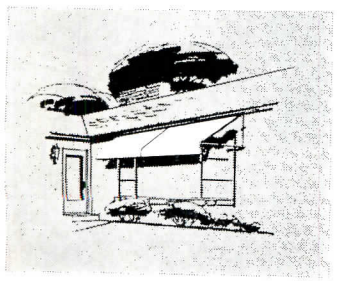


Sturdalite

THE QUALITY FIBER GLASS PANEL

is lighter than aluminum ... yet stronger than steel!





Pound for pound, this reinforced polyester has a higher strength-weight ratio than any other type of material.

Sturdalite is threaded through with myriad glass fibers which not only impart strength but, in addition, act as thousands of tiny prisms . . . each refracting light at a different angle. Thus, instead of transmitting only the light which plays directly upon it, Sturdalite takes light from all angles and turns it into soft, usable light within. Even in the indirect rays of early morning and late evening, Sturdalite appears almost luminous.

Sturdalite has proven all but indispensable for plant skylights and other daylighting uses. In residential construction, Sturdalite is of great value wherever daylight, shelter, privacy and safety are musts.

Sturdalite is available in a wide range of colors and sizes, either flat or corrugated. A sample will convince you that Sturdalite is the finest product of its kind that can be produced today.

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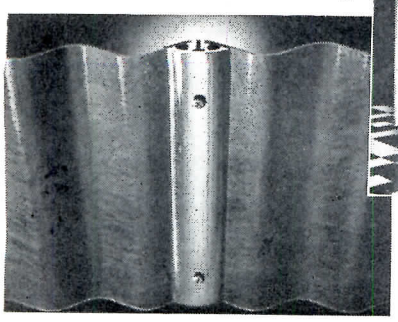
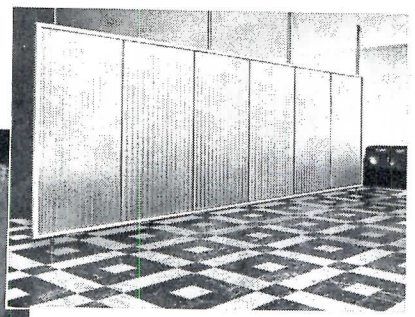




Exclusive! Sturdalite SEAL STRIP—weathertight aluminum molding neatly joins butting sheets of Sturdalite without lapping. Ask for information.

4822

THE RECORD REPORTS

WASHINGTON

(*Continued from page 256*)

T. CARR FORREST JR., 1954 president of the National Society of Professional Engineers, called on President Eisenhower to select at least two of the seven appointments he will make to the St. Lawrence Seaway Corporation from the engineering profession. The new Seaway law provides for the appointment of an administrator, deputy administrator, and an advisory board of five members to head the corporation. Mr. Forrest wrote Mr. Eisenhower that the successful design, construction, and administration of the project requires the best in professional engineering talent.

THE MARBLE INSTITUTE OF AMERICA has urged architects to have rough imported marble finished in this country to avoid delays in completing contracts. M.I.A. said reports are received constantly showing that the anticipated difficulties in importing finished marble are actually being experienced, causing delays in completing contracts in a manner satisfactory to the architect and owner. Fabrication outside the U. S. usually means schedule delays, it was said. The Institute suggested architects include a clause in their marble specifications stating that all finishing, including selection and jointing to size, polishing, cutting and carving, shall be executed in this country.

ENGINEERS SEEK REVIVAL OF PUBLIC WORKS AGENCY

Revival of the functions of the old Federal Works Agency are called for in a new presentation made to the Commission on Organization of the Executive Branch of the Government by the National Society of Professional Engineers.

The Society at the same time restated its proposal for a new Department of Public Works of Cabinet status. But failing this, it said, a minimum corrective measure would be to revive an agency similar in purpose to the former FWA.

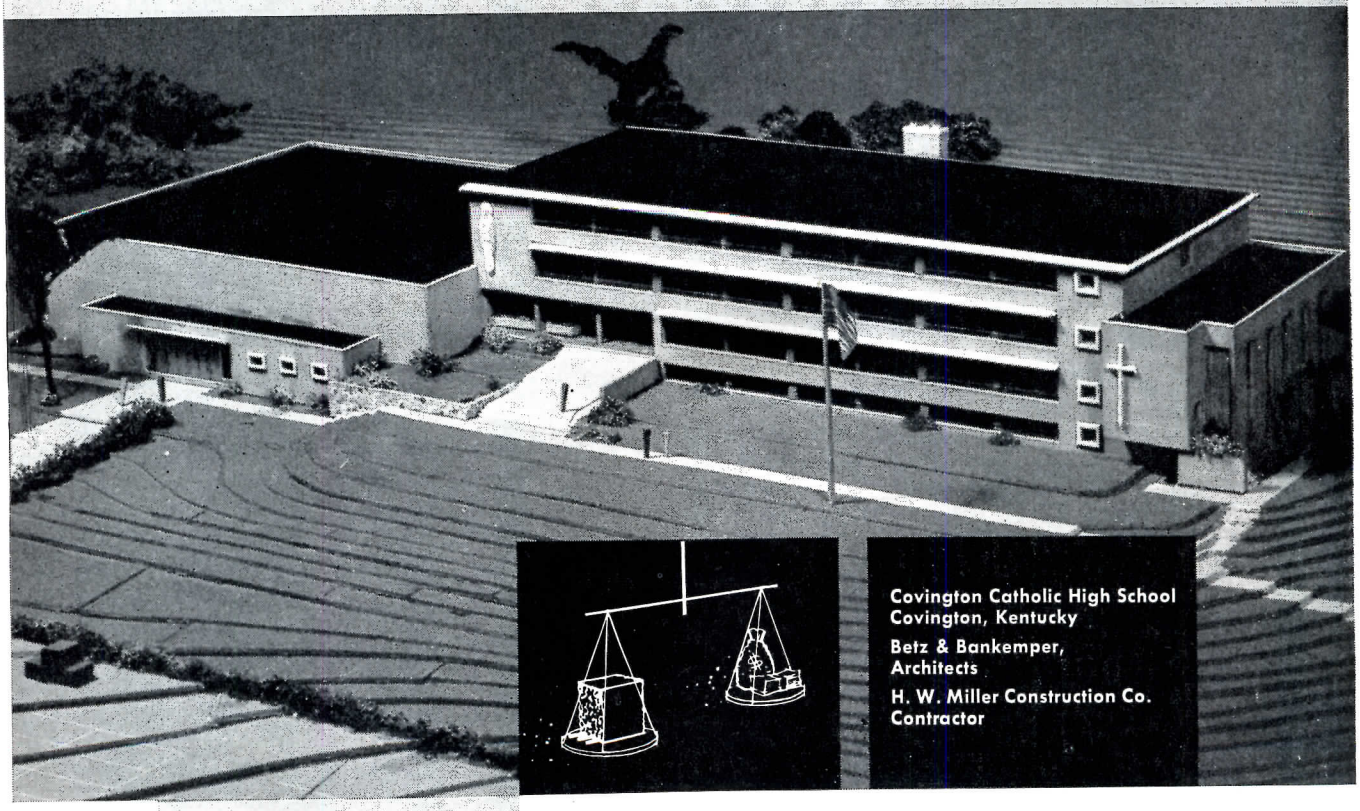
The present Hoover Commission's report on the Department of the Interior, referring to the integration of public works responsibilities in one department, said: "Had such a department been created 25 years ago, hundreds of mil-

(*Continued on page 260*)

A comparative cost analysis of a typical bay (16′ wide x 61′ long x 4 floors high) in this school building showed that flat plate reinforced concrete, with columns cast in round forms, was $1300 less expensive than other conventional types of construction. This saving helped attain an average cost of only $11.77 per sq ft. Furthermore, according to the architect, reinforced concrete gave ". . . the best fireproofing" and ". . . a structure that will take severe abuse without springing or deflecting."

Reinforced concrete structures also save money by saving erection time. Work can start sooner, because all construction materials are available locally in a matter of days instead of months. In addition, reinforced concrete can be erected faster than other types of structures. Take advantage of reinforced concrete on your next job.

cost analysis shows flat plate REINFORCED CONCRETE saves $1300 per bay!



Covington Catholic High School
Covington, Kentucky

Betz & Bankemper,
Architects

H. W. Miller Construction Co.
Contractor

Compare...

YOU'LL SAVE WITH
REINFORCED CONCRETE

CONCRETE REINFORCING STEEL INSTITUTE C.R.S.I. FOUNDED 1924

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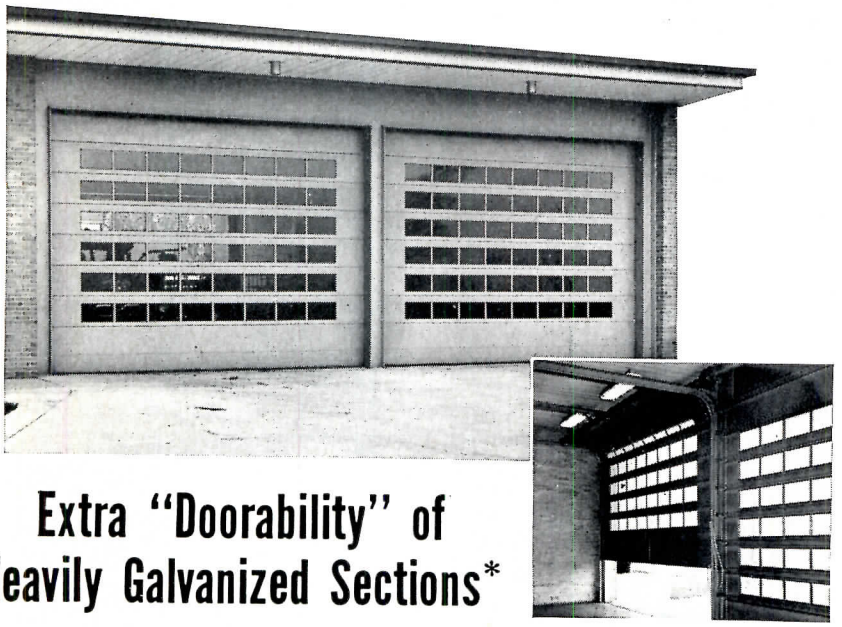
CONCRETE REINFORCING STEEL INSTITUTE

Kinnear Steel RōL-TOP Doors



Extra "Doorability" of Heavily Galvanized Sections*

Will not sag, warp, rot or split
Built to fit openings of various sizes
Easy space-saving upward action
Opens completely out of the way
Lasting resistance to fire, wind, weather
Heavy-duty torsion spring counterbalance
Provision for any number of glass panels
Easily installed in old or new buildings

WRITE FOR THIS FREE RoL-TOP BULLETIN TODAY!

In Kinnear Steel RōL-TOP Doors, you get the efficiency of smooth ball-bearing upward action . . . *plus* all-steel strength and durability . . . *plus* provision for glass panels in one or more door sections, as desired.

*To assure extra service life with minimum maintenance, the rugged steel sections are given a heavy coating of pure zinc (1.75 oz. per square foot of flat metal per ASTM standard) by the hot process. Then Kinnear's Paint Bond (a special phosphate immersion process) is added, to make sure paint will adhere *immediately and thoroughly* to the protective zinc coating.

In every detail, Kinnear Steel RōL-TOP Doors feature extra strength and ruggedness, for long, heavy-duty, low-cost performance. Sizes to fit any opening. Manual, chain, or motor operation. WRITE FOR FULL DETAILS.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

Kinnear Steel RōL-TOP Doors are designed and built by the same door specialists who *originated* the door with the interlocking steel-slat curtain—famous for more than half a century as the Kinnear Steel Rolling Door.

The KINNEAR Manufacturing Co. *Offices and Agents in All Principal Cities*

FACTORIES: 1860-80 Fields Ave., Columbus 16, O.—1742 Yosemite Ave., San Francisco 24, Calif.

WASHINGTON

(*Continued from page 258*)

lions of dollars would have been saved to the public over the years. Today it is a complete necessity."

Chief complaint of the N.S.P.E. is that Federal public works activities are widely distributed among several agencies, with little or no coordination between them.

N.S.P.E.'s statement to the Commission said it is noteworthy that the proposed advance planning program, for example, specifically excludes housing in its operations; yet it is located in an agency devoted to housing programs — the Housing and Home Finance Agency. More than 80 per cent of the projects under this program are for sewage and water facilities, hospitals and health facilities, and schools and other educational facilities — all of which are primary responsibilities of other agencies.

"Other proposals now pending would add more public-works-type operations to HHFA on the ground that they already administer some programs of the same general type," N.S.P.E. pointed out.

"As the Commission knows," the statement added, "some minor effort is being made to coordinate public works programming and planning in the office of the Council of Economic Advisers and some suggestions have been made in Congress to establish a Public Facilities Administrator in the Executive Office of the President. These steps, basically, however, are only attempts to relieve a situation basically unsound. The hodgepodge of administrative responsibility for public works activities of the Federal government will not be resolved short of the acceptance of the realization that public works is 'big business' and that it requires a centralized agency to bring forth order, economy and efficiency on an overall government basis."

BUILDING STATISTICS ON CONGRESS GROUP AGENDA

Construction statistics are among the vital economic data to be given a close going-over by the new Subcommittee on Economic Statistics of the Joint Committee on the Economic Report.

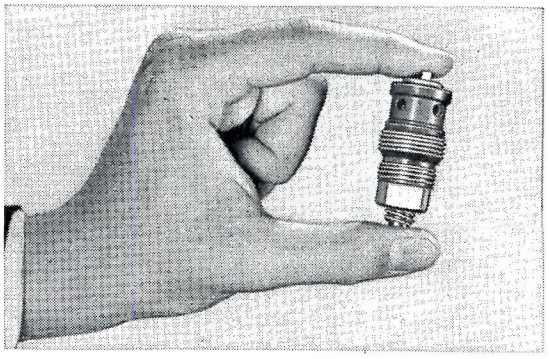
(*Continued on page 264*)

Why archi ects choose CRANE for public buildings

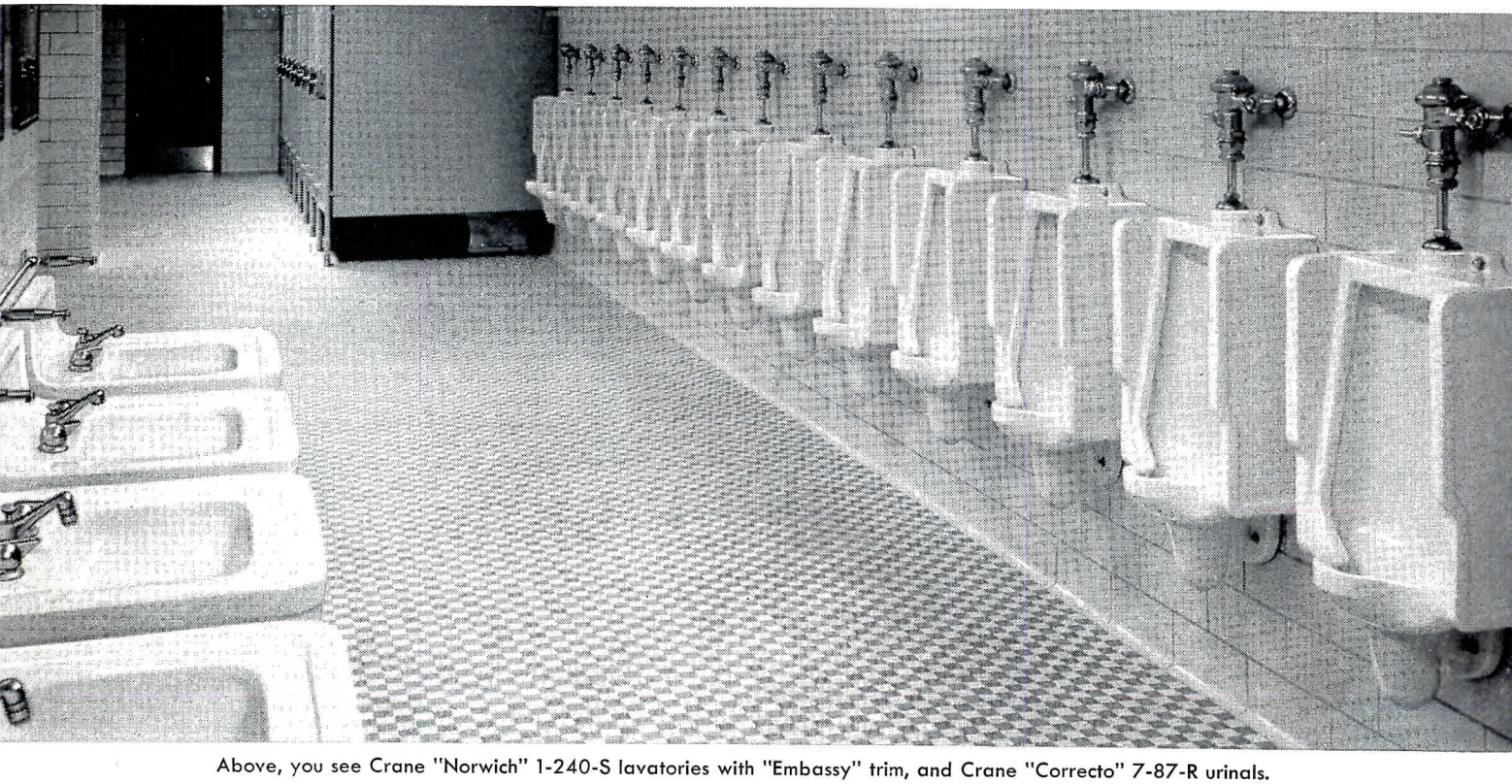
Buildings that are used by vast numbers of people are generally designed both to serve them efficiently and to please them visually. Also, of course, such buildings should be easy to maintain.

This applies to the buildings' equipment, too... and public washrooms are an important example of this. That's why so many architects specify Crane plumbing.

There are Crane fixtures for every purpose. They are handsomely designed and well engineered. And they are built to give satisfactory service, year after year after year.



Less faucet repairs! Crane Dial-ese faucet controls last longer—require less maintenance. That's because of the simple replaceable cartridge that contains all working parts. When necessary, old cartridge can be replaced by new one in seconds.



Above, you see Crane "Norwich" 1-240-S lavatories with "Embassy" trim, and Crane "Correcto" 7-87-R urinals.

New York Air Terminal features Crane plumbing

Four million people a year will use the new $7,500,000 East Side Air Terminal in New York City. It will be, for most air travelers, the first point of entrance into New York and the last point of exit. Until a similar West Side Terminal is built, air line busses for all New York airports will serve this block-square building—a total of some 550 bus trips a day.

Naturally—for a building so important and so busy—Crane plumbing was specified. In all types of commercial as well as domestic installations, Crane enjoys a justly superior reputation. Yes, Crane *plumbing equipment* will serve your clients better.

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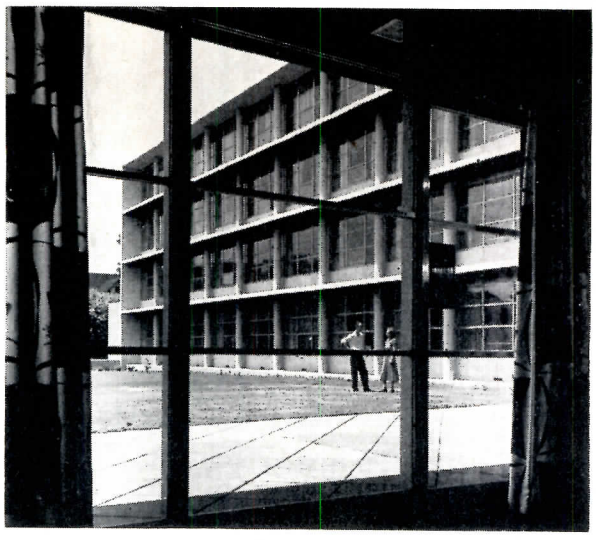

Le Bonheur Children's Hospital, Memphis, Tenn.
Harmon Construction Co., contractors
J. Frazier Smith & Associates, architects
Photo by Joseph W. Molitor

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THE RECORD REPORTS

WASHINGTON

(*Continued from page 260*)

Chairman Henry O. Talle (R-Ia.) said construction figures, together with figures on savings, inventories and sales, were under consideration for possible early examination by his group.

As a first step, Representative Talle has written the Bureau of the Budget and the Council of Economic Advisers. He asked the Council for its thinking "as to the current adequacy of the government's statistical programs from the standpoint of the Council's ability to assist the President to analyze economic trends and formulate economic policies." Also requested of the Council as a review of any steps it might have taken or be planning to take, to improve statistical programs.

Some indication of the scope of the subcommittee endeavor is contained in this exerpt from Mr. Talle's letter to Budget Director Rowland R. Hughes: "Later this year, and probably each year thereafter, the subcommittee will have need of a complete statement on the major Federal economic statistical programs provided for or proposed in the President's budget or in separate messages to the Congress."

ARMY OFFERS TALLY ON USE OF PRIVATE FIRMS

Some 1600 contracts for design and inspection of construction in connection with its military construction program were awarded to nearly 800 architect-engineers during the calendar years 1952 and 1953, the Department of the Army has revealed. Awards totaled approximately $70 million.

The large number of architect-engineer firms employed reflects the policy of the Corps of Engineers to utilize the architect and engineer professions "to the maximum extent consistent with efficiency and economy," said Major General Samuel D. Sturgis, Jr., chief of Army Engineers.

Services of the firms, General Sturgis noted, are obtained through negotiated contracts, such as fixed-price or cost-plus-fixed-fee contracts, although it is the policy of the Corps of Engineers not to use the cost-plus type unless circumstances preclude the fixed-price type.

(*More news on page 268*)

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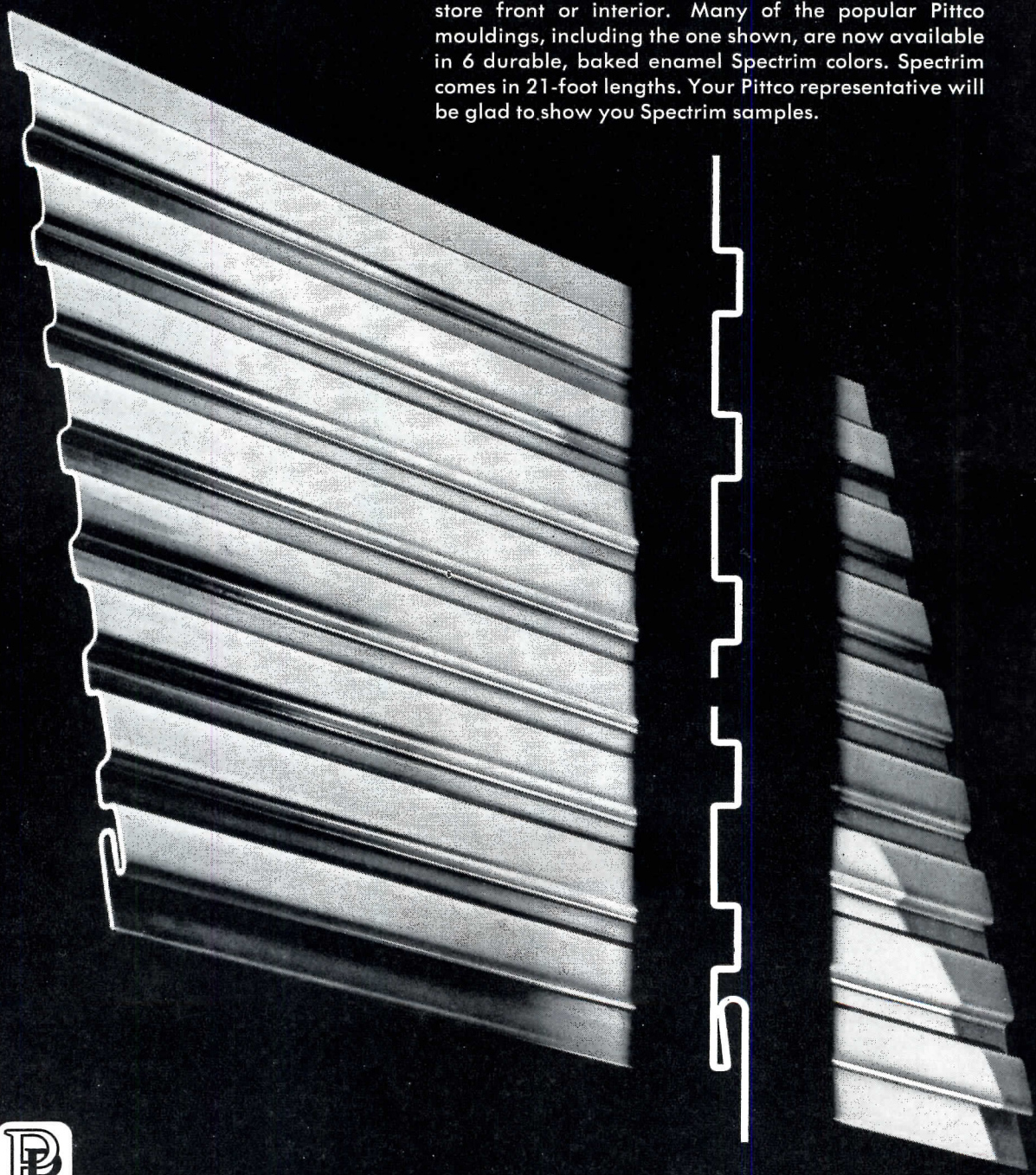

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THE RECORD REPORTS

(*Continued from page 264*)

ON THE CALENDAR

July

5ff Plants as Factors of Design: a summer course offered by the Department of City Planning and Landscape Design; through Aug. 13 — Harvard Graduate School of Design, Cambridge, Mass.

13–15 Western Plant Maintenance Show and Conference — Ambassador Hotel, Los Angeles

27–30 Eighth Short Course on Hot Water and Steam Heating Systems — University of Illinois, Urbana

August

17–19 Fire Protection Engineering, a conference jointly sponsored by the School of Architecture and City Planning, the School of Engineering and the School of Industrial Management — Massachusetts Institute of Technology, Cambridge, Mass.

17ff The Modern Movement in Italy: Architecture and Design; a circulating exhibition; through Sept. 6 — Museum of Modern Art, 11 W. 53rd St., New York City

19–21 Northwest Regional Conference, American Institute of Architects — Eugene, Ore.

23ff 16th Annual Summer Program in City and Regional Planning arranged in the School of Architecture and Planning — Massachusetts Institute of Technology, Cambridge, Mass.

25ff Tenth Triennale di Milano; an international exhibition of architecture and the allied arts and industrial design; *through Nov.* 15 — Milan, Italy. For information on participation, address: Triennale di Milano, Palazzo dell'Arte al Parco, Milano

September

1–16 Golden Jubilee Meeting, International Electrotechnical Commission — University of Pennsylvania, Philadelphia

4ff Fall Architects Trek to Spain, Italy, Greece, Egypt and France, under the leadership of Edmund Purves, F.A.I.A.

9–19 Sixth Annual National Home Furnishings Show — 71st Regiment Armory, 34th St. at Park Ave., New York City

13–14 33rd Annual Fall Meeting, The Producers' Council — Hotel Commodore, New York City

13–16 Annual convention and architectural exhibit of hospitals, American Hospital Association — Navy Pier, Chicago

13–17 National Technical Conference, Illuminating Engineering Society — Chalfonte-Haddon Hall, Atlantic City, N. J.

15 Chapter Presidents' Conference, The Producers' Council — Hotel Biltmore, New York City

19–26 National Home Week: a nationwide observance sponsored by the National Association of Home Builders

26–28 Regional Conference, Gulf States District, American Institute of Architects — Marion Hotel, Little Rock, Ark.

(*Continued on page 270*)

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G•J•S 16614—*Architectural Record*

Steel for Denver's Mile High Center 'ected in 82 Days

A remarkable new building is rapidly nearing completion in Denver, right across the street from the famous old Brown Palace Hotel. It is 1700 Broadway, a striking 23-story office building, principal structure of the spectacular "Mile High Center."

Fully air-conditioned, equipped with electronically-controlled elevators, and featuring an open ground floor and dramatic new facade treatment, the tall, graceful tower strikes a new note in beauty and efficiency. The Mile High Center will also include a handsome bank and office building, and a two-story structure housing a clear-span airline terminal on the street level, with a restaurant and shops below.

HIGH-STRENGTH BOLTS SPEED ERECTION

One of the eye-opening aspects of 1700 Broadway is the speed with which Bethlehem erected the 4600-ton steel framework. By using high-strength bolts instead of field-driven rivets, Bethlehem's erection crew was able to complete bolting the same day they finished steel erection—trimming a full week off erection time. Averaging better than 55 tons of steel per day, Bethlehem completed the entire job in just 82 working days.

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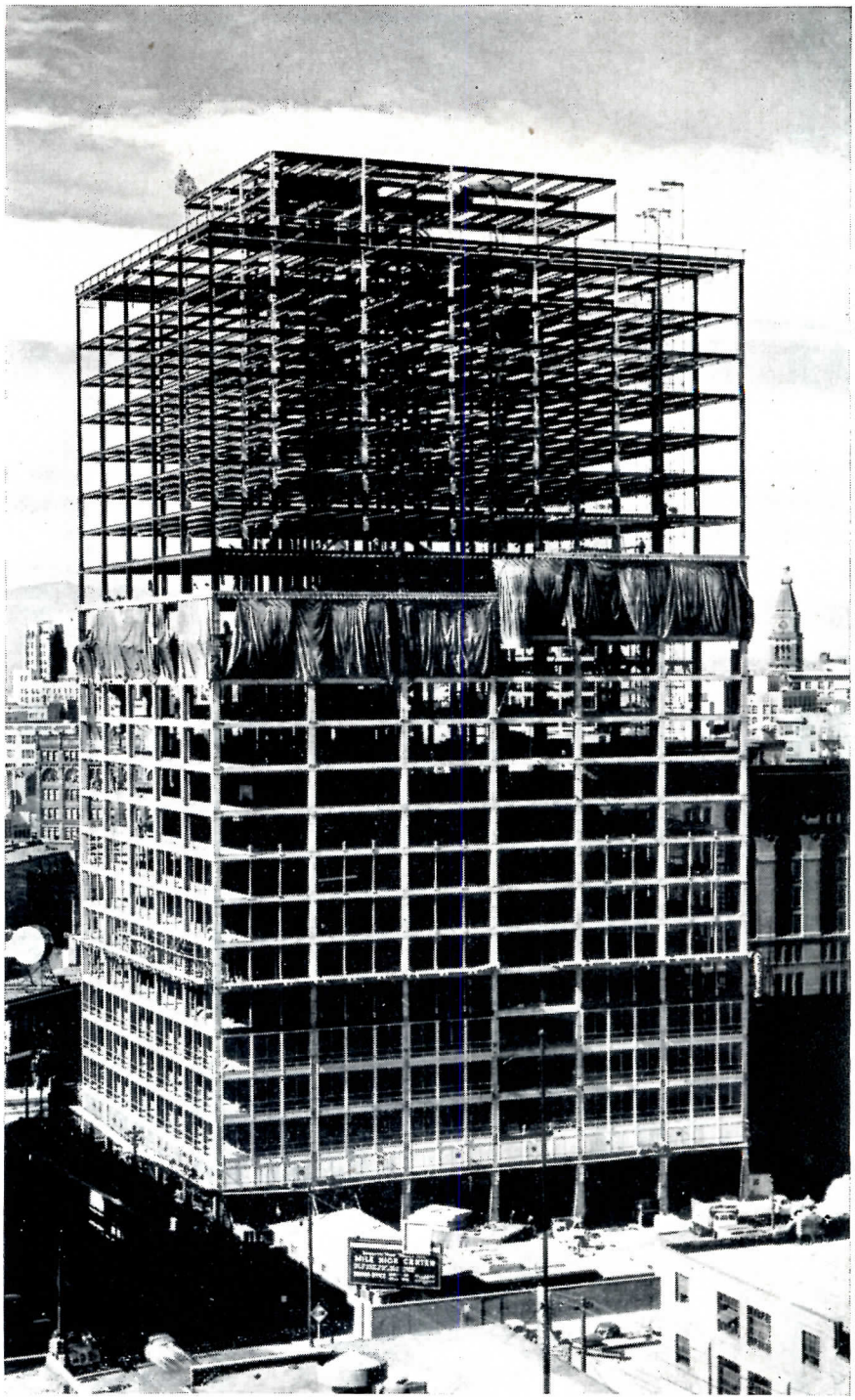

Completed structural steel framework of 1700 Broadway. Pouring of concrete and installing of aluminum cover panels was well under way when this picture was taken. *Owner:* Webb & Knapp, Inc., and George A. Fuller Co. *Architect:* Webb & Knapp, Inc., Architectural Div., I. M. Pei, director. *Associated Architects:* Kahn & Jacobs and G. Meredith Musick. *Consulting Engineers:* Jaros, Baum & Bolles and Severud-Elstad-Krueger. *Contractor:* George A. Fuller Co. *Steelwork:* Bethlehem Steel Co.

High-strength bolting, pioneered by Bethlehem, requires a minimum of men and equipment, speeds and simplifies erection.

(*Continued from page 268*)

27–30 Annual Meeting, Institute of Traffic Engineers — Hotel Muehlbach, Kansas City, Mo.

29ff Annual Meeting, Porcelain Enamel Institute; through Oct. 2 — The Greenbrier, White Sulphur Springs, W. Va.

30ff Annual Convention, California Council of Architects; through Oct. 2 — Hoberg's Lake County, Cal.

OFFICE NOTES

Offices Opened

• Nelson A. Faerber and Donald E. Nick have announced their association in the firm Faerber & Nick, Architects. Offices are located in Naples, Fla.

• Harold J. Cliffer and Lawrence J. Harrison have announced the formation of a partnership for the practice of architecture and planning. The firm, to be known as Cliffer & Harrison, has its offices at 5236 S. Blackstone Ave., Chicago 15, Ill.

• Michael A. Gallis, Architect, has opened his office at 414 Mason St., San Francisco, Calif. Mr. Gallis was formerly associated with the late Eric Mendelsohn.

• William N. Layman, A.I.A., has announced the opening of architectural offices at 1320 Grandin Road S.W., Roanoke 15, Va.

• Arthur C. Lucas Jr., A.I.A., announces that he has opened a new office in the Alworth Building at Duluth, Minn.

• Robert George Muncaster, Architect, has announced the opening of his offices. His address is Suite 11, Sampson Building, 75 Malaga Cove Plaza, Palos Verdes Estates, Calif.

• M. Wayne Stoffle, A.I.A., has announced the opening of his own offices at 730 Gravier St., New Orleans 12, La.

Firm Changes

• George Frederic Ashley, A.I.A., Lawrence H. Keyser, Architect, and Chris W. Runge, Architect, have become partners in the firm of Meyer & Evers, Architects, the firm announced recently. Offices are located at 149 California St., San Francisco 11, Calif.

• Bellman, Gillett and Richards, Architects, announce the retirement of John Gillett from partnership in the firm and the addition of three new partners, Orville H. Bauer, Raymond A. Etzel and Robert C. Moorhead, and three new associates, George F. Blamey, Fred J. Speirs and Donald L. Todd. The firm name will remain unchanged.

• Bolt, Beranek and Newman, Inc., Consultants in Acoustics, 16 Eliot St., Cambridge, Mass., have announced a change from a partnership to a corporate organization. The officers are: Leo L. Beranek, President; Richard H. Bolt and Robert B. Newman, vice presidents; Samuel Labate, executive vice president and secretary; and Jordan J. Baruch, treasurer.

• The architectural firm of Brackett & Brackett has been changed in name to William E. Brackett, Jr., A.I.A., architect, 9 Technical Building, Asheville, N. C.

(*Continued on page 272*)

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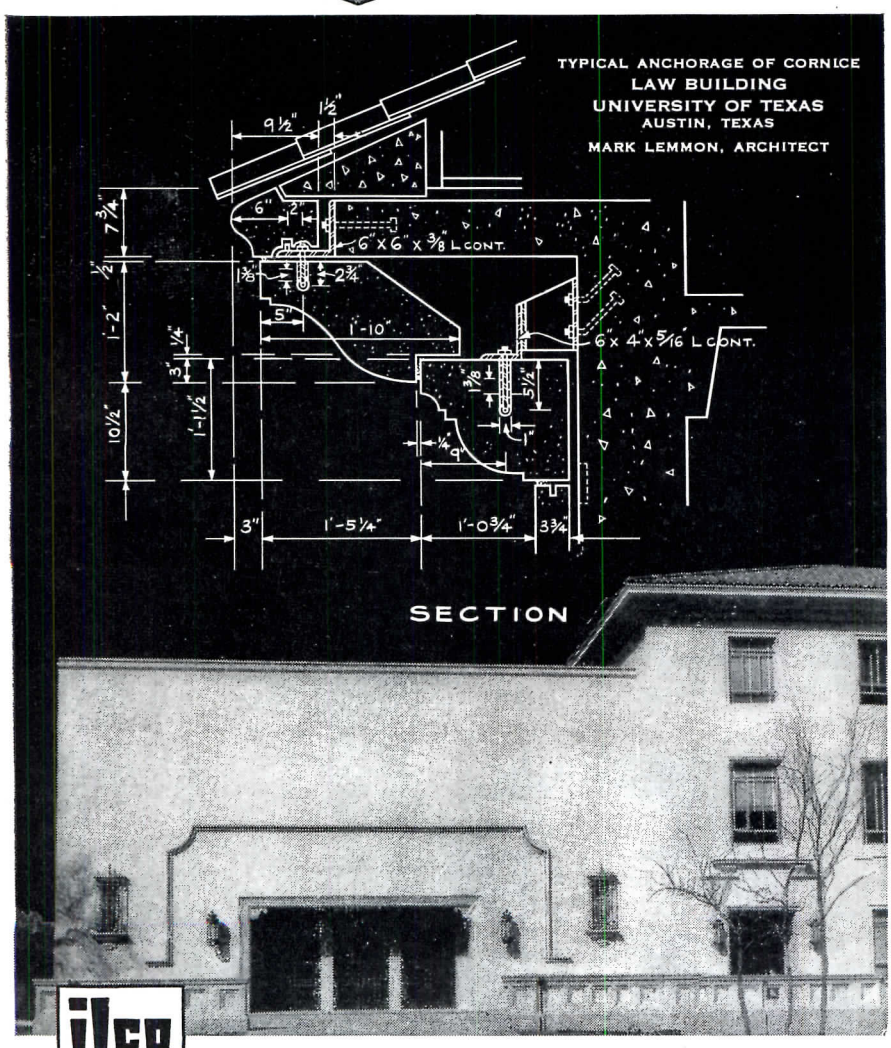

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Dramatic simultaneous fire test used identical fire intensities. Over 1900° F. fire, LEXSUCO ROOF CONSTRUCTION (left) has not added combustible materials to flames, smokes only slightly. Conventional roof construction (right) has fed combustible roofing materials to fire causing it to spread to roof surface.

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LEXSUCO ROOF CONSTRUCTION will prevent "feeding" of combustible materials to fire below the roof. It removes two dangerous conditions: (1) dripping of inflammable asphalt into fire area and (2) burning of material between roof deck and insulation. These were contributing factors which converted a recent plant fire into a major industrial disaster.

LEXSUCO ROOF CONSTRUCTION incorporates a single-thickness Koroseal vapor barrier instead of the conventional two-ply barrier of asphalt-saturated felt mopped with asphalt. The Koroseal is a specially compounded, fire-retardant film, easily installed and lap-sealed with LEXSUCO Adhesive to provide a superior vapor barrier. Insulation and the Koroseal barrier are secured to any type deck with either LEXSUCO Insulation Clips or LEXSUCO Adhesive. LEXSUCO ROOF CONSTRUCTION employs standard roofing components and techniques and can be used over any roof deck.

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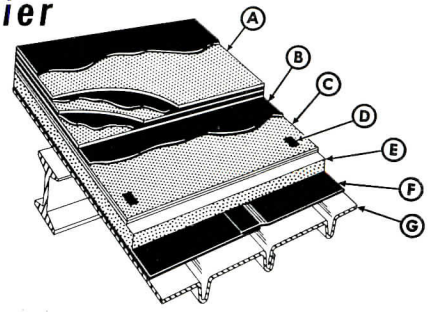
For a complete "Technical Report" on the Lexsuco Roof Construction or for further information, write to: *Lexsuco, Incorporated, 4817 Lexington Avenue, Cleveland 3, Ohio.*



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- Ⓖ Steel Deck

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THE RECORD REPORTS

(*Continued from page 270*)

• A. J. Loubet and W. B. Glynn, Architects, A.I.A., 400 Montgomery St., San Francisco, Calif., have announced the formation of a partnership to carry on the work of the office of the late W. D. Peugh, Architect: W. B. Glynn, A. J. Loubet, Associates.

• The former firm of Berman and MacLeod, Architects, 8 Mortlake Block, Edmonton, Alta., has been changed in name to Malcolm Donald MacLeod, Architect, with a new address at No. 8, 735 8th Ave., West, Calgary, Alta.

• Vernon L. Wheeler and Byran H. Becker announce the formation of a co-partnership under the firm name of Wheeler and Becker, Architects. They will be successors to the late Henry F. Stanton, F.A.I.A., with offices continuing at 1243 Free Press Building, Detroit 26, Mich.

New Addresses

Alper and Alper, Architect, 64 W. Randolph St., Chicago, Ill.

Eugene R. Banning, Architect, 400 E. 59th St., New York 21, N. Y.

Daniel Schwartzman, Architect, 8 E. 36th St., New York 16, N. Y.

Wilbur Watson Associates, Engineers, 2930 Prospect Ave., Cleveland 15, Ohio.

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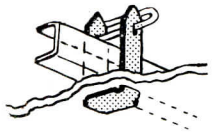
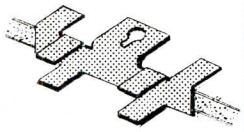

"U" CLIP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MORE FOCUS ON AMENITY IN BUILDING IS NOTED

Quotes from No. 17 in the Construction Markets newsletter series published in Washington by the Construction and Civic Development Department of the U. S. Chamber of Commerce:

"The construction industry is becoming steadily more aware of and responsive to the appeal of style, comfort and convenience.

"Modern materials and equipment, of course, make it easier to create this appeal. Beyond the novelty and better quality so achieved are also revolutionary developments in the exterior design and spacial arrangements of factories, commercial buildings, and dwellings.

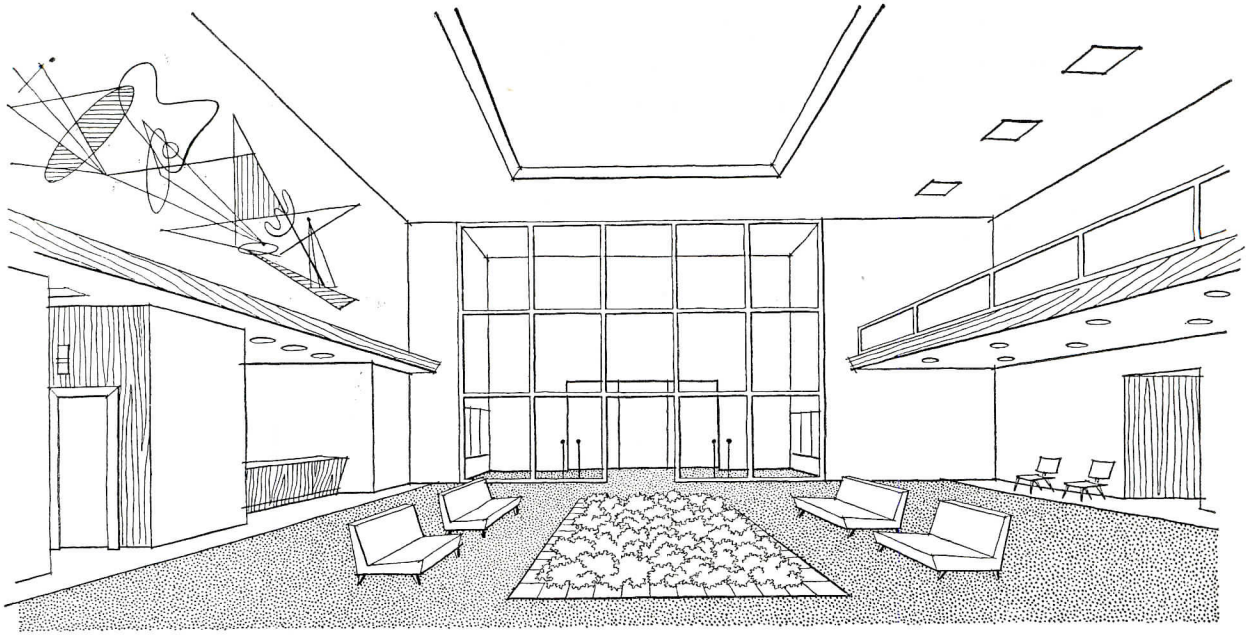
"A new age in design and planning is definitely with us. Yet this development is plainly still at its beginning. The next few years are certain to see an acceleration in progress."

The newsletter, issued over the name of Norman P. Mason, department chairman, and now the acting FHA administrator, noted that the American Institute of Architects maintains a special department and publication to keep its members informed about current technological developments and to aid them in putting them to practical application.

"The vast scope of technological innovation in itself presents problems," the letter continues. "The problems are those of synthesizing the work already done or under way, of recognizing imbalances, particularly between methods on the one hand and suitable materials on the other, of discovering the lags and gaps in current development, and of finding ways amid the great diffusion of participants of keeping the advance on a more or less even front."

The letter included strong support for the Building Research Advisory Board, which now has been in operation for five years.

(*More news on page 274*)



Why not add a comprehensive

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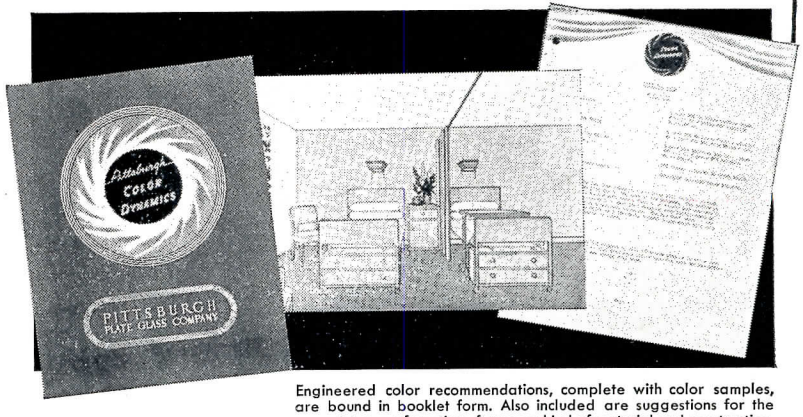

Engineered color recommendations, complete with color samples, are bound in booklet form. Also included are suggestions for the correct types of coatings for every kind of material and construction.

TODAY, nearly everyone who owns or operates an industrial, commercial or service enterprise recognizes the importance of the effect of color environment on people.

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Additional information on COLOR DYNAMICS in Sweet's Architectural File, Section 14/Pi.

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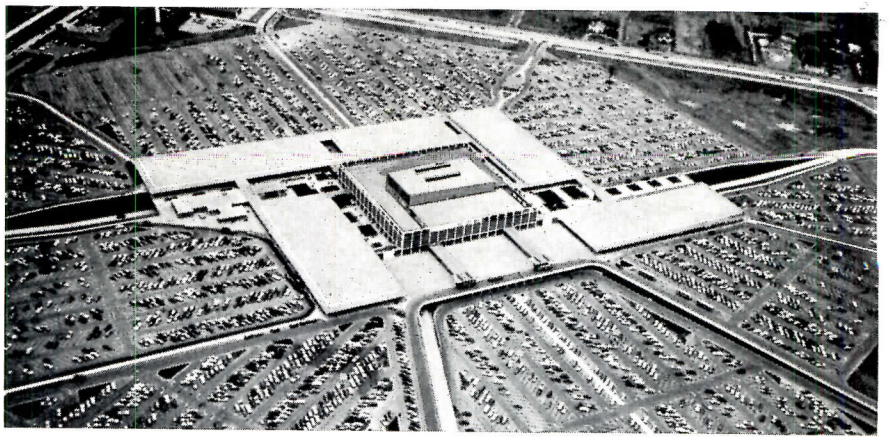
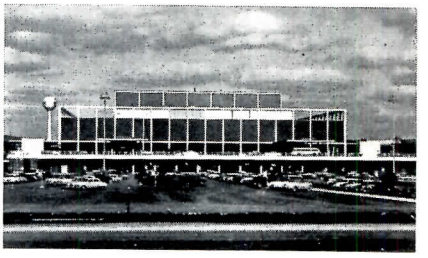
(*Continued from page 272*)

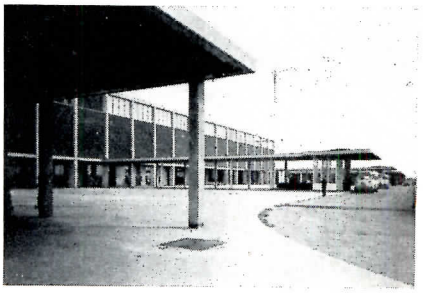
DETROIT SEES OPENING OF NORTHLAND CENTER

Detroit's new Northland Center was opened to the public recently. Built at a cost of $25 million, the 160-acre center contains 80 stores, a number which the owners expect to increase to 100 by the end of 1954.

At the core of the center are six buildings, the largest being the four-story branch of J. L. Hudson Company. The other five buildings are all of one story, with an additional level underground to be used for either storage or sales space. Most of these stores open on both the mall and the parking area.







Above: Northland Center approached from the front, with Hudson's branch store dominating the site. Below: the unloading terrace

Victor Gruen Associates were architects for Northland Center.

A group of service buildings in the northeast corner of the area houses the center's heating and air conditioning plants. Also located in this group are headquarters of the center's own police and fire departments.

Landscaped Malls

With the objective of imparting to the center an atmosphere of a medieval market place, the architect planned an extensive landscaping program, carried out by landscape architect Edward

(*Continued on page 276*)

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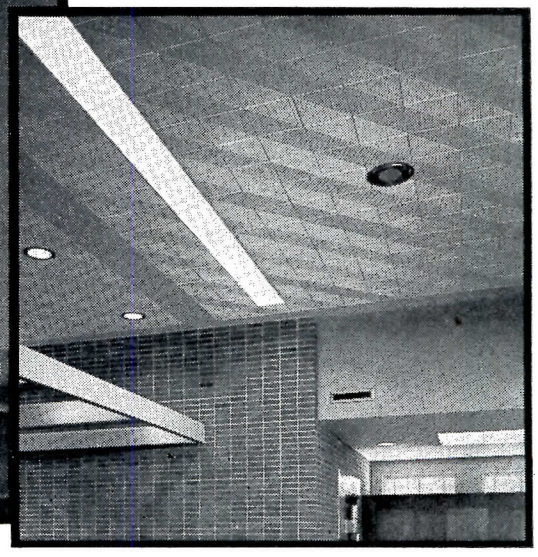

Citizen's Bank, Langley Park, Md.
Architect: Mr. Ronald Senseman, Washington, D. C.
General Contractor: H. O. McAllister, Silver Springs, Md.
Acoustical Contractor: T. M. Woodall, Inc., Takoma Park, D. C.

New approach to acoustical treatment, MOSAIC HANSONITE utilizes an exclusive two-toned effect of smaller and larger holes. An almost unlimited number of ceiling patterns is easily arranged providing harmonious architectural effects in all types of areas.

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ELOF HANSSON, INC.

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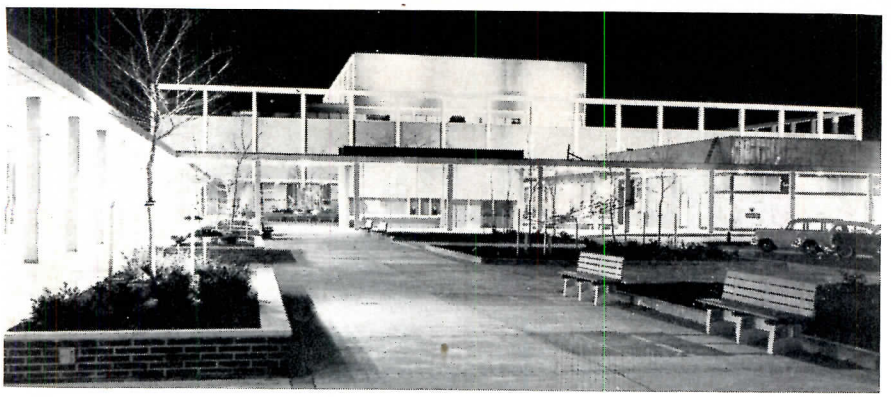
 (*Continued from page 274*)

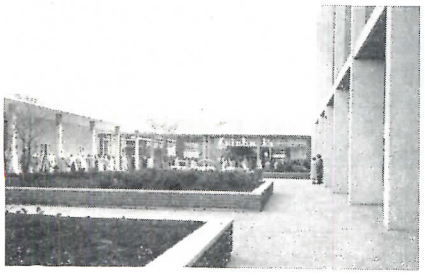


Above: the mall known as "Peacock Terrace." Below: the East Mall

A. Eichstedt. Each court was assigned its particular genus of tree — one mall, for example, will be dominated by magnolia trees, others by crabapple, Japanese cherry, redbud or birch.

In addition to the permanent landscaping, flowers will be displayed in season.

An important part of the landscaping scheme was the inclusion of sculpture. The works of six sculptors — Marshall Fredericks, Richard Hall Jennings, Gwen Lux, Malcolm Moran, Lily Saarinen and Arthur Kraft — were commissioned for the project and are on permanent exhibition.



Traffic and Parking

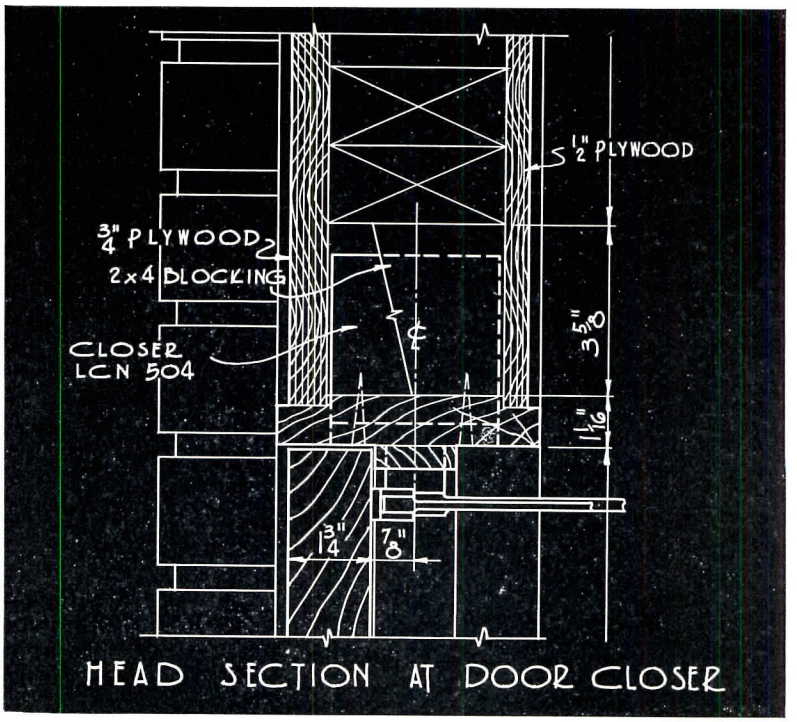
There are nine parking lots at Northland Center, arranged in a ring completely surrounding the store group. The parking lots can accomodate 7500 cars, with none of the lots larger than 900 spaces. Parking space can be expanded to handle as many as 11,500 automobiles. A separate parking area has been provided for employes at the center.

None of the individual parking spaces is more than 500 ft from the stores, and pedestrian walks to the stores have been raised above the level of the lots. A 52-degree angle was selected for the turn-on for each parking space. The area is illuminated at night with floodlights.

Traffic coming into and leaving the center has been separated, and intersections eliminated. Right hand turns were used as often as possible.

Heavier traffic, such as mail and delivery trucks, comes into the center underground.

(*More news on page 278*)



CONSTRUCTION DETAILS

for LCN Overhead Concealed Door Closer Installation Shown on Opposite Page

The LCN Series 500 Closer's Main Points:

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2. Mechanism entirely concealed; arm visible on inside of an out-swinging door
3. Hydraulic back-check prevents door's being thrown open violently to damage door, walls, etc.
4. Double lever arm provides maximum power to overcome wind and drafts
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Ralph C. Flewelling & Walter L. Moody, Architects

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CENTER STREET SCHOOL, EL SEGUNDO, CALIFORNIA

LCN CATALOG 11-E ON REQUEST OR SEE SWEET'S • LCN CLOSERS, INC., PRINCETON, ILLINOIS

(*Continued from page 276*)

MULTI-USE PLANTS RISE FROM IDLED FACTORIES

The Society of Industrial Realtors focused national attention on New England's idle plant capacity problems recently when it jointly sponsored with the New England Council a dramatic one-day 1500-mile air tour of six northeastern states.

A big problem of industrial plant loss had been posed by American Woollen's decision to close nine of its 11 manufacturing plants in that general area. This was reminiscent of a few isolated instances in the region's recent history when communities faced staggering unemployment difficulties as mill space was vacated. The industrial realtors and representatives of New England planning and development groups swooped down on five cities for brief conferences with local officials. In this rapid survey they got the "feel" of the critical plant crisis facing so many New England localities.

This minor revolution in industrial activity has prompted much new construction in other parts of the country — particularly the South — and results in a sizeable amount of remodeling of the older plant structures as they are adapted to other uses.

Architectural and engineering services have been in demand in such locations as Manchester, and Nashua, in New Hampshire, where vacated textile mill space has been remodeled to accomodate more diversified "growth" industries such as electronics, plastic, specialized chemicals, etc.

It was generally agreed, following the tour, that this many-for-one concept spells the major solution, in today's economy, to suddenly-posed problems of plant vacancies. Take Manchester, for example. There, the loss of local industry when the huge Amoskeag interest closed its cotton textile enterprise a couple of decades ago threatened to prostrate the city. Citizens groups, however, attracted more than 125 different industries to occupancy in the seven million sq ft of mill space that Amoskeag had occupied in closely grouped structures in the heart of the city.

Extensive remodeling was called for as the new firms came in. Dividing walls were installed, elevator service strengthened or replaced, and the old mill buildings were generally made over to accommodate the wide variety of new operations. Some of the space is occupied by nonmanufacturing operations such as warehousing. Nashua, a community watched closely by other New England cities with vacant plant troubles, has enticed 30 small industries to occupy 20-odd mills vacated a couple of years ago by Textron, large textile producer.

With the more immediate prospects of industry loss, however, other communities are not so fortunate. At Dover-Foxcroft, Maine, a community of 4200, American Woolen last month had decided to close two of its factories employing 600 persons. Needless to say, Dover-Foxcroft was searching frantically for new tenants. The blow had "broken the economic back of the community," according to a Chamber of Commerce spokesman.

S.I.R.'s chartered flight was headed by Carl Lloyd, executive vice president of the national Society.

(*More news on page 284*)

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LOWER TOTAL VOLUME
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Greater strength per ton permits greater free space with spans from 25′ to 125′, or larger multiples. Framing goes faster with no field fabrication, no subjoists or purlins, and with lighter columns and footings. The shallow T-Chord depth holds total volume to the minimum and still provides perfect layout for conduit, ducting and piping. This low total volume cuts heating, ventilating and maintenance expenses. Let our engineers show you how to profit with T-Chord planning. Write, wire, or phone us for more information.

See Sweet's Architectural File, Sweet's Industrial File No. 2c/Ha

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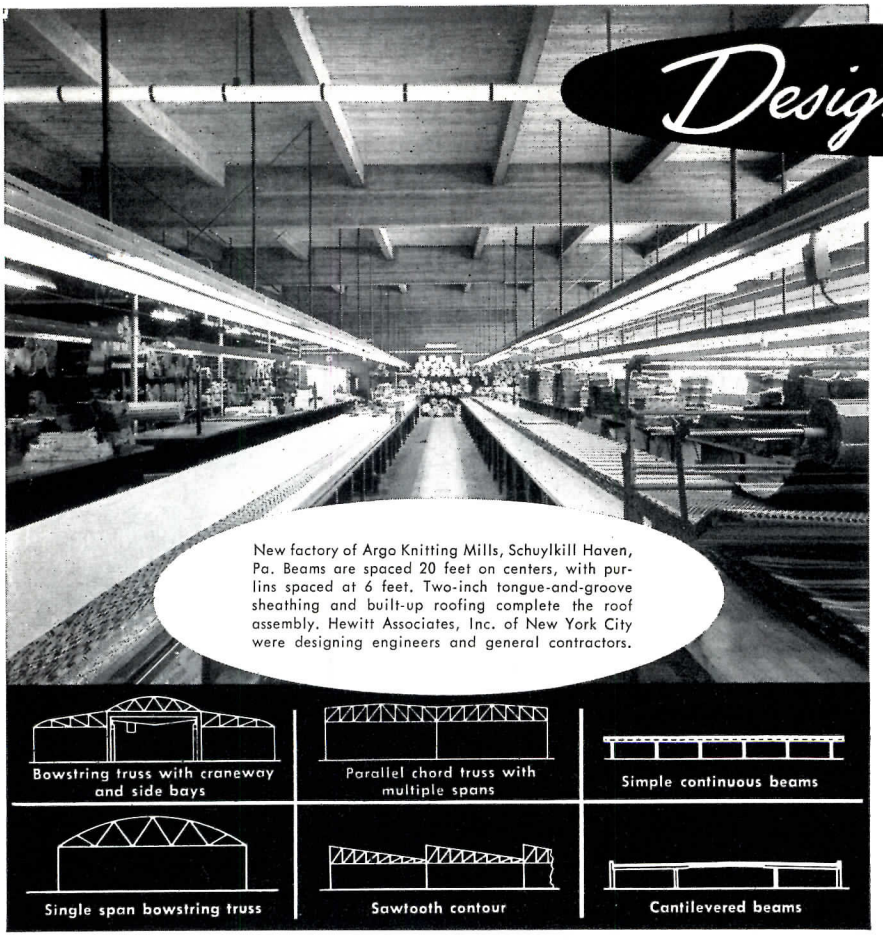

New factory of Argo Knitting Mills, Schuylkill Haven, Pa. Beams are spaced 20 feet on centers, with purlins spaced at 6 feet. Two-inch tongue-and-groove sheathing and built-up roofing complete the roof assembly. Hewitt Associates, Inc. of New York City were designing engineers and general contractors.

This modern factory building has bays 50 feet wide without a post to interfere with production processes and equipment. It will last for generations with negligible maintenance, yet it cost materially less than average for permanent structures of this kind. And its ability to resist destruction by fire is greater than buildings framed by other commonly used materials.

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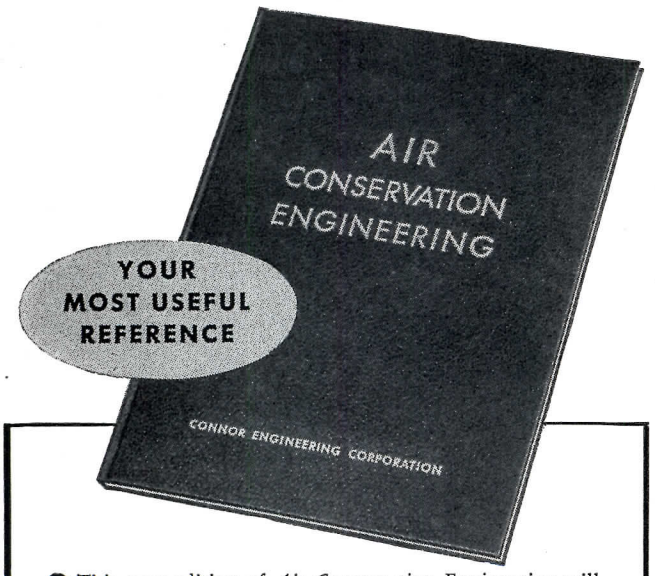

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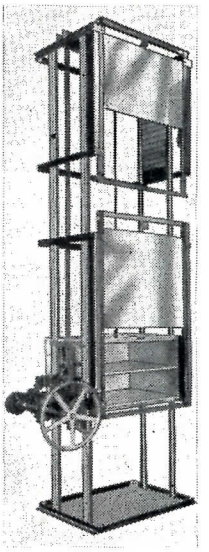

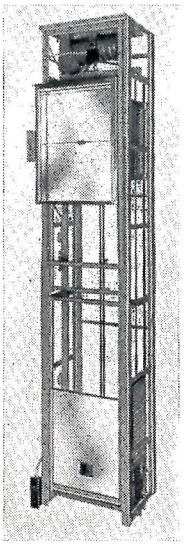

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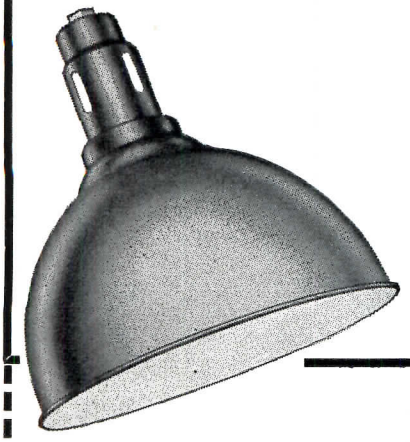

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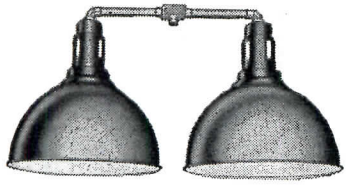

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ABOLITE *Lighting* DIVISION
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THE RECORD REPORTS

(*Continued from page 278*)

AIR CONDITIONING SURVEY QUERIES 325 FAMILIES

In an effort to compile statistical evidence of the effect of air conditioning in the home, the American Gas Association, through its Home Service Committee, conducted personal interviews of 325 families, a group including 782 adults and 390 children. The results indicated that year-round air conditioning does affect the pattern of home life.

For example, 71 per cent of the families interviewed reported a change in their recreational activities, citing such changes as fewer week ends away from home (42 per cent); fewer air conditioned movies (41 per cent); fewer trips to parks and swimming pools (28 per cent); and more entertainment at home (19 per cent).

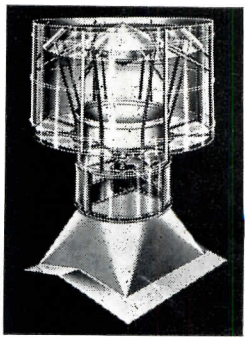
According to 49 per cent of the interviews, the families went out less often for meals with the result in some of these cases of savings on summer food bills.

In 31 per cent of the interviews it was reported that vacation patterns had changed after air conditioning had been installed. Some of the changes observed here were: vacations no longer taken just to avoid the heat (66 per cent); vacations taken in winter rather than summer (43 per cent); no vacations desired by family (7 per cent); and no necessity for trips to avoid hay fever season (2 per cent).

Less time required for house cleaning was noticed by 83 per cent of the respondents, with 90 per cent of this number reporting less dusting time. Other effects of air conditioning noted by this group: less cleaning of walls and woodwork (71 per cent); less frequent cleaning of drapes, upholstery and rugs (70 per cent); less redecorating work required (31 per cent); less use of domestic help (14 per cent). There were, however, some complaints of increased cleaning required, chief among which was the report that curtains located over air vents became soiled more quickly.

An improvement in the general health of the families was reported by 66 per cent of the respondents, who observed such changes as: better appetites and eating habits (45 per cent); relief from hay fever or pollen allergies (32 per cent); fewer colds (23 per cent); improved health of baby (15 per cent); and relief from asthma (11 per cent).

HERE'S TWO-WAY ECONOMY



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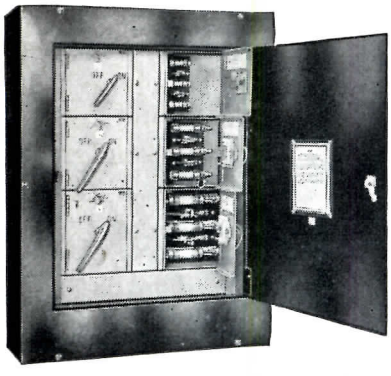

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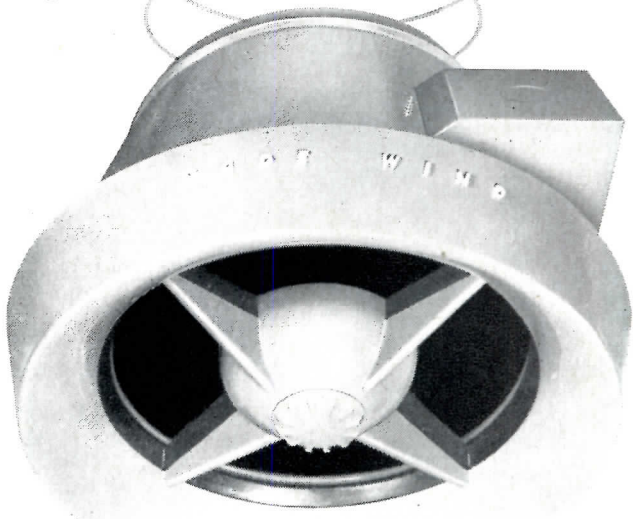

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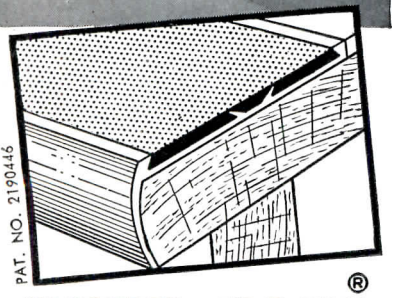

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REQUIRED READING

(*Continued from page 48*)

Irish nor his American buildings exhibit much in the way of innovation or experiment, but his best works, such as Christ Church in Indianapolis or the Probasco house in Cincinnati, still remain landmarks deserving of the name.

If, then, a study of Tinsley's work contributes very little of importance to an understanding of the historical development of American architecture, it does provide an accurate picture of the pleasures and problems of the architect in the last half of the 19th century. And the Midwestern reader (the reviewer is one) will have more than a little fun learning about one of the men whose work contributes so much to the flavor of the architectural landscape in Ohio and Indiana. — G. M. ANDERSON

THE PERSONAL PAINTINGS OF EDOUARD VUILLARD

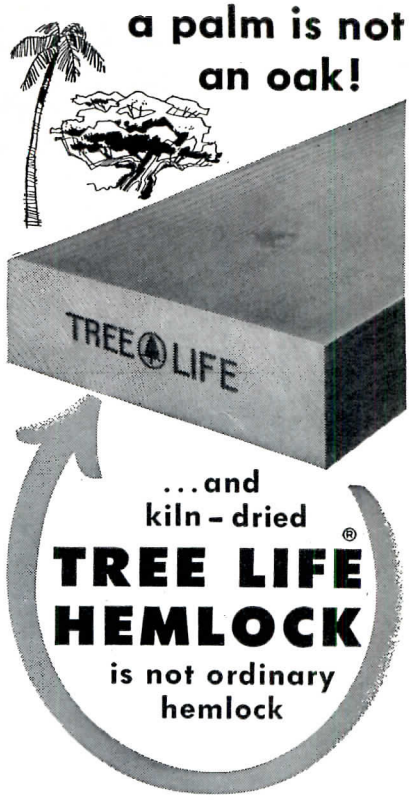
Edouard Vuillard (1868–1940), by Andrew Carnduff Ritchie. The Museum of Modern Art; distributed by Simon and Schuster (630 Fifth Ave., New York, N. Y.), 1954. 7½ by 10 in.; 104 pp., illus. $3.50.

A strong figure in the field of art during the modern movement, Vuillard left his impression with individuality in self-chosen work — both in subject matter and the use of color. Little variation is shown in theme as his paintings depict only the personal side of his life, with portraits, family scenes and intimate gatherings of friends. Painted in lovely, subtle colors in a carefully patterned plan, Vuillard's work is enhanced by a rich surface decoration.

For almost thirty-five years (approximately 1905–1938) Vuillard retired from exhibiting his paintings as the trend of the coming abstraction movement, with which he refused to conform, passed him by. However, two years before his death, he was persuaded to have a large retrospective exhibition at the Musee des Arts Decoratifs in Paris.

(*Continued on page 292*)

a palm is not an oak!



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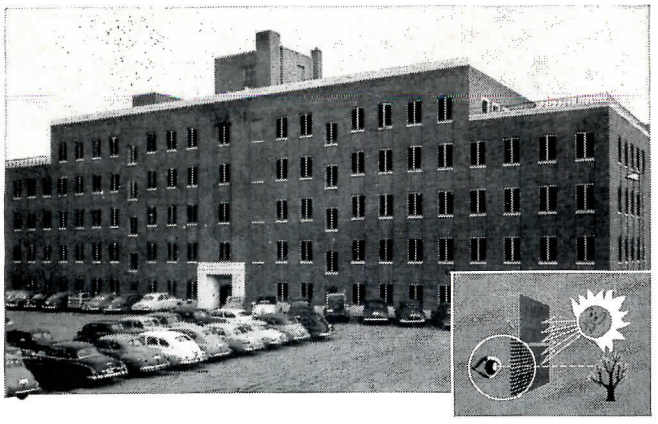

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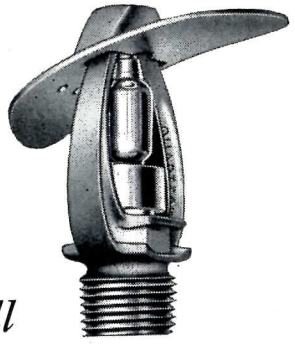

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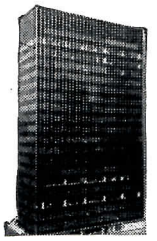
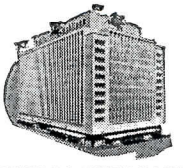


LEVER HOUSE, New York City. Zonolite Plaster Fireproofing. Architects — Skidmore, Owings & Merrill. Contractor—George A. Fuller Company.



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Liquid compounds, similar in all respects except as to color and viscosity. Applied by brush, roller, spray gun directly to floors, walls, ceilings, old or new. No need for surface preparation. Equal bonding permanence all climates, all types of surfaces, all sorts of conditions.

WHERE USED, BY WHOM

A few examples. Others gladly sent on request, including applications and names of architects, contractors, builders.

Midway Gardens Apts., Chicago, Ill.: ARCHTS.: Holabird, Root & Burgee & Associates; GENL. CONTR.: S. N. Nielsen Co.; PLSTG. CONTR.: McNulty Bros. Co.

Hollywood-Knickerbocker Hotel, Hollywood, Cal.: ARCHT.: W. D. Peugh and Associates, W. B. Glynn and A. J. Lauket; GENL. CONTR.: Walter Olerich; PLSTG. CONTR.: L. B. Paulsen.

National Institute of Health Clinical Center, Bethesda, Md.: GENL. CONTR.: John McShain; PLSTG. CONTR.: James Kane and Company.

Lansdowne Racetrack, Vancouver, B. C. PLSTG. CONTR.: Tommy Turner.

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BONDS...that never let go!

REQUIRED READING

(*Continued from page 288*)

The Museum of Modern Art recently presented an exhibition on Vuillard which thoroughly covers all phases of his work. It included his earlier, well-known paintings as well as some large decorations such as those for the Comedie des Champs-Elysees and the lesser known works done in the thirty year non-exhibition period.

The Museum's book not only contains the same complete coverage of the Vuillard era as their exhibition, but also includes a discerningly written biography of the painter himself. The illustrations and color tone are very clearly reproduced. — H. E. Cook

LESS IS MORE

Mies van der Rohe. By Philip C. Johnson. Revised edition. Museum of Modern Art (11 W. 53rd St., New York, N. Y.) 1953. 8 by 10 in., 216 pp., illus. $7.50

Mies van der Rohe is primarily interested in the craftsmanship of architecture. From Philip Johnson's biography of the architect we learn that he has always been interested in the "direct utilization of the inherent esthetic and structural qualities of building materials."

Mies never had formal architectural training. As a young boy he was apprenticed in his father's stone cutting shop where he gained a thorough knowledge of the possibilities and limitations of masonry construction. His next apprenticeship, which he now describes as "gruelling," was as a designer of the Renaissance stucco decoration that festooned the 18th century buildings that flourished anew in the early twentieth century. This training enabled him to develop his talent for drawing.

Dissatisfied with his inadequate knowledge of wood, Mies next apprenticed himself to Bruno Paul, a leading furniture and cabinet designer of Germany.

After building his first house, the Riehl house, Mies gained great experience as supervisor of construction of the German embassy for the office of Peter Behrens, which was also the training ground for Le Corbusier and Gropius. In Behrens' office Mies came under the influence of the unique sense of proportion in the work of Karl Frederic Schinkel (1781–1840).

Later, while in the Hague, Mies was impressed by the structural honesty of

(*Continued on page 296*)

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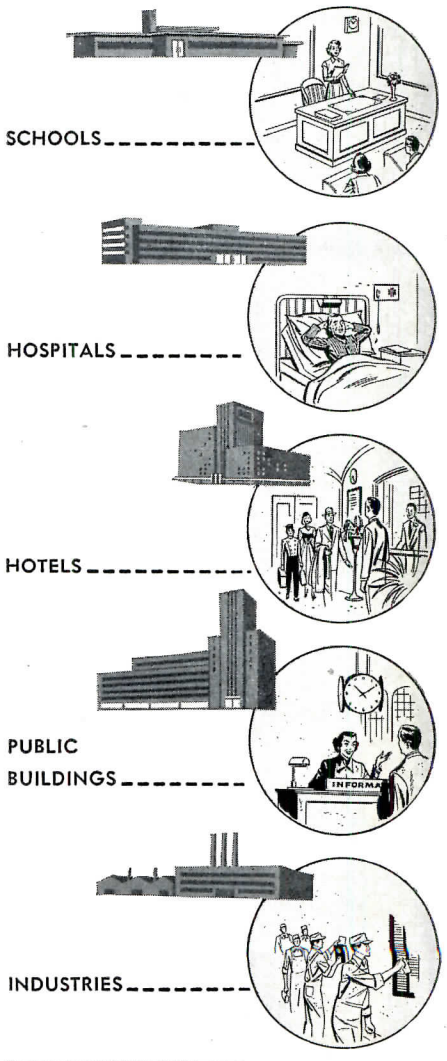

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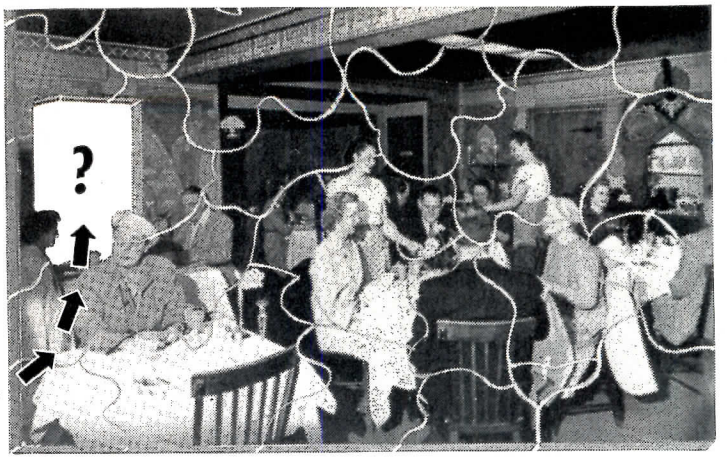

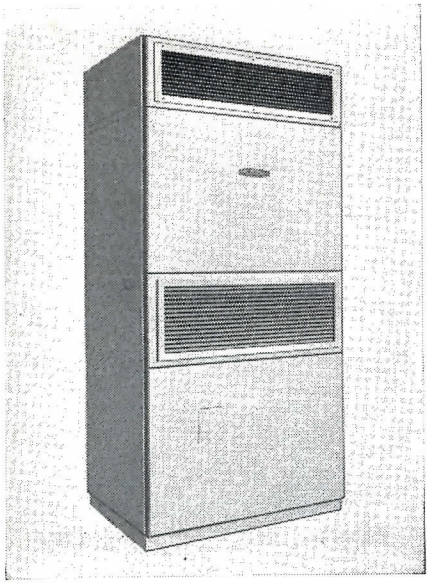

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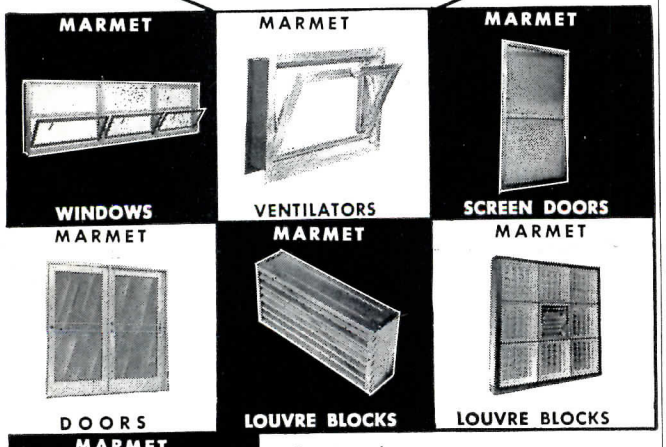

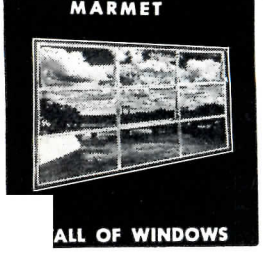

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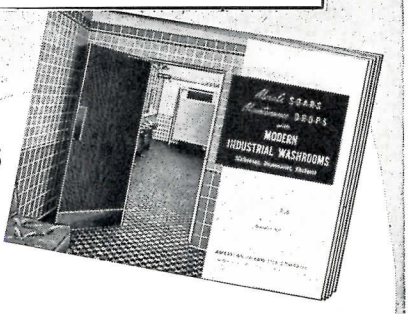

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REQUIRED READING

(*Continued from page 292*)

the work by Hendrik Petrus Berlage. Berlage, a contemporary of Behrens, believed along with Ruskin and Morris that "those parts of a building resembling supports should actually support and, conversely, that all the supporting elements should be evident."

From this background has emerged the well known and acclaimed International Exhibition at Barcelona, the buildings at Illinois Institute of Technology, the Chicago apartment houses and the Farnsworth House.

Mr. Johnson has related the work of Mies through 1953 concisely and with interest. The text is accompained by many fine photographs, Mies' renderings and 15 of his writings dating from 1922 through 1950. — M. Blake

OTHER BOOKS RECEIVED

The Modulor. By Le Corbusier. Harvard University Press (Cambridge, Mass.) 1954, second edition. 7½ by 7½ in., 243 pp, illus. $5.00.

Ancients Arts of the Andes. By Wendell C. Bennett. Museum of Modern Art (11 W. 53rd St., New York, New York) 1954. 7½ by 10¼ in., 188 pp, illus. $6.50.

American Planning and Civic Annual. Edited by Harlean James. American Planning and Civic Association (Washington, D. C.) 1953. 9¼ by 6¼ in., 163 pp.

Contemporary Architecture in Japan. By Shinji Koike. The Shokokusha Publishing Co. Inc. (11–2 Chome, Hirahawocho, Chiyodaku, Tokyo, Japan) 1954. 10¼ by 9½ in., 120 pp, illus.

The Castles of Great Britain. By Sidney Toy. The British Book Center (122 E. 55 St., New York, N. Y.) 1954. 6¼ by 9 in., 276 pp, illus.

Dwelling House Construction. By Albert H. Dietz. D. Nostrand Co., Inc. (250 4th Ave., New York, N. Y.) 1954. 9¼ by 6 in., 396 pp, illus. $7.50.

The New Architecture of Great Britain 1946–1953. Edited by E. D. Mills. Reinhold Publishing Corp. (New York, N. Y.) 1954. 12½ by 9¼ in., 209 pp, illus. $9.00.

Idea. Edited by Alvin Lustig. George Wittenborn and Co. (38 E. 57 St., New York, N. Y.) 1954. 8½ by 11½ in., 132 pp, illus. $8.50.

New Furniture. Edited by Alvin Lustig. George Wittenborn and Co (38 E. 57 St., New York, N. Y.) 1954. 8½ by 11½ in., 140 pp, illus. $8.50.

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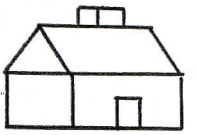

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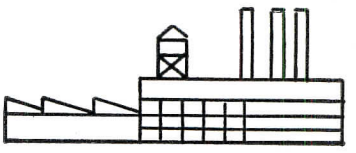

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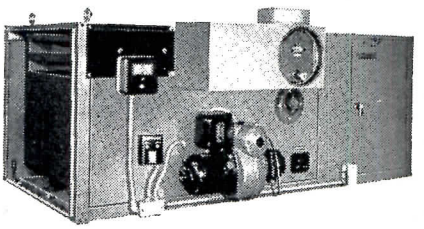

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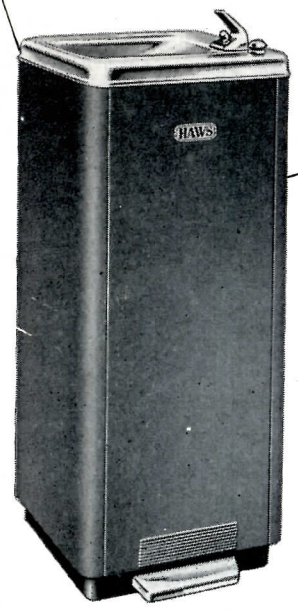

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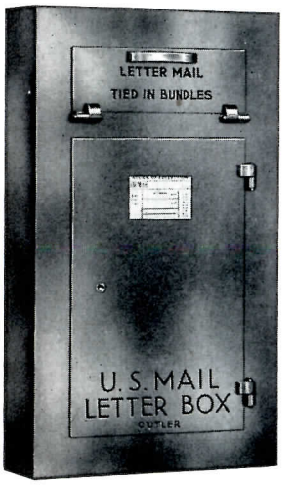

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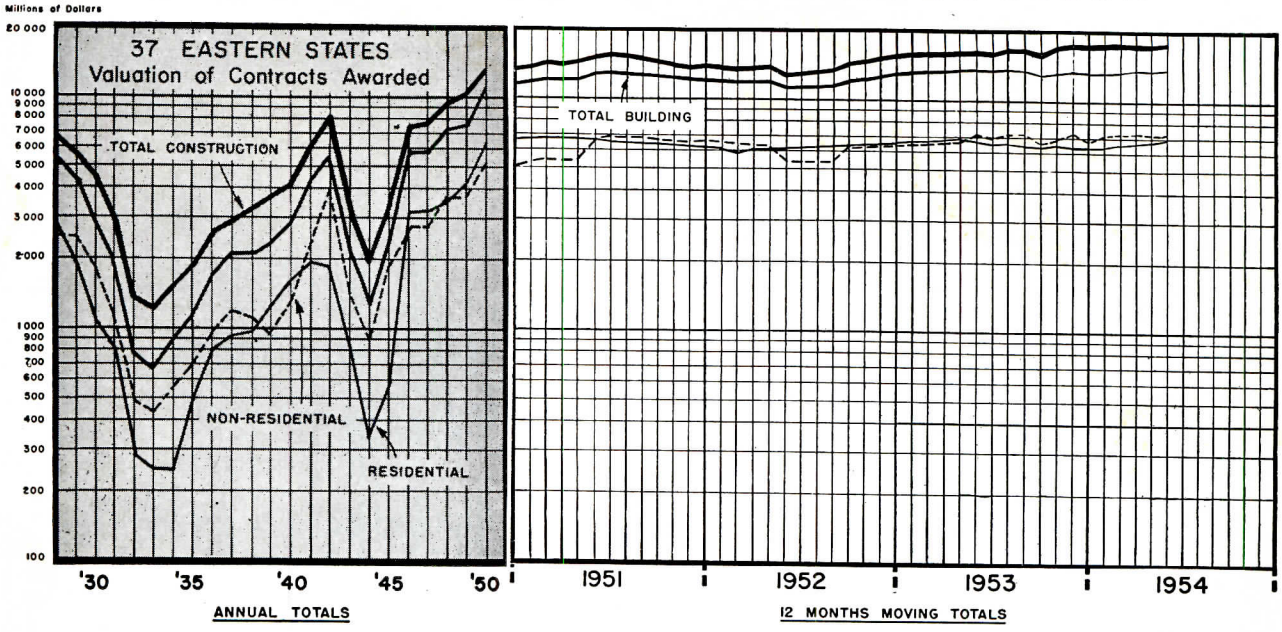
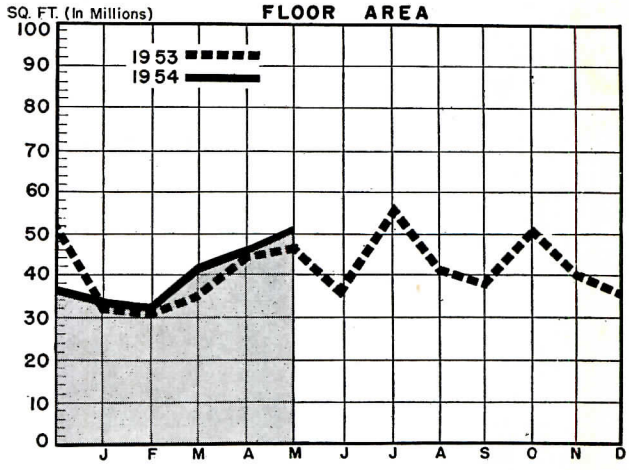


ALL CATEGORIES SHOW CONTINUED BOOM

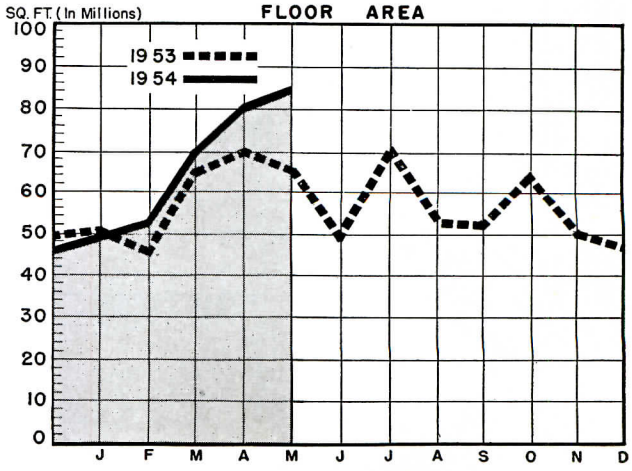
THIS YEAR was still running ahead of record 1953 in each of the three basic categories, according to F. W. Dodge Corporation's latest figures on valuation of contracts awarded for future construction in the 37 states east of the Rockies. Total dollar volume of $7,517,885,000 set a new high for the first five months of any year — 11 per cent over the equivalent 1953 period and two per cent over the previous first-five-months high in 1951, which had included a $980 million atomic energy project. Each of the three basic categories reflected the increase in valuation over the 1953 period — nonresidential was up 10 per cent; residential was up 17 per cent; and public works and utilities showed a slight increase. Construction contract awards in May alone totaled $1,925,-253,000, a whopping 20 per cent ahead of May 1953 and the third highest monthly valuation recorded by Dodge in its 63-year history — topped only by May 1951, and September 1952, which had big atomic energy contracts. Residential awards in May reached a new high of $825 million; non-residential was up 16 per cent, public works and utilities 11 per cent.

Charts by Dodge Statistical Research Service

NONRESIDENTIAL BUILDING (37 EASTERN STATES)



RESIDENTIAL BUILDING (37 EASTERN STATES)



INDUSTRIAL BUILDINGS*—SELECTED YEARS
F. W. Dodge Corporation Contracts Awarded
Floor Area (thousands of sq ft)
37 Eastern States

Year	Annual Total	Monthly Average	Year	Annual Total	Monthly Average
1929	105,524	8,794	1949	61,143	5,095
1935	20,638	1,720	1950	114,860	9,572
1941	187,923	15,660	1951	148,231	12,353
1944	84,356	7,030	1952	114,823	9,569
1946	235,238	19,603	1953	111,687	9,307

Monthly Totals

1953				1954	
Jan.	7,341	July	12,276	Jan.	7886
Feb.	8,085	Aug.	7,884	Feb.	5384
Mar.	7,241	Sept.	9,690	Mar.	6679
Apr.	11,267	Oct.	12,575	Apr.	9018
May	10,346	Nov.	12,477	May	8598
June	6,113	Dec.	6,392	5-mos. total—	37,565

* Industrial Buildings is the title of RECORD Building Types Study No. 212 (pp. 144-172).