ARCHITECTURAL RECORD

DECEMBER 1954

BUILDING TYPES STUDY NUMBER 217

RELIGIOUS BUILDINGS

ARCHITECTURE IN THE ATOMIC AGE

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ARCHITECTURAL RECORD

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The Record Reports

Semi-annual Index

This year the RECORD'S *semi-annual index is published separately, not included in the issue. Copies will be mailed automatically to library and university subscribers. Copies will be sent free to any other subscribers who request them.*

Architecture in the Atomic Age

Ever since the bomb fell on Hiroshima responsible minds have been trying to visualize the effects of nuclear fission on our world and our way of life. Clearly the word "world" is singular, but the "way of life" is plural. And individuals in both East and West have sought personal answers. The RECORD staff over many months has been looking at various aspects — the promises as well as the threats — and is pleased to present the first major result:

Building Types Study Number 217 — Religious Buildings

The challenge that religious buildings pose for contemporary architects is a familiar one, and each year the RECORD has in effect done a progress report. This year's study seems to record tangible progress in the search for a new church architecture. The study starts with a thoughtful article stressing conviction among the ingredients the architect might work with.

COVER: Saint George's Church, Seattle, Wash. Paul Thiry, Architect. Photo: Art Hupy

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Building Types Study Number 217 — Religious Buildings (*Continued*)

Architectural Interiors — Fireplaces

NEA Educational Center

Architectural Engineering

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

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THE RECORD REPORTS

PERSPECTIVES

PUBLIC RELATIONS NOTE: "Consumer Behavior," a new book edited by Lincoln H. Clark of New York University, includes the following comment in an article by Prof. Nelson N. Foote of the University of Chicago: "The customers, as in the professions, begin to take on the characteristics of a clientele. Instead of the commercial vocabulary . . . a professional vocabulary of objectivity and impartiality, a professional ethics of merited trust, are likely to be the newer sources of pride, *as among architects* [italics ours]."

WHOSE CHURCH? A comment by a Des Moines clergyman, speaking at an A.I.A. regional conference just a year ago, could be taken as a capsule statement of the most subtle and delicate of all the problems which beset the architect struggling toward a contemporary expression in religious architecture. Said the clergyman: "This is sometimes called an age of individuality and when I am shown a modern church with all the comforts of home and all the angles of geometry, I can agree that church architecture is expressing this characteristic of individuality. It may be obvious and well advertised that this is, say, a Frank Lloyd Wright church, but the question in my mind is whether it is God's church. Whatever his genius, Frank Lloyd Wright is a poor substitute. A church building must repeat to all who approach it the words of Jacob — 'Surely this is the house of God.'"

TRADITION FOR TODAY: Pietro Belluschi, upholding the "modern" church in a published debate some months ago, described Wright's Unitarian Church at Madison, Wis., as "one real example of contemporary ecclesiastical work." Dean Belluschi suggested that critics of "modern" religious architecture "fail to see that the best architects of our age are, in fact, attempting to do what creative architects of all times have always done, that is, to impart spiritual significance to the forms they are creating, and that it is their way to search for a deeper meaning of beauty." Today's forms may be different, and "there is good and bad modern, as there have always been good and bad architects"; but, Dean Belluschi concludes: "In its moments of greatest vitality the Church has never failed to attract the most creative spirits of its time by bidding them to find new ways and a new language to proclaim its glory. The great styles of the past, which were never static, were themselves the result of this search for renewal, this desire to give freshly felt answers to the eternal mystery of man and his God. And that to the modern architect is the only tradition worth following."

THESAURUS: "slumproofing" is the word HHFA Administrator Albert M. Cole uses to describe the new kind of attack on the problem of blight in cities he hopes will result from the Housing Act of 1954. A more formal designation, used in the Act itself, is "urban renewal." This replaces a phrase "urban rehabilitation," which came into use with the 1949 Housing Act but is now apparently archaic.

THE FUTURE OF PLASTICS in building is limited only by our imaginations and the public acceptance of new concepts in living," Vice President and General Manager R. K. Mueller of the Monsanto Chemical Company's Plastics Division, told the recent Washington conference on Plastics in Building (see page 173). "We predict that large, lightweight structural panels made possible by plastic adhesives and foams will speed construction and provide for flexibility of both interior and exterior arrangements. New style light-transmitting wall panels will lend a spacious air to living areas. Plastic dome-shape roofs, light in weight, will aid in air conditioning. Throughout, durable, decorative plastic surfaces will reduce the maintenance burden. Molded structural units will reduce material and installation costs."

THE "LAZY SUSAN HOUSE" idea (see page 274), says Architect Myron S. Teller of Kingston, N. Y., is based on the principle of the old rotating shelves called "the Lazy Susan" which in Colonial days were built in house cellars — this saved steps because anybody could stand or sit in one spot while skimming the cream off the many pans of milk that were stored thereon. Later came the "Lazy Susan caster" designed in pewter and silver to hold salt, pepper and other condiments within easy reach; still later engineers adopted the Lazy Susan idea in turntables for railroad and factory equipment. Now, of course, it's familiar in trays for the table and cupboard shelves. Mr. Teller reports that the only precedents for his proposal he can discover in the U. S. Patent Office involved rotating an entire house built on a revolving platform or track on a foundation base. The object of turning the house is apparently to give sun or shade to any room as desired. Mr. Teller points out that his rotating hall would in no way affect the construction of foundations, walls or roof. Mr. Teller suggests that his scheme, "while based on an historic foundation, would still afford the engineer or architect of this modernistic age plenty of freedom to plan rectangular or other distortions to surround the rotary unit."

AMONG OUR READERS: John Knox Shear, the RECORD's new editor-in-chief, who was visited by one of those hardworking RECORD subscription salesmen in his office at Carnegie just a week before announcement of his new appointment. His subscription was about to expire, the salesman advised him; could Mr. Shear deny the advantages of a three-year subscription? Mr. Shear signed up.

MORE CHURCH BUILDING IS REQUIRED TO KEEP PACE WITH MEMBERSHIP GROWTH

An analysis by George Cline Smith, F. W. Dodge Corporation Economist

A NOTABLE INCREASE of interest in religion is one of the major factors to be considered in estimating potential demand for religious buildings in this country. Church building is at record levels, but church membership has far outstripped it. And this fact has an important corollary: while church incomes are also at record levels, comparison with earlier years indicates that church incomes and outlays still have room to expand.

Church Building Up

According to Dodge Reports totals, contract awards in the 37 eastern states for religious buildings were 25 per cent higher in the first nine months of this year than in the same period last year.

Ever since the end of World War II, with the exception of a minor dip in the Korean War, religious buildings have tended to occupy a more important place in the construction picture. In 1946, the first full postwar year, such construction amounted to only 2.5 per cent of all nonresidential building contract awards. So far in 1954, religious buildings have amounted to seven per cent of total nonresidential awards, thus accounting for a considerably more important share of the total.

Follows Construction Curve

The building of churches and other related structures shows a remarkable relationship to total construction activity. The chart indicates the striking parallel between the two sets of contract award figures through war, prosperity and depression, with only a few easily explained divergences. Since the chart uses a ratio scale, rates of growth or decline can be directly compared regardless of the difference in size of the totals.

During the depression of the 1930's, the volume of church construction fell from the peak prosperity of the 1920's at almost the same rate as total construction; it then recovered at about the same rate until World War II.

In the war period, wartime restrictions caused church construction to drop almost to nothing while total construction volume was in part maintained by wartime projects.

Since church income held up well during the war, while construction was deferred, a backlog of effective demand for church buildings was created, which is reflected in the chart by the greater increase in church volume in the postwar years.

Something of the same pattern was repeated on a much smaller scale during and after the Korean War.

The changing importance of church construction during the years is also shown by Table I which compares total new construction activity as reported by the U. S. Department of Commerce with outlays for religious buildings. In the peak prosperity of the 1920's, religious buildings accounted for 1.49 per cent of total construction volume. They have almost recovered that position after shrinking to a depression low of 0.56 per cent followed by a slight recovery and then a wartime low of 0.07 per cent.

Why the Backlog Continues

While there are few statistics on church membership and attendance, figures from four special censuses taken by the government during this century and shown in Table II indicate two significant facts:

1. The United States is becoming more church minded. Church membership since 1916 has grown considerably faster than the population of the nation. While only 42.5 per cent of the people were members of churches in 1916, approximately 58 per cent belong to organized churches today. Although the data are spotty, this growth has apparently been fairly steady through depression, war and postwar years.

2. The number of churches has not increased in keeping with church membership. This is reflected by the fact that where there were 191 members per church on the average in 1916, there are now more than 300 per church.

Spending Could Grow

While church incomes now are at record levels, they have not kept pace with

ECONOMIC FACTORS IN CHURCH CONSTRUCTION

I DOLLAR CONSTRUCTION VOLUME

(in $ million)

Year	Total New Construction	Religious Buildings	Religious as % of Total
1927	12,034	179	1.49
1934	3,720	21	.56
1940	8,682	59	.68
1943	8,301	6	.07
1946	12,000	76	.63
1950	28,454	409	1.44
1953	35,256	472	1.34

II CHURCH MEMBERSHIP

Census Year	No. of Churches	Membership (thousands)	Members Per Church	Membership as Percentage of U. S. Population
1916	226,700	43,311	191	42.5
1926	232,150	54,576	235	46.5
1944	253,800	72,493	286	52.4
1951	284,600	88,673	312	57.5

the growth of the national economy. Table III compares the total after-tax spending of the American people (personal consumption expenditures) with the outlays of religious bodies for all purposes. In 1952 total spending amounted to $218 billion, while church spending amounted to about $1.3 billion, or 0.59 per cent of the total. This percentage is considerably lower than in the depression or war years. Unfortunately, comparable figures are not available for the 1920's so it is impossible to say how the present situation compares with that of the earlier prosperity.

As in any period of high level construction activity, the question of overbuilding is sometimes raised. We are certainly not overbuilding our churches. The current level of activity, while it is high in dollar terms, is still below levels of the 1920's, if growth of the nation and shrinkage of the dollar are taken into account.

Table IV shows that in 1927 outlays for church construction came to $1.50 per capita. In present day dollars, the corresponding figure for 1953 is $2.96 per capita. However, construction costs have risen sharply. And if an adjustment is made for this factor by putting all figures into 1927 dollars, the table shows that the 1953 outlay is only $1.23 per capita, considerably lower than the $1.50 reported for 1927.

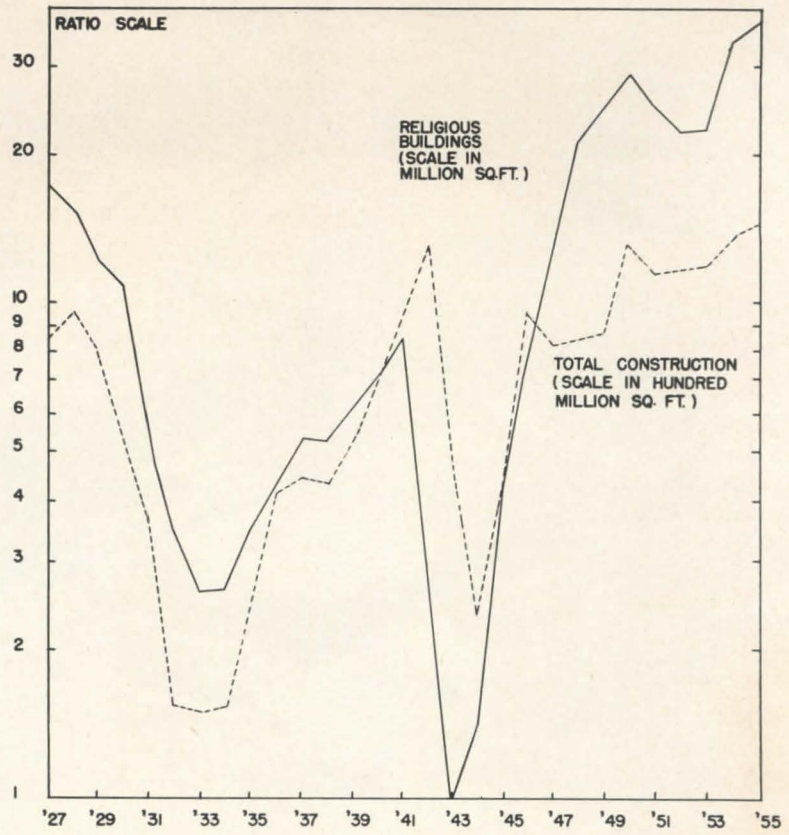
Since church building follows demand, and speculation is not a factor, it is doubtful whether we could ever have an "overbuilt" situation even in the most materialistic sense of the word.

Outlook: Excellent

The demand for new church building is high. With the population growing at the rate of 2,700,000 a year; with people shifting their residences, both within and between areas of the country; with church membership having grown faster than either population or the number of churches, there is obvious need for construction of large numbers of churches and related buildings.

That this need can be translated into effective demand is indicated by the excellent personal income position of the American people, by the rising incomes of churches themselves, by prospects of a more prosperous economy next year, and by recent changes in the tax laws which should stimulate contributions by church members and business firms.

As with schools and hospitals, the demand for church construction is affected by a wide range of factors of a social and economic nature. The most important of these would seem to be the current increase in interest in religion, the growth and movement of population, and the relatively prosperous state of the economy. All three factors point to a continuation of high levels of activity in church construction.



Graph shows relationship of religious building construction to total construction activity, 1927–1955, based on F. W. Dodge contract award totals (floor area, 37 Eastern States). Figures plotted for 1954 and 1955 are, of course, estimates

III CHURCH FINANCING

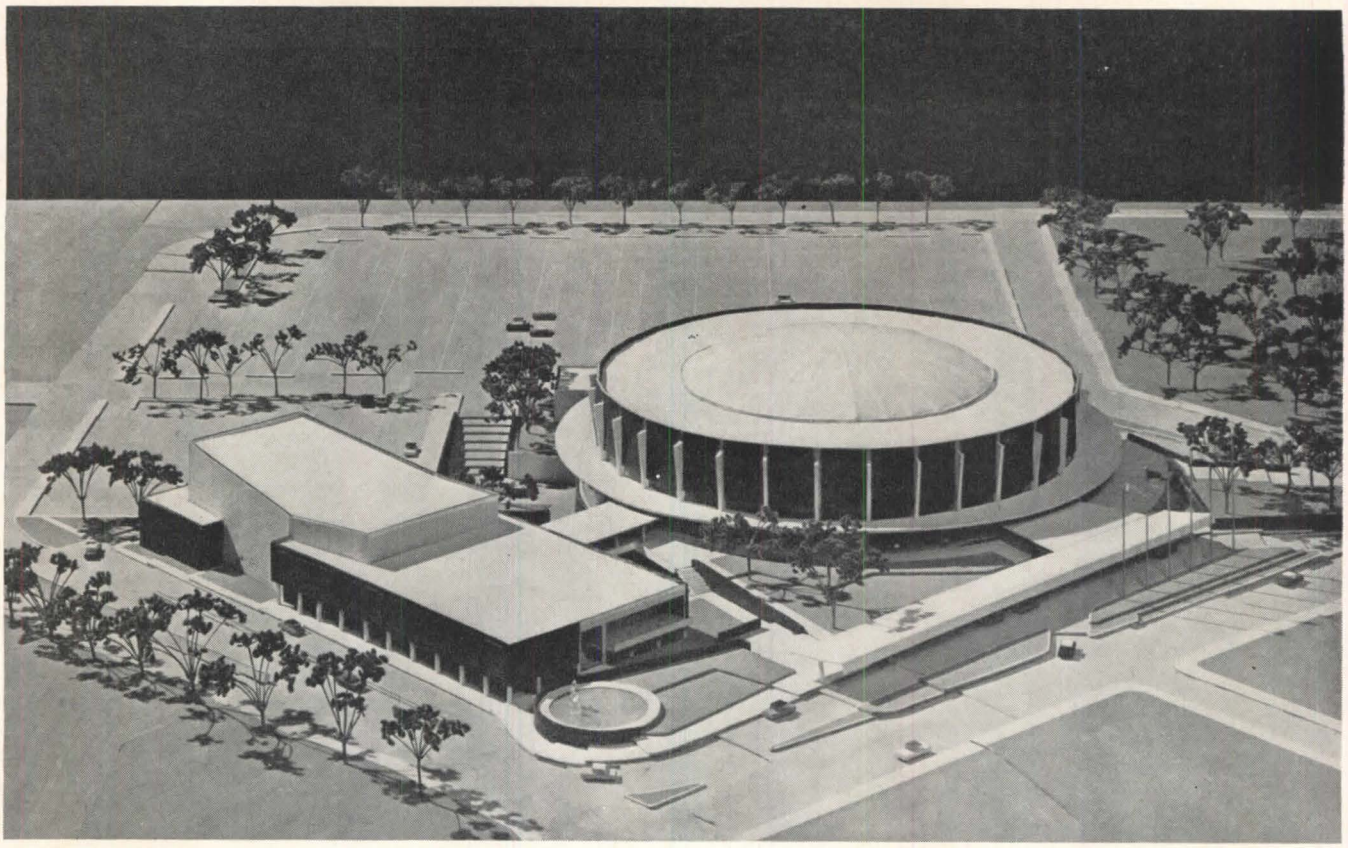
(in $ million)

Year	U. S. Personal Consumption Expenditures	Outlays of Religious Bodies	Religious as % of Consumption Expenditures
1927	n.a.	n.a.	n.a.
1934	51,882	641	1.24%
1940	72,052	662	.92
1943	102,244	695	.68
1946	146,907	818	.56
1950	193,568	1,125	.58
1952	218,130	1,296	.59
1953	n.a.	n.a.	n.a.

IV REAL CONSTRUCTION VOLUME

Year	Religious Construction Per Capita	Construction Cost Index (1927=100)	Rel. Construction Per Capita (constant dollars)
1927	$1.50	100	$1.50
1934	.17	95	.18
1940	.45	102	.44
1943	.04	128	.03
1946	.54	151	.36
1950	2.70	210	1.29
1953	2.96	241	1.23

Source of Data: U.S. Department of Commerce



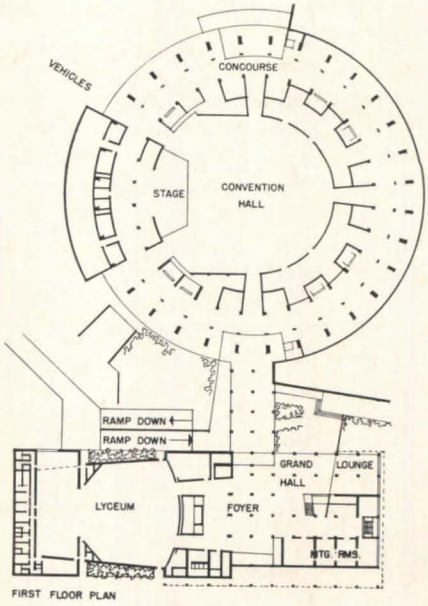
DALLAS MAKES BID AS CONVENTION CENTER

SOON TO GO UNDER CONSTRUCTION, the Dallas Memorial Auditorium represents the city's effort to attract national conventions, and to provide facilities for local events drawing large crowds. Plans call for a 10,000-seat arena for large conventions, athletic events, circuses and pageants; a 2000-seat Lyceum for smaller conventions, concerts and drama, and a wing containing nine meeting rooms of various sizes (from 40 to 600 seats). The size of the arena can be reduced for stage presentations by lowering a curtain to act as a backdrop for the stage and to screen off unused seats. For other events, the stage can be removed. In addition, there will be 97,354 sq ft of exhibition space.

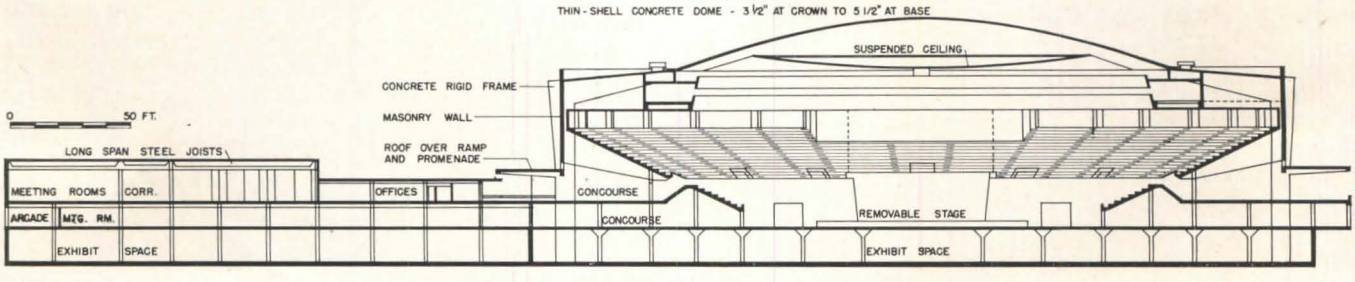
All areas of the building will be able to function separately — the arena, for instance, might be used for a circus without disturbing a convention in the Lyceum. Built on a naturally sloping site, the center will have grade entrances on three levels.

The thin shell concrete dome will be cast in two movable segmental forms; ribs will support the dome as the forms are pivoted for subsequent pours. Acoustical control in the dome will be effected by a suspended ceiling of light metal with four-in. fiberglass above.

Architects for the auditorium are George L. Dahl, Architects and Engineers, of Dallas; Amman and Whitney are the structural engineers; and acoustical engineering is being handled by Bolt, Beranek and Newman.



FIRST FLOOR PLAN



A World's Fair in Houston

SCHEDULED FOR A 1956 OPENING, the Houston World's Fair proposes building 1,500,000 sq ft of exhibition space, and will make available an additional 2,000,000 sq ft of space for the construction of special exhibit buildings by major exhibitors. According to Gosta Sjolin, Houston architect in charge of the fair's planning and design, all of the buildings will be air conditioned by a central plant, and will be connected by passenger conveyor belts. Mr. Sjolin reports that planning committees are being formed now, and that the fair intends to commission outside architects, artists, engineers and technicians for the design. Buildings will be of permanent construction so that they may be used at the end of the fair's run.

With the A.I.A.

NOMINATED FOR THE PRESIDENCY of the American Institute of Architects: George Bain Cummings of Binghamton, N. Y. Formerly a regional director of the Institute, Mr. Cummings is now in his second term as the A.I.A.'s secretary. Elections will be held at the Institute's annual convention in June.

Modular Measure Awards

THREE MEN chosen by the American Standards Association as "having done the most to encourage the use of the modular measure" in building received the association's Modular Measure Award at its annual meeting in New York last month. The three: Harold D. Hauf, head of the Department of Architecture at Rensselaer Polytechnic Institute, and formerly editor-in-chief of ARCHITECTURAL RECORD; C. E. Silling, architect of Charleston, W. Va.; and C. W. Kraft, president of the Kraftile Company, Niles, Calif.

With the A.S.C.E.

NEW OFFICERS ELECTED by the American Society of Civil Engineers include: William R. Glidden, Richmond, Va. — president; Frank L. Weaver, Federal Power Commission, and Louis R. Howson, Chicago — vice presidents. Mr. Glidden, who is assistant chief engineer of the Virginia State Department of Highways, will succeed Daniel V. Terrell, dean of engineering at the University of Kentucky, in the presidency.

In Search of a Plan

THE TURKISH GOVERNMENT has announced an international competition for a development plan for its capital city, Ankara. Funds alloted for prizes include $5400 for first place; $4320 for second place; $2700 for third place; and $900 for each of five honorable mentions. Requirements for entrants include previous experience in city planning and a 15-day visit to Ankara to study the city. Competition specifications and "appendices" are available from the Turkish Embassy, the Directorate of Development in Ankara or the Union of Architects in Istanbul or Izmir; the $18 entrance fee is returnable at the close of the competition. The competition ends March 10, 1955.

— *Drawn for the* RECORD *by Alan Dunn*

"What do I knock on for more radiant heat?"

N.B.F.U. Scholarships

SEVEN ARCHITECTURAL SCHOLARSHIPS, sponsored by the National Board of Fire Underwriters, have been awarded by the American Architectural Foundation, administrators of the $4500 fund. The scholarships, given this year for the first time, were awarded on the recommendation of the Committee of Awards and Scholarships of the American Institute of Architects. Recipients include: Byron Barton Black, Virginia Polytechnic Institute; Cora Lea Wells, University of Florida; Heinz Ewald Zobel, Washington University; Laurence Conway Gerckens, Cooper Union Art School; Rolland Harold Williamson, Iowa State College; Martha Worrall Darlington, Pennsylvania State University; and Harvey Allen Berg, Rensselaer Polytechnic Institute.

Home Builders Convene

A FIVE-DAY CONVENTION AND EXPOSITION have been scheduled by the National Association of Home Builders for January 16–20 in Chicago. This year, N.A.H.B. has announced, particular attention will be paid to "better business management for builders"; a number of technical sessions are also included on the program. Home builders, contractors, architects, engineers and building supply dealers are invited to attend; reservations should be made before December 15.

A Birthday for S.I.D.

MEETING IN WILLIAMSBURG for its annual convention, the Society of Industrial Designers celebrated its tenth anniversary October 28–31. The program included a comparative discussion of European and U. S. industrial design and an address by Albert Christ-Janer, of New York University, on the projected National Arts Center in New York. Officers elected for the coming year included Peter Muller-Munk, Pittsburgh — president; Arthur N. Becvar, Louisville — executive vice president; Herbert S. Barnhart, New York — secretary; and Eugene Gebereux, Port Washington, N. Y. — treasurer. Robert H. Hose, S.I.D.'s retiring president, will take over as chairman of the Board of Directors.

(*Continued on page 16*)

(*Continued from page 15*)

A.I.A. CHAPTERS ACROSS THE COUNTRY HOLD FALL MEETINGS

In New York

INTERPROFESSIONAL COOPERATION was one of the topics up for discussion at the fall meeting of the New York State Association of Architects, held at the end of October at Lake Placid. A committee report by liaison chairman Harry E. Rodman indicated interest on the parts of the other professions — engineering, medical, legal and dental, among others — in establishing an interprofessional group designed to promote or to combat state legislation relating to the professions and to coordinate licensing procedures; a less formal coalition of the professions was instrumental in blocking a recent bill leading, the group says, to the legalization of the corporation in professional practice. Delegates also heard addresses by Ralph Walker, F.A.I.A., on "The Human Use of Architecture"; by Earle L. Sheppard, who represented the Ontario Association of Architects; and by Roger Allen, F.A.I.A., of Grand Rapids, Mich. Officers re-elected were Adolph Goldberg, Brooklyn — president; G. Morton Wolfe, Buffalo — first vice president; Harry M. Prince, New York — second vice president; John W. Briggs, Rochester — third vice president; Trevor W. Rogers, Buffalo — secretary; and Martyn W. Weston, Brooklyn — treasurer.

In Ohio

DAYTON WAS THE SITE of the 21st annual convention of the Architects Society of Ohio held in October. Members, who broke all previous attendance records, decided to "spearhead" the revision of the Ohio State Building Code. They also voted to increase the society's efforts in a state-wide public relations program; these activities are to be directed in part toward students in architectural colleges. The newly-elected president of the A.S.O. is C. Melvin Frank of Columbus. Other officers elected include Leon M. Worley, Cleveland — first vice president; John P. Macelwane, Toledo — second vice president; Charles J. Marr, New Philadelphia — third vice president; Eugene F. Schrand, Cincinnati — secretary; and Hermand Broderick, Dayton — treasurer.

In Virginia

ONE BUILDER'S OPINION of the architect's place in the construction industry was expressed at the fall meeting of the Virginia Chapter of the American Institute of Architects by Edward R. Carr, past president of the National Association of Home Builders. Speaking at Alexandria in October, Mr. Carr remarked the need for understanding between architects and builders and said, "The builder that does work with an architect and produces the better result will, in a free competitive market, make it so tough on the fellow that doesn't have good design that we will eventually bring him around to the point where he is going to have to do something about architects." Walter A. Taylor, director of the A.I.A.'s Department of Education and Research, reviewed the work of his department for the members, who also heard addresses by Frank G. Lopez, A.I.A., senior editor of the RECORD, and Edward Bateman Morris, A.I.A.

In Texas

ORIENTING THE YOUNG PRACTITIONER" was the theme of the 15th annual convention of the Texas Society of Architects, which took place in Fort Worth November 3–5. In addition to the keynote speech, entitled simply "The Young Practitioner," by George Bain Cummings, secretary of the American Institute of Architects, the 500 people attending the conference heard discussions of a variety of problems besetting the young architect, from cost estimation to public relations. Awards in the society's architectural competition included: First Honor Award — Oak Cliffs Savings and Loan Co., Dallas, by architects Prinz and Brooks, Dallas; Commended — Schlumberger Overseas Co., Houston, by architects Bolton and Barnstone; Awards of Merit — Training and Workshop Building for the Blind, Houston, by architects Wirtz, Calhoun, Tungate and Jackson; O. Henry Junior High School, Austin, by architects Fehr and Granger; Scherr residence, San Antonio, by architect Milton Ryan; Blum residence, Beaumont, by architects Bolton and Barnstone; and the Cramerus residence, Houston, by architects Wilson, Morris and Crain. Officers elected included Grayson Gill, Dallas — president; R. Max Brooks, Austin — first vice president; and Fred J. Mackie, Houston — second vice president.

At the Ohio meeting: 1. retiring president of the Architects Society of Ohio, John W. Hargrave, presents Linn C. Smith, president, Michigan Society of Architects, with an honorary membership in the A.S.O. 2. new A.S.O. president C. Melvin Frank. With the New York State Association of Architects: 3. Ralph Walker, F.A.I.A. 4. Roger Allen; president Adolph Goldberg; Robert S. Hutchins, A.I.A.; S. Elmer Chambers, A.I.A.; and Harold D. Hauf, head of the Department of Architecture at Rensselaer Polytechnic Institute. At the Virginia meeting: 5. Paul D. Woodward, president, Virginia Chapter, A.I.A.; Senator John A. K. Donovan; Leon Brown, president Washington Metropolitan Chapter, A.I.A. 6. Joseph H. Saunders, program chairman, and speaker Edward R. Carr

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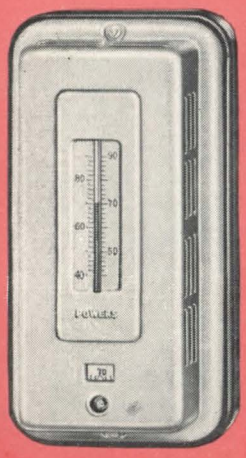
Traditional and modern religious buildings both require the greater comfort, fuel economy and dependable performance of

POWERS

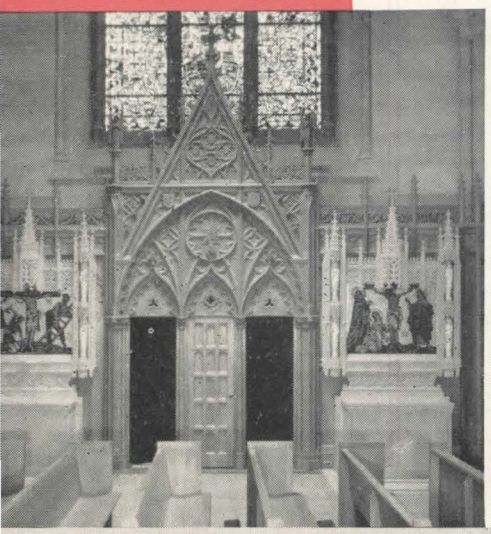
AUTOMATIC SYSTEMS OF
Temperature Control



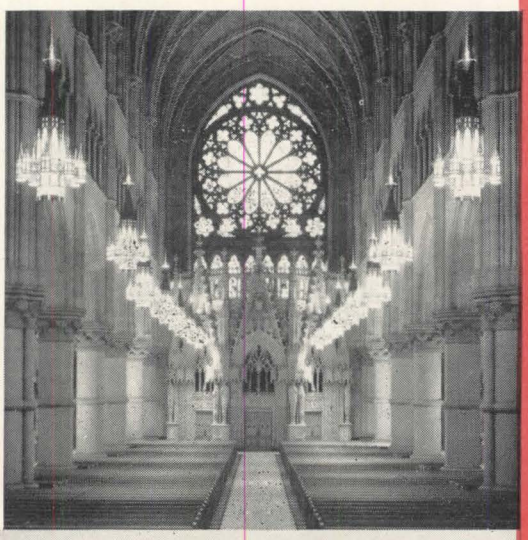
SACRED HEART CATHEDRAL in Newark, New Jersey — a masterpiece of French-Gothic architecture — is one of many distinguished churches and synagogues controlled by Powers.

Here thermal comfort and fuel economy will be assured by the traditional dependability of Powers automatic control regulating the heating and ventilating system throughout the church and rectory. Panel heating system for snow melting installed in the paved plaza leading to the main entrance of the church also is Powers controlled.

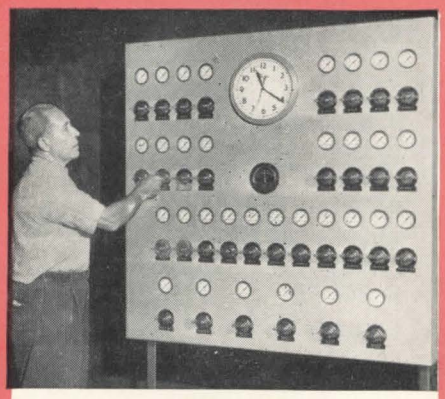
Experience gained by Powers, in this and other monumental buildings in the past 60 years, should be helpful to you in selecting the most efficient control for your building . . . regardless of type or size. For further information contact our nearest office or write us direct.



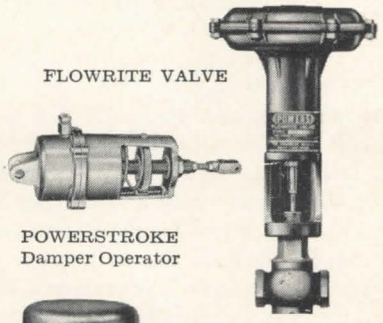
Confessionals of hand carved white oak flanked by mosaic stations of the cross.



View from altar looking toward rose window over main entrance.



POWERS CONTROL PANEL



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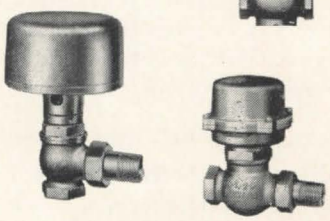

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(b97)

a **WASHINGTON** report by Ernest Mickel

HHFA LAUNCHES NEW ADVANCE PLANNING PROGRAM ON ALLOTMENT OF $1.5 MILLION FOR THREE YEARS

THE THIRD ADVANCE PLANNING PROGRAM now has been placed in operation by the Housing and Home Finance Agency, looking toward the preliminary planning of additional non-Federal public works throughout the country. It is on a limited basis at the present time, curtailed by the economy-minded 83rd Congress, which cut down the President's request for $10 million to a meager $1.5 million.

Having hoped for $10 million, of which an estimated $3 million would have been spent in fiscal year 1955, the President is sure to come back to Congress in 1955 for additional funds. Placing the program on a three-year basis, as was indicated in the Senate report on the supplemental appropriations measure, reduces the appropriation figure finally approved to $500,000 each year, which would hardly start the program.

This money is loaned out by HHFA, interest free, to states and their political subdivisions for the preliminary planning of non-Federal public works such as sewers, waterworks, schools, hospitals, roads and streets, municipal buildings, etc. Repayment is mandatory upon start of construction.

Engineering Projects First

The Community Facilities and Special Operations division of HHFA is confident that applications to be received under this reconstituted advance planning effort will so far exceed funds available for the loans that only water, sewer and sanitation facilities can be satisfied. At any rate, projects of this type will have top priority in the allocation of the planning money.

Next: Hospitals and Schools

New criteria announced by the division also made provision for loans for preliminary planning of the following building types if money is available for them: hospitals and health facilities; schools and other educational facilities; public buildings, including police and fire stations; bridges, viaducts and grade separations; miscellaneous public facilities, including airports, and highways, streets and roads. The priority occurs in that order.

Priority of Urgency Set

Priority on need and urgency was developed as follows:

1. Defense-connected public works projects — namely, those located in or near critical defense housing areas or defense installations, where there is urgent need for such projects as the result of local defense activity.

2. Essential civilian public works in areas certified as surplus labor markets or in areas of economic need, where the proposed projects will alleviate a local condition of serious unemployment or economic distress.

3. Other essential public works, where there is a demonstrated need for such public works.

The applicant's ability to finance and determination to construct promptly will be an important guiding factor in the HHFA's selection of applications.

Preliminary Planning Only

The administration of the new system differs from the previous two plans in that preliminary planning only will be allowed. This, said the agency, will include all investigations, surveys, and estimates of cost necessary to establish the complete scope, character, and cost of a proposed public works project. Foundation exploration, test pits, core-drilling, water source investigations (surface and sub-surface), topographic surveys and other specific data necessary for basic determination are to be included.

The preliminary plans, with sketches, estimates, and other exhibits, must be sufficiently comprehensive to permit, without the need for further engineering or architectural study, prompt completion of final detailed plans and specifications.

Object: Stretching Funds

The new approach is expected to make what little money is available go farther than funds used for full completion of plans and specifications. Obsolescence of plans, which plagued the two earlier advance planning programs, will be materially reduced, the authorities say. And they feel this aspect will help them in recovering the loans. It was estimated earlier that preliminary plans for 2200 public works jobs with estimated average cost of $300,000 each could have been financed with $10 million. This method would have planned $660 million worth of construction.

It was also estimated at that time that the average Federal advance per project would be around $4500, or about 28 per cent of the average cost of obtaining fully completed plans.

Local Selection Stressed

Officials like to emphasize that full control over the selection of each proposed public works project is at the state and local levels. No advance can be made for any project that does not conform to an overall state, local, or regional plan approved by a competent state, local, or regional authority.

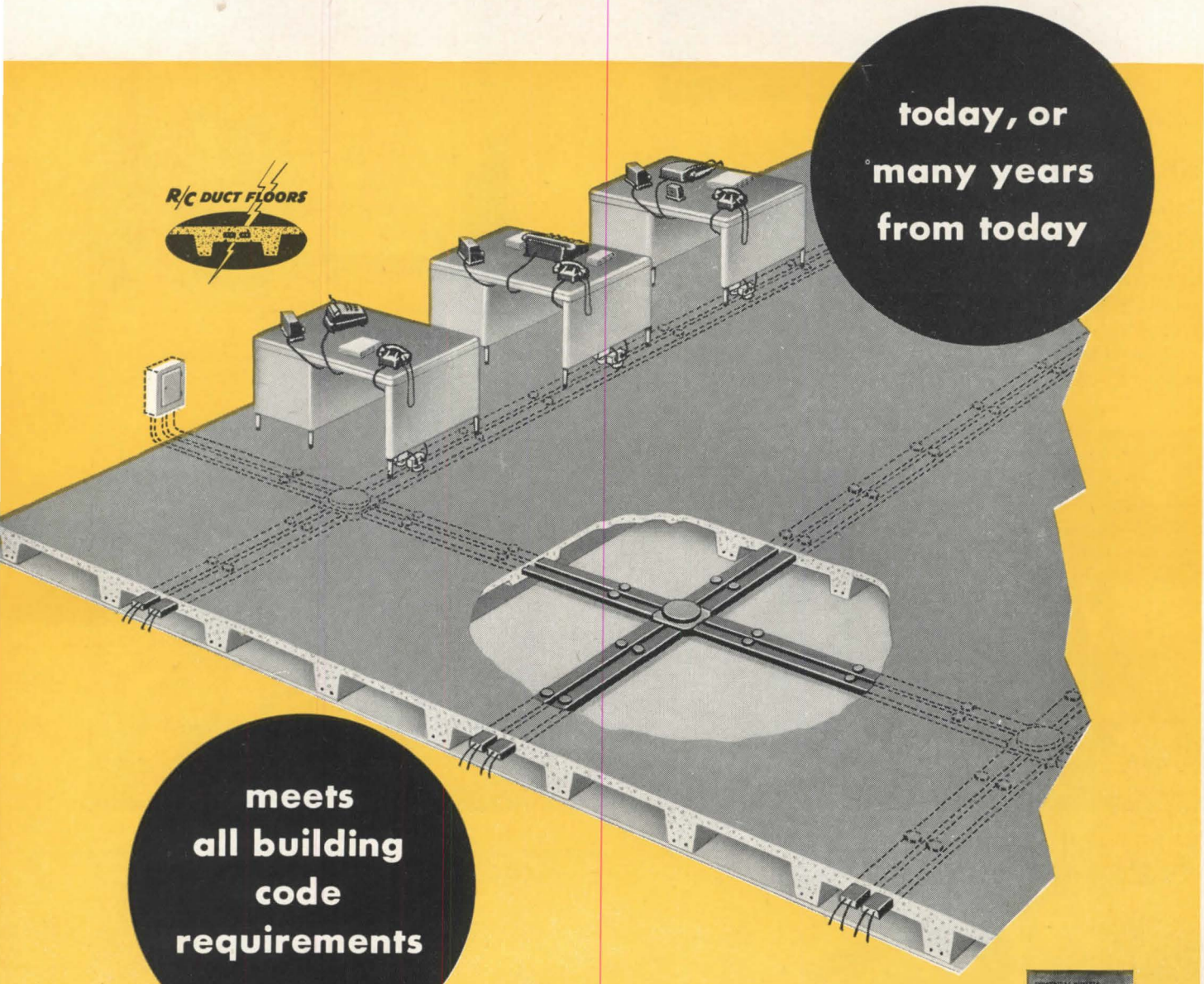
Some light may be shed on the plans of localities by two surveys currently under way. The Bureau of the Census was allocated $15,000 of the $1.5 million advance planning appropriation to conduct a survey of non-Federal planned public works throughout the country. A questionnaire mailed to a small group of representative cities asks just what public works are planned and to what stage this planning has been carried; from the results, the Bureau will attempt to project a national estimate. The Bureau's effort is being coordinated with the work of the President's Council of Economic Advisers, which has been undertaking the same sort of survey. Results of the HHFA-Census study will be made available to the office of Maj.-Gen. John S. Bragdon, coordinator of public works for the Council of Economic Advisers, and is expected to fill gaps in his own survey results.

HHFA said it would not consider "elaborate, long-range planning projects." Nor will it approve advances for projects which are to be a part of an urban renewal project for which application already has been approved, or is pending, under the Housing Act of 1949. Those jobs covered by applications for an urban planning grant under Section 701 of the Housing Act of 1954 also are excluded.

Old Programs: $62 Million

The first two advance planning programs operative during the past 10-year period saw $62 million loaned out for completion of plans on 7609 projects. Estimate of construction cost was placed at $3527 million. But only 3682 of these projects were actually started, construction valued in the aggregate at $1682 million.

WHERE YOU NEED THEM



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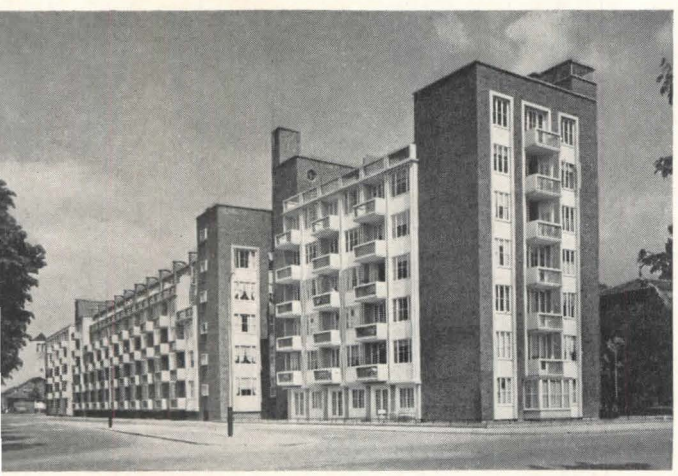
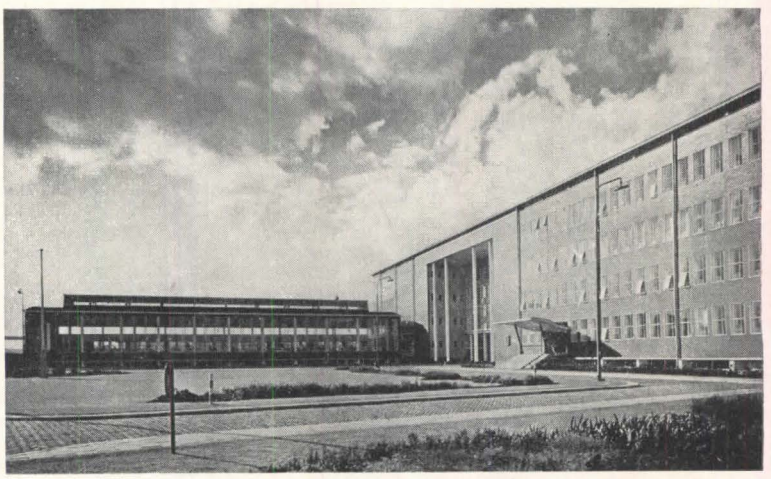
NETHERLANDS ARCHITECTURE ON VIEW

A CIRCULATING EXHIBIT "Building in the Netherlands" is currently touring the U. S. under the auspices of the Smithsonian Institution Traveling Exhibition Service and the American Institute of Architects. Assembled by the Association of Netherlands Architects and the Bouwcentrum, the exhibit, which traces postwar development in Dutch architecture, has already been seen in Washington and will visit ten cities during the next two years. Shown on this page are some of the photographs in the exhibit.

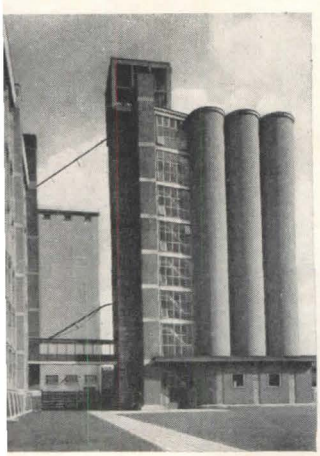
Above: J. J. P. Oud's Esveha offices, Rotterdam. Left: Lock, Amsterdam-Rhine Canal, by D. Roosenburg

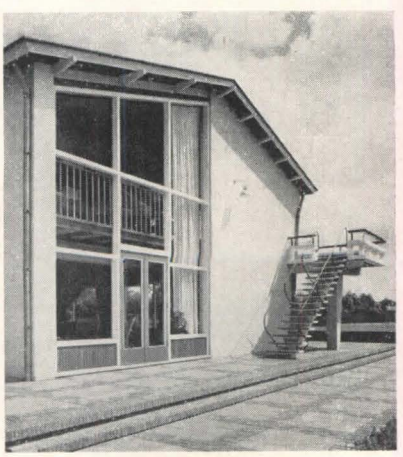


Block of flats in Maastricht, designed by Maastricht architect F. C. J. Dingemans, is one of many postwar housing developments



Offices of the Netherlands Blastfurnaces and Steel Works in Velsen are work of Hilversum architect W. M. Dudok





From left to right: flourmill in Rotterdam by architect J. J. M. Vegter; shop in Nymegen by architects Prof. G. H. Holt and M. E. Vengelers; lifeboat house at Wyk am Zee by architect B. B. Westerhins; and recreation building in Schoonebuk by A. C. Nicolai

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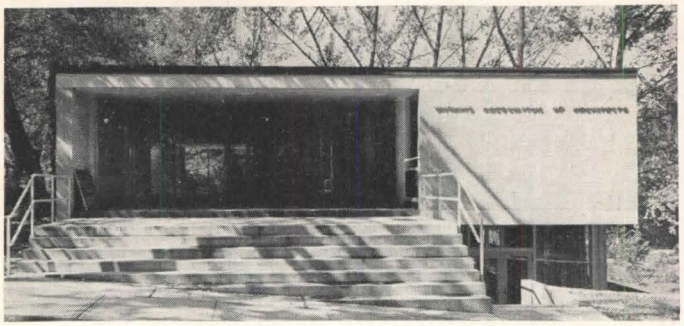
HONEYLITE

NEWS FROM CANADA *By John Caulfield Smith*



DESIGNED FOR ONTARIO ARCHITECTS: NEW HEADQUARTERS OPENS IN TORONTO

A NEW CENTER OF OPERATIONS for the Ontario Association of Architects was officially opened in Toronto by the Right Honorable Vincent Massey, Canada's governor-general, early in October. The building, which will serve the association's 700 members, cost $100,000.

John B. Parkin Associates of Toronto were the architects for the center; theirs was the winning design in the competition held by the association.

Erected on a sloping, wooded site, the new building was designed primarily as a business headquarters for the organization. It contains as well an exhibition hall for displays of architecture and the allied arts; a two-story ramp connects the upper and lower levels of the hall. The garden will also be used as exhibition space.

In addition, the new quarters provide offices, a library, board room and assembly hall; the latter can double as a lounge and buffet dining room. A kitchen is also located on this level. Another function expected of the center is its use as an auxiliary office in which out-of-town members may confer with clients.

Construction is of buff brick, steel and glass; the steel columns, left exposed on the outside of the building, have been painted "bone white." The structure is glazed on the north side to light the library, office, board room and assembly hall; the south elevation is entirely brick. The large window for the exhibition hall, on the west, is shielded by a 5-ft overhang.

(*Continued on page 30*)

Meeting in the walnut-panelled board room, members of the O.A.A. council (left to right): John D. Miller, Toronto—secretary; Alvin R. Prack, Hamilton—president; Gordon S. Adamson, Toronto—past president; George D. Gibson, Toronto, and E. C. S. Cox, Islington—councillors

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CANADA

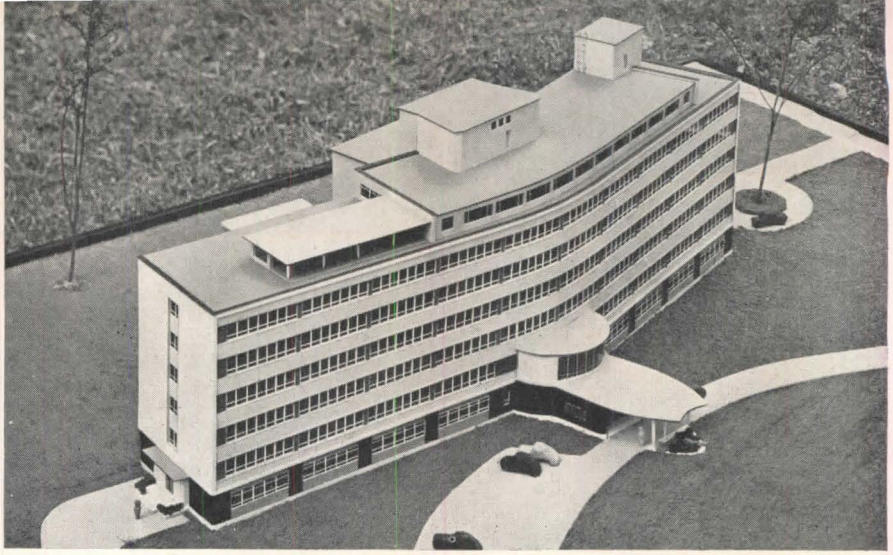
(*Continued from page 26*)

VANCOUVER SEEKS DESIGN FOR CIVIC AUDITORIUM

A nation-wide competition is being conducted by the city of Vancouver for a $2,750,000 civic auditorium. First prize in the R.A.I.C.-approved competition is $5000 and commission of the design. Second and third prizes are $2500 and $1000 respectively; there will be a maximum of five honorable mentions, each drawing $200 in prize money.

The deadline for entries is January 17, 1955.

Prof. Fred Lasserre, director of the School of Architecture at the University of British Columbia, is the professional adviser for the competition and is chairman of the panel of assessors. Other members of the panel are architect Eero Saarinen, Bloomfield Hills, Mich., and G. Sutton Brown, Vancouver city planning director.



Administration Building planned by the Montreal Catholic School Commission will replace offices now scattered in 14 other buildings. Auditorium and library will be built later. E. A. Doucet is the architect

MORTGAGE LOANS DOUBLE UNDER NEW HOUSING ACT

Preliminary figures released by the Central Mortgage & Housing Corporation show that mortgage loans issued under the 1954 National Housing Act in September 1954 were nearly double those issued in September 1953. During September of this year undertakings to insure were issued for 4168 loans, totaling $46,864,133 for 5141 units. In September 1953 joint loan approvals numbered 2206 and amounted to $22,001,520 for 2609 units. Total NHA loans made by approved lenders from January to the end of September amounted to $418,-199,295 for 31,142 loans and 38,485 units, an increase of $218,643,805 over the same nine-month period in 1953, when 19,353 loans for 25,552 units were approved.

REPORT ISSUED ON LOANS UNDER NHA AMENDMENT

Following the passage last March of the amendment to the National Housing

(*Continued on page 32*)

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THE RECREATION ROOM is served by one of the 3 zones of this home's heating system. Architect: Katz and Metsky, Newark, N.J. Builder: The Kopp Construction Co., Irvington, N. J.

teen ½" PG's were used for the floor installation in the basement recreation room, shown above. Fifty-four ⅜" PG's were used for the ceiling installations in the rest of the house.

Mr. Sincox goes on to say, "My men like to work with PG's because they come ready to install. They don't have to do any hand bending on the job. And they don't have to string up coiled tubing.

"We've found that the expanded end of each PG reduces the number of fittings needed. It also cuts the number of solder joints we have to make just about in half.

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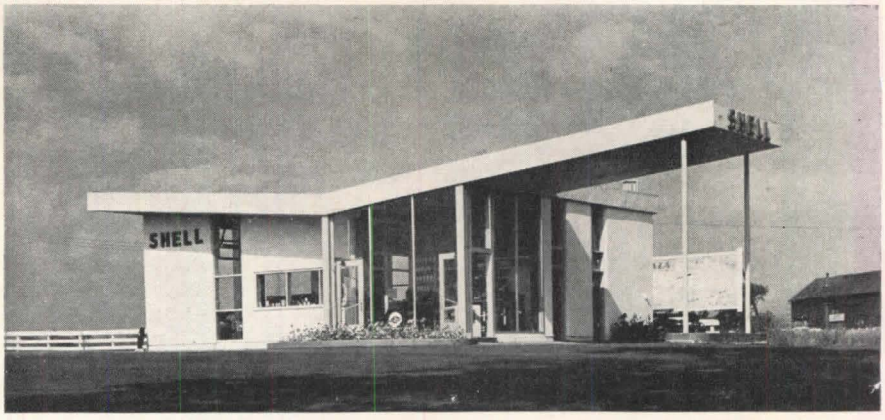
CANADA

(*Continued from page 30*)

Act permitting chartered banks to issue mortgages, Canada's chartered banks had made advances totaling $26 million on NHA-insured mortgages by October 6, according to preliminary estimates by the Bank of Canada.



Shell service station designed by Toronto architects Venchiarutti & Venchiarutti is a standard design which permits regional modification

Bank mortgage commitments, as distinct from loans, were estimated at about $110 million on 12,000 new housing units.

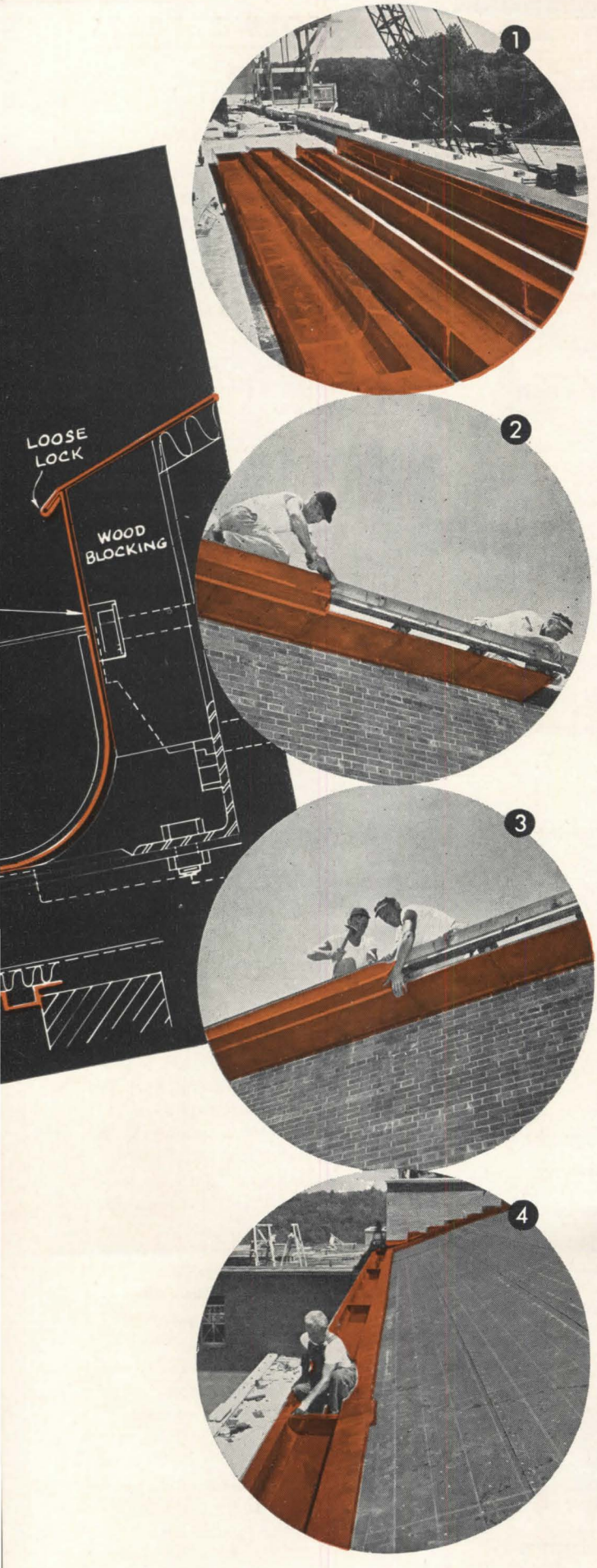
RECORD YEAR FORECAST FOR HOUSE CONSTRUCTION

The most recent figures from the Dominion Bureau of Statistics reveal that housing starts and completions will establish new records this year. At the end of August, starts had totaled 71,567, compared with 69,463 in 1953 and 53,511 in 1952; and completions were up to 57,673, against 53,764 in 1953 and 40,166 in 1952.

The figures also showed that houses completed in August 1954 took less time

(*Continued on page 36*)

Since the RECORD'S *story (Sept. 1954, p. 26) on the Montreal Terminal Development planned by Canadian National Railways, the hotel has acquired a name and a manager: with the personal permission of Her Majesty, it will be known as The Queen Elizabeth; and Hilton of Canada Limited, an operation of Hilton Hotels International Inc., will act as manager. Holabird & Root & Burgee are the architects*



This building was selected from our case history files primarily because it combines fine gutter design by the architect with splendid execution of the specifications by the sheet metal contractor.

Check the detail at left and you'll see what we mean. Also note photograph #1 showing prefabricated gutter sections as they were delivered from the contractor's shop. Copper lends itself so well to prefabrication, with resultant savings in time and labor. Also note photograph #4 showing the placement of the gutter expansion joints approximately 25' apart, a most important factor in trouble-free installations. (Caption #4).

In fact, proper installation is as important as good design. The two go hand in hand. For modern, trouble-free installation techniques consult Revere's "Copper and Common Sense", a booklet that has become the "bible" of the sheet metal industry. It is based on more than a century and a half of experience with sheet copper. If you do not have a copy send for it today. And if you have any technical problems confronting you on current jobs, let us know and we'll put you in touch with Revere's Technical Advisory Service. No obligations.

We are not just mouthing an advertising phrase when we say, "Keep out of trouble with copper." For this "ageless" metal has proved its enduring qualities for centuries. It can't rust or rot. Its design possibilities are unlimited, thus giving the architect a free rein. Sheet metal men prefer to work with it as it solders beautifully, requires no special tools, is readily worked into any desired shape and is ideal for shop prefabrication. *In fact, there is not another metal or alloy that has all of the outstanding construction characteristics of copper.* Write us today about the money-saving advantages of Revere Keystone Thru-Wall Flashing*. And, if you have technical problems, we will put you in touch with Revere's Technical Advisory Service.

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1 **PREFABRICATED SECTIONS** of gutter prior to installation. Much time is saved on the job when sections are prefabricated in the shop. This also prevents delays due to bad weather.

2 **SOFFITS** being installed. The copper pans underneath gutters are attached to wood outriggers with Fiberglas insulation between the outriggers.

3 **FASCIA AND CORNICE** being attached. Gutters are of 32 oz. Revere Copper with the outside cornice of 20 oz. Revere Lead Coated Copper; all cold rolled.

4 **SHEET METAL MEN** prefer copper to any other metal with which to work. It solders to perfection. No special tools are required and it is readily worked into any desired shape. Note expansion joints which are spaced approximately 25' apart. Spacing of expansion joints in relationship to the gauge of metal used is of the utmost importance to a trouble-free installation (See "COPPER AND COMMON SENSE").

• • •

45,000 LBS. OF REVERE SHEET COPPER were used on this job. Entire building was flashed with 16 oz. Revere Sheet Copper under the sills. Revere Copper was also used for through-wall flashing, cap and base flashing.

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THE RECORD REPORTS

CANADA

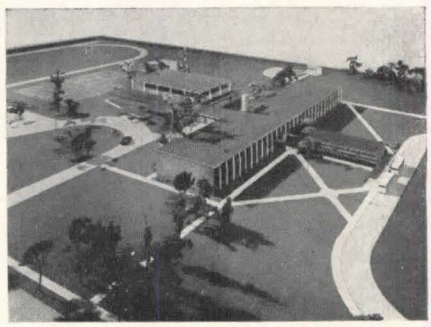
(*Continued from page 32*)

in construction than those completed in August 1953: 5.9 months this year compared with 6.4 months a year ago.

U. S. SYNDICATE INVESTS IN TORONTO MORTGAGES

Believed to be the first U. S. project of its kind in Canada, a plan to put $10 million in mortgages on Toronto apartment developments has been announced by a group of American investors. The syndicate intends to form a special Canadian corporation to place the funds, and has appointed Tankoos & Company, New York realty investment firm, as exclusive agents for the new corporation.

The funds are to be used to acquire apartment building mortgages insured under the National Housing Act.



HIGH SCHOOL CHOSEN AS "TYPICAL OF THE BEST"

The Collingwood (Ont.) Collegiate Institute, designed by architects Stone & Moffat, has been selected by the Canadian Education Association and the Department of Education as typical of the best standards in high school building in Canada. A model of the school is now on permanent exhibition at the Palais Wilson, International Bureau of Education at Geneva, Switzerland.

The school is built in three blocks: one contains classrooms, the second the administration offices, and the third a gymnasium-auditorium and a cafeteria. Large enough to accommodate 700 students, the building was designed to expand to a 1000-student capacity; such an expansion would add 10 classrooms and an auditorium. Construction costs totaled $735,000.

Structure is almost entirely of reinforced concrete, except for steel beams and wood deck in the gymnasium.

(*More news on page 38*)

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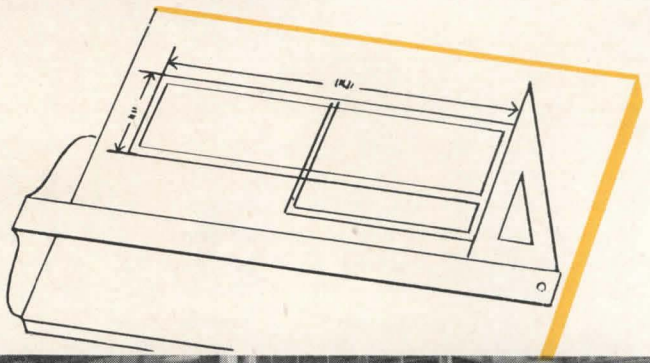

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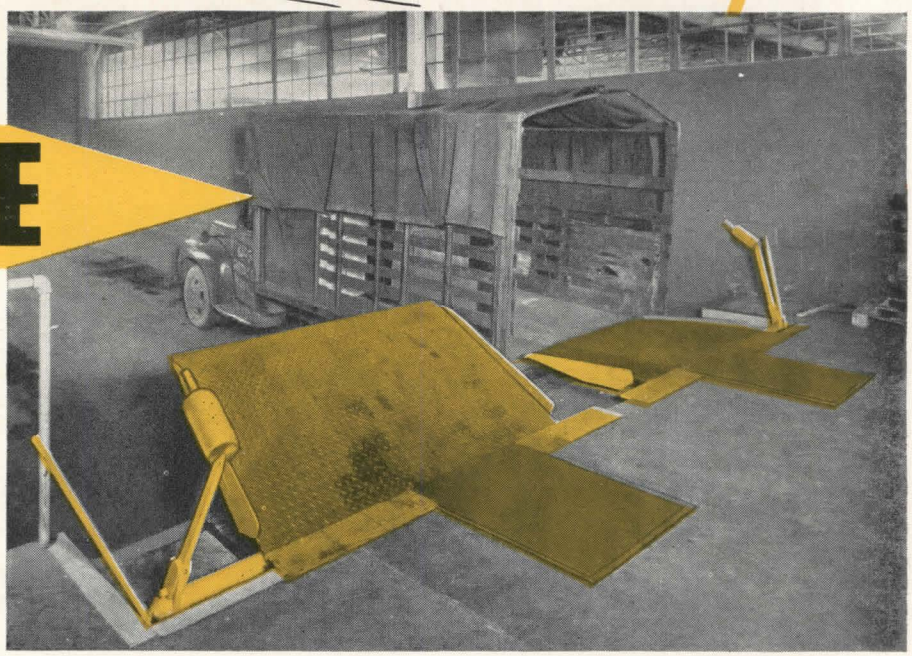

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National Retail Industry SHOW
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JAN. 7-11, 1955

URBAN RENEWAL SEEN AS CONSTRUCTION STIMULUS

PRIVATE AND PUBLIC REDEVELOPMENT expenditures amounting to as much as $75 billion might well be generated if American cities used the urban renewal provisions of the new housing act to make a thorough-going attack on their blight problems, according to James W. Follin, director of the Division of Slum Clearance and Urban Redevelopment of the Housing and Home Finance Agency.

It is only a matter of time, says Mr. Follin, before cities will have to face the problems of their obsolescence and high operating costs in the same way that industrial concerns have been facing them for years.

Mr. Follin cites 1950 census figures showing that 10 million of the nation's 40 million nonfarm housing units are deficient by modern standards and should be rehabilitated or replaced.

Some five million of these are so far gone that they will have to be removed within a reasonable time. Public cost of clearance and redevelopment per unit is placed at around $3000; this would spell a total public cost of about $15 billion for removal of the five million units and redevelopment of their areas.

In addition, approximately 15 million units need rehabilitation; and still another 10 million show signs of needing repair and modernization in neighborhoods where upgrading or conservation practices are required.

"As far as we can guess," Mr. Follin said, "public expenditures required in connection with the rehabilitation of neighborhoods will run to approximately $9 billion before the 15 million dwelling units have been rehabilitated and conserved against future deterioration."

Thus $24 billion is the rough estimate on the cost to all levels of government of supporting the replacement or rehabilitation of 20 million deteriorated or deteriorating dwellings (about half the present U. S. housing supply).

"Experience to date," said Mr. Follin, "indicates that new construction on cleared sites in redevelopment projects will run about four times the public cost; or in connection with the $15 billion of public cost for clearing five million slum and substandard dwelling units, it might amount to as much as $60 billion. It will consist principally of residential, commercial or industrial buildings and other improvements, largely private enterprise construction. Thus the total of private and public redevelopment costs may amount to $75 billion. It can give powerful support to construction volume, and hence to the national economy, even though spread over a period of years. If concentrated in a period of declining business, it could be extraordinarily useful. The apparently high multiplier — one public dollar generating four construction dollars — far exceeds experience on any previous Federal aid program."

CAA DIRECTOR FORESEES CONTINUING AIRPORT AID

F. B. Lee, director of the Civil Aeronautics Administration, believes there is a need for continuing the Federal-aid

(*Continued on page 234*)

Consulting on a Television City,

like CBS - Hollywood? National Heating Equipment fits into the year-'round climate control requirements.

Specializing in Motels

like Tom Sawyer Motor Inn, Albany? NATIONAL Heating Equipment will provide the same kind of installation flexibility.

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one like Vascoloy-Ramet at Waukegan? NATIONAL Heating Equipment will take care of office and plant heating from central or decentralized locations.

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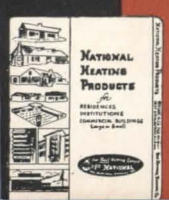
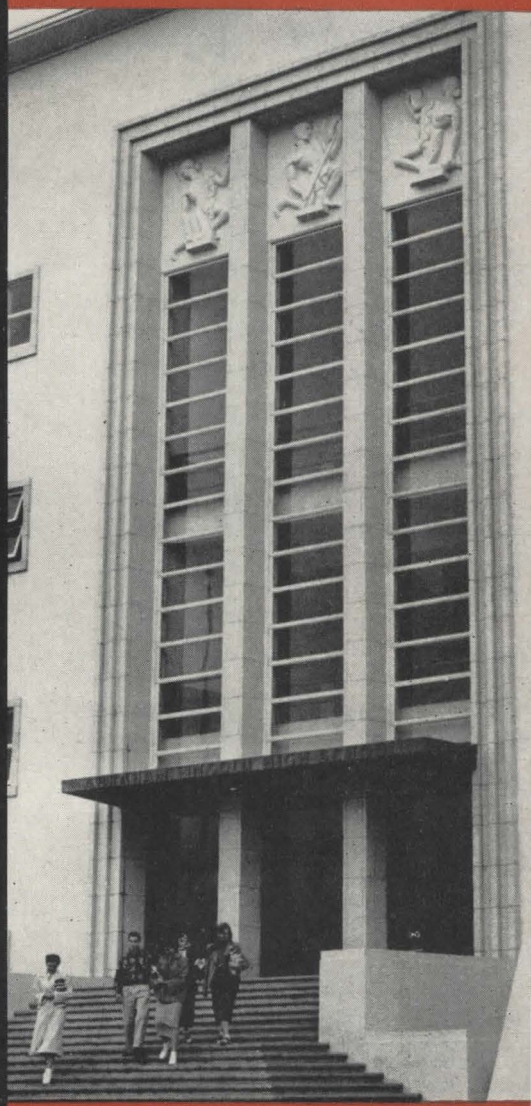
like Evergreen Plaza, Chicago? NATIONAL Heating Equipment fills the need for multi-zone installations with different requirements.

An Architects' and Engineers' File Folder containing complete information on National Heating Equipment will be furnished on request. Write for your A.I.A. file and bulletins covering equipment for current projects—then we'll supply new bulletins as they are released.





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One of a series of papers prepared by leading authorities on air conditioning. The opinions and methods presented are those of the author and are not necessarily endorsed by the Du Pont Company. Reprints of this article, and others in the series, may be had free upon request.

AIR CONDITIONING DEPARTMENT STORES

BY SIDNEY W. BARBANEL

SIDNEY W. BARBANEL—A Consulting Engineer, studied engineering at the Cooper Union School of Engineering.

He has made the design of air conditioning for department stores and commercial buildings his specialty.

Management men in progressive department stores have come to appreciate the full benefits of year-round air conditioning. They've seen it sustain—and frequently increase—sales volume during hot, humid weather. It has improved personnel relations, cutting the turnover in workers. Clean, filtered air has reduced decorating and maintenance costs. And air conditioning eliminates stale odors and stuffiness from hard-to-ventilate storage spaces and basement areas.

For these reasons, the addition of a year-round air conditioning system is an item of great importance in the modernization plans of existing department stores. And new shopping centers and department stores invariably make air conditioning an integral part of the building plans.

CONSIDERATIONS FOR EXISTING STORES

Expert remodeling, redecorating and the addition of air conditioning are ways in which established stores keep abreast of modern trends. Equipment for the cooling system is usually placed in conveniently located storage and stock rooms, either suspended from ceilings or mounted on the floor. Air distribution ductwork is furred in or made as inconspicuous as possible. In older, high-ceilinged buildings ductwork can often be hidden above newly installed acoustical ceilings. Ducts can be based on high velocity, sized on the static regain method, and the branches thus can remain a constant size. So even when they are run below the existing ceiling, these duct branches can very readily be painted to resemble beams, eliminating additional furring.

CONSIDERATIONS FOR NEW STORES

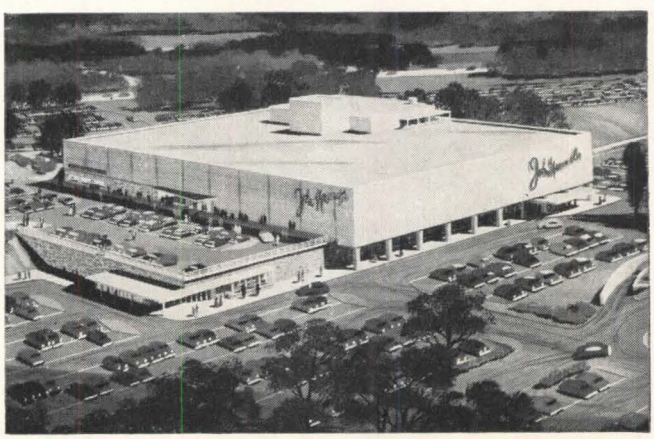
The architect and engineer have greater freedom in working an air conditioning system into the over-all plans of a new building. Plans will make provision for concealed ductwork and accessible equipment space right from the start.

CHARACTERISTICS OF DIFFERENT AREAS MUST BE CONSIDERED

Planning an air conditioning installation for any department store calls for a study of five basic categories of space within the store: (1) entrances, (2) show windows, (3) building-perimeter areas, (4) building-interior areas, (5) specialty shops.

Entrances: Sufficient cooling at store entrances invites prospective shoppers into the store. A one- or two-story structure in a modern shopping center can be designed for positive exfiltration of conditioned air from entrances by allowing approximately 20% outside ventilation air from the ground-floor sales area. Devices usually are needed to counteract large losses when the doors are constantly in use.

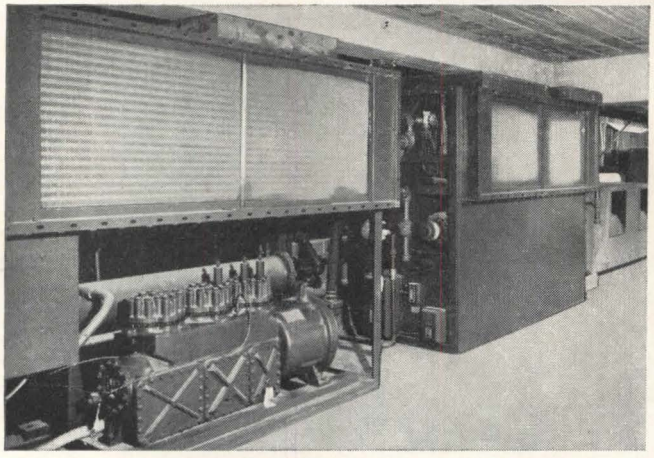
Show Windows: Modern show-window design tends to eliminate display-area backing, and heat from display lighting affects nearby sales areas. This is best overcome



Architect Lathrop Douglass' rendering of Wanamaker's Cross-County Shopping Center store in Westchester, N.Y. Windowless upper stories add to efficiency of air conditioning.

by having a blanket of conditioned air issue from all along the lower edge of the window. An air distribution system like this is important in winter, too, for it eliminates sweating or frosting of the glass from condensation.

Even a completely enclosed show window requires some cooling. Display lighting may produce a cooling load near 850 BTU/hr. per linear foot of display window, and some display materials are damaged by high temperatures.



One of the batteries of 25-ton Westinghouse units on a mezzanine of the new John Wanamaker store. 31 such units serve the entire structure.

Building Perimeter Areas: Most modern stores are designed with a minimum of windows, so the perimeter areas generally do not require separate treatment. But windows, where they are found, will make the cooling load fluctuate with outdoor temperatures and the effects of the sun. In such cases, consider this area as a separate zone for summer air conditioning purposes.

Building Interior Zones: Interior areas have a practically constant thermal load summer and winter, with the exception of the top floor. During summer a water-covered roof or roof sprays can cut the top-floor load by as much as three-quarters.

In general, interior areas need about 1 cfm/sq. ft. of air, with refrigeration tonnage requirements on the order of one ton for 300-500 sq. ft., depending on design conditions. Conditions of 80°F. and 50% R.H. are generally acceptable here.

Specialty Shops: Almost every department store has certain sales areas that require special consideration to assure air conditioning that will be economical, effective and trouble-free. Such areas—including beauty salons, dressing rooms, cafeterias and soda fountains—should be designed as independent zones for air conditioning purposes.

EQUIPMENT SELECTION AND LOCATION

There are three basic methods of air conditioning which lend themselves to department-store application.

1. In the **CENTRAL SYSTEM** the supply and return fans and compressors are located together, and handle the air distribution for the entire building. The new Gimbel store in the Cross-County Shopping Center in Yonkers uses this system. A roof penthouse contains the fans, boilers, compressors, pumps, cooling towers, filters and even the transformers, making for compactness and efficiency. High-velocity ductwork connects with the store space, allowing use of relatively small ducts.

2. In a **CHILLED-WATER SYSTEM** water is piped from a central cooling unit to a number of units which force air over cooling coils and through filters. This scheme gives maximum flexibility. Parts of the store can be conditioned, while units in other areas are unused.

3. INDIVIDUAL PACKAGE UNITS can be located throughout the store. This system offers the advantages of low first cost and flexibility. Failure of any one unit will not appreciably affect the conditioning of the entire store.

The John Wanamaker store in the Cross-County Center uses a series of mezzanines as locations for the units (at left), which frees considerable floor space for profitable use. Return fans can be installed to supply 100% outside air in intermediate seasons.

* * *

Overhead ductwork and outlets blend with the décor of Macy's —New York—gift department in their Herald Square store. Interior architecture: Copeland, Novak & Associates.

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
July 1954	285.6	278.3	293.9	302.1	296.6
Aug. 1954	285.4	278.0	294.1	302.3	296.7
Sept. 1954	285.4	278.0	294.1	302.3	296.7
	% increase over 1939				
Sept. 1954	131.0	127.1	125.0	126.6	128.0

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
July 1954	217.9	217.4	221.5	223.5	223.6
Aug. 1954	219.3	218.5	224.1	226.1	226.5
Sept. 1954	219.7	218.9	224.6	226.5	226.9
	% increase over 1939				
Sept. 1954	154.5	163.4	136.1	132.5	139.5

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
July 1954	265.9	259.3	265.2	274.9	268.3
Aug. 1954	265.5	258.8	265.1	274.9	268.2
Sept. 1954	265.5	258.8	265.1	274.9	268.2
	% increase over 1939				
Sept. 1954	140.9	141.8	123.3	129.4	125.3

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
July 1954	258.5	250.9	264.0	271.9	267.8
Aug. 1954	259.9	251.7	266.4	275.7	269.5
Sept. 1954	259.9	251.7	266.7	275.9	270.1
	% increase over 1939				
Sept. 1954	146.1	153.4	127.1	126.3	131.8

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.

IF YOU can reduce the space you need for an air conditioning system, you can obviously effect substantial savings in the over-all cost of a building. With a high pressure air conditioning system, you can do just that.

Small, low-cost conduit-type risers and branch feeders add more usable or rentable floor space, reduce floor-to-floor dimensions, and require fewer supplementary equipment rooms.

High pressure is the ideal type of air conditioning system for new multi-story office buildings, schools, hospitals, hotels, and institutions. It is also *particularly* well suited to installation in existing buildings where high pressure eliminates the need for major remodeling. In fact, in many older buildings, such a system is the *only* answer to air conditioning.

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To learn how you can take advantage of Tuttle & Bailey's high pressure know-how, get in touch with your nearest T&B Representative or the Home Office.

For information on the complete line of Tuttle & Bailey High Pressure Air Distribution Units, write for Bulletin 109.

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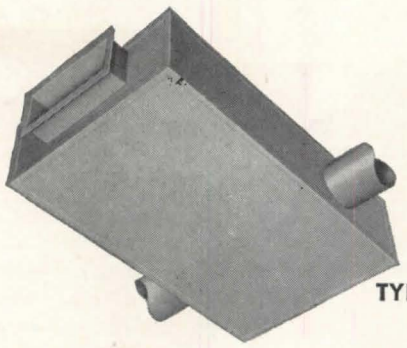
NEW BRITAIN, CONN.



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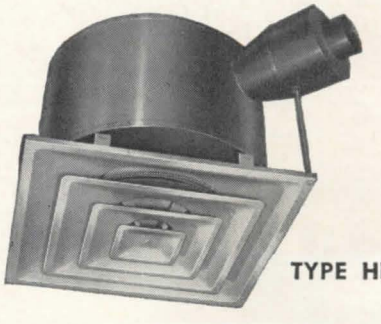

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IN ORDER TO BE FASHIONABLE

The Tastemakers. By Russell Lynes. Harper & Brothers (New York, N.Y.) 1954. 6 in. by 9½ in., 362 pp, illus. $5.00

Reviewed by JOHN RANNELLS

THE COURSE OF AMERICAN TASTE in art and furnishings and architecture is charted for us in THE TASTEMAKERS, an account covering the past hundred years and more by Russell Lynes, managing editor of *Harper's Magazine.* The author makes lively use of contemporary writings, selecting and arranging their substance into a broad historic panorama that holds consistently to his main theme: the influencing of taste. At intervals, when the broad treatment gets a bit thin, he gives us fascinating pictures in depth. Many readers will wish that other subjects were given this treatment but there's richness enough as it is. The book might easily have grown cumbersome but that, praise be, it is not.

It is a masterful job that the author-editor has done — a clear and convincing account of taste as made, free from the burdensome demands of formal historical scholarship, and all the better so, since this permits the free and easy discussion of a great many delightful items. The book will also serve as a wide-ranging outline into which the reader can fit pet items of his own that somehow got left out. It is a simple outline in three periods of about 40 years, the *Public Taste*, the *Private Taste*, the *Corporate Taste*, all set up in the first chapter:

". . . when Andrew Jackson was elected to the presidency in 1828 on a wave of cocksure Americanism there came with him not only a new 'age of the common man' but the beginning of what I would like to call the Age of Public Taste. Taste became everybody's business and not just the business of the cultured few. (p. 5)

"It was not until almost everybody could afford to be concerned with taste that the tastemakers, as we know them today, had any real function. The play in which they have acted divides itself, rather arbitrarily into three acts. In the first act, which I call the Age of Public Taste, they tried to discipline everyone to a higher appreciation of the arts and to a nicer sensibility to their surroundings. They managed to arouse the public interest to a very considerable extent, but they found to their dismay that the Public Taste was not to be controlled. And so they turned their attention to the Private Taste (in the 1870's). They aimed their fire at individuals — at the rich who were presumably looked up to as models of behavior and at housewives in whose hands local standards of refinement and culture were maintained. The curtain came down on the Age of Private Taste when in our own century the Tastemakers became exercised about what's now familiarly (but I think mistakenly) called 'mass culture' [about 1914]. It was then that the curtain went up on the Age of Corporate Taste, and the Tastemakers took to working through mass communications media and vast corporations to reach millions upon millions of people." (p. 6)

Clear enough! and the author keeps it clear by hewing strictly to his line throughout, telling how tastes have been formed and changed, without actually defining taste itself. For this is an account of taste *made*; to cover the story of taste that grows would be a tremendous task and the author was wise to avoid it. The line is further simplified, up to the latest "mass market" phase, by a strong leaning toward taste with a substantial price tag. This is the kind most worth forming, of course, while competition takes care of changing it, especially in the Art World: that ". . . band of zealots who have constituted themselves a sort of Salvation Army of our sensibilities."

There has always been a strong evangelical streak in Tastemakers; the old idols are always false. A classic revival mansion was a "tasteless temple" to Andrew Jackson Downing, the tasteful landscaper who did so much to bring the "honest" Carpenter Gothic into style. A few decades later Eastlake was preaching "sincerity" in furnishings while the "honest," "artistic" and at the same time "practical" Queene Anne Style was replacing Gothic, very generally in the form of alterations. It was replacing Colonial and Georgian, too, in every New England village. "In the seventies Americans were not timid about being 'modern' and bankers were as happy to give mortgage loans on a modern Queene Anne house as on a Gothic one. The country was not yet old enough to have become self-conscious about reviving its youth." Amen to that!

In this continuing sequence of styles the only durable goods are the arguments used in selling; they appear to be undestructable. This may be seen in the old Sears Roebuck catalogs where the same descriptive adjectives are used year after year for one furniture design after another. A chief virtue of the TASTEMAKERS is the perspective it gives as to the importance of the spoken or written word in matters of taste. It is *so* important what other people think or say!

What architects or artists themselves think is not too important in this context. In the Art World, Lynes tell us, the artist is almost incidental. Architecture, too, is something talked about here rather than something to be understood. If this hits the architect reader of the book with somewhat of a jolt, then he probably needs to be reminded of how seriously his art is taken by some. "Of all the arts," says Lynes, "none wraps itself in such a cloak of morality as architecture or assumes so many moral arguments to justify itself; no other art impinges so surely and inevitably on the

(*Continued on page 48*)

reprinted from THE TASTEMAKERS

THE SIX-MARK TEA-POT.

Æsthetic Bridegroom. "IT IS QUITE CONSUMMATE, IS IT NOT?"
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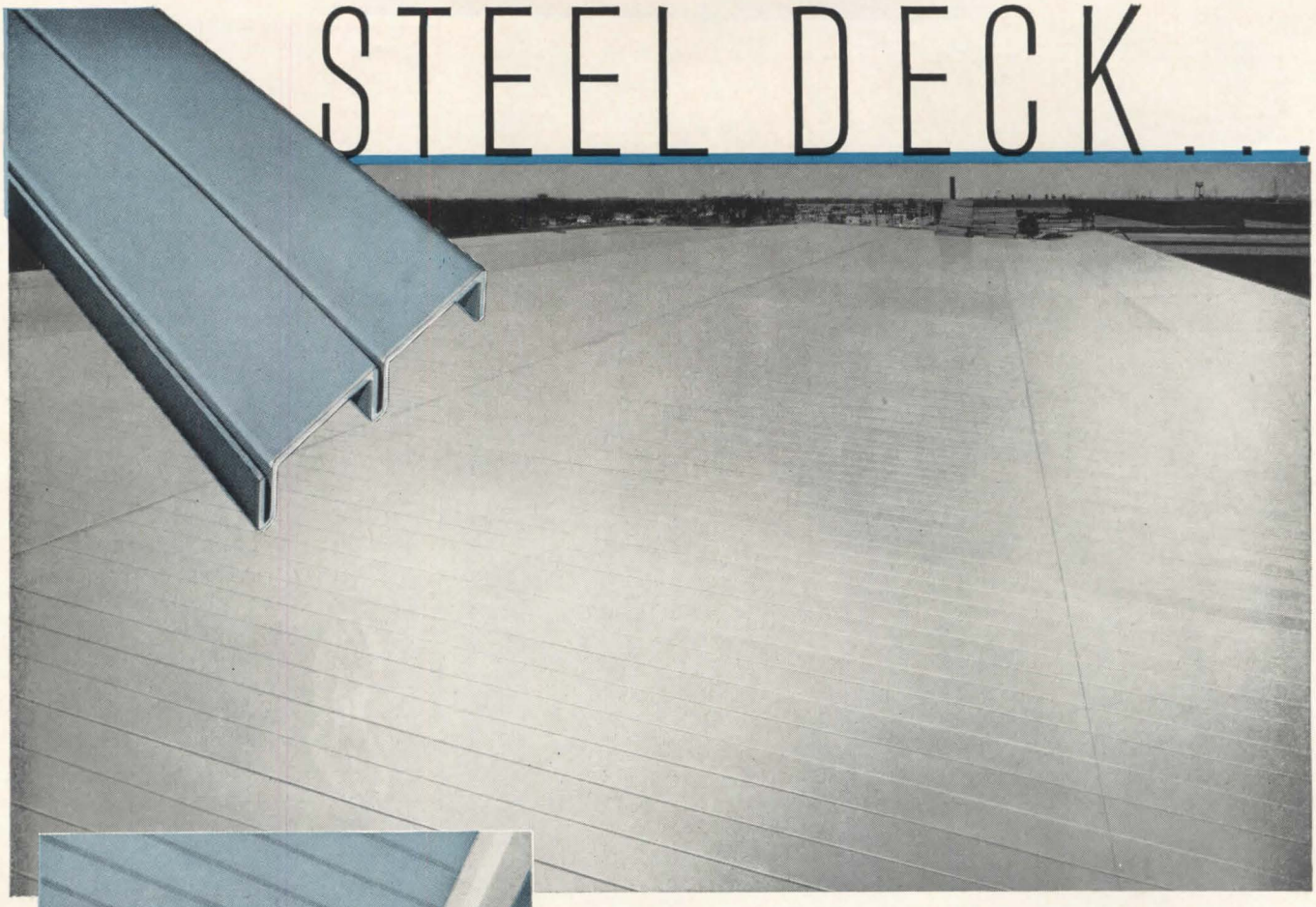

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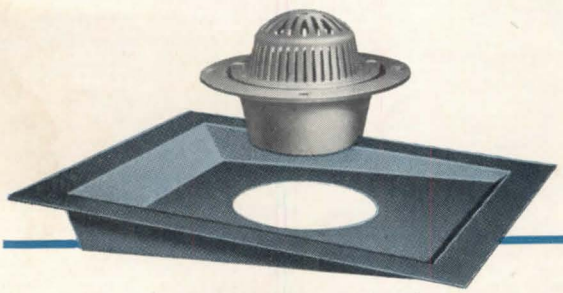

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Mahon Roof Sump Recesses for use with Mahon Steel Deck can be furnished to fit any roof pitch. Mahon Cast Iron Sumps can also be furnished for 4", 5", and 6" conductors.

MAHON

REQUIRED READING

(*Continued from page 46*)

life of everyone and therefore must justify itself to every man." A large obligation indeed!

The artist or architect reader may be surprised to find that the formulation of design principles is not considered in this book. This is a professional matter, beyond the present range of discussion, as the author makes quite clear in his last substantial chapter "Highbrow, Lowbrow, Middlebrow." This piece, once an isolated article in *Harpers*, fits right into context now. Like the book itself, it is all about attitudes and promotion of art; art itself is but incidental to this particular argument.

Architecture is quite incidental to the book, too, except perhaps the grand style architecture of the late 19th century, especially that of William Morris Hunt who was the first of the *Society Architects* to show his wealthy clients how to live. "No wonder Hunt was the trusted darling of the New York rich. He was their taste and their sense of fitness."

That our author has fine taste as a phrasemaker has been seen; the book is fairly dripping with choice phrases. But sometimes he stretches a point just a leetle bit to make it fit — "There was one dissenting voice amidst the general clamor of praise from the architects of Hunt's day" says Lynes, and quotes a very sarcastic statement by Sullivan that was written several years after Hunt's death, presumably about one of Hunt's houses. Sullivan's professional career and Hunt's did overlap but Hunt was studying in Paris before Sullivan was born. A slip-up in dates, not chargeable to the author is on p. 7, where the wrong century is turned. That Sullivan had a high regard for Hunt is evidenced by his description of the first design conference for the Columbian Exposition in Chicago, where Hunt got Burnham *off the hook* when he began apologizing to the eastern architects for the presence of their western brethren. He had tried to place all of the work with the eastern architects, "solely — on account of their surpassing culture," says Sullivan (AUTOBIOGRAPHY OF AN IDEA). Lynes' statement that Root and Burnham "felt that the exposition should represent the architects not merely of the Middle West but of the whole nation" is probably the official version, but Sullivan was there. Root, incidentally

(*Continued on page 230*)

"If the technology of the West can be put to the service of the world and not only in its own service, then the West may save the world and in doing so save itself. If the West tries to retain the bulk of the benefits for itself, it must . . . be prepared for Operation Phoenix."

Architecture in the Atomic Age

By JOHN ELY BURCHARD

Dean of the School of Humanities and Social Studies
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WHAT IS AN "ATOMIC AGE"? It is more than an age of the split nucleus, of super bombs and large new sources of peacetime energy. We name ages for one of their prominent characteristics but in doing so we always mean more. The Old Stone Age was something more than an age of certain stone tools — it was for example the age of fire. The New Stone Age rested on more than another kind of stone tools — it meant the hoe and digging stick, spinning and weaving, pottery, even an early form of mining. And so it was for the age of bronze and the age of iron and the age of the clock and the age of steam. The atomic age is, then, an age as well of jets and helicopters, of sensitive electronic controls of many kinds, of a potential direct exploitation of the enormous energy resources of the sun. No kind of forward look at the possible architecture of such an age can have any reality if it limits itself to what might happen simply through the new knowledge of fission and through new applications of radiation.

And what is the architecture of an age? Again, it is inevitably more than an application of the newly available technologies to the art of building. Roman architecture is more than an architecture of arches and domes; Gothic more than an architecture of buttresses and vaults; the architecture of the past hundred years is more than an architecture of structural steel and glass. So it will be in the atomic age.

The architecture of a time is not only more than an application of newly available technologies; it is often also less. It is possible to make a strong and documented argument that architecture has almost never applied to the hilt what was currently available in technology. This does not necessarily involve any criticism of architectural thinking. There are deep-lying human reasons why architecture should always be Conservative. New potentials will be realized only to the extent that a society finds it desirable to utilize them.

What the society finds desirable is conditioned, and in part at least determined, by the potentials of its new technologies. The technological advance provides the opportunity; once the opportunity is there and understood, the society uses what it thinks it needs, and uses it in a sense reluctantly, since it is a human characteristic (and not necessarily an immature one) to be resistant to change.

For instance, if we were to look at the age of electricity, beginning in the last quarter of the nineteenth century, we would find that the major effect upon building had not been the new illuminating sources. Very few buildings, even the most recent

ones, have provided the kind of luminous environment which electricity makes possible. Indeed, more can be said. There are few existing buildings which could not accommodate themselves without fundamental change to much older sources of artificial light.

The major effects of electricity are quite different. Electricity made it possible to have elevators which could run fast enough so that the skyscraper could work. Few of our tall buildings could operate with a vertical lift rate as slow as that accomplished on the four-stage hydraulic lifts of the Eiffel Tower of 1889, which took you a thousand feet from the street to the top in seven minutes. The skyscraper in turn, if it has any justification for being, has it only when it can serve a large population which can be brought with relative convenience to its doors. Here the spark-plug of the internal combustion motor, the electric rail of the subway, played their part. The very large building might also be inconceivable without a third use of electricity, the telephone, which made face-to-face communication unnecessary. It is quite possible too that we could not have the large sheets of glass which for the moment seem so essential to contemporary architecture had it not been for electronic controls in their manufacture.

Moreover, everything that is technologically possible will not necessarily come to pass; certainly it will not necessarily come to pass as soon as it might. Suppose, for example, that Whittle's jet engine had been approved by the Air Ministry when it was first invented in 1929; suppose the state of metallurgy had been just a little more advanced at that time. Suppose the RAF had had jet aircraft at Dunquerque and the Battle of Britain. It is not inconceivable that the war might then have terminated quickly with the defeat of Germany which would not have had the potential to develop the techniques of fission; there would have been no test of the strength of Russia with all that that might mean. Is it conceivable that the United States would then have put the enormous amount of scientific manpower and of money into the development first of the atomic weapons and then of more constructive applications? Could the scientists themselves have been mobilized in this direction with anything like the same intensity? The truths would still have been there; nothing known to Meitner or Bohr would have been unknown; but the absence of the social pressure might have provided a different or much delayed outcome. If this seems fallacious, consider the present position of research in the use of solar energy. The sun is a source which promises vastly more to humanity than the broken atom. Yet, as Ayres and Scarlott say in their excellent discussion of energy sources, "Our children's children may be puzzled when they read that in 1951 nearly two billion dollars was spent for scientific research under United States government auspices, but less than one-hundredth of one percent of this sum was devoted to solar-energy problems." [1]

If we push our inquiry into a forecast of what the society will demand, we begin to walk on treacherous ground. The Byzantines, when they thought their civilization was about to crumble, thronged into Santa Sophia to pray that God would regard them as the chosen people and save them. (That God did not think there was a single chosen people, and did not save them, does not alter the effort they made.) Others have acted in the same way before and since. A society which lives in sufficient fear of physical destruction by thermo-nuclear weapons and which finds in the actions of its social and political leaders scant assurance that this danger will be averted could conceivably turn, indeed will probably turn, to higher authority. This authority might be in a stronger political system, authoritarianism. It might be in the authority of a religion. So the atomic age can quite as well be distinguished by a set of architectural symbols of a "Nineteen Eighty-four" [2] or by a proliferation of temples and churches as it may by new manifestations of the technology in a life which otherwise goes on as usual. Indeed, the multiplication both of totalitarian architecture and of houses of faith seems already to have begun.

There are even more complicated philosophical considerations. It is not safe to assume that Aristotle, Plato, Aquinas, Hegel or a contemporary logical positivist or relativist will not have a serious effect upon a subsequent architecture. But to try to imagine what the implications of present scientific explorations may be upon philosophy and thus upon the architecture of a century hence is too speculative for today.

Given this gamut of conjectures, it is always tempting to try to be a Jules Verne and to discuss a variety of technologically possible things which may be either economically or socially improbable. Given enough time and a reasonable awareness of the present state of scientific knowledge, one has then a very good chance of finally turning out to be a prophet. Recollections are kind and in this sort of game the prophecies that came true are remembered as showing prescience and the prophecies that came false are gently forgotten. And in any event such prophecies are not very useful either to the genera-

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[1] *Eugene Ayres and Charles A. Scarlott, "Energy Sources — The Wealth of the World," McGraw-Hill Book Company, Inc., New York 1952, p. 280.*

[2] *George Orwell, "Nineteen Eighty-four," Harcourt, Brace and Company, New York, 1949.*

tion which reads them but does not fulfill them or to the later generation which, not having read them, has nonetheless brought them to fulfillment. Horatio Greenough's comparison of a building with a ship was wistful thinking. The purposes were different. Buildings did not have to sail in Greenough's day and they do not have to fly now, and there is no necessary conclusion that they would be better if they were given the same close attention which is given to aircraft.

It would not be hard to imagine new materials, produced by some of the transmutations already known to be possible through bombardment by various rays. But having imagined such materials, it does not follow that they will come to pass. There is first the question of whether they are needed. A society which has discovered that building high is actually unwise, and which feels no need for very many enormous covered spaces unimpeded by columns, may not have much use for a structural material much stronger and much lighter than the ones we now have. A society which has found a better way to use view and to enjoy sun than by clothing a building in glass or its equivalent may not covet a miraculous substitute for glass. A society which continues to like the "feel" of wool or wood or stone may reject metals and plastics which serve the same functional purposes but which seem unappealing either in appearance or in feel. Such rejections are not necessarily silly.

Conceivably, new materials might lend themselves to plastic designs now not possible, and particularly to curved and sinuous shapes suggested by some of the designs of Matthew Nowicki, Buckminster Fuller, Alvar Aalto, Eero Saarinen, Frank Lloyd Wright, Robert Maillart and Pier Luigi Nervi. Conceivably such forms, if serving a purpose which needs to be served, might like the flying buttresses and the steel frame result in an entirely new architecture. But the forms, at least the prototypes of the forms, have already been achieved and are there for the world to see. Unless the world feels at peace with these forms, or desperately needs the kinds of space they alone can enclose, they will remain sports. And the world's needs and rules change. The brilliant examples of iron architecture offered by the Bon Marché, the Bibliothèque Nationale and the Halles Centrales of Paris had their echo in the lobby of Brown's Palace Hotel in Denver. Such a space may still make the heart leap but the society no longer wants this kind of space, regards it as a fire hazard, and too costly, and the appearance of a modern Hilton palace is quite different. There would not have been a flying buttress had there not been the Mass and many celebrants.

THE RESISTANCE to the potentials of technological change have always been strong. They have rested in ignorance, prejudice, and self-interest. Many monarchs prohibited the adoption of coaches in the fifteenth and sixteenth centuries. Owners of railroads tried to stop highway developments in Andrew Jackson's administration. Ruskin drove through England in a mail coach to prove how silly the railroad was. Daniel Webster, a better judge of whiskey than of technology, predicted that frost on the rails would bring trains to a standstill in winter. People said that if Stephenson's predicted speeds of twenty miles an hour were attained, blood would spurt from travelers' noses and mouths and they would suffocate going through tunnels. James Watt discouraged his employee, William Murdock, from working on an automobile. The internal combustion motor was held back for a long time because so many people thought Edison would invent a better electric one when he got around to it. The United States Navy was reluctant to adopt Ericsson's screw propeller. The Popular Science Monthly rebuked Langley for his experiments on the ground that the director of the Smithsonian Institution should be careful not to reflect discredit on science in this country. Galvani was called the frogs' dancing master. The president of an important American Institute of Technology said in the New York Times in 1879 that people should not acclaim Edison's lamp when "everyone acquainted with the subject" would recognize it as a "conspicuous failure." When Buffington took out patents for an iron skyscraper in 1888 the Architectural News predicted that the expansion and contraction of iron would crack all the plaster eventually leaving only the shell. The people on Russian Hill, in San Francisco, hated to see the passing of the gas lights on the streets since they fitted the Bohemian character of the neighborhood. The cable car remains an historic monument in that same beautiful city and many of us will, underneath, be happy that this is so.[3]

In one sense we are more sophisticated today. Industrial organizations try to find out how they will fit into a new development rather than to stop it. Labor unions are more likely to seek to find a way for a gradual readjustment to an automatic milling machine than to try to keep it from being developed and used. In a sense we are even avid to try the new.

Yet this new attitude is probably at the simplest level and in local terms. The wider implications of the atomic age require thinking at a higher level and on world terms. At these levels there is a considerable evidence in other spheres that the resistances will remain.

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[3] *Many of the examples cited are taken from Bernhard J. Stern, in "Technological Trends and National Policy, IV, Resistance to the Adoption of Technological Innovations," National Resources Committee, G.P.O., June 1937, pp. 39–66.*

So though it may be pleasurable and titillating to speculate in such directions, it may not be very useful. What will be useful is that the society continue to support its Nowickis, Aaltos, Wrights and Saarinens, Fullers, Nervis and Maillarts, so that the new forms continue to be suggested for all of us to see; that the research on the new potentials continue and be published and heeded; then such realization as comes will be more valuable than any prophecy.

WE MAY DIVIDE architecture into three parts. Let the first of these be the environmental shell which protects from the elements. Let the second be the internal arrangement of the building. Let the third be the organization of the shells into communities.

New technologies have affected and will of course continue to affect all three. But the effects upon the shell have been and will probably continue to be the least significant, partly because the rudimentary problems of the shell have been met long ago. The effects upon the functional arrangement of the parts have of course been very large and will no doubt continue to be so, but many of these are trivial and the greatest problems have not always been approached. For example, the modern American house is abundantly equipped with "labor-saving" devices and the kitchen at least has become a "machine for living in." But the biggest problem of the house, that of keeping it clean, has if anything been magnified rather than diminished by the applications of technology. The tools for cleaning are improved but the sources of dirt have developed faster. James Fitch reminds us that Edward Bellamy predicted for his utopian Boston a city with no chimneys and with washable surfaces in all interiors.[4] He was answering the housewife's prayer. "For of all the tasks which face her, none is so remorseless, so physically exhausting and emotionally unrewarding, as the constant process of cleaning, polishing, and washing required to keep the dwelling in reasonable condition. . . . Yet in actual practice, the average American dwelling is not much closer to this goal than it was in 1887." This is an understatement. Yet one can jot down as fast as he can write a long list of pieces of equipment or sequences of operations which have materially affected the interior of our buildings — and perhaps avoid regret at realizing how many of them are trivial so far as any fundamental principle of good living is concerned.

It seems reasonable to estimate that the most important effects of the atomic age will be upon the organization of buildings in communities although lesser changes may come in structure and although there may be substantial additions to the amount of physical equipment.

WITH THIS IN MIND, what shall we say of the possible effects of the atomic age upon the city and therefore upon the civilization of the West? In order of their probability, as of this moment, the possible alternatives seem to be four:

a. It can destroy the civilization;
b. It can be dissipated in trivia;
c. It can redeem the Western city for a while;
d. It can bring material changes in the world as a whole and in so doing save the Western city and the Western civilization.

Destruction

ANY ONE WHO pays any heed to the actions and words of the two societies which now have come to fear and hate each other, and who has any notion of the destructive powers of the new weapons, must sense that massive obliteration of the cities of the West is not only likely but possibly imminent. The test may not come, of course, even though there is little consolation to find in the record of history, where men have seldom recoiled from dire and vicious deeds and where men have not often refrained from violent actions through fear of reprisal. Yet everything bad which might have happened in the world has not happened. Whether you believe in your heart, then, that such a thing may happen or not happen is largely a matter of your temperament and your personal mysticism. You can argue that dead-end kids and the enormous increase in the number of psychiatric disturbances are more dangerous to the West than the mushroom clouds which might arise above our cities. But even if you end by having faith that something terrible which you do not wish to happen will not happen, you cannot be sensitive to the present time without knowing that there is a real chance that it may happen. And you cannot be sensible about the consequences if it does happen without understanding that you are neglecting your responsibilities if you do not do everything in your power to help in reducing the chance that it will happen and also in reducing the dimensions of the catastrophe if it does happen. That there is more

[4] *James Marston Fitch, "American Building," Houghton Mifflin Company, Boston, 1948, p. 287.*

"Nuclear power is, however, but a small thing as compared with the potentials of the sun. More than twenty thousand times as much energy as we use comes to the earth as sunshine every day . . . It is perhaps in solar energy rather than in nuclear energy that the West may find the way to save the rest of the world and, in saving the rest of the world, save itself."

hope in the former than in the latter does not excuse us from activities on both fronts. Although the nature of the disaster has been stated over and over again, most of us act as though we had never heard of it. This is not, in the present state of affairs, a position to be proud of. To say we are bored with the hydrogen bomb is simply inane.

Any efforts we may make in the next few decades to ameliorate the aftermath of bombing attacks are bound to be minor and temporary. Given a long enough time, say one hundred years, we might, if the destructive capacity of the weapons did not keep pace with our efforts, develop an entirely new physical complex which would offer less attraction to strategic bombers. But if the delay were to be that long, it is a safe observation of human nature to remark that we would then do nothing in the meantime. We do almost nothing as it is.

But if we are not to speculate in such pleasant and enticing fairy-lands and if we are not to try to estimate the moral philosophy of our descendants a hundreds years hence, what may we say? We may explore the four ways in which the new knowledge of the nucleus and the kindred arts of propulsion, of hovering, and of control may have broader and more powerful effects upon the architecture of the next century, and not only in the West.

The most direct and simple action involves plans for evacuation of the cities in the event of attack. With a six-hour warning of an attack, it is possible that good enough planning plus thorough public understanding of the measures might very largely reduce the *immediate* casualties suffered in our major cities. This thorough understanding cannot be expected without full-dress rehearsals of a scope and at an inconvenience to our grasshopper minds which may not be tolerated. But after the evacuation has been successfully accomplished, the gains may be less than supposed. The lives of the people may have momentarily been saved but the city will have been bombed anyway, bombed and destroyed. Where then is the country to provide food and shelter and the minimum requirements of survival to this rapidly dislocated metropolitan population? How can mass evacuation be expected to work for more than a short time, and even then only if retaliatory bombings do in fact stop the attacks upon us? Suppose they do not, then what? Beyond this, imagine the enormous possibilities in blackmail of the cities without actual attacks, the solitary planes getting through and causing early warnings and marchouts at frequent intervals. How long could this go on? The history of Kassel in Germany is suggestive.

It seems evident that though we must practise evacuation plans, they solve nothing. They simply propose to keep more of us alive and to provide the hope that, being alive, we may be thinking up something to do next. One should support the efforts of civilian defense with a full heart. But even if the tension were to persist for a century it is hard to believe that one effect of the split nucleus would be substantial modifications in our buildings plans and their relations to each other, rearrangements of street and bridge and tunnel locations, so that mass evacuation could in time of crisis be executed more smoothly.

At a higher level of effectiveness we could consider the application of various "defense standards" to building construction. Any bomb, even the big one, will have a finite radius of destruction which is related to the quality of the structures it attacks. Buildings of glass will create hazards at far greater distances from any given explosion than buildings of massive concrete. On the other hand, buildings with walls made entirely of glass may survive nearer to an explosion than those without glass because when the glass blows out so easily the frame itself will be spared the stresses laid on it by a facing material which would not yield so readily. Buildings built according to this theory would have a glassless basement or basements for refuge and heavily protected stair walls, elevator shafts, and utilities; otherwise they would be designed so that the closure materials could blow out easily. Industrial buildings with redundant truss structures will collapse only if they are much nearer to point zero than industrial buildings without such protective devices.

The people of the East River project have estimated that application of defense standards to new buildings only, during a ten-year period, might reduce urban vulnerability by twenty per cent. Now such reductions are not trivial. Any individual's chances are enhanced as well as the chances of the whole city, although this is a matter of probability theory and individual luck. But application of defense standards may cost extra money and require the abandonment of certain very popular architectural treatments. The question every one has to ask is whether the times require the sacrifice of some profit and the sacrifice of whatever amenity there may be in the all-glass wall, for instance. It is fairly obvious that the public is saying "no" to this question. And the public may be right, for the wrong reason. The right reason could be that the order of magnitude of increase in safety is inadequate. The

power of the bombs may be increasing at a more rapid rate. There does not seem much reason to expect that the face of our architecture will be changed by individual relinquishment of economic advantage or aesthetic delight, or that we will see a land filled with defensive construction, even if good designers might build into them a new delight. The day when the public might be willing to make such an effort will be after the first attacks have been made — in short, too late.

It is practically impossible to provide individual shelter which will be effective at point zero or economically possible to provide for very many people a kind of shelter which will be effective at a decently short distance from point zero. Individuals and groups of individuals of key importance in a war effort may have and doubtless should have some of this protection. But it will be denied to most of us. A few individuals with more wealth than sense can betake themselves to the country and there build some kind of bunker, stock it with provisions and bonds, and look upon themselves as almost safe. The idiocy of this notion is only exceeded by its immorality. Individuals who think this way should picture themselves standing on the top of their fort the day after the attacks and wonder how they are to continue to survive, or even if they will not suffer the fate of the shopkeeper, Maigrat, in Zola's "Germinal." Most Americans are neither idiots nor immoral and this kind of private protection will not create a new kind of architecture on our landscape.

A more far-reaching approach is proposed by decentralization. Admiral Moreell's studies show that twenty-five per cent of our steel productive capacity would be replaced normally in eight years even without any threat of bombing. If this normal replacement were made on a decentralized basis, a period of twenty years could produce a very considerable decrease in vulnerability to the bombing of our industrial units. These findings deserve the closest of study. But dispersion of the plants will obviously not be enough, and other components of industrial production, houses or churches for example, do not obsolesce quite so rapidly. But even a full-scale dispersion, involving a rebuilding of many things besides factories in new and decentralized locations, will not quickly solve the problem. As Hornell Hart says, [5] "even if dispersion were not matching a sleeping tortoise against a racing automobile, the proposal would not meet the essential dangers involved. . . . The primary and essential danger appears to be the paralysis of the nation rather than the destruction of its factories." He goes on to say that if the twenty-five major metropolitan areas of the United States "were destroyed, and if coal, gasoline, oil, electricity, and repair facilities were largely cut off, the dispersed plants would be quite useless." Any one who has watched the efforts to clean up after the minor and localized disasters of a flood or a hurricane may have some intimation of what would be involved in this atomic disaster, but only a minor intimation, for the wounded region cannot so readily call upon its neighbors if they too are wounded.

The problem is perhaps even more complicated than Hart states it. "An industrial world consists of an elaborate network of causes and effects . . . if one part of it is disturbed or modified, all parts become disturbed or modified." [6] Harrison Brown, who wrote the preceding, remarks the analogy of this world to a biological mechanism but believes that the industrial world may lack the overall stability of the network of the universe of biological creatures. Surely this has been true of all earlier economic and technological systems.

Human greed and ignorance, the lack of foresight of the individual, the reluctance of Americans to give over so much of their freedom to the super planning involved, and the question of how much can finally be accomplished lead reluctantly to the conclusion that all these proposals are at most ameliorative and only slightly so at that. There is the further factor of time and the question of how much could be accomplished before the day of judgment, even if this day were to be postponed for twenty years. This is not a counsel of despair. It simply means that we must do all these things to the height of our ability, something we are not beginning to do now, and yet we must recognize that safety lies not in what we may do to reduce the effects of the drop but rather in what we may accomplish to see that the drop never occurs at all.

For quite different reasons it is to be expected that much of the dispersion which might be effective in reducing the effect of atomic attacks will take place in the atomic age. But the motives for the dispersal will be different from those of fear; the time over which the dispersal will take place will be longer; the dispersal will come through the benign possibilities in the atomic age, not through the malign. If the atomic age changes the face of our communities for the better, it will be because peace has been achieved and not because we have reduced the destruction of war.

There is of course one other painful way in

[5] *Hornell Hart, "The Remedies* versus *the Menace," Bulletin of the Atomic Scientists, Vol. X, No. 6, June 1954, pp. 197–205. This very disturbing article ought to be reflected upon by every thinking American.*

[6] *Harrison Brown, "The Challenge of Man's Future," The Viking Press, New York, 1954, p. 50.*

which the atomic age might change the face of our cities for the better — the way of catharsis. This might be called Operation Phoenix. Out of the shambles of the cities of the West the survivors might painfully create a new urban civilization, far better than the one we know. This has not often been done in the past. There have been few Lisbons and San Franciscos and Coventrys, and more cities which have clung to their old street patterns and old habits. (For example, the reconstruction around St. Paul's in London is mediocre.) Moreover, it is doubtful that the survivors would have enough techniques at their disposal to make rapid strides, more likely that they would be doing very well to create centers of subsistence on a lower level than those we have now, lower than those of Berlin in 1945. And human beings have a way of not remembering what they have learned. Despite all the evidence of the Birminghams and Sheffields and Liverpools and Pittsburghs, the new Karachis continue to spawn, imitating all the mistakes our Western cities made generations ago and are now trying to palliate so painfully and so expensively — and so ineffectively.

If the effects of the atomic age on architecture are to be those of destruction, there is hardly a master builder who could be so arrogant as to mean it when he said "let it come."

The other three alternatives all must rest on the assumption that there is time — a great deal of time, perhaps a century — and that total war does not come; that no one looses massive weapons of destruction on the world.

Trivia

IT IS NOT IMPOSSIBLE that the people of the West and especially we of America, who so often admire ingenuity rather than its fruit, may use the new powers placed in our hands in idle ways. T. S. Eliot in THE ROCK expressed what this attitude might mean:

> *"In the land of lobelias and tennis flannels*
> *The rabbit shall burrow and the thorn revisit,*
> *The nettle shall flourish on the gravel court,*
> *And the wind shall say: 'Here were decent godless people:*
> *Their only monument the asphalt road*
> *And a thousand lost golf balls.'"* [7]

This has happened before in technologically minded nations. The Romans brought more water to their ancient city in 100 A.D. than they do now —

[7] *T. S. Eliot, "Collected Poems, 1909–1933," Harcourt, Brace and Company, New York, 1936, p. 190.*

> ***"If American scientists and engineers and architects walk about the world humbly and bring their seeds for natives to plant in their own ways, it is not impossible that the cities of America and the architecture of America will be of the kind which befits a new form of imperium, a nobler imperium than that of Rome or of Queen Victoria, an imperium resting neither on tribute nor on gratitude."***

but they used more than half of it for public baths and fountains. We use the powerful domestic releasers-from-toil to provide leisure to waste on the low-level performances of the radio and television. It is not impossible that we may do the same sort of things with the blessings of the atomic age.

Although most radiant bombardments produce bad effects upon plants, some produce interesting mutations. We might work this in the direction of a more abundant food supply — or we might use it to modify the properties of plants so that the same ones could be used for both high and low screen cover around the house, or so that I could maintain coveted manzanitas not in the Sierras where I do not live but on the New England coast where I do. When everything becomes indigenous everywhere, nothing may have much esteem. There is some point at which the divorce from nature becomes undesirable — and it was not nature, left to herself, which would have developed these mutations. Yet give an artist freedom with this toy and he might produce for you what an earlier century would have called a "pleasant conceit."

We might with the new electronic controls and perhaps somewhat cheaper power be able to play with lights in our houses, working on our walls with a domestic variation of a color organ, walls to fit our humor à la des Esseintes, walls to flatter our guests just as the Japanese bring a special print to the special diner. We might be able to lie in bed and by manipulating a sufficient keyboard close the windows or the doors of our house when the thunderstorm breaks at midnight, just as we can now do in an automobile if we are willing to pay enough for the unnecessary. All this might even be done for us automatically with photocell and other triggering devices so that we need not play with a control panel at all. We might have thermal and other controls which would eliminate the need for changing the storm windows and screens several times a year in much of the temperate zones. We might even, as Fitch suggested a few years ago, be able to manage a building which would "open and close automatically with the sun, like morning-glories; or, like sunflowers, revolve slowly to keep their 'faces' toward the sun." [8] None of these achievements is impossible; many of them might be fun. The only question is whether

[8] *Fitch, op. cit., p. 247.*

they are worth while. Probably the roof would still leak.

At a somewhat more significant level but not creating earth shaking changes, we might expect to use tracer techniques for determining just what kind of structure the men on the job had actually put together, a new type of inspection which would let us reduce some of the factors of ignorance in building. We might more probably use these same tracer techniques to establish better controls of the properties of materials and assemblies in the factory; we might finally transmute materials far beyond their present properties to permit a new plasticity in architecture. If the society needs the spaces thus provided there might then be a new architecture of bubbles and hanging things. But in all our thinking about this kind of change we have to remember that the importance of such change must finally rest on its relevance to human beings. It is possible that every one will have such an abundant store of everything he needs that we can turn to pleasing fancy, even at great waste; fantasy for all which was once reserved for kings and which is now hardly available to any one — a kind of Xanadu for the general. In this sort of architectural society we might build spheres of great beauty without knowing just how we were going to use them, or indeed without using them at all. Some of us may prefer to wait for the new fantasies to develop so that a cracking tower in a New Jersey refinery, when lighted at night, may suggest a splendid sculpture by a Bertoia (or vice versa).

But in such extravaganzas it is well to remember the caution of Fitch on a lesser issue:

> *"It is characteristic of American illuminating engineering that, historically, it solved the technical and optical aspects of its problem before it solved the physiological; or that, once a new source of light was perfected, its use would, for a time at least, obscure its basic subordination to natural light. . . . Only in recent years has the interest of the lighting specialist broadened from an obsession with the efficiency of his light source to include a consideration of its effect upon human vision. . . ."* [9]

The line between trivia and consequentia is not always sharp or narrow; irradiated plastics might not be trivia if we are more concerned with satisfying needs than with expressing our ingenuity; nuclear power may make it possible to exploit materials which now are abundant in total but sparsely distributed in any one place so that extraction is costly — might give us more materials like zirconium, titanium, germanium, just as we found abundant aluminum through electricity. These in turn might make jets and electronic controls more common, jets which would let small craft make vertical take-offs and descents, controls to thread them safely through cities, adding a third dimension to the traffic of the city with very large results.

If matters reach this point, we pass from trivia to significant changes in the architecture of the West — but still not the most significant things which might be possible in the atomic age.

The Rescued City

THE ATOMIC AGE, in so far as it relies on atomic knowledge only, is most likely to affect architecture because it provides more abundant power or because of what can be done with radiation. The meaning of atomic power is still obscure and people who ought to know contradict each other. Some say that it means in the long run that every one of us will have much more energy at his disposal than he does now; some say that it does not mean that at all but only that we will be spared the agony of watching the supplies of fossil fuels run out. If solar energy can be captured, however, the story is very different. Then we can say that energy will be essentially limitless for any present known human need and throughout the earth. How this can be most effectively applied, I leave for the final section of this story.

There are a few things about atomic power upon which most experts seem agreed. First, every one expects that by the end of this century there will be a substantial number of atomic power plants in the United States and some in other countries of the West as well. The units which develop this power are likely to be large even if direct conversion of the energy were to become possible. For a long time to come this conversion is unlikely to be direct. The reactors are likely to use coolants to make steam to drive turbo generators. There are other proposals but up to now these have seemed inefficient. Reactors of this type become more efficient as they grow larger. So we would expect large central units converting the energy to electricity, and it is in the form of electricity that it will reach the building. Nuclear energy, then, means first and foremost some reassurance that our descendants will not run out of electricity for a long time to come, and less surely that each of us may have more electricity to use than we now have.

Nuclear energy probably does not in itself mean a new kind of personal vehicle. Neutrons and rays are damped out by sheer mass and nothing else so far as we know, and the search for a thin shield seems doomed. But even given a thin shield at rea-

[9] *Fitch, op. cit., p. 245.*

"Roman architecture is more than an architecture of arches and domes; Gothic more than an architecture of buttresses and vaults; the architecture of the past hundred years is more than an architecture of structural steel and glass. So it will be in the atomic age."

sonable cost, personal mobile units are not likely because every accident would proffer a potential disaster.

Nuclear energy might, however, release increased quantities of materials useful for building vehicles which could rise and descend vertically. It could also release fossil fuels for transport only, although the coal and oil no longer needed for large power sources may more profitably supply raw materials for cloth and other synthetics than add to our mobile fuel supply. Given elaborate and sensitive controls operating from towers so that the commuter at a certain point in his incoming or outgoing travel placed his vehicle at the disposal of the control tower, the greater flexibility of transport possible in this three-dimensional street pattern might restore some of the merits of the outmoded metropolis which not even Robert Moses has been able to save on the flat. One can imagine landings at many levels. A city with such transportation, which would of course also be fast from point to point, might well bring to reality the sort of speculation which Le Corbusier has been making for many years.

But even with this kind of traffic and perhaps because of it, there would be a tendency towards decentralization at least for domestic life; and since industry has already found reasons for dispersion which do not rest on fear of bombing but on the increased flexibility of the highroad as opposed to the rail, it is logical that this still more fanciful and more flexible transport might produce still greater decentralization. Complete electrification of industry would in turn mean cleaner industry and a general preservation of the rural environment. Freer use of electricity might make communal air conditioning a practical reality with the result that there could be a large extension of the areas of the earth in which a person is able to think clearly without the lassitude engendered by too much heat or cold or dampness or drought. Indeed, the transport may well be so vast and convenient that we could commonly live in the high, clean, blue mountains, a hundred miles from the city of our work or our man-made play, as readily as we now live in Scarsdale or Montclair and of course with considerably more benefit. This will be possible even if fantastic factories bestride the ocean's edge pumping up and converting the resources of the sea, even if these factories are our main source of life, and thus engage the attention of most of our working hours at the seacoast or even on or under the sea.

The land is so large that even an enormous dispersion would have little effect on the green zones. But save for spiritual purposes these green zones could in fact be much smaller since the present process of raising food and other necessities from the soil in such small yields would largely disappear in favor of exploitation of other media of growth, through a better understanding of photosynthesis, through opening of the sea frontier. It is hard, too, to see for example how much land can continue to be devoted to cotton plants or sheep in the face of the certain improvement of synthetics. We have neo-Malthusians of course who insist that the world will die of starvation through overpopulation. We have other and more confident scientists who insist that any such dilemma is transitory and that food will not in the long run be crucial.

It might even be possible to imagine a scheme of living in which a large number of people clustered in much smaller individual and different residential units, each having many of the characteristics of rural communities, have also by their great total size achieved the ability to support manifold special activities to engage their working and their leisure hours, to care for their higher education and for their health. We might suggest that the communities will have individual character and not all be poured from one mold so that every citizen will have some degree of choice and can live in accordance with his personal tastes, so that there can be color and variety in every one's life. What remains to be provided?

Of course the citizens have to be able to get from where they are to the places where they want to be, and here our new transport will be effective. There is nothing in this scheme of things which says that the advanced medical community, the community of the great hospitals, should not furnish one cluster and that many of the doctors and nurses might not want to live in that community and thus be able to walk or bicycle to work; that a similar ganglion of amusement, of theater, symphony and opera, might not exist somewhere else; that the great shopping center which carries the rarely purchased items might not be another unit; and a fourth built up to provide an educational complex of universities, higher schools, and scholarly libraries. If you can now imagine the whole thing as a set of circles or spheres connected by fast highways and good public transportation, including three-dimensional transportation, you can see that things might be quite convenient all around — a quick getaway from where you are, rapid, safe and uninterrupted travel to where you are going, convenient parking when you arrive, or convenient pedestrian travel to the various facilities from central stations of public transportation. Such an urban system would be but an ex-

tension, although a very dramatic one, of the constellation complexes which have frequently been proposed by planners but it would perhaps more effectively take the form of the regional city of Clarence Stein than the satellite form of Ebenezer Howard. The location of the circles or spheres with respect to each other is critical, but this is well within the range of thoughtful planning.

This dispersion will be made tolerable to active minds and to those who need individual stimuli of a kind which few people can share through a much wider application of electronic techniques. For example, it should be possible to organize a telephone service by which you and I can talk to each other over long distances or couple ourselves to other people in a full-scale conference around the nation or the globe by a system of video-telephony which permits us to see each other at full size, which permits us to stay connected for some hours, which assures us privacy as we confer. Technically, most of this is possible now; practically, nobody can afford it. It might be one promise of the atomic age that many could afford it — perhaps all who really coveted and needed this kind of communication.

It is now technologically possible to produce music electronically so that the ear alone cannot detect whether it is "live" or "canned." By comparable achievements in other areas it can be argued that all the special reasons which have made the metropolis an essential concomitant of civilization will disappear.

It is, however, dangerous to press this too far. There are psychological subtleties which remain unexplored. Is it possible, for example, that it is more satisfying to go to a live concert than it is to hear one over the finest reproduction, not for any acoustic reason whatsoever? Is it because when one goes to a concert he embarks upon a ritual? Do the other people at the concert have an effect which cannot be duplicated on performer and listener alike? Is it true that if you bring nothing to an aesthetic event you take nothing in return, and that part of the bringing is simply not to be accomplished by twirling a knob? Is it possible that as the arts of transmitting speech improve we may forget how to write, indeed how to read — and that the new oral culture may end by being illiterate?

But beyond this there is another flaw in the dream. People have been conjecturing ideal cities and ideal structures of society almost since the beginning of time. Sir Thomas More proposed a set of towns which, mutatis mutandis, were much like the ones we now conjecture. The principal defect of Anaurot was that it was deadly dull. An atomic age has within it the power to improve the chance for diversity. But it has the equal power to reduce this chance. In this matter the atom will stand neutral and human beings will make the choice. But to exploit the atomic age to its full will require planning — planning far beyond what we have ever yet been willing to make or to accept. And it will require administration of planning which may require a far greater conformity than even our present other-directed society likes to contemplate.

In this situation what Mumford said of the machine long ago will be even more true for the atomic age, — ". . . the machine imposes the necessity for collective effort and widens its range. To the extent that men have escaped the control of nature they must submit to the control of society." [10]

It is not an attractive choice and it may not be possible to work out, as Harrison Brown says we may, a system in which we enjoy the idyllic existence which is technologically possible while reducing the pressures which force the individual to conform and to become more highly organized.

To a certain point a society with a common objective will produce an architecture greater than a confused society and there can perhaps be no great architecture without such a common purpose. But there can also be no great architecture when conformity is essential in all major matters. The architect in the atomic age may well be confronted with such a dilemma. It is not a promising one. For it is hard to name really delightful works of architecture which have been designed by large socially integrated organizations, hard to find a single example which was not finally the shadow of a great individualist who was essentially in harmony with his times.

In any event, Anaurot or not, a picture of such a society existing only in America or only in the West is both indecent and unrealistic. The rest of the world now knows all too well that it does not have to remain in fetters. So in the final analysis the real meaning of the atomic age, not only for the world as a whole but for the West as a part of that whole, depends upon a much more imaginative and widespread application of the new technologies.

The Rescued World

THE WESTERN WORLD and particularly the American world lives by consuming energy. This consumption has been accelerating. In the hundred years ending

[10] *Lewis Mumford, "Technics and Civilization," Harcourt, Brace and Company, New York, 1934, p. 280.*

"It is not impossible that the people of the West and especially we of America, who so often admire ingenuity rather than its fruit, may use the new powers placed in our hands in idle ways."

in 1950, the world used two-thirds as much energy as it used in the entire Christian era of the preceding eighteen and a half centuries. Americans use fifty times as much a year now as they did in the time of Thomas Jefferson. We use four times as many horsepower per citizen as we did in 1905. The energy we presently use per person is equivalent to that which might be provided us by two hundred and fifty slaves.

Yet world consumption of energy is enormously below the American rate. Asia outside of the Soviet Union holds nearly half the world's population. These people consume energy at a rate equivalent to burning slightly over one hundred pounds of coal per person per year; that is about the amount we consume per person in the United States in two days.

At the rate we have been consuming energy in the United States the world supplies of fossil fuels could be seen to be diminishing at a rate which implied complete exhaustion in a thousand years or so. Coals which could be mined efficiently would run out long before. If all the world were to try to live at our material standard, the exhaustion would of course be much more rapid. Thus the chance to manufacture power through atomic plants, even if in a country like ours the power were not to be perceptibly cheaper than power from the fossil fuels, offers at the very minimum a long stay of sentence.

The world as a whole operates at a very low voltage today but is not likely to be content to continue in this position. By American standards there is not enough electric power anywhere in the world except in Canada and the Scandinavian peninsula, both of which consume more per capita than we, and in Switzerland which consumes almost as much.

Fuel costs are prohibitive in many other parts of the world, in South America for example where only Brazil has a reasonable hydroelectric potential. Australia and South Africa have high costs and low consumption. India has hardly entered the electric age. Brazil, Australia, the Belgian Congo, India and South Africa have larger deposits of uranium and thorium than the United States can safely count its own. Here is one of the important implications of the atomic age. Plant reactors unlike coal power plants, can be located anywhere. Even if the greatest technological advances in the conversion of nuclear energy are made in the West, and particularly in England and the United States, the greatest importance is likely to be elsewhere.

Nuclear power is, however, but a small thing as compared with the potentials of the sun. More than twenty thousand times as much energy as we use comes to the earth as sunshine every day. "Any sixteen-mile square area in the Arizona desert receives enough energy as sunshine to satisfy all of the current energy needs of the American people." [11]

Nuclear energy is of extremely high potential, capable of producing temperatures of millions of degrees. Solar energy is nuclear energy which has been degraded to 10,000° F so that it is much lower in potential and less concentrated. Our visible supplies of uranium and thorium atoms are limited and perhaps we shall need most of them for purposes which require concentrated power. Solar energy is available in much larger quantities. To equal the coal consumption of the United States alone, 50,000 tons of uranium would be needed annually at the present efficiencies. Yet the sun, you remember, sends twenty thousand times as much energy a day as we need.

Nuclear energy does not promise more autonomy to the West. Indeed, it presupposes central generators, power networks, other things which when they go wrong offer difficulties to people who are remote from the primary machinery. Solar heating on the other hand might be individualized and might give greater autonomy to the dwelling, make it less dependent upon the network of sewers and pipes and wires which now are its circulatory and nervous system, although this cannot happen unless longer storage is possible.

Coal supplies are spread unevenly on the globe; uranium and thorium supplies are uneven too, although differently distributed. The distribution of sunshine is somewhat more equitable, especially for many of the areas which we usually call backward.

Immediate utilization of solar energy on any large scale is improbable and it is by no means certain yet whether the best way will be through photosynthesis or more directly. But that it will come, if the West survives to bring it about, there seems no doubt. It has been given to our generation to find a new source of energy, the nucleus, and it may be given to the next to find a still more powerful source, the sun, a source hundreds of times more powerful than all the fossil fuels we know, which are but weak storages of all the sun that has been falling on the earth for four hundred thousand years. It is perhaps in solar energy rather than in nuclear energy that the West may find the way to save the rest of the world and, in saving the rest of the world, save itself.

ASIANS EACH USE 1/150th as much energy as Americans; Indians each have 1/150th as much steel as Americans; outsiders look at 1/16th of the world's

[11] *George R. Harrison, "The Utilization of Solar Energy." Remarks at National Academy of Sciences' Autumn Meeting, November 9, 1953.*

population enjoying 5/16th of the oil, 11/16th of the coal, 7/16th of the electric power, 12/16th of the automobiles! If all the world were to use steel at our rate it would take twenty billion tons of iron right now; this is many times the total known world supply of metallic iron. Brazil has a population one-third of ours; we would exhaust her total oil reserves in three days.

World mine production of copper in 1949 was 2.2 million tons. The President's Materials Policy Commission estimates that the United States will require in 1975 2.5 million tons of copper, which means that we must produce or import 1.8 million tons of new copper — roughly double our own mine production for 1950, roughly four-fifths of the world production of 1949. Look anywhere you want to look, and the figures are much the same. Look particularly at the energy figures and the food figures.

The world has waked up to this at last. This is the massive problem that technology has posed for the civilization it has created. It is in this framework that World Communism has scored its successes. But if by some miracle the inimical Communistic ideology and the imperialistic Russian regime were to vanish from the earth, the problem would still be here. The hatreds and envies would not be abated. At most we would have a somewhat longer breathing space. Sooner or later the benefits of the technological age must become general or it will die as other ages have before it.

The world could not operate at America's present material standards with the present conventional sources of metals, foods, and energy. But here nuclear energy and solar energy may dissolve the impasse. Perhaps the sea can be exploited so that there will be no famine. Perhaps new materials can be drawn from the sea. Perhaps abundant energy can be placed in the hands of each coolie. Perhaps transmutations by radiation can be effected to provide adequate quantities of substitutes for such essential materials as copper. This is a more exciting speculation than wondering whether we shall have some new plastic globe to live in.

If the technology of the West can be put to the service of the world and not only in its own service, then the West may save the world and in doing so save itself. If the West tries to retain the bulk of the benefits for itself, it must sooner or later be prepared for Operation Phoenix.

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[12] *Sigfried Giedion, "Mechanization Takes Command," Oxford University Press, New York, 1950, p. 715.*

[13] *Aeneid, Book I, lines 278–9: "His ego nec metas rerum nec tempore pono Imperium sine fine dedi."*

"So in the final analysis the real meaning of the atomic age, not only for the world as a whole but for the West as a part of that whole, depends upon a much more imaginative and widespread application of the new technologies."

WHAT CAN ALL THIS mean for architects? Most of all it is meaningful for them not as professional men but as citizens. It surely suggests something for their education, their ability to anticipate what is really potential in new technology. It indicates that the present education is almost sure to be entirely inadequate. It suggests they must have far more competence than they now have in matters of science, sociology, economics, political science and anthropology. It suggests that as they go as emissaries about the world, and they will go, they should not be sure that they can in a few moments transform their views so that they themselves can plan well for Hindus and Indonesians and Burmese and Bantus. Instead of going to build, it may be better that they go to learn.

As Giedion remarks, there have been periods of unity of culture and these have been the ones of the greatest architecture. The greatest meaning of the atom might be in this potential.

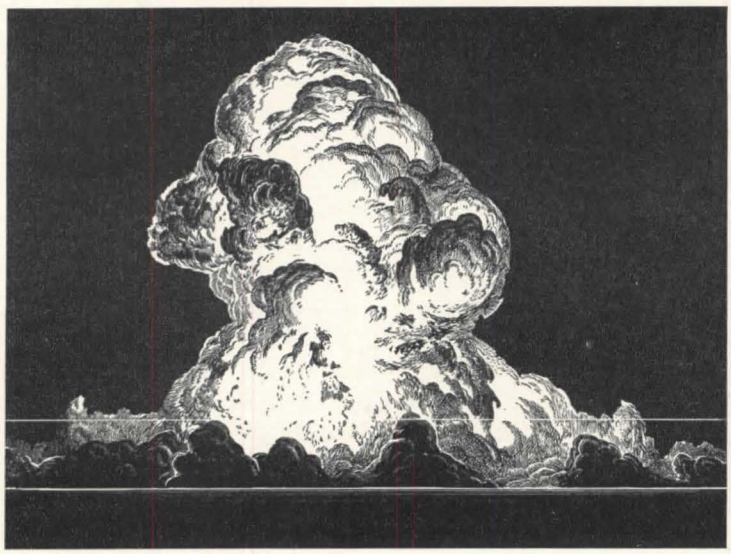
But Giedion has also said:

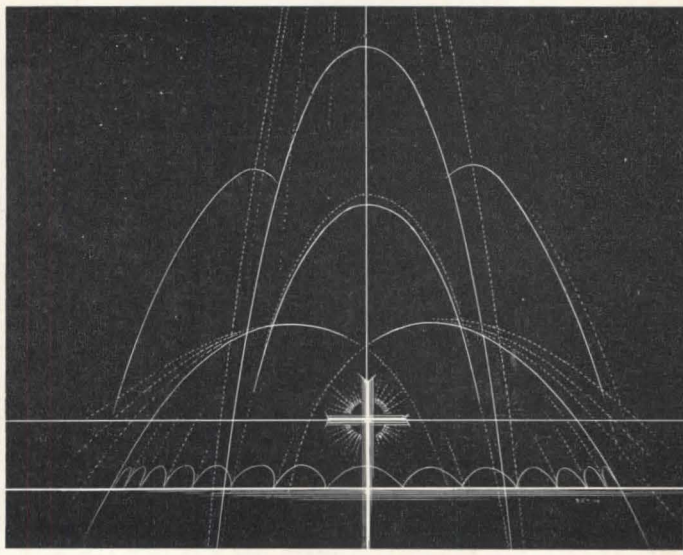
> *"Never has mankind possessed so many instruments for abolishing slavery. But the promises of a better life have not been kept. All we have to show so far is a rather disquieting inability to organize the world, or even to organize ourselves. Future generations will perhaps designate this period as one of mechanized barbarism, the most repulsive barbarism of all."* [12]

But by the same token this may be not the age of mechanized barbarism, not even the age of the atom, but rather the Age of the Sun.

If American scientists and engineers and architects walk about the world humbly and bring their seeds for natives to plant in their own ways, it is not impossible that the cities of America and the architecture of America will be of the kind which befits a new form of imperium, a nobler imperium than that of Rome or of Queen Victoria, an imperium resting neither on tribute nor on gratitude. Vergil said, "For them I set no boundaries of circumstance or time, I have given them an empire without limit." [13] From a center of technology and skills, educated engineers and architects may go to help others to develop their own skills. As they go, they will receive, if they are alert, stimuli to bring new beauties back to the center of the imperium.

RELIGIOUS BUILDINGS





A RELIGIOUS ARCHITECTURE FOR TODAY

By John Stewart Detlie, A.I.A.

AS A SYMBOL of man's relation to the mystery of his creation and of his role in an unfolding universe, the religious building has a special significance for the life and time which produce it. Each age sees that relationship in the context of its own day and expresses it in its arts and architecture in its own way. What of our age? What is the context of our day? Of what are our religious symbols the symbol? If we are to design structures which can stand as symbols of the faith, of whatever denomination, of our day, we must look for the answers to these questions in a more complete understanding of religious architecture, not only from the viewpoint of philosophy but in the context of history, of religion and of architecture itself.

Although each age regards itself as unique, ours has for us a challenge of a new, awesome dimension. We can no longer take the future for granted, and history offers little precedent for meeting this challenge. Where yesterday quantum mechanics and relativity provided the last word in the search for philosophic truth, today a

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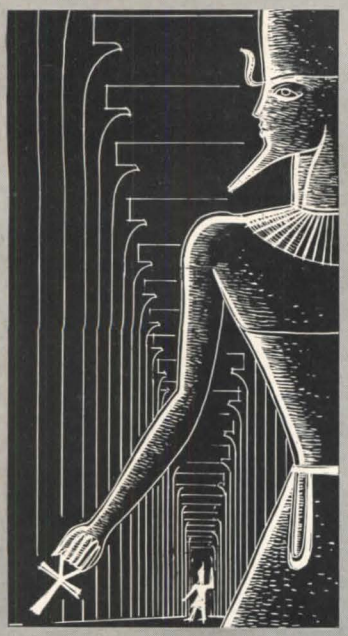
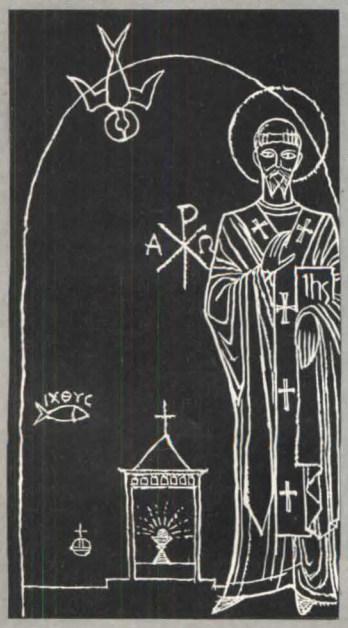


Egyptian

Greco-Roman



Early Christian

new metaphysics suggests that, just as the material universe is revealed, so is man's stewardship of that universe. Yesterday we could comfortably contemplate a pre-ordained universe unfolding in its pre-formed pattern; today we are confronted with fateful choice, and choose we must: either materialistically, interpreting the universe mechanically and denying the possibility of further choice, or spiritually, believing that we are created in love, not by a caprice of history, and that the choice of salvation by redemption is ours to make. This seems the mood of our anxious time, the context of our day. The architecture of religious structures for centuries will reflect the choice which we as a nation make, for we must choose collectively as well as individually, and who does not sense the gravity of our national and international acts?

The Context of History

History as interpreted in the architecture of its various periods is not without its message for us; sometimes clear, sometimes obscure, its record is everywhere eloquent. To understand it, however, we must try, difficult though it may be, to see the archaeological remains of the religious structures of the past in the context of their day, for only in that light are they to be understood.

Just as the simple pantheistic beliefs of prehistoric man are clearly evident in his bold stone monuments and sensitive cave paintings, so is the gloomy concern of the Egyptian plain in the great temples and tombs which, impelled by his religious belief that the body must survive if the soul is to attain a future state, he built of stone or hewed from rock to bridge the inescapable abyss between himself and eternity.

The portable Ark of the Hebrew which enabled him to take with him the tablets of the sacred law wherever he went in his wandering became when he settled in one place the focal point of his religion. In the rich materials with which he clothed his temple in the altar of sacrifice, necessary for the cleansing atonement, placed in the courtyard outside and in the Holy of Holies which contained the Ark, the Hebrew — thousands of years ago as now — expressed his devotion to the one God, Jehovah, the self-existent and eternal.

Greek temples, and later those of their conquerors the Romans, speak in the completeness of their design, in perfection of form and careful balance between movement and repose refined from centuries of search, of the Greek preoccupation with the finite ideal, the tangible reality, the pure present.

It is difficult for a Christian to remember that in its earliest days Christianity was an obscure religion; that although it spread quickly to many parts of the then-known world, its followers were frequently persecuted; and that a public expression of its doctrine of love and redemption was not possible for centuries. For as a Christian I cannot help believing that Christianity, of all the Western world's religions, has evoked the richest, most exalting of our architectural expressions; for it the finest concepts in art, architecture and structure have

been evolved; and through it has come to us the religious and cultural heritage which the twilight of the Dark Ages might otherwise have blotted out.

At first without even an established place to worship, this revolutionary new religion adopted, converted and used instead of destroying and liquidating the vacated pagan temple and the basilica of the decaying Roman law court. Even when it could build its own buildings and explore new forms, the basilica remained the essential form for the Christian church, for one of its outward signs was and is the Christian community, the assemblage of the faithful; the basilica, appropriately, was a place for assembly.

In the East the sister church found another and perhaps more natural expression in the dome lightly poised over space like the sky vault over the desert, and in the scintillating gold mosaic decoration of Byzantium.

Despite the invasion by barbarians and the confusion and disruption that followed, a new style — Romanesque — was developing, to be fulfilled four hundred years later in the Gothic style. Geometric, round-arched, solid-walled, with a feeling for sculptural form, remembering the past but strongly of its own time, Romanesque architecture was a material representation of the medieval mind: slow, deliberate, fortress-like, feudal, often devout, patiently awaiting a later fulfillment.

From the East an explosive force shattered the half-sleep of the West. A young Arab, Mohammed, founded a religion which owed much to both Judaism and Christianity but was different enough from either to become the major cause of the Crusades, the great religious wars of the Middle Ages. Mohammedanism spread through Persia, Syria, North Africa, crossed the water to Spain and the mountains to France, its militant followers sprinkling the beauty of their architecture on the land like jewels, from Baghdad to Constantinople, from Cairo to Granada. Lovers of geometry, learned astronomers, inherent poets, the Mohammedans endowed their buildings with a marvelous fusion of strength and lyric poetry.

The second phase of the medieval drama (for which the Romanesque period had been the first) gathered momentum with the reawakening of man's curiosity about himself, about his universe and, at the urging of the increasingly influential church, about his immortal soul. Gothic man, prying into the secrets of the unknown and investigating the entire universe by methods partly scientific, partly superstitious, and burning a sense of anxiety into his nature in the process, opened the way for our modern age of experimental knowledge. Spiritually he felt himself suspended between infinities, between the macrocosm and the microcosm, eternity and the instantaneous, between the hope of heaven and the fear of hell.

All the restlessness, all the turmoil of mind that made the Gothic age a great awakening, became a part of the majestic cathedrals which one by one arose across the continent and in England. Chief among the elements of this synthesis of the medieval spirit was the strength of the faith which made them possible; the devout heart and the stout back, the envisioning eye and the skilled hand, gave of their finest to the glory of God. In the structure tensed for thrust and counter thrust, in the supports soaring upward and breaking into a multiplicity of arches and vaults, in the walls dissolved in gorgeous colored light, in this matchless exaltation of the human heart, medieval man spoke for all time of the aspirations and limitations, the custom and endeavor, the fears and the faith, of his day.

The thirteenth century saw the finest flowering of this spirit. After that century the influence of the church in men's lives lessened and men gave themselves over to secularism, forgetting the essentially spiritual nature of life. The worldliness which swept over Western civilization during the Renaissance has persisted more or less until today. In his "new" learning man "discovered" that he belonged in a "stream of history," and this knowledge, held self-consciously, engendered in him a competitive spirit and caused him to measure his philosophies and his arts against the standards of the classical world.

Renaissance man clothed his buildings with a contrived beauty of form in an architecture of method and expression which, with minor variations, solved all "problems." What he lacked in spiritual awareness he tried to compensate for in size and grandeur, rededicating pagan form in a lusty paean to the power of the church.

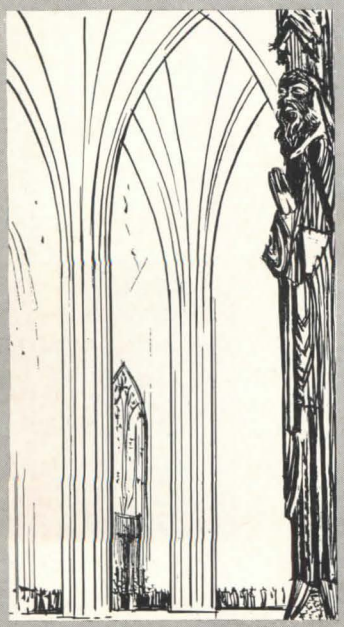
But even secularism had its limits. The Reformation kindled minds from one end of Europe to the other, and a reaction to such a stimulus was natural. The Baroque style had its origins in the decline of the Renaissance and the development of the Counter-Reformation; with it, architectural form became an ornamental system which, surging and exuberant, strained to express a mighty hymn of praise and glory.

During the centuries in which the architectural expression of the Christian religion was evolving, Judaism, which antedated it by thousands of years, was a religion in seclusion in the West. Oppressed, often persecuted, sometimes exiled, the Jewish people did not try to develop an architectural style of their own for their synagogues. Instead they accepted the style of the period and of the country in which they were. Nevertheless, whatever the stylistic expression, one basic idea permeated the design: the synagogue was a house of worship. Not until the twentieth century did the Jewish religion begin to find a distinctive architectural expression of its fundamental beliefs.

In any review of the periods of architectural history and the styles of religious architecture (only those in the direct line of Western tradition have been mentioned here) the inner necessity for the expression in ritual and in architecture of the religious feeling of all people is evident. We discern with some dismay that throughout the history of religious architecture many religions and many periods have offered their God or gods more of honesty and beauty of architecture, more

Saracenic

Baroque



Gothic

faith and reverence in the building of the church, temple or synagogue, than we have in this, our age of incomparable possibilities.

The Context of Religion

But the historical context is only one of several in which we must see architecture if it is to be truly of our day. In the context of religion and philosophy, architecture must be judged in the same way as any of man's other activities. Architecture is a component of philosophy. The phrase "philosophy of architecture" is often loosely used, but it should have but one meaning: architecture in the service of philosophy — and, we should add, of religion particularly. For in a very special way the architecture of churches transcends that of all other types of buildings and in its service we should make our noblest effort. If we do not, then we do not understand the essential nature of religion.

If a church is not, at least in part, itself an act of devotion, it fails at its very beginning; for even from a mechanistic, materialistic point of view it cannot "solve the problem" of being an act of devotion without there being devotion in it. Devotion is not something to be poured in by ritual; it must be mixed in the very essence of the mortar between its stones. Those who champion the organic concept of architecture, of structure evolving from inner necessity, are caught in the inexorable logic of their own premise. Religious buildings must be built from the inside out, and in this sense *inside* means the *spirit*. There can be no machines for worship.

The object of religious architecture needs neither roof nor walls, but if roof and walls are needed for the congregation, then the congregation must build in a worshipful manner. Architecture is an act of man fulfilling a need; but in the religious view the act is vanity unless there is something in it of the sacramental, something beyond the utilitarian. This sacramental motive is as necessary to the church of tomorrow as it was to the altar of Abraham.*

How can we appraise architecture in its own terms from a religious point of view? Could the method not be first to understand something of the creative process of the designed universe, to see that underlying each level is the purpose and the principle, and that form and structure follow, each part ordered in relation to the whole? To see the economy and unity with which the whole is achieved, the unique variation in each fragment of matter, each part hung upon time like pearls on a string and suffused with such beauty that the removal of a single part mars the whole?

As designers we can look about the universe and sense everywhere evidences of the ordering process. Material is not distributed through the cosmos like a weak gelatine, formless, energyless, static. Everywhere the hand and spirit of the Designer have been at work and, in all matter, form as shape, effect or formula is evidence of a

* Ed. Note: *Perhaps the historic lack of a distinctive style for Jewish temples and synagogues is an expression of the great importance of the Ark of the Covenant — once portable, still small enough in scale for human comprehension — and the lesser importance of shelter for the congregation.*

greater Architect than any of us. The very stones sing their history; timber reveals the cadence of its growth; mortar locks water into stone in obedience to law. Instinctively the designer can feel himself at one with this universe as he marshals the materials of building into a synthesis which he well knows is a second or reordering of those materials, each with its own cosmic design.

The Context of Architecture

In the context of architecture itself — the art of building with strength, completeness and beauty — we must approach the matter of religious architecture with fresh insight. Although millions of dollars are being poured into the construction of churches in this country, only a few works of real beauty have been produced; we must admit that in this age of great accomplishments, of vast projects, of vaunted scientific progress, of material wealth, we trail miserably behind practically every other age in the qualities of religious structures.

In the design and building of religious structures there is a place for humility. It should undergird our every act, but we need it particularly in the realization of our lack of absolute skill and artistry. Nevertheless, what talents and gifts we have we should put boldly into the service of the church.

Architects should take the lead in interpreting the spirit of an age — this is what they are trained for and what they work toward. But to do this we cannot have too much guidance from the past. From the religious viewpoint, a century is touched with a finger and a millenium is spanned with a hand; across the veil of time all ages speak. We must seek, like the archeologist and the historian, to know the inner meaning of man's life on earth and of his efforts at building houses of worship. Our leadership must be toward the development of a form of expression which will be *of* the congregation but which will show it a new dimension in architectural expression, for our churches built today are for tomorrow, and the form of expression must fit the tomorrow.

One of the difficulties which confronts us is our overabundance of materials. Yet in spite of this abundance there is a growing monotony in the appearance of our buildings; we use the same materials again and again regardless of the purpose of the building.

An even greater difficulty: although we are well into the atomic age, we are still conditioned by the attitude of the scientific age, which views all life and its activities as "problems" to which there are "solutions" if we do enough "research." We tend to approach the most gloriously demanding of all possible commissions in our profession with a mechanically contrived "problem-solution" process. Great works of art are not created by finding the solution to a posed problem, they are created by constant search for the most expressive form, by trial and error, if you will, applied to an end which may not be clearly defined in advance. Our method must be to bring to the task all the skills of the sciences and all the genius of the arts, with sound business practice as a solid foundation for it.

But the greatest deterrent to awakening the architect to the challenge of this anxious age is probably the lack of vision today of the churches themselves. What congregation of church or temple demands that its edifice be witness to the strength and fervor of its faith and stand boldly as a symbol in a perilous age? More often than not in this wealthiest of nations, those elements which carry the strength and beauty of the design are deleted because of cost, or misconception. How often we tolerate effects and finishes in our houses of worship which we would hide in shame in our homes!

These are harsh situations, requiring firm, resolute action. The average churchgoer, even in this age pulsing with the accumulated challenges of a thousand years, is apparently more concerned with his comfortable sitting and seeing than with how his faith was brought down through the centuries and how it is going to roll triumphantly down the years ahead.

Until there are a vision and an acceptance by everyone concerned in a church building project of the challenge of this day, we shall design around the central spirit of the age but we shall not design for it.

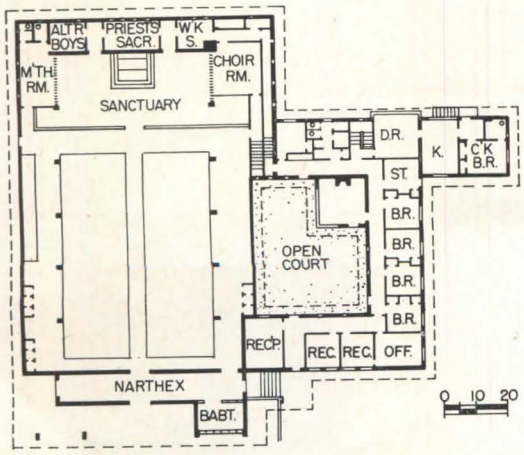
We have much to do. No commission can demand our best quite as a church does. We must go back to the fundamentals of design: form, texture, color, line, plane, solid, composition, proportion. Back through the centuries of art to the Cro-Magnon cave paintings and then forward through the centuries of architecture, through the strength of the Egyptian, the vital line and perfection of the Greek, the structural clarity and spatial richness of the Gothic, the splendor of the Byzantine and the song of the Baroque. Back through mathematics and the laboratory for the new structure; back to the natural world, to the flowers, to the crystalline minerals for their wealth of form; back through the history of the faith for the radiant personal expressions of those who shared in it; back to the pew for a little research in contemporary theology. And for a real experience in the exact nature of man and his church, try the most trying of all experiences: join in a campaign to canvass the members for building funds.

We should not be discouraged even though each church building fails to measure perfection. There is joy in the effort. Our task is a privilege, for each church structure is an affirmation of that faith which alone can bring light to an obscure tomorrow.

Illustrations by the author

SAINT GEORGE'S CHURCH AND RECTORY

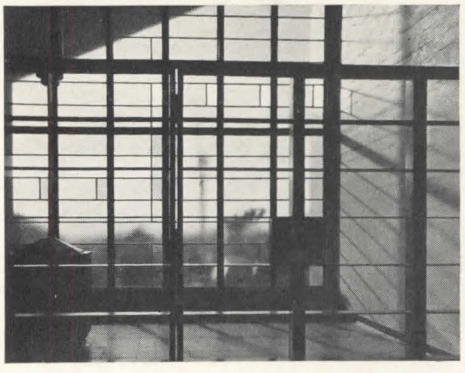
Corporation of the Catholic Bishop of Seattle



To express in contemporary form a strong religious tradition is a difficult, but not impossible, job, and the means for performing it are various. In the new church for St. George's parish in Seattle there has been no compromise in either direction. The bold structural system used — precast concrete arches and poured concrete walls, with thin-section, precast concrete panels as roofing — is a straightforward expression of the strength of the Catholic faith; the complete simplicity of the design concept acknowledges one of the fundamental rules of the order of the Franciscan monks who serve the parish; and the sloping roofs which follow the contours of the site subtly acknowledge the Italian origin of the Franciscans and their early days in this country along the California coast.

There were practical reasons for selecting concrete as the principal material for the church's construction: the building had to be easy to maintain, fireproof and of a good and lasting quality, and it had to be built within a definite budget. The walls, both exterior and interior, are of poured concrete, painted light beige, except the wall behind the altar which is the same dark red as the precast arches. The arches, poured on the ground in two sections, were an economical means of providing the required space in the nave, where 670 persons can be seated. Side aisles are wider than usual to allow for processionals and also for shrines which can be located along the wall.

Art Hupy



Seattle, Washington

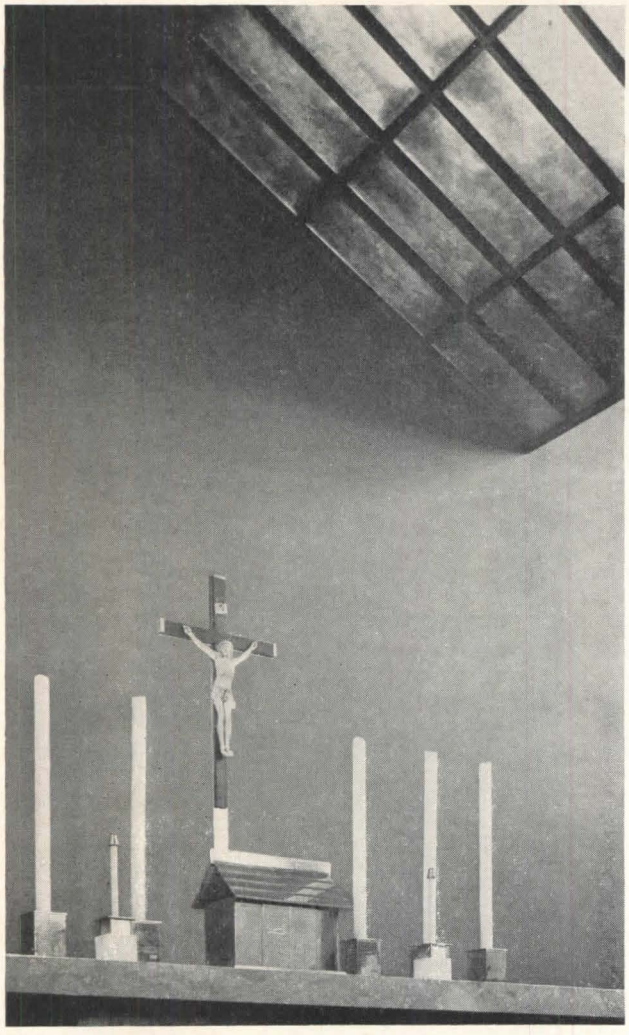
Paul Thiry
Architect

Sigmund Ivarsson
Structural Engineer

A. T. Kane
Mechanical Engineer

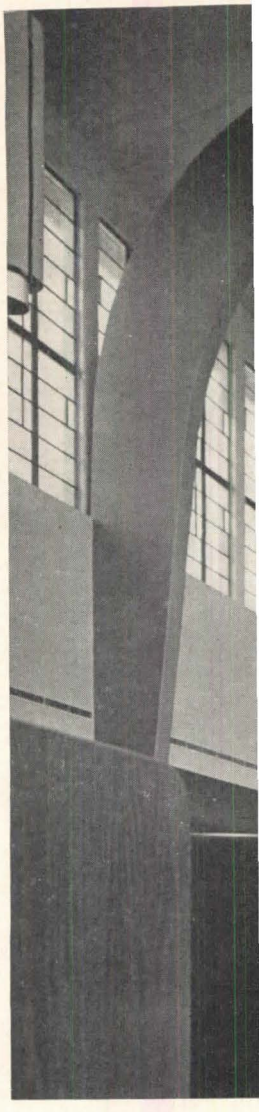
Beverly A. Travis
Electrical Engineer

Stairway on west leads to main entrance of church; street level entrance is on north. Landscaping, principally low-lying shrubs, rocks and a few trees, was in original contract. Rectory is on south side of church (top right) with access to its public rooms from either narthex or porch; friars have own entrance to living quarters. Afternoon sun filters through colored glass wall of baptistry (center). Shape of precast concrete arches which frame structure is boldly independent of building's exterior form



Tabernacle, candelabra were designed by architect. Renaissance crucifix is of carved ivory

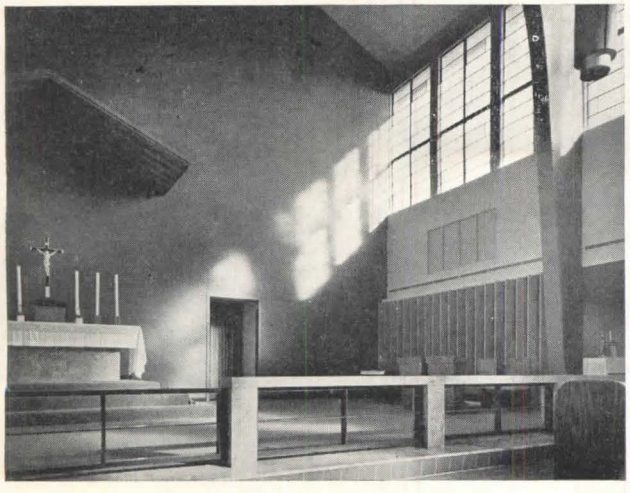
Although simplicity and restraint are dominant factors in the interior as in the exterior design, there is no exclusion of decorative detail. The black iron grille between the baptistry and the narthex (page 137), the windows with their abstract design in clear and colored glass, the light fixtures with their cruciform perforations, were designed by the architect as integral parts of the interior. Objects of purely religious significance such as the octagonal baptismal font, the tabernacle and candelabra on the altar, were also designed by the architect. The crucifix is, however, a Renaissance Christus fixed to a steel standard. The altar is of red brown marble and the same stone is used, in combination with black iron, for the altar rail. The deep red of the great arches — 42 ft from floor to ridge and 54 ft wide at their base — is emphatic against the light concrete walls and the gold ceiling. The blue fascia of the canopy, outlining it against the deep red chancel wall, is used also in the metal cylinders of the light fixtures. The chancel carpet is the same brown as the Franciscans' robes; the nave floor is red brown ceramic tile.



Art Hupy

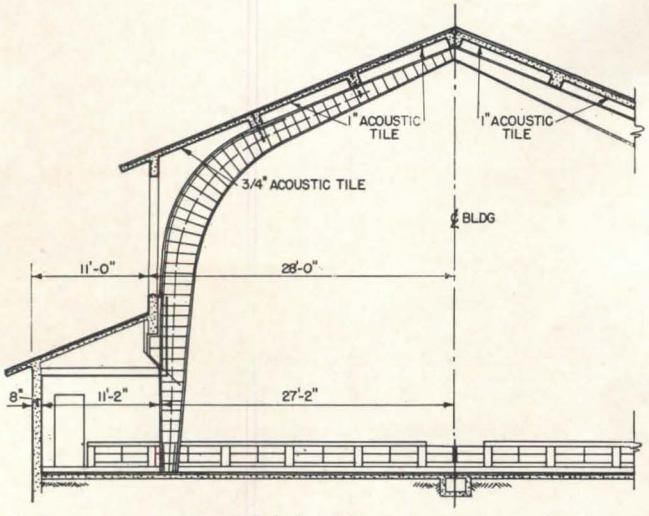
SAINT GEORGE'S CHURCH

Organ and choir are hidden behind louvered screen at right

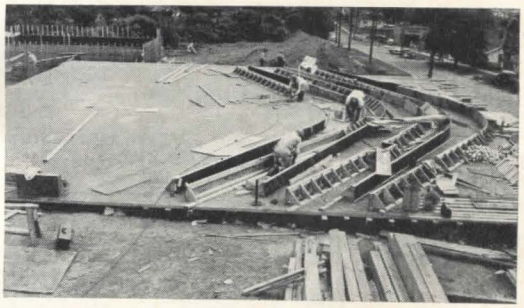


Seats in choir loft are also used in friars' daily offices

Paul Thiry, Architect



Arches, precast on ground, hoisted into place and exactly aligned, economically provided clear span of 54 ft base to base for nave of church. Roof slabs also were precast. Total cost of church and rectory was $350,000



Howard Staples

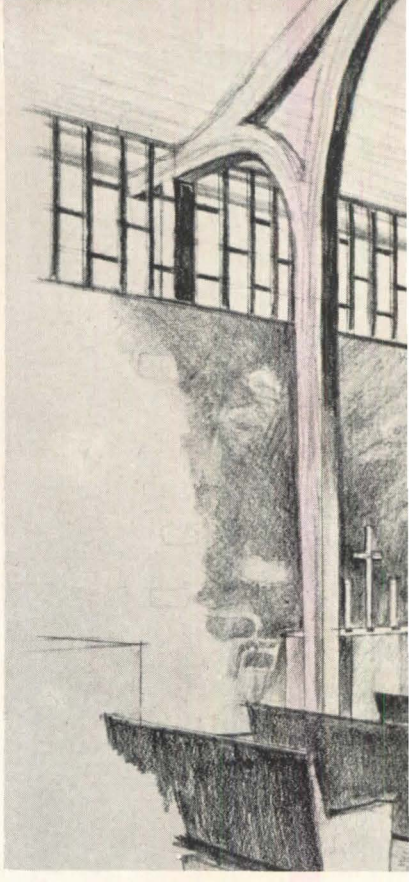
Roger Dudley

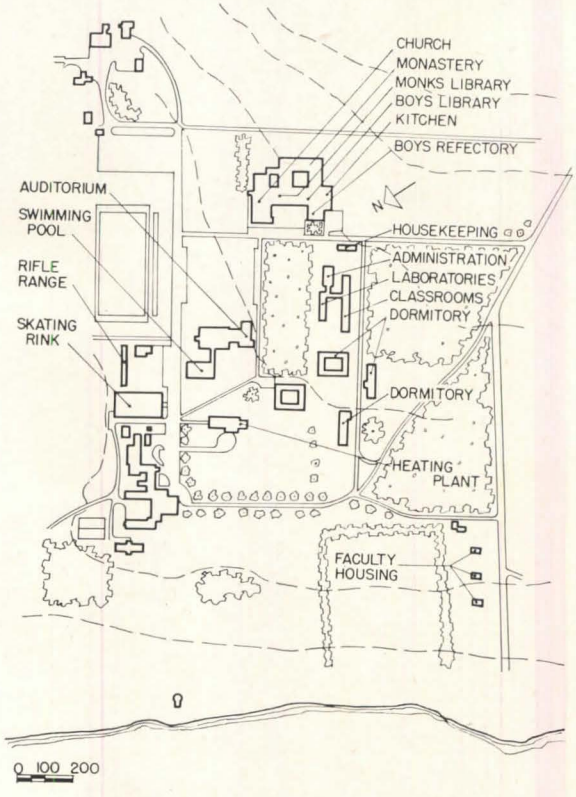
WHAT I HAVE SAID and written up to now on ecclesiastical design I still believe to be valid. Yet one fact stands now more clearly than ever in my mind, and that is that inert ideas have no power to move. If that is true, and if the modern educated man expects his religion to be more than an obsolete code of behavior, if he accepts it rather as a lively approach to the idea of God and a thoughtful answer to his spiritual needs in a complex changing society, then he will expect the physical design of the church building itself to speak to his emotions, not through a set of obsolete forms which to him have lost their power to move, but through lively creativeness.

I believe that only by means of forms wrought through a passionate desire on the part of the designer to express in a fresh way a religious mood will the believer's emotions be upheld. Obviously, the actual performance of giving form to such an emotional environment is full of difficulties and dangers. The architect must have passion but he must also be quite alert not to exceed the limits of his own abilities or of the boundaries imposed by existing facts and circumstances. Rather he can be helped, I believe, by the potential value inherent in such facts and circumstances and can extract from them a more convincing and original solution.

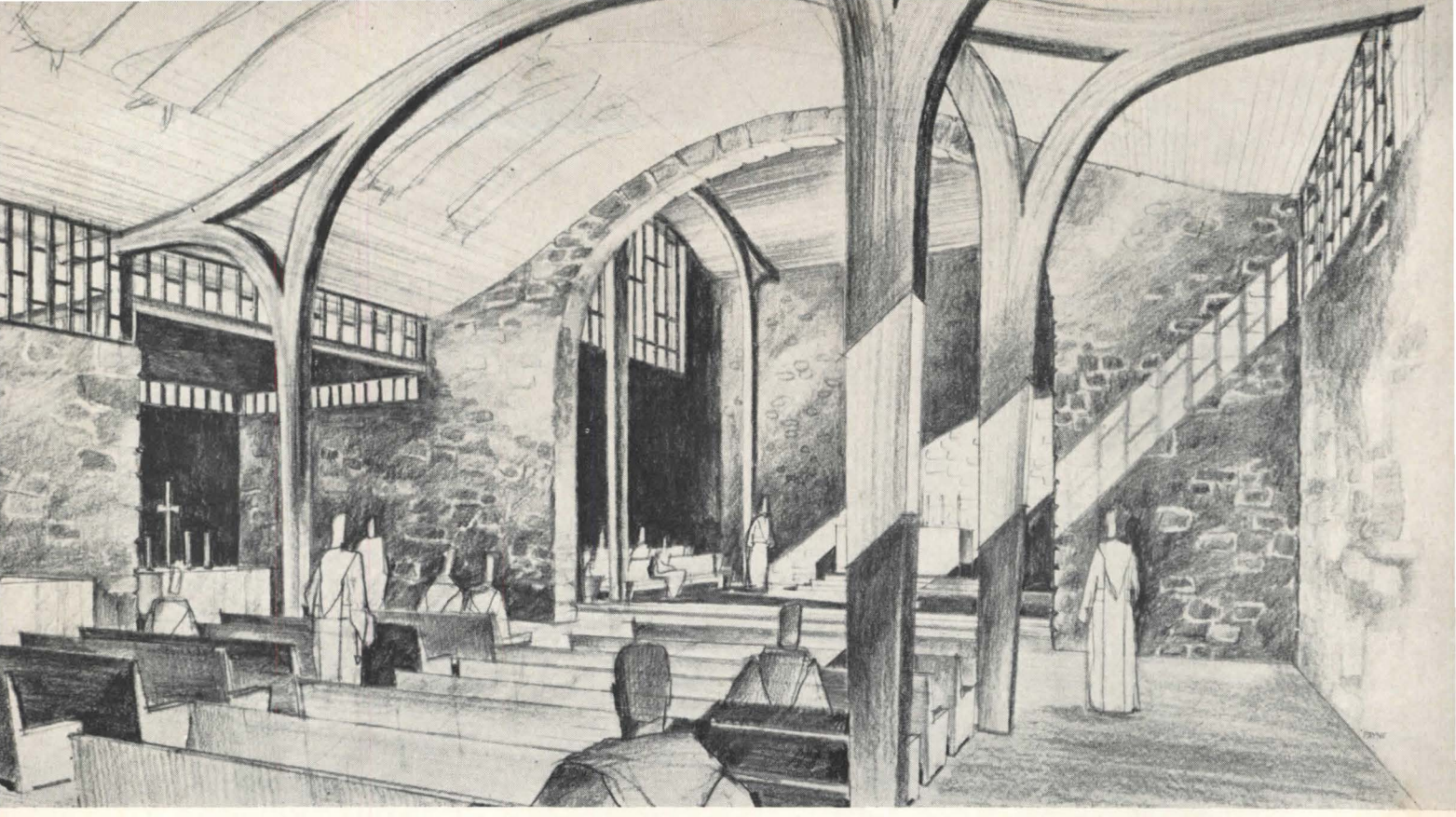
Pietro Belluschi

Pietro Belluschi, F.A.I.A., was consultant on the three religious buildings which follow. Each is for a different faith, each was done in association with another firm of architects. Two are in New England; the third is on the West Coast





Monastery and chapel dominate building group. Chapel is in one of two projecting wings which form forecourt for monastery overlooking campus

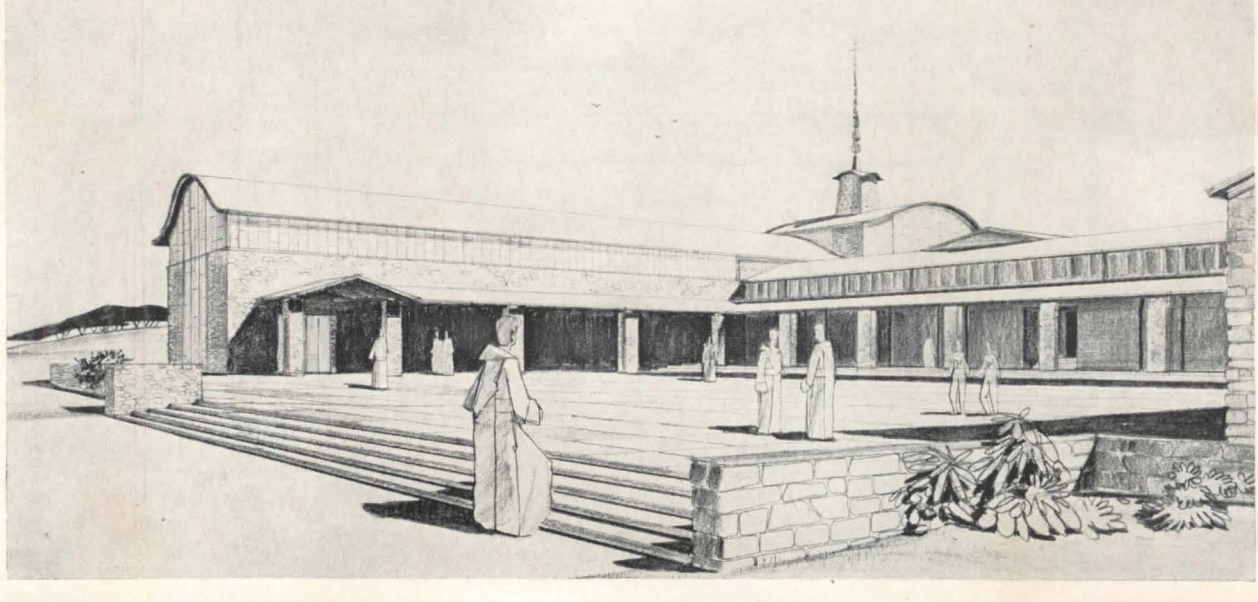


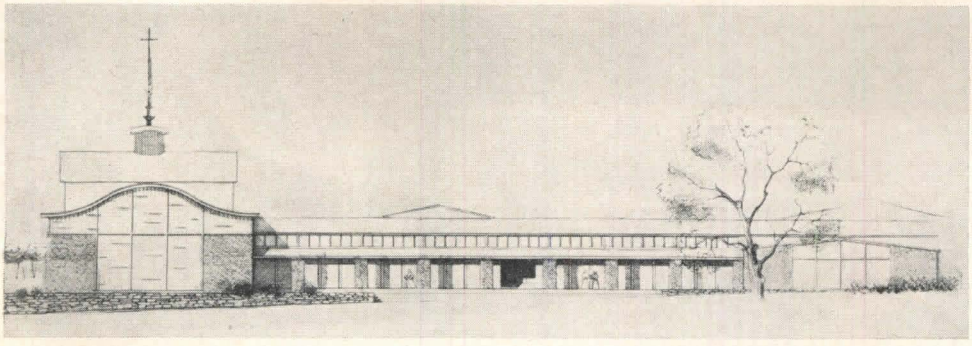
MONASTERY FOR THE PORTSMOUTH PRIORY

Portsmouth, Rhode Island

Pietro Belluschi and
Anderson & Beckwith
Architects

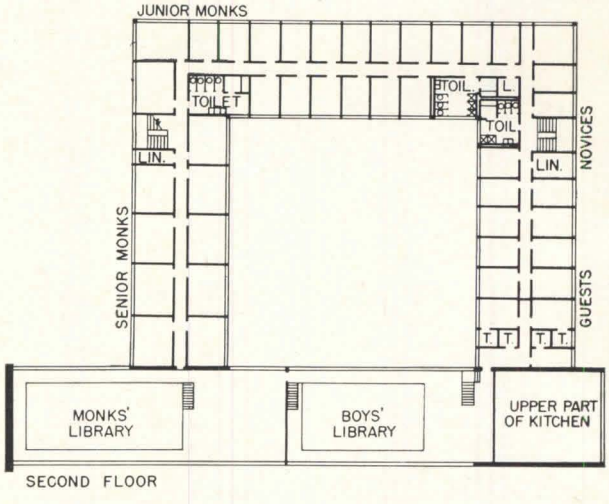
THIS PROJECT — a chapel and monastery — is for the Portsmouth Priory where an order of Benedictine monks conducts a preparatory school for boys. The new building will be situated on a slight rise so it will surmount the other buildings on the campus. The chapel is, of course, the building's most important element. Laminated arched supports carry its undulate roof the length of the nave; similar supports are used in the chancel where the direction of the curve is lengthwise rather than crosswise as in the nave. Except at the west end, which is almost entirely glazed, windows are set high on the fieldstone walls.

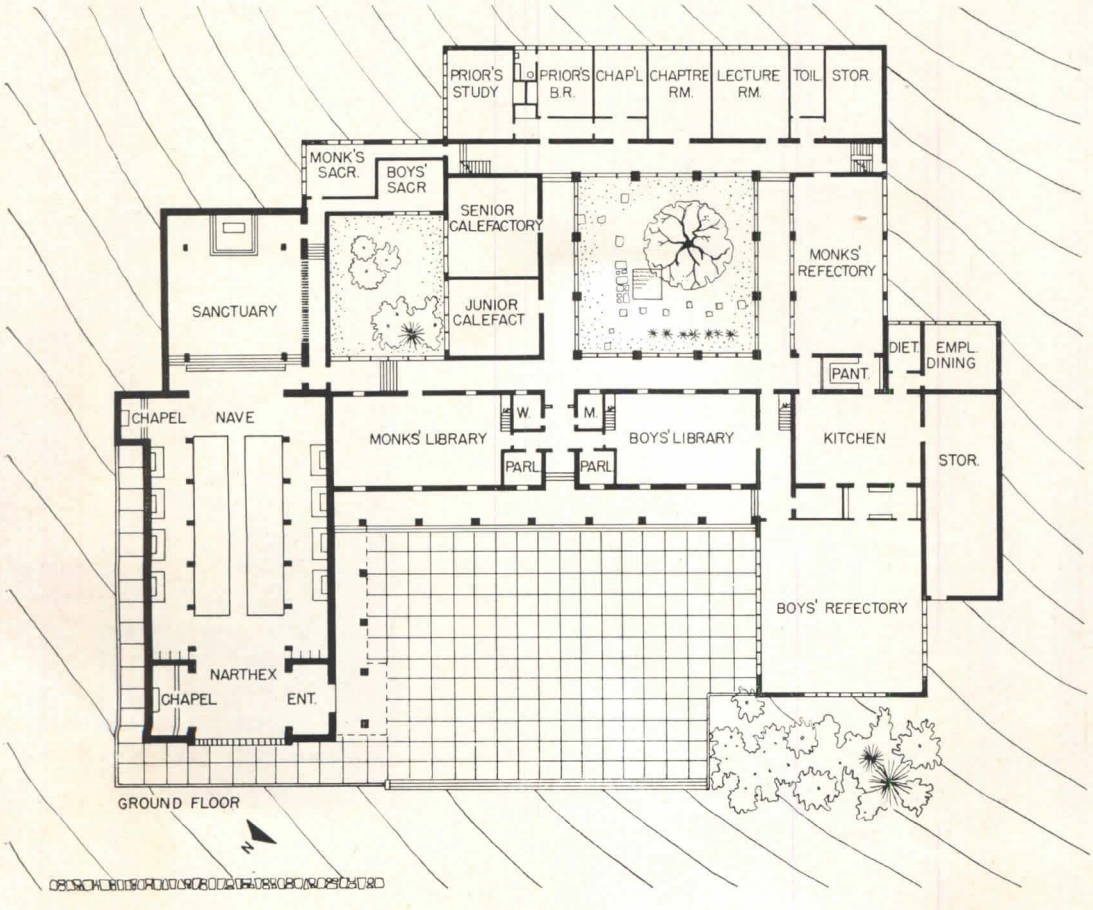


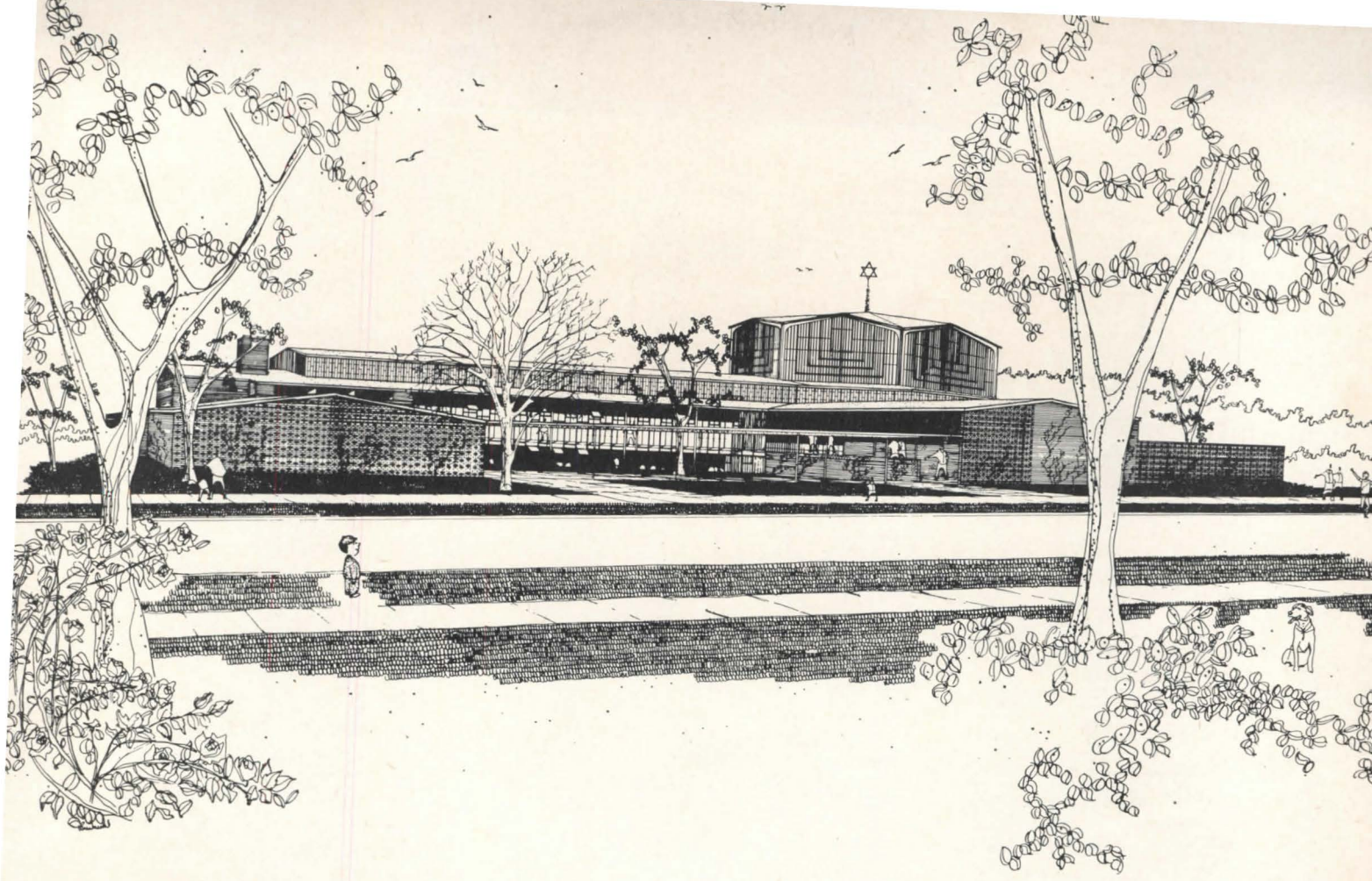


PORTSMOUTH PRIORY

P. Belluschi and Anderson & Beckwith, Associated Architects







ALTERATIONS & ADDITIONS TO TEMPLE ISRAEL

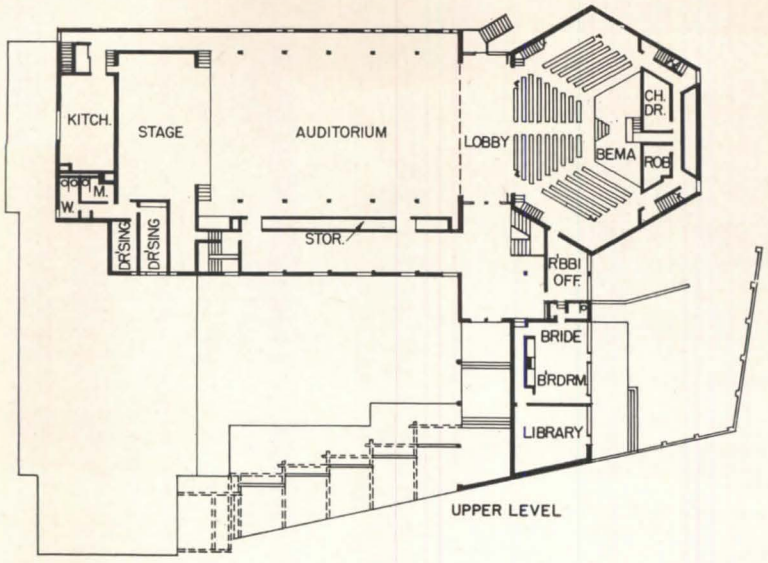
Swampscott, Massachusetts

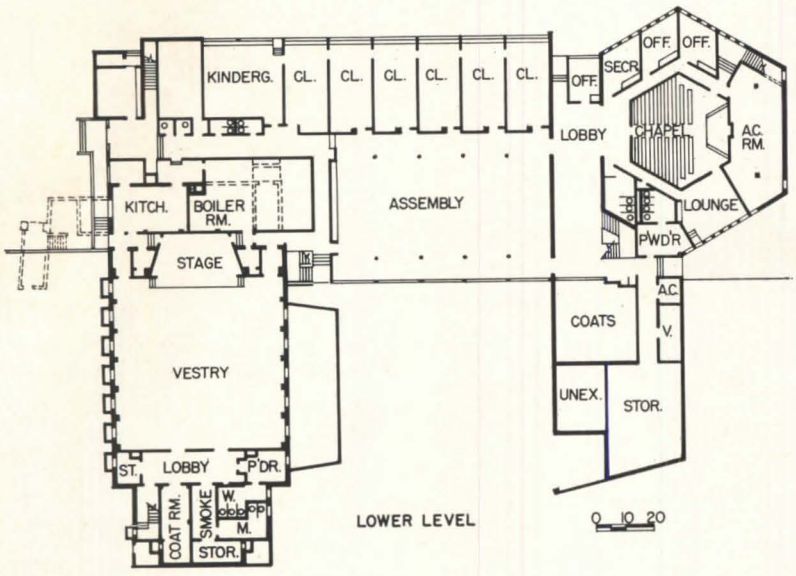
Pietro Belluschi and
Carl Koch & Associates
Associated Architects

Leon Lipshutz

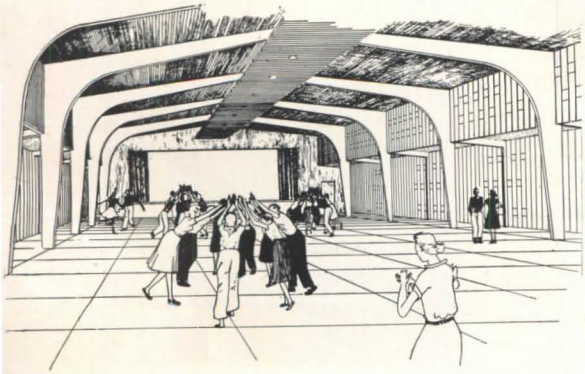
THERE ARE TWO essential requirements in the design of a sanctuary for a Jewish temple. The first involves creating a religious atmosphere that will continue the tradition of the ancient faith; the second, providing for the wide range in attendance at services. At the new Temple Israel in Swampscott, Mass., the hexagonal shape of the sanctuary, produced by the six structural bents which frame to the center of the top of the hexagon, creates a highly specialized space for the performance of religious rituals. The sanctuary can ordinarily accommodate the attendance (varying from 25 to 100) at weekly services, but on high holy days, when all members of the congregation attend with their families, seats must be provided for between 1100 and 1800 persons. Flexibility is therefore a prime consideration. The problem was solved here by providing folding partitions at two points along the walls of the adjoining auditorium; these can be opened as needed. For special occasions involving small groups there is a chapel under the sanctuary which seats 100.

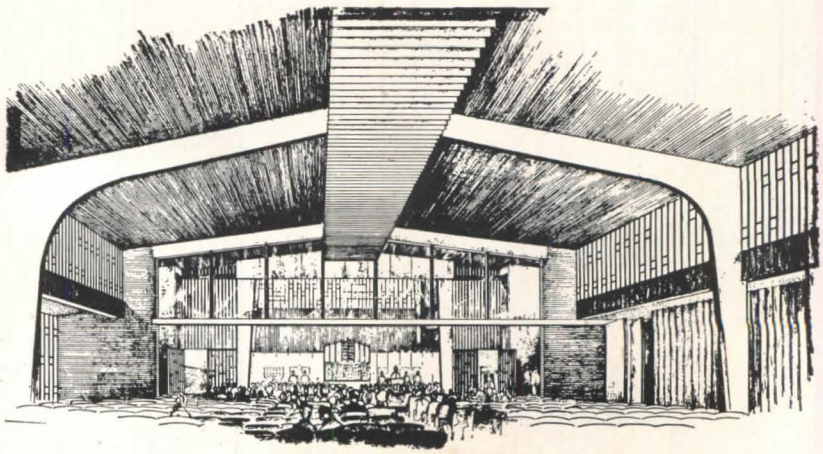
The existing structure to which new portions are being added was not a completed building; it consisted only of a basement to a contemplated building. This has been incorporated into the overall plan to provide an additional meeting room, social hall and crafts room; six classrooms and a kindergarten will be on a lower floor.

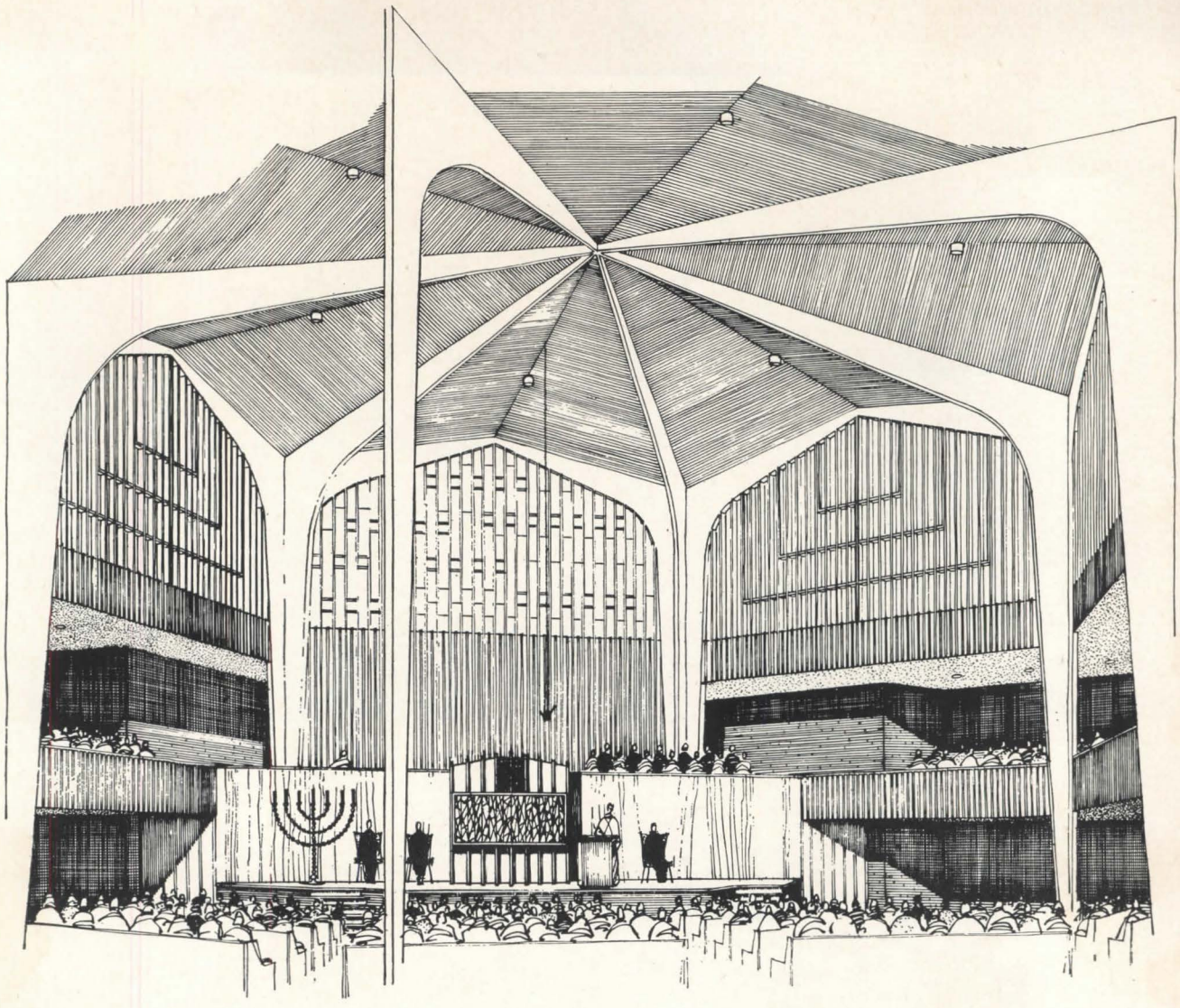




Additions to temple amount almost to new project as existing structure was basement to building contemplated but never completed. New plan uses structure for classrooms, offices and community hall, with sanctuary, auditorium and chapel in new wing. Auditorium (below) has double function of providing social and recreation hall space and, on the high holy days, much-needed additional seating space.





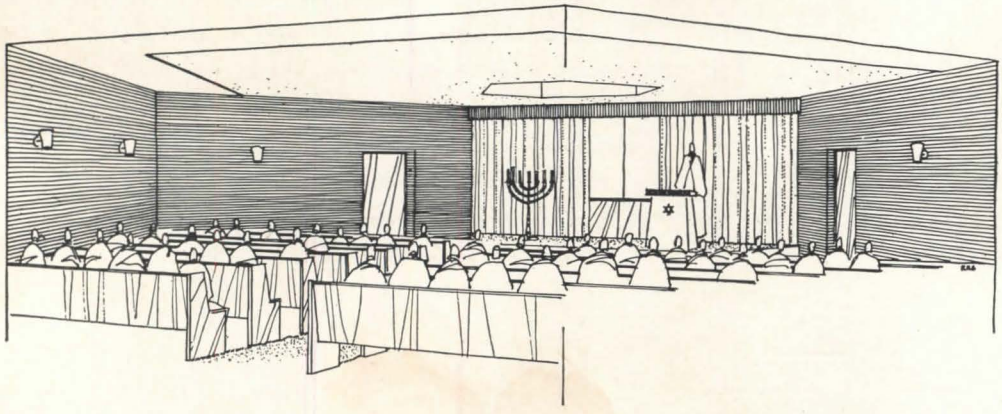


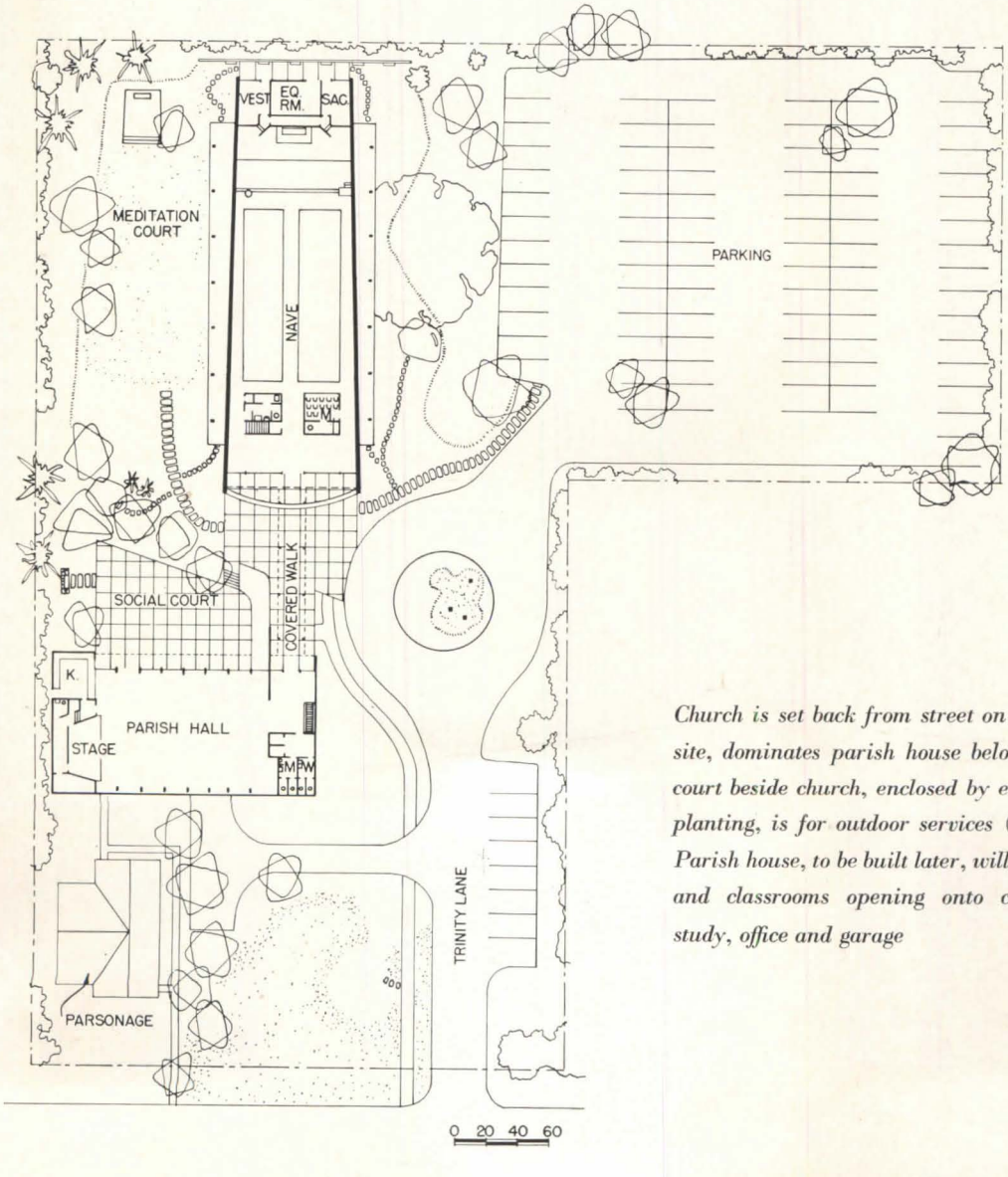
TEMPLE ISRAEL

Pietro Belluschi and
Carl Koch & Associates
Associated Architects

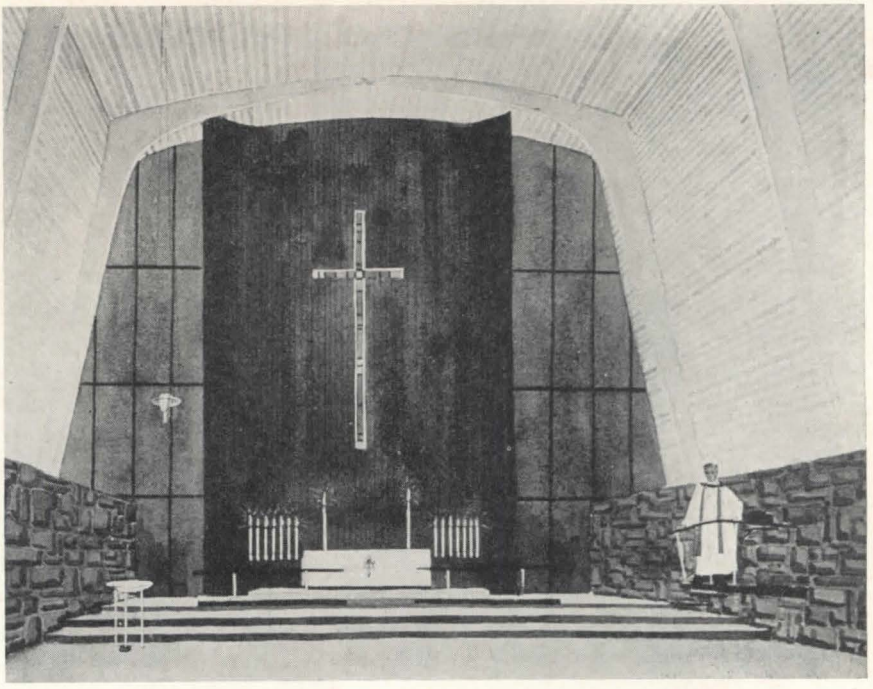
Leon Lipschutz

Hexagonal shape of sanctuary (above), derived from traditional symbol of Star of David, is produced by use of contemporary system of structural bents. Menorah (seven-branched candlestick) is used as decorative element in wood screens above balconies. Smaller chapel (below), located under sanctuary, can be used for small-group occasions





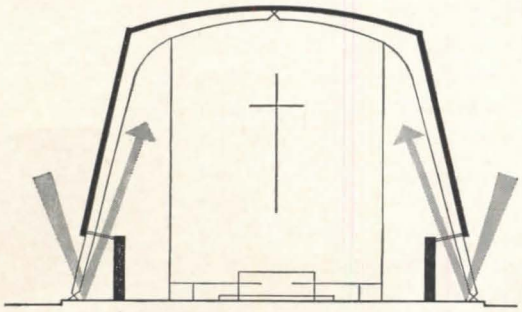
Church is set back from street on higher part of site, dominates parish house below. Meditation court beside church, enclosed by earth berm and planting, is for outdoor services (as at Easter). Parish house, to be built later, will contain social and classrooms opening onto court, pastor's study, office and garage



Pietro Belluschi and
Skidmore, Owings & Merrill
San Francisco, California
Associated Architects

TRINITY LUTHERAN CHURCH (Missouri Synod)

Walnut Creek, California



All lighting is indirect. Daylight is reflected through clear horizontal windows from white aggregate walk along both sides of building; floodlights duplicate effect at night

BEHIND THE DESIGN of this church building, to be built in a rapidly growing community in the San Francisco Bay Area, there is more than the need for more and better space. It is an attempt to express architecturally not only the Lutheran teaching and faith but the progress, both physical and mystical, of the church-goer as he leaves the street for the chancel, and to make of that progress a religious experience rather than a sudden transition. Structure, form, materials, lighting, plan and site plan have all been used to do this.

The church building is set back from the street so that there is a transition from noise and bustle even before the church is entered. An open, shaded narthex opens off the terrace and leads into a narrow passageway; this, in turn, leads into the dimly lighted nave. At the opposite end of the church the white marble altar and the cross in brilliant colored glass stand out against the dark background of the redwood screen and the dark glass panels that form the chancel wall. The only light, day or night, comes from hidden windows set horizontally between the side walls of the nave and the structural frame. The pulpit, a cantilevered concrete slab, is low, indicating the simple Lutheran relation between pastor and congregation.

Three-hinged arches of precast concrete frame the building. The enclosing walls are 3 by 4 in. wood planks, laid horizontally and stained, on the interior, and untreated Oregon white cedar siding on the exterior. The side walls are of reinforced concrete surfaced with gray Sonoma stone. The narthex end of the wall is of clear and colored glass in a wood grille with vertical louvers (to cut morning sun).

"WOULD YOU BUILD ANOTHER CONTEMPORARY CHURCH?"

YOU ASK "Would you do it again?" My answer is that it *is* being done again — in my present *parish* — and that if the Lord sees fit to place me in other parishes where church plants are to be built, it would be done again and again. I can't help asking when I look at some new churches whether we are living in our own day or are kidding ourselves that we live in some past age. I believe that we should have the courage to be unashamed of our own expression of devotion to God.

If you are going to build a church of contemporary design, there are some things that you shouldn't overlook. The first of these is yourself. Are you convinced that beauty can be achieved from simple basic things like light, space, color, texture? Or do you still believe that it takes a pompous monument to make beauty? As the leader of your congregation, you first of all must be sure of the answer to these questions. Visit some churches of contemporary design; it will be worth all it may cost you. Don't just look at them; stay in them for several hours until you absorb the devotional atmosphere that makes them churches. Read a few good books on contemporary architecture, too. Convince yourself thoroughly that you want a contemporary design for your new church.

The second step is to condition your congregation. Many of them have never thought in terms of a church designed differently from that which their grandfathers built. Often people are unimaginative, and lazy, and hesitate to take a step forward even when they suspect it might be good for them. They need to be taught how to appreciate the contemporary. In talking with them, I would forget the suggestion that a contemporary design will cost less than a copy of a past style. You will do better to lead them into accepting the idea that they should erect a building which is an expression of their own devotion, not their fathers' or grandfathers'. This means a lot of work for you.

The third step is the selection of a committee, often called a "building committee." The building committee doesn't have to be large — three is a good number; its members should be strong and aggressive leaders who are also unbiased and fair-minded. The building committee does not need to know anything of construction if it is to function as I feel it should, as a means by which the architect and the congregation can conveniently communicate with each other. In fact, if the members know something about construction they are likely to burden the architect with ideas and, while some of these may be good, most of them will cause misunderstanding and confusion.

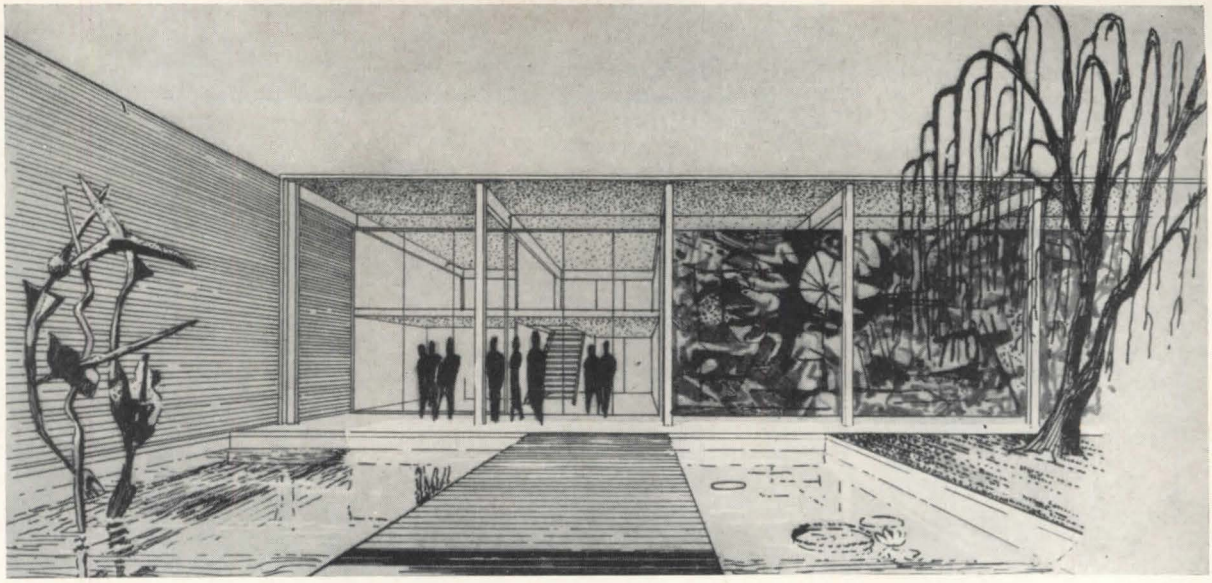
Selecting the architect requires utmost care. There are architects and architects and choosing between them is not easy. There are some — I sometimes think there are too few of them — who are truly creative. In interviewing architects, pay particular attention to whether a man understands such things as devotional quality and whether he indicates such an understanding without your prodding him. He should firmly believe that this devotional quality will emerge from space, light, color, texture; the right one will quickly and definitely disagree with you if you suggest otherwise. I particularly appreciated it when Mr. Belluschi in Portland informed us that if he could not create the devotional atmosphere which we wanted, he did not want to design the church.

Once you have determined the space requirements and budget, give the architect this information and ask him to go ahead. Let him use his imagination without hindrance — that is what you engage him for and that is what you pay him for. And, on the subject of fees, pay him the going rate so he can do a good job for you. When he presents the plot plan, accept it *in toto* or reject it *in toto*. The same holds for the final plan. If there are changes to be made — and there will be some — let the architect make them. In the measure that you or your committee or the congregation change the design it will be spoiled.

I'm no authority; but you can see from this that you have a very important and a very big job to do. There are still too few pastors with the courage and the faith to let their new buildings express a faith that is of today. But I can assure you that, if you do, you will be amply rewarded once the job is done.

Alwin L. Rubin, Pastor

The pastor of Trinity Lutheran, who was pastor in Portland, Ore., when Pietro Belluschi was selected as architect for Zion Lutheran Church in that city, answers the searching question of a fellow pastor

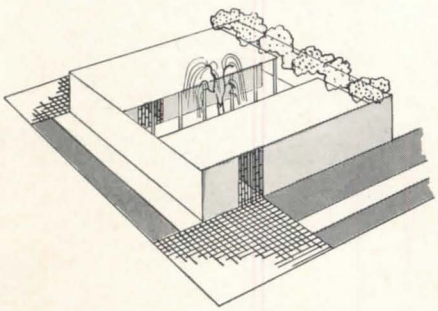


Bridge over shallow pool connects Sunday School building with church (above)

FIRST UNIVERSALIST CHURCH

Chicago, Illinois

Schweikher and Elting Architects

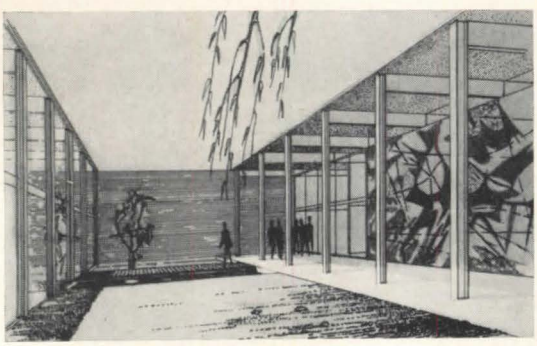


THE DOCTRINE of the Universalist church and a site in an unattractive neighborhood were the two factors which determined the inward-looking design of the new buildings for the First Universalist Church in Chicago. The corner location was noisy; the use of one of the two buildings (the Sunday School unit) as a buffer between the church and the busy streets made possible a quiet court which not only serves as approach to the church but can be used for social occasions in warm weather. A wall of warm brick completes the court and connects the two buildings. To prevent any sense of being shut in — and, even more, to prevent passersby from feeling shut out — the wall is pierced in several places and the 12- by 19-ft entrances, with their gates of glass and metal grille, permit views from the street of the gravel-surfaced garden with its trees and pool.

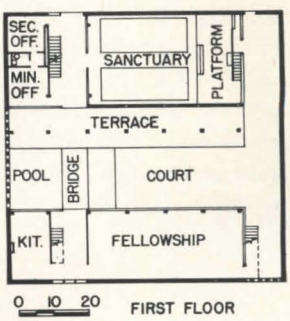
A covered corridor runs along the east wall of the church building and leads to the entrance to the church. Except for a mural painting on the east wall along the court, the church building is simple, reflecting the simplicity of the Universalist service. The sanctuary seats 120, and a balcony provides overflow seating as well. The church building also contains offices for minister and secretary.

Parking space, required under the Chicago code, is provided along the alley on the west side of the property.

The church building, now under construction, is due for completion during the spring of 1955.



Sunday school unit at left, church at right



Chapel is on hill site with street below. Steps lead up to patio (opposite page, top) through which chapel is entered. Chancel cross is on screen behind free standing altar

SAINT MARGARET'S EPISCOPAL CHAPEL

For Saint Margaret's House, Berkeley, California

Robert W. Ratcliff
Architect

Russ Cooley
Structural Engineer

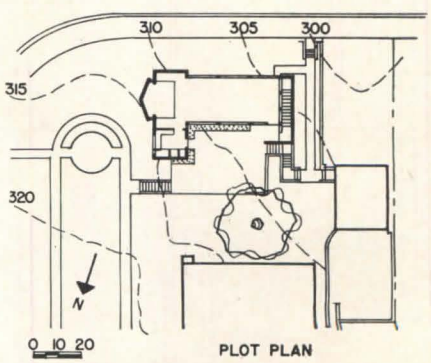
John Mitchell
Mechanical Engineer

Evelyn H. Ratcliff
Landscape Architect

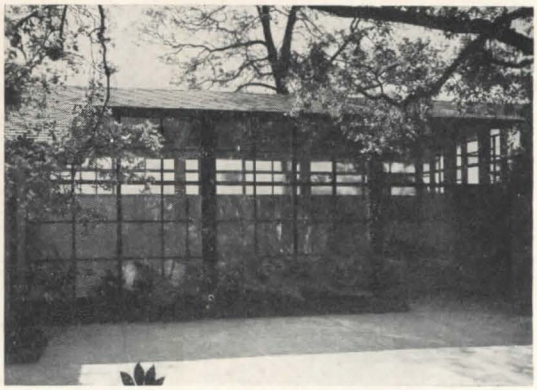
ST. MARGARET'S is the chapel for the Episcopal Church's Western training school for women. Since it is used in the school's teaching program, its function is somewhat different from that of the parish church or campus chapel. The chapel is situated on the school's campus which is in a residential neighborhood; its site is steep on two sides, almost level on the other two. Since students at St. Margaret's House and at the nearby seminary are the principal users, the chapel's entrance is from the campus rather than from the street. From the parking area just off the street and below the chapel's west end, steps lead up to a patio and to the entrance.

The north wall of the building, facing the patio, is of clear glass and gives a full view of the patio and of a large live oak tree which shelters it. Since the only foot traffic through the patio is to and from the chapel, the outlook is not distracting. Windows on the south and west are of colored glass. The building is of rosy beige concrete block, reinforced, which forms both exterior and interior walls. The woodwork is redwood throughout. Below the chapel are two classrooms.

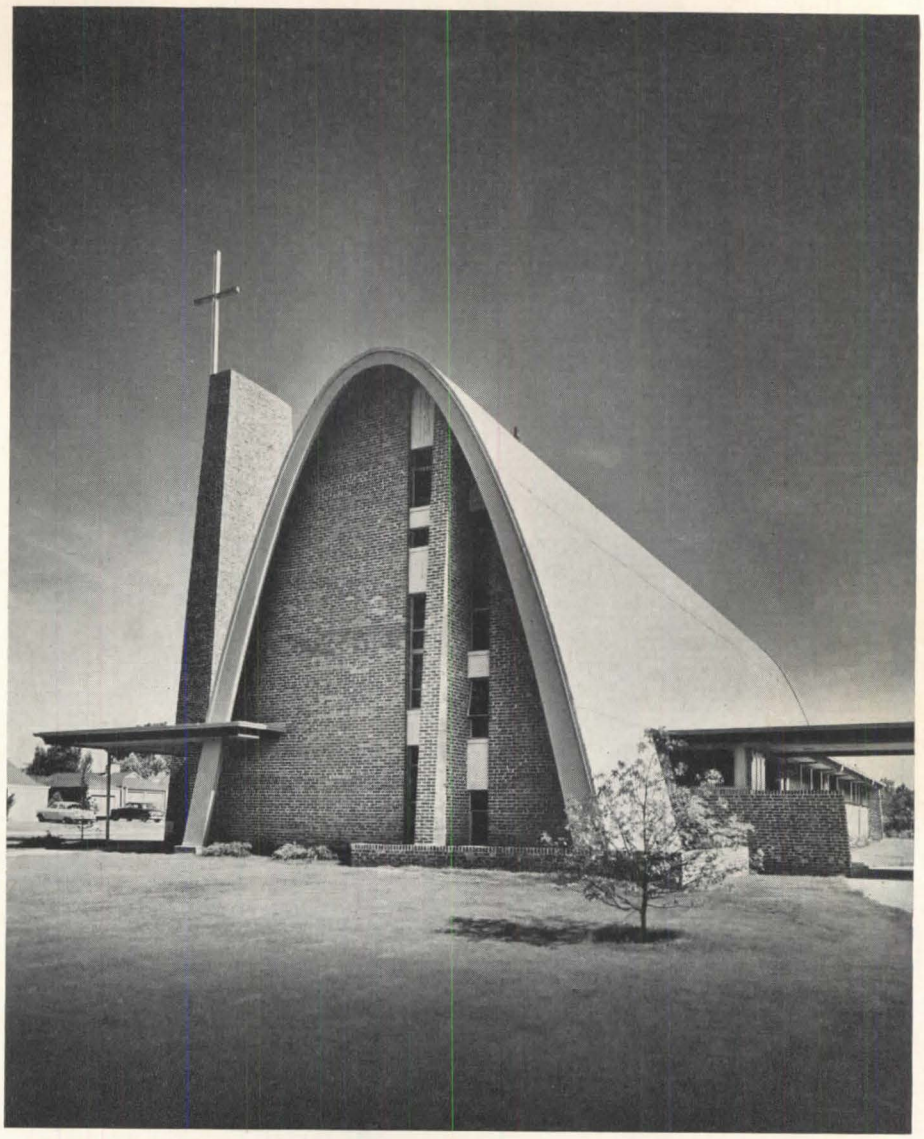
The chancel was made wider to focus attention on the altar and on the ritual there. Since the altar is a free-standing one, the cross is placed behind it; this permits use of the altar from the back (as in the Liturgical movement) as well as from the front. A curved redwood screen forms the background for the stark simplicity of the redwood cross. Narrow clear glass bands daylight the screen from both sides. The chancel is similarly lighted by four bands, not visible from the nave. The chapel was built at a cost of $35,000.



PLOT PLAN



Ronald Partridge



Parabola symbolizes man's efforts to save himself; tower points way to heaven. Carved on stone panels between windows are Lutheran symbols

HOLY CROSS LUTHERAN CHURCH

Wichita, Kansas

Ramey and Himes
Architects

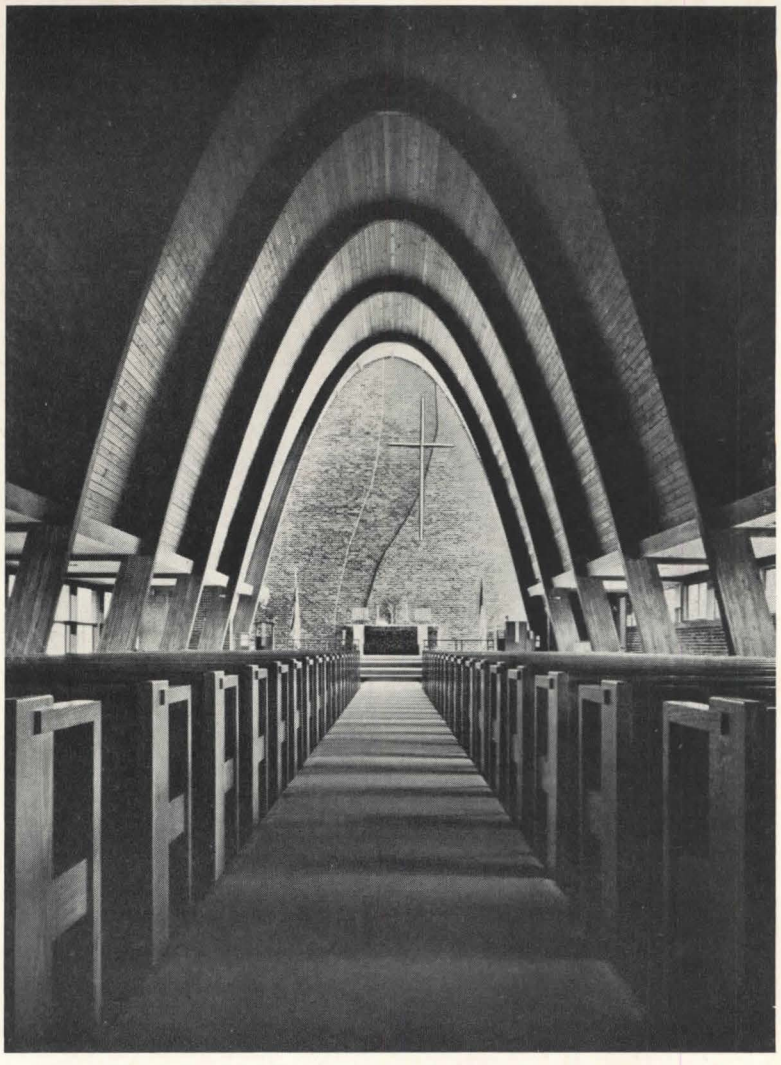
Carl Green
Structural Consultant

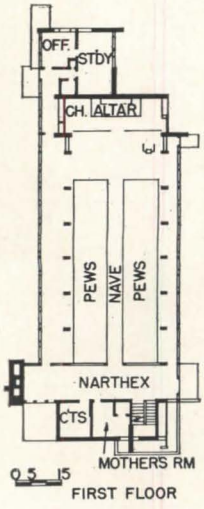
Oakle Bullock
Mechanical Consultant

Dudley Williams
Structural Consultant

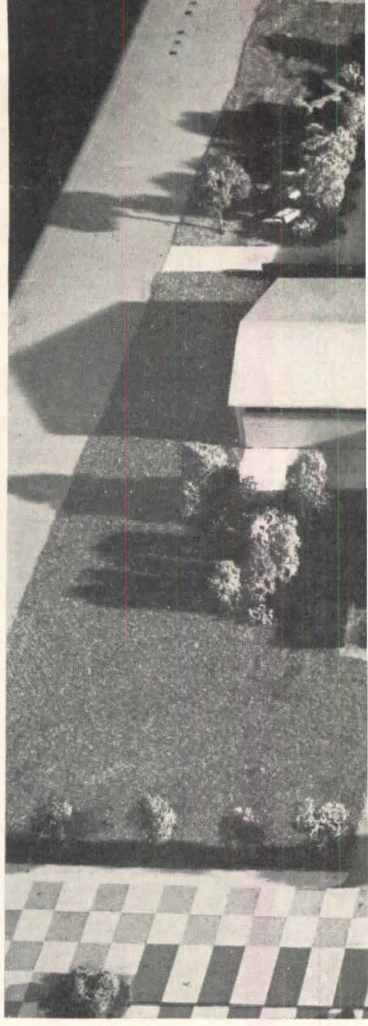
THE ARCHITECTS chose the parabolic arch as the basic form for this church because of the "height, spaciousness, beauty of form and simple and honest structural expression" which it offered. The choice was practical as well: it proved economical, fast in erection and efficient. The arches are of laminated wood, 35 ft high, 34 ft wide at base. Wood planks, 3 by 6 in., span between them and form both roof deck and finished ceiling. The end walls and other masonry, including the free-standing tower, are of dark red clinker brick. The church was designed to seat 350; fortunately its wide side aisles (which add 11 ft to the nave width) and the balcony provide additional seating for the membership has grown from 250 to over 400. All furnishings, including pews, pulpit, communion rail and lectern, are of wood stained gray. Carpet is also gray. Colored glass in windows is predominantly amber and violet with some red, blue and green. Corrugated plastic panels used in a strip along the end wall admit daylight to the chancel. A radiant warm air system heats the nave. Cost was $110,096.

Wide side aisles solve overflow seating problem. Cross, suspended over chancel from roof, is of laminated redwood (Bernard Frazier, sculptor). Recess in chancel wall is for ceramic mosaic panel to be installed later



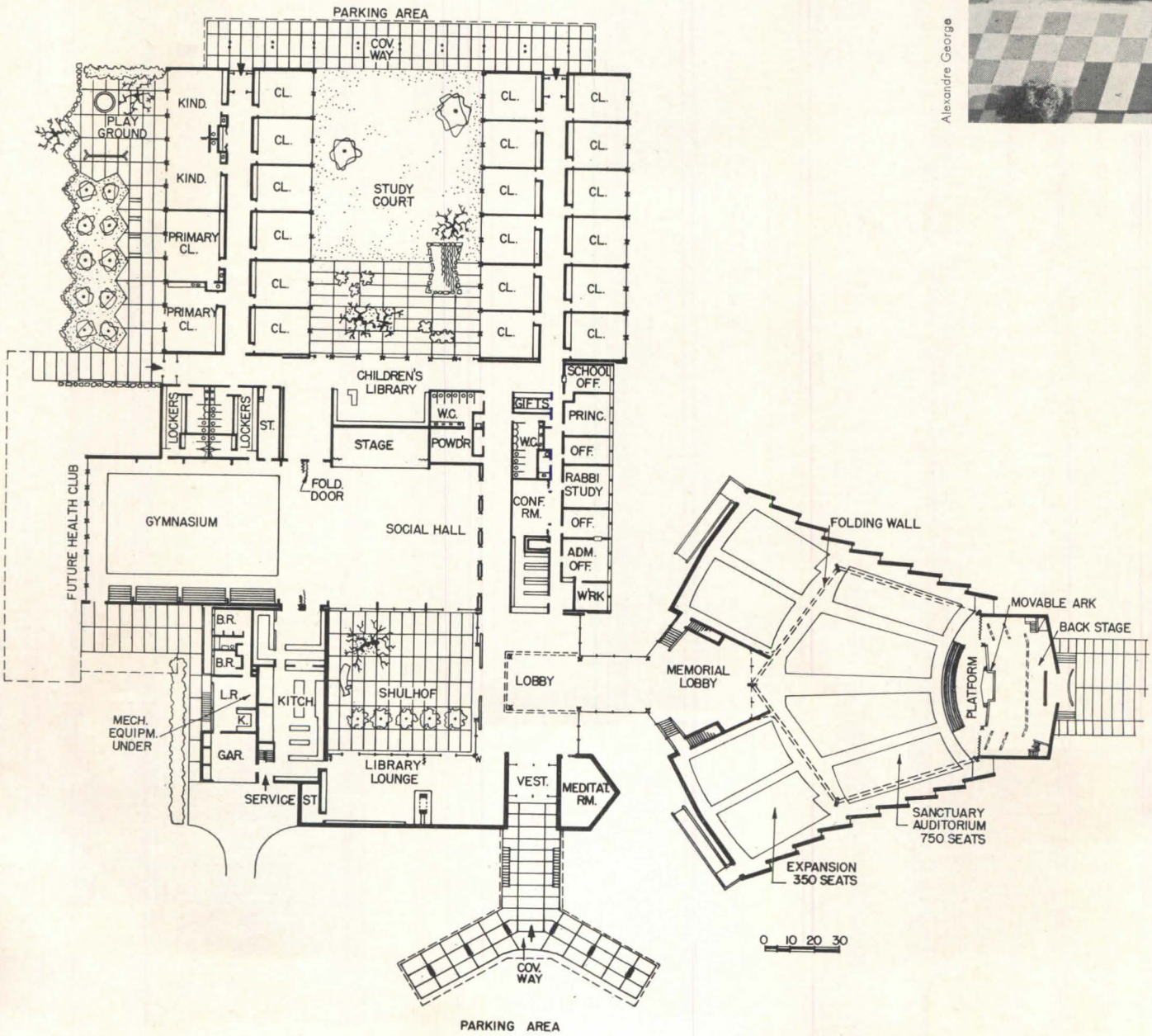


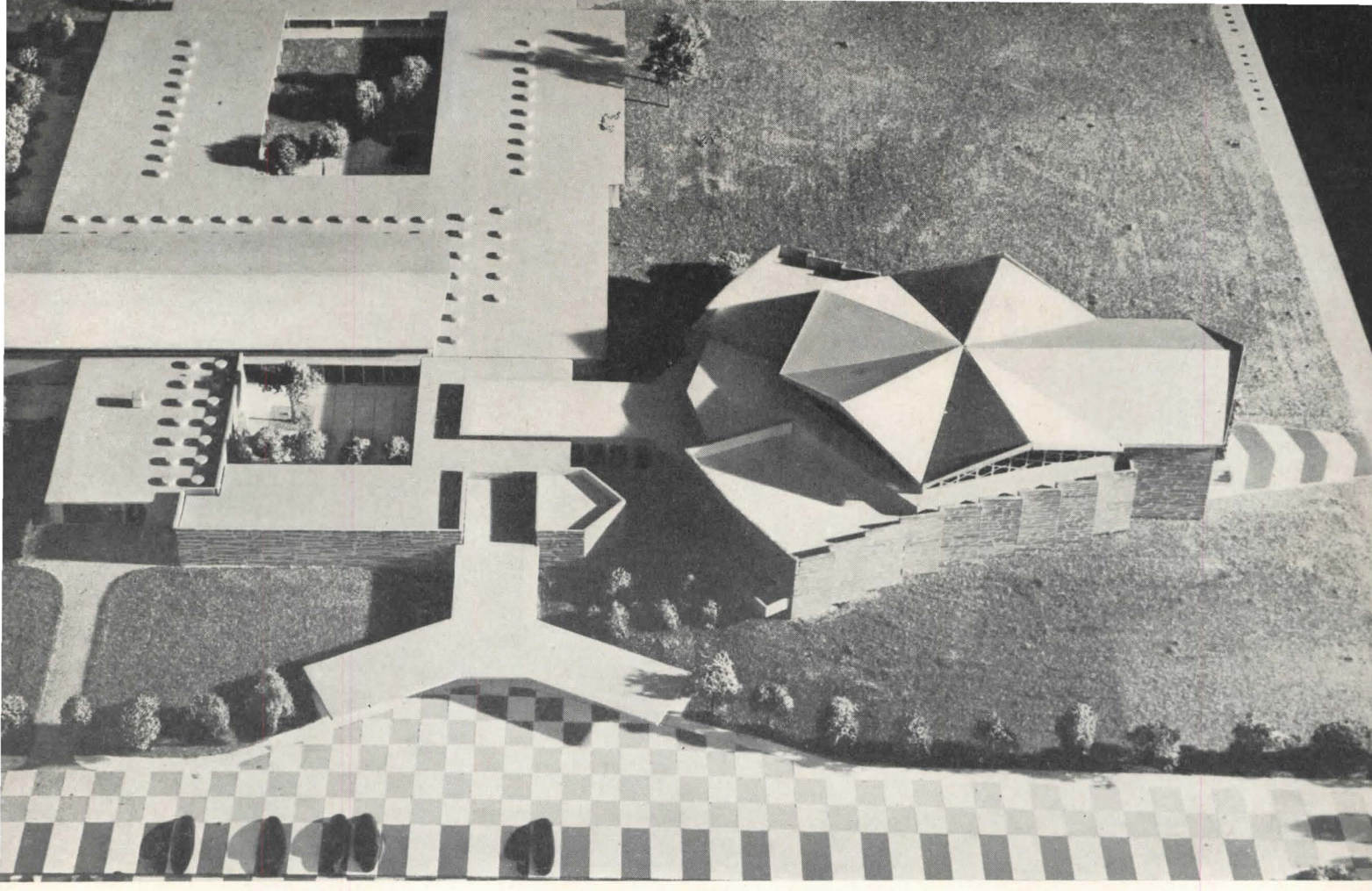
Julius Shulman



Alexandre George

Cantilevered covered way leads to lobby from parking plaza paved in pattern of colored concrete rectangles to mark traffic lanes and parking spaces. Temple roof is formed by rigid bents tied together by central ring at valley points



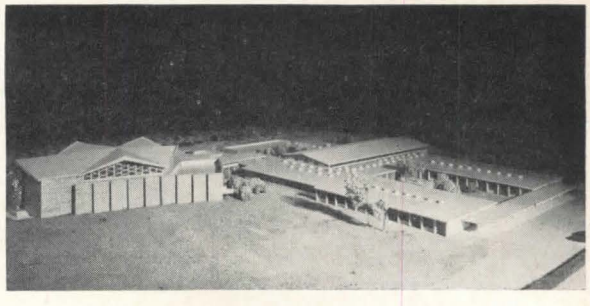


TEMPLE EMMANUEL, *Denver, Colorado*

THE JEWISH TEMPLE is both a place for worship and a place for growth, mentally, socially, physically, artistically. These principles of American Jewish culture are incorporated in the new Temple Emmanuel to be built in Denver. As the architect says, "this kind of worship place while designed for prayer primarily, searches by every means to help the pious wish become reality."

Percival Goodman, F.A.I.A.
Architect

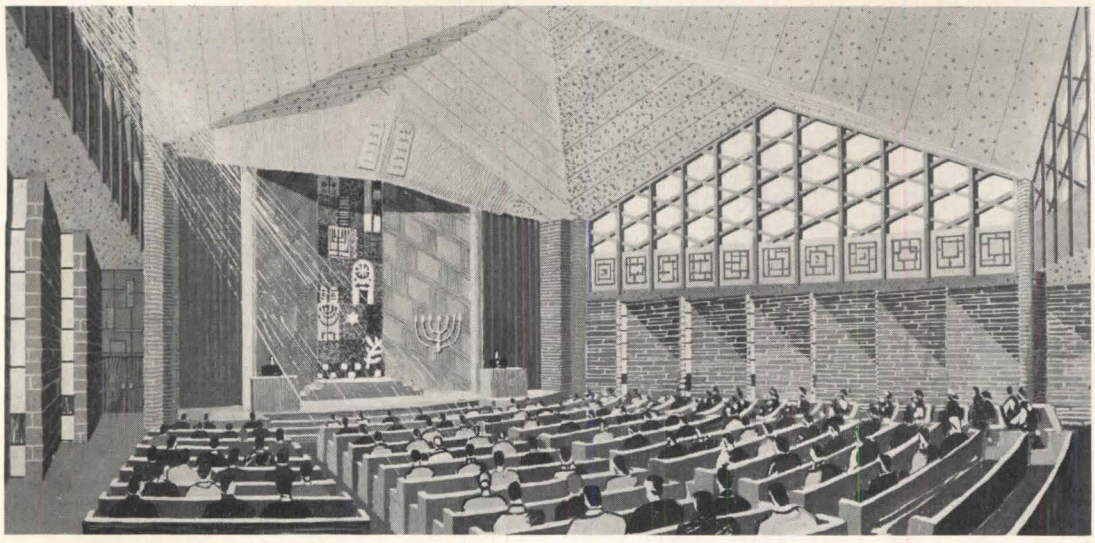
The site for the new temple is in suburban Denver, and this means that ample parking space will be a necessity. Since most people will arrive by car, the entrance to the lobby is from the parking plaza rather than from the street. A cantilevered canopy will provide a covered walk to the building. The school can be reached from this entrance but has its own parking area.

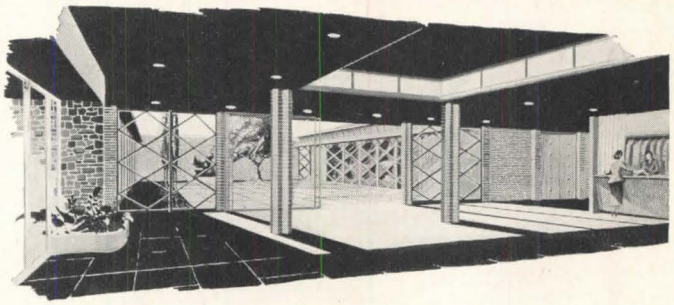


The synagogue, set apart by a short corridor from the school and social areas, is the place for communal worship, but there is also a small room off the lobby which is always open for private prayer and meditation. The synagogue shape was the result of the need to take care of a very large attendance on some occasions, and of about half the number during the rest of the year. The shape of the main area, with its sloping floor and the complete stage facilities, makes the synagogue a place for presentation of concerts of liturgical music, religious plays and pageants as well as for services.

For community functions — banquets, lectures, secular theatricals, movies — the social hall will be used. For large dinners and dances it can be combined with the adjoining gymnasium and recreation hall.

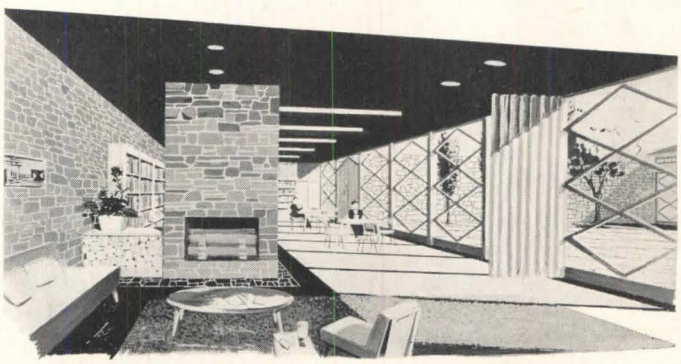
There are to be 21 classrooms in the school which has its own study court formed by the two classroom wings and the library.



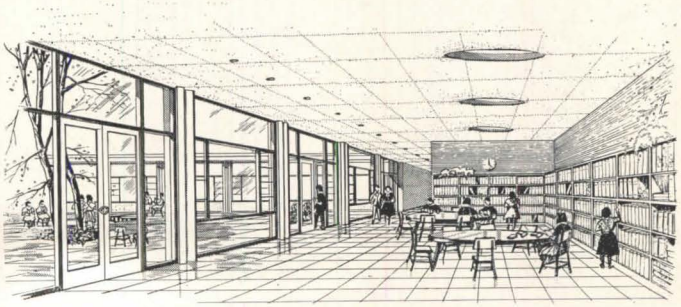


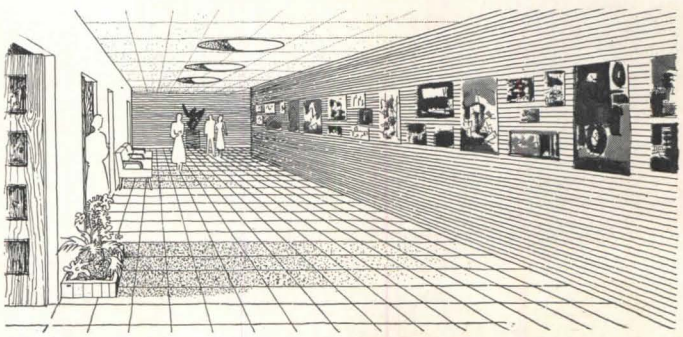
TEMPLE EMMANUEL

Percival Goodman
Architect



Need for flexible size dictated shape of synagogue: for usual services it seats 700, but by opening sections ordinarily kept closed, space can seat 1500. Roof construction forms dormer windows, to be filled with stained glass. Lobby opens on shul hof, *or temple garden, used as gathering place after services and for Feast of Booths. Library lounge is multipurpose area, sometimes is used as chapel. School library opens onto study court around which classrooms are grouped. Exhibition hall opens off social hall and connects lobby and school corridor*





FIREPLACES: A CHANGING TRADITION

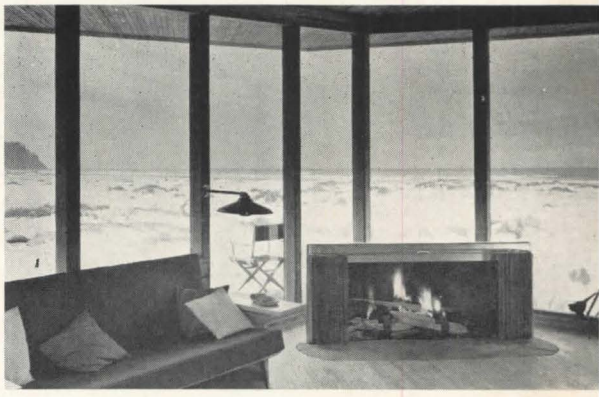
ARCHITECTURAL INTERIORS

Design | *Details* | *Materials* | *Equipment*

THE FIREPLACE may be outclassed as a source of heat, but it remains an important element in house planning. Its contribution to both atmosphere and comfort is such that clients are not willing to give it up despite its high cost. They are, however, looking at it differently. Although the traditional design and materials are still popular, cost-saving ideas are more and more to be seen. Fireplace walls make good room dividers, clients realize, and fireplaces can actually enhance rather than compete with the view; a raised hearth saves a lot of back-breaking labor and also puts the fire on a level where it can be enjoyed.

1

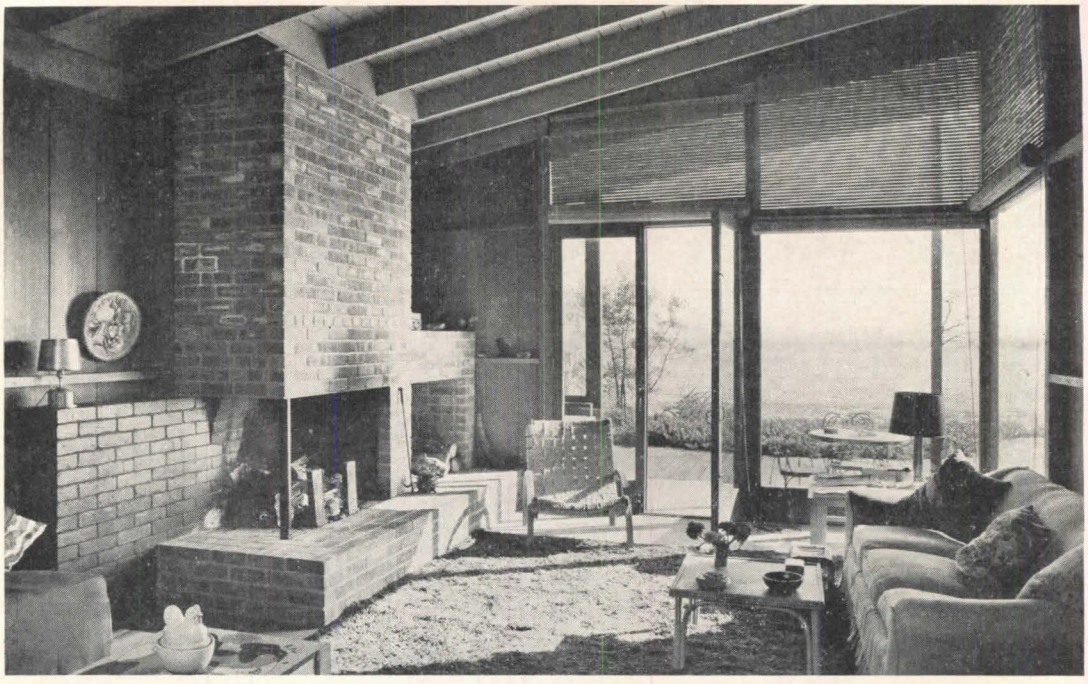
Roger Sturtevant



1 To conserve living space in a small beach cottage, this fireplace was put in view corner of living room and kept low so as not to impair view. Apparently chimneyless, it has steel-plate base standing on pipe legs to basement floor, and a splayed double back permitting suction of smoke from top of opening to under-floor fan and thence to chimney in center of house. ***Van Evera Bailey, Architect***

2

2 This free-standing octagonal "hearth" is on the glass-enclosed second floor of a Connecticut house; the view can be enjoyed both around and through it. Construction is boiler plate, welded and painted charcoal gray. ***Philip Johnson, Architect***



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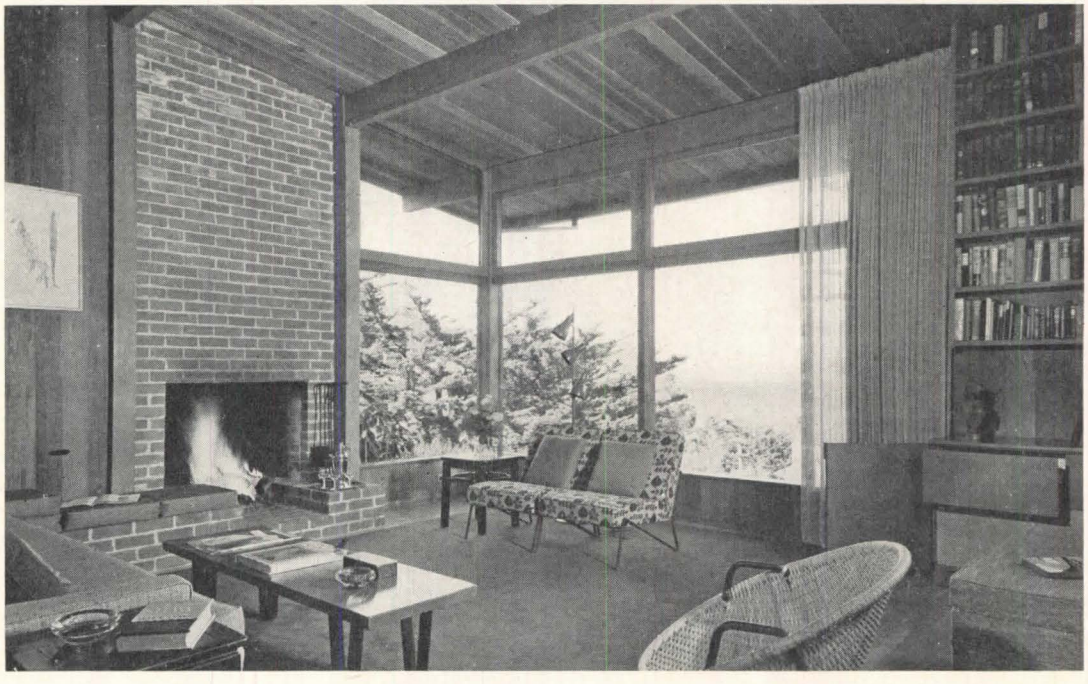
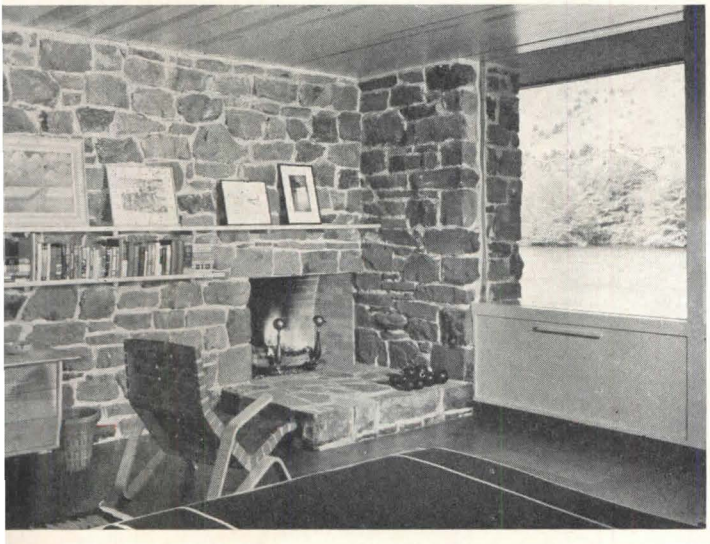
Roger Sturtevant



4

Ernest Braun

5



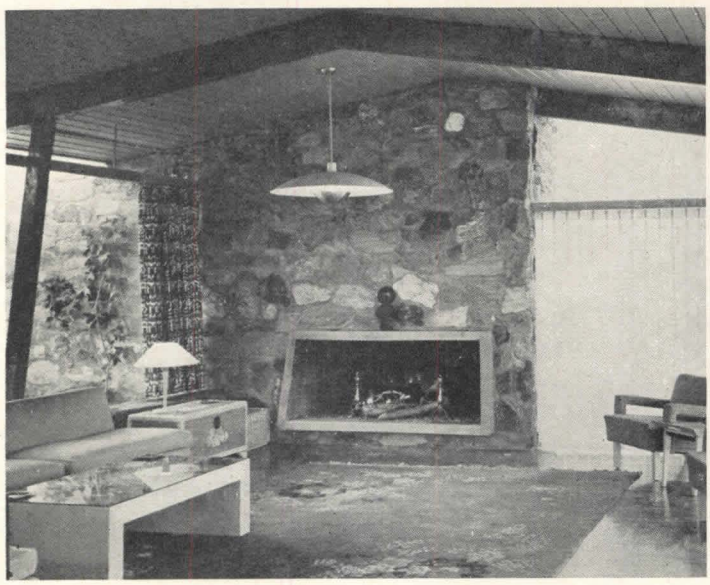
Dearborn-Massar

3 *In a beach house a fireplace always is a welcome source of extra or occasional heat, and this one was planned as such. It stands in one corner of living room, offering no competition to adjacent view of ocean. Open end is fine for odd shapes of driftwood found on beach.* ***Clark & Buettler, Architects***

4 *Here again is a fireplace which adjoins but does not detract from a view. The house is a split-level on a steep hill, and the living room is almost a story and a half in height. The fireplace would have been dwarfed without careful proportioning and such devices as hearth extensions.* ***Schubart & Friedman, Architects***

5 *What could be more pleasant for a vacation house in Oregon than this small fireplace in the master bedroom? Its location in the corner diagonally opposite hall door simplifies furniture arrangement; its rough stone adds color warmth and emphasizes informality.* ***Pietro Belluschi, Architect***

Stuart Wiener



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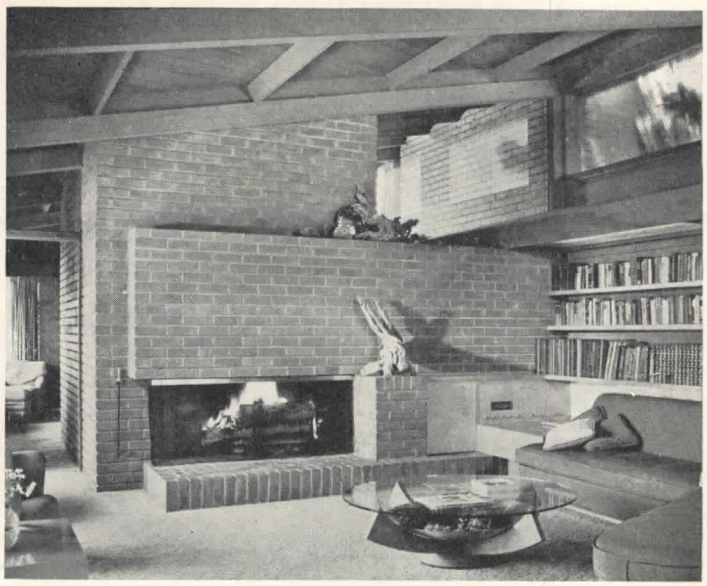


7

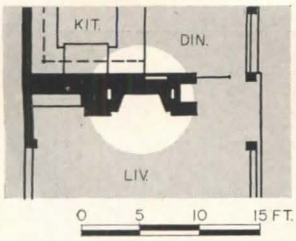
8

Julius Shulman

6 *Off-center and unusually long, this fireplace in a year-round house on the Arizona desert is canted at one end to echo exposed steel framing of house. Fireplace wall is brightly colored native stone; trim, copper.* ***Edward L. Varney Associates, Architects***

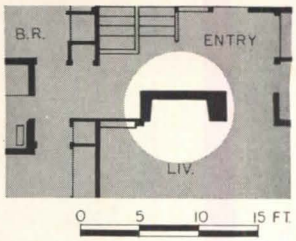
7 *This fireplace unit combines hearth, bookshelves, built-ins, and clerestory windows; materials vary from brick of fireplace wall to upholstery of built-in couch. Two "mantels" at differing heights provide driftwood display space.* ***John Storrs, Designer***

8 *A combination of brick, flagstone, plywood, glass, and built-in bookshelves gives this fireplace wall a character of its own. Note built-in fire screen, storage cabinet over left end of hearth, and extension of flagstone hearth*
Eugene Kinn Choy, Architect

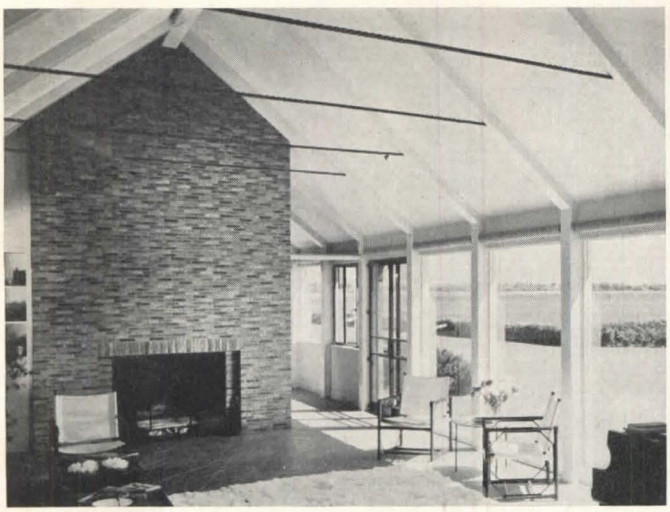


9 *This fireplace wall is the only solid note in a living room well over 20 ft in length: both long walls are floor-to-ceiling glass; short opposite end wall is open to entrance hall.* ***George W. W. Brewster, Architect***

10 *Here in contrast is a sturdy fireplace wall which separates entrance hall and living room with a solid bulk not unexpected in a room with windows on only one side. Hearth again is flush with floor.* ***John Storrs, Designer***



Ezra Stoller



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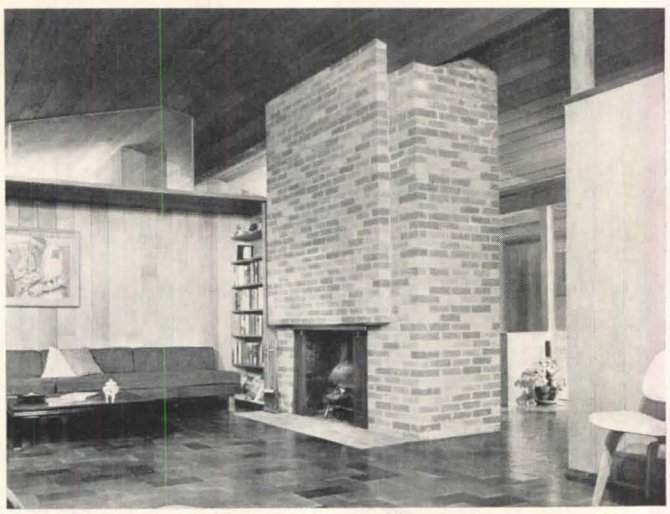


Charles R. Pearson

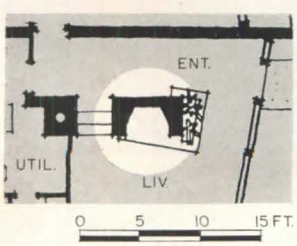
10

ARCHITECTURAL INTERIORS

Design | *Details* | *Materials* | *Equipment*

11

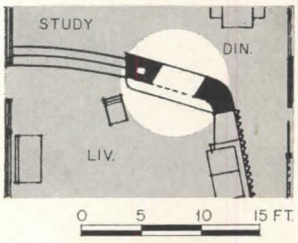
Hedrich-Blessing



11 *Raised hearth here combines with bookshelves at one side and planting box at other. Corridor wall in background is brick, blending with brick of fireplace wall to extend visual limits of living room.* ***George Fred Keck, William Keck, Architects***

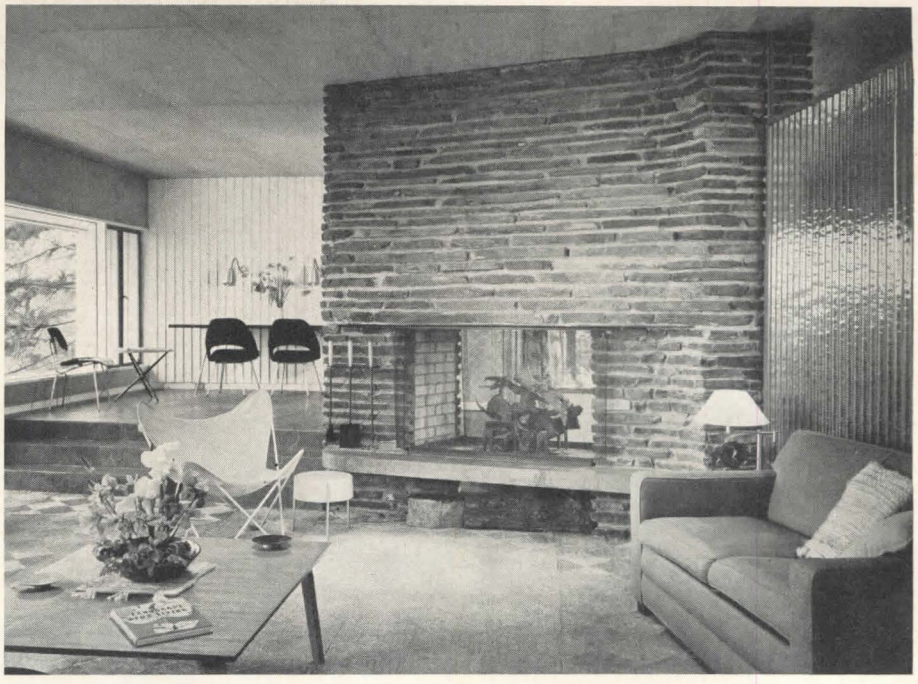
The contemporary fireplace has . . .

Advantages . . .



12 *A fireplace room divider is doubly effective when it is a two-way hearth such as this one between living room and study. Slightly raised on the living room side, it is flush on the upper study level.* ***E. H. and M. K. Hunter, Architects***

Joseph W. Molitor



12

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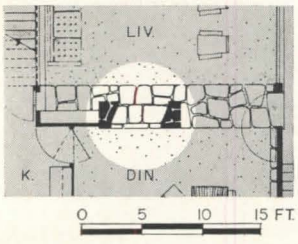
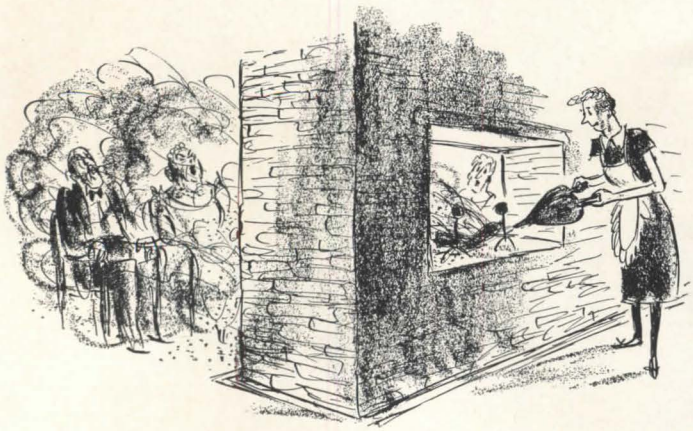
13 *This fireplace wall also separates living and dining rooms; much less formal than that above, it is of rough stone and angled toward living area. Brick-lined fireplace opens to both rooms, a step apart in height.* ***Marcel Breuer and Eliot Noyes, Architects***

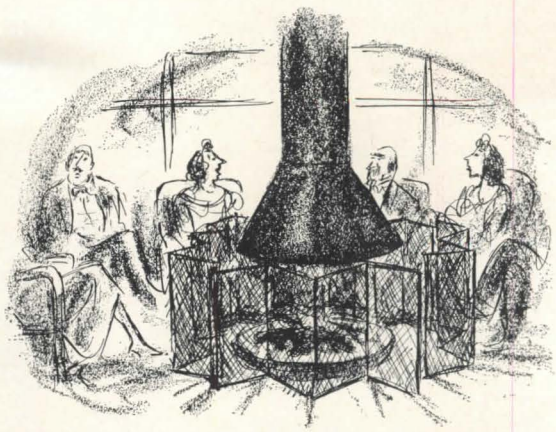


Ben Schnall

13

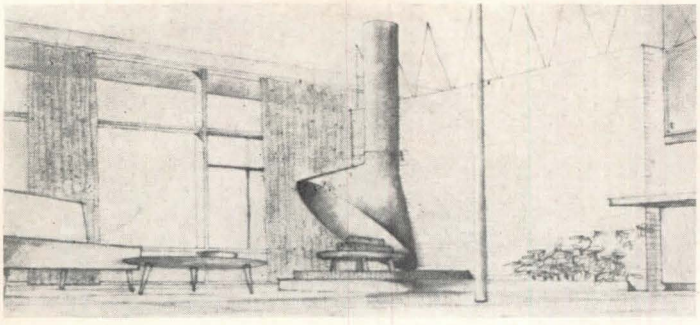


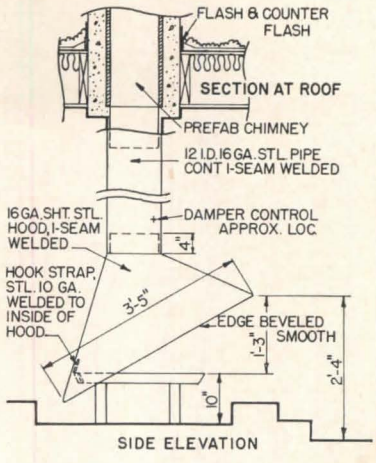
Disadvantages . . .



And problems . . .

Drawn for the ***Record*** by Alan Dunn





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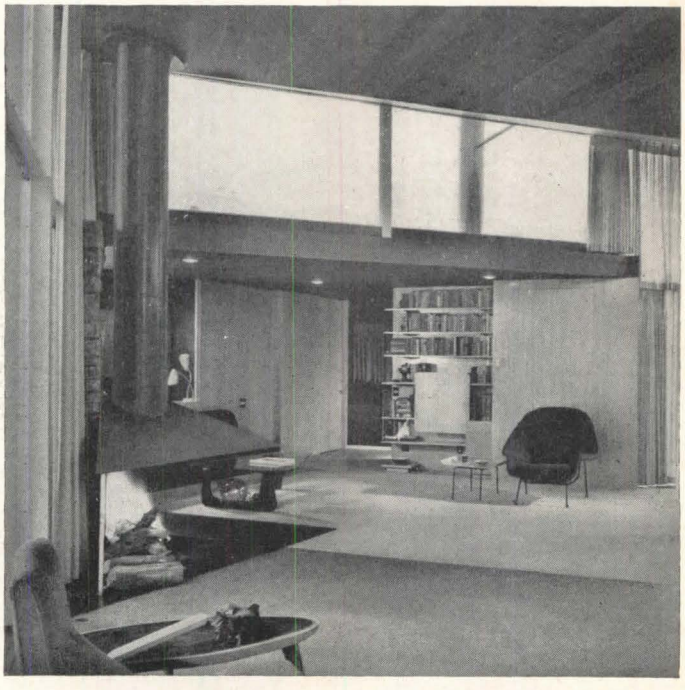


15

Julius Shulman

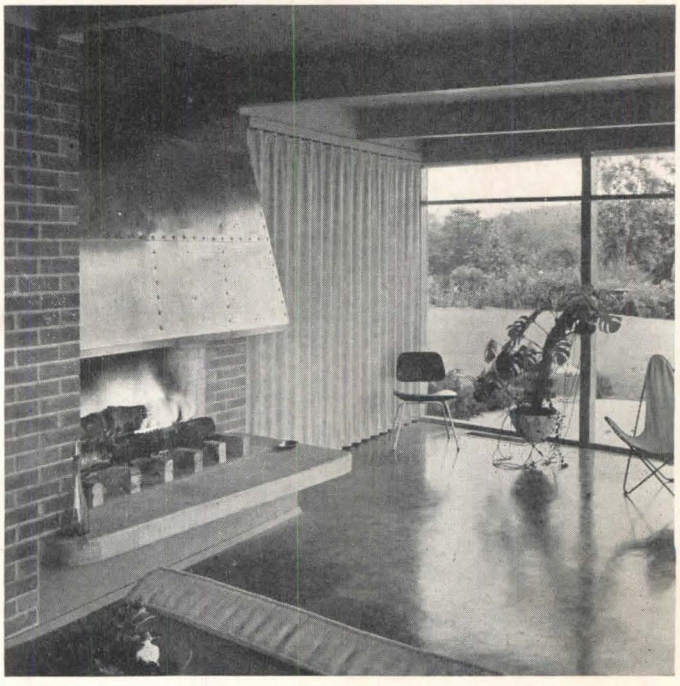
14 *This fireplace was designed expressly, in the terms of the architects, "to add an element of fun" to a small rectangular living room. Unorthodox in appearance, and on the gay side, it is constructed of inexpensive materials (see detail above); at this writing it is built but not as yet installed, so no report on its functional success is available.* ***Brown & Wright Associates, Architects***

---

15 *Nonetheless effective because of inexpensive construction, this fireplace in the living room of a California house occupies the central spot on the window wall. Angles play the important part here — note clerestory, hearth-line, background walls.* ***Sumner Spaulding — John Rex, Architects***

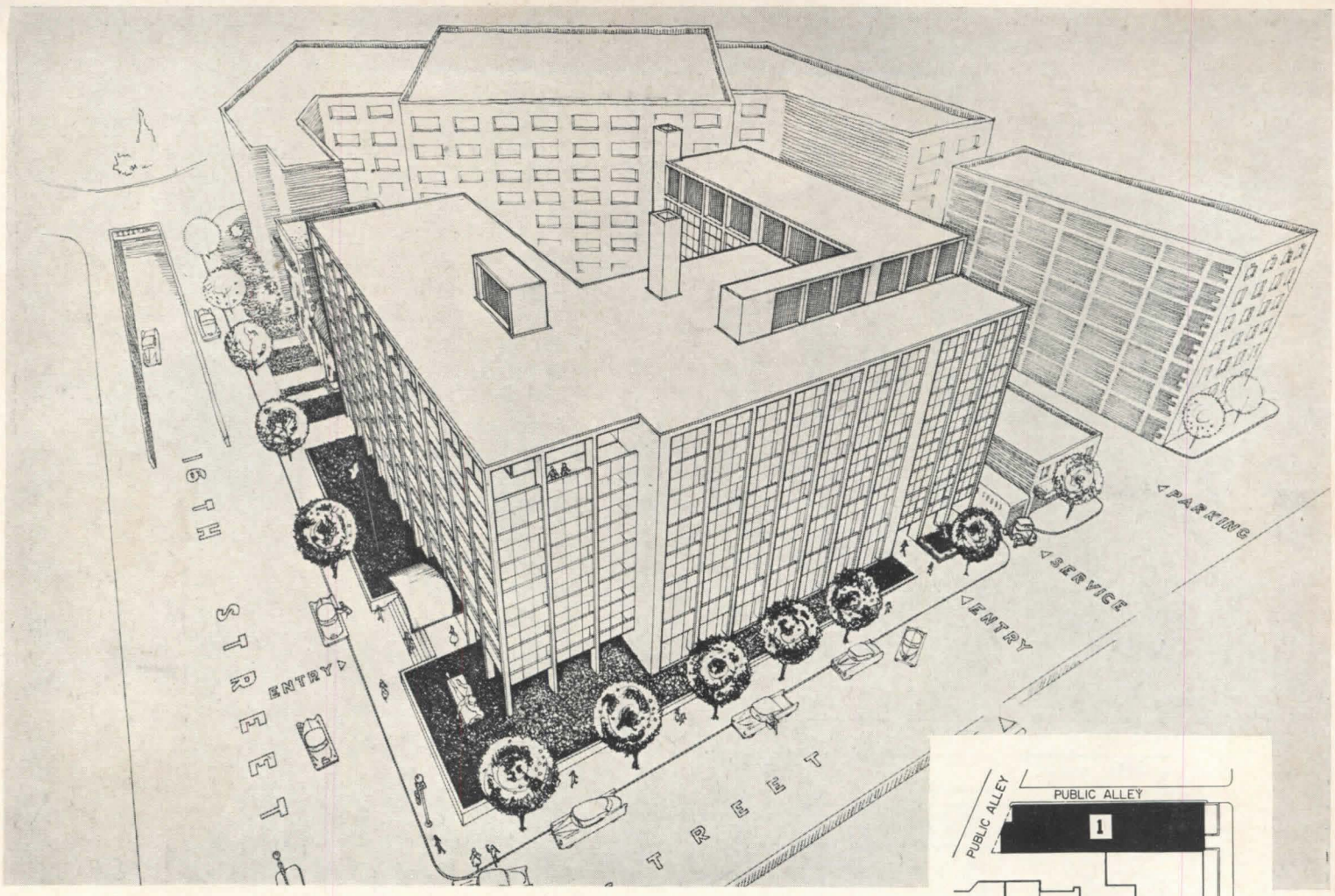
---

16 *Here are several recent design trends combined: a raised hearth for easy fire-tending; a location well suited to view and furniture location; a combination of construction materials adding to visual interest; and a semi-recessed hearth permitting a large choice of combustibles.* ***Harold W. Hall, Architect***



16

Chas. R. Pearson



NEA EDUCATIONAL CENTER

3 Part Scheme Provides Occupancy While Rebuilding

Joseph H. Saunders, Architect

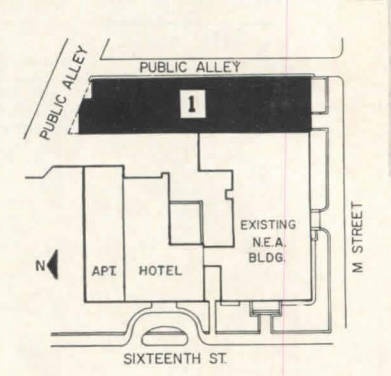
Reisner & Urbahn, Consulting Architects

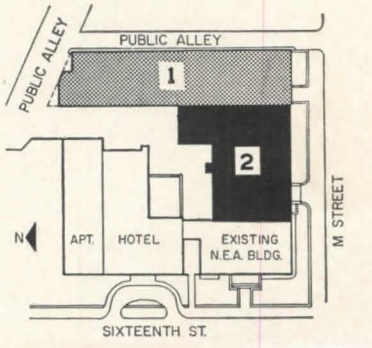
William F. Vosbeck, Architectural Project Manager

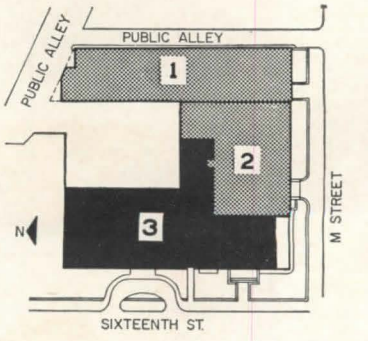
Beall & LeMay, Structural Engineers

William A. Brown, Mechanical Engineer

Joseph F. Nebel Co., Contractor







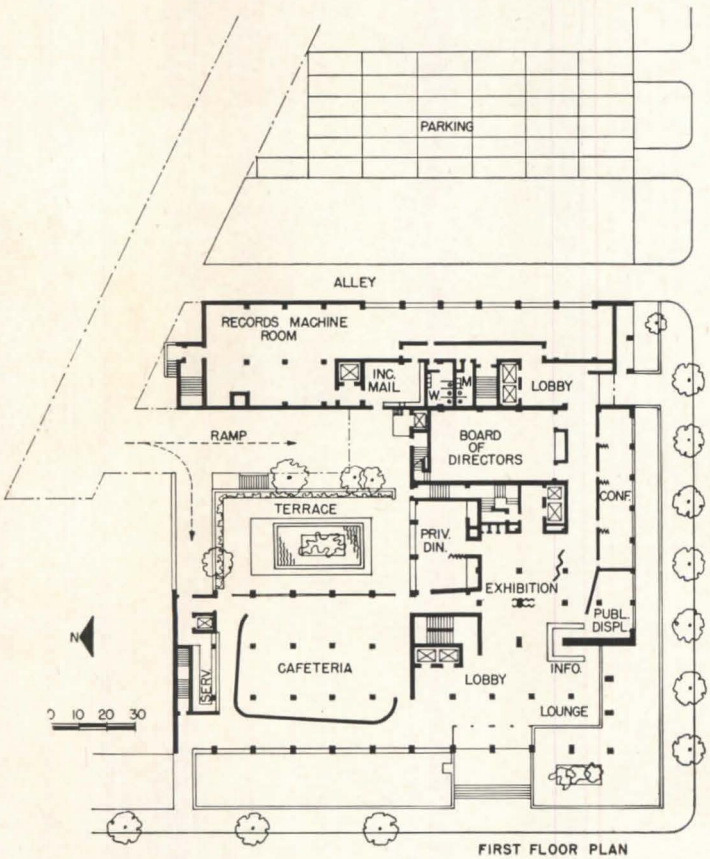
WORK HAS STARTED on the new headquarters for the National Education Association in Washington, designed to be built in three stages during four years in order to maintain continuous operation. The $5 million educational center will replace a group of five assorted buildings, Georgian in style, into which NEA has expanded during the past 30 years.

In the first stage, an existing garage will be replaced by an 8-story office building entered from M Street. This unit

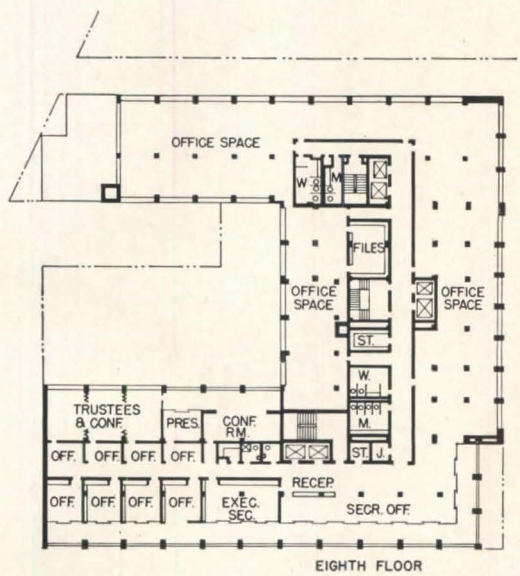
Existing buildings, to be replaced

will contain air conditioning and electrical centers for the entire project. The second stage will comprise extensive remodeling and face-lifting of the present 7-story office, the workers of which will occupy the adjacent new wing. The third stage will see the demolition of the present mansion, hotel and apartment house, followed by erection of the main office wing on 16th street. The completed building will accommodate a staff of 1000. Future plans call for a separate new service building (not yet designed) across the alley.

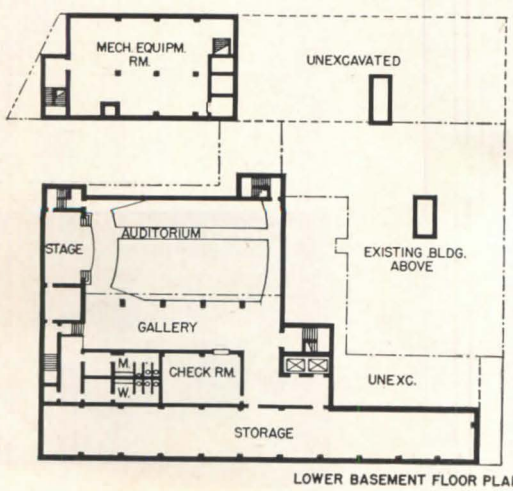
An additional floor will be gained in the new construction by raising the 4th and dropping the 2nd floors vis-a-vis the high-ceilinged existing group, thus permitting an added floor to be sandwiched between.



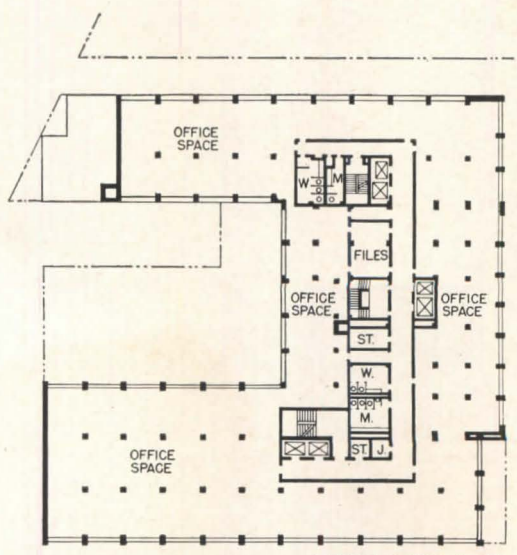
FIRST FLOOR PLAN



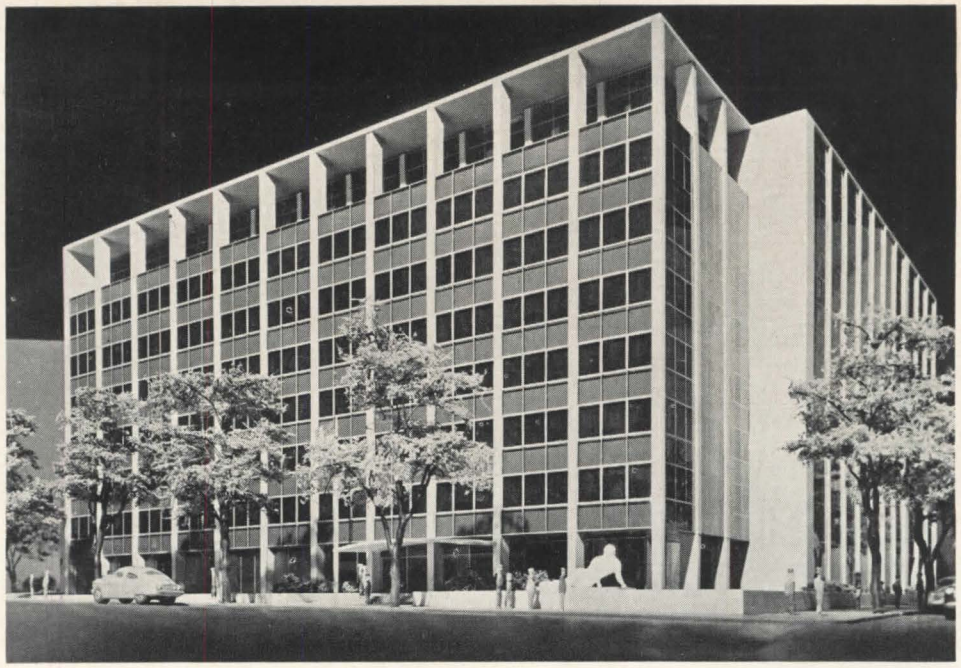
EIGHTH FLOOR



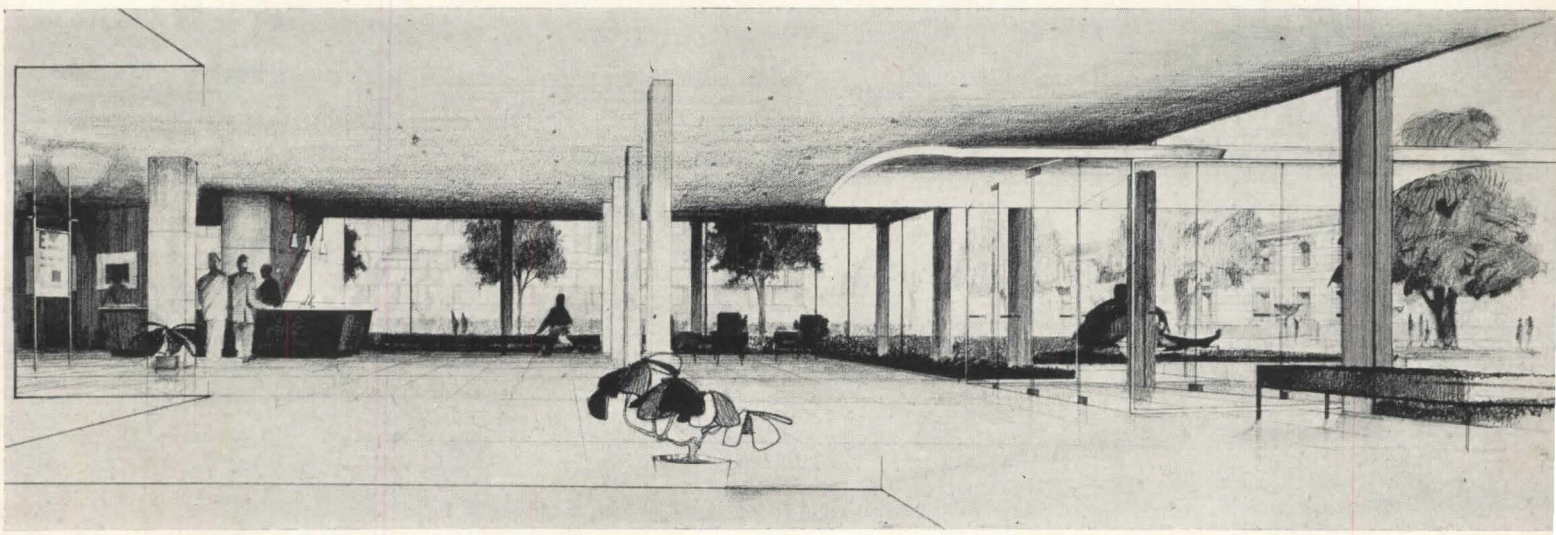
LOWER BASEMENT FLOOR PLAN



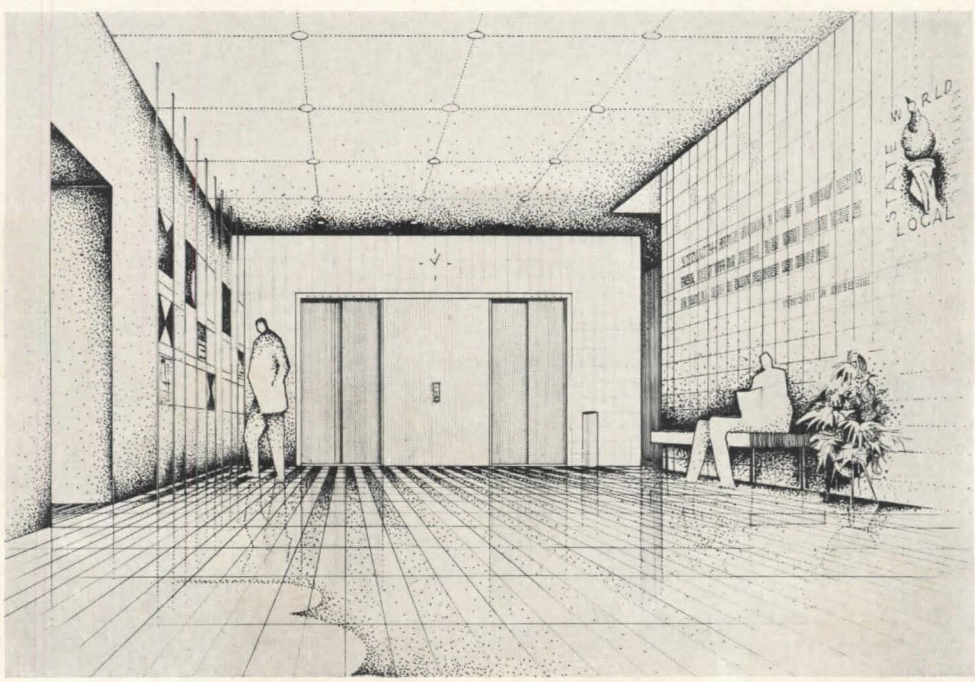
TYPICAL OFFICE FLOOR

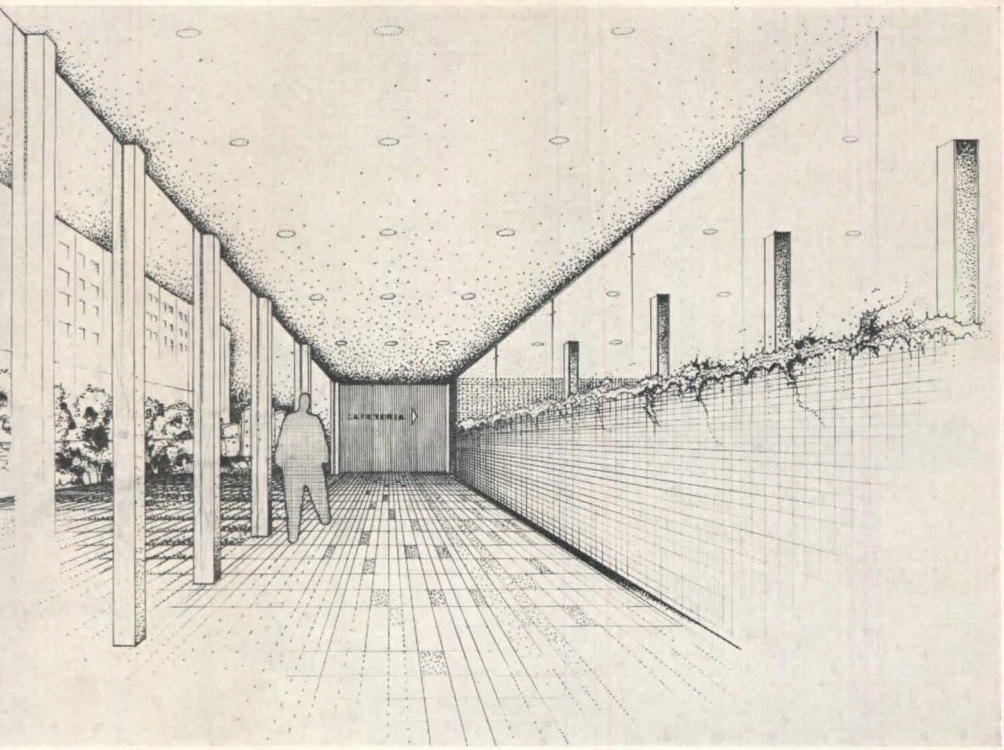


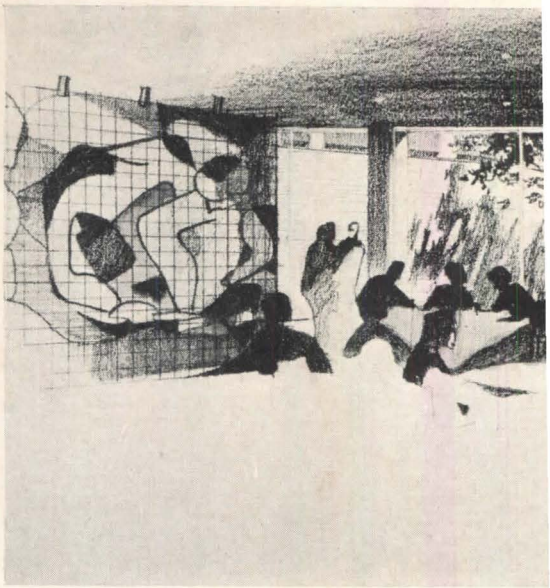
Louis Checkman

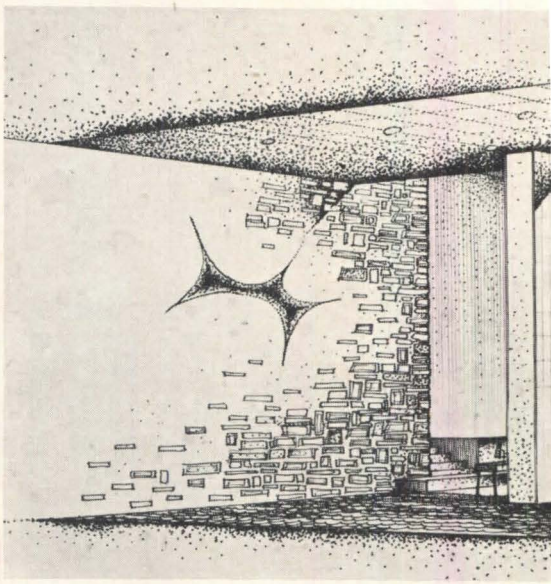


Above, the main lobby; below, the M Street lobby







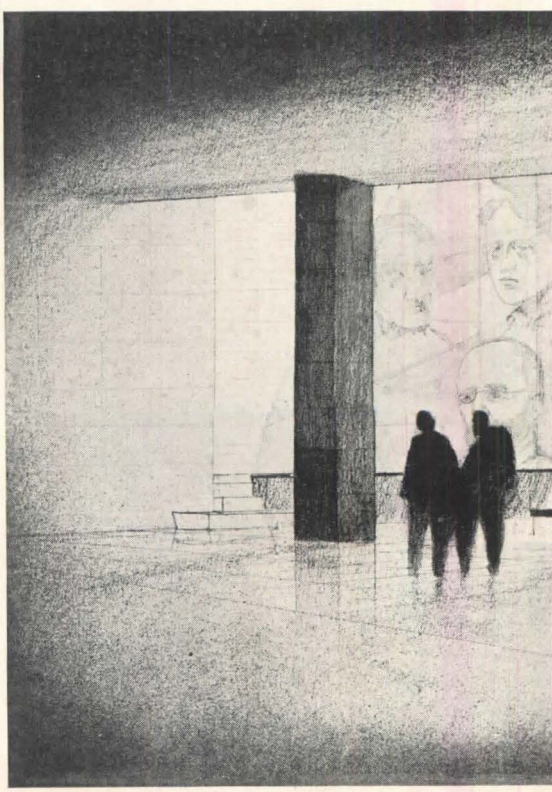


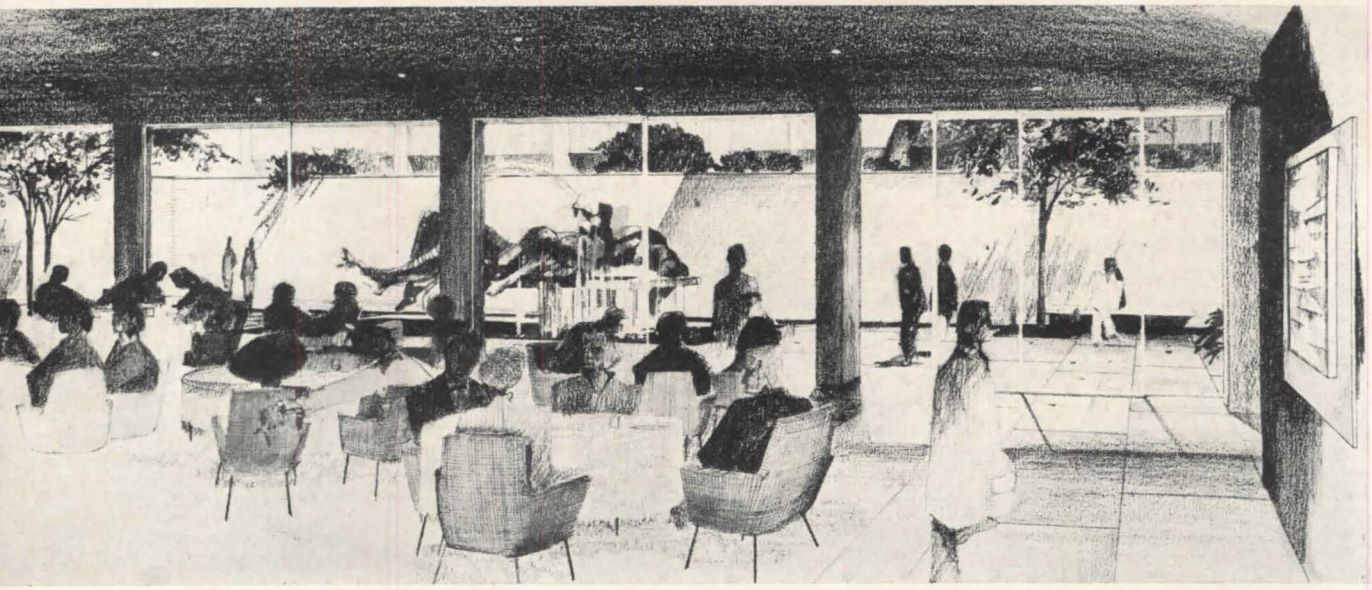
NEA EDUCATIONAL CENTER, WASHINGTON, D. C.

Interior finishes: typical office walls of painted plaster; walls in corridors, stairwells and toilets of glazed brick; ceilings of acoustic tile throughout; typical office floors of plastic asbestos tile, with terrazzo and rubber tile being used at lobby level; venetian blinds in built-in pockets.

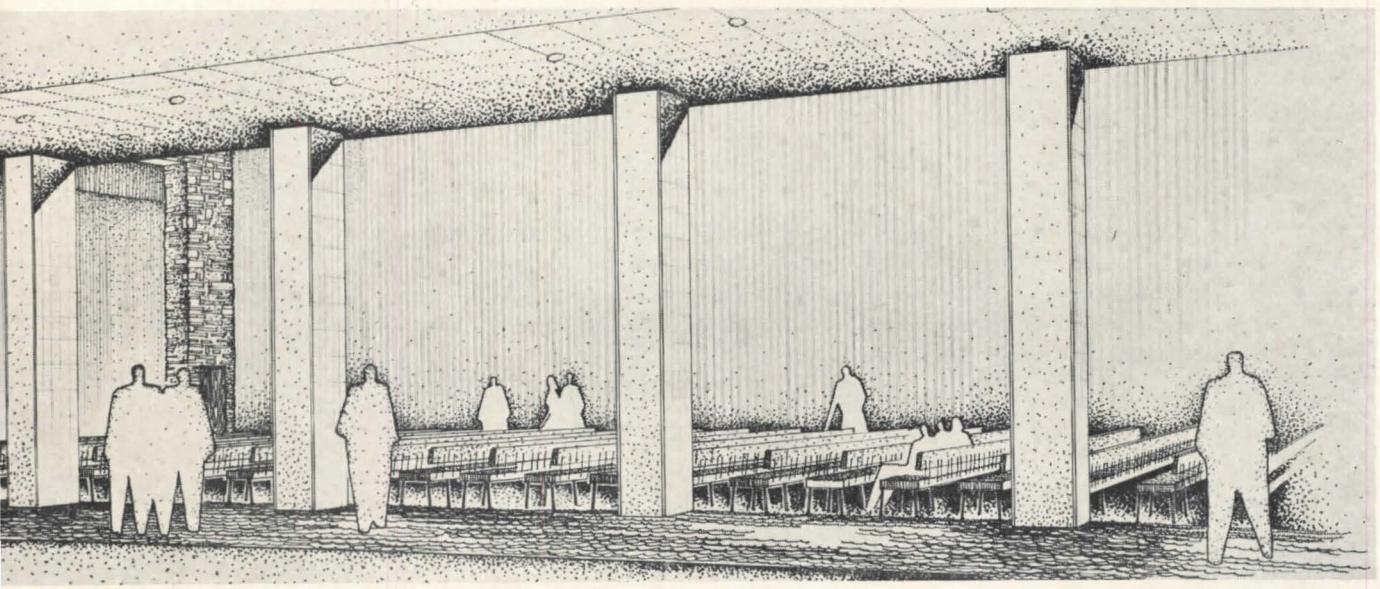
The building will be air conditioned by a high velocity system combining both peripheral and interior supply. Underfloor ducts will distribute electrical and phone lines.

Typical offices will be illuminated by low-brightness units and the lobby will contain a luminous ceiling of milky-white glass.

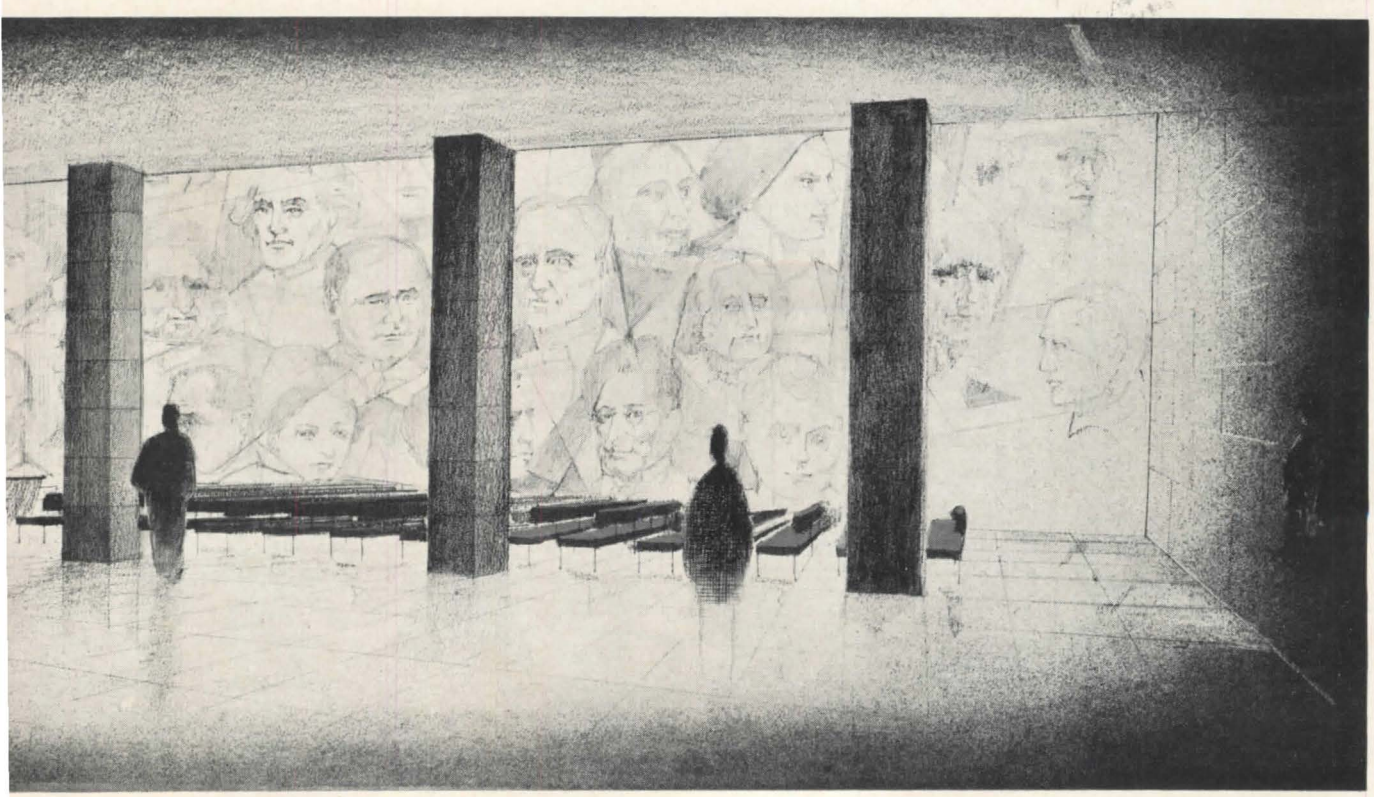




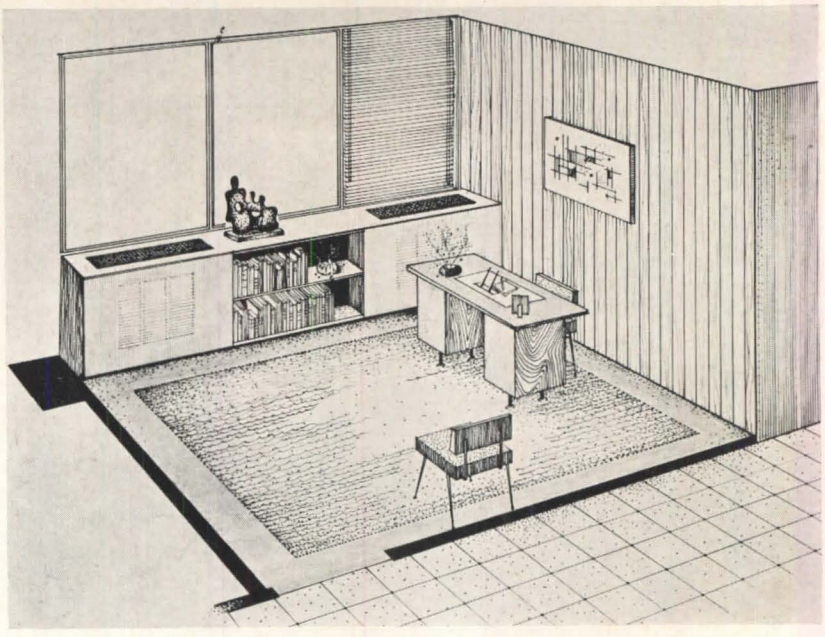
Far left, loggia to cafeteria. Above, terrace from the cafeteria



Above, the auditorium. Below, memorial wall in auditorium



NEA EDUCATIONAL CENTER, WASHINGTON, D. C.



A typical single office

The exterior will add a dash of tasteful color to the Washington scene. The columns of the reinforced concrete frame will be white marble clad, in bold contrast to the blue-green glass of sash and spandrels and the delicate lines of their aluminum surrounds. The windows will be vertically pivoted for inside cleaning.

Louis Checkman

AIR CONDITIONING APARTMENT BUILDINGS

Some of the factors in system selection

By Edward H. F. Dickens

In apartment air conditioning, the architect is confronted with a major design influence prior to the planning stage.

Keeping air conditioning costs within the range of economic feasibility is going to have a direct effect on the architectural design. For example, air conditioning costs go up the more the building varies from a square shape.

Some questions owners and developers will ask architects and engineers are, "What does it cost?," followed by "How much will it raise the rental value of each unit?," and then, "How can it be done cheaper and still provide the same comfort conditions to the occupants?," "How much will it cost to own and operate?"

INVESTMENT FACTORS

Factors the architect should consider in this matter of investment in air conditioning are:

1. Initial cost of mechanical equipment
2. Installation costs (in an existing structure there are the added expenses of cutting, patching and furring; painting; electrical wiring; plumbing; and space for the equipment to be added)
3. Amortization period and interest rate
4. Depreciation
5. Taxes on equipment
6. Insurance
7. Electricity costs
8. Steam costs, if any
9. Operating and maintenance personnel wages
10. Replacement of parts
11. Water costs
12. Service contract charges

The sum of annual fixed costs and operating costs can be apportioned to give an annual cost per apartment.

With these factors in mind, the architect, in collaboration with the consulting engineer and owner, is in a better position to choose the system in line with "what the traffic will bear." Actually, as one might expect, there is no single "best" system for any specific type or size of apartment dwelling. There are different problems in each case, and following are a few of the considerations affecting system selection, most of which have some bearing on economy:

1. Climate

Climate is the major governing factor. Outside design wet and dry bulb temperatures in New York, for instance, are considerably different than they are in Georgia.

Orientation to sun and wind, and design techniques aimed at cutting down the cooling load also come under the general heading of climate. Shading devices, attention to size and placement of glass areas, proper insulation, and the prevention of infiltration of moisture by tight construction and vapor barriers all go to reduce the operating costs, and perhaps size of equipment as well.

2. Size of Structure

In the smaller two- and three-story apartments, where space is at a premium, large, low-pressure ducts and the areas required for a central apparatus room would consume valuable space.

For larger and taller buildings under six stories, low-pressure induction systems are appropriate.

In walk-up and garden-type apartments, if enough of the apartments share a common wall, a central refrigeration machine supplying chilled water to under-window units in each apartment would be suitable. Ventilation air could be drawn directly through the outside wall of each conditioned room. Heating in the winter could be supplied by the same coils used for cooling.

Still another solution to the garden-apartment conditioning problem is the use of package units and window conditioners. The useful life of this type of equipment is shorter, and in a large project, maintenance and operating costs are apt to be greater than if refrigeration were centralized.

3. Height of Structure

For the taller apartment building using a central type air handling system, it may be necessary to have fan rooms on more than one floor. A 10- or 12-story building with air distribution equipment of the low-pressure type might require two or more rooms for equipment. Each equipment room takes up rental space, as do the large, vertical ducts.

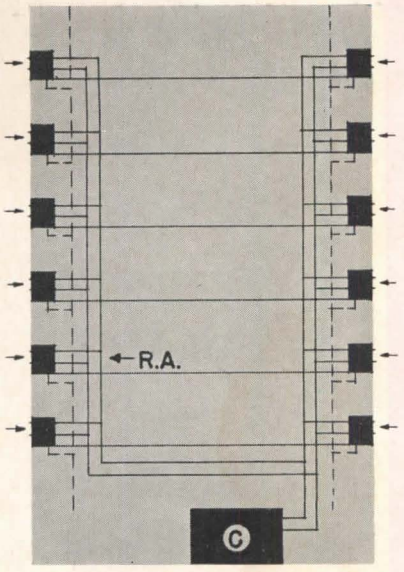
In the tall, narrow building, one of the perimeter systems (under-the-window units containing chilled water coils with primary air supplied by small, high-pressure conduits, or induction through the outside wall) should be given serious consideration. The risers for chilled water, drainage, and air take up a relatively small amount of space. It is even possible to enclose the ascending chases in pilasters or fins on the exterior of the building with little or no loss in cooling efficiency.

4. Plan Shape of Structure

As mentioned before, the more the building shape departs from the square shape, the higher are equipment, operating and maintenance costs. The low, lengthy rectangular structure, for instance, requiring long, horizontal runs of duct-work and piping sometimes can be handled only by two or three separate apparatus rooms. This is due (as in the case of tall buildings) to frictional and cooling losses in low-pressure ducts. The relatively larger solar load on the roof of this long, narrow structure further intensifies the problem. In this case, chilled water units with individual

ARCHITECTURAL ENGINEERING

SEVEN AIR CONDITIONING SYSTEMS FOR APARTMENT BUILDINGS



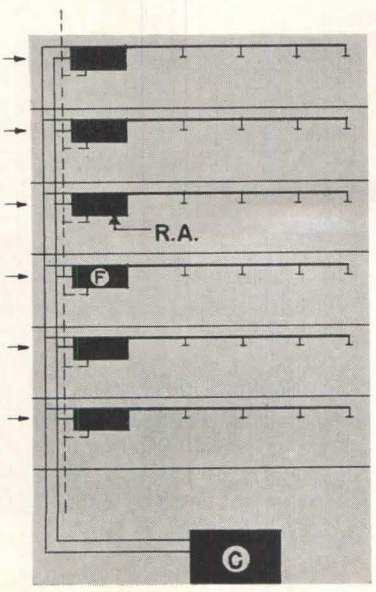
1

Under-Window Fan Units. With water coils. Central chilled water system

LEGEND

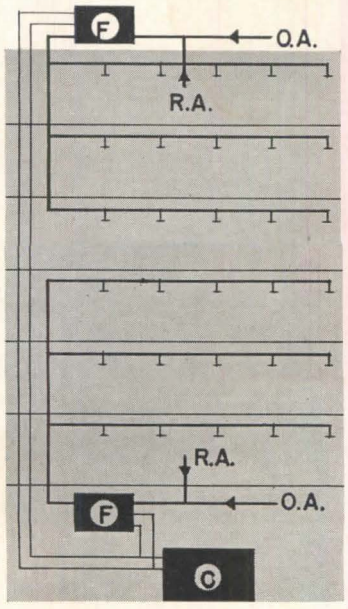
Ⓒ	CHILLED WATER
Ⓕ	FAN
———	DUCT
——	PIPELINE
----	CONDENSATE
⊥	DIFFUSER
R.A.	RETURN AIR
O.A.	OUTSIDE AIR

	1	2	3
Types of Applications	2- to 6-story apartment buildings. Alteration jobs because of ease in fitting piping	2- to 6-story apartment buildings. Alteration jobs where there is sufficient headroom	Taller apartment buildings. Alteration jobs (ducts can be outside building)
Temperature Control	Individual control at unit	Room or zone thermostat	Room or zone thermostat
Service Connections			
a. Power	Yes (110-v, single phase)	Yes, but fan room may not be located in tenant space	Yes, but not in tenant space
b. Pipes	Chilled water (2), drain	Yes, but fan room may not be located in tenant space	Yes, but not in tenant space
c. Ducts	Vent opening in outside wall	S R	Ⓢ R
Relative Considerations			
a. Operating cost	C	B	A (Best)
b. Maintenance	B	B	A
c. Loss of rentable area	B	C	A
Winter Heating	Yes	Possible, but difficult with same system. Tempering generally provided	Same as (2)
Quality of Air Distribution	B	Ceiling diffusers—A (Best) Registers—B or C	Ceiling diffusers—A Registers—B or C
Location of:			
a. Cooling tower	Roof if single building. Roof or grade in central location if more than one building	Same as (1)	Roof
b. Evaporative condenser	Same location as refrigeration equipment (may need discharge duct to roof)	Same as (1)	Same as (1)
c. Refrigeration equipment	Basement or other central location	Same as (1)	Basement or roof



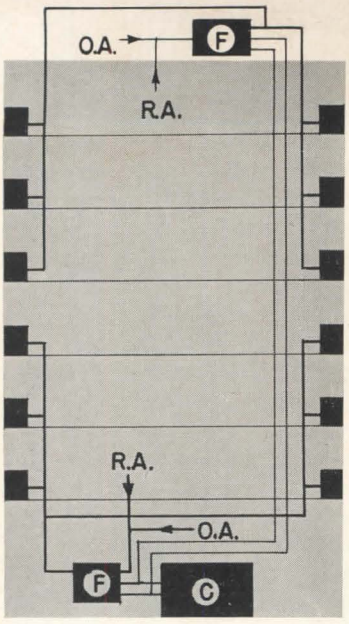
2

Multiple Fan—Water Coil Units. Ducts in corridors and rooms to outlets. Central chilled water system



3

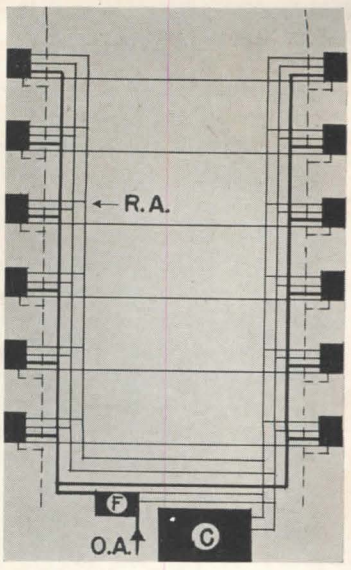
High Pressure Fans. High velocity ducts in corridors and rooms to outlets. Central chilled water system



4

Low-Pressure Induction Units.

(No cooling coils.) Supplied with conditioned ventilation air from central fans and recirculated room air. Central chilled water system

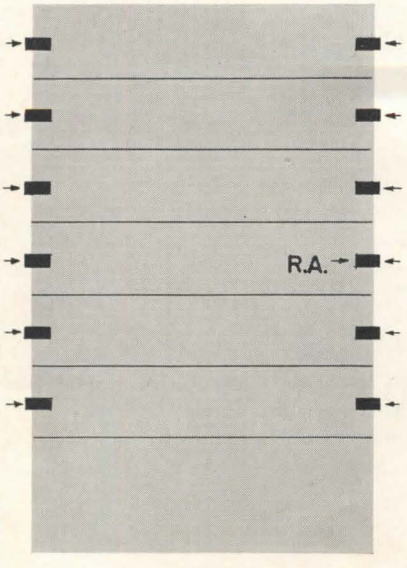


5

High-Pressure Induction Units.

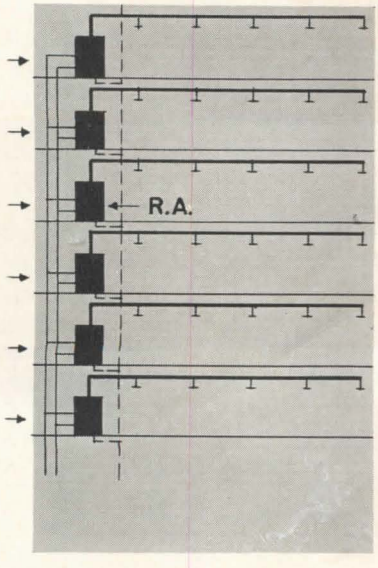
With water coils. Supplied with conditioned ventilation air from central fans and recirculated room air. Central chilled water system

4 Taller apartment buildings	**5** Tallest apartment buildings	**6** Buildings with only a few apartments conditioned	**7** 2- to 6-story apartment buildings. Some alteration jobs * *Refrigeration equipment must conform to N.B.F.U. requirements and local codes.
Individual control at unit	Individual control at unit	Individual control at unit	Room or zone thermostat
No	No	Yes	Yes, but not in tenant space
No	Chilled water (2), drain	No	Yes, condenser water (2), drain
S R	Ⓢ	No	S R
A A B	B A A	C D A	B C C
Yes	Yes	Some is possible	Possible, but difficult with same system. Tempering can be provided
B	B	B or C	B or C
Roof	Roof	No	Same as (1)
Same as (1)	Same as (1)	No	Same as (1)
Same as (1)	Same as (1)	Self-contained	On every floor or alternate floors



6

Portable Window Units



7

Packaged Air Conditioners.

Ducts in corridors and rooms. Separate refrigeration apparatus may serve multiple fan units

room air induction is perhaps the most economical solution, although the high-pressure air conduit and room-unit combination could fit in satisfactorily.

Wings angling off in various directions, recessed outside wall sections, vertical set-backs, and other valid design techniques relative to land use, view and privacy usually present more outside building surface to solar radiation. It should be remembered that these factors make necessary bigger equipment, more complex distribution systems and more maintenance.

5. *Choice of Heating System*

In existing structures it is frequently more economical to retain the present heating system and add summer conditioning separately. Certain types of existing steam supplies can be used for centrifugal refrigeration machines, or the absorption type of cooling equipment.

Generally it is conceded that a combined heating and cooling system may effect an annual savings of 20 to 30 per cent over separate systems.

In new buildings, it is obvious that common duct-work and piping should be employed for heating and cooling. However, certain situations where extremities of either winter or summer climate are involved, or where there are specialized design problems, might rule out this particular economy.

6. *Percentage of Total Area to be Air Conditioned*

This consideration gives the architect and owner a good deal of latitude investment-wise. To meet financial limitations, service areas, lobby, etc. may be left unconditioned.

Also there is the question of how many rooms it is necessary to condition in two- and three-bedroom apartments. Spill-over may take care of the second or third bedrooms to some degree.

Again, it is not mandatory to condition all of the apartments in a building. Certain sections may be oriented to a prevailing wind, and with sun shut out, so that they may be comfortable without summer cooling.

7. *Location of Apparatus Room*

In multi-story buildings central air conditioning equipment can be placed in the basement, on an intermediate floor, or on the roof. It is advantageous to keep refrigeration equipment and fans close together to take advantage of the short connections possible, and to reduce operating and maintenance costs.

There are some obvious advantages in locating the basic air conditioning apparatus within a single roof penthouse in new construction for the following reasons:

(a) the two systems can be coordinated more easily, in terms of power, water and steam.

(b) condenser water pipes to the cooling tower, and chilled water lines to equipment will not take up valuable space running the entire height of the building.

(c) fresh air for the air conditioning system may be cleaner: filter maintenance may be lessened.

(d) construction of penthouse need not be expensive. The cost is usually less, in the case of existing structures, than rearranging basements.

(e) frequently zoning regulations allow penthouses to exceed prescribed building height. This, in effect, adds rentable space to the building, especially where the ground slope might allow some basement space to be used for extra apartments.

8. *Local Zoning, Code and Health Requirements*

The main considerations here are plumbing, electrical wiring and equipment, building height, building construction, restrictions on water usage, duct construction and installation and cross-circulation of air between individual dwellings.

There are certain apparent economies in returning room air from apartments to the central air system, but there is the possibility of the spread of air-borne disease, and at least the chance of kitchen odors getting around. There is no general agreement on the matter of airborne disease so it largely becomes dependent on local opinions and ordinances. It is significant though that FHA will not underwrite apartment air conditioning in new construction where cross-circulation is planned.

If air is not cross-circulated, then it is exhausted through vents in kitchens and bathrooms plus normal exfiltration. Usually the capacity of these vents will have to exceed local code requirements to provide adequate air changes and freedom from odors.

9. *Other Factors Affecting Operating Costs*

There are other variables affecting operating costs over which the architect has little or no control. Foremost among these is the competency of the operating personnel. Complex installations in large buildings are by no means automatic, and they take experienced supervision around-the-clock.

The tenants themselves — when they have access to dampers, controls on under-the-window units, etc. — usually can be persuaded to shut off units when their apartments are unoccupied, and to coöperate by keeping windows closed during the cooling season.

The above factors are mentioned because the architect will be held partly responsible for the performance of the equipment after it is in operation.

Summary of Recently Formulated FHA Requirements for Air Conditioning

FHA's recent Mechanical Engineering Bulletin No. ME-12 on summer air conditioning listed some minimum requirements having bearing on the architectural design:

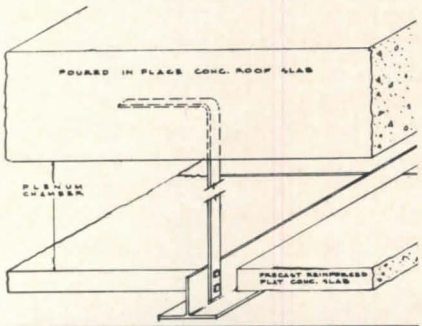
Facilities shall be safe, quiet (45 decibels furnished, 50 unfurnished), economical in operation and maintenance, and shall provide temperature and relative humidity within the Summer Comfort Zone (as described and illustrated in the 1954 edition of the ASHVE Guide) in apartments when the outside dry and wet bulb temperatures are at the design conditions.

Acceptable installations must be installed as a permanent part of the structure, and shall have distribution systems serving, as a minimum, the living room and any adjacent spaces not separated by doors; and at least one bedroom must be conditioned. Self-contained conditioners installed in the walls are acceptable, although these units when in the window or free-standing in the room are not regarded as part of the structure

Data must be submitted on construction details affecting heat gain. Heat gain and Btu extraction calculations must be submitted along with the cost of the installed system, and estimates of annual operating and maintenance costs of summer conditioning.

Return air from any living unit shall not be recirculated and delivered to any other living unit (in new construction). Grilles for return air shall be sized so that the velocity of air through free spaces will not exceed 500 fpm. Return air inlets shall be of sufficient number and located so that return air from one room will not pass across normally occupied floor areas of another so as to cause objectionable drafts.

PRECAST CONCRETE SLABS *Form Suspended Ceiling Enclosing Ventilation Plenum in Chicago Garage*



Precast concrete slabs have been used in a novel way to form a 131,000-sq ft suspended ceiling, enclosing a 450,000-cu ft plenum chamber for the ventilating system, in the new 2359-car Grant Park Underground Garage in Chicago.

The slabs, approximately 2 ft by 5 ft and 1⅝ in. thick, and designed for an ultimate load of 250 psf, rest on T irons which were bolted to steel hangers suspended from the poured-concrete roof on the upper level of the two-story garage. After all joints were sealed on the upper side with an asphalt asbestos mastic, the entire under-surface of the permanent, non-combustible ceiling and the toes of the T irons (which can be seen supporting the slabs in the photograph) were painted white, giving the appearance of a flush ceiling surface into which glass-enclosed fluorescent lighting units were recessed. Special slabs with rectangular cutaways were cast by the slab manufacturer to provide for the recessed lighting fixtures.

Fresh air is drawn into the plenum chamber between the suspended ceiling and roof through intake louvers which have been installed under the benches and terrace walls in Grant Park, which is being restored to its original appearance on top of the garage roof. The air is drawn into the garage from the chamber and then exhausted through grills on the west wall by means of 28 tubaxial fans ranging from 20 to 30 hp.

Car-handling facilities in the Grant Park Garage were covered in the August AR, p. 205. Ralph H. Burke, Inc., and John Griffiths and Son Construction Co., both of Chicago, were the designer and general contractors, respectively.

PLASTICS | *Conferees Consider Applications, Future in Building*

That plastics will play an increasingly important part in building seemed to be the feeling among the 500 architects, engineers, designers, builders and building manufacturers who attended the two-day Plastics in Building Conference in Washington during late October. The conference was sponsored jointly by the Building Research Advisory Board, the Society of the Plastics Industry and the Manufacturing Chemists' Association.

Summing up for the Building Industry at the end of the sessions, Dr. Harry N. Huntzicker, Conference Chairman and Vice President and Director of Research of U. S. Gypsum Co., lauded the combined efforts of the two industries, but stated that "we need to know more of each other's language." His remarks emphasized those of Fred M. Hauserman, President of the Building Research Institute and also of the E. F. Hauserman Co., who said, "We cannot think only in terms of a particular component in which we are directly interested, but we must think in terms of the relationship of that component to the finished building, which is the end product."

Robert K. Mueller, Vice President and General Manager of Monsanto Chemical Co.'s Plastics Div., speaking for the Plastics Industry, declared that "the trend toward prefabricated building materials and structural elements presents

(*Plastics continued on page 190*)

BRIDGES | *Ten Selected for 1953 Honors; Three Win Top Awards*

Ten bridges in ten states were selected from 68 entries as the best-looking steel bridges opened to traffic in this country in 1953. A jury composed of three architects (Edward D. Pierre, Indianapolis, Ind., John Nobel Richards, Toledo, Ohio, Kenneth C. Wischmeyer, St. Louis, Mo.), an engineer (L. B. Combs, Head of Civil Engineering Dept., Rensselaer Polytechnic Institute) and the director of an art museum (Bartlett H. Hayes, Jr., Director Addison Gallery of American Art, Phillips Academy, Andover, Mass.) awarded top honors to three bridges (shown below, left to right), withholding a first prize in Class I comprising bridges with spans of 400 ft or more:

Class II, for bridges with spans under 400 ft, costing over $500,000: Ninth and Tenth St. connection, Bayshore Freeway, San Francisco, Calif. Owner: State of California. Designer: Bridge Dept., Div. of Highways, State of California. Fabricator: Bethlehem Pacific Coast Steel Corp.

Class III, for bridges with fixed spans under 400 ft and costing less than $500,000: Robert St. Underpass (pedestrian) over South Freeway, Fort Worth, Tex. Owner: Highway Dept., State of Texas. Designer: Texas Highway Dept., Fort Worth Urban Project Office, A. M. Gordon, Supervising Design Engineer. Fabricator: North Texas Steel Co., Inc.

Class IV, for movable bridges: New York Central Railroad Bridge No. 8 over Cuyahoga River, Cleveland, Ohio. Owner: N. Y. Central Railroad. Designer: Howard, Needles, Tammen & Bergendoff. Fabricator: The Mount Vernon Bridge Co., Mt. Vernon, Ohio.

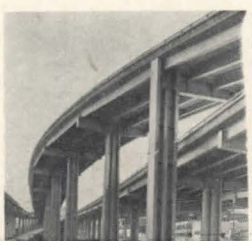
Honorable Mention Awards went to seven bridges:

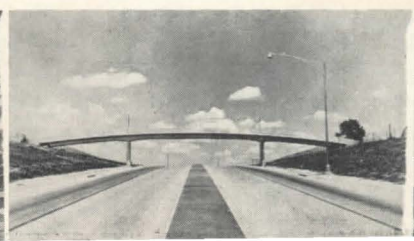
Class I: Mores Creek Bridge over Mores Creek near Boise, Idaho.

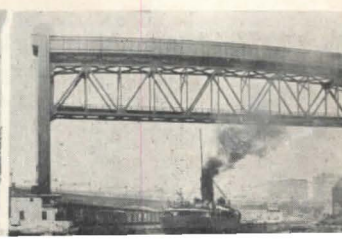
Class II: Milford, Pa.–Montague, N. J. Delaware River Bridge; New York State Thruway over Onondaga Lake Outlet, Towns of Geddes and Salina, N. Y.

Class III: West Henrietta Rd. Bridge over the New York State Thruway in Monroe County, N. Y.; New Hope Pond Bridge, U. S. Rt. 50 at Willards, Md.; Hoover Ave. Van Wyck Expressway Extension at intersection of Van Wyck Expressway and Hoover Ave., Queens, N. Y.

Class IV: Bay St. Louis Toll Bridge, U. S. Highway 90 in Hancock and Harrison Counties, Miss., between Bay St. Louis and Henderson Point.







INTEGRATED METAL TUBES | *New Process "Blows" Tubing Pattern in Bonded Metal Sheets*

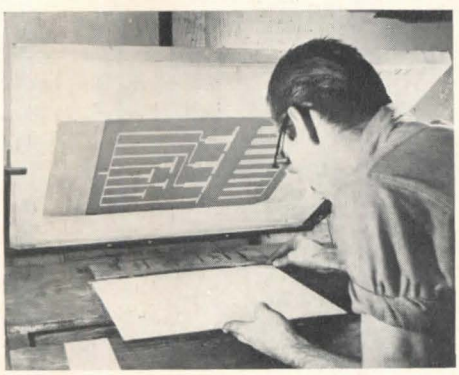
This is a piece of metal stamped with a "stop-weld" material to prevent bonding with another piece of metal. Directly below is the same piece of metal, bonded to another piece of the same size by hot and cold rolling and then hydraulically "blown up" into an elongated, integrated sheet of tubes and metal. That, in short, is the substance of a new process developed by the Metals Division of Olin Mathieson Chemical Corp., which promises to affect design and production techniques in home construction, insulation, heating and air conditioning.

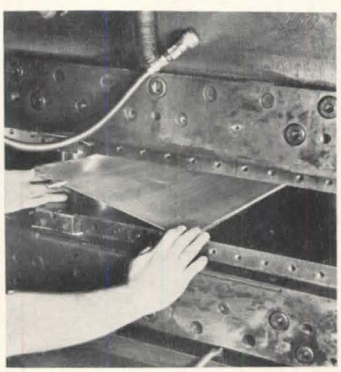
Mathieson engineers envisage unlimited possibilities for utilization of this new process, by which any pattern of tubing can be created within a single homogeneous sheet of any metal that can be roll-bonded: aluminum, copper and stainless steel. The homogeneity of the tubes and metal provides maximum heat conductivity. The absolute fusion of the metal sheets gives a product as strong as the original metal. Passageways can be designed like corrugations to provide great strength for structural members.

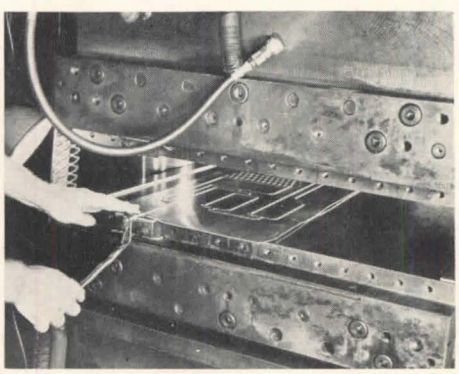
It is within the realm of possibility that entire sides of houses can be made from the roll-bonded sheets, with large air spaces or small passageways within the metal serving as insulation or conducting heating or cooling agents, wiring conduit, etc. Perhaps smaller and more efficient air conditioning units can be built or less expensive insulating materials used in walls having integral tubing. M.I.T. researchers report that the tube sheets bring solar heating of houses closer to reality.

The method by which these integrated metal tubing sheets is produced starts with a silk-screen process. One of two flat pieces of metal which have been cut to size and cleaned is patterned with a stop-weld material through a framed silk screen, as illustrated below left. The two sheets are then placed face to face to form a metal "sandwich" and are spot-welded to keep them together in the proper relative positions. The "sandwich" is heated and rolled to produce a complete bond. The hot rolling and subsequent cold rollings, which reduce the homogeneous sheet to proper thickness, elongate the stop-weld pattern several times, so the silk-screen pattern has to be pre-planned to result in the proper size.

After roll-bonding and annealing, one end of the elongated plate is trimmed and a needle is inserted into the bared end of the stop-welded pattern (*middle* picture). The next step is to place the bonded plate between two heavy platens in a hydraulic press and apply hydraulic pressure to inflate the non-welded design. Areas where stop-welding has been applied become passageways which correspond exactly to blueprint specifications.







AIR CONDITIONING | *Its Installation in Existing Building Makes More Floor Space Available*

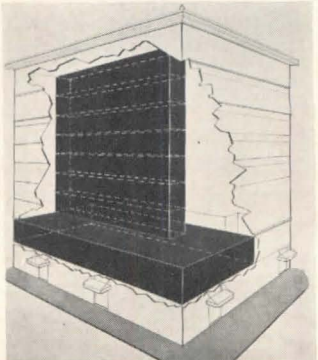
Air conditioning, in addition to serving its main function of comfort-cooling, has been reported as being indirectly responsible for the recovery of 29 per cent more floor space to the Wachovia Bank and Trust Co., Winston-Salem, N. C.

As shown in the cutaway drawing, a new second story was created by cutting horizontally through the original high-ceilinged ground-floor banking area, and about 1000 sq ft per floor was gained by constructing floors across the old ventilation court at every level from the second through the eighth story.

As originally designed 44 years ago, the air shaft and the two-story-high ceiling on the ground floor has permitted some alleviation of discomfort through ventilation and the fact that the warmest air would rise to the ceiling in the banking area. With the installation of the air conditioning system, these ventilation areas were no longer necessary. As designed by P. L. Davidson, Consulting Engineer of Greensboro, N. C., and Philadelphia, Pa., the system takes up none of the reclaimed space. The centrifugal refrigerating machine is located in a modernized equipment room in the basement, and a tower for central air conditioning equipment has been constructed up the outside of the building in a set-back area no longer required for natural ventilation.

Air Conditioning Corp. of Greensboro and Winston-Salem, N. C., was mechanical contractor, and Frank L. Blum was general contractor.

(*Roundup continued on page 186*)



OFFICE LITERATURE

WIRING SYSTEMS

• *Residential Wiring Handbook* reports on standards for home wiring systems in line with current and anticipated future usage of electricity in the average home. *Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y.*

• *Remote-Control Wiring System Manual #16-284* contains complete technical and installation data on the remote-control system of wiring, including wiring diagrams, wiring layouts, suggested specifications. 33 pp, illus. *General Electric Co., Construction Materials Div., Bridgeport, Conn.**

ELECTRICAL DISTRIBUTION

• A new bulletin carries a complete listing of fusible service equipment manufactured by *Federal Pacific Electric Co., 50 Paris St., Newark, N. J.*

• Electrical distribution and service connectors are covered in a 22-page illustrated *Bulletin 71. The Thomas & Betts Co., Inc., Elizabeth 1, N. J.*

FLOORS: FINISHES, CLASSIFICATIONS, APPLICATIONS

• Four pamphlets on floor treatments are available from Hillyard:

Finishing and Refinishing Gym Floors includes blueprints of regulation court diagrams and gives complete job instructions on cleaning, sealing, finishing and maintaining.

Treating Specifications for Cement and Terrazzo Floors gives full product information, including treatments for cement and terrazzo floors in industry.

Why Strip? explains cost-saving advantages achieved using quality wax

Floor Finishes and Treatments presents descriptions and specifications for initial treatment, refinishing and maintenance of every type floor including asphalt, rubber, linoleum, vinyl, wood, cement, terrazzo and magnesite. *Hillyard Chemical Co., St. Joseph, Mo.**

• *Floors and Floor Problems* explores how various types of floors are built and how their troubles can be treated. 24 pp, illus. *The Tremco Mfg. Co., 8701 Kinsman Rd., Cleveland, Ohio.*

• Composition, special characteristics, color range and installation data of *Vina-Lux Reinforced Vinyl Tile* and *Duraco Greaseproof Industrial Tile* are described in two new folders from *Uvalde Rock Asphalt Co., P.O. Box 531, San Antonio 6, Texas.**

• An illustrated folder containing complete specifications on the application and maintenance of *Plastile 22 Tygon Vinyl Plastic Flooring* as well as giving its complete chemical resistance analysis is available from *Conneaut Rubber and Plastic Co., Conneaut, Ohio.* (℅ Mr. Robert C. Hunter)

• A 12-page, illustrated brochure gives tile classifications and dimensions of *Vikon* metal and plastic tiles and lists the 26 available colors. *Vikon Tile Corp., Washington, N. J.**

• Four pages of color charts are part of an 8-page brochure discussing rubber and vinyl floor tile. *Wright Mfg. Co., 5200 Post Oak Rd., Houston, Tex.*

LIGHTING FOR A VARIETY OF INSTALLATIONS

• "*We'll Plan Your Lighting for Results Like These . . .*" is a folder illustrating store, factory, office, school, hospital and parking lot lighting installations. *Electro Silv-A-King Corp., 1535 S. Paulina St., Chicago 8, Ill.**

• *Westinghouse Lighting Handbook* includes the most recent data available on light measurements and maintenance factors as well as recommendations for design and application of lighting systems for specific requirements. 250 pp, illus., $2.50. *Advertising and Sales Promotion Dept., Westinghouse Lamp Div., Bloomfield, N. J.*

• *Style Book* covers lighting designs for both residential and commercial applications including lighting fixtures and wall, table and floor lamps. 96 pp, illus.

Wonderful Things Are Happening in Lighting is designed to show the contribution lighting can make to the beauty and comfort of the home. 16 pp, illus. 25¢. *Lightolier, Inc., Box 368, Jersey City 5, N. J.**

• A *Fluorescent Lighting Guide Book* is a reference digest of fluorescent lamps and parts. 22 pp, illus. *Sylvania Electric Products Inc., 1740 Broadway, New York 19, N. Y.**

• *Pittsburgh Permaflector Luminaires and Wall Urns* (4 pp, illus.) is Bulletin E in a series covering lighting equipment.

Lighting equipment for indirect lighting, strip lighting, interior spotlighting and interior floodlighting, as well as accessory equipment for these fixtures, are cataloged in *Bulletin F, Pittsburgh Reflector Co., 402 Oliver Bldg., Pittsburgh 22, Pa.**

• *Daylighting Your Schools* contains graphic data on the effective use of top-lighting in schools. 8 pp, illus. *Wasco Flashing Co., 87 Fawcett St., Cambridge, Mass.**

• A new, illustrated 44-page price catalog of fluorescent lighting equipment has been issued by *Smithcraft Lighting Div., Chelsea 50, Mass.**

• *Effective Stage Lighting* for auditorium presentations (12 pp, illus.) is offered by *Hub Electric Co., 2255 West Grand Ave., Chicago 12, Ill.*

• *Day-Brite Binder Index* pages gives construction, installation and wiring data on Day-Brite commercial and industrial lighting fixtures. *Day-Brite Lighting, Inc., 5411 Bulwer Ave., St. Louis 7, Mo.**

ACOUSTICS

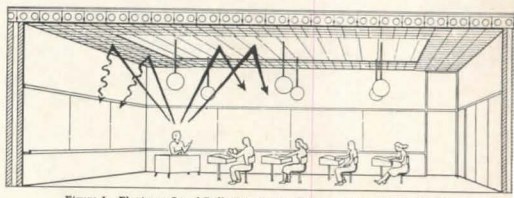


Figure I - Flexicore Sound Reflecting Ceiling with Acoustical Ceiling Border

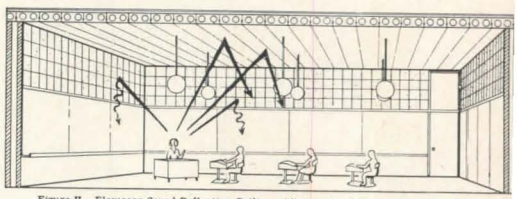


Figure II - Flexicore Sound Reflecting Ceiling with Acoustical Treatment on Upper Wall

• *Technical Report on Schoolroom Acoustics* stresses the need for a sound-reflecting surface as well as some sound-absorbing material for effective schoolroom ceilings. Two applications are shown in the illustrated drawings above. 5 pp, illus. *The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.**

• *Fiberglas Sound Control Products* offers complete data on Owens-Corning's entire acoustical line, illustrated. *Owens-Corning Fiberglas Corp., Toledo 1, Ohio.**

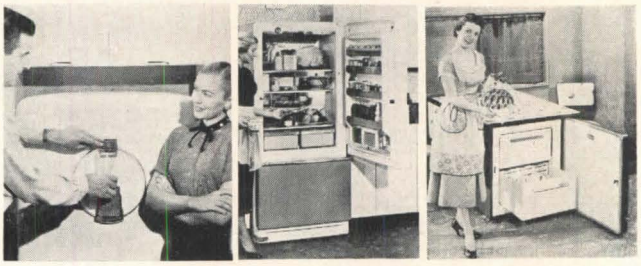
Other product information in Sweet's Architectural File, 1954

(*Continued on page 223*)

1955 IN THE HOME KITCHEN

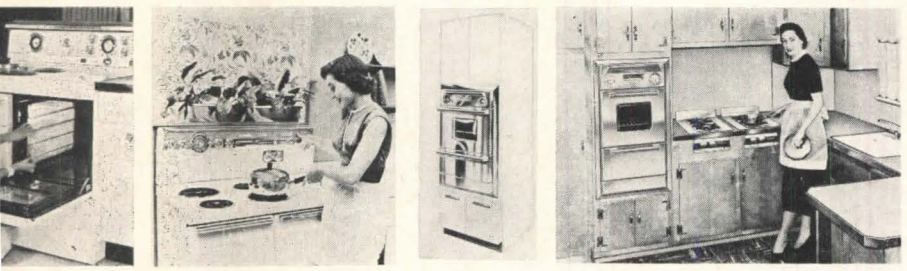
It will be a year of some surprise innovations and of further developments in already established lines of appliances. The trend toward brightness and comfort as well as utility in kitchens continues. Color has been accepted as a major market appeal by almost all manufacturers. And modular and "built-in" kitchens are practical for houses in all price ranges.

REFRIGERATORS AND FREEZERS come in all sizes and shapes, to fit in a number of different areas. The *Crosley Shelvador* freezer-refrigerator features a "roll-out" interior, five different temperature sections and an automatic beverage server through the closed door. *General Electric* continues its refrigerator-freezer combination with adjustable-level, revolving shelves and foot-pedal-operated freezer. G-E has also introduced a wall combination. *Revco* offers an under-the-table freezer with rolling drawers, and also produces a built-in refrigerator-freezer.



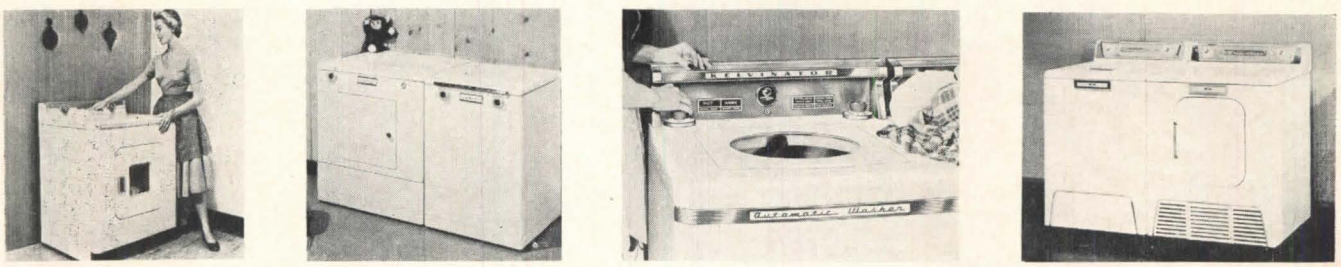
Crosley G-E Revco

Kelvinator G-E Republic Caloric



RANGES are designed for "effortless" cooking and cleaning. The *Kelvinator* oven has side racks fitted with disposable aluminum foil sheets and a removable bottom. *General Electric* range flashes colored lights in six different buttons to indicate proper cooking heats. *Republic's* built-in gas oven has storage space below. The *Caloric* gas range units are built in separately.

G-E Bendix Kelvinator Frigidaire



LAUNDRIES are an accepted part of the kitchen now, and units are designed with that in mind. *General Electric's* big news is its combination washer-dryer with built-in water heater. The *Bendix* washer and dryer have a counter-top work surface — and the hinged panel concealing controls on the washer reveals operating instructions. The *Kelvinator dials* — for water temperature and size of load — light up signal windows on the control panel. The *Frigidaire* washer-dryer pair comes in two price ranges.

DISHWASHERS appear everywhere in the kitchen — on wheels, in cabinets, under the counter. This *General Electric* roll-out dishwasher fits under the sink.

(Continued on page 198)

G-E

A list of manufacturers of products on this page and their addresses appears on page 218.

THERMAL INSULATION—3: Estimation of Economies

By Laurence Shuman, Consulting Engineer

TABLE 1 Suggested Efficiencies for use with the chart

TYPE OF FUEL	FIRING	TYPE OF HEATING APPARATUS: Boilers (steam or hot water)	Warm-air furnaces: Forced	Warm-air furnaces: Gravity	Overflow heaters (space heaters)
Gas	Designed for gas	80	70–80	70	70
	Conversion burners	70	60–70	60	—
Oil	Designed for oil	75	65–75	65	60
	Conversion burners	70	60–70	60	—
Anthracite or coke	Hand-fired:				
	No controls	60	50–60	50	40
	With controls	70	60–70	60	—
	Stoker-fired	75	65–75	65	—
Bituminous coal	Hand-fired:				
	No controls	50	40–50	40	40
	With controls	60	50–60	50	—
	Stoker-fired	65	55–65	55	—

TABLE 2 Fuel Requirements

Multiply number of therms by factor in left-hand column to find fuel requirements in units at right

Factor	Cu Ft of Gas at
91	1100 Btu/cu ft
100	1000 Btu/cu ft
111	900 Btu/cu ft
125	800 Btu/cu ft
143	700 Btu/cu ft
167	600 Btu/cu ft
200	500 Btu/cu ft
Factor	**Lb of Coal at**
7.1	14,000 Btu/lb
7.7	13,000 Btu/lb
8.3	12,000 Btu/lb
9.1	11,000 Btu/lb
10.1	10,000 Btu/lb
Factor	**Gal of Fuel Oil**
0.75	No. 1
0.71	No. 2
0.67	No. 4
0.66	No. 5
0.65	No. 6

Tables 1 and 2 can be used in conjunction with the chart on Sheet 2.

TABLE 3 Heat Transmission Coefficients

All values in Btu/hr/sq ft/F temperature difference
(Data from ASHVE Guide, as adapted by Tyler S. Rogers in "Design of Insulated Buildings," page 107.)

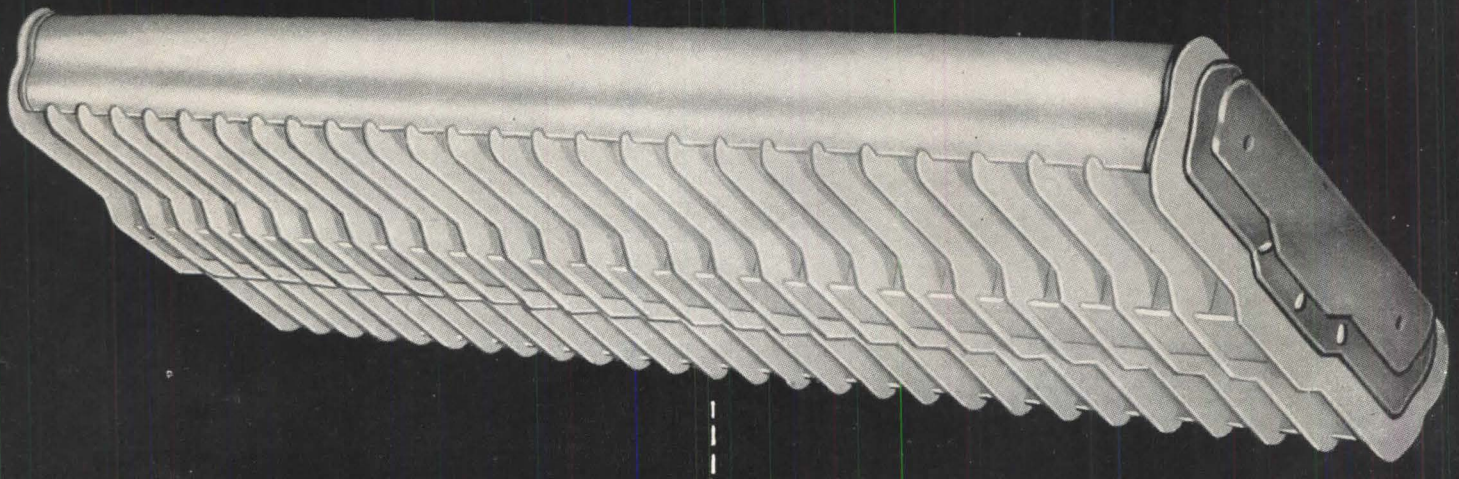
CLASS	MATERIAL	DESCRIPTION	CONDUCTIVITY k (for 1" thickness)	CONDUCTANCE C (for given thickness)	RESISTIVITY $1/k$ or r (for 1" thickness)	RESISTANCE $1/C$ or R (for given thickness)
Air Films	Inside—or still air	Ordinary materials—				
		heat flow horizontal		1.65		.61
		heat flow up		1.95		.51
		heat flow down		1.21		.83
	Outside—15 mph wind	Ordinary materials		6.0		.17
Air Spaces	Ordinary material both sides	Vertical—¾" or more in width		1.10		.91
	Aluminum foil both sides	Vertical—¾" or more in width		.46		2.17
Insulating Materials	Bats, blankets or fill	Mineral, animal or vegetable fiber	.27		3.70	
	Corkboard	No binder	.30		3.33	
	Insulating board	Wood or vegetable fiber	.33		3.03	
	Mineral or glass wool	Rock, slag or glass fiber	.27		3.70	
	Vermiculite	Expanded	.48		2.08	

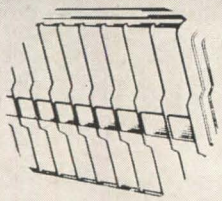
(Table 3 continued on page 181)

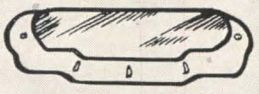
Flexibility PLUS

FOR TODAYS MOST EFFICIENT COMMERCIAL LIGHTING

Wheeler FLO-LINER

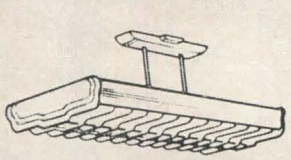


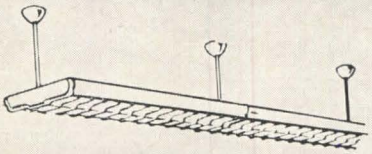




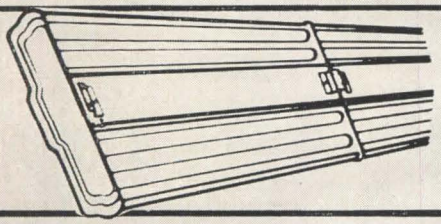
SHIELDING — All fixtures provide 45° crosswise shielding and are available with choice of 25° or 45° lengthwise shielding.

END CAPS — Satin finish aluminum end caps available — order separately.

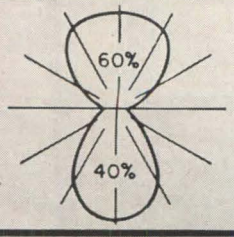




PENDANT MOUNTING — Stem hanger assemblies are required. Single stem hangers used for continuous row mounting. Twin stem hangers for the mounting of individual 48″ lamp fixtures.



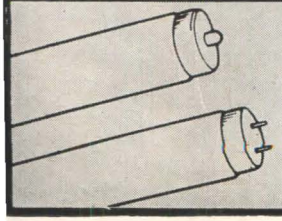
SURFACE MOUNTING — Units may be attached directly to the ceiling. Available as optional equipment are surface mounting plates and top reflectors.



OK

A quality fixture throughout!

85% EFFICIENCY — Translucent plastic side panels and center panel give low brightness for more comfortable seeing and high efficiency. Made of sturdy Polystyrene, they will not warp or discolor. For further seeing comfort 60% of the light is directed above the horizontal.



FIXTURES — 2 lamp and 4 lamp units available for 48 inch 38 watt and 96 inch 74 watt single pin lamps, as well as 48 inch 40 watt bi-pin lamps.

DISTRIBUTED EXCLUSIVELY THROUGH ELECTRICAL WHOLESALERS

Wheeler REFLECTOR COMPANY

275 CONGRESS STREET, BOSTON 10, MASS.

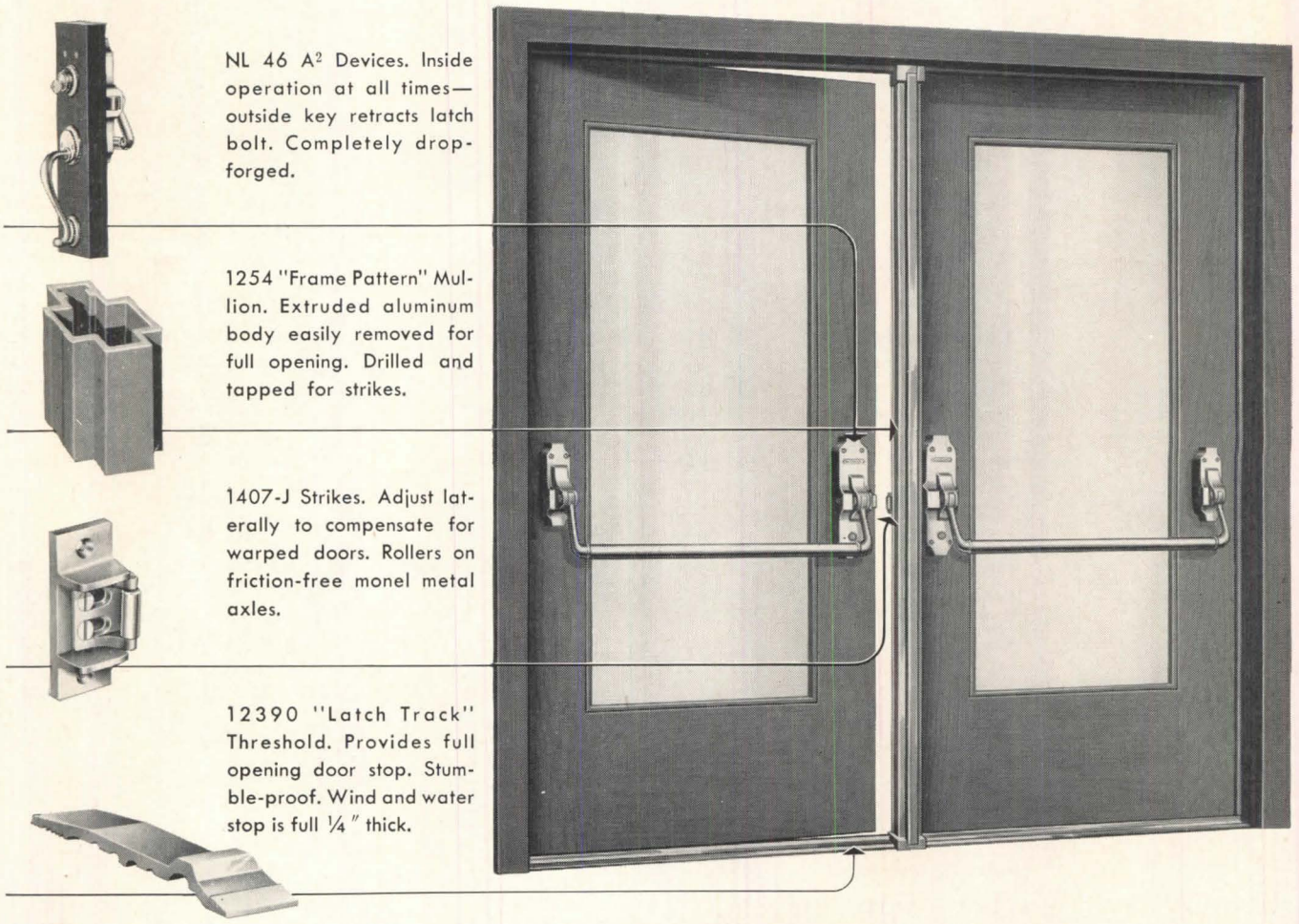
THERMAL INSULATION—4: Estimation of Economies

By Laurence Shuman, Consulting Engineer

TABLE 3 Heat Transmission Coefficients *(Continued)*

CLASS	MATERIAL	DESCRIPTION	CONDUCTIVITY k (for 1″ thickness)	CONDUCTANCE C (for given thickness)	RESISTIVITY $1/k$ or r (for 1″ thickness)	RESISTANCE $1/C$ or R (for given thickness)
Exterior Materials	Asbestos shingles			6.0		.17
	Asphalt shingles			6.5		.15
	Brick veneer	Nominal 4″ thick		2.27		.44
	Built-up roofing	3/8″ thickness		3.53		.28
	Gypsum sheathing	1/2″		2.82		.35
	Insulating fibreboard	25/32″		.42		2.37
	Lap siding, yellow pine			1.28		.78
	Plywood sheathing	5/16″ thick		2.56		.39
	Slate	1/2″	10.00	20.00	.10	.05
	Stucco or stone veneer	1″ thick	12.50	12.50	.08	.08
	Wood shingles			1.28		.78
	Wood, yellow pine or fir	25/32″	.80	1.02	1.25	.98
Interior Materials	Composition wallboard	3/16″ to 3/8″	.50		2.00	
	Gypsum plaster		3.30		.30	
	Gypsum wallboard	3/8″, plain or decorated		3.70		.27
	Gypsum lath and plaster	3 1/2″ plaster		2.4		.42
	Metal lath and plaster	3/4″ plaster		4.40		.23
	Plywood	3/8″, plain or decorated		2.12		.47
Masonry Materials	Brick, common	4″ thick	5.00	1.25	.20	.80
	Brick, face	4″ thick		2.30		.43
	Cement mortar		12.00		.08	
	Clay tile, hollow	3″		1.28		.78
		4″		1.00		1.00
		6″		.64		1.57
		8″		.60		1.67
		12″		.40		2.50
	Concrete	Sand and gravel	12.00		.08	
		Cinder	4.9		.22	
		Pumice	2.42		.41	
		Vermiculite	.86		1.16	
	Concrete block, hollow	Cinder, 4″		1.00		1.00
		Cinder, 8″		.60		1.66
		Cinder, 12″		.53		1.88
		Gravel, 8″		1.00		1.00
		Gravel, 12″		.80		1.25
	Gypsum tile, hollow	4″		.46		2.18
	Gypsum poured	12 1/2% wood chips	1.56		.60	
	Stucco or stone		12.50		.08	
	Tile or terrazzo	For flooring	12.00		.08	
Miscellaneous	Aluminum		1416		.0007	
	Glass	Average	6		.167	
	Soil	Average	7		.14	
	Steel		312		.0032	

for smooth, trouble-free performance, insist on a Von Duprin COMPLETE EXIT



NL 46 A² Devices. Inside operation at all times—outside key retracts latch bolt. Completely drop-forged.

1254 "Frame Pattern" Mullion. Extruded aluminum body easily removed for full opening. Drilled and tapped for strikes.

1407-J Strikes. Adjust laterally to compensate for warped doors. Rollers on friction-free monel metal axles.

12390 "Latch Track" Threshold. Provides full opening door stop. Stumble-proof. Wind and water stop is full ¼" thick.

● Whatever your exit needs, the Von Duprin line includes all types of devices and auxiliary items for a complete exit installation which is dependable, attractive—and above all, *safe*. Each Von Duprin exit hardware item is styled and engineered for unfailing, harmonious operation.

● Whenever you plan exit installations, insist on Von Duprin for the complete job. A Von Duprin "Exit Specialist"—either a factory representative or a selected builders' hardware distributor—will be happy to help you plan the most practical installation. For his name, write direct to:

VONNEGUT HARDWARE CO. • VON DUPRIN DIVISION • INDIANAPOLIS, INDIANA

Von Duprin PANIC DEVICES ASSURE SAFE EXIT ®

"THE SAFE WAY OUT!"

THERMAL INSULATION—5: U Factors for Frame Walls

By Laurence Shuman, Consulting Engineer

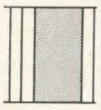
Legend:

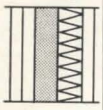
Interior Finishes

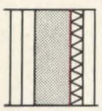
- **A** Metal lath and plaster
- **B** Gypsum board, 3/8" decorated
- **C** Wood lath and plaster
- **D** Gypsum lath, 3/8" and plaster
- **E** Plywood, 3/8"
- **F** Insulating board, 1/2" plain or decorated
- **G** Insulating board, 1/2" and plaster
- **H** Insulating board, 1" and plaster

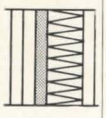
Sheathing

- **1** Gypsum 1/2"
- **2** Plywood 5/16"
- **3** Wood and building paper 25/32"
- **4** Insulating board 25/32"

Wall Type	External Finish	Sheathing	Interior Finish A	B	C	D	E	F	G	H
 No insulation of air space	Wood Siding	1	.33	.32	.31	.31	.30	.23	.22	.17
		2	.32	.32	.31	.30	.30	.23	.22	.17
		3	.26	.26	.25	.25	.24	.19	.19	.17
		4	.20	.20	.19	.19	.19	.16	.15	.12
	Wood Shingle	1	.25	.25	.24	.24	.24	.19	.19	.14
		2	.25	.25	.24	.24	.24	.19	.18	.14
		3	.26	.26	.25	.25	.24	.19	.19	.15
		4	.17	.17	.16	.16	.16	.14	.13	.11
	Stucco	1	.43	.42	.40	.39	.39	.27	.26	.19
		2	.42	.41	.39	.39	.38	.27	.26	.19
		3	.32	.31	.30	.30	.29	.22	.22	.16
		4	.23	.23	.22	.22	.22	.18	.17	.14
	Brick Veneer	1	.37	.36	.35	.34	.34	.25	.24	.18
		2	.36	.36	.34	.34	.33	.25	.24	.18
		3	.28	.28	.27	.27	.27	.21	.20	.15
		4	.21	.21	.20	.20	.20	.17	.16	.13

Wall Type	External Finish	Sheathing	Interior Finish A	B	C	D	E	F	G	H
 2" bat or blanket insulation in stud space	Wood Siding	1	.10	.10	.10	.10	.10	.09	.09	.08
		2	.10	.10	.10	.10	.10	.09	.09	.08
		3	.10	.10	.09	.09	.09	.08	.08	.07
		4	.09	.09	.08	.08	.08	.08	.07	.07
	Wood Shingle	1	.09	.09	.09	.09	.09	.08	.08	.07
		2	.09	.09	.09	.09	.09	.08	.08	.07
		3	.10	.10	.09	.09	.09	.08	.08	.07
		4	.08	.08	.08	.08	.08	.07	.07	.06
	Stucco	1	.11	.11	.11	.11	.11	.10	.10	.08
		2	.11	.11	.11	.11	.11	.10	.10	.08
		3	.10	.10	.10	.10	.10	.09	.09	.08
		4	.09	.09	.09	.09	.09	.08	.08	.07
	Brick Veneer	1	.11	.11	.11	.10	.10	.09	.09	.08
		2	.11	.11	.10	.10	.10	.09	.09	.08
		3	.10	.10	.10	.10	.10	.09	.09	.07
		4	.09	.09	.09	.09	.09	.08	.08	.07

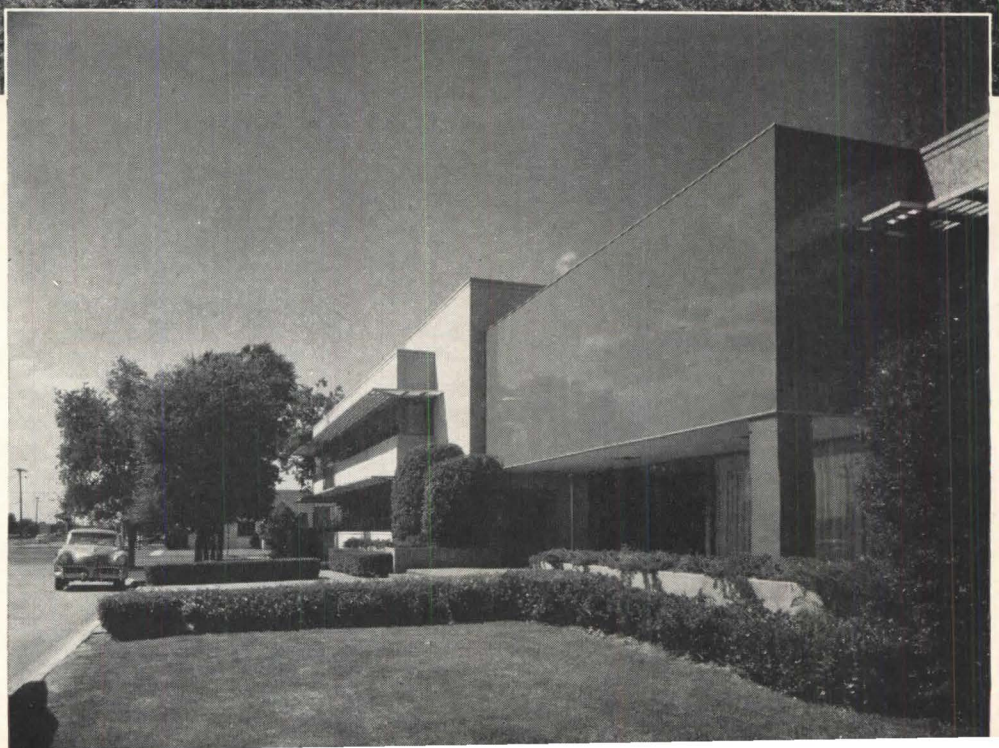
Wall Type	External Finish	Sheathing	Interior Finish A	B	C	D	E	F	G	H
 1" bat or blanket insulation in stud space	Wood Siding	1	.15	.15	.14	.14	.14	.12	.12	.10
		2	.15	.15	.14	.14	.14	.12	.12	.10
		3	.13	.13	.13	.13	.12	.11	.11	.10
		4	.12	.12	.11	.11	.11	.10	.10	.08
	Wood Shingle	1	.13	.13	.12	.12	.12	.11	.11	.09
		2	.13	.13	.12	.12	.12	.11	.11	.09
		3	.13	.13	.13	.13	.12	.11	.11	.10
		4	.10	.10	.10	.10	.10	.09	.09	.08
	Stucco	1	.17	.16	.16	.16	.16	.14	.13	.11
		2	.16	.16	.16	.16	.16	.14	.13	.11
		3	.15	.14	.14	.14	.14	.12	.12	.10
		4	.12	.12	.12	.12	.12	.11	.10	.09
	Brick Veneer	1	.16	.15	.15	.15	.15	.13	.12	.11
		2	.15	.15	.15	.15	.15	.13.	.12	.11
		3	.14	.14	.14	.14	.14	.12	.12	.10
		4	.12	.12	.12	.12	.12	.10	.10	.09

Wall Type	External Finish	Sheathing	Interior Finish A	B	C	D	E	F	G	H
 3" bat or blanket insulation in stud space	Wood Siding	1	.08	.08	.08	.08	.08	.07	.07	.07
		2	.08	.08	.08	.08	.08	.07	.07	.07
		3	.08	.08	.08	.08	.07	.07	.07	.06
		4	.07	.07	.07	.07	.07	.06	.06	.06
	Wood Shingle	1	.08	.08	.07	.07	.07	.07	.07	.06
		2	.08	.08	.07	.07	.07	.07	.07	.06
		3	.08	.08	.08	.08	.07	.07	.07	.06
		4	.07	.07	.06	.06	.06	.06	.06	.05
	Stucco	1	.09	.09	.09	.09	.09	.08	.08	.07
		2	.09	.09	.09	.09	.09	.08	.08	.07
		3	.08	.08	.08	.08	.08	.07	.07	.06
		4	.07	.07	.07	.07	.07	.07	.07	.06
	Brick Veneer	1	.08	.08	.08	.08	.08	.08	.07	.07
		2	.08	.08	.08	.08	.08	.08	.07	.07
		3	.08	.08	.08	.08	.08	.08	.07	.06
		4	.07	.07	.07	.07	.07	.07	.06	.06

(To be continued in a later issue)

ROTARY Oildraulic®

THE MODERN



TEXAS INSTRUMENTS INCORPORATED
Dallas, Texas

Rotary Oildraulic Elevator (Freight)
installed by Hunter-Hayes Elevator Co.

Enlargement project by:
Joseph M. Mills and
Harwood K. Smith, Architects
Jansen Construction Co.,
General Contractors

•

This modern air-conditioned building of Texas Instruments Incorporated provides 150,000 square feet of space for design and manufacture of TI's precision equipment in the fields of electronics, acoustics and geophysics. A Rotary Oildraulic Elevator serves the Radar *Tower at this* magnificent plant in Dallas, Texas.

ELEVATOR FOR ECONOMY AND EFFICIENCY

No penthouse or heavy supporting sidewalls

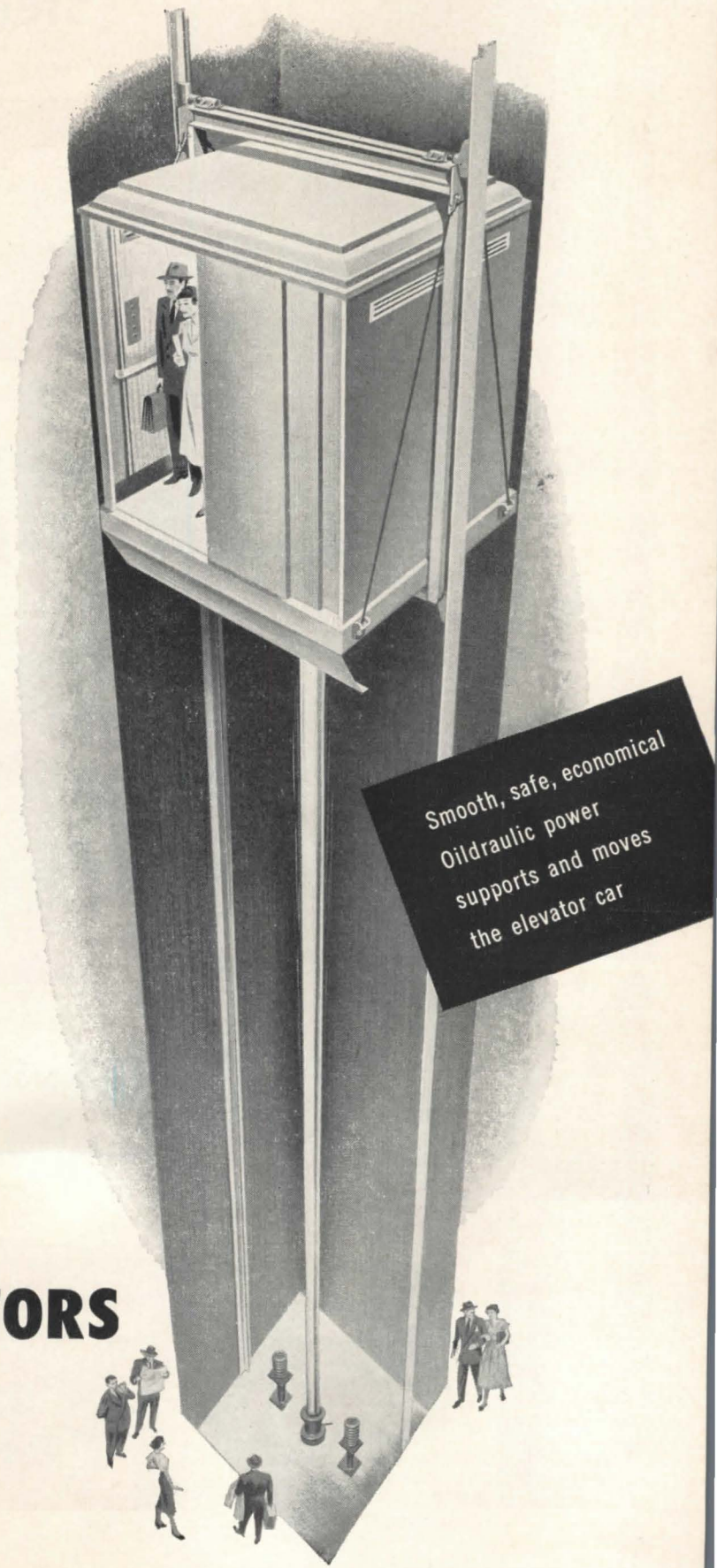
The Rotary Oildraulic Elevator is moved and controlled by oil under pressure, the most powerful and practical method of lifting heavy loads. The elevator car and its load are supported by the hydraulic system — not by the building structure. This eliminates the costly, unsightly penthouse and makes possible a substantial lightening of the shaftway structure. Rotary's compact power unit can be located on any landing, on any side of the hatchway. Thus it can be placed in an area with other mechanical equipment for convenience in servicing and to save valuable space.

Smooth starts, gentle stops, accurate landings

The revolutionary Rota-Flow oil hydraulic power system gives velvet-smooth fluid operation. You can depend on smooth starts and cushioned stops. Oildraulic automatic floor leveling positions the car to each landing with exactness—1/4" is guaranteed!

Over 75,000 Rotary Oildraulic elevators and lifts are serving leading companies from coast to coast. They are manufactured in sizes and capacities as specified, with any desired types of cabs, doors and controls. Our Engineering Department will be glad to assist you on plans and specifications. Write for catalog and complete architectural data.

ROTARY LIFT CO., 1112 KENTUCKY, MEMPHIS 2, TENN.



Rotary®

OILDRAULIC ELEVATORS

PASSENGER AND FREIGHT

Engineered and built by Rotary, world's oldest and largest maker of oil hydraulic elevators

SEE OUR CATALOG IN SWEET'S FILES

A/E ROUNDUP

(*Continued from page 174*)

MODULAR MEASURE | *BRI Confab Considers Use in Practice, Future*

Modular Measure — the dimensional system developed to coordinate building dimensions with unit sizes of stock building materials — was discussed by architects, contractors and producers during the Eighth Research Conference of the Building Research Institute in Washington, D. C., on December 9. The evolution of modular measure and its impact on design, presented by Max Foley of Voorhees, Walker, Foley & Smith and Edward X. Tuttle of Giffels & Vallet, Inc., L. Rossetti, respectively, were followed by panel discussions on the value of modular measure in practice and its future potentialities.

Gannett Herwig of LaPierre, Litchfield & Partners asserted that the architect now faces the problem of whether he shall persist in the maintenance of variations in dimensions (to create visual pleasure) or lead the way toward full implementation of the idea of modular measure. The general tendency, he believes, is toward the gradual adoption of the new system. J. P. Caldwell of J. A. Jones Construction Company thinks that this is an excellent time to push more widespread acceptance of modular coordination because of the development of new materials.

Three leaders in "spreading the doctrine" of modular measure to their colleagues were honored at the 36th Annual Meeting of the American Standards Association, which originated the system, in New York on November 15. The recipients of the citations, recommended by the NAHB, AIA and Producers' Council, were Harold D. Hauf, head of the Department of Architecture at Rensselaer Polytechnic Institute; C. E. Silling, architect, Charleston, W. Va.; and C. W. Kraft, president, Kraftile Co., Niles, Calif.

PLASTIC PIPE *in Skating Rink*

Plastic pipe is being used for circulating chloride brine in a 100- by 200-ft outdoor skating rink on Chicago's south side. The 200-ft runs of 1-in. ID plastic pipe were placed on 4-in. centers over 2½ in. of sand on cinder fill, then fastened by clamps to wood stringers and covered by sand wetted and frozen to form a base for the skating ice. The Buildice Co. were the engineers.

(*Continued on page 190*)

The pleasantly shaded mall, flanked by modern shops, adds charm to the Cross County Center's basically functional design. Towering in the background is the 1500-ton Bethlehem steel framework of the new Gimbel Brothers branch department store.

ANOTHER SUBURBAN SHOPPING CENTER TAKES SHAPE

One of the more spectacular indications of the current movement of population away from congested cities has been the phenomenal growth of suburban shopping centers. An estimated 2000 such developments, large and small, are now in the planning or construction stages, or have been recently completed.

Among the largest is the $30,000,000 Cross County Center at Yonkers, N. Y., at the southern tip of prosperous Westchester County. This 70-acre project, developed by Sol G. Atlas and designed by Lathrop Douglass, boasts branches of two famous department stores—John Wanamaker and Gimbel Brothers. These and other features are expected to attract shoppers from the Bronx and upper Manhattan, as well as from the surrounding suburban areas.

Many of the Center's stores are situated on the 1000-ft-long landscaped mall. At either end of the mall stand the department stores, Wanamaker's to the east, Gimbel's to the west. Ultra-modern in every respect, the stores are constructed on steel frames totalling over 3000 tons, fabricated and erected by Bethlehem.

Among the varied features of the mammoth project are two banks, a 125-bed hospital, restaurants, an auditorium, a huge supermarket and parking fields accommodating 5140 cars.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

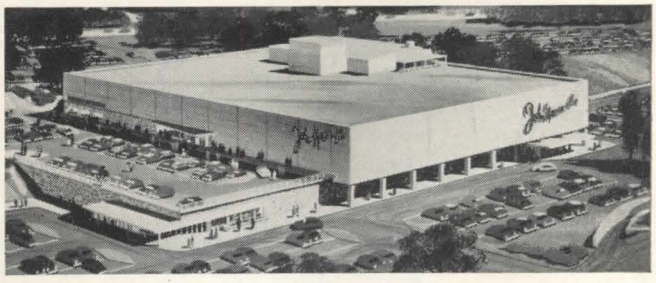
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

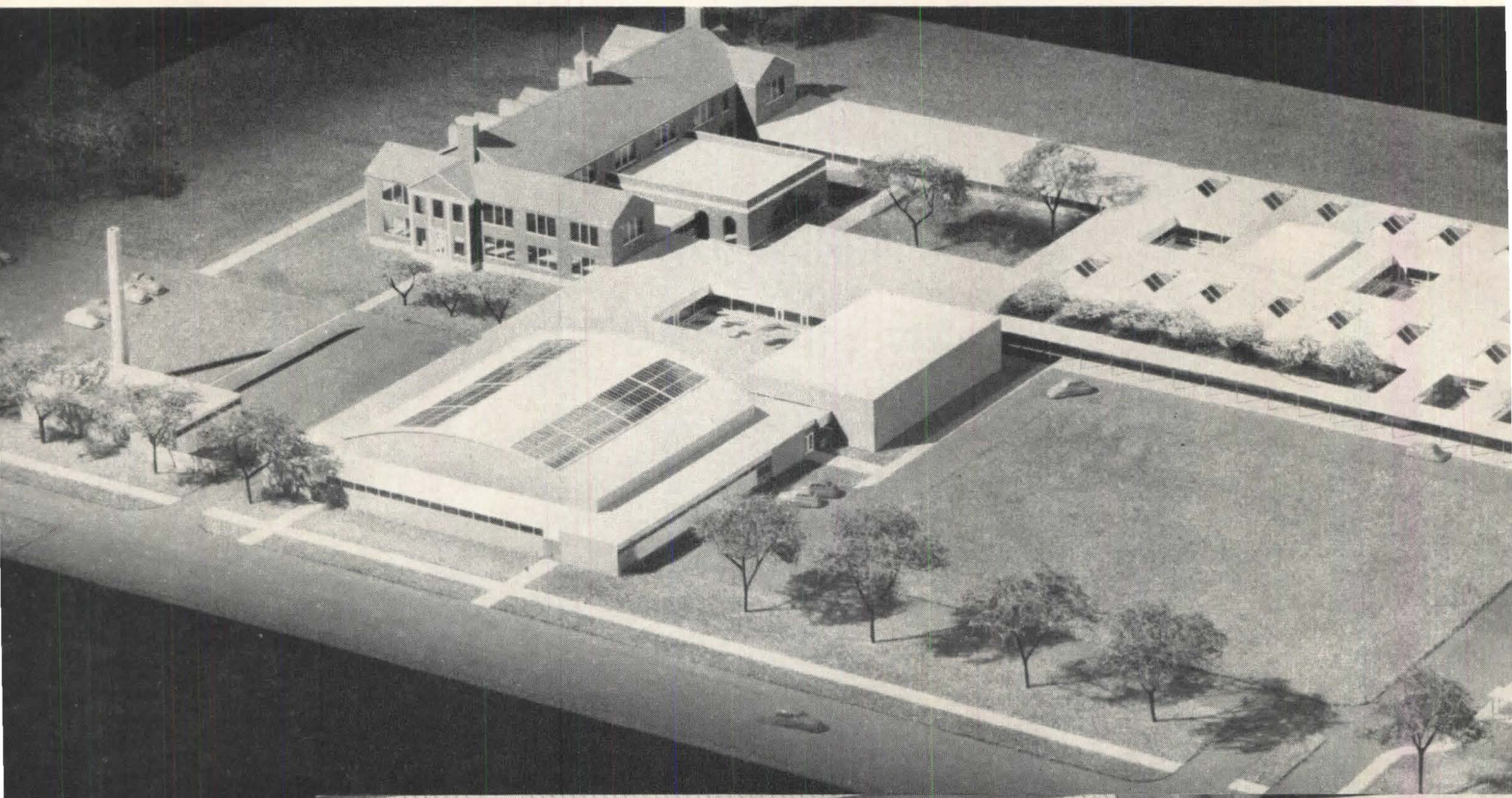
Architect's drawing of the Gimbel Brothers branch department store. The two-story-and-basement, 250,000-sq-ft building will be ready for business in Spring of 1955.

Planning a grand opening in late Fall of '54, Wanamaker's will provide "split-level" parking, with lots at various levels for stair-free access to all three shopping floors.



TOP DESIGN AWARD†

given this successful blend of contemporary with traditional



Detroit University School and Grosse Pointe Country Day School, Grosse Pointe Woods, Michigan

Architects: Leinweber, Yamasaki & Hellmuth

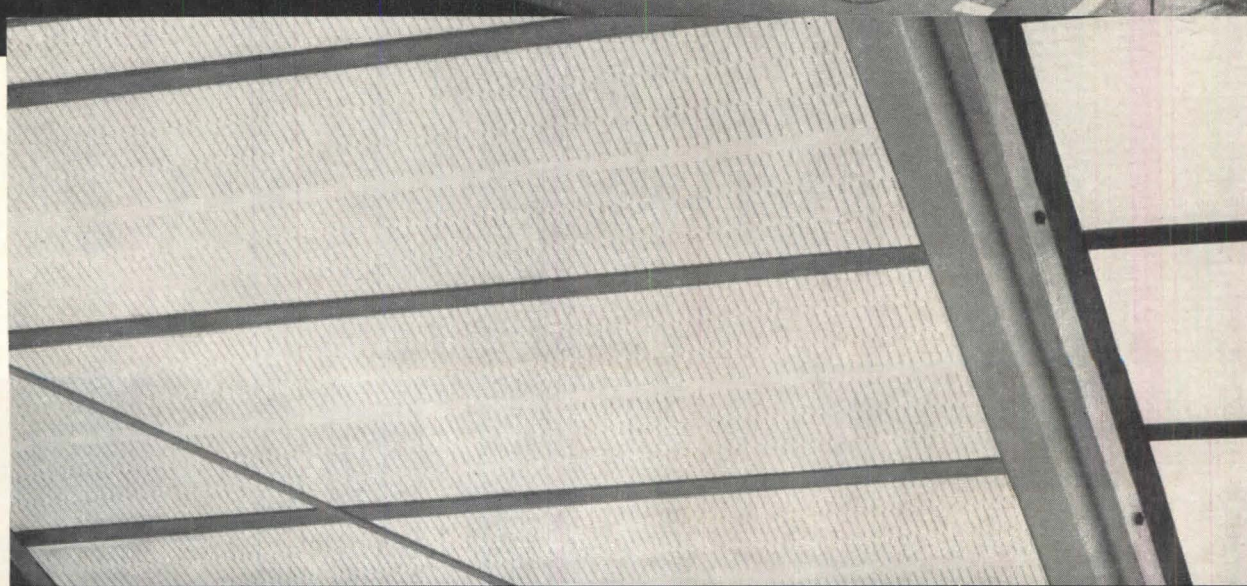
Structural Engineer: Richard H. McClurg

Mechanical Engineer: William Brown

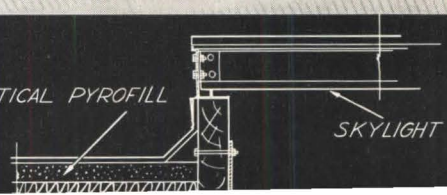
Electrical Engineer: Richard Klees

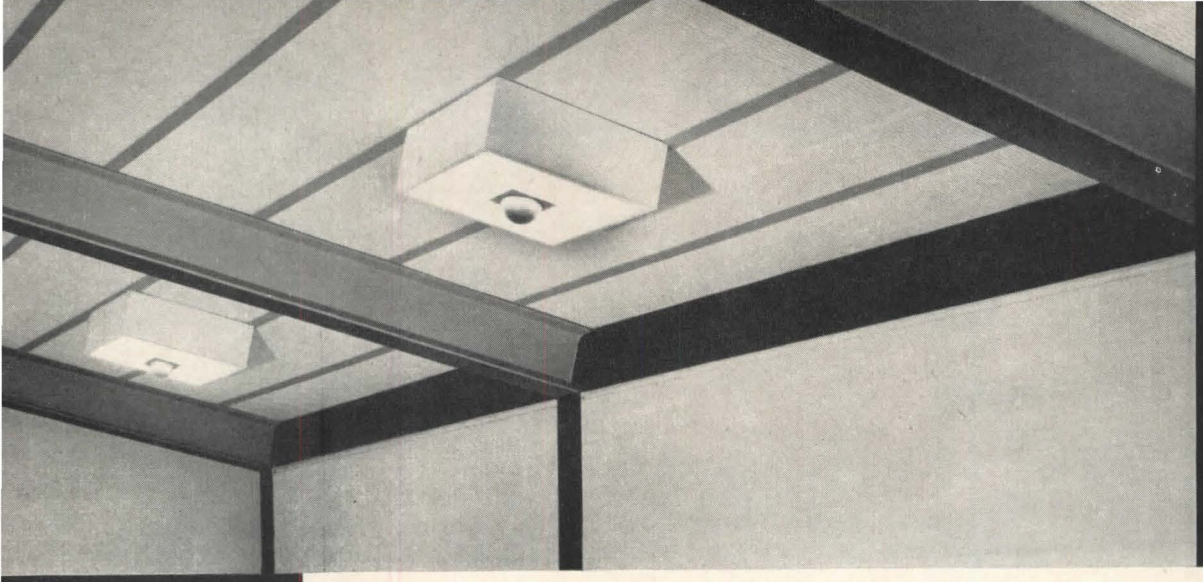
General Contractor: O. W. Burke Company

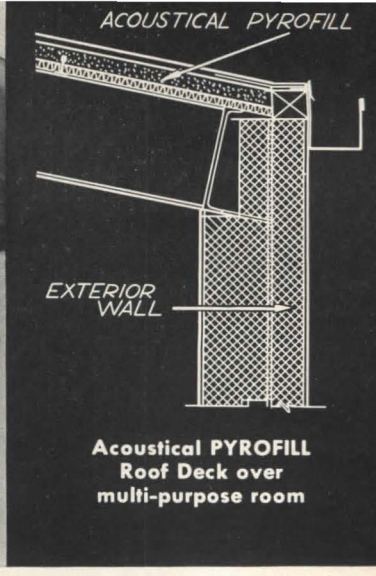
PYROFILL Roof Deck: Hodge-Warren-Zimmerman Co.



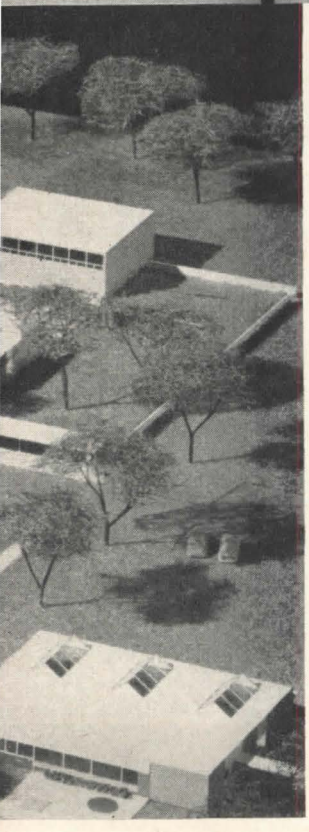
Acoustical PYROFILL at skylight over gymnasium







Acoustical PYROFILL Roof Deck over multi-purpose room



PYROFILL* roof deck

fulfills requirements for low cost, adaptability plus good appearance

Low Cost Insulation PYROFILL gives an incombustible deck and provides insulation. Acoustical PYROFILL affords similar insulation and high acoustical absorption—both at a cost lower than other constructions claiming equal benefits.

Adaptable Equally suitable for the curved, sloping and flat roof areas of this project.

Good Appearance The exposed underside of the Acoustical PYROFILL Roof Deck used over the gymnasium and the multi-purpose room provides a finished acoustical ceiling.

Fast Installation PYROFILL sets in less than an hour and is then capable of carrying normal construction loads. A single crew can pour from 20,000 to 30,000 sq. ft. per day ready for roof covering.

Incombustible PYROFILL is formulated from incombustible gypsum . . . it will not burn. Insurance rates often are 30% less than for combustible constructions.

Light Weight Weighs 10 to 12 lbs. per sq. ft., permitting important savings on structural steel and footings.

Strong—Durable The design as recommended has a high factor of safety. PYROFILL Decks over 30 years old are giving the same excellent service today as when first erected.

FOR FURTHER INFORMATION, refer to SWEET'S CATALOG, Section 2 E/un, contact the authorized PYROFILL contractor in your area, or write Dept. AR-6, 300 West Adams Street, Chicago 6, Illinois.

PYROFILL
roof decks
fear no fire

USG
UNITED STATES GYPSUM

UNITED STATES GYPSUM

The Greatest Name in Building

*T. M. REG. U. S. PAT. OFF.

†Presented by THE SCHOOL EXECUTIVE magazine.

A|E ROUNDUP

(*Continued from page 186*)

AUTOMATION | *Marketable Reactor Shown at ASME Power Exposition*

The latest advances in automation, ranging from the automatic regulation of a single mechanical operation to the "masterminding" of an entire power generating station, were among the many features of the 21st National Exposition of Power and Mechanical Engineering held under the auspices of the ASME at Philadelphia's Commercial Museum from December 2 to 7. Of particular note was the bow to the Atomic Age with an exhibit by the American Machine & Foundry Co. of what is said to be the first marketable reactor. Heading the show from the standpoint of number of displays and multiplicity of products was steam equipment, including everything for the power plant.

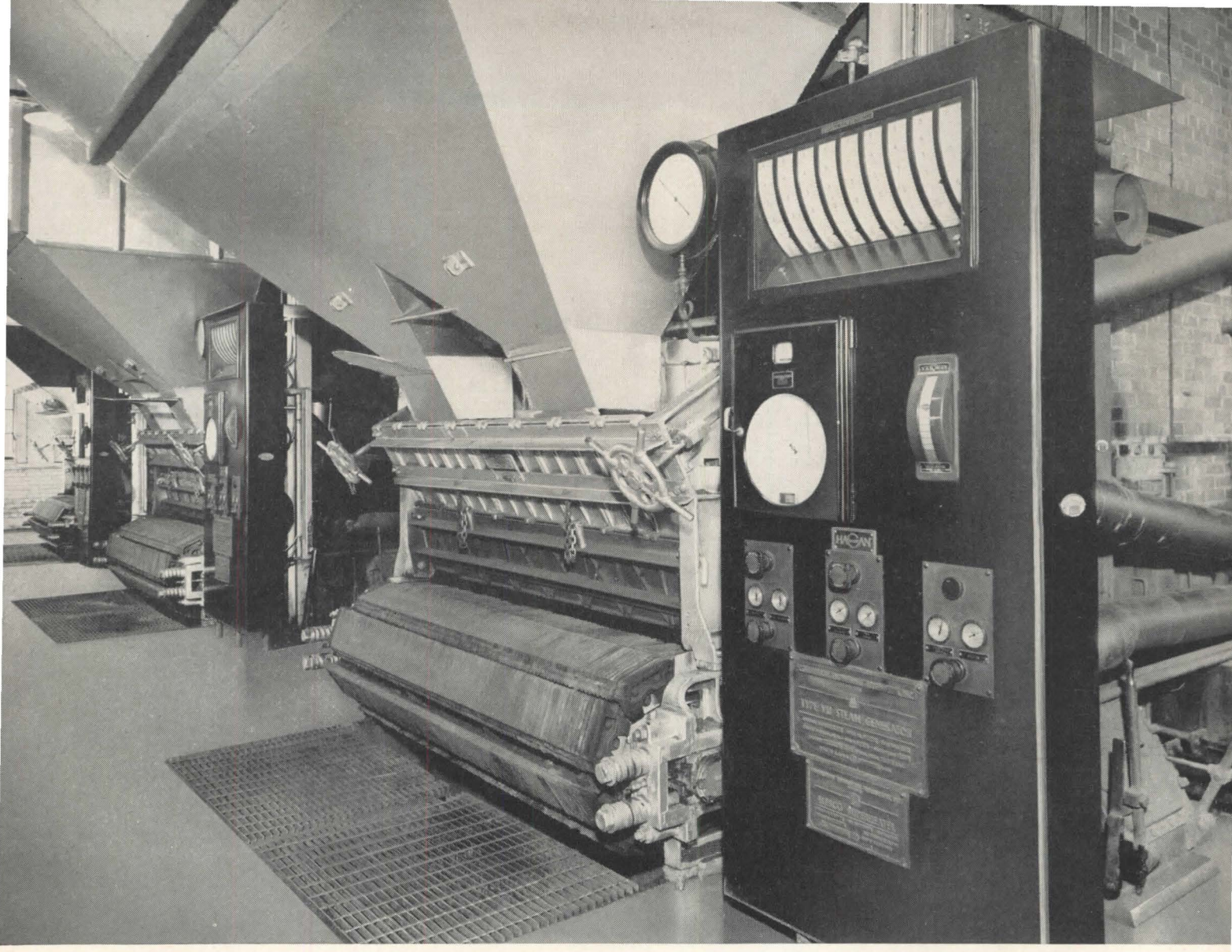
MEETINGS | *ASCE and ASHAE*

More than 100 technical papers on such subjects as highways, construction, air pollution, sewerage, sanitary engineering, power and water supply were presented during the Annual Convention of the American Society of Civil Engineers in New York in October. A major subject of discussion was the role of pipelines in national defense.

New officers installed at the convention were the following: President — William Roy Glidden, Assistant Chief Engineer of the Virginia Dept. of Highways; Vice Presidents — Frank L. Weaver, Washington, D. C., and Louis R. Mowson, Chicago; Directors — Don M. Corbett, Washington, D. C., Jewel M. Garrelts, New York, Frederick H. Paulson, Providence, R. I., George S. Richardson, Pittsburgh, and Graham P. Willoughby, Birmingham, Ala.

The 12th International Heating and Ventilating Exposition, under the sponsorship of the ASHAE in conjunction with its 61st Annual Meeting, is scheduled for Jan. 24–28, 1955, at the Commercial Museum and Convention Hall at Philadelphia. Products in raw and fabricated materials, parts, single-purpose units and complete systems representing leading manufacturers and every class of service will be displayed. ASHAE is the new name of ASHVE, effective November 23, reading American Society of Heating and Air Conditioning Engineers.

(*Continued on page 194*)



Pennsylvania R. R. saves $33,000 a year by burning coal the modern way

The Lafayette Street Power Plant of the Pennsylvania Railroad in Fort Wayne, Indiana, heats a passenger station, office buildings and repair shops. In addition, it also supplies steam for power, processing and car heating. To increase the efficiency of this coal-fired plant, the railroad replaced its old boilers with modern steam generating equipment, regulated by automatic combustion controls. At the same time, they modernized the ash removal system.

Today the cost of steam generation has been lowered from 77c to 59c per 1,000 pounds and combustion efficiency raised 25% higher than before. Overall heating costs have been cut $33,000 yearly.

Investigate Your Fuel Costs

If you're planning to modernize your plant or build a new one—or if you are just interested in cutting fuel costs—find out how coal, burned the modern way, compares to other fuels. Talk to a consulting engineer or your nearest coal distributor. Their advice may save you thousands of dollars every year.

facts you should know about coal

In most industrial areas, bituminous coal is the lowest-cost fuel available.

Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar.

Automatic coal and ash handling systems can cut your labor cost to a minimum.

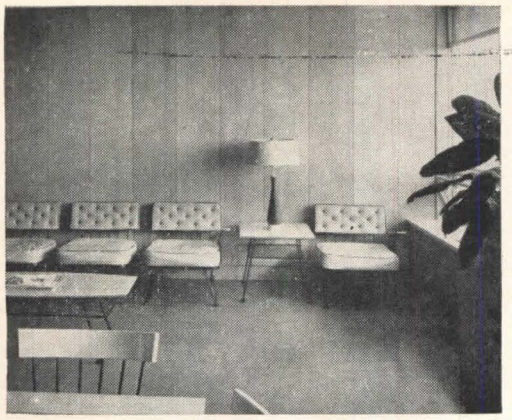
Coal is the safest fuel to store and use. No dust or smoke problems when coal is burned with modern equipment.

Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

BITUMINOUS COAL INSTITUTE
A department of National Coal Association
Southern Building, Washington 5, D.C.

You could almost enjoy being sick in this



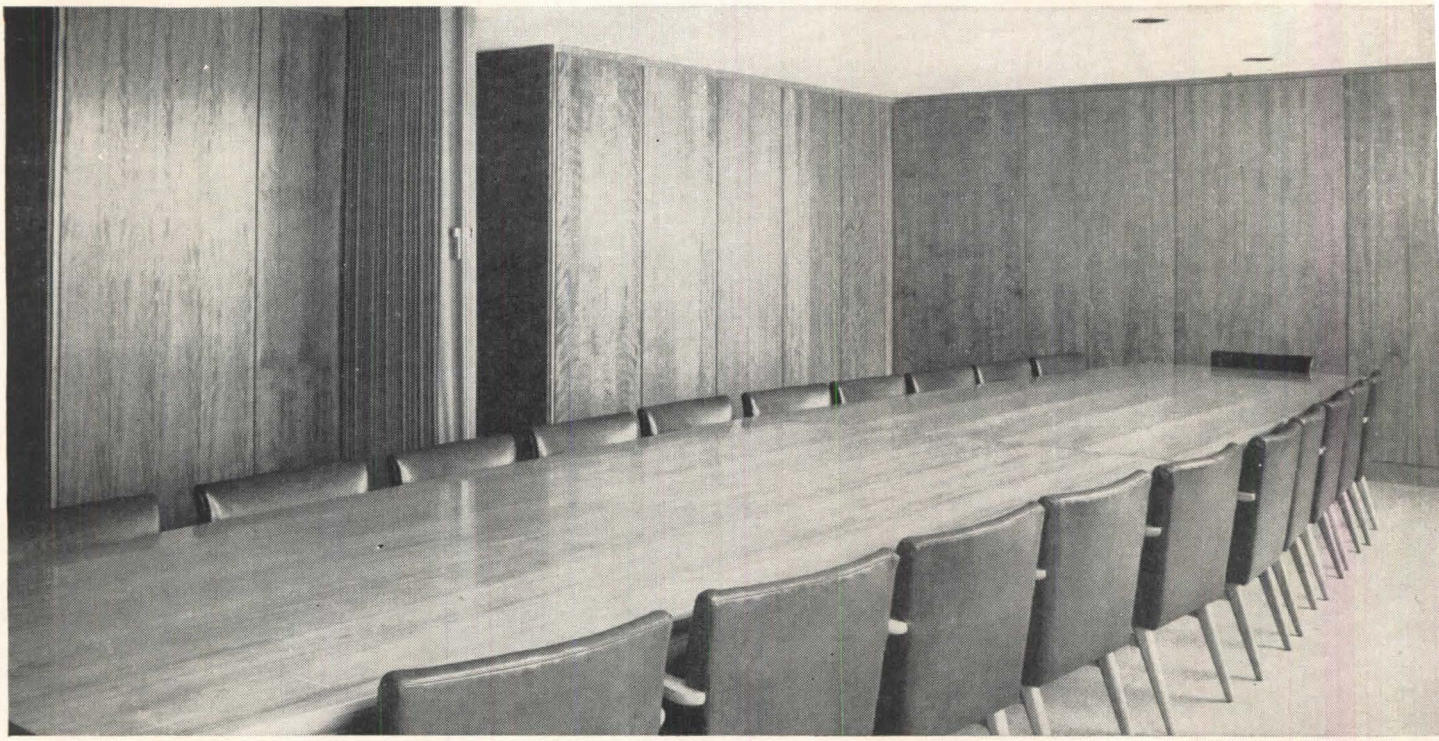
EASY-TO-INSTALL OAK PLANKWELD adds a cheery note to this waiting room. Plankweld can be installed on any wall with special metal clips which hide nails.

Weldwood paneling helps new Lankenau Hospital, Overbrook, Pa., escape from austere, institutional design. Cheerful, real wood, lifetime interiors boost patient, visitor and staff morale.

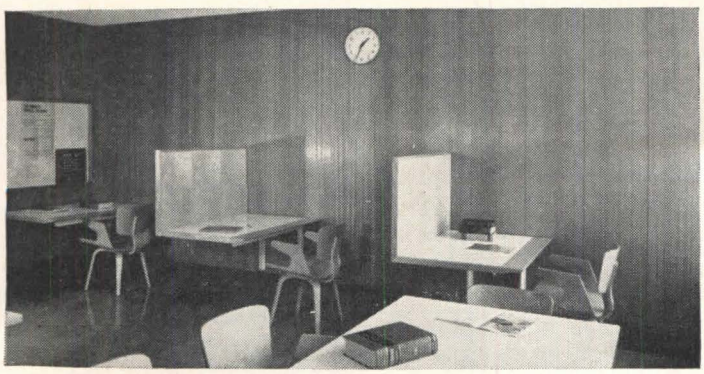
Call it built-in *get well* psychology! Call it a therapeutic assist on the part of the architect, builder and supplier alike! In any event, the Weldwood paneled walls in Lankenau Hospital represent a refreshing new approach to hospital interior design.

Gone is the plain institutional atmosphere so often associated with many hospitals. Lankenau, which proudly lays claim to being the finest, most modern hospital in the world, more closely resembles a resort hotel, where the patient's recovery is speeded by pleasant surroundings as well as by medical skills.

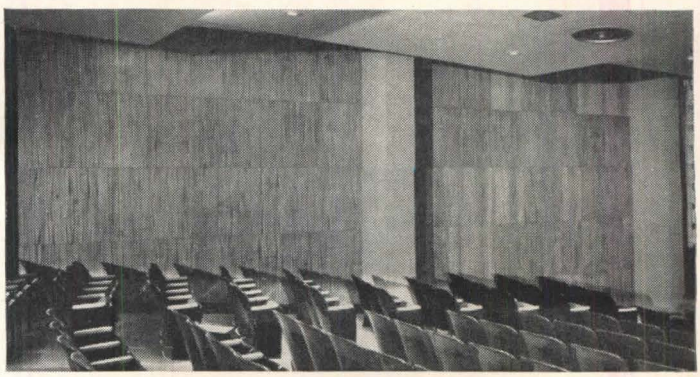
Easy-to-install pre-finished Weldwood Plankweld® (16¼″ wide), in a variety of fine wood faces, was used to soften walls in visitors' lounges, patients' waiting rooms and other areas. Plankweld keeps down costs because it is completely pre-finished, easy to maintain and is *guaranteed*



HALF-INCH RED BIRCH WELDWOOD was used to achieve this unique method of paneling in conference room. ¾″ recessed joints are backed by strips of white birch plywood. Stay-Strate Door is birch. Sliding door acts as room divider when necessary.



PHILIPPINE MAHOGANY PLANKWELD WALLS bring restful charm to this staff study room. Plankweld walls like this can be installed in a matter of hours. Desks are Weldwood birch; tops are white Micarta.



AFRICAN MAHOGANY WELDWOOD was used to panel auditorium walls. Notice the dramatic staggered grain effect made possible by this tier arrangement. Each tier is approximately 3′ high.

unusual, new type hospital

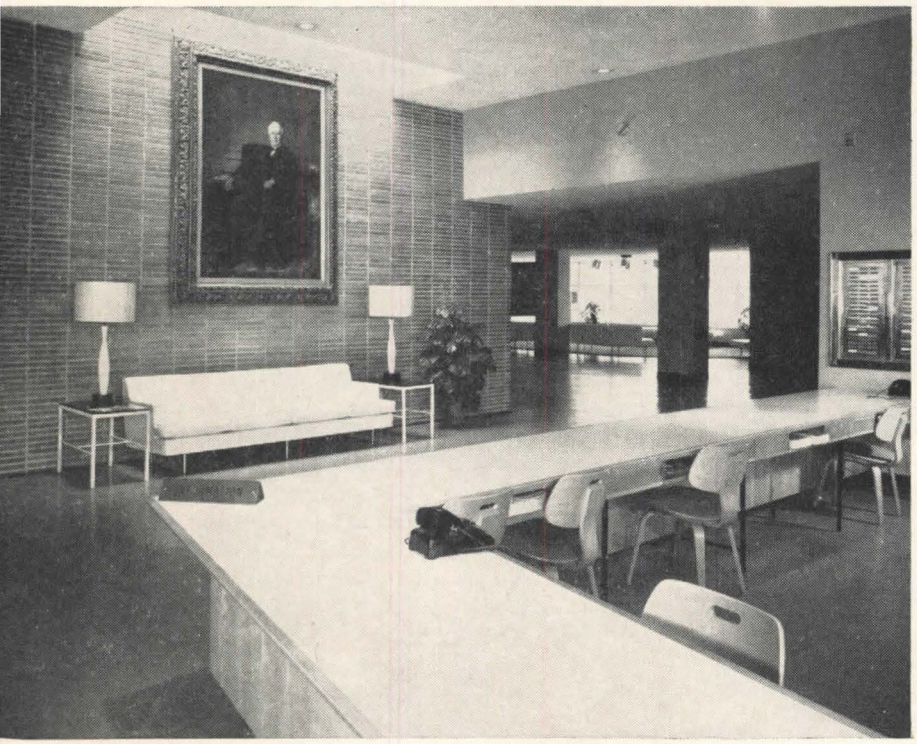
for the life of the structure! Other types of lifetime guaranteed Weldwood hardwood paneling were used extensively in conference rooms, study areas and in the auditorium.

Gayly hued Micarta® was used to brighten and protect hospital furniture in all patients' rooms; all table tops in cafeteria; all nurses' stations as well as on desks and tables in library. It was used, also, to cover the Reception Desk, and cashier's desk.

Weldwood is equally proud that 1131 Stay-Strate® Doors add to the beauty of Lankenau. Weldwood Stay-Strate Doors and Fire Doors* have an incombustible Weldrok® core and are backed by this outstanding guarantee: "This door, if properly installed, is guaranteed against warping, twisting, or manufacturing defects for the LIFE OF THE INSTALLATION."

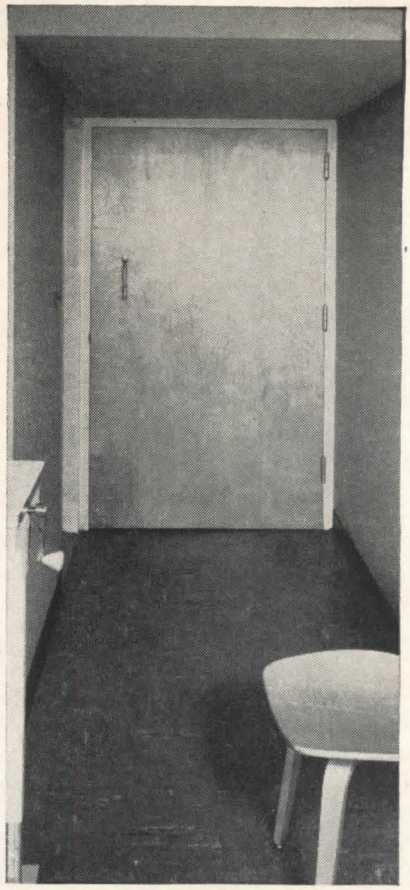
If you are planning a new project or remodeling an old one, consider using Weldwood Products. After all, what other wall covering material even comes close to matching the natural beauty and practicability of real wood paneling?

For further information consult any of the 73 United States Plywood or U.S.-Mengel Plywoods distributing units in principal cities, or mail coupon.

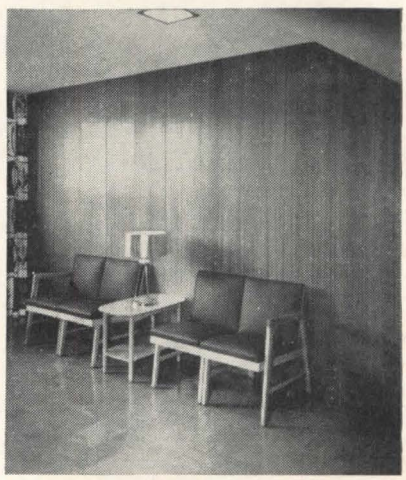


BIRCH WELDWOOD was used to construct this ultra-functioned reception desk. Wearproof, easy-to-clean white Micarta was used for top. Weldwood panels in various thicknesses and wood faces are especially suitable for built-ins.

ARCHITECT: Vincent G. Kling MILLWORK: John A. Yohn Co. CONTRACTOR: Wark & Co.
FURNITURE: Hospital Furniture Co.



STAY-STRATE DOORS® add a note of beauty and at the same time assure permanent savings because they are backed by the most remarkable guarantee in the industry.



PHILIPPINE MAHOGANY PLANKWELD WALL helps ease tensions in this clinic patients' waiting room. Plankweld holds down costs because it is guaranteed for a lifetime! *U. S. Pat. No. 2593050

Weldwood®

HARDWOOD PANELING AND FLUSH DOORS
UNITED STATES PLYWOOD CORPORATION
World's Largest Plywood Organization
U.S.-Mengel Plywoods, Inc., *Louisville, Kentucky*
In Canada, Weldwood Plywood Ltd., Montreal and Toronto

United States Plywood Corporation
55 West 44th Street, New York 36, N.Y.

☐ Please send me complete information on Weldwood Paneling
☐ On Weldwood Stay-Strate Doors and Fire Doors ☐ On Micarta

AR-12-54

NAME.....
ADDRESS.....
CITY.....STATE.....

AIA ROUNDUP

(*Continued from page 190*)

PLASTICS (*Continued from page 173*)

an unusual opportunity for plastic materials." He predicted that the year 1954 will show a 20 per cent increase in total plastics consumption in the building trades. Mr. Mueller listed nine characteristics and applications of plastics which he considers most useful to the building industry: (1) Adaptability to shop-made or factory-assembled units. (2) Availability of durable, decorative plastic surfaces. (3) Design and construction possibilities of light-transmitting plastic walls and roofs. (4) Flexible interior arrangements through use of lightweight plastic panels. (5) Resistivity to corrosion, weathering and wear. (6) Low-cost and improved applications in mechanical and electrical equipment. (7) Combination with conventional materials for a wide range of improved structural properties. (8) Safety and cost features. (9) Opportunities for dynamic coloring.

Down-to-earth papers on properties of plastics, applications in glazing and illumination, surfacing, piping and conduits, insulation, structural panels, and codes and standards were topped off by a "no-holds-barred" panel discussion on the Future of Plastics in Building during the final session. Dr. Johan A. Bjorksten, President of Bjorksten Laboratories, in introducing the panel, presented some dramatic ideas, including buildings made of high-strength plastics floating on tropical waters. Raymond F. Boyer, Director of Dow Chemical Co.'s Physical Research Laboratory, pictured lightweight but strong supporting walls poured of Styrofoam instead of concrete. James Fitzgibbons, Executive Vice President of Geodesics, Inc., envisioned "turtle-type" structures, in which bantam-weight plastic panels unfold to a greatly increased volume. Robert Fitch Smith talked of houses with no dark corners and interesting light patterns through the use of translucent plastic panels (see AR, September 1954, page 20).

Speaking of the relative delay in development of building materials and methods compared with other industries, Mr. Mueller compared costs of an American automobile built with tools of today and with tools of the same relative vintage as those with which houses are being built today.

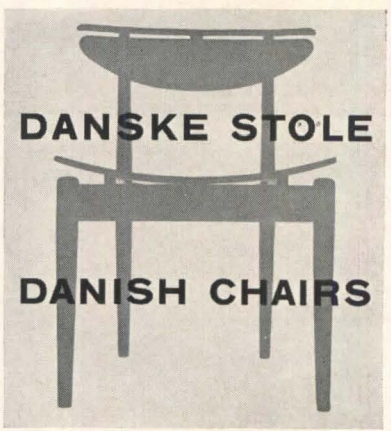
REQUIRED READING

(*Continued from page 48*)

was not, for he had died before the work started.

Another small quibble, while we are on Hunt concerns the statement (p. 31) "To most critics of architecture today Hunt is anathema." Big word, anathema. Where can one find a majority of critics today? There's not even a quorum!

These are small flaws indeed in a big and admirable work. Other readers will find other faults and they won't matter either. Mr. Lynes has given us a book of great scope and penetration — a book that will be read. Readers of it will be able to form their own ideas about taste — a result that should be pleasing to artists and architects.



Danske Stole. Edited by Bent Salicath. George Wittenborn Inc. (38 E. 57th St., New York 22, N. Y.) 1954. 8½ in. by 9¼ in., 93 pp, illus. $5.00.

This beautifully designed book contains clear, straightforward photographs, mostly of craftsmen-designed chairs, providing a comprehensive picture of modern Danish chair production in the last twenty years.

SCHOOL REFERENCE BOOK

American School and University — Vol. 26, 1954–1955. Edited by American School Publishing Corp. (470 Fourth Ave., New York 16, N. Y.) 1954. 8½ in. by 11½ in., 1076 pp, illus. $5.00.

The latest edition of the standard reference year book on school administration, design and equipment contains a 400-page editorial section. Recognized specialists have written 58 articles on subjects ranging from acoustics and audio-visual facilities to student transportation and vocational education. The 600-page section of manufacturers' catalogues on materials and equipment is conveniently indexed both by company and by use.

architectural magazines and Why!

2,101 pages

Testifying to the editorial excellence of Architectural Record are *thirty-one competitive editorial awards*, among them both first awards for which architectural magazines were eligible in the American Institute of Architect's 1954 Architectural Journalism Competition.

4. Steady preference of architects and engineers for Architectural Record expressed in 61 out of 68 readership studies SPONSORED BY BUILDING PRODUCT MANUFACTURERS AND ADVERTISING AGENCIES.

The strongest testimonials to advertising effectiveness are the media decisions of advertisers. Over 500 manufacturers of building products (better than two out of three advertisers in architectural magazines) use Architectural Record.

Again in 1955 . . . *you will be right with the Record.*

Architectural Record Again Moves Higher Among Nation's Top Magazines In Advertising Volume.

In *1952* Architectural Record ranked *13th* among all monthly magazines published in the U. S. in total number of advertising pages. In *1953* Architectural Record moved into *12th* place. Now *in the first nine months of 1954 Architectural Record is 11th.* No other monthly magazine in the construction field ranks so high in advertising volume.

F.W. DODGE CORPORATION

Architectural Record "Workbook of the active architect and engineer"

119 West 40th Street, New York 18, N.Y.

THE RECORD REPORTS

WASHINGTON

(*Continued from page 38*)

program for airport construction on a scale at least equivalent to its present volume. CAA's requests from would-be sponsors of eligible projects add up to three times the amount of Federal funds made available by Congress.

Citing President Eisenhower's proposed 10-year $50 billion additional highway construction program, Mr. Lee said: "All forecasts agree that the same trend will be felt in civil aviation, and there is every reason to believe that this Administration will show the same foresight and aggressiveness in pushing a program to meet the resulting airport needs."

Not all airports can be developed to take care of future traffic demands, he said. These will require replacement airports or supplemental fields. Some 300 new airports are needed to bring the national number up to the 2060 conventional airfields required, according to the National Airport Plan. This indicates, said Mr. Lee, that the biggest job ahead is further improvement of existing facilities to permit them to handle increased traffic with utmost safety.

Administrative funds for the program now are lower than at any time since 1947.

REHABILITATION IS NEXT IN VA HOSPITAL PROGRAM

The emphasis in the Veterans Administration hospital program is changing from new construction to modernization and rehabilitation of existing buildings. VA has no plans for extending its present building program as far as new structures are concerned, according to Administrator Harvey H. Higley.

This month the VA is dedicating two new hospitals — in Pittsburgh and in New York City. The 1000-bed neuropsychiatric hospital programmed for the San Francisco Bay area, and a similar one near Cleveland, will be started soon. Their completion will round out the 174-hospital quota so far authorized.

"What we must have in the very near future is adequate money in our budget for rebuilding, modernizing and rehabilitating some of our hospitals that sorely need attention," the VA chief said. "Better operation, less expensive

(*Continued on page 238*)

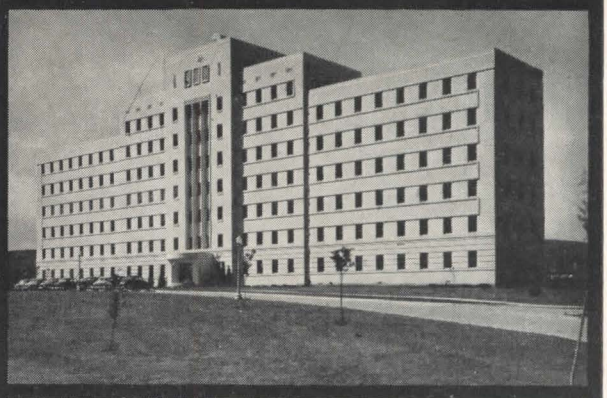
3 OUTSTANDING EXAMPLES OF ARCHITECTURAL CONCRETE

Contractor praises workability of concrete made with Duraplastic*

Contractor for John Moses Veterans Hospital in North Dakota, E. V. McGough, reports: "Duraplastic gave us a very good finish . . . required less water and vibration."

Duraplastic air-entraining portland cement helps make a more plastic mix that aids proper placement in forms.

John Moses Veterans Administration Hospital, Minot, North Dakota; Contractor, McGough Bros., St. Paul, Minn.

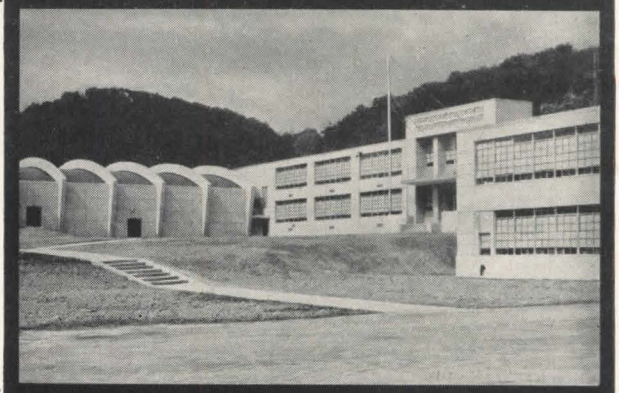


Duraplastic provides trim appearance for Pennsylvania school

Modern design is the keynote at Theodore Roosevelt Junior High School in Williamsport, Pa. Its trim lines feature concrete made with Duraplastic cement.

Minimized water gain and segregation with Duraplastic help produce an attractive surface—free of honeycomb and streaks. Its air-entraining feature fortifies concrete against freezing-thawing weather.

Contractor, Lundy Construction Company; Architect, D. H. Grootenboer—Williamsport, Pa.; Engineers, A. W. Lookup Co., Philadelphia.



Owner-builder reports lower costs with Duraplastic

W. C. Smith, whose firm is contractor and owner of the Mount Royal Manor Apartments in Duluth, says: "Concrete made with Duraplastic cement has better workability that helps lower costs."

Duraplastic makes concrete that is durable in any climate. When you design for or build with concrete, keep in mind the advantages of Duraplastic.

Mount Royal Manor Apartments, Duluth, Minn.; Contractor-Owner, W. C. Smith, Inc.; Architect, A. Reinhold Melander—Duluth.

DURAPLASTIC gives you all these advantages at no extra cost

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For more information and a descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, New York.

*"*Duraplastic*" *is the registered trade-mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

ATLAS® **DURAPLASTIC**

AIR-ENTRAINING PORTLAND CEMENT

AR-D-161

Makes Better Concrete at No Extra Cost

UNITED STATES STEEL HOUR — Televised alternate weeks — See your newspaper for time and station.

THE RECORD REPORTS

WASHINGTON

(Continued from page 234)

maintenance and greater safety of patients would be immediate dividends of such a program."

It also would go a long way in dealing with problems of patients who are diabetics, arthritics, amputees or pulmonary cripples, Mr. Higley noted. Special wings or wards would be converted to care for such patients giving them greater freedom to live to the extent their disabilities permit. As Mr. Higley described the approach: "It would be a sort of community life, lacking the usual hospital atmosphere, retaining only what is necessary to provide modified medical and nursing care."

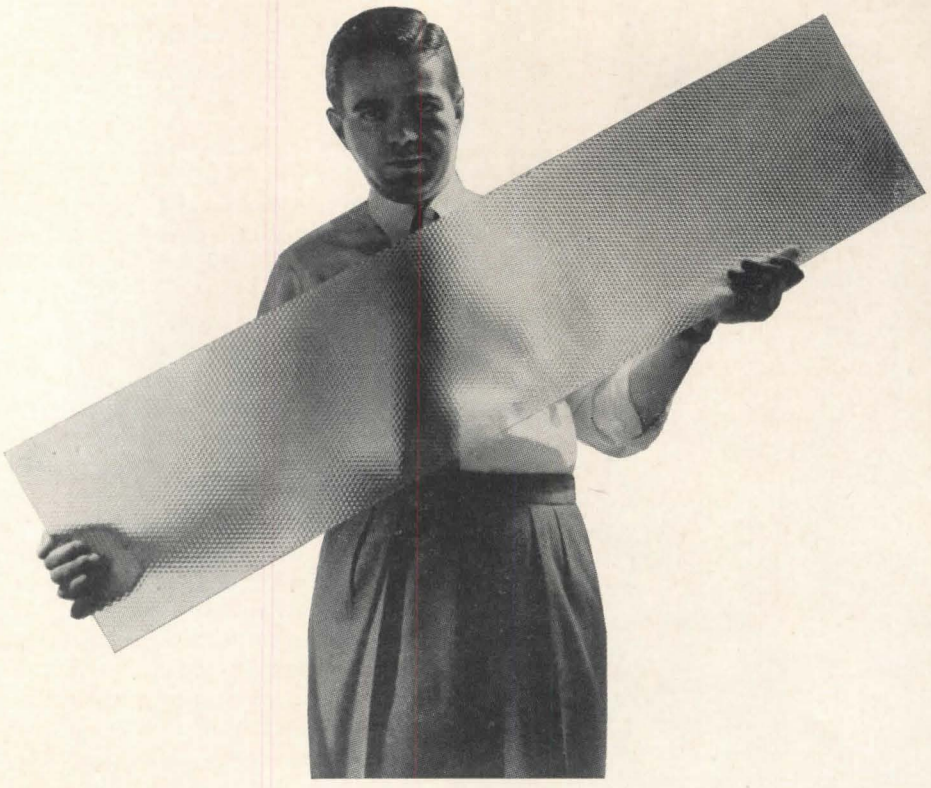
FANNIE MAE STARTS OFF ON TRANSITIONAL CAREER

A re-chartered Federal National Mortgage Association began operations last month with a capital of approximately $93 million. It now is authorized to sell debentures to finance its secondary market functions up to 10 times the amount of its capital and surplus. Under this formula FNMA can be provided with a potential financing base of some $1 billion.

The change in FNMA status authorized by the 83rd Congress looks forward to eventual operation of the secondary market outlet by private interests. The 1954 law was written in such a way that sellers of FHA-insured and VA-guaranteed mortgages to the agency now are subscribing to transferrable common stock equal to three per cent of the unpaid principal of the mortgages. Upon retirement of the preferred stock holdings, the Housing and Home Finance Agency Administrator will submit to the President a plan for turning the facility over to the common stockholders. This plan will then, in turn, be transmitted to Congress.

FNMA is buying the Federally-backed mortgages at market prices on an immediate purchase basis only. No longer are purchases limited to original mortgagees. Only those mortgages insured or guaranteed on or after August 2, 1954 are purchased, and these may not exceed $15,000 for each family

(Continued on page 242)



Give your imagination a lift

with Corning engineered lightingware

Your imagination has lots of room to work when you use Corning engineered lightingware.

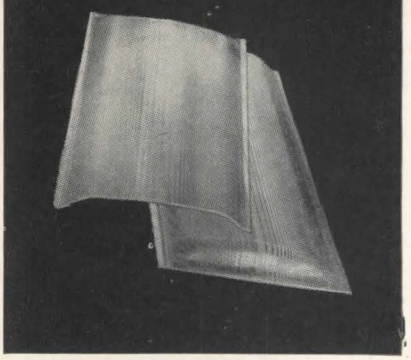
You determine the lighting job you want to do—and Corning can provide lighting glassware exactly engineered for the task. And you get utility plus attractive design.

Just for an idea, take the panel the fellow in the picture is holding. It's Corning Pattern 70 Low-Brightness Lens Panel. You use this pattern to control fluorescent lighting. A pattern of six-sided pyramidal prisms directs a maximum amount of light into the useful zone and reduces fixture brightness at all glare zone angles. You can get Pattern No. 70 in single panels for troffers or for larger luminous elements.

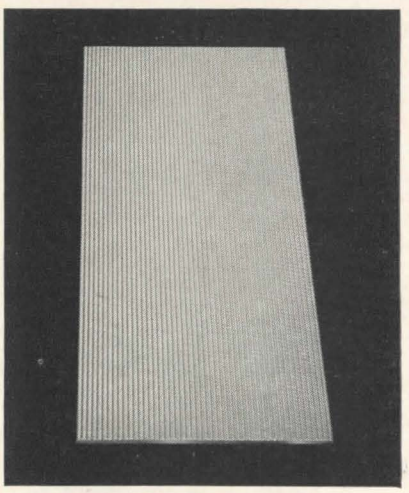
You'll enjoy working with exclusive features like lightweight single piece lens panels and the finest water-white crystal glass. You'll find these features in Pattern No. 70—and all Corning engineered lightingware.

To see how much you can accomplish with efficient long life lightingware like this, contact your Corning representative. He'll be happy to help you.

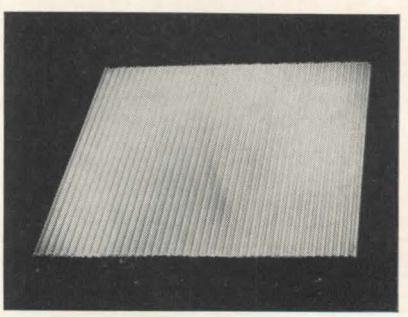
Other Corning products for fluorescent lighting



LIGHTWEIGHT CURVED LENS PANEL, single piece fresnel design curved lens for two- and three-lamp troffer applications.



CRYSTA-LITE NO. 63, straight prismatic-fluted brightness controlling glass in water-white crystal.



ALBA-LITE, made in three surface textures, the standard opal diffusing glass of the lighting industry.

CORNING GLASS WORKS
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Corning means research in Glass

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Please send me a copy of the "Architects and Engineers Handbook of Lighting Glassware."

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

Company.....

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City.....Zone.....State.....

THE RECORD REPORTS

WASHINGTON

(*Continued from page 238*)

residence or dwelling unit. The maximum is raised from the $10,000 figure formerly in effect. The old "one-for-one" commitment plan is abandoned except as the FNMA Board of Directors may revive it.

"Mortgage bankers, building and loan groups and home builder organizations have been advocating the formation of a privately financed and government supervised secondary market facility for several years," said HHFA Administrator Albert M. Cole. "The type of organization provided in the Housing Act of 1954 represents the composite of the recommendations made by the President's Advisory Committee on Government Housing Policies and Programs last December. Whether the secondary market facility will be successful depends upon whether the mortgage lenders and investors that need and have in the past advocated such a facility will now get behind it and make it work."

FHA ISSUES LAST TWO OF EIGHT NEW REGULATIONS

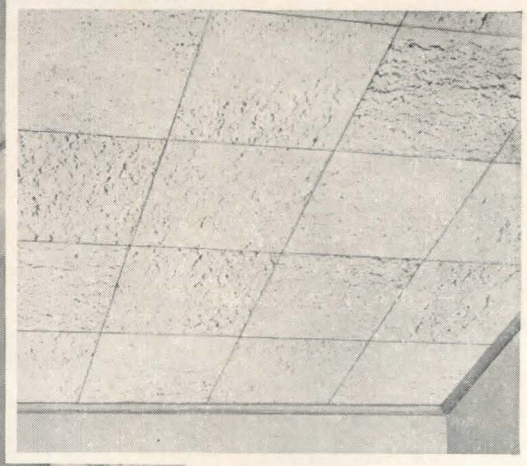
Issuance of regulations on the builder's warranty and the new rules boosting the mortgage insurance ceiling for certain servicemen last month completed the Federal Housing Administration's lengthy task of translating the Housing Act of 1954 into directives to guide field operations. Eight regulations were issued in all.

The regulations on the builder's warranty, one of the more troublesome provisions of the 1954 housing law for the home builders, have been circulated to FHA and VA regional and field offices.

Warranties issued on new houses will be transferrable by the owner to a second purchaser within one year following date of initial occupancy or transfer of title, whichever occurs first. If the title is transferred before completion of construction, the warrant runs from date of initial occupancy or completion of construction, whichever occurs first.

The National Association of Home Builders, with its own Home Owner's Service Policy, advised its members to consider giving purchasers their own

(*Continued on page 246*)



The Johns-Manville Permacoustic Ceiling in the beautiful Bradley Airport Terminal restaurant provides quiet and comfort despite noisy aircraft traffic outside.

A beautiful Solution

TO NOISE-CONTROL PROBLEMS...

Johns-Manville Permacoustic

decorative acoustical tile

Specify J-M Permacoustic® tile for ceilings that provide unusual architectural beauty with maximum acoustical efficiency and fire safety.

Johns-Manville Permacoustic is exceptionally sound-absorbent. It is attractive and noncombustible. It is available with either a textured or fissured surface. These random-textured finishes increase its noise-reduction qualities and provide design and decorative interest.

Made of baked rock wool fibres, Permacoustic is fireproof—*meets all building code fire-safety requirements.* Johns-Manville Permacoustic is easy to install on existing ceilings or slabs, or by suspension using a spline system of erection.

Send for your free copy of the new brochure about Permacoustic tile. Write Johns-Manville, Box 158, New York 16, New York. In Canada, write 199 Bay St., Toronto 1, Ontario.

INFORMATIONAL DATA ON PERMACOUSTIC

Sizes 12" x 12" 12" x 24" | Thickness ¾"* | Color: white

	ACOUSTICAL EFFICIENCY	
	Test No. A51-98	Test No. A51-99
cycles per second	cemented to plaster board (mounting No. 1)	mechanically mounted on special metal supports (mounting No. 7)
125	.04	.56
250	.21	.53
500	.75	.60
1000	.88	.73
2000	.85	.88
4000	.78	.88
noise reduction coefficient	.65	.70
weight per sq. ft.	1.3	1.3

*Also available in ⅞" thickness

JOHNS-MANVILLE PRODUCTS

Johns-Manville

40 YEARS OF LEADERSHIP IN THE MANUFACTURE OF ACOUSTICAL MATERIALS

THE RECORD REPORTS

WASHINGTON

(*Continued from page 242*)

service policy in addition to the required FHA or VA form.

The new housing act directs FHA and VA to require builders or sellers of insured or guaranteed construction to deliver to the purchaser or owner a warranty that the dwelling is constructed in "substantial conformity with the plans and specifications on which the FHA or VA valuation of the dwelling was based."

Speed up Efforts

Among developments aimed at speeding FHA operations:

— FHA field offices were authorized to approve the basic design for new construction of repetitive types. This was expected to allow the builder to begin construction of other units of a substantially similar design without waiting to process individual applications on them.

— The FHA Commissioner permitted those offices with overburdening backlogs to remain open nights and told all field locations to stay open Saturdays.

— An additional 300 employes were planned to process applications.

— A new "conditional commitment" was established. This has the dollar amount and certain other data left blank to enable the home builder to start his crews before the application has received final clearance.

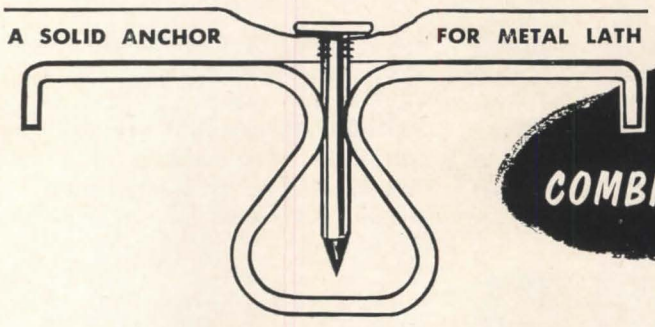
AEC REPORT DISCUSSES CIVIL DEFENSE NEEDS

The Atomic Energy Commission and the Federal Civil Defense Administration have been conferring about a public bomb test to determine further the effects of atomic weapons on structures and equipment and to dramatize for civil defense purposes the destructive force of such weapons, according to AEC's 16th semi-annual report to Congress.

There is *no definite* conclusion at this time about such a test shot to include observers and "public media participation." But a cooperative program to furnish technical advice and information relative to national civil defense preparedness is under consideration, AEC said, adding that industrial participation also is under discussion.

(*Continued on page 250*)

IS SPEED OF ANY CONSEQUENCE TO AN ARCHITECT OR STRUCTURAL ENGINEER?



FACT NO. 1
COMBINES TIME and MATERIAL SAVINGS

NAILABLE STEEL JOISTS

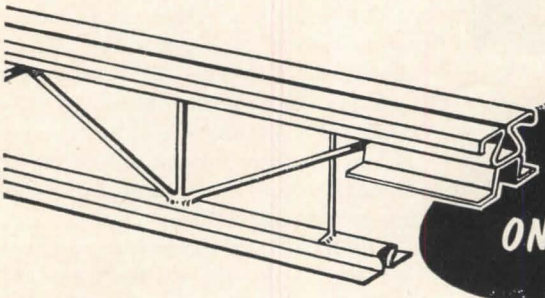
NOT JUST ONE JOIST—BUT THE TYPE ESPECIALLY DESIGNED TO MEET YOUR NEEDS MORE ECONOMICALLY.

SPEED is the total labor hours you save on any part of a job in contrast to usual work schedules.

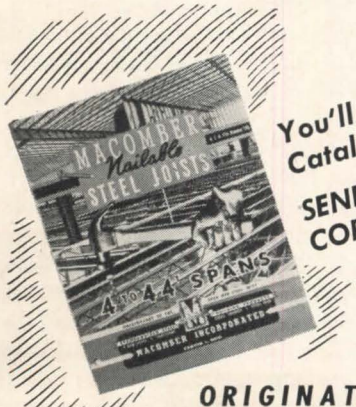
Is speed ONLY the concern of the general contractor or is this cost factor related to the design-engineering-specifying function of the architectural firm or consulting engineer?

ANY PRODUCT basically designed to save man hours and reduce material costs to the point construction costs can be lowered and better controlled—answers that question—and places a direct responsibility on the specifying team.

When metal lath or any centering material is nailed, the operation is faster than other methods and the solid anchor prevents tons of wasted concrete from sagging down into pockets between joists.



FACT NO. 2
ONE ENTIRE OPERATION IS ELIMINATED



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When Steel Erectors have to attach ceiling extensions, the whole job is slowed down. Macomber makes standard Steel Joists requiring no ceiling extensions. The bottom chord comes right up to the wall line. This is one of four standard joists described in the new catalog shown here.

● *These Exclusive Structural Advantages are Available ONLY in Macomber V Joists and Protected by U. S. Patents.*

ORIGINATORS OF THE OPEN WEB STEEL JOIST

SERVICE IN STEEL · STANDARDIZED CONSTRUCTION · MACOMBER · CANTON, OHIO

STANDARDIZED STEEL BUILDING PRODUCTS

V BAR JOISTS • LONGSPANS STEEL TRUSSES • STEEL DECK

MACOMBER INCORPORATED

CANTON 1, OHIO

• ENGINEERING • FABRICATING AND ERECTING •

WASHINGTON (*Cont. from p. 246*)

Proposals have been submitted on certain parts of the total program by FCDA, and these are being reviewed for feasibility pending official action on future AEC development tests.

AEC staff members also have been reviewing design criteria for protective construction standards soon to be released by FCDA. This material is intended to guide Federal agencies and the public in erecting structures in or near designated target areas.

Other highlights of the report:

• AEC expenditures for new plant and equipment averaged about $106 million per month during the first half of 1954. This compares with an average of $96.5 million per month during the last half of 1953. The peak monthly costs for the current construction program were passed at midyear when a rate of $120 million per month was reached. During the next six months, construction costs are expected to decline slowly, averaging about $107 million per month for calendar 1954.

• As of May 31, 1954, capital investment in atomic energy production plant facilities was estimated at about $5.7 billion before depreciation reserves. The only major project begun during the first six months of this year was the expansion of process facilities at Oak Ridge.

• Also noted was revision of the AEC Contract Manual for Construction and Associated Engineering Services issued in January 1949. This establishes standards, policies and procedures for obtaining construction and related engineering services for all offices of the Commission.

WANTED: MORE TO SPEND ON BUILDING STATISTICS

The need for a larger appropriation from Congress to improve the Federal government's series on construction statistics was under discussion again last month at a meeting of the Business and Defense Services Administration of the Department of Commerce with building industry representatives.

The BDSA and the Bureau of Labor Statistics again will ask for additional funds for expanding their figure-gathering services and for the second time will have the backing of the U. S. Chamber of Commerce and other business groups.

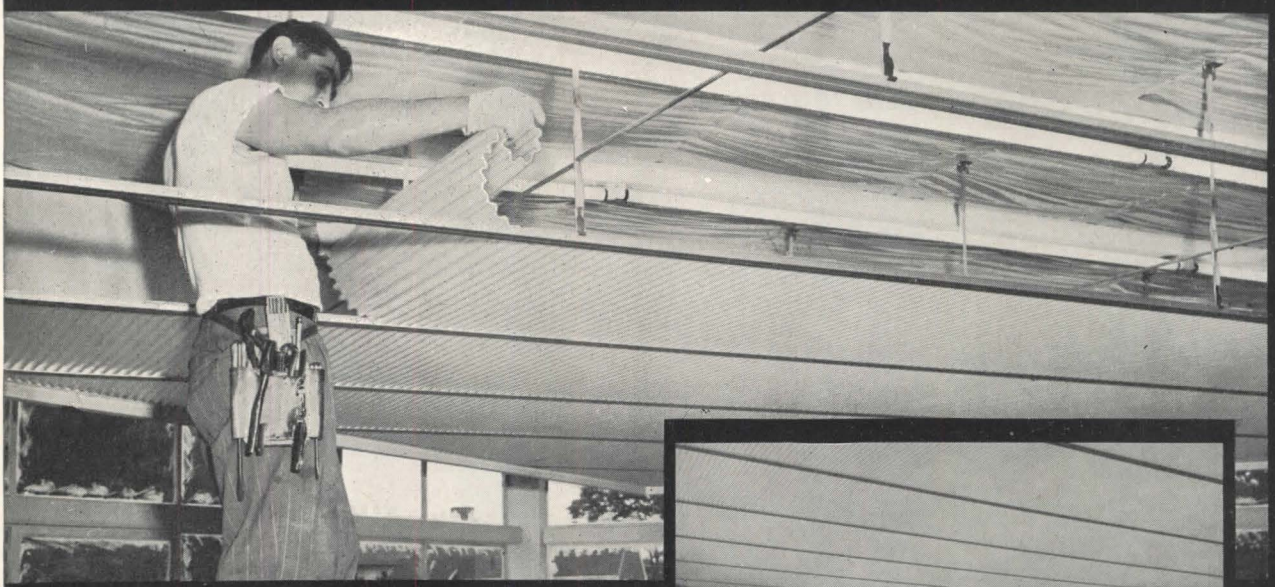
In a recent "markets letter" devoted to the subject of construction data, the Construction and Civic Development Department of the Chamber lamented the fact that Congress gave nothing for the expansion of construction statistics when a supplemental appropriation was requested earlier this year. It termed the $1 million needed for a more complete statistical approach as a modest figure in view of the $50 billion poured into construction activity annually.

Highpoints of the 1954 proposals which are expected to be the basis for next year's request: (1) improvement in the Commerce-Labor estimates of private non-residential and non-Federal public construction activity; (2) estimates of expenditures for repairs and improvements of existing structures; (3) estimates of residential vacancies; (4)

(*Continued on page 254*)

NOW! A material especially designed for luminous ceilings

Translucent Ultron rigid vinyl sheet gives glareless, shadowless light diffusion



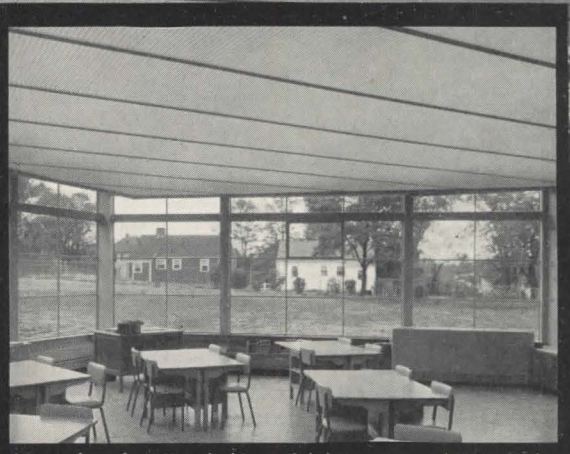
Workman slides continuous corrugated ULTRON rigid vinyl sheeting into supporting channels in new classroom for Franklin Elementary School, West Newton, Mass.

After careful comparison of available materials, Franklin Elementary School's architect and lighting engineer chose new ULTRON rigid vinyl sheet for luminous ceilings in the school's unique, demountable pentagonal-shaped classroom additions. Here's why:

Luminous ceilings made of ULTRON rigid vinyl sheeting offer *maximum* light diffusion with a *minimum* of shadows. Used in association with an effective fluorescent lighting system, the luminous ceiling gives even, shadowless light diffusion in all parts of the classroom. In addition, ULTRON rigid vinyl sheeting has greater resistance to darkening or blackening caused by prolonged exposure to ultra-violet rays.

Luminous ceilings made of ULTRON rigid vinyl sheeting hide unsightly pipes and ducts, reduce building costs. Sprinkler system nozzles can be concealed because ULTRON rigid vinyl sheeting gives way at temperatures slightly below that necessary to set off automatic sprinkler systems. These lightweight luminous ceilings are very easy to disassemble for quick cleaning in a mild detergent solution. And when destaticized, minimum maintenance is required.

For full information on new ULTRON rigid vinyl sheeting, write MONSANTO CHEMICAL COMPANY, Plastics Division, Room 6102, Springfield 2, Mass.



Note that functional, beautiful luminous ceilings made of ULTRON rigid vinyl sheeting completely diffuse the light — no "bright spots" or shadows!

Luminous ceiling fabricated by Marlux Corporation, Somerville 43, Mass.

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WASHINGTON (*Cont. from p. 250*)

improvement and broadening of indexes of building materials production to cover nine additional classes — to be provided monthly; (5) estimates of labor and material requirements for the various classes of construction; (6) surveys of residential builders' operations to determine volume of production, sales and financing experience, land holdings, future plans, etc.

ADDENDA

CONSTRUCTION-PUT-IN-PLACE in October set a record for the month at $3.5 billion, according to the preliminary estimates prepared jointly by the U. S. Department of Commerce and Labor. Outlays for both total private and total public construction, for private residential building, churches, schools (private and public), roads and sewer and water facilities were at an all-time October high.

FEDERAL HOUSING ADMINISTRATION Commissioner Norman P. Mason announced that FHA applications for mortgage insurance in September increased 24 per cent from August to more than 60,000 units, the highest monthly volume since 1950. It was the biggest September in FHA history and the second consecutive month to set an all-time record. The nine-months total was 12 per cent over the first nine months of 1953.

COLLEGE AND UNIVERSITY ENROLLMENT this year may show an increase of 10 per cent or more over last year when all the figures are tabulated, according to a U. S. Office of Education spokesman. Last year's enrollment figures showed a 4.8 per cent increase from the preceding year; and the Office of Education estimated then that an expenditure of $5 billion would be required to meet the need for facilities for higher education.

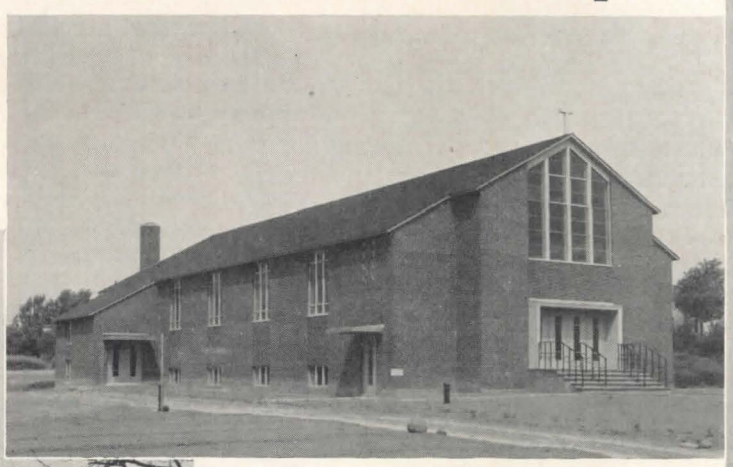
THE LARGEST NEW MARKET for the expansion of private housing lies downward in the price scale and in the field of minority housing, according to Albert M. Cole, Housing and Home Finance Administrator. Mr. Cole told the annual convention of the Prefabricated Home Manufacturers Institute last month that their continued efforts to develop "good quality, well designed and well equipped private homes at low cost can be a very important factor in accomplishing the purposes of the Housing Act of 1954 and the President's housing objectives."

A LIST OF REPORTS ON RESEARCH PROJECTS undertaken by the Housing and Home Finance Agency in connection with its now-defunct housing research program has just been published and can be obtained by writing HHFA, Washington 25, D. C. (For a complete list of all research projects undertaken by HHFA, see AR, April 1954, pages 312–316.)

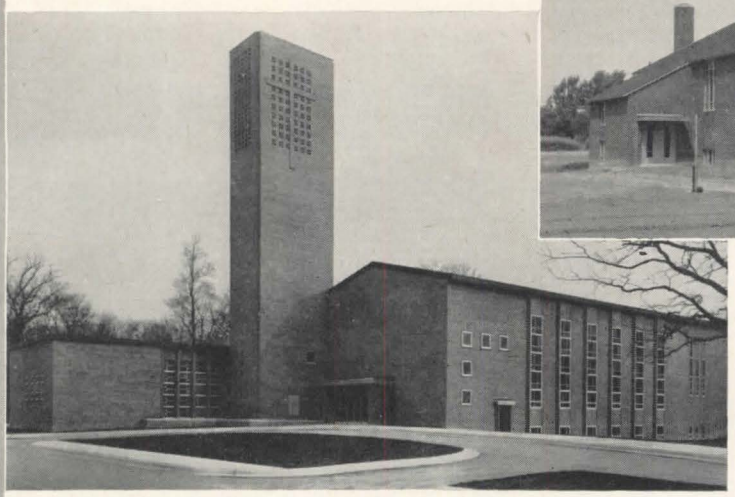
CLINT PACE of Dallas has been named director of the White House Conference on Education to be held in Washington next year. Mr. Pace had been since 1951 director of the Southwest Regional Office of the National Citizens Commission for the Public Schools.

(*Continued on page 258*)

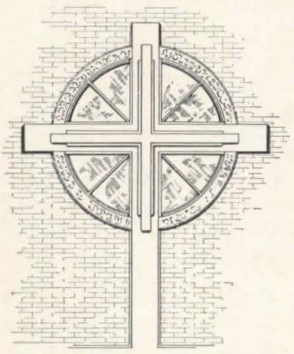
Modern Windows in Church Design by VAMPCO



St. Andrews The Apostle Church — Syracuse, N.Y.
Pederson & Hueber — Architects — Syracuse, N.Y.
Dygert Construction Co. — Syracuse, N.Y.



First Baptist Church, Flint, Michigan
Swanson & Associates, — *Architect*
Sorenson-Gross Const. Co. — *Contractor*

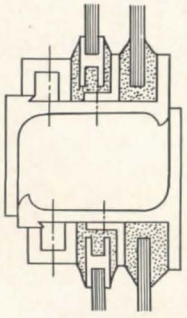


Detail from Haughey & Black Architects
616 Post Bldg., Battle Creek, Michigan

VAMPCO All Aluminum Windows will blend perfectly with the lines of Modern Church architecture. Not only does VAMPCO fit the modern church but is readily suited to the traditional design. Sturdy aluminum window frames will help bring the feeling of dignity that is so important.

Your precious stained glass windows can be protected by means of double glazing which also eliminates drafts.

Whatever your design VAMPCO can make it!



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THE RECORD REPORTS

WASHINGTON

(*Continued from page 254*)

CARL FEISS has left the government service to open offices at 730 Jackson Place, Washington, as a private consultant in urban planning and urban renewal. Mr. Feiss had been chief of planning and engineering for HHFA's Division of Slum Clearance and Urban Development.

THE HOUSING AND HOME FINANCE AGENCY has established its own compliance division. This central operation is charged with investigative and compliance responsibilities running to the Federal Housing Administration, the Home Loan Bank Board, the Public Housing Administration, and the Federal National Mortgage Association, all HHFA constituent agencies. David Allshouse, who assisted William F. McKenna in the recently completed probe of FHA, has been named acting director. He will report directly to HHFA Administrator Albert M. Cole.

THE DEPARTMENT OF COMMERCE made available for distribution its latest edition of the Simplified Practice Recommendations for pipes, ducts, and fittings for warm-air heating and air conditioning. This booklet, containing simplified practice procedures as recommended by industry groups, first was issued in 1945, revised in 1949 and finally amended in 1952. The contents cover gravity, forced air extended plenum, and perimeter systems and includes sketches intended as an aid to identification of items listed. Full title: "Simplified Practice Recommendations R207–54, Pipes, Ducts, and Fittings for Warm-Air Heating and Air Condition," available from Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

A NEW REPORT by Fred L. Daum, civilian scientist at the Air Development Center, Dayton, Ohio, indicates the damage to wooden structures that might result from speeding aircraft flying only 100 feet above the earth's surface. His report states that if a plane could travel 1.5 times the speed of sound at that height, it would generate air currents that would exert pressures up to 100 lb per sq ft on ground structures. The speed would be equivalent to 1125 mph. No plane has been known to travel that fast, but technological developments constantly look toward greater and greater speeds.

THE OFFICE OF DEFENSE MOBILIZATION announced a revision of the expansion goal for railroad terminal and other rail facilities to include construction or improvement of railroad main lines which are shown to have a defense relationship. The revision extends the fast tax write-off to main line improvements without which the line would be subject to interruption. Time limit for starting construction of facilities under the goal is June 30, 1955.

• David Lynn, architect of the Capitol for the last 31 years, retired September 30 from his $16,000-a-year job. Mr. Lynn, who has served Congress in various capacities for more than 53 years, was warmly commended for "distinguished" service in a letter from President Eisenhower accepting his retirement application. Mr. Lynn's successor will be J. George Stewart, former Republican Congressman from Delaware.

(*More news on page 262*)

THE RECORD REPORTS

(*Continued from page 258*)

ON THE CALENDAR

December

2–7 The 21st National Exposition of Power and Mechanical Engineering, sponsored by the American Society of Mechanical Engineers — Commercial Museum, Philadelphia

9 Conference on modular coördination, sponsored by the Building Research Institute — National Academy of Sciences, Washington, D. C.

January 1955

4ff January 1955 Good Design Exhibition, newest edition of the continuing exhibition sponsored by the Museum of Modern Art, New York, and the Merchandise Mart, Chicago; throughout the year — Merchandise Mart, Chicago

7–11 First National Retail Industry Show, sponsored by the Store Modernization Institute — Madison Square Garden, New York City

10 Fourth Annual Convention, Mason Contractors Association of America — Jefferson Hotel, St. Louis

16–20 The 11th Annual Convention, National Association of Home Builders — Conrad Hilton and Sherman Hotels, Chicago

21 First general assembly and banquet, Engineers Joint Council — Hotel Statler, New York City

24–26 Plant Maintenance and Engineering Conference — International Amphitheater, Chicago

24–27 Sixth Plant Maintenance and Engineering Show — International Amphitheater, Chicago

24–27 The 61st Annual Meeting, American Society of Heating and Ventilating Engineers — Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia

24–28 International Heating and Ventilating Exposition, sponsored by the American Society of Heating and Ventilating Engineers — Commercial Museum and Convention Hall, Philadelphia

26–28 Annual meeting, Society of Industrial Realtors — Shamrock Hotel, Houston

31ff Winter General Meeting, American Institute of Electrical Engineers; through Feb. 4 — Hotel Statler, New York City

February 1955

21–24 The 51st Annual Convention, American Concrete Institute — Hotel Schroeder, Milwaukee

23–25 Annual Joint Conference on Church Architecture, sponsored by the Church Architectural Guild of America and the National Council of Churches' Bureau of Architecture — Netherlands-Plaza Hotel, Cincinnati

26ff Regional convention, American Association of School Administrators — St. Louis

OFFICE NOTES

Offices Opened

• Jacques C. Brownson and Bruno P. Conterato have announced the opening

(*Continued on page 266*)

THE RECORD REPORTS

(*Continued from page 262*)

of their offices at 44½ Downer Place, Aurora, Ill. The firm will be known as Brownson & Conterato, Architects-City Planners.

• Alfred Watts Grant, Denver architect, has opened a branch office in the Majestic Bldg., 7½ E. Bijou St., Colorado Springs, Colo.

• Jules Gregory, Architect, recently announced the opening of his own office in Lambertville, N. J.

• Richard D. Levin and F. S. Toguchi have announced the formation of a partnership. The firm, to be known as Levin and Toguchi, Architects, has offices at 608 The Arcade, Cleveland 14, Ohio.

• Palmer W. Power, A.I.A., and Delma J. Daniel Jr., Architects, have announced the opening of offices at 3811 Long Beach Blvd., Long Beach 7, Cal.

• Stiles, Robert & Associates, Architects & Engineers, is a new firm composed of Marvin L. Stiles, Evan E. Roberts, E. Ross Gee and R. C. Messersmith. Offices are at 1907 Broadway, Lubbock, Texas.

Firm Changes

• The firm of Blackman and Strader, Architects, of Danville, Ill., has been dissolved because of the recent death of Mr. Blackman. George M. Strader has opened his own offices at 20½ W. North St., Danville.

• William A. Rutherford, landscape architect, has joined the Office of A. Carl Stelling, site planning consultants. The firm's address is 127 E. 39th St., New York City.

• Harold Wiener, Architect, has announced his association with Donald Reiff, Architect. Offices are at 600 Lincoln Rd., Miami Beach, Fla.

New Addresses

Kenneth E. Einhorn, Architect, 1101 Pennsylvania, Boulder, Colo.

Gardiner, Thornton & Partners, Architects, 1520 Alberni St., Vancouver 5, B. C.

Hall & Paufve, Architects, 9 Alden Ave., Yonkers, N. Y.

Philip Carter Johnson, Architect, 362 Queens Ave., London, Ont.

Magney, Tusler and Setter, Architects, 303 Roanoke Bldg., Minneapolis.

Charles Henry Sacks, Architect, 221 Linden Blvd., Brooklyn 26, N. Y.

David Sholder, A.I.A., 1630 E. Camelback Rd., Phoenix, Ariz.

White & Griffin, Architect-Engineer Associates, Suite 304, Lawyers Bldg., 139 Cadillac Sq., Detroit 26, Mich.

Millard F. Whiteside, A.I.A., 19 Carrigan Ave., White Plains, N. Y.

Joseph Lesher Steele, A.I.A., 1608 Boas St., Harrisburg, Pa.

Lyford & Magenau, Architects, 10 Fayette St., Concord, N. H.

Andre Merle Associates, Consulting Engineers, 1420 New York Ave., N.W., Washington 5, D. C.

Bernard G. Nobler, Architect, Brewster-Warren Bldg., Redwood City, Cal.

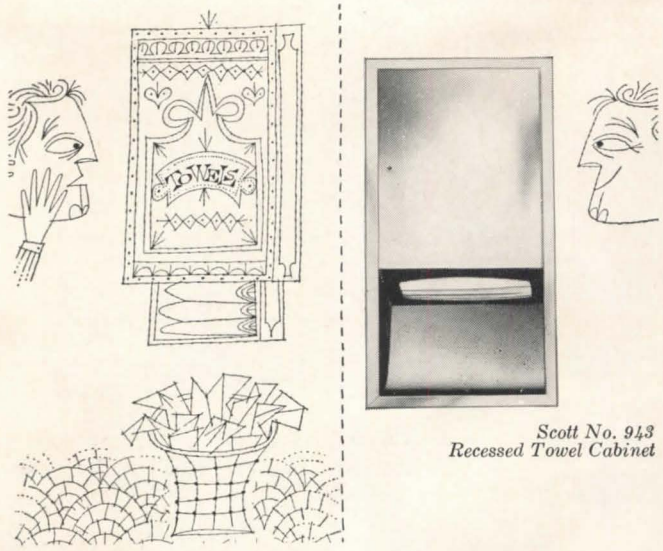
John B. Peterkin, A.I.A., 425 Fifth Ave., New York, N. Y.

William Rowe Smith, A.I.A., 155 East 3900 South, Salt Lake City 6, Utah.

Waldron & Dietz, Architect, 208 Columbia St., Seattle 4, Wash.

Wurster, Bernardi and Emmons, Architects, 202 Green St., San Francisco, Cal.

(*More news on page 270*)



Scott No. 943
Recessed Towel Cabinet

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SCOTTISSUE TOWELS

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Jet-Acoustic wishes you and your church will have a Warm and Colorful Christmas Resounding with good cheer.

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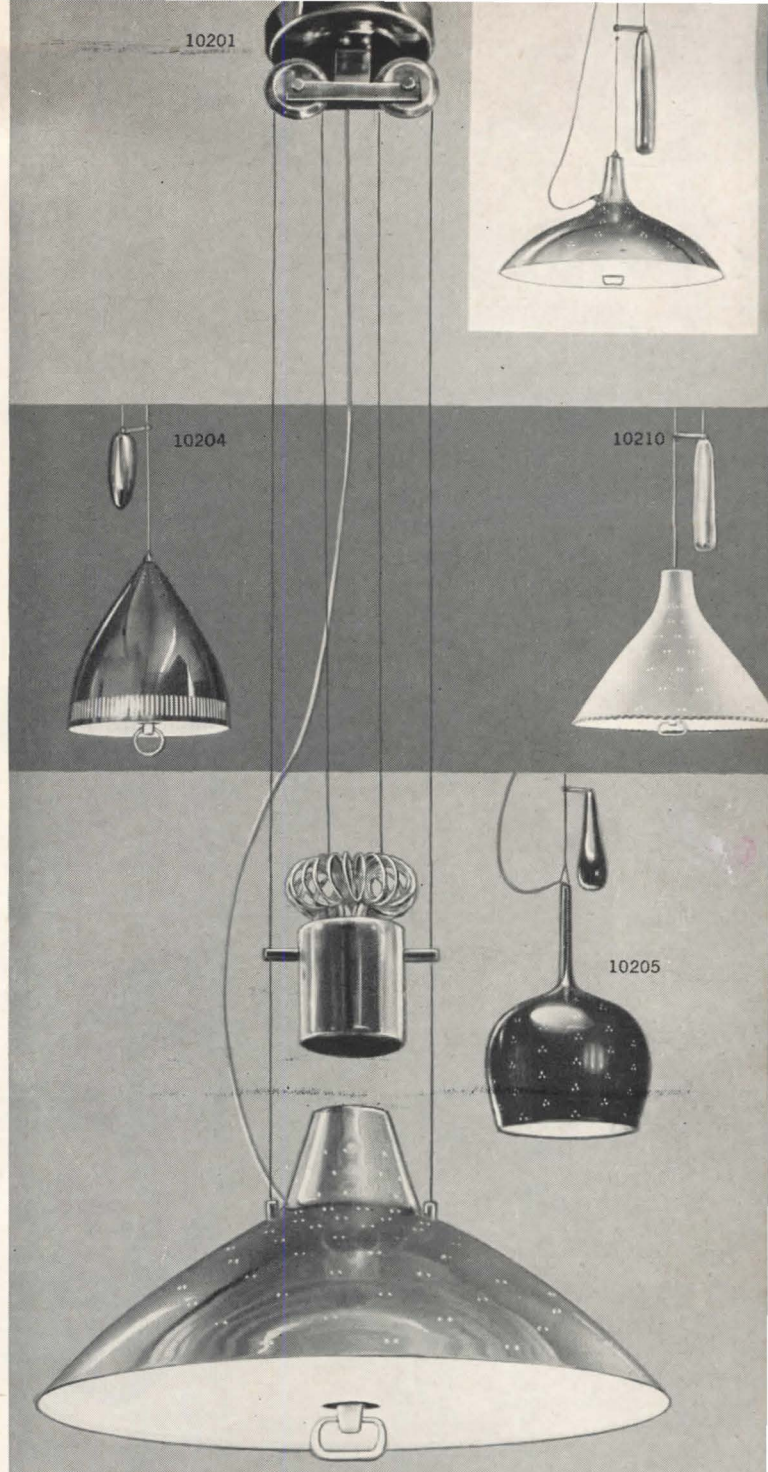

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by Paavo Tynell
—his **adjustable fixture**
—functional elegance
for dramatic lighting
—in sizes and styles
for any residential
or commercial decor
—in a wide selection
of brass, enamel and
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finland house lighting

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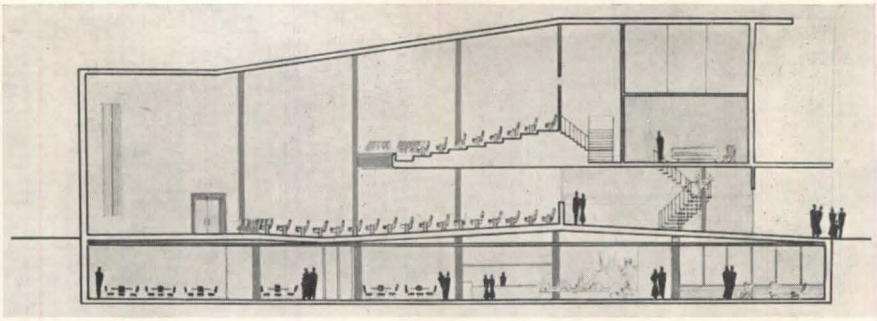
 (*Continued from page 266*)

ATTRACTING MOVIE-GOERS IS COMPETITION PROBLEM

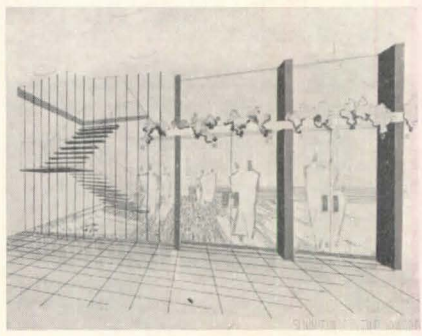
The real problem of a theater owner who wanted an architectural answer to lagging motion picture patronage formed the basis of the most recent edition of the annual competition for architectural students at Pennsylvania State College sponsored by Summitville Tiles, Inc.



Winning design put cocktail and dining areas on basement level, theater above

The winning entry submitted by Fred W. Diseroad of Bloomsburg, Pa., put the required cocktail lounge and dining area on the basement level and provided an outdoor terrace adjoining the theater above. Stairs lead to the refreshment level both from theater lobby and from the terrace.

The program projected a site 100 by 140 ft on level land in the business section of a small city. The existing commercial area offering no attractive entertainment for late-evening patrons of the movies, the owner proposed to erect a wide-screen theater of 650 seats together with adjacent cocktail and dining facilities — these elements so designed as to observe the state code prohibiting direct contact between them and at the same time encourage patrons to go from one to the other. Required elements of the theater: a 450-seat auditorium, a 200-seat balcony, a 20 by 50 ft screen, projection booth, foyer, ticker lobby, lounge, toilets, exterior display and exterior sign. Cocktail and dining facilities for 200 were to have adjacent kitchen, waiting lounge and rest-room facilities.



Perspective of lobby as presented in Diseroad's scheme. Program provided site with 100-ft frontage on "main street"

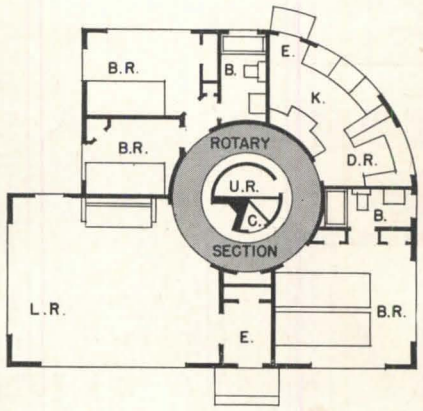
(*More news on page 274*)

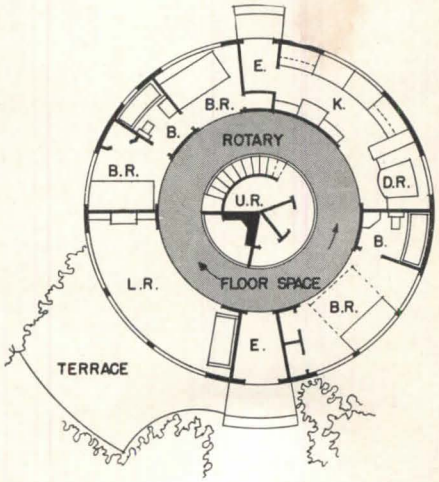
THE RECORD REPORTS

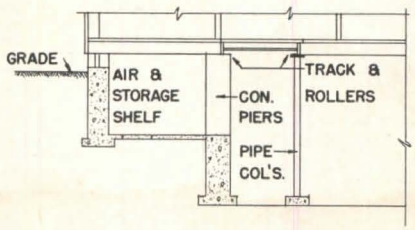
(*Continued from page 270*)

ROTATING CIRCULAR HALL PROPOSED AS STEP-SAVER

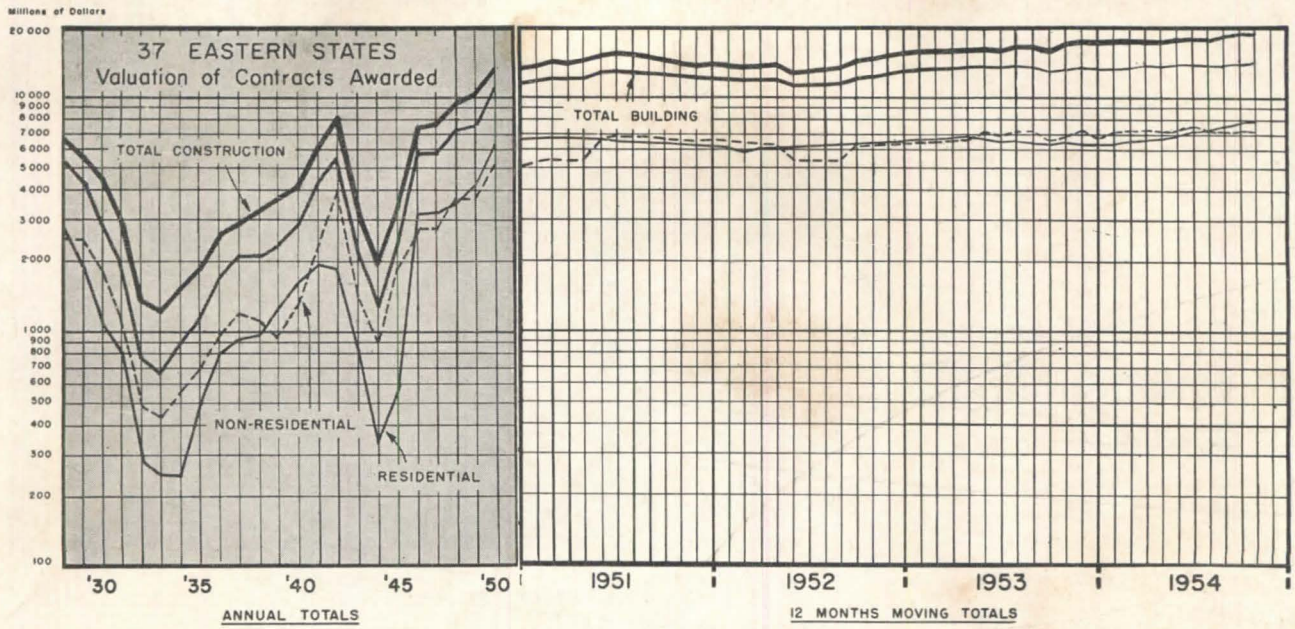
The "Lazy Susan" principle familiar in today's revolving trays and yesterday's milk cellars — not to mention the factory turntable and the circus merry-go-round — has been applied by Myron S. Teller, a retired architect of Kingston, N. Y., to a house design which he suggests might be adapted to the needs of handicapped persons. The rotating hall (see in two possible plans below) would eliminate room-to-room walking; the touch of a button would start the hall revolving, another touch would stop it at the desired point.







CURRENT TRENDS IN CONSTRUCTION



Charts by Dodge Statistical Research Service

FOURTH QUARTER CONTINUES STRENGTH

THE FIRST FOURTH-QUARTER FIGURES reported by F. W. Dodge Corporation on dollar volume of construction contracts awarded in the 37 eastern states showed a monthly total for all types of construction at the highest level of the year and brought the total for the first 10 months of 1954 to $16.4 billion, 11 per cent over the same period in 1953 and a new all-time high for the first 10 months of any year. October contract awards totaled $1,965,339,000, four per cent above October 1953; of the three basic categories, residential construction continued to make the biggest strides — the October residential total of $851,824,000, 34 per cent over October 1953, was the highest monthly total ever recorded in the residential category. Nonresidential construction declined 12 per cent from October 1953; but if atomic energy awards which upped the total for the 1953 month are subtracted, this October bettered last by something less than one per cent. Heavy engineering declined 11 per cent. The 10-month cumulative figures showed 1954 nonresidential construction still ahead of 1953 by two per cent.

RELIGIOUS BUILDINGS*—SELECTED YEARS

F. W. Dodge Corporation Contracts Awarded (37 Eastern States)

Valuation (in Millions of Dollars)

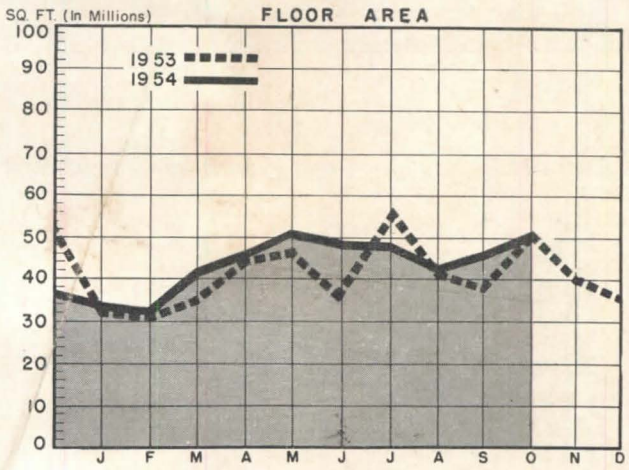
Year	Annual Total	Monthly Average	Year	Annual Total	Monthly Average
1929	106.1	8.8	1950	336.3	28.0
1935	23.7	2.0	1951	299.3	24.9
1943	7.1	.6	1952	317.5	26.5
1947	117.5	9.8	1953	384.7	32.1

Monthly Totals

1953				1954			
Jan.	18.7	July	45.8	Jan.	23.2	July	51.4
Feb.	20.1	Aug.	37.6	Feb.	25.3	Aug.	47.5
Mar.	25.3	Sept.	33.5	Mar.	30.9	Sept.	41.2
Apr.	38.2	Oct.	37.6	Apr.	42.7	Oct.	48.8
May	38.4	Nov.	25.2	May	52.0	10-mos.	
June	32.2	Dec.	31.9	June	48.1	total—411.1	

** Religious Buildings are the subject of Building Types Study No. 217, pages 131–156*

NONRESIDENTIAL BUILDING (37 EASTERN STATES)



RESIDENTIAL BUILDING (37 EASTERN STATES)