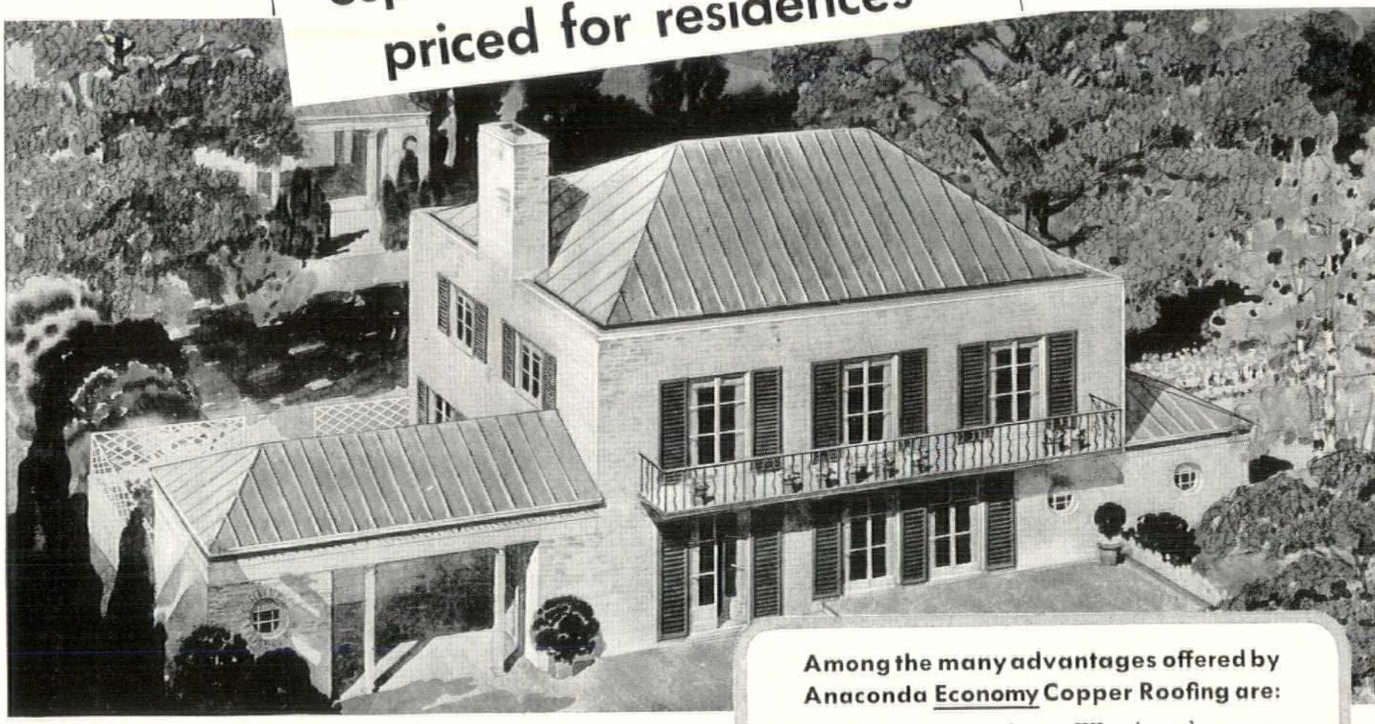
AMERICAN ARCHITECT and ARCHITECTURE

NOVEMBER • 1936 • NEW YORK'S 1939 WORLD'S FAIR

HERE IS COPPER ROOFING

especially designed and priced for residences



This rendering of a house with a standing seam copper roof designed by Frank J. Forster, Architect, illustrates his conception of an effective employment of copper as a durable and practical roofing material.

Among the many advantages offered by Anaconda Economy Copper Roofing are:

Charm and Dignity—Weathered copper harmonizes with landscaping at all seasons.

Fire-Proof—Copper roofing eliminates the flying spark hazard.

Lightning-Proof—When properly grounded, copper roofing protects the structure against lightning.

Light Weight—One of the lightest of roofing materials, copper does not need heavy, costly supporting structure.

Insulation Protection—Impervious to moisture, copper preserves the efficiency of under-roof insulating materials of cellular type.

ANACONDA *Economy* Copper Roofing offers all the traditional beauty and durability of copper, minimum expense for maintenance and many other distinctive features . . . *at a new low cost*. In fact, it provides the home-owner with a combination of advantages possessed by no other roofing material.

This new durable copper roofing (standing seam construction) is offered primarily for residences. Installations in various localities throughout the country are evoking widespread interest. Anaconda *Economy* Copper Roofing is lighter in weight (10 ounces per square foot) and is furnished in narrower sheets which provide a space of but 13¾ inches between standing seams. This reduced width is more in keeping with residential lines, and gives the 10-ounce copper approximately the same rigidity and wind resistance as heavier, more expensive material in wider widths.

36189

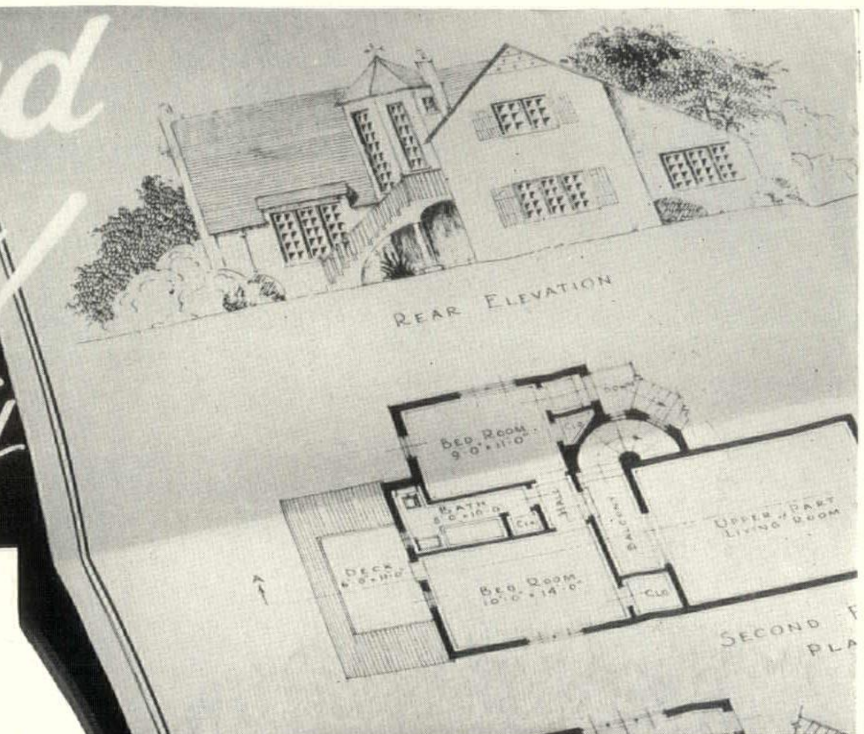
Anaconda Copper

ANACONDA from mine to consumer

THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONNECTICUT

Offices and Agencies in Principal Cities • In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

Selected again at Atlantic City!



Last year, in "The LITTLE HOME" which drew many thousands of visitors to the Steel Pier, Atlantic City, a FITZGIBBON'S "OIL-EIGHTY" STEEL BOILER was installed as the source of heat—and hot water supply.

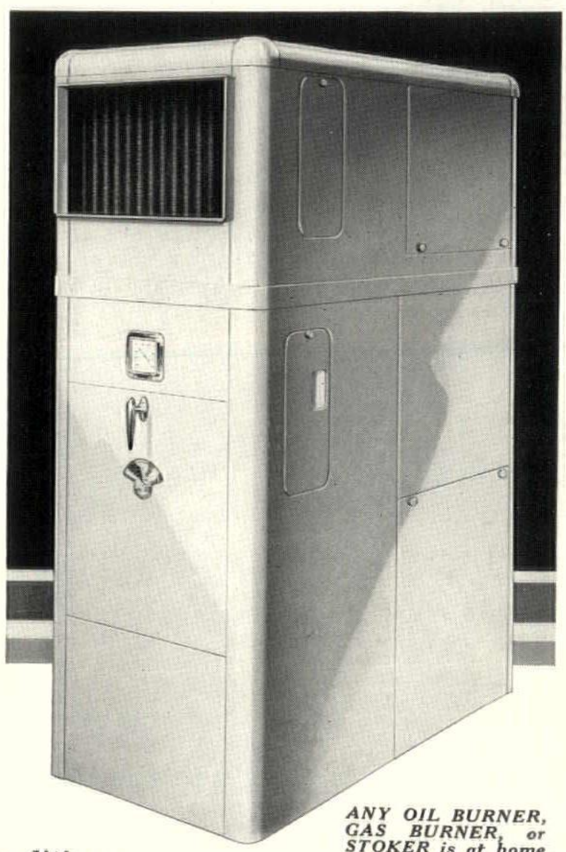
This year the architect, Wm. F. B. Koelle, Philadelphia repeats—and selects the

FITZGIBBONS

BOILER-AIR CONDITIONER

for

"The Home of 1936"



Right up to the minute in every particular, "The Home of 1936" is of course "Split-System" air-conditioned and heated. Certain of its rooms such as kitchen, bath, and garage are supplied with radiator heat, while the remainder are provided with conditioned air—tempered, humidified, cleaned and circulated. The selection of a Fitzgibbons unit for this service is most significant.

But heat and conditioned air were not the only factors governing the selection of this unit. The simplicity of HOT WATER SUPPLY from the unit itself, with NO STORAGE TANK required, aided greatly in the decision—just as it has in thousands of homes where Fitzgibbons Boilers or Boiler-Air Conditioners are giving dependable and economical service.

ANY OIL BURNER, GAS BURNER, or STOKER is at home behind the rear panel of this unit.

• •

LEARN WHY the Fitzgibbons Boiler-Air Conditioner was selected for "The Home of 1936." . . . . Write us for Bulletin AM on "Split-System" air conditioning.

MOST ECONOMICAL IN FUEL — THE FITZGIBBONS BOILER

Fitzgibbons Boiler Company, Inc.

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Works: OSWEGO, N. Y.

BRANCHES AND REPRESENTATIVES IN PRINCIPAL CITIES

50 YEARS — STEEL HEATING BOILERS

American Architect and Architecture, published monthly by Hearst Magazines Inc., 572 Madison Avenue, New York, N. Y. $3.00 per year; Canada, $4.00; Foreign, $5.00. Entered as second class matter April 5th, 1926, at the Post Office at New York, N. Y., under the act of March 3rd, 1879. Issue 2651, dated November, 1936.

AMERICAN ARCHITECT and ARCHITECTURE

CONTENTS

NOVEMBER, 1936

Vol. CXLIX No. 2651

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TRENDS NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

PHOTO: ACME

PHOTO: WIDE WORLD

Biggest story of the month in architecture was the publicity release of plans for New York's 1939 Fair (page 44). Naturally, impeccably groomed, boutonniered, Fair President Grover A. Whalen was pretty much the center of things. (Above) Mr. Whalen shyly points out the features of the model of the Exposition to amused members of the Board. (Below) Affixing his signature to the contract to start actual construction on the project. Seated at Mr. Whalen's right is Harvey Stevenson. Standing from left to right, Gerald Holmes, Richard Kimbell, Colonel John P. Hogan, Edgar Williams, Richmond Shreve, Earle Andrew, Charles C. Green, Stephen Voorhees, Commodore Howard A. Flanigan

AIA Blast

"In the name of the profession of architecture in the State of New York, we, its undersigned representatives, wish to register a most emphatic protest against the employment of the State Architectural Bureau in the Department of Public Works to design the New York State War Memorial Building."

Denied a conference with Governor Herbert H. Lehman, it is small wonder that the New York City Chapter of the A. I. A., along with affiliated chapters throughout the state, chose to begin its letter of protest so brusquely. Branding Governor Lehman's attitude as "Bureaucratic domination of the arts," challenging the "moral right" of the Department to ignore the best professional talent of the State in designing and erecting a great public monument, the letter continues:

"While you have appointed an Authority to handle all phases of this Memorial, we believe we are justified in assuming that the present disposition of this project meets with your approval. It was with a keen sense of disappointment, bordering on incredulity, that we received in response to our request to you for a conference on this subject a curt reply from one of your office staff referring us to Mr. Scheiberling, and an equally curt reply from Mr. Scheiberling stating that the Commission had by resolution on July 13 accepted the 'offer' of the Department of Public Works to design the structure.

"We had entire confidence that you, whom we know to be a gentleman of culture and broad understanding in addition to your abilities as leader and administrator, would not be unmindful of your responsibility to see that this great monument, paid for by public subscription and dedicated by the people of the State to such a high purpose, should represent the best efforts of the greatest creative artists of our community.

"We have a deep respect for the personnel and achievements of your Department of Public Works. Many of us have had the opportunity of working with it and are familiar with its value and also have some idea of its proper limitations.

"This situation called so obviously for the selection of the best possible talent among architects, painters and sculptors by competition or otherwise—the winners to design the memorial, in association perhaps with the Department—that this latest triumph of bureaucratic domination of the arts is viewed with deep concern by many elements of the community.

"It has been known for some time that it is the policy of the Department of Public Works to oppose the services of private architects and engineers on public work connected with the State. Our experience seems to justify our stating that the rulings of this Department have been actuated by a resentful, even an arbitrary and unenlightened attitude.

"We submit to you that this Department as the servant of the public has no moral right to ignore the entire profession of architecture in this State. This applies especially to this particular building, the funds for which are being obtained by public subscription.

"We therefore urge that you shall give this matter further serious consideration and that the architects of the State shall be heard."

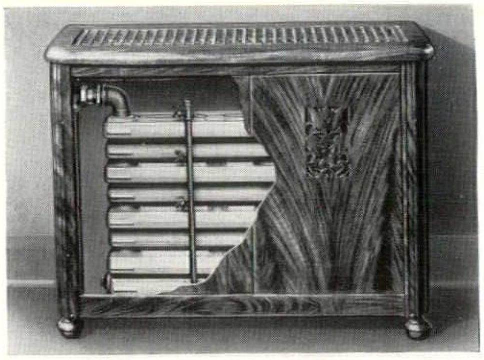
The letter is signed by the following: Hobart B. Upjohn, president of the New York Chapter of the American Institute of Architects; Stephen W. Dodge, president of the Brooklyn chapter; Robert D. Kohn, president of the council of Registered Architects; R. H. Shreve, director of the New York Division of the Institute; Leon N. Gillette, president of the Society of Beaux

(*Continued on page* 8)

HOW TO CAPITALIZE ON

Crane Heating Economy

★ ★ ★ ★ ★ ★ ★ ★



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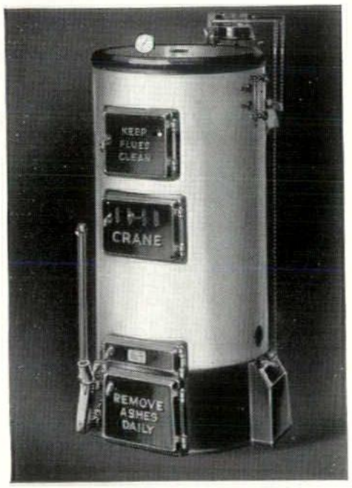

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Crane Round Boiler for Coal Burning—the boiler with 24 radical improvements which result in substantial economies and great ease of tending. Readily adapted to oil burning.

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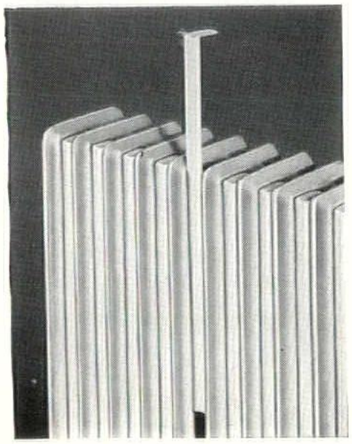
Directed Radiation. Invisible shields direct heat outwardly into room, minimizing ceiling-floor temperature difference, protecting walls, etc., from smudge.



● One test of the value of architectural service is reduced residential "*operating cost*" effected by scientific selection of equipment. A gem of architectural design is of little value if it costs too much to "operate."

When you specify a Crane Heating System—straight radiation or with auxiliary air conditioning—you are capitalizing, in the value of the home, an operating economy born of modern engineering and the latest researches in residential heating. You match the perfection of your architecture with perfection in its operating equipment.

Crane boilers have 50 per cent more horizontal "ceiling" heating surface over the hot gases than ordinary boilers. Patented baffles direct the water to the most efficient heating areas. This saves heating dollars in amounts *big enough to count!*

Crane Heating Systems include boilers for coal (hand or stoker-fired), oil or gas, for the operation of steam, hot water, vapor or vacuum systems, with or without air conditioning. You have your choice of Directed or Concealed Radiation plus the Crane Humidifying Radiator.

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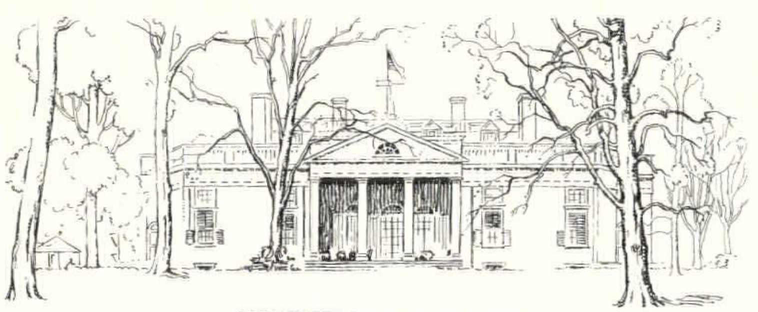
VALVES, FITTINGS, FABRICATED PIPE, PUMPS, HEATING AND PLUMBING MATERIAL

Something About Some Brick Truths That Were Accused Of Being Lies

[Furthermore I Was Accused Of Telling Them]

SEEMS like it's about time to tell some more brick truths, much as I may hate to do it. My idea of truth is, a something that is an *is*, and no amendments. So when I get to ranting about Old Virginia Brick, it tain't at all about just any old brick made in old Virginia. There's a whale of a difference.

Am not denying there's a considerable passel of such latter bricks made and sold down here, that we don't have a hand in. Yes, and some of them are Jefferson size at that. But adding a half-inch or so to the top of a brick doesn't make it a true Jefferson, nohow.



MONTICELLO—EAST FRONT

Nor can making them out of a mud-clay having a dingy clouded color—as mud-clay has a way of having — give them the *born-old* look and depth of color that our True Jeffersons so unfailingly have. If you really want such "dingies" there's no use at-all of our talking.

But if you want deep rich clear colorings, a certain amount of off-shapeness and just enough softening of the edges to make them full brothers to those Mr. Jefferson made and used building Monticello, (and a right smart number of other notable Virginia structures), then reckon you might induce us to part with some of ours.

You can have 'em either mould-made or hand-made at that. There's very little difference in the cost in any event.

'Tother day a "smart Alecky" contractor made a crack at me about it being "a lot of hooey about our using three different kinds of coal in burning our brick to get the colors and age-old effect."

So I straight-away invited him to pay us a visit for 30 days, which is the time it takes to make our true Old Virginians. He could then see for himself how they are neither a clay nor a shale brick, but just the right painstaking mixture of both. He could also see what a powerful lot the particular kind of sand we use in the mould, has to do with their making. So far as we have been able to learn, no place else in Virginia is this sand found.

No, he didn't come. But he did send along a passable order for the Jeffersons and a lot of special shapes, which last although we can't make a cent on them, we are always glad to be accommodating about.

A while back we made 70 thousand of them for a Government job, and not a single reject. Which near as have been able to figure out, comes close to being around 100 percent satisfactory.

But even so, even if the most part of what have been saying tallies fairish with the truth, you might feel I'm doing a considerable tooting of our nice shiny tin horn. Maybe so. But long as we must sell a few brick now and again, there doesn't seem to be any cause for tucking them under a bushel and expecting much light to leak out.

HENRY GARDEN
Brick Maker for
OLD VIRGINIA BRICK CO.
with Mr. Jefferson as a Guide.

P.S.
You are right. Did make a near promise to chat with you this time about Holland brick. But that can wait. Suspect you ain't so alfired het-up about them anyway.

OLD VIRGINIA BRICK

Old Virginia Brick Company
Salem, Virginia

TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

COURTESY: GERMAN RAILWAYS

In the rumble of the future war the obbligato of whirling airplane propellers will be an earpiercing one. New airports are an important part of the general theme. One of the most recently build and one of the finest is in Frankfort, Germany

Arts Architects; Charles A. Dewey, president of the Westchester Society of Architects; James Whitford, president of the Staten Island Society of Architects; Clarence H. Gardinier, president of the Albany Chapter of the Institute; John J. Wade, president of the Buffalo Chapter; Conway L. Todd, president of the Central New York Chapter; Walter M. Nugent, president of the Rochester Society of Architects.

Letters supporting the protest were also sent to Governor Lehman by Electus D. Litchfield, president of the Municipal Arts Society, and Thomas S. Holden, president of the New York Building Congress.

Housing and Public Health

According to Professor C. E. A. Winslow, the director of the school of Public Health at Yale University, there are 6,000,000 families in this country that must be housed by the government because their incomes are so low that they are unable to purchase decent housing. Furthermore, Professor Winslow believes that the housing of these people is at a level lower than that which prevails in the leading countries of Europe. These two basic facts were pointed out last month in a radio address during which Professor Winslow called the idea that housing should be left to private enterprise "a romantic dream."

Said he, "Overcrowded conditions of living promote immorality. An unattractive home drives children into the streets and increases juvenile delinquency. Neither physical nor mental health nor fullness of living is possible where a whole family is crowded into a single room of a city tenement or struggles for existence in an insanitary shack on an Appalachian mountainside. The reason why we have so far failed to meet this situation is that, obsessed by the romantic dreams of rugged individualism, we have held to the view that the housing problem could be solved by private commercial enterprise. The brute fact is that in the United States, as in all the countries of western Europe, there is a considerable section of the population which has an income too low to permit housing of a minimum standard of health and decency. This is the very unpleasant conclusion we must face and, once we face it, there are only three alternative solutions of the problem. Either the lower economic group of our fellow citizens must continue to be housed like cattle (far worse than the cattle on a model dairy farm), or the economic structure of society must be changed to provide a living wage for all, or the government must subsidize housing for the lower income groups. The magnitude of the problem is beyond the possibilities of private enterprise; its importance is above any considerations of partisan politics."

As evidence of the soundness of his case, Professor Winslow points to the fact that English authorities estimate 10 per cent of their population has an income too low to permit the payment of an economic rent. Even in the boom days of 1929, the Brookings Institute's study on "American Capacity to Consume" estimated that more than 2,000,000 families, nearly 8 per cent of the total, had annual incomes of less than $500; nearly 4,000,000 families, almost 14 per cent of the total, had incomes between $500 and $1,000, and nearly 6,000,000 families, 21 per cent of the total, had incomes between $1,000 and $1,500. Today even the most conservative appraisers believe that 30 per cent of all families in the United States are unable to pay an economic rent.

"It is abundantly clear," said Professor Winslow, "that the families below the $1,000 income level cannot pay even 6 per cent on the capital investment involved in home construction. If minimum standards of health and decency are to be secured, 4,000,000 families must be housed by government aid with an interest return of 3 or 4 per cent, and 2,000,000 families must be provided for with practically no return at all."

Professor Winslow is in absolute sympathy with the present administration's attempt to establish a national housing program. He feels, however, that these efforts have no more than "scratched the surface of the problem." To meet the need of 6,000,000 low-cost dwelling units in twelve years would call for half a million government-subsidized homes a year, Professor Winslow points out. Figuring cost of homes at a meagre $4,000, this would call for at least two billions of dollars a year.

Capital Investment in Labor

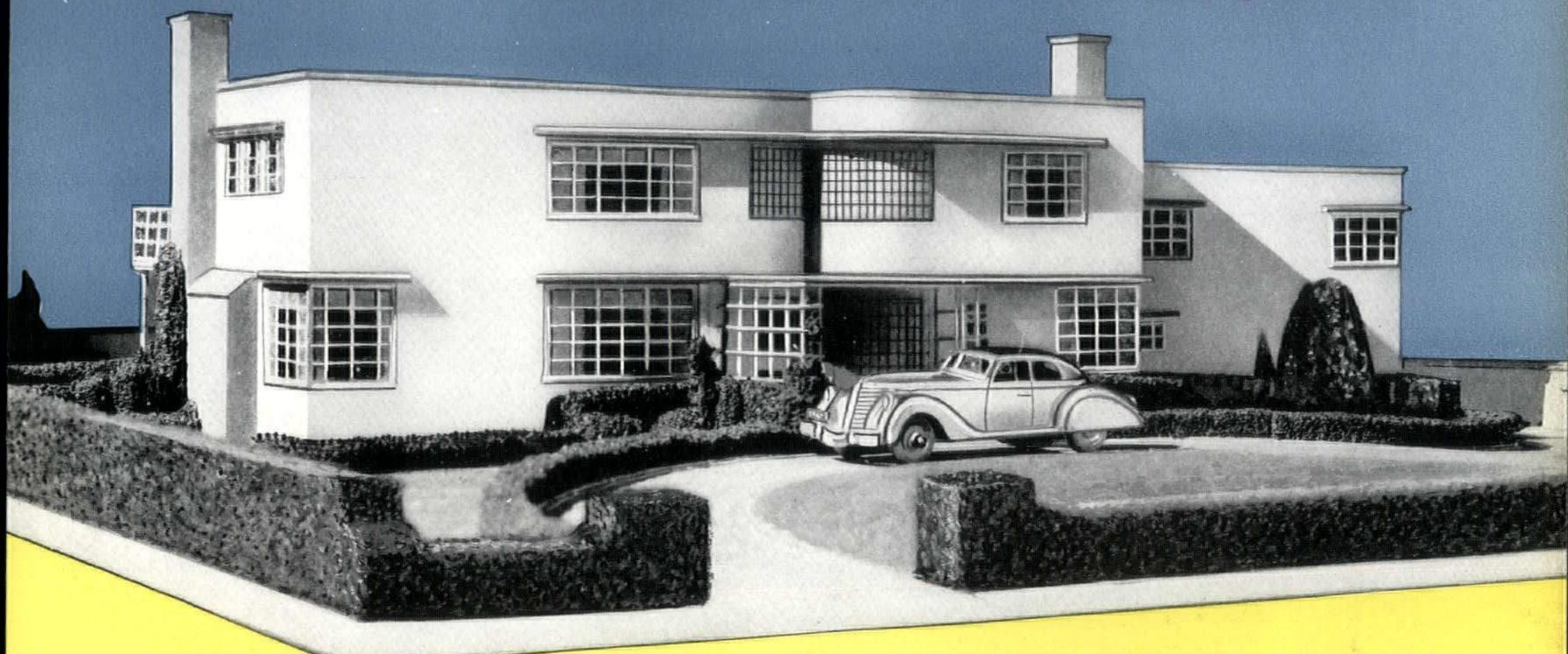
When organized labor talks glibly of the possibilities of a redistribution of wealth, and offers such pat phrases as "wealth serves only the rich," there is bound to be an answering volley from the forces of capital. And such a rebuttal, complete in its statistical analysis, was published in a recent issue of *News & Opinion*, official organ of the Building Trades Employers' Association.

Using the construction industry as an example, *News & Opinion* says: "In no other field does the man with money play such an important part, nor in any other are such tremendously high capital investments constantly necessary to provide a day's work for mechanics. Examination of the cost of building

(*Continued on page* 12)

Briggs Beautyware

in keeping with the TEMPO of Modern architecture



● The "Made in Detroit" Home, built and equipped with materials made in Detroit and sponsored by the Detroit Board of Commerce. Hugh T. Keyes, architect, Detroit. Owners, Mr. and Mrs. Lloyd H. Buhs. An outstanding example of modern architecture, equipped throughout with Beautyware plumbing fixtures.

RECENT national surveys show that the preference for modern architecture by new home owners has gone from 4th to 3d place during the past year. More and more homes are being built for living—from the inside out. And Briggs Beautyware plumbing fixtures keep step with this swing to functional design in modern living.

Every detail of Briggs Beautyware aids the architect in his present-day problems of using space to the best advantage —of using a wider range of materials for design, style and decorative effect.

Precision in manufacture permits greater accuracy in installation of units. Due to its design, a 5-foot Beautyware tub has as much bathing area as the ordinary 5½-foot tub. This is important. Every Beautyware tub has a patented lip flange for perfect joining with the wall material. Beautyware's lighter weight makes special wall or floor supports unnecessary and cuts down installation costs. And the embossed serpentine bottom of the Beautyware safety tub is a great advance in home safety.

All Briggs Beautyware lavatories have removable overflow and waste valves. Briggs units are surfaced all over with porcelain enamel—including the under sides. These features give exclusive sanitary protection. And the porcelain surface of Beautyware, acid resisting at no extra cost, has a higher lustre—easier to clean.

Beautyware in gleaming white, in soft, rich, solid tones or exclusive two-tone combinations complements floors and walls in whatever decorative scheme you create.

Functional efficiency and compelling beauty, utility and charm are merged in Briggs Beautyware—modern plumbing fixtures for modern homes. Investigate Briggs Beautyware for bathroom, kitchen and service room!

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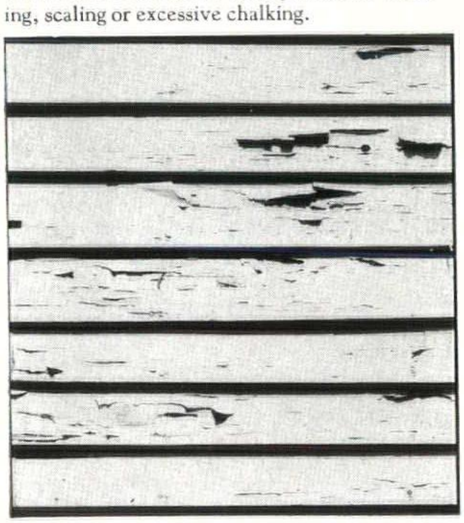
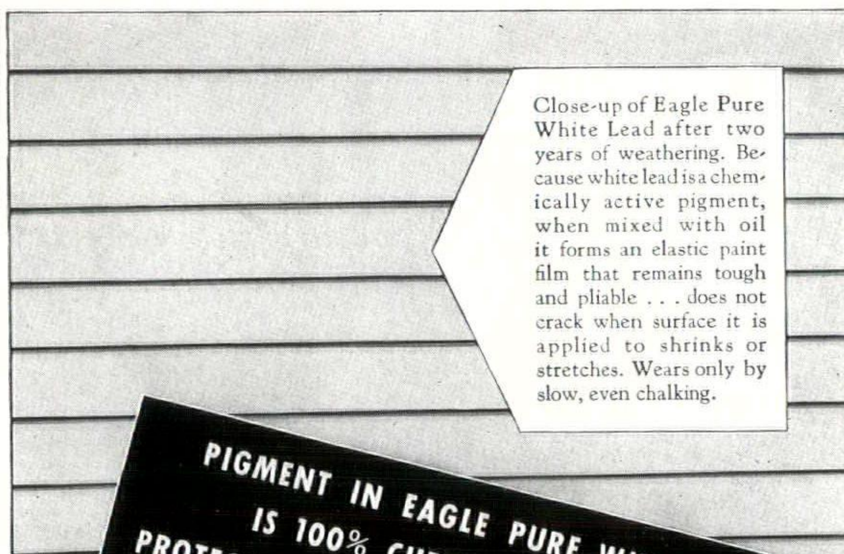
Camera shows why

EAGLE pure WHITE LEAD

gives better paint protection

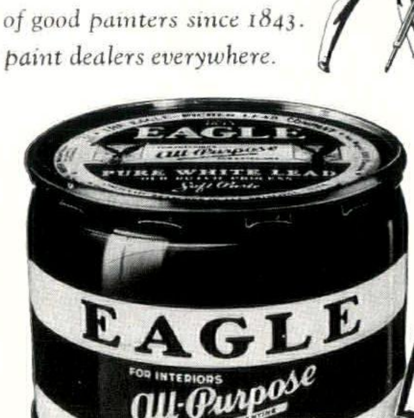
Substitute pigments in this paint created a brittle film . . . cause of most premature cracking, scaling or excessive chalking.



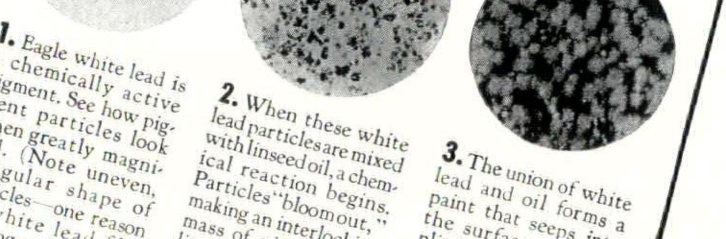


Close-up of Eagle Pure White Lead after two years of weathering. Because white lead is a chemically active pigment, when mixed with oil it forms an elastic paint film that remains tough and pliable . . . does not crack when surface it is applied to shrinks or stretches. Wears only by slow, even chalking.

Choice of good painters since 1843.
Sold by paint dealers everywhere.



PIGMENT IN EAGLE PURE WHITE LEAD IS 100% CHEMICALLY ACTIVE— PROTECTS AGAINST CRACKING AND SCALING



1. Eagle white lead is a chemically active pigment. See how pigment particles look when greatly magnified. (Note uneven, irregular shape of particles—one reason for white lead film wearing so long.)

2. When these white lead particles are mixed with linseed oil, a chemical reaction begins. Particles "bloom out," making an interlocking mass of pigment and linseed oil. (Inert paint pigments do not bloom out.)

3. The union of white lead and oil forms a paint that seeps into the surface it is applied to . . . sticks on like glue. Stays tough and pliable...does not crack when surface stretches or shrinks.

THE EAGLE-PICHER LEAD COMPANY · CINCINNATI

What telephone arrangements will you plan for the Webers

PROBLEM No. 4

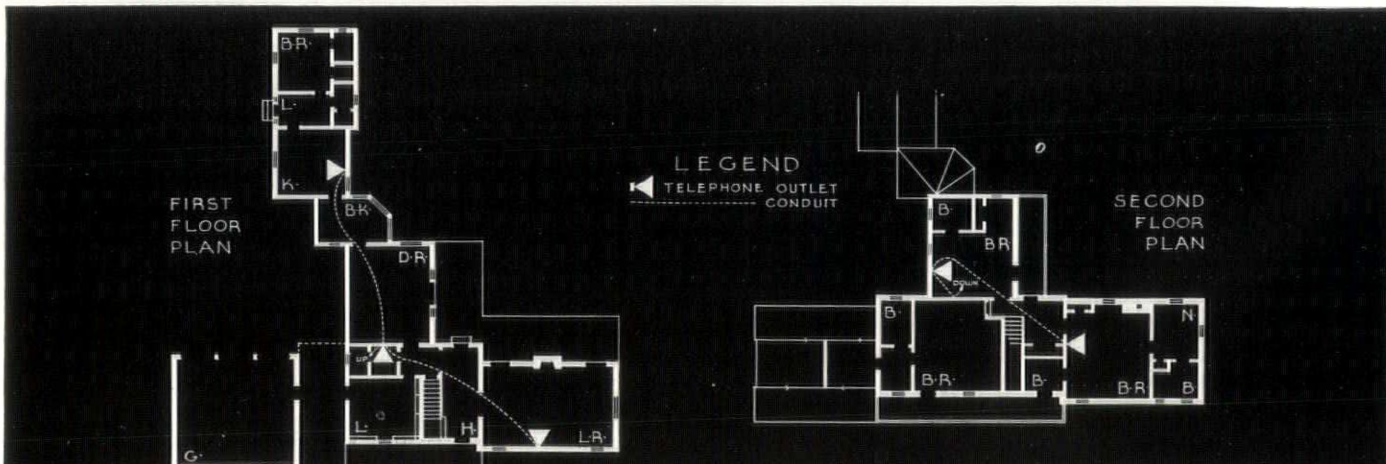
if they build this house?

FRED WEBER is "on the way up" in the printing business. He's going to build his home now—so the whole family can enjoy it while the children are growing. The plans on this page have been tentatively approved. *What provisions will you make for telephones?*

First of all, built-in conduit or pipe to avoid exposed wiring and protect against certain types of service interruption. Also, the Webers may want to add more telephones later on. Conduit, leading to outlets at strategic points, makes further telephone installation easy . . . even with the permanent, modern building materials you specify today.

An outlet belongs in the master's bedroom. When the girls grow up they'll want a telephone for their own use, so conduit should lead to the room they'll occupy. Three outlets will be enough for the rambling first floor. One in the living-room. One in the hall closet, easily accessible from the dining-room and library. And one in the kitchen to serve the rear of the house.

This is a suggested approach to a typical problem. Our engineers will help you develop efficient, economical conduit layouts at any time. No charge. Call your local telephone office and ask for "Architects' and Builders' Service."



TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

PHOTO: WIDE WORLD

With "correct thinking clinics" and Dr. Kanichi Tanaka's discovery that Japanese have as strong hand grips as Americans, Japan's interest in education is growing apace. Moppets engage in developing the honorable grip on the playground of their new international style primary school in Tokyo

projects and the man hours of labor involved, shows without question how dependent labor in this field is upon capital investment. Recently the Ford Motor Company gave $9007 as its cost of setting up a job for a Ford employe. The Goodyear Tire & Rubber Co. showed $4811 as its capital investment. The sums needed for each building trades worker are much greater, because the capital investment must be raised time and time again."

As illustrative proof of these assertions, *News & Opinion* analyzes the capital investment by trades on the Knickerbocker Village apartment development in New York City. The pay roll accounts totalled 1,759,640 man-hours of employment at the site. The daily wage per man, including all workmen, ranged from $5 to $14, averaging about $9.50. *News & Opinion* makes the following tabulation showing the capital investment required for a day's work for one man in specified trades:

Glazier	$17,150
Roofer & Sht. Met. Wkr.	7,425
Painter	1,146
Electrician	1,046
Plumber	790
Lathing & Plstrng Wrkrs.....	402
Cement & Con. Wrkrs.......	312
Masons	182

Taking into consideration the amount spent for direct payments in wages, the costs of materials, and the investment necessary for the land costs, *News & Opinion* feels justified in concluding that: "We believe sufficient examples have been given to indicate that building trades labor is entirely dependent upon capital investment for its livelihood and that whenever building trades workers adopt policies that tend to prevent the accumulation of capital or its active flow in building erection as office buildings, factories or houses, they are hurting their own chance of employment."

Purdue's "Number Four"

It was just about a year ago that Purdue University set aside 120 acres in Lafayette, Indiana for the purpose of practical experiment in the hope of learning something about construction and cost in the small house field. All in all, five houses have been erected on the "laboratory campus," one of the most interesting being a steel dwelling that cost $4,992—$8 less than the originally established top price.

This new house, officially designated as "number four," took seventy-five days to construct, has three bedrooms, a living room, dining alcove, kitchen, bath and garage, was financed by the Purdue Research Foundation, and was built on land donated by the University trustees.

Says the bulletin issued by the University: "Steel used in home construction has been generally in the direction of replacing the structural members, such as wooden wall studs and floor joists, with rolled or pressed structural steel shapes, but house No. 4 goes beyond this point. The construction methods used have produced what is practically an all-steel dwelling. The walls and roof were largely prefabricated in the shop ready for erection at the site."

Principal objective of the plan arrangement has been to avoid the box-like appearance frequently criticized in flat-roofed houses that attempt extreme simplicity. Here, mainly by increasing the height of the living room area, the "shoe-box" effect has been eliminated. Three features of the plan, pointed out as noteworthy, are the compact hall which prevents waste space; the small space required for heating equipment, and the use of the garage for laundry.

Quoting the bulletin: "Hall space is limited to a small passage which provides access to the bathroom and bedrooms from the living room. Since the wall space of this passage is practically all doors, it is difficult to conceive of a hall to serve four rooms being smaller."

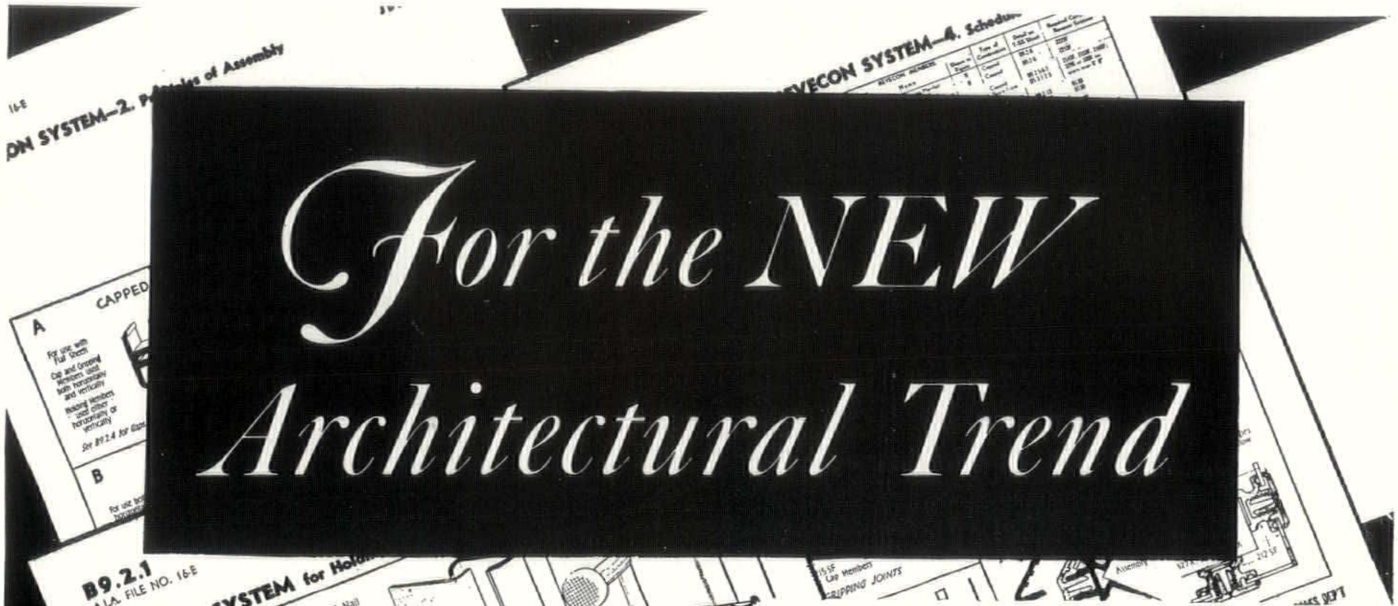
Further, "few small houses, in which space must be conserved, as an aid to cost reductions, make use of the garage for laundry purposes. In House No. 4 the arrangement of the kitchen entrance provides additional room in the garage to allow for laundry trays in this area without crowding."

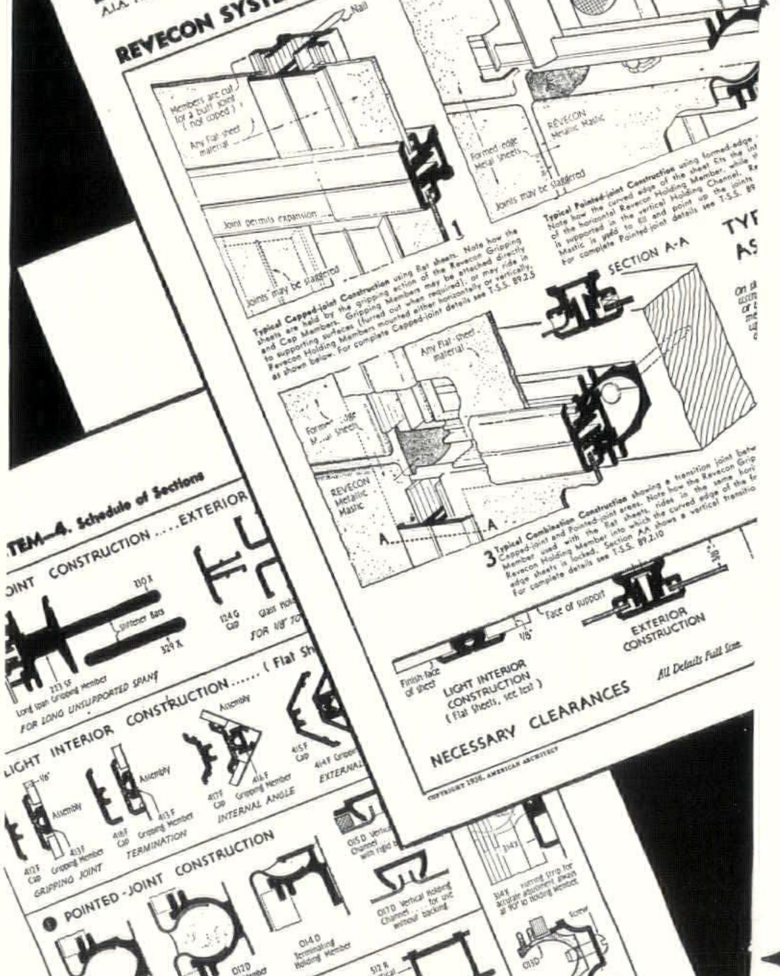
(*Continued on page* 16)

PHOTO: UNDERWOOD & UNDERWOOD

Strange indeed are the things that often happen to a western style of architecture when adapted to oriental needs. This sort of baroque garden gate is the facade of the Ministry of Navy Building in Nanking, the new capital of China

For the NEW Architectural Trend





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ZOURI STORE FRONTS
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ARCHITECTURALLY SPEAKING

by

OTIS ELEVATOR COMPANY

Recently, we used this *Architecturally Speaking* page to announce the rounding out of what we consider the most modern phase of elevator development—a complete line of elevators whose control mechanism is operated by buttons—Finger-Tip Control. May we now direct your attention to an important feature in this announcement, namely, the adaptation of Signal Control (master of the Finger-Tip line) to moderate-speed machines.

You are already familiar with the use of Signal Control in the higher buildings. By adapting Signal Control to geared, moderate-speed car-switch machines, we have made it possible for the moderate-sized building to give big-building elevator convenience. Which puts the older building on a far more favorable basis with the new and towering giant.

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If you are interested in more complete details, we suggest that you request full information from the Otis office in your city.

TRENDS

NEWS • EVENTS • FACTS • FACES • IDEAS • OPINIONS • COMMENTS

From the chrysalis of Atlanta's most blighted slum area, consisting of dilapidated frame houses and shanties, emerges PWA's Techwood, first slum clearance project. The rents for these apartments start at $16.50 per month for three rooms

While the kitchen arrangement has been criticized on the grounds that doors at both ends of the long axis make it a busy thoroughfare, and that cupboards are inadequate to accommodate all utensils of cooking, the bulletin contends that this can be proved only after actual use.

The dining space is essentially a part of the living room, but is so placed that it affords privacy at meal times and also serves to increase the apparent size of the living room. This effect of spaciousness has been carried out by opening one end of the dining area to the living room, and by increasing the ceiling height of the living room 1 foot 9 inches above that of the other rooms where the height is eight feet. No cellar is included.

Closets are of average size and are arranged to present minimum space for greatest usefulness. Each closet is equipped with a shelf and clothes hanging rod. In addition to closet space for each bedroom there is a linen closet, and a coat closet near the door. No other storage spaces are provided. In all, the house contains 1,289 square feet and on this basis cost $3.90. The University has found that the overhead and profit to builder on this project was 4½ per cent, a total of $223.80.

Building Permits

After less than seasonal decline in August, the volume of building permits issued in September made a substantial gain in that month over both the preceding month and the same month of last year. According to figures compiled by Dun & Bradstreet, Inc., totals for 215 cities were $88,791,762 in September, 1936, compared with $83,109,944 in August, and $47,479,944 in September, 1935. The increase over last year amounted to 87 per cent.

For New York City alone permits issued had a total value of $17,331,441 as against $12,095,174 in August and $9,227,037 in September, 1935. This represented increases, respectively, of 43.3 and 87.8 per cent.

For the 214 cities outside of New York, permit values for September aggregated $71,460,321, a gain of 0.6 per cent over the $71,014,579 figure recorded for August this year, and a rise of 86.8 per cent as compared with the 1935 total of $38,252,907.

NAREB Convention

Just about this time of year, when the first cold breeze begins to snap at your pants legs and you take the mothballs out of your winter overcoat, most everyone realizes that it is a swell time to take a southern vacation. Taking this weakness of the flesh into consideration, smiling broadly at the upward swing in building, officials of the National Association of Real Estate Boards have little doubt that their 29th annual convention, to be held in New Orleans from November 16-21, will bring out a record breaking attendance.

One man sure to be on hand for the convention is Charles N. Chadbourn, member of the Minneapolis Real Estate Board. Just twenty years ago Mr. Chadbourn coined the term "Realtor" as a designation of NAREB membership. Mr. Chadbourn, known as the "Father Realtor," will be honored at the "old timers" dinner opening the convention.

After the executive sessions covering the first two days, meetings of the Association's specialized institutes, Divisions, and Councils will be staggered over a period of three days. Excerpts from the convention program follow:

American Institute of Real Estate Appraisers, November 18, P.M.;

Institute of Real Estate Management, November 19, A.M.;

National Mortgage Board, Thursday November 19, A.M.;

Brokers Division, November 18, P.M.;

Land Developers and Home Builders Division, November 18, P.M.;

Industrial Property Division, November 18, P.M.;

Institute of Farm Land Brokers and Managers, November 19, A.M.

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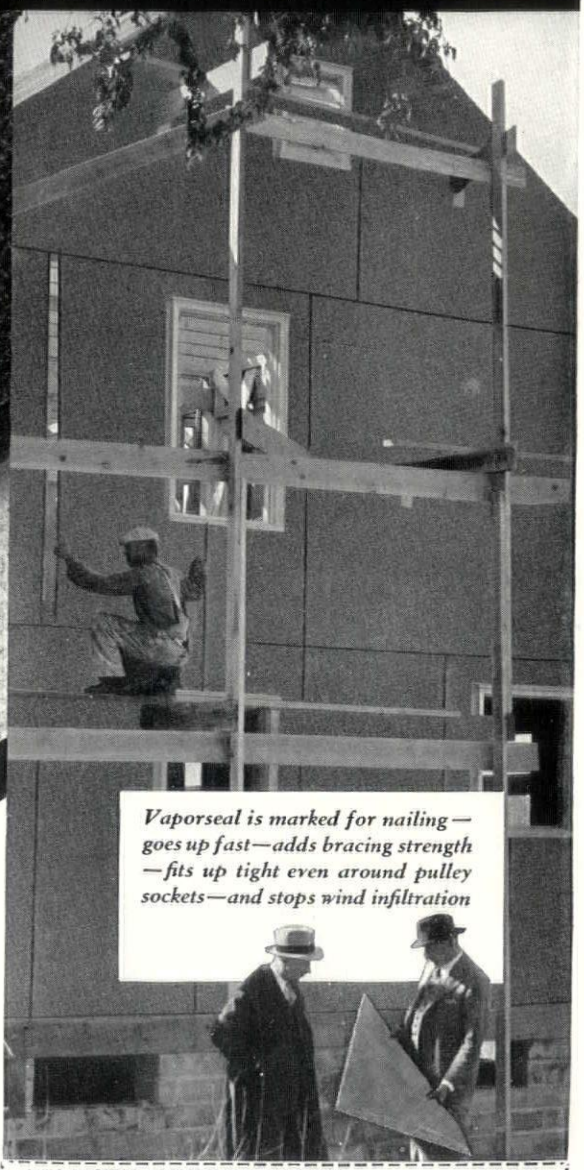

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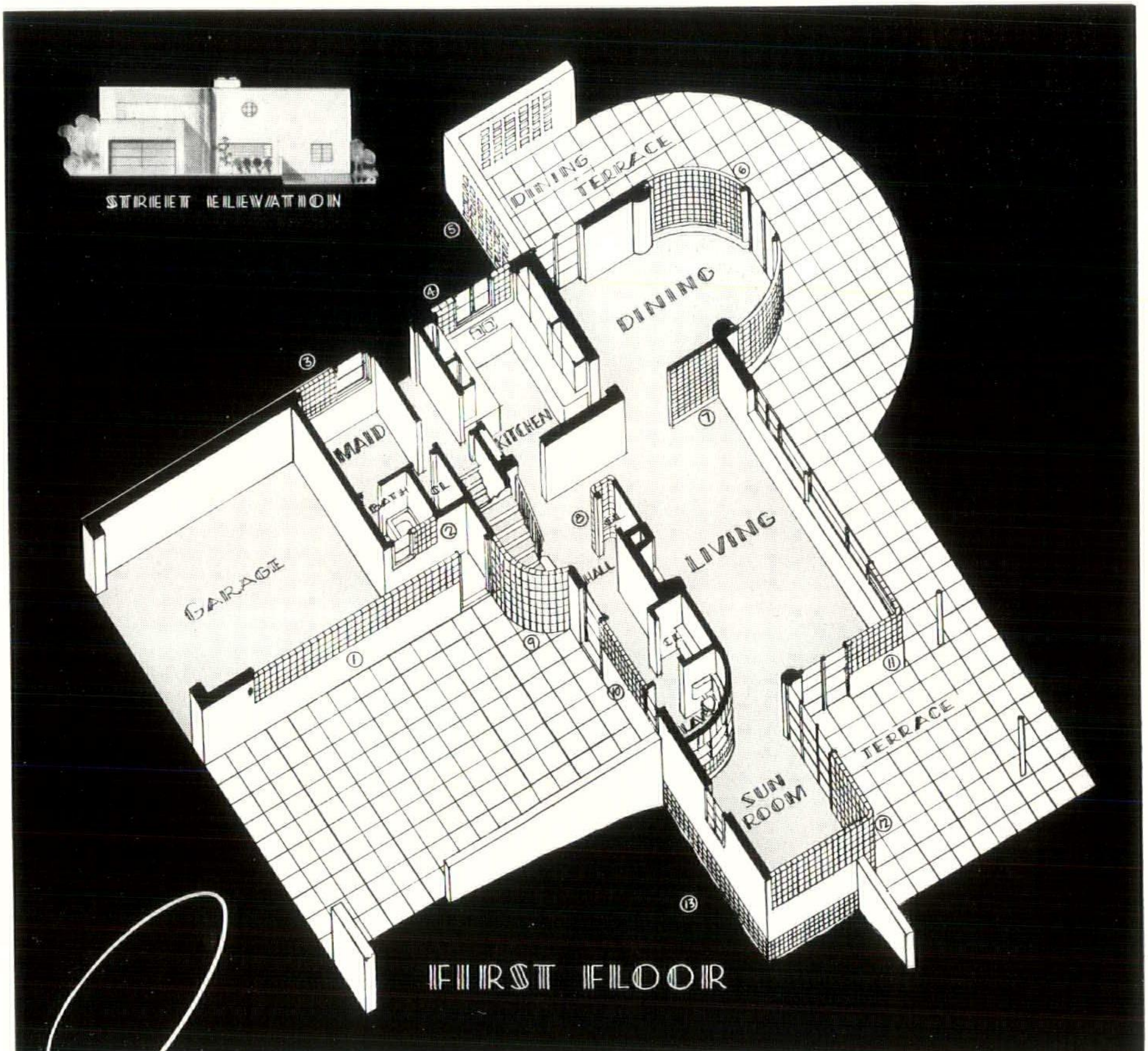
STREET ELEVATION
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KITCHEN
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SUN ROOM
TERRACE
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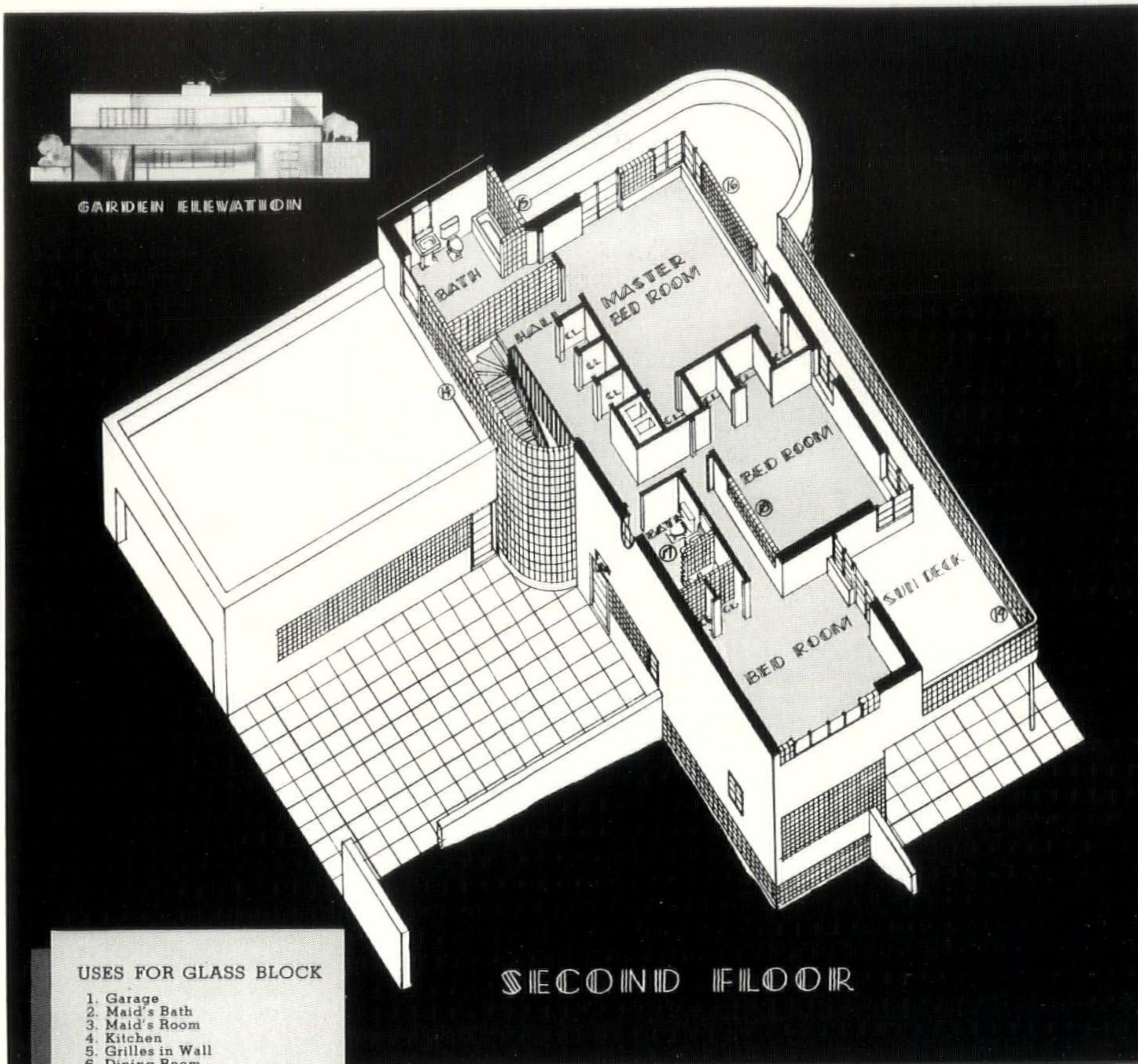

USES FOR GLASS BLOCK

1. Garage
2. Maid's Bath
3. Maid's Room
4. Kitchen
5. Grilles in Wall
6. Dining Room
7. Living Room Partition
8. Hall—Decorative Panel To Be Illuminated
9. Stair Hall
10. Entrance Hall
11. Living Room
12. Sun Room
13. Basement
14. Stair Hall
15. Bath
16. Bedroom
17. Shower Bath
18. Hall—Borrowed Light
19. Balustrade

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PHOTO: SCHALL AND TIMES WIDE WORLD

MUNICIPAL RECREATION

PHOTO: WIDE WORLD

BY ROBERT MOSES
Park Commissioner, City of New York

NUMBERING AMONG HIS ACHIEVEMENTS IN ONLY TWO AND A HALF YEARS TENURE OF OFFICE, THE ADDITION OF 169 NEW PARKS TOTALING 3,357 ACRES, 150 NEW PLAYGROUNDS, 3 ZOOS, 8 GOLF COURSES, 1 STADIUM, 10 SWIMMING POOLS, THE TRI-BOROUGH BRIDGE, NUMEROUS RECREATIONAL FACILITIES ALONG THE MANY NEW PARKWAYS, AND THE PREPARATION OF FLUSHING MEADOWS PARK FOR THE NEW YORK WORLD'S FAIR OF 1939, ROBERT MOSES IS APTLY CALLED BY MANY "THE GREATEST ARCHITECT IN NEW YORK"

IN 1934 there were 14,827 acres of land under the jurisdiction of the Park Department of New York City in 408 individual parks and playgrounds. There was one public bathing beach which was suitable for the accommodation of large crowds of bathers. There were two small outdoor swimming pools, one of which was simply a concrete tank with no provision for cleaning or sterilizing the water.

Of the 119 playgrounds scarcely a dozen had been developed with any thought of proper planning and all were in a dilapidated and unsightly condition. Central and Prospect Parks were the only two large areas which had been properly planned and constructed, and even they had received no attention for so many years that they were far from suitable to serve the present needs of large city parks.

Most of the park acreage had been either left to uncontrolled public use or developed without any sort of preconceived plan, and what little maintenance had been carried on was misdirected and had resulted in no substantial benefit to the public.

The new administration came into office with not much more than a handful of executives and a large amount of initiative. It found a run-down park system, under-staffed with old, inefficient personnel and an assignment of some 60,000 relief workers, without supervisors, tools or plans to work by.

Inside of a month a program had been formulated for the improvement of those facilities which were adaptable to rehabilitation, and plans were under way for the construction of playgrounds, golf courses, and general park improvements.

By an agreement with the relief authorities a staff of technical designers and field superintendents was set up with personnel selected for their ability, regardless of relief or political qualifications.

PLAYGROUNDS

By the middle of the year all park structures had been repainted at least once, usable fences had been repaired and miles of unnecessary fences had been removed, lawns had been re-seeded, trees had been pruned, walks had been repaired—the park system in general had taken on a new appearance. Construction had been started on dozens of playgrounds throughout the city, new zoos in Central Park, Prospect Park and in Barrett Park, Staten Island, and on the reconstruction or new construction of 8 golf courses. With a fund of one-quarter million dollars, which had been held in trust by the City Chamberlain for 13 years for the erection of a war memorial to police heroes, 8 new playground sites had been purchased and recreation buildings had been constructed, under contract, for each of them. The general construction work around the buildings was done with relief labor. These playgrounds were opened to public use in July.

A study of the condition and use of large park areas, and particularly Central Park, indicated that much of the vandalism and unnecessary damage to shrubbery and lawns, could be prevented by the establishment of definite areas around the perimeter for playground use. There have been completed around the edge of Central Park 18 so-called marginal playgrounds. These playgrounds are equipped with small sized swings, see-saws, slides and playhouses, shower basin and benches. They are surfaced with a resilient asphalt preparation, which prevents digging and eliminates dust. They are fenced and the gates are locked at night. Located near the major entrances, they intercept children on the way into the park and provide a place in which excess energy can be worked off without damage to the park surroundings.

In 2½ years the playgrounds in the park system have been increased from 119 dilapidated and generally unused areas to 271 modern, fully equipped and intensively used playgrounds for all ages.

The one natural bathing beach is being reconstructed to increase its capacity three-fold. A complete new bathing beach just under a mile in length has been constructed and provided with a bathhouse, parking facilities and other incidentals necessary for a development of this kind.

The parks in the city have been increased in number to 577 and in area 3,357 acres, bringing the total to 18,184 acres. Among the major new areas acquired are Randall's Island, on which has already been constructed the stadium in which the Olympic try-outs were held for 1936; and Flushing Meadows Park, which is now being prepared for the 1939 World's Fair.

SWIMMING POOLS

In July of 1934, with playground construction well under way according to a definite program, it became obvious that the next major problem of the Park Department was to provide additional outdoor public bathing facilities. Other city agencies had little more to offer. At Coney Island in Brooklyn, the familiar thronged strand extended 21 miles along the Atlantic, while on the Rockaway Peninsula, Queens, 7.4 miles of narrow beach lay between an encroaching boardwalk and the water's edge. Both of these public beaches are under the jurisdiction of the Presidents of the respective boroughs. Clean, healthful and adequate bathing facilities were practically out of the reach, both geographically and financially, of millions of the city's inhabitants.

Up to that time, the various relief administrations had been unstable and had given no promise of lasting long enough to permit the construction of substantial buildings or other types of large public park improvements. It was becoming increasingly obvious, however, that the work relief business would endure for considerable time and that large sums of money and unlimited man power would be available for use on worth while park improvements.

Work was started immediately on the preparation of plans for eight swimming pool and bathhouse units and construction was actually commenced on all eight jobs in the fall of 1934. During 1935, work was started on three additional pools, one of which was the reconstruction of the old antiquated tank which was one of the two pools inherited from former administrations.

Only two of the new pools were constructed on land which had not previously been at least partially developed for park or playground use. With one exception, in the areas already developed, the entire surroundings were redesigned and have been or will be reconstructed so that there will be no reduction in the facilities for active recreation and playground use. The one exception is Hamilton Fish Park on the lower east side of Manhattan where the park area was so small and already so intensively developed that it was impossible to avoid some reduction in the space allotted to play. However, by careful planning the new playground and park arrangement, outside the bathing area, will accommodate as many people as did the former scheme.

With park land in the densely populated sections of the city at a premium, intensive study was made for off season usage of the newly constructed facilities, so that there would be no idle recreation areas. To make the new swimming pool and bathhouse units usable during the fall, winter and spring, the pools and surrounding promenades were constructed so that they could be converted into playgrounds when drained, and the bathhouses were designed so that the dressing areas could be used as gymnasiums.

There was never any idea that these new swimming pools could be made to pay for their construction but it was deemed reasonable and proper that they should pay for their maintenance and operation. Their use naturally must be rigidly controlled and the comparatively limited number who use them should not receive this service at the expense of the general public.

On the basis of estimated attendance, it appeared that the city could afford to allow the free use of the pools by children up to 14 years of age from 10:30 A.M. to 12:30 P.M. on week days and that during the balance of the day a charge of 10 cents for children and 20 cents for adults would pay for operation and maintenance. The operation of the completed units, since they were opened last summer, worked out according to the estimates.

OTHER RECREATIONAL FACILITIES

Space does not permit extended mention in this article of the numerous recreational facilities provided along the new parkways constructed or under construction in New York City, including the Grand Central, Interborough and Laurelton Parkways in Queens and Brooklyn, the new Shore Drive Extension in Brooklyn, the West Side Improvement from the south boundary of Riverside Park to the City-Westchester line, the Marine Parkway, and the Triborough Bridge parkway approaches in Manhattan and Queens. Not only are these genuine parkways with comparatively wide rights of way, flanked by landscaped areas and crossed by ornamental stone bridges, but numerous playgrounds have been provided along the borders to provide safe recreation for people of the neighborhood. Stopping places for automobilists with picnicking facilities have also been constructed. Comfort and filling stations and cafeterias have been or are being built, and walks and benches have been provided, so that the parkways will not merely be of benefit to motorists but also to pedestrians.

PHOTO: SCHNALL

MUNICIPAL RECREATION, DEPARTMENT OF PARKS, NEW YORK

ROBERT MOSES, COMMISSIONER . . . . . . A. R. JENNINGS, GENERAL SUPERINTENDENT
W. H. LATHAM, PARK ENGINEER . . . . W. R. C. WOOD, SENIOR PARK DIRECTOR

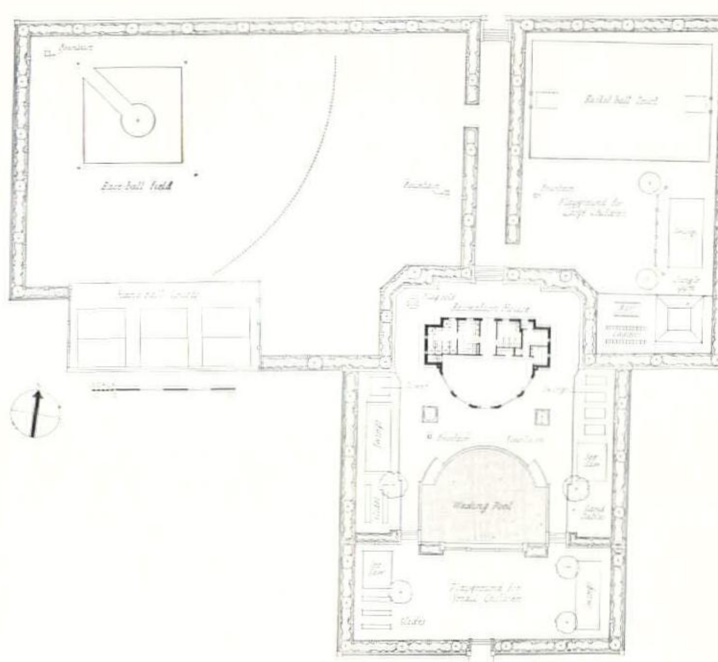
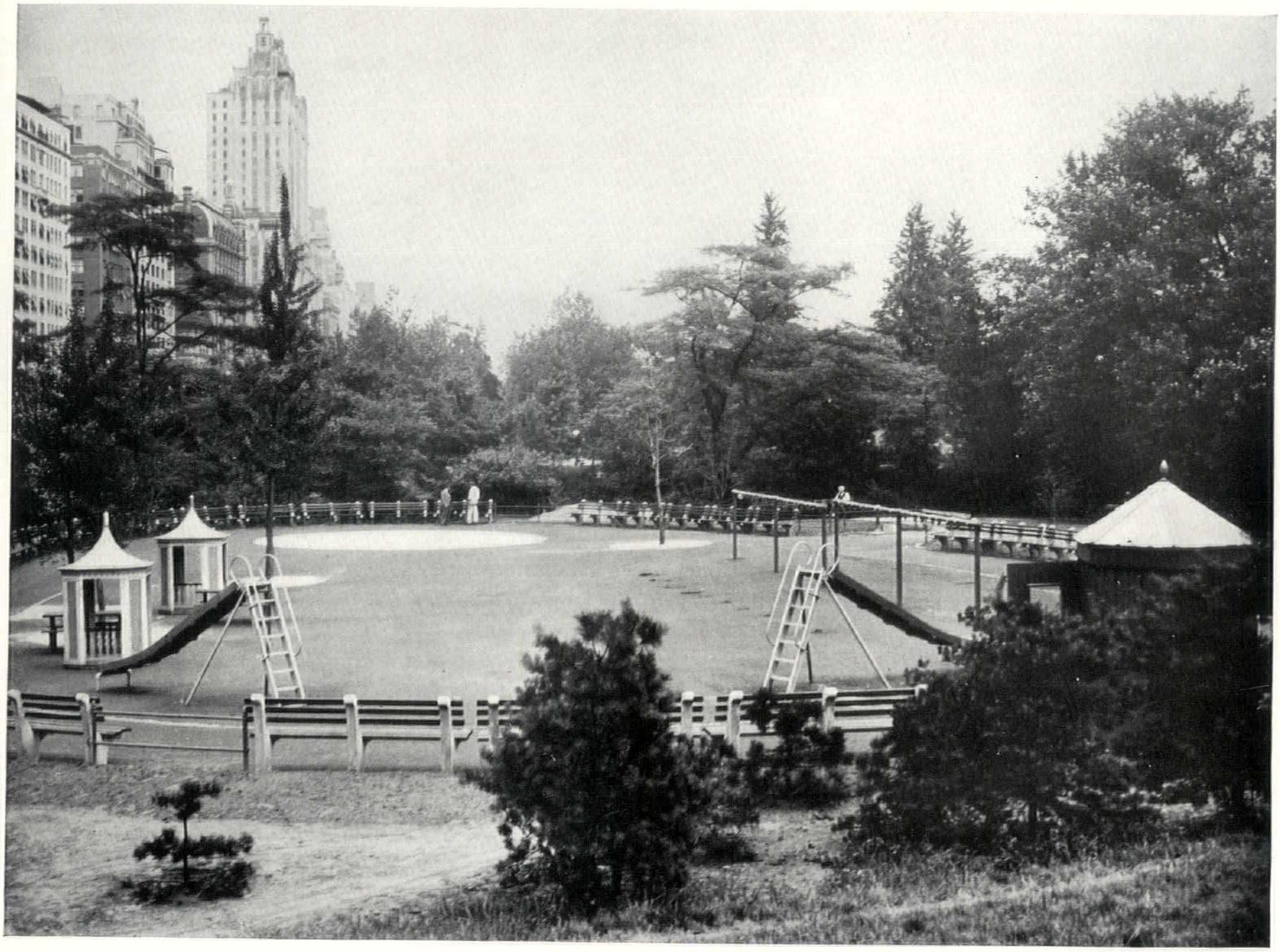


PHOTO: SCHNALL

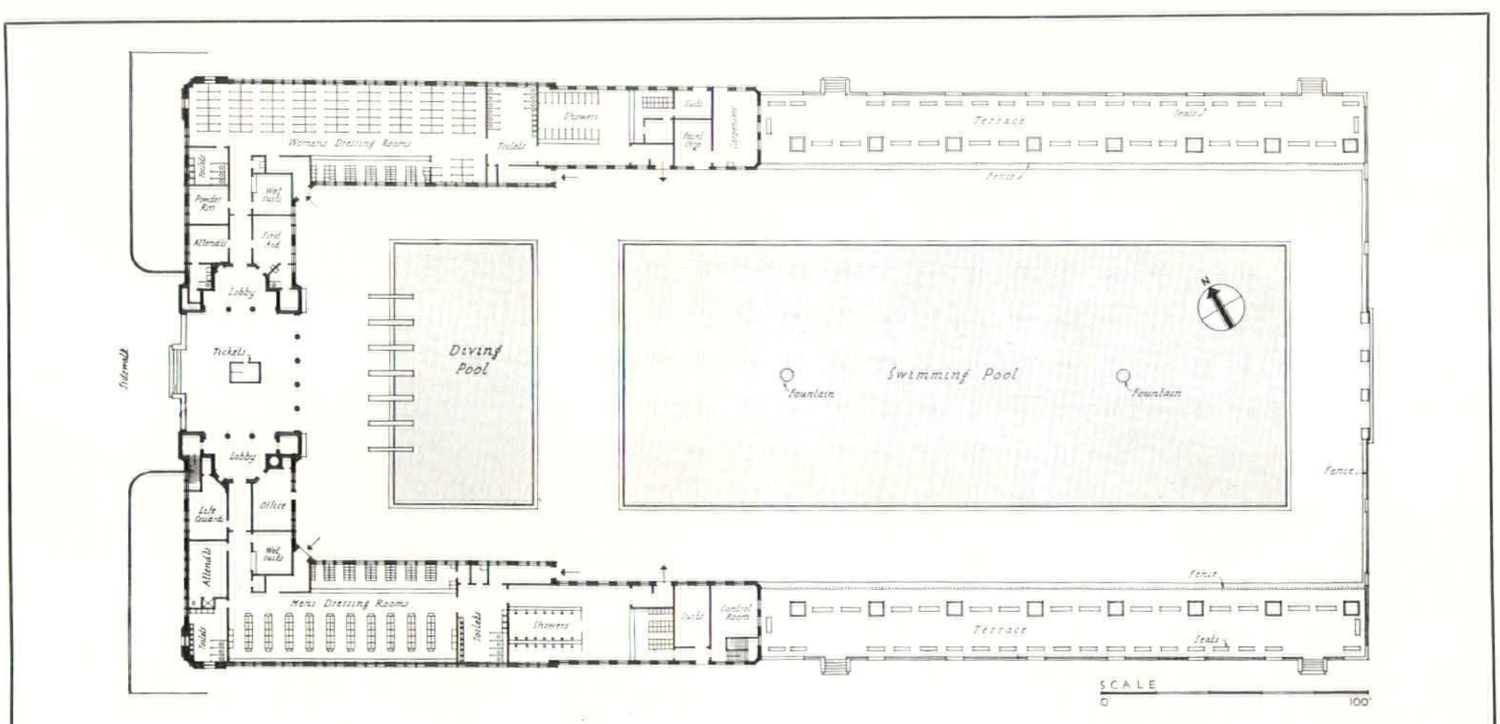


Two of the eighteen "Marginal" playgrounds (above, right), placed near entrances on the perimeter of Central Park to attract the children immediately and confine their play to definite areas. Vandalism, harm to planting and risk of accidents are greatly reduced and the larger areas kept free from obstruction. The Austin J. McDonald Memorial playground (opposite page), one of eight erected from funds held by the City Chamberlain for a memorial to police heroes. This type of playground has facilities for indoor recreation besides equipment and play areas for larger children.

PHOTOS: PARK DEPARTMENT

MUNICIPAL PLAYGROUNDS
DEPARTMENT OF PARKS, NEW YORK
G. D. CLARKE, CONSULTING LANDSCAPE ARCHITECT
F. CORMIER, LANDSCAPE ARCHITECT


MAS JEFFERSON SWIMMING POOL


Womens Dressing Rooms
Showers
Toilets
Terrace
Fence
Lobby
Tickets
First Aid
Diving Pool
Swimming Pool
Fountain
Fountain
Office
Life Guards
Mens Dressing Rooms
Showers
Control Room
Terrace
Seats
Sidewalk
SCALE
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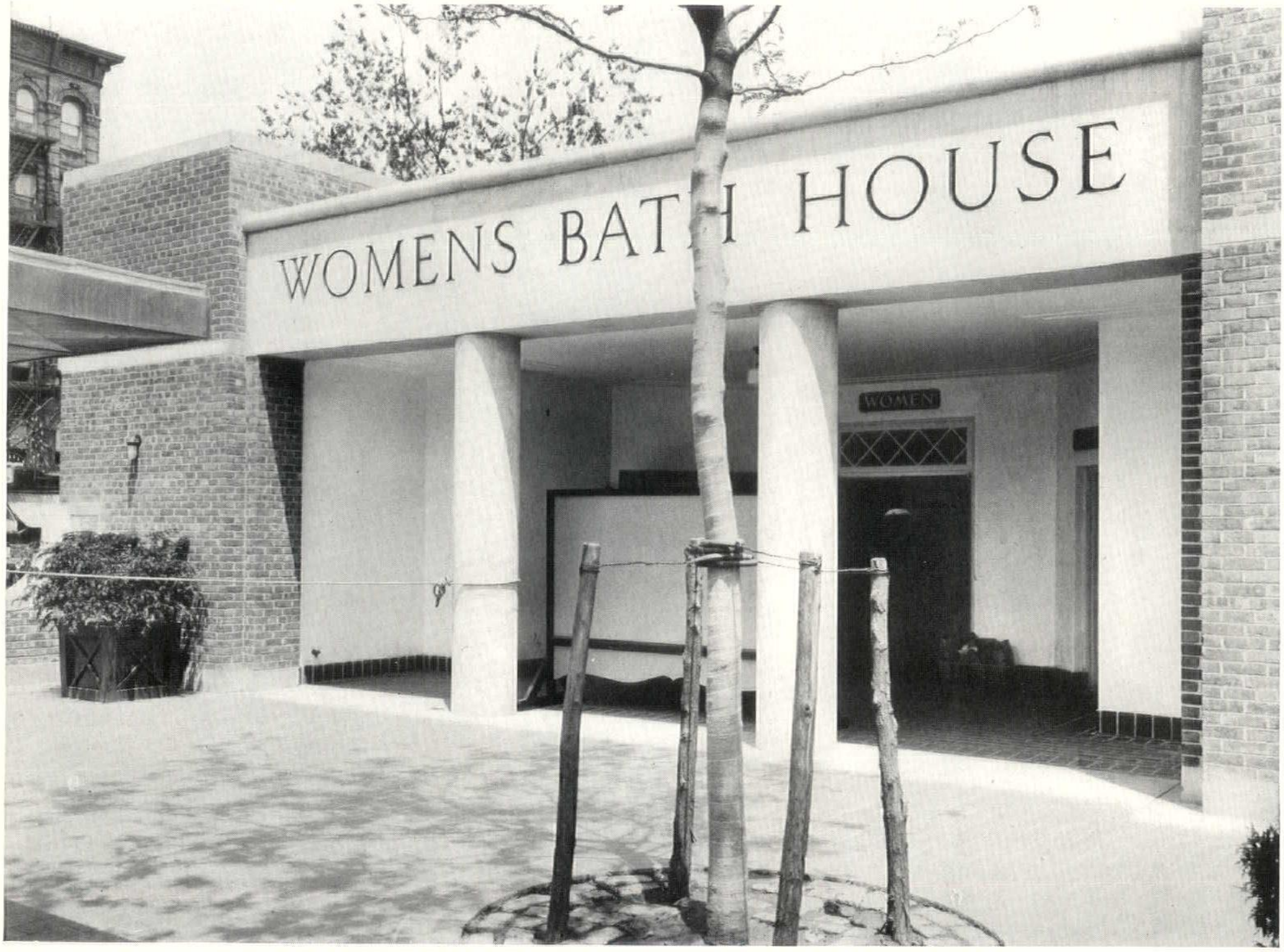
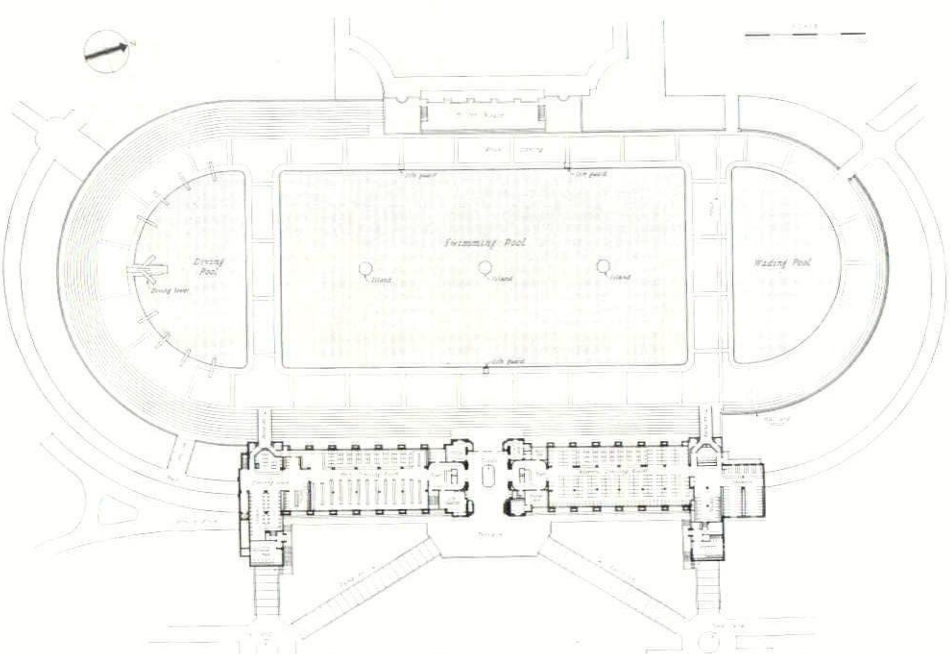


The separate pool, for diving only, affords greater use, flexibility and economy of the swimming pool proper. Varying in depth from only 3½ feet at the edges to 4½ feet at the center, the swimming pool allows an even distribution of several hundred bathers over the entire area. The practically level surface thus obtained is also more adaptable for games during the non-swimming seasons when the pool is drained. A general view of the pool (opposite page) from the entrance gates. Detail (above) of entrance to Women's Bath House. View (right) of diving pool with Women's Bath House in background. Capacity, 2,600.

PHOTOS: WIDE WORLD

THOMAS JEFFERSON POOL
DEPARTMENT OF PARKS, NEW YORK
AYMAR EMBURY II, CONSULTING ARCHITECT
STANLEY BROGREN, ARCHITECTURAL DESIGNER

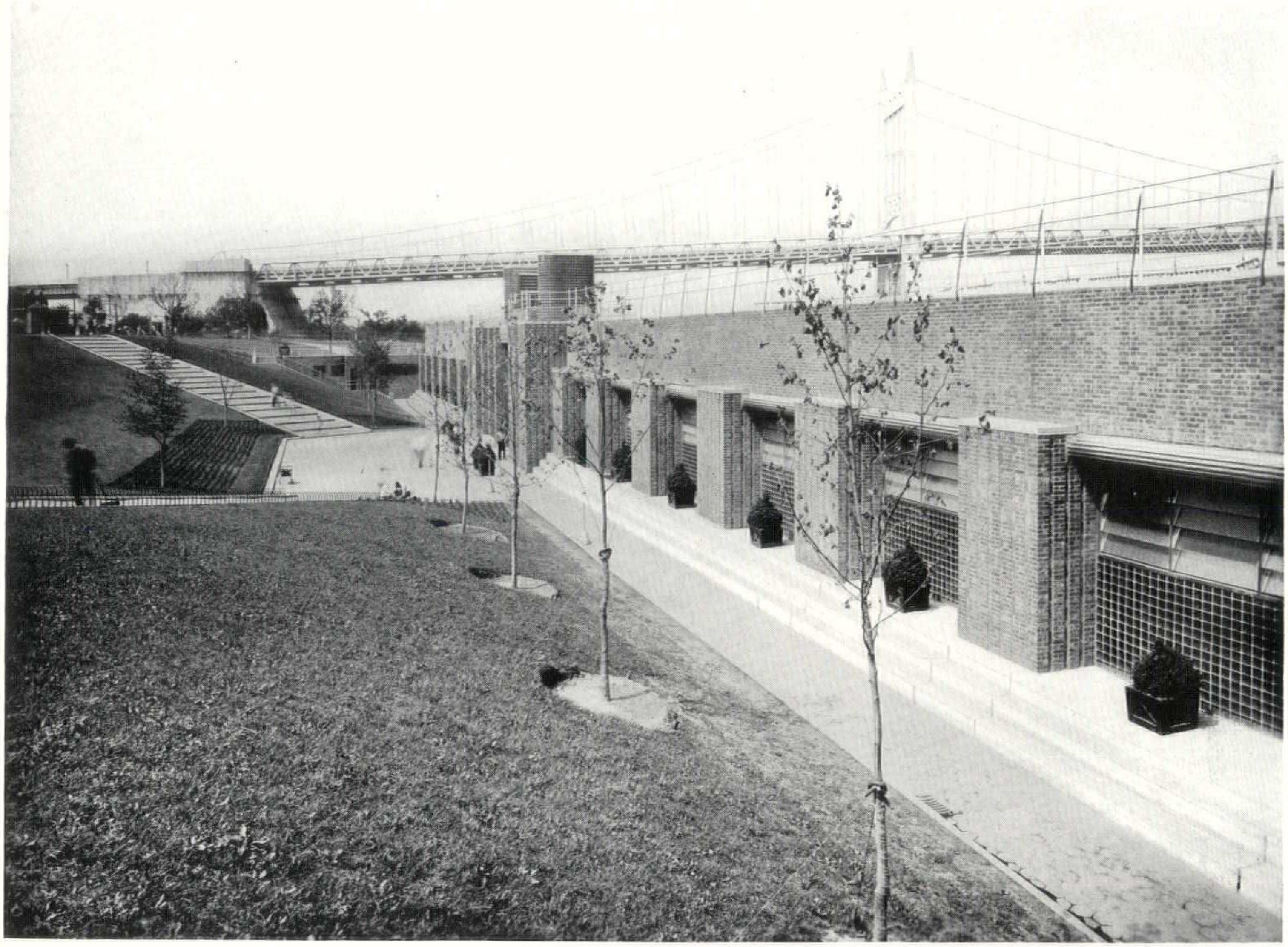
PHOTOS: WIDE WORLD



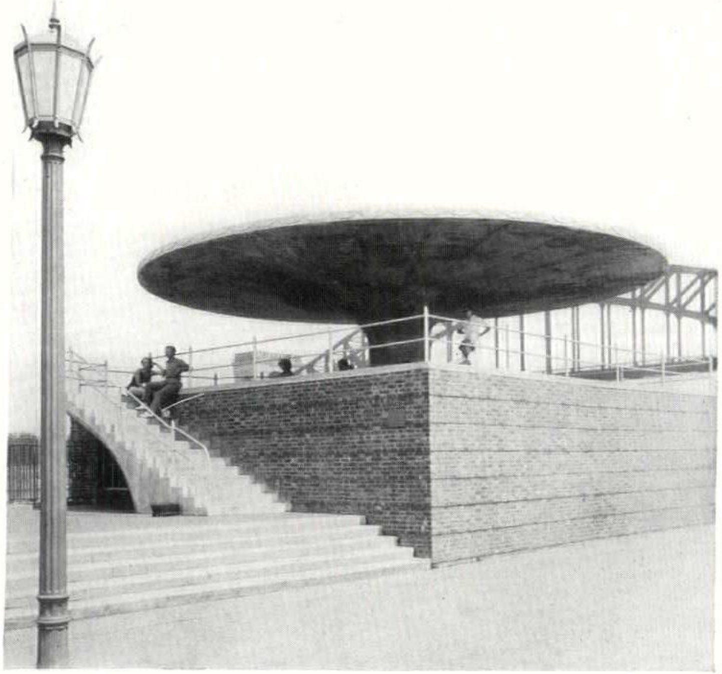
Astoria, one of the largest of the pools, with a total of 78,390 square feet of pool area and a capacity of 6,200. The semi-circular wading pool at the north end is made an integral part of the design, but separated from the paying area by means of a fence.

ASTORIA PARK POOL

AYMAR EMBURY, II, CONSULTING ARCHITECT

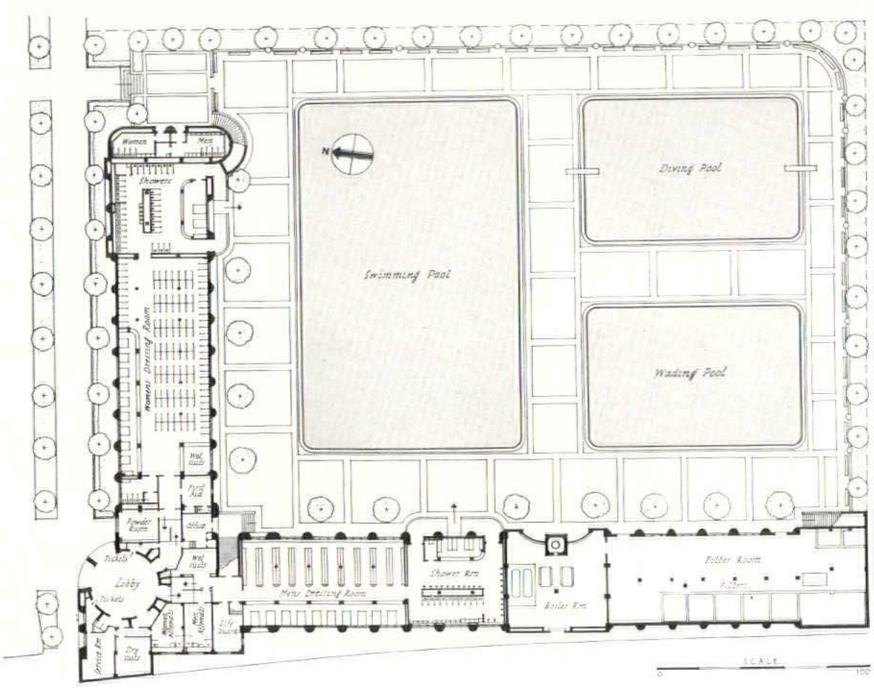


General view (above) of approaches and bath house with the Triborough Bridge in the background. Glass blocks are used in the lower half of window areas to admit light but prevent sight. Ventilating louvers are used in the upper half. One of the cantilevered concrete shelters (right) on the sun deck above the filter house.



DEPARTMENT OF PARKS, NEW YORK
J. M. HATTON, ARCHITECTURAL DESIGNER

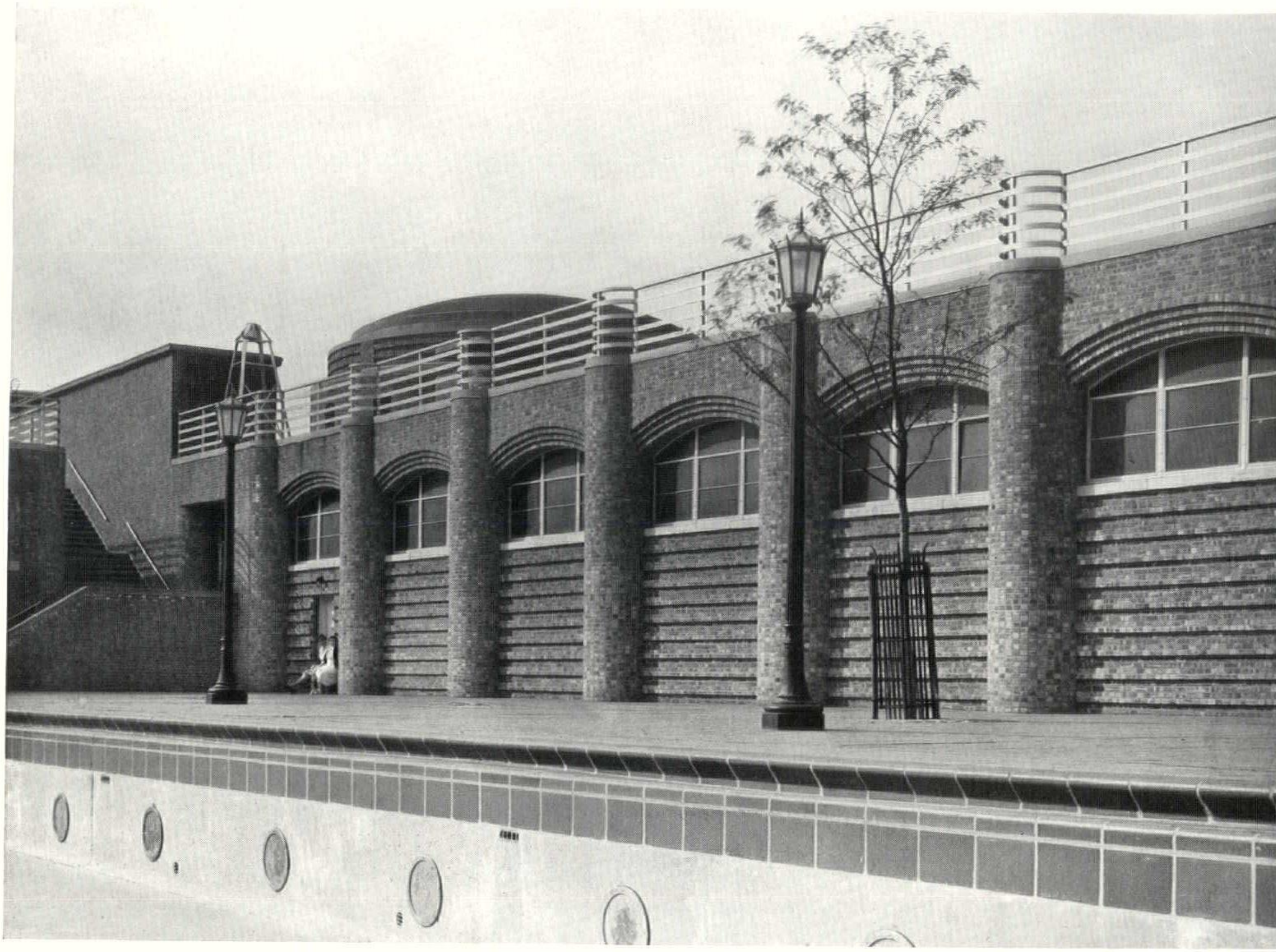
PHOTO: PARKS DEPARTMENT



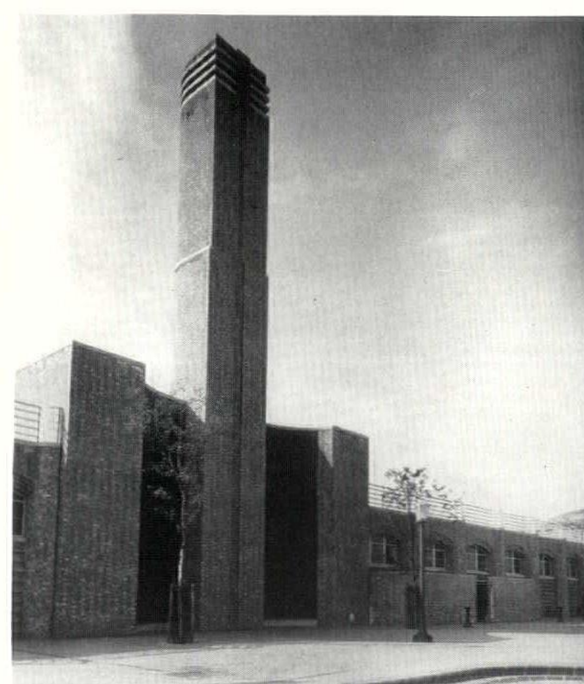
Restricted size of the plot led to the compact layout of bath house and pools and capacity of 3,200. The roof is used for sun decks, observation and concessions. The stack for the boilers was treated as an integral part of the design, and is flanked by curved panels of glass blocks lighting the boiler room behind.

TOMPKINSVILLE POOL

AYMAR EMBURY, II, CONSULTING ARCHITECT



View of the women's locker room (above) shows the ample yet protected windows which do not allow sight. The flat dome in the background, lighted by glass block panels set in the drum, is that of the entrance lobby. The underwater lighting fixtures are accessible from the pipe tunnels surrounding each pool. View (right) of stack and boiler room with men's dressing room beyond.



DEPARTMENT OF PARKS, NEW YORK

J. WEISBERG, S. BAUM, ARCHITECTURAL DESIGNERS

PHOTOS: SCHNALL

General view (above) of Highbridge Park Pool equipped for autumn activities. In the pool basin, backstops for handball and basketball are erected and courts for paddle tennis, volley ball and shuffle board laid out. The dressing areas are converted to gymnasiums for use in inclement weather. General views (left, above) of McCarren Pool and (left, below) of Astoria Pool adapted to autumn activities.

DEPARTMENT OF PARKS, NEW YORK
AYMAR EMBURY, CONSULTING ARCHITECT
W. H. LATHAN, PARK ENGINEER

SWIMMING POOL CONSTRUCTION

THE CONSTRUCTION OF TEN MUNICIPAL SWIMMING POOLS, TOTAL POOL AREA OF WHICH IS 559,230 SQ. FT. AND BASKET CAPACITY 42,400, CALLED FOR RESEARCH OF A MOST THOROUGH SORT. BASIC PRINCIPLES THAT RESULTED FROM THIS STUDY AND THEIR APPLICATION TO PRACTICE SHOULD BE OF TREMENDOUS IMPORTANCE

By W. H. LATHAN

Park Engineer, City of New York Department of Parks

THE design and construction of municipal swimming pools to fit conditions in New York City present numerous problems for which the answers are not given in the back of any book yet printed. The ten new pools constructed by the Department of Parks required all types of construction ranging from simple concrete footings to piping, mechanical and electrical equipment which would do credit to a modern ocean liner. The work was only complicated by the fact that it had to be done with work relief funds, which placed all manner of restrictions and regulations in the kinds of materials which could be used and on the proportion of money which could be spent for the purchase of materials and equipment.

The sites for these pools were selected first in proportion to the density of population in the various sections of the city and, second, according to available park land. No new land was purchased and in some cases the locations were not as ideally suited for this type of development as they could have been. However, with the great demand for suitable bathing accommodations within the city limits, a pool of almost any size located at almost any spot in the city would be used to capacity.

A few basic principles, adopted before plans were prepared, were followed in practice.

1. To avoid the danger inherent in the mingling of divers and swimmers, diving areas are kept apart from swimming areas, as far as local conditions permit.

2. All swimming and diving pools are provided with underwater lights for night use.

3. At least one dimension of every swimming pool is a multiple of 55 yards, so that swimming competitions can be held at standard distances in either the English or metric systems. The largest pools constructed are 165′ x 330′.

4. A wading pool for small children is a part of each development; it is located in the free playground area outside of the general swimming area.

5. Each swimming and diving pool is surrounded by a tunnel which gives access to all plumbing and wiring which directly serve the pool.

6. Because of the past history of neglect and indifferent operation in the city park system, all features of these developments were designed for a maximum of life, a minimum of maintenance expense, and the greatest simplicity of operation.

7. The designs, as far as possible, called for the use of basic materials which could be fabricated with common labor, because of the necessity under the various work relief administrations of making the labor costs higher than the proportion which is customary in construction work of this type.

The capacities of the various pools were estimated at 20 square feet in swimming area, and 50 square feet in the diving area, per person. These capacities were determined from all available publications and from numerous public authorities who had had experience in the operation of swimming pools. The partial season of operation of the new pools in New York City has clearly demonstrated that a swimming pool in a densely populated metropolitan area will accommodate one person to every 10 square feet of water area. This does not mean that the water itself will actually be occupied by one person to every 10 square feet; actually, a swimming pool is operating to capacity with one person to every 40 square feet. The other 75% of the patrons will be sunning themselves on the promenade, walking around, or just sitting on the edge of the pool watching those who are swimming.

It was also found that the capacity of a diving pool should be estimated from the number of boards not from the area of water. It was determined that each board will accommodate 12 persons and that the minimum safe water area per board is 15 feet in width and 40 feet in length. Although under peak loads the diving facilities seem to be inadequate, it is not economical to provide enough boards to satisfy the full demand. A reasonable ratio is one board to every 500 patrons.

In general, the promenade decks around the pools are 20 feet in width and they average in area 65% of the water area of the pools.

The depths in the swimming pools vary from 3½ feet around the edges to 4½ feet at the drain grates in the center. Some of the larger pools were constructed with a so-called beach section along one half of the side nearest the bathhouse. At the beach section, the scum gutter is exactly the same as it is around the rest of the pool but the water depth is reduced by bringing the bottom up uniformly from the center to a line six inches below the lip of the scum gutter. The depth of water in the swimming pools was determined as being deep enough for ordinary swimming and yet shallow enough for all non-swimmers and for any children old enough to use the pools alone.

The diving pools were all constructed with a uniform depth of five feet around the edges. At the five-foot depth, there is a 12-inch shelf which permits most people to hold onto the edge of the scum gutter and reach the shelf with their toes. The bottom drops off from the edge of the shelf to a depth of 11 feet under the 3-meter boards and 16 feet under the 10-meter platform at the Astoria pool.

CONSTRUCTION

The pool tanks were constructed of reinforced concrete with all expansion joints waterproofed. No admixtures were used to waterproof the concrete itself. Where sub-surface conditions required it, underdraining through a bed of crushed stone was used.

The bottom slabs of the pools were finished with a smooth, wood-float, monolithic finish, rough enough to prevent slipping by bathers but smooth enough to be used for game playing when the pools are drained during the non-swimming season.

Scum gutters were surfaced with a water-green glazed terra cotta with a baked-in sand, non-skid surface, laid in 12" sections. The tile was carried 12 inches below the lip of the scum gutter and back into the promenade deck 12 inches. Contrary to the usual practice, the scum gutter is 7 inches deep and 18 inches wide. This permits easy cleaning, keeps the scum gutter open to sunlight, and prevents people from catching their feet in it.

The promenade decks were surfaced with a special tile, terra cotta in color, and with a non-porous surface rough enough to prevent slipping when wet. The promenade tile was selected for its density and uniformity so that it could be easily cleaned by flushing with a hose, and to prevent the harboring of bacteria of any kind.

All railings, ladders, and exposed plumbing and drainage fixtures are either brass or bronze to reduce maintenance and deterioration.

Standard 16-foot white ash diving boards were used at all pools. They are set at ½ meter, one meter, and three meter heights, and at locations where competitions are expected, they are provided with adjustable fulcrums.

City water is used in all the pools. The water is recirculated three times every 24 hours, filtered, treated with soda ash and alum, and sterilized with chlorine and ammonia.

Reinforced concrete open gravity filters were used on seven of the developments and steel pressure filters on the other three. The open gravity type of filter was considered more desirable in these developments because of the great volumes of water to be handled and because of the simplicity of operation and control which are characteristic of this type of installation. Pressure filters were used on three of the jobs where foundation conditions were such that it was not practical to construct the concrete tanks.

The water is sterilized with chlorine gas and anhydrous ammonia, introduced by the usual type of vacuum feed apparatus. Soda ash and aluminum sulphate are fed into the water mechanically, to form the floc on the tops of the filter beds. Each pool is equipped with a portable vacuum cleaner to remove dirt from the bottom and sides without draining.

The sterilized water is injected into the pools at 20-foot intervals around the perimeters, 10¾ inches below the surface. The injectors are designed to give a flat horizontal jet which spreads the water so as to secure greater diffusion of the sterilizing agents. The larger pools are equipped with small islands in the middle which house additional injectors to feed sterilized water to the central portions of the pools.

Each individual injector is valved so that the rate of flow in any part of the pool can be adjusted to insure uniform distribution of filtered and sterilized water, or so that increased flow can be supplied to those points which may be subject to abnormally heavy use. The nozzles of the injectors are also arranged so that a deflecting plate can be clamped on to direct the flow toward the bottom of the pool, if necessary, to insure uniform circulation of water.

In most large pools past experience has indicated a dead stagnant area in the corners formed by the side walls and the bottom. To overcome this condition, Park Department engineers designed a special by-pass arrangement by which this stagnant water is sucked up from the bottom and re-injected through the injector nozzles so that it is resterilized by the fresh water coming from the treatment tanks.

On six of the jobs, the water is circulated by centrifugal pumps connected directly to electric motors. On the other four, the pumps are operated through speed-increasing gears by Diesel engines. The use of Diesel engines was determined upon partially as an experiment because preliminary estimates indicated a substantial saving in operating costs, which would more than compensate for increased initial costs inside of four to five years.

The results of studying the comparative operating and maintenance costs of the two types of power plants will determine the type to be used on any future developments of this kind which may be constructed by the City.

LIGHTING

Underwater flood lights are set in bronze housings cast in the pool walls. In the smaller pools, 500 watt units were used and in the larger pools, 1500 watt units. On all lighting units, the lenses are held with bronze rings and made water-tight with rubber gaskets. The backs of the lighting fixtures can be removed from the pipe tunnel so that complete fixtures can be changed or worked on without draining the pool, as long as the lenses are tight. The 500 watt units are cooled by air vents in the back plates. The housings of the 1500 watt units are double walled and pool water is circulated through the spaces between the two walls to cool the units.

Lights are spaced according to the size of fixture and depth of water. In general, they are 9 feet apart on the walls of the swimming pools, and on each face of the octagonal islands in the larger pools. In the diving pools, they are 3'-10" below the scum gutter and 7 feet apart along the wall.

Each swimming pool and diving pool is completely surrounded by an access tunnel five feet wide with a minimum head room of five feet. The wall of the pool forms one wall of the tunnel and the roof of the tunnel is the underside of the slab supporting the promenade deck. Access to the tunnel can be had from the filter rooms and from manholes in the promenade deck.

The tunnels carry all recirculating water pipe around the pools, the drain lines from the scum gutters, and electrical feeders for the underwater flood lights. These tunnels give access to valves which control the flow to each main section of the recirculating feed lines and to each individual injector.

Although these pipe tunnels increase the construction cost of a pool, they give complete flexibility in the control of water recirculation, and they allow all ordinary maintenance work on recirculating and underwater lighting lines and fixtures to be done without disturbing the operation of the pool.

PHOTO: PUBLISHERS PHOTO SERVICE

The Alcazar from the left bank of the Tagus River with the Alcantara Bridge in the foreground

TOLEDO

Built upon a commanding granite hill, Toledo is one of the most ancient cities of Spain. Capital of the Carpetani, it was captured by the Romans in 192 B.C. Athanagild, the King of the Visigoths, made it his Capital in 567 at which time it was the scene of religious and political struggles between Catholic and Arian. In 587 the Catholics gained control. Under the name of Tolaitola, the chief stronghold of the Moors, it had four centuries of great prosperity through the manufacture of steel arms, silks and woolens. Recaptured by Alfonso VI, it was the Capital of Spain until 1560, after which its decline was rapid.

PHOTOS: PUBLISHERS PHOTO SERVICE, INC.

THE ALCANTARA BRIDGE, spanning the Tagus River, is of Moorish origin. The present structure dates mainly from the 13th Century with some later minor additions. It was the means by which the Cid, first Alcaide of Toledo, entered the city with his followers in 1085. The East Gate (opposite page) looking toward the Alcazar. The derelict Castle of San Servando, (above) built by Alfonso VI, dominates the bridge from the left bank of the river.

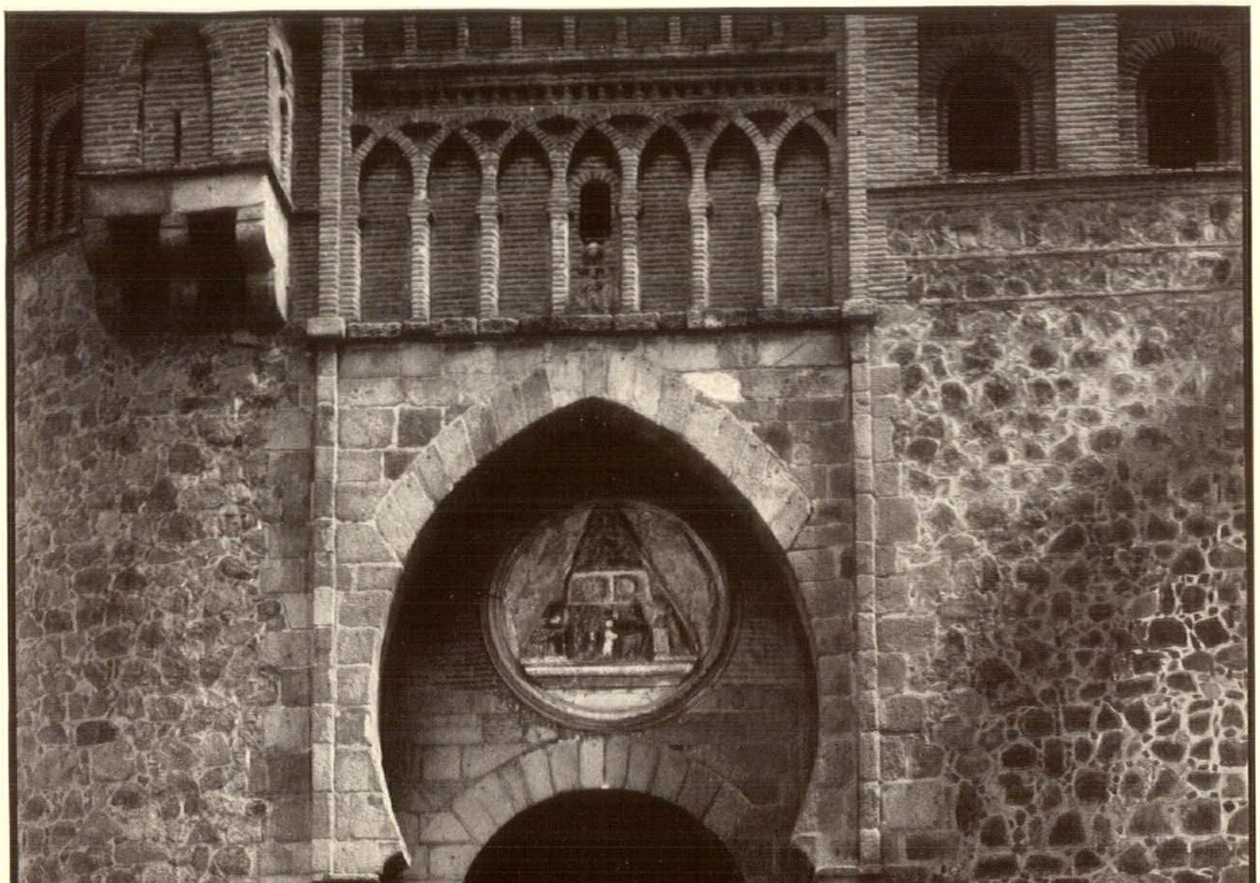


PHOTO: PUBLISHERS PHOTO SERVICE

FACING PHOTO: EUROPEAN

THE INFLUENCE OF THE MOORS is constantly evident in the narrow, winding streets with their many portals in Toledo. The double towered Puerta del Sol (above), in the Mudejar style, was probably built about 1100. The bas-relief in the tympanum representing St. Ildefonso receiving the chasuble is of a later period. The Puerta del Cambrón (opposite page), formerly called Bab al-Makara, was built by Alfonso VI in 1102 and restored in 1576.


POSADA DELA SANGRE

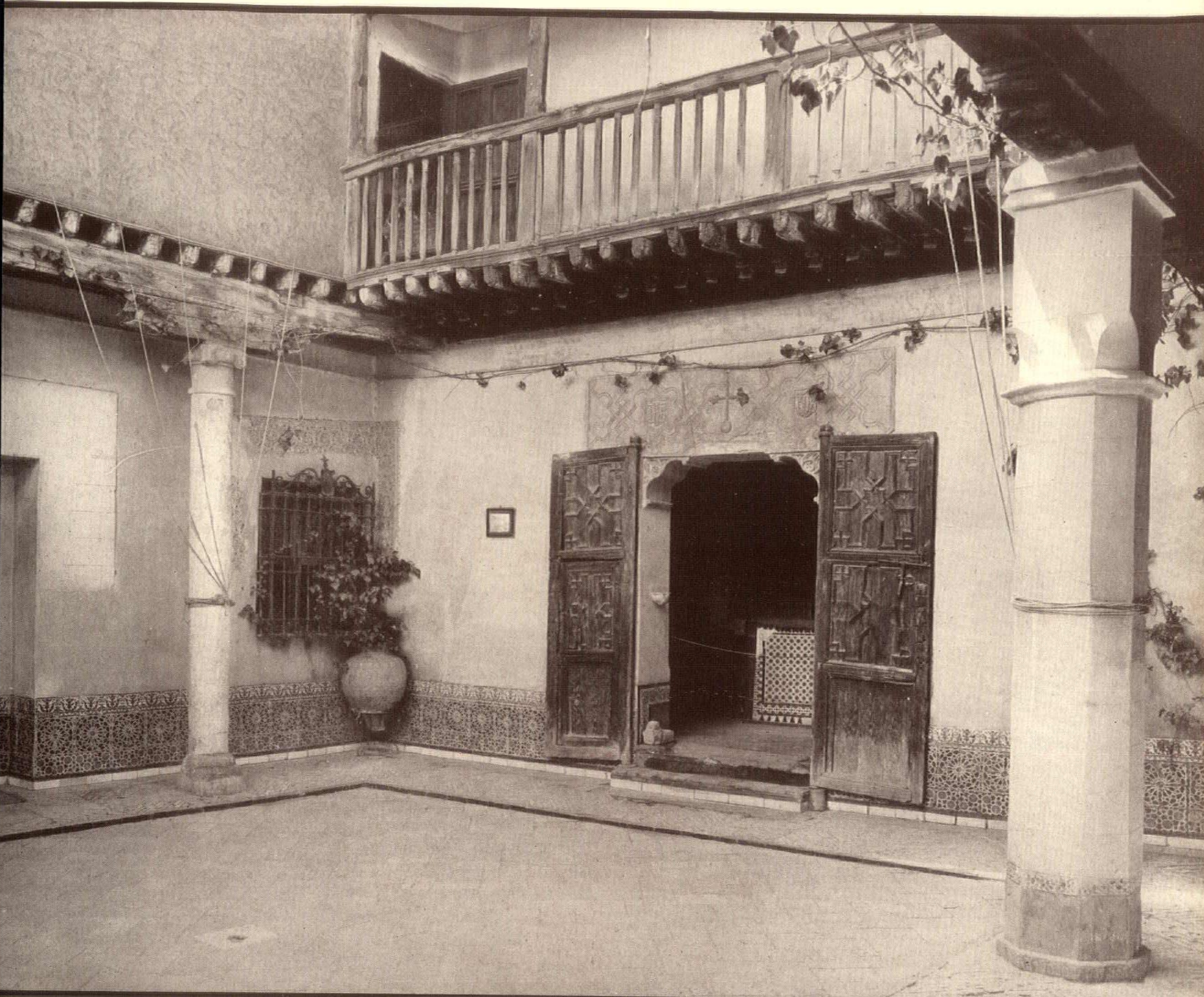


PHOTO: WIDE WORLD

CERVANTES lived in the house called Posada de la Sangre (opposite page) which is seen at the right through the Arco de la Sangre de Cristo. Domenico Theotocópulí (El Greco) lived and worked in Toledo. The Courtyard (above) of his supposed home shows unmistakable Moorish influences. It is built on the foundations of a house which belonged to Samuel Levy, rich Jewish treasurer of Peter the Cruel.

PHOTO: PUBLISHERS PHOTO SERVICE

The Cathedral rises high above the curiously oriental-like streets of Toledo.

BANKS AND BUILDING BOOMS

IS jerry building rampant? Will the home building racket be in full swing next spring? Can homes be made wise investments for both the banks and for "owners" as well?

• Home building leads and will continue to lead in the present upswing of building activity. The annual need for half a million new dwelling units was not met this year but next year this figure should be realized. Increased economic confidence (and income), banks with funds seeking safe investments, a standardized form of home financing (on the single amortized-mortgage principle), insured mortgage loans, fewer foreclosed properties, less distress-selling,—all these are factors pointing to *more* home building in 1937. More, yes, but will it be *better?*

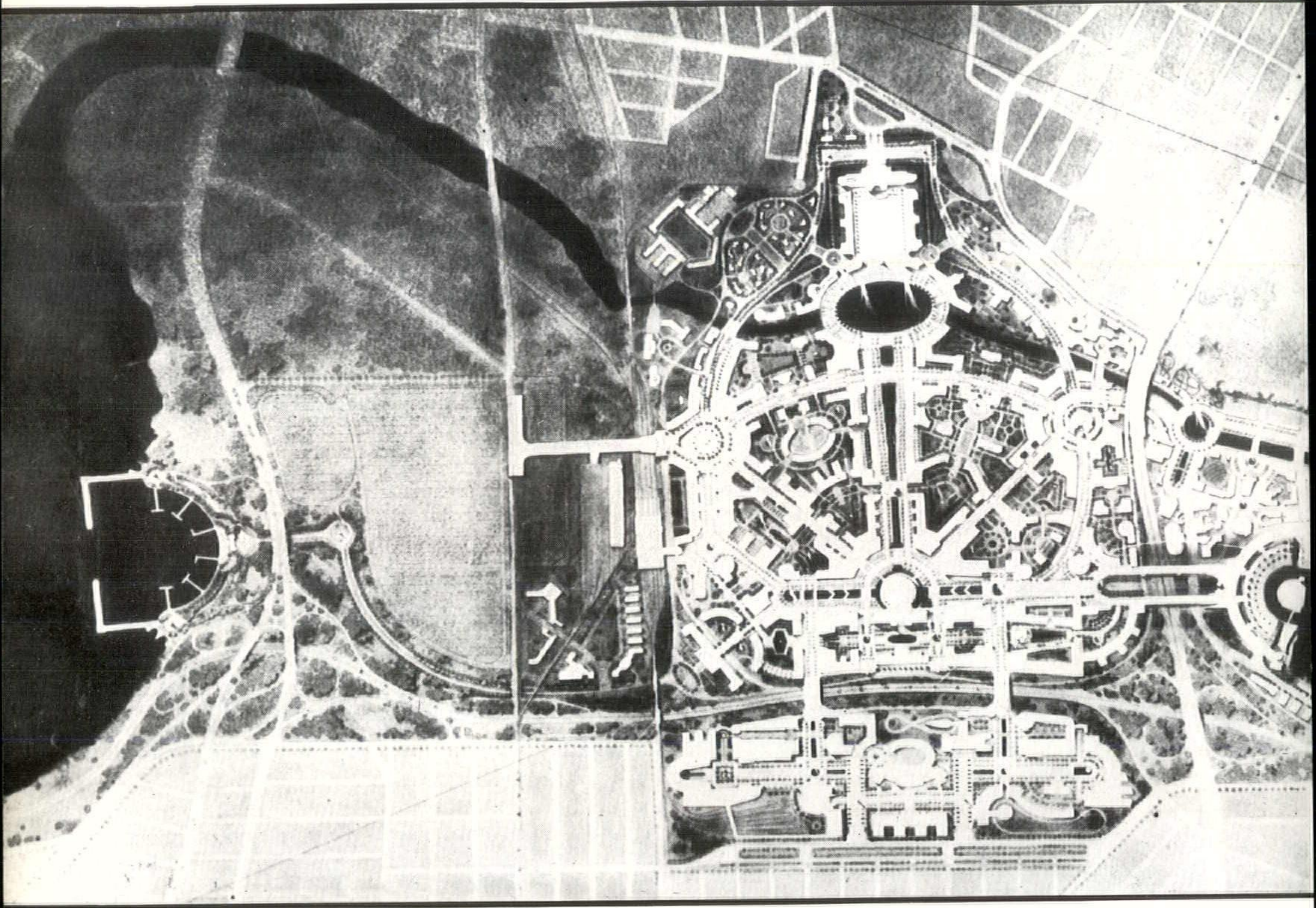
• Much of this year's building is but little if any better than the shoddy, poorly planned jerry building of the boom of the twenties, in spite of FHA. The banks' best insurance of the safety of the investment in building loans is well-designed, thoughtfully planned, soundly constructed homes. And the best insurance that the homes will be just that is the employment of competent architects not only to design, to put in "selling features" and "talking points," but to *supervise the construction*. Specifications are mere scraps of paper,—even if the loan is obtained and insured because of their promising phrases,—unless the quality materials they call for actually are made part of the house. Setting minimum standards of specifications for houses on which loans will be made is a step which progressive (conservative) banks have already taken, and more are taking. But it is only one step. To make these specifications realities in the houses requires the supervisory services of responsible, professional architects. This is true whether the loan is made to an individual owner or to an operative builder. The time is coming rapidly when lending institutions will realize that their best insurance lies in professional integrity. Banks will protect themselves, their depositor and the home owner by making the employment of a supervising architect a condition of their loan contract.

• Soundness of construction and quality of equipment are not in themselves, however, a guarantee of the value of the house (on which the mortgage rests). Proper planning for use and convenience, orientation, site-planning and style all affect resale value, and in these the architect's knowledge, experience and creative ability are necessary if the best house for the money, for the site and for the comfort of the owner is desired. These services become part and parcel of the house; essentially they make or break the house. For this reason the fee of the architect is included as an integral part of the cost of the house when loans are being made. This added increment in the resale value of the house (added by the architect) is just that much additional protection for the lending organization and its depositors.

• The banks can and will in these two ways protect investments; the architect-designed, architect-superintended house will be their best collateral. Of course, there will be cheap imitations of these better houses; jerry builders will copy. However we believe that the increased sales competition which will come with the residential building boom will force better planning, better design, better construction, and that the architects' houses will sell faster and at a premium. Imitators thus will be forced to offer better houses and the standard of the whole will be raised. Houses built next year and after will be better,—because banks and lending institutions now know that permanent values of the homes on which they lend can be insured by competent architectural design *and* supervision of construction. The profession is ready to serve. Individual architects and all architectural organizations must see to it that the banks are aware of the facts, must collaborate with the lenders to eliminate the practices that have brought disaster to home building in the past.

Kenneth K. Stowell

EDITOR



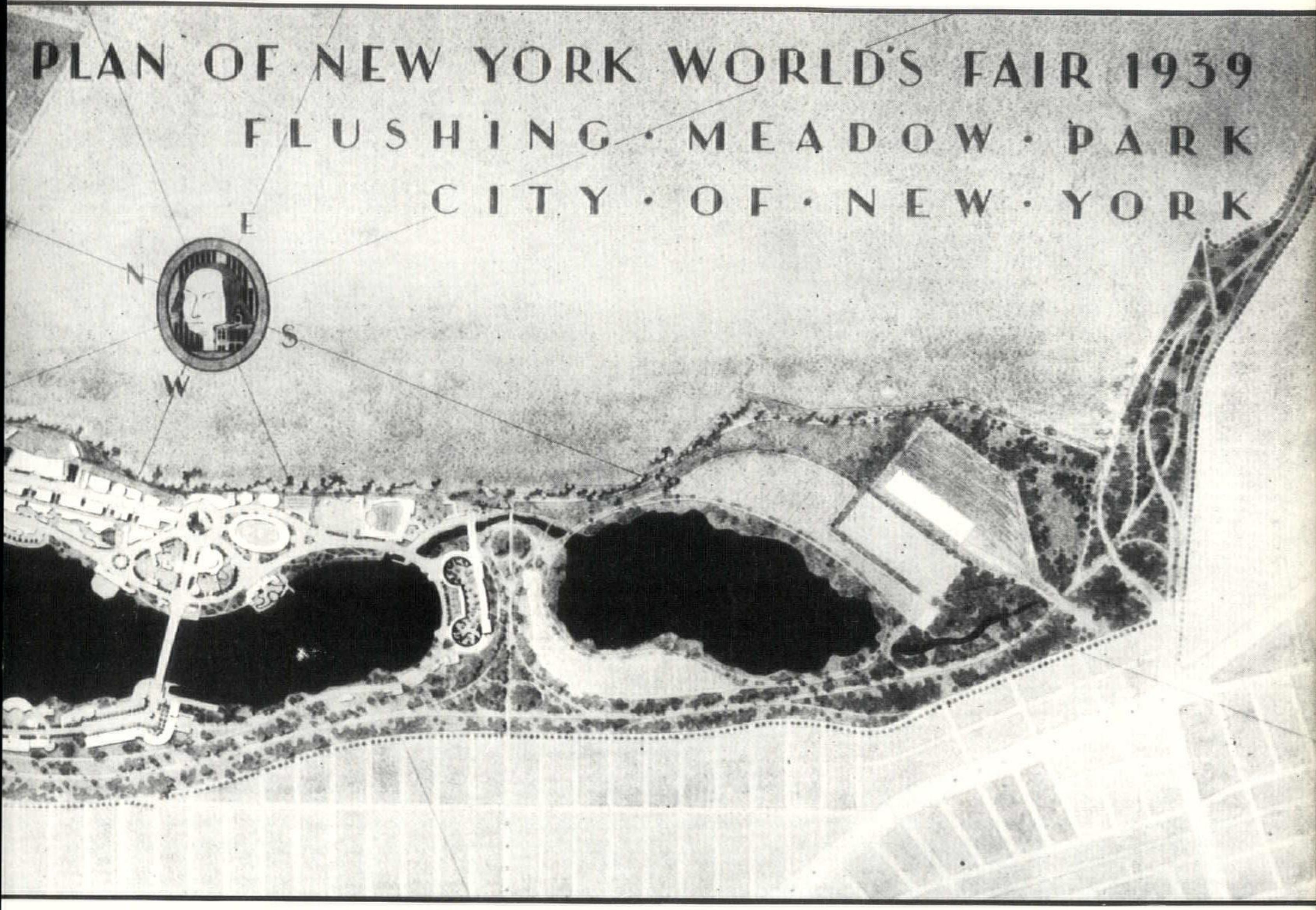
THE NEW YORK WORLD'S

THE theme is the creation of a better and fuller life—the advancement of human welfare. All that has been learned, or discovered, or fabricated toward this end, in the one hundred fifty years since George Washington's first inauguration as President in the City of New York; all that is good and attainable by individuals and communities, all the goods and ideas thus far developed, will be displayed in a connected sequence, so that, seeing what is available to them, visitors to the Fair may be inspired to work with their fellow citizens for a more worthy future."

In these words the men who have undertaken the creation of New York's Fair of 1939 set their goal.

In a central tower and its connected "Theme Building," the visitor will receive his impressions of the significant alliance between the potential contributing factors making for a better world. Radiating from this center the plan provides ten sectors. In each of these a branch of the main theme will be developed—Shelter, Education, Health, Recreation, Clothing, Government and so on. Exhibitors will not pick locations; space will be allotted in a correlated whole.

Theoretically, the ideal plan would take somewhat the form of a pie that had been cut into ten sectors, with the lines of communication between them. Practically, such a plan would conflict with the necessity of handling great crowds in comfort. Moreover, you cannot merely pour these multitudes in at a center and have them find their way out. Other factors intervene: the existing and to-be-expanded means of transportation, the character of the soil—not all of it would bear, for example, the structures needed for transportation and the heavy industries.

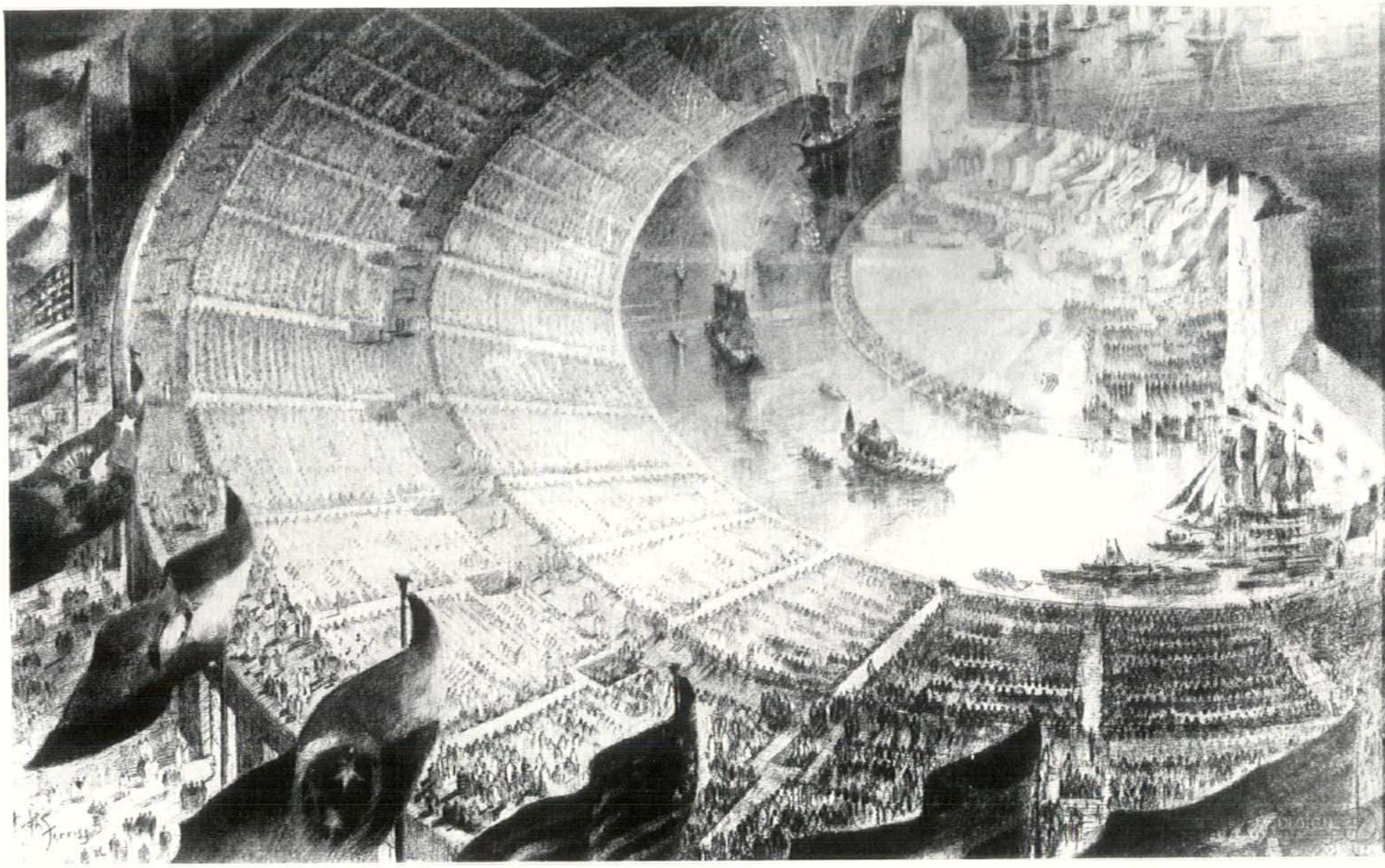


FAIR—ITS THEME AND PLAN

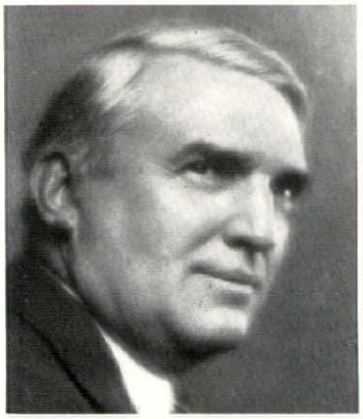
The problem of getting people to and from a Fair spreading over twelve hundred acres is in itself a staggering one. It is estimated that on gala days the attendance may reach a maximum of 800,000 persons. Transportation by railroad, bus, subway and automobile will make it possible to deliver 160,000 persons per hour to the Fair grounds. Obviously there could not be just one entrance—as a matter of fact, nine are provided in the plan. Once inside the gates, these people must find a comfortable and logical distribution of their numbers—plenty of open spaces, broad means of circulation, plenty of seats, plenty of shade. The traditional "tired feet" of the visitor have been recognized as a vital consideration in the plan.

One of the general plan's great merits is that it has form—there is a structure here on which are disposed the various elements. Axes, circulation, disposition of masses—all are in evidence, yet it is no mere Beaux Arts dream. Perfect symmetry does not raise its head to dispute the practical controlling factors. The main vertical axis has at its lower end the dominant tower of the Theme Building; at the upper end, joined by the broad tree-lined avenue, is the Government Building flanked by the states and framing a great parade ground for pageantry. Radiating from the Theme Building are the avenues leading to the sectors, with Transportation below the tower on the higher ground. Off to the right is an amphitheatre at the end of the main lagoon, with an amusement section stretching along its upper side.

It is evident that in its basic theme and in its vast plan this exposition is going to be something more than "just another Fair."



The removable stage is a feature of the vast outdoor amphitheatre



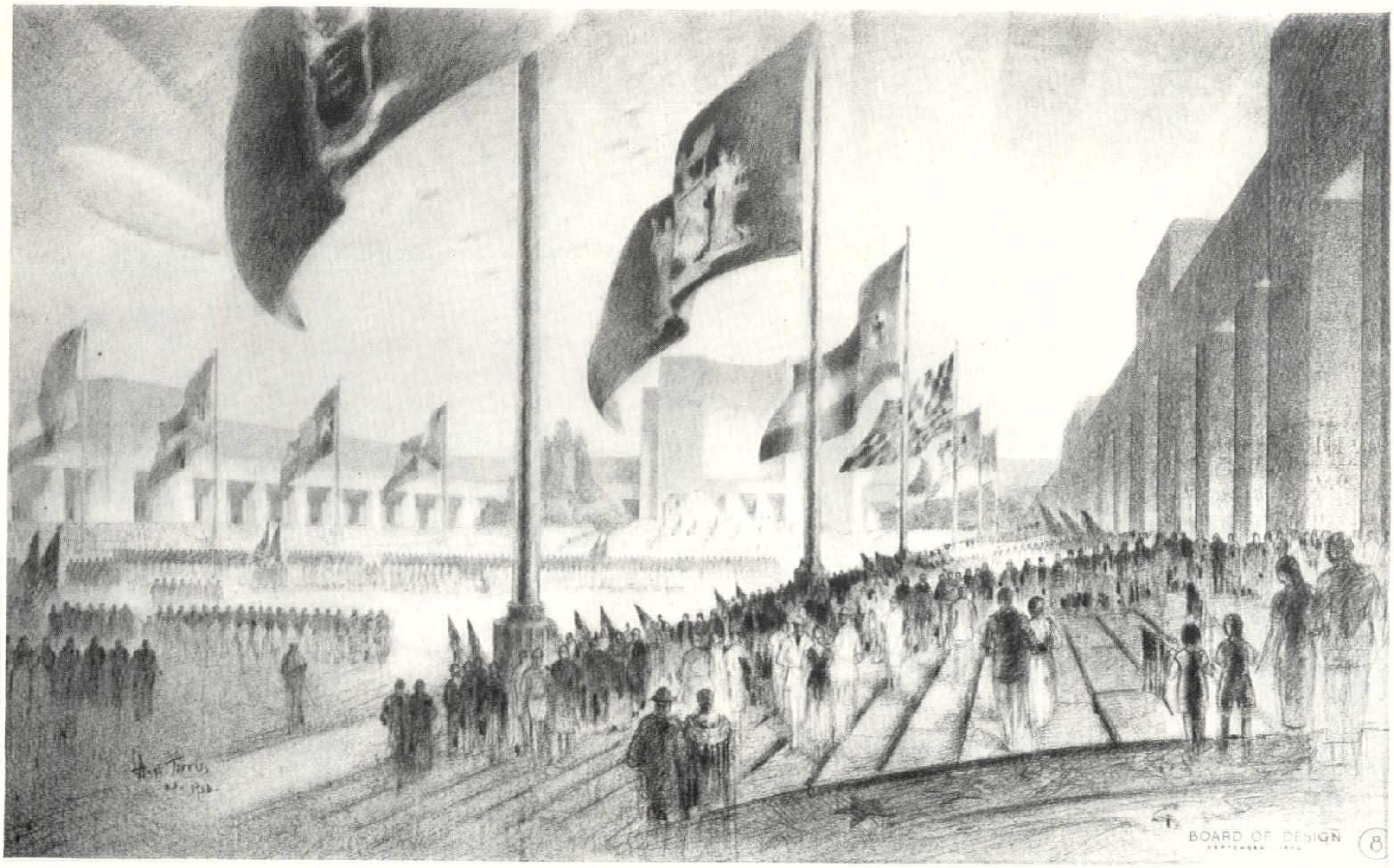
STEPHEN F. VOORHEES
Chairman
Voorhees, Gmelin and Walker; President of the American Institute of Architects; Supervising Architect for Princeton University; Former President of the New York Building Congress

ROBERT D. KOHN
A practising architect in New York for over forty years; Past President of the American Institute of Architects; Associated with the design of the Paris World's Fair in 1900

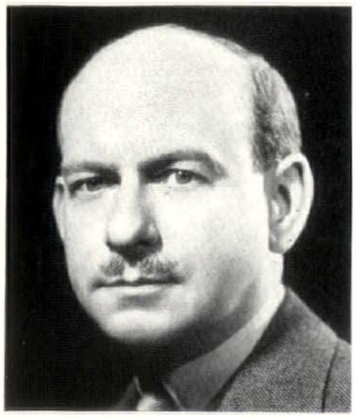
WILLIAM A. DELANO
Senior member of the firm of Delano and Aldrich; Past President of the American Institute of Architects; Member of the Institute de France; Designer of many public buildings

RICHMOND H. SHREVE
Member of the firm of Shreve, Lamb and Harmon; Former President of the New York Building Congress; Associated in the design of the Empire State Building and numerous other structures

FACES OF THE FAIR—THE MEN IN CHARGE



The parade ground is flanked by Government and State buildings



WALTER DORWIN TEAGUE

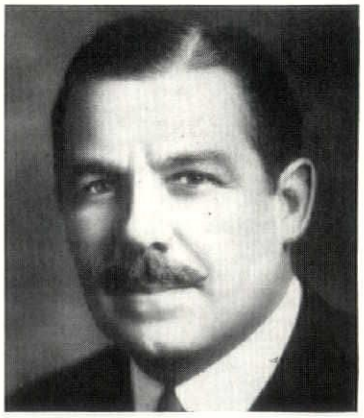
Industrial designer; has gained attention in previous exhibitions by his designs for buildings and exhibits for various notable fairs in Chicago, San Diego and Dallas

GILMORE D. CLARKE

Landscape architect; Consultant for the New York Park Department; Designer of such parkway systems as the Westchester County Parkway system and the Washington Memorial Highway

JAY DOWNER

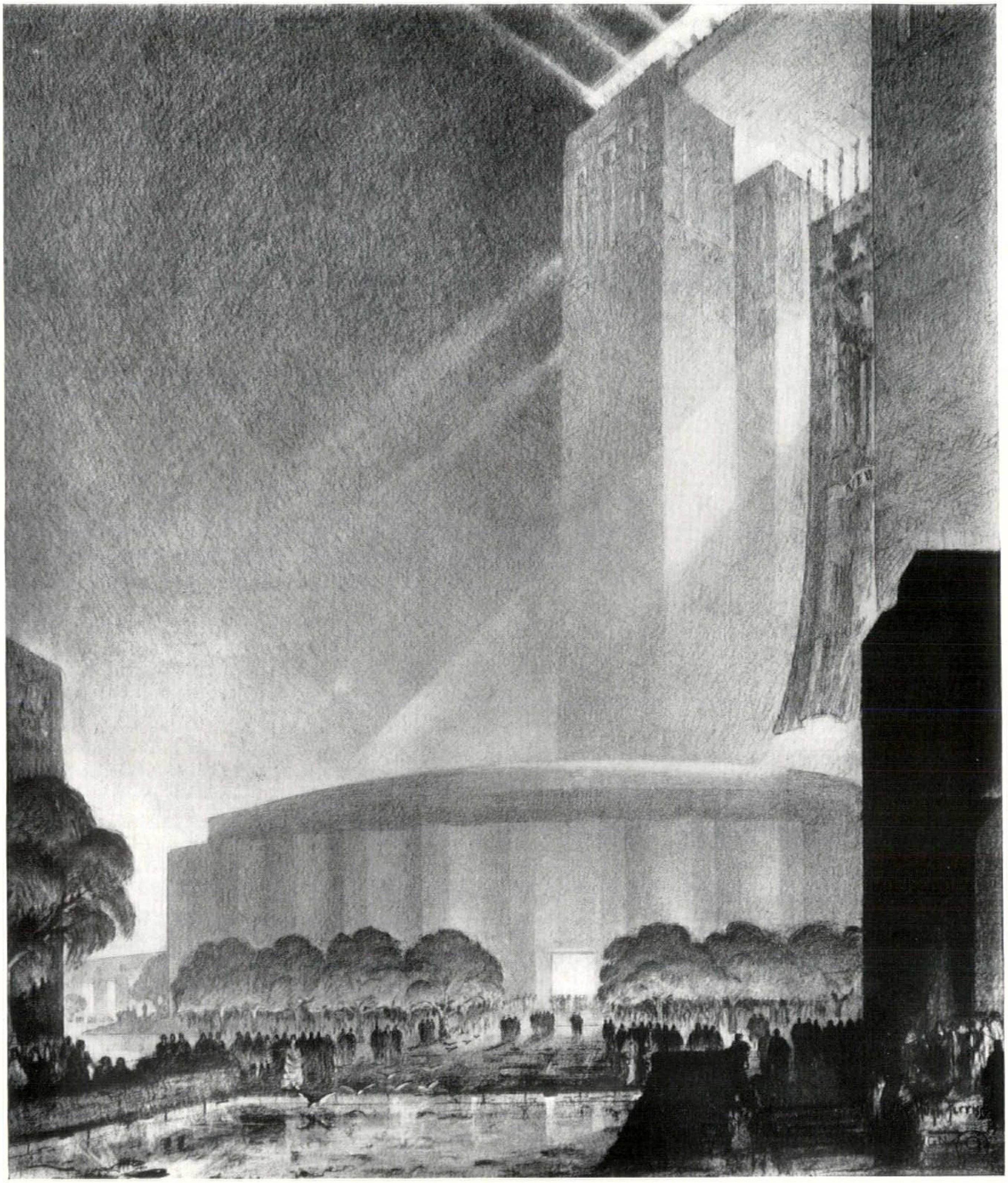
Engineer; Chief Engineer of Westchester County Park system; built Playland Park in Rye, an amusement center; chief engineer for the Bronx River Parkway; Consulting Engineer of Rockefeller Plaza



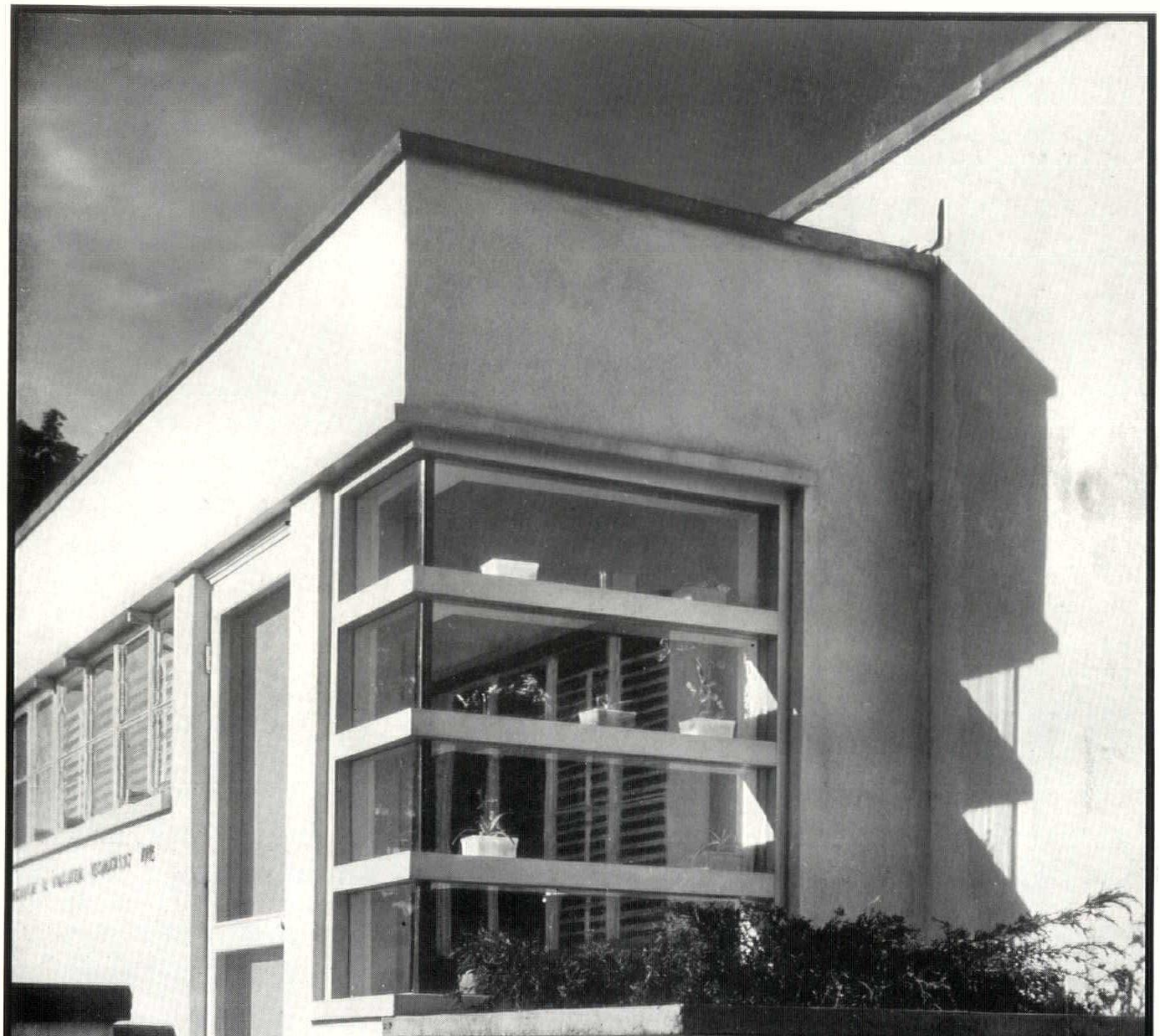
GROVER A. WHALEN
President

Chairman of the Board, Schenley Products; Former Police Commissioner of New York; Former Commissioner of Plant and Structures; Member of many civic commissions in New York City

OF THE DESIGN OF NEW YORK'S EXPOSITION



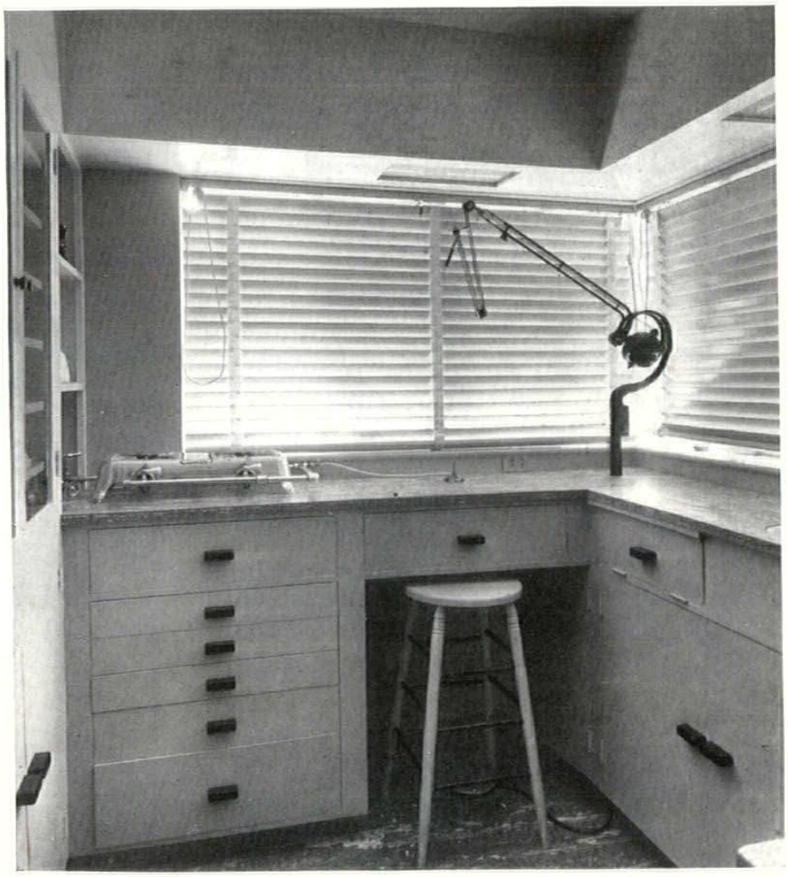
This massive structure, 250 feet high, will, as the Theme Tower, dominate New York's World's Fair. Designed to house a dramatic panorama depicting the milestones of the past in the arts and sciences, it will correlate the kaleidoscopic elements and forces of modern life into a pattern for America's future. From its portals broad avenues will radiate to the ten exhibit zones. A series of fountains and basins along the main axis will link it directly with the Plaza of Governments and the Federal Hall



DENTAL OFFICE, MELROSE, MASSACHUSETTS

ROYAL BARRY WILLS, ARCHITECT

HUGH A. STUBBINS, ASSOCIATE ARCHITECT



Built of 8" cinder concrete blocks finished with stucco, the organic yet reposeful character of the building makes it inviting from the exterior. View from the street (above), showing staggered operating rooms which maintain privacy yet allow some north light. Left, interior of laboratory

DENTAL OFFICE, MELROSE, MASSACHUSETTS

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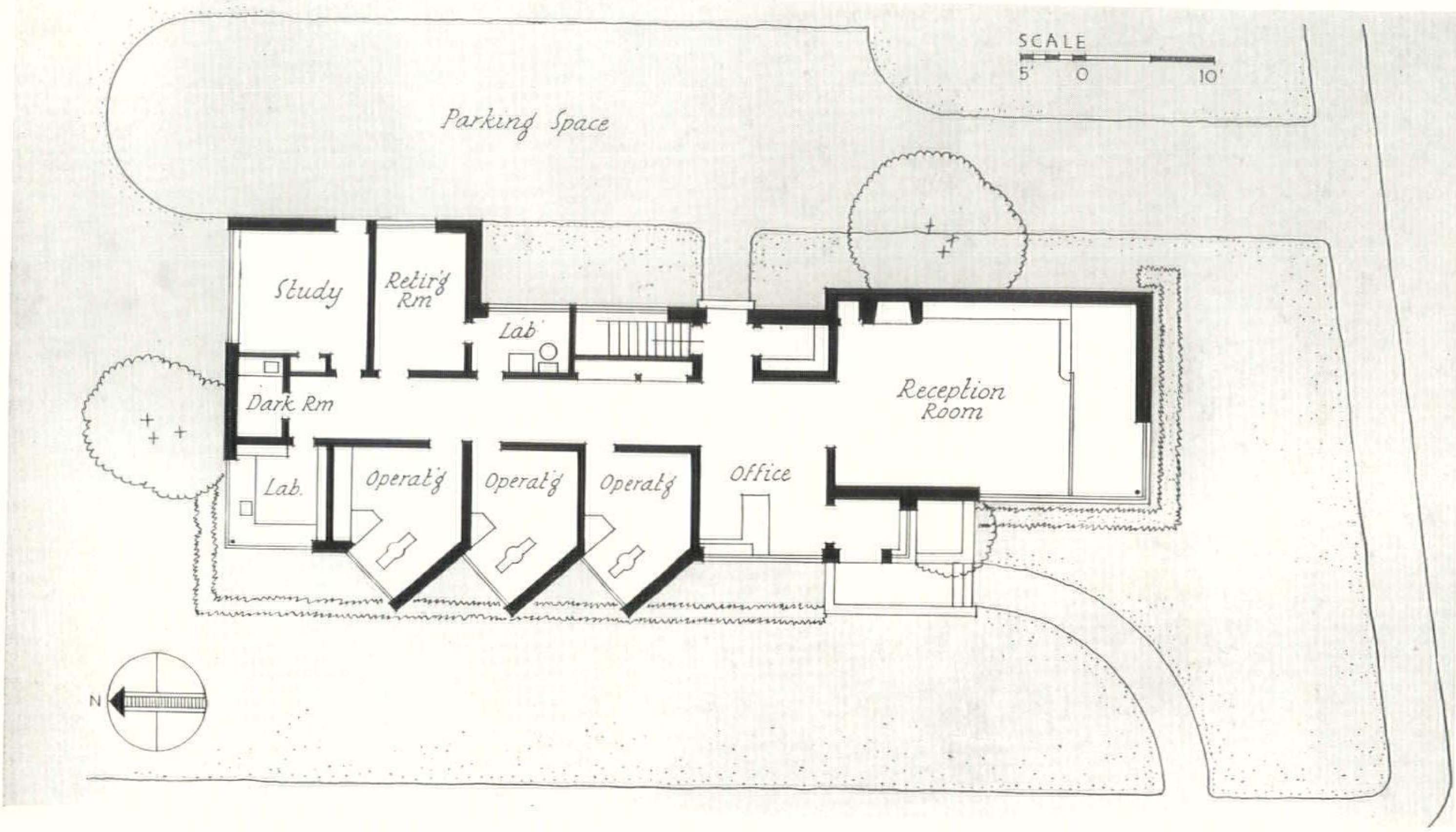
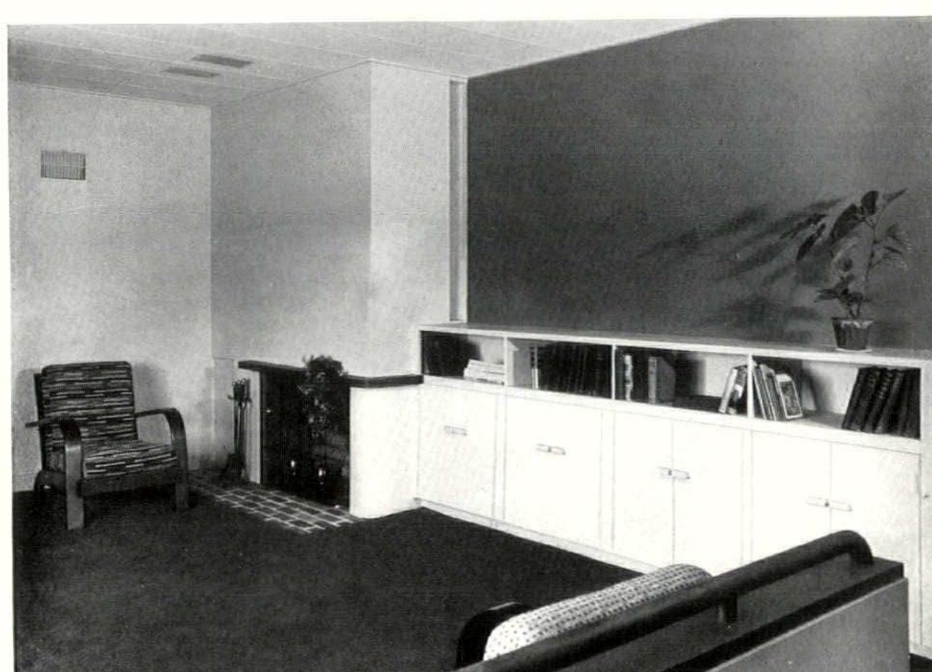


The distinct separation of working area and reception room, the projecting bays of the operating rooms, and the privacy of study and retiring rooms, are indicative of a thorough knowledge of the problem and its proper solution. The office is accessible from either the street or the parking area at the rear. Below, reception desk in office. Designed by the architects, it includes typewriter space and steel filing cabinets. The top is of ebony

A fireplace and built-in bookcases lend an informal and restful character to the reception room shown here. Soft indirect lighting is supplied from the cove at the right of the chimney breast



DENTAL OFFICE, MELROSE, MASSACHUSETTS

ROYAL BARRY WILLS, ARCHITECT

HUGH A. STUBBINS, ASSOCIATE ARCHITECT

THE DIARY

Friday, October 2.—An eighth-inch scale model of the Oregon State Capitol starts today on its way west from Rochette & Parzini's studio. Francis Keally, who, in association with Goodhue Livingston, won the competition, took me down to have a look at it as developed through restudy of the competitive design. It looks good. What appealed to me particularly was the vast wall surfaces of white marble, untouched by ornament but serving as a foil to some intricately detailed bronze of window or door. Keally says that his chief occupation during the period of restudy and making working drawings was "keeping the garbage off."

Saturday, October 3.—Several months ago this column was considerably set up over the fact that the winner of the A.I.S.C. Annual Student Bridge Competition this year was an architect, rather than an engineer. Ralph E. Winslow, professor of architecture at Rensselaer Polytechnic Institute, now tells me that not only was the winner an architect, but the second prize design and the first Honorable Mention were entered by architectural students from his department. Moreover, last year, the three students from Rensselaer Tech who placed in the preliminary stage, and, the year before, the five students in the preliminaries and winners of the first and second prizes and Honorable Mention, were all architectural students from the same department. It would seem that the engineering students had better look to their laurels.

Tuesday, October 6.—The New York World's Fair 1939 invited representatives of collaborating professional associations and the architectural editors to luncheon today to see the plans and hear the story of what the Fair may be. To my mind the results are among the most amazing achievements in design that have appeared for many a long day. Consider the fact that it was not until the latter part of May that the Architectural Advisory Board was commissioned to devise a basic theme for the Fair and a plan which should express it. Allowing some time for organization, securing quarters, getting personnel together, there were less than three months available to do the job. Only twelve men, I believe, are on the pay roll, though various other branches of the Fair organization have contributed time and men in collaboration.

Two things impressed me: first, the breadth of vision of the basic theme; and second, the fact that the plan has form. It is not a mere labyrinth of miscellaneous units; one grasps at once the structure of it—though it is by no means a Beaux-Arts scheme—and, set down upon any spot of the vast area, one would know where he stood in relation to the whole.

Friday, October 9.—Not many years ago, the architectural profession was somewhat concerned over the fact that we were apparently standardizing our post offices without very much consideration for geographical or traditional backgrounds. The post office in Dubuque, Iowa was likely to look very much like a post office in Reading, Pennsylvania. There was considerable outcry from some of the more sensitive members of the profession to the effect that we were in grave danger of losing the elements which, in their variety, had made the early architecture of America what it is.

That danger seems to have passed away. Another has taken its place. In motoring through three states today I was impressed with the fact that all of our schools look alike. At least one can divide them into two classifications. Any big example is, or tries to be, Georgian or else an adaptation of English Tudor in brick and limestone. The Pacific Coast is still apparently conscious of its background, and designs its schools accordingly. Where else in this land is there a noticeable effort to design schools belonging unmistakably to that locality?

Monday, October 12. — In driving through the back country of Eastern Pennsylvania today, I developed the single-minded ardor of a collector. I was collecting Pennsylvania barns. They vary mainly in size, and only occasionally in color—red is the type; white the minority branch. No matter what the size, the barn has the wide overhang to the south, sheltering with the hay loft the halved doors to the stalls. On the other side, or perhaps at an end, a grassy slope ramps up to the second floor level, to be used only when the hay comes in to be stored for the winter.

The collector will also distinguish between two other characteristics: one group has naïve murals of a cow or a horse, occasionally a hog, or a sheep, painted in symmetrically disposed panels on the side or on the gable end. Probably some itinerant mural painter wandered through this country long ago and painted for his board and keep. After his departure, however, restoration and retouching followed at the hands of the hired help, with results that would surprise the original artist.

Still another characteristic, the variety of which will add to the collector's bag, is the circular design of geometrical forms painted on the barns in energetic and apparently hopeful effort to avoid the attacks of witchcraft. These marks, I believe, were elaborately devised by the powwow man or witch doctor on the basis of the owner's horoscope, and, if properly designed and kept well painted, would forever fend illness and trouble from the stock.

Tuesday, October 13.—Benjamin Betts, who is out at Purdue University helping with the experiments in five thousand dollar houses, sends us some of the first findings. One of the houses made use of steel for both exterior and interior wall surfaces, roof construction and structural members. The outside finish is a cement paint, the third coat of which was rough-textured with sand, resembling stucco. The actual cost of each operation, from foundation to painting, was recorded with meticulous care. So far as we know, there never before has been a thoroughly reliable and unbiased record of costs kept in this detailed way. One can estimate to the penny the cost of labor and materials of each item. These records, of course, will be of considerably greater value when the University has completed other houses of different types.

Thursday, October 15.—Those of us who frequent Fifth Avenue buses, have for a year or more noticed Admiral Farragut standing in the corner of Madison Square Park on the slightly sloping tar papered roof of a shanty. The setting which Stanford White and Augustus St. Gaudens devised for the naval hero was inside of the shanty. And now the Admiral has marched up to Central Park Yard. He is without his sword and its scabbard, but he still grasps the indispensable binoculars. It will be a year or more before the Admiral returns, as he must, to his Madison Square location—not the precise spot on which he stood, for Madison Square is being redesigned. Meanwhile, the North River bluestone pedestal, which also showed the effect of the years and the weather, is being restored.

The craftsmen who move statues have, it seems, their own traditions. When they put a rope around the Admiral's waist and hoisted him from his pedestal, they turned him around after they set him down upon the ground. Since he had been looking west for so many years, the craftsmen, as usual, thought it only fair to give him a view in the opposite direction.

Saturday, October 17.—Dr. Margaret S. Miller, who is secretary of the Society of Women Housing Managers, London, is over here looking at our efforts. She gives us several good thrusts of the critic's rapier:

"You have no national program on housing as we have in England.

"You have lived so long under a regime of individualism that it is difficult for you to accept government action in connection with housing.

"Your slum problem is complicated by what I can only call slovenly municipal housekeeping. By this I mean extremely bad street paving, inadequate lighting, inadequate street cleaning and garbage collection, delay in clearing away debris after demolition, and so on."

Dr. Miller expressed surprise at the way in which our city population moves about, raveling our housing problem. In England, population is much more static. Dr. Miller adds a final word of caution which, from her vast experience, should carry a deal of weight with us: "In England we have been hammering away at the housing question for generations. We have accumulated experiences that may be of value to other countries like your own, which are just approaching reconstruction. For instance, take the question of housing management. Without management, the public money you spend on housing may be generally wasted."

Monday, October 19.—Lunched with Arthur J. Sweet, a consulting engineer on lighting. He remarked that our Portfolio of Church Lighting Fixtures, recently published, indicated with emphasis that the architect has been thinking of lighting far too strongly in terms of fixtures, and too slightly, if at all, as a vital element in composition. Mr. Sweet points out that with the open flame, then the only illuminant, the early masters of church architecture were sharply limited in the use of artificial light to produce influence harmonious with, and conducive to, the spirit of worship. Now these limitations have been removed through modern invention and modern knowledge of light control. It irks Mr. Sweet, as an engineer, to find the architect clinging to his old fetters, unaware of, or uninterested in, the freedom and the creative power which science has put into his hands.

Of course, it is not quite so simple as that, for the architect realizes that in order to continue to produce ecclesiastical interiors that encourage a spirit of worship, he cannot depart too suddenly from forms which have always been depended upon to produce that spirit of worship. The use of the gifts which science bestows always has, and possibly always will, lag behind their giving.

Wednesday, October 21.—The other day I called up Clarence Stein to remind him that a year or more ago he had piled several million brick together up in the Bronx to create Hillside Housing. We had talked about this a lot, and written more. Now that it had been in use for a year, how was it working? As a pile of brick it was an impressive architectural spectacle. As a social experiment, what could be said for it? Stein seemed to think that we had better go up there and find out, so today with George Gove of the State Housing Authority, Sir Raymond Unwin, and a group of his pupils from Columbia, we investigated Hillside Housing.

As to the test of popularity, the management has perhaps two or three apartments vacant, with the problem of choosing among many applicants the ones to whom these apartments should be rented.

A spirit of community pride is much in evidence. The grass plots are kept grass plots, not only because the fourteen hundred children respect them, but also, I imagine, largely because Mrs. Cautley had the foresight to surround most of them with low hedges to form a psychological, even though not a formidable, barrier against romping children.

Stein had provided a considerable number of rooms in the basement for community groups with great psychological astuteness. The management allowed these to remain idle and undiscovered until a group of the tenants themselves asked for space in which to conduct meetings of a men's club, a camera club, an art class for the children, and what not. Thereupon heat and light were provided by the management with the responsibility for furnishing and maintenance placed upon the group itself.

Sir Raymond was particularly interested in costs, not only of construction, but of maintenance, and was not at all surprised to find that these costs in America are practically double those in England.

Thursday, October 22.—The comings and goings of Kenneth Murchison are major events in the architectural world. Two years or so ago he left architectural practice to become a banker. Today a luncheon in the League club house marked his return to the fold. Aided and abetted by Tony Sarg—the two are practically Siamese twins since Tony gave him a blood transfusion some months ago—Ken told a large gathering some of the woes of being a banker. Both because of Ken Murchison's presence and the capacity crowd that filled the newly decorated dining room, the League surely took on today a pre-depression air.

Friday, October 23.—B. Lubetkin arrived a day or so ago from London, and lunched with our editorial staff today. London appears to be nearing the crest of a building boom. Many of the handicaps and obstructions that irk us in American practice—such as out-moded building codes and the like—are apparently far more troublesome for the London practitioner. Lubetkin told us in detail of the efforts required over a period of six months in order to get permission to build a temporary four- by six-foot tool house along a back edge of Regents Park. The drag of stupidity and ignorance among minor public officials and other guardians of the public taste and safety is one of the great handicaps to progress in architecture.

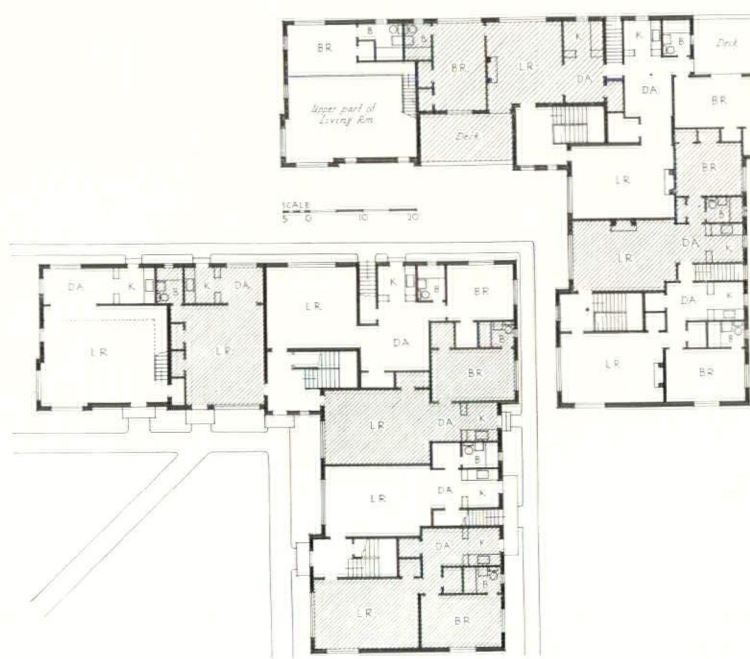
Lubetkin pointed out the inevitable development of the so-called modern movement. A group of men rebelled against the dead hand that permitted only the copying of old forms. The group gathered to itself younger enthusiasts, and appeared to be attaining a controlling hand, when disintegration started in the group because its members suddenly found that almost no two of them were fighting for the same thing. Here was a group of men who believed that anything functional must necessarily be beautiful. Here again was a group who saw merely a new set of motives, mannerisms, forms, and materials to be used. Here was a group so intense in their revolt from the traditional that they would use only forms, materials and methods that approached as nearly as possible to the opposite of the traditional. And thus what seemed to be the beginnings of a movement dissolved again into the main stream, to be replaced perhaps by some freshly inspired nucleus, gathering unto itself other iconoclasts.

PHOTOS: SAMUEL H. GOTTSCHO

Façade of the Pinecrest Apartment

TWO APARTMENTS, MIAMI BEACH, FLORIDA

L. MURRAY DIXON, ARCHITECT



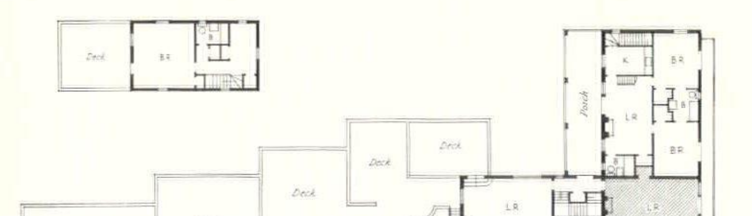
The building contains ten apartments, one of which is a duplex (left). Foundation is of precast concrete piles, first floor slab of concrete, second floor and all interior partitions of wood. Exterior walls are of concrete block finished with stucco. Stair halls are lighted by glass blocks

PINECREST APARTMENTS, MIAMI BEACH, FLORIDA

L. MURRAY DIXON, ARCHITECT

OCEAN FRONT APARTMENT, MIAMI BEACH, FLORIDA
L. MURRAY DIXON, ARCHITECT

Wide variety of layout is achieved by the isolated "maisonette" and the second floor duplex (right) in addition to the eight other apartments. Precast concrete piles and concrete slab are used for foundation and first floor. Second floor and all interior partitions are of wood



MODERN PLANS WITHOUT PICTURES

BY RAYMOND BAXTER EATON

MUCH interest has been aroused recently in the so-called "modern" house. Many people have absorbed only the novel exteriors and do not realize that the modern house must present a modern plan that will fit modern needs.

The period of development has passed where the architect took a hackneyed plan, moved the windows to the corners and unveiled the result to a breathless public as the last word in design. Recent developments in mechanical equipment and new construction materials and methods have done much to change the approach to the plan problem. The important part the automobile plays in the life of the present day family has been another great influence reflected in the plan of the modern house.

It must also be realized, however, that with all the changes in planning many of the old problems remain and should be properly solved. Good circulation is still of paramount importance and blank wall space is still desirable for furniture. Large windows and glass brick walls are attractive and lend themselves readily to the modern spirit but "temperance in all things" applies as well here as elsewhere. Many modern designers in attempting to provide unique elevations have so tortured the plan that the torments of the Inquisition pale beside them.

Certain general trends in modern planning may be noted by a study of houses falling in this category. The inclusion of the garage is an obvious development which has become universally recognized. The flexibility of plan resulting from new materials and new modes of living has given birth to the large second floor terrace. The circular and elliptical form is returning to favor after a long absence due chiefly to the adaptability of structural glass.

Following are a series of 49 house plans selected to illustrate the trends in planning. They are classified for architectural use into the following divisions:

A. The 3-bedroom house, no servant's room.

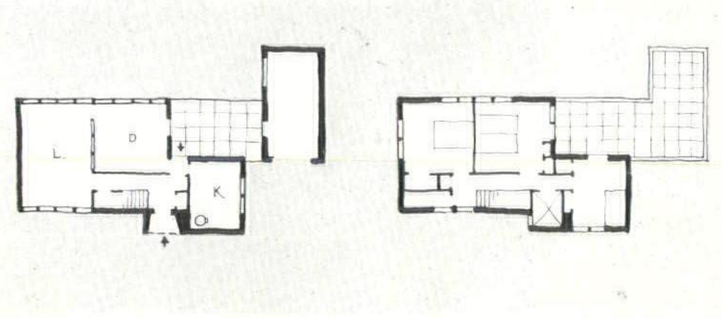
B. The 3-bedroom house and 1 servant's room.

C. The 4-bedroom house, no servant's room.

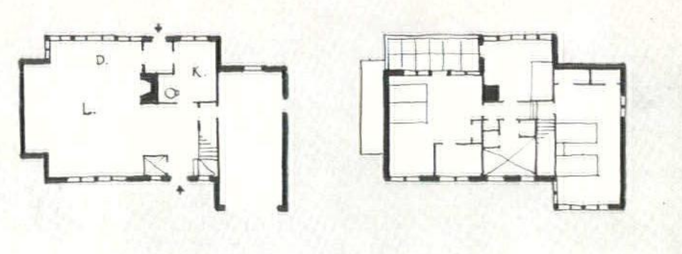
D. The 4-bedroom house and 1 servant's room.

These plans are intended merely as suggestions to the creative mind of the architect and are arranged in a manner designed to facilitate comparison and analysis. All living rooms are shown at the left and all plans are drawn at the same scale. Schemes of fenestration are shown because of their close association to modern planning. The possible variations are infinite in number and this group is not intended to cover the entire field.

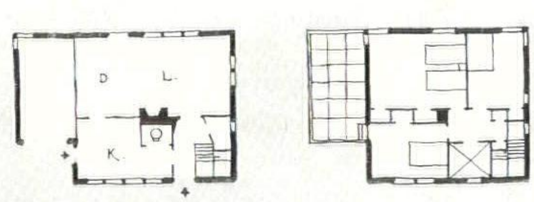
These plans are presented for the mutual benefit of architect and client.



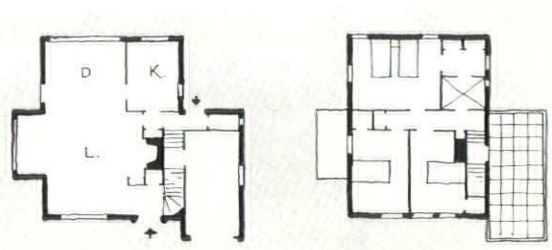
Privacy is insured by exposing blank service walls to public view and concentrating the main glass areas at the rear. There is no basement and little storage space



Lack of proper storage space, common to most houses without basements, is evident here and the bedrooms are somewhat out of proportion to the whole



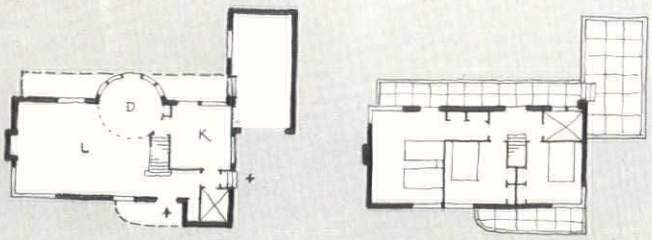
This very tight little plan is well worked out but for the storage facilities. The entrance hall leads into the large living room and the circulation is good



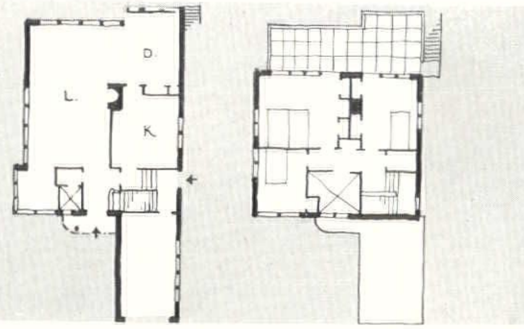
A good compact plan with but one bad feature—the necessity of using the living room as a traffic route from kitchen to front door and to second floor

THREE BEDROOMS, NO SERVANT'S ROOM

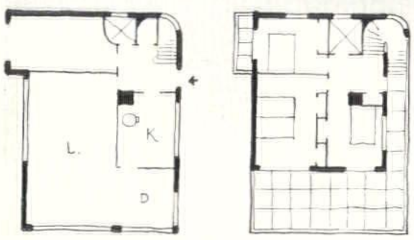
SCALE 1" = 32'-0"



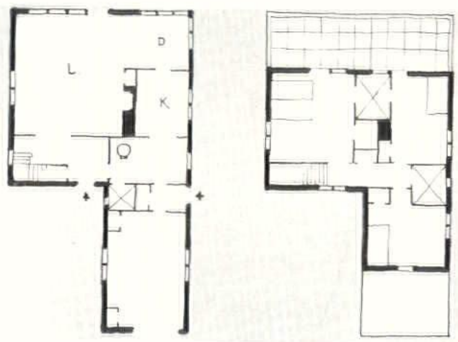
A good arrangement has been evolved with the dining room part of the living room but having the effect of being separate. Small hall areas are adequate



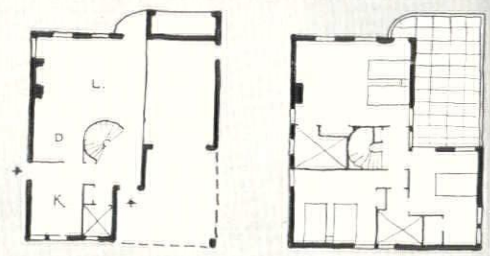
The use of an outside stair to the lounging terrace on the second floor implies a profound trust in the policing of the neighborhood. Circulation is good



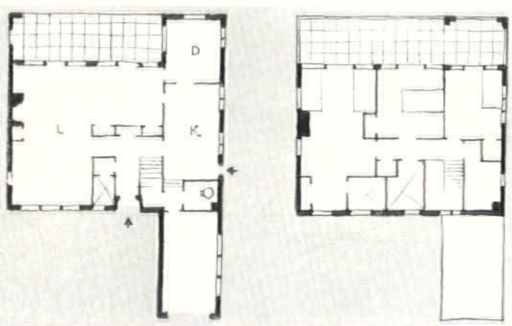
The living room entrance from the hall might easily be confused with the door to the garage



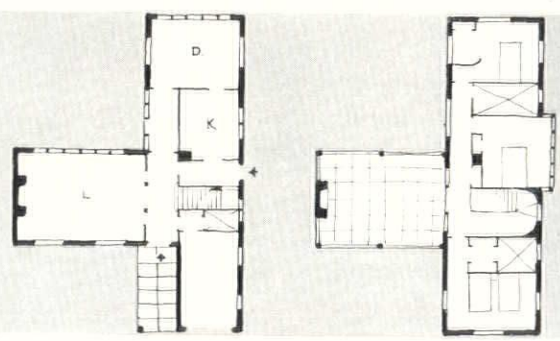
The inclusion of a combination heater and utility room in the house that has no basement is sensible



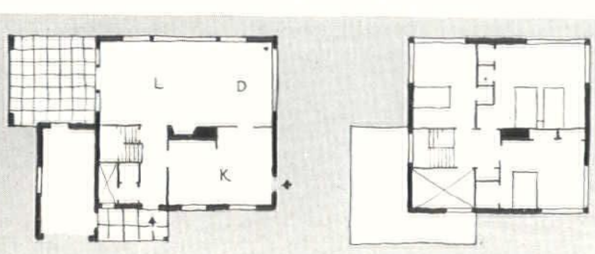
The stair is a little too prominently placed and the living room seems somewhat tucked away behind it



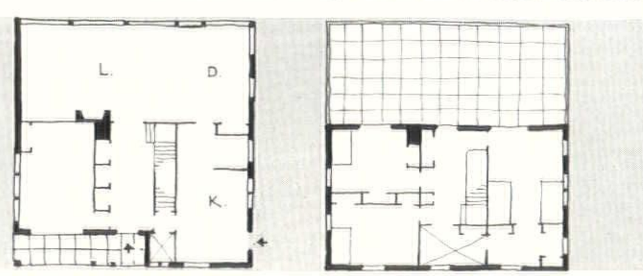
The entrance to the living room is indirect. Arrangement of various rooms is good but the closet accommodations in the master's bedroom are insufficient



An excellent formalized arrangement of rooms that are well related to each other. The clever planning of the second floor gives all rooms three exposures



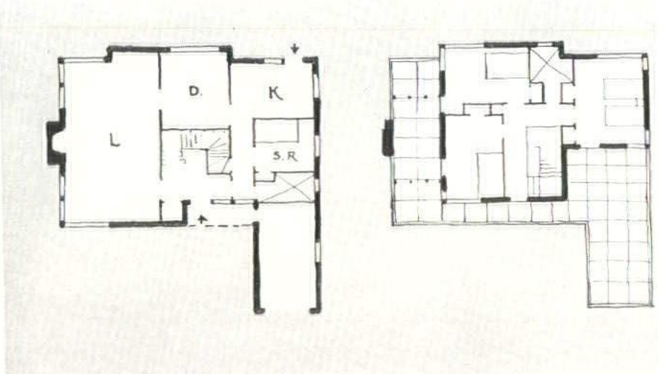
The cellar stair location is poor as its entrance is in full view of the living room and across the main hall from the kitchen. The second floor is clean cut



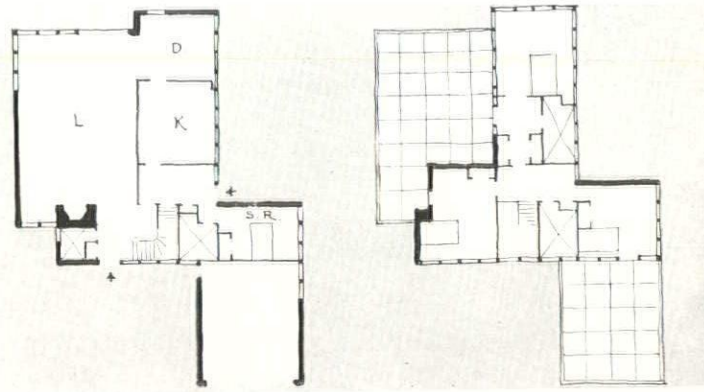
The large living-dining area open to the rear is attractive and the placing of the garage within the mass of the building makes it inconspicuous

THREE BEDROOMS AND SERVANT'S ROOM

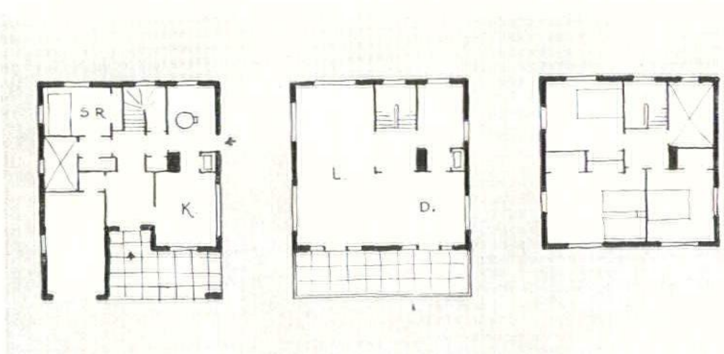
SCALE 1" = 32'-0"



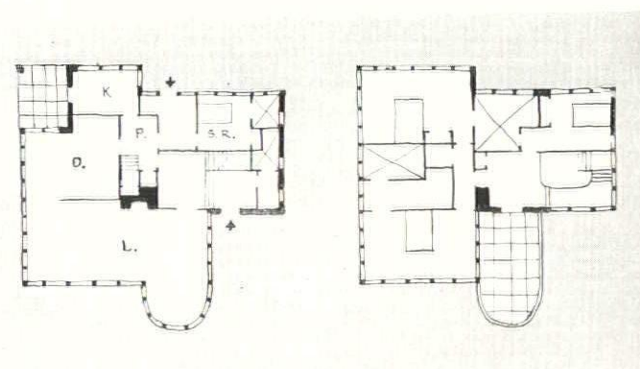
This plan of generous proportions is well arranged and incorporates the feature of an enclosed sleeping porch on the second floor terrace. The door to the garage is unobtrusive but conveniently placed.



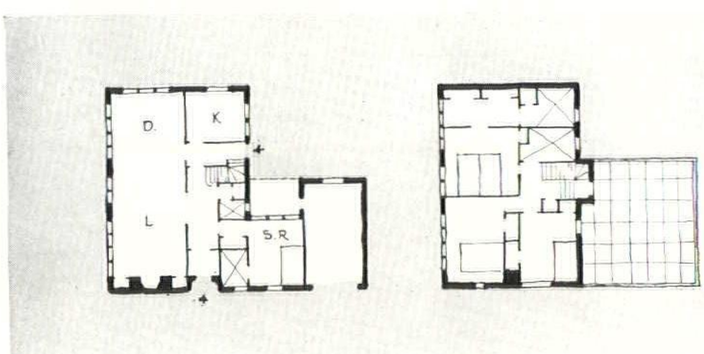
The fireplace is located a little too near the entrance to make it a natural center of a furniture group. The rooms are well disposed, but there is a too much glass area in the bedrooms for a feeling of privacy.



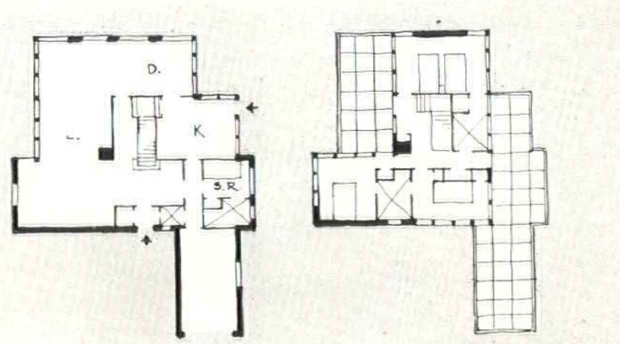
This type of house is more popular in Europe than in America. There are more stairs than the usual American housewife cares for. The definite segregation of living and service functions on separate floors is good.



The tremendous glass area makes furnishing most difficult and necessitates odd bays and alcoves to provide focal points for furniture groups. One of the bathrooms is almost as big as one of the bedrooms.



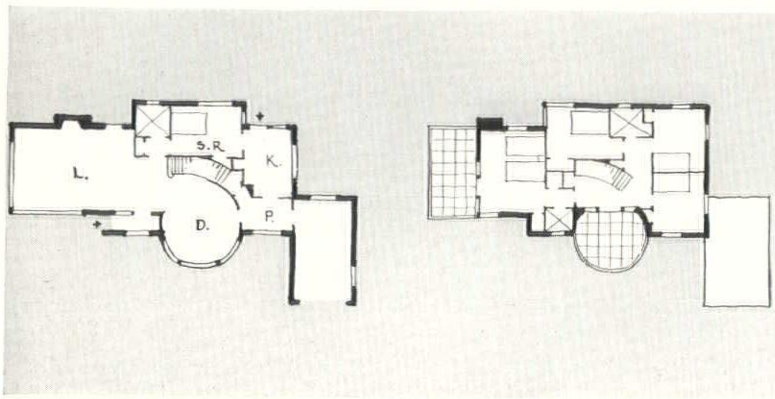
The location of the servant's room suggests its alternative use as a guest's room. Bedrooms on the second floor are cramped. The long, narrow living-dining room calls for careful furniture treatment.



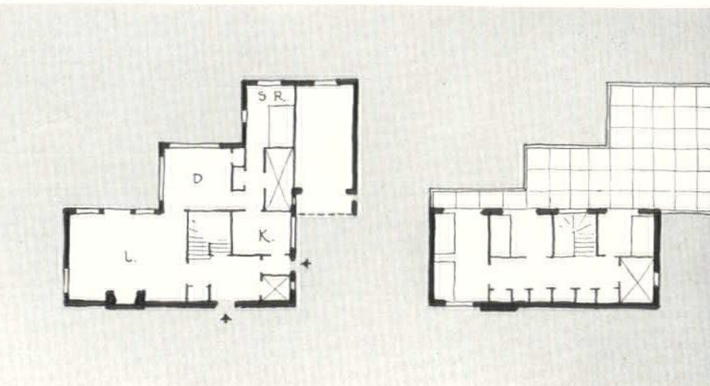
The oddly shaped living room dictates separate areas dedicated to various purposes. The arrangement of servant's room is well handled. An excessive amount of space is given over to the narrow hall on the second floor.

THREE BEDROOMS AND SERVANT'S ROOM

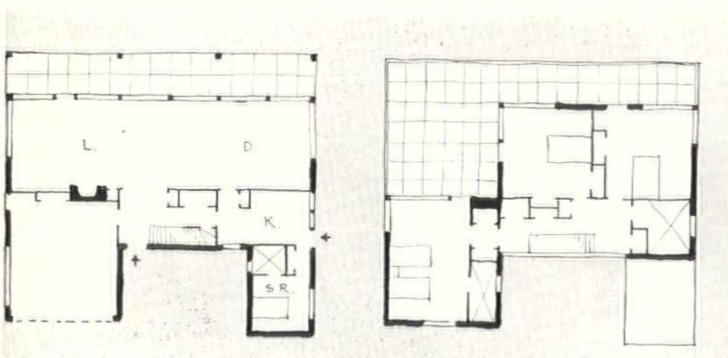
SCALE 1" = 32'-0"



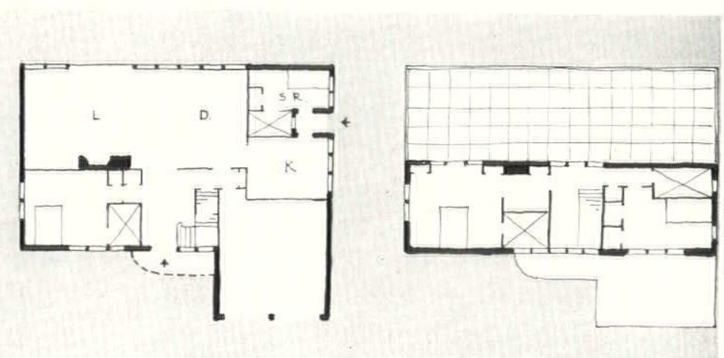
The dramatic stair somewhat dominates the general scheme, but is a very interesting element of this plan. The open area which must be crossed in answering the door bell is a rather undesirable feature.



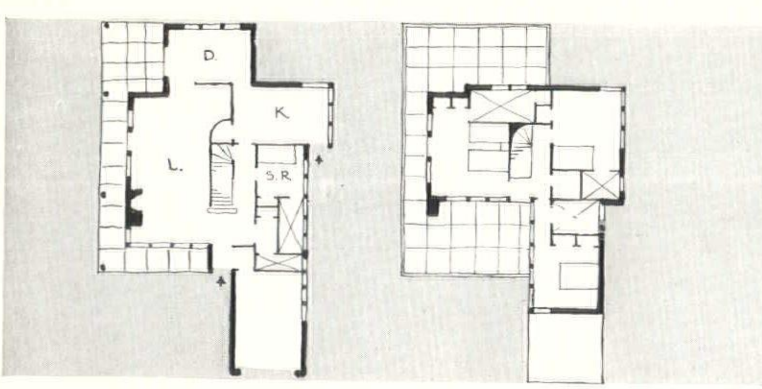
The easy and natural arrangement of the first floor does not hint at the unorthodox handling of the second floor. The battery of inconveniently located closets gives the hall the appearance of a communal dressing room.



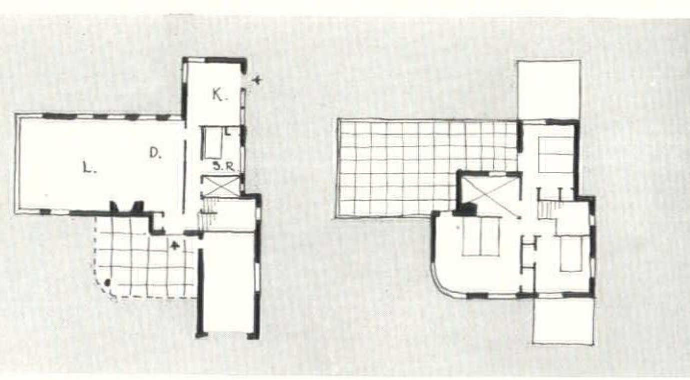
The living-dining room is somewhat narrow for its length. No lavatory is provided on the first floor, but otherwise the arrangement is good. The second floor terrace is large and well placed in relation to rooms.



In a plan with such a good location of rooms, it is unfortunate that there is no direct connection from kitchen to entrance hall. The accessibility of the second floor living terrace is very praiseworthy.



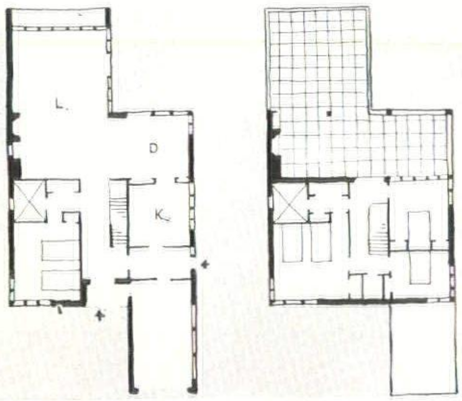
The connection between garage and house is excellent as is also the arrangement of lavatory and coat closet. Second floor rooms are large and pleasingly proportioned. One bathroom might have been omitted.



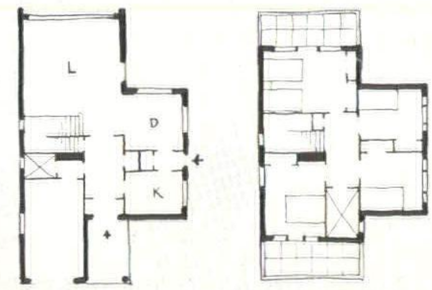
The dining area is awkwardly placed in the living room. The second floor plan is very compact with hall space at a minimum. The master's bedroom is very light and airy but lacking in proper closet facilities.

FOUR BEDROOMS, NO SERVANT'S ROOM

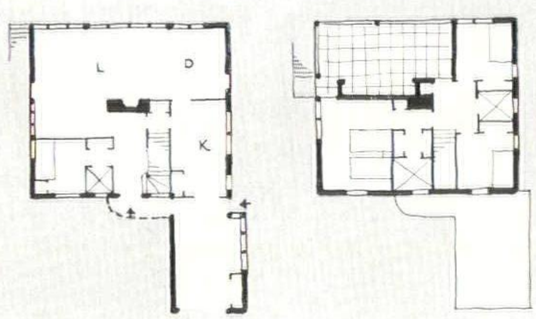
SCALE 1" = 32'-0"



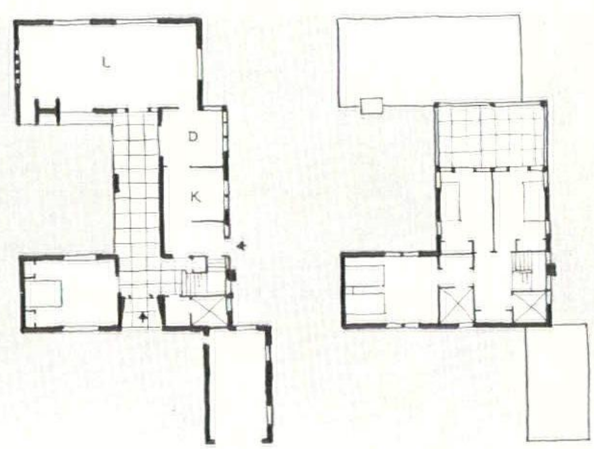
The entrance hall leads invitingly to the living room and the arrangement of the guest room on the first floor is especially well done. The covered terrace on the second floor affords an outdoor living room.



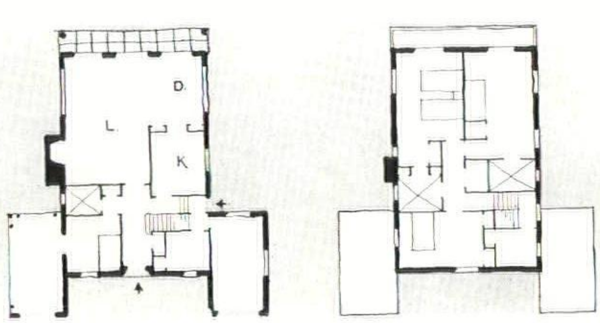
The stair is made a feature of the living room in this compact plan. The sequence of the rooms here is pleasing and well thought out. Interesting elevations should result from this simple and logical plan.



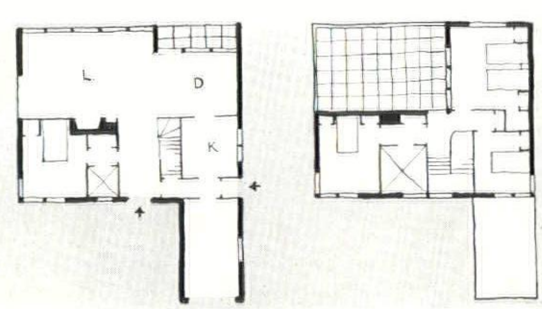
The use of the garage as a service entrance is novel and economical. The placing of the fireplace on axis is questionable here as it is inconvenient to the living room proper. Closet space is excellent.



A very open type of house for warm climates. The separation of the kitchen and dining room from the living room and court is well done. The location of the bedroom on the first floor plan makes its use flexible.



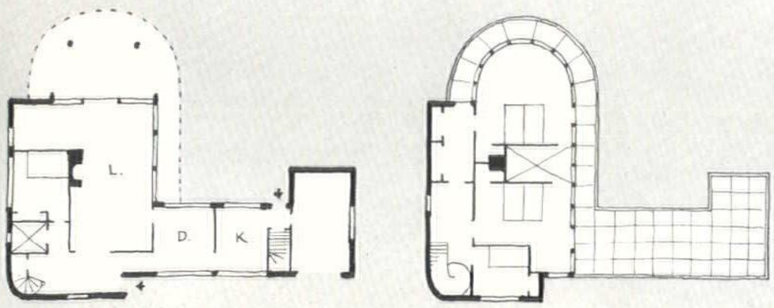
The entrance hall and stair are cramped but the general arrangement of rooms is good. The porch balancing the garage is a novel feature, but its relationship to the plan is questionable. Second floor hall is tight.

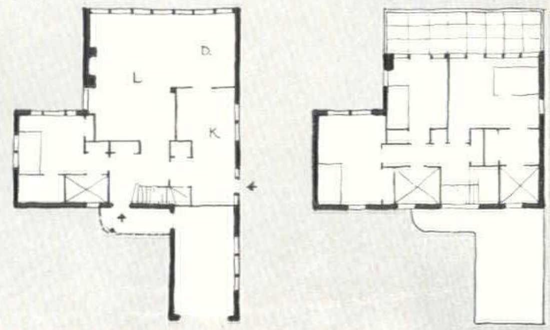


The straightforward entrance hall arrangement is pleasing and the secondary hall connecting the rear entrance is sensible. Second floor rooms are well proportioned and the terrace is properly accessible from the hall.

FOUR BEDROOMS, NO SERVANT'S ROOM

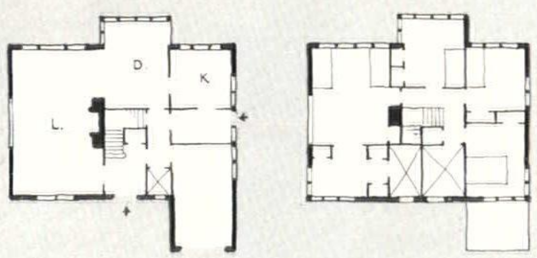
SCALE 1" = 32'-0"

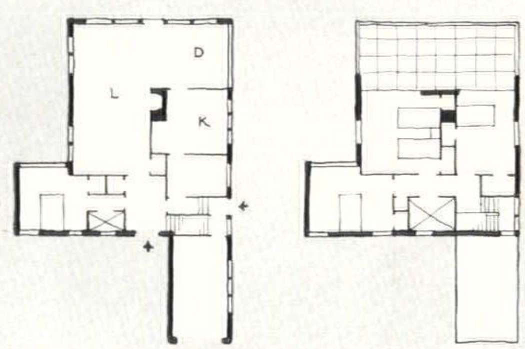




This rambling plan places the service areas in a separate wing. The guest suite on the first floor is well worked in. The small bedroom on the second floor is unfortunate in its lack of direct access to a bathroom.

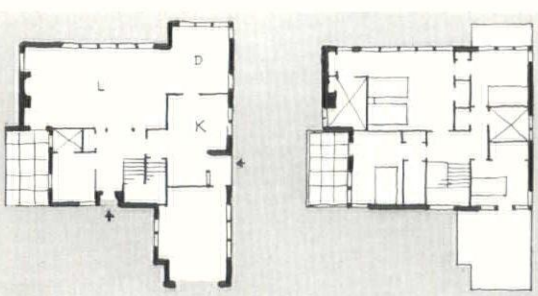
The first floor plan is unnaturally cut up by the location of the closets. The rooms themselves are well related and the second floor arrangement is good especially in the regard to closets and cross ventilation.

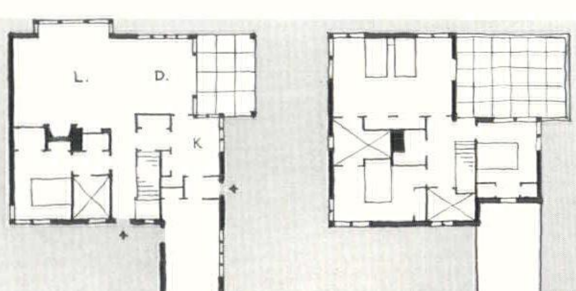




All rooms have at least two exposures by virtue of the bay at the back. All rooms are well proportioned and easily accessible. The secondary hall on the first floor solves the traffic problem nicely.

The living and dining room areas have interesting furnishing possibilities. The opening to the garage from the house is well handled in the stair hall. The second floor arrangement of conveniences is excellent.



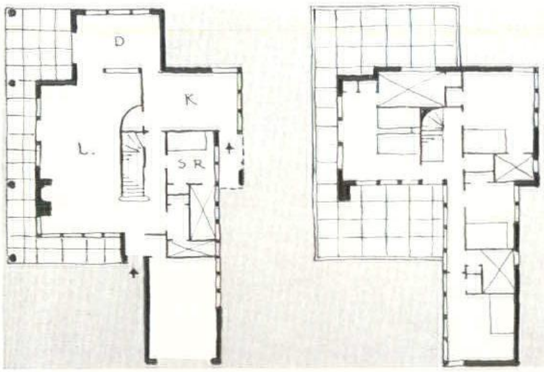


An interesting stair arrangement imparts spaciousness to the hall and the kitchen is accessible to it. The second floor terrace is small and rather inaccessible and the baths are disproportionately allocated.

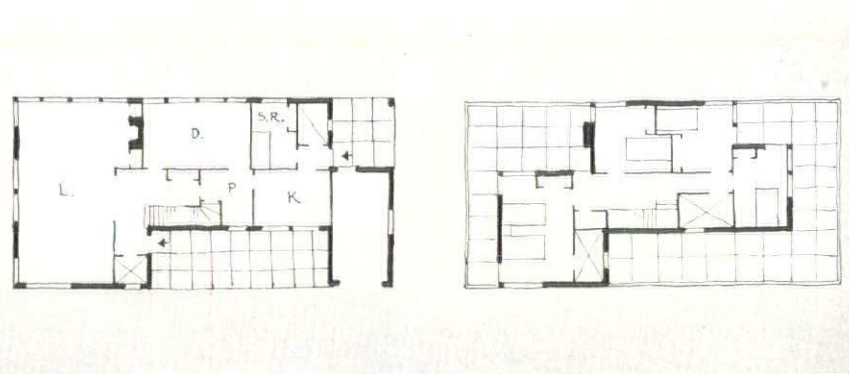
The entrance hall is long and narrow. The kitchen walls are too much cut up by openings. Second floor layout is good with closet space well proportioned. Storage closets are provided throughout the house.

FOUR BEDROOMS AND SERVANT'S ROOM

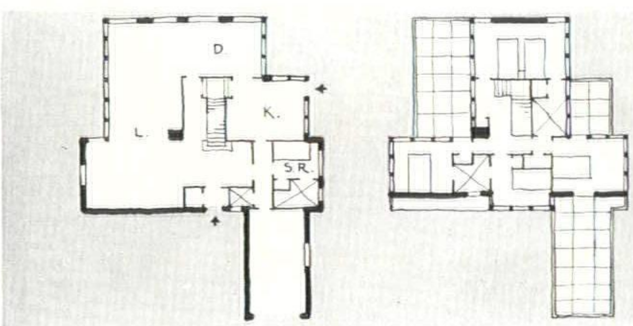
SCALE 1" = 32'-0"



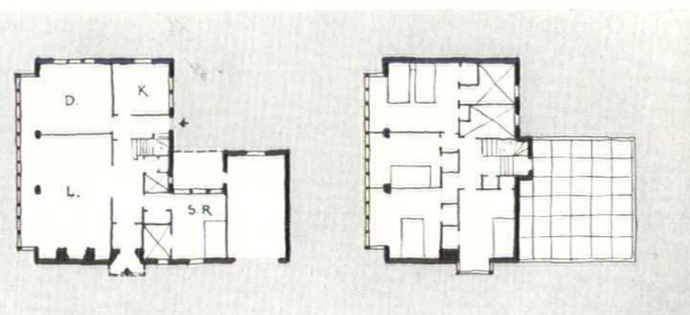
The location of the fireplace is odd in its relationship to the living room area. The kitchen is large and light. The stair is perhaps a little too prominent on axis with the front door. Second floor hall is well lighted.



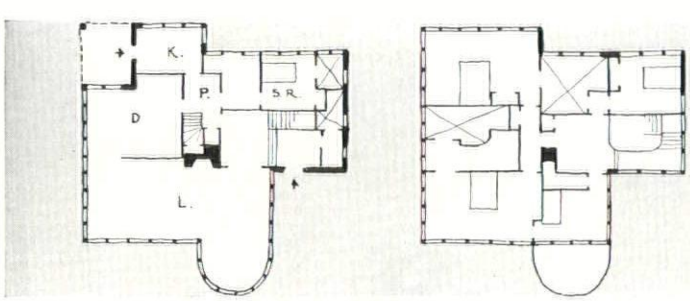
An unusual but satisfactory arrangement of rooms on the first floor. The bedrooms are cleverly handled but closets are few and small especially in a house of this size. The large terrace on the second floor is good.



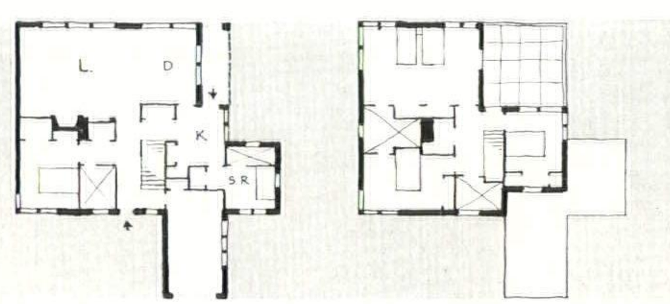
Both the first and second floor plans seem unnecessarily cut up and the various areas are oddly shaped. The bedrooms all have three exposures, however, and are adequate in size. The closet locations are unhandy.



The concentration of glass on one side of the house is unusual. The servant's room could well be nearer the kitchen. The second floor plan presents a maximum of its area usable for bedrooms with good closets.



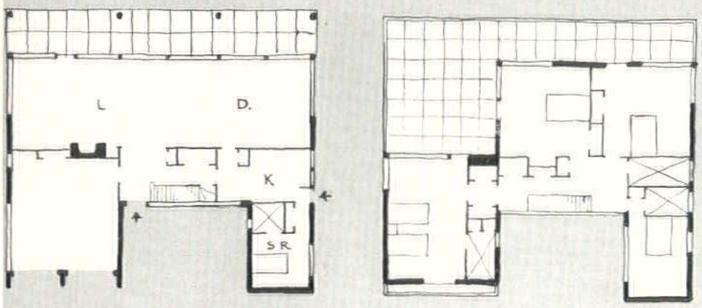
The entrance hall is large and leads graciously into the living room. The location of the stair makes the second floor hall unnecessarily large, but it is in keeping with the feeling of openness that pervades this plan.



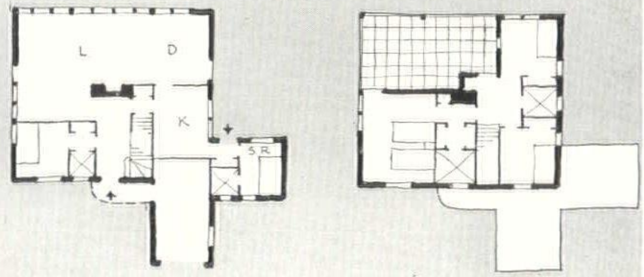
This very compact plan has interesting possibilities. The kitchen wall area is too broken up to provide much cabinet or counter space. The second floor bedrooms and closets are well arranged and proportioned.

FOUR BEDROOMS AND SERVANT'S ROOM

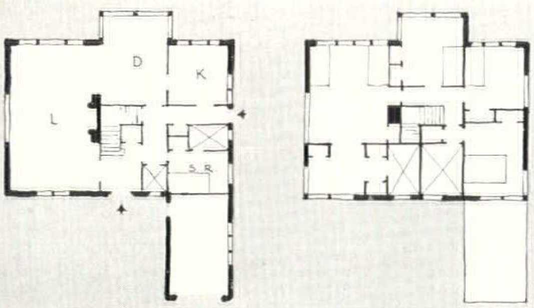
SCALE 1" = 32'-0"



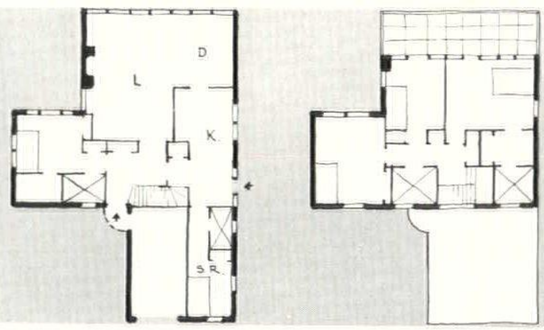
The entrance from the garage to the house is too direct and the front door is very tightly placed. The tremendous glass area in the living-dining room is a striking feature. Bedrooms are spacious and closets ample.



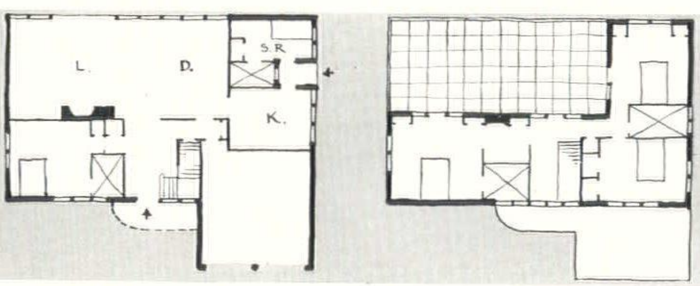
Rooms in this plan are well related and nicely proportioned. The living room should be most attractive when furnished. The bedrooms are nicely placed about the central hall. The service door is well located.



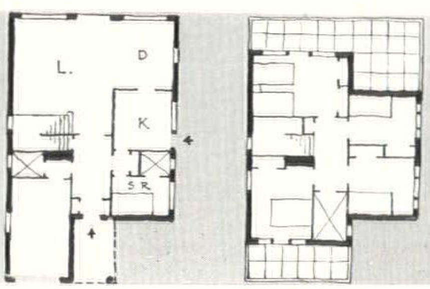
The rooms are spacious and well disposed. The fireplace is awkwardly placed between two large openings which makes proper furniture grouping a problem. The economy of the plumbing arrangement is obvious.



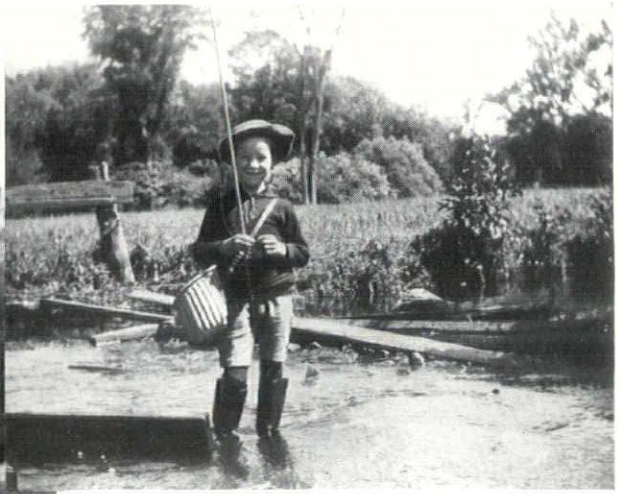
The living-dining room is poorly shaped for furniture, but the rooms impart an air of spaciousness. The front entrance and the stairs are cramped. Bedrooms are pleasant and airy. The balcony assures privacy.



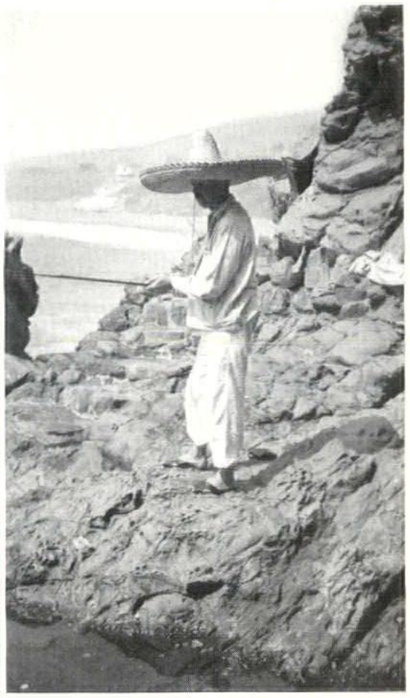
The servant's room is well isolated and cleverly placed. The rooms are all of comfortable size and little space is wasted. The terrace should be a most attractive outdoor living room and is accessible from hall.



This compact plan is very livable. The various rooms are excellent in their relationship and the symmetrical distribution of rooms on the second floor presents a simple but pleasing arrangement. Terraces are good.



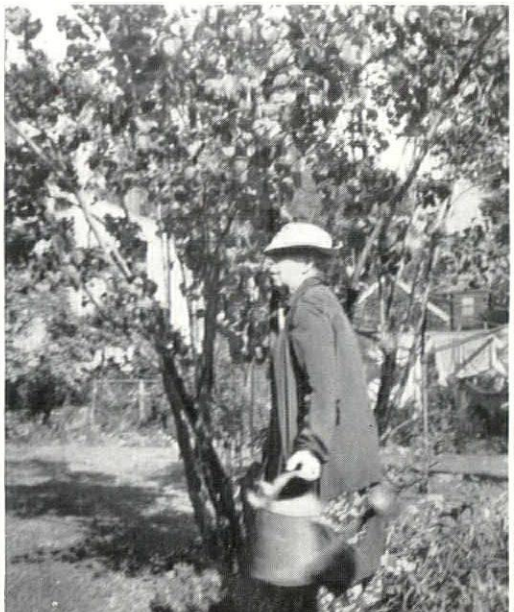
The victim of trout fishing gets a dreamy look in April and violent in May and June. Whether the disease is caused by spirochette, fly or worm is unknown, but it recurs annually, attacks the young and is inheritable. Lorimer Rich (man and boy) and his daughter are victims.



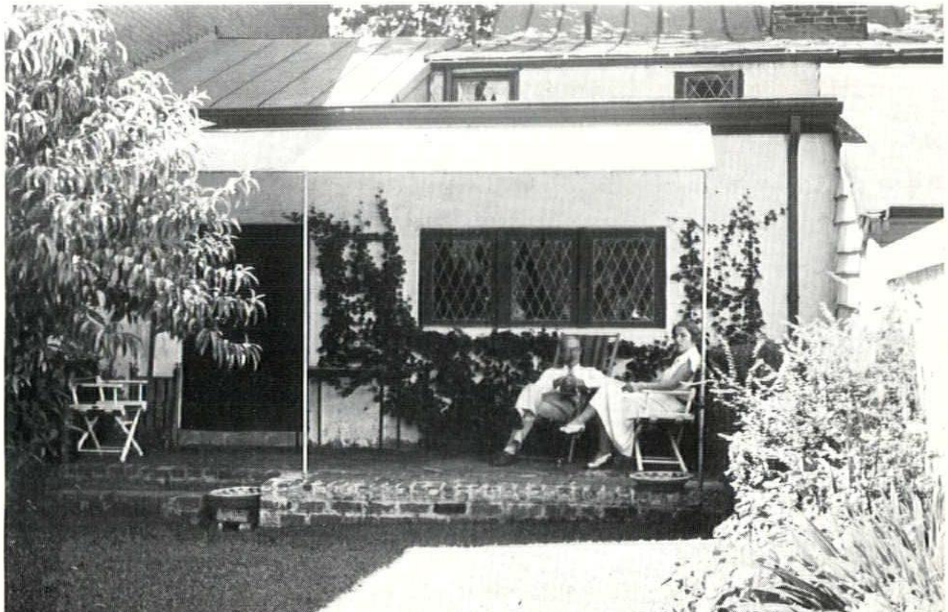
What at first would seem a beach umbrella actually turns out to be Palmer Sabin of Pasadena, another Izaak Walton. The costume would do very nicely for almost any Beaux Arts Ball or for singing "La Cucaracha" in the bathtub.

ARCHITECTS AND AVOCATIONS

The lyfe so short, the craft so long to lerne,
Th' assay so hard, so sharpe the conquering.
—Chaucer.



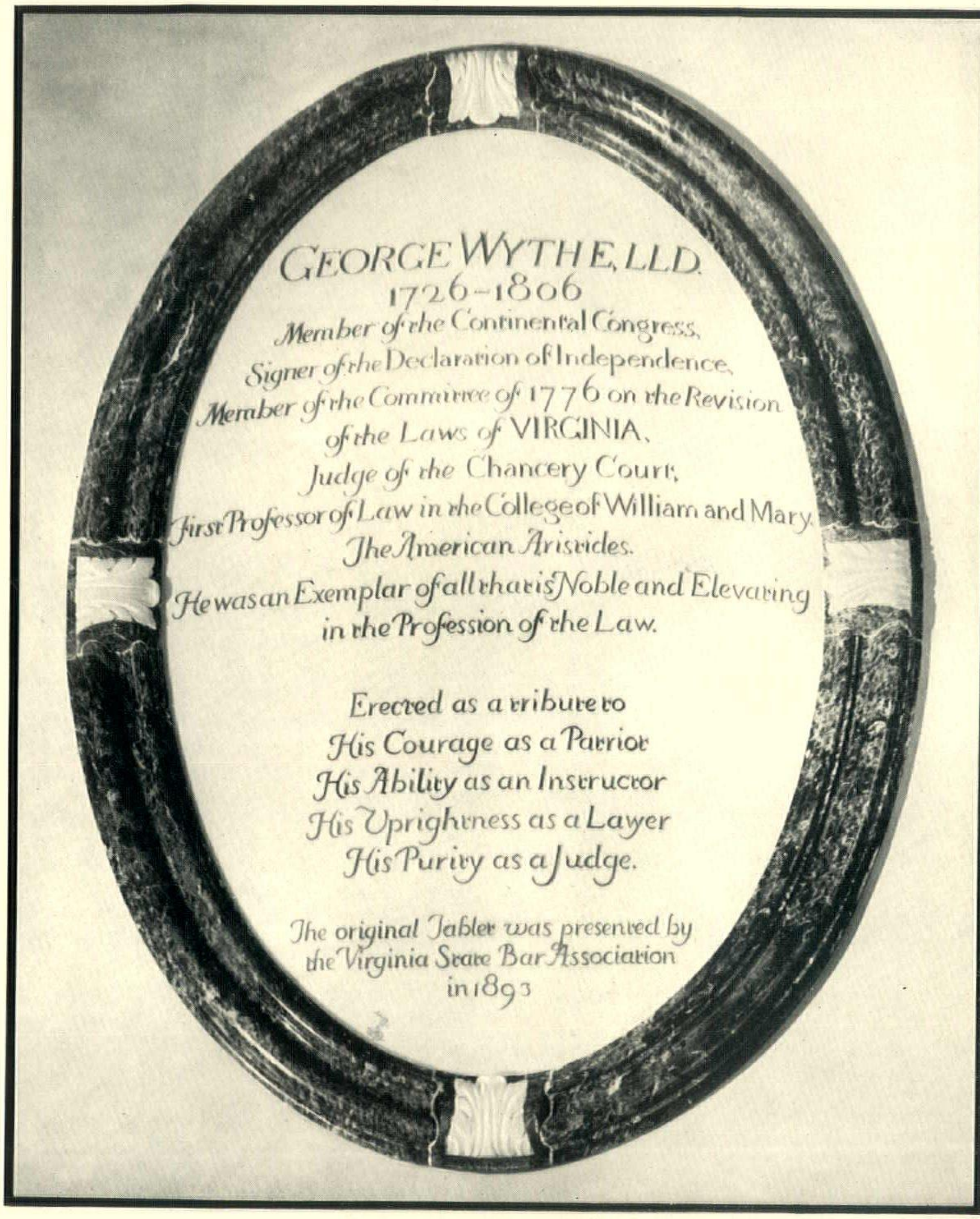
The gardener's lot is to dig, plant, prune, weed, spray and water, with small material and vast spiritual results. Lois Lilley Howe, F.A.I.A., hastens to alleviate the thirst of a budding rose.



In a world of constant bustle and hurry, it is nice to know that William Dewey Foster's avocation is simple sitting. The setting is from the garden of his "boondoggling" house in Georgetown and the lady is Mrs. Altman whose husband, Charles Altman, University of Chicago Near East archeologist, lurked behind the candid camera to get this bit of rusticity.

PORTFOLIO OF MEMORIAL TABLETS

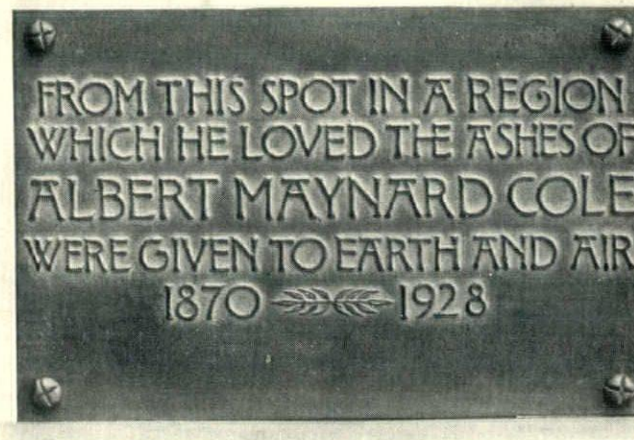
NUMBER 121 IN A SERIES OF COLLECTIONS OF PHOTOGRAPHS ILLUSTRATING VARIOUS MINOR ARCHITECTURAL DETAILS



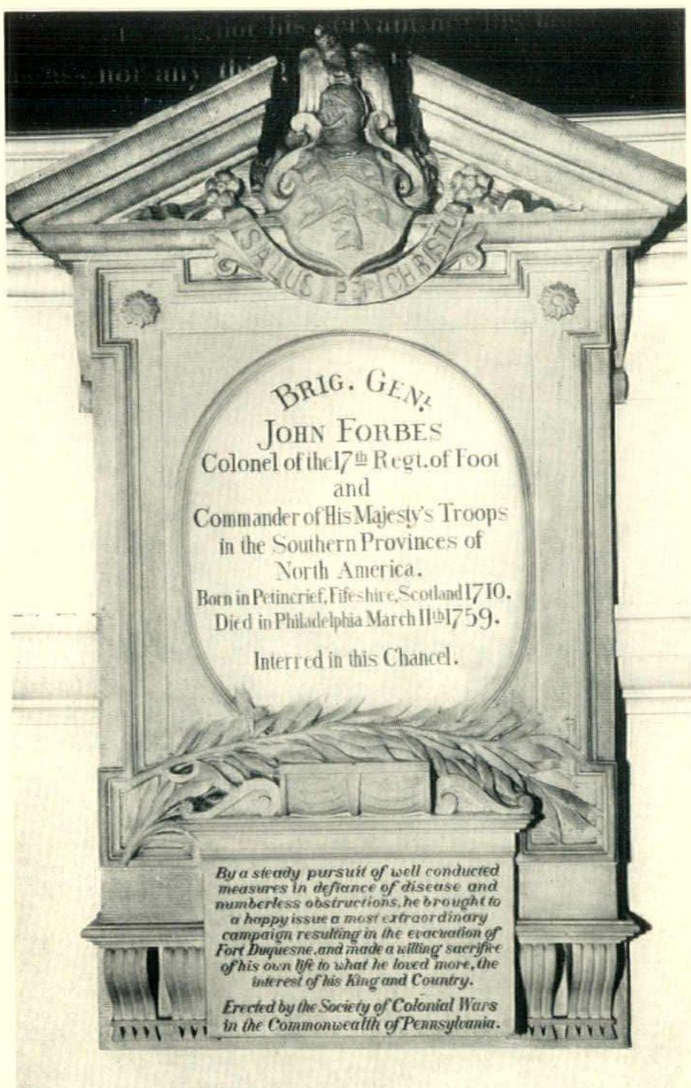
Wren Chapel, College of William and Mary, Williamsburg, Va.
Perry, Shaw & Hepburn

PORTFOLIOS IN PREPARATION
Cast-Iron Treillage, December . . . Outdoor Paving, January . . . Shop Windows, February . . . Porch Columns and Posts, March
The Editors welcome photographs of these subjects. Forms close six weeks in advance of publication.
A list of the subjects that have appeared will be sent upon request. Certain of these past Portfolios are available to subscribers at 25 cents each; five for one dollar.

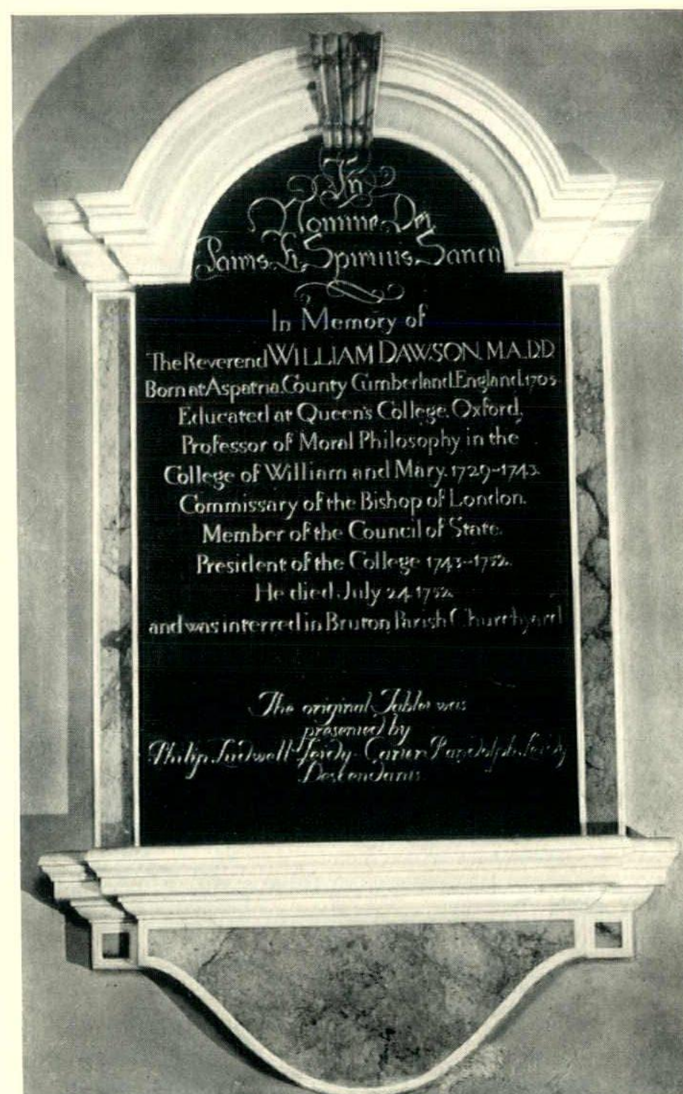
Ivory white; incised letters and bolts in dull red
T. B Hapgood



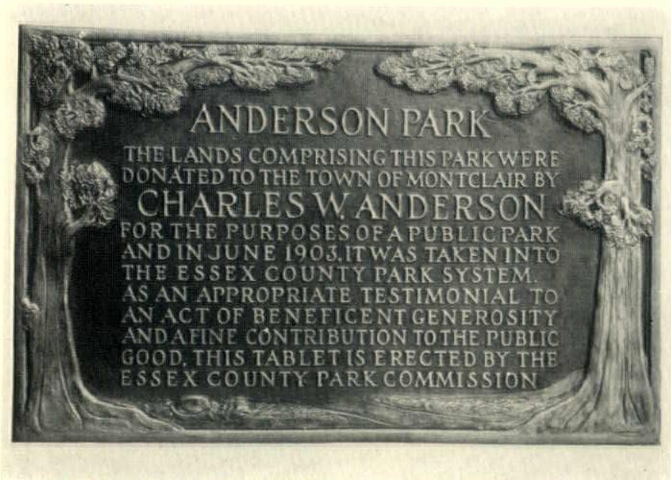
Affixed to a tree
T. B. Hapgood



Brick lettering on white marble
Christ Church, Philadelphia, Pa.

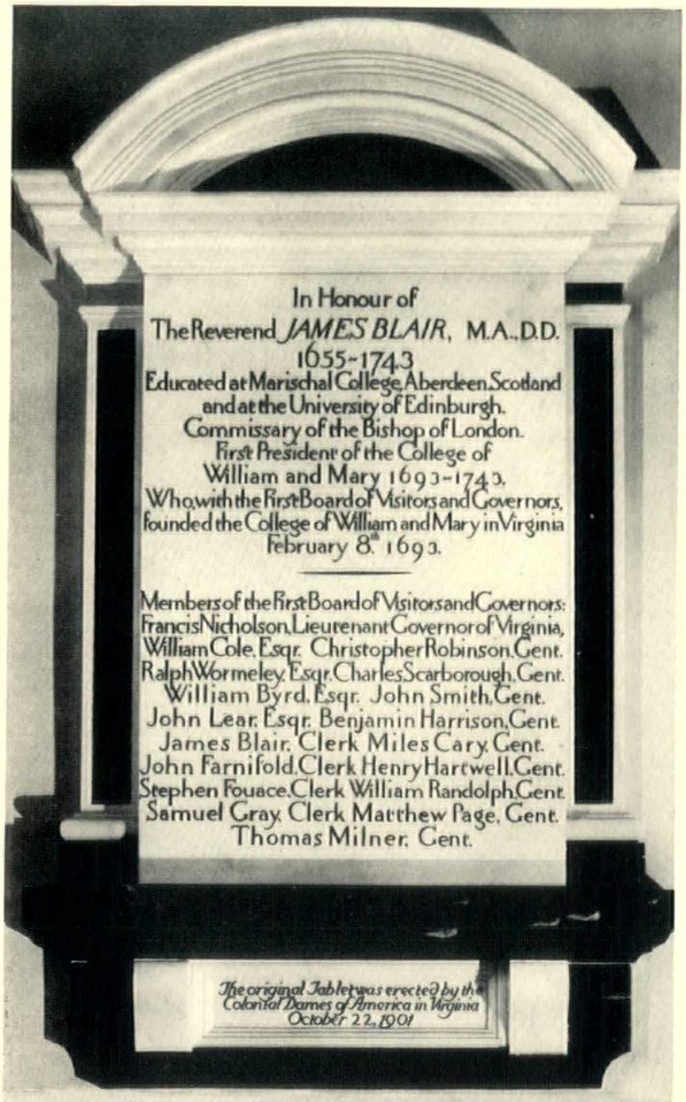


Wren Chapel, College of William and Mary, Williamsburg, Va.
Perry, Shaw & Hepburn

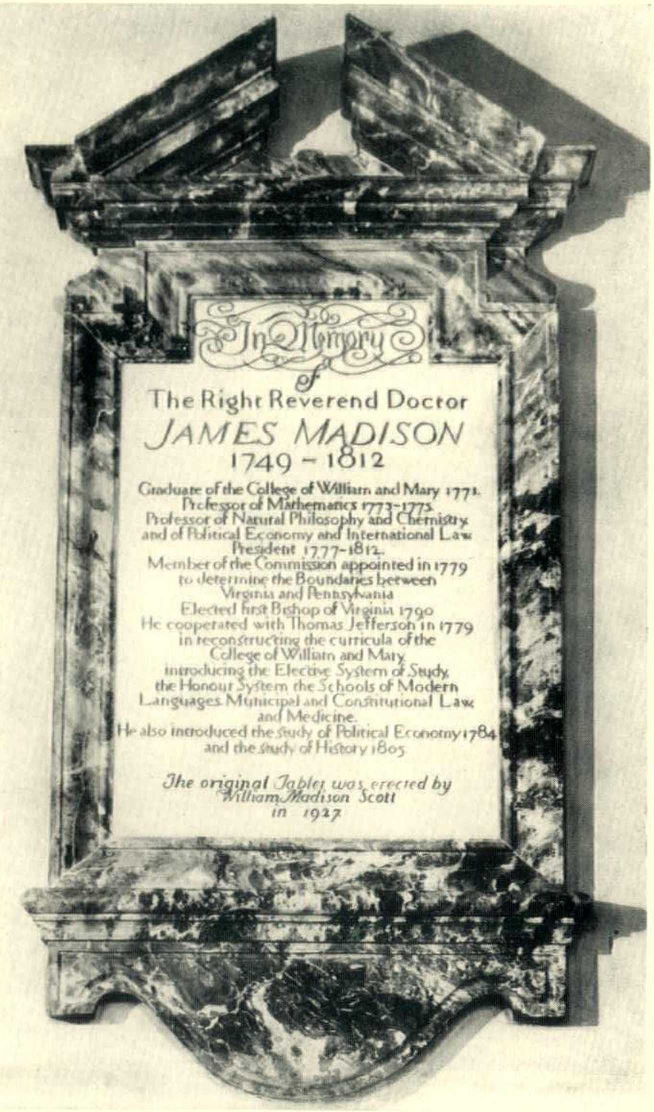


General Bronze Corporation

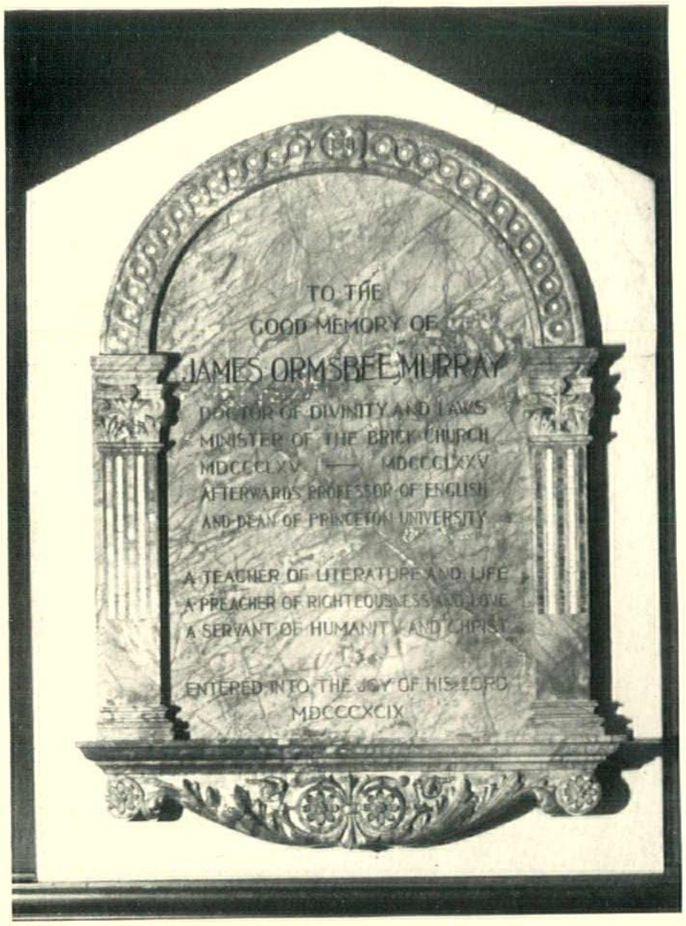
White marble; incised letters and border in red
T. B. Hapgood



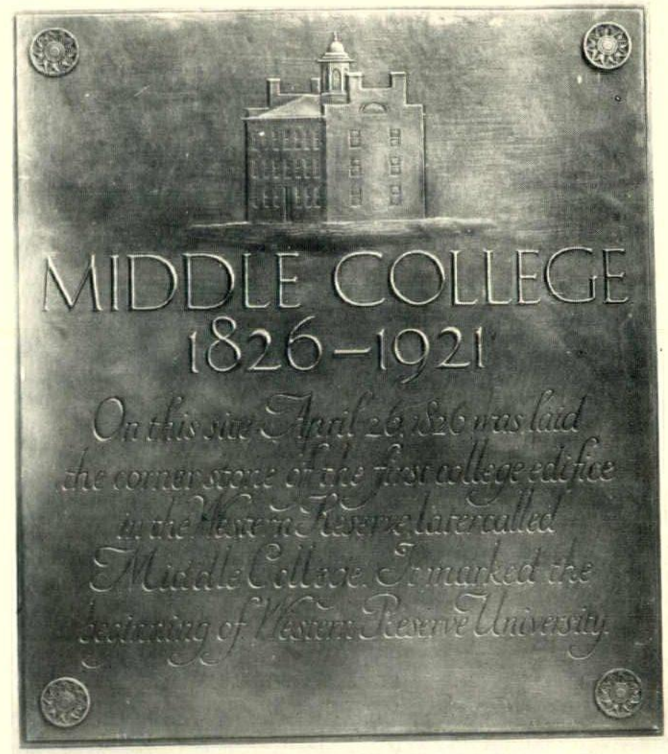
Wren Chapel, College of William and Mary, Williamsburg, Va.
Perry, Shaw & Hepburn



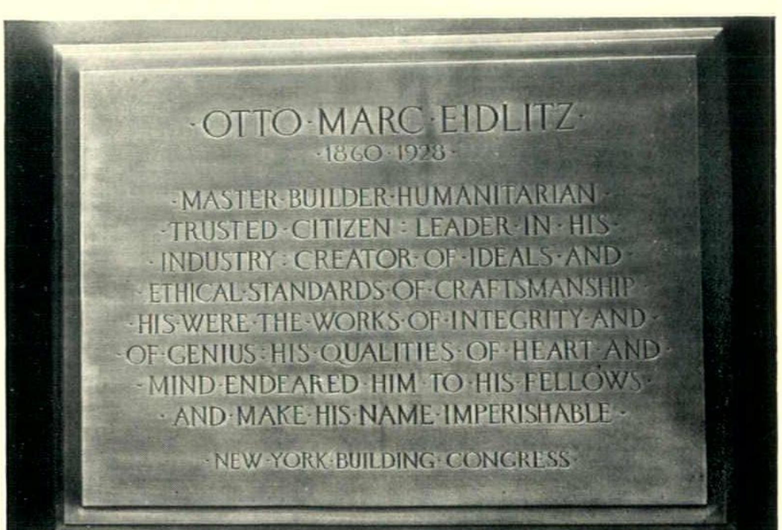
Wren Chapel, College of William and Mary, Williamsburg, Va.
Perry, Shaw & Hepburn



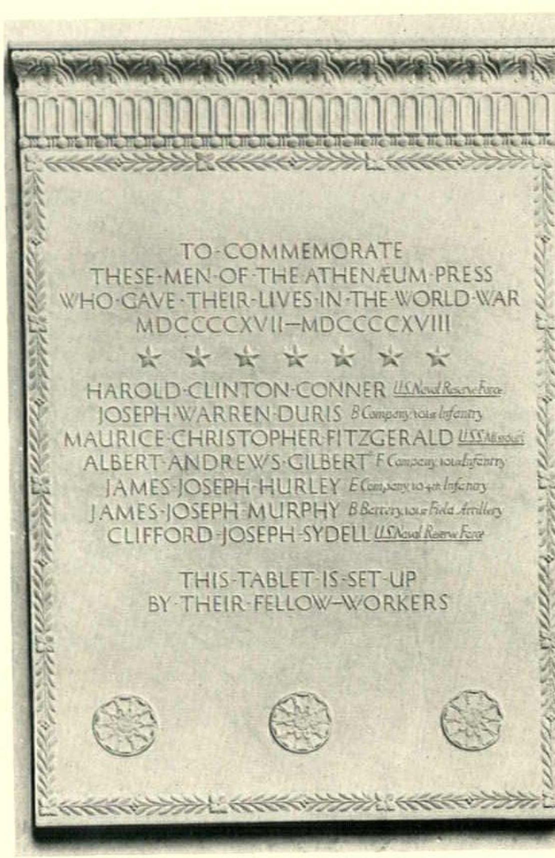
The Brick Presbyterian Church
New York, N. Y.



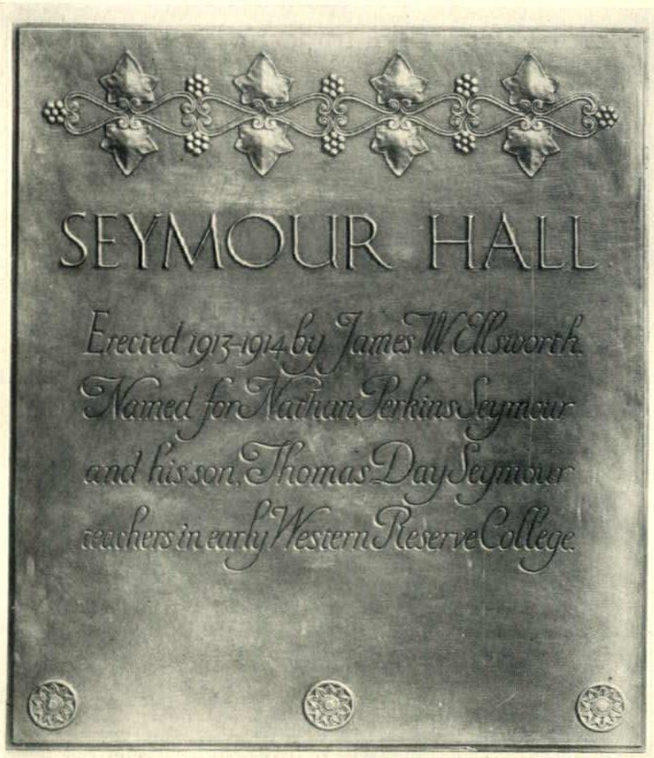
Western Reserve University, Cleveland, O.
T. B. Hapgood



General Bronze Corporation

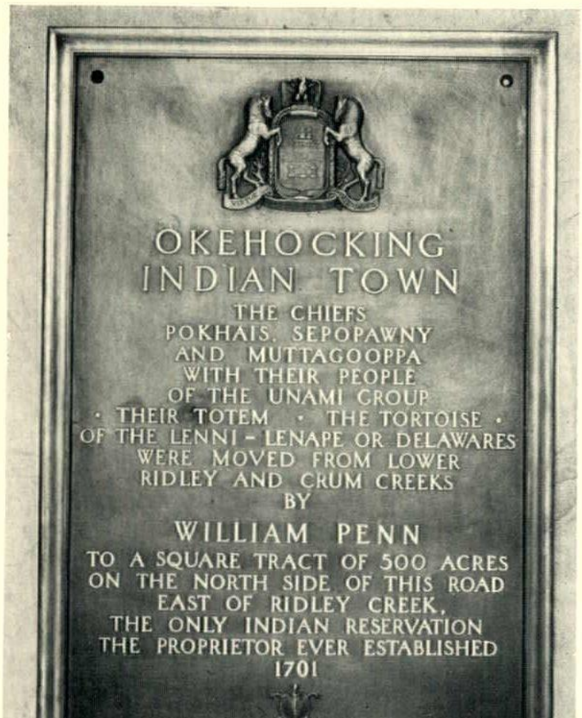


Plaster model
T. B. Hapgood



Western Reserve University, Cleveland, O.
T. B. Hapgood

Chapel of All Saints, Trinity Church, New York, N. Y.
Thomas Nash



Bronze countersunk in marble
Paul P. Cret

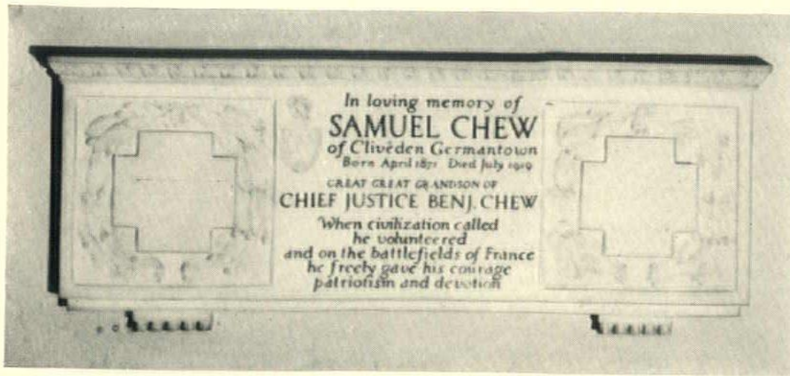
General Bronze Corporation

The Gorham Company

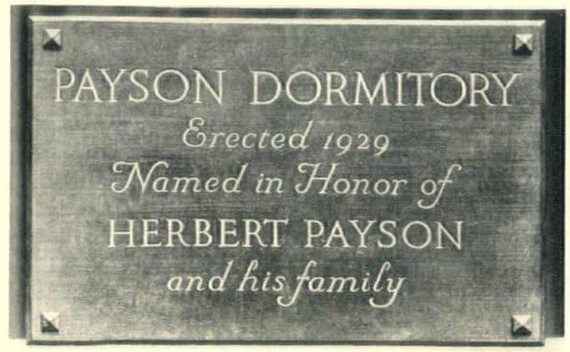
Christ Church, Andover, Mass.
Frank Chouteau Brown

Church of the Ascension
New York, N. Y.

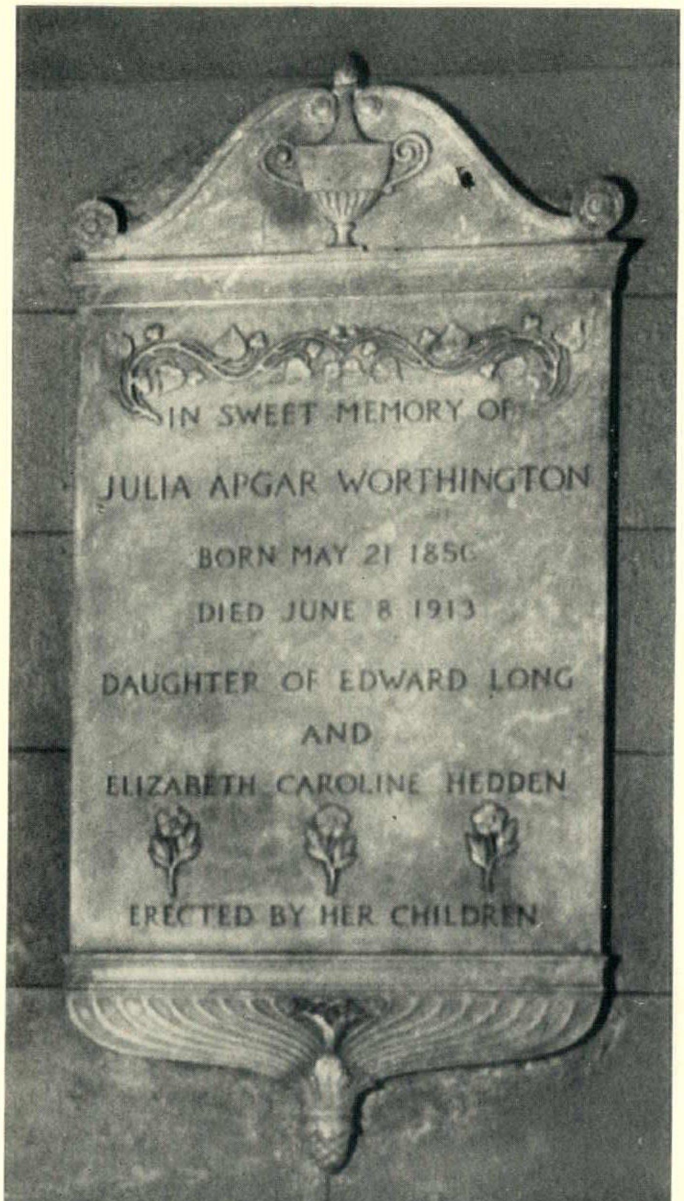
Church of the Ascension, New York, N. Y.
McKim, Mead & White



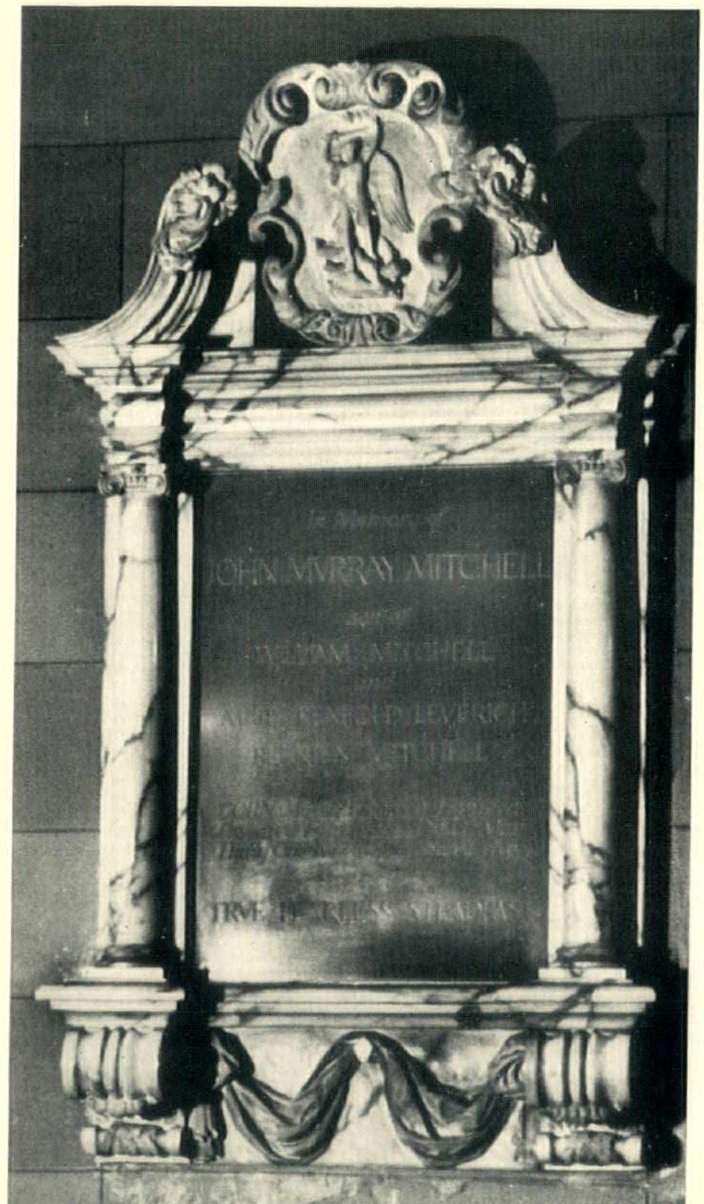
Black lettering on white marble
St. Peter's Church, Philadelphia, Pa.



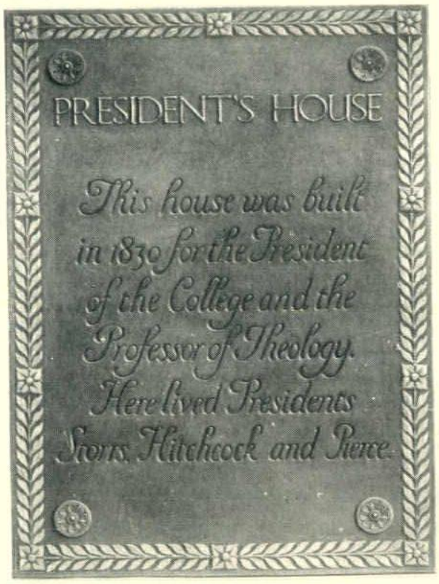
The Gorham Company



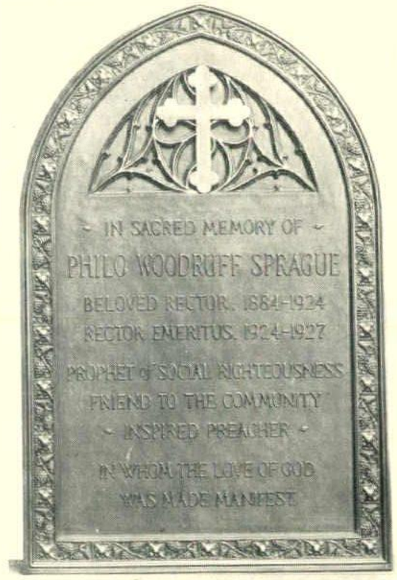
Church of the Ascension
New York, N. Y.



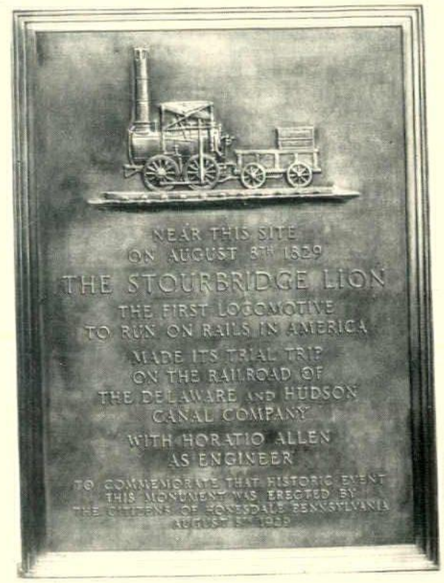
Church of the Ascension, New York, N. Y.
Percy Griffin



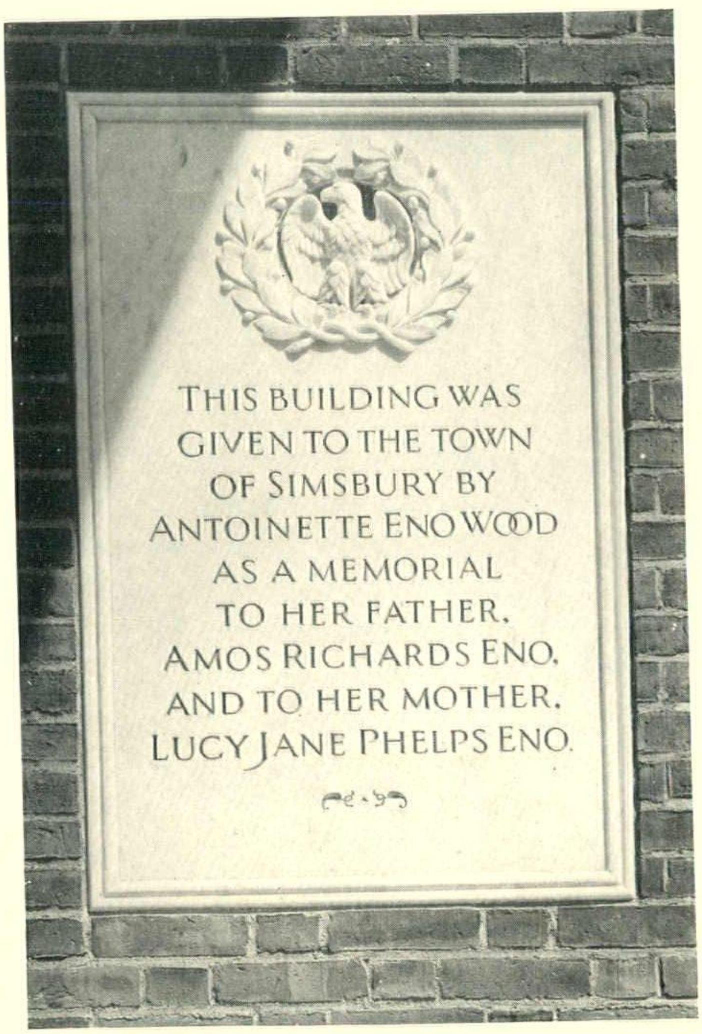
Western Reserve University, Cleveland, O.
T. B. Hapgood



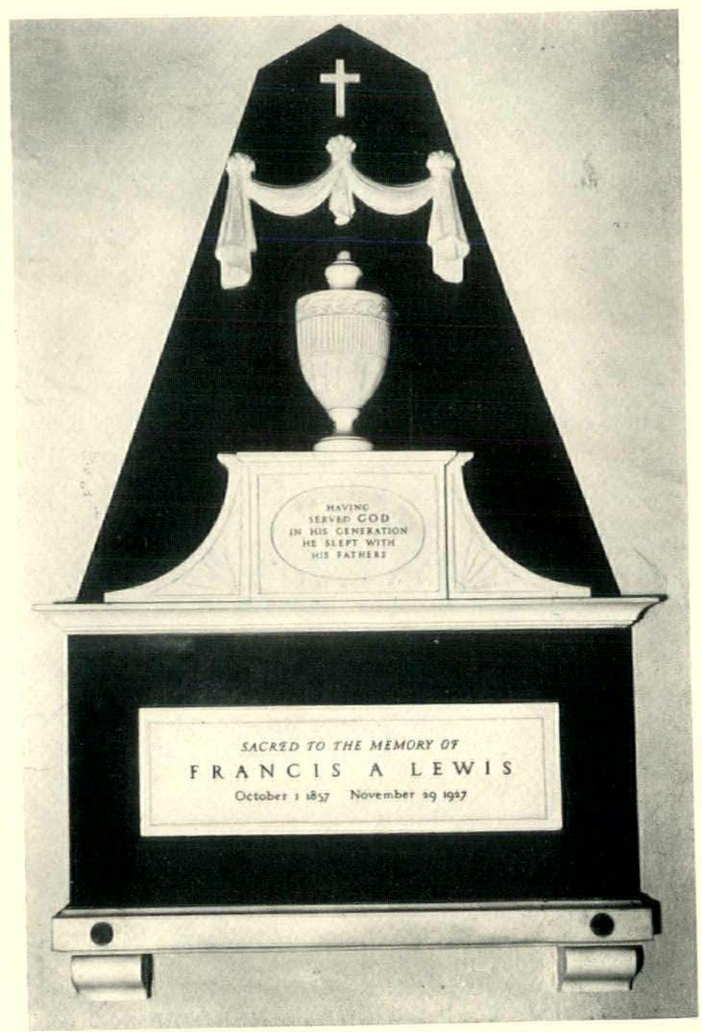
Charles J. Walsh



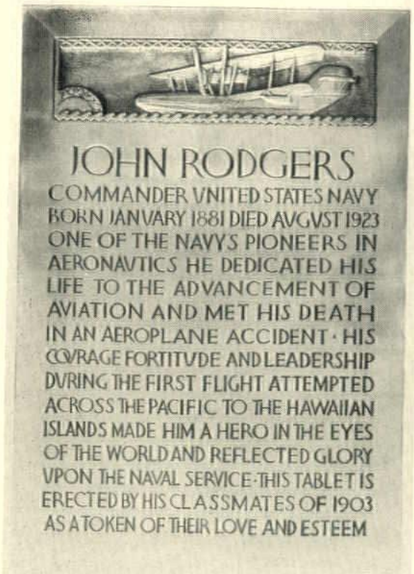
The Gorham Company



Marble countersunk in brick
Smith & Bassett



White marble against slate
St. Peter's Church, Philadelphia, Pa.

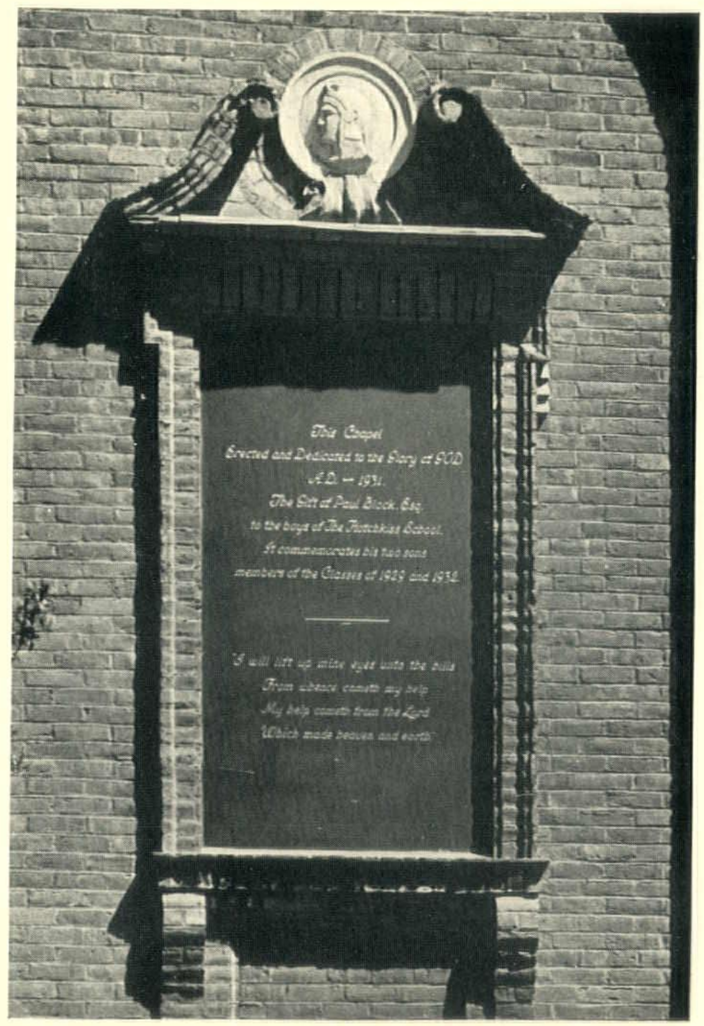


General Bronze Corporation

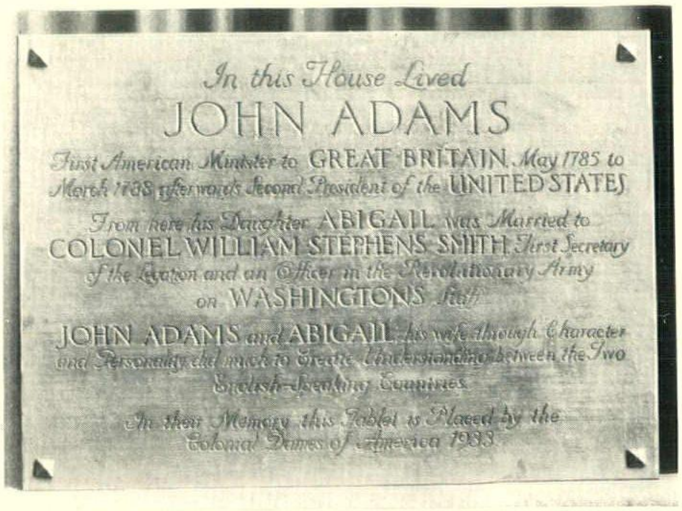
Marble countersunk in ledge stone
Charles S. Keefe

Robert Aitken

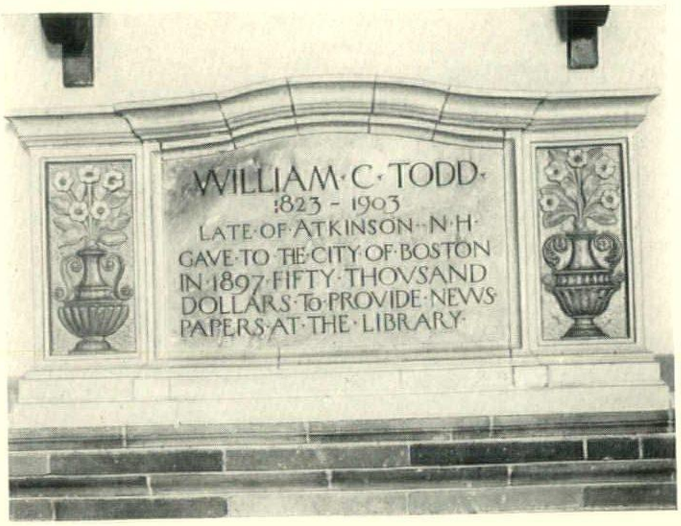
Black, red and white marble
Christ Church, Philadelphia, Pa.



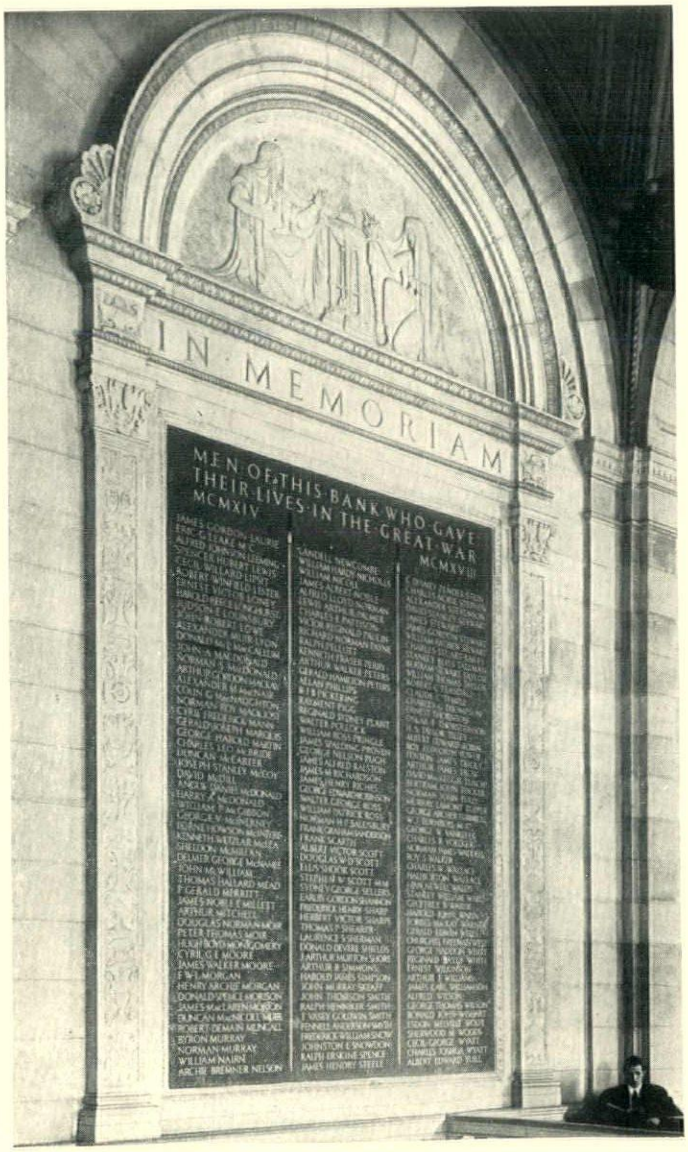
Chapel, Hotchkiss School, Lakeville, Conn.
Delano & Aldrich



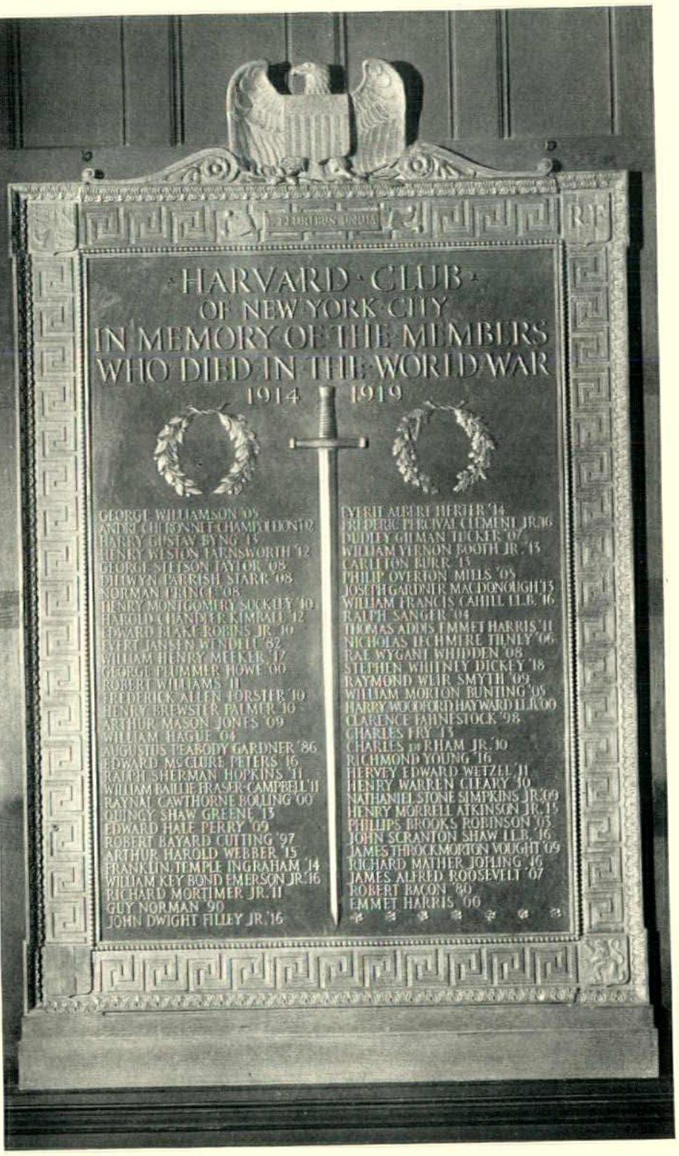
The Gorham Company



Frank Chouteau Brown



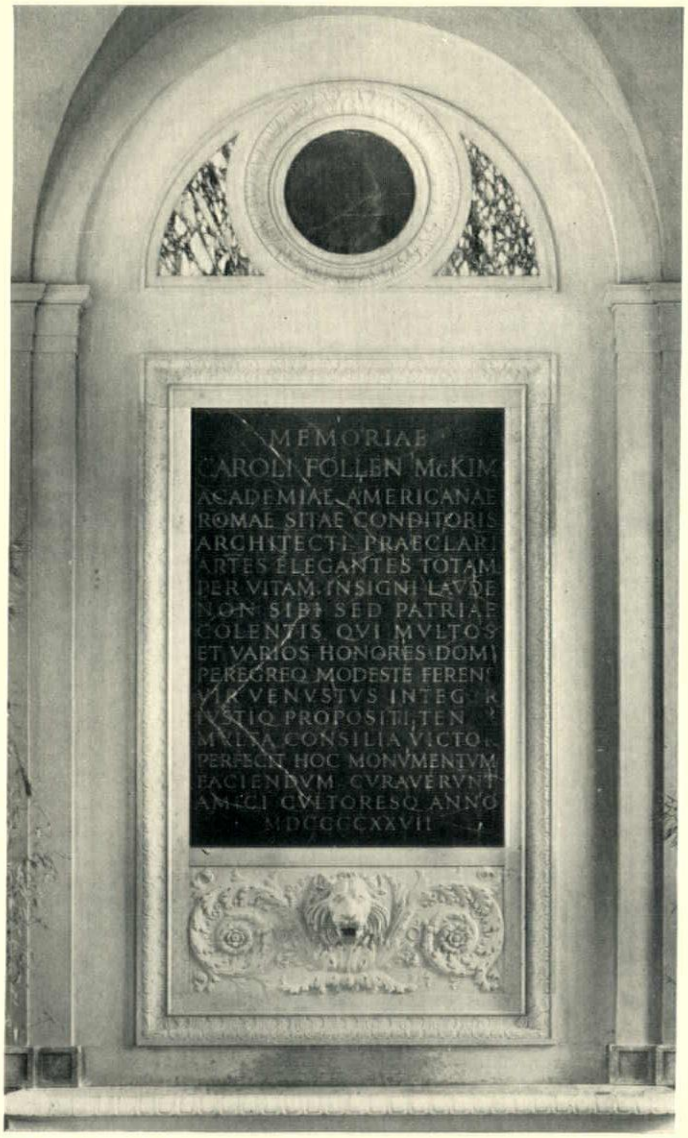
Royal Bank of Canada, Montreal, Canada
York & Sawyer; S. G. Davenport



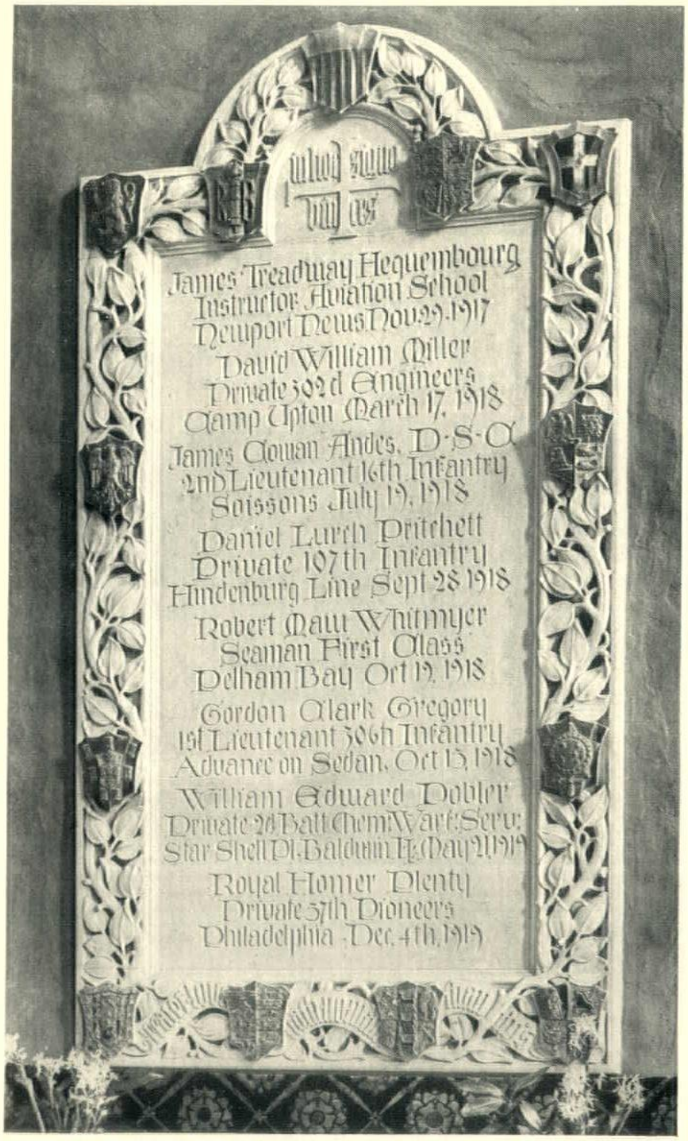
McKim, Mead & White

Julio Kilenyi

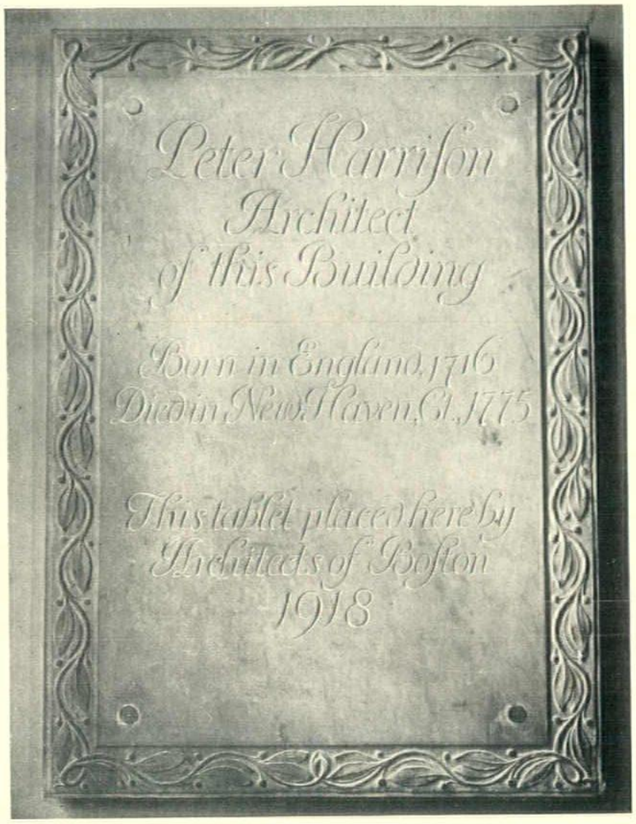
Bronze on ledge stone
Walter B. Chambers



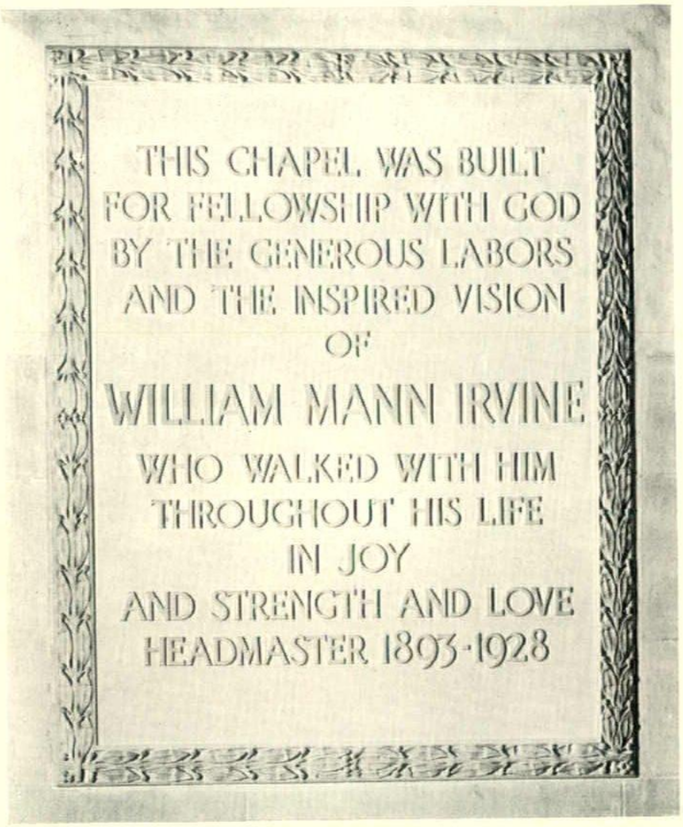
American Academy in Rome
McKim, Mead & White



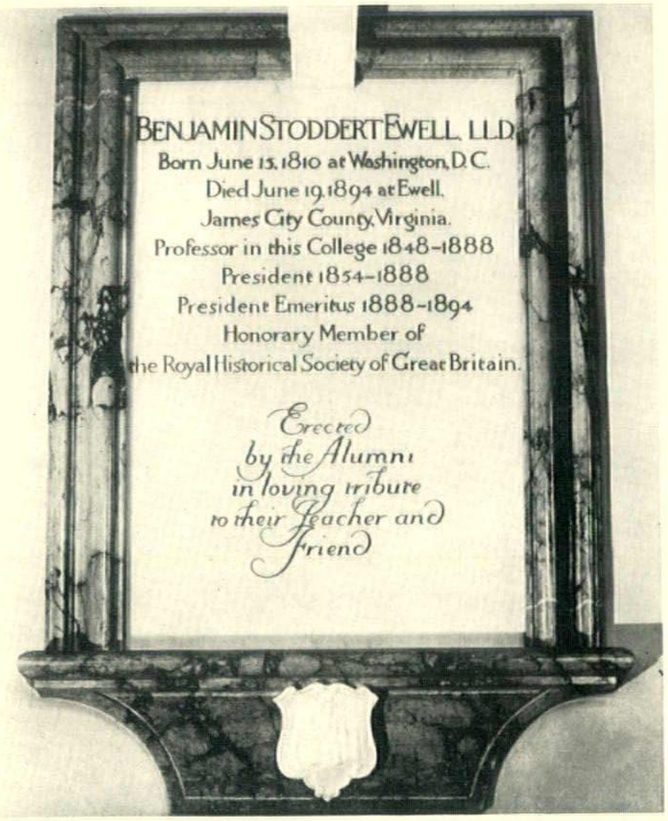
Chapel of the Intercession, New York, N. Y.
Mayers, Murray & Phillip



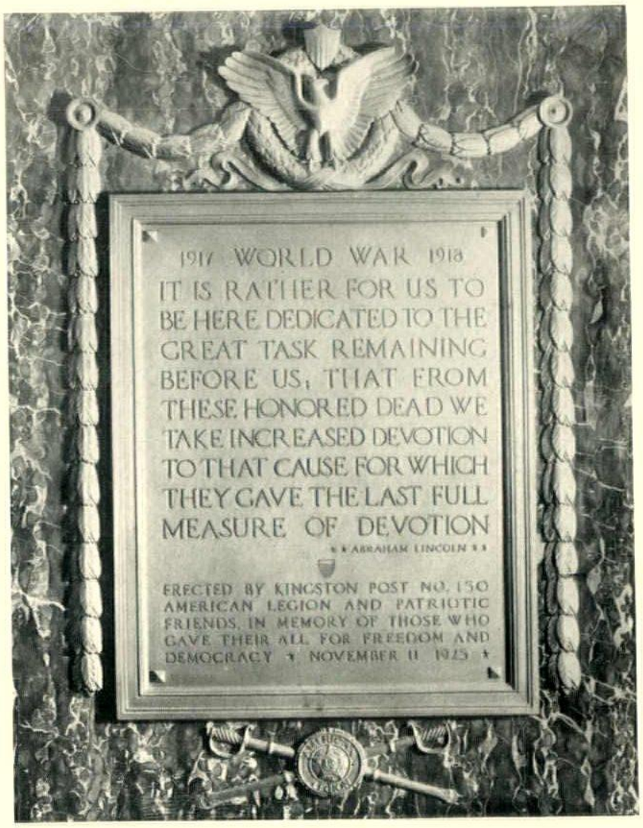
Kings Chapel, Boston, Mass.
T. B. Hapgood



Mercersburg Academy, Mercersburg, Pa.
Cram & Ferguson



Wren Chapel, College of William and Mary, Williamsburg, Va.
Perry, Shaw & Hepburn



Bronze on black and gold marble
Charles S. Keefe

The cartoon of D. W. Powers, Rochester tycoon, that cost Claude Bragdon his job

PHOTO BY MARY DALE CLARK

Warner Building, damper to any draftsman's dreams, by Bragdon's first boss

SALVAGED FROM TIME

Extracts from the Autobiography of

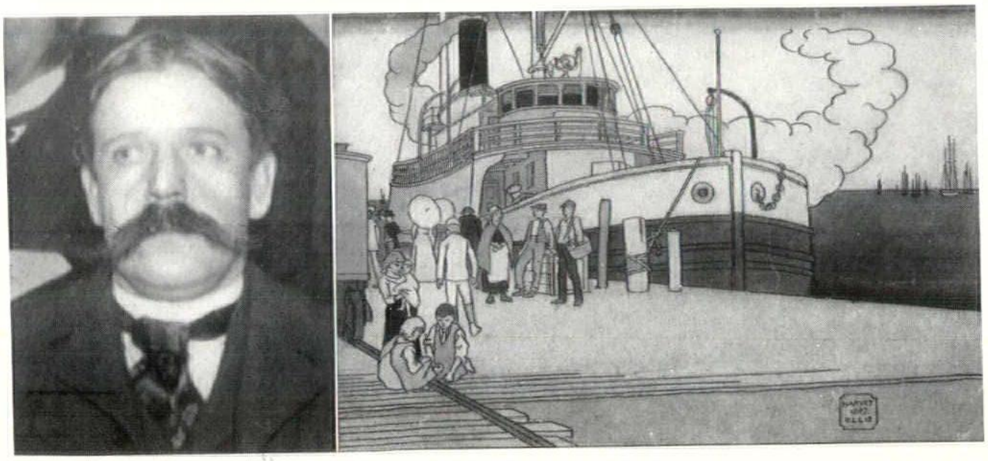
CLAUDE BRAGDON

MY architectural apprenticeship began at the age of sixteen, in Oswego, New York. Here there was only one architect. His name was A. J. Hopkins, a sandy-haired, watery-eyed man, with a somewhat swollen sense of his own importance. Clients were scarce, and he eked out his meagre income by doing odd jobs of various sorts involving mechanical draftsmanship, the most remunerative being those maps of places, plans of houses, et cetera—"Exhibits A, B, and C"—used in court proceedings to inform the jury of the physical aspects of the matter in hand. He got well paid for this work, and it was important to have his diagrams look worth the money; therefore he adorned them with elaborate titles of fancy lettering, done in colored inks. This was tedious and difficult work of a sort at which he was not proficient, so when he happened to see an example of my skill he hired me to work for him after school hours. My first job was lettering the plan of a farm kitchen in which a horrible murder had been committed, designating every bloodstain, and the stick of wood with matted hair on it, found underneath the stove.

Such was the rather ominous beginning of my career as draftsman and architect; but if it were a warning I did not heed it, and as an omen of evil fortune the prediction signally failed to come true.

In 1886 my parents moved to Rochester, New York, and there I entered the architectural office of L. P. Rogers as an apprentice at a salary of nothing a year. He was a great goat-like man with grandiose ideas. These found their architectural expression in façades of red pressed brick and gray cast iron in which the classic orders, handled without respect and without mercy, were arrayed against one another. The Warner Building, on North St. Paul Street, which housed the business of the then famous Warner's Safe Cure, was the supreme example of his art. Since the windows of his office, in an old stone house a little farther up the street, commanded a fine view of this edifice, its image still remains extraordinarily clear.

There were two others in the office with me, one an apprentice like myself and the other a paid draftsman. Business was bad and Rogers made his appearance only occasionally, being immersed in other affairs of a mysterious nature. Thus, left largely to our own devices, we loafed, read, played cards, and looked out of the window, particularly on gusty days when the cross-winds played havoc with the women's skirts. Like most young men we were more or less lascivious-minded, but I



Harvey Ellis, one of the master draftsmen of the Nineties, and a characteristic representation of his work in pen-and-ink outline with superimposed color somewhat in the Japanese manner

was still an innocent, of Puritan upbringing, and could neither accustom my tongue to obscene talk nor reconcile my ears to the sound of it.

I cannot count the year spent in this office as anything but wasted: I learned nothing of value in my profession, and a great deal of no value regarding matters with which I had no concern. It ended in my feeling a dislike for architects, as represented by Rogers, and a distaste for architecture as represented by the Warner Building. I wanted to be in the stream of life instead of in this slack backwater; I wanted to make money, and to "Leave my stamp upon the age."

I was ready for a change of some sort, and after an interval of waiting the opportunity came. I was offered a job as a cartoonist on a projected local comic paper at a salary of fifteen dollars a week. Confident of making good and dazzled at the prospect, I accepted, the understanding being that I was to contribute one major cartoon a week. I succeeded so well that I worked myself out of a job in short order. It happened in the following way:

At that time Rochester's most prominent citizen was D. W. Powers, owner of Powers Block, the mansard of which housed the celebrated Powers Art Gallery, where for an admittance fee of twenty-five cents one could view many bad and mediocre pictures along with a few good ones. But Mr. Powers' pride in his collection was immense. The third cartoon I made for *Jury* was directed at the quality of his connoisseurship. It so happened that the Great Atlantic and Pacific Tea Company was giving away a colored lithograph with every purchase, and I represented Mr. Powers coming out of the store door with a pound of tea in one hand and under his arm a picture. "Now I'm Grandmamma," of a little girl putting on a pair of spectacles. Underneath the cartoon was the legend: "Mr. P——rs' latest acquisition."

When this made its appearance Powers was furious and threatened reprisals. To placate him I was discharged. This taught me the truth of what the Autocrat of the Breakfast Table said, that one should never be as funny as one can. It disgusted me with my new profession even more than I had been disgusted with my old one, so I accepted a position with Putnam and Block, architects, at a salary of five dollars a week.

I had not been working for them long when I was offered double this amount and the position of head-draftsman in the office of Charles Ellis. Though I knew that I was deficient in experience the opportunity seemed too good to let pass, so I accepted, but with an inward fear that I would be betrayed by my own incompetence. I soon found, however, that my new employer was as incompetent as I. His talent lay in getting commissions, and as soon as he had landed one he would turn it over to his draftsman to execute while he went out to capture another. Having just landed a big factory for the Stein-Bloch Company, he now expected me to carry the building through. I realized that my whole future might depend upon my success in this, and resolved not to fail at any cost. I was a sufficiently good planner and designer, but was deficient in knowledge of construction. Fortunately, one of the contractors chosen to do the work, a skilled engineer, seeing the plight I was in, solved all my structural problems for me. As a result I came triumphantly through this ordeal. My assiduity won me not only the confidence, but the friendship of Nathan Stein, the Company's head and founder, so that when I went into practice on my own account he was one of my first clients.

I have often noted that when one earnestly desires to do a thing which seems beyond his power to achieve unaided, help is forthcoming. As it was with my first important building, so it was also with my first theatrical production. I knew nothing of the technique of costuming, lighting, scene building and scene painting, but at every crisis where I needed help, I got it. Something in my atitude of mind seemed to attract just the right person to me. When faith is reënforced by faithfulness, prayers are answered.

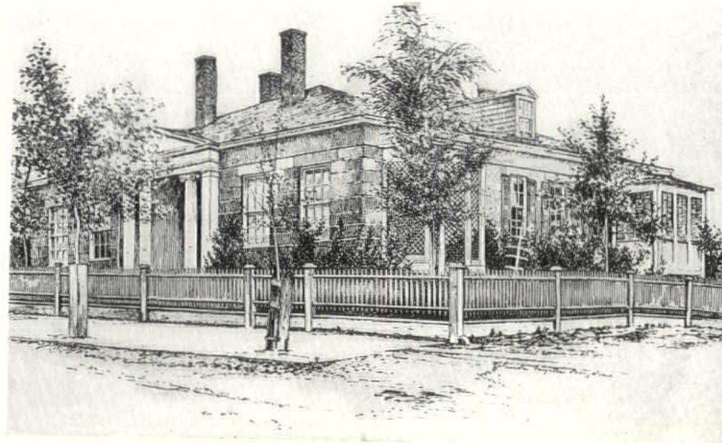
At about this time I suffered a disappointment in love. I sought and found relief from my unhappiness in work. But the daily routine failed to satisfy me; I needed new and more imaginative outlets. In those days if one wanted to become an architect he studied at the *Ecole des Beaux Arts* in Paris—provided he could afford it—or he went into some architect's office and learned his profession there. The man I worked for could teach me nothing, but there was a third educational alternative. The Architectural League of New York and the T-Square Club of Chicago held annual competition open to all draftsmen; the architectural magazines often held contests of a similar sort, and in the larger cities there were architectural associations the purpose of which was educational as well as social. Such was the Rochester Architectural Sketch Club, which I helped to organize. I entered into these activities with gusto, and spent most of my free time working on imaginary *projects* in friendly rivalry with clever draftsmen everywhere. Whatever skill I may have as a designer I attribute largely to this training. I won the President's Medal of the Architectural League on three separate occasions, and my success in one of these competitions brought me good fortune of another sort, as I shall tell. But first I must speak of Harvey Ellis, the personal influence most potent at this period of my life.

This began before I ever saw him, for he was the brother, and had been the partner, of Charles Ellis, for whom I worked. The office was full of Harvey's drawings, which moved me to admiration, emulation and despair, because he was one of the finest pen-and-ink artists this country has produced. Having heard that Lafe Heidell had a "nude" in his barroom, done by Harvey in discharge of a debt, I paid the place a visit, and found that he was no less accomplished as a painter. The picture represented two white-bodied nymphs stretched out on the sea beach, one of them engaged in tracing with a pointed shell on the wet sand "A Letter to Neptune." It was charming! I heard so many tales about the man as artist, wit, raconteur, barroom idol and man-about-town that I longed to meet him.

This desire was at last gratified, and we became friends. After a brilliant career as architectural designer in Chicago, St. Louis, and Minneapolis offices, Harvey returned to Rochester—not triumphantly, but "like a spent swimmer, crept desperately ashore." As in the case of so many men of similar talents and temperament, drink had been his undoing. He had given it up but it had done its work and left its mark. Notwithstanding this, he could be funny about it on occasion: I complimented him on how well he was looking, and he answered: "Yes, but you forget that I was preserved in alcohol for twenty years!"

Harvey was slightly under medium height but of erect and soldierly carriage—for he had been educated at West Point. His clear, thoughtful, gray-blue eyes looked out from underneath a delicate, high, white forehead; a drooping moustache concealed a sensuous mouth set in a somewhat heavy jaw. Thus his dual nature, the embodied intelligence and the amiable epicurean touched with animalism, found expression in his face. His hands were small and exquisitely shaped, the forefinger of the right hand stained yellow by cigarettes, and the thumb phalange too short for one who would leave his stamp upon his age. He was at all times very much the gentleman; there was a certain quiet dignity about him, and I think it never was more present than in the crowded public ward of that Syracuse hospital where I took final leave of him.

Harvey seldom sold a picture, because if anyone expressed a liking for one of them he was so pleased that he made that person a present of it. Toward the end of his stay in Rochester he lived for the most part on the bounty of his friends, of whom he had many. When Gustav Stickney of Syracuse, the furniture maker, and publisher of *The Craftsman*, offered Harvey a job in that city, he made a final clean-up by representing to every one of his friends that he had not enough money to take him there. In an uncongenial environment, and bound to routine tasks far below his talent, he took to drinking again, and became ill in consequence. Though his friends rallied to his aid at the very end, the attending circumstances of his death were sordid and distressing.




Bruce Price, from painting by Harper Pennington, and Bragdon's pen drawing of the Southern mansion in which Price was born—a drawing made for Scribner's with the guidance of a faded photograph

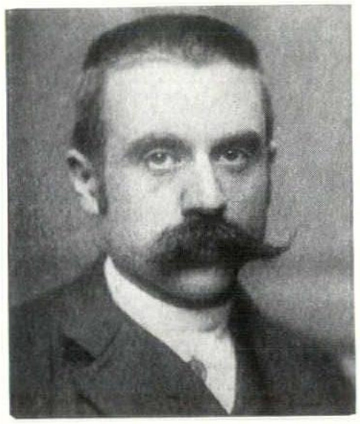
My formal education was of the scantiest, but I have had the inestimable privilege of being inspired and instructed in the arts I practised by two great masters of them: Harvey Ellis and Louis Sullivan. Both paid the penalty of being ahead of the time they lived in; both sought the false solace of drink, died poor, and were more or less neglected. Although Ellis left less to justify his title to greatness than did Sullivan, he exercised an influence in his own chosen field not less potent: The strong-nerved young draftsmen of the Middle West used to nick the edges of their T-squares in the effort to reproduce Harvey's crinkled pen line—the product, did they but know it, of nerves unstrung. Artists of greater eminence pored over his water-colors trying to discover by what means he imparted to them the depth and richness of a Persian rug. He was one of the pioneers in that so-called "charcoal school" of water-color painters who, following the method of the Japanese print-makers, develop their design in bold outline, then establish their *notan*—values in dark and light—superimposing their color upon that.

Many are the things which Harvey Ellis taught me: that a picture, like a growing plant, should look finished at any stage of its progress; that hiding behind every color is its complementary, like a child behind its mother's skirts, and can be made to show itself; that symmetry is death, but balance—livingness; that "chairs were made for people to sit in," and that "one should go sketching with his hands in his pockets."

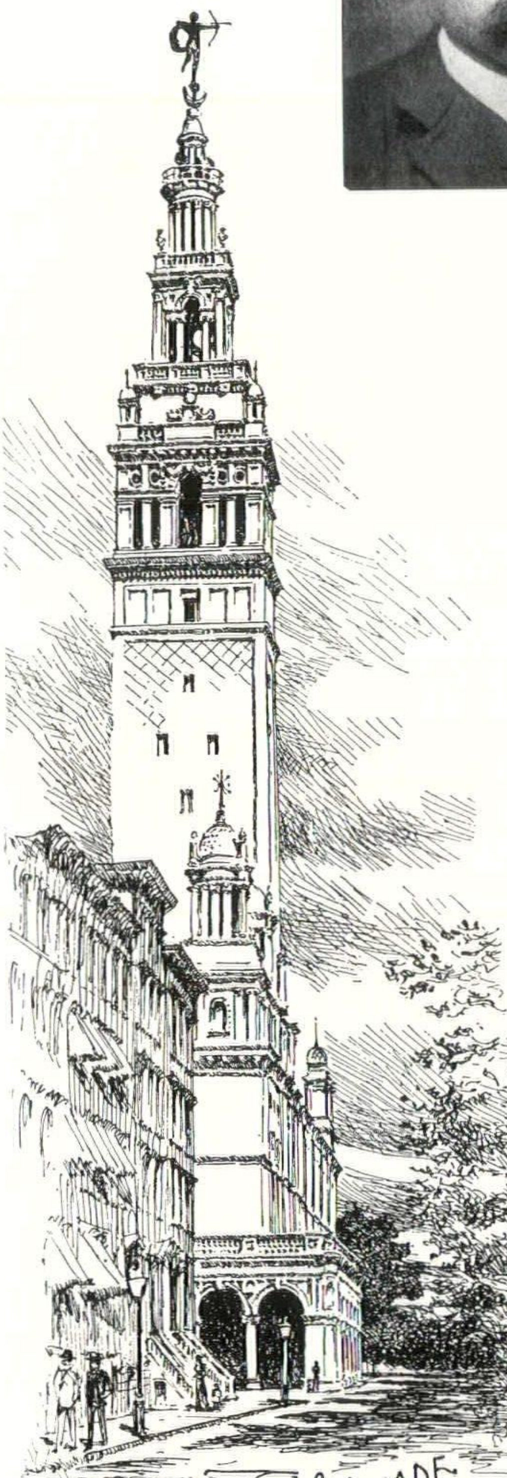
After Charles Ellis had failed to pay me my salary for several weeks on end, I left his employ and began to cast about elsewhere. I was by then an excellent pen-and-ink renderer of architectural subjects, and it occurred to me that I might use this talent in the field of magazine illustration. I was encouraged in this belief by my friend Henry Milford Steele, at that time assistant art editor of *Scribner's Magazine*. Accordingly, with all the money I had in the world, which was thirty dollars, I went to New York to seek my fortune.

On my arrival in New York I took a little inside room at the Grand Union Hotel, opposite the New York Central Station, and lost no time in calling upon Steele, who introduced me to his chief. This gentleman, whose name I fail to remember, was affable but vague. He said that sometime he might have something for me, and asked to see an example of my work in pen and ink. Incredible as it may seem, I had nothing to show him, but I promised to bring him what he asked for on the following day. So I bought a sheet of bristolboard and a bottle of black ink, retired to my cubicle and set to work. My only source of light was a flickering gas jet, my drawing-board was the marble top of a cold steam radiator; I had to work in an overcoat to keep from freezing, and my fingers were so stiff that they could scarcely hold the pen. Nevertheless I achieved a fairly good pen-and-ink rendering of a photograph; at any rate it satisfied the editor, for he assured me that he would send for me as soon as he had need of the kind of thing I could do best.

This was not failure, but neither was it success. I saw that I must get some



Stanford White, idol of New York's end of the century draftsmen and his famous Tower of Madison Square Garden —from a drawing made later by Mr. Bragdon



kind of work if I were to remain in New York. Architectural draftsmanship was my only marketable talent, so I spent the following few days going from office to office in search of a job. Sometimes I was received politely, sometimes rudely, but always with the negative answer and hastily turned back. For the first time in my life I encountered the Great Indifference, and experienced its icy chill.

To make my money last longer I went hungry much of the time, and I allowed myself no pleasures other than that of hovering over one of the great coal fires in the hotel lobby and watching the people come and go. By Saturday morning I had only enough money left to keep me over the week-end and to buy a ticket back to Rochester: I definitely had to face the prospect of a retreat. I started out that morning, therefore, with the realization that this was my last day of grace.

I went first to the office of Bruce Price, an architect whose work I knew and liked. I was not permitted to see him, of course—I had grown used to that—but his head draftsman appeared at the little aperture just long enough to tell me brusquely that he was not taking on any new men at that time. At that moment a tall, distinguished-looking gray-haired man whom I knew to be Price came from an inner office, and as he passed the window on his way out glanced at the card I had thrown down. At the sight of my name he stopped, eyed me sharply, and asked me if I were the man to whom The Architectural League had awarded its silver medal. Assured that such was the case, he said: "Your design was the best. I was one of the judges of that competition and would have given you the gold medal had not the others voted me down. You're just the man I'm looking for. Come in on Monday and work for me; I'll pay you twenty-five dollars a week."

I had been in Price's employ for about a month when the art editor of *Scribner's* sent for me and set me the task of making a pen-and-ink rendering from a faded photograph of a fine old southern mansion. It was just the sort of thing which I could do best and I made a good job of it. One day Price came to me with a copy of the magazine in his hand open at the page containing the reproduction of my drawing. It was one of the illustrations of an article written by him. "That's a picture of the house where I was born," he said, "It's a beautiful drawing; I wonder who made it." There was a deepening of our mutual liking when I told him that the drawing was mine.

I had taken a large rear room in a "brownstone front" on West Thirty-eighth Street, presided over by a big, red-headed Irishwoman, the wife of a Hudson River steamboat engineer. I was often lulled to sleep by the faintly-heard music from the near-by Metropolitan Opera House. My rent was four dollars and a half a week; ten dollars went to my mother, and I lived on what was left. Being fastidious about food, service, and surroundings, I went without a mid-day lunch for the sake of enjoying a good dinner at an expensive restaurant in the evening. In order to forget my hunger I used to spend the noon hour watching the construction of the Madison Square Garden, distant only a short walk from Price's office, eastward along thronged Twenty-third Street, past the white portal of the Fifth Avenue Hotel, and diagonally across the great green, friendly Square.

On these excursions I used sometimes to encounter Stanford White, identifiable by his great stature, his walrus moustache, and his upright carroty hair. The Madison Square Garden was not only the supreme expression of his architectural talent, but it was a sort of compendium of his tastes as well, embracing as it did a great arena, a theatre, a restaurant, a roof-garden and an apartment house. His tower room was the scene of that alleged seduction which led to his murder by Harry K. Thaw. This occurred on the Garden roof, amid a crowd of pleasure-seekers. From a newspaper man's point of view it was perhaps the most sensational event which ever happened in New York. How fortunate that we do not know what the future holds for us! Had White known that he was building the stage-setting for his own life's tragedy, how could he have had the courage to carry to completion what was certainly one of the most admirable buildings of modern times?

(To be continued)

INSULATION

WHAT WE KNOW AND OUGHT TO KNOW ABOUT IT

By TYLER STEWART ROGERS
Director of Technical Service

THERE is no longer any question in the minds of architects and engineers of the economic value of insulation in modern heated or air conditioned buildings. In a decade the building world has become "insulation conscious." Insulating materials, and such collateral heat-transfer-reducing devices as multiple glazing, weatherstripping and entrance infiltration barriers, have become staple products rather than specialties; they are prerequisites of sound modern construction.

No doubt this position is due largely to their economic worth. Almost any type of insulation now in commercial production and general use can pay its own way in buildings. That is, its cost will be offset largely by initial economies in the size and cost of heating and cooling equipment, and any difference that may remain will be paid off in a relatively short period of time by fuel and operating economies that result directly from the diminished heat flow. It can be truly said, in residential work at least, that no dollar invested in a building pays such handsome dividends as the dollar spent for insulation.

PRESENT KNOWLEDGE

Condensed for easy reference in the accompanying three TIME-SAVER STANDARDS sheets are all facts essential to the architect or engineer for determining the influence of insulation, weatherstripping, multiple glazing and entrance door types on the heat loss or gain of any building structure, excepting only the influence of solar heat.

The first sheet "How to Find Heat Transmission of Building Sections" gives standard rules and data for calculating the overall coefficient of transmission of any combination of building materials.

The second, entitled "Heat Transmission through Building Sections with Per Cent of Heat Transfer Stopped by Insulation" presents a comparative study of the effect produced by different quantities and different types of insulation when employed as indicated in ten representative wall, floor, ceiling and roof sections. This sheet is primarily a guide to the selection of materials by type and quantity, for it gives both the coefficient of heat transmission and the per cent of heat transfer stopped by the selected insulation. Obviously ten sections are insufficient in number to meet all practical needs; but the relative value of lesser or greater quantities of any given insulation or the relative effectiveness of different types may be seen at a glance, so that attention can be turned to such other vital matters as cost, ease of installation, durability and performance of the kinds tentatively chosen.

The third sheet, "Heat Transmission and Infiltration through Doors, Windows and Glass Masonry" covers the collateral subjects of multiple glazing, weatherstripping and entrance infltration. New information, never before presented to the architectural profession, appears here. A tentative value is given for the transmission of hollow glass masonry units; tentative because of wide variations in test data and lack of a sufficient number of tests to confirm the average value shown. Tables showing entrance infiltration under summer and winter conditions through entrances fitted with swinging doors, vestibules and revolving doors, offer much needed new data. See the following article by the author of these tables, Arthur M. Simpson, for a clear and instructive explanation of their significance.

Except where otherwise noted, all of the basic reference data in these TIME-SAVER STANDARDS are derived from the American Society of Heating & Ventilating Engineers Guide, 1936. This is recognized as the primary source of engineering data used generally by heating, ventilating and air conditioning engineers and equipment manufacturers. Purposely conservative, and for this very reason often subject to controversy over the admission of new data, the Guide figures have generally proved satisfactory in field practice and may, therefore, be used with confidence.

KNOWLEDGE NEEDED

It is, nevertheless, true that what is known today about insulation, and particularly about insulation technique in field practice, is inadequate and must rapidly be expanded. Some of the things now subject to research, or about to be given extended study, are worth reviewing in order to see, in advance perspective, what improvements may be anticipated.

There are only four basic types of insulation, rigid, semi-rigid or blanket and fill types of what may be termed mass insulations and reflective types. In each category, however, there are from a half dozen to a half hundred different kinds of manufactured products, each made by from one to several hundred different companies. It is said there are well over two hundred producers of rock wool or its equivalent. Inevitably there is a certain amount of confusion in the minds of buyers between the merits of these different types and brands in consequence of the keen competition between so many interests for each insulation dollar.

What architects need, obviously, is more knowledge than now exists as to the proper choice between types (if not brands) for any given condition encountered in building practice. It must be clear that not all materials are equally suited to all conditions, cost included. No one material can properly claim universality in use or even a predominance of advantages under average conditions. Each one has its merits and its limitations. The industry is too young, perhaps, to have learned that architects place greater faith in a material when they know its limitations than they do in any product for which only advantages are presented. So for the present at least, the profession must rely upon its own best judgment until the accumulation of experience tends to settle each type of insulation into its proper place in the building picture.

We need, too, more precise knowledge about installation technique. It has already become obvious that honest craftsmanship is as essential to satisfactory performance as inherent quality of material. Practically all reputable manufacturers have formulated standards of good practice in the use of their materials, but only a few of them have done enough to disseminate this information broadly among architects and contractors alike. Some extremely unsound practices have developed among low-grade speculative builders and contractors, particularly in the improper use of fill and rigid insulations or in substituting less thicknesses than the amounts claimed, and in the misplacement of reflective materials. These abuses, deliberate or made through ignorance, are cheating the public. Architects can do much to establish proper techniques, first by demanding of manufacturers adequate installation instructions under all conditions encountered in use, and second by insisting that these practices be followed faithfully through proper specifications and rigid supervision.

It is time for us to gain more knowledge about the final behavior of building insulation materials after installation. Up to the present, most of our knowledge of transmission values has been derived from laboratory tests that bear no relation to field conditions.

All insulation materials are rated on their transmission as determined by "hot box" or "hot plate" tests on bone dry samples about one foot square. The very nature of the test eliminates variables due to moisture content. Yet we know that materials used in construction are constantly exposed to air-borne moisture, and cannot remain bone dry in use. These tests also fail to recognize the effect of wood or metal or masonry framing members which may extend from the cold side to the warm side of the building section. Wood has low conduction, metals and masonry have high conduction. It is ridiculous to believe that the overall transmission of a wood framed wall is identical with that of one using steel to separate and support the inner and outer surfaces. There must also be some difference in performance between materials placed over the framing members and those placed in between.

While these considerations are utterly neglected in present methods of rating insulations, it is impossible to say how much significance would attach to more precise knowledge. For the present, it is comforting to realize that calculated heat losses or gains work out quite closely in actual practice. Hence our empirical knowledge is at least keeping us out of trouble. But with the steady advancement in building arts, and the need for facts that may lead to further economies in construction, it seems very important to have a careful check between laboratory values and those encountered in building service.

Architects ought to know how much insulation is enough. Ordinary wood stud construction with wood sheathing and siding on the exterior and metal lath and plaster within transmits .26 Btu per hour per degree F difference in temperature. For many years, until fuel costs mounted and operating costs became subject to scrutiny, this construction proved quite satisfactory. Then we learned that insulation would reduce heating costs sufficiently to pay for the added materials, and dividends would be earned in increased comfort as well as in cash. But how far should we reduce this overall transmission in different sections of the country? Would a value of .08 or .10 represent de luxe practice for severe climates? Should we say that .15 to .20 is minimum good practice? It is possible to find the answer for each specific project by a series of calculations, including transmission values, insulation costs and fuel and operating costs. But this is too tedious for most architects to undertake. Some guiding figures, developed without bias, would help materially. For the law of diminishing returns makes it possible to over insulate as well as to under insulate.

The advent of air conditioning is opening up still another field for constructive research. Technicians know that when indoor relative humidities are artificially controlled (as they should be for comfort and health) there is a theoretical dew point temperature somewhere within the exposed walls or roof at which point air-borne moisture is condensed into water. This occurs, of course, only under certain climatic conditions. It is also known that infiltration through some kinds of construction is very high (as much as 7.85 cubic feet per square foot per hour through an 8½" brick wall exposed to a wind velocity of 15 mph) but that it is reduced to negligible quantities by plastering or by the use of a stout building paper. It is further known that vapor pressures tend to move this internal moisture toward the cold side of the wall.

These facts set up a number of speculations that cannot be answered without further research. It seems important to know how much air-borne moisture permeates building sections of different types. For if any type admits large quantities, sufficient dampness might collect to cause damage to the structure or temporarily to impair the value of the insulation. This question might arise with some of the newer experimental assemblies, such as are being tried in prefabricated and "dry" constructions. It would appear also that plaster, building paper or any other impervious curtain on the warm side might be a sufficient barrier to prevent any measurable accumulation of dampness.

Many of these questions are purely academic today. Nevertheless leading manufacturers and such organizations as the American Society of Heating & Ventilating Engineers are awake to the importance of greater knowledge. Much research is being undertaken, more is planned for 1937. Problems relating to the heat capacity of materials (that contributes to "lag" in cooling calculations) and to solar heat on buildings and glass are included. Progress is being made.

It may confidently be expected that this new phase of building science will soon become as well established and as familiar as carpentry, masonry and steel work. Standardized practices are the objective. AMERICAN ARCHITECT AND ARCHITECTURE, having placed present knowledge of insulation practice before the profession in the accompanying article and TIME-SAVER STANDARDS, will report further advances as they reach the stage of practical application.

EW DATA ON ENTRANCE DOOR NFILTRATION WITH AIR CONDITIONING

BY ARTHUR M. SIMPSON*

ENTRANCE doors in buildings—particularly those in stores and commercial structures where traffic is continuous and often very heavy—have long been the bugaboo of heating and air conditioning engineers. They admit unwanted cold air in winter and even less desirable hot air in summer, and dust and dirt all the year around. Swinging doors equipped with strong closing mechanisms, vestibules and revolving doors have all been used in efforts to control the troublesome infiltration of air through entrances. But their use has been governed largely by guesswork, for until very recently no real data have been available. Inadequate rules-of-thumb appearing in the American Society of Heating and Ventilating Engineers Guide for 1936 attest the scarcity of information in this important field.

Inspired by commercial considerations, but directed by a competent engineer's inherent desire for reliable facts, the author of the following article, in collaboration with Kenneth B. Atkinson, Technical Advisor on Air Conditioning, University Extension Division, Rutgers University, and others, made scientific field tests on 596 entrances to buildings of many sizes and types, up and down the Atlantic Seaboard and inland to Chicago. The results of these tests have been reported in scientific papers† and constitute the most accurate and comprehensive data known. They have been interpreted in this article for use by architects; the results of these tests are given in tabular form in an accompanying Time-Saver Standards sheet. The fact that the author is chief engineer of the Van Kannel Revolving Door Company and the further fact that the performance of doors working on the "air-seal" principle proves to be greatly superior to other types of entrances, has no bearing on the importance of the findings, in view of the soundness of the test procedure, using smoke puffs to reveal actual velocities of air movement.

Infiltration in summer arises from different causes than infiltration in winter. But summer cooling loads are more seriously affected by the design of entrances than winter heating. Therefore, the author presents his data in two sections; the first on summer conditions, the second, more briefly, on winter conditions. (The Editors.)

ENTRANCE INFILTRATION WITH SUMMER AIR CONDITIONING

The surest way to keep down the cost of summer air conditioning would be to lock all the doors and windows and draw necessary fresh air from a clean, cool, shady side of the building. Such air passing through the conditioning apparatus could be very easily and economically reduced to the proper temperature and humidity and it could be cleaned so that all outside dust and dirt would be excluded from the room. However, the work of the engineer and architect planning an air conditioning installation is complicated by the necessity of having doorways through which people can enter and leave the place of business. Each opening of these doors permits the passage of a large volume of air which increases the load on the air conditioning equipment.

This is not good air for ventilation; in fact, it is the worst possible air for this purpose. It has been swept over hot pavements. It is super-heated and laden with dust and dirt which are deposited on merchandise and fixtures before the air can be washed or filtered. The other air in the room has to be super-cooled to counteract the humidity and heat that this street air brings into the room. Where the doors are frequently opened in a busy entrance, this excess outside air is a useless and expensive load on the cooling equipment. Air for ventilation should enter through the apparatus in order to control it, to clean it and to assure even, undisturbed distribution throughout the entire conditioned area.

Under windy conditions entrance infiltration often exceeds all ventilation needs. If the opening of doors is depended upon for ventilation, all control is lost. In buildings with entrances facing on two or more streets and to a lesser extent in those with entrances on one street only, mere reliance on keeping the doors closed to exclude outside air fails to solve the problem, since the continual opening of the doors allows an excess flow of air. In many cities where summer wind velocities average over twelve miles per hour, the pressure differential built up across a building by the wind action produces air velocities through doorways frequently as high as five miles per hour. Particularly in buildings with entrances in two or more outside walls drafts can sweep through every time the doors are opened. Obviously, the greater the traffic and business activity, the worse the conditions thus brought about.

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† "The Infiltration Problem of Multiple Entrances," by A. M. Simpson and K. B. Atkinson, A.S.H.V.E. Journal Section, Heating, Piping and Air Conditioning, June, 1936.

* Member: American Society of Mechanical Engineers; Am. Soc. of Heating and Ventilating Engineers; Am. Soc. of Refrigeration Engineers. Chief Engineer and Sales Manager, Van Kannel Revolving Door Co.

PHOTO: WEILL & STONE

The revolving door acts as an air lock. Because it has less than 20 per cent volumetric efficiency and the door rotates on an average of only 4/10ths revolution per person, it permits less infiltration than swinging doors

RECENTLY DEVELOPED INFILTRATION DATA

Door infiltration in the summer cooling season is caused largely by wind pressure and the Weather Bureau records show that on the hottest days the wind velocity is usually above normal. Field tests show the direction of the prevailing wind to have small bearing on the actual direction of entrance infiltration under conditions of exposure in cities. Obstruction of air currents at the street level by surrounding buildings of varying heights causes the forces of wind velocity to be transformed into eddy currents and areas of varying pressures. These create entrance velocities in surprising directions. Even supposedly protected entrances may prove to be serious problems.

Such conditions, of course, are most apparent in stores or buildings having entrances in more than one outside wall. However, equally unexpected problems are common in such areas having entrances in only one outside wall. The theory that a single entrance building is in effect an air-tight shell with only the single doorway to act as a part through which all the air is exchanged is false. Most stores or shops have ventilating fans, rear windows, stairways or elevator shafts through which the air pressure can be relieved as fast as built up by winds blowing against the entrance doors. Of course, too, the flow can be reversed and a strong exfiltration take place. Examples of this condition can be found in almost any single entrance store where the wind is piling up a pressure in upper floors or on the blank side of the building.

COST OF OPEN DOORWAYS

A summary of field data taken in a large number of cities shows that infiltration and exfiltration velocities in buildings having entrances in more than one outside wall will vary normally from a maximum of 350 feet per minute to a minimum of 150 feet per minute, with a mean of 250 feet per minute. For single entrance buildings draft velocities will vary from 80 feet up to as high as 250 feet per minute. Here the mean velocity for open door operation may be considered to be 160 feet per minute.

These figures show why it is impracticable to attempt to maintain comfortable conditions in buildings where cross drafts through opposed open doorways are possible, and why it is costly to permit the doors of single entrance air conditioned buildings to stand open.

With two opposed entrances remaining open and a mean infiltration velocity of 250 feet per minute, assuming a double doorway 5'-0" wide by 7'-0", the volume of infiltration or exfiltration would amount to 8750 cubic feet per minute. With ventilation requirements for 200 persons which would be supplied through the apparatus credited to the infiltration loss, we have left a waste of 6750 cubic feet per minute of unconditioned air which would have to be cooled and dehumidified by contact and mixture with super-cooled and dehumidified air from the apparatus. Cooling from outside conditions of 90° Dry Bulb and 75° Wet Bulb to 78° Dry Bulb and 65° Wet Bulb inside, this would demand an additional cooling capacity of 19 tons. Allowing only one of

Stop watch tests of traffic in and out of swing doors show the duration of the equivalent of full door opening lasts 2.00 seconds per person. Each person passing through permits the entrance of 166 cubic feet under normal conditions

PHOTO: GENDRAU

these entrances to remain open would save a considerable amount of load but there would still be an excess infiltration loss of over 4 tons.

In view of loads of such magnitude it is obviously impracticable even to attempt efficient or effective cooling when two or more opposite or cross draft entrances are standing open. It is further apparent that leaving single entrance doors open is a costly practice.

EFFECTIVENESS OF SWING DOORS

Unfortunately, simply keeping swing doors closed is not entirely a satisfactory solution to the infiltration problem. With a normal volume of traffic the doors remain open a very large percentage of the time and at peak capacity conditions, very closely approach the situation with open doors. Tests conducted by clocking the traffic in and out of a large number of entrances and timing the duration of equivalent full door opening with a stop watch show an average of 2.00 seconds per person passing through a single set of swing doors.

As pointed out above, tests show average draft velocities of 250 feet per minute through multiple entrance buildings having entrances on two or more streets. Assuming the area of the average swing door to be 20 sq. feet the average infiltration per person through a single set of swing doors into a store having entrances facing on another street will be 2/60 minutes draft opening per person x 20 sq. ft. x 250 feet per minute = 166 cu. ft. per person.

For single entrance buildings with a draft velocity of 160 feet per minute, the corresponding cubic feet of infiltration per person would be 100.

Cooling outside air infiltrated at such a rate makes air conditioning almost prohibitively costly. Moreover, with distribution difficulties thus brought about satisfactory results are virtually impossible. For example, with a small dollar chain store averaging 600 entrance passages per hour, at 166 cubic feet per person going in and out the drafts through the multiple opposed entrances produce an infiltration of 100,000 cubic feet of outdoor air per hour. With 12° cooling under heavy wet bulb conditions this represents a cooling load of nearly 4 tons additional refrigeration capacity. Since air conditioning costs about $300.00 a ton installed, 4 additional tons capacity represents an added cost of $1200.00.

This excessive heat gain from infiltration is the reason why reputable engineers qualify temperature and humidity guarantees where there are entrances on more than one street unless the owner undertakes to keep the doors on one side permanently closed.

EFFECTIVENESS OF VESTIBULES

The time honored answer to entrance drafts, of course, has been vestibules. However, investigation of their efficacy explains the failure of vestibuled entrances to materially assist in maintaining guaranteed conditions.

Casual observation of people passing through a vestibule gives a hint of why this device fails. With modern traffic both inner and outer doors are open at the same time so frequently as to provide a duration of through draft opening for each person entering that is apparently little better than a single door.

Actual tests show that vestibule action is even less satisfactory than is apparent to an observer. Figures on a large number of entrances of this type show the time, during which at least one inner and one outer door are open, to average 1.5 seconds per person passing in and out. It is evident therefore, that in busy entrances a vestibule gives only 25% better protection than just a pair of swing doors. This means that the show window space or the floor area taken up by the vestibule is practically wasted.

RESULTS WITH REVOLVING DOORS

While the revolving door is an air lock and prevents drafts from sweeping through the entrance it is also a form of metering device and has been generally considered to force an exchange of air which would be greater in amount than the draft volume through a swing door entrance, except under most unfavorable conditions. While admitting the reduction of draft with heavy winds prevalent in the streets, especially where multiple entrances exist, would not this advantage be nullified by the fact that on calm days the very action of the door would enforce an infiltration not otherwise to be contended with?

Pursuing the investigation, however, laboratory tests showed surprising results. Measurements were taken to determine the actual amount of air displaced within the building by the rotation of a revolving door as each person entered the room. It was found that a revolving door, as a metering device, had less than 20% volumetric efficiency and that a revolving door rotated on an average of 4/10ths revolution for each person passing through. The faster the revolving door rotated or the more people passing through the revolving door per hour, the less infiltration there was for each person using the entrance. Table 4 in the accompanying Time-Saver Standards sheet "Heat Transmission and Infiltration through Doors, Windows and Glass Masonry" gives a comparison of entrance infiltration losses in various types of both occupancies and entrances.

REDUCTION OF COOLING EQUIPMENT SIZE

Considering the amount of additional entrance infiltration due to wind pressure in buildings where there are doors in two or more outside walls and the corresponding cooling load and equipment capacity required, the only possibility of guaranteeing conditions without excessive cost is to prevent excessive entrance infiltration. It seems evident from the facts developed that this can be accomplished by the use of a revolving door at one of the opposed entrances. About the only effective alternative would be to close permanently the doors at one of the opposed entrances.

In single entrance buildings the possibility of making a sharp reduction in the original cost of equipment by using doors of the air seal principle should receive the greatest attention of the designer, particularly from the standpoint of improving air distribution and cutting operating costs, sealing out hot drafts from the street should be considered. Air conditioning is too expensive and the adjustment of distribution too delicate a matter not to employ every helpful auxiliary means available.

PERFORMANCE OF ENTRANCE DOORS WITH WINTER HEATING

All of the fundamental objections to uncontrolled entrance infiltration which so seriously affect summer cooling and air conditioning apply as well to winter heating and air conditioning. But the causes of infiltration differ.

Entrance infiltration during the heating season is due to combinations of wind pressure, chimney action of tall buildings and exhaust fan ventilation. Velocities through entrance doors are roughly proportional to the height of buildings and vary with outside temperatures, thus indicating the dominant importance of chimney effect. The following table shows velocities found by tests for normal wind. They will be greatly increased by severe wind storms.

ENTRANCE INFILTRATION VELOCITIES IN TALL BUILDINGS

Height of Building Floors	Normal Entrance Infiltration Velocities Miles per Hour Outside Temp. 35°F.	Outside Temp. 0°F.
5	11.0	12.2
10	13.8	16.8
20	16.0	21.0
30	18.2	26.0
40	20.3	29.00
50	22.5	32.00
60	24.5	35.00

Note: The above velocities are based on normal wind. They will be greatly increased by severe wind storms.

Exhaust fan ventilation causes entrance infiltration in varying degree, depending, of course, on the fan capacity. Medium exhaust fan ventilation is at least equivalent to the chimney action of a 10-story building; heavy exhaust fan ventilation is equivalent to the chimney effect of a 20-story structure.

OPERATION OF DOORS IN WINTER

With a single hinged door controlled by a door check, the equivalent duration of a full door opening for each person passing through is 2 seconds. With a hinged door vestibule (4 feet to 15 feet deep) the equivalent duration of full door opening through the vestibule for each person passing through is 1.5 seconds.

A revolving door prevents through drafts but its rotation causes some displacement which is an infiltration load. This volume depends on the rate of operation and is not seriously effected by wind pressure or chimney action or variations in outside temperature.

Results of tests similar to those made for summer cooling conditions are presented in Table 3 in the accompanying Time-Saver Standards sheet "Heat Transmission and Infiltration through Doors, Windows and Glass Masonry." It should be noted that infiltration is expressed as the cubic feet of air entering per person passing through the doors, whereas in Table 4 on summer conditions the values given are cubic feet per minute per person in the room. In other words, winter infiltration is measured in terms of traffic while summer infiltration is expressed in terms of occupancy.

PHOTO: ACME

Time-Saver Standards

HEAT TRANSMISSION

No. 64—HOW TO FIND HEAT TRANSMISSION OF BUILDING SECTIONS

No. 65—HEAT TRANSMISSION THROUGH BUILDING SECTIONS WITH PER CENT OF HEAT TRANSFER STOPPED BY INSULATION

No. 66—HEAT TRANSMISSION AND INFILTRATION THROUGH DOORS, WINDOWS AND GLASS MASONRY

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 64
NOVEMBER 1936

How to Find HEAT TRANSMISSION of Building Sections

PURPOSE

The determination of heating and cooling loads in buildings is governed in large measure by the heat transmission of the enclosing walls, roofs, floors and other exposed parts of buildings. The "coefficient of thermal transmission," (designated by the symbol (U) which expresses the rate of heat transmission, is given for a number of typical building sections in the accompanying T-S.S. "Heat Transmission through Building Sections with Per Cent of Heat Transfer Stopped by Insulation." Values for other commonly employed building sections are published in the current A.S.H.V.E. Guide. When any building section differs in its assembly of component materials from those published in these or similar sources it is necessary to calculate the overall coefficient of heat transmission U. The method of making such computations and the basic data required are presented in this sheet.

THEORY UNDERLYING CALCULATIONS

The overall coefficient of heat transmission U is the amount of heat expressed in Btu transmitted in one hour per square foot of wall, floor, roof or ceiling for a difference in temperature of 1 degree F between the air on the inside and that on the outside of the wall, floor, roof or ceiling.

It has been determined that heat transfer is retarded by the following elements comprising a wall, roof or other building section, taken in order from outside air to inside air: (1) the resistance of a film of air on the outside (which is generally considered to be exposed to wind velocities averaging 15 miles per hour); (2) the resistance of each layer of building materials forming the structural section; (3) the resistance of each measurable enclosed air space formed within the building section; and (4) the resistance of the surface film of air on the inner face (which is considered to be in still air).

The overall coefficient of heat transmission U is the reciprocal of the sum of the foregoing resistances.

THICKNESS OF MATERIALS

When a material is homogeneous, such as a piece of wood or insulating board, its ability to transfer heat is measured and expressed "per inch of thickness." Its thermal conductivity (k) is the Btu transmitted per hour, per square foot, per degree F difference in temperature between the two faces, *per inch of thickness.* Its internal resistivity is the reciprocal ($1/k$) of its thermal conductivity. When calculating overall coefficients of heat transmission U of building sections it is necessary to take thickness into consideration. Example: Assume a material having a conductivity of .33 and therefore a resistivity of 1/.33 or 3.03 is to be used in a thickness of ¾ inch. In the calculation of its contribution to the resistance of the whole section it is necessary to *divide* its conductivity by ¾" (.33 ÷ .75) = .44 or to *multiply* its resistivity by ¾" (3.03 x .75) = 2.27 which is also the reciprocal of .44. It is easy to remember these relationships by the fact that a *low conductivity* (k) indicates superior insulation value while a *low resistivity* ($1/k$) indicates poor insulation value.

When a material is not homogeneous, such as a hollow building block or a composite of plaster and lath, laboratory tests are made for each thickness of material commonly used rather than per inch of thickness. The values are then stated thus: thermal conductance (C) is the Btu transmitted per hour, per square foot, per degree F difference in temperature between the two faces, *for the thickness stated* or used in construction. Internal resistance (R) is the reciprocal of thermal conductance (that is, $R = 1/C$).

If the thermal conductivity or thermal conductance of a material is known, its resistivity or resistance (as the case may be) can be found by taking the reciprocal of the known value.

REQUIRED DATA

The accompanying table gives the values for common building and insulating materials recommended for use in computing heat transmission coefficients by the A.S.H.V.E. Guide, 1936. It shows the conductivity (k) or conductance (C) and the resistivity ($1/k$) or the resistance (R). Values for a variety of proprietary products and for variations from average types of staple building materials may be found in the A.S.H.V.E. Guide, 1936, beginning on page 107. For all normal computations the data presented here should be used.

PROCEDURE

To compute the correct overall coefficient of transmission U for any wall, floor, ceiling or roof section for which the coefficient cannot be found in existing tabular data, proceed as follows:

Rule I. Find in the accompanying table the resistance (R) or the resistivity ($1/k$) of each material, exposed surface and air space in the given section. Where resistivities are given (per inch of thickness) adjust the value to the actual thickness used by multiplying the resistivity by the actual thickness in inches or decimals thereof. Take the sum of all resistances and divide into one (to obtain the reciprocal of the sum); the result is the coefficient of transmission U in Btu per square foot per hour per degree F.

Example 1: To compute the overall conductivity U of Section I in the Time-Saver Table.

Exterior surface resistance (15 mph. wind movement)	.17
Fir sheathing, building paper, Y. P. lap siding	2.00
Air space between studs	.91
Metal lath and plaster, ¾"	.23
Interior surface resistance—still air	.61
Overall Resistance	3.92

Overall coefficient of transmission U = 1/3.92 = .26 Btu per square foot per hour per degree F.

Example 2: To find the effect of using one inch of rigid insulating board in place of wood sheathing and the introduction of one inch blanket form insulation midway in the air space in the same wall:

Exterior surface resistance (15 mph.)	.17
Wood siding (shingles or clapboards)	.78
1" rigid insulating board sheathing	3.03
First air space	.91
1" blanket insulation	3.70
Second air space	.91
Metal lath and plaster	.23
Interior surface resistance—still air	.61
Overall Resistance	10.34

Overall coefficient of transmission U = 1/10.34 = .10 Btu per square foot per hour per degree F.

Reflective metals used as insulation must be associated with air spaces. The metal may be installed on one or both sides of an air space or as curtains dividing the air space into two or more separate air spaces. Thus in some cases an air space may have one side faced with aluminum foil and in other cases both sides may be bounded by foil. Values for each condition and for two widths of air spaces are given in the accompanying table.

Rule II. To find the overall coefficient of transmission of any construction involving reflective metals, follow Rule 1, substituting for the normal air space resistance (.91) the resistance of each air space bounded on one or both faces by bright metal as given in the accompanying table. Note this table also includes values for standard assemblies of foils which save the addition of the separate air spaces.

AMERICAN ARCHITECT
TIME-SAVER
STANDARDS

Serial No. 64

How to Find HEAT TRANSMISSION of Building Sections

NOVEMBER 1936

RECOMMENDED VALUES FOR COMPUTING OVERALL COEFFICIENTS OF HEAT TRANSMISSION

MATERIAL	Conductivity or Conductance*	Resistivity or Resistance*
MASONRY MATERIALS		
Brick, Common	5.00	.20
Face	9.20	.11
Brickwork, damp or wet	5.00	.20
Cement Mortar	12.00	.08
Cinder Concrete	5.20	.19
Cinder Blocks— 8 inch (note (a))	.62*	1.61*
12 inch (note (a))	.51*	1.96*
Concrete	12.00	.08
Gypsum Fibre Concrete	1.66	.60
Concrete Blocks— 8 inch	1.00*	1.00*
12 inch	.80*	1.25*
Stone	12.50	.08
Stucco	12.00	.08
Hollow Clay Tile— 4 inch	1.00*	1.00*
6 inch (note (b))	.64*	1.57*
8 inch (note (b))	.60*	1.67*
10 inch (note (b))	.58*	1.72*
12 inch (note (b))	.40*	2.50*
16 inch (note (b))	.31*	3.23*
Hollow Gypsum Tile— 4 inch	.46*	2.18*
Tile or Terrazzo	12.00	.08
BUILDING CONSTRUCTIONS		
Frame		
Fir Sheathing (1"), Building Paper	.71*	1.41*
Fir Sheathing (1"), Building Paper and Yellow Pine Lap Siding	.50*	2.00*
Fir Sheathing (1"), Building Paper and Stucco	.82*	1.22*
Pine Lap Siding and Building Paper, Siding 4" wide	.85*	1.18*
Yellow Pine Lap Siding	1.28*	.78*
Flooring		
Battleship linoleum (1/4")	1.36*	.74*
Woods (Across Grain)		
Maple or Oak (typical hardwoods)	1.15	.87
Yellow Pine or Fir (typical softwoods)	.80	1.25
ROOFING CONSTRUCTIONS		
Roofing		
Asphalt, composition or prepared	6.50*	.15*
Built-up—3/8 inch thick	3.53*	.28*
Shingles		
Asbestos	6.00*	.17*

MATERIAL	Conductivity or Conductance*	Resistivity or Resistance*
Asphalt	6.50*	.15*
Slate	10.37	.10
Wood	1.28*	.78*
PLASTERING MATERIALS		
Plaster (Gypsum)	3.30	.30
Metal Lath and Plaster (3/4")	4.40*	.23*
Wood Lath and Plaster	2.50*	.40*
Plaster Board—3/8 inch	3.73*	.27*
1/2 inch	2.82*	.35*
INSULATING MATERIALS		
Blanket or Flexible Fiber	.27	3.70
Loose fill or bat type:		
Gypsum (flaked, dry and fluffy)	.48	2.08
Mineral Wool, all forms	.27	3.70
Rock Wool, Glass Wool	.27	3.70
Rigid,		
Corkboard	.30	3.33
Fiber, typical wood, cane, etc.	.33	3.03
Reflective Type (see below, Air Spaces faced with reflective metals aluminum foil)		
AIR SPACE AND SURFACE COEFFICIENTS		
Air Spaces, over 3/4" faced with ordinary building materials	1.10*	.91*
Surfaces, Ordinary, Still air	1.65*	.61*
Air in motion, 15 mph	6.00*	.17*
AIR SPACES FACED WITH REFLECTIVE METALS (ALUMINUM FOIL)		
Air space, faced one side with foil: over 3/4" wide	.46*	2.17*
Air space, faced one side with foil: 3/8" wide	.62*	1.61*
Air space, faced both sides with foil: over 3/4" wide	.41*	2.44*
Air space, faced both sides with foil: 3/8" wide	.57*	1.75*
Air space divided in two with single curtain of foil (both sides bright). Each space over 3/4" wide	.23*	4.35*
Each space 3/8" wide	.31*	3.23*
Air space with multiple curtains of foil, bright both sides, curtains more than 3/4" apart, in standard construction:		
2 curtains forming 3 spaces	.15*	6.78*
3 curtains forming 4 spaces	.11*	9.22*
4 curtains forming 5 spaces	.09*	11.66*

NOTES

* Indicates conductances and resistances for the thickness stated or used in construction, not per 1 inch thickness. All values not so marked are conductivities or resistivities and must be proportionately modified if the material is used in any other net thickness than 1 inch.

(a) One air cell in direction of heat flow.

(b) Hollow tile values for 6", 8" and 10" units are based on two air cells in the direction of heat flow. The 12" tile is based on three cells in the direction of heat flow. The 16" hollow tile consists of one 10" and one 16" tile, each having two cells in direction of heat flow.

All values are taken from A.S.H.V.E. Guide 1936, Chapter 5, Table 2, "Conductivities and Conductances of Building Materials and Insulators" and are those recommended for computing heat transmission coefficients.

Example 3: To find the effect of adding to the wall section defined in Example 1 an aluminum faced plaster base and two equally spaced curtains of foil within the air space:

Exterior surface resistance (15 mph.)	.17
Fir sheathing, building paper, Y. P. lap siding	2.00
First air space (bounded 1 side by foil) over .75"	2.17
Second air space (bounded both sides by foil) over .75"	2.44
Third air space (bounded both sides by foil, one being the curtain and the other the plaster base) over .75"	2.44
Metal lath and plaster	.23
Interior surface resistance—still air	.61
Overall Resistance	10.06

Overall coefficient of transmission $U = 1/10.06 = .10$ Btu per square foot per hour per degree F.

PER CENT OF HEAT TRANSFER STOPPED

It is sometimes convenient to express the values resulting from the use of an insulation material in non-technical terms, particularly when dealing with clients. This may be expressed as "per cent of heat transfer stopped by the use of building insulation materials." See T-S.S. Serial No. 65. This percentage may be found as follows:

Rule III. Determine the coefficient of transmission of the building section as it would be constructed without using an insulation material. Also compute the coefficient of transmission of the same section as if the selected insulation materials had been incorporated therein. Subtract coefficient of transmission of the insulated section from the coefficient of transmission of the uninsulated section and divide this difference by the coefficient of transmission of the uninsulated section. Multiply by 100 to obtain per cent of heat transfer stopped by the use of insulation.

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 65

NOVEMBER 1936

HEAT TRANSMISSION through Building Sections with Per Cent of Heat Transfer Stopped by INSULATION

LIGHT FACE figures in table give the coefficient of heat transmission U of the building section shown, with the indicated insulation material in place.

BOLD FACE figures in table show the per cent of the heat movement through the uninsulated building section which is stopped by the addition of the indicated insulation.

DEFINITIONS

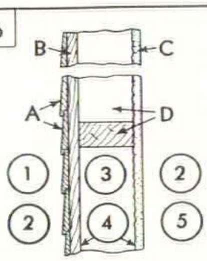
U — Overall coefficient of heat transmission (thermal transmittance) in Btu per hour per sq. ft. of assembled structural section per degree F difference in temperature on exposed faces

% — Per cent of heat transfer stopped = $\frac{U \text{ (not insulated)} - U \text{ (insulated)}}{U \text{ (not insulated)}} \times 100$

k — Thermal conductivity of homogeneous material in Btu per hour per sq. ft. per inch thickness per degree F difference in temperature on exposed surfaces

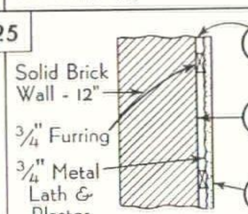
Section		Position		RIGID BOARD: k = .33 Average Fibre Board					RIGID BOARD: k = .30 Average Cork Board			BLANKET or FLEXIBLE: k = .27				FILL TYPE (Loose or Batts): Rock Wool Type k = .27	FILL TYPE: Powdered Gypsum k = .48	REFLECTIVE METAL FOILS (See Note 7 for description of Types): 1 Air Space - Type I	2 Air Spaces - Type II	Type III: 2 Layers	Type III: 3 Layers	Type III: 4 Layers
				½"	¾"	1"	1½"	2"	1"	1½"	2"	½"	1"	1½"	2"	3⅝"	3⅝"					
Wood Stud Wall, U.26	1	In place of sheathing	U	.24	.21	.17	.14	.11														
			%	**8**	**19**	**35**	**46**	**58**														
	2	Under sheathing or plaster and lath	U	.18	.16	.14	.12	.10	.14	.12	.10	.17	.13	.11	.09			.19				
			%	**31**	**39**	**46**	**54**	**62**	**46**	**54**	**62**	**35**	**50**	**58**	**65**			**27**				
	3	Between studs	U									.15	.12	.10		.06	.10		.14	.10	.08	.07
			%									**42**	**54**	**62**		**77**	**62**		**46**	**62**	**69**	**73**
	4	Both sides of air-space (See Notes 5 & 6)	U	.18	.15	.12	.10	.07	.12	.10	.07	.13	.09	.07				.19	NOTE: Rigid boards replace sheathing and plaster base. Other types added to existing materials			
			%	**31**	**42**	**54**	**62**	**72**	**54**	**62**	**72**	**50**	**65**	**73**				**27**				
	5	As plaster base, ½" plaster	U	.19	.17	.15	.12	.10	.14	.11	.10											
			%	**27**	**35**	**42**	**54**	**62**	**46**	**58**	**62**											
Masonry Wall, U.25	1	Between furring strips	U									.19							.16			
			%									**24**							**36**			
	2	Under lath and plaster	U	.18	.16	.14	.12	.10	.14	.11	.09	.17	.13	.11	.09			.19				
			%	**28**	**36**	**44**	**52**	**60**	**44**	**56**	**64**	**32**	**48**	**56**	**64**			**24**				
	3	As plaster base, ½" plaster	U	.19	.17	.15	.12	.10	.14	.11	.10											
			%	**24**	**32**	**40**	**52**	**60**	**44**	**56**	**60**											
Masonry Wall, U.34	1	Cemented to wall, and plastered ½"	U	.22	.20	.17	.13	.11	.16	.13	.10											
			%	**35**	**43**	**50**	**62**	**68**	**53**	**62**	**71**											
	2	Cemented to wall, no plaster	U	.23	.20	.17	.14	.11	.16	.13	.11											
			%	**32**	**41**	**50**	**59**	**68**	**53**	**62**	**68**											
Wood Floor & Ceiling, U.25	1	Under flooring or above plaster base	U	.18	.16	.14	.12	.10	.14	.11	.09	.17	.13	.10	.09			.19	NOTE: Rigid boards usually placed between sub- and finish floors. Values are not affected			
			%	**28**	**36**	**44**	**52**	**60**	**44**	**56**	**64**	**32**	**48**	**60**	**64**			**24**				
	2	Between joists	U									.15	.12	.10	.08	.06	.09		.13	.10	.08	.07
			%									**40**	**52**	**60**	**68**	**76**	**64**		**48**	**60**	**68**	**72**
	3	Both sides of air-space or ① + ④	U	.14	.12	.10	.08	.06	.09	.08	.06	.13	.09	.07	.05			.18	NOTE: Double flooring retained in all cases. Rigid boards replace plaster base only			
			%	**44**	**52**	**60**	**68**	**76**	**64**	**68**	**76**	**48**	**64**	**72**	**80**			**28**				
	4	As plaster base, ½" plaster	U	.18	.16	.14	.12	.10	.14	.11	.09											
			%	**28**	**36**	**44**	**52**	**60**	**44**	**56**	**64**											
Top Floor Ceiling, U.69	1	Nailed over floor joists	U	.26	.23	.19	.15	.12	.18	.14	.11							.28				
			%	**62**	**67**	**72**	**78**	**83**	**74**	**80**	**84**							**59**				
	2	Between joists	U									.24	.17	.13	.10	.07	.11		.17	.12	.09	.08
			%									**65**	**75**	**81**	**86**	**88**	**84**		**75**	**83**	**87**	**88**
	3	Above metal lath & plaster	U	.34	.28	.22	.17	.13	.21	.16	.12	.30	.19	.14	.11			.28				
			%	**50**	**59**	**68**	**75**	**81**	**70**	**77**	**83**	**56**	**72**	**80**	**84**			**59**				
	4	As plaster base, ½" plaster	U	.35	.29	.23	.17	.13	.21	.16	.12											
			%	**49**	**58**	**67**	**75**	**81**	**70**	**77**	**83**											

Wood Stud Wall

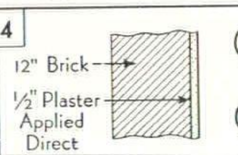


A Siding or Clapboards
B Wood Sheathing
C Metal Lath & Plaster
D Studs, 3¾"

Masonry Wall

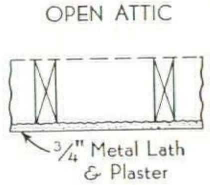


Masonry Wall



Wood Floor & Ceiling

Top Floor Ceiling



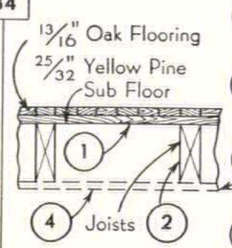
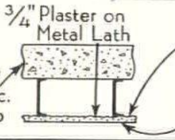
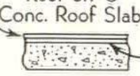
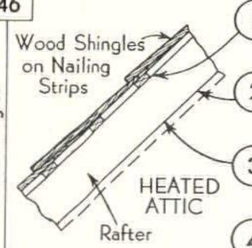
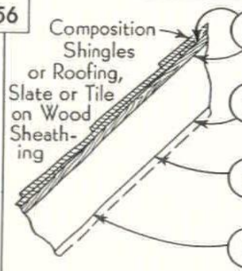
AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 65
NOVEMBER 1936

HEAT TRANSMISSION through Building Sections with Per Cent of Heat Transfer Stopped by INSULATION

NOTES

1. All calculations are carried to second decimal only
2. All exterior surfaces are considered exposed to 15 M.P.H. wind, interior surfaces still air
3. Insulating value of building paper is neglected
4. All calculations are based upon "Recommended Conductivities and Conductances for computing Heat Transmission Coefficients," A.S.H.V.E. Guide, 1936

Section	Position		RIGID BOARD: k = .33 Average Fibre Board ½"	¾"	1"	1½"	2"	RIGID BOARD: k = .30 Average Cork Board 1"	1½"	2"	BLANKET or FLEXIBLE k = .27 ½"	1"	1½"	2"	FILL TYPE (Loose or Batts) k = .27 Rock Wool Type 3⅝"	FILL TYPE k = .48 Powdered Gypsum 3⅝"	REFLECTIVE METAL FOILS (See Note 7 for description of Types) 1 Air Space - Type I	2 Air Spaces - Type II	Type III 2 Layers	Type III 3 Layers	Type III 4 Layers
U.34 Floor over Unheated Space  13/16" Oak Flooring; 25/32" Yellow Pine Sub Floor; (4) Joists (2)	(1) Under flooring	U	.23	.20	.17	.13	.11	.16	.13	.10							.20	NOTE: Rigid boards placed between sub - and finish floorings			
		%	**32**	**41**	**50**	**62**	**68**	**53**	**62**	**71**							**41**				
	(2) Between joists	U									.18	.13	.11	.09				.14	.10	.08	.07
		%									**47**	**62**	**68**	**74**				**59**	**71**	**76**	**79**
	(3) Fastened beneath joists	U	.19	.17	.15	.12	.10	.14	.11	.10	.18	.13	.11	.09			.20				
		%	**44**	**50**	**56**	**65**	**71**	**59**	**68**	**71**	**47**	**62**	**68**	**74**			**41**				
	(4) With ½" rigid insulating board (k.33) used as interior finish	U	.19								.14	.11	.09	.08	.06	.08					
		%	**44**								**59**	**68**	**74**	**76**	**82**	**76**					
U.33 Supended Ceiling  ¾" Plaster on Metal Lath; 8" Conc. Slab	(1) Above metal lath & plaster	U	.22	.20	.17	.13	.11	.16	.12	.10	.21	.15	.12	.10	.06	.10	.23	.15	.11	.09	.08
		%	**33**	**41**	**48**	**61**	**67**	**52**	**64**	**70**	**36**	**55**	**64**	**70**	**82**	**70**	**30**	**55**	**67**	**73**	**76**
	(2) As plaster base, ½" plaster	U	.22	.20	.17	.13	.11	.16	.13	.10											
		%	**33**	**41**	**48**	**61**	**67**	**52**	**61**	**70**											
U.64 Masonry Roof Deck  Built-up Composition Roof on 6" Conc. Roof Slab	(1) Under composition roofing laid on slab	U	.33	.28	.22	.16	.13	.20	.15	.12											
		%	**48**	**57**	**66**	**75**	**80**	**69**	**77**	**81**											
U.46 Pitched Roof - Wood Shingles  Wood Shingles on Nailing Strips; HEATED ATTIC; Rafter	(1) Under shingle lath	U	.25	.22	.18	.14	.12	.17	.13	.11	.23	.16	.12	.10			.23				
		%	**46**	**52**	**61**	**70**	**74**	**63**	**72**	**76**	**50**	**65**	**74**	**78**			**50**				
	(2) Beneath or between rafters	U	.22	.19	.16	.13	.11	.16	.12	.10	.20	.15	.12	.10			.23	.15	.11	.09	.08
		%	**52**	**59**	**65**	**72**	**76**	**65**	**74**	**78**	**57**	**67**	**74**	**78**			**50**	**67**	**76**	**80**	**83**
	(3) With ½" fibre board (k.33) used as interior finish	U	.22								.16	.12	.10	.08	.06	.08					
		%	**52**								**65**	**74**	**78**	**83**	**87**	**83**					
	(4) Both sides of air space or (1) + (2)	U	.14	.12	.10	.08	.06	.10	.08	.06	.15	.10	.08	.06			.22				
		%	**70**	**74**	**78**	**83**	**87**	**78**	**83**	**87**	**67**	**78**	**83**	**88**			**52**				
U.56 Pitched Roof - Sheathed  Composition Shingles or Roofing, Slate or Tile on Wood Sheathing	(1) Over or under sheathing	U	.30	.26	.21	.16	.13	.19	.15	.12	.27	.18	.14	.11			.25	NOTE: Foil facing enclosed air space under sheathing			
		%	**46**	**55**	**63**	**71**	**77**	**66**	**73**	**79**	**52**	**68**	**75**	**80**			**55**				
	(2) Beneath or between rafters	U	.24	.21	.17	.14	.11	.17	.13	.11	.22	.16	.12	.10			.25	.16	.12	.09	.08
		%	**57**	**64**	**70**	**75**	**80**	**70**	**77**	**80**	**61**	**71**	**79**	**82**			**55**	**71**	**79**	**84**	**86**
	(3) With ½" fibre board (k.33) used as interior finish	U	.24								.17	.13	.11	.09	.06	.09					
		%	**57**								**70**	**77**	**80**	**84**	**89**	**84**					
	(4) Both sides of air space or (1) + (2)	U	.14	.12	.10	.08	.06	.10	.08	.06	.16	.10	.08	.06			.24				
		%	**75**	**79**	**82**	**86**	**89**	**82**	**86**	**89**	**71**	**82**	**86**	**89**			**57**				

NOTES (Continued)

5. Where insulating materials are used on both sides of a dead air space the same thickness and type of insulation is assumed to be employed on each side. In actual practice the thickness used on the cold side may be greater than that used on the warm side (in the case of rigid boards and blankets). To find the correct value for such conditions use the figure given for insulation used on one side of the air space in a thickness equal to the sum of the thicknesses used on both sides, except with reflective metals
6. Where rigid board insulations are shown used on both sides of an air space, they are assumed to replace wood sheathing and metal lath; hence these values are lower than for other materials which do not eliminate structural products
7. Reflective metal foil installations. Calculations for reflective metal foils are based on the assumption that bright aluminum foil is used and that it always faces a dead air space. The values given do not apply to dull sheet metals, aluminum foil paints, or other reflective materials

Type I - Aluminum foil on one side of air space (either warm or cold side.) Also applies to conditions where insulation is used on both sides of a single air space

Type II - Aluminum foil, bright both sides, dividing air space in two

Type III - Aluminum foil, bright both sides, used in multiple curtains without metal-to-metal contact. Spacing of foils is considered uniform in narrow air spaces and in wide horizontal spaces is considered as over ¾" spacing. In all cases where foil would otherwise face an infinite air space, building paper is included to form a limited air space

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Serial No. 66
NOVEMBER 1936

Heat Transmission and Infiltration through Doors, Windows and Glass Masonry

PURPOSE

In the calculation of heating, cooling or air conditioning loads the movement of heat (loss or gain) through doors and windows and the increased heating or cooling load due to air infiltration through the cracks around these openings are determined separately from the heat movement through walls, roofs, ceilings and floors. See T-S.S. "How to Find Heat Transmission of Building Sections," and also T-S.S. "Heating and Air Conditioning Loads—I, II, III."

Presented here are data relating to heat transmission and infiltration through doors and windows, exclusive of solar heat gain through glass, which is considered in T-S.S. "Heating and Air Conditioning Loads—II."

HEAT TRANSMISSION

Since doors and windows may be considered as homogenous materials always exposed to moving air outside and to still air inside, conductances and resistances can be neglected and the overall coefficient of heat transmission U given directly. These coefficients are presented in Table 1. The importance of multiple glazing to reduce condensation and fogging on windows, especially with winter air conditioning, is shown on Chart 1.

INFILTRATION DUE TO CRACKAGE

Air entering buildings from out-of-doors affects heating and cooling loads to an important degree. It may leak directly through walls, enter through cracks around windows and doors and their frames, and enter directly through entrance doors during the periods when they are opened by traffic. Air leakage through walls may be reduced so effectively by a layer of good building paper or by continuous plastered surfaces that this source of infiltration is commonly neglected. There is no measurable infiltration through walls built of structural glass masonry.

Air leakage through cracks can be effectively reduced by weatherstripping. Since the quality and performance of various types of weatherstrips vary over a wide range, it is better, wherever possible, to use authenticated test data supplied by the manufacturer of the material used, than the average values necessarily presented herein.

Note that variations in type and installation make it possible for wood windows to develop double the average leakage shown. Also that proper fitting, especially of steel windows, can materially reduce them.

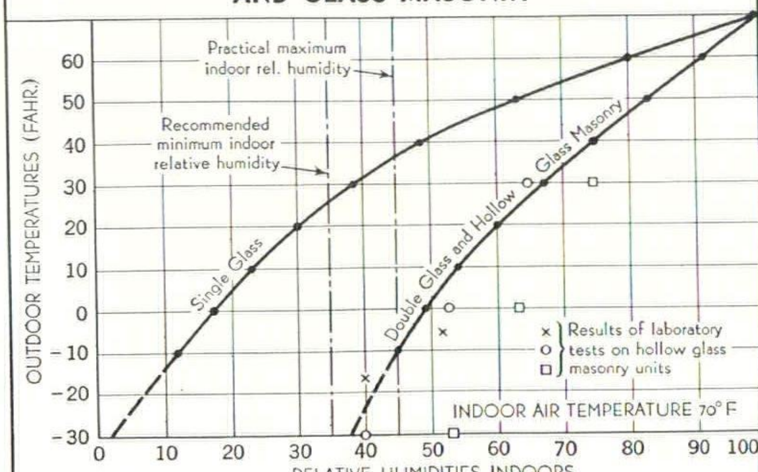
TABLE 1 - COEFFICIENTS OF TRANSMISSION (U)
Doors, Windows, Skylights, Glass Masonry**

		U
Windows and Skylights		
Single sheet of glass (window or plate)		1.13
Double sheets of glass (compound lights, storm sash, etc.)		.45
Triple sheets of glass		.28
Glass Masonry		
Hollow glass blocks*		.50*
Panel Wood Doors (assumed same as glass)		1.13
Solid Wood Doors (calculated values)		
Nominal thickness	Actual thickness	
1	25/32	.69
1¼	1 1/16	.59
1½	1 5/16	.52
1¾	1 3/8	.51
2	1 5/8	.46
2½	2 1/8	.38
3	2 5/8	.33

* Tentative value, based on average of tests on three types of units, pending greater accumulation of data. All values assume 15 mph wind velocity

** All other data except as above, from A.S.H.V.E. Guide, 1936, Ch. 5, Table 13

CHART 1 - CONDENSATION ON WINDOWS AND GLASS MASONRY



Condensation or fogging of windows will occur in winter in most parts of the U.S. if single glass is used and indoor relative humidity is maintained within the desirable range. Double glazing and hollow glass masonry cut heat losses approximately in half and greatly reduce likelihood of condensation

TABLE 2 - INFILTRATION THROUGH CRACKS AROUND WINDOWS AND DOORS

Type of Window	Condition	Cubic feet per hour per foot of crack for various velocities in miles per hour: 5	10	15	20	25	30
DOUBLE HUNG WOOD SASH WINDOWS (UNLOCKED)	Average window, not weatherstripped	6.6	21.4	39.3	59.3	80.0	103.7
	Average window, weatherstripped	4.3	15.5	23.6	35.5	48.6	63.4
	Poorly fitted window, not weatherstripped	26.9	69.0	110.5	153.9	199.2	249.4
	Poorly fitted window, weatherstripped	5.9	18.9	34.1	51.4	70.5	91.5
DOUBLE HUNG METAL WINDOWS	Not weatherstripped, unlocked	20	47	74	104	137	170
	Weatherstripped, unlocked	6	19	32	46	60	76
STEEL SASH WINDOWS	Residential casement, average	14	32	52	76	100	128
	Heavy casement sections, average	8	24	38	54	72	92
	Architectural projected, average	20	52	88	116	152	182
	Hollow metal, vertically pivoted	30	88	145	186	221	242
DOORS*	Well fitted, not weatherstripped	27	69	111	154	200	249
	Well fitted, weatherstripped	14	35	55	77	100	125
	Poorly fitted, not weatherstripped	54	138	221	308	398	499
	Poorly fitted, weatherstripped	27	69	111	154	200	249
DOORS**	In active use, as in stores	81	207	332	462	598	748

NOTES: * Values for door leakage are based on rules-of-thumb in common use and are not test values. ** For more exact data see Tables 3 and 4. For more detailed data see Chapter 6, A.S.H.V.E. Guide, 1936

AMERICAN ARCHITECT
TIME-SAVER STANDARDS

Heat Transmission and Infiltration
through Doors, Windows and Glass Masonry

Serial No. 66
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Infiltration through cracks around windows and doors may be computed from data in Table 2:

1. Measure the lineal feet of crack around each opening as follows: For double hung windows take the perimeter plus the length of the meeting rail. For casements and pivoted windows take aggregate perimeter of all movable or ventilating sections.

2. Determine the total *effective* crackage (which is the total crackage adjusted to allow for exfiltration from the leeward side of buildings) as follows: In a room having one exposed wall take all of the crack. With two exposed walls use the wall having the most crack. With three or four exposed walls, take the wall having the most crack but in no case less than half the total crack.

3. Find the prevailing average wind velocity from local weather bureau data or from T-S.S. "Heating and Air Conditioning—Basic Data." Refer to Table 2 for the cubic feet of air entering per hour, per lineal foot of crack, for the selected wind velocity and for the type of window or door under consideration. Multiply this value by the effective crackage in lineal feet. The result is the total cubic feet of air per hour due to infiltration.

For data on converting this leakage into heating and cooling loads see T-S.S. "Heating and Air Condition Loads—I."

INFILTRATION THROUGH ENTRANCE DOORS

Due largely to lack of authentic test data it has been customary to neglect the air entering a building while entrance doors are in use except by the rule-of-thumb: "A single door in frequent use, as in a store, should have an infiltration value applied which is three times that for a well fitted door."

Recent research based on field tests on nearly 600 entrances reveals that heating and cooling loads are materially affected by entrance door infiltration.*

Losses in summer are governed by wind velocity, type and size of doors, presence of cross draft through building due to doors in different walls and volume of traffic or nature of occupancy of the buildings. In winter, these losses are governed by the chimney effect due to the height of the building, and volume of traffic. In buildings of commercial character, therefore, the total infiltration load through entrance doors should be calculated from data in Table 3 for winter conditions and Table 4 for summer conditions.

* The Infiltration Problem of Multiple Entrances, by A. M. Simpson and K. B. Atkinson; A. S. H. V. E. Journal Section, Heating, Piping and Air Conditioning, June, 1936.

TABLE 3 - INFILTRATION THROUGH ENTRANCE DOORS - WINTER CONDITIONS

Height of Building-Floors	Entrance Infiltration - Cubic Feet per Person Passing Through					
	72" Revolving Door		36" Hinged Door Vestibule		36" Single Door	
	Traffic over 800 per Hr.	Traffic under 800 per Hr.	Temp. 35° F	Temp. 0° F	Temp. 35° F	Temp. 0° F
5	20	32	490	540	650	720
10*	20	32	610	735	810	980
20*	20	32	710	930	940	1240
30	20	32	805	1140	1070	1530
40	20	32	900	1280	1200	1700
50	20	32	980	1410	1320	1880
60	20	32	1080	1540	1440	2050

* EXHAUST FAN VENTILATION; Medium exhaust fan ventilation causes entrance infiltration at least equivalent to the chimney action of a 10 story building and heavy exhaust fan ventilation causes entrance infiltration equivalent to the chimney action of a 20 story building

TABLE 4 - INFILTRATION THROUGH ENTRANCE DOORS - SUMMER CONDITIONS

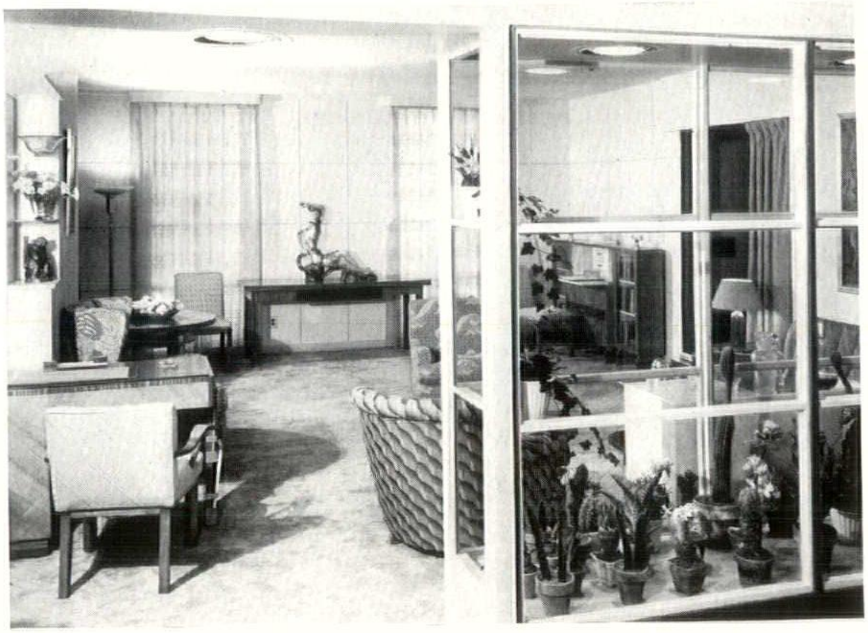
Type of Establishment	Entrance Infiltration - Cubic Feet per Minute per Person in Room					
	72" Revolving Door		36" Hinged Door - Single Entrance (Doors in one outside wall only)		36" Hinged Door - Cross Draft Entrance (More than one door in different walls)	
	Small Occupancy Max. Infiltration	Large Occupancy Min. Infiltration	Maximum Infiltration(1)	Minimum Infiltration(2)	Max. Infiltration(1)	Min. Infiltration(2)
Bank	4.7	2.0	22.0	7.0	30.5	13.4
Barber Shop	2.3	2.3	11.0	3.5	15.2	6.7
Broker's Office	4.7	3.3	22.0	7.0	30.5	13.4
Candy & Soda	3.5	2.0	16.5	5.2	22.7	10.0
Cigar Store	14.5	8.0	66.0	20.8	91.0	40.0
Dept. Store (Small 5 & 10¢)	6.4	3.0	33.0	10.4	45.5	20.0
Dept. Store (Large)	4.7	2.0	22.0	7.0	30.5	13.4
Dress Shop	1.7	1.6	8.2	2.6	11.4	5.0
Drug Store	4.7	3.3	22.0	7.0	30.5	13.4
Furrier	1.7	1.6	8.2	2.6	11.4	5.0
Hospital Room	—	—	3.5	3.5	—	—
Lunch Room	3.5	2.0	16.5	5.2	22.7	10.0
Men's Shop	2.3	2.1	11.0	3.5	15.2	6.7
Office (Private)	—	—	2.5	2.5	—	—
Office (Professional)	—	—	3.5	3.5	—	—
Office Building	1.2	.5	5.5	1.7	7.7	3.4
Public Building	1.7	.7	8.2	2.6	11.4	5.0
Restaurant	1.7	.7	8.2	2.6	11.4	5.0
Shoe Store	4.7	2.1	11.0	3.5	15.2	6.7

(1) - Maximum values for exposed position and average wind velocity above 10 miles per hour

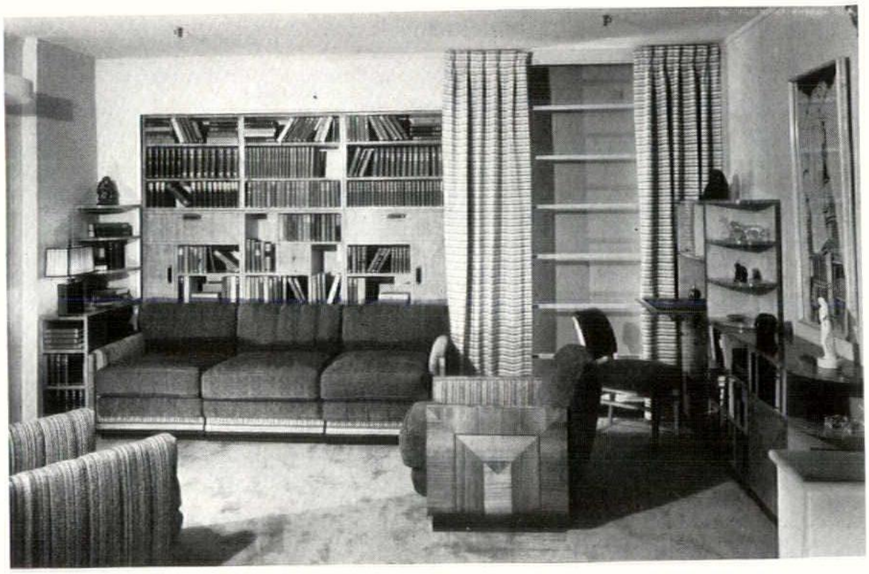
(2) - Minimum values for sheltered location and average wind velocity below 5 miles per hour

NOTES: For vestibule (double bank of hinged doors) entrance infiltration is 25% less than the value for single bank of hinged doors given above

With two doors only, each one in different outside walls figure as SINGLE ENTRANCE during portion of time opposite door is closed and as cross draft entrance during portion of time opposite door is open. With two or more doors in each of two or more outside walls figure throughout as cross draft entrance



1



2

3

THREE ARCHITECTS AS DECORATORS

DUE to a constantly increasing acceptance of modern design, architects are assuming a more important position as decorators and designers of decorative appurtenances. Usually their work in decoration is limited to that for the individual client. Recently, Grosfeld House, New York furniture manufacturers opened an exhibition consisting of two model houses, one decorated in various traditional styles and the other modern. Three of the rooms and their furniture in the modern house were designed by well-known architects.

1. Eugene Schoen's living room was distinguished by the manner in which he introduced a relationship between the interior and the exterior of a modern home. A large flower window, forming a wall of the house gives one a feeling that the room extends into the garden. The feeling of openness is further achieved through the lack of door openings between the rooms. Another noteworthy feature is the harmonious effect which can be achieved by combining Amboyna, Sapeli, Paldao and Japanese Ash Woods in one setting. The room is done in soft beige with hand carved beige carpet.

2. Irvin Scott, in his library, demonstrated the versatility of sectional furniture in a modern library in which the pieces of light, tropical Yuba wood are arranged into built-in wall units, while the upholstered pieces adapt themselves to use as a long sofa, love seat, or corner chairs. The sectional furniture may be used interchangeably as dividing partitions, bookcases, curio cabinets, desks, storage facilities, or other practical units. The walls, draperies and carpet are carried out in two-tone effect of sand color and black with touches of green introduced in the upholstered pieces.

3. Morris Sanders, winner of the Architectural League's 1936 Silver Medal, created a trim modern bedroom within a background of three white walls and one in Chinese red, and an imposing full height window of glass brick. Mr. Sanders avoided the use of color in the furniture, preferring to confine his color to the red wall. The furniture combines the softness of brown leather with African Walnut wood with metal trimmings to emphasize wood tone.

Main Lounge

"*My Schemes* were built around Bigelow Carpets"... *says* Neel D. Parker,

Advisory Decorator of the San Francisco War Memorial

We're proud of the part Bigelow carpets played in decorating the luxurious War Memorial building in San Francisco. We're proud, too, of the fine tribute paid Bigelow by Neel D. Parker, the advisory decorator on this project.

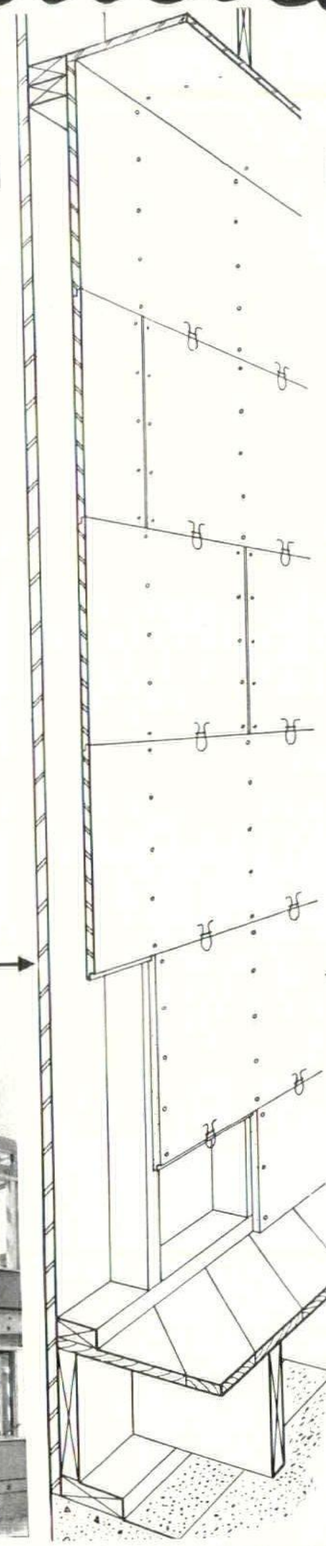
"I have been sold on Bigelow carpets for a long time," says Mr. Parker. "Bigelow not only makes excellent qualities, but has a very fine color range and unusual patterns as well. I have always found their service to be exceptional. They have men at the head of various departments who know all there is to know about carpets."

Architects and decorators all over the country have found us helpful in solving the multitude of carpeting problems that call for highly specialized knowledge. Whatever *your* problem, may we serve you, too, as Carpet Counsel? Contract Department, Bigelow-Sanford Carpet Co., Inc., 140 Madison Ave., New York, N. Y.

Carpet Counsel by Bigelow Weavers

THE *Insulite* WALL

INSULATE



BILDRITE SHEATHING

On the outside of the wall Bildrite Sheathing offers these advantages:

1. **Four times the bracing strength of eight inch shiplap.**
2. **Far more insulation than lumber.**
3. **No open joints or knotholes . . . windproof walls.**
4. **Easily handled . . . does not injure hands, does not gum up tools.**
5. **Waterproofed by a patented asphalt treatment.**
6. **One solid piece 25/32 inch thick . . . easily applied.**

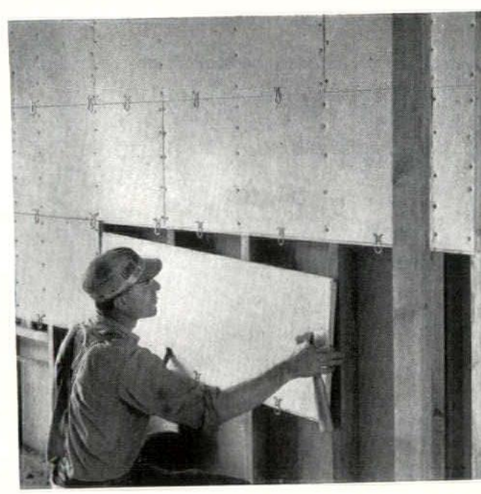
LOK-JOINT LATH

On the inside of the wall, Lok-Joint Lath as a plaster base offers you these advantages:

1. **Eliminates lath marks on walls and ceilings.**
2. **Reduces passage of sound through walls and ceilings.**
3. **Effectively insulates.**
4. **The "Lok" joint assures a rigid level plastering surface.**
5. **Minimizes plaster cracks.**

BILDRITE SHEATHING →

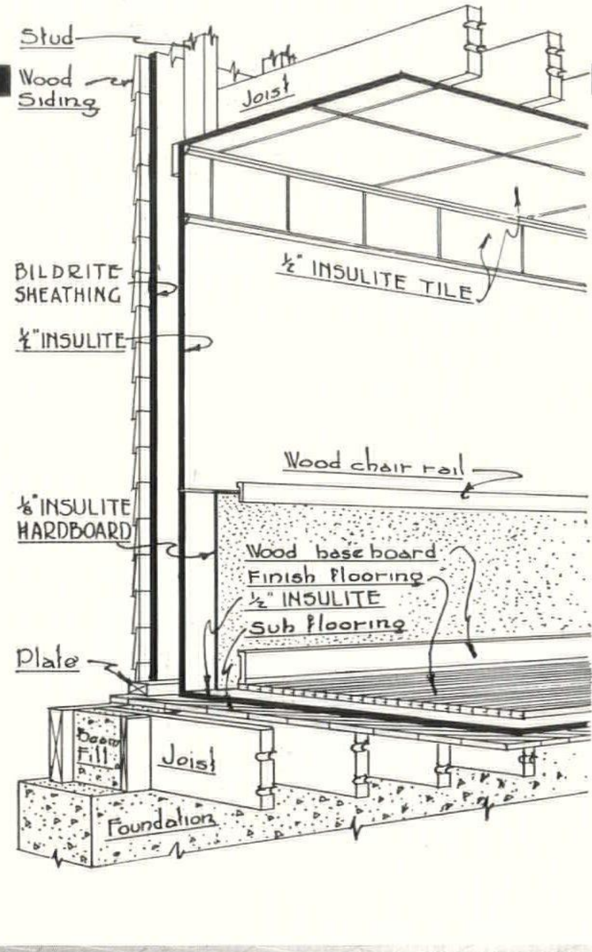
← LOK-JOINT LATH



INSULATE WITH INSULITE

OF PROTECTION

AS YOU BUILD



INSULITE INTERIOR FINISH

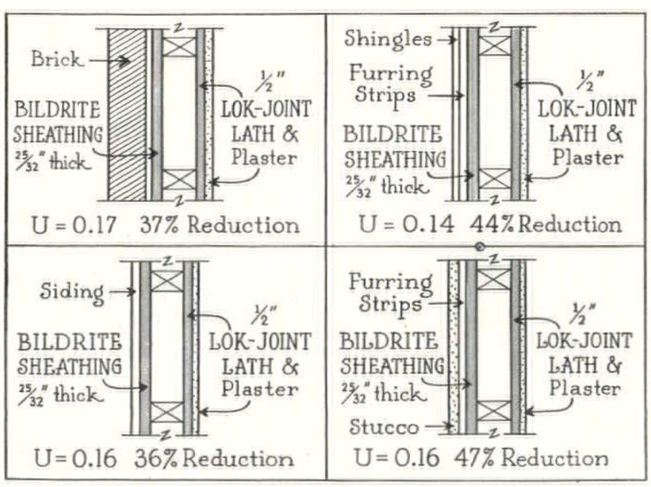
Insulite interior finish products... Tile, Plank, Building Board and Hardboard... may be used on the inside of the wall to:

1. **Provide permanent decoration.**
2. **Assure charming, modern interiors.**
3. **Effectively insulate.**
4. **Correct acoustics.**
5. **Reduce the passage of sound through walls and ceilings.**

Buildings constructed with the Insulite wall of protection are buildings of permanence and comfort. Let us send you complete details and samples.

HEAT LOSS REDUCTIONS

Compared with same relative type of construction with wood sheathing and wood lath. The same percentage of reduction applies when ½" Insulite interior finish products are used instead of Lok-Joint Lath.



THE INSULITE COMPANY

Department AA76, Minneapolis, Minnesota

SULLIVAN LETTERS AT COLUMBIA

The Avery Architectural Library of Columbia University has recently come into possession of an important and unique Sullivan item. It is a scrapbook, prepared by Sullivan's close friend, Lyndon P. Smith, and contains not only clippings of the complete first publication of the "Kindergarten Chats" in the "Interstate Architect and Builder" for 1901-1902, but also several letters from Sullivan to Smith, numerous manuscript comments on the history and derivation of this series of articles made by Smith, and, on the back cover, Sullivan's original pencil layout for the completed series, made when the series was about half finished. It is dated "Palisades, New York, August 12, 1901," and signed "Louis H. Sullivan."

Lyndon P. Smith was an architect whose chief claim to fame seems to have been his continuing friendship with Louis Sullivan. He wrote the article in the "Architectural Record" on the Schlesinger and Mayer building in July 1904, pages 53-60. This article, by the way, is particularly rich in illustrations of the lavish decorative metal work on the Schlesinger-Mayer building in which Sullivan's ideas of dynamic growth-expressing lines were possibly carried further than in any of his other work.

At the period during which the "Kindergarten Chats" were written, Lyndon Smith was living in Palisades, New York, and several of the articles in the series were composed while Sullivan was visiting him there. The whole series of fifty-two articles was an attempt by Sullivan to place his extraordinary organic philosophy in relation to the architecture of America, and to present the whole in a way which was vivid and compelling. He evidently realized the importance which this series had in his own development, and also as perhaps the most alive presentation of his basic ideas. For instance, on February 22, 1901, Sullivan wrote from Chicago as follows:

The 'Kindergarten Chats' will strike deeper than you are inclined to imagine. As a psychological study they will be far and away beyond anything I have hitherto attempted. The key to them, you will find, as the development proceeds, slowly but elaborately,—in the development of the character and artistic nature of the young man, *from within.*

It will be the first serious attempt ever made to test architecture by human nature and democracy. Don't let a certain flippancy of treatment mislead you. Try to spread them as far as you can among the laity, for they will be free from technicalities. I am writing for the people, not for architects.

Kelly is a rough diamond. He deserves great credit for his nerve and foresight, and a certain vague but strong desire to make his journal an educational power. He insisted that I should write absolutely with a free hand. It's a pretty heavy money investment for him and he ought to be backed up with subscriptions. I have written 27 of the articles, so I have my "curve" all right.

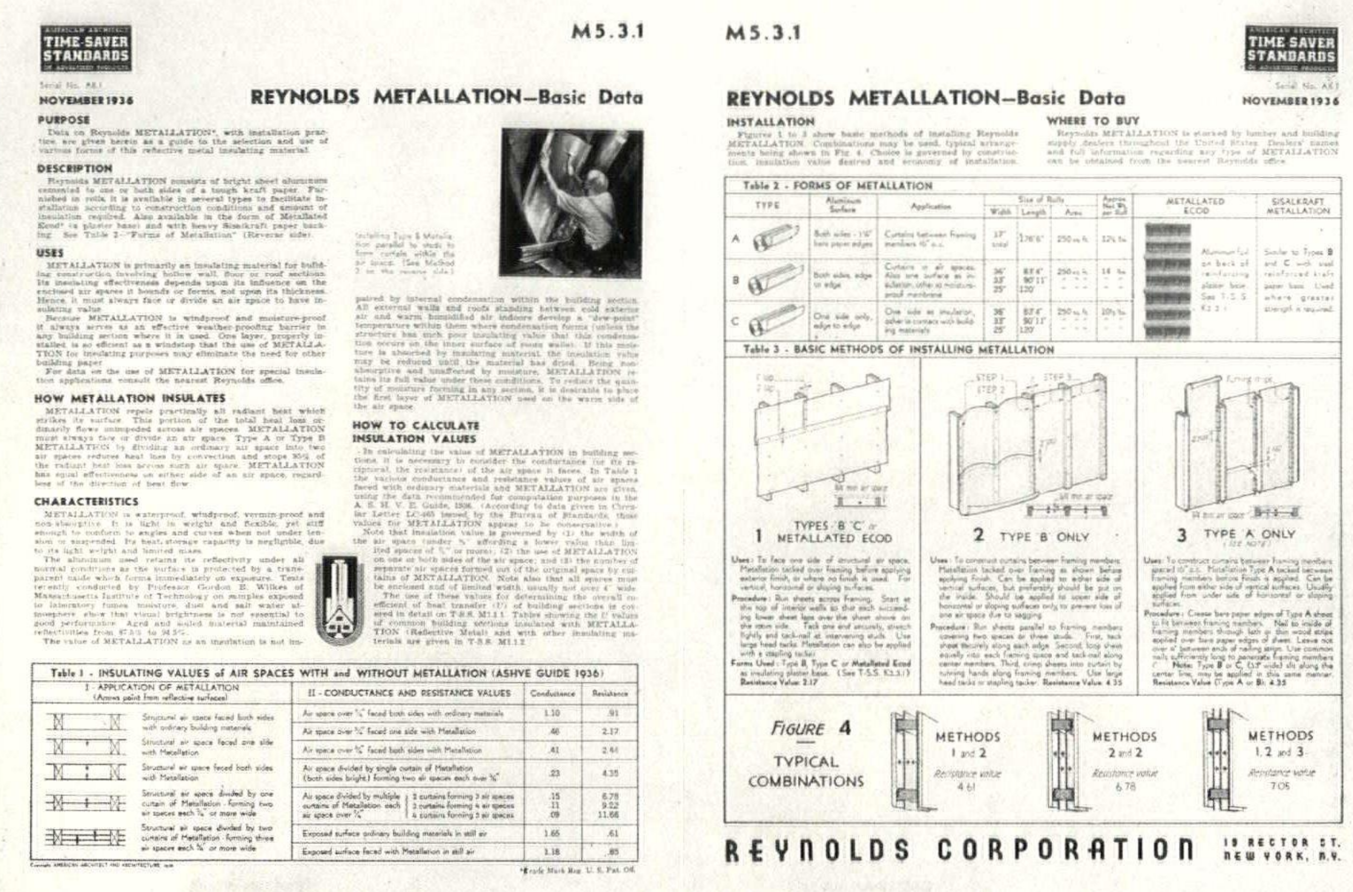
Yours,

(Signed) Louis."

As he progressed in writing the series, and Kelly's insistence that he write "absolutely with a free hand" was leading to more vigorous and perhaps more bitter denunciations of what he felt was cheap and wrong in the American architecture of the time, he evidently came to realize that what he was writing was really more for the general

NEW INSULATION DATA

FOR YOUR INFORMATION AND REFERENCE



TIME-SAVER STANDARDS

M5.3.1

Serial No. AK1

NOVEMBER 1936

REYNOLDS METALLATION—Basic Data

PURPOSE

Data on Reynolds METALLATION*, with installation practice, are given herein as a guide to the selection and use of various forms of this reflective metal insulating material.

DESCRIPTION

Reynolds METALLATION consists of bright sheet aluminum cemented to one or both sides of a tough kraft paper. Furnished in rolls it is available in several types to facilitate installation according to construction conditions and amount of insulation required. Also available in the form of Metallated Ecod* (a plaster base) and with heavy Sisalkraft paper backing. See Table 2—"Forms of Metallation" (Reverse side).

USES

METALLATION is primarily an insulating material for building construction involving hollow wall, floor or roof sections. Its insulating effectiveness depends upon its influence on the enclosed air spaces it bounds or forms, not upon its thickness. Hence, it must always face or divide an air space to have insulating value.

Because METALLATION is windproof and moisture-proof it always serves as an effective weather-proofing barrier in any building section where it is used. One layer, properly installed, is so efficient as a windstop that the use of METALLATION for insulating purposes may eliminate the need for other building paper.

For data on the use of METALLATION for special insulation applications consult the nearest Reynolds office.

HOW METALLATION INSULATES

METALLATION repels practically all radiant heat which strikes its surface. This portion of the total heat loss ordinarily flows unimpeded across air spaces. METALLATION must always face or divide an air space. Type A or Type B METALLATION by dividing an ordinary air space into two air spaces reduces heat loss by convection and stops 95% of the radiant heat loss across such air space. METALLATION has equal effectiveness on either side of an air space, regardless of the direction of heat flow.

CHARACTERISTICS

METALLATION is waterproof, windproof, vermin-proof and non-absorptive. It is light in weight and flexible, yet stiff enough to conform to angles and curves when not under tension or suspended. Its heat storage capacity is negligible, due to its light weight and limited mass.

The aluminum used retains its reflectivity under all normal conditions as the surface is protected by a transparent oxide which forms immediately on exposure. Tests recently conducted by Professor Gordon B. Wilkes of Massachusetts Institute of Technology on samples exposed to laboratory fumes, moisture, dust and salt water atmosphere show that visual brightness is not essential to good performance. Aged and soiled material maintained reflectivities from 87.5% to 94.5%.

The value of METALLATION as an insulation is not impaired by internal condensation within the building section. All external walls and roofs standing between cold exterior air and warm humidified air indoors develop a "dew-point" temperature within them where condensation forms (unless the structure has such poor insulating value that this condensation occurs on the inner surface of room walls). If this moisture is absorbed by insulating material, the insulation value may be reduced until the material has dried. Being non-absorptive and unaffected by moisture, METALLATION retains its full value under these conditions. To reduce the quantity of moisture forming in any section, it is desirable to place the first layer of METALLATION used on the warm side of the air space.

Installing Type B Metallation parallel to studs to form curtain within the air space. (See Method 2 on the reverse side.)

HOW TO CALCULATE INSULATION VALUES

In calculating the value of METALLATION in building sections, it is necessary to consider the conductance (or its reciprocal, the resistance) of the air space it faces. In Table 1 the various conductance and resistance values of air spaces faced with ordinary materials and METALLATION are given, using the data recommended for computation purposes in the A. S. H. V. E. Guide, 1936. (According to data given in Circular Letter LC-465 issued by the Bureau of Standards, these values for METALLATION appear to be conservative.)

Note that insulation value is governed by (1) the width of the air space (under ¾" affording a lower value than limited spaces of ¾" or more); (2) the use of METALLATION on one or both sides of the air space; and (3) the number of separate air spaces formed out of the original space by curtains of METALLATION. Note also that all spaces must be enclosed and of limited width, usually not over 4" wide.

The use of these values for determining the overall coefficient of heat transfer (U) of building sections is covered in detail on T.S.S. M1.1.1. Tables showing the U values of common building sections insulated with METALLATION (Reflective Metal) and with other insulating materials are given in T.S.S. M1.1.2.

Table 1 - INSULATING VALUES of AIR SPACES WITH and WITHOUT METALLATION (ASHVE GUIDE 1936)

I - APPLICATION OF METALLATION (Arrows point from reflective surfaces)	II - CONDUCTANCE AND RESISTANCE VALUES	Conductance	Resistance
Structural air space faced both sides with ordinary building materials	Air space over ¾" faced both sides with ordinary materials	1.10	.91
Structural air space faced one side with Metallation	Air space over ¾" faced one side with Metallation	.46	2.17
Structural air space faced both sides with Metallation	Air space over ¾" faced both sides with Metallation	.41	2.44
Structural air space divided by one curtain of Metallation - forming two air spaces each ¾" or more wide	Air space divided by single curtain of Metallation (both sides bright) forming two air spaces each over ¾"	.23	4.35
Structural air space divided by two curtains of Metallation - forming three air spaces each ¾" or more wide	Air space divided by multiple curtains of Metallation each air space over ¾": 2 curtains forming 3 air spaces	.15	6.78
	3 curtains forming 4 air spaces	.11	9.22
	4 curtains forming 5 air spaces	.09	11.66
	Exposed surface ordinary building materials in still air	1.65	.61
	Exposed surface faced with Metallation in still air	1.18	.85

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*Trade Mark Reg. U. S. Pat. Off.

M5.3.1

TIME SAVER STANDARDS

Serial No. AK1

NOVEMBER 1936

REYNOLDS METALLATION—Basic Data

INSTALLATION

Figures 1 to 3 show basic methods of installing Reynolds METALLATION. Combinations may be used, typical arrangements being shown in Fig. 4. Choice is governed by construction, insulation value desired and economy of installation.

WHERE TO BUY

Reynolds METALLATION is stocked by lumber and building supply dealers throughout the United States. Dealers' names and full information regarding any type of METALLATION can be obtained from the nearest Reynolds office.

Table 2 - FORMS OF METALLATION

TYPE	Aluminum Surface	Application	Size of Rolls: Width	Length	Area	Approx. Net Wt. per Roll
A	Both sides - 1¼" bare paper edges	Curtains between framing members 16" o.c.	17" total	176'6"	250 sq. ft.	12½ lbs.
B	Both sides, edge to edge	Curtains in air spaces. Also one surface as insulation, other as moisture-proof membrane	36" / 33" / 25"	83'4" / 90'11" / 120'	250 sq. ft.	14 lbs.
C	One side only, edge to edge	One side as insulation, other in contact with building materials	36" / 33" / 25"	83'4" / 90'11" / 120'	250 sq. ft.	10½ lbs.

METALLATED ECOD: Aluminum foil on back of reinforcing plaster base. See T.S.S. K3.3.1

SISALKRAFT METALLATION: Similar to Types B and C with sisal reinforced kraft paper base. Used where greater strength is required.

Table 3 - BASIC METHODS OF INSTALLING METALLATION

1 TYPES 'B' 'C' or METALLATED ECOD

Uses: To face one side of structural air space. Metallation tacked over framing before applying exterior finish, or where no finish is used. For vertical, horizontal or sloping surfaces.

Procedure: Run sheets across framing. Start at the top of interior walls so that each succeeding lower sheet laps over the sheet above on the room side. Tack one end securely, stretch tightly and tack-nail at intervening studs. Use large head tacks. Metallation can also be applied with a stapling tacker.

Forms Used: Type B, Type C or Metallated Ecod as insulating plaster base. (See T.S.S. K3.3.1) **Resistance Value:** 2.17

2 TYPE 'B' ONLY

Uses: To construct curtains between framing members. Metallation tacked over framing as shown before applying finish. Can be applied to either side of vertical surfaces, but preferably should be put on the inside. Should be applied to upper side of horizontal or sloping surfaces only to prevent loss of one air space due to sagging.

Procedure: Run sheets parallel to framing members covering two spaces or three studs. First, tack sheet securely along each edge. Second, loop sheet equally into each framing space and tack-nail along center members. Third, crimp sheets into curtain by running hands along framing members. Use large head tacks or stapling tacker. **Resistance Value:** 4.35

3 TYPE 'A' ONLY (SEE NOTE)

Uses: To construct curtains between framing members spaced 16" o.c. Metallation Type A tacked between framing members before finish is applied. Can be applied from either side of vertical surfaces. Usually applied from under side of horizontal or sloping surfaces.

Procedure: Crease bare paper edges of Type A sheet to fit between framing members. Nail to inside of framing members through lath or thin wood strips applied over bare paper edges of sheet. Leave not over 4" between ends of nailing strips. Use common nails sufficiently long to penetrate framing members. **Note:** Type B or C, (33" wide) slit along the center line, may be applied in this same manner. **Resistance Value** (Type A or B): 4.35

FIGURE 4 — TYPICAL COMBINATIONS

METHODS 1 and 2 — Resistance value 4.61

METHODS 2 and 2 — Resistance value 6.78

METHODS 1, 2 and 3 — Resistance value 7.05

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Bright metal insulation is one of the most discussed subjects in architecture and building. In order to provide you with the latest, authoritative data, we have prepared a Time-Saver Standards Sheet on Reynolds Metallation*, giving established facts about its efficiency and approved methods of installation. We are glad to offer copies of this Time-Saver Standards Sheet to all architects, so that their offices may be fully informed on the subject of this increasingly popular insulation.

In brief: Metallation provides permanent high-efficiency at very low cost; its insulating value is not impaired by moisture; it saves time and expense in heating or cooling a structure because of its low heat storage capacity. We believe that Reynolds Metallation, according to all known tests, gives more insulation per dollar than other materials. Its use leaves more dollars to be spent on other parts of the building. In these days of tight budgets it solves many a knotty problem.

If you are not enrolled to receive Time-Saver Standards as issued, use the coupon below or your letterhead for your copies of the Time-Saver Standards Sheet on Reynolds Metallation.

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public than for the architect, and that architects would be either blinded to its message by his denunciation of much that they were doing, or else so immersed in technicalities that its philosophy would be over their heads. In another letter to Smith, which bears no date but evidently was written a little earlier than the one just quoted, he writes:

"My dear Lyndon:

I should like to have the 'Kindergarten Chats' circulated as extensively as possible among the *laity*. The architects will not understand much of what is in them, but the laity, more open minded, will.

Please send to

E. C. Kelly
Mgr. Interstate Publishing Co.
Chamber of Commerce Bldg.
Cleveland, Ohio

as copious a list as you can of those who might be interested in reading these articles, and he can send them notices and a subscription blank. It is among the *people* that we want to work. The composition of the articles is going along merrily. I have written 27. In the 24th I get the 'young man' out of doors on a hot summer's day, and the *awakening* begins.

Let me know, from time to time your impressions of the articles, as they appear. How is everything with you and yours?

Truly,

Sullivan."

It is one of the tragic happenings of American architectural history that this series of articles should have been published in an obscure weekly technical paper which never enjoyed a large circulation. Its numbers have unaccountably disappeared, because, as far as I know, this set, in Lyndon Smith's scrapbook, and now in the Avery Library, is one of only two or three extant today; Lyndon Smith thought it a unique set.

Nevertheless, despite the comparatively small circulation which these articles enjoyed, their fame spread rapidly, and the "Kindergarten Chats" were almost a legend—as important and elusive as many legends—until the reprint of the series, edited by Mr. Claude Fayette Bragdon, was brought out by the Scarab Fraternity in 1934. It is noteworthy that in this reprint Mr. Bragdon felt himself called upon occasionally to moderate Sullivan's vituperations and to eliminate some of his puns and some of his slang. Just how far this modification went, only a word for word examination of the original would reveal. The changes are undoubtedly very minor and admirably fitted to make the articles more understandable today. On the other hand, to read them actually as they came, hot from Sullivan's imagination, puns, vituperation, and all, is an experience worth having. Whatever one may think of the quality of Sullivan's poetry, and however one may deplore certain narrownesses of appreciation and certain blindnesses to other types of architecture than his own, one can only admire the extraordinary vitality of the entire series. The wide sweep of its design, and especially Sullivan's deep feeling that architecture and human life, economically and politically, as well as culturally, were inevitably bound together—that to change one was to change the other—that was insight rare at the time. It is that which makes Sullivan the unique figure he is. The blindnesses and some of the vituperation were the results of a life of tragic conflict which neither Sullivan nor his opponents understood

Sloane-Blabon
AHOY!

Henry Davis III, Architect

Sloane-Blabon Linoleum, Azure Blue with Gray center circle and stars of Clear White, plays an important part in the decorative scheme of the club's lounge.

The Sloane-Blabon Linoleum floor in the bar, below, is particularly colorful. The largest area is Azure Blue; the wave effect, Clear White; the border, Burgundy.

IT goes without saying that a yacht club should have a nautical atmosphere. How well this has been achieved in the Tri-State Yacht Club at Essington, Pennsylvania, is shown in the accompanying photographs.

The officers of the club have been good enough to say the following about the contribution of Sloane-Blabon Linoleum to the attractiveness of these rooms:

"The smart and colorful appearance of the linoleum floor attracts all-comers and completes two extremely pleasing rooms. We are well satisfied with Sloane-Blabon Linoleum and the manner in which it stands up under hard wear."

We shall be glad to send you a list of other recent Sloane-Blabon installations together with our new, profusely illustrated Linoleum Handb ok. Write W. & J. Sloane, Selling Agents Division, 295 Fifth Ave., New York.

SLOANE-BLABON LINOLEUM

a tragic conflict which embittered and eventually destroyed him. The marvel is that out of such bitterness, out of such unhappiness, there could flow these vividly presented architectural truths and these almost orgiastic hymns to the power of nature.

Lyndon Smith was one of the few men who realized the implications of this series of articles to the full. On the next to the last page of the scrapbook, he wrote the following statement:

"The Series herein contained represents the views, philosophy and preachments resulting from many years of observation and study resulting again in eminent results of a 'practical' nature of a true *Master of Art.*

To the unbiased and receptive mind of the young, they can be of great value, a store house of intellectual and psychological lore; not to be read superficially but with a gradual awakening of normal moral life. To the elderly and experienced they speak with prophetic force.

I know of no other copy extant except possibly the original manuscript and its successive transcripts.

In case of my demise, it is my desire that this book be placed within the reach of students of Art, possibly in the Avery Library, Columbia, or similar abiding place of thought.

Lyndon P. Smith."

A more personal touch is given by his comments written on the last page, telling the story of Sullivan's visit to Palisades in a way sympathetic and deeply felt.

"The morning after S. arrived at Palisades, we went down the hill to Sneeden's Landing—the western side of Dobb's Ferry, N. Y. There, sitting on the frame of an old sailboat hulk, he thought out his final chapters. On returning home, he wrote out the synopsis (sic) opposite. The articles were written under vastly varying conditions and environment. In smoky Chicago—around the spots at Palisades—down in the Sunny South at his beautiful place in Ocean Springs, (see my Art, in Architectural Record 1905) and in varying moods.

While at my place, he was often at his best—many walks in the woods and drives down the Palisades and back into the country. It seemed as if it were the zenith of our friendship and lives.

He enjoyed his visit greatly—so did I.

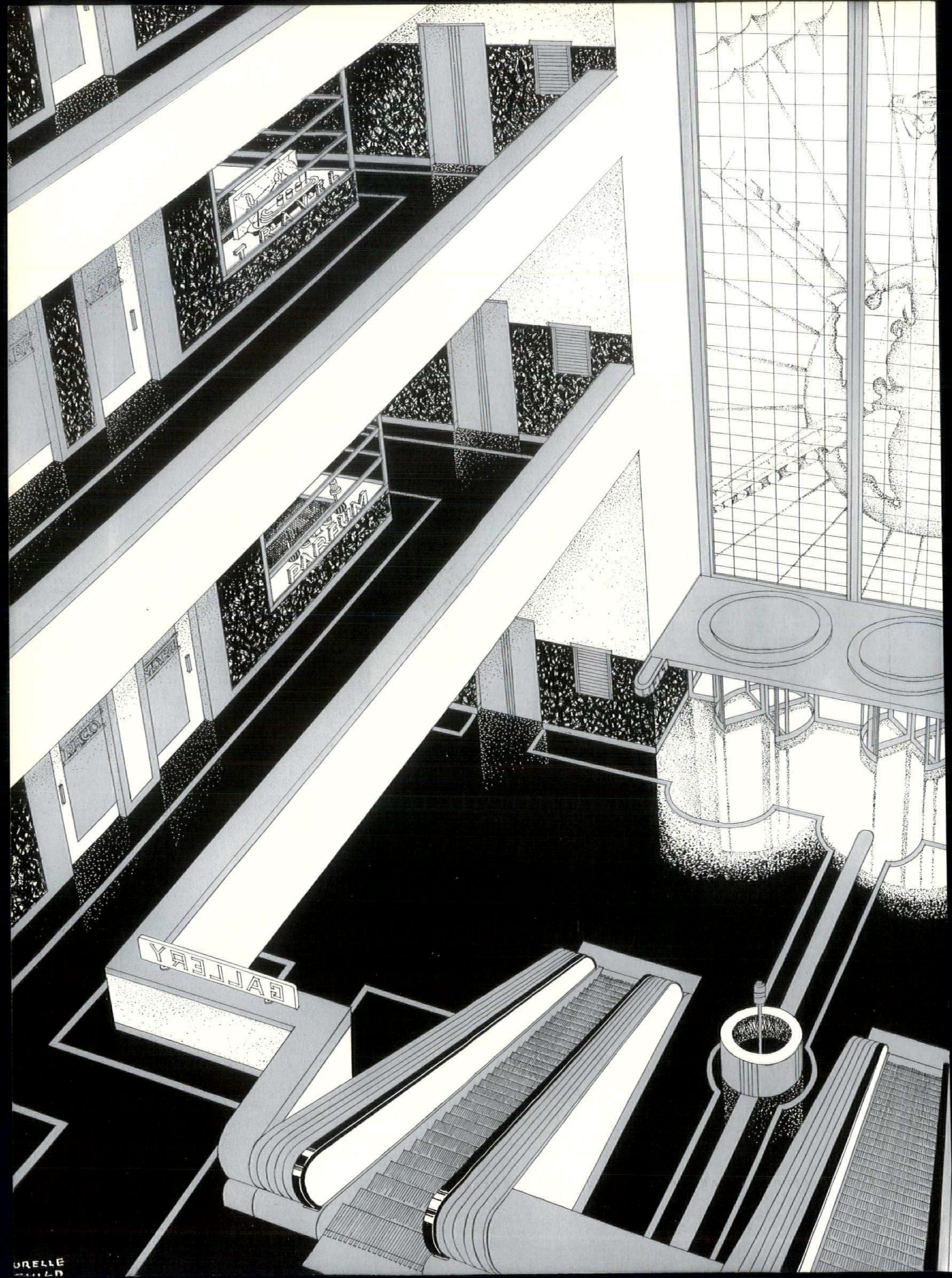
L. P. S."

It seems particularly fitting that as Lyndon Smith wished, this scrapbook has finally come to rest on the shelves of the Avery Library, to take its place with the other expressions of great architectural thinking there enshrined.

KELVIN BUST FOR SMITHSONIAN

A bronze bust of Lord Kelvin of Largs, Nineteenth Century British physicist, commonly known as the "father of modern refrigeration and air conditioning," was recently presented to the Smithsonian Institution by officials of the English-Speaking Union.

The gift was made possible through the generosity of George W. Mason, president of the Kelvinator Corporation, who was among the prominent guests who gathered to do honor to the great scientist whose name is identified with the Kelvinator, first electric refrigerator for household use; the kelvin, a commercial unit of electricity; Kelvin's law for measuring the most economical diameter of an electric wire; and Kelvin, or Absolute, temperature scale.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REG. U. S PAT OFF.

ALCOA ALUMINUM

HOUSE BEAUTIFUL AWARDS

The judgment of the 9th Annual House Beautiful Small House Competition was completed last month. In addition to the usual awards was a special prize this year for a week-end house. The judges were Kenneth Kingsley Stowell, Editor of House Beautiful; Ethel B. Power, author; Andre Fouilhoux, architect of New York; Pope Barney, architect of Philadelphia; and H. F. Hentz of Hentz, Adler and Shutze, architects of Atlanta.

The winners in Class I (houses east of the Mississippi) were—

1st—Perry M. Duncan, New York City
Graham Edgar House, Bronxville, N. Y.
2nd—Hunter McDonnell, New York City
Norman Kadison house, White Plains, N. Y.
Honorable Mention—Edwin M. Loye, Bronxville, N. Y.
Raymond A. MacDonald house, Scarsdale, N. Y.
Honorable Mention—Royal Barry Wills, Boston, Mass.
House in Revere, Mass.

The winners in Class II (houses west of the Mississippi) were—

1st—William Wilson Wurster, San Francisco, Cal.
Edwin S. Berry house, Santa Cruz, Cal.
2nd—Frederick L. R. Confer, Berkeley, Cal.
Mr. & Mrs. W. H. Hall house, Sausalito, Cal.
Honorable Mention—Wallace Neff, Hollywood, Cal.
Robert F. Garner, Jr. house, San Marino, Cal.
Honorable Mention—William Wilson Wurster, San Francisco, Cal.
Mr. & Mrs. Forest Naylor house, Oakland, Cal.
Honorable Mention—Winchton L. Risley, Los Angeles, Cal.
Nelson Wheeler house, Pasadena, Cal.

The winners in Class III (week-end houses) were—

1st—Gardner A. Dailey, San Francisco, Cal.
William Lowe, Jr. house, Woodside, Cal.
Honorable Mention—(1) Harwell Hamilton Harris, Los Angeles, Cal.
House at Fellowship Park, Los Angeles, Cal.
(2) Donald Beach Kirby, Balboa Island, Cal.
Mr. & Mrs. Fred Pease house, Balboa Island, Cal.
(3) William Wilson Wurster, San Francisco, Cal.
Miss Diantha Miller house, Carmel, Cal.
(4) William Wilson Wurster, San Francisco, Cal.
Frank McIntosh house, nr. Los Altos, Cal.

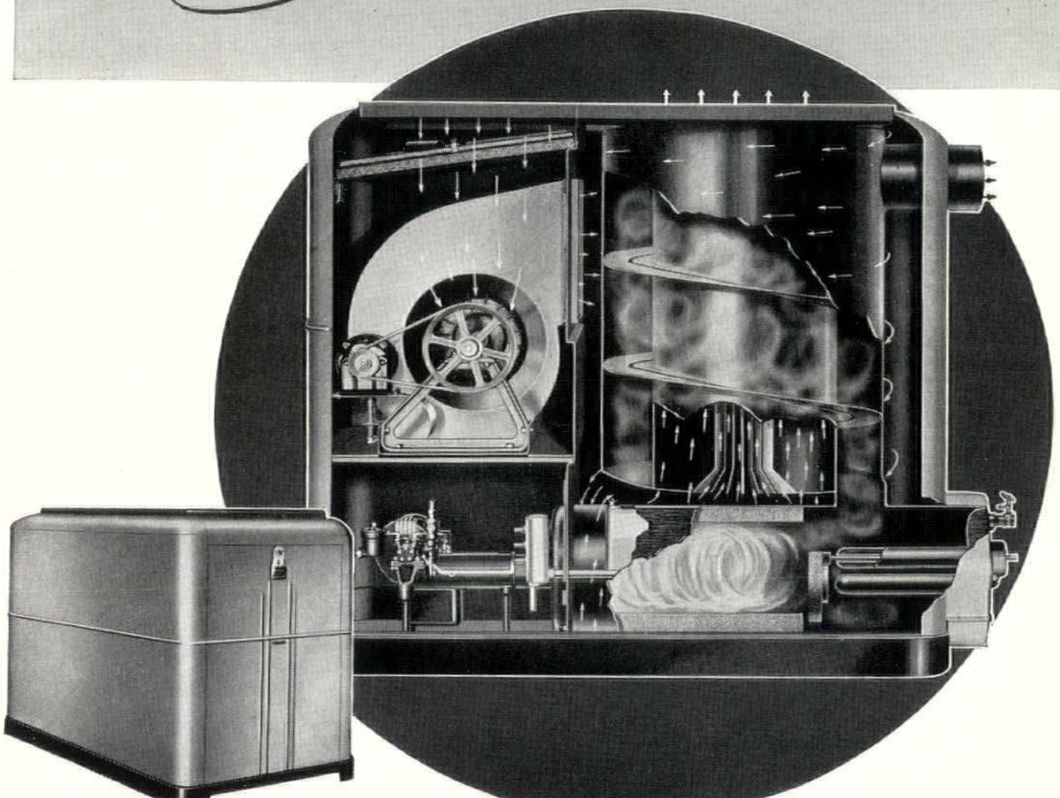
ANNOUNCEMENTS

Don Uhl, Architect, announces the removal of his office to 183 N. Martel Avenue, Los Angeles, Cal.

James B. Hawkins and William A. Netherland, Architects, announce that they have dissolved partnership. Mr. Netherland will continue his practice at the former location, and Mr. Hawkins has opened an office at 405 Elsby Building, New Albany, Ind.

E. Burton Corning, Architect, announces the removal of his office to 1640 Connecticut Avenue, N. W., Washington, D. C.

Gerald S. Adelman announces the opening of an office at 104 S. Michigan Ave., Chicago, for the practice of architecture and is interested in manufacturers' catalogs.



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DOUBLE FEATURE, STARRING 'INCOR'

Perhaps you are facing the same kind of problem which John Eberson, New York architect, solved last Fall in completing Washington's new Penn Theatre. Behind-schedule construction and approaching cold weather, with its concrete frost-hazard, meant overtime and costly heat-protection to the contractor—delayed opening date and lost revenue to the owner. Mr. Eberson got both parties together, and they decided to use 'Incor' 24-Hour Cement for the all-concrete balcony, with its inclined beams and supporting risers, 20-foot cantilevered span.

District of Columbia Code specifies 21-day shore removal in fall and winter. 'Incor' test cylinders, job cured at 51° by building inspector, averaged 5-day strengths of 2160 lbs.—exceeding the 28-day requirement with ordinary cement. Result, riser forms stripped in 4 days, beams in 6 days. Total of 15 days saved by using 'Incor', theatre opened on time, owner's revenue protected.

A 15-day time saving, with job overhead $50 a day, means a $750 cash saving, and 'Incor' also saves costly heat-protection, because it is self-supporting, safe from frost-hazard, in one-fifth the usual time. An important two-way saving, which suggests that architects consider the economy of changing to 'Incor' on jobs now in progress. Write for free copy of new book, "Winter Construction" —address Lone Star Cement Corporation, Room 2211, 342 Madison Ave., New York . . . 'Incor'* and Lone Star Cement sales offices in principal cities.

*Reg. U. S. Pat. Off.

'INCOR' 24-HOUR CEMENT

NEW CATALOGS...

Readers of AMERICAN ARCHITECT and ARCHITECTURE may secure without cost any or all of the manufacturers' catalogs described on this and the following page by mailing the prepaid post card printed below after writing the numbers of the catalogs wanted. Distribution of catalogs to draftsmen and students is optional with the manufacturers

Weatherstrips

1. . . . Complete information on standard methods of equipping wood or metal windows and doors with Chamberlin Metal Weatherstrips is contained in a new 24-page catalog (Fifth Edition) issued by Chamberlin Metal Weatherstrip Co., Inc., Detroit. Filing size; A. I. A. File 35-P-6.

Air Conditioning

2. . . . National Air Conditioning Inc., Johnstown, Pa. offers a new 12-page booklet which discusses the functions of air conditioning equipment and describes the construction and operation of three basement-type "packaged weather" units for homes and small buildings. Photographs and diagrams of the units are followed by typical installation plans and recommendations for estimating the size and type of units, ducts, etc. Filing size; A. I. A. File 30-F-1.

Ice Skating Rinks

3. . . . Bulletin No. 198-C issued by Frick Company, Waynesboro, Pa., gives helpful data on the construction of indoor ice skating rinks. Floor piping, insulation, type of floor to use, temperature regulation, and refrigerating equipment are all discussed.

Convectors

4. . . . The Smith Convector is illustrated and described in an 8-page filing-sized catalog (A. I. A. File 30-C-4) issued by The H. B. Smith Company, Westfield, Mass. Dimensions, steam and water ratings, and description of standard enclosures are included.

Kitchen Cabinetry

5. . . . Various types of kitchen-cabinets and package units manufactured by Kitchen Maid Corp., Andrews, Indiana, are illustrated and briefly described in a 12-page catalog just published. The three standard types of kitchen arrangements are illustrated in plan. A supplement gives details and dimensions of the various units. Filing size; A. I. A. File 35-C-12.

Insulation Wallboard

6. . . . A new 12-page catalog describing the merits of Fir-Tex Insulation Board and its use as a plaster base or interior finish and for soundproofing has been issued by Dant & Russell, Inc., Portland, Oregon.

Anti-Vibration Products

7. . . . The opening section of a new 16-page booklet issued by the Korfund Co., Inc., Long Island City, N. Y. contains a discussion of the elementary considerations of vibration control. The following sections are devoted to illustrations and descriptions of Korfund products, including natural cork plates, Seismo-Damper Type-T, and standard and special Vibro-Dampers.

Home Furnaces and Air Conditioners

8. . . . A new bulletin (No. 591) issued by Carrier Corp., Newark, N. J., describes typical applications, combinations, operation cycle, ratings and capacities of Carrier Home Air Conditioners and Carrier Home Furnaces for oil or gas burning. Detailed specifications are also given. Brief data on Carrier Oil Burners are included. Filing size; A. I. A. File 30-F-1.

Toilet Partitions

9. . . . The Sanymetal Products Co., Inc., Cleveland, Ohio, has published a 12-page, filing-sized catalog illustrating and describing Porcena (porcelain enameled) Toilet Partitions and Wainscot Panels. Detail drawings and specifications are included.

Red Cypress

10. . . . Florida Louisiana Red Cypress Co., Jacksonville, Fla., has issued a sixteen-page, filing-sized catalog which discusses the advantages and uses of Arrow Brand Tidewater Red Cypress in building construction.

Lime

11. . . . A comprehensive summary of the manufacture, usages and differentiation of the kinds and types of lime used in building construction, industry and agriculture is presented in a 48-page booklet issued by United States Gypsum Co., Chicago.

Heating Accessories

12. . . . Five new circulars on Ideal Arco Accessories have been released by American Radiator Co., New York. These pertain to air, vacuum and vent valves; direct and indirect heaters for domestic hot water; regulators and controls for steam, water and vapor; packed and packless radiator valves; and Thrush and McDonnell-Miller products.

Lighting Equipment

13. . . . Catalog No. 903 recently published by The Miller Company, Meriden, Conn. covers the complete line of Ivanhoe metal reflectors and fittings for industrial lighting. Ivanhoe fixtures and glassware for commercial lighting, and I. E. S. type better sight lamps manufactured by this company. Containing over 136 pages, this booklet gives descriptions, dimensional data, applications and prices. Filing size, A. I. A. File 31-F.

Shielded Arc Pipe Welding

14. . . . The advantages of using shielded arc welding for installing piping are discussed in a new 12-page bulletin issued by The Lincoln Electric Company, Cleveland, Ohio. Numerous illustrations of typical installations are shown.

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AMERICAN ARCHITECT and ARCHITECTURE November, 1936

New York, N. Y.

Please have the following catalogs reviewed in this issue sent to me.

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Concrete Joist Construction

15. . . . A handbook of useful data for the proper specification and design of concrete joist construction has been issued by Concrete Reinforcing Steel Institute, Chicago. This 28-page booklet contains a complete set of safe load tables for both 20" and 30" wide forms in depths ranging from 6" to 14", enabling the designer readily to select the total depth of floor and the number and size of reinforcing bars required for a given combination of load and span. Filing size; A. I. A. File 4-E-5.

Folding Partitions

16. . . . . A new four-page folder issued by American Car & Foundry Co., New York, illustrates several typical projects which have used the A. C. F. Unitfold Folding Wall and describes its features. Specification data are included. Filing size; A. I. A. File 19-E-61.

Unit Heaters

17. . . . A new revised publication (Bulletin 46-E-1) covering Kroy Type Unit Heaters has been issued by Carrier Engineering Corp., Newark, N. J. It illustrates and describes the unit, explains its application, and gives dimensions, ratings and specifications.

Air Circulators

18. . . . An 8-page catalog illustrating and describing all types of Emerson Air Circulators and the different styles of mounting has been released by The Emerson Electric Mfg. Co., St. Louis. Diagrams and helpful installation suggestions are given.

Resilient Floor Tile

19. . . . Standard specifications and an approved method for installing Dee-Gee Floor Tile are contained in a four-page folder issued by Paul Coste, Inc., Providence, R. I. Filing size; A. I. A. File 23-C.

Automatic Coal Burner

20. . . . Descriptive data and illustrations on the Anchor Kolstoker for residences are contained in Bulletin 16-B-36, a sixteen-page catalog issued by Anchor Stove & Range Co., Inc., New Albany, Ind. The Heavy Duty Industrial Models are also briefly described and illustrated.

Propeller Fans and Blowers

21. . . . Complete specifications on on Ilg self-cooled motor propeller fans and Ilg Universal blowers for ventilation and air conditioning are contained in the 64-page Catalog FB-45 issued by Ilg Electric Ventilating Co., Chicago. Filing Size; A. I. A. File 30-D-1.

Steel Boilers

22. . . . General Catalog No. 80 issued by Kewanee Boiler Corp., Kewanee, Ill., contains Simplified Practice Ratings for the complete line of Kewanee Firebox Boilers. Included are data on Firebox Riveted Boilers in the up-draft and smokeless type, Type "C" Welded Boilers for coal, oil, gas or stoker firing, Square and Round Type "R" Residence Boilers, Tabasco Water Heaters, Water Heating Garbage Burners and Tanks.

Sheathing

23. . . . Angier Corporation, Framingham, Mass., has published a four-page folder which describes Copper-Faced Brownskin, a flexible sheathing and insulation for residential construction, and illustrates some of its applications. Filing size; A. I. A. File 7.

Ventilation

24. . . . A non-technical discussion of ventilation for industrial and commercial buildings is contained in Bulletin V-100-B, a 16-page booklet issued by The Swartwout Co., Cleveland, Ohio. Illustrations and descriptions of the Swartwout Rotary Ventilator and the Swartwout-Dexter Heat Valve are included.

Asphaltic Tile Flooring

25. . . . An eight-page catalog issued by Armstrong Cork Products Co., Lancaster, Pa., gives data on Armstrong's Accotile flooring. Colors available are shown in natural reproduction. Data on gauges, sizes and accessories are included.

Septic Tank

26. . . . Complete details about the Mallory Concentric Syphon Septic Tank, a scientifically designed sewage disposal system for suburban and rural homes, schools, etc., are given in Bulletin M issued by Lancaster Iron Works, Inc., Lancaster, Pa. Filing size; A. I. A. File 29-C-21.

Pipe

27. . . . Data on dimensions, capacities, weights and properties of Grinnell wrought iron and steel pipe, Arco cast iron pipe, seamless steel boiler tubes, seamless tubing, are contained in Catalog No. 1 issued by Grinnell Co., Inc., Providence, R. I. List prices and specifications are also given.

Hardware

28. . . . A series of cards is available from Sargent & Co., New Haven, Conn., illustrating the Lord Leicester line of hardware. The Lord Essex line, the Warrenton line and Georgian Colonial brass rim locks are described and illustrated in three small brochures. Dimensional data and list prices are included.

Wood Preservative

29. . . . Technical Bulletin No. 6 issued by Western Pine Association, Portland, Oregon, pertains to Permatol, a new preservative treatment for sash, doors, frames and other exterior millwork.

Process Control

30. . . . The Brown Instrument Co., Philadelphia, has just published a new catalog (No. 8901) on Brown Air Operated Controllers for the control of temperature, pressure, flow and liquid level. It explains the principle of operation of these units and contains many helpful diagrams illustrating their construction.

Porcelain Enameled Signs

31. . . . Historical and background information regarding porcelain enamel and porcelain enameled signs is presented in a 16-page, filing-sized booklet issued by Porcelain Enamel Institute, Inc., Chicago. It tells how they are made and contains a summary of their uses and advantages. The booklet is profusely illustrated.

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NO matter how *you* feel about details of the Colonial as compared with the modern, you need a pencil with a sensitive "feel" to do justice to either. Pick up certain pencils and you know before the end of the first line that things aren't going well—and won't get better. Pick up a Microtomic Van Dyke and use solely an F grade if you choose, as was done for the entire drawing above (reproduced actual size), and at once sense what may be termed a "facile point." The wood whittles easily. The lead wears down slowly. Best of all the lead is so strong that when bearing down hard, as with an F Microtomic to get good blacks, the point will neither crumble nor grumble. If you want to be able to concentrate on the drawing and never give the pencil a thought, Microtomic Van Dykes are the most obvious solution.

MICROTOMIC VAN DYKE
EBERHARD FABER

BOOKS

TRINITY CHURCH IN NEWPORT, RHODE ISLAND. By Norman Morrison Isham. 111 pages, 7¾ by 10¼ inches. Illustrations from photographs and drawings. Boston: 1936: D. B. Updike, The Merrymount Press. $5.

Here is the architectural history of the church fabric of the oldest parish in Rhode Island. Its importance in exemplifying the strength of Sir Christopher Wren's work in influencing our early meeting houses, well warrants the scholarly treatment afforded it by Norman Morrison Isham. Mr. Isham has come to be regarded as the outstanding authority on the early architecture of his State, and this particular subject seems to have enlisted his most painstaking study and research. The first church, 1701-1726, was replaced by a second structure, 1725-1762, which was lengthened and otherwise altered to its present form. Incidentally, D. B. Updike has given the volume a typographical dress worthy of its subject matter.

SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS. Revised 1936. 26 pages, 8½ by 11 inches. Illustrations from graphs. Pamphlet binding. New York: 1936: American Institute of Steel Construction. Single copy gratis, variable prices in quantities.

This booklet is the result of an authorization, by the Board of Directors of the American Institute of Steel Construction, of a committee to review the Institute's standard specification. After two years' work, the committee has completed its task, and the specification now printed was officially adopted by the Board June 24, 1936. It recognizes, of course, the increase of basic unit stress from 18,000 to 20,000 pounds per square inch.

FROM FOREST TO FURNITURE. The Romance of Wood. By Malcolm H. Sherwood. 284 pages, 5½ by 8½ inches. Illustrations from photographs. New York: 1936: W. W. Norton & Co., Inc. $3.

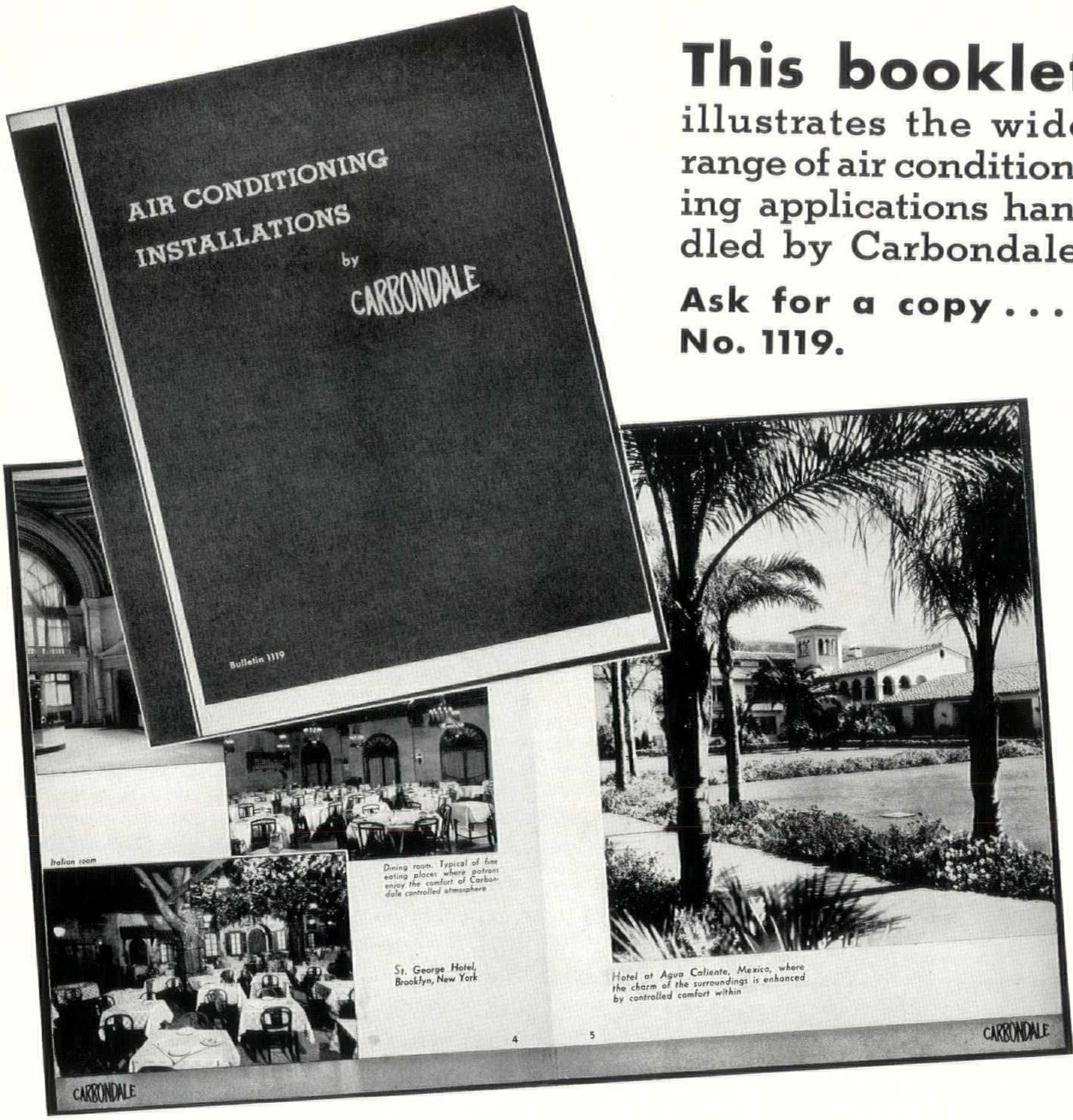
The word "romance" in the title is significant. Here will be found no records of stresses and strains, manufacturing processes and grading rules. The author is interested in telling the story of where the many varieties of wood originate, finding their way eventually into our furniture, our paneling, and wall veneers. To make up for his romanticism, he appends a table of condensed data, listing sixty woods, their commercial sources, botanical names, color, and one or two other significant facts.

PAPERS PRESENTED AT THE FIRST ANNUAL CONFERENCE ON AIR CONDITIONING. Held at the University of Illinois May 4 and 5, 1936. 154 pages, 6 by 9 inches. Illustrations from photographs and diagrams. Pamphlet binding. Urbana, Ill.: 1936: Engineering Experiment Station. 50 cents.

Here is a wide range of detail and discussion regarding air conditioning in a comparatively non-technical manner. There is no attempt to discuss the many phases of industrial air conditioning bound up with the manufacture of many commercial products. Each of the papers was presented by a technician recognized as an authority on the subject of which he wrote.

PLANNING NEIGHBORHOODS FOR SMALL HOUSES. Technical Bulletin No. 5. 32 pages, 6 by 9¼ inches. Illustrations from drawings. Pamphlet binding. Washington, D. C.: 1936: Federal Housing Administration.

The principles involved, and the methods of achieving a proper plot plan for residential communities, the governing principles of thoroughfares, culs-de-sac and street patterns generally, are set forth in succinct text and diagrams.



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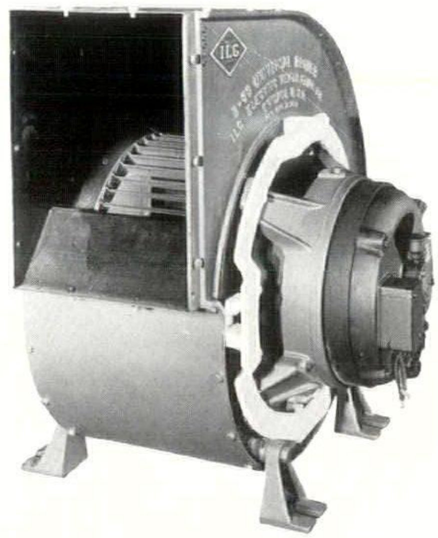
TECHNIQUES

METHODS • MATERIALS • RESEARCH • PRACTICES

BONDING RESIN FOR VENEERS AND PLYWOOD

A new synthetic resin, developed for use in the production of superior grades of plywood and other laminated products, has recently been placed on the market. This material, termed "Catabond," is practically colorless and can be used as a bonding material between the different plies as well as a surface coating. Both operations are performed at the same time during the hot pressing of the plywood or veneer. Catabond is said to be waterproof, weatherproof and highly resistant to washing and to injury by fungus growth, insects and the like. It can be applied in bonding wood that has been rendered fireproof by salt or other impregnation and in bonding wood or other materials to such composition fireproof boards as Transite and Masonite. The resin itself is said to be non-inflammable and resistant to heat up to temperatures at which wood itself is injured. Forming a transparent and practically colorless film when it is applied to wood prior to curing, it is said to take the place of lacquer or varnish and the grain of the wood is brought out in the same way. If a colored surface is required, the wood may be stained or pigment can be mixed with the liquid resin when it is applied. Catabond is produced and marketed by American Catalin Corp. **684M**

AIR-CONDITIONING



BRACKET FOR QUIET BLOWER

The development of a sound and vibration dampening device for a direct-connected blower has been announced by Ilg Electric Ventilating Co., Chicago. This new mechanism, known as a "floated drive bracket" is intended for use on Ilg direct-connected blowers in those installations where extra precautions must be taken in the maintenance of unusual quietness of operation. The standard motor bracket is mounted on a second floating bracket which is insulated from the blower housing to which it is secured by flexible rubber cushions. There is no metal to metal contact between this floated drive bracket and the blower housing. It is claimed that due to the Ilg method of direct connection in which the blower wheel is mounted directly on the motor shaft, permitting the isolation of both motor and wheel as a single unit when using the Ilg floated drive, maximum quietness is assured. **685M**

FLOOR AND CEILING PLATES

Floor and ceiling plates, made especially for copper pipe sizes to give a finished appearance to pipe lines where the pipe is run into the wall, floor or ceiling, are now available through American Radiator Company, New York. Made with a non-tarnish chrome finish, the floor and ceiling plates employ a special spring that holds the plate in place without noise. **686M**

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the latest in

WINDOWS

for

Homes of Moderate Cost

as well as for

Towering Buildings

in

BRONZE *or* **ALUMINUM**

by

GENERAL BRONZE

A SMALL RESIDENCE can now include windows of quality by General Bronze.

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Cass Gilbert, Architect

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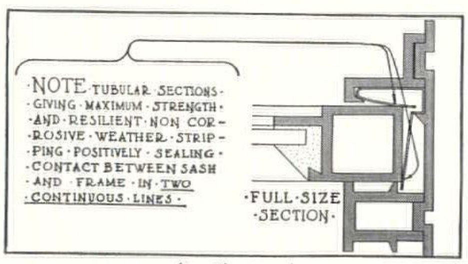

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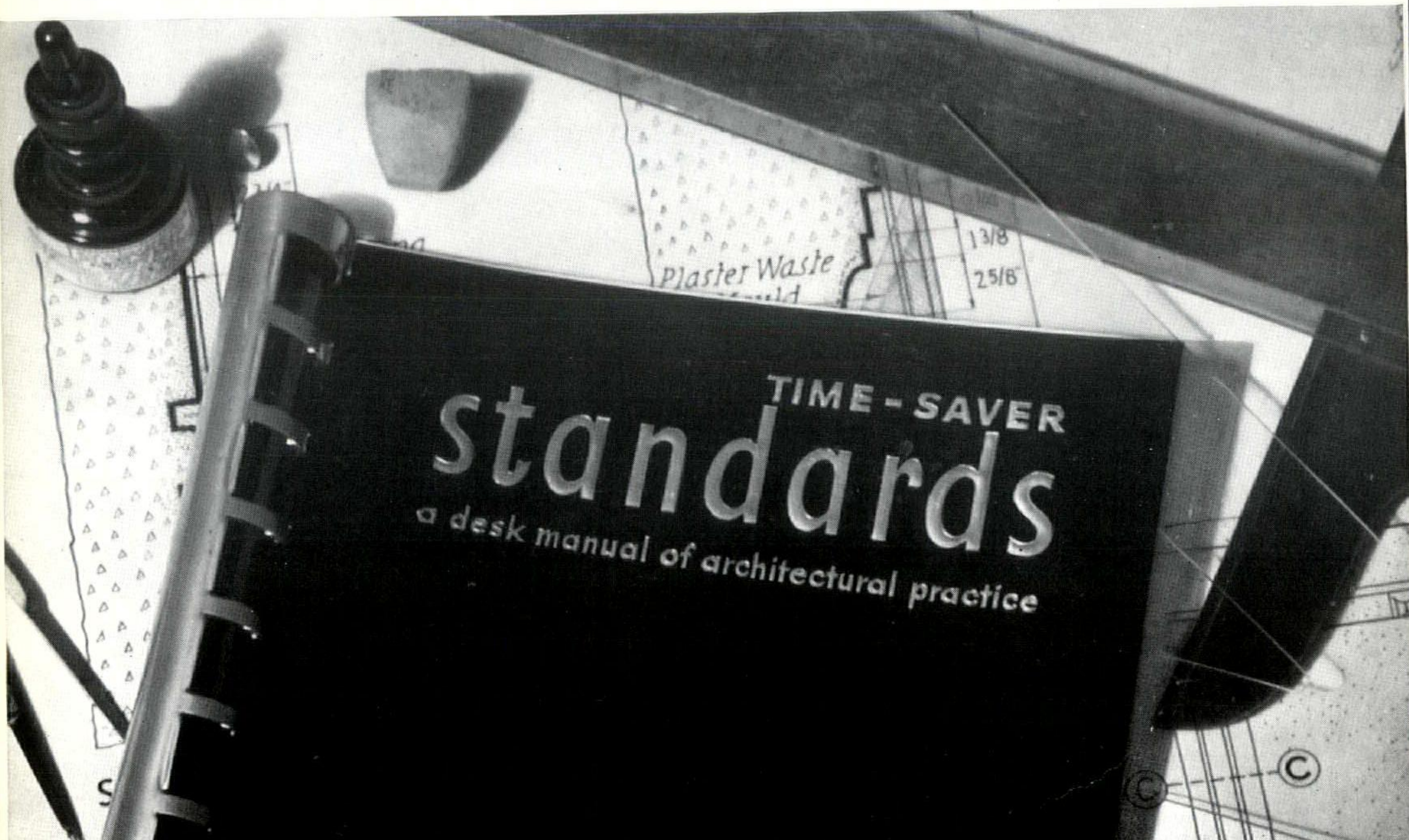

N OCTOBER, 1935, American Architect announced the inauguration of TIME-SAVER STANDARDS ervice. Within twelve months more than 6,000 architects, engineers, designers, specification writers and other en responsible for the selection of hundreds of millions of dollars worth of building material and equip- ent, have applied for and have been enrolled to receive these TIME-SAVER sheets.

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PLANNERS

Manufacturers find TIME-SAVER STANDARDS equally valuable. They decrease sales costs, increase pres- ge and acceptance, create confidence, save time. Among the companies for whom our Technical Service aff has prepared TIME-SAVER STANDARDS are General Electric, Westinghouse Electric, Electrolux, ay Oil Burner, Revere Copper and Brass, Reynolds Corporation, Western Red Cedar Lumber. Under con- act are Crane, Otis Elevator, American Radiator, International Nickel.

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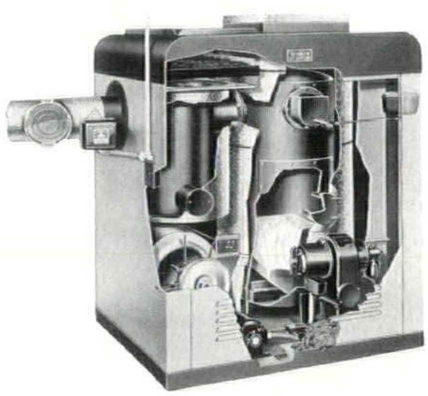
WINTER AIR CONDITIONING FURNACE



A new type of low-cost winter air conditioning oil furnace features a chromium steel fire-box used in conjunction with a pressure oil burner. This metal fire-box replaces the usual brick or cast refractory. The bottom and all of the sides of the combustion drum are used as heating surfaces. The unit is designed on the "counter-flow" principle, which enables air passing through the unit to absorb maximum heat. The air passes over increasingly hotter surfaces so that the hottest air contacts the hottest part of the furnace just before leaving the unit. The cabinet is of heavy gauge steel, finished in baked green lacquer. Controlled moisture supply is made possible through the use of a humidifier equipped with an automatic water supply mechanism. The unit has a capacity of 80,000 Btu at the registers and can deliver from 800 to 1200 cubic feet of air per minute. It is made by The Timken Silent Automatic Division of The Timken-Detroit Axle Co., Detroit. **688M**

HEAT

OIL HEATING BOILER

The National 018 Series Oil Heating Boiler, recently introduced by the National Radiator Corp., Johnstown, Pa., is especially designed for automatic heating with the use of oil as a fuel and is equipped to furnish year-round domestic hot water supply without any auxiliary hot water heating equipment being required. The boiler is of cast iron construction with a 42-inch waterline carried through the top nipple ports. Extended heating surface, in the form of fins, is provided on the crown, waterlegs and flue chambers of the sections which provide a four-pass fire travel. The back section of the boiler is flanged to accommodate either of two sizes of storage type built-in hot water heating coils or an instantaneous type coil heater. A 40-gallon storage type coil is furnished as standard equipment. Cleanout and access doors are immediately removable, and lock into ground seats upon replacement. Both have cast-iron liners and are heavily insulated. The jackets, designed by Lurelle Guild, are finished in baked enamel. **689M**

CONSTRUCTION

LAMINEX STREAMLINER DOOR

The Laminex Streamliner Door is manufactured with plain panel surfaces of 3-ply Douglas fir or Philippine mahogany. The rigidly braced hollow core is said to provide strength with light weight. It has a series of channels, screened at exterior openings, allowing thorough circulation of air for resistance to warping effects of moisture and temperature changes. Laminex cement is used in this new type door to provide a permanent, moisture-proof bond. The surface of the Streamliner Door can be painted or stained. Virtually any arrangement of panel effects can be obtained, and routed and inlaid designs are provided. A Streamliner Cupboard Door, built on the hollow-core principle, is also available. Both doors are a recent development of Wheeler, Osgood Sales Corp., Tacoma, Wash.

OBITUARIES

Edwin Howland Blashfield, dean of American mural painters, died recently at the age of 87 years at his home in South Dennis, Mass. Mr. Blashfield was for 38 years President of the National Academy of Design. He was born in New York, son of William Henry and Eliza Dodd Blashfield. He attended the Boston Latin School. Mr. Blashfield began the study of art in Paris under Léon Bonnât in 1867. He remained in Paris for thirteen years exhibiting annually from 1874 to 1879 in the Paris Salon. Mr. Blashfield, upon his return to this country, became an easel painter until early in the 90's when he turned to murals. In 1892 he was commissioned by the City of Chicago to paint murals for the Columbian Exposition of 1893. Along with seven other artists including Kenyon Cox, Carrol Beckwith, Walter Shirlaw, Stanley Reinhard, Julian Alden Weir, Edward Simmons and Robert Reid engaged in designing murals of the same project, Mr. Blashfield turned out his paintings in six weeks. These men were the first important American muralists, since the only fine work of this nature done previously had been by John Lafarge and William Morris Hunt, but after the Exposition in which, incidentally, the paintings were destroyed by fire, there became an increased demand for mural work. From then on the road to fame was clear for Mr. Blashfield. Other of his important works include the central dome of the Library of Congress in Washington; decorative panels in the Bank of Pittsburgh, Lawyers Club, New York; the library of the town house of G. W. C. Drexel, and the supper room of the New York house of W. K. Vanderbilt; the Appellate Court of New York and a ceiling (and three lunettes) in the board room of the Prudential Life Insurance Company of Newark, N. J. He also decorated a room in the house of Adolf Lewisohn, New York; two lunettes in the Senate Chamber of the State Capitol of Minnesota; a panel in the State Capitol of Iowa; the decorations in the chancel of the Church of the Saviour, Philadelphia; the four main pendentives of the dome of the new Court House in Newark, N. J.; a symbolic decoration in the Great Hall of the College of the City of New York; murals in the State Capitol in Madison, Wisconsin; the Court House and the Federal Building in Cleveland, and a decoration in the State Capitol of South Dakota. In 1911 he received a gold medal of honor from the Architectural League of New York for his four pendentives in the Court House in Youngstown, Ohio. Mr. Blashfield was a member of the Society of Mural Painters; the Architectural League and the American Academy of Arts and Letters. He was President of the National Institute of Arts and Letters in 1915-16 and received its gold medal in 1923; he was vice president of the American Federation of Arts, president of National Academy of Design and member of the Federation of Fine Arts of New York. He was also an honorary member of the American Institute of Architects and also former president of the Society of American Artists. He lectured extensively on art, notably at Columbia, Yale and Harvard Universities. Among his many other awards were a bronze medal from the Paris Exposition in 1900; a gold medal from the St. Louis Exposition, 1904; a medal of honor of the New York Architectural League; the Carnegie Prize of the National Academy of Design, 1911, and the gold medal of the National Institute of Arts and Letters, 1923.

(*Continued on page* 124)

Finley Forbes Ferguson, architect, died recently at his home in Norfolk, Va. He was 60 years of age. He attended Hampden-Sydney College and the Massachusetts Institute of Technology. He began practicing architecture in Norfolk in 1899. In 1917 he became a member of the firm of Peebles & Ferguson. Mr. Ferguson was responsible for the plans of the Virginia Museum of Fine Arts, Phi Beta Kappa Memorial Hall and Grace Covenant Presbyterian Church in Richmond and Ghent Methodist Church, First Presbyterian Church and Obef Sholon Temple in Norfolk. He was a member of the advisory committee of architects on restoration work in Williamsburg, Va., a trustee of Norfolk Academy; a member of the board of the Norfolk Public Library and the Norfolk Society of Arts.

Lee D. Miller, Deputy Commissioner of Hospitals in New York, and head of the department's architectural-engineering force died recently at his home in Croton, N. Y. He studied architecture at the University of Pennsylvania, engineering at Columbia, and building laws at New York University. Before entering the service of New York City, he was for five years superintendent of construction of public buildings in Minneapolis. Under his direction, the Department of Hospitals developed a capital outlay program which calls for an expenditure of more than $50,000,000. He was also in charge of the work of WPA architects and engineers working on plans for 600 alteration projects estimated to cost $12,000,000. Mr. Miller was a member of the American Institute of Architects.

Frederick T. Labouisse, architect and etcher, died recently in Ellsworth, Maine. Mr. Labouisse was 28 years old, a graduate of St. Mark's School and later a special student at the School of Fine Arts at Yale University.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of AMERICAN ARCHITECT AND ARCHITECTURE, published monthly at New York, N. Y., for Oct. 1, 1936.

State of New York }
County of New York } ss.:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared R. F. Gardner, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the American Architect and Architecture and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Hearst Magazines Inc., 959 8th Ave., New York City. Editor, Kenneth Stowell, 572 Madison Ave., New York City. Managing Editor, Carl Maas, 572 Madison Ave., New York City. Business Manager, R. F. Gardner, 572 Madison Ave., New York City.

2. That the owner is: Hearst Magazines Inc., 959 8th Ave., New York City. Sole Stockholder, The Hearst Corporation, 100 West 10th St., Wilmington, Del. Sole Stockholder, American Newspapers, Inc., 100 West 10th St., Wilmington, Del. Sole Common Stockholder, W. R. Hearst, 111 East 57th St., N. Y. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

R. F. GARDNER,
Business Manager.

Sworn to and subscribed before me this 21st day of September, 1936.

[Seal.] REGINALD WEST,

Notary Public, Queens County, No. 2516, Reg. No. 2518. Cert. filed in N. Y. County, No. 518. Reg. No. 8W312. Commission expires March 30, 1938.

New **SCRIBNER** Books

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by

MALVINA HOFFMAN

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Art, science, travel, adventure and humanity are superbly combined in this absorbing autobiography of an internationally famous American sculptress whose fascinating life story leads the reader from the sidewalks of New York, through the studio of Rodin, to South Sea island jungles and golden cities of the Orient. Much of the book is devoted to Miss Hoffman's amazing world-wide quest for the racial types that now appear in the bronze statues of the Hall of Man in the Field Museum in Chicago. The 128 pages of illustrations rival the brilliant text in interest. $5.00

English Church Screens

Being Great Roods, Screenwork and Rood-Lofts of Parish Churches in England and Wales

by **Aymer Vallance**
F.S.A.

•

This complete and authoritative work by one of England's leading authorities on ecclesiastical art and architecture will, without doubt, become the standard work on the subject. Profusely illustrated, there are more than 250 pictures in black and white and a number of color plates. $10.00

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by

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Seventy selected modern English homes falling within the $2500 to $7500 price range are fully described and illustrated with photographs and floor plans by the famous author of "Small Family Houses." Many styles including modern, Georgian and cottage style are presented to give a complete picture of the English small houses being built today. $2.75

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Extra Comfort That Costs Nothing!

RED TOP INSULATING WOOL

pays for itself in savings on fuel

■ For the architect Red Top Insulating Wool comes very close to being the perfect insulation. It combines tremendous efficiency with low cost . . . lets the architect get the results he knows are best at a price the client can pay. A four-inch thickness has eight to ten times the efficiency of typical half-inch insulations. And the cost installed is low, so low that Red Top soon pays for itself in fuel saved.

FIREPROOF PERMANENT. There is no other insulation quite like Red Top Wool. It is unique in its light weight . . . only eight ounces per square foot four inches thick . . . in its life, its resiliency and in its clean white appearance. Red Top stays in place to give long and efficient service. It is genuine wool, made of long staple fiber free from shot and other non-insulating impurities. It is fireproof, vermin proof, permanent.

A PRACTICAL INSULATION. Not a one purpose insulation, Red Top helps to solve many problems . . . insulation of the new home, reconditioning the old home, economical use of automatic heat, reduction of fuel costs in homes expensive to heat and always the achievement of comfort summer and winter.

USG

SPECIAL TYPES. Red Top is now made in new special types with special advantages. Red Top Strip Wool . . . nine-foot strips that fit snugly between studs, ceiling to floor. Each has a face of tough waterproof paper with a flanged edge for nailing to studs or rafters. Red Top Bat Wool also has the same waterproof paper face with flanged nailing edges.

COMPLETE SPECIFICATION DATA. Send for specification book pictured below. Bat Wool, Strip Wool, Junior Bat Wool, Nodulated and Granulated Wool are all described and a specification is provided for each. You will find this a handy manual and a practical reference source on insulating wool. Send for your copy today.

UNITED STATES GYPSUM COMPANY AA-11
300 West Adams Street, Chicago, Illinois
Please send me, free of charge, a copy of USG Red Top Insulating Wool Specification Book.

Name..

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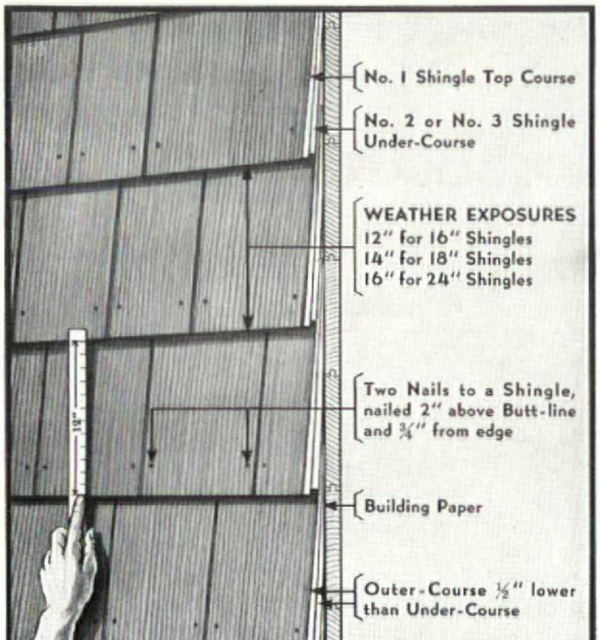
UNITED STATES GYPSUM COMPANY

Specify "Double-Coursing"

ON SIDE WALLS

For — beauty
— insulation
— long life
— economy



This sketch indicates the proper double-coursing method and shows the wide exposure obtained together with the very deep shadow lines resulting from the over-lap of the butts of the outer course over those of the concealed course. Hot dipped zinc clad nails (5d 14 gauge box nails should always be used, both in single and double-coursing.

CERTIGRADE Red Cedar Shingle double-coursing is adding to its popularity daily, both with architects and laymen. The doubly-deep shadow lines and the added exposure add amazingly to the beauty of the home.

Comfort, too, is emphasized. The two courses of Certigrade Shingles provide a high degree of insulation against heat losses. Double-coursed homes are cooler in summer, much warmer in winter and fuel bills are substantially reduced. Walls of this type exhibit a phenomenally long life.

With all its advantages, architects find Certigrade double-coursing most economical. The usual method is to use No. 2's under the outer course of No. 1's. For homes of the more economical type No. 2 can be used for the outer course, and No. 3 for the under course.

For a distinctive side wall treatment—combining the utmost in beauty with high insulation value and long-time endurance—specify Certigrade Red Cedar Shingle double-coursing. And, of course, Certigrades for the roof. Red Cedar Shingle Bureau, Seattle, Washington; Canadian office, Vancouver, B. C.

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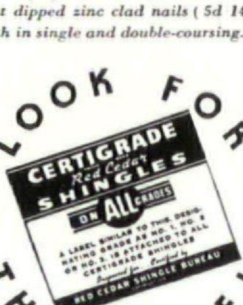

Insulate as you decorate!

Certigrade

RED CEDAR SHINGLES