THE ARCHITECTURAL FORUM

CITY HALL · HILVERSUM · DUDOK

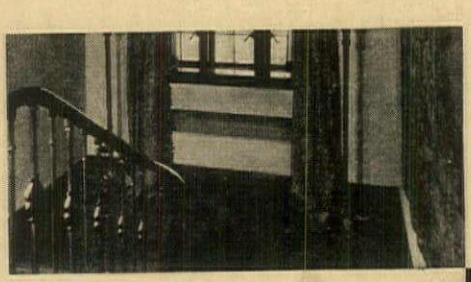
IN TWO PARTS

APRIL 1932

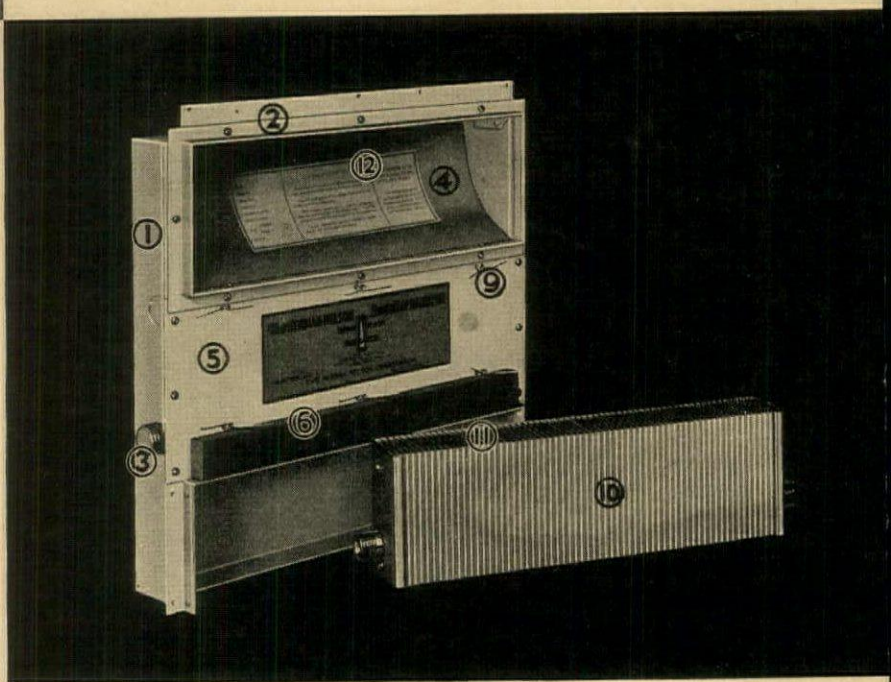
PART ONE

ARCHITECTURAL DESIGN

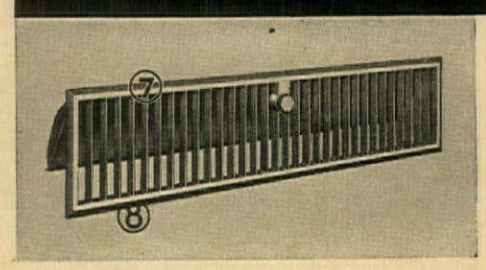
COMPLETE and READY TO INSTALL WITHIN THE WALL



. . . scientifically engineered for proper heating results



1. *Sheet steel cabinet* scientifically designed to maintain proper ratings and capacities.
2. *Cabinet flanged at edges* to provide means for securely fastening cabinet to building construction.
3. *Temporary cap* to protect radiator opening and threads from damage before installation.
4. *Shield* to protect heating element during construction—prevents dirt and plaster from dropping into heating element and impairing heating efficiency.
5. *Sturdy front panel construction* prevents damage of plaster due to pressure.
6. *Wood strip* above inlet opening provides for nailing.
7. *Grille and damper unit* fastened to frame itself and not screwed to a wood brick or plaster.
8. *Felt strips* to prevent leakage around grille.
9. *Wire ties* on front of cabinet for direct fastening of metal lath.
10. *Patented Wedge Core Heating Element*—light, strong, compact, free from joints to fail and leak or parts that can rust or get out of order.
11. *Free air passage* through radiator assures quick, uniform heating of air.
12. *Instructions* on correct installation.



Competent architects are avoiding "built on the job" and makeshift methods of concealed radiation. They know that only a scientifically designed, properly installed unit can produce the heating results their clients have a right to expect.

One unit, the Herman Nelson Invisible Radiator, is giving such results in thousands of installations throughout the country. Many architects rec ognize it as by far the most prac tical concealed unit ever built.

The Herman Nelson Invisibl Radiator is carefully designe according to proved principles o heating. It is sturdily built an furnished as a complete unit— ready for installation.

Note, above, some of the man features that set the Herman Nel son Invisible Radiator apart fro all other heating units. For furthe information, get in touch with ou nearest sales office or write us The Herman Nelson Corporation Moline, Illinois.

HERMAN NELSON *Invisible* RADIATOR

Factory at Moline, Ill. Sales and service offices in principal cities

Manufactured by the originators and pioneers of Univent Ventilation, the Her-Nel-Co System of Ventilation, the Invisible Radiator, and other heating and ventilating innovations that have received world-wide recognition.

Belfast
Portland, Me.
Boston
Springfield, Mass.
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New York City
Albany
Syracuse
Rochester
Buffalo
Scranton
Philadelphia
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Harrisburg
Erie
Johnstown
Pittsburgh
Wheeling
Washington
Charlotte
Cleveland
Cincinnati
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Nashville
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Kansas City
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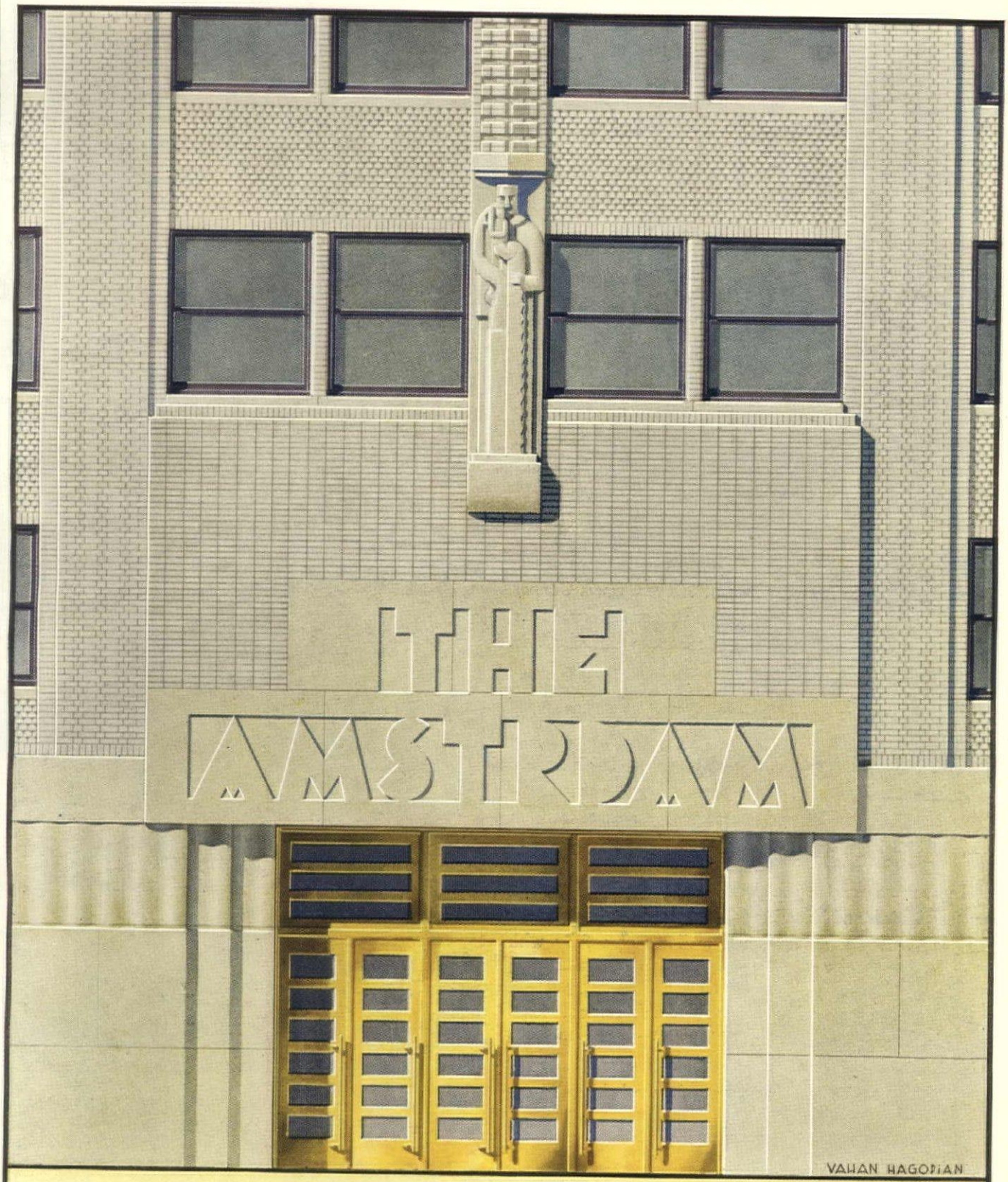


STONE AND GREY GLAZED BRICK

This design illustrates how limestone and Hanley dull finish grey glazed brick can be combined in a facade rather than using the customary all stone front and face brick side walls.

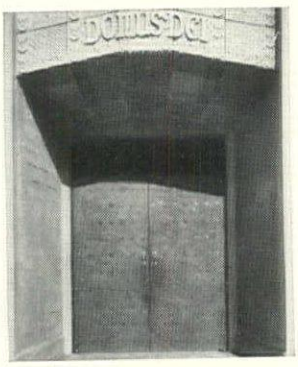
Thus the decorative and sculptural possibilities of stone can be used to the best advantage at the minimum of cost. Glazed brick colors can be so closely controlled as to make an attractive blend with any stone.

HANLEY COMPANY, INC.

BOSTON—260 TREMONT ST. BRADFORD, PA. NEW YORK—565 FIFTH AVE.

In the Service of a Seattle Church

Revere Sheet Copper is put to Ornamental Use



Doors of Revere Copper

A fresh note in church architecture is sounded by St. Joseph's, Seattle. Modern, simple, different ... it depends for most of its exterior ornamentation on Revere Sheet Copper.

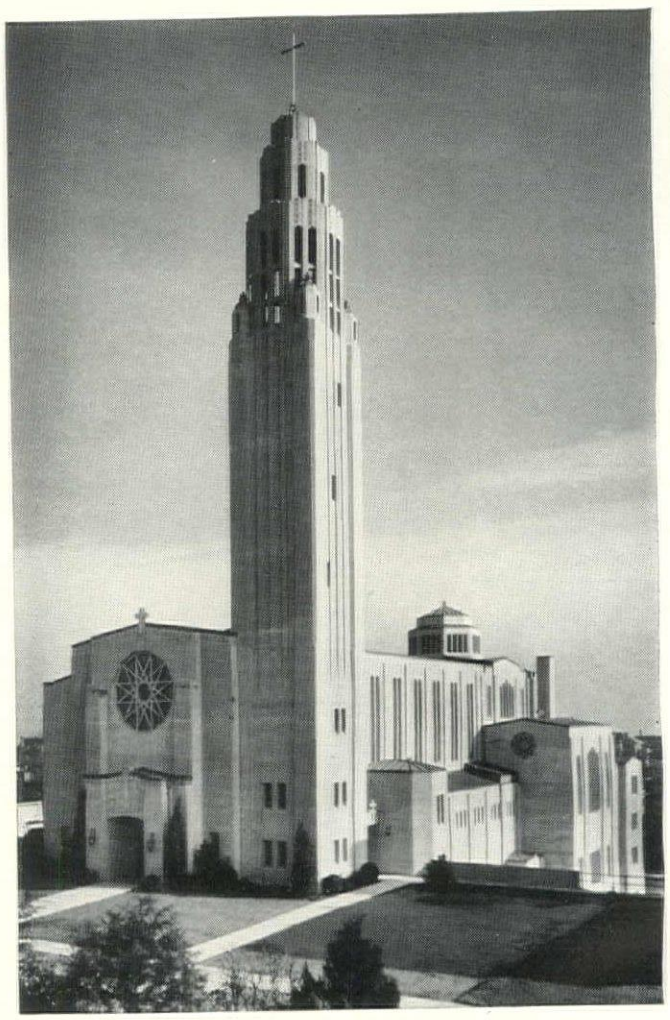
To mention but two of the places... Revere Sheet Copper sheathes the cornice around the top of the main entrance... it covers the massive, studded, ornamental doors.

This decorative use of copper is somewhat out of the ordinary. Yet it is not the first time that Revere Sheet Copper has been employed for its beauty of finish and its ornamental possibilities. It is not the first time that architects have seen in Revere Sheet Copper a material both esthetic and inspirational.

In its more usual applications, such as roofing, flashings, gutters, leaders and leaderheads, Revere Copper is economical, workable, permanent, and mellows gracefully with the years.

Companion material to this is Revere Leadtex... lead-coated Revere Sheet Copper. This enables the architect to utilize the beauty and decorative possibilities of lead with copper's lightness, its economy and its workability.

For further information address Revere Copper and Brass Incorporated, 230 Park Avenue, New York City.



St. Joseph's Church, Seattle, Wash. Revere Sheet Copper was used for most of the exterior ornamentation. Architect: A. H. Albertson in association with J. P. W. Wilson and Paul Richardson. Sheet Copper work by Builders Sheet Metal Works, Seattle, Wash.

Revere Copper *and* Brass

INCORPORATED

Revere COPPER BRASS Products

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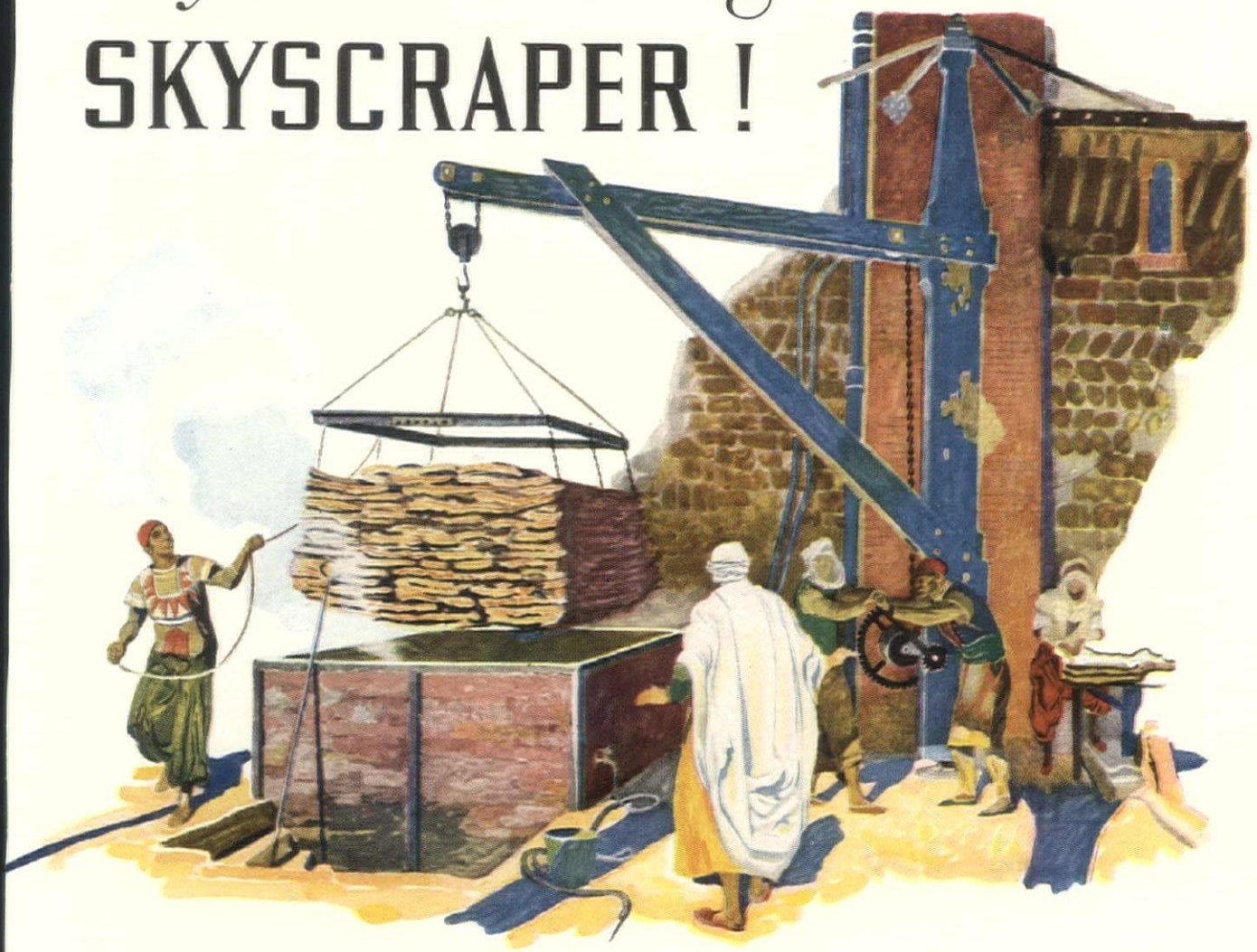
They are building a new SKYSCRAPER !



OR perhaps it's a new apartment or school that these Algerians are helping to construct. You see them boiling cork bark so that the weatherbeaten outside surface can be scraped off and the slabs of cork flattened for shipping.

This is the cork that Armstrong uses to make the many cork products which eventually find their way into the finest buildings. Whether you are planning a school or a church, a hospital, hotel, or home, there are numerous ways in which you can use cork to give your clients attractive and comfortable buildings.

Below is a partial list of Armstrong Products. You may already be familiar with them. The following pages tell you more about some of them and about the service Armstrong has developed to help you use them. This service includes suggestions on building plans, special designs, and installation of the products. It is offered through Armstrong branch offices and agents in principal cities.

Armstrong's Floor Products—LINOLEUM . LINOTILE . CORK TILE . ACCOTILE . CORK CARPET

Armstrong's Insulation Products—CORKBOARD . . . CORK COVERING . . . TEMLOK . . . INSULATING BRICK . . . HIGH PRESSURE INSULATION

Other Armstrong Products—CORKOUSTIC . VIBRACORK . CORK BULLETIN BOARD . CORK BRICK

For complete specification detail on any Armstrong's Product, see Sweet's Architectural Catalogues

Armstrong's (A) Product

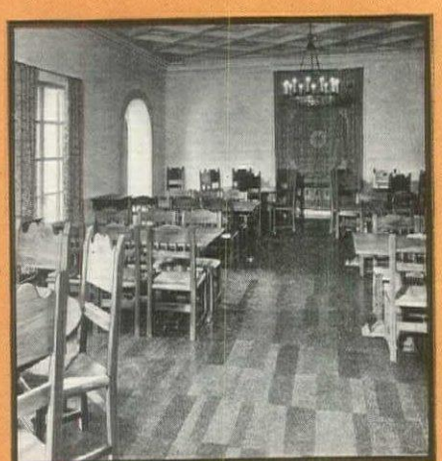
This trade-mark identifies and guarantees the quality of every Armstrong Product.

A floor consultant you ought to know—

THE ARMSTRONG SERVICE

DESIGNING TALENT *is given full freedom with Armstrong's Linotile. This office of E. A. Pierce Co., Seattle, Wash., shows one of the infinite design possibilities that custom-laid Linotile affords. Kent & Hass, architects.*

CAREFULLY PLANNED *home interiors, too, are often helped by distinctive, hand-laid floors of Armstrong's Linotile. The living-room and dining-room of this Charlestown, Md., home are floored with Tourmaline Linotile.*



CORK TILE FOR QUIET. *Floors of rich brown cork muffle noise in dining-rooms of Scripps College for Women, Claremont, Calif. Armstrong's Cork Tile was used in many other areas, too. Gordon B. Kaufman, architect.*

HERE'S how it works! Let's suppose you are designing a college dormitory. Your plans require distinctive floors for the lounges, dining hall, corridors, and students' rooms—the question being what kind of floors to use in each area.

Send a description, blueprints if possible, and our bureau will recommend the best floor for each interior—will draw up designs to be executed in Armstrong's Linoleum, Linotile, or Cork Tile—will suggest decorative schemes to be carried out in draperies, furnishings, and walls. Floor-to-ceiling plans for every room will be made for you.

Whether it be a dormitory or an office building, a hospital or a church, put our Service Bureau to work on it. Experience gained through daily contact with all sorts of floor problems is yours for the asking.

For complete details about Armstrong Floors, write for our new file-size specification book. Ask, also, for "Public Floors of Enduring Beauty," picturing the latest in linoleum floor designs for all types of public buildings. Address Service Bureau for Architects, Armstrong Cork Company, Lancaster, Pennsylvania.

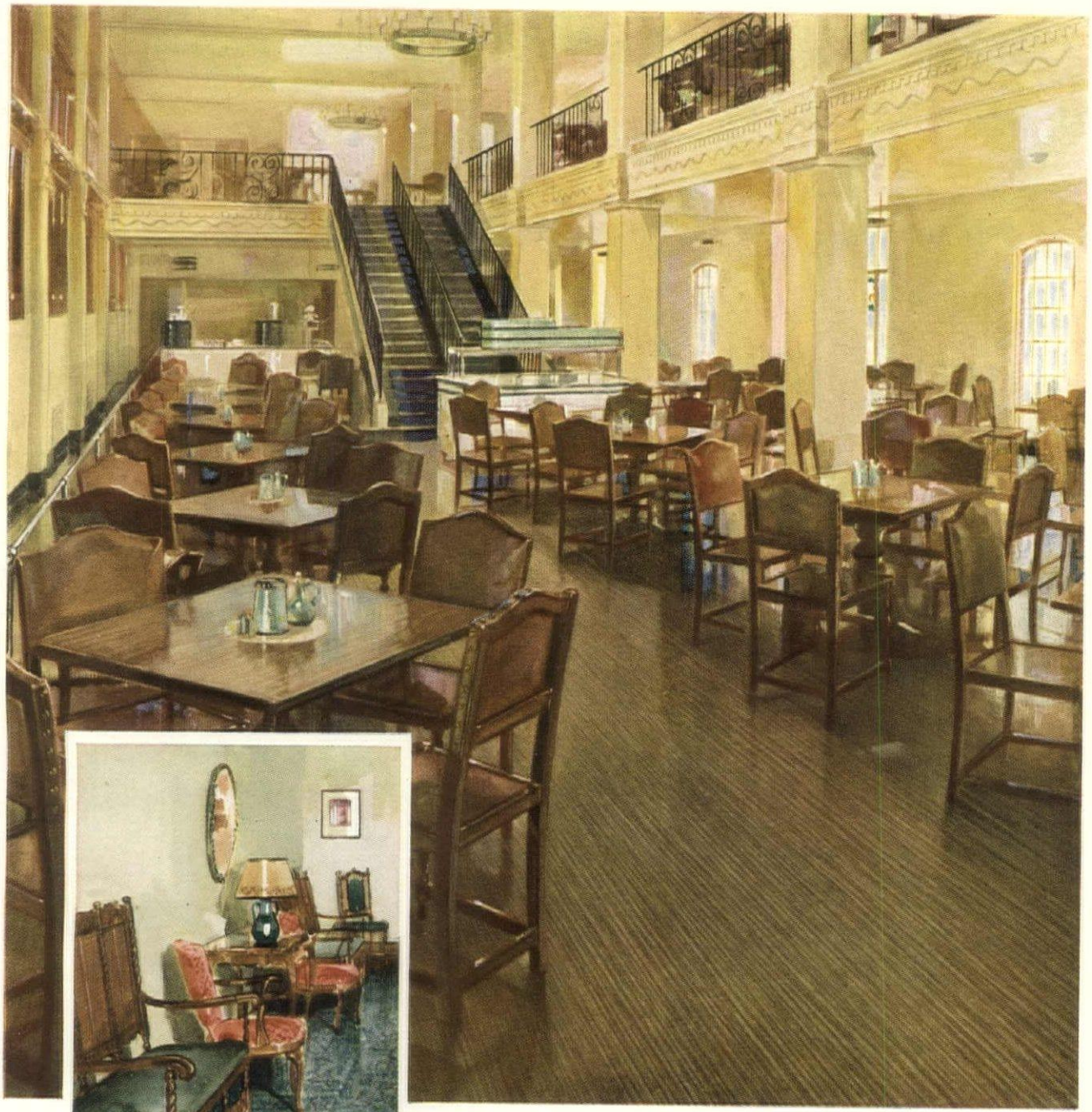
Armstrong's (A) *Product*

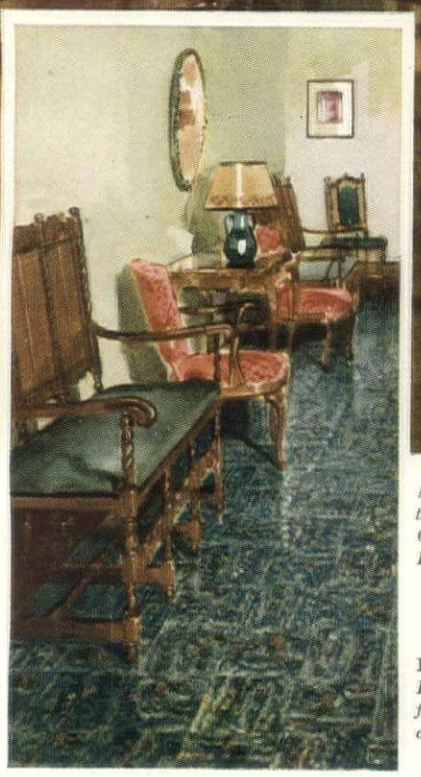
Armstrong's Floors

for public buildings and homes

LINOLEUM	LINOTILE	LINOFLOR
CORK TILE	ACCOTILE	CORK CARPET

BUREAU FOR ARCHITECTS





ABOVE: *Feet scuffle . . . chairs scrape . . things spill. This Armstrong Floor (Taupe Jaspé No. 12) takes it all smiling. But ability to stand hard wear is only one of the reasons the University of California at Los Angeles has Armstrong's Linoleum in this cafeteria and other interiors. Armstrong Floors are also quiet, warm, and easy to keep clean. Allison & Allison, architects.*

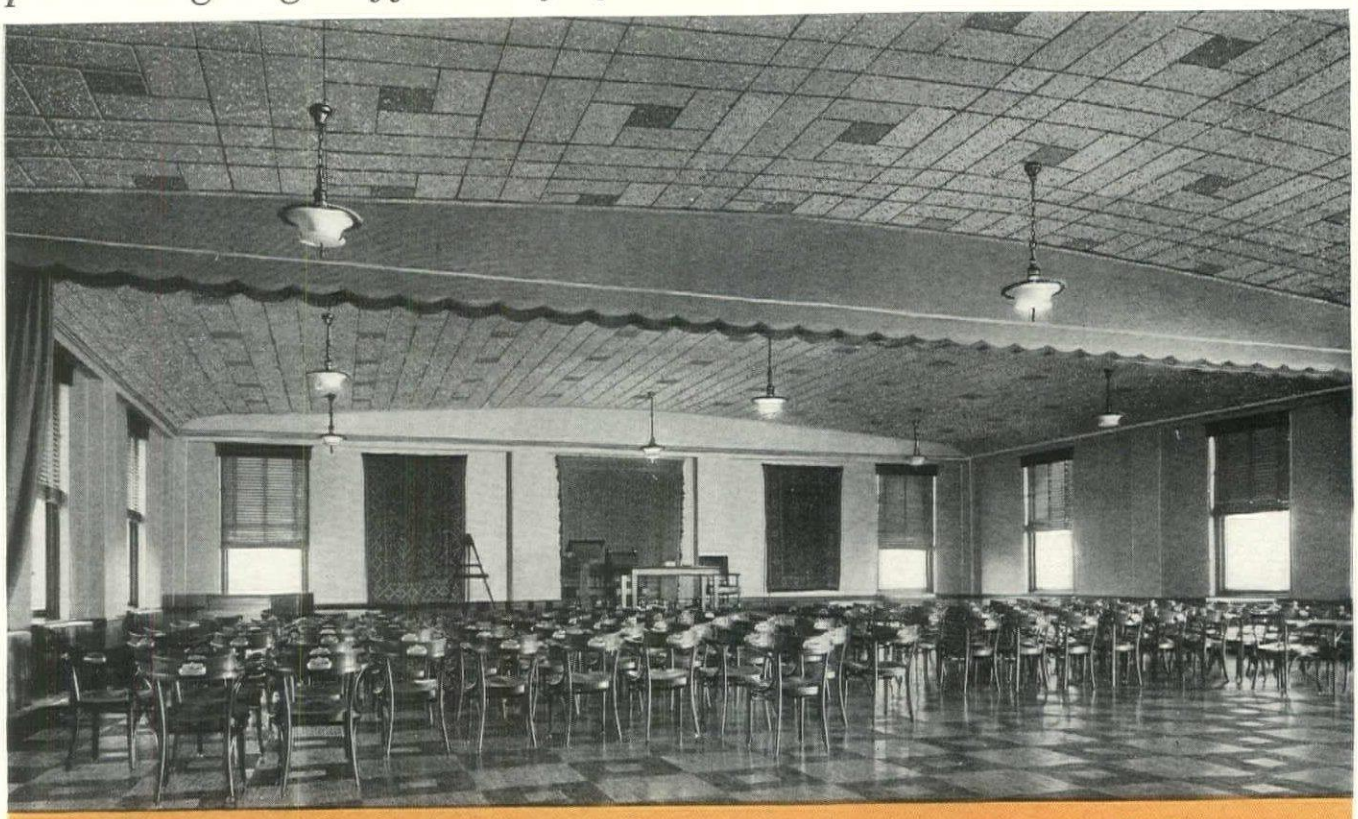
* * *

LEFT: *Here's one lobby floor that can take the traffic! It's Armstrong's Linoleum, No. 13126, in the Downtown Department of the University of Chicago. Colors are inlaid. That means permanence. The floor is cemented over linoleum lining felt—another assurance of long wear. From every standpoint—appearance, comfort, and maintenance as well as durability—Armstrong Floors are ideal for schools.*

Armstrong Announces

THREE NEW ACOUSTICAL MATERIALS

providing high efficiency, fire-resistance, ease of decoration



THIS AUDITORIUM CEILING *has been treated with Armstrong's Corkoustic Type C for acoustical correction. Note the pleasing decorative effect secured by combining unpainted and painted panels. Ease of cleaning assures low maintenance costs.*

DEVELOPED by the Armstrong research laboratories, three new acoustical products, together with Armstrong's Corkoustic Type A, offer architects and builders a special material for every need in the acoustical and noise-quieting field. These products cover a range of absorption from 80% to 30%.

New Armstrong Acoustical Products are:

1. Corkoustic Type C, possessing, in the one-and-one-half-inch thickness, a sound-absorption coefficient of 61% at a frequency of 512. It has the pleasing light color of natural cork.

2. Corkoustic Type B, made by a new process, with a sound-absorption coefficient of 50% at a frequency of 512 (one-and-one-half-inch thickness). Color is rich warm brown.

3. Ceramacoustic, an entirely new type of acoustical material made of inorganic matter. Absolutely fireproof, it has the exceptionally high sound-absorption coefficient of 82% at a frequency of 512.

CLOSE-UP *of Corkoustic Type C showing texture. Left unfinished, it has the pleasing light color of natural cork. Spray painting with washable paint does not reduce absorption efficiency.*

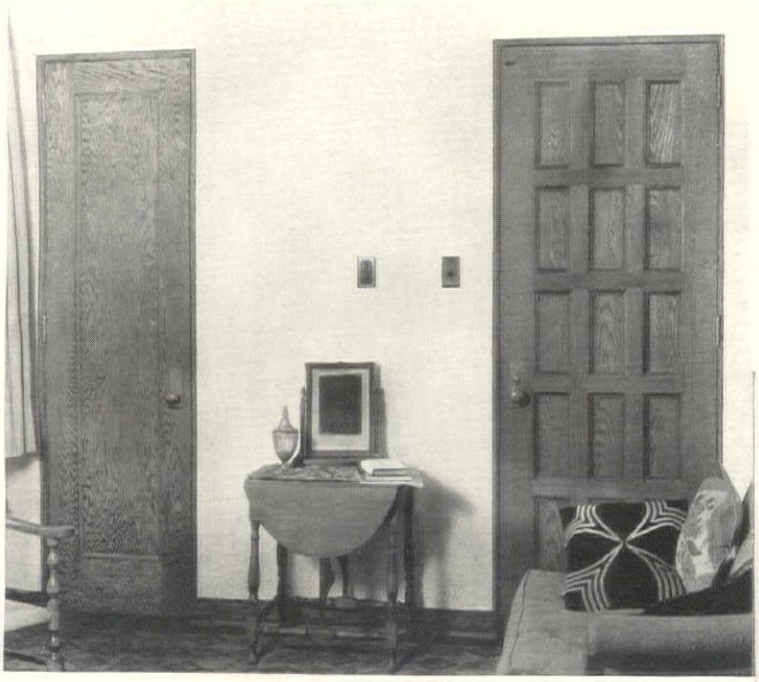
All Armstrong Acoustical Products offer a variety of decorative treatment, easy cleaning, and, therefore, low maintenance costs.

For further information and samples of these three new products, write to the Armstrong Cork & Insulation Company, Lancaster, Pennsylvania.

Armstrong's Acoustical Products

FOR EVERY ACOUSTICAL AND NOISE-QUIETING NEED

Modern Doorways that are *Versatile*



KALMAN Steel Door Frames meet both esthetic and practical demands. They are good-looking, clean-cut, and blend perfectly with the atmosphere of their surroundings.

At the same time, Kalman Steel Door Frames are eminently practicable. They have been designed to take stresses which result from door action. There is nothing to warp or twist. A stronger and better wall structure is obtained. The steel frame becomes an integral part of the wall, preventing plaster cracks.

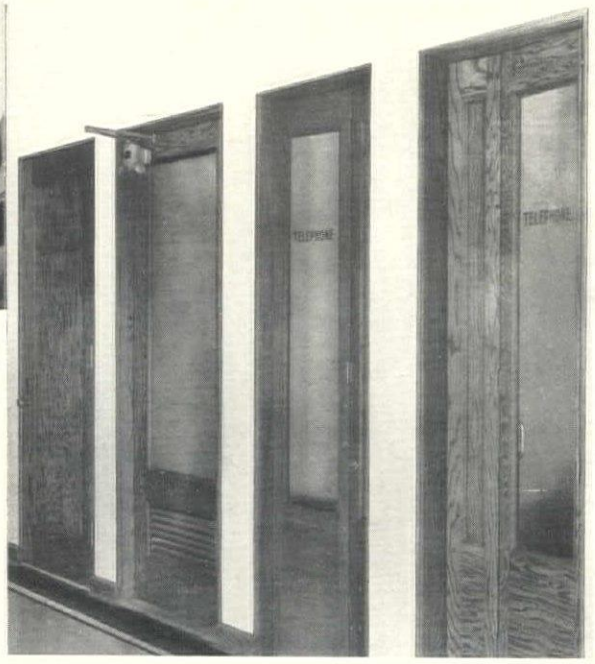
The advantages of Kalman Door Frames are of importance in every type of modern building. Architects will find that the use of Kalman-built doorways simplifies many of their design problems, at the same time adding character to the job in hand. Write for special folder giving more detailed information.

KALMAN STEEL CORPORATION — General Offices: Bethlehem, Pa.

Subsidiary of Bethlehem Steel Corporation

District Offices: Albany, Atlanta, Baltimore, Boston, Buffalo, Chicago, Columbus, Detroit, Houston, Milwaukee, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Syracuse, Washington, D. C.

Export Distributor: Bethlehem Steel Export Corporation, 25 Broadway, New York City.

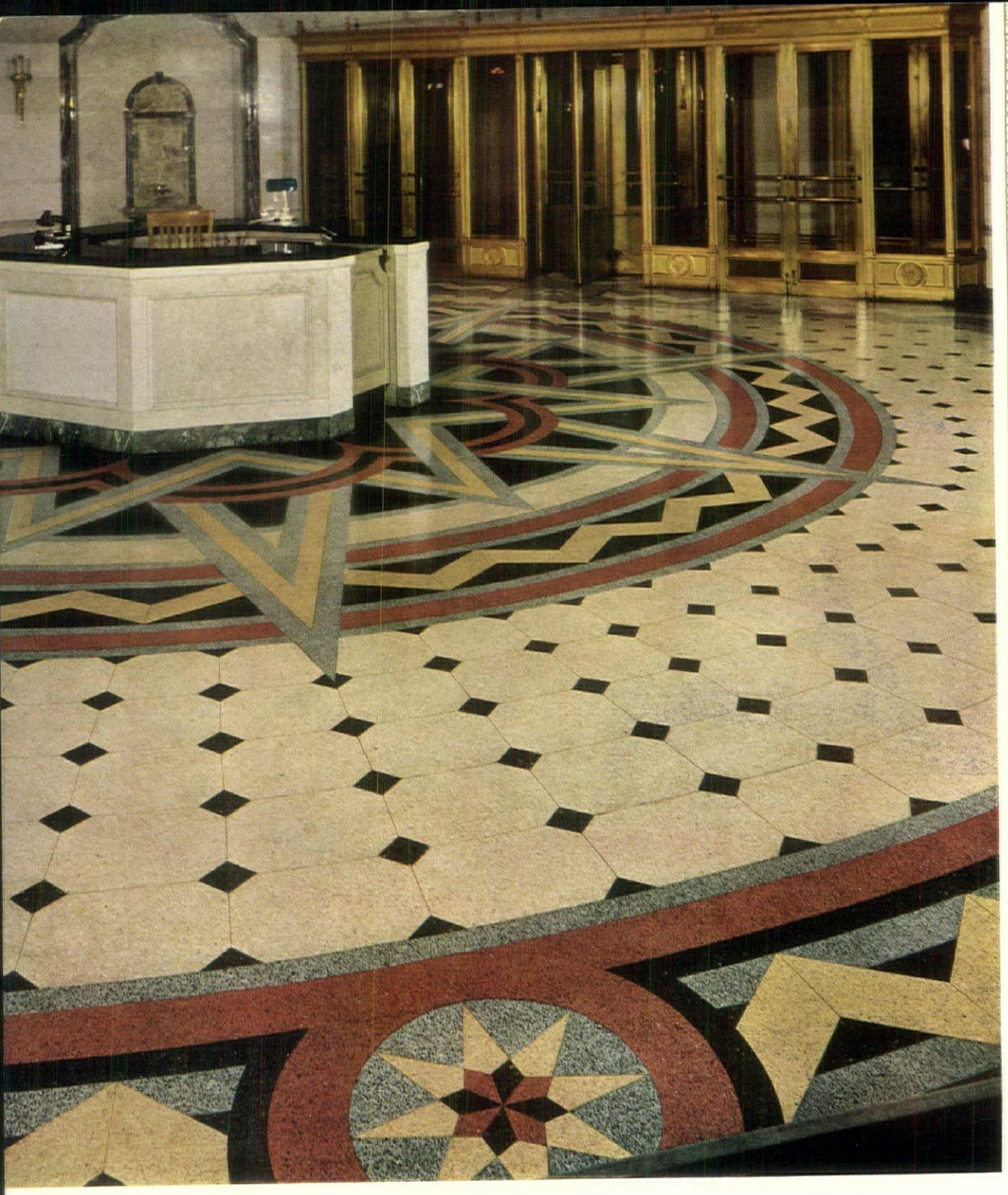


The Girls' Dormitory Building at Michigan State College, East Lansing, affords excellent examples of the use of Kalman Steel Door Frames. Note the attractive appearance of the dormitory room shown above. At the right is a particularly good example of the economy in wall space and improved appearance secured by elimination of space-occupying trim and ornament.

Girls' Dormitory Building, Michigan State College, East Lansing, Mich.

Architects: Malcomson, Higginbotham & Trout, Detroit. Contractors: Reniger Construction Co., Lansing, Mich.

KALMAN STEEL DOOR FRAMES



Garfield Park Administration Building, Chicago. Michaelsen & Rognstad, architects; American Mosaic & Terrazzo Co., terrazzo contractor, all of Chicago.

DURABILITY is the first requisite of a public floor. Terrazzo made with Atlas White portland cement fulfills that demand and is richly beautiful as well.

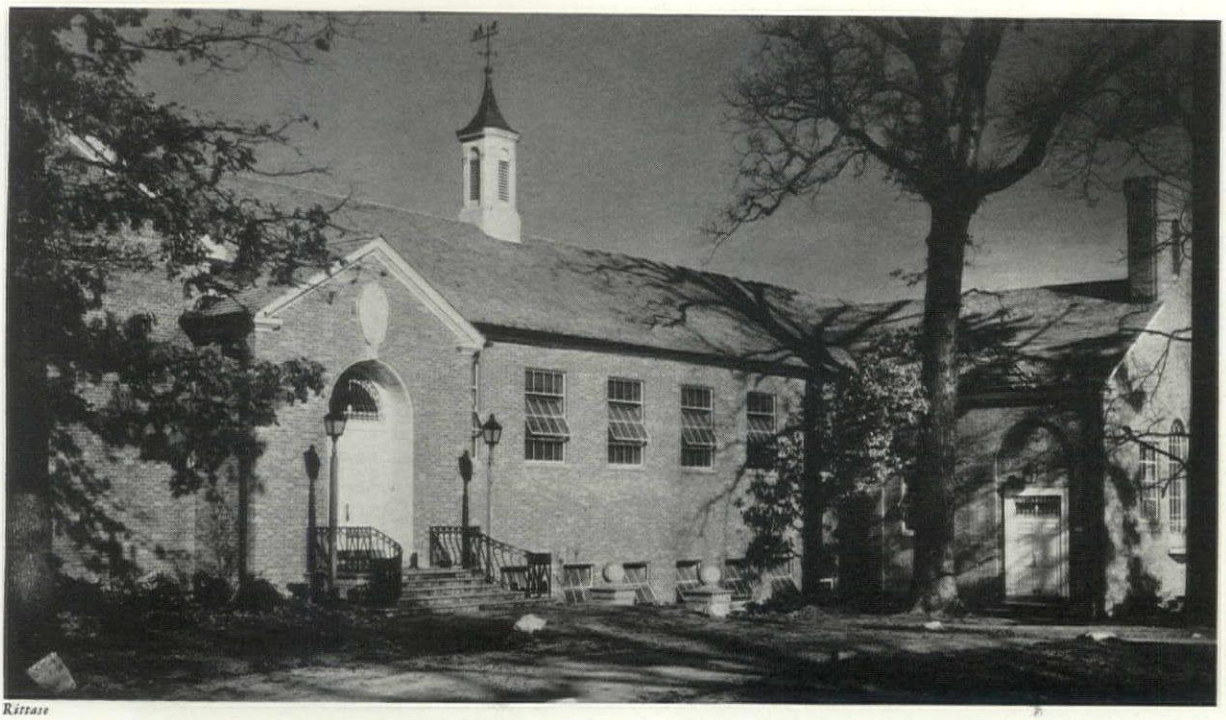
The beauty of terrazzo lies largely in its vivid contrasts and clear, fresh hues. Note how distinct and clear the colors of this floor are. Such purity of tone is only possible with a *white* portland cement.

Write for further information concerning the use of Atlas White portland cement in terrazzo and other work.

UNIVERSAL ATLAS CEMENT CO.
Subsidiary of United States Steel Corporation
208 South La Salle Street, Chicago

ATLAS WHITE PORTLAND CEMENT
PLAIN AND WATERPROOFED

NEXT MONTH'S FORUM



Rittase

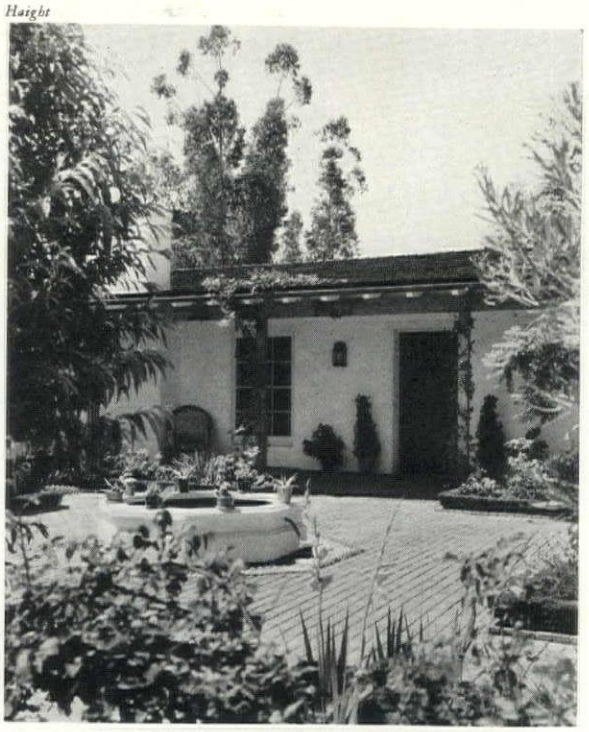
The gymnasium of the Haverford School at Haverford, Pa., for which W. Pope Barney and Roy W. Banwell, associate, were the architects, is illustrated above. Below is a view of a house for Preston Hotchkis at San Marino, California, Roland E. Coate, architect

THE plate sections of the May issue present a widely diversified and particularly interesting series of architectural problems. Among them are included a large new apartment hotel in New York, a country house near Philadelphia, and a modern county court house in the South.

THE FORUM OF SMALLER BUILDINGS is devoted this month to the illustration of several small houses, for which ROLAND E. COATE was the architect. They are all located in California and have been chosen as particularly good examples of plan and design. Each of the buildings illustrated in the plate section is described in captions to help visualize the color, texture and materials of the building.

THE articles include an additional installment to the series of articles on Rockefeller Center. TALBOT FAULKNER HAMLIN of the Columbia University School of Architecture has contributed an article on church remodeling which is illustrated by the work of WARNER & MITCHELL, architects.

Haight



(*See Page 47 in the Advertising Section for Engineering Announcement*)

DUTCH BOY *gives a quality paint job*

● Paint intended for service in hotels, office buildings, schools or hospitals...must stand up under repeated cleaning, and still keep a pleasing, fresh appearance. In this respect, Dutch Boy White-Lead paint has no superior. It can be washed again and again.

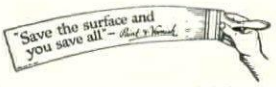
But that's only part of the story: You can specify Dutch Boy for every purpose...to make paint for wood, plaster, wall board, masonry or metal...flat or eggshell finishes for interiors...gloss paint for outside use...undercoatings for enamels...plastic finishes.

Furthermore, you can achieve the exact color effects you desire by specifying Dutch Boy. With this pure white-lead, the necessary thinners and tinting materials, the painter will find it quick and easy to obtain the precise colors your decorative plans demand.

"The Decorative Possibilities of Paint" is a useful booklet that should be in every architect's file. If you have no copy, just request our nearest branch to send you one.

NATIONAL LEAD COMPANY

111 Broadway, New York; 116 Oak Street, Buffalo; 900 West Eighteenth Street, Chicago; 659 Freeman Avenue, Cincinnati; 820 West Superior Avenue, Cleveland; 722 Chestnut Street, St. Louis; 2240 Twenty-fourth Street, San Francisco; National-Boston Lead Co., 800 Albany Street, Boston; National Lead & Oil Co. of Pa., 316 Fourth Avenue, Pittsburgh; John T. Lewis & Bros. Co., Widener Building, Philadelphia.



The well-known brand of Carter White-Lead is also made by the National Lead Company. In purchasing either Carter or Dutch Boy White-Lead, the buyer is assured of obtaining white-lead of the highest quality.

BOOK FORUM

A HISTORY OF THE ENGLISH HOUSE

BY NATHANIEL LLOYD, F. R. I. B. A.

A REVIEW

THE English, we are accustomed to think, know how to live, and with the exception of not including all modern conveniences, know how to build houses to live in. Certainly American architecture owes an important debt to the generations of architects and builders who, since the Conquest, have been developing the styles of English houses which we adapt with uneven success to our times and conditions. One element not usually present in our Anglicized houses that is inevitable in the originals is an intangible sincerity. They treat their houses with so much more respect than we do. The house is to them an institution, to us, a commodity.

In his *History of the English House*, Nathaniel Lloyd traces historically, architecturally, and personally, the course of its development. The story of their design is there, but not to the exclusion of the less professional but just as interesting details of their history. Unlike so many similar books, this one includes considerable information about the men who designed and built the houses. Anecdotes run throughout the text to lighten the succession of heavy facts. Even one with little or no professional interest in architecture would enjoy it.

One interesting story Mr. Lloyd tells concerns the building of Castle Blenheim for the Dutchess of Marlborough. The architect, Sir John Vanbrugh, had a series of quarrels with the Dutchess, "Ultimately, Vanbrugh's quarrels . . . culminated in a permanent rupture, and when Parliament voted 22,000 pounds a year to her (the Dutchess) Vanbrugh ungallantly said that, 'Parliament has allowed the Dutchess 10,000 pounds a year to spoil Blenheim and 12,000 pounds a year to keep herself clean and go to law.' The Dutchess's retort is not recorded, but after Vanbrugh's death, her protege, the Rev. Abel Evans, suggested as his epitaph the couplet:

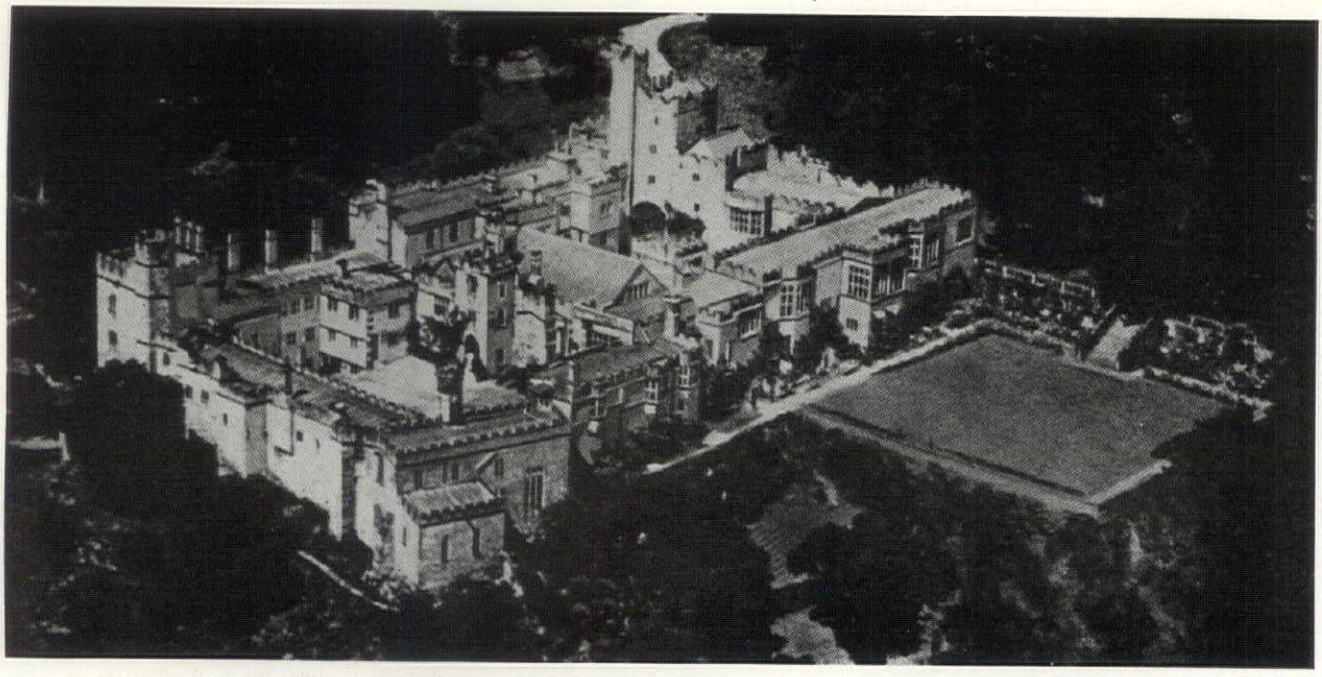
'Lie heavy on him earth, for he
Laid many a heavy load on thee.'

The broadness of the subject naturally required a limited treatment. Not every English house of importance is shown in the hundreds of pictures; and yet there are so many houses considered that only one with an intimate knowledge of the subject would know that omissions had been made.

The first section of the book is devoted to an unillustrated history. The second takes up the study of the houses architecturally. Chapters on general exteriors, windows, and doorways are thorough in their discussion, and are amply illustrated. Despite the large number of volumes which have been issued on doorways of old England, and similar topics, there are many details of houses that are entirely new.

Considered strictly on the basis of its use by architects, Mr. Lloyd's book might be subject to one criticism. Too many of the houses he has included are of the palace type, Windsor, Buckingham, Haddon Hall.

A HISTORY OF THE ENGLISH HOUSE, Nathaniel Lloyd, 487 pp., 8½ x 12½, illustrated, cloth. Published by William Helburn, Inc., New York, Price $20.00.



AN AIR VIEW OF HADDON HALL

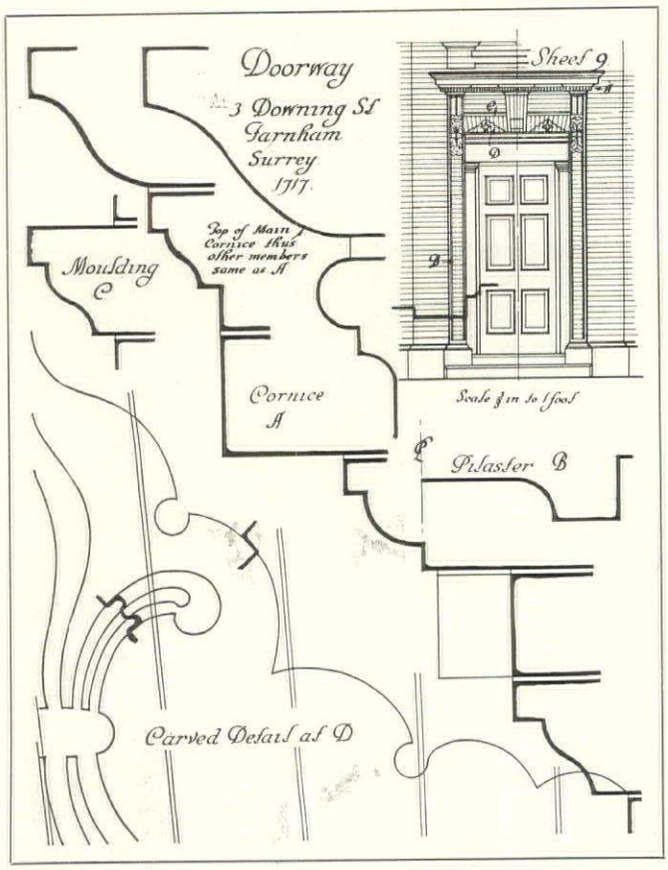
BRICKWORK AND WROUGHT IRONWORK

THOSE who are already familiar with the "F.S." series of portfolios by Tunstall Small and Christopher Woodbridge will welcome two new volumes, "English Brickwork Details" and "English Wrought Ironwork," by the same authors. Each of the volumes contains twenty full-size drawings on stiff board paper to make them easy to handle.

The details of ironwork illustrated include plain and ornamental strap hinges, both exterior and interior, railings, screens, grilles, door handles, lifting latches, knockers, escutcheons, casement fasteners and latches. It is the intention of the authors to correct what they believe to be the mistaken method of showing ironwork details. By presenting full size drawings of the various details combined with small-scale measured drawings of the subjects from which the details are taken, the exact contours and dimensions are shown and their relative positions and application can be seen from the "key drawings," which are in themselves a valuable adjunct to the work.

A similar method is followed in the volume on brickwork details, which have been selected from the smaller specimens of domestic and ecclesiastical work of the periods from 1450 to 1750. The drawings include full-size sections of cornices, frieze moulds, mullions, and many other contours taken from doorways, chimneys, niches, gables, gateways, etc. Each set of mouldings is accompanied by a small-scale measured drawing of the feature or building to which it refers.

Although the illustration reproduced here to indicate the type of plate is accurate, its reduced size may create a false impression. The actual size of the drawings in each volume is 12½ x 10. The price of each volume is $4.00, and the set of six volumes may be purchased for $20.00.



Detail from the "F.S." series

ENGLISH WROUGHT IRONWORK, ENGLISH BRICKWORK DETAILS, by Tunstall Small and Christopher Woodbridge. 20 plates in each volume, 12½ x 10, loose-leaf portfolio. Published by William Helburn, Inc., 15 E. 55th St., N. Y. Price $4.00 each

HEATING AND VENTILATING GUIDE

THE 1932 *Guide* of the American Society of Heating and Ventilating Engineers is, like the nine volumes which preceded it, an invaluable contribution to the engineering literature of an architect's office. It contains, as everyone knows, complete reference data on the design and specification of heating and ventilating systems, together with a manufacturers' catalogue data section with reliable information concerning modern equipment.

This edition is larger than any other that has been issued. It contains five new chapters, and the material has been almost entirely rewritten. Comprehensive information on concealed heating units of various types has been compiled in a separate chapter entitled Gravity Convectors. The latest research in hot water heating is given separate treatment. An entirely new discussion of handling condensate and air is given in Chapter 10. Another new and valuable chapter is No. 13, which contains practical data on hot and cold water requirements of buildings.

Entirely new information is to be found in the chapters on draft and chimneys, mechanical stokers, and automatic temperature control. And, of course, to keep pace with the rapid succession of developments, the presentation of the material on air conditioning has been completely revised. Chapters 36 and 37, on Unit Ventilators and Unit Air Conditioners are entirely new.

Architects who have formed the habit of subscribing to each issue of the *Guide* will be certain to obtain this one. Those who have not taken advantage of this really worth while service should be sure to investigate.

THE AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS GUIDE, 1932, 876 pp., 6 x 9, flexible, illustrated. Published by American Society of Heating and Ventilating Engineers, New York. Price $5.00

BRIDGES OF THE RHINE

IN NO other instance, probably, is the progress of constructive science so well illustrated as in the bridges which span the Rhine in Germany. From the earliest to the latest the story of twenty centuries is told. In his book, *The Bridges of The Rhine*, Karl Mohringer, a German bridge engineer, gives us a brief historical account of each, and a few notes on engineering.

The most interesting portion of the book is the second half in which he discusses fully the Cologne-Mulheim Bridge and the Dusseldorf-Neuss Bridge. Both of these are recent, and represent the latest developments in bridge engineering. The information presented on each is specific enough to be of value, and is interesting enough to be read. The text, surprisingly enough, is in English.

THE BRIDGES OF THE RHINE, by Karl Mohringer, 104 pp., 9 x 12, cloth, illustrated. Published by Joh. Mohringer, Verlag, Messkirch, Baden, Germany. Price $6.00

ANACONDA

PLATE 34

SPANDRELS OF STAMPED COPPER ARE DURABLE, LIGHTER AND LESS EXPENSIVE THAN CAST SPANDRELS. BRONZE OR LEAD-COATED COPPER OFFERS THE SAME ADVANTAGES.

THE AMERICAN BRASS COMPANY
GENERAL OFFICES: WATERBURY, CONN.

Seventy years ago, Frederick Walton looked into a can of paint—and started a great industry. Above: One of the gigantic linoleum factories owned by the largest manufacturer of smooth-surfaced floorings in America, Congoleum-Nairn Inc.

A long way from a can of paint!

A young man stares earnestly at the gummy film which has formed on the paint in an open can. What is it? Is it good for anything? Experiments followed. Young Frederick Walton combined this rubber-like substance (oxidized linseed oil) with this and that—finally with ground cork. And an amazingly useful new floor had been discovered—linoleum.

That was in 1863. Only a few years later, linoleum came to America. Ground was broken for the beginning of the great factory illustrated above—today the home of Sealex Linoleums.

It would take more room than we have here to tell the whole story of linoleum progress. Let us finish what we have begun by sending you two books:—

The first is a *book of pictures*—containing fifty-one actual photographs of modern, resilient floors in many different types of buildings. It will show you what distinctive effects may now be inexpensively achieved with these materials.

The second is a *book of facts* about school floors—written by architects. It gives you information that makes for *intelligent buying.*

Both books are free. Write for them today—and for full information on our Bonded Floors installation service, in which Sealex materials are backed by Guaranty Bonds.

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NOTICES AND EVENTS

A. I. A. CONVENTION

THE annual convention of the American Institute of Architects, marking the 75th year of its founding, will be held in Washington, D. C., with headquarters at the Mayflower Hotel, from April 27th to 29th. Institute members, in conjunction with the landscape architects, mural painters, and sculptors, will also participate in the Washington Bi-Centenary celebration.

In addition to the formal program, those events which will make this year's convention of more than usual interest, are discussions on housing, unification of the profession, the relation of the Architects' Small House Service Bureau to the Institute, and "What Can an Architect Do in a Time of Depression."

On the 25th and 26th of April, the Monday and Tuesday immediately preceding the Institute meeting, the annual convention of the Association of Collegiate Schools of Architecture will be held at the Mayflower.

The Producers' Council will hold its tenth annual convention in the same hotel April 26-29.

A. I. S. C. BRIDGE COMPETITION

TEN students from 111 contestants have been selected to compete for the annual award offered by the American Institute of Steel Construction for the most beautiful bridge design. Two are engineering students, Ojus Malphurs, Univ. of Florida, and A. Lyall House of Montana State College. The remaining eight are students of architecture: Homer R. Truesdale, Pennsylvania State College, Pierre A. Bezy, D. E. Campanella and E. M. Soniat of Columbia Univ., Herman C. Light, Ohio State Univ., Leslie E. McCullough, Iowa State College, and Boris R. Leven and Edward S. Okubo of Univ. of Southern California.

GUGGENHEIM FELLOWSHIP AWARDED TO MUMFORD

LEWIS MUMFORD, author and architectural critic, has been awarded a Guggenheim Fellowship which he will use for travel in Europe gathering material for the completion of his next book, "Form."

ARCHITECTURAL TOUR

UNDER the direction of Talbot Faulkner Hamlin, lecturer at Columbia University School of Architecture, a modern architecture tour through the principal cities of Europe will be conducted, sailing from New York June 27th and returning August 19th. Included in the itinerary are Paris, Cologne, Frankfurt, Stuttgart, Munich, Salzburg, Vienna, Prague, Berlin, Stockholm, Copenhagen, and Hamburg.

FRANCIS S. MARLOW
1888–1932

THE profession lost one of its keenest economists in the death on March 16th of Francis Smith Marlow, of the firm of Joannes & Marlow, New York architects. Prior to his association with Mr. Joannes two years ago, Mr. Marlow had been head of the architectural department of S. W. Straus and a member of the firm of Sloan & Robertson. He was intimately connected with such important buildings as the Chanin, Graybar, and Rikers Island Prison.

N. Y. HOUSING MEETING

UNDER the auspices of the Housing Section of the Welfare Council and the Housing Association of the City of New York, an afternoon and evening meeting will be held April 13 in the Empire State Building on the construction and financing of large-scale housing. Speakers will be Alfred K. Stern, Director of the Rosenwald Fund, Andrew J. Eken, of Starrett Bros. & Eken, builders, Robert D. Kohn, Willard I. Hamilton, Vice President of the Prudential Life Insurance Company, Charles F. Lewis, Director of the Buhl Foundation, and Paul Blanshard, Executive Director of the City Affairs Committee.

CHRYSLER BUILDING COMPETITION

ELIEL SAARINEN, Paul Philippe Cret, Voorhees, Gmelin & Walker, Holabird & Root, Henry Hornbostel, and Roger Bailey have been selected to compete for the design of a building to house the Chrysler Corporation exhibitions at the Century of Progress Exposition. The jury will be composed of Raymond Hood, Albert Kahn, Edgar I. Williams, and four Chrysler executives.

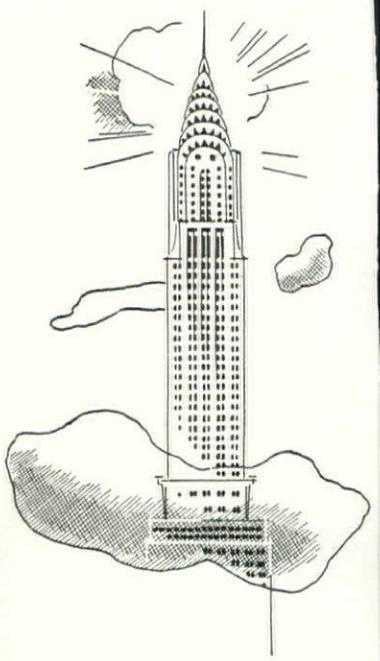
ERRATA

IN THE March issue, certain of the houses at Sunnyside, Long Island, shown on pp. 250–251 were designed by Frederick L. Ackerman.

The architects for the Academy Housing Corporation apartments on p. 291, as well as for the Amalgamated Housing Corporation apartments on p. 293, were Springsteen & Goldhammer.

Andrew J. Thomas, and not Eugene Klaber, was the architect for the Marshall Field Apartments, Chicago, shown on p. 294.

OLD-FASHIONED CARPET HAS NO PLACE IN A MODERN BUILDING



When you enter the Board of Directors' room of the Chrysler Corporation, in the Chrysler Building, New York, you notice that the soft, quiet carpet on the floor is not marred by stitched seams. Credit the seemingly seamless Collins & Aikman Carpet (installed April, 1930), which has been extensively used in the offices of the Chrysler Corporation.

BEFORE Collins & Aikman Carpet was introduced, the only way to get a broadloom effect was to pay the higher price for broadloom carpet. And even then, if the floor-space were larger than the ordinary broadloom limit, or if there were irregular places around which the carpet had to be fitted, the entire floor-surface could not be covered without showing some ugly stitched seams.

Now, because of the new way of joining sections on the under-side, Collins & Aikman Carpet can be used in rooms of any size or shape, fitted around pillars or obstructions, into irregular corners, up stairways—and still be seemingly seamless. More than that, various colors can be cut and fitted together to make individual designs, inlaid crests, monograms, special borders—still without the marring effect of stitched seams. It is durable, unusually easy to clean, and the resilient back prevents it from slipping on the floor.

Here is a genuinely modern carpet, with unique advantages. And what does it cost? *It costs no more than the old-fashioned type of narrow-width carpet that had to be stitched together!*

That is the final point that has clinched the popularity of Collins & Aikman Carpet . . . and made a good many architects and decorators decide that no longer does old-fashioned carpet have a place in a modern building. For complete information, write to Collins & Aikman Corporation, 25 Madison Ave., New York City.

The Seemingly Seamless **COLLINS & AIKMAN CARPET**

THE ARCHITECTURAL FORUM

VOL. LVI. NO. 4

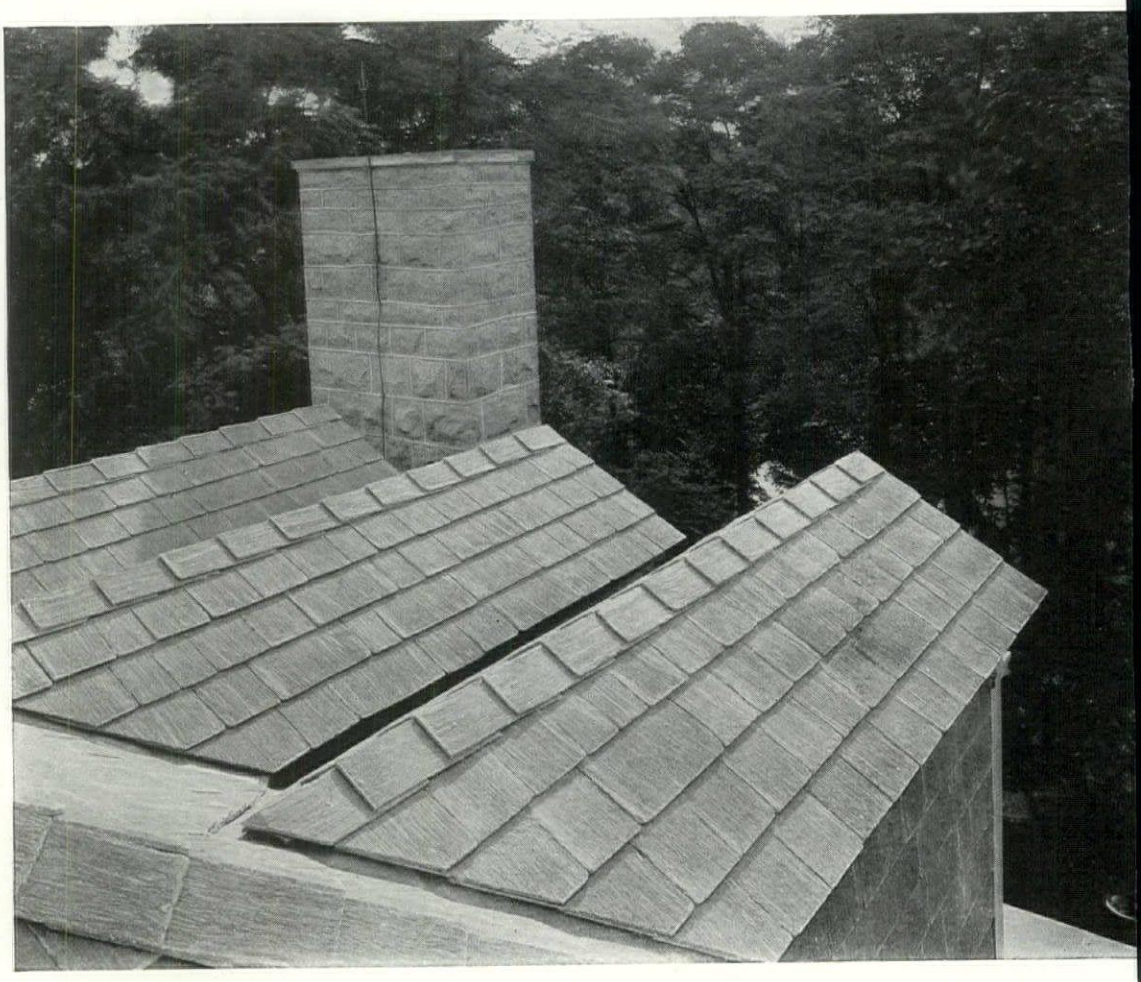
CONTENTS

APRIL, 1932

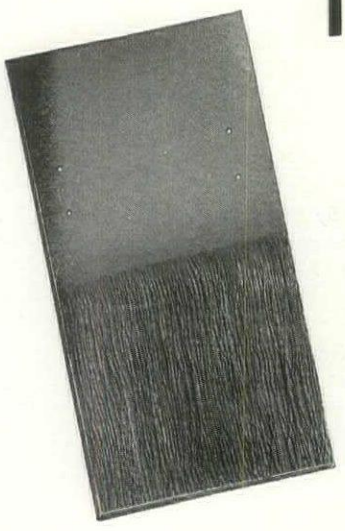
PART I — ARCHITECTURAL DESIGN

PART II — ARCHITECTURAL ENGINEERING AND BUSINESS

THE ARCHITECTURAL FORUM is published monthly by Rogers and Manson Corporation, Howard Myers, President. Publication Office, 10 Ferry Street, Concord, N. H. Executive, Editorial and Advertising Offices, 220 East 42nd Street, New York. Advertising Manager, George P. Shutt. Production Manager, Ruth H. Goodhue. Business Manager, W. W. Commons. Subscription Office, 350 East 22nd Street, Chicago, Illinois. Yearly Subscription, Payable in Advance. U. S. A., Insular Possessions and Cuba, $7.00. Canada, $8.00. Canadian duty 60¢. Foreign Countries in the Postal Union, $9.00. Quarterly Reference Numbers, $3.00; Regular Issues, $1.00. All Copies Mailed Flat. Trade Supplied by American News Company and its Branches.



Time won't "weather" them — so Ambler does



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Being fireproof, not merely fire-retardant they reduce insurance cost and eliminate painting, repairs, replacements and complaints. And that is a lot to write *out of* your roofing specifications!

Standard colors include Lindenwold—a mossy green-black—Royal Red, Sylvan Green, and four blended tints of soft autumnal browns known as "Rustic Blend". In addition, by the special Ambler process, as many as thirty other variations of these shades can be made to secure any color effect you desire.

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AN

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B

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THE now isolated elements of the building world —architects, engineers, contractors, manufacturers, dealers, workmen, investors—are being brought together into the greatest single industry in the United States.

Before them, urgent of solution, are problems of organization, of planning, of design, of new materials, new relationship, new conceptions . . .

The leader in the constructive revolution which must result will be the architect, in his multiple capacity of planner, designer, financial adviser and coordinator . . .

The Architectural Forum is the leading journal of its profession. Independent, forward looking, it gauges the pace of modern building and construction as the industry stands on the threshold of a decade of changes. Here is opportunity . . .

For these reasons, TIME INCORPORATED, Publishers of TIME and FORTUNE, have purchased a controlling interest in *The Architectural Forum*. With the wider scope offered by this affiliation the present staff of *The Architectural Forum* will continue to produce the first-choice magazine of progressive architects.

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HE ARCHITECTURAL FORUM

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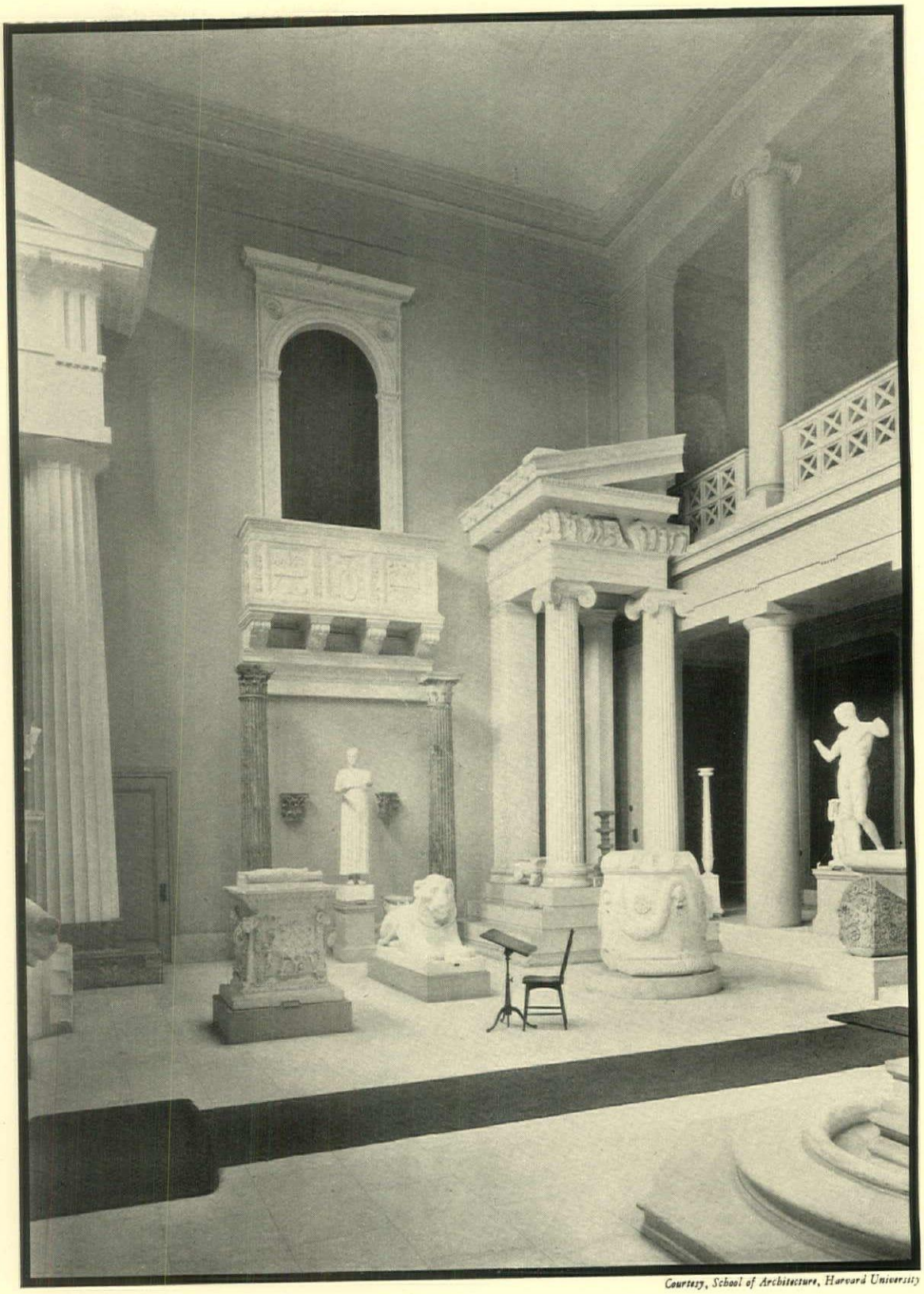


Courtesy, School of Architecture, Harvard University

"As a Background of Vicarious Experience . . . Broadening —"

The Architectural Forum

THE
ARCHITECTURAL
FORUM

VOLUME LVI NUMBER FOUR

APRIL 1932

ARCHITECTURAL EDUCATION

BY

KENNETH KINGSLEY STOWELL

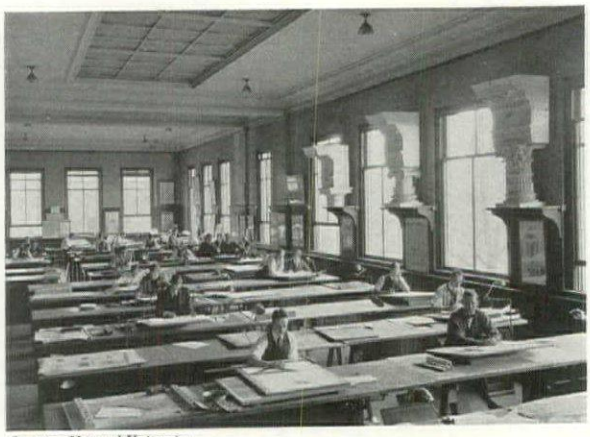
HOW well we can all recall those charettes, the first one when we "niggered" for so-and-so (who won the Paris Prize), wondering how we were going to finish our own "order problem." Then the last "Class A" or thesis when we slapped in the last tree of the entourage and took our cohorts out to the *table d'hote* with red ink — the good old days! We wouldn't give up the memories of those long nights and the fun of the work, the spirit, the fellowship, the crowd. Yet we wonder if we didn't put just a little too much emphasis on that elevation and its rendering, or on getting a Medal or 1st Mention. We sometimes wonder if we might not have been a little better off if we had heard of mortgages as well as of medals, or of carrying charges as well as of cartouches. Perhaps we would not be subject to those embarrassing remarks of the contractor if we had paid more attention to "Engineering A" — not such a useless course after all.

Of course, we don't regret those wonderful years, but we might have been spared some of the hard knocks if someone had taken the trouble to explain what-it-was-all-about before we adopted the design-is-the-only-course idea. The practical workings of the architect's office, which we were supposed to learn from our first job, never percolated to the drafting room. We still can only guess how old P.D. got the hotel job and how much his fee was and what kind of contract he had and how much of his fee he had to take in stock. Will we ever know as much about our profession as we thought we knew when we received our diplomas? Why have we such radically different ideas about architecture now? Why have we found the practice of the profession so different from what we supposed it to be? Was there something radically wrong in the curriculum, the method or the faculty of the old school?

Many architects have been asking themselves these questions and many a faculty group is seeking the answer. The faculty recalls that the university authorities have much to say with their rules and regulations, and that changes are hard to make no matter how desirable they may seem to those who teach and to the alumni. The alumni are not blameless, they may be asking the impossible, forgetting that "art is long and time is fleeting." The alumni, when they were students, never realized what the objectives of the school were, and some today have questioned whether or not these objectives were ever formulated by the school itself or whether they have been modified to meet the changing conditions in the practice of the profession.

Educational purposes are changing and educational methods are in a state of flux, not only in architectural schools but throughout the whole realm from pre-kindergarten groups through elementary and secondary schools to the university. One of the underlying causes is the realization of the fact that education is a continuous process through life and that it does not end with the graduation from the formal school group. "Educated b'gosh," as an exclamation of the graduate, is amusing but it shows an all too prevalent attitude for which the school is at least partially responsible.

The architectural school might well inform its students of its objectives — they are old enough



Courtesy, Harvard University

Where design, engineering, history and economics meet — the drafting room

to be told and might even understand. A statement of the purposes, an explanation of the methods and an acknowledgment of the limitations of the courses would do much to orient the student and clarify his thinking. If he understood from the beginning that the school course is only the beginning of his architectural education, probably it would distinctly change his attitude toward many of his courses. This preliminary orientation would not take the form of a plea by each professor for the importance of his particular course. However, a series of conferences, at the beginning of a student's architectural training, devoted to the consideration of what architecture *is*, what an architect should be and do, and the *what*, *why* and *how* of the school program might produce more understanding and able architects and more capable leaders of the building industry.

Different schools, of course, may have different purposes — some to train men for architectural drafting as a vocation, some to specialize in architectural engineering, others to train designers and renderers, others to provide architectural executives. The education we are discussing here is that designed to provide a well rounded training in the essentials of architecture as a basis for whatever specialization the individual may pursue later. The average architectural school should be of this type, allowing subsequent training at universities specializing in certain advanced branches, or providing the foundation on which the graduate may build his own way.

If the objective of architectural education is to train men who will produce buildings which are functionally and structurally efficient, economically sound and æsthetically satisfying, the building itself must be paramount always in the student's mind. The end sought is the building, a conception that can be constructed. All too frequently the drawings are considered ends in themselves. The schools of architecture have allowed and fostered this idea through the competitive design system with its emphasis on rendering. This happily is changing and the emphasis is turning to architecture, to the solution of the problem of creating a building to serve specific needs in the most efficient and pleasing way, the drawings being mere methods of visualizing the actual building. There are still too many schools attaching undue significance to the student's cleverness in winning medals and mentions, instead of his ability to think through the problems of creating a building.

IN THE four or five short years allotted, what is it possible for the school to develop in the student? At least there are five things — a mind trained to think, a breadth of vision, a method of attack, a working knowledge and technique of the elements of the profession, and a facility of expression.

What changes in the curriculum and in the method of teaching architecture must be made in developing a mind trained to think constructively rather than a hand trained in a traditional technique and a memory of historical forms? Does it not imply a change of emphasis to the development of a student's powers of analysis and synthesis, of observation and of creation? The attempt in this short article is to bring out the possibility of change in the attitude of those who are active in architectural education, to indicate a point of view and a direction of thought, not to set forth a crystallized system of teaching or to outline a definite curriculum.

The first objective of the school is above all to develop creative thinking, a way of mind-working that can be brought to bear on any branch or phase of the problem. Creative and constructive thinking develops in a mind that continually asks itself *what*, *why* and *how*, an inquisitive, seeking, questioning mind. It is not fostered by memorizing the text, copying from the plates, or manually mastering the mannerisms of the "patron." It is engendered by presenting situations that arouse interest in seeking knowledge, data, information or techniques to produce solutions to problems which appear to be of value to the student. Freedom to work out one's own ideas is one of the greatest incentives to significant development — freedom with such guidance as may be sought by the student as to ways and means, the critic or teacher indicating sources of knowledge and the possible directions of quest. This means much individual rather than mass instruction, the problem or case method, and discussion groups rather than the more formal lecture courses. It is not the easiest way for the professor. It means that through the student's work the *need* for a specific knowledge or technique is made evident, and there follows a

definite urge to acquire it. How different from being presented with the facts or the techniques without this active realization of its need, its ultimate use or its relative value! How much more an intimate part of one's working equipment they become when they are the result of one's own desire and search.

The case and research method of education seems in this light to offer distinct possibilities. The power of analysis can be called into play in the first problem in architecture — a problem that might well involve design, history, construction and economics. It might begin naturally with a simple problem, perhaps selected by vote from among a few suggested by the instructor, thus insuring active interest. Perhaps a "Week-end Cottage at the Shore" would be chosen. Each student would then write his own program, analyzing the needs, determining for himself the requirements. A discussion of these programs, of the *what* and *why* of each requirement suggested, would bring into play the student's power of analysis as well as of imagination. In later, larger problems it would develop his social consciousness. A final program, embodying the most significant features, could be agreed upon and issued.

The next effort would be to express by sketches, (most of them in perspective or isometric), a visualization of the enclosed space, the arrangement of parts. This is a creative effort. Then would come the search for "the previous state of the art," independent study of the history of the small dwelling. This is training in observation as well. Such tracings as might be made would be for the purpose of learning the *how*, and of developing technique in graphic expression. The question of the materials and methods of construction would arise naturally and the quest for information as to possibilities would then be undertaken by the student from his own desire to know. Even the costs might be investigated. Infinite possibilities are opened up.

IT IS probable the beginner in architecture would from such a preliminary problem, realize the intricacy of architecture, the interrelation of factors, the correlation of parts and the importance of each branch of instruction. The essential unity of architecture as the correlation of many factors would be emphasized by his own experience and his need for knowledge, discovered through his own work. His design would be studied as a problem in materials and construction to meet a thoroughly understood program of needs for a building. The courses that are now considered tasks, something to be gone through, take on new meaning and new interest.

The development of a method of case and research would involve new techniques in teaching,

Courtesy Columbia University

Architecture as the creation and treatment of enclosed space necessitates its study in models

less formalized but more alive. It would necessitate close personal association of teachers with pupils, a studying-and-working-together atmosphere, with genuine leadership by the instructor. The instructor would supply directional guidance and suggestion. From the first, the student would be trained to think for himself, his breadth of vision would be increased, a method of attack would be developed, he would acquire a working knowledge and technique in the elements of his profession, and his facility of expression would be increased through his own desire.

Such a system would probably eliminate the introductory drudgery of painstakingly rendered plates of the classic orders and would put the study of the orders later in the course, when the classic examples could be more intelligently studied as examples of expressive form in its highest development. The courses in freehand drawing and color would be closely related to the student's active need for expressing himself graphically in his architectural problem. The need for perspective methods would at once be evident to the student and engage his active interest to the extent of increasing rapidly his progress in its principles and practice. Every architectural problem would require presentation in perspective as well as plan and most of the development studies would be in freehand perspective. Naturally models would be made and used, not only in their current form but for the study of the shapes and space relationships of various rooms as parts of the problem. The technique of rapid model making would be developed as the need for this three-dimensional presentation of ideas became more apparent. This practice of designing in three dimensions is already highly developed in the actual work of many offices, notably by the architects of Rockefeller Center.

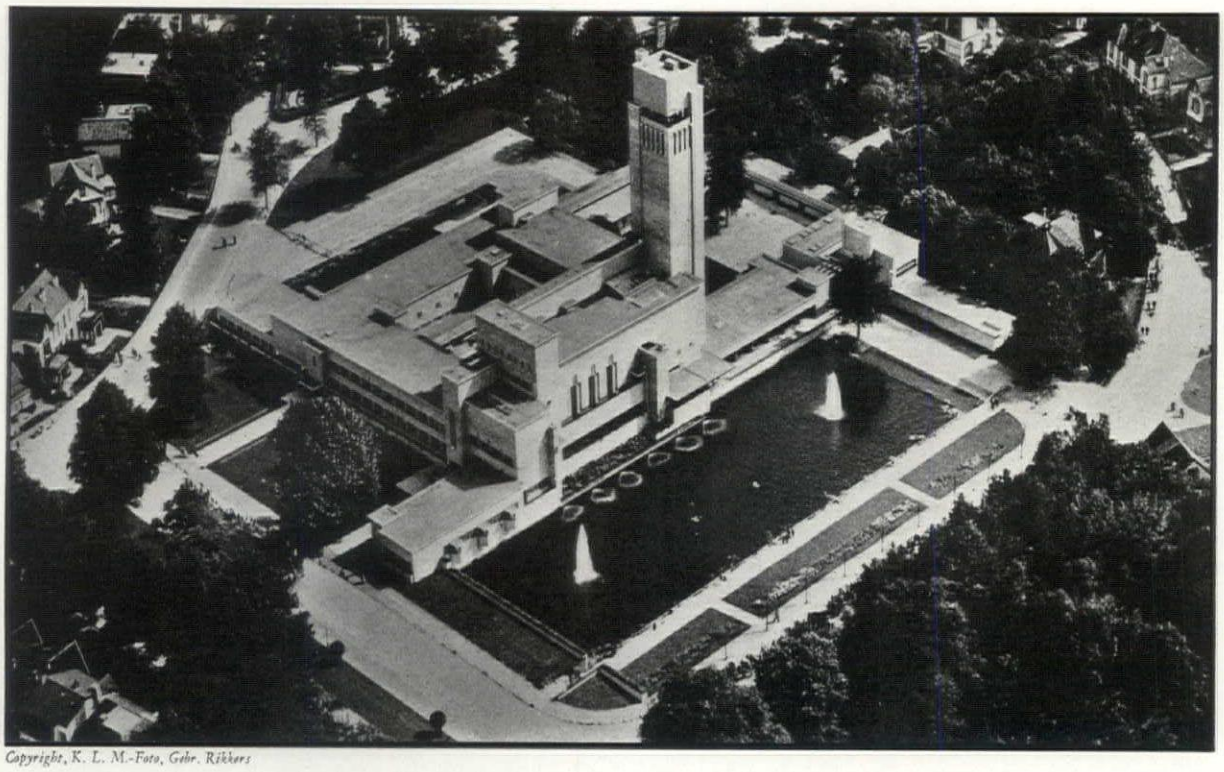
As the student and faculty concentrate on the architectural study as the development of fully

laid plans for actual buildings, rather than as projects, the questions of relative costs, of methods of financing and of the necessary business of architecture will take their places in the work of the school. Design, engineering and business will be considered as necessary concurrent studies to be provided for in the training of the architect. The scope of his training in principles and practice will more nearly parallel that of his work as an architect in later years.

The breadth of vision thus to be gained implies an understanding of the scope of the profession and of its responsibilities, social and economic as well as æsthetic. It includes a sense of the essential unity of architecture; the correlation of the various factors — spatial, functional, structural, mechanical, economic and expressive. It implies a sane regard for the spiritual or emotional as well as the purely physical needs of those served by the architect's buildings — a realization that man is not merely a machine but a being capable of appreciating form, proportion, texture and color as means of emotional and intellectual expression, as well as experiencing the satisfaction derived from the efficiency of the object in serving its physical purpose.

This breadth of vision that sees the problem whole and the relation of the component parts in harmony, can be developed also through the study of the history of architecture, not as dates of styles and forms but as the development of the ideas and ideals of the times expressed in its buildings. The study seeks the inner meanings, the purposes and the ways and means developed in the use of materials, the forms evolved to meet the practical requirements and to give expression to the intellectual and emotional desires. The architectural history would naturally be studied in relation to the cultural and economic conditions of the time and place, the student searching out the *why* and *how* of the evolution of form, not merely acquiring an erudite patter of designations of periods and a collection of forms to be copied. History as a background of vicarious experience in solving problems and ascertaining principles is broadening; as an accumulated series of forms to be used in assembling a "design," it is stultifying.

To sum up, the embryo architect might well be informed, early in his school career, of the nature of architecture and of the requirements and workings of the profession. The functions of an architect should be thoroughly understood from the beginning. The early discussion of the objectives of the school and its methods in relation to these functions would clarify in the student's mind the interrelation of the courses and would tend to unify his study. A conscious emphasis on the student's development of his powers of analysis, synthesis, observation and creation, throughout his work, would add new meaning to his efforts and lead to more effective thinking. This emphasis might come most naturally through a "case and research" method of study, as indicated, with discussion groups as well as the lecture and problem courses. It may be possible to bring about such changes in objective, in point of view and in method without radical changes in the established curriculum and without upsetting the requirements and regulations of the administrative authorities of the college or university. Even the tradition of the good old "charette" might be preserved, the student days losing none of their attractiveness while gaining in effectiveness through these changes.



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THE CITY HALL

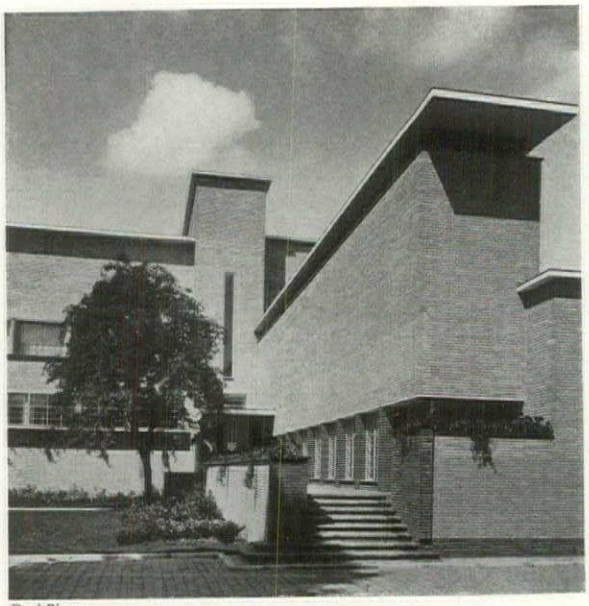
HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT

IN TIMES past the city hall fulfilled the single purpose of housing the governmental organization of the community. The modern town hall, however, has a dual function. One part of it remains unchanged. The building is still the main administrative center of the community: the point from which the town is governed. The other part, because of the widened scope of government interests, takes on the character of an efficient, modern office building to house the varied requirements of the many technical services necessary to a contemporary town organization. Both of these functions have been provided for in the Hilversum City Hall without damage to the architectural unity of the whole. From both practical and æsthetic standpoints the problems have been admirably solved. Although the details of solution are evident from a study of the plans on page 332, some characteristics are especially noteworthy.

The city of Hilversum is one of the few completely planned garden villages of Europe. It is a community largely of homes, with public buildings designed to harmonize with the prevailing domestic atmosphere. The City Hall standing in the center of a relatively large park finds its natural setting in a monumental garden. This location is an important contributing factor to the domestic character of the building. Equally as important to this character is the distribution of area and mass in the provision of the functions already spoken of.

One of the most interesting features of the plan and one which contributes not only to the appearance of the building but also to its practical efficiency is the manner in which the wings are disposed around courts and open areas. This is not in any way a forced disposition. On the contrary, it is a most natural one, for the uses served by the several wings demand separate entrances with their consequent traffic ways and open areas.



Deul Photos

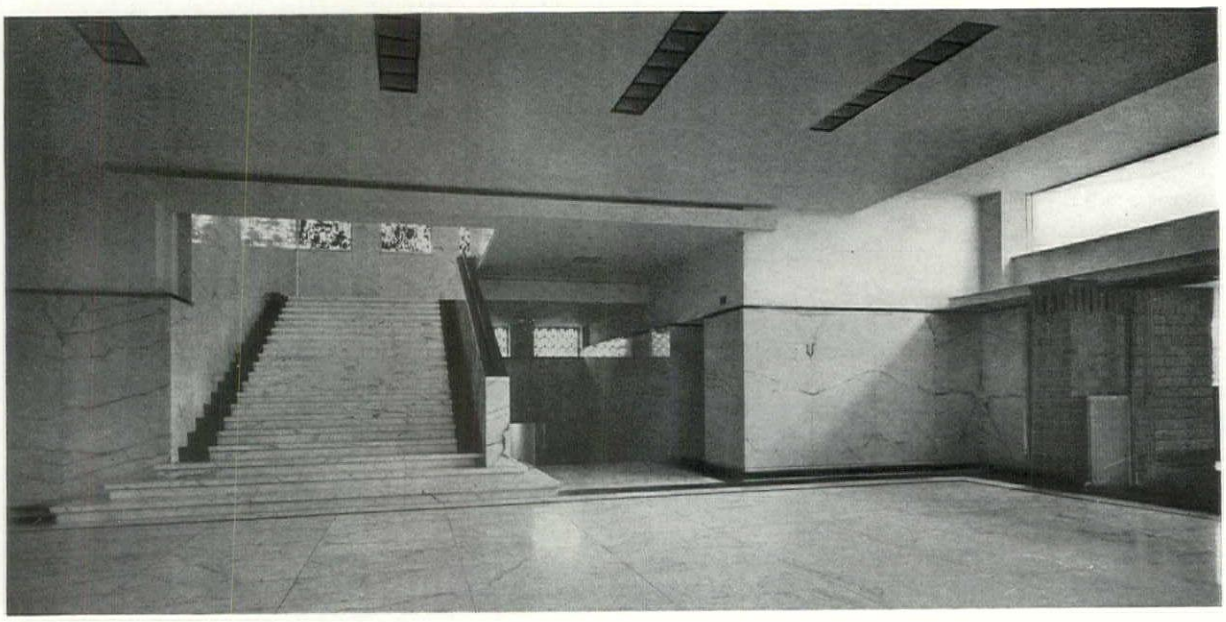
The entrance to the northeast wing, containing the tax department and marriage rooms, from the main entrance court. Piers are of black brick

In plan the administrative suites — the most important part of the building — occupy the south side of the structure, facing the pond and the main thoroughfare. The west, north and east parts of the main structure house the general offices. They are grouped about a large interior court and are reached by a direct, simple system of corridors. At the east the entrance road and court separate the main structure from a low unit housing the superintendent's quarters, a parking garage and several mechanical service spaces.

The stair halls placed at each of the four corners of the main building have made this division of space doubly significant from the standpoint of efficiency in use. Any of the various offices may be reached quickly and easily from the outside without the necessity of traversing long, tortuous corridors. Particularly is this true in the case of the executive and council chambers, the assembly rooms and other spaces used most frequently by the public.

The planning of the main entrance to the building and the spaces located on the south and east sides are worthy of particular study. In Hilversum, the town hall is used for the reception of parades and demonstrations on holidays and occasions of public gatherings. The entrance has been planned with this specific use in mind. The fact that the building is set back from the main approach with its south front reflected in a large pond gives a certain monumental dignity otherwise absent. When a delegation approaches the city hall and turns in at the main entrance the colonnade serves the double purpose of a reviewing stand or, upon occasions of inclement weather, a sheltered entrance. The public may easily be held at a distance; they are able to view everything from the other side of the pond and there is nothing in the approach to disturb a dignified reception. From one standpoint perhaps an unnecessary emphasis has been placed upon the entrance but from a larger view it conforms with a balanced nicety to both custom and practical requirements of community life. The entrance is only one instance of this balance. It exists in every part of the plan and is disclosed by an analysis of its various parts.

The mass of the building is in many ways an



The main entrance lobby is often used to receive visitors. It is large and light in color

ideal complement to its plan and follows in its three-dimensional aspects the same systematic division of use as the plan. The executive and administrative portion on the south side has already been spoken of, but it is interesting to note how their prominence dominates the entire composition.

From every point of view the composition is dominated by the high, square tower adjacent to the entrance at the southeast corner of the building. Practically it is a clock tower and houses as well certain parts of the mechanical equipment of the structure. Æsthetically, and in equally as practical a sense, it symbolizes the seat of vested authority and civic control. From this dominant point, buttressed to the west and north by sturdy blocks which contain respectively the executive and council suites and the public meeting hall, the masses fall away to one story dependencies of the less important spaces.

It requires no searching analysis to understand the particular æsthetic disposition of other parts of the building. The grouping of the least important factors in low wings which serve to buttress the most important parts of a structure is a well recognized expedient. Here it has an added force derived from simple, rectangular masses placed to fulfill best their practical functions.

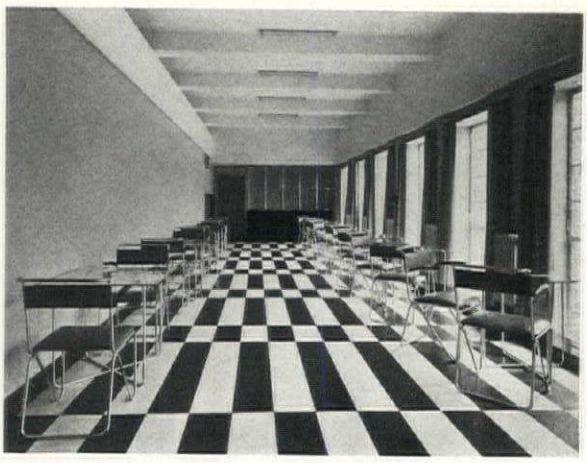
In regard to the actual details of the design, it is unnecessary to say more than that they have received the same logical treatment. Mr. Dudok is a particular kind of an artist. In addition to the clarity of the plan, there are evidences throughout the building of a personality which, though not designing form without regard to use, is still highly sensitive to a balance of line, mass and proportion.

In addition the building is a striking example of the successful use of color which unfortunately the illustrations do not convey. The brick is of a very light buff color with a semi-glazed finish laid with exactness. The cornices are all painted white. The piers of the entrance on the south side are of gold tile with black bases and the balustrades have blue glass caps. The base course around the building is a dark lavender and the piers throughout the other parts of the building, such as the entrance on the north side of the court, are of black brick.

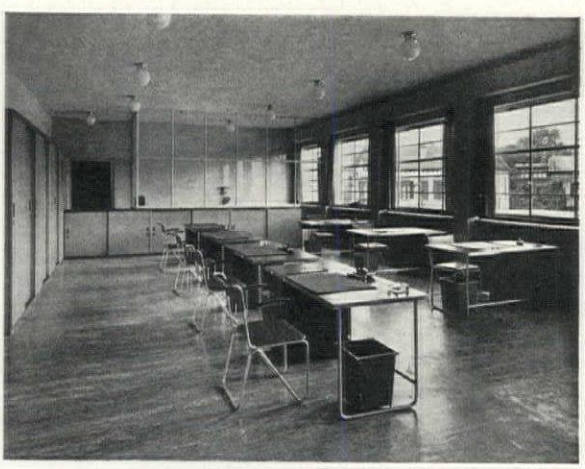
The interior treatment is entirely consistent with that of the exterior, both in regard to materials and color. Throughout the building an obvious effort has been made to omit detail and to allow the beauty inherent in the color and finish of materials to serve in place of it. In general the floors are of rubber tile throughout, mostly of yellow-green jaspé pattern, and the walls in the ordinary are plastered with a white, semi-smooth finish. The notable exceptions to this treatment are, of course, the public spaces and the mayor's suite which are simple insofar as the absence of

Deul Photos

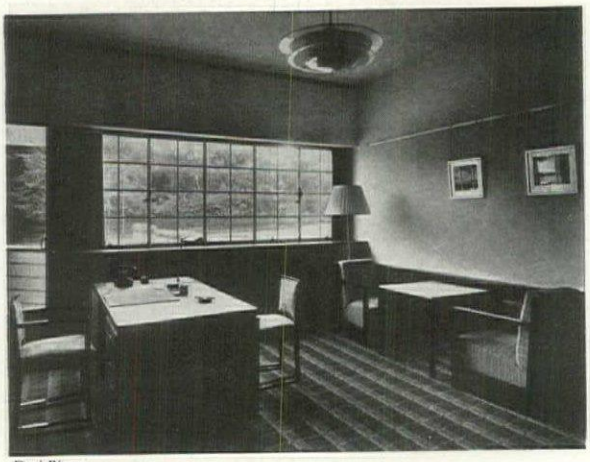
The furniture of the reading room is upholstered in blue and silver. The hangings are gray



The floor of the foyer is black and white linoleum. The hangings and upholstery are yellow

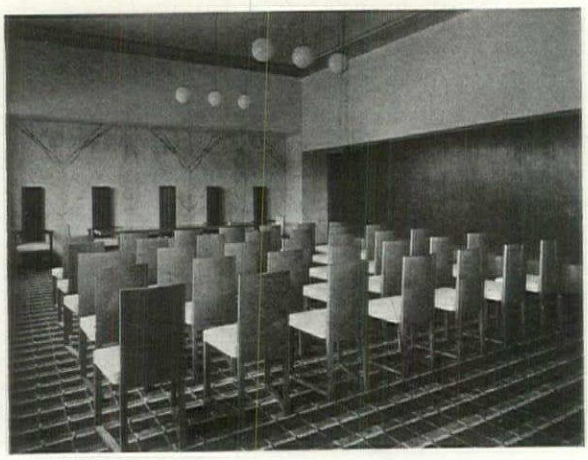


A typical office. The floor is jaspé linoleum. The hangings and upholstery are blue



Deul Photos

The mayor's office is decorated in tones of brown, with natural oak woodwork and burnt sienna hangings



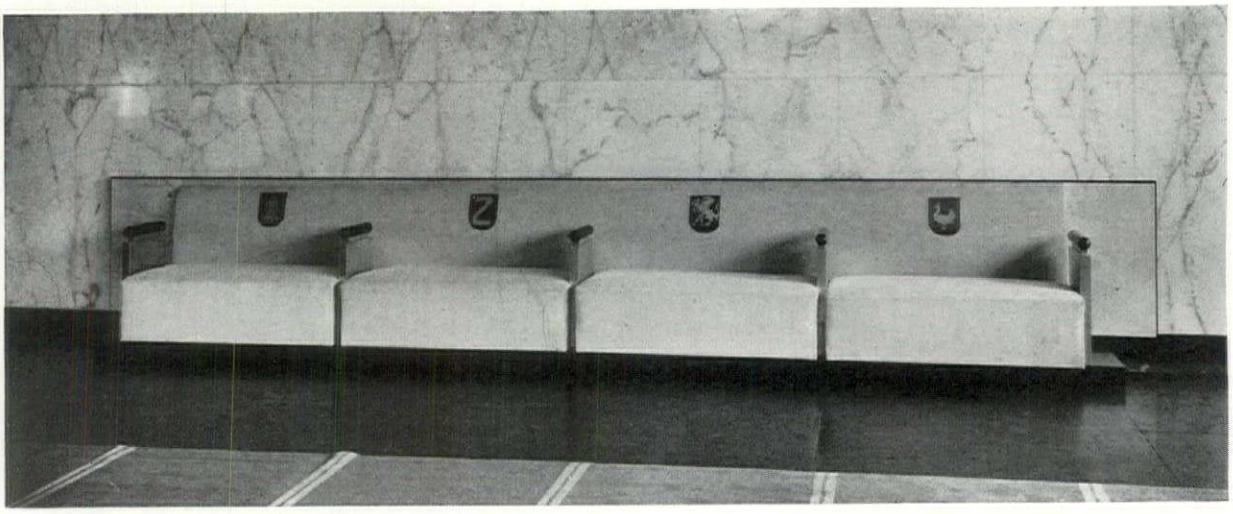
The large marriage room has mahogany woodwork and polished maple chairs with white horsehair upholstery

detail is concerned but are rich from the harmony of contrasting color and finishes of material.

The reception room will serve as an example. Around three sides the walls are faced with a light cream Italian marble. The window columns on the east side are of light blue tile, while the row of columns near the opposite side of the room are covered with gold tile. The floor is of black and gray marble covered in the central portion with a dull blue rug striped with green. The hangings are dark blue and the upholstery material on the couches is of blue, silver and buff. The doors are vermilion. The room is lighted directly, the fixtures being flush with the ceiling surface.

The same simplicity in conception and actual execution may be observed in the furnishings throughout the building. A nice distinction has been observed in the design of those pieces which serve the ordinary office spaces and those which constitute the furnishings of the special rooms. It is obvious at a glance that all of them were designed primarily for hard usage, but the furniture in the special rooms shows more refinement in material and color than that in other spaces throughout the building. A comparison of the illustrations on this page with those on page 327 will show how well this has been accomplished.

The entire scheme shows an understanding of every detail of the problem and an enviable ability to translate that understanding into concrete form. All elements have been composed into an harmonious whole which analysis cannot help but stamp as successful. Unhappily, the combination of engineering efficiency and æsthetic comfort is not often achieved. The Hilversum City Hall is an exception, for while it meets adequately every practical contingency its beauty is a very real stimulus to emotional appreciation.



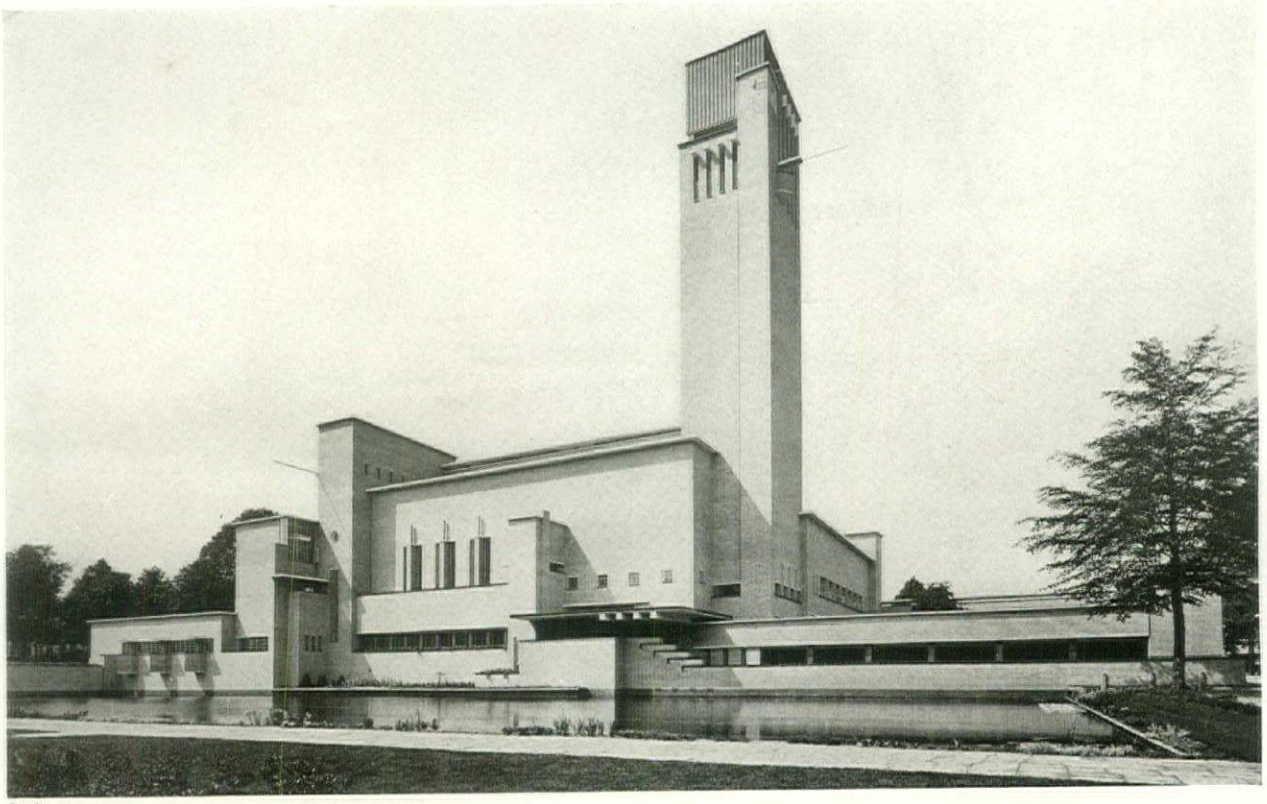
The bench in the reception room. The upholstery is silver-gray and the patterns on the back are in red, gold and black

FROM THE PARK AT THE NORTH

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT



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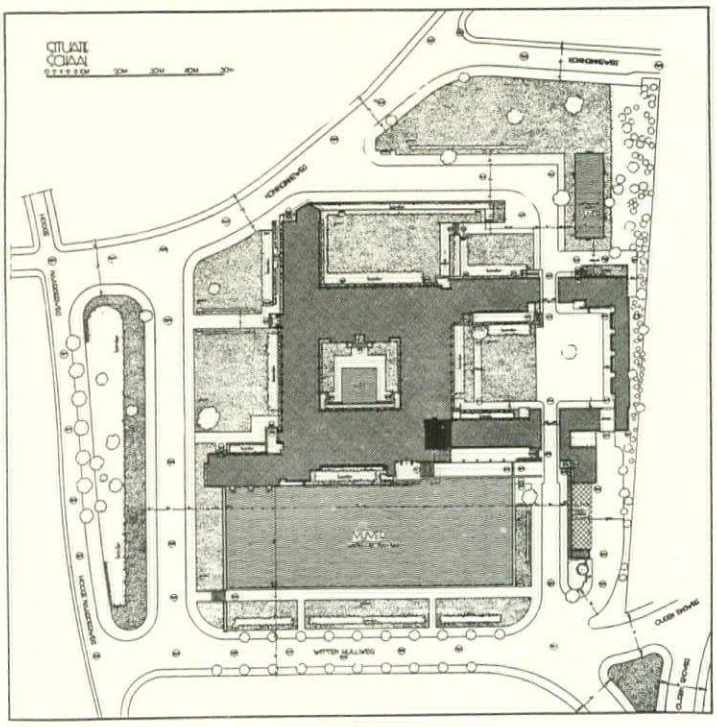


THE building stands in the center of a relatively large park and is so placed that from all sides of the building it is possible to obtain a complete impression of it. The picture above is of the south side and shows the general effect from the main approach. On the opposite page is a detail of the main entrance corner taken from the entrance road. The brick is of a light buff with an impervious matt surface, laid in a very even manner with weathered joints. The cornices are white, as are the small detail caps in the tower. The tower clock is a brilliant turquoise blue

THE CITY HALL

HILVERSUM, HOLLAND

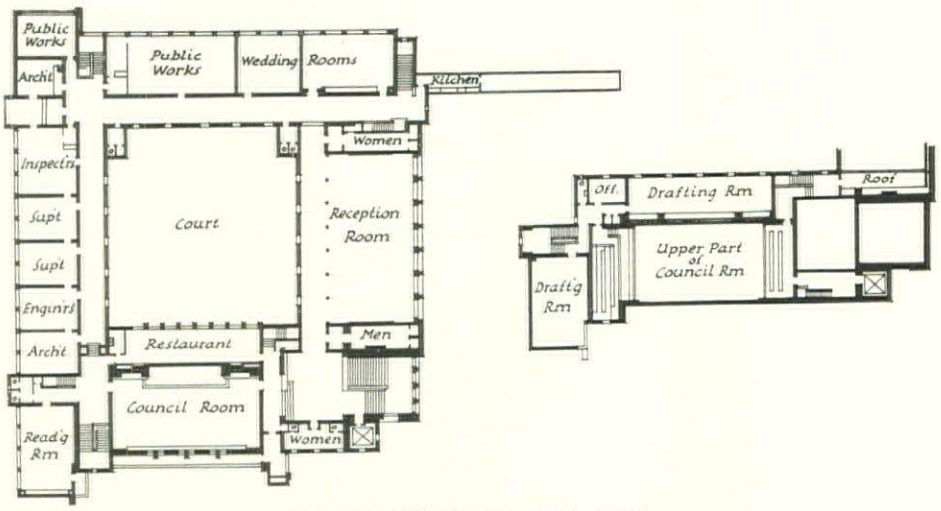
WILLIAM DUDOK, ARCHITECT

Deul

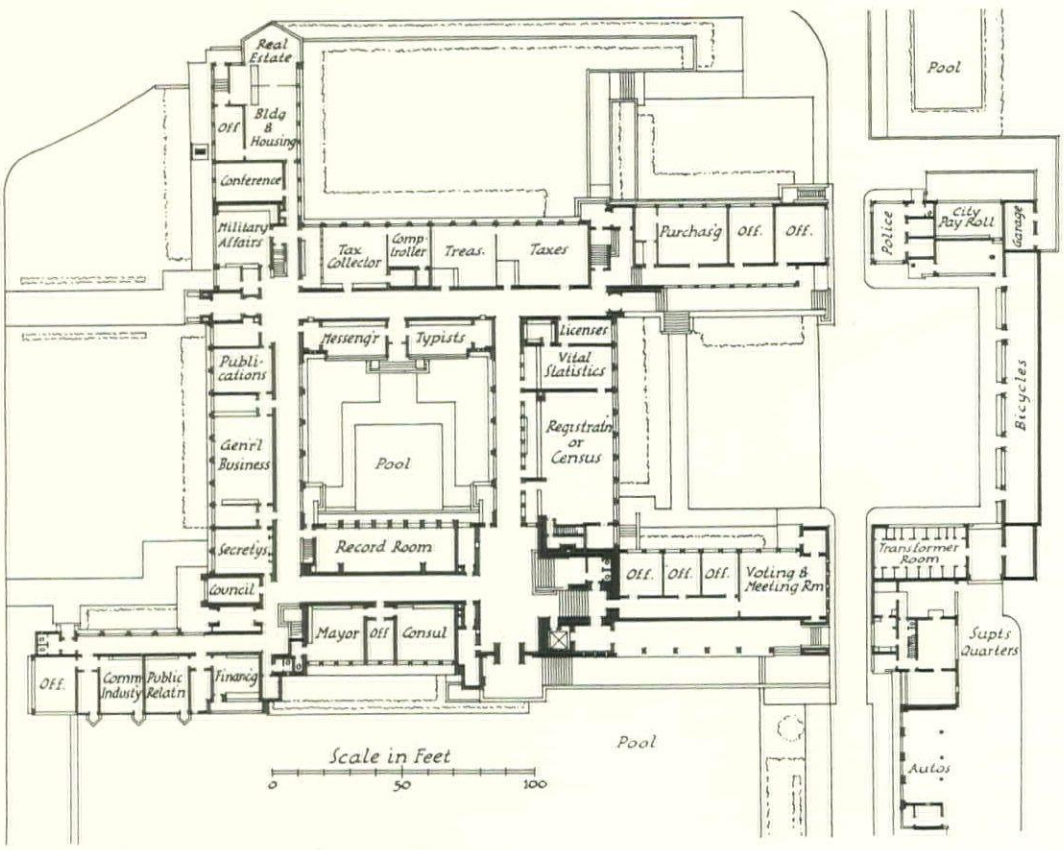
THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT



SECOND AND THIRD FLOOR PLANS

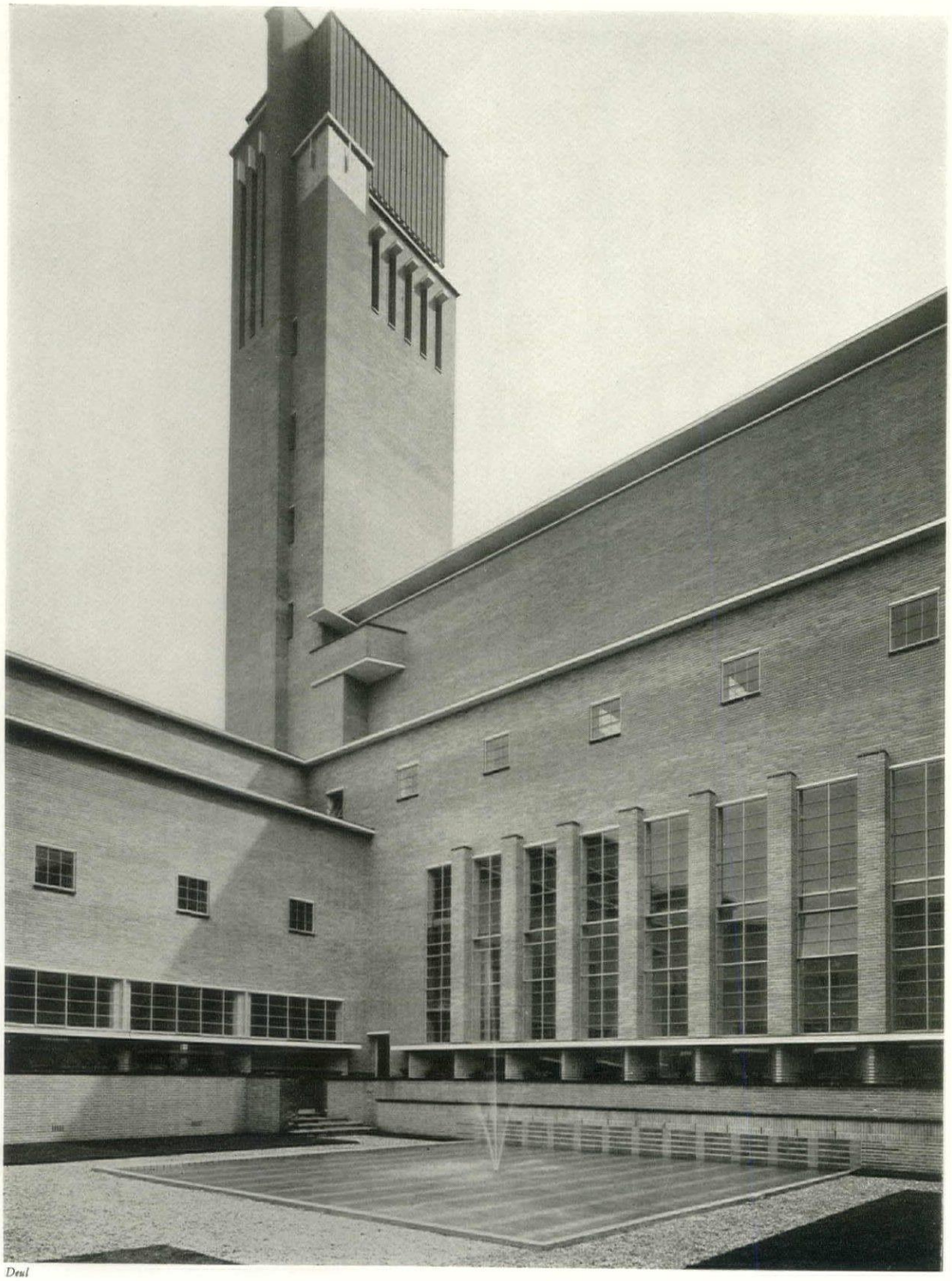


FIRST FLOOR PLAN

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT



Deul

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT

Deul

THE illustrations on this and the opposite page are of the council chamber, located on the second floor directly above the mayor's suite and overlooking the pond on the south side of the building. Although the room is barren of architectural detail its effect is extremely rich. It is an excellent example of an interior wherein materials have been carefully selected for their harmony in combination and at the same time their contrast in color and texture. The floor is a light cream marble and the carpet which covers a large portion of it is patterned in alternate squares of silver and light gray. The two walls of the long sides of the room are covered with a patterned wall fabric in green and gold, with the exception of the recess shown on the opposite page which is faced with a gold tile. The ends of the room are paneled with Hungarian oak in a natural color. The hangings are green. The furniture is of ebony with upholstery of light gray and black. The ceiling is neutral and serves as a reflecting surface to an indirect lighting system at either end of the room. The only additional lighting fixtures are the simple globes over the dais shown in the illustration on the opposite page

THE CITY HALL

HILVERSUM, HOLLAND

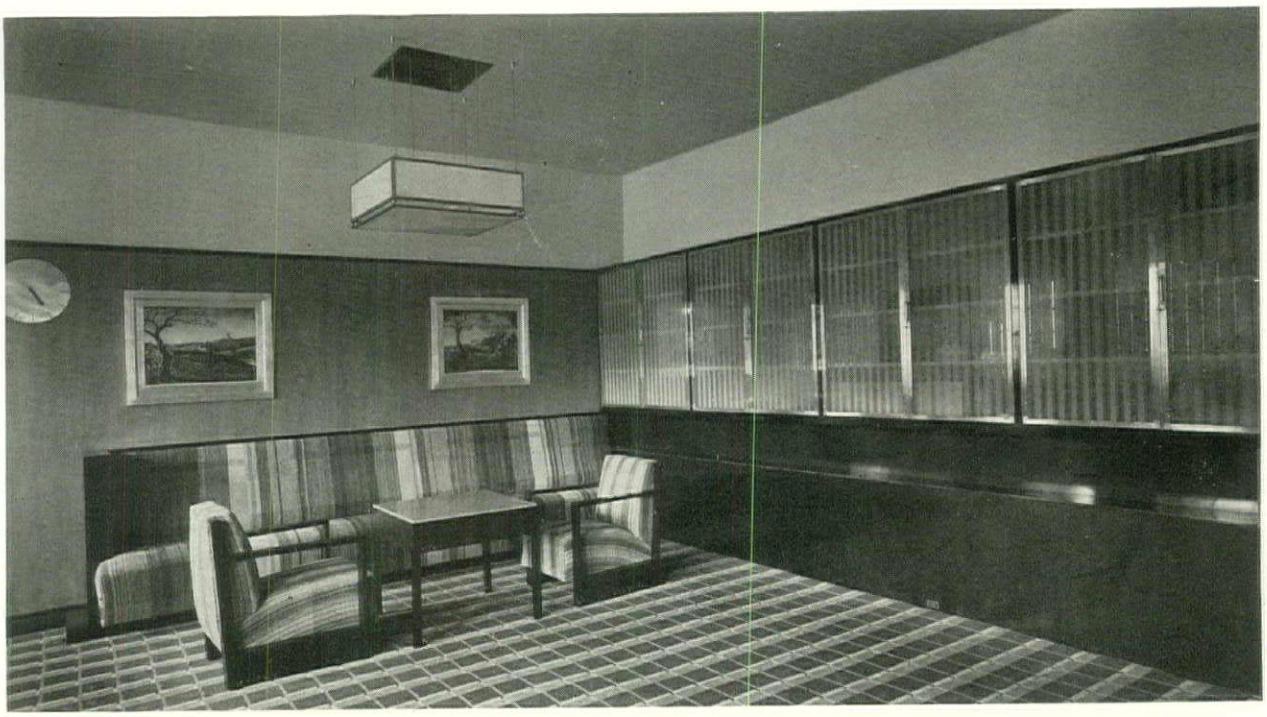
WILLIAM DUDOK, ARCHITECT

Deul

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT



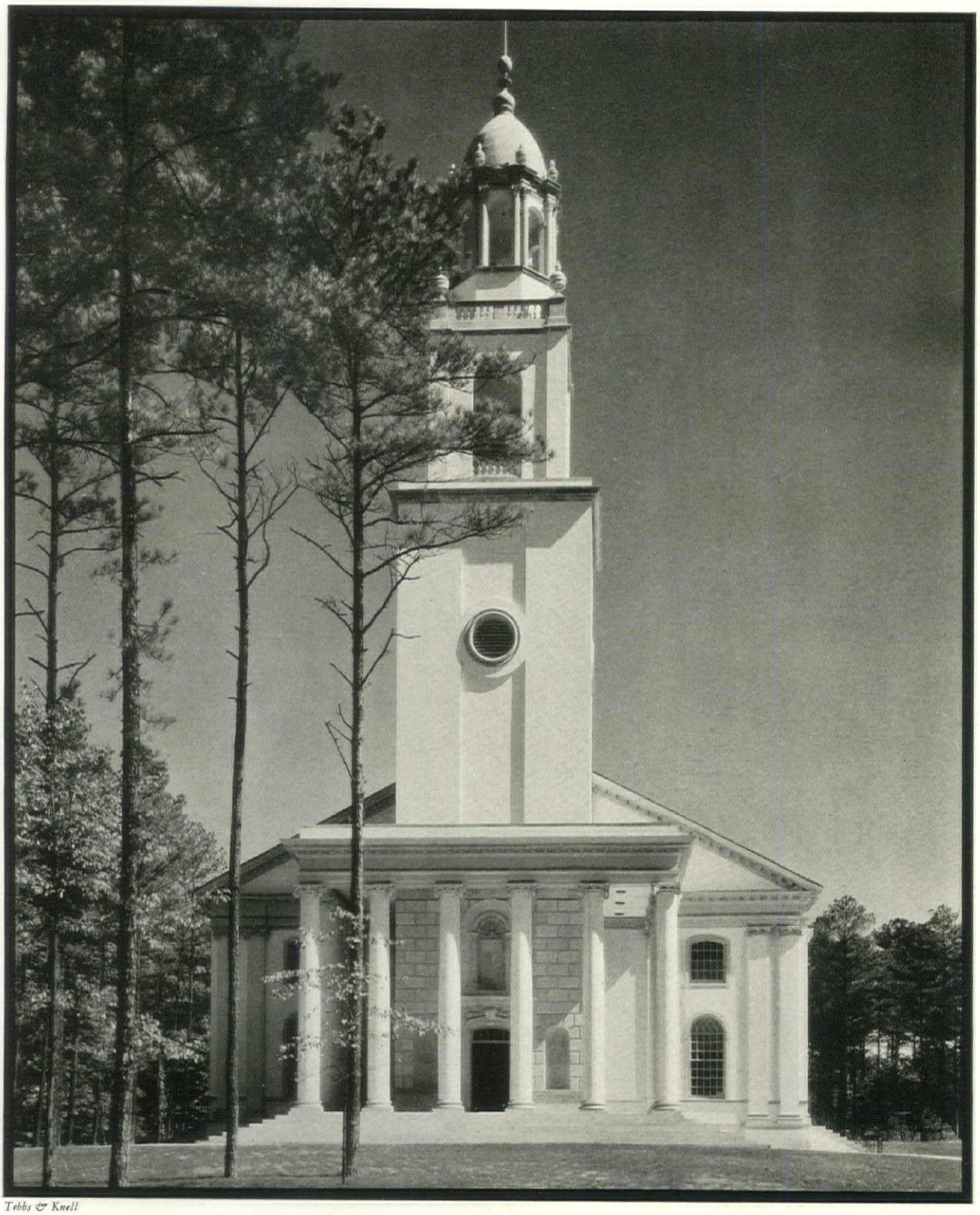
Deul

THE illustration on the upper part of the page is of the mayor's private office. The high paneled wainscot is of natural oak and the cabinets at the right are black and red with etched glass doors. The rug is patterned in two tones of brown. The hangings are burnt sienna and the upholstery is of random width brown and gray stripes. Above the paneling the walls and ceiling are plastered and painted a light neutral tone. The illustration at the left is a view of the reception hall taken from the entrance, a complete description of which will be found on page 325

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT

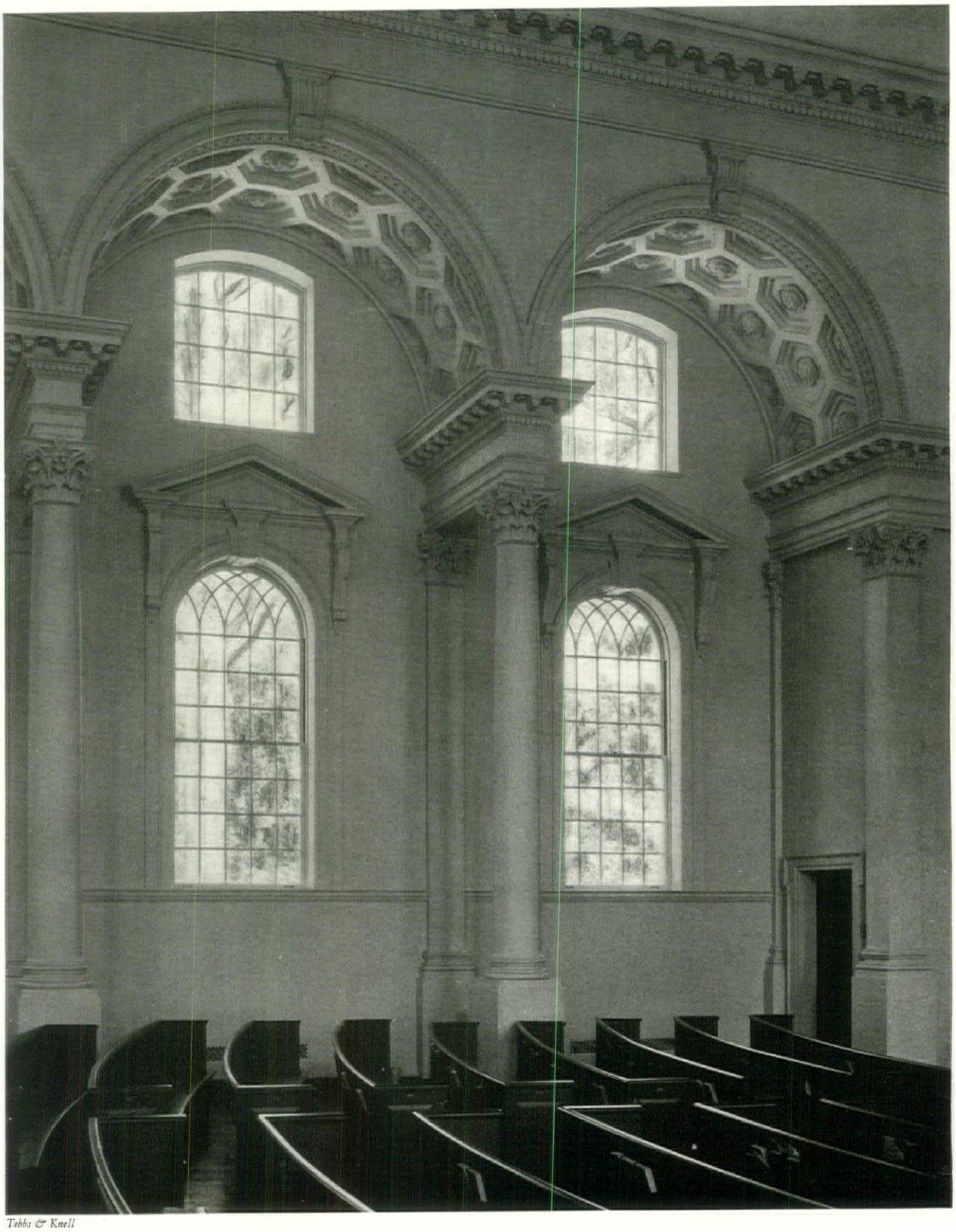


Tebbs & Knell

GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

HENTZ, ADLER & SHUTZE, ARCHITECTS

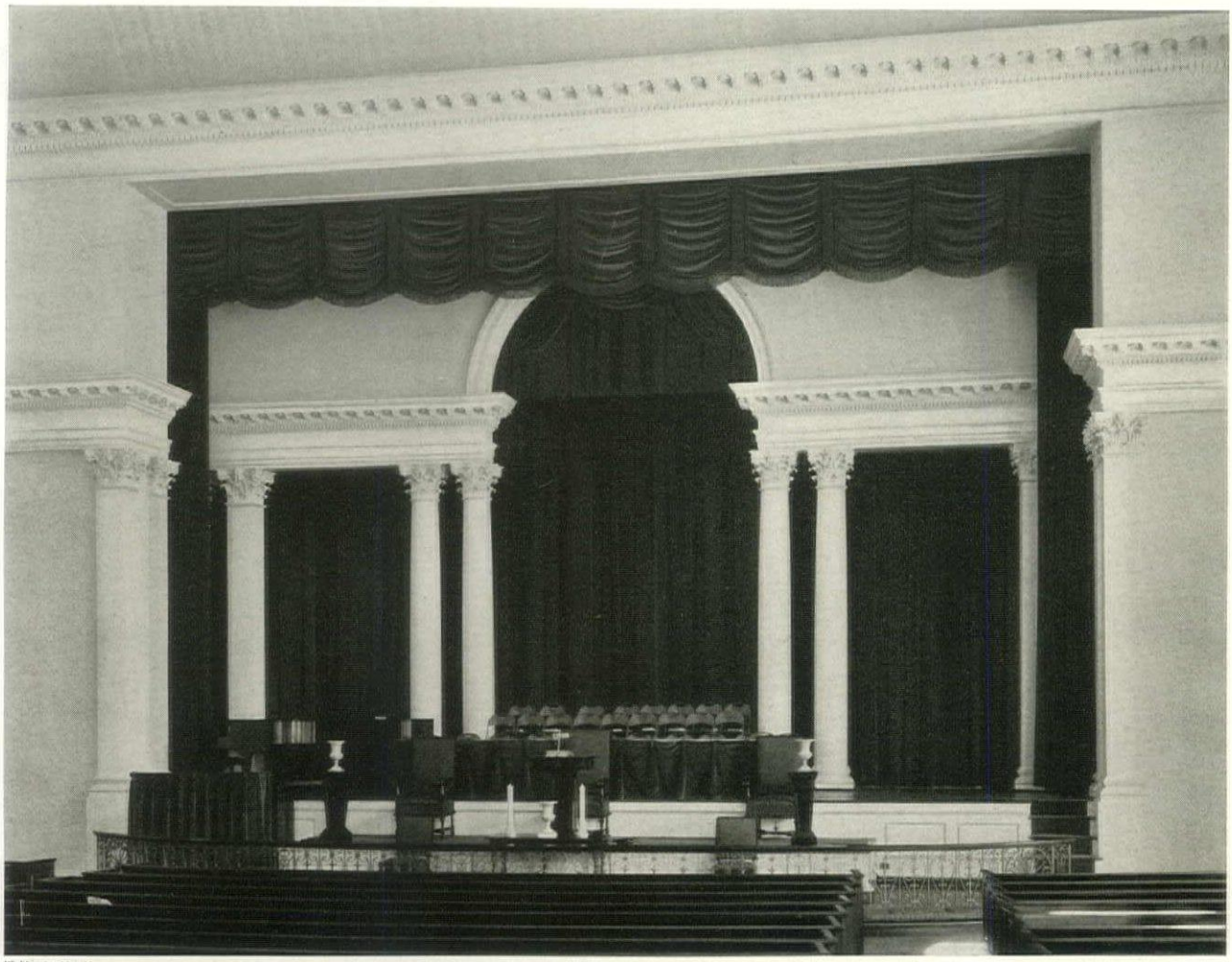


Tebbs & Knell

GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

HENTZ, ADLER & SHUTZE, ARCHITECTS



Tebbs & Knell

THE building is located on the grounds of Emory University and serves not only as a Methodist Church for the community but also as an auditorium for student activities, which include concerts, college dramatics, graduating exercises, etc. This double purpose brought about the necessity of combining what is essentially the plan of a theater with that of a church. The stage is hidden from the auditorium by a Palladian motif carried on enormous hinges. When the building is in use as a theater it is swung out of the way and discloses an unobstructed stage 29 ft. deep, 44 ft. wide. The pulpit platform is also movable. When not in use it is rolled upon a steel track under the front of the stage and the space occupied by it becomes an orchestra pit. The theater dressing rooms are located in the basement and on each side of the stage at various levels. The projection room, equipped for talking motion pictures, is located in the tower at the rear of the balcony. The auditorium, including the balcony, seats 1,450 people. The building is constructed of reinforced concrete and structural steel on a concrete foundation. The exterior has been finished in smooth white stucco, trimmed with wood and limestone. The interior walls are of painted plaster. The auditorium floor is of cork; the stage floor of wood. Elsewhere the floors are of cement. The building, which contains 667,000 cu. ft., was built for 29.6 cents per cu. ft. or a total cost of $197,650, including the architects' fee but exclusive of the organ and furniture

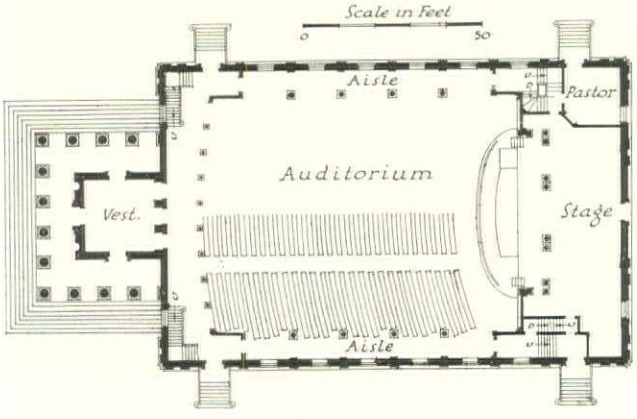
GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

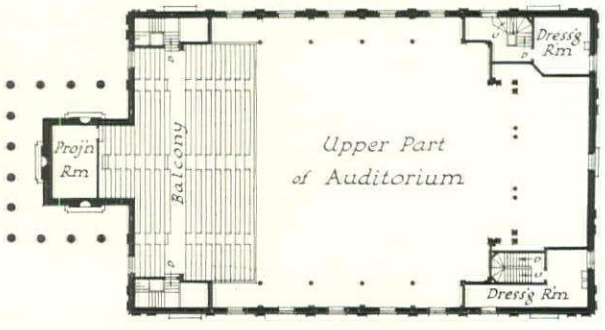
HENTZ, ADLER & SHUTZE, ARCHITECTS

Tebbs & Knell

ENTRANCE TO THE AUDITORIUM FROM THE VESTIBULE



MAIN FLOOR PLAN



BALCONY FLOOR PLAN

GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

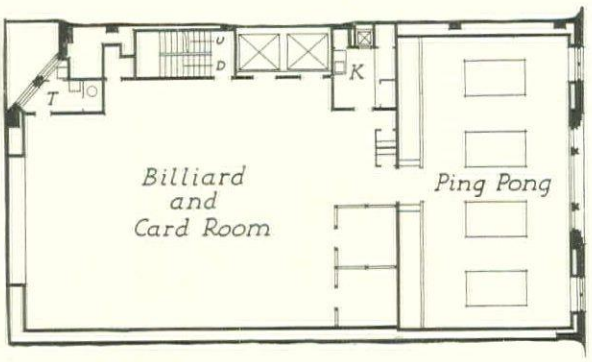
HENTZ, ADLER & SHUTZE, ARCHITECTS

Hedrich-Blessing

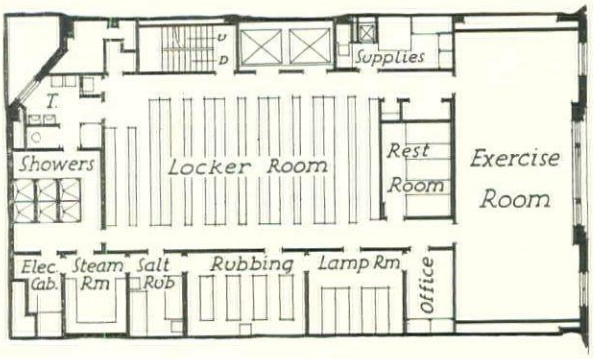
INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

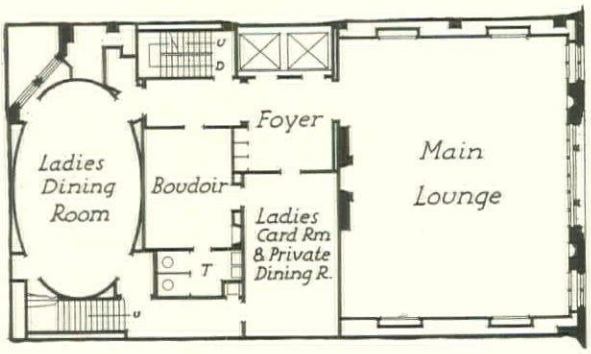
HOLABIRD & ROOT, ARCHITECTS



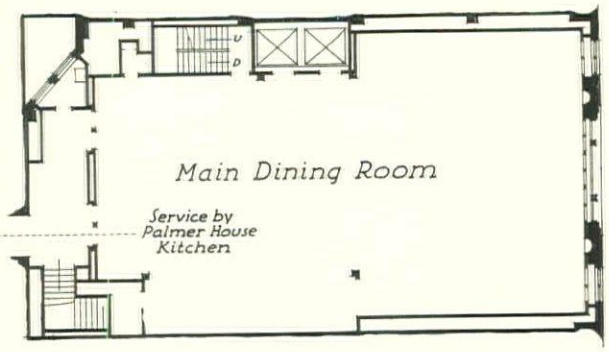
FIFTH FLOOR



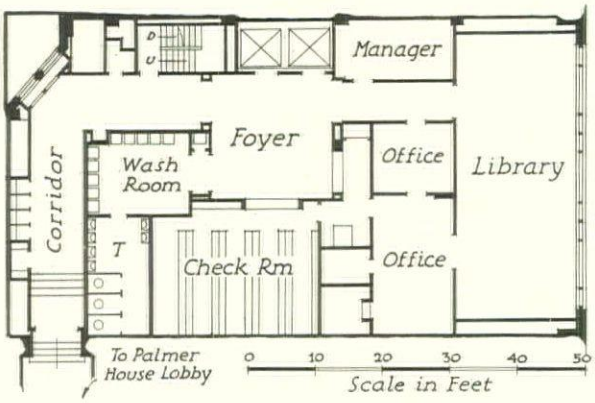
SIXTH FLOOR



THIRD FLOOR



FOURTH FLOOR



SECOND FLOOR

THE quarters of the club include six floors and basement of a small new building adjacent to the Palmer House. The only space on the first floor actually used for club purposes is a small lobby, shown opposite. It has a black terrazzo floor, a 7 ft. wainscot of Fossgraynelle marble and plastered walls and ceiling. The walls are decorated with large areas of black and yellow, and the ceiling in tones of yellow and gray

INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

HOLABIRD & ROOT, ARCHITECTS

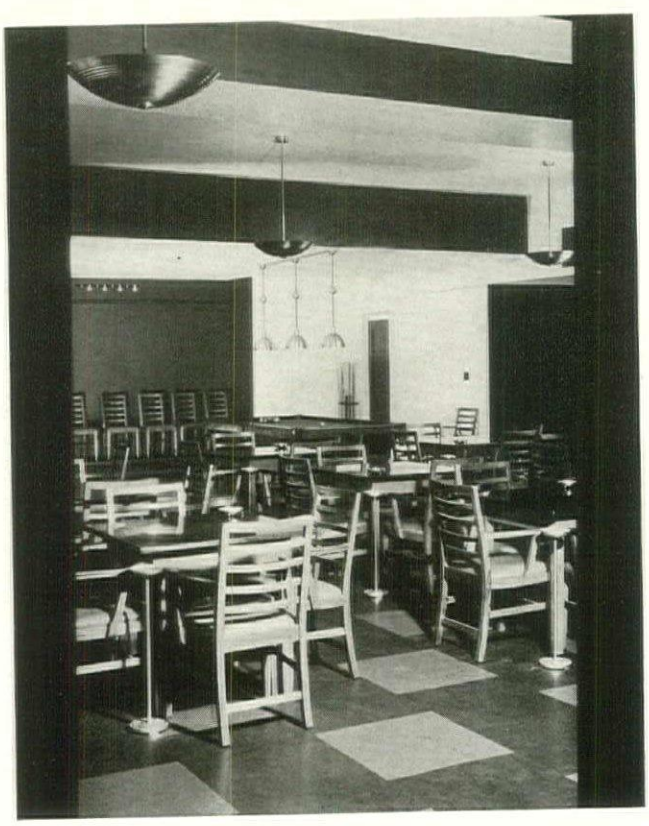
Hedrich-Blessing

INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing Photos



THE main lounge illustrated above has a general color scheme of brown and various shades of yellow. The walls are covered with a natural colored walnut Flexwood rubbed to a dull gloss. The ceiling is plaster painted in varying tones of yellow. The carpet carries the same general tone as the woodwork and all metal work, including the lighting fixtures, is of white metal. The illustration at the left is of the card and billiard room. The floor is covered with asbestos tile in 2 ft. squares of black and Venetian red. The walls are painted in large areas of yellow and black. The furniture is walnut with upholstery of red leather

INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

HOLABIRD & ROOT, ARCHITECTS

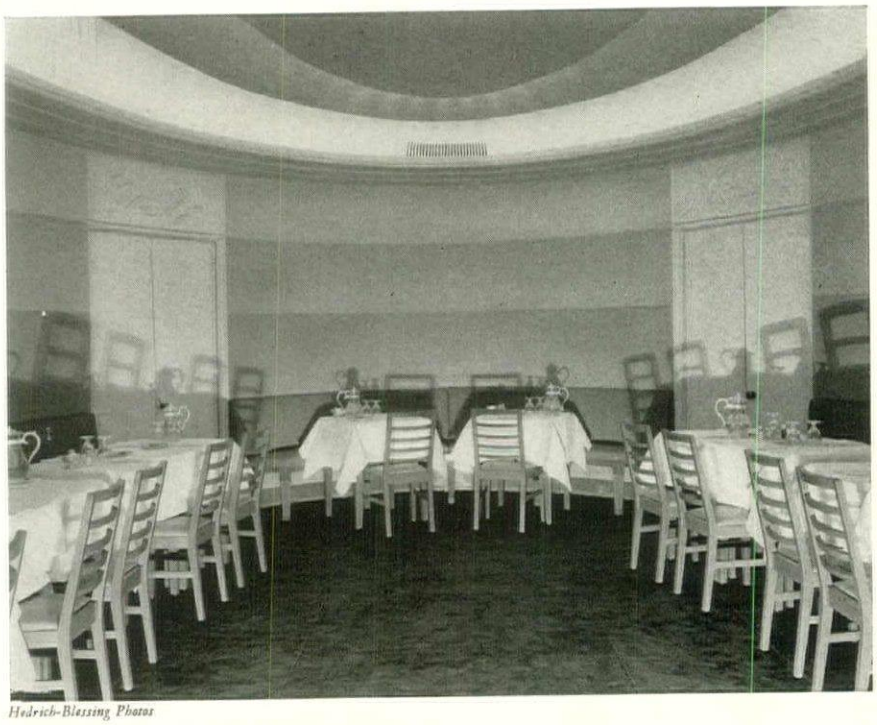
Hedrich-Blessing Photos

ABOVE is the library and directors' room looking toward the north side. The east and west walls of this room are painted a light gray and the ceiling is decorated in bands of red and black which continue down the north and south walls to the floor. The carpet and draperies are a henna color and the furniture is upholstered with red and black leather. All metal work, including the lighting fixtures, is white. At the right is a view of the ladies' card room, which is papered to a height of about 7 ft. in blue with a pattern of pink polka dots and inverted swags. The walls above are pink; the ceiling is blue, and all metal work is white

INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

HOLABIRD & ROOT, ARCHITECTS



Hedrich-Blessing Photos

THE walls of the women's dining room at the left are painted in bands which start with a blue violet and graduate to a pink at the ceiling. The graduation is continued in the ceiling from pink to cream. The carpet is purple blue and the benches are upholstered in a blue leather. The main dining room, below, has plaster walls and ceiling painted cream color and walnut furniture with henna leather upholstery. The floor is surfaced with Cellized oak blocks, polished for dancing

INTERFRATERNITY CLUB

CHICAGO, ILLINOIS

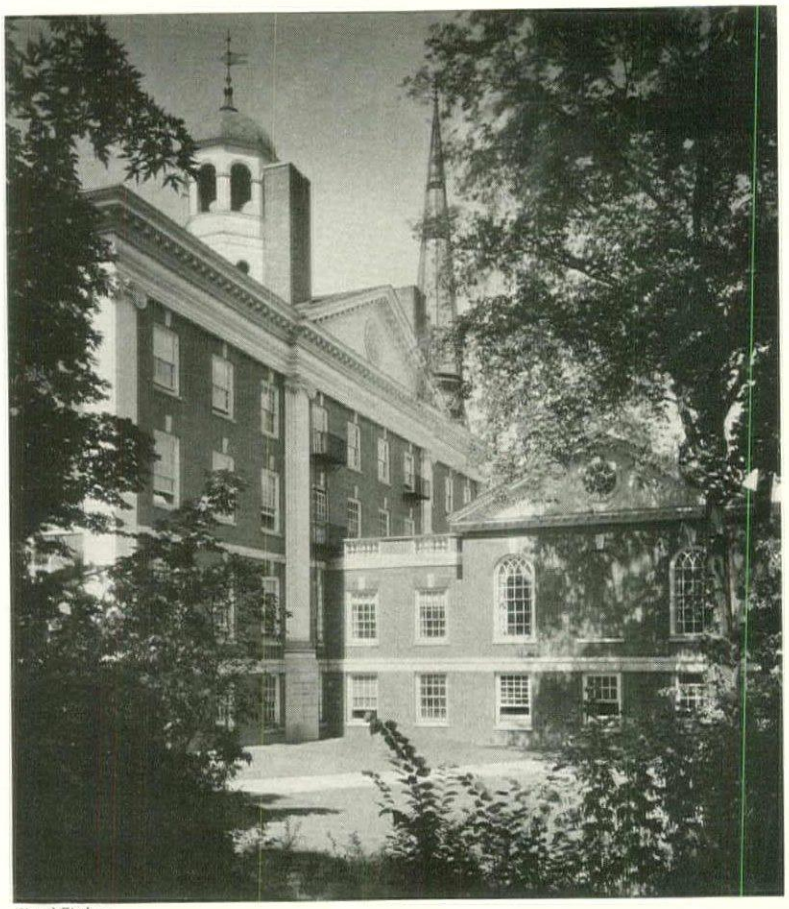
HOLABIRD & ROOT, ARCHITECTS

Sigurd Fischer

AUBURN CITY HALL

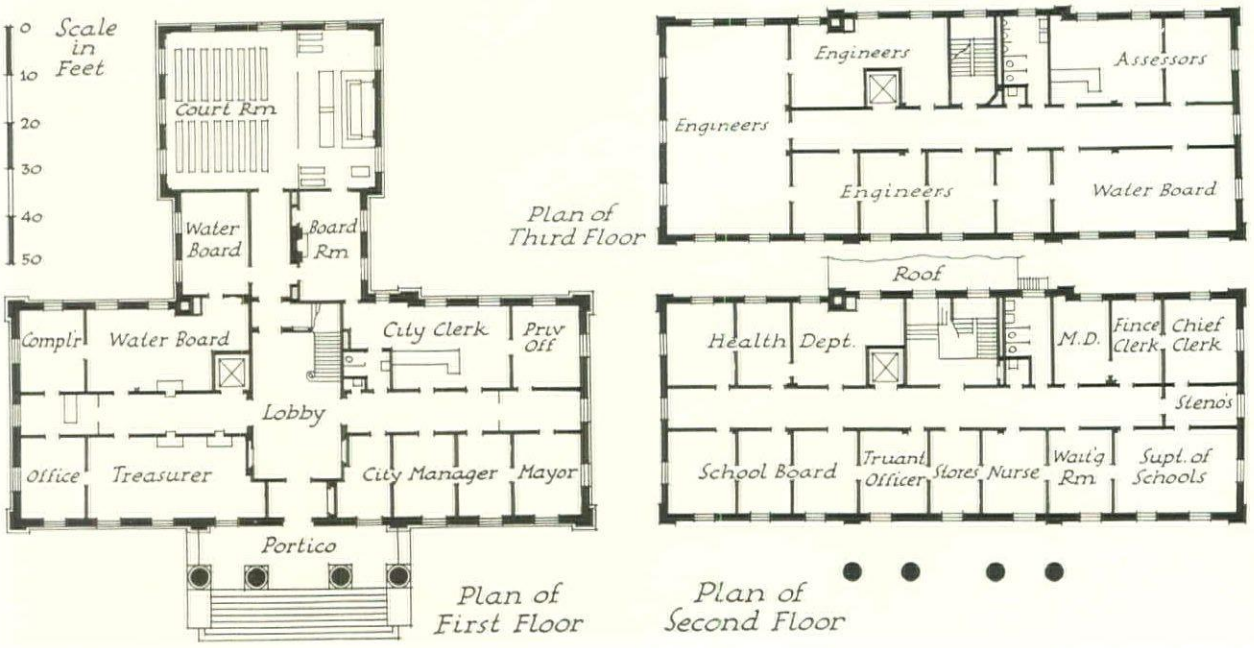
AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS



Sigurd Fischer

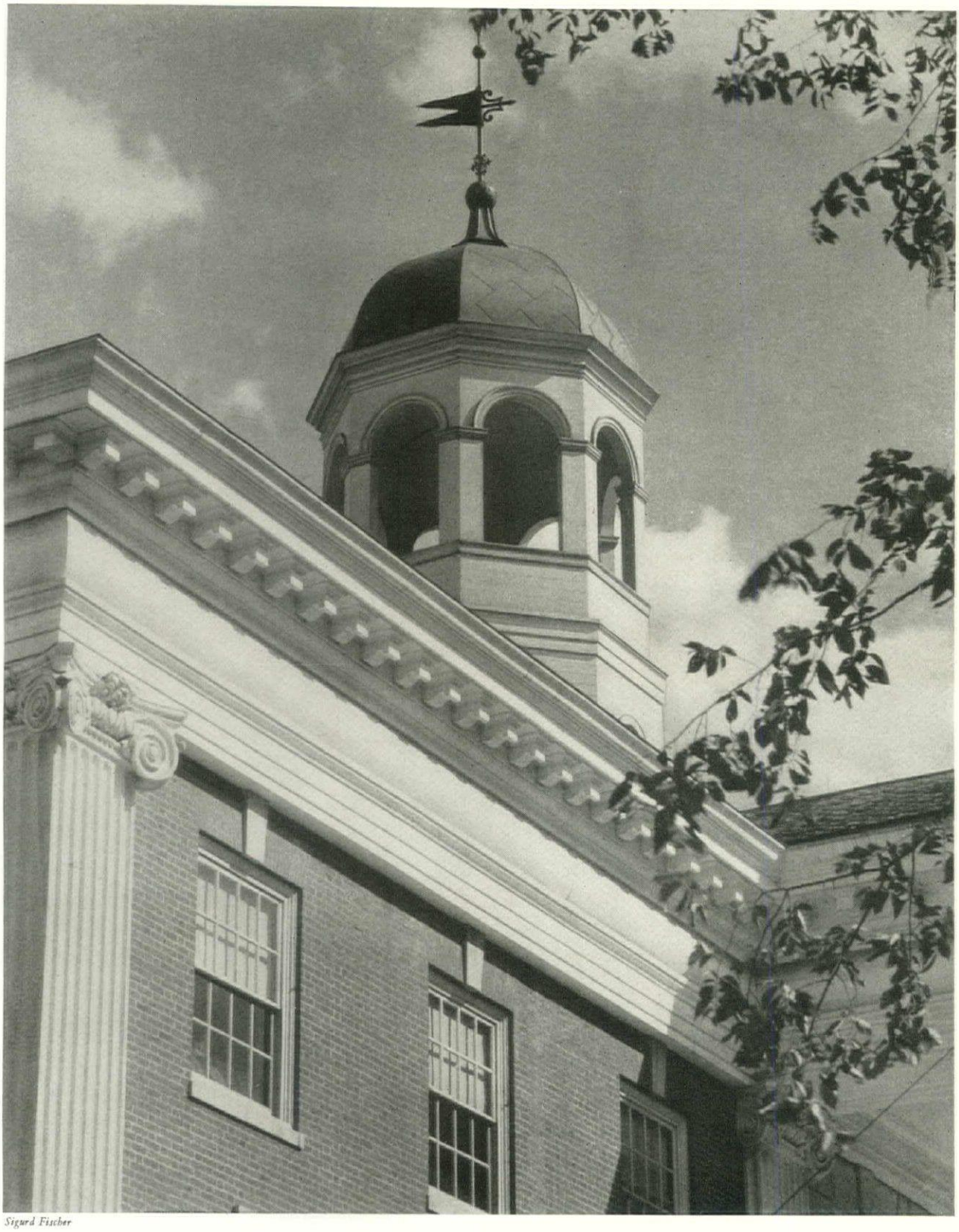
THE building is a good example of a Colonial solution to the problem of a small city hall. The architects have succeeded in developing a building efficient in plan and economical in operation which still conforms to the Colonial tradition of the locality. The illustrations on this and the opposite page show how thoroughly the design was studied in every detail of the characteristic style



AUBURN CITY HALL

AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS



Sigurd Fischer

AUBURN CITY HALL

AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS

Sigurd Fischer

AUBURN CITY HALL

AUBURN, NEW YORK

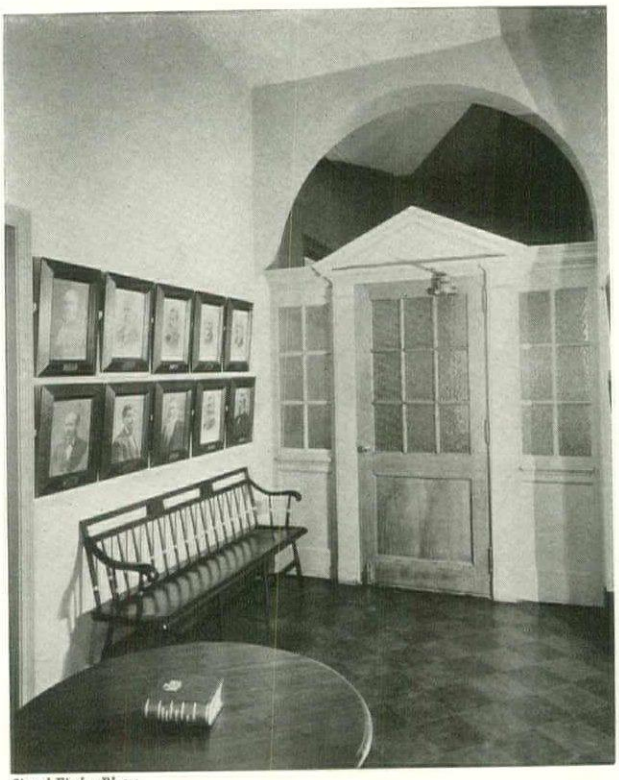
COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS

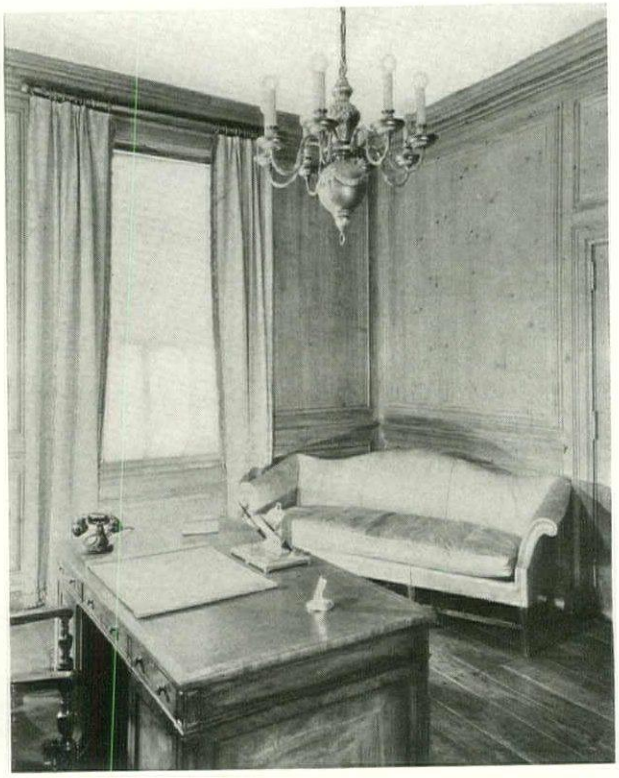
Sigurd Fischer

AUBURN CITY HALL

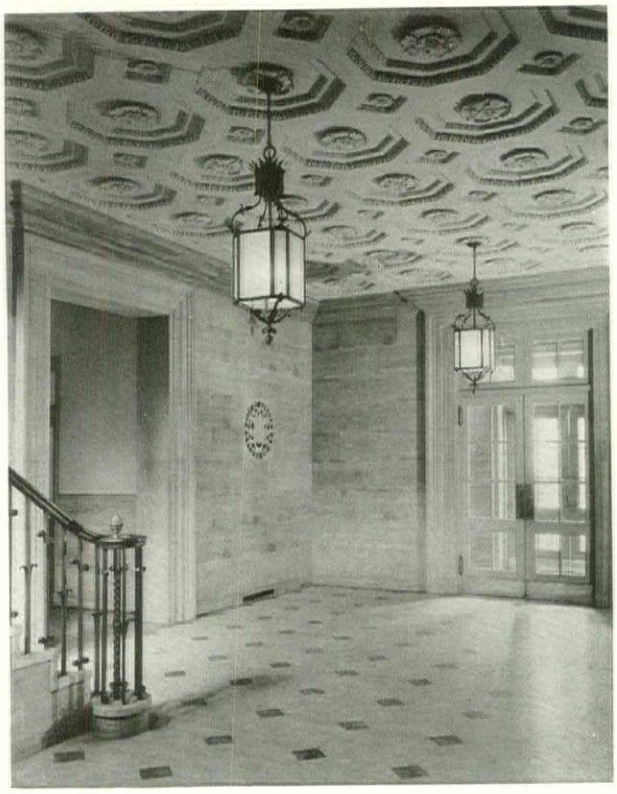
AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS





Sigurd Fischer Photos



THESE three interiors show a faithful consistency of interior design. Above at the right is a corner of the mayor's office and the illustration below is of the entrance lobby looking toward the main entrance doors. These interiors with those illustrated on pages 350 and 351 offer an interesting contrast in design and the utilization of materials with those of the city hall at Hilversum, which appear on pages 334 to 336, inclusive

AUBURN CITY HALL

AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS

THE EDITOR'S FORUM

THE A. I. A. CONVENTION

WASHINGTON, D. C., APRIL 27–29

IT IS a fitting coincidence that the A. I. A. Convention is to be held in Washington during the Bicentennial Celebration of Washington's birth. It is a further coincidence that this year marks the Seventy-fifth Anniversary of the founding of the Institute and is the Sixty-fifth Convention. The closing dinner of the Convention will probably observe all of these anniversaries and will naturally be historical and reminiscent. The sculptors, mural painters and landscape architects will be on hand in Washington for their own meetings and for the joint exhibition of these arts and the art of architecture which will be held during the Convention. However, the assembled delegates will not be devoting all of their time to the enjoyment of the past, for several topics of the utmost importance at the moment will be considered because of their bearing on the future course of the profession.

First among these, both in time and perhaps in importance, will be the special session on the subject of "the economics of site planning and housing." Mr. Bigger and his committee have been delving thoroughly into this subject in which the general public and the whole building industry are vitally interested. As a natural sequel to the discussion of this subject, Mr. W. R. B. Willcox will discuss the effect of taxation on architecture and building projects generally, as well as considering it as a part of the economics of site planning and housing. It is to be hoped that the evening session of the first day will bring out practical suggestions as to what the architect can do in furthering housing projects as a part of the general subject of discussion, which is, "What Can an Architect Do in a Time of Depression?"

The unification of the profession, which was so enthusiastically approved at the San Antonio Convention last year, will be brought down to definite ways and means through the good offices of Mr. Edwin Bergstrom's committee which has prepared the proposed amendments to the by-laws with which members are familiar through their publication in the February issue of *The Octagon*.

After the luncheon under the auspices of the Structural Service Department and the Producers' Council, the "free souls" not involved in committee work will relax in various interesting ways afforded by Washington with its new buildings.

If the announcement of the evening session, which is to be devoted to the work of the Committee on Education, of which Mr. Charles Cutler is Chairman, is to be taken literally, the discussion of "architectural education in all its aspects" will last into the wee small hours. To understand the present status of architectural education and to qualify for the discussion, it is almost essential to be thoroughly familiar with that most readable report of Messrs. Bosworth and Jones, entitled, "A Study of Architectural Schools."

After the morning session of reports and recommendations, which will continue into the evening, the pros and cons of the Architects' Small House Service Bureau will be thrashed out. Because of the wide divergence of opinion regarding the Bureau, a most interesting session is promised. Although the discussion will be limited to the work of the Bureau and its effect upon the status of the architect and its relation to the Institute, there will undoubtedly arise in many minds the larger question of the architect's place in the building industry in the light of the developments which are now taking place. The competition which the architect now faces indicates the necessity of considering this larger problem before that place is determined by events. The service which the architect has felt it was his prerogative to render is threatened by plan services of all sorts, from stock plans backed by able merchandising organizations to house patterns offered by various popular magazines at negligible prices. As some of these services with which the architect must compete are accompanied by other services which the architect has not been able to render, such as those relating to the matters of actual finance, the architect must consider whether to compete or to participate in the various types of organizations which are formed to provide buildings for the public. This brings out once again the necessity for a thorough study of the possible and probable integration of the building industry and the preparation of the architectural profession for such participation as may be necessary in such a movement.

The united profession and each individual architect must attack this fundamental problem for, in the words of Secretary Baldwin, "Readjustments and new relations are taking place throughout the whole world. When stabilization finally comes in the United States the architectural profession, and the individual architect, will be confronted with conditions of practice and with forms of competi-

tion not encountered before . . . the profession of architecture . . . must be prepared to meet the new conditions if it is to survive as a profession, and if it intends to maintain intellectual command in the building industry. Now is the time to lay the foundation, to prepare for competition, and to make ready for the opportunities of the future."

IN THE NAME OF HOUSING?

AMONG the various solutions offered to the problem of low-cost housing there has frequently been mention of the possibility of the State condemning land on which model low-cost housing might be erected. In New York a tract of land on the Lower East Side, known as the Chrystie-Forsyth section, has been condemned and the buildings razed. The property is now vacant. Various proposals have been made for the use of this property as playground, park, traffic artery, and for the erection of a low-cost housing development. One such project, designed by Howe & Lescaze, was illustrated in the March issue of THE ARCHITECTURAL FORUM.

Inasmuch as legislation regarding housing in one section of the country is considered throughout all sections as a possibility for establishing precedents, considerable interest is centered on an act introduced in the Senate in the State of New York. This act, known as the Dunnigan Bill, purposes "to amend the Greater New York charter, in relation to additional real property acquired in excess condemnation proceedings, by authorizing the said city to mortgage the fee thereof and to lease the said property for the purpose of eliminating unsanitary and dangerous housing conditions and for the relief of congested areas in the said city." It goes on to say, ". . . the commissioners of the sinking fund of the city of New York, wherever additional real property is acquired by the said city in excess condemnation proceedings . . . , are hereby authorized to mortgage the fee of the said additional real property for the purpose of eliminating unsanitary and dangerous housing conditions and for the relief of congested areas, upon such terms and conditions as may be determined by resolution of the board of estimate and apportionment of the said city; and the said commissioners of the sinking fund of the city of New York are further authorized to lease for housing purposes, including stores on the street level, such additional real property for such terms and upon such conditions as the board of estimate and apportionment may determine."

It so happens that New York State already has a State Housing Law which, in section twenty-two, grants the power to mortgage the fee of said property for housing purposes under rigid safeguards. The State Board of Housing has issued a memorandum opposing the approval of the Dunnigan Bill in which they set forth the reasons for their stand. The first reason is that the bill is unnecessary, as the power to mortgage the fee is already granted by the existing State Housing Law; the second, that the bill is unsound because it "disregards all the safeguards that the Legislature found essential in granting this power under the State Housing Law."

"Under existing legislation, if city property is permitted to be mortgaged for housing purposes, it is done upon a *public utility basis* assuring (a) a limited return on private capital; (b) the devotion of the property to low rent housing; (c) supervision by a body specially qualified; (d) other safeguards insuring that the project will be feasible and that any profit in excess of the limited return will enure only to the public."

The Dunnigan Bill as written is shown to give extremely wide powers to the commissioners of the sinking fund and the board of estimate and apportionment. A bill that grants such powers and is at the same time capable of so many interpretations regarding the exercise of these powers is dangerous. It would take away from an already established supervisory board all of its power to safeguard the public through its supervision of the entire housing project. The State Housing Law has been carefully framed for the protection of the public interest.

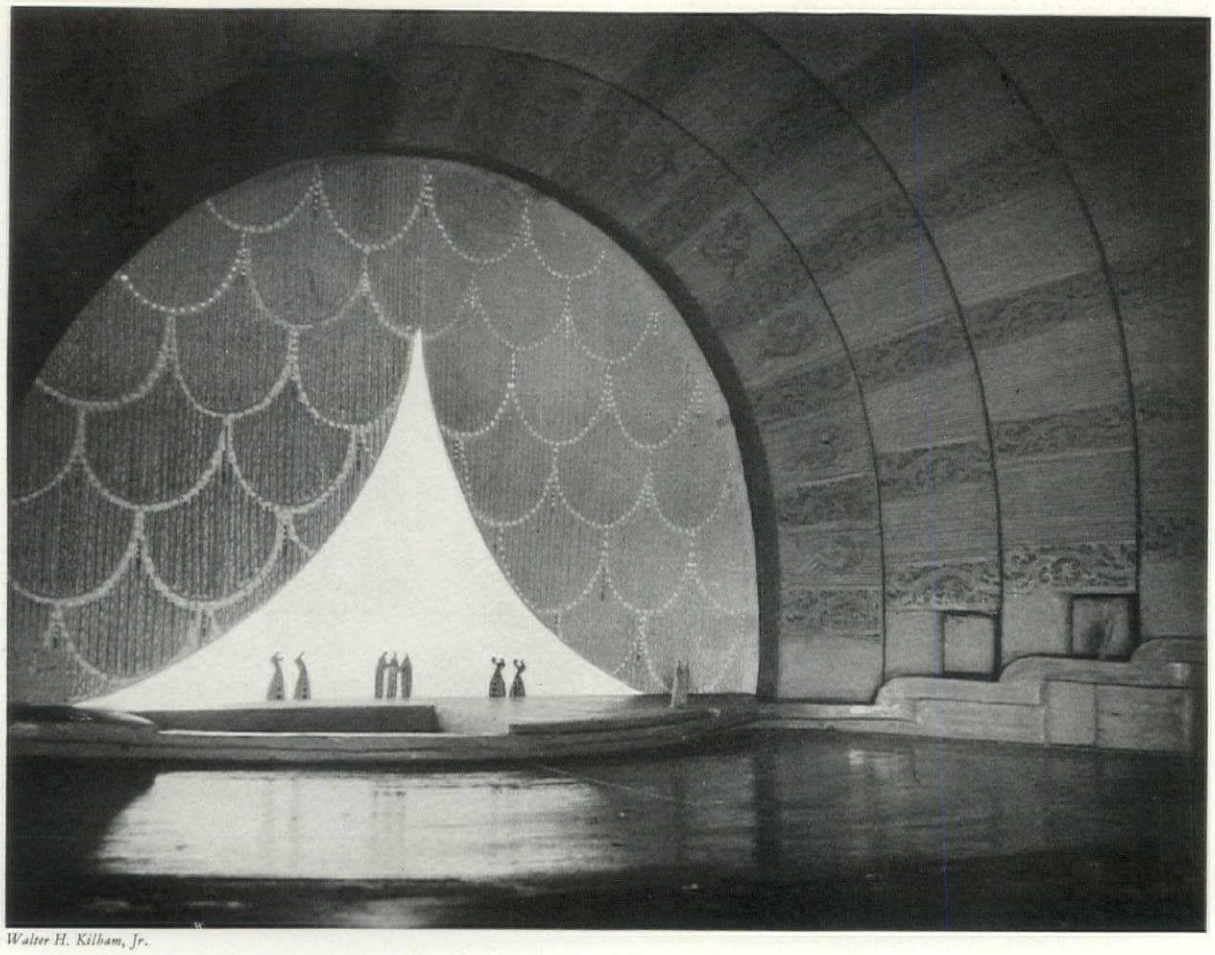
"If the City should lower the standards imposed under the State Housing Law, it will, of course, be difficult for the State Board to insist upon higher standards in the future. If there are two systems of housing relief operating within the same area — one restricted as to rents, limited as to returns, exacting as to its standards, and supervised by an independent body, and the other system not so restricted, not so supervised — only confusion can result. In such case, either the safeguards will be lowered or, what is more likely, private capital will refuse to invest under either system unless there are speculative profits or other ulterior purposes to be attained."

It would seem disastrous, in the name of housing, to enact a bill which would discard the work which has already been done in the interests of low-cost housing, a bill which would give almost unqualified power in the use of the property acquired by the city through excess condemnation proceedings to a body not especially qualified to function in housing operations. While it is desirable that housing operations be undertaken, it is essential that the existing organization be used. The public interest will not be served by destroying present safeguards.

Kenneth K. Stowell

EDITOR

THE STORY OF ROCKEFELLER CENTER



Walter H. Kilham, Jr.

V. THE INTERNATIONAL MUSIC HALL

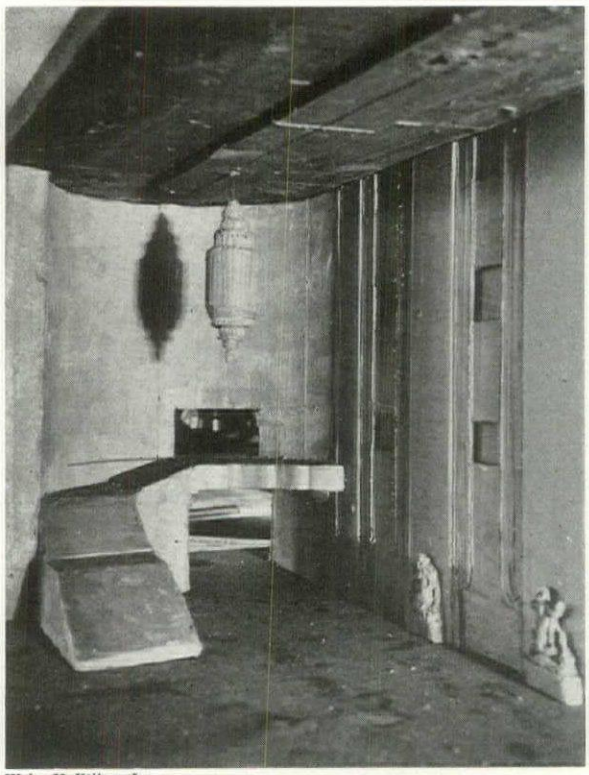
BY

HENRY HOFMEISTER

OF THE FIRM OF REINHARD & HOFMEISTER

NOVELTY and the spectacular in entertainment, inevitably associated with S. L. Rothafel, known better, in fact almost exclusively, as Roxy, had an important influence on the design and plan of the International Music Hall, now under construction in Rockefeller Center. Although Mr. Rothafel has not announced publicly the type of entertainment which he will offer in this largest of all theaters, it is understood that it will be a sort of glorified musical revue. The plan is flexible enough, however, to permit conversion into any type theater, motion picture or legitimate, concert hall or general auditorium. Sight and sound requirements for all types have been provided.

The Music Hall will have a seating capacity of approximately 6,250, a few hundred more than the present Roxy Theater in New York. With 3,500 seats on the orchestra floor, the remainder will be distributed almost evenly throughout three mezzanines. Present plans call for a uniform price of admission to the entire auditorium, set tentatively at two dollars. The advantage of sitting in the orchestra will be offset by permission to smoke in the upper reaches, and perhaps some day, patrons will be permitted to sip drinks in the top mezzanine. The shape and size of the building lot was determined, of course, in relation to the general plan of Rockefeller Center itself. The Music Hall



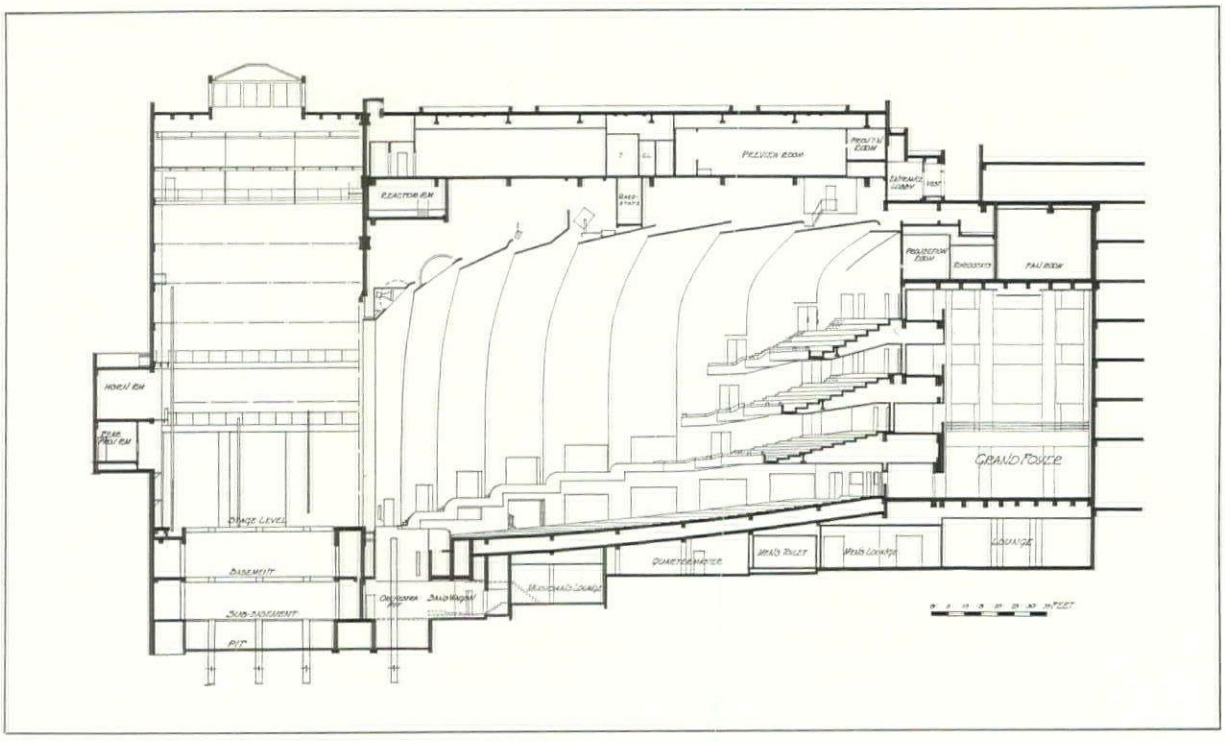
Walter H. Kilham, Jr.

Rough model of the foyer, showing the staircase above which will hang Winters' mural. Velour will cover the right wall, mirrors the other

is located in the northwest corner of the three block site, from 50th to 51st Streets, with its main entrance located at the corner of 50th Street and Sixth Avenue. It is built in connection with the R-K-O office building, occupying the extreme northwest corner. The rear wall of the theater building supports the upper stories of the office building.

Design Development. After a succession of seating arrangements had been studied, the present plan was decided upon as solving successfully the manifold problems involved. Despite the unalterable provision that its seating capacity had to exceed 6,000, Mr. Rothafel was equally insistent that the theater retain an intimacy not usually thought possible in houses of such size. Had it been possible to obtain the necessary number of seats, it is likely that a stadium type plan would have been adopted, with only one floor sloping rather sharply to the stage and with ramps coming up through the floor for circulation. The chief advantage of such a plan would have been that the performers would have had a single unified audience to please. Theatrical people have paraphrased the old proverb to read, "A house divided against the performer cannot stand."

The obvious alternatives suggested themselves — one, a rather deep balcony, with perhaps a shorter balcony above, and second, three shallow

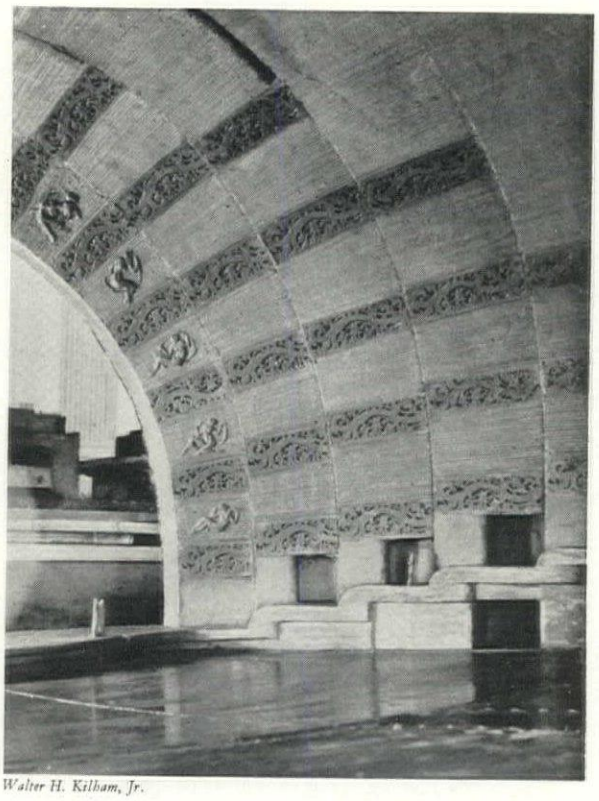


Longitudinal section. The variance in the angles of the ceiling segments were tested and revised to provide proper acoustics. The office building at the right rises 25 stories above the theater

mezzanines. From experience with scores of theaters in all parts of the country, the R-K-O interests were convinced that the deep balcony reacts unfavorably upon that part of the orchestra audience seated under the projection in the rear two thirds of the theater. Not only is their vision limited to the lower part of the proscenium opening, but they are consciously or unconsciously irritated by the feeling of "something hanging over them." Better vision from the balconies, it was believed, could be obtained by having short balconies. Even those seated far back will be able to see the audience in the orchestra as well as the presentation upon the stage. A maximum distance of 180 ft. from the stage to the most remote seat will insure adequate visibility, and an extensive public address system eliminates the possibility of inaudibility.

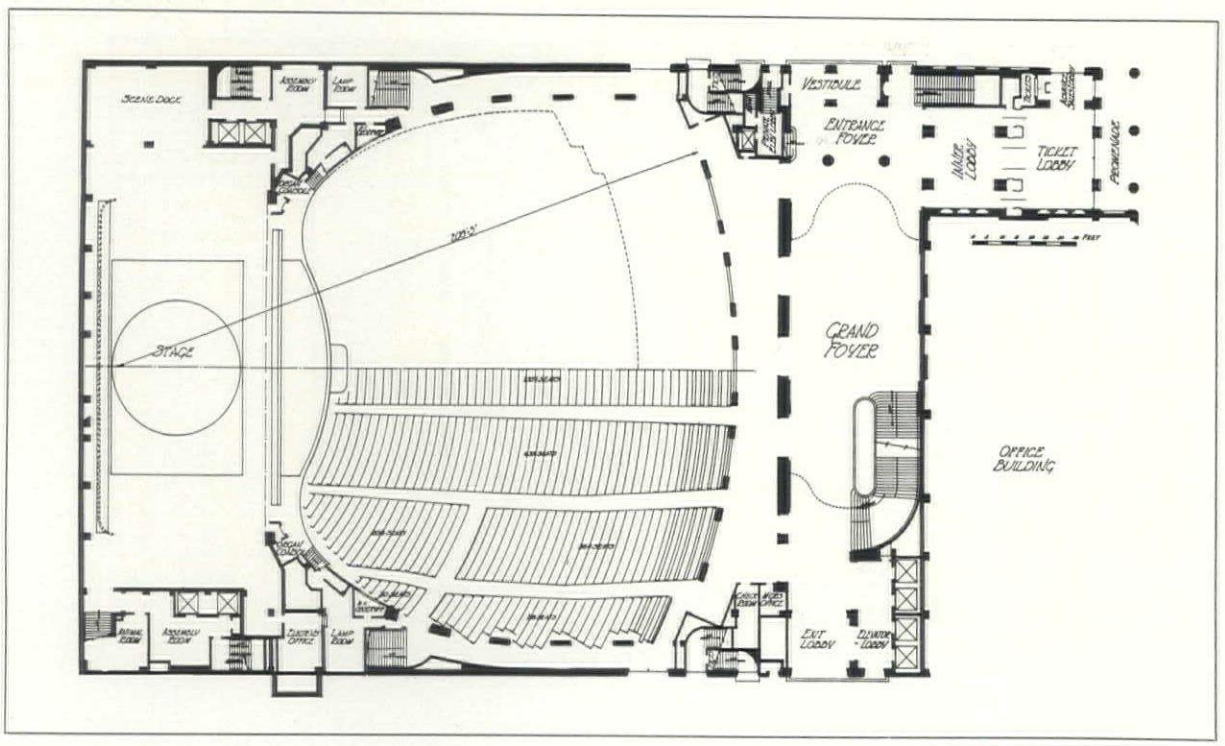
Innovation. Further intimacy between performers and audience will be obtained by a rather unique innovation. Runways will extend around the side walls from the stage to the first mezzanine. Upon these, the chorus, dancers and other performers will disport themselves. Not only will greater intimacy result, but opportunity for more spectacular presentations will be afforded, and the side aisle seats will become more desirable.

Circulation on the orchestra floor will be provided by six aisles, 6 ft. 3 in. wide at the rear,

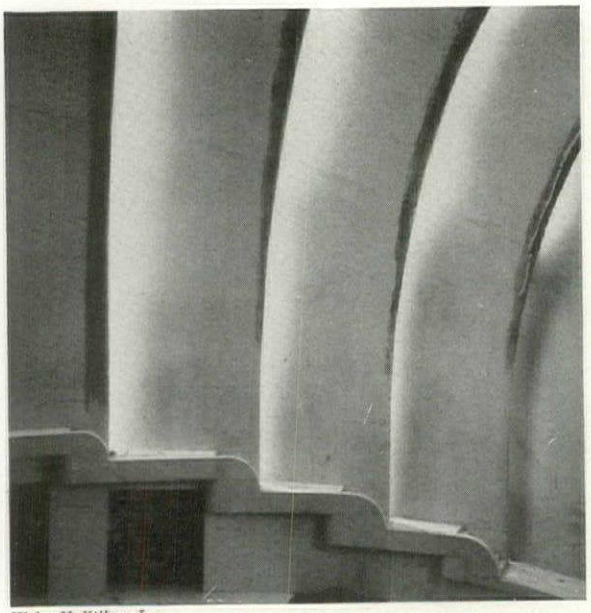


Walter H. Kilham, Jr.

Study for the walls and ceiling of the auditorium, and the fan-like arrangement of the grilles which will conceal amplifiers and organ pipes



Ground floor plan. The orchestra has a seating capacity of about 3,500, with a maximum row seating of 14. Note the advance sales booth out of the main line of traffic at one side of ticket lobby



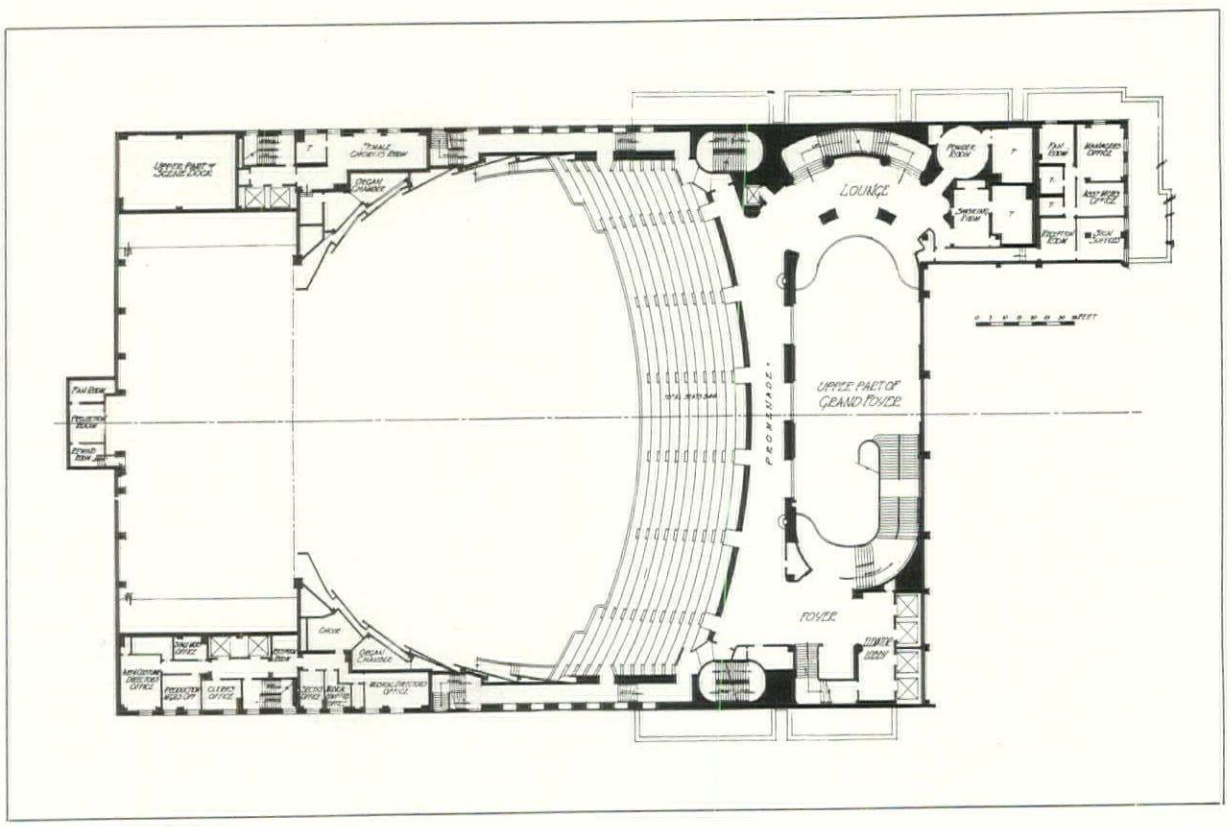
Walter H. Kilham, Jr.

Portion of the large model used to study the actual conditions which will prevail in the theater. The dark edges of the curved segments indicate that they have been undergoing corrections. The concealed lighting system is also being studied to eliminate all possibility of error in theory

5 ft. 10 in. wide in the center, and 3 ft. 4 in. in front. A cross over occurs one third of the distance back from the stage. In accordance with fire regulations, the maximum number of seats from aisle to aisle is 14, but only 13 in one section and 10 in the other. More than the customary space between rows of seats has been provided. The usual 2 ft. 4 in. has been increased to 2 ft. 10 in., giving maximum leg room and comfort. In the mezzanines, the shallowness eliminates any traffic problem, and the seating is simply divided by four aisles.

Design. The design of the main auditorium indicates an acceptance of the current trend toward oval shaped roofs for theaters. Acoustic experts are almost unanimous in declaring this type to be as nearly perfect as possible for sound transmission. The roof is formed of a series of flat circular arches, stepped back from each other in such a way as to create breaks about 2 ft. deep. These occur about every 30 ft. The arches themselves are of acoustical plaster, with hard plaster ridges every 6 ft.

At first, it was intended to curve the arches themselves, but acoustic engineers advised against the practice because it would set up concentrated



First mezzanine plan. This is slightly larger but similar to the two upper mezzanines. Each of the three floors has adequate lounge and toilet facilities. Each is served by elevators

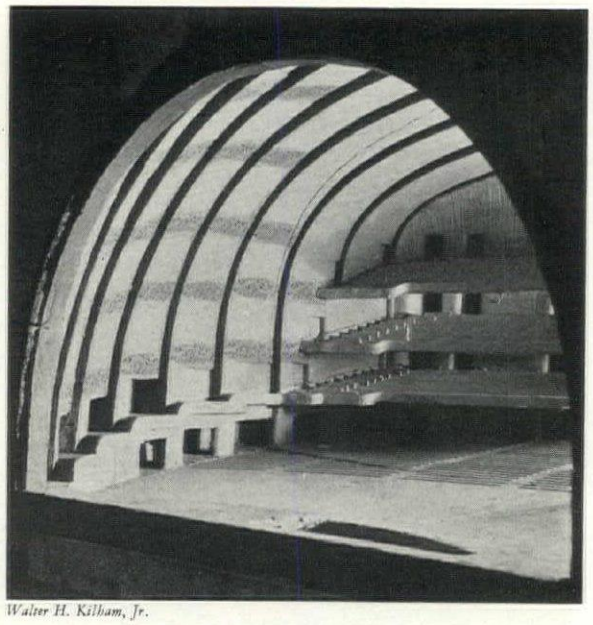
sound spots. The angles for the arches have been determined on the basis of acoustics as well as upon the principles of design. It was found, for instance, that the angle for the arches nearest the stage had to be changed in order not to set up pockets of sound in the openings.

In a fan shaped arrangement, plaster grilles will be located in the ceiling. These are to be used to conceal amplifying equipment and organ pipes. The breaks in the ceiling will conceal all the lighting for the theater, as well as for the stage presentations. They will be controlled from a light organ located directly in front of the orchestra pit. As in the Earl Carroll Theater, the light conductor will be able to see the effect of his work, and to correct deficiencies immediately. Also concealed in the ceiling breaks will be the air conditioning equipment.

The Stage. More interesting probably than any other features of the theater are the stage and orchestra pit arrangements. From one proscenium column to the other, the stage measures 110 ft., and from the center of the stage front to the rear wall, 60 ft. In its center is a revolving section approximately 50 ft. in diameter. Not only does this central portion revolve, but it is divided into three segments which may be raised and lowered independently or together. The mechanism for their operation is so timed as to permit synchronized elevation and descension, with the rear section moving more rapidly than the central one, and the central section more rapidly than the first.

Transportation of the "band wagon," which is the movable platform upon which the orchestra performs, is decidedly novel. Directly off the dressing room for musicians, which is located below the auditorium floor, the band wagon is loaded. It may then be rolled horizontally to an opening just in front of the stage, and there raised to its regular position in the pit. Or it may be rolled underneath an opening in the stage, and raised to the stage level. From the stage it may either be rolled off to the side or lowered again into the basement.

Back Stage. The speed with which scenes are changed in the musical presentations today and the unusually large number of performers who must be accommodated in the region beyond the footlights combined to make the back stage planning of the International Music Hall unusually complicated. On each side of the stage, two elevators will serve to transport actors and actresses to and from the stage in the quickest time possible. The circular iron staircase has been definitely supplanted. Because of the large number of chorus girls, their dressing rooms, rest rooms, and other facilities are concentrated as near the stage as possible. On the other side of the stage, dressing rooms for male performers are grouped.



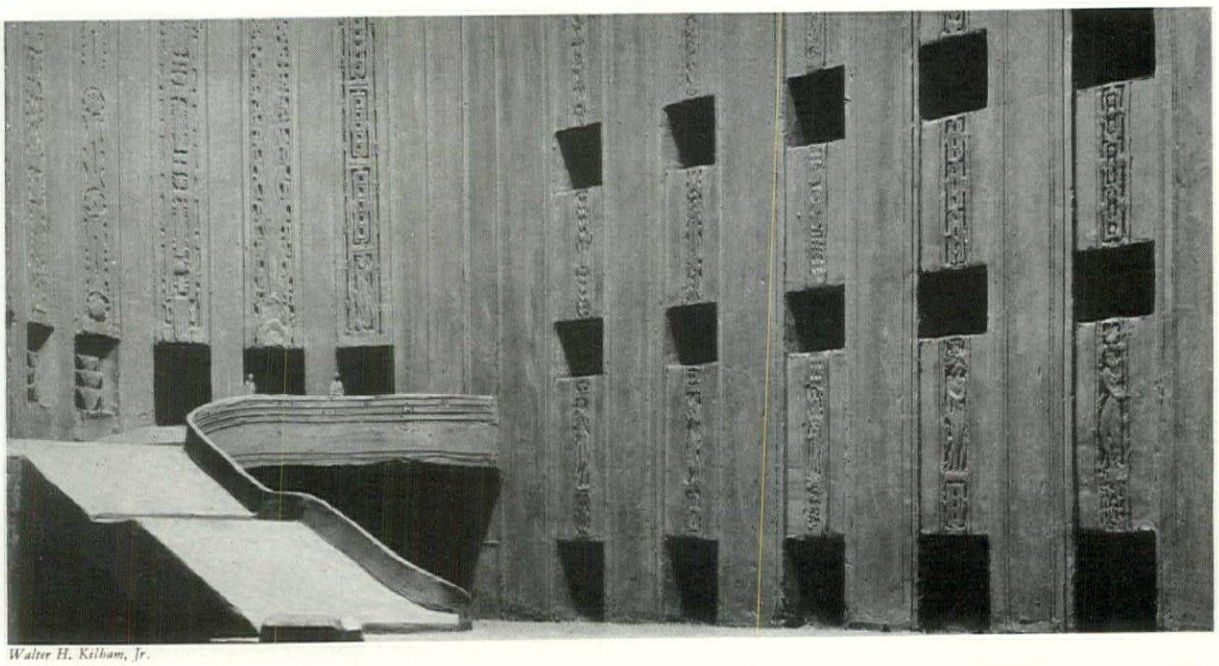
Walter H. Kilham, Jr.

View of model looking from the stage into the auditorium, showing particularly the side runways

Distributed throughout the remainder of the back stage area are offices for the various executives of the theater, locker rooms, clubs rooms for ushers, stage hands, and other members of the theater staff. The architects were aided considerably in laying out the various rooms required, and in determining sizes of rooms by officials from the construction department of the Radio-Keith-Orpheum Corporation, who have, through experience with scores of theaters in all sections of the country, been able to contribute definite knowledge of actual conditions when the "show is on." Every effort has been made, furthermore, to provide accommodations for performers and other employes that are equal in comfort and convenience to a first class hotel. This is an outgrowth of the Roxy policy that "happy performers make successful shows."

Lobbies and Foyer. The relation between the theater building and the adjoining office building was so flexible that it would have been possible to locate the main entrance of the theater anywhere on Sixth Avenue from 50th to 51st Streets. The 50th Street corner was chosen in preference to an inside space to provide a longer approach to the theater from the street, with visibility from Broadway. A further argument in favor of such a location was the fact that the corner site provided a greater number of entrances and exits to the ticket lobby.

Six ticket sales booths, grouped in pairs, are located 22 ft. from the entrance doors. Although there would have been some spontaneous-sale



Walter H. Kilham, Jr.

An early model for the grand foyer. It has since been revised to include the mural over the staircase, and the wall openings at the right have been reduced to obtain a surface of greater simplicity

advantage in having a booth directly on the street, it was felt that greater comfort, especially during stormy seasons, would result to patrons if the booths were placed under adequate shelter. The four aisles into which the booths divide the space are continued up to the ticket deposit boxes. The space between them is 16 ft., too small for congregating, and yet large enough to eliminate congestion. The architects were guided by the success of a similar arrangement in the Roxy Theater.

One feature of the ticket lobby plan that is intended to relieve congestion is the provision, off to one side, of advance sales windows. They are located out of the path of the general line of traffic, yet prominently identified so that confusion will not result.

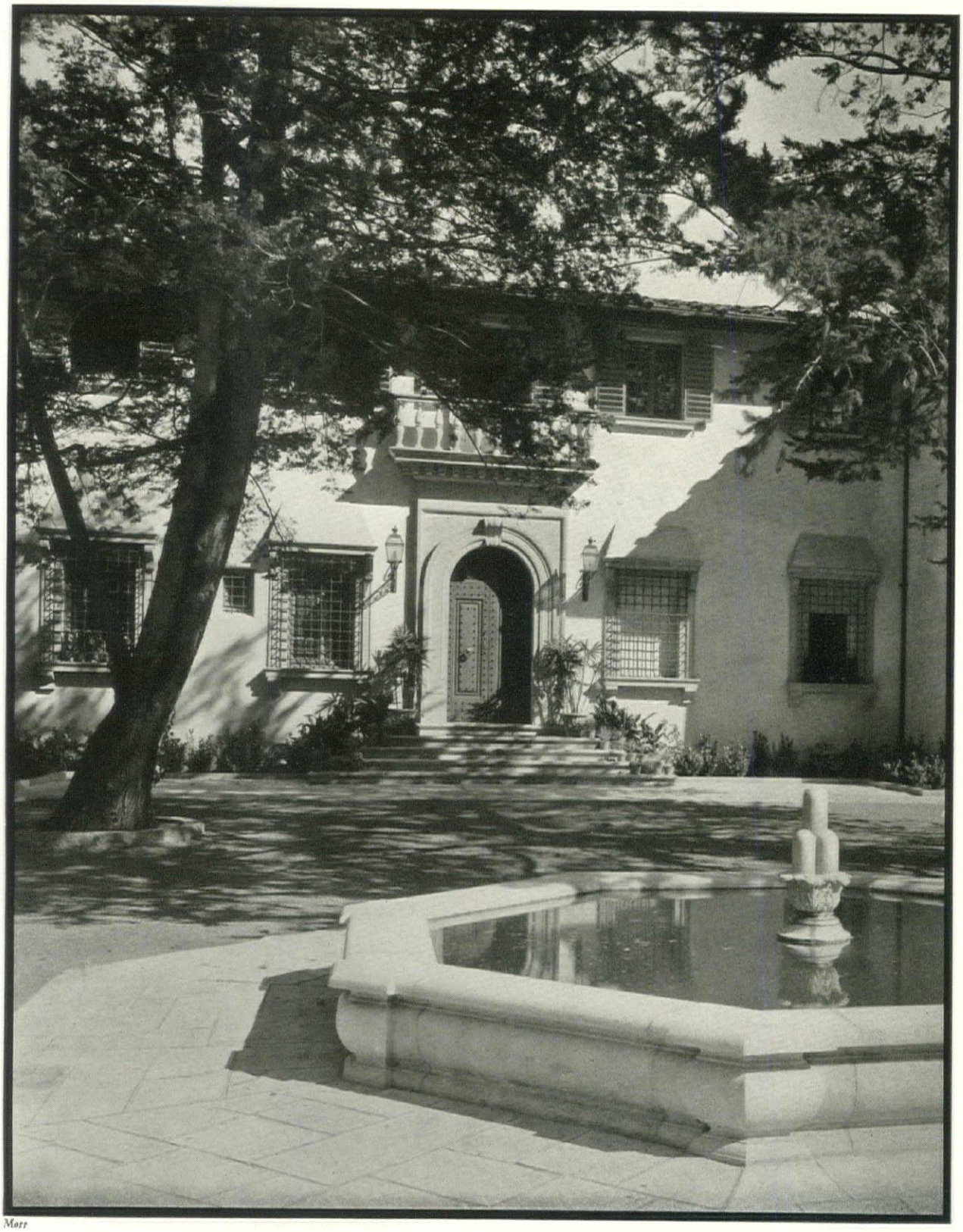
In the main foyer, located just beyond the ticket lobby, ample space has been provided for a large portion of the audience in the orchestra. It runs the entire width of the theater and is approximately 40 ft. deep. A broad staircase sweeps up the far end, leading to the mezzanine lounges which encircle the main one on three sides. Through the main foyer, mezzanine patrons may pass to a bank of four elevators beyond the staircase. On each of the mezzanine floors, as well as on the ground floor, there are powder, toilet, and smoking rooms, larger in size than is generally considered adequate.

Probably the main object of decorative interest in the theater is the huge mural painting for the main foyer by Ezra Winters. It is 60 ft. long, and 30 ft. wide, and is so located as to follow the sweeping curve of the grand staircase.

The basement lounge, which is about twice the size of the main foyer, will serve as the chief *entr'acte* place of congregation. Refreshments will be served to theater patrons here as guests of the management. From this lounge, an arcade running under 50th Street leads into the Forum, which is located between 49th and 50th Streets near Sixth Avenue. The Forum will serve as an entry and exit, not only for the International Music Hall, but for all the buildings in the Center as well. It will also serve as a social center, its chief attraction being a restaurant, with music for dancing and entertainment. Ticket offices for all theaters will be located there, and in that way, it is hoped, will relieve the strain on the main box offices.

Studio Floor. Above the theater proper, in the space between the roof trusses, Mr. Rothafel will have a series of studios for his private use. On this floor also will be two pre-view rooms, a rehearsal room, and a broadcasting studio.

The Model. All the details of the decorative scheme are being worked out on a plaster model that is large enough for a man to walk about in. The difficulty of obtaining the proper proportions in the curved ceiling of the auditorium made it necessary to adopt this method. As shown in an accompanying photograph, the curves can be revised very readily, with the result that when it is completed contractors will be able to work directly from the model.

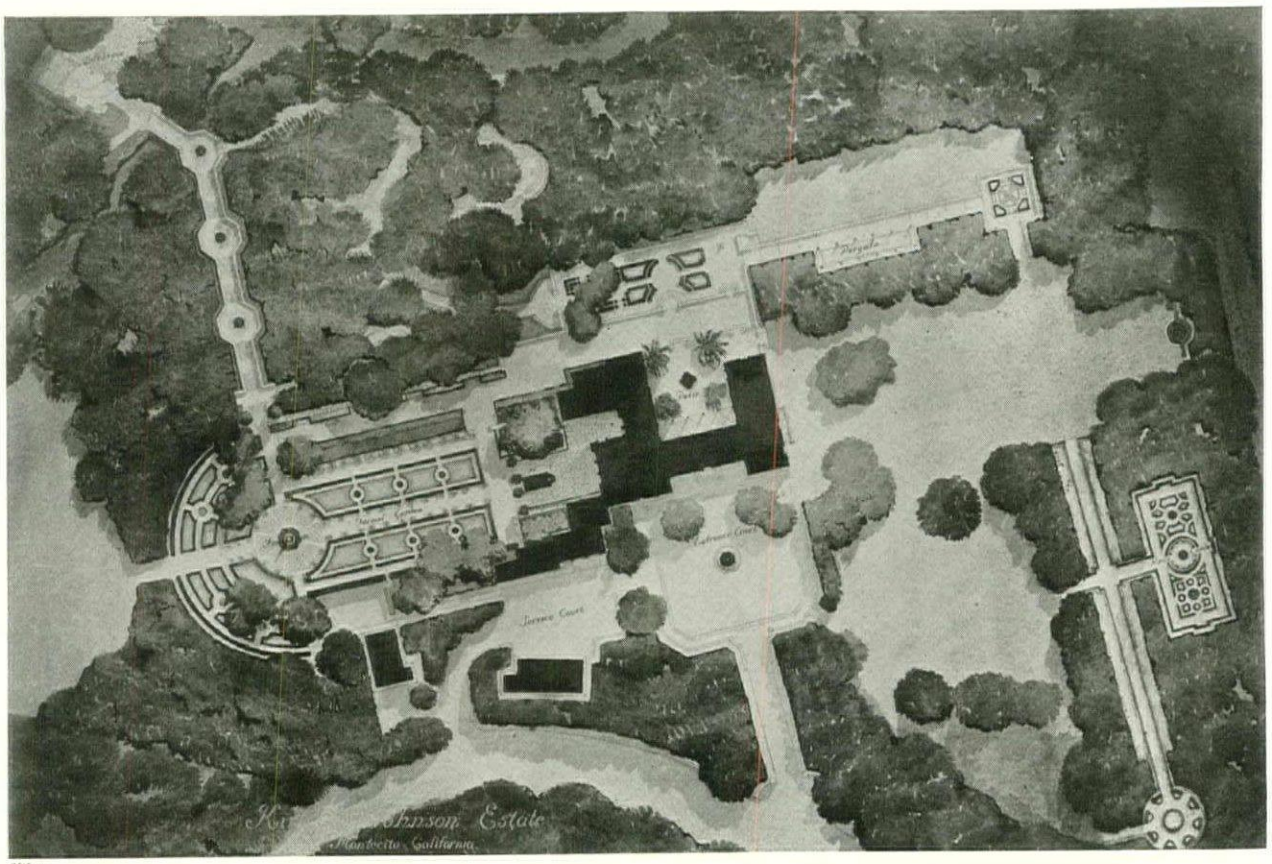


Mott

HOUSE OF MR. & MRS. KIRK B. JOHNSON

MONTECITO, CALIFORNIA

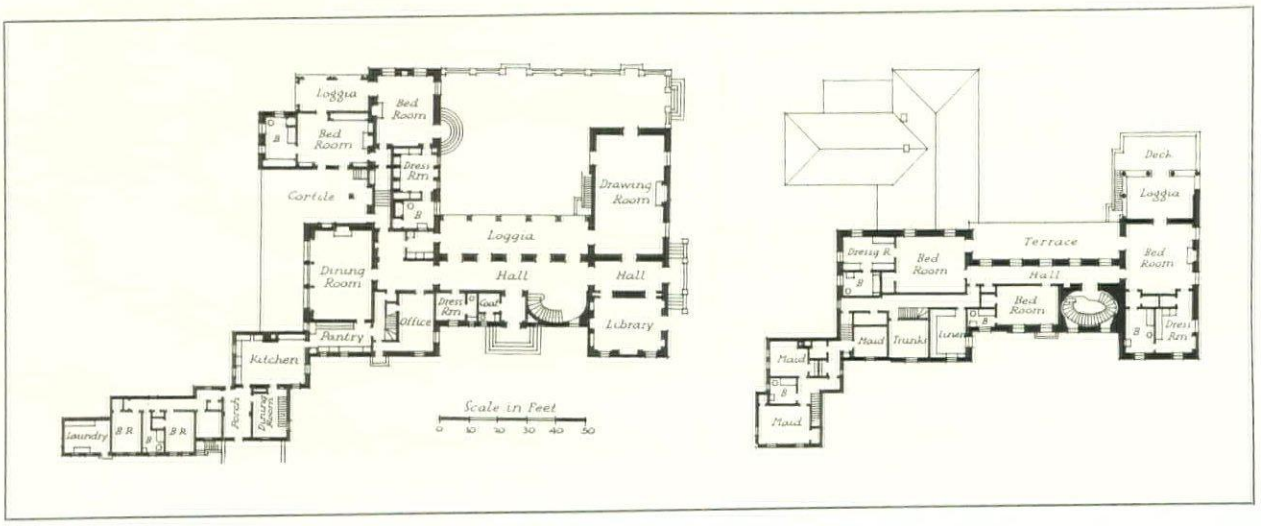
GEORGE WASHINGTON SMITH, ARCHITECT



Clifton

PLOT PLAN — A. E. HANSON, LANDSCAPE ARCHITECT

THE house, which is called "La Toscana" by its owners, is placed on a plot of land with the lengthwise dimensions running north and south. The topography influenced the location of the house as the land slopes toward the south and drops off sharply to the east, preventing an extensive garden development in that direction. The entrance to the house was therefore placed toward the west and advantage was taken of the north and south views for the development of the garden areas



HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.

GEORGE WASHINGTON SMITH, ARCHITECT

Mott

THE PATIO AND EAST TERRACE

HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.
GEORGE WASHINGTON SMITH, ARCHITECT

Mott

THE GARDEN COURTYARD

COMPLETED in 1929, the house is built of a reinforced concrete frame with brick and hollow tile filler walls, reinforced concrete floor slabs. The exterior has been covered with a buff textured stucco, trimmed with artificial stone, sand blasted to produce a weathered texture. The roof is of dark brown clay tile and the shutters and trim are wood painted ultramarine blue. The wrought iron grilles have been finished with one coat of varnish and one coat of beeswax; the entrance doors are of natural brown walnut with a wax finish. The underside of the second floor loggia is of pine, stained dark brown, and the soffit of the overhanging eave extending completely around the house is decorated in stripes of red, black and white, the colors being neutralized and very low in key. The courtyard shown above is paved with black and white pebbles laid in mortar. The materials of the fountain and walls are of tufastone, as are the paths and flagging in the patio, part of which is shown on the opposite page. The garden balustrades, walls, etc., were designed by the architect and are executed in artificial stone similar to that used in the house. The gates at the entrance court are of tajiguas limestone, laid according to the architect's design and sand blasted to a weathered surface after being set

HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.

GEORGE WASHINGTON SMITH, ARCHITECT

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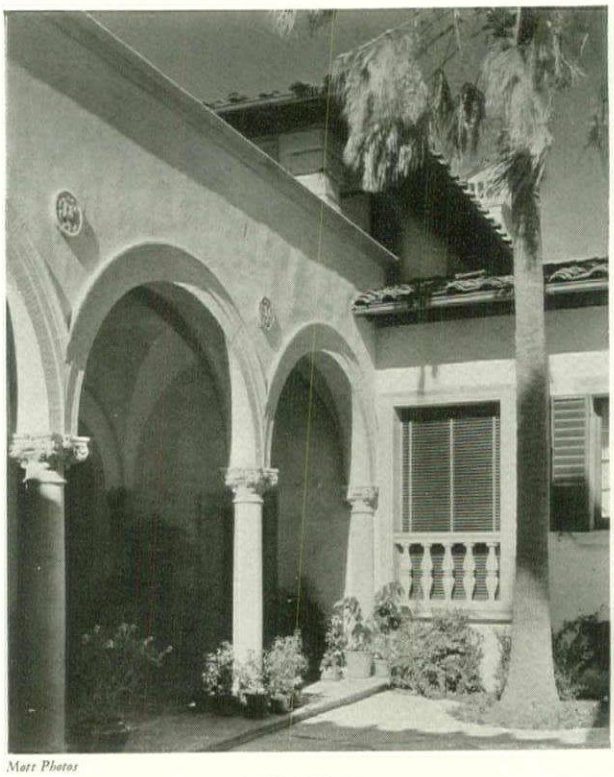
THE PATIO STAIR FROM THE LOGGIA

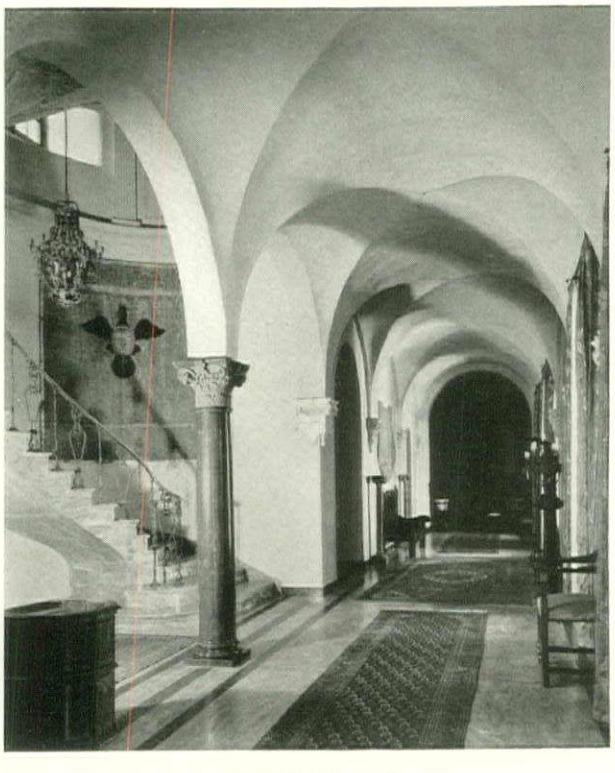
HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.

GEORGE WASHINGTON SMITH, ARCHITECT

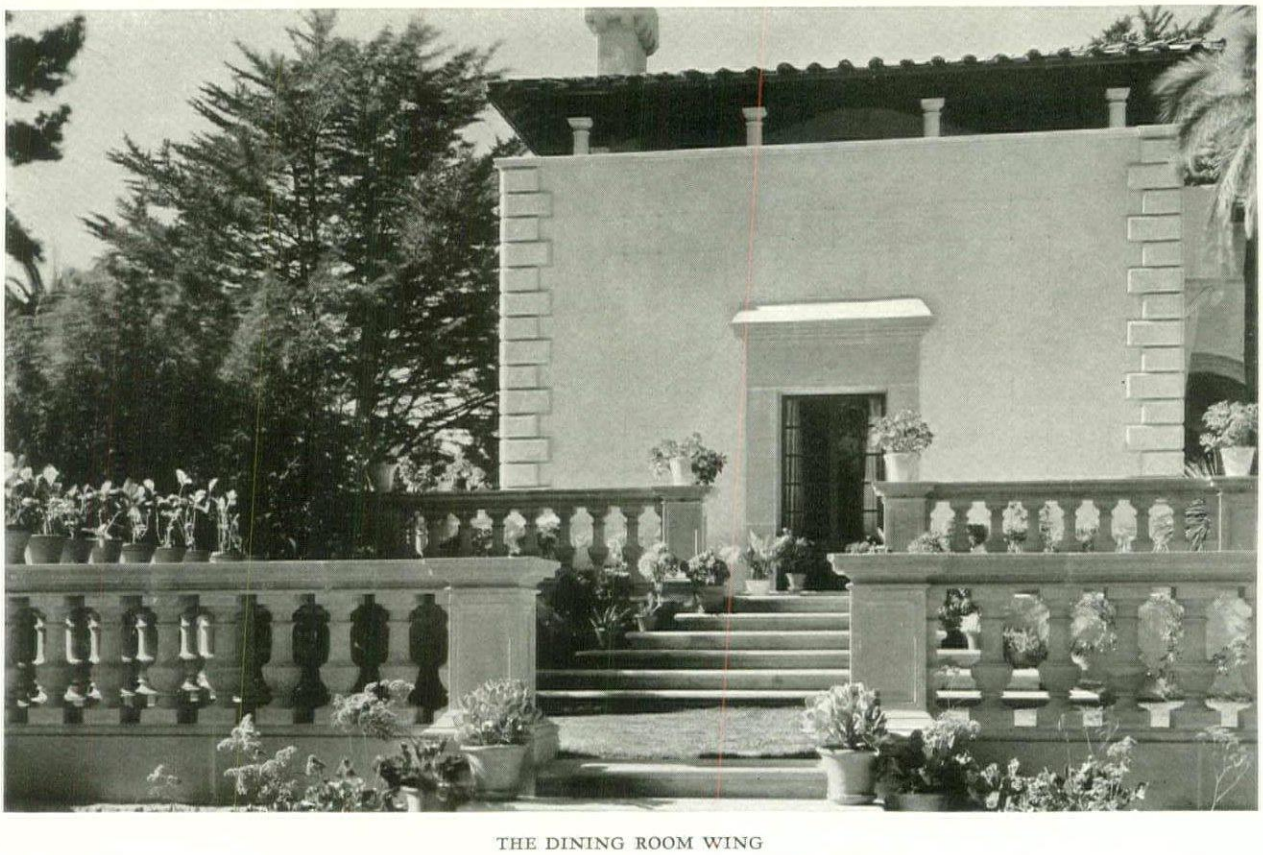


Mott Photos

THE LOGGIA



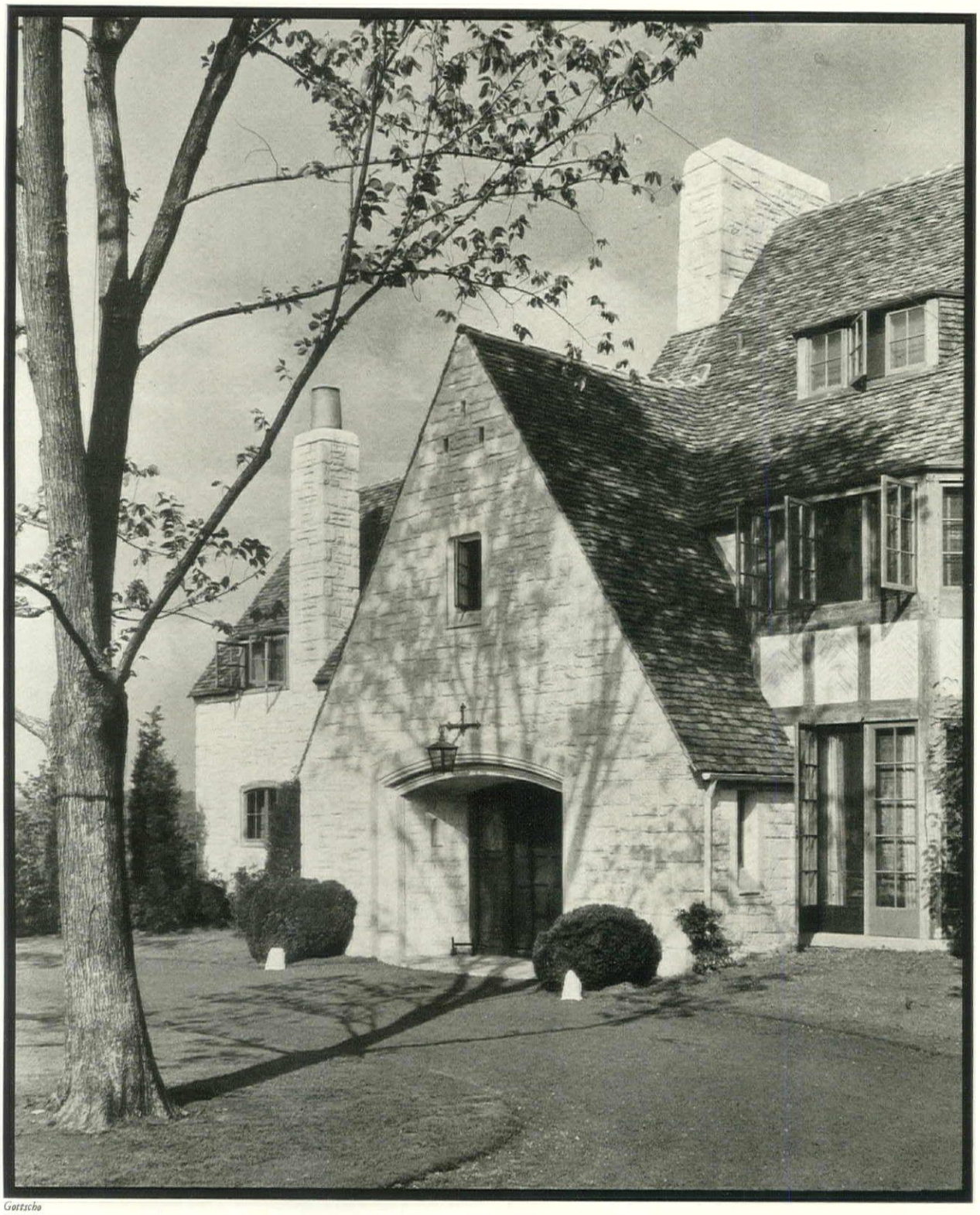
THE STAIR HALL



THE DINING ROOM WING

HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.

GEORGE WASHINGTON SMITH, ARCHITECT



Gottscho

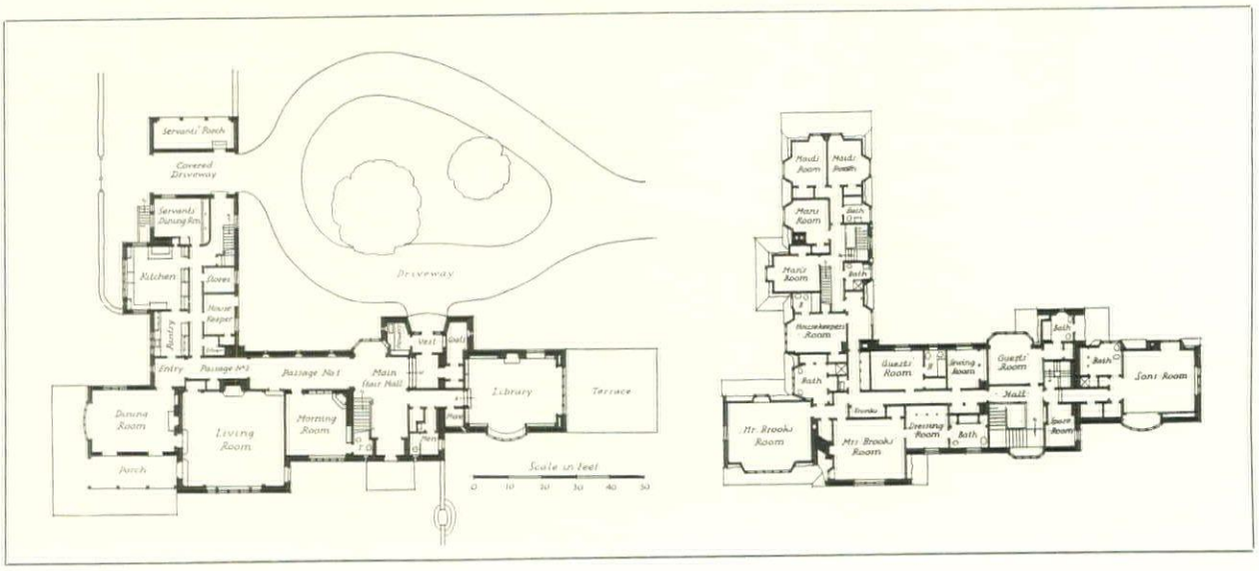
HOUSE OF MR. & MRS. RAYMOND BROOKS

GREENWICH, CONNECTICUT

GREVILLE RICKARD, ARCHITECT

Gottscho

THE house which contains 191,692 cu. ft. is constructed with walls 18 in. thick of a local stone similar to granite. Parts of the house have been framed with structural half timber and surfaced with stucco and brick nogging. The stone and brick walls have been whitewashed. The roof is a variegated red clay tile and the stucco is a pale buff. The entrance trim is limestone and all timbers are oak with a natural light finish



HOUSE OF MR. & MRS. RAYMOND BROOKS

GREENWICH, CONNECTICUT

GREVILLE RICKARD, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS

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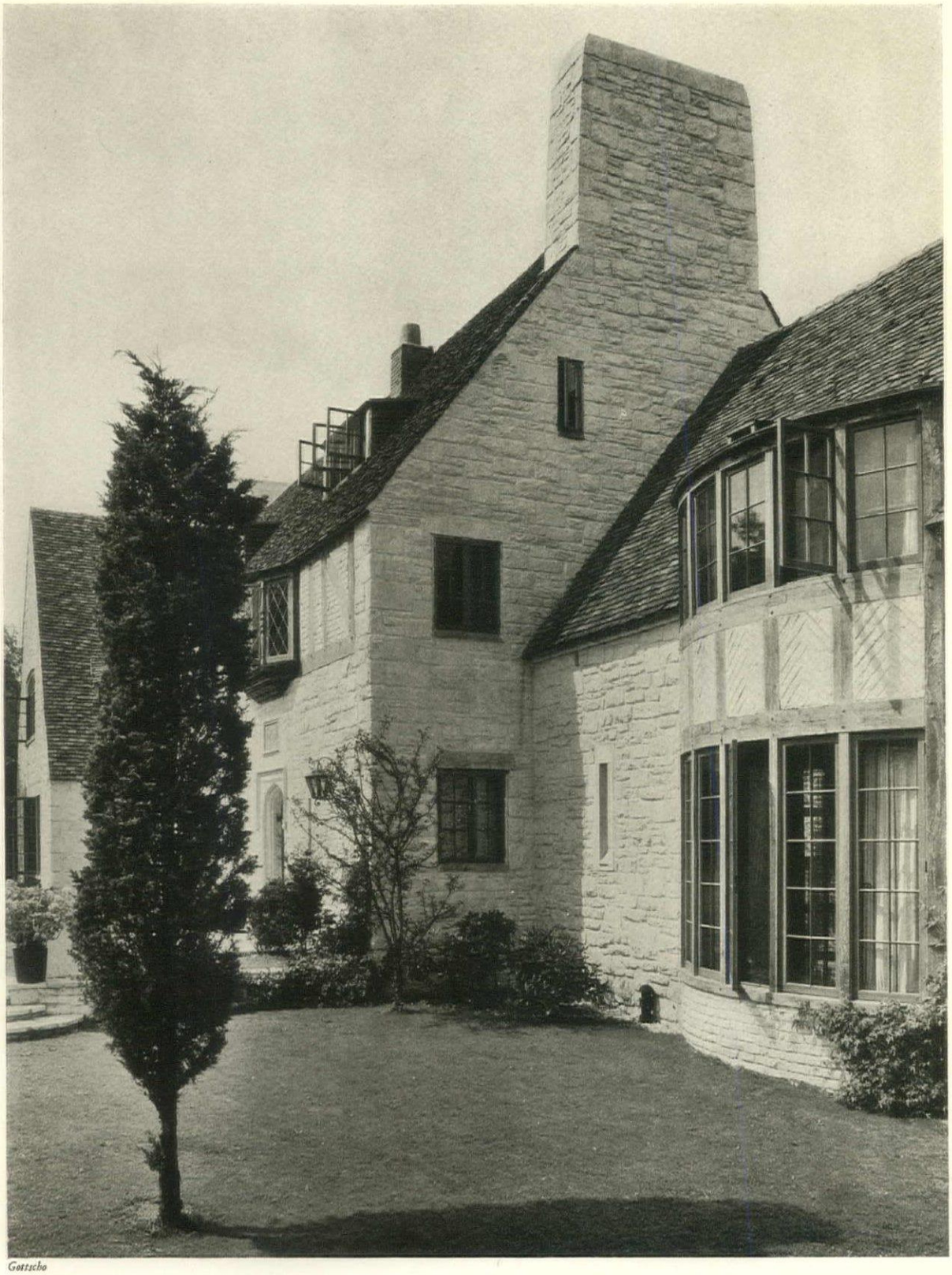

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Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS

GREENWICH, CONNECTICUT

GREVILLE RICKARD, ARCHITECT

THE FORUM OF SMALLER BUILDINGS

Ellison

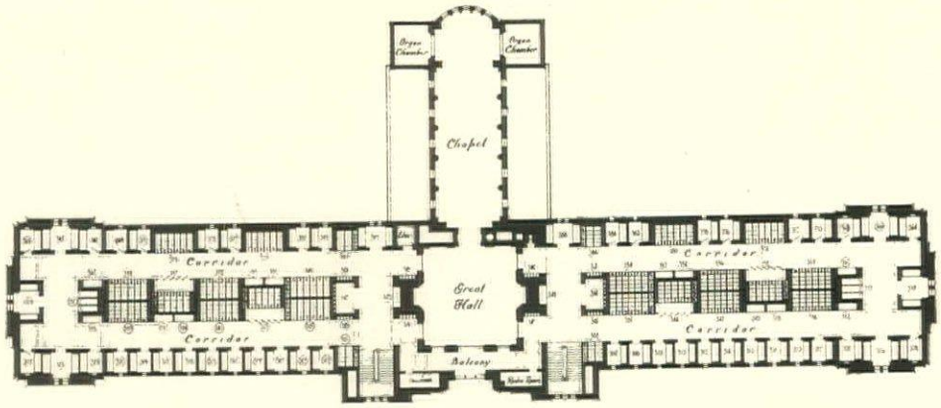
TEMPLE OF MEMORIES

WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

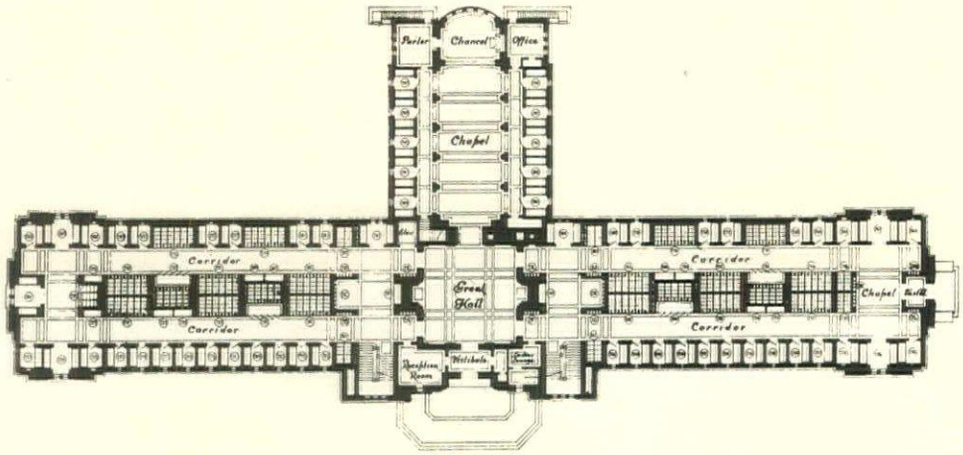
ALVIN E. HARLEY, ARCHITECT, C. KENNETH BELL, ASSOCIATE

FIVE COMMUNITY MAUSOLEUMS

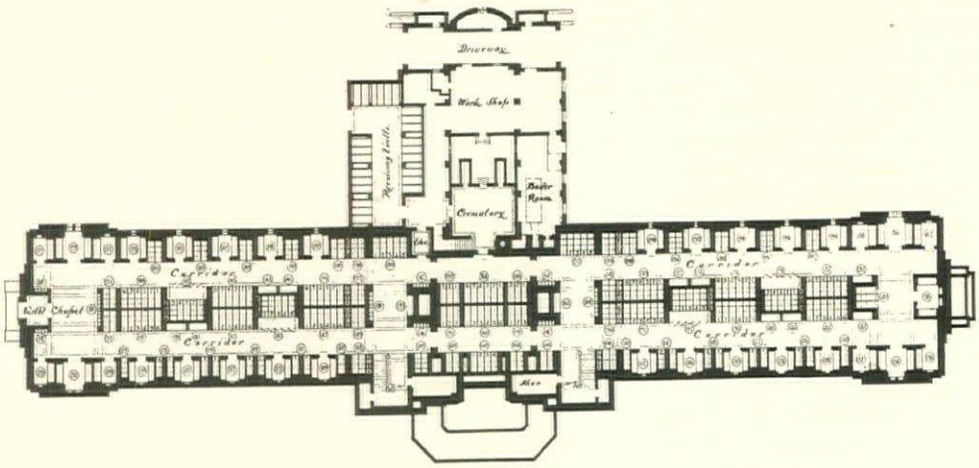
PRACTICAL PROBLEMS OF SMALLER BUILDINGS WILL BE FOUND ON PAGE 411



MEZZANINE PLAN



CHAPEL FLOOR PLAN

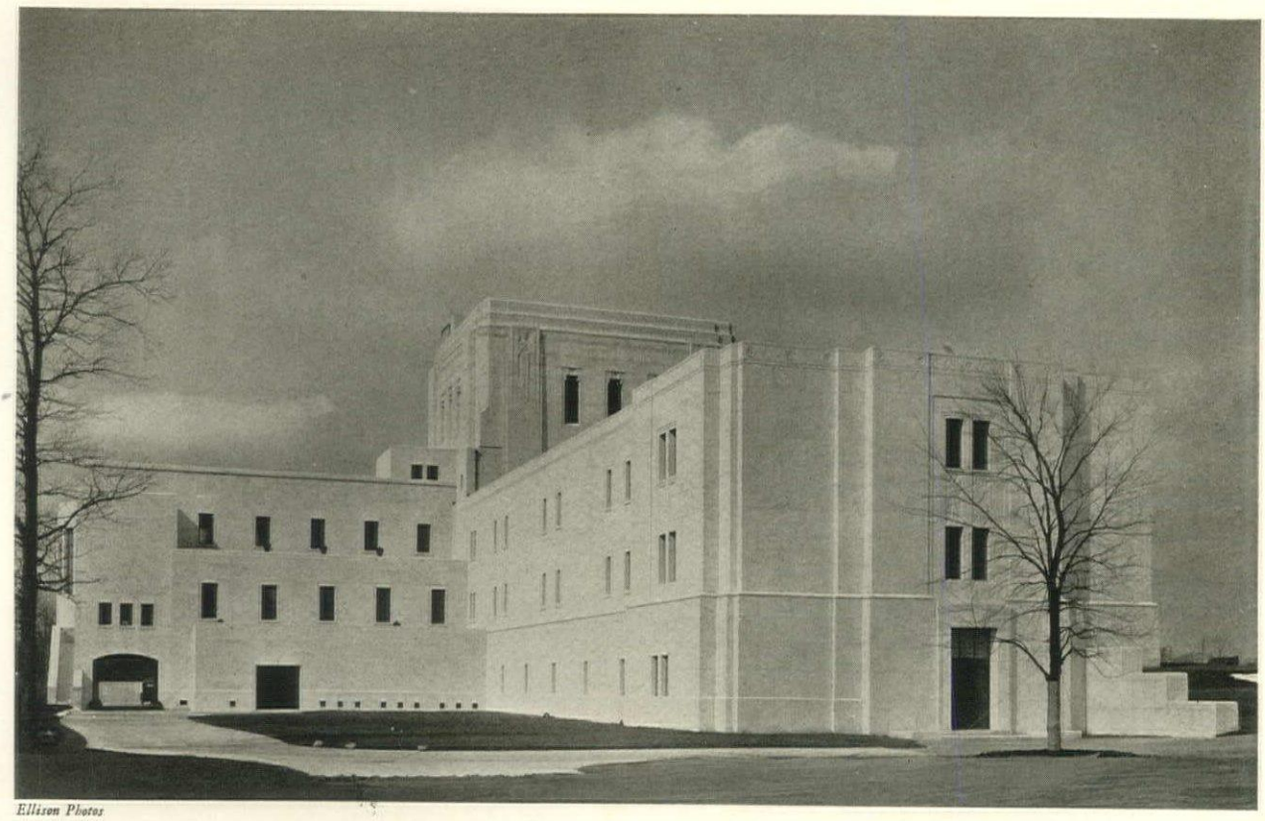


FIRST FLOOR PLAN

TEMPLE OF MEMORIES

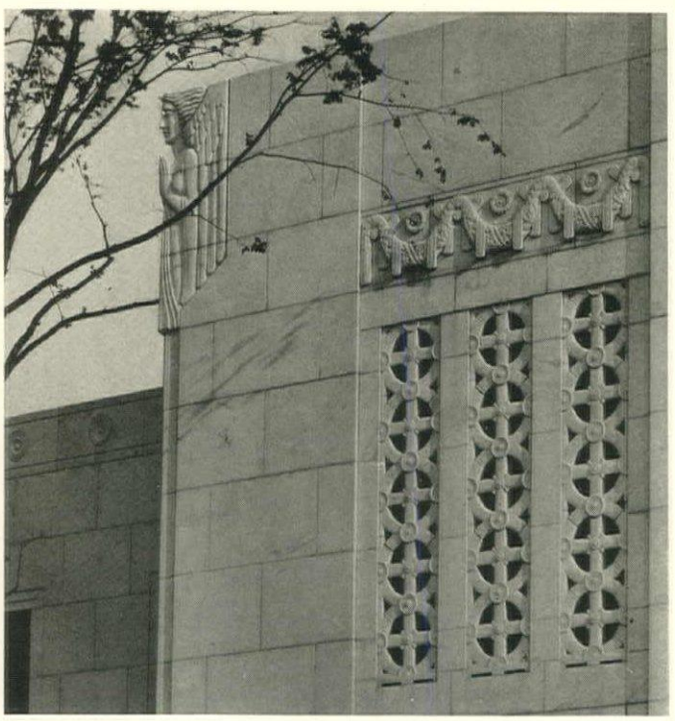
WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

ALVIN E. HARLEY, ARCHITECT, C. KENNETH BELL, ASSOCIATE



Ellison Photos

THIS building is one of the largest and most completely equipped mausoleums in the country. It is constructed entirely of heavy, reinforced concrete with a 6 in. exterior facing of light Georgia marble. All exterior rough curtain walls above ground are 12 in. thick of solid brick masonry and all interior partitions and walls are of solid masonry consisting of brick and hard burned clay tile. The crypts are constructed independently of the building structure and are executed in structural slate. In general the walls and ceilings of the interior are of Botticino marble, the floors of travertine, except in some private rooms where colored marbles have been used. All hardware, including the doors, windows, gates, grilles, etc., is of solid bronze. The reception room, parlor and office are paneled in walnut; the toilets and rest rooms are finished in colored faïence tile. The central portion of the building, including the chapel and the great hall, has a monolithic, reinforced concrete ceiling, decorated in high color and illuminated by a system which permits changes in color and intensity during funeral services



TEMPLE OF MEMORIES

WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

ALVIN E. HARLEY, ARCHITECT, C. KENNETH BELL, ASSOCIATE

Ellison

A PRIVATE CHAPEL

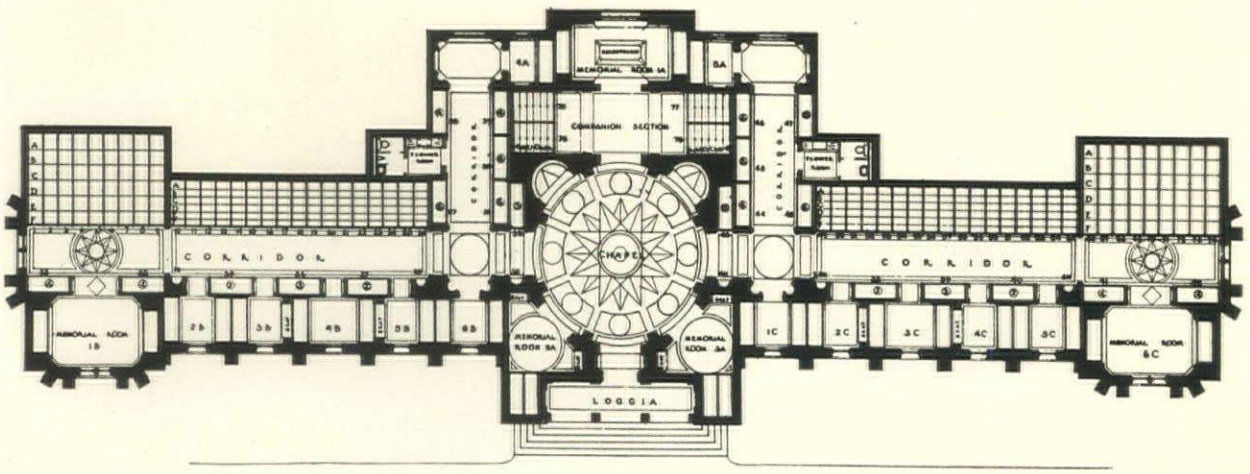
TEMPLE OF MEMORIES

WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

ALVIN E. HARLEY, ARCHITECT, C. KENNETH BELL, ASSOCIATE

Hahn-Millard

THE plan of this building shows an interesting combination of ordinary crypt spaces with the more elaborately designed private rooms and special areas devoted to memorial entombments. The elaborateness of the appointments made it necessary to use space which might otherwise have been employed for additional stacks of crypts. The structure is faced on the exterior with variegated Bedford stone trimmed with granite. The dome of the chapel rotunda is covered with a gold glazed tile. The interior is finished entirely in marble, varying in color with the spaces in which it is installed. The windows are colored cathedral glass set in bronze sash and frames



FOREST HILL ABBEY

KANSAS CITY, MO.

ALFRED C. FINN, ARCHITECT

Hahn-Millard

THE CHAPEL

FOREST HILL ABBEY

KANSAS CITY, MO.

ALFRED C. FINN, ARCHITECT

Carter

THE mausoleum occupies the crest of a small hill overlooking a cemetery park and has been designed to conform to the contour of its location. In style it has been characterized as an "adaptation of the Italian Romanesque." The building contains 6,430 crypts and 3,163 niches for columbaria, and is built of reinforced concrete, integrally waterproofed and further protected from the weather by an exterior cement wash of a light cream tone. Every effort was made to assure the permanence of the structure itself, as well as every part of its equipment. In addition to the reinforced concrete structure, a 5 in. monolithic concrete veneer has been applied over the entire edifice. The crypts themselves are also of reinforced concrete, entirely separated from the supporting walls and roofs of the building by an air space approximately 2 ft. wide. This system of construction prevents damage to crypts due to possible earthquake shock and further serves to offset the condensation of moisture. One of the features of the design is a replica in stained glass of Leonardo da Vinci's painting of "The Last Supper." The window measures 15 x 30 ft. and occupies a dominant position in the main chapel of the mausoleum. The owners of the structure have been at some pains to provide an attractive setting for the mausoleum and the natural advantage of its situation has been enhanced by the development of a carefully studied landscape

FOREST LAWN MEMORIAL MAUSOLEUM

GLENDALE, CALIFORNIA

FOREST LAWN ARCHITECTURAL DEPARTMENT, ARCHITECTS

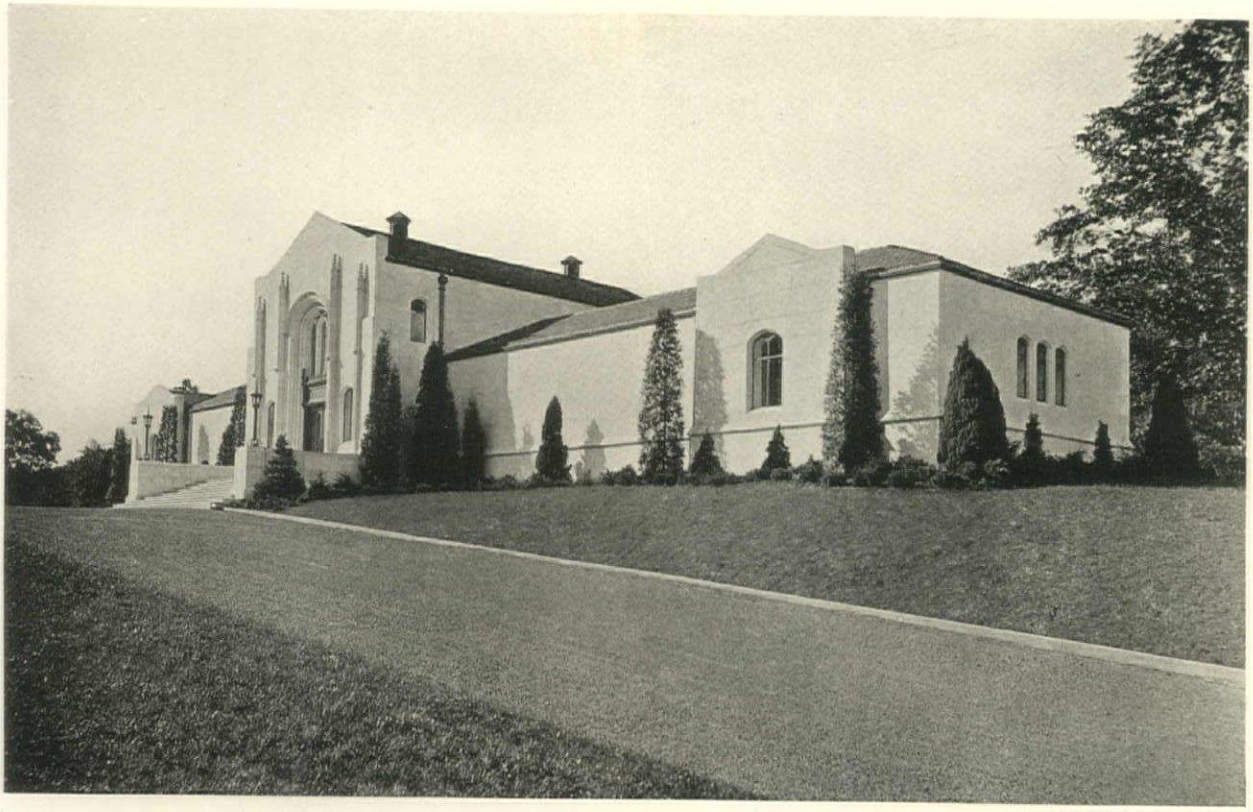
Carter

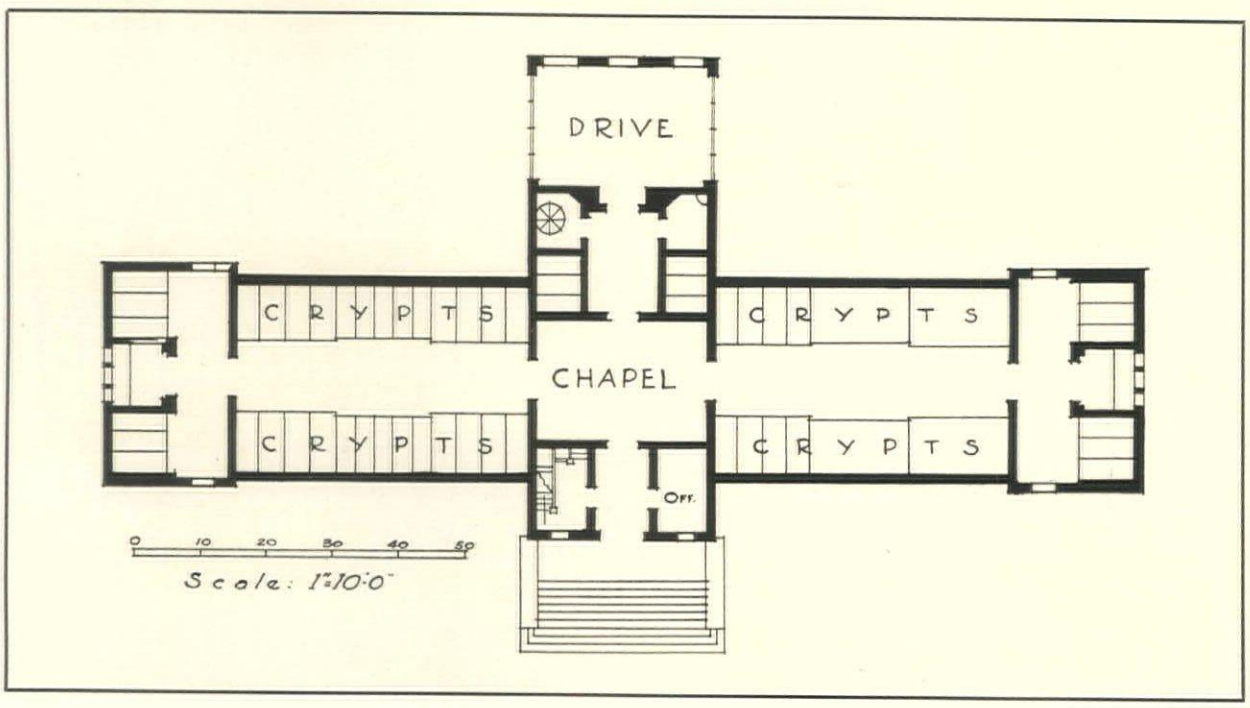
THE CHAPEL

FOREST LAWN MEMORIAL MAUSOLEUM

GLENDALE, CALIFORNIA

FOREST LAWN ARCHITECTURAL DEPARTMENT, ARCHITECTS





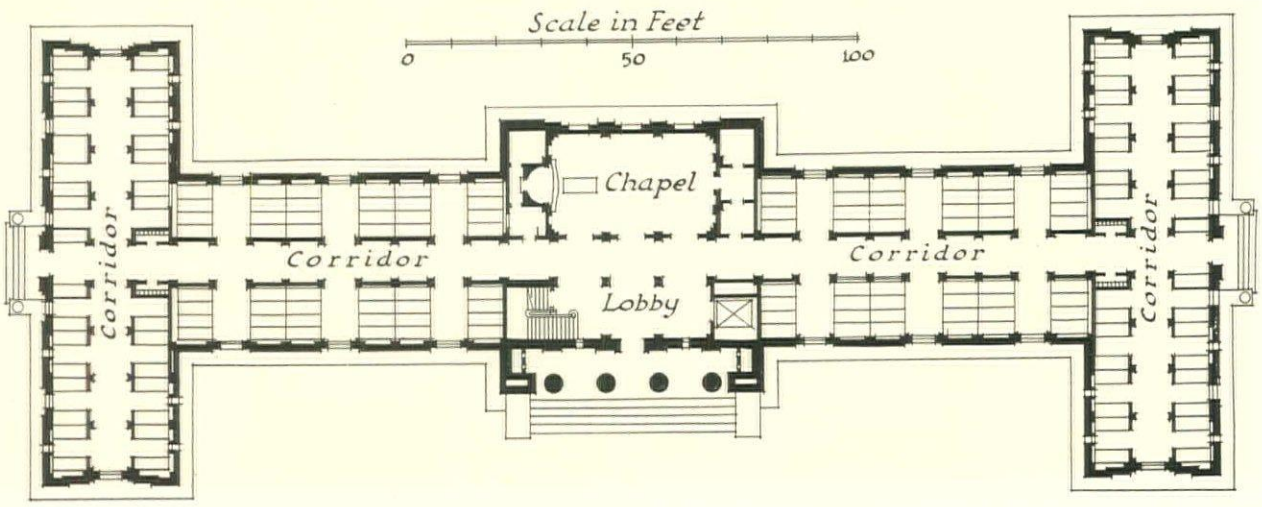
KENSICO CEMETERY MAUSOLEUM

VALHALLA, NEW YORK

LOVELL & LOVELL, ARCHITECTS

Guild

THIS building which has an exceptionally compact and economical plan is built of reinforced concrete construction, faced on the exterior with a light gray Vermont granite with an ironed finish. The interior is faced for the most part with matched mezzotint Georgia marble. The borders of the floor are York gray and the fill is pink Georgia. All metal work and hardware is of wrought and cast bronze. The chapel contains an interesting mosaic in high color, a view of which is shown on the opposite page. The cost per cubic foot for the building, exclusive of foundations, was $1.75. The cost per crypt was $300



FAIRMOUNT MEMORIAL MAUSOLEUM

NEWARK, NEW JERSEY

WILLIAM HENRY DEACY, ARCHITECT

Guild

FAIRMOUNT MEMORIAL MAUSOLEUM

NEWARK, NEW JERSEY

WILLIAM HENRY DEACY, ARCHITECT

Guild

ONE OF THE PRIVATE ROOMS

FAIRMOUNT MEMORIAL MAUSOLEUM

NEWARK, NEW JERSEY

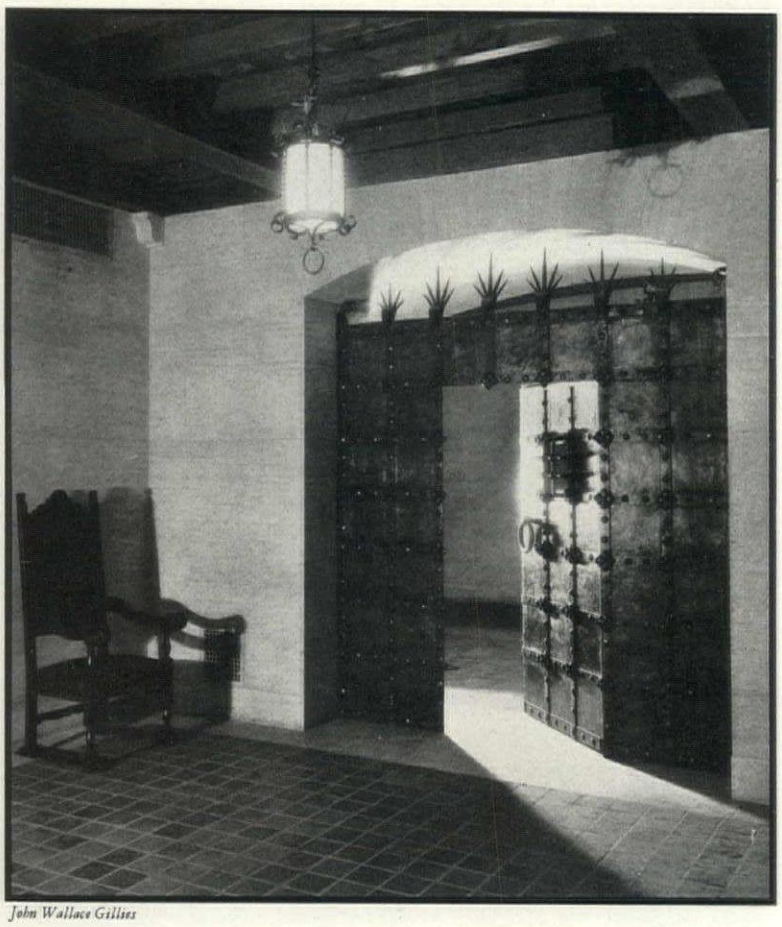
WILLIAM HENRY DEACY, ARCHITECT

CRAFTSMANSHIP IN FORGED IRON

BY

BERNARD HEATHERLEY
OF THE OFFICE OF SAMUEL YELLIN

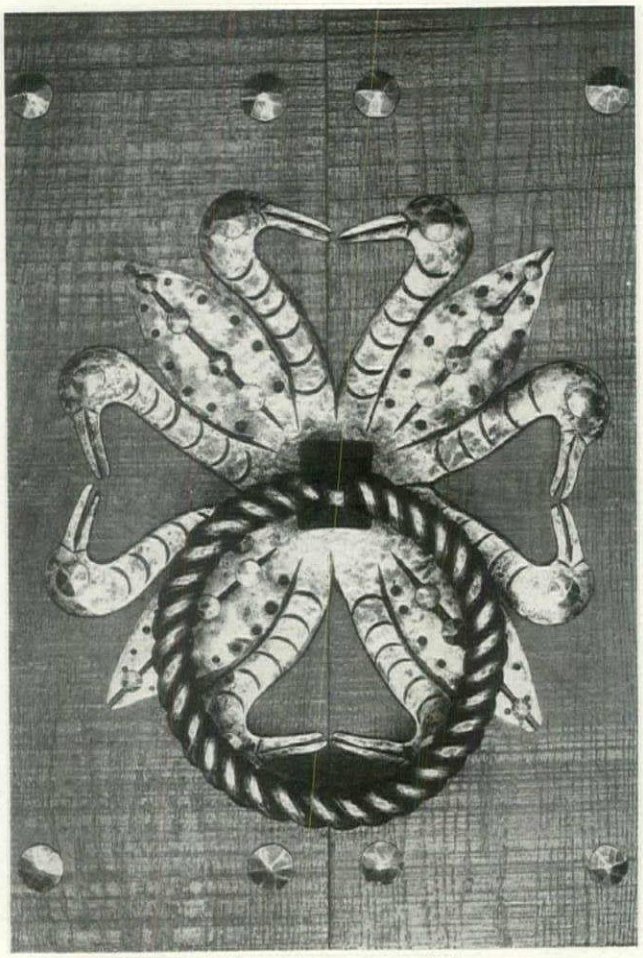
Other articles which have recently appeared in these pages have dealt with the technical and artistic possibilities of metal work. They have been primarily concerned, however, with the newer metals and have given pertinent information regarding the possibilities of design and their fabrication by means of modern machinery and methods. In this article we are fortunate in presenting the work of an artist who has concerned himself largely with developing the tradition of hand-wrought iron. It sets clearly the standpoint of a master craftsman and points to his artistry in form, technique and material. The author is an associate of Samuel Yellin whose designs are illustrated

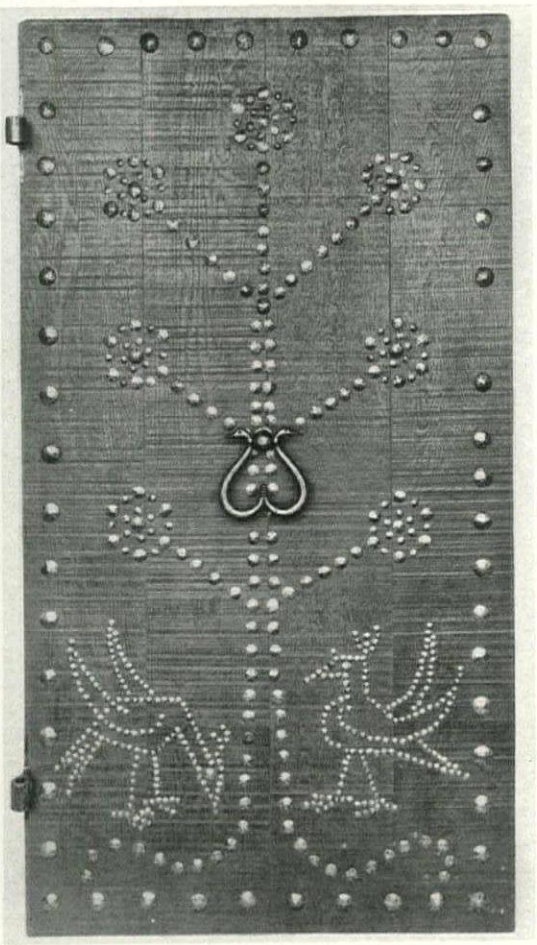


John Wallace Gillies

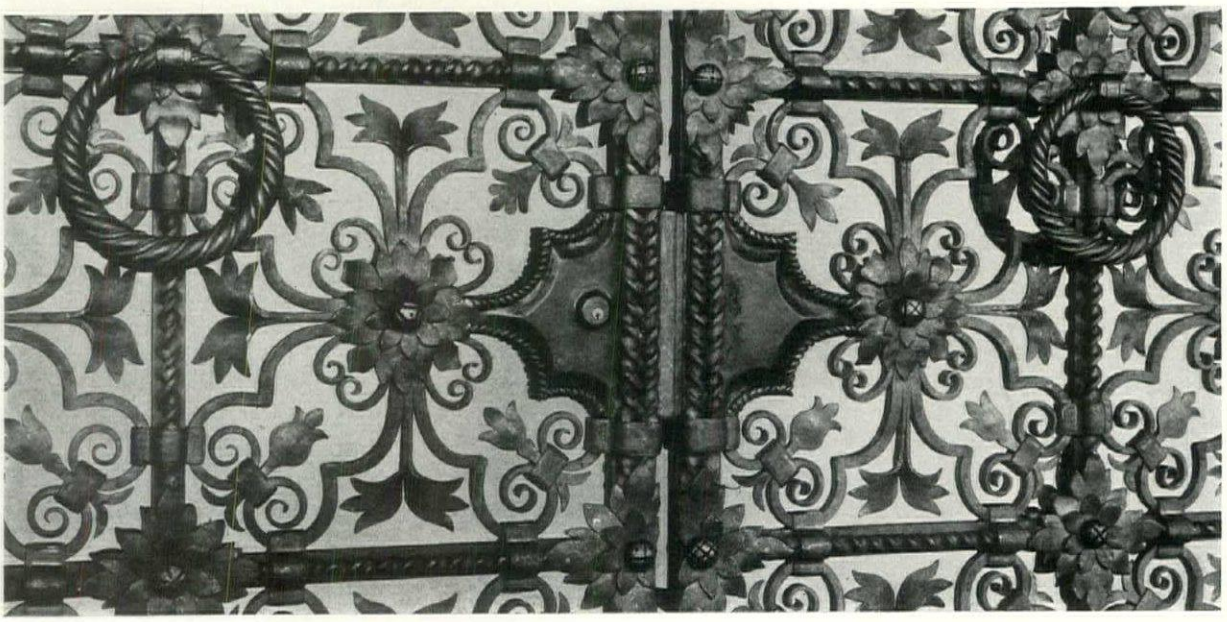
WITH the research chemists and metallurgists working continuously in the production of new alloys and making claims for them; with architects and artisans employing these new alloys — hopeful for their virtues and eager to try the new, the time seems ripe for a calm judicial weighing of the various elements involved in the present-day craft of working in metals.

There is probably more ingenuity being employed in synthesis and imitation today than ever before. Manufacturers are employing chemists to transmute new material into something that is far removed from its original state and which is used again to imitate something to which it is not kin. The shops are full of articles whose existence may be a triumph of chemistry, but which contribute to weaken the belief that any object is finest when it is well designed and undisguisedly expressive of the material in which it is made. Beside the chemists are the metallurgists and we must be sure that our judgment of their products — often evolved under the wing of commercialism — is based, not upon the scientific cleverness that brought them into existence, but upon the degree of nobility in the material evolved and its capability of æsthetic expression. This is an aspect in which the commercial research men probably are not primarily interested.





The two illustrations above are wrought iron work for wooden doors in the Carillon Singing Tower at Mountain Lake, Fla., for which Milton B. Medary was the architect. They show what interest may be created with simple materials used in an unpretentious manner. The picture below, a detail of wrought iron gates for the Central Savings Bank, New York, York & Sawyer, architects, shows a skillful handling of an intricate wrought iron design



Now, what criterion have we by which to estimate the nobility of a metal? I suggest that as measuring sticks we might consider the extent and number of usages and methods of working to which the metal easily lends itself without at any point losing caste or individual character, or stepping outside of its true nature. To this we should add the requirements of strength, the ability to please when new, yet to grow old gracefully, and the extent of its service to man.

By this standard, iron proves itself to be of undisputed nobility and grandeur — its uses being almost infinite, its methods of working more numerous than any other metal enjoys, its strength and rugged character always evident and its adaptability to artistic expression complete.

This article presupposes a desire for metal work having the fewest possible limitations. This means, of course, that even though machines may play a small part, manual labor is the backbone of the metal-working craft because confinement to mechanical means at once limits expression. Even the partial use of mechanical methods imposes limitations and is apt to disguise rather than to emphasize the special quality of the material.

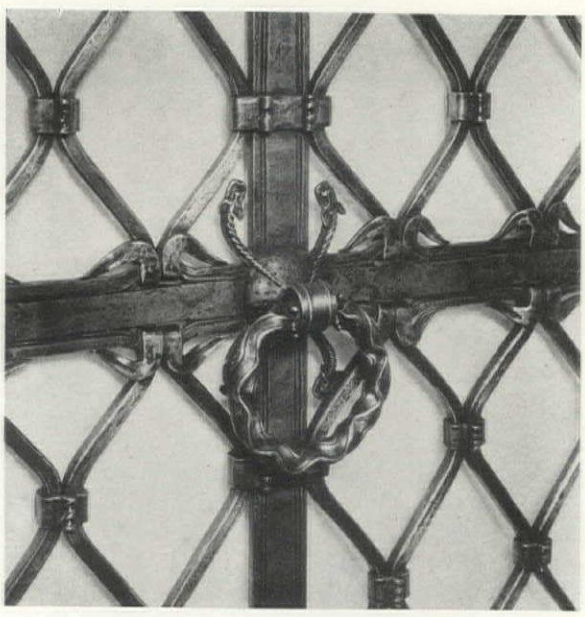
Although the limitations of iron have been so stressed, it is probably the least limited of the metals. There is no other metal that can go through the fire as iron can and emerge unscathed — without loss of character. The ultimate test of the forgeability of a metal is its ability to be welded freely by the hammer on the anvil. Iron is the only metal so far found having the virility to permit this process. Subjected to this test, other metals show a softness and effeminacy. Many of them melt even before a weld heat is reached or resent the constant, rough treatment given by the hammer by crumbling under its blows.

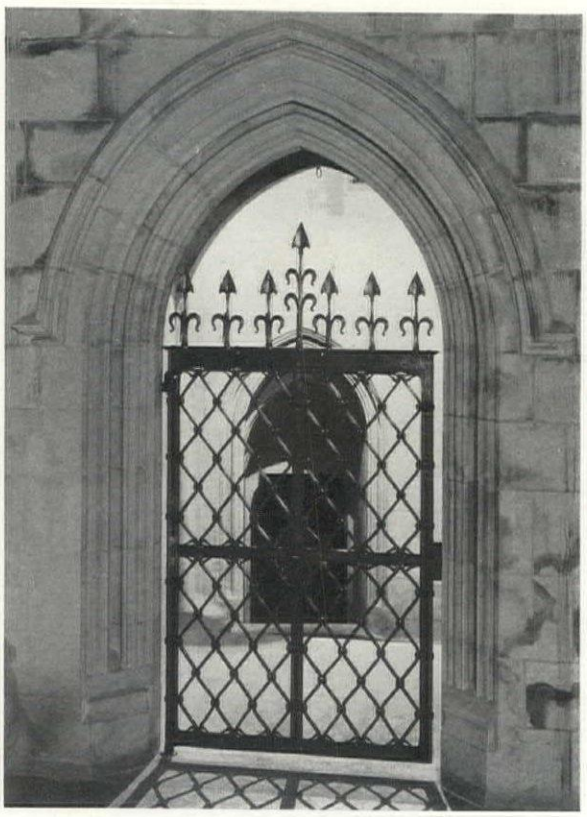
Some other metals, or alloys, can be "wrought" in a very limited way, but a brittleness and lack of freedom and adaptability so soon shows itself that an artistic limitation is immediately imposed and another form of technique — either working cold or with limited heat or casting — is indicated, in deference to the nature of the material. To iron belongs the fun of a craft permitting the craftsman the use of craftsman's methods and not the methods of the factory or laboratory.

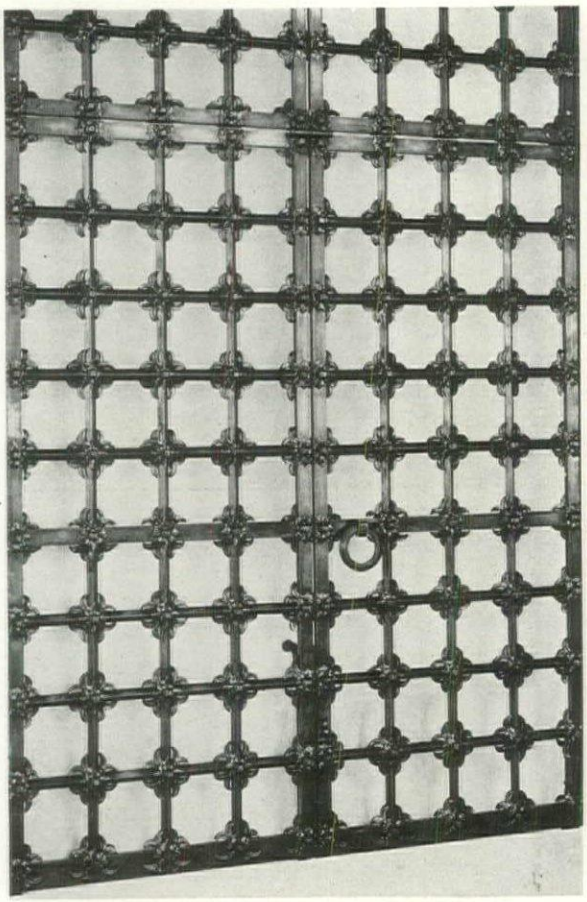
The freedom, then, of this metal makes possible and desirable expression in every conceivable style of design. "What," somebody asks, "of the classic?" Mr. Starkie Gardner, the eminent English writer on wrought iron, has done the work of collecting data on this subject and states it fully in the preface of his first book. He sums up his conclusions in saying: ". . . the Greeks, who seem to have left little further to be discovered in the manipulation of iron for the purposes of art . . ."

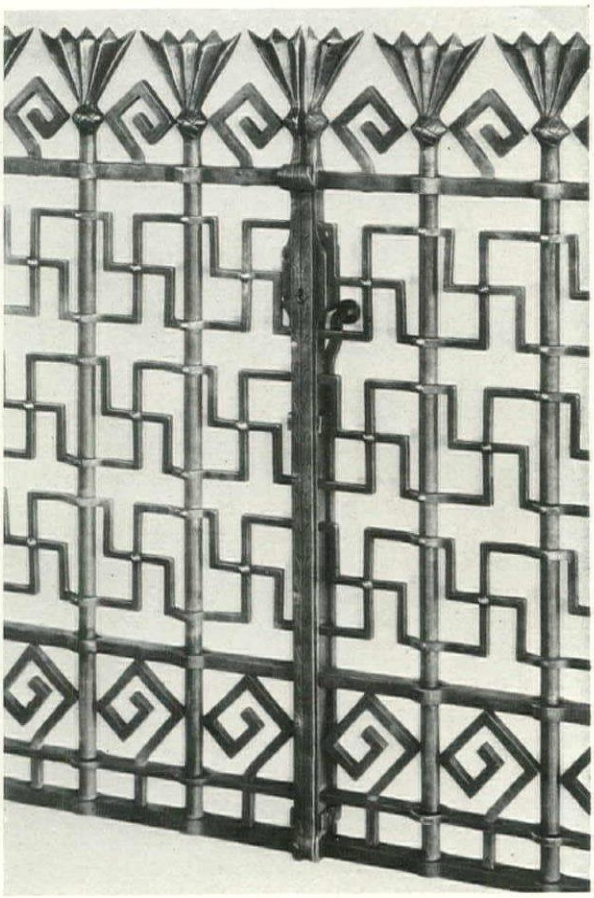
"And what," asks someone else, "of the Moderne?" To this I would reply by asking to what extent has Moderne (or "contemporary" — the

A general view and detail of a wrought iron gate located in one of the memorial chapels in the Washington Cathedral, Washington, D. C., for which Frohman, Robb & Little were the architects

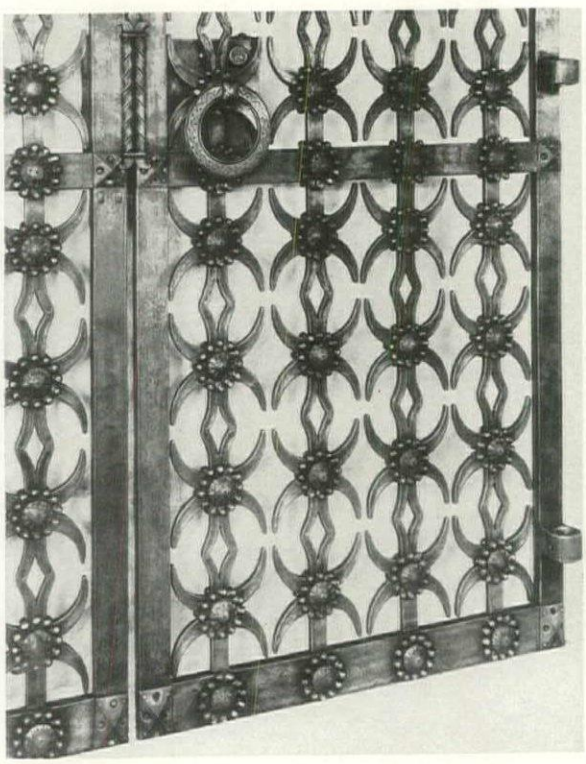








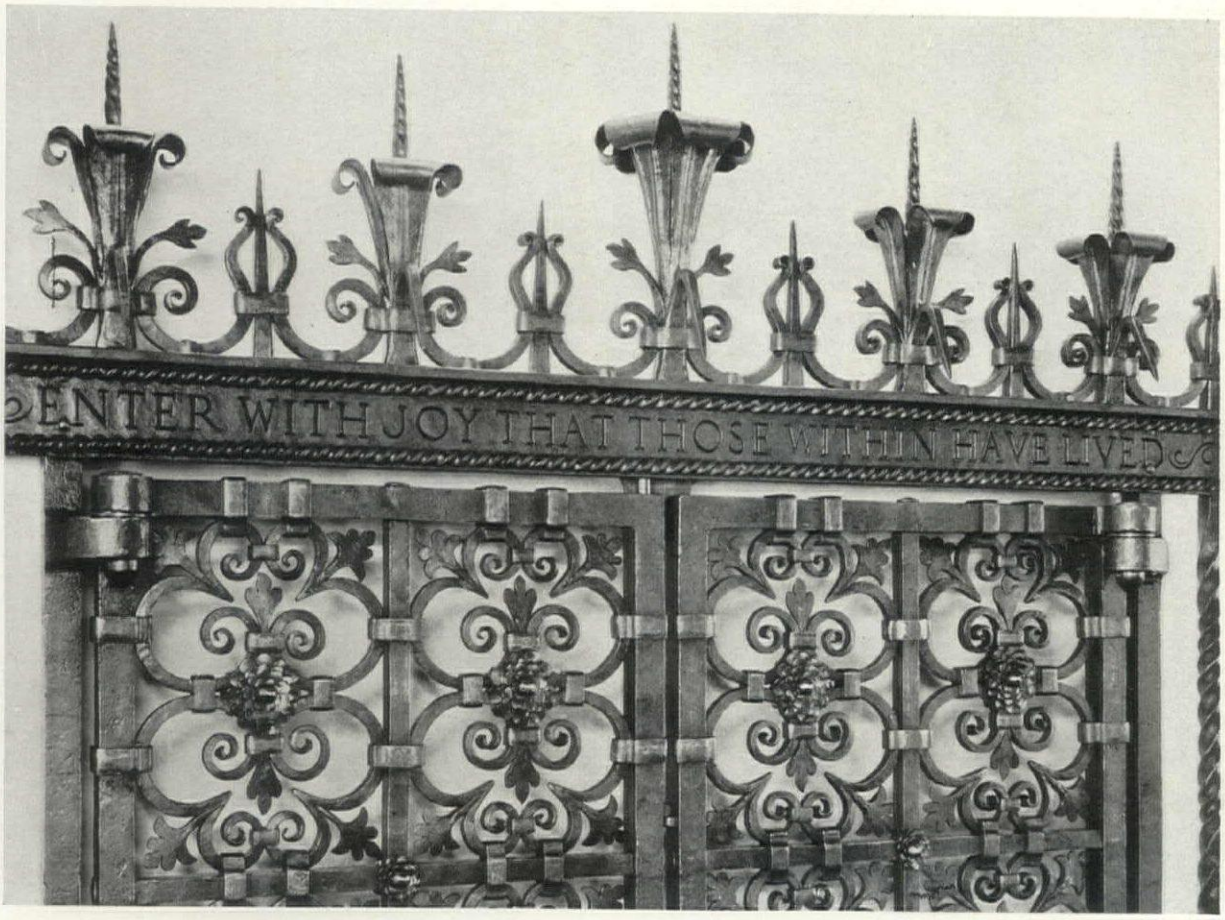
The three illustrations on this page are of Monel metal grilles. The one at the upper left is in the Yale Graduate School, New Haven, Conn. At the right is an entrance gate to the Strauss Tombs at Woodlawn Cemetery, New York



A gate detail for the Sterling Library at New Haven, Conn.

right word has not yet been found) design achieved success? The answer to this question is the answer to how far wrought ironwork has been successful in adaptation to the style. The intervening styles are so full of this ubiquitous metal that it is unnecessary to mention them.

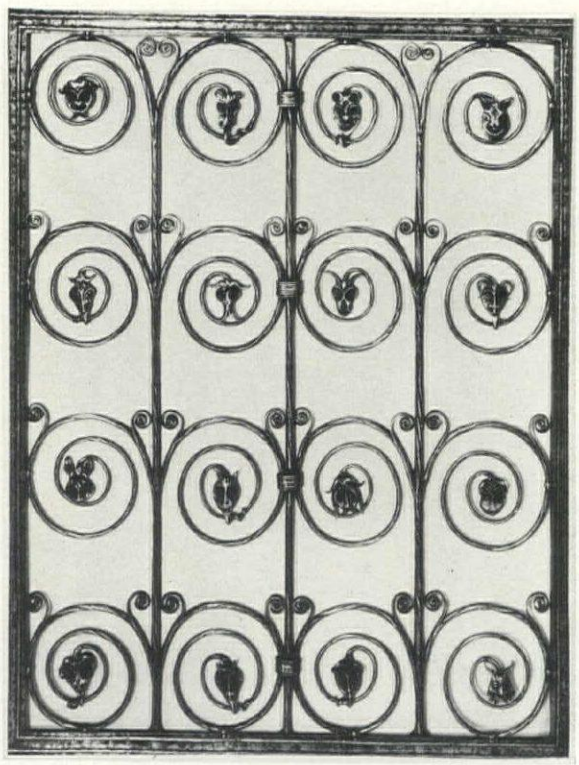
But if all the virtues claimed above for iron exist, what is its weakness that a need to use other metals should sometimes be felt? Well, we will let this metal show the virility claimed for it by facing the question squarely. Rust — corrosion — that is the great flaw. Let it be said, however, that the story of corrosion of wrought iron is the story of man's wilful neglect of property — man's unwillingness to take the most meager precaution necessary to avoid it. "But," it is argued, "this condition is so; human nature cannot be changed to suit a craftsman." This is true, so what is being done about it? Efforts are being made to evolve a metal that is non-corrosive and at the same time is capable of doing all that iron will do. One day



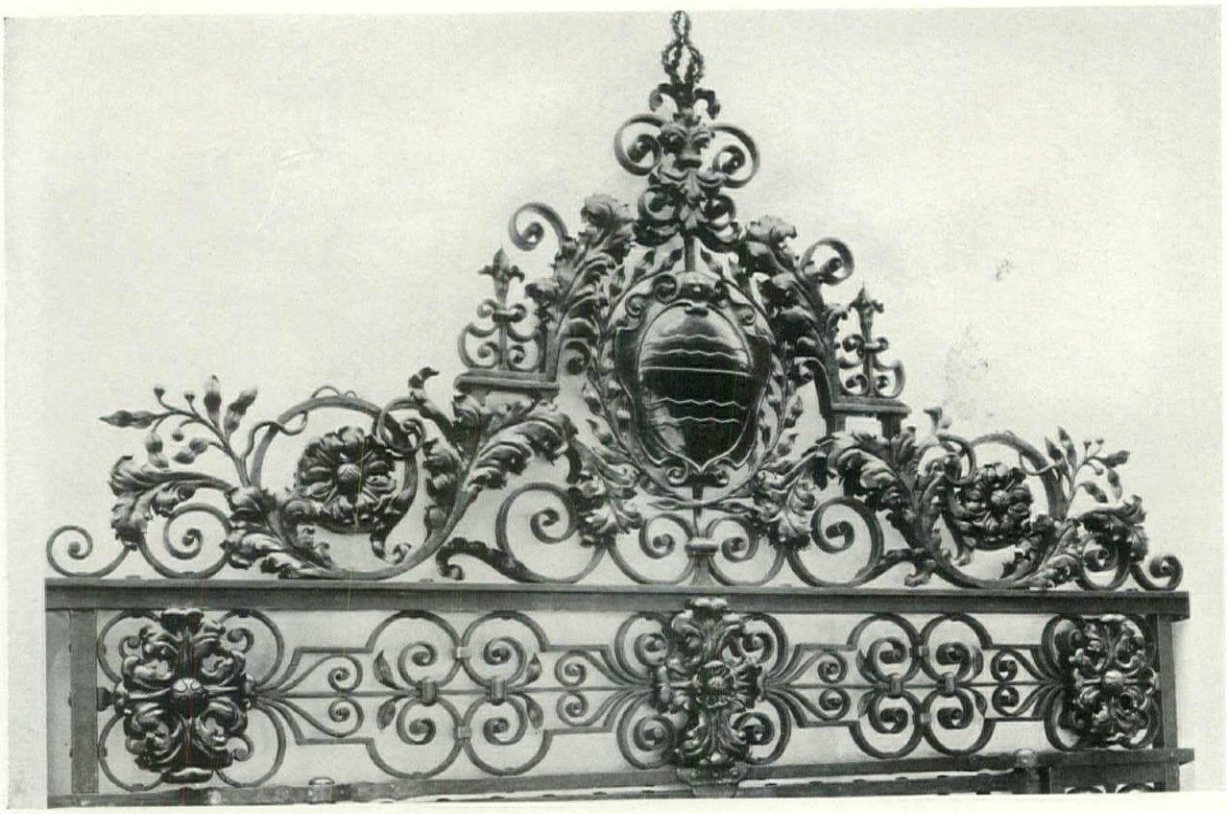
Compare the technique of wrought iron work with that of Monel metal shown opposite. Notice particularly its greater adaptability to varied forms. Above is a detail of the gates for the Hall of Fame at New York University

this may be achieved — and the wrought ironworker will welcome it — *but it is not here yet.*

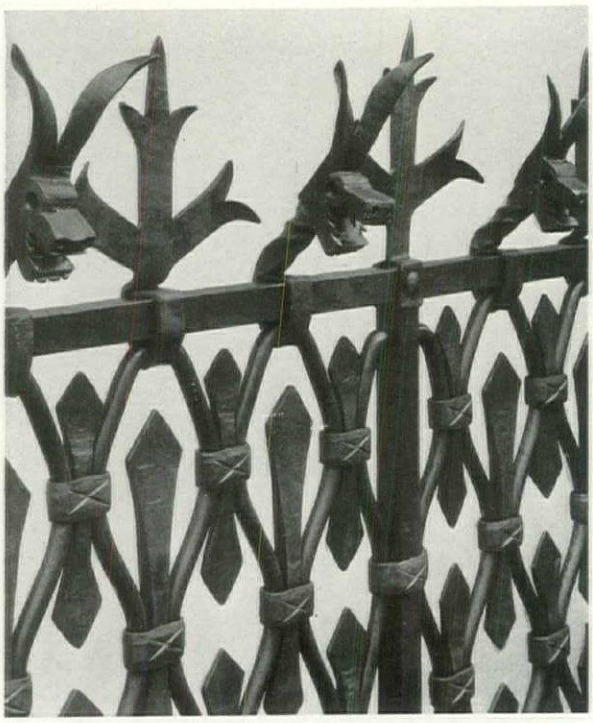
Some of the newer alloys may not corrode, but will oxidize unpleasantly, requiring the same slight servicing that iron benefits by. Some will neither corrode nor oxidize if left as they come from the mill. But where is artistic expression if the fire and the hammer may not be used for fear of losing the non-corrosive qualities? Limitations is the price paid for non-corrosion. And yet, an inspection of the exterior wrought ironwork of The Federal Reserve Bank in New York, erected in 1923, or of the exterior gates of the Packard Building in Philadelphia, erected in 1924, or of numerous other pieces, will show that this weakness is not to be so feared — even in spite of little or no servicing — provided that the work is properly handled in the first place. In fact, this work proves that what is true of most good things is especially true of wrought ironwork — that the passing of the years is more apt to increase than to diminish its beauty



A grille with details executed by different artisans



A detail of the cresting for the wrought iron gates to Eliot House at Harvard University, Cambridge, Mass., for which Coolidge, Shepley, Bulfinch & Abbott were the architects

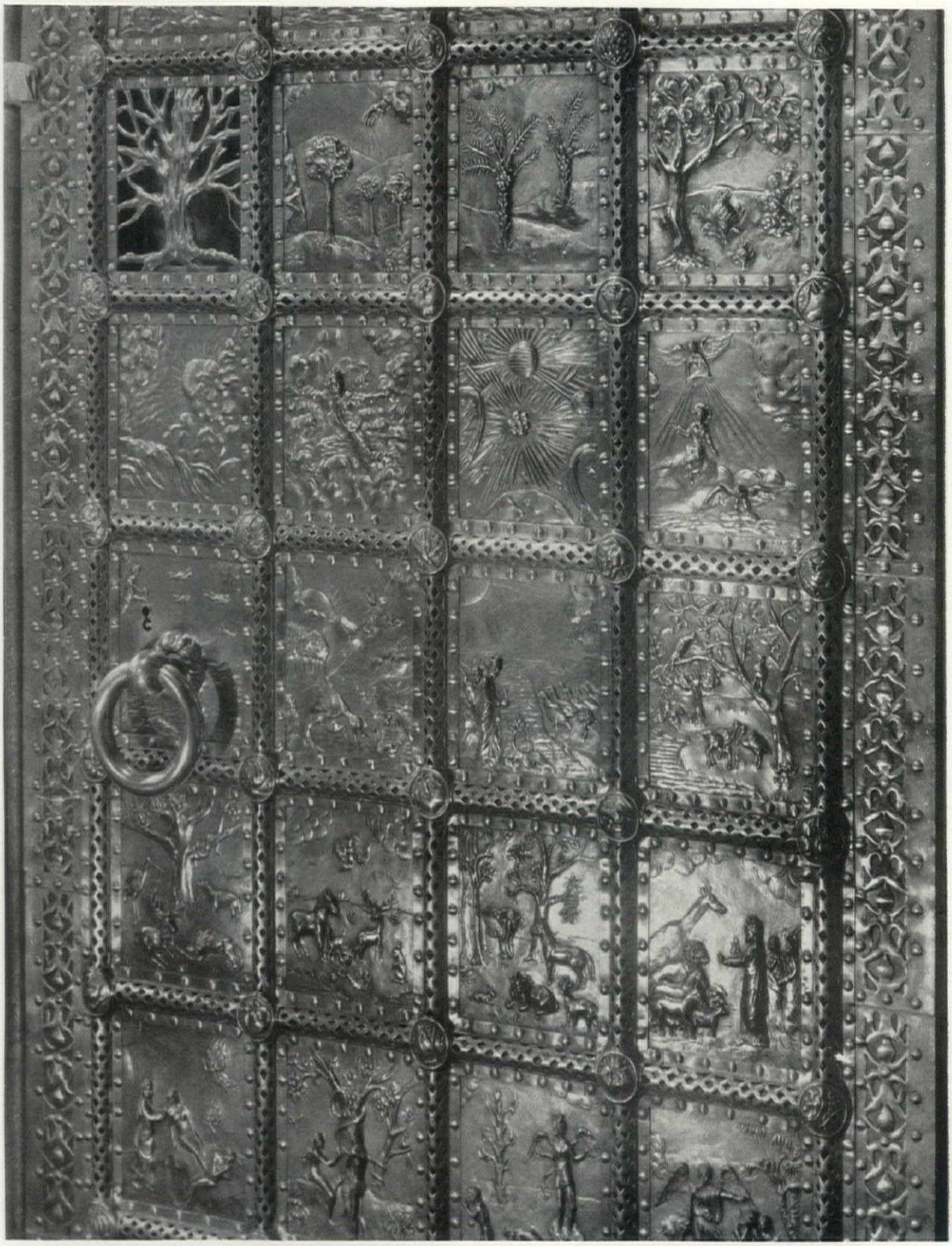


Compare the rugged simplicity and humor of this wrought iron grille with the sophisticated design of the gate cresting illustrated at the top of the page

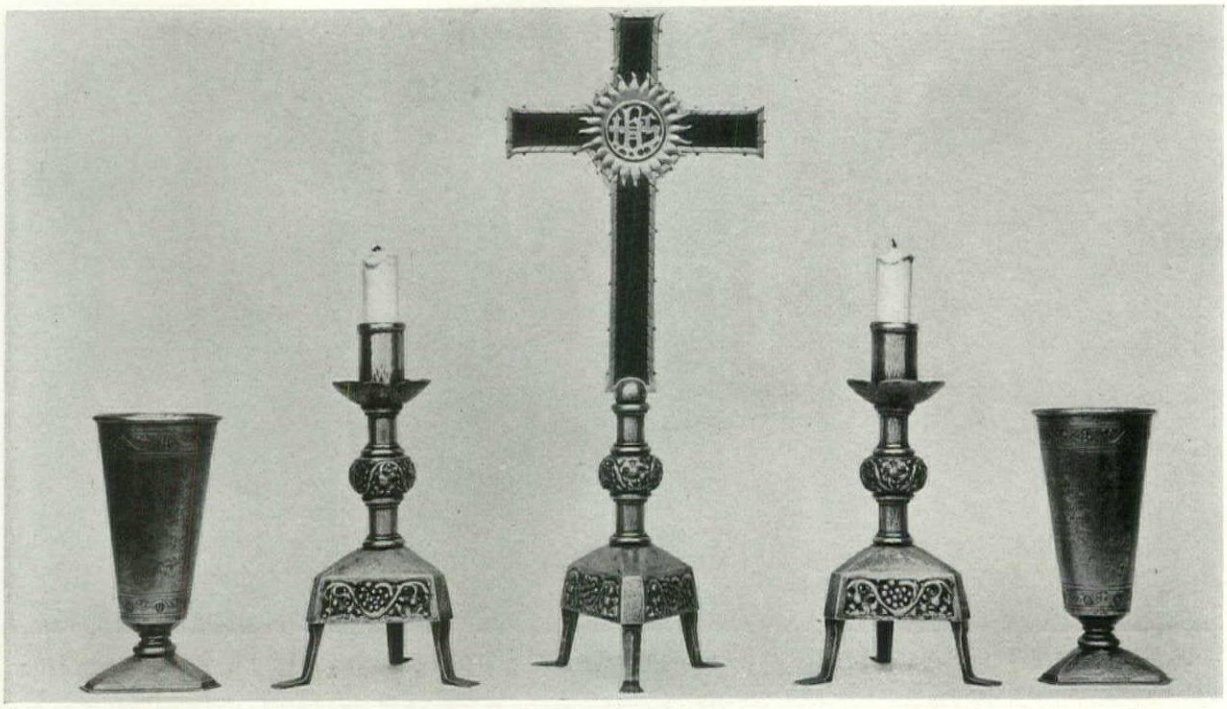
and value with the mellowness that age brings.

But let us suppose that the desire for a bright and shining world persists, together with a reluctance to do any work in keeping it bright and shining. The craftsman, then, must see what he can contribute to beauty in the materials he is called upon to use. The only path he can follow, to maintain the integrity of his craft, is to approach the new metals on their own merits and find the technique that will make the working of them an art and not a mechanical process. For there is yet no proof that the machine is the ultimate instrument of good in life and art.

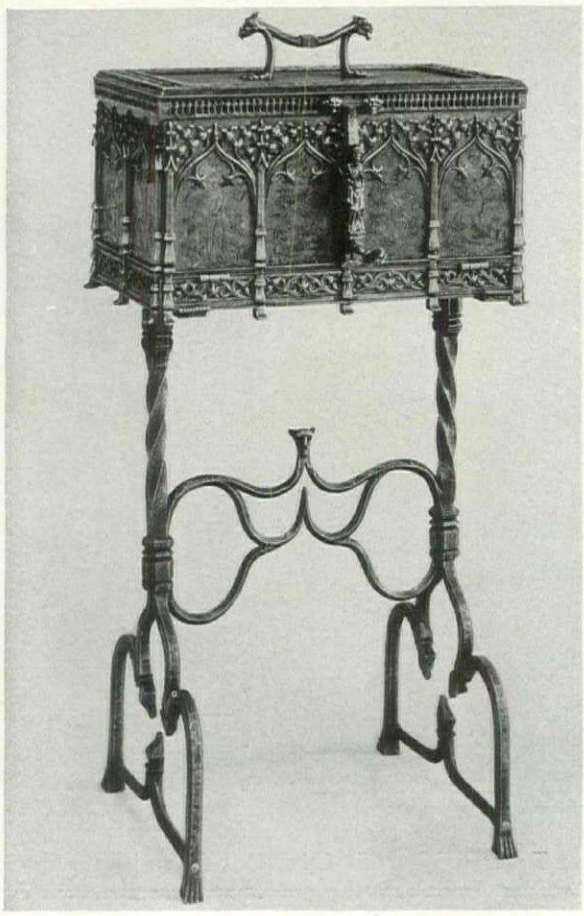
The illustrations accompanying these words show some of the work of Samuel Yellin, to whom the world of art, and especially the world of craftsmanship, owes a great debt. From the low estate into which wrought ironwork had fallen from, say, 1830 to the earlier part of this century, Mr. Yellin raised it to the highest point of development it has ever achieved in history. He evolved long ago from the "adaptive" stage of a craftsman's career, becoming more and more creative. His work delights because while being full of new things, it is always in the tradition and is always extending the tradition of the craft. Thus, examination of it would satisfy the person who demands that today's vital art must be of today's creation and would



THIS detail of the massive bronze door in the Carillon Singing Tower at Mountain Lake, Fla., for which Milton B. Medary was the architect, is a particularly striking example of Mr. Yellin's mastery of decorative metal design. The work is an intricate combination of wrought work and repoussé. The delicacy of the detail and workmanship shows a thorough understanding of the limitations as well as the possibilities of bronze. The design and craftsmanship are interesting in comparison with the illustrations opposite and those of the Monel metal grilles on page 388



Cross, candlesticks and altar vases for Washington Cathedral, Washington, D. C.



A wrought iron Gothic chest

satisfy the old masters, because it would show them new forms recognizing the discipline to which everything worthwhile must be subject.

To be able to live up to these difficult qualifications for a present day craftsman, and be neither copyist nor radical, complete mastery of material is necessary. Such mastery Mr. Yellin joins with the greatest skill in design, the deepest knowledge of his craft which prompts ever continuing study, analysis to the last detail and a fighting spirit to conquer the objections which sometimes arise from an incomplete understanding of the work on the part of patrons. Any metal that comes before him will develop under his hand as far as its physical composition will allow.

A wrought iron letter basket and paperweight

Here's where we planned to show an installation of Gothic Oak

—but when the plate was made, we all agreed that neither fine photography nor skilful engraving could do full justice to a wood of such exquisite color and texture —a wood which many leading architects today prefer to even the costliest of imported materials.

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In a Montreal cathedral, in a Battle Creek bank; in a Michigan academy, in a California villa—such broad uses of Gothic Oak suggest its rare charm and versatility.

Rich and mellow as the paneling of medieval churches—virtually free from swelling or shrinking—responsive to carving by hand or machine—finished with neither filler nor stain—*and,* surprisingly low in price. Your samples are waiting for you. Send for them today. The coupon is for your convenience. Wood-Mosaic Co., *Incorporated,* Louisville, Kentucky.

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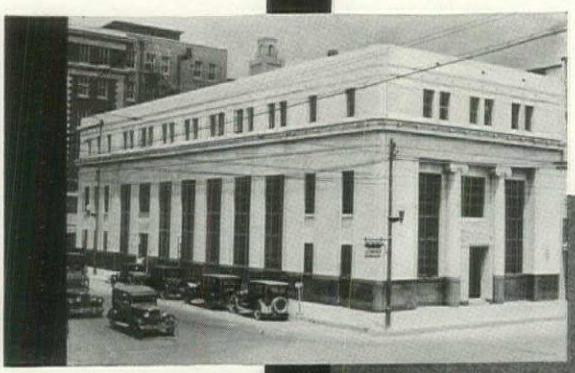
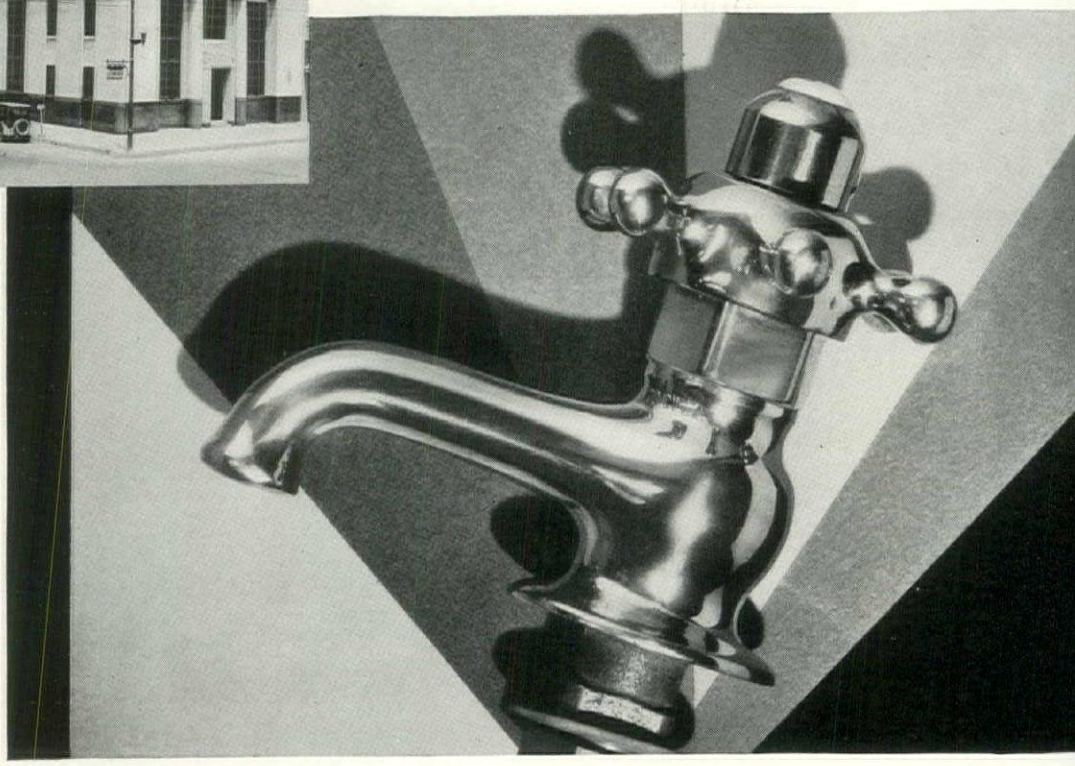


First National Bank, Port Arthur, Texas. Architects: Fairot & Livaudais, New Orleans, La.; Plumbing: Port Arthur Plumbing Co.; Solid Nickel Silver Plumbing fixtures by the John Douglas Co., Cincinnati, O.



● In specifying Solid Nickel Silver for the plumbing fixtures of this modern bank building, the builders had their eyes on the future. No other available material renders such faultless service . . . looks or wears better longer. ● The rich, gleaming beauty of Solid Nickel Silver is permanent. Since it has no surface coating to become worn or marred, hard use or repeated cleaning will not lessen its inherent attractiveness. ● It has the require resistance to corrosive fumes, acids, soaps and cleaner and because of its bronze-like toughness and hardnes it gives trouble-free service in valve seats and bea ing surfaces. ● Surely the builders of the Port Arthu First National Bank chose wisely in specifying mod ern, lifetime sanitary fixtures of Solid Nickel Silve

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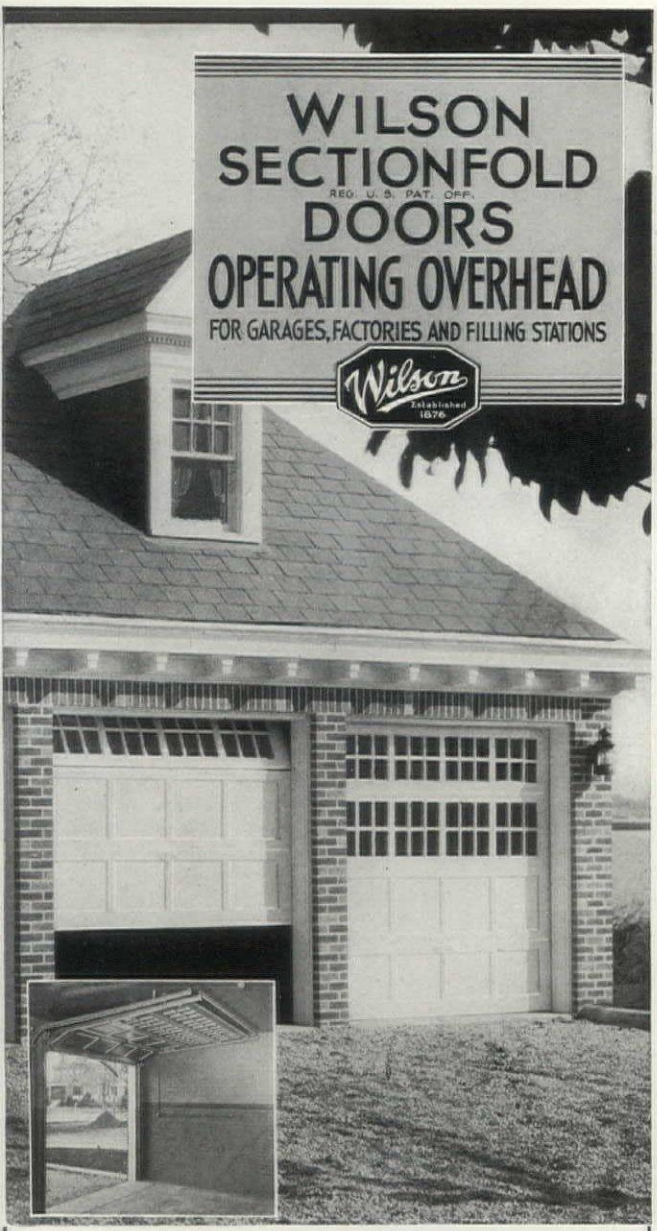

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REVIEWS AND ANNOUNCEMENTS

BARBER-COLMAN CO., Rockford, Ill. "Duplex Thermostat"

A new duplex thermostat, suitable either for general use as a two-temperature thermostat or for applications requiring control of double range circuits, has been developed by Barber-Colman Company. The instrument is essentially two room-type thermostat units mounted side by side, and individually adjusted to any range between 60° and 80° by means of a lever and scale at the bottom of each unit. The duplex differs from the Barcol two-temperature thermostat in that there is no manual or magnetic switching means, but is otherwise similar in construction and appearance.

In heating installations where a night temperature lower than that maintained during the day is desired, the duplex may be used as a two-temperature thermostat by using an external switching means for throwing the control from one unit to the other. One unit is adjusted to control the normal daytime temperature, and the other is set for a relatively lower temperature, and placed in control during the night. A manual or automatic switch may be used to change the thermostat at morning or evening, placing the proper unit in control of the heating equipment.

Like other thermostats of the Barber-Colman electric system of temperature control, the working elements of the duplex are mounted upon a base of phenolic resin, and protected by a molded cover of the same material. An accurately calibrated thermometer on the cover indicates the room temperature at all times.

KANTACK & COMPANY, INC., 238 East 40th St., New York City. "The Kaleidoscope"

Amply illustrated by typical installations of Kantack lighting fixtures, the latest issue of *The Kaleidoscope* is featured by an article on the selection of lighting fixtures by Walter W. Kantack, president of the company. He finds considerable, but just, fault with the practice of competitive business among manufacturers of lighting equipment.

The lighting fixtures of the Joslyn Memorial, Omaha, Nebraska, of which John McDonald and Alan McDonald were the architects, are presented in a series of interesting photographs. Probably the finest of the group are those used to light the auditorium, which are double-faced aluminum reflector pendants. Another interesting detail shown is the stair rail of an apartment in New York.

Copies of this and future issues may be obtained by addressing the company.

BARBER-COLMAN CO., Rockford, Ill. "Furnace Limit Switch"

A three-terminal furnace limit switch for use in conjunction with a low-voltage regulator on hot air installations, has recently been developed by Barber-Colman Company. The limit switch may be used alone as an operating control, or may be used in connection with a standard room-type thermostat, as a cutout for excessive furnace temperatures. When used as a cutout, the switch is a reliable safety control, protecting the furnace, and conserving fuel.

The limit switch consists of an adjustable switching mechanism in a phenolic resin box, to the back of which is fastened a long tube carrying a bimetallic helix. Within this tube is a rod which links the free end of the helix with the contact tongue of the switching mechanism. Detent magnets are employed on either side of the contact tongue, eliminating any operating errors due to vibration, and making a neutral switching position impossible.

The switch may be mounted on the bonnet of practically any hot air furnace. For this purpose, a large square stud is fastened to the back of the switch case, and a special flange capable of holding the switch in a horizontal position on the furnace bonnet, is installed. A set screw on the flange makes a rigid assembly and holds the switch so that the bimetallic helix is directly in the path of the warm air generated by the furnace. The action of this element in expanding or contracting with changes in temperature, causes the Limit Switch to function.

PETROLEUM HEAT AND POWER CO., Stamford, Conn. "Petro-Nokol Commercial Industrial Oil Burning Systems"

Coupling the necessary engineering information with an attractive presentation of the product, this new pamphlet should be of interest to all architects doing commercial and industrial work. Three types of oil burners are presented, the direct-driven, rotary cup type, the air-driven cup type, and the mechanical type. Complete pictorial and printed information on each is given.

The points which the company stresses as being provided by their products are: increased operating efficiency, increased fuel economy, increased capacity, quick steaming ability, increased flexibility of operation, increased life of boiler and brickwork, fuel conservation, space saving, and elimination of coal handling, ash removal, and smoke nuisance.

ART METAL CONSTRUCTION COMPANY, Jamestown, N. Y. "Steel and Bronze Interior Equipment"

In this particularly illuminating booklet, recently issued by the Art Metal Construction Company, the interior equipment of banks, public buildings, libraries, and hospitals is dealt with fully. Ample illustrations, both photographic and diagrammatic, are included with each type of building. In addition to equipment for these specific building classifications, consideration is given to general office equipment, doors and metal trim.

Some conception of the wide range of material contained in the 54 pages may be gained by an examination of the equipment listed for banks: counters, counter fronts and screens, check desks, wickets and grilles, sign plates, currency guards and cages, coin guards and trays, partitions, wainscoting, rails and gates, doors, cage partitions, coupon and telephone booths, sorting racks, coin trucks, book trucks, omnibuses, entrance, vestibule, and elevator doors, and all types of trim.

There are specifications covering all types of equipment; and the detail drawings are full. The isometric drawings of library stacks are especially well done. Accompanying the material on library equipment is a table of general data on book stacks that is applicable, not only to Art Metal equipment, but to other kinds as well.

Several pages are devoted to styles of doors and their construction, and seven pages are given over to mouldings. Other pages are devoted to elevator enclosures, dumb waiter enclosures, unit partitions, and decorative metal work.

KERNER INCINERATOR CO., 3707 N. Richards St., Milwaukee, Wis. "Bennett Bonded Fireplace"

Several pamphlets have been issued on the Bennett Bonded Fireplace, the last of which is a small brochure stressing the point that with their patented type of fireplace, the "heat formerly wasted up the chimney is used to warm the home." Contrary to the usual practice, where the air heated by the fire on the hearth is drawn from the room in which the fireplace is located, the Bennett fireplace draws its air from the outside through an intake that is usually located behind the back wall. It is heated by the flames and shot out into the room through grilles that may be located above the opening or at the sides.

The advantages to be obtained from this departure in fireplace design are reported to be that the fireplace delivers from four to six times the amount of heat sent out from an ordinary fireplace. Fresh air and not stale air is heated and circulated by this system. In addition to these particular advantages, Bennett fireplaces have all those which are common to all types.

The firm of Denison B. Hull and Stanley W. Hahn, associated architects, 77 West Washington Street, Chicago, has dissolved. Mr. Hahn's address is 6 North Michigan Avenue, Chicago. Mr. Hull will continue at the present address.

Miller & Yeager, architects, 819 Ohio Street, Terre Haute, Ind., will be glad to receive catalogues and other manufacturers' publications. Their old files were completely destroyed by fire.

REVIEWS OF MANUFACTURERS' PUBLICATIONS

SPEAKMAN COMPANY, Wilmington, Delaware. "Speakman Heads and Showers" and "Speakman Showers and Fixtures"

The first of these two booklets on Speakman equipment is perhaps the most valuable to an architect, because, in addition to containing all the necessary information on the equipment itself, it contains much informative material on the layout of shower rooms for clubs and institutions. There is a wide variety of shower head types, sufficient to meet the requirements of any type of installation. Exposed showers and built-in showers, with mix valves and without mix valves are shown.

In a thorough discussion of piping layout data, the pamphlet points out the five essentials for efficient operation of showers, listing them as follows: sufficient pressure, adequate piping sizes, straightest possible runs to the showers, adequate piping supply to the hot water tank, and from tank to showers, and last, ample supply of hot water. Insurance of all these elements is obtained by following the instructions which follow the listing of essentials.

One particularly interesting point is brought out in the discussion of straight runs. "Where elbows and tees must be used in the lines to showers," says the pamphlet, "it is very desirable to ream the ends of the pipes. Tests have shown that, even with reamed pipes, elbows have as much friction as a straight pipe whose length is forty times the diameter of the elbow. For example, a 1-inch elbow causes as much pressure loss by friction as 40 inches of straight pipe. If the ends of the pipes in elbows are not reamed, the friction is five times as great as with reamed pipes. Thus, a 1-inch elbow would be equivalent to 200 inches of straight pipe."

The catalogue on showers and fixtures includes, besides photographs and descriptions of shower fixtures, similar data on lavatories and dressing tables.

ROLSCREEN COMPANY, Pella, Iowa. "Rolscreen Topics"

The monthly issues of *Rolscreen Topics* contain many interesting articles describing the installation of Rolscreens in buildings all over the country. The current issue is no exception. City and suburban apartment houses receive the major share of attention. The buildings illustrated include No. 1430 Lake Shore Drive, Chicago, Robert S. DeGolyer, architect; the Admiral Apartments in Indianapolis, T. A. Moynihan Co., architects; Hillcrest Arms, Toledo, Alfred A. Hahn, architect; Chateau Crillon, Philadelphia, Horace Trumbauer, architect; and the Belvedere Apartments in Cincinnati, C. H. Ferber, architect.

One of the interesting features of this issue is a comparison of initial and upkeep costs of Rolscreens and flat wooden screens, which tends to prove that for an installation of 500 screens, there is a saving of $2,232.40 over a ten year period. Architectural offices may receive this pamphlet monthly by addressing the Rolscreen Company.

CURTIS COMPANIES, INC., Clinton, Iowa. "Silentite Pre-Fit Window and Frame"

An interesting development in the construction of windows and frames will be found in the three pamphlets just issued by the Curtis Woodwork organization on the new *Silentite* pre-fabricated unit. Discussed in detail in the "New Products and Practice" section of this issue of THE ARCHITECTURAL FORUM, the unit is a vast improvement over the wood double hung window and frame that has been standard for many years.

The improvements in construction resulting from the fact that the unit is shipped complete ready to be installed are accompanied by an improvement in appearance. Because of the fact that weights, cords, and pulleys have been eliminated by the use of a spring balance, it has been possible to reduce the width of the trim and mullions. This feature is one which should interest architects particularly.

The unit includes weatherstripping, which in itself, is an improvement. The weatherstripping, which sets up a metal to metal contact that insures permanent weather-tightness, is a patented feature. From installations made by contractors in field experiments, it has been estimated that as much as 50 per cent of the installation cost can be eliminated.

THE CHENEY COMPANY, Winchester, Mass. "Cheney Interlocking Wall Flashing"

Calling attention to the serious problem of seepage and leaks through exterior masonry walls, with the resultant efflorescence, streaks, stains, and discoloration, the Cheney Company offers its copper interlocking wall flashing as a satisfactory solution to the problem. The pamphlet states that "Cheney interlocking wall flashing runs entirely through the masonry wall and forms a positive key bond in every direction with the mortar bed."

One important claim that the company makes is that their product ". . . does not break the bond. It is so designed that when properly laid, it forms a positive unbreakable key-bond owing to the fact that the flashing is keyed both horizontally and vertically on both sides. The ends of the strips hook together to form a continuous unbroken course of watertight flashing. The design of the flashing also takes care of expansion and contraction due to temperature changes."

There are four different types of Cheney flashing, one the straight flashing in all widths, and two, made with one-half inch turndown on both sides to prevent capillary attraction. The third type is one with a four inch turn down on one side for a counterflashing face, and the fourth is similar to the third except that it has a one-half inch turndown on the other side.

Information contained in this pamphlet is admirably presented. Several photographs are shown of the results of not having flashing, efflorescence, defacement of interior walls, etc. In addition, there are series of photographs of different important installations, the Empire State Building, the Cornell Medical Center, the Folger Memorial Theatre, and others. Complete specifications and drawings are also given. The company also maintains an engineering service which is at the disposal of architects, engineers, and builders.

In another pamphlet the Cheney Royal Pipe Covering Protector, which is a heavy gauge aluminum cap for the ends of pipe covering, is fully described. This, the pamphlet says, fills the need for covering protection and adds to the appearance of the building. The adjustable feature insures a tight fitting locked cap. By using the protectors, ragged, dirty, broken ends on pipe coverings are entirely eliminated.

DIEBOLD SAFE AND LOCK CO., Canton, Ohio. "Style "T" Door"

The Style "T" Door recently added to the Diebold Triumph Line of fire-resistive vault doors is built with a wide opening to permit the passage of buses and transportable record trays. It is recommended wherever double outside and inside doors are required for record rooms. The double outside doors swing in the minimum of space. The inside doors are useful for daytime operation.

A flush entrance from the office into the vault is claimed as an attractive feature where record buses are used. The Style "T" Door is adaptable for installation in vaults where the wall openings are already built, or in new vaults. The manufacturer calls attention to the anti-warp channel reinforcing of the front frame, the interlocking channel on the hinge side of the doors, the deep box tongue of the jambs and the deep striker on the left hand door — features that are claimed to increase the fire-resistance of Triumph doors many times.

CENTURY ELECTRIC CO., 1806 Pine St., St. Louis, Mo. "Century Fans," Bulletin No. 42

Stationary, oscillating, ceiling and ventilating fans, which operate on alternating or direct current, are treated in this new booklet of the Century Electric Company. Both the 36-inch and the 60-inch ceiling fans are recommended by the company for their quiet operation, as well as for many other individual features described in the pamphlet. The 12- and 16-inch ventilating fans are said to "move an unusually large volume of air because the blades are especially wide, deeply pitched, and have a sharp curve near the center of the blade which prevents 'dead' spots in the air column." This type of fan is also reported to operate quietly.

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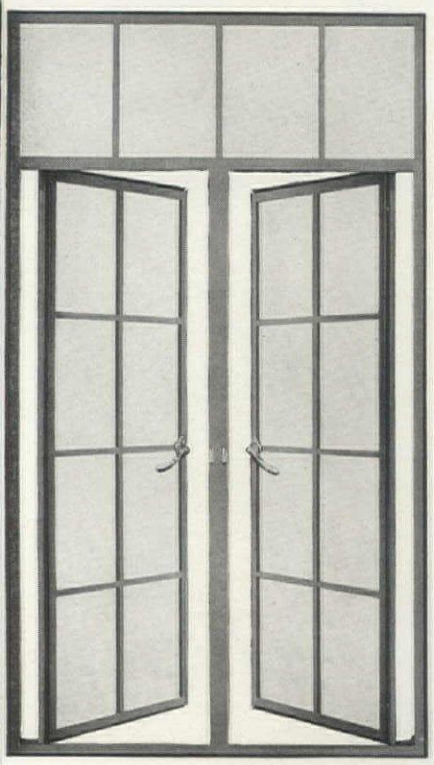

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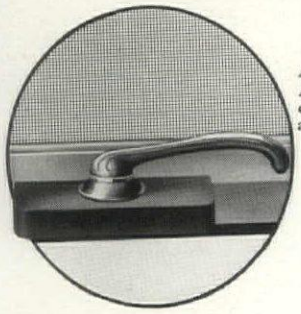

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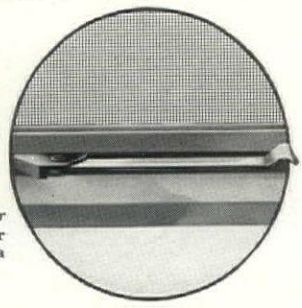

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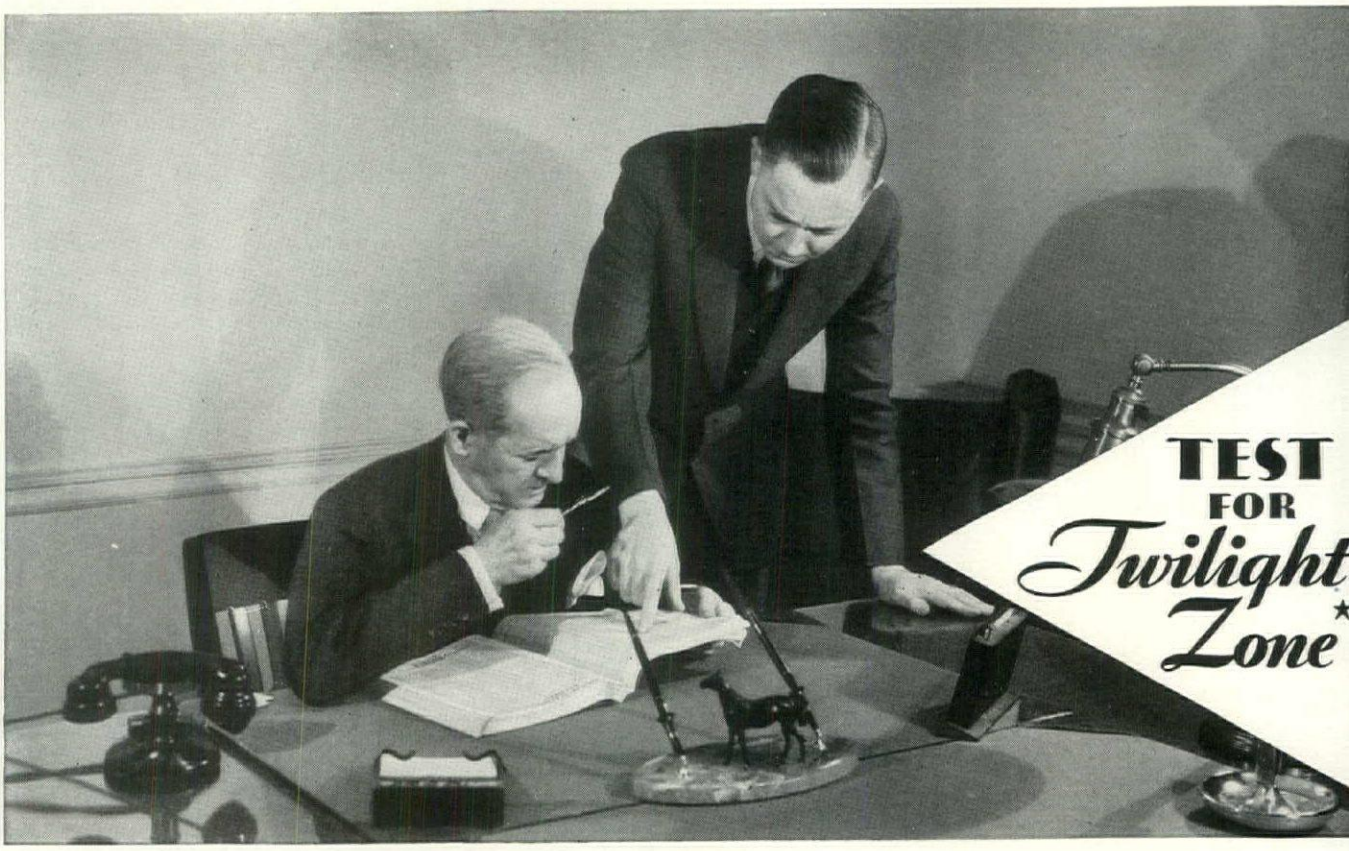
A GRAVE RESPONSIBILITY RESTS UPON THE ARCHITECT



MORE than one grave responsibility rests upon the shoulders of the architect for a building. But proper illumination is one of the most important. Here are two very important reasons why this is so.

First, the health of office workers is affected. Eyestrain, a common result of ordinary office lighting, causes headaches, sleeplessness, and functional disorders—not only of the eye, but of the entire human system.

Second, no group of workers is more than 70% to 80% efficient under ordinary lighting conditions. For example, a series of tests conducted in the offices of seven large firms who thought their lighting was "good" proved conclusively that the transcription of shorthand notes averaged 20.1% faster under scientific illumination. Even typewriting from printed copy shot up 11.2%.

The simplest thing to do

Lighting is a highly technical subject. You have a hundred other problems of your own to solve. The surest and simplest way to be certain the specifications for lighting in your plans are right is to consult with illuminating engineers of your local light and power company or of the Westinghouse organization. There will be no fee or obligation.

Don't let your clients suddenly discover, after your job is done, that their lighting facilities are not the best. You get the blame, whether justly or not.

Write the Commercial Engineering Department of the Westinghouse Lamp Company, Bureau 21, 150 Broadway, New York City, for new bulletins on correct illumination.

★ **TWILIGHT ZONE**

The deceptive half-light between obvious darkness and scientifically correct illumination. A simple phone book test at a worker's bench quickly shows whether it is present or not. If the type is hard to read, and the book must be drawn close to the face to make it out, Twilight Zone is present. Try this test yourself.

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Kokomo Cathedral and Opalescent Glass are especially adaptable, owing to their exceptional color range, running the gamut from the faintest tints to rich, strong colors. The quality is comparable in every way with that of imported glass.

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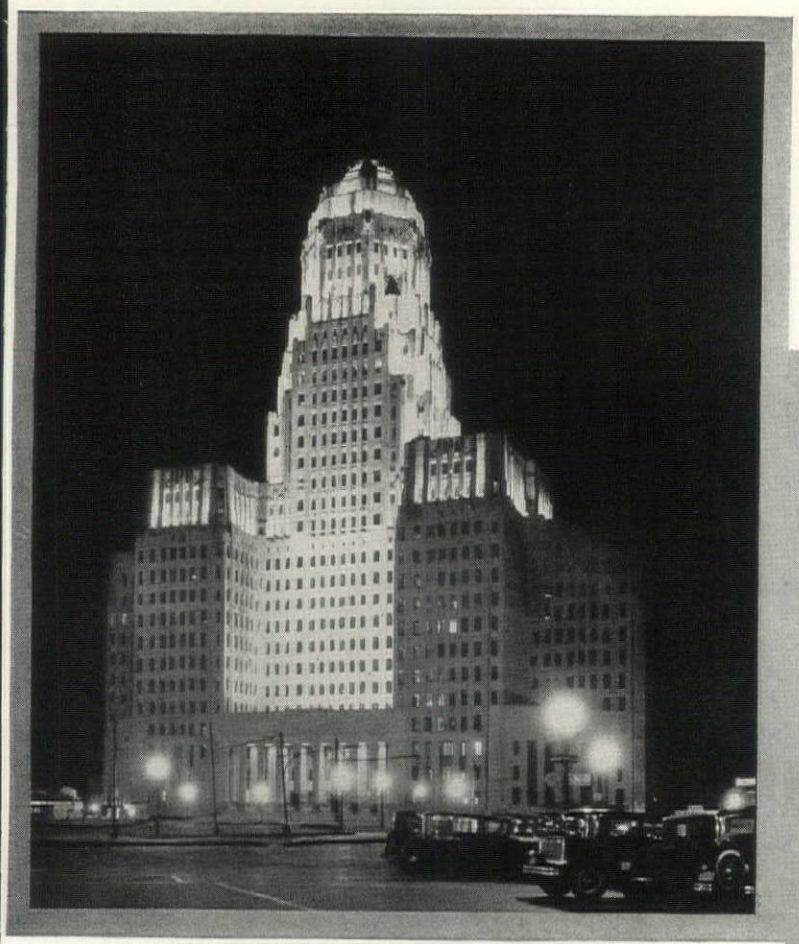

Buffalo City Hall. Architects, Dietel and Wade, Buffalo; Sullivan W. Jones, New York. Electrical and Illuminating Engineer, Bassett Jones of Meyer, Strong & Jones, Inc., New York. Electrical Contractor, The Robertson Electric Construction Company. Floodlighted with General Electric Novalux Projectors. Compare the photograph (left) with the drawing (below) on which the floodlighting was based

The G-E Illuminating Engineering Laboratory offered this interpretation of the engineer's recommendations for floodlighting when the city hall was being designed

The architectural value of FLOODLIGHTING *depends on scientific planning*

WHEN General Electric was invited to coöperate with the architects and engineers of Buffalo's new city hall in designing the floodlighting of that noble building, the G-E Illuminating Engineering Laboratory prepared the drawing here reproduced from the lighting designs, before the contract for the floodlighting was let.

As the building took physical shape, G-E projectors were located in conformity with the floodlighting design prepared by Meyer, Strong & Jones, Inc. A wrongly directed beam or incorrect intensity might easily produce a false effect, but the results practically duplicated those in the drawing—from brightest intensity to subtlest shadow.

Sullivan W. Jones, associated with Dietel and Wade, architects, says: "The similarity between the actuality and the prophesy predicted in the rendering is quite amazing." Bassett Jones, of Meyer, Strong, & Jones, consulting engineers, says: "It is the first time in my experience that the exterior illumination of a building has turned out exactly as it was planned."

General Electric lighting specialists will be glad to put their accumulated experience at your service—no matter what the size or style of the structure that you intend to floodlight. The nearest G-E office will send you, on request, a complete analysis of the Buffalo installation and will be glad to make technical recommendations after a study of your plans.

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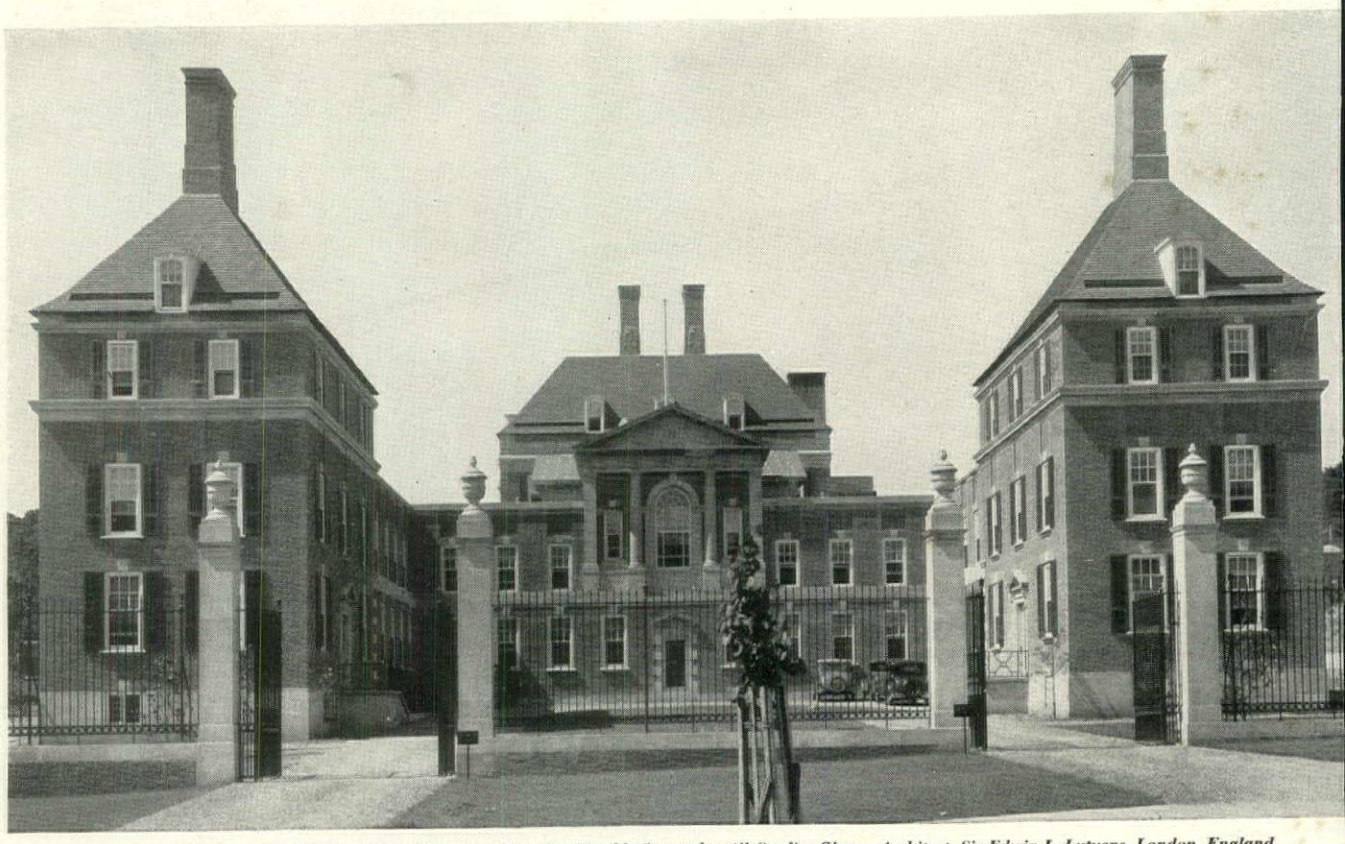

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may more exactly

fill the needs of the architect

The following comes from a letter by A. Moorman & Company, of Minneapolis, bank builders, in commenting on a car installed by Otis in Spokane, Washington: "This is the most beautiful elevator car that we have seen. The workmanship is excellent and the finish, castings, and all the equipment are as nearly perfect as any one could hope to obtain."

. . .

It is the unanimous belief of every one within the organization of Otis Elevator Company that highest quality of materials and workmanship give, in the long run, greatest value. This applies not only to such elevator mechanism as motors and controllers and brakes, but to such things as elevator entrances, fixtures, and cars —visible portions of the elevator which can either add to or detract from the appearance of the building. Thus it is that Otis has a special department of architectural designers, artists, and craftsmen for the purpose of adapting modern architectural practice and the ideas of the building architect to the visible details of an elevator. Within this department many interesting elevator cars and accessories of excellent modern design have been created. Here also craftsmen faithfully produce any special design conceived by the architect.

OTIS

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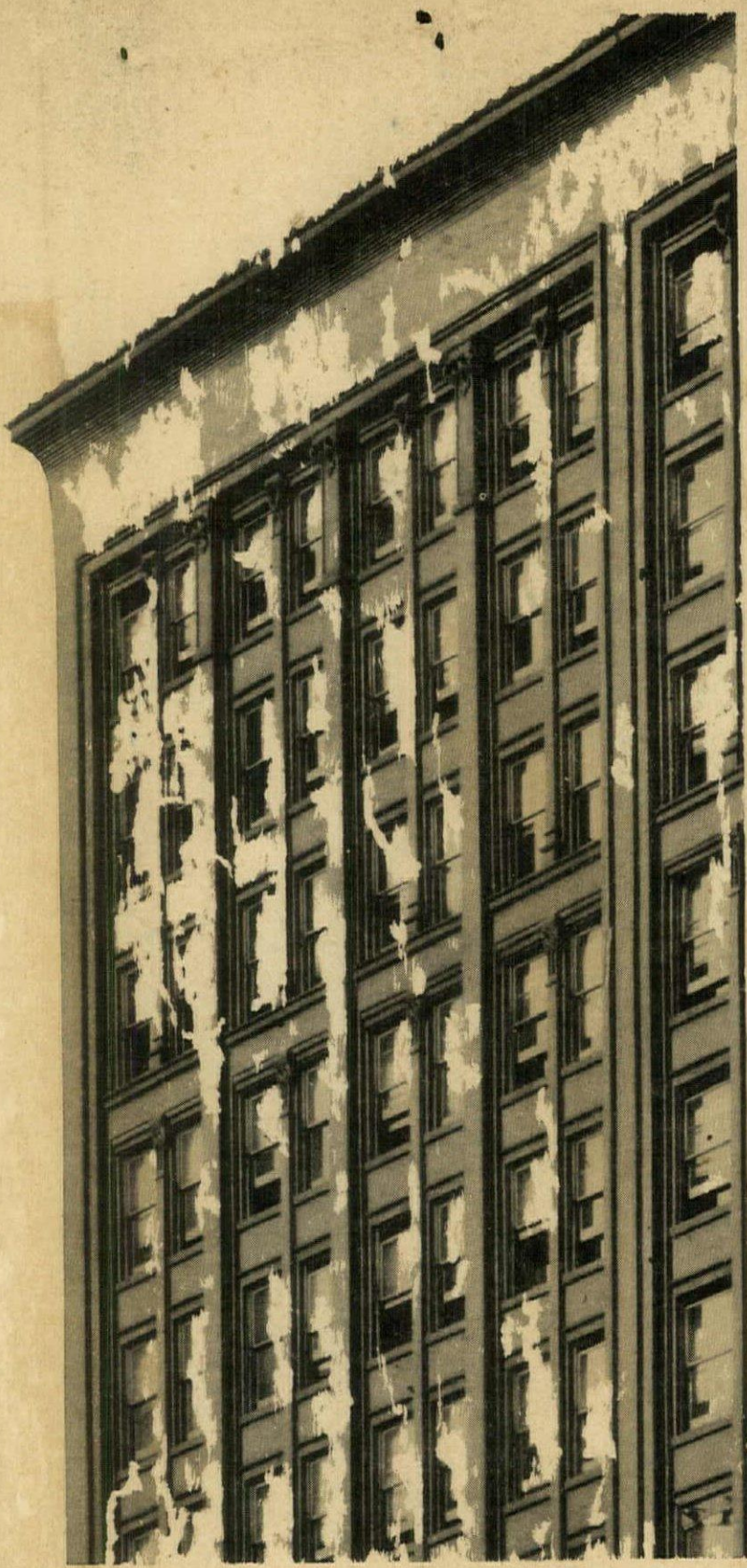
Elevators in the Rockefeller Building of Cleveland, Ohio, to be *modernized* —by Westinghouse

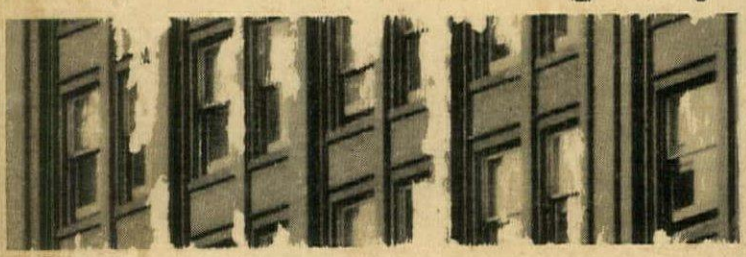
The installation of modern elevator equipment, together with complete new elevator enclosures of marble at the main floor and hollow metal on all the floors above, will enable the Rockefeller Building, constructed in nineteen hundred and four, to maintain its place and reputation for outstanding service.

Westinghouse *offers complete co-operation in rehabilitation plans for elevators in older buildings—everywhere.*

Rockefeller Building
Cleveland, Ohio

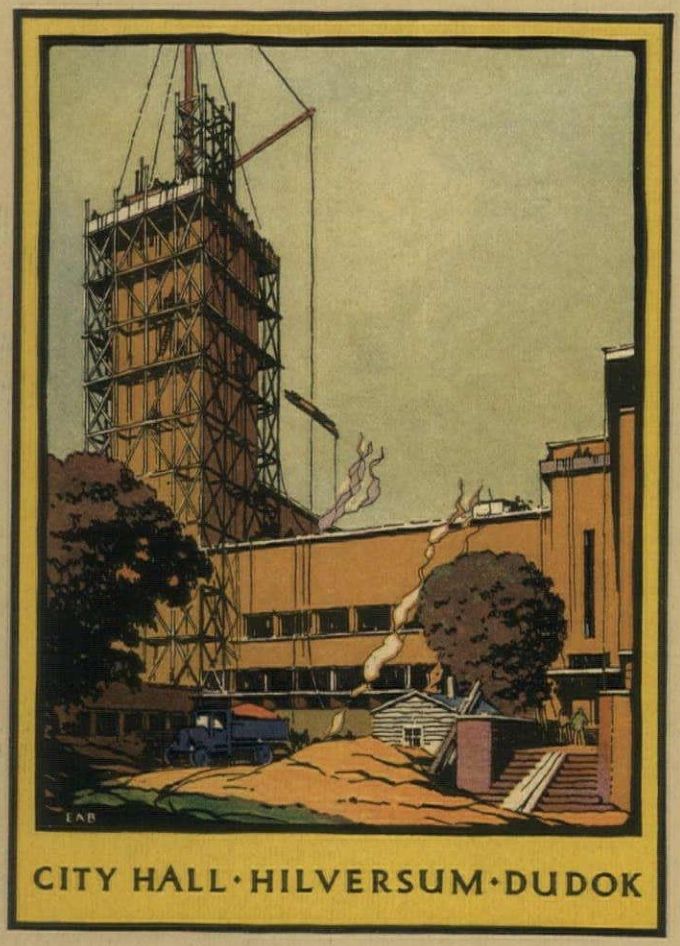


Westinghouse Electric Elevator Company



W
WESTINGHOUSE ELECTRIC
ELEVATORS

THE ARCHITECTURAL FORUM



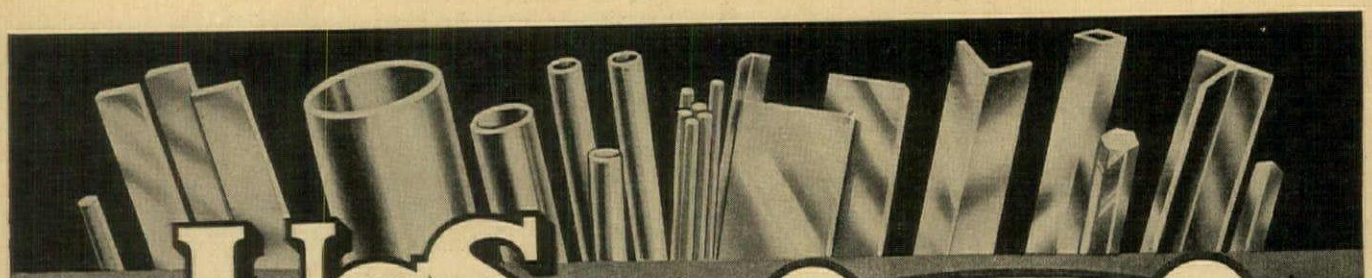
CITY HALL · HILVERSUM · DUDOK

IN TWO PARTS

APRIL 1932

PART TWO

ENGINEERING & BUSINESS



USS STAINLESS AND HEAT-RESISTING ALLOY STEELS

MODERN STEELS
For Modern Uses

SCIENTIFIC research and modern metallurgy have brought about a new order of things by placing at the disposal of architects, engineers, technologists and manufacturers, a series of alloy steels which may very properly be described as both *stainless* and *rustless.*

The industries and the arts are daily taking advantage of these metals for hundreds of useful applications. Each grade of USS Stainless and Heat Resisting Alloy Steels possesses singular virtues for particular uses. Collectively these alloys furnish an able answer to the question—*what metal is adaptable?*

These products are recommended according as one or another of these alloys is best suited to the specific requirements involved. Correspondence is invited by the five subsidiary companies of the United States Steel Corporation named below—each with respect to the particular forms of steel that it produces. Send for literature.

Typical Uses:

¶ **AUTOMOTIVE and AERONAUTIC**—For radiator shells, hub caps, lamps, bumpers, moldings, polished parts and fittings, hardware and trim, airplane parts and instruments.

¶ **MANUFACTURING and INDUSTRIAL**—Machinery and furnace parts, dampers, fans, preheaters, pumps, conveyors, turbine blades, nozzles, plungers, and machinery specialties.

¶ **CHEMICAL**—Vats, tanks, stills, digesters, condensers, retorts, paper and pulp manufacturing equipment, circulation systems, and laboratory apparatus.

¶ **OIL REFINING**—Bubble caps still tubes, linings, heat exchangers, ducts, containers, tanks, agitators, and other refining equipment.

¶ **FOOD HANDLING**—Pasteurizers, tables, hospital and hotel kitchen equipment, restaurant fixtures, cafeteria trays, food preserving and dairy machinery and accessories, ice cream and milk containers and utensils.

¶ **ARCHITECTURAL**—Structural members and supports, hinges and hardware, decorative metal embellishments, flat surface facings, moldings, doors, grilles, panels, and ornamental work.

¶ **HOME APPLIANCES**—Kitchen equipment, cooking and canning utensils, furniture, cabinets, electrical appliances, sinks, plumbing fittings, stoves, ranges, and tableware.

¶ **MISCELLANEOUS**—Packing house equipment, soda fountain counters and fixtures, display cases, humidors, handles, hooks, trays, golf clubs, skates, switch boards, metallic mirrors, laundry machinery, tank cars, railway car parts and fittings, and many other uses where beauty and resistance to corrosion are important factors.

Chromium-Nickel Steels *Austenitic*	Chromium-Alloy Steels *Ferritic*
USS 18-8	USS 12
USS 18-12	USS 17
USS 25-12	USS 27

USS Chromium-Nickel Alloy Steels are produced under licenses of the Chemical Foundation, Inc., New York; and Fried. Krupp A. G. of Germany.

AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh
Sheets and Light Plates

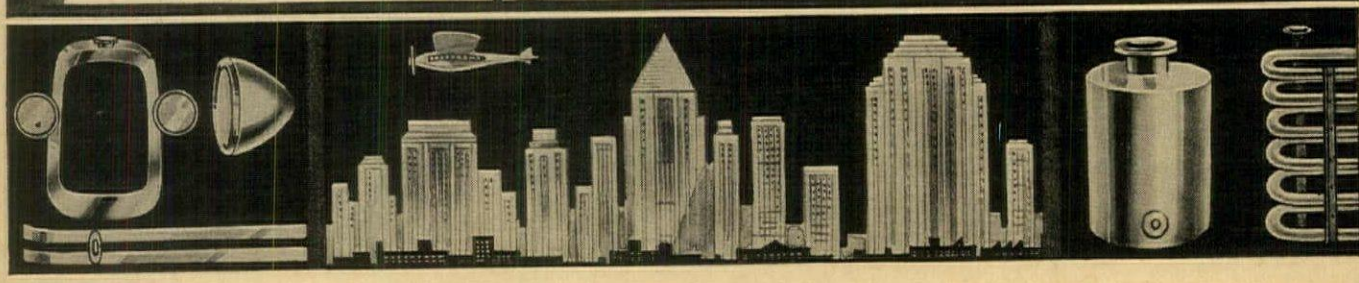
AMERICAN STEEL & WIRE COMPANY, Chicago
Cold Rolled Strip Steel, Wire and Wire Products

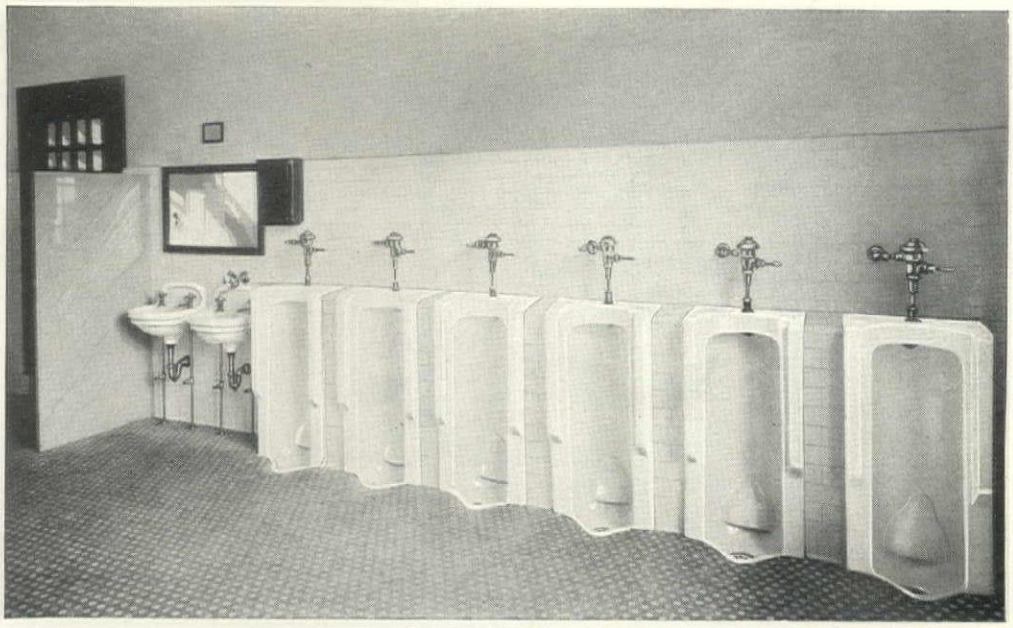
CARNEGIE STEEL COMPANY, Pittsburgh
Bars, Plates, Shapes, Special and Semi-Finished Products

ILLINOIS STEEL COMPANY, Chicago
Bars, Plates, Shapes, Special and Semi-Finished Products

NATIONAL TUBE COMPANY, Pittsburgh
Pipe and Tubular Products

Pacific Coast Distributors: COLUMBIA STEEL COMPANY • Russ Building, San Francisco
Export Distributors: U. S. STEEL PRODUCTS COMPANY • 30 Church Street, New York City





With higher standards of education has come a wider appreciation of sanitary plumbing

· · and a constantly increasing demand for Te-Pe-Co vitreous china plumbing fixtures. For kindergarten or college, quality, design and durability make a Te-Pe-Co installation the *ideal installation.*

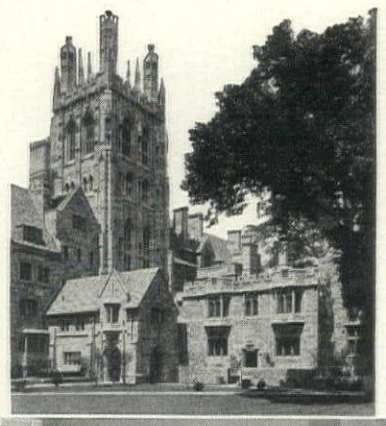
To cite one example: the improved design of the "Victory" Urinal Stall shown above has enabled us to reduce its weight to nearly one-half that of a former pattern which permits installation on lighter floors — saving handling, installation charges and construction costs.

Let us assist you in the selection of fixtures best fitted to meet the individual requirements of any educational institutions with which you may be working. Architects and School Executives may find many worthwhile ideas relative to school sanitation by submitting to our Engineers their specific problems.

THE TRENTON POTTERIES CO.
Trenton, New Jersey, U. S. A.

Showrooms:
New York City, 101 Park Ave., Entrance on 41st St.
Philadelphia, Architects' Bldg., 17th & Sansom Sts.
Branch Offices: Boston, Chicago
Export Office: 115 Broad Street, New York City

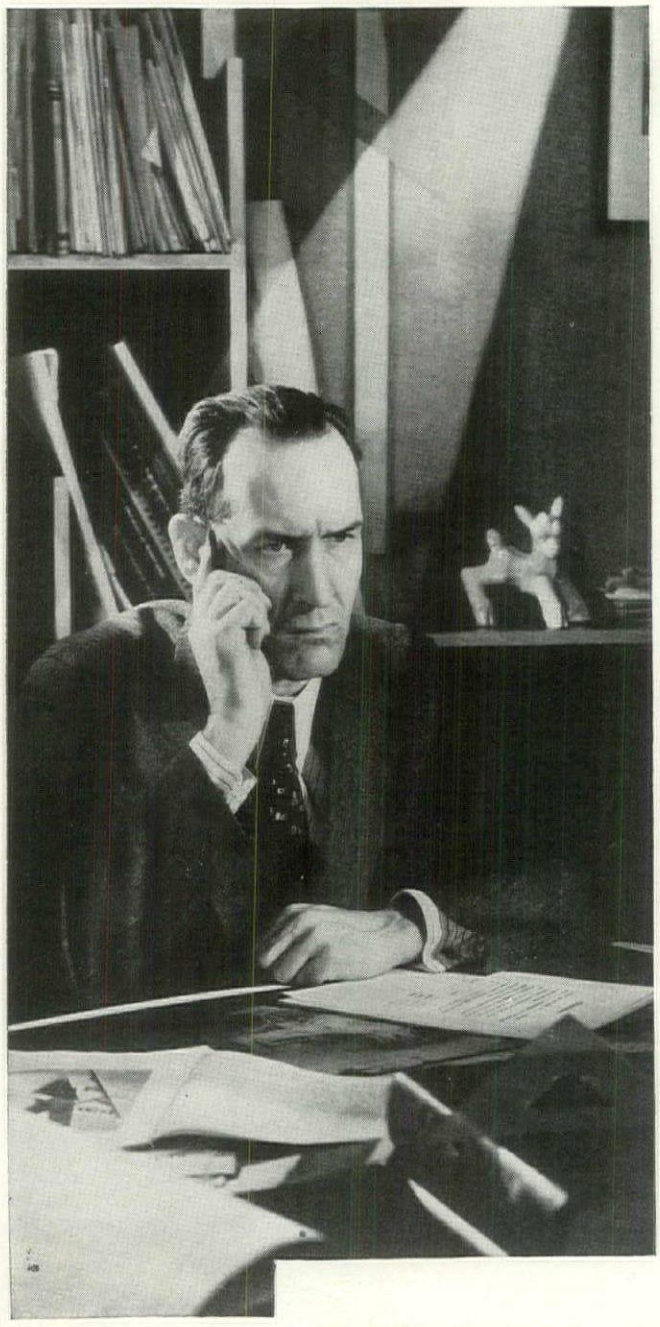
OUR GUARANTEE . . . *We make but one grade of ware—the best that can be produced — and sell it at reasonable prices. We sell no seconds or culls. Our ware is guaranteed to be equal in quality and durability to any sanitary ware made in the world. The Te-Pe-Co trade mark is found on all goods manufactured by us and is your guarantee that you have received that for which you have paid.*



TE-PE-CO

All Clay Plumbing Fixtures

What Other Kind of Pipe Offers YOU These Proved Advantages?



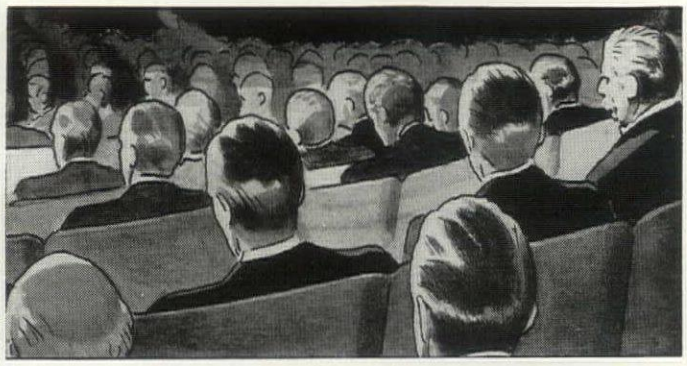
Architects who have made a study of pipe under actual service conditions, know that pipe may fail for *a variety of reasons*. Reading Puddled Iron Pipe owes its longer life to the fact that it resists *practically every* natural destructive agent . . . not just one or two.

The millions of siliceous filaments in every square inch of genuine Puddled Iron act as an effective barrier to the penetration of rust or corrosion. Puddled Iron has a *fibrous* structure — unique among metals — which protects it from the effects of vibration and shock. Puddled Iron is famous for its ability to take sharp, clean threads, insuring tight joints that *stay* tight. And Puddled Iron contains no alloys, no dissimilar metals, to hasten electrolysis.

The superior endurance of Reading Pipe has been PROVED in thousands upon thousands of installations, through nearly a century of use. Specify READING when you want to be *sure* of having the longer life of genuine Puddled Iron.

READING IRON COMPANY, Philadelphia

Science and Invention Have Never Found a Satisfactory Substitute for Genuine Puddled Iro



Row-Z sitters become row-A hearers

when you specify Western Electric Public Address System . . . . . .

Even the people in the rear seats hear perfectly when the auditorium is equipped with a Western Electric Public Address System. Amplified by this equipment, the speaker's voice reaches not only every corner of the hall but as many other rooms as desired. Sound reproduction is faithful—apparatus is made to  **Bell System standards. Auditorium installation is one of many uses for Public Address in schools, hotels, city halls. Applications are described in our folder (AIA File No. 31-i-7). You may have a copy by filling in and returning the coupon.**

Western Electric

PUBLIC ADDRESS AND MUSIC REPRODUCING SYSTEMS

Distributed by GRAYBAR *Electric Company*

GRAYBAR ELECTRIC CO., AF 4-32
Graybar Building, New York, N. Y.

Gentlemen: Please send us Architect's Specification Folder (AIA File No. 31-i-7).

NAME .....

ADDRESS .....

CITY ..... STATE .....

The EMPIRE STATE *Building*

equipped throughout with

AMERICAN SASH CHAIN

•

The "Mount Everest of Fifth Avenue," as the Empire State Building is sometimes referred to, presents an appearance of a mountain of windows . . . 6349 windows . . . every one of them suspended with dependable American Sash Chain.

•

. . . dependable because links are copper-bearing steel—uniform in size, shape and strength—of adequate strength to withstand continuous operation for the lifetime of the building itself.

•

It is safe to specify American Sash Chain. Write for particulars in handy booklet form for specification writing. Address:

AMERICAN CHAIN COMPANY, *Inc.*
BRIDGEPORT, CONNECTICUT
District Sales Offices:
Boston · Chicago · New York · Philadelphia
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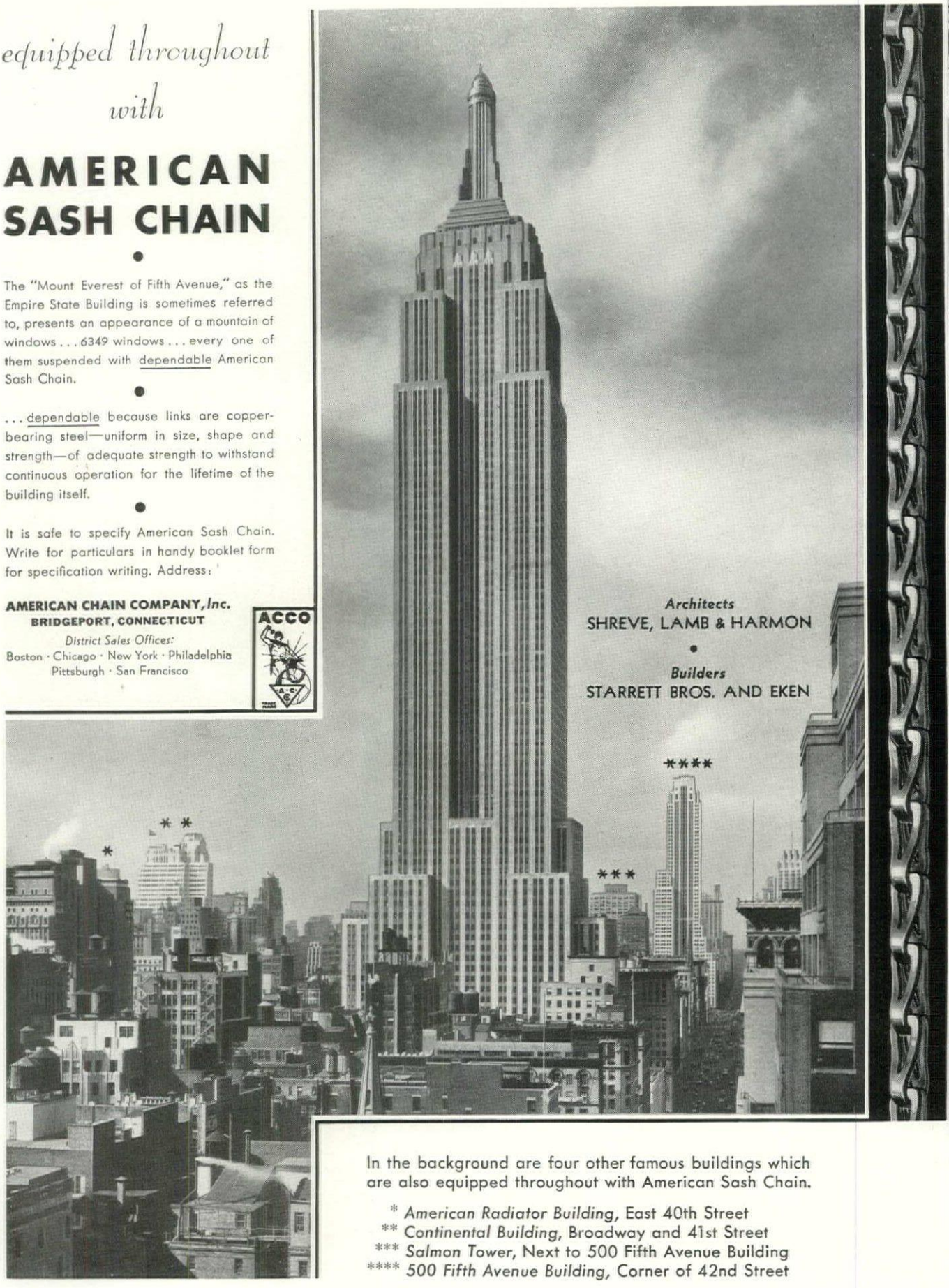
ACCO



Architects
SHREVE, LAMB & HARMON

•

Builders
STARRETT BROS. AND EKEN

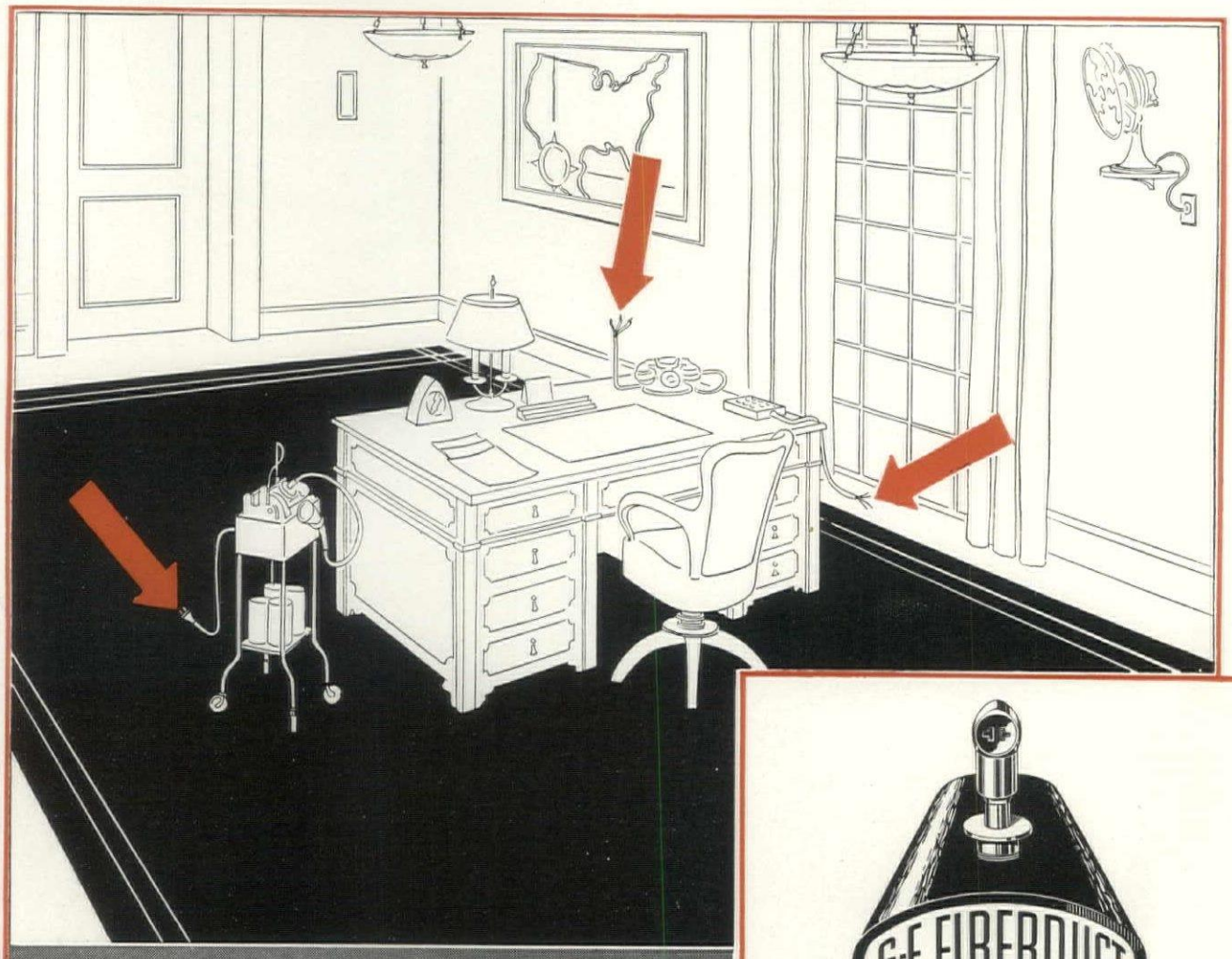
In the background are four other famous buildings which are also equipped throughout with American Sash Chain.

* *American Radiator Building,* East 40th Street
** *Continental Building,* Broadway and 41st Street
*** *Salmon Tower,* Next to 500 Fifth Avenue Building
**** *500 Fifth Avenue Building,* Corner of 42nd Street

THINK OF UNDERFLOOR DUCT

AS YOU WOULD OF WIRING FOR GENERAL ILLUMINATION

In modern commercial buildings, **ceiling** and **wall** outlets are given careful consideration. **Floor** outlets should receive the same attention. Every need for floor outlets is fully taken care of by G-E Fiberduct.



HOW ARE YOU PLANNING TO SOLVE THESE WIRING PROBLEMS ?

The non-corrodible underfloor wireway that permits outlets for telephone, buzzer, light and power circuits to be installed at any point along the line of the duct at any time during the life of the building .. economically .. quickly .. neatly and safely.

For more information write to Section CF-164 Merchandise Department, General Electric Company, Bridgeport, Connecticut.

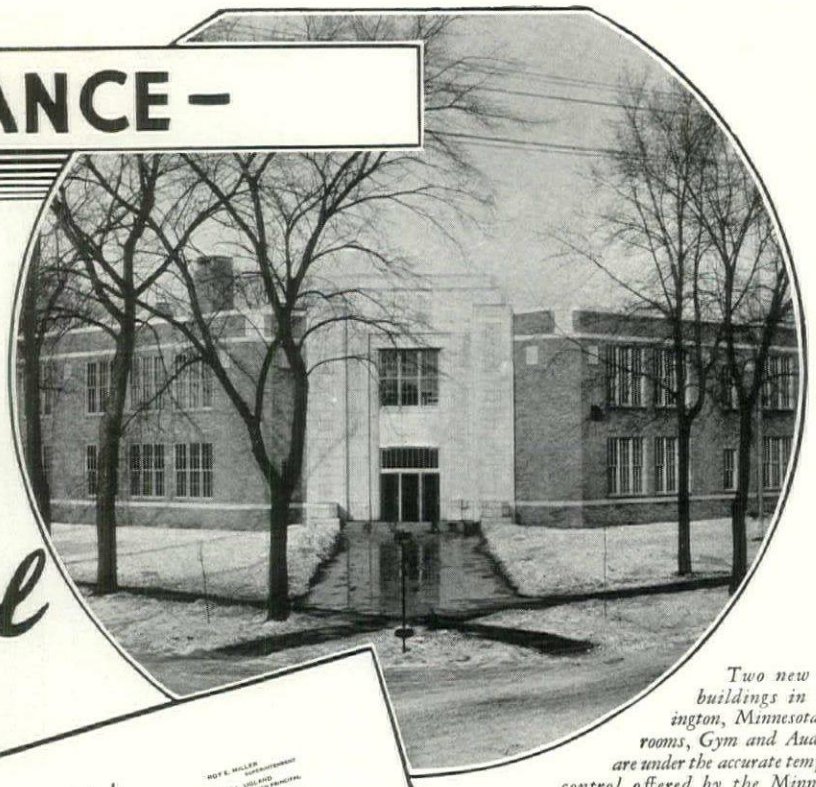
GENERAL ELECTRIC

FIBERDUCT

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

ACCEPTANCE—

the MINNEAPOLIS HONEYWELL *Modutrol System*



Two new school buildings in Worthington, Minnesota. Class rooms, Gym and Auditorium are under the accurate temperature control offered by the Minneapolis-Honeywell Modutrol System. Jacobson & Jacobson, Minneapolis, Architects; Frank Tustison Company, Minneapolis, Engineers; Fanskee & See, Worthington, Heating Contractors; C. H. Peterson & Co., General Contractors.

Worthington Public Schools
WORTHINGTON, MINNESOTA

Feb. 27, 1932

Minneapolis-Honeywell Regulator Co.,
Minneapolis, Minn.

Gentlemen:

The Modutrol System of temperature control installed in the new Grade School Building and the Gym-Auditorium is working very satisfactorily. Although the new school has been in use only two months, the Board is very much pleased with the way the system is working.

I have been in the new school several times during the past 2 months and have found that the temperature has been the same each time, and is the same in each class room. I don't believe that the temperature will vary a degree at any time, as it has been 70 degrees each time that I visited the school.

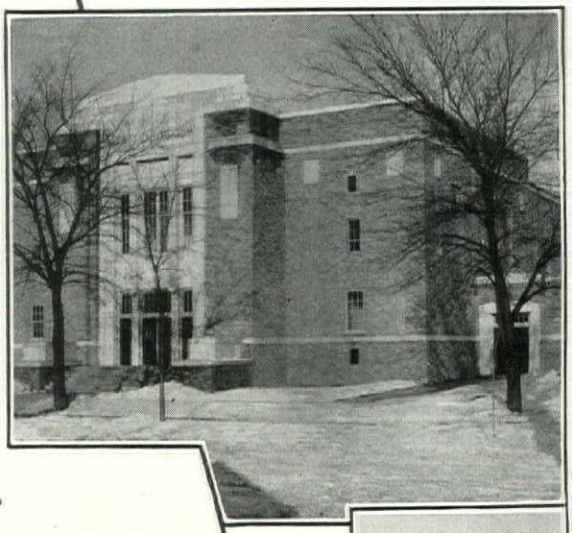
On the night of the dedication of the new Auditorium, there was a very large crowd and the temperature in the balcony varied less than 2 degrees above the normal setting.

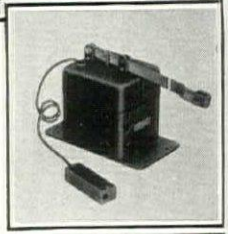
I think that the Board made a very wise decision when they decided to use the Modutrol system, thus saving the tax payers some money.

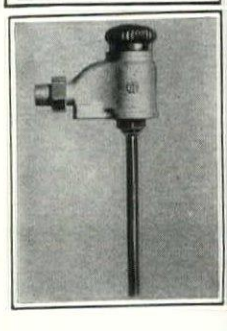
At this time I wish to thank the Minneapolis-Honeywell Regulator Co. for the prompt and courteous service that they have given the Board on this contract and I want to assure you that it has been a pleasure to the Board to do business with a concern like yours.

Yours very truly,

L. A. Hons
Secretary
Board of Education







The Modutrol System of electrical modulation provides accurate control of room temperatures in all types of buildings, large or small, old or new. In this System each control unit operates independently of all other units on the installation. The Modutrol System can be adapted to meet every type of temperature control requirement.

The Minneapolis-Honeywell Catalog is filed in **SWEET'S** Pages D4625 to D4636

MINNEAPOLIS-HONEYWELL *Modutrol Systems*

Minneapolis-Honeywell Regulator Company: Executive offices, 2740 Fourth Avenue So., Minneapolis, Minn. Factories: Minneapolis, Minn., Elkhart and Wabash, Indiana. Branch offices or distributors in all principal cities.

Only the Scovill Flush Valve is

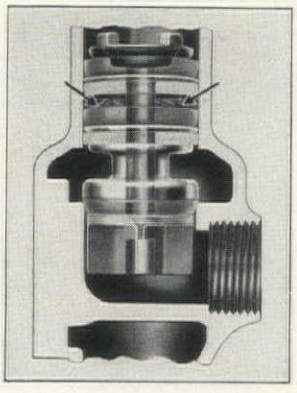
SELF-LUBRICATING

WHAT does this self-lubricating feature mean o the architect? A flush valve that is quieter, moother in operation . . . that gives many more ears of service than the ordinary type. A flush alve that the architect can specify, and be sure hat he has given his client a dependable, asting job.

The self-lubricating feature is simplicity itelf. Each valve plunger is equipped with a hamber in which a lubricant is permanently acked. This lubricant preserves the softness nd pliability of the leather washer . . . and rovides a film that keeps the washer from wearng against the metal cylinder wall.

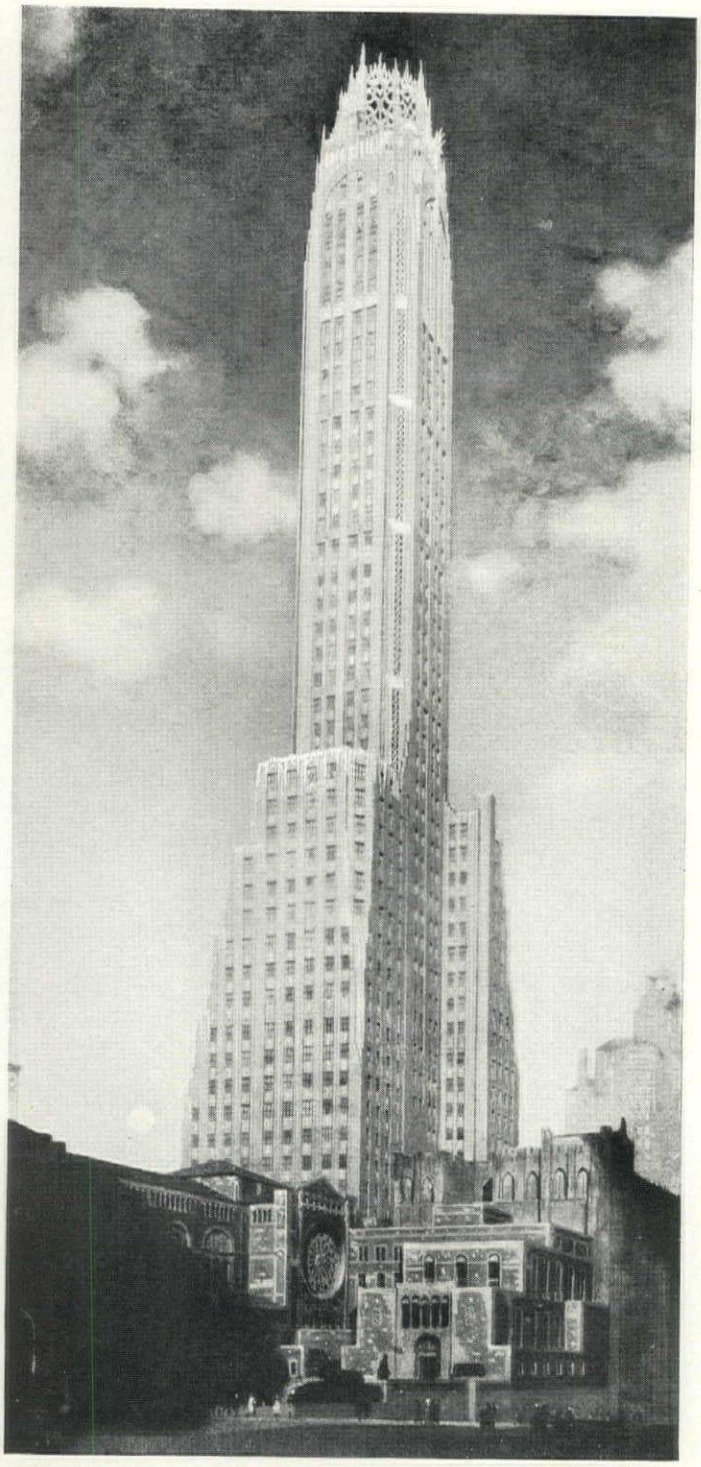
The Scovill Flush Valve has other advantages. . . A self-cleansing by-pass that automatically revents clogging. Balanced piston construcion and a long bearing plunger that eliminate ater hammer. Sure operation under low presures, given sufficient volume of water.

To the making of this valve, Scovill brings 129 ears' experience, unusual manufacturing facilies, and exacting laboratory control of materials. There is a Scovill Flush Valve in the style, nish and price you want. Send for the special ooklet presenting the entire line of valves.



he Self-lubricating Feature

he arrows indicate the life-olonging lubricant packed in e valve plunger. All features the Scovill Flush Valve are overed by design patents No. 1,600,774 and No. 1,813,709.



The R. C. A. Building, New York City, equipped throughout with Scovill Flush Valves. Architect: Cross & Cross, New York City. Plumbing Contractor: J. N. Knight, New York City.

SCOVILL MANUFACTURING COMPANY
PLUMBERS' BRASS GOODS DIVISION
WATERVILLE • CONNECTICUT

Scovill Flush Valves . . . Shower and Bath Fixtures . . . Tubular and Miscellaneous Plumbers' Brass Goods for General Plumbing Requirements.

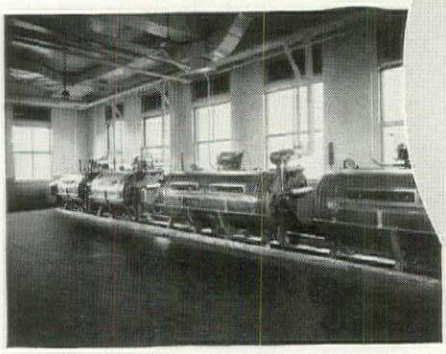
Scovill

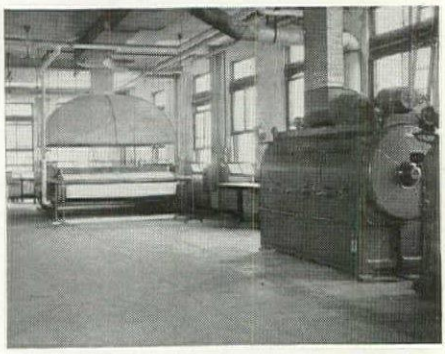
MONTEFIORE HOSPITAL

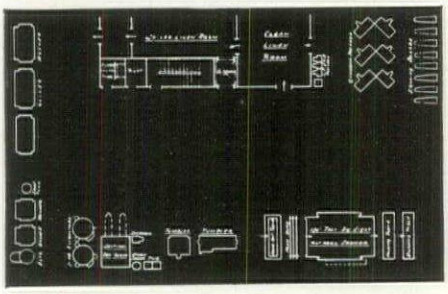
Specifies

TROY

LAUNDRY MACHINERY







Now, Montefiore Hospital, New York's famous hospital for chronic diseases, has selected Troy equipment. Its laundry is the latest word in modernization. In a well-lighted and well-ventilated department, the work flows through in straight-line production. Every step has been planned. There is no back tracking. No confusion. The machines were designed for their specific jobs — and this they do, for where formerly twenty six operators were required, nineteen now turn out half again as much work — more than 8,000 pounds daily for its fourteen hundred patients and employees.

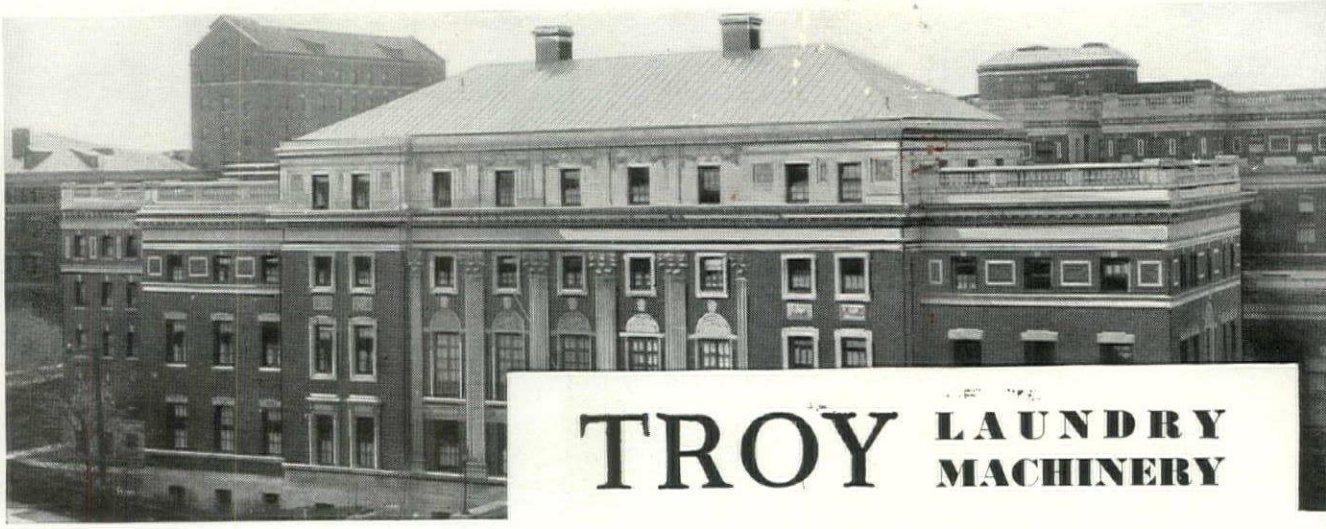
• • • •

For more than a half century Troy has served the hospital field. Its machines are installed in hospitals both large and small. In any consideration of laundry equipment, consult the TROY HOSPITAL ADVISORY SERVICE. Write any of the offices below.

TROY LAUNDRY MACHINERY CO., INC.

Chicago — New York City — San Francisco — Seattle — Boston
Los Angeles. Factories: East Moline, Ill.

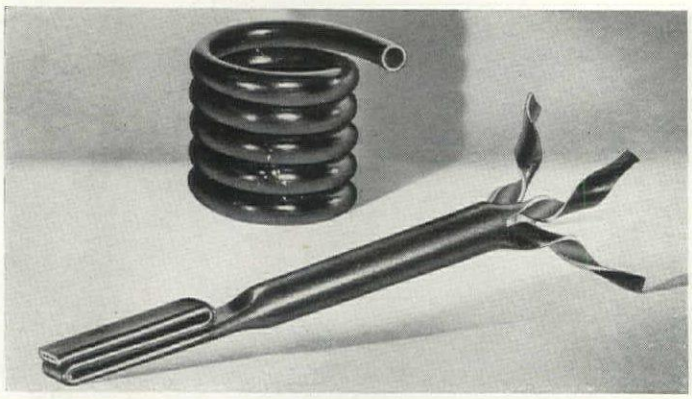
JAMES ARMSTRONG & CO., Ltd., European Agents
London — Berlin — Zurich



TROY LAUNDRY MACHINERY

STEEL PIPE—ONE OF MANY J&L STEEL PRODUCTS

J & L steel products, including practically the full range of the industry, are known and used everywhere. J & L steel piling aids in the building of foundations. J & L structural shapes go into buildings everywhere. J & L railroad spikes hold down the rails on countless miles of track. J & L tin plate forms the cans that hold all kinds of food products. J & L nails, staples, and other wire products serve a wide variety of industries. J & L cold finished steels are used in an almost endless list of machines and products. These things are of significance to the buyer of J & L steel pipe, for they testify to a breadth of knowledge, a completeness of facilities, that is an excellent indication of the ability of J & L to make just the kind of pipe that will fill the customer needs, in any quantity required.



Samples of J & L Pipe to which unusually severe tests have been applied.

RIGIDLY INSPECTED

Every length of J & L steel pipe is subjected to a hydrostatic test, to prove its strength and tightness. Routine crushing and bending tests are regularly applied; on certain sizes the cropped pipe ends are flattened, then given a sharp 90° bend. Routine tests likewise provide a check on the coiling qualities of the pipe. Lengths are wound to form spiral coils of small diameter (the one inch pipe, for example, is wound around a piece of three inch pipe). In such rigorous tests as these is found the secret of J & L Steel Pipe satisfaction. Quality is always maintained—and so the user is always satisfied.

OUTSTANDING FEATURES OF J & L STEEL PIPE

1—Uniform Quality Steel
2—Free from Excess Scale
3—Accurate Mill Threads
4—Free Cutting—Easy to Thread
5—Sound Couplings
6—Thoroughly Coated
7—Rigidly Inspected
8—Galvanized Pipe Uniformly Coated—No Clogging with Spelter

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS
JONES & LAUGHLIN BUILDING, PITTSBURGH, PENNSYLVANIA

Sales Offices: Atlanta Boston Buffalo Chicago Cincinnati Cleveland Dallas Denver Detroit Erie Los Angeles Memphis Milwaukee Minneapolis New York Philadelphia Pittsburgh St. Louis San Francisco
Warehouses: CHICAGO CINCINNATI DETROIT MEMPHIS NEW ORLEANS PITTSBURGH
Canadian Representatives: JONES & LAUGHLIN STEEL PRODUCTS COMPANY, Pittsburgh, Pa., U. S. A., and Toronto, Ont., Canada

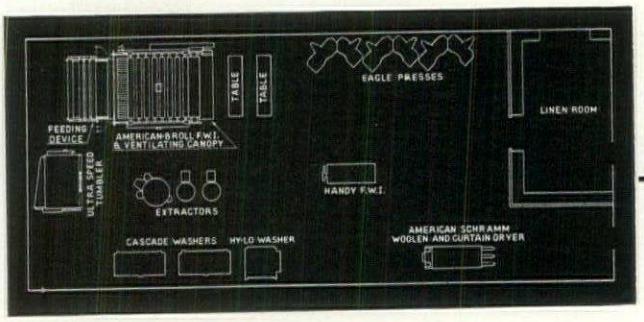
J & L JUNIOR BEA | J & L STEEL PIPE | J & L LIGHT CHANNELS | J & L NAILS and STAPLES BRIGHT and GALVANIZED | J & L CONCRETE BARS | J & L STRUCTURAL STEEL | J & L STEEL PILING

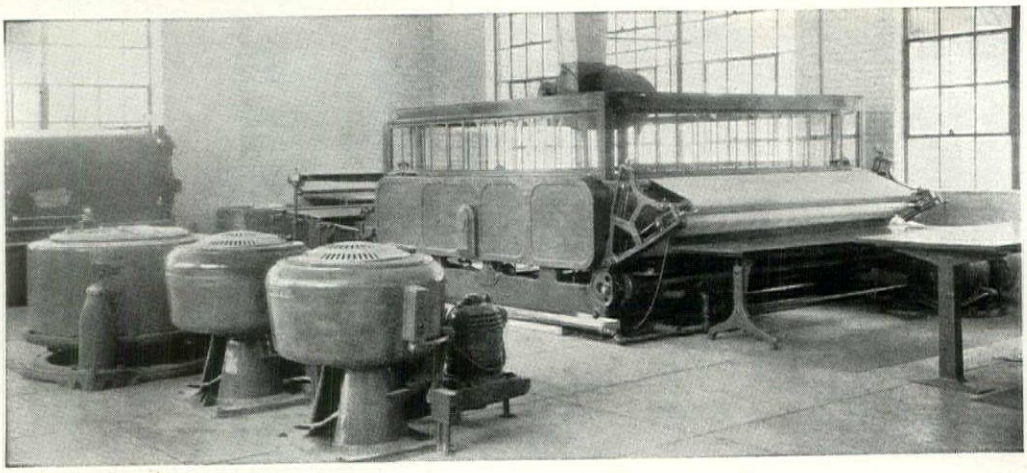
When you find the *Laundry Department* "smothered"

...Let the American Specialist lend a hand with your plans

Not long ago, Fechheimer & Ihorst, architects, were asked to design a new building for the Jewish Hospital, Cincinnati. Finding the laundry department hopelessly overloaded, these men took the logical "short cut"—asked The American Laundry Machinery Company for suggestions. The "American" Specialists helped with a complete revamping, installing machines that would do more work in less time. A 48" American O-T Extractor, for example, which, in little extra space, increased the department's extracting capacity a generous 70%. Dr. Walter E. List, Jewish Hospital Superintendent, certainly had good reason to write: "This installation has every indication of having been most excellently planned by your sales engineers."

When your specifications say "Laundry Department," you can save many hours of your time and many dollars of your client's money by conferring with an American Specialist.

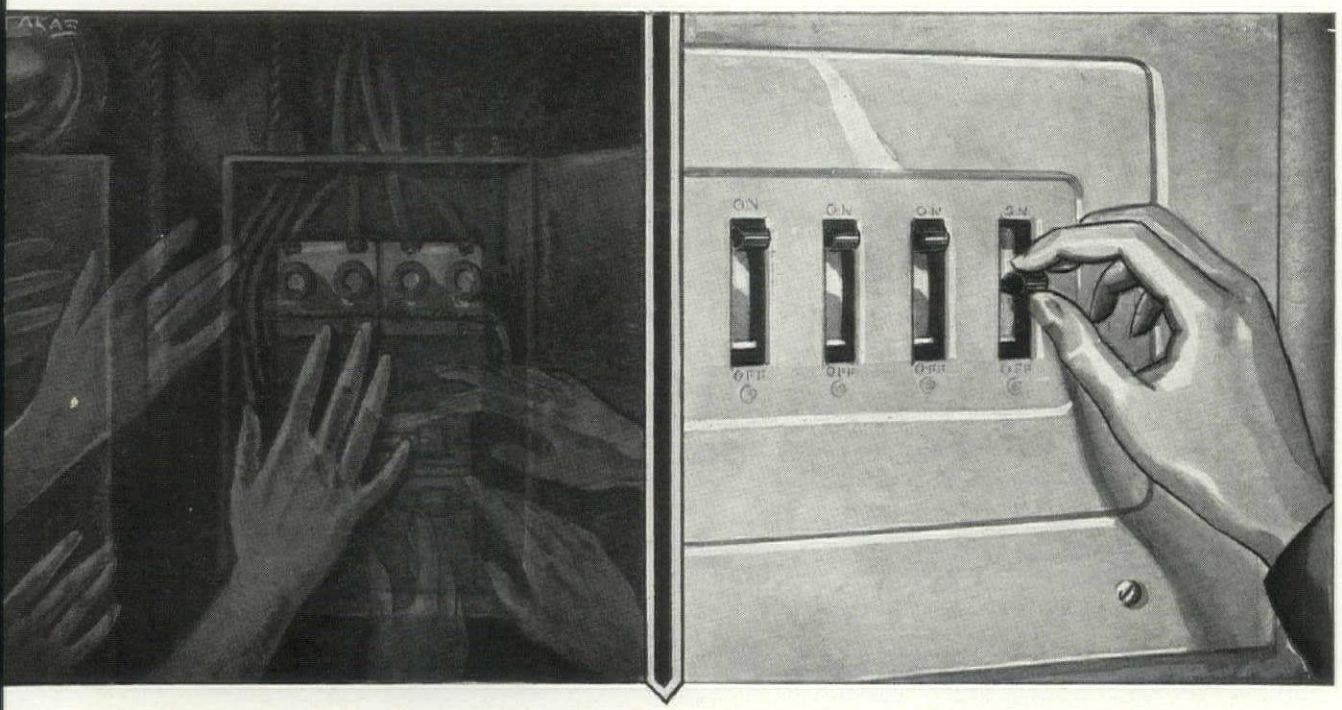




The "new" laundry department at the Jewish Hospital, Cincinnati. A complete "American" revamping eliminated overtime operation and improved the quality of the hospital's laundry work.

Fechheimer & Ihorst,
Architects,
Cincinnati, Ohio

THE AMERICAN LAUNDRY MACHINERY COMPANY
CINCINNATI, OHIO



Groping fingers NOW *find light*

WITH THE NOFUZE LOAD CENTER

NOFUZE LOAD CENTER

anishes fuses and switches from home circuit protection

* * * * *

"DE-ION" BREAKERS

which replace fuses in electrical circuits in every class of service are available in

Load Centers (*for homes*)
Panelboards
Switchboards
Motor Circuit Protection

Eliminate Fuses throughout the building

THOSE dreaded trips to the cellar to renew a blown fuse are now passe. Electrical service in any home can be restored easily and quickly from the kitchen or other convenient spot when a Westinghouse Nofuze Load Center guards the circuits.

Outstanding advantages of this *fuseless home protection* are:

SAFETY

Tinker-proof and unfailing protection for the wiring systems and electric appliances.

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Service is restored from the kitchen or other convenient spot by a mere flip of the handle.

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Short wire runs decrease wiring costs. No fuses to buy. In this day of architectural achievements in comfort and convenience, the new Nofuze Load Center fills a long-felt want in electric circuit protection.

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Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

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Name .....
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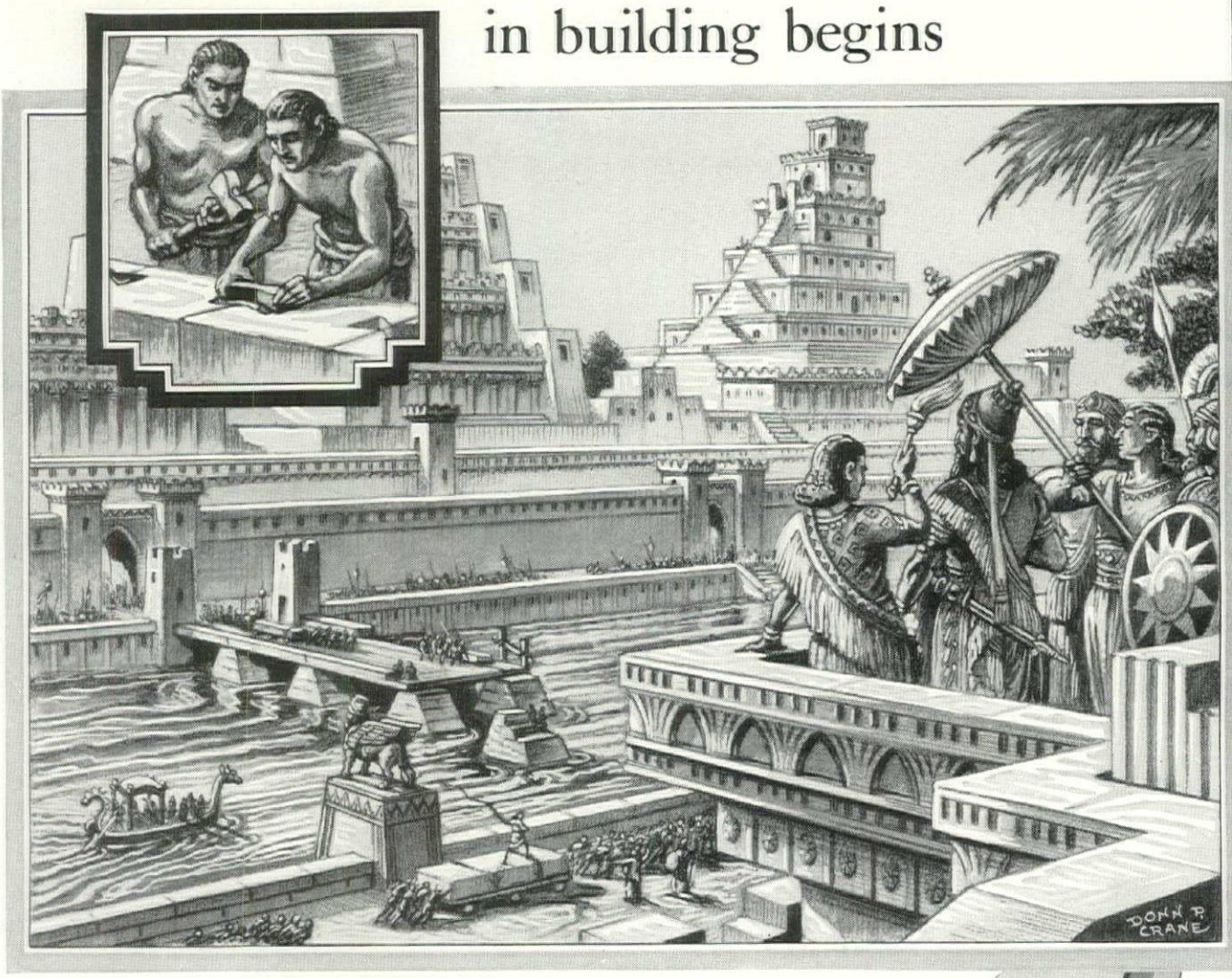
Address .....
City ..... *State* ..... AF 4-32

1500 B. C.—the Age of Iron in building begins



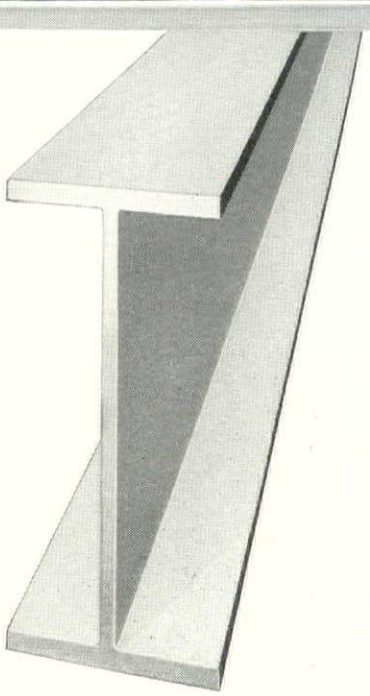
FAR back in the dim and unrecorded history of man, the iron age began to dawn—first as the use of meteoric iron in religious ceremonies, next as the development of iron weapons.

It is not unlikely that iron was first used in building construction by the Babylonians, more than 1500 years before the Christian era.

Archaeologists have discovered that the Babylonians used iron for the hinges of gates and as clamps embedded in the adjoining stones of a wall to serve as a bond, for this was before the days of cement or mortar.

For such usage, iron was known to many of the peoples of antiquity . . . to the Athenians, the Assyrians, the Phoenicians —forerunners of our own age of steel.

Today, the age of steel gives us C B Sections, a product of Illinois Steel Company



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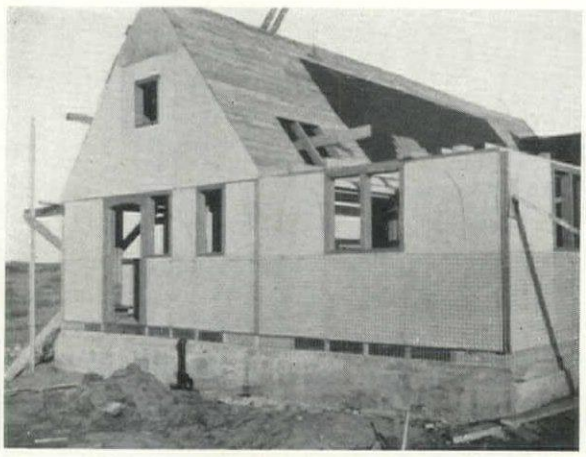
C B SECTIONS

NEXT MONTH'S FORUM

THE series of outlines on community housing which CLARENCE S. STEIN has prepared for THE ARCHITECTURAL FORUM is concluded in the May issue. In this third part, MR. STEIN considers the solution to the problem of housing and sets forth in a particularly clear fashion the important points which must be considered from the social and civic, the economic and the architectural standpoints.



A house built with large construction units, from a system of planning described in the May issue by Robert Tappan

THERE seems to be something forever new in the progress of office management. It may be a different way of filing blueprints or an unusual method of cost accounting, or it may be a combination of those little tricks of organization which save time in the office and help to produce a better architectural production. Things such as these are discussed in an article on office practice by a former member of the office of CROSS & CROSS.

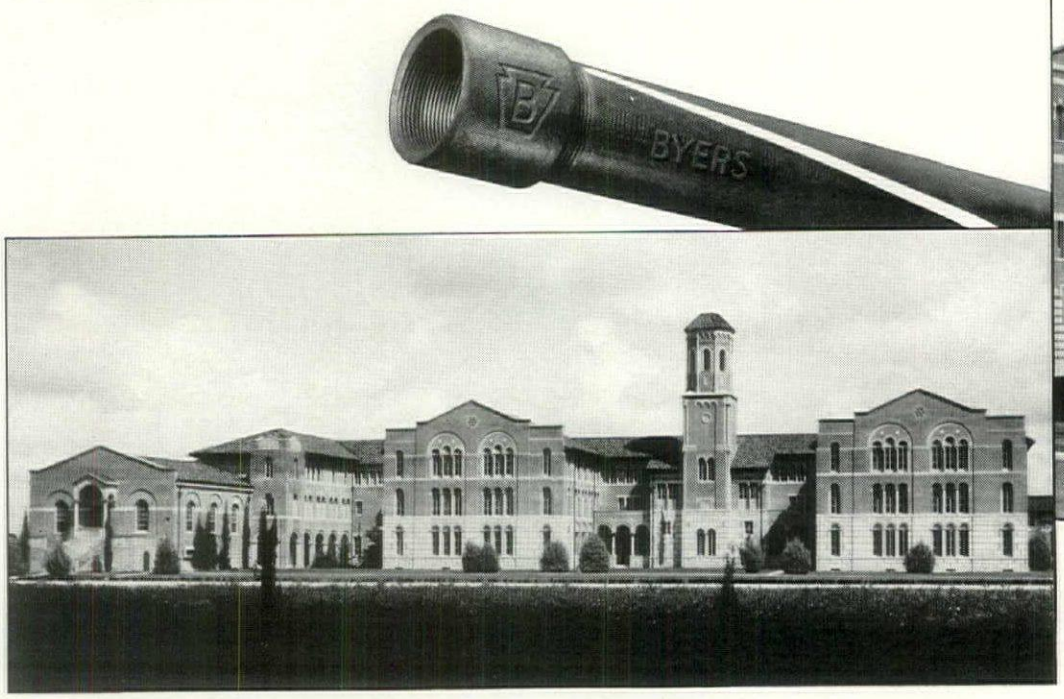
THE section entitled "THE FORUM OF SMALLER BUILDINGS" is proving to be as valuable and as interesting as we hoped it might. In May, ROBERT TAPPAN contributes from his wide experience an explanation of his ingenious method of house construction. It is illustrated by details and diagrams of his unit planning method. In the same section also is an article dealing with the financing of the small house. It is an eminently practical article, written in a straightforward manner, and sets forth clearly and simply every factor which must be included in a financing plan. It should be of particular interest at the present time to every office concerned with houses or housing projects.

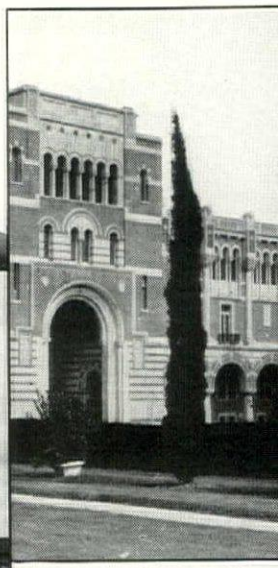
Wurts Bros.

A progress picture of Rockefeller Center, with the R-K-O Office Building and the International Music Hall at the right

(See Page 9 in the Advertising Section for Design Announcement)

Pipe Decision of a generation ago





Experience with Byers Wroug Iron Pipe in the Administrati Building (above), erected in 191 pointed the way to the use of By Pipe for all lines in the Chemist Building (left) erected many ye later.

Proves good again

today

EXPERIENCE is always the best teacher. Consider this striking lesson! In 1912 the first of the Rice Institute buildings, Houston, Texas, was erected.

Byers Wrought Iron Pipe was used in the heating and cold water systems. A more expensive pipe was used in hot water lines. Other buildings in this beautiful group have been added, the latest being the Chemistry Laboratory. Again Byers Pipe was used, this time for hot water as well as heating and cold water lines. In all this time the original piping is still giving satisfactory service — not a failure, no extensive replacements. What indisputable evidence of the wisdom of using Byers Genuine Wrought Iron in the battle against corrosion!

It is upon such plain evidence as this that Byers Genuine Wrought Iron Pipe is being specified today for outstanding medical, educational, commercial and public buildings. A PIPE DECISION OF A GEN ATION AGO PROVES GOOD TODA

SHOW YOUR CLIENT OUR ECONOMY FACTS

Let us help you show your client the w dom of using Byers Genuine Wroug IronPipe. Let us give h actual figures on w it is false economy "shade" building co by using materials th require expensive placements. Our en neering staff is ready answer your call. M. Byers Compan Pittsburgh, Pa. Esta lished, 1864.

GET THIS 47 YEAR OLD PIECE OF WROUGHT IRON PIPE FROM FIRST SKYSCRAPER

When the Home Insurance Building; Chicago, the first skyscraper, was torn down, the wrought iron pipe was found to be in first class condition. A piece of this pipe is yours for the asking.

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STANDARD of QUALITY for 68 YEARS · BYERS 1864 GENUINE WROUGHT IRON · TODAY BETTER THAN EVE

THE ARCHITECTURAL FORUM

VOL. LVI. NO. 4 APRIL, 1932

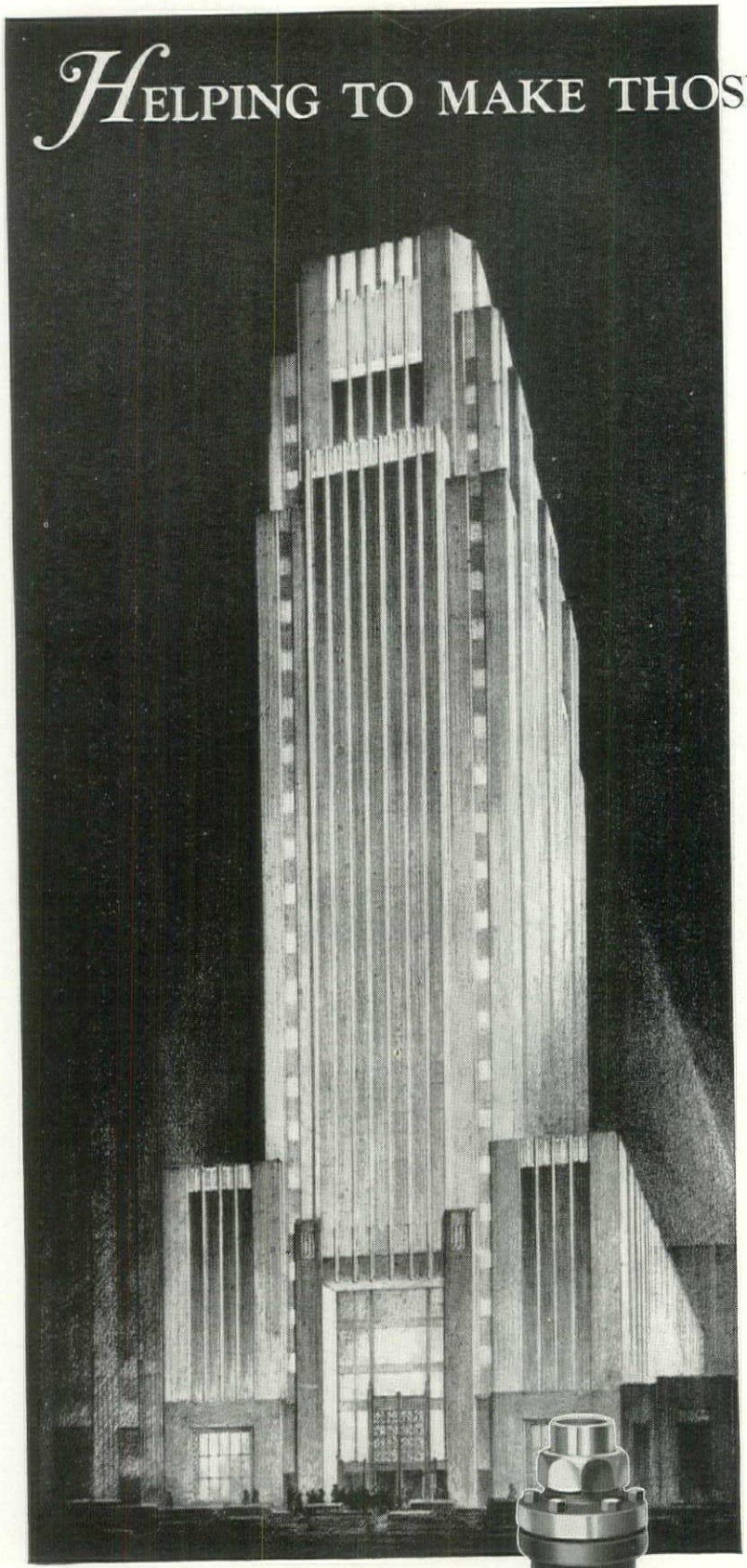
CONTENTS

PART I — ARCHITECTURAL DESIGN

PART II — ARCHITECTURAL ENGINEERING AND BUSINESS

THE ARCHITECTURAL FORUM is published monthly by Rogers and Manson Corporation, Howard Myers, President. Publication Office, 10 Ferry Street, Concord, N. H. Executive, Editorial and Advertising Offices, 220 East 42nd Street, New York. Advertising Manager, George P. Shutt. Production Manager, Ruth H. Goodhue. Business Manager, W. W. Commons. Subscription Office, 350 East 22nd Street, Chicago, Illinois. Yearly Subscription, Payable in Advance. U. S. A., Insular Possessions and Cuba, $7.00. Canada, $8.00. Canadian duty 60¢. Foreign Countries in the Postal Union, $9.00. Quarterly Reference Numbers, $3.00; Regular Issues, $1.00. All Copies Mailed Flat. Trade Supplied by American News Company and its Branches.

HELPING TO MAKE THOSE GLORIOUS LINES PRACTICAL!



1616 Walnut Street Building, Philadelphia, Pa.
Architects—Tilden, Register & Pepper
Heating & Plumbing Contractors—
Keystone Heating & Equipment Co.
General Contractors—Wark Co.
Consulting Engineer—Charles S. Leopold

73 Sylphon Packless Expansion Joints, used on the heating risers, and unobtrusively tucked away in the ultra-compact side walls, give utility to the proud stream lines of the 1616 Walnut Street Building, one of Philadelphia's newest and finest office buildings.

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Write for Bulletin GA-300, a valuable treatise that should be in every architect's and engineer's file.

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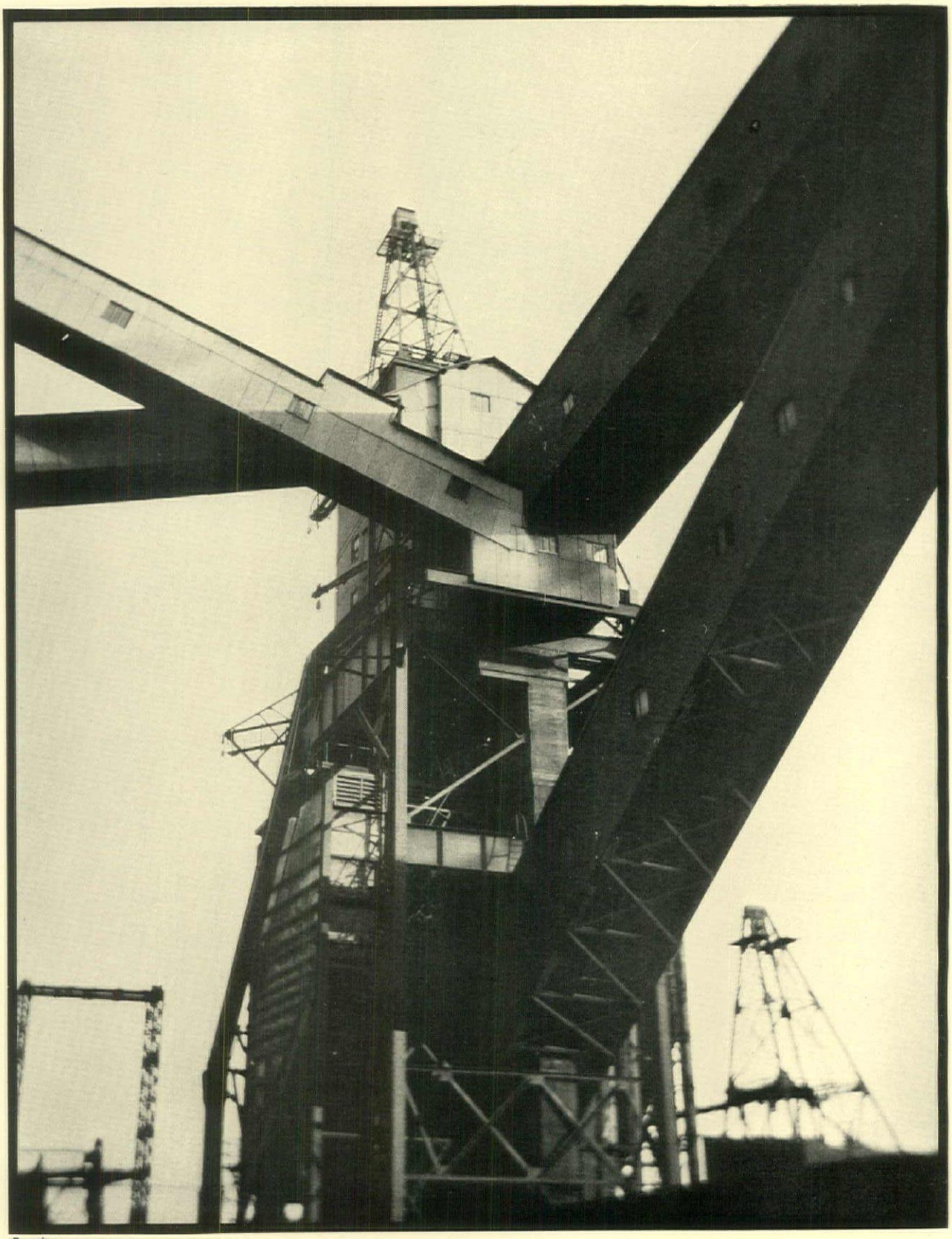


Browning

INDUSTRY — WILL THE HOUSE BECOME ANOTHER ITEM OF ITS STANDARDIZED PRODUCTION?

The Architectural Forum

THE
ARCHITECTURAL
FORUM

VOLUME LVI

NUMBER FOUR

APRIL 1932

COMMUNITY HOUSING PROCEDURE

SECOND STAGE: TEST STUDIES

BY

CLARENCE S. STEIN

THE problem having been analyzed and limited by the first series of studies, the second stage will consist of a series of investigations and studies to decide on a site and the general form of the development and of the organization to carry on the operation.

The social survey will consist of studies of existing social and civic conditions on the sites under consideration and in the neighborhood of these properties. The object of such studies is to find out, first, whether the sites provide the possibility for satisfying the requirements of the groups under consideration; secondly, what community equipment and facilities exist in or near the properties which would be available for a new project; thirdly, to what degree the needs of the new community could be met with existing equipment.

The architectural survey will consist of the study of the existing conditions on the various sites available so as to decide which offers the best opportunities for a solution of the problem. A series of test plans will be made of various uses of different properties considered. The types of residence chosen as preferable at the end of the first stage will be used in this study. Tentative decisions reached at that time may be revised as a result of this additional study.

The economic survey will be an analysis of the cost of carrying out the various test plans. This will be roughly estimated and tabulated or shown graphically to bring out the relative importance of various factors. They should be translated into rent or sale costs on a uniform basis. The economic study will also determine the type of housing company to be set up for the purpose of carrying out the project and the functions and activities of the various related parts, including all the agencies and technicians either within or outside the main directing company.

AT THE end of the second stage of the survey definite decisions as to policy should be reached. It may be necessary to sacrifice certain desired features as economically impossible of attainment. For instance, it may be found that in a locality in which only free-standing houses are sold, it is impossible to construct, at a low enough price for existing markets, any but row houses of a required size, capacity and quality. If it is thought that row houses can be successfully rented, this may lead to a decision to build for rental. This will affect design and particularly the grouping of houses and land subdivision. It may also lead to a different organization for financing as well as for management after construction.

One advantage will have to be weighed against another — *as:*

A site inside the city near industry where land is so expensive as to require apartment houses; *or* —

A site outside where individual houses are economically possible but where tenants will have expense and inconvenience of transportation.

At the end of this, the second stage in the series, the way should now be cleared for the detailed study and execution of the project —

On a site which has been chosen;

For a definite economic and social group;

By a housing company in which the functions of the various elements or agencies are defined in accordance with a plan which has been outlined in regard to its essential features and elements.

SOCIAL AND CIVIC (DIV. SII)

A. SURVEY TO FIND LAND AVAILABLE FOR CONSTRUCTION OF PROJECT

I. SOURCES OF INFORMATION, to be used jointly in social, economic, and architectural studies

- a. Population maps of region
- b. Topographical maps of region
- c. Land-use maps of region
  - 1. Present location and trends in new location of industry, business, commerce and residence
- d. Zoning and other restrictive maps
- e. Road and transportation maps
- f. Information from real estate market, leaders in community life

B. EXISTING CONDITIONS IN AND CONTIGUOUS TO VARIOUS PROPERTIES CONSIDERED FOR PROJECT

I. SIZE OF SITE, with relation to type of development possible

- a. Complete community, with central shopping district, industrial section, recreational facilities, possibly agricultural belt
- b. Complete residential neighborhood, with local shopping center
- c. Too small for development as a community

II. LOCATION

- a. With relation to industrial, business and residential sections of city or region
  - 1. Time and distance and cost by present or possible means of transit: *Walking, automobile and bus (main highways or local roads), trolley, rapid transit, railroad (main line or local branch), other means*
  - 2. Character of neighborhoods traversed in transit
- b. With relation to surrounding country: *Other cities or towns, open country (agriculture, recreation)*
- c. Geographical relation of site for project to existing stations or transit-lines in neighboring communities

III. LAND-USE

- a. Present character: *Rural or undeveloped. Self-sufficient village (agricultural or industrial). Suburban residence. Recreational resort. Urban (residence, industry, business)*
- b. Degree of development in present use: *Concentration and height of buildings. Concentration of population*
  - 1. General character of developed sections: *Growing, thriving, run-down, deserted*
- c. Present trends
  - 1. History
  - 2. Likelihood of permanence, or of change in present use, as indicated by:
    - *a.* Assessed values, past and present
    - *b.* Sales prices. Number of recent sales
    - *c.* Population trends: *degree of congestion. Scale of rents past and present*

(*Continued on page 396, column one*)

ECONOMIC (DIV. EII)

A. TYPE OF ORGANIZATION OF HOUSING COMPANY

I. COMMERCIAL

II. LIMITED OR NON-PROFIT MAKING

- a. By civic or social minded citizens (City and Suburban Homes Co., City Housing Corporation, Julius Rosenwald, Chicago)
  - 1. With or without some form of governmental financial assistance such as tax exemption in New York
- b. Foundations (such as Buhl Foundation, Pittsburgh; Sage Foundation, Forest Hills)
- c. By single industry for its employees — directly or through subsidiary or related company (Kohler, Wisconsin; Goodyear Heights, Akron, Ohio)
- d. By company organized and financed by group of industries or Chamber of Commerce (Bridgeport Housing Co., Bridgeport, Conn.; Kingsport, Tenn.)
- e. By insurance companies or other semi-public organizations for civic or publicity purposes. (Metropolitan Life Insurance Co., New York 1922–24; Prudential Insurance Co., Newark, 1931–32)
- f. By cooperative organizations. (Amalgamated Housing Corporation, New York)
- g. By municipalities — directly, (City of Cohoes, New York) Indirectly through financial aid and supervision, (City of Milwaukee, Wis. 1918), through tax exemption under New York State Housing Law
- h. By state or national government. (War time housing, Yorkship Village, Camden, N. J., and Buckman Village, Chester, Pa.; Massachusetts Homestead Commission)

III. LIMITATION OF ACTIVITIES. (Applicable to either of the above groups)

- a. Housing Corporation carrying all phases of work *(see below: Div. EII-B)*
- b. Limitations as to method of carrying on construction
  - 1. Building under supervision of company or its agent by:
    - *a.* Direct labor
    - *b.* Subsidiary company
    - *c.* Sub-contractors
    - *d.* Direct labor in some trades — sub-contractors in others
    - *e.* General contractor
  - 2. Financing
    - *a.* Loans to operating builders
    - *b.* Land put in as part of first mortgage
    - *c.* With or without restrictions as to building, etc.
  - 3. Real Estate: *Sale of excess land to take advantage of increment developed by activity of company*

B. ORGANIZATION FOR CARRYING OUT HOUSING DEVELOPMENT

(*Continued on page 395, column one*)

(hereafter referred to as the housing company).

Many of the items listed may be delegated to technicians, contractors or other agencies outside the main directing organization, or to subsidiary companies

I. DIRECTION
- a. Board
- b. General Manager
  1. Policy setting 2. Direction of operation

II. FINANCIAL
- a. Securing and distribution of first mortgages
- b. Securing and placing junior mortgages
- c. Arranging payments of interest and amortization
- d. Accounting

III. LEGAL
- a. Land title c. Restrictions
- b. Sales contracts and leases

IV. REAL ESTATE
- a. Purchase of land b. Use of land
- c. Sale of land

V. DESIGN: *(town or development and site planning, architectural)*
- a. Planning b. Execution of drawings
- c. Specifications d. Permits and other public relations
- e. Supervision

VI. ENGINEERING
- a. Surveys b. Planning
- c. Specifications d. Field Work
- e. Supervision
- f. Permits from and coordination with governmental and public utility agencies

VII. CONSTRUCTION
- a. Organization b. Contracting
- c. Supervision d. Execution

VIII. PUBLIC RELATIONS and information
- a. For purpose of security selling (publicity and promotion)
- b. For purpose of selling or renting
- c. For purposes of education
  1. Of other agencies interested in housing and community planning
  2. Interpretation of project to those in community
- d. Relations with governmental and public utility agencies

IX. MARKETING: *Sale or Rental*

X. OPERATION
- a. Collections of rentals or monthly payments
- b. Upkeep—repairs and alterations
- c. Care of grounds

XI. COMMUNITY ORGANIZATION
- a. Recreation — education, etc. *(See Div. SI-D-IV, Div. SII-B-IV, VIII)*

(*Continued on page 396, column two*)

ARCHITECTURE (DIV. AII)

A. COMPARATIVE STUDIES OF POSSIBLE PROPERTIES

I. PHYSICAL CHARACTERISTICS

a. Size and shape, in relation to:
1. Adequacy for development of self-contained neighborhood
2. Efficient large scale development
3. Continuity of building operation over period of years
4. Expense of carrying charges during period of development
5. Surrounding street system
6. Obstacles to complete plot assembly

b. Topography: effect on
1. Cost of grading, streets, utilities, and building
2. Drainage 3. Appearance
4. Orientation of sites, fenestration of buildings
5. Street layout, approaches, traffic and utilities, circulation
6. Type of building 7. Usability of land

c. Character of soil and sub-soil
1. Surface: *rock, marsh, sand, gravel, clay*
2. Subsurface: *ground water, bed rock, mine tunnels, subterranean structures, etc.*
3. Effects on construction: *foundations, footings*
4. Effects on drainage, dryness of cellars
5. Use of materials on property for construction of buildings or roads
   a. Sand, gravel, stone, timber, water, etc.

d. Services and utilities
1. Roads (and walks)
   a. Existing: plan, cross-section and type of construction in relation to —
      i. Contours and per cent of grades
      ii. Type of development
      iii. Public regulations or private agreement
   b. Requirements
      i. Existing facilities
      ii. Type of construction required
      iii. Is it better or more economical to have roads installed by government or builder? What regulations?
2. Public utilities: *water supply, sanitary sewage and storm water disposal, gas, electricity, telephone, central heating, rapid transit and bus service*
   a. Existing installation
   b. Cost of securing additional installation required
      i. Investment required
      ii. Future payments, assessments, taxes, payments for service to public utilities companies or amortization of original cost
   c. What utilities should be supplied by government, public utility companies or developing companies?
      i. Legal requirements ii. Customs
      iii. Existing plant or company: *reliability and efficiency*

e. Existing structures: possible temporary or permanent use

f. Portion of land available for economic development for housing, after deducting streets, paths, public open spaces and public or commercial building sites, and those

(*Continued on page 397, column two*)

(SOCIAL AND CIVIC, Div. SII-BIII, *continued*)

d. Resources nearing exhaustion
i. Agricultural. Mining. Recreational (due to industrial nuisance or increased population)
e. Resources not yet opened up
i. Agriculture. Mining. Sites for industry, commerce, business, residence, recreational activity

d. Public regulation (such as zoning, housing codes, etc.) and private agreements. Their past, present, and possible effect on land use

IV. CIVIC ORGANIZATION: *Unincorporated Separate town, borough, or village. District of city or town*

a. Single unit, part of single unit, parts of several units
b. Character of government. Scope and effectiveness of activities
c. Civic interest manifested by present citizens
d. Relation to municipal set-up: *Utilities owned and run directly, or regulated. (See Div. AII-A-I-d)*

V. LEGISLATION such as zoning, housing codes, sanitary codes, use of eminent domain. Existing private agreements. Possible effect on construction of new community *(See Div. AII-A-II)*

VI. GENERAL PHYSICAL ATTRACTIVENESS: Topography, vegetation, streams and ponds, view, climate

b. Nuisances: *Smoke, dust, odors, noise, relation to railroads and main highways*

1. Effect of prevailing winds
2. Effect of probable highway program

VII. POPULATION

a. General type *(See check-list under Div. SI-D-I.)*

b. Natural groupings: *According to race, occupation, income level, type of home, religious or political belief, accidents of topography or plan. Relations between groups*

1. Probable relation to specific group under consideration for re-housing

c. Number and size of recognizable neighborhood units

1. Degree of conformity with natural groupings
2. General types and costs of homes in each neighborhood (*See Div. SI-D-III*)
a. Character of construction: *brick, frame, etc.*
b. Quality of construction
c. Ownership or rental
d. Garages
e. General state of repair or dilapidation
3. Density of population in each neighborhood
a. Number of persons per room
4. Local transit facilities between present neighborhoods
5. Possible transit facilities between present neighborhoods and proposed community

VIII. PRESENT COMMUNITY EQUIPMENT From the points of view: *Is it adequate for present needs? To what extent could it be used by the proposed new community?*

(*Continued on page 398, column one*)

(ECONOMIC, Div. EII-B, *continued*)

XII. RESEARCH

a. Design
b. Construction
1. Materials 2. Methods
3. Cost Accounting
c. Social and civic
d. Economic
e. Uniform practice

C. METHOD OF FINANCING

I. EQUITY

a. Source of capital
1. Investing public
2. Members of cooperative organization
3. Foundation
4. Public spirited or philanthropic individuals
5. Insurance Company, etc.
6. Industrial Company
7. Government
b. Basis of division of profits
c. Type of securities
1. Stock 2. Bond

II. OTHER CAPITAL (mortgages)

a. Source
1. Savings banks
2. Life Insurance Co.
3. Savings and loan association
4. Trust & Title Company
5. Private individuals and estates
6. Mortgage and bond houses
7. Governmental agencies

b. First Mortgage
1. Amount and charges depending on:
a. Value of land and buildings
b. Character of neighborhood and likelihood of values being maintained and increased
c. Appraisal — method and ability of appraisers
d. Portion of appraisal lent
2. Interest rate
3. Length of term
4. Costs of obtaining mortgage money
a. Mortgage recording tax
b. Title policy
c. Revenue stamps
d. Attorney's fees
e. Supervising architect's and inspection fees
f. Brokerage
5. Renewal costs
6. Amortization
7. Guarantees
8. Cost of collecting installments

c. Junior Mortgages
1. Interest rate 2. Length of term
3. Costs of securing or renewing mortgage
a. Discount or write-ups
b. Brokerage, etc.
c. Legal expenses
4. Amortization

D. COMPARATIVE COST (to time of completion for marketing) of projects studied (*See Div. AII-B-VI*)

I. LAND AS OF DATE OF STARTING building operation, including:

a. Original cost with all expenses
b. Carrying charges (interest)
c. Taxes and assessments

(*Continued on page 397, column one*)

(ECONOMIC, Div. EII-D, *continued*)

II. PUBLIC IMPROVEMENTS
- a. Streets and paths
- b. Public utilities (where capital charges)
- c. Parks

III. GENERAL DEVELOPMENT (proportional part of improvements benefitting larger area than above local improvements: *such as recreation fields, parks, sewage disposal plant, public buildings, and other community equipment*)

IV. BUILDING, including construction
- a. Buildings *(See Div. EII-E-IV)*
- b. Yard work: *terraces, steps, walks, driveways, finished grading, seeding, planting*
- c. Building supervision or contractor's fees

V. CARRYING CHARGES and fees
- a. Carrying charges and taxes on land during building operation
- b. Carrying charges on building and improvements, lot and public utilities (where a direct capital investment)
- c. Architect's and engineer's fees
- d. Incidental expenses in connection with construction, such as governmental charge for permits, etc.

VI. PROPORTIONATE COSTS of organizing or direct-company

VII. TOTAL COST of development to time of completion for marketing (use): *(Totals of above items I to VI)*

E. COST (to time of completion for marketing) of individual dwelling units

I. SITE COSTS
- a. Land (raw land and grading)
  1. May be figured on basis of square feet or front foot (The basis of front foot is useful only when depth of lot is constant)
  2. Total area should be divided into usable (or salable) portion for house and lot, and that for public use such as streets and parks (including those portions that can not be economically used for housing)
  3. To actual cost per square foot of usable area should be added proportion of cost of public area
  4. In later studies judgment must be used in marking up or down, good or bad sites
- b. Yard work *(See Div. AII-C-XIII)*

II. PUBLIC IMPROVEMENTS: *roads, walks, public utilities*
- a. Total costs *(see Div. EII-D-III)* divided in proportion of front footage or area of plots

III. GENERAL DEVELOPMENT COSTS
- a. Portion of general development costs allocated to the project to be proportioned as are public improvements

IV. BUILDING COSTS
- a. Dwelling

(*Continued on page 398, column two*)

(ARCHITECTURE, Div. AII-AI, *continued*)

portions of site that cannot be economically developed

(Requires parallel analysis of types of dwellings, preliminary street and site plans and estimates of cost. (See Div. AII-B, and Div. EII-D, E, F, G.)

- g. Aesthetic considerations
  1. Relation to topography
  2. Existing trees or other landmarks to be preserved
  3. Immediate physical surroundings
  4. Surrounding natural view and distant landscape

II. LEGAL RESTRICTIONS affecting plan or costs *(See Div. SII-BIII-d)*
- a. Governmental jurisdictions applying to the site
  1. Authority of city, county, and special government units (as sanitary districts, etc.)
  2. Specific legislation
     - *a.* Codes of building, health, fire, police departments
     - *b.* Zoning
     - *c.* Town-planning
     - *d.* Housing legislation
- b. Private authorities or jurisdictions
  1. Rights and responsibilities of utility or other corporations: *powers of condemnation or assessment; easements and rights of way; responsibility for maintenance*
  2. Deed or other restrictions: *individual use-agreements*
- c. Problems of land-assembly
  1. Validity of titles
  2. Obstruction by individual land-holders

III. SITE COSTS: Effect of: *(See Div. EII-DI, II)*
- a. Raw or improved state of property
- b. Speed with which it is planned to develop and market property in relation to carrying charges on land and utilities
- c. Portion of land available for housing. *(See Div. AII-A-I-f.)*
- d. Character of land *(See Div. AII-A-I-b, c)*
- e. Highways and public utilities *(See Div. AII-A-I, d, 1, 2)*
  1. Cost of securing if non-existing
  2. How those costs will be paid or spread over a period of time

IV. CONSTRUCTION as affected by character of the site
- a. Materials

  1. On premises 2. Means of transportation
- b. Labor
  1. Available near site or means of transportation
  2. Special local regulations, costs or efficiency
- c. Effect of topography, soil and sub-soil. *(See Div. AII-AI, b, c)*
- d. Improvements existing

  1. Clearing, stumping and grubbing 2. Grading
  3. Roads 4. Utilities 5. Buildings 6. Planting

(*Continued on page 399, column two*)

(SOCIAL AND CIVIC, Div. SII-BVIII, *continued*)

a. Schools *(See Div. SI-D-IV-C)*

1. Number and type: *Nursery, kindergarten, elementary, junior high, high-school. Private, sectarian, public. Platoon, or other system. Number of sessions. One or two shifts*
2. Number of pupils per school, by age-group and grade. Capacity
3. Sites: *Relation to homes of possible pupils in new communities. Relation to parks, playgrounds, transportation*
4. Play space: *Amount, equipment, availability for adults. Degree of present use according to age groups*
5. School buildings
   - *a.* General quality: *safety, sanitation, convenience, light and air*
   - *b.* Equipment: *Educational (laboratories, etc.), athletic (gym, swimming pools, etc.), social and cultural (auditorium, stage and workshops, art-studios, dancing, music facilities). Library*
   - *c.* Space and hours now used by or available to adults. Type of adult activity carried on

b. Churches. *(See Div. SI-D-IV-f)*

1. Number, size, kinds: *Catholic, Jewish, Protestant*
2. Congregations: *Economic and social status by churches. Room for additional members*
3. Services and religious, social, educational organization provided
   - *a.* Prayer meetings, missionary societies, mutual benefit associations, social service clubs, brotherhoods, ladies' aid, Sunday School, day-schools, special schools, athletic activities
4. Equipment: *Church buildings proper, chapels, community buildings, auditoriums, gymnasiums, swimming pools, restaurants, recreation or club rooms*
   - *a.* Degree of present use. By congregation proper. By community at large
   - *b.* Present trends in expenditure, type of construction, facilities offered
5. Location: *with relation to homes of possible new community*
   - *a.* Transit facilities, present and possible

c. Equipment of other social, recreational, philanthropic or cultural organizations. Consider in each case *quality, degree of present use* (partial or capacity), *convenience of location* with respect to homes of new community

1. Non-commercial
   - *a.* Parks and playgrounds *(See Div. SI-D-IV-d)*
     - i. Facilities offered: *Playground sports. Field athletic; Tennis, Golf, Walking, Riding, Swimming. Boating. Eating places. Comfort stations. Athletic and social supervision*
   - *b.* Community organizations and buildings. (Includes settlements, country clubs, fraternal societies, etc.) *(See Div. SI-D-IV-c*
     - i. Age, race and income groups now served
     - ii. Type of organization: *Membership restrictions. Cost to members*
     - iii. Facilities for: *Lectures, Theater, Dancing, Craft and theater workshops, Concerts, Music study, Art Exhibitions, Art practice, Parties, Meals, Bowling, Tennis, Gymnasium, Golf, Adult education, Civic meetings*
   - *c.* Libraries
   - *d.* Museums, art galleries
   - *e.* Little theater: *Indoor equipment. Outdoor stage*
   - *f.* Upkeep of each: *Costs, organization, quality*
2. Commercial: *Consider degree of present success or failure. Likelihood of new enterprise in each line*
   - *a.* Movies, theater, restaurants, lecture and music halls, dance-halls, swimming pools, public baths, amusement parks *(See Div. SI-D-IV-g)*

(Continued on page 400, column one)

(ECONOMIC, Div. EII-EIV, *continued*)

1. Structure or shell: *foundation, walls, floor construction, roof, chimney*
2. Finish: *wall and floor finish, stairs, trim, tiling, fixtures, hardware, decoration*
3. Mechanical equipment: *heating, plumbing, lighting, utility connections*

b. Other structures: garages, etc.

V. CARRYING CHARGES and fees and general overhead during building *(See Div. EII-D-V)*

a. To be proportioned on basis of actual cost of houses

VI. TOTAL COST chargeable to house to time of completion for marketing (all of above)

F. TOTAL COST OF PROJECT to the housing company — if dwellings are *SOLD. (See Div. EII-J for annual cost to owner)*

I. PRODUCTION COST *(See Div. EII-D-VII)*

II. COST OF MARKETING

a. General overhead (not connected with building operations) during period of marketing including: office expense, etc. of the Housing Company
b. Carrying charges on land and building during marketing period: *taxes, interest, insurance, etc.*
c. Advertising and publicity
d. Sales commissions or salaries of sales force
e. Legal expenses in transfer of premises
f. Furnishing, decoration, and attendance for sample dwellings or suites
g. Maintenance and repairs of dwellings until occupancy
h. Alterations for occupants
i. Costs of time payments, collections, etc.
j. Maintenance and repairs of community equipment until delivery to community association or other operating agency (or permanently in so far as not paid for by such agency)
k. Special costs of organization for cooperative ownership

III. TOTAL COST (I+II)

G. TOTAL COST OF PROJECT to housing company — if dwellings are *RENTED*

I. PRODUCTION COST. (Cost to time of completion for marketing) *(See Div. EII-D-VII)*

II. COSTS OF MARKETING rental dwellings a. *(See Div. EII-F-II-a to h)*

III. TOTAL COST (I+II)

H. BASIS OF RENTAL CHARGES (in relation to capital costs of production and marketing) *(See Div. EII-D-G)*

I. INTEREST on complete capital cost

II. TAXES

(Continued on page 399, column one)

(ECONOMIC, Div. EII-H, *continued*)

III. DEPRECIATION (on building costs): (This may be covered by amortization of loan.) The rate based on probable life of building affected by:

a. Quality of construction
b. Type of use requiring replacement: *(Obsolescence of equipment and fixtures)*
c. Design in relation to
   1. Function
   2. Changes in style or habit
d. Neighborhood stability *(See Div. EI-CII)*
e. Changes in price level affecting reproduction cost

IV. OPERATING COSTS *(Items depend on type of buildings and the extent to which services are furnished by management or by tenant)*

a. Cost of management and rent collection
   1. Local office and proportionate part of office or organizing company
   2. Executive, legal, accountant, and clerical salaries and expenses
   3. Agents' fees and superintendent's salary
b. Repair, maintenance and redecoration (including upkeep of dwellings not rented and their repair or alteration when rented)
c. Insurance — (Fire, liability, workmen's compensation, rent, burglary, etc.)
d. Upkeep of grounds and other general or communal equipment. Parks, buildings, roads, walks, utilities, etc.
e. Heat, gas, electricity, water
f. Supplies and Sundries
g. Community organization and upkeep or addition to equipment
   1. Part of original cost, parks, etc. which are not paid for as taxes, assessments or fixed charges for use
   2. Upkeep of park and other community facilities
   3. Management of community activities
h. Lost Rent as Result of Vacancies and bad accounts — allowance to cover

I. BASIS OF SELLING PRICE of individual houses

a. Cost of individual dwellings *(See Div. EII-E-VI)*
   1. For purpose of sale, price may be modified in consideration of desirability of location, etc. But total selling cost of all dwellings should cover cost of production of the whole housing development
b. Cost of selling or marketing: proportionate part of: *(See Div. EII-F-II)*
c. Profits

J. COMPARISON of total annual cost to occupant under OWNERSHIP or RENTAL

I. To compare fairly the costs of ownership (individual or cooperative) with those of rental, in addition to charges on capital costs *(for ownership, see Div. EII-F-III; for rental see Div. EII-G-III)*, all operating costs to occupant must be set up

(ARCHITECTURE, Div. AII-B, *continued*)

B. TEST PLAN SOLUTION

I. GENERAL PROCEDURE: *A series of rough test plans should be made of various uses of different properties considered. These should be roughly estimated and tabulated or shown graphically to bring out relative importance of various factors and interpreted into rent or sale costs on a uniform basis (See Div. EII-D-E-F-G)*

II. DEVELOPMENT OF TOWN PLAN STUDIES

a. Open spaces (public)
   1. Spaces least available for housing or other buildings such as steep hillsides or rough contours, land difficult to drain
   2. Attractive sites — with interesting views, woods or streams
   3. Level sites for playgrounds
b. Circulation
   1. Connection with outside highways
   2. Topographical consideration
   3. Maximum protection of safety and peacefulness and quiet of development
   4. Classification and design in accordance with proposed use for economy and convenience
c. Division into blocks
   1. Convenience 2. Economy 3. Safety
d. Sites for dwellings
   1. Economy of development
   2. Healthfulness (freedom from dampness, etc.)
   3. Drainage and water supply
   4. Sunlight 5. Beauty
e. Sites for required public or commercial buildings and services. *(See Div. SII-B-VIII, Div. SIII)*

III. TYPES OF DWELLINGS to be developed

a. Suitability of various types in relation to:
   1. Functional and economic requirements and local customs (*See Div. AI-B and C*)
   2. Site and topography (See Div. AII-A-I)
b. Necessity of intermingling several dwelling types for varying family and individual needs

IV. GROUPING OF DWELLINGS and development of general schemes as affected by:

a. Topographic features
b. Block arrangement
   1. Size and shape, possibility of open spaces and building distribution
   2. Orientation
   3. Relation to streets, access by motor, foot, rapid transit
c. Utilities and services
d. Community and neighborhood relations and equipment

V. PLANS FOR COMMUNITY and neighborhood equipment required *(See Div. SII-B-VIII)*

VI. COMPARATIVE COST STUDIES of various schemes, and of types of dwelling units *(See Div. EII-D-E-F-G-H-I)*

(SOCIAL AND CIVIC, Div. SII-BVIII, *continued*)

d. Health equipment: ***Consider quality, expensiveness to use, degree of present use, convenience with respect to new community (See Div. SI-D-IV-a)***

1. Hospitals: *private, public, special type*
2. Clinics and dispensaries: *dental, medical, child care, etc.*
3. Health education

e. Municipal equipment (Community services): ***Adequacy for present needs, sufficiency to meet needs of new community as well***

1. Including: *Street-cleaning and repair, utility service (gas, electricity, telephone), sewers, fire and police protection, mail delivery, ash and garbage collection and disposal, local courts, local transportation*

f. Industrial developments

1. Amount and kinds. Area. Number of workers by kinds of industry. Workers resident in neighborhood. Degree of organization of labor. General working and wage conditions
2. Location: *Relation to homes of possible workers in new community*
   a. Relation to local and main line transportation
3. Trends: *Expansion or falling off in old industries. New industries coming in*
   a. Sites available or likely for new industry. Relation to new community
      i. Effect of restrictions as to areas available to industry: *zoning, private agreement, or others*
4. Nuisances: *Smoke, noise, dirt, odor. Present and possible. Effect on present and proposed development*

g. Business and financial equipment

1. Stores: *General type of development: Rural market town. Village. Urban sub-center. Suburban. Neighborhood*
   a. Amount and kinds. Quality and variety of goods offered. Rent-scales. Number of failures
   b. Location: *Convenience to possible customers in new community. Transportation. Delivery or cash-and-carry*
   c. Trends: *Likelihood of growth. Probable location of growth*
      i. Effect of restrictions as to area available to stores: *zoning, private agreements, and others*
2. Banks: *Quality. Location with respect to new community*
3. Offices
   a. Number and types of office-buildings and suites
   b. Degree of occupancy
   c. Types of occupant: Professional, business
   d. Scale of rents
   e. Location: *relation to new community*
   f. Trends in type, amount, location of new construction

h. Transportation: ***(See check-list under Div. SII-B-II-a-1. Also separate items under each main equipment head) (See Div. SII-B-VIII)***

IX. GENERAL CHARACTER OF NEIGHBORHOOD

a. Natural beauty: *setting, topography, views. (See Div. SII, B-VI)*

b. Man-made amenities: *architecture, town-planning, use of natural features*

c. Quality of leadership: *dominant clubs or organizations. Degree of culture and education*

C. COMPARISON OF SITES STUDIED for purpose of choosing location of project. Decision should be based on information gathered:

I. Does this site provide the possibility for satisfying the particular requirements of the group under consideration for re-housing? *(See Div. SI, D-V)*

a. Are the adjacent neighborhoods suitable to adjoin new project?

II. What usable equipment exists on the site? *(See Div. SII-B-VIII, Div. AII-A-I-c-5, Div. AII, A-I-e)*

III. What usable equipment exists in adjacent properties? *(See Div. SII-B-VIII)*

THE THIRD STAGE

THE third stage, which will be printed in THE ARCHITECTURAL FORUM for May, will carry the project through to solution.

The Social and Civic Division will provide a check-list of possible and necessary community equipment, and a program for the organization, management or control of community activities and equipment. The first of the three main sections will consist of a list of social activities for which equipment should be provided where needed, classified by age-groups and under main headings such as Education, Recreation, etc. The second will deal with the buildings, plans, equipment and location required to facilitate these activities. The third section will consider the form of organization (management or ownership) of non-commercial activities and the possible and desired degree of control of commercial activities, including retail shopping centers.

The Economic Division will take up the actual functioning of the economic, and business structure of the housing project, including sales methods, method of payment and management, etc. It will also deal with the question of upkeep, of both dwellings and community equipment.

The Architectural Division will consider the final detailed development of the project, including the program of sequence of work, the coordination of all the departments and agencies involved, and the final study, planning and production of the buildings, roads, public utilities and grounds.

EDITOR'S NOTE: The first stage of the outline by Mr. Stein appeared in pages 221 to 228, inclusive, of the March issue. It constituted a statement of the problem and set forth considerations from social and civic, economic and architectural standpoints

PROMOTING A COOPERATIVE APARTMENT

BY

ALTON L. WELLS

PROMOTION can, and will, produce new business, and resourceful architects are using this means to keep their offices going on a more comfortable basis. Potential benefits from promotion work need not necessarily be confined to the resultant new architectural business which may be placed on the architect-promoter's boards. Sometimes it is possible for the architect to contribute some portion of the needed preliminary working capital, thereby insuring for himself a share in the eventual profits of the enterprise. Also an active promoter often can advance his project sufficiently before enlisting outside capital to warrant his receiving a substantial interest in the undertaking as a fair payment for the services which he has rendered.

Promotion of a building project is never easy and it is doubly difficult in times such as these. Hence the wisdom of selecting with great care the type of operation to be promoted. In the residential field it would seem that the 100 per cent cooperative apartment building, providing housing accommodations at moderate cost, offered the best chance for successful promotion just now.

There are several reasons to support this contention: Recent income tax returns show that incomes from $5,000 to $25,000 have suffered least during the past year or two. Purchasers of apartments of the type mentioned are drawn largely from persons in these classes. Savings banks report unprecedented amounts of deposits. These deposits are owned mostly by people of moderate means. There is a decided trend toward apartment house living where families may be relieved of the care of maintenance and upkeep usually imposed by life in an owner-occupied home. Buyers are looking for bargains today. Cooperative apartments, when soundly conceived and properly financed, usually have proved to be more economical than rented quarters.

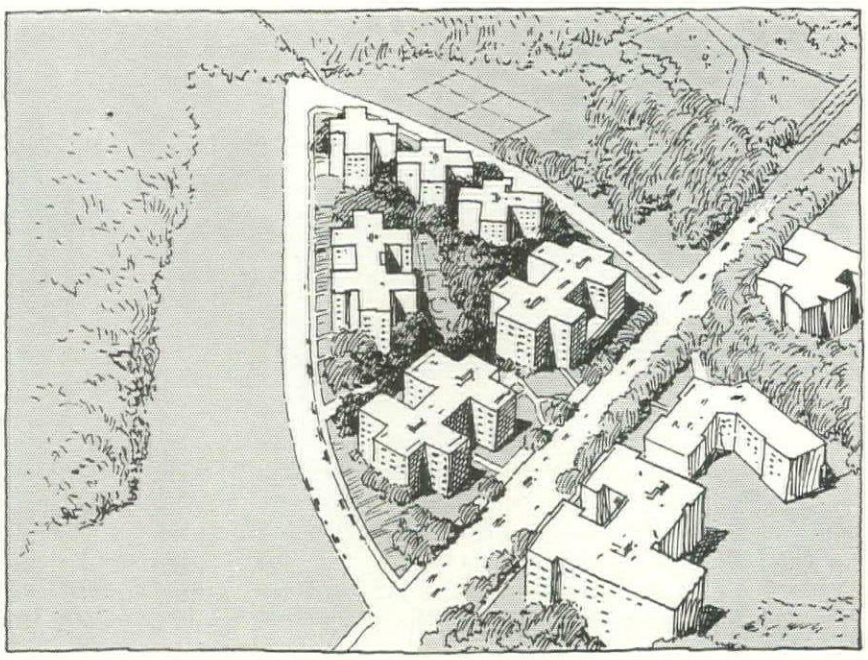
Promotion Work Is a Selling Operation. Promotion is selling, pure and simple. The work involved in the promotion of a 100 per cent cooperative falls into three definite selling operations:

1. Selling the project to one's self. The promoter must convince himself that the undertaking is a sound one.
2. Selling the proposal, when set up, to investors.
3. Selling the completed apartments to the ultimate owners.

Most of the work necessary to set up the project and to secure the operating capital must be done by the architect-promoter himself. The selling of the finished apartments probably will be done largely by others, with the architect cooperating. It is urged strongly that the architect complete all his preliminary work before he approaches any sources of operating capital. Money, these days, is not surrendering easily to mere ideas. Matured plans, backed up with sound reasoning, will often get a sympathetic hearing where vague statements would meet with a prompt refusal. Then too the further advanced the undertaking is, the better the position of the promoter to make a demand for his fair share of the rewards of the enterprise. Too often mere ideas receive scant return when profits are divided.

Preliminary Investigation and Set-up. This involves a thorough examination of local housing conditions, as well as a study of the general business situation. To justify going ahead, satisfactory answers ought to be obtained to such questions as: Is there a demand for new housing? If so, is it among families that will be likely to buy cooperative apartments? What are building conditions? Can a cooperative be built and operated at a cost that will be attractive when compared with rental charges for similar accommodations?

If the facts uncovered confirm the promoter's judgment as to the soundness of his proposed operation he should proceed at once to set up his project. These steps will serve the double purpose of a check-up on the wisdom of his undertakings and of providing sales equipment with which to seek funds. The following outline, though incomplete, indicates the type of essential information:



A sketch showing the various units of the Tilden Gardens, Washington, D. C., an apartment development for which Parks & Baxter were the architects, with Harry L. Edwards, associated. Although the land, comprising about five acres, was acquired and the general scheme planned at one time, units were built from time to time as the demand for this type of apartment increased

1. Determine roughly design and size of individual apartments.

2. Decide within what cost limits apartments must be priced in order to sell readily.

3. Select general locality in city best adapted to building of this type. This involves such factors as character of neighborhood, transportation, schools, churches, proximity to downtown centers, utilities available, ground costs, etc.

4. Pick out specific piece of ground on which apartment may be built. Size and shape of plot must be suitable to apartment house designing. Price must be right. Most important of all, owner must be willing to give an option on his property for not less than 90 days, for little or no consideration. If option cannot be obtained it is well to look elsewhere.

5. With option in hand, prepare sketches showing typical floor plans, public space and possibly one elevation.

6. Prepare estimate of cost of completed project. Such estimate should show: (a) price of ground; (b) cost of erecting building, including cost of financing, builder's profit, architect's fee, insurance premiums, legal fees, and other usual charges; (c) the probable carrying charges until apartments are sold.

7. Tabulate number and size of apartments in proposed building together with tentative list of prices to be charged for the various apartments. The proper pricing of a cooperative is a difficult job and one that can be accomplished best with the advice and aid of some experienced operator or realtor.

8. List the estimated annual operating cost, item by item. This estimate will provide a basis for determining the approximate yearly maintenance charge that must be paid by each tenant-owner.

9. Secure a conservative appraisal of the value of the completed project from some reputable authority. Two appraisals are better than one.

10. From the data available, prepare a neat prospectus to be submitted to possible sources of operating capital. This prospectus should contain:

(a) A brief digest of the results of your preliminary investigation with convincing data, opinions, and statistics.

(b) Description of land under option, with a copy of the option and a simple drawing showing the location of the plot in relation to the city, transportation, etc.

(c) Sketches showing floor plans, elevation, and public space. Outline specifications may be included.

(d) Detailed estimate of cost of completed project and list of estimated annual maintenance charges.

(e) Tabulation of number of apartments with prices suggested for each. Total sales value of apartments should balance estimated cost of project, with allowance made for carrying charges, sales expense, reasonable profit for operating capital, and for contingencies.

(f) Comparison may be made, in brief statement, between prices of apartments and the prices of corresponding properties; also between carrying and maintenance charges for such apartments, and rental charges in the same neighborhood.

(g) Copies of appraisals.

(h) Financial set-up showing cost of project, estimated amount that may be obtained on mortgage, and probable amount of operating capital that will be needed. For example:

TENTATIVE SET-UP

Costs	
Ground	$.....
Building	.....
Carrying charges, legal fees and other miscellaneous items	.....
Total Costs	$.....
Financing	
First mortgage (not more than 50 to 60 per cent of conservative appraisal of completed project)	$.....
Second mortgage (if any)	.....
Operating capital needed	.....
Total Financing (to balance costs)	$.....

If the promoter is in close touch with mortgage loan sources he may find it advisable to sound them out to see if they will consider a loan on the project. In most cases, however, lenders will give greater consideration and more favorable action on projects that come with the operating capital already arranged for.

It is not recommended that the prospectus contain any statements as to what operating capital may expect in the way of profits. This matter is better discussed in personal conference.

Cooperative Apartment Financing. Most conservative operations are financed with one mortgage, usually with an institutional loan made by some life insurance company. The amount of the loan seldom exceeds 50 to 60 per cent of the sound appraisal value of the completed project. Some operations carry second mortgages, often participated in by the owner of the ground or the builder.

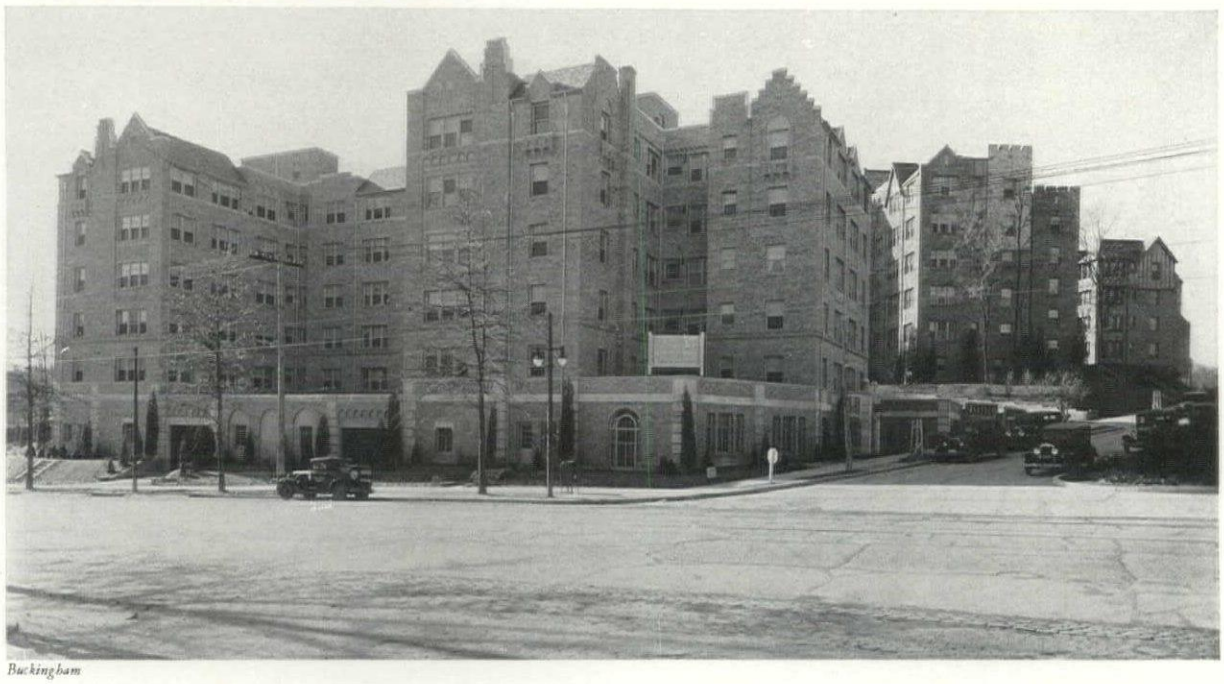
From the standpoint of the apartment buyer, less mortgage indebtedness means a larger cash payment for his share of the equity, but a smaller annual carrying charge. Many cooperatives have been sold on terms which permit buyers to amortize their equity payments over a period of several years. This privilege is made possible through arrangements concluded with the builder or with a finance company.

There is a variety of practice in regard to the length of term for which the first mortgage is placed and the type of loan used. Some projects use a building loan and replace it with a permanent mortgage upon completion of the building or shortly thereafter. Other operations are financed by means of a building loan which is later made into a permanent mortgage, running usually from three to five years. Another plan is to complete the building with funds supplied by the operating company and then to arrange permanent financing. There is a tendency at present to lengthen the maturity periods of cooperative apartment loans, these periods ranging up to ten years. This practice has the advantage of reducing refinancing costs.

Most permanent mortgages carry an annual curtail provision, generally one of 3 per cent. If the first mortgage does not contain this curtail feature a sinking fund should be set up in the annual carrying charges paid by tenant-owners. This arrangement insures refinancing at a reasonable rate.

The equity of the operation (the total cost less mortgage financing) is provided for by stock issue when the owning corporation is formed. One share of stock is generally allowed for each $100 of equity value. Each purchaser receives a number of shares corresponding to the sales price of his purchase. Annual carrying and maintenance charges are apportioned to the various apartments in proportion to the stock holdings of the owners. Besides receiving stock each purchaser is given a proprietary lease to the premises bought by him. This lease entitles him to possession of the apartment as long as the obligations imposed by the rules of the owning corporation are met.

What is sound financing? We may learn much from the experience of others. Here is a rule laid down by Albert W. Swayne of Chicago, a successful operator of long experience. He says: "My principle is that the equity price (the price in excess of the amount of the mortgage indebtedness on the property), plus the monthly assessment that will be paid by the purchaser of any apartment for a period of five years, will not exceed the normal rental value of the apartment over the same period of time."



Buckingham

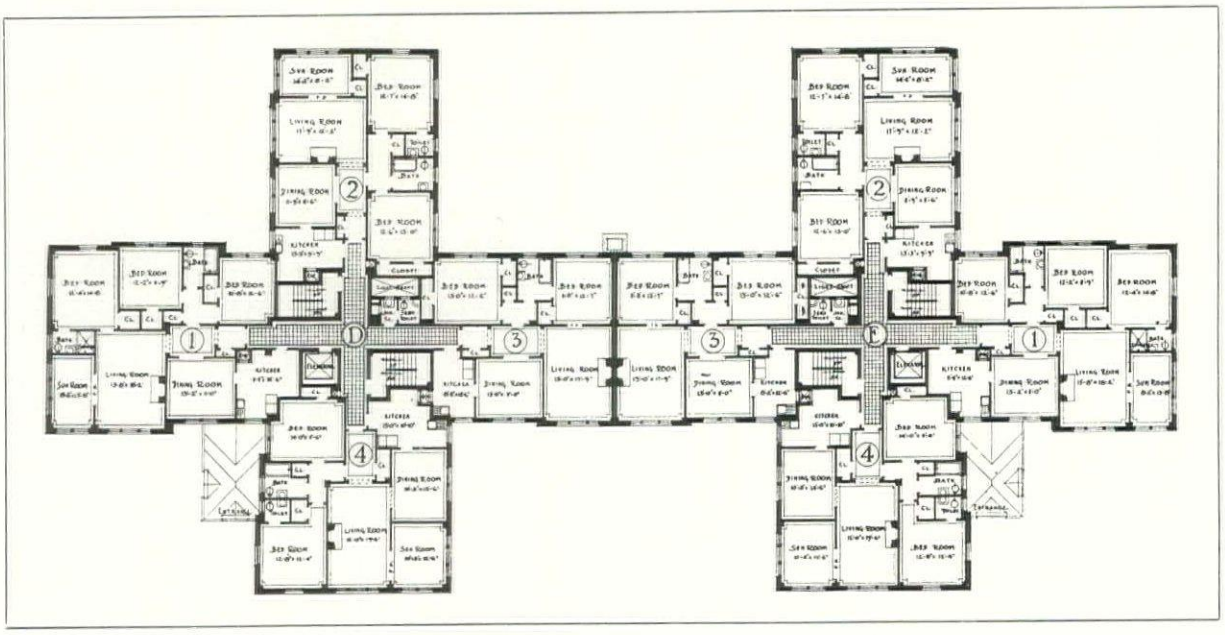
A view of one portion of the Tilden Gardens apartment development showing the advantage which was taken of the irregular contour of the land. The lower level of these apartment units has been utilized as a garage to accommodate tenants' automobiles

Buckingham

Organizing a Successful Cooperative. Probably the clearest method of illustrating the principal steps mentioned above will be to detail the organization of an actual project that has proved to be successful. Tilden Gardens, Washington, D. C., has been selected for this purpose. This operation was conceived and carried to completion by M. & R. B. Warren, builders. Parks and Baxter were the architects, Harry L. Edwards, associated.

In this case a block of ground comprising about five acres was acquired and the project developed by erecting, over a period of time, several units or buildings; the sale of one unit being well under way, or completed, before the next unit was started. One owning corporation was used for the entire operation, different series of stock being issued for the several units. The set-up below covers the "H" and "I" units of Tilden Gardens, the data being as of the date when the apartments were offered for sale.

Cost of ground and buildings	$625,000
First trust, due in about 2½ years, interest at 6 per cent	375,000
Equity, represented by 2,500 shares of no par stock	250,000



This picture, with that on the opposite page, illustrates a landscape treatment that is an important factor in promoting the desirability of an apartment location. More attention must be paid to the amenities of living in the planning of a cooperative apartment than is advisable in a project of another type. At the bottom of the opposite page is a typical plan for one of the apartment units

Buckingham

Each owner of an apartment was assessed each month, in advance, his share of the cost of operating the property. The estimated budget of operating expense is given below:

ESTIMATED BUDGET OF ANNUAL OPERATING COST

Taxes	$7,395.00
Fuel oil	5,000.00
*Management	2,000.00
Insurance	300.00
Electricity	1,400.00
*Wages for employes	1,800.00
Water rental	300.00
Corporation fee	16.67
Miscellaneous	2,788.33
	$21,000.00

* These items probably are below normal because the expenses of management and employes' salaries were shared by other units in the development.

The above units have been in operation about two and one-half years and the actual operating costs have closely approximated the estimate shown. Deficits in the budget are covered by assessment and surpluses are placed in a surplus account to care for contingencies.

The financial details of the sales plan are given in the schedule of prices and terms. The building in unit "H" has five floors, each floor containing the same number and types of apartments. Apartments are priced according to location. The schedule of prices for one floor sufficiently illustrates the selling method. (See page 406.)

The price of apartment No. 1, for example, was $15,000. Sixty per cent of this amount, or $9,000, was represented by this apartment's proportionate share of the mortgage on the property. The price of the equity was $6,000, which was sold for one-half cash, the balance being made payable at the rate of $45 per month. These payments will complete the amortization of this amount in about eighty months from the date of sale. Ability to offer these sales terms decreased selling resistance while the variety in size and price of apartments provided the salesmen with a more flexible offering.

Seeking Operating Capital. When the promoter has finished the set-up he faces the hardest part of his promotion job, namely, locating the operating capital with which to finance his project to completion. Few architects are in a position to do this financing from their own pockets. Funds must be sought elsewhere.

In looking for money it is well to keep in mind these two cardinal principles of success in securing investment funds: (a) *Know* your proposition, and (b) go to your prospect with a *definite* proposal showing just how he is to benefit from his investment. An analysis of a cooperative promotion suggests, among others, three possible methods of securing the required capital. These are:

1. The formation of a group of prospective cooperative owners. Not impossible, but rarely accomplished, especially if the proposed building is to contain many apartments. If this plan is used, sales agreements must be signed with a large majority of all purchasers before construction work may be started. In such cases the contract usually provides for a series of payments to be made as construction progresses. One promoter uses the following schedule: on signing subscrip-

First Floor Apartment No.	Shares	Price	Cash	Monthly Payment to Stock	Monthly Interest on Trust	Monthly Operation	Total Monthly Payment
1	60	$15,000	$3,000	$45.00	$45.00	$42.00	$132.00
2	62	15,500	3,100	46.50	46.50	43.40	136.40
3	46	11,500	2,300	34.50	34.50	32.20	101.20
4	32	8,000	1,600	24.00	24.00	22.40	70.40
5	32	8,000	1,600	24.00	24.00	22.40	70.40

SCHEDULE OF PRICES, BUILDING "H"

These prices are typical for one floor of a Tilden Gardens unit, and illustrate the variation in price according to locality, with the method of payment for a cooperative sale

tion, 10 per cent; when title to land is taken, 15 per cent; when foundations are completed, 15 per cent; when third tier of beams are in place, 10 per cent; when roof is on, 10 per cent; when building is enclosed, 10 per cent; when brown plaster is in, 15 per cent; and on completion, 15 per cent. If this plan is followed it is incumbent on the promoter to see that no risks are taken with purchaser's funds.

2. The organization of a syndicate. A more feasible plan, but not an easy one. Persons with interests related to the proposed project should be approached first. These include the owner of the ground to be used, the builder, property owners whose holdings might be benefited by the erection of the building, etc. When this list has been exhausted other persons with money should be seen, especially those familiar with this type of investment such as real estate operators, large property owners, etc. A syndicate subscription agreement should be drawn. Often one influential signer will bring others.

3. The securing of some financially responsible builder who, because of his interest in doing the construction work, will consent to finance the undertaking. This is the simplest method, and it is the best one because it necessitates selling the idea to but one prospect. This method is particularly well adapted to the use of the architect-promoter because he is usually well known to most of the larger builders in his community.

Selling the Apartments to Ultimate Owners. The promoter's work is well advanced when his project is set up and the financing arranged. However, the promotion of a cooperative apartment is, in a way, a double-jointed operation. First, the building must be erected, but the apartments must be sold and the operating capital returned before the promotion may be called entirely successful. To this extent the promoter has a moral obligation to assist in the sale of apartments. The architect-promoter is in a peculiarly favorable position to help in selling work for not only will he design the building itself but often he will be called into sales conferences to discuss with prospective buyers the details involved in finishing up the interiors of apartments in which they may be interested.

Early sales, before the building is completed, are desirable. These sales not only relieve the financial burden of construction but purchasers often become volunteer salesmen. Sales once started may be made only to those persons who have been approved by tenant-owners who have already bought. A building whose completion date comes about the time when apartment rental leases expire is easier to sell because purchasers may take up their new quarters without becoming involved in lease complications.

It has been found that advertising, attractive sales literature and other selling aids are a good investment. In figuring the costs of the project, from three to five per cent should be allowed for selling expense where the bulk of the sales are to be made by others than the promoter and those associated with him in the erection of the building.

The usual selling arguments for the cooperative apartment are:

1. In the long run this arrangement is much less expensive than renting.

2. One's investment increases in value, thus providing a speculative element.

3. In a cooperative, one may choose his immediate neighbors.

4. The bother and care of upkeep and maintenance of the home is transferred to the management of the apartment.

5. There is the pride of ownership in occupying a home in a cooperative apartment.

THE STORY OF ROCKEFELLER CENTER

VI. THE STRUCTURAL FRAME OF THE INTERNATIONAL MUSIC HALL

H. G. BALCOM
STRUCTURAL ENGINEER

ALMOST any theater is an interesting problem to a structural engineer. Even the smallest has its complications. Far from being an exception, the International Music Hall in Rockefeller Center offered more than its share. In addition to its size, there were many unusual requirements, some of which were absolute innovations in theater design.

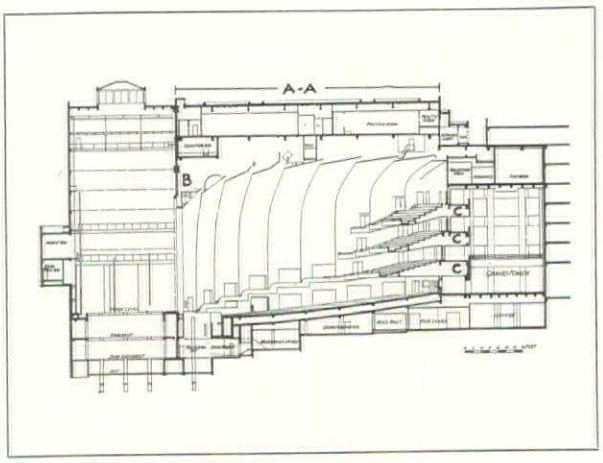
Generally speaking, the structure is composed of a 30-story office building and a theater having a seating capacity of slightly more than 6,000 persons. The main entrance, the grand foyer, the elevators serving the theater, the lounges, smoking rooms, powder rooms, etc., are all contained in the lower portion of the office building. The steel columns which support the east side of the office building also serve as supports for the rear of the theater. The office building, however, does not extend over any portion of the theater auditorium proper.

Wurts Bros.

Progress photograph of R-K-O office building, with steel erection almost completed, and of International Music Hall, with the orchestra framing finished

Foundations. Fortunately, the foundations offered no difficulties, because solid, hard rock was encountered a short distance below the natural surface. It was, therefore, possible to support the columns on short, concrete piers of slightly greater area than the grillages or bearing plates. With the exception of the two columns which support the proscenium truss and a large part of the roof and studio floor framing, and the columns at the rear of the auditorium which support the main trusses over the auditorium and also part of the office building adjacent, none of the column loads was unusually heavy. The proscenium columns, which were the heaviest, carried a load of slightly less than 7,000,000 pounds each; and the columns at the rear of the auditorium carried loads of between 5,000,000 and 6,000,000 pounds.

Auditorium. The main auditorium is approximately 175 ft. from the curtain line to the rear wall of the theater, and is about 200 ft. wide. The roof over it is supported on heavy trusses. Four of them extend the full length of 175 ft., and two others, one on each side, have a 140 ft. span. They weigh 260 and 215 tons each respectively, and have a depth of 29 ft. from center to center of chords. To erect the trusses, a special steel tower had to be built in the middle of the main auditorium. The tower will act as a temporary support for the middle portion of the trusses until they have



Longitudinal section, showing position of trusses. A-A indicates span of the 6 roof trusses; B is the proscenium truss; C the cantilevered mezzanine trusses

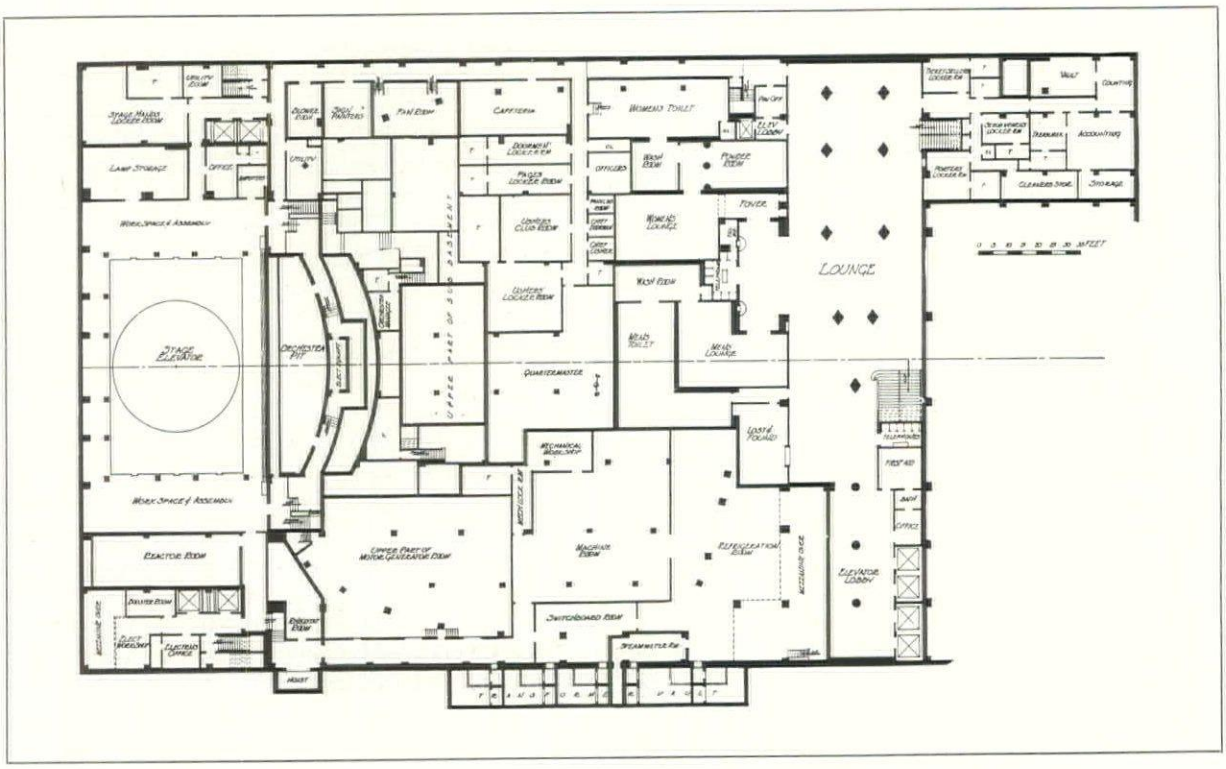
been fully assembled and riveted into place, after which it will be removed, and the steel used in another building in the Center.

The depth of the trusses made it possible to include, over the auditorium, an additional floor which is supported on the trusses about 10 ft. above the lower chord. This floor is to be used for rehearsal and broadcasting studios.

Made up of segments arched across the auditorium, the hung ceiling is a rather radical departure from ordinary construction. The segments overlap each other, with a space of about 2 ft. between them, which form coves for concealment of lighting. Due to the extensive area of the ceiling, it was necessary to hang from the trusses a sub-frame of structural steel completely across the auditorium from which the ceiling could be hung and constructed.

The auditorium floor was of the usual dish-shaped type. It was framed by spacing columns about 20 ft. apart in east and west direction, and in varying spacings from 17 to 23 ft. in north and south direction. The north and south line of the columns was placed on arcs of the same radius as the seating of the auditorium. The beams were framed on the center line of columns in both directions; and a two-way concrete slab 8 in. thick was used to form the floor construction. Below the auditorium is the plenum chamber, approximately 4 ft. deep, which also has an 8 in. slab at the lower side similar to that of the auditorium floor.

Stage and Orchestra. The stage is 135 ft. wide and 60 ft. deep, with a proscenium opening 100 ft. wide and 60 ft. high. The truss over the opening has a span of 110 ft., is 36 ft. deep, and weighs about 260 tons. It supports the ends of two main



Plan of the first level below ground. The lounge is to be connected by an underground passage of the Forum. The diamond-shaped columns are to be sheathed in mirrors. The level below contains additional mechanical equipment

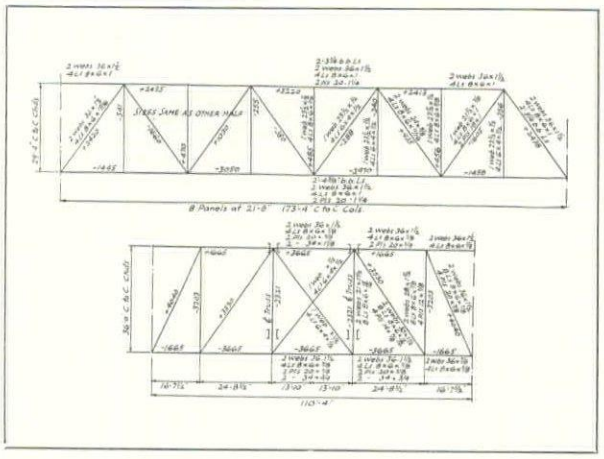
roof trusses, part of the stage roof, the gridiron over the stage, the 12 in. brick wall between the auditorium and the stage, and the double leaf steel and asbestos fire curtain.

Provision for the movement of the "band wagon," which may be transported to a position in the orchestra pit, or on to the stage itself complicated the stage framing considerably. In order to do this, it was necessary, of course, to provide an opening the full width of the orchestra pit (about 70 ft.) underneath the stage. The front part of the stage had to be supported on girders spanning across the clear width of the required opening for the band wagon. It was necessary, further, to install a rigid fire curtain below the stage to cut off this opening at all times except when the band wagon was being moved.

Since the orchestra pit and stage elevators are of the plunger type, the weight of the elevators did not have to be supported by the structural frame.

The roof of the stage is supported on plate girders spanning from the front to the rear of the stage. From the girders is hung the gridiron. The rear wall columns are made up of 30 in. rolled girder sections in order to get sufficient stiffness for the immense unsupported height of the wall.

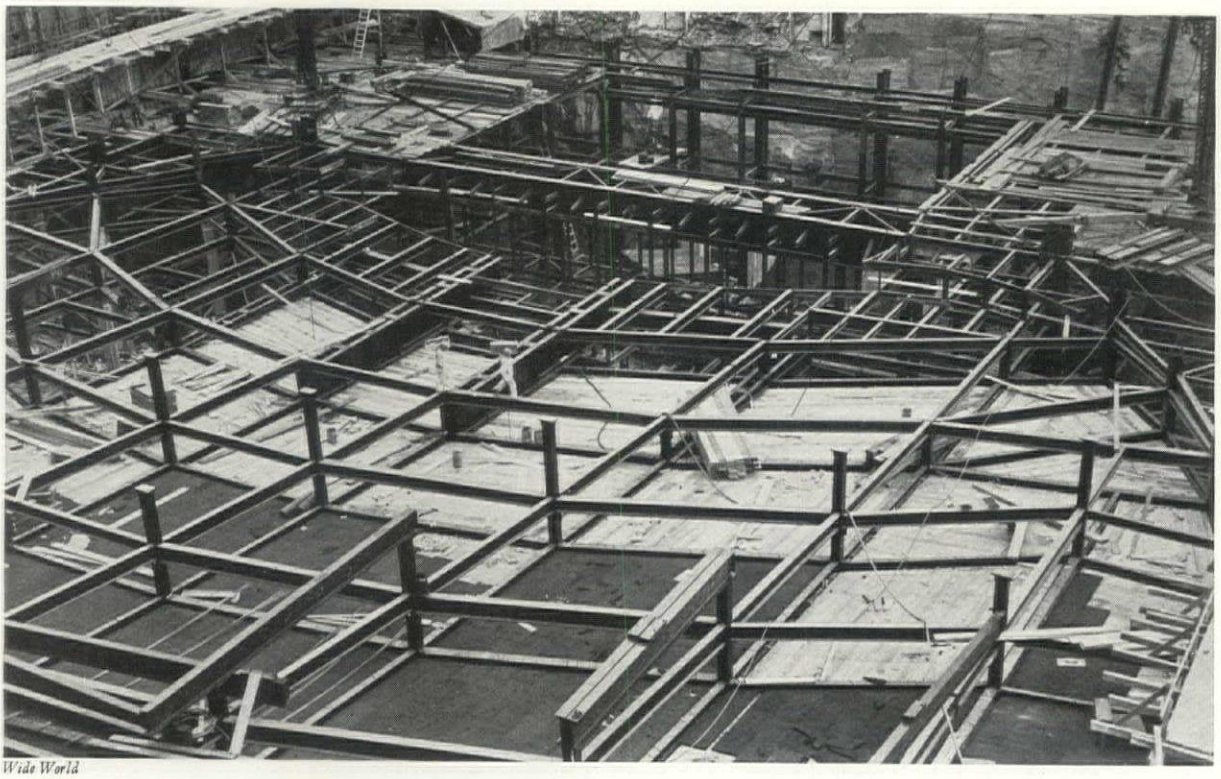
At both sides of the auditorium there are runways which extend from the stage level along the



Diagrams of two trusses. The upper one is an auditorium roof truss, and weighs approximately 215 tons. The lower one, the proscenium truss, weighs 260 tons

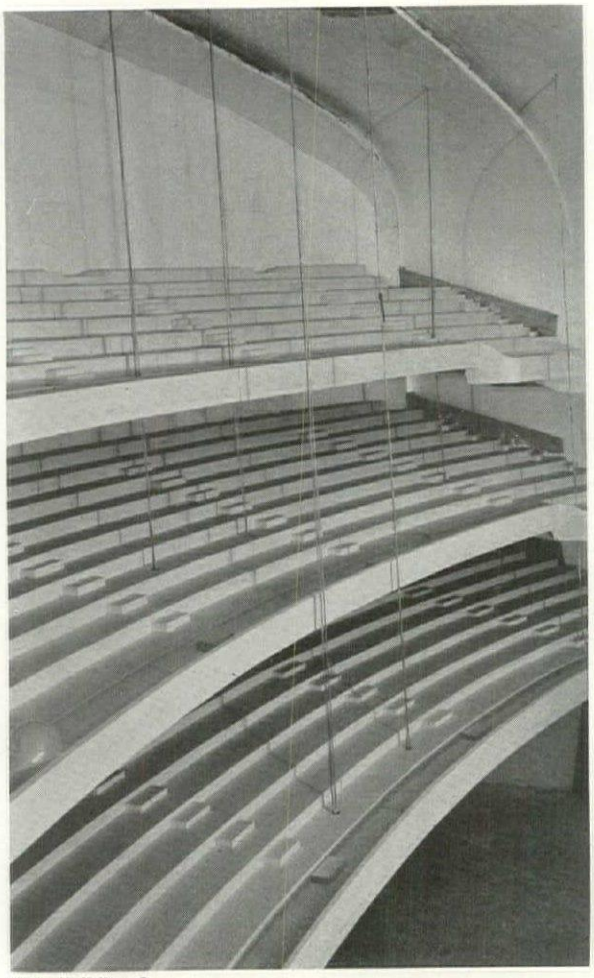
auditorium walls to the first mezzanine level. The runways are arranged in a series of platforms connected with short flights of steps. The framing for them was supported on cantilever brackets, riveted to the face of the columns, and involving considerable bent and special work.

Foyer and Mezzanines. Extending across the rear end of the auditorium, the grand foyer is 40



Wide World

Section of the framing for the dish-shaped auditorium floor and plenum chamber. The size is suggested by the workmen in the center. The stage opening for the elevators necessitated the heavy girder supporting the stage



Walter H. Kilham, Jr.

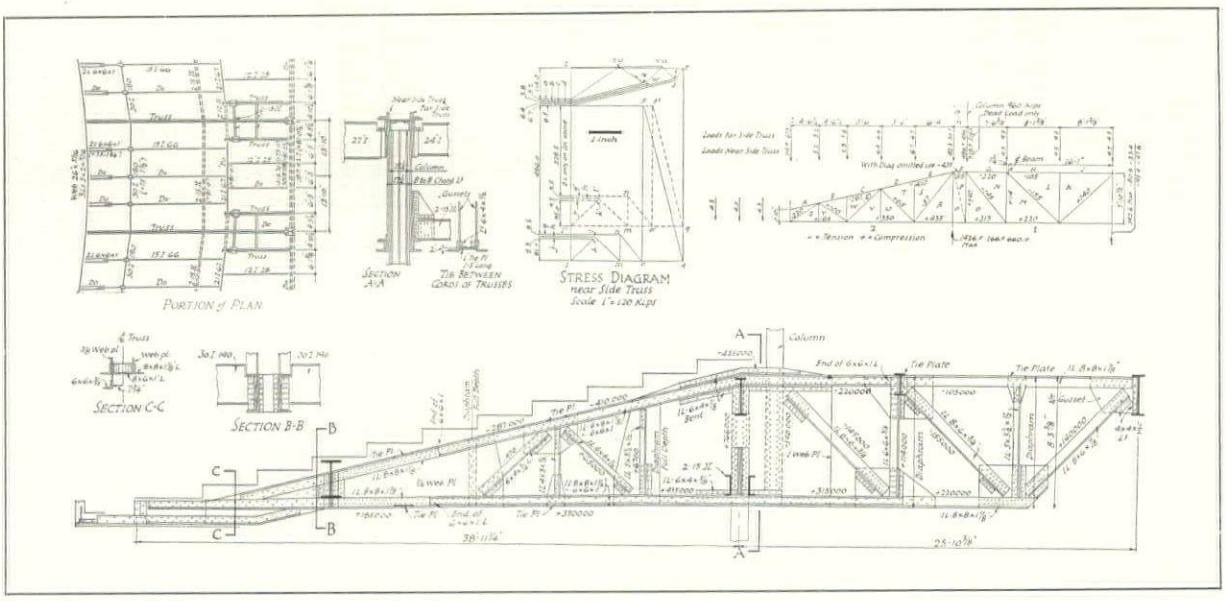
Mezzanine portions of the large model. The supporting rods will not, of course, be present in the building

ft. wide, and 80 ft. high in the central portion. Over the ceiling of the foyer are trusses two stories deep, which carry 25 stories of office building above.

The three mezzanines extend across the entire width of the auditorium. They are carried on cantilever trusses which are supported on columns at the rear of the auditorium seating space. The overhang of the cantilever truss in the lowest mezzanine varies from 38 to 45 ft., and is only slightly less for the upper mezzanines. The mezzanines were made as shallow in vertical depth as it was reasonably possible to make them from a structural standpoint. This was done to keep the sight lines as low as possible.

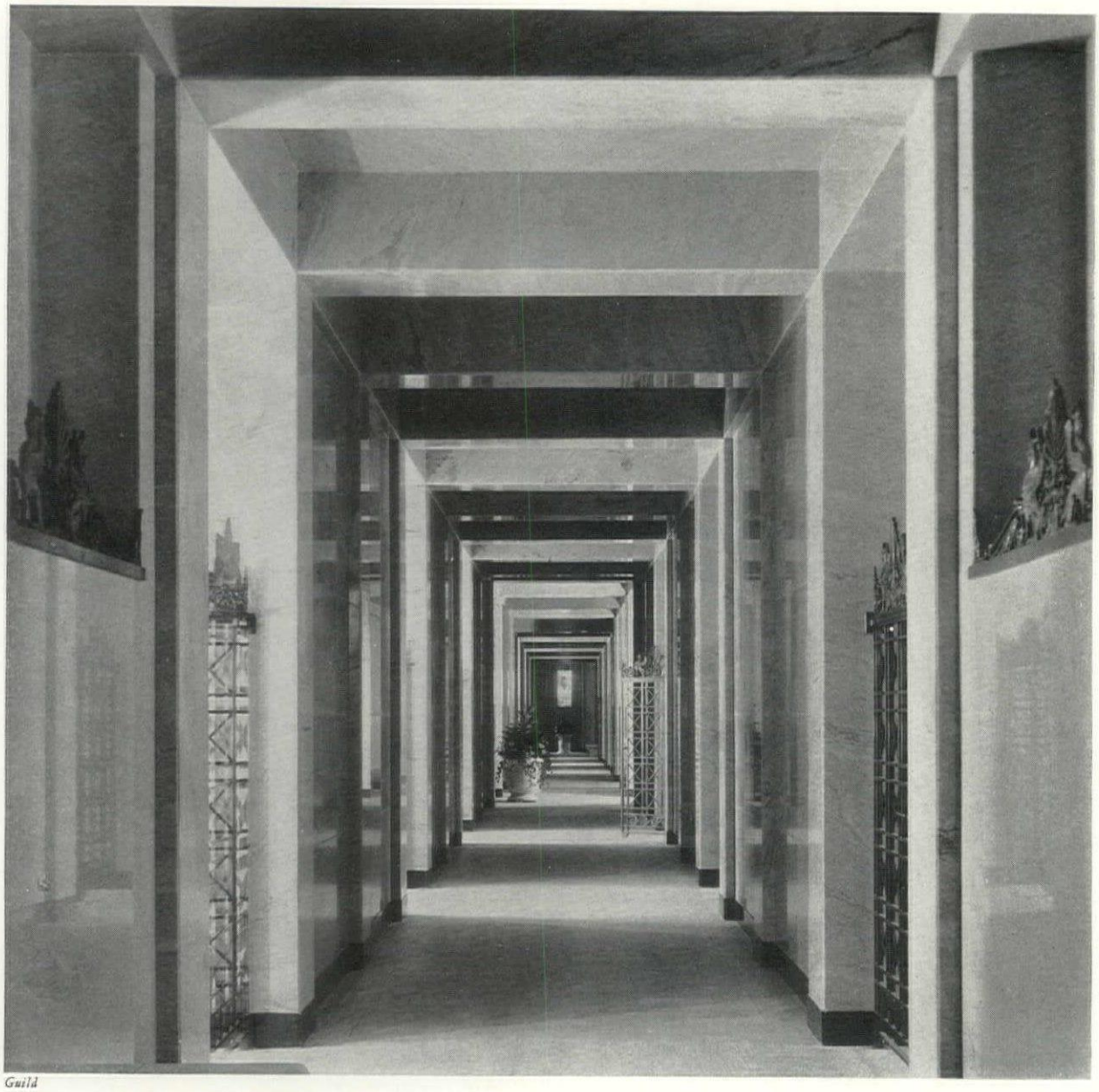
This type of construction was made possible by the fact that the columns receiving the upward thrust from the end of the anchor arm of the cantilever trusses were very heavily loaded by the office building which they also supported. No special anchorage, therefore, was necessary. There are six trusses in all, supplemented by the type of framing shown in an accompanying illustration.

Conclusion. The structural design was rather unique as a whole because the important structural members, the trusses, had to be very heavy to support great weights and to span long distances. A further reason for their weight was that the entire roof is to be landscaped with gardens and fountains, thus adding greatly to the dead load. Earth 30 inches deep in some places, in which trees 30 feet high will be planted, had to be figured in the loads. All these elements combined to make it an unusual problem.



Details of the framing for the mezzanines, showing the assembly of a cantilever truss, stress diagram, and a section of the floor framing. The heavy load on the supporting column permitted the long unsupported overhang

THE FORUM OF SMALLER BUILDINGS



Guild

A NEW-BUSINESS OPPORTUNITY

A SURVEY OF THE COMMUNITY MAUSOLEUM

ILLUSTRATIONS OF FIVE OUTSTANDING MAUSOLEUMS WILL BE FOUND ON PAGES 373 TO 384

THE COMMUNITY MAUSOLEUM

BY

MORGAN G. FARRELL

Public acceptance of the community mausoleum offers the architect a new opportunity in the three departments of his profession: design, engineering and business. The field of mausoleum design is a comparatively free one and much work may still be done toward the development of standards in planning and construction. The facts presented in this article have been compiled from many sources.* They represent the best current practices and will serve as a basis for further investigation

A COMMUNITY mausoleum is neither a receiving vault, in the ordinary sense, nor a crematory or columbarium. It is a structure of permanent crypts or catacombs built above ground instead of below. The purpose is to provide a sealed and permanent crypt for sepulture instead of a grave or tomb. This plan has much to commend it. A private mausoleum costs, without the plot, at least $10,000; a single crypt in a community mausoleum, however, costs from $500 up, including permanent maintenance, an appreciable item in the case of private plots.

The present status of design of this type of building appears to be a compromise between an idea of great antiquity and an application of modern materials. Since the structures are intended as permanent resting places for the dead, many of the details of construction and equipment now in use cannot be regarded as conclusive. The life expectation of all parts of the building should be unlimited. Therefore, only such materials, workmanship and engineering should be employed as may be expected to resist the ravages of time.

The Financial Set-up. Formerly, cemetery companies put up the mausoleums on their own property and with their own funds. The larger buildings, however, are usually financed in other ways. Although a five thousand crypt mausoleum costs from $1,500,000 to $2,000,000 to build, the financing of the best examples of the community type is relatively easy. It is similar to that of the cooperative apartment in that the maximum amount of capital is required only for a very brief time. The contingent sale of crypts starts while the project is still in the preliminary plan stage, the commitments of the purchasers providing that payments shall be made as the work of the building progresses. This plan makes a considerable sum available to meet construction costs, for, unless a sufficient number of commitments come in during the promotional period, the project would not proceed. The plan, therefore, should commend itself to most of the accepted methods of building finance.

Here is the problem as the owner puts it, using instance figures: "We think we can sell 5,000 crypts and urns in this community. We can appropriate $500,000 to initiate the project and carry it to the point at which sales receipts will take over the load. Plan the building accordingly."

The architect may be sure that the number and arrangements of the crypts, urns and private rooms will be constantly changing. Consequently, the plans will change and arrangements may even be made to complete part of the building only, the remainder to be added in stages.

The two most formidable conditions of his problem are flexibility in design and durability of construction.

Crypts Control Layout. The crypt is the unit of measurement by which the entire plan is laid out. The number in a vertical tier determines the floor heights of the building; their placement longitudinally or transversely determines the widths of the body, wings and pavilions, and the length dimensions of the plan. Finally, the external length of the crypt establishes the clearance in both directions of the supporting columns, hence the column centers. Aisle widths vary between 5 and 10 feet.

Specific inside dimensions of crypts to accommodate standard caskets are: height 2 ft., 2 in.; width 2 ft., 8 in.; length 7 ft., 6 in. Assuming that the thickness of the top, bottom, sides and ends of each crypt compartment is 2 in., the center to center dimensions of crypts are: height 2 ft., 4 in.; width 2 ft., 10 in.; length 7 ft., 8 in.

Thus, if the crypt tiers are five high, the height of the stack would be 11 ft., 10 in., which would be the minimum clear floor height. Practically, two to six inches or more should be allowed for clear-

* Particularly in this connection from William S. Mershon of The Structural Slate Company who assisted in the compilation of data regarding crypt layout and construction.

ance above the stacks. To accommodate crypts lengthwise, the clear distance between columns could be 7 ft., 8 in., but to allow three to be placed side by side would call for 8 ft., 8 in. Accordingly, a center spacing of 10 ft. has been adopted by several leading designers. This leaves room enough for a column 16 in. square which is ample for the first tier of a three-story mausoleum.

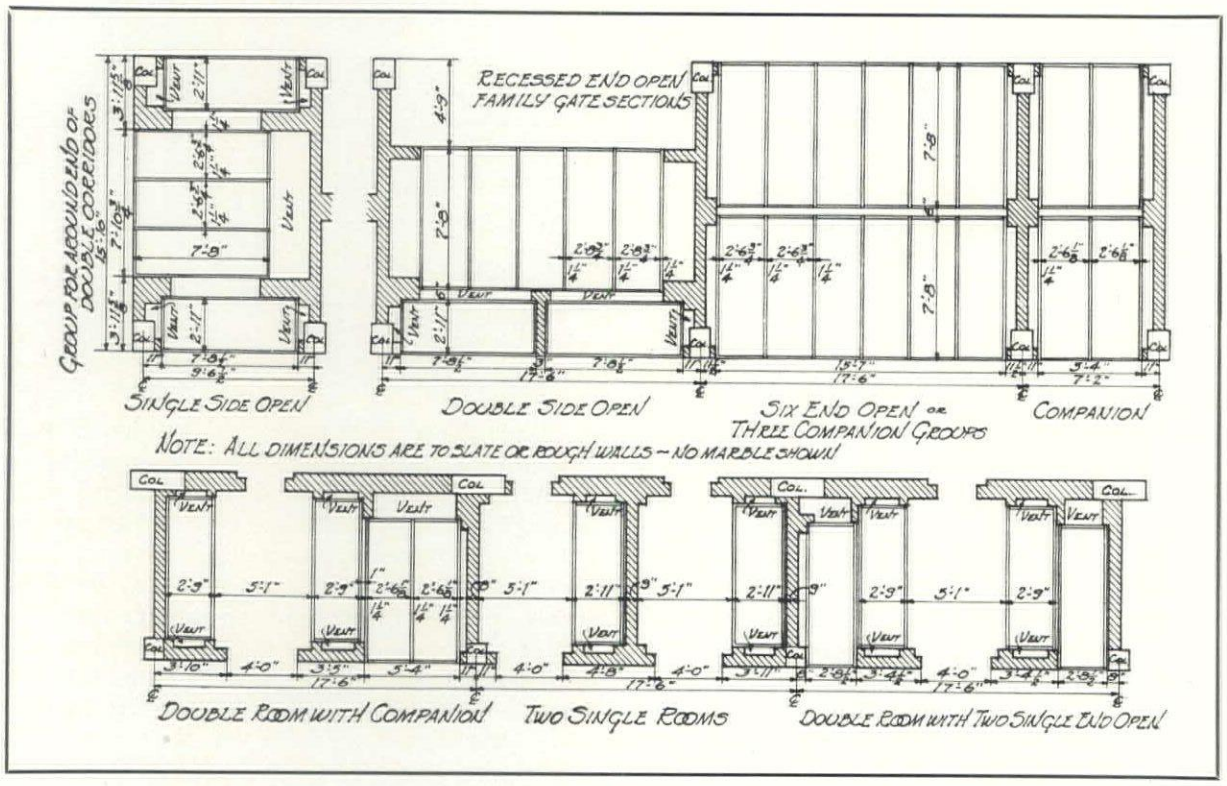
The plan of White Chapel Mausoleum, Detroit, illustrates an excellent flexibility of crypt layout. The crypts are built independently of the building structure and the following combinations of units are possible between columns: (a) two sections of six end-opening single crypts, (b) three pairs of companion crypts, (c) two banks of side-opening crypts recessed to form a family section group, (e) a double private room with companion crypts adjacent, (f) two private rooms, (g) a double room with end-opening, single, family sections.

Crypt stacks are usually five high. They are seldom higher for two reasons. One is that considerable structural reinforcement would be necessary in the stacks to support the extra load. The other is psychological: people prefer the compartments nearest the horizontal plane of vision. Otherwise there is no objection to lofty halls with tiers up to twenty high, if proper footings can be provided to support the great weight.

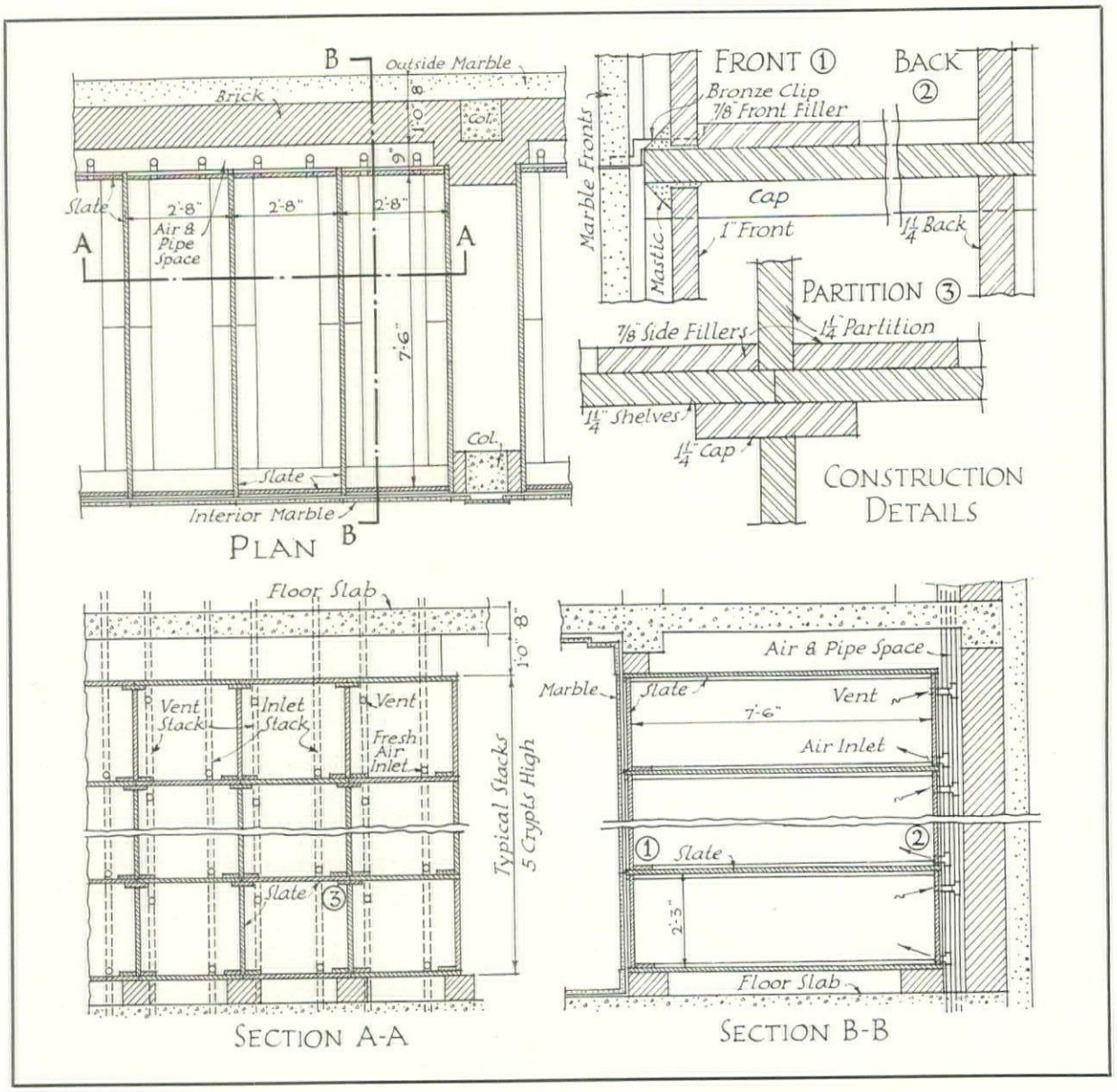
Crypt Construction. The tiers of crypts (also called catacombs) should be constructed independently of the building structure. The crypts themselves must be built moisture- and air-tight of strong, durable materials. Many crypt tiers have been built of monolithic reinforced concrete, poured in place. Concrete of a rich composition (1:2:4) is sufficiently permanent if the best cement and the cleanest sand and crushed stone are used, thoroughly mixed with the correct proportion of pure water, and if the mixture is properly reinforced and carefully poured. The system has the disadvantage, however, of inflexibility.

Crypts are being constructed while the sale of space is proceeding. It is impossible to foresee the demand and the best form of construction is that which can be erected quickly and in which alterations of arrangement can be made. The monolithic method is not adapted to these possibilities.

Slab construction, however, complies with all requirements. The slabs may be of precast, waterproofed concrete or of some other strong and impervious composition. Or they may be of a strong, natural stone which can be cut into thin sheets, such as slate, marble or bluestone. Slate is in many ways the ideal material. Slabs, 1¼ in. thick, with a sanded finish have proved satisfactory. The weight is low; the coefficients of expansion



Various crypt layouts, showing a maximum of flexibility between structural supports, to permit a last minute change in layout. This system was developed by Alvin E. Harley, architect, with C. Kenneth Bell, associate, and has been used in the White Chapel Mausoleum at Detroit



Typical crypt layout and construction details for stacks independent of the building structure

and absorption are negligible and the combination of high strength, durability and finish are equalled by few other suitable materials. Metal is out of the question. The life of steel is too short and the cost of bronze too great.

The construction of slate crypts is quite simple as the cuts show. The joints are made square and filled with plastic asphalt by means of hand pressure guns. This material is elastic, adhesive and air-tight.

The Building Structure. The best possible materials and the closest field supervision should be specified for every portion of the building if the desired result of permanence is to be attained. Foundations, wherever possible, should be laid on bedrock and every precaution taken to insure their absolute stability. The building frame, including columns, girders and floor slabs, should be of reinforced concrete, preferably of a 1:2:4 mixture.

Particular attention should be given to the placement of the reinforcing steel and the subsequent pouring of the concrete. In large buildings reinforcing for the columns should be prefabricated of structural sections. In girders and spandrels deformed bar reinforcing is adequate, but the design should be shop fabricated, all joints being welded. Adequate overlapping of reinforcing steel should be provided at every structural connection, preferably spot welded to assure proper placing.

The rough enclosure may be brick, structural tile or reinforced concrete Although normally

faced on both exterior and interior with a finish material such as marble or granite, there is no structural reason why brick or concrete could not be used as a finished surface as well as a backing. Since moisture promotes decay, waterproofing is necessary. It should take the form of an integral waterproofing compound in *all* concrete or a waterproof membrane in all exterior walls and floor slabs which rest on the ground. If the outside walls are faced with any but impervious masonry, they should receive a surface application of a guaranteed and colorless waterproof liquid coating.

Flat slab floor construction with two or four-way reinforcement is both strong and economical. When columns are set at 10 ft. in each direction, shallow girders across the column heads with a thin slab (about 5 in.) having two-way reinforcement and forming a countersunk panel or ceiling vault are highly satisfactory. This construction is economical, strong and suitable as a base for ornamentation.

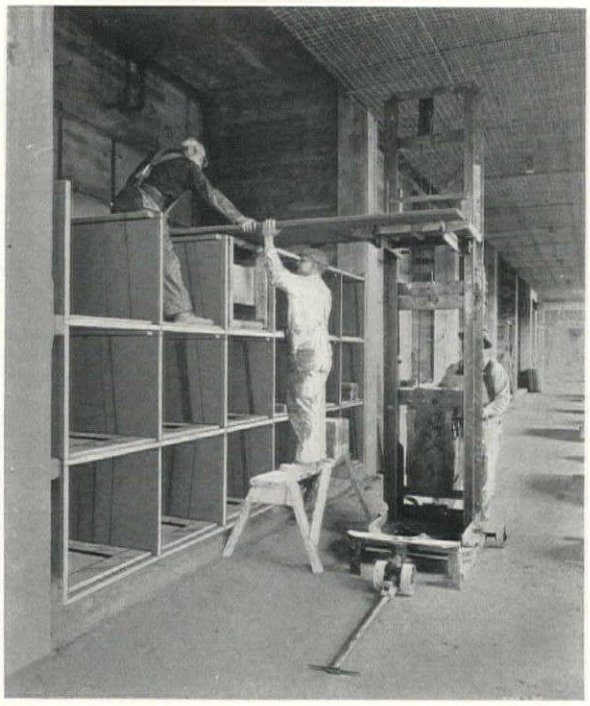
Whatever material may be used, the weight of a five high stack of crypts and the contained caskets is considerable — about 250 pounds per square foot of floor area. The concrete may be roughly calculated on this basis, though a careful check of all weights should be made in each case, for this is an actual and not a theoretical load as in most buildings.

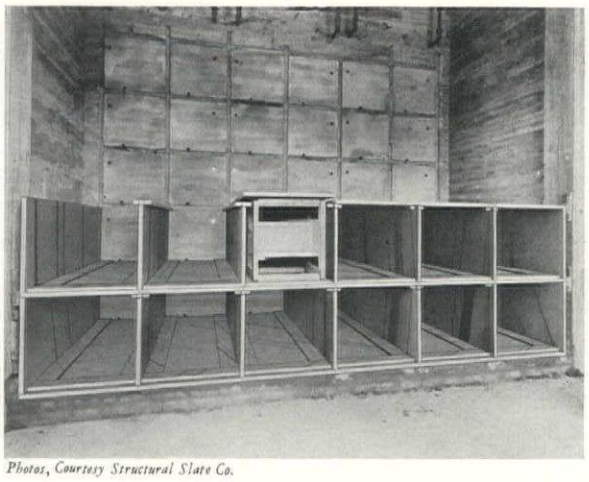
Stairways are usually of reinforced concrete with marble treads and balustrade. Elevator enclosures and partitions around offices and service rooms may be of concrete, brick or hollow tile. For flat roofs the best built-up guaranteed roofing obtainable should be used and copper, zinc or lead employed for flashing.

The stone with which the exterior is faced should be of tried durability. Granites and marbles are most commonly used but they should have a known record of weather resistance. In setting, only the best cement mortar (1:2 to 1:3 mixture, waterproofed) should be used.

Most of the best known contemporary mausoleums in America are finished throughout the interior in white marble with colored relief, applied to the concrete with cement, and anchored every 2 ft. by bronze bolts or strips. The floor finish is usually of honed marble or travertine. Although not extensively used at present, tile is particularly adaptable as a finish material throughout the mausoleum. Ceramics, quarry tile, faience, mosaics and terrazzo are all suitable. They are permanent in structure, easily installed and are susceptible to a wide range of colors and designs.

All architectural metal work is usually of cast or wrought bronze, though any metal of equal permanency might be employed. This includes grilles, gates, railings, sash and window frames, door and door frames, saddles, brackets, hardware and lighting fixtures. Clear glass, in lighting fixtures is seldom used. Windows are few since much daylight is unnecessary and are often glazed with leaded stained glass. It is not uncommon for private rooms to place stained glass windows in blank recesses, lighted from behind.

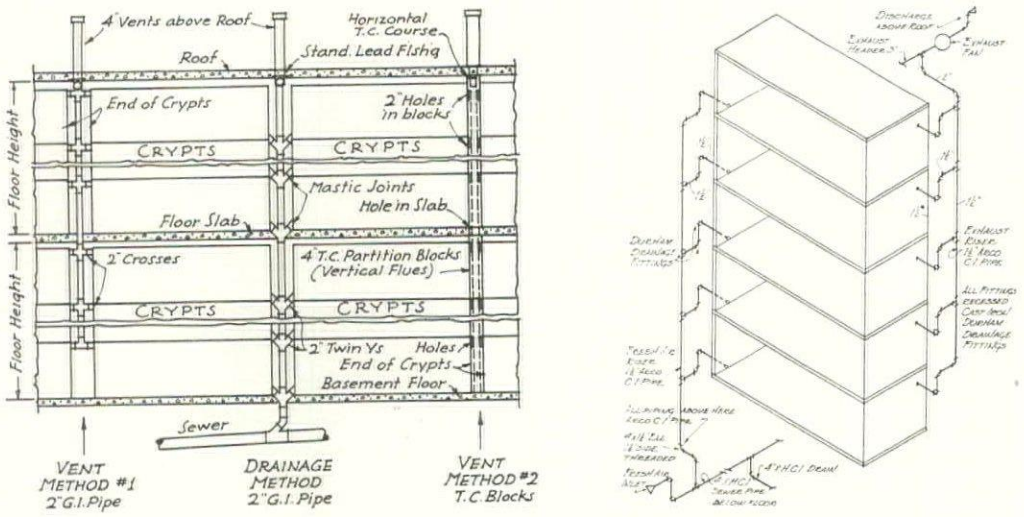




Photos, Courtesy Structural Slate Co.

Two views during the construction of crypts based upon the system shown on the opposite page. In this case the crypts are rabbetted into the concrete at the rear. Free standing tiers are preferable

Plumbing. Two toilet rooms should be provided equal to the usual public building standard. All concealed pipe (water, vent, soil, leader and drain) should be the best of its type: brass, copper, wrought or cast iron. Specifications should call for the heaviest weights, the most durable joints,



Methods of draining and ventilating hermetically sealed crypts. The drawing at the left illustrates two simple ways of venting and a common method of crypt drainage. The one at the right illustrates the preferred method which has been used in the White Chapel Mausoleum at Detroit. The importance of good construction in drainage and ventilation cannot be overemphasized

with the most careful workmanship and field inspection. This is absolutely essential to insure permanence as is the provision of oversize pipes, numerous clean-outs and ready access to shut-offs and traps.

There may be an important adjunct to the plumbing system that is peculiar to mausoleums. The laws of some States and cities require that each crypt should be drained and vented. This is effected by two independent systems of concealed piping. There is a 2 in. pipe connection to the top of the remote end slab of each crypt for ventilation and another at the bottom for drainage of any condensation. The vent system with its risers and headers discharges above the roof through 4 to 6 in. stacks like those of the plumbing system. The discharge is often aided by a small exhaust fan located near the discharge and of an exhaust header, servicing several independently vented tiers of crypts. The drainage system discharges to the sewer through a form of non-return trap or check. Water seals are useless in this work. The pipes should be of wrought iron or other non-corroding material, and the connections to the crypts sealed with plastic asphalt. Lead flashing and sleeves are placed at the point where the vent pipes pass through the roof.

There is a sharp difference of opinion as to the necessity for such drainage and ventilation.

Heating. The net volume to be heated in a mausoleum is not great, for the crypts require no heat. Radiators are few and are recessed at the ends of corridors and in the entrance hall and chapels, usually behind metal grilles. The plant may be a small, low-pressure steam or vapor boiler located in the basement. The system should be automatic with oil-burners, thermostats and a vacuum return system. The temperature is kept at 70° but can be regulated at a thermostat near the superintendent's office. Wrought iron concealed pipe is used with forged fittings and bronze valves and traps.

Some form of heater for hot water for the lavatories should be provided.

Lighting. The lighting requirements of a mausoleum are also comparatively simple. High intensity of illumination is not only unnecessary but in most cases undesirable. The fixtures and the wattage in the offices and service rooms may conform to current practice for rooms of this type. An allowance of 1½ watts per sq. ft. of area provides a satisfactory intensity.

Corridor lighting with an intensity of about 1 watt per sq. ft. of area is usually sufficient. It is commonly provided by ceiling clusters, enclosed by flush type opaque or colored globes and placed at intervals of about 20 feet. It is customary to control the corridor lights by gang-switches at the head of the stairs or near the elevator if there is one, so that part or all of the illumination may be controlled from a central point. The ceiling candelabra or bracket lights of the private rooms are controlled by local switches on an adjoining column or wall panel.

Lighting in the main lobby and the chapel may be anything the designer wishes. The only control-

ling consideration is a minimum intensity of ¾ watt per sq. ft. of area. Even this might vary considerably if a system of changing intensities and colors, controlled either manually or automatically, were installed.

Since the lights are few in number, there is usually no need for a distributing panel on each floor unless required by ordinance. The gang-switches provide centralized control so that only one master panel is required. It may be placed in the office or in the basement. The power control may also be located in the basement since the power demands are simple, involving only the elevator, the pump and a few outlets for a portable vacuum cleaner, which should be placed at convenient points in the offices and chapel. Wiring should be best grade rubber covered conductor in rigid conduit, buried in the concrete or concealed behind the finish material of ceilings or wainscots. Lead covered wire would be still better.

Crematories and Columbaria. Columbaria for the reception of cinerary urns are invariably provided in modern mausoleums. They are an important economic factor. Their number varies with the available space and public demand. The urns may be any size from small, bronze receptacles of about 100 cu. in. capacity to elaborately carved alabaster vases 30 in. in height. The columbaria to receive them may be stacks of rectangular compartments 10 by 14 in. by 10 in. deep, with or without plate glass doors having bronze frames and locks. The shelves are usually of marble, 1¼ in. thick. Or they may be huge, carved, altarlike structures with marble shelves and stiles 3 in. thick with a heavy face pierced with arches. The compartments in this type of columbarium vary in size to 2 by 3 ft. by 2 ft. deep.

The columbaria are placed in entrance halls and corridors against piers or blank parts of the wall, utilizing space otherwise wasted. Sometimes entire rooms are assigned to them in which case single stacks are placed against the walls and double stacks in the center of the room, much like bookcases in a library. The aisles are about 4 ft. wide.

A fully equipped mausoleum will have a crematory in the basement. This is an oil-fired furnace with a brick setting which can be purchased as a unit from the manufacturers. It occupies about 8 by 16 ft. floor space and must have about 8 ft. of clear room at one end. A flue about 12 by 24 in. is usually built under the floor, at the rear, and a fire-brick stack of the same area must be provided to a point about the roof parapet.

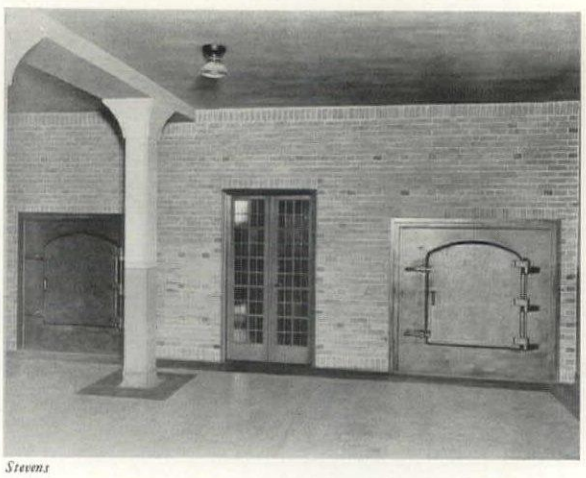
Other Mausoleum Requirements. Items often included in a mausoleum are:

(a) CHAPEL. When the entrance hall is not to be used for funeral services a separate space is provided. The finish and equipment depends upon denominational type. Usually included are pews, lectern, chancel, catafalque, organ and loft, a clergyman's room and an anteroom.

(b) OTHER ROOMS. One or more reception rooms, a superintendent's office, locker and service rooms, cleaners' closets and a shop are almost always provided. Storage space for a portable elevator used for raising caskets is also necessary. A flower case is sometimes built in the main hall.

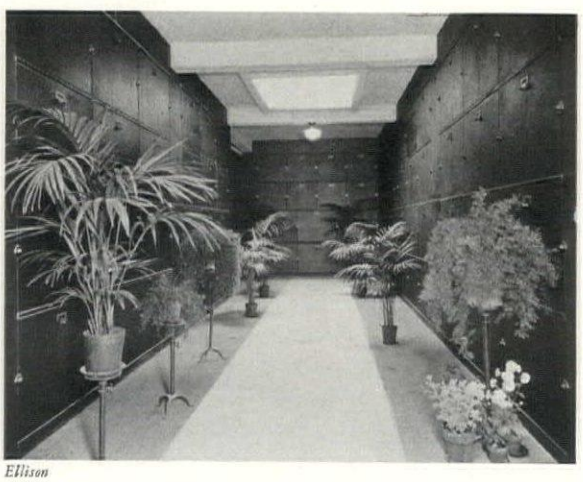
(c) ELEVATOR. In large structures a passenger elevator with an 8 ft. square platform is required. It should run from the basement to the top floor, with access from the main lobby.

(d) HEARSE ENTRANCE. This should be located at the rear of the building so the casket can be removed to the chapel unseen by the mourners. It is generally in the form of a porte-cochère and may be fitted with garage doors.



Stevens

A view of the basement workroom and the crematory chamber doors of White Chapel Mausoleum



Ellison

A basement corridor with receiving vaults having slate fronts, in the White Chapel Mausoleum

SUPERVISION OF CONSTRUCTION OPERATIONS

BY

WILFRED W. BEACH

CHAPTER 30—COMPLETION AND ACCEPTANCE

AS EACH contract nears completion, its two major concerns to the conscientious superintendent are whether or not it has been executed in all respects in accordance with contract requirements, and whether or not the contractor is paying his bills. The difficulties that are to be anticipated in connection with this latter subject were discussed in some detail in Chapter 14, Job Progress, in THE ARCHITECTURAL FORUM for February, 1930. The caution exercised by the careful architect or engineer in the issuance of each successive certificate for a payment on account to a contractor increases as the work nears completion, and reaches maximum when the pre-final certificate is due. The final may include only a little more than the 15 per cent that has been regularly withheld.

This final certificate is not issued until it is known that all work is done, all bills paid (or waivers and affidavits filed), all guaranties and certificates of inspection and tests delivered, and all keys scheduled and accounted for. But it is the next previous certificate that may have worked the mischief through over-allowance, if computed on the assumption that the final balance would be ample for safety. One must be absolutely sure of this.

Maintaining Protection. One must remember, also, that neither the architect nor engineer has a right to include in a certificate for payment any part of the 15 per cent residue until all the work is accepted. To do so, to reduce the final payment to a dollar less than the 15 per cent (or whatever the amount of reserve stipulated in the contract), may, if recourse to a bond is found necessary, render such protection nil. Contractors frequently plead for leniency toward the end of a job, being apparently more eager to collect than to complete. The more insistent such pleading, the more suspicion it should engender. The contractor knows just what he is entitled to and knows as well that it is the business of the owner's agent to see that all bills are paid; but a contractor who is "on thin ice" will do everything possible to get more than is properly coming to him.

As an instance of this, the young architect of a county court house was making sure that the general contractor was not being overpaid and that each "sub" was getting his share. The contractor was dissatisfied and appealed to the Board of Commissioners. It was a real supplication, so real that one member moved that the Board instruct the architect to increase his certificate to twice the original amount. This the architect declined to do, for obvious reasons. Thereupon the sympathetic member moved that the increased amount be paid without the architect's certificate, but was warned that such action would vitiate the bond; so the abused (?) contractor had no recourse other than to the lawsuit which he threatened. He went into bankruptcy two weeks later, and the chairman of the Board apologized to the architect for the lack of support accorded him by Board members, and thanked him for his firmness. He was thanked still more heartily at the end of the job, when the Board collected on the contractor's bond.

The young practitioner has but to use his imagination to envision the plight in which one might expect to find himself if it should be proved that a defunct contractor had been overpaid, that he had neglected his subcontractors and supply dealers; and should the surety company allege evident collusion between the contractor and the man employed to conserve the owner's interests, but failure to do so. The time to determine whether one is to earn praise or opprobrium in this service is before the questionable certificate has been issued.

Dangers of Delay. Another factor to be unremittingly watched by the superintendent is the matter of delays in the progress and completion of a contract, especially if there be penalties attached. It is one of the peculiar traditions of contracting that there is always some avenue of escape for a contractor from the stated penalties of a time-limit contract. It is unfortunate that this belief obtains also with many architects, engineers and owners, yet that they, nevertheless, continue to execute contracts containing penalty clauses

that are not intended to be exacted. This is on a par with the demanding of certified checks from bidders, then giving consideration to a low bid unaccompanied by such check. Obviously, either pretense is out of place in the documents of an ethical practitioner.

As a matter of fact, there are several ways of writing a penalty into a contract and "making it stick" if the work is not completed on time. One method is to fix upon a just and equable rental for the premises, to which the contractor agrees at the time of signing, and which he is to pay on and after a given date, for every day that he occupies the premises, without exception or extension. There are no "ifs nor ands" about such a contract and no avenue of escape for the contractor, unless he can prove that he was hindered by the owner.

The Owner's Attitude. This attitude of the owner is ofttimes most embarrassing to his loyal agent. At the time the contract is drawn, the owner and contractors may be strangers, and the former is very emphatic about wanting all contractors held to the very letter of their agreements, including all penalties for delays. Contractors sign, despite the rigors of such stipulations, figuring on the law of averages to make the particular deal work out as an asset rather than a liability. From then on, if the contractor is of the type that "doesn't get along very well" with the owner's representative, he assiduously "sells himself" to the owner at every opportunity. So successful at this game are some contractors with shady reputations that owners have been known to complain that their architects were too severe and stiff-necked in their dealings with men on the job.

In such event, it matters little what form of penalty for delay is stipulated, unless it be the not uncommon proviso of "premium and penalty," whereby the owner agrees to "pay the contractor (so much) per day for each working (or calendar) day that the building is ready for occupancy in advance of the date of completion stipulated in the contract, plus such extensions for delays as have been duly allowed by the Architect (or Engineer); and the Contractor agrees that he will pay the Owner an equal amount per day for each (similar) day during which the work remains unready for acceptance, after the stipulated date of completion, plus, etc." Acting under this clause, a contractor may find it to his interest to speed up his completion in order to collect a premium — and the man in charge may find the owner no more willing to be assessed than is the contractor in the other event. It is well that the understanding be most explicit before the contract is drawn.

On the other hand, if work has been delayed, the owner, as the stated time for completion draws near, frequently is led to promise all sorts of indulgences to his contractors, if only he can get possession. Eventually, he is so glad to be able to move in that the dilatory tactics at the job's beginning are forgotten and the superintendent is adjudged overly conscientious for bringing up the subject. He knows, for example, that the general contractor owes the owner $500 for the five days' delay in releasing the concrete mixer from the preceding job — days that were to have been made up, but were not — but, if the owner is willing to cross it off, what then?

THIS installment of SUPERVISION OF CONSTRUCTION OPERATIONS, by Wilfred W. Beach, completes the series of articles which have been appearing in THE ARCHITECTURAL FORUM since January 1929. The articles have dealt with every part of a superintendent's work and have traced in detail many of the problems which he encounters from the first day on the job to the completion and acceptance of the building. They constitute an important reference on the subject of job supervision, and it is hoped that the arrangements now under way for the publication of a book based on these articles will soon be completed. The following is a list of the chapters, with the issues of THE ARCHITECTURAL FORUM in which they appeared:

Chapter	*Name*	*Date*
1	Introductory	Jan. 1929
2	The Duties of Superintendents	Jan. and Feb.
3	Superintendents, Records	Feb.
4	The First Day on the Job	Feb. and April
5	Beginning the Work	April and May
6	Contract Changes	May
7	Foundations and Masonry Materials	July
8	Form Work	Aug.
9	Concrete Work	Aug. and Oct.
10	Concrete Reinforcements and Other Built-in Members	Oct. and Nov.
11	Waterproofing and Dampproofing	Nov.
12	Finished Concrete Surfaces	Nov.
13	Roughing-in by Pipe Trades	Jan. 1930
14	Job Progress	Feb.
15	Masonry	Feb. and April
16	Terra Cotta, Cut Stone and Pre-Cast Stone	April and May
17	Structural Steel	May and July
18	Miscellaneous Metal Work	July and Aug.
19	Structural Carpentry	Oct.
20	Roofing and Sheet Metal Work	Oct. and Nov.
21	Furring, Lathing and Plastering	Nov. and Jan. 1931
22	Marble and Tile	Jan. 1931
23	Finish Carpentry	Jan. and Feb.
24	Finish Hardware	Feb.
25	Glass and Glazing	Feb. and April
26	Painting and Varnishing	April, May and July
27	Electric Work	Aug. and Oct.
28	Heating and Ventilating	Oct. and Nov. and Jan. 1932
29	Plumbing	Jan. and Feb.
30	Completion and Acceptance	April

Enforcing the Penalty. However, the anticipated attitude of the owner on such matters is no prior concern of the superintendent. If he finds a penalty clause in the contract, he is to regard it as enforceable; must keep definite record of each lost day, and note all time allowances to which the contractor is justly entitled. If the contractor is to be allowed "time out" for inclement weather and for other factors supposedly beyond his control, it is the duty of the superintendent to report upon the exact number of such days of extension, as they occur, rather than to wait until the contractor has made application for the allowances.

Such stipulated allowances, forecast in a contract, should make it obvious to an owner that he is not to count upon taking over his property the day after that set for completion. On a project of any size, there should be a month's leeway between the completion date and the hoped for possession, and the contract worded with that in mind. Once committed to a penalty contract, however, no contractor should be excused for using ordinary forces and ordinary equipment when it is obviously essential that either or both be augmented if the obligation is to be met. It was for this reason that our school building superintendent, early in its construction, insisted upon the employment of more men than just enough that could be counted upon to complete the schedule, if conditions were favorable. (See page 299 in THE ARCHITECTURAL FORUM for February, 1930.)

After numerous experiences, one is forced to a conclusion that, unless it is very thoroughly understood all round that penalty (and premium) stipulations are as *de facto* as any other elements of the contract, they had best be omitted, thus saving the pretense and the ensuing bother. Instances of the enforcement of penalties are not so rare, however, as some seem to suppose. A certain general contractor was remodeling a bank building during an exceedingly busy season. He allowed operations to drag, through lack of attention. The architect's superintendent was more punctilious and had his records in such shape that he forced the contractor to admit that he had no legitimate excuse for the twenty-two days' delay, for which the architect assessed him $550. But the owners were so happy to get into their new quarters that they yielded to the pleas of the contractor and cut the penalty in half.

Another bank established the monthly rental of its new space at $300 and the architect wrote into their fixture contract a rental of $10 per calendar day for occupancy of the premises after a certain date. The fixture factory changed hands and was delayed forty days in completing the contract, for which they paid $400 to the exasperated bankers, without attempting to fight the charge.

Keeping Accurate Records. Knowing then that penalty clauses may be enforced and are liable to be, it behooves every superintendent who finds one in a contract under his jurisdiction so to conduct his office and keep his records as to be a competent "court of last resort" in a question of what is just in this respect between owner and contractor. If it is stated that a contractor must make application for allowable delays within a certain time after their occurrence, it is well to call his attention to this once or twice, so as to establish by this evidence the intent of square dealing on the part of the superintendent. Written time extensions are the best evidence that other delays, for which a contractor may later claim allowance, have no just foundation.

Having audited all extras, deductions, payments, charges for delays and credits for premiums (if any), the superintendent makes his pre-final estimate as a basis for the next-to-the-last certificate, if so instructed by his employer. If there are many penalties for delays they must be taken into consideration at this time. If such reckoning be postponed until issuance of the final certificate, one might find that the 15 per cent supposedly retained was being seriously impaired by the assessed penalty. The owner's agent must be on the safe side, always, though dealing fairly and squarely with contractors at the same time. For this reason, he investigates and reports as to whether or not the contractors are paying their bills (regardless of waivers of liens), and as to the general reputation of their credit. Creditors have been known to attempt to revoke their waivers; in which event, if not too late, the certificate and payment are withheld, pending adjustments.

It may be thought that, on public work and on contracts protected by bond, one can afford to be less careful and exacting in this matter of forcing a contractor to meet his obligations. The answer to that is that it is less trouble to make him pay up when he still has money coming than it is to worry because he has not paid and liens are being filed.

Prior to the issuance of the last certificate, the superintendent busies himself with final inspections. He has made timely notations of every item of each contract that has remained unfinished, and has seen that the foreman responsible in each case has a duplicate memorandum. Such inspection of a general contractor's work is liable, at the start, to disclose too many unfinished items, whereupon the superintendent terminates the trip and advises the contractor or his foreman that work is supposed to be *finished* when offered for acceptance. They should go over it first with that in mind before taking up the time of the superintendent with things that are quite palpably not right.

Provisional Acceptance. Frequently, certain items that have been in dispute have been allowed to drag until they become factors in the final settlement. These must be cleaned up, one way or another. "At all times, in all parts of any construction work, the superintendent may be faced with a question as to whether it is better to reject certain work, slightly defective or worse, and take a chance on the job suffering on account of delay in awaiting replacement; or of passing something that is not up to requirements. Rather than doing the latter, he can go on record as not accepting it, have the work proceed, and allow a decision as to replacement to be based upon its relation to the good of the whole work. Later, it may be found expedient to accept the second-rate article or workmanship at a discount — to be determined by the architect or engineer.

"A stiff-necked prompt rejection policy for all inferior work is not always best for the owner's interests, nor is an easy working 'give-and-take' habit. 'Be ye wise as serpents and harmless as doves' might have been addressed very appropriately to building superintendents."*

Occupancy. Partial or provisional acceptance of work is sometimes advisable when a building must be occupied in whole or part before final completion and acceptance. This, if foreseen, should be covered by some such specification provision as:

"The right to occupy the whole or any part of the building or premises at any time prior to completion is reserved by the Owner. It is understood and agreed that the right to so use same is a part of the contract and that the Contractor, in event of such occupancy, shall proceed with the completion of his contract in a manner to cause the least possible interference to the Owner or to the Owner's employes or to others having business on the premises.

"If such occupancy of the premises by the Owner, in whole or part, prior to the time set for completion of the contract, is the cause of added expense to the Contractor in pursuance of this work, such expense shall be accurately reckoned by him, will be audited by the Architect, and an extra order issued for the amount justly due the Contractor on such account; but no allowances will be made for such expense incurred after the time set for completion of the contract, plus extensions thereto."

If partial occupancy before completion has not been anticipated, but is found desirable, difficulties may be experienced if a contractor is inclined to make trouble. He may attempt to cite law, written or unwritten, to the effect that an owner, having delivered his premises to the contractor for certain specified purposes, cannot thereafter recover his property until those purposes have been carried out and paid for. How much standing this contention may have in court may be debatable, but trouble from such source can and should be avoided by proper foresight. If there be no clause in the specifications asserting the owner's rights in this particular, and a dispute arises, the architect can wield no influence over the contractor (even though he be at fault) other than to delay his payments and threaten to withhold later patronage. If the contractor has passed the stage where such things disturb him, the owner has no relief other than in the courts, until the contractor decides to behave. While his contention may or may not lack legal support, it is obviously better to have the specifications so written that it is the contractor, rather than the owner, who is trespassing, in case the matter becomes an issue.

Unforeseen Substitutions. One of the most awkward causes of friction between architect or engineer and contractor toward the completion of a contract is the discovery of substitutions concerning which there was no warning. Such *contretemps* may be aggravated, either by the owner's bias for or against the contractor at this stage, or by the fact that the work has not been given continuous or sufficient supervision. In the latter event, the understanding of the man in charge and that of the owner must have been most specific, if the former hopes to escape censure. If a contractor errs through failure to notify the architect in advance regarding intended substitutions, he has no reasonable excuse or defense when they are rejected. He may be able to prove that the substitutes are every whit as good as those specified, but they are not what the owner contracted to buy nor what the contractor agreed to supply — and that's about all there is to it.

On the other hand, the complete installation of a number of improper items and their subsequent removal is as much an indication of inadequate supervision as it is of reprehensible behavior on the part of the contractor. A point involved is that, whereas an architect or engineer, acting in the capacity of an unbiased interpreter of the terms of the contract, cannot favor either of the parties thereto, yet it is well understood that he was originally employed to safeguard the owner's interests, the while the contractor attends to his own.

In a particular instance, it was discovered that the contractor had used his usual makes of hardware and radiation in place of what had been called for. He was made to suffer a severe hardship by being compelled to replace all these items and comply with specification requirements. He had no reasonable defense, yet, if the replaced items had been equal to those contracted for, there would

*W. W. Beach, in "Specifications for a Hospital, York & Sawyer, Architects," Pencil Points Press, 1927.

have been no good purpose served by forcing the replacement. Certainly, an owner has a right to choose what he pleases and to ask his agent to buy it for him. He likewise has a right to demur when he finds that he is getting something else, but his representative should use common sense in handling this, as in all subjects that pass through his hands.

Final Inspection. When final inspections are at last in order, a superintendent provides himself with a checking list (persistently built up during preceding weeks) and proceeds through the building with each contractor or his foreman, one at a time, and reviews his notes, checking off previously noted defects that have been corrected, and inspecting everything that may need final adjustment. Frequently, a contractor will ask his painter or another subcontractor or foreman to make the rounds at the same time. This should be avoided for several reasons: it may lead to needless discussion and much waste of time; it may prove embarrassing to offer free criticism to either party in presence of a witness; and it might give the general contractor an idea that the superintendent is willing to deal directly with the subcontractors. The superintendent cannot object, however, to a contractor's having his own foreman made a party to these final inspections, and some superintendents prefer to have him along.

For the experience to be gained, we will accompany our superintendent and the general contractor's foreman on their final inspection trip through the supposedly finished school building. Room by room, they proceed, notebooks in hand. In every room, they operate each door, key, shade, drawer and other movable or mechanical parts (unless already approved), and observe whether or not defective items previously noted have been corrected.

In the same manner, the superintendent journeys through the building with the heating, plumbing and electric foreman, separately, in each instance. It is essential that no smallest detail escape the keen eye of the inspector. We take a page at random from our superintendent's notebook and find it devoted to the condition of the school library toward the end of the job:

ROOM 202 — LIBRARY

1. **November 28.** Painters finished and moved out.
2. Two shelf supports in case No. 14 missing.
3. Keys for loan desk missing. x
4. Bottom edges of corridor doors not varnished. x
5. Sash grooves varnished; should be tallow-coated. x
6. Bad stain on south wall.
7. Two screws missing in cold air register face. x
8. Two cork-tile to be replaced.
9. **December 7.** Trip with general foreman.
10. Items 3, 4, 5 and 7 have been corrected.
11. Window No. 207 needs adjusting.
12. West picture mold failed under test.
13. Glass in window No. 209 cracked. Cause unknown.
14. Glass in door to case No. 3 cracked. Cause unknown.
15. Black paint in cold air duct to be done over.
16. **December 8.** Trip with electric foreman.
17. One bracket lamp burned out; 2 missing from pendants.
18. Defect in gang switchplate.
19. Plug outlet in loan desk defective.
20. West pendant insecure.
21. **December 8.** Trip with steam-fitter foreman.
22. Valve on west radiator needs adjusting.

Thus, the checking process goes on through every room in the building, and, one at a time, the superintendent adds to his list those rooms which are satisfactory. Repeatedly, he insists upon certain foremen doing more final inspecting of their own but, even so, there are few who will relieve the owner's representative of much of this burden. And it must not be forgotten that, regardless of the high moral character of a large number of contractors, there are some who expect their foremen to cover up defects, from beginning to end of a job, but especially at the end. The owner knows something of this and suspects much more. Woe be to that superintendent who *thinks* that a certain something is right, because it was done by a contractor or foreman in whom he had confidence, and who later learns that the owner *knew* it was wrong and was merely watching to see what was to be done about it. It is the superintendent who must *know*. Generally, a too interested owner is so often set right by his representative that he learns to depend upon him and terminate the interference.

Non-Infallibility of Superintendents. Nevertheless, a superintendent, be he architect, engineer or employe, too often finds himself far from infallible, no matter how cautious and conscientious. He need not be surprised to discover a few defective items on his last trip that should have been discerned before.

An architect was called back to a public building shortly after it was turned over, one complaint being that there was a serious gutter-leak which had caused damage to the decorating in the room below. Investigation disclosed that the wires in the conductor strainer were bent, permitting ingress to sparrows which had built a nest there and caused stoppage and overflow. The nest might or might not have been there when the building was accepted. The architect's man couldn't say.

So, although every part of the roof was known to be in good condition, the architect insisted upon paying it a visit, together with his superintendent. They found nothing out of the way, except that some careless workman had left a piece of scaffold plank in a gutter, and that wire men, the preceding day, had left their scraps lying about.

On this occasion, which proved actually to be the final trip, they also went around the outside of the building, first with the general foreman then with the contractor for yard improvements.

With the former, they checked off the final repairs to concreting, some to the cleaning of face brick and cut stone; and noted the character of the caulking, painting and other visible surfaces.

With the yard improvement contractor, they looked over the walks, driveways, fences, goal posts, flagpole, planting, surfacing and sodding. There was evidence, too, that seeding had been uniformly done. Finally, all corrections having been made and all other formalities attended to, the contracts were accepted, one by one, and the final statements prepared, from which final certificates were issued.

The final statement of the general contractor read:

	Extras	*Deductions*	
Contract Price			$716,437
Change Order 1	$467	$1,917	
" " 2	25,735	8,035	
" " 3	115		
" " 4	420		
" " 5		894	
" " 6		600	
" " 7	2,940		
" " 8	181		
" " 9	165		
	$30,023	$11,446	
	11,446		
	$18,577		18,577
Total General Contract			$735,014
Previously Allowed			622,504
Amount of Final Certificate			$112,510

The final statement of the heating and ventilating contractor read:

	Extras	*Deductions*	
Contract Price			$75,700
Change Order 1		$750	
" " 2	$246		
" " 3		69	
" " 4		50	
	$246	$869	
		246	
		$623	623
Total Heating and Ventilating Contract			$75,077
Previously Allowed			61,035
Amount of Final Certificate			$14,042

The final statement of the plumbing contractor read:

	Extras	*Deductions*	
Contract Price			$54,000
Change Order 1		$56	
" " 2		50	
		106	106
Total Plumbing Contract			$53,894
Previously Allowed			43,850
Amount of Final Certificate			$10,044

The final statement of the electric contract read:

	Extras	*Deductions*	
Contract Price			$63,050
Change Order 1	$342		
" " 2		$56	
" " 3		65	
	$342	$121	
	121		
	$221		221
Total Electric Contract			$63,271
Previously Allowed			50,214
Amount of Final Certificate			$13,057

Final statements and certificates for three minor contracts, for movable furniture, decorating and yard improvements, were handled in like manner.

Extras and Deductions. Regarding the extras and deductions in connection with the general contract, Change Orders 1, 2, 3 and 4 were discussed in Chapter 14 (in THE ARCHITECTURAL FORUM for February, 1930); 5 represented the saving in the price of the face brick; 6 was for the omission of mortar color; 7 covered the cost of storm sash; 8 was for plaster patching, and 9 for replacement of broken glass. These last two items were distributed between the heating, plumbing and electric contractors: Orders 3 and 4 to the heating contract; 1 and 2 to the plumbing, and 2 and 3 to the electric. Order 1 of the heating contract covered the saving in radiation due to the addition of storm sash, and Order 2 represented the cost of resetting 82 temporary radiators at $3 each. Order 1 of the electric contract was for temporary lighting and for power for certain testing.

The total cost of operations stood:

General Contract	$735,014
Heating and Ventilating Contract	75,077
Plumbing Contract	53,894
Electric Contract	63,271
Furniture Contract	38,750
Yard Improvement Contract	26,210
Decorating	20,000
Architect's Fee, 6%, Plus Expenses	60,330
Total Cost	$1,072,546

All matters in connection with all contracts being thus disposed of, our superintendent was relieved of his charge, confident that he had done his best in nearly every instance, but aware that a few subjects in his next job would receive better attention because of the experience afforded by this, for, as always, experience is the best (albeit, the most expensive) teacher.

PRODUCTS AND PRACTICE

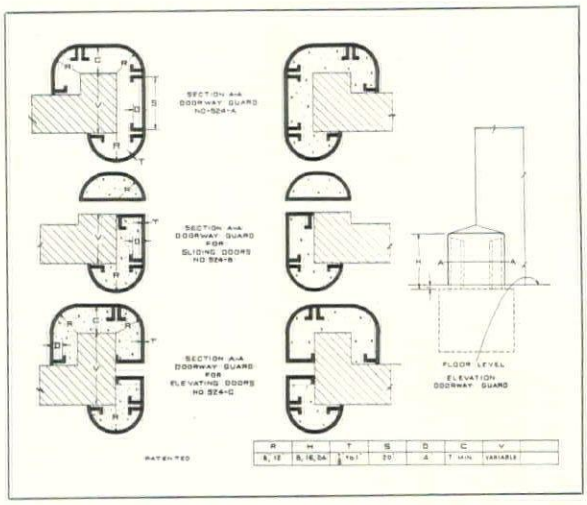
The FORUM staff seeks out new materials and methods which merit the attention of architects. Here each month is presented concise news covering purpose, advantages, and other pertinent facts about recent developments.

PROTECTION FOR REINFORCED CONCRETE

MUCH difficulty has been experienced in developing edge or corner construction to withstand the heavy impacts common to industrial work, for natural materials tend to crumble under a succession of impact loads or fail under unusual conditions of temperature. Recently perfected is a patented system of armored concrete which has withstood these failures under almost every condition of impact and temperature.

In this construction concrete is faced with heavy cast iron forms with angle arms bonded into the mixture and cast integrally with it. The angle arms in the concrete serve as shock absorbers, transmit a more even pressure to the concrete behind the shell, and the combination overcomes the brittleness of the cast iron, according to engineers familiar with the system. The forms can be designed for even the most unusual conditions and are particularly adapted as a protection to curves, doorway guards, warehouse wainscots, platform edges, etc.

The system has been found to overcome failure of surfaces due to temperature change and it has been used in industrial plants as a heavy duty expansion joint. The cast iron forms are manufactured by the Armored Concrete Corporation in a variety of standard shapes and sizes.



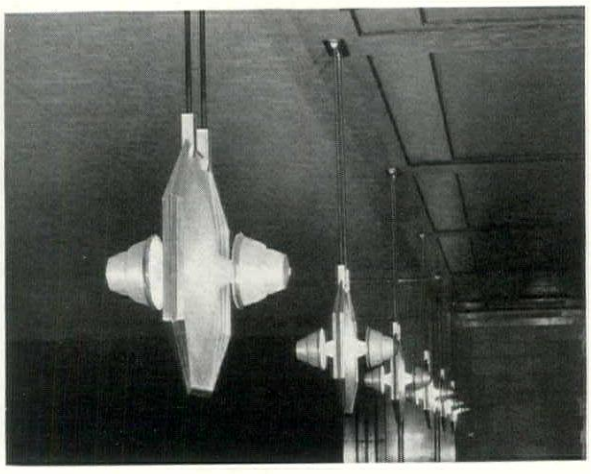
Further information regarding their detailed specification and adaptability to use may be obtained by addressing the Department of Development and Research, The Armored Concrete Corporation, 83 Polk St., Newark, N. J.

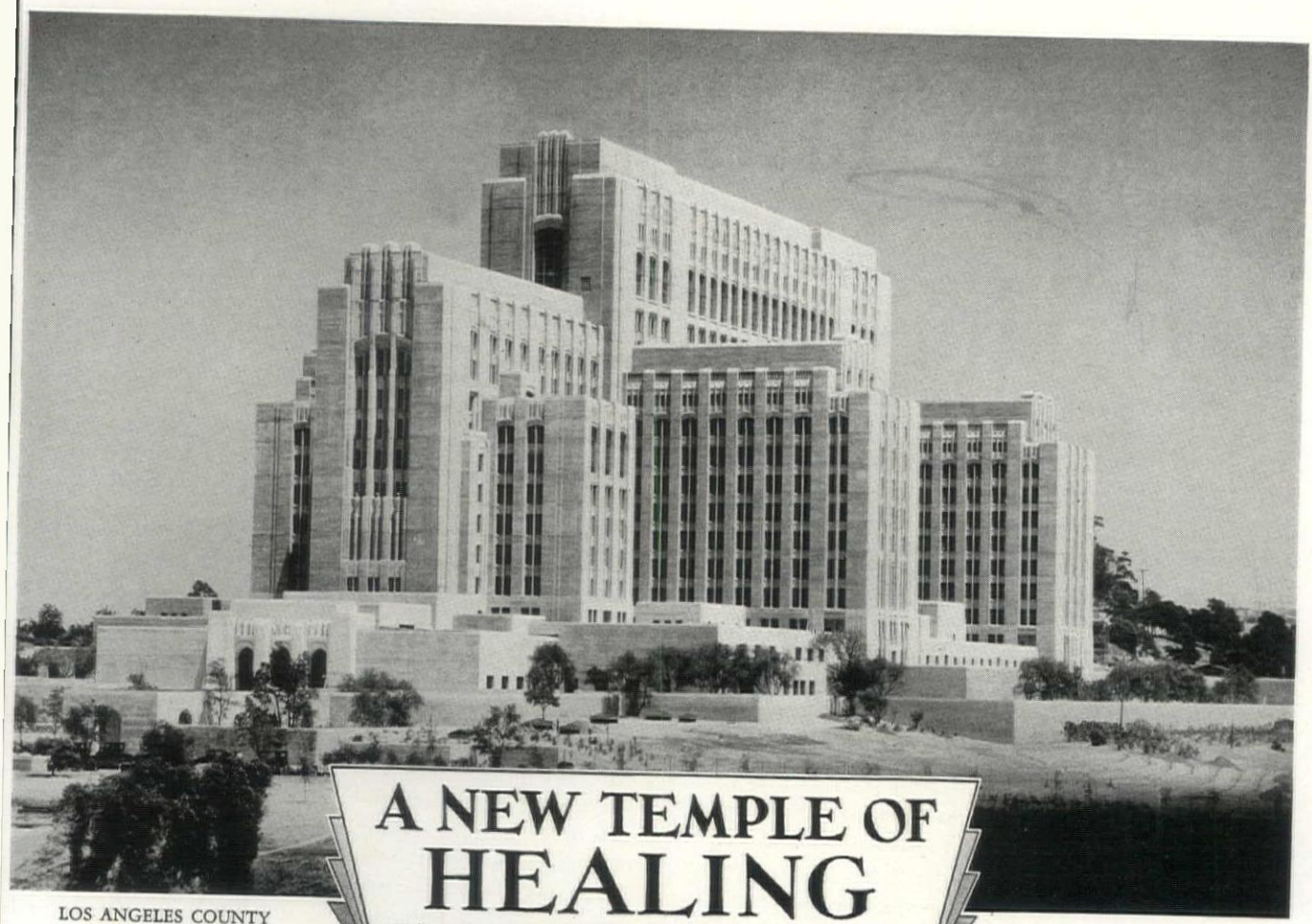
A DOUBLE DUTY LIGHTING FIXTURE

THE scientific approach to illumination has led to important improvements in the design of lighting fixtures. One such improvement is found in the auditorium fixtures for the Joslyn Memorial in Omaha, Nebraska, John McDonald and Alan McDonald, architects. To project adequate light over the central seating area of the room, and at the same time to provide less intense light for the balcony area, the aluminum reflector pendant shown at the right was employed.

Suspended from outlets 10 ft. from the side walls, the fixtures are composed of convex polished aluminum plates, upon which the light is thrown from bulbs concealed in bell-shaped aluminum

(*Continued on adv. page 54*)





A NEW TEMPLE OF HEALING INVITES THE SUN

LOS ANGELES COUNTY GENERAL HOSPITAL

Architect: Allied Architects, *Cons. Engr.:* E. L. Ellingwood, *Gen. Con.:* Weymouth C. Crowell, *Plumb. and Heat. Con.:* Howe Brothers. All of Los Angeles, California

ON a hill remote from the din and stress of the city, bathed by the sun and soft airs of a favored region, admirable for design, great in size and facilities, complete in every modern resource, the Los Angeles County General Hospital takes high rank among the marvelous institutions of its kind built in this country in recent years. Their like never was before in the world. For never had science and the arts reached a development to make them possible.

Only the best in design, construction and equipment could be thought fit to go into such a building for any use.

It is a matter of pride for the manufacturers of NATIONAL Pipe that in the Los Angeles County General Hospital, as in other noteworthy hospitals lately completed, the major tonnage of pipe was NATIONAL—

America's Standard Wrought Pipe

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

Subsidiary of United States Steel Corporation

NATIONAL PIPE

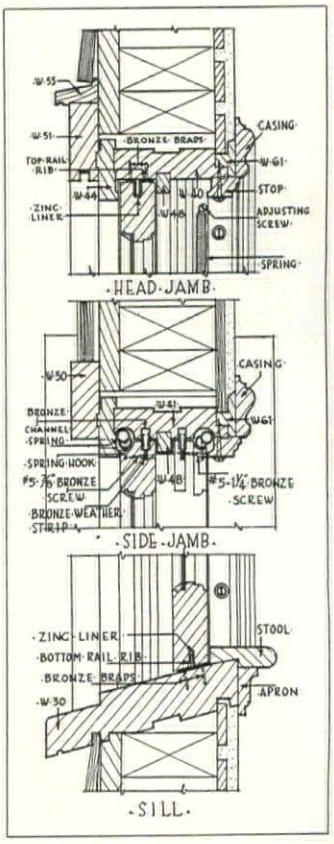
PRODUCTS AND PRACTICE

(*Continued from page 424*)

shields. The reflector on the side of the central seating area throws off the light from a 750-watt bulb, while the other plane spreads 250 watts over the balcony area. The fixture was designed and executed by Kantack & Co., Inc., 238 East 40th St., New York, N. Y.

A PREFABRICATED WINDOW

REDUCTION in construction cost, typical of all prefabricated units, is the salient feature of a new type of window which includes frame, trim, screen, and weatherstripping. Of almost equal importance and value is the elimination of weights and cords by using instead a spring balance, which in turn permits narrower outside casing and interior trim. Actual installations indicate a saving of from 20 to 50 per cent in construction cost.



The patented weatherstripping is an integral part of the unit, with the location of each part predetermined and automatically located by the shape of the frame and window parts. The zinc weatherstrip member at the head and sill makes metal to metal contact with the weatherstrip member in the top rail of top sash and the bottom rail of bottom sash. The bottom rail is beveled at a slightly flatter angle than the slope of the sill to produce a water drip and pocket, in which impounded air keeps the joint between the sill and bottom rail free from water and allows it to drain out quickly.

The spring suspension which makes prefabrication possible, since it makes the window adaptable to all types of wall construction, has another advantage in that it permits narrow trim and narrow mullions. The elimination of pulleys and jamb pockets reduces air leakage, because there are no through cuts in the frame jambs.

The combination of frame sash, trim screen and weatherstripping is applicable to installation in remodeling operations as well as in new work. Both the product and its practical operation have been thoroughly tested by the manufacturer under all conditions of use.

Known as Curtis *Silentite Pre-Fit* Frame-Window-Trim, the units are manufactured by the Curtis Companies, Inc., Clinton, Iowa. They have prepared a manual, in which complete information is given.

(*Continued on adv. page 56*)

IDENTIFY THE 3 GRADES OF G-E BUILDING WIRES

Black Compound.....Code Grade
Red Compound.....Intermediate Grade
Green Compound.....30% Grade

HELP CONTRACTORS TRACE CIRCUITS WITHOUT TESTING

There can be no question as to the grade of wire used when you specify General Electric building wires. Each grade has a distinctively colored insulation, so that examination of the rubber insulation on the wire itself reveals its quality. . . . The eight colors of braid are provided in combination with each of the three colors of rubber compound to facilitate installation by assisting the contractor to identify circuits without the need for testing. . . . Specify G-E wires and cables and insist upon getting them. For more information write to Section W-164, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

GENERAL ELECTRIC

WIRE AND CABLE

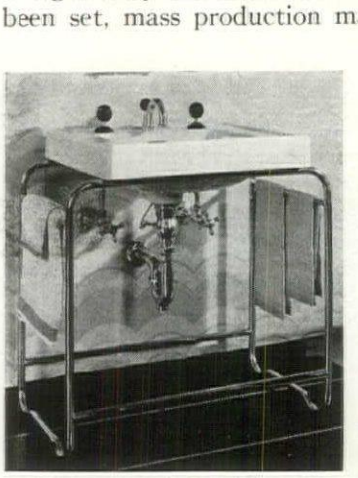
MERCHANDISE DEPARTMENT. GENERAL ELECTRIC COMPANY. BRIDGEPORT. CONNECTICUT

PRODUCTS AND PRACTICE

(*Continued from adv. page 54*)

AN UNUSUAL LAVATORY

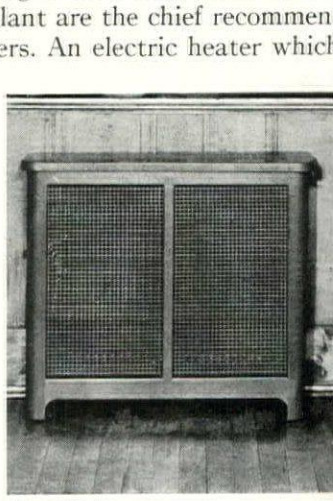
ADDED convenience and a relative reduction in cost are the resultants of a new type lavatory, designed along strictly functional lines. Although no list price has been set, mass production may reduce the price to as little as $55.



The lavatory is supported on a continuous piece of chromium plated steel. Neither brackets nor any other type of suspension from the wall is required. As a consequence, installation cost will be reduced slightly. Another noteworthy feature of the frame is the presence of two integral towel bars ideally located for the user. In production now is a patented type lavatory of the same design which includes a heating element for the towel rods. The lavatory was designed by George Sakier of the American Radiator and Standard Sanitary Corporation. Further information may be obtained from the Company, at 40 West 40th Street, New York, N. Y.

PORTABLE ELECTRIC HEATER

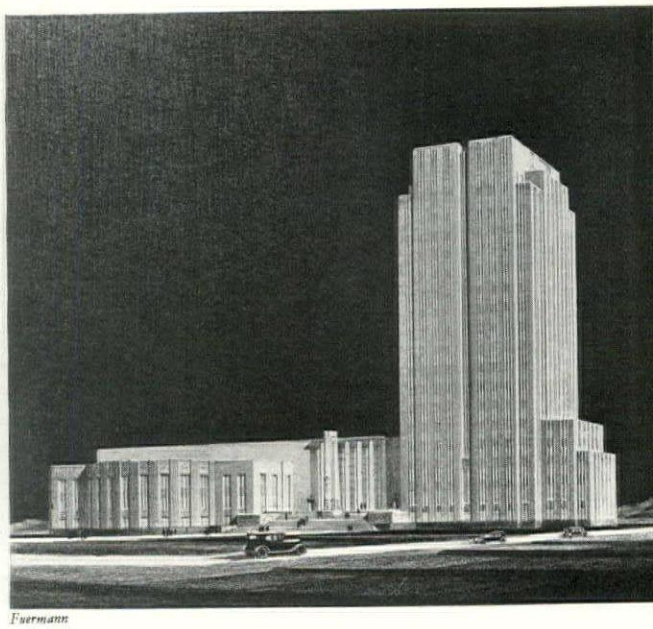
IMMEDIATE heat when it is wanted, and the conservation of fuel resulting from reduction in operation of the main heating plant are the chief recommendations of individual heaters. An electric heater which operates on what is referred to as the "patented duct" principle shares these advantages, and adds another — the provision of a large heating area, 36 sq. ft.



Advanced Studios

The unit may be plugged into an ordinary socket, and it is sufficiently light in weight to permit transfer from room to room. Air is taken off the floor, heated by copper plates in multiple-flue formation, passed out through the top. An automatic thermostat, which keeps the room temperature at a specified level, may be attached to the unit. Further information and descriptive pamphlets may be obtained from the Duct Electric Heater Corporation, 114 Liberty Street, New York, N. Y.

ANNOUNCEMENTS



Fuermann

THE NORTH DAKOTA STATE CAPITOL

PLANS have been approved and work is now under way for a new State Capitol building at Bismarck, North Dakota. Joseph Bell De Remer and W. F. Kurke are the architects, with Holabird & Root as associate architects.

The new structure is notable for its divergence from the traditional capitol building plan and its adherence to accepted planning practices common to present day office buildings. Although the new capitol building is twice as large as the old one, its cost is estimated at only $2,000,000. This low cost has been due largely to the elimination of unnecessary ornamentation and the fact that 80 per cent of the floor area may be utilized for office space with corridors, service areas kept to the practical minimum. The building houses all State officials under one roof and is planned so that future additions, if necessary, may be easily made without disturbing the routine of office activity.

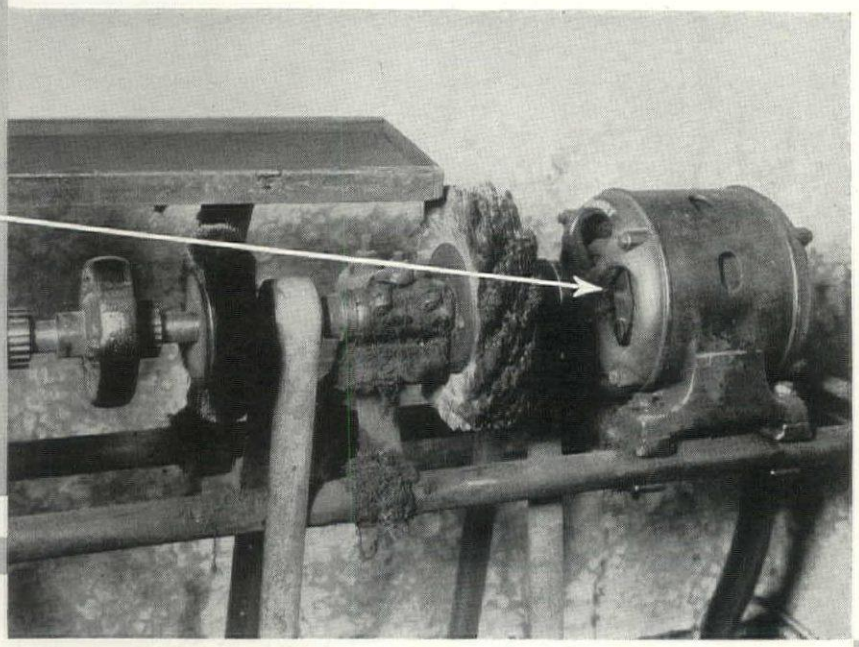
The structure will be more fully presented from the standpoints of both design and engineering in forthcoming issues of THE ARCHITECTURAL FORUM.

NEW ENGINEERING COMPANY

THE narrow gap between architecture and engineering was bridged formally by Albert Kahn recently with the announcement of the formation of the Albert Kahn Engineering Corporation as an affiliated organization with Albert Kahn, Inc., Architects. As consultants to bankers and industrial executives, the new company is prepared to offer the following services: general engineering, modernizing, production management, examinations and reports, surveys and valuations and design of power plants. The company is a development of the engineering departments which were organized by Mr. Kahn as a result of constant demands for engineering service upon him as an architect.

"THEY KEEP A-RUNNING"

SINCE 1906



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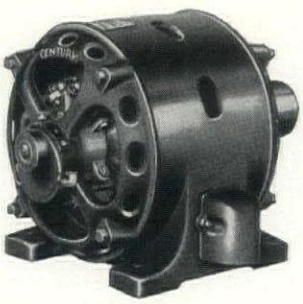
Here's a Century Single Phase Motor that has "Kept a-Running" under unfavorable conditions since 1906 . . . No repairs have been necessary during 26 years of service . . . The brushes have been replaced once!

In Century Single Phase Motors of the brush-lifting type the brushes last. The brush-lifting mechanism has been proved thoroughly reliable in many hundreds of thousands of installations in all classes of service, in all climates, in all parts of the world.

Their high starting torque, low starting current and ability to "Keep a-Running" recommend them especially for such applications as Electric Refrigerators, Oil Burners, Pumps, Compressors and any similar hard-to-start apparatus.

Built in standard H.P. ratings from 1/8 to 40.



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REVIEWS OF MANUFACTURERS' PUBLICATIONS

CIRCULAIR HEAT CO., Louisville, Ky. "Circulair Concealed Radiation."

This new catalog of the Circulair Heat Company is an unusually complete and useful presentation of the merits of their concealed radiation units. The orderly progress of the material offered, from the discussion of the adaptation of the units into any architectural scheme to the table of capacities, is clear and convincing.

Circulair heaters may be used in connection with steam, vapor, vacuum, or hot water systems. They may be installed in either new buildings or modernization jobs, and as such have an added interest at the present time. The company calls particular attention to the guaranteed leak-proof construction.

"The method used to join the tube to the steam header," says the catalog, "is unique, and is the basis of Circulair Heat Company's ability to make the life-long leak-proof guarantee. . . . This joint is so perfect that it makes the bronze steam header one piece with the copper tubing. This is accomplished by first forming both ends of the oval tube so that they become perfectly round. Over these round ends are slipped the cast brass jamb nuts, and the ends of the tubing are spun on to the jamb nuts in a special machine designed solely for that purpose. The bronze header is then screwed tightly to the jamb nut, thus forming a perfect Van Stone joint."

There are four standard types of circulair heaters, all but one of which are of such widths as to fit between standard studding. The 15 in. wide unit may be installed under a window seat, built into a furred space, or in a recess in the wall. With nine lengths, and eight heights for each type, the company offers 288 standard ratings, which should be sufficient to meet the requirements of any installation.

In addition to an interestingly presented pictorial and printed story of each of the elements which go to make up the units, particular attention is given to the method of installation. The drawings are well done. Estimating data is also included, so that nothing essential in the discussion of the product is omitted.

WESTERN BRICK CO., Danville, Ill. "Recapturing the Charm of Old Brick Work."

Architects who are accustomed to forceful sales brochures from manufacturing concerns will be delighted to receive this new booklet on old brick work recently issued by the Western Brick Company. Not only is it done in good taste, but the information presented is well worth while.

In eight full page color plates, nine different blends are shown. The realistic quality of the plates is almost equal to having actual panels to examine. The blends illustrated are the Early American, Regal, Verd Antique, Italian, Weathered Gray, Mossblende, Dark Cloister, Western Empire, and Western Chicago. These plates in themselves are fine enough to warrant the suggestion that every architectural office should obtain a copy of this booklet.

Besides the color plates, there is a wealth of other material offered, including a general discussion of brick manufacture, old and new, and a detailed description of each of the blends.

MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis, Minn. "The Protectoglow."

A new development in the automatic control field is a device which provides instant and positive protection against the escape of unburned gas or oil in the event of flame or pilot failure. Although it may be used in place of the customary combustion or pilot safety device, its outstanding characteristic is its ability to handle installations where conventional controls are inadequate.

This new system, called the Protectoglow, has been developed by the Minneapolis-Honeywell Regulator Company. Entirely electric and without moving parts, it is not dependent upon temperature and is absolutely reliable. The heart of the device is the Protectoglow tube, which acts as an electrical relay and is capable of operating at the command of an exceedingly minute electric current passed through the flame itself. Should the flame fail, the circuit through the flame is broken, instantly shutting off the gas or oil flow. In the absence of pilot flame, the Protectoglow will not allow the burner to start.

The Glo-Relay is used in conjunction with the Protectoglow and serves to operate the valves or motor of the burner at the command of the thermostat, control switch, or Protectoglow. It is self-contained and is available for either constant or intermittent ignition burners.

MONITOR CONTROLLER COMPANY, Baltimore, Md. "Monitor Accelerator."

Electro-magnetic balance, the principle which forms the basis of the Monitor accelerator for starting D. C. motors, is compared to the chemist's balance, in a new bulletin recently put out by the Monitor Controller Company. This comparison is used to clarify a discussion of motor starting problems. Beginning with the "ideal start" and going on to the various types of load and starting, the bulletin takes up torque, current, resistance and interlocking. It goes on to explain the manner in which the Monitor accelerator employs electromagnetic balance to solve the problems and to produce constant-torque acceleration.

One side of the accelerator has a shunt coil with a constant pull. The other has a variable-pull coil connected in series with the motor armature. Starting with a pull one-and-one-half times that of the constant pull coil, the variable-pull coil gradually exerts less and less pull, as the motor speeds up, until the balance swings over and the switch is closed at the proper moment.

The outstanding features of the Monitor accelerator, said to be the only one successfully to employ the balance principle, are: complete independence of one coil from the other, the constant, continuous pull of the shunt closing coil, the long airgap in the lock-out coil and non-sensitive adjustment over a wide range. The controller is said to be unprejudiced by dirt, rust, vibration and heat.

KENNEDY VALVE MFG. CO., New York, N. Y. "Bronze Stem Gate Valve."

The Kennedy Valve Mfg. Co. has placed on the market a new Standard Bronze Solid Wedge Stationary Stem Gate Valve for 125-lb. steam pressure and 175-lb. water pressure. One of the features of this valve is the extra large bonnet hex which is placed close to the hub face joint where it screws into the body. This construction makes the valve particularly rigid and also assists in removal of the bonnet and stem assembly when the valve is placed where clearances for installation are close. Another feature is the extreme depth to which the stem engages with the disc, providing a large number of contact threads which practically eliminate possibility of stripping. Special attention has also been given to the design of the pipe end hexes which are made heavy, with a large number of threads for tightness on pipe or valve. The stuffing box is provided with gland on all sizes and the packing rings are of molded square section and made of a composition which has a high graphite content. The weights of all sizes meet United States Government specifications.

MUNDET CORK CO., New York, N. Y. "Jointite Cork Products."

"Jointite Cork Products," the new catalog published by Mundet Cork Company, is a compendium of information on the uses of cork for insulation purposes including useful data, specifications, tables, and charts for refrigeration, soundproofing, heat prevention, heat conservation, vibration deadening, and condensation prevention. It contains concise and valuable data on all of these subjects.

Space is also devoted to cork, its properties and history, photographs and drawings showing specific examples of various types of construction, test curves, and so on. One page is given over to Cork Tile Flooring. A page is also devoted to Mundet "Jointite" Cork Bulletin Boards. Vibration isolation is thoroughly treated. The catalog is a valuable addition to modern engineering literature.

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"Over-the-Top" Door Equipment offers the most revolutionary improvement in garage door operation since garages came into existence. . . . . .

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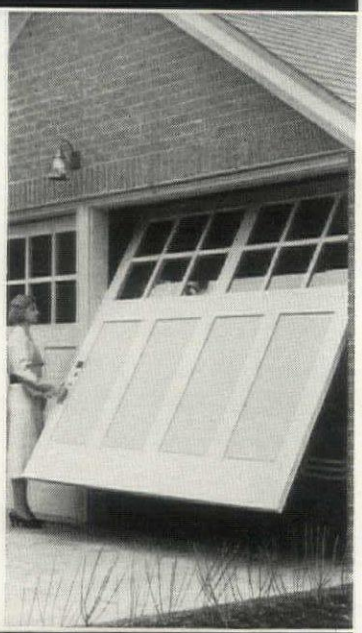

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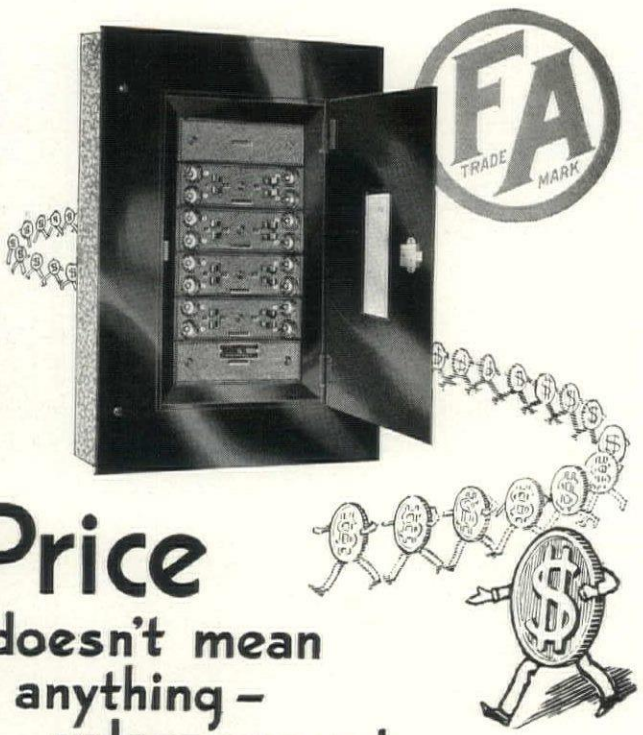

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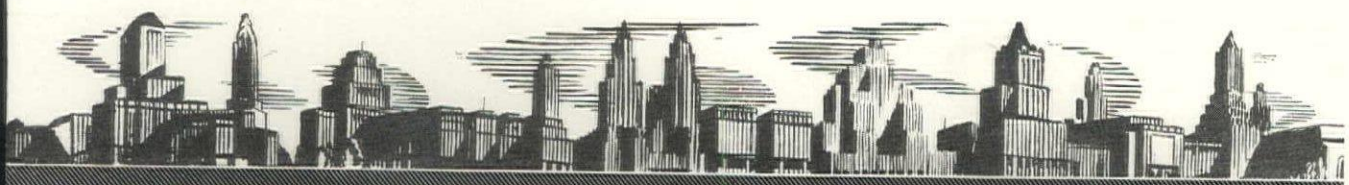
Part 2—Architectural Engineering and Business



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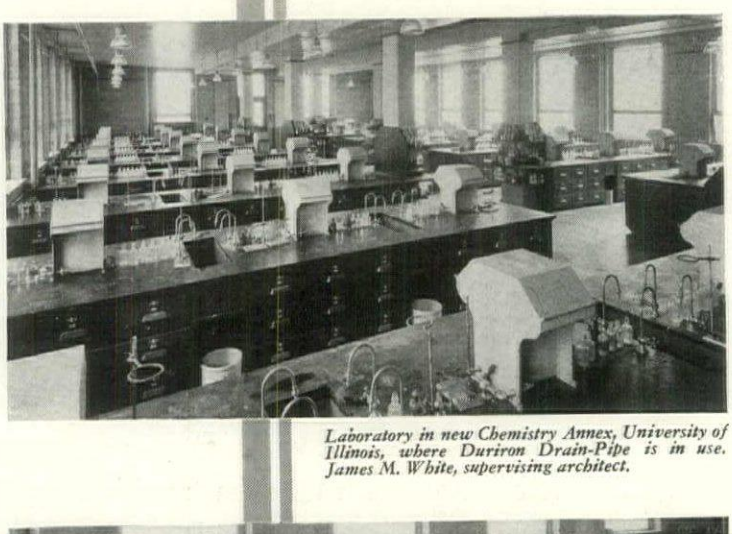
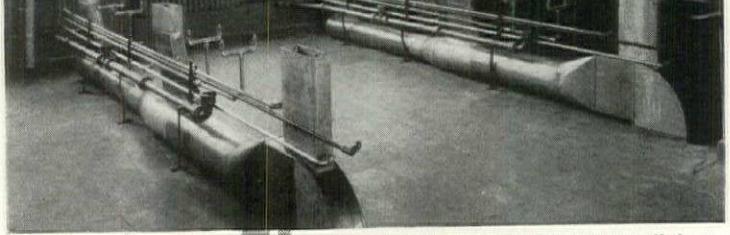


Laboratory in new Chemistry Annex, University of Illinois, where Duriron Drain-Pipe is in use. James M. White, supervising architect.



Unusual is the way pipe has been installed, concealed within the desks and placed along the lower walls.

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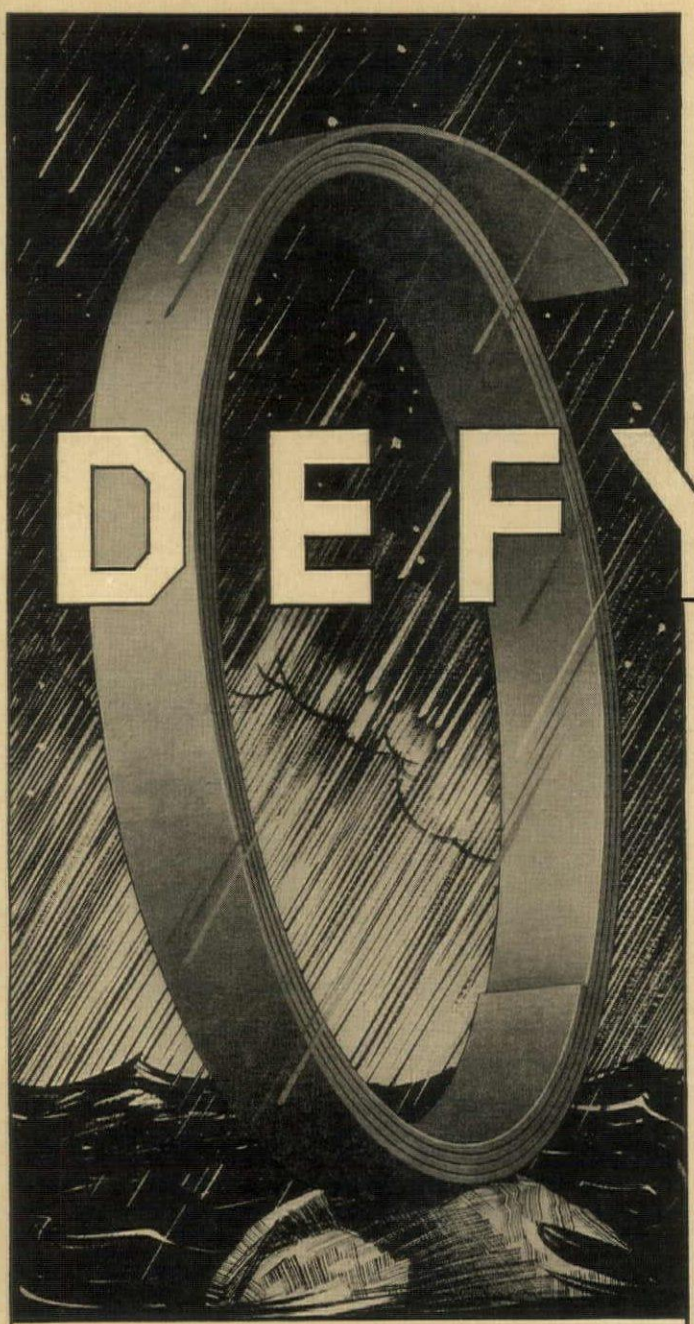
Use DURIRON ACID-PROOF PIPE and DRAINS

DURIRON ACID PROOF DRAIN-PIPE



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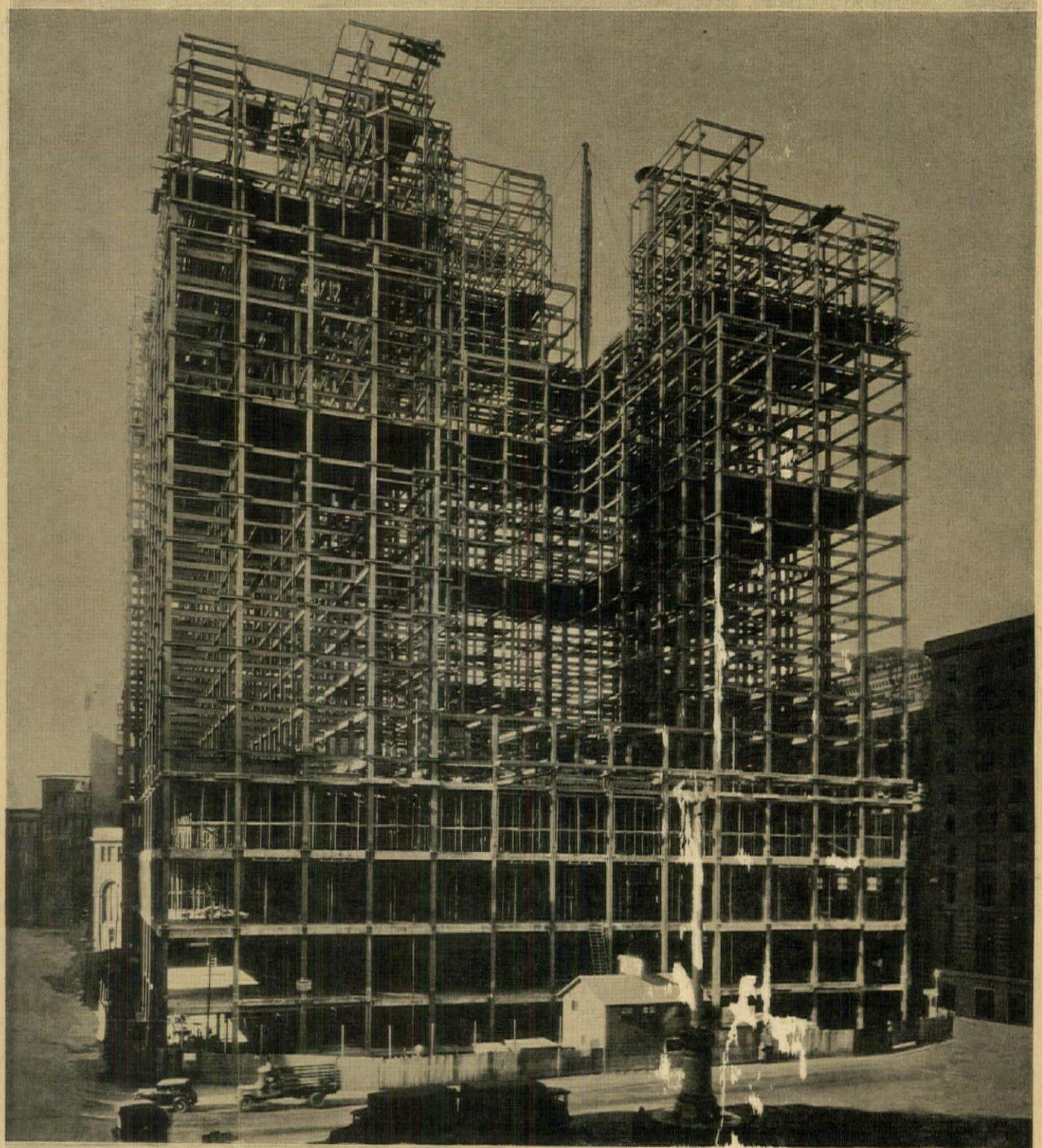
BETHLEHEM *WIDE-FLANGE* STRUCTURAL SHAPES
FOR NEW BOSTON POST-OFFICE



Architects: (Exterior) Cram and Ferguson; (Remainder of Building) Supervising Architect, U. S. Post Office Department; Engineer: H. G. Balcom; Contractors: N. P. Severin Company.

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