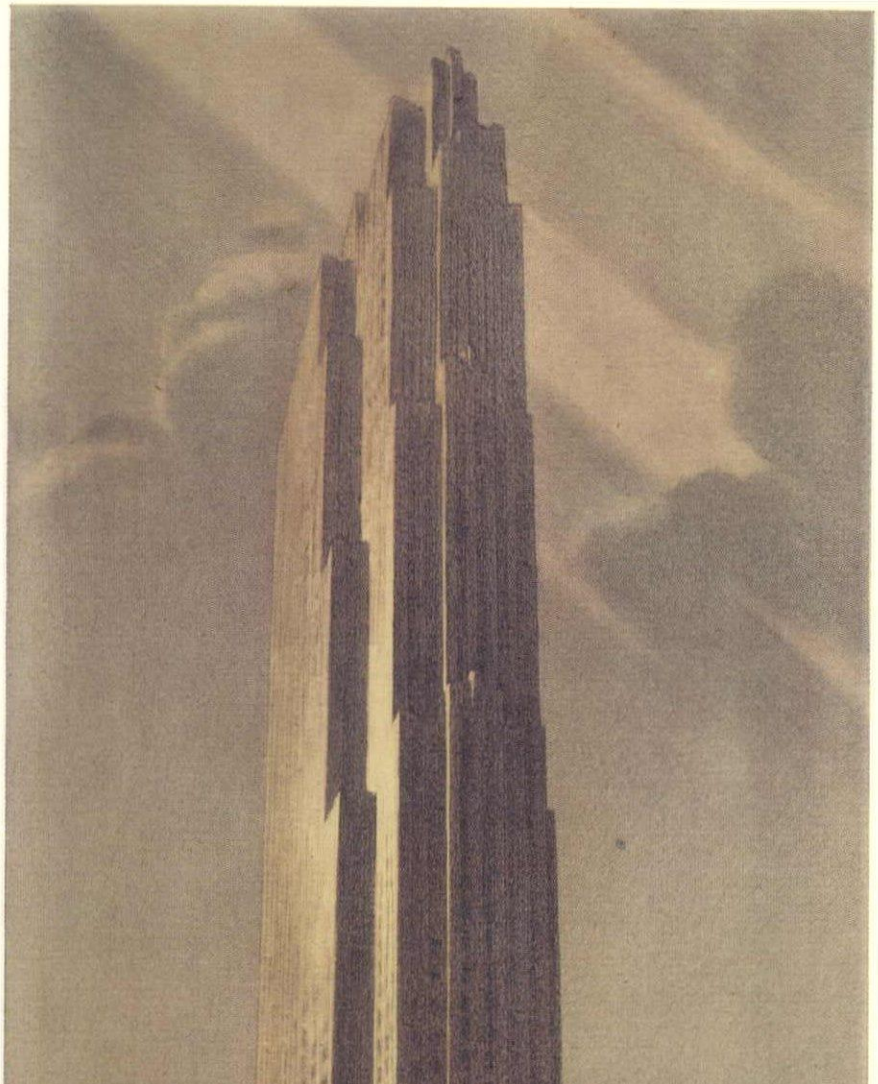


The Architectural Forum

THE CENTRAL TOWER
ROCKEFELLER CITY

REINHARD & HOFMEISTER;
HOOD & FOUILHOUX;
CORBETT, HARRISON &
MACMURRAY, ARCHITECTS

IT IS a distinct pleasure to begin the New Year with the first of the series of officially authorized articles describing Rockefeller City. This exclusive series begins with the articles by Raymond Hood, L. Andrew Reinhard and Wallace K. Harrison. The unusual interest shown in the announcement of this feature of THE FORUM for the coming year is evidently due in part to the fact that so many of the ideas developed will be adaptable to architectural practice and procedure in connection with the average architectural work, both large and small.

The Architecture of Smaller Buildings will be featured in each issue of THE FORUM for 1932, not only in Design but also in the Engineering and Business aspects. Of Smaller Buildings this month, three distinctive residences are shown in Part I. The technical and economic considerations of selecting insulation for such buildings are competently discussed in Part II.

THE FORUM will continue to present the most timely information regarding those elements in architecture of greatest interest and usefulness, in the most concise yet complete form possible, matching progress in architecture with progress in architectural publishing.

THE ARCHITECTURAL FORUM

VOLUME LVI

NUMBER ONE

JANUARY 1932

THE DESIGN OF ROCKEFELLER CITY

BY

RAYMOND HOOD

OF THE ARCHITECTS OF ROCKEFELLER CITY

HOW definitely the day of the architectural one-man show has passed is borne out with unmistakable emphasis in the planning of Rockefeller City. Within the remembrance of the youngest of us is the time when an architect, with the aid of a few draftsmen, planned, designed, and supervised construction of an entire project. Rapid growth in the size and complexity of architectural problems, however, has forced all of us to realize that in the face of them our own capacities are relatively limited and that we must consult freely with experts in allied arts and sciences. If this is to be regretted from the standpoint of individual expression, it is nevertheless inevitable, and it is responsible for general improvement in the quality of our architecture. Certainly no one man can cope successfully with the problems that one of our great buildings imposes on the architect.

The process of developing the plans for Rockefeller City has been going on for approximately four years — although the group which is now in charge of the project has been working on the problem for only two years. It would be impossible to estimate the number of official minds that have engaged in untangling the complexities of the problem; and certainly the number of unofficial minds that have pondered over it is even a more meaningless guess. Architects, builders, engineers, real estate experts, financiers, lawyers — all have contributed something from their experience, and even from their imagination. With expert advice on all problems constantly available to the architects, nothing has been done hastily, nothing without consideration from all angles, or without estimating the probable consequences. Throughout, there has been a marked absence of architectural whimsies, of which most of us architects are guilty from time to time.

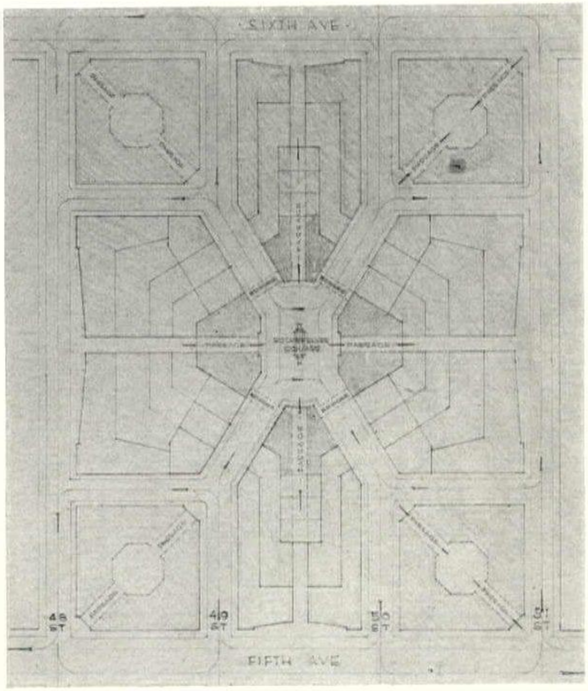
I have, and I suppose every architect has, done things of which I was not entirely certain. On a single building operation, something may be risked for the sake of experimentation, but on a two hundred and fifty million dollar development, and one which may set a precedent for many in the future, mistakes can be so costly that they become catastrophes. It is needless to say that every man associated with Rockefeller City knows that he is risking his reputation, his professional future on the success of Rockefeller City.

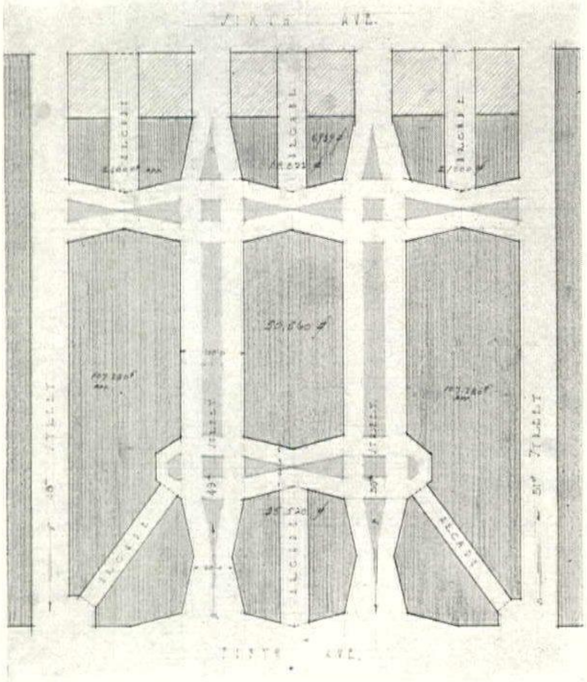
The property to be developed consists of the greater part of three large city blocks, extending from 48th Street to 51st Street, and from Fifth to Sixth Avenues. An accompanying illustration shows the exact area controlled by the Metropolitan Square Corporation, which is the holding company for Mr. Rockefeller. It contains 513,000 sq. ft., or between twelve and thirteen acres.

The property was acquired from Columbia University on a lease hold, and since there is a twenty-year cancellation and re-appraisal clause, it is evident that Columbia is vitally concerned in the financial success of whatever venture is tried on the site.

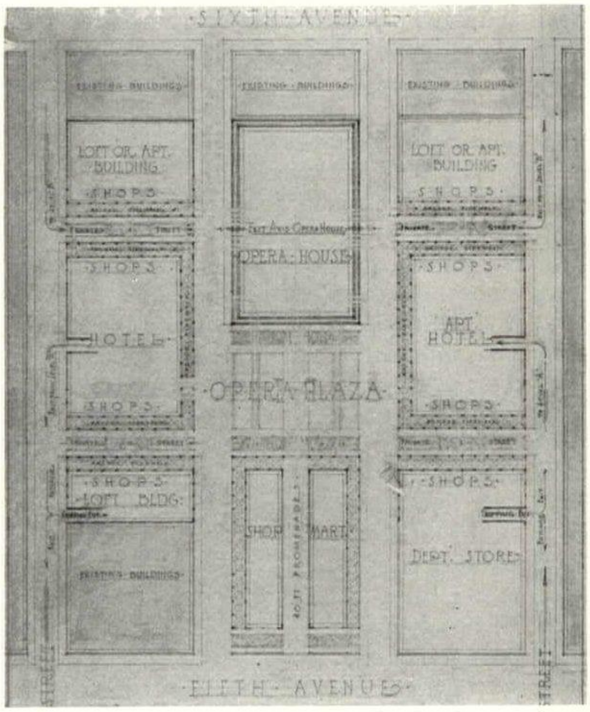
So, conscious that the development must first of all pay its own way, we started to work. During the early stages, each of the three associated archi-

Two other articles in the series on Rockefeller City appear on pp. 77 and 81 of this issue. One is by L. Andrew Reinhard on the organization of the project, the other by W. K. Harrison on office practice





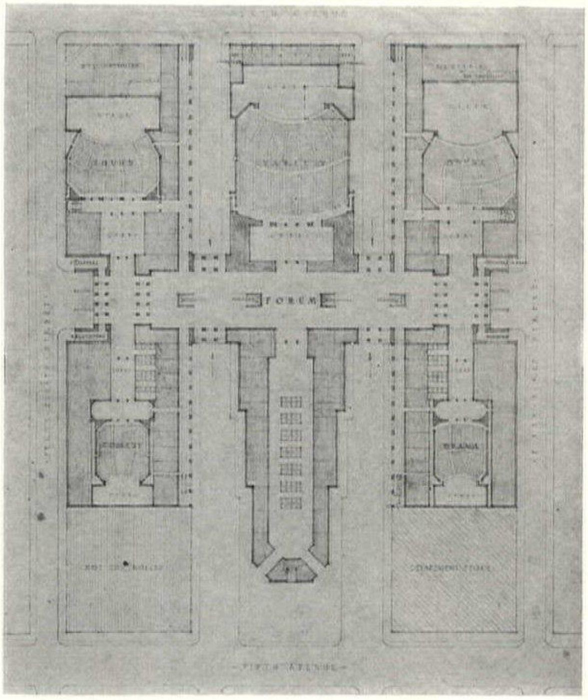
The six ground plans on these two pages are representative of the great number of studies made in developing the present plan. At the left is an attempt to build up a pyramid unit, and at the right, one which employed an interesting deviation from the present system of street traffic

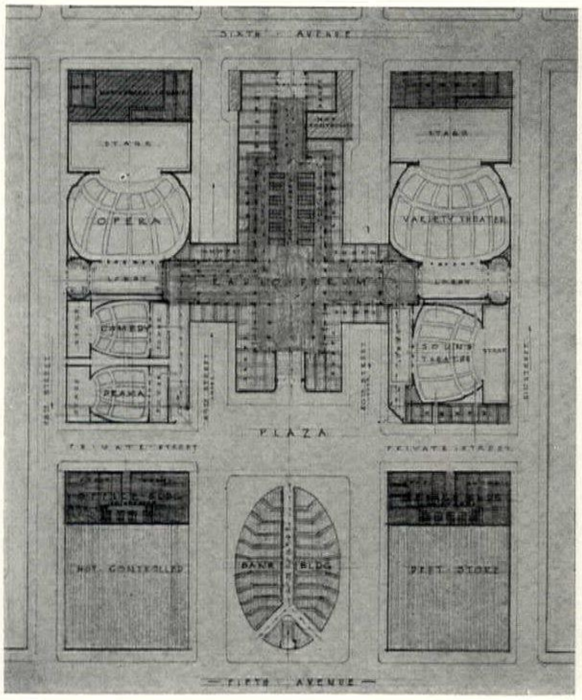


This is the earliest plan of the development in existence, made before its limitations had been definitely established. Although this is only one level of an interesting two level plan, its similarity to the present scheme is remarkable

tectural offices made independent studies, with the intention of obtaining as many varied attacks of the problem as possible. Reproduced on these two pages are five typical studies made in the general working out of the ground plan. I would not attempt to guess how many such solutions were made; I doubt, however, if there were many possible schemes that were not studied before the present plan was adopted. And, even after arriving at a definite scheme, changes are continually being made to coincide with rental developments.

In general, the approach to the problem was the same as that which is followed on any large commercial building operation. It may be summed up briefly in those two words which have come to mean so much in the architect's vocabulary — "cost" and "return." This thought, I know, is unpalatable to some architects. Certainly I was taught to believe that the overstressing of the financial end of an operation would result in very little good, and that good architecture could be produced only when restraint of this sort was lifted from the architect. To be sure, the architect is always supposed to analyze in a vague way his spending of the client's money, but there was always the advertising value of good art to fall back on if the figures did not work out well — and then the client's pride could be drawn on heavily in case of necessity.



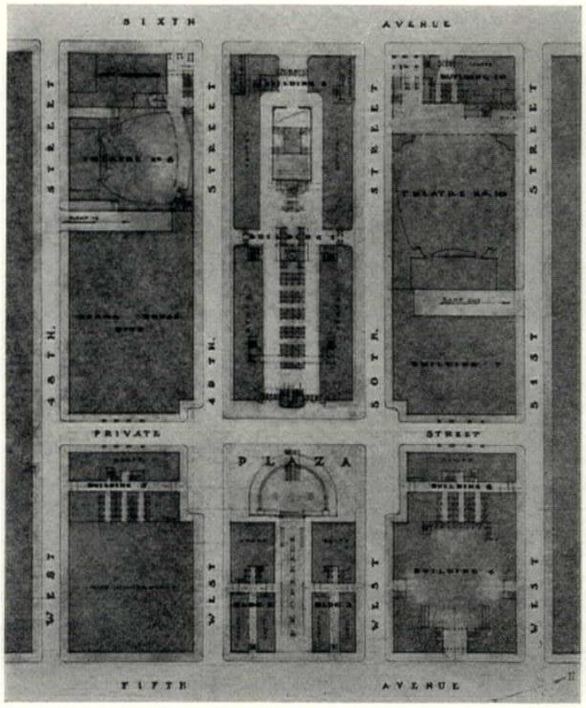


These plans are more strictly steps in the working out of the existing plan, since the requirements were known. Although each is marked by a forum connecting the group, the one at the left has an open plaza on Fifth Avenue, and the right one has a cross street and an enclosed plaza

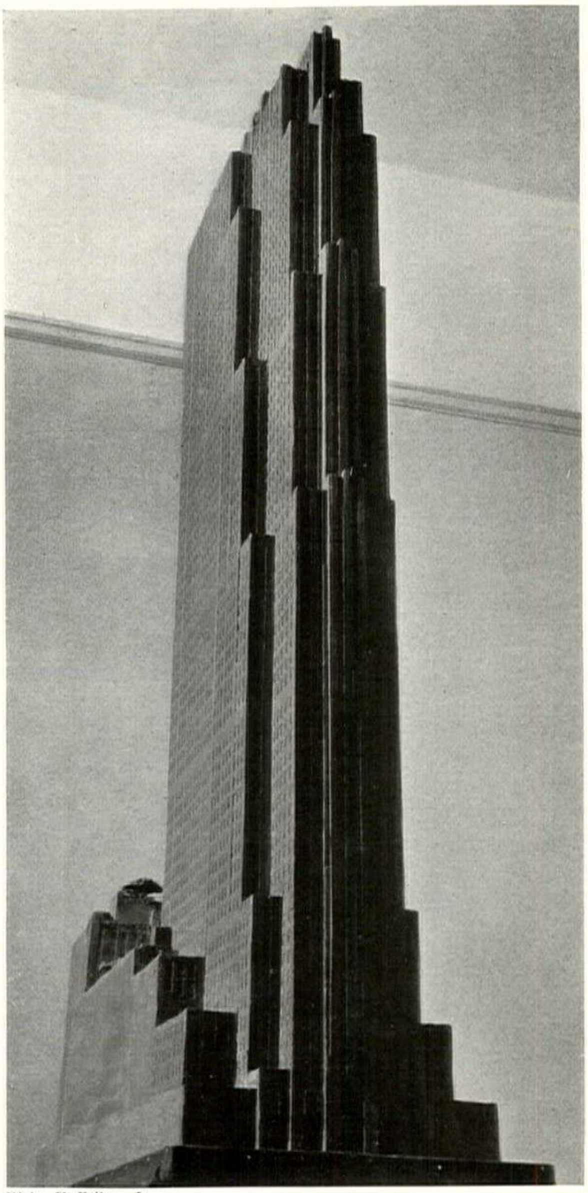
Far from being a handicap, this discipline, I am convinced, of being obliged to make a project stand on its own financial feet and to submit its details and materials to a constant critical analysis leads to honesty and integrity of design. Under this stimulation, the cobwebs of whimsey, taste, fashion and vanity are brushed aside, and the architect finds himself face to face with the essentials and elements that go to make real architecture and real beauty.

Since street level space in this district earns many times as much as office space in the upper stories, one of the guiding principles in the plan was to obtain the maximum ground floor area and street perimeter. The office space above of necessity had to be ideal, which meant flexibility for arrangement and all outside space of shallow depth from the windows.

The scheme we adopted was of obvious simplicity. The zoning law allowed us to cover the entire site without setbacks to an approximately uniform level of 100 ft. above the ground. Above this point we took advantage only of our 25 per cent tower rights on each block. In the middle block the tower right is concentrated in a single great unit in the center. On each of the other two blocks, it is divided in two, a tower at each end. This gives a staggered tower plan, like a five spot card. In the towers is concentrated the office space which is thus as ideal as possible, since every office

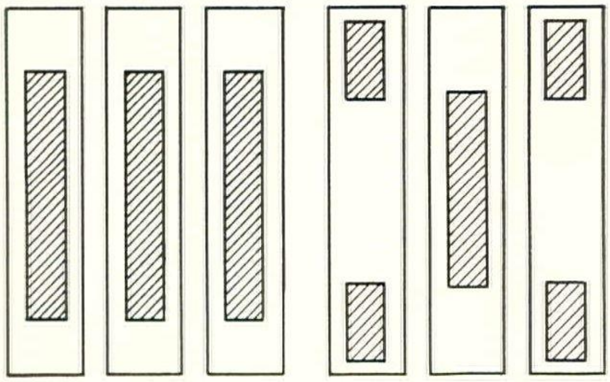


This is the existing plan of the development, which is somewhat more intensive than the others, but which is still open enough to provide adequate light and air for the Rockefeller City buildings as well as for those in the vicinity



Walter H. Kilham, Jr.

Model of the central building in the project



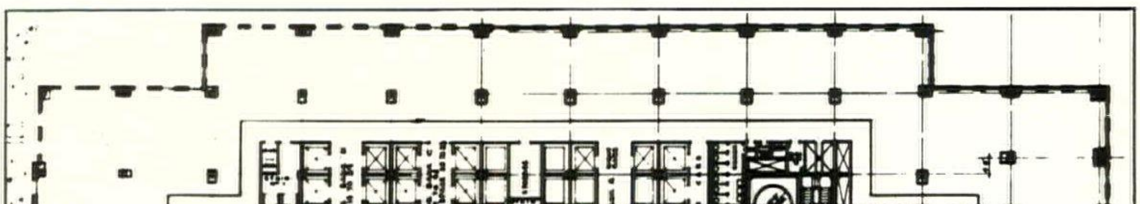
The diagram at the left shows the permissible tower rights under the zoning law; at the right is the existing less intensive staggered plan

has a protected outside view and light. In the lower part, *i.e.* below the 100 ft. level, are concentrated theaters, stores, and all those rental spaces that require direct contact with the street and can be artificially lighted and ventilated.

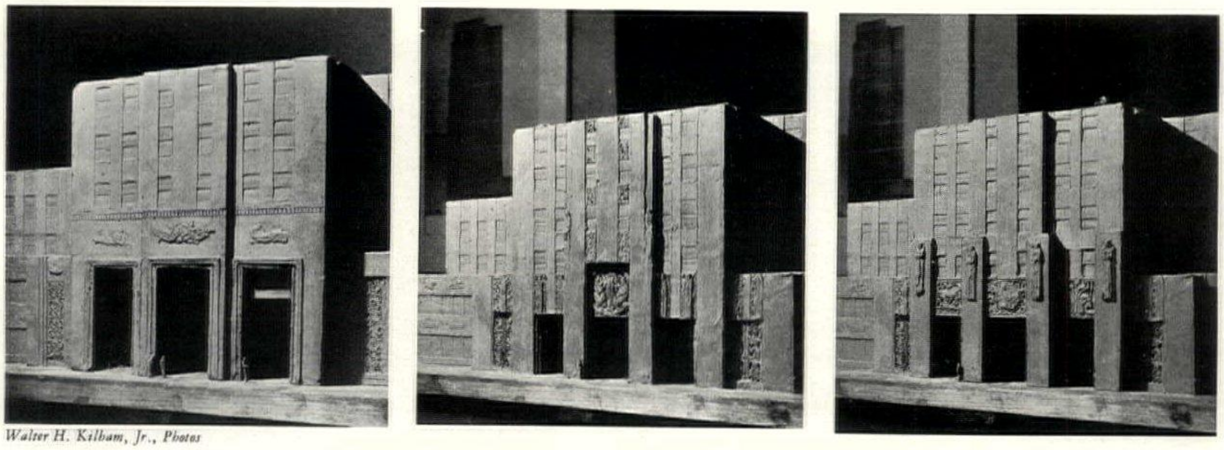
The plaza that is developed in the middle block serves three purposes. It creates a shopping center that gives additional value to the shops around it, it furnishes a distinguished setting for the three great office buildings that face on it, and by sinking its center it gives an important entrance to the basement shopping level that extends underneath the whole project, tying the buildings into a single unified scheme.

The staggered tower scheme described above has one obvious advantage for our neighbors, as compared with the more usual composition of towers on office buildings grouped about a monumental light court, the advantage of turning our light courts out so that they furnish light and air to our neighbors as well as to ourselves.

With the grouping of the buildings definitely approved, and the approximate capacities of the various buildings already determined, the study of



Typical floor plan of building above, consisting simply of 27 ft. rentable area around the core



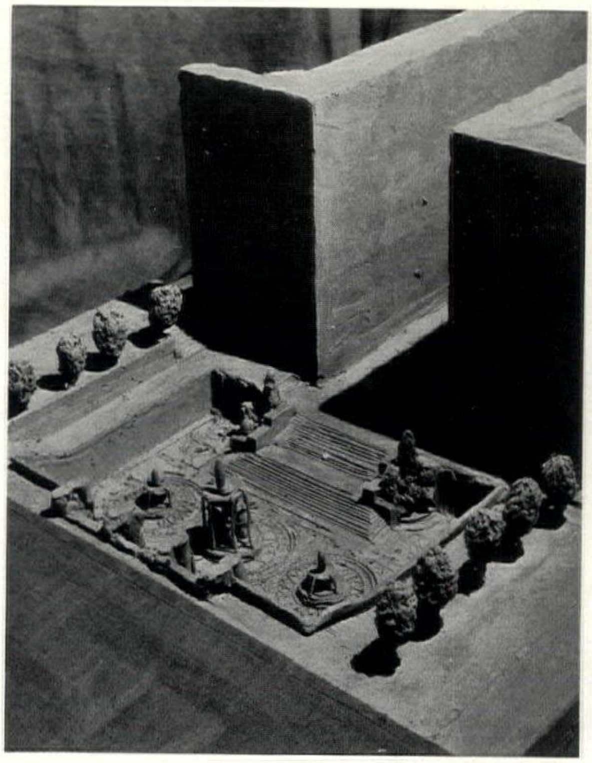
Walter H. Kilham, Jr., Photos

Three plaster studies for a triple entrance to the building on the opposite page

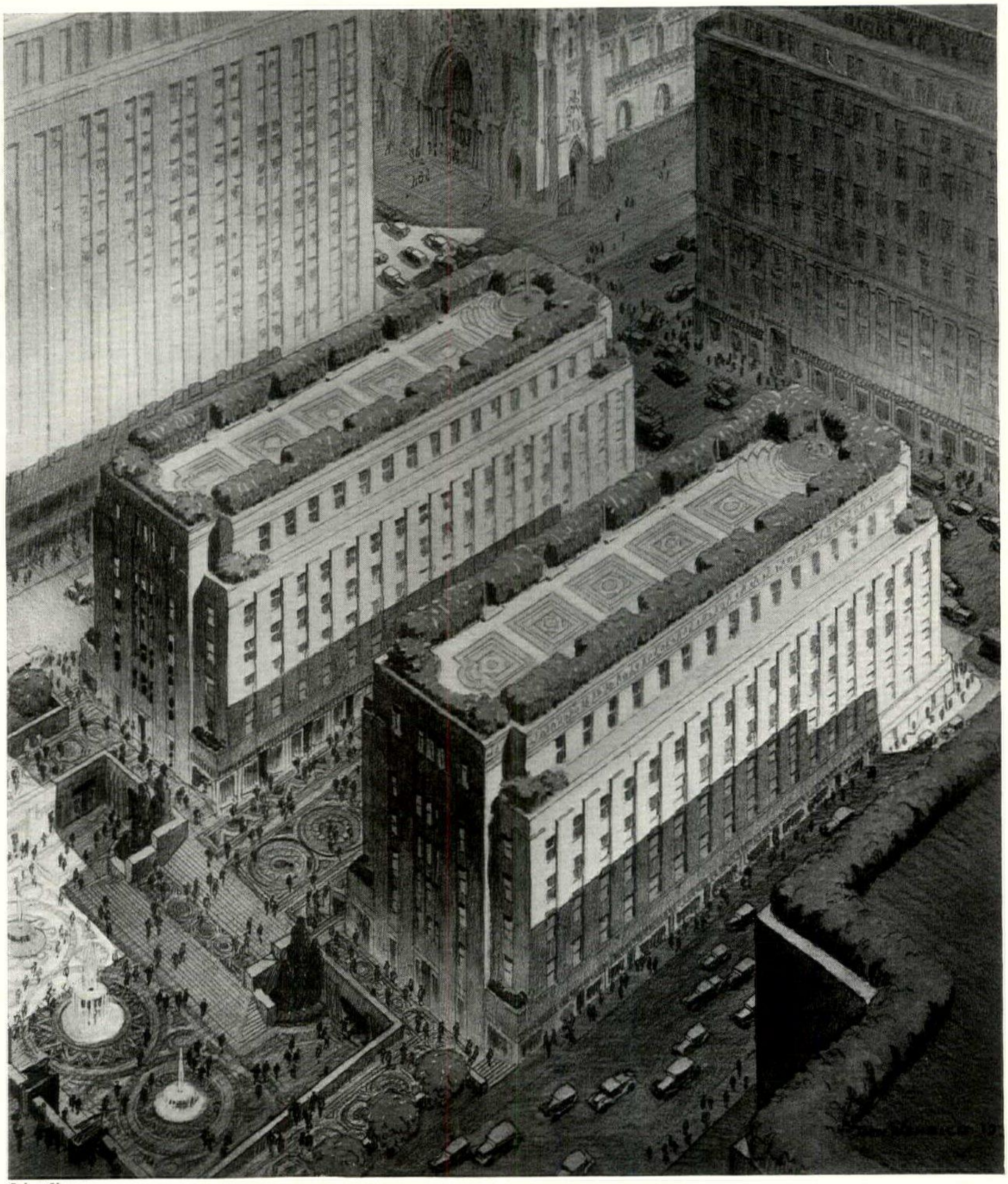
the definite planning of each building followed the same course that is taken on every large commercial building. In the 66-story tower, which we refer to as Building No. 9, we have worked out a scheme which is likely to have an important bearing on all future commercial office buildings. Grouped in the center are the elevators, and the service facilities, and surrounding them on each floor we have stretched the 27 ft. of lighted space that experience has proved is the maximum to be allowed to provide adequate light and air to all parts of the building. Although many a building has been planned upon this principle, we have carried the principle to its logical conclusion. As each elevator shaft ended, we cut the building back to maintain the same 27 ft. from the core of the building to the exterior walls. By so doing, we have eliminated every dark corner; there is not a single point in the rentable area of the building that is more than 27 ft. away from a window. A study of the plan (see page 4) will establish more clearly what is meant.

Since each of the buildings is to be discussed in later articles, there is no necessity for outlining them here. Perhaps one of the most interesting features of the design, and certainly the one which seems to have stirred the imagination of the public more than any other, is the utilization of the roofs of the lower buildings for gardens. Those of us who work in offices above the twentieth floor in large cities know too well the dismal appearance of a bird's-eye view of a large city. The tenants of Rockefeller City, for whom the buildings are being constructed, are entitled, we believe, to the most consideration in the allotment of beautification, or perhaps ornamentation. Exterior ornamentation of our great skyscrapers is in large measure both wasteful and wasted. It seemed wholly logical, therefore, to cover the roofs of the lower buildings with beautiful flowers, shrubs, fountains, and to transform them from eye-sores into beautiful vistas. It is intended that these beautiful gardens, too, shall pay their way. As every architect knows, it is one thing to propose something beautiful on the basis of its being beautiful and quite another thing to propose the same thing as a producer of revenue. In this instance, there was far more interest displayed in what the newspapers call "The Modern Hanging Gardens" when it was pointed out that the gardens themselves can be treated so as to bring in a revenue commensurate with their cost, as well as to provide a feature of such great attraction to the paying public and the tenants alike.

I doubt, in fact, if we ourselves as yet appreciate how much these gardens will do for both the



Suggested development of the central plaza



Palmer Shannon

A REPRODUCTION of one of the architect's perspectives looking toward Fifth Avenue and showing the two smaller buildings and a study of the plaza behind them. These buildings replace the oval building which was included in the announcement of Rockefeller City plans and serve as a Fifth Avenue gateway to the entire Rockefeller City development. This picture indicates an interesting feature of the Rockefeller City design: the roof gardens which are being developed as an important part of the project. The plans for these landscaped areas are elaborate and if they are completed a botanical expert will collaborate with landscape architects to develop one of the most unusual areas of botanical gardens in the world. It is expected that admission to them will be charged so that in addition to providing a most attractive vista to the tenants of the adjacent buildings the roof gardens will become economically justified. It is obvious that such landscaping schemes imply a number of highly technical engineering problems. When plans for these gardens are completed, articles about them and the solutions to the construction problems will be included in forthcoming issues of THE ARCHITECTURAL FORUM

Wurts Bros.

An air view of the area to be occupied by Rockefeller City, showing in the center of the picture the excavation for the 68-story building shown on page 4 and, in the background, the steel frame work for the 31-story building on the corner of Sixth Avenue & 51st Street

Rockefeller group itself, and our neighbors, for these gardens instead of being sunk in a well of surrounding buildings, as in Bryant or Gramercy Park, will be lifted up to the general level of the roofs of the city so that they can be seen from every skyscraper and tower within range of the site.

In the sub-basement is arranged the mechanical services, and the deliveries for the whole group. The level is reached by ramps from 48th and 51st Streets.

An express station of the new Sixth Avenue subway will give direct access to the first shopping basement, and naturally every other possibility of access to the group by subway and tunnel is being studied, although as yet there are no results to be announced.

It has been impossible, obviously, to do more than to outline the general development of the plans of this project. It has been founded upon the principle that concentration in a metropolitan area for business reasons is a desirable condition. We are aware that many oppose that view. Nevertheless, the commercial success of urban life is dependent upon concentration, which provides immediate access to those with whom we have to deal. Every large city has its insurance district, its financial district, its garment center, its theatrical district. These are essentials to city life. Decentralization means loss of time and inconvenience. The Radio Corporation of America has adopted Rockefeller City as its center, which has this advantage over other commercial centers. Instead of being in a few scattered buildings within fifteen or twenty minutes' walk of each other, they are all under one roof, within a minute or two of each other. It is the belief of those who are responsible for this project that other interests will follow the lead established here to provide even closer coordination than is now possible.

We have been given a great opportunity. In a sense, for the first time in the history of building development, capital has allied itself with building as a partner. Heretofore, the relation of capital to building has been that of a lender, of a mortgage holder. If Rockefeller City is successful, we shall prove what architects have contended — that, given a great opportunity, they will accept the responsibility and show that order and commercial success are not incompatible. If it fails (and it will have failed, if it cannot stand on its own feet and is only sustained by pumping in money every year to make up a deficit) it may be many years before capital will give another such opportunity to architects.

CHRONOLOGICAL SUMMARY OF ROCKEFELLER CITY

IN 1801, the present site of Rockefeller City, then three and a half miles from New York City, was purchased by Dr. David Hosack, professor of botany at Columbia College for $4,807.36. He bought the property for the purpose of establishing a botanical garden. After spending more than $100,000 for improvements, he sold the property to the State of New York in 1810 for $74,268.75. The State permitted the property to fall into ill repair, and in 1814 it was granted by the State to the Trustees of Columbia University, who accepted it rather reluctantly because the land had depreciated in value to less than $10,000.

By 1857, however, values had increased to such an extent that 16 lots were sold to the Dutch Reformed Church for $80,000, and approximately 25 years ago, the entire block from 47th Street to 48th Street was sold for $3,000,000. The three blocks north of this were held, due to the foresight and tenacity of the University trustees, and they now form the basis of the Rockefeller City site.

1928

December 6. Incorporation of the Metropolitan Square Corporation.

1929

January 22. Lease to Metropolitan Square Corporation signed with Columbia University retroactive to October 1, 1928. Covering three blocks above mentioned.

October 1. Contract signed between Metropolitan Square Corporation and Todd, Robertson & Todd, and Todd & Brown as builders and managers covering development as builders' managers of property.

1930

May 5. Conditional building agreement signed with the Radio Corporation of America, the National Broadcasting Company, Radio-Keith-Orpheum Corporation, and the Victor Photophone Company.

May 17. Demolition started.

July 1. Contract with architects executed. Architectural firms retained thereby — Reinhard & Hofmeister, Corbett, Harrison & MacMurray; Raymond Hood, Godley & Fouilhoux.

Contracts with H. G. Balcom, structural engineer, and Clyde R. Place, mechanical engineer.

August 13. Plans for general development approved by Columbia University.

1931

March 6. Tentative plans made public.

July 26. Excavation started.

September 4. Revised plans, eliminating two theaters and oval-shaped building shown on first plan, approved by Columbia University.

September 11. First concrete poured.

September 14. $65,000,000 loan obtained from the Metropolitan Life Insurance Company.

October 16. Contracts signed for 70-story office building, International Music Hall, and Sound Motion Picture Theater with general contractors Hegeman-Harris Company; John Lowry; and Barr, Irons & Lane respectively.

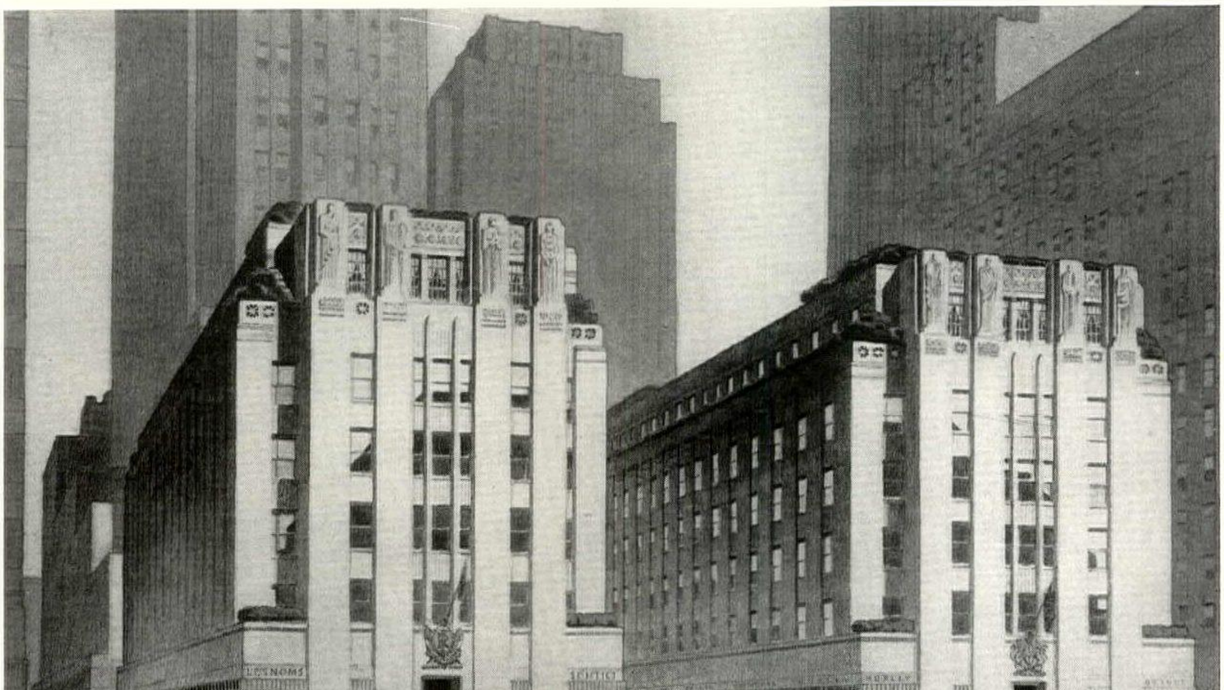
October 29. Final lease signed by Radio Corporation of America, National Broadcasting Company, Radio-Keith-Orpheum Corporation, and R. C. A. Photophone Company for 1,000,000 sq. ft. of office and studio space, and for two theaters.

November 1. Hartley Burr Alexander retained by the architects in advisory capacity on Rockefeller City plans.

November 30. First steel erected for International Music Hall.

December 1. Contract with New York Steam Corporation covering all steam for heating, etc. required by Rockefeller City.

December 3. Contract with United Electric Light & Power Company covering supply of all electricity for lighting and power.



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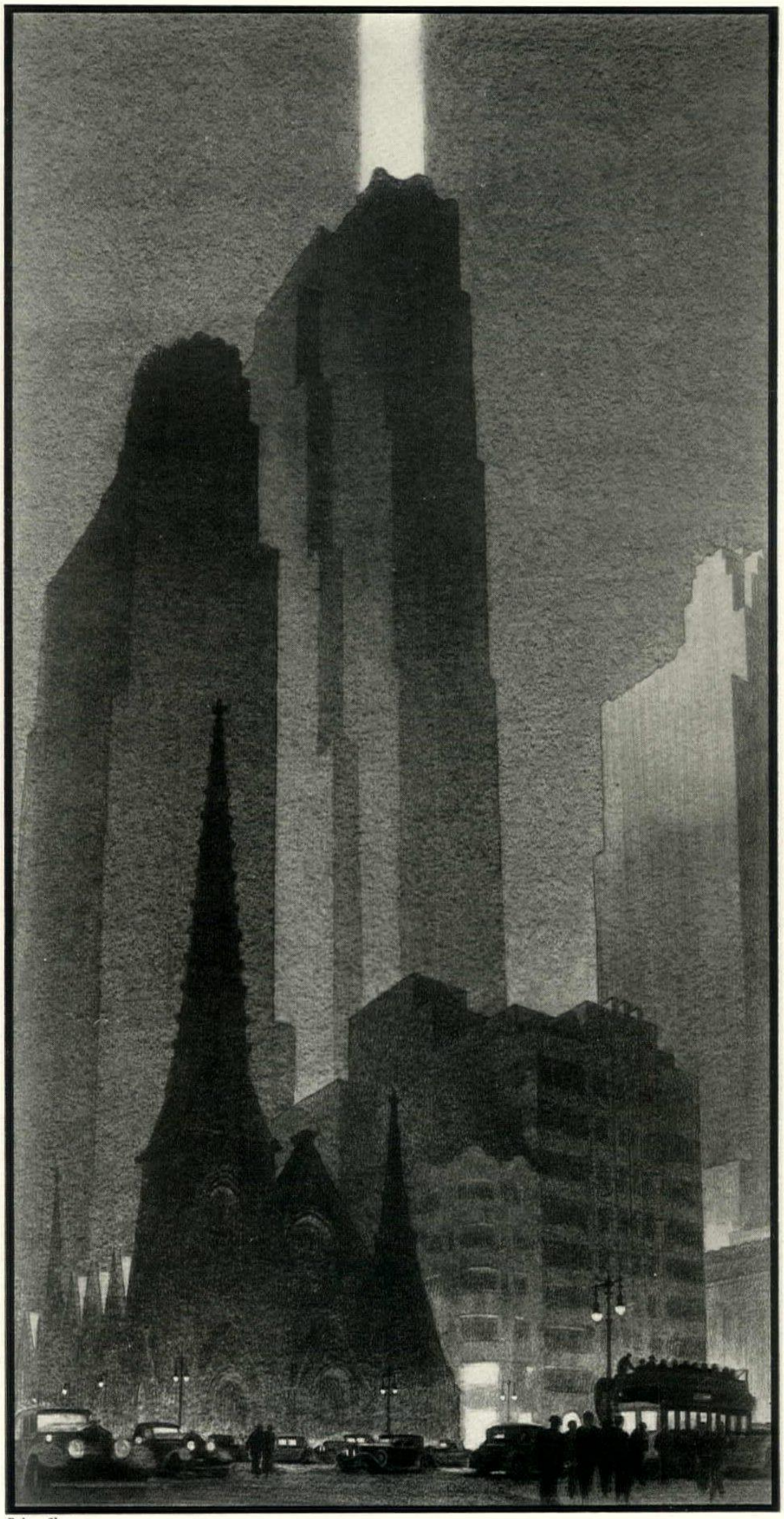
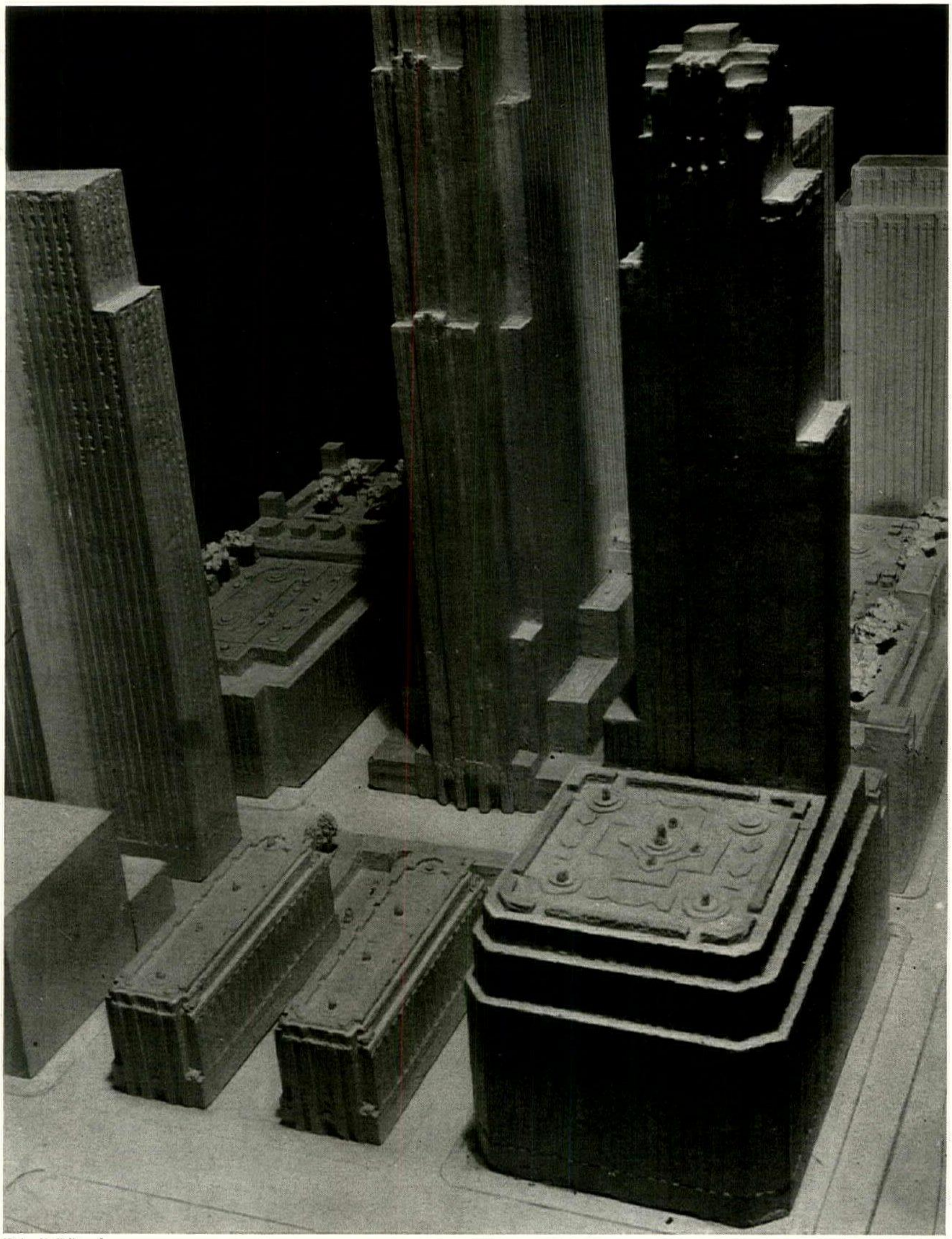
View from Fifth Avenue of two proposed buildings for occupancy by foreign interests



Palmer Shannon

ROCKEFELLER CITY
NEW YORK, N. Y.

REINHARD & HOFMEISTER, CORBETT, HARRISON & MacMURRAY, HOOD & FOUILHOUX, ARCHITECTS

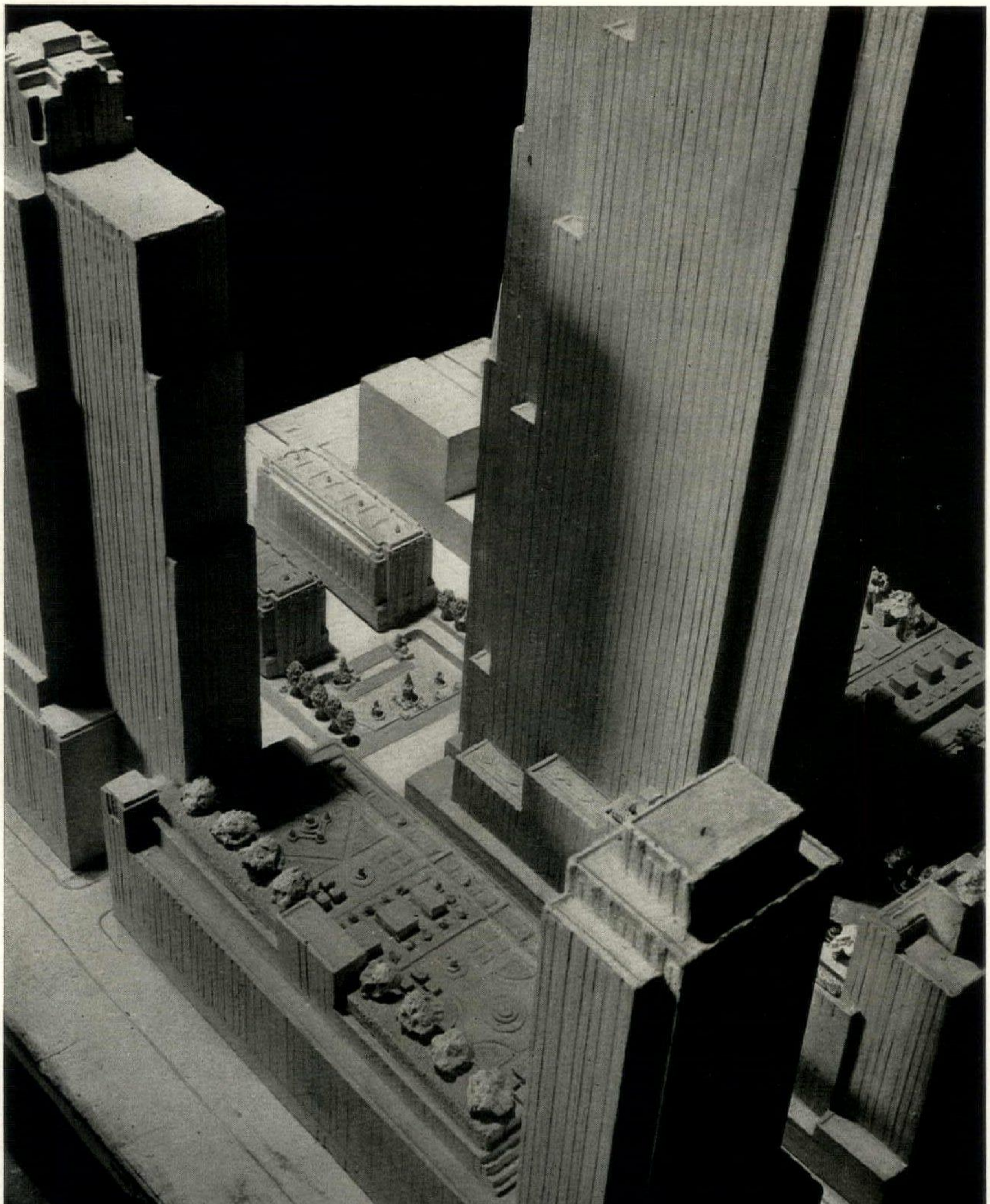


Walter H. Kilham, Jr.

LOOKING DOWN FROM ACROSS FIFTH AVENUE. FROM THE CURRENT MODEL

ROCKEFELLER CITY, NEW YORK, N. Y.

REINHARD & HOFMEISTER, CORBETT, HARRISON & MacMURRAY, HOOD & FOUILHOUX, ARCHITECTS

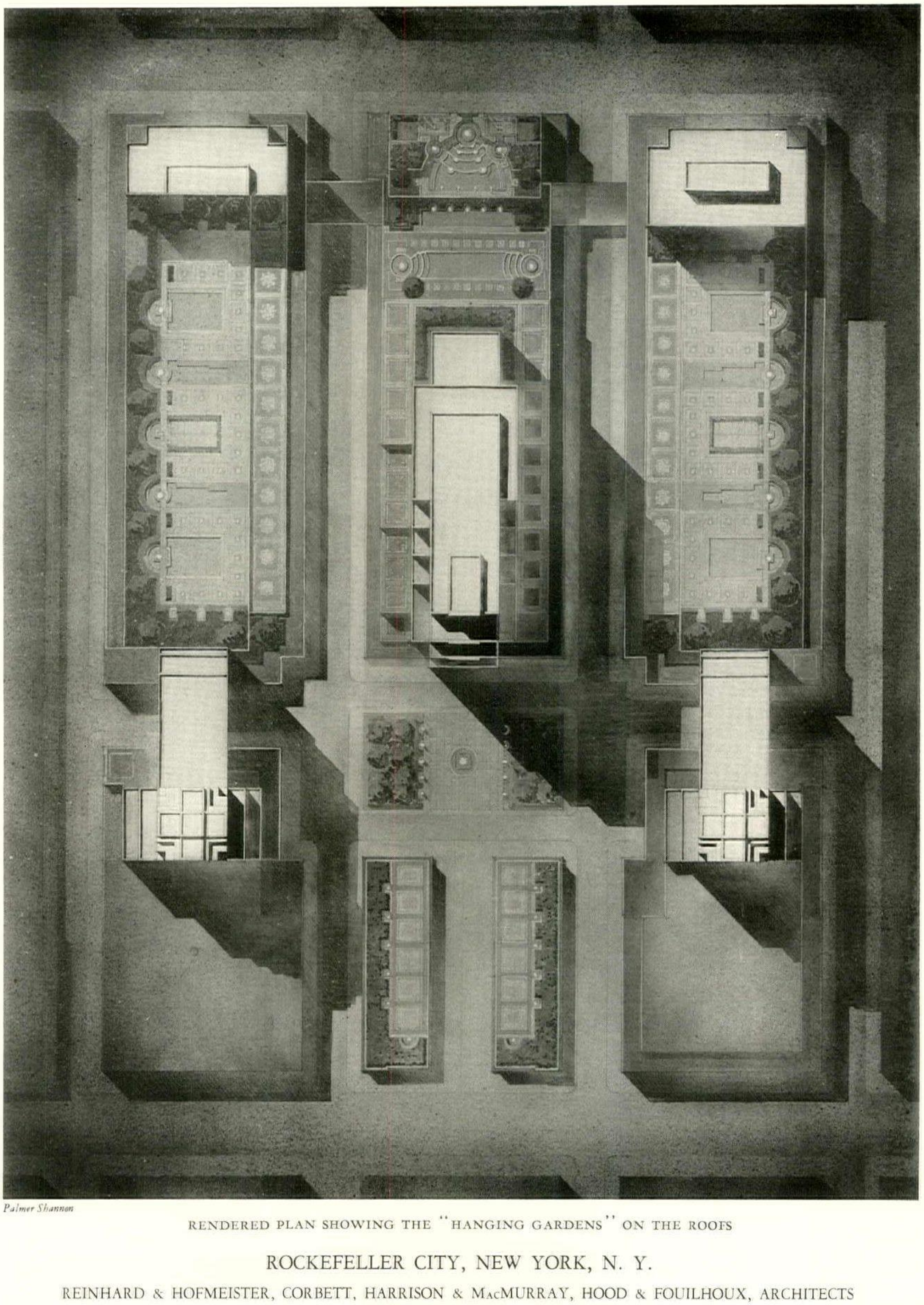


Walter H. Kilham, Jr.

LOOKING ACROSS THE LANDSCAPED ROOFS TOWARD FIFTH AVENUE FROM SIXTH

ROCKEFELLER CITY, NEW YORK, N. Y.

REINHARD & HOFMEISTER, CORBETT, HARRISON & MacMURRAY, HOOD & FOUILHOUX, ARCHITECTS

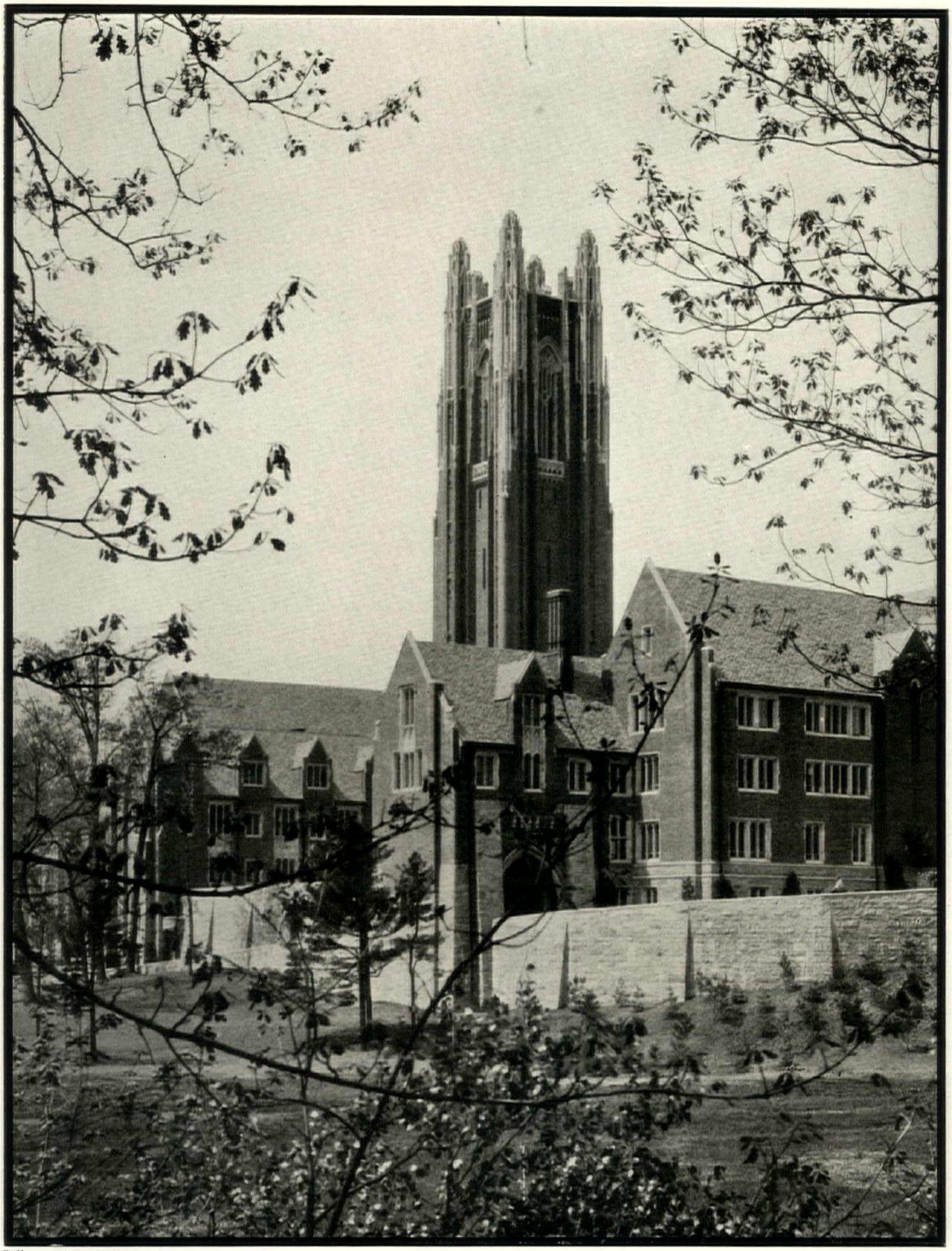


Palmer Shannon

RENDERED PLAN SHOWING THE "HANGING GARDENS" ON THE ROOFS

ROCKEFELLER CITY, NEW YORK, N. Y.

REINHARD & HOFMEISTER, CORBETT, HARRISON & MACMURRAY, HOOD & FOUILHOUX, ARCHITECTS

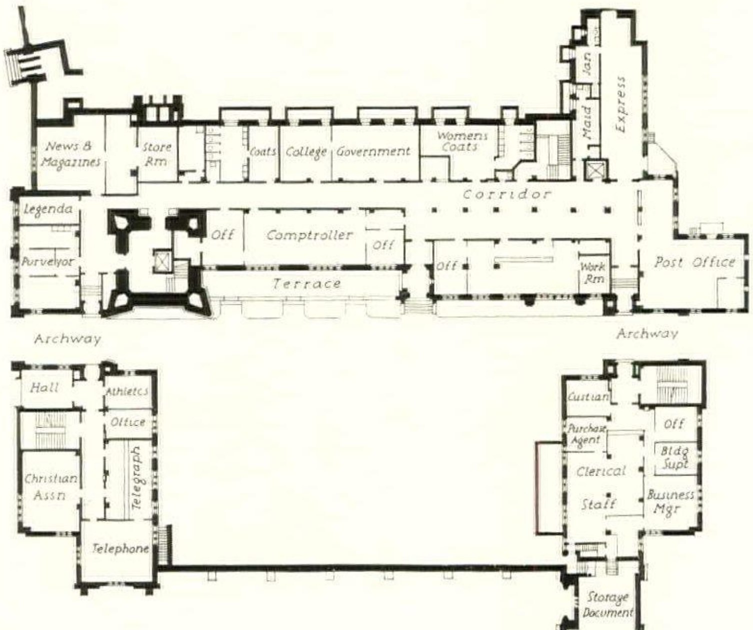


Dillon

ADMINISTRATION BUILDING, WELLESLEY COLLEGE

CHARLES Z. KLAUDER, ARCHITECT

Dillon

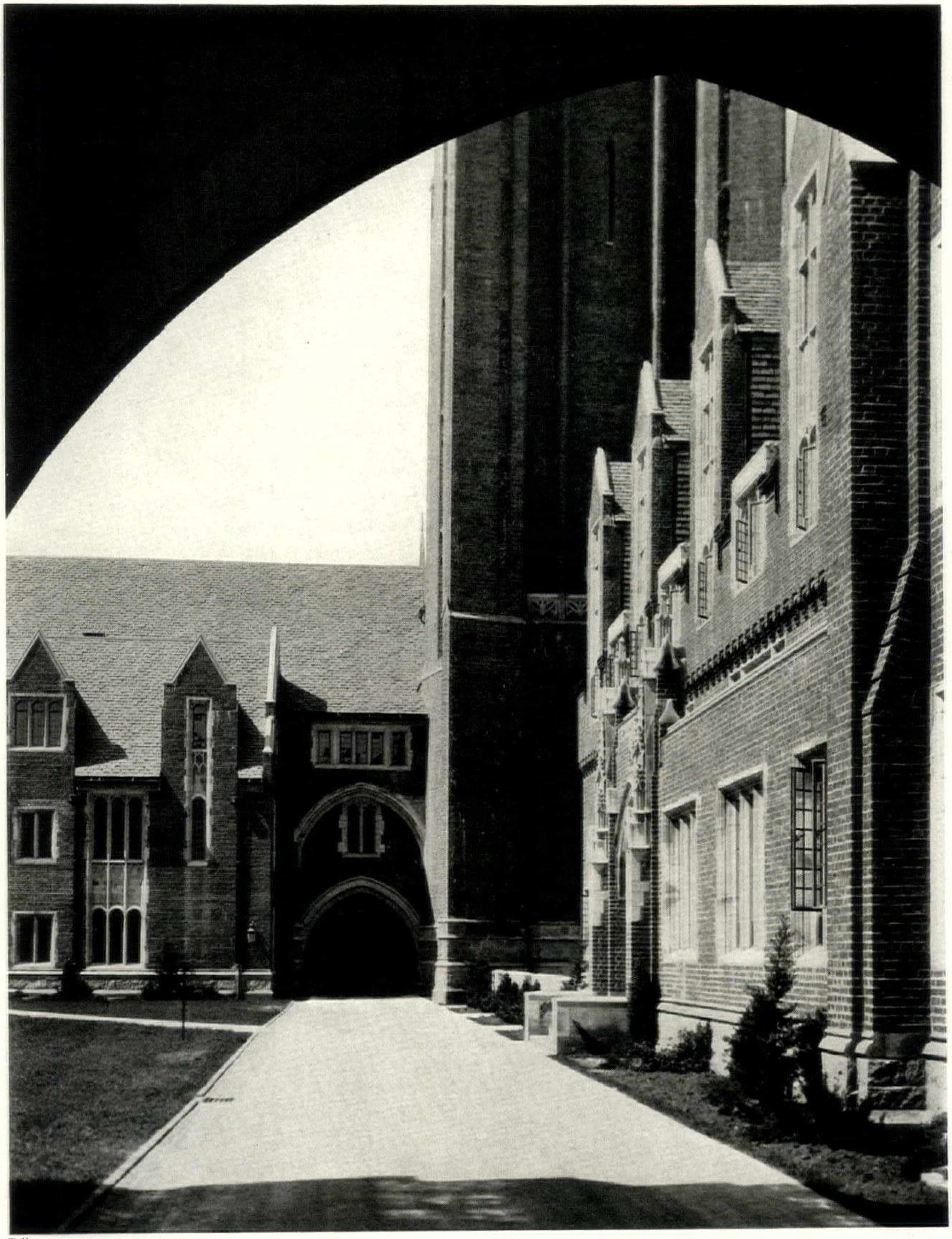


GROUND FLOOR PLAN

This newest addition to the Wellesley College campus was completed in December 1930 and contains 1,726,000 cu. ft. It is entirely of fireproof construction on a concrete foundation. The floors are of reinforced concrete on T joists, with terra cotta fillers. The walls are of load-bearing masonry construction faced with brick and trimmed with limestone. The interior columns are of reinforced concrete. The roof is covered with ¾ in. butt Vermont slate and the windows are leaded steel casements

HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

CHARLES Z. KLAUDER, ARCHITECT



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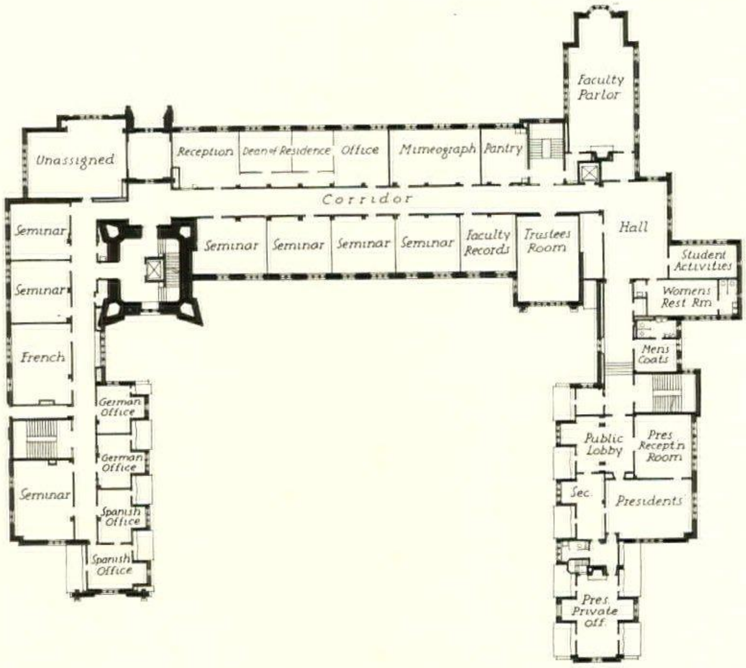
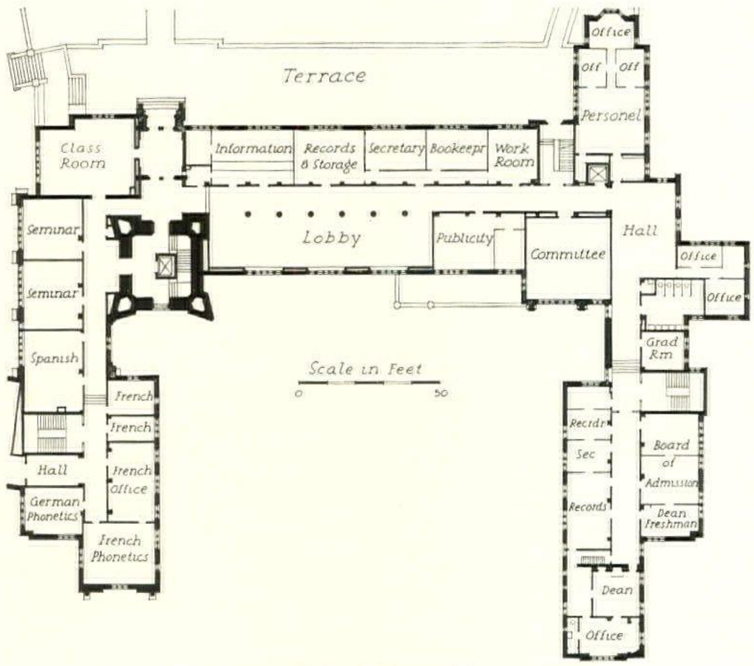
HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

CHARLES Z. KLAUDER, ARCHITECT



SECOND FLOOR PLAN



FIRST FLOOR PLAN

HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

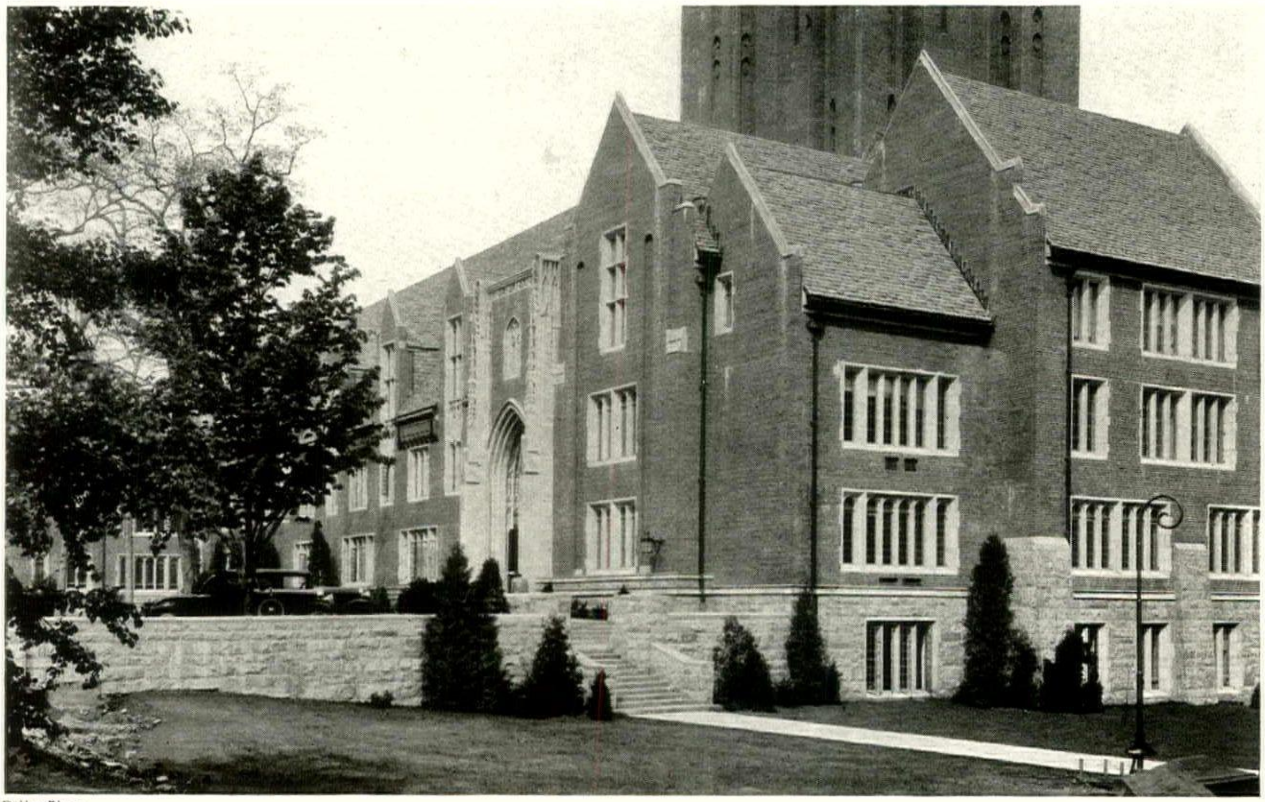
CHARLES Z. KLAUDER, ARCHITECT

Dillon Photos

The building is located on a slope and advantage of this fact has been taken in the development of the plan, entrances to the building being on two levels and from opposite sides. The picture above is a general view of the building from the lower level; at the right is a detail of the approach

HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

CHARLES Z. KLAUDER, ARCHITECT



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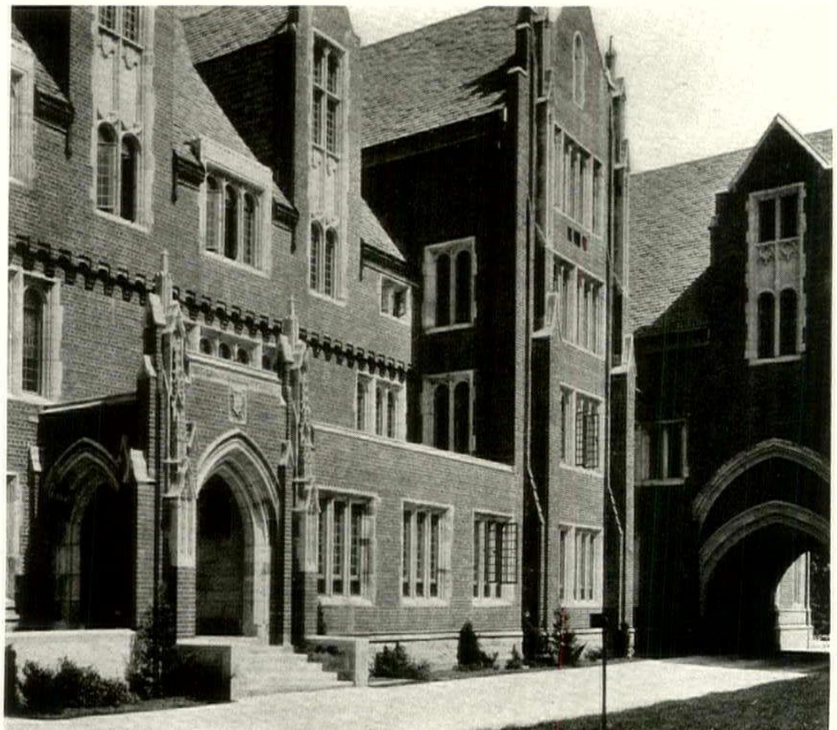
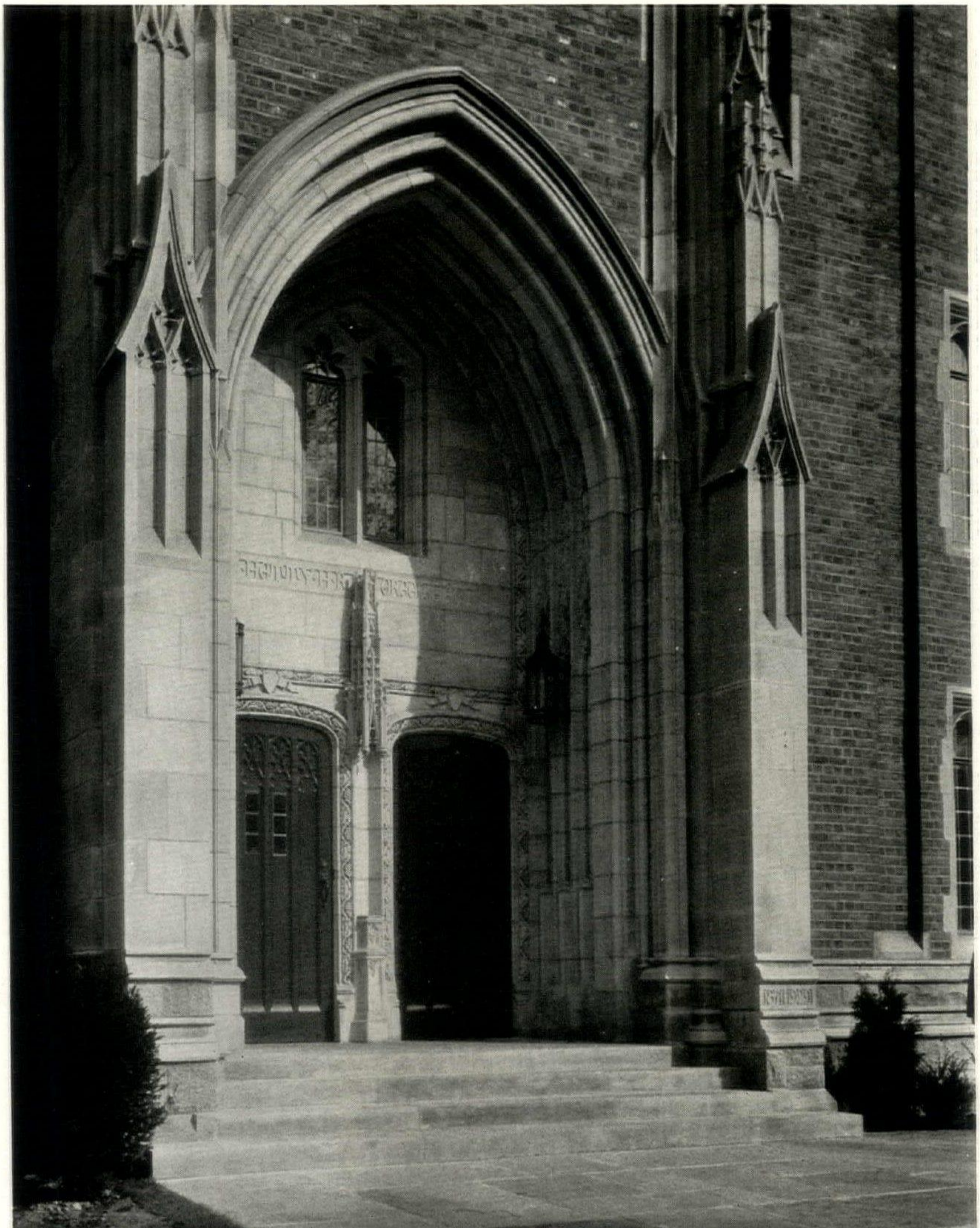


The picture above is a corner of the building from the upper level. Below is a view of one of the entrances facing the courtyard formed by the two wings, and on the opposite page is a detail of the entrance shown in the general view above

HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

CHARLES Z. KLAUDER, ARCHITECT



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HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

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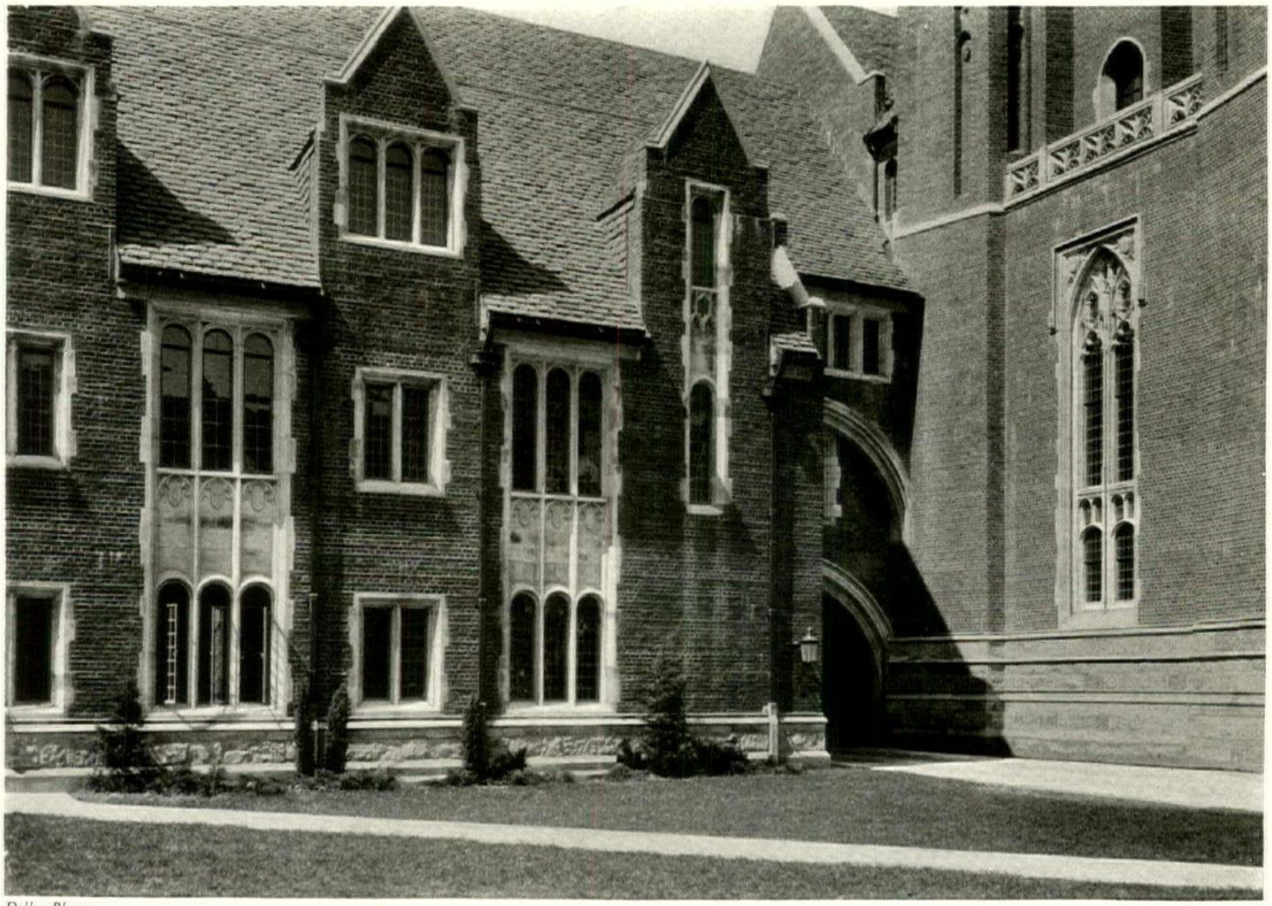
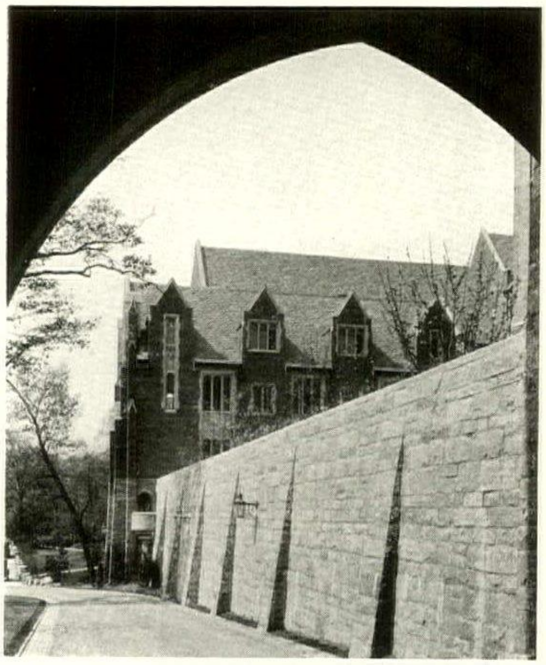


Dillon Photos



The building is largely utilitarian in purpose, providing working offices for the administrative departments of the college. In addition to these offices and their services there are the language offices and several seminar rooms. The interior treatment is in keeping with the building's purpose and but few rooms have received special treatment. However, the large hall, marked "Lobby" on the first floor plan (page 16) is made especially attractive by its appointments and the murals by Albert Herter at each end of the room

HETTY H. R. GREEN HALL, WELLESLEY COLLEGE, WELLESLEY, MASS.

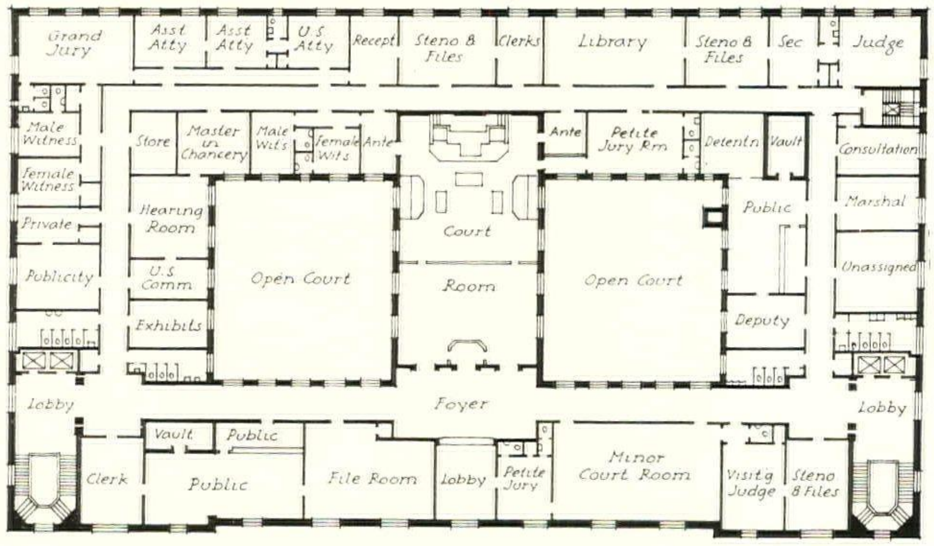
CHARLES Z. KLAUDER, ARCHITECT

Dreyer

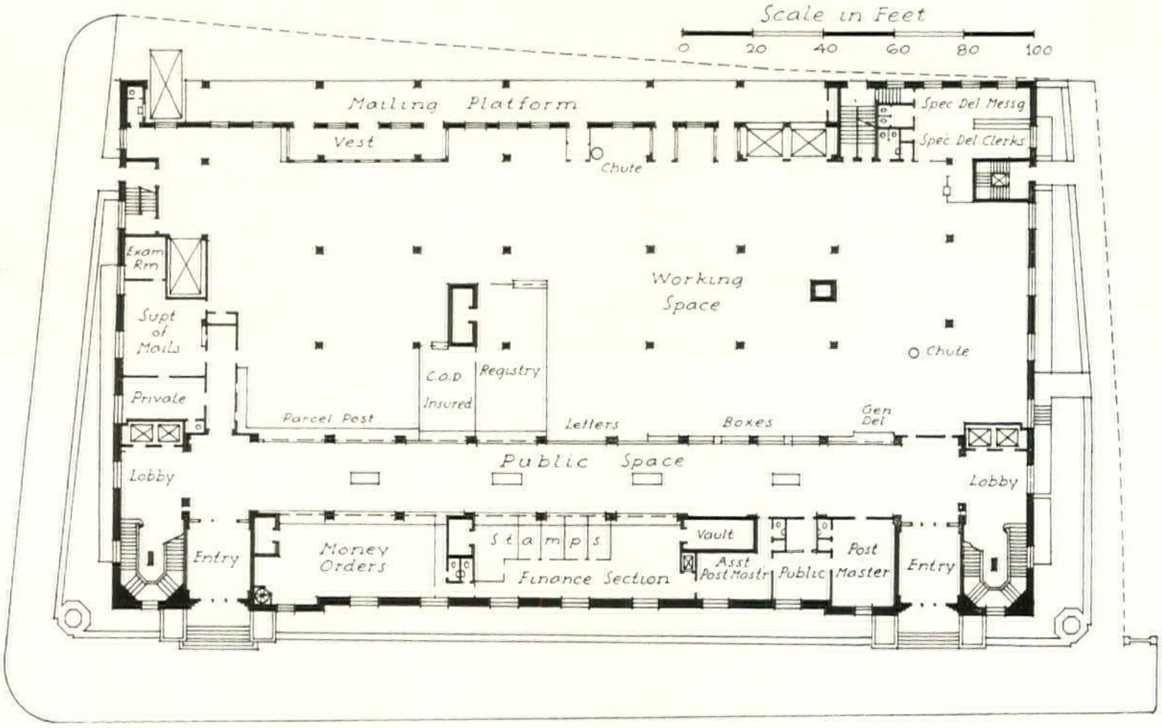
THE NEW UNITED STATES POST OFFICE COURT HOUSE AND CUSTOM HOUSE
ALBANY, NEW YORK

Federal buildings have usually been as monumental as the details of the particular problem would allow, but they have not always shown the understanding of their peculiar function or the originality in its interpretation that is displayed in this new structure at Albany. Since the building is still under construction, it is impossible to present more than the plans and the perspective at this time. A study of the two plans on the following page, however, will indicate how well the requirements of the various governmental departments have been met, and the reproduction of the architects' perspective reveals a design of consistent excellence. Without columns or cornice and with detail that is characterized as entirely modern, the building is still monumental in proportion, and, in the disposition of parts, almost classical in feeling

GANDER, GANDER & GANDER, ARCHITECTS
NORMAN R. STURGIS, ASSOCIATE
ELECTUS D. LITCHFIELD, CONSULTING ARCHITECT



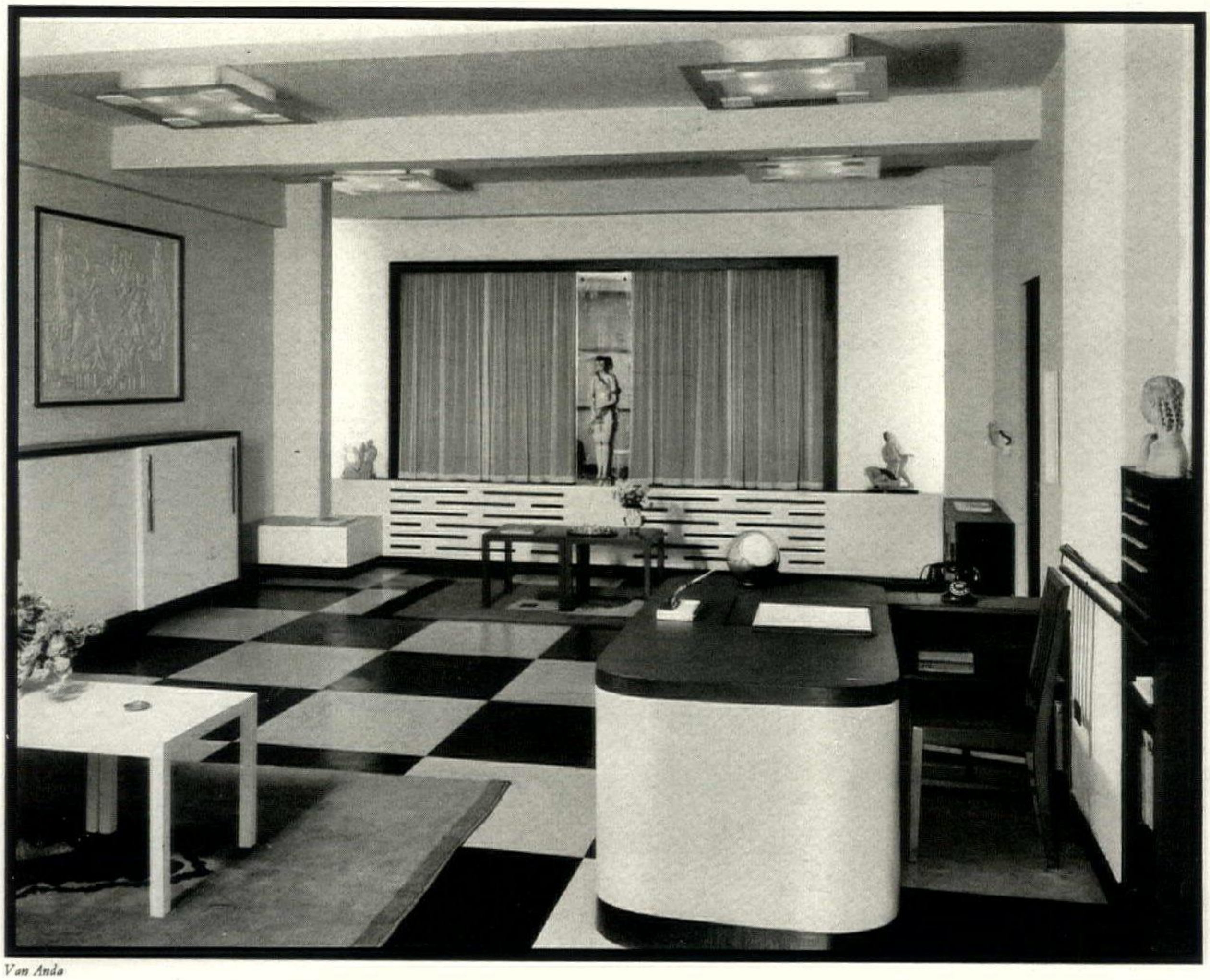
FOURTH FLOOR PLAN



FIRST FLOOR PLAN

UNITED STATES POST OFFICE, COURT HOUSE AND CUSTOM HOUSE, ALBANY, N. Y.

GANDER, GANDER & GANDER, ARCHITECTS, NORMAN R. STURGIS, ASSOCIATE
ELECTUS D. LITCHFIELD, CONSULTING ARCHITECT

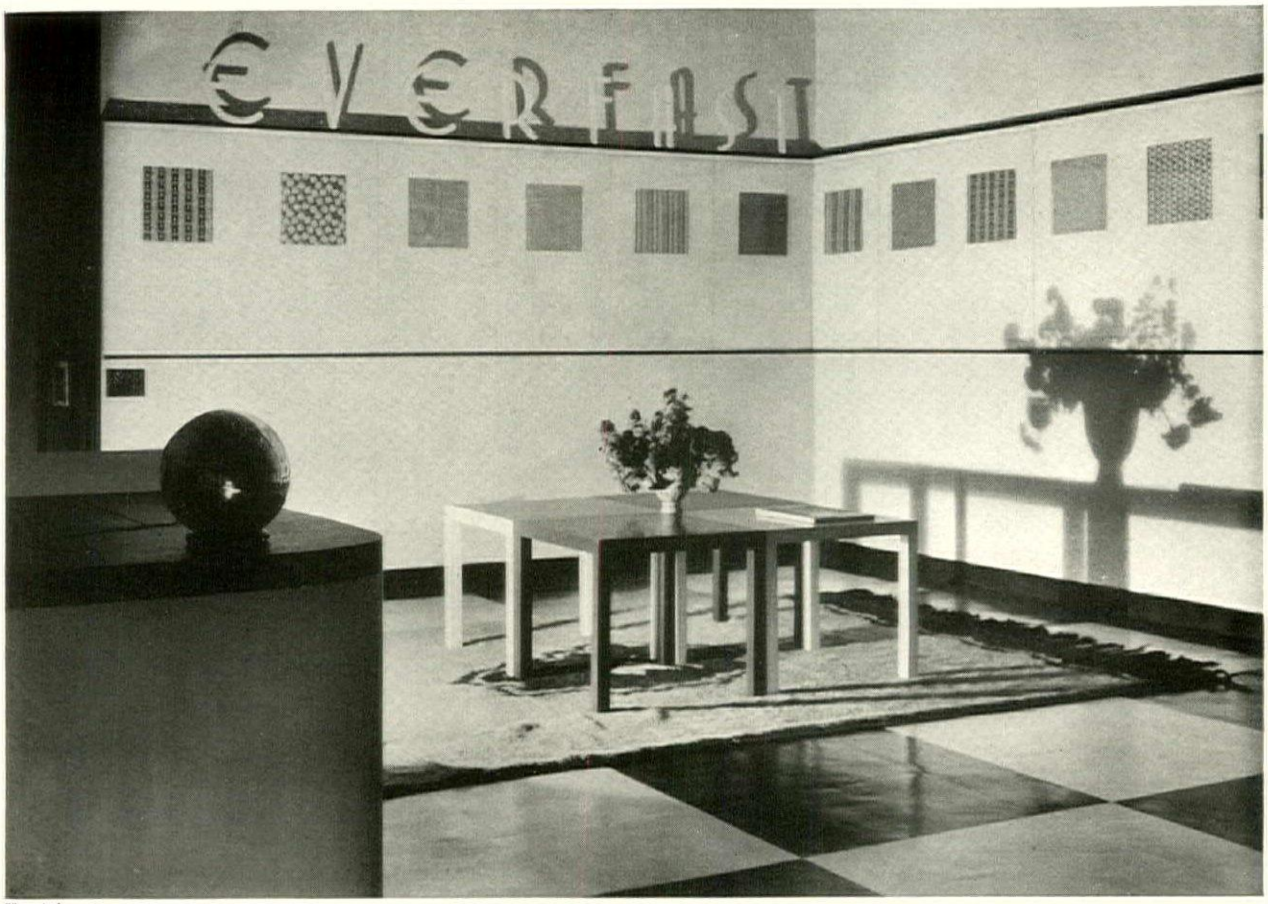


Van Anda

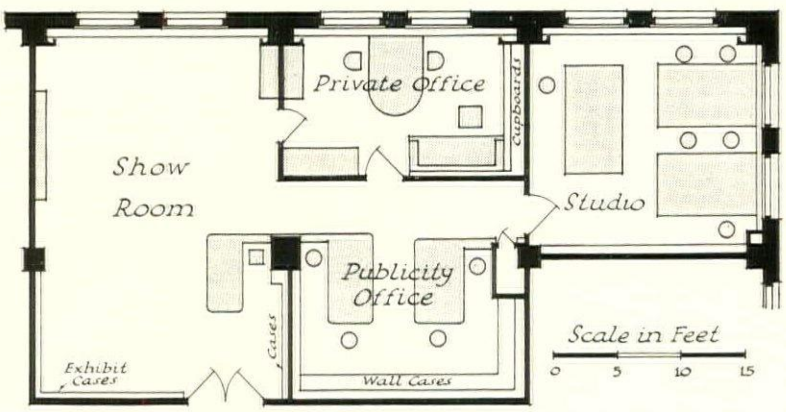
OFFICE AND STUDIO OF CONTEMPORA, INC., NEW YORK, N. Y.
HENDIRK SENDKER, DESIGNER

This interior contains particular architectural interest from two standpoints. The first is the manner in which the various parts have been disposed to fulfill best the special functions which they perform and also in the materials and finishes which were used in furnishing them. The second lies in the fact that the interior was built almost entirely from materials which had been used before in other ways. The entire operation, including the architectural treatment and the furnishings, was executed with the utmost economy and the finished studio and office stands as an example of what can be done with simple materials if utilized toward the achievement of a direct objective with skill and imagination. The entire scheme has been arranged to serve most effectively as a simple background for the display of decorative merchandise and as a work room for the production of show window designs, industrial arts exhibits, and decorative interiors. An effort has been made to reduce to its simplest terms the architectural background both for exhibits and the work of designing. The entire design has been developed from a conviction that simplicity and directness in furnishings will accentuate the objects that may be displayed. The plan, shown on the following page, indicates a clear division of space for particular needs and is well studied in the interrelation of its parts and in the completeness and efficiency of its equipment

TWO CONTEMPORARY OFFICE INTERIORS



Van Anda



The picture above showing the exhibit cases in the show room and the one on the opposite page, taken from the show room into the publicity office, are typical of the design of the entire interior. The exhibit cases are built with sliding glass panels in a simple, black-painted frame and as designed constitute a practical as well as a decorative feature. The color scheme of the show room is dark brown and oyster white with black trim and doors. The walls of this room as well as of the others throughout the office are made of a thin wallboard nailed to studs and painted. The lighting is semi-indirect on the ceiling and entirely concealed at the end of the room on either side of the windows in pockets which conceal also heating and water pipes. The floor is patterned in large squares of black and oyster white linoleum. The color scheme in the publicity room is dark brown, yellow, and oyster white, with black trim and doors. The brown is confined to the linoleum floors and the tops of the desks. The desk panels are yellow and the walls and ceiling are dull white

OFFICE AND STUDIO OF CONTEMPORA, INC., NEW YORK, N. Y.

HENDIRK SENDKER, DESIGNER

Van Anda

OFFICE AND STUDIO OF CONTEMPORA, INC., NEW YORK, N. Y.
HENDIRK SENDKER, DESIGNER

Van Anda Photos

The picture above is of the back wall of the publicity department showing the wall cases and the indirect lighting from the ledge above them. The picture on the opposite page is of the private office. The walls and ceiling of this room are oyster white. The floor is of linoleum in two tones of yellowish gray. The round desk in the foreground has a bright yellow base with a black lacquered top and the upholstery of the couch is a dull blue. The lighting is semi-indirect, the ceiling fixture being augmented by lamps concealed behind a translucent panel near the couch. The picture at the left is a detail of the liquor cabinet which is directly under a translucent panel. The arrangement of the furniture has been well studied to produce a comfortable and informal office

OFFICE AND STUDIO OF CONTEMPORA, INC., NEW YORK, N. Y.

HENDIRK SENDKER, DESIGNER

Van Anda

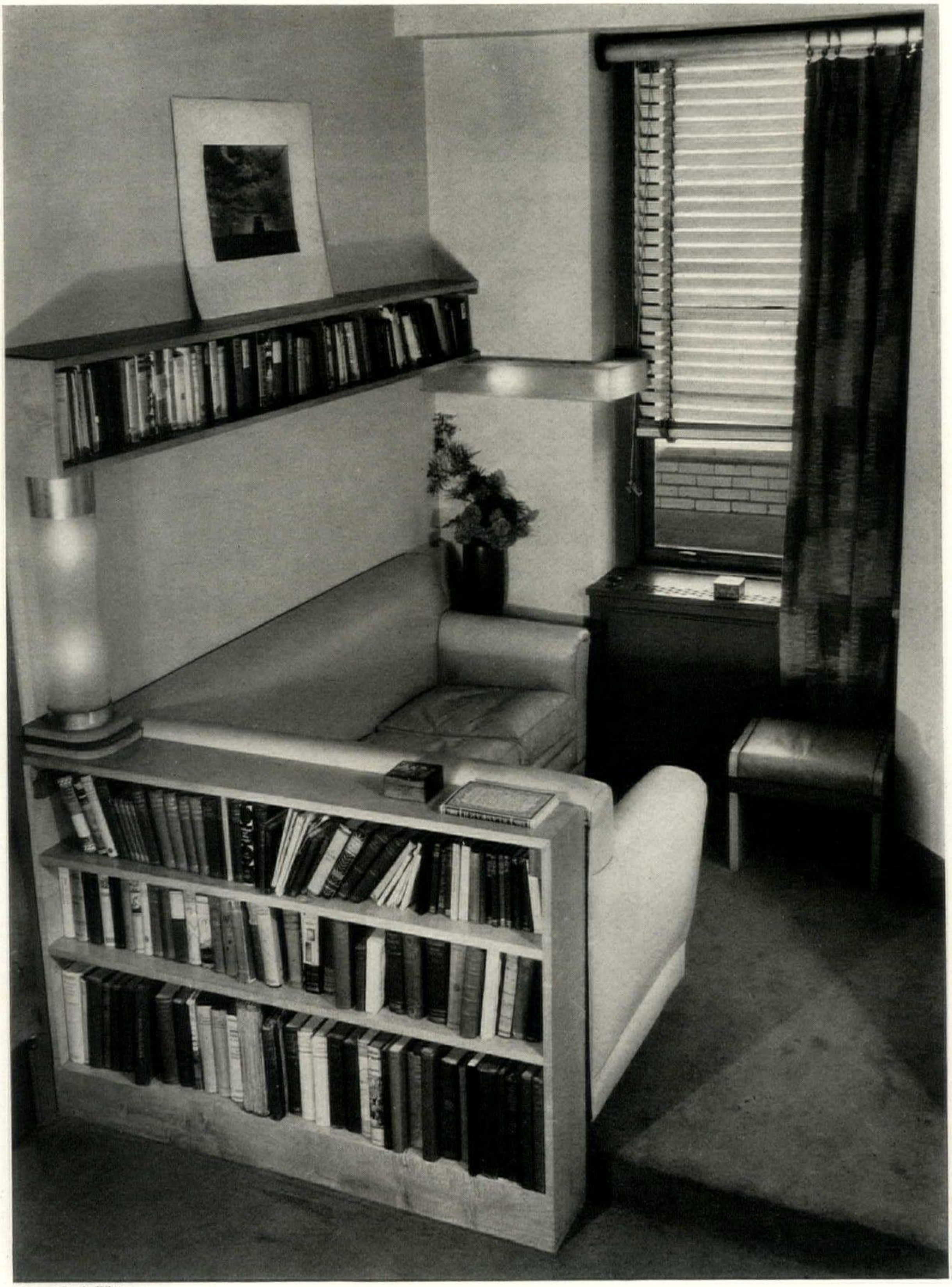
OFFICE AND STUDIO OF CONTEMPORA, INC., NEW YORK, N. Y.
HENDIRK SENDKER, DESIGNER

Margaret Bourke-White

The pictures illustrate the reception room of a suite which comprises a foyer, studio, and photographic laboratory. In every detail of the furnishing and decoration of the room an effort has been made to produce a character of informality and comfort. The arrangement of the furniture (shown on the small perspective plan on page 30) has been well studied to accentuate this character and the colors and materials have been chosen to achieve accents of color and texture against a plain background. The floor is covered by a carpet of a dull rose color, the walls are a light warm tan and the ceiling is oyster white. The wood paneling and doors are of a natural finish walnut and all the bookcases are of maple except that adjacent to the writing desk illustrated on page 31. The Venetian blinds are made of corrugated aluminum, chosen both for its color and its peculiar ability to reflect light. The hangings at the windows add much to the general effect of the room. They have a background of a dull veridian green and are patterned in pale yellow and light tan, a combination which harmonizes excellently with the general tone of the walls. The lighting system is a semi-indirect one and the fixtures have been designed to furnish "cakes of light" where light concentration was most desirable. They are for the most part built of frosted glass held by brushed aluminum strips. Much of the furniture is upholstered in Fabrikoid, the couch shown on the opposite page being covered with this material in a pigskin finish. Other chairs are upholstered in a pale green Fabrikoid and a light tan suede velvet

OFFICE AND STUDIO OF MARGARET BOURKE-WHITE, NEW YORK, N. Y.

JOHN VASSOS, DESIGNER

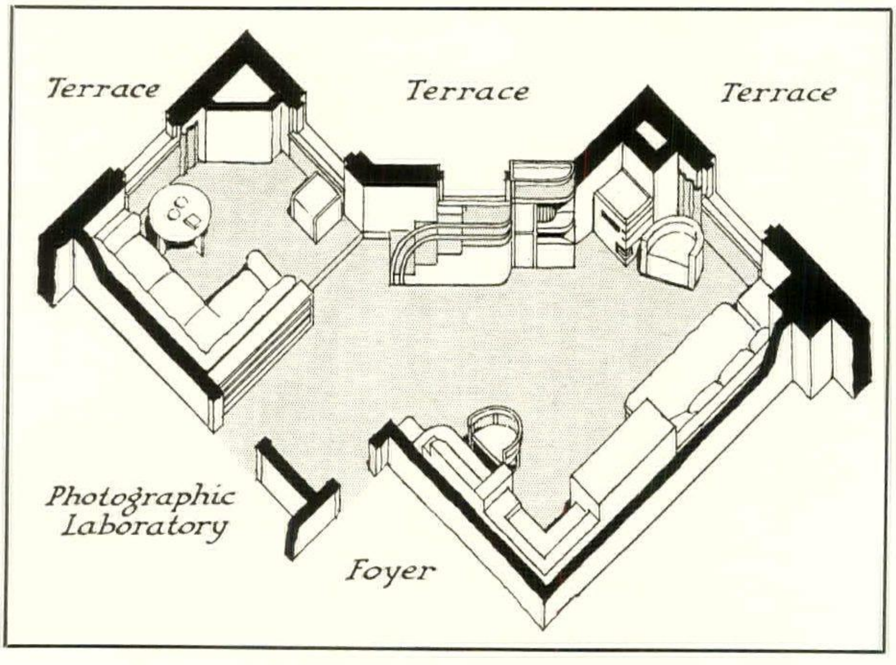


Margaret Bourke-White

OFFICE AND STUDIO OF MARGARET BOURKE-WHITE, NEW YORK, N. Y.

JOHN VASSOS, DESIGNER

Margaret Bourke-White



The diagram shows the unusual plan of the corner of the 51st floor of the Chrysler Building where this studio is located. The picture on the opposite page is a detail of a general view of the desk and bookcase shown above. The back of the desk as well as the baseboard is of medium tan cork. The desk leg is of brushed aluminum as are the supports of the plate glass bookshelves in the corner. The woodwork in this corner of the room is of natural finished walnut and the handles of all the cabinets are made of brushed aluminum strips

OFFICE AND STUDIO OF MARGARET BOURKE-WHITE, NEW YORK, N. Y.

JOHN VASSOS, DESIGNER

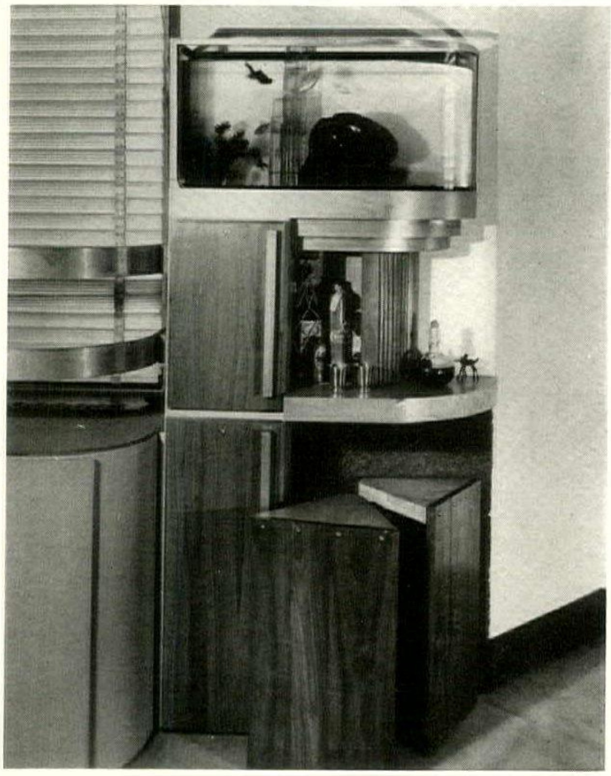
Margaret Bourke-White

OFFICE AND STUDIO OF MARGARET BOURKE-WHITE, NEW YORK, N. Y.

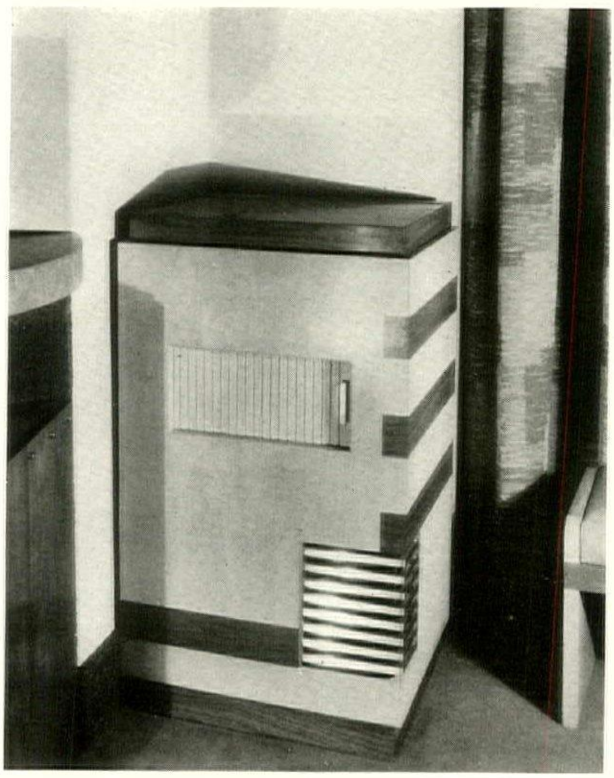
JOHN VASSOS, DESIGNER

Margaret Bourke-White Photos

CELLARETTE, CLOSED



CELLARETTE, OPEN



RADIO, CLOSED

RADIO, OPEN

OFFICE AND STUDIO OF MARGARET BOURKE-WHITE, NEW YORK, N. Y.

JOHN VASSOS, DESIGNER

THE EDITOR'S FORUM

1931 to many should be written small, for the individual members of no profession have been more seriously affected by the deflation than our own. Yet there were worthwhile accomplishments during the year and the beginnings of comprehensive movements toward bettering conditions in the building industry. The profession has had much to do with these forward-looking developments. In the first place, the steps taken by the A. I. A. and the State, county and city societies to unite will strengthen the profession and make for concerted action. But the industry as a whole remained unorganized. The "Preliminary Plan for the Building Industry" [1] met with an immediate response, not only in words of approval but in definite action to bring about its objective, i.e. "*the building of cooperative effort in the production of better buildings to fulfill real needs, scientifically determined.*"

Then, the Construction League of the United States was formed to "build cooperative effort" through its representation of organizations, architects, engineers, contractors and manufacturers.[2] The President's Conference on Home Building and Home Ownership has centered attention on Housing[3] to encourage, in that field, "the production of better buildings to fulfill real needs, scientifically determined." The committees of this Conference cover exactly the work outlined for the "Working Divisions" in the Preliminary Plan. And now the profession has an opportunity for concerted action in the support of the bill just introduced to require private professional services to be employed in federal building design.[4] The upgrade out of the present cessation of business and building will find the profession and the industry better prepared because of the foundations thus laid in 1931.

NOW all eyes are straining straight ahead into this new year; all ears attuned to signals however faint; all hearts hoping for the dark and fog to lift. In this peculiar sea our trusted compass needle spins, our barometer seems ever falling and the weather-wise have made the same mistakes as we. Prophets have been constantly foretelling the break in the clouds, sunshine just ahead — and sooner or later, they'll be right. Charts of records of past years are used in anticipating the coming months, and all other things being equal in normal times, they can be interpreted to give a fairly accurate indication of the coming year.

For the past ten years THE ARCHITECTURAL FORUM has conducted an independent survey of work on the architects' boards, and this has been the basis of its Annual Forecast. This year it was suggested that the architectural publications sponsor a collaborative survey in cooperation with consumer magazines and other interested trade journals. Eighteen publications in all sponsored this comprehensive study. Because THE ARCHITECTURAL FORUM took part in this survey, it was deemed unnecessary and superfluous to conduct its separate investigation at this time. The report of the collaborative survey has been widely distributed and copies will be sent to those interested who request them. The value of building construction for 1932 is estimated as approaching four billion dollars ($4,000,000,000) a volume comparable to the averages of 1923, 1924 and 1925.

The volume and value of construction in 1932 will be largely dependent on the state of mind of banking interests responsible for the financing. Encouraging is the proposed Home Loan Discount Bank which will come before Congress early this year. Encouraging also are the various credit measures now being developed. The uncertainty and lack of confidence caused by the international banking situation, with its concomitant "necessity of liquidity" of banks (which limits building financing) is nearing its termination in the sessions of international bankers and statesmen now being held. There is every effort being made to reach definite conclusions in the shortest time possible. If satisfactory settlements can be made early this year and confidence thus restored, money will be available for building. However, there is no inflation or building boom to be anticipated. Careful scrutiny of all aspects of a prospective building will be the rule, and this augurs well for better architecture and for the employment of architects who are able to provide economically sound plans for projects.

Kenneth K. Stowell

EDITOR

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[1] "A Preliminary Plan for the Building Industry," by Kenneth K. Stowell, THE ARCHITECTURAL FORUM, August, 1931, pp. 125–129.

[2] "A Foundation for the Future," THE ARCHITECTURAL FORUM, November, 1931, pp. 557 and 558.

[3] "Home Building and Home Ownership," THE ARCHITECTURAL FORUM, January, 1932, pp. 85–87.

[4] "Architects for the Government," THE ARCHITECTURAL FORUM, January, 1932, p. 88.

PLANNED CONSTRUCTION

BY

A. P. GREENSFELDER

PRESIDENT, THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA

On these pages during the past year have appeared many comments regarding the building industry, setting forth practical means to bring it back again upon the road of normal, healthy activity. This article is encouraging in its statement of things already accomplished toward this end and its recommendation for a betterment of future conditions

A DEPRESSION always presents an opportunity for good resolutions. They are usually prompted by recent sad events, and evidence lack of profiting by previous experiences taught by the preceding depression. The construction industry does not differ from other industries in this respect. It should properly assume its share of blame for the boom and its resultant depression which again visits our nation.

It seems timely, therefore, to resolve anew, not only for the year ahead, but also for the next decade. The economic cycle completes its turnover in seven to ten years as various graphs covering the last century indicate. If we could prevent booms, we could diminish depressions. If it were possible to inoculate our citizens against feverish speculation as we do for malarial fever, the result might be equally desirable. Our citizens die from over-feasting during years of opulence and from famine and worry during the consequent depressions.

It thus behooves the construction industry to analyze the economic factors which evolve the fluctuating cycles of industry. Whether or not the United States chooses to join the political League of Nations with headquarters at Geneva, its industrial destiny is insolubly leagued in the economic world.

While a delegate to the Fifth Construction Congress held under the auspices of the International Federation of Building and Public Works, in London two years ago, I found a graph showing that the costs of American commodities have generally coincided with the commodity index of England during the last century. The chart showed at a glance how closely we are dependent on international trade and finance.

The increasing rapidity with which the world becomes informed today makes this response just that much more delicate. Before "Pepper" Martin could throw the last catch to the home plate in the deciding game during the recent championship baseball series, radio auditors the world over knew that the St. Louis Cardinals had won the pennant. Airplanes with their recent speed of four hundred miles an hour are reducing incredibly the time to encompass the globe. The time element or the "Fourth Dimension" discussed by Stephen F. Voorhees, prominent architect of New York, at the recent Convention of the American Institute of Architects in San Antonio, is becoming a most important factor in our current viewpoint.

The construction industry must recognize the importance and obligation of adapting itself to economic trends now more than ever before in its history. It is most timely that THE ARCHITECTURAL FORUM should invite consideration of this vital problem. International discussion can add to the enlightenment. Blindness only increases the hazard.

The Associated General Contractors of America, through its Committees on Construction Development and Finance, has been studying this planning problem from various angles during the last several years. In 1924 it pointed out that bond issues should have ample security and yet only too frequently, through carelessness, ignorance, improper or inexperienced supervision, sufficient security was not being provided. Bond houses made loans as high as one hundred per cent or more of the then value of the property, in order to make extravagant commissions. They jeopardized not only their own reputation, but were a menace to legitimate real estate loans. We urged cooperation with the various State regulatory bodies acting under so-called Blue Sky Laws and insisted upon skill, integrity and responsibility of the Underwriters and promoters financing realty projects.

It is not a case of "we told you so," but merely an indication of the willingness and endeavor to forecast coming events. A prophet in Biblical days had a following if the prophecy finally materialized. The Yankee in King Arthur's Court was saved by Mark Twain from fictional decapitation by his cleverness in forecasting the eclipse of the sun which astronomy had predicted beforehand. It would seemingly take no great seer to foretell that real estate bonds are priced as much too low today as they were "appraised" too high during the boom.

Looking Forward. Presuming that we all shall wish to profit, therefore, by our past experiences, it is timely that we glance ahead. Planned construction depends upon the construction industry evolving a proper plan of action. It is amazing to realize that construction as such, has never been sold by the industry as a whole. Every element of the construction industry today which advertises its own wares, does not materially contribute to the publicity of construction. It does little good to advertise window glass unless frames are authorized. It may be good business for the various metal and steel groups to proclaim the advantages of their products against the use of wood and other material, but little will result unless the foundations of a structure are laid. Therefore, it would seem that if we would plan our future intelligently and cohesively, our forces and efforts must be joined with every other element interested in our industry.

Construction League of the United States. In order to coordinate the activities of the various elements of the construction industry, a league of various national associations representing the constituent factors of the construction industry has been tentatively organized. It has heretofore seldom been practical for national officials of any one group to arrange a conference at the convenience of similar officials of another group. Each national officer is kept so busy endeavoring to guide the destiny of his own group, that he can usually spare but little time to go and meet other national officials who are equally as busy.

The Construction League of the United States automatically offers an opportunity at least once a year for such an informal gathering. It will now be the *duty* of each national president to assemble with all the other national presidents in the industry. In this way, any new idea of sufficient merit to attract attention can be spread directly throughout the industry within a year. It now easily takes ten years to do it indirectly. Such a periodical gathering can weigh from all angles any propositions for the good of the industry and the public, can easily whip them into proper shape, and all simultaneously get behind them. Under the broad and able leadership of Robert D. Kohn, President of The American Institute of Architects, we all look for prompt and far reaching results.

The analytical article in the August number of The Architectural Forum entitled "A Preliminary Plan for the Building Industry" had a great deal of bearing on the program finally outlined for the League at its organization meeting, September 24 last. The first policy of the Construction League is to obtain a national plan for America. This will be the function of the members of the Plan Committee, who should study internationally and nationally the application of community, public utility and private plans and planning programs covering construction work of various kinds.

Stabilization. The volume of construction is dependent upon cycles and seasons. America is gradually being sold on the idea that twelve-month construction is not based upon climate but upon custom. Power operated construction equipment and modern methods are slowly but surely breaking down the traditional objections to winter work. That "*Winter Work Is Worthwhile*" is now generally conceded.

As the sizes of the projects increase, interest during construction warrants, or detour of the public justifies, there will be less seasonal interruption on account of frost. Only fingers and mortar freeze. Both can be kept warm at reasonable expense. In the United States with its extremes of summer heat and winter cold, the effect upon field labor output averages perhaps is equalized in the winter and summer during the year.

Cyclical variations are dependent upon the Nation's economic condition. In times of boom we must learn to regulate the volume of construction and spread it over times of depression. Our national Government is setting us a fine example along this line.

The Federal Employment Stabilization Board under the experienced direction of Colonel D. H. Sawyer is studying this problem in Washington, D. C. It is his job to plan Federal construction at least six years ahead, watch prosperity indices and guide Government activities to speed up when private construction lags. Such a good example set by our Federal Departments should be followed in State, county and municipal construction.

The public is now paying a large indirect tax to the Federal Government not only in increased cost of construction in times of high prices, but in increased competition between governmental and private projects in prosperous times. Stabilization of employment is vital if we would stabilize the purchasing power of the employe.

People in America need live only within "good housing," and should avoid undue vacancy of office buildings and hotels through the stabilization of all national production. The law of supply and demand is inexorable, but it is now conceded that the human psychology of fear plays an enormous part in applying that law. We fear a scarcity of supply when prices rise and fear a lack of demand when values fall. If we would use our vaunted intelligence in lieu of such unjustified fears, we would add to our own happiness and longevity. In spite of such steep variations, however, it is interesting to realize, as well as vital to our continual success, that the demand for floor space per capita in the United States is regularly increasing. One has only to compare the number of roofs over one's head today during twenty-four hours with similar requirements of one's father and grandfather to realize this.

If the construction industry desires to maintain a market of construction securities, it must stabilize values. It will not suffice to induce the public to buy building bonds at 100 per cent based on artificially high appraisals and then permit these bonds to drop on the market to a third of that price. Whether we shall set up machinery for issuance of permits of "necessity or convenience," the same as public utilities or not, it would seem that some guidance is necessary. Either the industry must find some way to regulate this, or the Government will and in a way the industry may not like.

Certified Construction. One tendency in the direction of better control within the industry itself is a movement to certify quality and proper completion of a structure. Financing of homes, particularly, must extend over a fifteen year period if we would encourage home ownership. This warrants assurance of using good materials and obtaining good workmanship.

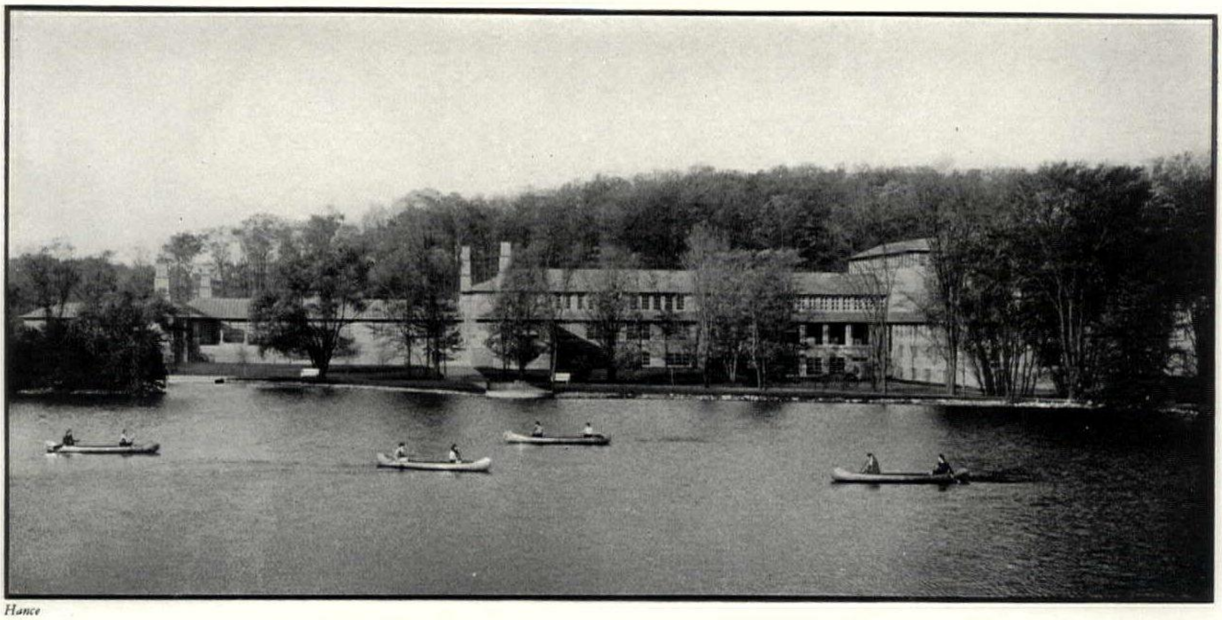
Our Association, with architects, engineers and other groups is conducting an "experiment station" in Cincinnati. The local building and loan association there is about ready to commit its members to a policy of inspection and certification before making long term loans. The Construction Committee of President Hoover's Conference on Home Building and Home Ownership is recommending one additional step. Not only does the Committee advocate good architectural planning but the inclusion of plans, specifications and list of names of all parties directly furnishing services or products with the land title. It urges that title insurance companies thus file with their papers a complete record of not only the land but the building erected thereon. Such measures can undoubtedly add to a proper recognition of complete planning and coordinated construction.

Planned Construction. Our country no longer has frontiers. It is completely discovered. Our natural resources are gradually being depleted. If we would not have our future generations find themselves in today's plight of the present descendants of the ancient Egyptians, we needs must plan our country's future. Treading antique water wheels and following wood plows is not necessary in this modern universe if world wide diffusion of education and inventions is insured.

We need a plan for our Nation, for every State, and for every regional and political subdivision thereof. We must direct constructive minds to this problem. Construction being the second largest industry next to agriculture, and the "key" industry at that, then planned construction has a vital place in such a comprehensive program. All elements of the construction industry must cooperate. "Life, liberty and the pursuit of happiness" of all our citizens depend upon it.

★ ★ ★

Construction developments have followed closely the program suggested in "A Preliminary Plan for the Building Industry," by Kenneth Kingsley Stowell, mentioned in this article (page 35). Many conferences have been organized to promote coordinated action and research. One of the most outstanding of these has been the President's Conference on Housing and Home Ownership, held in Washington December 2nd to 5th, 1931. The findings of the various committees are important, for they present a long list of vital facts and some definite recommendations. These however, will influence affairs only in proportion to the action taken upon them. On pages 85 to 88 of this issue the Editor reports briefly the significance of this conference to every architect



Hance

THE KINGSWOOD SCHOOL FOR GIRLS

CRANBROOK, MICHIGAN

ELIEL SAARINEN

ARCHITECT

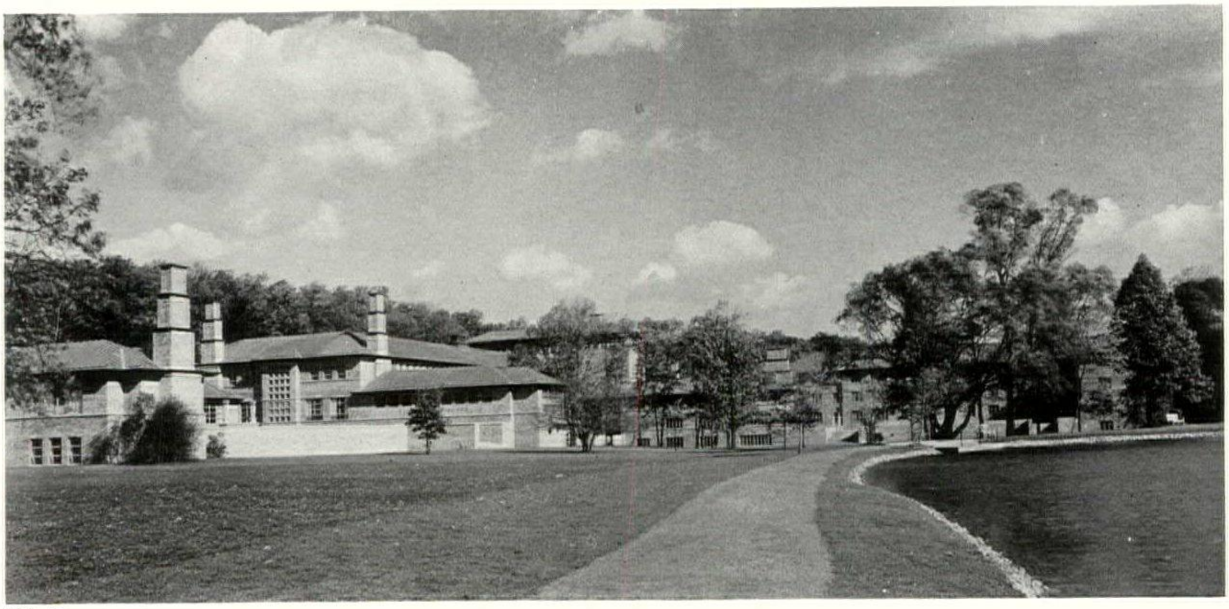
THE success or failure of practically every architectural effort is largely dependent upon the collaboration of a group of individuals. In the contemplation of an architectural project significantly successful in both the conception of the design and its execution may be recognized the guiding hand of a master designer working in the closest possible harmony with the representatives of whatever collaborative artists may be involved.

It is unnecessary to characterize the designer of the Kingswood School, for the abilities of Eliel Saarinen need no introduction to any architect either in America or abroad; and the Kingswood School as the latest example of his work needs little comment as an exemplification of his designing genius. It is significant, however, as one of the most pointed lessons in cooperative designing which we have been fortunate enough to present in some time.

The Plan. In accordance with the unalterable principle of school planning, Mr. Saarinen points out that the plan was determined solely by the particular needs of the school organization, the topography of the site, and the orientation of the entire problem. Occasionally it is necessary to sacrifice one of these, but the conditions at the Kingswood School were such that it was possible to develop a plan which gave adequate satisfaction to each of these elements.

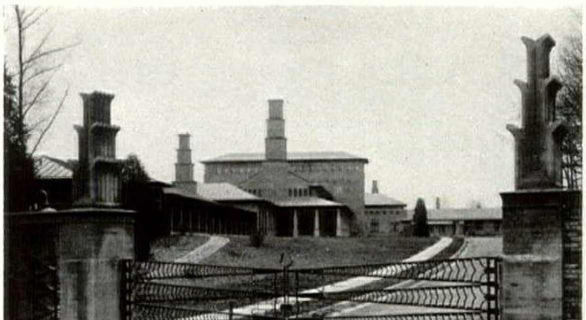
It is not laid out to provide merely the proper space divisions or an adequacy of circulation, light, air and sanitary conveniences. The plan is thought of as encompassing both the location of the building with respect to the landscape areas about it and its three-dimensional aspect. An examination of it (see pages 42 and 43) will disclose a disposition of parts to achieve the maximum of the light, air and sunshine so much desired. It will disclose an easy and logical circulatory system and an efficient disposition of required areas. In addition, however, it shows an attitude of mind that has taken advantage of the natural excellence of the site.

The courts and wings have been placed so that from the interior the landscape presents a framed picture, which has been kept constantly in mind in the detail treatment of the interior spaces from which it is viewed. Again, the mass of the building has been kept horizontal on a succession of levels to conform naturally to the slight slope of the land from the entrance court to the lake at the



Habrecht

The school from the lake walk at the southeast side of the building looking toward the dormitory wing



Hance

A view of the school from the east, showing a detail of the stone entrance piers and wrought iron gates

Arnold

A view of the entrance lodge from the main road

southern side. It should be noted that most of the living quarters of the school are on this side and have the advantage not only of the best outlook but all the benefits of the east, south, and west exposures as well, the north side of the entire building being protected by a heavy wooded hill.

The Exterior. There has been no effort to achieve a startlingly different or individualistic scheme of architectural design — a fact which may account largely for the undoubted success of the building. The mass of the building composes itself naturally to meet the needs of space; and the influence of topography, already noted, has been carried out in a scheme of a warm tan brick and a buff mankato stone. The roof on all parts of the building is of copper with standing seams and a fairly prominent overhang which supports the gutter. Copper seems a logical material for a roof of this type, for the pitch is almost too slight to make a less easily attached material entirely practical. From the standpoint of weathertightness as well as from the æsthetic attitude, copper in its natural state harmonizes excellently with the material of the walls and trim. As it weathers in time it will furnish a neutralized complement to these walls and will harmonize admirably with the heavy foliage of the location.

The pictures in the accompanying plates (pages 41 to 60) are worthy of study, for they show that brick may still be used with imagination and taste to produce an effect that is unusual yet entirely straightforward and unforced.

In thinking of the exterior walls of a building as a shell merely, perhaps we have followed an inevitable trend in failing to take full advantage of the design possibilities of brick, losing the sense of detail in striving for an impressive mass. That the two are not incompatible is well illustrated in the Kingswood School.

The Interior. It is here that the effect of co-operative designing and collaboration of individuals toward a commonly understood objective is most evident. The spaces were, of course, planned both in general effect and in architectural detail by Mr. Saarinen, but the furniture was designed entirely by his son and the hangings, the rugs, and the upholstery were designed by Mrs. Saarinen. The small amount of painted decoration was designed by and executed under the direction of Pipsan Saarinen Swanson.

Not so noteworthy is the unusual fact that the architect's family collaborated with him in the interior decoration and furnishing of the Kingswood School as is the fact that designers other than the architect were intimately concerned with important parts of the project. The salient thing in this connection is that the collaboration of several individuals who have worked with each other long enough to recognize the predominating trend in an architectural problem have achieved in their individual fields a unification of motif, color and texture which would have been impossible otherwise. As a result the entire design of the Kingswood School is eminently consistent.

The keynote of the entire operation was simplicity, a simplicity that would give to the people who will inhabit the building a feeling of comfortable relaxation. This is a term which the designers have interpreted in a wide sense. Throughout the interior a considerable amount of high color has been used but it has been disposed so that it appears in motifs which accent an otherwise quiet scheme throughout the building. The dining room will illustrate this point as well as any other room. The floor is oak, finished in a dark acid-stain and waxed to a dull gloss. The wainscot, columns and paneling are also of oak with a waxed silver gray finish. The walls and ceiling are of sand finish plaster toned to a warm, flat gray. This furnishes a neutral background for the furniture, hangings, and the lighting system. The furniture is of silver gray birch, striped with vermilion and upholstered with a linen damask of the same color. The curtains are of wool and rayon patterned in vermilion, silver and gray, which contrasts both in texture and color with the background. The lighting is perhaps the most unusual thing in the room. Entirely indirect, it consists of apertures at the base of the coved ceiling and is wired for three circuits which may be switched independently of each other to form a most interesting angular pattern of light and shade on the ceiling arch.

The same unanimity of conception and consistency in execution is carried out in the other rooms of the school. Not only in the coloring, but in the repetition and modification of design motifs are the influences of close coordination of purpose and effort visible. Singularly effective is the treatment of the auditorium, in which the system of illumination is one of unusual merit. The series of small dome coffers, in addition to furnishing a reflecting surface for the suspended aluminum reflectors, provide the necessary broken ceiling line for proper acoustics. Here the acid-stained dark oak floor, the similarly finished oak wainscot, and the light oak pilasters supply the warm but neutral background for the interesting silver leaf decoration of the ceiling. Further interest to the color scheme is contributed by the leaded glass windows of light amber and green shades.

In the dormitory bedrooms, which in many

Arnold

The dining room from the reception lobby

Hance

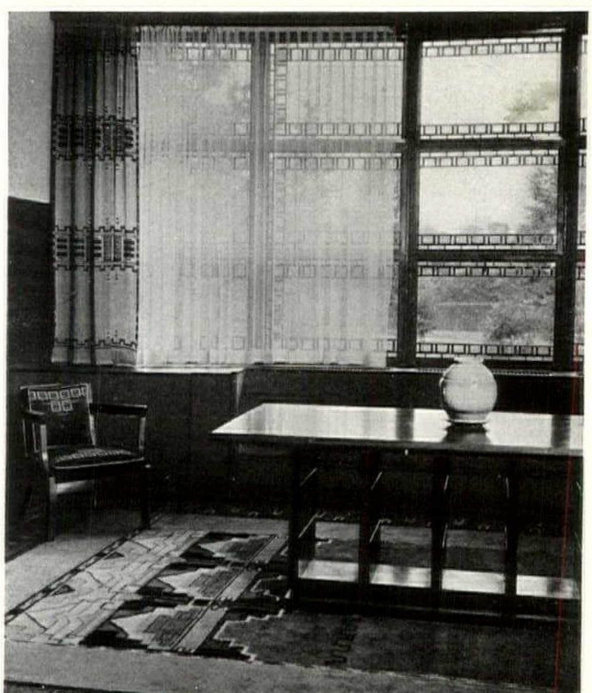
The library from the entrance lobby


Hance

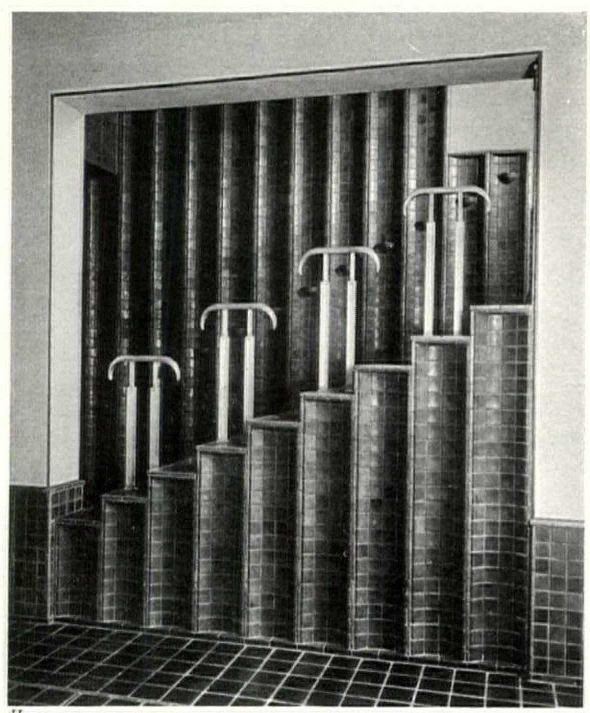
A typical dormitory room. The rooms are of the study-bedroom type and accommodate two girls, with a study table and lavatory for each one. They are finished in colors to harmonize with a basic scheme of either yellow, rose, green or blue. The floors are of dark stained oak; the woodwork is painted a light gray enamel, and the walls are sand finish plaster, painted light gray. The furniture and hangings were designed at Cranbrook under the direct supervision of the architect

cases, would have been perilously left to chance, the rugs, curtains, upholstering, etc., were designed in colors to harmonize with either yellow, rose, green, or blue, since these colors were used as a basis for the four color schemes distributed among the bedrooms.

The types of color schemes were chosen to produce a room which in its simplicity would be an aid to concentration in school work yet at the same time a cheerful and pleasant place in which to live. The variations in the basic color, each one chosen for a certain feminine effect, avoid monotony in the dormitory rooms and present a certain amount of latitude in choice. The color schemes do not follow one another in any set sequence but have been chosen to harmonize as far as possible with the view from the dormitory windows and the various exposures of the rooms. In every detail these rooms show the satisfactory effect of effort on the part of both architect and decorator working in collaboration toward a definite objective.


Habrecht

A detail of the furnishings in the library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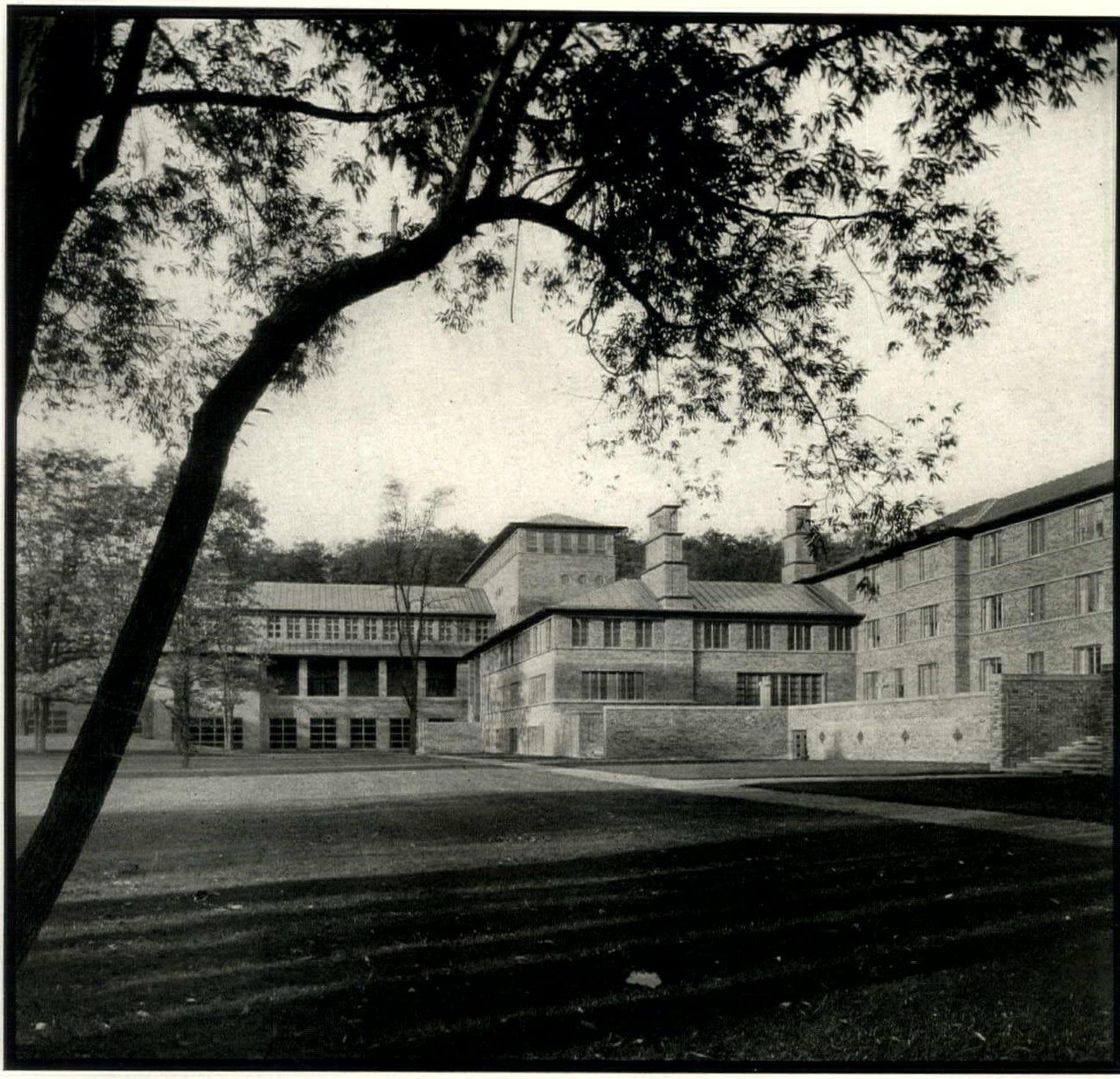
The tiling and balustrade of the main stair

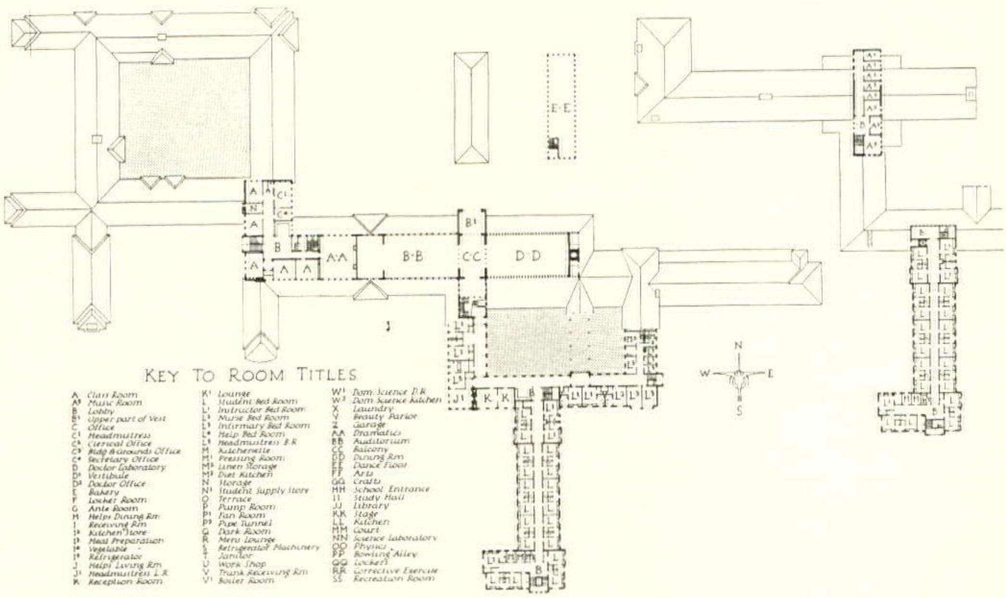


The building is situated within a short distance of a large educational development which includes the Cranbrook School for Boys and the Cranbrook Academy of Art, both of which were designed by Eliel Saarinen. The Kingswood School provides accommodations for both boarding pupils and day pupils and includes facilities for both college preparatory and finishing school work. The school plant includes a boat house and recreation hall in addition to the building shown in the accompanying illustrations

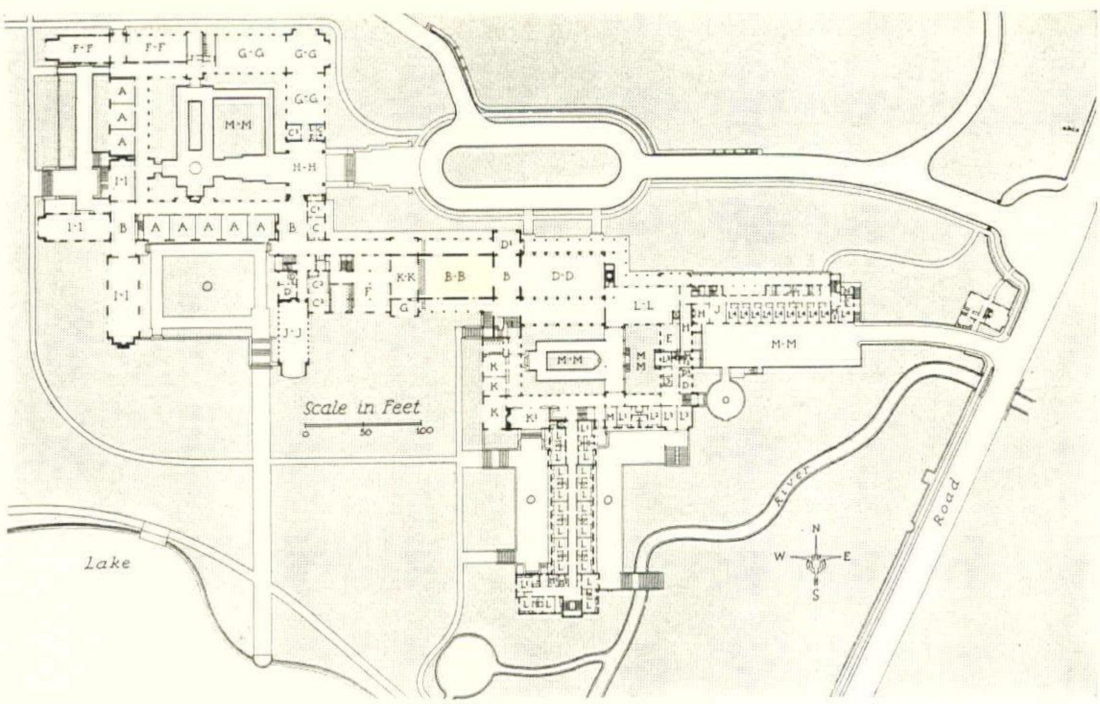
THE KINGSWOOD SCHOOL FOR GIRLS

BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



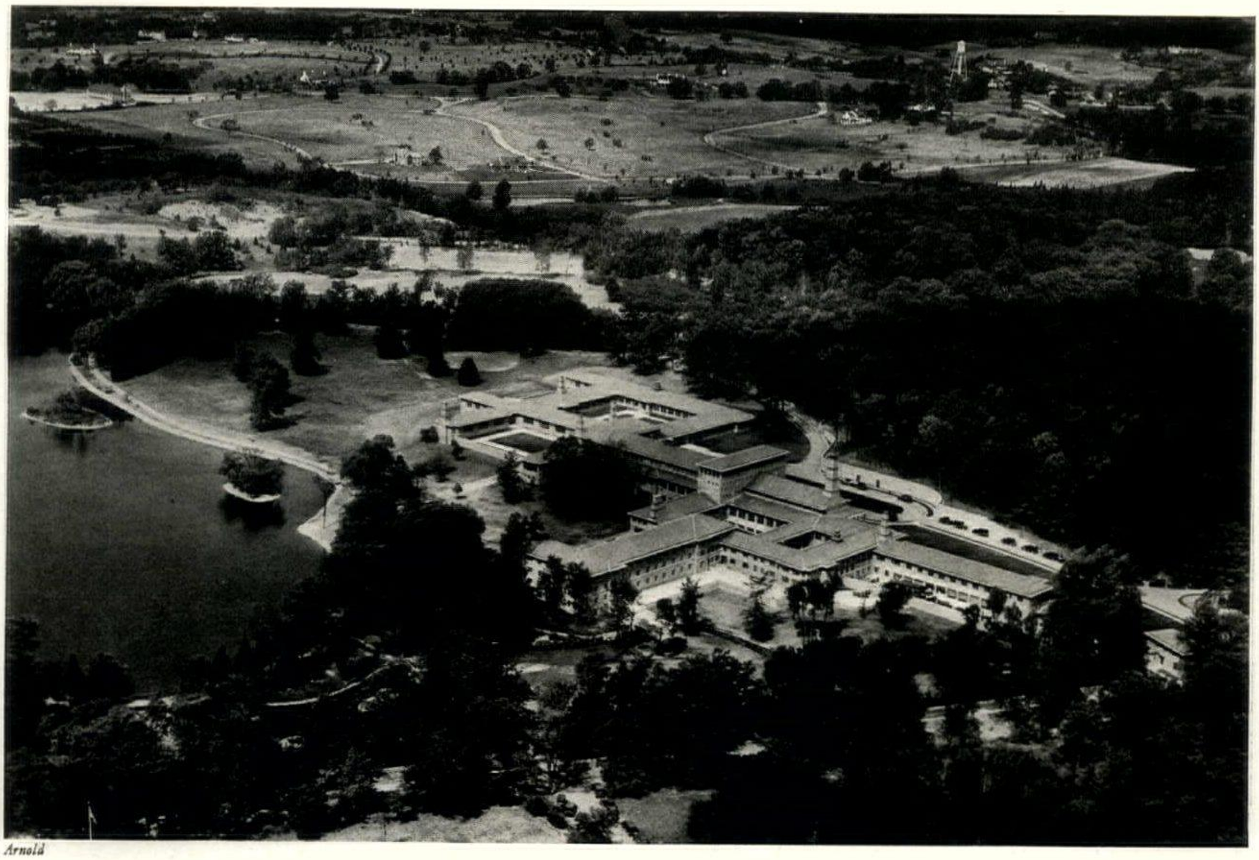
SECOND FLOOR PLAN



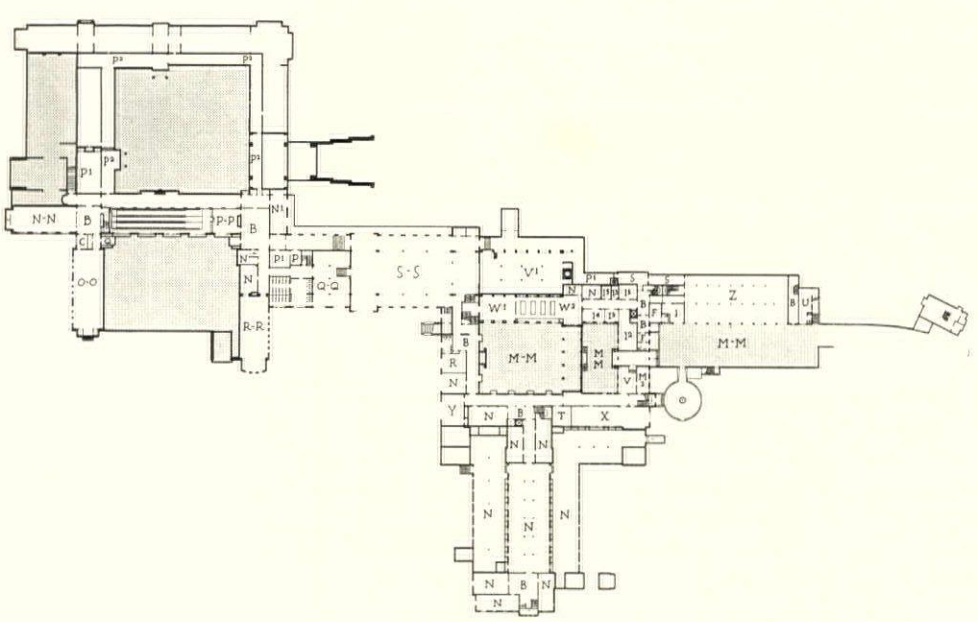
FIRST FLOOR PLAN

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



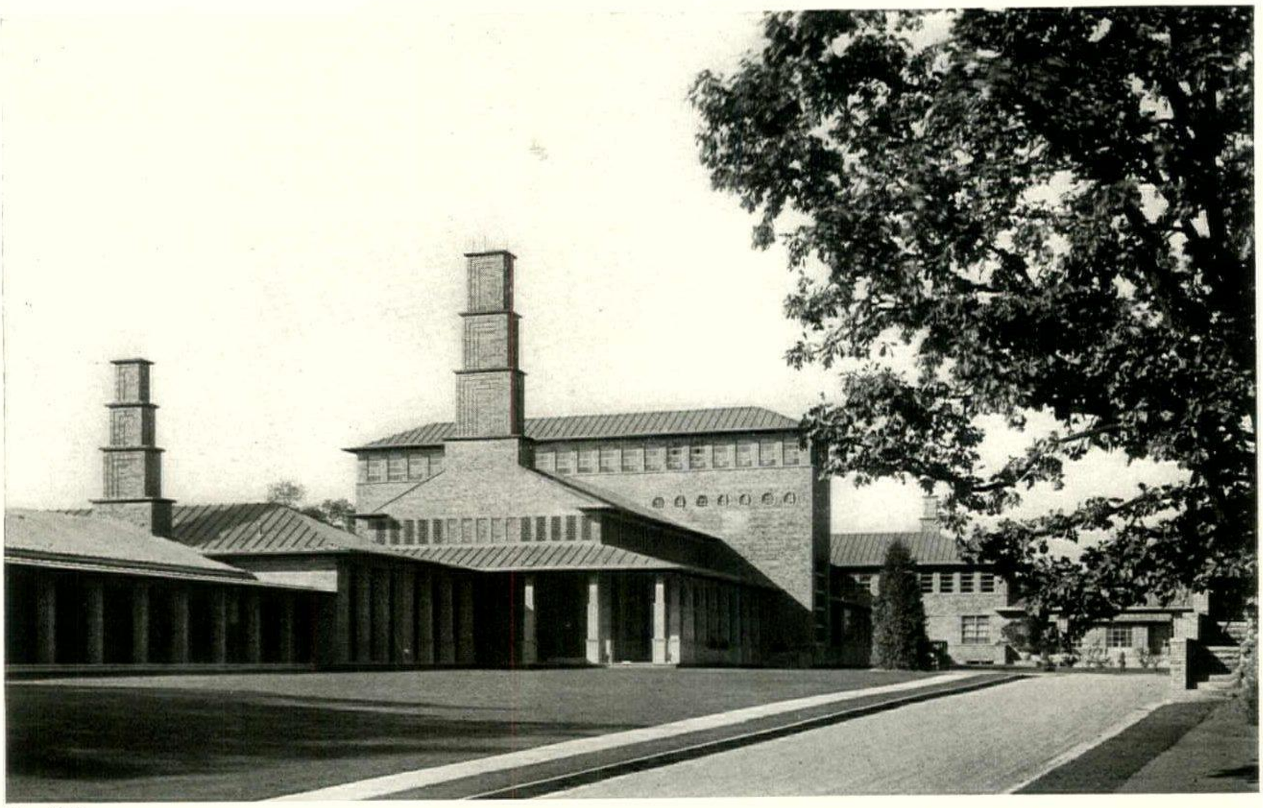
Arnold



BASEMENT FLOOR PLAN

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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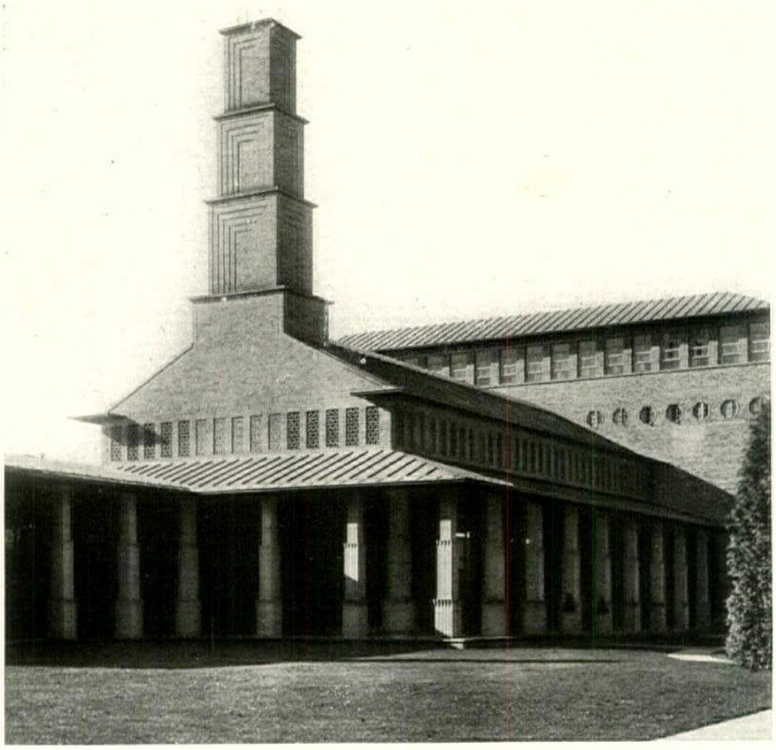
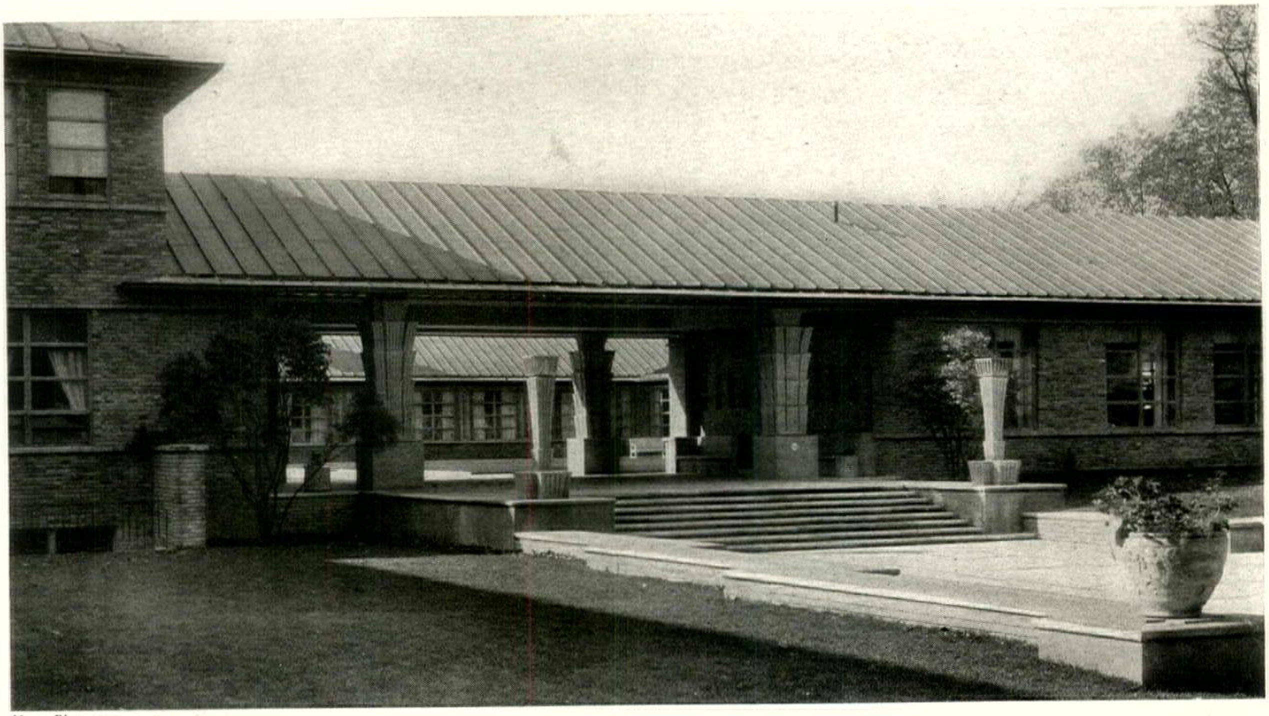


The two pictures on this page are taken from the north side along the approach to the main entrance of the school. That on the opposite page is a view from the open porch looking west toward the entrance court

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT



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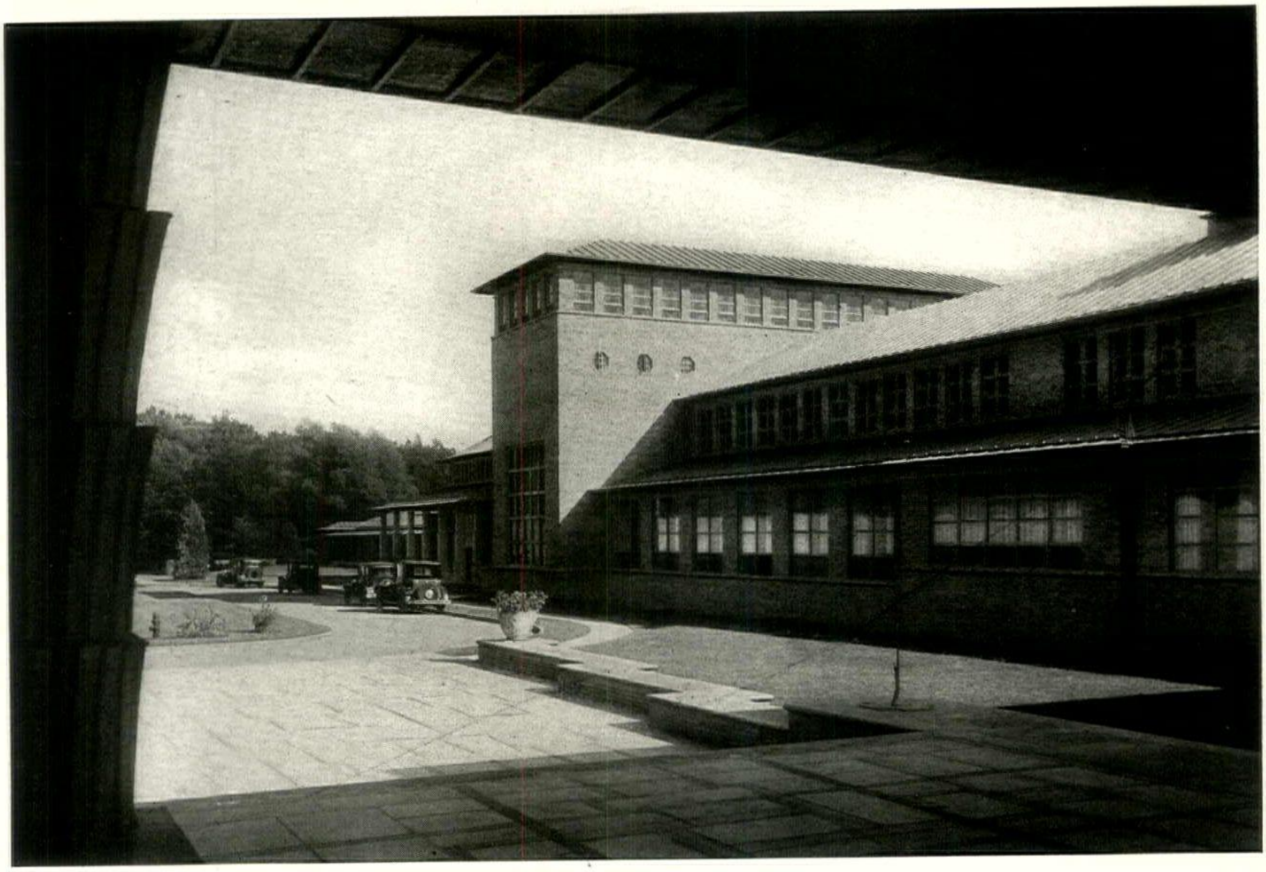
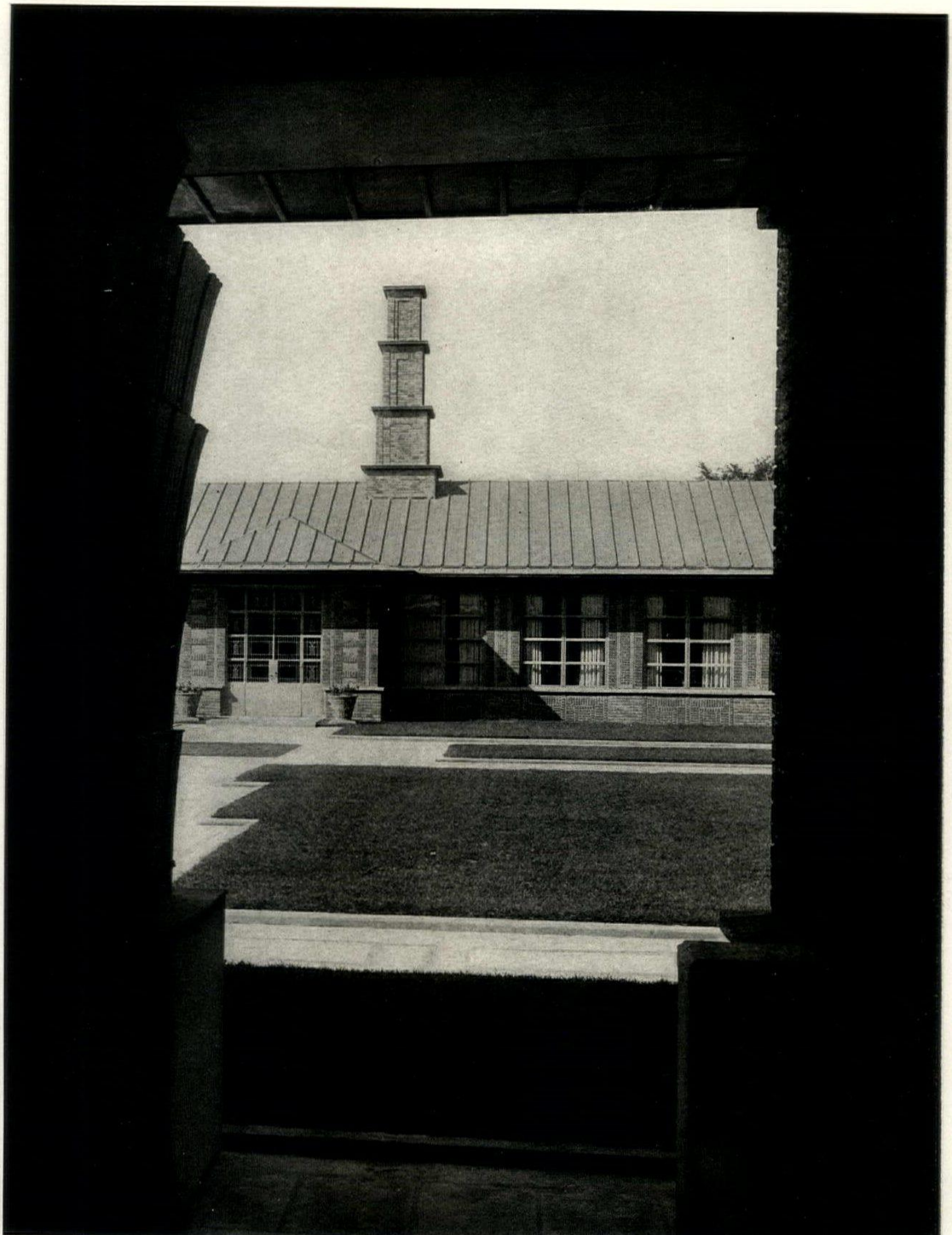


KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

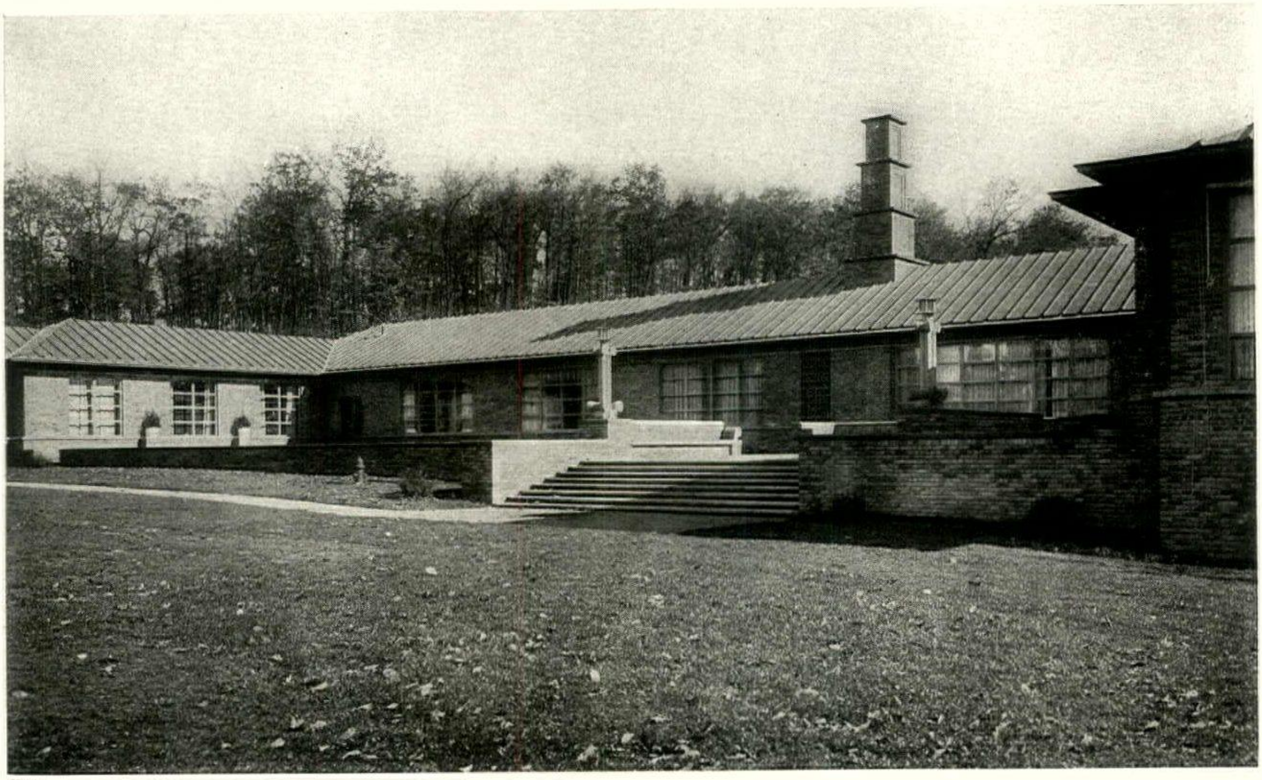


Hance

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT



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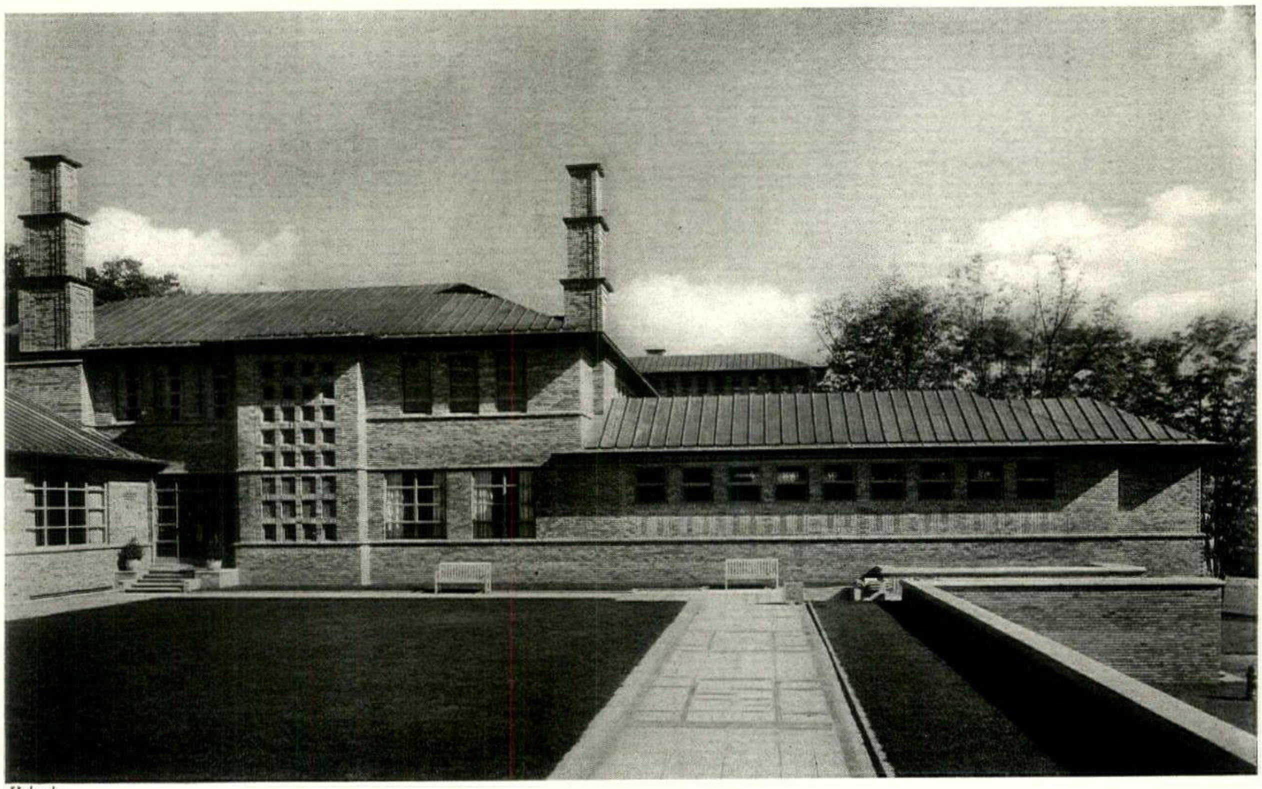
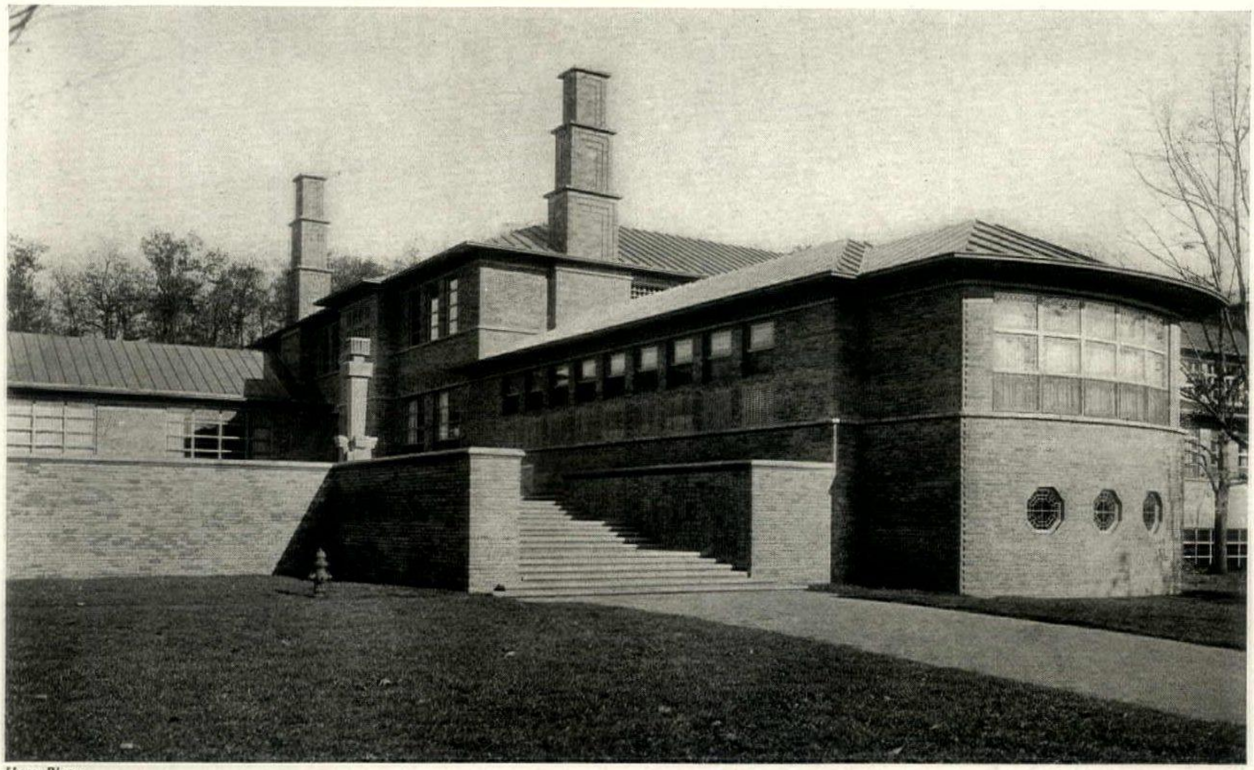


Habrecht

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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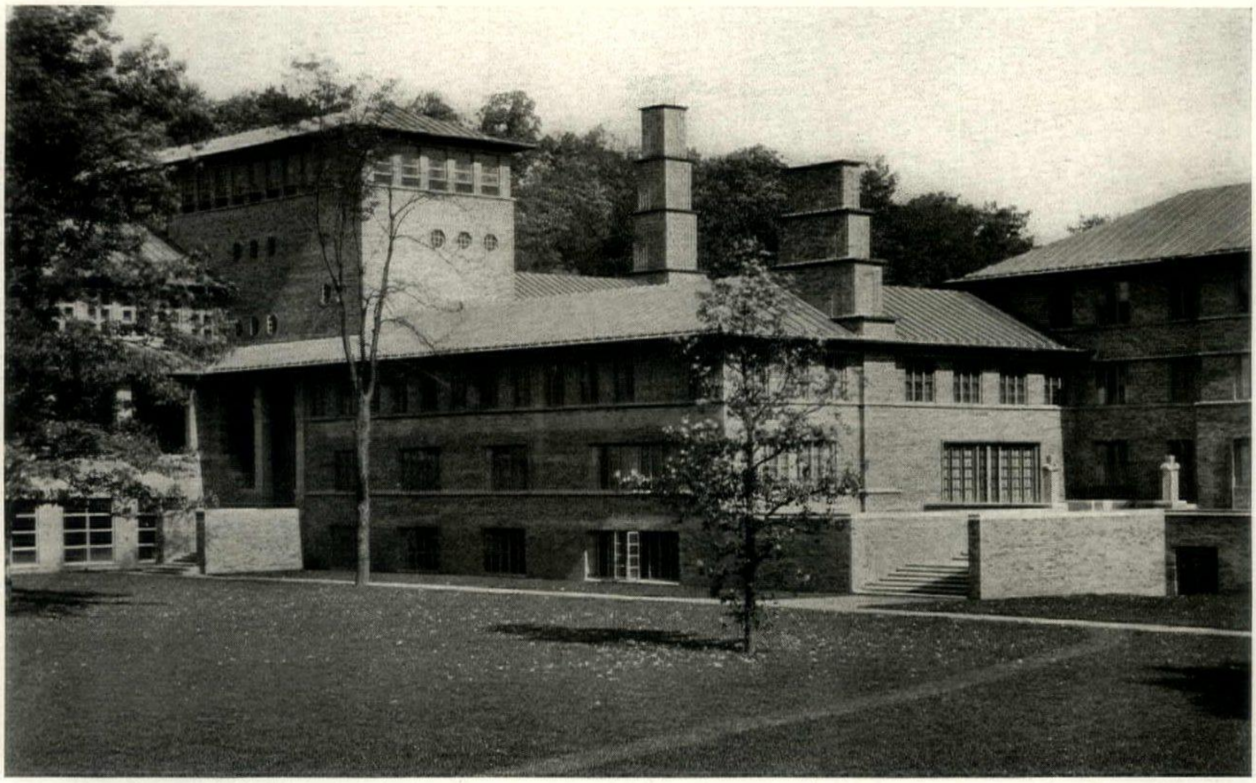
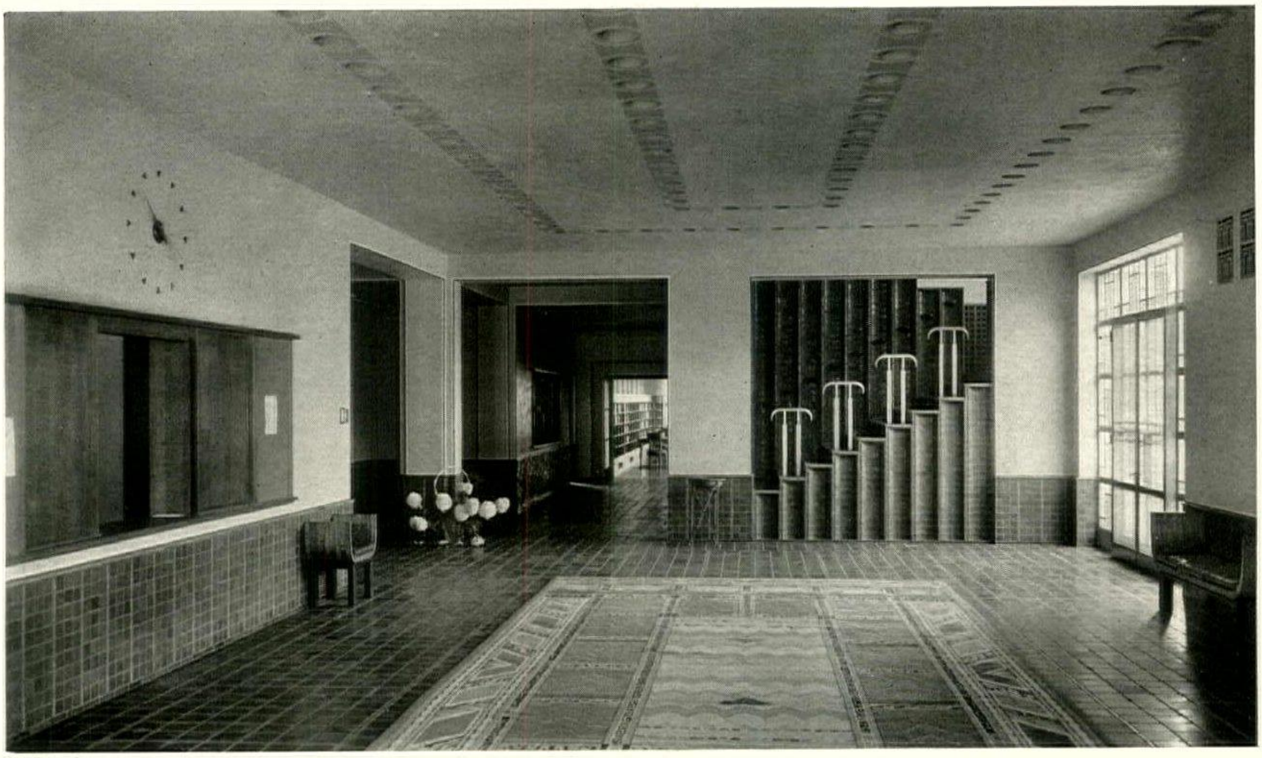


KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

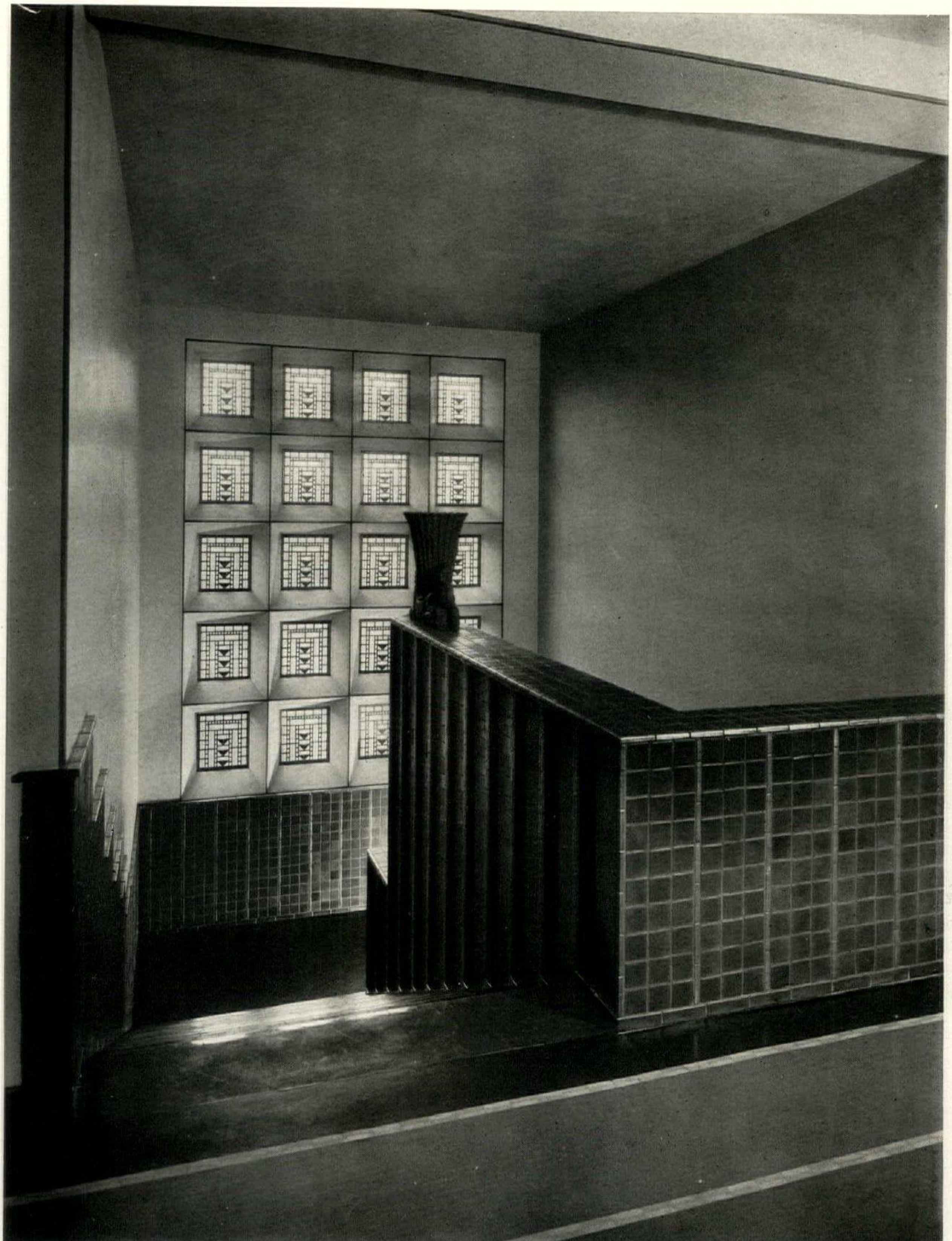


Hance

Two views of the entrance lobby. The picture above was taken from the entrance toward the library. A detail of the entrance door is shown at the left, and on the opposite page is a detail of the stair hall window from the second floor. The floor of the lobby is of green hand-made tile and the wainscot is paneled in a dark green tile with silver tile strips set in black mortar. The walls and ceilings are of sand finish plaster painted flat gray and striped with green and white. The lighting fixtures are concealed in the cylindrical recesses of the ceiling. The rug on the floor has a light green background and a yellow and white pattern

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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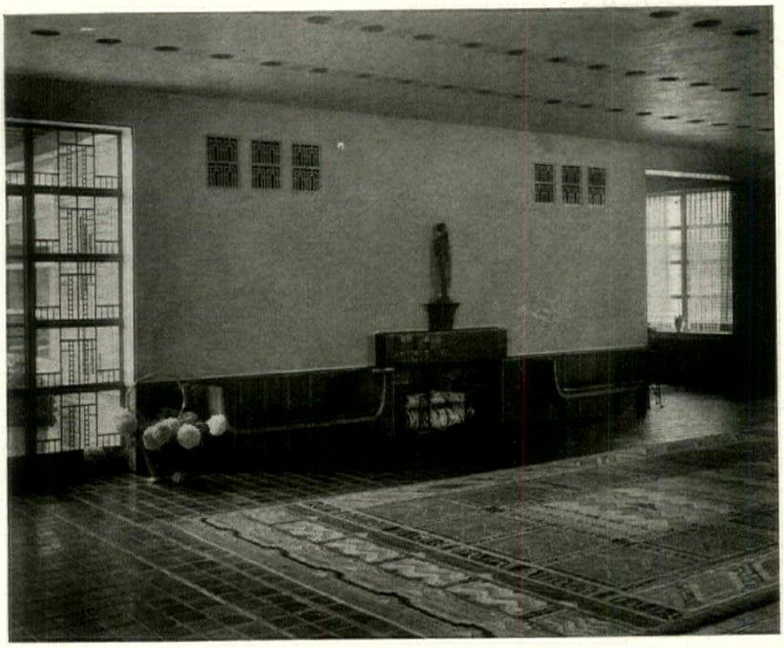
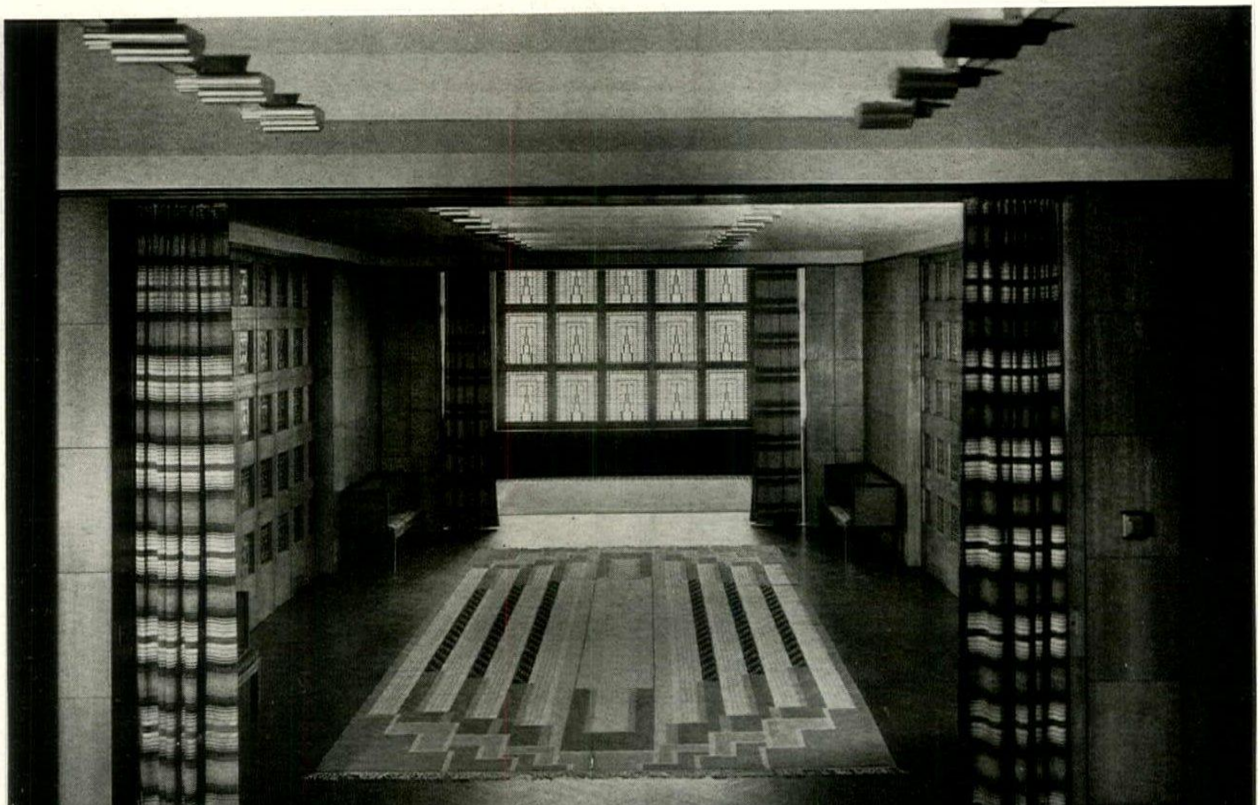
KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT



At the left is a detail of the lobby fireplace and below is a view of the reception lobby between the dining room and the auditorium. The floor is of oak, acid stained and waxed, and the paneling is oak, stained to a light tone and waxed. The ceiling is sand finish plaster painted light gray, and the lighting fixtures are concealed above aluminum reflectors. The ventilation and door grilles are chromium plated. The doors and the large window, a detail of which is shown on the opposite page, are leaded and contain cathedral glass of light amber and green



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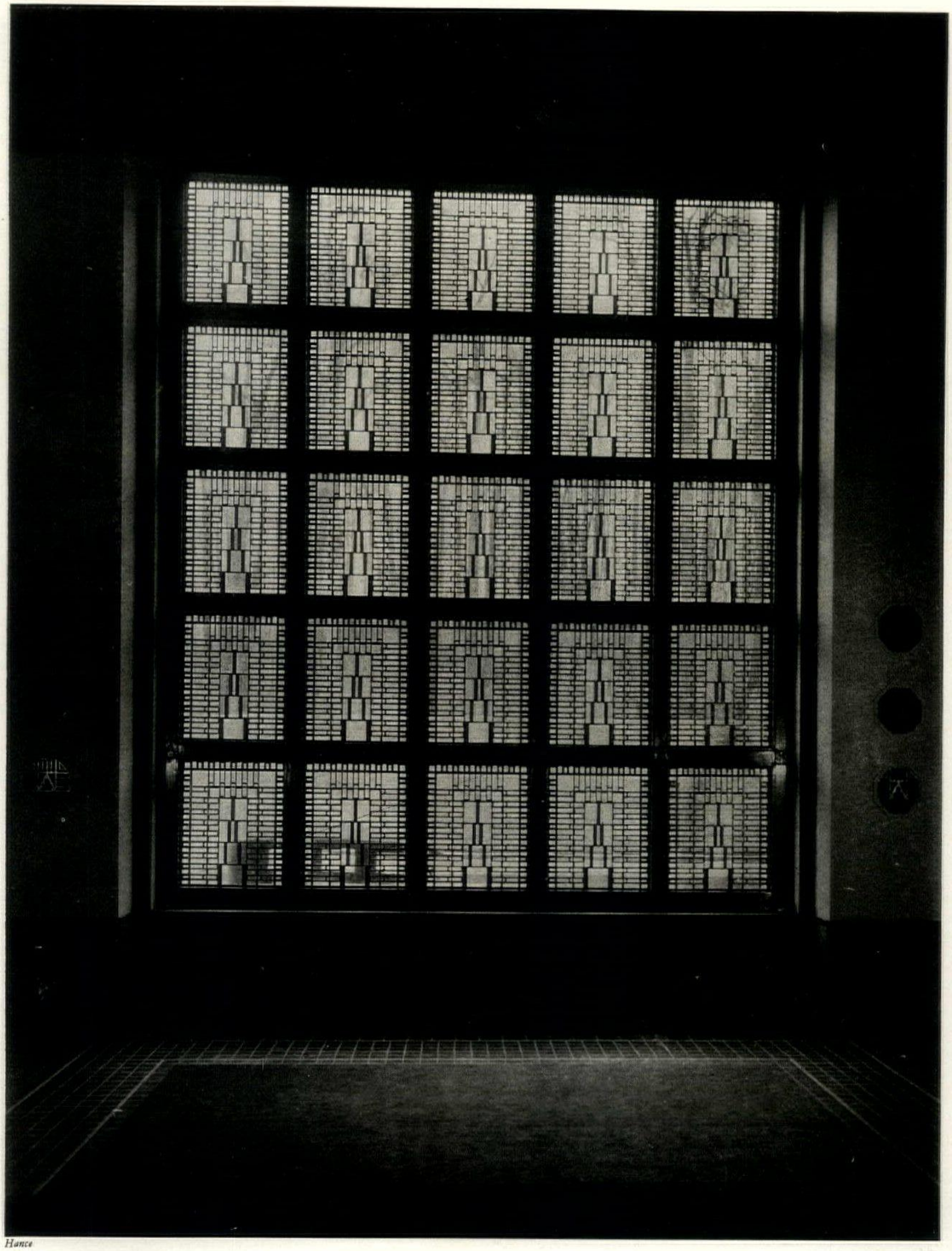
KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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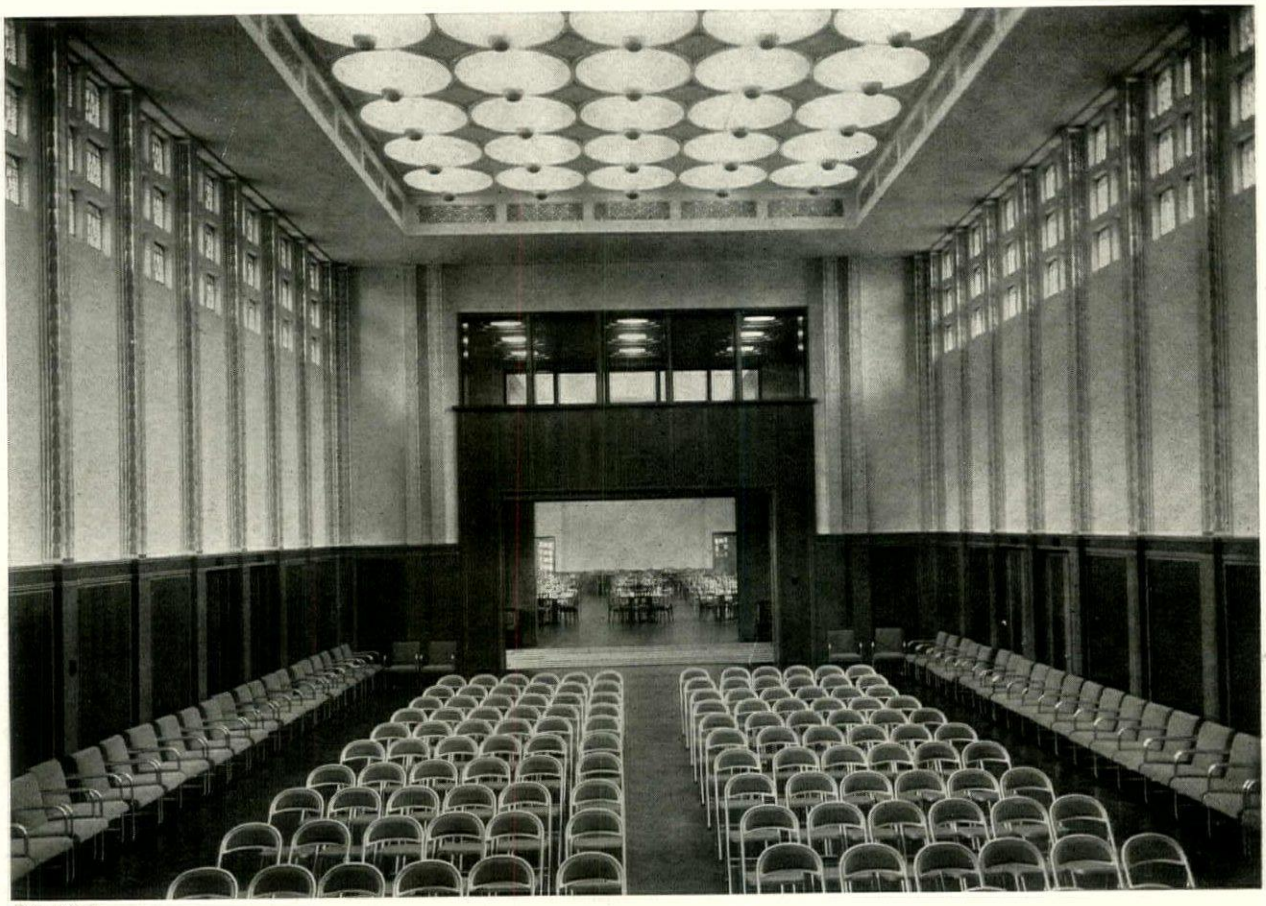
KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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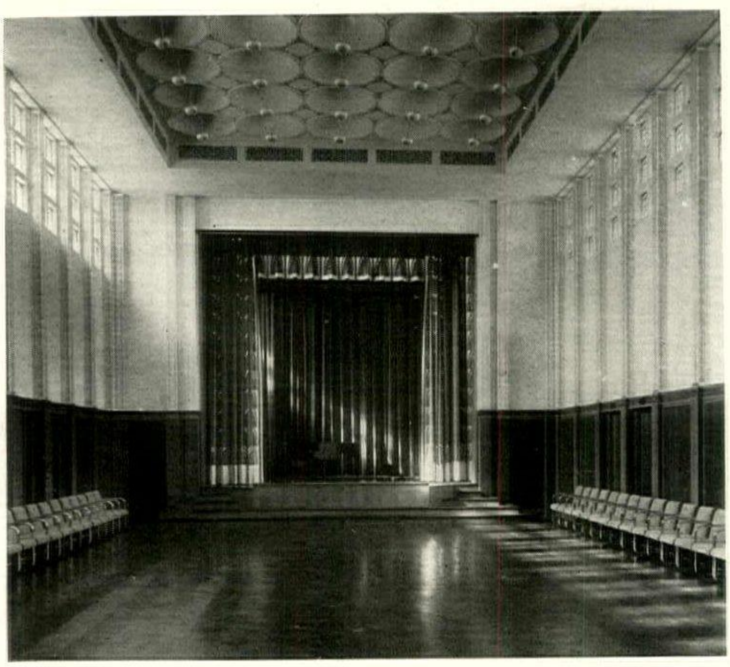
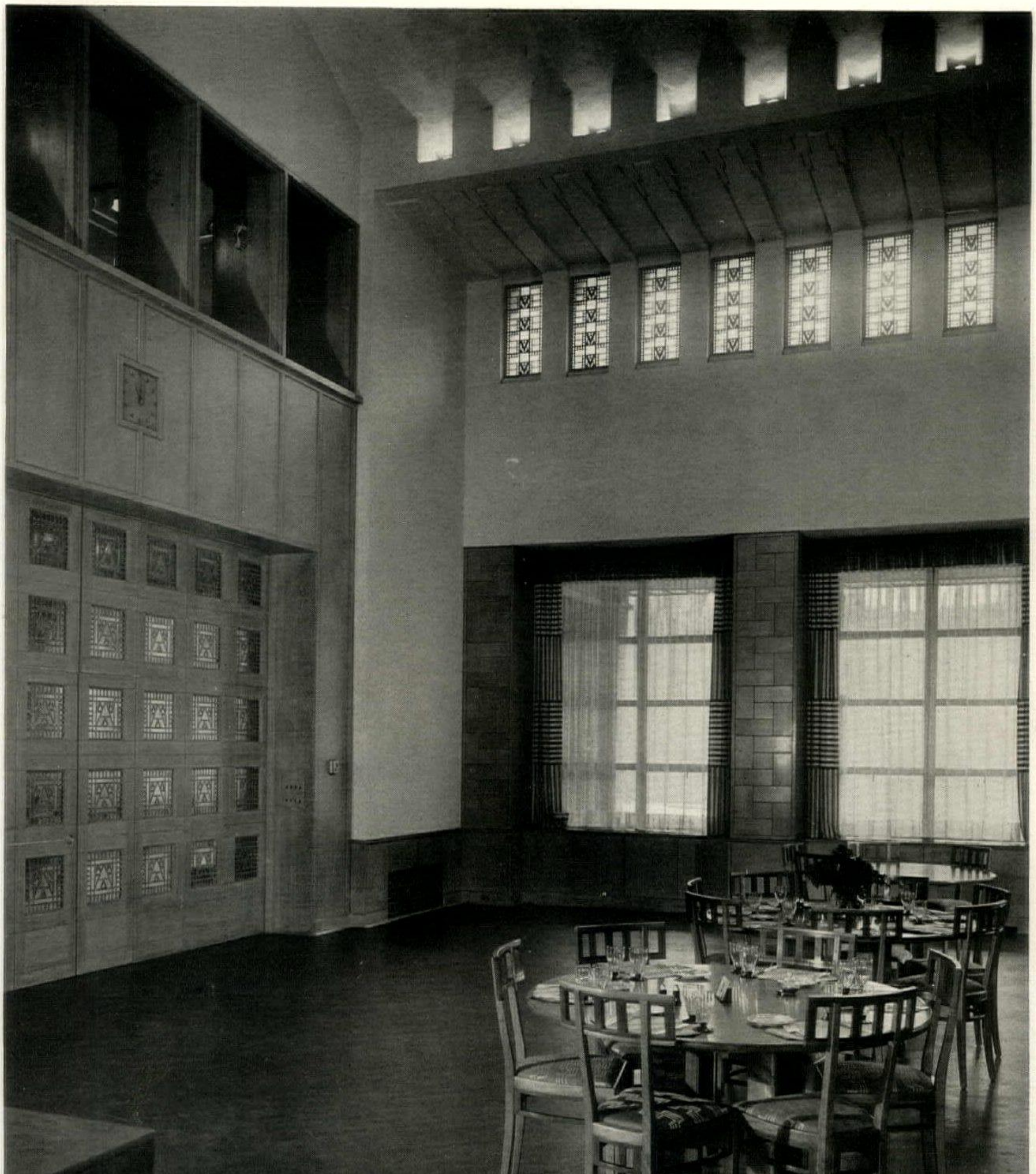


The Auditorium. The floor is of oak, stained and waxed, as is the wainscot and also the paneling above the entrance. The pilasters are of light stained oak to wainscot height and sand finish plaster above. The walls and ceiling are of sand finish plaster painted a light gray and decorated with silver leaf. The stage curtain is a warm gray velour ornamented in silver Fabrikoid, and covers a back curtain of light green velour. Chairs are chromium plated and upholstered in light green Frieze. The lighting from aluminum reflectors is especially interesting. The fixtures are suspended and the lighting is entirely indirect, being reflected from small domes in the ceiling panel. On the opposite page is a detail of the dining room

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT



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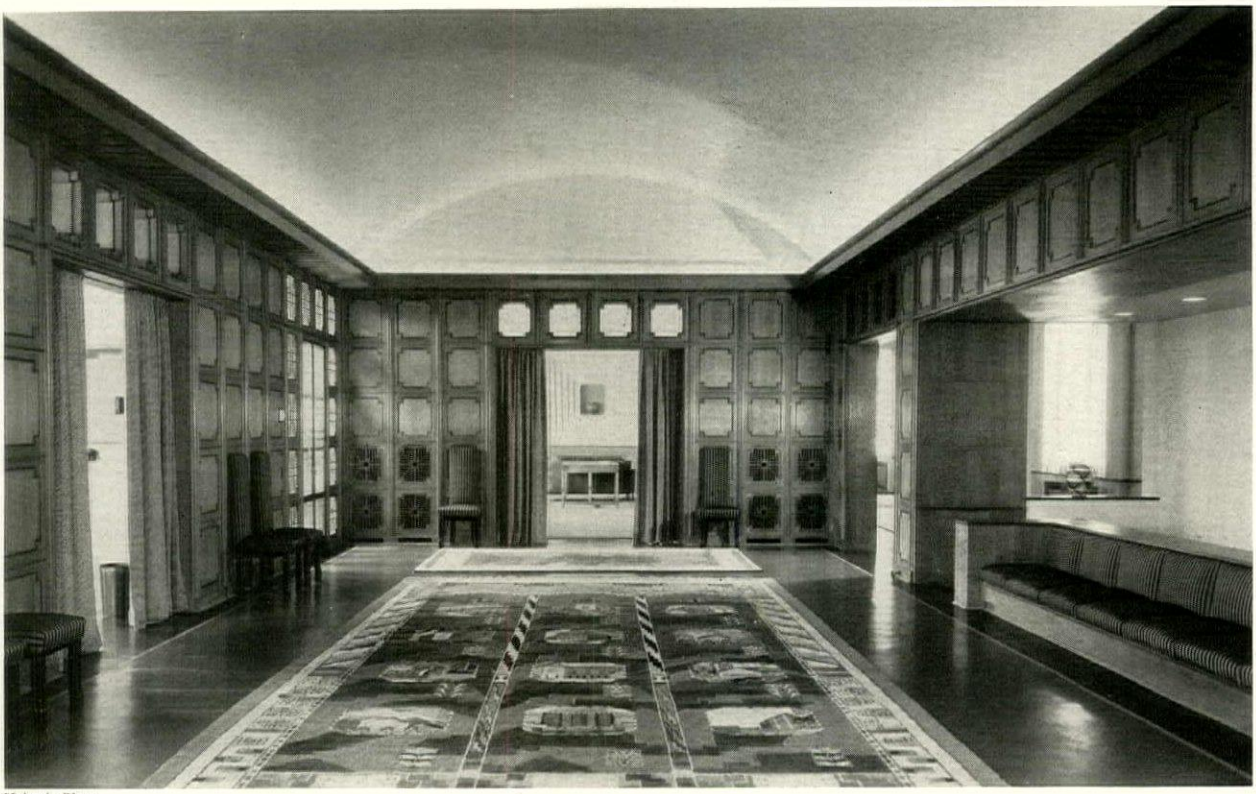
KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT



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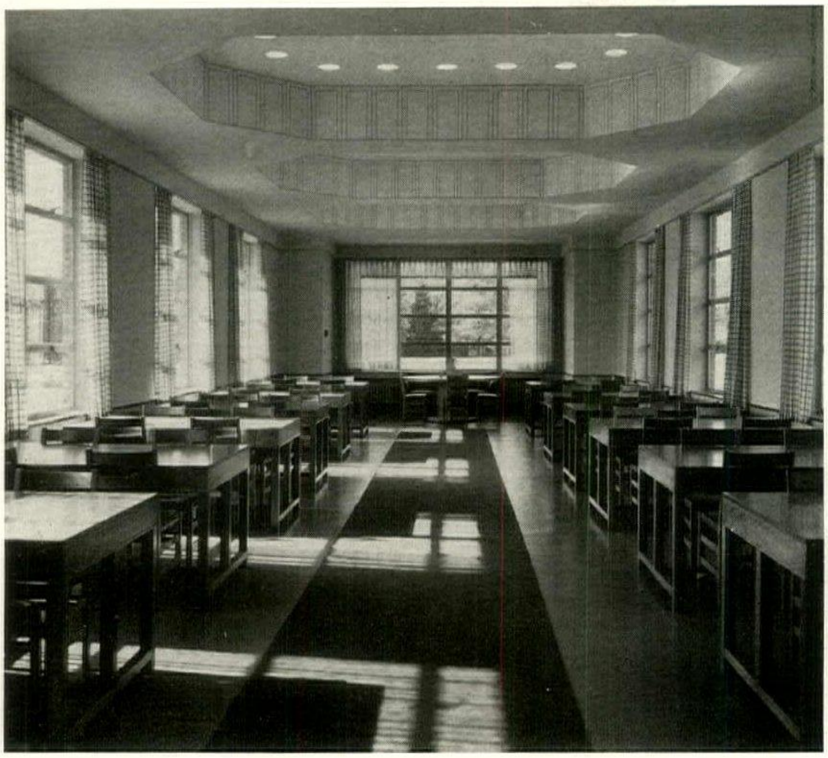


Above is the study hall lobby which has a brown linoleum floor; oak paneled walls, stained light and waxed; and a sand finish plaster ceiling, painted light gray. The rug has a reddish brown background and contains a pattern in several high colors. At the left is one of the study halls which has a medium brown linoleum floor and a cream colored vitritile wainscot with a dark brown coved base and cap. The walls and ceiling are sand finish plaster painted a light gray and striped with blue. On the opposite page is a view of the study hall corridor finished like the study hall

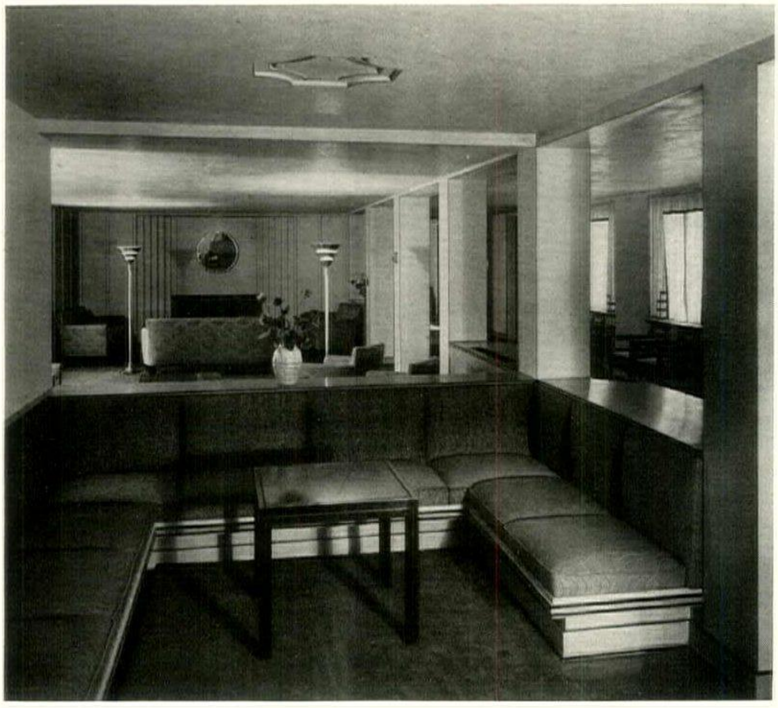
KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

Hance

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN
ELIEL SAARINEN, ARCHITECT

Hance Photos



Above is the dormitory reception room which has a dark stained oak floor, wood trim painted with a light gray enamel, and sand plaster walls and ceiling, painted light gray. The rug has a gray and reddish brown background with a white and blue pattern. The furniture is upholstered in gray and red brown. At the left is a corner of the dormitory lounge. The walls and ceiling are the same general tone as those in the reception room, but the floor is carpeted in a dull green, and the upholstery is a combination of green and gray

KINGSWOOD SCHOOL, BLOOMFIELD HILLS, MICHIGAN

ELIEL SAARINEN, ARCHITECT

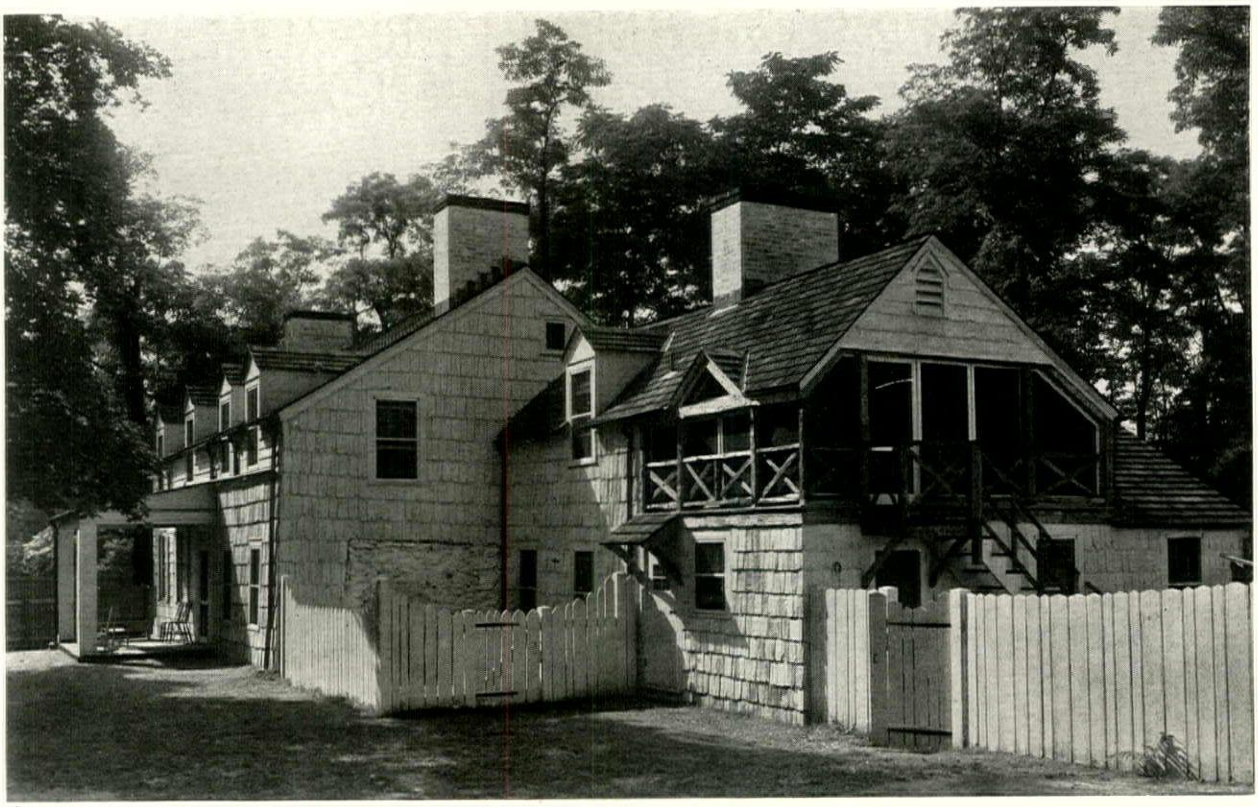
THE FORUM OF SMALLER BUILDINGS

Practical Problems of Small Building Construction Will Be Found on Page 89

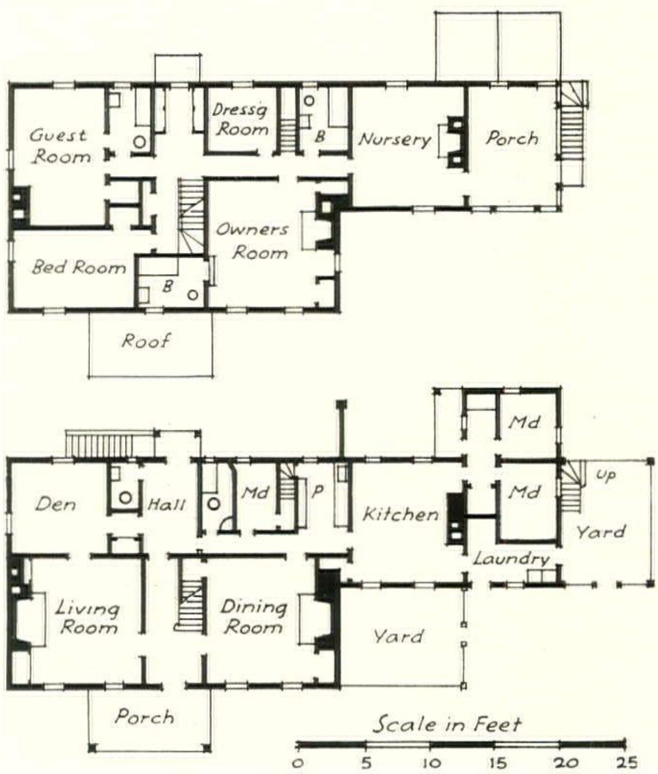
Amemya

HOUSE OF CLETUS KEATING, GLEN COVE, L. I., N. Y.

BRADLEY DELEHANTY, ARCHITECT



Amemya



The house as it appears now is an alteration to a structure built in 1735. Except for the addition of the service wing, the dormers on the second floor and the rebuilding of the chimneys, alterations had principally to do with the installation of modern sanitary facilities and a back stair. The second story had been used formerly only as an attic and its replanning necessitated some structural changes. In every case the old materials were reused in the alteration work. Many of the shingles on the walls were on the original structure, but the roof has been insulated and re-shingled. The heating system is a vapor vacuum type

HOUSE OF CLETUS KEATING, GLEN COVE, L. I., N. Y.

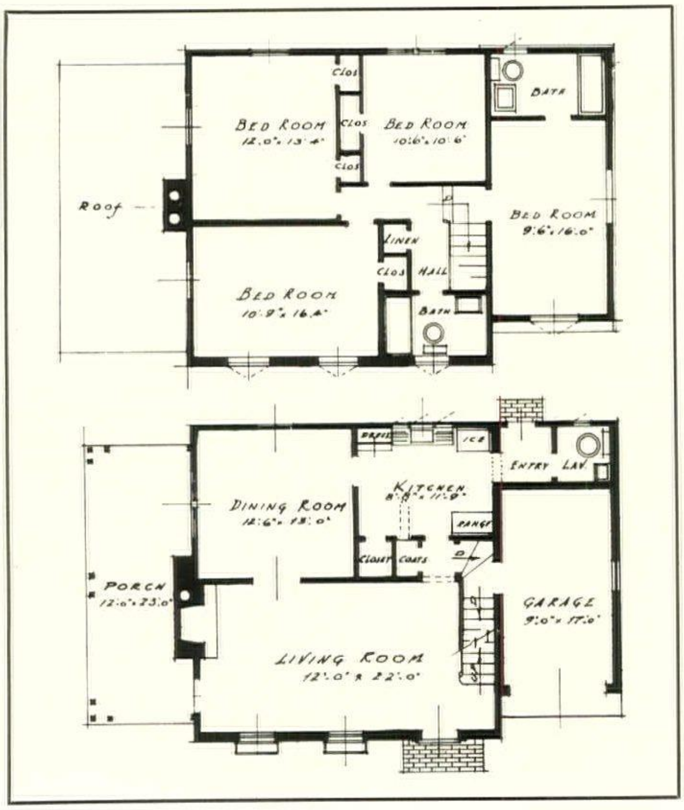
BRADLEY DELEHANTY, ARCHITECT

Amemya

HOUSE OF CLETUS KEATING, GLEN COVE, L. I., N. Y.

BRADLEY DELEHANTY, ARCHITECT

Tebbs & Knell



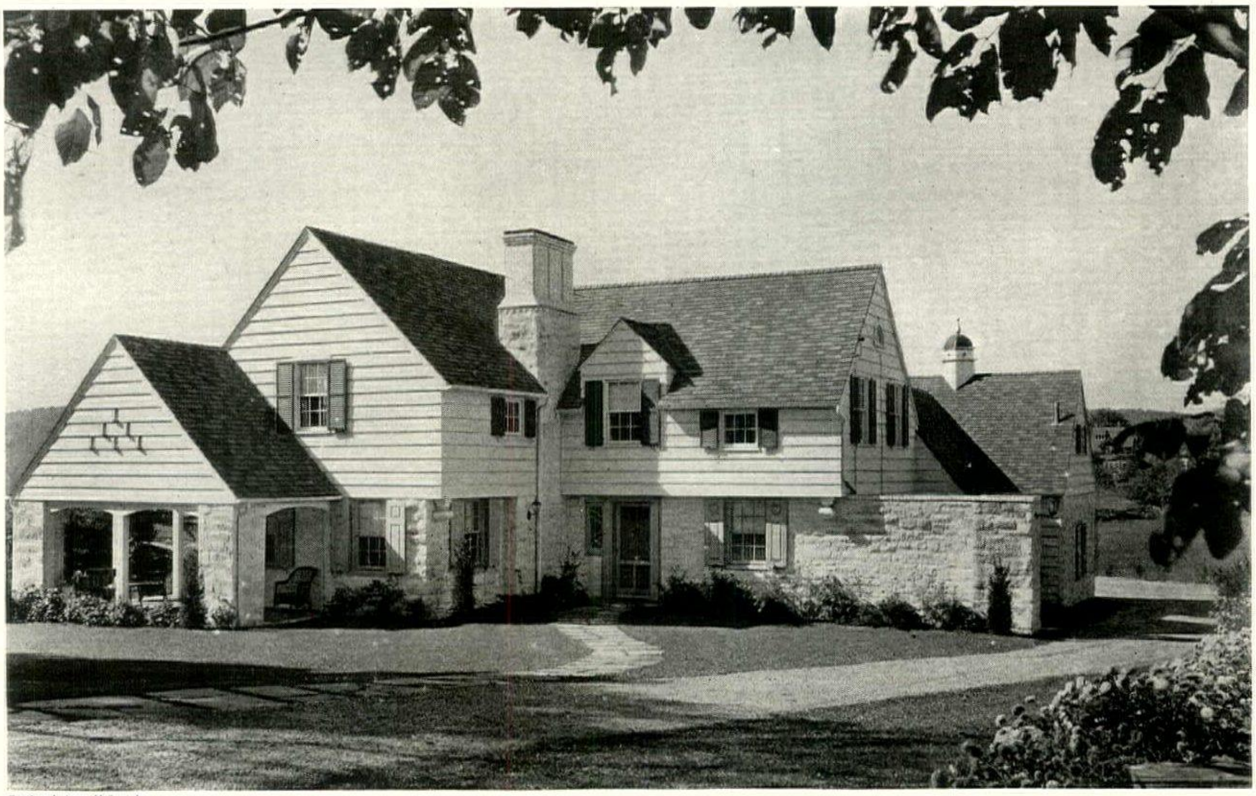
The house, which contains 20,914 cu. ft. and cost $5,700, is built of frame construction, with white pine siding on three sides. The facade is faced with brick to the second floor and the wing containing the garage is finished in stucco over metal lath. The roof is covered with wood shingles, stained black. The siding and brick of the exterior are painted white, the shutters, blue. The interior is plastered with a sand finish brown mortar on insulation board. All plaster walls are covered with one coat of pale yellow paint; the trim is painted white pine, and the floors are of oak throughout, except that in the kitchen which is linoleum

HOUSE OF EDWARD A. CRONE, PLAINFIELD, N. J.

JOHN DECKER, ARCHITECT

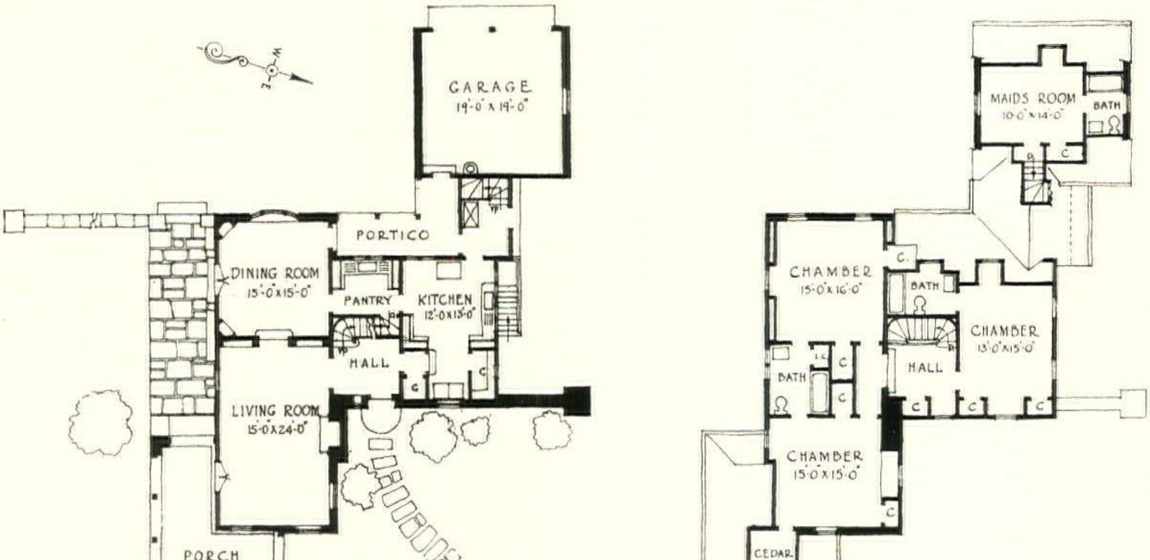
Richard Averill Smith

HOUSE OF THE MISSES ROMER, PLEASANTVILLE, N. Y.
JAMES RENWICK THOMSON, ARCHITECT



Richard Averill Smith

The house is of frame construction with a veneer of rugged stone on the first floor. The roof is insulated with Celotex and covered with brown shingles. The siding is painted white; the stone is whitewashed, and the shutters are light gray on the first floor and bottle green on the second



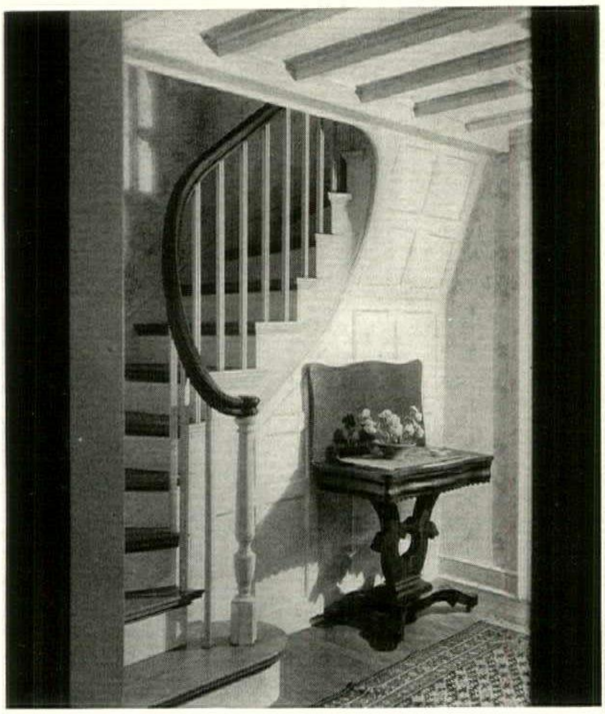
HOUSE OF THE MISSES ROMER, PLEASANTVILLE, N. Y.

JAMES RENWICK THOMSON, ARCHITECT

Richard Averill Smith

HOUSE OF THE MISSES ROMER, PLEASANTVILLE, N. Y.
JAMES RENWICK THOMSON, ARCHITECT

Richard Averill Smith Photos



The picture above is of the living room looking toward the dining room. A detail of the stair hall is shown below. The living room is typical of the general interior treatment of the house, which is an adaptation of the Colonial style with cream painted trim and paneling, a very light cream ceiling, and papered walls. The furniture in the living room is of walnut and mahogany, and the color in the Oriental rug harmonizes with the colors of the books on either side of the entrance to the dining room. The dining room has a low painted wood wainscot and a scenic paper on the walls. The china cabinets are painted blue to harmonize with a blue Chinese rug on the floor

HOUSE OF THE MISSES ROMER, PLEASANTVILLE, N. Y.

JAMES RENWICK THOMSON, ARCHITECT

TECHNIQUES IN MODERN MOSAICS

BY

EUGENE CLUTE

MOSAIC has been regarded formerly as particularly applicable to the decoration of churches and large monumental buildings, but with the simplification of modern interior design and with the varied possibilities of color and texture which are inherent in mosaic decoration a more extensive use of such work is a thing logically to be looked for in almost every type of building.

This type of decoration undoubtedly offers certain advantages over the more common kinds of applied interior designs. A mosaic surface may be textured to a remarkable degree. The range of color is as wide and varied as any artist could desire. The nature of the material with which a design is composed renders it actually a part of the structure to which it is applied, implying permanence and reducing the effort necessary for proper maintenance to a negligible quantity. There remains one possible objection to it which might be active in some instances. The cost of mosaic work is high when compared directly with that of other types of interior decoration, but even this may fall within justifiable limits when the advantages of mosaic are weighed, point for point, against those common to other decorative methods.

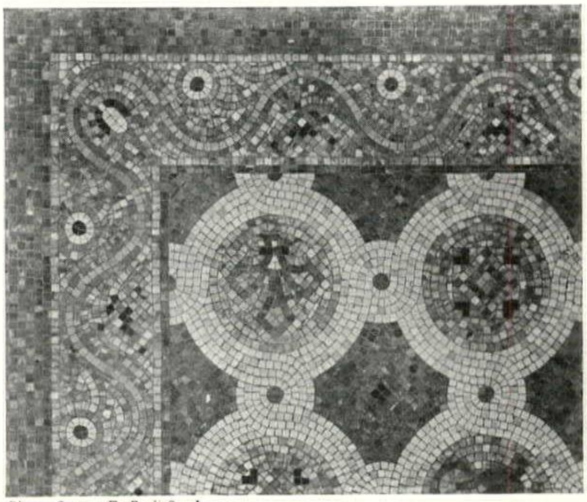
A part of this high cost may be explained by the fact that mosaic technique is substantially the same today as it was in the days of the Byzantine churches. But it is little understood by the majority of architects, which may in a measure explain its comparatively rare employment as a medium for decoration. The technique of mosaic work is essentially a handicraft and may be thought of in two divisions, the first being the actual design of a mosaic pattern, the second being the development of that pattern by an artisan, often an accomplished artist in his own right, into terms of subtle color relations and intricate surface treatment. The first of these two divisions, that of design, is largely a problem individually to be solved in relation to the controlling factors of space and consistency of arrangement.

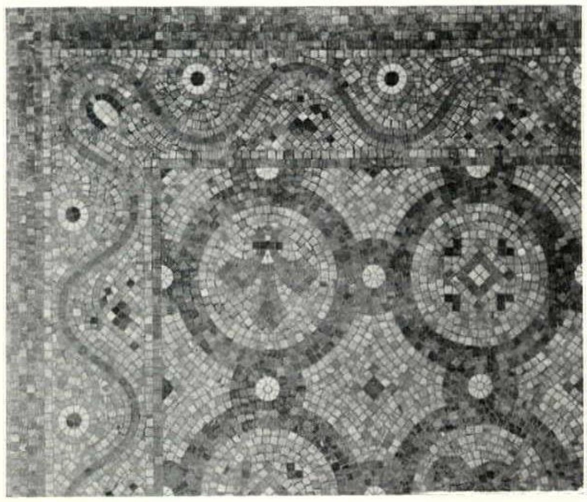
Courtesy, Ravenna Mosaics, Inc.

"The technique of mosaic work is essentially an handicraft, the pattern being developed individually by an artisan who is often an accomplished artist in his own right"

That the design of a successful mosaic requires a high degree of artistic ability is obvious, for though the color range is nearly as wide as may be obtained in the medium of oil paint, the technique is complicated by the intricacies of surface texture and the fact that the subject of the design must be interpreted in a multiplicity of small units, each independent in itself and possessing a stonelike brilliance, which makes a subtle interrelation often extremely difficult. The size of mosaic units, called tesserae, has in many instances spoiled what otherwise might have been a brilliant effect, for the size of the tesserae will vary much with the subject of the design, the space in which they are to be placed, the color, and even the manner in which they are set into the pattern.

The second part of mosaic technique can be more easily set forth, and it may be that an explanation of the possibilities and limitations of the method will make for a clarity in the outlook toward mosaic design. Mosaic may be generally classified into two divisions each of which within themselves are subdivided in a variety of ways by artisans. In the first division, marble tesserae are used, and the second employs tesserae of enamel. The latter are of an opaque glasslike composition, similar to the material used for glazing ceramics which, due to its high lead content, can be broken cleanly without shattering. In both types of



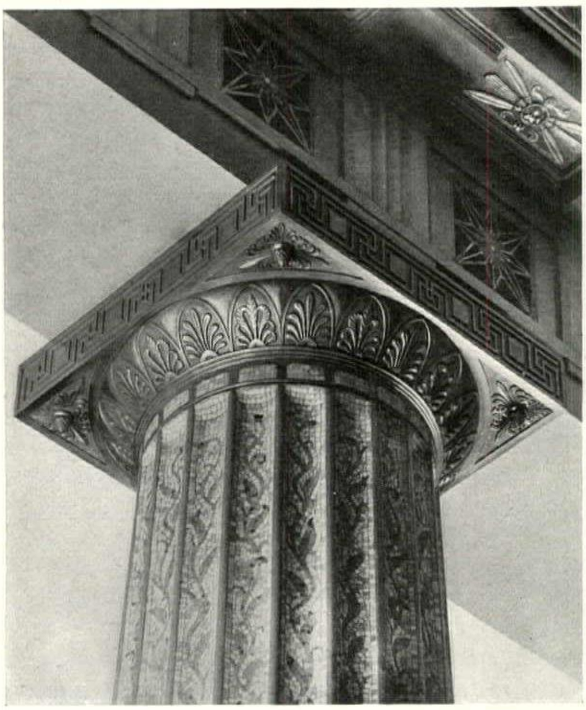


Photos, Courtesy De Paoli Co., Inc.

Two samples of Roman mosaic laid for the criticism of the architect. The one at the left is the first sample; at the right is the revision. Notice the general softening and blending of the colors, accomplished by reversing the field and by the use of less contrasting and thinner bands for the detail

mosaic, the color range is broad and the possibilities of the arrangement and size and even the finish are limited only by the general nature of the material and by the taste of the designer.

Marble Mosaics. These are divided by artisans into such classifications as Roman mosaic, Cosmati mosaic, Pompeiian mosaic, and these terms as used today indicate a certain size range of tesserae and a more or less definite manner of design, setting, and finish.



Detail of marble mosaic on a column with bronze arris and capital. In the Lee Higginson & Co. Bank, New York, Cross & Cross, Architects

Roman Mosaic. The design is developed from multi-colored marble plaquettes (*plachette* or *cubetti*) that are commonly ¼ in., ½ in., ⅝ in., and ¾ in. square, and they vary in depth with the face size from 38 to 58 inches. For wall and ceiling work these plaquettes are usually split to half their thickness. They are usually applied with a smooth face outward, but sometimes, for variety of texture, the split face is exposed.

The full plaquettes are used as tesserae in the mosaic, when they are split in half or cut where it is necessary to fit parts of the design. They are arranged face downward upon a piece of paper that bears a portion of the design approximately 2 sq. ft. in area. They are held to the paper by an adhesive, usually gum arabic.

In installing the mosaic these sections are turned over upon a coat of fresh mortar of special composition (*mastico*), usually composed of cement, 1 part; slaked lime, 1 part; clean, sharp sand, 4 parts. The scratch coat to which the mastico is applied is commonly of 1 part of cement and 4 parts of sand. When mosaic is being applied to a wall, the bottom edge of the paper bearing the tesserae, coated with mastico to fill the joints, should be placed against the wall first and the paper smoothed upward as the tesserae are pressed in. When mosaic is applied to a floor, the sections are not coated but are simply turned over upon a coat of fresh mastico. The subsequent tamping and rolling fill the joints of the tesserae.

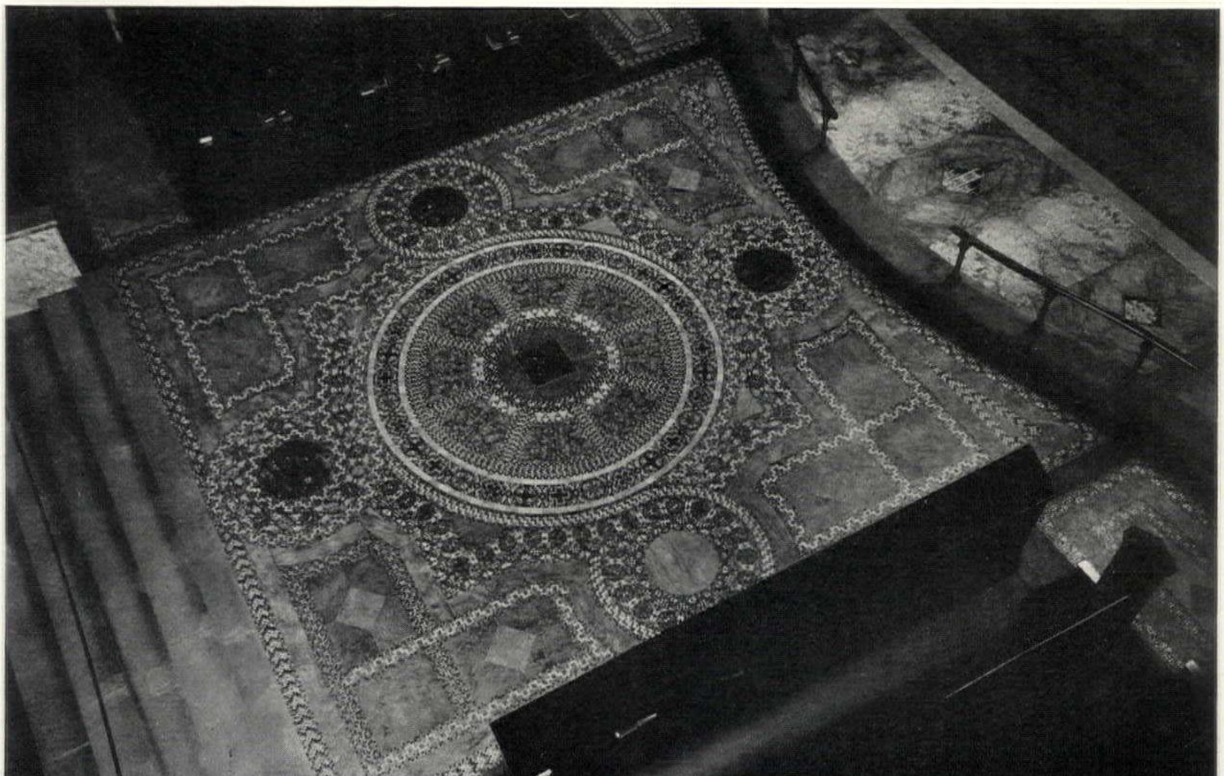
In whatever place it is applied, the mosaic surface should be tamped true with a block of wood (*cugno*) which is slid around over the surface and tapped with a hammer. The work should be kept wet until leveled and then washed with a mixture of lime, sand and water to remove the paper and adhesive. The work is again tamped and, in the case of a large floor design, leveled again with a stone roller called a *colonna*. Low stones are then lifted with the point of a knife, the tesserae adjusted to conform exactly to the design and the work again washed, this time with clear water.

Floor mosaic is finally grouted with a lime-cement-sand mixture. It is left until the job is nearly complete, then honed with a grinding machine, using at first 40 grit and finally 80 grit carborundum stones.

Mosaic on walls and ceilings is not usually finished in this way. Although a honed or even a polished surface is practically possible, the natural, unrubbed surface is usually to be preferred because of its varied texture and freedom from a mechanically smooth surface. This quality of texture is increased when tesserae showing a split face are used.

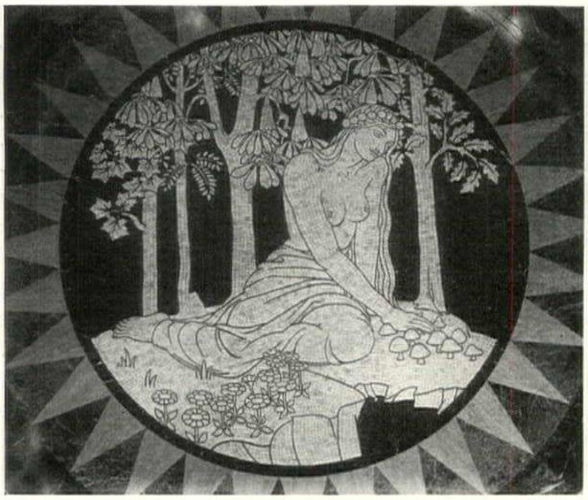
Among the marbles best adapted to use in Roman mosaic are the following: *Rouge Antique*, deep red; *Rouge Acajou*, maroon; *Rouge Chagney*, light red; *Red Verona; Rouge Royal*, deep blood red with white mottling; *Red Marrema*, light chocolate; *Fleur de Peche*, mauve; *Siberian Green*, soft olive green in various shades; *Irish Green*, very dark to light; *Corona Green*, three shades mottled with light green; *Verona Green*, very dark, slightly mottled with lighter green; *Emeraldo Green*, dark green; *Fleuri*, light blue; *Blue Turquin*, medium gray-blue; *Yellow Verona; Yellow Sienna*, varying in tone; *Blanc de Mines*, cream; *Comblanchien*, pinkish cream; *Carrara*, white; *Belgian Black*, clear, true black; *St. Anne*, two shades of gray. *Lithographic stone* is used, in two shades of yellowish gray. In addition to these marbles which may be safely used in any part of a building there are those which, though not recommended for floors, are particularly useful because of their coloring and may be used in places not subject to hard wear. Among these marbles are: *Rouge Cuit*, warm medium red; *Vert Frejus*, clear, medium green; *Jaune de Lyon*, clear medium yellow; *Emerald Green*, soft, clear green.

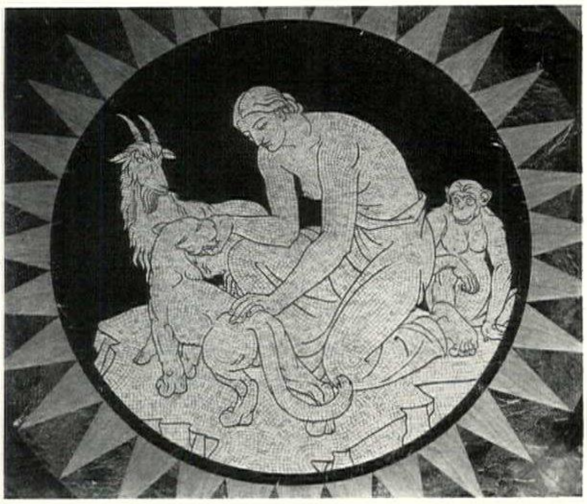
Cosmati Mosaic. This is composed of tesserae somewhat larger than those used in Roman mosaic. Their form varies and includes triangles, oblongs, irregular polygons, etc., as well as squares. The size also varies and ranges usually from a ¾ in. by 4 in. face and in some instances even to a 6 in. face. The tesserae are about ⅞ in. deep, being broken from slabs of marble or stone of that thickness, and are usually laid with irregular joints about ⅛ to ¼ in. wide, depending upon



Courtesy, V. Foscato, Inc.

Roman mosaic in a marble floor of St. Bartholomew's Church, New York. Bertram Grosvenor Goodhue, Architect





Two Roman mosaic tondi designed by Hildreth Meiere for the Nebraska State Capitol

the scale of the design. The process of installing Cosmati mosaic is generally similar to that used for Roman mosaic work.

Though some marbles may be used for both types of mosaic, many which are used in Cosmati are not applicable to Roman work. The tesserae in Cosmati mosaic are comparatively large. Marbles with bold markings can be used to advantage; and some that are useless for Roman mosaic plaquettes can be broken easily enough into tesserae of the proper Cosmati size.

Among the marbles commonly employed in the making of Cosmati mosaic are: *Verde Antique*, green mottled with white; *Alps Green*, green with white veining; *Tinos*, a rather uniform green, dark, also light; *Cardif*, dark green mottled with light

Photos, Courtesy De Paoli Co., Inc.

Cosmati mosaic in the rotunda of the Nebraska State Capitol, designed by Hildreth Meiere. Bertram Grosvenor Goodhue and Mayers, Murray & Phillips, Architects green; *Levanto*, red-and-green mottled; *Rouge Jasper*, bright red with white blotches; *Rouge Antique*, deep red; *Botticino*, creamy; *Tennessee*, three shades, cedar, gray and pink; *Belgian Black; Black-and-Gold*, black with golden yellow veining. In fact, any marble on the market can be used in Cosmati work. Certain stones, as well as marbles, are used in Cosmati, notably, *Travertine*, a well known creamy stone with fissures, and *Traniville*, a creamy stone.

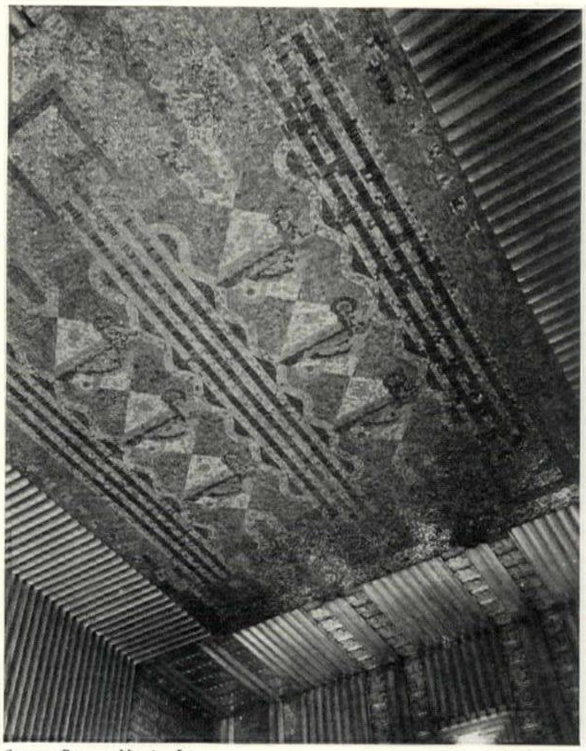
Enamel Mosaic. The technique employed in this division of mosaic work varies from that employed in marble mosaic work for the most part in the material used for the tesserae. This is a much more important difference than might be obvious at first, for the plaquettes of enamel mosaic (commonly about 3/8 by 5/8 in. and about 1/4 in. thick) are much different in their material structure as well as in general appearance from the marble plaquettes employed. A mosaic made with marble tesserae, even though it is polished, has not the quality of brilliance common to enamel mosaic work. A plaquette of enamel mosaic has the appearance of a piece of glass backed with a metallic color. Although actually opaque, it seems translucent and almost crystalline, due to the light reflection from the metallic backing. This is especially true with respect to the gold, silver, copper, and bronze colors which, in contrast with tesserae of other colors, glow with a peculiar radiance which is highly effective in accenting a mosaic design.

In addition to the metallic colors is a range of about 500 colors that are commonly used. All of them are permanent and the shades and tints obtainable run into the thousands.

The natural face surface of an enamel plaquette usually has a satin finish, but the plaquettes are often made with molded surfaces which may take the form of irregular mounds, fine parallel ridges, wavy raised lines or a fine pebbled texture.

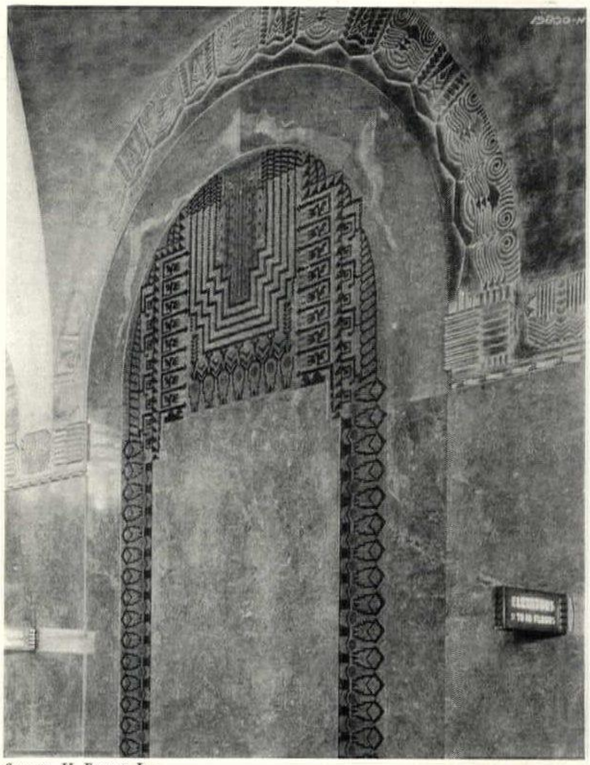
The surface of Venetian mosaic is rough, for the enamel plaquettes are used with broken edges of the material face outward, as a rule, though tesserae broken from the flat way of the material are sometimes mingled with the others to secure some desired effect, especially where tesserae are needed that are larger in face size than those that can be obtained from a cross section. Tesserae broken across the piece of enamel are limited in width to the thickness of the material, of course.

Using a broken edge as the face of the material brings out to the full extent the value of the color, its richness, depth or delicacy of tint, which is somewhat dulled in the plain surfaces. The broken surfaces also catch the light because of their irregularity and in this way lend liveliness to the mosaic.



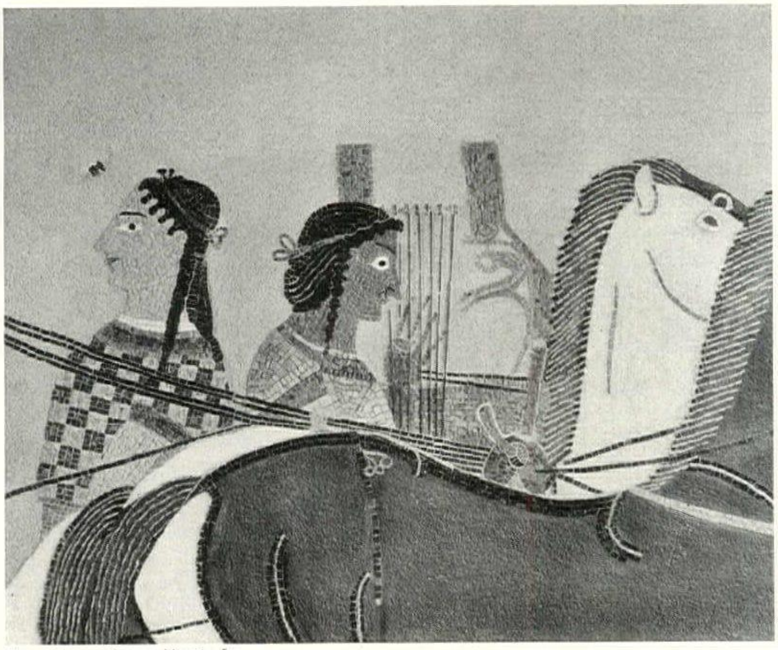
Courtesy, Ravenna Mosaics, Inc.

An enamel and gold mosaic ceiling which blends well in color and design with the aluminum ornamentation adjacent to it. Ely Jacques Kahn, Architect



Courtesy, V. Foscato, Inc.

A panel of Venetian mosaic set in marble for the lobby of a New York office building, Ely Jacques Kahn, Architect

Photos, Courtesy Ravenna Mosaics, Inc.

Silhouette mosaic with enamel tesserae. The one at the left is a decoration in the Greek manner by Leon V. Solon. The tesserae are highly colored against a gray-white and black background. The subject at the right was designed by Winold Reiss

The gold and other metallic tesserae are always broken from the flat way of the material, for the metal is only a thin film just under the top layer of the glass.

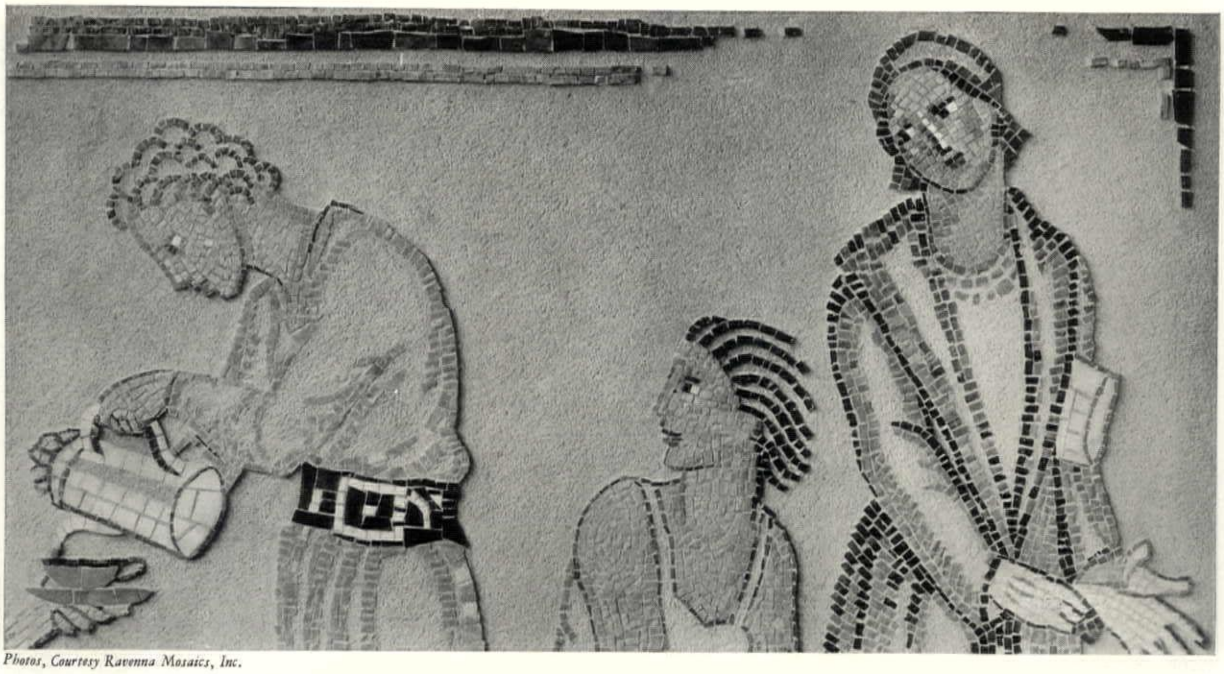
The mosaic is applied in much the same manner as Roman mosaic. The tesserae arranged upon pieces of paper are coated with mortar and sections turned over against a coat of fresh mortar. The mosaic is then pressed into the mortar with a wooden block, the paper soaked and removed and the tesserae adjusted with a knife blade or trowel, where necessary. When the cement has set, the mortar in the joints is stained with powdered pigment mixed with water, leaving upon the mosaic surface, when dry, a powder which can easily be brushed off the surface. A reddish brown stain is often used (commonly burnt umber) though some other color is sometimes chosen to harmonize with the coloring of the design.

Byzantine Mosaic. Byzantine mosaic is similar to Venetian mosaic in technique, but is characterized by the design treatment, which shows the primitive drawing, verging upon the archaic, the naive handling of the subject matter and the highly decorative simplification that mark the Byzantine manner.

Ravenna Mosaic. Ravenna mosaic is a development of Venetian mosaic that is usually distinguished by a much greater degree of freedom and variety in the handling of the materials than is customary in the latter technique. This freedom is seen particularly in the frequent use of tesserae of many different sizes in the same work and in the use of a large number of tesserae in which the enamel plaquettes are used on edge. Especially in large areas the tesserae are often 3 or 4 in. across, depending upon the scale and detail of the design. This is done to widen the range of texture and in addition the surface is often made slightly irregular, some tesserae being pressed into the mortar to a greater depth than others. This causes a variation in light reflection and produces a most satisfactory result, particularly when the surface is set in a solid color.

In this technique the full size cartoon of the architect's or artist's design, drawn and painted in colors, is carefully traced with a soft lead pencil upon tracing paper and the massing of the different colors indicated by shading. This drawing is then put face downward on heavy paper to which the design is transferred in reverse, by rubbing. This is the working drawing, which is then divided into sections of convenient size, each of which is marked with a number. A small scale key drawing of the whole design is then made and the sections are marked and numbered. This is used as a guide in assembling the sections during the installation of the mosaic. Sweeping curves are drawn on the back of the working drawing with a blue or red pencil and are made to match in setting.

Silhouette Mosaic. In this type of design the background and often some of the larger areas are of a textured mortar, while the lines and accented



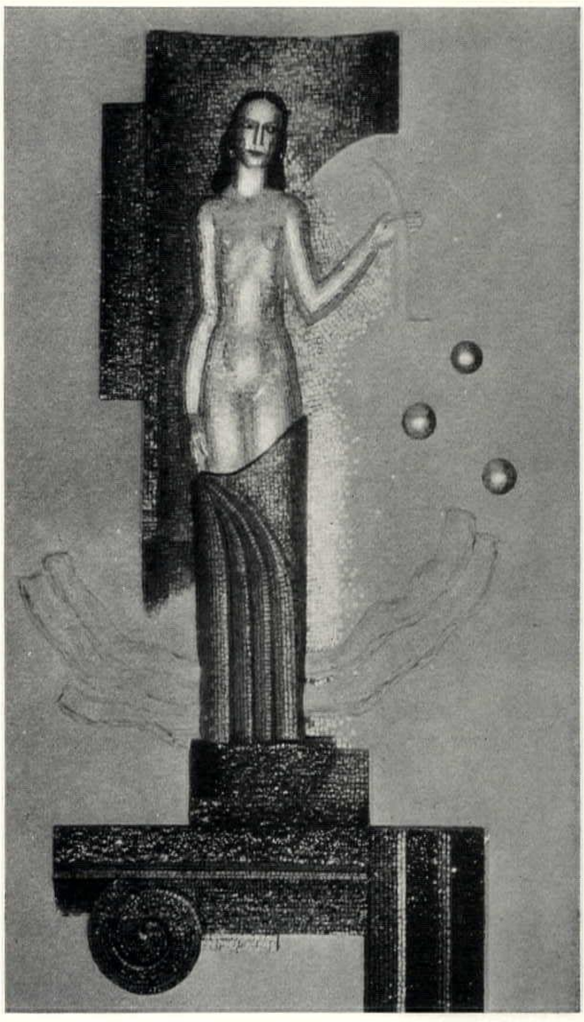
Photos, Courtesy Ravenna Mosaics, Inc.

A panel of silhouette enamel mosaic, with the tesserae slightly raised from a gray and white background. Designed by Hildreth Meiere

areas are of enamel tesserae of various colors set in the usual manner. By the use of gray portland cement mortar in some areas and white portland cement mortar in others, a difference in tone value is secured. Other tints can be obtained by coloring the cement before applying it. Differences in texture are also used. Sometimes small, round pebbles ($\frac{1}{16}$ in. to $\frac{1}{8}$ in. in diameter) are mixed in the mortar, which, after setting, is scraped with the side of the trowel to produce the texture. In some examples of silhouette mosaic the design is slightly raised ($\frac{1}{4}$ in. or less) above the background and sometimes the tesserae project slightly beyond the mortar.

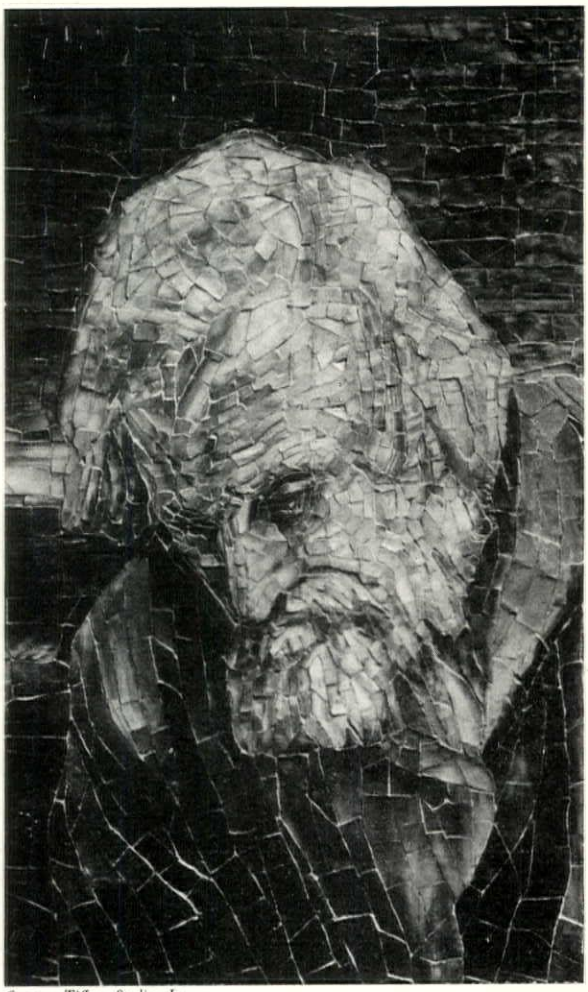
In installing silhouette mosaic the tesserae, arranged on paper, are plastered with mortar, but the open spaces of the design are not. The tesserae are pressed into the wall in the usual way. As soon as the mortar has set sufficiently the paper is removed and the open areas are cleaned out by scraping, to a depth of a little less than $\frac{1}{4}$ in. The finish coat of mortar is then applied.

High Relief Mosaic. Enamel mosaic work is executed also in high relief, some parts showing sculptural roundness of modelling. In such work the relief is modeled in cement mortar on steel mesh with whatever other reinforcement may be needed. This modelling is $\frac{1}{2}$ in. less than finished size, to allow for mortar and tesserae. When it has set, the surface is plastered and the mosaic applied in the usual manner on sections of paper, excepting where the form of the surface renders this im-



A high relief mosaic modeled in cement mortar. Designed by Ralph Jester, sculptor

Courtesy, Ravenna Mosaics, Inc.



Courtesy, Tiffany Studios, Inc.

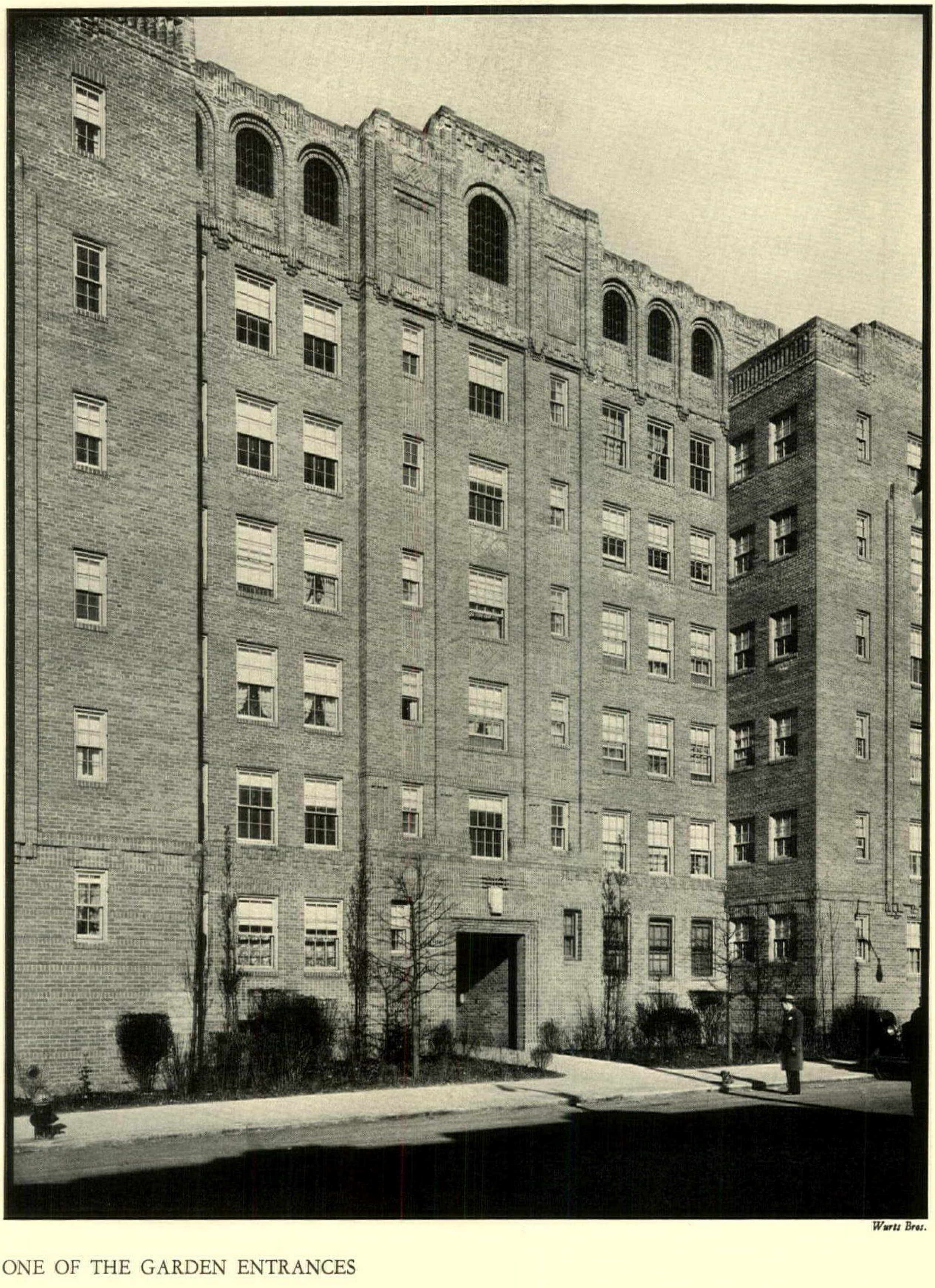
These two pictures illustrate the difference in technique and appearance between enamel mosaic and glass mosaic. At the left is a self-portrait in enamel and gold mosaic by Einar Forseth, executed in the Golden Hall of the Stockholm Town Hall, Stockholm, Sweden. At the right is a design in glass mosaic of the head of Joseph of Arimathea by Louis Comfort Tiffany

practicable. If this is the case the tesserae are placed in the mortar individually by hand. Often these relief mosaics show more or less textured mortar in the background, after the manner of silhouette mosaic, and sometimes this mortar shows modeled minor detail in relief.

Glass Mosaic. An outstanding example of the possibilities of mosaic is the technique developed by Louis Comfort Tiffany. This mosaic is made from pieces of transparent glass, varying in tone and color, that are marked with blended or graded bands and irregular forms. Some of the pieces are iridescent and others are backed with gold or some other metal leaf.

The method of developing this mosaic is different from that common to other types and resembles the technique used in making stained glass windows. The glass tesserae are selected for shadings of color to assist in expressing the subject and often are made with special markings for a particular design. For instance, glass with graded and blended bands of ruby might be used to indicate the varied tones in the folds of a rich robe, which would usually be represented in other kinds of mosaic by several rows of differently shaded tesserae.

The pieces of glass are selected, cut, and assembled upon the working drawing. They are then reassembled, face downward, upon a table and covered with cement mortar to form a slab with the glass imbedded in its surface. The slabs are often divided into rectangular sections by metal strips and can be taken apart after the cement has hardened for a final reassembly on wall or ceiling. The joints between sections are concealed after it is placed by fitting in the tesserae omitted from the original casting. The mortar backing, being white, reflects the light through the glass in a softly luminous effect.



Wurts Bros.

ONE OF THE GARDEN ENTRANCES

PHIPPS GARDEN APARTMENTS, LONG ISLAND CITY, N. Y. CLARENCE S. STEIN, ARCHITECT

THE ARCHITECTURAL FORUM

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PHIPPS GARDEN APARTMENTS

BY

ISADORE ROSENFIELD

OF THE OFFICE OF CLARENCE S. STEIN, ARCHITECT

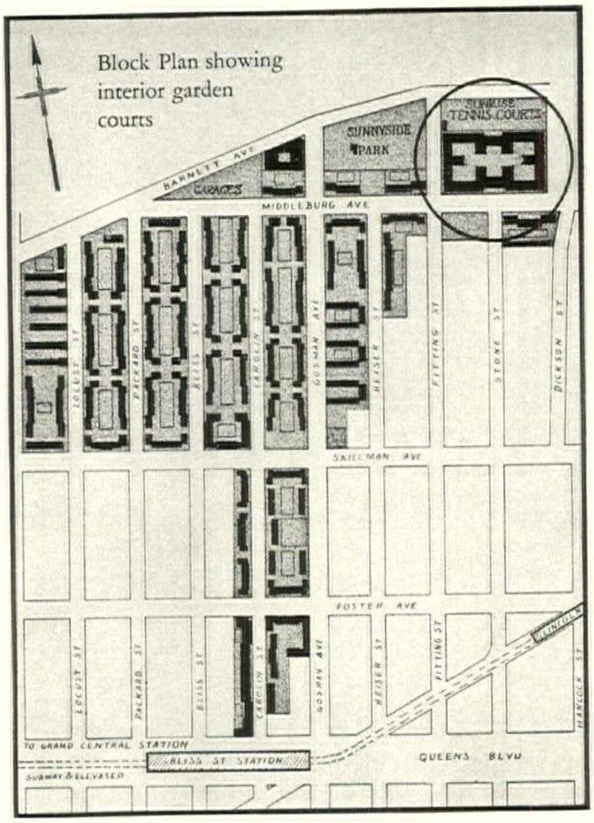
TO PROVIDE decent housing within reach of the lower wage classes is a problem which still awaits a solution. Although many housing schemes within recent years have been given publicity, for which enthusiastic promoters claimed enticingly low figures of rentals per room, efforts to provide adequate housing conditions for the lower income groups have not yet borne fruit.

Some progress, however, has been made in the field of social housing, as differentiated from speculative housing in the medium income brackets. At the President's Conference on Home Building and Home Ownership, recently held in Washington, the problems of housing were given official notice for the first time in our history and the social aspects were emphasized. The committee on large-scale housing operations expressed the opinion that projects similar to the Phipps Garden Apartments pointed toward the solution of the urban housing problem and intimated that such operations, if undertaken on a large enough scale might serve to improve in a measure the depressing situation of the building industry. Social housing, often spoken of as "limited dividend housing," almost necessitates a large-scale operation for its success.

As distinguished from housing entirely for profit, the limited dividend corporation is usually satisfied with a 6 per cent return on the capital investment. On a small project, with its attendant gambles regarding tenancy, shifting land values and possible early obsolescence due to the inability to control adequately the surrounding area, a return limited to 6 per cent is not attractive to capital. On a large-scale operation, however, securing the benefits of a problem solved from the social as well as financial standpoint, a 6 per cent return is a safe investment. In fact, today it is difficult to find a safer investment than in social housing which will consistently return 6 per cent while many "profit-making" investments have gone down in value below the first mortgage.

Preliminary Scheme. The Phipps Garden Apartments were erected on a plot which was part of the original Sunnyside development on Long Island. This community was developed by the City Housing Corporation, a limited dividend organization devoted to experimentation in low-cost housing consistent with socially beneficent standards of habitation. On the theory that apartment house dwellers would refuse to walk more than a short distance to the subway, it was decided to place apartment houses near the boulevard and to develop the remaining land toward the railroad with houses for single family ownership and occupancy. The construction proceeded until the plot in the northwest corner of the property was reached. Building operations were about to begin on this plot when an analysis revealed that the use of the land for single-family dwellings would be uneconomic. In addition, the character of the surrounding neighborhood indicated that an apartment house could be placed at a considerable distance from the subway without affecting rental potentialities. Although the location of the plot in question was somewhat farther from the subway than others in the neighborhood, conditions seemed generally favorable and an apartment scheme was developed for the plot.

Another article by Mr. Rosenfield describing the economic and engineering phases of the Phipps Garden Apartments will be found on pages 183 to 187, inclusive

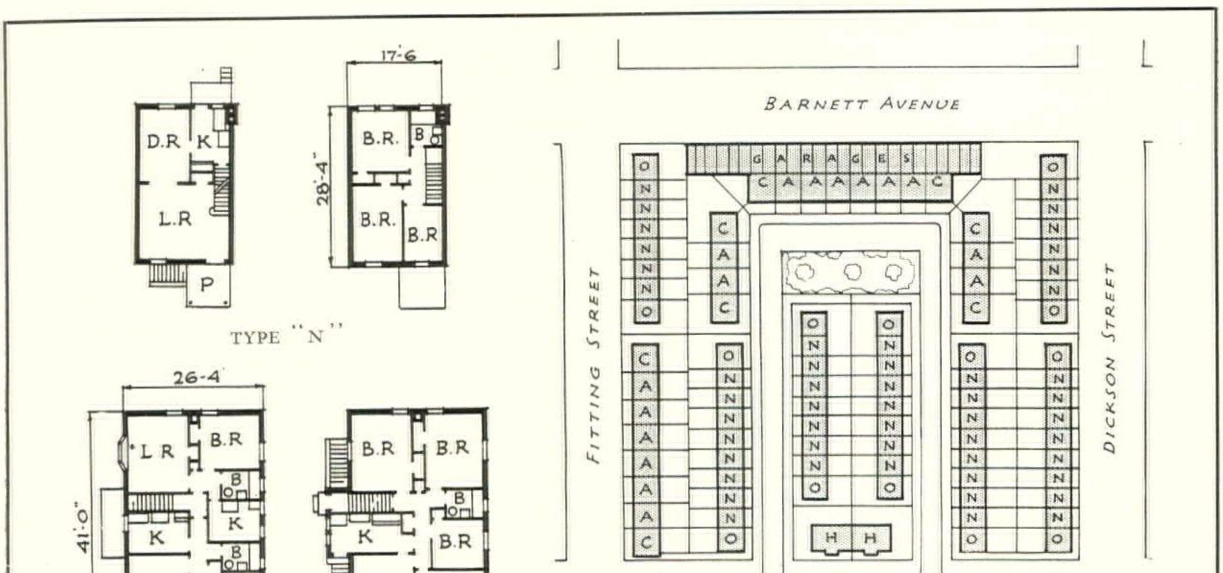


A plan of the Sunnyside development on Long Island, showing the location of the Phipps Garden Apartments

At this point the corporation decided that sufficient experimentation had been made in Sunnyside to demonstrate its objectives and concentrated its attention on Radburn. At the same time the Society of Phipps Houses became interested in the project. This society, formed "to provide tenements or other housing accommodations for the working classes" has built several houses in Manhattan, but because of the high land values, and comparatively small plots, they found it necessary to adhere to 70 per cent land coverage allowed by law in order to compete with tenements built for speculation in the same districts.

In the plot in question there existed an opportunity to demonstrate what could be done on a large-scale operation on comparatively low-priced land, and accordingly arrangements were made for the development of a large-scale housing scheme.

The streets at Sunnyside were originally laid out in normal city blocks of 200 ft. in width. (See map, opposite.) In many respects this width imposes serious limitations on the use of land, for it is usually uneconomical. The location of the Phipps project was bisected by Stone Street into two city blocks. On application, however, the city authorities vacated the extension of Stone Street through the property, thus creating a super-block, measuring 460 x 400 ft. Clarence S. Stein, the architect, had also been the architect of Sunnyside. The building organization of the City Housing Corporation was retained as the builder. These facts



The original development of the plot was planned for row houses for single-family occupancy assured the continuity of the general character of Sunnyside into the Phipps project. Every cooperation was obtained from the City Housing Corporation and all its experience was placed at the disposal of the architect and owners of the Phipps project. On this basis, studies of the use of the plot were started anew.

Land Coverage. As it seemed imprudent to develop the entire block in one operation, it was decided to use the plot to a depth of 260 ft., leaving 140 ft. in the rear for future consideration. This was determined to be sufficient for economic usefulness.

The value of the site was determined not by the cost per square foot of the whole block, but a higher and arbitrary value was assigned to it by virtue of its position and size. The rentals current in the neighborhood could be easily determined, as the district is now well populated.

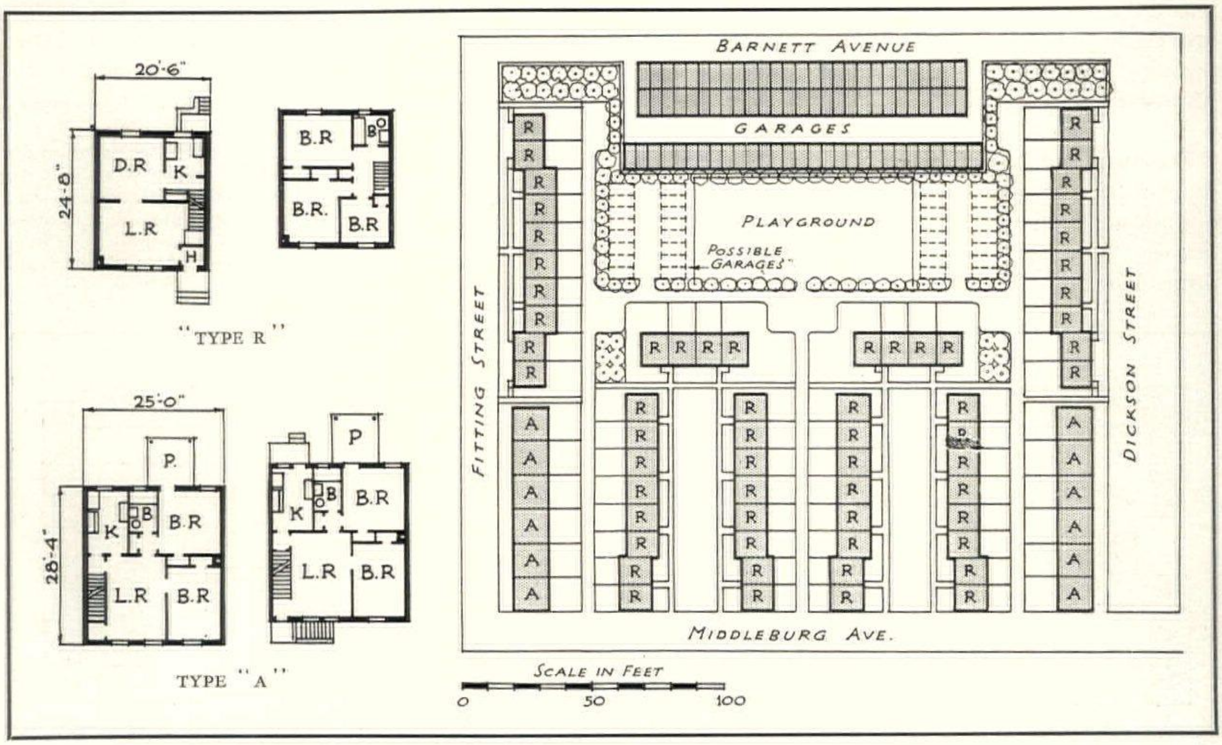
When a commercial project is being planned its analysis must show a good margin of profit. In social housing the problem is how much light, air, conveniences, park, play facilities and communal life can be provided for the rental which is current in the neighborhood for the economic class of people intended to house.

In commercial projects, small coverage is not accepted as an essential to the problem. Usually full advantage is taken of what the law allows, *i.e.*, 70 per cent of interior plots and 90 per cent of corner plots. If the coverage is less, it is charged to the tenant in higher rentals and therefore does not apply to the economic class with which we are here concerned. (Recent experience with increased vacancies and the general demoralization of rent standards show that the commercial builder has been shortsighted from a business standpoint.) Here the problem was how little of the land need be covered consistent with an economic return on one hand and with the ideals of light, air, park, etc., on the other.

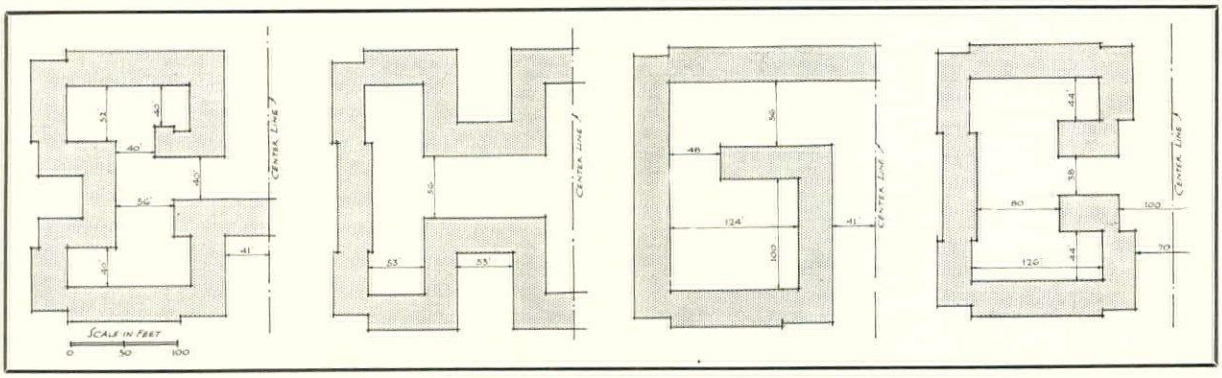
Ideal coverage cannot be stated in any definite percentage and make it applicable to all situations. Plans based on a 50- or 100-ft. plot grouped in a block must have a lower coverage than when the whole block is the unit of design. Seventy per cent coverage is unquestionably too much for most situations, but 40 per cent may be needlessly low and 50 to 60 per cent coverage under block design may be as effective as 40 per cent in the 100-ft. plot. It is also true that 40 per cent coverage of a block may be so poorly arranged as to nullify the effectiveness of the 60 per cent open spaces. In other words, within certain limits, the question is not how much to cover, but how to cover.

The amount of the land that is required to be covered to bring in an adequate return can be computed mathematically from known facts and assumptions.* These assumptions and facts, how-

* For an explanation of the methods of computing costs, returns, and coverage, see articles by Henry Wright in *The Architectural Record*, March 1929.



An alternate for the preliminary scheme for single houses, shown on the opposite page



Four preliminary studies of the land coverage of an apartment scheme

ever, are not altogether fixed. The results of the computations may be further tested by introducing variations.

How to conserve the open spaces is not soluble by mathematics. The experience of the architect on this project led him to think that the simpler the flow of the line of building the more economical it would be. The building units were, therefore, arranged by letting them follow the perimeter of the plot. When the length of the perimeter is not sufficient to produce the required quantity of rentable space the building length may be increased by indentations or projections.

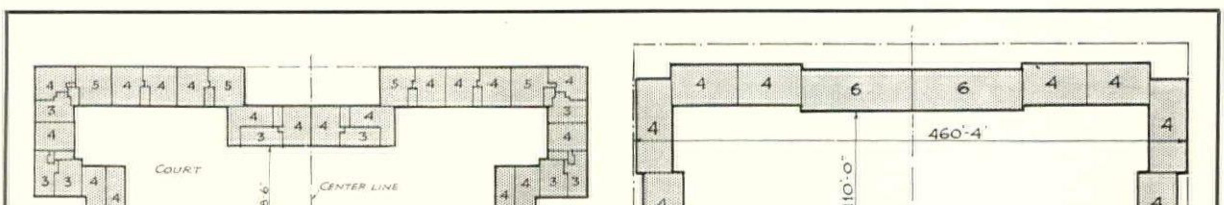
Generally, indentations from the exterior are only justified when adjoining buildings interfere with light or view. This was not a factor in the present project. Consequently, the chief problem was how to combine the various interior court spaces for maximum effectiveness. The accompanying plot schemes show the attempt at more intensive use of the land.

Elevator and Non-Elevator Units. In the planning of apartments in Sunnyside two basic units of building form were evolved. One was the straight line or "link" unit most frequently used, and the other was the corner unit. Both proved adequate and economical for grouping two to four apartments per floor around a single stair in a non-elevator apartment.

The laws of New York permit semi-fireproof apartment construction * up to six stories. Above that fireproof construction is required. Some housing authorities believe in and the laws of some cities require fireproof construction above three stories for multiple dwellings. This is very sound, but in cities where second-class construction is permitted up to six stories it would seem that it is impossible to produce fireproof buildings six stories in competition with non-fireproof buildings of the same height. Therefore, social housing in New York remains non-fireproof and within the height of six stories.

There is no market for a six-story walk-up apartment. In fact for the white-collar class four stories seems to be the limit, while a fifth story would cost less to build than the lower stories, the rent for this story would have to be so reduced to be made

* The chief characteristics of this type of construction for four to six stories are: (1) Exterior masonry walls with interior steel beam and column bearings. (2) Wood stud non-bearing partitions and wood floor joists. (3) Fireproof stairs and fireproof walls in shafts. (4) Fireproof slab over the basement story permitted to be pierced by elevator and dumb-waiter shafts, but not by stairs.



Scheme "A" at the left was planned for non-elevator four-story units. At the right Scheme "A 1," which included four six-story non-elevator units attractive that it would not pay. Consequently the set-up reduced itself to four-story walk-ups and six-story elevator units, the elevators being of the push-button type.

The "T" Unit. To compete with push-button elevator apartments elsewhere, it was found that \$1.75 to \$2.30 per month per room was all that could be added to the walk-up rates. While this charge is not uniformly applicable to all floors, it is, nevertheless, chargeable to some degree even to the first floor because of accessibility to roof, more spacious lobby, and finally some people will pay to be able to say that they live in an elevator apartment. When the various items comprising cost, maintenance, and depreciation of a push-button elevator were computed and divided by the extra income that such elevator may bring in, it was found that each elevator should serve about 100 rooms.

This meant that there would have to be about 17 rooms per floor in a six-story building. And as the demand for accommodations ranged from 1½, 2, 2½ and so on up to 5½-room apartments, it meant that long corridors would have had to be resorted to for proper circulation. However, the principle of economy in circulation space was not given up and so the "T" unit was developed, permitting the clustering of more than the usual number of apartments around a single stair and elevator.

This unit does not eliminate the corridor altogether as the link and angle units do, but it is reduced to an extremely small proportion and much of the added space was used up as secondary space within the apartments.

Had it not been for the "T" unit, the general layout might have confined itself to the simple perimeter scheme. Obviously a simple perimeter for so large a plot would have created a rather monotonous inner court. Thanks to the projections of the "T" stems, the court assumes a great deal of interest and at the same time the effectiveness of the perspective of distances is not destroyed. In the outside perimeter only such slight indentations were introduced as were desirable for architectural interest.

Comparison of Schemes

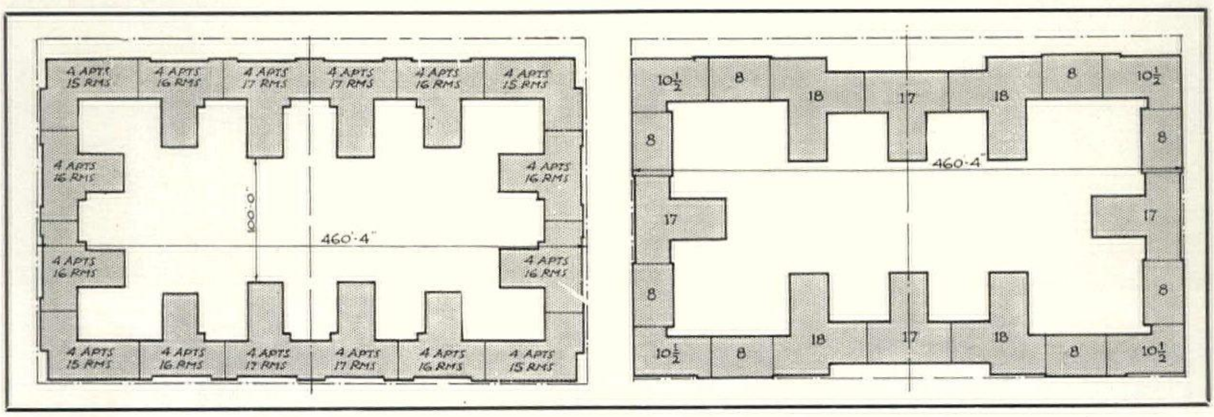
Scheme	Rooms	Characteristics
Scheme A.....	214	1 exterior court — good interior court
Scheme A1....	244	4 exterior courts — fair interior court
Scheme B.....	256	12 elevator "T" units — crowded interior courts
Scheme F.....	256	10 elevator "T" units — crowded interior courts
Scheme C.....	246	8 elevator "T" units — crowded interior courts
Scheme 5.....	228	6 elevator "T" units — good interior courts
Final........	236	6 elevator "T" units — good interior courts

Numbers indicate rooms per typical floor

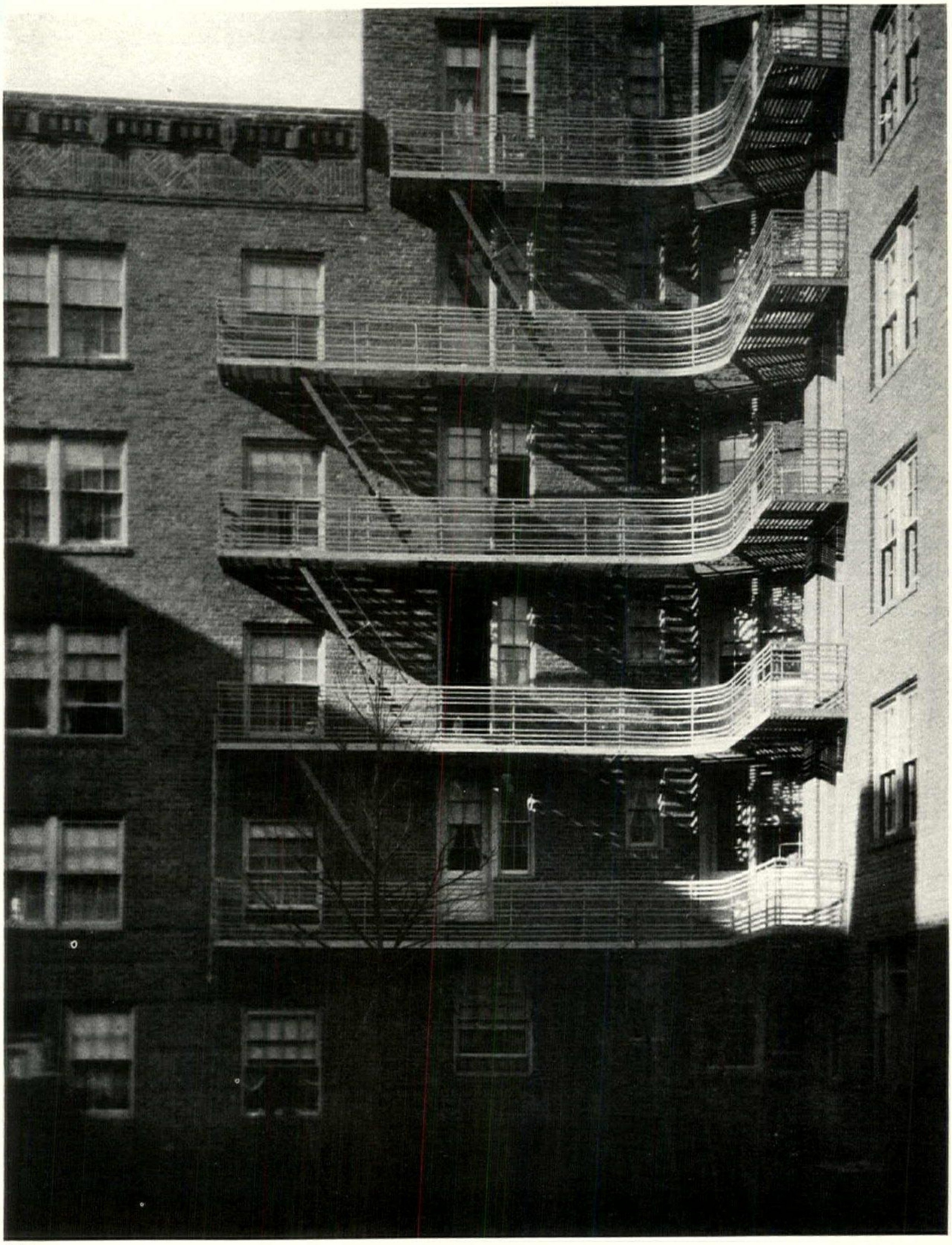
While schemes A and A1 were good solutions, they were predominantly in walk-up units. Beginning with B the schemes lean toward a goodly proportion of elevator units, 12, 10 and even 8 T-shaped elevator units crowded the court too much. Scheme 5 with six elevator units gave satisfactory results, but the final plan showed further improvement with respect to room quantity.

Width of Unit. One of the cardinal principles of planning non-speculative apartments is preservation of cross-ventilation. In the interest of ventilation, units are never more than two rooms deep.

In the earlier experience of Sunnyside, units were designed 28 ft. 4 in. deep. This proved too tight for convenience. A study of the problem showed that within limits it is more economical to add space by increasing the depth dimension than the width or frontage. The width of rooms was



Two schemes including elevator apartments in "T" units. Scheme "B" at the left is more open than Scheme "C" at the right. See page 120 for final scheme



Lubschez

This detail shows the ingenious method of combining the necessary fire escape with the highly desirable balcony. The strong horizontal lines harmonize with the general design of the building and the gray-green color with which the balconies are painted gives a pleasant contrast with the color of the brick wall

Wurts Bros.

A view of the interior court looking down the long axis

therefore kept constant, while the depth of the units was gradually extended to 32 ft. In this project the depth was further increased to 35 ft. By increasing the depth, practically the only additional cost is in the increased span.

This cost is negligible compared with the advantages derived from the deeper rooms, kitchen, closets, bath, and wider circulation spaces. Under the old depth there was not enough space for eating in the kitchen. Under the new depth this is possible with comfort. In case of the bath, under the old depth the tub had to be placed across the room adjoining the window. Under the new arrangement the tub can be placed adjoining the partition and a 5 ft. 6 in. tub can be used instead of a 5 ft. tub.

Communal Facilities. By agreement in the purchase of the land from the City Housing Corporation the residents of the Phipps apartments enjoy all playground facilities of the large play park immediately adjoining this project belonging to the Sunnyside Community Association. It was not necessary, therefore, to provide outdoor recreation facilities on the grounds of the Phipps project. Several small play spaces were, however, created in the court for small children who should remain within sight of their mothers.

In the lower story of one of the elevator units a complete nursery was provided. Immediately adjoining it is a special play space for the exclusive use of the nursery children. This nursery will be maintained by an organization of the parents.

In another wing there is a large community room with the necessary facilities for adult activities.

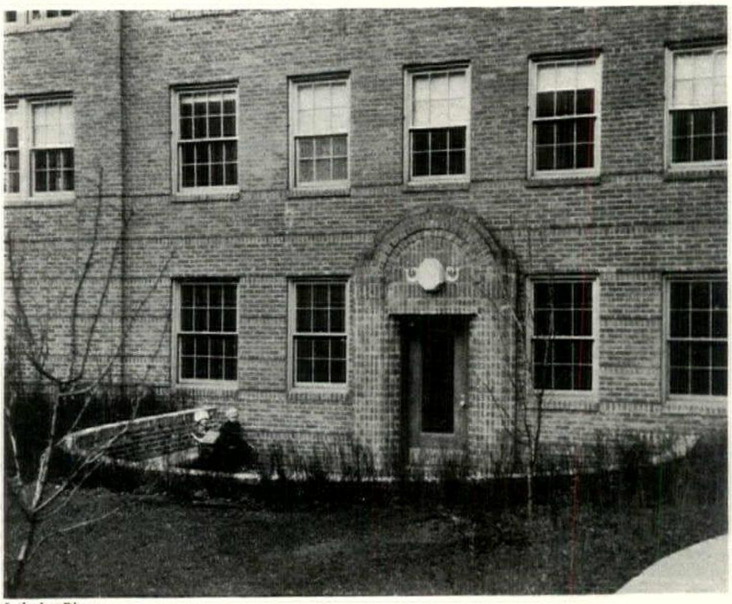
The Gardens. The gardens as well as the planting around the perimeter of the property were developed with the assistance of Margaret Coutley, landscape architect.

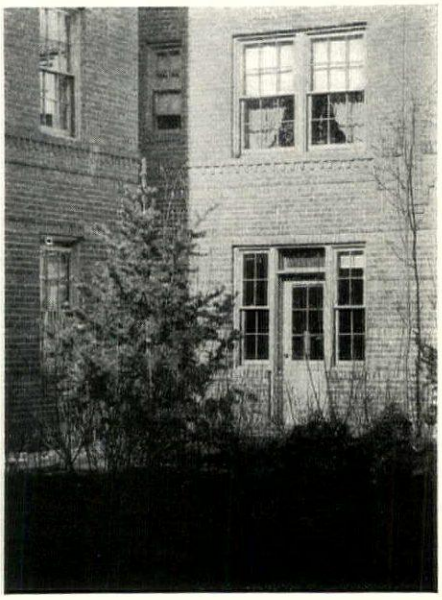
Unfortunately the photographs were taken before the planting was completed and the conditions of the season prevent the showing of the planting to advantage. Nevertheless, a great deal was done, perhaps more than could be usually expected. In order to give the court a mature appearance, several full-grown trees were planted in addition to many shrubs and smaller trees.

A unique provision is the special watering system for the gardens and lawns. The lack of water in the city reservoirs during dry summer months in the last few years threatened cutting off the precious liquid from use for watering lawns, etc. To insure the life of the planting against such exigencies a special well was drilled on the property and pumping facilities provided. A net of sprinkler heads was installed at frequent intervals so that the grounds could be watered from a single control point, thus reducing maintenance cost of the gardens considerably.

To increase further the domestic atmosphere of the development most ground floor apartments have doors leading directly into small private gardens that may be developed to the individual taste of the tenant.

Balconies and Porches. The person who is not sentimental about house ownership is in a dilemma. He likes to live in an apartment because of the service like heat, hot water, janitor service, less





Lubschez Photos

At the left is a children's play area opening off the nursery, and at the right one of the private gardens. Both of these features add much to the attractiveness of the garden court

housekeeping, etc. But he also enjoys looking out on green grass and trees and, above all, to dress informally in hot weather and sit out on the open porch. The Phipps apartments have solved this problem to a great extent. The huge parklike court with its trees and shrubbery are restful and soothing. But no longer is it necessary to dress up and go out to sit on a park bench to get a breath of fresh air. In the elevator apartments facing on the court, two kinds of porches were provided: open porches at the east and west units, and glazed porches on the north and south sides. Those of the elevator apartments facing on the court that do not have porches have balconies which connect with the fire escapes, while the walk-up apartments have balconies at the top story.

This was done not merely out of consideration of designer, but to add inducement to walk up four stories. A similar consideration caused the provision of individual gardens for ground-floor tenants, otherwise the ground story is not popular.

Fire Escapes. The average fire escape is seldom a thing of beauty. Its ugliness was here overcome in several ways. First consideration of appearance was given to the court side rather than the street on the theory that the court is an extension of the living room. Therefore, fire escapes in the court were eliminated from sight as much as possible, *i.e.*,

1. An interior fire tower was substituted for fire escapes between units "A" and "W".

This fire tower serves four apartments and supplants two sets of required exterior fire escapes that would have come in such awkward position as to affect materially the appearance of the building. To change the position of the fire escapes consistent with good appearance, at least four fire escapes would have been necessary. Compared with these the cost of the interior tower costs no more and is more economical to maintain.

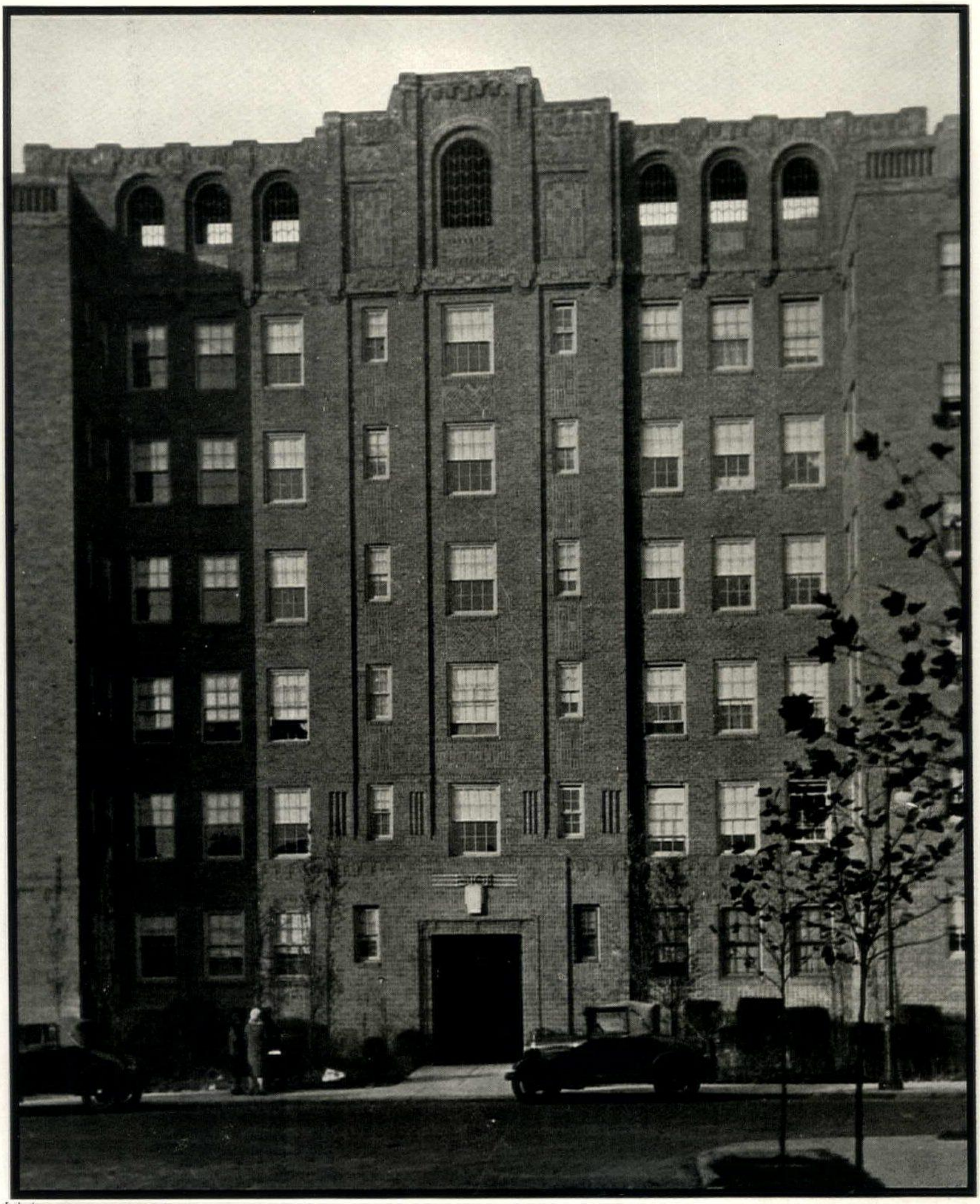
2. They were made integral with the porches in the cases of units "F" and "R".

3. They were placed in wall recesses and masked by the balconies in "L" and "M".

4. Where the fire escapes were frankly used, they were made unobtrusive by the following treatment. The balcony portions were designed in strong horizontal lines and painted a gray green in contrast to the brick work while the ladders were made as simple as possible and painted to simulate the color of the brick work.

Significance of the Project. This project demonstrates that:

1. Large-scale operation is as economically sound in housing as it is in automobile production.
2. Scale production need not lead to monotonous appearence due to repetition of units.
3. While a tenant may spend for rent here no less than elsewhere, he gets much more for his dollar in terms of services, amenities, and recreation facilities.
4. It would seem that the more domestic in character and in accommodations, the more popular the project becomes.
5. There seems to be a great public demand for living in homes of this character.
6. It is a very stable form of investment.



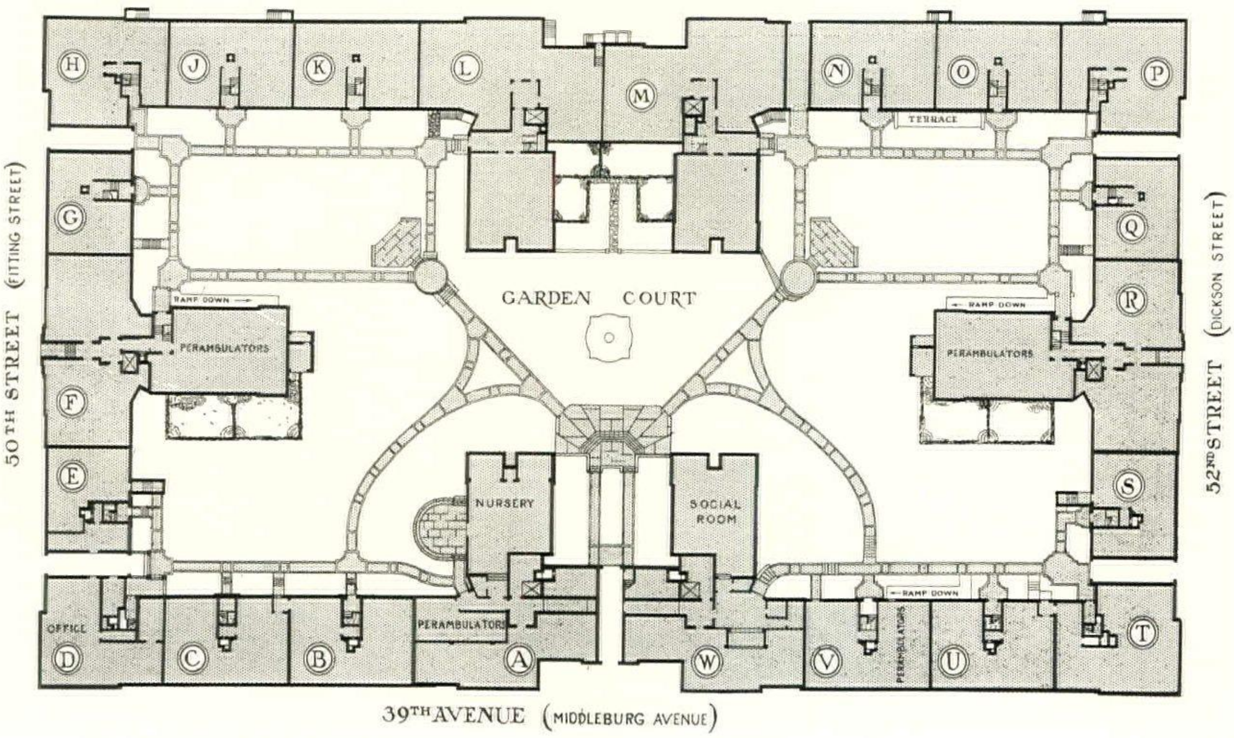
Lubschez

THE ENTRANCE ON MIDDLEBURG AVENUE

THE PHIPPS GARDEN APARTMENTS

LONG ISLAND CITY, L. I., N. Y. CLARENCE S. STEIN, ARCHITECT

Wurts Bros.



THE PHIPPS GARDEN APARTMENTS

LONG ISLAND CITY, LONG ISLAND, N. Y.

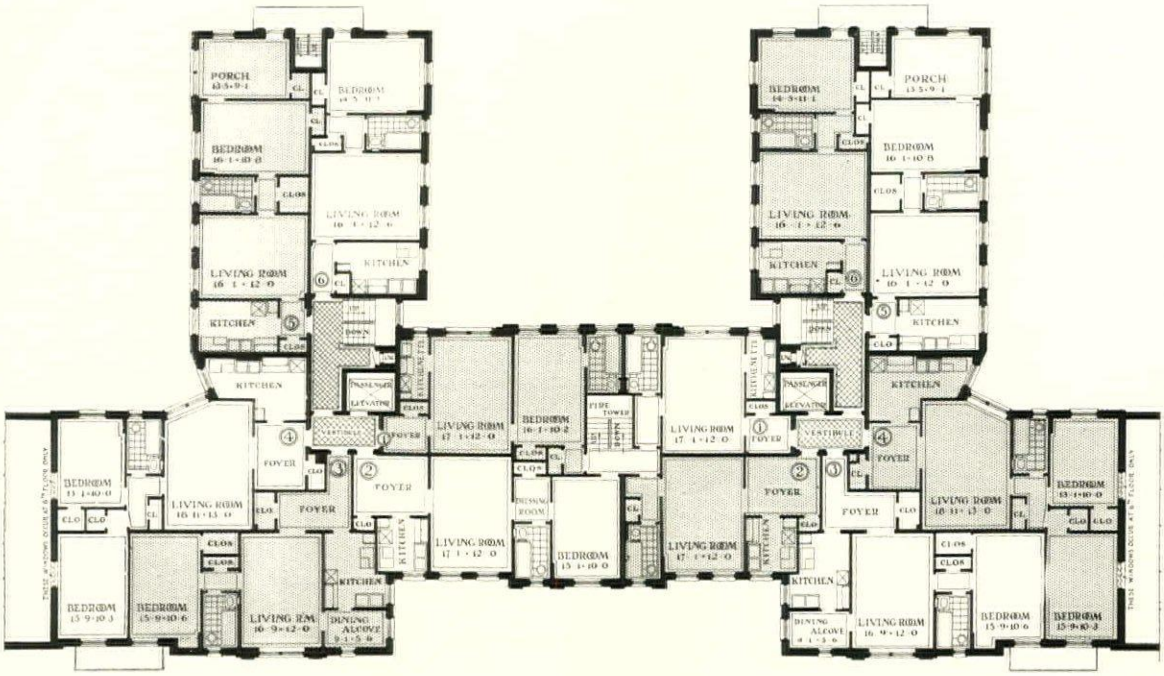
CLARENCE S. STEIN, ARCHITECT

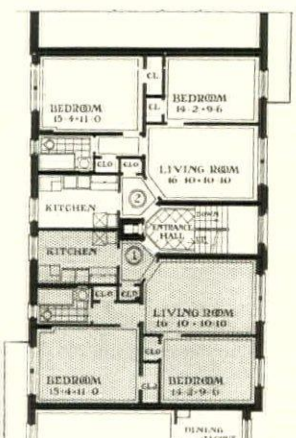
Wurts Bros.

THE PHIPPS GARDEN APARTMENTS

LONG ISLAND CITY, LONG ISLAND, N. Y.

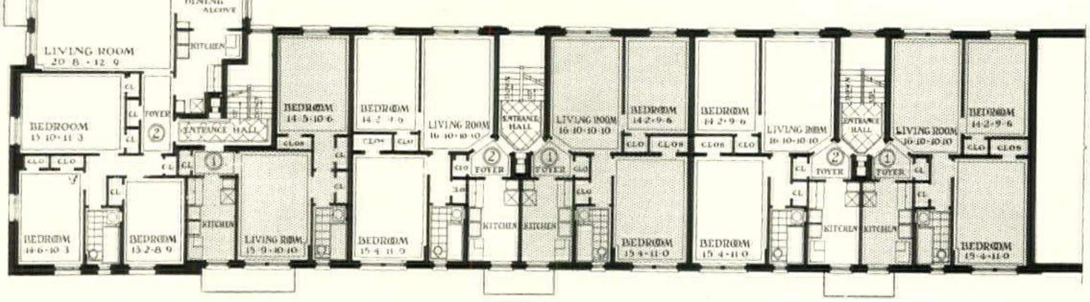
CLARENCE S. STEIN, ARCHITECT





TYPICAL FLOOR PLANS

ABOVE is a plan of the typical six-story elevator buildings. The left-hand portion is a plan of Building "A," facing *south*, and Building "M," facing *north*. The right-hand portion is a plan of Building "W," facing *south*, and Building "L," facing *north*. Below is a plan typical for the four-story non-elevator apartments, illustrating the corner buildings, "D," "H," "P," "T"; buildings "B," "C," "J," "K," "O," "N," "U," "V" with *north* and *south* exposures; buildings "E," "G," "Q," "S" with *east* and *west* exposures. The letters refer to the key plot plan shown on page 120



THE PHIPPS GARDEN APARTMENTS

LONG ISLAND CITY, LONG ISLAND, N. Y.

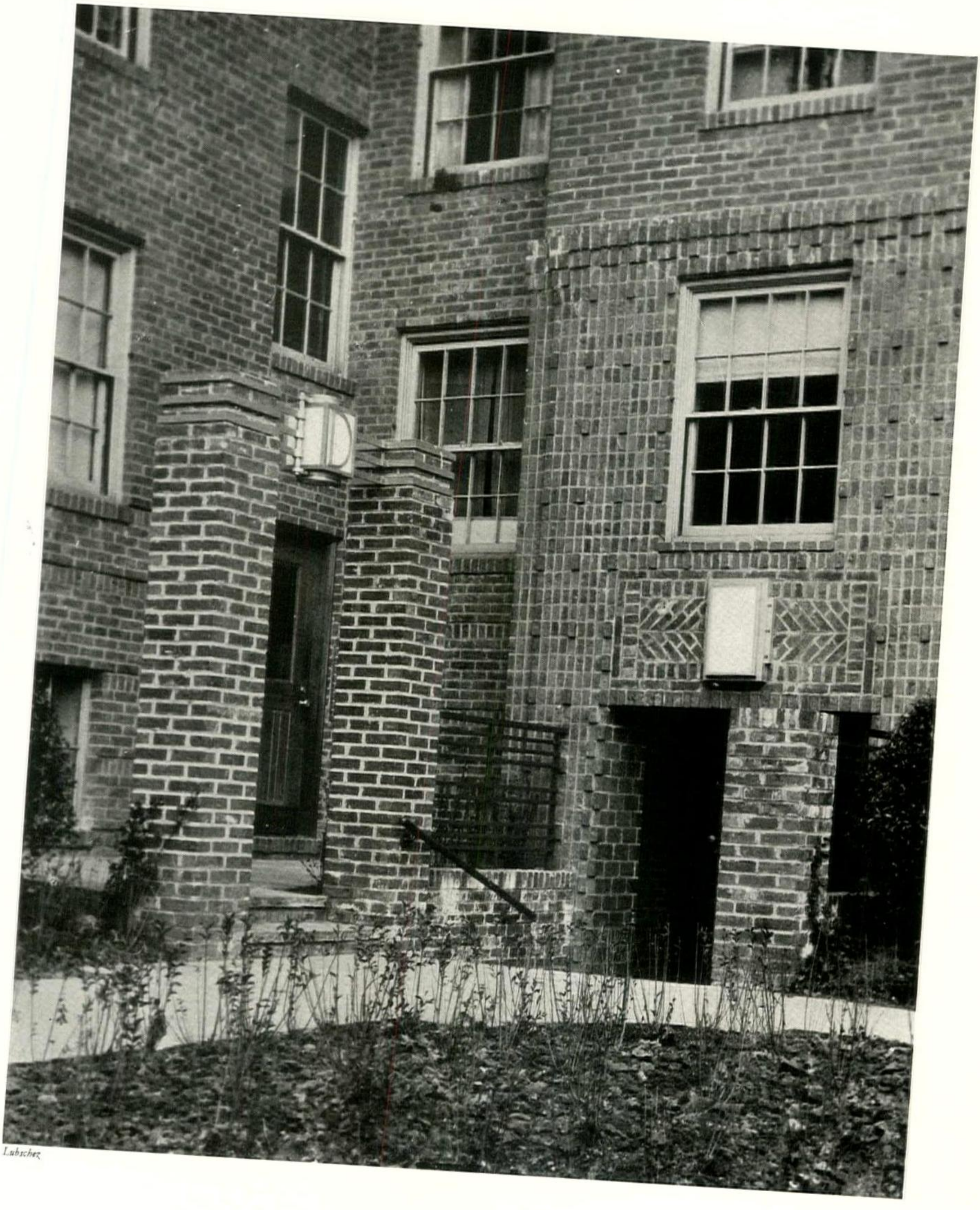
CLARENCE S. STEIN, ARCHITECT

Wurts Bros.

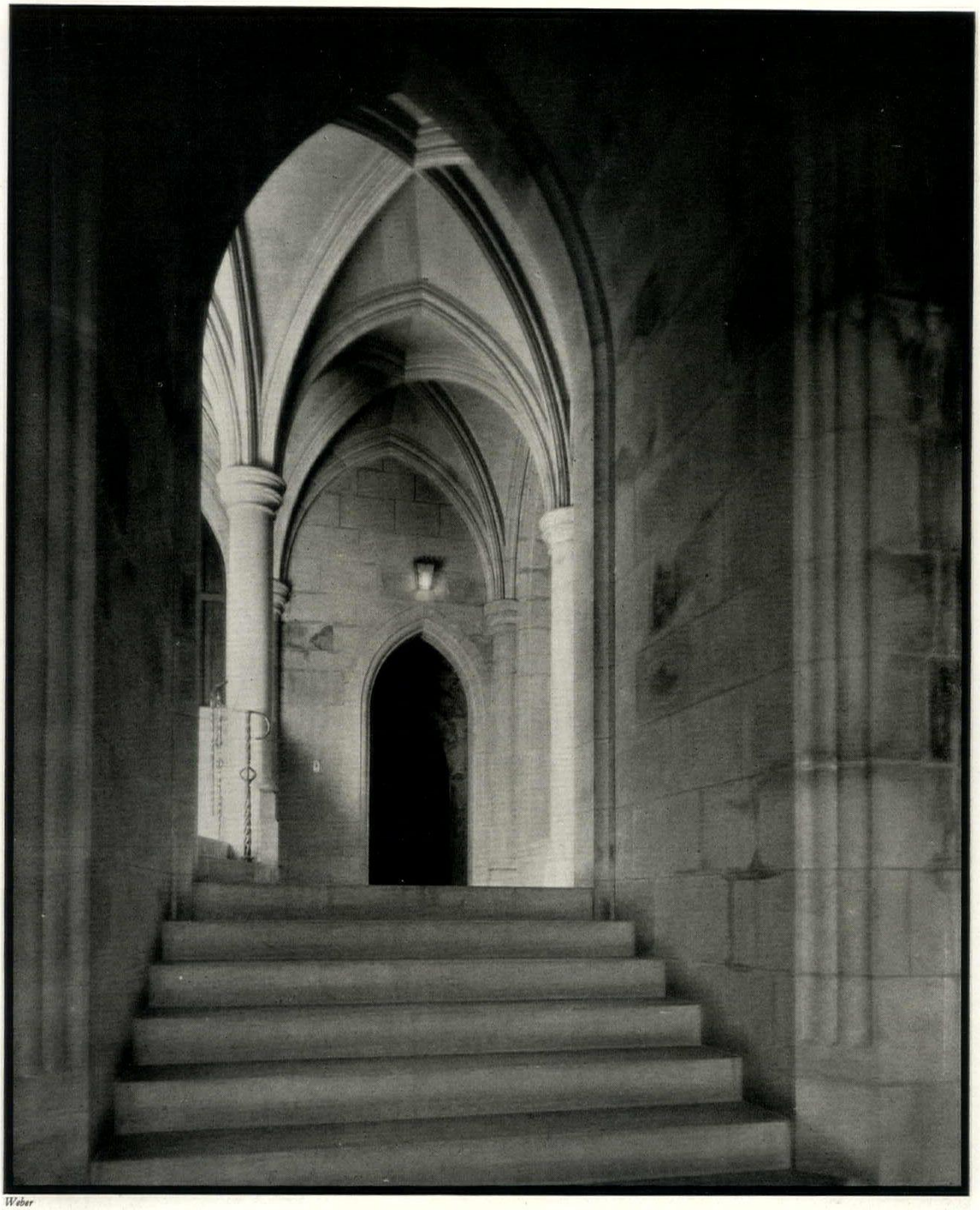
THE PHIPPS GARDEN APARTMENTS

LONG ISLAND CITY, LONG ISLAND, N. Y.

CLARENCE S. STEIN, ARCHITECT


Lubschez

THE PHIPPS GARDEN APARTMENTS
LONG ISLAND CITY, LONG ISLAND, N. Y.
CLARENCE S. STEIN, ARCHITECT

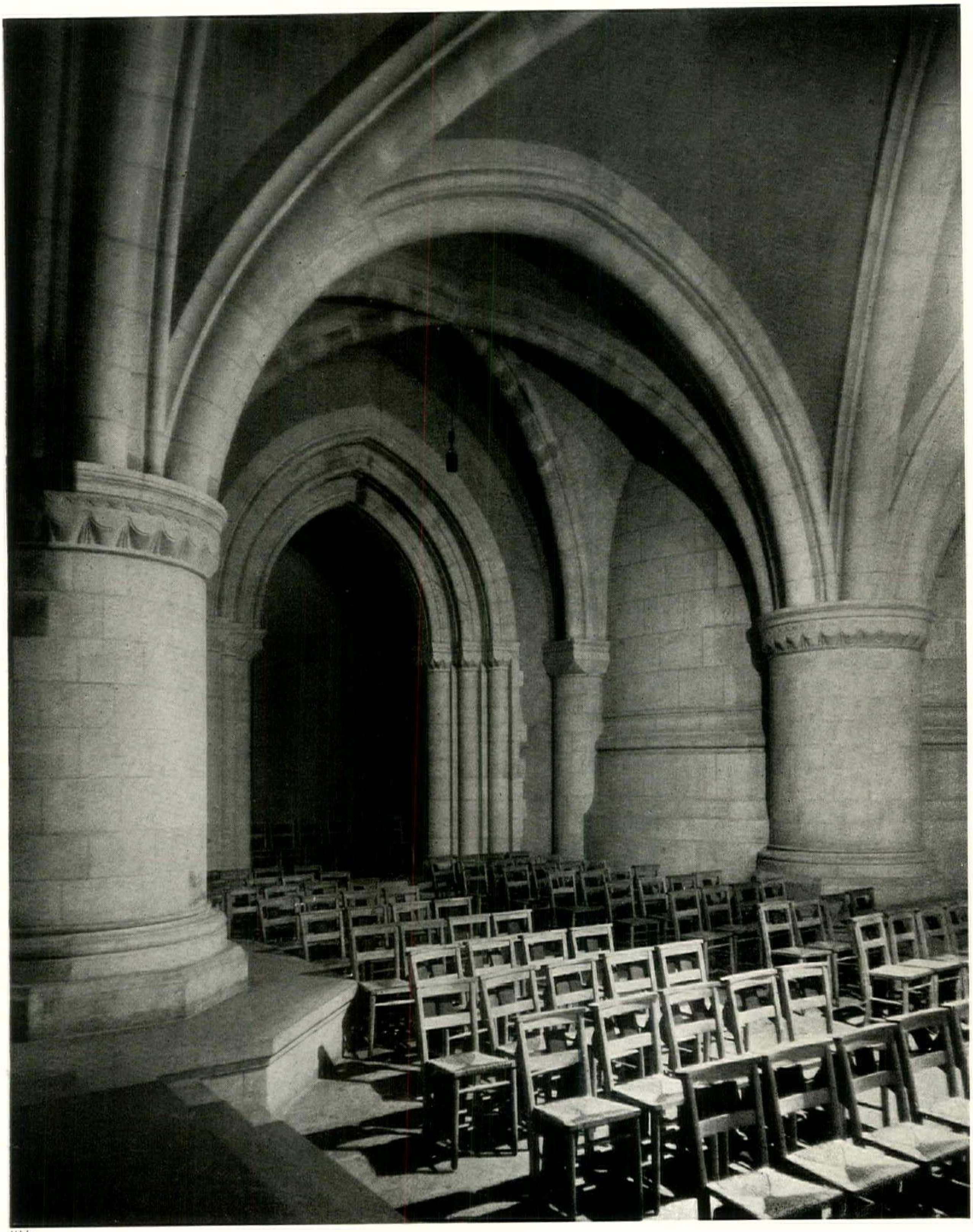


Weber

THE STAIRWAY FROM THE CRYPT TO THE NORTH TRANSEPT

THE WASHINGTON CATHEDRAL

WASHINGTON, D. C. FROHMAN, ROBB & LITTLE, ARCHITECTS



Weber

CHAPEL OF ST. JOSEPH OF ARIMATHEA

THE WASHINGTON CATHEDRAL

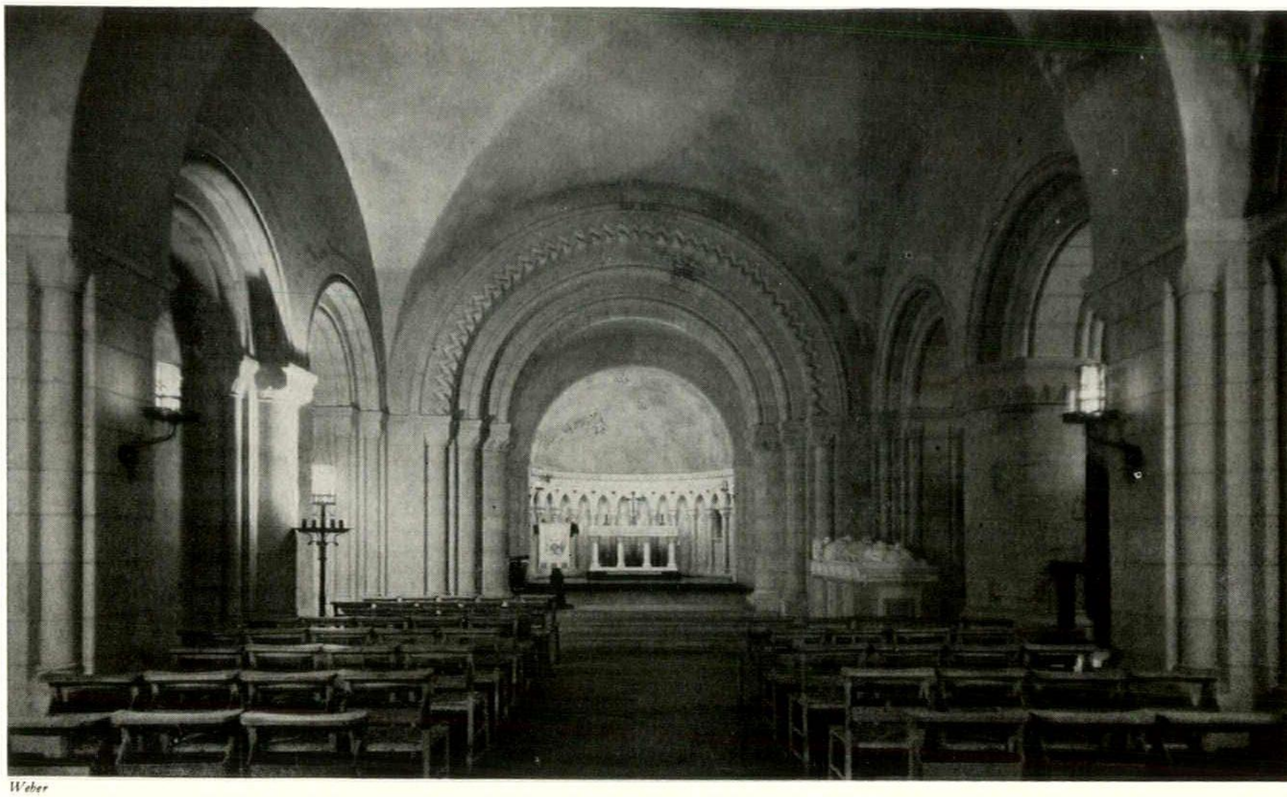
FROHMAN, ROBB & LITTLE, ARCHITECTS

Weber

THE ALTAR, CHAPEL OF ST. JOSEPH OF ARIMATHEA

THE WASHINGTON CATHEDRAL

FROHMAN, ROBB & LITTLE, ARCHITECTS



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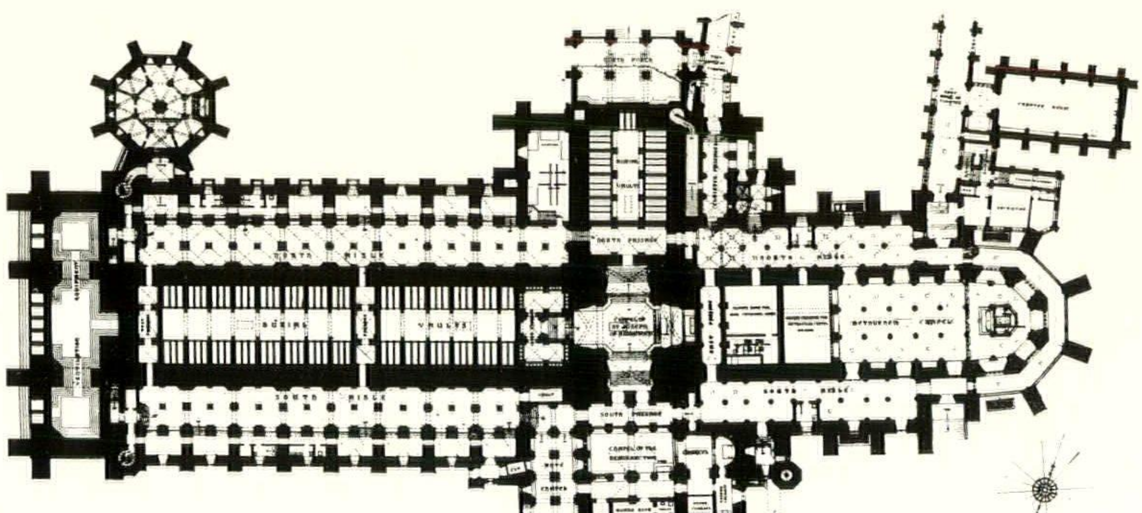
LOOKING EAST, CHAPEL OF THE RESURRECTION



THE WASHINGTON CATHEDRAL

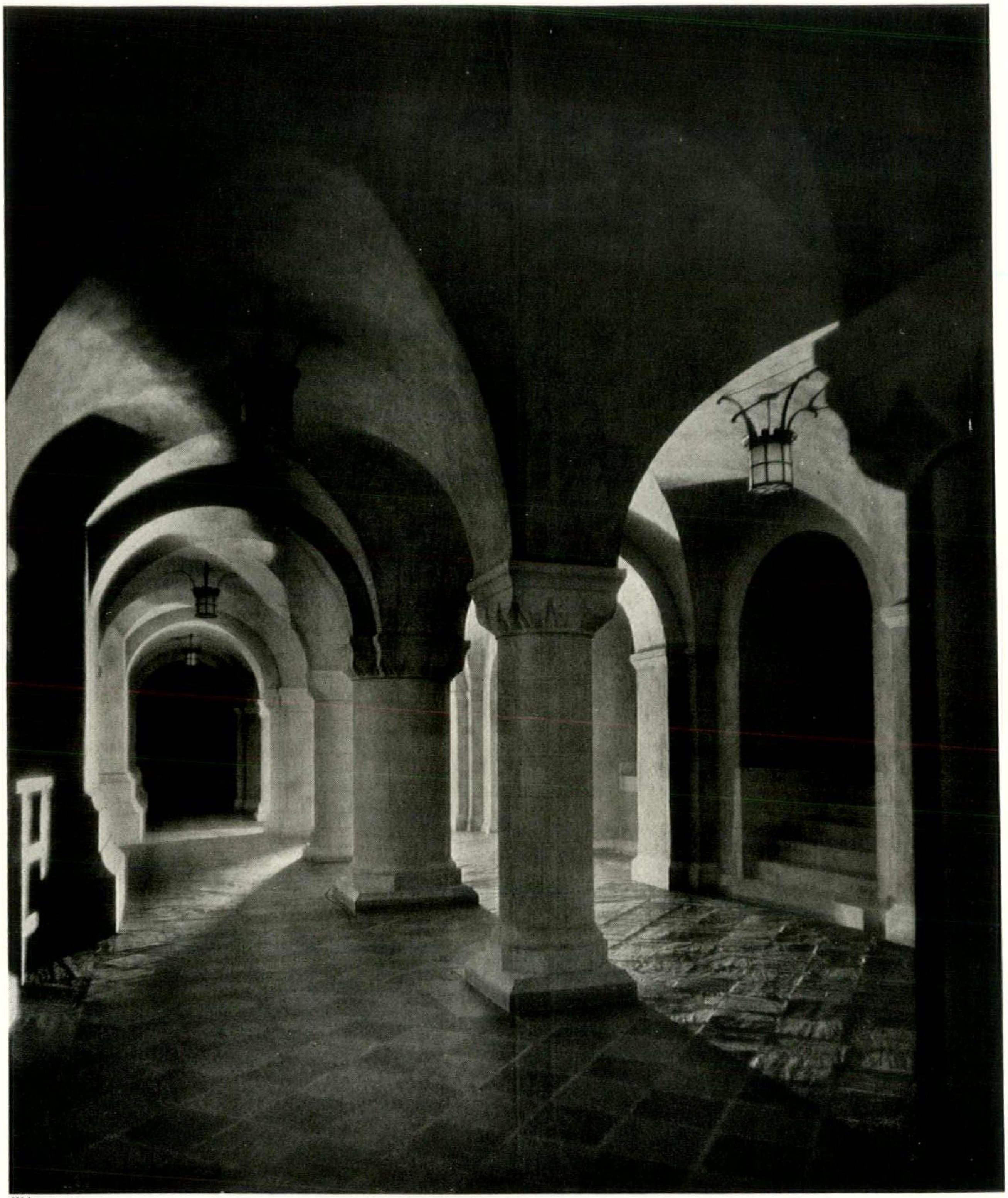
FROHMAN, ROBB & LITTLE, ARCHITECTS

Weber

LOOKING WEST, CHAPEL OF THE RESURRECTION

THE WASHINGTON CATHEDRAL

FROHMAN, ROBB & LITTLE, ARCHITECTS



Weber

SOUTH AISLE OF CRYPT UNDER THE NAVE

THE WASHINGTON CATHEDRAL

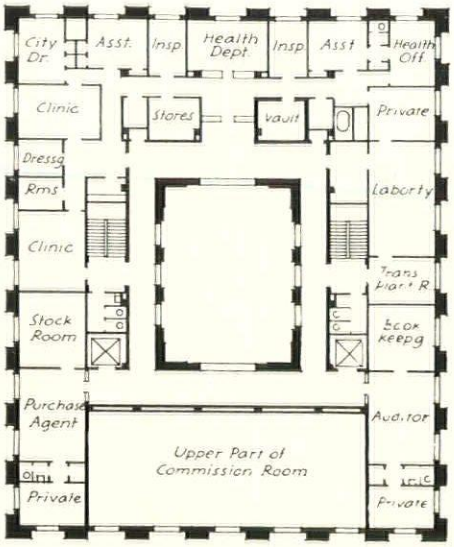
FROHMAN, ROBB & LITTLE, ARCHITECTS

Hedrich-Blessing

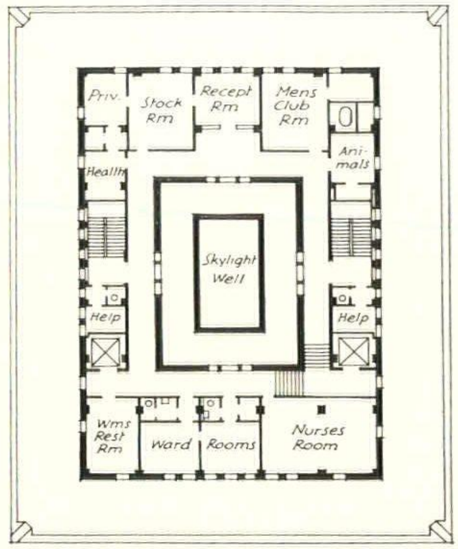
IN PLAN and general character the building is suggestive of Classic Grecian form, yet the ornament and other details are essentially modern in interpretation. The structure is of reinforced concrete with an exterior facing of limestone. The carved panels of the frieze are symbolic of historic events in the city. The window frames and metal spandrels are of dark, deplated cast aluminum with polished highlights. The building contains 860,280 cubic feet and was completed for $524,000, or approximately 62 cents per cubic foot. This cost includes architectural fees, interior finish, and all furniture and fixtures

THE CITY HALL, KALAMAZOO, MICHIGAN

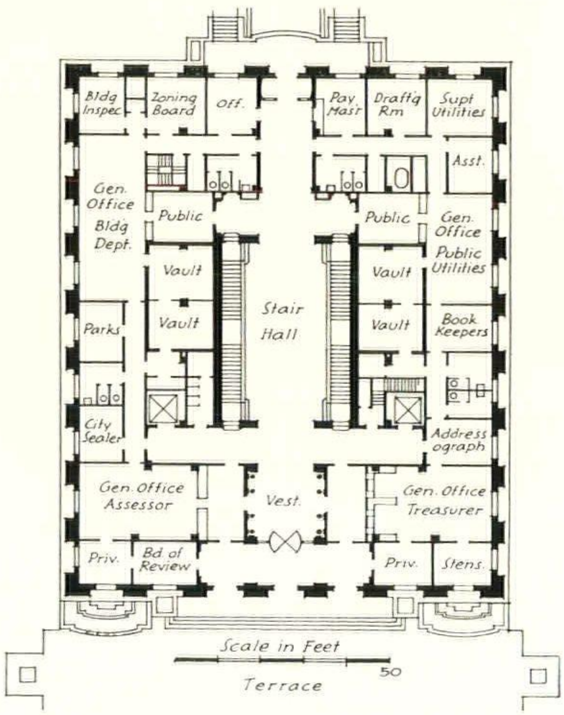
WEARY & ALFORD CO., ARCHITECTS



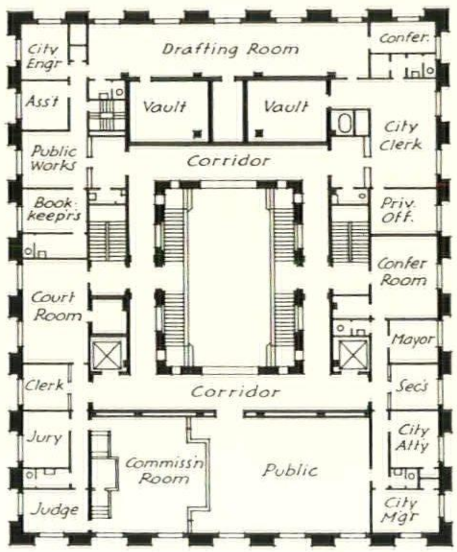
THIRD FLOOR PLAN



FOURTH FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

CITY HALL, KALAMAZOO, MICHIGAN

WEARY & ALFORD CO., ARCHITECTS

Hedrich-Blessing

CITY HALL, KALAMAZOO, MICHIGAN

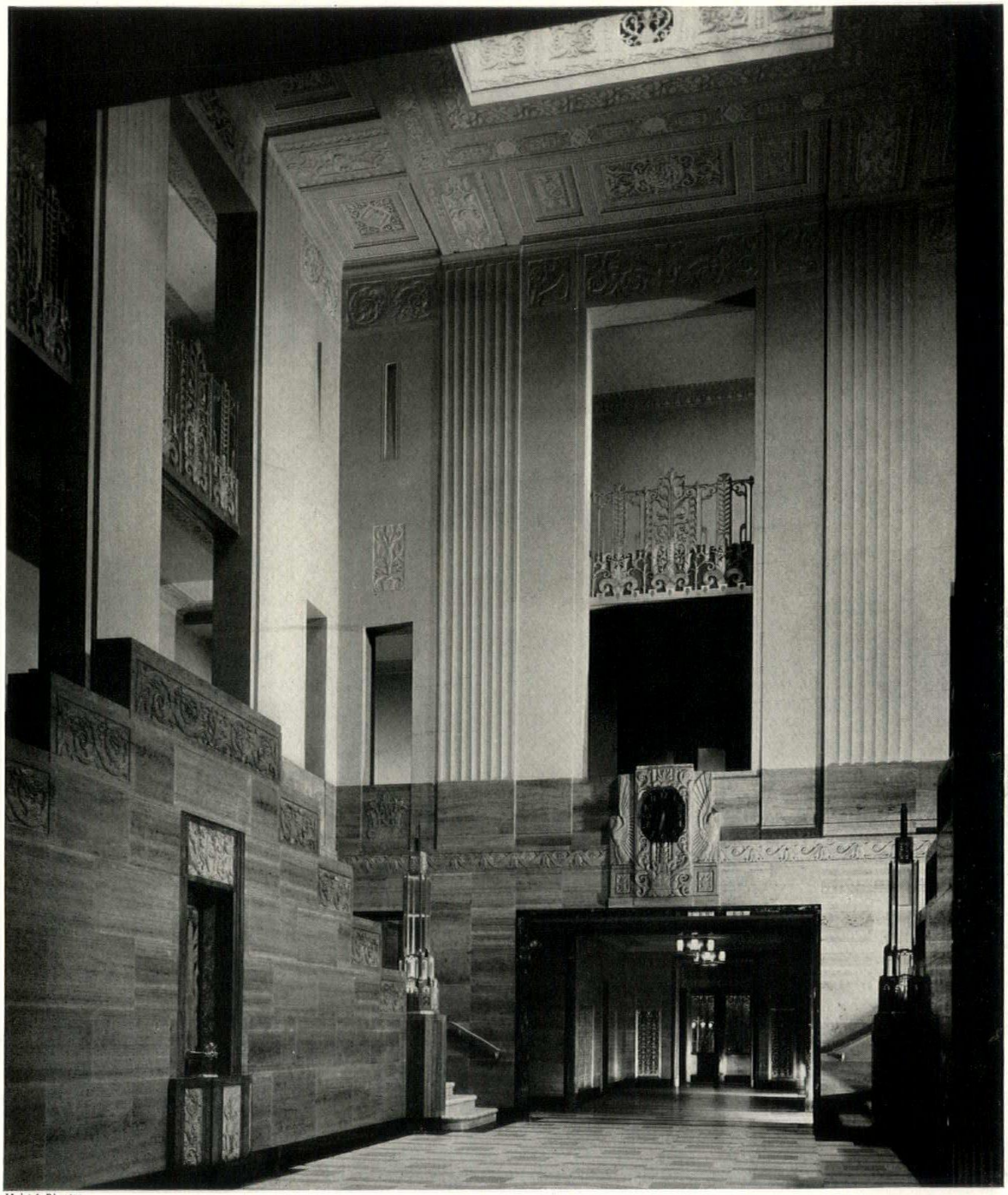
WEARY & ALFORD CO., ARCHITECTS

Hedrich-Blessing

ON THE opposite page is a general view of the lobby; above is the court room. The lobby has a floor patterned in three shades of travertine. The marble walls are of polished Sienna travertine with black and gold marble base and trim. The plaster surfaces above as well as the ornament in the ceiling are painted in a light buff to harmonize with the yellow of the travertine walls. Stair rails, grilles, etc., are of a dull finish aluminum. In the court room the woodwork is of quarter-sawed white oak, selected for its resemblance to English oak. The walls and ceiling are of plaster, painted a parchment color and ornamented in patterns of red, green, blue and gold. The hangings are dark red brocade and the lighting fixtures are a dull finish cast aluminum with ivory glass panels

CITY HALL, KALAMAZOO, MICHIGAN

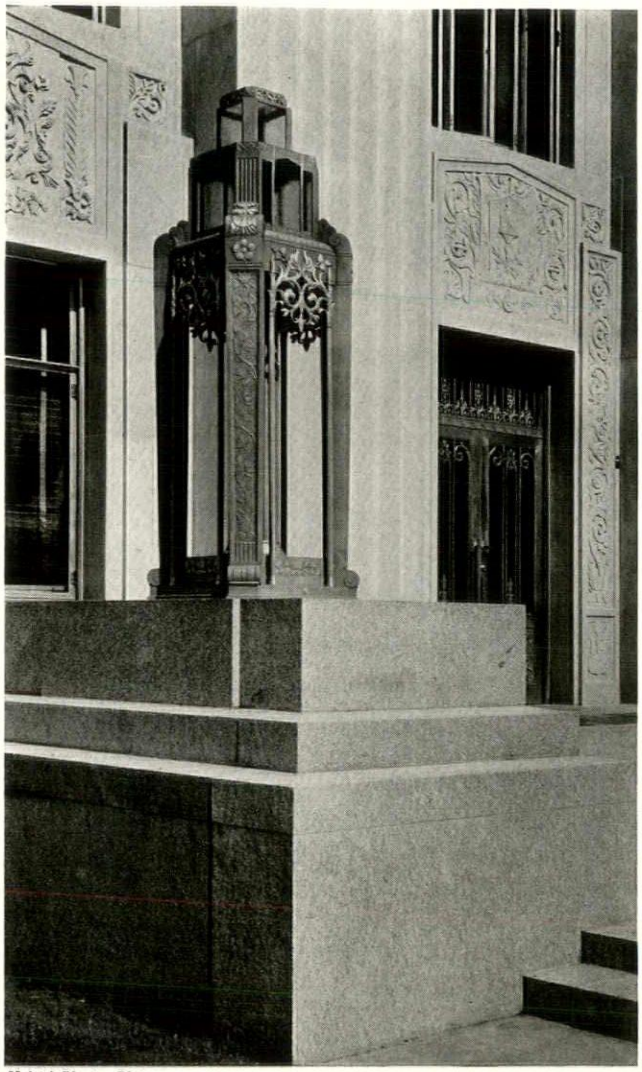
WEARY & ALFORD CO., ARCHITECTS



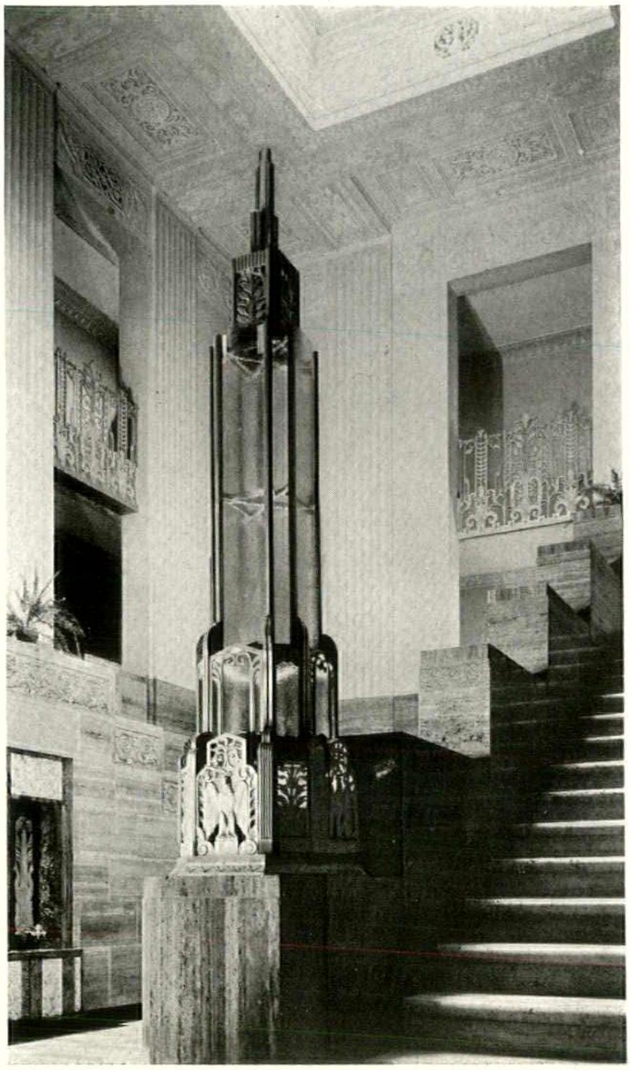
Hedrich-Blessing

CITY HALL, KALAMAZOO, MICHIGAN

WEARY & ALFORD CO., ARCHITECTS



Hedrich-Blessing Photos

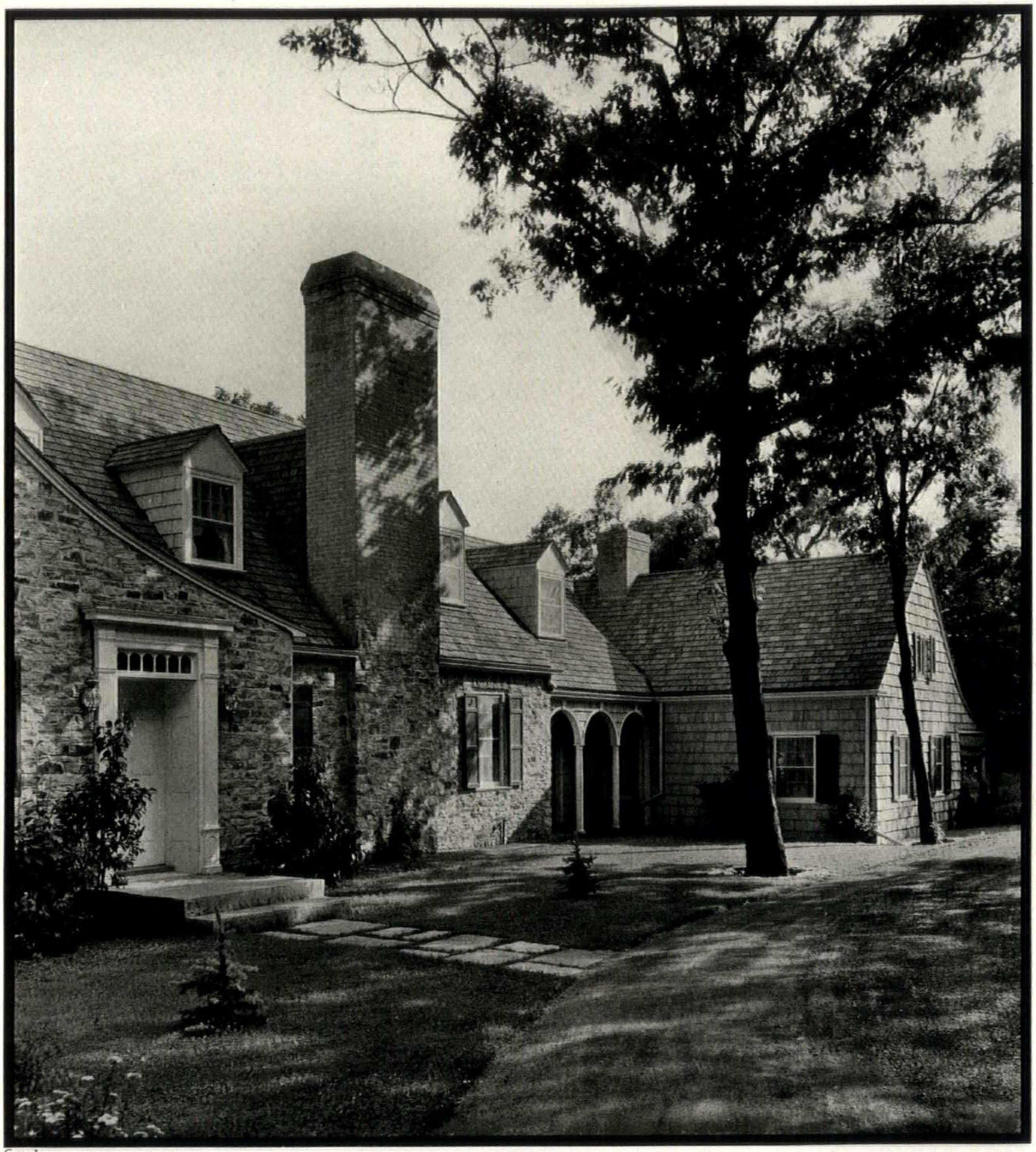


A DETAIL of the exterior lighting fixture with a view of the main entrance to the building in the background. The base upon which the fixture rests is part of a wide terrace and is built of granite. The fixture itself which has been designed to correspond within the limits of its purpose and material with the character established in the stone carving is of aluminum. The aluminum is cast and has a dull, half polished finish

A DETAIL of the stair lighting fixture in the main lobby. In material and finish it is similar to the fixtures on the exterior of the building, but its form has been changed to conform to its location and to harmonize with the more delicate decorative treatment of the interior. The two illustrations indicate the consistency in general treatment and type of decoration which exists between the exterior of the building and its interior

CITY HALL, KALAMAZOO, MICHIGAN

WEARY & ALFORD CO., ARCHITECTS



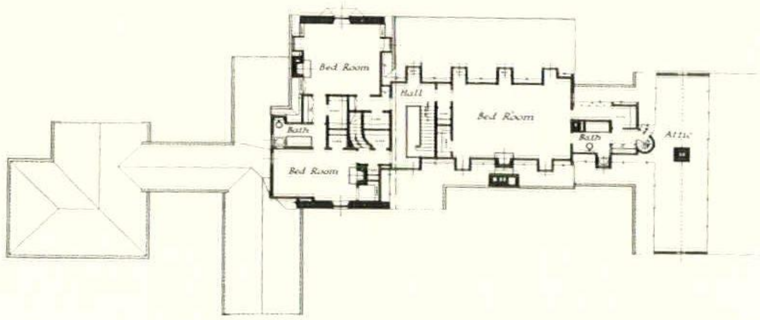
Gottscho

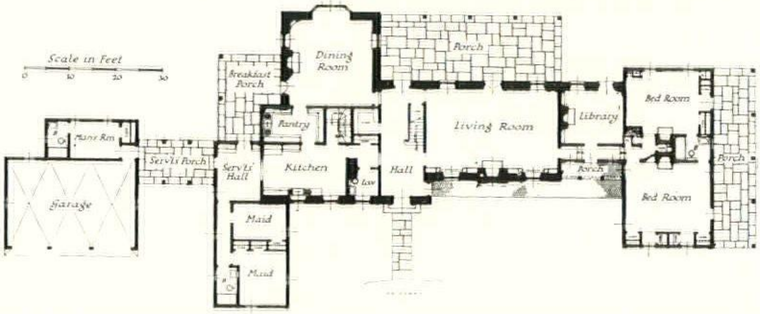
A SUMMER RESIDENCE IN CANADA

HOUSE OF MR. & MRS. D. M. SPAIDAL
GANANOQUE, ONTARIO, CANADA
ELECTUS D. LITCHFIELD, ARCHITECT


Gottscho

THE house was designed as a summer home and is situated on a rocky, wood crowned bluff on the Canadian shore of the St. Lawrence River. Every advantage has been taken of the location and the main living rooms face toward the south and overlook the valley. The house is particularly well planned from this standpoint and the large living porches and the fireplaces add much to its comfort and livability. The house contains 89,623 cu. ft. and cost approximately 62 cents per cu. ft. The main portion is built of brick walls, faced with a rust colored local stone. The remainder is of the usual frame construction covered with gray-stained, hand-split shingles. The roof is covered with asbestos shingles, the trim is painted white pine, and the shutters are painted a soft blue green. Both walls and roof are insulated, and the house is heated by a hot air, forced blast system





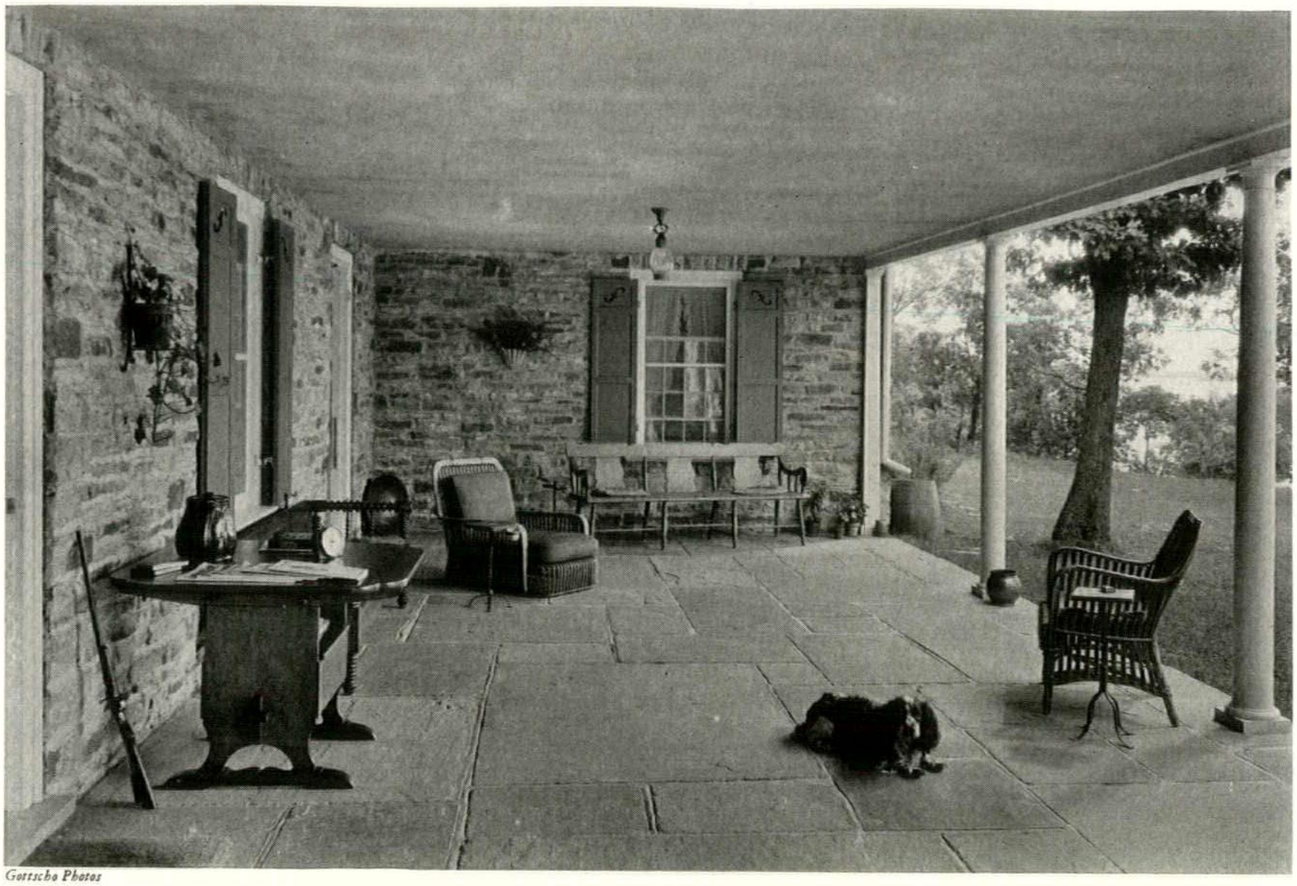
HOUSE OF MR. & MRS. D. M. SPAIDAL

GANANOQUE, ONTARIO, CANADA

ELECTUS D. LITCHFIELD, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. D. M. SPAIDAL
GANANOQUE, ONTARIO, CANADA
ELECTUS D. LITCHFIELD, ARCHITECT



Gottscho Photos

ABOVE is a view of a living porch, looking toward the dining room wing. Below is a view of the dining room with the entrance to the breakfast porch at the extreme left. The mantel and wainscot are painted sepia, the walls are covered with a scenic paper containing the same sepia tone, glazed with blue and the trim, including the corner cupboard and the doors, is a soft, gray blue. The curtains are light tan and the rug contains sepia, blue and rose, blending well with the rest of the room. On the opposite page is a view of the stair hall which in every detail of color and furnishing holds to the early American tradition

HOUSE OF MR. & MRS. D. M. SPAIDAL

GANANOQUE, ONTARIO, CANADA

ELECTUS D. LITCHFIELD, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. D. M. SPAIDAL
GANANOQUE, ONTARIO, CANADA
ELECTUS D. LITCHFIELD, ARCHITECT

Gottscho Photos

ABOVE is a view of the north side of the living room and below is a detail of the fireplace side in one of the guest rooms. Both are finished as far as colors and materials are concerned in the Colonial tradition. The paneling is painted a light cream color and the walls are papered. In both rooms note the original treatment of the mantels and the paneling which surrounds it

HOUSE OF MR. & MRS. D. M. SPAIDAL
GANANOQUE, ONTARIO, CANADA
ELECTUS D. LITCHFIELD, ARCHITECT

THE EDITOR'S FORUM

SHALL IT BE HOUSING?

TIMES of relative inactivity may have few compensations but one of them is certainly that there is time both to take stock of the present situation and to plan ahead. We have the opportunity, which has been lacking these past ten years, to determine building needs and to plot the direction of our future activity. The search for the type of building for which there seems to be the greatest need has led in most instances to the conclusion that it is the home. The most obsolete and inadequate class of building today is the housing of the majority of the population, whether small house or tenement.

Architects can no longer devote their attention entirely to the aspects of housing design and plan, nor can they consider just the social desirability of adequate housing and the reclamation of blighted areas. The economic problem is the crux of the whole matter. Until housing can be built and financed at low enough cost to make it available to the tenant for whom it is designed, no housing will be erected. But this problem has been solved in notable instances and much progress has been made in developing new solutions.

Housing in all its aspects offers a very real opportunity for architects, both for the individual architect and for the profession. We believe it is also the outstanding opportunity for architects to gain recognition by rendering a social service in taking the initiative in the movement to provide better housing.

JUST what is to be done and how can it be accomplished? What can architects do in their own city? If the objective of architects is to produce "better buildings to fulfill real needs, scientifically determined," the first task is one of survey and investigation to find out what buildings are actually needed. Each organization of architects can undertake (for their own sakes as well as for the public good) the investigation of housing needs in their locality. To this end the cooperation of social welfare agencies, of planning boards, housing commissions, and of realtors, of city officials and departments can be enlisted. The nature of necessary investigation and its procedure will be presented and discussed in the March issue of THE ARCHITECTURAL FORUM, the Housing Reference Number. If these studies were initiated simultaneously throughout the country, the interest of the public, as well as that of the building industry, can be aroused through the public press. The President's Conference on Home Building and Home Ownership and the system for the Home Loan Discount Banks have set the stage for this step on the part of the architectural profession. Reports of what the architects *are doing* for the community are more effective than advertising what they feel competent to do for individual clients.

THE study of the economics and the development of a financing plan must be undertaken at the same time as the investigation of building needs. The establishment of a determining survey under the direction of a committee of architects or of a "building congress" is the first step. Incidentally, it might give work to some unemployed in the profession, even though the investigation might then have to be financed by a foundation, by a public-spirited citizen or by subscription among the most interested parties. This survey would provide one of the most constructive ways for a municipality to give work to unemployed in the disbursement of relief funds, for it would supply much needed information.

The second step is to decide upon ways of fulfilling the needs thus determined. So many factors — social, financial, legal and architectural — enter into the problem at this point that their consideration must be left for the Housing Reference Number. The perfect solution will not be forthcoming at once. A technique and a method of procedure, however, are now well enough established to be used as a basis of action. If any progress is to be made, it devolves on the architectural profession to do its share, as individuals and through organized effort in every locality. Is the American Institute of Architects, with the affiliated societies and associations, ready to undertake this work, to take the active leadership in providing better housing on an adequate large-scale basis? If such a program were formulated and adopted at the spring convention, we would find allied interests in the building industry ready and willing to cooperate in this definite effort toward tangible results!

Kenneth K Stowell

EDITOR

MUSEUM OF THE CITY OF NEW YORK

JOSEPH H. FREEDLANDER, ARCHITECT

McClennons Photo

MUSEUM OF THE CITY OF NEW YORK

JOSEPH H. FREEDLANDER, ARCHITECT

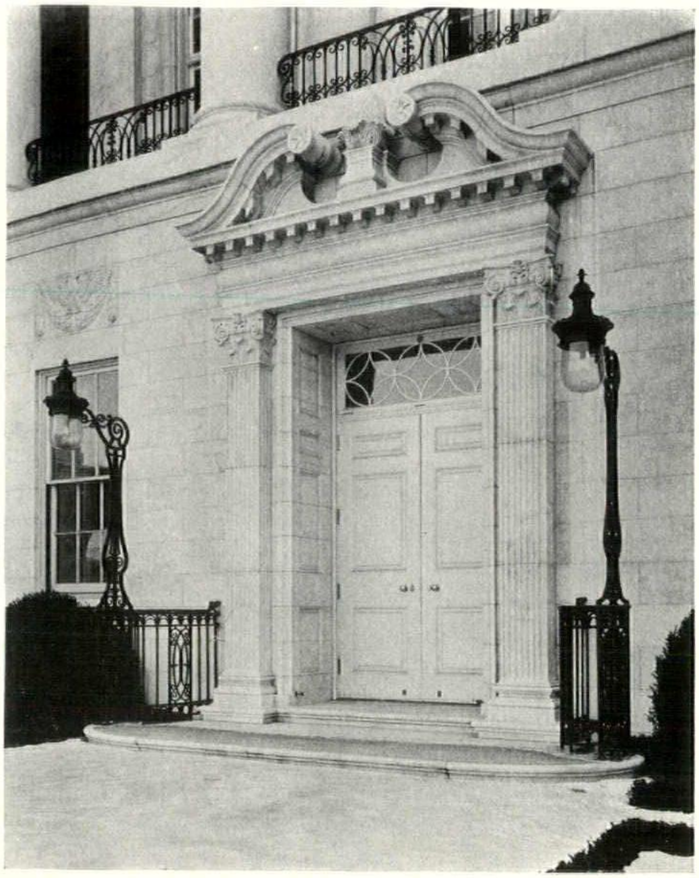
Detail of the staircase which faces the entrance. Above is a view from the park

THE Museum of the City of New York, which was opened to the public during the month of January, is in itself a fitting expression of the purpose which the museum serves. Just as the exhibitions within indicate an appreciation of the wisdom and fortitude of our ancestors, so does the pure Colonial character of the building acknowledge graciously the debt that current architecture owes to Seventeenth and Early Eighteenth Century America. The consistency with which the architect, Joseph H. Freedlander, has followed respected precedent in every exterior and interior detail not only results in good architecture, but it contributes a sympathetic atmosphere to the relics of the past that are housed in the museum. Except in the rotunda, which demands appreciation for itself as an architectural achievement, the interiors are simply background, thus permitting visitors to study undisturbed the models, pictures, documents, and other curios that they came to see.

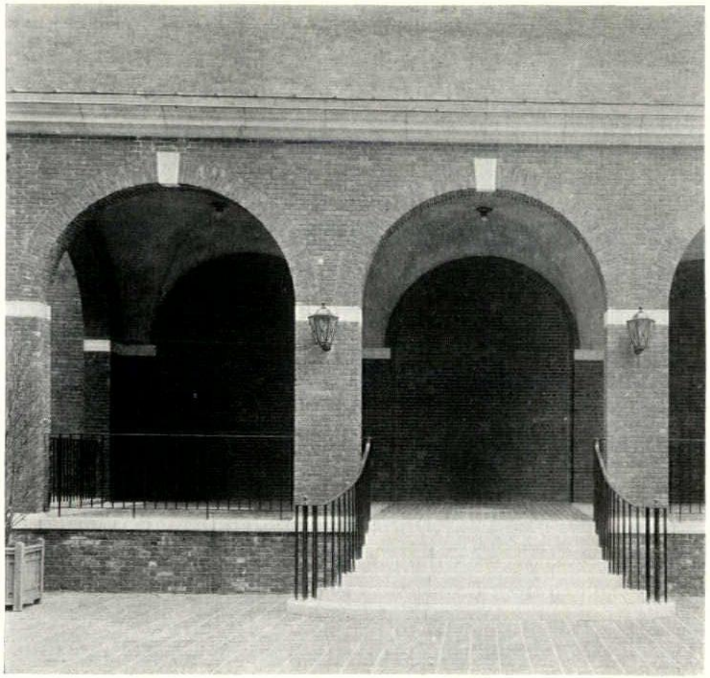
The U-shaped building is particularly well adapted to a museum of this type, since it permits not only a logical division of the exhibitions into chronological groups, but also a maximum number of small rooms for individual subject displays. At present, only the first two floors are given over to exhibitions; it is hoped that, in time, the endowment fund will grow to an extent large enough to devote the upper floors to the same purpose. The wings are subdivided into one large room, and several smaller rooms, in which the displays are grouped, some in chronologic order, and some as to subject. Additional space has been provided for exhibitions in rooms which give off the corridors connecting the two main wings.

One of the contemplated exhibition groups is a history of New York architecture. Models of buildings will be constructed, ranging in period and type from the earliest frame dwelling to the most modern skyscraper. It is hoped that public contributions will be forthcoming for this exhibition as well as for many others which have been financially impossible up to the present time.

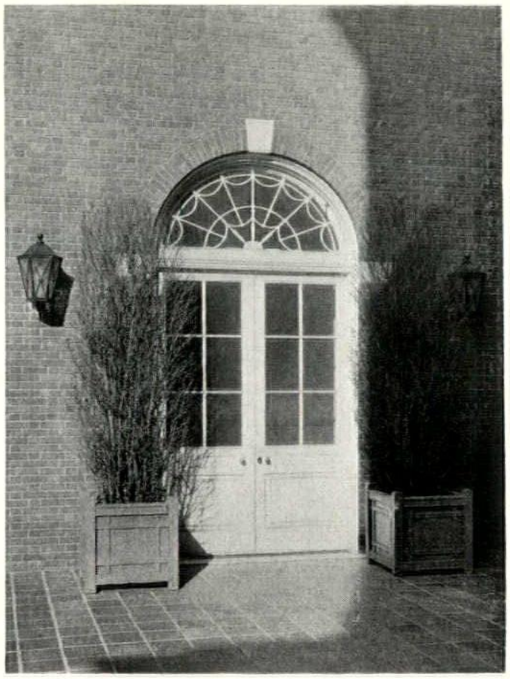
Mr. Freedlander was selected as the architect for the building as the result of a competition held a few years ago. The total cost of the work was approximately $1,300,000, all of which was raised by public subscription. An equal fund is being raised for its maintenance.



Detail of the main entrance, with its rich pediment



One of the covered porches which flank the entrance court



An entrance to the building from the rear

DESIGN POSSIBILITIES IN METAL

BY

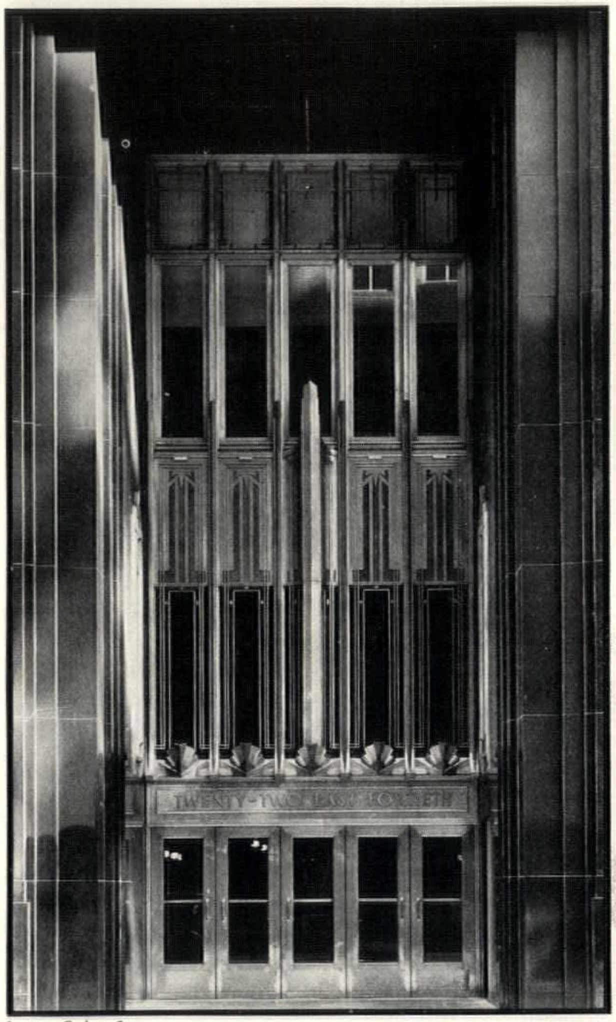
EUGENE CLUTE

ONE of the outstanding features of current metal work is the use of different metals or alloys in combination to an extent not previously attempted. When, for instance, cast bronze details are combined with wrought iron, the delicacy of modeling in figures and other motifs in the bronze is added to the vigor and vibrancy of the forged iron. The clock dial at the School of Industrial Arts, Cranbrook, is an excellent example of the enhancement of the beauty of each by contrast.

Steel, wrought iron and repoussé copper are used together very effectively, sometimes with vitreous enamel in colors for accent. Chrome-nickel steel ornamented in repoussé and combined with cast bronze and vitreous enamel is capable of very rich treatment, particularly when gold plated in parts. Bronze is beginning to be used more often with nickel silver (nickel bronze) and with Monel metal. Aluminum, although sometimes used in combination with bronze, as in the panel in the main entrance hall of the Empire State Building, or with other metals, is most often used alone.

Electrolysis. When metals or alloys of widely different character are combined, some electrolytic action may take place, especially under conditions of exposure, tending to deterioration. When the work is indoors, the effect of such action is usually regarded as negligible. Even in the use of aluminum and bronze in combination in the Empire State Building, where the conditions are highly favorable, serious electrolytic deterioration probably never would result even if the precaution had not been taken of having the metals separately coated with spar varnish before they were combined.

Metals of the same general character can be combined with impunity, whether outdoors or indoors. For instance, bronze, brass, nickel silver, Monel metal and copper are all of one group, and when used together practically no electrolytic action is set up. The same may be said of the group including wrought iron, mild steel and chrome-nickel steel. Copper may be used safely enough with iron and steel, especially when not exposed, and this is true also of bronze.

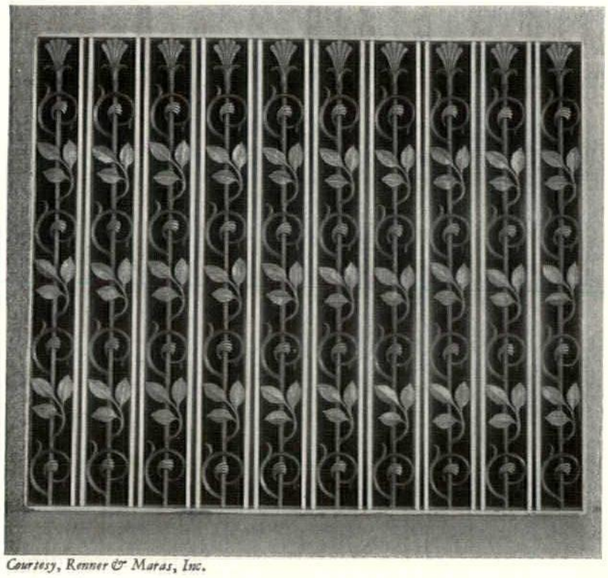


Courtesy, Gorham Co.

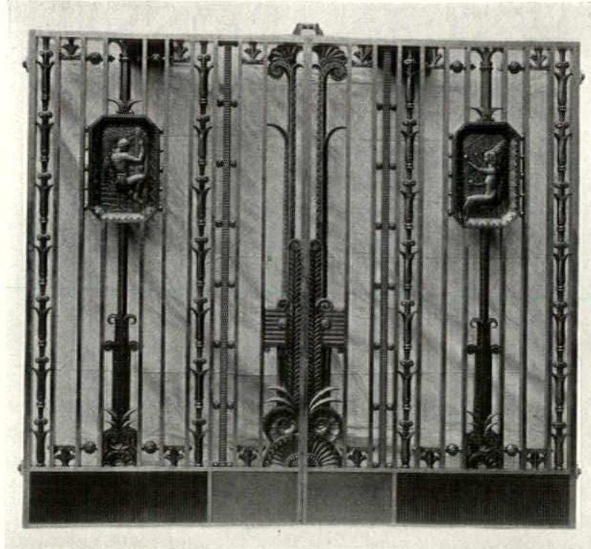
The possibilities of design in metal have been greatly extended by modern methods of fabrication. An aluminum grille designed by Kenneth Franzheim, Architect

Fabrication. Most present-day ornamental metal work — excepting forged iron executed in accordance with the old traditions — is commonly built up of parts joined together in various ways, welds, screws, dowels and rivets being largely used. These parts, even when the work is all in a single metal or alloy, are often formed by different methods. Extruded and cast parts are combined in many cases.

In the better work care is taken either to conceal the means by which the parts are joined or to render them decorative. Often great ingenuity is displayed in fitting together the parts of a piece of metal work in such a manner that few if any screw



Courtesy, Renner & Maras, Inc.



Courtesy, Wm. H. Jackson Co.

Two ornamental metal grilles. The left, designed by James W. O'Connor, architect, is wrought in chrome-nickel steel. The scrolls were welded with an oxyacetylene torch and the leaf forms were forged by hand. The illustration on the right is of a bronze entrance grille in a telephone building at York, Pa., for which F. G. Dempwolf was the architect

heads are visible, and that these few are made inconspicuous. Sometimes, the screw heads are partly countersunk and the portion of the head containing the slot is filed off flush with the surface after the screw has been driven to place. This makes a very neat method of attachment. Most of the connections can be made by means of concealed pins or dowels or by welding. Screw heads are often made decorative by filing a slot at right angles to the one intended to receive the screw driver and by otherwise working the head to shape. Innumerable suggestions for this kind of treatment of screws can be found in any collection of old armor, such as that at the Metropolitan Museum, in New York.

A particularly interesting method has been employed in inlaying the bronze strips in the aluminum rays that spread over the upper part of the panel in the Empire State Building, the bronze being spread by beating it from the back with a tool introduced through holes drilled in the aluminum for this purpose. Sometimes steel reinforcing rods are concealed within hollow members to carry the weight. It is good practice to design grilles, gates, etc., so that structural members carry through to give rigidity to the work.

Welding. Welding has become one of the most important factors in the fabrication of metal work through the introduction of oxyacetylene welding and electric arc welding, which make it possible to do many things that would never have been accomplished by welding at the forge in the old-time manner.

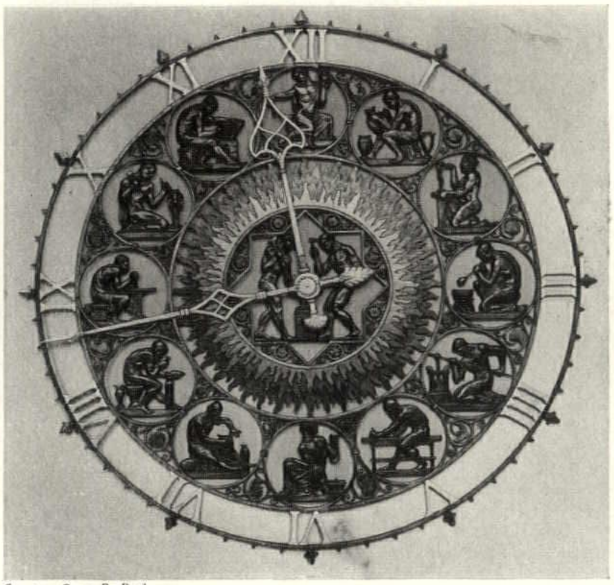
In oxyacetylene welding the flame from a torch that burns acetylene gas in combination with oxygen, producing an intense heat, is directed upon the pieces of metal to be joined and upon the end of a slender rod of the same metal held at the joint. The rod is fused and the pieces of metal are partly fused, uniting firmly. This method is particularly useful in joining together slender members of wrought iron that could not be welded at the forge. Oxyacetylene welding is also very useful in the fabrication of ornamental bronze work.

Spot-welding is the kind of electric welding most used in this field. In this process, the metal parts to be joined are placed between the electrodes of a powerful electric arc and are partly fused, so that they unite. It is particularly useful in joining the parts of the framework of grilles, etc., and in laminated work.

Welding is usually employed for joining parts of the same metal; iron to iron, bronze to bronze, etc. But metals that are of the same group are also welded quite frequently, as bronze to nickel, silver or Monel metal, also iron to steel. Aluminum is welded to aluminum and various aluminum alloys are welded to each other. Though some metals of very dissimilar nature have been welded to each other, at least experimentally, this is seldom if ever done in practice.

The possibility of electrolysis usually makes this impractical. Combinations of metals are commonly put together with rivets, dowels or screws and usually welding is done only between parts of the same metal.

Laminated Work. The modern manufacture of metals in rolled sheets, and the introduction of modern machinery for cutting such sheets in any desired form have led to the building up of ornamental metal work from parts cut from heavy sheet metal applied one upon another—laminated work. This appears in combination with other techniques, as in the sunburst about the central motive of the clock dial for the Cranbrook School. It is also sometimes the method by which the entire work is executed, as in the great grilles, banking screens, and other metal work in the Union Trust Company building at Detroit. In the latter case the material is Monel metal and the parts were cut out on a routing machine with a movable cutting head on the end of an arm which travels over the work in response to the movement of a stylus along the outline of a template, after the manner of a pantograph. These parts were joined by oxyacetylene welding.

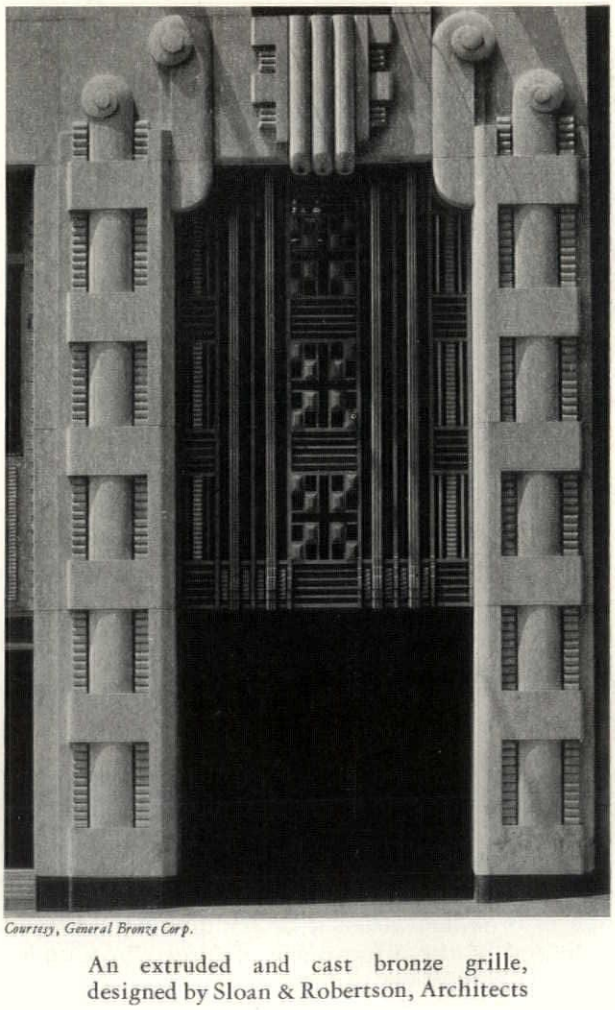


Courtesy, Oscar B. Bach

Cast bronze and wrought iron. The clock dial at the School of Industrial Arts, Bloomfield Hills, Mich., Eliel Saarinen, Architect

Extruded, Rolled and Drawn Sections. A distinctive characteristic of the metal work of our day is the use of straight members, rectangular, tubular, or molded in section, that are extruded, drawn or rolled. These members are combined with more or less cast metal usually. During the last few years designers have shown a recognition of these materials, and a type of design has developed that is based upon the use of straight bars interspersed with cast ornaments — a style, characteristic of these materials. This is a desirable kind of design, since it makes frank and often effective use of machine work, inasmuch as the extrusion, drawing and rolling of metal are all machine processes. It also makes for economy, producing a high degree of enrichment for the expenditure.

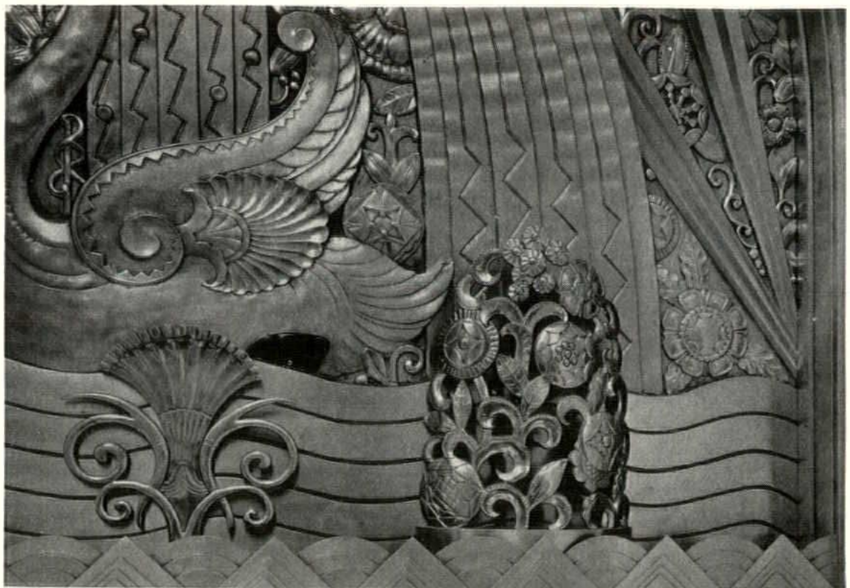
Aluminum and bronze are extruded in a great variety of stock sections and in almost any desired special section and are also drawn. Monel metal is not extruded but is mainly used in rolled bars and sheets. Benedict nickel is not extruded but is rolled and drawn; only the nickel silvers with low nickel content may be extruded. Wrought iron, mild steel and chrome-nickel steel can be had in a variety of rolled sections and sheets.



Courtesy, General Bronze Corp.

An extruded and cast bronze grille, designed by Sloan & Robertson, Architects

Repoussé Work. The ornamentation of sheet metal by beating it from the back to form the design in relief, then tooling it from the front to sharpen the outlines, perfect the modeling and relieve the tension in the metal produced by the beating, thus straightening the work, is an old method which is experiencing a revival. Repoussé work has a spontaneity and liveliness that cast ornament in relief can never have, for it bears the impress of the workman's tools. Also, when executed directly in the metal from the designer's sketch repoussé work is economical for details that



Photos, Courtesy General Bronze Corp.

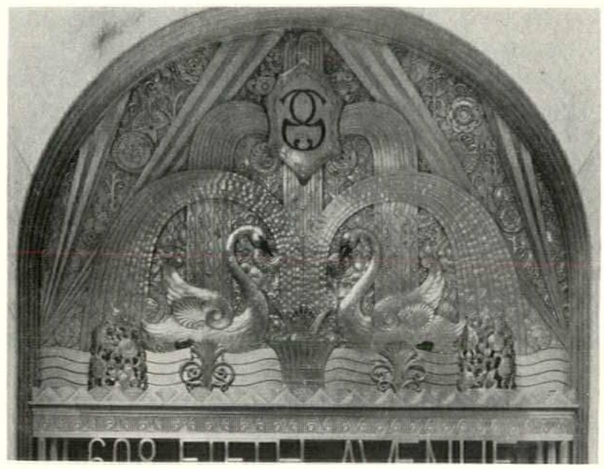
These two illustrations are of an entrance grille designed by E. H. Faile & Co., engineers, and indicate the fineness of detail and the combination of technique to which modern work in metal may be adapted. It includes cast, laminated and extruded metal and has been fabricated by employing both screws and welds

are not to be repeated, such as symbolical and allegorical designs in panels, or medallions inserted in gates, grilles and other works. Wrought iron and copper are commonly worked in repoussé and chrome-nickel steel can be ornamented in this manner. Such technique is rarely employed on the latter due to the toughness of the material.

Cast Metal. Although entire doors are still cast occasionally from bronze in a single piece, castings are now used chiefly in combination with parts formed by some other method. Cast panels are inserted in a frame work of extruded bronze in fabricating doors; cast bronze medallions, balusters and other details are incorporated in works composed mainly of wrought iron, steel, Monel metal or Benedict nickel.

Cast iron, though still used for entire works, is often combined with wrought iron or with forged mild steel.

Forged Iron. The recognition of the nature of materials and of the methods of working is bringing about not only an understanding of modern methods but an appreciation of the old methods of craftsmanship, particularly in wrought iron. Drawing down a bar of hot iron on the anvil, hammering it to form, or twisting it are being recognized as the best ways of developing the character of the material, the ways that naturally grew out of the early hand-craftsmanship. With this appreciation is coming a more serious study of the design possibilities of forged iron, of the proper weight and combination of bars and the right degree of ornamentation, a better understanding of scale and of the appearance of forged iron under different conditions.



Time and Color. Most metals change color more or less in time and most of them are more pleasing when toned down at least by the darkening of the depressed portions of the surface. To give the metal the beauty that comes with time until exposure has done its work, a patina is often produced artificially. In the case of bronze this is usually accomplished by the application of various chemicals in solution which are burned in with a blow torch. Such a patina also serves to promote the even weathering of the bronze as the patina of time replaces the applied finish. In our cities, however, dirt accumulates on the bronze and it is not beautiful, so proper maintenance usually calls for oiling the exposed bronze work, just enough friction being used to clean the surface without disturbing the patina. Within doors, metal work retains its finish for it is usually lacquered and is not exposed to wet or to street dust and smoke.

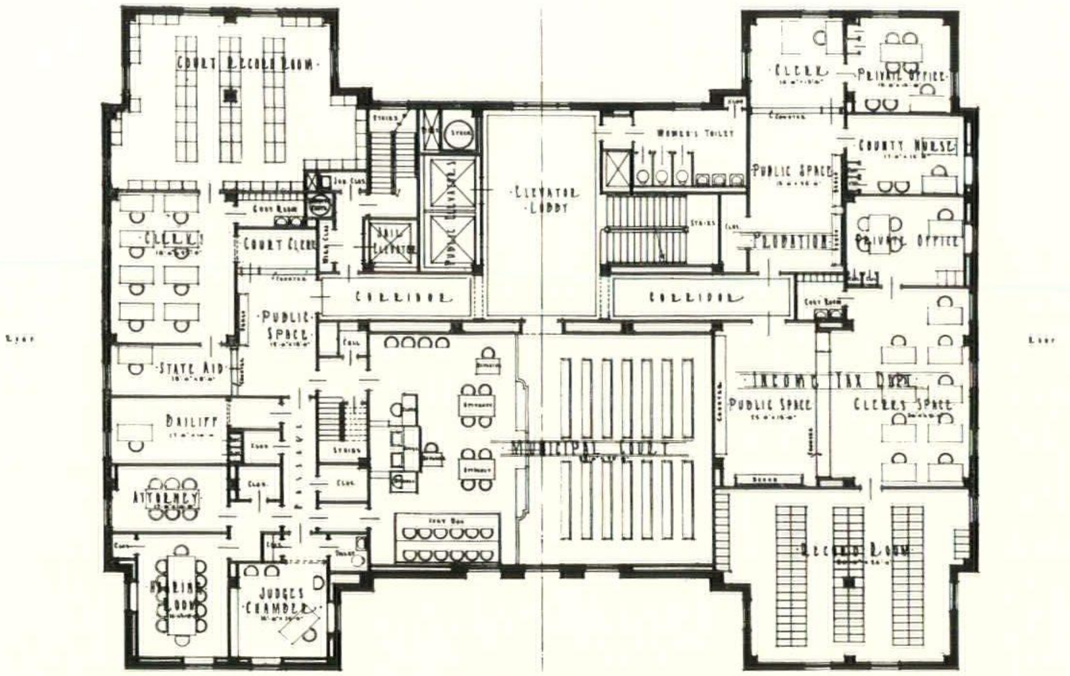
Hedrich-Blessing

THE COURT HOUSE FROM THE SOUTHWEST

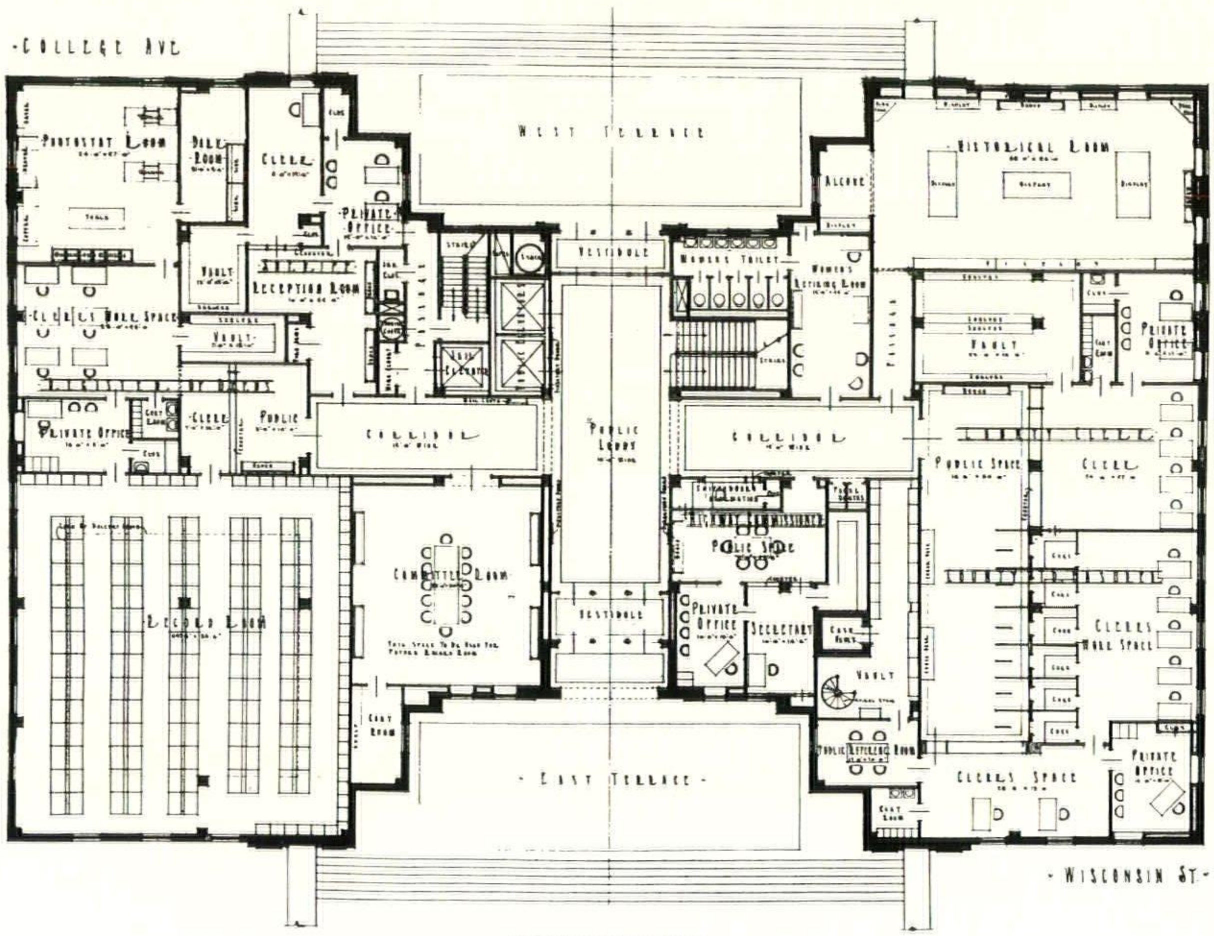
THE RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS



SECOND FLOOR PLAN



FIRST FLOOR PLAN

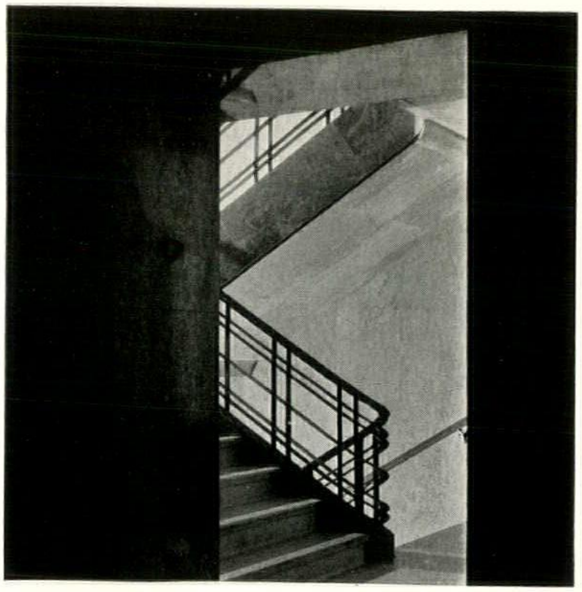
Hedrich-Blessing

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing Photos



ON THIS and the opposite page are three views of the first floor public lobbies. The simplicity of the exterior treatment has been held admirably throughout the interior, and an effort has been made to keep the decorative effect of the spaces as far as practical within the limitations of the materials used. In the case of the lobby, this has been done by the use of contrasting marbles, complemented by a plaster ceiling with a slight amount of ornamentation. The floor is of Champville, set in a patterned tile design. The walls from floor to ceiling are of Laredo Chiaro set above a Belgian Black base, with the intersection of the corridors and with all the door openings accented by an outline of Premier Unique. The drinking fountains in the walls of the side vestibules are Belgian Black marble. The ceiling throughout the lobby space is finished in a dull gold. All metal work, including directory board, mail chute, elevator doors, etc., is statuary bronze which is similar in color to the finish of the ceiling. The elevator doors contain panels symbolic of industry and agriculture. At the left is a view of the main stair hall. The main stairs throughout the building have "Art Marble" treads and risers and a heavy bronze railing. The stair halls are lined entirely with Notre Dame marble

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

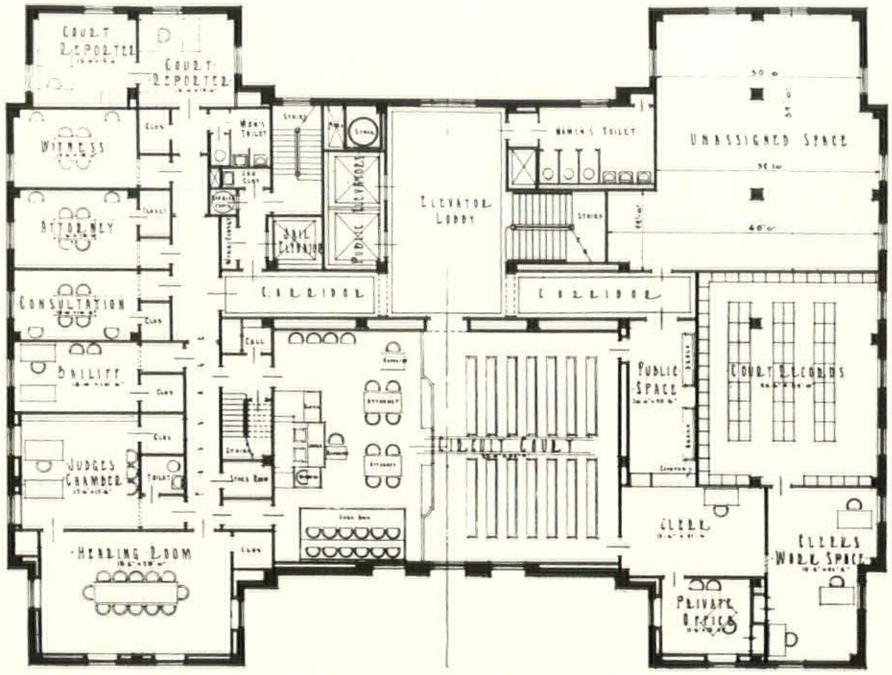
HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

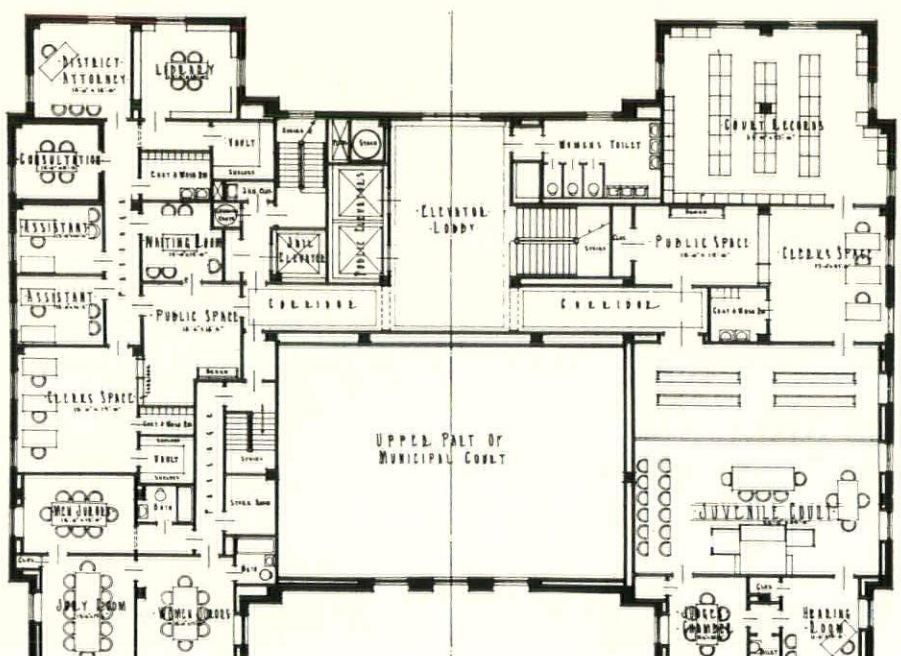
RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

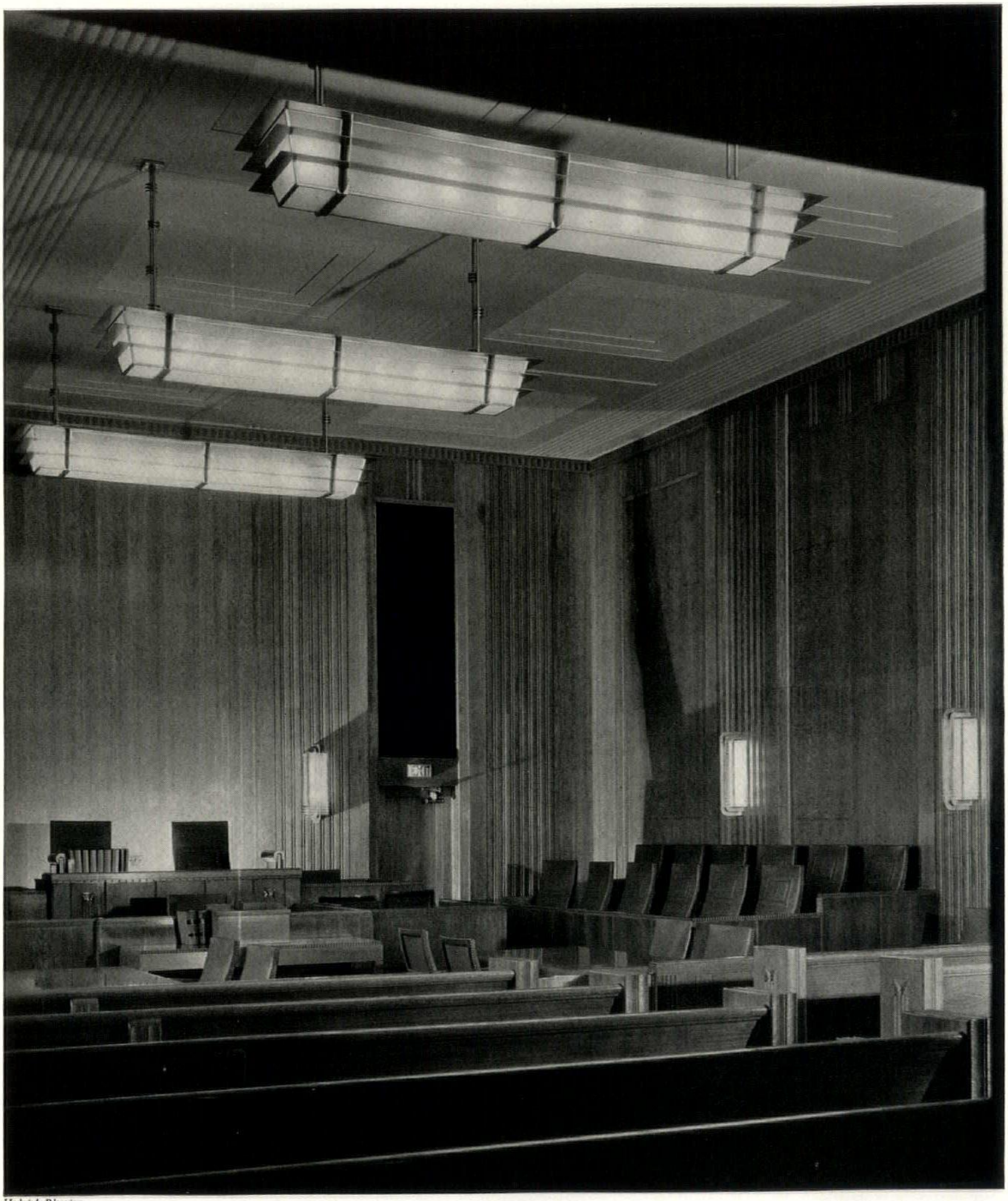


FOURTH FLOOR PLAN



THIRD FLOOR PLAN

See page 190 for plans of the fifth to tenth floors inclusive



Hedrich-Blessing

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

A VIEW of the Probate Court on the sixth floor is shown above. Although it is one story in height it is finished in the same general manner as the Municipal Court shown on the preceding page. The floors of all court rooms are covered with rubber tile and paneled in wood above a Belgian Black marble base. The Municipal and Probate court rooms are paneled in American oak with a natural finish. The ceilings of all the rooms contain Acoustic Celotex. In the Municipal Court the material is arranged in panels, and in the Probate Court shown above the ceiling is treated in a tile pattern. The furniture in all cases is of special design and of a material similar to the wood paneling. On the opposite page is a corner of the Supervisor's Office. The walls are sheathed in a matched paneling of California walnut

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

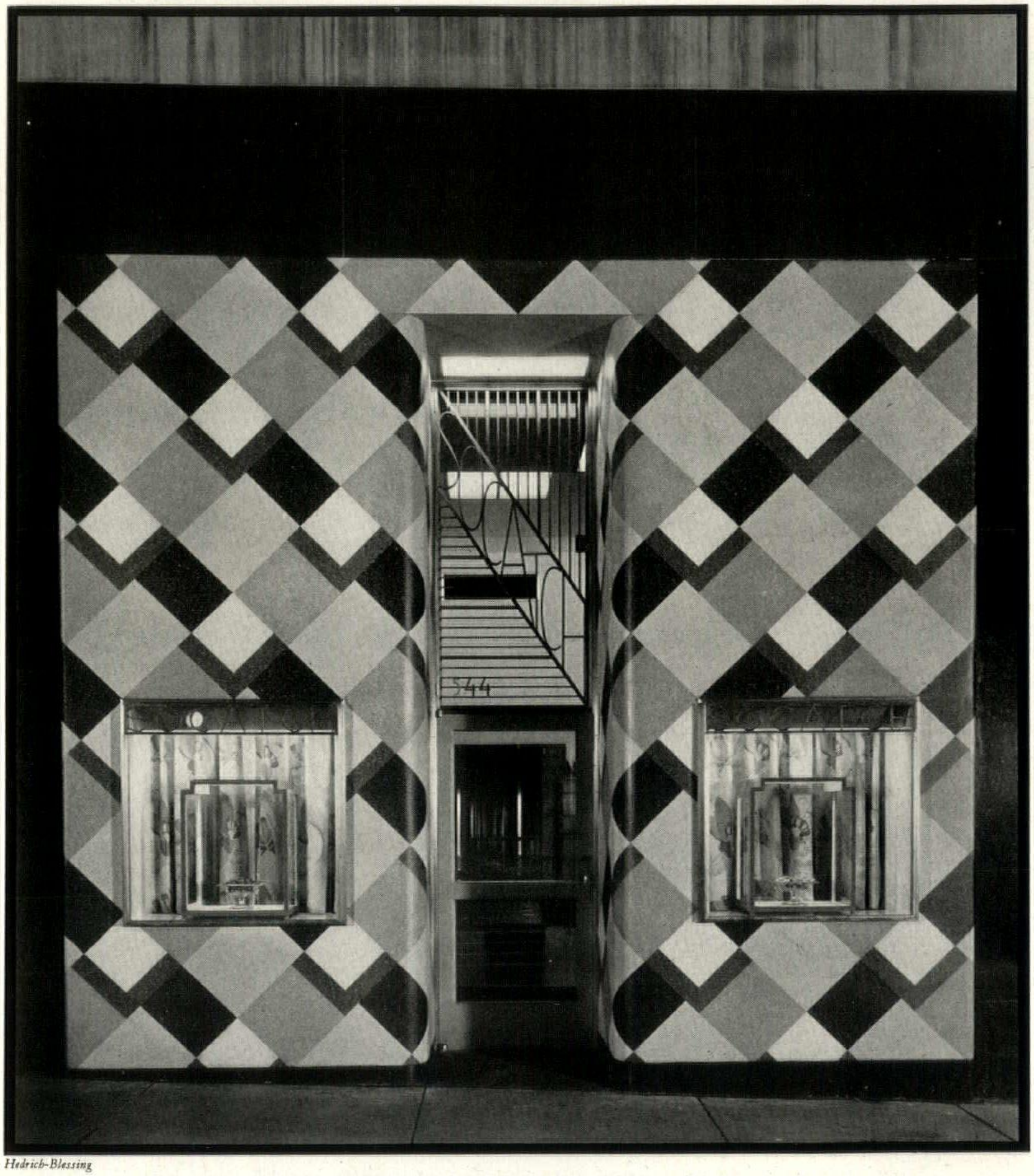
Hedrich-Blessing

RACINE COUNTY COURT HOUSE

RACINE, WISCONSIN

HOLABIRD & ROOT, ARCHITECTS

THE FORUM OF SMALLER BUILDINGS

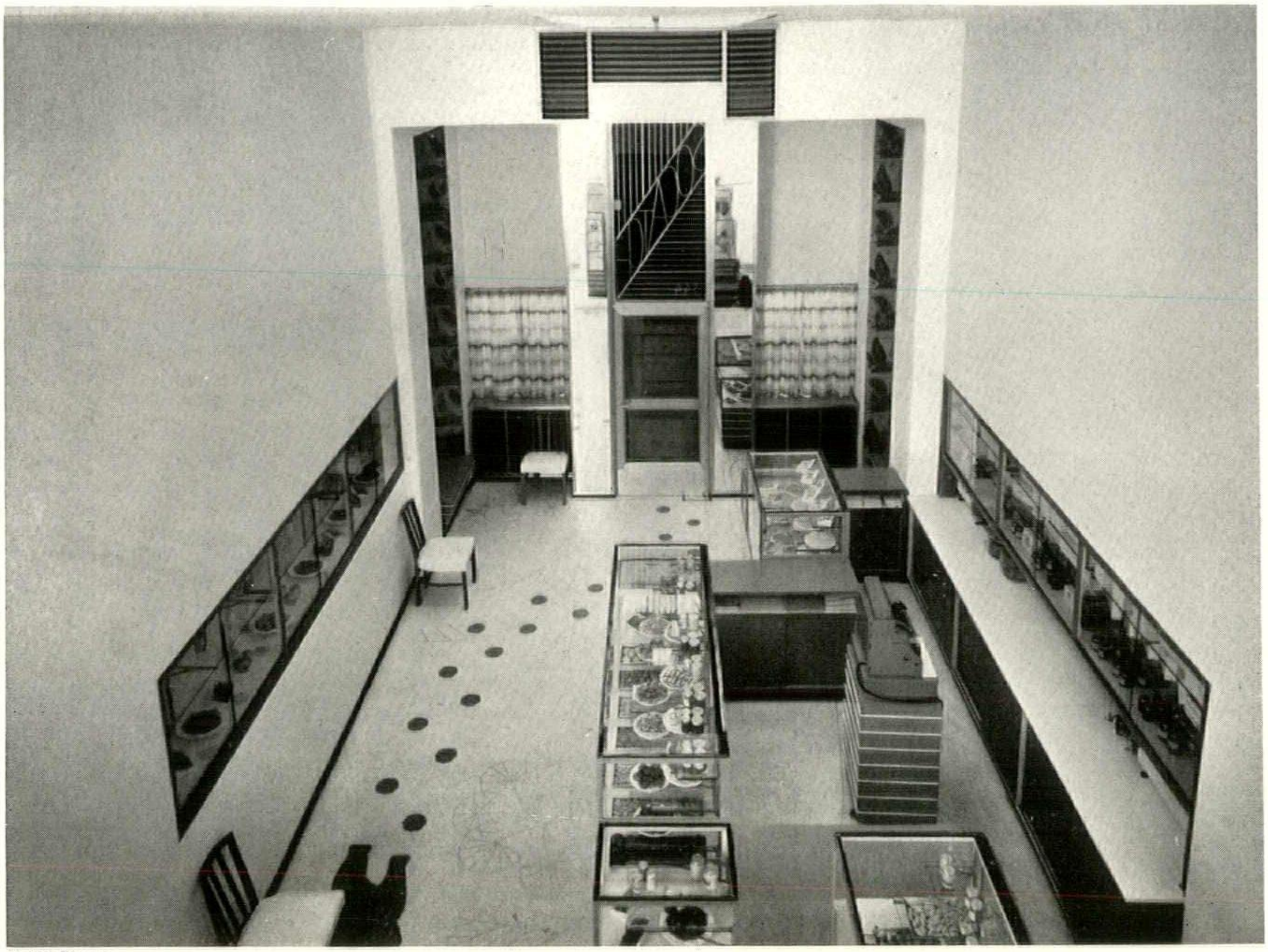


Hedrich-Blessing

SOCATCH BAKERY SHOP, CHICAGO, ILL., HOLABIRD & ROOT, ARCHITECTS

THREE DISTINCTIVE SHOPS

Practical Problems of Smaller Buildings Will Be Found on Page 205



Hedrich-Blessing

THE store is a small retail bakery catering to a discriminating clientele and has been designed to present an attractive and unusual background for the display of the out-of-the-ordinary type of merchandise. A large amount of show window space is undesirable in this type of retail shop and the exterior has been designed to produce an invitation to enter rather than an invitation merely to look at the window displays. The exterior is faced with blocks of "Art Marble" arranged in a pattern of white, buff, violet and brown and set without a separation by metal strips. The window frames, door trim, transom grille and the door itself are all of aluminum with a dull gloss finish. The entire front is framed in black marble. In the interior the general color scheme is white and vermilion. The walls and ceilings are painted an oyster white and the furniture is of wood, finished in a vermilion lacquer. The free standing show cases are striped with white, and white leather upholstery is used on all the chairs. The built-in show cases are painted vermilion also. The floor is laid in a white terrazzo and patterned in an unusual design of metal strips. The elephants and foot prints are outlined with brass strips filled in with red terrazzo. The picture above was taken looking from the ventilation grille at the rear of the store, which is shown on page 164. The interior metal work is light colored bronze

SOCATCH BAKERY SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

SOCATCH BAKERY SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

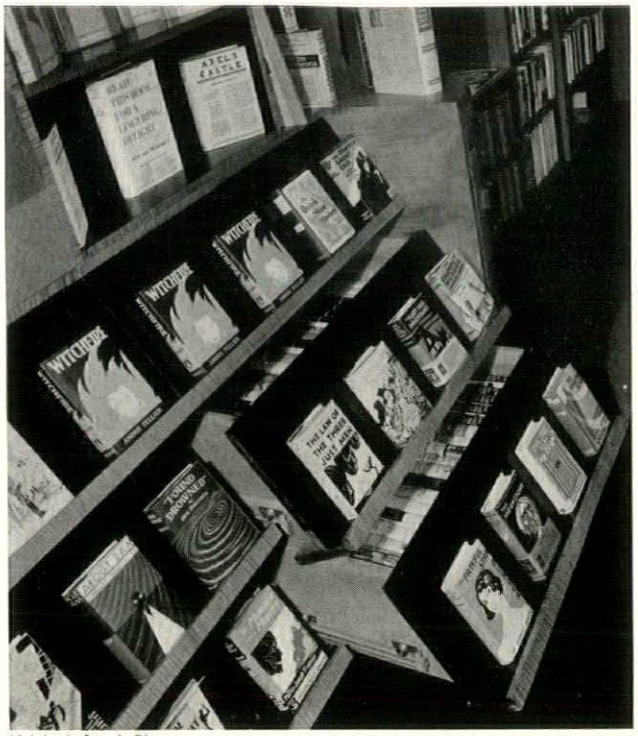
SOCATCH BAKERY SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

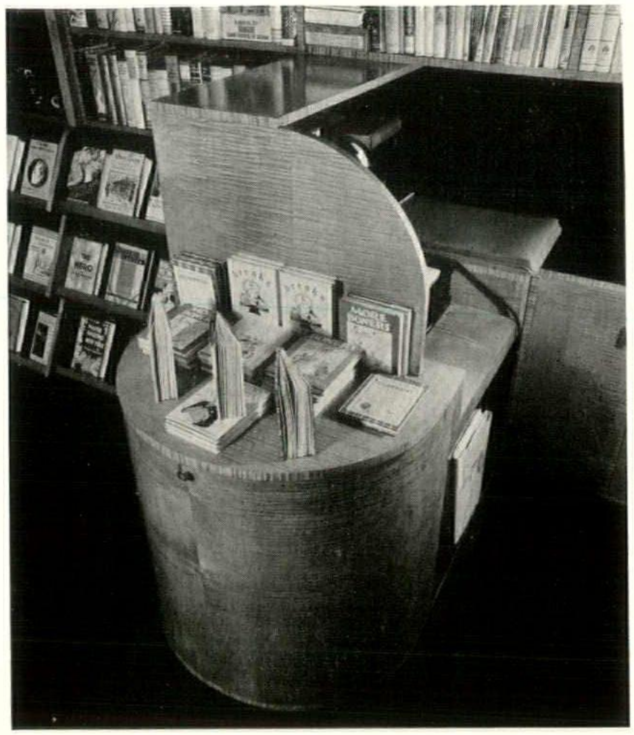
Nyholm & Lincoln

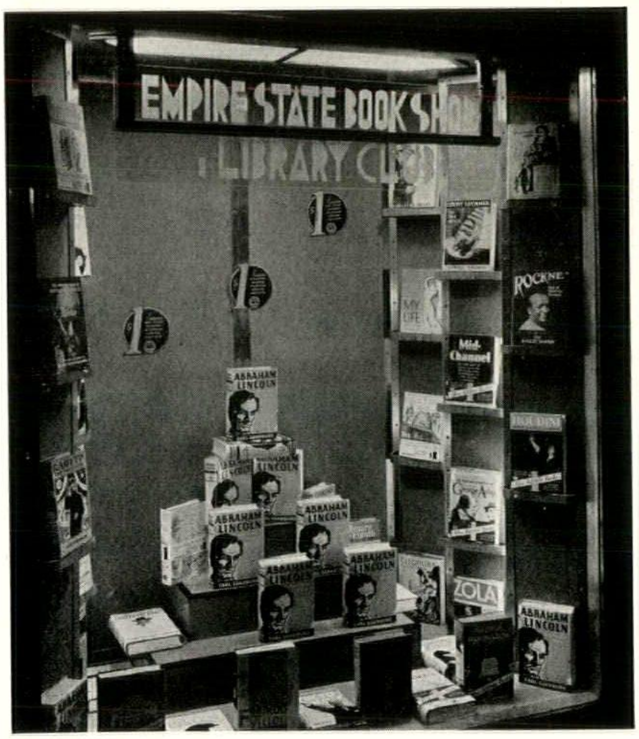
EMPIRE STATE BOOK SHOP, NEW YORK

FELLHEIMER & WAGNER, ARCHITECTS



Nyholm & Lincoln Photos





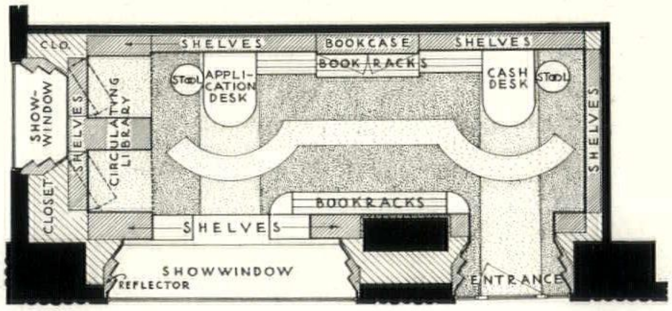
THE shop serves as a book store and circulating library and the design in every particular has been carefully considered in view of the limitations of space and the type of commodity sold. Since the merchandise itself would give color to the room, the background was kept neutral. The floor is of linotile patterned in gray, green and light tan to mark the direction of travel and the location of the fixtures. The walls are covered with cork, and the woodwork is gray harewood with the recessed bases and all inside faces of shelving and book cases of ebonized American walnut. The ceiling is aluminum leaf. Hardware is a dull chromium plate. The lighting has been designed to eliminate all shadows, the main source of illumination being a continuous reflector countersunk into the ceiling so designed as to light up the book shelves, the racks, and other displays. Additional lighting is from three exposed fixtures of metal and prism glass. Books are displayed on adjustable shelving, limited in height to that of easy vision, with racks substituted for the three bottom shelves where space permitted. These racks are constructed like drawer fronts and can be pulled out to serve as storage space. The show windows have cork sides and backs and the small shelves are supported by adjustable chromium plated strips

EMPIRE STATE BOOK SHOP, NEW YORK

FELLHEIMER & WAGNER, ARCHITECTS

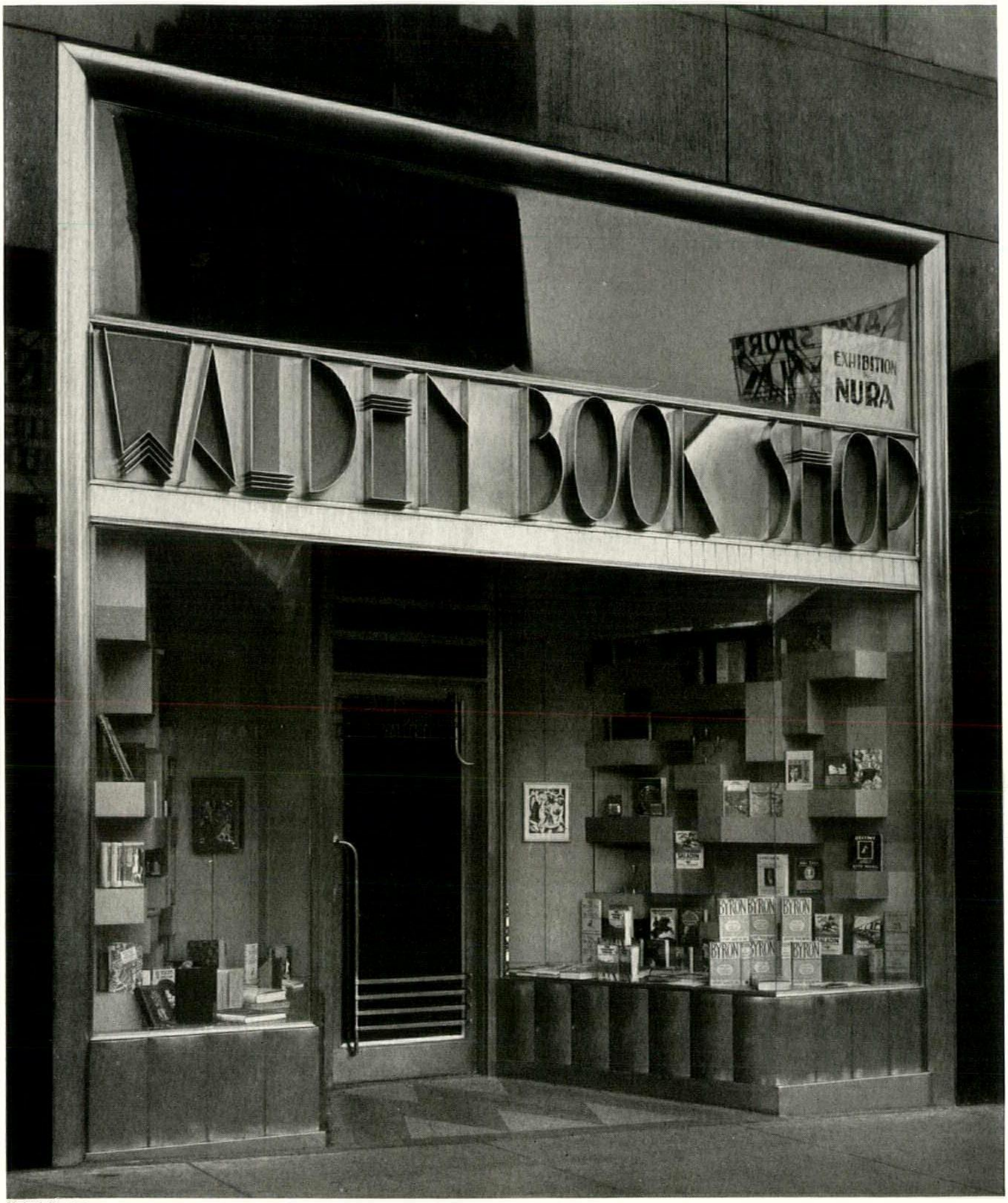
Nyholm & Lincoln

THE circulating library was placed in the corner farthest from the door to necessitate walking past the interior display, thus increasing its sales value. The large show window was treated without a back to increase the spaciousness of the narrow shop and also to increase the sales value by attracting the passer-by. The small show window near the circulating library was closed to gain more wall space, although it is accessible through the hinged book cases as are also the closets on either side



EMPIRE STATE BOOK SHOP, NEW YORK

FELLHEIMER & WAGNER, ARCHITECTS



Hedrich-Blessing

WALDEN BOOK SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

IN THIS shop the general color scheme is gray and green. The exterior is mostly white metal and plate glass, the interior of the show windows being painted gray. The interior, a general view of which is shown above, has silver-gray walls and ceilings with green and silver bands, and a terrazzo floor, patterned in green, gray and white. The book cases and furniture are made of gray maple. The chairs are of aluminum, upholstered in green. All colors are somewhat neutralized, and the effect of the shop is one of quietness and coolness

WALDEN BOOK SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing Photos

AT THE left is a more detailed view of the wall and floor treatment and the stairs to the mezzanine and basement. Below is a general view of the basement store. The color scheme here is in general the same as on the first floor, but in reverse: the walls and ceilings have been painted in varying tones of a light blue green; the trim is largely of white metal; the floor is patterned in terrazzo of green, gray and white; and the woodwork is of gray maple, stained and waxed

WALDEN BOOK SHOP, CHICAGO, ILL.

HOLABIRD & ROOT, ARCHITECTS

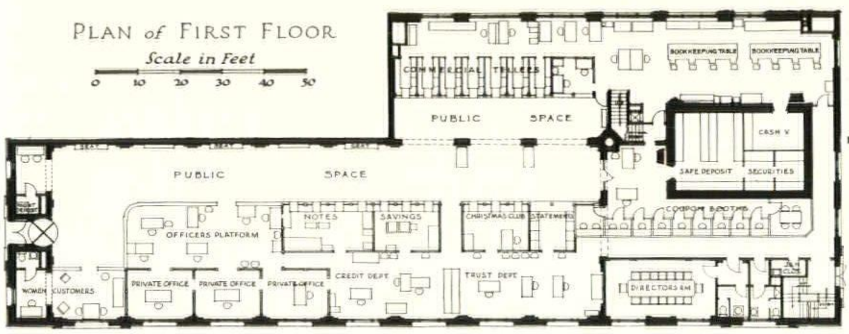
Loomis

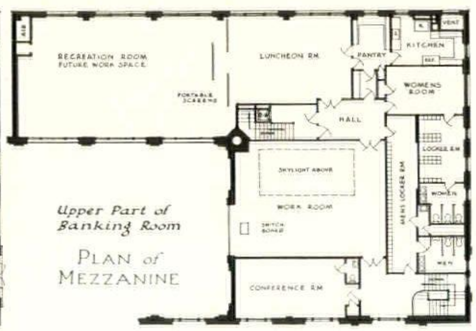
THE building stands upon the site previously occupied by the old building of the First National Bank and Trust Company. When it was decided to build a more modern structure, additional property was obtained immediately behind the old building and the architects' problem resolved itself into the planning of a structure which would be built separately but which would ultimately be joined to accomplish a unified architectural project. Since it was necessary to begin one portion of the work while the bank was still doing business in the old building, the portion containing the vaults, the commercial tellers, the bookkeeping department and officers' spaces was planned first. The banking room itself was planned so that the building operations would not interfere at all with the finished design. It is interesting to note that at no time during the entire building operation was the routine of the bank's business interfered with. As soon as the first portion of the building was completed, the contents of the vault in the old building was transferred to the new, and a temporary entrance arranged in the new rear portion

FIRST NATIONAL BANK AND TRUST COMPANY, ELMIRA, N. Y.

PIERCE & BICKFORD, ARCHITECTS

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT





TRADITIONS of the bank seem to call for an interior of a Colonial character. The wainscot, counters, bank screen, office partitions, etc., are of imported wood known as Philippine mahogany. In order to reduce the strong contrast between a Colonial wall of light color and a wainscot of dark wood experiments were undertaken to neutralize the color of the mahogany. By the application of a stain and filler a soft, grayish brown finish resulted which has proved to be eminently successful with the rest of the furnishings. Above is a view of the officers' platform looking toward the main entrance; on the opposite page is the space reserved for women customers

FIRST NATIONAL BANK AND TRUST COMPANY, ELMIRA, N. Y.

PIERCE & BICKFORD, ARCHITECTS

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT

Loomis

FIRST NATIONAL BANK AND TRUST COMPANY, ELMIRA, N. Y.

PIERCE & BICKFORD, ARCHITECTS

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT

Loomis Photos

ABOVE is a view of the public space and the tellers' cages under the mezzanine and below the entrance to the safe deposit vault and work space. The floor of the banking room is laid in large pieces of variegated slate flagging in a pattern of random ashlar. The metal work of the tellers' cages is of bronze and the wicket shelving is of black vitrolite

FIRST NATIONAL BANK AND TRUST COMPANY, ELMIRA, N. Y.

PIERCE & BICKFORD, ARCHITECTS

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT

The Jury at the Beaux Arts Institute of Design, New York. Standing, left to right, Frederick C. Kendall, chairman, Paul P. Cret, Earnest Elmo Calkins, Gustav Jensen, Frederick Goudy. Seated, Heyworth Campbell, Ralph T. Walker

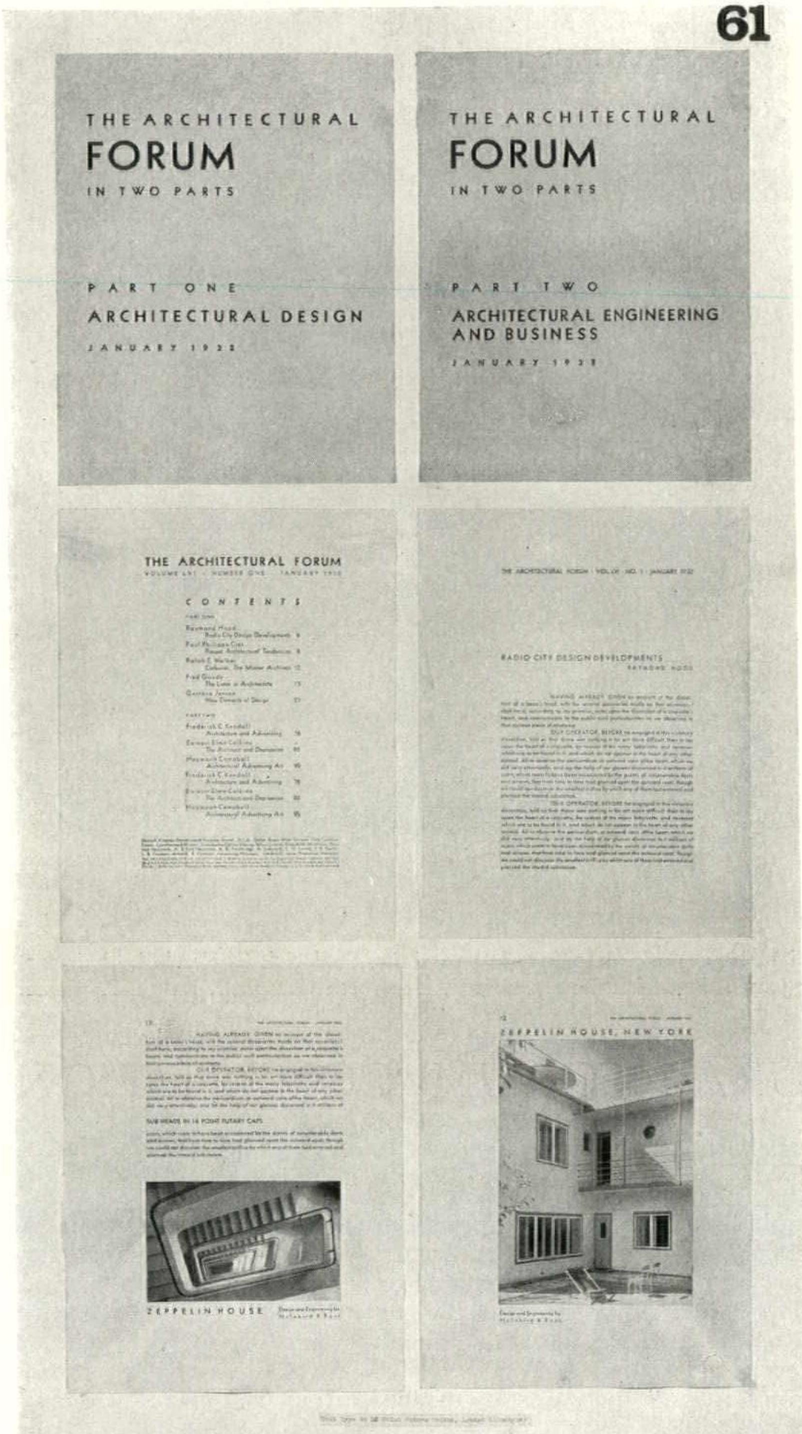
THE ARCHITECTURAL FORUM COMPETITION

REPORT OF THE JURY

THE members of The Architectural Forum Jury of Awards met at the Beaux Arts Institute of Design in New York on January 11 to study the 109 designs submitted to the competition for a new physical dress for the magazine. The designs were received from all sections of the United States and several came from foreign countries. Since the purpose of the competition and the basis for selection had been expressly stated in the program, the jury adhered to those principles in its deliberation.

"The purpose of the competition is the determination of a magazine format which most effectively expresses the ideas and ideals of the distinguished profession which THE ARCHITECTURAL FORUM is privileged to serve. The designs of the magazine pages should have the same essential qualities that characterize good architecture — appropriateness to function, logic in arrangement, beauty of composition, simplicity, directness, character and distinction."

Because of the general excellence of the designs, considerable difficulty was experienced in making the necessary choice, but late in the afternoon, by a process of elimination, the choice was narrowed to the consideration of sixteen designs from which the prize winners were to be selected. The judging was complicated by the fact that some of the designs were excellent from a cover standpoint but suffered from the impractical layout and typography of the other pages. Others ranked high from a page standpoint, but the covers were not so fresh, dignified, or attractive as they might have been. It was not until the eleventh ballot early in the evening that a unanimous opinion could be reached.

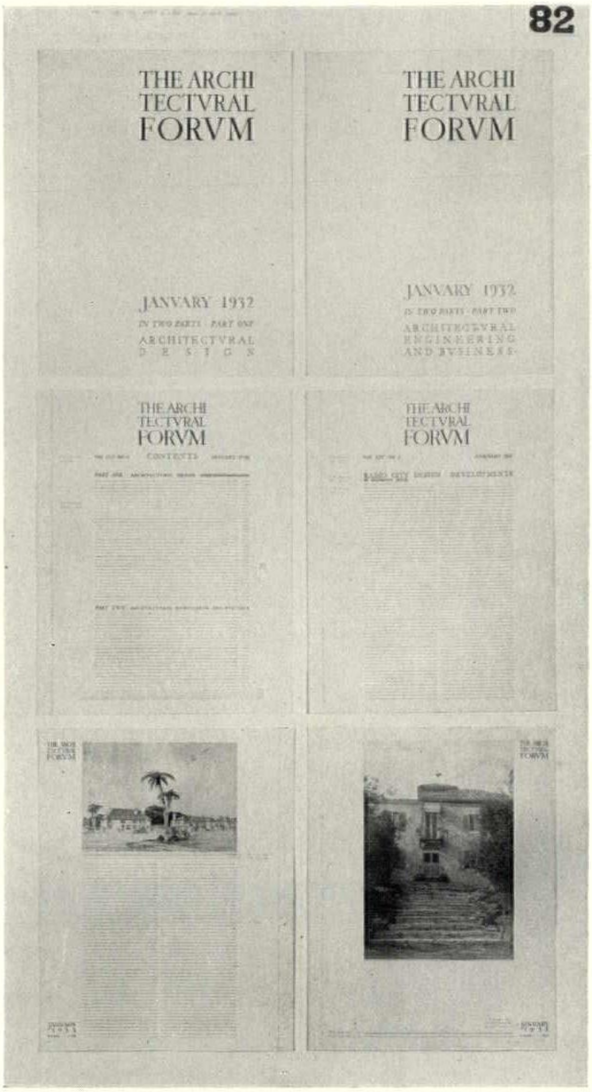


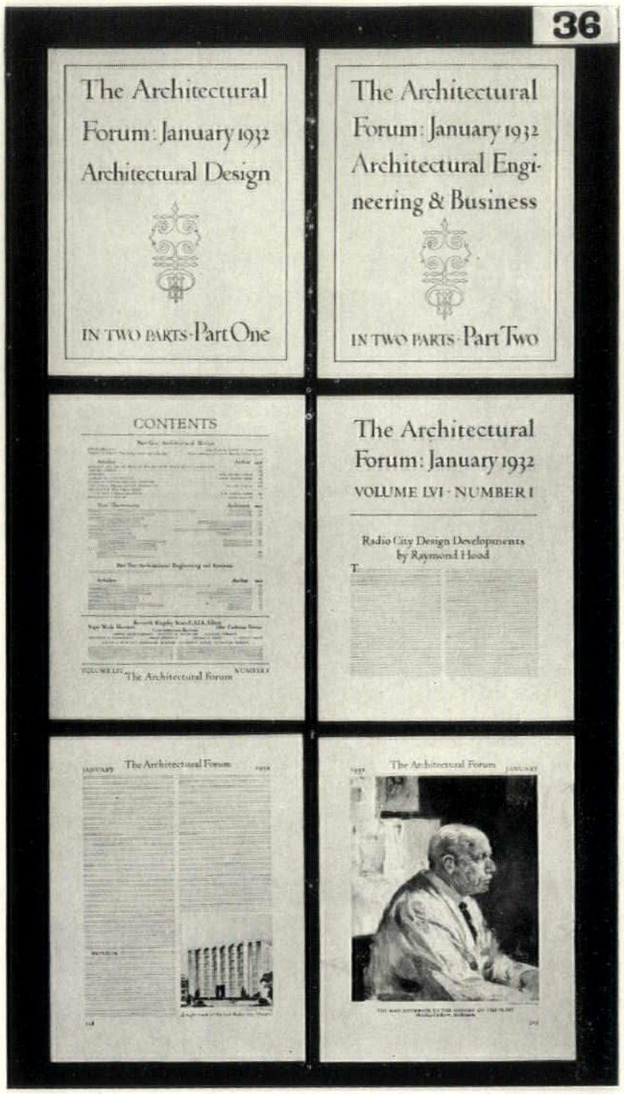
Otto Maurice Forkert, of Evanston, Illinois, winner of the competition, and the design which received the award. Mr. Forkert, a native of Switzerland, is an instructor in the printing arts at the Art Institute of Chicago, and is associated with the Lakeside Press in the same city

Following are the final decisions with comments on the design and typographic factors which influenced the jury in its selection.

Design No. 61. The design placed first was considered the most consistent throughout the six required pages. Its simplicity and directness recommended it highly to the jury. There was a freshness in the point of view and a pleasing distinction in the composition of all the pages. The jury commended the format that departed entirely from the usual in the straightforward type arrangement and selection.

Design No. 82. This was considered to have a decidedly architectural character, being dignified without being absolutely formal and showing a pleasing sense of balance and composition through-





The design which was awarded second prize, submitted jointly by Francis Adams Comstock and Kennard G. Keen, Jr., of Princeton, N. J. Mr. Comstock is an associate professor in architectural design at Princeton University, and Mr. Keen is associated with the Princeton University Press

The third prize award, the work of L. J. Ansbacher of New York. Mr. Ansbacher is a book designer for the Braunworth Press, and was at one time associated with Alfred A. Knopf in a similar capacity. He studied typographic design under Frederic Goudy, Walter Lewis, and Elmer Adler

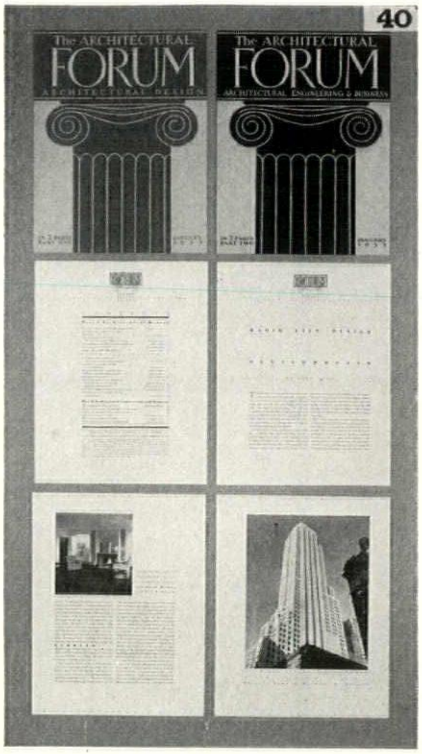
out. Consistency and coherence were gained by the repeated use of the rectangular title design The Architectural Forum. It was thought that more space in the arrangement of title and author lines would improve legibility and strength.

Design No. 36. It was felt by the jury that this design was both distinguished and attractive. The simple ornament on the cover would of course be made more architectural in form. While not deviating from the traditional to any great extent, the whole design showed a fine feeling in the form of lettering and had a character that was expressive of the architectural ideal.

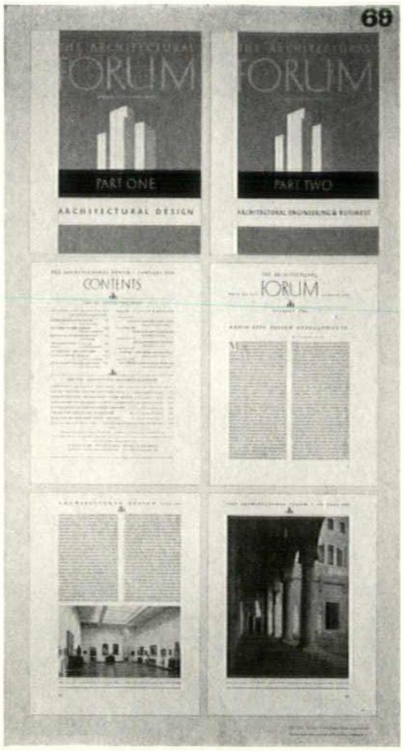
It is interesting to note, in passing, that the jury in selecting the designs for the first three prizes selected those which did not have an illustration on the cover.

The mention designs show a wide range in ideas although all of them were judged to be sound, both in idea and design. They range from the purest Classic to the present vogue for striking compositions and the use of sans serif type, yet all have the qualities of balance and harmonious composition and all were excellently executed. Design No. 86 was particularly complimented by the jury on its draftsmanship.

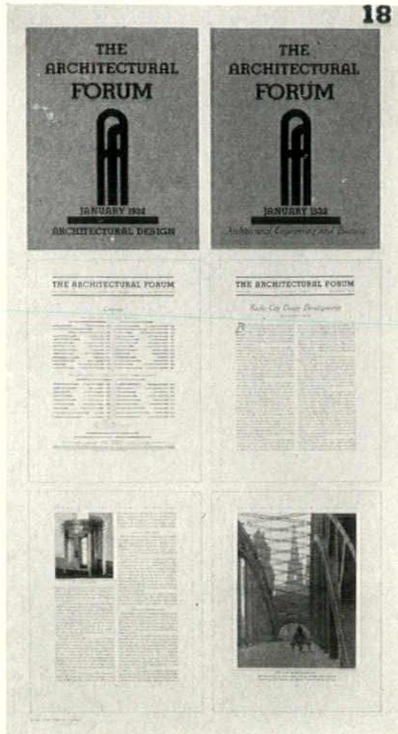
FREDERICK C. KENDALL, CHAIRMAN



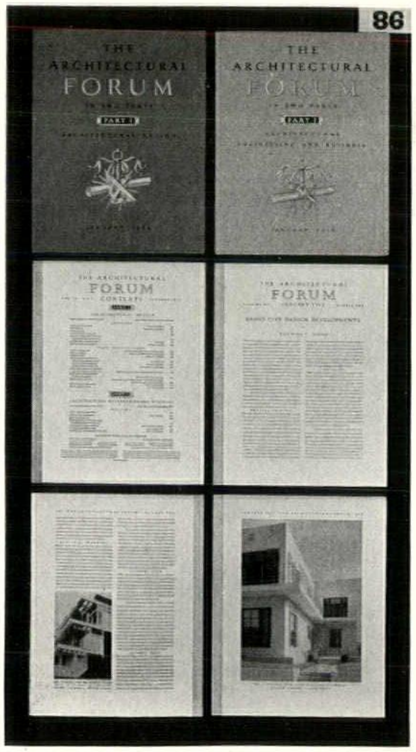
Honorable Mention
Robert L. Leonard, Lewis F. White
New York, N. Y.



Honorable Mention
William K. Allen
Chicago, Ill.



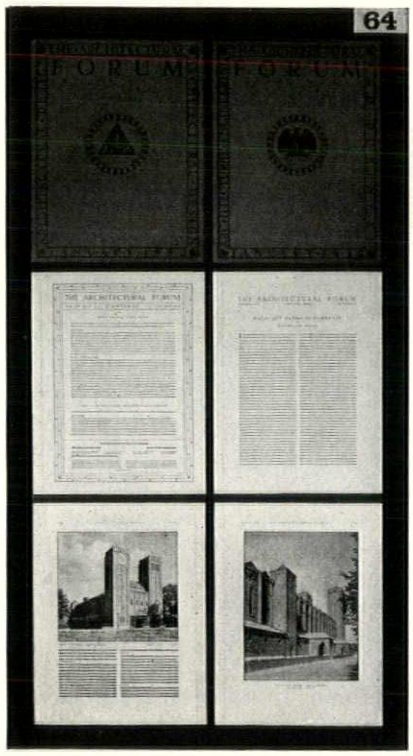
Honorable Mention
Alfred Bader
Ozone Park, N. Y.



Honorable Mention
Charles R. Jaquish
Detroit, Mich.

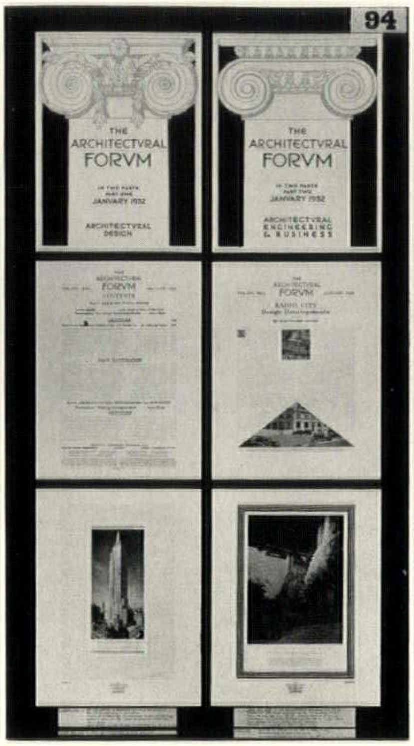
The reproductions of the page designs shown on this page are those which received honorable mention in the competition, each having a monetary value of $50.00. Those shown on the following two pages have been selected, not by the jury, but by the editors of THE ARCHITECTURAL FORUM, to illustrate the uniformly high calibre of the entries in the competition. The arrangement of the drawings on this page does not indicate the order in which they were chosen.

Designs were submitted by architects, artists, commercial designers, typographic experts, and advertising layout men. The three first prizes were awarded to a typographer, an architect, and a book designer. It is interesting, merely as a coincidence, that none of the three prize winners used an illustration on the covers.

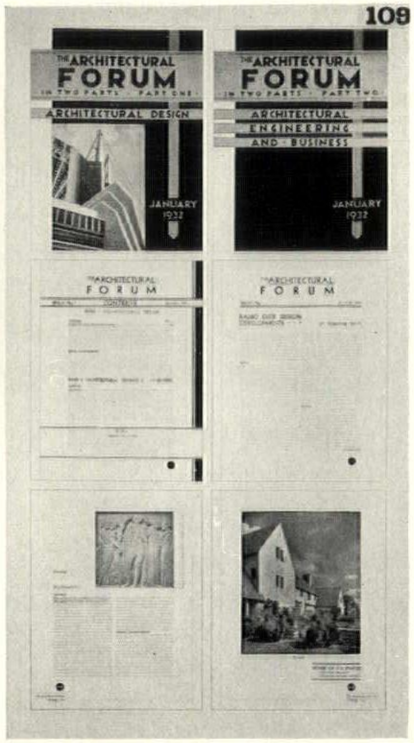


Honorable Mention
Salvatore Grillo
New York, N. Y.

Harry K. Wolfe
Seattle, Wash.

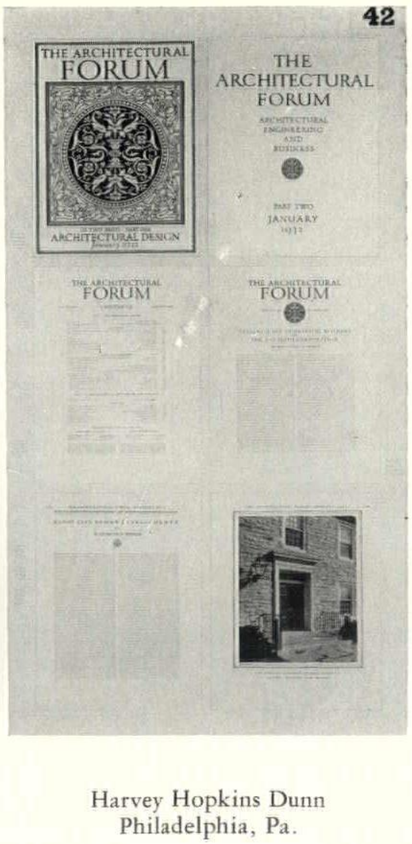


Frederick A. Jacobson
New York, N. Y.

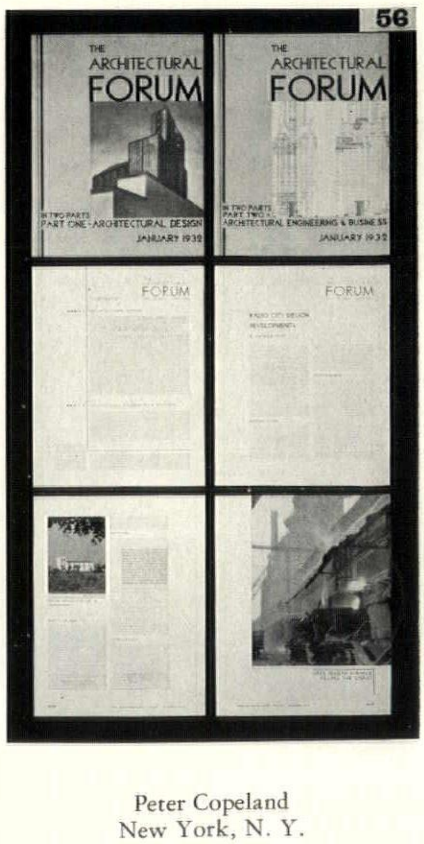


E. W. Lagershausen
Chicago, Ill.

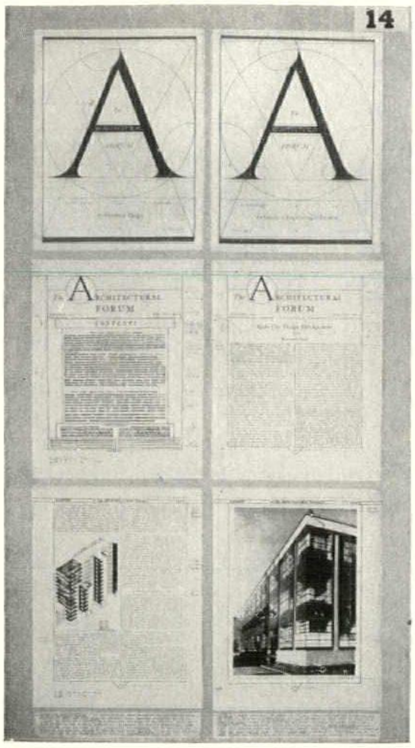
D. R. McDavid
Chicago, Ill.



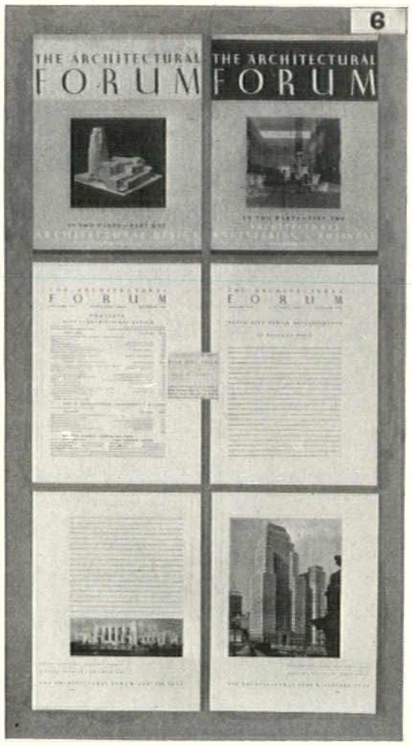
Harvey Hopkins Dunn
Philadelphia, Pa.



Peter Copeland
New York, N. Y.

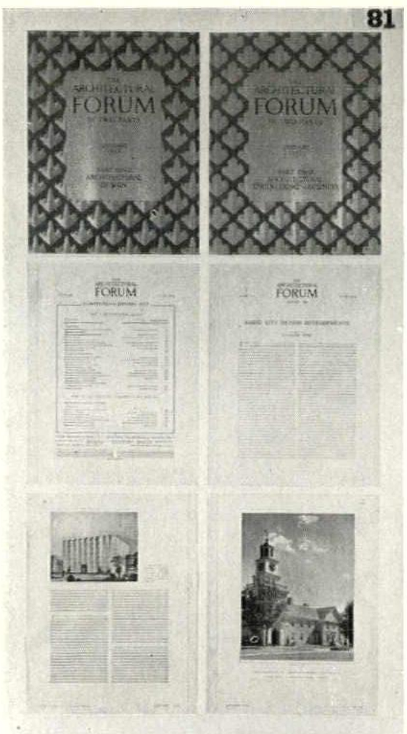


Wilder Bentley
Pittsburgh, Pa.

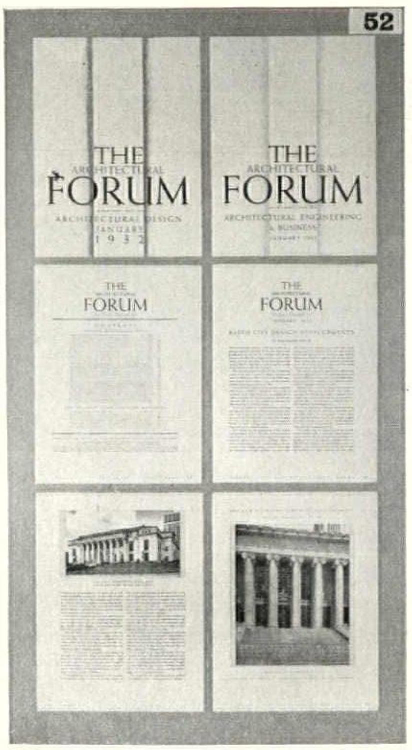


Joseph W. Korninsky
Brooklyn, N. Y.

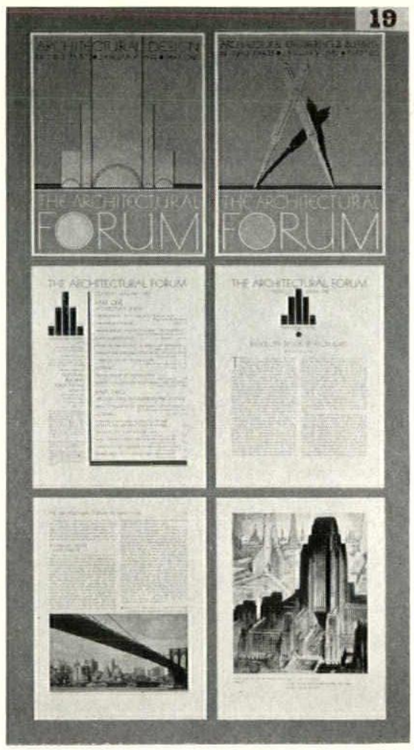
Glenn M. Pagett
Indianapolis, Ind.



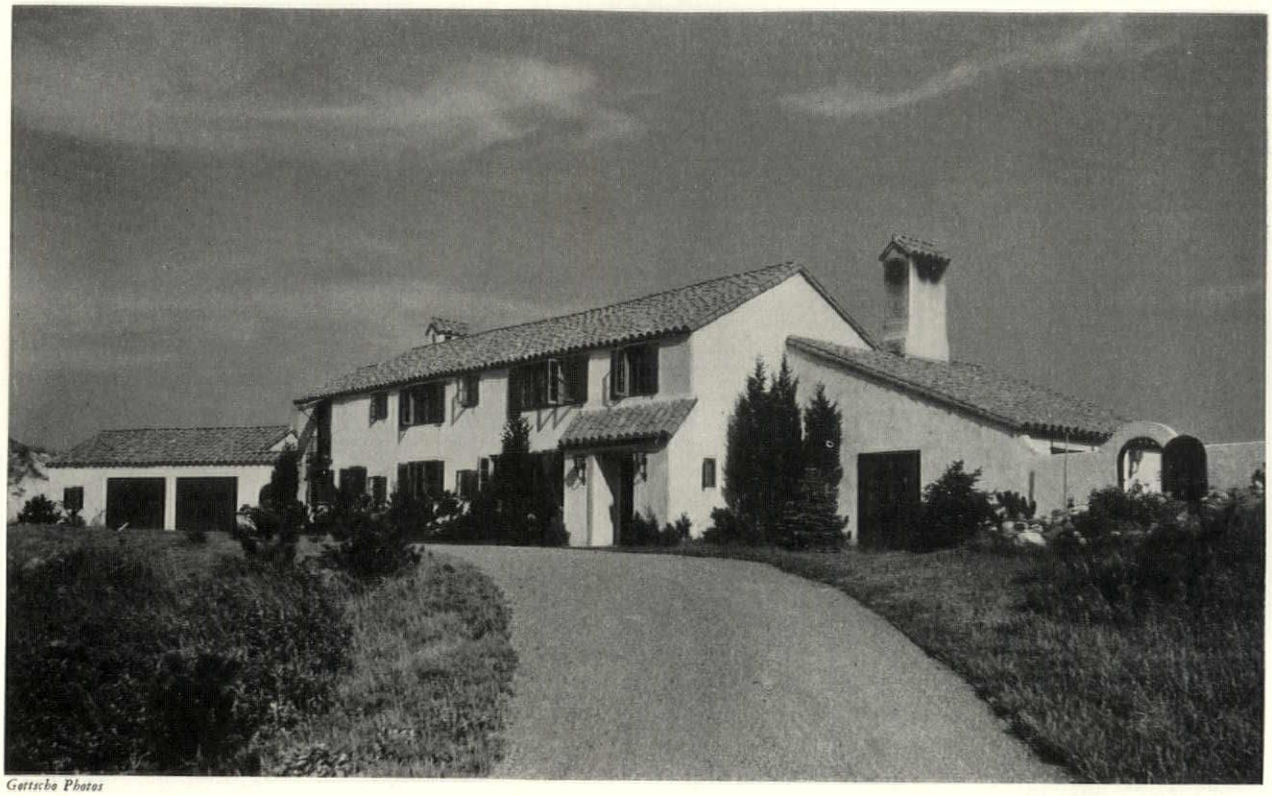
Ralph R. Knoblaugh
Toledo, Ohio



John Nickelsen
New York, N. Y.



William E. Hegle
Rochester, N. Y.



Gottscho Photos

A COUNTRY HOUSE BY THE SEA

THE house is placed on a slight elevation with the main entrance overlooking sand dunes to the north. The south side faces the open sea. Planned as a summer home, the house is well adapted in form and layout to its location. The patio on the south side is the focal point of the entire plan, for all the important spaces open on it. In every respect the house meets adequately the demands of an outdoor country life. The details of design are simple and present a pleasant contrast with the rugged surroundings. The walls are textured stucco of a warm salmon color. The roof is of variegated red tile. Polychrome tile has been used extensively in the patio, the paving of the loggia, and in various parts of the interior. The metal work, both interior and exterior, is of wrought iron and the balcony overlooking the patio is of dark stained wood

HOUSE OF ELTINGE F. WARNER

EAST HAMPTON, LONG ISLAND, N. Y.

ROBERT H. TAPPAN, ARCHITECT

Gottscho

HOUSE OF ELTINGE F. WARNER

EAST HAMPTON, LONG ISLAND, N. Y.

ROBERT H. TAPPAN, ARCHITECT

Browning

IS THERE A HOUSING PROBLEM?

THE ARCHITECTURAL FORUM

VOLUME LVI · MARCH 1932 · NUMBER THREE

HOUSING THE OTHER HALF

BY

KENNETH KINGSLEY STOWELL

"NEED 300,000 NEW HOMES ASSORTED SIZES AND TYPES PLEASE QUOTE PRICE PER BASIC SIX ROOM UNIT STOP MUST BE UNDER $4,000 TO INTEREST US STOP WHEN CAN YOU DELIVER AND WHERE CAN WE SEE SAMPLES STOP STATE TERMS STOP WANT TO DISPOSE OF 1893 MODELS WE NOW USE."

The order comes from the Lower Income Group and is addressed to the Building Industry in care of the Architect. This group in the Lower Income Bracket must be looked up for they have never been direct customers of the Building Industry and they are not rated in Dun's and Bradstreet's. And the Building Industry rubs its chin and ruminates; its eyes glisten at the thought of this order, but there is also a puzzled frown.

"Can we fill the order at that price? How soon? Will they pay? Can they pay? I've heard the L.I.B. is having a hard time of it right now. Who'll finance and carry them? Maybe I'll have to. I'll have to quote attractive terms. I don't want a lot of repossessed models coming back on my hands. I wonder about repeat orders. Perhaps I'd better investigate a little to line up the needs of the L.I.B. and chart their demands. It might be a good idea to get the heads of my departments together on this. They'll have to work this out on a new basis of large-scale production and cut costs all along the line to meet that price. The order doesn't say whether they want to rent or to buy; we'd better find out about that, too. Someone will have to look after that 1893 housing, too. Perhaps our architects can work out a way to fill this order."

These questions, although thus easily put, are serious. They are not idle queries or random thoughts for in the aggregate they sum up the practical considerations of the housing problem.

The search for the way out of the present building doldrums has centered interest on this one problem. It has always been with us, but has been allowed to solve itself, if one may call it solving. The problem is that of providing better shelter for the bulk of the population — in other words, *housing* for the masses. All new dwelling construction heretofore has been planned to take care of those who are fortunate enough to have incomes far above that of the average family. Many of the housing developments shown throughout this Reference Number are not within the economic possibilities of two-thirds of the families in this country. The model housing developments in many cases are occupied by people from economic groups far higher in the scale than those for whom the houses were built. Those in the lower income brackets have been forced to occupy the obsolete dwellings left by those in the class above as they moved a step or two upward in the level of prosperity. Producers of buildings have paid attention to "class" and forgotten the "mass" and the housing problem has been left to others.

What really is this housing problem? Is it not that of providing homes for the average worker dwellings that function fully in providing shelter, privacy, healthful conditions and opportunities for decent living, at a price within the income of the average family? If so, it is a social problem, a technical problem in architecture and building, and an economic problem. These are tied together in the all-important question of *costs*. The economic question is first and foremost — can the costs of the production be cut to fit the purse of the wage-earner and still be profitable to all those whose interests are in the building industry or allied to it? We must remember that two-thirds of the

Low in cost, but high in standards. Housing Development, Gothenburg, Sweden. J. Jarlin and K. S. Hansson, Architects

families in the United States have incomes under $2,000. Many of the problems of housing with which the architect, as well as the rest of the industry, is concerned, boil down to determining costs and developing techniques and organizations to produce houses at low enough costs to reach the need of this mass market.

With the cessation of effective demand on the part of the "class" population, and with seemingly more than an adequate number of homes for the upper income groups, the building industry has been forced to seek a new field. This search has disclosed that most communities are well provided with commercial structures, such as office buildings, hotels, theaters, etc., and that plans for religious and educational buildings, while needed, must perforce be held in abeyance because funds have not been forthcoming and endowments have been inadequate to take care of operating expenses. The faith placed in the program for public works — federal, State and municipal — has gradually become a rather forlorn hope. Although some such buildings have progressed and further plans have been made, the burden of taxation and the difficulties of obtaining government funds, as well as the political and economic necessity for curtailing government expenditures, have shown that this program is inadequate to tide the building industry over its present crisis.

This search for the way out, by this process of elimination, has led to the large and practically untouched field of providing living quarters for the mass of the population. In the production of such housing the architect sees an opportunity to plan the community on a higher standard than ever before — a community in which light, sunshine and air abound, and in which real living is possible through every facility for convenience, recreation and self-development. Circumstances seem to be conspiring to make possible the dreams of the city planner-architect. The builder sees here the opportunity to engage in immense projects, building new sections of the city or replacing sordid slums with new structures. The manufacturer now finds in housing the potential market for unheard of quantities of his materials. The financier sees the possibility of investing funds in securities that will be stable and secure and that will produce an adequate yield, (if he is not too perturbed at the thought of the effect which new housing construction will have on the value of the existing properties on which he has perhaps loaned just a little too much for safety). The realtor contemplates the possibility of assembling whole blocks in cities or whole sections of property for a large-scale operation, and the stabilizing of neighborhood value. The speculative builder and the shoestring promoter, however, find little solace in contemplating the movement toward scientific housing, for their possibilities of profit are evaporating and their sources of money are no longer available. The social worker rejoices, for at last the facts about deplorable slum conditions (so carefully gathered for years) are being made known, and public-consciousness of conditions is the only promise he has for their correction. And lastly, the municipal government may find in new housing ventures an increase in the land valuation for purposes of taxation, a possibility of reducing the expenses of crime, an increase in the health of its citizens and

Dramatic, but disillusioning as a place to live. Sections like Chinatown, New York, can be eliminated by comprehensive planning

Irving Browning

an occasion for pointing with pride to the better living conditions of its populace.

Portions of this Utopian visualization are possible of accomplishment, but only through wise leadership, proper technical direction and sincere and organized cooperation.

IF ALL those so vitally interested in building thus see the great opportunity in cultivating the new field of housing, why do they not go ahead with it, and why have they not seen it before? The obvious answer is, "Because there was no money in it"; and that is still the reply of the majority of architects, builders, bankers, *et al.* But perhaps there *is* money in it after all, and some of the wiser minority may soon prove it. There was "no money" in selling trifles at five and ten cents until Woolworth put the large-scale idea into such business. Perhaps all that is needed to make low-cost housing pay is the large-scale idea, carried through the entire housing project. However, it seems that there can hardly be expected the speculative profits and the pyramiding of the profits of each factor that contributed a part to the project, such as has obtained in previous promoter-projects. In those the public, or the buyer of the property, or the mortgage holder stood the loss when inherent defects, obsolescence and depreciation set in, that *rigor mortis* of the housing industry with its concomitant "frozen assets". Profits must be kept within bounds, and a chastened and idle industry may be more reasonable in its demands if it can see a way to keep busy. Profits along the line must be a smaller part of the cost of housing.

The cost, whether on the basis of home ownership or rental, includes: cost of land; financing and interest; labor and service; materials and equipment; sales or management; maintenance, upkeep and repair; depreciation and taxes. The two costs of greatest importance to the building industry are those of actual construction and of finance. Naturally, architects are primarily interested in the cost of actual construction and can contribute most to cost reduction by functional planning and by careful selection of materials and methods, but they must not forget that they can play an important part in bringing about reductions in the other items. There are many ways already known that will reduce the cost of construction, such as prefabrication, waste elimination, new and more efficient materials and methods, but the cost of finance seems difficult to reduce without radical changes or the introduction of the borrowing power of the State.

All the costs of housing are eventually shouldered by the home owner or tenant and the President's Conference on Construction brought out forcibly that this burden must be lightened if new housing is to proceed. The original program of the conference implied that home ownership was desirable. Investigations of several committees concurred in this idea, while others indicated that it is possible that the individual ownership of living quarters in many instances might not be so advantageous as a system of corporate ownership in which the housing facilities would be on a rental basis. The word, "ownership", has the connotation of complete control as well as possession, whereas the ownership of homes may be found to be limited to an investment covering but a small fraction of the actual cost or value of the home. The proprietary interest of the "owner" in his home is certainly a valuable asset in the community, for the pride and pleasure of the owner serve to stabilize not only real estate values in the community, but the ethical and moral values of the owner and his family. However, present conditions have shown that partial ownership may be an undue burden to the so-called owner and may have demoralizing and devastating effects. Home ownership involves more responsibilities than ownership of any other type.

THE analogy between housing and the automobile has been developed and stretched until it provides a most plausible argument for mass production of homes. If millions of cheap automobiles can be produced, why not millions of manufactured and fabricated homes? Individual units of various types can be manufactured, delivered and assembled as houses just as scientifically and economically as motor-cars. It should be possible, by the same token, to finance the purchase of the ready-made house on a basis similar to that provided by the automobile industry. It is possible and probable, but to do this, the building industry must become actually organized for the purpose. The independence of all factors must in a measure be sacrificed, and cooperation must supersede the chaos of competition.

The technical problems are rapidly being solved, for architects and research engineers have, during the past few years, been developing many possibilities in the manufacture of materials and in the methods of factory assembly of units for house construction.

It would be the part of wisdom for the producers of building materials to meet and to consider various types of houses and construction that have been and are being proposed for mass production. A cooperative research and development organization is a necessity for full and rapid progress. Only in this way will it be possible for an economic assemblage of units to be worked out to produce the manufactured or largely prefabricated house. Of course, there may be several such groups of manufacturers, each group cooperating to produce a factory-built housing unit of its own kind. There is no reason why there should not be Fords, Chevrolets and Plymouths in the realm of house manufacture as well as in the automobile field. Large-scale production can be an important factor in solving "the housing problem."

The large-scale idea must begin with a certain amount of integration in the building industry in order to cut both actual production costs and multiple profits. The large-scale idea as applied to housing may mean either the production of a new community (on a new site or in place of an old or blighted area) or it may mean large-scale or mass production of standardized houses, factory-built units. Of course, it may mean both. The idea in any case is to reduce costs by increasing efficiency. Manufacturers and merchandisers are seeing the possibilities in this necessity and even threaten to step into the field and wrest it from the loosely associated aggregation now constituting the building industry. They can do this by offering a house that is better and cheaper because it is produced by an organization using modern machinery, materials and methods of construction.

However, the greatest need at the moment is not for a satisfactory plan for an apartment or a typical fabricated small house but that there be developed a group in each community which is conscious of the broad base on which any housing development must be founded, an understanding of the three main phases of the problem — the social, the economic and the architectural. This need can be met only if the architect is thoroughly alive to the necessity of solving the problem in the light of all three, not merely as a plan and structural problem, but one controlled by the social and economic factors as well.

Wallace

Lessons in large-scale housing were learned during the war. Yorkship Village, Camden, N. J. Electus D. Litchfield, Architect

COMMUNITY HOUSING PROCEDURE

BY

CLARENCE S. STEIN

THIS check list is intended to act as a reminder of the many factors that must be considered in connection with a housing development. They have been grouped under three headings: Social and Civic, Economic, and Architectural. The subjects dealt with are in many cases difficult of classification: they will be of equal interest to those who are carrying on studies in the fields of design, of finance or of human or community welfare. The investigations will in part overlap, and the findings under each group must be checked and correlated from time to time. Each of the titles covers a number of activities.

UNDER **Social and Civic** we shall deal not only with the housing needs, habits and preferences of individuals and groups and with the organization and equipment of neighborhood communities. We shall also inquire into the effect of new housing and its location on the problems of the city, town or region: on the location of highways, utilities, and means of transportation, on plans for schools and parks and other community equipment, on zoning laws and plans for industrial or business expansion or contraction and finally on the relation of all these to the fiscal policy of the government.

Under **Economics** we shall consider housing as a business. We shall analyze the elements that have to do with the organization for producing, financing, marketing and managing a housing project. We shall consider methods of calculating cost and determining marketing price.

Under **Architecture** will be included much more than the design and supervision of construction of buildings. We shall also deal with the related problems of town and site planning as well as with the various fields of engineering and construction that must be coordinated to produce the complete physical structure — a community housing development.

SCHEME OF THE OUTLINE

	SOCIAL & CIVIC (S)	ECONOMIC (E)	ARCHITECTURAL (A)
FIRST STAGE THE PROBLEM	**Division SI** A survey of the housing needs of the locality (city, town, region) and of various income and social groups.	**Division EI** An analysis of the existing market and methods of supplying housing demands; and how to increase effective demand.	**Division AI** A study of functional requirements, housing customs, local conditions, and how to improve quality and decrease costs.
SECOND STAGE TEST STUDIES	**Division SII** An inquiry into the human and communal needs in relation to projects studied; and how to meet them.	**Division EII** The organization of the housing company and the economic cost analysis of projects studied.	**Division AII** Comparative studies of various ways of developing sites under consideration.
THIRD STAGE THE SOLUTION	**Division SIII** A program for the organization of the community and its equipment.	**Division EIII** A plan for the organization of the economic and business structure for the housing project.	**Division AIII** The development and building of the housing project; architecture, town and site planning, engineering and construction.

The outline is divided into three stages chronologically, —

First Stage: To determine or evaluate the problem and so to decide on the broad limitations of the project.

Second Stage: To decide on the form of organization for its execution, the best location and the general form the project is to take.

Third Stage: To plan in detail and to execute the project.

THE outline is intended for all the groups that have to do with the creation of a housing development. It is for those who will organize and manage the business organization; for those who will make a social and civic survey, and plan for and carry on community activities; for municipal officials and engineers, as well as for all those who will plan and build the physical structure — be they architects, city or site planners, engineers, landscape architects or builders. The problem is too great for any single group or profession; it must be a cooperative undertaking. It offers opportunities for leadership to those who have a broad understanding of all the phases of this many sided problem — the making of urban environment in harmony with the need of living today and tomorrow.

THE program of procedure outlined here is not an attempt to *solve* all the problems that enter into a housing project. It does not tell what to do. It is intended as a check list for those who plan to carry out such an operation. It should be all-inclusive to serve its purpose even though all of the items listed will probably never enter into any single operation. It deals with a general field in which every undertaking is different from all others. A community housing operation may consist of small detached houses or of towering apartments; it may be a replacement of slum clearance or a development on a new site; it may be made up of a hundred dwellings forming part of an existing neighborhood or of a whole new city.

That the check list is incomplete no one knows better than the author. It is based on the limited experience of one office and the organizations for which it has worked. It should be revised and augmented from time to time on the basis of the experience of others, both architects and those in the other activities that cooperate in carrying on a housing operation.

A HOUSING development to be successful must be comprehensive and must be economically sound. To be comprehensive, it must when completed have all the equipment for carrying on the full life that will be needed or demanded

(*Continued on page 224, column 1*)

SOCIAL AND CIVIC (DIV. SI)

A. PLANNING FOR POPULATION MOVEMENTS OF CITY

I. PAST AND PRESENT TRENDS and their effect on social and civic welfare

a. Population movements

b. General character and locality of housing activity ***(See Div. AI-A-II-a-b)***

II. DESIRABLE DISTRIBUTION OF POPULATION

a. Effect on:

1. Living conditions of various groups
2. Industrial prosperity of locality
3. Economic development of highways, utilities, community equipment such as schools, parks, playgrounds, transportation
4. Taxes

b. Affected by:

1. Regional limitations
2. Topography
3. Transportation
4. Industry

B. CIVIC PROBLEMS AFFECTING THE LOCATION OF HOUSING

I. REHABILITATION OF BLIGHTED AREAS. Slum clearance

a. Effect of slums on health and general welfare

1. Overcrowding, filth, lack of sun, air, privacy, convenience, open space, facilities for recreation
   a. Effect on disease, crime, passive acceptance of low standard of living

b. Effect of slums and blighted areas on taxes and fiscal policy ***(See Div. EI-C-VI)***

1. Increased expense of policing, fire protection, welfare activity, education, means of transportation, due to congestion
2. Reduced income from taxes, due to blighted areas (misuse or disuse of land)

c. Rehabilitation of blighted areas to replace this circle of profitless outlay with constructive profit-bearing investment

II. RE-LOCATION OF WORKERS' HOMES. Reconstruction on same plot of construction of new communities in different location. Decision affected by:

a. Groups of population in need of new housing

b. Land cost of present location of residences

c. Availability of cheaper areas

d. Suitability of available areas

1. Time, distance, cost of transportation from home to work
   a. Cost of new transportation lines, highways and other municipal or quasi-municipal equipment
   b. Effect on best use of leisure time of workers

e. Possibility that industry and business may, or may be induced to, move to areas convenient to new housing projects

(*Continued on page 224, column 2*)

ECONOMIC (DIV. EI)

A. NORMAL MARKET FOR NEW HOUSES

I. QUANTITATIVE COMPARISON of existing housing facilities and population divided into price groups

II. NORMAL GROWTH OF POPULATION studied by economic groups

III. NORMAL CONSTRUCTION to care for this growth

IV. WAGE LEVELS that can pay for existing houses or those normally produced

- a. Percentage of family income paid for housing
- b. Effect of other living costs: of stable employment

V. EFFECT OF MOVEMENT of industry or population in opening up new markets

VI. FORECLOSURES as gauge to ability to pay, of various economic groups

VII. CHANGES in composition of the community: ***size of families, average age of people, newly married (marriage, birth and death records)***

B. PRESENT METHODS OF SUPPLYING HOUSING

I. LAND: Practice and legal requirements

- **a. Street layout:** ***type; how controlled***
  1. By municipal regulation, or plan
  2. By owner or subdivider
- **b. Plotting of subdivision:** ***filing plots, staking out, and other preliminary engineering***
- **c. Methods of sale:**
  1. By lot with or without improvements
  2. In large plots to builders
  3. By auction
  4. By advertisement or "super"-salesmanship
- **d. Analysis of costs**
  1. Cost of raw land
  2. Carrying (or ripening) costs, including interest on investment, taxes and assessments
  3. Subdivision costs, engineering and legal expenses
  4. Selling costs: *preparation of land with streets, signs, etc., auction, advertising, salesmen, legal expenses, promoters' commissions*
  5. Lot improvement: grading, etc.
  6. Public improvements: streets, utilities, parks, etc.
- **e. Actual cost compared with selling price**

II. PUBLIC IMPROVEMENTS: ***grading, roads, curbs, sidewalks, sewers, water, gas, electricity, telephone***

- **a. By what agency installed:** ***municipality, utility company, land developer, builder, owner***
- **b. At what period of development**
- **c. Adequate or inadequate**

(*Continued on page 225, column 1*)

ARCHITECTURE (DIV. AI)

A. TYPES OF DWELLINGS: factors in their consideration

I. FUNCTIONAL REQUIREMENTS of dwellings. ***(See Div. AIII for detailed outline)***

- **a. Space required per unit (family or other) for:**
  1. Household activities: *sleeping, cooking, eating, washing, bathing, sanitation, recreation, study, social gathering, household administration*
  2. Storage: *personal effects, household supplies, cleaning equipment, tools, vehicles (automobile, bicycle, baby carriage, etc.), fuel, furniture, etc.*
  3. Services: *heating, deliveries and waste disposal*
- **b. Room design: sizes and shapes, wall space, windows and lighting**
- **c. Grouping and location of rooms**
  1. For amenity: *orientation, ventilation, vistas, privacy, efficient internal circulation*
  2. For economy of construction and upkeep
- **d. External circulation**
  1. Access to dwelling by vehicle (including bicycle, perambulator), or by foot: *by occupant, guests, services*
  2. Services requiring access:
     - *a.* Deliveries: *laundry, milk, ice, coal, furniture (including pianos), general merchandise*
     - *b.* Disposal: *garbage, refuse, ashes*
- **e. Special problems of planning multi-family dwellings (flats or apartments)**
  1. Service requirements: stairs, halls, deliveries, garbage disposal, access to common spaces in basement or yard, etc.
  2. Need for analysis of plan efficiency related to:
     - *a.* Waste space: *its cost of construction and upkeep*
     - *b.* Comparative efficiency of high-land-coverage and more open garden-court buildings
- **f. Relation of plan, construction and finish to conditions of occupancy**
  1. Tenancy or ownership: *long or short tenure*
  2. Social and economic status of occupant
  3. Personnel of typical households

II. LOCAL HOUSING PRACTICES AND TRENDS

- **a. Character of general local housing facilities**
  1. Dominant types
     - *a.* Single family, two family or flat, apartment
     - *b.* Bungalow, two-stories, three stories or more
     - *c.* Free standing, attached, short or long row
     - *d.* Small lot or garden apartment
     - *e.* Horizontal apartment (group or attached single family house with common service)
  2. Typical plans
     - *a.* Functional use of space: (*number and kind*) *living room, dining room, dining nook, kitchenette, kitchen, pantry, library, study, workroom, bedrooms, maid's room, bathrooms, toilets, wash rooms, dressing rooms, closets, other storage space (coal, etc.) (See above: Div. AI; A-I, a, 2), vestibules, corridors, stairs, porches, garage*
     - *b.* Location of rooms and relation to each other
       - i. Circulation: *stairs, corridors, halls, vestibules,*
       - ii. Use of cellar and attic
     - *c.* Efficiency of plan compared with other units of equal usable space or serving similar purpose

(*Continued on page 225, column 2*)

by those who are to be members of the community. Houses alone, no matter how well designed or constructed, are not enough. Opportunities for recreation, for education, for culture, for entertainment, easy access to stores and working places, beauty of surroundings — all of these are quite as essential as houses.

To be economically sound all the costs must be considered and counted upon in the beginning. The original budget must cover not only the cost of land and houses and all the physical equipment for communal activities, but also all of the expenses of the development of the property — roads, grading, utilities — as well as all that which must be paid for financing, selling and management.

THE solution of the problem of large-scale housing requires a different approach by the architect from that which he normally follows. Generally his problem is definite and limited by his client's requirements: a plot of land that has been chosen and the amount that is to be spent. The whole approach to the problem of large-scale housing is utterly different. The limits of the problem must be found before it can be solved. It is a question of supplying a *need* rather than a *demand*. A large part of the population in all of our cities is in need of new and decent houses forming part of modern communities. The need is there, but the articulate demand has not been expressed because in the past, the machinery for filling the need has not existed. Our present slovenly and extravagant method of producing homes has supplied with new houses the needs of only one-third of the population — those in the upper economic groups. Through the use of large-scale methods of production, under the direction of trained technicians, it is possible to cut the costs and produce homes in an environment more in harmony with the real needs of the day. The building industry can do a great deal toward making this possible, but it requires the cooperation of all the other elements that have to do with the production and organization of houses and communities.

THE first stage in carrying out a housing development is preparatory. It has to do with finding the problem. It asks, what are the housing needs of the locality? To what extent are they met by present means? In what way and to what extent can these means be improved? With improved methods, what can be done to better housing conditions and what specific groups can be re-housed?

THE social survey should be carried out with the assistance of a trained investigator or expert observer, not an amateur. There is no measuring stick of intangible aspects of housing

(*Continued on page 226, column 1*)

(SOCIAL AND CIVIC. *Div. SI, continued*)

C. DIVISION OF CITY INTO POPULATION-GROUPS OR NEIGHBORHOOD UNITS

I. GROUPS TO BE DETERMINED BY:

- a. Divisions by main arterial highways
- b. Topographical demarcations
- c. Political boundaries: *Voting, school, health districts*
- d. Natural groupings of population
  - 1. Racial, national, occupational, income and rent level, religion, special preferences
- e. Types of home: *separate houses, row houses, various types of multi-family dwellings, rooming-houses, hotels*
- f. General atmosphere and appearance of area: *growing, thriving, deteriorating, dilapidated*

D. SURVEY OF SPECIFIC GROUPS OR NEIGHBORHOODS

I. POPULATION

- a. Race, nationality, length of time in country and in this neighborhood, degree of Americanization, religion
  - 1. Special social and psychological characteristics resulting from above
- b. Occupation
  - 1. Industrial: *skilled, unskilled, executive*
  - 2. Commercial and business: *executive, sales, clerical*
  - 3. Professional
  - 4. Domestic or other service
  - 5. Relation of present homes to place of work: *time, distance, cost and means of transportation, congestion*
  - 6. Relative degree of permanence of jobs
  - 7. Unemployment: *seasonal and other*
- c. Total number in group. Number of families. Number of persons per family (not including boarders). Number of wage-earners per family

II. INCOMES (per family or household) in relation to housing.

- a. Amount and nature of income
  - 1. Median or average amount; minimum and maximum range.
  - 2. Number of wage-earners per household: *full or part-time and relation to general household budget.*
  - 3. Regularity, seasonal or cyclical variations of income.
- b. Proportion of income spent for housing *(See also Div. E-III)*
  - 1. Direct costs: *rent, payments toward ownership, taxes, assessments, insurance, etc.*
  - 2. Upkeep: *fuel, repairs, etc.*
  - 3. Expense of travel to and from employment.

III. HOUSING CONDITIONS: *present homes*

- a. Sanitation, ventilation, light, sunlight
- b. Type of tenancy: *ownership or rental*
- c. Type of landlord: *resident or absentee*
- d. Plan and construction
  - 1. General type of dwelling: *single-family separate house, row house, type of multi-family dwelling, rooming-house*

(*Continued on page 226, column 2*)

(ECONOMIC. *Div. EI-BII, continued*)

d. What substitutes required until installation, such as cesspools for sewers, wells for water mains

e. How charged for: *as part of land cost, assessments, taxes, periodic payments for services of public utility corporation*

III. PLANNING: *what technical skill used. Costs. Economic advantages gained (Compare with Div. AI-C and Div. AII-B)*

IV. CONSTRUCTION

a. Type of organization
1. Large or small builders.
2. Mass housing or individual building.

b. Scale of operations

c. Financial responsibility of builder

d. Labor supply, organization and regulations as affecting costs and continuity of operation

e. Building methods and customs
Building code requirements

f. Building costs

V. FINANCING: *practice, legal or other regulations and costs (For detailed list see Div. EII-C)*

a. Equity: *amount required*

b. First mortgage: *sources, percentage of value of property, means of evaluating property, rate of interest, other costs, amortization*

c. Junior mortgages: *sources, amount, interest rate, costs such as discount and "write up," refinancing charges*

d. Total annual cost to buyer (including interest on investment and all charges for securing loans as well as interest and amortization of mortgages*)*
1. Compared with actual costs of production of house and site (See *Div.* AI-AII-a-7)
2. Compared with rental charges on similar property to give adequate return

VI. MANAGEMENT or operating *(See Div. EII-B-X)*

a. By building operator

b. By purchaser
1. Resident owner
2. Non-resident owner

c. Cooperative

C. POSSIBLE METHODS OF INCREASING EFFECTIVE MARKET

I. BETTER HOUSING *(See Div. AI-AI)*

II. BETTER AND MORE STABLE NEIGHBORHOOD *(See Div. SI-B)*

a. Parks, playgrounds and other community equipment

b. Planning to prevent change of use

c. Community or single ownership of land

d. Private or public regulations

(*Continued on page 227, column 1*)

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

3. Size of dwelling suites (Either individual houses or suites in apartment, two-family or other flat)
   a. Floor area or cubage
   b. Number of rooms *c.* Size of rooms

4. Construction and equipment
   a. Structural quality
   b. Fireproof, semi-fireproof, non-fireproof
   c. Soundproofing and heatproofing
   d. External structural and finish materials: *brick, concrete, wood, metal, etc.: slate, asbestos, asphalt, or wood shingles, etc., window types*
   e. Interior Finish: *floors, trim, painting, tile, etc.*
   f. Heating: *type and quality of installation*
   g. Plumbing: *bathroom and kitchen equipment*
   h. Electrical Work.

5. Equipment (installed primarily as selling points or to meet competition rather than for actual needs)

6. Location of dwellings as affected by:
   a. Lot — size and position on lot
   b. Neighboring dwellings in regard to outlook, light, and ventilation and economic use of land
   c. Site conditions: *contours, conditions of soil*
   d. Orientation
   e. Street plan
   f. Parks, playgrounds, schools and neighborhood equipment. As part of integrated neighborhood unit

7. Costs of Housing. (See Div. SI-D-II-b)
8. Extent of renting and owning
9. Neighborhood blight or obsolescence

b. Recent trends in relation to present and future needs

1. Character of recent housing product (as in Div. AI-AII-a)
2. Areas of housing activity (See Div. SI)
3. Relation of supply and demand (See Div. EI-A-B)
4. Costs of production, marketing, and ownership or rental
   a. Comparison of various types of dwelling having approximately similar accommodations in single family, two-family, and apartment may be compared as well as freestanding and row houses. The effect of various lot sizes and site conditions on costs of similar houses may be tested.
   b. Comparative costs of various types of housing (See Div. EII-D-E-F-G)
5. Probable future trends

III. EFFECTS OF LOCAL CONDITIONS on housing practice

a. Climate b. Soil

c. Local materials and industry

d. Transportation

e. Building practices and labor

f. Customs of living or housing

g. Industrial or economic character of community

h. Legislation

i. Effects of past housing shortage or surplus

B. DWELLING SPACE THAT CAN BE SECURED under current methods in various types of housing: in relation to expenditures available for housing by members of various economic groups *(See Div. SI-D-II, Div. EI-B)*

(*Continued on page 227, column 2*)

that can be passed on to unskilled workers. Short cuts will often have to be found. It is of the utmost importance to know where to find existing information in past studies that is not out of date.

Comprehensive social and civic surveys of housing conditions and needs should be carried out continuously over a long period of time in every city. But in most localities these basic data do not exist or are too fragmentary to be of much value. If there is time, just as thorough a survey as possible should be made. But when it is proposed to carry out a housing project it may be quite impossible to wait for the completion of an all-inclusive study. It may be better to set limitations on the objectives, based on conferences with those who are best informed as to existing conditions, and then do a thorough job in a limited field.

The scope of the first period of study will thus be limited by the object of the work to be undertaken and information that has already been collected. If it is decided in the beginning that a specific group is to be housed — Negroes, workers in a certain factory or factories, white collar workers, young executives — the problem is naturally simpler than if a solution is sought for the broad problem of housing all who are in need of better homes.

DURING the first period, the architectural studies will be intended to find the best types and organization of dwelling to serve the purpose of the project. And so dwellings will be considered from the point of view of functional design, of customs and practices of the locality and in relation to local conditions.

On the basis of these considerations, the architect should be able to set up tentatively the types of housing and in general the manner of grouping that are to be considered in future studies. His decisions naturally will be modified by considerations of site and cost in future studies. For the moment it is important that he make, in cooperation with the economic group, sufficient cost studies of various acceptable types, so that a decision may be reached in regard to the wage and salary groups that can be served and the economic set up that will be required.

AT THE end of the first period of study sufficient information should have been collected to limit and define the work that is to follow. The Social and Civic survey will have disclosed the housing needs of various groups of the population and the amount they can afford to pay for housing. The Architectural studies will have found the most economical types of housing both to meet the needs and satisfy the preferences of the various groups for whom it is economically possible to

(*Continued on page 228, column 1*)

(SOCIAL AND CIVIC. *Div. SI-DIIId, continued*)

2. Material of construction: *frame, brick, etc.*
3. Plan: *efficient or inefficient, large or small rooms, windows, fire-safety, fire escapes*
4. Utilities: *water, hot water, gas, electricity, toilets, baths*
5. Type and quality of architecture

e. Degree of wear: ***new, kept up, in need of repair, dilapidated***

f. Upkeep: ***Plumbing, structure, painting, lighting, heating, stairs, halls, yards, collection of garbage and ashes***

g. Overcrowding and congestion: ***Privacy, number of persons per room, families per apartment. Lodgers or boarders***

h. Visible and determinable effects on social and moral conditions. On health and sanitary conditions

i. Effect of restrictive housing legislation, housing and building codes, etc.

1. Compare conditions with those in same area at some past date

IV. GENERAL SOCIAL CONDITIONS

a. Health

1. Prevalence of disease: *by kinds and age-groups*
2. Death-rate: *infant and adult*
3. Present health equipment
   a. Hospitals, clinics, dispensaries: *public or private, special or general treatment*
   b. Degree of use. Cost: *real and to the residents*

b. Moral conditions

1. Rate of arrests: *by age and sex groups*
2. School delinquencies
3. Effect and amount of drinking, prostitution, gambling, etc.
4. Existent gangs: *Boys, adults, degree of power and viciousness*

c. Education

1. Schools: *Number of pupils by age-groups and grades; equipment for education, art, athletics, social life, theater; degree of use of equipment by pupils and by adults*

d. Outdoor recreation

1. Available facilities: *Public or private. Quality and extent of equipment. Supervision. Upkeep. Degree of use, by age groups. Most popular form of outdoor activity*

e. Community and club organizations: *Number and kinds. Buildings and rooms. Degree of use, by age groups. Costs to members. Equipment. Most popular kinds of equipment*

1. Settlements
2. Fraternal organizations. Benefit societies
3. Political clubs
4. Social or cultural clubs: *singing, dancing, art, sewing, literary, etc.*
5. Dramatic clubs
6. Athletic clubs
7. Leadership: *Strength and local feeling, each organization*

f. Religion

1. Churches, synagogues, etc.
   a. Number, kinds, degree of use
   b. Social, welfare, educational, recreational, cultural facilities offered. Equipment and degree of use, by age groups

(*Continued on page 228, column 2*)

(ECONOMIC. *Div. EI-C, continued*)

III. DECREASED COSTS *(See Div. AI-C)*

a. Land

1. Carrying or ripening charges decreased or eliminated by putting land in market only when needed and used for housing, thus eliminating all premature land subdivision and lot sales
2. More economical street plans
3. Lot division in accordance with requirements of use

b. Planning *(See Div. AI-A-I-c-2 Div. AI-AI-e-2 Div. AI-c-I-II-III-IV)*

c. Construction *(See Div. AI-c-V)*

1. Organization: *large scale; use of technical skill*
2. Structural improvements, simplification, standardization
3. Large scale operation
4. Legal (code) restrictions adjusted to large scale operation by legitimate builders

IV. FINANCING

a. Loans on basis of quality or real value of property judged by competent technicians

b. Elimination or reduction of various costs of securing money

c. Reduction of rate of interest

1. Investment instead of speculation
2. Limited dividend corporation
3. Use of state credit

d. Increased length of term of amortization justified by safety of investment as result of improved planning, building, management, and stabilizing neighborhood

V. BETTER MANAGEMENT

a. Type of organization

b. Relation of management to building organization so as to produce housing meeting requirements of market

c. Type of tenancy: *rent or sale*

d. Community organization

VI. DECREASED MUNICIPAL COSTS reflected in taxes and assessments *(See Div. SI-B-I-b)*

a. Orderly development of city to prevent unnecessary opening of new areas and more efficient use of existing areas. This will prevent wasteful lengths of streets, public utilities and transportation lines and increased costs of policing, fire protection, schools and other community equipment

b. Street plans adjusted to actual needs for purposes of economy of installation and upkeep and to stabilize neighborhood

c. Prevention of lot sale without installation of roads, and public utilities or adequate plans for financing same

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

I. CONSIDERATIONS OF DWELLING TYPES in relation to functional requirements and to general controlling conditions

a. Types of dwellings *(See Div. AI-AII-a-1)*

b. Characteristics of each type to be considered in their selection

1. Ability of each type to satisfy functional requirements (See Div. AI-A-I)
2. Ability to meet local housing customs and prejudices. (See Div. AI-AII, AIII)
3. Appropriate intensity of ground coverage: *population housed per acre* by each type.
4. Ability of each type to carry present and future costs of public improvements, increasing land values etc.
5. Necessity of intermingling the types to meet various family or individual needs
6. Relative economies in land-use, construction and upkeep cost of grouped and detached dwellings
7. Adaptability to sale or rental
8. Comparative efficiency and desirability of garden-type *vs.* high-coverage apartments

II. SPACE AND FACILITIES which can be secured under current methods for amount of money available under varying conditions of:

a. Portions of incomes available for housing *(See Div. SI-D-II)*

b. Other expenses than dwelling proper connected with housing *(See Div. EII-E-F-G and Div. SI-D-II-b)*

c. Method of financing, marketing, and management *(See Div. EI-B-V and VI)*

C. POSSIBLE METHODS OF REDUCING HOUSING COSTS

I. LAND

a. Effect of various land values on various types and grouping of houses

b. Effect of various types of street plans on cost of land (prepared for housing) required for different types of dwellings

II. SITE PLANNING AND GROUPING, as affecting cost of —

a. Grading, terracing, and walks

b. Roads, utilities c. Construction

III. STREET AND UTILITY PLANNING

a. Decreased length by —

1. Grouping of residences, garages, and other buildings
2. Larger block
3. Relation to contours
4. Use of walks to replace roads in places where practical

b. Decreased widths and construction costs by —

1. Planning and building for intended use only
   a. Residential streets built for limited traffic and light loads with no heavier or wider pavement than needed

c. Coordinated development of plans and construction of streets, utilities and buildings

(*Continued on page 228, column 1*)

produce housing. The Economic division will have determined to what extent the production of housing can be carried on more economically for wage groups that could not be decently housed before. Thus a decision can be reached as to the general limitations of the work to be undertaken. It will be apparent that certain parts of the population could be housed only through municipal bounty of some type; that others could be cared for by limited dividend type of financing; that still others, who are just below the economic groups that are served by usual methods of building operations, can be housed by projects organized as large-scale operations with more businesslike, scientific, economic methods of planning, use of land and construction.

The general policy to be followed can thus be chosen and tentative decisions on which to base future studies can be reached as to

1. What groups are to be housed.
2. The types of dwelling that will be considered in future studies.
3. The part of the city or region in which the housing should be located.
4. The changes that are needed in the organizations of the various agencies that will take part in producing the housing project.
5. Legislation changes, if any, needed to facilitate the work.

In the preparation of the Outline of Procedure, I have had the helpful criticisms of Herbert Emmerich in the field of economics and administration, of Ralph Eberlin in engineering, of G. W. Bailey in construction, of Marjorie Sewell Cautley in landscape architecture, and that of my Associate, Henry Wright, in site and city planning, as well as the assistance of Catherine K. Bauer and Allan A. Twichell in research work.

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

IV. HOUSE PLANNING

a. Comparison of cost of various types used locally, used elsewhere and new plans
b. Costs should be broken down as suggested Div. EII-E-IV.

V. CONSTRUCTION *(See Div. AIII and Div. EII-B-VII)*

a. Large scale operation — How large an operation is needed for purposes of efficiency?
b. Research and experiment in —

1. Standardization. 2. Use of new materials
3. New methods including increased shop work and use of additional machinery on job
4. Effect of improved construction on maintenance costs including heating

(SOCIAL AND CIVIC. *Div. SI-DIV, continued*)

g. Commercial facilities for recreation: *Movies, theater, dance-halls, restaurants, amusement parks*

1. Degree of popularity. Costs

h. Activities carried on outside of neighborhood: *where, how far away from home, how much?*

1. Schools and colleges. Technical schools. Night schools
2. Amusements
3. Athletics
4. Museums, art exhibits, concerts

V. BEST LOCATION OF HOUSING for each group depending on:

a. Cost of land in relation to rents payable *(See Div. EII-D-I-II, Div. AII-AIII)*
b. Relation between site and present or possible place of work. Transportation facilities
c. Specific group habits or desires as to garden space, open country, time spent in transit to work, leisure activities
d. Probable relations between group to be rehoused and present neighborhoods contiguous to available plot

VI. GENERAL TYPE OF HOUSING REQUIRES to meet needs and wants of each group

a. General character of population: *amount of income spent for rent and transportation, size of families, number of wage-earners. (See Div. SI, D-II)*
b. National or racial customs and habits as affecting special needs: *Houses, community equipment. (See Div. SI-D-IV-d-e-f)*
c. Preference as to type of dwelling: *space-requirements. (See Div. SI-D-III)*
d. Type of dwelling best fitted to needs

E. RELATION BETWEEN HOUSING LEGISLATION AND CONSTRUCTION OF NEW COMMUNITIES

I. EFFECT OF EXISTING LEGISLATION on housing

II. NEED OF NEW OR REVISED LEGISLATION: *Such legislation might be desired*

a. To limit bad housing. *(Multiple Dwelling Law — New York.)*
b. To encourage good housing

1. By aiding limited dividend housing corporations (New York State and New Jersey Housing laws)

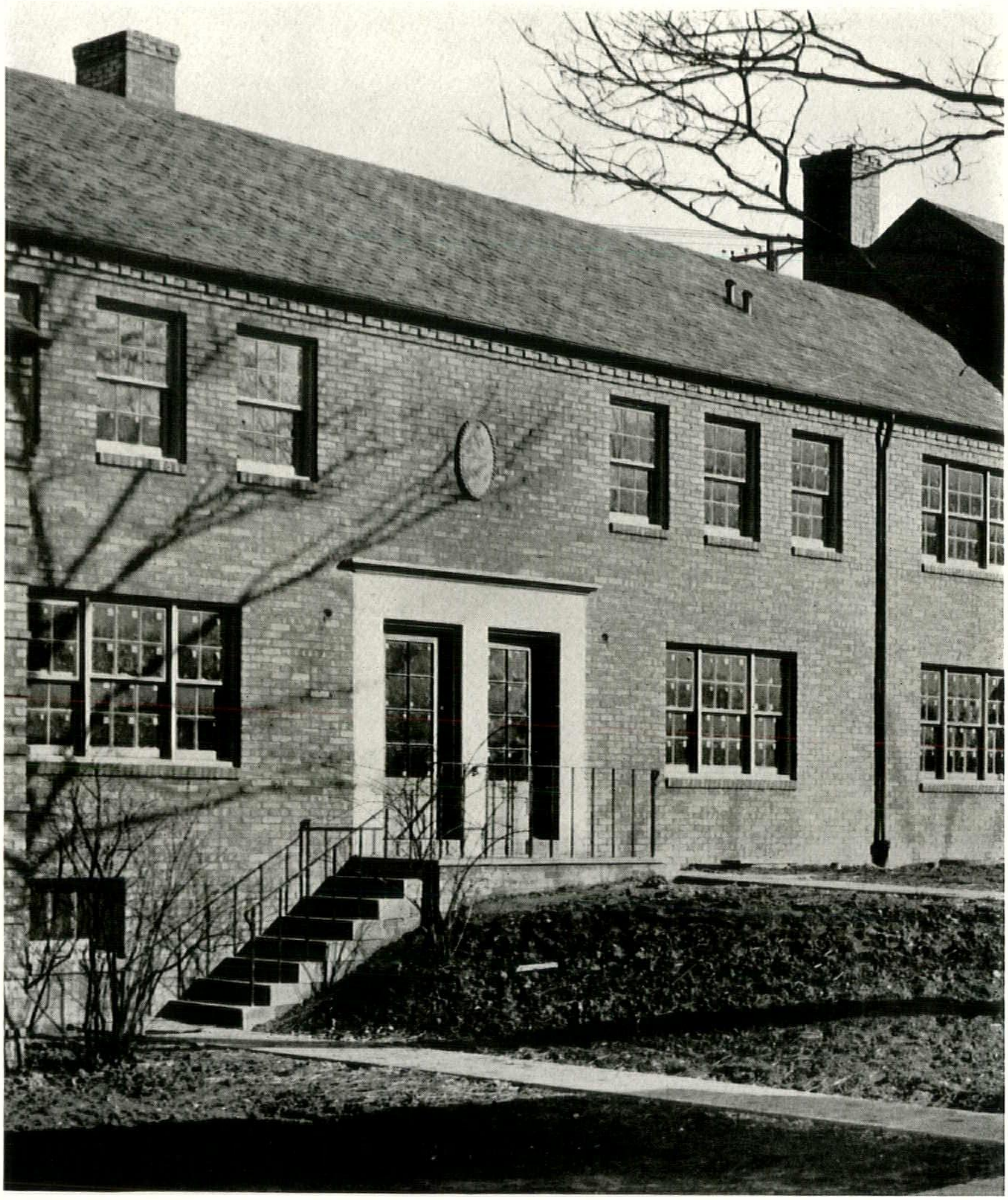
c. To change street plans so as to improve living conditions and decrease cost of development
d. To prevent limitation on good housing (Chicago law limits ownership of more than single building by corporation)

EDITOR'S NOTE. This completes the First Stage of the outline. The Second Stage will be published in the April issue of THE ARCHITECTURAL FORUM and will take up the considerations of the form of organization for the execution of a housing project, the best location and the definite general form of the project. The Third Stage will appear in the May Issue.

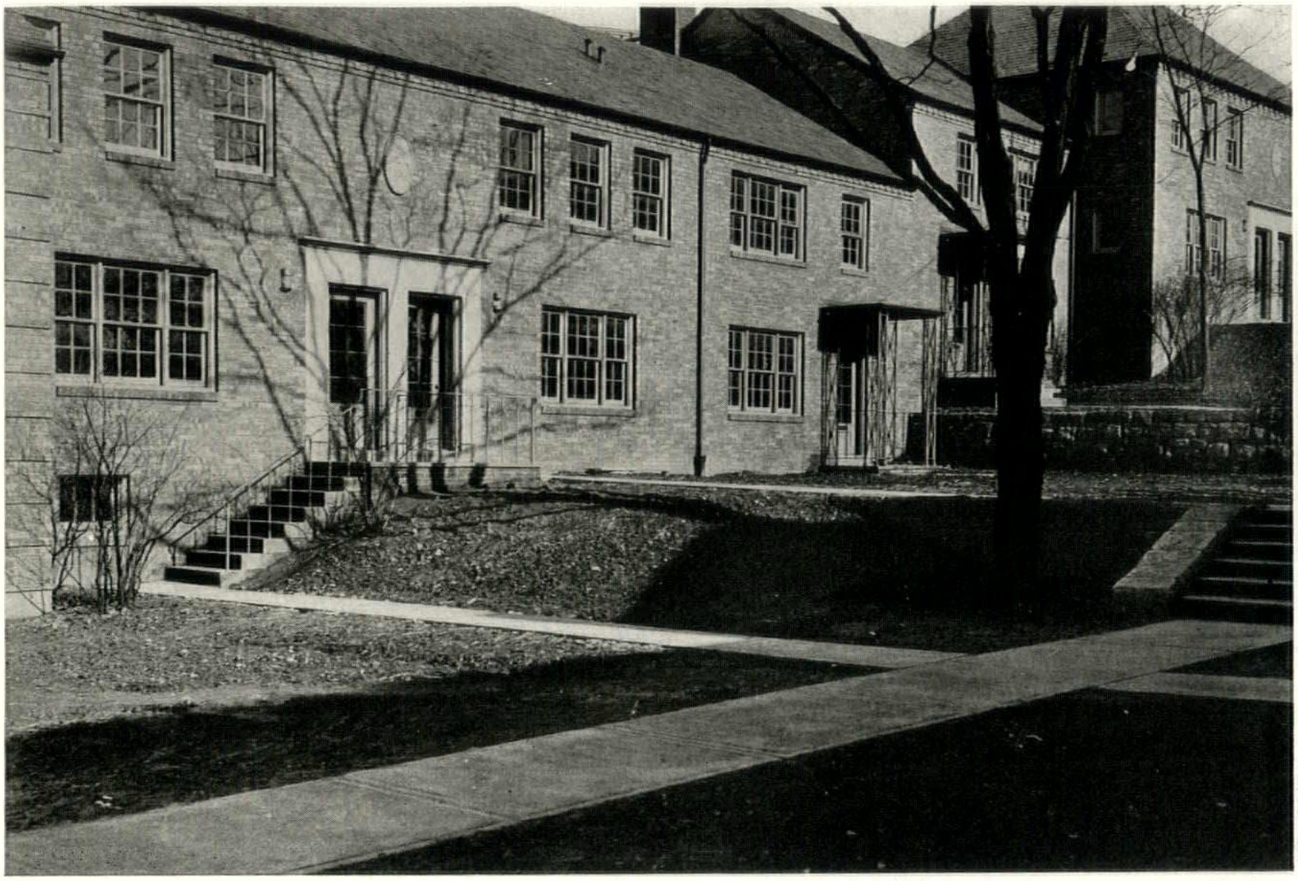
CHATHAM VILLAGE, PITTSBURGH, PA.

THE Buhl Foundation development, called Chatham Village, for which Ingham and Boyd were the architects and Clarence S. Stein and Henry Wright consultants, is one of the most thoroughly thought out low-cost housing developments thus far produced. The intensive analysis which was undertaken before the project was planned now serves as a model for subsequent housing developments. The analysis undertook to determine the needs and the way in which these needs could be met, continuing with studies of costs, the possibilities in regard to site, and the development of the site in various ways. The details of the way in which the analysis was carried out are described elsewhere in this issue by Charles F. Lewis, Director of The Buhl Foundation

ELEVEN HOUSING DEVELOPMENTS



THE BUHL FOUNDATION, PITTSBURGH, PA.
INGHAM AND BOYD, ARCHITECTS
CLARENCE S. STEIN AND HENRY WRIGHT, CONSULTANTS

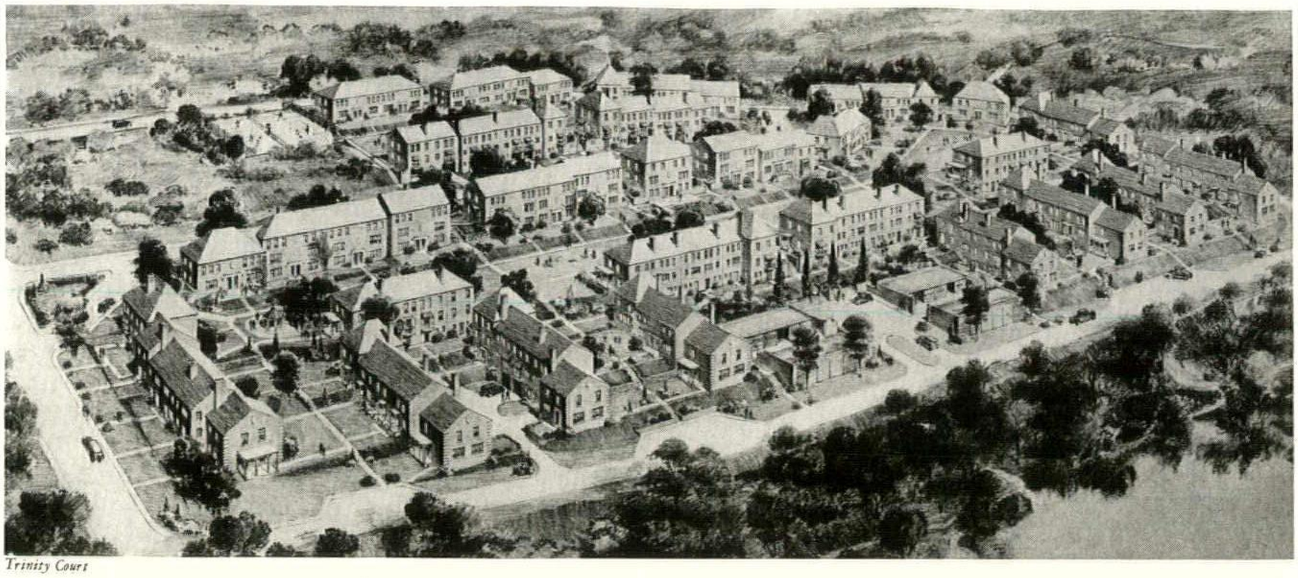


INTENSIVE studies were made to determine the best plan solution for the particular site chosen in the light of the previous investigations as to the income group to be served and the housing requirements of this group. The schemes included free-standing houses and row houses, and it was found that the cost per house of the row type averaged $1,225, while the free-standing houses ranged from $1,834 to $1,948. Investigations also showed the advantages of building the houses to rent rather than for sale in this particular project. There were four basic types of house plans evolved, two being six-room houses, 20 ft. 6 in. by 28 ft. 8 in. and 20 ft. 6 in. by 26 ft. 8 in., the other two being 16 ft. 8 in. by 26 ft. 8 in. and 17 ft. 8 in. by 26 ft. 8 in., designed for small families. These are shown in the plans on the following page. There is a finished basement in each house with a laundry and heating plant. Garages are included within the house where practical and advantage is taken of the contour of the land in placing the garage in the basement. Typical plans are shown on page 232. A portion of the group was recently opened for inspection and reports indicate a very large public interest and an influx of applications from prospective tenants. The rentals range from $54 to $79 per month and the average rental per room is approximately $11

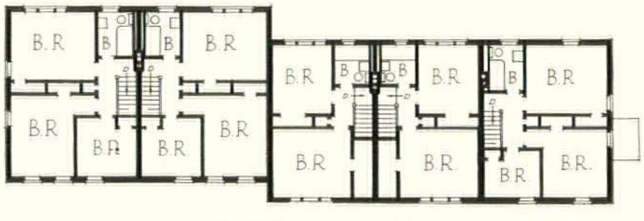
THE BUHL FOUNDATION, PITTSBURGH, PA.

INGHAM AND BOYD, ARCHITECTS

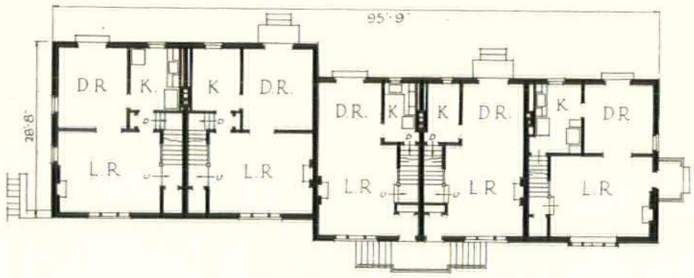
CLARENCE S. STEIN AND HENRY WRIGHT, CONSULTANTS



Trinity Court

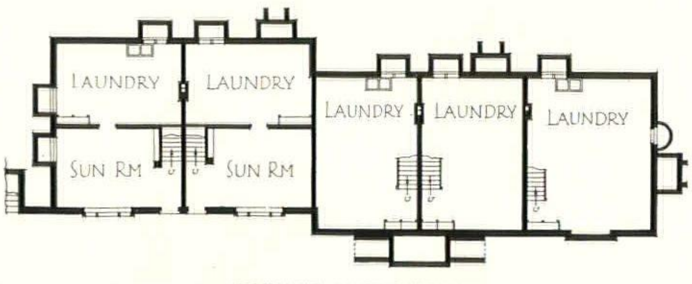


SECOND FLOOR PLAN

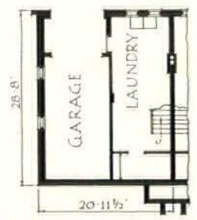


FIRST FLOOR PLAN

THE plans here reproduced show, at the left of the row, two houses of the six-room type (P. 14) which are 20 ft. 6 in. by 28 ft. 8 in., some having a garage and laundry on the ground floor, others providing a sunroom and laundry, omitting the garage. The central houses of the row are of the smaller type, 16 ft. 8 in. by 26 ft. 8 in. (P. 11). The plans of the houses are reversed in such a way as to bring the plumbing lines close together thus effecting economies. The smaller houses have two variations in the plans of the first floor, some having a dining room and small kitchen, others a larger kitchen and a dining alcove



GROUND FLOOR PLAN



ALTERNATE UNIT

THE BUHL FOUNDATION, PITTSBURGH, PA.

INGHAM AND BOYD, ARCHITECTS

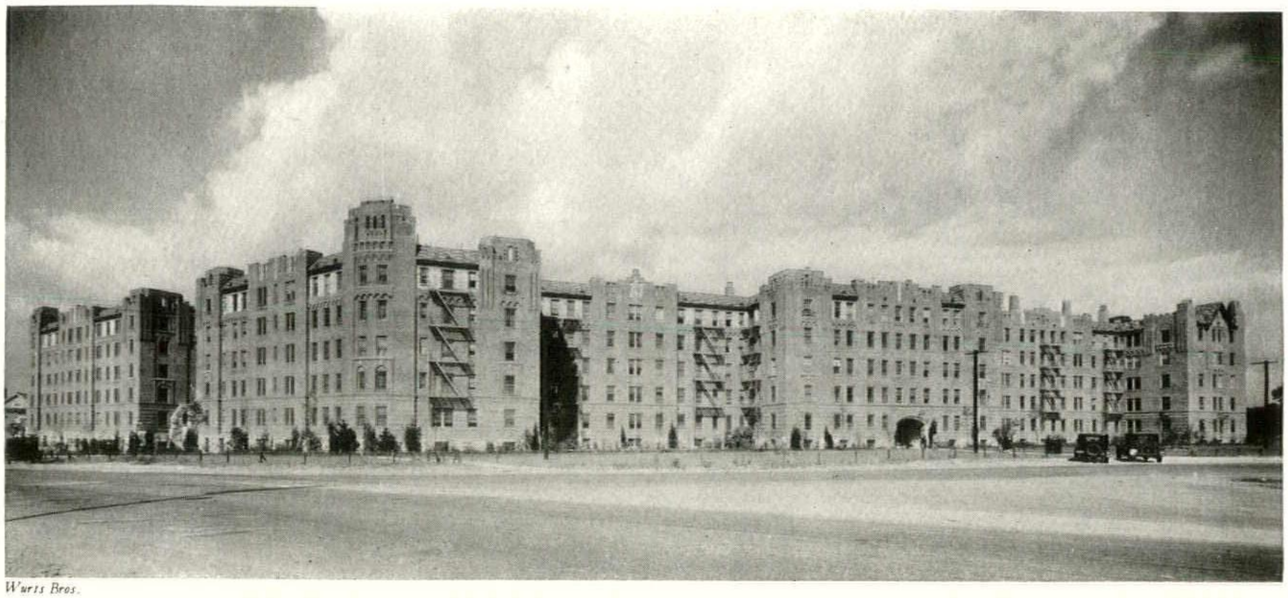
CLARENCE S. STEIN AND HENRY WRIGHT, CONSULTANTS

Wurts Bros.

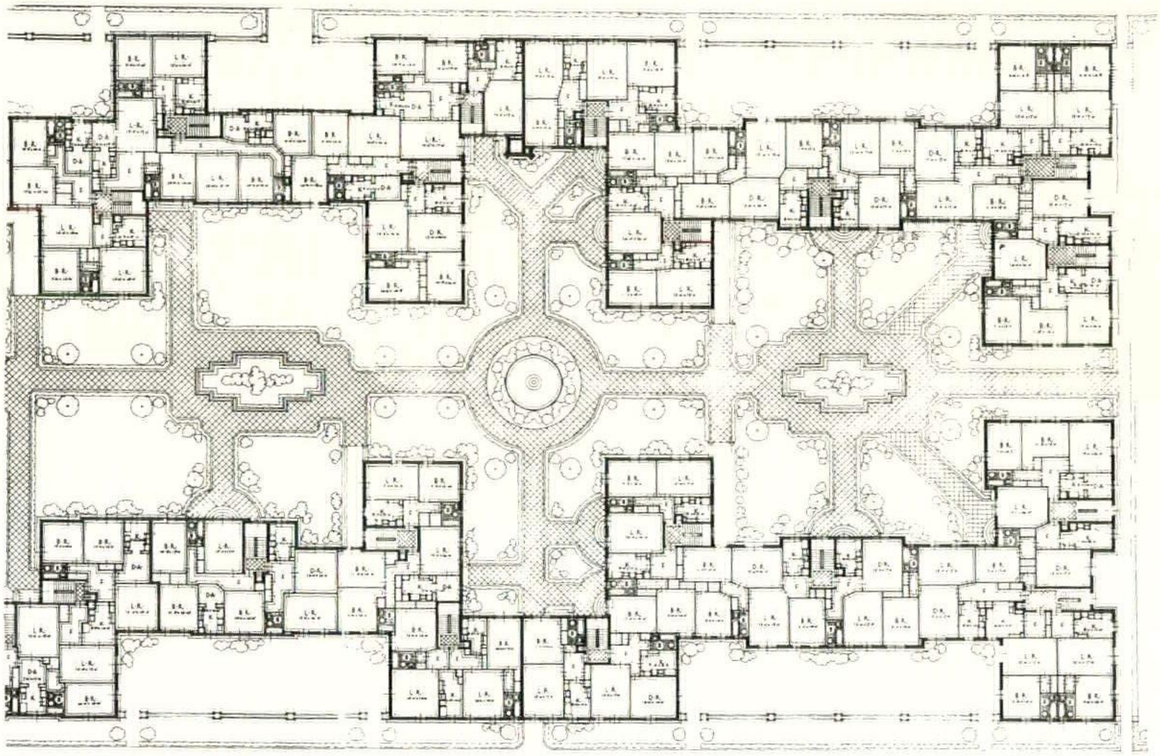
AMALGAMATED COOPERATIVE APARTMENTS

NEW YORK, N. Y.

SPRINGSTEEN & GOLDHAMMER, ARCHITECTS



Wurts Bros.



PORTION OF TYPICAL FLOOR PLAN

AMALGAMATED COOPERATIVE APARTMENTS

NEW YORK, N. Y.

SPRINGSTEEN & GOLDHAMMER, ARCHITECTS

Wurts Bros.

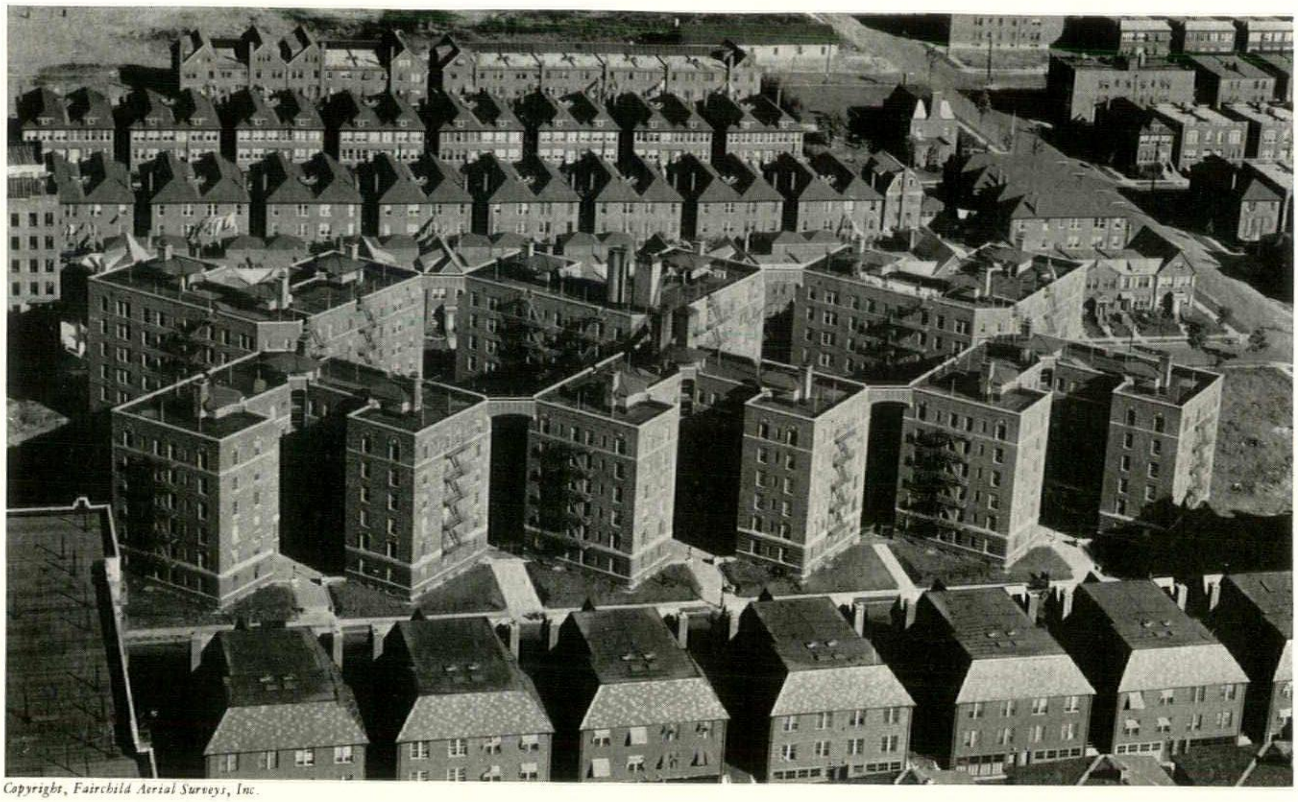
AN ENTRANCE, SHOWING COURT BEYOND

IN THIS cooperative apartment building which rents for an average of $11 a room, the materials and equipment are of a high standard. The interior stairs are of steel with marble treads and wrought iron handrails and the stair hall floors are of ceramic tile. The flooring is almost entirely of oak. The bathrooms are furnished with built-in tub and shower and the walls are tile to a height of four feet. The bathrooms contain many accessories, including a medicine cabinet and mirror, tumbler holder, towel rack, etc. The exposed piping in the bathroom is nickel plated. Each kitchen has a porcelain sink and double wash-tub with enamel covers, and there are adequate dish and pot closets, white enamel gas range and mechanical refrigeration. The incinerator is in the cellar and each stair hall is furnished with a garbage closet. The heating is a two-pipe vacuum system with radiators in every room

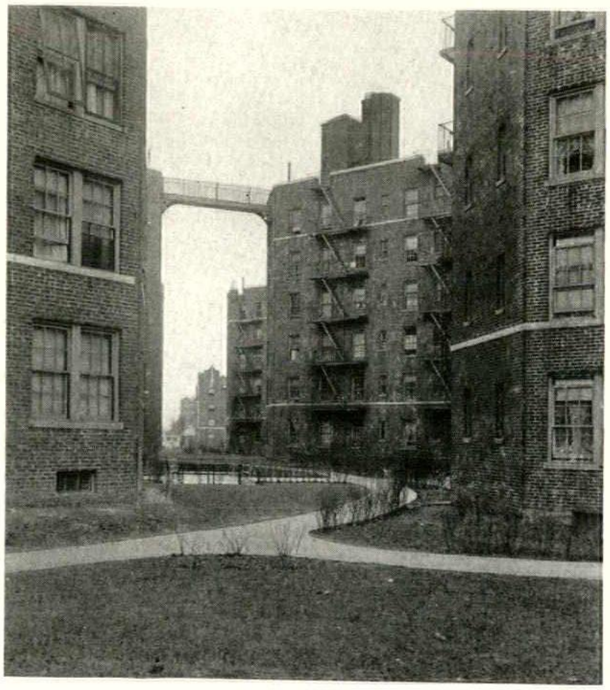
AMALGAMATED COOPERATIVE APARTMENTS

NEW YORK, N. Y.

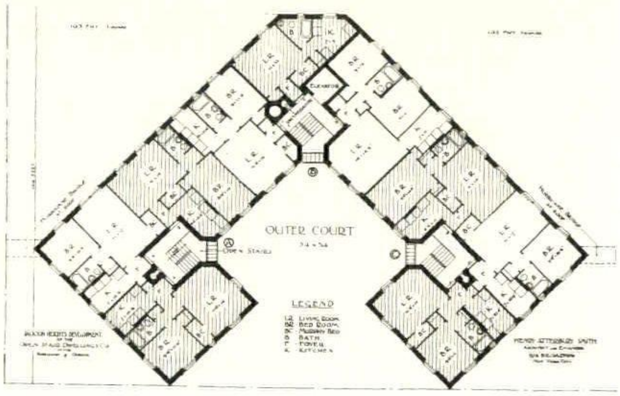
SPRINGSTEEN & GOLDHAMMER, ARCHITECTS



Copyright, Fairchild Aerial Surveys, Inc.

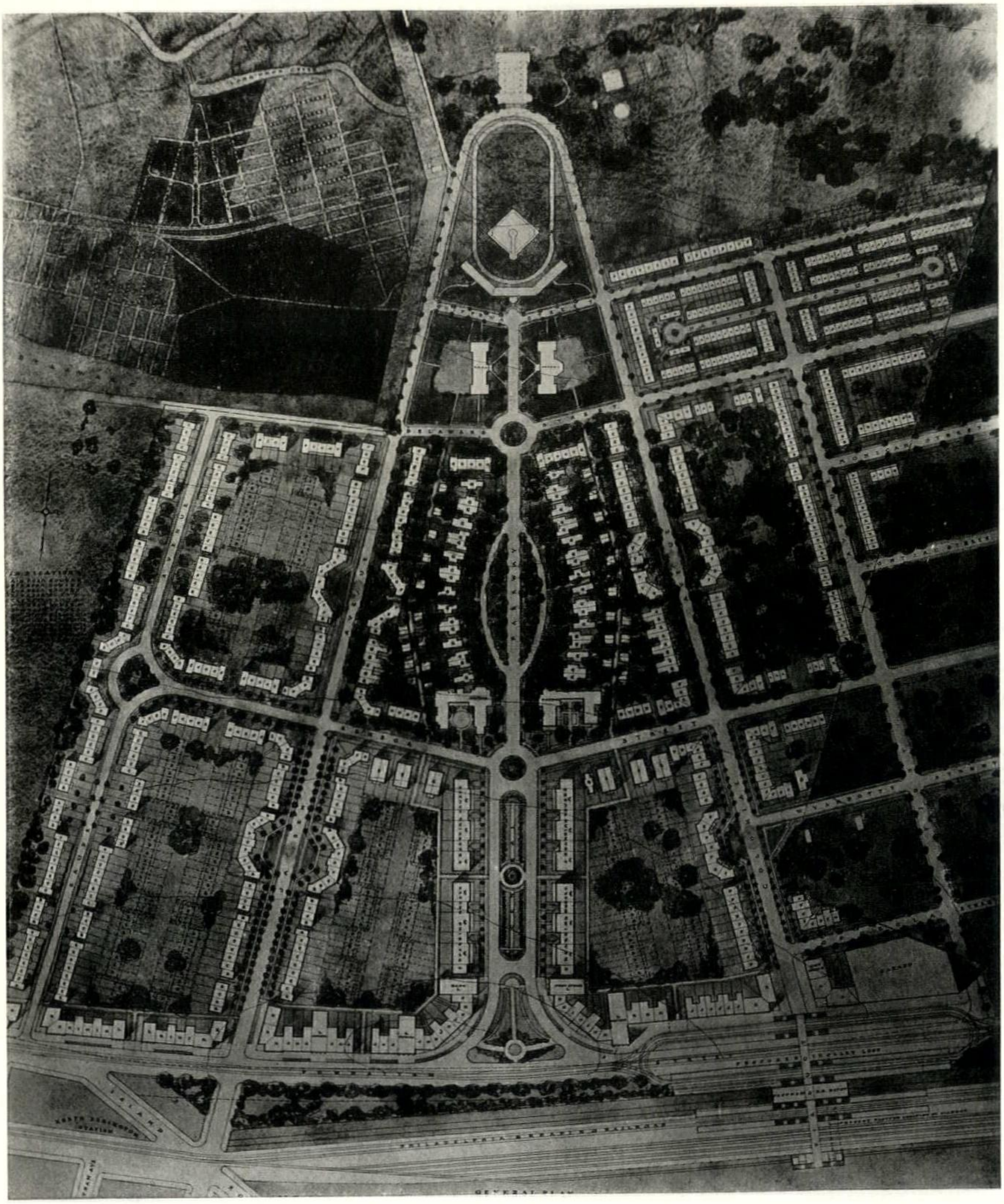


THE Open Stair Dwelling offers one solution to the problem of multi-family housing. Horizontal halls are eliminated in the buildings and this type of stair minimizes fire and smoke risks as well as odor annoyance. The arrangement on the lot gives an assurance of light, air and maximum view from each window



JACKSON HEIGHTS DEVELOPMENT, NEW YORK, N. Y.

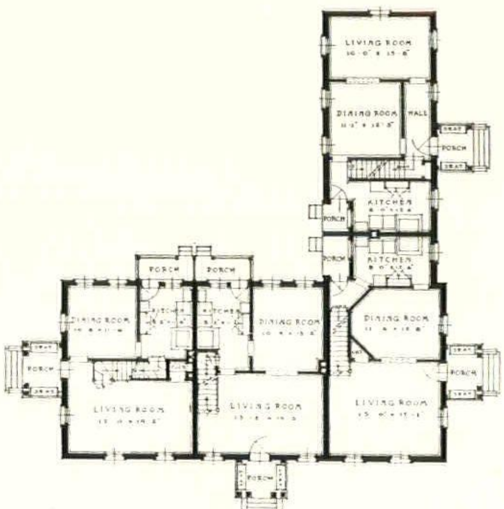
HENRY ATTERBURY SMITH, ARCHITECT



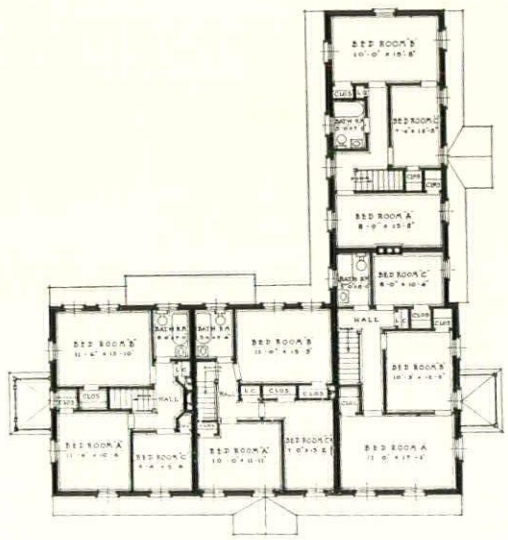
PLOT PLAN

WESTINGHOME VILLAGE, SOUTH PHILADELPHIA, PA.
CLARENCE W. BRAZER, ARCHITECT

A CORNER ROW FOR FOUR FAMILIES



FIRST FLOOR PLAN



SECOND FLOOR PLAN

WESTINGHOME VILLAGE, SOUTH PHILADELPHIA, PA.
CLARENCE W. BRAZER, ARCHITECT

Palmer Shannon

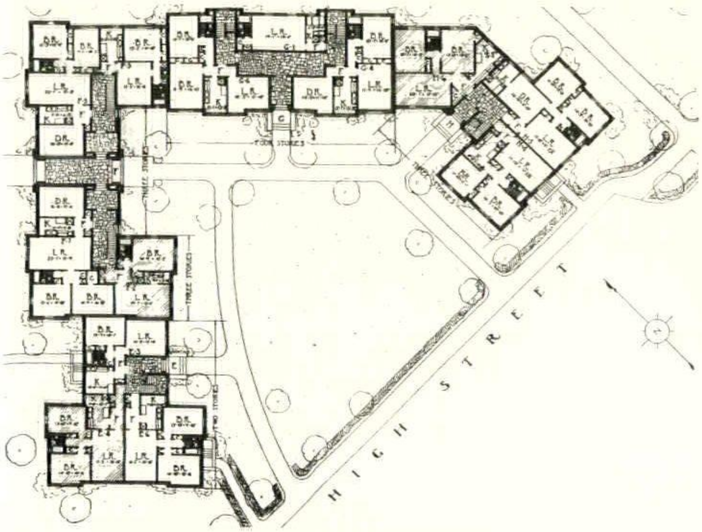
RADBURN, NEW JERSEY

CLARENCE S. STEIN AND HENRY WRIGHT

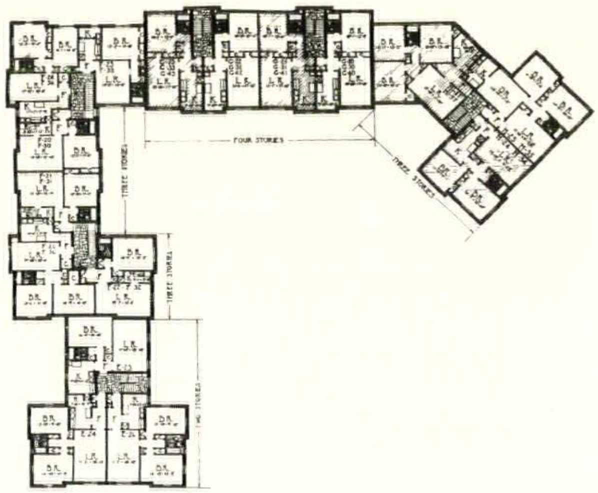
ARCHITECTS AND TOWN PLANNERS

Richard Averill Smith

EXTERIOR VIEW



FIRST FLOOR PLAN

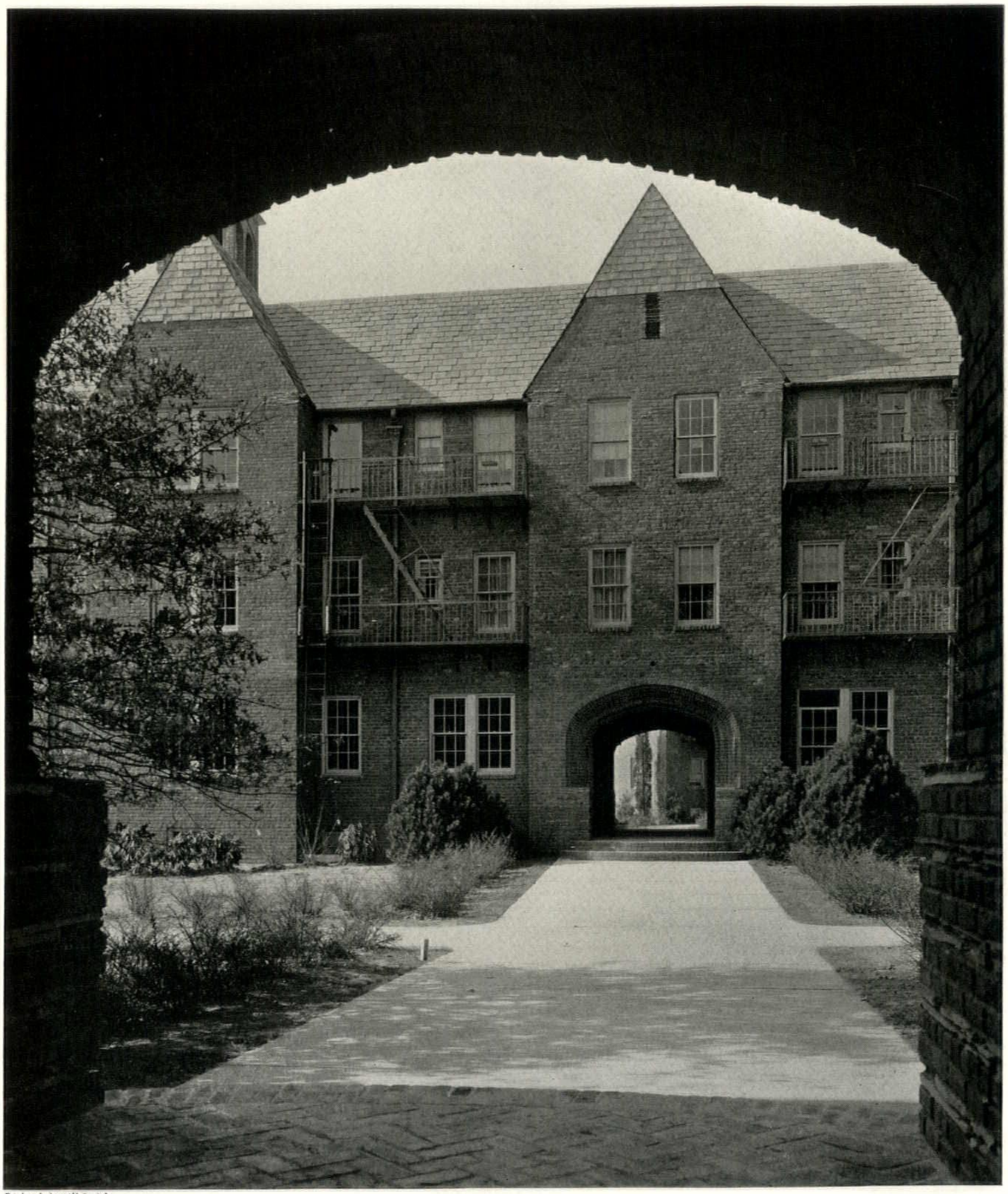


TYPICAL FLOOR PLAN

ABBOTT COURT APARTMENTS

RADBURN, N. J.

ANDREW J. THOMAS, ARCHITECT



Richard Averill Smith

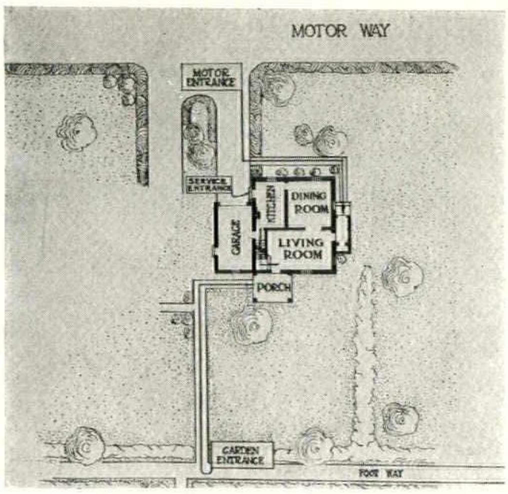
INTERIOR COURT

ABBOTT COURT APARTMENTS

RADBURN, N. J.

ANDREW J. THOMAS, ARCHITECT

Heinrichs



VIEW along the footway in a section of Radburn. Clarence S. Stein was the architect for the houses in the foreground, and Frederick L. Ackerman for those in the distance. The ground plan at the left is typical of the general scheme, one of the most important features of which is the complete segregation of the motor way and the foot path. The orientation of the house, instead of conforming to illogical precedent, has been planned to take full advantage of the garden outlook. The living room and porch face the garden, while the kitchen and dining room front on the highway. Safe play areas for children, greater sunlight and fresh air in the living portions of the house are the chief advantages obtained by this arrangement

RADBURN, NEW JERSEY

CLARENCE S. STEIN AND HENRY WRIGHT

ARCHITECTS AND TOWN PLANNERS

Heinrichs Photos

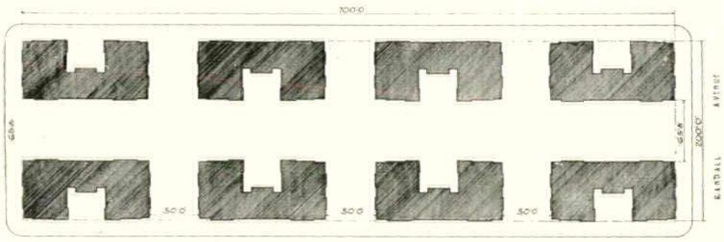
Above is a garden development of two- and four-family houses, for which James Renwick Thomson was the architect. Below is a group of four two-family houses which were designed by Clarence S. Stein

RADBURN, NEW JERSEY

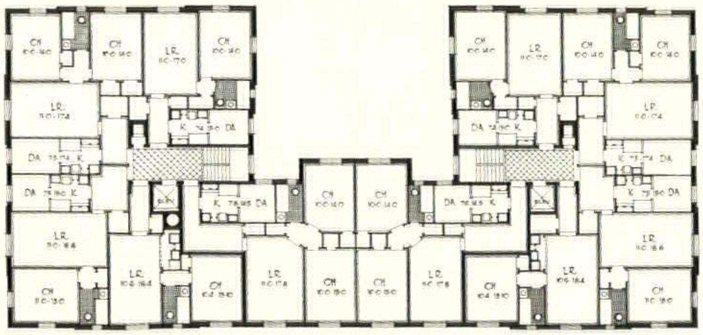
CLARENCE S. STEIN AND HENRY WRIGHT

ARCHITECTS AND TOWN PLANNERS

Dushman



PLOT PLAN



TYPICAL FLOOR PLAN

THIS is the largest single housing project for wage-earners thus far undertaken under the New York State Housing Law. They provide 1,755 rooms accommodating 474 families at an average rental of $11 per room. The apartments cover only 44 per cent of the site. The total cost is estimated as $2,158,000. The buildings are equipped with all modern facilities including automatic push-button elevators and incinerators

APARTMENTS FOR THE ACADEMY HOUSING CORPORATION

NEW YORK, N. Y.

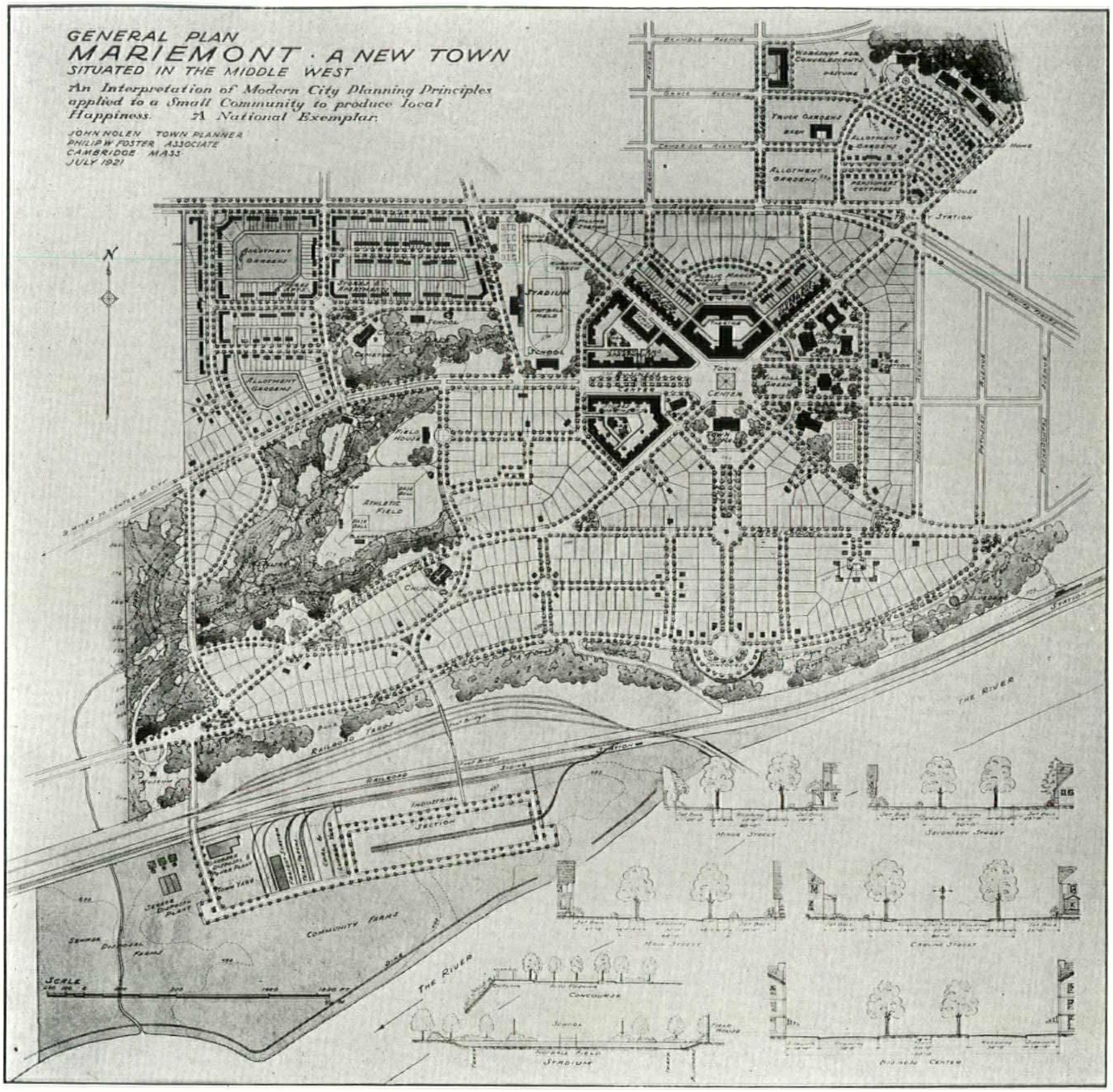
SPRINGSTEEN & GOLDHAMMER, ARCHITECTS

ROW HOUSES, CHESTNUT STREET

MARIEMONT, OHIO

RIPLEY & LE BOUTILLIER, ARCHITECTS

JOHN NOLEN, CITY PLANNER



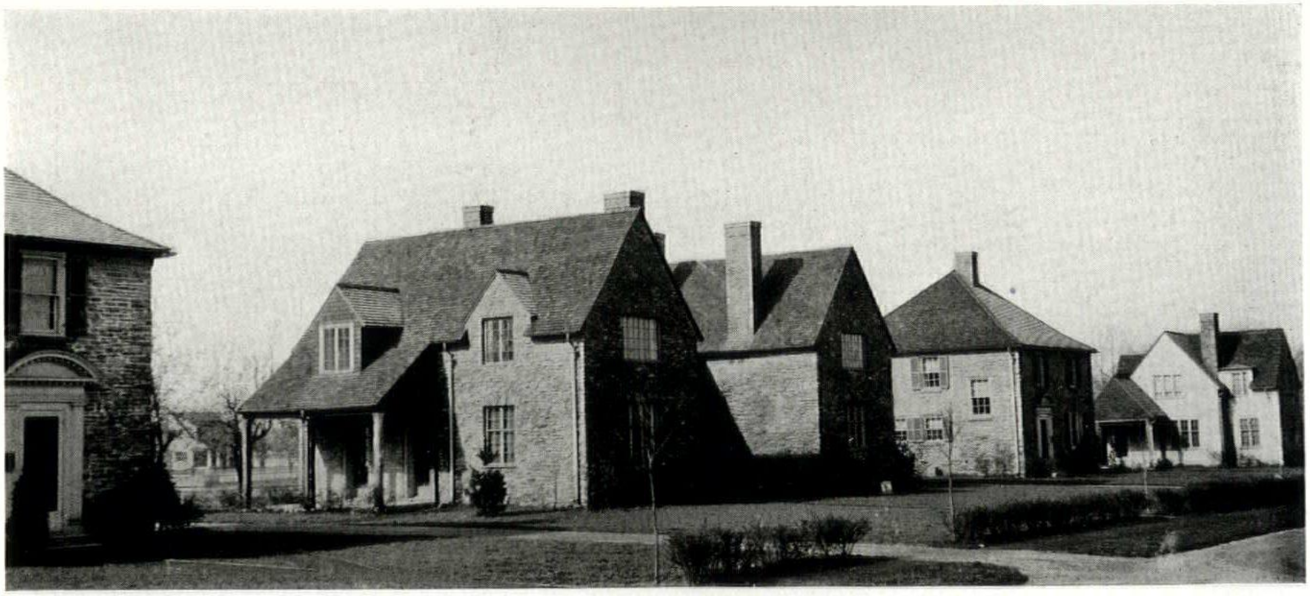
MARIEMONT is an example of the new type of town that can be created near a city as a satellite town. Towns such as this provide the workers in cities with a real place to live. Mariemont is a garden suburb of Cincinnati, Ohio, and follows in general the example set in the creation of Letchworth and the other garden cities of England. It covers an area of about 365 acres on the main line of the Pennsylvania Railroad. The layout of dwellings allows for a population density of about six or seven families per acre, and group-houses, apartments, semi-detached and detached houses are provided to take care of individual requirements. A method of "home ownership" has been worked out on a cooperative basis through the issuance of shares which the Mariemont Company intends to offer for purchase to the residents. Such participation in ownership avoids many of the hardships of the usual type of ownership and allows the managing company to control the tenancy and prevent values from depreciating

MARIEMONT, OHIO

JOHN NOLEN, CITY PLANNER

ROW HOUSES

KRUCKEMEYER & STRONG, ARCHITECTS

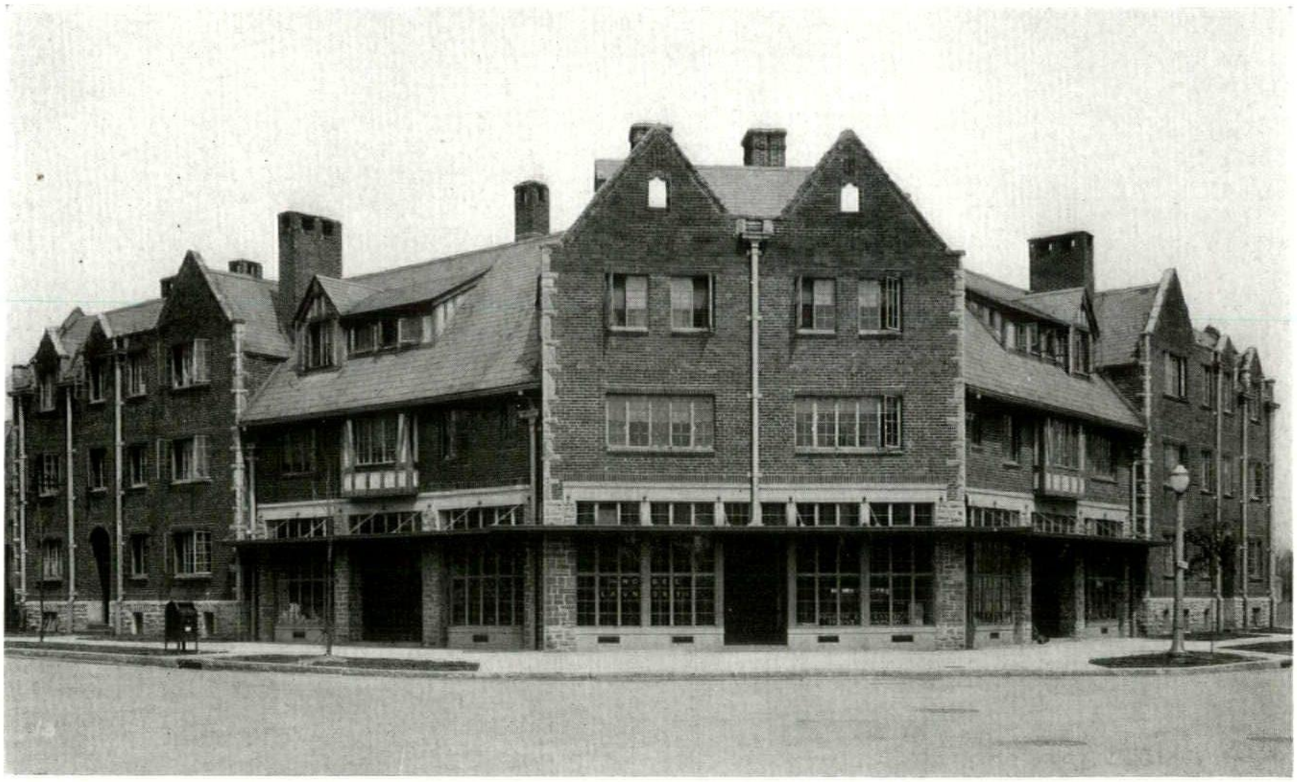


SINGLE-FAMILY HOUSES

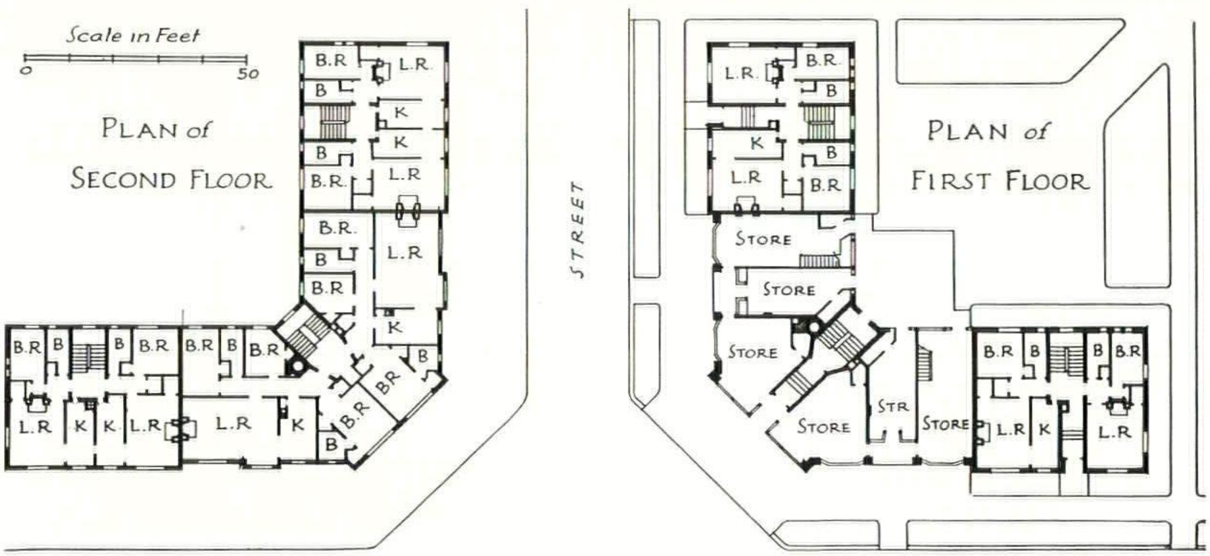
HOWE & MANNING, ARCHITECTS

MARIEMONT, OHIO

JOHN NOLEN, CITY PLANNER



THE provision of community services such as shops and stores is an important consideration in planning a large-scale housing development. It is frequently advisable to combine the stores with apartments in order that the land centrally located may yield an adequate return

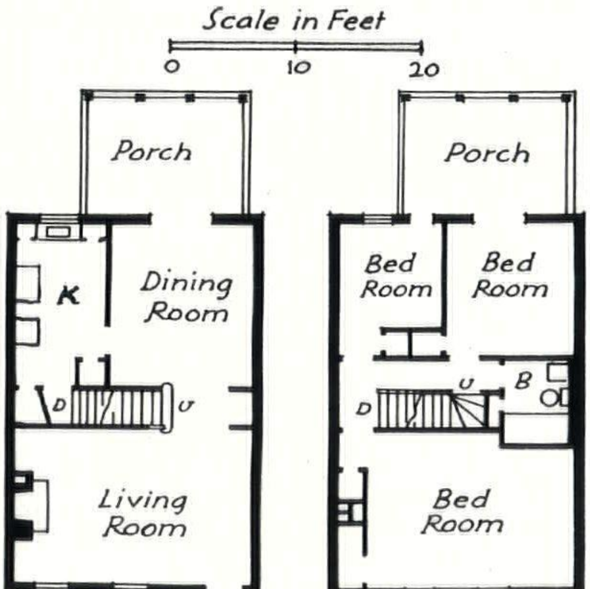


APARTMENTS AND STORES, MARIEMONT, OHIO

RIPLEY & LE BOUTILLIER, ARCHITECTS

JOHN NOLEN, CITY PLANNER

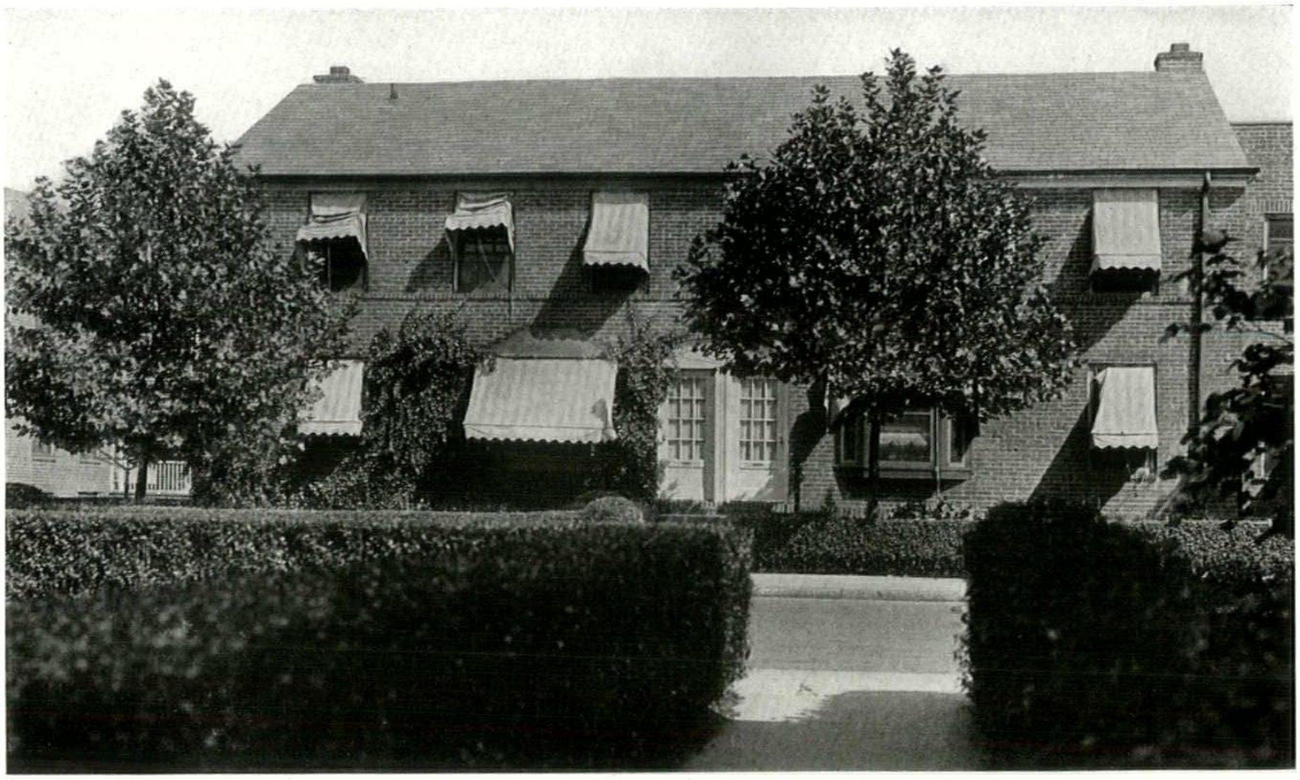
Commercial

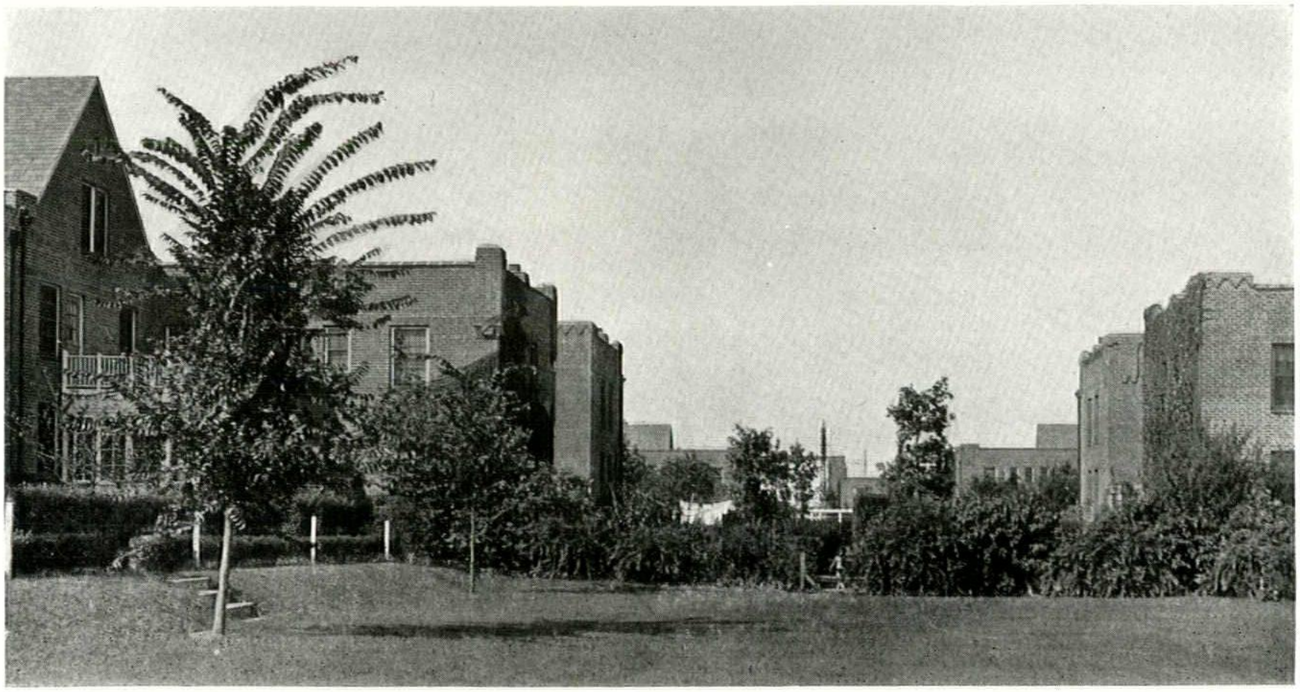


FOXALL, of which a portion is shown above, is a residential development of row houses in Washington, D. C. While above the price level of what is termed low-cost housing, it shows the possibilities of producing an attractive yet simple variation in row housing. These homes are heated by hot water, each with its gas-fired boiler and thermostatic control. Concealed radiators are used and the houses have every modern convenience, including electrical refrigeration, sunken garbage receiver, storage hot water heater, electric clock, etc. The third floor is insulated with a fibre insulation board, and in the two-story houses the second floor ceiling joists are covered with a quilt insulation

FOXALL, WASHINGTON, D. C.

DEVELOPED BY WAVERLY TAYLOR, INC.

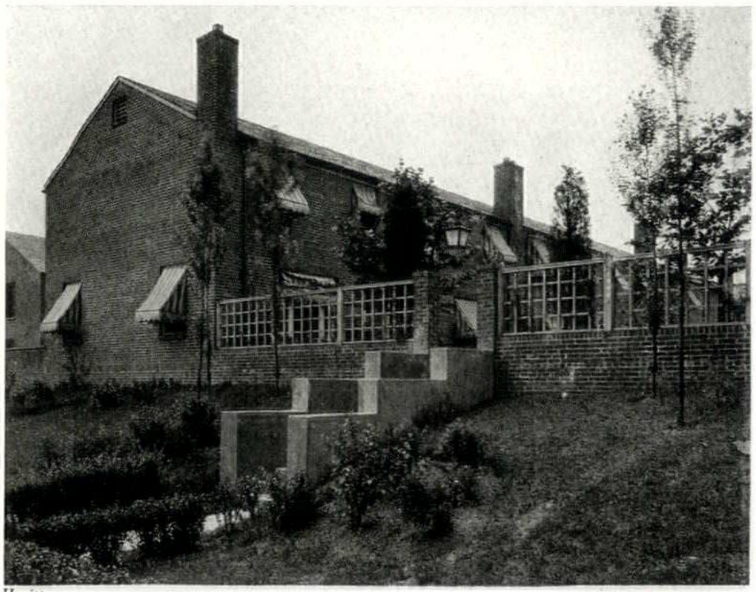




SUNNYSIDE, QUEENS, NEW YORK, N. Y.

CLARENCE S. STEIN AND HENRY WRIGHT, ARCHITECTS, ASSOCIATED

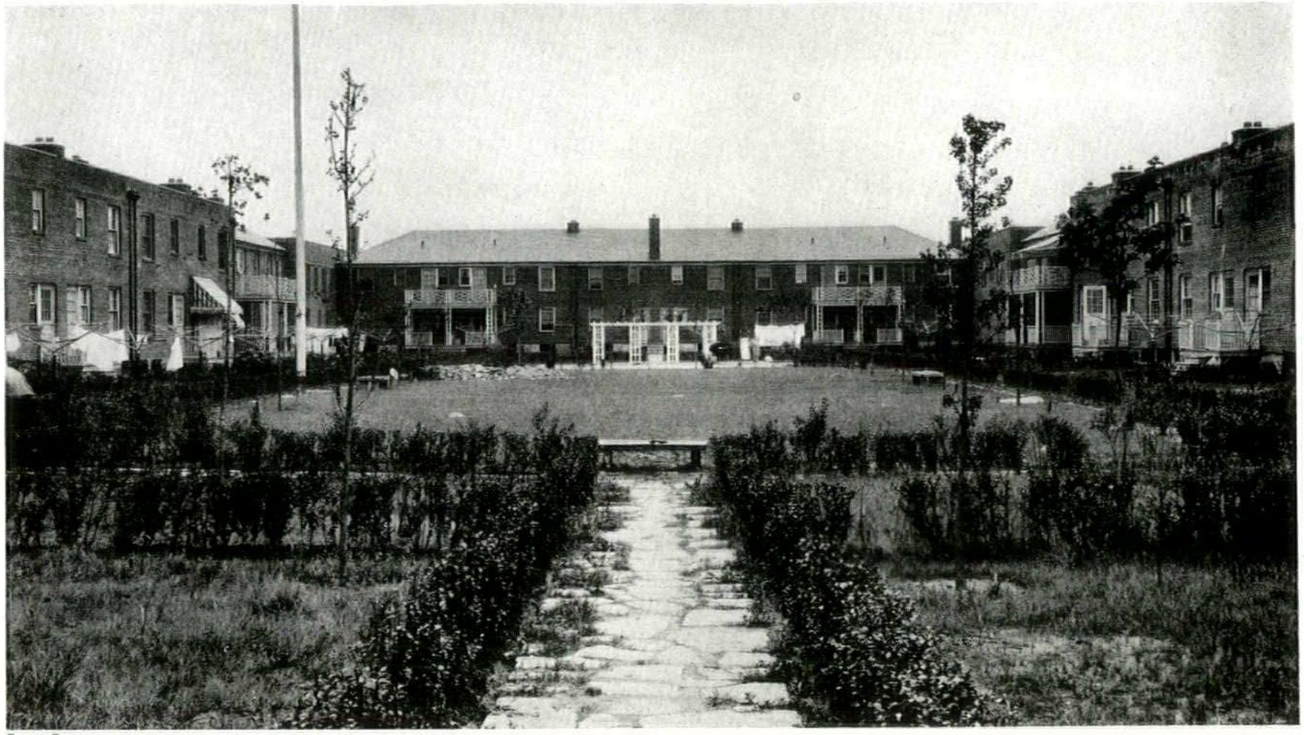
SUNNYSIDE is the development which has for several years been the outstanding example of the possibilities of developing city blocks with low-cost housing. The project was sponsored by the City Housing Corporation, a limited dividend corporation paying 6 per cent. There are small houses, row houses, two-family houses and apartments, and in all cases the planning provides a large proportionate area devoted to garden courts, planted spaces and recreational facilities. The latest development in the neighborhood of Sunnyside is that of the Phipps Garden Apartments, shown in the February issue of THE ARCHITECTURAL FORUM



Hewitt

SUNNYSIDE, QUEENS, NEW YORK, N. Y.

CLARENCE S. STEIN AND HENRY WRIGHT, ARCHITECTS, ASSOCIATED



Brown Bros.

Richard Southall Grant

SUNNYSIDE, QUEENS, NEW YORK, N. Y.

CLARENCE S. STEIN AND HENRY WRIGHT, ARCHITECTS, ASSOCIATED

THE EDITOR'S FORUM

THE INTERNATIONAL STYLE

NEW YORK architects, and incidentally the interested though somewhat bewildered public, have been treated to an exceptionally well chosen and perfectly staged exhibition of the work of exponents of the "international style." "Modern" or "Moderne" are less descriptive and connotative terms, for the examples shown (with but few exceptions) were distinctly of an established *style*, unified in idea and in form. This consistency was surprising for it showed how fully formulated the new "international style" has become — stark, unadorned wall surfaces, expanses of glass, steel stilts, flat roofs, plans studiously different from the conventional with the entire emphasis on the solution of the problem of *use*, "design" limited to the simple structural necessities. Ornament and decoration as such are of course eliminated and the old hampering considerations of balance, proportion and rhythm (so dear to academicians who consider architecture a fine art) have been superseded by practical function, space-enclosing and manufactured materials.

The "international style" is based on a thoroughly logical philosophy, even if the designs are not always quite consistent with it. It is an inevitable development as an expression of the fast-growing band of scientific-minded who believe in the universal efficacy of machine efficiency in satisfying all human needs. The style is the result of conscious effort applied to solving a physical problem by the simplest means. Architecture begins where this engineering effort leaves off, for, "We require from buildings as from men two kinds of goodness: first the doing of their practical duty well; then that they be graceful and pleasing in doing it — which last, is itself, another form of duty." The new "international style" may be accused of being recreant to this last duty unless all æsthetic ideas and ideals undergo a rapid and radical change and emotion no longer is a factor in the expression of man's activity.

The rôle of the "international style" may be to clear the way for a new architecture by sweeping aside the chaff of copyism, though there is the danger of this style itself becoming the happy hunting ground of copyist charlatans. But from this bare beginning may grow through the fertile imaginations of youthful designers, an architecture that will be truly "functionally efficient, economically sound *and* æsthetically satisfying."

HOUSING AND THE EMERGENCY

THE speedy resumption of building construction through housing projects cannot be expected as housing should not be considered an emergency measure to "make work" for the industry. Proper large-scale housing must be the result of comprehensive planning after determining the social, economic and architectural needs, and the ways and means of meeting these needs. Clarence S. Stein's article on Procedure (page 221 of this issue) shows this clearly.

However, housing does offer opportunities for relief in this emergency in several ways.

First, housing surveys in each city can be undertaken under the direction of Building Congresses, A.I.A. Chapters, or other cooperative agencies. Capable unemployed men, such as architectural draftsmen, can be employed as field forces in making surveys for building in each city.

Secondly, architectural men can be employed in the preparation of plans of the city which will show existing conditions, and also in working on more comprehensive city planning projects under competent direction.

Thirdly, under the auspices of A.I.A. Chapters, with the aid of manufacturers and others, architectural men can be engaged in the development of plans and construction methods for fabricated houses. With the amount of material already developed in this direction, the further thought and study should produce practical means of providing standardized units which can be prefabricated and erected in the most economical manner.

Finally, there is a possibility of giving work by following the example of one suburban community in which the relief commission has undertaken to build three houses in a community where they are desired. The local architect contributes the plans, the landowner provides the lot at cost, the material dealer extends credit for the materials and the builders' exchange employs the foreman at its own expense. The local relief board chooses the most needy of the capable carpenters, masons and other mechanics, and the wages are paid from the local relief funds. The houses will be sold at actual cost. In this way men are employed at their own work instead of at "made" jobs.

Kenneth K Stowell

EDITOR

A COMMUNITY BUILT ON FACTS

BY

CHARLES F. LEWIS

DIRECTOR, THE BUHL FOUNDATION

IN THE summer of 1931 The Buhl Foundation acquired an undeveloped estate of 45 acres of rolling land, two miles by motor, twenty minutes by street car, from the heart of the Golden Triangle, Pittsburgh's business and financial center. The Foundation announced that upon this tract it proposed to build on a strictly commercial, though limited dividend basis a modern community of 300 garden homes designed to embody the best contributions of the site planner and the building and landscape architect. The first unit of 125 of these homes would be ready for occupancy May 1, 1932, it was announced, at rentals within the reach of families with incomes of from $2,400 and above.

On January 23 the first unit of Chatham Village was thrown open to the public with the announcement that monthly rentals would range between $54 and $79 for houses of five, six and seven rooms, many of them including garage, and representing an average for the entire project of almost exactly $11 per room per month. In spite of a cold dismal rain there was a throng at the property and the next day, Sunday, a huge crowd, estimated by the police at 20,000, filled the exhibition houses to capacity and jammed traffic for nearly two miles down the Mt. Washington Highway and across the Liberty Bridge. During the ensuing week an average of more than 1,000 persons a day visited the Village and on the second cold Sunday nearly 2,500 were checked through one of the typical exhibition houses.

This demonstration of public interest in Pittsburgh's first garden homes development may well be interpreted as an evidence of deep-seated dissatisfaction with the housing that our cities now provide and an earnest longing on the part of the so-called "white collar" groups, particularly, for a greater degree of social and economic security in which to rear their families. This interpretation is backed by nearly 2,000 inquiries that have come to The Buhl Foundation and its subsidiary management corporation, The Chatham Realty Co. More than 500 formal applications were received in the first two weeks after the rental schedules were announced. In this same time 90 leases were signed, definite reservations made upon all other houses pending inquiry into the applications, and a long waiting list established particularly for homes in the lower-priced levels.

It is believed, then, that those who for years have been advocating large-scale community building as an approach to the solution of the urban housing problem may point to Chatham Village as an initial success which at this stage justifies some of their enthusiastic claims. The sponsors of Chatham Village by no means consider the present public acceptance of the project as indicating that their work is done. On the other hand they feel that it is only started, and that this public approval increases immeasurably the responsibility they have assumed. They recognize, furthermore, that the complete success of the large-scale building idea can be fully demonstrated only over a period of several years, and they are prepared to administer Chatham Village with this long-term purpose ever in mind.

The Buhl Foundation's studies showed to its satisfaction at least that there is such a field in socially minded experimentation and demonstration in urban housing. Its inquiries into American and European experience led to the acceptance of the large-scale operation as a sensible approach to the program. Its studies of the housing situation in Pittsburgh particularly led to the conclusion that a useful field for demonstration was in endeavoring to meet the needs of a part of the "white collar" groups. Its social and economic studies led it to believe that it could best serve these groups, not by promoting an "own your home" campaign but by developing a rental project assured of long-term, responsible management.

In a project of this kind, even after the most careful study, the elements of uncertainty are so great as at times even to stagger stout hearts. The experience in building Chatham Village thus far seems to be very gratifying as indicating the reliance that may be placed upon careful study and planning. It is very likely that an entirely different kind of development would have been projected in Pittsburgh had it not been for the long months of study and deliberation in which the Board of

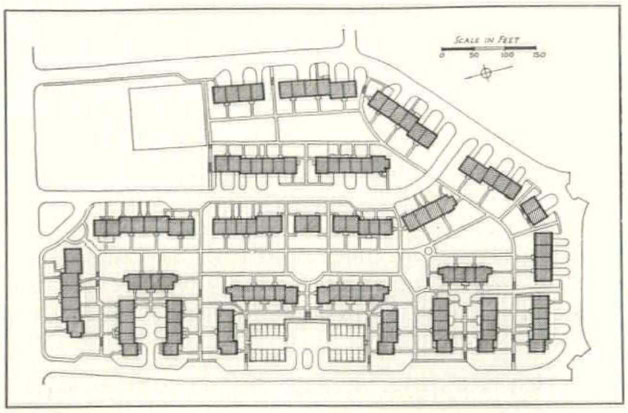
Managers joined with the Foundation's staff and it does not seem probable that any initial success, even remotely resembling that which has been won by Chatham Village, could have been achieved had it not been for plan and study.

At a time when enthusiasts in many cities are endeavoring to promote housing as a means of reviving industry in general, the Pittsburgh experience in this respect may be valuable as indicating at least one type of study which seems to have been sound. But certainly Chatham Village cannot be properly cited as evidence that any type of large-scale operation can succeed in any place or situation without due regard for, and understanding of, the controlling factors in that particular locality.

In its studies of the Pittsburgh market The Buhl Foundation fixed for itself certain questions as points of attack. These were such as the Foundation's staff felt justified in setting up for examination on the basis of observation, experience and the best counsel that could be had.

Among the questions for which the Foundation sought specific answers were:

1. Is Pittsburgh a growing city with an assured future?
2. Is the number of houses proposed to be built in a two-year period small or large in comparison with the annual total of residence building in the projected cost range?
3. Is the Pittsburgh district overbuilt in the proposed price class?
4. By producing (a) better houses at (b) lower prices than speculative or commercial builders now build, will a broader market than now exists be opened?
5. Can the advantages enjoyed by limited dividend housing in other cities be enjoyed in some degree in Pittsburgh, through (a) lower financing charges, (b) better plan, and (c) large-scale operations, at this time?
6. What types of housing and what locations will best meet the needs of those families for whom the homes are to be built?



The plot plan of Chatham Village, the first unit of The Buhl Foundation development

In its search for answers to these controlling questions the statistics of population growth, residential construction, mortgages and foreclosures of the entire metropolitan district and minor subdivisions were tabulated, charted and weighed. Rent schedules, wage levels, living costs, statistics of family income and surplus were assembled. In the meantime a search for sites had encompassed the district and, when this had been narrowed, the 45-acre Bigham estate was planned for development and a final and detailed inquiry made into the cost of grading, utilities, and house construction of the proposed project. This cost analysis, which was broken up in great detail, was utilized as a check at every stage of the subsequent development.

All of these studies were carried along against a background of information provided by a searching questionnaire sent by the Bureau of Business Research of the University of Pittsburgh to some

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An air view of the business center of Pittsburgh showing the site of Chatham Village, at the lower left

4,000 clerical workers in the downtown business district, receiving salaries of $5,000 a year or less. More than 30 per cent of these, 1,415 in all, 592 of them home owners and 823 of them renters, filled in these questionnaires faithfully and in great detail. This afforded for the first time an effective cross-section of information upon which it was possible to plan homes of a type, quality and price that fitted to their needs and their incomes.

This questionnaire was designed to provide answers to the following questions concerning these families:

1. What relationships exist between the costs of housing accommodations and the salaries and family incomes of home owners and renters?
2. What are the costs of housing accommodations to the renters and to the home owners?
3. What proportion rent and what proportion own their homes?
4. What are the reasons for renting or for home owning?
5. What are the housing accommodations enjoyed by the salaried workers?
6. What form of transportation is employed to get them from home to work and how much time is taken?
7. Where do they live?

The questionnaire was quite satisfactory from the standpoint of providing information as to existing living conditions among the groups studied. Analysis of it now, however, suggests additional information that might properly be asked for in such a survey. Particularly what is needed is to search the hearts and the minds as well as the homes of the groups under study. It is hardly enough to ask what conditions families now live under. It is equally important to ask what conditions they would like to live under. With that thought in mind the questionnaire used in the Pittsburgh study has been revised and expanded to accompany this article for whatever suggestive value it may have for architects and others interested in large-scale residential building.

It is clear that this questionnaire could not have been used, as now redrawn, in the original Pittsburgh study. It would have been quite beside the point to ask, as is done under Question 19, whether the family would like to live in a garden grouping in a completely planned community. At that time Pittsburgh had no demonstration of this type of development and the question would not have been understood by more than a few persons. Likewise the leading questions asked under No. 23 would have had less significance in Pittsburgh a year ago than they have today since the opening of Chatham Village.

The economic and social interpretations of any basic housing studies touch the interest of the architect at so many points that it is apparent that he should be a part of them from the first. He can influence and help to guide the inquiries into commercial practicability and marketability, and in turn can be guided by the useful economic and social facts that are brought to light.

Surely it must not be supposed, however, that factual justification should be required for every step that is taken in a large-scale project, particularly if that project is intended to blaze new trails, as was the case at Sunnyside, at Radburn, and more recently at Chatham Village. Each of these undertakings embodies new ideas in site planning, in house design and equipment, and in architecture, just as each has embodied advanced ideas in economics, finance and broad social policy.

To the extent that large-scale projects may be intended to blaze trails, they must be experiments as well as demonstrations. They must attempt, within reason, to solve problems previously unsolved and to suggest new ideas, methods and approaches. In doing this, they will make their greatest contribution. But such contribution is one that involves some element of risk because an experiment cannot be proved before trial.

It must be manifest, however, that the element of risk is reduced as the bounds of factual understanding are enlarged. We may be sure that the more thoroughly any project of this nature may be studied in advance, the greater is the assurance of success and the greater commercial justification for experiment with new modes and new ways.

QUESTIONNAIRE ON HOUSING

(Note: If any of these questions are not clear to you, please call.................... and ask for.............)

SECTION I

1. Where do you live?
Pittsburgh Ward No. ......Street ....
Nearby cross street .... Or borough name............. Or township name............

2. Do you own your home or rent? Check one.
Own.....
Rent ....

3. If you rent, what is the total amount of rent paid?
For the year? $.........
For one month? $.........
Does your rental include the following?
(a) Gas. Yes...... No......
(b) Water. Yes...... No......
(c) Electricity. Yes...... No......
(d) Refrigeration. Yes...... No......

(e) Heat. Yes...... No......
(f) Household service. Yes...... No......
(g) Garage. Yes....... No...... If two-car garage, check here......

Do you rent your home furnished?...... or unfurnished?......

4. **If you own your own home:**

What is its assessed valuation { On land? $......... / On buildings? $.....

What was the total in real estate taxes paid on it in 1931:

For city, borough or township purposes? $.......
For school purposes? $..........
For county purposes? $..........

5. **If you built your own home:**

What was the cost of the lot? $...........
What was the cost of the building? $ ....
Does this cost figure include garage? Yes...... No......
If garage was built subsequently, what was its cost? $..........
In what year was home built? ....

6. **If you purchased your home:**

What was the purchase price? $..........
Does this cost figure include a separate garage? ......
If garage was built subsequently, what was its cost? $..........
In what year was home purchased? ....

7. **Is your home mortgaged?** Yes...... No......

(a) What is the amount outstanding on the first mortgage? $..........
(b) What is the amount, if any, oustanding on second mortgage? $..........

SECTION II

8. **What type of dwelling do you live in?** Check one.

(a) Single......
(b) Double (party wall)......
(c) Duplex (one family above the other)......
(d) Double duplex (two families upstairs, two downstairs)......
(e) Row......
(f) Apartment......
(g) Housekeeping rooms......
(h) ....

9. **How many rooms does your home contain?** Total number..........(Not including bath)

(a) Bedrooms, Number..........
(b) Dining room, Yes...... No......
(c) Private bath, Yes...... No......
(d) Full-size kitchen...... Kitchenette......

10. **What is the type of heat used in heating your home?**

Type of furnace? Check one.	What fuel is used? Check one.
Hot air......	Coal......
Steam......	Gas......
Vapor......	Oil......
Hot water......	....
Gas stoves in rooms......	

11. **How many persons live in your home?**

Wife. Yes...... No......
Number of children under 16..........
Number of children 16 and over..........
Number of other relatives..........
Number of other persons..........

12. **What form of transportation do you usually use?**

Check one.

Street car...... Inclined plane......
Motor bus...... Walk......
Railroad...... ....
Private auto......

How long does it usually take you from home to work, using the medium of transportation checked above? ....minutes.

13. **Do you own a family automobile?** Yes...... No......

(If more than one for personal or family use, how many?..........)

SECTION III

14. **What is your age?** ....years.

15. **What type of work are you engaged in?**

Selling...... Clerical......
Accounting...... Executive......
....

16. **What was the combined income of your family in 1930? $**..........

17. **What was your personal income in 1930? $**..........

Of this amount, how much represented salary or earnings from your main occupation? $..........

18. **How much income, if any, was received for rooms or lodging** (from children, boarders, or lodgers)? $......

SECTION IV

19. **If you were renting and moving into a new home now, would you prefer:**

(a) Single family house on separate lot......
(b) Double (party wall)......
(c) Duplex......
(d) Double duplex......
(e) Row......
(f) Garden grouping in completely planned community (such as Chatham Village)......
(g) Apartment......
(h) Housekeeping rooms......
(i) ....

20. **In a new home would you prefer:**

(a) Full-sized dining room......
(b) Dinette......
(c) Full-sized kitchen......
(d) Kitchenette......
(e) Bedrooms (how many?)......
(f) Garage......

SECTION V

21. **Why do you prefer to rent?**

22. **Why do you prefer to own your home?**

23. **Are you satisfied with the neighborhood in which you live, as to:**

(a) Convenience to your work. Yes...... No......
Convenience to shopping centers. Yes...... No......
Convenience to recreation centers. Yes...... No......
Convenience to schools. Yes...... No......
(b) Social security (*i.e.*, the general cultural tone of the district). Yes...... No......
(c) Would you like to have greater protection for your family in this last respect? Yes...... No.....
If so, why?............................

24. **In what part, if any, of the city or suburban district would you rather live than where you live now?** .... Why..............

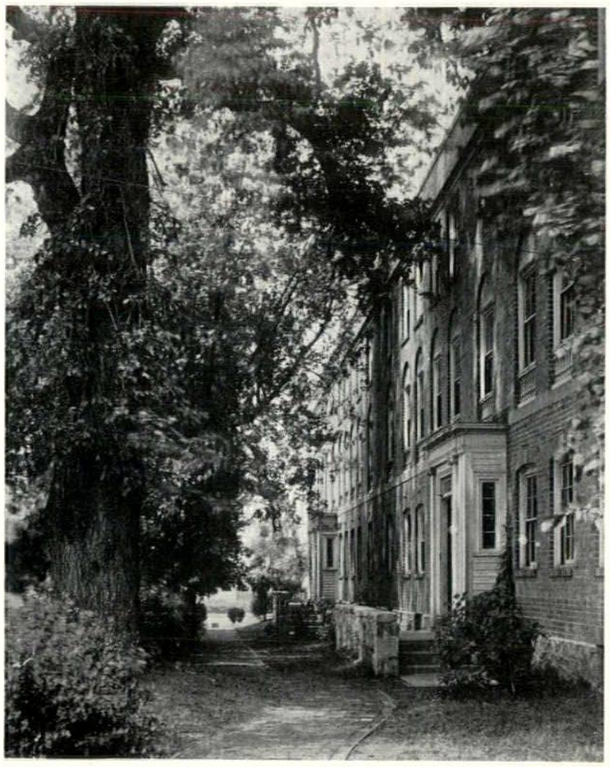
THE BRIDGEPORT DEVELOPMENT

A CASE HISTORY

Few housing projects are old enough to stand as lessons in experience. The Bridgeport development is an exception. What was learned there may well be applied in present considerations of housing

THERE is probably no development in the history of low cost housing which offers so much as an object lesson as the one in Bridgeport, Connecticut. Completed during the war to relieve the housing shortage, it has been in existence long enough to justify the assertion that it has "stood the test of time." Fortunately for its use as source material, the Bridgeport development experiences have been accurately recorded by W. H. Ham, general manager of the company.

The development consists of 1,200 houses in nine separate small communities, the houses ranging from a three-room type to an apartment house with 216 apartments. Two hundred and fifty of the houses were constructed by the company before the war; and the remainder were built by the government, and sold to the company after the war. An acceptable generality which holds for both the houses built privately and by the government is that the approximate cost to the Bridgeport Housing Company was about a third less than it would cost to build them now. That is to say, that the price of reproduction of a house which originally cost $2,500 to build would be $3,800.



Typical street front view of Garden Apartments

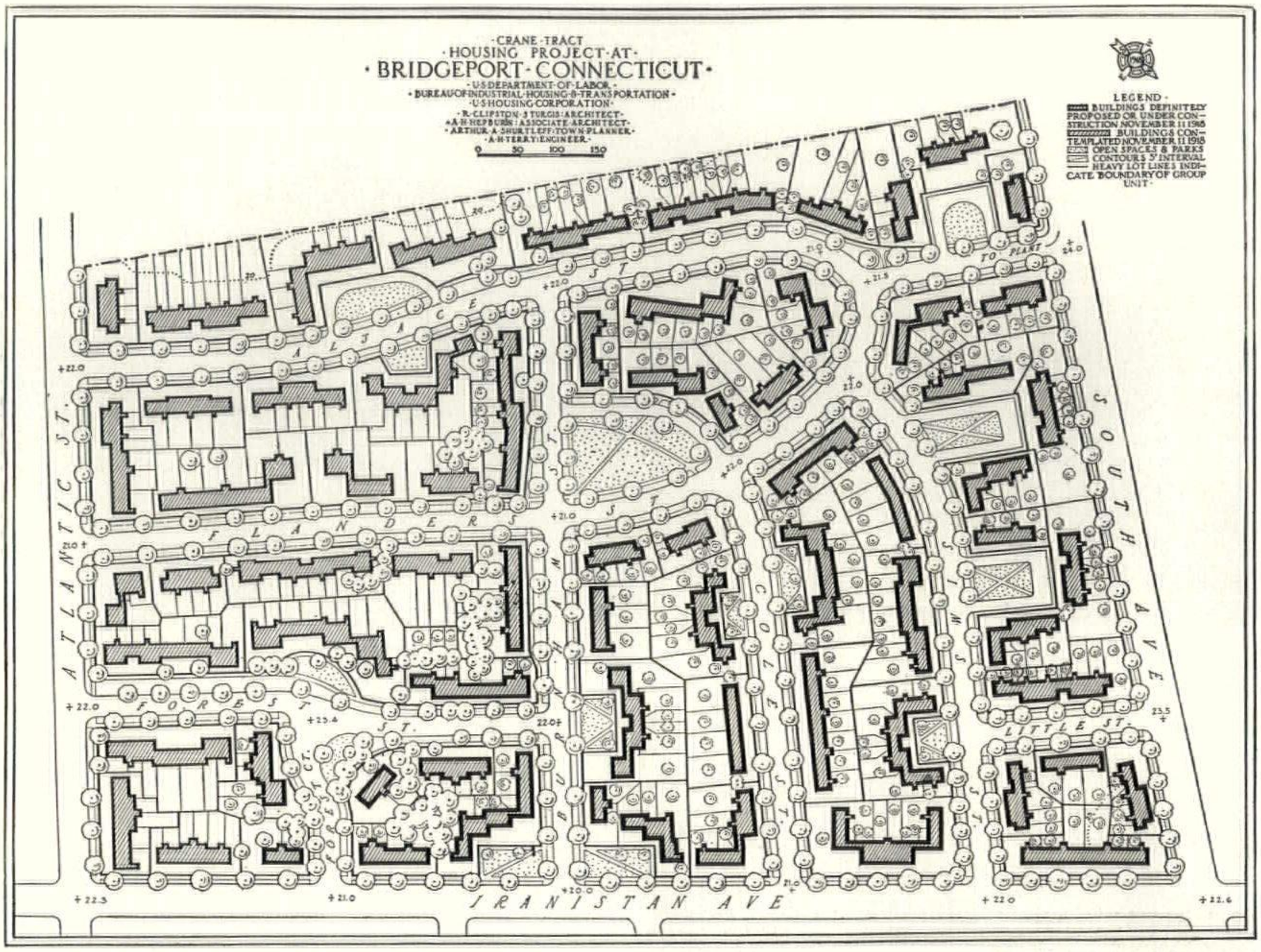
Perhaps the most interesting of all the units in the development is Seaside Village, which is composed of three-, four-, and five-room houses only. They are built in rows, with access, in most cases, limited to the front of the house. Private gardens, some large, some small, have been provided for each family. The houses are 100 per cent occupied, and have been, for the past ten years, by mechanics who receive wages ranging from $25 to $30 a week.

Because of the unusually low figure for which these houses were bought, the rental schedule in houses of this type, and of houses similar in character in other units, is proportionately low.

Type		*Rent Per Month*
4-Room Individual Houses		$29.00
5-Room Individual Houses		$32.00
3 Rooms in 2-Family House		$24.00
4 Rooms in Flats		$27.50
3-Room Apartments	(Including Heat)	$35.00
4-Room Apartments	(Including Heat)	$46.00
5-Room Apartments	(Including Heat)	$51.50

Obviously, such a rental schedule could not be duplicated today under the present system of construction. What the Bridgeport project has demonstrated is that small, well designed houses, minus the meaningless ornamentation found in most large-scale developments, are eagerly acceptable to families in the lower wage scale brackets.

Mr. Ham has found, however, that the houses at Seaside Village are difficult to sell. The trouble lies in the absence of a form of rental contract which would entail part ownership, although such a form has been adopted for other similar units, principally at Mill Green and at Grasmere, which consist of one- and two-family houses.

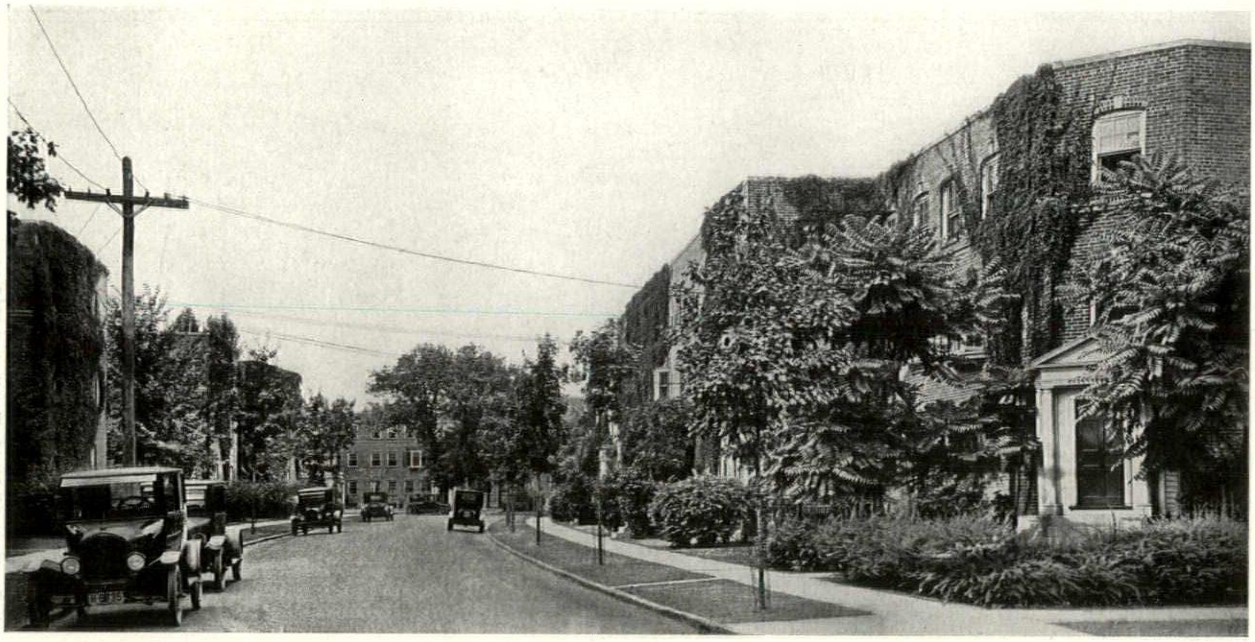


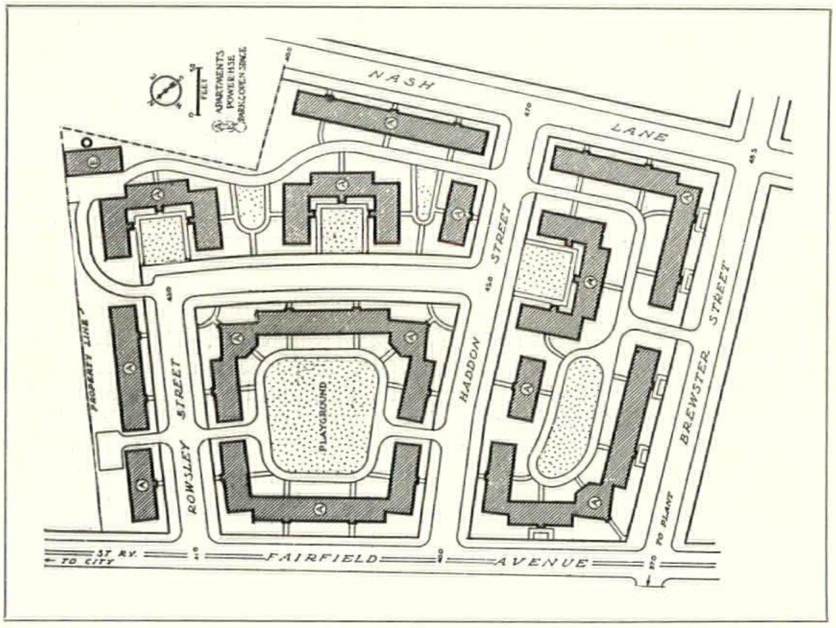
Plan of the Seaside development, originally known as the Crane tract. Below is a typical house. In this housing unit, which consists of flats and single family residences, 17 families are provided for in one acre at an approximate cost of $2,911 per family, including land, land development, and building. Rentals range from $25 to $35 per month

In another unit, Fairfield, the houses are 100 per cent occupied as rented property. This was one of the earliest successful solutions of the problem of the small house and garage on a small lot. The garage is latticed in with a laundry and service yard, thus giving the entire lot at the rear for a garden. At the outset, the company was perplexed by the reluctance of uneducated people to accept houses of this type, because of their simplicity of design. The workers thought of them as being "institutional." With the passage of the years, however, and their accompanying growth in beauty, the permanent quality of good design is being recognized more than it was.

The garden type of apartment, which is now being successfully promoted in other sections of the country, is represented in Black Rock, a building development of 216 apartments. Of all the types of buildings in Bridgeport, this is the only one which, the owners believe, can be reproduced today and made to pay a profit to the owners with a rental schedule ranging from $25 to $35 for apartments of three, four, and five rooms.

Since all of the properties are being successfully operated and show a proper return to the owners,

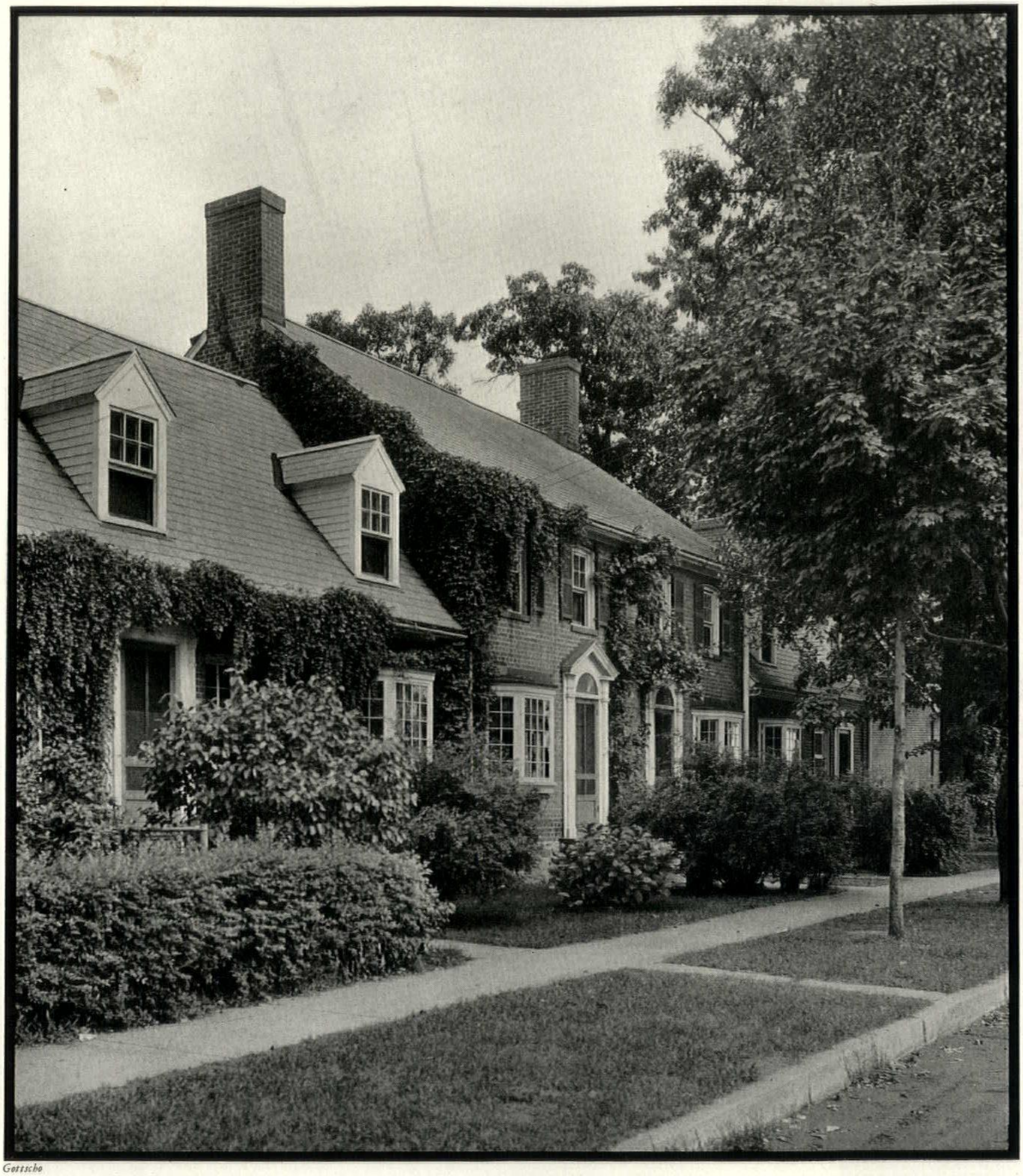




Above is a typical street in the Black Rock Garden Apartments development. At the left is the ground plan. There are 216 apartments in the development, with a density of approximately 14 families to an acre. They were built for approximately \$2,585 per family including land and improvements. Rents range from \$35 to \$45 monthly

based on a capitalization at cost of approximately one-third less than they can be reproduced for today with the present method of construction, the experience at Bridgeport is conclusive proof of the contention that the solution to the low cost housing problem lies in reducing the costs of building by at least 33⅓ per cent. The only other alternatives are going without houses of these types, or building them without profit. With pre-fabrication methods slowly coming to the fore, it is the belief of Mr. Ham, as well as of many other qualified experts, that these same types of houses may be produced within the near future at the demanded saving in cost. Mr. Ham's contention is predicated on the financial set-up of giving stockholders of the promoting company 8 per cent on their stock, which should represent about 25 per cent of the investment, and giving the bondholders an assured return of 6 per cent on the remaining 75 per cent of the investment.

The Bridgeport Housing Company has found the solution of part of the problem, namely, what the people want, and the architectural treatment of simple homes so that they can be built artistically, durably, and maintained to grow better as they grow older.

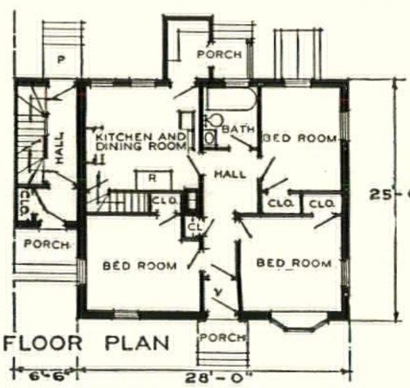


Gottscho

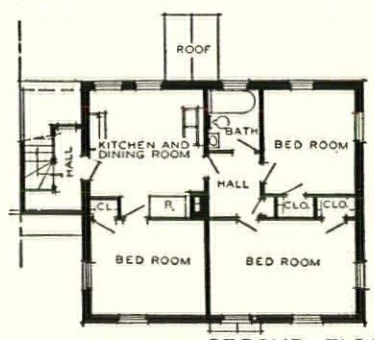
BRIDGEPORT HOUSING GROUP
BRIDGEPORT, CONNECTICUT

THIRTEEN HOUSING DEVELOPMENTS

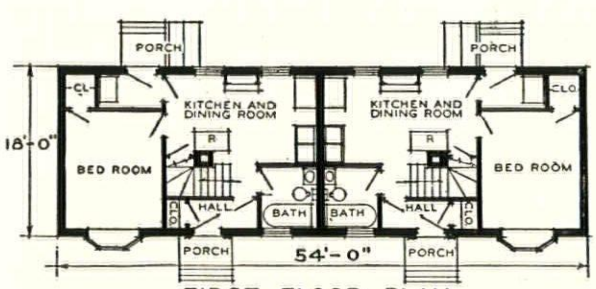
Gottscho



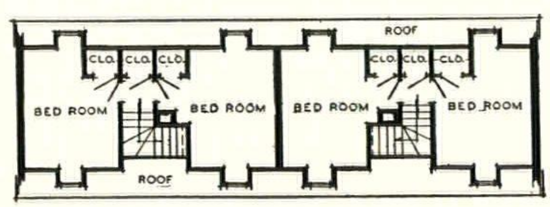
FIRST FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN

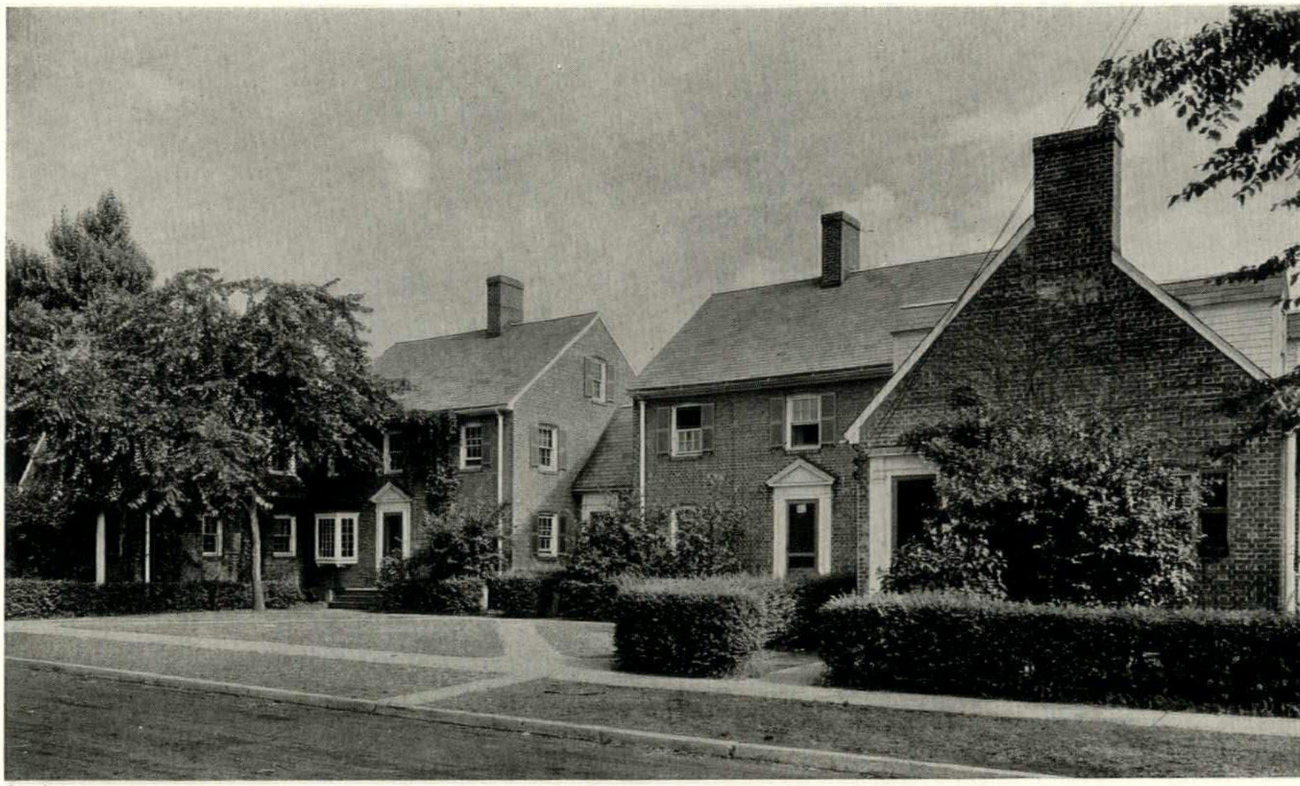


SECOND FLOOR PLAN

BRIDGEPORT HOUSING DEVELOPMENT

BRIDGEPORT, CONNECTICUT

R. CLIPSTON STURGIS, A. H. HEPBURN, ASSOCIATE ARCHITECTS



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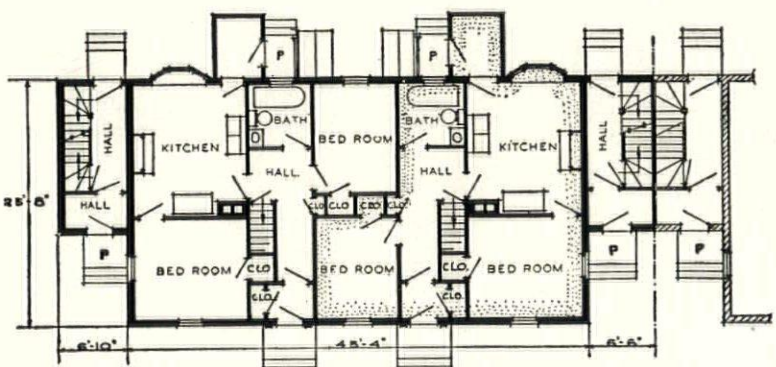
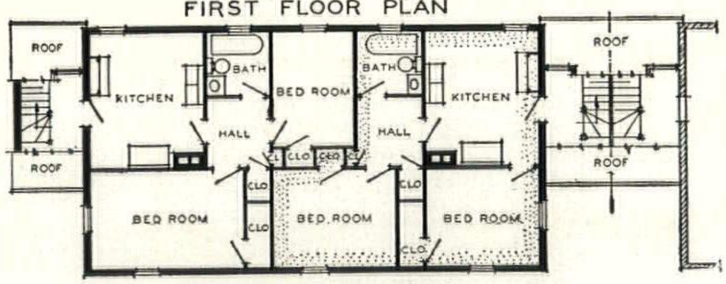


FIRST FLOOR PLAN



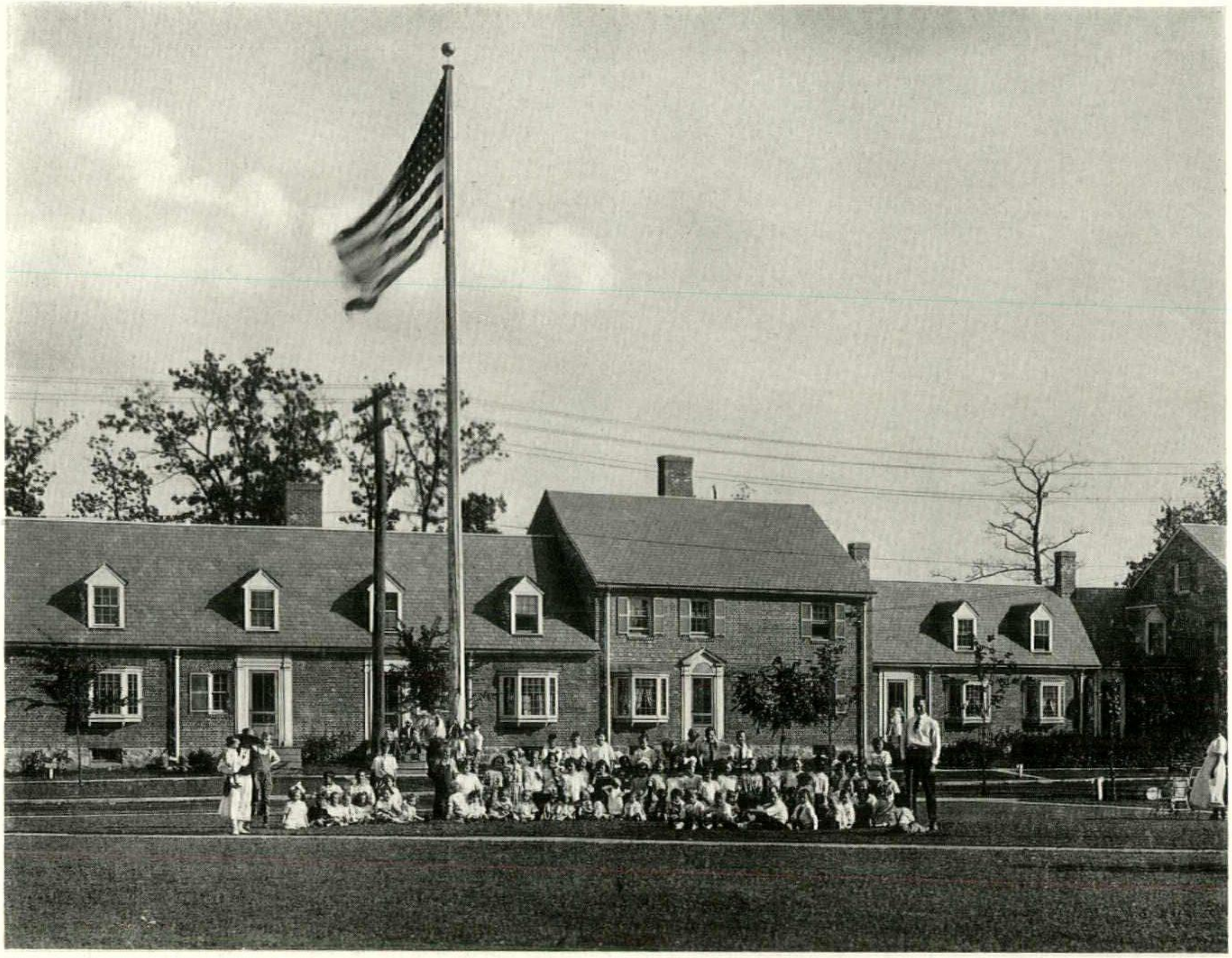
SECOND FLOOR PLAN

THE houses illustrated are included in a development planned and built by the United States Housing Corporation in 1918. It is an interesting example of a community which, although planned for an emergency, was developed along sound and economical lines and continues to serve admirably the purpose for which it was first designed. A fuller explanation of its history will be found on page 258

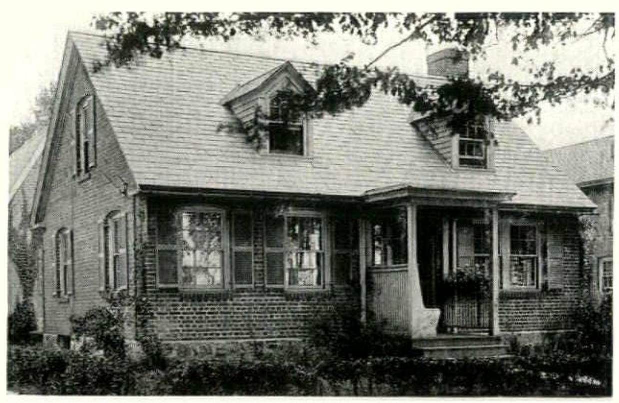
BRIDGEPORT HOUSING DEVELOPMENT

BRIDGEPORT, CONNECTICUT

R. CLIPSTON STURGIS, A. H. HEPBURN, ASSOCIATE ARCHITECTS



A typical row house is shown above, and below are two of the small four-room houses



BRIDGEPORT HOUSING DEVELOPMENT

BRIDGEPORT, CONNECTICUT

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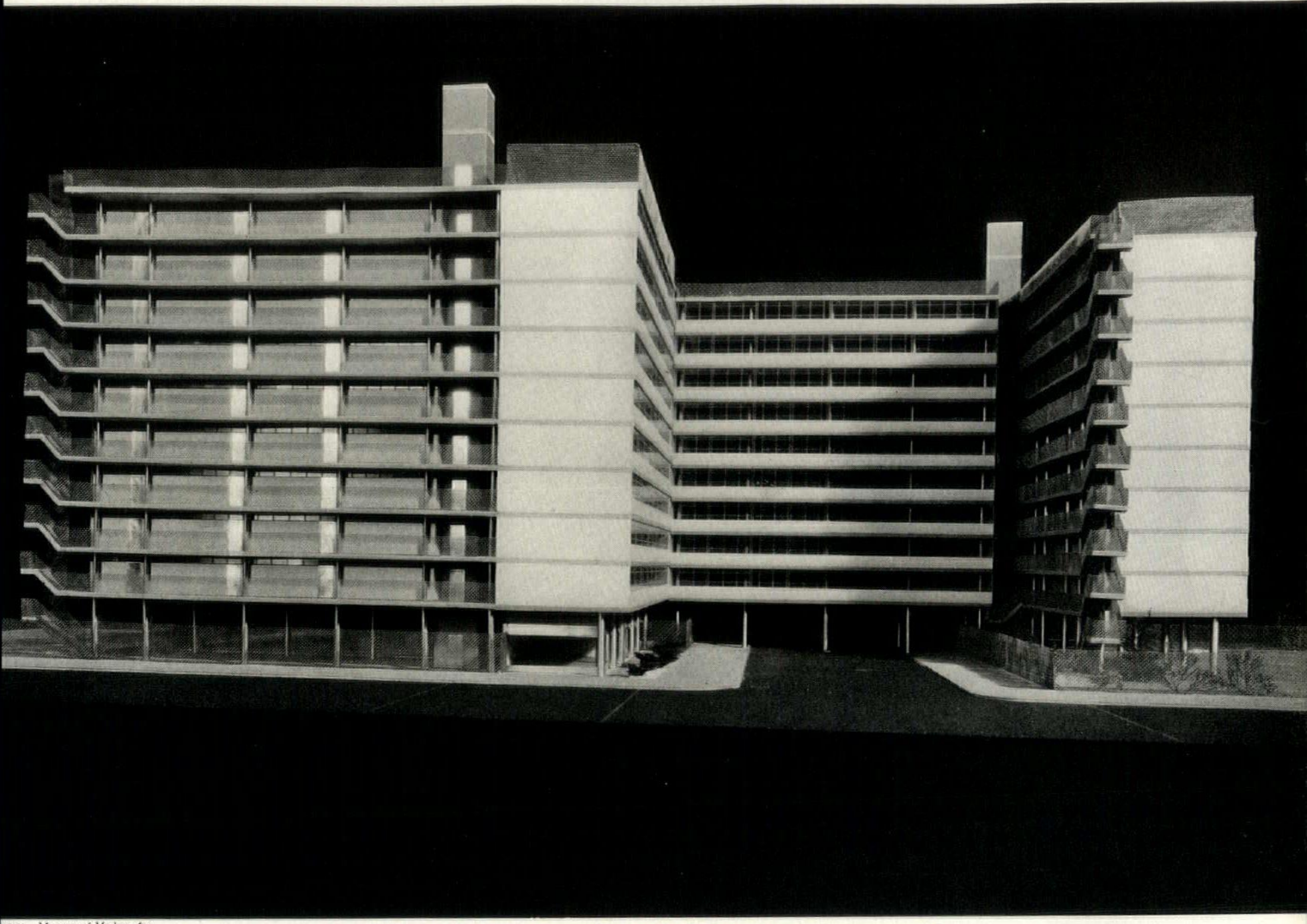


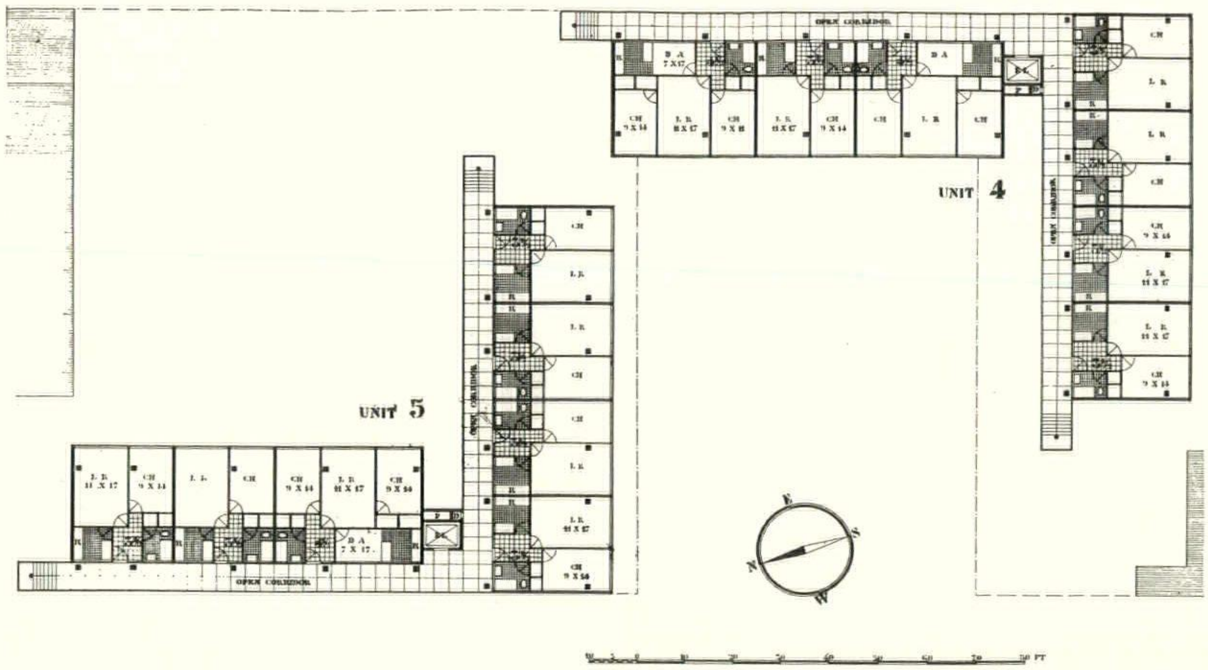
urtesy, Museum of Modern Art

THE European practice of developing plans for important urban housing developments has had much influence in the public acceptance of housing schemes fundamentally controlled by architects and city planners. The plan for the Chrystie-Forsyth Streets development is such a project and may have much bearing upon the subsequent construction of city apartment buildings. Many of its features, although common enough in Europe, are innovations in American planning practice. In this development several of the buildings have been planned to span an east and west street. Although this is a practice not usually condoned by city planning authorities, in this instance it offers an increase in apartment space with east and west exposures and little or no detriment to urban traffic conditions. The project is a commendable attempt toward raising the standard of city housing conditions

PROPOSED HOUSING DEVELOPMENT

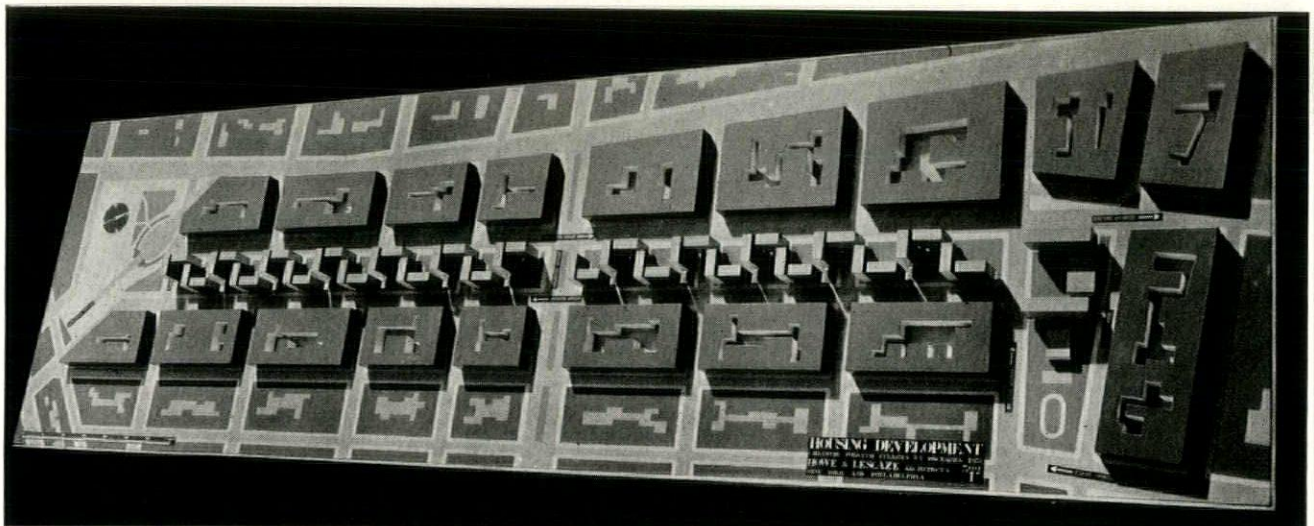
CHRYSTIE AND FORSYTH STREETS, NEW YORK, N. Y.

HOWE & LESCAZE, ARCHITECTS



TYPICAL FLOOR

THE first living floor of two typical units showing how part of Unit 4 spans a traffic way, shown by dotted lines. The location of the buildings upon the land provides a maximum of air and sunlight and at the same time gives the greatest possible chance for the utilization of the ground for recreational purposes

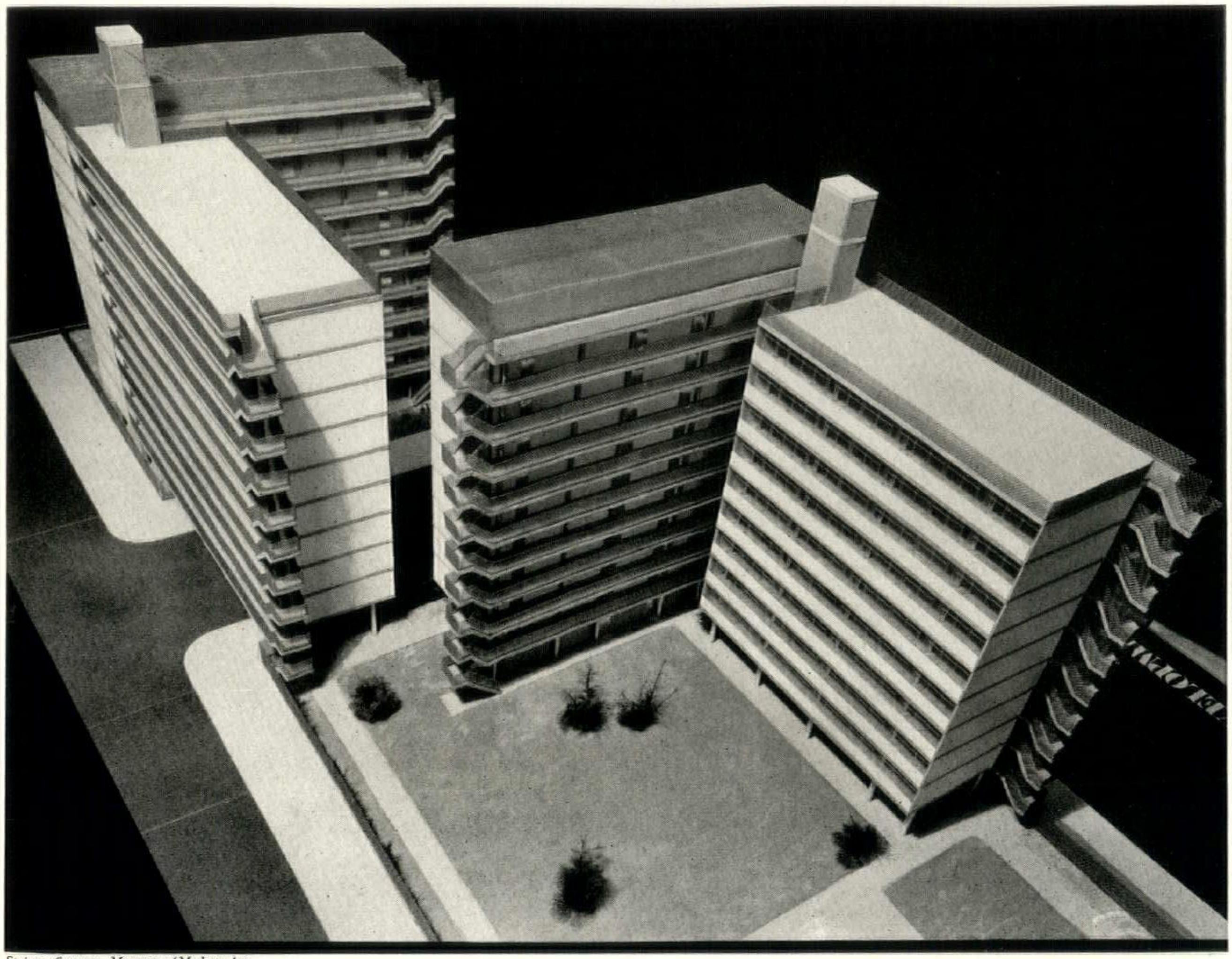


Steiner, Courtesy, Museum of Modern Art

PROPOSED HOUSING DEVELOPMENT

CHRYSTIE AND FORSYTH STREETS, NEW YORK, N. Y.

HOWE & LESCAZE, ARCHITECTS



Steiner, Courtesy, Museum of Modern Art

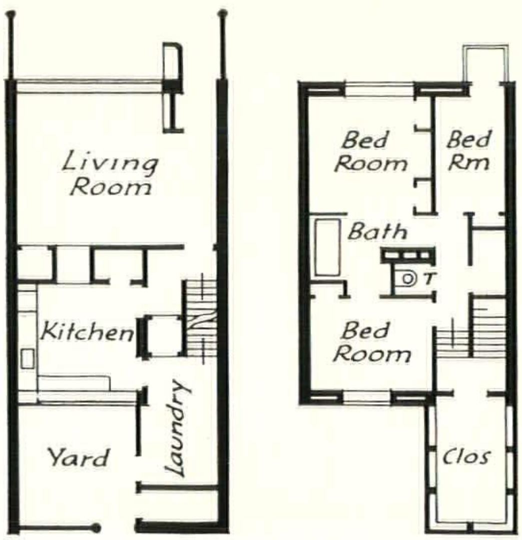
THE illustrations are of a model planned to provide inexpensive sanitary housing for families in the lower income groups. The whole project has been planned to replace the intolerable slum conditions existing in the Lower East Side of New York City. The illustration on the opposite page shows the difference in plot coverage between this project and the old style tenements which exist on either side of their proposed location. The advantages are too obvious to need comment. Due to the fact that the plot area is distinctly limited in size and due also to the desirability of developing it to its fullest use the buildings have been planned without the usual first floor. With a few exceptions the entire ground area is left open and serves as a large park, the buildings themselves acting as shelters from inclement weather. The open corridors served by a central elevator at the juncture of the two wings is an innovation in apartment planning. It secures the advantages of rapid communication, eliminates interior stair halls, provides each apartment with an open air balcony, and combines the necessary fire escapes with the essential equipment of the structure. In addition it assures privacy to individual apartments. The orientation of the units is such that the northern exposure is used for service and communication entirely and apartments have the benefit of east, south and west outlooks. These buildings would lend themselves well to mass production methods. The construction is simple and each individual apartment is standardized as to design and equipment

PROPOSED HOUSING DEVELOPMENT

CHRYSTIE AND FORSYTH STREETS, NEW YORK, N. Y.

HOWE & LESCAZE, ARCHITECTS

Courtesy, Museum of Modern Art

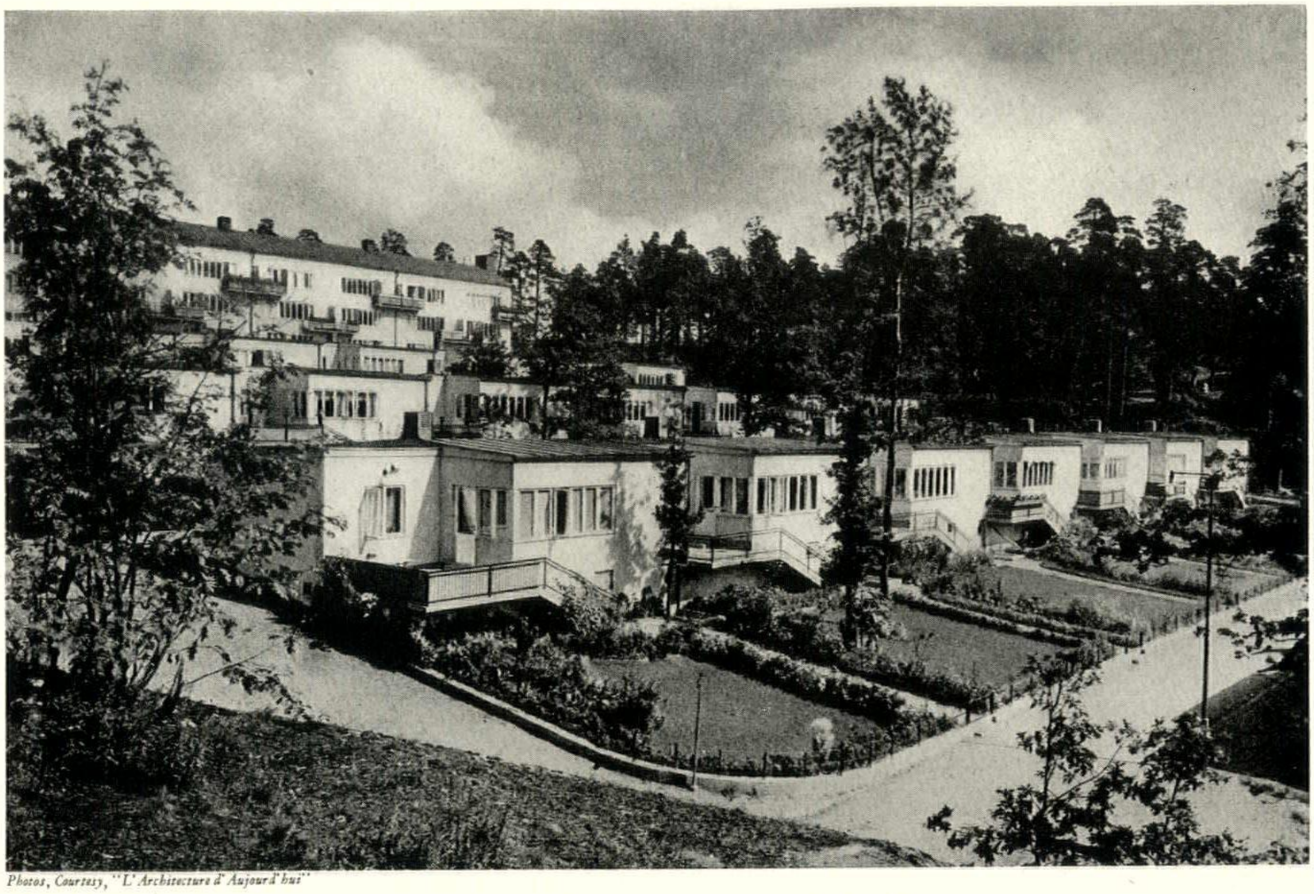


THE solution to the housing of families with a minimum income has received much more attention in Europe than in this country. Especially in Germany, many experimental housing developments have been built and the general standard of housing conditions has been raised, as evidenced by the illustration and the plans which are typical of many such developments. The problem has been solved with the minimum of expense and ostentation. The houses make no pretense of being anything more than the most simple living spaces

WEISSENHOF HOUSING EXPOSITION

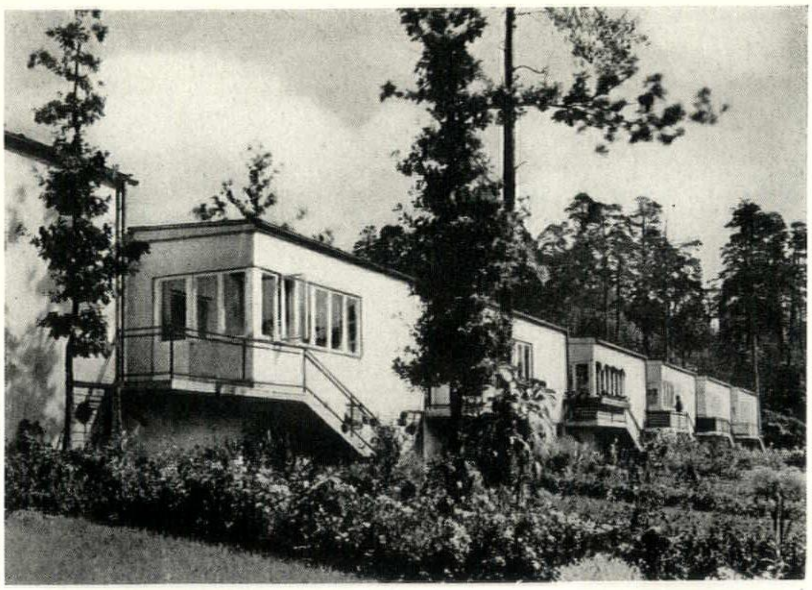
STUTTGART, GERMANY

J. J. P. OUD, ARCHITECT



Photos, Courtesy, "L'Architecture d'Aujourd'hui"

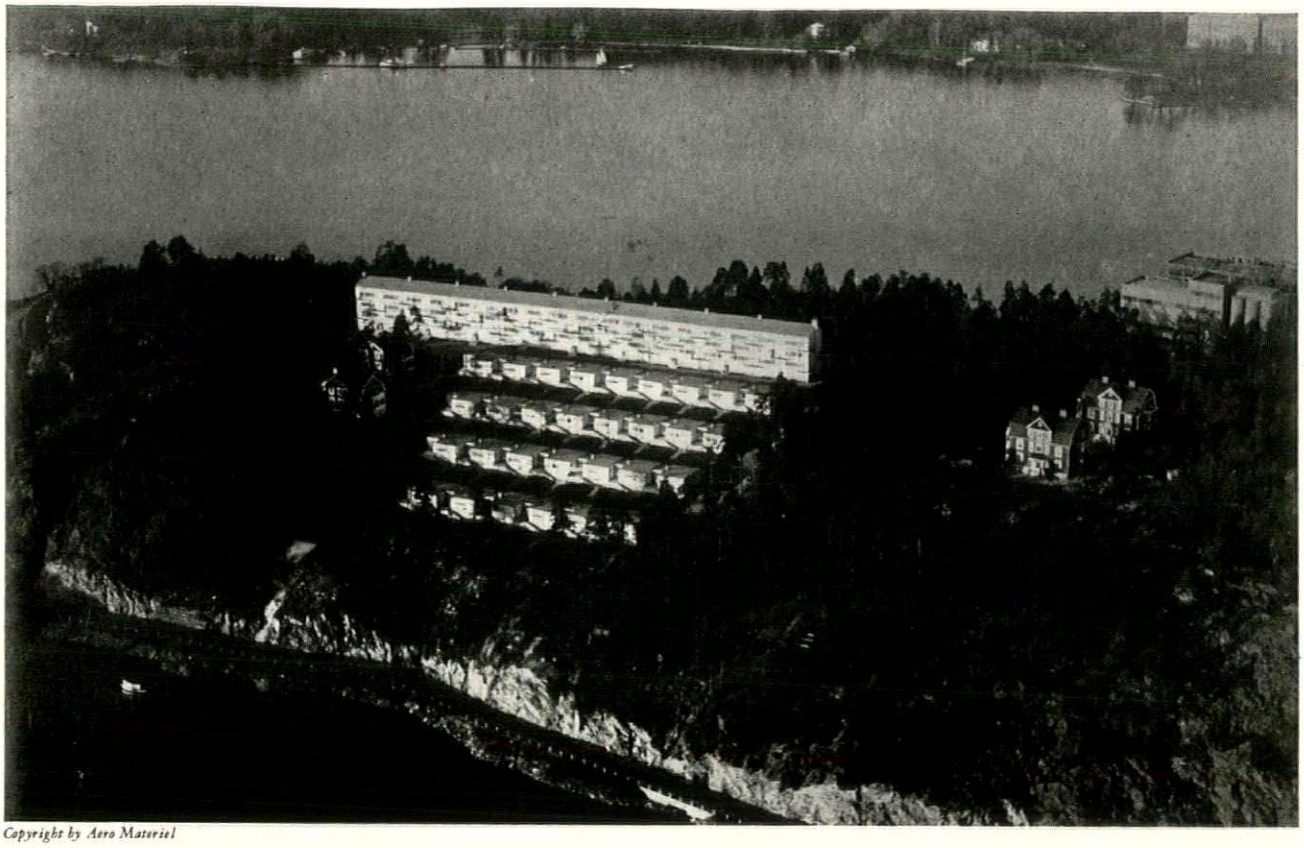
THESE houses were built for working men in a garden city development near Stockholm, Sweden. They illustrate a high type of large-scale operation and their location on a hillside, near a lake, gives many advantages of sunshine and air circulation. This also makes for economy in construction cost as the houses were built in long rows without sacrificing any of the benefits which are secured by differences of orientation on a more nearly level location. The large building at the top of the hill contains three-room apartments. The others are single family row houses



WORKINGMEN'S HOUSES

HASTHOLMEN, SWEDEN

ESKIL SUNDAHL AND OLAF THUNSTROM, ARCHITECTS



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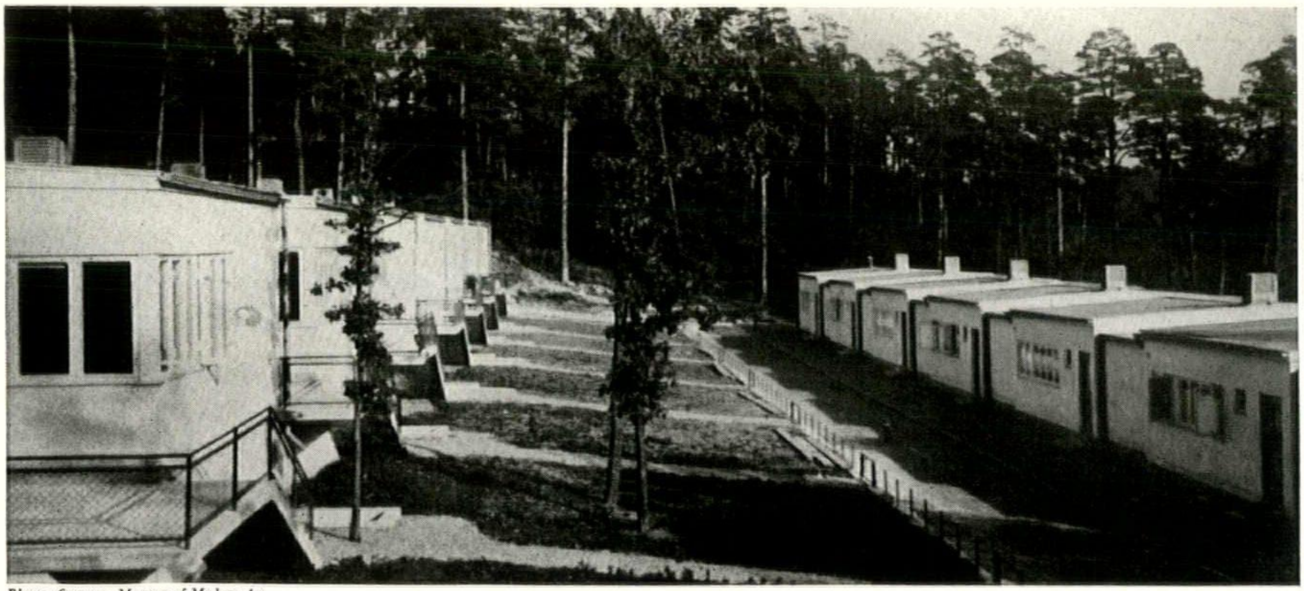
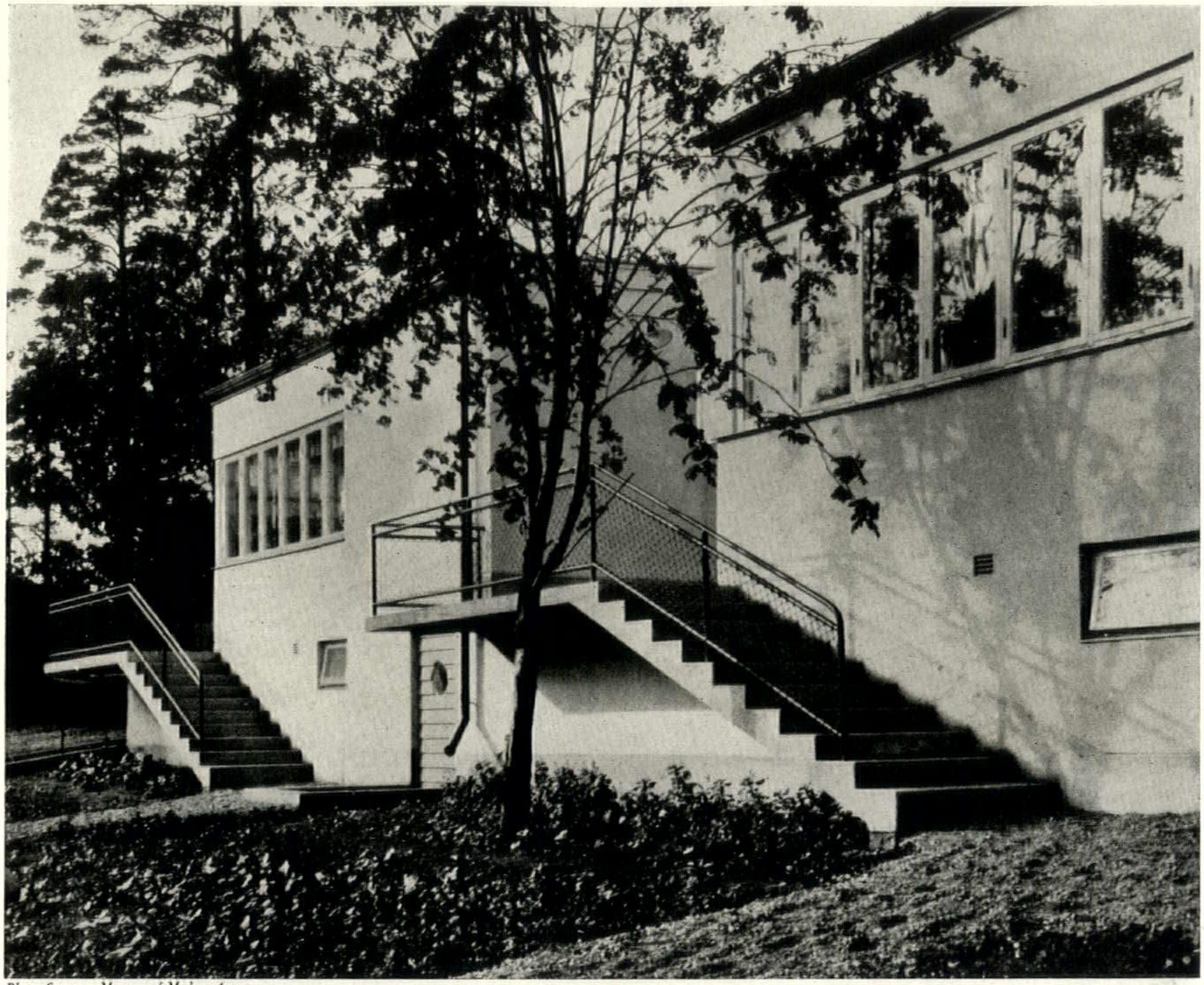


Photos, Courtesy, Museum of Modern Art

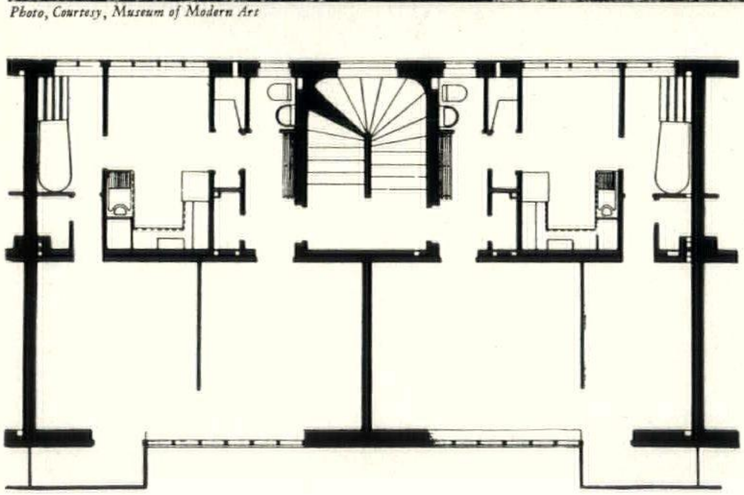
WORKINGMEN'S HOUSES

HASTHOLMEN, SWEDEN

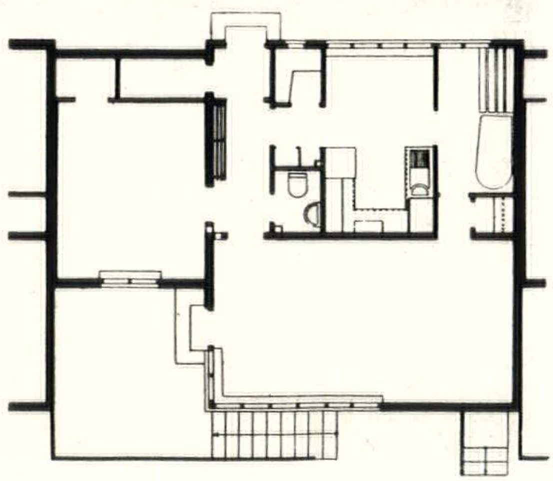
ESKIL SUNDAHL AND OLAF THUNSTROM, ARCHITECTS



Photo, Courtesy, Museum of Modern Art



PLAN OF TYPICAL APARTMENT



PLAN OF TYPICAL SINGLE HOUSE

WORKINGMEN'S HOUSES

HASTHOLMEN, SWEDEN

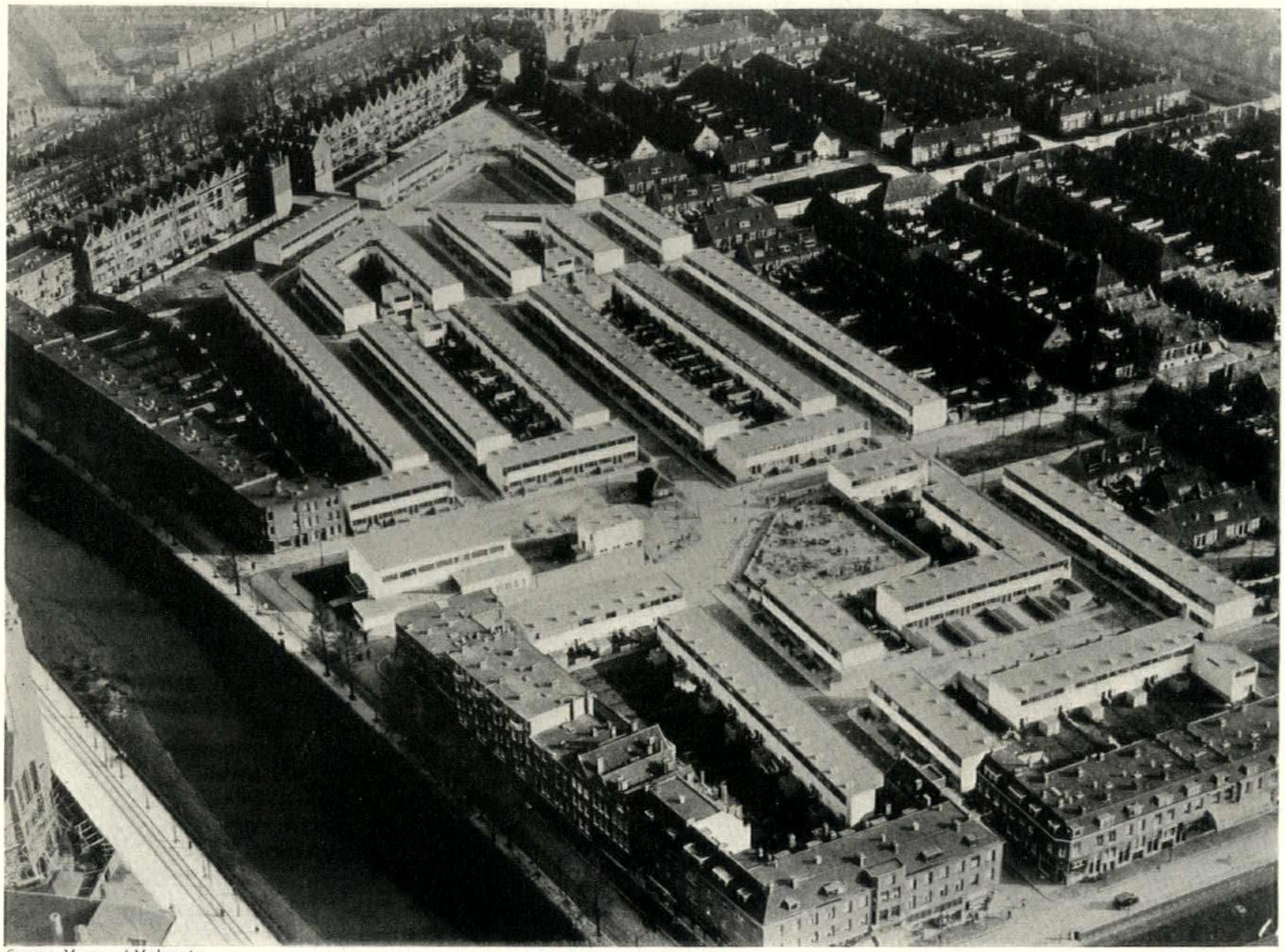
ESKIL SUNDAHL AND OLAF THUNSTROM, ARCHITECTS

Coster, Courtesy, Museum of Modern Art

SIEMENSSTADT APARTMENTS

BERLIN, GERMANY

HANS SCHAROUN, ARCHITECT



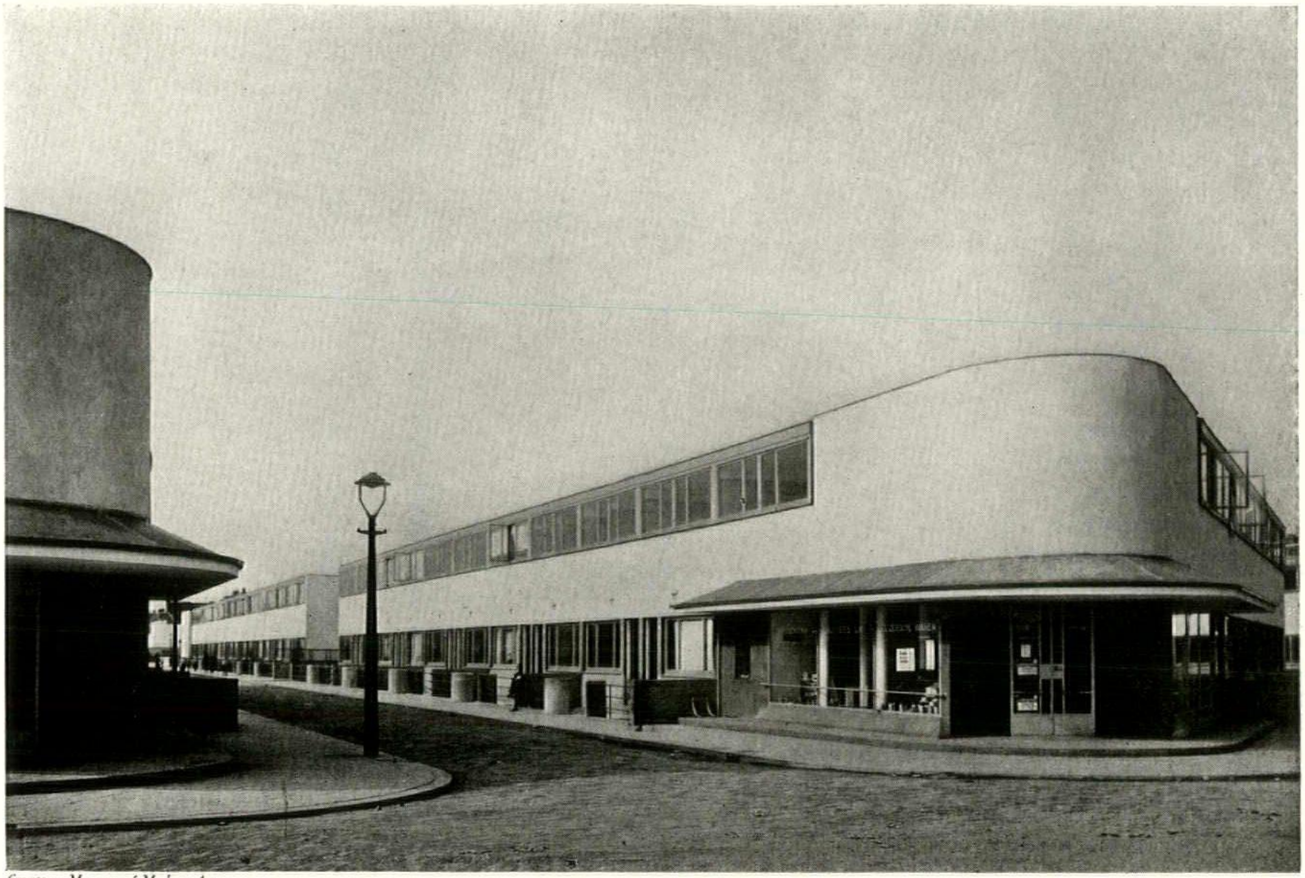
Courtesy, Museum of Modern Art

THIS project is one of several designed by the architect as a solution to the problem of economical industrial housing. The illustration above is particularly interesting from two standpoints. First, it shows the radical difference between the older apartments and the contemporary buildings. That many evils attendant upon congested housing areas have been eliminated is obvious from even a cursory examination. In addition the size of the development is significant. It is almost impossible to secure economically the benefits of sanitary housing conditions without large-scale production methods. This project is only one of many throughout Europe which show a thorough appreciation of housing needs and a deep study of the conditions which govern their fulfillment. For the most part such developments have concerned themselves with the housing of working men and have laid no stress upon the amenities of middle class living. The objects have been to provide sanitary and healthful surroundings with as much comfort as is consistent with simple living conditions. It has been recognized that the problem is concerned with the requirements of a minimum income tenancy and the architect has adhered closely to the limitations of his particular problem

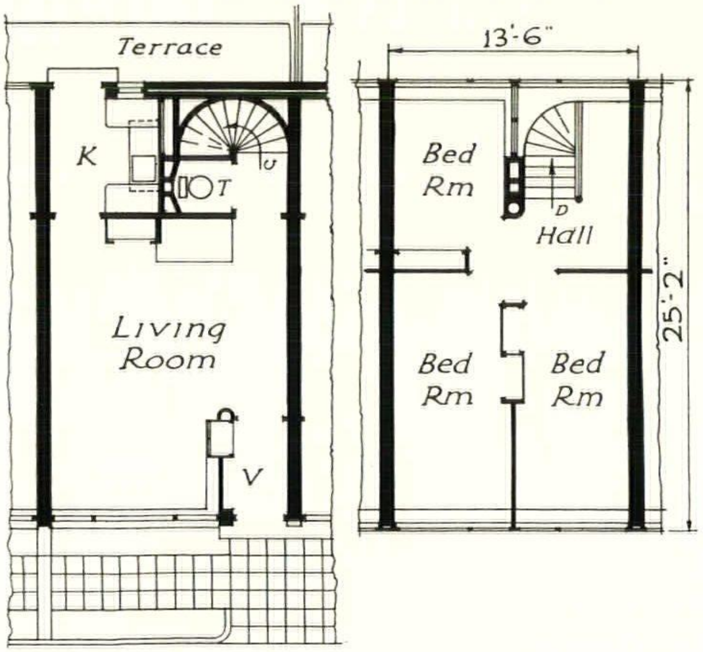
KIEFHOEK HOUSING DEVELOPMENT

ROTTERDAM, HOLLAND

J. J. P. OUD, ARCHITECT



Courtesy, Museum of Modern Art

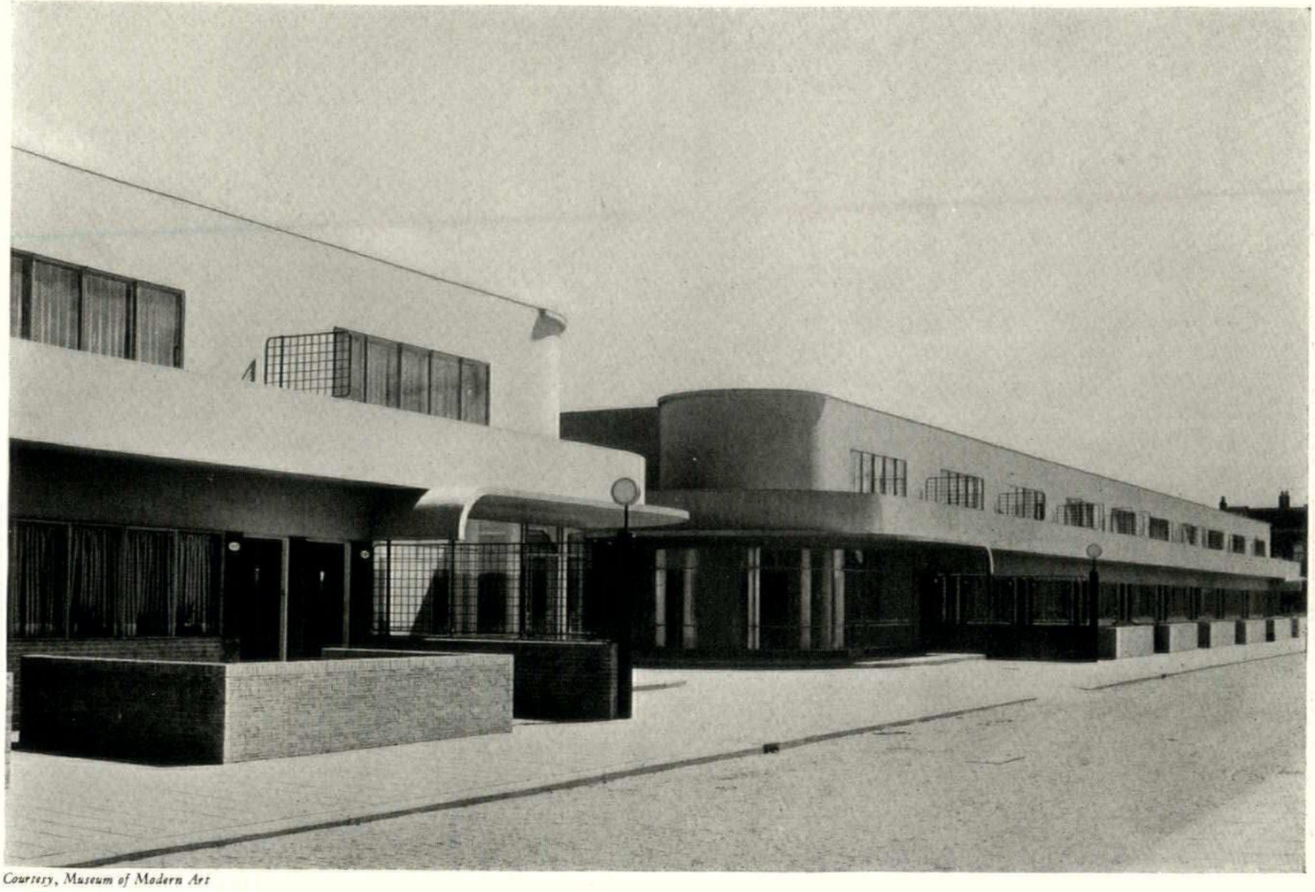


THE plan is typical of a single house within the development, which includes the necessary shops and recreation centers. Note especially the large window areas and the simplicity of the entire plan. Apartments of this type are particularly adaptable to methods of large-scale production and are economical to construct and maintain. Each apartment may be easily altered without affecting the ones adjacent to it

KIEFHOEK HOUSING DEVELOPMENT

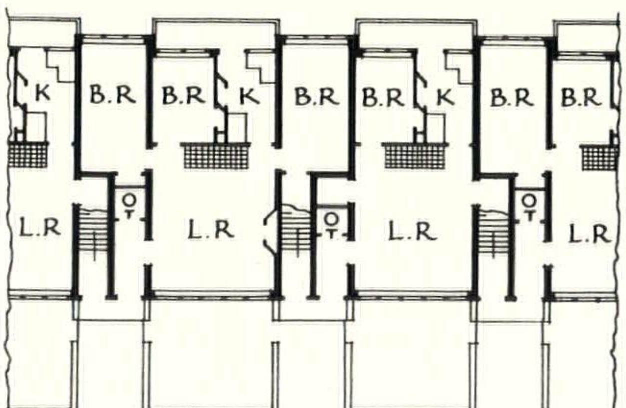
ROTTERDAM, HOLLAND

J. J. P. OUD, ARCHITECT

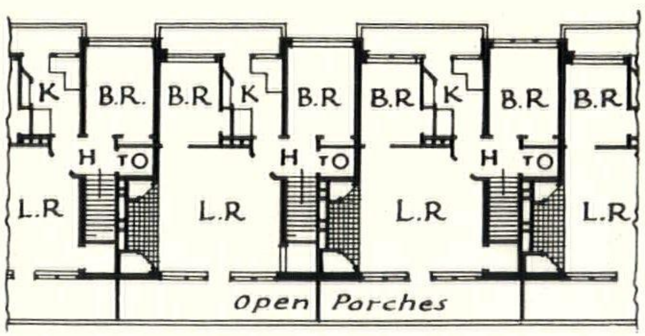


Courtesy, Museum of Modern Art

THIS development is similar in principle and general design to the one at Rotterdam, but provides larger accommodations. The arrangement of the units is particularly interesting as they are completely adaptable to economical production. The unusual location of the sanitary facilities is explained by the differences in European and American methods of living



FIRST FLOOR

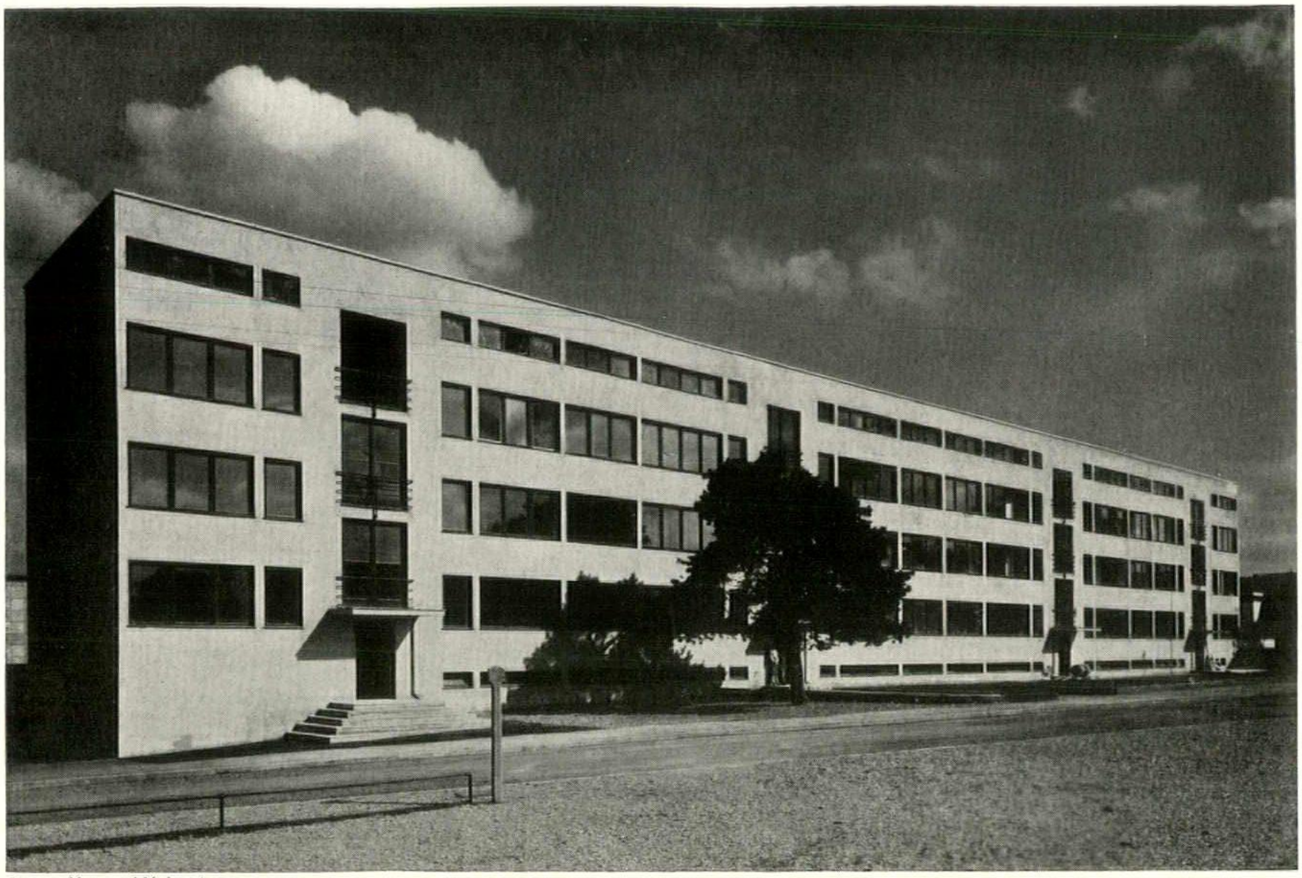


SECOND FLOOR

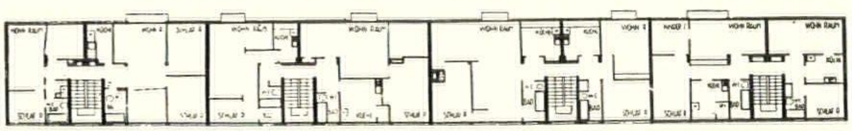
WORKINGMEN'S HOUSES

THE HOOK OF HOLLAND

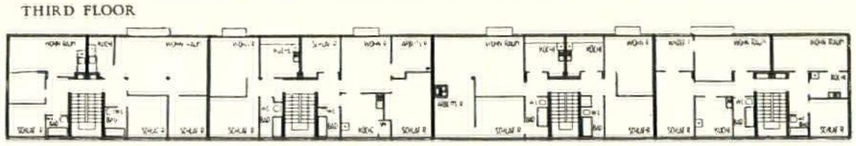
J. J. P. OUD, ARCHITECT



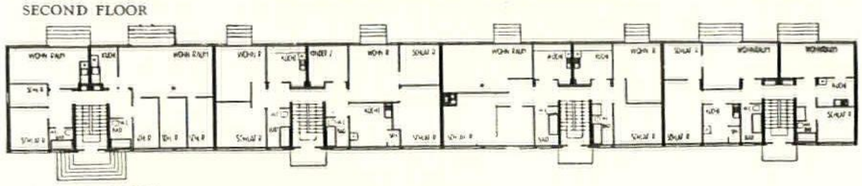
Courtesy, Museum of Modern Art



THIRD FLOOR



SECOND FLOOR



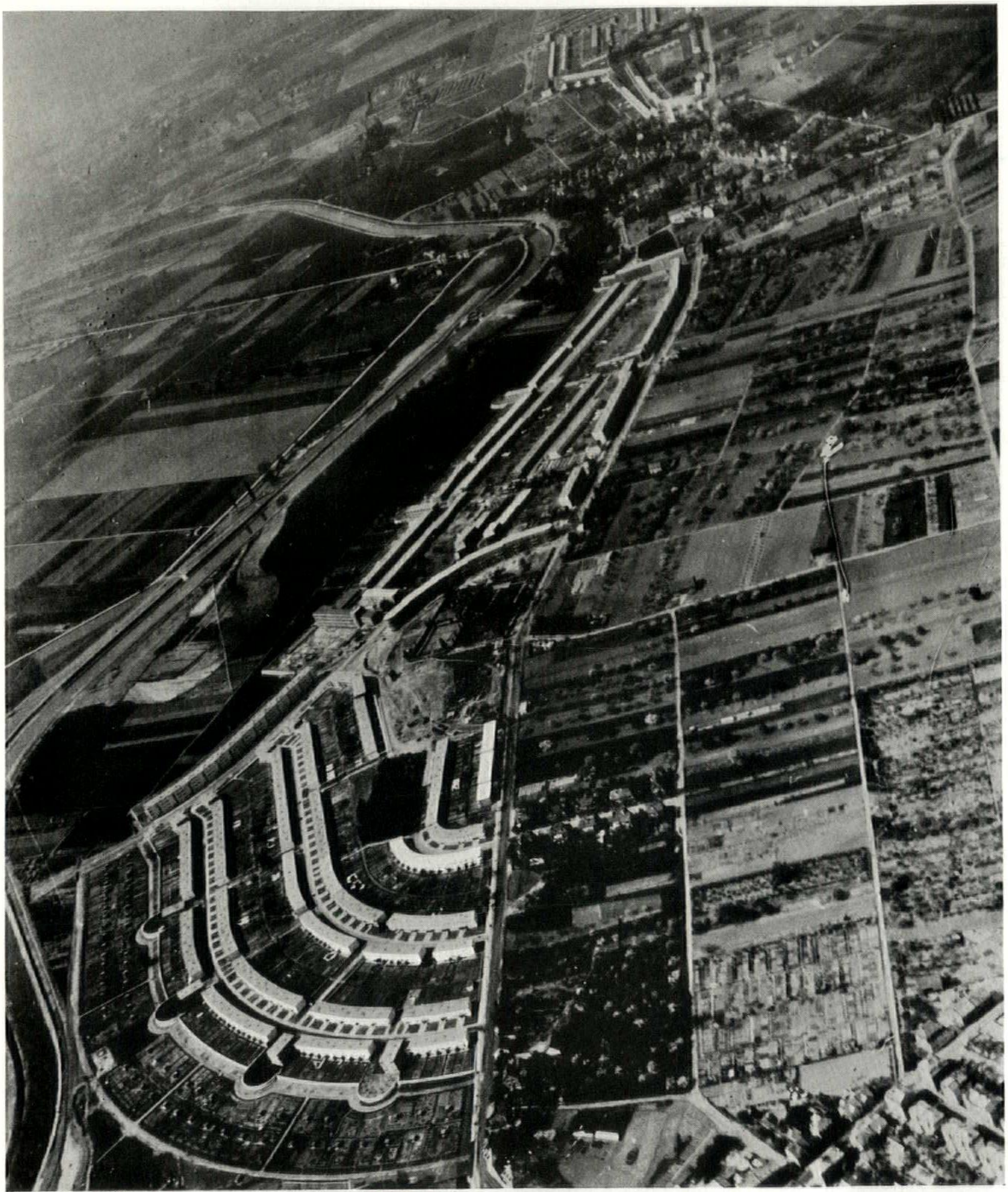
GROUND FLOOR

THIS apartment building, a unit of the extensive housing exposition held at Stuttgart a short time ago, is similar in its general structural arrangement to American buildings of a similar type. The plans of the individual apartments, however, vary considerably and are worthy of close study. In them every effort has been made to differentiate between the space used for living by a family and that used merely for sleeping and in every case as much space as possible is allotted to the living room. Notice in addition the variations in apartment sizes and the economy of space in corridors and stair halls

WEISSENHOF HOUSING EXPOSITION

STUTTGART, GERMANY

MIËS VAN DER ROHE, ARCHITECT

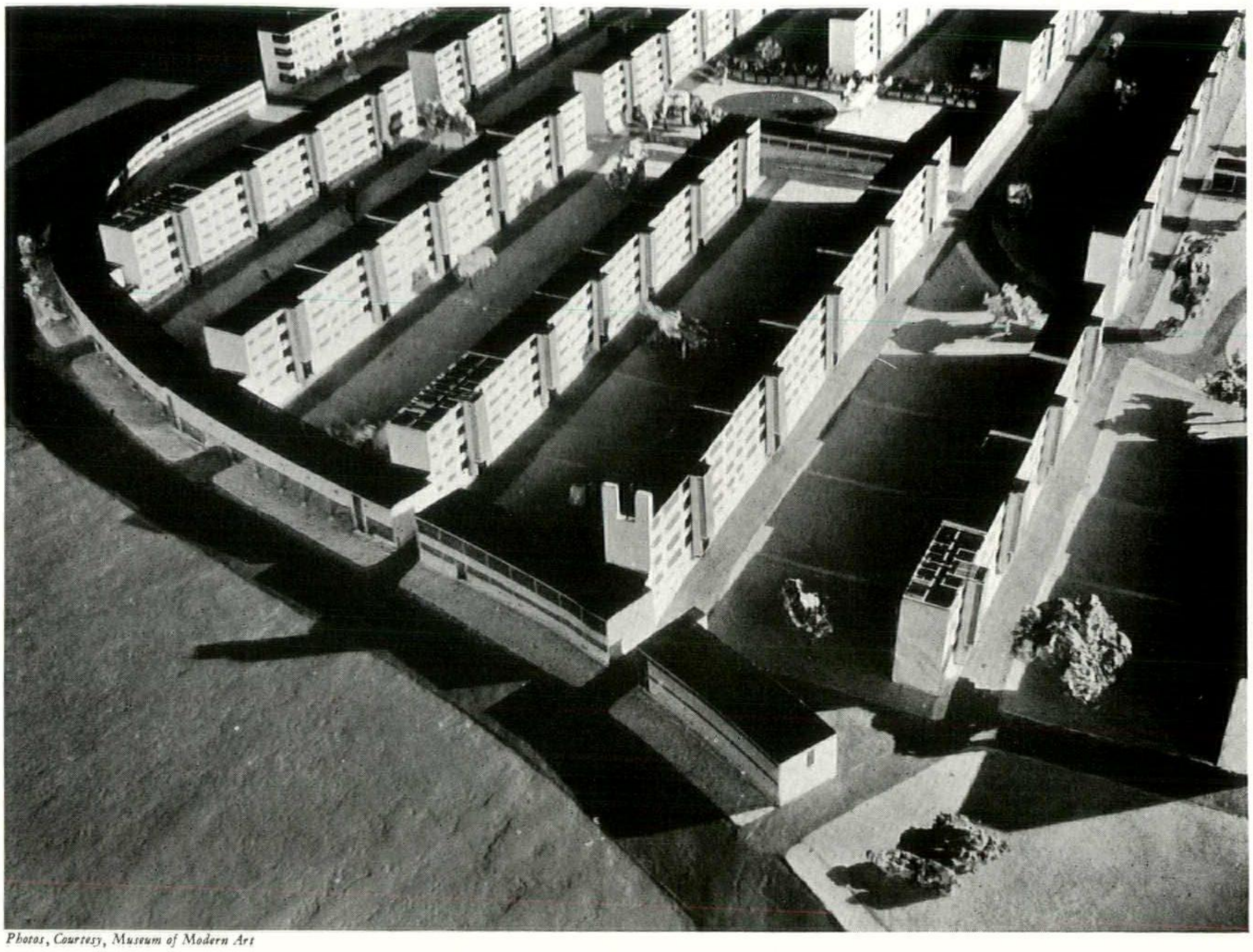


Courtesy, Museum of Modern Art

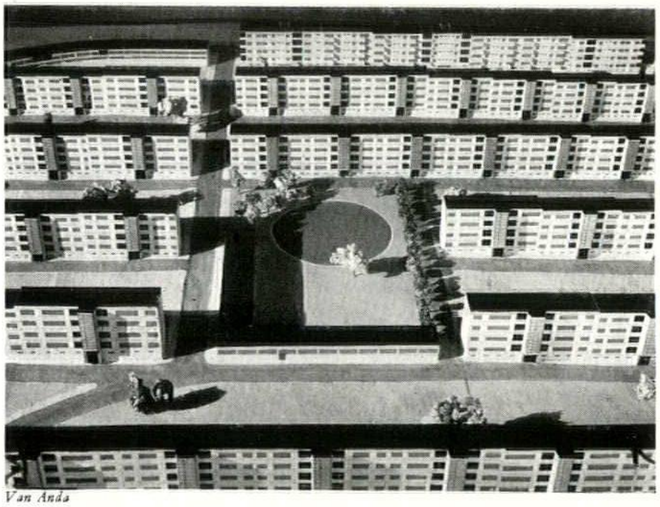
RÖMERSTADT HOUSING DEVELOPMENT

FRANKFORT-ON-MAIN, GERMANY

ERNST MAY & ASSOCIATES, ARCHITECTS AND PLANNERS



Photos, Courtesy, Museum of Modern Art



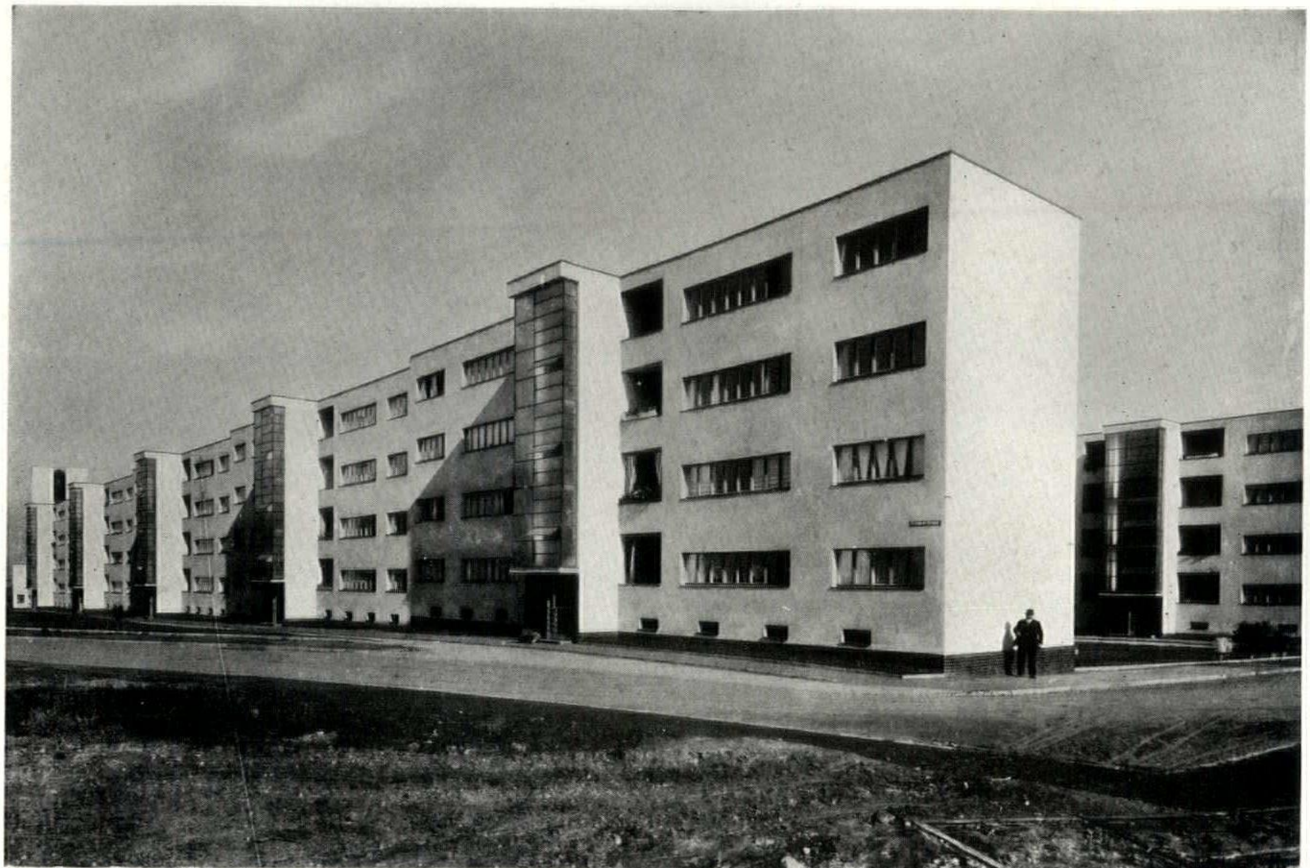
Van Anda

THIS extensive development although not planned primarily as a solution to the minimum housing problem is interesting for the grouping of the buildings and the plans of the individual apartments themselves. As in the majority of European housing schemes adequate area is allowed between the buildings to assure a free circulation of air and a maximum amount of light at all times. The buildings are planned in rows to permit a constant amount of sunlight in the most used portions of the apartment, and the fact that they are two rooms deep assures cross ventilation in every case. Especially noteworthy is the economical grouping of the service areas and the construction of the stair halls which allows a maximum amount of living space with a consequent minimum of useless corridor area. The straight row type of plan makes this especially practical

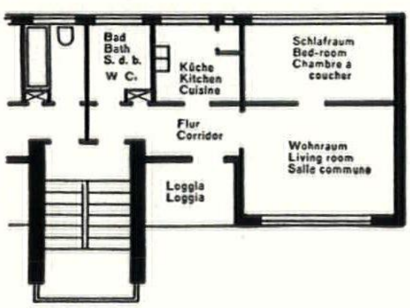
ROTHENBERG HOUSING DEVELOPMENT

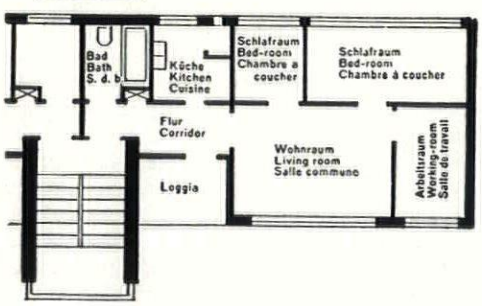
KASSEL, GERMANY

OTTO HAESLER, ARCHITECT AND PLANNER



Photos, Courtesy, Museum of Modern Art





ROTHENBERG HOUSING DEVELOPMENT

KASSEL, GERMANY

OTTO HAESLER, ARCHITECT AND PLANNER

Rausch & Pester Photos

Courtesy, Museum of Modern Art

DAMMERSTOCK HOUSING DEVELOPMENT

KARLSRUE, GERMANY

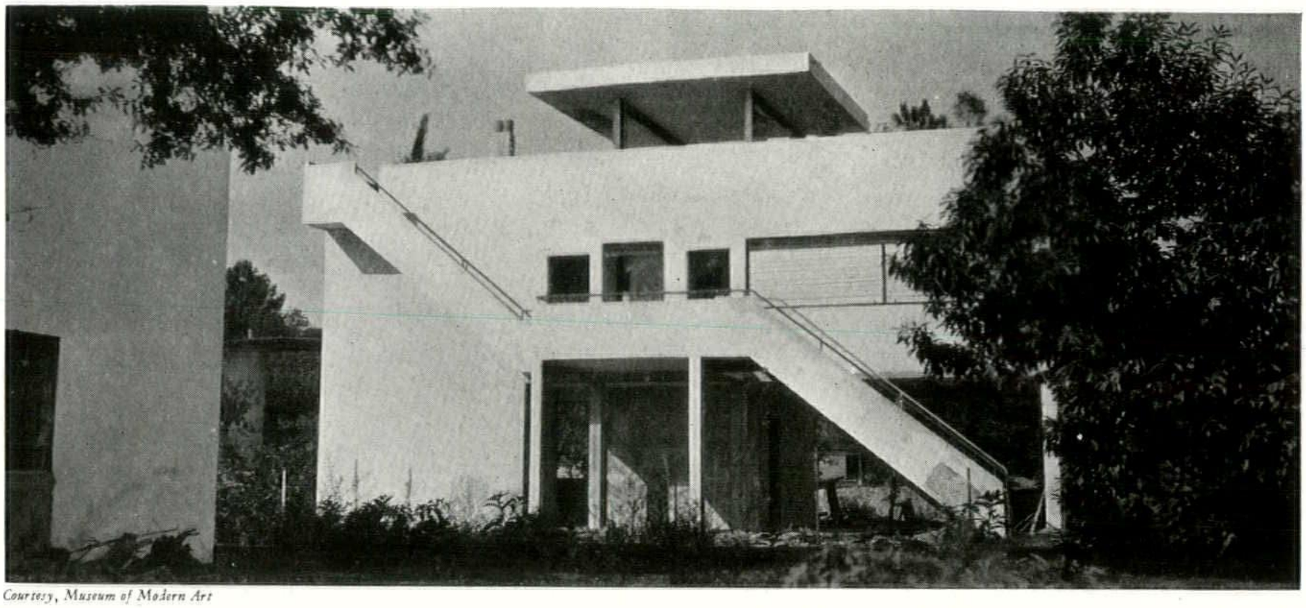
WALTER GROPIUS, SUPERVISING ARCHITECT

Courtesy, Museum of Modern Art

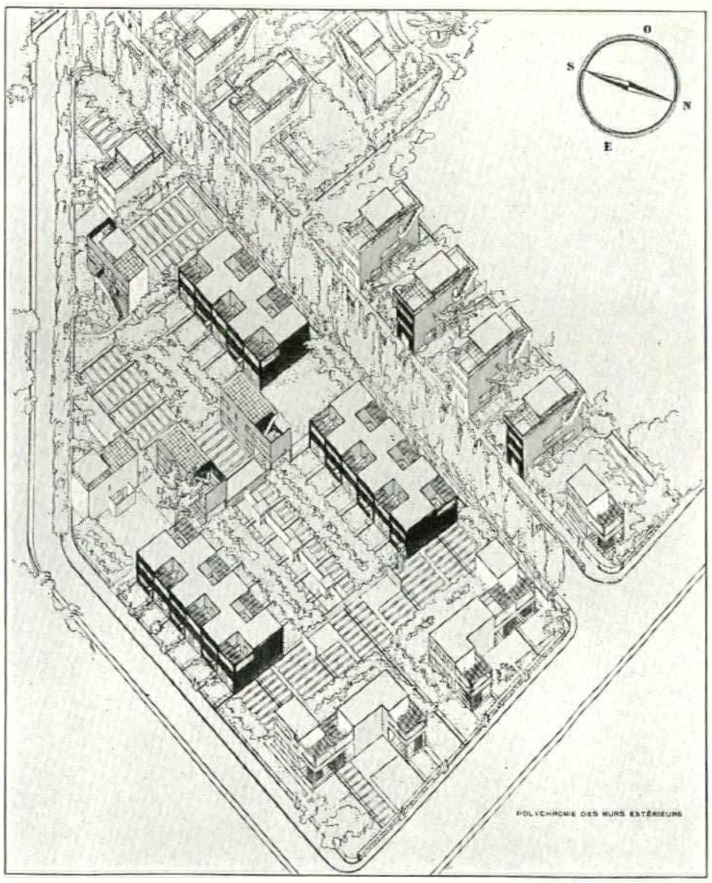
PESSAC HOUSING DEVELOPMENT

PESSAC, FRANCE

LE CORBUSIER AND PIERRE JEANERRET, ARCHITECTS



Courtesy, Museum of Modern Art

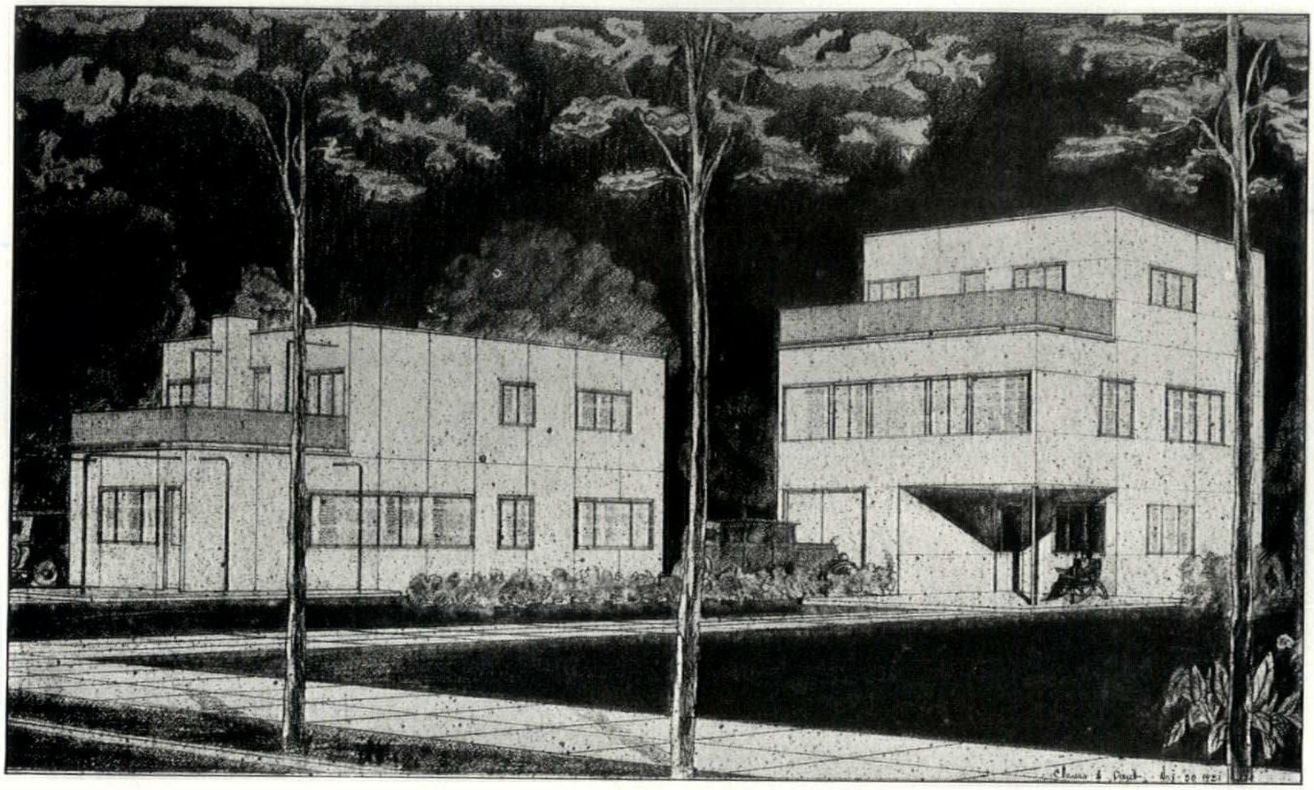


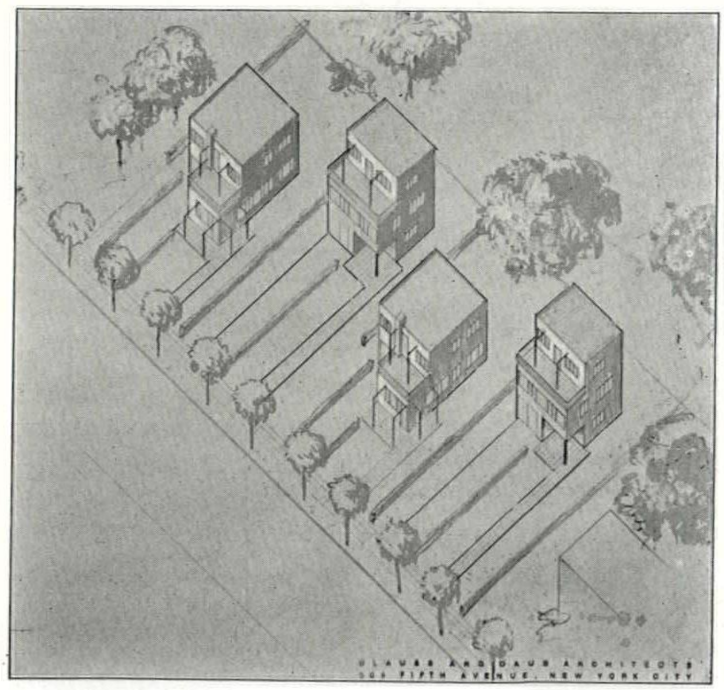
THE group of houses illustrated has been planned with all the attention to sociological considerations which has characterized former activities of the architects. Le Corbusier, ever since his first important work in 1916, has considered the development of the building's location quite as important as the planning of the structure itself and most of his projects include plans for a garden and play area which cannot be divorced from the house itself. The group at Pessac is no exception. It contains both single family and row houses and is laid out in such a way that each family is assured of an area of garden and a maximum amount of fresh air and sunlight. In form the houses are typical of Le Corbusier's "international style." The exterior walls are painted blue, green, white, brown and terra cotta. The colors are not used with any particular regard for orientation but are disposed to make an attractive landscape in combination with the garden areas

PESSAC HOUSING DEVELOPMENT

PESSAC, FRANCE

LE CORBUSIER AND PIERRE JEANERRET, ARCHITECTS

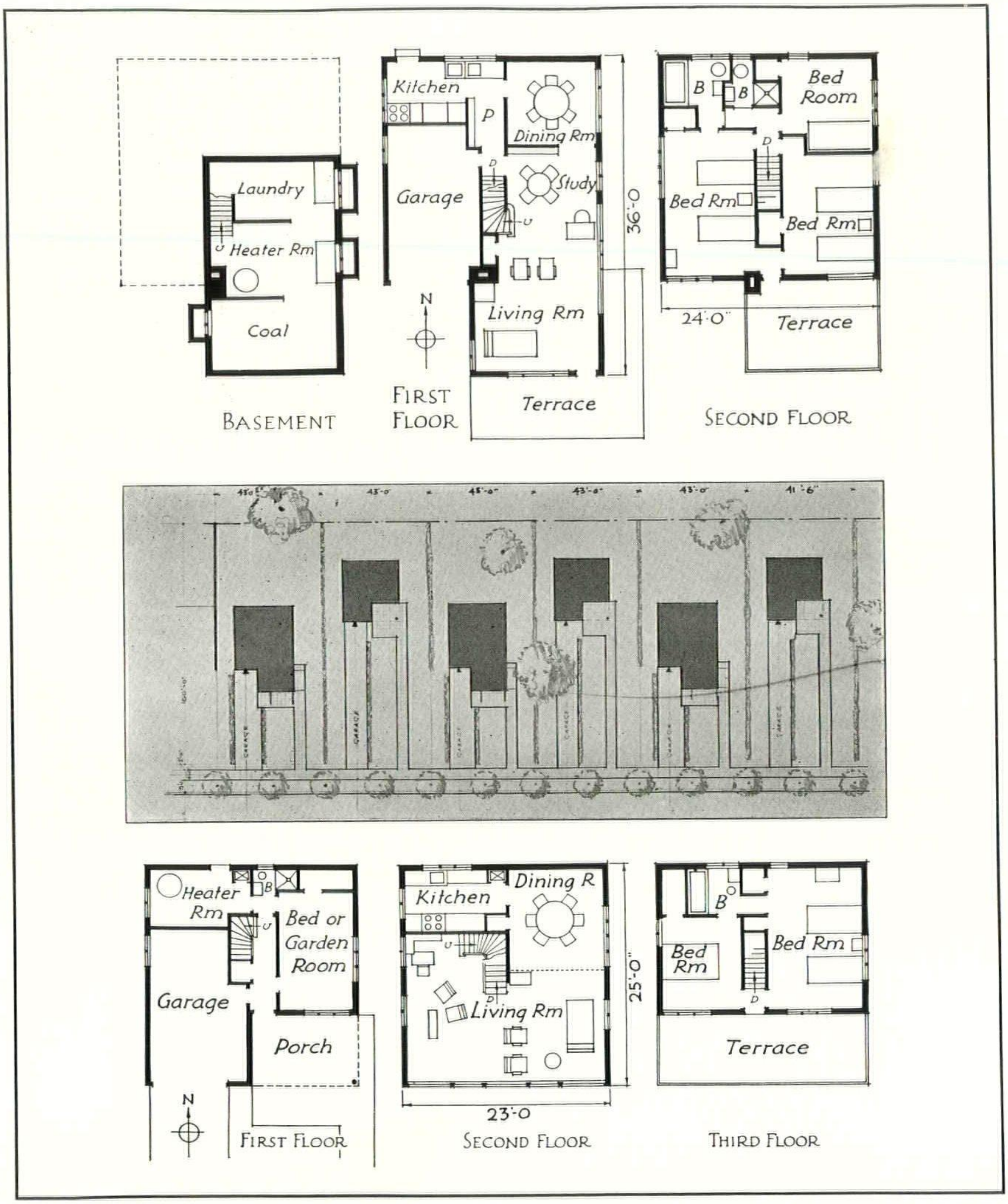




THESE houses have been planned as two solutions for a low-cost housing scheme applicable to the present method of real estate subdivision. They have been planned for narrow lots, but have been placed so that their alternate positions will assure a greater amount of privacy than obtains in the usual inexpensive real estate development as well as the greatest possible amount of sunshine and air. A study of the plot plan and the plans of the individual houses shown on page 284 will illustrate these points. Both houses have been planned with the living quarters toward the south and east, the garage and service areas in each case being toward the north and west. The design of the houses has been conditioned by the construction problems arising from the plan and the problems of cost. Applicable to large-scale production, the construction would utilize to a large extent prefabricated units for floors, walls, partitions and roofs

PROPOSED SMALL HOUSES

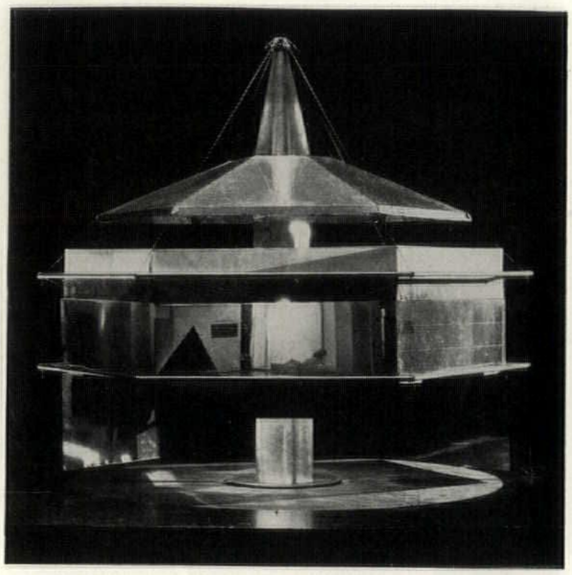
CLAUS & DAUB, ARCHITECTS



PROPOSED SMALL HOUSES

CLAUS & DAUB, ARCHITECTS

DYMAXION HOUSE



The Dymaxion House. A model of the five-room house for the machine age. The house itself is 40 ft. high and 50 ft. in diameter, and contains two bedrooms, each with a bath, living room, a study, and service unit

R. BUCKMINSTER FULLER

ARCHITECT

THE first Dymaxion House was the forerunner of many attempts to solve the housing problem by producing a manufactured house on a mass production basis. The house originally presented has been modified in detail, though not in principle, and the illustrations show the present stage in the development of this revolutionary conception — the house designed as the solution to a social and engineering problem, a machine for living. Buckminster Fuller's study and philosophy have been extensively used as basic material, although the hexagonal form has not been used to any great extent by other architects in this field.

Thinking in terms of giant presses, forges, dies, blast furnaces, chemical laboratories, mile square plants — together with transportation, distribution, and service — Mr. Fuller has suppressed individual taste in finding a "best-for-all" solution.

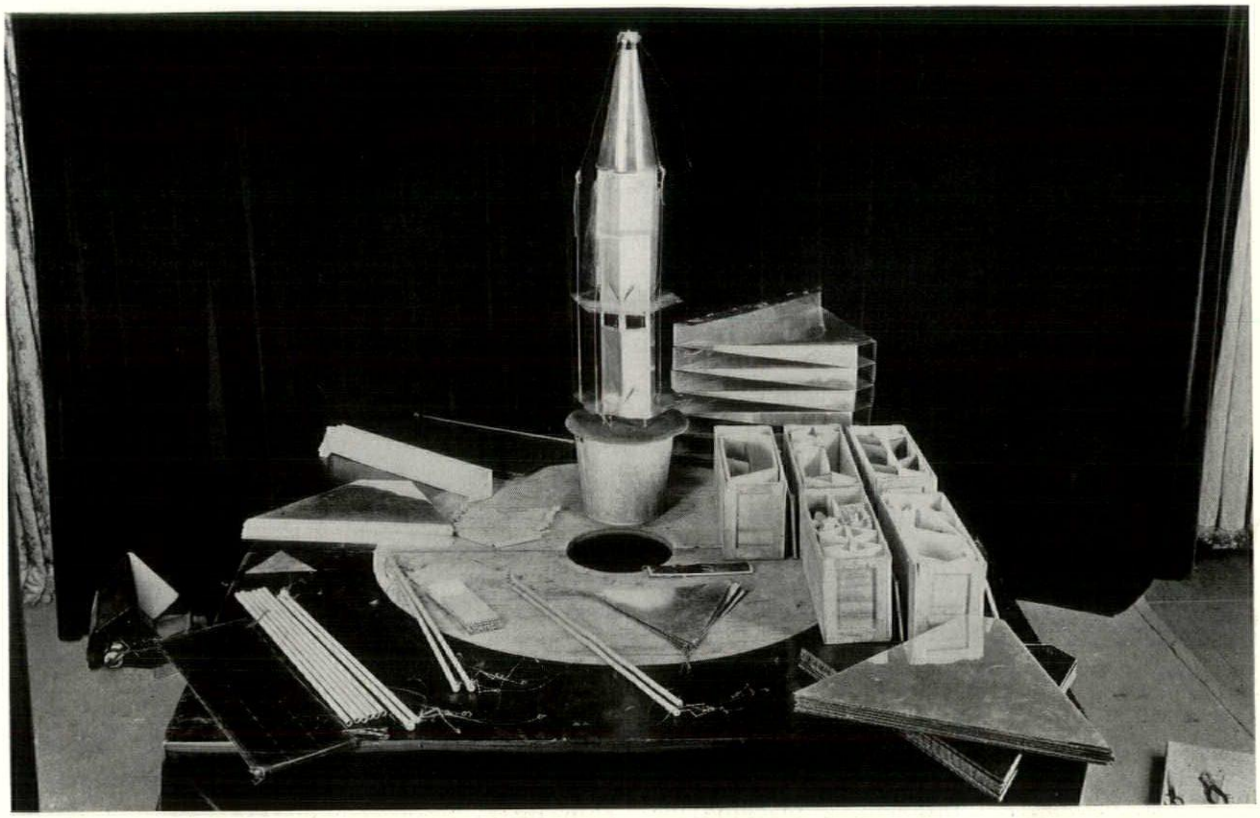
Actually, the Dymaxion House shown here is only the minimum sized example of a system of construction which would embrace all branches of housing. The system is based upon the principles of tension and triangulation. The structural character suggests the tree form, with a central stem containing what might be termed the elements which give life to the rest of the house, which spreads out from the stem as limbs do from the trunk of a tree. The central tower, composed of inflated duralumin tubes in flexible-jointed triangulation, contains all the required utilities, a triangular elevator, equipment for air conditioning, light and heat generation and distribution, water pipes and facilities for sewage disposal.

The base of the mast or tower is anchored to the ground, and in the base, which is a sunken pedestal, are located the septic and fuel tanks. From the top of the mast, steel guys support the tubular floor beams, which, like the central stem, are compression members. They form a hexagonal frame. Thin metal triangular plates connected to the mast and frame by taut wires make up the floor decking. A pneumatic floor system, firm and soundproof, neutralizes the sag of the decking. Rigidity of the frame is insured by the bracing guys which are anchored to the ground.

The walls of the Dymaxion House are double pane vacuum plates which may be translucent, transparent or opaque. This permits the heating of the house with the heat generated in its illumination and in supplying it with power. The air is drawn into the house from vents at the top of the mast, thoroughly conditioned, and circulated throughout the various rooms.

By means of prisms, mirrors, and lenses, a central lighting system in the mast diffuses illumination to all parts of the house. The result is not only the elimination of lighting fixtures but of wiring each room in the house. The central arterial system, furthermore, makes possible standard manifold hook-ups of the various utility units in the bathroom, laundry, grill, etc.

The smallest unit house in the Dymaxion system provides a living room, study, two bedrooms with separate baths, and a service room. The latter, of course, might more loosely be referred to as a kitchen, but the elimination of all household drudgery symbolized by "the kitchen" is one of the principles behind Mr. Fuller's design. Instead, he has included cooking grills, which, to use his own description, "are like pianos and have nothing to do with a servant." The dish closets, as well as



The component parts of the house as they would be delivered ready to erect. Mr. Fuller estimates that the assembly could be finished within a day, including the service facilities and much of the furniture, both of which are considered as parts of the house. All the material for the house weighs approximately three tons

the linen and clothes closets are revolving so that they swing around at one's convenience rather than forcing one to walk around to them.

Other mechanical innovations included in the house are: a laundry unit into which soiled clothes are deposited individually, laundered and ready to use within three minutes; an incinerator pocket, readily accessible; revolving book shelves which "are completely equipped with maps, globes, atlases, drawing board, typewriter, mimeograph, calculating machine, television unit, radio loud speaker, and microphone"; and a hangar in which "the transport unit, an amphibian airplane-automobile," is quartered. The intention of all the equipment is to reduce to a minimum the physical drudgery of the occupant, and to have all necessary utilities as conveniently accessible as possible.

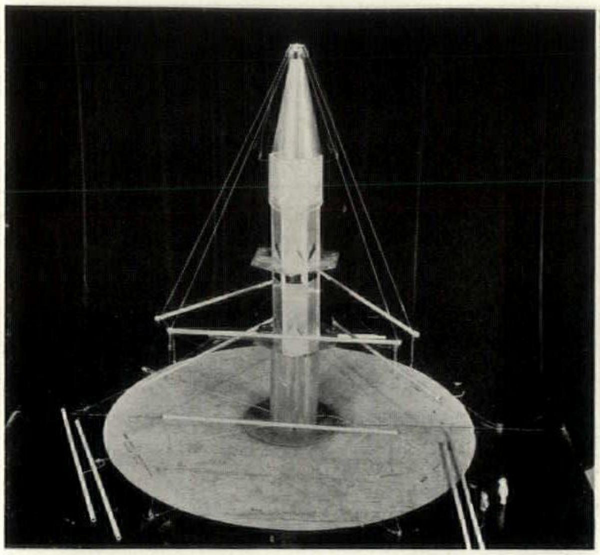
The upper deck of the house is protected by a hood which is suspended from the mast independently. This deck forms a playground for the children or a relaxation area for the adults, where sun baths may be taken.

Other features of the interior are: the pneumatic soundproof floor, completely soundproof partitions, built-in furniture, pneumatic beds. The conditioning of the air eliminates the necessity of bed clothes, and, of course, reduces to insignificance the amount of dirt that can be brought into the house. A compressed air cleaning system, however, makes cleaning no task at all.

The house will be delivered in sections ready to be erected. The five-room house, which has been referred to as the Dymaxion House, weighs only 6,000 pounds complete with all accessories and furnishings. Since mass production is the basis of the design, the cost of the house can be determined only in terms of quantity production, which Mr. Fuller estimates at fifty cents a pound.

"No limit to the cost of the original, as a single unit of fabrication, need be considered," the architect points out. "Though it cost $100,000,000 if but one unit were constructed, the machinery, thereto attendant, having been set up and its distribution ordered, replicas may be had for close to the materials cost."

Acceptance of the Dymaxion House depends, of course, upon the acceptance of Mr. Fuller's belief that the house is in the class with the automobile as a commodity. He has, at least, indicated one possible answer to the question of providing decent living for those who cannot afford it under present conditions.



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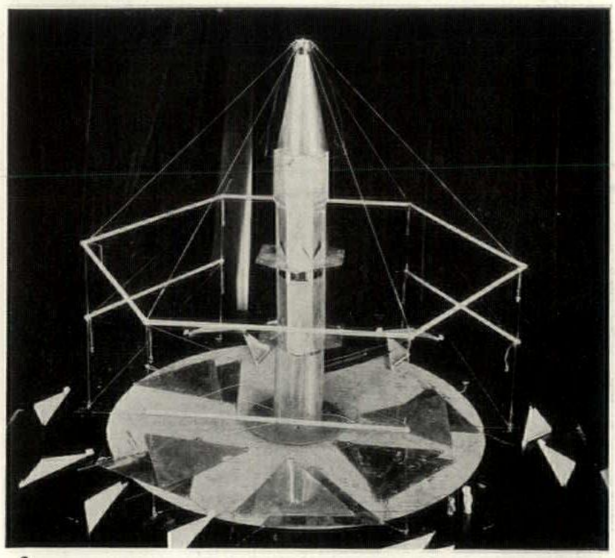

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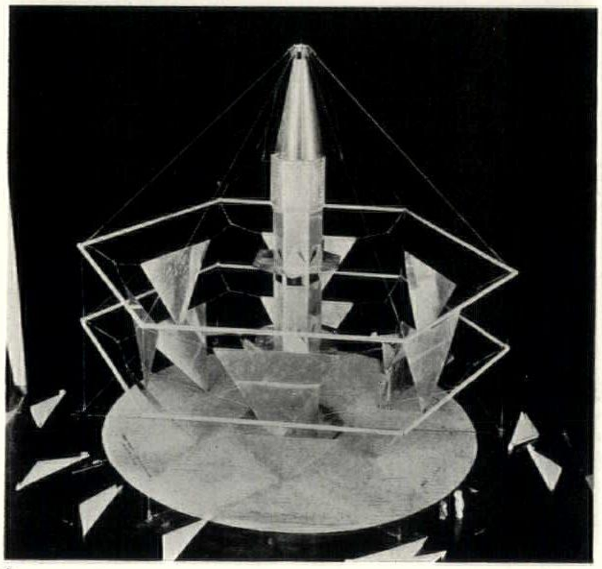

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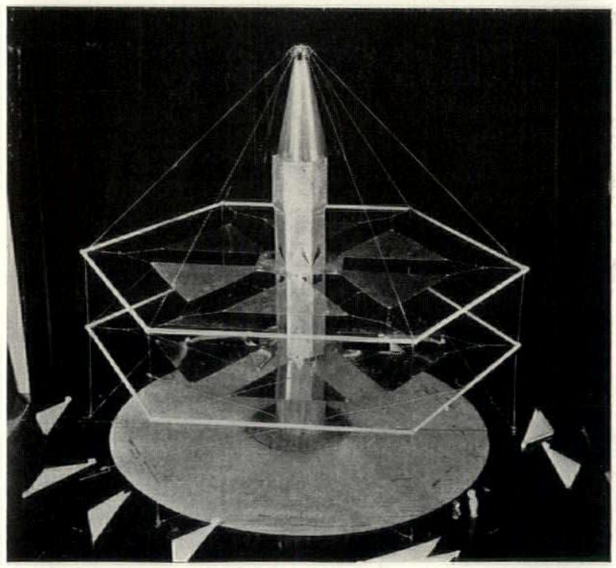

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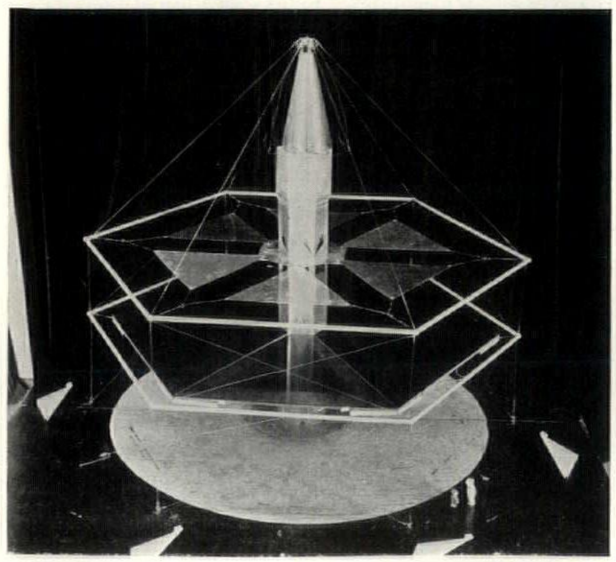
1. The central mast anchored to the ground, with three of the floor beams of each deck suspended by thin steel wires from the top of the anchored mast

2. The frame of the house anchored to the ground by wire guys, and made rigid by other wires fastened diagonally from the corners of the frame to the ground

3. The triangular steel floor plates partly raised into position. The plates are attached to the central mast and to the frame by wire in tension

4. All the floor decks in position after the tension wires had been tightened by turnbuckles. Despite its light weight, the framework is absolutely immobile and rigid

5. The pneumatic floor laid on the lower deck. It is so constructed that it will offset the deflection of the suspended plates, and form a level surface



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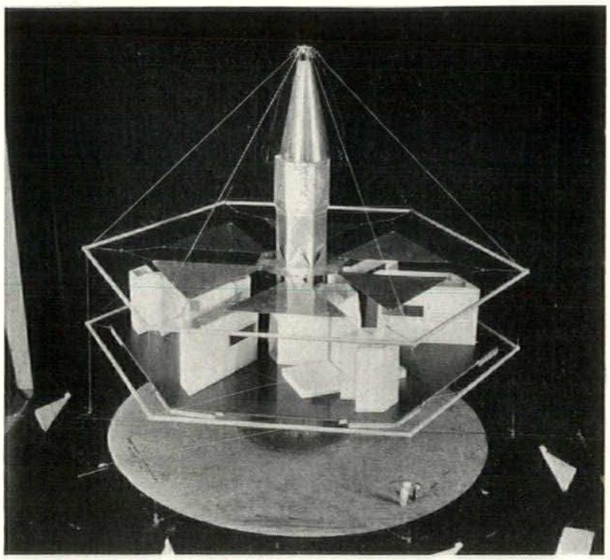
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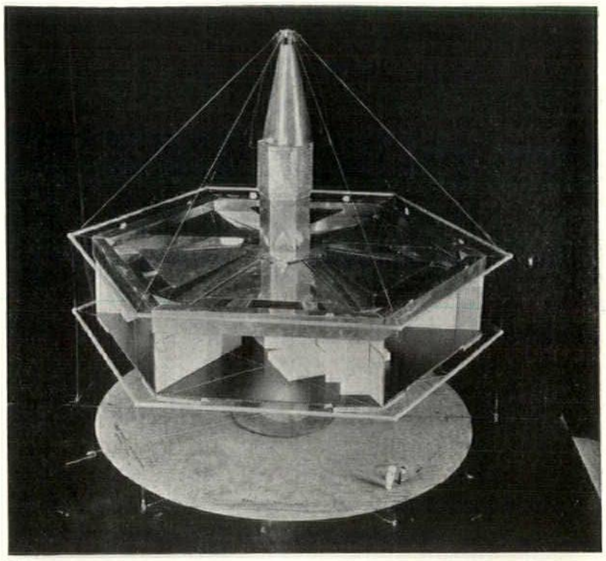
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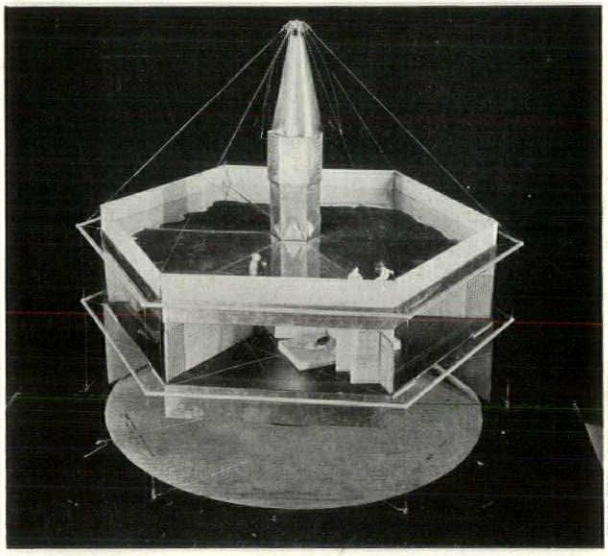
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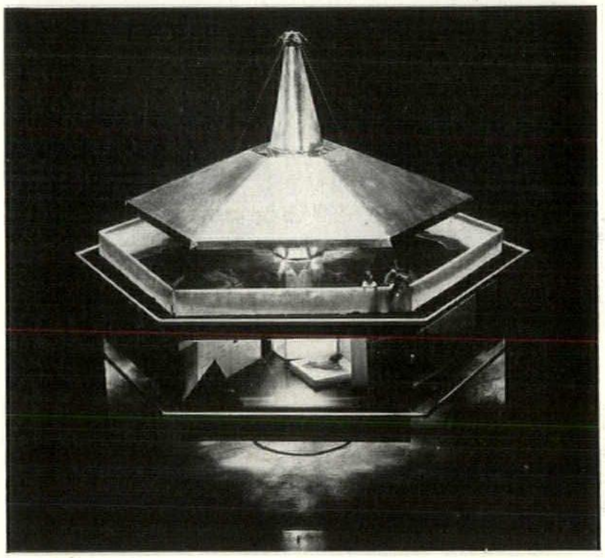
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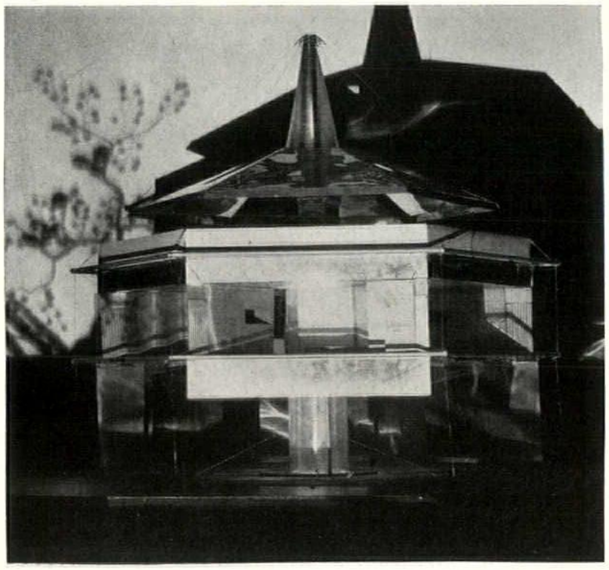
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6. Service units set in place. These include the bathrooms, closets of revolving shelves and hangers, laundry, cooking grills, and closets. Each of them is prefabricated as a structural element of the house itself

7. The natural divisions formed by the service units completed by the installation of soundproof partitions. The ceiling units, which form the upper part of the wall structure too, are in place. Their polished sloping surface serves as light reflector, and also as a ventilating duct

8. Flooring of the roof installed, the parapet erected, and the transparent vacuum wall plates set up

9. The house completed with the suspension of the protective hood from the mast by independent wires

10. Another view of the completed Dymaxion House

Courtesy, School of Architecture, Harvard University

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

THE
ARCHITECTURAL
FORUM

VOLUME LVI NUMBER FOUR

APRIL 1932

ARCHITECTURAL EDUCATION

BY

KENNETH KINGSLEY STOWELL

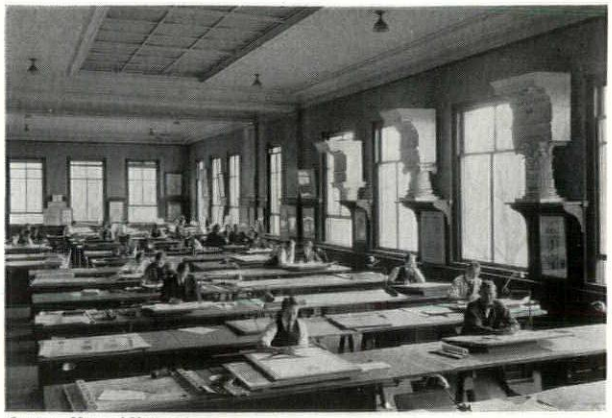
HOW well we can all recall those charettes, the first one when we "niggered" for so-and-so (who won the Paris Prize), wondering how we were going to finish our own "order problem." Then the last "Class A" or thesis when we slapped in the last tree of the entourage and took our cohorts out to the *table 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, 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.

Courtesy Columbia University

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

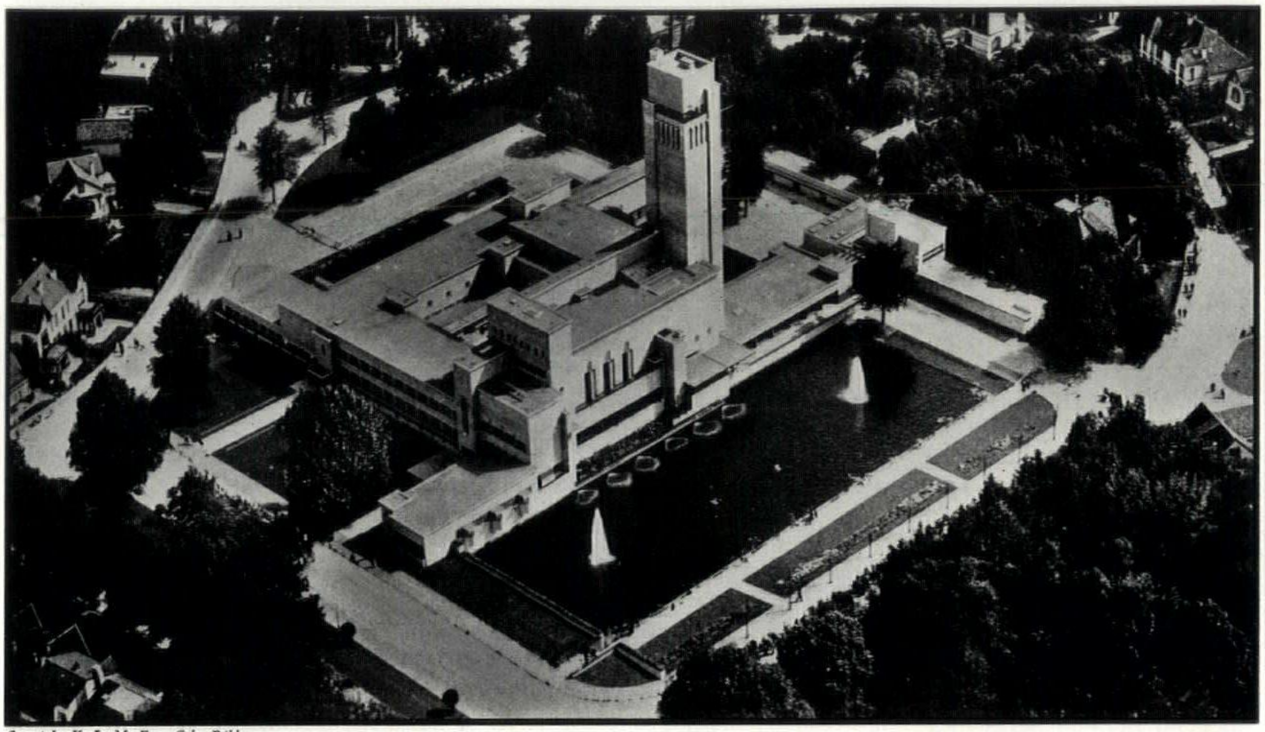
Such a system would probably eliminate the introductory drudgery of painstakingly rendered plates of the classic orders and would put the study of the orders later in the course, when the classic examples could be more intelligently studied as examples of expressive form in its highest development. The 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

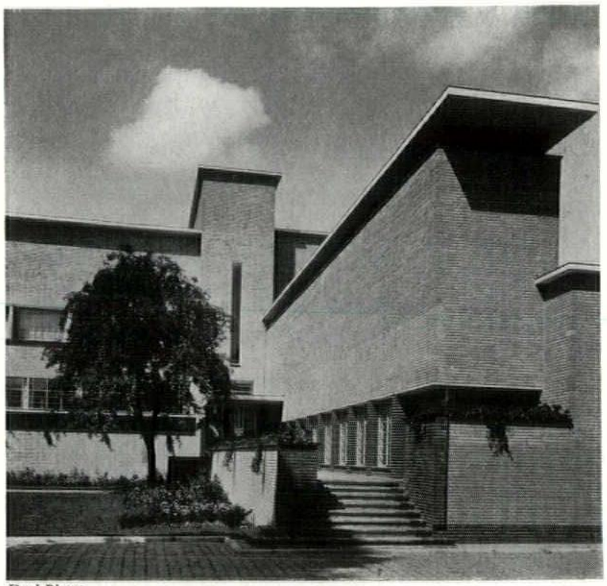
HILVERSUM, HOLLAND

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

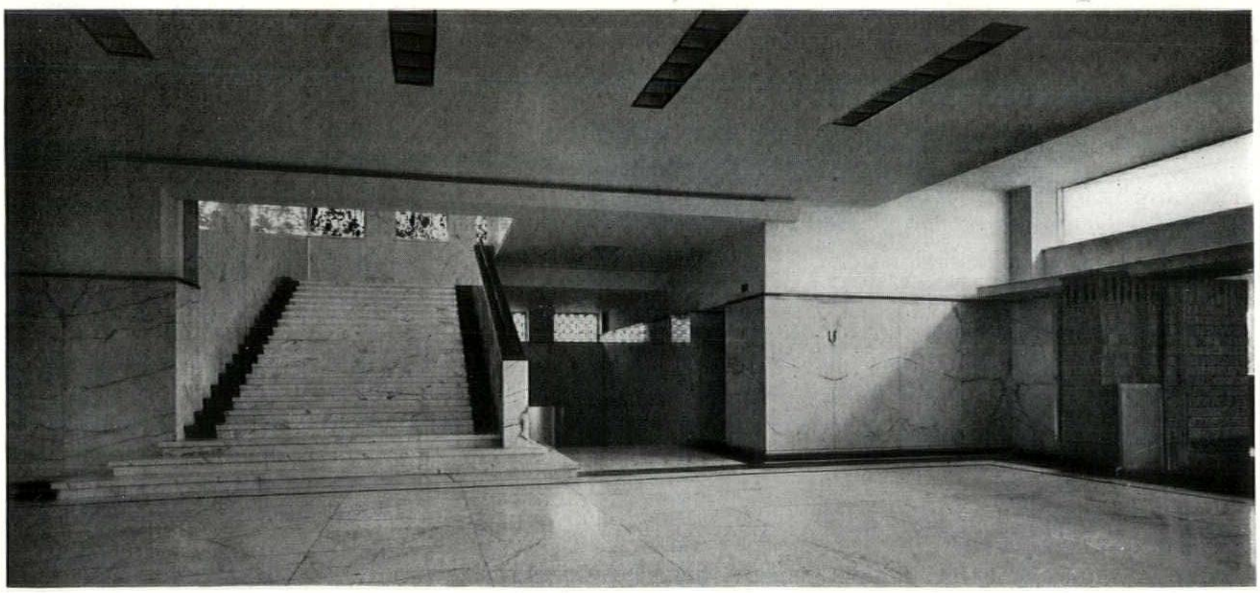
The entrance to the northeast wing, containing the tax department and marriage rooms, from the main entrance court. Piers are of black brick

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.

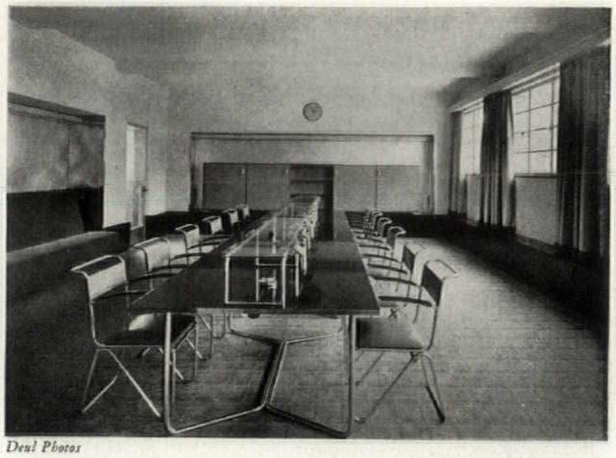
From every point of view the composition is dominated by the high, square tower adjacent to the entrance at the southeast corner of the building. Practically it is a clock tower and houses as well certain parts of the mechanical equipment of the structure. Æsthetically, and in equally as practical a 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.

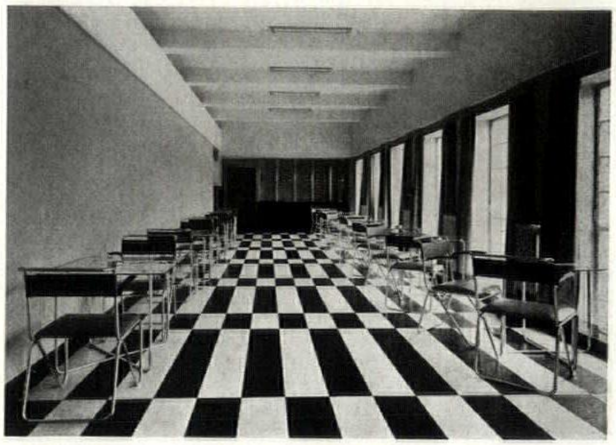
In addition the building is a striking example of the successful use of color which unfortunately the illustrations do not convey. The brick is of a very light buff color with a semi-glazed finish laid with exactness. The cornices are all painted white. The piers of the entrance on the south side are 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

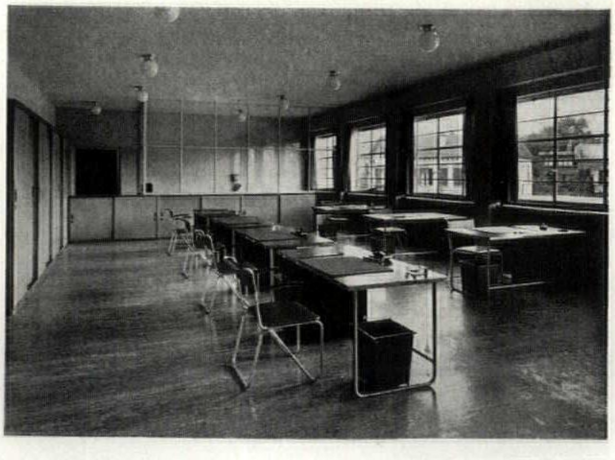


Deul Photos

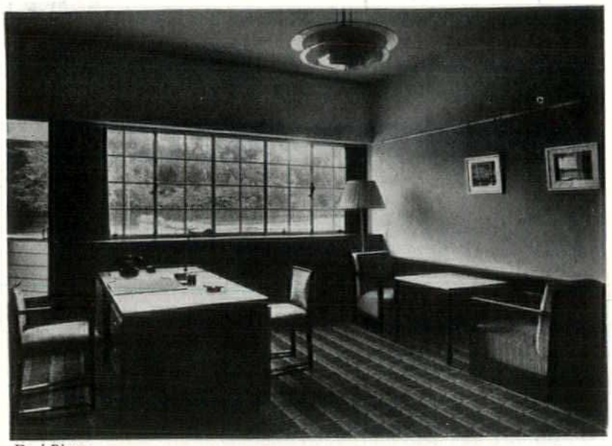
The furniture of the reading room is upholstered in blue and silver. The hangings are gray



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

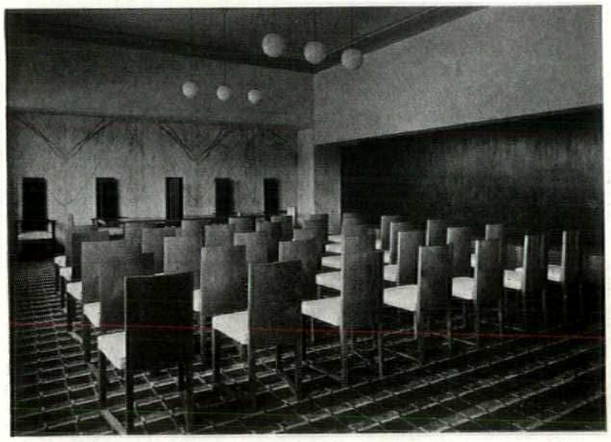


A typical office. The floor is jaspé linoleum. The hangings and upholstery are blue



Deul Photos

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



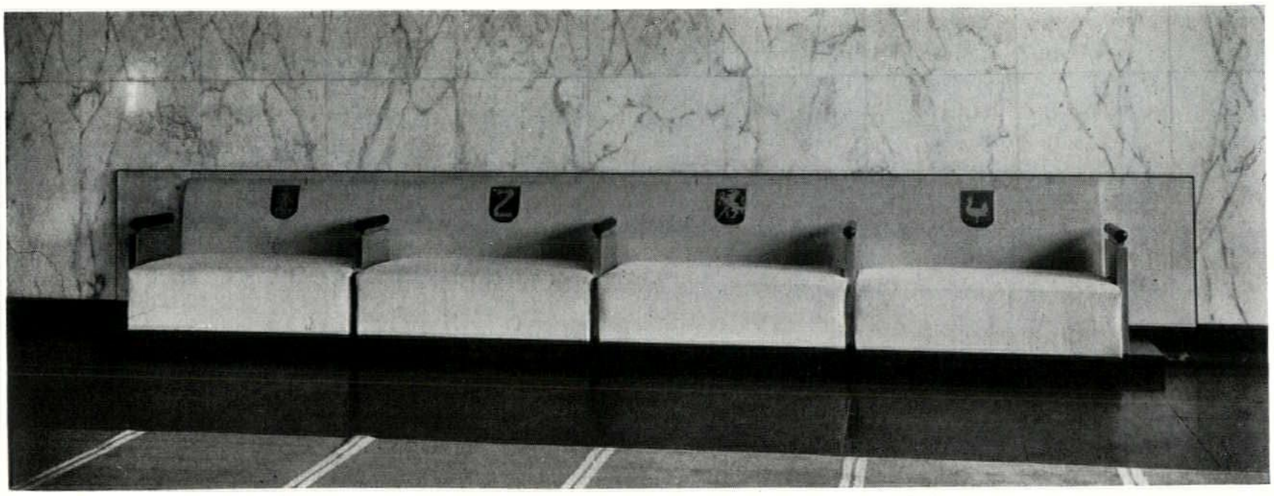
The large marriage room has mahogany woodwork and polished maple chairs with white horsehair upholstery

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

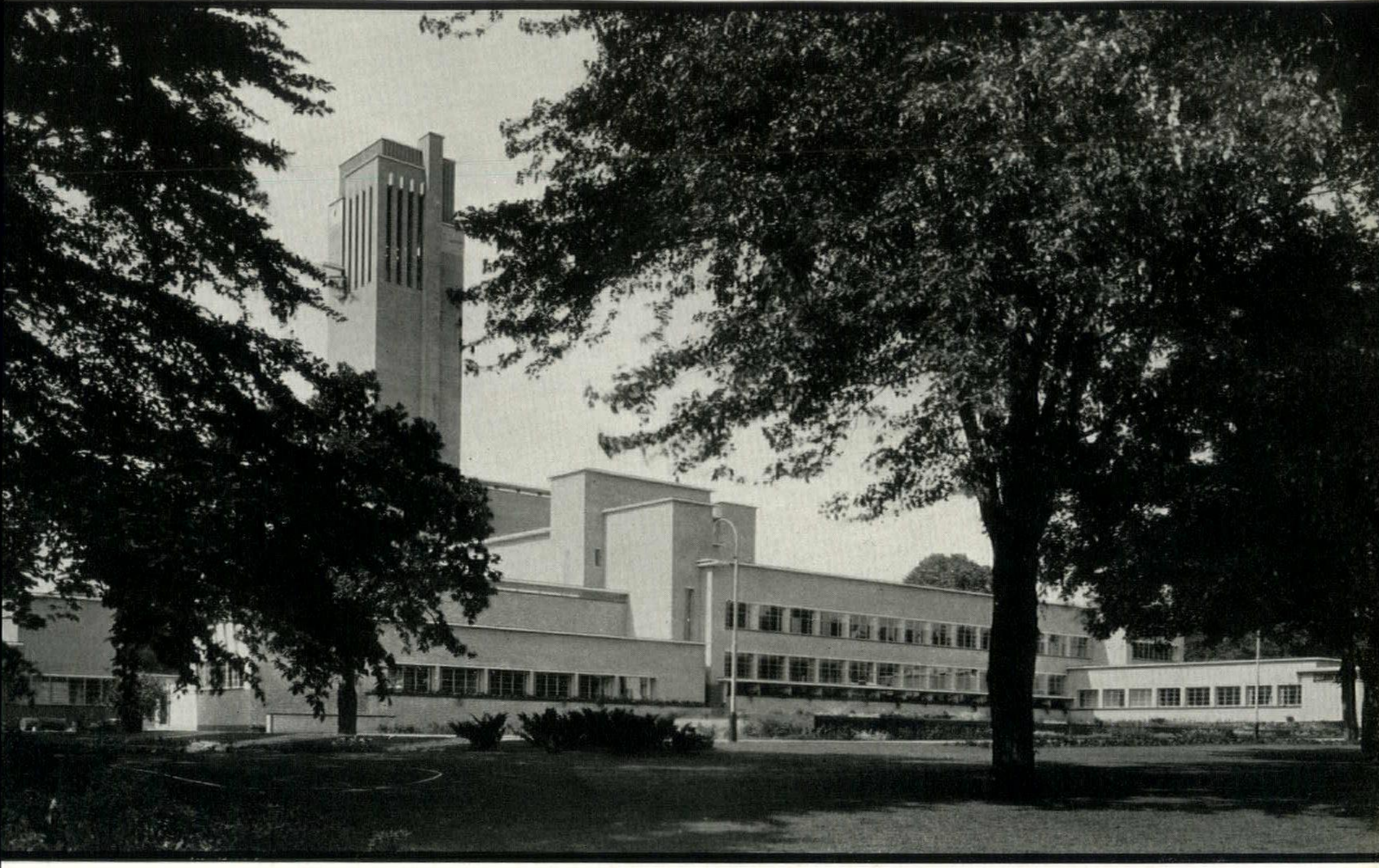
The reception room will serve as an example. Around three sides the walls are faced with a light cream Italian marble. The window columns on the east side are of light blue tile, while the row of columns near the opposite side of the room are covered with gold tile. The floor is of black and gray marble 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

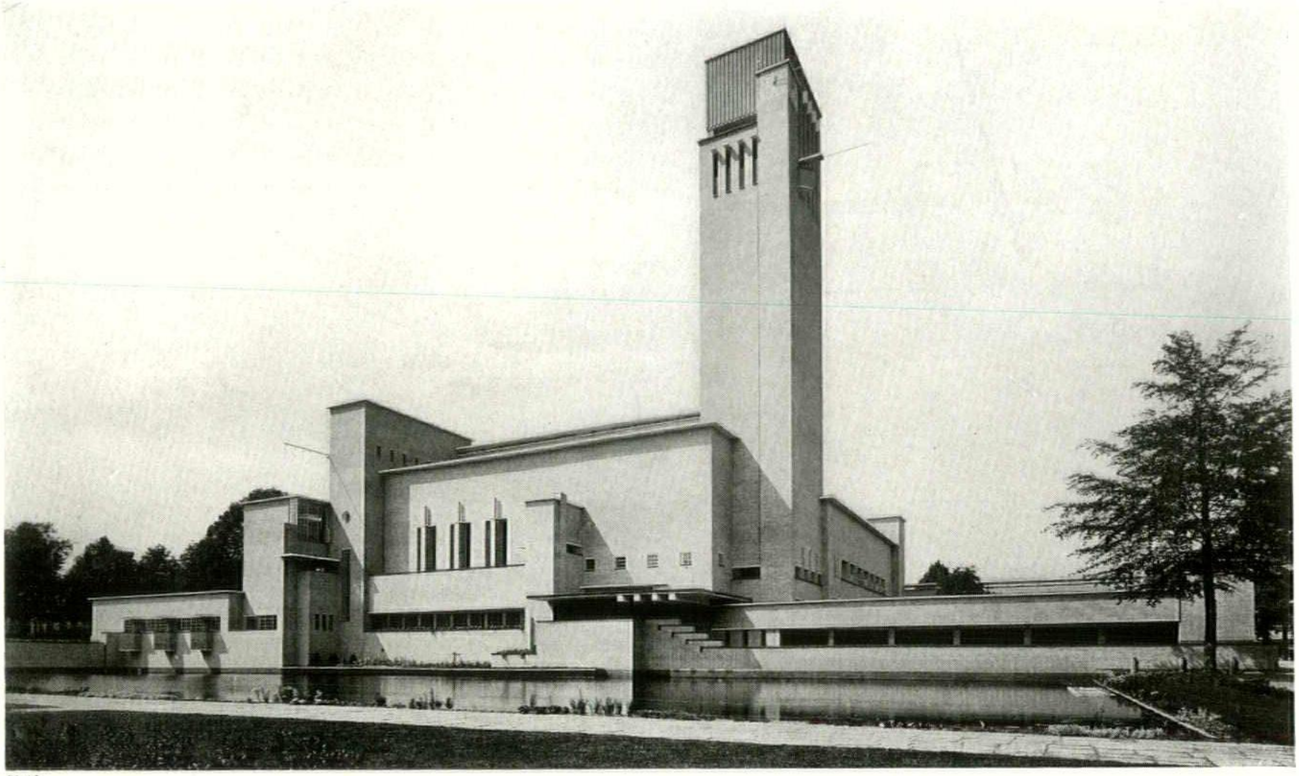


FROM THE PARK AT THE NORTH

THE CITY HALL

HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT



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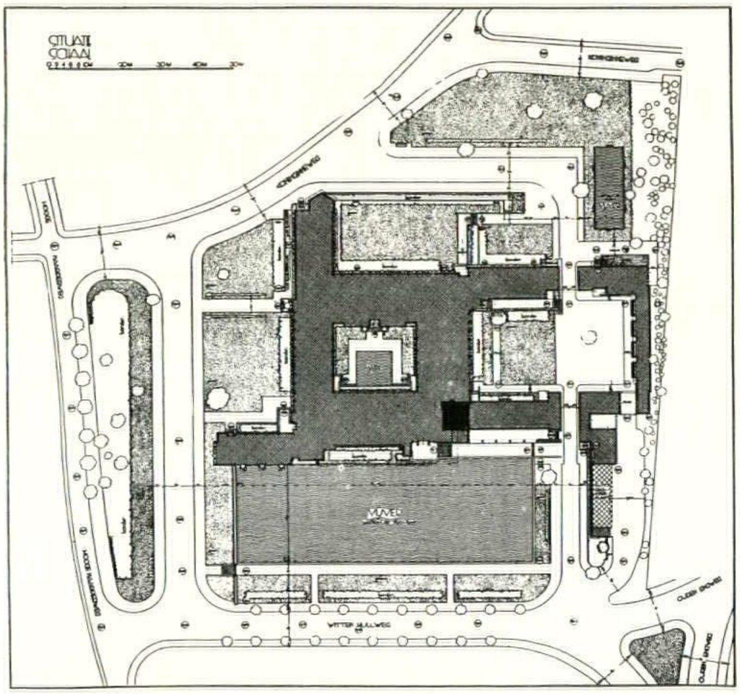


THE building stands in the center of a relatively large park and is so placed that from all sides of the building it is possible to obtain a complete impression of it. The picture above is of the south side and shows the general effect from the main approach. On the opposite page is a detail of the main 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

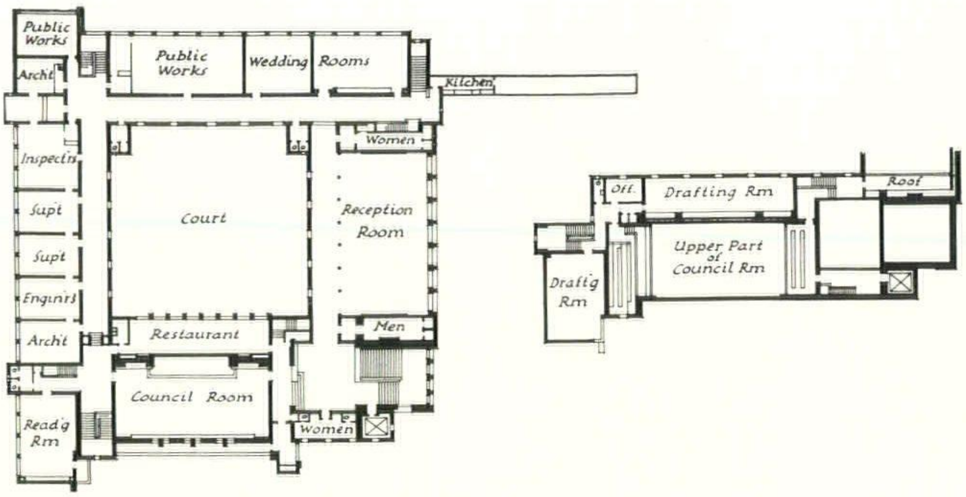
WILLIAM DUDOK, ARCHITECT

Deul

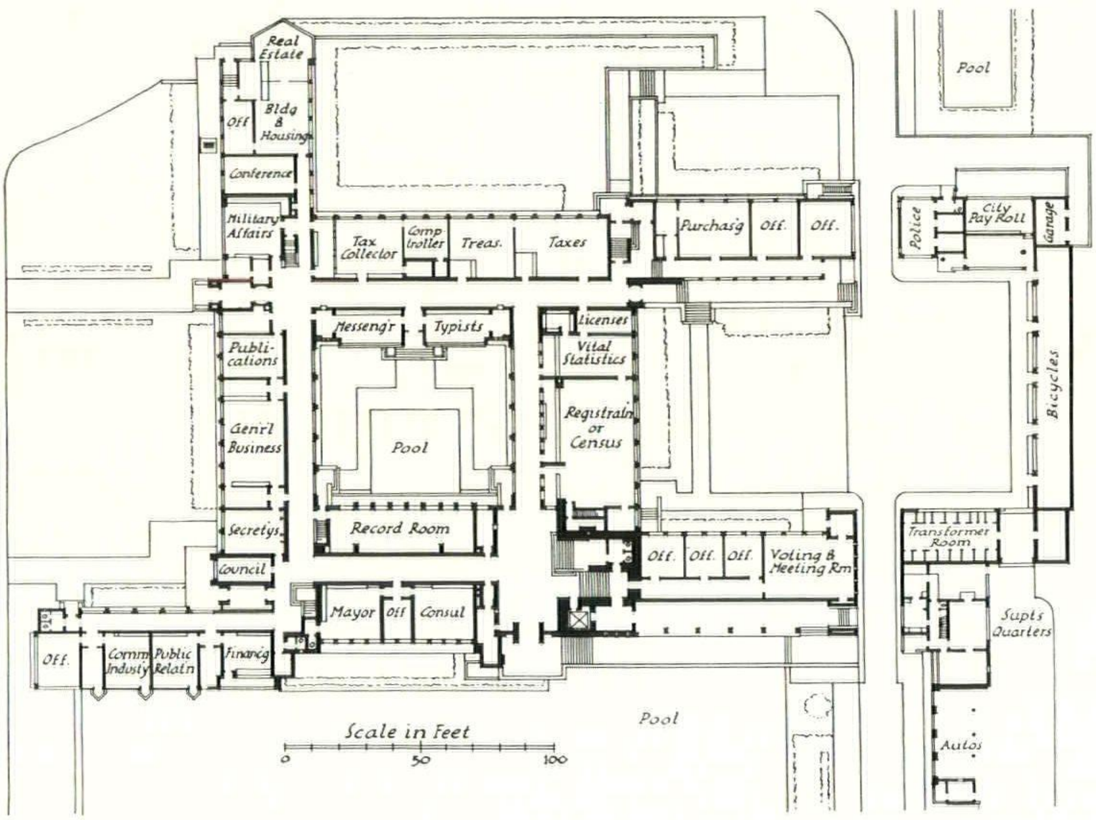
THE CITY HALL

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

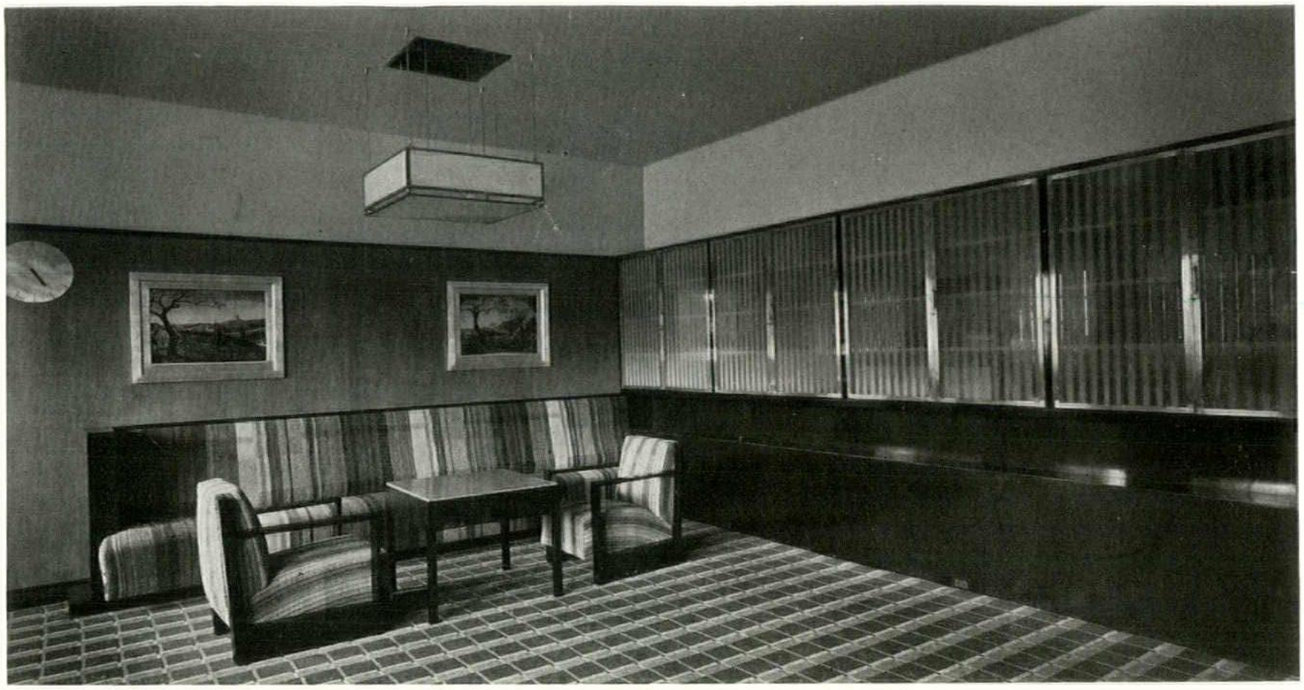
THE CITY HALL

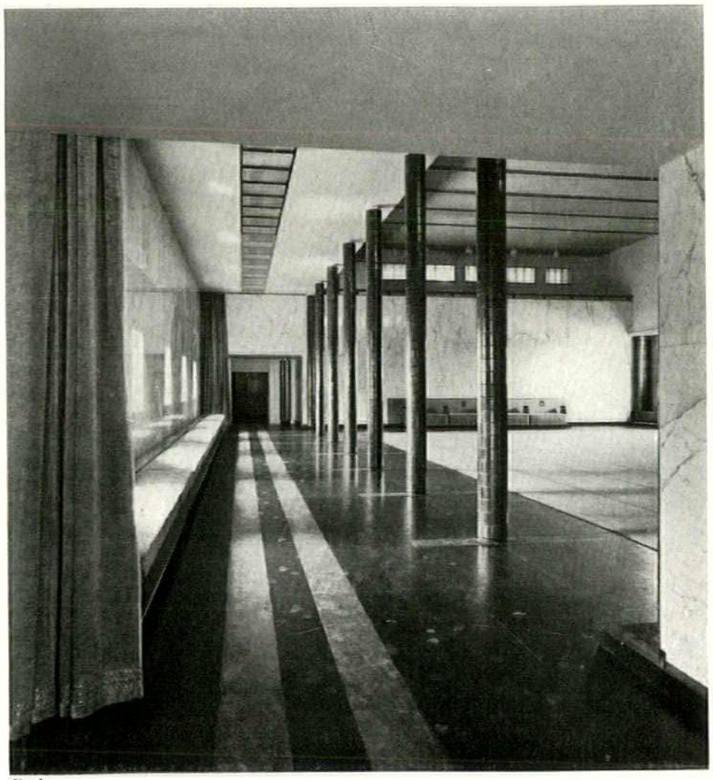
HILVERSUM, HOLLAND

WILLIAM DUDOK, ARCHITECT

Deul

THE CITY HALL
HILVERSUM, HOLLAND
WILLIAM DUDOK, ARCHITECT





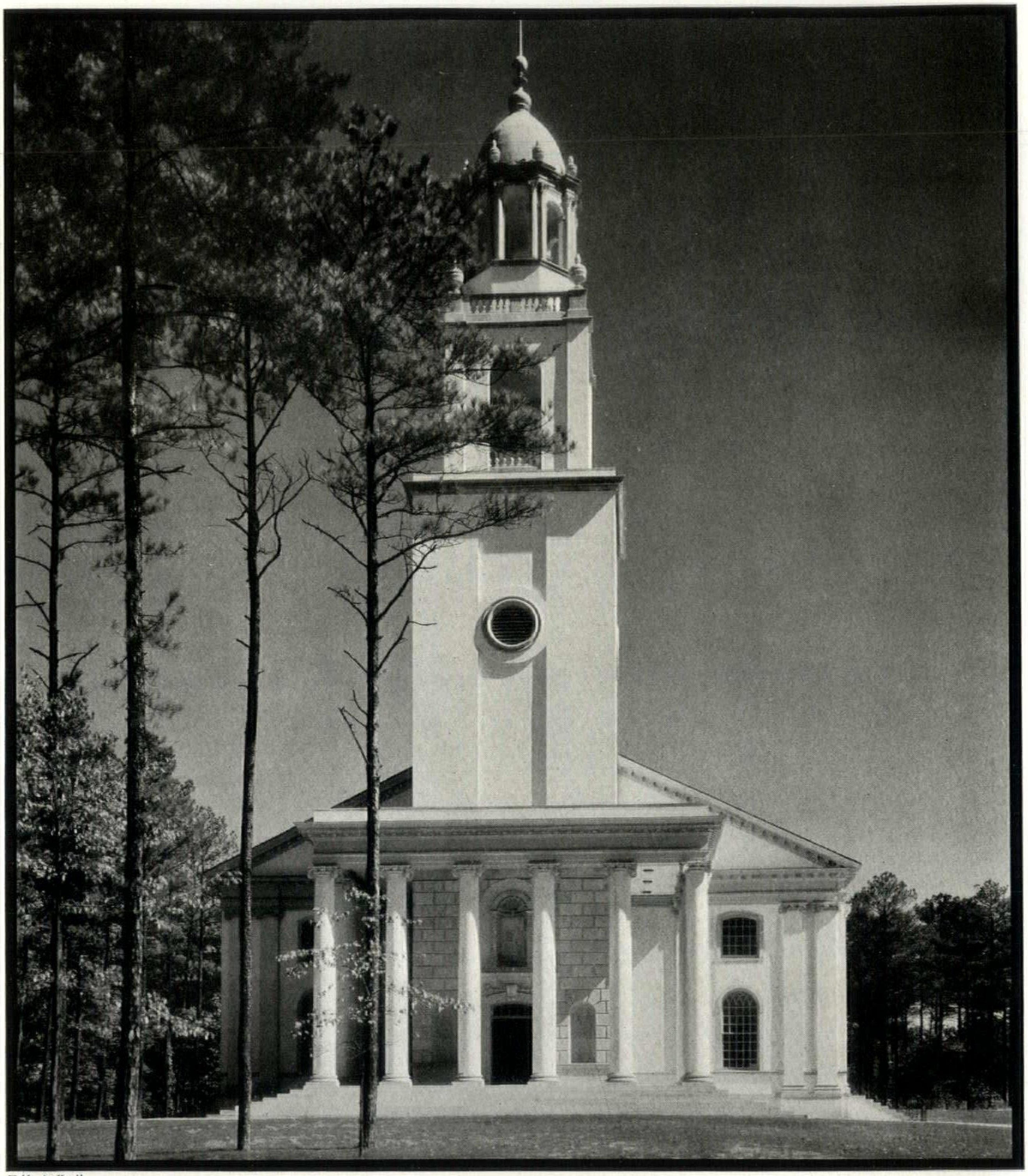
Deul

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

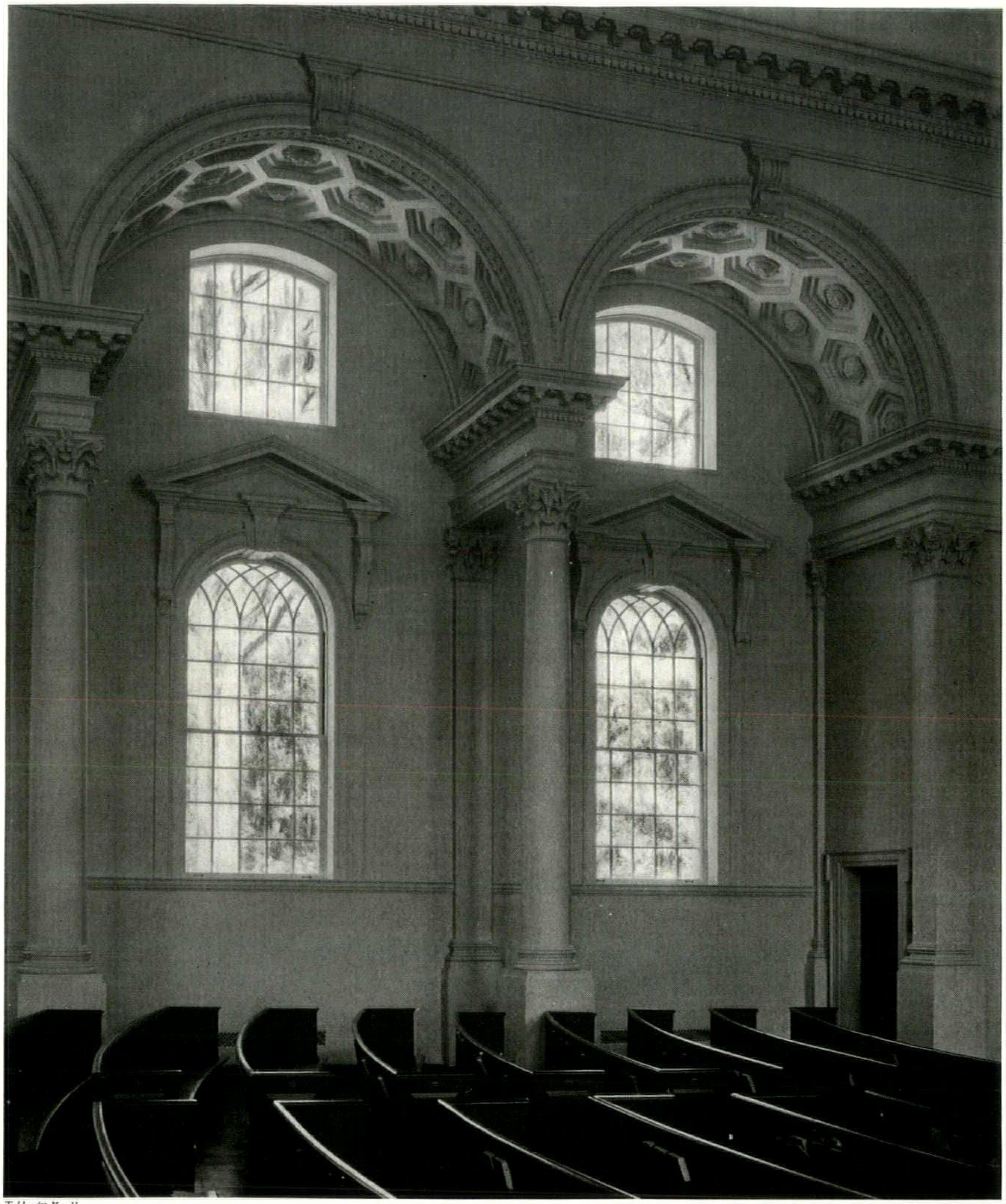


Tebbs & Knell

GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

HENTZ, ADLER & SHUTZE, ARCHITECTS

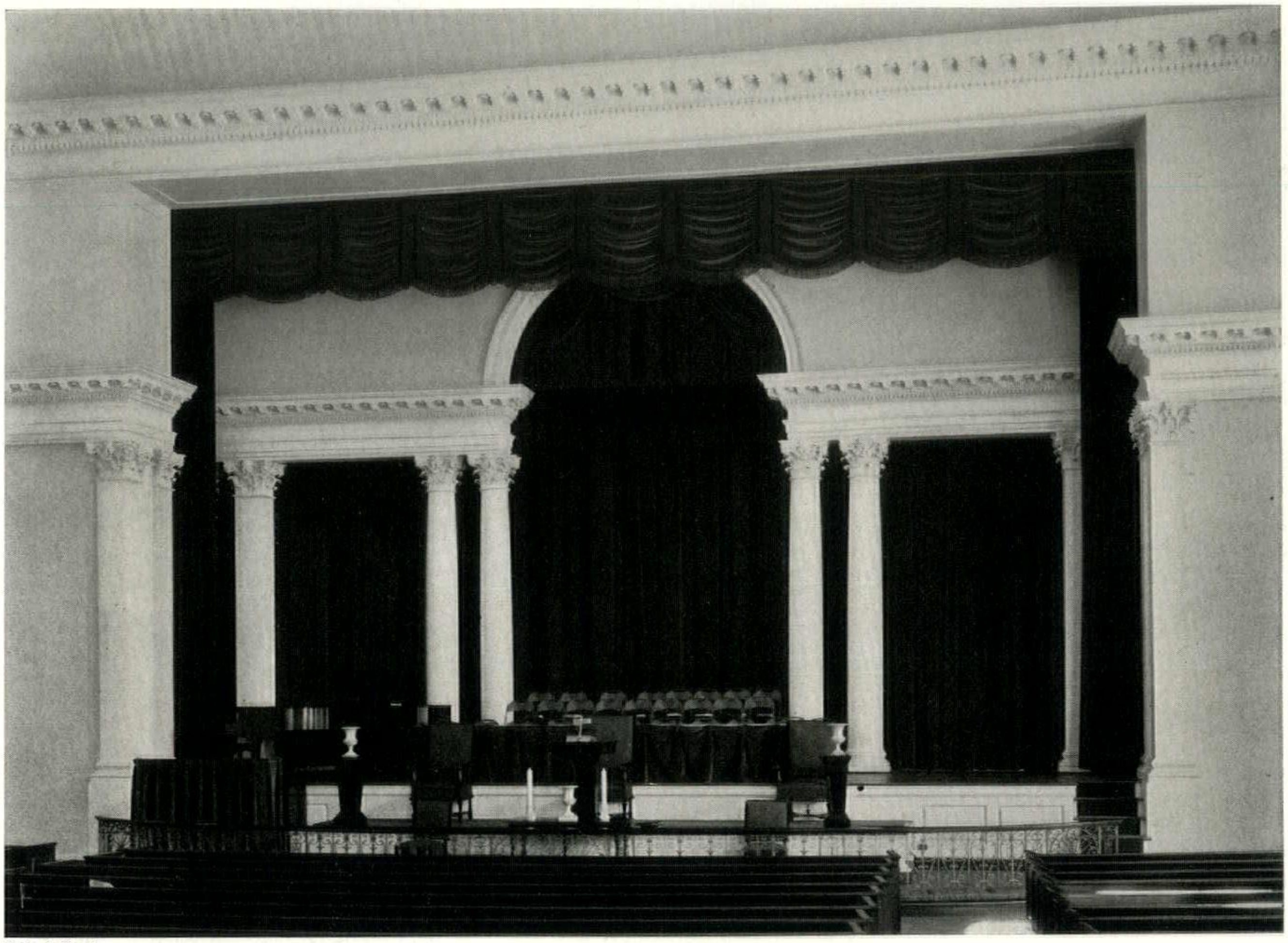


Tebbs & Knell

GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

HENTZ, ADLER & SHUTZE, ARCHITECTS



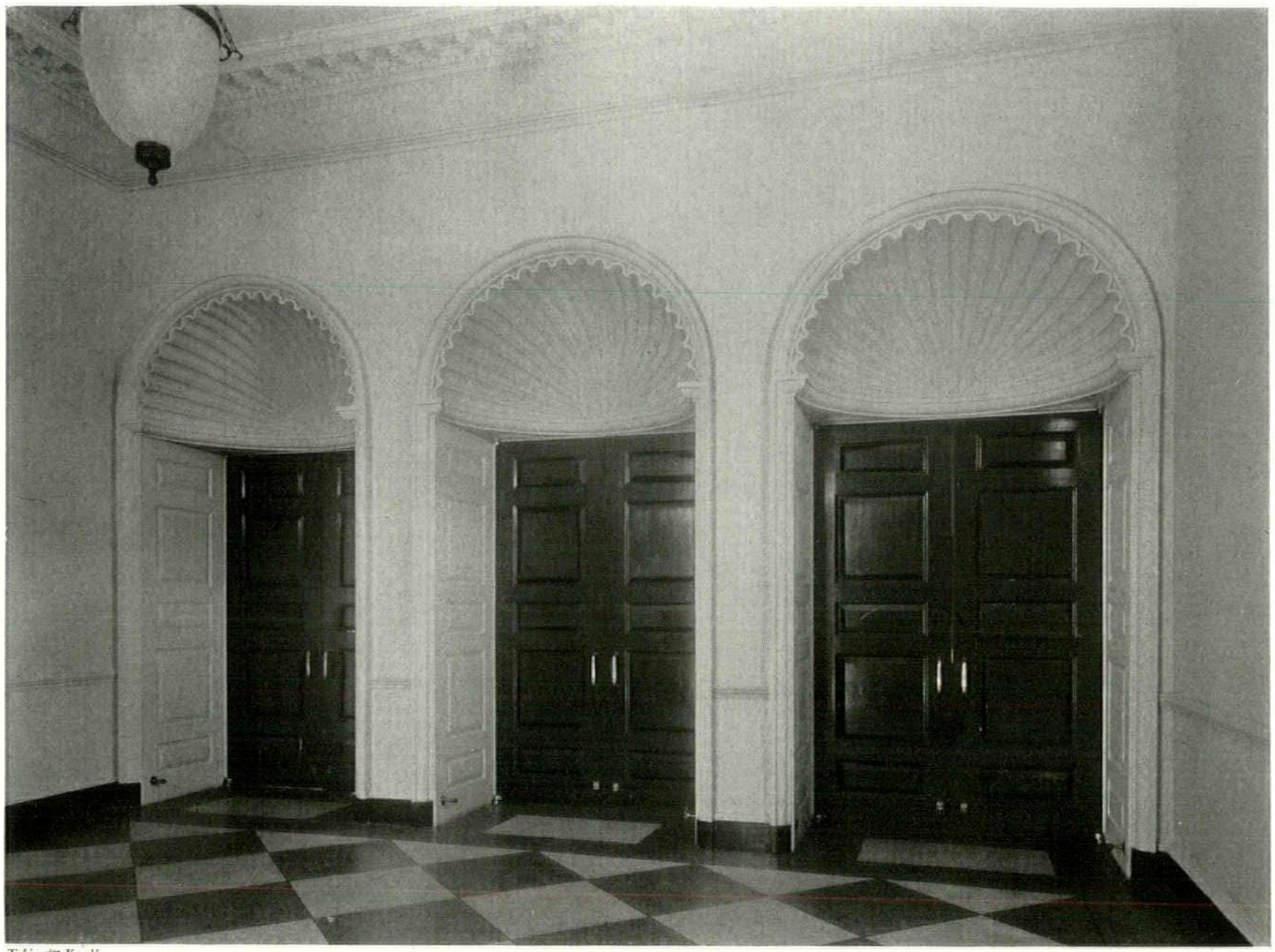
Tebbs & Knell

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

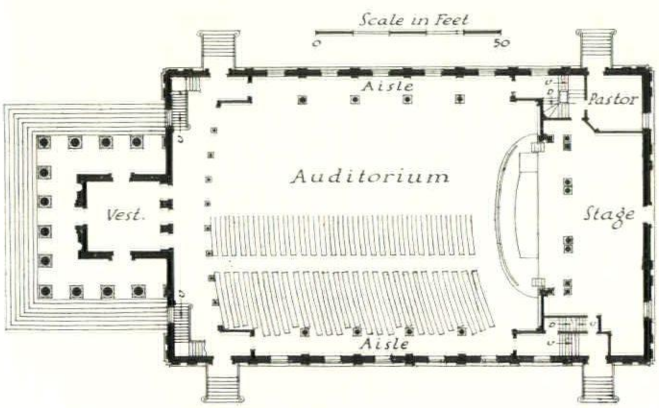
ATLANTA, GEORGIA

HENTZ, ADLER & SHUTZE, ARCHITECTS

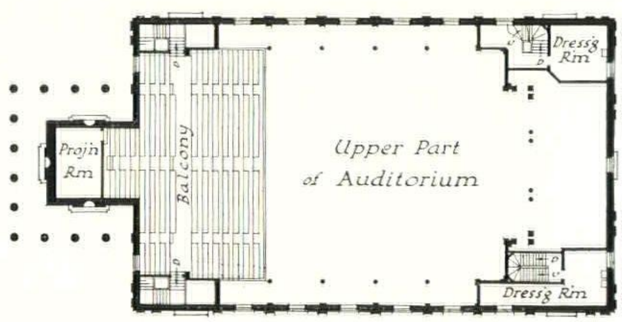


Tebbs & Knell

ENTRANCE TO THE AUDITORIUM FROM THE VESTIBULE



MAIN FLOOR PLAN



BALCONY FLOOR PLAN

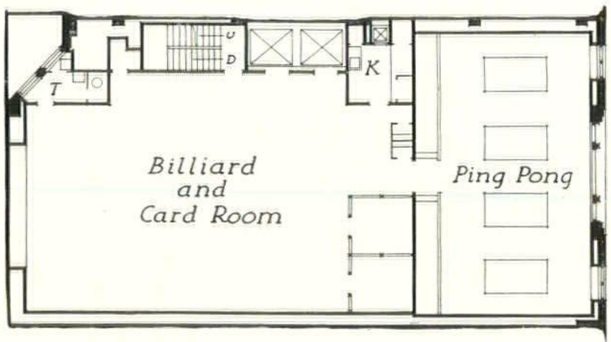
GLENN MEMORIAL CHURCH

ATLANTA, GEORGIA

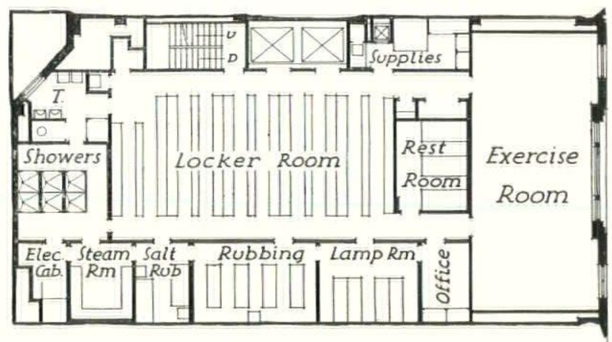
HENTZ, ADLER & SHUTZE, ARCHITECTS

Hedrich-Blessing

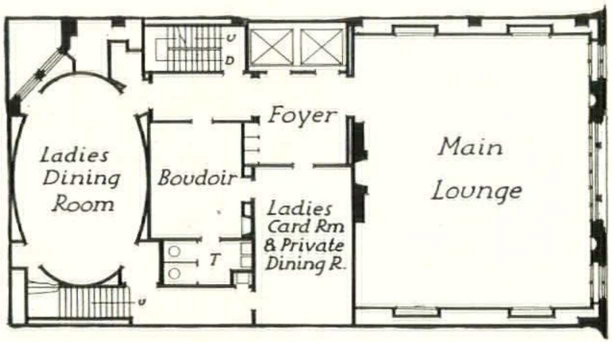
INTERFRATERNITY CLUB
CHICAGO, ILLINOIS
HOLABIRD & ROOT, ARCHITECTS



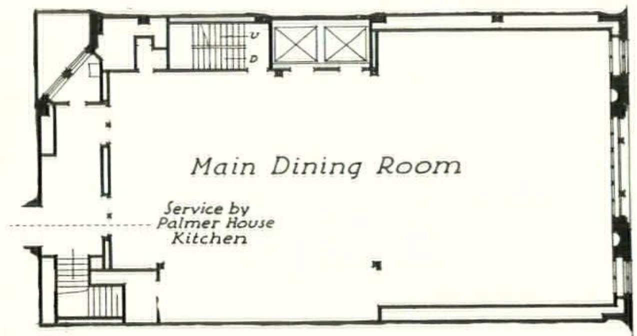
FIFTH FLOOR



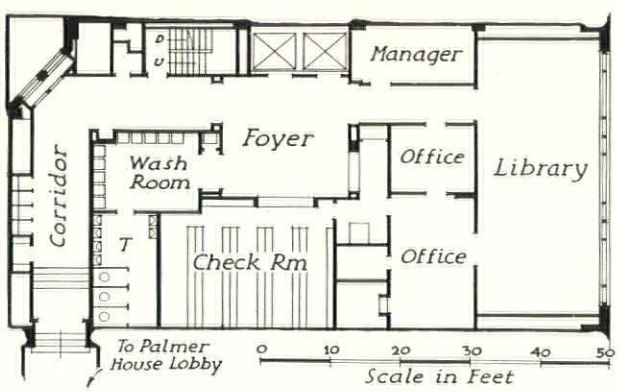
SIXTH FLOOR



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

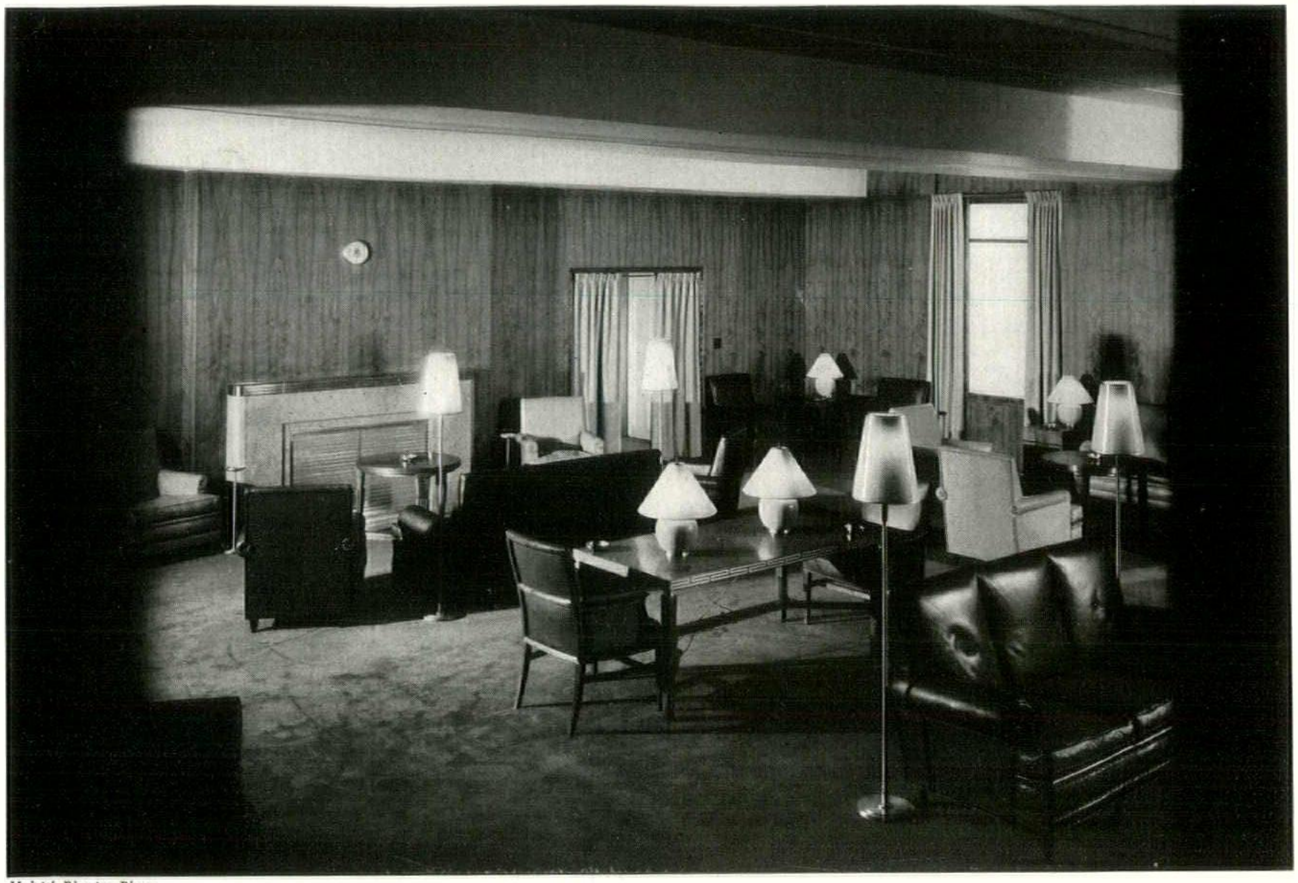
HOLABIRD & ROOT, ARCHITECTS

Hedrich-Blessing

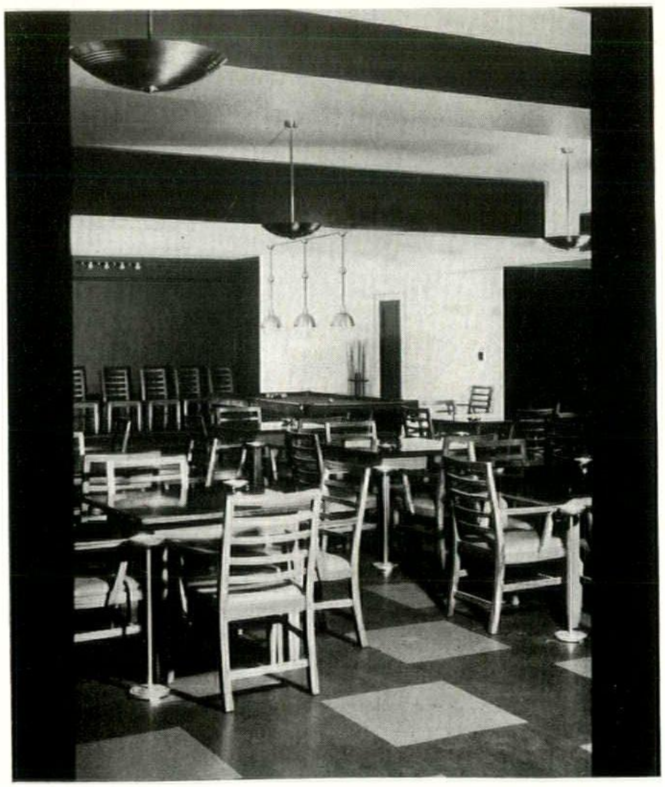
INTERFRATERNITY CLUB

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

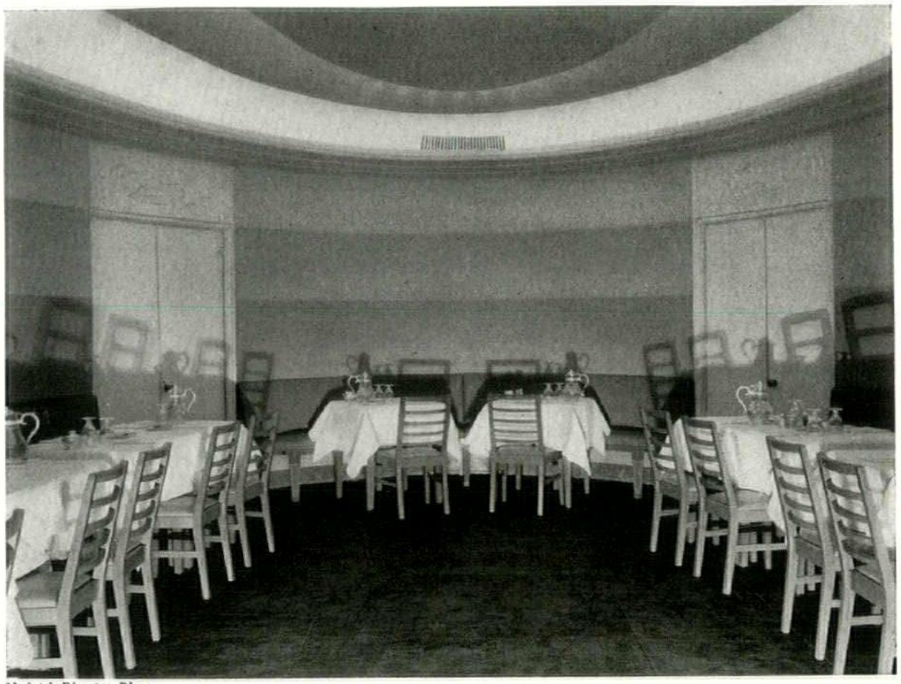
Hedrich-Blessing Photos

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

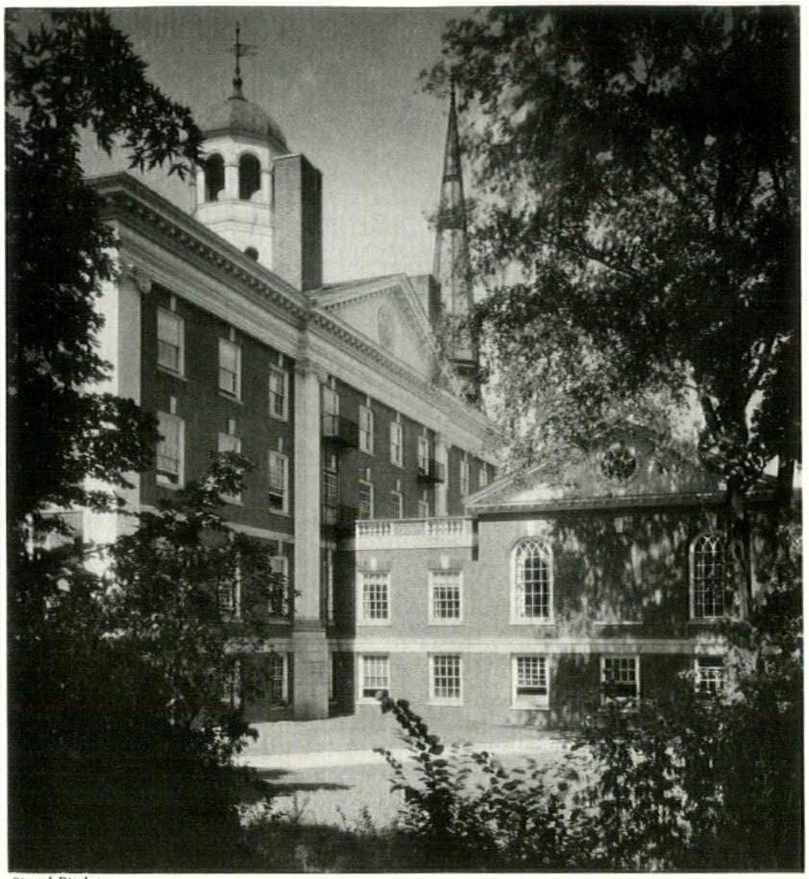
HOLABIRD & ROOT, ARCHITECTS

Sigurd Fischer

AUBURN CITY HALL

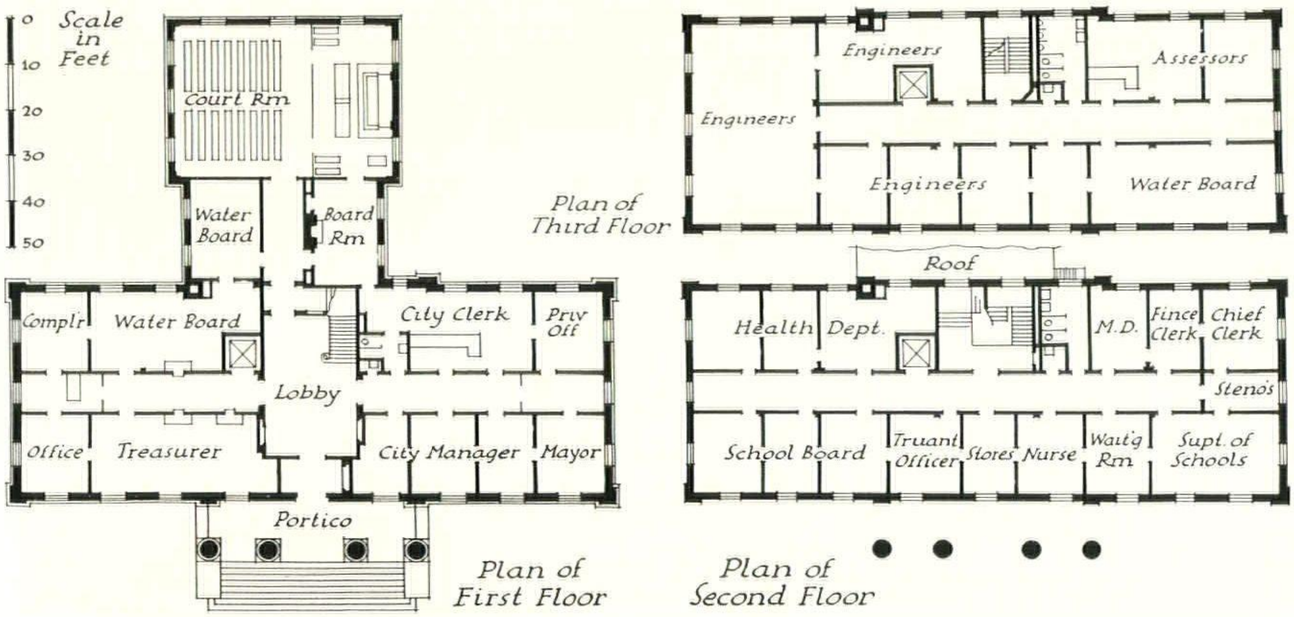
AUBURN, NEW YORK

COOLIDGE, SHEPLEY, BULFINCH & ABBOTT, ARCHITECTS



Sigurd Fischer

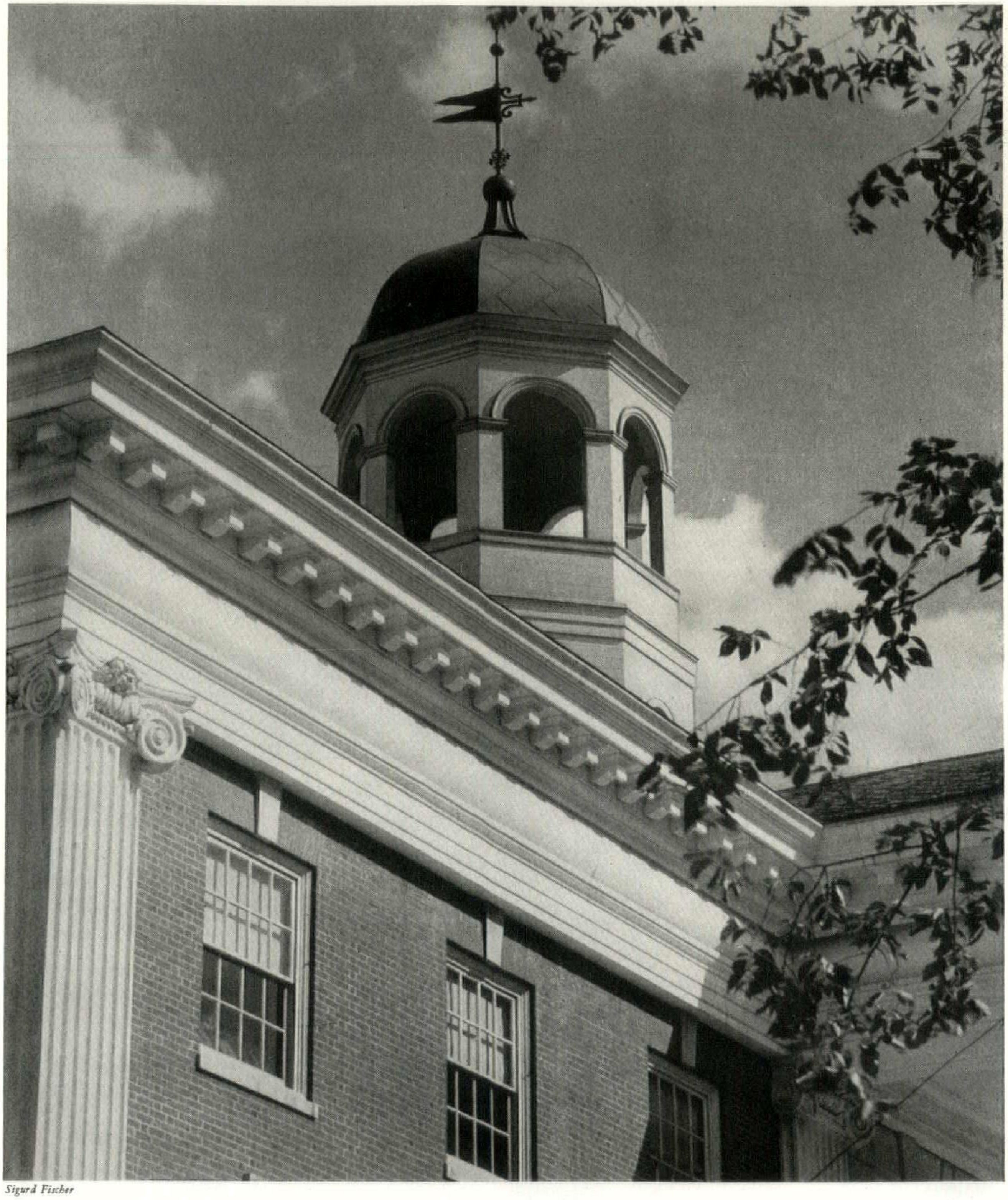
THE building is a good example of a Colonial solution to the problem of a small city hall. The architects have succeeded in developing a building efficient in plan and economical in operation which still conforms to the Colonial tradition of the locality. The illustrations on this and the opposite page 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

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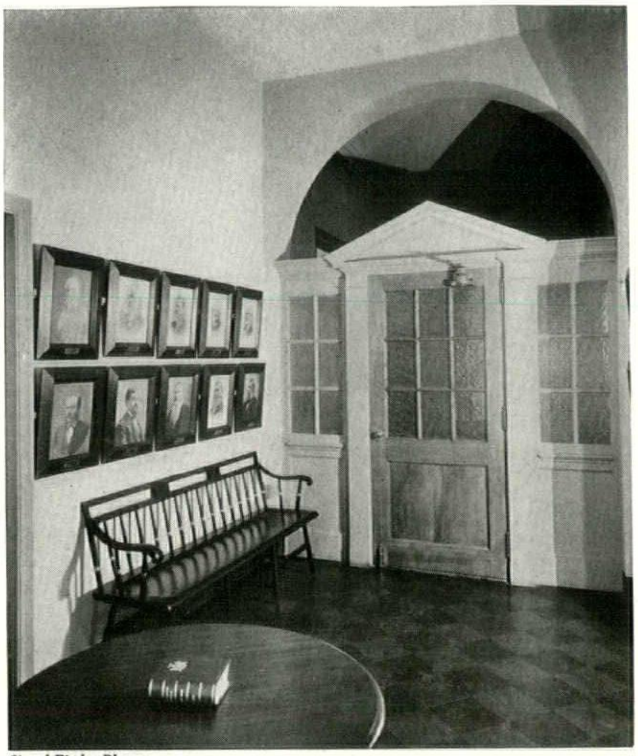
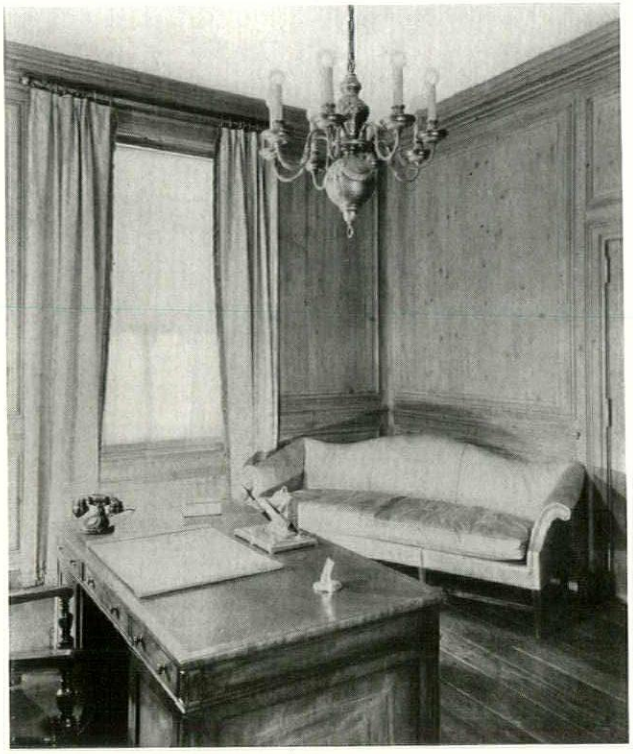


Sigurd Fischer Photos



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 competition 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.

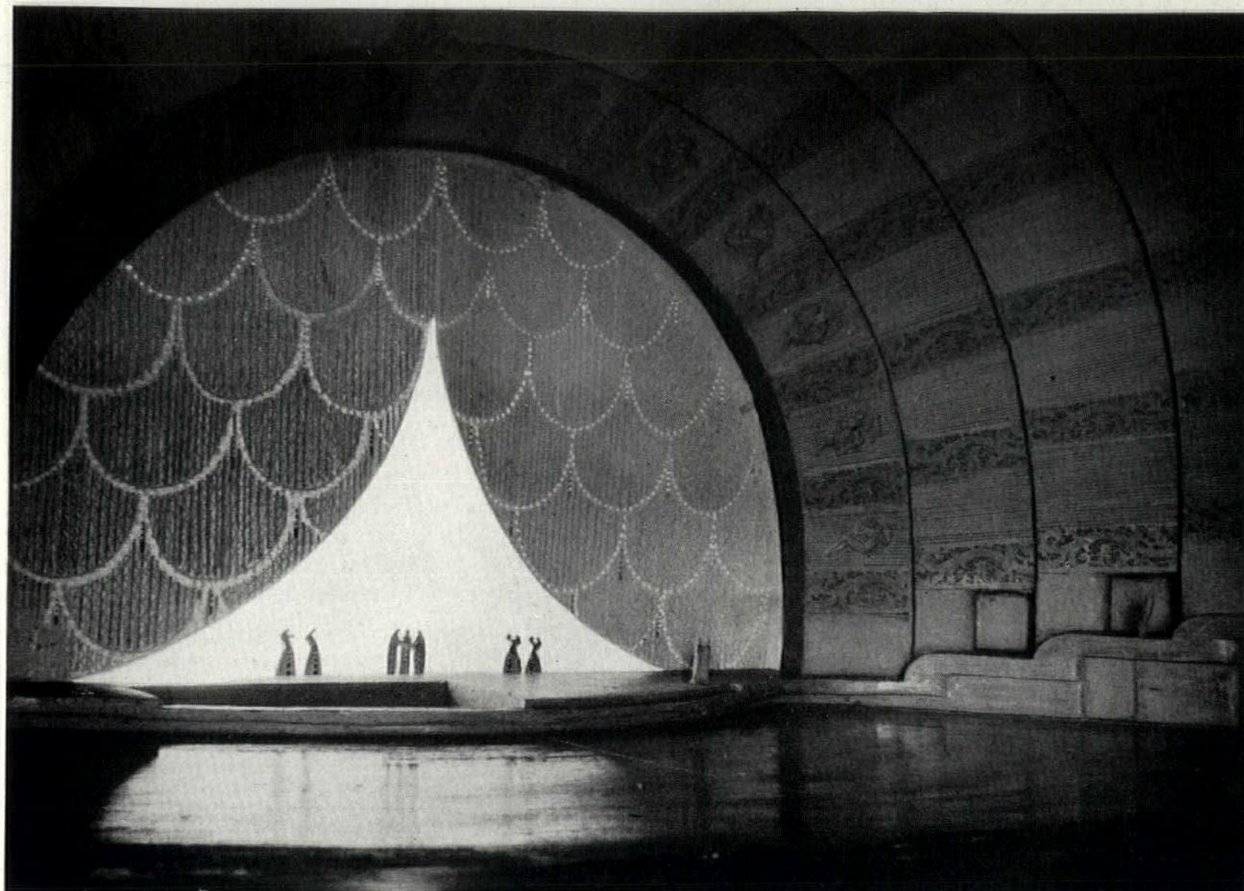
"If the City should lower the standards imposed under the State Housing Law, it will, of course, be difficult for the State Board to insist upon higher standards in the future. If there are two systems of housing relief operating within the same area — one restricted as to rents, limited as to returns, 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

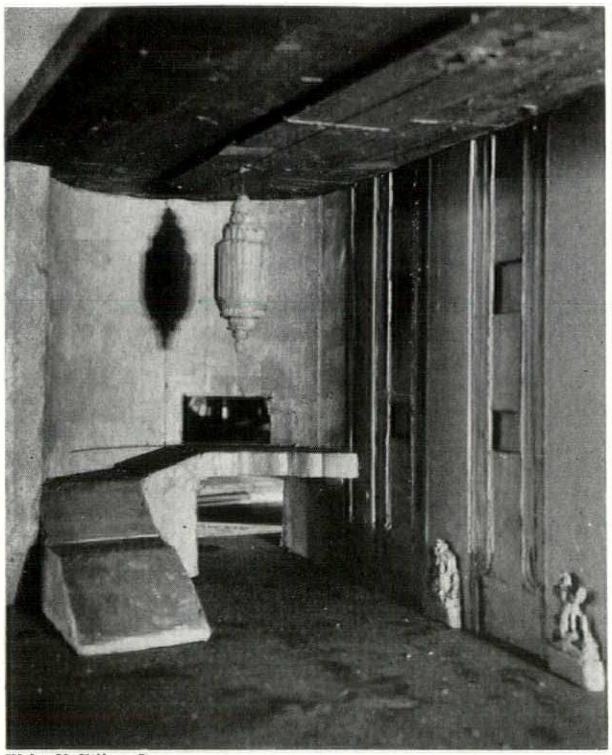
BY

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



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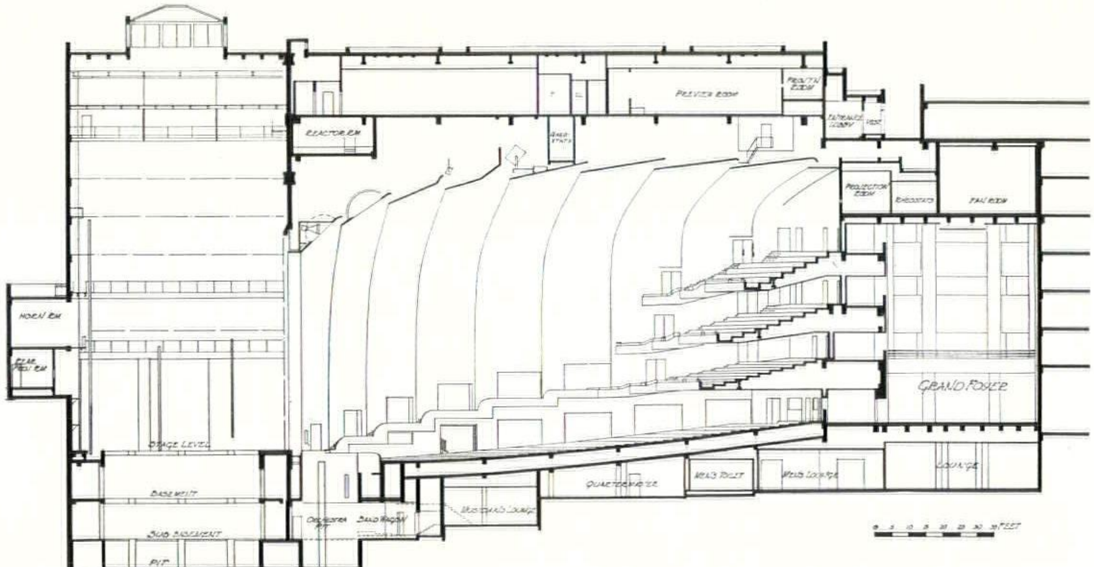
Rough model of the foyer, showing the staircase above which will hang Winters' mural. Velour will cover the right wall, mirrors the other

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."

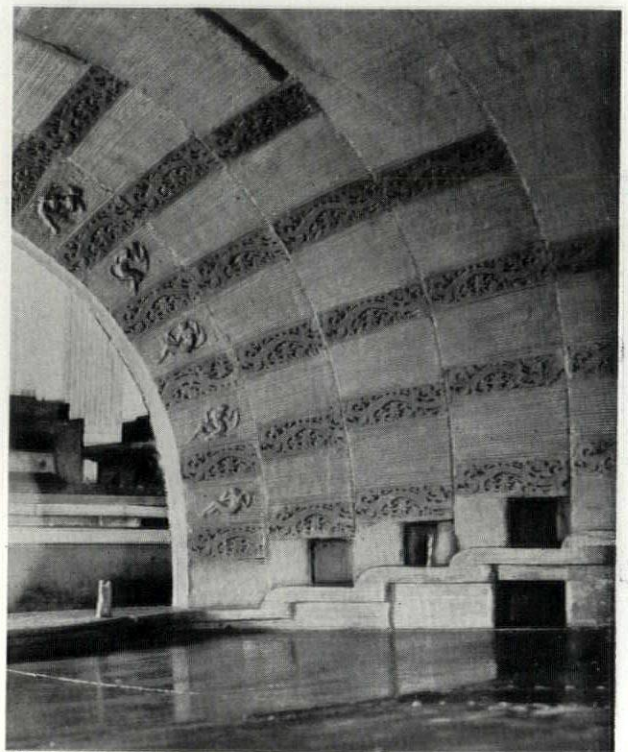
The obvious alternatives suggested themselves — one, a rather deep balcony, with perhaps a shorter balcony above, and second, three shallow



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,



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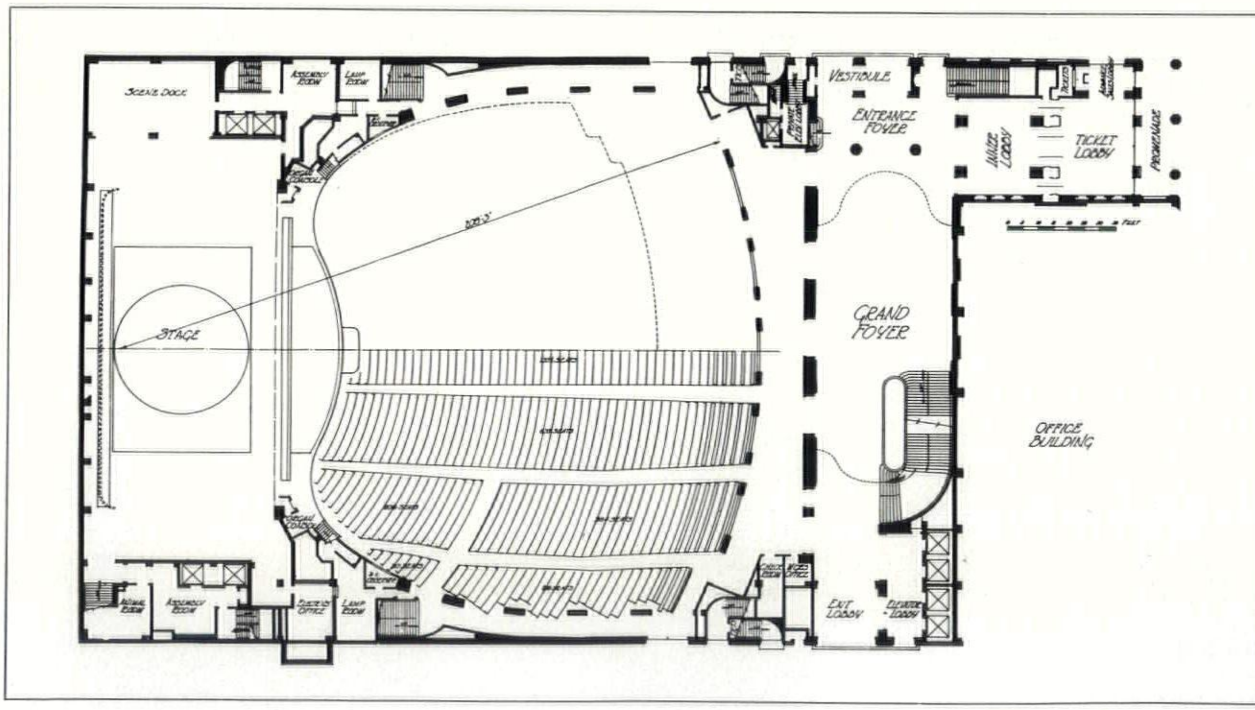
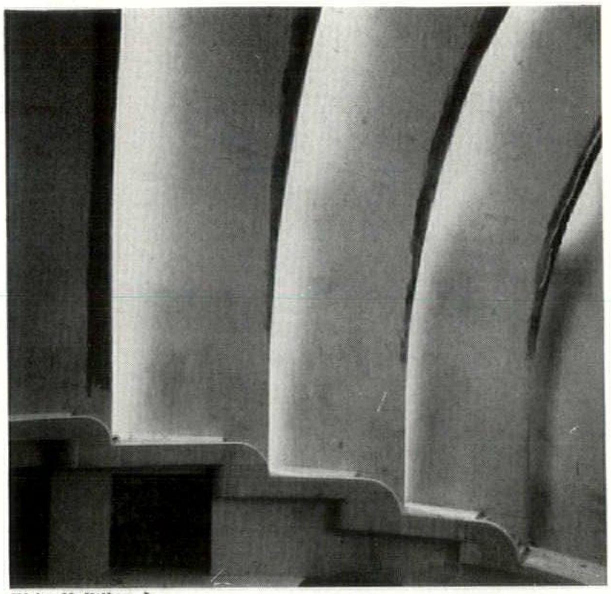
Study for the walls and ceiling of the auditorium, and the fan-like arrangement of the grilles which will conceal amplifiers and organ pipes



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



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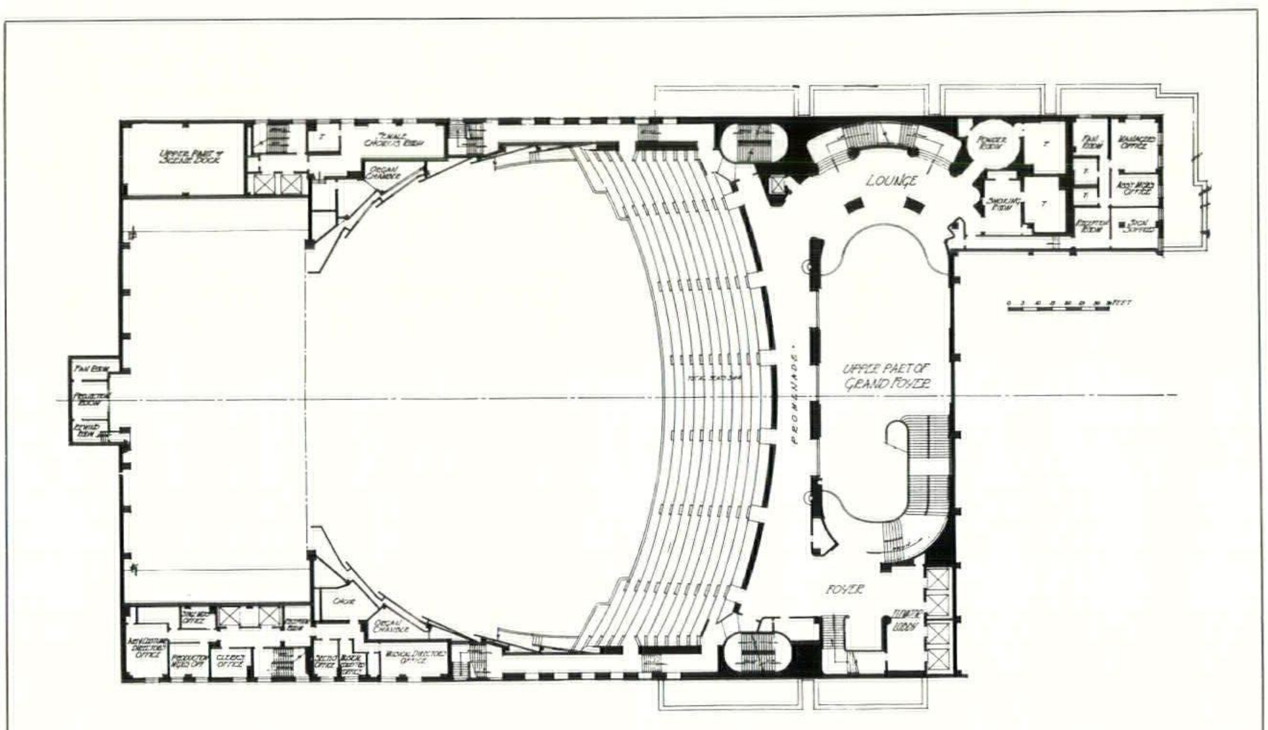
Portion of the large model used to study the actual conditions which will prevail in the theater. The dark edges of the curved segments indicate that they have been undergoing corrections. The concealed lighting system is also being studied to eliminate all possibility of error in theory

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



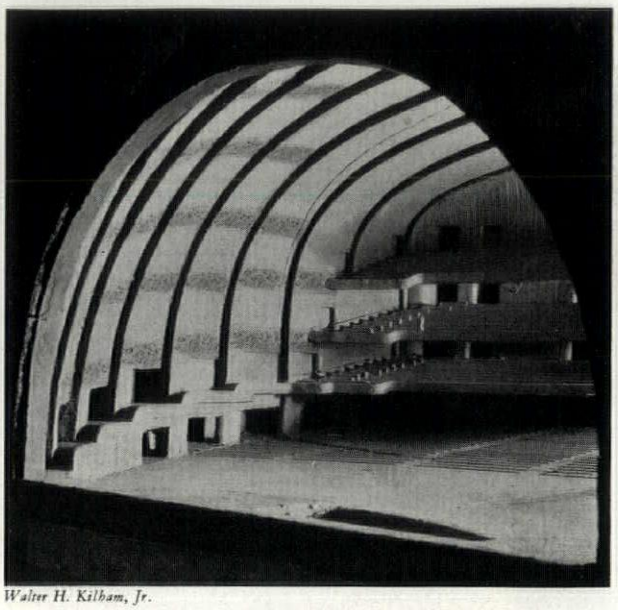
First mezzanine plan. This is slightly larger but similar to the two upper mezzanines. Each of the three floors has adequate lounge and toilet facilities. Each is served by elevators sound spots. The angles for the arches have been determined on the basis of acoustics as well as upon the principles of 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.



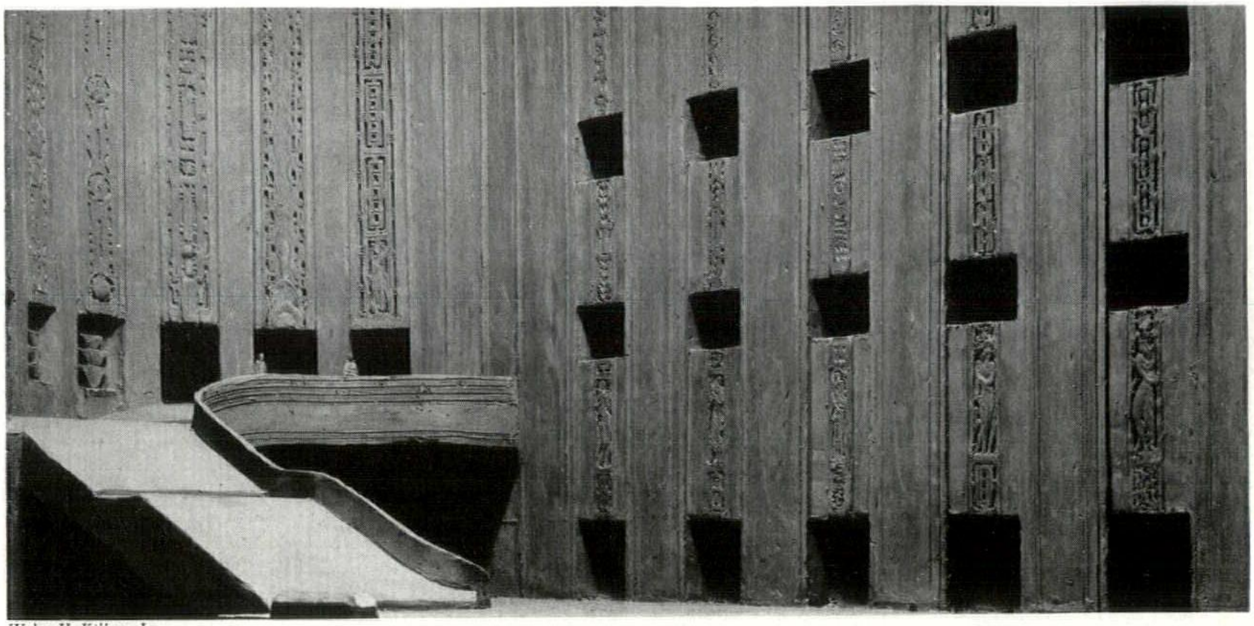
Walter H. Kilham, Jr.

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.

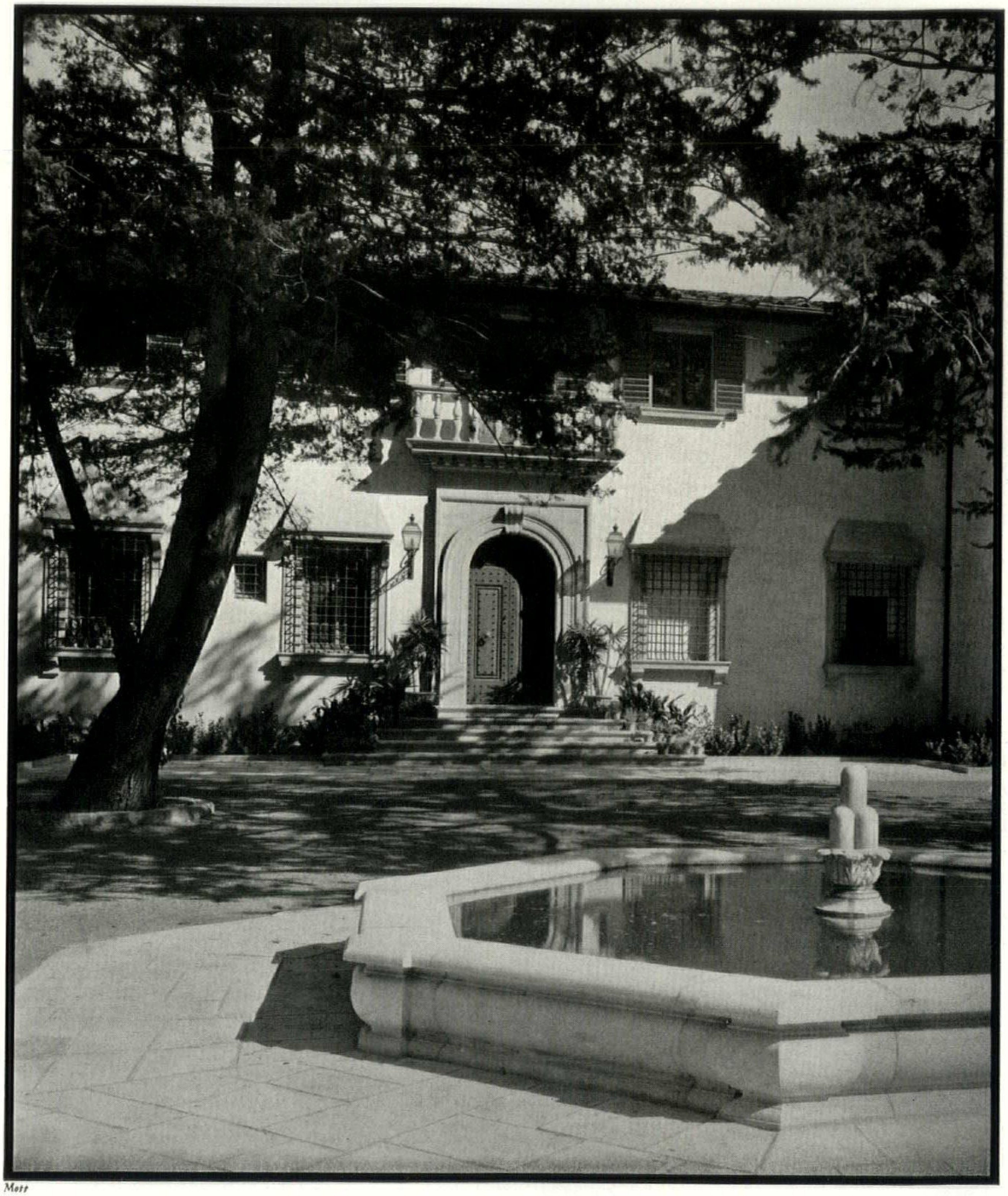
In the main foyer, located just beyond the ticket lobby, ample space has been provided for a large portion of the audience in the orchestra. It runs the entire width of the theater and is approximately 40 ft. deep. A broad staircase sweeps up the far end, leading to the mezzanine lounges which encircle 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.

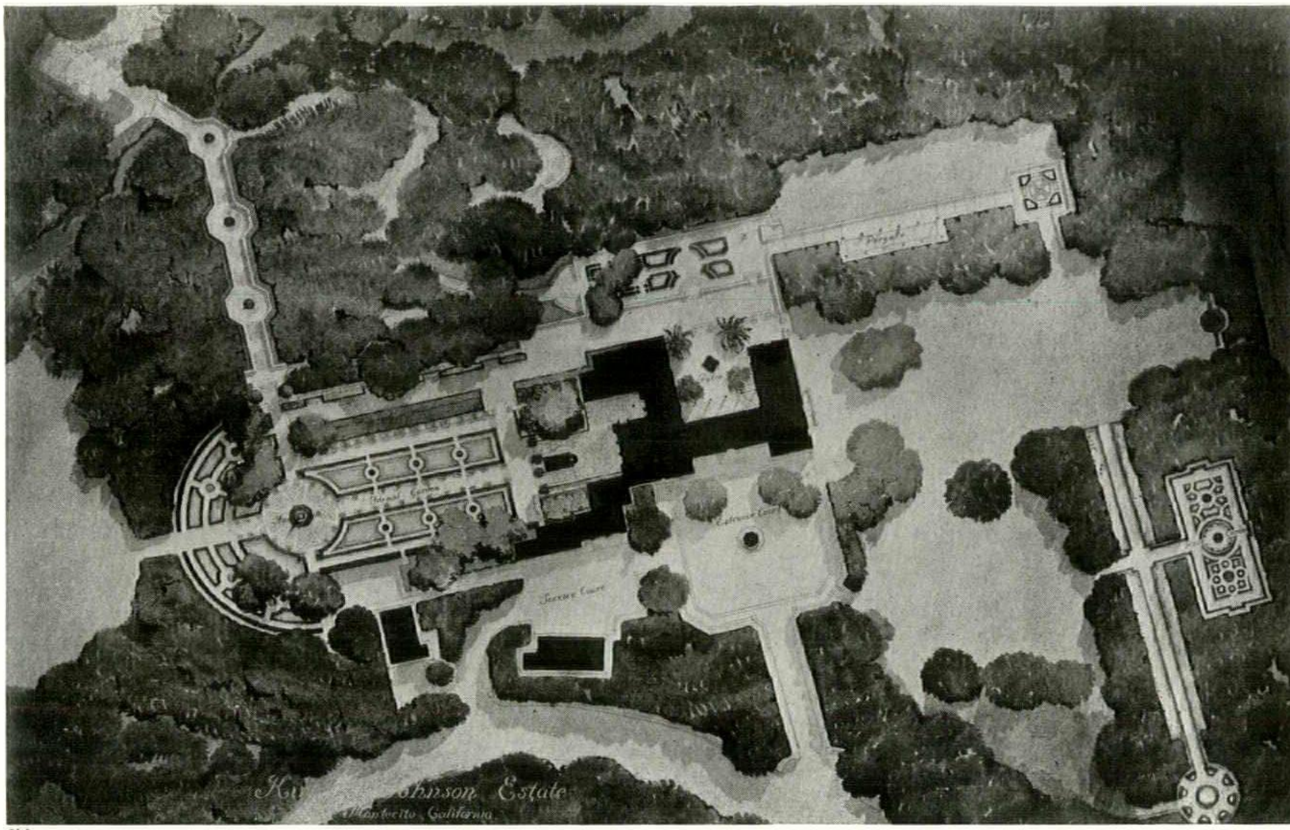


Mott

HOUSE OF MR. & MRS. KIRK B. JOHNSON

MONTECITO, CALIFORNIA

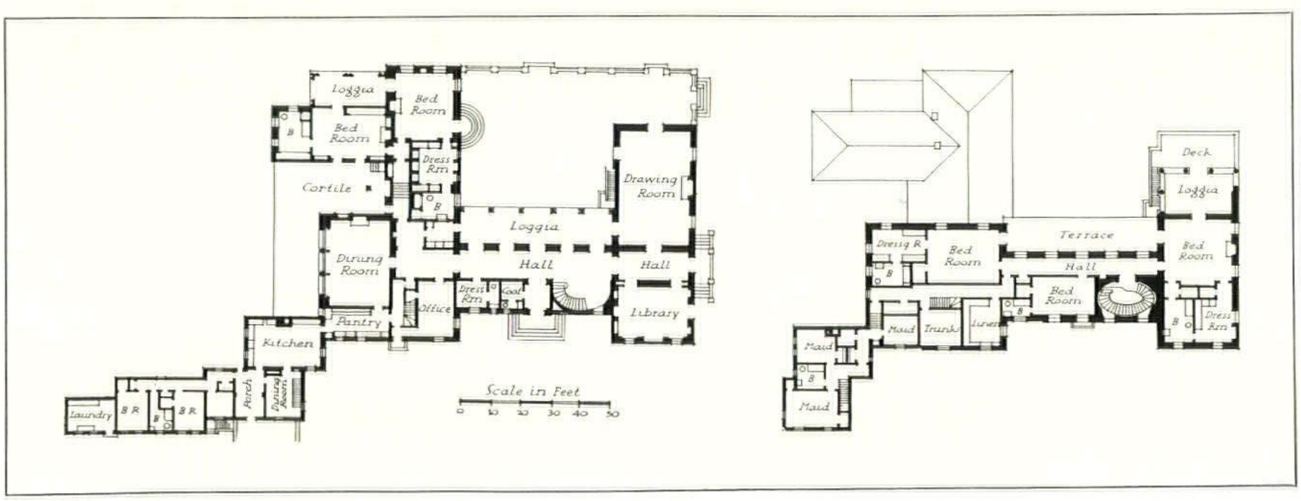
GEORGE WASHINGTON SMITH, ARCHITECT



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

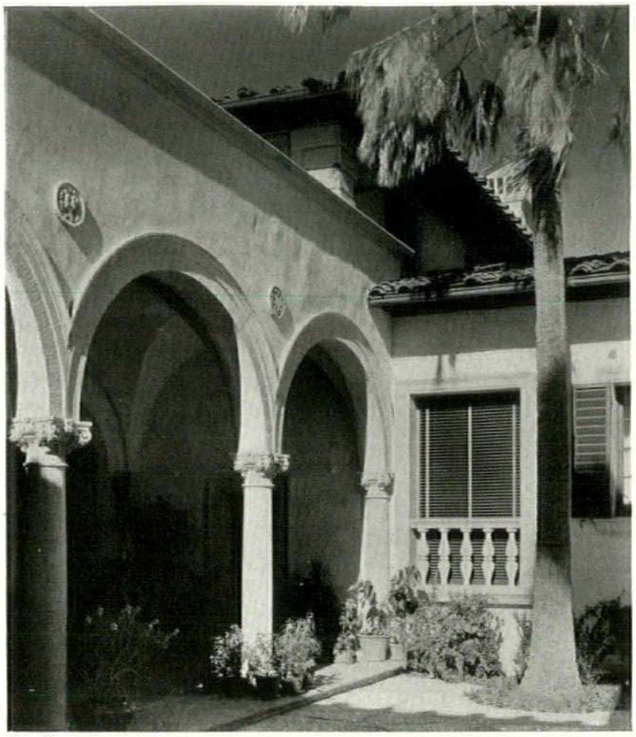
HOUSE OF MR. & MRS. KIRK B. JOHNSON, MONTECITO, CAL.

GEORGE WASHINGTON SMITH, ARCHITECT

Mott

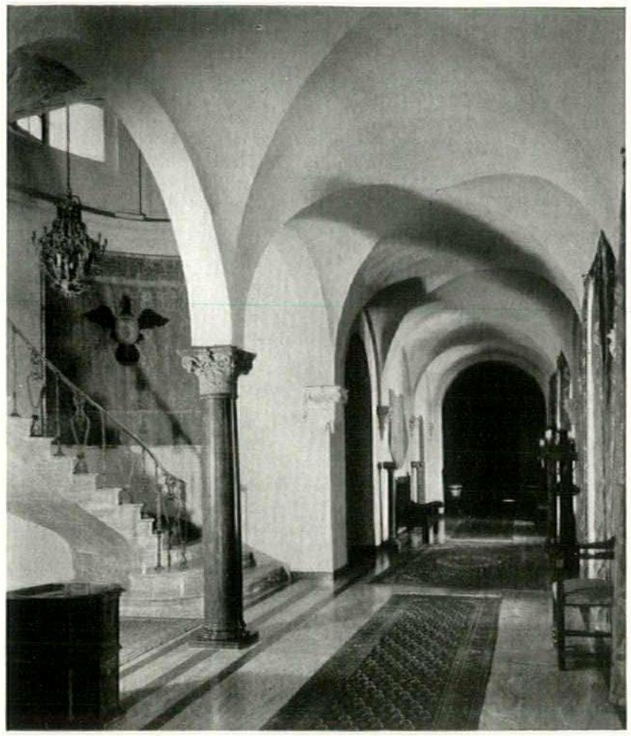
THE PATIO STAIR FROM THE LOGGIA

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.

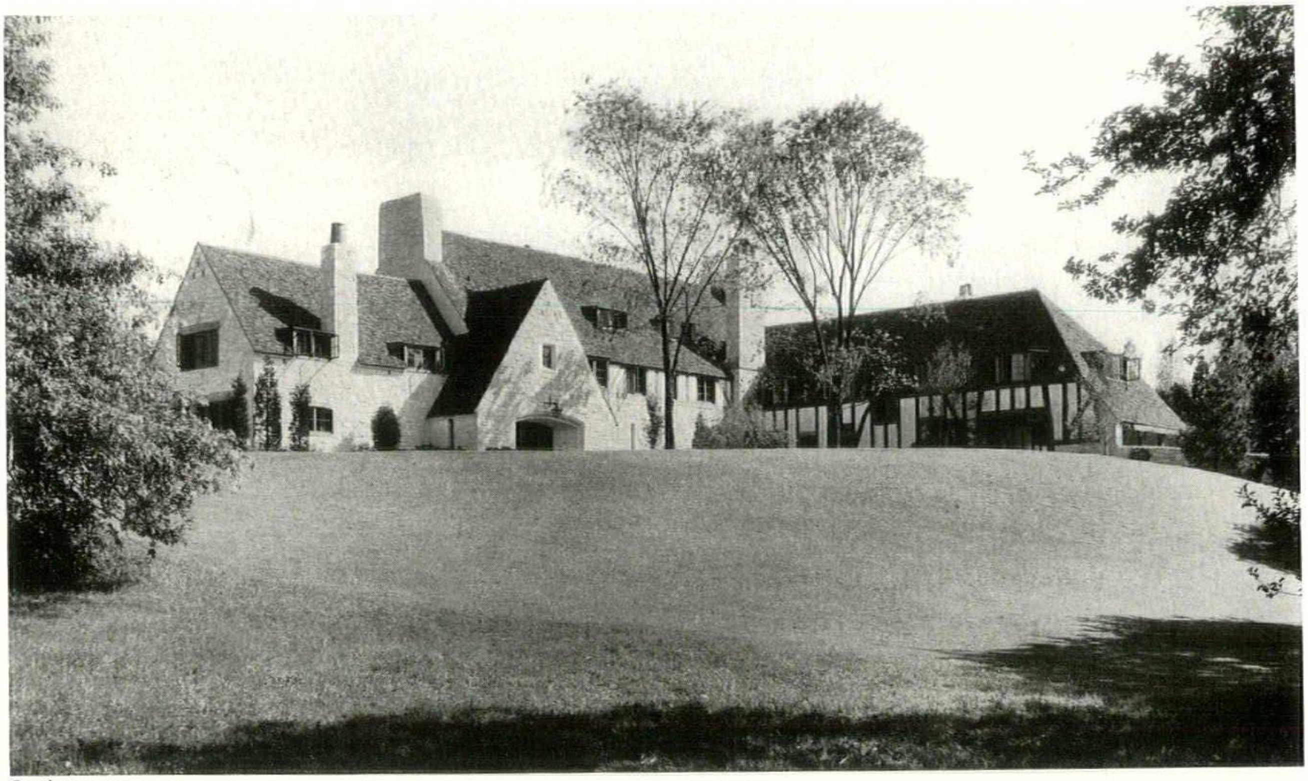
GEORGE WASHINGTON SMITH, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS

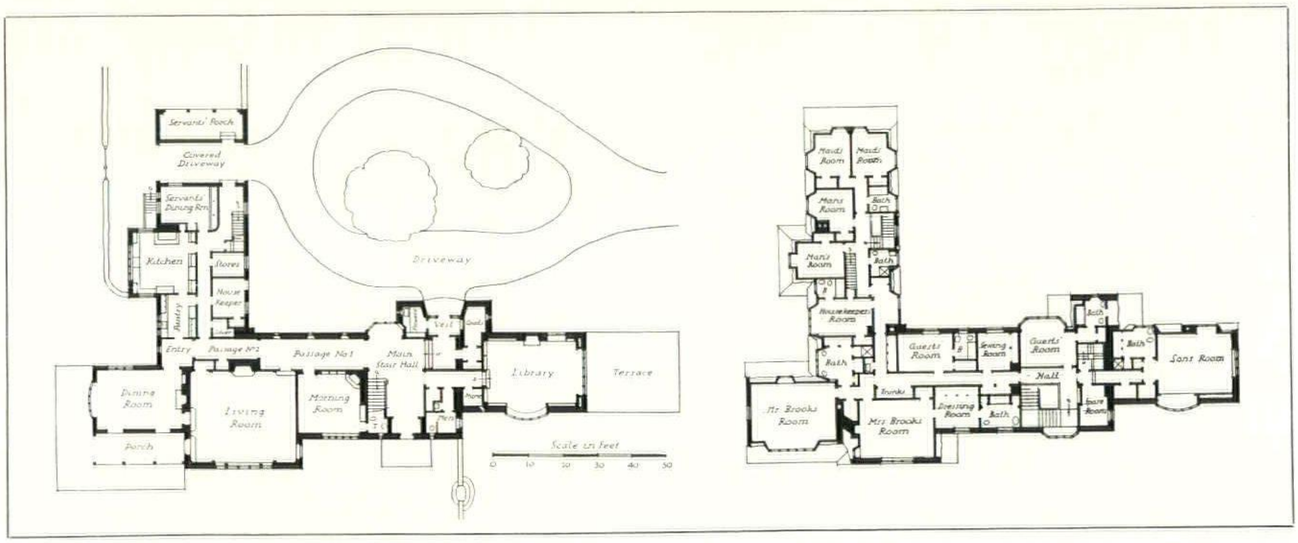
GREENWICH, CONNECTICUT

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

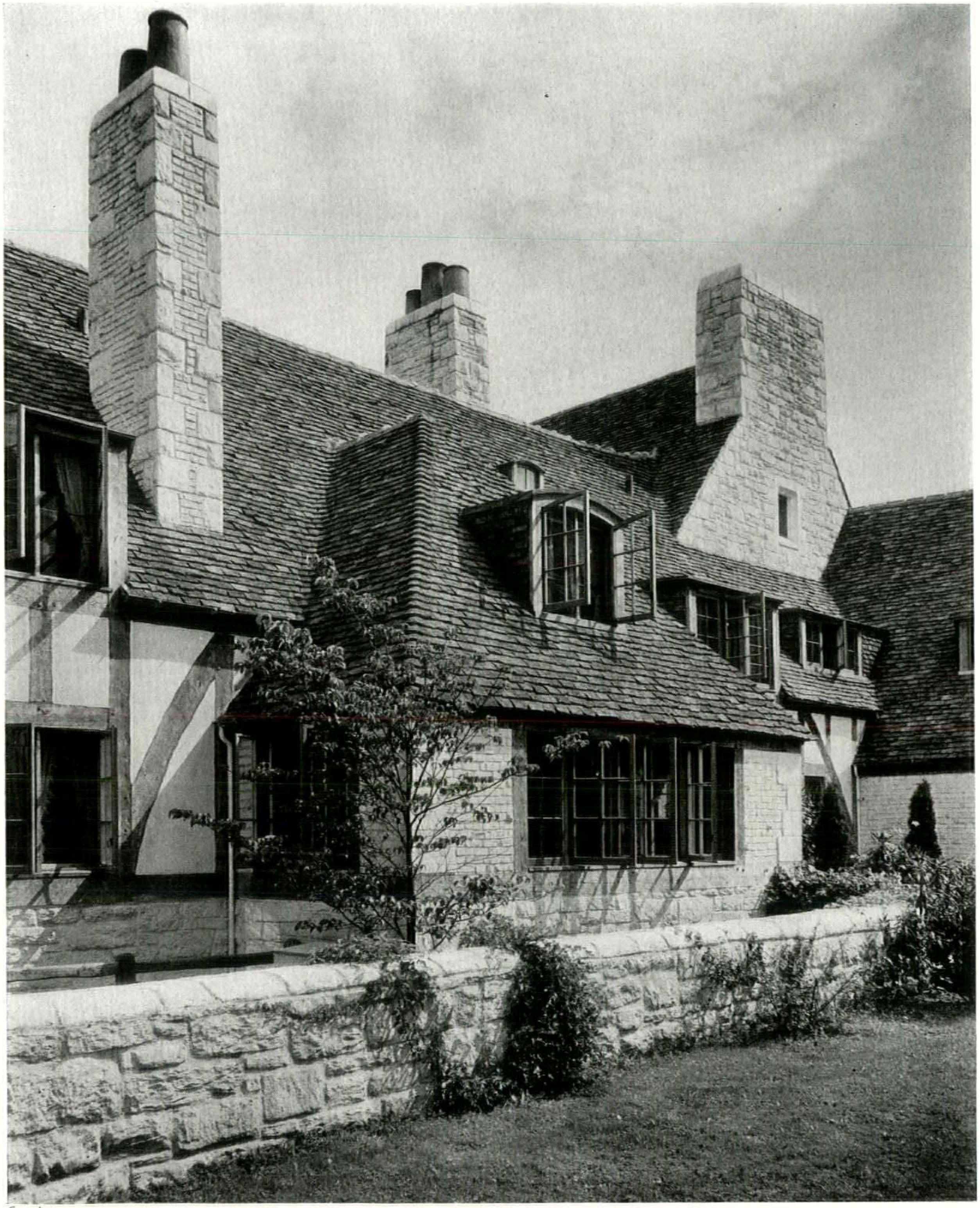
GREVILLE RICKARD, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS

GREENWICH, CONNECTICUT

GREVILLE RICKARD, ARCHITECT

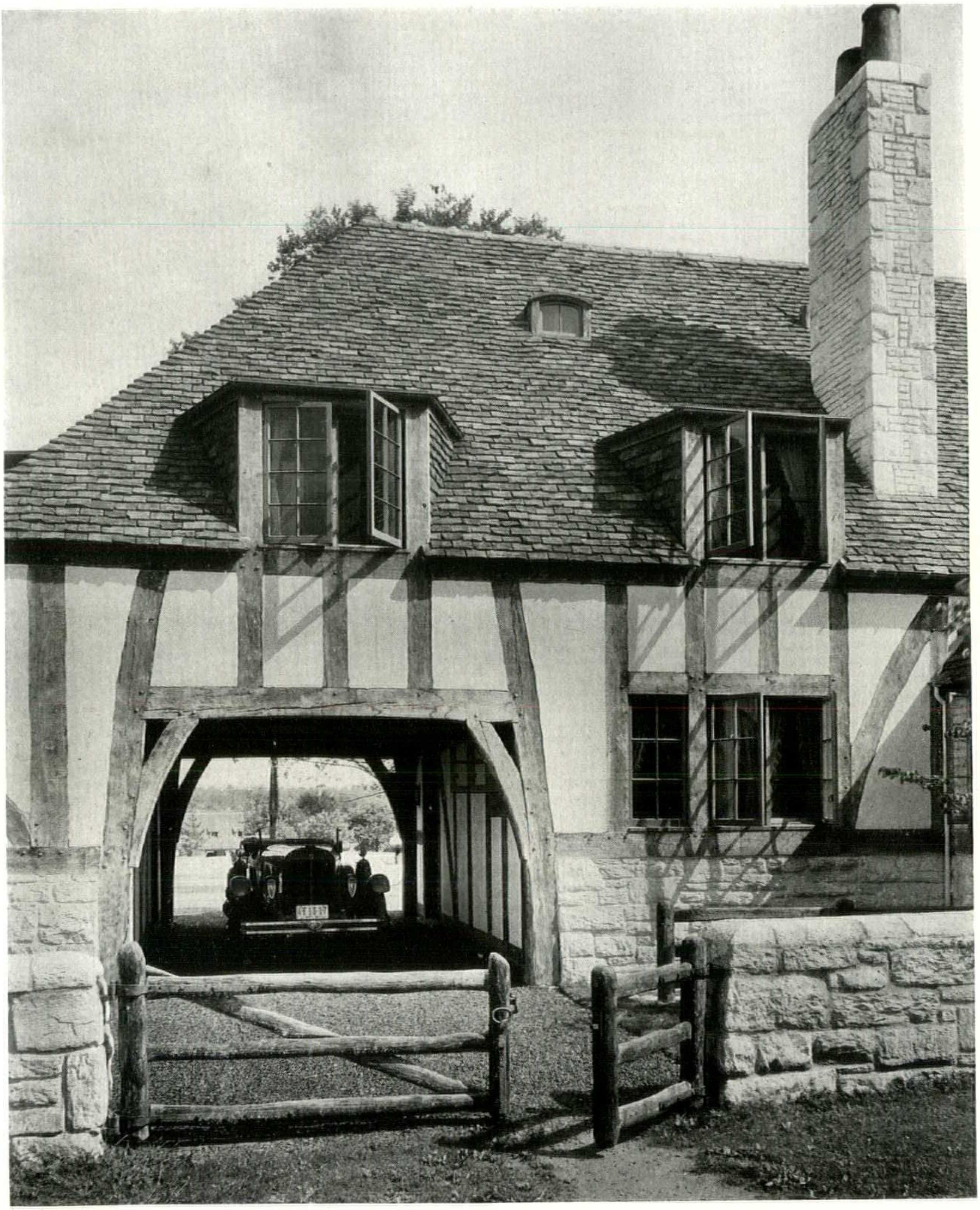


Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS
GREENWICH, CONNECTICUT
GREVILLE RICKARD, ARCHITECT

Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS
GREENWICH, CONNECTICUT
GREVILLE RICKARD, ARCHITECT



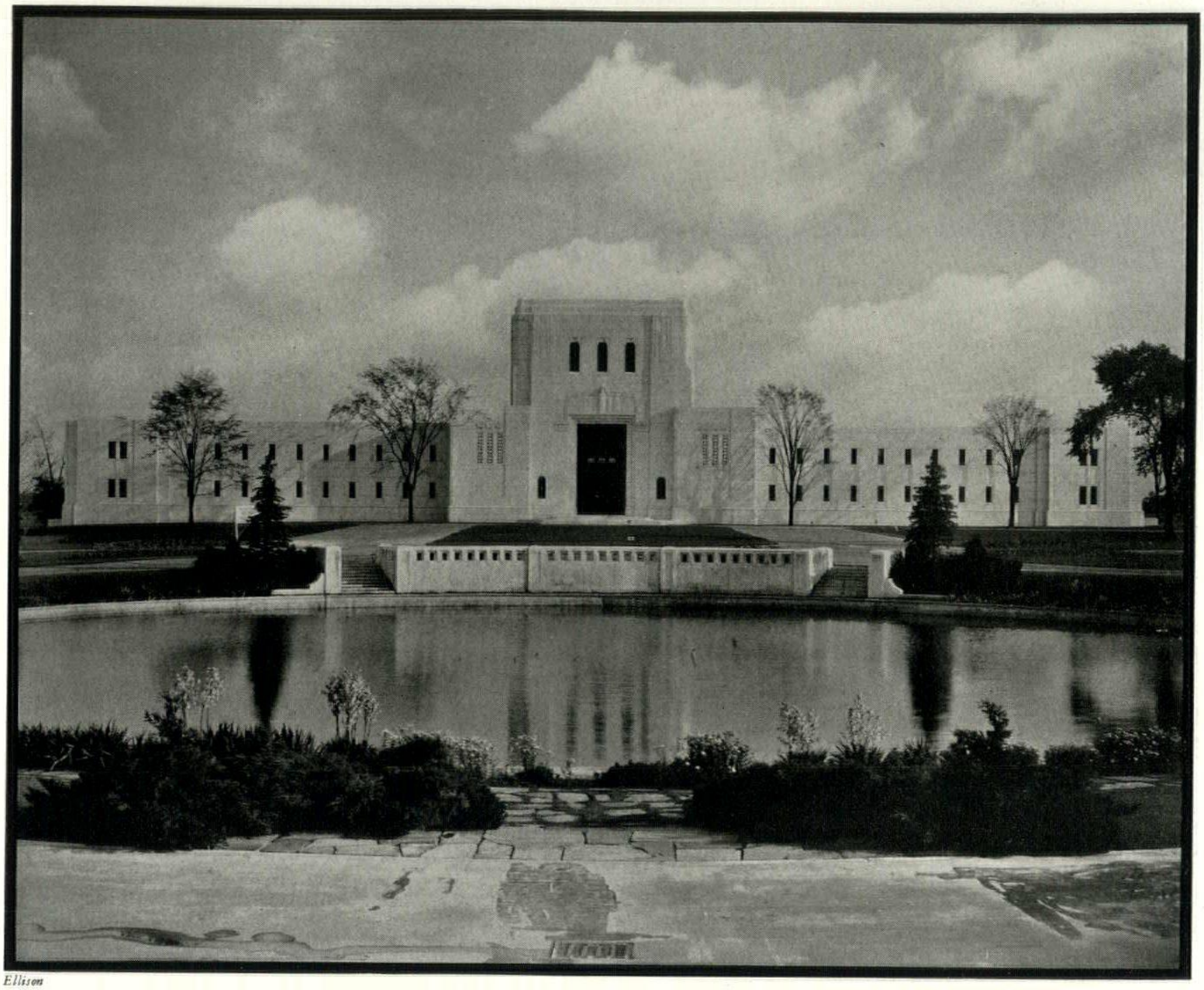
Gottscho

HOUSE OF MR. & MRS. RAYMOND BROOKS

GREENWICH, CONNECTICUT

GREVILLE RICKARD, ARCHITECT

THE FORUM OF SMALLER BUILDINGS

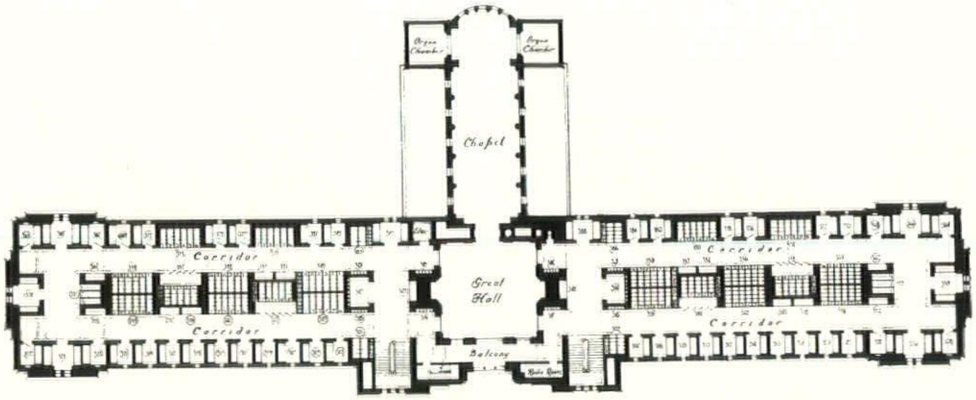


Ellison

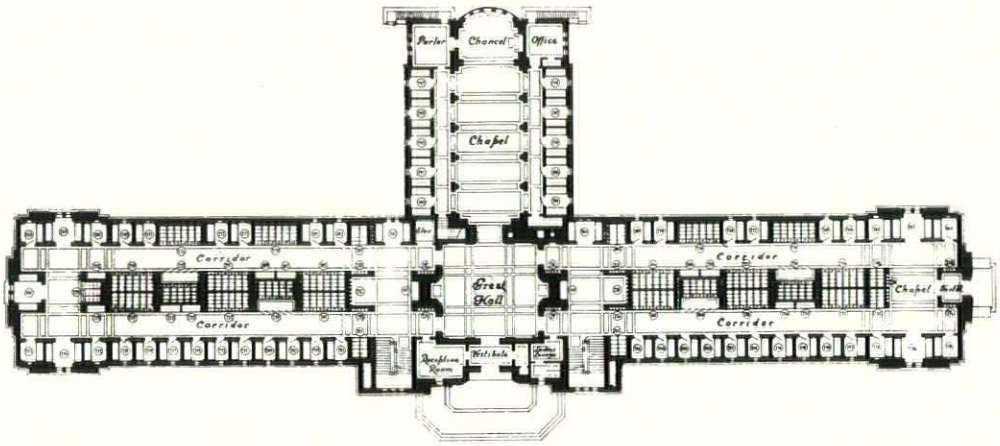
TEMPLE OF MEMORIES
WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN
ALVIN E. HARLEY, ARCHITECT, C. KENNETH BELL, ASSOCIATE

FIVE COMMUNITY MAUSOLEUMS

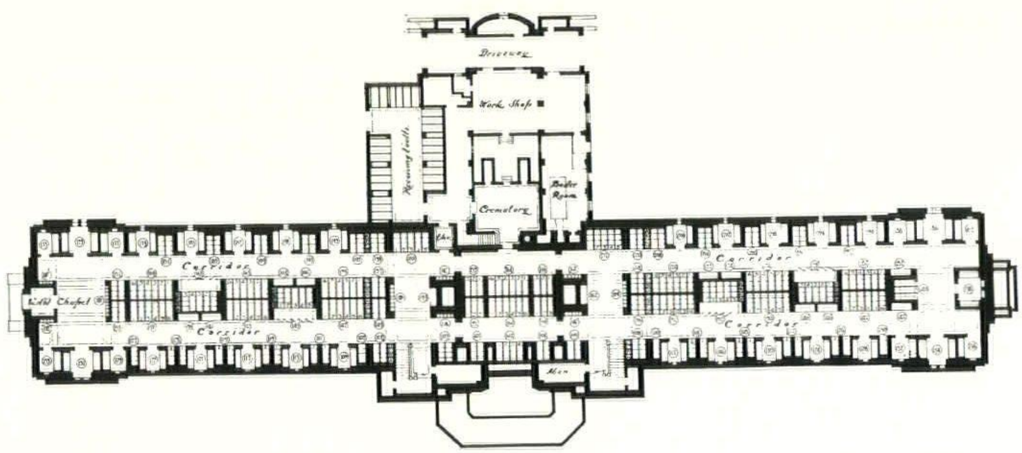
Practical Problems of Smaller Buildings will be Found on Page 411



MEZZANINE PLAN



CHAPEL FLOOR PLAN

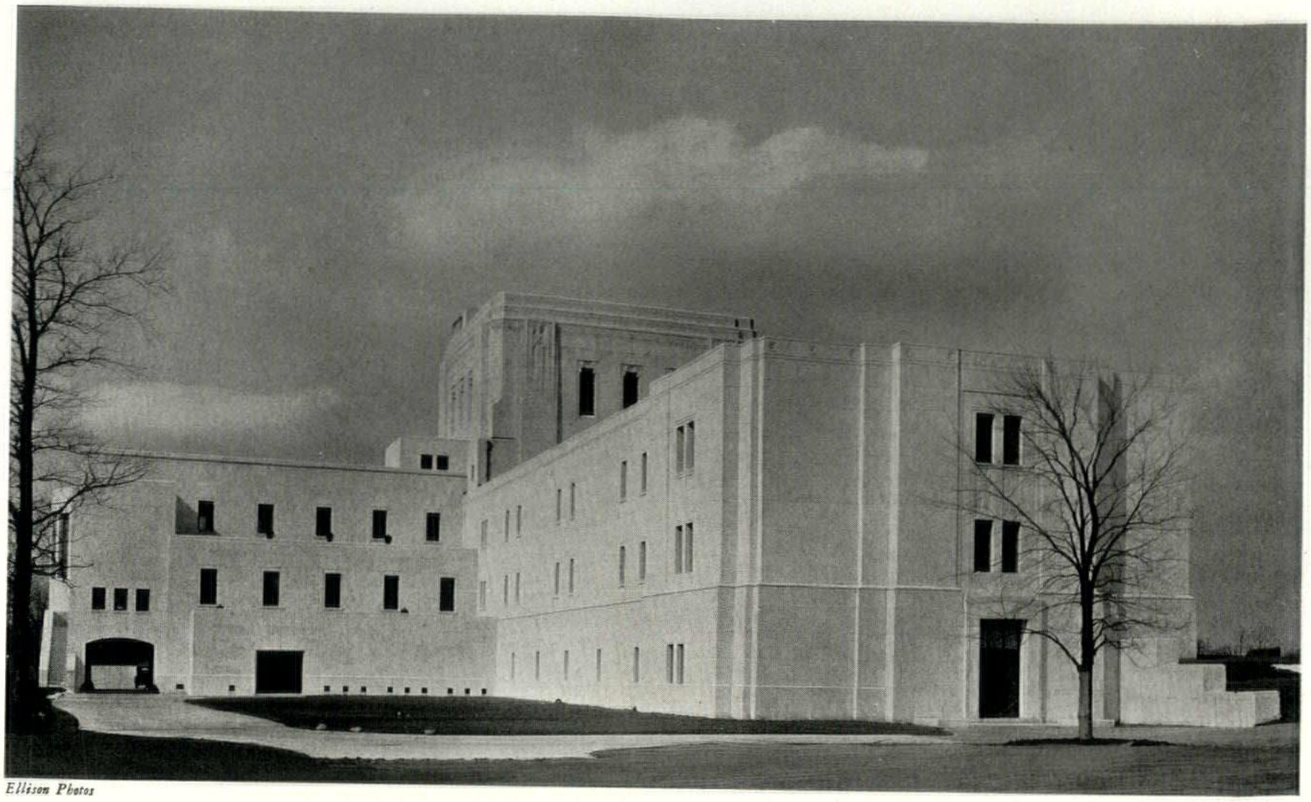


FIRST FLOOR PLAN

TEMPLE OF MEMORIES

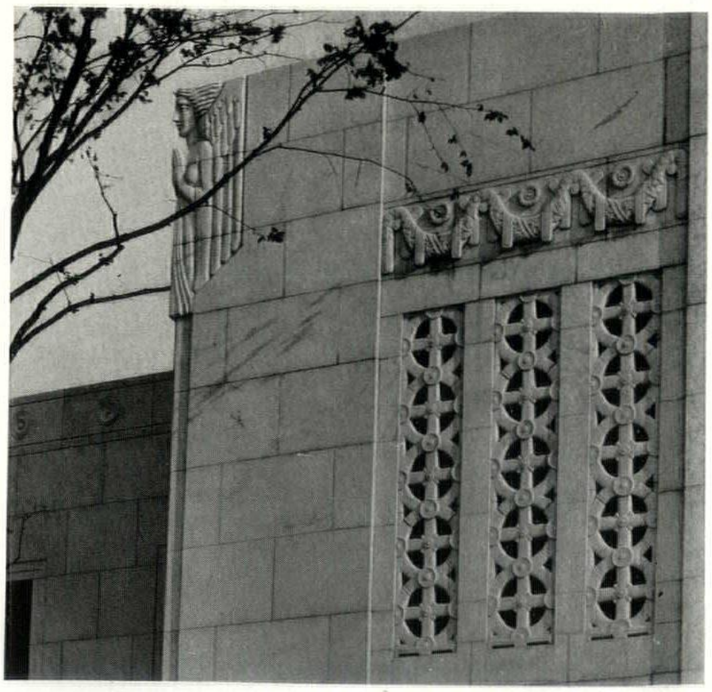
WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

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



Ellison Photos

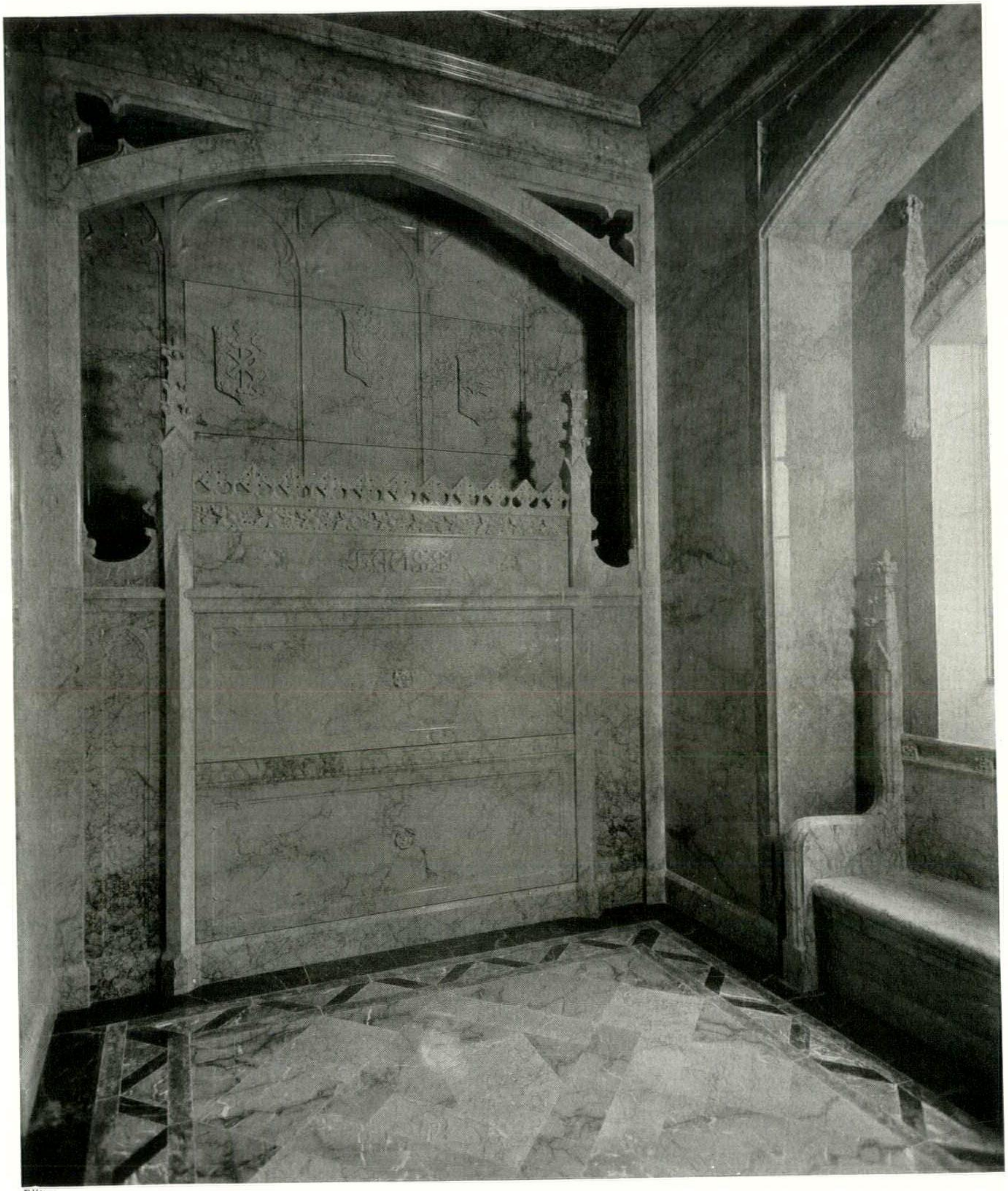
THIS building is one of the largest and most completely equipped mausoleums in the country. It is constructed entirely of heavy, reinforced concrete with a 6 in. exterior facing of light Georgia marble. All exterior rough curtain walls above ground are 12 in. thick of solid brick masonry and all interior 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

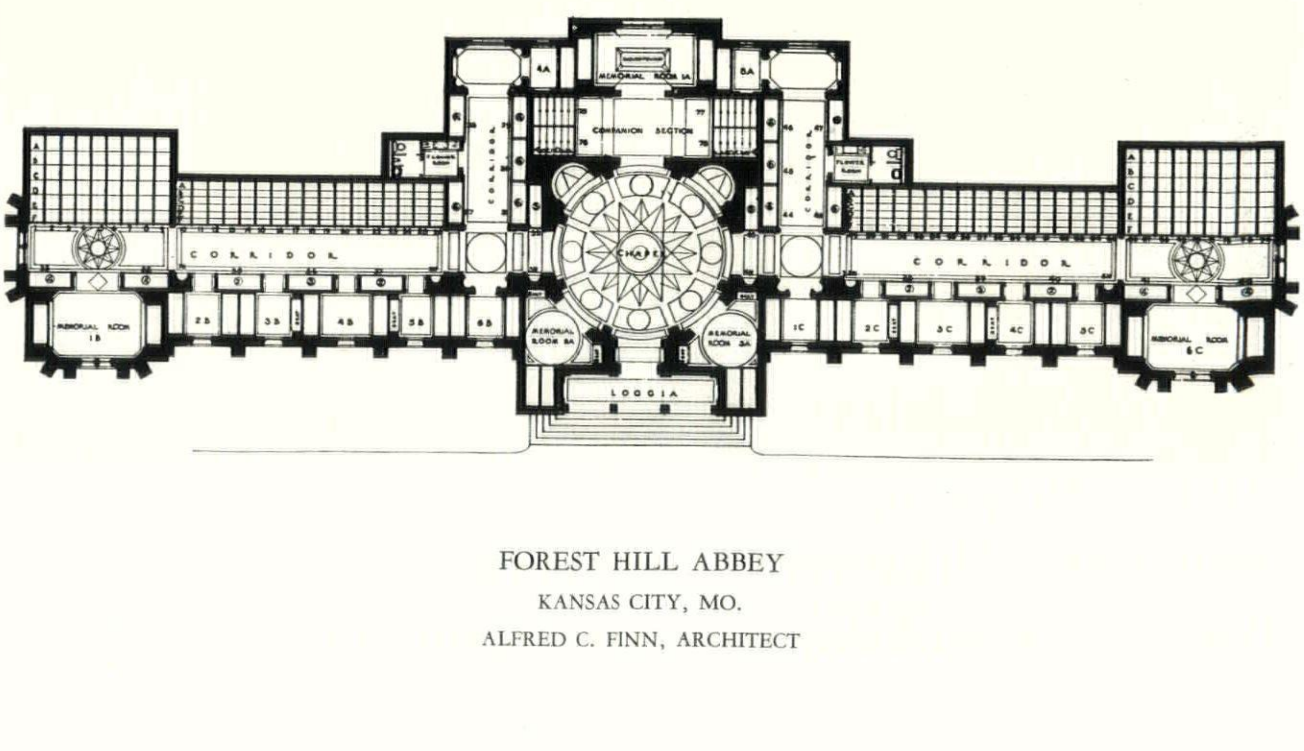
TEMPLE OF MEMORIES

WHITE CHAPEL MEMORIAL PARK, DETROIT, MICHIGAN

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

Hahn-Millard

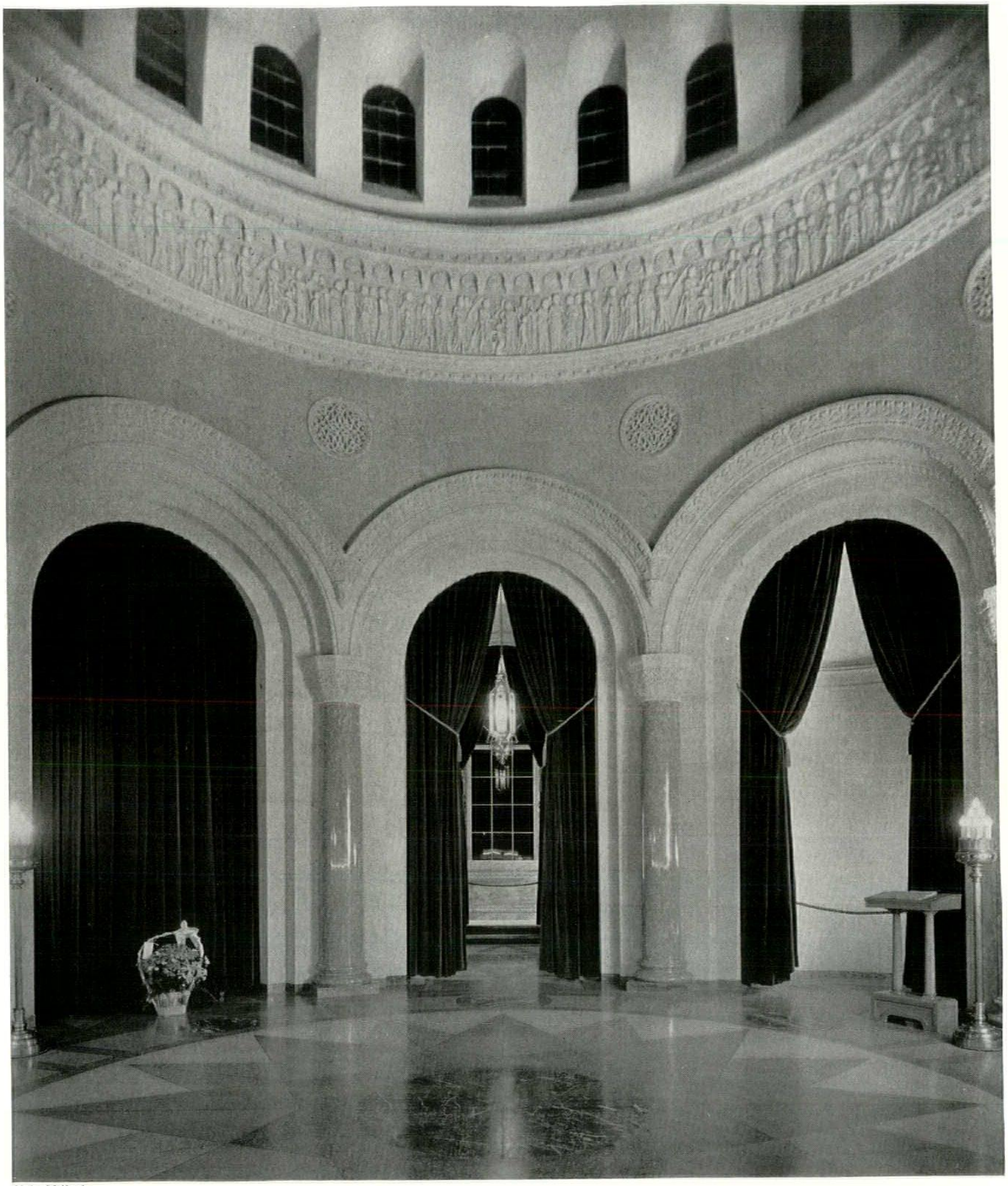
THE plan of this building shows an interesting combination of ordinary crypt spaces with the more elaborately designed private rooms and special areas devoted to memorial entombments. The elaborateness of the appointments made it necessary to use space which might otherwise have been employed for additional 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

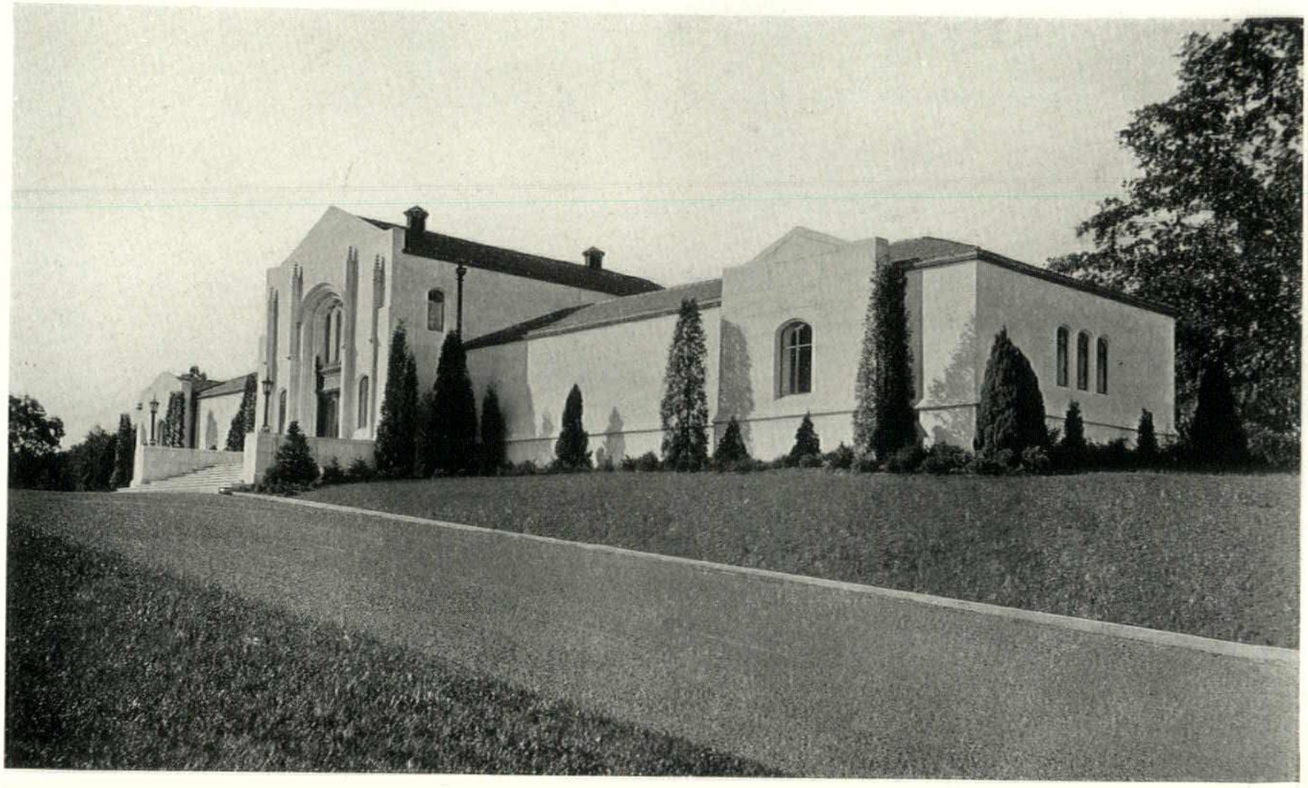
Carter

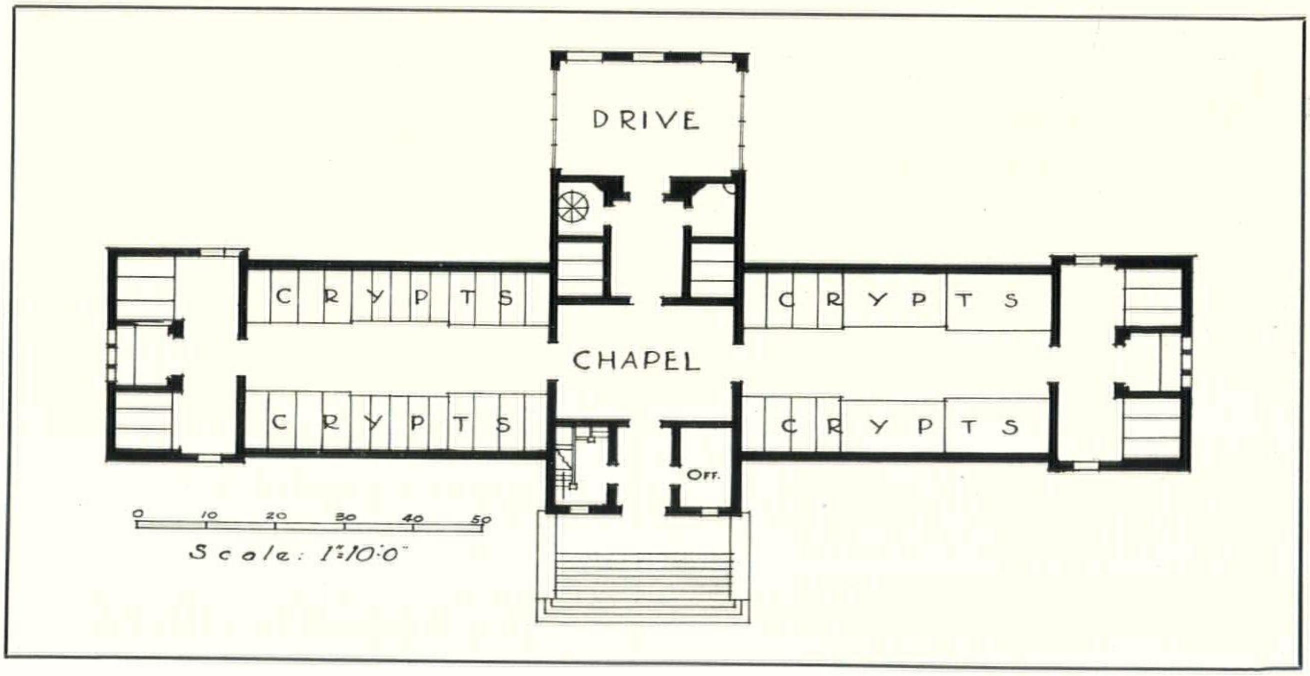
THE CHAPEL

FOREST LAWN MEMORIAL MAUSOLEUM

GLENDALE, CALIFORNIA

FOREST LAWN ARCHITECTURAL DEPARTMENT, ARCHITECTS





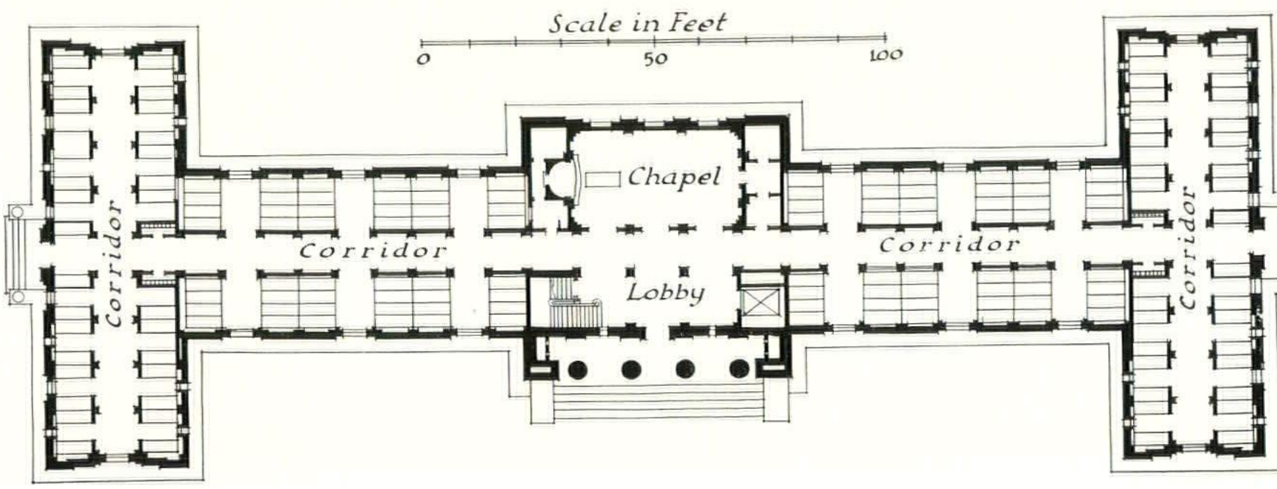
KENSICO CEMETERY MAUSOLEUM

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

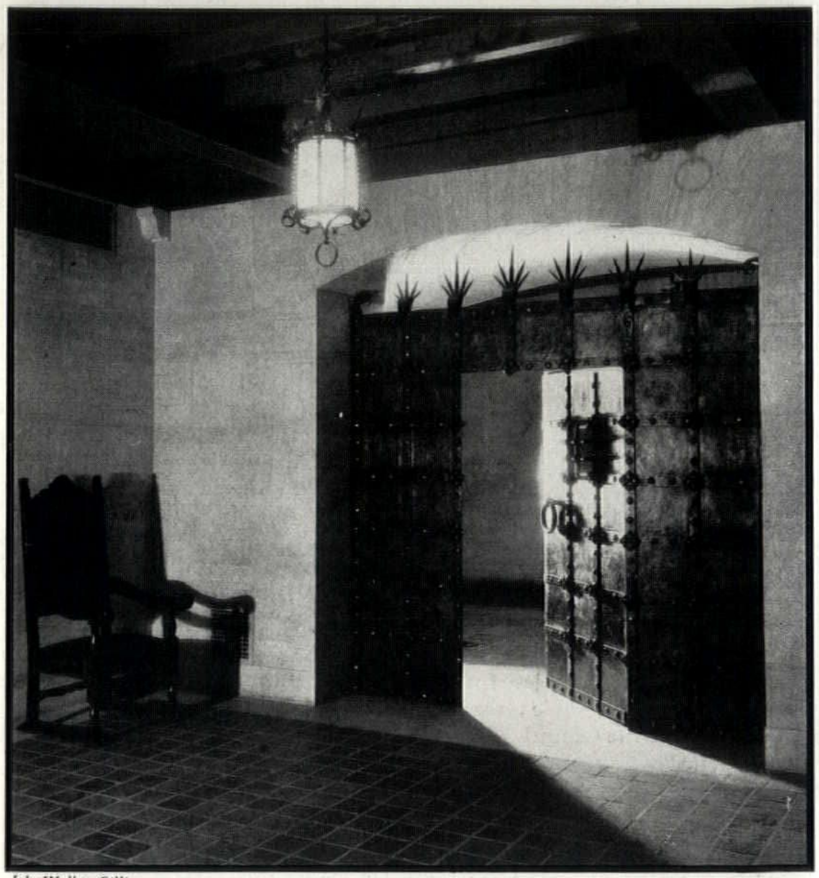
CRAFTSMANSHIP IN FORGED IRON

BY

BERNARD HEATHERLEY

OF THE OFFICE OF SAMUEL YELLIN

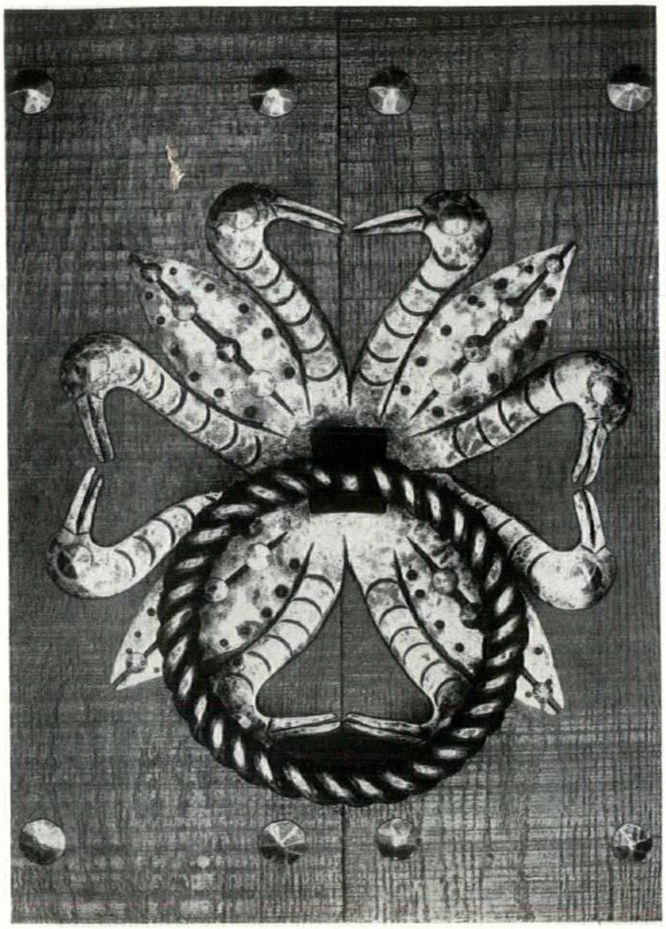
Other articles which have recently appeared in these pages have dealt with the technical and artistic possibilities of metal work. They have been primarily concerned, however, with the newer metals and have given pertinent information regarding the possibilities of design and their fabrication by means 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

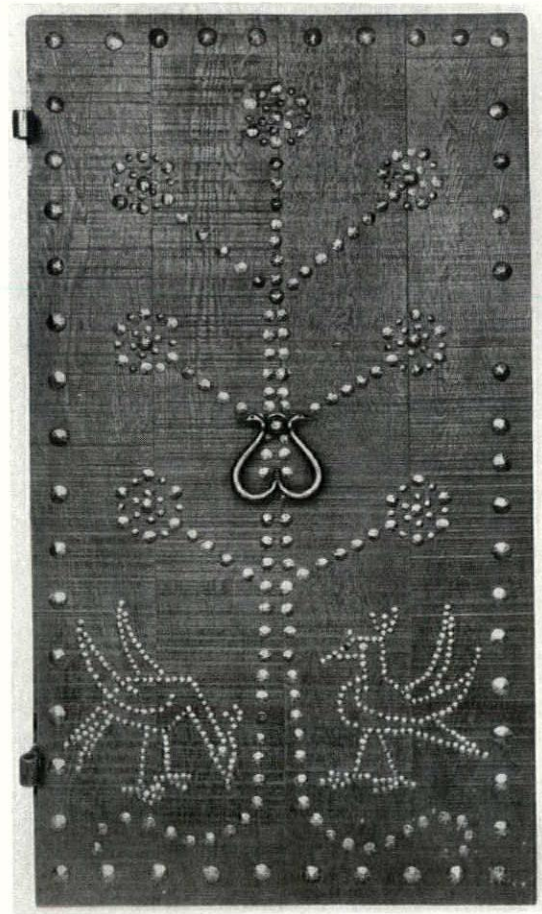


John Wallace Gillies

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.

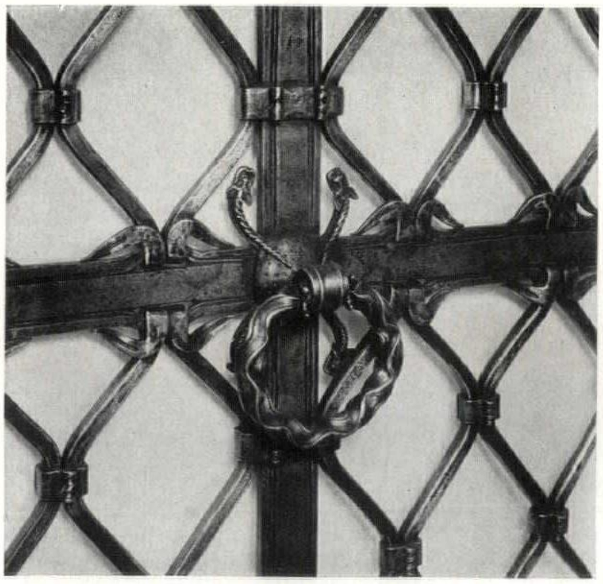
Although the limitations of iron have been so stressed, it is probably the least limited of the metals. There is no other metal that can go through the fire as iron can and emerge unscathed — without loss of character. The ultimate test of the forgeability of a metal is its ability to be welded freely 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.

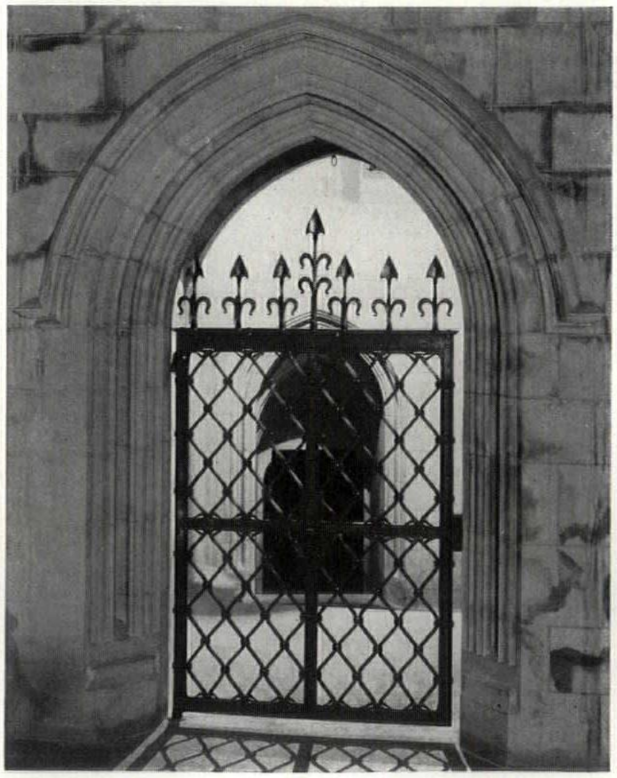
Some other metals, or alloys, can be "wrought" in a very limited way, but a brittleness and lack of freedom and adaptability so soon shows itself that an artistic limitation is immediately imposed and another form of technique — either working cold or with limited heat or casting — is indicated, in deference 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.

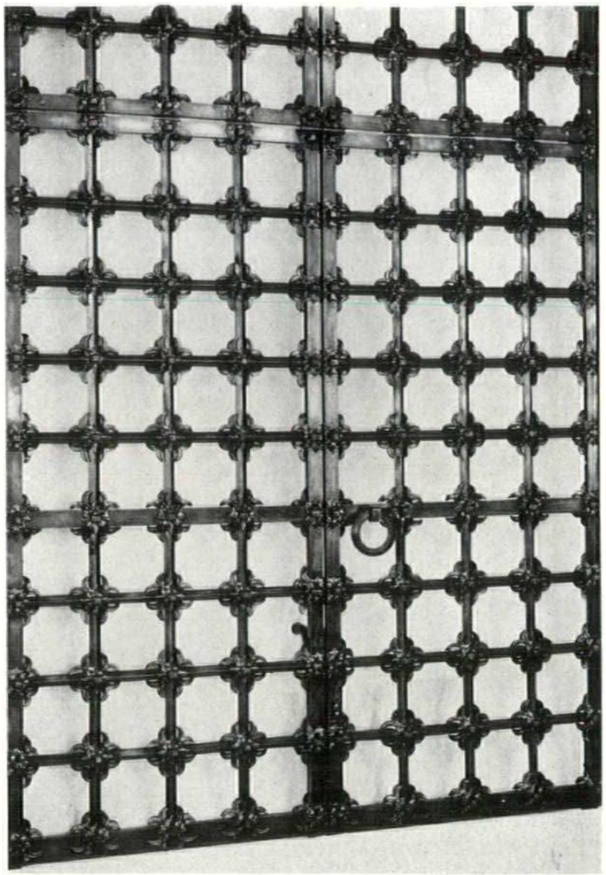
The freedom, then, of this metal makes possible and desirable expression in every conceivable style of design. "What," somebody asks, "of the classic?" Mr. Starkie Gardner, the eminent English writer on wrought iron, has done the work of collecting data on this subject and states it fully in the preface 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 . . ."

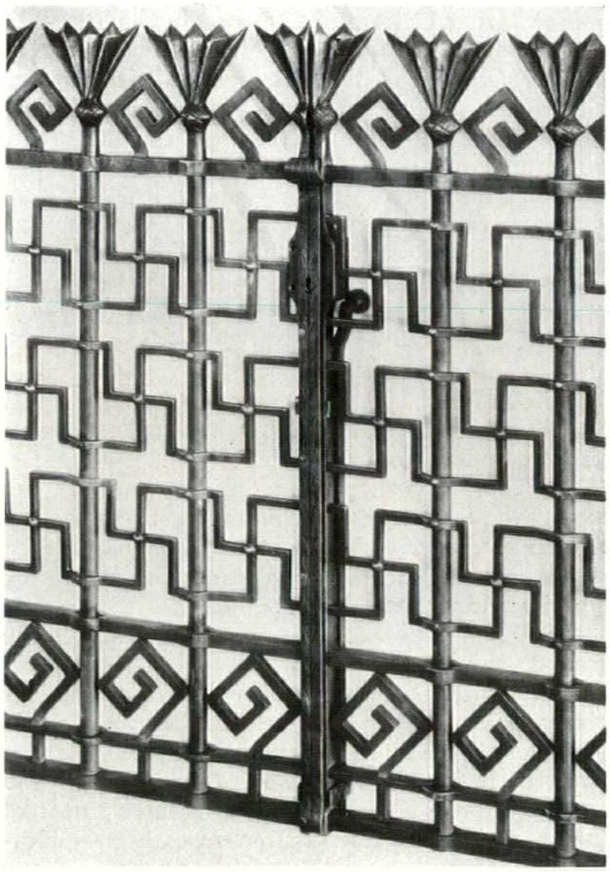
"And what," asks someone else, "of the Moderne?" To this I would reply by asking to what extent has Moderne (or "contemporary" — the

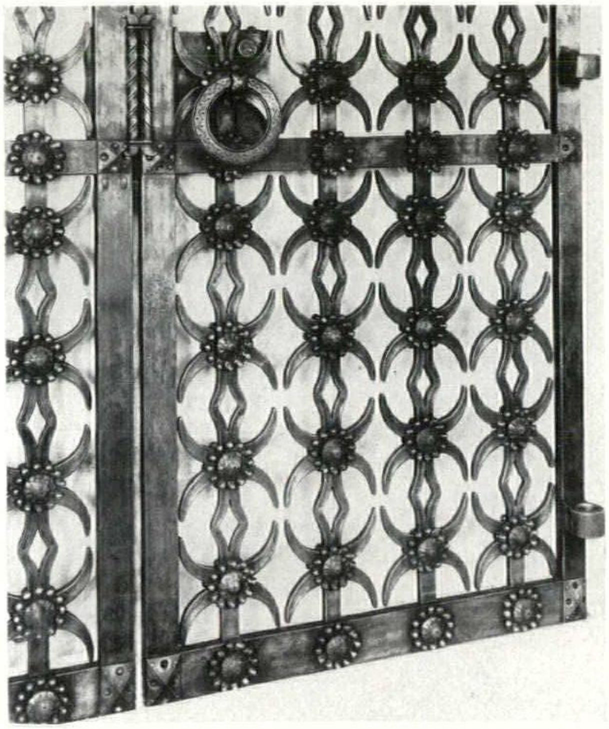
A general view and detail of a wrought iron gate located in one of the memorial chapels in the Washington Cathedral, Washington, D. C., for which Frohman, Robb & Little were the architects









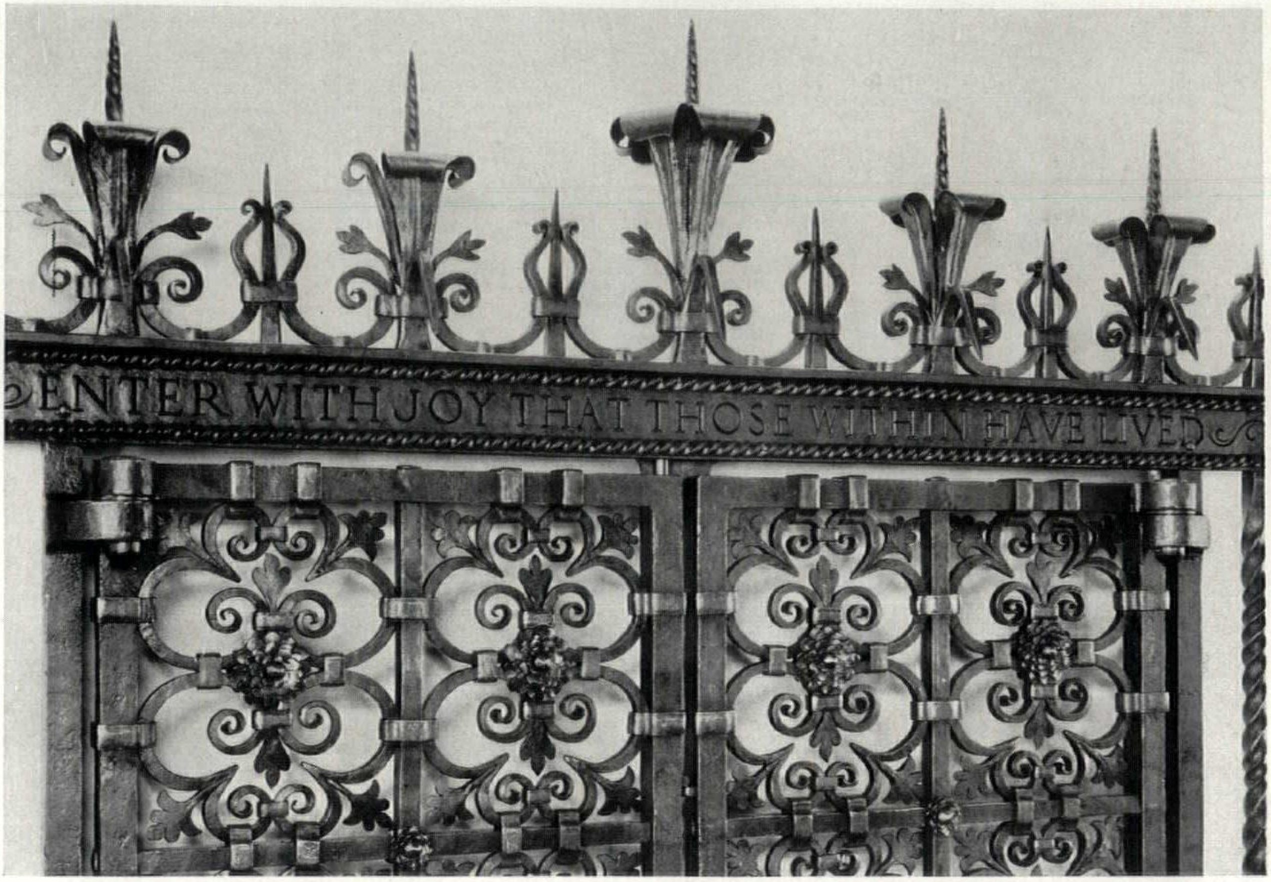


A gate detail for the Sterling Library at New Haven, Conn.

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

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.

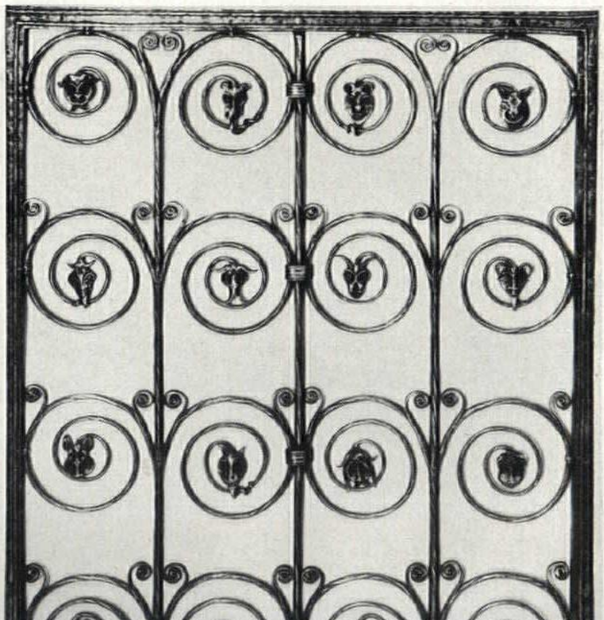
But if all the virtues claimed above for iron exist, what is its weakness that a need to use other metals should sometimes be felt? Well, we will let this metal show the virility claimed for it by facing the question squarely. Rust — corrosion — that is the great flaw. Let it be said, however, that the 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



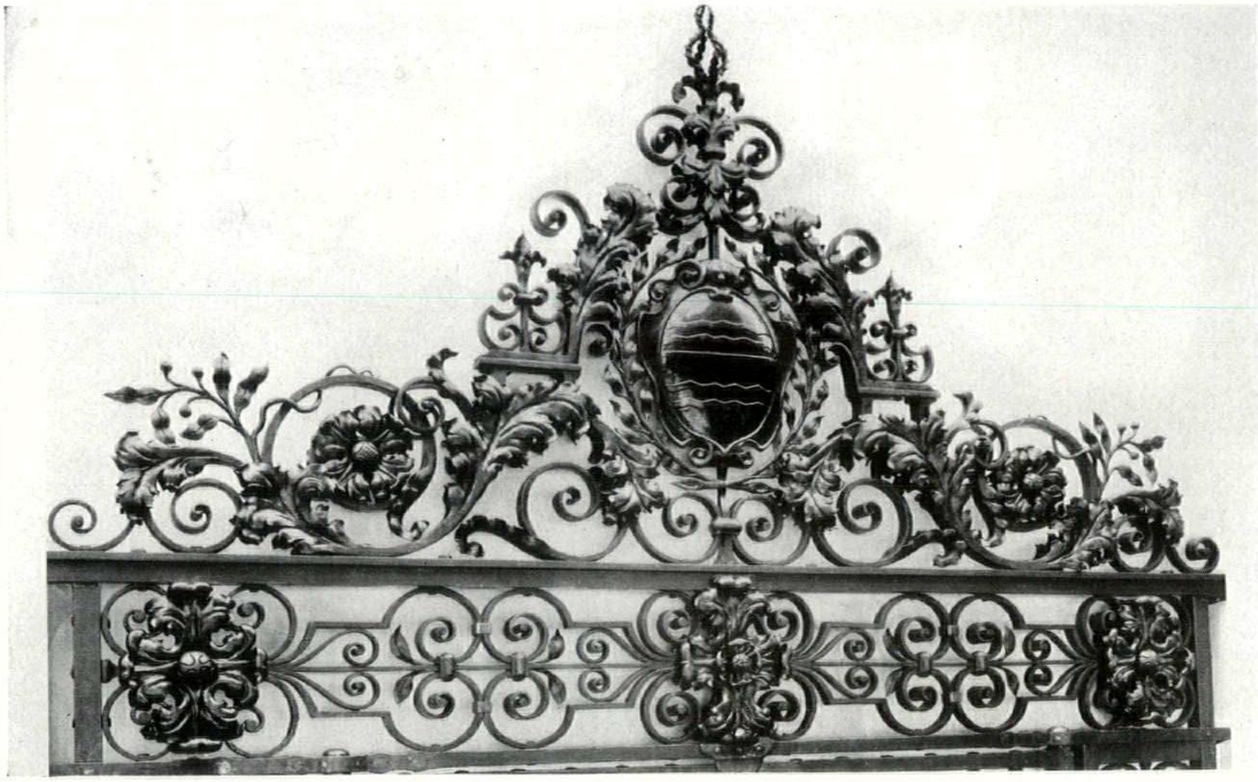
Compare the technique of wrought iron work with that of Monel metal shown opposite. Notice particularly its greater adaptability to varied forms. Above is a detail of the gates for the Hall of Fame at New York University

this may be achieved — and the wrought iron-worker 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

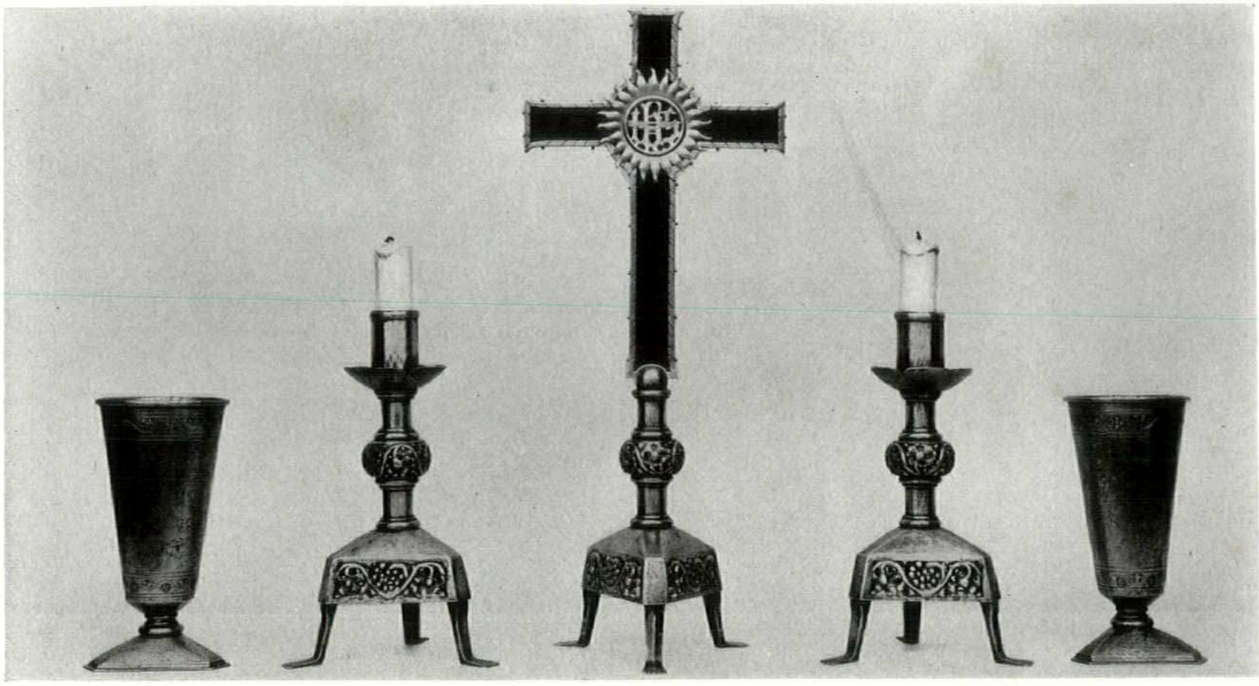
Compare the rugged simplicity and humor of this wrought iron grille with the sophisticated design of the gate cresting illustrated at the top of the page

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



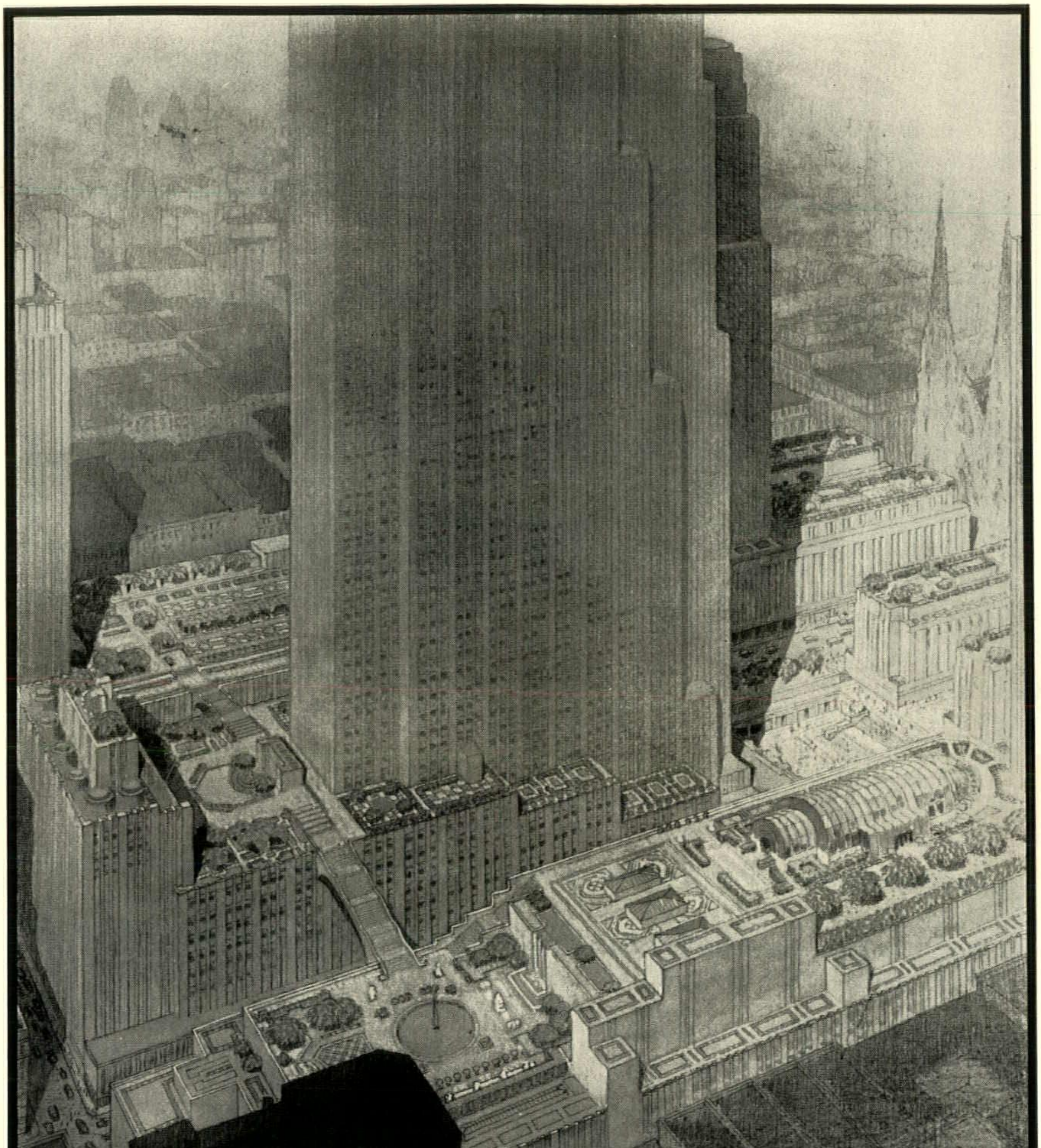
Cross, candlesticks and altar vases for Washington Cathedral, Washington, D. C.

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



Palmer Shannon

A GARDEN CITY ALOFT

THE ROOF TERRACES OF
ROCKEFELLER CENTER

THE ARCHITECTURAL FORUM

VOLUME LVI NUMBER FIVE

MAY 1932

THE STORY OF ROCKEFELLER CENTER

VII. A QUESTION ANSWERED

BY

MERLE CROWELL

DIRECTOR OF PUBLIC RELATIONS
ROCKEFELLER CENTER, NEW YORK

THE public has recently been enlightened on the subject of Rockefeller Center through an article appearing in Harper's Magazine with the provocative title of "Radio City — Cultural Center?" By far the most important element in the title is the question mark, although it would seem that the author, Frederick Lewis Allen, had no questions in his mind about the cultural values of the project. After several very entertaining pages, he advanced the contention that mass entertainment rather than culture was the keynote we had sounded.

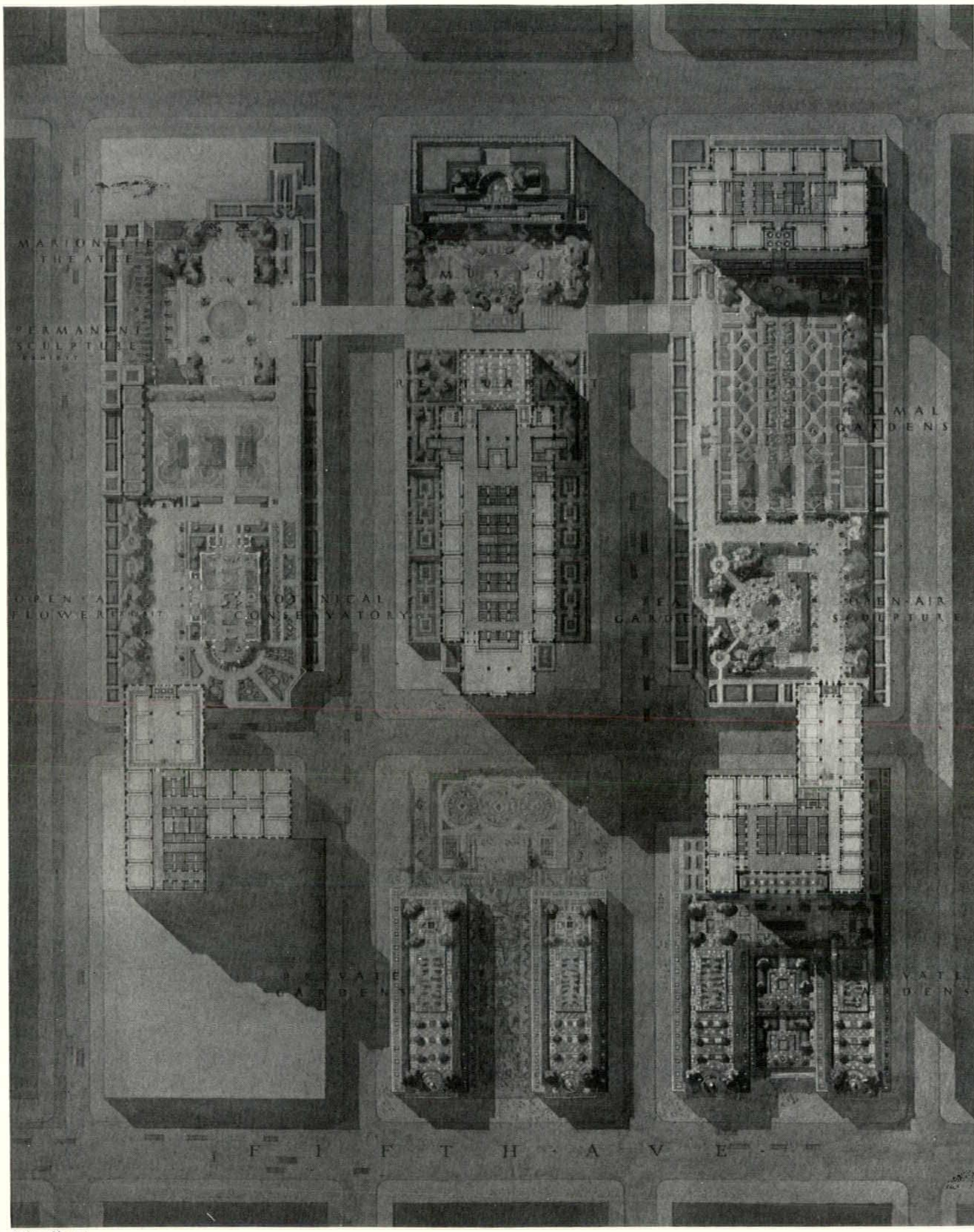
So far as any of us can remember, Rockefeller Center was never referred to as a cultural unit by anyone immediately concerned with its actual development. One or two newspapers may have interpreted the aim of Mr. Rockefeller in that light, but they had no authority to do so beyond their own imaginations.

Since the question of its cultural value has been raised, however, it might be interesting to review those aspects of the project which might have contributed to the impression evidently held by Mr. Allen before he learned the facts and exposed us publicly. We must, at the outset, express the belief that culture is not a commodity to be bought or sold. Nor can culture be massed together for the inspection of those in search of it. Not even our universities, which probably have as clear a title to the distinction as any other organization, could profess to be "cultural centers."

Although it would hardly seem necessary after such a declaration, I repeat, for the record and for those who may have read Mr. Allen's article, that none of us is bold enough to believe that we are producing a cultural center in those three midtown Manhattan blocks. We do believe, however, that those who visit Rockefeller Center will be exposed to beauty and education in many forms — music, drama, architecture, painting, and sculpture. It is hoped that not only the intellectuals will find there some of "the finer things of life," but that the man-in-the-street will be able to join his more enlightened fellows in appreciation of what is offered in Rockefeller Center.

It has been said, by many in disappointment, that Rockefeller Center is a commercial venture, and not an altruistic development supported entirely by Mr. Rockefeller. But the time is actually here, or is at least approaching, when the wealthy few need not support the arts with a sort of paternal condescension. For one thing depressions may occur again; and with them, withdrawn support from our endowed institutions. Further, and of course more important, art that does not pay for itself tends to lose its value as a public educational factor. How comparatively few visit the museums of art that dot the country.

To be really worth while, appreciation of the finer things must not be set apart from living. The existing movement to bring about "art in industry" is one of the most encouraging facts in our national life. The increased demand for good design in household utensils, food packages, and tin cans is an indication that the public will respond to beauty in the routine of daily living, whereas it is indifferent to the masterpieces lodged in our marble halls.



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Rendered plan, showing the latest plan and landscaping developments. The two buildings in the center foreground, and the one in the right foreground are to be occupied by foreign interests. The building in the left center has been reserved for an opera. The use of the roofs for revenue as well as for beauty is a noteworthy feature

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Arcade between two foreign units leading from Fifth Avenue to a 45-story office building in the rear. The rich treatment suggests the arcades of Milan. The space is to be used for reception of distinguished visitors

Cellini's metals were not designed to rest under glass cases, nor were Michelangelo's murals created to cover museum walls, to be seen free on Mondays, Tuesdays, and Wednesdays, and for a lira on the other days of the week. The nation's artistic sense is in an unhealthy condition when it must depend on exhibitions for stimulation. If this is a cultural nation, expression must be present in the character of our architecture, in the design of our furniture, and the shape of the knives and forks we use at the table.

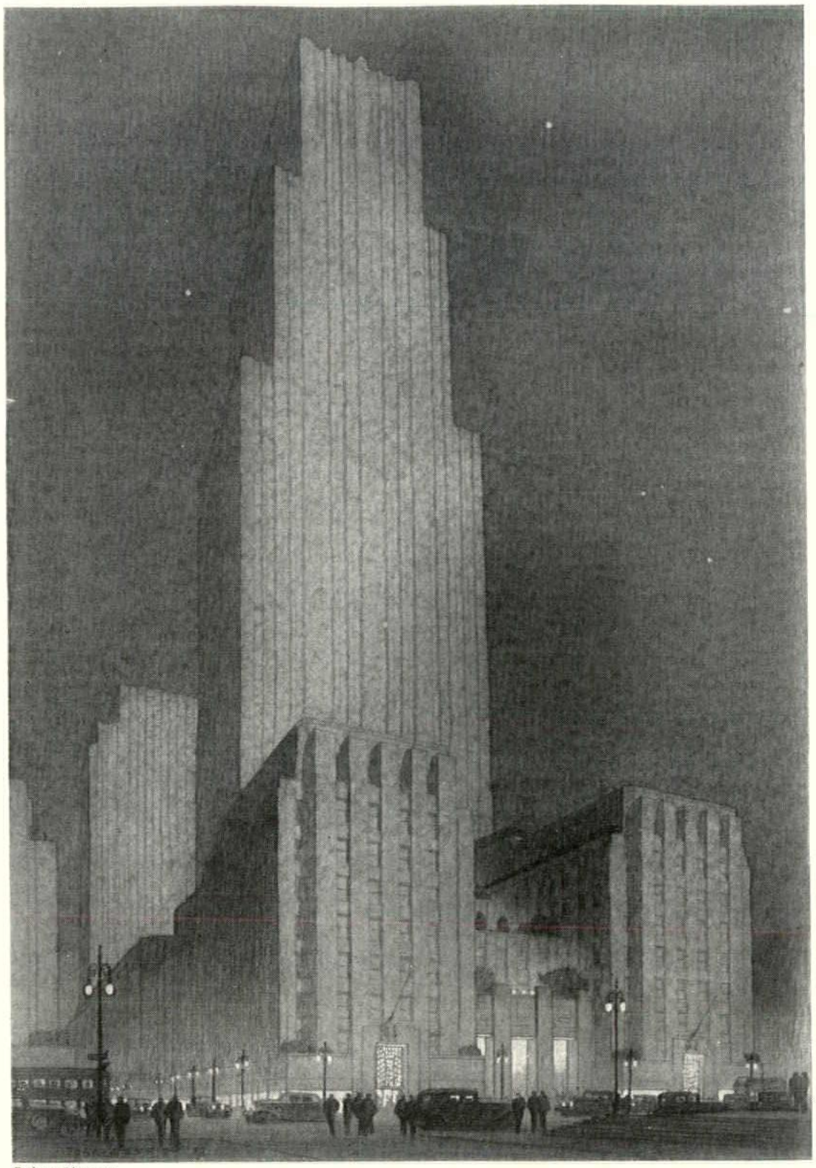
Rockefeller Center represents a sincere attempt to incorporate art into business, into entertainment, and into all the activities which may be housed there. Regardless of the character of our tenants — an opera company, a broadcasting organization, a foreign consulate, an insurance company, a department store, or a sales office for a manufacturing company — we are striving to create an environment that will be stimulating to all.

Plan Development. In the January issue of THE ARCHITECTURAL FORUM, the general plan and design were discussed in as much detail as had been decided upon at that time. Since then, there have been additions to and modifications of the plan. The general scheme of decoration, furthermore, is becoming more definitely outlined.

With the announcement early this year that a British syndicate had leased a six-story building on the southwest corner of Fifth Avenue and 50th Street, other foreign countries expressed interest in obtaining similarly prominent space in the project. A group of French officials and business men last month leased a similar six-story building, to occupy the northwest corner of Fifth Avenue and 49th Street. These two buildings, identical in exterior treatment except for appropriate national insignia, form a gateway to the rest of the development. Between them a promenade 60 ft. wide slopes down to a sunken plaza, identified as The Forum, about which the other nine buildings will be grouped.

The ground floor in each building will be devoted to shops and salons, and in the first basement additional shops will probably be grouped about a central loggia, from which passageways will lead to the main 70-story building, as well as to the theaters and other office buildings. One or more floors in the British building will be occupied by a prominent British bank, and an upper floor will be used as headquarters for several British clubs.

Several floors of the French building, which is to be known as La Maison Française, will be devoted to displays of the widely diversified commercial arts and industries of the country. It is prob-



Palmer Shannon

At the left, view from Fifth Avenue of the block between 50th and 51st Streets, with the international buildings in the foreground and the R-K-O office building in the rear. Right, a view looking down Fifth Avenue, showing the complete foreign group

able, also, that some government offices may be located in the building.

With these two buildings lending an international character to the project, it seemed logical that other countries should be invited to join them. Consequently, the building located on Fifth Avenue from 50th to 51st Street, originally discussed as a possibility for a department store, will probably be devoted to other foreign governments. The proposed scheme for the use of this site includes a building of three units: two low wings, similar to the English and French buildings, and a 45-story office building at the rear. Between the two wings, which have Fifth Avenue frontage, an arcade will lead back to the office building. Besides offering interesting possibilities from the design standpoint, the arcade gives the tall office building a Fifth Avenue entrance, valuable, of course, to possible tenants.

The arcade is likely to become one of the most important elements in the entire project, and is certainly one of the most unique. Perhaps the suggestion came from the famous arcades in Milan. At any rate, the rich mosaic floors and the mural-covered walls will be an extreme departure from the usual treatment of such spaces. Shops will probably line the walls, and the arcade itself used for the reception of distinguished visitors, international celebrations, and similar events. It is hoped that each of the wings will be occupied by a single foreign country, and that the major part of the large office building will be occupied by other foreign interests.

In the present plans, the first floor of the large office building which rises above the two low wings will be devoted to an international club. A landscaped terrace, with trees, shrubs, and other foliage occurs at this level; and in addition, the landscaped roofs of the wings will contribute to form a beautiful garden.

Decorative Theme. An even more interesting development was the establishment of a definite theme for all the decorative elements contained in all the buildings. Presented with an opportunity unequaled in modern times for an outstanding contribution to the arts allied with architecture, we believe that the plans now under way will realize that opportunity to the fullest. Rather than select arbitrary subjects for the different buildings in the Center, it was decided to incorporate all the decorative elements into one impressive theme, a theme that would be both inspiring and significant. After weeks of discussion, we concluded that the most logical would be the best — that the decorative scheme of Rockefeller Center should reflect the contributing elements in the evolution of the civilization which made such a project possible. Since many of the details still remain in a formative stage, it is impossible to describe fully just what that will include.

One of the first steps in the working out of the program was the appointment of an advisory committee to consult with the architects and artists on matters of decoration. The committee consists of:

Prof. Edward Waldo Forbes, *Director of the Fogg Art Museum, Harvard University*

Prof. Everett V. Meeks, *Dean of the Yale University School of Fine Arts*

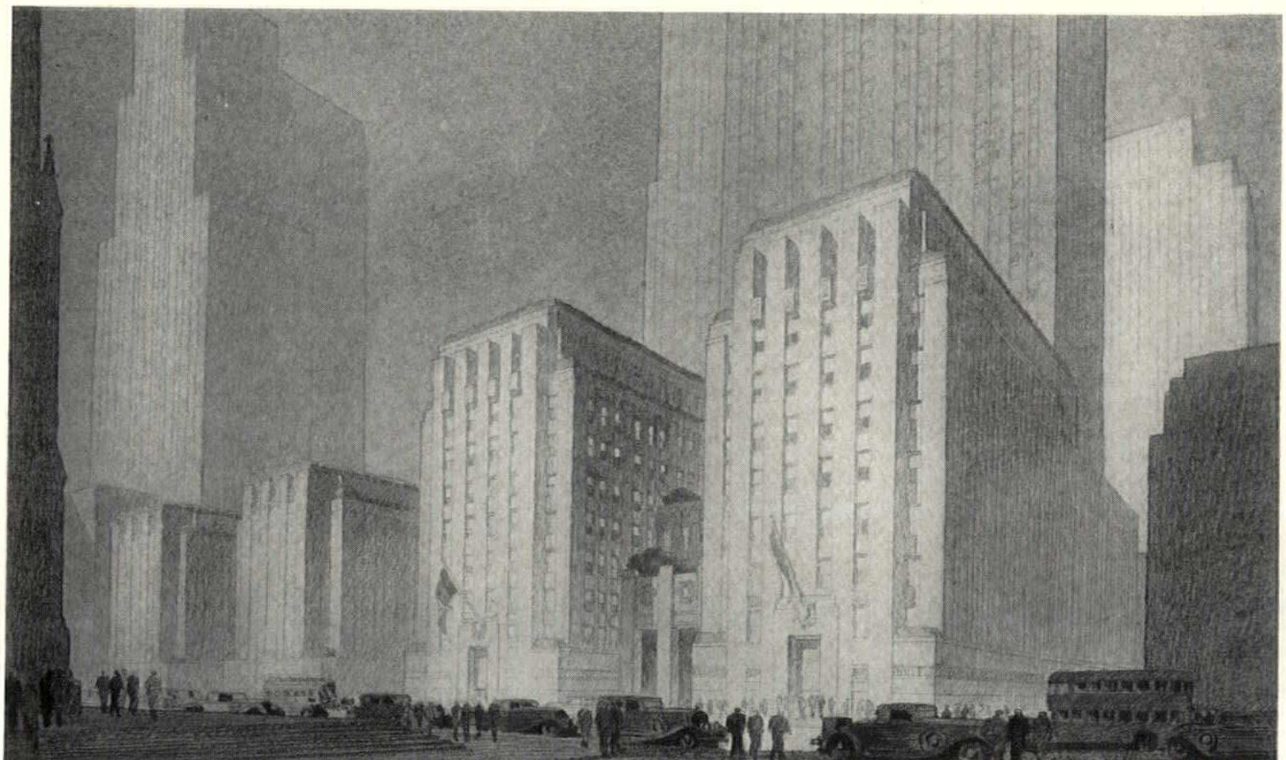
Dr. Fiske Kimball, *Director of the Philadelphia Museum of Art*

Prof. Paul J. Sachs, *Trustee of the Museum of Fine Arts, Boston*

Herbert E. Winlock, *Director of the Metropolitan Museum of Art*

It is intended that the meaning and atmosphere of the theme shall so pervade the entire ornamentation and decoration as to result in a unified effect and the telling of a connected and understandable story. The members of the advisory committee will have an active voice in the determination of murals, sculpture, landscape gardening, and decorative floors, ceilings and pavements.

There has been considerable controversy over the selection of American artists to do all the decorative work. An unfounded rumor that Diego Rivera and José Maria Sert had signed contracts to do the murals caused several protests against giving work to any foreign artists when there are so many outstanding American artists available. With the general opinion of the ability of American artists, the authorities of Rockefeller Center are wholly in accord. There is, however, an international character to the project that must be considered. If, as it appears now, four of the eleven buildings are to be devoted to foreign interests, it



Palmer Shannon

seems logical that some of the work should be done by foreign artists. The most important work, however, will be done by American artists.

At the present time, only two contracts have been signed, and each of these is with an American artist. Ezra Winter has been retained to execute a huge mural for the foyer of the International Music Hall. This, as reported in the April issue of The Architectural Forum, will be a canvas 60 by 30 ft. and will be based upon the Indian legend that the Fountain of Youth was in an Oregon crater.

For the same building, as well as for the sound motion picture theater, Hildreth Meiere has been commissioned to do four decorative plaques for the exterior of the buildings. Three circular plaques, 18 ft. in diameter, depicting the spirit of song, dance, and the drama, will be placed in the Music Hall, and a rectangular plaque, 18 by 35 ft., will be set in the wall of the motion picture theater. They will be executed by Oscar Bach in metal and enamel.

More than forty murals, at least fifty groups of sculpture, and an infinitely varied display of other forms of decoration will eventually contribute to the decorative theme. With many of the ablest artists of this and other nations participating, it is unlikely that so large a collection of murals or so imposing an assemblage of contemporary sculpture will be found anywhere else in the world. Since the logical entrance to the development is through the sloping promenade between the French and British buildings, the story of the successive frontiers which civilization has crossed will begin in the mosaics of the promenade walk leading to The Forum. Sculptured figures will flank the broad stairway leading directly to the sunken plaza. A large sculptural fountain against the west wall of The Forum will continue the theme presentation, aided by other sculptured figures and mosaics in the floor of the plaza.

The main entrance to the central 67-story office building will be enriched by still another sculptured group. Access to this building from Sixth Avenue will also be provided, leading into the Concourse, which is to be an entertainment hall. Here the main decorative elements will consist of rich murals and frescoes. The underground thoroughfares leading from the Concourse to the lobbies of the two theaters, the site for the opera house, and to the other buildings will be enlivened by mural panels and frescoes.

The decorations for the central office tower and for the two 45-story office buildings will be rather unique in the use of murals. The decorative theme will be continued in murals extending to the ceiling from a height six feet off the floor, completely surrounding the central elevator enclosures as well as the rest of the wall surface. Floor mosaics will supplement the decoration in the office building lobbies.

Garden Landscaping. It is not simply the intention of the Rockefeller Center authorities to devote the roofs of the various buildings to landscaping as a decorative element solely. Each of the roofs will probably be used for some sort of service as well as to provide a vista for tenants. A restaurant, an outdoor music hall and a botanical garden are possible occupants of the garden roofs. It is our hope that we will be able to demonstrate that such treatment of roofs is not only a better substitute for tin and gravel, but that the landscaping has financial advantages. If they are able to support themselves, the way will be opened for similar development of other city roofs.

RIVER HOUSE
A COOPERATIVE APARTMENT

BOTTOMLEY, WAGNER & WHITE

ARCHITECTS

PARAPHRASING the words of the late Frank Munsey, River House is a "merger" of the city apartment and the town house, incorporating the best features of each. Situated on the East River Front, between 52nd and 53rd Streets, in the heart of New York's newest and possibly most exclusive residential district, the developers sought to make it "the most distinguished modern residence in New York." Entirely cooperative, the building contains spacious simplex, duplex, and triplex apartments.

Conditions. A difference of approximately 30 ft. exists between the levels of 52nd Street and 53rd Street. At the outset, it seemed that the building would have to be developed either as separate units facing on either street, or as a single building incurring the loss of three stories in height. Happily, the recently passed Multiple Dwellings Law rescinded the more drastic requirements of the old Tenement House Act, and permitted the building height to be determined from an average theoretical measuring point. To maintain a level façade on the river front and on the low streets, however, it was necessary to install three floors below the grade of the high street. After it had been decided to provide a drive at street level for vehicles, because of the congested traffic conditions prevailing on all dead-end streets, courts and yards could not conveniently have been carried down to provide light and air for this space. The solution was finally found in the utilization of the three stories below the street level but facing the river, as a private club with indoor tennis and squash racquet courts being housed on the below grade side to good advantage.

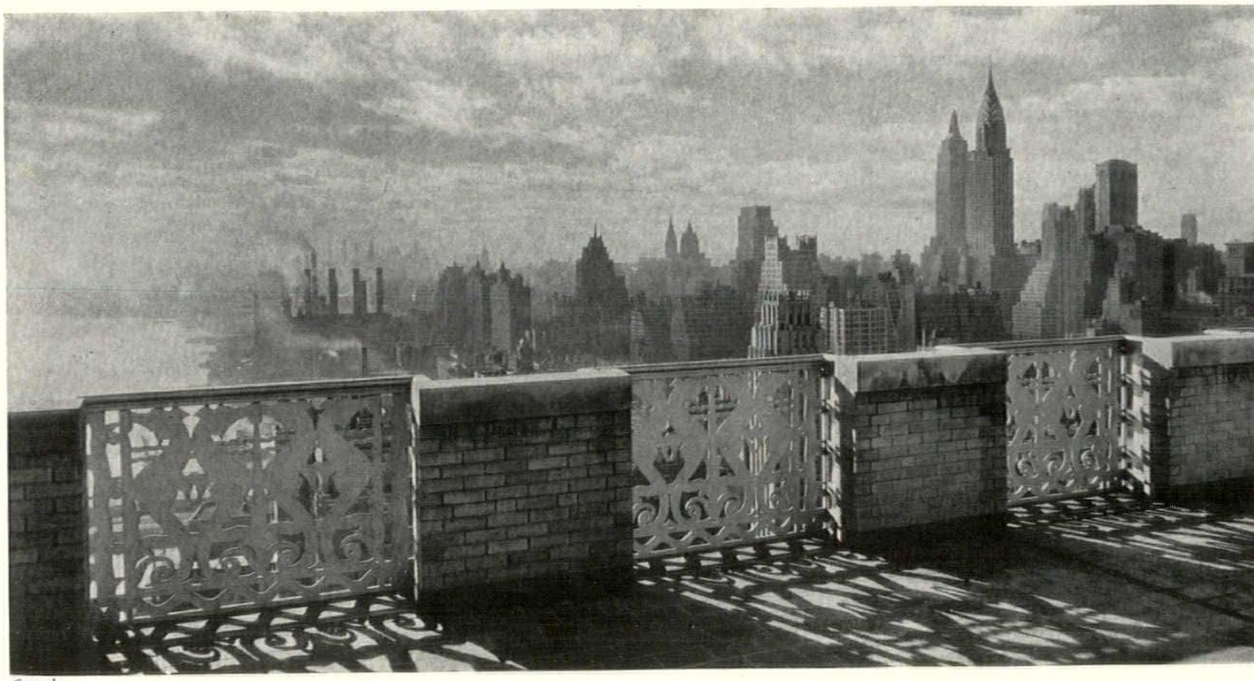
The limiting lines of the streets were definite. The high water lines, found to be irregular from various city maps, determined the river front façade. The legal restrictions for corner buildings fixed a definite line in the rear, limiting any portion beyond this point to the restrictions for a narrower street.

General Plan. Since river view and orientation were of paramount importance, the units had to be so planned to utilize these advantages to the fullest extent. Privacy was also emphasized, the courts being made far in excess of the required minimum width. The center garden court, for instance, is 8 ft. wider than the average city street.

The basic plans of the eighth and tenth, and the ninth and eleventh floors are the keys to the entire project. Portions of the layout of these floors recur from the third to the thirteenth floors. Variations occur in the northeast wing from the second to the seventh floors; this portion was planned for "interlocking duplex" apartments. By this unusual arrangement, multiple exposure for the apartments is provided by locating the entertaining portions on one side of the wing and the sleeping quarters on the opposite exposure on the floor above. In addition, varying story heights provide extremely high

Gottscho

The roof garden and pool looking toward the main lobby



Gottscho

One of the advantages of the zoning law is the number of terraces which it demands. This is a view of mid-town New York from the high setback of River House

ceilings for the living quarters and lower ceilings for the bedrooms. Above the seventh floor this wing reverts to large simplex apartments.

In the northwest wing, typical apartments do not start until the fifth floor, the third and fourth tiers having been given over to maids' rooms. The height gained by the substitution has been devoted to a special triplex maisonette, permitting 14 ft. clear story height in the major rooms.

The staggered floor scheme, that is high ceiling living quarters and low ceiling bedrooms, has been carried out in the central portion of the building, where duplex apartments again occur. This variation continues through the tower from the second floor, although a complete change of plan occurs at the sixteenth floor where the tower emerges from the mass of the structure. From the twelfth to the fifteenth floor the layout varies, due to the setback requirements. The duplex apartments in the tower, enjoying four exposures, continue to the twenty-third floor, above which a triplex apartment extends from the twenty-fourth to the twenty-sixth, with private terraces at various levels.

Entrance, Service and Delivery. Since the sale of apartments might have been seriously impaired by a poor or inaccessible approach, the rear yard was made to serve as a private driveway, with an entrance from 52nd Street and an exit ramp leading up to 53rd Street. The main entrance to the building, therefore, is at the rear. The general service level faces on the lower street, and is practically at grade level, thereby permitting rapid delivery of merchandise without excessive handling. Portions of the three cellars not used as club quarters are devoted to maids' rooms on the lower street frontage, individual laundries, storerooms, and mechanical equipment.

Mechanical and Structural Features. The size of the project required that the building be split into two parts for the supply of electrical current, with a secondary transformer on the fifteenth floor. Standpipe and fire regulations demanded that the water supply be divided into two units, and the size of the building required three sources of hot water supply and two separate heating systems. The fan system is capable of supplying and exhausting air from 1,500,000 cu. ft. of space that is not supplied with natural ventilation. In addition, ventilation is supplied to bathrooms, toilets, kitchens, and other interior spaces from other motor and fan rooms.

The structural design was a combination of the complicated apartment house type with heavy transfer trusses and girders usually found in hotels and office buildings. The trusses range in length from 25 to 60 ft., and from 10 to 23 ft. in height. Varying floor levels, unsymmetrical layout, and legal restrictions all combined to make the problem an extremely difficult one to handle.

Gottscho

A GENERAL VIEW OF RIVER HOUSE

A COOPERATIVE APARTMENT BUILDING

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

Gottscho

THE main entrance to River House is from the court on the west side of the building on what is actually the third floor of the structure. It is on the level of 52nd Street at the south of the building and is reached by a ramp from 53rd Street at the north. Most of the space beneath the entrance floor is devoted to the quarters of the River Club, the water entrance to which is over 30 ft. below the main entrance floor of the building. The illustration at the top of this page is of the garden terrace on the east side of the building. The garden covers the roof of a portion of the River Club and is an interesting example of the possibilities for landscape treatments of otherwise unattractive roof areas. The trees, turf and shrubbery have been set in earth 3 ft. deep, and with the paved walks and fountain give the illusion of a natural garden area. The illustration on the opposite page is of the fountain on the terrace below, which serves as a promenade for the River Club. River House is faced to a height of three stories with a variegated buff limestone. Above this point the walls are a gray tan brick. The cornices and trim are of limestone and the bays, shown in the illustration on page 433, are sheathed with lead covered copper. The window frames and sash are painted a light tan to blend with the brick work and the entrance doors are a dark blue green. The iron work is a combination of cast and wrought work covered with aluminum paint

RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

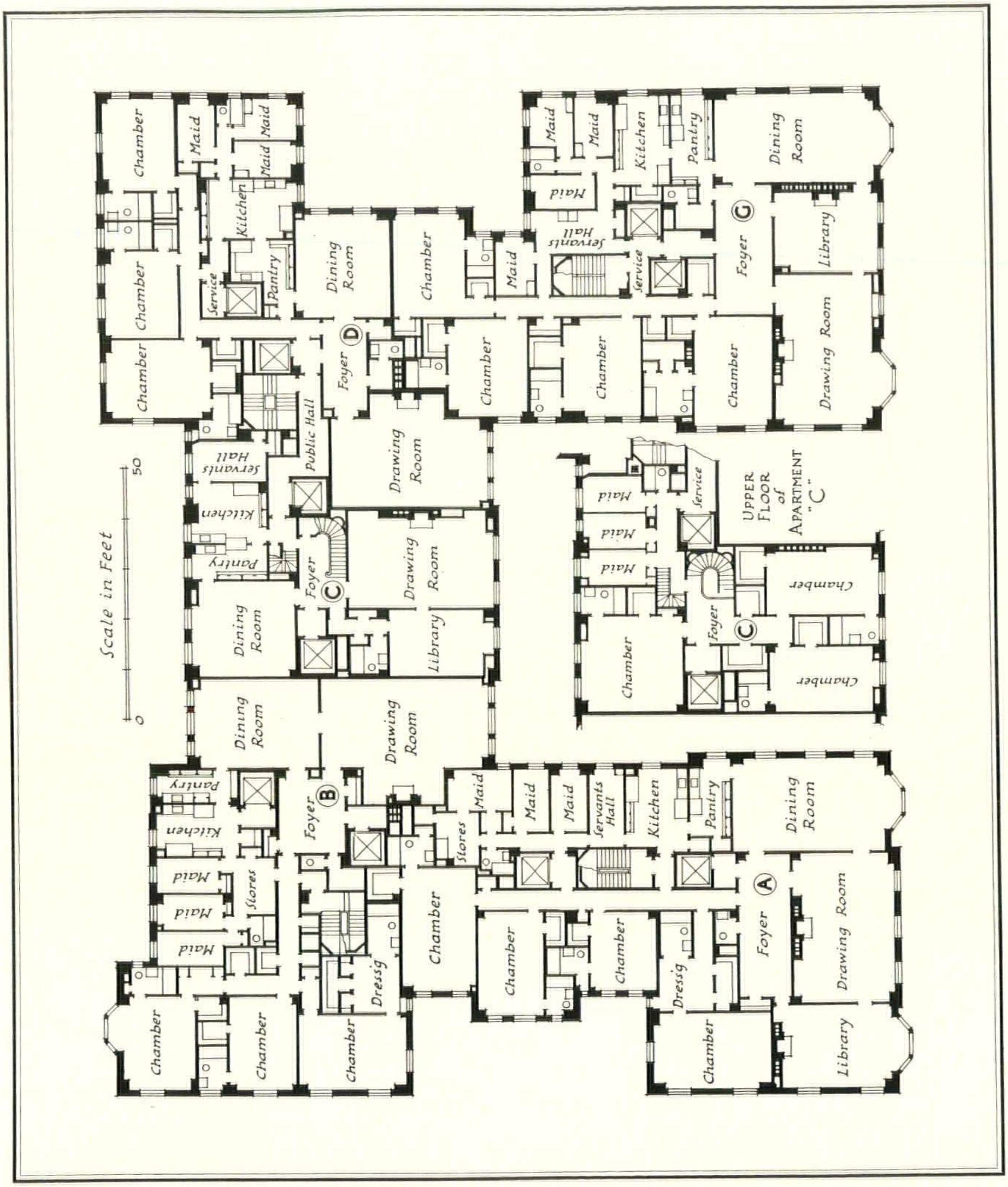
BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

Gottscho

RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS



RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

Gottscho

RIVER HOUSE, A COOPERATIVE APARTMENT

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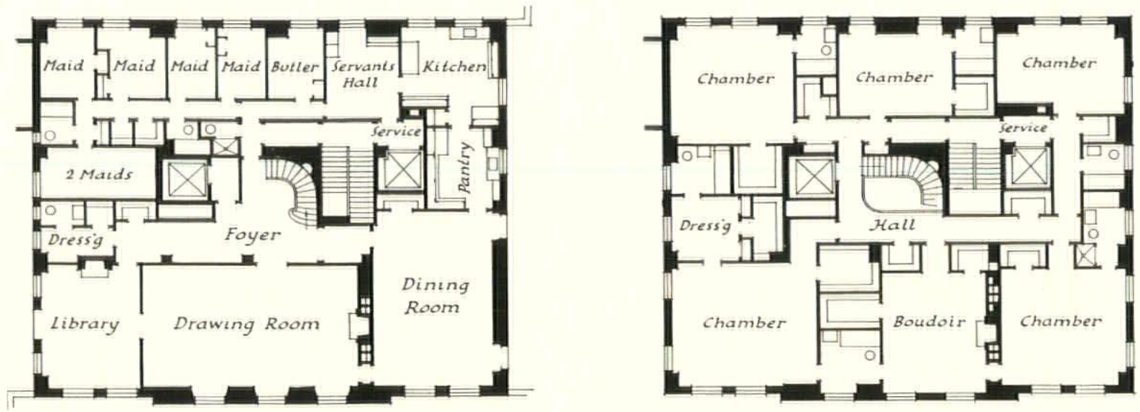
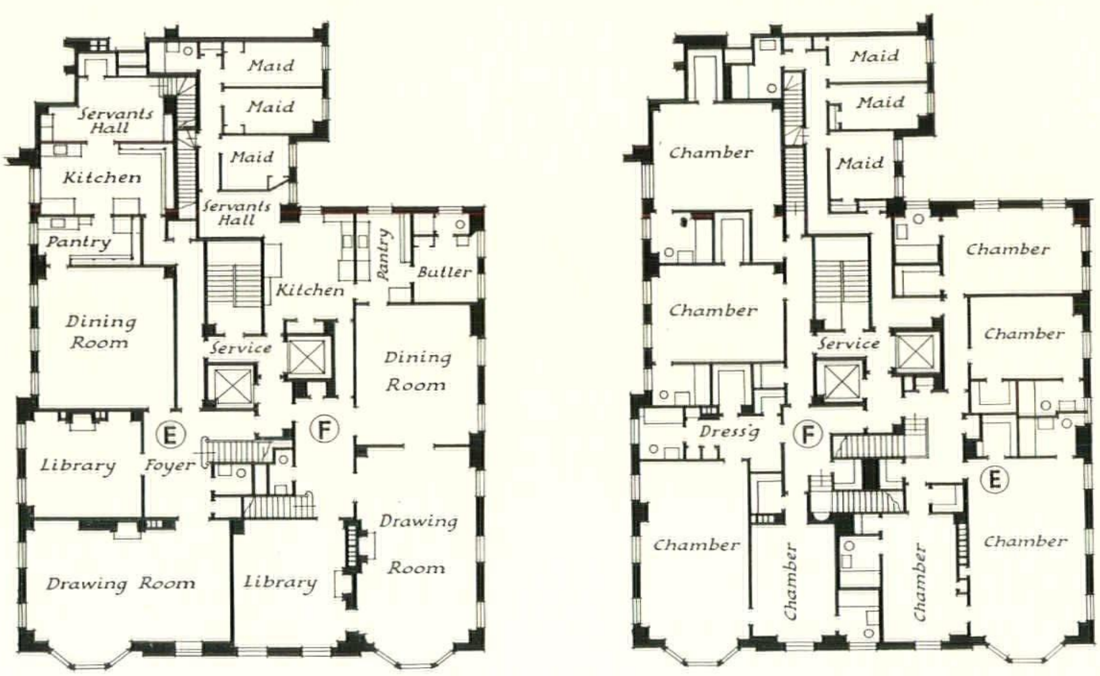


TYPICAL DUPLEX TOWER APARTMENT



TYPICAL DUPLEX APARTMENTS "E" AND "F"

RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

Gottscho

RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

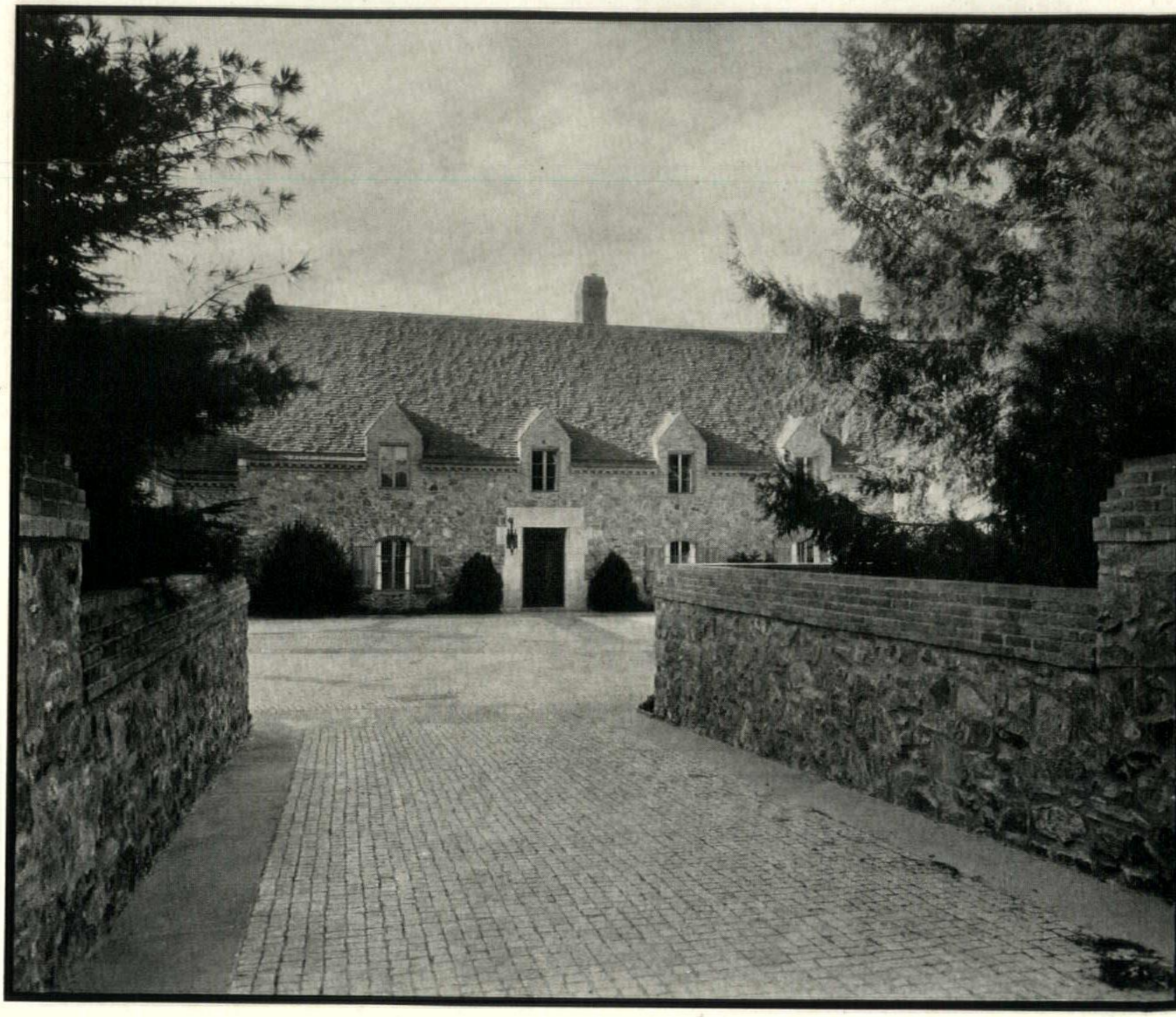
Gottscho

THE main reception lobby of River House looks out on the garden terrace illustrated on page 434. The lobby space of the building is actually divided into several parts due to the location of the elevators which serve the various apartment suites. The illustration above is of the large reception space, the openings at the left being the entrance to the garden court. The doors at the right lead to the entrance foyer and the elevators of the "C" and "D" apartments. Each of these spaces is finished in various tones of chocolate brown. In general the color of the walls is dark, the cornice somewhat lighter and the tones of the ceiling graduate to a light cream in the center panel. The pilasters are of a variegated chocolate-colored marble and the panels over the doors at the right are of Belgian black. The large wall panels are decorated and antiqued mirrors, the predominating colors being silver, Indian red and black. The floor is of black and brown terrazzo with a Belgian black base. The general effect of the hangings and furniture is brilliant, the hangings being of a deep old rose and the upholstery tan, red and black

RIVER HOUSE, A COOPERATIVE APARTMENT

NEW YORK, N. Y.

BOTTOMLEY, WAGNER & WHITE, ARCHITECTS

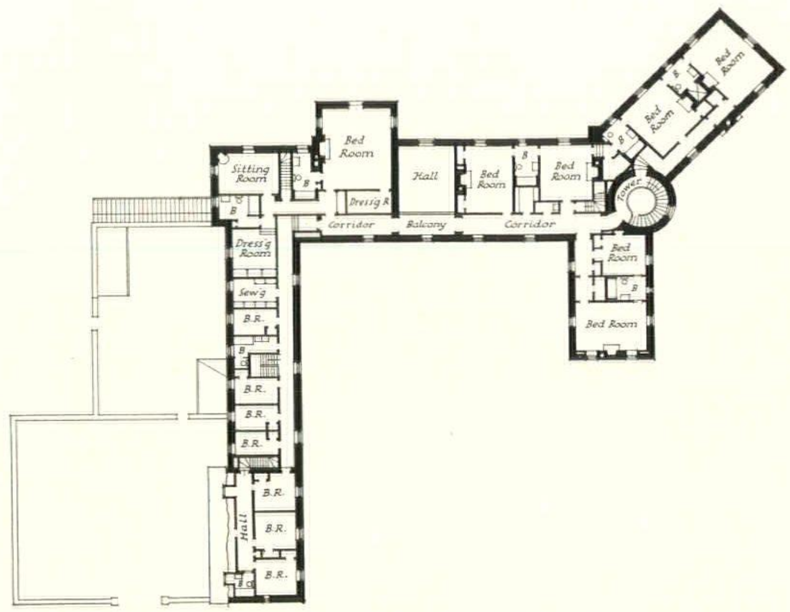


FROM THE ENTRANCE GATE

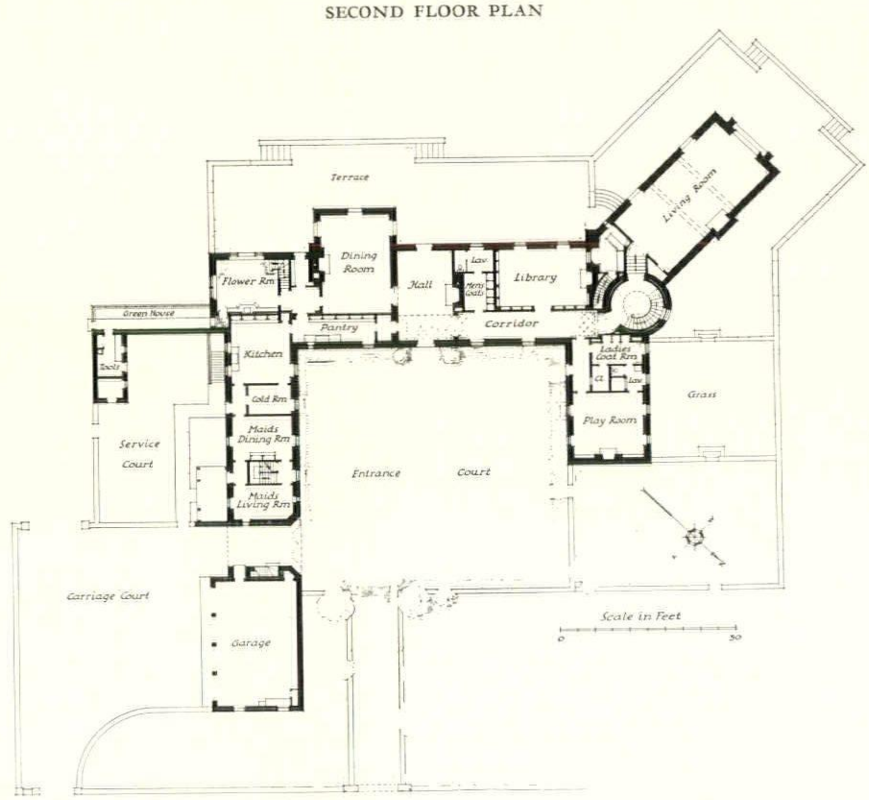
HOUSE OF SCHOFIELD ANDREWS

PHILADELPHIA, PENNSYLVANIA

TILDEN, REGISTER & PEPPER, ARCHITECTS



SECOND FLOOR PLAN

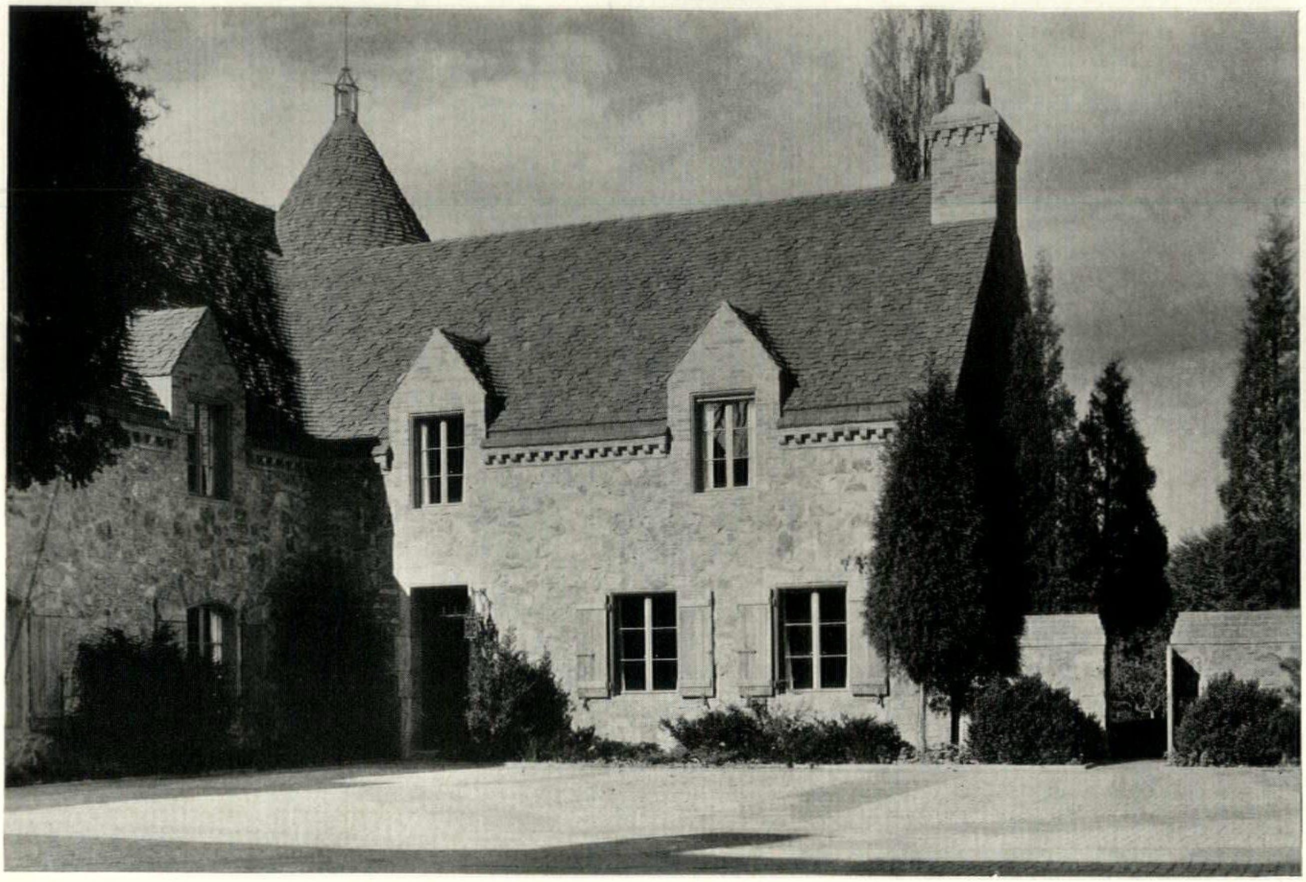


FIRST FLOOR PLAN

HOUSE OF SCHOFIELD ANDREWS

PHILADELPHIA, PA.

TILDEN, REGISTER & PEPPER, ARCHITECTS

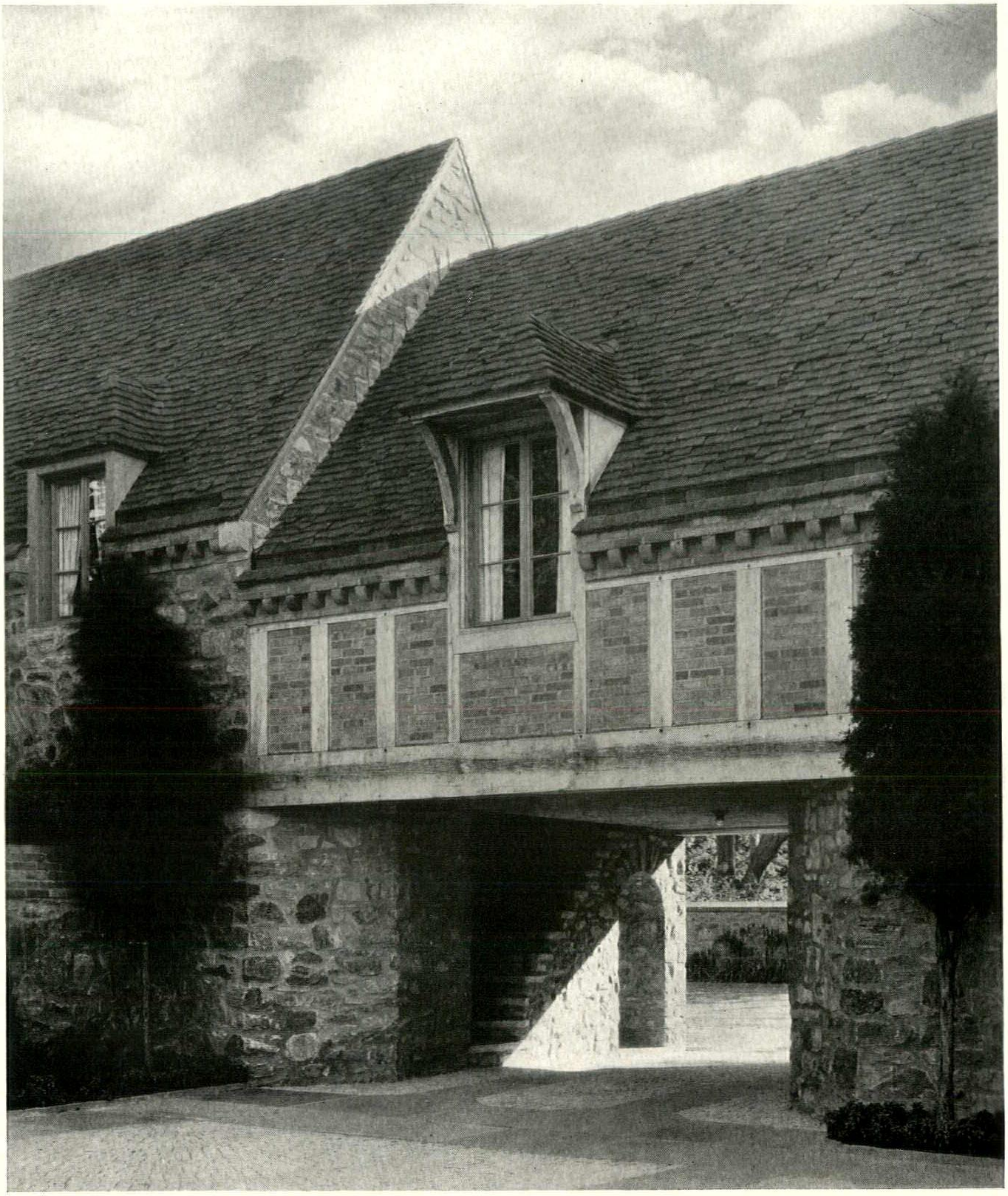


THE house is an interesting example of traditional elements of design in the development of a plan to provide for every contingency of modern life. The plans developed naturally from the orientation of the wooded site and the requirements of the owner. The materials employed were chosen for their consistency with the purpose and location of the building. The exterior walls are of a random shape local stone varying in tone from brown to gray. The trim of the doorways and the cornice are of cut limestone, the dormers, the wall covering and the upper part of the chimneys being of a light red brick. The roof is covered with a dark red shingle tile. The small picture at the right is of the entrance gate leading to the forecourt; that above is a view of the playroom wing

HOUSE OF SCHOFIELD ANDREWS

PHILADELPHIA, PA.

TILDEN, REGISTER & PEPPER, ARCHITECTS



HOUSE OF SCHOFIELD ANDREWS

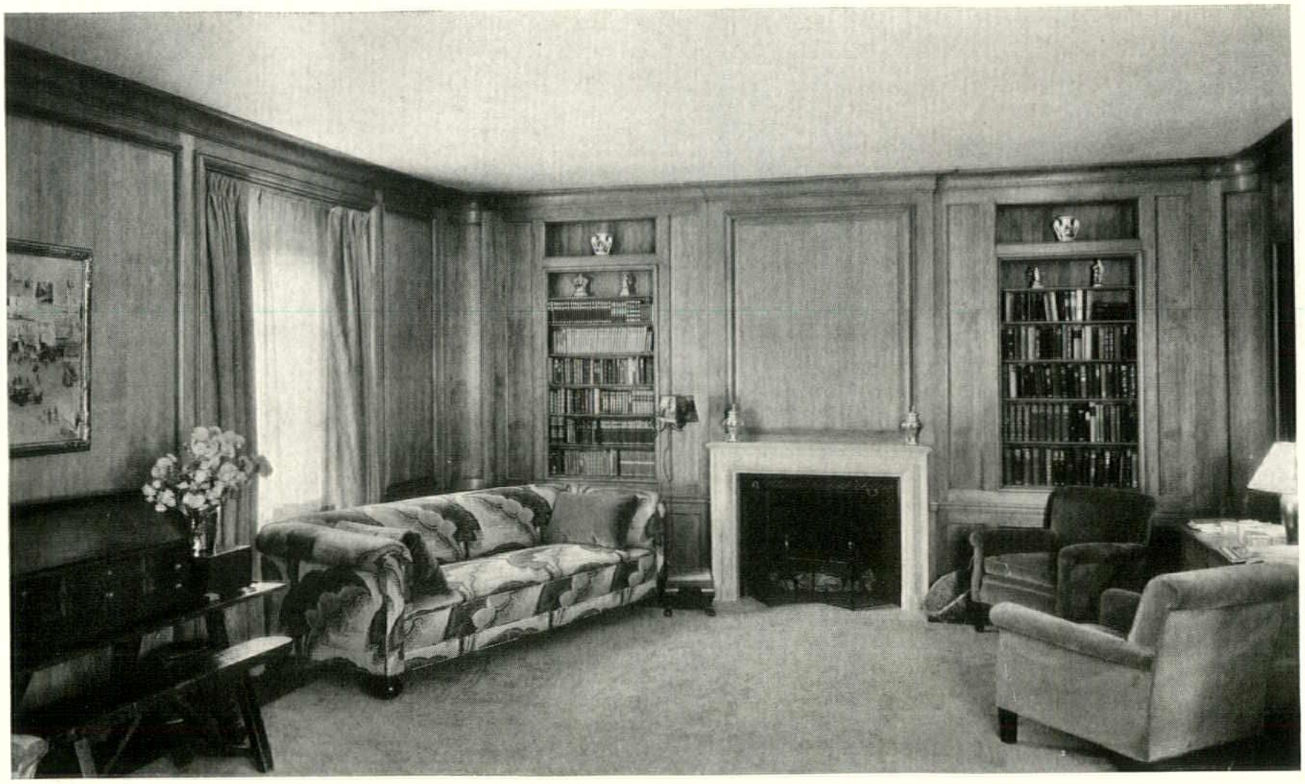
PHILADELPHIA, PA.

TILDEN, REGISTER & PEPPER, ARCHITECTS

HOUSE OF SCHOFIELD ANDREWS

PHILADELPHIA, PA.

TILDEN, REGISTER & PEPPER, ARCHITECTS

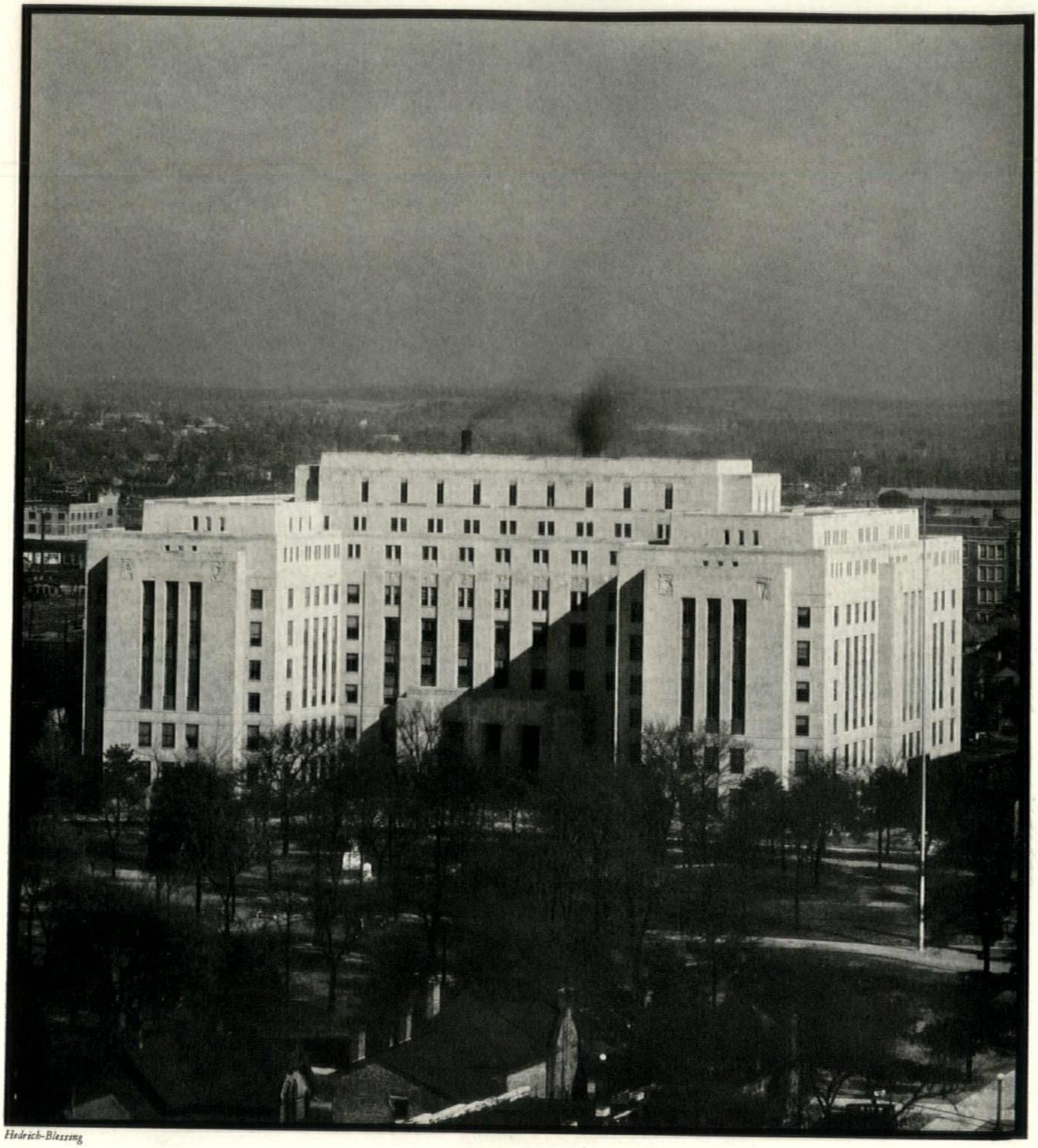


THE library is paneled entirely in French walnut with a light colored, waxed-finish surface. The illustration above is of the west end of the room. The wall of the east end and the one opposite the windows are lined entirely with bookshelves. The illustration at the left is of the flower room. The walls of this room are of plaster, painted in turquoise-green of a slightly lighter shade than the tile wainscot below. The ceiling is silvered. The fountain at the right and the tile panel above it is finished in dark turquoise-green and silver

HOUSE OF SCHOFIELD ANDREWS

PHILADELPHIA, PA.

TILDEN, REGISTER & PEPPER, ARCHITECTS



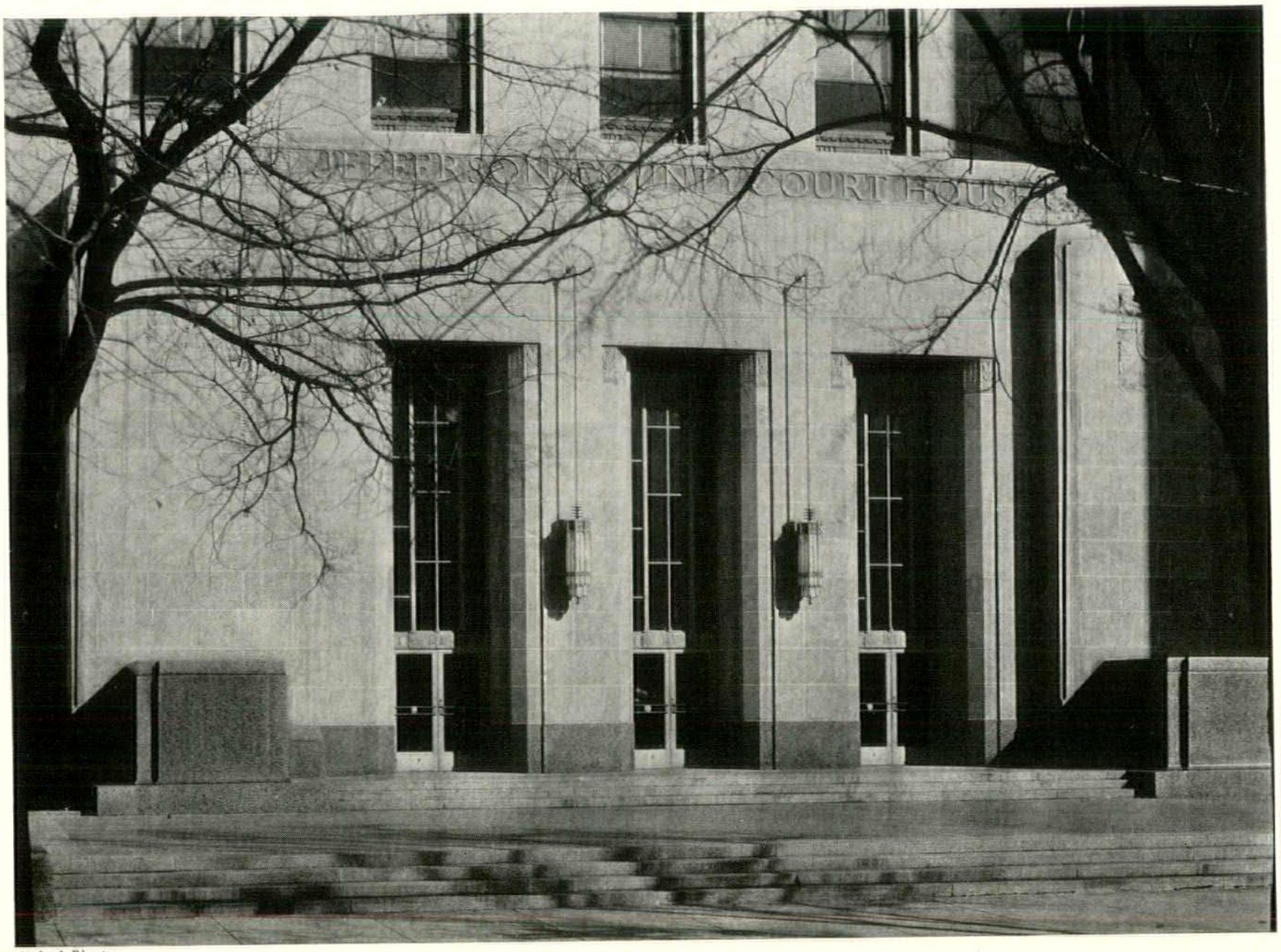
Hedrich-Blessing

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK

ASSOCIATE ARCHITECTS



Hedrich-Blessing

THIS building illustrates a well considered type of H-plan, in which the elevators, stairs, stacks and other utilities are arranged in the connecting link to permit a highly efficient development of the wings. The need for long communicating corridors is obviated, and the location of the working spaces insure a maximum of air and light. The structure, which is nine stories in height, covers an area 170 x 265 ft. The net working area represents 81 per cent of the total, indicating a high degree of plan efficiency. Built of a steel framed, fire-resisting construction, the courthouse is faced on the exterior with limestone set above a gray granite base. The entrance doors, frames, etc., are of bronze. Most of the windows are steel, double-hung sash, except the large ones, which are of the steel casement type. Spandrels are of cast iron. The entrance lobby, shown on the opposite page, has a gray Tennessee marble floor and Botticino marble walls set above a Belgian black base

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

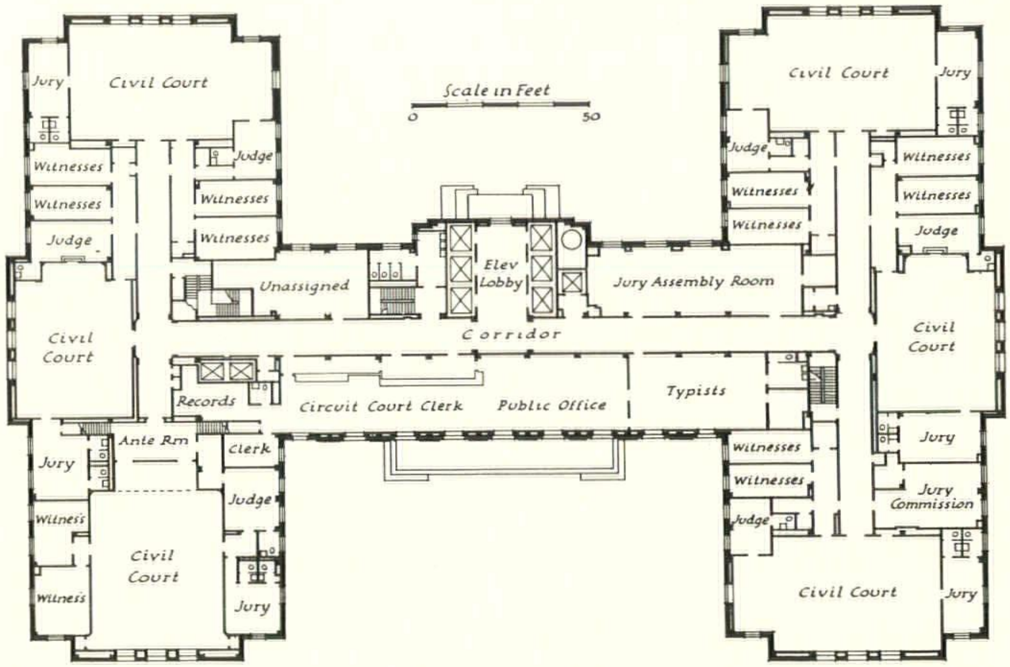
HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS

Hedrich-Blessing

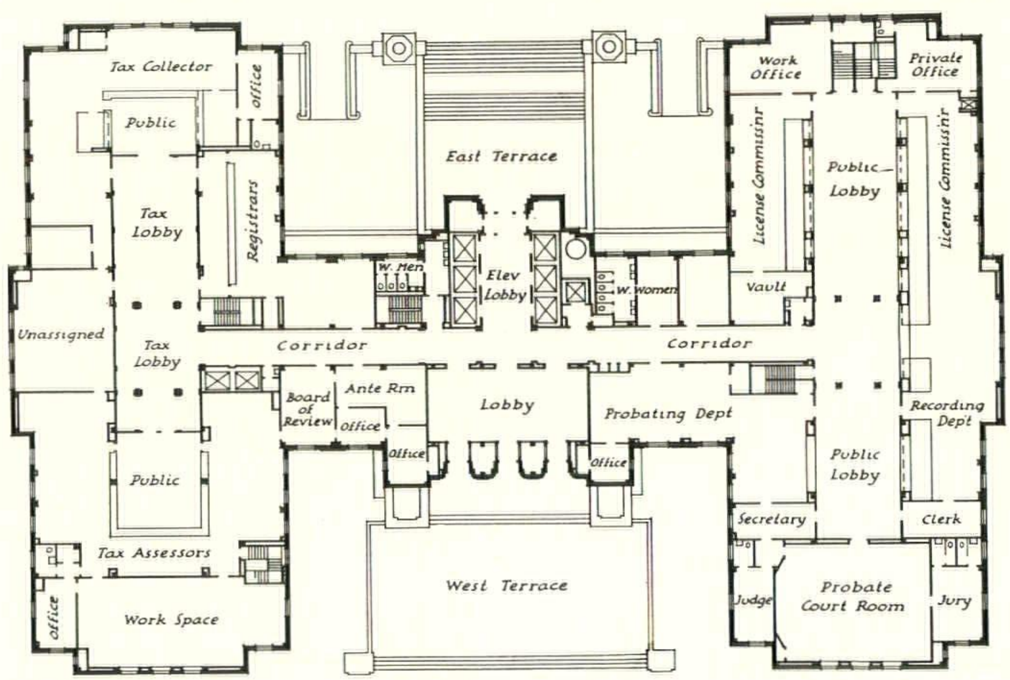
JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS



THIRD FLOOR PLAN

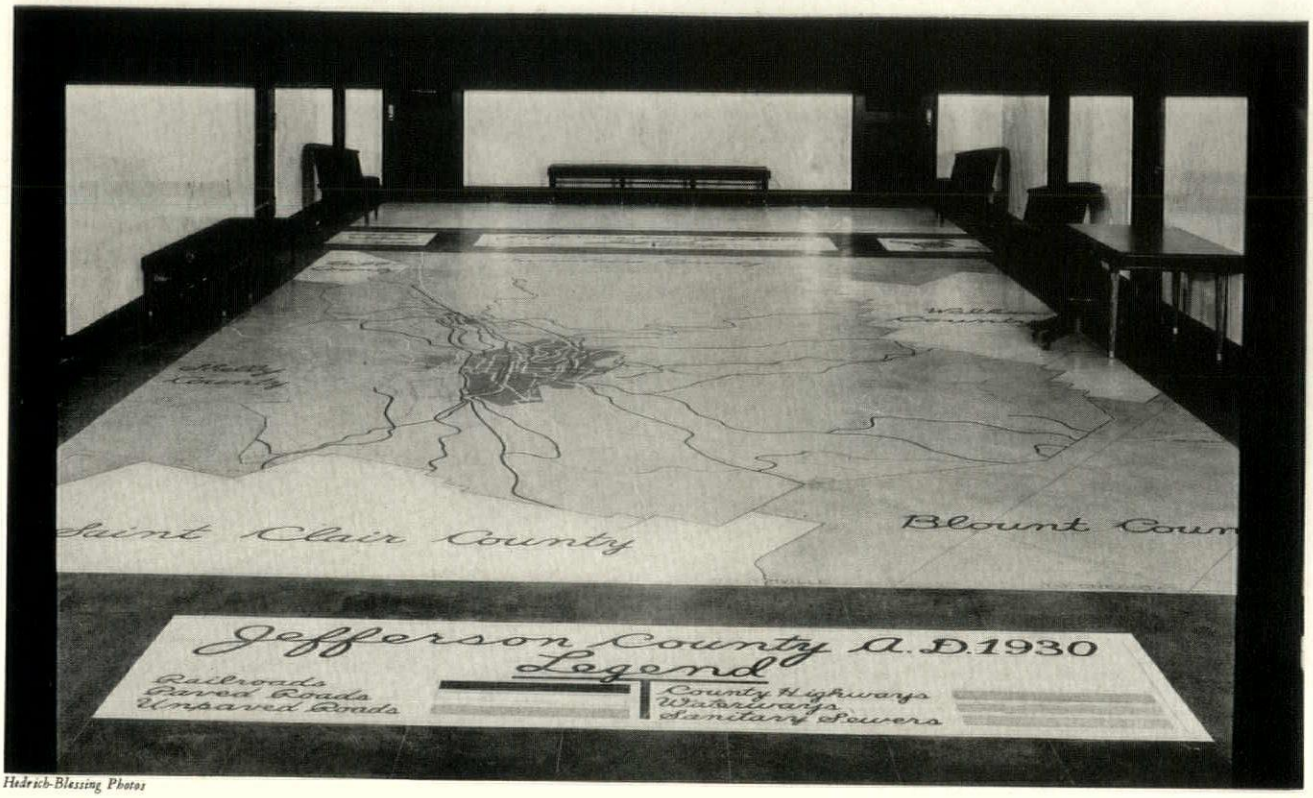


FIRST FLOOR PLAN

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS



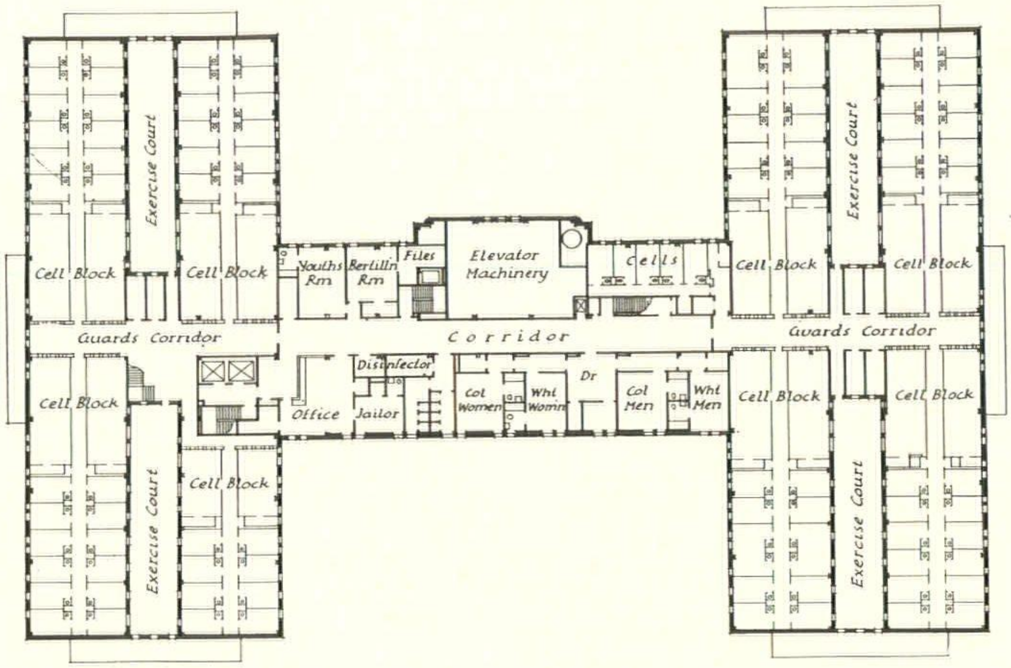
Hedrich-Blessing Photos

THE illustration above shows the floor of the County Commissioners' Reception Room. The map is executed in terrazzo of various colors, and the highways are outlined with small pieces of mosaic tile. The first floor elevator lobby at the right is similar in color and finish to the main entrance lobby, shown on page 449

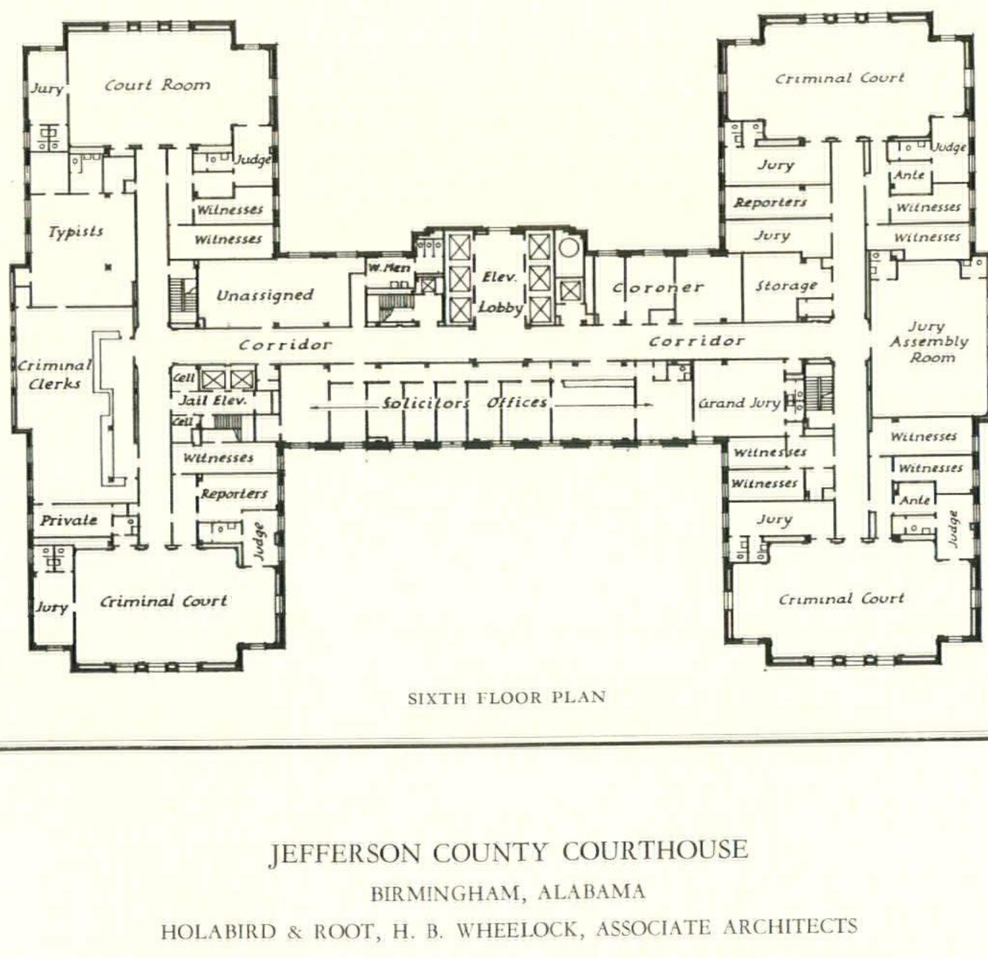
JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS



SEVENTH FLOOR PLAN



SIXTH FLOOR PLAN

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

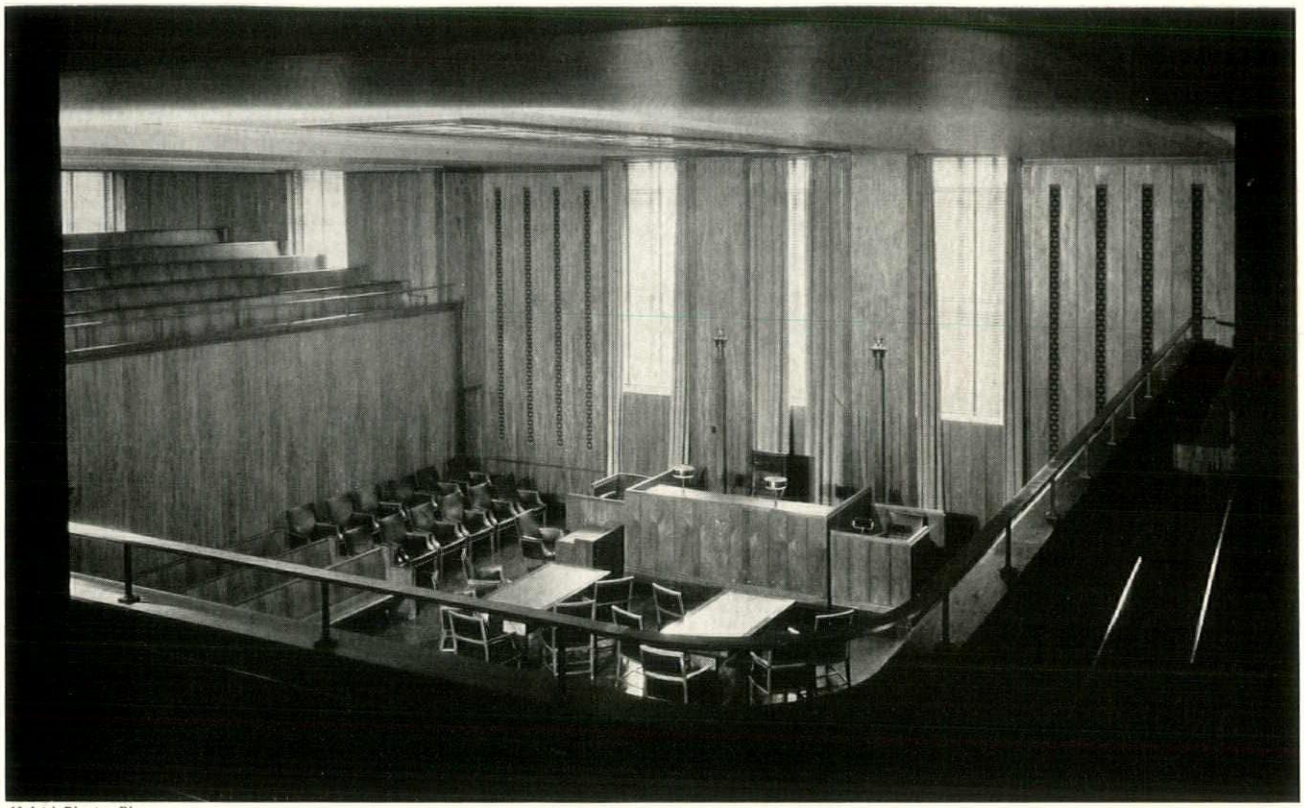
HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS

Hedrich-Blessing

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS



Hedrich-Blessing Photos

THE illustrations on this page are of two typical court rooms. On the opposite page is a detail of a witness stand. All the court rooms are finished similarly: the floors are rubber tile, the walls paneled in wood to their full height. Notice the even distribution of light, which is controlled by Venetian blinds at all the windows

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS

Hedrich-Blessing

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

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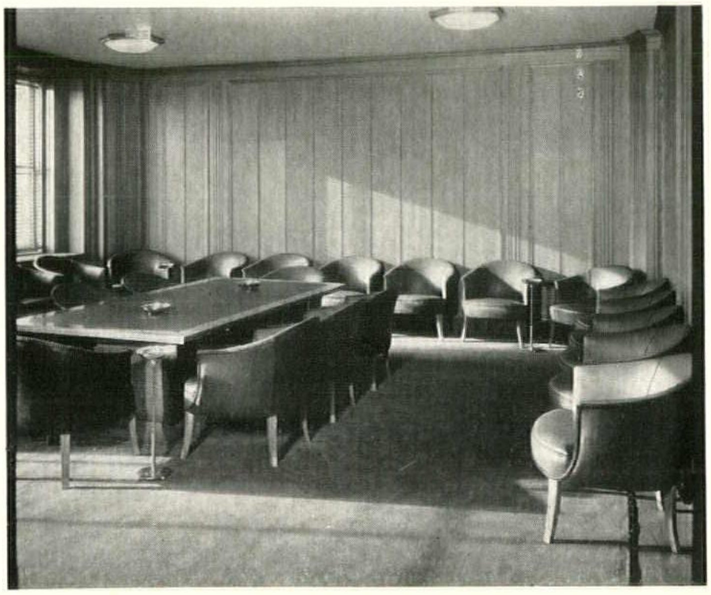
Hedrich-Blessing Photos



THE library, shown in the illustration at the top of the page, is comparable in comfortable appointments to a club lounge room. At the left is one of the conference rooms, finished to harmonize with the treatment of the court rooms

JEFFERSON COUNTY COURTHOUSE

BIRMINGHAM, ALABAMA

HOLABIRD & ROOT, H. B. WHEELOCK, ASSOCIATE ARCHITECTS

THE EDITOR'S FORUM

HOUSING AND INTEGRATION

ACKNOWLEDGEDLY, the greatest building need now is decent housing for the average American. The greatest need to bring this about is the efficiency of an integrated building industry. Housing and integration are related as directly and as logically as the objective and the means of reaching it. An integration of building interests into a housing-producing organization will give the necessary impetus to begin actual work. If the general integration of the industry is necessary for the really efficient production of buildings, a start can best be made by organizing to attack this one specific problem — housing. Having succeeded in thus organizing for one purpose in an emergency, the feasibility of efficiently organizing for any or all purposes can be demonstrated. This can begin in varying degrees and can be inaugurated locally. Without waiting for a national super-organization to be operative and all the procedure outlined in rules, the most potent building group in any one locality can be brought together by the one strong motive — *self-preservation*. Enlightened self-interest, realizing that this effort now is better than stagnation, will bring cooperation on a rational basis.

Local integration is possible through the formation of a housing body consisting of the leading local building interests, from architect to artisan. In some localities the nucleus of the group exists in the Building Congress, the Builders' Exchange or the Chamber of Commerce. Is it not possible to pool interests to the extent of all contributing their knowledge and their time on a pro rata basis? What the local real estate promoter cannot accomplish, the architect, the contractor, the engineer, the land owner, the realtor, the banker, the manufacturer may be able to bring about through the formation of a housing organization in which each has a proportionate financial as well as civic interest, a limited profit organization which will find national manufacturers ready to cooperate.

The first action might well be inaugurated by the local architectural organization combining with the builders, the bankers and realtors — a small group to be called together to consider the existing housing conditions and the possibility of creating a large-scale development to meet the ascertained needs. There is ample information available regarding the factors — social, economic and physical — that must be studied, and enough of a technique of investigation has been developed and made public to warrant such a procedure in every locality. If such movements were inaugurated in hundreds of localities and such cooperation begun, there is every reason to believe that national organization for cooperation would be a natural outgrowth. With several national organizations and associations now working toward an integrated industry, the immediate need seems to be for local groups working toward the same end on definite projects, and such projects are most logically *housing*.

RESEARCH AND RELIEF

FUNDS that have been collected in each city for the relief of unemployed architectural draftsmen should not be distributed as a dole. That would be demoralizing. But it has seemed difficult to find fitting work for these trained and experienced men. Obviously any work they undertake for which they receive relief funds must be for the common good and available to all, not for a particular architectural firm or a commercial enterprise. Research work in the field of architecture, analyzing the functions of buildings and methods and materials in relation to those functions, offers the opportunity of engaging these men in a constructive way. Coordinated direction and supervision, with a definite program, are necessary from the start. A headquarters can usually be obtained rent free and drafting tables or working spaces borrowed in various offices. A committee should be established by the local group of architects to prepare the research program, and "job captains" appointed with squads to work on each division of the program. The start made thus locally may well be the means of bringing into being an organized national body for the correlation and dissemination of research information which must be a factor in an effectively integrated industry.

Kenneth K Stowell

EDITOR

RECONDITIONING THE PRIVATE HOME

RESIDENCE OF LIVINGSTON SHORT

OYSTER BAY, LONG ISLAND, N. Y.

J. C. GURNEY, ARCHITECT

ARCHITECTS who once shied away from residence remodeling work are finding in this field of activity an opportunity greater than they had anticipated, from the standpoint of income as well as from the standpoint of architectural interest. The type of problem encountered in modernizing old buildings is usually an intricate one, containing many special conditions, puzzling structural and design difficulties, and calling for a kind of skill not often exercised in new construction. It is the opinion of many architects who have specialized in remodeling work that there is fully as much professional satisfaction in the final result of a modernizing job, well done, as there is completing a new building.

One factor which should encourage remodeling work at the present time is the readiness with which lending institutions will supply money for this type of work as opposed to the comparative reluctance displayed in financing new construction. The amounts required are usually smaller, of course, and the lending companies place a significant value upon the fact the home owner considers his property of sufficient permanent worth to spend the money for its complete reconditioning.

Those who doubt the importance of the residence modernizing market will be interested, and probably astounded, to know that the home construction division of Sears, Roebuck, Inc., is reported to have completed $12,000,000 worth of work in this field alone. Although this figure includes equipment replacements that are not strictly remodeling work, the volume of business is sufficiently large to indicate the extent of the field. Much of their work has been done in collaboration with architects who were attracted by their offer to finance remodeling work up to 75 per cent of the cost.

The residence illustrated here is typical of the projects now awaiting architectural attention, aided by convenient financing. Built in the early part of the eighteenth century, it had been remodeled once before its recent modernization. The owner, aware that it was structurally sound, and reluctant to spend the money necessary for a new house, decided to recondition. Investigation revealed, however, that to obtain the result he desired, the ground would have to be re-land-

Smedley Photos, Courtesy, Sears, Roebuck, Inc.

Richard Averill Smith Photos

On the opposite page are "before" and "after" views which illustrate clearly the extent of the exterior alterations. Above is a view from the rear, and below the porch which overlooks Oyster Bay. The original house was stripped to its frame, the foundations reinforced, and the ground graded to eliminate the elevated porch. Two garages at the entrance to the estate were also reconditioned completely

scaped. When an estimate was submitted to him, it was three times the amount he had decided to spend; but since a five-year financing plan was offered, he accepted.

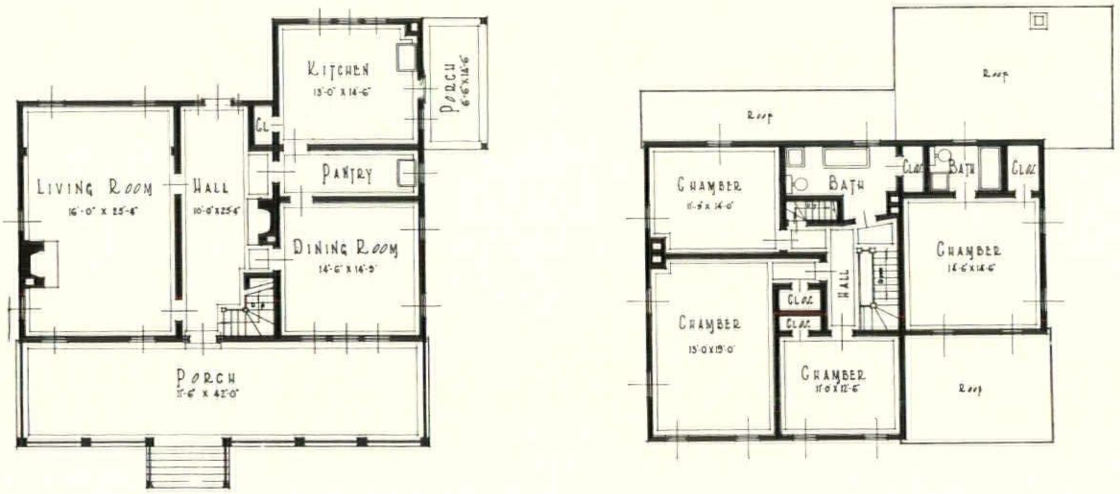
The total cost, which included rebuilding two small garages, constructing a sea wall, grading and landscaping, as well as rebuilding the house was $32,409.76. The itemized costs follow:

Permits, etc.	$44.00
Demolition	988.88
Spraying trees	55.00
Excavating	1,155.52
Sea wall	1,547.00
Masonry	3,122.52
Carpentry	10,708.14
Plumbing	3,814.04
Heating (including oil burner)	2,333.31
Electrical work (including fixtures)	2,969.22
Sheet metal	513.88
Lathing and plastering	1,316.62
Tilework	502.00
Painting and decorating	1,315.63
Grading and landscaping	2,024.00
Total	$32,409.76

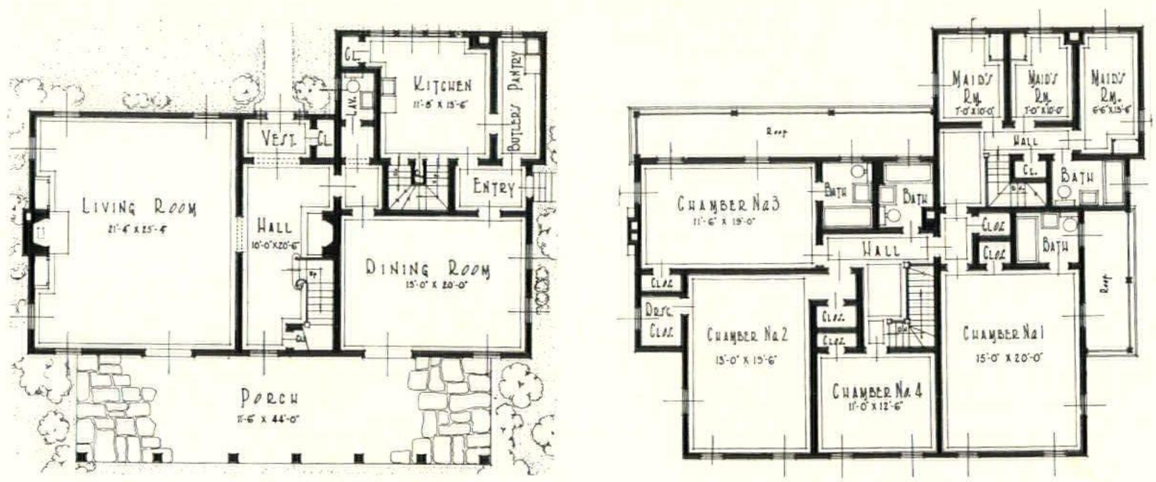
Although this operation was more extensive than the usual modernization job, the reason was that the owner demanded additional space and complete rehabilitation. A new porch, a new roof, heating, plumbing and electrical equipment might have been installed by a contractor, and the house would have been "modernized" in that it would have had "all modern conveniences." The owner, however, appreciated the value of complete re-designing and re-landscaping. This example offers substantiation to the claim that other residences now being remodeled by incompetent workmen might better be reconditioned with architectural guidance to insure satisfactory results.

Architects in small towns and suburban communities are in a fortunate position to capitalize the opportunity which lies in modernization work. An architect in Northern New Jersey whose successful practice in residence work had been curtailed during the present period of forced respite decided to investigate its possibilities. With each of the contractors and supply dealers in town he made arrangements to obtain the names of those home owners who were having repair work done. In return for the leads, he recommended the contractor or material man for whatever additional work he was able to convince the owner should be undertaken. Results were profitable to all.

One of the most serious difficulties encountered in work of this type is the inability of contractors to estimate properly the cost of the work involved. As an insurance against failure in this respect, it is advisable to insist upon a quantity survey rather than to depend upon the experienced guesswork of even an able man. It is good practice to provide quantity survey forms upon which estimates are to be made.



THE PLANS BEFORE ALTERATION



THE PLANS AFTER ALTERATION

THE HAVERFORD SCHOOL PLAN

W. POPE BARNEY, Architect, ROY W. BANWELL, Associate

BY

HAROLD DONALDSON EBERLEIN

THE complete reorganization of the Haverford School buildings at Haverford, Pa., affords an instructive instance of what can be accomplished by the adoption of a thoroughly considered scheme of new building and ground planning to replace a previous arrangement of long standing that was marked chiefly by its utterly casual, fortuitous character. Although the final realization of the new scheme involves the eventual abandonment and demolition of all the present school buildings, substantial and individually adequate as they are, and their replacement by wholly new structures, this sweeping alteration will not only effect an actual economy of ultimate expenditure but will also render the whole plant far more efficient. A beginning has already been made. One new unit of the future group has been finished and another is just being started.

When it became necessary several years ago to have a new athletics building, one of the most urgent problems confronting the school authorities was to get more playing fields. There were only two, and three more were necessary. Nearly all the land adjacent to the school property or, in fact, anywhere near it has long been devoted to residential purposes and is occupied by handsome estates which the owners have no desire to part with or to divide; every foot of land in the neighborhood is held at a very high figure, since Haverford is in the heart of the Philadelphia Main Line section and is an highly popular suburb. Besides the difficulty of acquiring more land, it would have been extremely inconvenient, both from administrative and utilitarian considerations, to have additional playing fields separated from the rest of the school property, by however small a distance.

Diagram "A" shows the entire arrangement of buildings and grounds as existing before a new comprehensive scheme was entertained and before the new athletics building was undertaken. The buildings are dotted about without any particular relation one to another, just as chance or whim

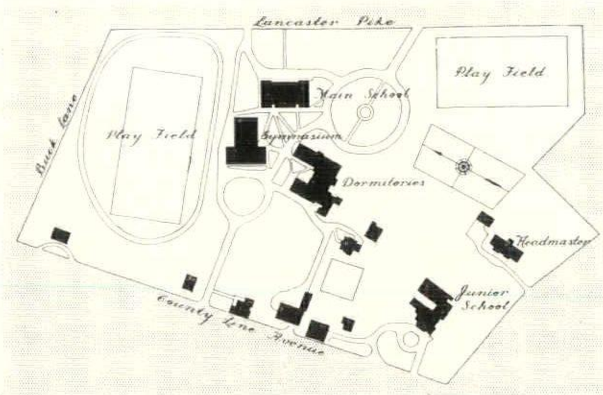


Diagram A. The arrangements of the buildings and grounds before the present comprehensive plan was instituted. The buildings are haphazardly arranged and the disorganization in relation to their usefulness is evident in wasted space

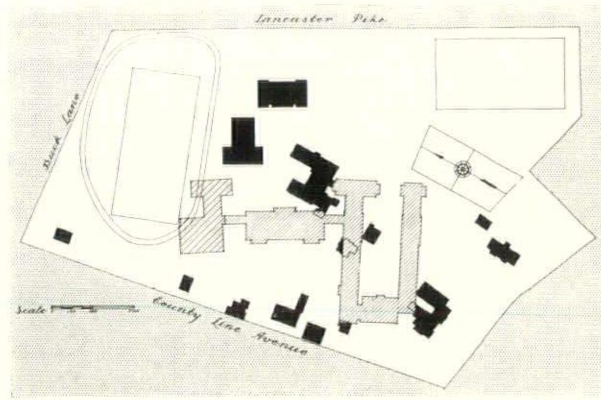


Diagram B. A composite scheme showing the block plan of the new building project superimposed on the old building arrangement. This plan made it possible to build without disturbing the usefulness of the existing structure

determined their position. The arrangement of the grounds is about as prodigal of space as could be imagined. The existing structures represented a varied architectural assortment that had not "even the virtue of being so poorly built that they might fall down and thus bless the owner with the necessity of replacing them." In actual value, however, they did not equal what it would cost to buy more land in the neighborhood for the three new playing fields, and these three new playing fields, were imperatively necessary.

While the definite site for the new athletics building was under discussion, the building committee, the architect and the landscape architect made an automobile survey of the leading schools of the East for one week and came back convinced of the wisdom of adopting a comprehensive scheme of reconstruction in which each unit of building would enhance, and be enhanced, by its neighboring units, while all together would combine to present a satisfying continuity of architectural impression. But æsthetic conviction in this respect was also strongly buttressed by purely material considerations. If the proposed athletics building were made part of a comprehensive scheme for the development of a future group of new buildings, to be placed at the side of the property farthest from the noise of the Lancaster Pike or Lincoln Highway, then the maximum use of the land already owned would be assured and the three new playing fields could be provided for without any further acquisition of land.

Diagram "B" shows how the new scheme was made to adjust itself to the preservation of the great white oak trees and to the eminently practical progressive evacuation of the old buildings as the new units are completed.

Diagram "C" shows the block plan of the proposed complete group. It also shows the three additional fields and the tennis courts gained without buying one foot more of land — gained merely by a process of sane rearrangement, by removing the many wasteful winding roads from the campus, and by concentrating vehicular approach to the entrance court and parking space.

By superimposing diagrams "B" and "C" successively upon Diagram "A," the feasibility of the new comprehensive scheme from the physical point of view, was demonstrated beyond all question. Simple arithmetic, land values and a look to the future fully justified the "dollars and cents" wisdom of making this drastic change. All the evidence was too conclusive to leave tenable any ground of objection by those who might at first be disposed to demur at a program of such fundamental reconstruction.

The first unit of the new group to be completed is the Lillie B. Ryan Memorial Athletics Building. This structure represents the consensus of opinion expressed by some two dozen head masters and athletic directors, in 1929, as to what they considered the ideal type of athletics building for a boys' preparatory school, where the largest percentage of attendance is made up of day scholars. The distribution of play court, gymnasium, squash courts, swimming pool and locker rooms, and the dimensions of these divisions are all carefully calculated for the number of pupils to be accommodated, without assigning any superfluous area or cubic space, though allowing generous provision free from any danger of crowding.

In the dimensions thus followed, calculation has been made for 225 students in the middle and upper schools and for 225 in the junior school; in

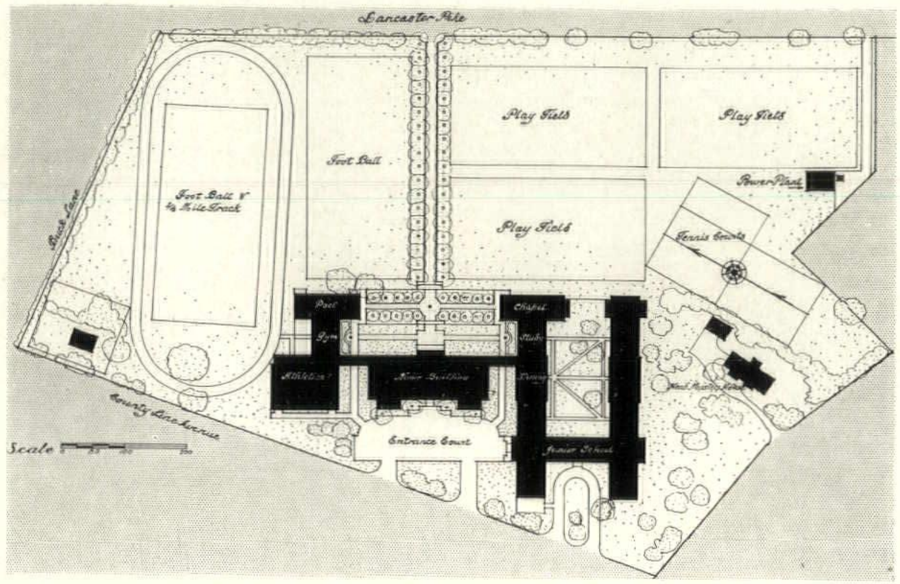


Diagram C. A plot plan of the new building project showing the space utilized for new playing fields, made possible by a provision within one structure for all the activities formerly housed in several buildings

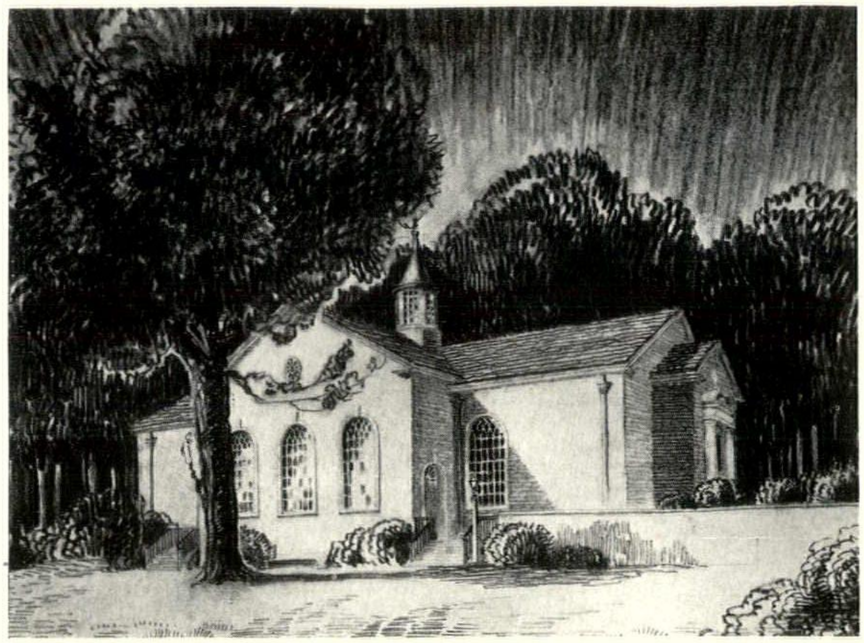
the latter case the boys use the building for the swimming pool only. In the play court, the dimensions were planned to admit of several practice games of basket ball at the same time. The total area covered is 22,500 sq. ft., with a cubage of 600,000 cu. ft. Inclusive of planting, but exclusive of fees, the cost was $170,000. The landscaping was arranged by Arthur F. Paul. The heating is supplied by the central plant and the chimneys that appear at the ends of the building perform the function of ventilating flues to carry off heated and used air.

Incidentally, the aspect of this building and its place as an important unit of the whole system directly challenges the statement so often met with that the athletics group or building cannot be made to balance or accord with other elements of the architectural ensemble and, therefore, had best be placed entirely outside the main composition. In other words, the sponsors of this defeatist theory are content to regard an athletics building as an unsightly but necessary evil which it is expedient to banish from sight as far as possible. In this instance, by a form which gives a maximum of light and air and is of economical construction, the building has become in effect a group of small-scale units, the two smaller of which can very well balance the library and auditorium units now on the point of erection.

The mode of architectural expression is fully in accord with the local tradition of Philadelphia which has always employed red brick as well as gray stone for the walls of country buildings. To have followed any other type and especially for conservative clients, belonging for the most part to the Society of Friends, would have been little short of an impertinence and would have given an exotic savor totally at variance with the spirit of the school. No apology is needed, of course, for adherence to a worthy and vital tradition, but in this connection it is just as well to forestall those captious persons who are always ready to complain that any deference to wonted usage is a gratuitous slap at the trend of the modern age, or those equally captious reactionaries who can conceive of nothing fitting for a school except collegiate Gothic.

The walls are built of Virginia bricks of a warm salmon pink and all the woodwork is painted white. One of the accents of the exterior is a limestone cartouche over the door, representing the Infant Hercules, sculptured by Walker Hancock. In restraining the customary exuberance of cartouches in general and in keeping the character of the composition in harmony with the plain character of the buildings the sculptor has been particularly successful. The other bit of exterior decoration is a sun dial, at the gable end, by Edith Emerson. In this the prevailing colors are tawny yellows and warm creams, picked out with gold. It is interesting to note that the spacing of the bars in the overdoor iron grilles was determined by the size of a baseball; they are just close enough together to prevent a ball going between them.

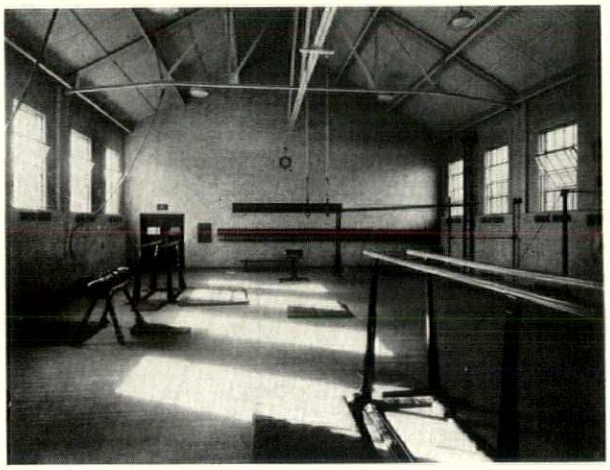
The plans and elevations of the new library and auditorium unit, just begun, speak for themselves, but the arrangement that permits the auditorium to be used for daily chapel exercises and, with equal facility, for occasional dramatic presentations is worth pointing out. Ordinarily, there is a curtain hung back of the head master's chair which makes a sufficient platform 8 ft. deep and 24 ft. wide. When a play is to be given this curtain is removed, making a stage 24 ft. deep and 24 ft.

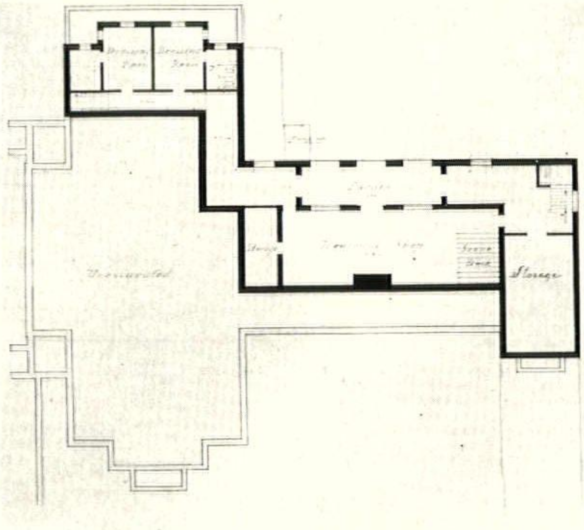


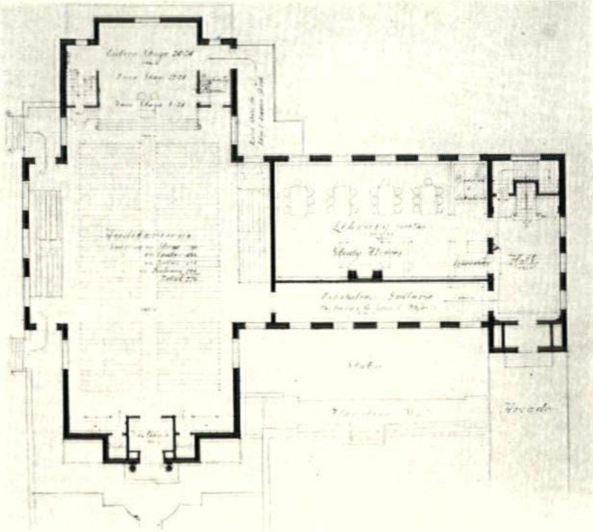
At the left is a perspective drawing of the auditorium and library building which will be the second unit in the proposed building plan. Directly below is the interior of the present gymnasium. On the following pages and at the bottom of the page are two floor plans of the auditorium

wide, with all the accessories for scenery and scene shifting. On both sides there are high openings to allow large pieces of scenery to be brought in easily, and at one side there is a ramp to facilitate the moving of scenery to the basement where there are dressing rooms, an adequate storage space for properties and a theatrical shop with a scene dock where the scenery can be stored.

The auditorium, with transepts and gallery, has a seating capacity of 776. A pleasant feature is that the ordinary approach to the auditorium for the boys is through an exhibition gallery where the exhibition of drawings, paintings, prints and other objects can be changed from time to time. Above this gallery are five study alcoves available for the masters and older boys doing special library work.







Rittase

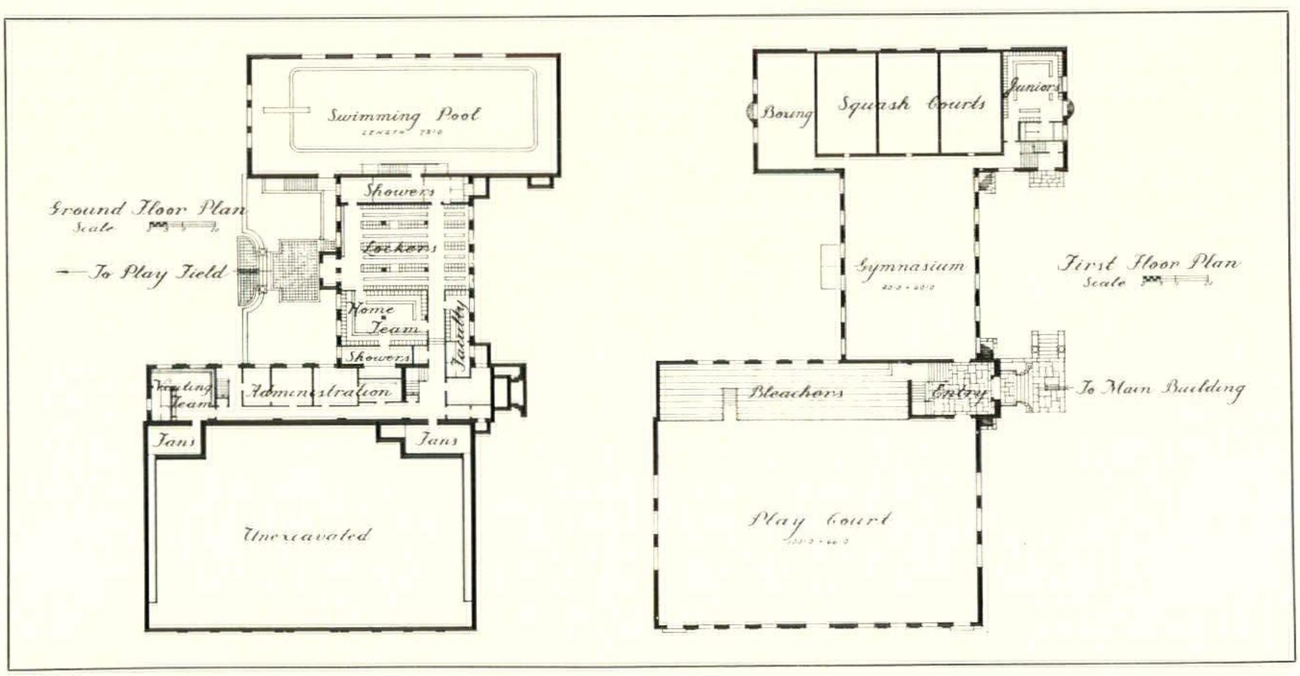
THE new athletics building for Haverford School is the first unit of the large structure that will replace the various scattered buildings which at present house the activities of the school. It has been carefully planned to provide every necessary facility for the athletic life of the school. In design it is a particularly interesting illustration of the harmony which may exist between a building of this type and others designed primarily for academic purposes

ATHLETICS BUILDING, HAVERFORD SCHOOL

HAVERFORD, PENNSYLVANIA

W. POPE BARNEY, ARCHITECT, ROY W. BANWELL, ASSOCIATE

Rittase



ATHLETICS BUILDING, HAVERFORD SCHOOL

HAVERFORD, PENNSYLVANIA

W. POPE BARNEY, ARCHITECT, ROY W. BANWELL, ASSOCIATE

Rittase

ATHLETICS BUILDING, HAVERFORD SCHOOL

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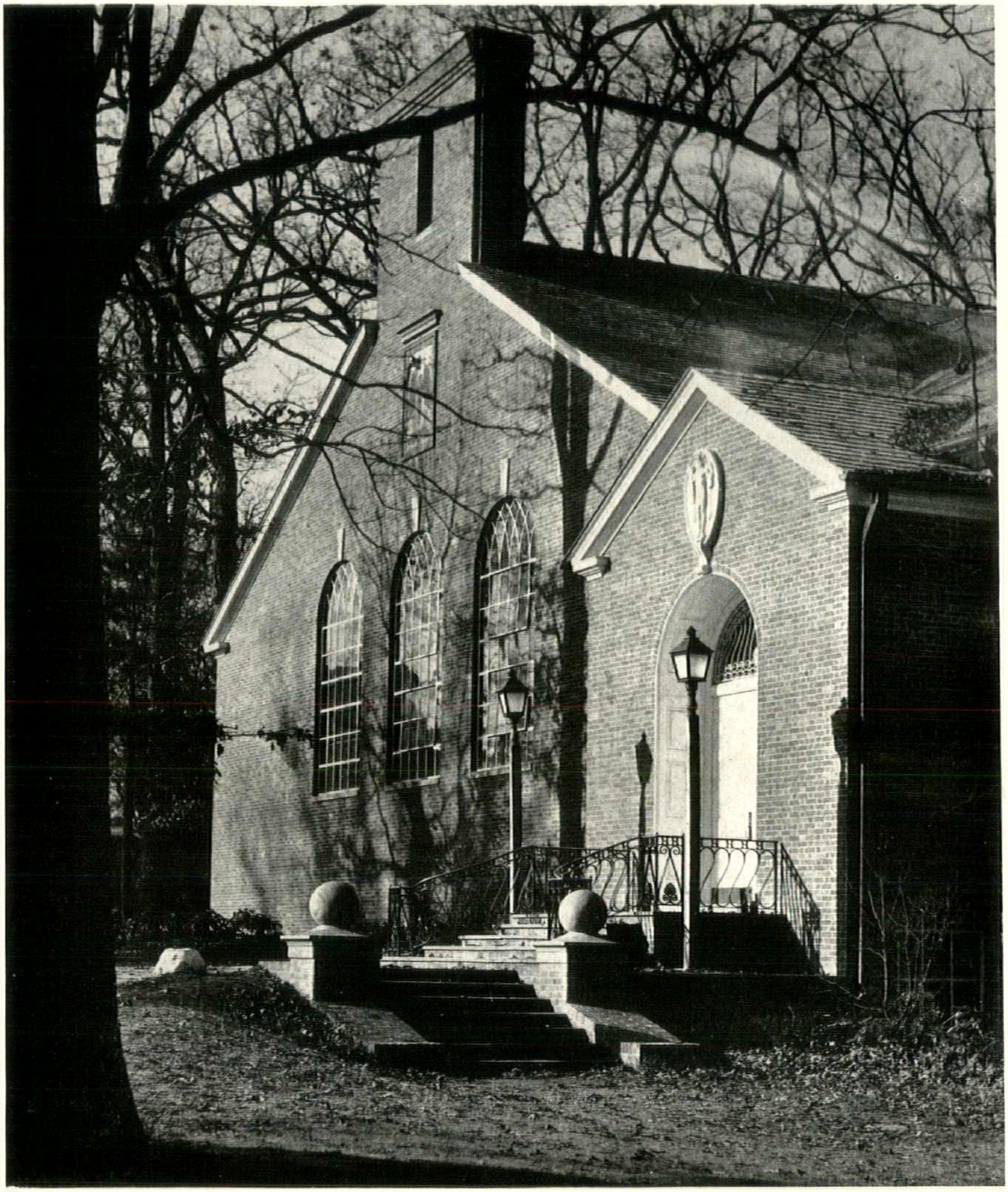

Rittase

ATHLETICS BUILDING, HAVERFORD SCHOOL

HAVERFORD, PENNSYLVANIA

W. POPE BARNEY, ARCHITECT, ROY W. BANWELL, ASSOCIATE

Nyholm & Lincoln

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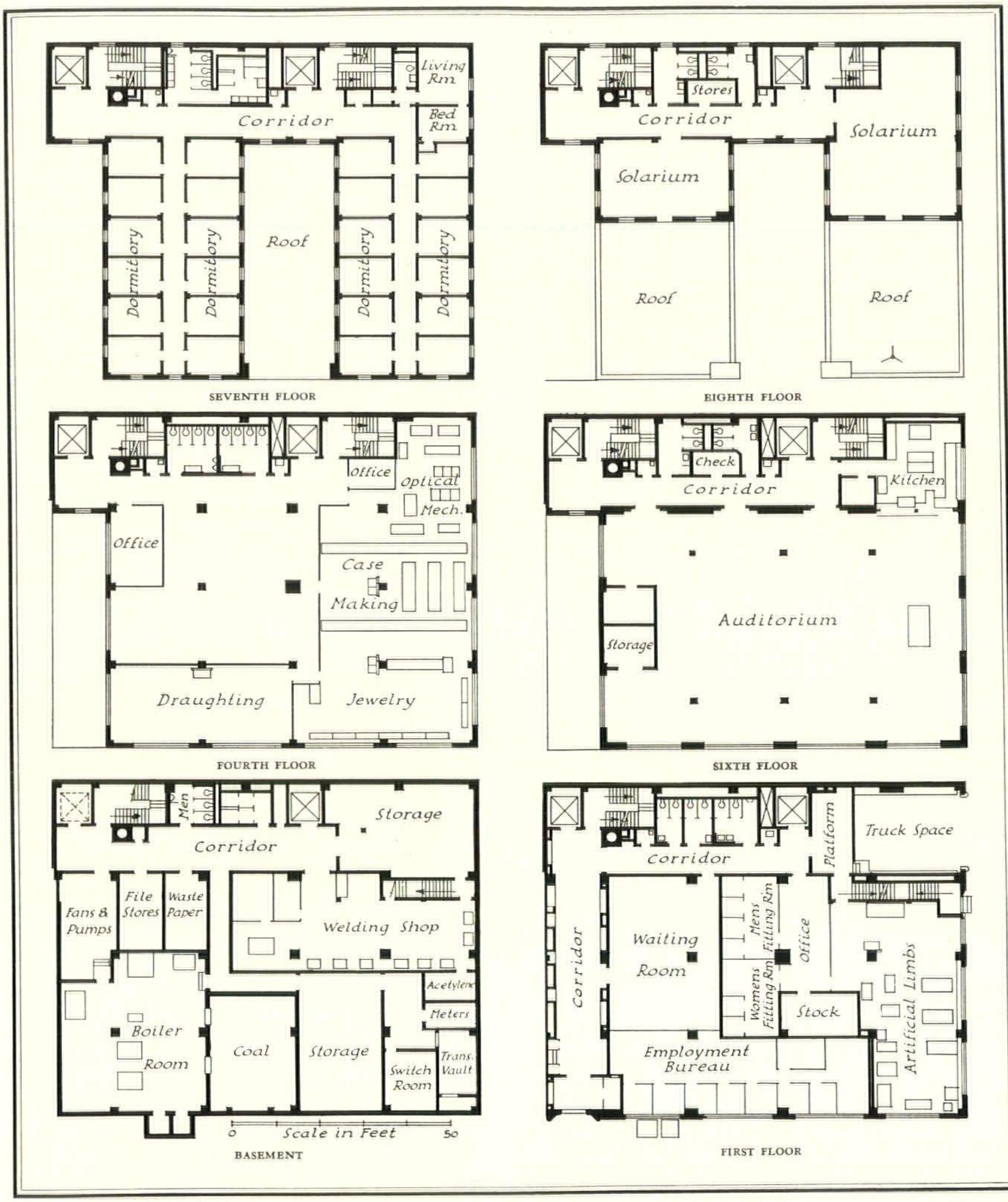

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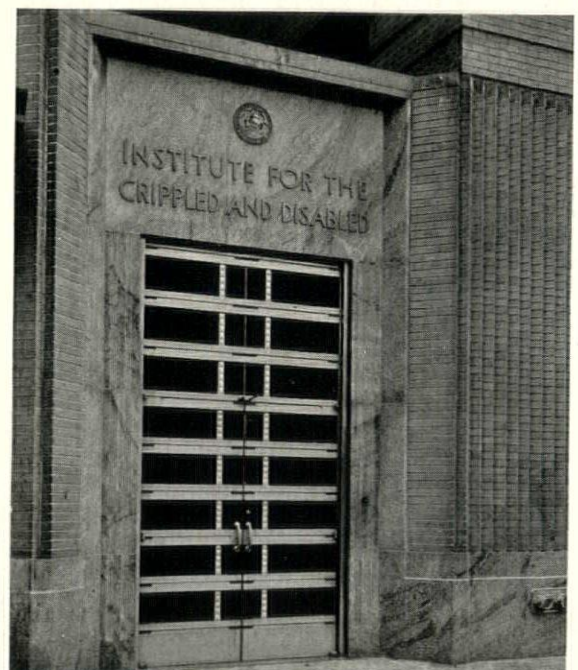
VOORHEES, GMELIN & WALKER, ARCHITECTS

Hiram Myers

THE exterior of the building is of brick in various shades of salmon pink. The absence of trim, except cast stone for the copings, was compensated for by varying the pattern. By laying the brick diagonally, the column facing up to the second floor is given the appearance of being fluted. The windows are of the pivoted steel sash type. The first floor corridor has walls of Rouge Altico marble, floor of terrazzo, and trim of Benedict nickel. The same metal is used for the entrance door at the right, and the trim around it is cast stone. The plaque is cast in bronze



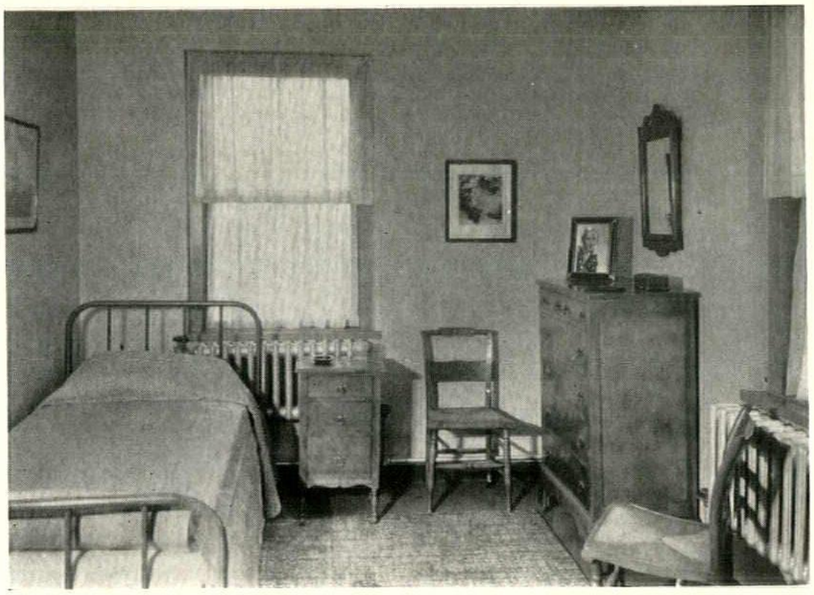
Nyholm & Lincoln

INSTITUTE FOR THE CRIPPLED AND DISABLED

NEW YORK, N. Y.

VOORHEES, GMELIN & WALKER, ARCHITECTS

Hiram Myers Photos



THE auditorium above, which is used for school assemblies, receptions, and as a cafeteria, is admirably sound treated with an acoustical tile ceiling. The floor is of a resilient composition tile, and the walls are painted plaster. A symbolic mural covers the motion picture and storage booth. At the left is a typical bedroom in the 24-room dormitory

INSTITUTE FOR THE CRIPPLED AND DISABLED

NEW YORK, N. Y.

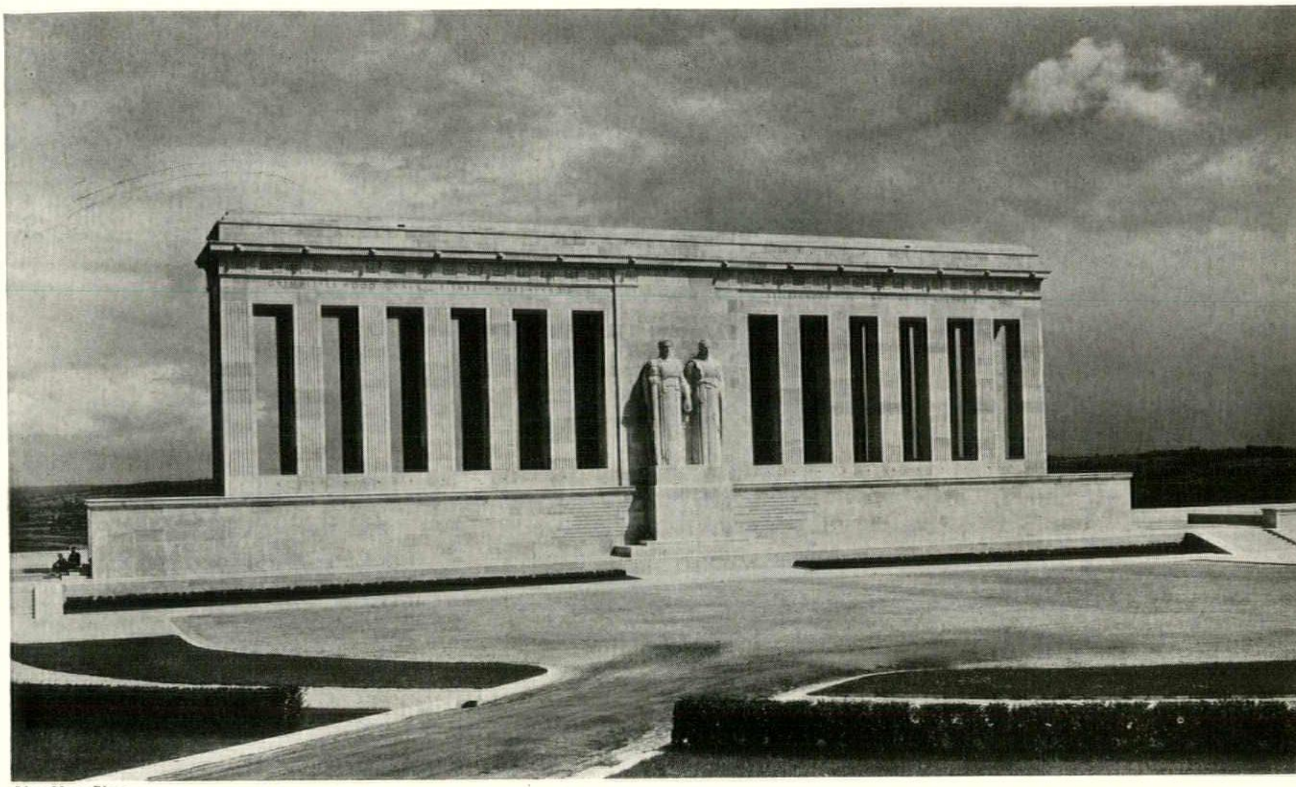
VOORHEES, GMELIN & WALKER, ARCHITECTS

Marc Vaux

AMERICAN BATTLE MONUMENTS

FRANCE AND BELGIUM

PAUL P. CRET, ARCHITECT



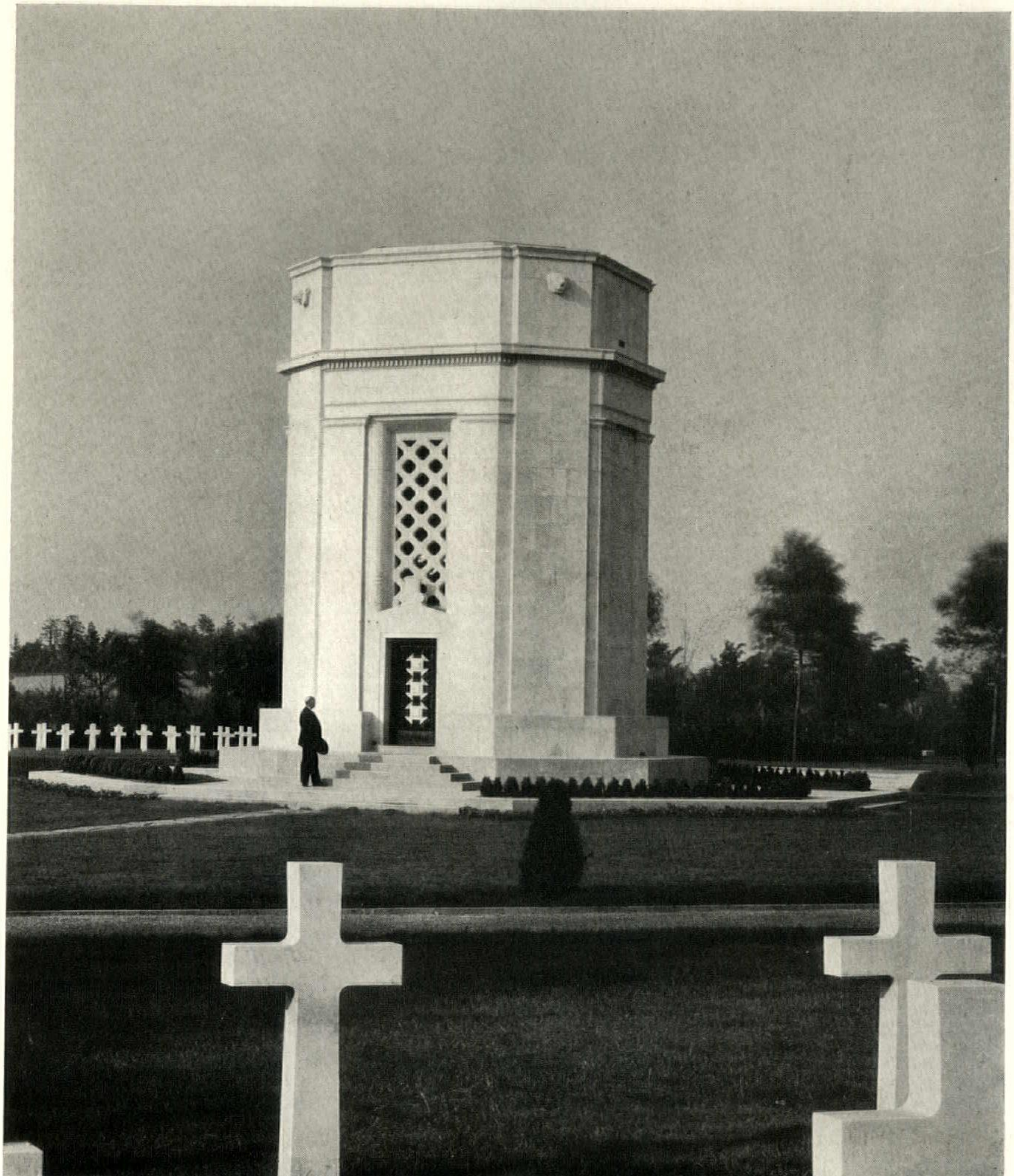
Marc Vaux Photos

THE two illustrations on this page are of the war memorial at Chateau Thierry, France, a detail of which is shown on the preceding page. The illustration on the opposite page is a chapel in the United States Cemetery at Waereghem, Belgium

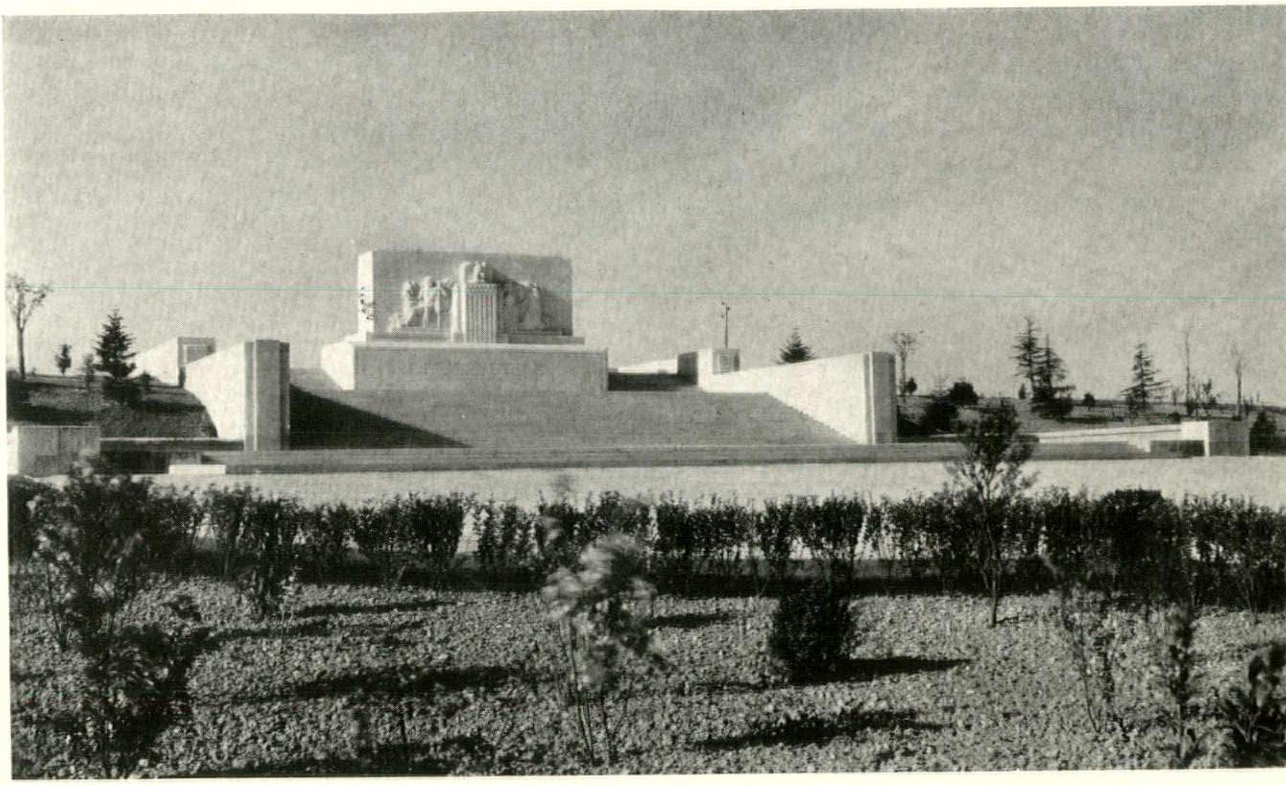
AMERICAN BATTLE MONUMENTS

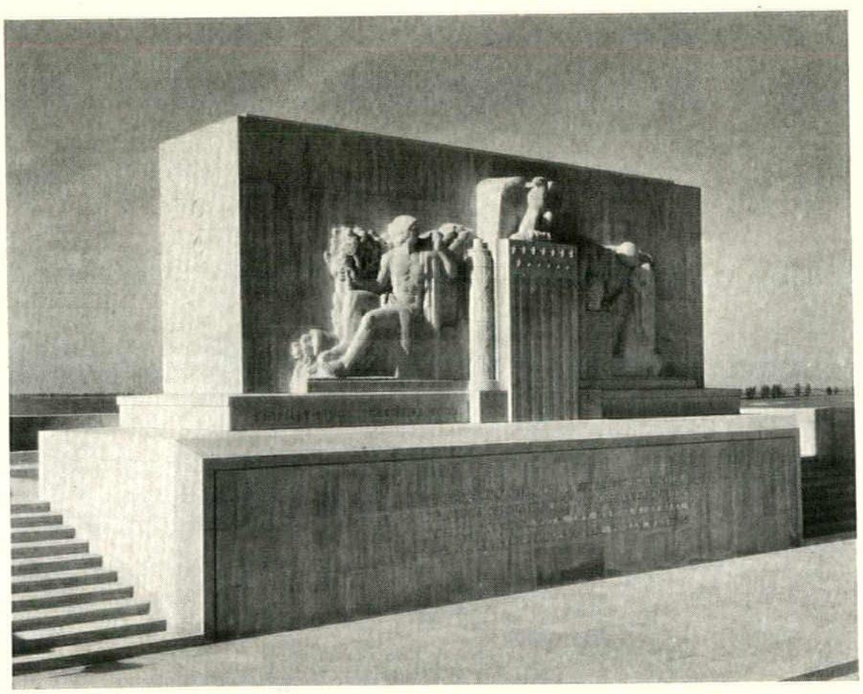
FRANCE AND BELGIUM

PAUL P. CRET, ARCHITECT



AMERICAN BATTLE MONUMENTS
FRANCE AND BELGIUM
PAUL P. CRET, ARCHITECT





TWO views of the American memorial near Bellicourt, France. The inscription reads, "Erected by the United States of America in commemoration of those American units which served with the British armies in France during the World War"

AMERICAN BATTLE MONUMENTS

FRANCE AND BELGIUM

PAUL P. CRET, ARCHITECT

THE FORUM OF SMALLER BUILDINGS

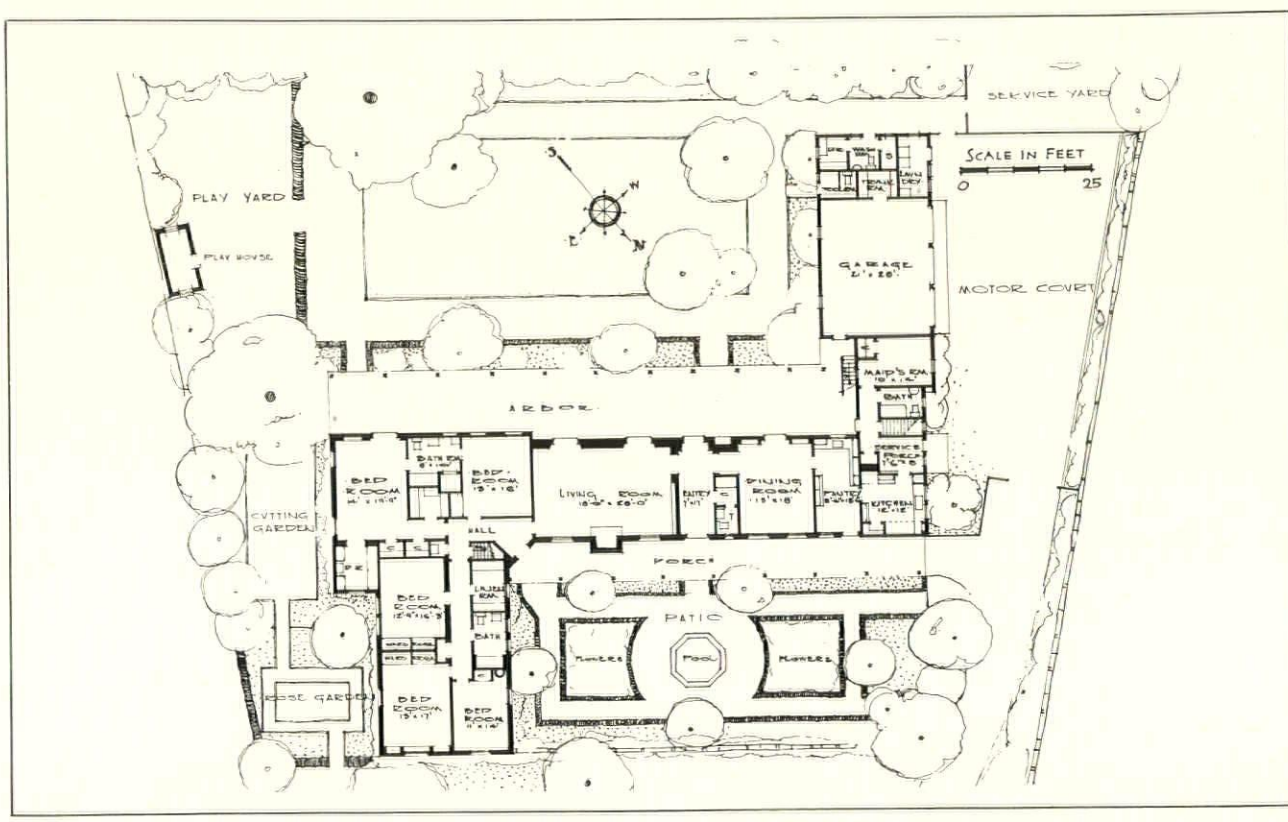
Haight

HOUSE OF PRESTON HOTCHKIS
SAN MARINO, CALIFORNIA

FOUR UNUSUAL SMALL HOUSES
ROLAND E. COATE, ARCHITECT

Practical Problems of Smaller Buildings will be found on page 519

Haight



HOUSE OF PRESTON HOTCHKIS

SAN MARINO, CALIFORNIA

ROLAND E. COATE, ARCHITECT

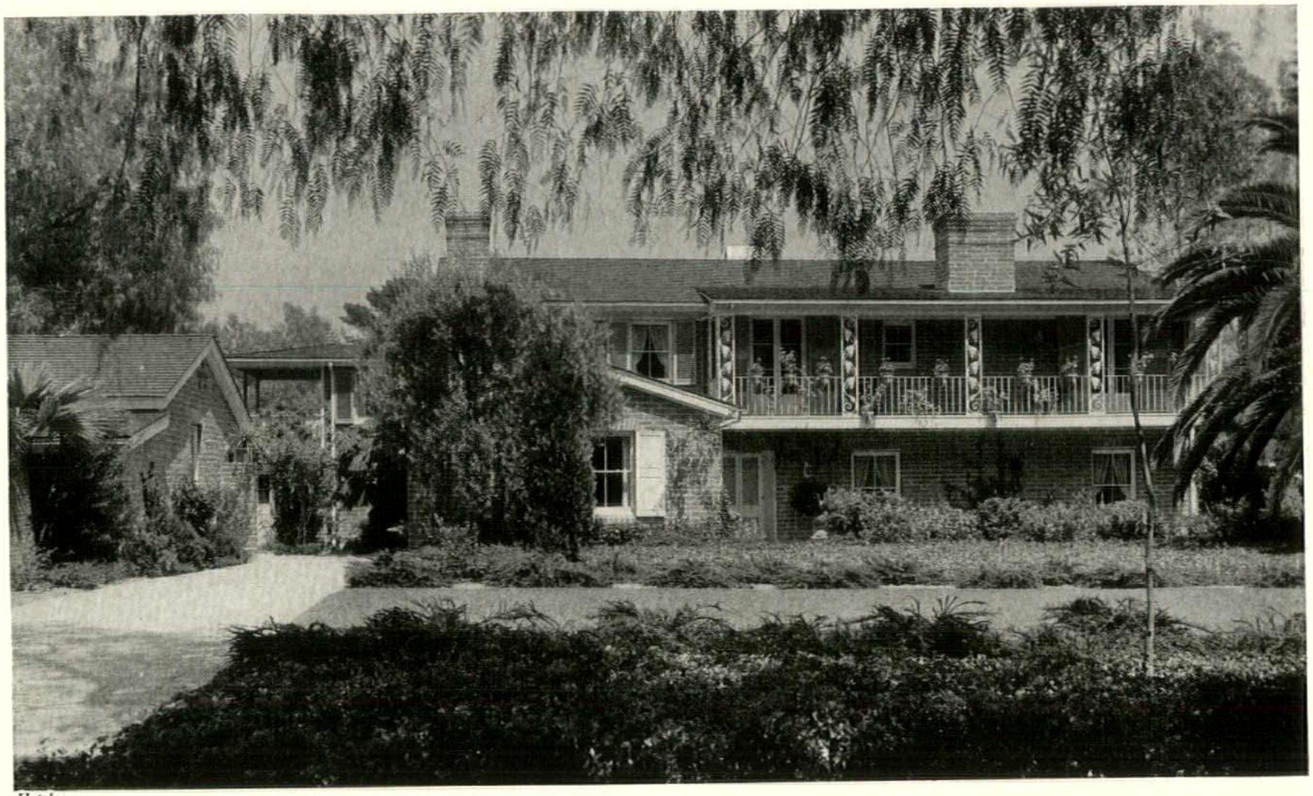
Haight

THESE four small houses have been chosen particularly to illustrate an important trend toward a less stylized and more rational residence design. Their location in California where the temperate weather permits much outdoor living has influenced the plans to some degree. The planning principles, however, are applicable to any climate or location. In no case has a consideration of style overbalanced the importance of use and the essential livability of the structure. An analysis of any of the houses will disclose an excellent organization of useful space with a definite separation of that space into living quarters and service areas. In each case also the plan has been disposed to take the greatest advantage of the most pleasant and beneficial exposures and has been related to the land with a system of pleasant porches, arbors or terraces. As a result, each house fits its landscape admirably and gives every outward indication of an interior which is physically comfortable as far as a particular use is concerned and pleasantly arranged in relation to its outdoor surroundings

HOUSE OF PRESTON HOTCHKIS

SAN MARINO, CALIFORNIA

ROLAND E. COATE, ARCHITECT



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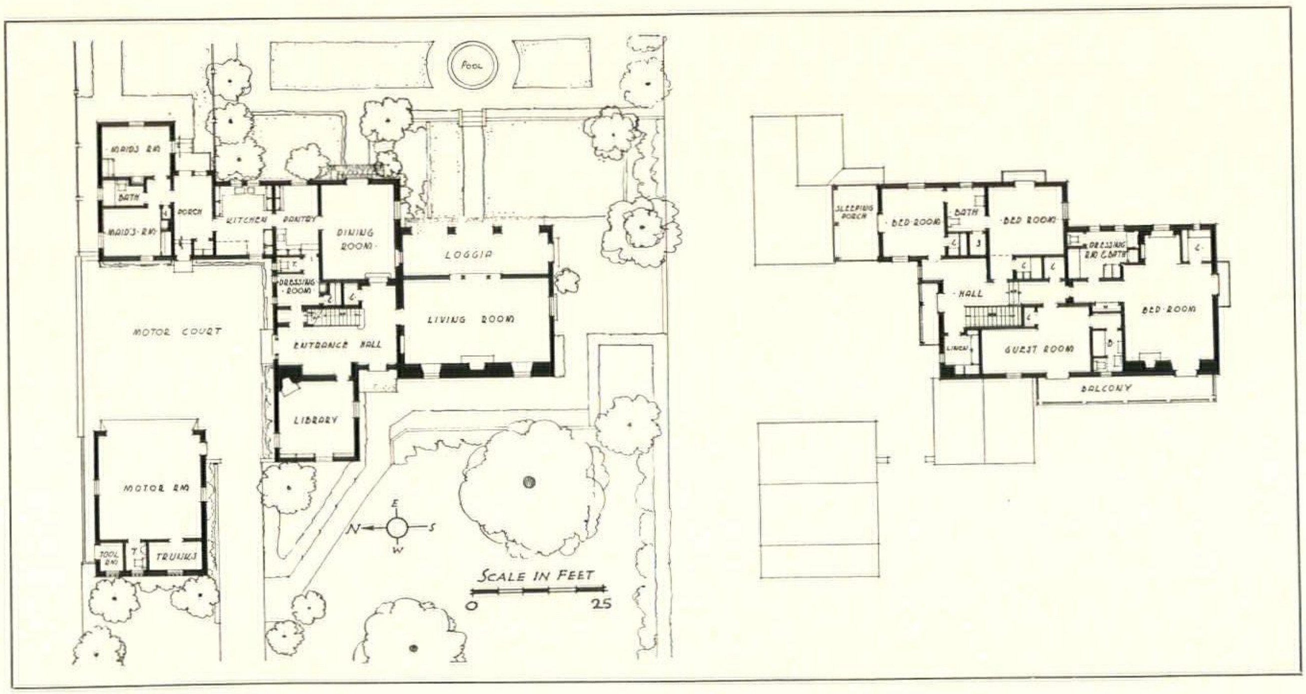


HOUSE OF WILLIAM B. HART

PASADENA, CALIFORNIA

ROLAND E. COATE, ARCHITECT

Haight

HOUSE OF WILLIAM B. HART

PASADENA, CALIFORNIA

ROLAND E. COATE, ARCHITECT

Haight

THE plan of this house, which was completed in 1929, is more like that of an English house than any of the others illustrated in this issue. The development of it, however, shows a pleasant informality consistent with its location and outlook. The house is built of brick veneer over a wooden frame. The bricks are unusually large and are colored a strong red. The trim and shutters are painted white and the roof is covered with shingles stained coffee brown. The balcony ornament, shown in the illustration on page 480, is painted cast iron. The structure is insulated on the underside of the roof and heated with a hot air plant

HOUSE OF WILLIAM B. HART

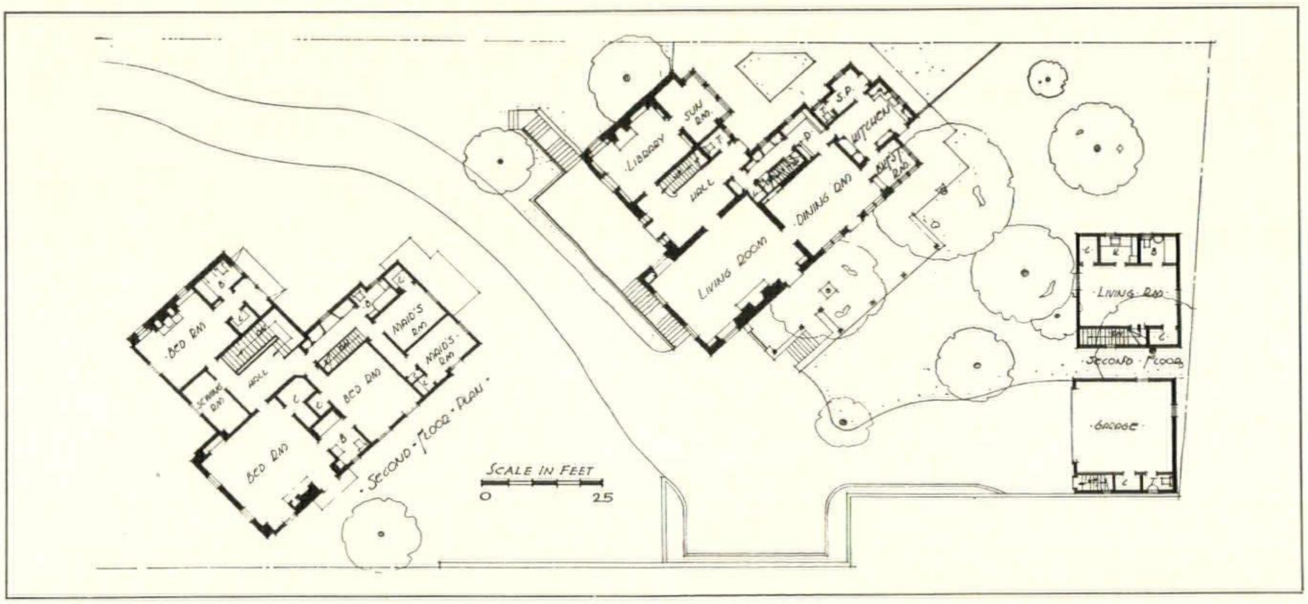
PASADENA, CALIFORNIA

ROLAND E. COATE, ARCHITECT

Haight

HOUSE OF IRA L. BRYNER
PASADENA, CALIFORNIA
ROLAND E. COATE, ARCHITECT

Haight



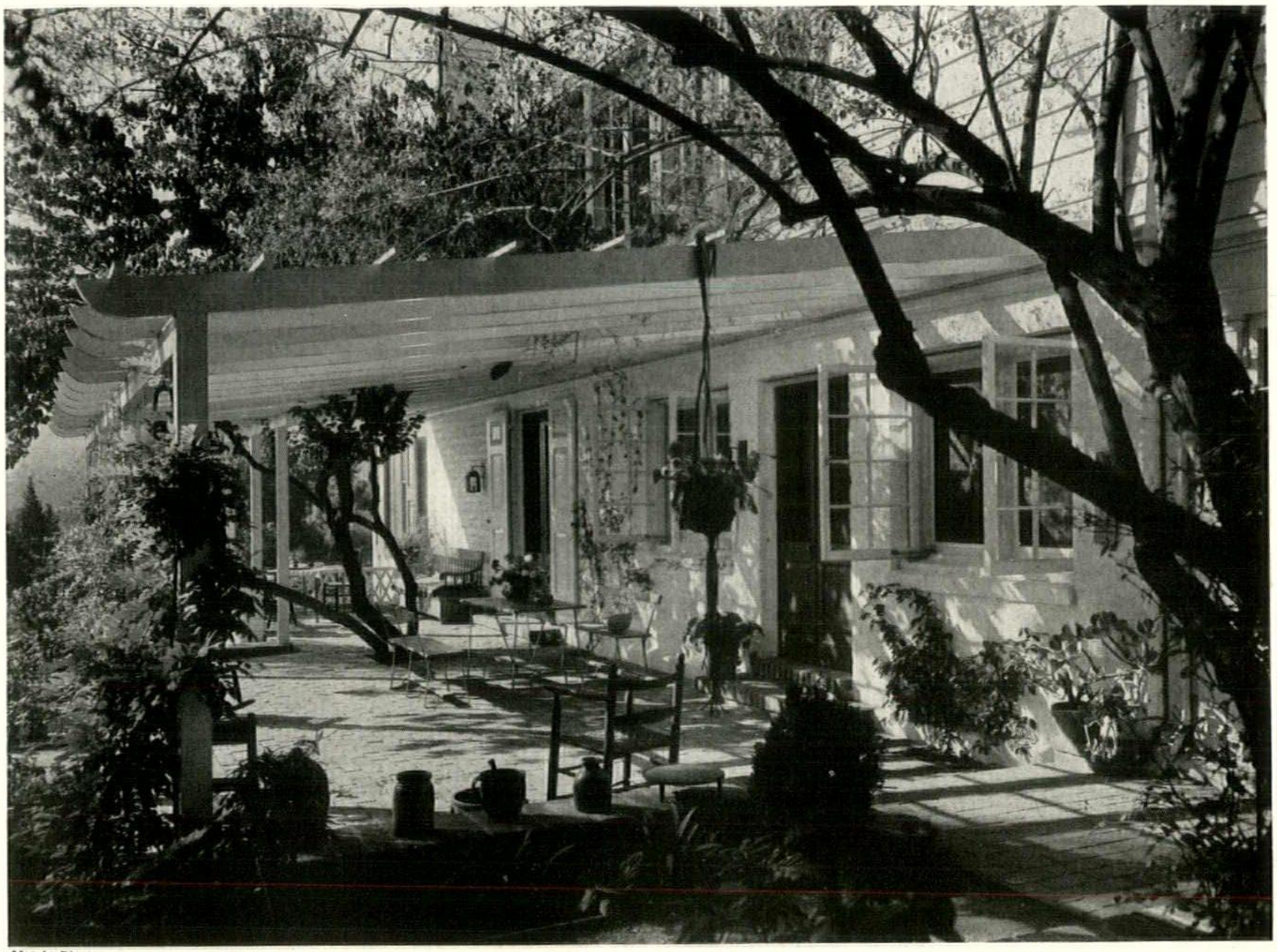
HOUSE OF IRA L. BRYNER

PASADENA, CALIFORNIA

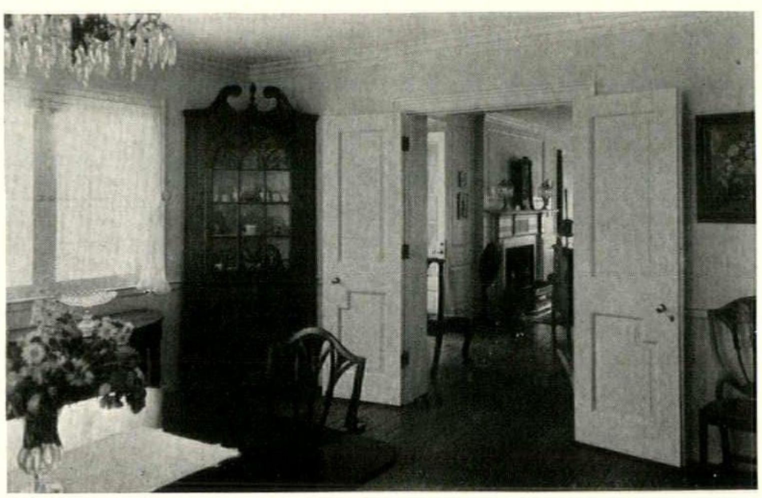
ROLAND E. COATE, ARCHITECT

Haight

HOUSE OF IRA L. BRYNER
PASADENA, CALIFORNIA
ROLAND E. COATE, ARCHITECT



Haight Photos



THE living and dining rooms of this house, which is situated on the crest of a hill, overlook a deep valley. The plan takes every advantage of the situation and has been developed with a quiet adaptation of the Colonial. The construction is of brick veneer over a wooden frame. The brick walls are whitewashed. The shutters are painted dark green and the roof shingles are stained brown. The illustration above is a view of the terrace off the living and dining rooms. At the left is a picture of the dining room looking toward the living room

HOUSE OF IRA L. BRYNER

PASADENA, CALIFORNIA

ROLAND E. COATE, ARCHITECT

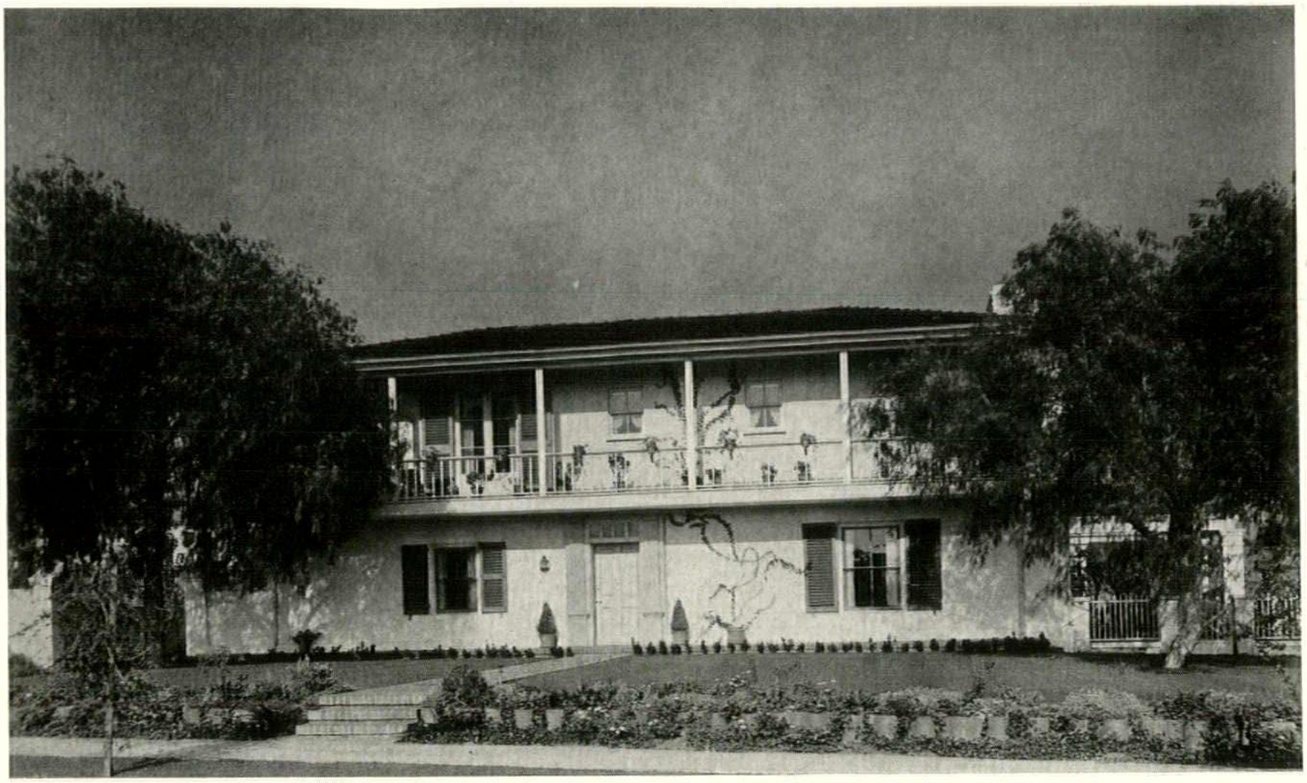
Haight

THE NORTH TERRACE

HOUSE OF FRANK HICKMAN

LOS ANGELES, CALIFORNIA

ROLAND E. COATE, ARCHITECT



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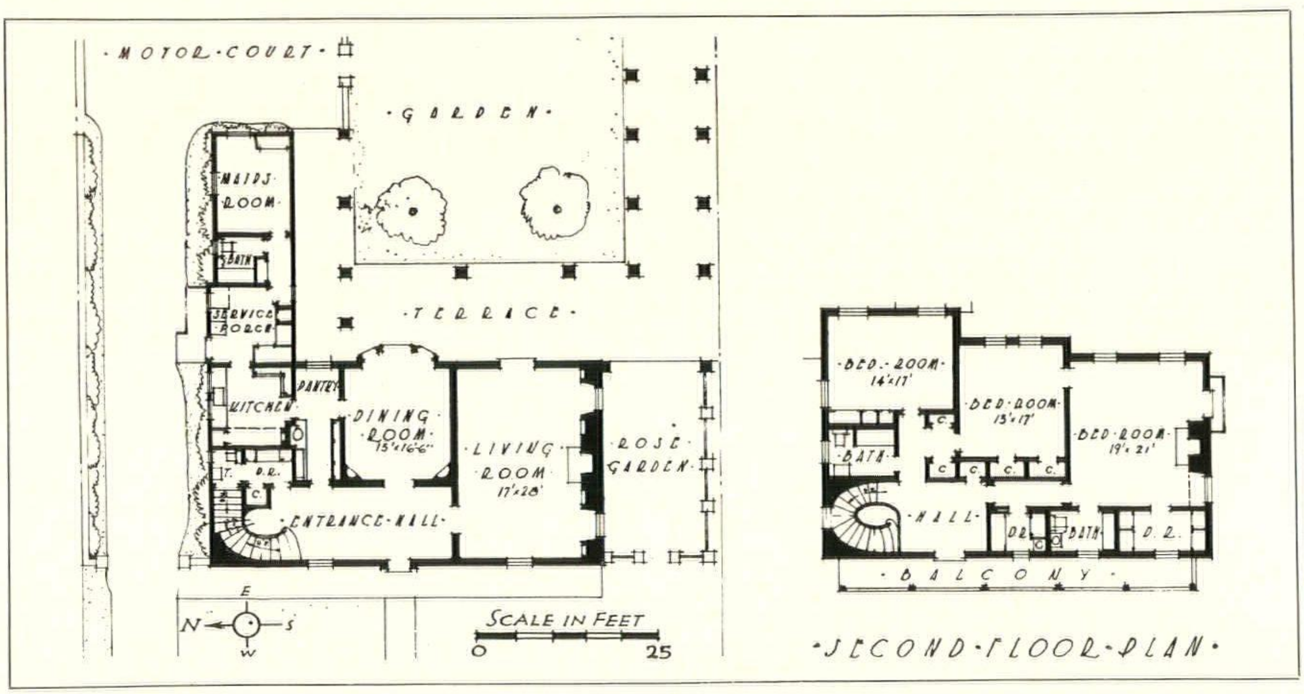


HOUSE OF FRANK HICKMAN

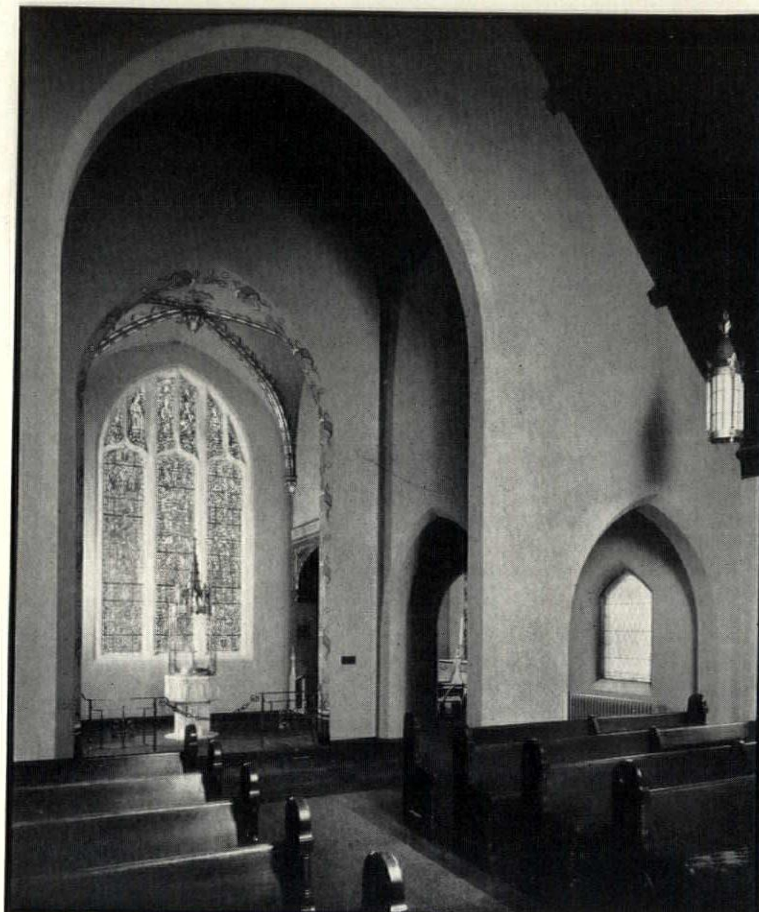
LOS ANGELES, CALIFORNIA

ROLAND E. COATE, ARCHITECT

A COLLABORATIVE ALTERATION

BY TALBOT F. HAMLIN

IT IS perhaps unnecessary to point specifically to the many architectural opportunities that may be developed in the alteration of existing structures. Not so easily recognized is the value of close coordination of architect, owner, decorator, and builder in accomplishing economical work of a high aesthetic order. The alteration of St. John's Church is a particularly striking example of the results which may be obtained through the sympathetic collaboration of every individual involved. Warner & Mitchell were the architects, and though responsible for the general alteration program and design, many of the actual details were developed by Theodor Karl Muller who is associated with the Rambusch Decorating Company

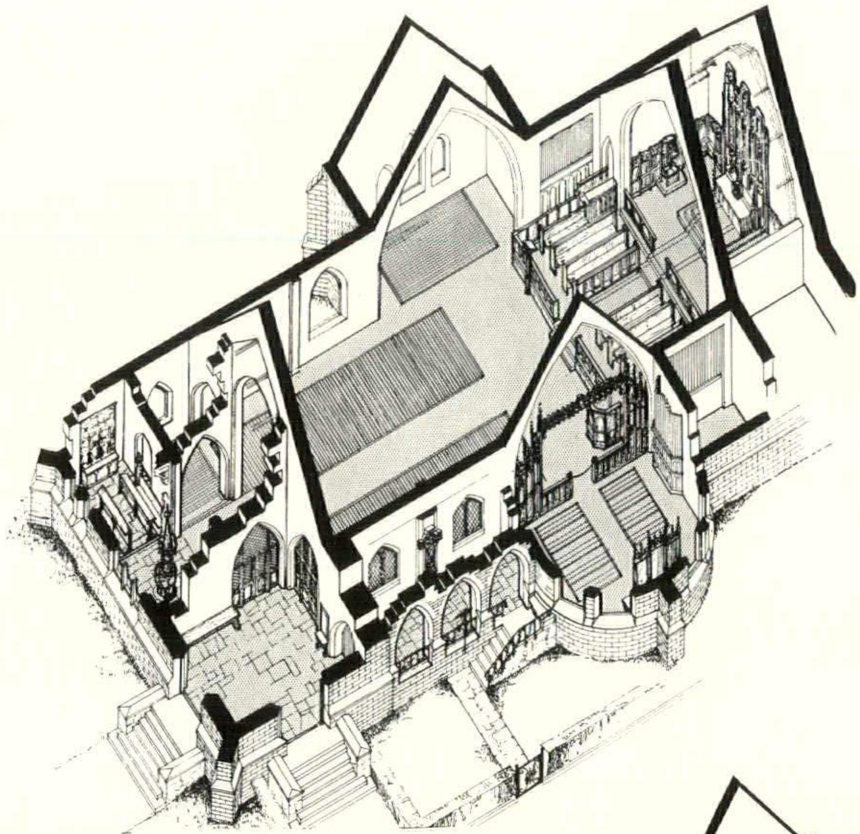


Nyholm & Lincoln

THE depression in architecture today is only a symptom of prevailing conditions; for every empty drawing board a client has been compelled to renounce, or at least to postpone, some dream. Yet alterations like this reveal almost endless possibilities. Think of the thousands of cluttered and inefficient churches that dot the country only waiting for some architect to remove the clutter and repair the stupidities of past accumulations! Here, even today, is a fertile field for development, and the experience of St. John's Church, Sharon, shows that even with a modest expenditure, entirely inadequate for any completely new structure, results satisfactory both practically and æsthetically can be achieved.

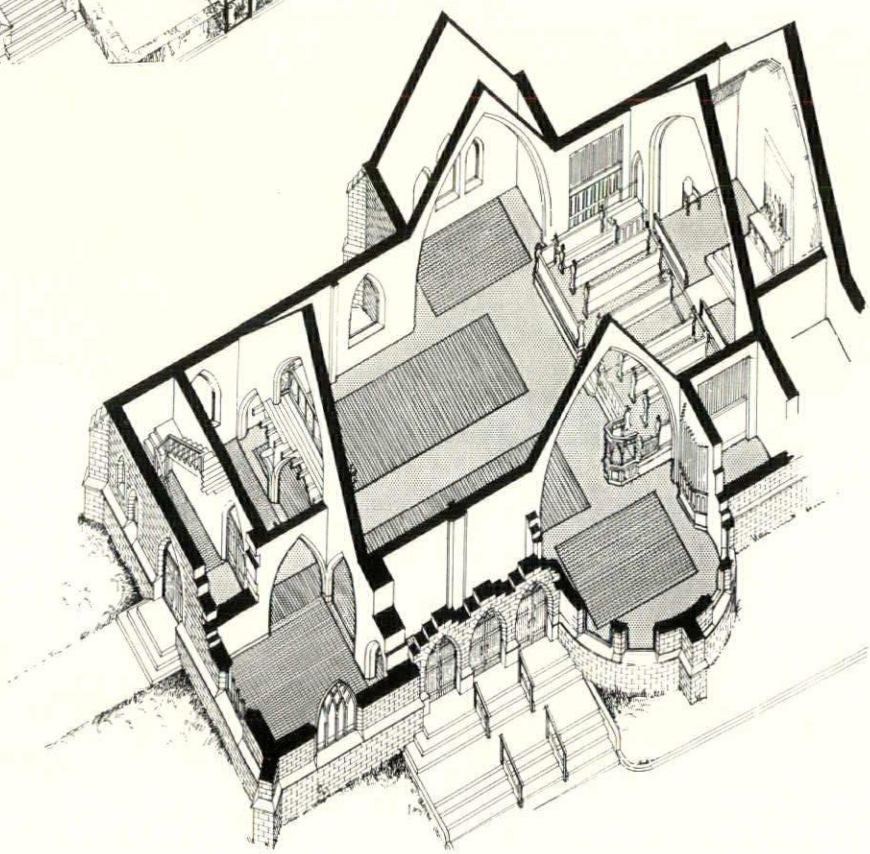
Two donations were available — one of $13,000 for a chapel dedicated to All Saints, and one of $35,000 for a baptistery, a children's chapel, and certain other miscellaneous work. In order to make these amounts go just as far as possible, it was necessary to prepare the most careful budget. With great foresight, the rector, the Reverend F. B. Atkinson, called in the architects, Warner & Mitchell, of Cleveland, and the decorators, the Rambusch Decorating Company, at the very beginning; and the budget was arrived at only after a preliminary study of the problem by all three and was the result of their combined judgment. In this way, the amounts that could be spent on each item were known in advance and the very utmost possible produced for this amount.

A study of the existing building showed that the entrance arrangements were illogical and wasteful, that the transept was neither beautiful nor particularly useful, and that the gallery was too small to justify its existence. Fortunately, the sanctuary required no change; and, with the removal of the old gallery, entirely unsuspected beauties of pro-



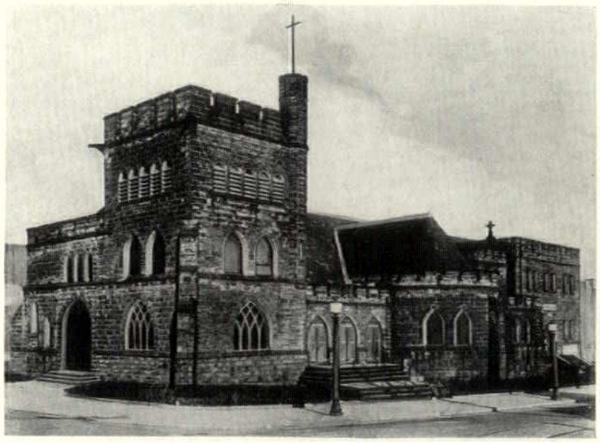
AFTER

THIS isometric shows the alterations which were made in the plan below. The removal of the old side doors created an inviting cloister, transformed the old baptistery into an entrance vestibule and eliminated the confusion which had existed. The removal of the gallery added much to the interior appearance of the church and gave space for the children's chapel opening directly off the new baptistery which was placed on the main axis of the nave. The inclusion of a chapel screen added much to both practicability and appearance of the chapel



BEFORE

AN ISOMETRIC of the church before the alterations were made. Almost every one knows this type of Victorian structure planned by rules rather than from the influence of a logical analysis. The entrance arrangements here are particularly wasteful of space. Especially is this true of the triple entrance near the chapel which appears entirely out of proportion to the purpose which it serves and creates an intolerable congestion in the corner room formerly used as the baptistery



A general view of St. John's Church before any alteration had been attempted

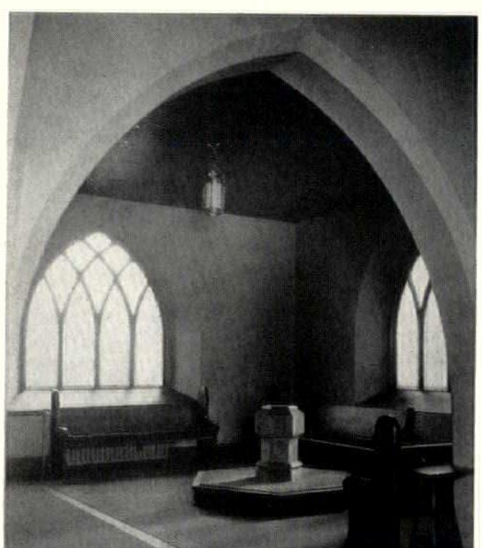
A similar view of the church after alteration. Notice particularly the changed entrances

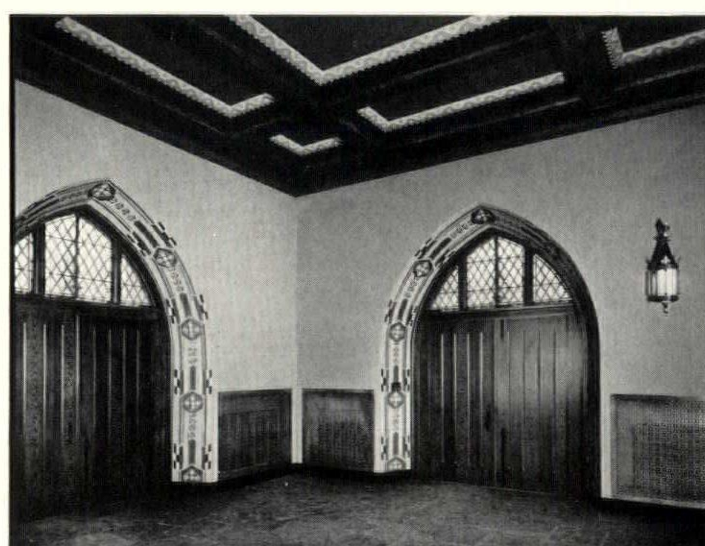
portion appeared and a most interesting note of dignified and simple height was brought into the once stuffy interior.

The old transept, with its apsidal end, was admirably fitted for use as the chapel, and could serve also as a place for overflow congregations at particularly important services by merely turning the pews to face the church (their original position), from their new position facing the chapel altar. As this arrangement necessitated no structural alterations, the entire amount of the chapel donation could be devoted to the furniture and decoration. It was apportioned among the oak screen, new stained glass windows, the altar, reredos, mural painting and miscellaneous decoration.

The stepped outline of the entrance screen and the tall form of the reredos both increased the apparent height of the chapel and at the same time helped in setting an intimate, yet impressive, scale. Richness of form and carving was used with discretion but the whole was enlivened with rich polychromy, based on a scheme that leads from the dark toned stained glass windows up to the sharp and definite colors of the triptych painting over the altar. The general color tones of the painting on the old cornice and the inscription below it are the typical Gothic red and blue.

The basis of the chapel iconography is the his-





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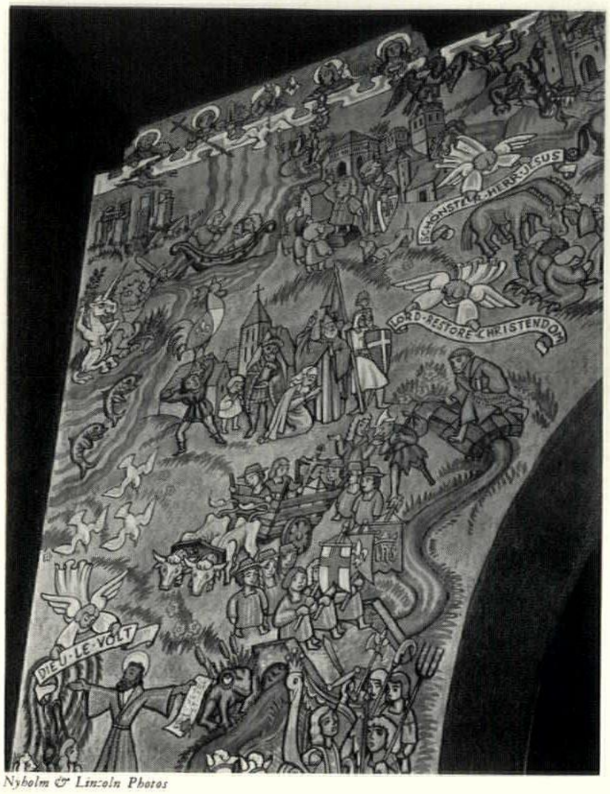
Two views of the present entrance vestibule. At the left is the space before alteration when it was used as a baptistery. The illustration at the right shows the doors which were installed in place of the windows and the new ceiling which is decorated in tan, blue and white

Nyholm & Lincoln

The children's chapel off the baptistery was created in the space formerly occupied by the stairway to the old gallery. Every detail has been executed in a "child's scale," even to the altar candlesticks. The general color scheme is a light gray tan with the exception of the mural. The woodwork has been acid stained to a silver gray tone, harmonizing with the white metal fixtures and the blue and white dossal



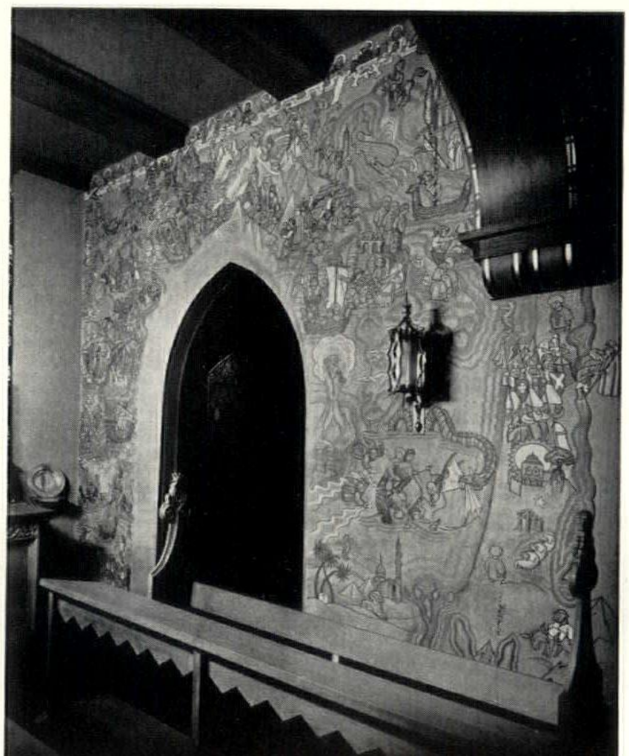
Nyholm & Lincoln Photos

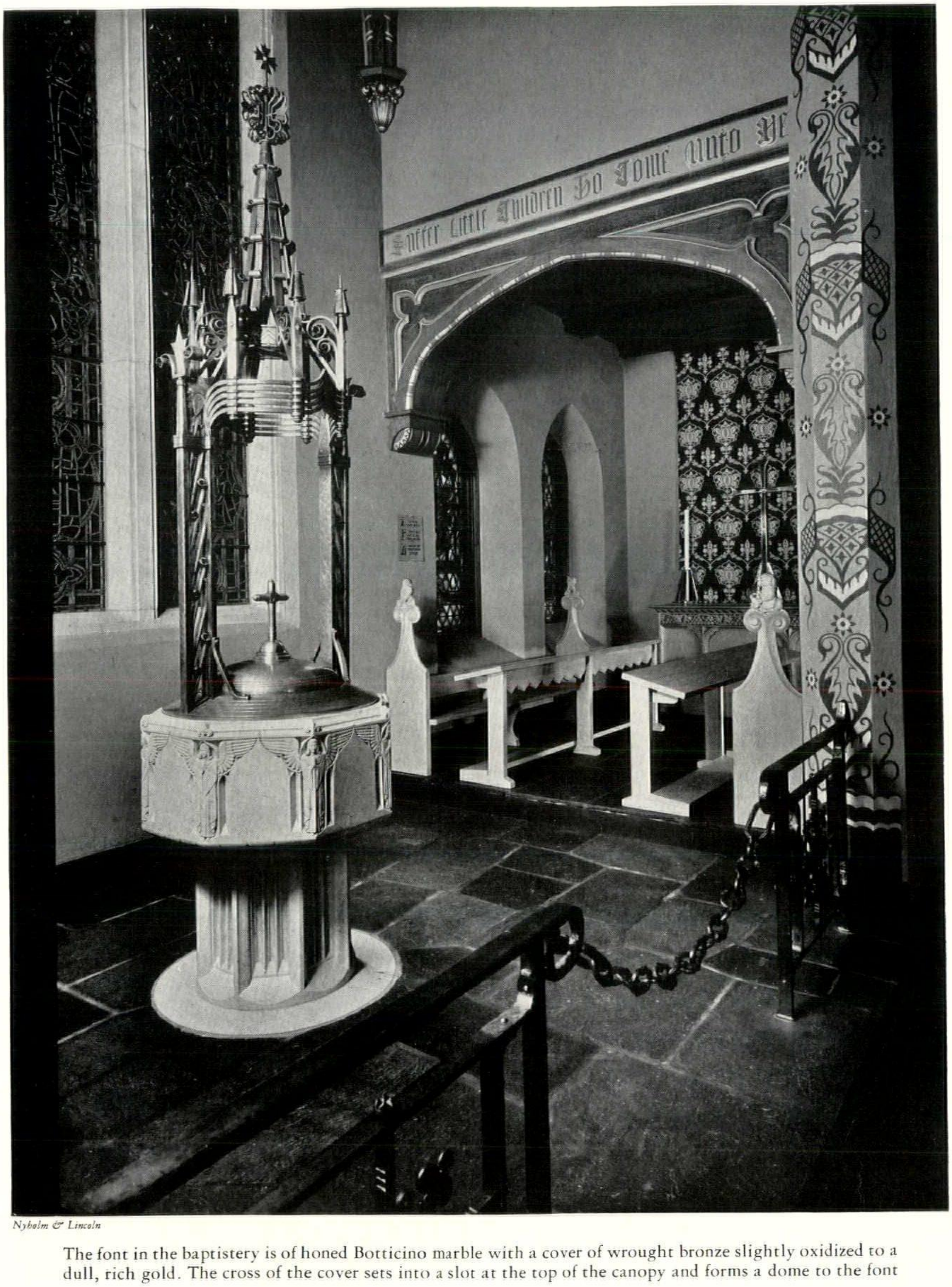
The mural in the children's chapel serves two purposes. It is not only a successful piece of decoration but serves also as a child's visual text-book on Christian history. It has been executed simply in red, white and blue, with outlines of sepia. The background is sand-finish plaster of a light parchment color

tory of the church as well as of All Saints, to whom the chapel is dedicated. The triptych painting itself is naturally devoted to the saints worshiping Our Lord in glory. In addition, the shield over the structure, applied to enrich the old cornice, tells the story of the descent of the parish from its original source.

The problems at the entrance end of the church were more complicated, due to the necessary structural alterations. The contract for them was let on the basis of an upset price of $14,275, with savings below that divided so that 40 per cent should go to the contractor and 60 per cent to the church. Enough was gained by this arrangement not only to allow the entire church to be repainted but also to enable the church to turn back to the donor $200. This general contract sum left a balance of some $20,000 for furniture, decoration and metal work, which was carefully budgeted to cover the various elements, as in the case of the chapel.

The change in the entrance plan and the elimination of the gallery furnished a tall, dignified space, which is emphasized by the insertion of a large traceried window on the axis of the church. This was kept light enough to throw a pleasantly subdued glow far down the nave and yet rich and dark





Nyholm & Lincoln

The font in the baptistery is of honed Botticino marble with a cover of wrought bronze slightly oxidized to a dull, rich gold. The cross of the cover sets into a slot at the top of the canopy and forms a dome to the font

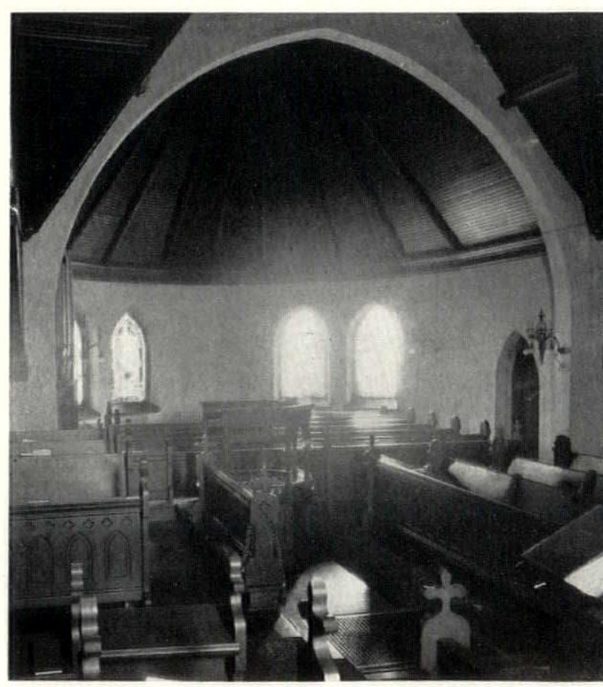
Nyholm & Lincoln

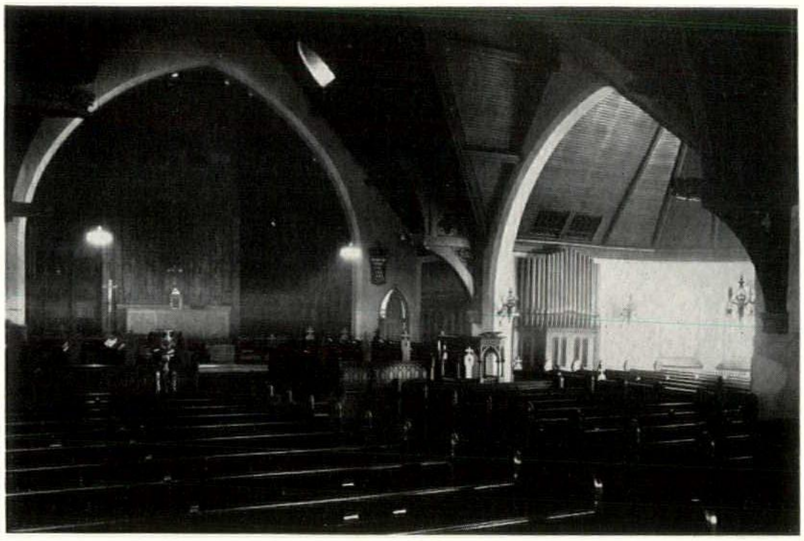
enough to act as a background, almost a reredos, for the font and font cover. The design of this font cover developed naturally from its position; it had to be important enough for its location on the main axis of the church and yet light and delicate so as to obscure as little as possible the richness of the window.

The space made available by the removal of the gallery stairs was ideal for the children's chapel — small, intimate, slightly removed from, and yet definitely a part of, the entire body of the church. The most has been made of its tiny area by a frank acceptance of "child scale"; and even the altar, although its height was necessarily normal, was kept as small as possible in order not to dwarf its surroundings. The same "child scale" had dictated both the iconography and the treatment of the decoration, so that there is a continuous appeal to children's imaginations, and yet a perfectly artistic consistency. The two little windows bear the figures of two children favorites: one, St. Christopher, for the boys, and the other, St. Jeanne d'Arc, for the girls. In treatment they are simpler, more pictorial and lighter in tone than the other windows of the church, in order to tell their story more directly.

The mural representing the Children's Crusade is in many ways the most distinguished element in the entire ensemble. The general framework is a map over which the children struggle, insistent,

The illustration above shows the chapel after the alterations were completed. Both the practical and æsthetic effectiveness of the open screen is obvious from a comparison with the old interior shown below



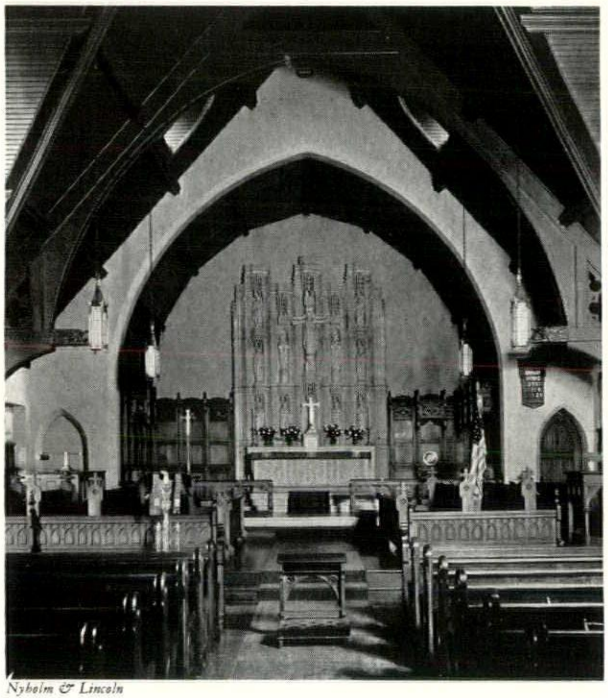


Two general views of the interior. The one at the left shows the church before alterations were begun. Below is a view of the sanctuary. This portion of the church required no change for in 1919 an altar, reredos and wainscot had been installed from the designs of Cram & Ferguson, architects

intense, hopeful — to end in the tragedy of shipwreck and slave market. The great merit of this is that it is done with perfect sincerity, with the outspoken directness of a child. The mixture of humor and pathos is simple, childlike. There is not a trace of sentimentality. Even the outward simplicity of technique — largely a matter of pure outline, with touches almost diagrammatic of flat colors — seems neither archaistic nor manneristic; it is like the drawings of a gifted child, full of the same mixture of ideographical and representational elements. It is obviously a child's type of decoration, superbly done for a place dedicated to children's use.

This alteration of St. John's Church is important not only because of its own consistency but because it illustrates things of more than local significance. One objection to the alteration of old churches has been that their Victorian Gothic style so hampered design that no creative alteration was possible short of entire reconstruction. Such work as this in Sharon effectively disproves this objection. Many of these old churches have basically pleasant proportions; it is necessary only to remove the excrescences which obscure them. And no buildings respond so well to light, clarification of design, and carefully applied color as do these Victorian Gothic churches.

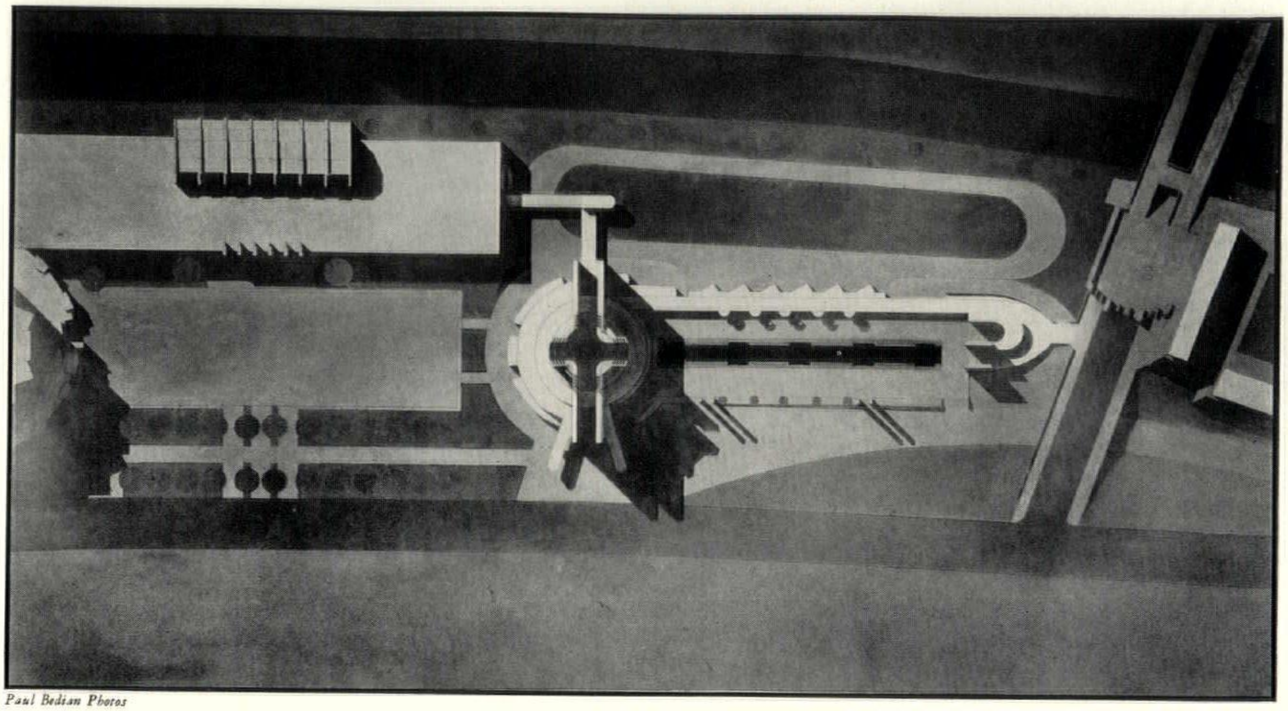
Nor is the matter of style a barrier. Just as many medieval churches abroad have absorbed and made their own Renaissance grilles and Baroque tombs and tablets, so many Victorian churches here can absorb and make their own such purely modern work as the Allegheny metal cross and candlesticks on the altar of the children's chapel at St. John's. Indeed, the work here that is most successful is that which is most wholly of its time, like the bronze font cover and the Children's Crusade mural. After all, it is not a matter of stylisms, of



Nyholm & Lincoln

being in this, that, or the other type of Gothic, or in this, that, or the other school of modernism — all eclecticisms are lazy men's routes, much traveled but strewn with moribund bodies. It is a matter of composition, of harmony, of consistency, and of using materials in ways that are natural and in accordance with the thinking of today. And just that, it seems to me, characterizes the best of the work at Sharon.

Perhaps the old Victorian church, beautified and altered from time to time, as best it can be done, achieves a humanity, a warmth, a quiet dignity, impossible in the brand new edifice, however brilliantly designed in the current fashion.



Paul Bedian Photos

RENDERED PLAN

CHRYSLER EXHIBITION BUILDING

A CENTURY OF PROGRESS EXPOSITION

CHICAGO, ILLINOIS

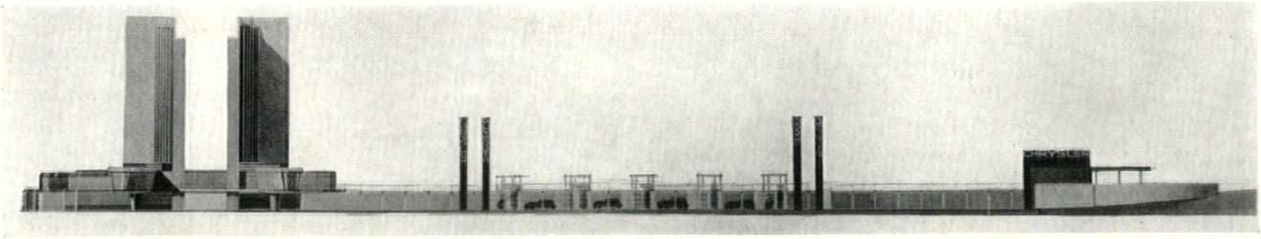
HOLABIRD & ROOT, ARCHITECTS

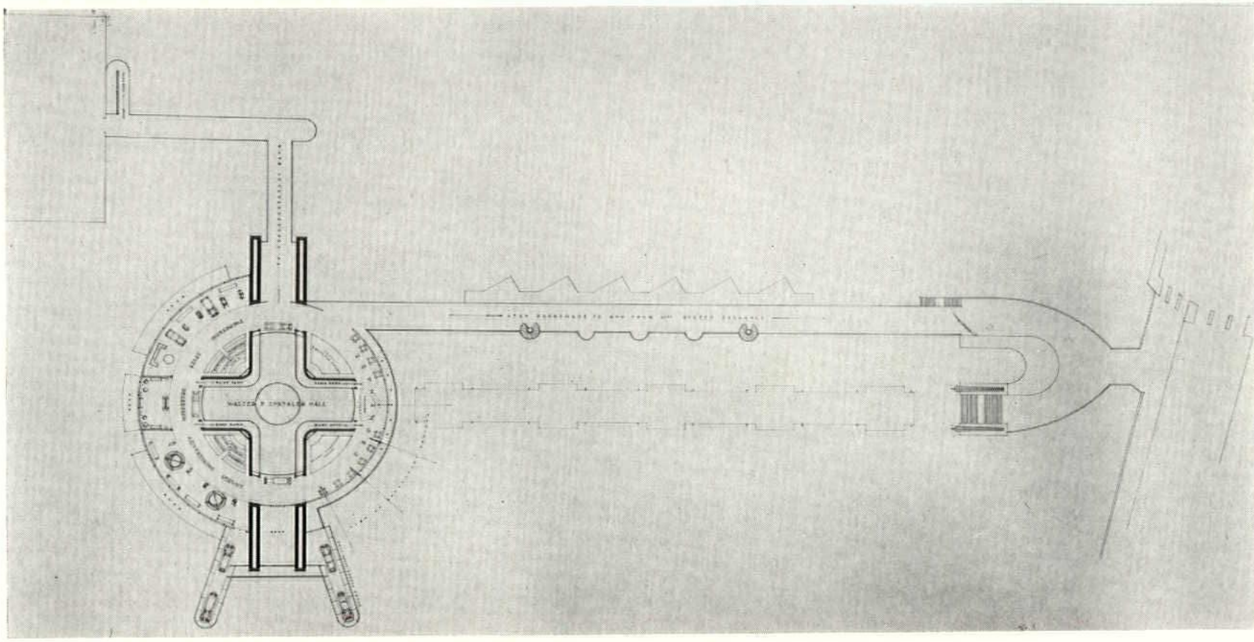
ADJOINING the Transportation Building at A Century of Progress Exposition in Chicago, the Chrysler Corporation is constructing its own exhibition building to house its four different types of motor cars. As the result of a competition, in which Holabird & Root, Paul P. Cret, Voorhees, Gmelin & Walker, Eliel Saarinen, Henry Hornbostel, and Roger Bailey participated, the firm of Holabird & Root has been designated as the architects. Kenneth Franzheim was technical advisor to the committee, which was composed of Raymond M. Hood, Albert Kahn, Edgar I. Williams, and four Chrysler executives.

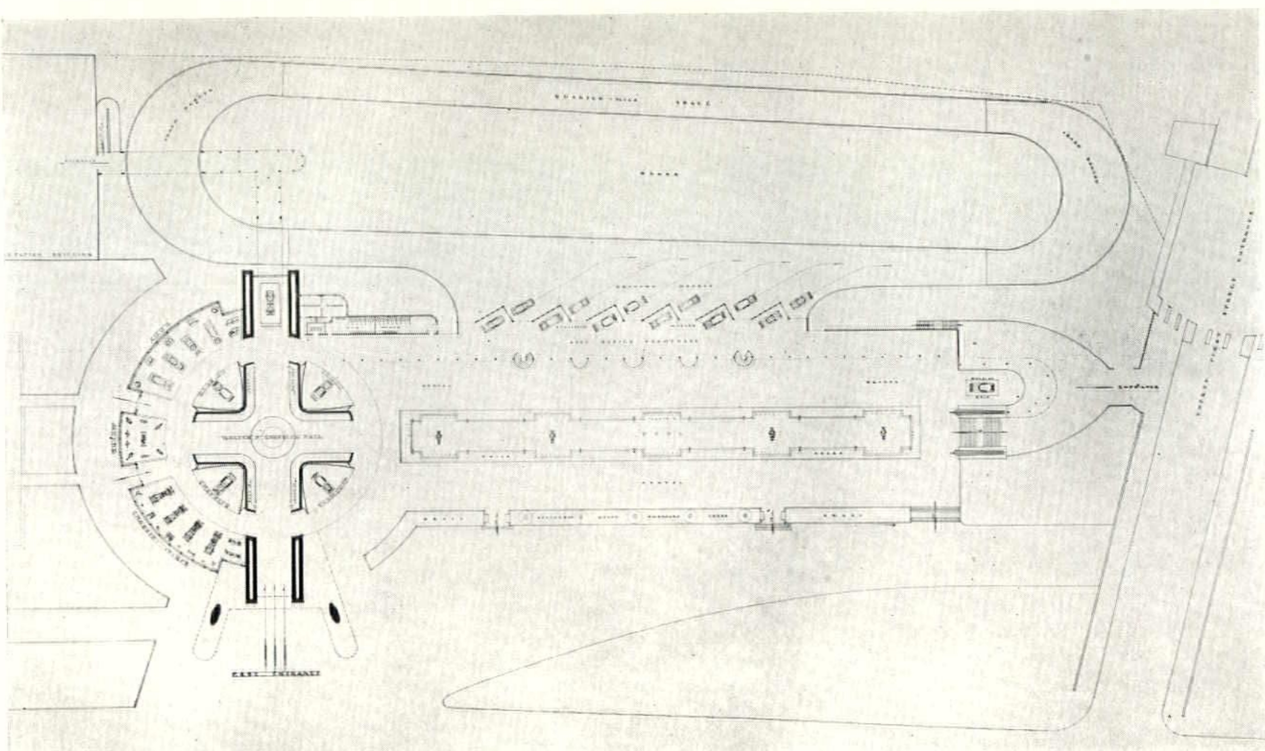
Conditions. The purpose of the project, as outlined in the program, is to exemplify in the building design as well as in the display, the spirit and force of the company. The building, therefore, was required to be not only an independent and appropriate shelter for the display within, but rather an integral part of the complete exhibit. The competitors were requested to design the display as well as the building so that they would excite and retain public interest throughout the period of the Exposition.

The site faces Lake Michigan across Leif Ericksen Drive. It was indicated that the building should be located at the south end of the property, with consideration given to a connection on the ground and second floor with the north end of the Transportation Building, and with the main entrance from the East, and a secondary entrance from the axis of the Transportation Building forecourt. Mandatory space requirements included an entrance rotunda, manager's office, secretaries' office, general reception room, public and private retiring rooms and toilets, closets for light storage, exposition hall with display space, exclusive of aisles, of at least 50 per cent of the area of the entire plan.

The cubical foot cost was limited to 15 cents, and the total cost of the building to $150,000.


CHRYSLER


WALTER P. CHRYSLER HALL

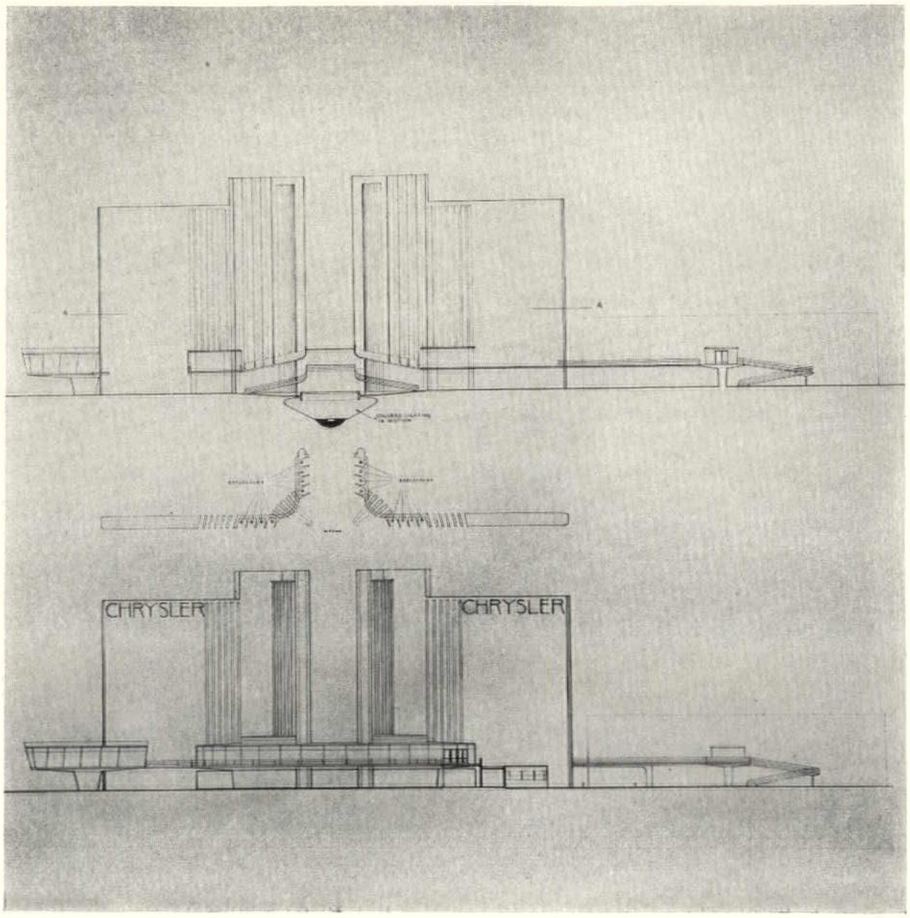

WALTER P. CHRYSLER HALL

Solution. Complying with a stipulation of the program, one of the entrances to the exhibition building in the winning design is located on 31st Street, with an open loggia connecting it to the principal display area. Provision has been made along the loggia for incidental showing of motor cars. An open walk leads to the second floor of the building and to the second floor of the Transportation Building. In the covered passageway below it, automobiles are mounted on rollers so that visitors may drive the cars in place. The platform upon which these are placed has a sawtooth plan, which permits the convenient placement outside the building of additional models ready to be driven around the quarter-mile track adjoining the building. The combination of these two types of displays, in both of which visitors are able to participate and to test the qualities of the cars, is one of the outstanding features of the entire plan.

In the central portion of the long open court which occupies the area at the left of the covered passageway, extending from the 31st Street entrance to the main part of the building at the opposite end, there is a long narrow pool flanked by gravel promenades. Stainless steel umbrella trees will provide shade for this area. At one end of the court, a display device known as the Belgian Roll will be installed. By this method, a car is subjected to all the tests which it would undergo during its period of actual use. The car is kept constantly in motion by mechanical means, is bumped about in such a fashion as to demonstrate its durability.

The main entrance, at the East, is flanked by cantilevered show cases, with transparent floors, and glass walls so that the public may view the cars within from all angles. The floor level of the show cases is the same as that of the second floor. At the intersection of aisles which lead to the entrances, in the center of the main exhibition area, which is known as the Walter P. Chrysler Hall, is a depressed pool, in which is a floating motor, symbolic of advertised feature of Chrysler cars — "Floating Power." On the walls which line the pool, the future of Chrysler development is suggested by an intricate electrical device employing colored lights and moving forms. Although the exact nature of the display is to be revealed only at the time of the Exposition, it is believed that this will prove to be an outstanding attraction.

Around the walls of the promenade which encircles the pool, there are other models of the four



At the top of the page opposite is a side elevation, directly below the second floor plan, and at the bottom the ground floor plan. At the right is a transverse section, below it a plan at A-A, and at the bottom the North Elevation types of Chrysler cars that can be driven in place. On the opposite side of the promenade, against the exterior walls are show space divisions, one devoted to the motor, another to the body, and a third to the chassis and tires. In a glass refrigerator show case at one end of the hall, a car is enclosed, where it is subjected to tests against wind pressure and weather.

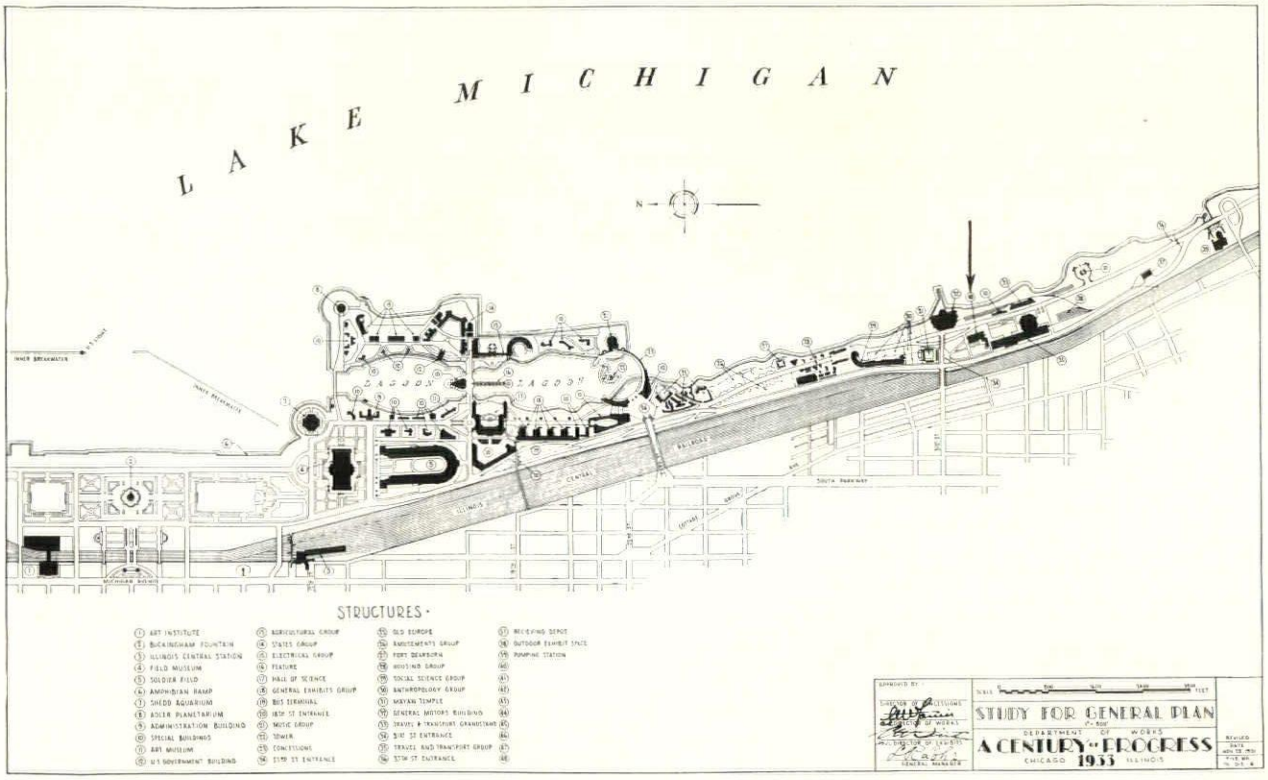
Four ramps lead up to the second floor of the Chrysler Hall. Here the space is given over to engineering tests, advertising service, and other displays. Sound motion pictures will be used to show methods of car production and other interesting points. In addition, there will be a reception room where refreshments will be served. The portion of the floor which overlooks the court will be devoted to an observation deck, from which visitors may obtain a clear view of the entire Exposition grounds, and watch the cars being driven around the track.

One of the obvious essentials in the design of the building was a means by which guests of the Exposition would be attracted to the building from a distance. This has been accomplished, first, in the height of the building, which is 120 ft. The walls themselves will be of a material that has a high degree of reflection to catch the sun in the daytime, and the artificial lights at night. Rising above the building will be four pillars of neon light, in each of which the name of one of the four types of cars will be displayed. Since these have been located on the side of the building nearest the main Exposition grounds, they will be visible from almost any point in the entire area.

The entrances to the building itself are designed to encourage passersby to enter. Unornamented except by the white metal bands which form part of the structure, they are impressive enough in size and character to command attention. The cantilevered glass show cases are also intended to attract those who approach near enough to see them.

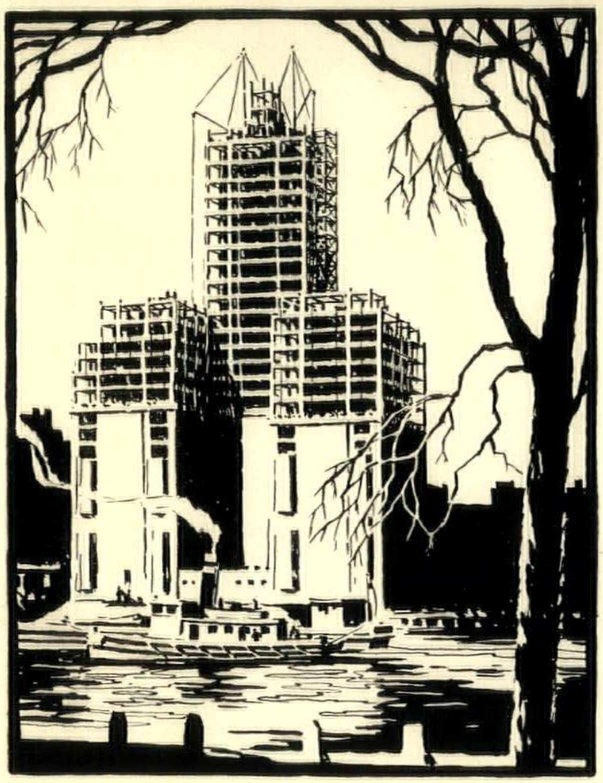
Simplicity in the structure, supplemented by the use of materials that will permit easy erection have kept the construction costs well within the 15 cent per cu. ft. cost limit imposed by the program. In common with other buildings being constructed for the Exposition, there will be a high percentage of salvage.

There has been an obvious intent to cover the area with mass, height, and embellishment with a minimum sacrifice of the area necessary for the adequate display of the motor cars. The plan has been so developed that a visitor to the building is almost obliged to see all the exhibition before he can leave. All passageways lead to the center of the Walter P. Chrysler Hall, which is the focal point of the exhibition.



General plan for A Century of Progress Exposition. The arrow at the right points to the Chrysler site

ENGINEERING & BUSINESS



MAY 1932

THE STORY OF ROCKEFELLER CITY, CHAPTER VIII . . . . SIMPLIFIED PRACTICE FOR DRAFTING ROOM EFFICIENCY . . . . PROCEDURE IN COMMUNITY HOUSING, THIRD STAGE . . . . REDUCING HOUSING COSTS WITH PREFABRICATED BUILDING UNITS . . . . A CURRENT PROMOTION METHOD FOR LARGE SCALE HOUSING

Curtiss Wright

"THE GREATEST BUILDING PROJECT. . ."

ROCKEFELLER CENTER, APRIL, 1932

THE STORY OF ROCKEFELLER CENTER

VIII. SUPERVISING CONSTRUCTION AND CONTROLLING COSTS

BY

ERNEST L. SMITH

PROJECT MANAGER FOR TODD & BROWN, INC.

UNLIKE most construction operations which are carried forward by one owner, one architect, and one general contractor, Rockefeller Center has one owner and an owning corporation, three architectural firms combined, two management companies, and at the present time three general contractors. There are, furthermore, several tenants whose already signed contracts entitle them to a voice in the design and construction of the buildings which they are to occupy. With such a large group of interested authorities, the problem of keeping their allied interests from entangling is one which demands an organization with specifically designated duties and responsibilities.

The general problems of organization were discussed in an article by L. Andrew Reinhard in the January issue of THE ARCHITECTURAL FORUM. Certain of the more specific problems and their solutions will be discussed in this article.

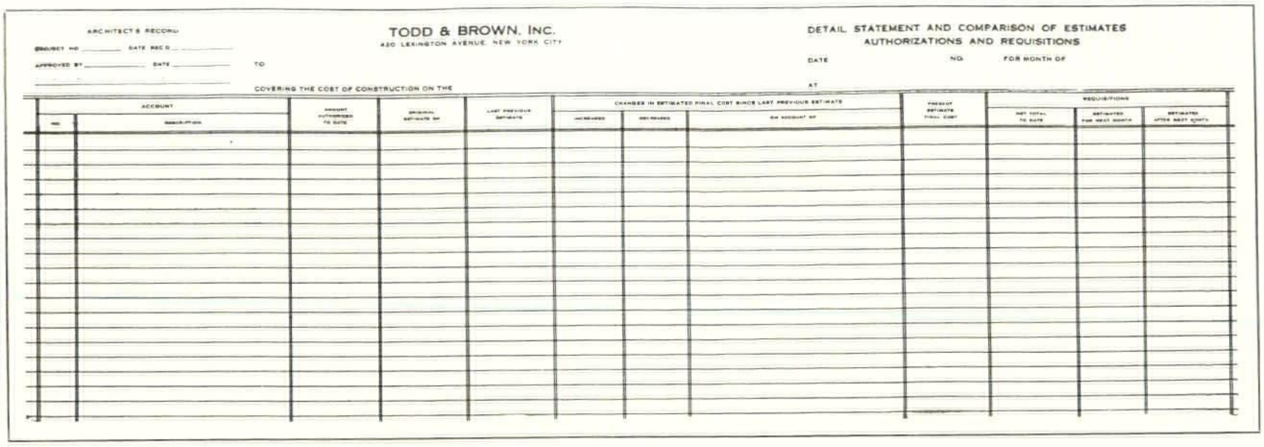
Management. As the owner's representative in matters of policy, finance, renting, etc., Todd, Robertson & Todd is charged with all the duties that might be included under the heading of broad supervision. The firm of Todd & Brown supervises the more specific details of construction, working as a liaison officer between the owners and the general contractors and the architects and general contractors. By lifting the responsibilities usually imposed upon architects, these two companies serve to free Reinhard & Hofmeister, Corbett, Harrison & MacMurray, and Hood & Fouilhoux from work that is not strictly architectural.

Financial Set-up. We have adopted to advantage a system of handling finances that is not customary on building operations. The three general contractors, Hegeman-Harris, John Lowry, and Barr, Irons & Lane, are being financed entirely in the work of this project by the Metropolitan Square Corporation, the owning company. The contractors are not required to advance any money either for the payment of their own men or for the payment of the subcontractors. The chief beneficial result from this arrangement is obvious: money has to be borrowed only once. One may imagine how much the interest charges are reduced by eliminating the old system of having the contractor borrow to meet his obligations and the owner borrowing to pay the contractor.

At the beginning of each month, each of the general contractors submits to Todd & Brown a requisition detail statement, upon which is listed by trades the amount received from Metropolitan Square Corporation the preceding month, the amount actually spent, and a requisition for expenses by trades for the next month. After the figures have been checked, an amount sufficient to cover the total requisitioned is deposited to the account of the contractor, from which he draws as his obligations arise. Although each of the contractors is doing his work on a different basis, that is, in regard to the work being done by the firm itself and the work being sub-let, the same requisition system is used by all.

Each of the buildings was, of course, budgeted by trades in a manner similar to that shown in the table accompanying the article by Webster B. Todd in the February issue of THE ARCHITECTURAL FORUM. By comparing the progress of the work with the requisition statements, an accurate check is kept on the budgetary costs.

In its report to Metropolitan Square Corporation, which is a monthly detail statement and comparison of estimates, authorizations, and requisitions, Todd & Brown presents a complete picture of the progressive cost on each building. The form used (see accompanying illustration) gives by trades the amount authorized to date, the original estimate and the last previous estimate. If there is an increase or decrease in the last estimate, as compared with the original estimate, the difference is explained, and another estimate is given. In addition, a statement is made of the total amount requisitioned for each trade, the amount needed for the following month, and the amount needed for the completion of the trade's work

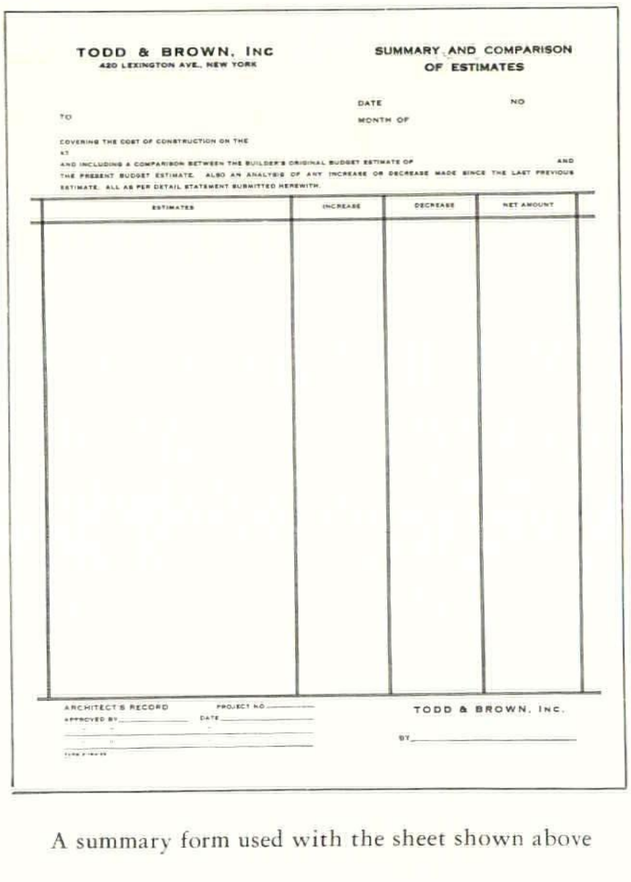

TODD & BROWN, INC.
420 LEXINGTON AVENUE, NEW YORK CITY
DETAIL STATEMENT AND COMPARISON OF ESTIMATES
AUTHORIZATIONS AND REQUISITIONS
ARCHITECT'S RECORD
PROJECT NO. DATE REC'D
APPROVED BY DATE
TO
COVERING THE COST OF CONSTRUCTION ON THE
DATE NO. FOR MONTH OF
AT

Form used by Todd & Brown to report to Metropolitan Square Corporation. Besides being a requisition, it serves as a check on the actual cost as compared with estimated cost. A similar statement on each building is submitted monthly

With this form, another summary form is submitted which simply states the amounts required for the following month.

Under this arrangement the owner has his finger on the cost pulse at all times. Amounts spent in excess of estimates are understood immediately so that corrections, if any are possible, can be carried out before the work has progressed too far.

Contractor Relations. The general contractors are immediately responsible to Todd & Brown.


TODD & BROWN, INC
420 LEXINGTON AVE., NEW YORK
SUMMARY AND COMPARISON
OF ESTIMATES
DATE NO
TO MONTH OF
COVERING THE COST OF CONSTRUCTION ON THE
AT
AND INCLUDING A COMPARISON BETWEEN THE BUILDER'S ORIGINAL BUDGET ESTIMATE OF AND
THE PRESENT BUDGET ESTIMATE. ALSO AN ANALYSIS OF ANY INCREASE OR DECREASE MADE SINCE THE LAST PREVIOUS ESTIMATE. ALL AS PER DETAIL STATEMENT SUBMITTED HEREWITH.

ESTIMATES	INCREASE	DECREASE	NET AMOUNT

ARCHITECT'S RECORD PROJECT NO.
APPROVED BY DATE
TODD & BROWN, INC.
BY

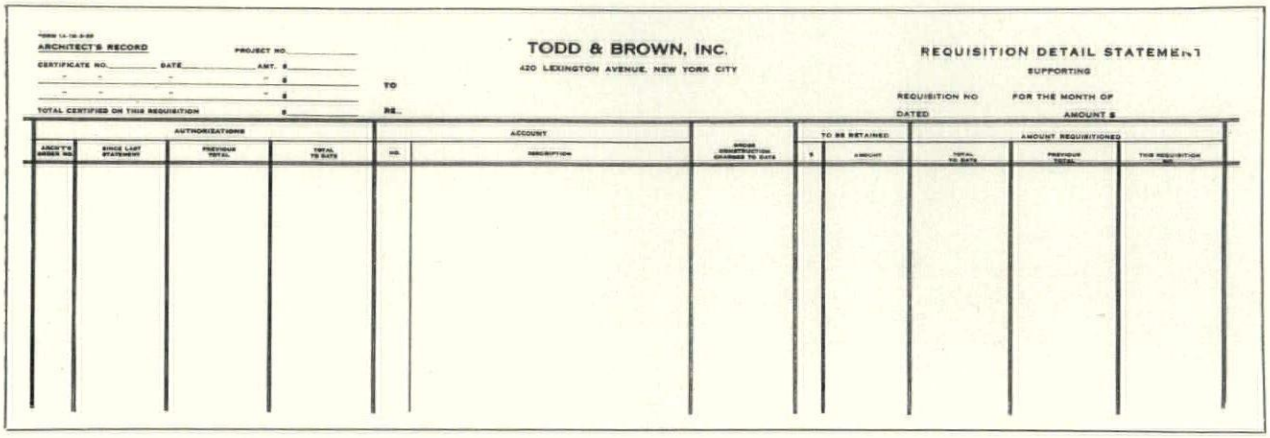
A summary form used with the sheet shown above

On each building, Todd & Brown has a superintendent whose work is to interpret the owner's wishes rather than to perform actual supervision. At the present time, there are three such superintendents, one in charge of the International Theater and the adjoining R-K-O office building, one in charge of the sound motion picture theater, and a third in charge of the 67-story office building. Over these three men is a general superintendent for the entire operation, whose work is to coordinate the operations of all three general contractors, the engineers, the inspectors, and so on. Although his position is rather hard to define, he fills an extremely important role.

Each of Todd & Brown's superintendents makes a daily as well as a weekly report. The daily report is similar to that which is usually made by a general contractor's superintendent to his own office as well as to the office of the architect. It relates briefly the number of men at work on each trade during the day, and the work done by each trade. In addition, it includes a weather and temperature report, a summary of the total number of working days elapsed since the operation began, and the total number of inclement days.

The weekly letter to the office of Todd & Brown is probably one of the most informative checks on the work which the office receives. It is a specific answer to the constant question, "How is the work coming along?" Since no outline is suggested, the superintendent is free to report fully on those phases of the work which would not be covered in a form report.

With the exception of the monthly requisition statement, the general contractors do not report regularly to Todd & Brown. Each superintendent, however, makes a daily report to the Todd & Brown field man, and this report is the basis of the daily report made by the field man to the central office. For their own use, two of the three general contractors keep unit cost records of each



ARCHITECT'S RECORD

PROJECT NO.

CERTIFICATE NO. DATE AMT. $

TOTAL CERTIFIED ON THIS REQUISITION $

TO

RE.

TODD & BROWN, INC.

420 LEXINGTON AVENUE, NEW YORK CITY

REQUISITION DETAIL STATEMENT

SUPPORTING

REQUISITION NO FOR THE MONTH OF

DATED AMOUNT $

AUTHORIZATIONS				ACCOUNT		GROSS CONSTRUCTION CHARGES TO DATE	TO BE RETAINED		AMOUNT REQUISITIONED		
ARCH'T'S ORDER NO.	SINCE LAST STATEMENT	PREVIOUS TOTAL	TOTAL TO DATE	NO.	DESCRIPTION		%	AMOUNT	TOTAL TO DATE	PREVIOUS TOTAL	THIS REQUISITION NO.

Form used by general contractors in making requisitions to Todd & Brown. Submitted monthly, it reveals the amounts spent during the preceding month, amount required for the following month, and amount needed to complete the job

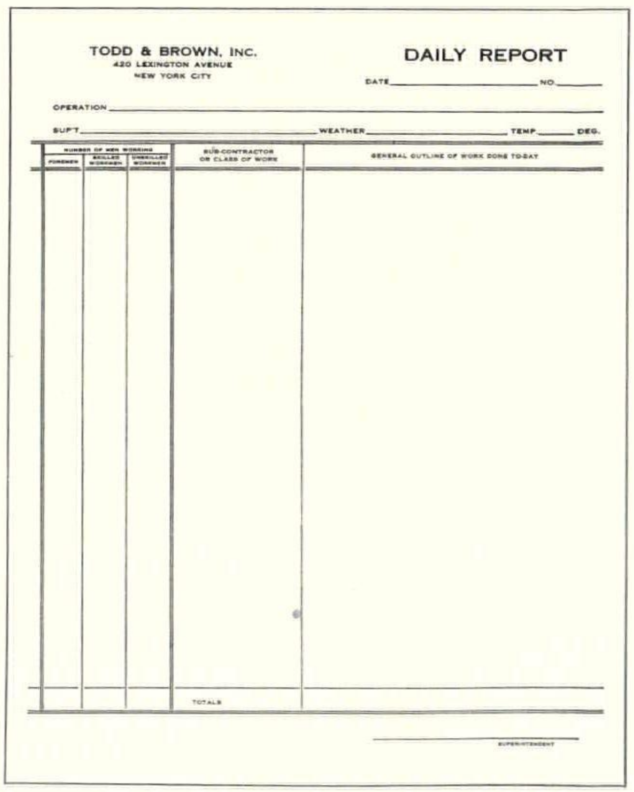
day's work in the trades which the firm is handling with its own force. The third firm, Barr, Irons & Lane, sub-lets all the contracts and does no actual construction work. The unit cost record is obtained by dividing the amount of work done by the number of men at work.

Contact Work. All other relations between contractors and the architects and owners are handled by Todd & Brown. Working drawings and specifications are sent to their office from the architects, and passed on to the field superintendent for Todd & Brown on each job, and from him to the superintendent for each contractor. Shop drawings from subcontractors are submitted by the general contractors to Todd & Brown, and are then checked by the architects, returned to Todd & Brown to pass on to the general contractors. Although the process may seem circuitous, it eliminates all difficulties as to procedure, and actually saves time in transmission.

A further saving in time and effort is effected by the establishment of what might be termed the office of a project manager in the office of Todd & Brown. He is responsible directly for all contacts between the field office and the central office. It is he who receives progress charts, construction cost reports, the daily and weekly reports. His work, furthermore, includes contact work between the offices of the engineers and the contractors. He makes the financial reports to the owners, and in general is in direct charge of the construction work.

Field Work. Besides the great number of superintendents whose duties have already been outlined, there is in the field a veritable host of inspectors and representatives from the offices of the engineers, the lending company, the job insurance company, the municipal authorities. Those whose work does not come directly under the supervision of the general superintendent for Todd & Brown report either to their own central offices, or to the architects or managers.

The structural engineer, H. G. Balcom, has seven field engineers on the job, a chief engineer, three steel inspectors and three concrete inspectors. Two representatives from the office of D. Everett Waid, consulting architect for the Metropolitan Life Insurance Company, the lending company, are in constant attendance. The office of Clyde R. Place, consulting engineers for all mechanical



TODD & BROWN, INC.

420 LEXINGTON AVENUE

NEW YORK CITY

DAILY REPORT

DATE NO.

OPERATION

SUP'T WEATHER TEMP. DEG.

NUMBER OF MEN WORKING			SUB-CONTRACTOR OR CLASS OF WORK	GENERAL OUTLINE OF WORK DONE TO-DAY
FOREMEN	SKILLED WORKMEN	UNSKILLED WORKMEN		
			TOTALS	

SUPERINTENDENT

Form used by superintendents for daily report

Kilham, Jr.

View from roof of Fifth Avenue building, showing general progress of the work. The excavation in the center is for the 67-story office building. The basement steel in the right foreground is for the International Theater, and the building behind it is the R-K-O office building. Steelwork for the sound motion picture theater may be seen at left

installations, has four representatives in the field.

Although it is usual for the general contractors to carry insurance on the construction work, in this instance, the owners have retained the Travelers Insurance Company to represent them. Their work is divided into three departments, a medical department, which has seven doctors and a staff of nurses, a claim department, and a staff of safety engineers. Chiefly due to their efforts, we have not had to date a fatal or a really serious accident.

Two other departments whose work is outside the regular construction office are the renting and maintenance department and the public relations department. The first of these has charge of old buildings and other properties in addition to being the field office for the central renting office. The public relations department has two field representatives, and their work is essential to the efficient operation of the other departments. The number of visitors, photographers, artists, writers, and newspapermen who come to the site daily is really amazing. If there were not specially designated men to handle them, it is probable that they would offer constant interference to those actually engaged in the construction work.

In the office of the general superintendent for Todd & Brown, there are three field engineers who are subject to call from the superintendents of any one of the buildings. These men are not inspectors, but interpreters of plans and specifications, whose duty it is to eliminate as much unnecessary reference to the central office as possible. They work in conjunction, too, with the inspectors for the structural and mechanical engineers.

The all-important expediter is also a member of the general superintendent's office. A familiar figure on every construction operation of size, he handles all the details of questions which fall outside the general routine as well as expediting orders from one department to another.

The office staff of the general superintendent includes, besides the usual clerical and telephone help, an office manager who is in direct charge of all reports, pay-rolls and communications, and a clerk, who receives, despatches, and files all plans. Instead of building the usual shanties for this office and for the offices of the other companies represented, use has been made of the old unoccupied buildings which are later to be razed to make way for other construction. Communication between the various offices is more rapid than usual, because they are grouped together.

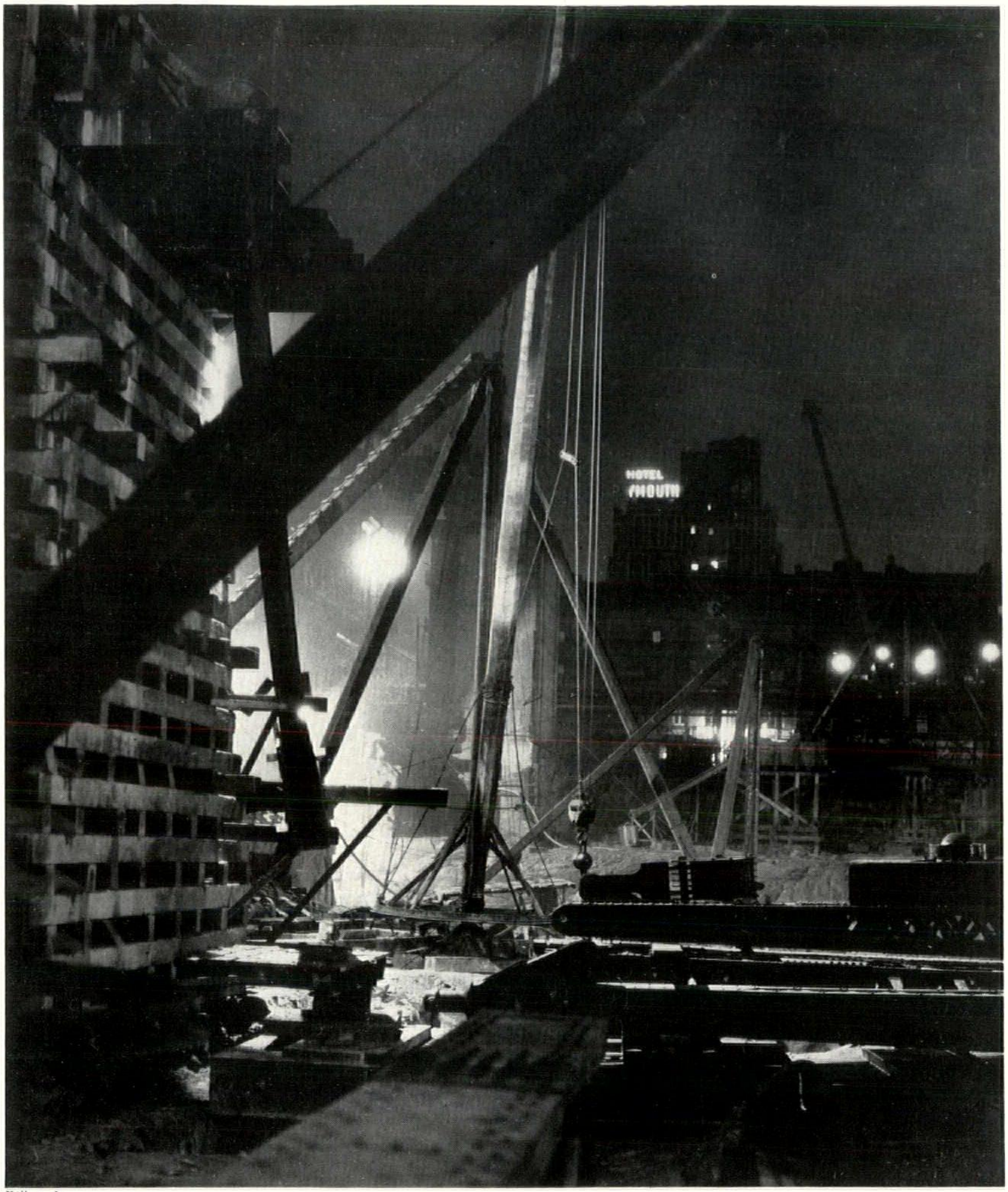
Marshaling the forces for an operation which includes eleven buildings is a problem similar to that which confronts military leaders who must direct the units of offense against a no less definite objective. Cooperation, close and purposeful, must be maintained if the operation is to move forward with rapidity, efficiency, and safety. Although each operation has its peculiarities, experience on one may prove valuable in similar future work.

THE STORY OF ROCKEFELLER CENTER

Kilham Jr.

ROCKEFELLER Center is now in one of the most interesting stages of construction. Some idea of the magnitude of the undertaking may be gained from the illustration above and those on the following pages. The excavation is for the 68-story central tower, called Building No. 9 by the architects. The illustrations in this issue are of the R-K-O office building and International Music Hall. Construction progress of the other units will be recorded in forthcoming issues of THE ARCHITECTURAL FORUM

THE PROGRESS OF THE WORK



Kilham, Jr.

THE PROGRESS OF ROCKEFELLER CENTER

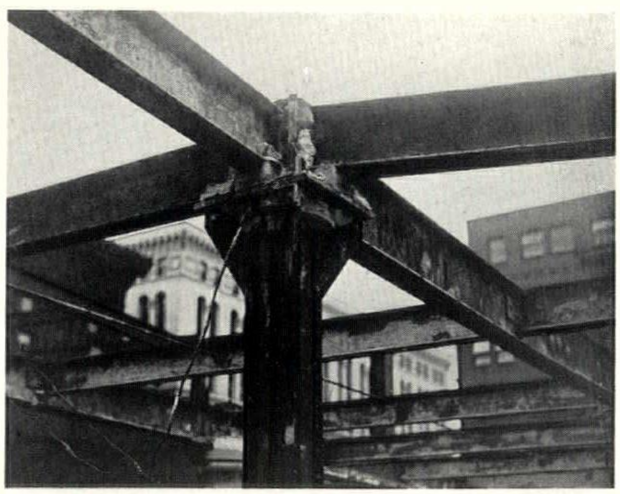
REINHARD & HOFMEISTER

CORBETT, HARRISON & MACMURRAY

HOOD & FOUILHOUX, ARCHITECTS

Kilham, Jr.

ON THE opposite page is a most unusual night view of the loading platform. It conveys, better than many words, an idea of the power and skill which vitalizes the building industry. The two pictures on this page form an interesting contrast in building practices. The one above was taken during the progress of the steel work on the R-K-O office building. The small picture is a detail of an old cast iron column and beams which made up the frame of the Home Insurance Building in Chicago. This building, one of the first to use a system of metal framing, was built in 1884 and demolished in 1931. The picture showing the cast iron structure in an excellent state of preservation recalls the day when a ten-story structure was a "cloudscraper," and points to the amazing developments in materials and the advancements in technical knowledge which the last 50 years have produced



THE PROGRESS OF ROCKEFELLER CENTER

REINHARD & HOFMEISTER

CORBETT, HARRISON & MACMURRAY

HOOD & FOUILHOUX, ARCHITECTS

SOCIAL AND CIVIC	ECONOMIC	ARCHITECTURAL

THE PROBLEM

DIVISION SI

A survey of the housing needs of the locality (city, town, region) and of various income and social groups.

DIVISION EI

An analysis of the existing market and methods of supplying housing demands; and how to increase effective demand.

DIVISION AI

A study of functional requirements, housing customs, local conditions, and how to improve quality and decrease cost.

TEST STUDIES

DIVISION SII

A survey of the neighborhood of proposed site to determine possible use of existing community equipment and organization by the new project.

DIVISION EII

The organization of the housing company and the economic cost analysis of projects studied.

DIVISION AII

Comparative studies of various ways of developing sites under consideration.

THE SOLUTION

DIVISION SIII

A program for the organization of the community and its equipment.

DIVISION EIII

A plan for the organization of the economic and business structure for the housing project.

DIVISION AIII

The development and building of the housing project; architecture, town and site planning engineering and construction.

OUTLINE FOR COMMUNITY HOUSING PROCEDURE

BY CLARENCE S. STEIN

COMMUNITY HOUSING PROCEDURE

THIRD STAGE: THE SOLUTION

BY

CLARENCE S. STEIN

THE third and final stage in the outline of community housing procedure deals with the factors to be considered in the final solutions of the correlated problems — social and civic, economic and architectural. Because of space limitations, the outline has been condensed and should be considered as indicative of types and classes of questions to be considered, stimulating further thought in the directions indicated. In order to obviate repetition, many of the considerations necessary to the solution of the problems have been included by the references to the appropriate previous Divisions. In this third stage, the subjects thus referred to are however to be considered as definite points for decision and action, whereas in the previous stages they were subjects of investigation to determine existing conditions. This final stage in the procedure is that of determining results sought and setting in motion the final organization executing the work.

In addition to the further assistance of those whose aid has already been acknowledged, I have had the valuable criticism of Mr. Charles S. Ascher on the legal aspects of community planning, and of Major John O. Walker in the field of administrative community organization.

EDITOR'S NOTE. The first and second parts of Mr. Stein's "Outline on Community Housing Procedure" appeared in the March and April issues respectively. The outline in the March issue set forth the problem and the April installment was concerned with text studies. The complete outline will be available in pamphlet form upon publication of this issue. A limited number of the pamphlets may be obtained upon application to THE ARCHITECTURAL FORUM.

SOCIAL AND CIVIC (DIV. SIII)

A. POLITICAL CHARACTER OF COMMUNITY. SIZE

I. COMPLETE (OR DOMINATING PART OF) POLITICAL UNIT

a. Provision by developer of all facilities and equipment for local government

b. Planning for acceptable and efficient governmental organization: ***administration, taxation, sale of bond issues***

II. DEVELOPMENT AS LARGE AS NEIGHBORHOOD OR ELEMENTARY SCHOOL UNIT, BUT NOT LARGE ENOUGH TO DOMINATE POLITICAL UNIT

a. In undeveloped or partially developed district ***(Example: Radburn, N. J.).*** **In developed district** ***(Example: Sunnyside, L. I.)***

b. Cooperation with existing local government

c. Planning for future administration of projected facilities or equipment: ***by municipality, community or company***

d. Detailed analysis to determine existing social or civic facilities ***(See entire survey outlined in Division SII)***

III. SMALL SUBDIVISION OR BLOCK DEVELOPMENT

a. Provision for community association and smaller unit facilities ***(Nursery school, playgrounds, etc.)***

B. GENERAL CHARACTER OF COMMUNITY, AS DETERMINING AMOUNT AND KINDS OF EQUIPMENT

I. POPULATION ***(See Div. SI-DI)***

a. Density: ***Population per acre***

b. Occupation: ***Industrial, agricultural, etc. In or near community or more distantly located***

II. DWELLING TYPES: Apartments, houses, etc. Rental, cooperative, sale. Coverage of land by buildings ***(See Div. AIII-CII)***

III. COMMUNITY AS A WHOLE: Self-sufficient, suburban, city-district, etc.

C. GENERAL REQUIREMENTS IN PLANNING COMMUNITY EQUIPMENT

I. SOCIAL REQUIREMENTS. A developed

(Continued on page 506, column one)

program, in light of surveys made, to provide new or to alter old facilities or services

a. Facilities or services desired

1. Education (*See Div. SII-BVIII, a*)
2. Recreation, outdoor (*See Div. SII-BVIII, c*)
3. Recreation, indoor: *Athletic, social*
4. Art: *Plastic, graphic, dramatic, musical*
5. Religion (*See Div. SII-BVIII, b; SI-DIV, f*)
6. Health (*See Div. SII-BVIII, d*)
7. Protection (*See Div. SII-BVIII, e*)
8. Welfare: *Aged, insane, poor, etc.*
9. Convenience: *Utilities* (*See Div. AIII*)
10. Commerce (*See Div. SII-BVIII, g*)
11. Work: *Industry, business, agriculture, etc.* (*See Div. SII-BVIII, f*)
12. Clubs and organizations (*See Div. SI, D-IV, e 8*)
13. Living facilities for transients, students, etc.

II. CIVIC AND LEGAL REQUIREMENTS

a. Governmental agencies which may have to be considered for sites, or consulted

1. Federal Government
   - *a.* Department of Agriculture: *Rain, snow, fog, soil, trees*
   - *b.* Post Office Department: *Mail, local delivery, air mail, post office*
   - *c.* War Department: *Harbors, piers, etc., navigable streams*
   - *d.* Department of the Interior: *Reclamation*
   - *e.* Treasury Department: *Warehouses*
   - *f.* Department of Justice: *Court, jail*
2. State Government
   - *a.* Highway Department: *Present or proposed highways. State aid for local highways, grade crossing elimination*
   - *b.* Educational Department: *Minimum standards, regional schools, universities, extension service*
   - *c.* Tenements, etc.: *State building codes*
   - *d.* Parks: *Present, proposed, conservation*
   - *e.* Water supply: *Control, limits*
   - *f.* Health: *Water approval, sewerage, service*
   - *g.* Courts, State Police, etc.
   - *h.* State institutions
   - *i.* Utility Commission: *Transportation, grade crossing elimination, rates*
3. County Government. Duplicates State government in nearly every department to a lesser degree and should be checked in every instance: *Special bureaus, commissions*
4. Local Government
   - *a.* Planning board: *Plans, zoning, subdivision control, official plan*
   - *b.* Building regulations: *Building code, plumbing code, electrical code*
   - *c.* Welfare: *Health, hospitals, clinics, recreation, parks, animals — control*
   - *d.* Education: *Pre-school, elementary, high school, adult, library, etc.*
   - *e.* Public service: *Highways, water, sewers (septic tanks), gas, electric, disposal plant, street cleaning, garbage disposal, street lights, airports*
   - *f.* Police
   - *g.* Fire: *Insurance rates*
   - *h.* Taxes: *Assessment, assessment percentage, assessment local improvement, financial condition*
5. Regional: *Regional plan, regional government, regional services*

b. Special aspects of plan for which governmental permits or approval may be needed

(*Continued on page 508, column one*)

ECONOMIC III (DIV. EIII)

A. DIRECTION, FINANCIAL (See EII)

B. MARKETING PROCESSES (Sales or Rentals)

I. SECURING PROSPECTS *(Publicity and Promotion)*

a. Advertising media

1. Newspaper: advertising, news articles
2. Signs and billboards
3. Radio
4. Direct by mail circularizing
5. Oral presentations — at meetings and clubs
6. Excursions to property of interested groups

b. Advertising personnel

1. Staff publicity manager (usually sales manager) coordinates company policy with sales department and outside agencies
2. Advertising agency places paid insertions

II. SECURING APPLICATIONS (sales or rent)

a. Outside real estate brokers

b. Own staff — sales manager and salesmen

1. Compensation — salary, commission, etc.
2. Training
3. Duties — showing property, follow-up of prospects, writing applications
4. Supervision — sales meetings, daily reports. Prevention of misrepresentation and high pressure

III. SELECTION OF APPLICANTS

a. Application form. ***Information relates to:***

1. Present residence: *size, rent, landlord*
2. Family: *size, race, ages, relationships*
3. Economic: *assets, income, employment, liabilities*
4. References

IV. LEGAL ARRANGEMENT

a. Sale: conveyance. ***Form of contract; down payment with application, contract, title. Mortgages. Frequency of payments of interest and amortization, other charges, due dates. Title closing. Expense of recording***

b. Sales: cooperative. ***Form of corporation. Charter, By-Laws, Stock, Plan of Organization. Powers of Directors and Management. Form of proprietary lease. Down payment, monthly charge. Term of lease***

c. Rental: ***Form of lease, term of lease. Security deposit. Concessions and special inducements***

d. Operation

1. Sales Properties
   - *a.* Service organization for decorating, occupancy, etc. (See Div. AIII, D-III-g)
   - *b.* Deed restrictions: *administration of*
   - *c.* Collection of mortgage payments
     - i. Receiving of monthly payments
     - ii. Enforcement of delinquent payments
2. Rental Properties
   - *a.* Service Department (or outside agent): *for maintenance of buildings, grounds, etc.*
   - *b.* Collection of rentals: *weekly, monthly, property office, main office, at residence through collector*
   - *c.* Enforcement of rentals: *dispossess, legal action*
3. Cooperative Ownership Properties

ARCHITECTURE (DIV. AIII)

A. SURVEY OF EXISTING CONDITIONS. (For drawings and documents required in execution of work, see Div. AIII, BII) in relation to:

I. TOPOGRAPHY. Boundaries, contours, woods, trees, etc.

II. SOIL AND SUB-SOIL

III. EXISTING IMPROVEMENTS ON PROPERTY. *(See Div. AII, AI-d)* (Note: The first step will be to go over the planning check-list, Div. AIII, C. to determine possible use of existing conditions or services, considering *streets and paths, water supply, sewage disposal, sanitary and separate storm drainage; electricity, gas, telephones, parks, buildings, post boxes, fire alarms, hydrants, etc.)*

IV. PHYSICAL CONDITIONS OUTSIDE OF PROPERTY, AFFECTING PLAN *(See Div. SII, whole survey)*

a. Roads, main highways and bounding streets
b. Buildings: character, use, appearance
c. Public equipment in neighborhood *(See Div. SII-B-VIII, Div. AII-A-I-d)*
d. Transit facilities *(See Div. S-II-B-VIII-h) (See Div. A-II-A-I-d-2)*

V. LEGAL AND ADMINISTRATIVE RESTRICTIONS *(See Div. AII-A-II; SIII-BII)*

B. ORGANIZATION OF WORK

I. QUESTIONS OF POLICY FOR GENERAL PROCEDURE

a. For engineering, construction, labor, supervision
b. Among city planners, architects, private engineers, engineering department for project, general contractor, construction force for project, separate contractors, union, non-union, open-shop labor, supervision force
c. As affected by local labor conditions. As affected also by time-sequence of work and interrelating trades or functions. *(See Div. AIII, BIII, DIII, IV)*

II. DRAWINGS AND DOCUMENTS WHICH MUST BE COORDINATED. (In preliminary and final stages)

a. Surveys: *General land survey, topographical maps, maps of existing improvements, grade and surface drainage maps, title survey maps, utility record maps, assessment maps, natural resources, existing transportation, etc.*
b. Plans, designs and working-drawings: *Town or development, streets, utilities, sites and grouping, dwellings, public buildings and other community equipment, landscaping, transportation, parks, etc.*
c. Records: *Deeds and easements, utilities, zoning or other land-use restriction, etc.*
d. Coordination and correlation between surveys, plans and records and existing legal plans or restrictions. *(Such as city master-plans, zoning codes, street layout restrictions, set-backs, etc.) (See Div. SIII-CII)*

III. PROGRAM OF SEQUENCE OF WORK IN RELATION TO:

a. Completion in time for best selling or renting
b. Minimizing carrying charges by:
  1. Coordination and proper sequence of work
c. Seasonal working conditions affecting:
  1. Length of season
  2. Cost of work (for example additional cost of heating when plastering during winter)
  3. Quality of work
d. Minimizing cost by
  1. Coordinating operations, as opening streets once to install all utilities
  2. Preparing one operation to facilitate another, as streets finished to allow material delivery
e. Time required for
  1. Preparation of preliminary studies
  2. Preparation of working drawings
  3. Securing permits and other legal work
  4. Actual construction

C. PLANNING

I. PRELIMINARY CONSIDERATIONS (Disposition of principal elements of plan) *(See Div. AII-B-II) (See Div. AIII-C-V, main headings)*

II. DWELLING UNITS. (Final restudy of types tentatively chosen in Div. AI and revised in AII)

a. Factors in planning
  1. Space required per household for household activities, storage and services *(See Div. AI-A-I-a)*
  2. Room design
    a. List of spaces considered as rooms *(See Div. AI-AII-a-2)*
    b. Sizes and shapes: *minimum and desirable*
    c. Wall space, openings, and furniture placement
      i. Doors
      ii. Windows
      iii. Furniture placement: *sizes of probable pieces, clearances required, cut-outs at scale for plan study*
      iv. Utilization of corners, jogs, waste space. *Built-in furniture*
    d. Orientation of room. Relation to sun, breeze, neighbors, traffic
  3. Grouping of rooms and services
    a. For amenity: *orientation, ventilation, vistas, privacy, efficient internal circulation*
    b. For economy of construction and upkeep
      i. Simplicity of major framing
      ii. Vertical alignment and grouping of plumbing and mechanical services, etc.

(Continued on page 509, column one)

(SOCIAL AND CIVIC, Div. SIII-CII-b, *continued*)

1. Subdivision and land planning: *layout of streets and lots* . . . 2. Corporate administration: *if limited dividend or cooperative, philanthropic enterprise* . . . 3. Changes of grade . . . 4. Street openings, *i.e., cuts in pavement* . . . 5. Water main and sewer layout: *size, location of valves, manholes, etc.* . . . 6. Connections with existing public utility lines . . . 7. Crossing of railroads . . . 8. Bridges, piers, bulkheads . . . 9. Reclamation of land by fills, etc. . . . 10. Garbage disposal . . . 11. Building plans, tenement house plans . . . 12. Elevators . . . 13. Source of water supply . . . 14. Change of stream flow: *culverts under highways, bridges over highways* . . . 15. Paving, curbs . . . 16. Use, height, and bulk of buildings (zoning); certificates of occupance . . . 17. Plumbing . . . 18. Design of school buildings

c. Utilities which may require consultation or agreement, private agencies

1. Water, gas, electric, telephone, transportation; rates, extension; cost, method

III. ECONOMIC REQUIREMENTS

a. Consideration of factors listed in *Div. EII-E*

b. Analysis of *Div. SID, I, II, III, IV*, of what residents can pay for, what municipality or other governmental agency will provide, what must be provided without return by developer or philanthropical agency, and what can be self-supporting

c. System of taxation

1. Existing or possible system of taxation by municipality: *Site-value taxation or Graded Tax Plan (Pittsburgh), tax-rate limitations, limitations on bonded indebtedness, condemnation proceedings, special assessment procedure*

2. Possible system of taxation by community or developing company: *Charge in rental or monthly payment, head-tax, use-tax, or fee*

IV. GEOGRAPHIC AND TOPOGRAPHIC REQUIREMENTS *(See AII-AI)*

V. OTHER FACTORS WHICH INFLUENCE SIZE, LOCATION AND GROUPING OF EQUIPMENT UNITS

a. Grouping of all equipment in relation to neighborhood units (school districts)

b. Centralizing factors

1. Necessarily expensive equipment, which must be used by a large number of people
2. Economy or desirability of interchangeable use of school, community and religious buildings by community as a whole, or by neighboring ones
3. Facility of transportation
4. Aesthetic, psychological and administrative value of central grouping
5. Maintenance of convenient relation between activities: *education, recreation, culture, etc.*

c. Decentralizing factors

1. Desirability of maintaining informal, casual or intimate qualities
2. Frequent use for short periods
3. Use by very small children and mothers
4. Walking distances
5. Inadequacy of circulation or transportation

d. Questions of separating or combining the social, educational, administrative, commercial and industrial centers

VI. FACTORS WHICH INFLUENCE ORDER OF CONSTRUCTION

a. Analysis of indispensable equipment

1. Needed from start
2. Needed as population increases

b. Optional equipment, dependent on funds, degree of demand, availability of sites, etc.

c. Planning school or other indispensable buildings for social activities until separate equipment can be provided

d. Equipment at start to attract residents

VII. COMMUNITY FUNCTIONS OR ACTIVITIES WHICH CAN BE TAKEN CARE OF ELSEWHERE

a. Neighboring communities or larger centers *(Check with entire survey, Div. SII)*

b. Temporarily or permanently

D. COMMUNITY EQUIPMENT TO BE PROVIDED

I. BUILDINGS

a. Schools: *Public, private, parochial*

1. Possible planning features: *Auditorium, gymnasium, swimming pool, restaurant, kitchen, theater, laboratory equipment, art practice equipment, public library, exhibition or gallery rooms, health bureau, rooms for committee or club meetings*
2. Costs and administrative responsibility
   a. Borne by: *State, municipality, community, families of pupils, religious or social organizations, philanthropy, combinations*
   b. Consider for adult use of school equipment out of school hours: *double janitor shift, arrangement for payment by community or organization for extra heat, light, service, etc.*

b. Community buildings, social centers

1. To be constructed and administered by developing company, community or municipality *(See Div. SIII-E)*
2. Size and location factors *(Follow general check list under "schools," above)*
3. Possible planning features: *Auditorium, concert hall, theater, theater work shops, ball room, banquet hall, kitchen, restaurant, cafeteria, club rooms, community administrations offices, gymnasium, bowling alleys, squash courts, swimming pool, classrooms, studios, soundproof music practice rooms, craft work shops, rooms to be rented for private parties, club or lodge meetings, religious activities, nursery school, clinics, etc.*
4. Outdoor planning: *Tennis courts, golf, other sports*

c. Churches and other religious equipment *(In relation to Div. SII-BVIII, b)*

1. Problem of duplication with community social and educational equipment
   a. Possibility of joint construction for different denominations and community

d. Libraries

1. Main and branch, lending and research

(Continued on page 510, column one)

(ARCHITECTURE, Div. AIII-CII-a, *continued*)

4. Circulation
   a. Extra-mural. (*See Div. AI: A-I-d*)
      i. Access by motor and foot, for occupant, servants, guests
      ii. Access for deliveries and services
   b. Intra-mural
      i. Vestibules and weather buffers. Wrap, umbrella and rubber storage
      ii. Direct access to upper floors: *From outside, service, or kitchen*
      iii. Access to lavatory and bath: *For kitchen worker, children, guest*
      iv. Direct access to basement and service quarter: *From kitchen, and upper floors*
      v. Adequacy of passages. For persons: *width, headroom, slope, safety of turns.* For objects: *furniture, pianos, stretchers, coffins*
      vi. Access to air and sun (porches, balconies, terraces, etc.). *From lower living quarters, kitchen service. From upper floors*
5. Mechanical services
   a. Utilities: *Ingress and grouping. Space for meters and examination*
   b. Plumbing, pipe, and conduit services: *Concentration and distribution*
   c. Heating. General heating: *boiler, fuel storage, chimney & f.p., humidification and atmospheric control. Hot water*
   d. Electric services: *light, radio, power consuming devices, etc.*
   e. Drainage of floors, areas, and surfaces
6. Considerations in relation to appendages: *porches, garages, areas, etc.*
   a. Circulation, outlook, light and ventilation interference
   b. Drainage and other considerations
7. Occupancy conditions
   a. Source of financing and length of tenure. (*Resale and re-rental probability; tenancy vs. ownership*)
      i. Effects on plan: *Standardization for short tenure, specialization for long*
      ii. Effects on quality of finish and detail
   b. Type of occupancy. (*Type of occupant*)
      i. Social and economic status. Size and organization of household. Types of intercourse and entertainment. Attitude toward groups or community enterprise in connection with maintenance, finance, etc. Racial background: *reflection in plan*
      ii. Personnel of household: *Children, servants, invalids, elderly persons, guests, roomers or transients*
   c. Multiple occupancy (*upper floors*)
      i. Access of secondary occupants to yards: *Walks and entrances, porch, roof or terrace; basement and service, laundry and laundry yard*
      ii. Maintenance of extra services and stairs

b. Local conditions and practices affecting plan

1. Customs, habits, public opinion. (*See Div. SI-D*)
2. Climate
3. Customary methods of production, management, etc. (*See Div. EI-B*)
4. Special conditions at site. (*See Div. AII-A-I-II-III-IV*)

c. Special problems of multi-family dwellings*

1. Non-apartment (group or flat) dwellings
   a. Legal: *Easements, fire-safety, etc.*
   b. Maintenance: *Porches, yards, walks and other features of common use*
   c. Harmonious use: *Soundproofing. Privacy of porches, etc.*
2. Planning of apartment types.* (*See also Div. AI-A-I-e & f*)
   a. The unit building
      i. Long hall vs. compact stair-hall
      ii. Freestanding units vs. "continuous perimeter" groupings
      iii. Basic building shapes: *the straight "link," the L, T, H, U and X*
      iv. Walk-up vs. elevator types
   b. Grouping and organization of buildings
      i. Desirable land coverage
         a. For economy: plan efficiency of low-coverage (garden) apartments
         b. For air and sunlight
         c. Height an essential factor in land coverage
      ii. Entrances and circulation: *use of courts and gardens*
      iii. Utilization of basement and roof
         a. Common services and storage
         b. Recreation and social gatherings
   c. The individual apartment suite
      i. Need for double-purpose rooms (*living-sleeping, cooking-dining, etc.*) means careful study and space planning
      ii. Increased difficulty of providing full amenity: *cross-ventilation, orientation, etc., for all suites*

* See Henry Wright's Analyses of Apartment House Problem, Architectural Record, March 1929, March 1930.

d. Construction and equipment of dwellings

1. Shell or general structure
   a. Foundations: *Footings, walls, waterproofing, subsoil, drainage*
   b. Exterior walls. Solid masonry: *types and materials.* Frame construction: *wood, steel, reinforced concrete, etc.*
   c. Floor and roof systems. Framing: *wood, heavy or light steel, reinforced concrete.* Slabs: *wood underflooring, woodboarding, concrete, gypsum, tile, etc.*
   d. Roof covering: *Sheet metal, tile, slate, wood shingles, asbestos shingles, composition*
   e. Chimneys. Flues: *boiler, fireplace, linings, clean-outs, ash dumps.* Fireplaces: *fuel, back hearth, hearth, proportions*
   f. Interior partitions. Solid masonry: *terra cotta, gypsum, etc.* Stud: *wood, metal, etc.*
2. Basic mechanical installations
   a. Heating and ventilation. Local: *fireplaces, wood, coal, gas, electric.* Central: *warm air, steam, hot water, gas, oil, coal, electric.* Comparative costs: *installation, fuel, operation, upkeep.* Insulation: *effect on comparative costs*
   b. Electrical: *lighting, telephone, radio, heating, refrigeration, door bells and openers*
   c. Plumbing: *amount and type of equipment.* Waste: *pipe, fixtures, sewage disposal.* Water supply: *pipe, meters, softeners.* Hot water: *pipe, heaters, storage. Gas*
   d. Air conditioning: *advantages, cost*
   e. Incineration: *fuelless type, fuel type*
3. Finish and equipment
   a. Windows and trim: *types, materials.* Glazing. Weather stripping
   b. Doors and trim: *types, materials*
   c. Wall finishes: *plaster (two coat, three coat), wall board, plywood, tile*
   d. Floor finishes: *wood, plastic materials, tile, etc.*
   e. Stairs. Carriage: *wood, steel, concrete.* Finish: *wood, steel, slate, tile, cement, etc. Handrails*
   f. Hardware: *materials, type locks, knobs, etc., master keys*
   g. Painting and decoration: *paint, enamel, lacquer, stain, plastic paint, wall paper, fabric, flexwood*
   h. Equipment
      i. Kitchen: *range, sink, drain board, laundry tray, refrigerator, cupboards and broom closet (stock or built-in), ironing board, clothes dryer, etc.*
      ii. Living room: *built-in furniture, door beds, bookcases, radiator covers, etc.*
      iii. Bathrooms: *closet, basin, bath tub, shower, floors, walls and accessories, medicine cabinet, mirrors, etc.*

(*Continued on page 511, column one*)

(SOCIAL AND CIVIC, Div. SIII-DI-d, *continued*)

2. Reading rooms, exhibition rooms, study rooms
3. Possibility of location in or with school buildings or community center
4. Administration: *By community, municipality or other agency*

e. Museums and galleries: *Permanent and temporary. Local or general. History, science, art. Possibility of location in schools, library or community center*

f. Theaters *(See Div. SII-BVIII, c, 1, 2)*

1. Little Theater: *Amateur or other*
2. Professional theater. Movies

g. Administrative offices and equipment. Civic center *(See Div. SIII-CII, a, 4 for possible departments or functions to be housed)*

1. Personnel, equipment, space and convenience factors for each department
2. Location factors
   a. Equipment to be centralized for correlation, coordination, economy of plant, planning interest
   b. Equipment to be located with respect to direct use by or for the community
   c. Desirability of separating or combining administration, social and educational centers

h. Stores. Commercial center *(See SII-BVIII, g)*

1. Determination of suitable number, size and kinds of store for given community
2. Architecture: *Construction by developer or control by developing company*
3. Restrictions *(See Div. SIII-E-IV)*
4. Location and grouping
   a. Classification by frequency and type of demand: *Convenience shopping services, specialty goods*
   b. Kinds of shopping center:
      i. Neighborhood shopping center
      ii. Community retail center
      iii. Regional shopping center
5. Specific factors which enter into store planning
   a. Buildings designed for specific use
   b. Adequate parking space
   c. Convenience of approach
   d. Grouping for convenience to shopper and retailer
6. Possibility of consumer's cooperatives

i. Offices and office buildings

1. Professional and business
2. Location depends on relative desirability of placing offices over stores or keeping business section separate from commercial section

j. Hotels and boarding houses. Dormitories

1. Transients, single workers, students, etc.

k. Clubs and private meeting rooms

1. Types of organization to be taken care of
2. Location
   a. Desirability of providing rentable space for them in public community buildings
   b. Desirability of keeping them separate from public community buildings

m. Industry *(See Div. SII-BVIII, f)*

1. Means of attracting suitable industries
   a. Sites near transportation, power, main highways
   b. Assurance of permanent well housed labor supply
   c. Reasonable site costs and taxes
2. Location with respect to community
   a. Convenience to homes of workers
   b. Avoidance of all possible nuisances
   c. Avoidance of location which necessitates workers from other neighborhoods traversing residential section of projected community
   d. Classification: *Heavy, light*
3. Control by community *(See Div. SIII-E-IV)*
   a. Zoning or other legal land use restriction
   b. Plan which leaves adequate space for growth

n. Transportation equipment

1. Stations, platforms, shelters, safety islands: *Number and location, with respect to needs of commuters, local workers, shoppers, etc. Architectural control*
2. Freight terminals, sidings, loading and unloading and storage facilities
3. Storage and repair space: *Yards, barns, trains, trolleys, buses, etc. Location to avoid nuisance in residential community*

II. SITES, PLANNING AND EQUIPMENT FOR OUTDOOR ACTIVITIES

a. Parks

1. General types *(See Div. AIII-C, XII)*
2. Landscaping, maintenance and equipment
3. Convenience and attractiveness of location with respect to: *Homes, schools, playgrounds, community centers, civic centers*
4. Provisions for maintenance: *Organization, labor, equipment, funds*
5. Income possibilities: *Fee system*

b. Playgrounds and playfields

1. Activities to be provided for *(See Div. SIII-CI, a-2)*
2. Location with respect to homes, schools, community centers
3. Provisions for maintenance
4. Equipment: *Shelters, grandstands, seats, refreshments, toilets, storage facilities*

c. Swimming pools, outdoor

1. Lockers, dressing rooms, showers
2. Location with respect to homes, schools, parks
3. Provisions for maintenance

d. Farming or allotment gardens

1. Likely degree of demand from specific people to be housed in projected community
2. Sheds for storage of tools: *Individual or in groups*
3. Location: *Walking distance, by automobile*

e. Outdoor theaters

f. Cemeteries

1. Chapels and administration buildings
2. Provisions for maintenance: *Public, private*
3. Location with respect to community psychology

g. Flying fields. Nearby buildings. Ground transportation

h. General planning to preserve outlook

i. General treatment of surrounding country

1. Paths and trails, lookouts, shelters, picnic grounds, camps
2. Control to preserve natural amenities

j. Transportation and utility rights of way

1. Location with respect to community: *convenience and economy, avoidance of nuisance*
2. Control of appearance: *Planting, etc.*

E. COMMUNITY SET-UP FOR ADMINISTRATION AND CONTROL

I. POLITICAL SET-UP

(*Continued on page 512, column one*)

(ARCHITECTURE, Div. AIII-CII-d, *continued*)

iv. General equipment: *mail boxes, awnings, screens, blinds, shades, dumbwaiters, elevators, telephones*
i. Refrigeration: *ice, electric, gas*
j. Insulation: *heating, house, sound deadening, acoustical correction*

e. Cost of construction as affected by:

1. Size and type of operation
2. Standardization of plan elements, of building operations
3. New materials, processes and equipment

f. For the provision and general planning of buildings other than dwellings: ***See Community Equipment, Div. SIII-DI***

III. GROUP AND SITE PLANNING

a. Disposition of buildings in relation to:

1. Desirable coverage
2. Orientation and penetration of sunlight
3. Open spaces: *public and private*
4. Circulation
5. Method of servicing for heating, etc., and preservation of natural features
6. Appearance
7. Grading, utilities (*See Div. AIII-C IV*)

IV. SITE DEVELOPMENT: general

a. General rough grading: ***cut and fill, amount, disposition of surplus***

b. Utilities: ***location in relation to proposed final grades***

1. Streets and roads
2. Buildings

c. Lot subdivision of property, in relation to

1. Functional requirements
2. Type and requirements of house plans
3. Facility in marking boundaries

d. Yard grading, etc. ***(See Div. AIII, C-XIII for detailed yard work)***

V. CIRCULATION PLAN (roads and paths)

a. Factors determining type of layout

1. Topography: *steep grades and drainage*
2. Existing or mapped streets on property
3. Connection with street plan outside development
4. Type of development. Economic groups served, type of housing, other features such as shopping or community center
5. Safety, quiet, convenience
6. Proposed use of various roads and paths
7. Economy of development (considering not only costs of roads and paths, but most efficient use of land and total cost of development)
8. Needs and costs of maintenance
9. Legal and governmental restrictions

b. Classification of means of circulation: ***Arterial highways. Boulevards and parkways. Secondary roads. Turning spaces. Sidewalks and paths: as part of or parallel to street, or separated (as at Radburn) for safety and convenience. Local residential roads or lanes: through ways and dead end***

c. Cross sections: ***Total width. Width of various elements: vehicular road for passage and parking, foot paths or sidewalks, planting space or margins. Set-back of buildings***

d. Construction: ***Foundations, top surface, curbs***

VI. WATER SUPPLY

a. Agency supplying ***(for existing conditions see Div. AII-A, I, d, 2)*****: Governmental: regional or local; developing company; public service corporation**

b. Sources of supply

c. Quality. Expert analysis: tests; hardness; safety from pollution

d. Quantity. Existing supply; additional possible future sources

e. Pressure

f. Water mains

1. Location with regard to installation and use, highways and other utility plans
2. Size, depth, control valves

g. Building connections

1. Independent or joint laterals
2. Sizes
3. Time of installation

h. Public uses

1. Hydrants: *Location in regard to use and convenience of circulation and parking, fire protection, street cleaning, etc.*

VII. SEWAGE DISPOSAL: Sanitary drainage

a. Scope of problem may be:

1. Connection with existing main lines of sewers in streets and existing sewage disposal plant; (*See Div. AII-A-I-d-a*) or, installation of new lines and new disposal plant
2. Capacity of trunk lines in relation to needs of industrial, office building, apartment house and other areas

b. Agency for installation and management

1. Government; *regional or local;* public service corporation: developing company

c. Type of system

1. Combination or separation of sanitary and storm sewers
2. Sewer mains at both sides of wide boulevards or highways to avoid long connections and street openings

d. Disposal Plant: ***Location, requirements, nuisance factor, method of treatment, final discharge of effluent***

e. Sewers

1. Main lines: *Depth and sizes. Location. Grades. Expense of opening up streets for future changes in relation to house groups and to length of connections from houses. Catch-basins, man-holes, drains. Intermediate pumping stations. Force mains*

f. Possible economies over ordinary practice

1. Connections prepared for future branch lines
2. Branch sewer serving group of houses (one connection to main sewers), common English housing practice
3. Temporary disposal plant to serve partial development, or a progressive series of such
4. Cesspools or septic tanks: *generally temporary expedient. Costs to be checked against immediate installation of all or part of ultimate system. Consider subsoil and ground-water conditions*

(*Continued on page 512, column two*)

a. Degree of possible political control within community *(See survey made under Div. SIII, A)*

b. Local government departments to be either set up by community or coordinated with community organization *(See Div. SIII-C-II, a-4)*

c. General type of local government, if to be set up by new community

1. To be decided after consultation with groups or people particularly interested: *Public, private, business, industry, social, prospective residents*

II. COMMUNITY SET-UP

a. Degree of identification with political organization

b. Kinds of community administrative organization: *voters, cooperative, etc.*

III. SET-UP OF DEVELOPING COMPANY IN RELATION TO ABOVE

a. During development

b. In early stages of community

c. After community is complete and running smoothly

IV. CONTROL OF COMMERCIAL ACTIVITIES

a. By ownership and rental of buildings

b. By ownership of land

c. By private restriction or zoning

V. OWNERSHIP OR MANAGEMENT OF NON-COMMERCIAL ACTIVITIES

a. By developing company, municipality, community organization or trust organization for community

b. Possible division into departments and committees

1. In general: *Construction, administration, upkeep, promotion, program organization, supervision*

c. Possible cooperative commercial undertakings, for revenue or for saving to consumers

1. Shops: *Food, etc., restaurants, tea rooms, cafeterias, food preparation, hotels or boarding houses, public utilities, amusement parks.* Services *(See Div. SIII, CI, a, 9, b)*

VI. MEANS OF FINANCING ACTIVITIES: Equipment, upkeep

a. Charges according to use. Fee system

b. Taxes *(See Div. SIII-CIII, c)*

1. Inclusion in rental charge, if houses remain in community ownership
2. Municipal taxes

c. Degree of financial assistance expected from: *Federal Government, State, municipality, cash contribution of residents, philanthropy*

1. Period over which such assistance may be expected

d. Permanent budget

VIII. SEWAGE DISPOSAL: Separate storm drainage

a. General surface

1. Determination of watersheds
2. Disposal into streams, ditches, swamps, artificial pond, natural gulleys, dry wells
3. Right of use of existing culverts, of flooding adjoining property, or of augmenting existing flow through adjoining property

b. Permeability of soil and local run-off factor from unpaved surfaces. Ground water level. Lowering of ground water level

c. Extent of gutter drainage possible

d. Pipes: *Size, location, depth*

e. Appurtenances: *Inlets, catch basins, basin manholes, manholes, gratings and heads for curb-gutter drainage, gutter, walks, etc.*

f. Roof drainage: *into dry wells (possible common dry wells); onto lawn; onto walk, road, driveway, through curb; into storm sewers*

g. Footing drainage

h. Cellar floor, areaway and window areaway drainage

IX. ELECTRICITY

a. Scope of problem, as limited by existing conditions

b. Agency for installation and management: *Government, regional or local. Public service corporation. Developing company*

c. Source of supply

d. Connection outside property

e. D.C. or A.C. Cycles, voltage

f. Kind of installation: Transformers, location. Poles or underground conduits. Separate or group house service connections

g. Location or equipment in relation to buildings: *Roads and other public utilities and their installation; rights of way: public and private*

1. Legal restrictions
2. Appearance
3. Public lighting: *Location, adequacy, kind of standards (nuisance if directly opposite bedroom windows)*

h. House connection: *Type of equipment. Location*

X. GAS (follow check list under *Electricity, Div. AIII, C-IX-a, b, c, e, g, h*)

a. Possible future use of gas for heating

XI. TELEPHONES (follow check list under *Electricity, Div. AIII, C-IX-a, b, d, f, g, h)*

a. Public telephones

XII. PARKS

a. Purpose (classification): *Decoration or beauty; ventilation and sunshine; protection from noises and other objectionable features; recreation; gardens*

b. Landscaping *(See Div. AIII-C-XIV)*

c. Preparation for: *Care, watering mains, hy-*

(Continued on page 513, column one)

(ARCHITECTURE, Div. AIII-CXII-c, *continued*)

drants, sprinkling systems, springs, wells, drainage

d. Paths and roads *(Div. AIII-C-V)*

e. Lighting *(See Div. AIII-C-IX)*

f. Accessories and buildings: *Seats, fences, bridges, underpasses, waste paper receptacles and incinerators, arbors, pergolas, garden houses, toilets, restaurants, tool houses*

XIII. YARD WORK

a. Disposition of plan: *Elements*

1. Walks and drive
   a. In relation to services and access (*See Div. AI-A-I-d, Div. AIII-C-V*)
   b. Width, construction, pitch for drainage
2. Service yards: *Laundry yard, kitchen yard, etc.*
   a. In relation to privacy and appearance
   b. In relation to access and circulation
3. Yard equipment: *Ash and garbage receptacles, laundry dryers, refuse burners, outside mail boxes, lanterns, fences and gates, pergolas or seats, playhouses, etc.*
4. Grading in relation to dwellings and other plan elements
   a. Pitch of ground from building foundation
   b. Pitch of walks and drives
   c. Terraces, steps and retaining walls
   d. Grading in relation to porches, areaways and other appendages
   e. Sequence of work (*See Div. AIII-D-IV*)
   f. Also see Drainage (*Div. AIII-C-VII-VIII*)

XIV. LANDSCAPING

a. General considerations:

1. Program of work
   a. Over a period of years
   b. Detailed program for current year
   c. Coordination with work of site-planner, engineer, architect, etc.
   d. Approximate budget, and rough allocation to public and private areas, current and deferred work and percentage of initial cost necessary for upkeep for one year after planting
2. Topographic conditions (*See Div. AIII-AI, II*)
   a. Areas of cut and fill, terracing, etc.
   b. Preservation of trees, other land marks
   c. Preservation or purchase of top soil
3. Emphasis of group effects, vistas, and focal points of landscaping
4. Climatic, atmospheric and soil limitations

b. Landscaping of public and semi-public spaces

1. Planting disposition for special areas
   a. General parks, plazas, etc.
   b. Play areas: *adults' and childrens'*
   c. Street borders (*street trees, curbs, etc.*)
   d. Monuments, shelters, seats, walls, artificial pools, etc.
   e. Borders and shade for walks
   f. Parking areas, shade and surfacing
   g. Planting as markers for boundaries
   h. Windbreaks and visual screens
   i. Terraces and steep slopes (*preventing erosion*)
   j. Banks of ponds, streams or other water
   k. Easements
2. Factors in plant selection: *trees, shrubs, hedges, vines, flowers, bulbs*
   a. Physical and chemical character of soil
   b. Areas of total shade, areas exposed to winds, to reflected heat
   c. Amount of soot and gas in air
   d. Foliage effects, flowers, fruits
   e. Heights and shapes when mature
   f. Seasonal planting of certain varieties and immediate effects vs. permanent growth
   g. Comparative cost of evergreen vs. deciduous stock
3. Lawn areas
   a. Seeds, sods or stolons, depth of soil, character of subsoil
   b. Quality and cost determined by utility
   c. Effect of size and shape on maintenance charges in parks and squares, private lots, sod strips along streets
4. Cost estimates and planting schedule
   a. Contract vs. "cost plus"
5. Problems and policies of maintenance of laws and planting
   a. Cost borne by whom? How administered?
   b. Physical equipment: *water outlets, tools, trucks and equipment, storage and upkeep*

c. Landscaping of dwelling plots

1. Harmonious planting of dwelling unit in group
   a. Variety by contrast between group units
   b. Planting to emphasize vistas, architectural masses and layout of unit groups
   c. Planting to provide privacy for porches and service utilities
   d. Planting to provide shade and wind shelter
   e. Planting used to mark boundaries of plots
      i. Staggered each side of property lines
      ii. Shrubs and trees when mature must never obstruct visibility along motor lanes
2. Responsibilities
   a. Installation: *by development company; by occupant; degree of control and assistance by the company*
   b. Replacement of unsuccessful planting
   c. Upkeep: *by owner or occupant; regulations and enforcement of spraying and pruning; special problems of easements*

XV. RECREATION: places, outdoor. *(For full check list, see Div. SIII, C-I-a-2, and C-II)*

D. CONSTRUCTION AND FIELD OPERATIONS (See Div. AIII, B-I, II)

I. ORGANIZATION OF ENGINEERING DEPARTMENT TO PROVIDE:

a. Plans: *General utility maps and details. Grade and surface drainage plans (See Div. AIII-CVIII)*

b. Designs: *Sewers and sewerage disposal. Sections of roads and utility locations and connections to construction. Mechanical layout of plumbing, heating, lighting, special features such as refrigeration, radios, sprinklers, irrigations, wells, etc. Engineering construction such as bridges, swimming pools, etc.*

c. Estimates and costs of engineering and engineering construction

II. SECURE FROM ARCHITECTURAL DEPARTMENT:

a. Plans and working drawings: *Group plans. Construction plans and elevations for various types of buildings. Architectural detail drawings. Standard layouts for kitchens and baths. Building permits. Construction specifications*

b. Plans for landscaping and planting

(*Continued on page 514, column one*)

(ARCHITECTURE, Div. AIII-DII, *Continued*)

III. ORGANIZATION OF CONSTRUCTION WORK

a. Estimating and cost keeping

b. Purchasing

c. Auditing: *accounting, payrolls, statements, payments, inventories*

d. Office administration: *Stenography and files for letters, quotations, contracts, orders, catalogs, general data, plan files.* Insurance: *fire underwriters, certificates for wiring and fixtures, accident reports, fire loss reports*

e. Drafting: *engineering and mechanical studies; standard details; framing plans; equipment and plant layouts; progress plans and charts*

f. Field construction force and equipment

1. Superintendents, timekeepers, material clerks
2. Foremen
3. Mechanics and labor
4. Separate and sub-contractors
5. Tool and equipment storage and force; repair force
6. Material storage and shop, with force
7. Watching and policing force
8. Transportation force: *Teams and stable; trucks and garage; railroads*
9. Gardening and landscape superintendent, foremen, labor force, equipment

g. Finishing and service force: *their work*

1. Inspection of construction work at time completed, by construction force
2. Cleaning and maintenance of completed construction before occupancy. Temporary heating before occupancy
3. Decorating and fitting up for occupancy; minor alterations for occupancy; reconditioning
4. Check-up with occupant at time of occupancy
5. Complaint from and adjustment with occupants
6. Storage of fittings and materials used

h. Supervision: *By architect, general superintendent, inspectors*

i. Coordination with:

1. Architects and engineers
2. Sales and rental departments: *Demonstration dwellings, special occupancy requirements*
3. Local authorities: *Plumbing and sanitary inspectors and departments; building inspectors and departments; union officers; utility authorities; municipal, county and state highway departments; fire underwriters, fire and liability insurance companies, fire department; police department; state labor department*
4. Title and mortgage companies involved
5. Local building employes' organizations

j. Reports to executive authority of the company

1. Budgets and estimates, progress, costs, general and comparative reports and costs

k. Use of mechanical equipment in the field

1. Steam shovels, trenchers, etc.
2. Trucks, narrow-gauge railroads
3. Central or portable saw-mills, concrete mixers, pipe-fitting equipment, etc.

IV. GENERAL SEQUENCE OF WORK

a. Recorded by progress charts or schedules, field reports, progress photos

b. General clearing and grading: *site work and roads*

c. Installation of utilities: *sewerage and drainage system, water, gas, electricity, etc.*

V. ESTIMATING AND COST KEEPING

a. For budgeting

b. For distribution of charges of utilities and general improvements among individual units

c. For fixing rental or selling charges *(See Div. E-II-H, I)*

d. Uniformity in manner and form of keeping records

1. Importance in building up information

e. Records of periodic prices and variations of all stable items of costs, labor rates, fittings, etc.

f. Periodic statistical information

1. Ratio of labor and materials to whole cost of any particular type of unit
2. Periodic costs for each type of unit: *per cubic foot, per square foot, per occupants, per room*

VI. CORRELATION OF CONSTRUCTION AND RESEARCH

a. Pre-fabrication and shop assembly

b. New materials and methods: *structural materials, finish materials, protective materials (water-proofing, fire-proofing, sound-proofing, etc.), mechanical and service equipment.*

c. Cost anaylsis

SIMPLIFIED PRACTICE FOR
DRAFTING ROOM EFFICIENCY

BY

PRISCILLA OGDEN DALMAS

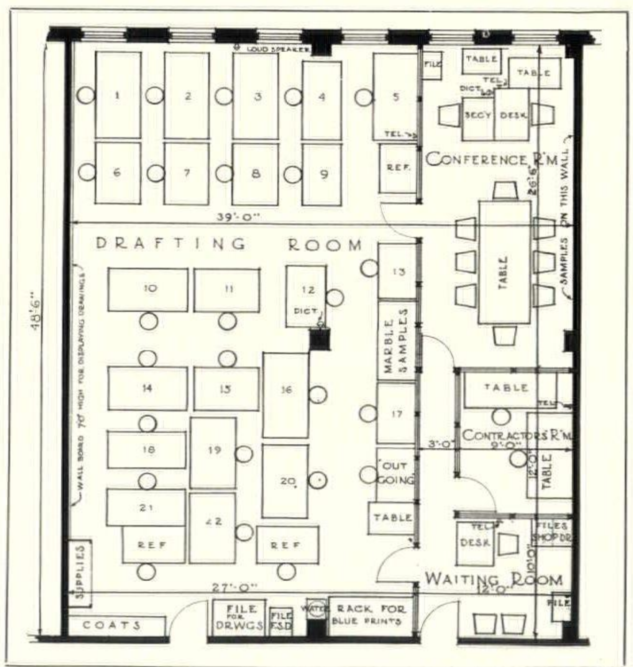
MILLION dollar skyscrapers indicate unusual procedure in the drafting room. In the successful design of such a project every effort must be made to keep the office overhead down and to expedite the execution of the work. Although the design of a skyscraper is not an every day occurrence, many of the methods devised for handling such jobs can be used to advantage in the case of any modern building. The following notes explain several devices of office management that have proved effective in keeping profits up and costs down in the drafting room.

The Office Layout. In the drafting room itself the *sine qua non* of progress is the free circulation and easy accessibility of authentic information. Just as important is the concentration of energy with its consequent elimination of diversion and confusion. Any job that is big enough to warrant a filing system of its own should be segregated from the other parts of the office, and desks, drafting tables, filing cases, etc., should be arranged to constitute in effect a private office for the particular job at hand.

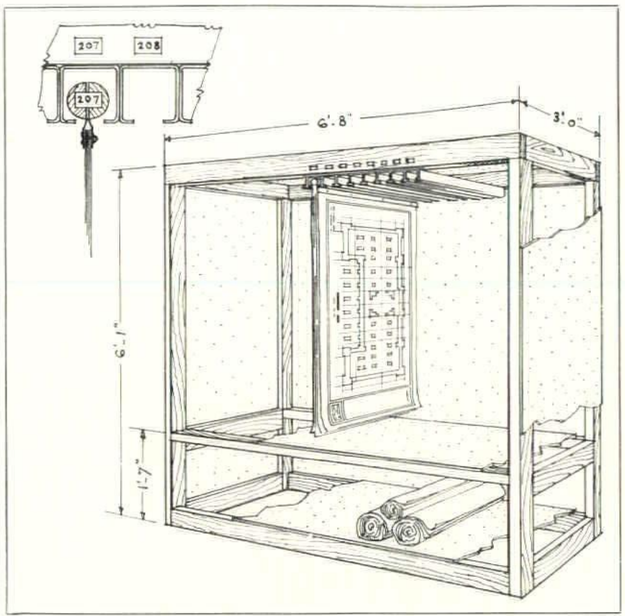
A study of the plan (which, in this case, was laid out for the design of a metropolitan skyscraper) will indicate the possibility of eliminating lost motion in having every part of the office routine within its own small sphere of activity. The idea makes for close and easy supervision of the job by the executive in charge, close contact with outside agencies, and saves much time in the distribution of authentic information.

Organization of Personnel. For operations too large for a single job captain to manage — no longer extraordinary — the best means yet devised for efficient executive direction is to divide the authority among three men. One of them acts principally as the architect's representative and conducts all meetings with owners and builders. He writes outline specifications, handles all correspondence and signs all subcontracts. The second is responsible for design throughout the building and for the assignment and supervision of architectural work in the drafting room. The third has charge of the mechanical and engineering details and of their correlation with the architectural work. He supervises the recording, checking, and routing of shop drawings. These three men cannot function without constant cooperation, of course. But by making the separation of their jurisdictions definite, the work will be more thoroughly supervised and will move more smoothly. All three executives have to collaborate with the specification writer and later on with the outside superintendent.

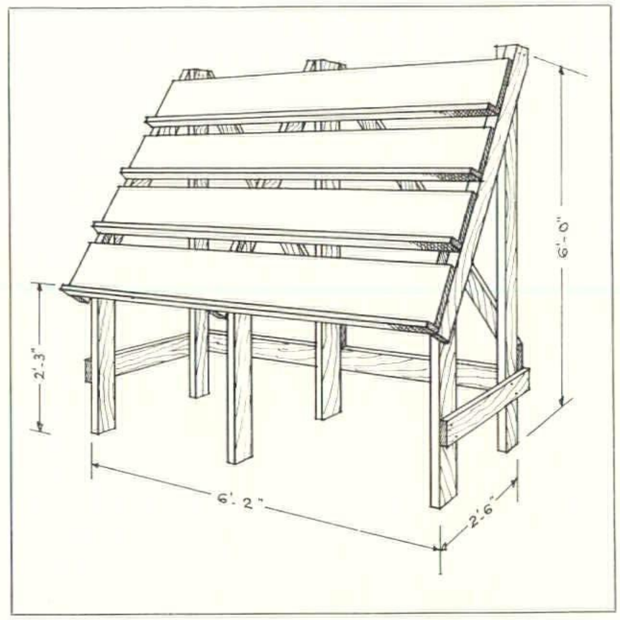
The draftsmen may be divided roughly into three groups: for plans, design, and shop drawings, distinctions which are merged and altered as the work progresses beyond the small scale stage.



The layout of the portion of the office of Cross & Cross used for the City Bank Farmers Trust Company building job. Note the efficient arrangement of the Conference and Contractors' Rooms, the files and sample racks



Sketch of rack for bound blueprints with detail of hanging device, suitable for filing current job sets. The sheathing gives additional stiffness



Sketch of samples rack. This rack will accommodate forty standard size marble samples and is also suitable for displaying samples of wood finish

Drawings and Prints. From the point of view of expediting the job, as well as from that of office overhead, the problem of the drafting room is to reduce the number of drawings and also the time spent on each drawing to a minimum. On a large job it is economical to have standard size sheets printed with border and title, similar to that shown in the accompanying illustration. This set can be used for practically every type of architectural, mechanical and engineering drawing, and the inclusion of general notes at the end of the sheet makes for a quick reference of revisions, additional information, and contemplated changes.

The following system for designating drawings saves time and prevents confusion not only in referring to the different sheets but also in ordering sets of prints for different trades.

Number all sketches SK-1, SK-2, etc., and keep the drawings filed flat in numerical order. This series will continue on some buildings throughout the entire course of the job and the SK designation is a practical means for keeping track of sketches that are not part of the sets in regular circulation.

Number all general drawings G-1, G-2, etc. These drawings in ink on cloth comprise 1/8 in. scale working plans and elevations. So long as the drawings are in constant use space and time may be saved by keeping them flat on a table or in a drawer.

Tenant Drawings. All work not included in the general contract but planned subsequently for tenants, should be shown on a separate set of plans. A set may be made with cloth litho prints from the original "G" drawings by altering the titles to read T-1, T-2, etc. These litho prints are very similar to original ink drawings on cloth, will erase easily, are clear and durable and may be blueprinted.

Scale details numbered S-1, S-2, etc., for convenience in filing should be made on standard size sheets, on cloth if they must bear much handling. This series comprises all exterior and interior details and where it is likely to consist of a large number of drawings a further classification should be made. They may be divided into groups, as: A — exterior details, B — utilities (1/4-in. scale part plans showing elevators, electric closets, etc.), C — stairs, D — special interiors such as corridors, toilets, vaults, etc. This may actually effect an economy of time, as frequently there is need for referring to an entire group exclusive of the others. "S" drawings are best filed flat in folders according to groups.

Full size details number D-1, D-2, are best made on paper of uniform width, say 42 in. wide, and varying in length. They should be kept flat on a table until issued and then may be folded and filed in a legal size file.

Blue print lists of each classification should be posted in the drafting room in numerical sequence. Cross-reference lists may also be posted giving titles and numbers of groups of drawings by subject, which might not be in numerical sequence.

If the mechanical and steel designing is done in the office, separate drawers should be provided for the drawings of each. If it is done outside, the bound sets of prints can be kept in the rack.

The detailing of woodwork may be materially reduced by making large scale details to show the general intention of the design and confining the full size drawings to profiles. This puts the burden for complete elevations and full size details showing the proper construction on the wood-worker whose shop drawings may be checked in the architect's office. The same procedure might be recommended for some of the other trades. The success of this procedure, however, will depend upon the technical excellence of the contractor's organization which in this case will become an important factor in the award of a contract. If this system of large scale details is used, a projection machine included in the drafting room equipment is useful for enlarging them to full size for study and for working details.

Schedule Sheets and Lists. The well-known door schedule principle may be applied with equal profit to other quantity installations that are repetitive with minor variations. The checking of all correlated trades, all shop drawings and quantity lists is greatly expedited by having data accessible in such form, and duplication of error is thereby prevented. The illustration shows a typical floor data schedule. Other schedules which have proved practical are:

Stair risers — height and number of risers for each floor.

Elevators — speed, stops, and total run.

Doors and bucks.

Pneumatic tube stations — size, number and location.

Electric clocks — size, type, finish, number, and location.

Annunciators — location, number, and size.

Directional signs — location, size, and inscriptions.

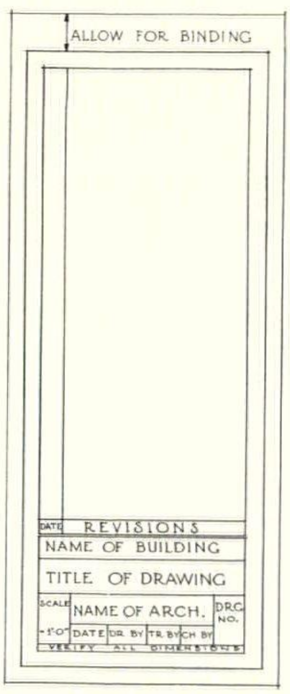
Drinking fountains — location, size, color and number.

Ventilation and radiator grilles.

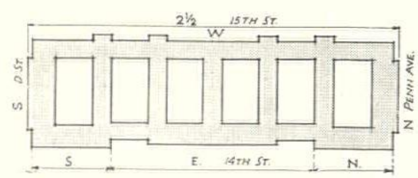
Lighting fixtures.

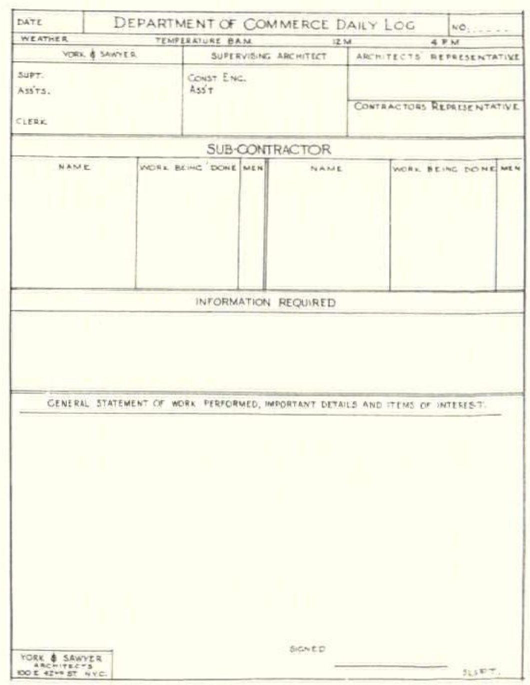
Change Orders and Revisions. Except on the plainest type of commercial building, revisions to the general drawings are usually numerous. As soon as the architect is informed regarding a change of any kind, he should issue typed instructions to the job executive. If the direction of the work is divided as suggested each executive should receive a copy so that he may make the necessary changes to the drawings and, in the event of an important revision, transmit the information to the superintendent on the job.

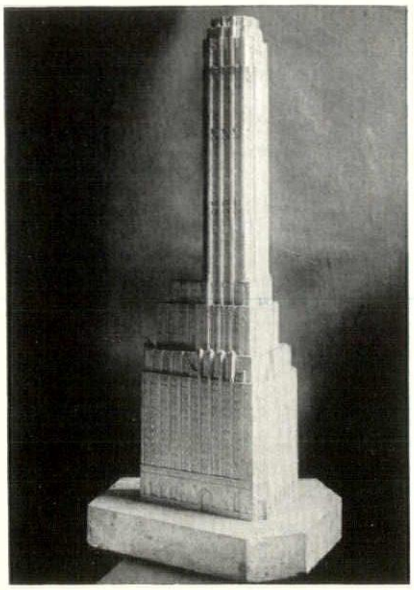
The keeping of revision records will avoid the excessive cost and the liability to error inherent in many sets of prints. It is merely a duplicate record of the revision notes completed in the boxed columns on the original drawing and is reissued each time a revision is made. Its operation may be indicated thus: When the electric push buttons are added the revision record sets are sent to the general contractor, who orders prints for those trades which are directly concerned with this item.

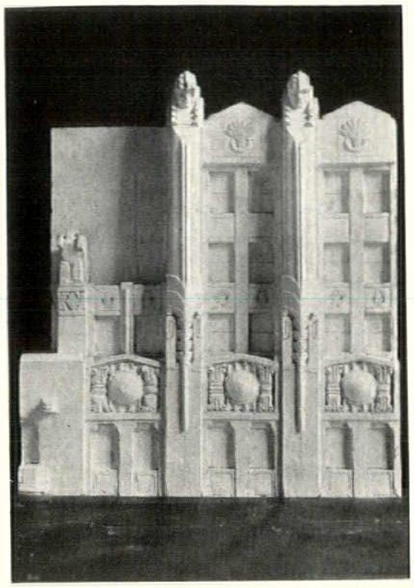


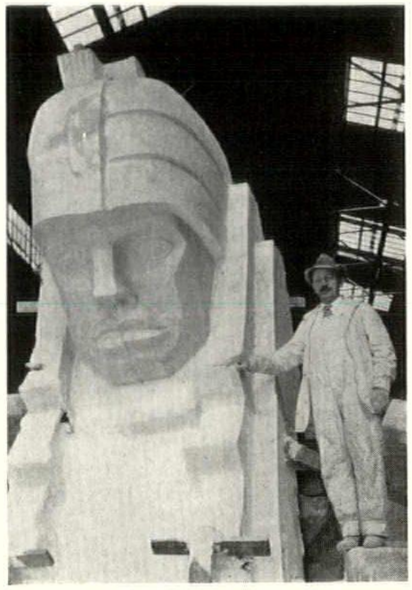
At the left is a record for revisions on the contract drawings. It is issued in duplicate in place of a revised drawing. Below is a detail of a key plan stamp used by York & Sawyer on the Department of Commerce job. Each detail drawing was stamped and its location indicated by a mark on the key plan. At the right is a daily log used by York & Sawyer on the same building. Filled out each day, they afforded an efficient record of the progress of the job



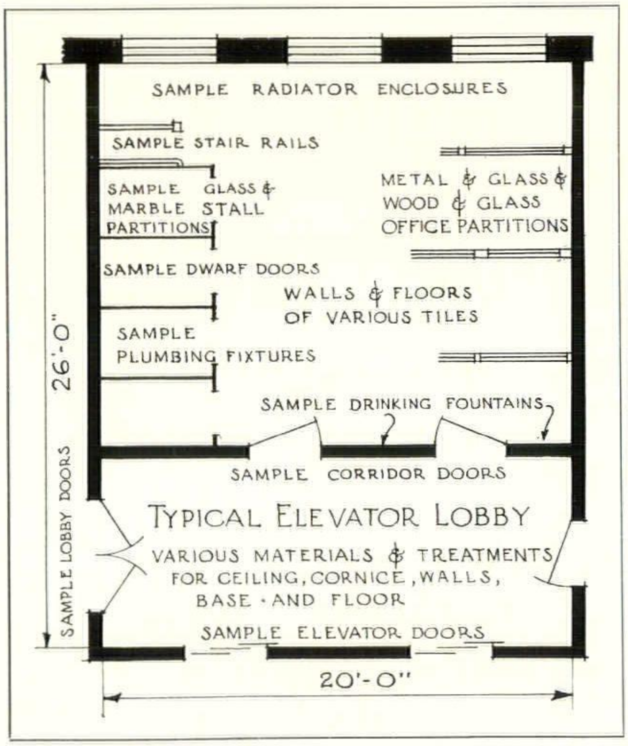








The three illustrations above are of models used by Cross & Cross for the City Bank Farmers Trust Company building. They show how the design was studied in three dimensions to keep pace with the drafting room details. Below is a plan of the samples room provided by the George A. Fuller Company in connection with the City Bank Farmers Trust Company building. It gives a visual check on specified materials and helps in obtaining quick dispositions



Set-up Samples Room. On a large job many decisions regarding material and equipment may be expedited if a separate room is used for the various contractors for sample installations. Where large orders are involved, it is to the interest of the general contractor and his subcontractors to show the materials for interior finish floor materials, toilet partitions, etc., so that the architect may justify to his client the specification of a particular kind of product or installation. Although not applicable for a small project, the saving in both time and expense is obvious in a large job.

Models. A justification for models is two-fold. From the client's standpoint they show a building project in a form which can be easily visualized, free from the convention of elevation or perspective drawings even though the model may be a plasterline sketch, incomplete in detail. From the architect's standpoint, the model furnishes a three-dimensional study of the progressive stages of the job and enables him to coordinate mass, scale detail, and full size cast as they develop in a logical order from a sketch.

Various materials may be employed besides cardboard or plaster. Plasterline is easily and quickly modeled and wooden blocks cut to the scale of various parts of a building envelope may be used to determine mass. It is even possible to employ thin sheets of aluminum in the study of wall surfaces or in indicating a contrast in material. Finished models made of such material are much more durable than cardboard and require no more craftsmanship to construct.

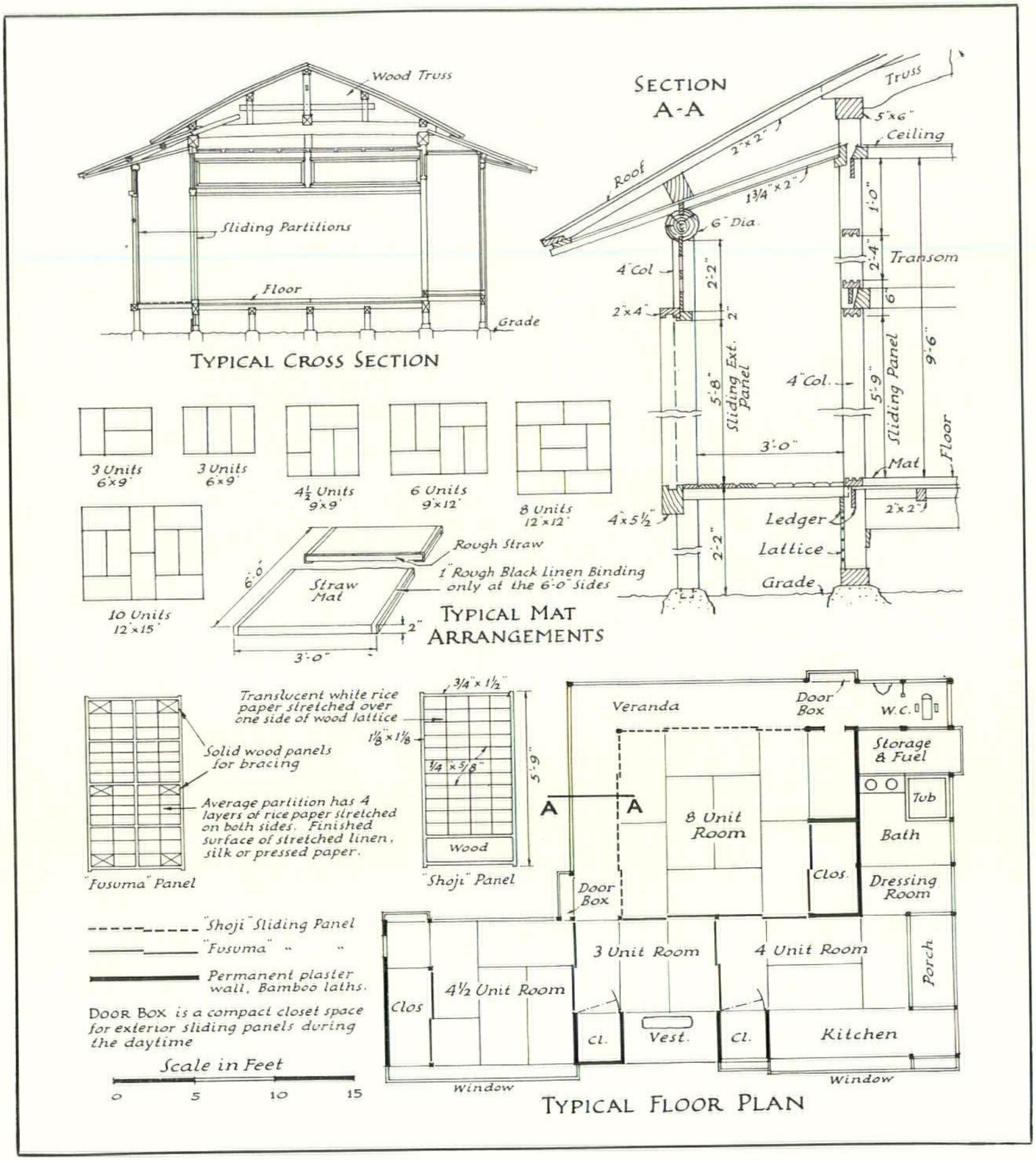
Aiklee, Courtesy of "Fortune"

THE HIGH COSTS OF HOUSES

COSTS — the terror and despair of the building industry — must be reduced. Despite many pleasant theories of structure and design, a confusion of building practices and the lack of cooperation between the gentlemen who labor combine to keep costs high. In the following pages Robert Tappan, well known for his investigations in this field of wide endeavor, presents one practical advance in the war against high prices. He knows whereof he speaks and his construction plans are laid on the foundation of a wide practical experience

THE FORUM OF SMALLER BUILDINGS

ILLUSTRATIONS OF FOUR SMALL CALIFORNIA HOUSES WILL BE FOUND ON PAGES 477 TO 488 INCLUSIVE



JAPANESE HOUSE CONSTRUCTION

THE Japanese have employed the principle of unit design for centuries. The illustrations above show a few typical details of a Japanese house, many of which, although unusual in American practice, might well be adapted advantageously to small house planning and construction. The dimensions of the plan are determined entirely by the arrangements of straw mats, and the construction details are largely standardized to conform with the resulting room sizes. Lumber and paper are used largely for the partitions, and plaster, tile and brick are used sparingly and in some instances not at all. The chief differences between Japanese and American methods of construction lie in the adaptability of the house and in the lightness of the structure

REDUCING HOUSING COSTS WITH PREFABRICATED BUILDING UNITS

BY

ROBERT TAPPAN, ARCHITECT

FOR five years I have studied steel housing intensively. The fire-safe possibilities of steel skeleton construction have spurred me into efforts to devise ways and means to produce individual homes of steel construction that would cost little or no more than those of ordinary wooden materials. Schemes were based upon the use of simple, standard structural shapes combined with many varieties of standard materials. A half-dozen structures were completed. But as yet to no avail. The home building industry, if one may call it that, has not seemed ready for these developments. Lending institutions, insurance companies, trade unions, building contractors, and prospective home owners have shown incredible inertia.

I have decided, therefore, to take up again the task of continuing to perfect the unit design and shop fabrication theory as applied to homes of wooden construction. The shortcomings of wood are thoroughly understood and easy to guard against. While less permanent than masonry, a well-built wooden house will too often outlast its usefulness. Our rapidly changing standards of living already have made thousands of American wooden houses obsolete. Many excellent household devices for comfort and labor saving are installed in the cheapest speculative houses; in fact, speculative builders place more accent upon unnecessarily elaborate equipment than upon good construction. As a result, the innocent home buyer is too dazzled by the contents to question the worth of the container.

Unit Design. The object of the unit design theory is to put the shell of the house on a par with its contents. Unit design permits fabrication. Unit fabrication lowers costs by reducing waste of materials and labor. Unit fabrication, however, can defeat itself if the units are too large or bulky for economical handling and transportation.

The idea of combining unit design and shop fabrication is an adaptation of Japanese house construction methods. The poverty of the masses forced Japanese builders to invent many interesting methods of design and construction. Some of these methods are applicable to our own housing problems. For centuries Japanese homes have been planned in units and the designer never bothered to prepare elevations or details. A unit floor plan showing the desired arrangement and size of the rooms was all that the builder required.

The unit of the Japanese floor plan is the floor mat of straw, about 3 x 6 ft. in size and two or three inches thick, with sharp, square edges. The dimensions have not varied for centuries. These mats fit so closely together that the floor they rest on is completely concealed. The rooms are square or rectangular and are planned with absolute reference to the number of mats that they contain.

In Japanese houses architectural embellishment, as we know it, is conspicuous by its absence, there being little or no attempt at ornamentation. Many features that go to make up the usual American dwelling are absent: no front door with pretentious display, no permanently enclosed rooms, a minimum of movable furniture.

Walls and Partitions. One of the chief points of difference in a Japanese house, as compared with ours, is in the treatment of partitions and outside walls. In our houses these are solid and permanent, and when the frame is built it forms an integral part of the structure. In the Japanese house, on the contrary, two or more sides of the house have no permanent walls. Within, also, there are but few fixed partitions. In their stead there are lightweight sliding screens that run in appropriate grooves in the floor and overhead. There is no cellar or attic, and there are no windows as we know them but light is diffused throughout the whole house by means of translucent exterior walls and partitions.

The structural walls, though generally of unpainted wood, are sometimes of stucco, white or dark colored. In some buildings the fixed exterior walls are tiled. The roofs are of moderate pitch, shingled, tiled or thatched. Nearly every house has a porch protected by an overhanging roof, and in some of the better class houses there

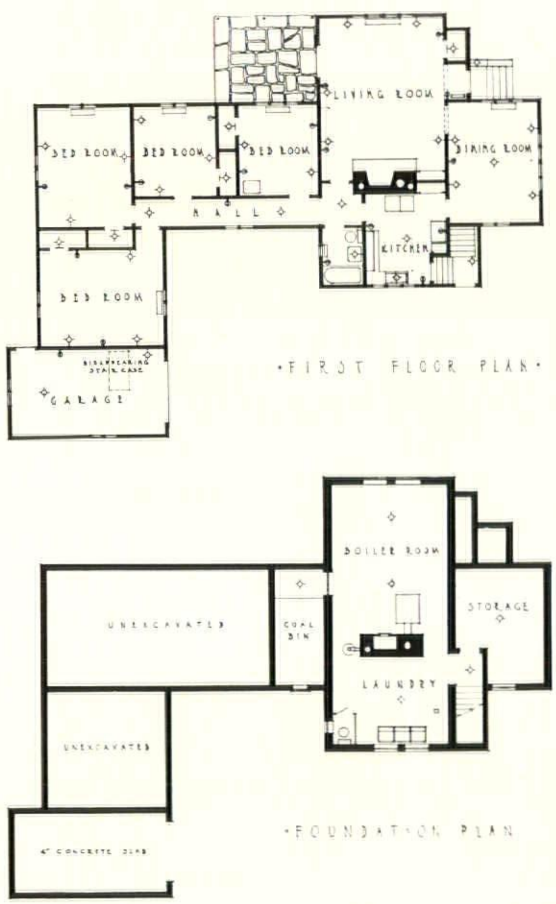
A house at Sea Cliff, L. I., built by the ready-cut method described in this article. The plans are shown below. The panel units together with the manner of their installation were designed by Mr. Tappan who has applied for a patent on the system

is a definite entrance vestibule; however in houses of the simpler types one may enter from almost any point.

During the past fifteen years I have had several opportunities to experiment with adaptations of the ancient Japanese method of unit design and construction with significant results.

Unit Houses at Montauk. A few years ago, at Montauk, Long Island, I set up a group of stuccoed cottages to form the nucleus of a workingmen's village. The cottages were fabricated in Forest Hills and shipped by truck to the job. On an appointed day, five carpenters started to assemble a two-family, semidetached house, and by three thirty in the afternoon two slaters were putting on the roof. In another day we were ready for stucco and plaster. The windows and doors were protected with sheets of Celotex and the stucco was shot on, in two coats, in less than four hours. The second coat was a flash coat of colored stucco, about $1/16$ in. thick, so completely imbedded in the damp first coat that after five years it is still in remarkably good condition. In spite of minor difficulties we succeeded in assembling these houses, ready to live in, in six working days, at costs that averaged about $525 a room. These cottages were designed for year-round occupancy.

Construction of Units. At Forest Hills, the wall units had been made by four carpenters working at two simple jigs. The ready-cut studding was stacked nearby, and as fast as the pieces were set in the jigs they were spiked together. No toe-



nailing was necessary — in fact, all studding was literally doweled together. As soon as the frame work was assembled, a sheet of Celotex was nailed to the surface. Window and door frames were ready to drop into place, and I found that 70 to 80 panels represented an easy day's work for four men. All doors were fitted and hung while the panels were flat on the bench. The men worked under shelter, unhampered by weather conditions. The key letters were stenciled on all four edges and the units were stacked to await shipment.

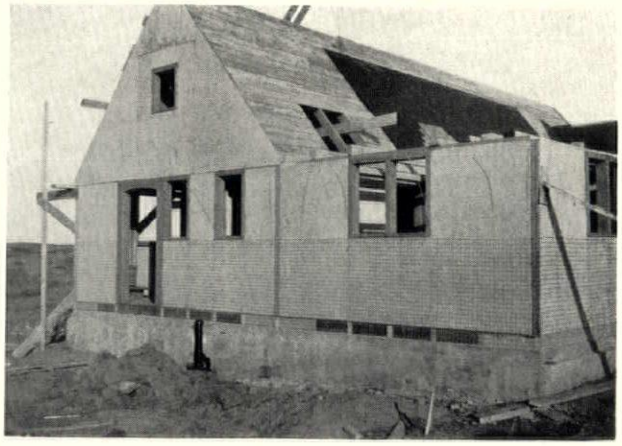
Foundations. The foundation walls were of concrete, poured into trenches. The trenches were just the width of a shovel and were dug deeply enough to avoid frost. Reinforcing rods were used instead of footings. A simple strap anchor was imbedded at intervals in the top of the concrete walls to hold the superstructure down, in anticipation of excessively high winds from the ocean. As there were no cellars, interior concrete walls were used to support the construction, in place of girders.

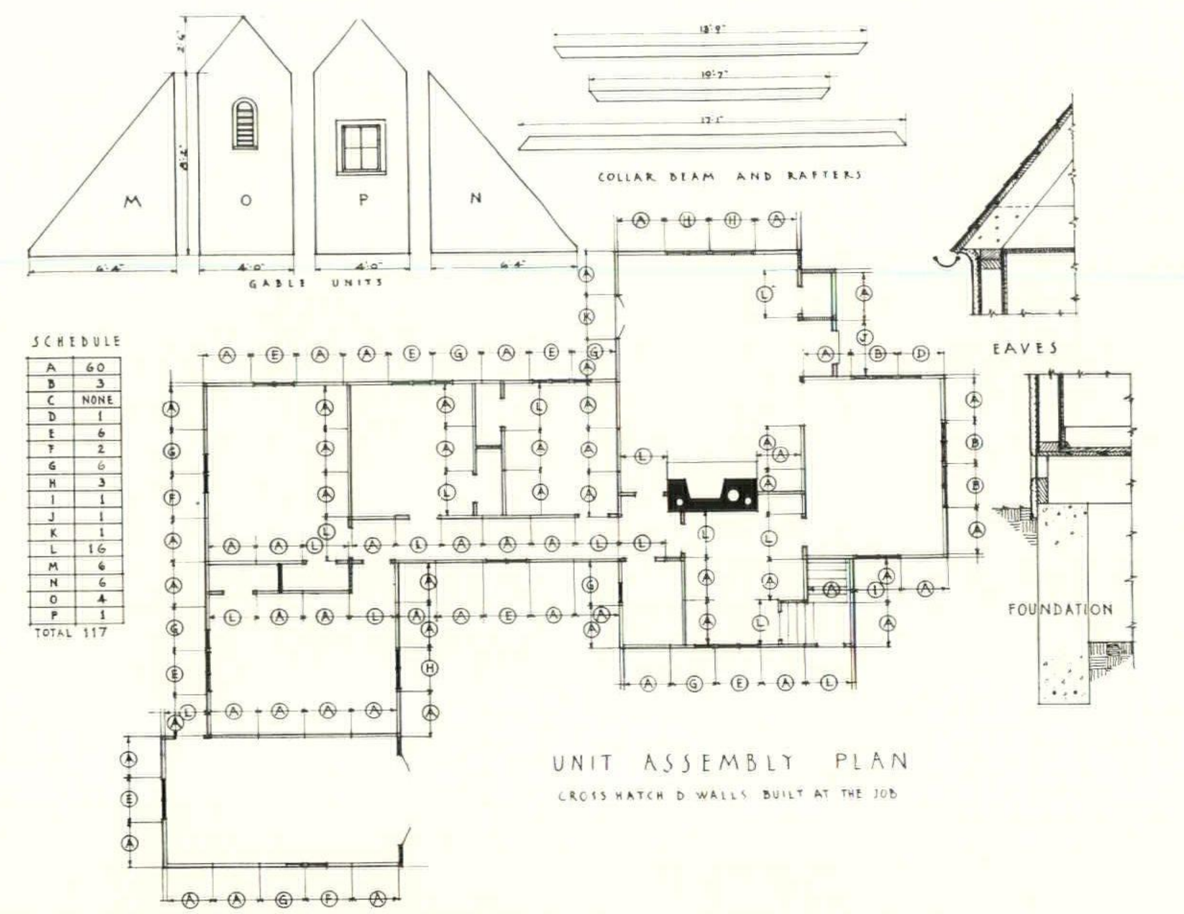
First Floor. The first step in constructing the superstructure was the building of a box sill type of floor framing, because it was simple, easy to level up and anchor to the foundation. Wire mesh covered holes were cut at intervals in the boxed sills to ventilate the air space between the first floor and the ground. Sub-floor drainage and heating pipes were installed before the carpenters commenced work. The rough flooring was of ship-lap, nailed diagonally. Holes were left at intervals to accommodate the plumbing and heating sub-contractors.

Upon the completion of the rough platform which covered the entire floor area of the house it was tested for level, and we then were ready to install the wall and partition units. A steel tape was used to mark off all divisions and lines were drawn to locate interior partitions. With a colored crayon we marked the key letters on the floor, corresponding to the wall unit to be used, in accordance with the assembly plan. This assembly plan was the only drawing required by the carpenters. The elevations were entirely unnecessary in constructing, though carefully prepared.

Walls. Starting at an exterior corner, two overlapping "A" panels were spiked to each other and to the rough floor. These panels braced each other. From this point, guided by the marks and key letters on the rough flooring, it was a simple job to complete the installation of all of the exterior

Progress pictures of the house shown on the opposite page. The entire structure was prefabricated in units, as shown on pages 524 and 525. The sections were marked on the first floor shown below; within one day all the wall partitions and gables were in place, as illustrated at the right below. Above at the right are shown the walls partially covered with metal lath to receive the exterior stucco. The roof was covered with random cut ship-lap





A plan and details of the house shown on page 522. The letters indicate the placement of the ready-cut wall units which are shown on the opposite page. Notice that a very small part of the entire structure was manufactured at the job

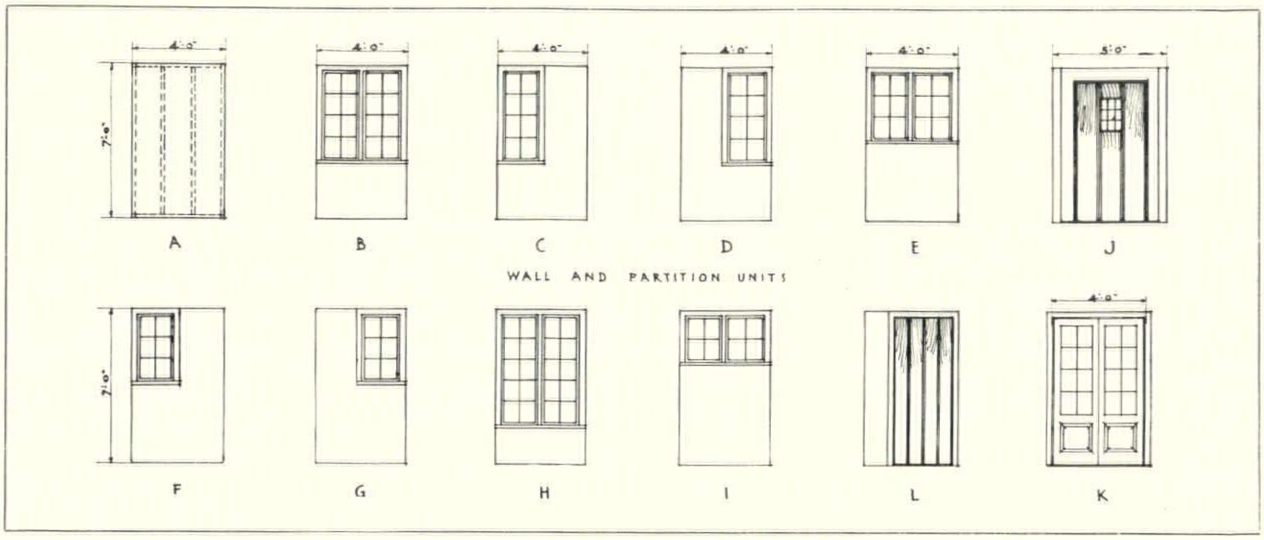
and interior wall and partition units. In an unbelievably short space of time, the house took shape, and we were ready for the ready-cut rafters, ceiling joists and gable panels. Two carpenters can install wall units almost as fast as two helpers can bring them to the required spot. The vertical jambs of the panels, or units, were grooved and splines were inserted to insure correct vertical alignment. After the rafters were in place the entire roof area was covered with ship-lap. No attempt was made to ready-cut this item.

For a four-room house the carpentry labor outlined above required less than two days, using four carpenters and two helpers to carry. The men caught the spirit of the thing and soon developed surprising skill and pride in their accomplishment.

Trim, Roof and Finish. We generally trimmed out the exterior and put on the roofing next, saving all interior work for rainy weather. Wire lath was wrapped around the exterior walls and steel sash were set in place and glazed before we attempted interior work. Celotex was used for interior linings. Its application was easy and rapid because of the regular spacing of all studs and joists. At first, we covered joints with wire mesh but later discarded this as unnecessary. The two-coat interior plastering shows hardly a crack after five years.

All interior trim was oil stained and installed before plastering. Copper nails were used for all exterior and interior trim, avoiding countersinking as much as possible. The use of plywood panels of Douglas fir would totally eliminate the plastering problem and the exterior could be finished in any desired materials.

The fireplace was built of brick. The chimney was constructed of precast cubes, about 20 in. square, made of light-weight concrete, with 8 in. sewer pipe running through the center. All piping was consolidated and prefabricated. The heating system was hot water. I had planned to use oil



for heating and cooking but this was abandoned and exterior coal bins had to be provided.

Conclusion. As a result of these experiences, I am convinced that any properly organized building company could, with the easiest of preliminary preparation, produce American homes, by the unit system, at a very significant saving in comparison with the usual methods. To sum up my adventures in economic housing, I would say that *unit design, shop fabrication, economical transportation* and *speedy erection* are the essential factors required to produce a good home at a price the average American can afford to pay. When this is accomplished, land, labor, financing and selling problems will be easier to tackle.

A CURRENT PROMOTION METHOD FOR LARGE SCALE HOUSING

FROM THE DATA OF ARTHUR E. ALLEN, ARCHITECT

SUCCESSFUL promotion of large scale housing operations, certain to become a constantly recurring problem in the minds of the profession during the next decade, has been almost exclusively the business of real estate developers and speculative builders up to the present time. From them, architects who justly scorn many of their designs may learn two things: how such projects have been financed and how they sell by catering to the desires of their clients. It is a simple statement of fact that developers and speculative builders have been able to give the public what it thinks it wants at a price and with a profit.

Actual experience in selling offers conclusive evidence that what the public wants is:

1. Brick construction at a price of from $7,000 to $9,000.
2. Colorful kitchen, with complete mechanical equipment installed, and an adjoining dining alcove.
3. Modern bathroom, with dressing alcove adjoining.
4. Impressive living room, preferably of "studio" type, with exposed beams and wood burning fireplace.
5. Finished living or play room in basement.

The following is a typical promotion study. On property costing $292,500, containing 195 building lots, it is proposed to build 186 houses, which gives a land cost per house of $1,575. For the type of house illustrated, the estimated construction cost would be:

Contractors		
Foundation and cement work	$650.00	
Paving street	100.00	
Brick work	775.00	
Plumbing and heating	675.00	
Lumber	300.00	
Trim	350.00	
Carpenter	230.00	
Plaster	335.00	
Roofing	185.00	
Electric wiring and fixtures	110.00	
Flooring	155.00	
Tile	175.00	
Painting	225.00	
Stairs	75.00	
Iron	35.00	
Hardware	50.00	
Gas range	42.50	
Breakfast set	15.00	
Kitchen cabinet	55.00	
Refrigerator	110.00	
Linoleum	35.00	
Shades	7.00	
Shower doors	30.00	
Weatherstripping and caulking	13.00	
Landscaping	15.00	
Medicine cabinets	6.25	
Vanity tables	35.00	
Sewers	100.00	
Architect	20.00	
Survey	12.50	
Gas and water permits	20.00	
Total construction work		$4,941.25
Added Costs		
Financing 5% on first mortgage	$225.00	
Advertising	100.00	
Commission	100.00	
Interest, taxes, and insurance	50.00	
Superintendent	50.00	
Watchman and miscellaneous	35.00	
Contingency	98.75	
Total added costs		658.75
Total estimated cost		$5,600.00

The capital requirement was set up with standard building loan mortgages on the following basis:

Construction Cost			
186 houses @ $5,600			$1,041,600
Cash to be Received			
Mortgages:			
164×$4,250	$697,000		
11×$5,000	55,000		
11×$4,750	52,250		
Total mortgage receipts		$804,250	
Purchasers' payments			
22 end and corner houses @ $1,000	$22,000		
144 inside houses @ $790	123,760		
20 cash sales @ $3,000	60,000		
Total purchasers' payments		205,760	
Estimated total cash receipts			1,010,010
Net capital required			$30,590

These figures show the capital required at the completion and sale of the houses. From the time of the commencement of the operation until the first payment of the building loans, it would be necessary on the first unit of ten completed to obtain a temporary advance of no more than $10,000 to pay certain of the contractors. This loan would be repaid out of the first building loan payments.

The estimate of total capital required is supplemented by a tabulation of mortgage installments and interest payments applied against it during the operation. Accepting the premise that the entire operation would be closed within two years (considerably below the sales figures of similar developments in other years), and that sales would be comparatively evenly distributed throughout a twenty-month period (allowing four months during which there would be no mortgages on hand, and no titles passed), there would be an average monthly sale of nine houses. Allowing for one cash sale, eight mortgages each month would be left. The average payment per mortgage per month would be $25, and at least $10 additional interest. The first month's receipts, therefore, would be 8×$35, or $280. The second month it would be doubled, the third tripled, and so on to the conclusion of the twenty-month period. The total of all mortgage and interest payment receipts for that length of time would be $58,800, which is $28,210 more than the $30,590 estimated requirement. So that at the termination of the project, there would be a cash balance, and no capital required.

The proposed schedule of sales prices is:

164 inside houses @ $7,490	$1,228,360
11 end houses @ $7,990	87,890
11 corner houses @ $8,490	93,390
Total	$1,409,640

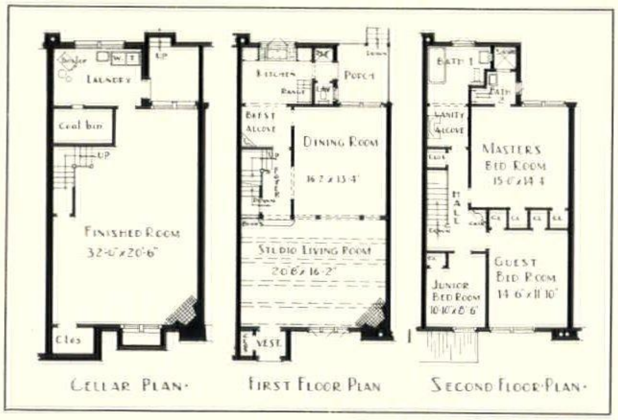
The estimated profit is as follows:

Total sales prices		$1,409,640
Construction cost 186×$5,600	$1,041,600	
Land cost	292,500	
Architects' surcharge 186×$250	46,500	
Total cost		1,380,600
Net profit		$29,040

An alternate proposal based on 5½ per cent savings bank mortgages, and not on building loans, would require more capital, but would increase the attractiveness of the proposition from the home purchaser's standpoint. Since savings banks do not make building loans, it would be necessary to bring the first lot of houses to completion before any mortgage money is obtained.

In estimating the capital thus required to complete first a group of thirteen houses, the following factors influence the plan:

The type of row house used in this study, Arthur E. Allen, architect. Mr. Allen has been unusually successful in working with developers, having designed 5,000 houses in two years



1. Certain of the fixtures and certain contract work, as listed below, need not be put into the houses until the houses are ready for placing of mortgages. The work can be done immediately preceding the obtaining of the mortgage loans, and payment not made until after the new funds are available for use.

2. Certain added costs, also shown below, are in the same category.

3. Approximately 25 per cent of the money owed contractors and supply men would not be due until after the additional money had been received. Most contractors accept partial payments in the form of 30- or 90-day notes.

The estimated capital requirement, consequently, to bring thirteen houses to completion before mortgages are placed and sales are made would be as follows:

Full Construction Cost per House			$5,600.00
Installations postponed until just before mortgage is placed			
Electrical fixtures	$50.00		
Painting and decorating	125.00		
Gas range	42.50		
Breakfast set	15.00		
Refrigerator	110.00		
Linoleum	35.00		
Shades	7.00		
Shower doors	30.00		
Landscaping	15.00		
Vanity table	35.00		
		$464.50	
Added costs postponed			
Financing first mortgage	$225.00		
Commission	100.00		
Interest, taxes, insurance	50.00		
		375.00	
Total deferred costs			839.50
			$4,760.50
Total contractors' construction cost		$4,941.25	
Less deferred amount above		464.50	
Net due contractors up to completion		$4,476.75	
Less 25 per cent to be deferred until after completion			1,119.20
Net cash required per house			$3,641.30
Total Cash Required for 13 Houses 13×$3,641.30			$47,366.90
There will also be the following expenditures — Sales office		$1,500	
Paving (less 25 per cent)		3,700	
			5,200.00
			$52,536.90
Note. — Model house would be completed before others, and would have permanent mortgage placed thereon, which would give a net reduction in cash of:			4,250.00
Net Cash Needed			$48,286.90

Such is an existing basis for the promotion of large scale housing. It holds, at least, subject for further study.

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.

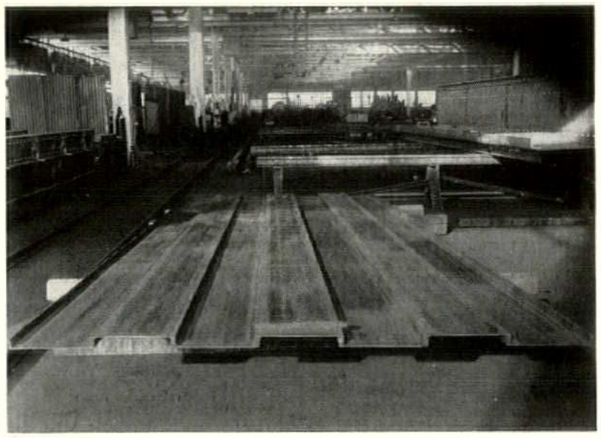
A HEAVY DUTY STEEL FLOOR

An interlocking steel channel floor system has been added to the list of possibilities for prefabricated building units. Particularly adapted to heavy duty buildings, the floor is made of 12-inch light weight structural steel stair channels, bolted, riveted, or welded in the shop ready for installation. Protection of the floor from fire can be effected with any fireproof material, such as gypsum, concrete, mastic, not possessing structural qualities. The troughs in the floor, formed by the interlocking flanges, are available for all piping, conduits, etc. Any type of flooring, terrazzo, linoleum, tile, cork, etc., can readily be applied.

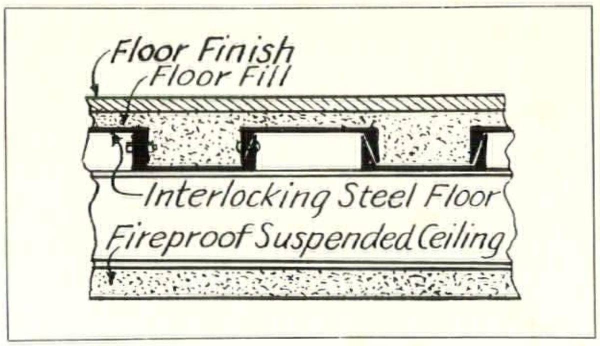
Besides sustaining loads under test from 125 to 8,000 lbs. per sq. ft., this system of floor construction has the further advantages of eliminating reinforcing for slabs, and of increasing safety in construction by doing away with temporary floor planking and wood forms.

When made in panel lengths, the flooring can be attached directly to the floor girders. The flexibility of the flanges permits width adjustment to meet all field conditions. Openings for elevators, stairways, pipes, wiring, etc., can be readily cut with torches after the floor is in place.

Further information may be obtained from the Belmont Iron Works, the patent holders, at 22nd & Washington Ave., Philadelphia, Pa.



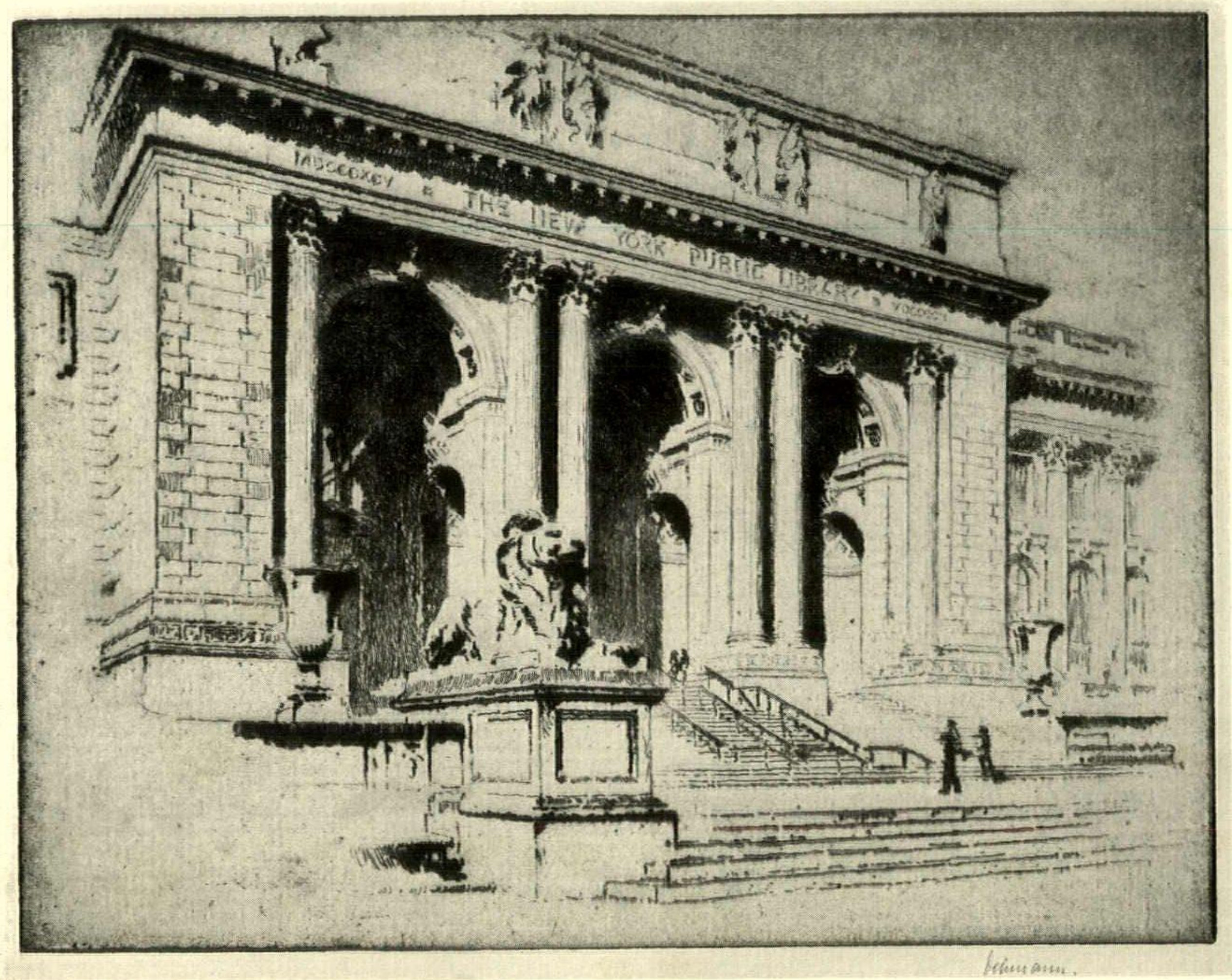
Green



BRICKS THAT FLOAT IN WATER

Of interest to the profession, but not of immediate practical use is the recent development of an aerated, light-weight clay which will float in water. The material will not be marketed for at least several months. Although it is probable that it will not be limited commercially to the standard brick unit, demonstration pieces have been moulded in that size and shape. In comparison to ordinary brick, which weighs from 4½ to 5 pounds, this brick weighs only 13 ounces. Naturally clinker color, it may be dyed to meet any requirements. Glazing and enameling are also possible. It may be sawn to shape with an ordinary hack saw. Other reported advantages are: that it can be manufactured in 12 hours as

(*Continued on adv. page 26*)



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CARRERE AND HASTINGS, ARCHITECTS

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THE ARCHITECTURAL FORUM

VOLUME LVI NUMBER SIX

JUNE 1932

THE WHY AND WHEREFORE OF MUSEUM PLANNING

BY

HENRY W. KENT

SECRETARY, THE METROPOLITAN MUSEUM OF ART

RECENT museum buildings in this country have shown but little change in plan and style from those which have been erected since the general interest in this form of public edifice began to evidence itself. The new ones still present façades in a classic style, and courts of honor, monumental staircases, and architectural embellishments in a manner of buildings designed for other purposes under earlier social and economic conditions. They have, however, shown in their plans a recognition of the changes which have taken place in the understanding of the fundamental principles governing the administration of such public institutions.

Since the erection of the Museum in Cleveland, in 1916, these new buildings have recognized the principles governing the museum and its public relationships, as expressed in what is called its educational work, and have provided space for it. They have shown also an attempt to solve the important question of lighting, and in one or two cases have sought to solve the problems involved in the arrangement of their collections.

However, they have shown but little consideration for certain other matters which should be recognized as deserving of attention if present and future needs, and the problems connected with such needs are to be adequately met. The architect is often blamed for failure to study his problem in all its aspects, but it may well be that those responsible for the guidance of the architect in connection with the planning of museums have themselves not always recognized these needs, or have been unable to work them out before the building took shape.

This is not surprising because the profession of the museum man, and the philosophies and principles, such as they are, which are supposed to guide him are of comparatively recent development and record. Nor is it surprising that such philosophies and principles are too often unconsidered by boards of trustees, who prefer to play safe by following courses already and frequently pursued by other similar bodies, rather than embark upon a new venture in museum plan, however promising and however effective where experiment is involved.

It may be worth while to trace briefly the change that has taken place in recent years with regard especially to the principles governing the exhibition of museum objects, and to consider how these changed principles affect the planning of a museum building.

Doubtless all will admit that the primary purpose of a museum building is to make possible the exhibition of works of art in the most effective manner as respects space, light, and the relationship of objects to one another, to the end that they may be well seen, studied and understood. This is an obvious necessity. But it may not be so obvious that most of these objects must be shown in an effective manner, also, as respects their historical relationships, the objects of one class or period to the objects of another class or period. Again, these classes of objects must be arranged in orderly and related sequence as respects the larger departments to which they belong, and the departments, also, must be arranged with due regard to their development, and their relation to one another — their sequence. In a word, the exhibition of objects of art must take into consideration the effective showing of them not only individually but according to a definite scheme of classification.

The classification of objects of art in a museum, until comparatively recently, was a simple matter, the division being chiefly either by materials — paintings, sculpture, metalwork, textiles, etc. — grouped by themselves, with subdivisions by countries; or else the other way around, the division by countries and the subdivision by materials, as is shown most clearly in the earlier arrangement of collections of classical art. The earlier museums followed pretty closely the example set by the older museums of Europe, such as the Louvre, the British Museum, the Victoria and Albert Museum, and the many other foundations dating before the middle of the nineteenth century and practically untouched by any modern thought since then.

The first change in this easy going method of classification was introduced by the Germans, who provided for the division of material first by country, and then by period, all of the arts of that country and period being brought together to give opportunity for the study of the individual arts in their relationship to one another, rather than as separate arts or examples of craftsmanship grouped by themselves. Or, to put it more simply, they attempted to show the cultural development of the various periods as exhibited in the arts, including those of design.

The museums of Germany which carried out this scheme of classification most successfully were those which were dealing with the arts of one state or one city; their problems were less complicated than they would have been if they had been dealing with collections representing the arts of several countries. The recognition of the importance of this new scheme of classification was immediate, especially in this country where museum buildings were being erected in a greater number than ever before — but the "period" arrangement, as it was called, while it was toyed with in principle was adopted only with reservations, and not in its most logical manner. Nearly all of our museums of today show its effects, however, to a greater or less extent.

The period arrangement or classification of collections, whatever else it may have done, provided for the architect three most important lessons in the planning of museum buildings; the first two became immediately evident, but the third and perhaps the most important of all is not yet so evident; indeed, its real importance begins to show itself clearly only with the progress of time.

The German classification resulted, first, in the exhibit of objects with colorful backgrounds, so to speak, which sought to give the characteristic atmosphere of the periods represented — which effected a sort of revivification of them. Whole rooms taken from old buildings were brought into the galleries and were made a part of the exhibition, and some museums did not hesitate to decorate their galleries in the style of the old rooms, where real examples could not be obtained. Whatever may be said for the ethics of these copies, the plan succeeded in giving to the exhibits an interest which had not been obtained in the older arrangements. The objects in the collection took on a new liveliness which had been denied to them before. The Museum at Zurich, Switzerland, gives perhaps the best example of what had now begun to be called the "room arrangement."

The second result of the German contribution to principles of museum exhibition was the fact, which at once became apparent, that to place rooms of one or more styles in a building of an entirely unrelated style was a matter of questionable taste. To show German styles in a building in the Italian or French manner was, to say the least, unnecessary. The need of harmony of the exterior with the interior was at once made apparent. The general principle was admitted in Germany, but in this country the lesson has not yet been learned, so far as one may judge from a study of the more recent buildings. It is to be hoped that with the coming of the new or "modern" style of building, which concerns itself with its own problems without copying some by-gone style, the fashion which has been followed in this country of making all public buildings reminders of the classical or some other period may give way to a better studied solution of the problem of appropriateness. One could find an excuse on the score of economy, if nothing else, for putting objects of later periods in an old building, as is done in continental countries, but to put objects in an imitation of an old building is open to discussion.

I have said that the third result of the classification by periods was the most important in its effect upon the planning of museum buildings even if the full significance of it has not yet been realized. This classification makes it perfectly clear that the growth of the collections and the extension of the galleries which contain them must be provided for in the original plans. It makes it clear that the happy-go-lucky trustfulness shown in plans for the extension of the collections under the old, loose classification will not suffice with the new. It calls attention to the need of the extensibility of the building, and to the folly of any method of exhibition which by architectural limitations precludes the removal of the exhibit.

In this connection attention should be called to one or two circumstances that affect the growth of museum collections whatever their classification. The growth of the collections in any museum is always spasmodic and irregular, depending upon several conditions. Funds for the purchase of objects of art are more generously given for some objects

Courtesy, Museum of Fine Arts, Boston

The period arrangement of collections provides the architect with important lessons in museum planning. A portion of the permanent exhibit in the American Wing of the Museum of Fine Arts in Boston, Mass. It is a room taken from the Shumway House of Fiskdale, Mass., dating from about 1740

than for others; for instance, today money is more readily obtainable for European paintings than for Chinese paintings. Opportunities are frequent for the acquisition of English furniture, but not of Italian furniture. Gifts of some sorts of things are frequent and of others infrequent. Fashions in collecting play a large part in the unequal development of the various classes of objects — in the increase of certain groups at one time and of others at other times. Paintings by Cabanel were given to museums freely in the eighties and Corots in the nineties; Monet and Manet are having their turn now; soon, doubtless, the works of Matisse will be given as freely as the Cabanels, Corots, and Manets of other days. Chinese porcelains of the K'ang Hsi period were the *summum bonum* of collectors in the nineteenth century, but now no collection is distinguished unless it contains T'ang, Sung and Ming pottery, sculpture, and painting. Time was when Persian objects were seen but rarely in private hands or in American museums; now they are to the front. Fashion itself is due in large part to opportunity. Before 1922, no museum contained objects of the decorative arts of this country; now none is thought to be up-to-date unless it has its "American Wing."

Fortune, luck, or whatever it may be called, in the receipt of whole collections of objects by bequest or gift is to be taken into account, also, in the growth of collections. A notable bequest of a large number of objects, of one class or several classes, affects the exhibition of the museum possessions more than anything else, and in some cases works a revolution in them. The entire arrangement of the departmental exhibits may be upset by such an unexpected windfall, through the necessity of the rearrangement of a class or division to accommodate the new objects with the old in the adopted classification or scheme of things.

Too often, by the terms of a will, collections of distinguished importance are placed by themselves in rooms or even buildings, without regard to the classification of the other collections, interrupting, upsetting such logical and reasonable plan to the confusion of the student. Such a continuing incubus forever interferes with the wise arrangement of the collections.

Let us suppose that a museum has provided a room or rooms for its collection of Gothic art, arranged with care between its Romanesque and its Renaissance rooms, and that all of them have fine examples of architectural monuments built into their walls, when out of a clear sky comes an unlooked for bequest which doubles the original collection. To avoid great expense, and the remodeling of all these rooms and others that may hinge upon the sequence, this collection must be placed somewhere else, breaking up all classification.

Another matter which may not be forgotten is that the scheme or classification used by a museum is itself liable to change, certainly as respects its subdivisions. The curator of today has one idea, the curator of tomorrow may have another, requiring a rearrangement of his predecessor's plans. One curator may classify Coptic art with Christian art, the other with the Egyptian collections. Drawings may be given to the department of paintings under one régime, and displayed separately in the next.

In a word, the museum collections as respects their exhibition are to be regarded as subject to a continuous succession of changes. The building that is irrevocably static is not fitted to its needs.

Funds for specific purchases, fashion in collecting, and opportunity for acquisition make the museum collections what they are, and the collections expand or stand still according to the amount of the first, the violence of the second, and the extent of the third of these influences. For these reasons no museum looking to the future can ever be sure of the relative growth of its departments and the space required for them. It cannot be said with certainty that so much space will be required for this or that class of objects. The steady present flow of objects into one group may be shut off next year, while the group that has seemed hopeless of expansion may take on new activity. An architectural scheme, or a plan, a classification which tends to hold the museum collections static, which prevents their easy and economic expansion — any cause which prevents the rearrangement of the collections at will to meet the demands of the spasmodic growth of which I have spoken is detrimental to the best interests of the museum. A building cast in a mold of early traditions in the nature of the case cannot meet these demands.

One does not have to be a student of architecture, or to do more than observe the great changes that have taken place in the construction of office and factory buildings in this country in the past few years — changes in style, in materials, and in all the things that make for appropriateness and usefulness — to understand what would be the result in a museum building if the same principles of adaptability were applied to the solution of its needs. With unitization, with steel, movable partitions, new substitutes for old materials, new methods of lighting for day and night, glass walls, setbacks, etc., the museum of today could be built so as to allow growth and change economically, so as to allow classification its perfect work, and so as to give opportunity for effective exhibition. The floor spaces of such a building would not be hampered by party walls and fixed partitions, its divisions of space would be changeable at will, its lighting would be ample and controllable, and its decorations would be neutral.

It *is* possible today to build a museum building suitable to the needs of the institution it is to house. To spend space and money on monumental halls, which are unusable, staircases which no one mounts, and solid partitions which have no structural necessity — in fact to build a house in an old style when a new one is clearly indicated — is not to have learned what is required, and to have missed the most obvious lesson of museum experience.

What has been said about museums in general may be said also about library buildings, wherein classification reigns also, where growth and change are also the order of the day. To monumentalize a library building, to preclude the economical and advantageous shifting of rooms and departments by building solid walls of masonry is not to recognize these fundamental things about a library — its growth and change. Space for growth (of books and readers), light and ventilation are the desiderata in the library building. These the new methods of building offer to a degree never to be approximated in the monumental structures imitated from those of some other and earlier epoch. Not until these methods have been applied to the building can we do more than record failure to solve a problem well.


Ward

A model of a pediment panel for the Philadelphia Museum of Fine Arts

MUSEUM SHOWMANSHIP

BY

LEE SIMONSON

THREE showcases, each containing 28 court swords, 35 daggers, 82 Japanese tea caddies, 9 Graeco-Phoenician jars, 19 beer steins — these are a few of the displays I counted on a recent visit to the Metropolitan Museum of Art. Is it surprising that most people are bored by walking past miles of such accumulations of "art"? How rarely do even those of us who have a professional interest in art leave a museum atingle and refreshed with a new experience of beauty? Does the open air ever seem more electric, sunlight and the green of grass and trees more comforting than after an hour spent in an art museum?

A new form of nervous exhaustion was diagnosed fourteen years ago by Benjamin Ives Gilman of The Boston Museum, who named it "museum fatigue." Recently Professor Robinson of Yale tested its symptoms clinically with a stop watch. In a museum in a large American city containing one thousand paintings, 56 were actually looked at and the average time spent in looking at them was 9.2 seconds. A glance of no more than ten seconds at the visitors in any gallery of almost any American art museum today is enough to verify Gilman's description of them in 1912. "Daily watching, listless and tired wanderers that chiefly populate our galleries, we see plainly how little they gain compared to what might be gained. Are such things the affair of the exceptionally educated only? Unfortunately, the exceptionally educated neglect our museums even more conspicuously than the unlettered. There must be some general underlying causes hindering the effectiveness of our permanent exhibitions of art."

These causes are sufficiently apparent to everyone but museum directors and their curators. Our museums remain ineffective very largely because the arrangement of their collections inevitably dulls the interest they are supposed to arouse. Everything is shown; almost nothing is displayed. More is shown to the visitor's eye at one time than any eye can possibly grasp. No effort is made to focus attention; everything, on the contrary, contrives to distract it. A medley of visual impressions fight for predominance within a given range of vision. The art museum, which might be made as emotionally exciting as a great drama, well directed, becomes nothing more than a huge dictionary of art.

Museums are encouraged to evade their responsibility to the public by the trend of modern education which makes it everybody's duty to appreciate art. We are so impressed by the amount of art of former epochs that has been unearthed or preserved that we expect high school students or the average man or woman to appreciate more kinds and forms of art than a connoisseur of imperial Rome or a Renaissance patron of Buonarotti or Botticelli ever knew. Every year more "treasures" are added. The problem of assimilating even a fraction of what he so fitfully stares at would not be so insuperable for the museum visitor if museums limited their displays to the traditional forms of "fine" art — painting and sculpture.

But they have become depositories of every kind and variety of "applied" art until they are a monumental medley of paintings and pottery, furniture and firearms, monuments and miniatures, rings and rugs, cameos and ceramics. Nothing in arrangement of these innumerable objects signifies that any are less important as art than any others. They are presumably all worth being carefully catalogued and preserved and then by the thousand allowed to join in the free-for-all competition for the public's eye.

But how are they preserved? For the maximum convenience and satisfaction of the curator, not for the edification of his public, whether the casual sightseer, or for the exceptional visitor, sensitive to the æsthetic values. As a result of the propensity to catalogue, the most obvious relations between the art forms of any one epoch are carefully sundered.

In most cases the museum visitor might get exactly the same kind of visual experience walking through the department of parlor ornaments and bric-a-brac at the local department store as through the galleries of an art museum. Indeed, American museums have become the department stores of art.

". . . a plethora of material arranged with encyclopedic repetitiousness and monotony. In most cases the museum visitor might get exactly the same kind of visual experience walking through the department of parlor ornaments and bric-a-brac at the local department store as through the galleries of an art museum. Indeed, American museums have become the department stores of art." Here the masterpieces of the past are "preserved" for study rather than displayed for appreciation

But they have one great disadvantage as compared to our department stores where the visitor goes knowing what he needs and what he wants to buy. The visitor to a museum usually has no such preconception. Most art museums might be better arranged if curators, like department store sales managers, had to interest their visitors to the point of selling them some of the objects they show.

The first thing that a dealer who wants to excite real interest in a client does is to take the necklace, the vase, the painting, out of a serried rank, and place it along where it can create its particular meed and atmosphere, under a propitious light, against an appropriate background, often in a room by itself. Much of the dealer's hocus-pocus of velvet hangings and dim, religious lighting is ludicrous. But the principle underlying his method is psychologically sound. The South Kensington Museum has just acknowledged the fact in a rudimentary way by regularly "isolating" one exhibit and calling it "The Masterpiece of the Week" in order to attract popular interest.

Museums need to establish as direct a contact with each visitor as the dealer succeeds in establishing with his client. For the visitor is the museum's client and the ideal relation between them is a sublimination of the one that exists between a dealer and his customer. The museum visitor should become so absorbed in some object of art, so delighted by it, that he would buy it if he could, and as he lingers in front of it his appreciation should have, vicariously, some of the pleasures of ownership and possession.

Having displayed instead a plethora of material arranged with encyclopedic repetitiousness and monotony, having destroyed any effective indication of the unity binding together the art forms of any epoch, which made them a milieu where the values of living were enhanced, our museums proceeded to set up the huge apparatus of an educational department, wave free pamphlets at the visitor or offer him free lectures. All this in order to tell him what he is supposed to have seen, most of which he could have seen and discovered for himself with elation and excitement if the museum had given him half a chance. In a well-designed art museum an educational department should be superfluous. A visit to an art museum, built and arranged not to present its accumulations in imposing array but to reveal their meaning, would be an education in itself.

There is almost no architectural planning of museums that attempts to alter the traditional and ineffective methods of relating museum collections to the public. As a rule, architects and museum directors are in an *impasse*. On the one hand, the director and his curators are so unaware of the problem of presentation that no help is demanded from the architect and some slight variation of palace interiors strung end to end is blandly accepted, a monumental Graeco-Roman or Renaissance façade being *de rigueur* so that the museum can be recognized from afar as a civic monument no less imposing than the railroad terminal or the public library. On the other hand, architects are so little aware of the problems of displaying objects of art that they accept present museum traditions without a qualm and contribute far less in the way of original solution than they do when tackling the specific problems involved in a hospital, a school building or a convention hall.

I offer the following postulates as a tentative set of first principles for architects and curators:

Aesthetic

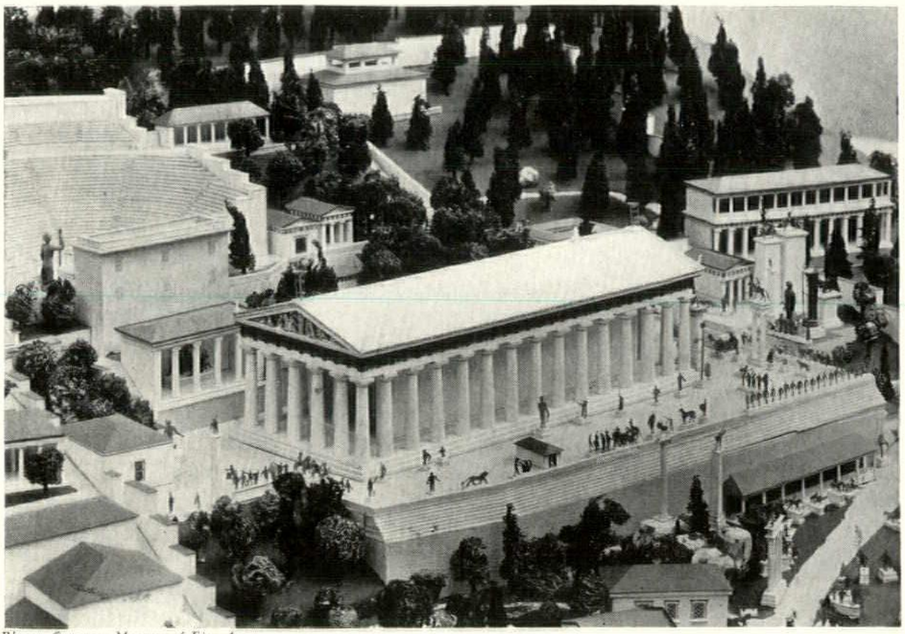
1. A museum exists only secondarily to preserve art objects and to catalogue them, for this might be done equally well in a vault. An art museum exists primarily to reveal the meaning and the value of art to the general public.
2. Æsthetic appreciation must be induced by an art museum. It cannot be taught until it is experienced. A museum has no justification unless it enhances the spectator's latent powers of perception and the emotions released thereby, and subjects him to less fatigue and less distraction than he encounters when viewing works of art elsewhere.
3. The æsthetic pleasure given him by works of art is an emotional release aroused by visual impressions. The form and design of the backgrounds in which art objects are displayed are therefore inseparable from the objects themselves in determining these visual impressions.
4. In a museum a thing of beauty if not a "joy forever" unless it is effectively displayed. Improperly displayed, it loses most of its æsthetic significance and cannot be adequately sensed or experienced.

Psychological and Physiological

1. The eye is extremely sensitive to fatigue. It is easily distracted. It loses all resiliency and the capacity for keenness of perception if shown too much at once or too much in succession.
2. The capacity for visual attention requires that the eye be focused and guided, and given continual opportunities for rest and relaxation.
3. Æsthetic appreciation involves contemplation and reflection. The museum visitor, if he is to reflect on what he sees, must be given the maximum opportunity, not to stand up, but to sit down.
4. The state of attention necessary to appre-

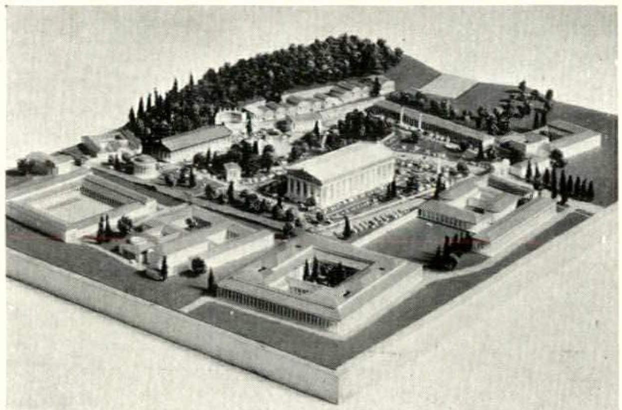
Courtesy, Museum of Fine Arts, Boston

Reproduction of a room from Hamilton Palace in Lanarkshire, Scotland, as shown in the Museum of Fine Arts, Boston. Here the original meaning of the pieces is recreated



Photos, Courtesy, Museum of Fine Arts

Model of Delphi, with the Temple of Apollo in the foreground. And below a model of Olympia. In such exhibits the appeal is to the general public, rather than to the expert. Fragments and details have new meaning when their relationships to the whole are shown in accompanying scale models



ciate a work of art requires a degree of concentration and conscious effort far beyond the native capabilities of the average and even the exceptional museum visitor, unless such concentration is deliberately aroused and sustained by every possible means.

Sociological and Educational

1. An art museum must satisfy the needs of two classes of visitors — the expert and the layman.
2. Their needs are entirely distinct and require that the plan and display of collections intended entirely for the layman be different from the arrangement of collections intended for the specialist.
3. The general architectural plan of the museum must keep these two functions separate if one is not to nullify the other.
4. The amount of plastic art accumulated today is so great that no one except an historian or a philosopher of æsthetics can appreciate all the known epochs of art. An intensive appreciation of a few periods is all that even collectors or artists are capable of. The aim of an art museum should therefore be, not to lure the visitor in looking at everything on display, but to lead him directly to the art to which he has a temperamental affinity and, once there, to give him surroundings conducive to contemplating it.

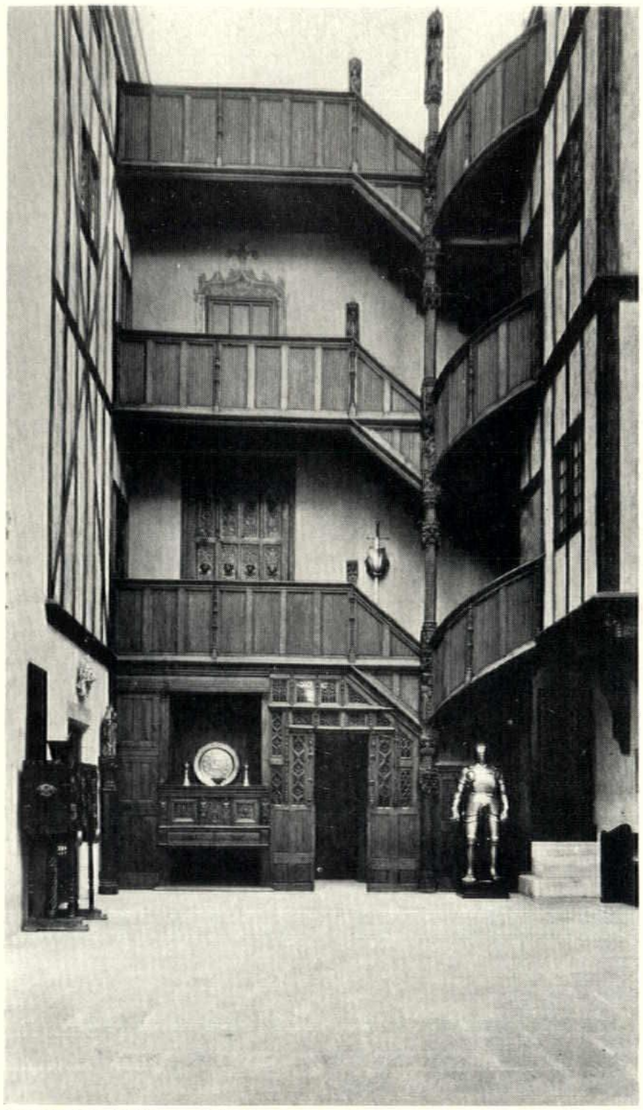
Once these premises are accepted, their effect upon the architectural planning of museums is obvious. The imperial palace plan, spreading out longitudinally into interminable galleries, has been abandoned. When a museum's aim is not to show a visitor everything he can look at, but to make him see a few things intensively a system of circulation must be evolved which prevents him from walking past several hundred yards of paintings if he has come to see tapestries, or through a collection of Egyptian sarcophagi on his way to medieval wood carvings.

If a sightseer is to be affected by an art museum, whatever he sees must be an experience stimulating to his imagination. This can be best done by taking some of the museum's finest examples of any art period and grouping them at the threshold of a department so that, even to the most untutored eye, the meaning of art in China, Japan, medieval France or Renaissance Italy becomes apparent. In an art museum art is no longer used as it was in the environment for which it was created; it is shown. The director or curator is perforce a showman. And the meaning of any form of art can be shown if it is to a degree dramatized.

The threshold of the Oriental collections would be a Japanese room with a single scroll painting in its appointed niche, a single superb vase, placed where its value as an ornament would be plain, a single painted screen given its full value as decoration, a single sword in its lacquered rack, a single brocaded robe on its garment holder, in the places prescribed for them in the house of the Samurai. Does this seem needlessly theatrical? Such a room is no more theatrical in arrangement and effect than the original rooms from which the museum's "treasures" came. The hundred and one sword guards, the eighty-one other tea caddies, the thousand and one other examples of Japanese ceramics could be spread out for the expert in more remote study rooms where he could compare their variations at leisure, undistracted by the layman passing by. From this Japanese room the visitor might be led to a courtyard set for a performance of a *No* play, and there see the resplendent *No* robes, not flattened on a wall in the textile collection but on wax figures, posed in the formal attitudes of *No* players emphasizing, as they originally did, the symbolic power of the human body, heightened by the subtle masks, used as they once were, not arranged in a glass case. Or the courtyard might be a Japanese garden, where another aspect of oriental design could be directly felt and enjoyed, and lead to the anteroom of a Chinese palace or temple.

The scholar that is more than half of any museum curator rises in wrath to ask contemptuously whether he is, as an administrator, expected to descend to making stage settings. Let me point out to him that such rooms are settings for art in exactly the same sense that Chartres is, or Santa Maria Novella, a temple at Kyoto or Karnak, the summer palace at Peiping, the mosques at Cairo or Tclemsen, or the tombs of the kings at Luxor. These sites are the goals of incessant pilgrimages by art lovers precisely because there the related art forms of an epoch can be experienced as an expressive whole. Unless art museums can provide an equivalent experience for the mass of our citizens who cannot indulge in world tours and continental trips, all talk of museums existing for the great general public is empty pretense, and the millions spent annually on museum endowments a senseless extravagance.

Between these threshold rooms and the study galleries where a maximum of objects were arranged by categories chronologically for the specialist, an intermediate group of rooms, containing selected works of the first rank, would be needed where the visitor could enlarge his acquaintance with any given art period. But these examples should be rigorously selected; four or five to a room is enough if they are as large as paintings or statues, not more than a dozen if they are smaller objects, such as ceramics or prints. Even then every wall space should be broken up wherever possible with angled planes, alcoves or projecting screens so that no more than one picture or one vase is seen at one time.



Courtesy of City Art Museum, St. Louis

"The shape and color, height, ornament and layout of every gallery is a separate problem in arrangement and decoration for the museum architect, and must be dramatically related as a whole to the objects it contains." That principle is carried out in this reproduction of a French Gothic Hall in the City Art Museum, St. Louis. LaBeaume & Klein, architects

Every object in a museum must be appropriately framed by the space in which it is set and must be isolated if it is to attract a second glance longer than the average ten seconds that Professor Robinson counted on his stop watch. The shape and color, height, ornament and layout of every such gallery is a separate problem in arrangement and decoration for the museum architect and must be dramatically related as a whole to the objects it contains. The usual standardized wall partition is the sign of an architect's bankruptcy as a designer. The standardized glass show case is the transparent tomb of a curator's incompetence.

Photos, Courtesy, Museum of Fine Arts, Boston

Above, a Japanese Garden in the Museum of Fine Arts, Boston, about which a museum representative states: "Of delight to the general public but frowned upon by the more discriminating public because basically incorrect in æsthetic principle of exhibition." And below, a Japanese Temple Room which is "architecturally accurate but embodying a questionable æsthetic principle of installation." The display of typical objects of art in their original setting gives them real meaning

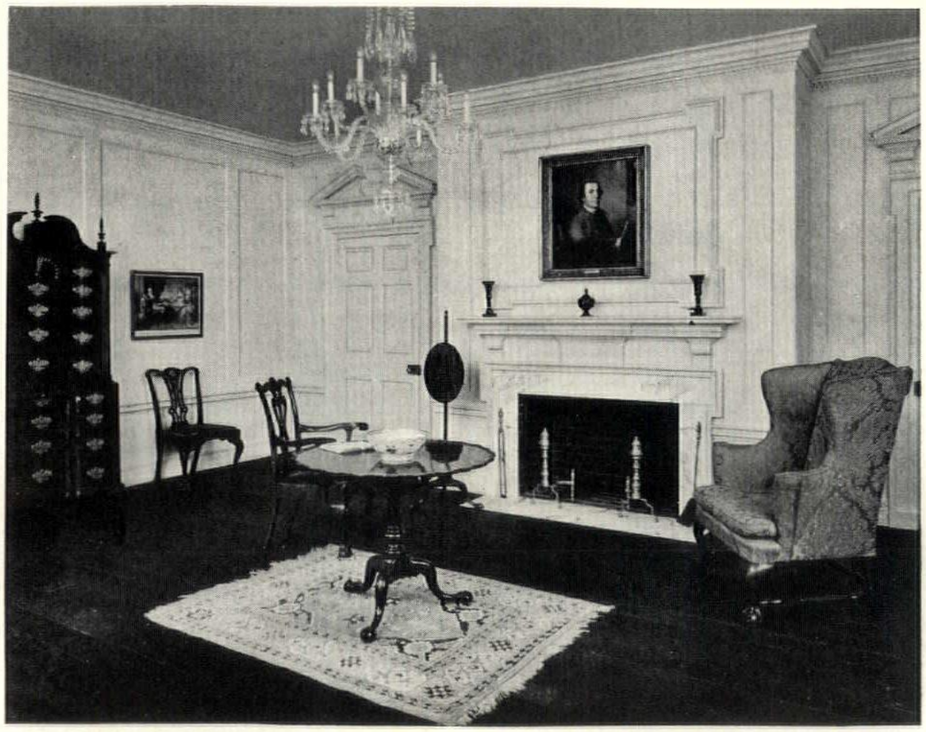
Various types of ground plan can be used as a basis for the kind of museum policy I have been outlining. Mr. Clarence S. Stein has published one in diagrammatic form where each museum department extends like the spokes of a wheel around a small central hub that serves as a bureau of information and a distributing center. The increasingly specialized galleries extend along the spokes to the connecting study rooms at the periphery of the circle. The triangular spaces between the spokes, besides being a source of side lighting, are ideal sites for courtyards and gardens. The threshold rooms form the core of the inner circle and the layman, by continuing through this smaller circumference, can complete a circuit of the greatest periods of the world's art, if he wishes to, with a minimum of fatigue and a maximum of inspiration. The student can proceed on a direct radius and remain entirely within one department while pursuing his special studies without ever having to distract himself by walking through the other collections in which he has no interest.

The same result is achieved in Mr. Stein's design for the Pasadena Museum by an asymmetrical plan of small galleries and courtyards grouped at different levels. Several years ago, in an article published in the *American Mercury*, I outlined a museum built about a skyscraper tower, where its accumulated collections could be easily reached by a bank of elevators and its masterpieces kept at the tower's base in separate Oriental, medieval or Renaissance pavilions, connected by gardens. Whatever plan is adapted the ostentatious ornamented façade with its pediments, architraves, columns and statues will be abandoned. For a museum exists not to impress the man in the street but to minister to the visitor within. And because a maximum of directed daylight is a desideratum, the glass façade of the so-called modern international style will eventually, I think, prove to be the appropriate one.

Where the material of any one art epoch, as those of Greece and Rome, is preserved very largely in fragments, art museums can, I think, take a hint from our museums of natural history and use colored models to fill the gaps and create the necessary background for the museum visitor. Six black granite statues of a Lion Goddess mean little to anyone except an Egyptologist. But seen in conjunction with a fairly large scale model of Karnak where an avenue of similar statues was part of a monumental architectural effect, these six fragments, or any others, would achieve relevance and meaning as part of Egyptian art. The rayed necklace of an Egyptian queen is beautiful not only because of its intrinsic design and materials, but because of its fitness in use. Spread out in a case it

Photos, Courtesy, City Art Museum, St. Louis

Doorway from Newport, R. I., in the City Art Museum, St. Louis, as part of the exhibition in which fragments of art are related to their history and their actual use

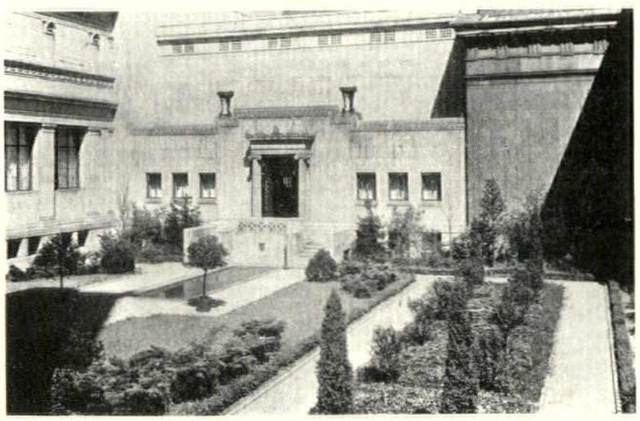


An eighteenth century American room in the St. Louis Museum, typical of the tendency to display a few pieces well, rather than to assemble a large number as a pointless "dictionary of art"

Courtesy, Museum of Fine Arts

A garden court in the Museum of Fine Arts, Boston. In addition to fulfilling the important function of supplying daylight, the introduction of such areas in museum plans provides ideal settings for display of sculpture, and for rest and relaxation. Clarence Stein's proposed wheel-shaped museum supplies a maximum number of such garden areas

can at best interest only a jeweler. But let some curator of Egyptology venture to put it on a life-sized model, reproducing the superb "style" of Egyptian garments, let him place on that figure all the other jeweled ornaments, now scattered as *disjecta membra* in other show cases, and he will be surprised to find how much more directly the beauty of Egyptian jewelry is appreciated than by reading special illustrated leaflets on the subject. I venture to predict that as a consequence he would find necklaces of Egyptian design appearing in the leading jewelers' windows and gracing the necks of the leading local hostesses. Perhaps, if they were the wives of the museum's trustees, he would not consider the result unimportant. More likely, being a curator, he would consider the result much less important than the ability to recognize a necklace in a museum show case as belonging to the XI, the XVIII, or the XIX dynasty.



Court, Cincinnati Art Museum. Garber & Woodward, architects

But the curator of tomorrow will think otherwise. He will recognize that beauty, after it has been rescued and catalogued, exists to be used anew in nourishing the desire to interpret, decorate and enhance life. He will recognize too that a museum comes to life when it serves the needs of the life around it, offers itself most directly to the living, not when it remains dedicated to the dead.

It can do so not by relating historic fragments of art to their history, but by recreating their original meaning. The museum's aim is not to give the museum visitor a haphazard "appreciation of art" by leading him through a succession of crowded storehouses, but rather to arrange a fraction of its material so that its impact (to use Chesterton's illuminating phrase) will knock even the most casual spectator into the middle of eternal life, and awaken his sense of beauty.

So long as directors and curators regard themselves primarily as custodians of precious treasure, they will, like the guardians of a certain legendary hoard, remain dwarfs in so far as their social importance is concerned. They can become important servants of society today only by reconsidering their rôle and then, with the maximum of imagination, cooperate in creative fashion with architects in replanning and remodeling American art museums.

Bostwick

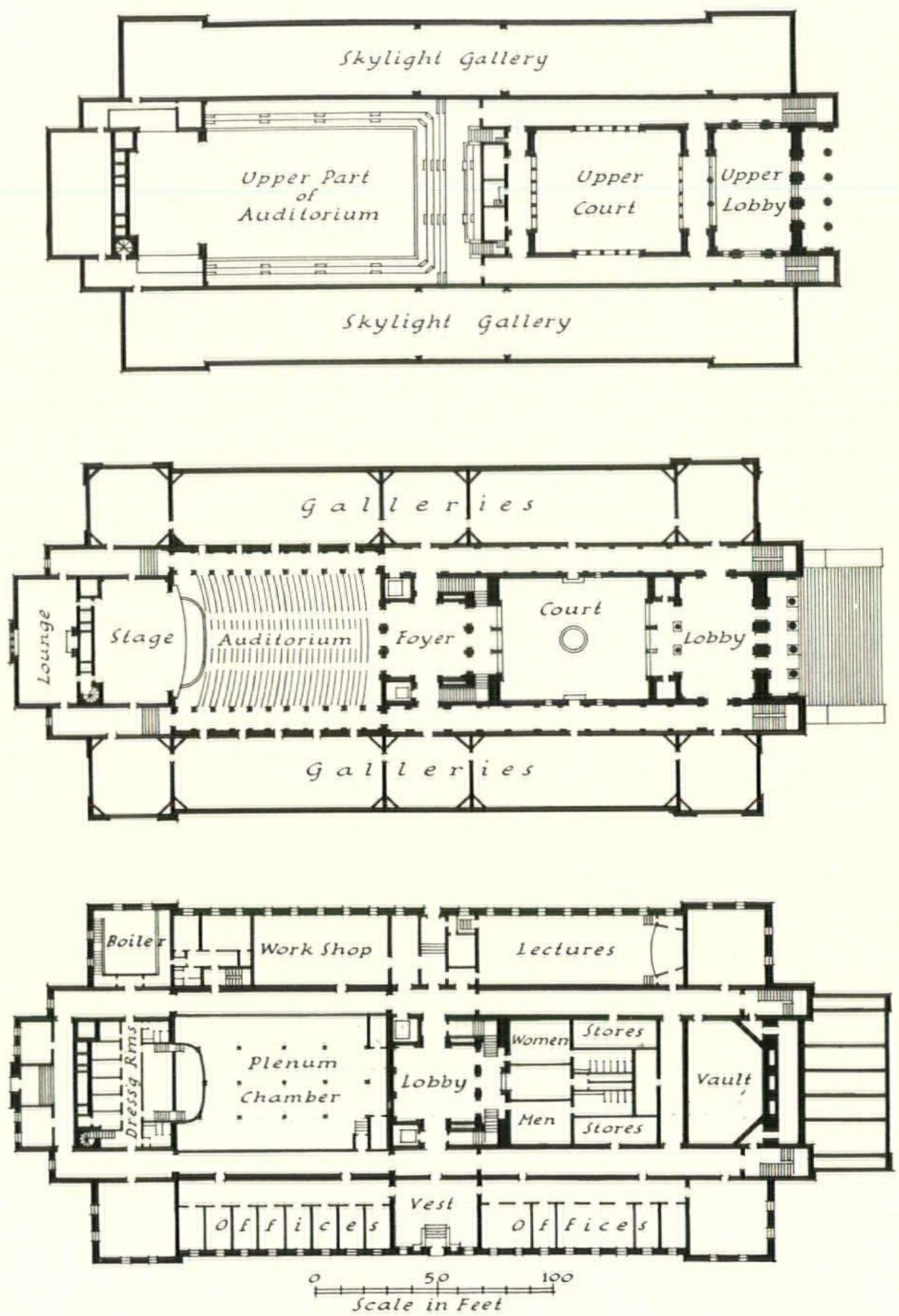
JOSLYN MEMORIAL MUSEUM

OMAHA, NEBRASKA

JOHN McDONALD AND ALAN McDONALD, ARCHITECTS

LOCATED on a small hill overlooking the city, the Joslyn Memorial is effective as a massive memorial as well as an efficient building. It occupies two city blocks and houses the musical and art activities of Omaha. The latter include permanent and traveling exhibits of painting, sculpture and the allied arts and a complete fine arts library. Opened in December, 1931, the building, completely equipped, cost approximately $2,600,000. The exterior, the surrounding walls and all approaches are faced with a pink Georgia marble. The stone is heavily veined and offsets well the simplicity of the general design. Although the detail has been executed in a simple manner, modern in spirit, the architects have been at some pains to develop a classical proportion in the mass

EIGHT MUSEUMS OF THE FINE ARTS



JOSLYN MEMORIAL MUSEUM

OMAHA, NEBRASKA

JOHN McDONALD AND ALAN McDONALD, ARCHITECTS

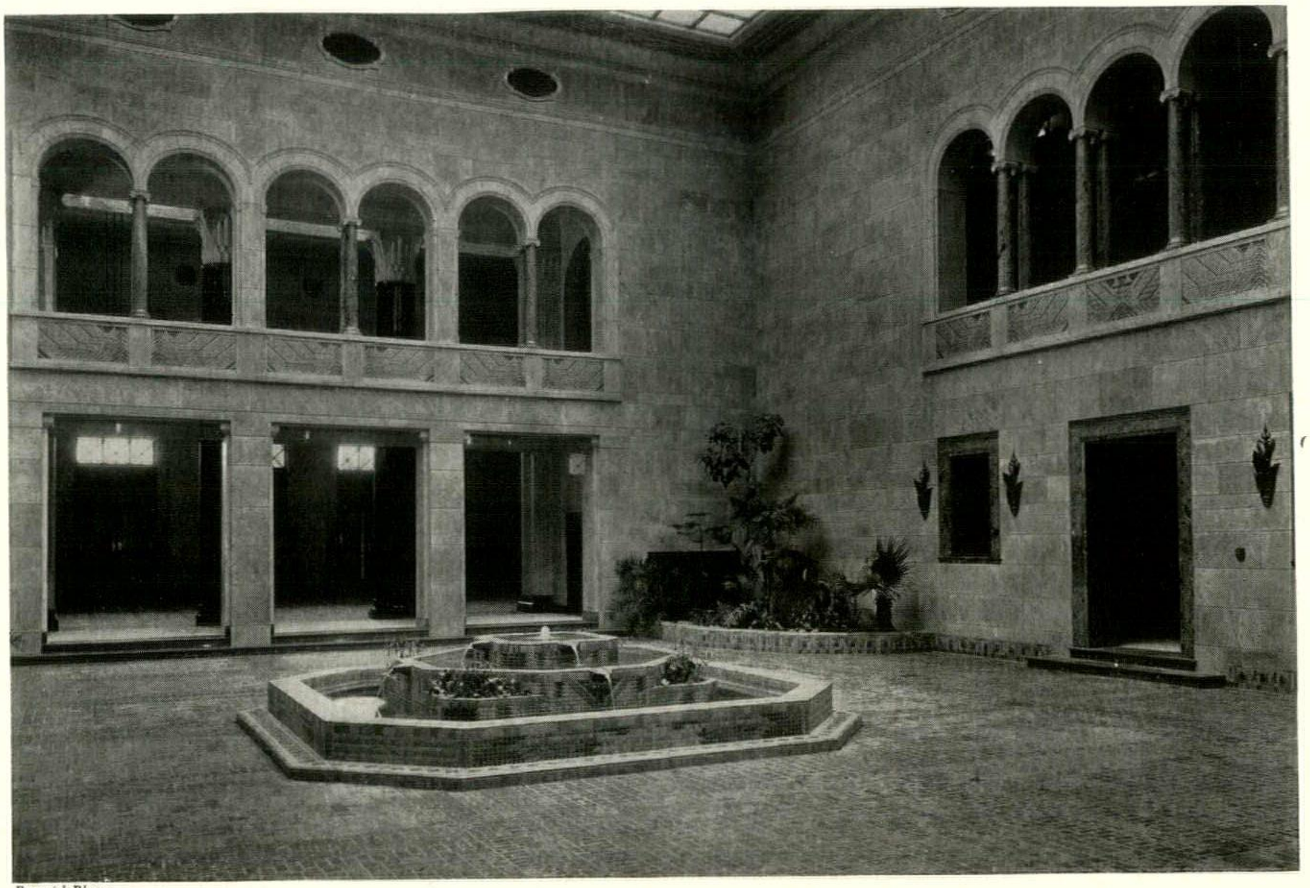
Bostwick

THE ENTRANCE LOBBY

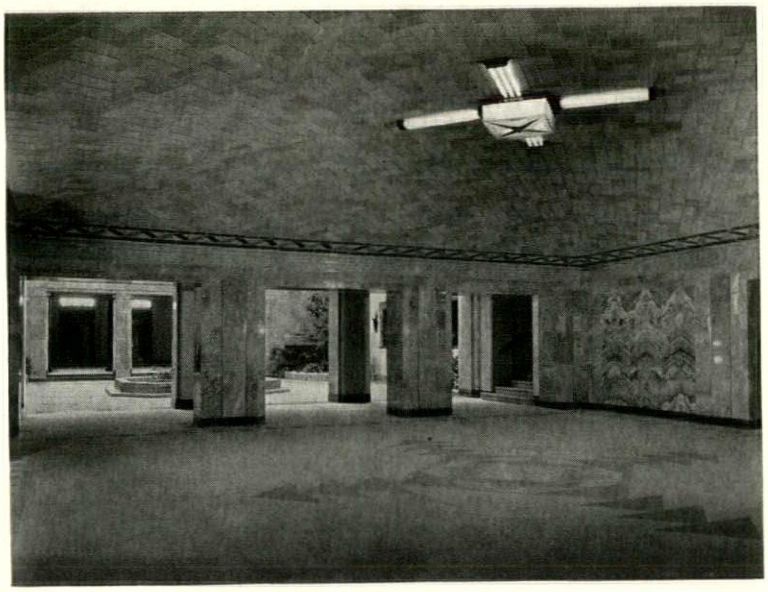
JOSLYN MEMORIAL MUSEUM

OMAHA, NEBRASKA

JOHN McDONALD AND ALAN McDONALD, ARCHITECTS



Bostwick Photos



ON THIS and the opposite page are three views of the court. The court itself, which is roofed with a large skylight, has walls of Aquia stone, columns and door trim of Vert Antico marble. The fountain, wall panels and base are of colored faience tile. The floor is of Moravian tile. At the left is the auditorium foyer looking toward the court. The walls are entirely sheathed in marble. The floor is laid in marble with a pattern of Vermont slate. The ceiling is vaulted and finished with a sound-absorbing tile. The illustration on the opposite page was taken from the entrance lobby looking through the court toward the concert hall

JOSLYN MEMORIAL MUSEUM

OMAHA, NEBRASKA

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Bostwick

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Logan

LOUIS TERAH HAGGIN MEMORIAL GALLERIES

STOCKTON, CALIFORNIA

WILLIAM J. WRIGHT, ARCHITECT

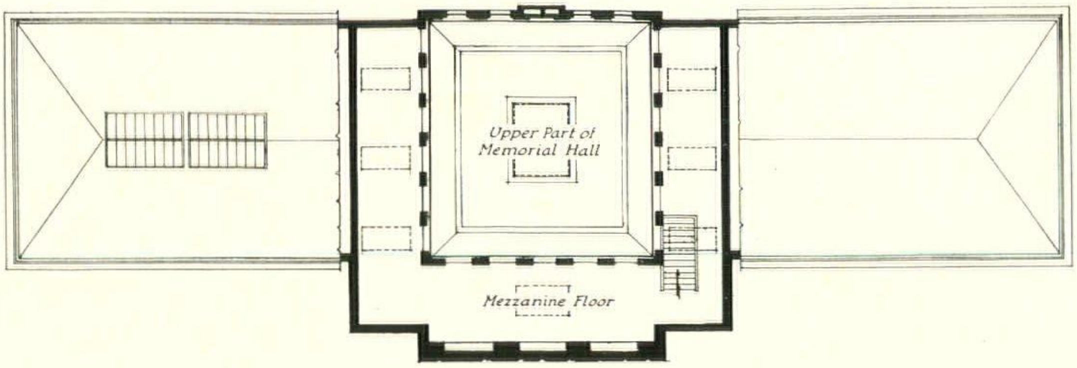
Logan

THE museum is situated in a thirty-acre park which terminates an important street. The building faces east, its major access coinciding with the center line of the street. The exterior is faced with a Roman tapestry brick, varying in color from a light tan to a dark reddish purple. The joints are raked. All the exterior trim, including the columns, cornice, etc., is of cast stone, warm gray in color. The interior is simply designed to conform to the style of the exterior. The floors of the picture galleries are oak, laid over concrete; all the other floors are cement, marked to simulate quarry tile and colored in mottled pastel tones. The lighting is all indirect, and the general color scheme throughout the interior is gray. The building is constructed of solid brick walls on a reinforced concrete foundation. Floors and roof are framed with steel, the former finished with reinforced concrete slabs. All bearing partitions are of brick, non-bearing partitions are of steel studs finished with metal lath and plaster. Completed in 1931, the building contains 315,793 cu. ft. and cost $64,414.50, at a cubic foot cost of 20.4 cents

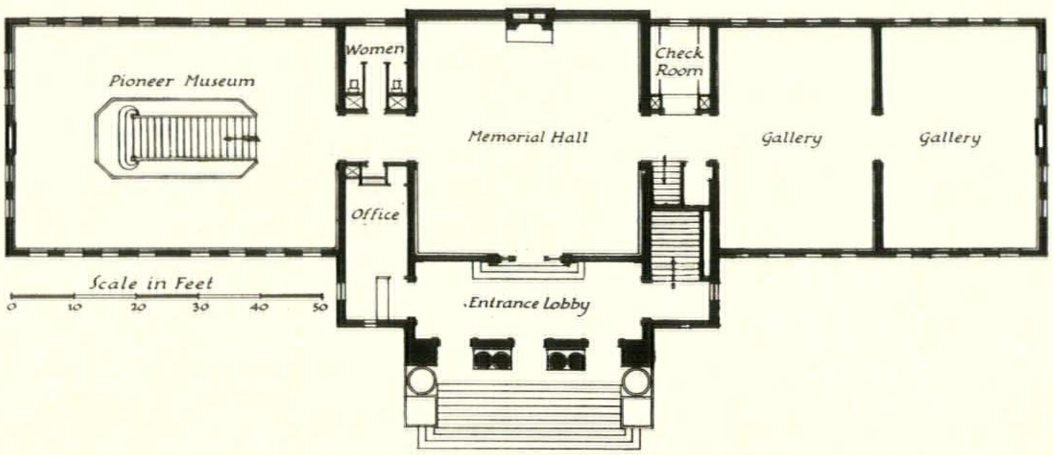
LOUIS TERAH HAGGIN MEMORIAL GALLERIES

STOCKTON, CALIFORNIA

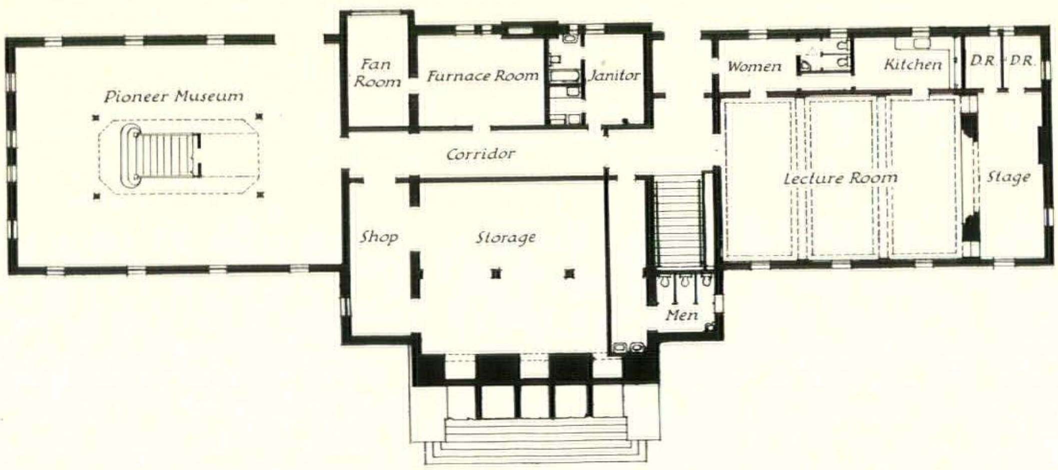
WILLIAM J. WRIGHT, ARCHITECT



MEZZANINE FLOOR PLAN



MAIN FLOOR PLAN



GROUND FLOOR PLAN

LOUIS TERAH HAGGIN MEMORIAL GALLERIES

STOCKTON, CALIFORNIA

WILLIAM J. WRIGHT, ARCHITECT

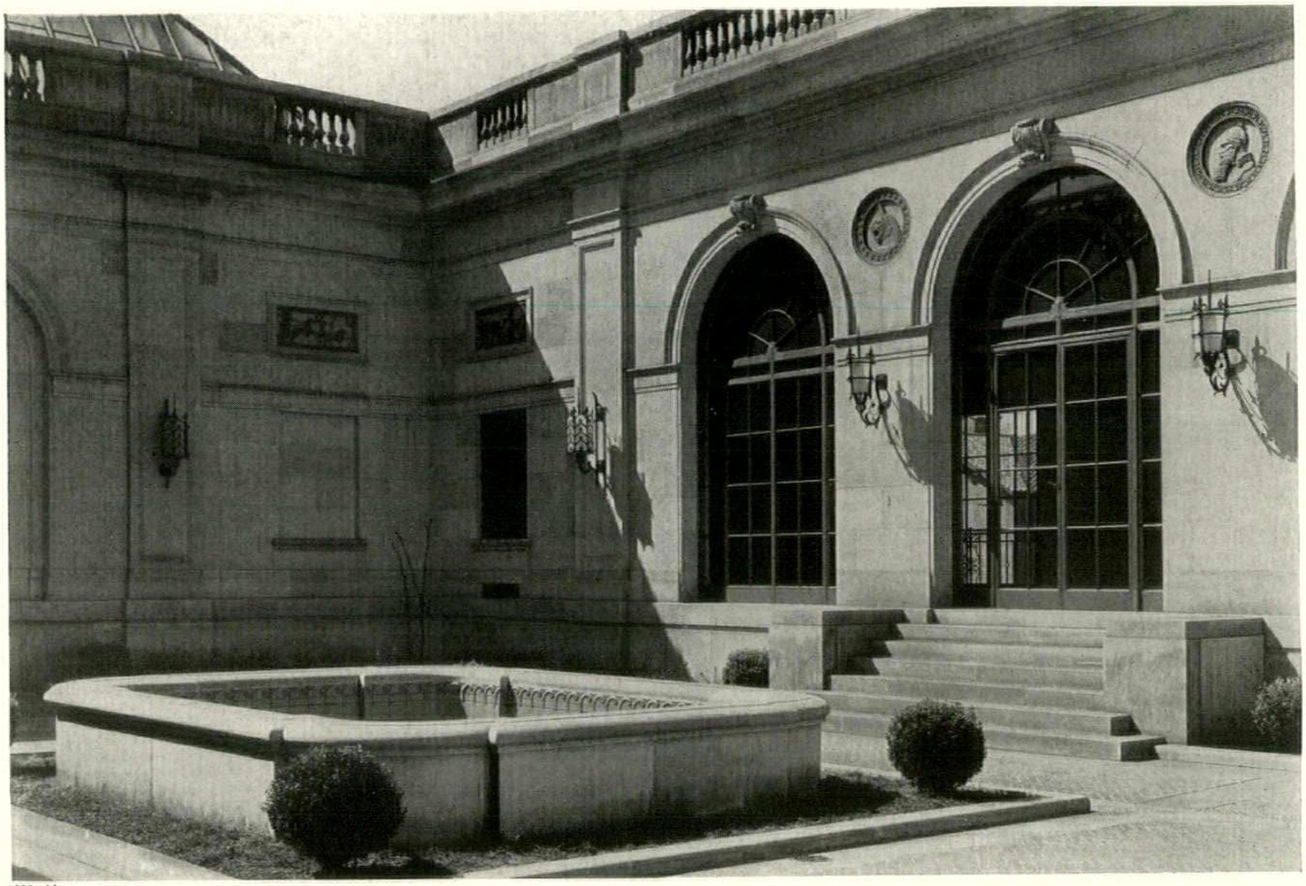
THE MAIN ENTRANCE

THE building is designed to house a complete collection of fine arts and contains also a large fine arts library and facilities for educational activities in addition to the necessary spaces for work in connection with the museum administration. The exterior walls are entirely faced with a warm buff limestone. The public spaces of the interior are elaborately treated in stone and decorated plaster. The galleries are all skylighted and the building is completely ventilated by a steam fan blast system. The auditorium, located in the basement, is ventilated by a separate system. All heating and ventilating control is automatic throughout the building

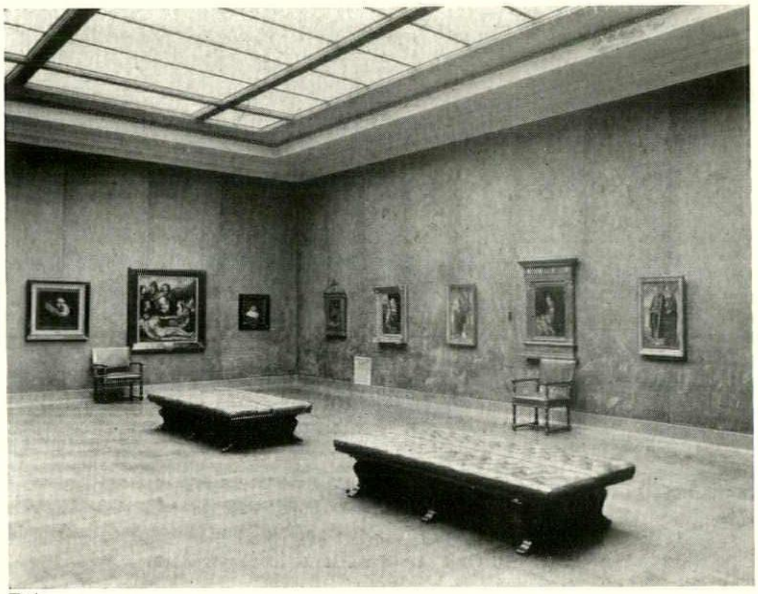
COLUMBUS GALLERY OF FINE ARTS

COLUMBUS, OHIO

RICHARDS, McCARTY & BULFORD, ARCHITECTS



Washburn



Trubee

ABOVE is the garden court faced with a warm buff limestone. The walks are of reddish brown tile. At the left is an illustration of a typical gallery. The artificial lighting is concealed in a cornice below the skylight. The walls are sheathed with gypsum board covered with plastic paint, colored a neutral gray. On the opposite page is the main corridor with a portion of the entrance hall showing at the extreme left. Both entrance hall and corridor have floors of Roman travertine and walls sheathed with buff French limestone. The ceilings are of plaster with stenciled decorations in a variety of color

COLUMBUS GALLERY OF FINE ARTS

COLUMBUS, OHIO

RICHARDS, McCARTY & BULFORD, ARCHITECTS

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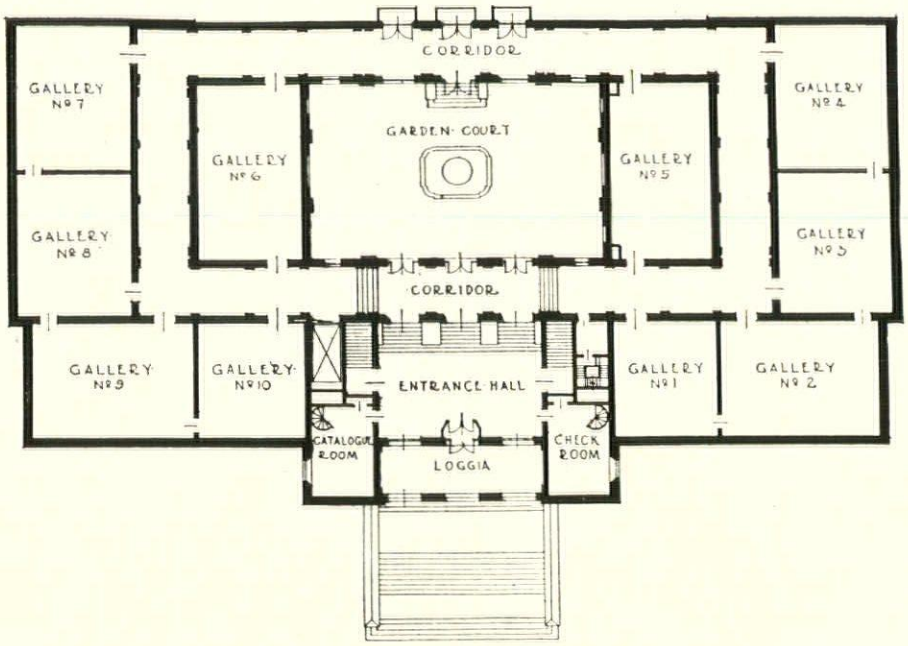
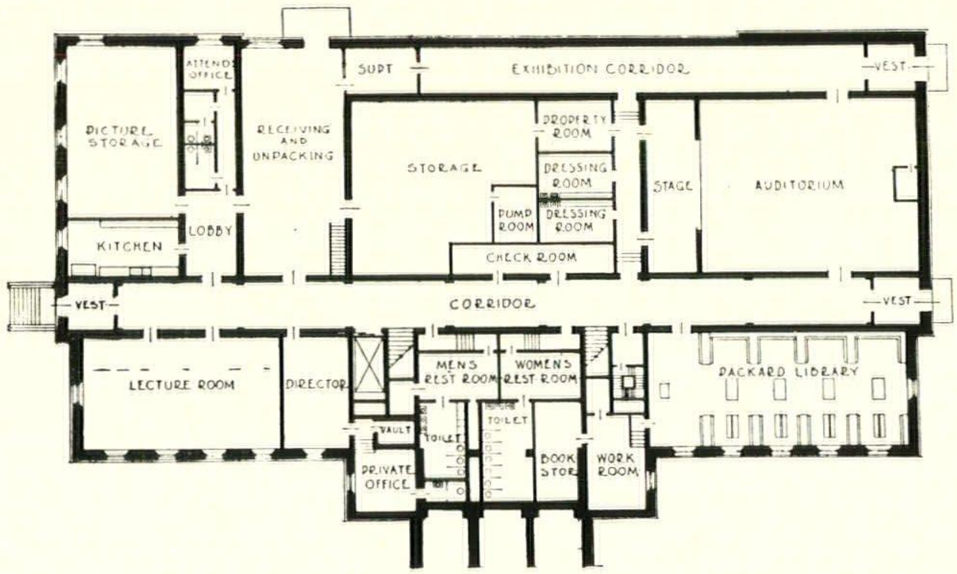


MAIN FLOOR PLAN

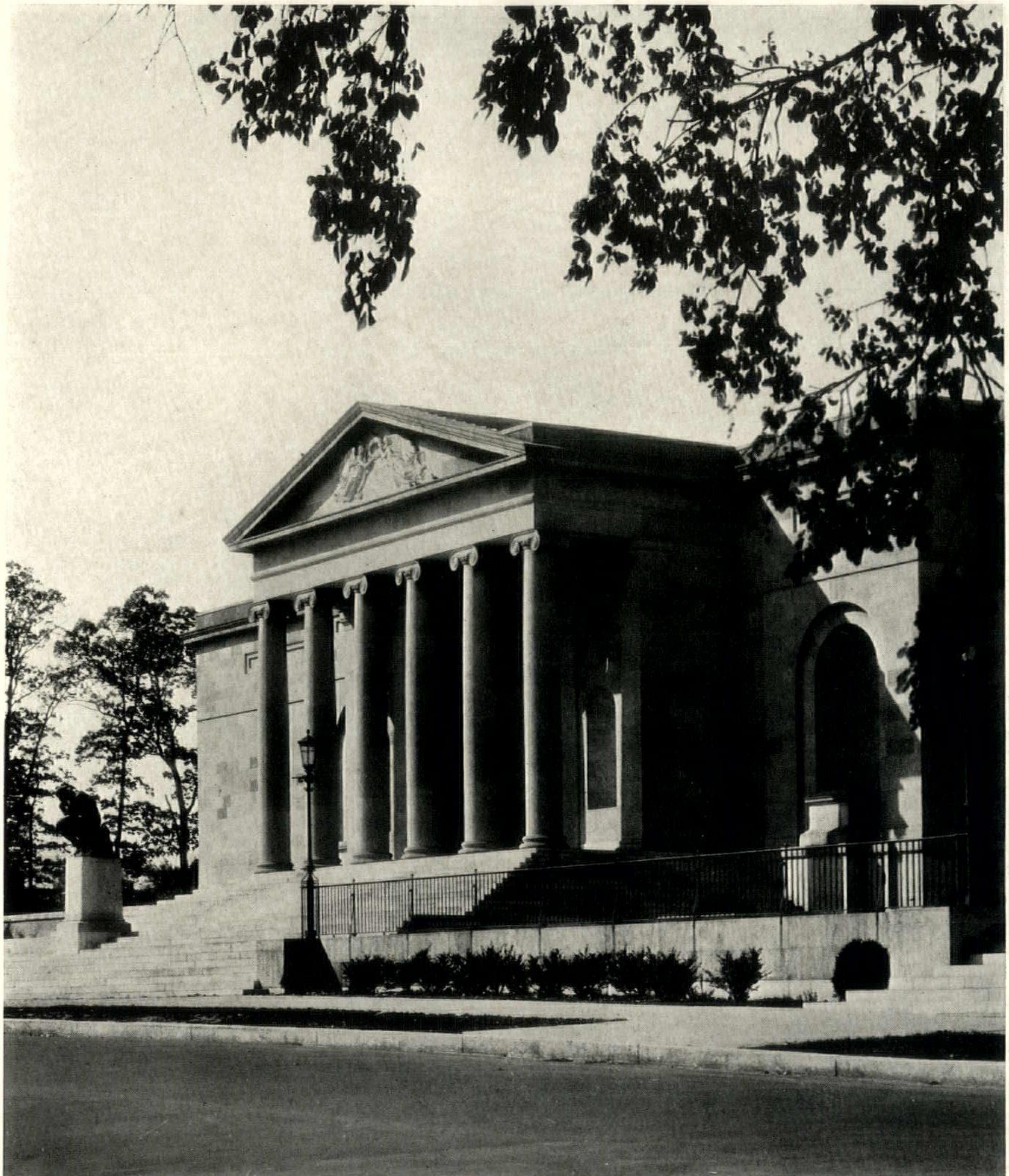


GROUND FLOOR PLAN

COLUMBUS GALLERY OF FINE ARTS

COLUMBUS, OHIO

RICHARDS, McCARTY & BULFORD, ARCHITECTS



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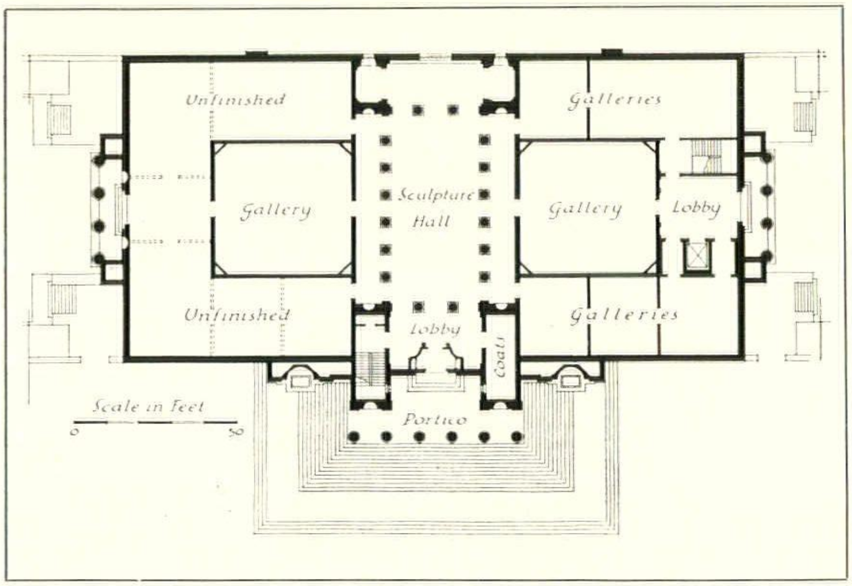
BALTIMORE MUSEUM OF ART

BALTIMORE, MARYLAND

JOHN RUSSELL POPE, HOWARD SILL, ASSOCIATED ARCHITECTS

Hughes



THE building faces west and is placed upon a wooded knoll, flanked with well paved thoroughfares. It is planned to house a permanent, miscellaneous collection of paintings, sculpture and *objects d'arts* and has as well accommodations for traveling exhibitions. The exterior is faced entirely with a warm buff limestone. The interior finish is conventional in the gallery spaces. In the lobbies and sculpture hall the walls, pilasters and columns are of limestone

BALTIMORE MUSEUM OF ART

BALTIMORE, MARYLAND

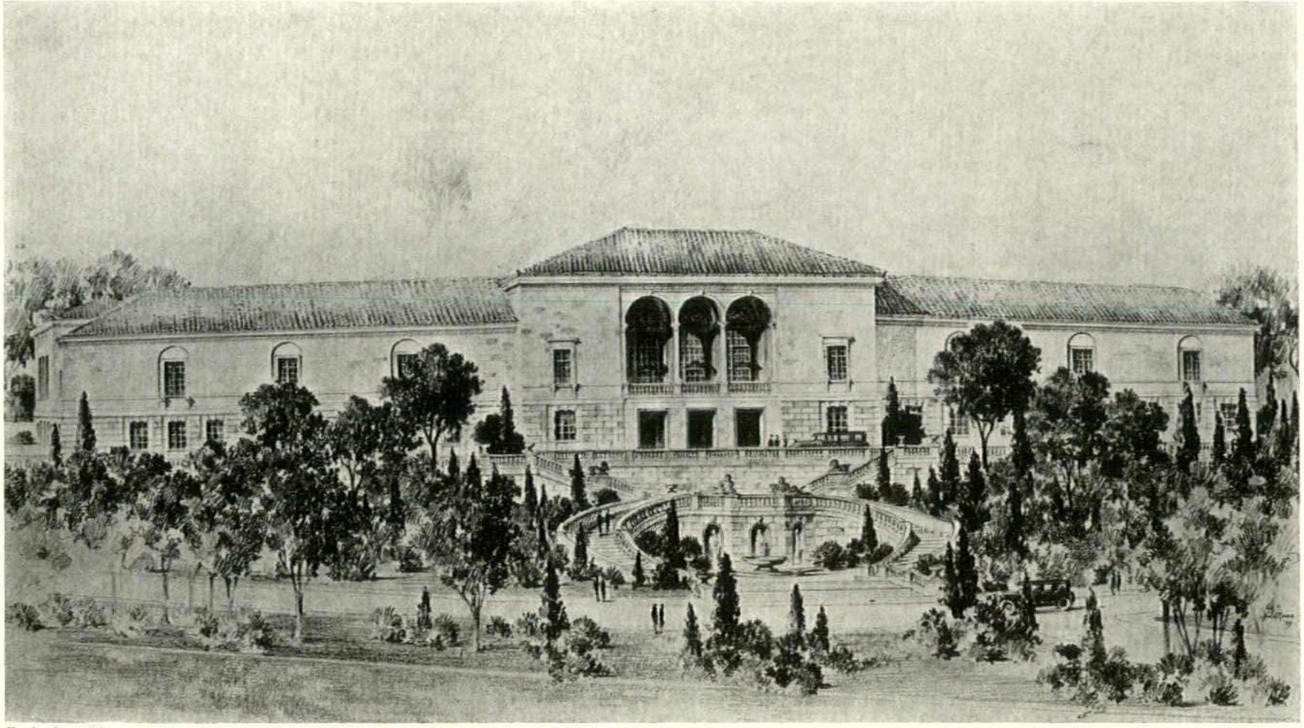
JOHN RUSSELL POPE, HOWARD SILL, ASSOCIATED ARCHITECTS

Gottscho

BALTIMORE MUSEUM OF ART

BALTIMORE, MARYLAND

JOHN RUSSELL POPE, HOWARD SILL, ASSOCIATED ARCHITECTS



Engler Bros. Photos

SITUATED on a commanding site which overlooks the Miami River, the museum has complete facilities for its permanent fine arts collections, for traveling exhibitions and for educational work. Particularly interesting is the large amount of space devoted to fine arts instruction and public participation in art activities. In the lower part of the building are classrooms, a lecture hall and library, the whole being connected by a tunnel to a separate building which houses an art school. The central lecture hall seats 800 and is used for musical activities as well as for public lectures on the fine arts

THE DAYTON ART INSTITUTE

DAYTON, OHIO

EDWARD B. GREEN & SONS AND ALBERT HART HOPKINS, ARCHITECTS

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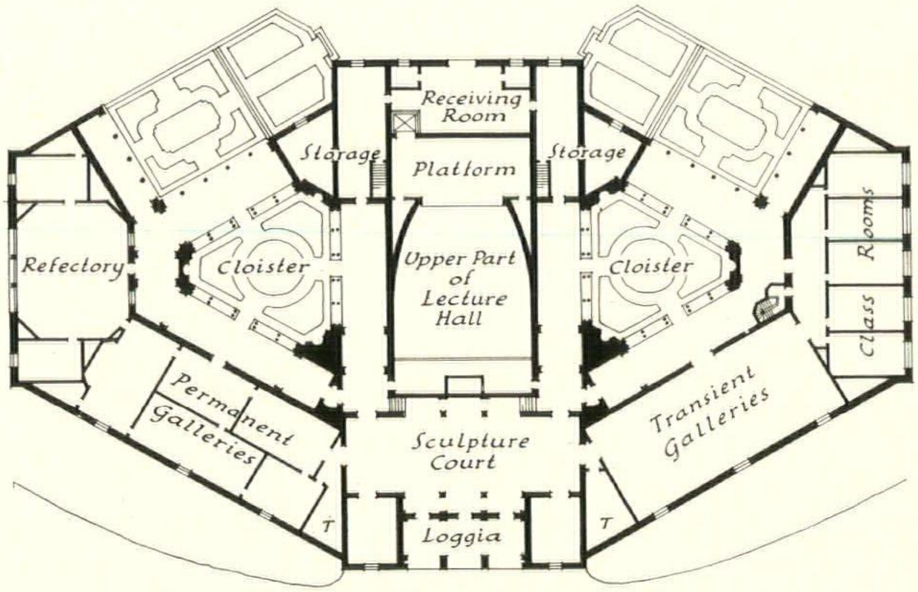
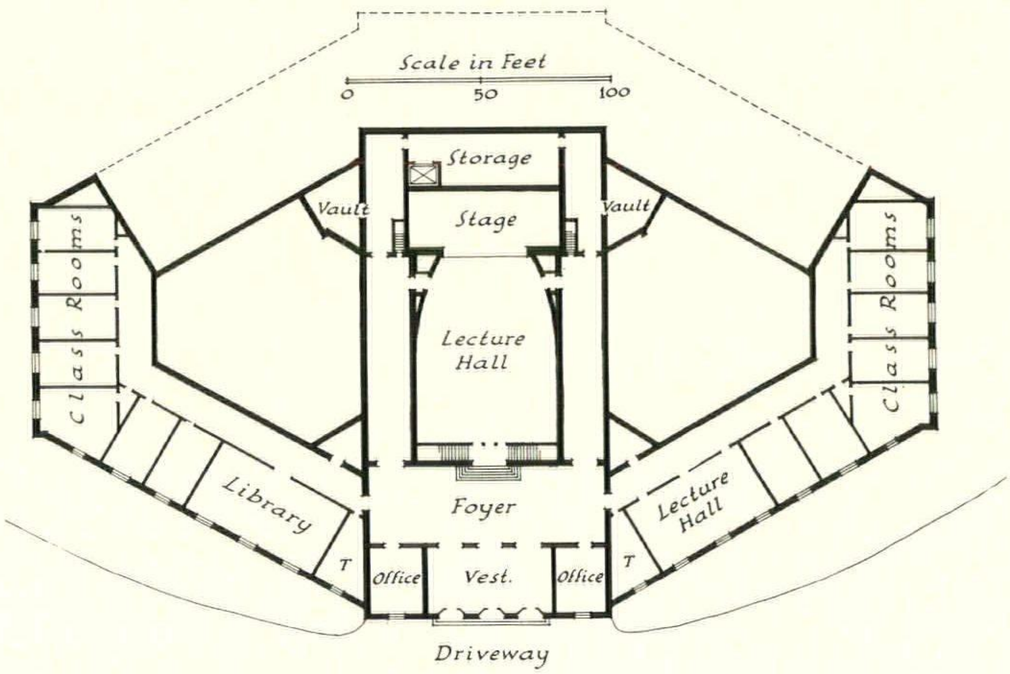
THE DAYTON ART INSTITUTE

DAYTON, OHIO

EDWARD B. GREEN & SONS AND ALBERT HART HOPKINS, ARCHITECTS



MAIN FLOOR PLAN



GROUND FLOOR PLAN

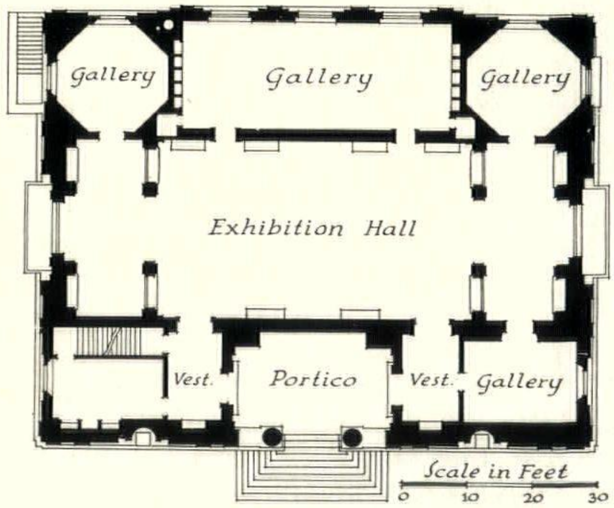
THE DAYTON ART INSTITUTE

DAYTON, OHIO

EDWARD B. GREEN & SONS AND ALBERT HART HOPKINS, ARCHITECTS

Rittase

THE plan of this museum differs from the usual gallery in that it is designed to house a special collection, Rodin's work. Constructed in 1929, the building contains 247,000 cu. ft. and cost 80.6 cents per cu. ft., or a total of $199,777. It is faced on the exterior with a planed-finish Indiana limestone. The fountains, the walks and the walls of the garden are of French limestone. The floors of the interior are of terrazzo with inlaid marble patterns and borders. The base, columns and pilasters are of Tavernelle marble; the walls and ceilings are of plaster, the latter being decorated in subdued color. The pedestals for the exhibits are of Benedict stone



MAIN FLOOR PLAN

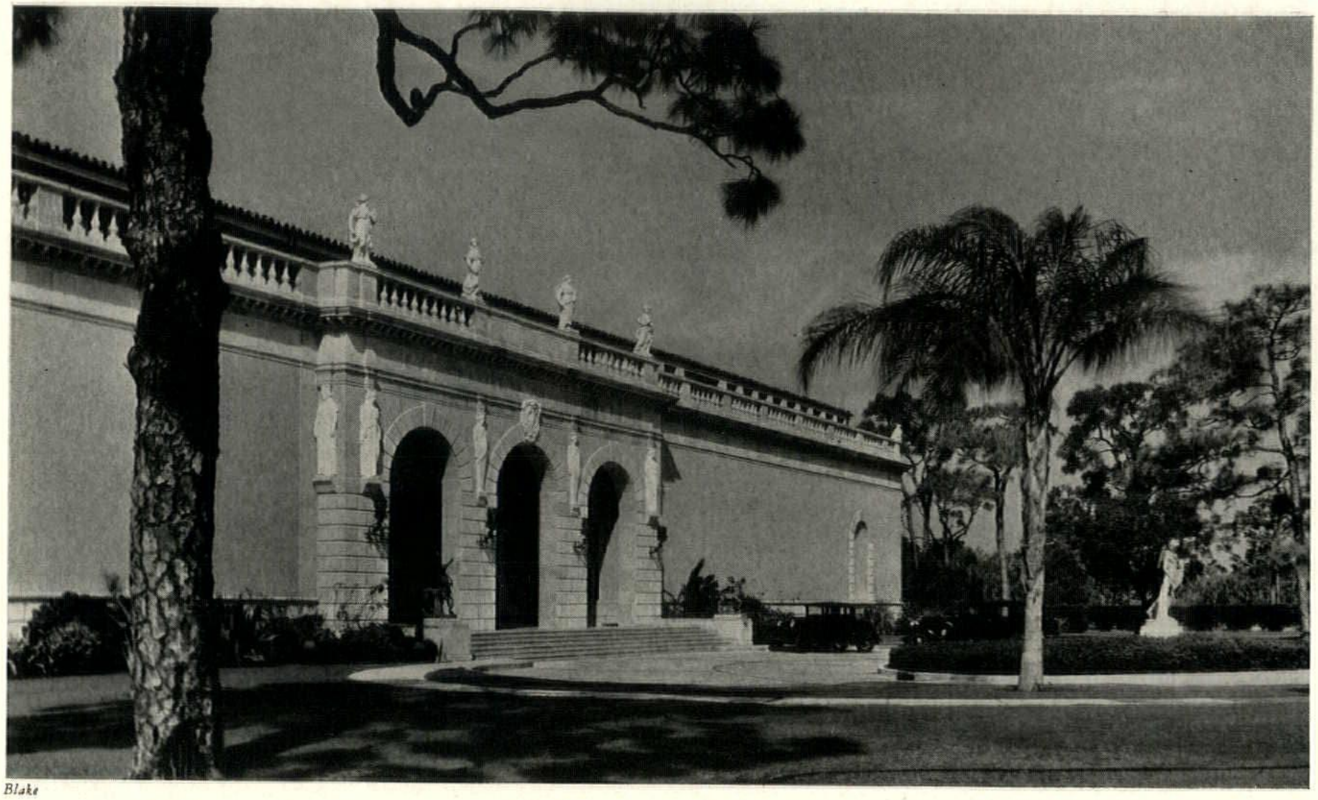
THE RODIN MUSEUM

PHILADELPHIA, PENNSYLVANIA

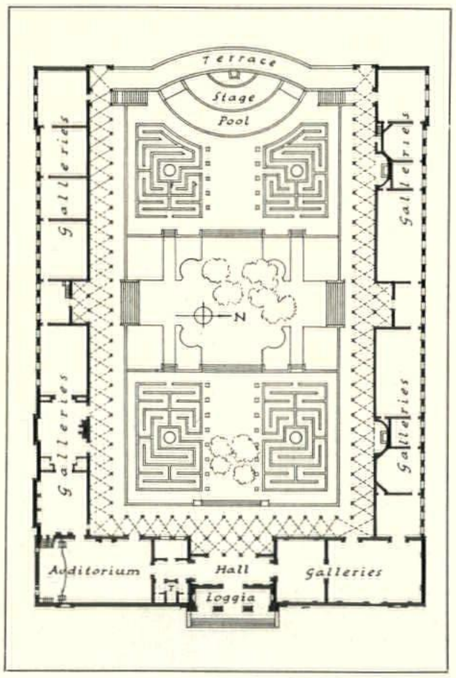
PAUL P. CRET AND JACQUES GREBER, ARCHITECTS

Commercial

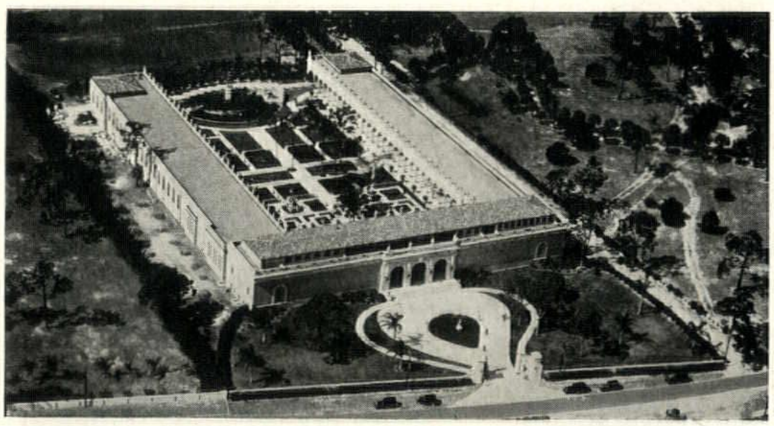
THE RODIN MUSEUM
PHILADELPHIA, PENNSYLVANIA
PAUL P. CRET AND JACQUES GREBER, ARCHITECTS



Blake



THE building, which contains 1,279,604 cu. ft. and cost approximately $1.15 per cu. ft., is built with a steel frame on a concrete foundation. The walls are faced with salmon color stucco over brick and tile masonry. The floors are of reinforced concrete. The roof is covered with red Cuban tile, the trim is of Istrian stone and Verona marble. The galleries are daylighted with high clerestory windows



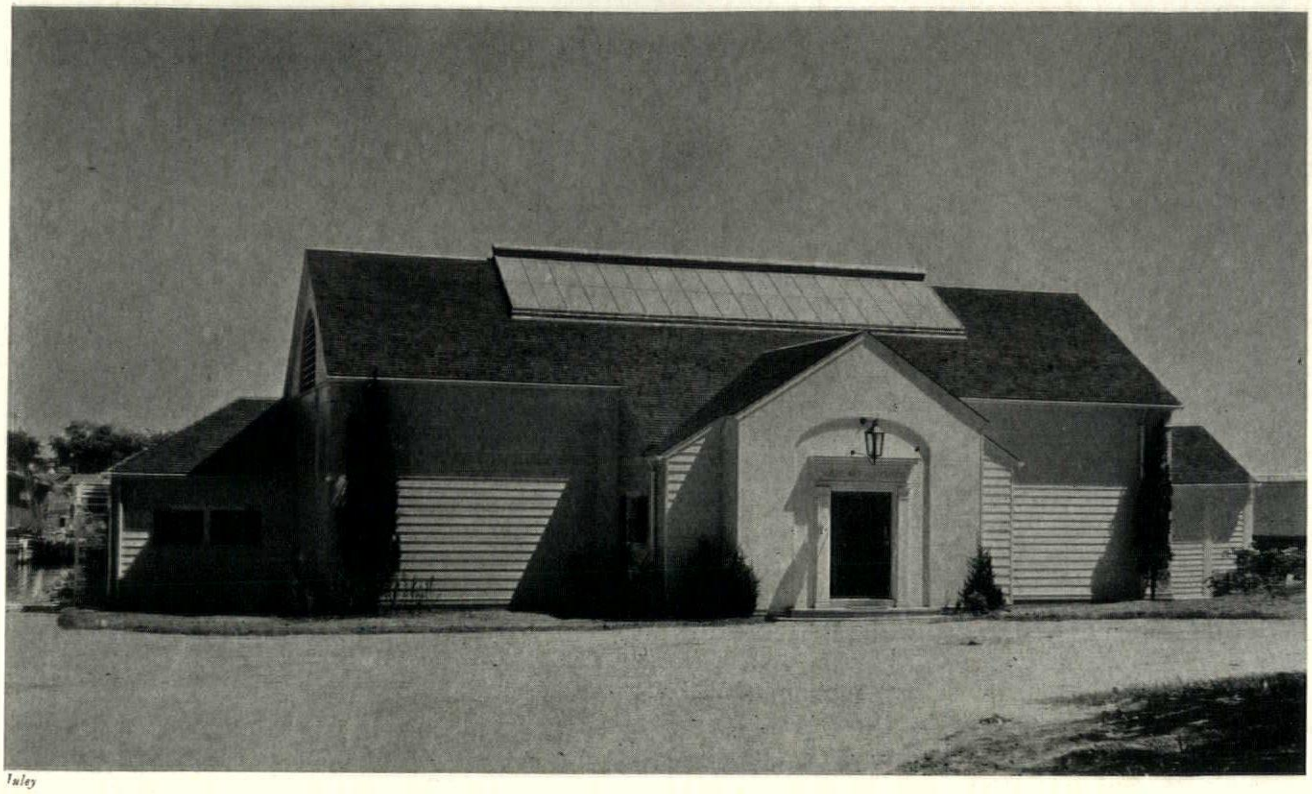
RINGLING MUSEUM OF ART

SARASOTA, FLORIDA

J. H. PHILLIPS, ARCHITECT

Blake

RINGLING MUSEUM OF ART
SARASOTA, FLORIDA
J. H. PHILLIPS, ARCHITECT



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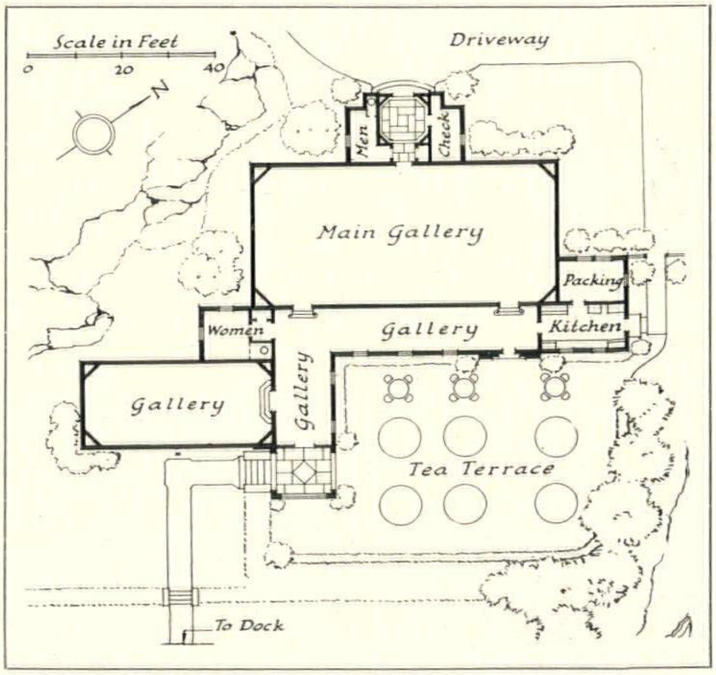


THE museum is privately owned by an art society whose members work in arts and crafts as well as in fine arts. It serves as a social center as well as exhibition space and the plan differs accordingly from that of the usual, formal art gallery. The change in levels between the corridor galleries and the others serves the double purpose of adapting the building to the contour of its location and providing a means of natural ventilation in the larger spaces. The building is of frame construction, the roof being supported by steel trusses. The studs are 2 x 6 and the floors are of white oak. The exterior is finished in clapboards and plain sheathing, all painted white. The shingles on the roof are stained in two shades of dark red

MYSTIC ART GALLERY

MYSTIC, CONNECTICUT

JACKSON, ROBERTSON AND ADAMS, ARCHITECTS

Juley Photos

ABOVE is an illustration of the main gallery. The walls are covered entirely with monk's cloth. The rooms are used only in the summer, and the lighting has been confined to the skylight areas for exhibition purposes. The fixtures are used in the evening only. At the left is the long corridor gallery. The treatment in this space is similar to that in the larger gallery spaces. Throughout the interior, the woodwork is painted a cream color

MYSTIC ART GALLERY

MYSTIC, CONNECTICUT

JACKSON, ROBERTSON AND ADAMS, ARCHITECTS

THE EDITOR'S FORUM

HOUSING—A NATIONAL ISSUE

CONSTRUCTIVE measures to stimulate employment and revive trade must involve building. The public, the President and the politicians have realized that building is the vital force now needed.

Building must be undertaken if business is to revive. The country's second largest industry cannot remain standing idle; it is the key industry in the present crisis. It uses the greatest number of different kinds of raw and finished material of any industry. It employs directly and indirectly the widest range of all classes of workmen and brainmen. Yet up to the present this industry has remained inarticulate, unorganized. Even the leaders in its separate branches had not formulated a plan or banded together to do so until the past year.

Why is it that the industry is almost idle? And why is there so little building being undertaken today? Building suffers from the same over-expansion and speculation that has been rife in other industries. Perhaps it is just as well therefore that capital is not available for investment in most types of buildings. We have built more office buildings, hotels, high-priced apartments and more of all sorts of commercial buildings than can be profitably rented. Any further capital invested in such enterprises would aggravate the situation.

If this is true, and we must acknowledge that it is, what types of buildings can logically be undertaken now? The obvious answer is — public buildings, institutional buildings and housing. The first type can be financed by government credit — local and State, where such credit is not already exhausted, and aided by Federal purchases of local bonds where necessary and justified. Even though comparatively few such buildings may be imperatively needed, the situation demands their completion. Besides being capital investments not producing any revenue, they involve carrying charges and maintenance charges which add to the tax burden and make the tasks of budget balancing more difficult. Nevertheless, the program of government buildings should be continued as an employment measure, as most of the sites have been acquired and the plans are drawn or are nearing completion.

Housing can be made to pay its way and amortize its loans, and it need not increase taxes. Decent housing is the one class of building for which there is the most actual need. It must be given the necessary financial aid through the use of Federal credit, not as a stop gap, but as a safe, self-supporting enterprise yielding an adequate though limited return on the investment, not to mention the "unearned increment" in benefits to the health and morale of those housed.

THAT the time is ripe for the use of the Federal borrowing power to provide for housing is evinced by these recent developments.

Alfred E. Smith has just reiterated his forceful and logical suggestions including (a) an expanded program of Federal improvements, (b) the advance of money to limited dividend housing corporations for construction of low-cost housing. He advocates the sale of Federal bonds for these purposes rather than the indirect methods to accomplish the same result.

The LaFollette bill proposing a five and a half billion dollar bond issue for unemployment relief contained a provision for one hundred million dollars to be loaned to limited dividend housing corporations to build for the low-income group under proper safeguards.

We have also the recent proposal of Senator Robinson for "two billions of tax exempt bonds to be spent upon self-liquidating or profit-making enterprises, such as tunnels, bridges and the reconstruction of slum districts in great industrial centers." Further, he brings out that, "The benefits to be derived from this method of increasing the buying power are not limited to the sums actually spent for unemployment, but extend to the revival of business, to the sale of material, supplies and other commodities. In addition, improved living conditions may be anticipated by the use of a portion of the funds in improvements in slum and tenement districts where the rent of structures could be lowered from the present charges and yet be sufficient to pay interest and sinking fund upon the venture."

On the same date, May 12, Walter Lippmann wrote in the *New York Herald-Tribune*, "I venture to suggest that it be explored on the following principles: that no money be raised which entails a charge upon any governmental budget, that an inquiry be instituted to determine what socially useful projects could be started which would be self-supporting, which would not be destructively competitive with existing enterprises, which could be constructed at low costs, which would create a demand for labor and materials. . . . Another field of enterprise which should be studied is slum clearance. Here the principle that the project should be non-competitive may be invoked. Yet I should suppose that housing built by semi-public corporations on land occupied by slums would not add to the oversupply of housing; it would merely replace bad housing. Certainly this is worth examining at a time when land is cheap and building costs at a point where contractors and unions might be willing to take lower rates in return for fuller employment."

President Hoover's statement of May 13 in regard to his proposed three-point Federal relief plan for united action explains that relief should and can be effected through the Reconstruction Finance Corporation, without increasing taxation, by loaning to "self-liquidating" public works. *Housing is the most necessary self-liquidating public work.*

Two things are imperative to produce this housing: *first,* the funds must be made available through government credit (no other capital is available at low enough interest rates); *secondly,* local housing projects must be crystallized immediately and so planned and organized as to be ready to proceed as actual construction as soon as these funds are made available. This requires the highest type of technical service and the cooperation of all the local factors in building.

It is the business of the industry to see that both these measures are undertaken at once. Much can be done through the active initiative and the combined efforts of the American Institute of Architects, the Construction League of the United States and the affiliated organizations. They must do it NOW!

The building industry, and architects in particular, can concentrate on this one phase of the present need where they can render the greatest service. While fully realizing the importance of the solutions to the problems of balancing the budget, of taxation, of foreign debts, of armament limitation, of tariff agreement, and all that — and while considering (as they must) the underlying problems of the whole social-economic-political order — they can best devote their energies to the constructive measures involving building activity.

TO SUM up the argument — and the action: Goods must be consumed and men employed or a direct dole will be inevitable.

Increased consumption is necessary to a resumption of production and a revival of trade.

The building industry is the key industry to increase both consumption and employment because:

It uses the most kinds of raw materials.

It uses the most kinds of finished materials.

It uses the most kinds of men, directly and indirectly, in brainwork and in skilled and unskilled labor.

Building can be undertaken logically only by constructing public buildings, institutional buildings and housing—for supply exceeds need in most types of commercial buildings.

Government buildings are the first that can proceed to give employment.

Housing can be self-supporting, "self-liquidating," and need not increase taxes.

Housing is the one most needed class of building.

Housing construction can be started only through a new source of credit.

Federal credit should be used to stimulate housing financing by providing 50 per cent of the necessary funds, the remainder to be supplied by properly safeguarded, limited dividend corporations, subscribed to by savings banks, insurance companies, institutions, trust funds, private capital and the building industry itself.

Housing projects of large scale only should be undertaken in this endeavor.

Therefore:

1. A bill must be introduced in Congress by the building industry to bring this about through appropriations, and must provide for a competent board, having architectural and engineering members, to pass upon the social, economic and functional needs and provisions of each large scale project to be so financed.

2. Such bills, either separately or as parts of larger bills, must be actively supported by the entire industry.

3. The American Institute of Architects and its affiliated organizations must concentrate on such support through publicity and through contact with all Senators and Congressmen by each and every chapter and society and individual member.

4. Specific projects must be made ready at once to use the funds. The mode of procedure is known.

5. Architects must assume the leadership in the preparation of the local organization program and plans for the large scale housing in which the funds will be used.

Will the American Institute of Architects and the State societies devote their energies now to this one constructive program and cooperate with the Construction League of the United States to bring a united industry to frame and support this one program of public service?

Kenneth K Stowell

EDITOR

Davis

The Wendell Holmes Library at Andover, Mass., for which Charles A. Platt was the architect

LIBRARY PLANNING AND DESIGN

BY

EDWARD L. TILTON

OF TILTON & GITHENS, ARCHITECTS

A LIBRARY building should combine the æsthetic and the practical; the former to allure, the latter to satisfy. The plan is paramount, that the usually limited appropriation may be expended to accommodate properly the maximum of readers and of volumes. Good taste should prevail throughout; decoration may be restricted, although of value in its place.

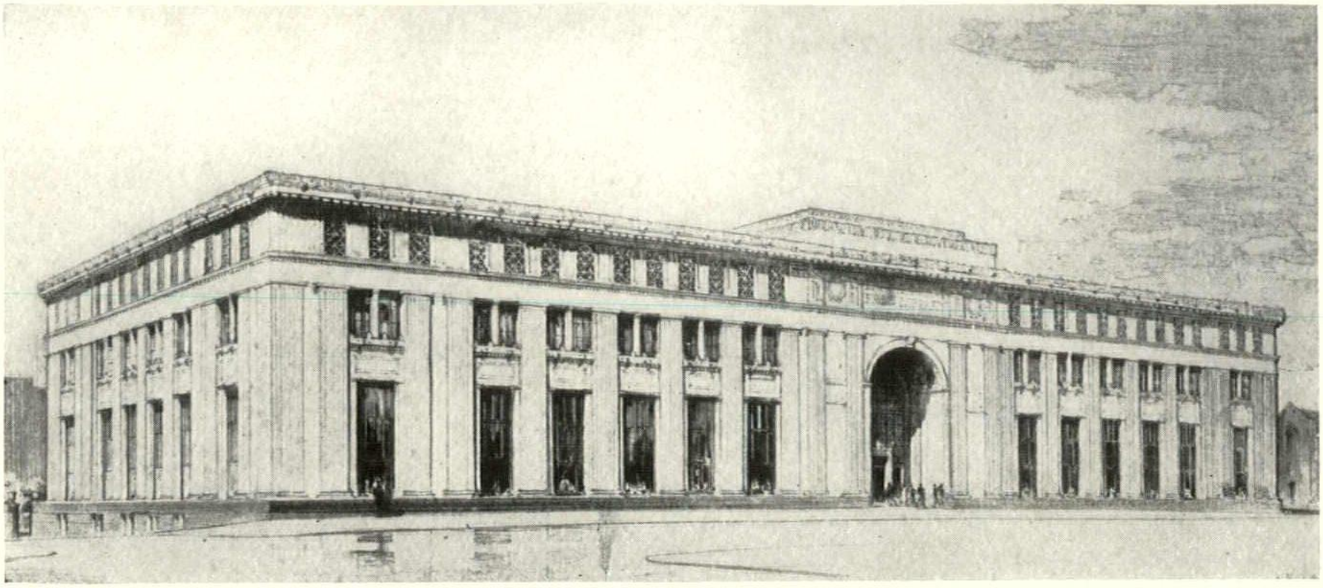
It is easy to think how an ideal library might be planned but difficult to produce a result in accord with our ideal, owing to hampering conditions. It is almost as difficult as attempting to make a concrete reality of the mathematical fourth dimension.

For instance, the main floor, with its entrance on the street level is a desideratum, but this conflicts with a well lighted basement unless, happily, the lot slopes rearward. The catalogue cases would be ideally located if proximate to the delivery desk, the reference room, the cataloguing room and necessarily easily accessible to the public — a consummation more devoutly to be wished for than to be attained.

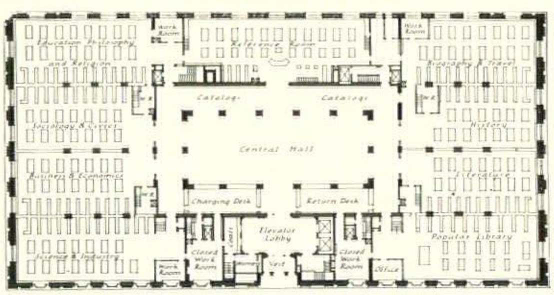
If aerial space could be condensed without reducing the physical dimensions of the various rooms, then the librarian at a central control desk might supervise every reader, a result one can imagine achievable by properly constructed periscopes and mirrors, but not (excepting in a very small library) by the eye unaided. The book stack arrangement should minimize footsteps, although every twenty require an average of a square foot of floor space, seven shelves in height.

These are but a few of the dilemmas that confront one when striving to convert idealism into actualities, and there is still unmentioned the major requirement of confining the perimeter of the building within the limit of the appropriation. Visions cost nothing, but their realization requires money, and money often dominates the form of expression and may demand a glorification of the donor to the detriment of the building's purpose.

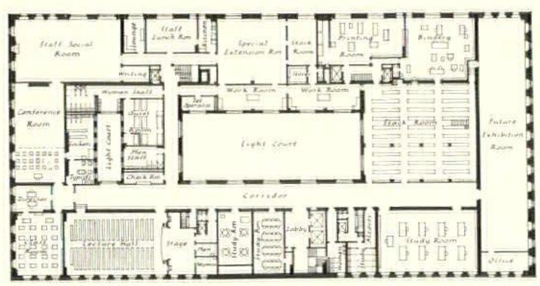
Throughout civilized ages records of human interest have been preserved to cater to a thirst for knowledge or simply to acquisitiveness or to



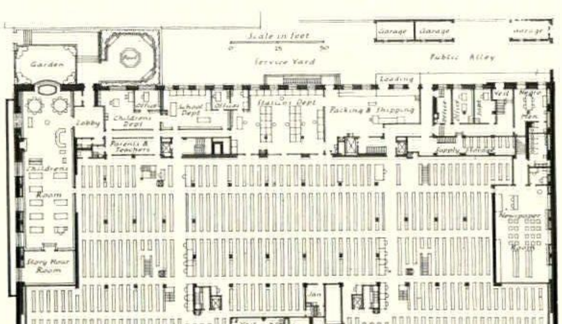
Illustrated on this page are the architects' perspective and the plans of the Enoch Pratt Free Library at Baltimore, Md., which is now in the process of construction. Clyde N. Friz and Nelson Friz were the architects. E. L. Tilton and A. N. Githens were the associated and consulting architects. In this large structure an attempt has been made to incorporate arrangements which will simplify the administration and control. Noteworthy from this standpoint is the centralized location of the catalogue and work rooms, surrounded on three sides by the various departmental reading rooms. These are separated from one another by easily removable shelving which will facilitate a possible future rearrangement. The plan gives easy access from all reading rooms to the public catalogues, and the supervision of the various departments by a trained librarian does much to aid an efficient and centralized control



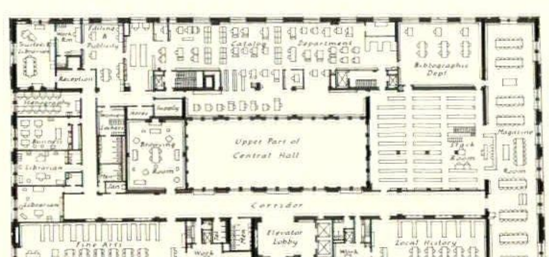
FIRST FLOOR PLAN



THIRD FLOOR PLAN



SECOND STACK LEVEL



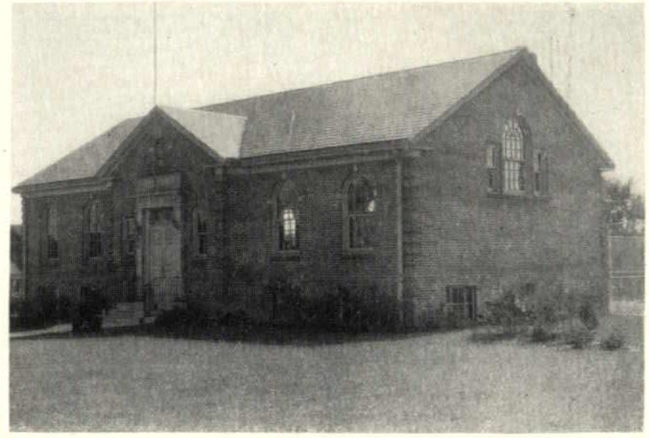
SECOND FLOOR PLAN

memorialize some person. Under the last heading are many examples, ancient and modern. In early eras the temples were the book depositories and the priests were the librarians; during medieval times the monasteries functioned similarly. One of the abbots said in the twelfth century that, "A monastery without a library is like a fortress without armament."

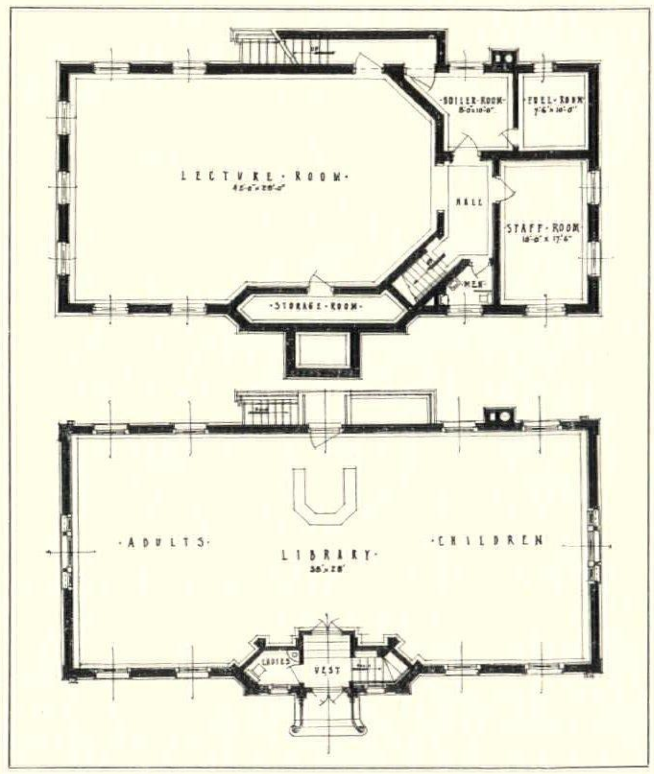
But those were for intramural pleasure and development and even within cloistered walls books were chained to the desks. Contrasted with such restraints is the modern altruism that endeavors to bring books freely to every person. In striving toward this objective, library development has passed through many phases, especially in regard to the fundamental provisions for readers and for books.

When Antonio Panizzi, one hundred years ago, gave to the architect, Sir Robert Smirke, his sketch for the British Museum reading room, he could not have foreseen that it would, unhappily, serve as a prototype for libraries in this country. Panizzi, a native Italian, had in mind, possibly, such attractive circular buildings as Bramante's San Pietro in Montorio, Caprarola's Santa Maria della Consolazione, or other similar chapels, and it seemed logical to assume that a building suitable to house a congregation would be appropriate for a reading room, ignoring its imperfect daylighting and its inhibition of further expansion.

The Columbia University and the Congressional libraries adopted the Panizzi model followed by many smaller buildings throughout the country, wherein the book stacks were well lighted and the readers placed in obscurity. Coeval with Panizzi, Labrouste in Paris, as architect for the Ste. Genevieve Library (1843–50), conceived a better reading room which was copied for the Boston Public Library. Later libraries have profited by a realization that readers should have the benefit of daylight, while it lasts, and that books are better off in the dark, provided they are well ventilated. The new Columbia Library will doubtless incorporate improved arrangements.



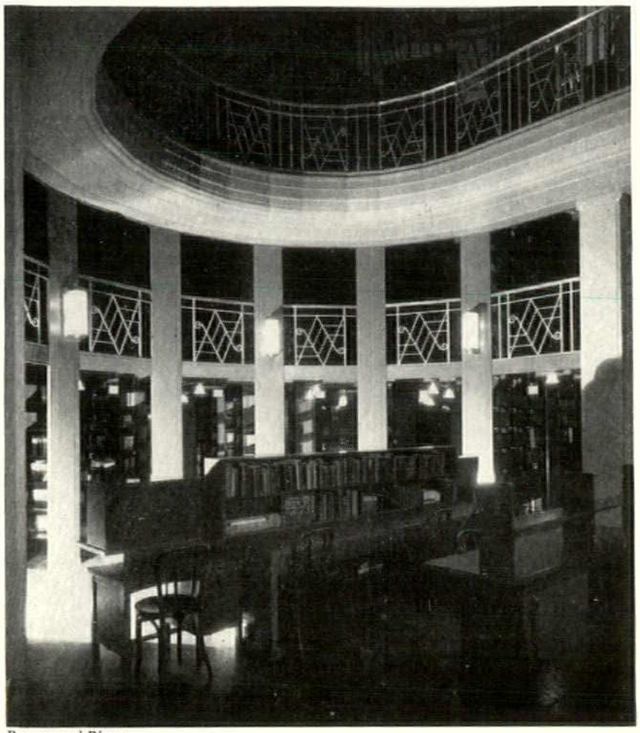
In contrast to the Enoch Pratt Free Library is this small West Side Branch of the Youngstown Public Library, Youngstown, O., for which B. E. Brooke and H. R. Dyer were the architects

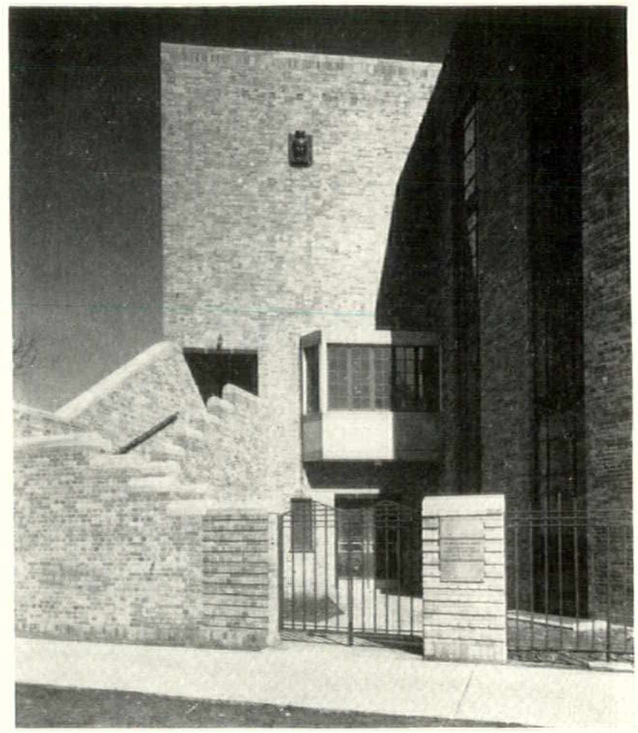


Types of Plans. Some years ago the Carnegie Corporation requested the writer to make diagrams of variously proportioned small libraries to be issued to applicants for donations. The object was to indicate economical arrangements whereby maximum accommodations for readers and books might be secured at minimum cost. Prior to this time much money had been wasted on badly proportioned buildings with resultant poor designs that frequently incorporated domes and other extravagant features to the detriment of necessary elements.

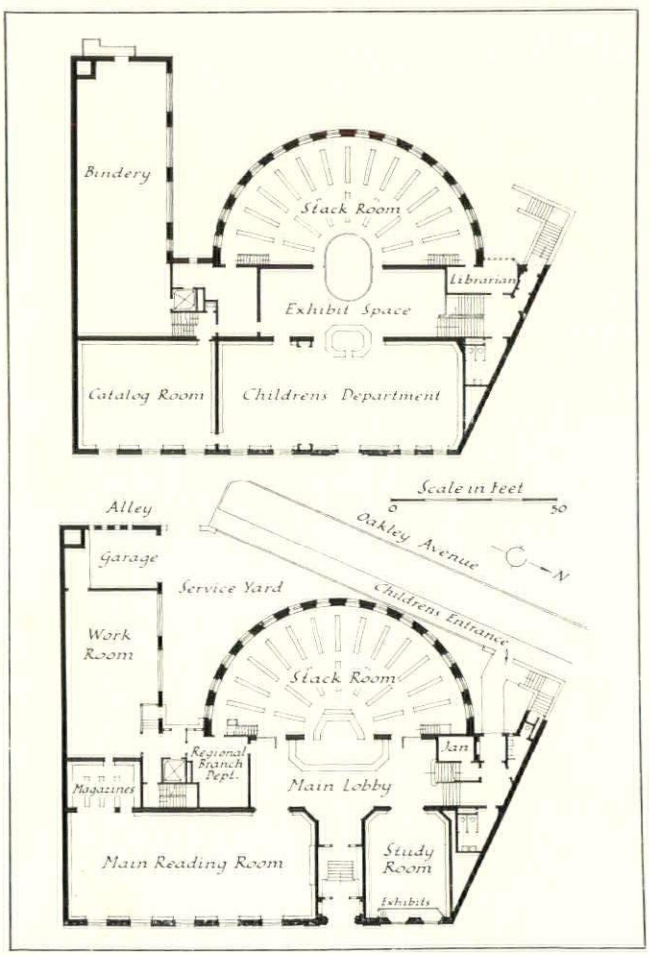
The conditions were hypothetical, as for example: Donation $30,000, for a building on a shallow interior lot, 100 ft. front. The plan was then developed in proportion of 3 to 7, with the exterior dimensions 28 x 65 ft. equaling 1,820 sq. ft. Adults' reading room 25 ft. square, seating 24 at six tables of approximately 25 sq. ft. per reader; children's reading room, same size but could seat 30 readers or approximately 20 sq. ft. each. The adults' room would shelve more than 5,000 volumes and the children's room nearly 4,000.

Another suppositional plan in the proportion of 4 to 7, or 37 x 65 ft., would contain, in addition to the two reading rooms, a small reference room and a





Ravenswood Photos



The plans and two views of the Frederick H. Hild Regional Branch Library in Chicago, Ill., Pierre Blouke architect. The problem here was somewhat unusual, due to the irregular site and the fact that the library serves as a distributing point for fifteen branches and a work shop for the whole system. The radial stack room has proved very practical for this particular site

stack room for nearly 6,000 volumes. The wall shelving in the room would hold approximately 9,000 additional volumes.

For a plot at the junction of two equally important streets a plan with a corner entrance was developed. The library at Vicksburg followed this plan, but as a rule the schemes were "more honored in the breach than the observance," since it militates against economy of arrangement and usually precludes a well-balanced exterior.

A square building contains the maximum area for the minimum length of enclosing walls, but a square plan is limited in size due to light and æsthetic considerations.

Methods of Administration and Control. In a small building the librarian can control from the delivery desk more or less efficiently the entire floor, but in a large one this is impossible. In the new Enoch Pratt Library of Baltimore an attempt has been made to incorporate arrangements that will simplify the control. The public catalogues are centrally located and accessible, while opening from the Central Hall are eight departmental reading rooms and a reference room with a balcony to increase its book capacity.

The departmental reading rooms are separated from one another by shelving, easily removable, thereby facilitating any desired future rearrangements. A librarian specialist will have a desk and workroom at the entrance to each of the eight departments and a ninth in the reference room. By this method the skilled librarians may serve the public to the best advantage while the routine work of charging books or registering applicants is delegated to less expensive assistants. This all makes for centralized control, since the departmental desks radiate from, and are within easy reach of, the desks in the Central Hall.

The exterior design of the building was influenced by the demand for "show windows" wherein to exhibit not only books but articles of current interest that might attract the passing public. High base and entrance steps, the usual concomitants of a dignified building, were, perforce, omitted.

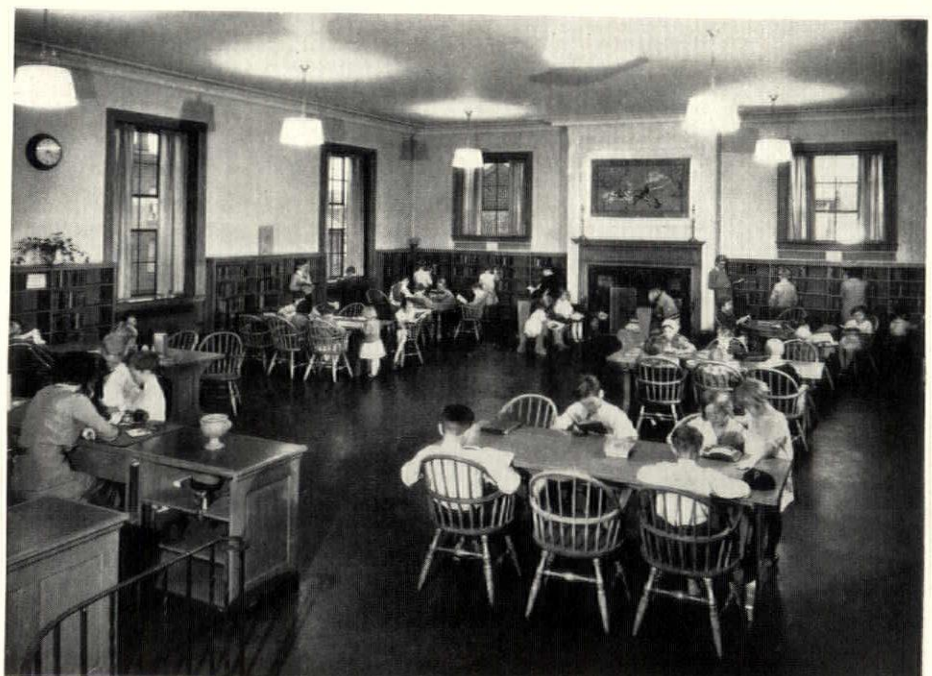
The sloping land admitted of an entrance to the children's room nearly on the street's lower level. At the opposite end of this floor is a newspaper room with special access from the street. A quarter of a million volumes may be shelved on the first floor and more than ten times that number on three tiers of basement stacks with stairways and lifts to each department above.

Provisions for Book Storage. The above location of stacks tends to an economy, possibly greater than the tower type, where there are more floors with less area to each one. For example, approximately one million volumes may be stacked in a tier of 50,000 sq. ft. area, or 300 x 166 ft. (the approximate dimensions of the Enoch Pratt stack room) whereas, assuming a tower 100 ft. square or 10,000 sq. ft., five tiers would be required to shelve the same number of volumes. In the former case two call-boys or pages might suffice where a page to each tier would be necessary in the tower.

"Of the making of books there is no end," much to the librarian's embarrassment when his stack room has reached its limit of capacity. The Bodleian Library at Oxford resorted to crypt storage, extending through to the Radcliffe "Camera," and when still more space was required, sliding sections like laundry racks were introduced in the aisles; but these, when pulled out, obstruct the passageways. In some places the Bodleian shelving sections, at the ends of stack tiers, equipped with rollers, are pulled out sideways. This is literally a makeshift.

A suggested possibility is to support stack floors on independent light columns, spaced 6 ft. apart one way and 4 ft. the other, with the stacks in 3 ft. lateral units on rollers placed lengthwise between the six-feet-apart columns. When increased capacity is required, these units are turned 90° and placed side by side. Each unit may be pulled temporarily into the 4 ft. aisle to give access to the books. This method would increase the capacity 50 per cent.

Some librarians have adopted the suggestion made by Dr. Charles Eliot, many years ago, to provide a separate building as a book necropolis and for moribund volumes or those in scant demand. At Providence, an old church some distance from the main building has been adapted to this purpose, a



Moyer

A separate children's department is particularly important in a city library. This illustration is of the children's room in the Charles Skelton Branch of the Public Library in Trenton, N. J. P. L. Fowler Company were the architects reversion to the ancient custom of housing libraries in temples and monasteries.

Conveyor belts for the transfer of books from stack to delivery desk have been installed in larger libraries. Pneumatic tubes are used to transmit book slips and orders.

Location of Reading Room. An arrangement that tends to the conservation of energy is that of placing the reading rooms on the street level rather than in the second or third story, the usual location in large libraries of a few decades ago. To raise a thousand readers, each averaging 150 pounds, twenty or more feet from the lower to an upper story represents a force equaling 3,000 or more foot tons. This energy might conceivably be used to better advantage than wasted in electric elevator current or in muscular effort on the stair cases. Especially is an easily accessible reading room desirable in these days when the librarian employs every recourse (except that of standing in the windows to beckon) to lure the stranger or friend who might otherwise pass by.

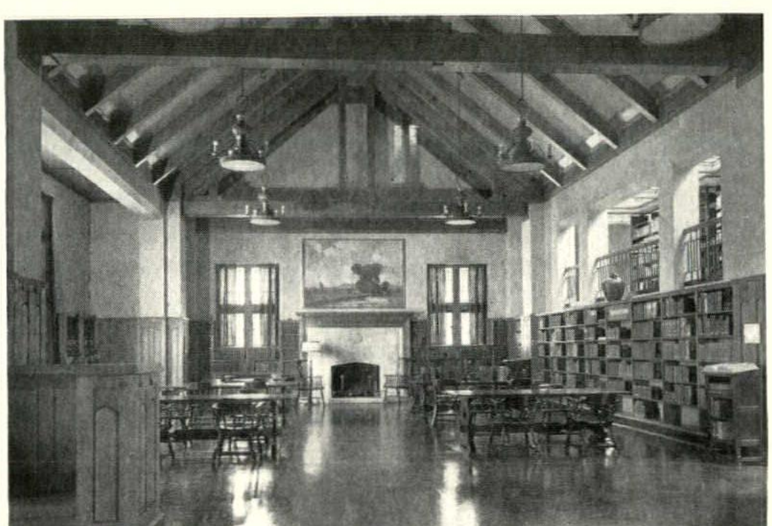
Besides the general reading room, another type, possibly secluded in an upper floor, is required to cater to the bibliophile, where he can read while comfortably ensconced. Such a room counters the objection of Gerald Stanley Lee who bemoaned the inaccessibility of books in the stack type where one must charge a barricade of pretty girl librarians to have the book swung out as by a derrick instead of being able to browse untethered in the rich pasture.

Lighting. Proper artificial lighting is always a topic of discussion and sometimes leads to heated arguments. The resultant desired is the assurance of approximately ten candle-power of light intensity, at a level of the reading tables. This may be secured in several ways and there is a protagonist for each method.

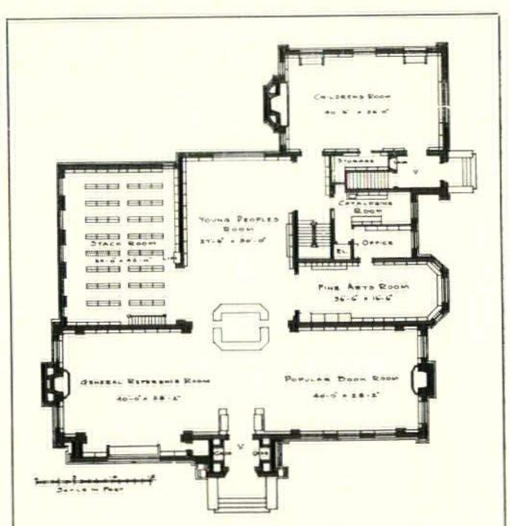
For reading rooms general illumination is desirable and may be secured most economically by a sufficient number of small bulbs in fixtures suspended 12 ft. above the floor. Table lights have their proponents with the accompanying disadvantage of tables fixed in certain prearranged positions and possibly an uncomfortable reflection from the reader's book. Indirect light requires that the ceilings be not too high and that they be kept clean in order to reflect. Semi-indirect fixtures represent a compromise that often falls between two stools and with the indirect types require more current to produce a requisite yield of two watts to each square foot of floor area. Excessive light intensity is as objectionable as an insufficient quantity.

Daylighting should be assured by ample windows with their glass area equal to one-fifth of the floor area and of height sufficient to project the light into the room to a distance equal to one and one-half times the height of the windows.

Finally we might similize a library to a bank, although it deals in words instead of money. One thousand books may contain one hundred and fifty million words of varying value like gold, silver or copper which the librarian loans freely. When Polonius inquired of Hamlet what he was reading the reply was, "Words, words, words," although he concealed the "matter" with his pseudo-madness. But it is the *matter* of the word currency that is an index of a library's true value and its *availability* that measures the quality of its service.



Trowbridge

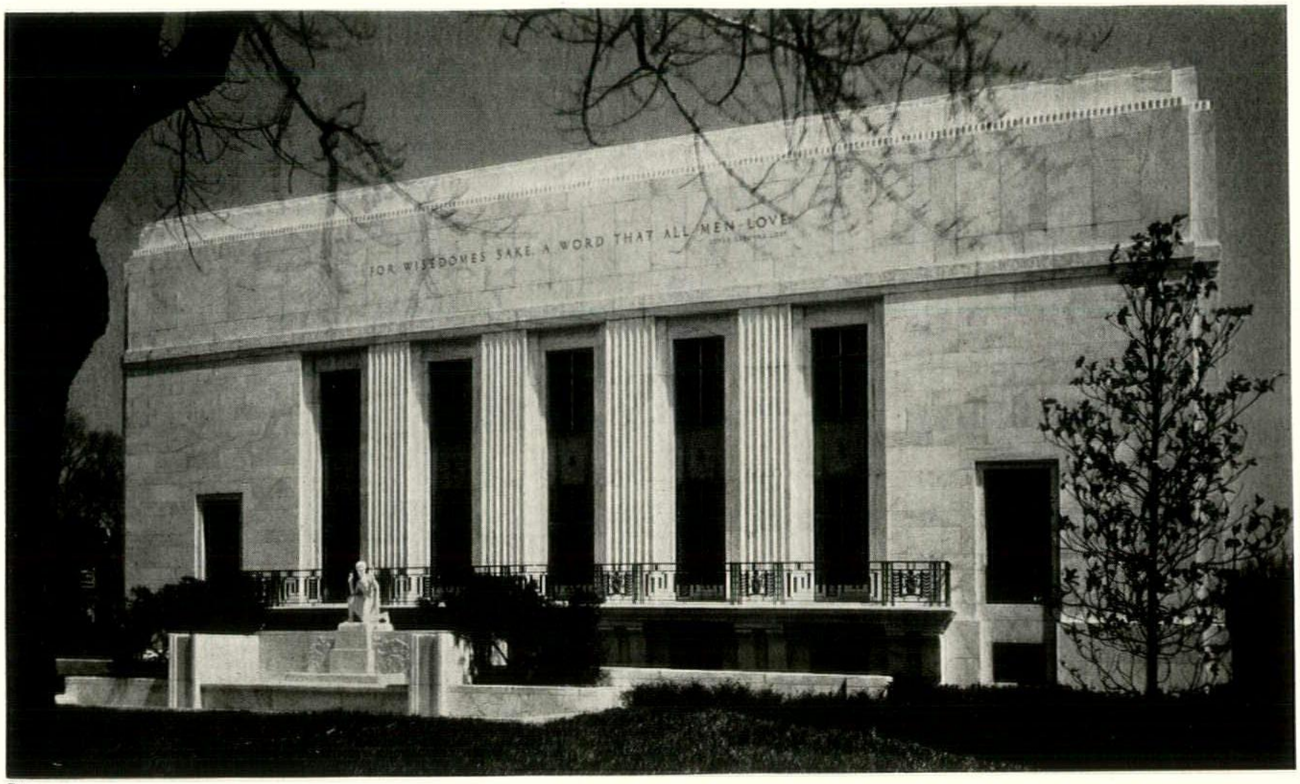


The reference room and first floor plan of the Highland Park Public Library at Highland Park, Ill., for which Holmes & Flinn were the architects. The plan is especially noteworthy for the separation of the adults' space from the remaining areas

Rittase

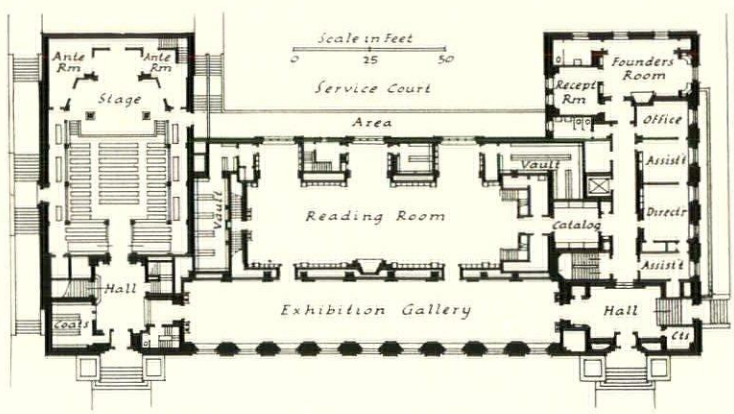
THE FOLGER SHAKESPEARE LIBRARY
WASHINGTON, D. C.
PAUL PHILIPPE CRET, ARCHITECT
ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT

THIRTEEN LIBRARY BUILDINGS



Rittase

THE exterior design of the Folger Shakespeare Library was influenced by its proximity to the classical government buildings surrounding its location. The modern adaptation of the classical has been executed in a Georgia marble, using as a principle of decoration a set of nine bas-reliefs illustrating Shakespeare's plays. The window spandrels and grilles are of white metal. The building has a triple purpose: first, it houses a collection of 75,000 volumes with the necessary administrative quarters and services; secondly, it includes a theater or lecture room to permit the performance of Shakespeare's plays in the manner of his time; and, thirdly, it includes an exhibition space for the display of books, prints, costumes, works of art relating to Shakespeare. The reading room shown on page 576 has been designed as a typical English hall and is daylighted by three huge bays. Paneled bookcases and the trusses which support the roof are all executed in stained oak. The plaster walls have a smooth texture and are painted a warm cream. On the east end is an oak hall screen having as a center feature a reproduction of Shakespeare's memorial in Trinity Church on Stratford-on-Avon. The room is not open to the public but is reserved for students who have access to the two tiers of book shelves which line both sides of the long hall

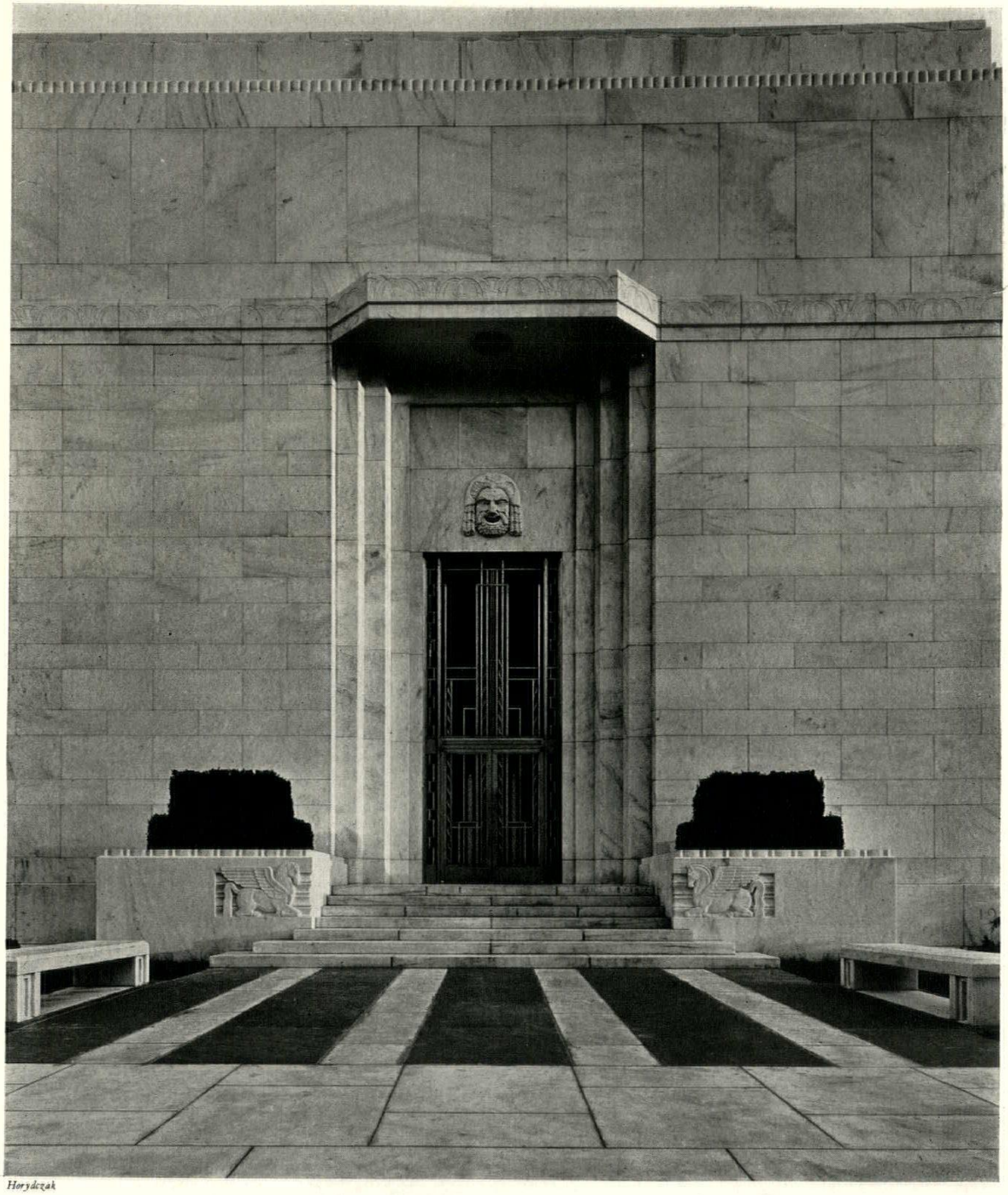


THE FOLGER SHAKESPEARE LIBRARY

WASHINGTON, D. C.

PAUL PHILIPPE CRET, ARCHITECT

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT



Horydczak

THE FOLGER SHAKESPEARE LIBRARY

WASHINGTON, D. C.

PAUL PHILIPPE CRET, ARCHITECT

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THE FOLGER SHAKESPEARE LIBRARY

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Horydczak

THE FOLGER SHAKESPEARE LIBRARY

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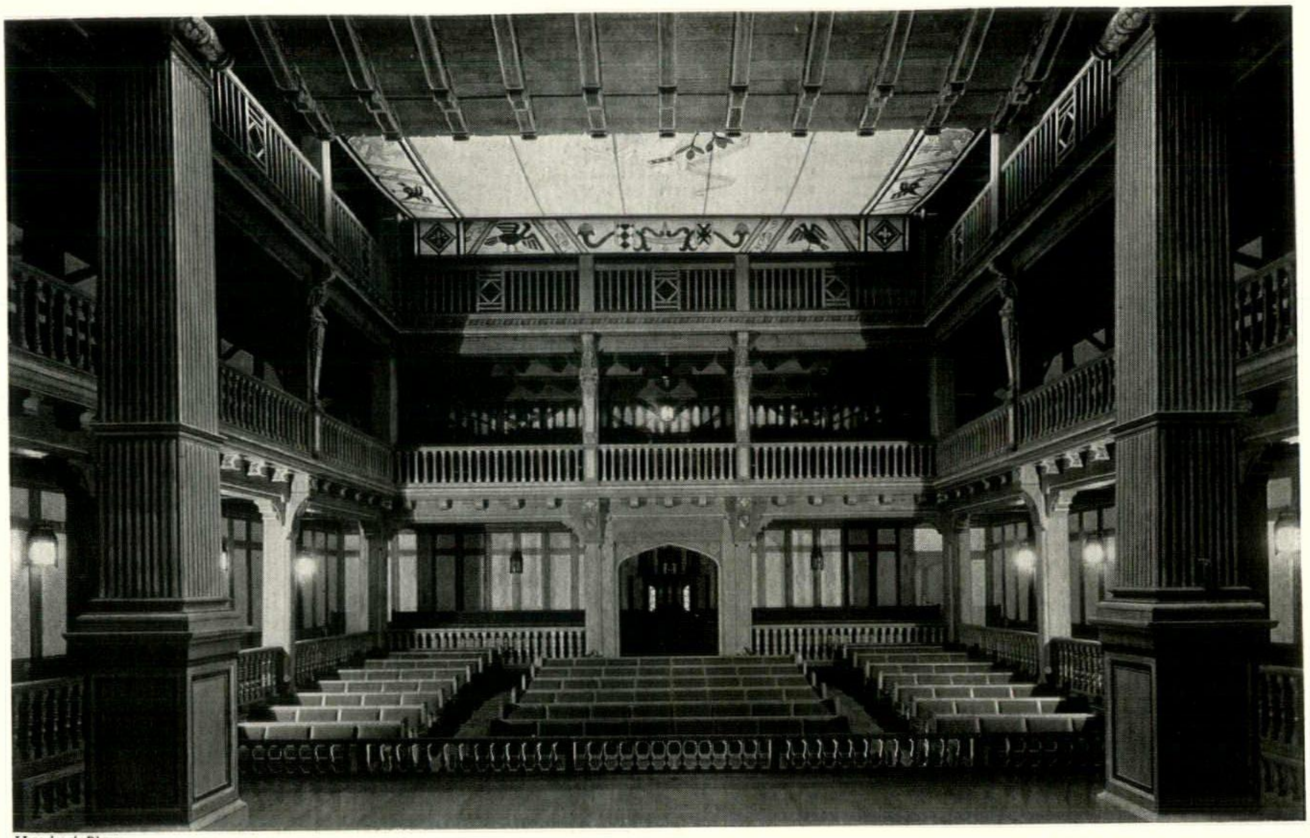
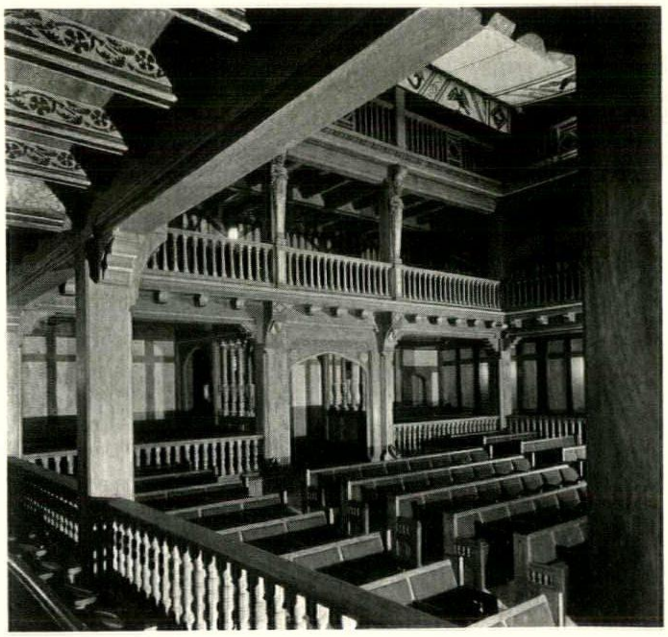


Horydczak Photos



THE two pictures on this page are illustrations of the lecture room or theater. Although it is not an exact reproduction of a Shakespearean playhouse, due to the changed requirements of the modern theater, it has been designed to create an atmosphere similar to that obtaining in the theater of Shakespeare's time. To this end it was planned from as much information and graphic data as were obtainable in reference to the theaters in which Shakespeare's works were first presented. The stage devices are in all cases simple and as similar as possible to those that were used in Shakespeare's time. The walls are made of half timbered stucco, the stage "shadow" is covered with tile and the woodwork polychromed in characteristic designs. The effect of sunlight in the pit is approximated by powerful lights above a linen curtain

THE FOLGER SHAKESPEARE LIBRARY

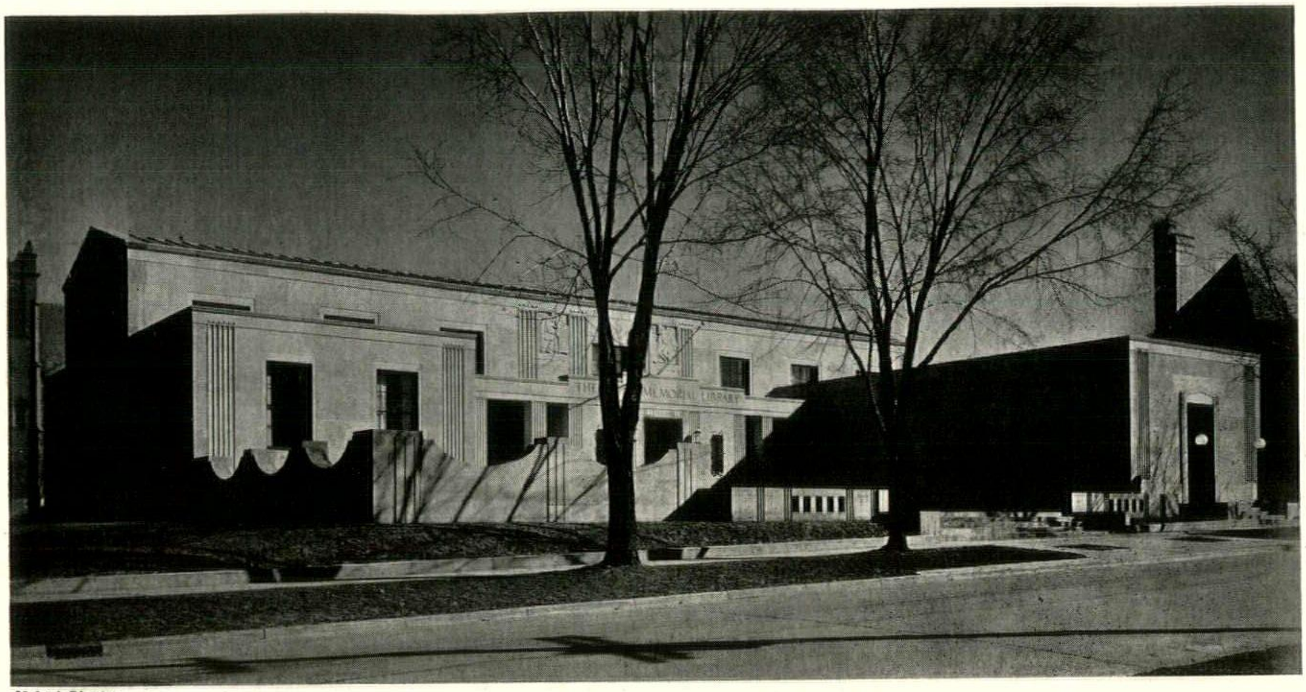
WASHINGTON, D. C.

PAUL PHILIPPE CRET, ARCHITECT

ALEXANDER B. TROWBRIDGE, CONSULTING ARCHITECT

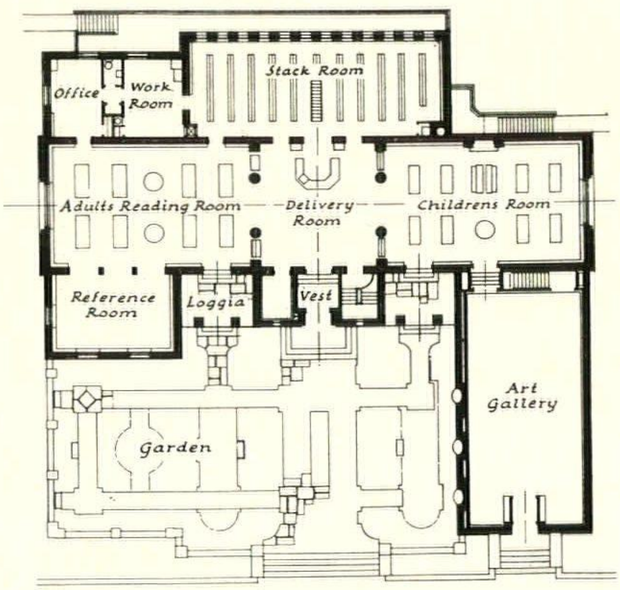
Hedrich-Blessing

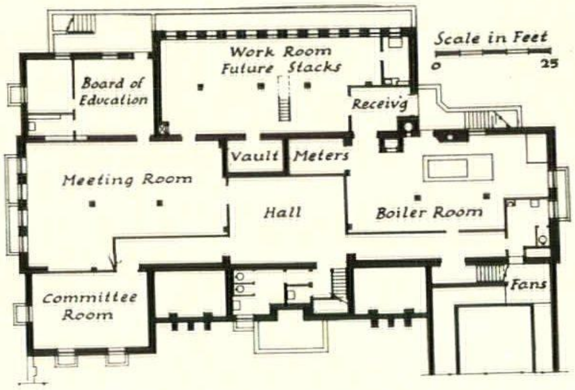
HAISH MEMORIAL LIBRARY
DEKALB, ILLINOIS
WHITE & WEBER, ARCHITECTS



Hedrich-Blessing

THE exterior of the building is faced with stained, shot-sawed limestone, trimmed with smooth buff limestone. The pitched roof and skylights are of aluminum. The flat roof is covered with a composition material. The picture on the opposite page is of the delivery room which is lined with pink Kasota stone with a red Levanto marble base. The columns are scagliola, colored to match the marble base





BASEMENT FLOOR PLAN

FIRST FLOOR PLAN

HAISH MEMORIAL LIBRARY

DEKALB, ILLINOIS

WHITE & WEBER, ARCHITECTS

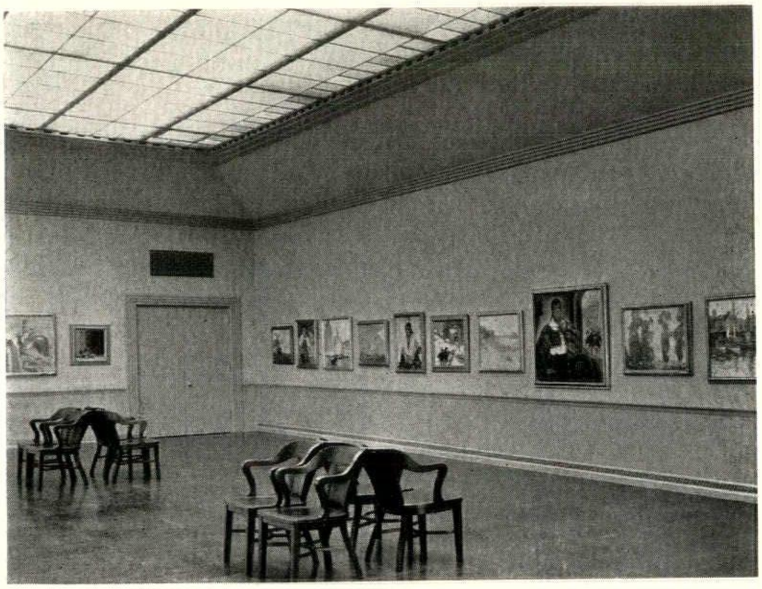
Hedrich-Blessing

HAISH MEMORIAL LIBRARY

DEKALB, ILLINOIS

WHITE & WEBER, ARCHITECTS

Hedrich-Blessing Photos



THE illustration above is taken from the children's reading room looking through the delivery room toward the adults' reading room. Both reading rooms have plastered walls and ceilings which are painted jade green. The entire main floor is covered with waxed and polished cork tile laid in a herringbone pattern. The lighting fixtures are chromium plated. The furniture is English oak and the draperies in the reading rooms are of terra cotta colored homespun. The illustration at the left is of the art gallery. The room is ventilated from grilles over the door, the ventilation outlets being in the cornice directly beneath the skylight

HAISH MEMORIAL LIBRARY

DEKALB, ILLINOIS

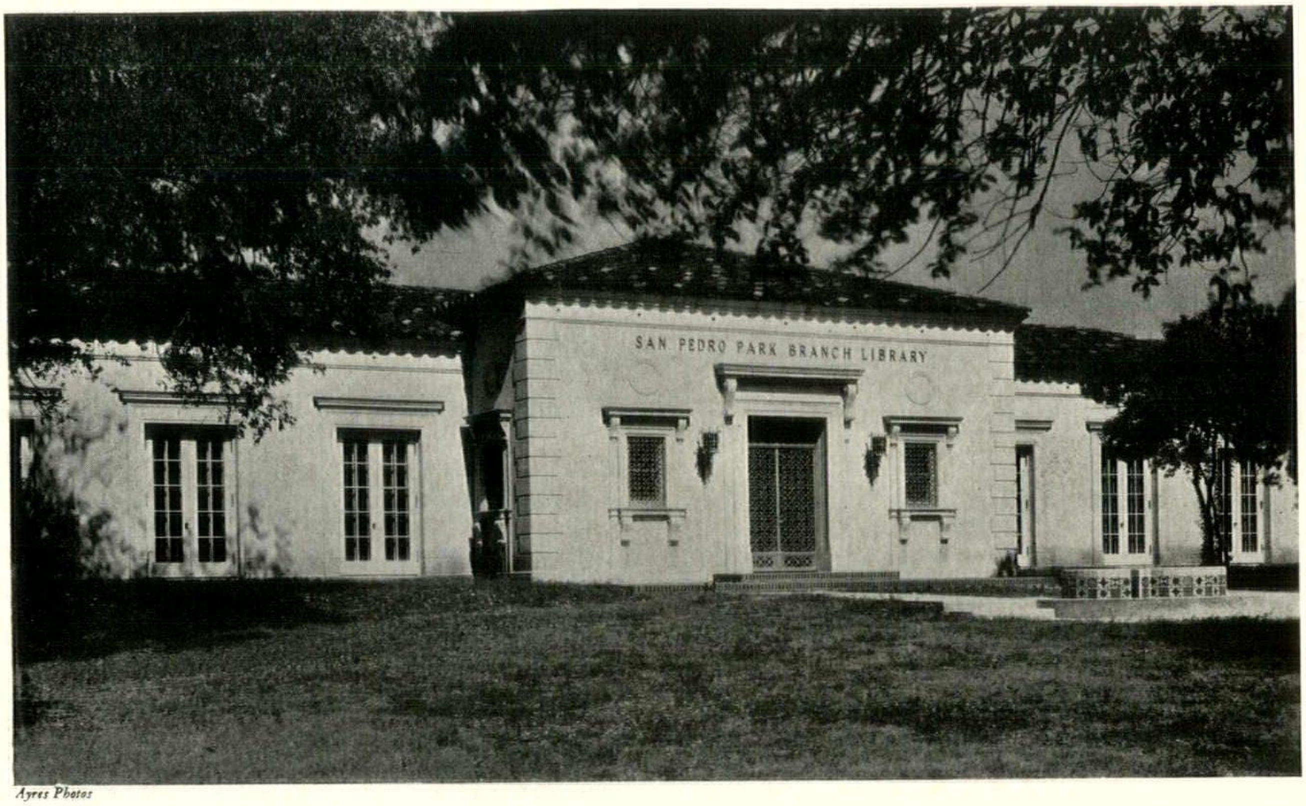
WHITE & WEBER, ARCHITECTS

Ayres

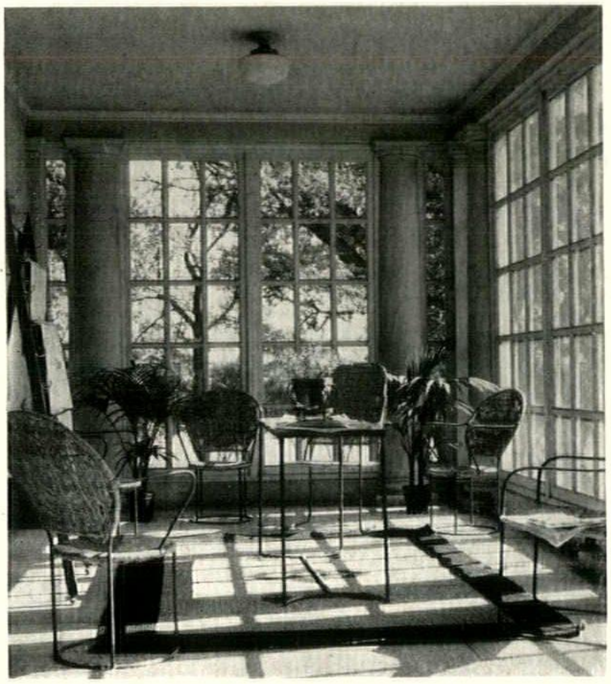
SAN PEDRO PARK BRANCH LIBRARY

SAN ANTONIO, TEXAS

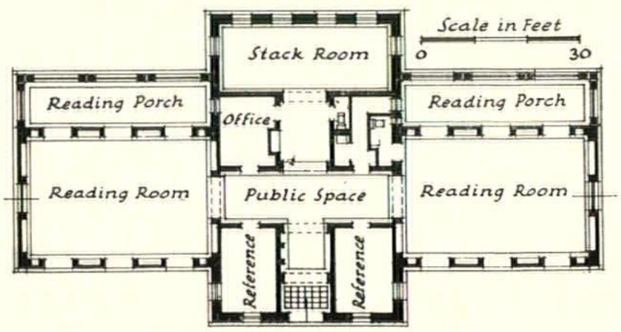
ALTEE B. AYRES & ROBERT M. AYRES, ARCHITECTS



Ayres Photos



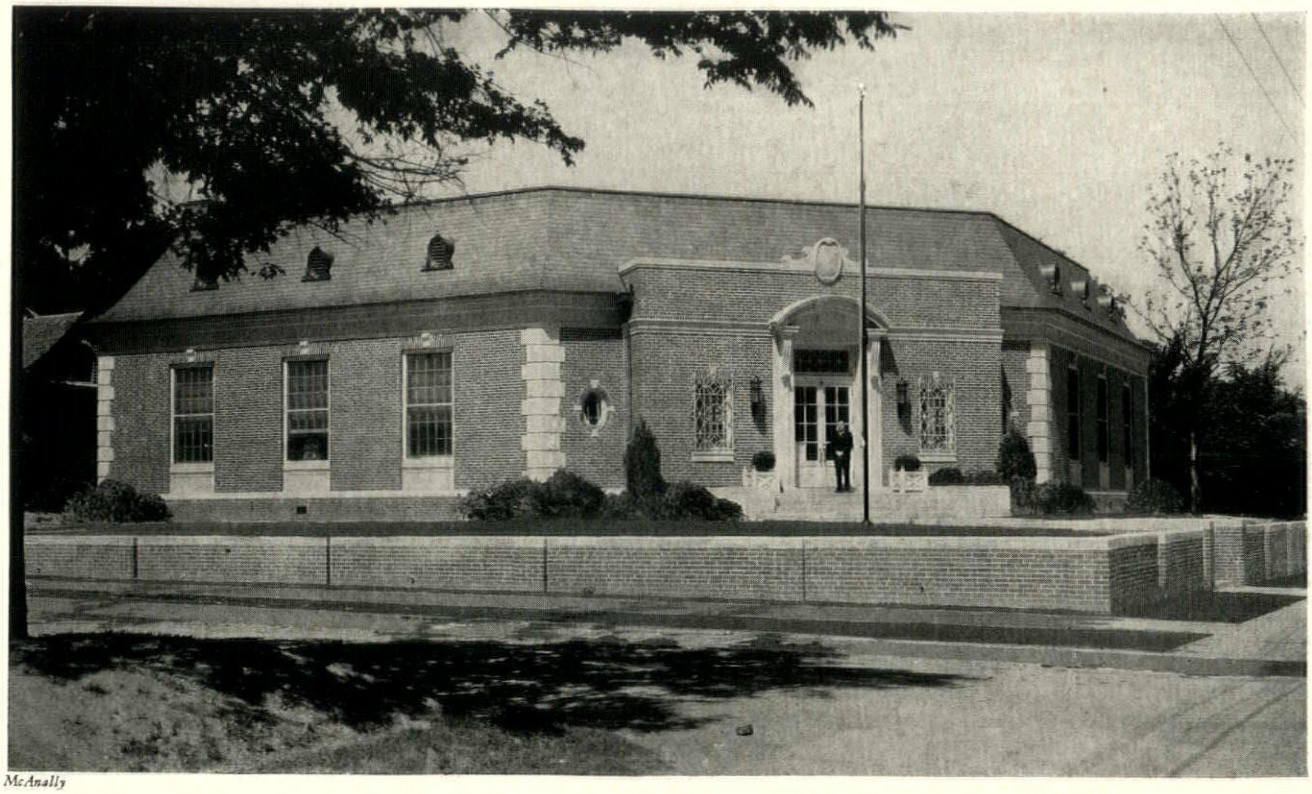
THE building is a fireproof structure with a reinforced concrete frame, the outside walls being hollow tile finished with white stucco. The roof is of red Mission tile. The interior has walls and ceilings finished in smooth plaster, and a rubber tile floor. The front entrance vestibule is of tile, with tile panels in niches and bronze entrance gates. An unusual feature of the building is the two open-air reading rooms, one of which is illustrated at the left. The approximate cost of the completed structure was $35,000



SAN PEDRO PARK BRANCH LIBRARY

SAN ANTONIO, TEXAS

ALTEE B. AYRES & ROBERT M. AYRES, ARCHITECTS



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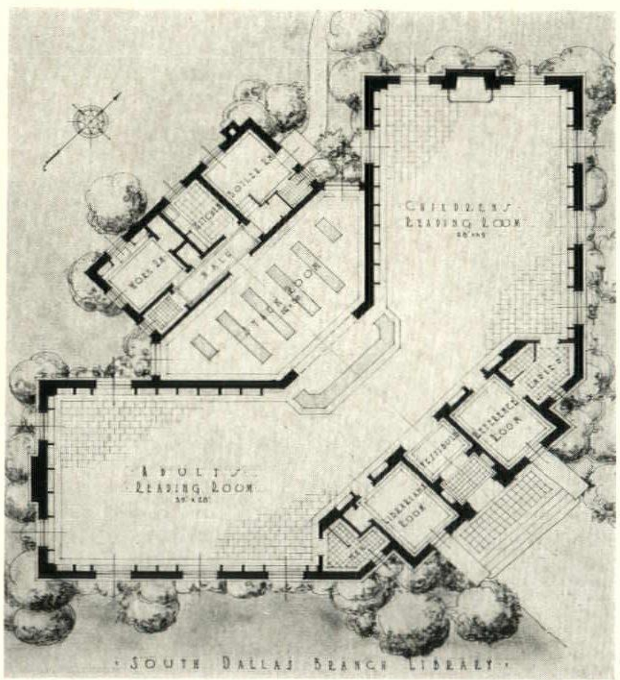


UNUSUAL in plan, this building offers an efficient, simple solution to a small branch library with a corner location. Growth is not particularly important in such cases and the stack problem in this case has been cleverly solved. The structure is built of solid brick walls with face brick on the exterior in various shades of red. The foundations and the floor slabs are of reinforced concrete, the partitions being of the usual frame type. The roof is framed with steel and wood and covered on the mansard portion with slate. The flat deck is of tin and the ventilating louvres are copper. On the following page are two illustrations of the interior. The reading rooms are plastered and finished with canvased and painted panels trimmed with wood. The floors are rubber tile. Heat is supplied from a gas-fired boiler. The system is vapor steam. Completed in 1932, the building contains 99,180 cu. ft. and was built at approximately 30 cents per cu. ft., or a total of $35,000, including the retaining walls

ALEXANDER SANGER BRANCH LIBRARY

DALLAS, TEXAS

HENRY COKE KNIGHT, ARCHITECT

ADULTS' READING ROOM

DELIVERY SPACE

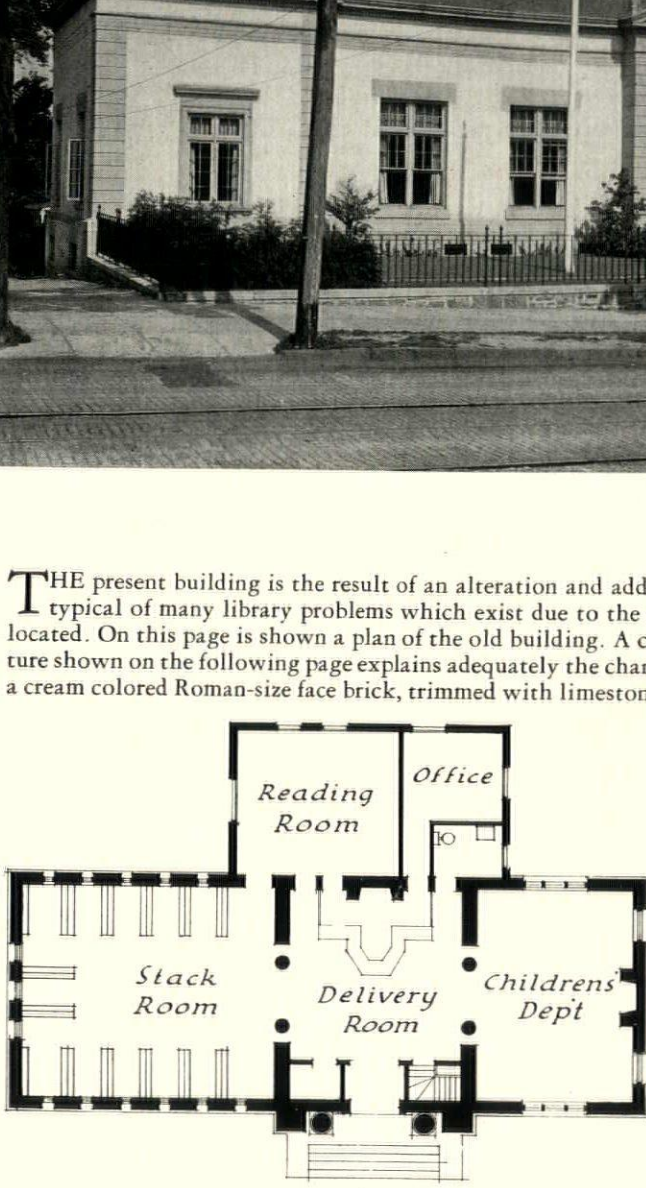
ALEXANDER SANGER BRANCH LIBRARY

DALLAS, TEXAS

HENRY COKE KNIGHT, ARCHITECT

Snyder

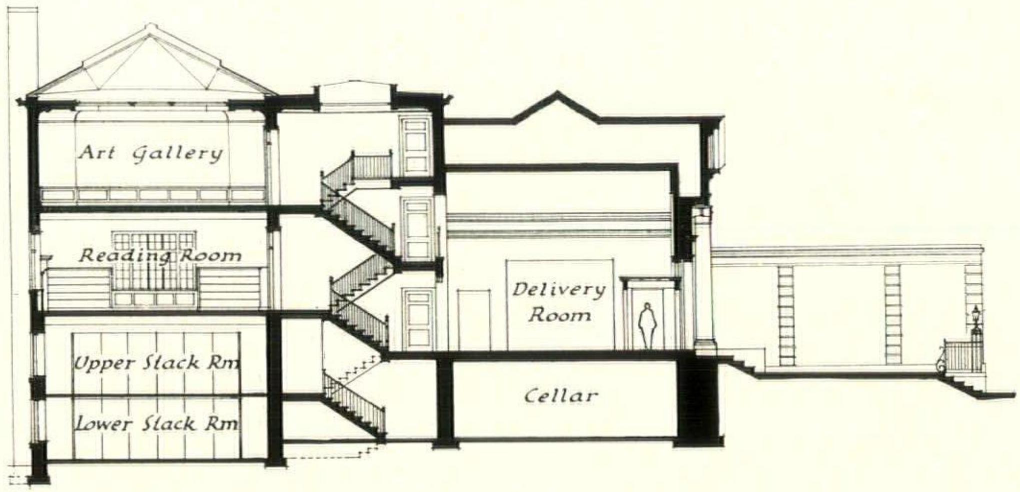
THE present building is the result of an alteration and addition to a much smaller library structure. It is typical of many library problems which exist due to the development of the district in which they are located. On this page is shown a plan of the old building. A comparison with the plans of the present structure shown on the following page explains adequately the changes. The building is faced on the exterior with a cream colored Roman-size face brick, trimmed with limestone and granite. The cornice has a lower member of stone, upper members of painted metal to match that of the old structure. The roof is slate. The floors of the interior are brown linoleum, the walls and ceilings are of plaster. The color of the walls is cream and the ceilings are white, with ornamental cornices. The trim throughout the building is of stained oak and the lighting fixtures are dark bronze. The addition to the old building is constructed with solid masonry walls, reinforced concrete and structural steel floors, and a steel trussed roof. The original cubage of the building was 72,964 cu. ft. The alteration increases the capacity to 249,480 cu. ft., at a cost of $125,000



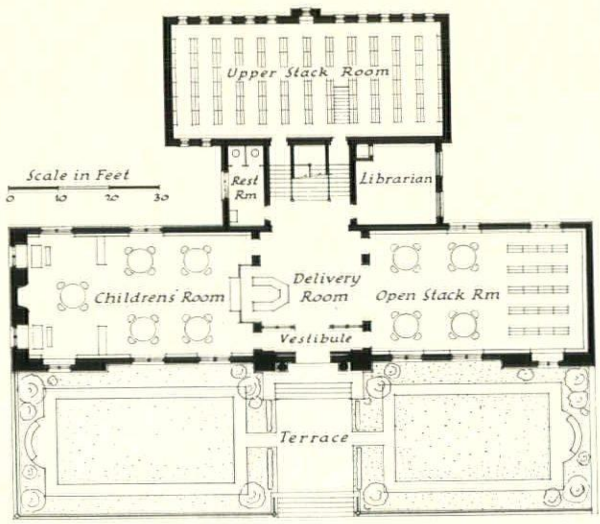
GREENWICH PUBLIC LIBRARY

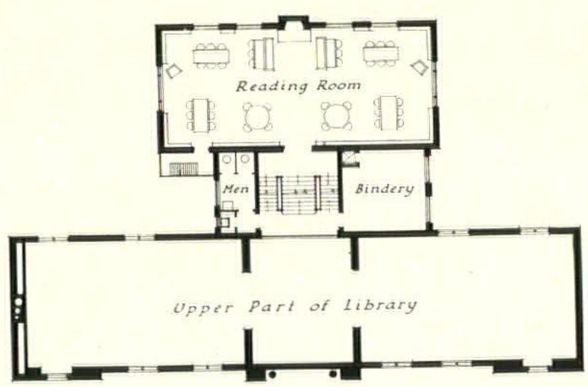
GREENWICH, CONNECTICUT

WILLIAM B. TUBBY, ARCHITECT



THE plans and section of this alteration are worthy of study in that they illustrate an unusual advantage which has been taken of the contours of the lot. The ground slopes from the front of the building to the rear and instead of carrying through the floor lines, the floors at the rear of the building have been staggered to minimize stair flights and to permit two tiers of book stacks under the reading room. This expedient also gives more than the usual amount of privacy in the reading room and at the same time makes the stack space more easily accessible than it would otherwise be. Attention should be called to the location of the art gallery and the children's room. Note that the latter may be easily supervised from the delivery desk. On the opposite page are two illustrations of the interior. The one above is the children's room and below is the upstairs reading room. Both are evidence of the pleasant, homelike character of the spaces





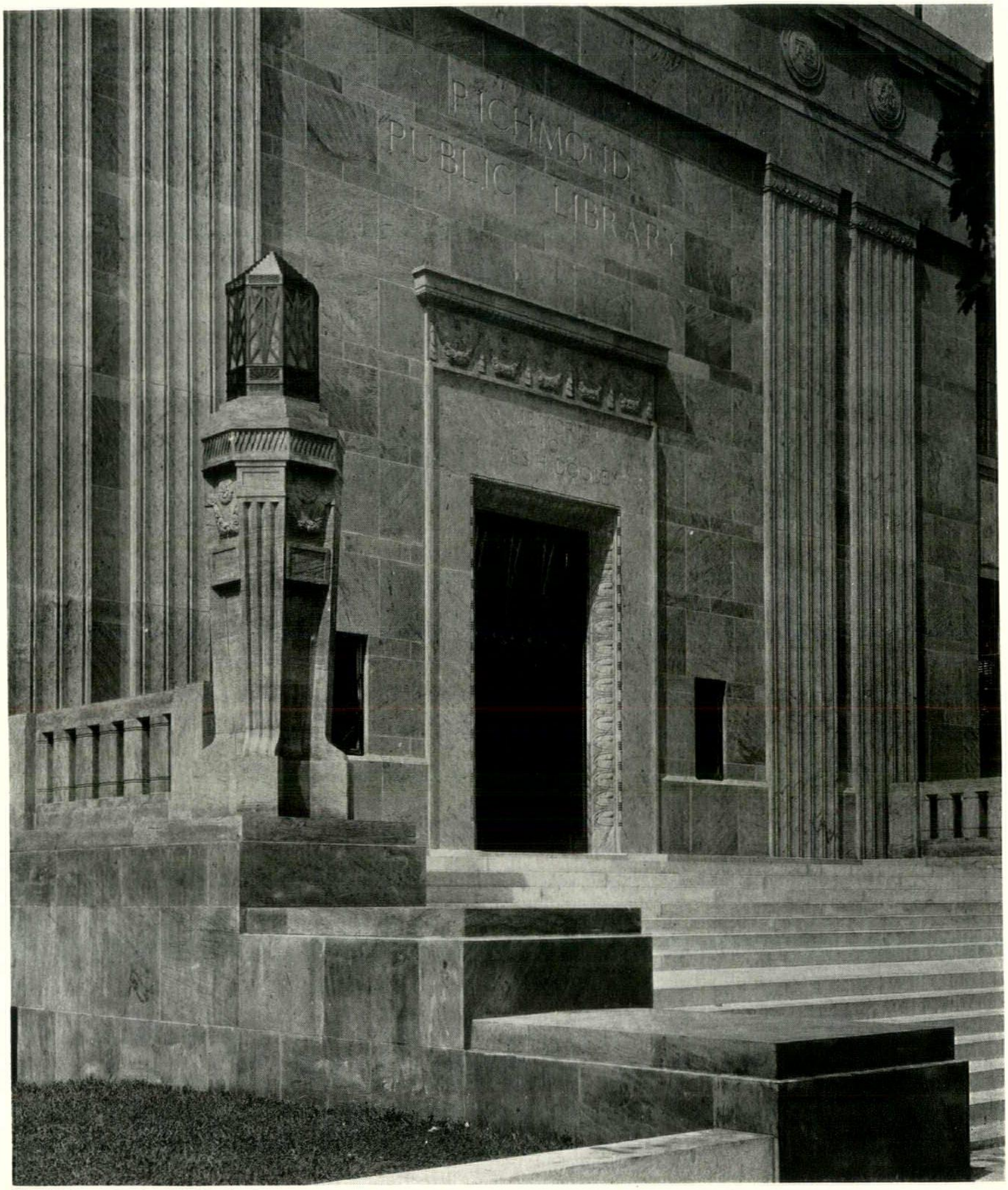
GREENWICH PUBLIC LIBRARY
GREENWICH, CONNECTICUT
WILLIAM B. TUBBY, ARCHITECT

Snyder Photos

GREENWICH PUBLIC LIBRARY

GREENWICH, CONNECTICUT

WILLIAM B. TUBBY, ARCHITECT



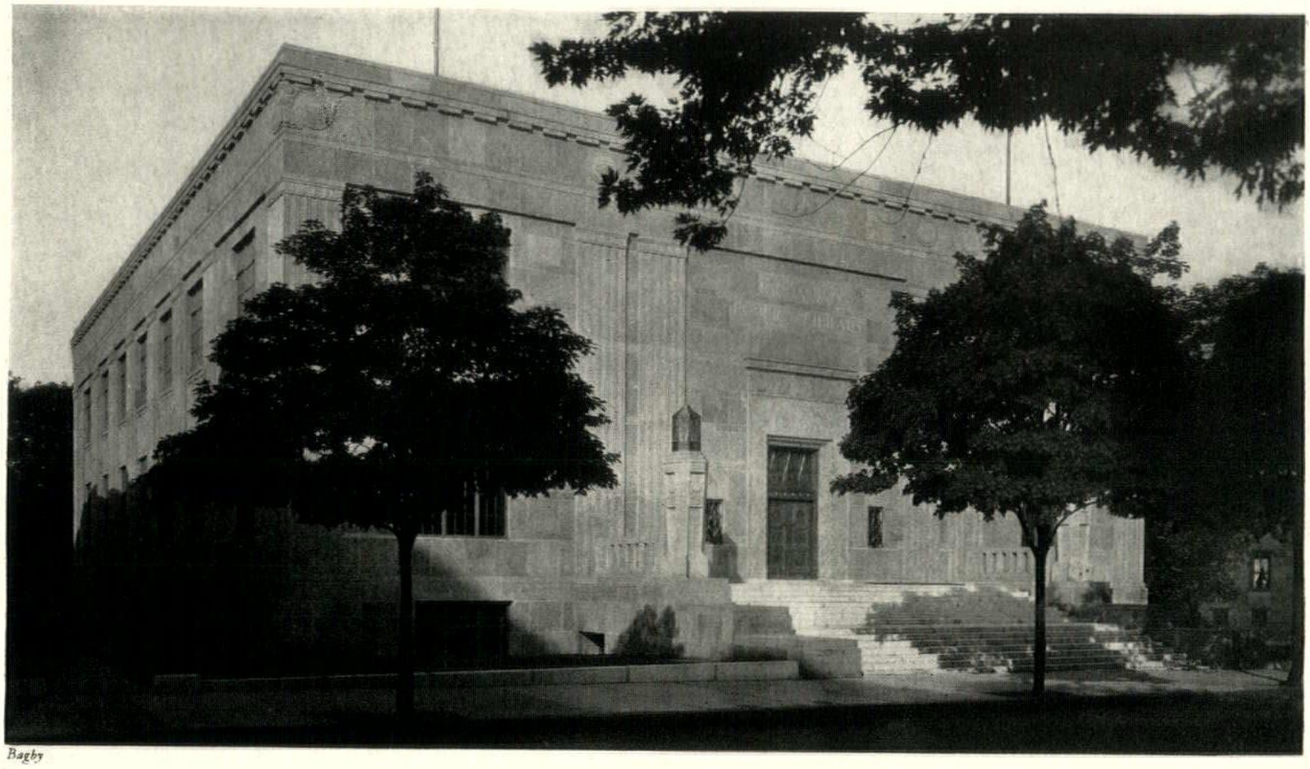
Dementi

RICHMOND PUBLIC LIBRARY

RICHMOND, VIRGINIA

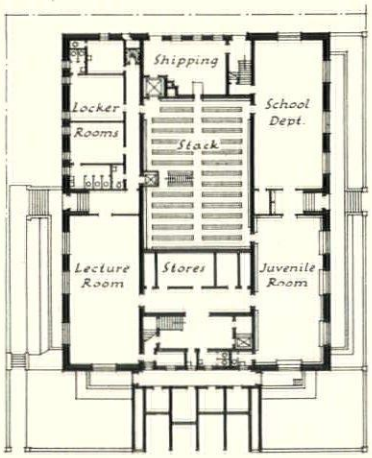
BASKERVILL & LAMBERT, ARCHITECTS

EDWARD L. TILTON, CONSULTING ARCHITECT

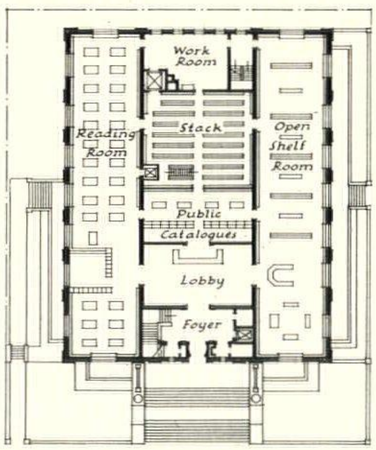


Bagby

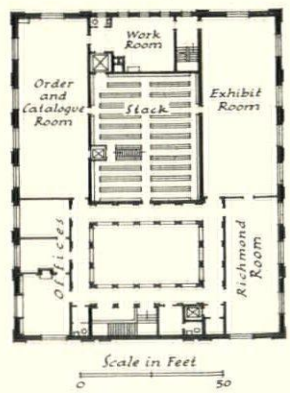
THE plans of this building are well coordinated and show a good example of complete library facilities for a comparatively large city. Particularly efficient is the manner in which the stacks have been located in the center of the building allowing the maximum of public space and the minimum confusion in service. On the ground floor are included complete facilities for educational work



GROUND FLOOR



FIRST FLOOR



SECOND FLOOR

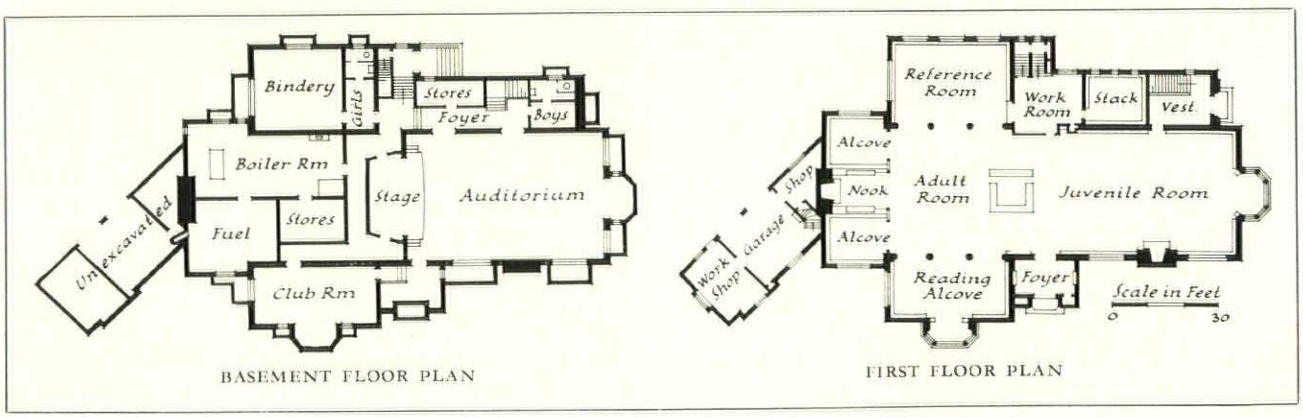
RICHMOND PUBLIC LIBRARY

RICHMOND, VIRGINIA

BASKERVILL & LAMBERT, ARCHITECTS

EDWARD L. TILTON, CONSULTING ARCHITECT

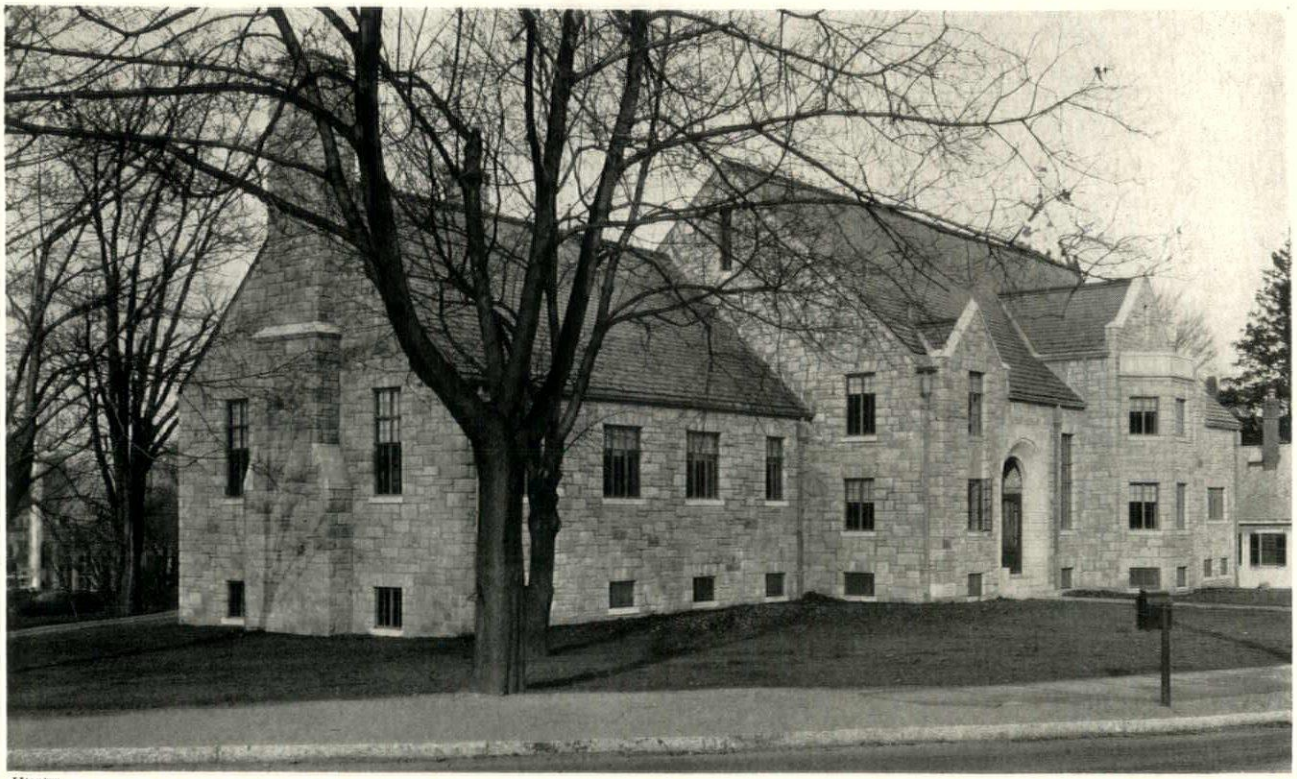
THE building is faced with common brick of a variegated orange-red color and rough-dressed local limestone laid in an ashlar pattern. The trim is carved limestone. The exterior woodwork is of oak, stained to a light tobacco brown. Windows are steel casements. The roof is of slate, variegated both as to color and thickness. Both exterior and interior walls are of load bearing masonry, the former being of hollow tile with common brick backing. The floors are of concrete slabs over bar joists, finished throughout to receive linoleum. The roof is framed with steel trusses and insulated with a blanket 1 in. thick. Built in 1929, the building contains 259,000 cu. ft. and was completed at a total cost of $112,300 or a unit cost of 43.25 cents per cu. ft.



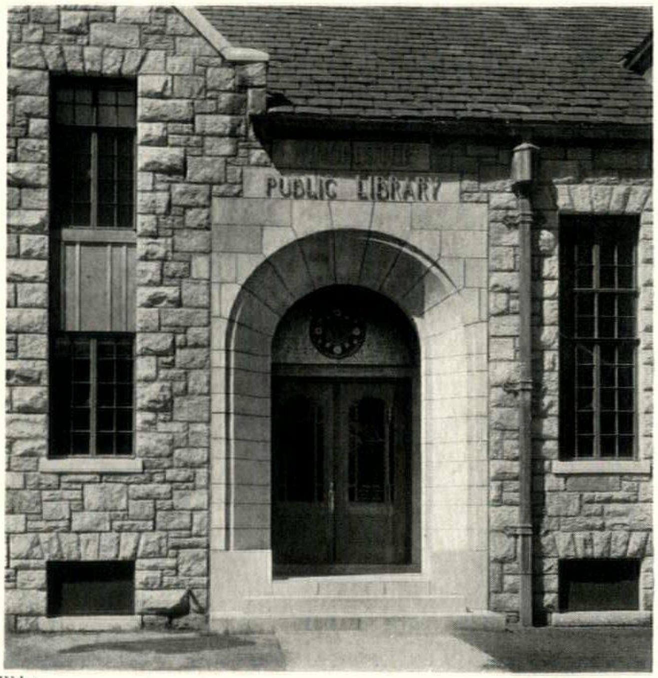
WEST TOLEDO BRANCH LIBRARY

TOLEDO, OHIO

GEROW & CONKLIN, ARCHITECTS



Higgins



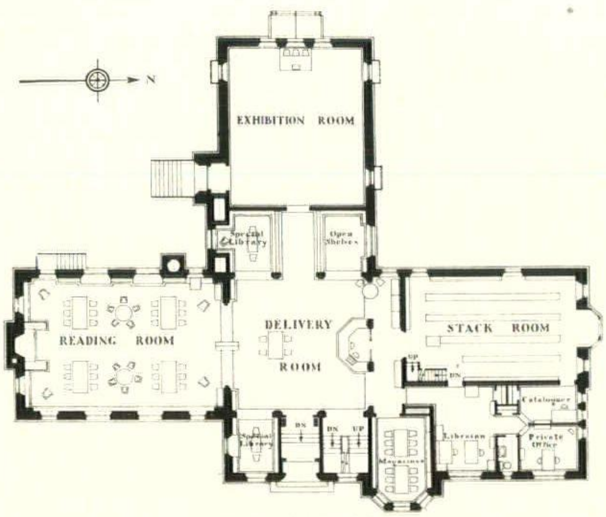
Weber

THE building serves as the art center of the community as well as its library, and is located in the center of the town with sufficient open areas surrounding it to set it apart as an important community building. The pictures on this page show a general view of the building above and at the right a detail of the entrance. The exterior is of rough-faced Massachusetts granite laid in a random ashlar pattern with tight joints of dark mortar. The trim is cut limestone, the window spandrels are of sand blasted aluminum. The windows themselves are steel casements

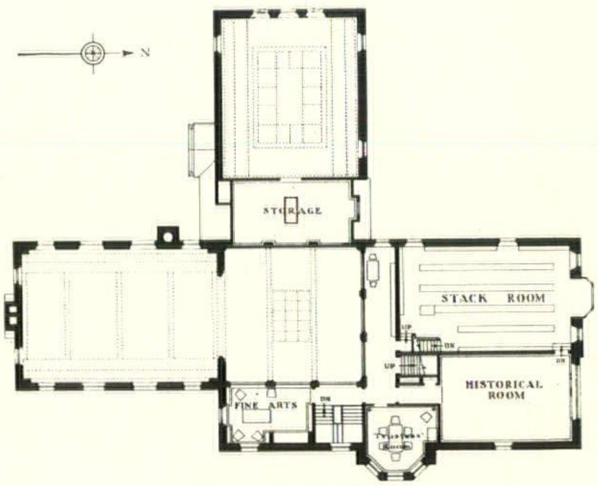
WINCHESTER PUBLIC LIBRARY

WINCHESTER, MASSACHUSETTS

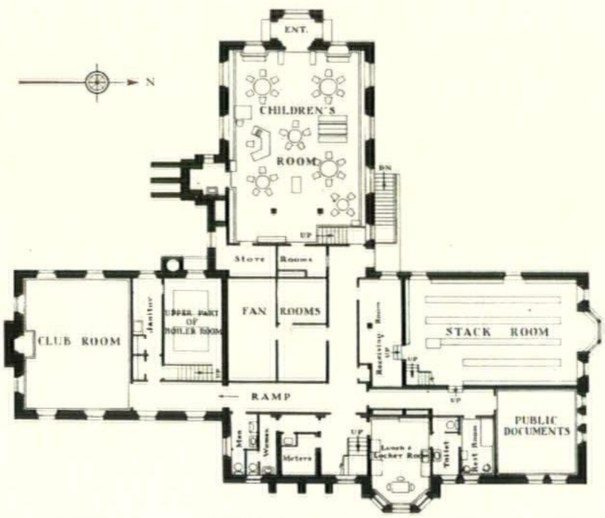
ROBERT COIT, AND KILHAM, HOPKINS & GREELEY, ARCHITECTS



FIRST FLOOR PLAN



SECOND FLOOR PLAN



GROUND FLOOR PLAN

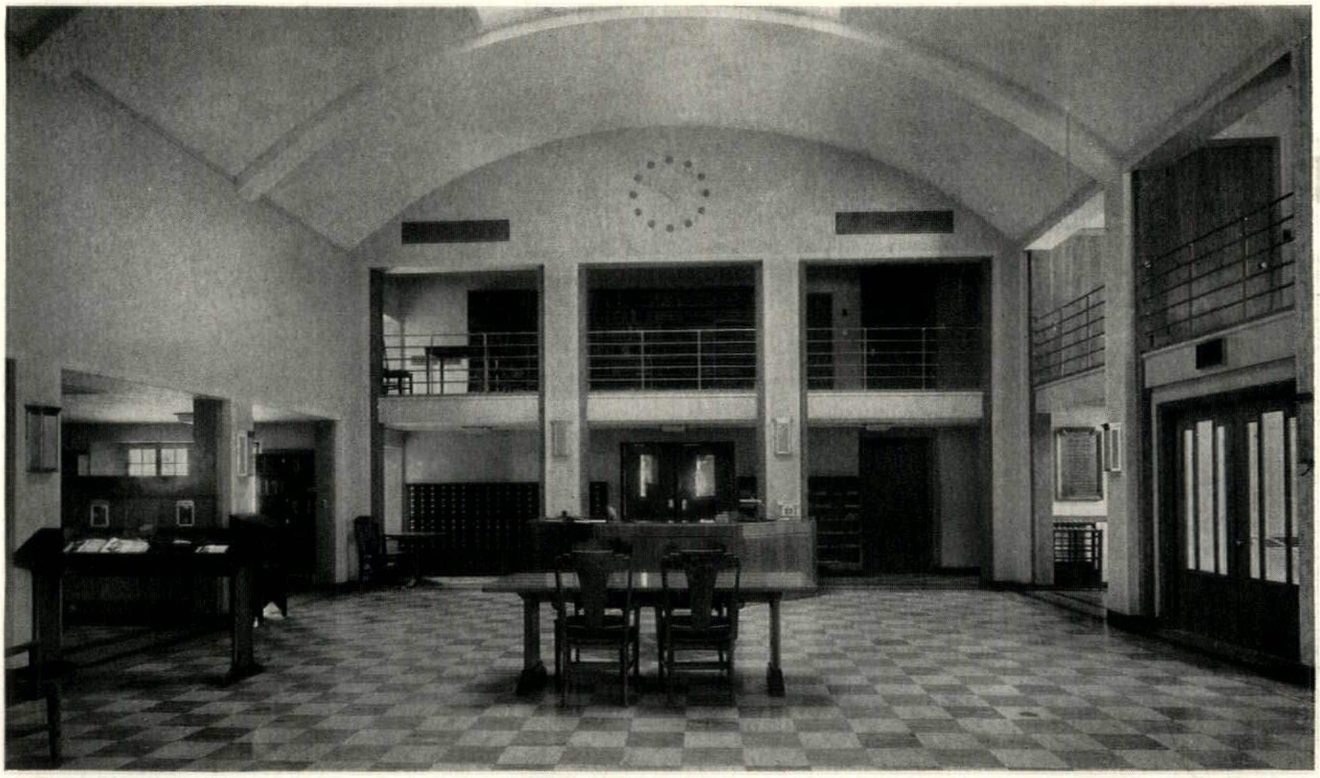
THE somewhat unusual plan of this library was due to the fact that the building is the art center of the town as well as the library. A study of the plans reveals a well balanced assignment of space to serve most efficiently a variety of special uses. Particularly noteworthy is the privacy which obtains in the special rooms and the location of the exhibition room, reached from both the library proper and from the exterior by a separate entrance. Noteworthy also are the facilities for social life located in the basement of the building. On the opposite page are illustrations of the interior. The one above is the reading room and below it is a view of the delivery room looking toward the stack room. The reading room is lighted entirely from the ceiling, thus eliminating table lamps. Both spaces are finished with plaster walls and ceilings and rubber tile floors. The building cost $173,649.11, including the grading, furniture and miscellaneous fees

WINCHESTER PUBLIC LIBRARY

WINCHESTER, MASSACHUSETTS

ROBERT COIT, AND KILHAM, HOPKINS & GREELEY, ARCHITECTS

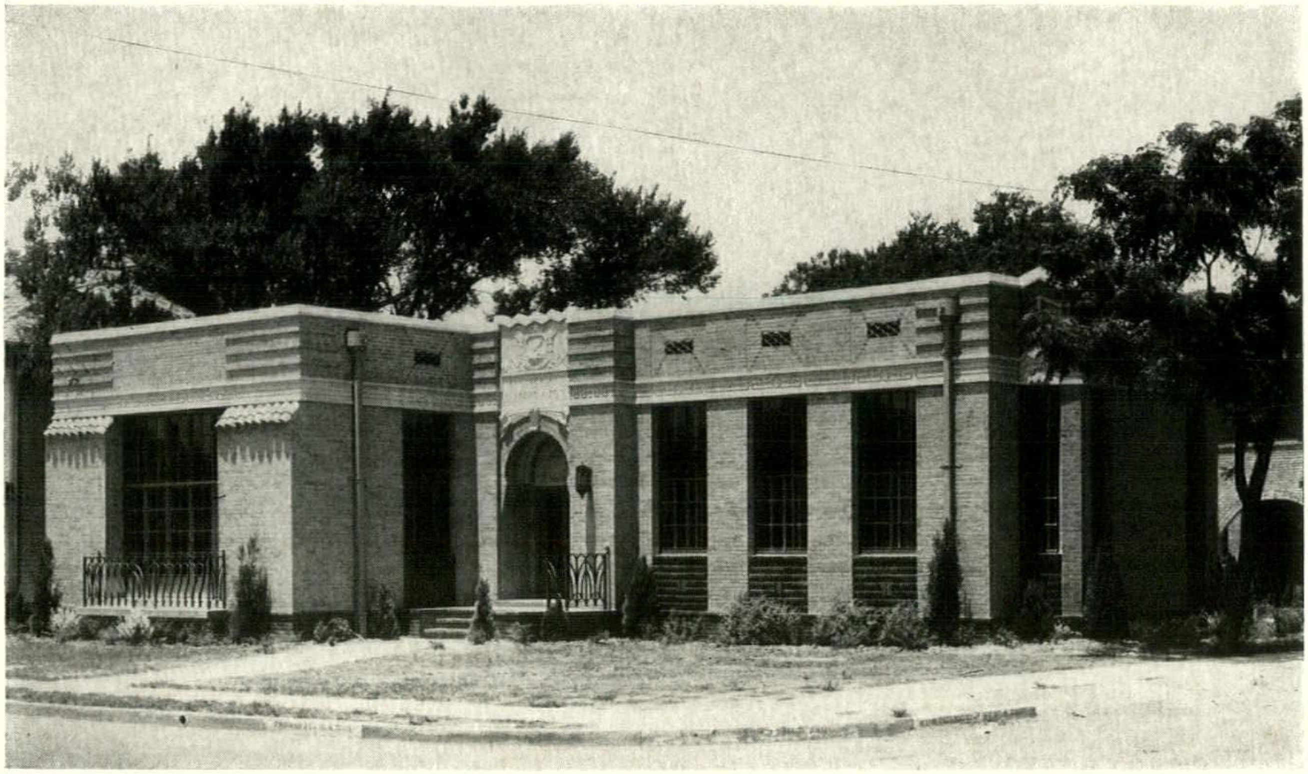
Weber Photos



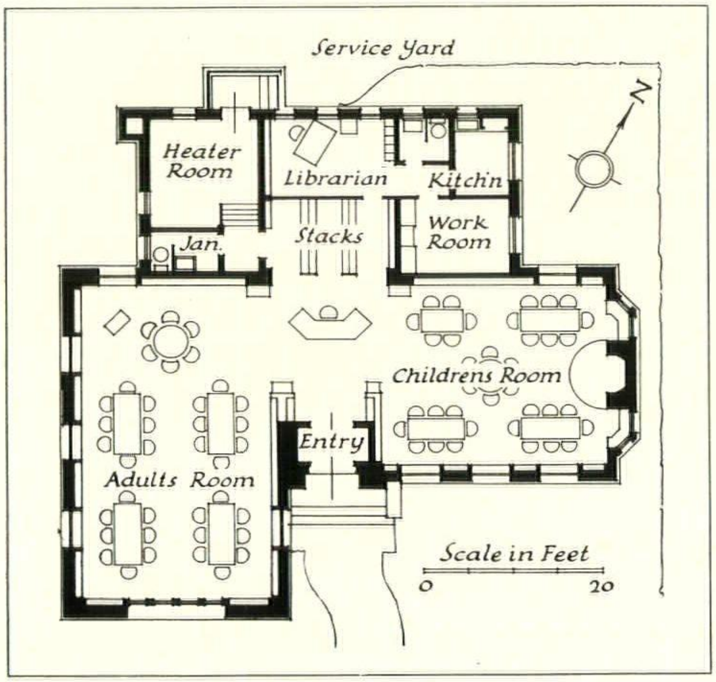
WINCHESTER PUBLIC LIBRARY

WINCHESTER, MASSACHUSETTS

ROBERT COIT, AND KILHAM, HOPKINS & GREELEY, ARCHITECTS



Miller



THE exterior is faced with a warm buff brick, trimmed with cast stone of the same color. The base and the panels under the windows are faced with a dark gunmetal brick and the ironwork and metal windows are painted a similar tone. The interior has floors of asphalt tile, plaster walls and wall bookcases. The ceilings of the reading rooms are paneled in celotex and all windows are fitted with Venetian blinds. Completed in 1931, the building cost $22,270, at 42 cents per cu. ft. The walls are load bearing masonry of brick and hollow tile. The floors are concrete and the roof is framed with wood

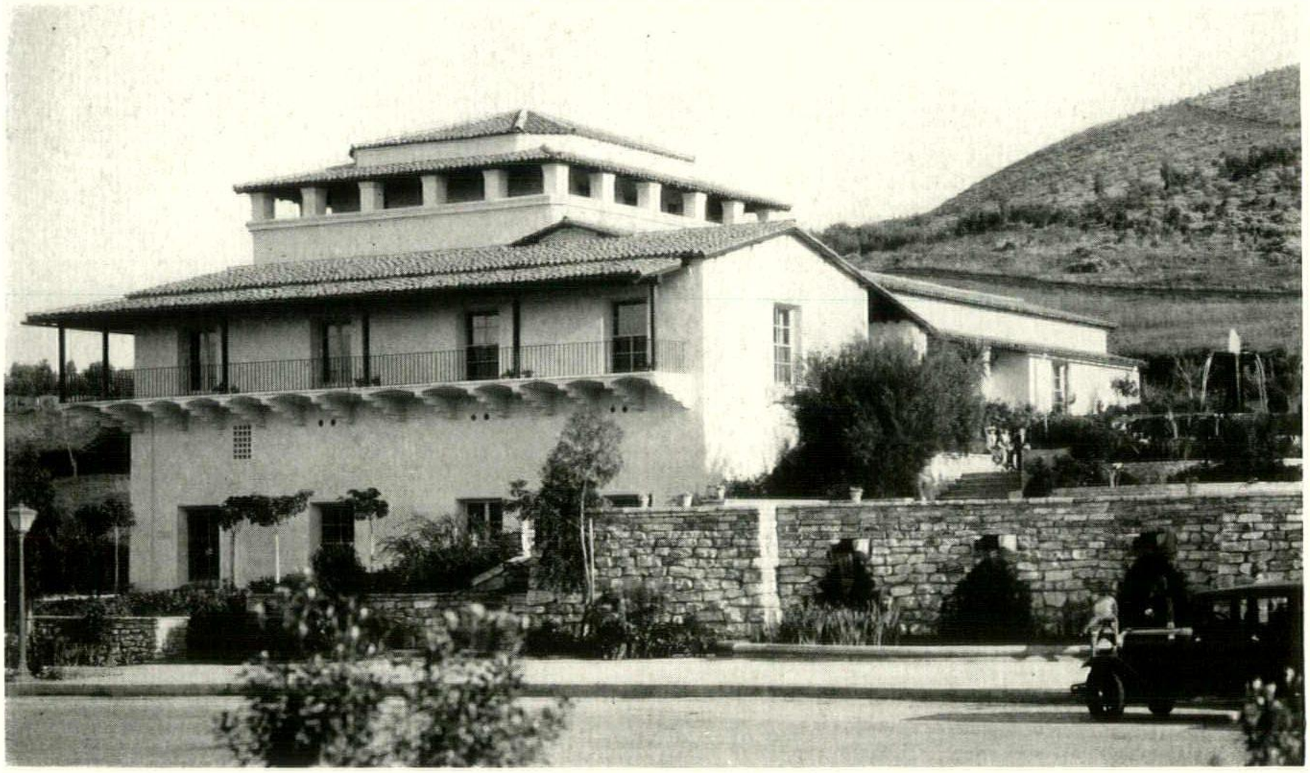
DUNBAR BRANCH LIBRARY

DALLAS, TEXAS

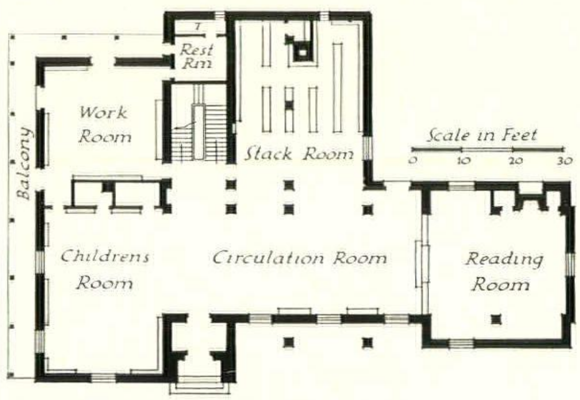
BRYAN AND SHARP, ARCHITECTS

Mott

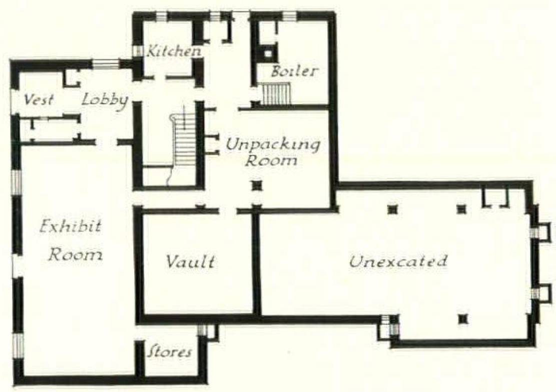
PALOS VERDES PUBLIC LIBRARY
PALOS VERDES ESTATES, CALIFORNIA
MYRON C. HUNT AND H. C. CHAMBERS, ARCHITECTS



THIS building illustrates an interesting solution to the problem of a small community library where unlimited expansion is neither anticipated nor desired. The plan has been well adapted to the uneven nature of its location and the various levels have been well studied to produce an efficient, simple structure. Particularly to be noted is the location of the services on both the ground and main floor plans. The exhibit room on the ground floor may be used as a social center if the need arises and is served by the kitchen adjacent. Notice also the location of the reading room. It is placed at the rear of the building to minimize the effect of noise from the street, and the change in level adds to its privacy



MAIN FLOOR PLAN



GROUND FLOOR PLAN

PALOS VERDES PUBLIC LIBRARY

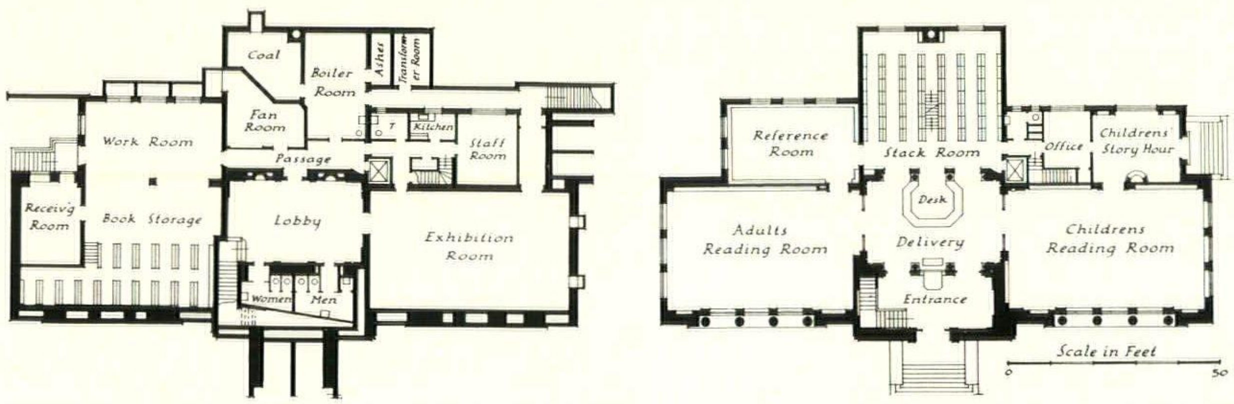
PALOS VERDES ESTATES, CALIFORNIA

MYRON C. HUNT AND H. C. CHAMBERS, ARCHITECTS

Rembrandt

B. F. JONES MEMORIAL LIBRARY
ALIQUIPPA, PENNSYLVANIA
BRANDON SMITH, ARCHITECT

Rembrandt



BASEMENT FLOOR PLAN

FIRST FLOOR PLAN

B. F. JONES MEMORIAL LIBRARY

ALIQUIPPA, PENNSYLVANIA

BRANDON SMITH, ARCHITECT

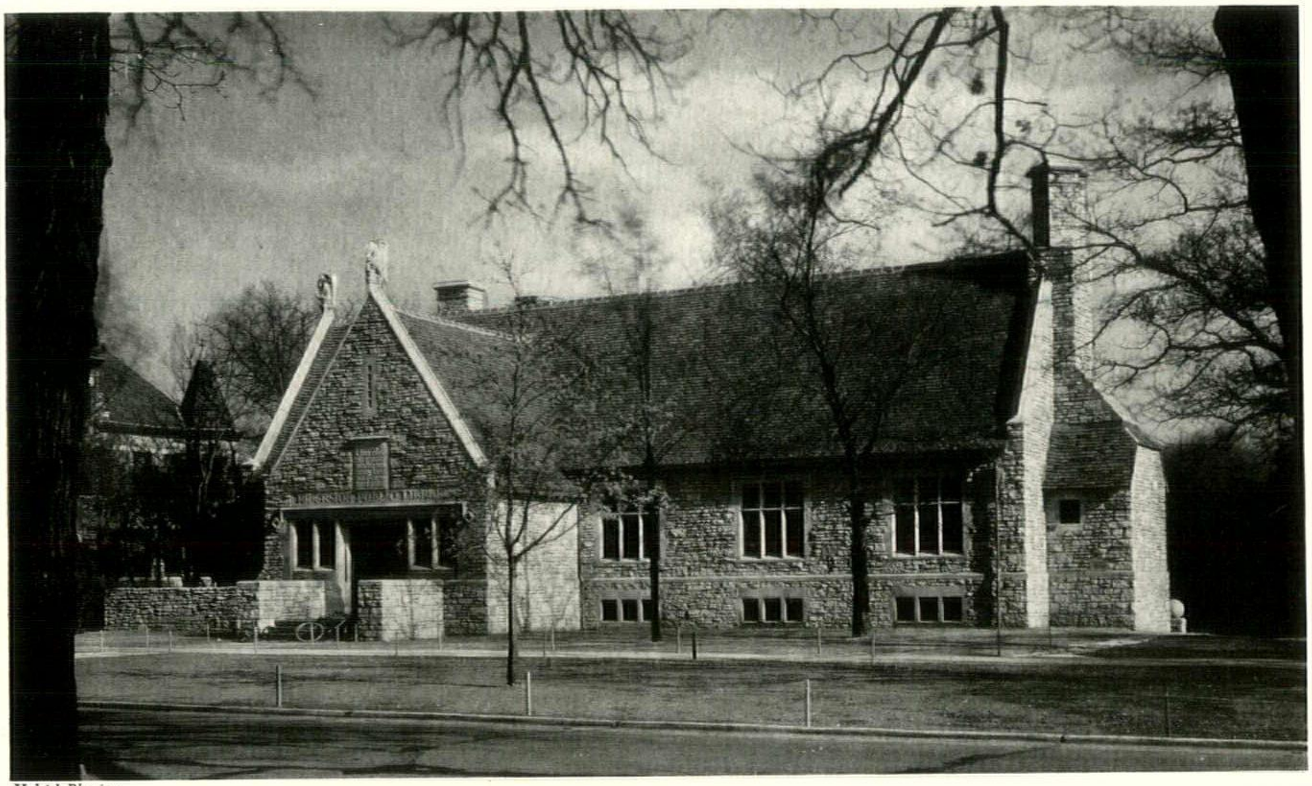
Rembrandt Photos

THE library was built to accommodate the needs of a community whose ultimate growth has been estimated never to exceed 40,000 inhabitants. The building has been planned to care for this population. It is entirely fireproof and is faced on the exterior with limestone. The doors, windows, etc., are of bronze. All floors throughout the main portion of the building are travertine; those in the working areas rubber tile. All shelving is metal and the furniture throughout is oak. The building is heated by a forced-feed warm-air system operated from a fan room over steam coils. Completed at a cost of $341,550, including furniture and equipment, the building contains 320,770 cu. ft.

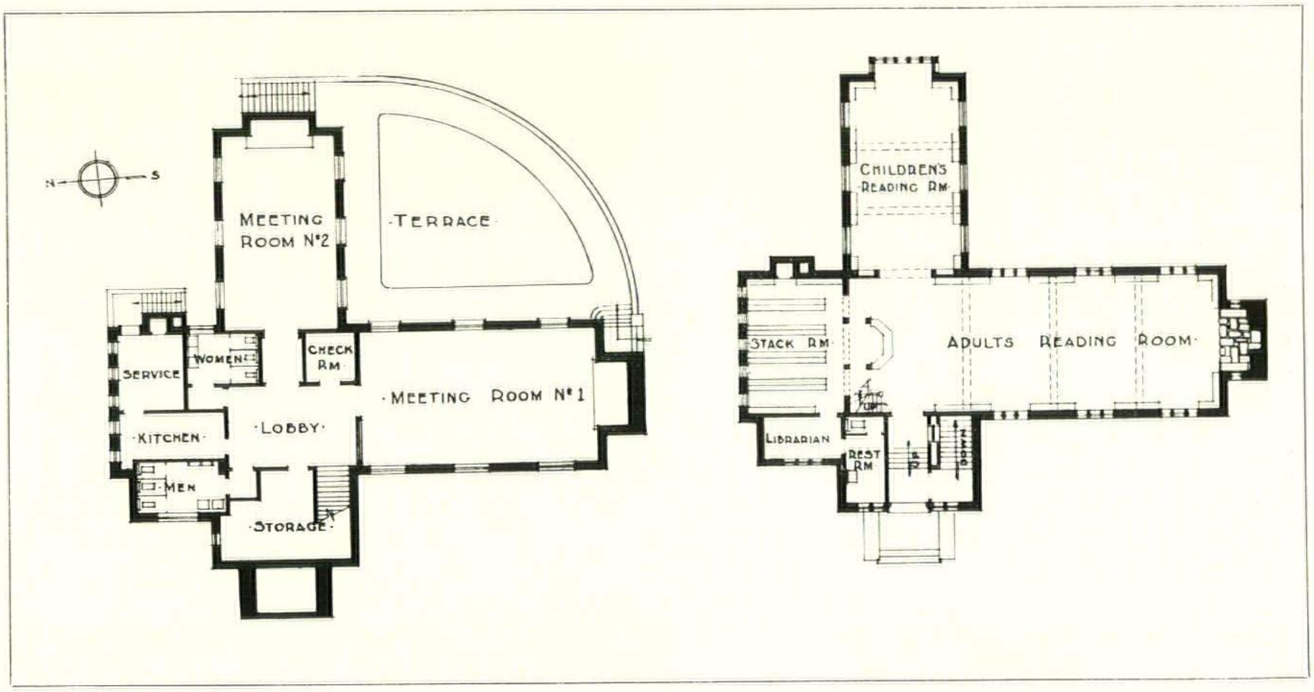
B. F. JONES MEMORIAL LIBRARY

ALIQUIPPA, PENNSYLVANIA

BRANDON SMITH, ARCHITECT



Hedrich-Blessing



RIVERSIDE LIBRARY

RIVERSIDE, ILLINOIS

CONNOR & O'CONNOR, ARCHITECTS

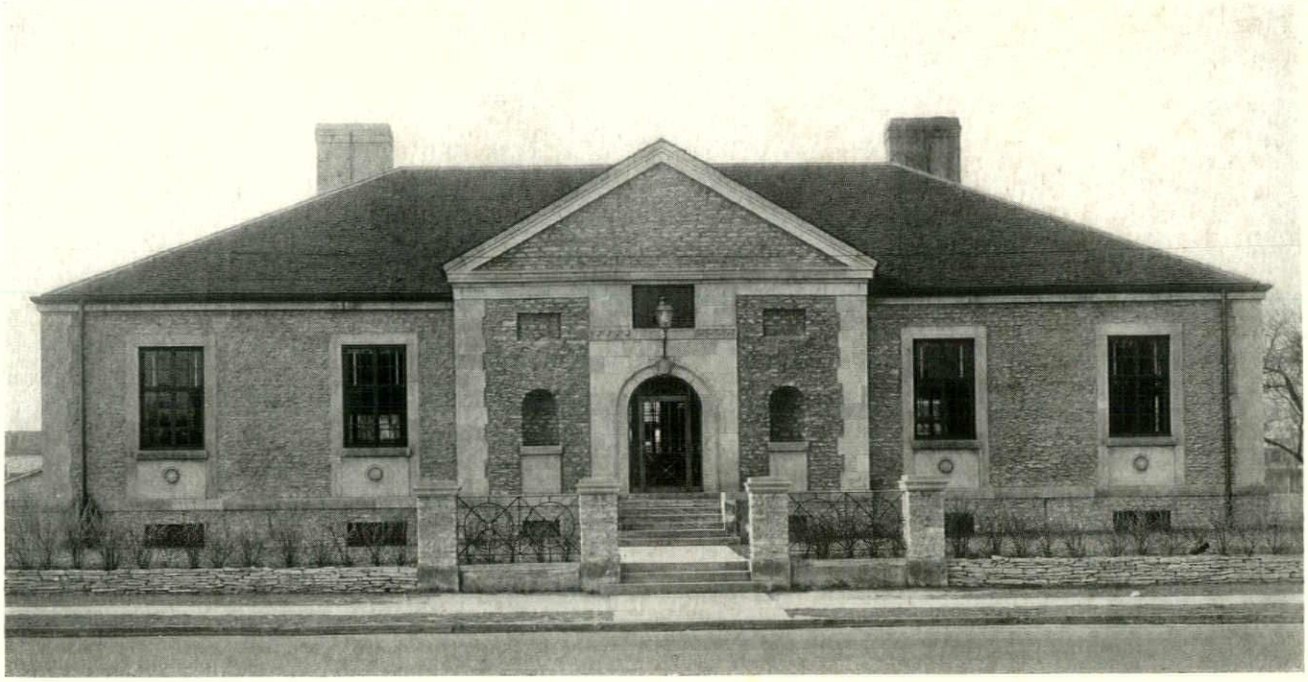
Hedrich-Blessing Photos

LOCATED on a lot which slopes sharply toward the rear, the building combines the functions of a library with a social center. It is faced on the exterior with a rough textured limestone, predominantly warm gray in color. The roof is slate. The interior has been finished to create an informal, homelike atmosphere. The floor is covered with inlaid linoleum in two shades of tan. The walls above the bookcases are of sand finished plaster, painted cream color, and the roof trusses and boarding are fir, hand adzed and stained a light brown. The building has solid masonry walls of stone backed with brick laid upon a reinforced concrete foundation. It is heated from an outside source. It was built for a unit cost of approximately 72 cents per cu. ft., or a total of $75,000

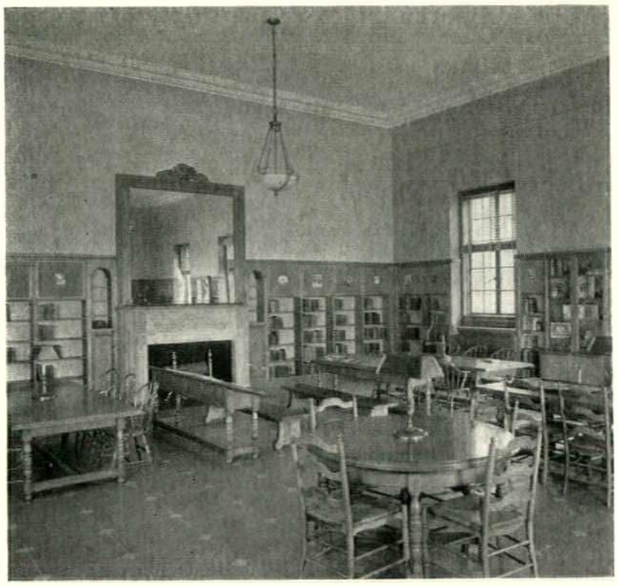
RIVERSIDE LIBRARY

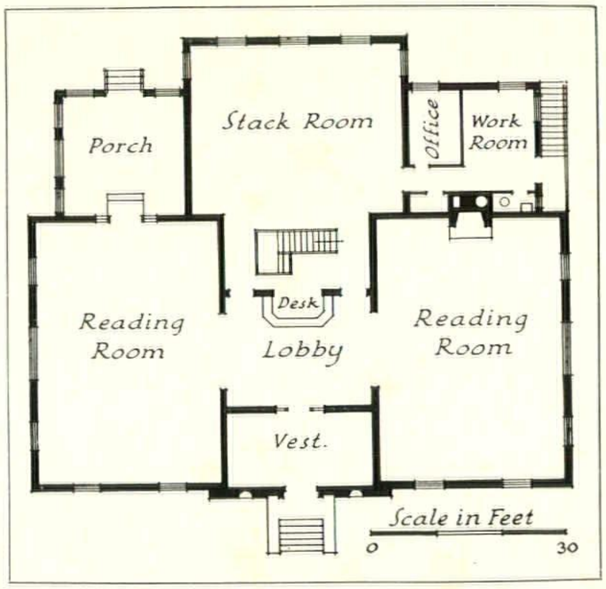
RIVERSIDE, ILLINOIS

CONNOR & O'CONNOR, ARCHITECTS



THE exterior of the building is faced with a local limestone rubble of a warm gray color, heavily pointed with mortar. The trim is coarse grained buff limestone. The roof is of variegated red clay tile with hip and ridge covers of lead. The interior has plastered walls and ceilings above the wall book cases. Floors throughout the library are of black and gray mastic tile. The building is constructed of load bearing masonry walls on a concrete foundation. The floors are of reinforced concrete. The roof is framed with steel trusses. Built at a cubic foot cost of 42.7 cents, the structure contains 133,180 cu. ft. and, including the equipment, cost $63,846.18



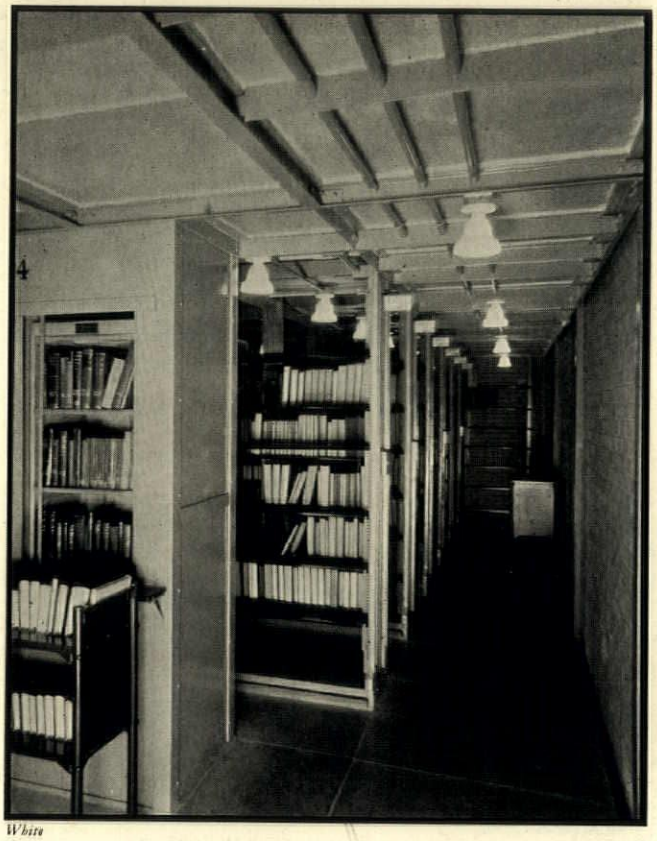


BEXLEY PUBLIC LIBRARY

BEXLEY, OHIO

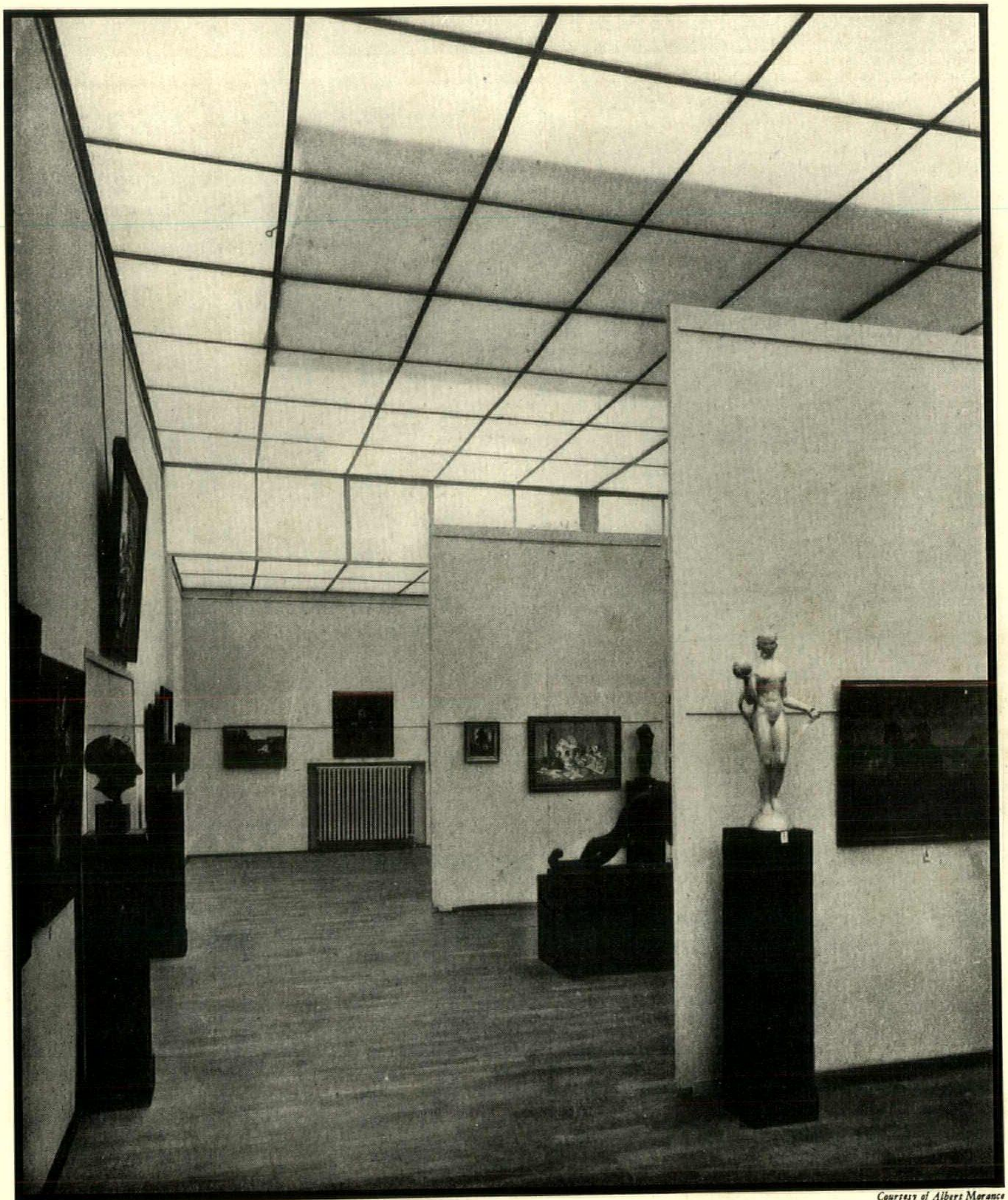
MILLER & REEVES, ARCHITECTS

ENGINEERING & BUSINESS



White

CLARENCE S. STEIN ON PLANNING THE MUSEUM FOR MORE INTENSIVE UTILIZATION . . . IMPORTANT POINTS OF MUSEUM LIGHTING BY ISADORE ROSENFIELD . . . SCALE DETAILS OF MUSEUM AND LIBRARY EQUIPMENT . . . EFFICIENT LIBRARY LIGHTING . . . PRACTICES IN HEATING AND VENTILATING BY SAMUEL R. LEWIS



Encyclopedie de L'Architecture, Paris — *Courtesy of Albert Morance*

STRUCTURAL SIMPLICITY
AND FLEXIBILITY

MUSEUM AT HAMBURG, GERMANY, KARL SCHNEIDER, ARCHITECT

MUSEUM REMODELING AND RESTORATION

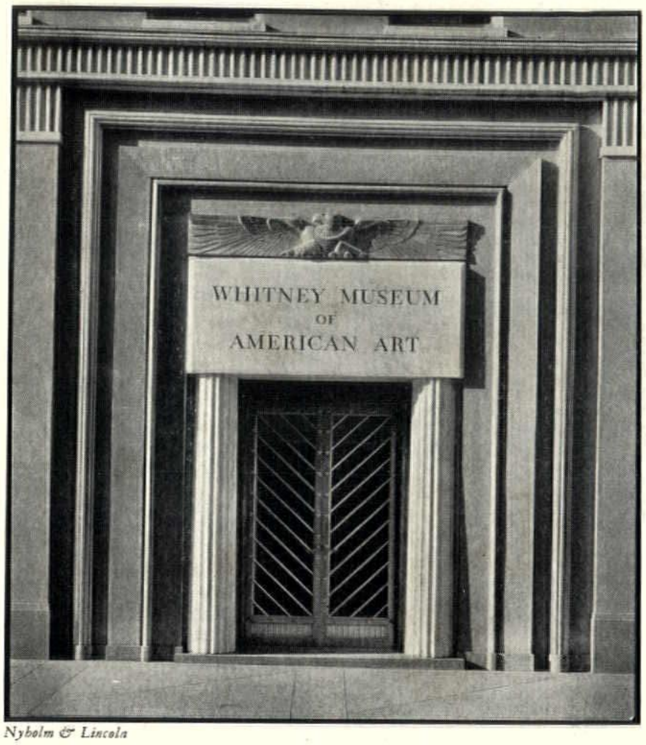
WHITNEY MUSEUM OF AMERICAN ART

MUNICIPAL MUSEUM OF THE CITY OF BALTIMORE

THE inevitable curtailment of public benefactions which accompanies slack business conditions is keenly felt in the arts and sciences. Funds that might ordinarily be available for the construction of libraries and museums are being used for the protection of investments, tax payments, and other necessary, though less interesting, purposes.

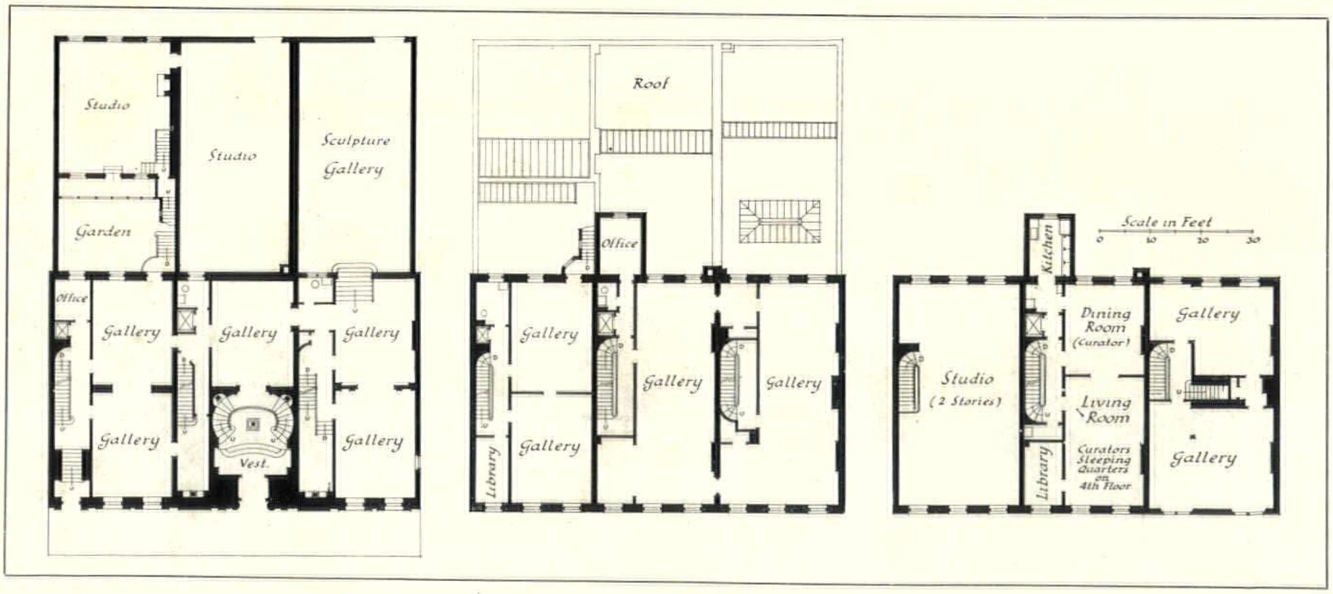
Two types of activity in museum construction, however, remain in good times or bad — the preservation of historic buildings and the remodeling of old buildings to house art and science collections. To the architect with an active interest in the history of architecture, the problem of restoring an old building is an appealing one from the standpoint of sentiment as well as of design, whereas the remodeling operation is often equally interesting, because it demands ingenuity and unusual skill in plan and construction.

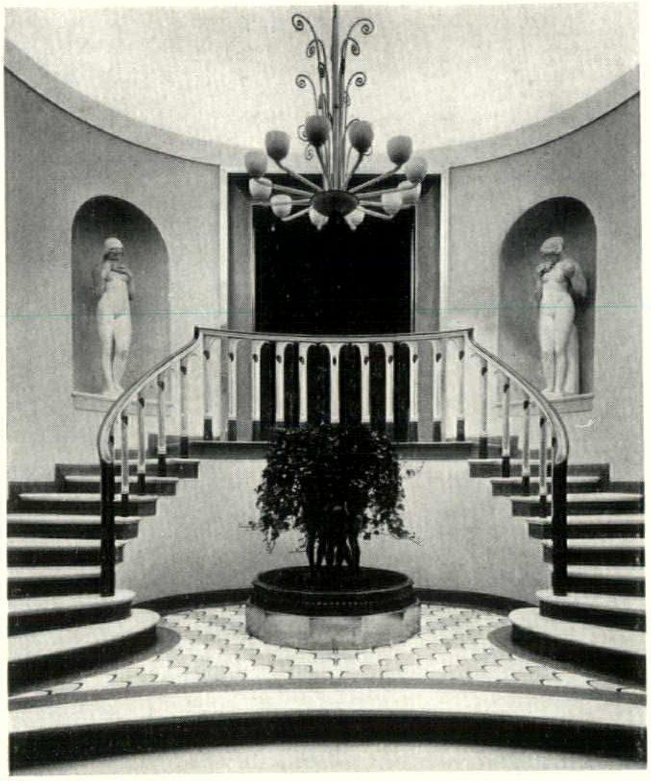
The examples illustrated here, one the restoration of an old building in Baltimore with elements of redesigning, and the other the conversion of four old residences in New York into an art museum, are typical of the work to be done. Although they are alike in that they are not new buildings, the



Nyholm & Lincoln

Entrance to the Whitney Museum of American Art in New York, Noel & Miller, architects. The exterior walls of the multi-colored original buildings were surfaced with a subdued-tinted stucco. Slight alterations were required to balance the fenestration





Demarest

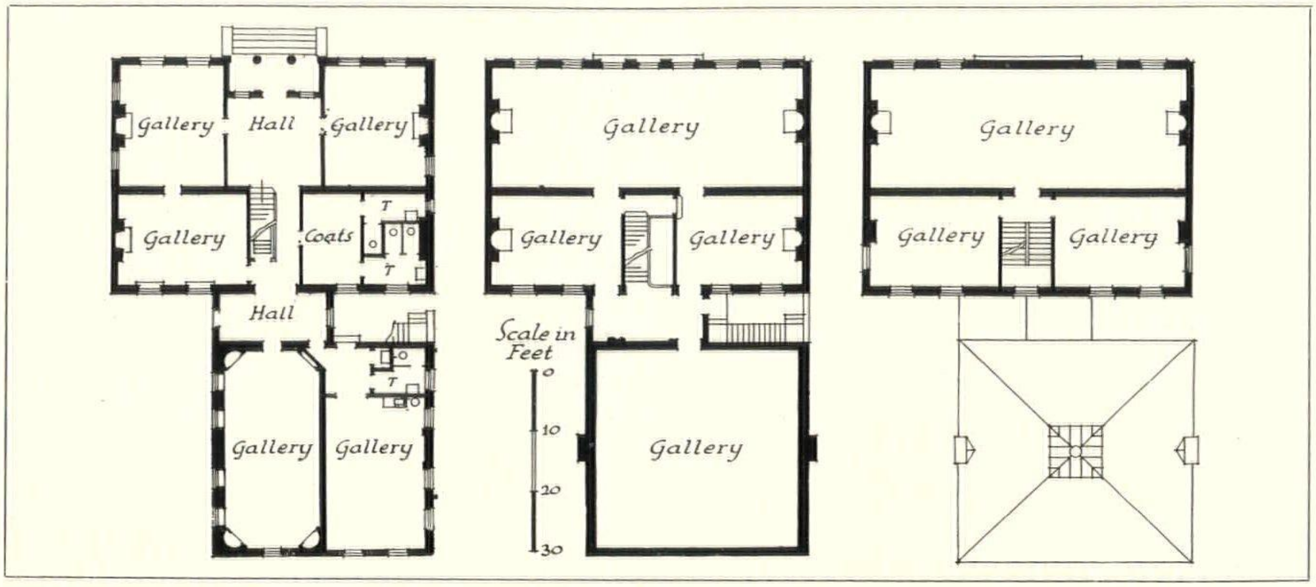
Above, entrance foyer to the Whitney Museum of American Art, in the treatment of which the furthest departure from the original building was made. Below, an exhibit room, altered slightly from the original

similarity ends there. In the first instance, the purpose was to retain and enhance the original character of the building, and in the second, to obliterate as completely as possible the Victorian residences' brownstone stuffiness.

The Whitney Museum of American Art, for which Noel and Miller were the architects, offered its major difficulty in working out a continuity of plan from the rather confusing plans of four old residences. Uneven floor levels, varying ceiling heights, and the structural peculiarities of the last century combined to complicate the logic of arrangement. It would have been possible to rip out the old walls and start with an entirely open area, but that constant source of architectural worries, a limited appropriation, argued against disturbing too much the structural character of the original buildings. The solution was found in piercing the old walls with new doors on the first floor alone and separating the upstairs galleries into units whose size and shape conformed with the walls of the old houses.

In the Municipal Museum of the City of Baltimore, the architects, Wyatt & Nolting, simply refaced the exterior of the building, without changing the beauty of its faultless symmetry. Coincidentally, it was built in 1813–14 by Rembrandt Peale as "A Natural History Museum and Gallery of the Fine Arts." During years from 1830 to 1876 it served as the City Hall. From that time until 1931, the building suffered severely from neglect, but it did not, fortunately, fall into the hands of a "remodeler." Since few changes were required in the plan, the problem resolved itself into one of reconditioning

Gottscho

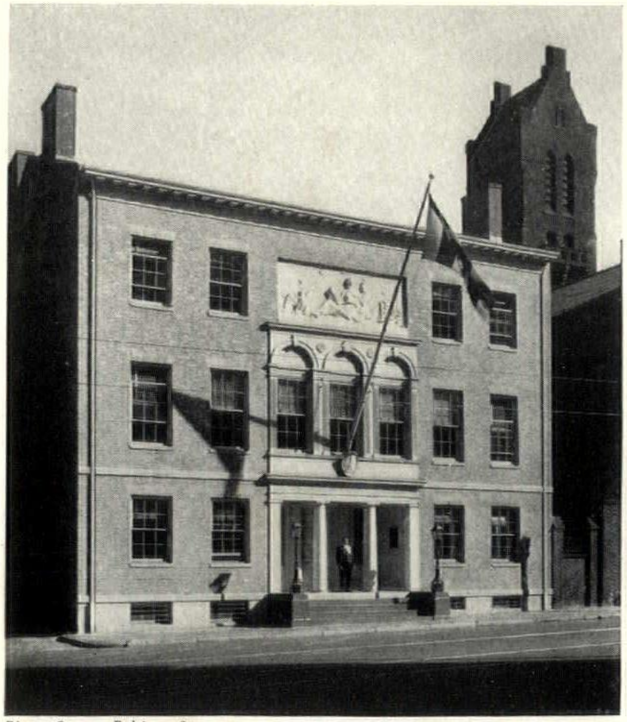


Above, the three floor plans of the Municipal Museum of the City of Baltimore. Below, left, the building after it had been restored, and right as it was after 100 years of use as a museum, City Hall, and worse

and redecorating. Under the restraining hand of John H. Scarff, a member of the firm, every detail that was preservable was kept intact.

The growing appreciation of our historical heritage, and a more widespread appreciation of the arts are responsible primarily for the increasing number of small galleries and historical museums. The once consuming ambition of all collectors to strip Europe of its masterpieces and house them in museums that matched those of Europe in splendor is tapering off into a saner and more general appreciation of the arts of America as well as the Continent. And while, as a nation, we are still in our infancy, we are becoming aware of our ancestors.

These feelings should be encouraged by good small museums and well designed small galleries.



Photos, Courtesy Baltimore Sun

Photos, Courtesy of Baltimore Sun

Two interiors of the Baltimore museum. As the pictures clearly show, the building in itself is a museum, a relic of the past, so that one of the principal demands upon the architect was that it should be finished as nearly identical as possible with the original. Historical pieces will be added when acquired

MAKING MUSEUMS FUNCTION

BY

CLARENCE S. STEIN

THE problem of museum display is that of arranging a collection so as to serve best the different purposes of scientific organization and conservation and that of human use for enjoyment or education. Many museums are perfect store houses and little else. The exhibits seem to be the sole reason for their being — the collection, the care, the labeling, the orderly arrangement of objects. It is as though the theater existed only to give playwriters, directors and scenic designers a chance to practice and perfect their talents. Just as good play production is valueless without an appreciative audience, so a good museum requires public appreciation and understanding.

The scientific and the human or psychological purposes of a museum are often confused. As a result most of our galleries adequately serve neither one nor the other. The scientific approach which is interested in the objects requires that:

1. All the possessions of the museums be shown.
2. The collections be arranged in an orderly manner.
3. Everything be shown in the best possible light.
4. All objects be protected against injury from fire, humidity, temperature, light, dust and dirt, as well as vandalism and theft.
5. The easy rearrangement of the collections to care for their orderly growth.

The human approach which deals with the effect on visitors demands:

1. The separation of the collection into two divisions, one for the general public, the other for students.
2. That the study collection be as comprehensible as possible and be arranged to facilitate research and comparison.
3. That the public galleries be arranged so that: (a) A visitor may see a limited number of objects; (b) every object is displayed in congenial surroundings; (c) the visitor's attention is attracted to each object; (d) his interest is held; (e) he is not fatigued because of monotony of setting.

These varied requirements should be carefully analyzed so as to harmonize the two and thus make it possible to design and to develop museums that will serve adequately for the care and orderly arrangement of art objects as well as for their presentation, so as to arouse the interest and develop the appreciation and understanding of the public.

A Museum Should Be Arranged To Serve Adequately the Different Needs of Students and the General Public. Most museums display all or most of their possessions in crowded galleries which serve neither as a satisfactory place for study nor for pleasurable appreciation. When the walls are covered the remaining objects are usually stored away where they are inaccessible to the public and where their examination by students is difficult.

The exhibits for the general public and the study collections should be completely separated. The presentation of the two should be different. The casual visitor seeks appreciative acquaintance; the student comes for understanding. The former gets most if he is offered but a limited number of the choicest objects, each placed in a harmonious setting that best brings out its æsthetic qualities. A dozen objects so displayed would give more to the public than all the miles of crowded galleries of the Louvre, the Hermitage and the Metropolitan museums.

The essential object of public display of art works is to appeal to the emotions, to give pleasure, to pass on to the present generation the feelings of the artists who created. If these feelings are not aroused, art museums serve no purpose as far as the general public is concerned.

The student as well as the designer, the craftsman, the connoisseur, and the critic, on the other hand, should have easy access to all that the museum possesses. They should have the same opportunity for unmolested, orderly study as they would have in a library. The appearance of the books in the stacks of a library is not the essential; it is the ease with which a student can obtain and use the books. The material in the study collections is working material and requires a different arrangement from the display material in the public galleries. The material should be arranged and lighted so as to facilitate research and comparison. The student's attention need not be caught or held.

The casual visitor may in time become the student and seek in the study collection for new beauties and understanding. (Figure 1)

The Public Should Be Given an Opportunity To See a Small Group of Objects Without Passing Through Other Collections. The classical type of museum is arranged to route the visitor in such a way that he will systematically pass in review all the possessions of the museum. Such museums are built

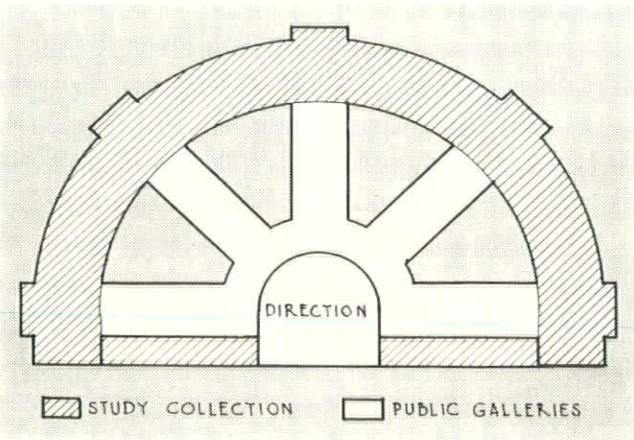


Figure 1

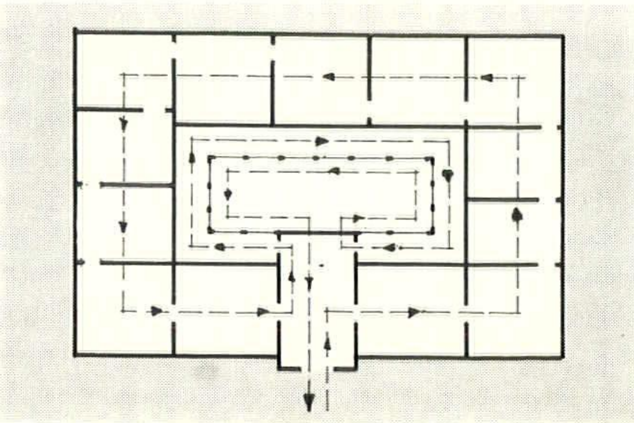


Figure 2

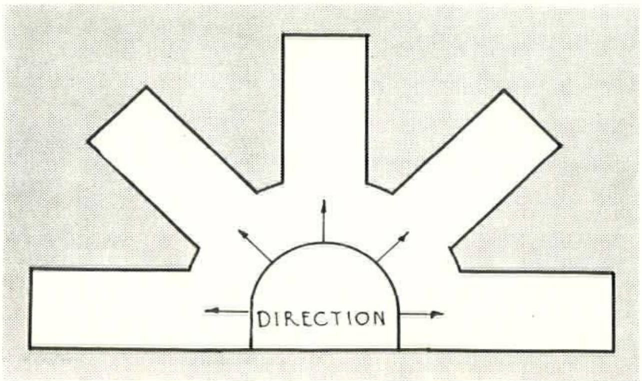


Figure 3

primarily for the storage and conservation of objects and their ostentatious display, *not for the best presentation to the public.* Visitors leave them tired and bored and their greatest pleasure is in reaching the exit. (Figure 2)

A museum for pleasant appreciation of art divides the public collections into a number of small collections of related objects. It is arranged so that a visitor may have direct access to a single collection without passing through other divisions. Each section contains no more than the most casual sightseer will want to view at one time. He may see as much or as little as he wants and leave the building with a clear impression of a few objects instead of jumbled recollections of many unrelated and artistically antagonistic exhibits. (Figure 3)

Every Object in the Public Galleries Should Be Shown in the Setting That Will Best Bring Out Its Individual Qualities. It may be displayed:

1. In authentic interiors of the period of the works exhibited.
2. As part of a small related group.
3. Individually.

Authentic interiors form a natural and therefore congenial setting. Most pictures are at home in the type of surroundings for which they were painted. Period rooms appeal to emotions of the public because they form an harmonious, sympathetic setting for the collections. Furniture, hangings, and all of the work of craftsmen and artists arouse a greater interest in their natural atmosphere and thus arrest and hold the attention of the visitor. The critics of period rooms, particularly as settings for paintings, claim that:

1. Pictures do not always look their best in the rooms of the same period.
2. Attention is distracted from the paintings.
3. The quality of other works shown with them often is not so fine as the paintings.
4. The best natural light cannot be secured in most old interiors, and if the artificial light is arranged in the most scientific manner the interior will no longer look natural.
5. The old rooms do not fit into the monumental shell of our inflexible museum buildings. Unless the external walls are built around them, as in the Colonial Wing of the Metropolitan Museum of Art, or the exterior walls of the museum are entirely of glass, the windows will not fit those in the external buildings.

In spite of these criticisms I think that authentic interiors are most attractive methods of exhibition for most works of art. But the supply of good old interiors is so limited that even if they were all transferred to American museums — which God forbid! — it would be possible to show only a very limited number of objects in such settings. Imitations of old interiors are objectionable. The visitor, if he knows they are fakes, will question the authenticity of all the exhibits.

Group arrangement places objects together which form an harmonious, sympathetic environment in which each exhibit accentuates the artistic quality of the others. The works need not be of the same period or from the same place. The reason for grouping them in the public section of an art museum is to enhance the interest in each and to form a composition that will have an emotional rather than an educational appeal.

I can think of no better way of illustrating this method of display than by likening it to the Japanese Tokonama described by Mr. Simonson.

The third method of display is the exhibition of an object by itself against a simple background and in surroundings that will not permit any other exhibit to distract or call attention from its individual beauty. Its setting should be designed to serve best both the object exhibited and the beholder — the object, by best bringing out its color, form and character; the visitor, by capturing his attention, holding his interest, developing his appreciation and æsthetic pleasure.

To attract the attention and hold the interest:

1. *The visitor should approach an exhibit* as he enters a room. It has been the practice of many museums to place an important exhibit at the end of a long axis, as has been done with the Venus de Milo. This is desirable sometimes for variety. But it is generally inadvisable to sacrifice the opportunity of approaching objects as one enters each or most rooms. Visitors pass by exhibits in going from room to room when doorways are placed on a single axis. There is nothing more tiring and monotonous than the view of a succession of openings. (Figures 4 and 5)

2. *Each object should be disassociated from other conflicting objects.* On the long walls of typical large galleries this is impossible. The object is lost in and belittled by vast spaces or attention is distracted by competing objects. Walls of large halls may be broken up into a series of niches on each wall of which a single, or at most a few pictures can be hung, or in which a single harmonious group of objects can be placed. But in such rooms there is the danger of a visitor passing through without being arrested by the exhibits. (Figures 6 and 7)

The plan can be divided into a series of small spaces or rooms of varied sizes and forms. The visitor's attention will be arrested and he may be "trapped" by one setting after another. (Figure 9)

Wall surfaces should be designed as a limited and simple background for a single or a few objects. They should not be long or high enough to look vacant without numerous exhibits. (Figure 8)

3. *Rooms should be in proportion to the size of exhibits.* For the display of all but such exceptional objects as tapestry, monumental sculpture or very

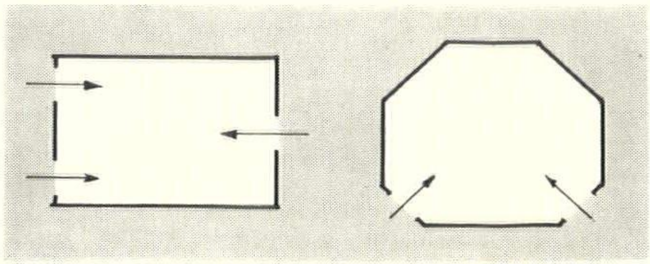


Figure 4

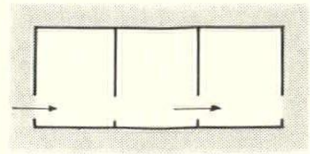


Figure 5

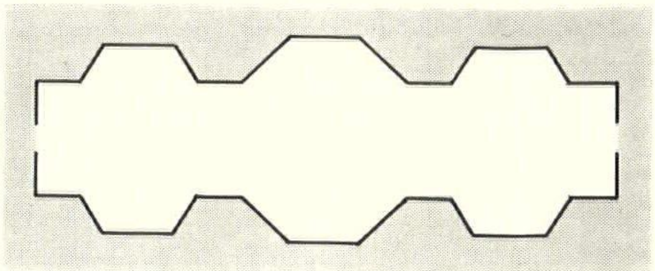


Figure 6

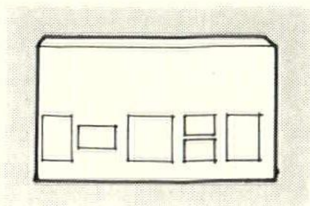


Figure 7

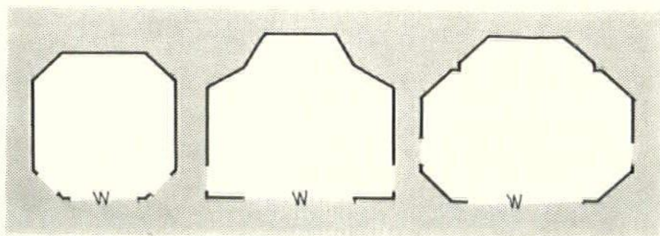


Figure 8

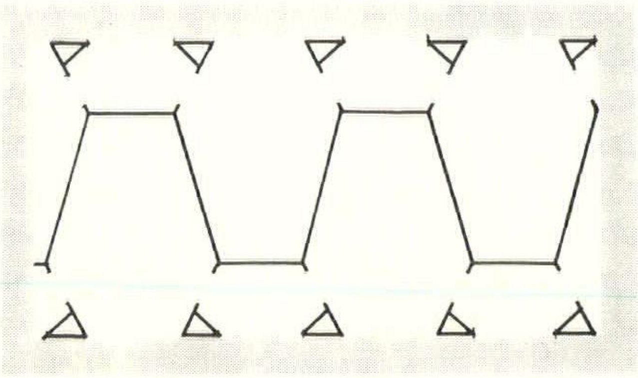


Figure 9

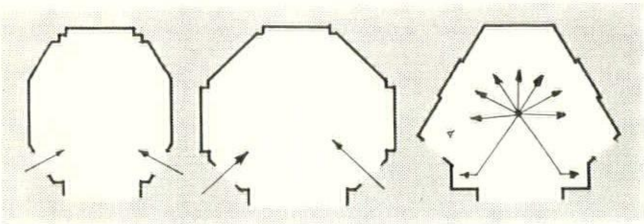


Figure 10

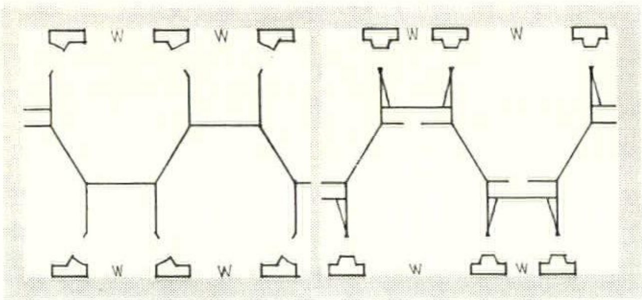


Figure 11

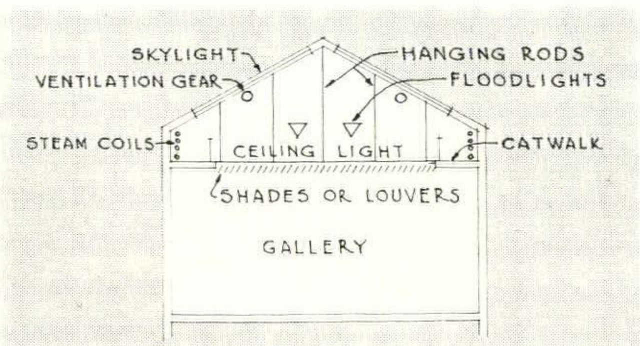


Figure 12

large pictures, they should be as small as possible. However, they must be large enough (a) to permit examination of all exhibits at a desirable distance (3 to 10 ft. in case of moderate sized picture, 10 to 20 ft. for large picture or sculpture); (b) to permit easy circulation of crowds without interfering with the tranquillity of those examining exhibits. Small rooms are sometimes criticized because they will require more guardians for the same number of exhibits. But it is better to cut down the number of objects on public view than to show any in an undesirable setting merely to decrease the cost of guardians.

Rooms of shapes in Figure 10 have these advantages:

1. The visitor's *attention is captured* by the object he approaches as he enters the room. *Interest is held* because there are no conflicting objects on the wall.

2. He passes on from one object to another, each having its distinct background framed and separated from other portions of the room by a broken wall surface.

3. The light is thrown on most objects from the most desirable angle to prevent reflection. The worst lighted position of the wall is used as entrance.

4. *There should be variety* in size, shape, treatment and lighting of rooms and walls not only to give different settings, but also to prevent "museum fatigue." Sometimes a compromise may have to be made with the very best lighting or even with the need of disassociating objects from each other so as to facilitate the desired variety. But with sufficient study it should be possible to fit varied forms of rooms to meet the needs of every individual exhibit. However, a new and flexible type of museum structure is required for this purpose. (Figure 11)

The rooms from time to time should open upon gardens and pleasant natural vistas to give additional relaxation.

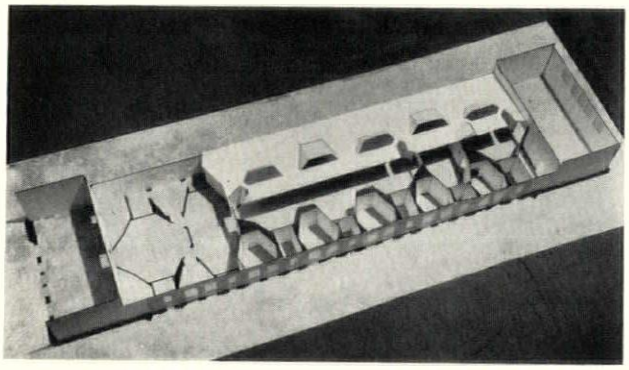
5. *Architectural surroundings shall not call attention from exhibits.* Except where authentic interiors are used as a setting, they should serve as a simple background that in no way "steals the show." Only those architectural motives that have a practical object should be used, such as doorways and sometimes niches, when needed as a frame. Doorways should not be prominent in design, material or color. Generally, the fewer moldings there are the better.

Every Object Should Be Lighted So As To Bring Out Best Its Individual Aesthetic Characteristics of Form, Color and Texture.

The skylight makes available all four wall surfaces for exhibition purposes. But skylights are objectionable for most classes of exhibits, not only because of the depressing flatness and evenness of their light, but because they are the most expensive type of natural illumination. To be effective, they require not only a tall gallery, but a good-sized room space for regulating light. They necessitate additional heating in winter and increased ventilation to prevent overheating in summer, and it is an expensive and difficult matter to keep skylights clean enough to be effective. (Figures 12 and 13)

Clerestory windows free all four walls for exhibition purposes and they give a more satisfactory light. But a high ceiling is required to keep the light out of the visitors' eyes and this makes a disagreeably proportioned room with vast vacant spaces between the bottom of windows and exhibits and requires the construction of much greater bulk than is needed.

Niches in a large gallery disassociate objects or groups from other exhibits and thus give more opportunity for concentration. Rooms of this kind can be very well lighted by natural light thrown directly on the objects exhibited, as is artificial light. This method is exemplified by the Courtauld Galleries in Cambridge, England, and in the studies for the Princeton University Art Museum. This arrangement can be used only in the upper floor of a museum.



Preliminary model of third floor of an Art Museum for Princeton University. Section is shown at right, Figure 14

Side lighting from a single source is most satisfactory for most types of exhibits. With side lighting more than one window in a single room is objectionable: on sculptures it causes conflicting shadows; on paintings it results in increased reflections. As different types of exhibits require different lighting, it should be possible to control the location of source as well as intensity of lighting.

As much as possible of the well lighted portions of walls should be reserved for exhibitions. Doorways, whenever possible, should be placed in the most poorly lighted portions. This is generally nearest to windows.

To keep light out of visitors' eyes, (1) windows may be raised above eye level excepting when it is desired to give an opportunity to look out at a view of nature; (2) windows may be set in deep jamb; (3) visitor may enter room in such a way as not to face light. (Figures 15 and 16)

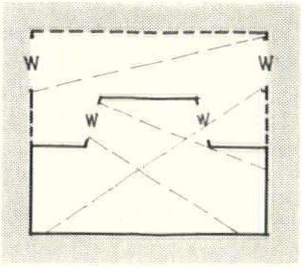


Figure 13

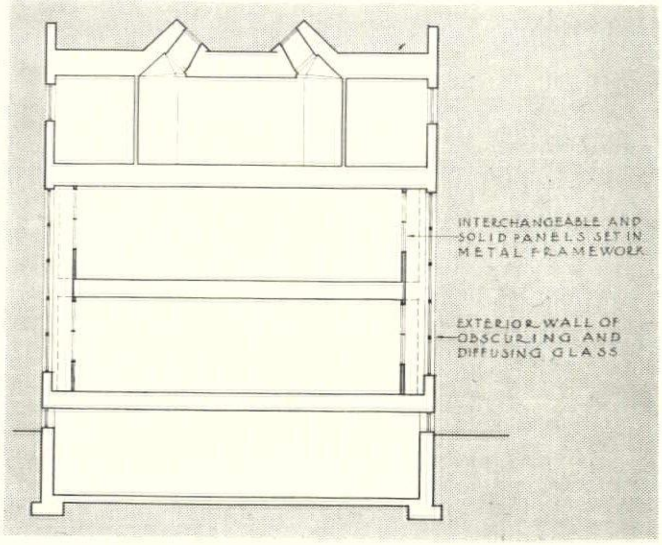


Figure 14

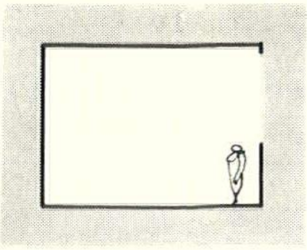


Figure 15

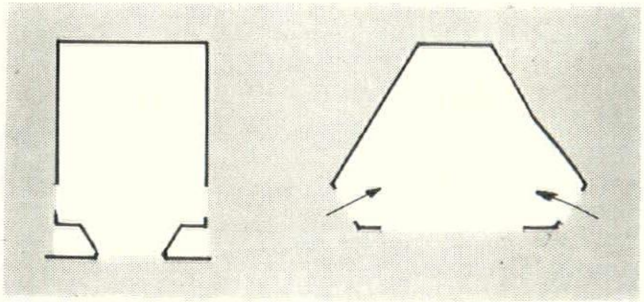


Figure 16

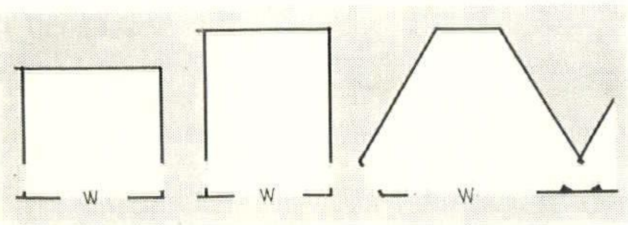


Figure 17

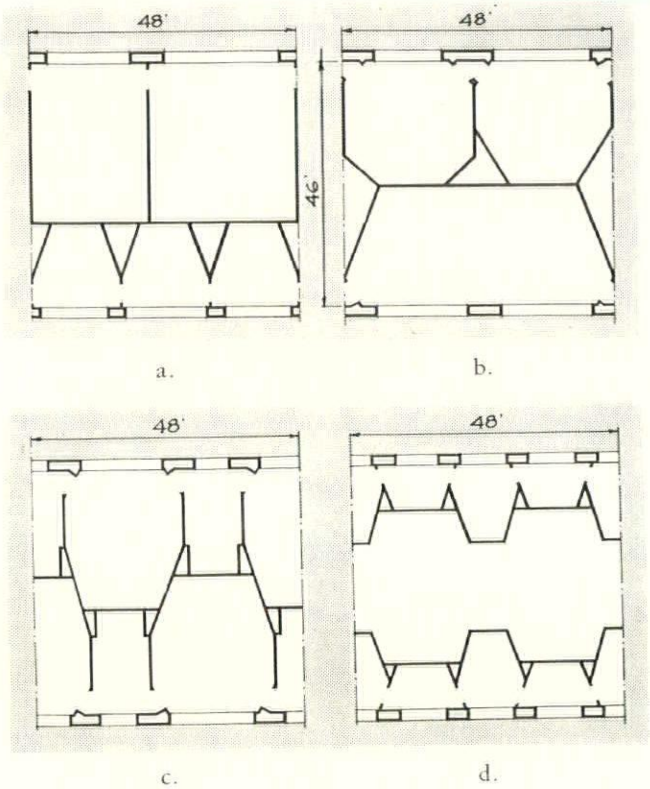


Figure 18. Comparative Studies of Lineal Feet of Wall. (a) 246 lin. ft. If clerestory light, 290 lin. ft. (b) 175 lin. ft. (c) 251 lin. ft. (d) 316 lin. ft. requires top light

To prevent reflections on pictures, the walls parallel to the source of light, which have most reflection, should be minimized and those perpendicular or approximately perpendicular to window wall should be increased as far as possible. But the depth of rooms is limited by carrying power of light which varies according to height of the source and intensity of the light. (Figure 17)

By sloping walls inward toward rear of wall, side walls are increased in length and walls parallel to windows minimized. Thus, a greater part of wall space has light thrown from the most desirable angle to prevent reflections and give most adequate light.

For economy of construction and of upkeep, *rooms should be related to each other* so as to give maximum desirable wall surface at minimum cost. Rooms should be no higher than is needed for the best display of exhibits. (Figure 18)

THE FLEXIBLE MUSEUM

IN THE past insufficient study has been given to the best method of showing art objects in such a way as to bring out the individual æsthetic quality of each object. This is in great part due to the fact that most of our museum buildings were conceived as inflexible structures. They consist of a series of galleries divided by immovable masonry walls and with the source of natural light, either skylight or windows, definitely fixed. Not only must the permanent collections be inadequately displayed, but the exhibits never fit. Their arrangement is always a makeshift because they are placed in a building erected generally before there is any collection to be housed. There is no possibility of showing temporary or traveling exhibits to the best advantage. Every museum collection is constantly expanding and changing. A good museum is a growing, living organization — it is never complete. But no matter how progressive its direction or how fine its acquisitions, within an inflexible shell its growth tends to become static. It is as though a theatrical director with an infinite variety of plays and actors was forced to show them all against the same set and with the same fixed lighting. The possibility of arousing different moods or even attracting or holding the attention of his audience would be very slight. A flexible museum would permit:

1. Arrangement to fit individual requirements of every exhibit.
2. Rearrangement to meet changing requirements.
3. Orderly growth of collections.
4. Complete command of the source of natural as well as artificial light.
5. Experimentation with new methods of display without affecting permanent structure.

To meet these conditions a new conception of museum design is required. In existing museums, partial — but only partial — flexibility can be obtained by the use of movable or hinged screens.

Movable Screens. A common type consists of panels of wood or wall board set on heavy spread feet. They are adaptable to a variety of forms of enclosures. These, however, have the defect of being too apparently part of the furnishings rather than part of the structure, and they are limited in arrangement.

Hinged Screens. The most successful use of screens that I have seen is the Galerie d'Expositions in Hamburg. Here, the screens, though they have been made a permanent part of the structure, have a great deal of flexibility. The system consists of pairs of hinged flush panels of plywood, one leaf hinged on the other so as to swing into any desired position even folding flat against one another. At least four combinations of arrangement can be made with this system. This system requires the floor area to be divided into units or multiples of units which may be enclosed by the screen leaves which are all equal in size. The chief objection to this system is that unsightly edges and hinges show at the vertical joints which admit light. Light is also admitted at the top and bottom edges of the panels. These defects may be eliminated by the use of strap hinges and easily removable molds to cover the cracks at the floor, ceiling and meeting stiles.

Other Types of Movable Partitions. There are many other types of sliding, rolling and folding partitions on the market, all of which have limitations and which on account of their complicated mechanism would be costly in comparison with the simpler types described above. They usually require overhead hangers or pockets as well as unsightly and objectionable side pockets and guides.

A completely flexible museum requires:

1. Large units of floor space free of all structural or utility impediments, such as walls, columns or pipes.
2. Adequate natural light in every part of the structure.
3. Attractive interior walls or partitions, the location of which can be changed with minimum effort, nuisance and cost.
4. An artificial lighting system permitting easy and economical relocation of sources of lighting fixtures.
5. Ceilings, the location and character of which can be changed.

Floor Area. So that the floor may be completely free of structural walls, columns should be placed in the exterior walls. This is preferable to a system of cantilevering even though the latter gives a greater surface of uninterrupted glass area on walls.

The width should be such as to permit good natural light up to about three-quarters of the distance across the floor from exterior glass walls. The carry of light will depend on the height of the ceiling and the intensity of natural light. Forty-five to fifty feet has seemed a desirable width in the preliminary studies of the Princeton Museum in which I am using a ceiling 12 ft. high. Where artificial light is to be depended on as a whole or in part, there naturally is no limit to the width of unobstructed area excepting structural need of support.

Natural Lighting. This should be such that its source and intensity can be controlled and changed freely and easily. Side lighting is preferable to skylighting. Skylights are objectionable for most classes of exhibits not only because of the depressing flatness and evenness of the light, but because they are the most expensive type of natural illumination both in first cost and maintenance. They add enormously to the bulk of the building and to be made effective they must be wastefully loaded with lighting, heating, ventilating and diffusing mechanisms.

Glass in Exterior Wall. For complete flexibility of natural lighting all of the exterior walls should be of glass. However, most practical purposes are served if the two long sides of a unit are as completely of glass as is structurally possible. If natural light rather than artificial is to be used as far as possible, the width of the building should be such that adequate light will carry three-quarters the width of the building.

Windows should be arranged so that portions can be easily blocked off to meet requirements of best lighting of any arrangement of rooms. But the appearance of the exterior would be objectionable if windows were spotted irregularly over the surface. Therefore there should be separate outside walls. The exterior wall should consist of as large as possible an area of glass which (a) shall transmit a maximum of daylight, (b) shall diffuse it over all parts of secondary wall and to a sufficient depth to give adequate light for exhibits, (c) shall be obscure enough to obliterate view of secondary wall from outside of building.

The interior wall may consist of a metal framework dividing the wall surface into openings of equal size. Into these will fit interchangeable solid and glazed panels which will permit the control of the volume of light and the adjustment of its location. Whole sections of the metal framework should be arranged so that they can be taken down when necessary to make room for the actual windows in authentic interiors.

Of the glass investigated, that which seemed to meet the requirements for exterior glass best was a sheet glass with both surfaces crossed by scientifically designed cylindrical lenses (at right angles to each other on either surface) which produce uniform diffusion of light. This glass transmits about 79 per cent as compared with 88.2 per cent in clear glass. It is easy to clean because it contains no pockets in which dirt can collect. By glazing with the ribs vertical on the exterior, rain assists in keeping the glass clean. The lenses obscure vision from both the inside and outside and reflect the heat rays from the sun.

Glass for Interior Windows. This should:

1. Transmit a maximum of light received from exterior windows.
2. Diffuse it so as to light galleries as evenly as possible.
3. Be obscure enough to obliterate silhouettes of structural columns and mullions, muntins of exterior wall.
4. Be easy to clean.

The two parallel walls should be set far enough apart so as:

1. To facilitate the obliteration of view of one wall through the other.

Need of Further Investigation. Much additional investigation is needed but it is apparent that the transmission factor has a definite relation to the amount of diffusion and obscurity obtained. When greater diffusion is obtained, less transmission is obtained. Since with clear glass the light at the windows is too intense and the light at the rear of a room is too weak, it is desirable to diffuse the light so as to equalize it by cutting down its intensity at the window and spreading it over a wider area at the rear of the room. This result is obtained by the use of diffusing glass, the glass with the lowest transmission factor giving the greatest degree of diffusion and therefore the most even distribution of light. Likewise the greater the degree of diffusion, the greater degree of privacy or obscurity is obtained and the amount of sun glare is cut down proportionally.

Interior Walls or Partitions. Museums are not even so flexible as loft or office buildings in which walls and partitions are rearranged to meet the needs of each new tenant. There should not only be easy means for change, but it should be possible to make alterations in the cleanest possible manner. Therefore, as a first requirement, all such processes as plastering should be eliminated. This does away with all the ordinary block systems of wall construction.

The principal requirements for the partition system are:

1. Ease and simplicity of installment. 2. Unit system easily changed to new localities. 3. Minimum alteration of parts. 4. Maximum salvage. 5. Fireproof, moistureproof, dustproof. 6. Rigidity. 7. Durability. 8. Good appearance. 9. Ease of redecoration. 10. Good nailing or fastening surface. 11. Ease of storing of surplus parts.

These requirements are best met by interchangeable partition units which consist of steel stud framework into which are set and secured units of sheathing. Partitions of this kind are about to be put on the market. These partitions are adjustable to variations in ceiling heights. They require drilling of floor and ceiling for anchorage, but a system is being devised whereby perfect rigidity can be obtained by wedging, and in this manner neither the floor nor the ceiling will be injured.

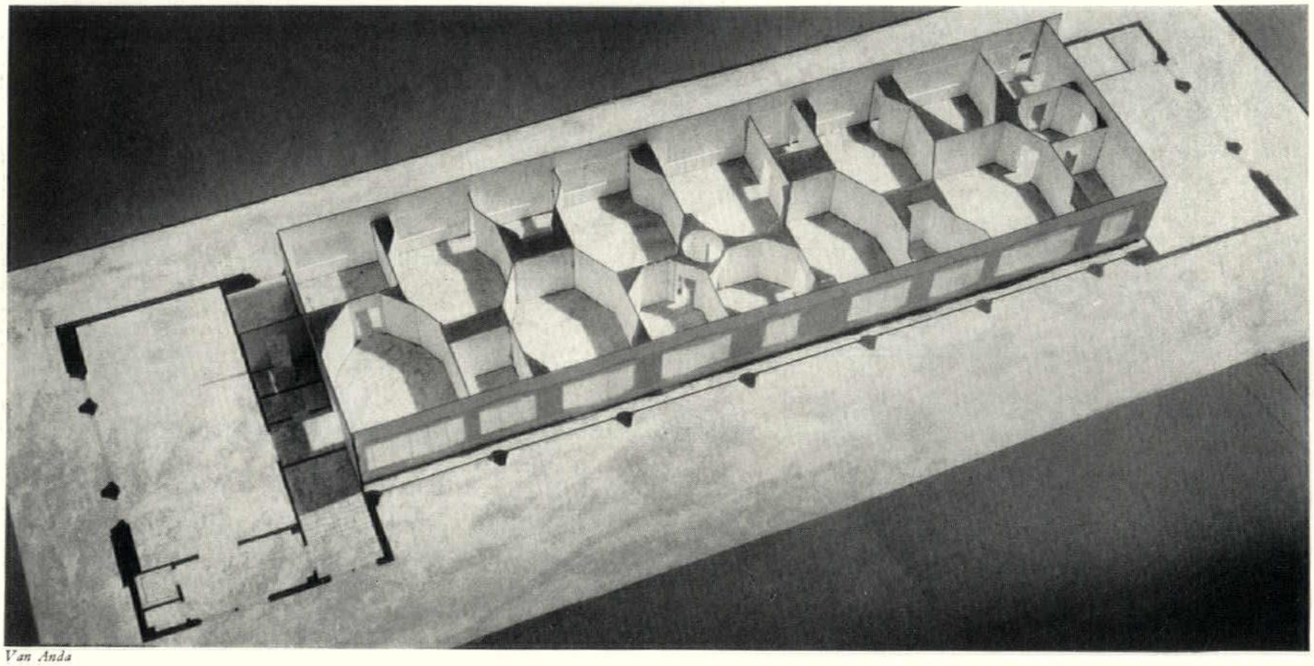
The units of sheathing may be of two kinds: *Asbestos cement boards* which come in various thicknesses and standard sizes. The chief advantage of this board is that it is fireproof. As they cannot be nailed into, it is necessary to introduce strips of wood at a convenient height. The whole wall is then covered by a stretched fabric. Except for the consideration of the wood nailing strip asbestos board can be left natural or painted. *Plywood panels.* These are also procured in various thicknesses and standard sizes. They have the advantage of holding nails. Plywood panels can be finished natural, lacquered or painted. To avoid unsightliness due to defacing subsequent to repeated nailing, it may be well to cover it with fabric. Plywood panels are, of course, not fireproof, but at an additional expense they can be so rendered.

Ceilings. Unless a flat floor system is used, the ceiling should be furred so as to give a flat surface. Where a lower ceiling height is required, stretched muslin or other fabric may be used. Experimentation is required in ceiling panels to be set up in a manner similar to wall partitions. A type of glass panel might be evolved through which artificial light could be directed.

Artificial lighting. If an economical unit system of movable hung ceiling panels can be developed, certain of these panels can be arranged to contain cove reflectors or other sources of artificial lighting. Electric wiring should be arranged as it is in progressive department stores so that pull boxes are accessible from convenient locations on wall and floors.

Experimentation is needed to see if adequate and satisfactory artificial light can be thrown from the same location as the source of natural lighting. This might be done by covering the inside of the outer window with a screen or curtain that would reflect light thrown from concealed sources between the two windows, somewhat as has been done in the Pennsylvania Museum.

A Unit System. The successful and economical use of a flexible museum will depend to a great extent on the use of a definite unit system throughout. The same modules should be used in the original layout of floor space and interior windows and also in all panels and fixtures, such as cabinets and cases, as well as light reflectors.

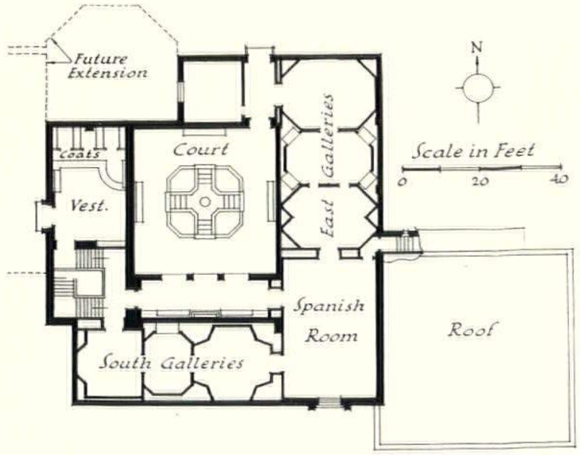


Van Anda

TWO MUSEUMS

BY

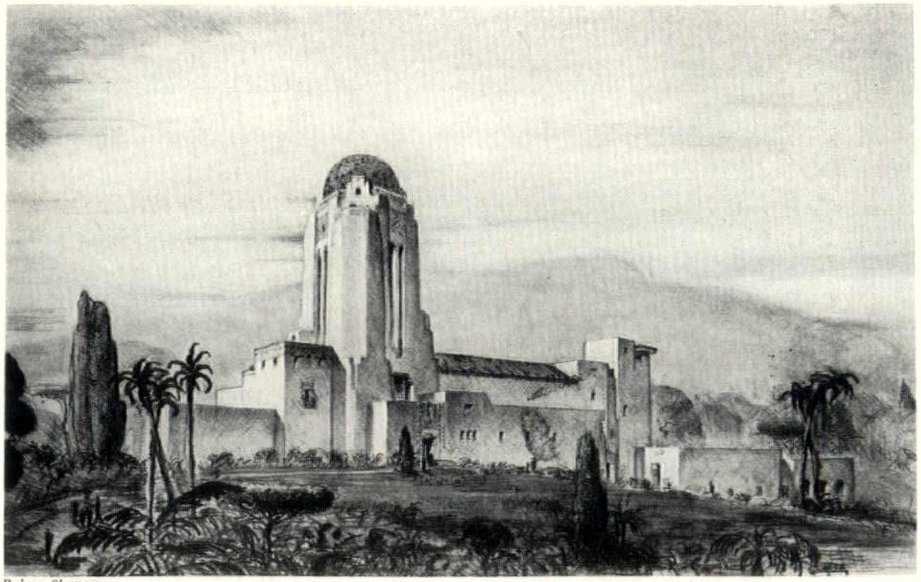
CLARENCE S. STEIN, Architect



The preliminary model for an Art Museum at Princeton University shows the arrangement of a flexible museum. *Exterior* surface of glass crossed by semi-cylindrical lenses designed to diffuse light and obscure vision from outside. *Interior* surface of metal frame into which fit interchangeable solid and glazed panels permitting adjustment of location and source of light. Two-and-one-half foot space between two surfaces for heating and other utilities. Floor completely free of structural and utility impediments. Interior interchangeable partitional units set into steel framework which can be easily and singly installed and demonstrated.

It should be noted that this museum for a University has no problem of the circulation of large crowds. This museum is designed so that every portion can be used without artificial light.

On the other hand, the Pasadena Museum, of which the general perspective and plan of the first unit are shown to the right, is to be illuminated entirely by artificial light. Southern California sunlight is so intense that the control of natural light would be more expensive than the use of electricity.



Palmer Shannon

Courtesy, Cleveland Museum of Art

Because of a desire to produce the effect of an outdoor garden at night, this court is lighted by four lanterns on posts. The ceiling is kept as dark as possible although some lights are installed behind the glass

THE CLEVELAND MUSEUM OF ART

CLEVELAND, OHIO

HUBBELL & BENES, ARCHITECTS

LIGHT IN MUSEUM PLANNING

BY ISADORE ROSENFIELD

OF THE OFFICE OF
CLARENCE S. STEIN, ARCHITECT

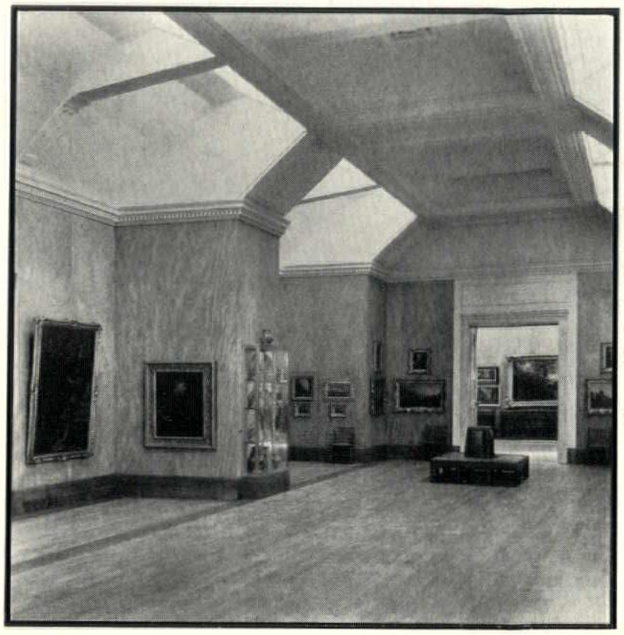
THE planners of museums in America found their inspiration (or shall we say examples to copy) in European models, chiefly from Italian sources. The north Europeans followed Italian precedents, and the Italians were of course inspired by classic Rome and Greece.

In this process of imitation the Italians came nearer a correct solution than any of the later followers. Under conditions of Italian sunlight and bright skies, it is possible to light great halls through a small skylight or a small window. The problem of glare is less with comparatively small light sources. Upon entering a room one is merely aware of a general glow of light and not of the source itself. Under such conditions the results are pleasing, though not uniformly successful.

When the northern Europeans began to imitate the Italians they found that in order to get volume, which is the first requisite of proper light, they had to make the skylights and windows much larger. They also realized that they could not afford to build or to heat halls of the lofty dimensions of the Italian examples. As a result they provided rooms large in plan but with rather squat ceilings which were largely glaring skylights.

American art museums are for the most part architectural monuments and if efficiency was at all considered in their planning it must have been measured by the lineal feet of wall space for hanging of pictures or placing of rows of sculptures. To attain the ideal of maximum wall surface windows were avoided as much as possible and light was usually admitted through large skylights. If the museum were more than one story, the lower stories were illuminated through a minimum of windows which were not disposed for efficient lighting but rather to conform with the preconceived architectural style of the exterior.

Such planning and lighting usually resulted in quantitative rather than qualitative exhibitions. It permitted hanging of uninterrupted miles of pictures, but it rendered the exhibits monotonous and uninteresting.



This gallery in the Fitzwilliam Museum at Cambridge, England, for which A. Dunbar Smith, F.R.I.B.A. was the architect, illustrates the use of the "Seager" type of top light

A New Understanding. Within recent years persons interested in museums began to question the old methods and to experiment with new ones. Out of the sporadic attempts we discern the gradual evolution of a new set of convictions. A museum should endeavor to exhibit a few objects well rather than many badly. It must be planned to light each object to best advantage.

The exhibits themselves should be divided into two categories, those for satisfying and stimulating the sense of the beautiful in the average museum visitor and those grouped for study and comparison by the student, the artisan, or the person with a specific interest. This article will concern itself primarily with lighting of exhibits intended for the general public.

Orientation. If we were to concede that a museum should be lighted through skylights exclusively then the question of orientation need not be raised, because skylights might be arranged in any direction without regard to the orientation of the building. Experience indicates, however, that the most pleasing illumination, whether for pictures or sculpture (as will be borne out later), is obtained from sunny exposures. We should conclude there-

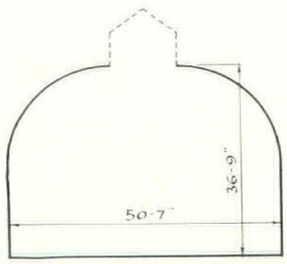


FIGURE 1

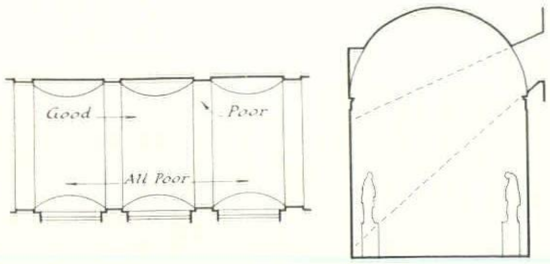


FIGURE 2

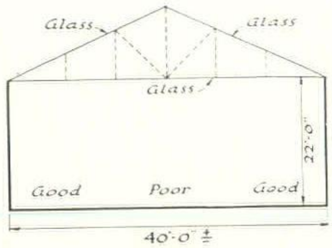


FIGURE 3

These diagrams illustrate top lighting existing in famous European museums. Figure 1 is a diagram of the Brera in Milan. Figure 2 illustrates the uneven lighting in the Braccio Nuova Gallery in the Vatican. Figure 3 is a diagram of the Luxembourg Gallery. The latter is well lighted at the walls but poorly lighted in the middle of the floor

fore that in our latitude a museum should be planned to intercept the maximum of sunlight.

The difficulty with north light is that it is flat and cheerless. In order that a painting may appear at its best it should first of all have a warm glow of light upon it and, in the case of sculpture or most other three-dimensional objects, it can obtain expression only through light and shade.

In 1902 a Royal Dutch Commission consisting of distinguished artists and scientists was appointed to report on the best method of displaying Rembrandt's "Night Watch." They built an experimental gallery and tested the masterpiece under various conditions of skylight and sidelight. The Commission's report was practically unanimous in favor of southerly sidelight.

Size of Traditional Gallery. The literature on the subject of museum lighting is not very extensive. What there is of it is largely confined to criticism of lighting of the various well famed European examples. Most critics take for granted two conditions: first, that the gallery must remain heroic in scale and, secondly, that it must be expressed in the traditional forms of architecture. Yet here precisely was the trouble — the galleries suffered from excessive scale and too many architectural elements.

Let us take as an example the Brera in Milan. (Figure 1) This room is 50 ft. 7 in. square. It is vaulted and measures 36 ft. 9 in. to the crown. It is lighted by a monitor light only 11 ft. 10 in. square, without ceiling light. Its lighting is considered to be quite satisfactory. But to reproduce it in our latitude would be expensive and unsatisfactory because such a room could not be adequately lighted through the small monitor. To increase the size of the source would bring problems of glare and reflection and troubles without end.

The Braccio Nuovo Gallery in the Vatican (Figure 2) which is lighted by high lunettes in each bay of the long vaulted room has fair light on the wall opposite to the windows while the sculpture under the windows is in semi-obscurity. Even on the wall that receives direct light the sculpture placed opposite the piers is suffering from a confusion of cross light.

The Luxembourg Gallery for sculpture (Figure 3) is well lighted at the walls, but very poorly lighted in the middle of the floor because there the light is directly overhead.

The accompanying illustrations show several other examples of skylight and top light. If the results obtained with them are not satisfactory it is not the fault of the light but rather it is inherent in the scale and the architecture of the room. (Figures 5 to 8)

The German Cabinet. The Germans were the first to discover that it is not possible to reconcile palatial interiors with proper light and proper display, because of the architectural elements and confusing light sources. They therefore gave up the idea of the palace museum and narrowed the problem to small units, each unit having a single source of light. An American architect, who had an important museum commission, investigated the so-called "German cabinet" and, while he admits that their lighting is good, dislikes them for "the hideous results on the room itself." That is the way architects felt in 1903 about anything that was not Gothic or Renaissance.

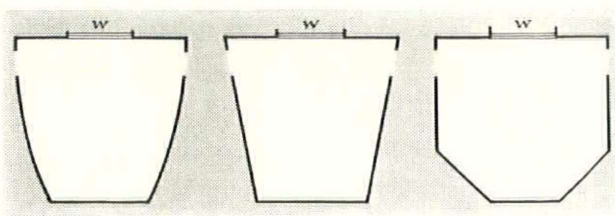


FIGURE 4

Size of Gallery. Today most architects would accept the "cabinet" as reasonable. The cabinets are purposely shown without scale (Figure 4) because the size may vary within a wide range. It may be said that 12 to 14 ft. is the average distance at which a person can take in a field of vision not too large for proper observation. This, of course, refers to the average size of objects commonly found in a museum. If a room is devoted to very small articles, then the room may be correspondingly reduced. This principle holds for a gallery which may be visited by only a few persons at one time. If it is expected that the gallery may be visited at one time by a considerable number of people then it should be enlarged sufficiently for proper circulation.

Clarence S. Stein, through independent analyses, arrived at certain conclusions as to the shape of galleries. His ideas were based on observations, but it is interesting to find them borne out by experimentation.

Some years ago the Museum of Fine Arts in Boston, Mass., was about to build a new museum for its collections. A thorough study of European museums was made and the conclusions were that while there was much to be admired and much to be criticized the only way to establish any principles would be through actual experimentation.* Accordingly they built a box 40 ft. long, 32 ft. wide, 28 ft. high. It had interchangeable sashes on all four sides, an enormous skylight that could be narrowed down at will and a floor that could be lifted or lowered.

Skylight Experiment. The first experiment was made with the skylight, as shown in Figure 9. It was found that the north wall had "the golden quality of sunlight" while the south wall, which was getting north light, was thought by some to be "colorless and cold." The light was, of course, too glaring, so the south slope was glazed with diffusing glass. This caused sun spots and irregular blotches on the pictures. The diffusing glass absorbed about 40 per cent of the south light on bright days, but on dull days the north and south walls were in fair balance.

Then they introduced a diffusing ceiling light and later doubled it by adding a diffusing plane of glass 10 in. below the first. They tried louvres and fins but found no satisfactory solution. The skylight was finally given up and modified to two slightly inclined top lights with an opaque span in between.

The results were recorded as follows: "The advantage, in avoidance of glare, of a liberal screening of the zenith was evident. The light fell on the pictures and not upon the visitor who was screened by the opaque zenith, while the light was distributed

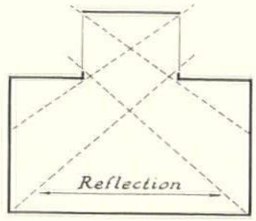


FIGURE 5

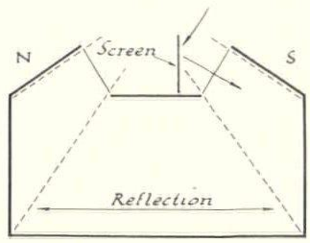


FIGURE 6

The monitor light illustrated in Figure 5 lights the center of the room more than the sides. In Figure 6, from a model by S. Hurst Seager, the vertical or slightly inclined top light delivers light directly on displays

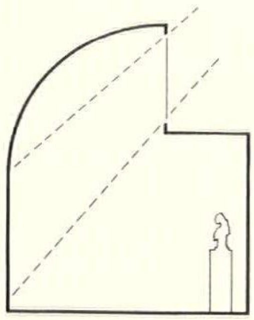


FIGURE 7

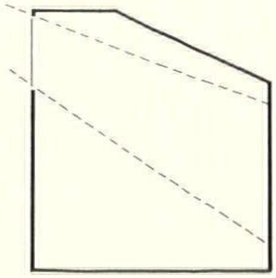


FIGURE 8

The one-sided, vertical skylight in Figure 7 leaves sculpture in comparative darkness. In Figure 8 the one-sided clerestory light delivers good light on one side of the room but poor light on the other

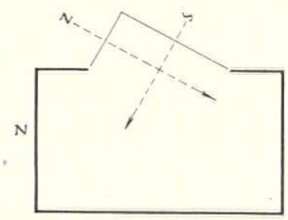


FIGURE 9

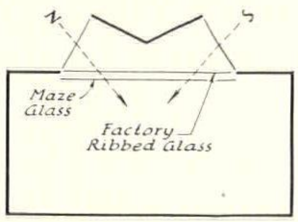


FIGURE 10

Figures 9 and 10 show skylight and top light used in the Boston experiments

at a good angle upon the picture zone." Thus stands condemned the usual skylight.

Top Light. A few years ago the writer came to the conclusion that a light designed to throw its rays to the opposite wall, as shown in Figures 2, 5, and 10, was not reasonable and recommended the type shown in Figure 6. He later discovered that S. Hurst Seager of Australia and England came to the same conclusion and actually had built an experimental gallery of this kind. He had

* *Communications to the Trustees*, Museum of Fine Arts, Boston. Communications 1 to 4 inclusive.

difficulty in balancing the light on both walls which he overcame by an exterior reflecting baffle. It was tested by the National Physical Laboratory in England and found satisfactory. The chief virtue of this top light is that it delivers the light directly where it is wanted — on the wall — and the source itself is practically out of sight. This principle was later adopted in the remodeled National Galleries of England, as shown in Figure 7.

Determining Cross Section. In determining the proportion of the cross section of a gallery using top light, in the Boston experiments, it was found that the 45° lines of light were the best. The field for exhibiting objects of normal scale, such as pictures and sculpture of natural scale, lies within the heights of 3 ft. and 12 ft. from the floor. By drawing 45° lines from these points one can determine the size and the position of the light source. A higher or a lower ceiling will alter the dimensions of the light source.

The conclusions in regard to top light are:

1. Good results are obtainable for both sculpture and paintings.
2. The source should be so placed with reference to the exhibits as to deliver the light at from 45° to 70°. Vertical light on sculpture is decidedly bad.
3. The top light should be so situated as to be practically out of sight of the visitor.

Side Light. Clerestory light is a form of side light. If used on one side of the room only, it delivers good light on the opposite wall (Figure 8) but leaves the wall under the window in comparative obscurity. This wall might be used to advantage for the display of tapestries. Clerestory windows on both sides of the room produce fair results. Clerestory galleries are, however, needlessly high and therefore expensive as well as usually unpleasant.

Window light has many mechanical advantages

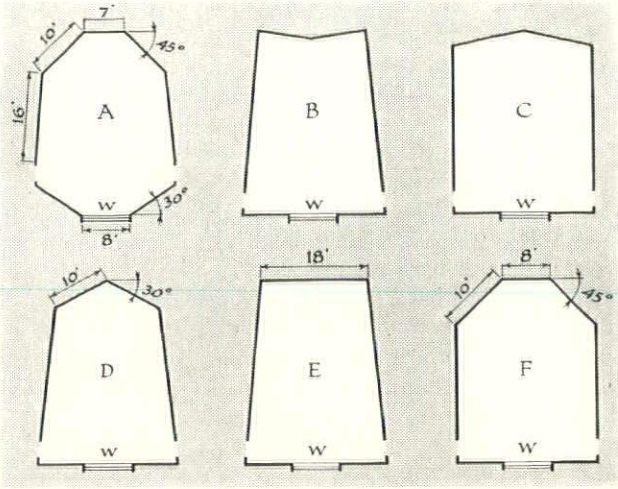


FIGURE 12

The Boston experiments with the German cabinet

over top light. The window is accessible and much easier to manage than top light. It would seem that skylight and top light should never be resorted to except in situations where side light is not available, as might be the case in city galleries or in inner portions of a top story when it may be desirable to divide the space into small inner units.

Shape of Room in Plan. The Boston experiments first referred to above proceeded to test the German cabinet. They constructed a series of rooms shown in Figure 12. All the rooms were 24 ft. wide, 32 ft. deep and 22 ft. high. The head of the window was at ceiling and the sill was 7 ft. above the floor. All the windows were 8 ft. wide, or one-third the width of the room.

The comment on Room A is particularly interesting. "In this setting the various portions of the hanging wall received light from the windows at approximately the same angle. The paintings were

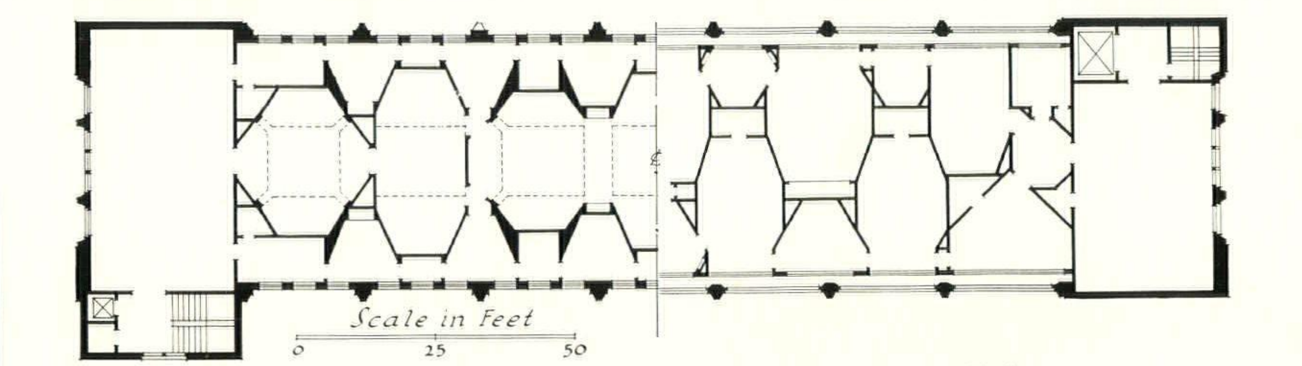


FIGURE 11-A

FIGURE 11-B

Preliminary plans for an art museum at Princeton University, Clarence S. Stein architect. Since no problem of large circulation existed, small exhibition spaces were permissible. Figure 11-A is half of the first floor; Figure 11-B is half of the second floor never more favorably illuminated than under these conditions, the objection being a lack of architectural effect, a picture exhibit machine." Rooms A, B, C, D and E do not produce good enough results to compensate for the "poor architectural effect." The rear corner angle produced good results even when less than 30°, but was best at 45°.

It was finally suggested that Room F is a good compromise between "architecture" and light.

A series of rectangular rooms of the same depth and height, but with varying widths was then tried with both sculpture and paintings but they could not improve on Room F, which was the poorest of the group in Figure 12.

Relation of Depth to Width. It was thought that in a series of deep rooms with the doors near the windows there might be congestion on the line of travel as people may merely view the room from the end without going far into it. This led to the experiment with shallow rooms. Accordingly, a room 32 ft. square was built. The sense of spaciousness was found very pleasant, and with a window 10 ft. wide, or about one-third the width of the room, "the light in the room was excellent." (Figure 13.)

With the aid of the photometer, the interesting principle was arrived at that, given a room with a window in one end, the light on the side walls is best at an angle of 45° from the center of the window (the window being one-third as wide as the room). The light continues to be good up to an angle of 60° away from the window and 30° toward the window. From the end of the 60° line the light continues to be good if the corner of the room is cut off at 45°. The poorest light, of course, is at the rear wall where it is complicated by reflections. Pictures on this wall should be hung low so that the light would strike at an angle to the vertical. This suggests the use of the rear wall for small pictures. Naturally the narrower the room, the shorter the extent of good light on the side walls.

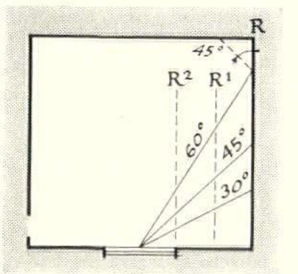


FIGURE 13

Light for Sculpture. When the various rectangular rooms above described were tested again with sculptures instead of paintings it was found necessary to raise the sill of the window to 10 or 12 ft. above the floor, where for pictures the height was 7 ft. In other words, while for pictures the governing angle of light is horizontal for sculpture the vertical angle must also be considered and should be vertically oblique.

Conclusions. *Source:* a. Top light for pictures should come from one side of the room only, otherwise images on one side will be reflected in the pictures on the other side. Top light for sculpture may come from more than one source provided each source lights a separate alcove or niche. Care should be taken to avoid confusing shadows.

b. Side light for pictures and sculpture should come from one source only.

c. For miscellaneous objects side light is preferable to top lighting; one window is preferred to several and the window sill may be as low as desired.

Directions: a. In top light oblique direction of the illumination is imperative for both sculpture and paintings. For sculpture, light vertically from above is particularly bad.

b. Side light is preferable to top light for both sculpture and paintings. In a horizontal plane the best light on the side wall is that intercepted by an angle of from 30° to 60° with the window wall. For sculpture the angle of light should also be oblique in the vertical plane.

Exhibition Zone: The exhibition zone for pictures is from 3 to 12 ft. from the floor and generally 10 to 11 ft. is quite high enough under normal conditions. The height of 12 ft. is also good for reliefs and sculpture of natural scale.

Size of Gallery: The effective size of a room is determined in plan by projections of 30° and 60° angles from the center of the window (the window being one-third the width of the wall in which it occurs). Within these limits various shapes and types of rooms are possible, still maintaining good light. The ceiling height varies with the extent of obliqueness of light desired, a 12 ft. ceiling being probably the least height under normal circumstances.

Windows: a. The window width found best in the latitude of Boston was about one-third the width of the room. This may have to be increased in northern latitudes or reduced further south.

b. The head of the window should be as near the ceiling as possible.

c. The height of sill should be above the eye level in order to avoid glare and to increase hanging height in the rear of the room. For sculpture the sill should be higher than for paintings. Variations of sill height may be obtained by a screen at the bottom of the window.

Diffusing Media: Most diffusing glass is oppressive on dull days and on bright days the indentations produce secondary sources of concentrated light. This may be overcome by finding a proper glass. Clear glass with curtains or folding gauze screens gives best results. Screens pulling from top and bottom will give flexible control.

Window Jambs: A deep window reveal conceals the window from sight upon entering and thus minimizes glare. A splayed reveal affords additional reflecting surface.

Location of Doors: Usually doors should be close to the window wall where the light is poorest, but from which the visitor can see the setting of the whole room as he enters without getting the glare of the window in his eyes.

Floors: Floors should be dark and non-reflecting. A color simulating outdoor conditions produces pleasant light in the shadows of sculpture.

Flexibility of Natural Light. If a museum is designed to house a fixed collection, its fenestration can be planned as permanent. If, however, its collection will be subject to constant change and growth, then a fixed fenestration is a serious liability. Therefore, it seems that the best solution for most museums would be to have the exterior wall entirely of glass. A secondary wall of light construction could then be built about 2 ft. from the structural all-glass wall and penetrated by any size and shape of secondary windows that the situation might require from time to time. (See Figure 11-B)

Natural vs. Artificial Light. Some museum authorities are wholly committed to artificial illumination, others would have only natural light. There is reason for one, or the other, or a combination of both depending on the circumstances.* Artificial lighting alone is largely justified where almost unlimited flexibility of interior arrangement is desired or where a museum is located in very warm and dusty regions. Thus a museum in California or Arizona, or in a dusty section of a large city might very well be lighted entirely by artificial means for the reason that strong sunlight and dust are injurious to pigments and fabrics. It is also easier to control temperature in a room that has no windows.

By the same token, museums in temperate zones might very well have large glass areas, because natural light is not only cheaper than artificial light but it is also pleasanter. We are psychologically inclined to favor the natural. The middle course is natural light supplemented by artificial light, as may be necessary for dull days, evening exhibitions, or for display cases and portions of the building that cannot be reached adequately by natural light.

Artificial Light. In the museum of the past, artificial light was an afterthought rather than a planned consideration. It usually took the following forms:

1. Rooms with skylights had floodlights concealed behind the ceiling light.
2. Ordinary commercial lighting fixtures were suspended from the ceiling.
3. Reflectors were bracketed out or suspended in front of paintings.
4. In late years cove lighting has been in use for special or period rooms.

In considering natural top lighting, we concluded that at its best it is not so good as side lighting, particularly in case of a skylight which usually requires a ceiling light for diffusion. This objection applies equally to artificial light. (Figure 14) However, the principle of having the artificial light come from the same source as natural light is very sound and such arrangement should be sought where physically possible.

Where vertical top lighting is used the artificial sources could be disposed over the vertical sashes. (Figure 15) In most forms of vertical top light the artificial source would cause glare in the eyes of the visitor, but this could be overcome to a degree by the use of diffusing glass. Where top light is designed to deliver the light directly on the wall without crossing the room reflectors could be over the sashes without being in the line of sight. (Figure 16)

The Suspended Fixture. A lighting fixture at its best is objectionable because it is a point of interest and therefore detracts attention. If it is a direct fixture (Figure 18) it is a source of annoyance because of its glare. Another difficulty with a direct fixture is that its image is reflected in every glass case and shelf and every polished surface. This is not a factor in the case of the indirect fixture provided the underside of the reflecting pan is a dull, flat surface. As a means of general lighting there is something to be said for the indirect fixture which uses the ceiling as a reflecting surface. (See Figure 19) Finally, "general lighting" is not suited to the proper illumination of either sculpture or pictures because it is indiscriminate.

Reflectors in Front of Paintings. Lighting pictures by reflectors bracketed out in front of them is not satisfactory because the bulk of the reflector is in the line of vision and therefore annoying. (Figure 20) The light from such a device is usually spotty and calls upon the eye to adjust itself constantly between the bright spot and the general gloom of the room.

Cove Lighting. Cove lighting is as deficient as general lighting from a suspended indirect fixture. (Figure 21) It produces a glaring ceiling, particularly at the cove which is in the line of sight, and it fails to deliver the light efficiently where it is wanted. Such lighting is usually resorted to in special or period rooms, which in their original situations were, of course, illuminated either by oil lamps or candle light. These being out of the question, the possibilities are:

1. The use of antique fixtures "electrified."

*Museum Lighting, by Clarence S. Stein, *Museum News*, Oct. 1, 1930.

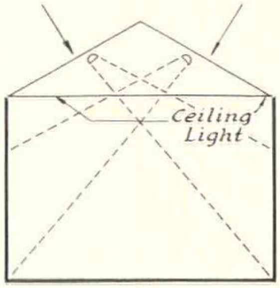


FIGURE 14

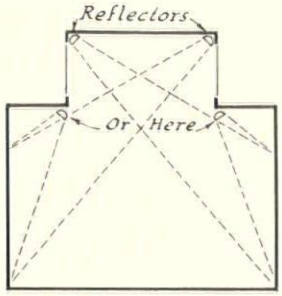


FIGURE 15

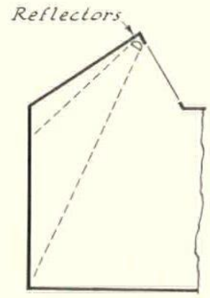


FIGURE 16

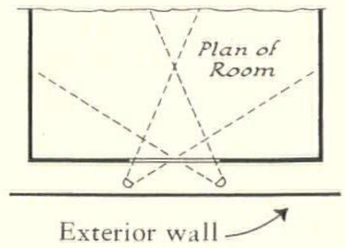


FIGURE 17

2. The placing of the light source back of the inner windows in a manner to simulate daylight. (Figure 17)

3. The showing of the period rooms by daylight only. This is the solution adopted in the American Wing of the Metropolitan Museum of New York.

Artificial Window Light. Our conclusions on natural light suggests that the best way to illuminate a side lighted room by artificial means would be to place the source at the window. We have an example of that in the Pennsylvania Museum of Art. Here floodlights are placed in back of a series of false windows. The same can be done behind a secondary sash in any room. We have several examples of this in modern department stores. Under the window conditions shown in Figure 11-B there would be plenty of space back of the secondary sash for reflectors. Of course, the glass in the secondary sash would, of necessity, have to be of a diffusing character in order to conceal the reflectors. Where there is only one line of sashes, it is conceivable to arrange the reflectors in the splayed jambs of the window reveal. The writer does not know of any examples of such an arrangement, but this is only one of many problems in museum planning that need testing.

Artificial Top Lighting. The artificial top lighting referred to above was predicated on existing natural top light. In a room which is intended for artificial illumination as the only means of lighting, the following forms are being evolved:

1. Reflectors are placed in back of diffusing glass and the glass is inclined to an angle calculated to deliver the light to the hanging zone on the wall. Instead of the glass, adjusting louvres may be used. (Figure 22)

2. Instead of reflectors, a prismatic lens is used. The electric bulb is placed off center from the lens in a manner calculated to deliver the light where it is wanted.

3. Horizontal louvres of fabric or opalescent glass in frames with reflectors in back delivering light to the wall.

Flexibility. If a museum is to be flexible in plan arrangement, it must also be flexible in its lighting

FIGURE 18

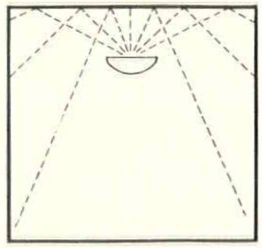


FIGURE 19

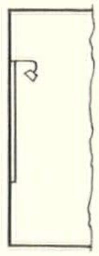


FIGURE 20

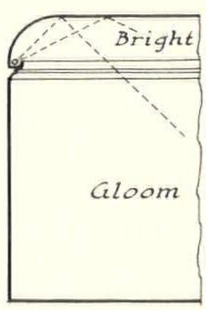


FIGURE 21

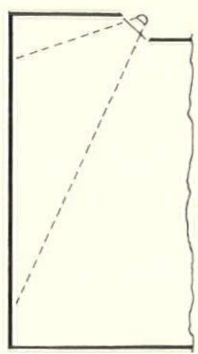


FIGURE 22

system. Department stores appreciate this problem. A leading store in New York achieved flexibility by installing a gridiron wiring system with about five circuit fuse boxes at the base of every interior column and wall pier. This arrangement provides a ready source of electricity at the four corners of each bay. From these points connections can be had readily within a small radius as changes in floor arrangement may demand. This system does away with the necessity of costly wiring from a remote point. There is no reason why such a system could not be adapted to modern museum planning.

Figure 23 illustrates a section of one of the artificially illuminated galleries in the first unit of the new Pasadena Art Museum, Pasadena, Cal., for which Clarence S. Stein was the architect

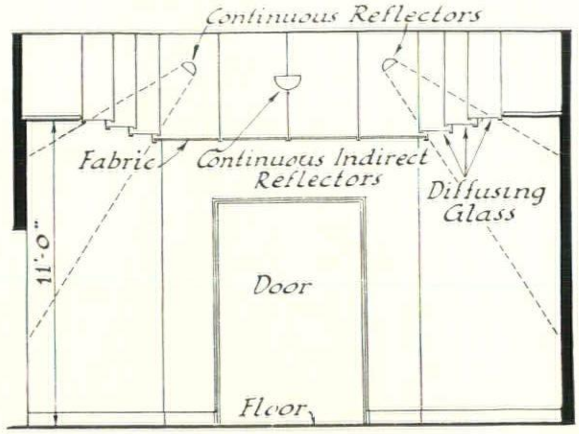
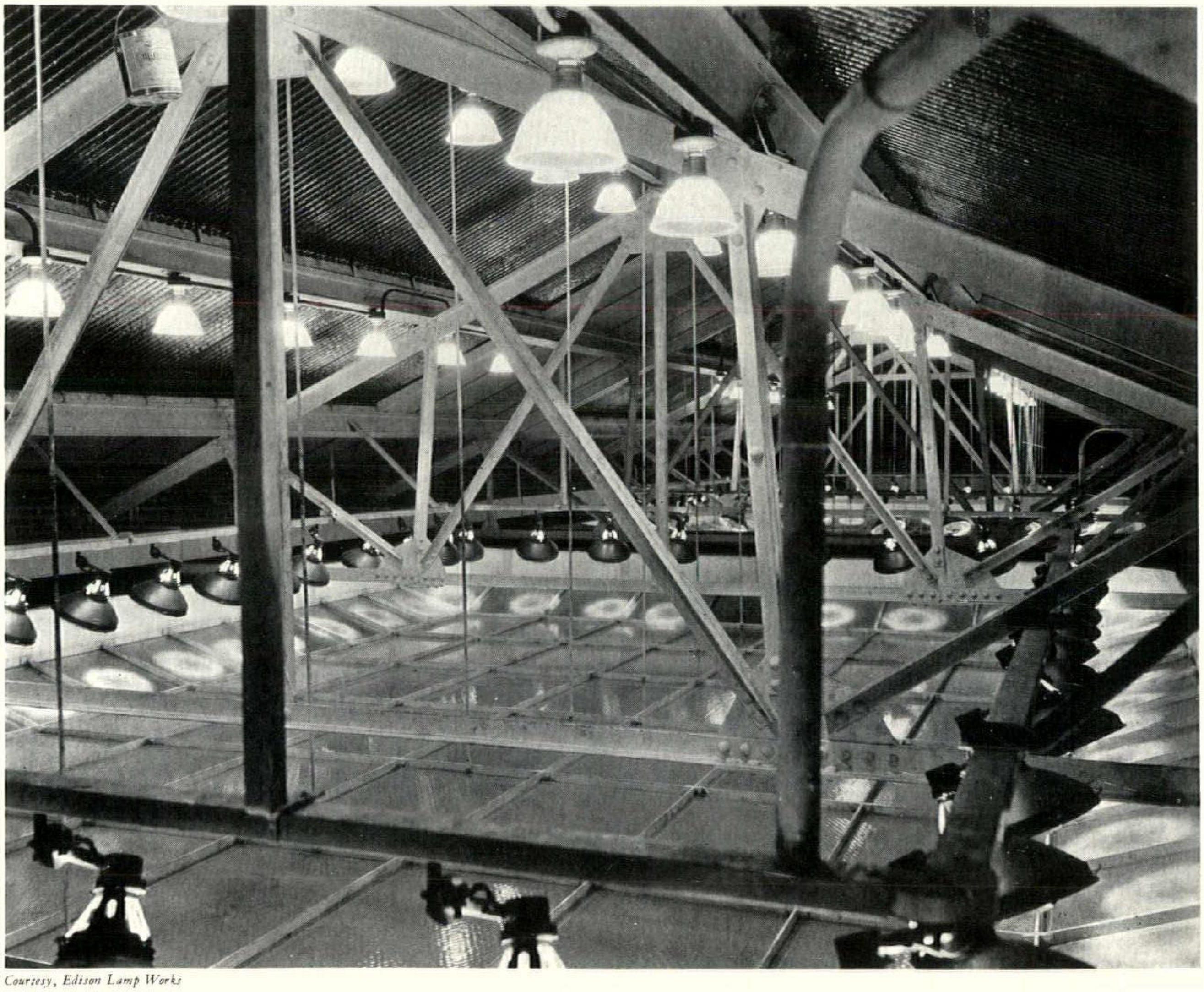
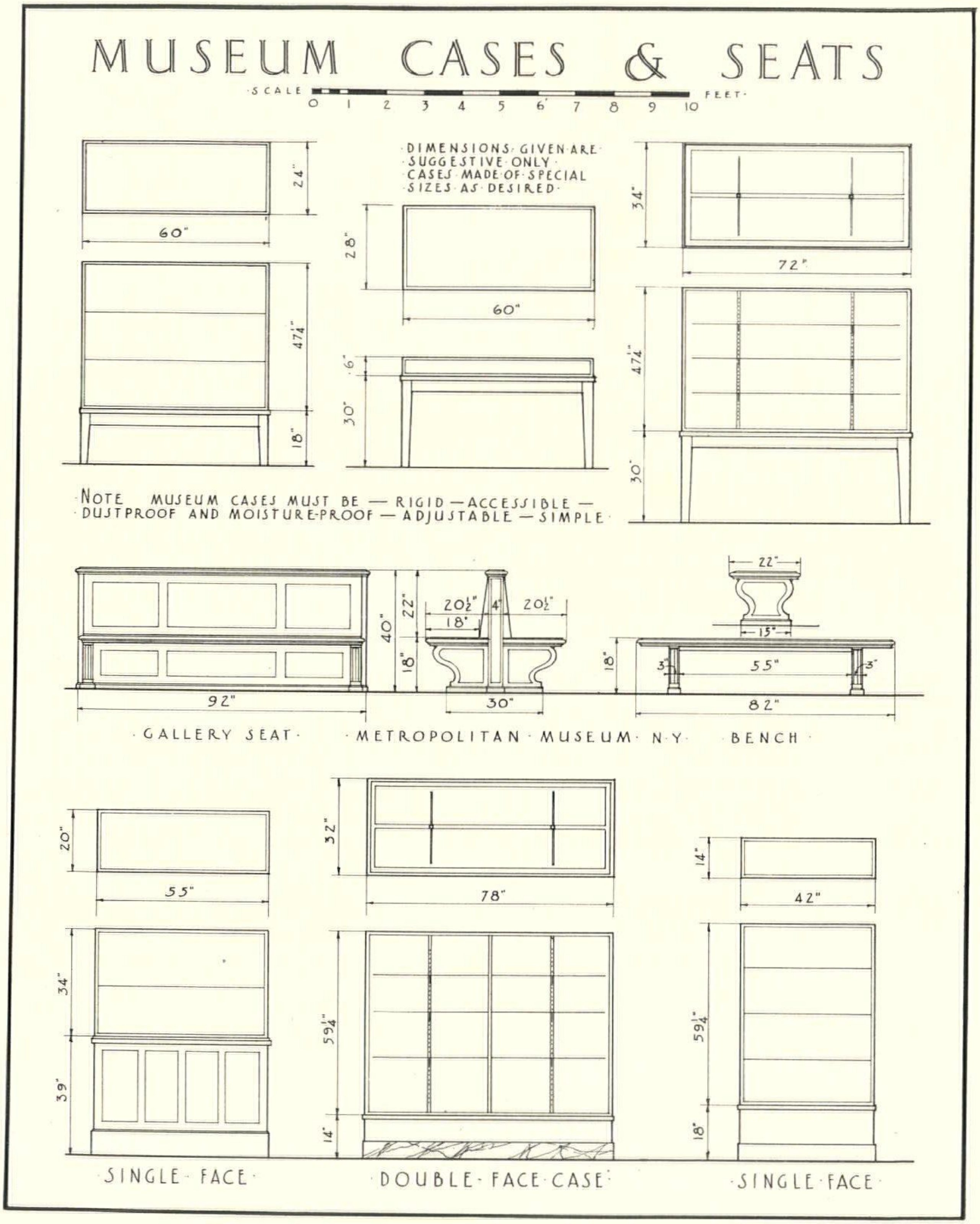


FIGURE 23

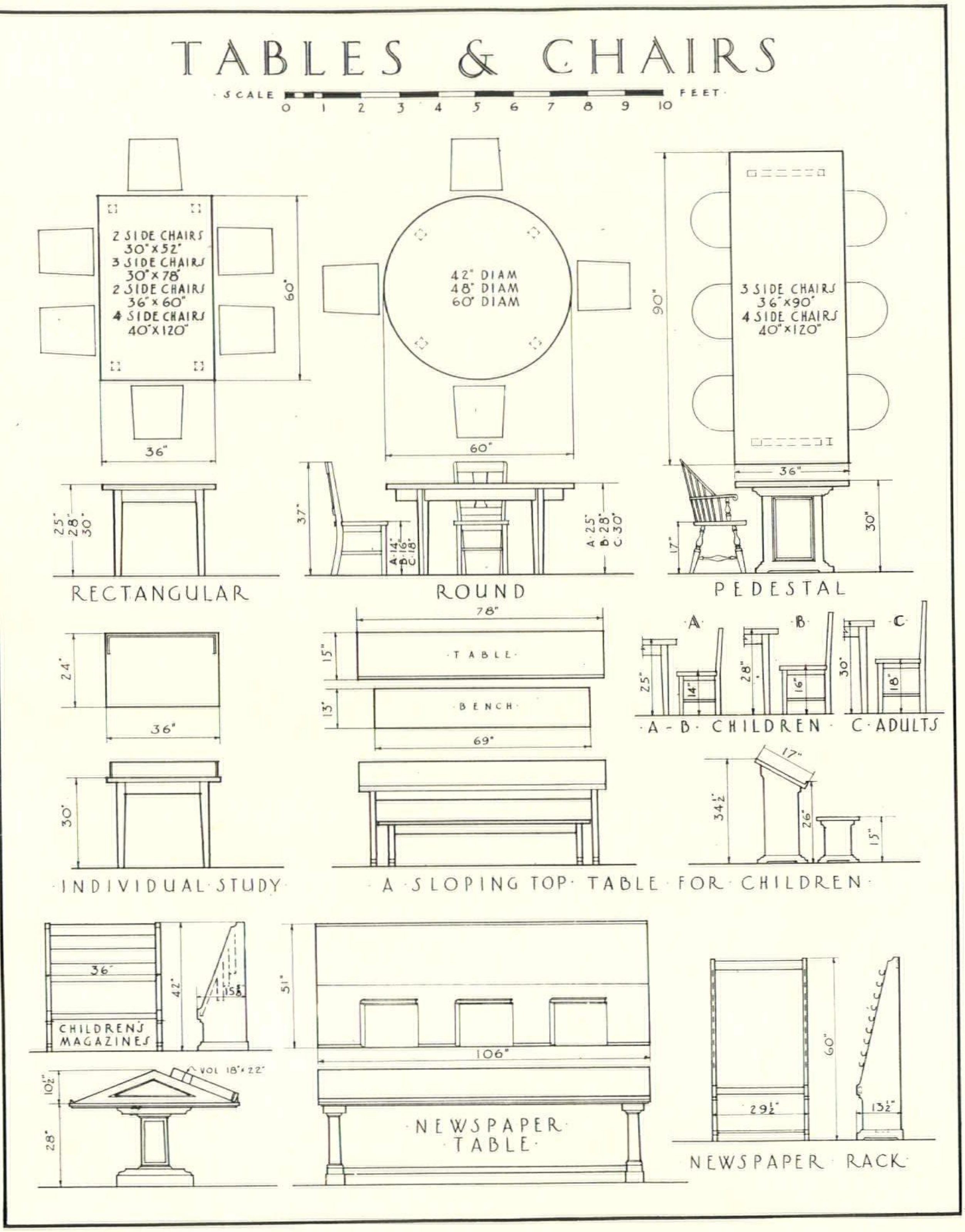


Courtesy, Edison Lamp Works

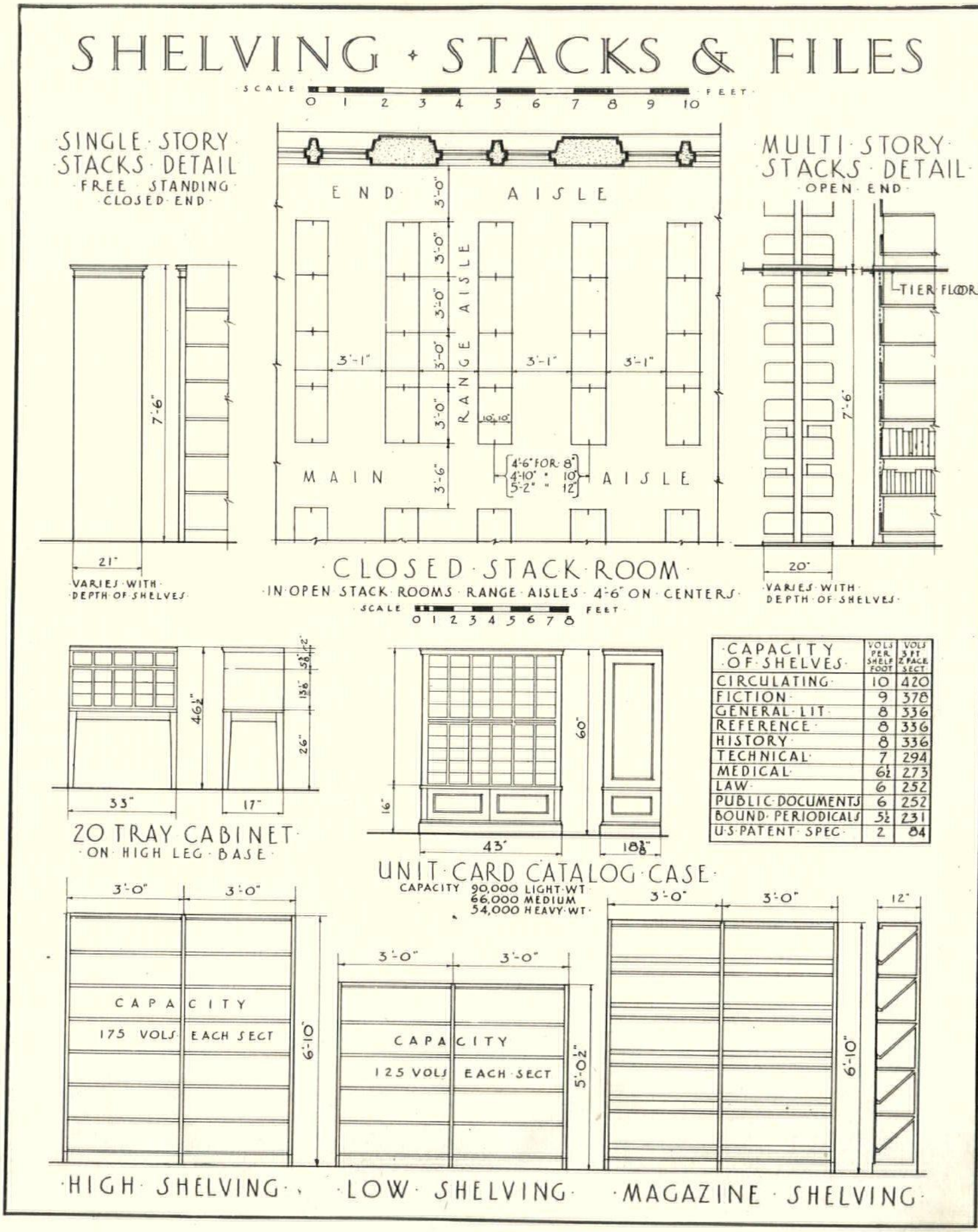
A view under the skylight of the Butler Art Institute at Youngstown, Ohio, Paul Boucherle, architect. It shows the manner in which the floodlights for the pictures are concealed behind the ceiling light of the room



MUSEUMS AND LIBRARIES

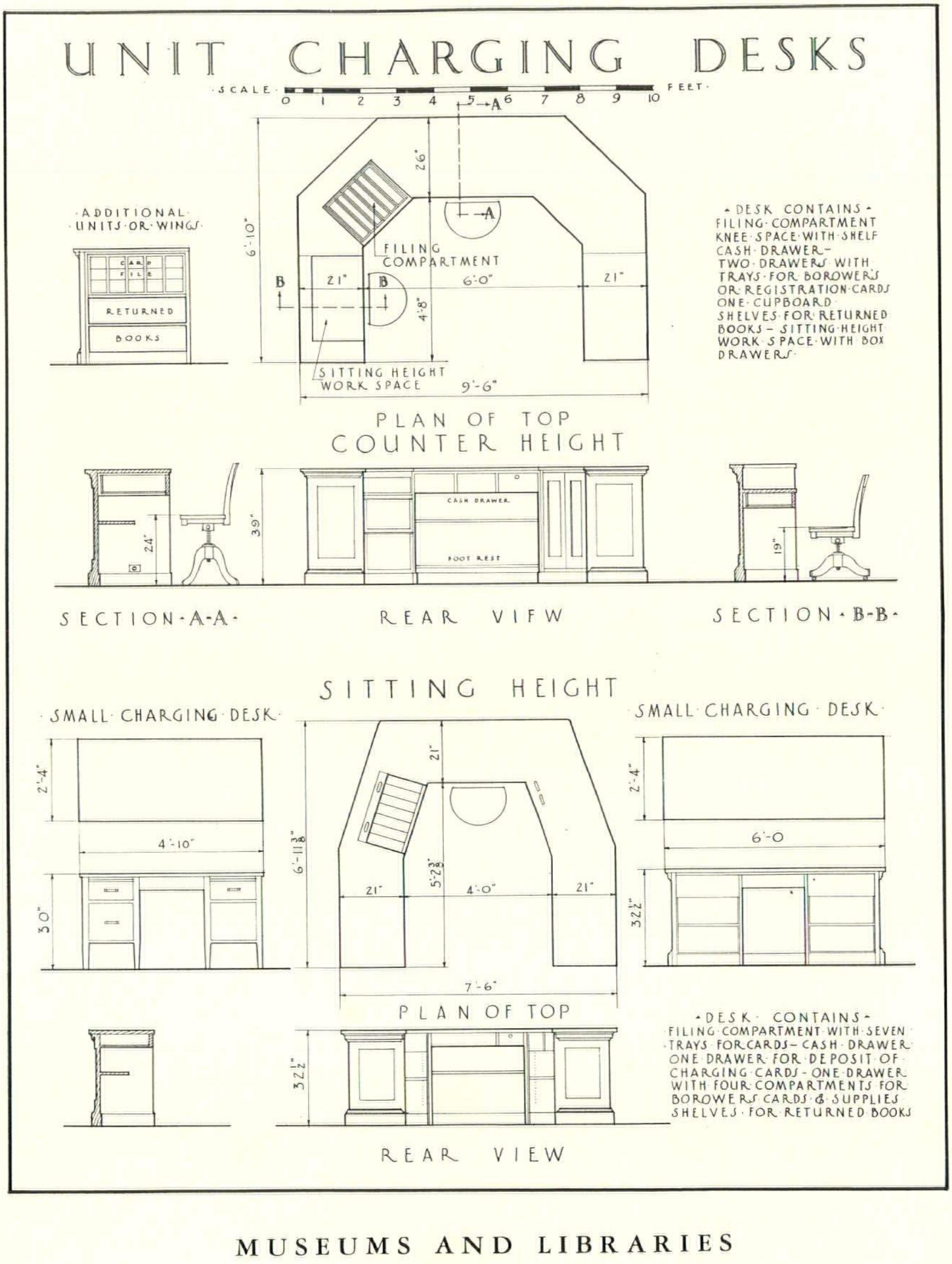


MUSEUMS AND LIBRARIES

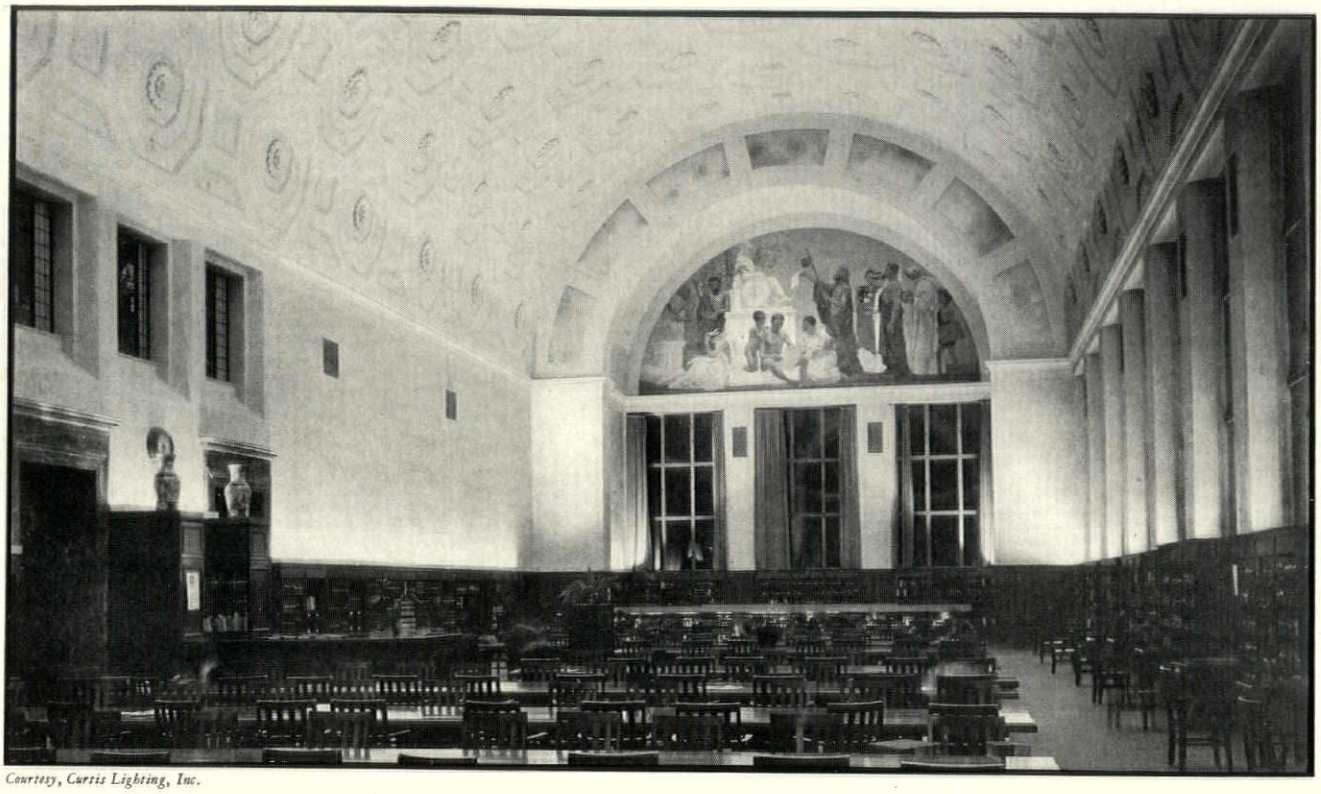


CAPACITY OF SHELVES	VOLS PER SHELF FOOT	VOLS 3 FT 7 FACE SECT
CIRCULATING	10	420
FICTION	9	378
GENERAL LIT	8	336
REFERENCE	8	336
HISTORY	8	336
TECHNICAL	7	294
MEDICAL	6½	273
LAW	6	252
PUBLIC DOCUMENTS	6	252
BOUND PERIODICALS	5½	231
U S PATENT SPEC	2	84

MUSEUMS AND LIBRARIES



MUSEUMS AND LIBRARIES



Courtesy, Curtis Lighting, Inc.

Main reading room, University of Michigan Library, with lights concealed in tops of shelves encircling the room

EFFECTIVE LIBRARY LIGHTING

BY

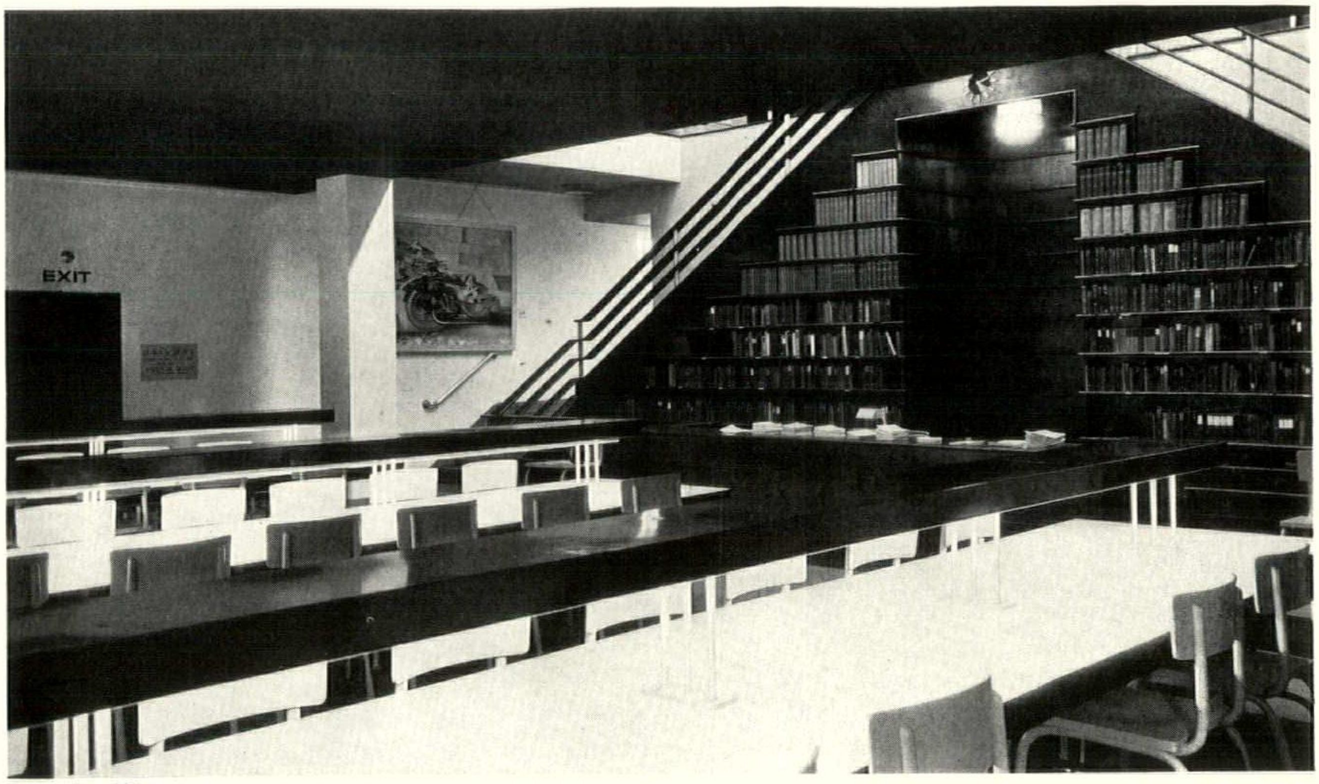
ANGUS S. MacDONALD

SINCE reading and study are the *raisons d'être* of all libraries, it would seem unnecessary to emphasize the need for adequate illumination of library buildings. A recent survey, however, revealed that only 10 per cent of more than 100 Eastern buildings tested photometrically received a rating of good, 42 per cent received a rating of fair, and 49 per cent received a poor grade. The scope of the survey included large and small buildings, all the important rooms in each, and daytime and night-time testing.

Although the chief cause for insufficient lighting was the apparent sacrifice of utility for beauty, strong evidence was found to prove that many of the buildings were too dependent upon natural daylight. This condition prevailed particularly among the older buildings, wherein cubage and orientation were controlled almost entirely by the attempt to admit daylight to the maximum interior space. Before the days of electricity this was a necessity. The light court which extended through the center of the building solved the problem of daylight, but it wasted a large amount of space and resulted in an inefficient plan.

Elimination of the light well, and greater reliance upon the more easily controlled illumination by electricity will not only provide better lighting, but will increase the usable cubage, simplify the plan, and reduce the cost of construction.

The introduction of large window areas and skylights is still a question for debate. In sections of the country which can boast consistently bright weather both may be advisable. In the less favored sections, however, the theoretical benefits to be obtained are often dissipated by the capriciousness of the sun. Generally speaking, it is good practice to obtain as much light from natural sources as possible without sacrificing any of the more desirable ele-



Courtesy, General Electric Co.

Reading room, New School for Social Research, New York. Local illumination supplied by inverted metal trough reflector of rectangular shape, painted black on outside, white on inside, with 60-watt lamps in double sockets on 18-inch centers. Using alternate lamps an intensity of 16 foot-candles is obtained in reading area, and 1 foot-candle in walking aisles

ments. High windows are advocated for large reading rooms by almost all librarians. The equivalent of natural skylighting can be obtained by the use of ceiling lights which require only three watts of current per square feet. This produces 20 foot-candles of illumination on the working plane, which is equal to good daylight 15 to 20 ft. from a window.

To indicate the maintenance cost for artificial lighting, the following figures are significant. At 3 cents per kilowatt hour for current, the cost of maintaining ceiling lights for an area of 500 square feet would be:

3 watts per sq. ft.	1500 watts, 1½ kilowatts
1½ kilowatts @ 3 cents	4.5 cents per hour
4.5 cents per hour, 10 daylight hours	45 cents per day
45 cents per day, 360 days	$162 per year
$162 per year	interest at 6% on $2700

Main Reading Room. The illumination of the main reading room in the large monumental type of building is usually provided by a combination of general illumination of from 4 to 6 foot-candles and local lighting of from 10 to 15 foot-candles. General illumination is usually supplied by decorative fixtures which have an intensity only sufficient for supervision to prevent severe contrasts of brightness. The type of table lamp which provides working light must be selected for its efficiency, and must be of such a character and so placed that both direct and reflected glare may be avoided. The Higbie library lamp, a diagram of which is shown on an accompanying page, is regarded by most librarians as being nearly ideal. It throws upon the working plane a well diffused, glareless light of 14 to 16 foot-candle intensity in the space where the book is held and tapers off at the edge of the table to 6 foot-candles. This gradation is less tiring to the eye than the sharp contrast usually found in local illumination. Another important feature of the Higbie lamp is that the eye-level trough serves as a screen from other readers, and thus aids concentration.

The principle of the Higbie lamp has many adaptations. In the New School for Social Research, in New York, a boxlike shield was used, and the matte finish of the table permitted an even greater intensity without glare. Whatever the design of the table lamp, it is good practice to maintain a ratio between the distance from the center of the table to the edge, and the height of the lamp, of not less than three to two. This is a conclusion drawn by the Society of Illuminating Engineers. In terms of actual distance the height of the lamp should be about 12 to 15 inches from the top of the table.

For the small library building, in which the reading room usually serves as a distributing room also, general illumination of from 10 to 12 foot-candles on the working surface may be sufficient. The character of the room will determine whether local lighting need be used. It is advisable to install the indirect type of ceiling fixture if the walls are of sufficiently reflecting character to provide the necessary intensity.

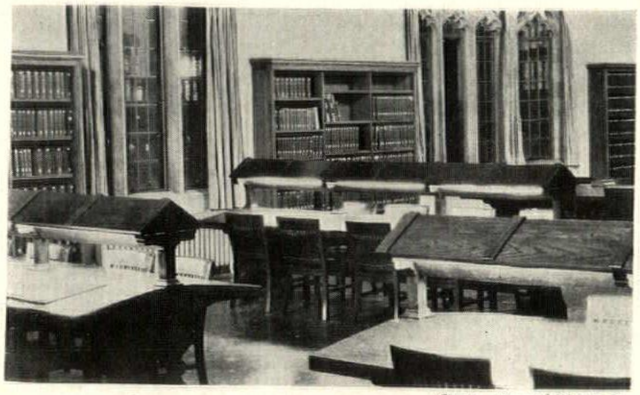
A rather unique installation was made in the reading room of the State Library in Stockholm. Here table lamps with off-center shades were used to supply the working light. Attached to the lamp support was another lamp which threw its light upon the shelves around the walls. An adaptation of this principle was the installation of a tubular bulb in the lamp standard, with reflectors throwing the light upon the shelves.

Totally indirect lighting for reading rooms has certain advantages that should not be overlooked. It eliminates reflections from polished table tops, and provides an even light throughout the room. Furthermore, the elimination of ceiling pendants often adds to the height of the room and gives a broad sweep that has decided architectural merit. Two methods of supplying indirect lighting have been found unusually satisfactory. One is to install the light in the top of the book shelves which run around the room. This is particularly advantageous from the standpoint of cleaning and replacing bulbs. The more common method of using ceiling cove reflectors, although theoretically sound, offers the practical difficulty of maintenance.

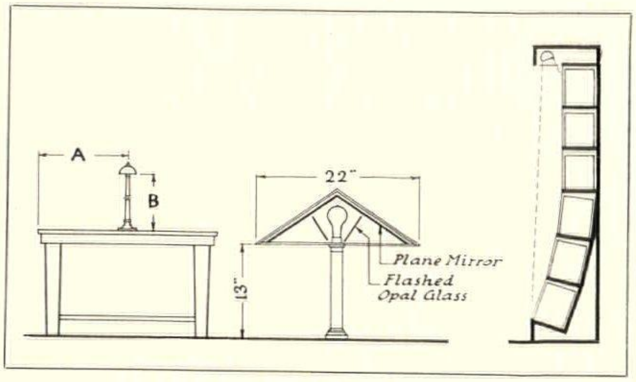
Stack Room Lighting. Artificial illumination for stack rooms is admitted to be far more satisfactory than daylight lighting. Since the working plane is a vertical one, ranging from the ceiling to the floor, the problem of obtaining good lighting for the top row of books as well as for the bottom is one which calls for strict conformity to utilitarian principles. Good practice demands that lamps must not be installed more than 12 feet apart in the main aisles, or more than 6 feet apart in the range aisles. Any attempt to compromise with efficiency will prove to be false economy.

The type of reflector used should be of a type which throws adequate light on the bottom shelf as well as on the top one. A perforated enameled steel reflector has been designed specifically for this purpose.

A new type of stack has been advocated by the British Society of Illuminating Engineers. It is shown in Figure 3. Here the lower shelves are inclined so that they fall in the path of the light which is concealed in a cove at the top of the stack. Although this is probably more expensive than the ordinary stack, and although it will require more



Courtesy, General Electric Co.



Top, Higbie lamp in use. Ratio of A to B in left diagram should not exceed 3 to 2. Diagram of Higbie lamp in center. Right, new type of book shelf with bottom shelves on incline to receive adequate light from concealed lamps

Trowbridge

Good local lighting for frequently used reference books, Highland Park Public Library, Holmes & Flinn, architects space it does provide sufficient light for all shelves. Perhaps its ultimate use will not be in the stack room, but rather for shelving in reading rooms.

Study carrels in stack rooms are essential, and must be provided with independent lighting that is under the control of those using the carrels.

Other Room. The entrances and corridors of the library building offer no special problems. Lighting of the decorative type, with an intensity of from 4 to 6 foot-candles will be adequate. There are, of course, special considerations in providing working light for the various auxiliary branches of the library. Ten to 15 foot-candles are required at the information desk, in exhibition cases, on statuary, paintings, the delivery desk, and other similar locations.

If the library building contains separate catalogue rooms, bindery, and staff work rooms, the problem is the same as in the ordinary office, and calls for an intensity, with good distribution of from 10 to 15 foot-candles.

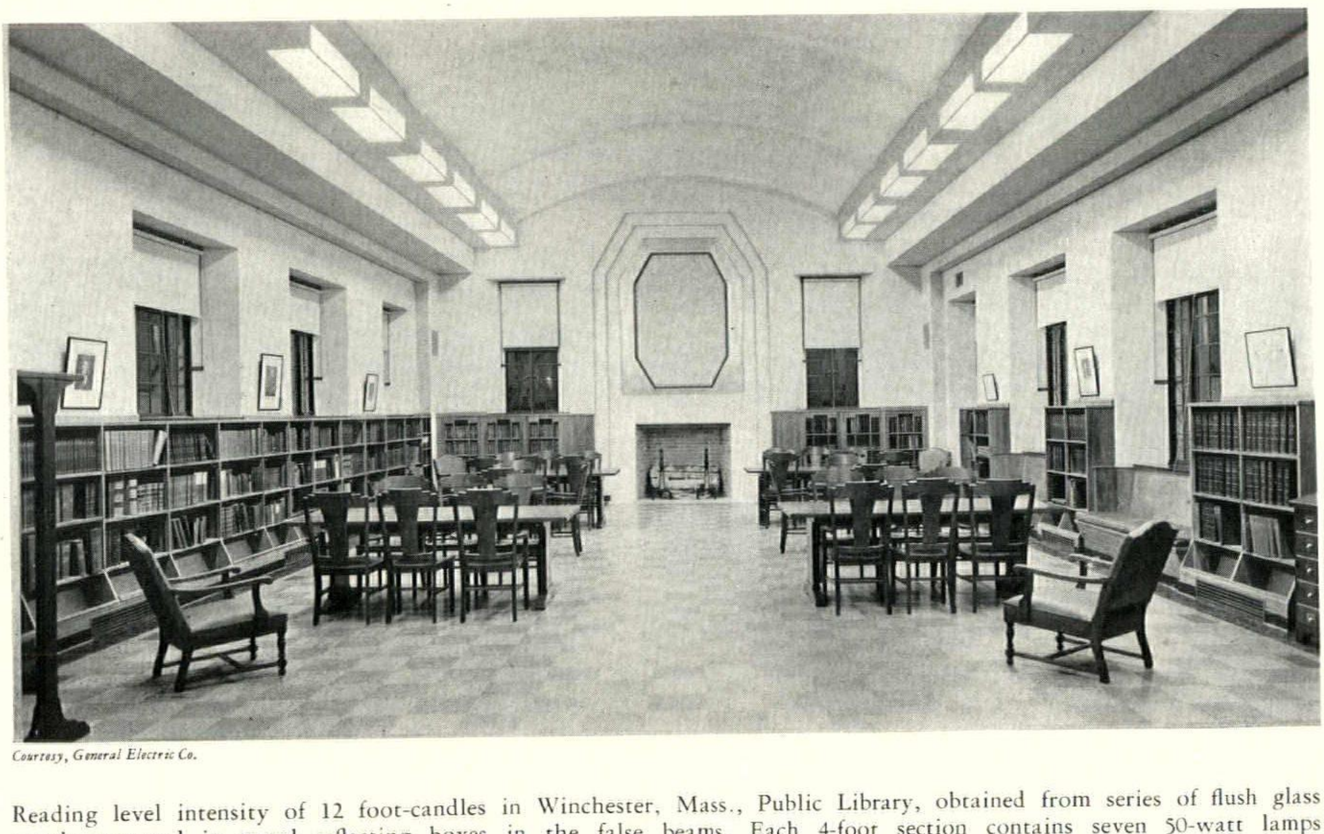
The following is a summary of the stated requirements:

Department	Ft. Candles Gen. Illum.	Ft. Candles Local Illum.
Entrance Hall, corridors	4 to 6	
Information, delivery desk		10 to 15
Small library reading rooms where shelves, delivery desk and tables are concentrated	12 to 15	
Small reading and study rooms	12 to 15	
Large reading rooms	4 to 6	10 to 20
Stack rooms	6	

Wall Reflections. Since the reflective qualities of walls and ceilings are important in the final determination of light intensities, the following table of figures will serve to indicate the percentage of incident light from tungsten filament lamps reflected from surfaces finished in the colors named.

White (paper)	80	French gray	32 to 40
Ivory white	80	Tan	35
Caen stone (clean)	78	Light oak	32
Silver gray	75	Olive green	13 to 21
Cream	74	Dark oak	13
Grays	19 to 72	Dark blue	3 to 9
Buff	55 to 64	Mahogany	8
Sage green	41 to 48	Walnut	7

The only further recommendation in regard to lighting is that light well used can serve to decorate as well as to illuminate. A floodlighted library building is more appealing than one which is dark and gloomy. Libraries to be useful must be used. Exterior lighting for libraries could serve the purpose that exterior lighting does for theaters.



Courtesy, General Electric Co.

Reading level intensity of 12 foot-candles in Winchester, Mass., Public Library, obtained from series of flush glass panels mounted in metal reflecting boxes in the false beams. Each 4-foot section contains seven 50-watt lamps

MUSEUM AND LIBRARY PRACTICE IN
HEATING AND VENTILATING

BY

SAMUEL R. LEWIS

YEARS ago the Wisconsin Industrial Commission retained a group of men to draw up a State heating and ventilating code. The difficulties in developing this code became very much clarified as soon as it was realized that the patient for whom the group was trying to prescribe was a room in a building rather than a building itself. An assembly room for instance, in a museum building, is not different from an assembly room in a library building so far as heating and ventilating are concerned. Museum and library buildings often have classrooms and restaurants, all have toilet rooms, and the heating and ventilating of such rooms is conventional. This discussion therefore will be limited to museum rooms and book stack rooms in museum and library buildings in which conditions are similar.

Most of the rooms in which ancient books and works of art have been preserved were provided with very thick walls, few windows, very rudimentary heating and no designed ventilation whatever. They are located in mild climates, where, due to the resistance of the heavy walls to heat transfer, there is not much variation in the interior temperature or relative humidity from summer to winter.

During summer, on account of the thick masonry walls and small window area, the noonday sun effect cannot drive through to the inside of the wall before the shadows of evening with attendant coolness cause the heat to travel back the other way. During winter, the inside temperature drops very slowly in these old palaces, and as there is usually inadequate heating, the interior relative humidity stays high during the winter. Thus ancient works of art in Roman galleries have endured with comparatively small deterioration during many centuries.

A modern house in the temperate zone has thin walls. Only yesterday, speaking figuratively, was attention first given to the value of building insulation in general housing construction, and only this morning, speaking comparatively, did research by the American Society of Heating and Ventilating Engineers demonstrate the remarkable gains to be made in heating economy and comfort by having house walls which would store heat up within their substance.

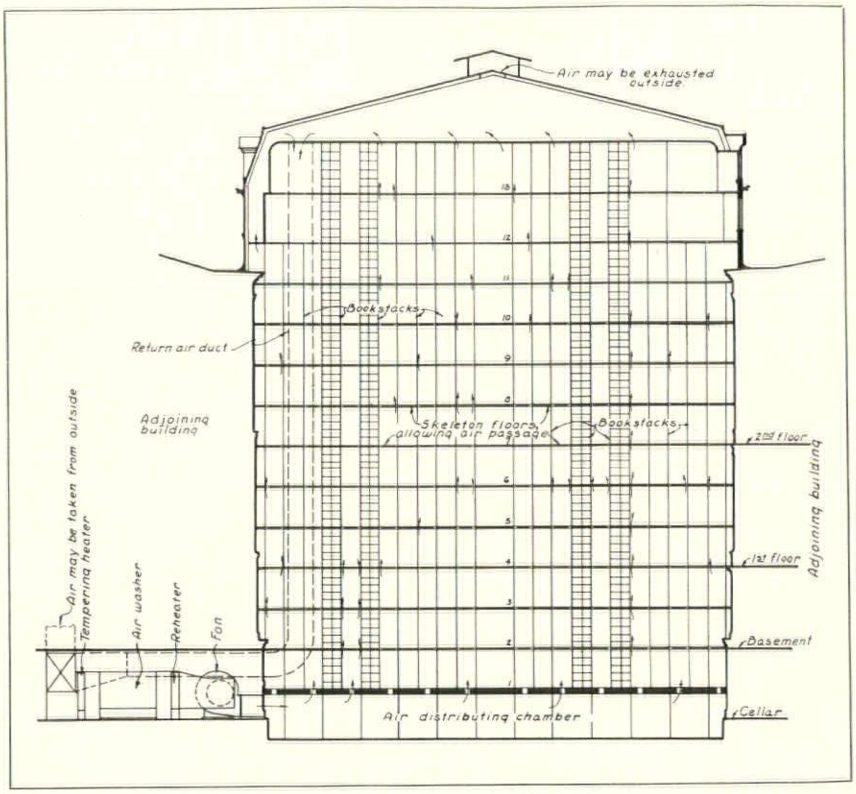
In any ordinary heating and ventilating system for a conventional museum or library room in the temperate zone the conditions will be about as follows:

In summer, the outside temperature will be around 65 F. to 75 F. at night and 85 F. to 95 F. during the heat of the day, with a relative humidity averaging perhaps 75 per cent. The relative humidity will be lower than this in sunshine at noon, and will reach saturation with deposition of dew at night. The interior summer temperature will lag along behind and below the outside daylight temperature, and will be higher than the outside night temperature, perhaps averaging 80 F. with 75 per cent relative humidity. The interior air never reaches saturation because the building structure holds stored-up heat and because the windows and doors are closed and because there is no circulation of the cooler outside air at night.

Organic objects, such as wood, canvas, leather, etc., apparently are quite comfortable in the normal summer air condition. Inorganic materials, such as stone and metal, do not care very much, so long as they do not get damp, and then are not subjected to freezing while damp. This summer condition in our libraries is very similar to that in which ancient paintings have endured during the passage of the centuries in the Mediterranean countries.

Our ordinary museum, however, along about October of each year, becomes chilly, and the custodians, if not the visitors, must have heat. As soon as heat is supplied, unless precautions shall have been taken, the museum rooms become dry kilns. The wood and the canvas and the books, all relatively damp in their interior fastnesses, suddenly and inexorably have their surfaces exposed to a withering aridity, in which the air may be at 70 F. and 20 per cent relative humidity. The surface, losing its moisture, must contract in every cell, but the interior, which cannot so rapidly lose its moisture does not contract with equal speed. It follows that the surface must split open, much as the outer bark of any lusty tree splits open to accommodate the increasing girth of the sapwood.

A few museums and library stack rooms have



Section through the air conditioning apparatus in one of the stack rooms of the Congressional Library. It is as important here to consider the comfort of the individuals who work in the stack rooms as it is to provide proper air conditions for the preservation of the books themselves

water-using air washers which are provided with heaters for warming the water and with which it is possible to maintain, during operating hours, in the heating season, a controlled relative humidity. If there are double windows, the relative humidity may be kept up to about 50 per cent at 70 F., without prejudice. Such a condition may be very dangerous, however, unless the outside walls are well insulated and unless all cold surfaces, such as skylights, pipes, and the like, are provided with condensation gutters and anti-condensation insulation.

In one of the largest library stack rooms in the world air washers of the water-using type were operated, and satisfactory conditions were maintained during the winter. Unfortunately they were kept operating all summer also. The recirculated water reached the same temperature as the outside air, with which it had intimate contact, say 80 degrees or so, and this warm summer air was delivered, practically at saturation, upward through the lofty book stacks. The leather bindings of the books developed molds, the glue softened, and the paper itself decomposed. More damage apparently was being done by the too-damp summer air than would have been done by the too-dry winter air.

A beautiful library was built as an addition to an existing residence. It was placed at an elevation several feet below that of the balance of the house. The owner stipulated that there should be no doors either at the top or the bottom of the wide, easy stairs which lead down to the library. The new room had French windows at frequent intervals all around its three exposed elevations. The spaces between the French windows were filled with book shelves. The windows, since they were like doors, could not practicably be double. The original hot water heating plant of the house was not large enough to serve the addition, so a separate gas burning vapor system with convection type concealed radiators was installed for the library, the insulated radiator enclosures being in the lower parts of the bookcases. When the first winter came, behold they could not heat the library! The library heating plant was adequate for that room alone, but since the library was below the balance of the house, and since there were no doors separating it, the library and its independent vapor system became a gravity warm air furnace which attempted conscientiously to heat the whole house! If the weather were mild, the library could be heated to a livable temperature, but the balance of the house then became an oven.

The situation finally was corrected by installing a good sized fan with ducts which permitted rapid recirculation of the library air through heating surfaces installed in the recirculating ducts, the combination effecting, by well arranged exits and entrances for the air, an invisible door which isolated the library.

In another private library the owner installed a mechanical recirculating humidifier capable of introducing up to six gallons of water each day, to maintain around 40 per cent relative humidity within the library when heating was in evidence. To his consternation, some time later, he found that the valuable books on the upper shelves especially were standing in water, which had ruined the bindings and the pages. The cold outside walls behind the books, achieving very little air circulation, had acted as condensing surfaces. The dew running down the wall had trickled off onto the shelves and the books had acted as sponges to absorb it. The lesson here, of course, is that the book shelves must be protected by adequate building insulation against the outside walls, or must have a free air circulation between them and the walls.

Larger libraries usually have free-standing book shelves in the stack rooms, and there is no danger of such unauthorized dew accumulation.

One very large museum has run a wide gamut of experience with heating and ventilating and has had the courage to undertake a considerable amount of research. The following are some of the gleanings:

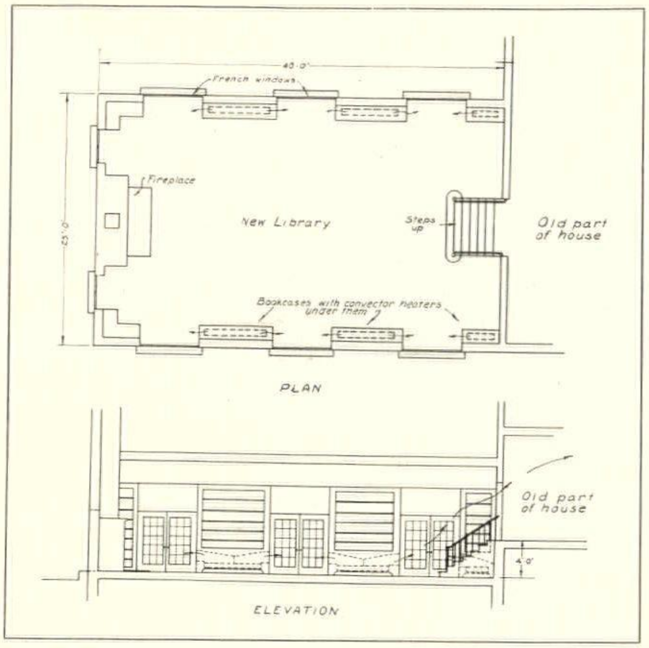
1. Museum and book stack rooms should have mechanical ventilation, as otherwise the temperature and odors get out of control and become unspeakable when the public is present in appreciable numbers.

2. Conventional exposed direct radiators or even concealed local convector type radiators are objectionable because the walls anywhere near and especially above the heaters become too warm and too dry for the wellbeing of organic exhibits.

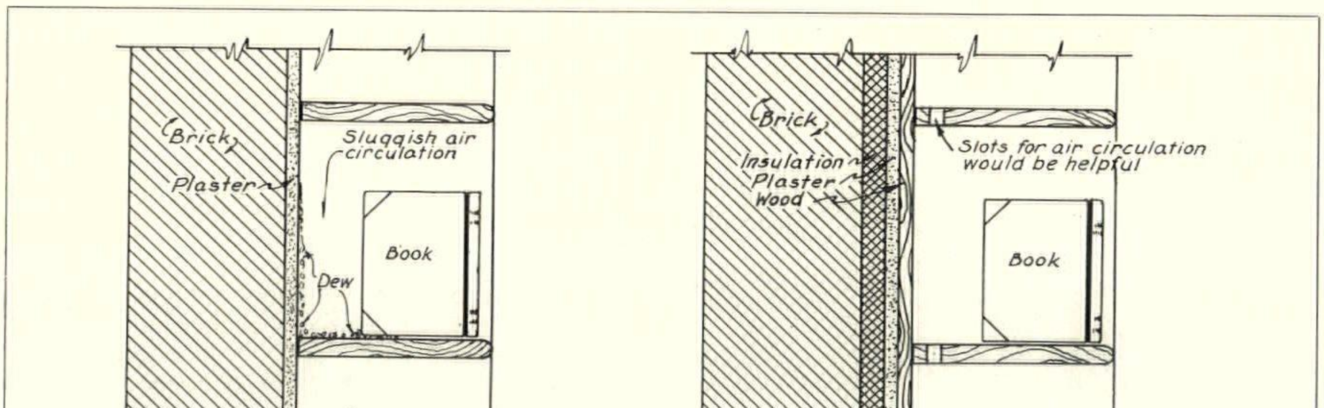
3. Inlets for air in side walls limit the hanging of pictures or cases and cause local overheating, with drying-out of the books in those stacks upon which the air is discharged directly.

4. Outlets for air, which conventionally are placed near the floor in side walls, limit the disposition of cases, cabinets, etc., and are inadequate in summer when attempts are made to reduce the temperature as the coolest air which invariably attempts to stratify close to the floor escapes through them.

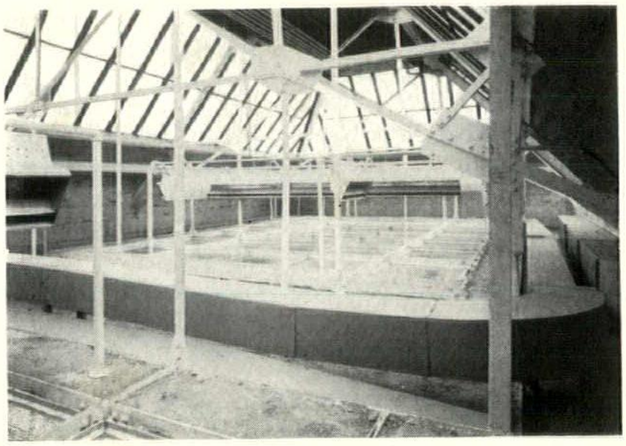
5. Inlets in ceilings are objectionable because of difficulty in placing these in skylights without shadowcasting ducts above the skylights, and because when the entering air is cool it may cause objectionable drafts upon the heads of the patrons.



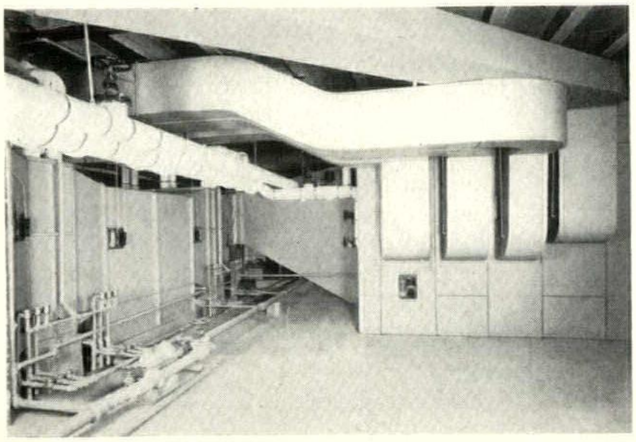
Plan and elevation of a private library near Chicago. Proper heating was impossible until an elaborate system of fans was installed to serve in lieu of doors between the library and other parts of the house



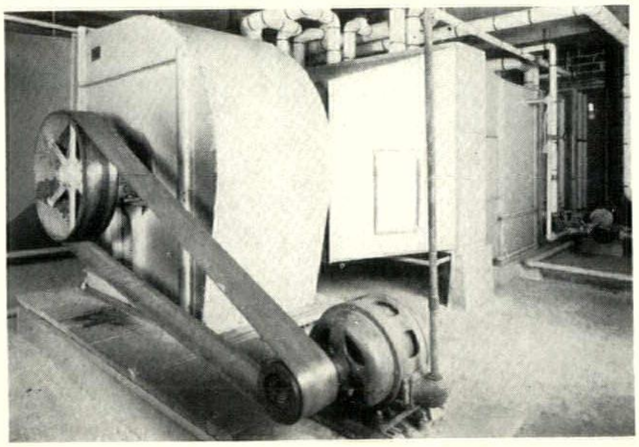
Insulation is necessary to prevent interior condensation from a cold outside wall



On this page are illustrations from the Columbus Gallery of Fine Arts, Richards, McCarty & Bulford architects. Above at the left is a typical gallery. The air is supplied through grilles at the bottom of the wall and is exhausted at an opening directly beneath the skylight. At the right is a view above the skylight showing the exhaust ducts



In the attic over the main lobby is the mechanical heart of the heating and ventilating system. At the left in this picture is the air washer. Beyond is the reheating chamber from which the warm, conditioned air is forced into the plenum chamber



One of the fan units that forces the air into the plenum chamber where automatic dampers regulate outgoing air: both cool air from the lower and warm air from the upper. Beyond is shown the conditioning equipment

Deflectors can be installed to alleviate these drafts but these usually are objectionable in appearance.

6. Any local radiator carrying steam or water has at least a sentimental objection in that if any leak should occur the steam or water therefrom might impinge upon and work irretrievable damage to some priceless exhibit.

7. The outside walls should be exceedingly thick so as to gain the advantage of heat storage, with its attendant virtues in reducing the peaks and valleys in the interior relative humidity condition.

The latest addition to this museum has all of the heating apparatus, as far as pipes, radiators, and ducts are concerned, in the basement. The air circuit normally is from the outside intake through tempering heaters to automatic oil coated dust filters which cannot be by-passed; then to humidifying air washers. These may be by-passed when no humidity is desired.

The fans then deliver the air, at about 70°, to reheaters under or near the various galleries and book stacks. The temperature of the air delivered to each of these is controlled by a thermostat in each room, which adjusts a valve on the hot water supply to the reheater to that room.

If the fans are stopped for any reason the local reheaters insure that the temperature reduction will at least be very gradual.

The air supply enters each room through nearly invisible slots along the walls at a speed of about 250 linear feet per minute. It passes out horizontally across the floor at the floor in such a manner as to cause the air in the room to revolve as an undershot mill wheel revolves. The exhaust air leaves the gallery through invisible slots in the ceiling at the edges of the skylights. The space between the gallery glass ceilings and the roof skylights is used as an exhaust air space, across which the air travels to the exhaust fans, from which it may go out of doors or may be returned to the supply fans.

This arrangement operates with satisfaction both in winter and in summer, as it permits economical recirculation when there are few visitors, yet allows the most effective summer cooling, removing the warmest air at the ceiling, replacing it with the coolest air at the floor and insuring a pleasant and positive air movement.

All of the wall areas in the rooms are available for exhibits. There are no local spots which are appreciably warmer or dryer than any other spots. The dust which usually is visible around any air inlet easily may be disposed of every time the floor is cleaned and every time the enameled steel baseboard is wiped off.

There are no troubles with condensation from the roof skylights as there is a rapid passage of rather dry air under them, whether this air is being recirculated or whether it is being discharged through the roof. The outside walls and the roof areas of this building are all insulated with 1½ in. cork between the interior finish and the masonry, as a measure against heat loss, condensation and dust deposition.

Very recent research by the Bureau of Standards has resulted in the following suggestions, paraphrased from Bulletin No. 128, "A Survey of Storage Conditions Relative to the Preservation of Records."

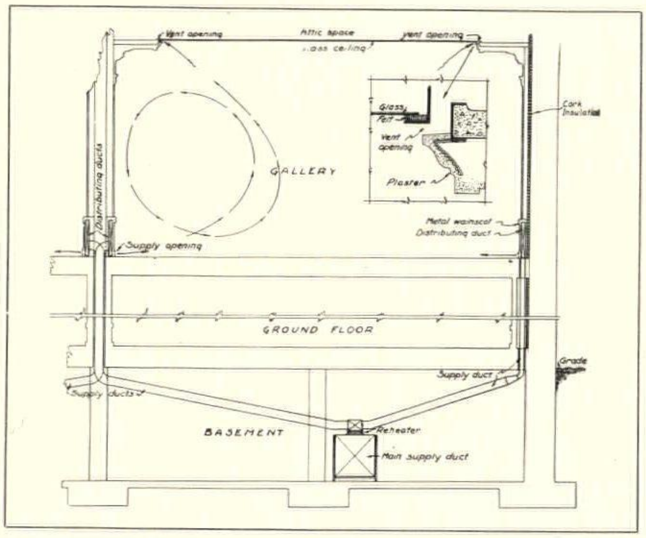
1. The less daylight on book stacks, the better. The electric lighting need not be brilliant, and darkness seems to be the best of all.

2. Temperature should be kept within a range of 65 F. to 75 F. and 45 to 55 per cent relative humidity.

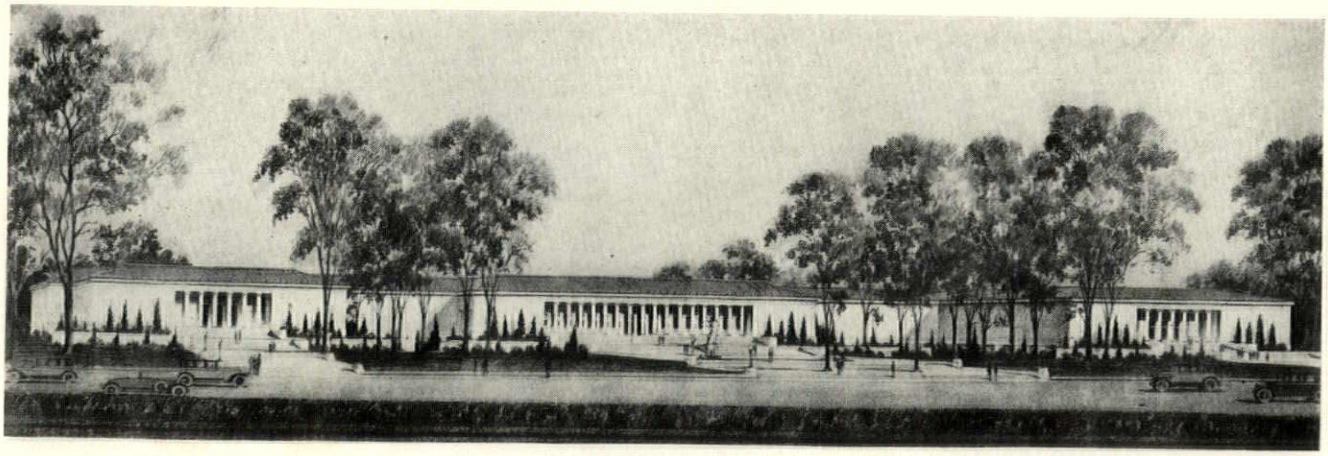
3. Air supply should have dust removed, preferably by automatic oil-immersed filters, and the water in the air washers or humidifiers should be kept in an alkaline condition.

4. As far as the books are concerned, there is the best of evidence that dehumidifying of the air in damp, warm weather will be helpful to them. If the books are carried out of their conditioned environment, even for a short time they may receive marked damage. If windows are opened, allowing acid bearing gases and dust and sunshine free access to the books, so much the worse for the books.

Temperature and relative humidity are also, of course, factors of human comfort. Ranges that produce comfortable working conditions for human beings have been found to be most generally suitable for the best average preservation of books.



Air distribution diagram for the galleries of the Toledo Museum of Art, Edward B. Green & Sons and Albert Hart Hopkins architects. The air rises through the locally controlled reheater and enters from ducts behind the wainscoting. The inlets are continuous openings about 1½ in. high. The exhaust openings are at the skylights. Below is a perspective of the building



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.

INSULATED STEEL PARTITION

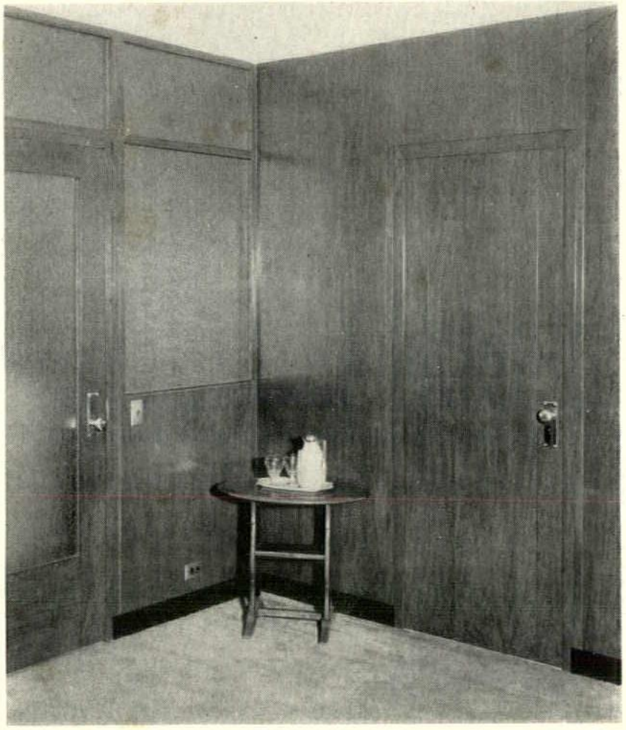
A NON-LOAD-BEARING steel partition, packed for sound and heat insulation, is the most recent development to replace the conventional built-up masonry or lath type. The construction consists of standard movable units, with an over-all thickness of three inches. Obvious advantages of this new type are speed in erection and minimum use of otherwise usable floor area.

One important feature of the partition is the hinged base which lies open for the installation of horizontal electric wiring and which raises up to permit the floor covering to be slipped under it.

In addition to its use for new building construction, this type of partition is well adapted to replacement use. Units may be installed with any doors or bucks already being used in the building, and they can be refinished to match existing wall covering or trim. In common with all other types of movable steel partitions, the salvage value is approximately 100 per cent. Units can be assembled and disassembled without damage or destruction to any part, so that they constitute an asset on the building owner's furniture and fixtures account instead of being considered a liability.

A further adaptation of this type of partition, is its use for paneling load-bearing walls. It may be applied directly over the rough masonry.

Further information may be obtained from the E. F. Hauserman Company, 6800 Grant Ave., Cleveland. They are known as Hauserman Masterwall partitions.

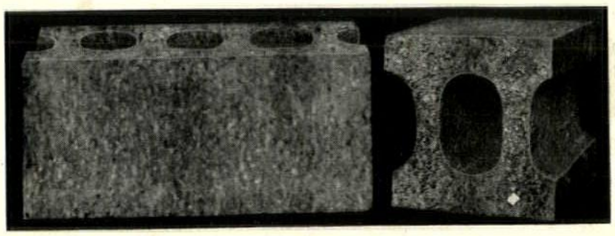


This view of the new insulating partition illustrates both its simplicity and its adaptability to various conditions of use. It may be installed with a glass panel, as shown at the left, or as a solid finished wall, as illustrated at the right of the picture. Being of metal, the panels are susceptible to any finish

NAILABLE FIREPROOF CINDER BLOCK

IN THE production of the already widely used nailable cinder block, asbestos is now added to cement, sand, and cinders to make a unit that has fire retarding and insulating qualities as well as the advantageous properties common to all units of this type. Used as back-up for brick, stone, or other exterior finish, or used for partition walls, furring is

(Continued on adv. page 20)



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Note: **Illustrated* ex.—*exterior* in.—*interior* pl.—*plan*