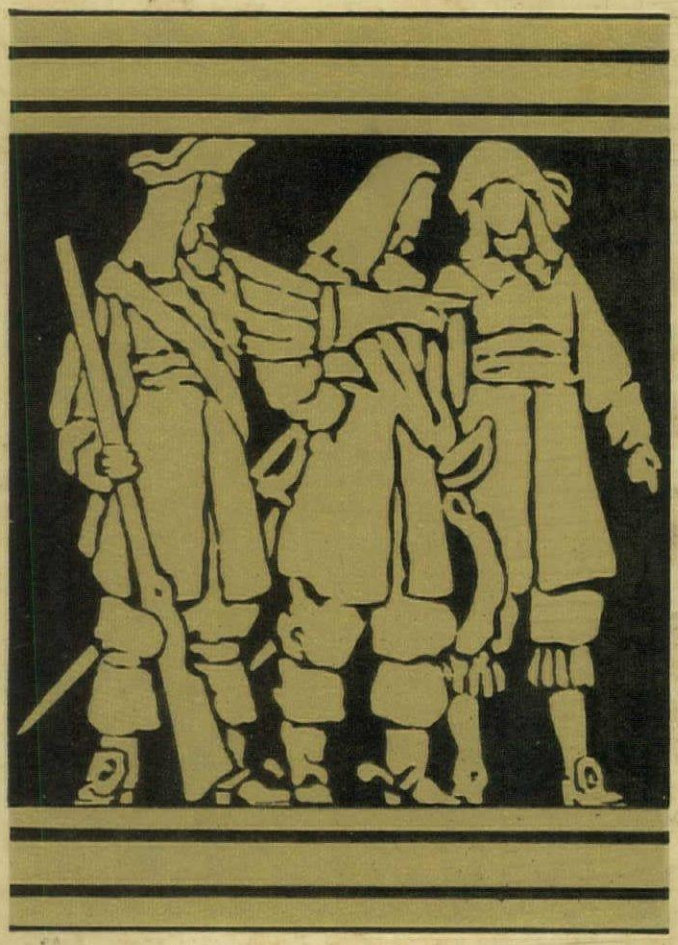
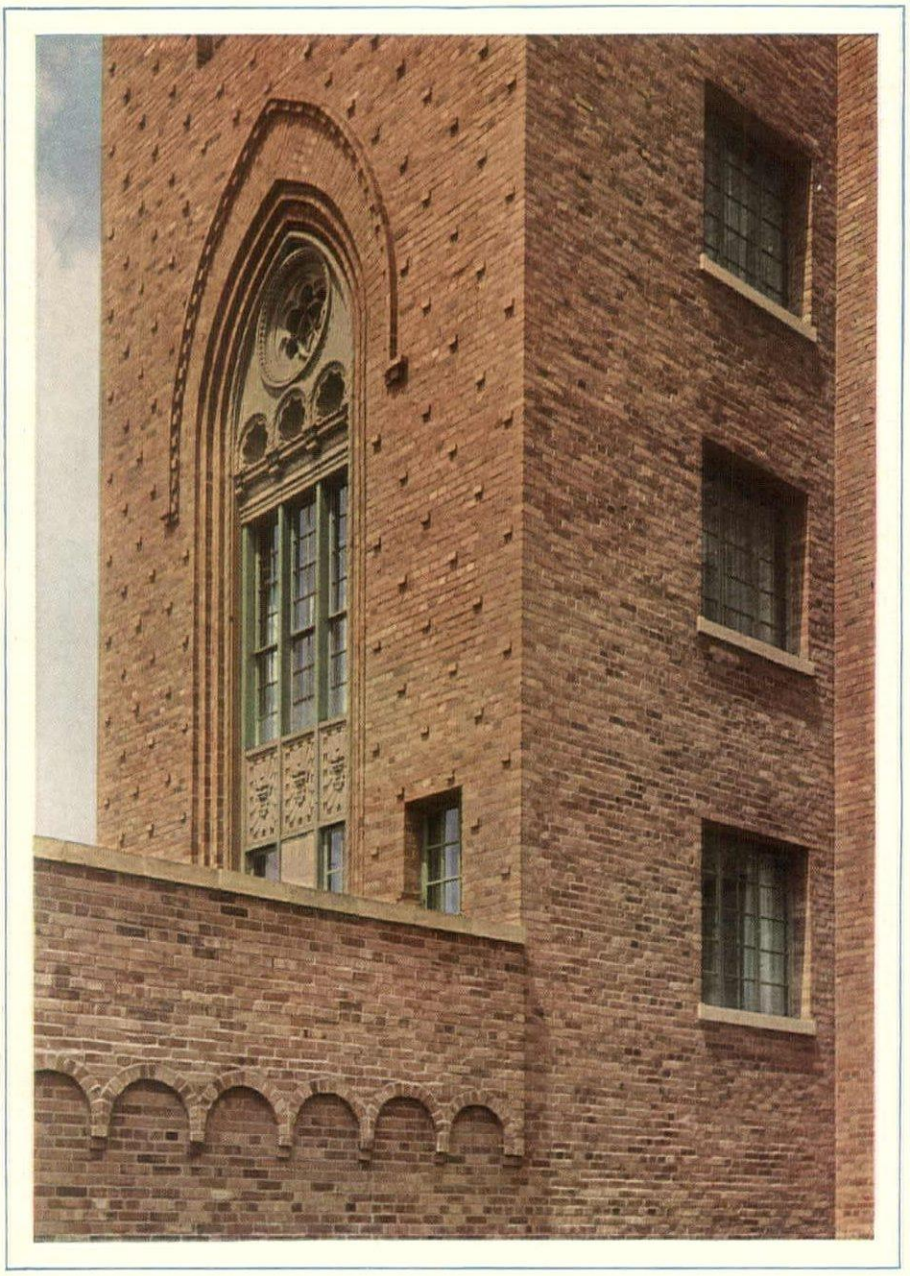
THE ARCHITECTURAL FORUM



JULY 1932

DESIGN · ENGINEERING · BUSINESS



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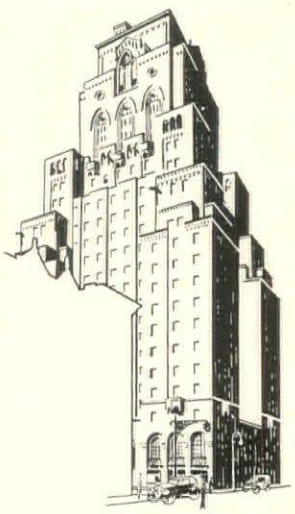

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INDEX TO VOLUME LVI
JANUARY TO JUNE, 1932, INCLUSIVE

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220 EAST 42nd STREET, NEW YORK

THE ARCHITECTURAL FORUM

INDEX TO VOLUME LVI

JANUARY TO JUNE, INCLUSIVE, 1932

Note: **Illustrated* ex.—*exterior* in.—*interior* pl.—*plan*

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THE ARCHITECTURAL FORUM

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VOLUME LVII
Number 1

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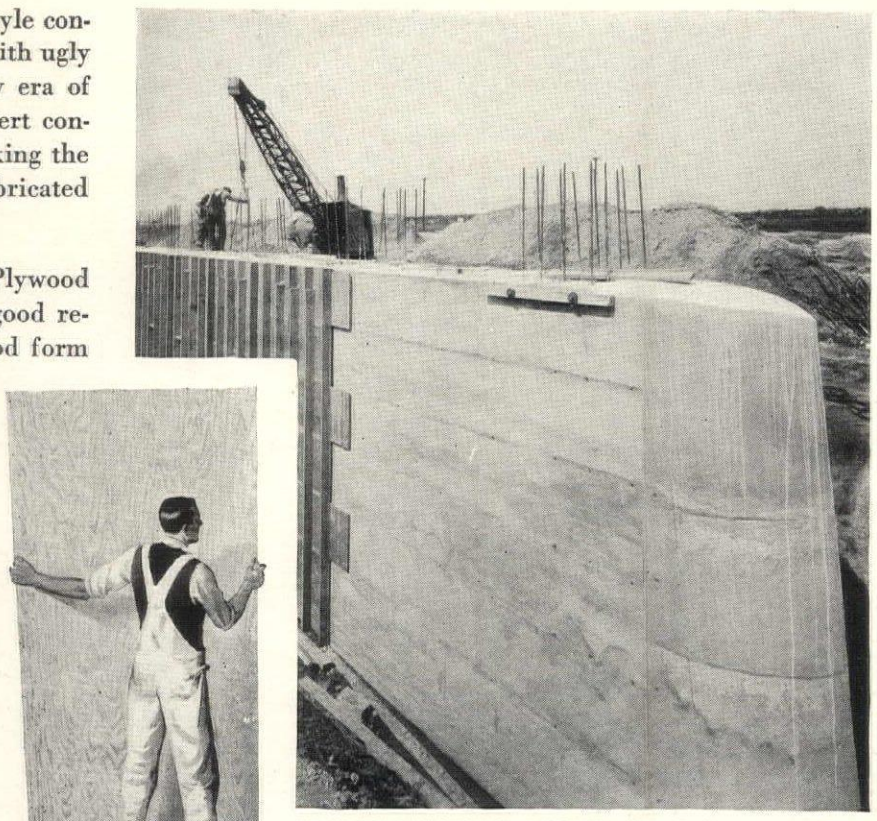

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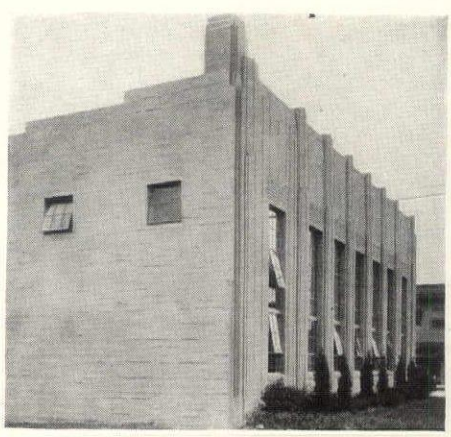

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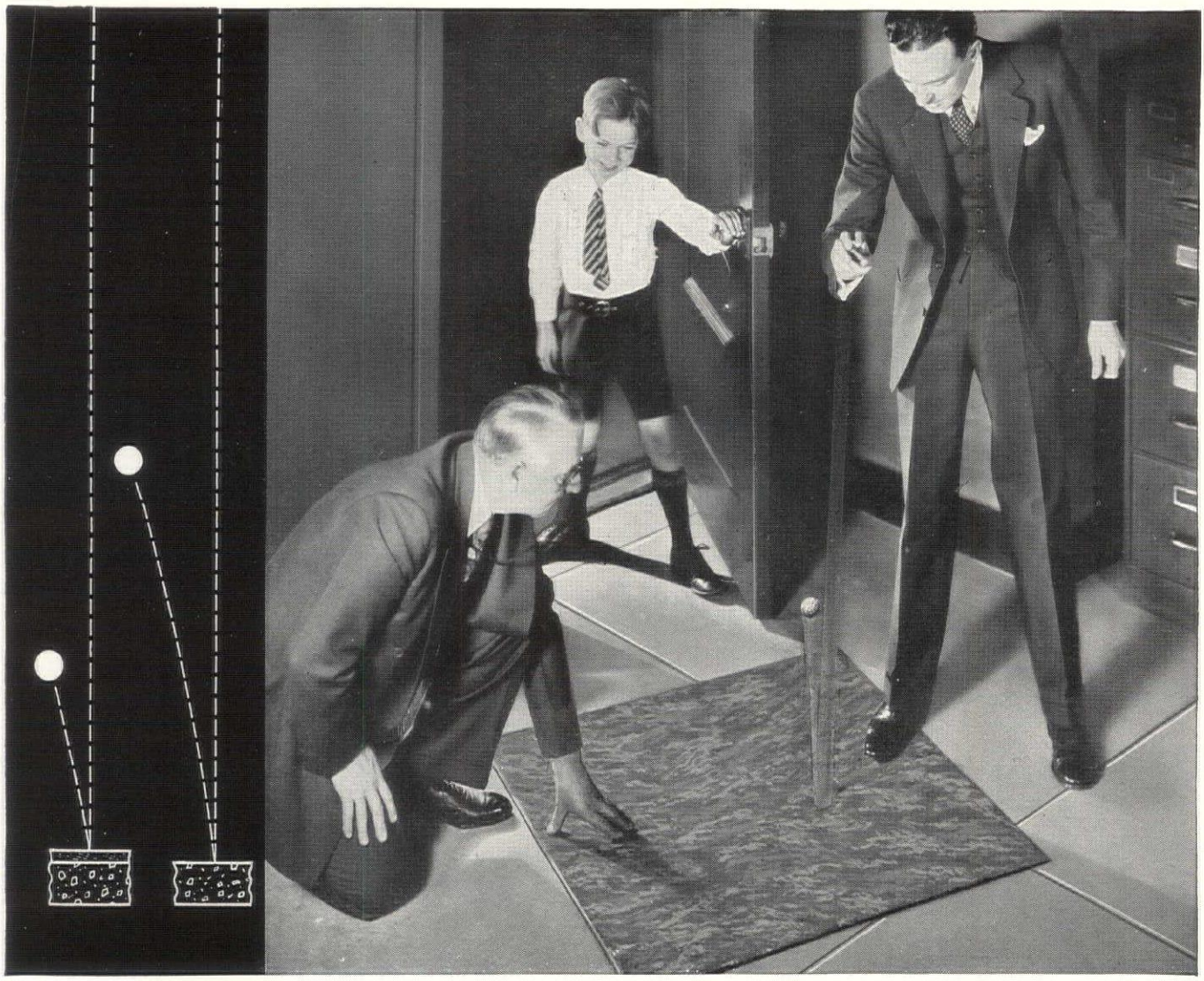

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IT MAY be that the unsettled conditions which prevail generally throughout the world have contributed largely to the conviction, current in many quarters, that the status of the architect is now undergoing a radical change. In speaking about the place of the architect in a future period of building industrialization, HARVEY WILEY CORBETT has gone so far as to state that if the architect did not change as the times changed he would be in the same position as the carriage builder at the advent of the automobile. It is a subject not to be dismissed too lightly, and for the August issue we have asked several prominent men — some of them architects, some of them economists, some educators and engineers — to give briefly their views on the subject. We are confident that it is provocative of a wider professional comment and look forward to receiving a letter from you stating your reactions, and your own ideas.

THE current issue contains a survey of New York's Lower East Side by HARLAND BARTHOLOMEW in which the problem of this huge area is stated in the clear terms of economics, traffic, population and use. In the August issue, JOHN TAYLOR BOYD, JR. presents a solution to this problem insofar as it can be solved by a planned housing development. There are, of course, innumerable complications inherent in any plan for urban rehabilitation. MR. BOYD'S scheme is important in that it cuts across the limitations of individual restrictions and presents a comprehensive community development directly related to the master plan developed from extensive research.

A COMPANION article to that of MR. BOYD'S is the summary of studies for similar "superblock" communities developed by the architectural group of the New School for Social Research in New York. They indicate several well-considered solutions to some of the generally fundamental problems existing in any problem of this kind. The PLATE SECTIONS of the August issue will contain a particularly diversified series of illustrations. Among them is the Department of Commerce Building at Washington, the Science Building for A Century of Progress Exposition in Chicago, the notable New Haven Lawn Club, a new publishing plant in London, England, the new biology building for Harvard University at Cambridge, Mass., and, in THE FORUM OF SMALLER BUILDINGS, a number of plates illustrating beach clubs and swimming pools.

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THE
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VOL. LVII. NO. 1

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JULY, 1932

ARCHITECTURAL DESIGN

ENGINEERING AND BUSINESS

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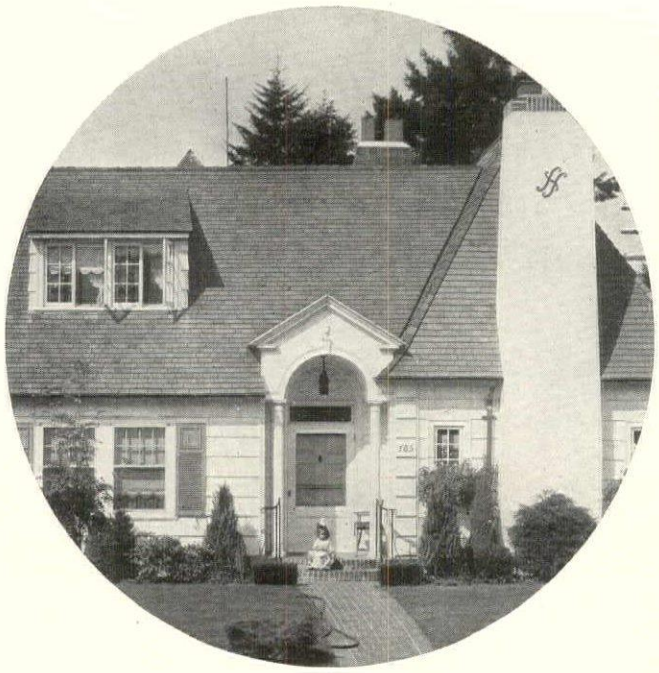

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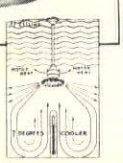

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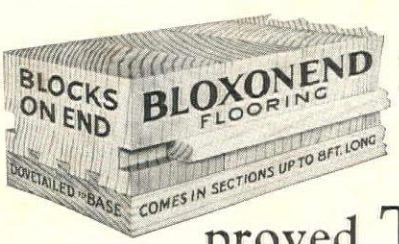

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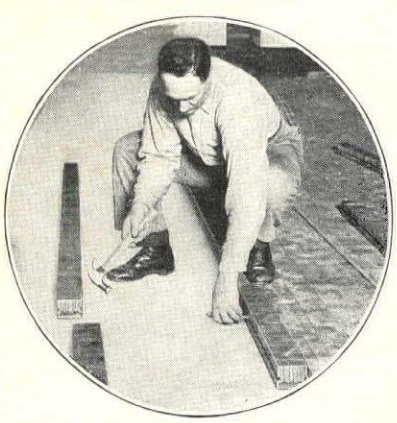

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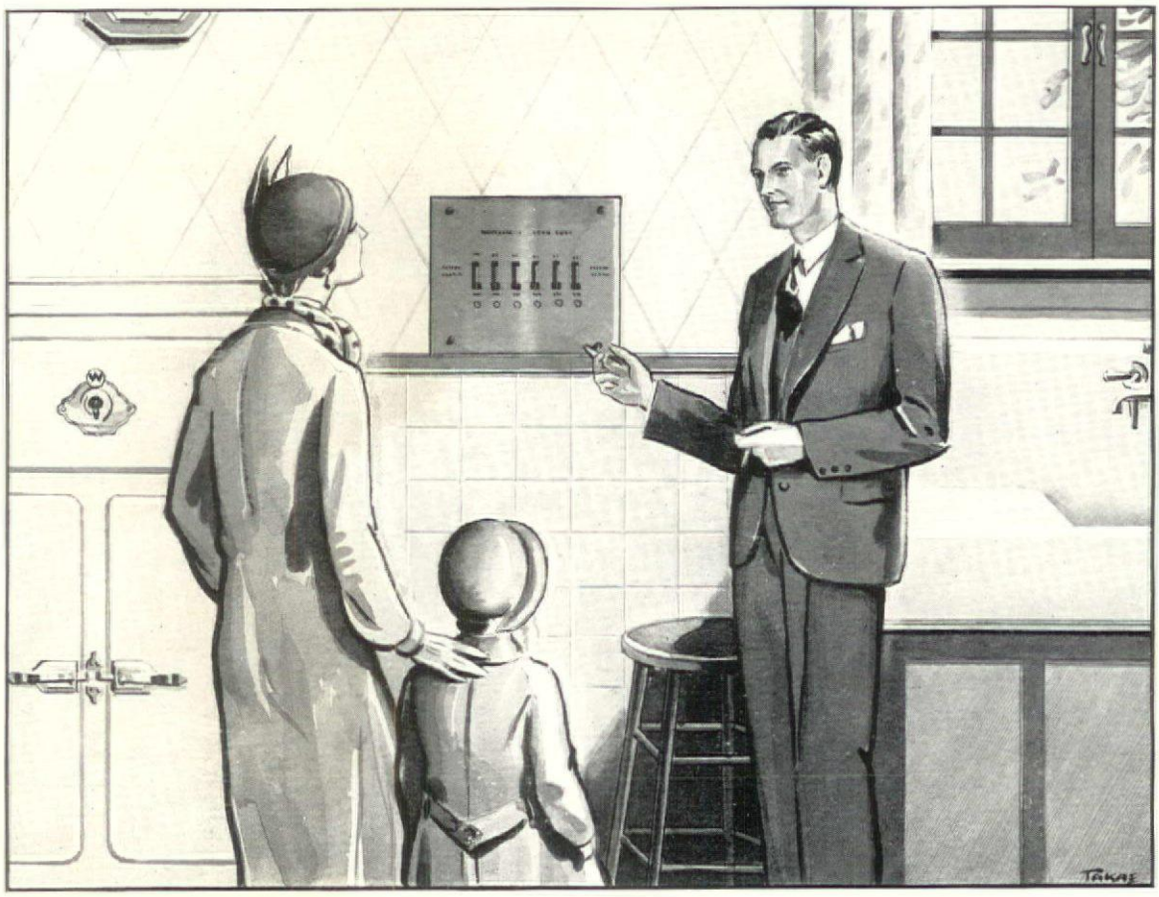

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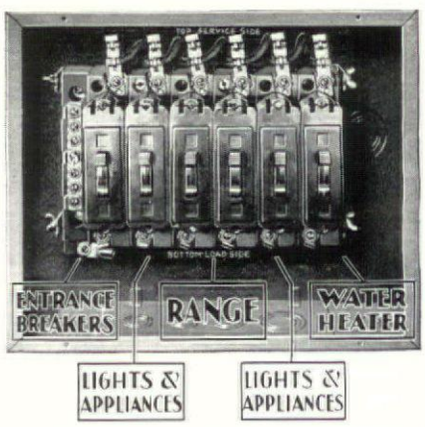

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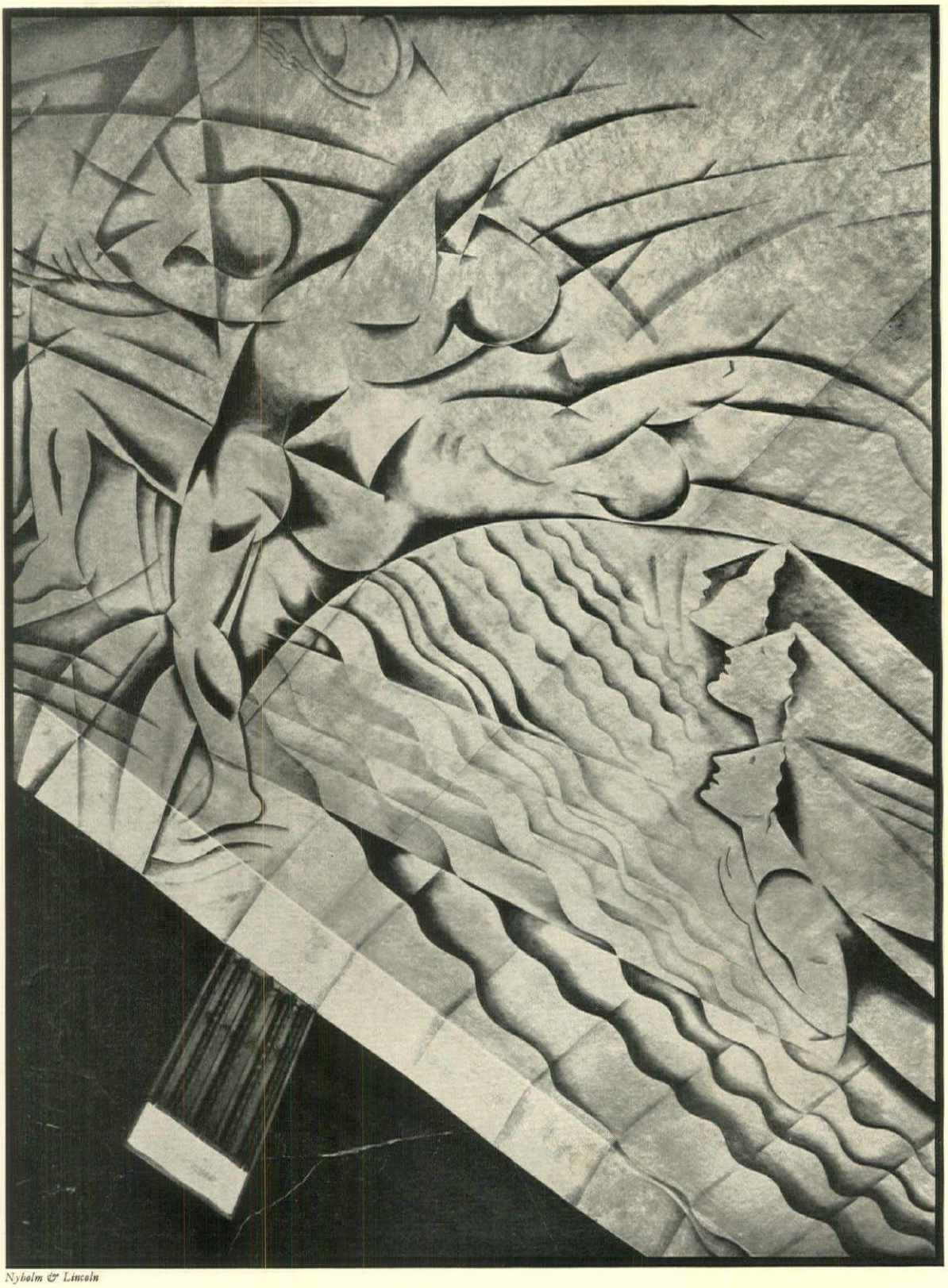

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The Architectural Forum

THE
ARCHITECTURAL
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VOLUME LVII NUMBER ONE

JULY 1932

THE QUESTION OF DECORATION

BY

HILDRETH MEIERE

WHAT is ornament? What is decoration? Do we want either, or shall we discard them? Can we? These are debatable questions, yet man's impulse toward the decoration of all that touches his life, all that he wears, uses and lives in, is so universal that it seems that it can be accepted as a fundamental part of human nature. The simplest and most prosaic of primeval garments soon became embroidered or trimmed with a bit of fur; the handle of the primitive spoon or tool was carved to make it attractive or individual, and throughout the history of architecture we find man's habitations developing from crude shelters into æsthetically satisfying creations, enriched with ornament.

This is true of all races of whom we have record, and it is true of all parts of the world. The African savage's idea of what constitutes beauty of decoration may not be ours. He tattoos his body and paints designs on his shield; we enamel our finger-nails bright red, and go in for chromium figures on radiator caps — but it all has its roots in the insuppressible human instinct to decorate. Decoration is not a negation of efficiency or suitability of form to purpose; it is its enhancement.

Most people select their clothes according to their ideas of what is pleasing in color, texture and design, quite apart from their practicability, and even when their ideas are molded for them by Fashion, they are selecting not only a protective covering but an adornment. The manufacturers of the things we use are in constant competition to make their wares more attractive to us by some appeal to our æsthetic sense, whether it be the design of the upholstery in the automobile or the color of the fountain pen; and upon the architects who design our buildings rests the responsibility of giving us what we demand — something beautiful as well as efficient in housing our activities.

I have perhaps identified the beautiful with the decorated in what I have said, and I should therefore explain my meaning of the word. To my mind, decoration is that which gives color or texture, scale or pattern or interest, which is used, whether functionally or not, because it gives pleasure or expression. An architect instinctively employs it because he is an artist who designs for æsthetic enjoyment as well as a builder who must build adequately for physical needs. . . . To choose a certain brick for a wall, is to choose decoration; to design a terrazzo floor, is to start ornamenting.

The extreme Left Wing Modernists have confused decoration with historic ornament, and I feel that in disclaiming all interest in decoration or ornament they are taking an attitude that they will eventually abandon. Human nature demands interest and relief from barrenness by some sort of enrichment. Even the most modern architects must deal somehow with their plain surfaces and that, under my definition, brings them to decoration in spite of themselves. Cornices and columns may be relegated to oblivion but windows and doors remain. How can one treat these elements without evolving some expressive form and treatment of texture and color? Granted that something new must evolve to be appropriate and right with the new conditions and tastes in architecture itself, granted that perhaps even the conception of decoration is developing from that of a generation ago, we cannot get away from its necessity — nor should we try.

One of the great reasons for the unquestionable

Savastano

Cartoon for one of three proposed plaques to be executed in metal and enamel for the exterior of a theater in Rockefeller Center. This one symbolizes the spirit of dancing

increase of interest in the broader conception of the decorative problem, is the variety of new materials which are coming on the market every day. The use of color has increased amazingly, and is being given consideration as never before. New metals, new structural materials, new fabrics, compounds, alloys and aggregates are being introduced, while the old materials, such as glass, wood, ceramics, marble and established metals, are being presented with new finishes, new properties, and new advantages.

This rising tide of products is being directed to the architect's attention, and it is his tremendous task, along with all his others, to select from them what he needs for his building and to direct their application. His primary and ultimate responsibility for the effect of the finished building is a heavy one, and is inherent in his position as creator and coordinator. He cannot escape it on any plea, and on his judgment, taste and often courage and inventiveness in the selection or use of decorative materials may rest a large part of that effect.

During the past ten years it has been my privilege to work for a number of distinguished architects who have done pioneer work with new mediums and materials, but who have done even more — pioneer thinking in the decorative field. As a mural painter and decorator I presume to speak to them only in relation to what I know personally. Their decorative conceptions are, of course, only a part of their contribution to architecture, as such. Among them I would like to list the late Bertram Grosvenor Goodhue and the Goodhue Associates; Voorhees, Gmelin and Walker, Ely Jacques Kahn and three firms now associated in the designing of Rockefeller Center.

Of Mr. Goodhue it has been said that he is the only man to be claimed by both sides of the great Traditional vs. Modern agrument. His attitude towards new materials was certainly that of a

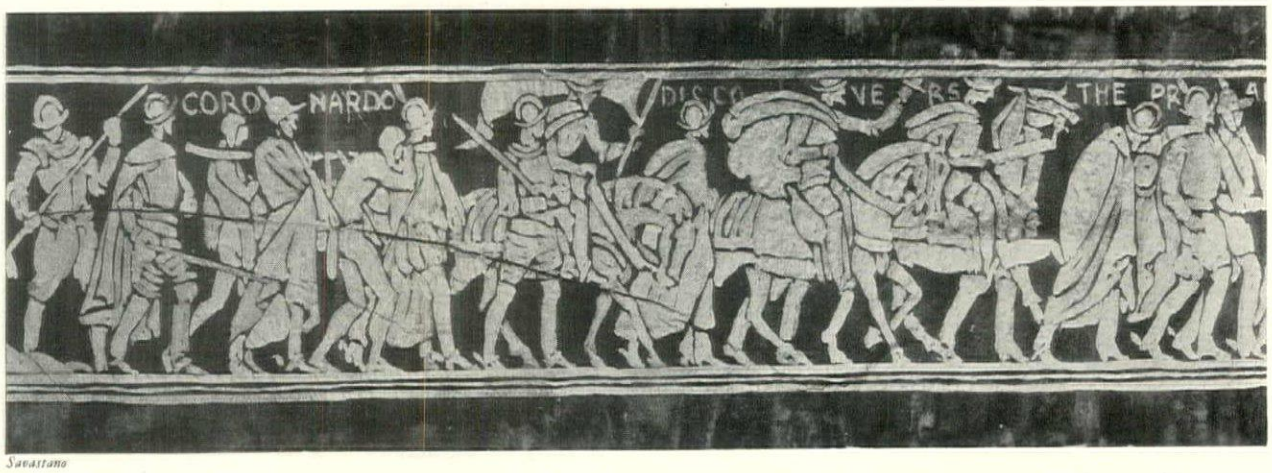
Savastano

Cartoon for another Rockefeller Center theater plaque, depicting the spirit of song. Each of the plaques is to be 18 ft. in diameter. The third one is reproduced on page 8

modern, and he was the ideal type to carry us forward—interested, enthusiastic, perfectly sure of what he wanted, with courage to back his judgment, and a willingness to experiment. True, though he was interested in a thing because it was new, he always considered it in its final effect, and he had a singular capacity for feeling that effect from the beginning.

The well-known Acoustalith was developed by Professor Sabine of Harvard with the cooperation of Mr. Goodhue, who used it extensively in his buildings. In designing the dome of the Academy of Sciences at Washington he wished to use this acoustic material, as the rotunda was to be the main speaking hall. Such a huge expanse of the plain brick he felt would be unhappy, and he set about finding a method of decorating it. Some experiments with paint on the brick were made, and I remember seeing him make faces at the unpleasant result. It looked poor and thin on the rough surface, and he was particularly sensitive to texture. By doing the design in flat relief in gesso, which was then gilded or painted, we finally got a rich and colorful effect, and by using a sort of grill work all-over design, the sound absorber was left sufficiently exposed to fulfill its function. This to my mind is a perfect example of an æsthetic demand being made of a new material and of a beautiful as well as an appropriate and practical result being obtained.

In speaking of the Nebraska State Capitol, it is hard not to speak of the daring and originality of the design as such, and the same is true of all the interior he lived to design in detail. He was extremely fond of ceramics and felt that something could be done with it in a very large scale. The dome of the vestibule was designed along the suggested lines, and he approved the cartoons. It was an experiment. Nothing quite like it had been attempted before, and the result was just what he had forseen, brilliant and interesting in texture and color, handsome

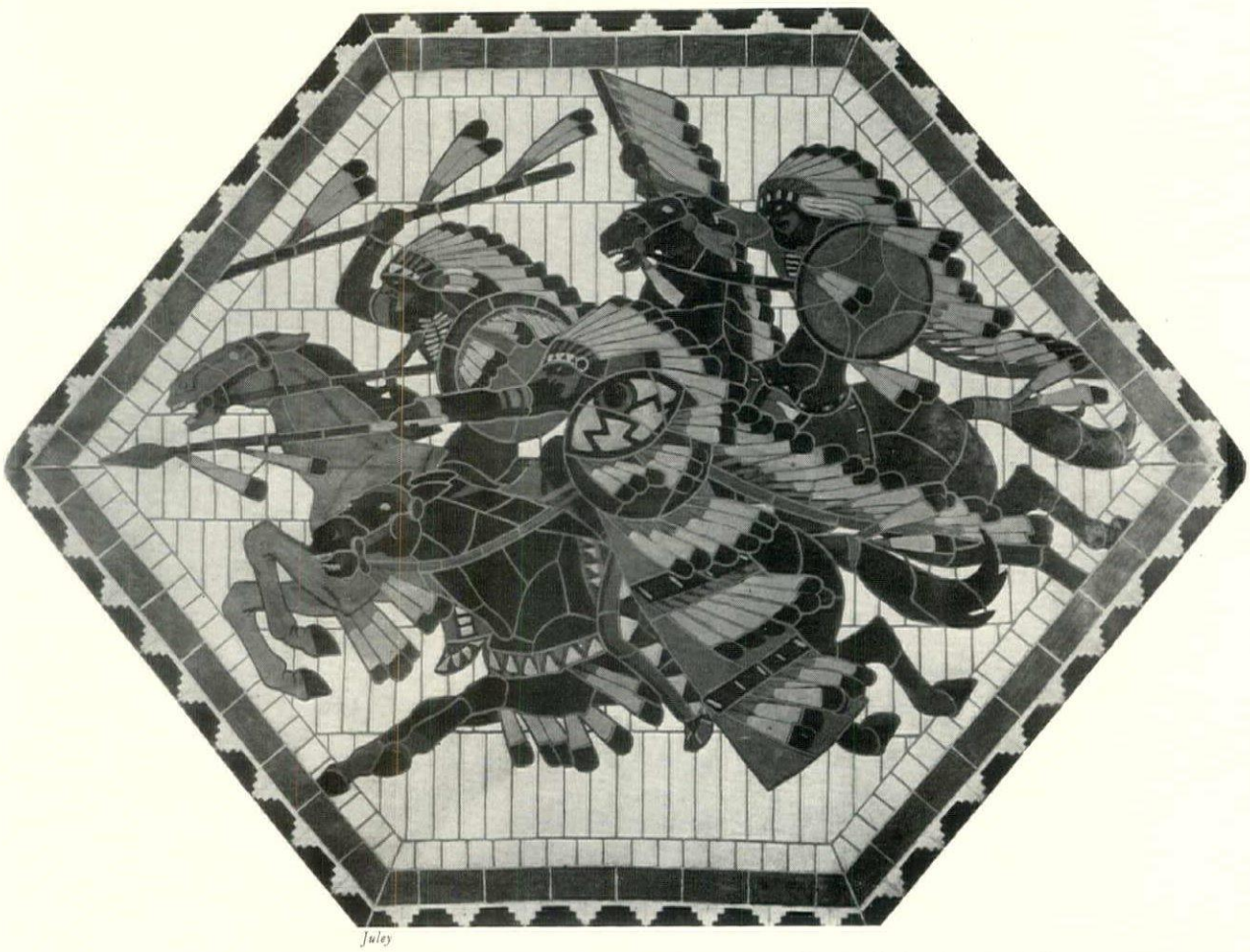


Savastano

Decorative frieze for the House Chamber of the Nebraska State Capitol. The historic figures are silhouetted in gold leaf on the walnut frieze which forms the lower part of the ceiling, making a band nearly 250 ft. long

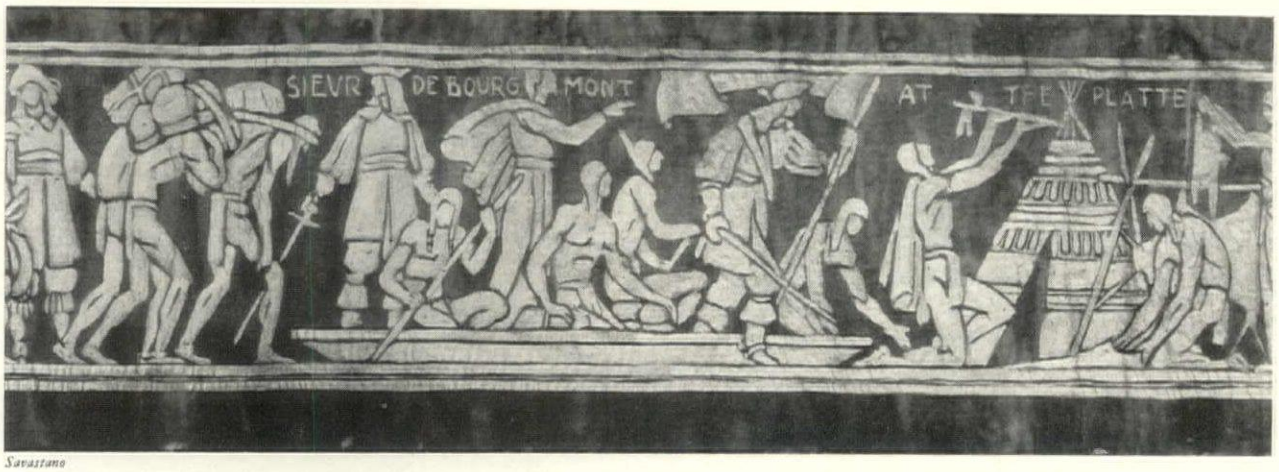
in scale and in complete sympathy with the other materials surrounding it.

Afterwards I designed three other ceilings or domes for the same building, in the same material. Technically I had nothing to guide me but the limitations of the material. Each piece had to come within certain over-all dimensions, and certain shapes were to be avoided because of the danger of breaking in the kiln. I found it was best to select colors from the stock samples, as getting a required color in ceramics is sometimes impossible and always necessitates long experiments and added expense.



Juley

This and the panel on the opposite page are ceiling panels for the Nebraska Capitol

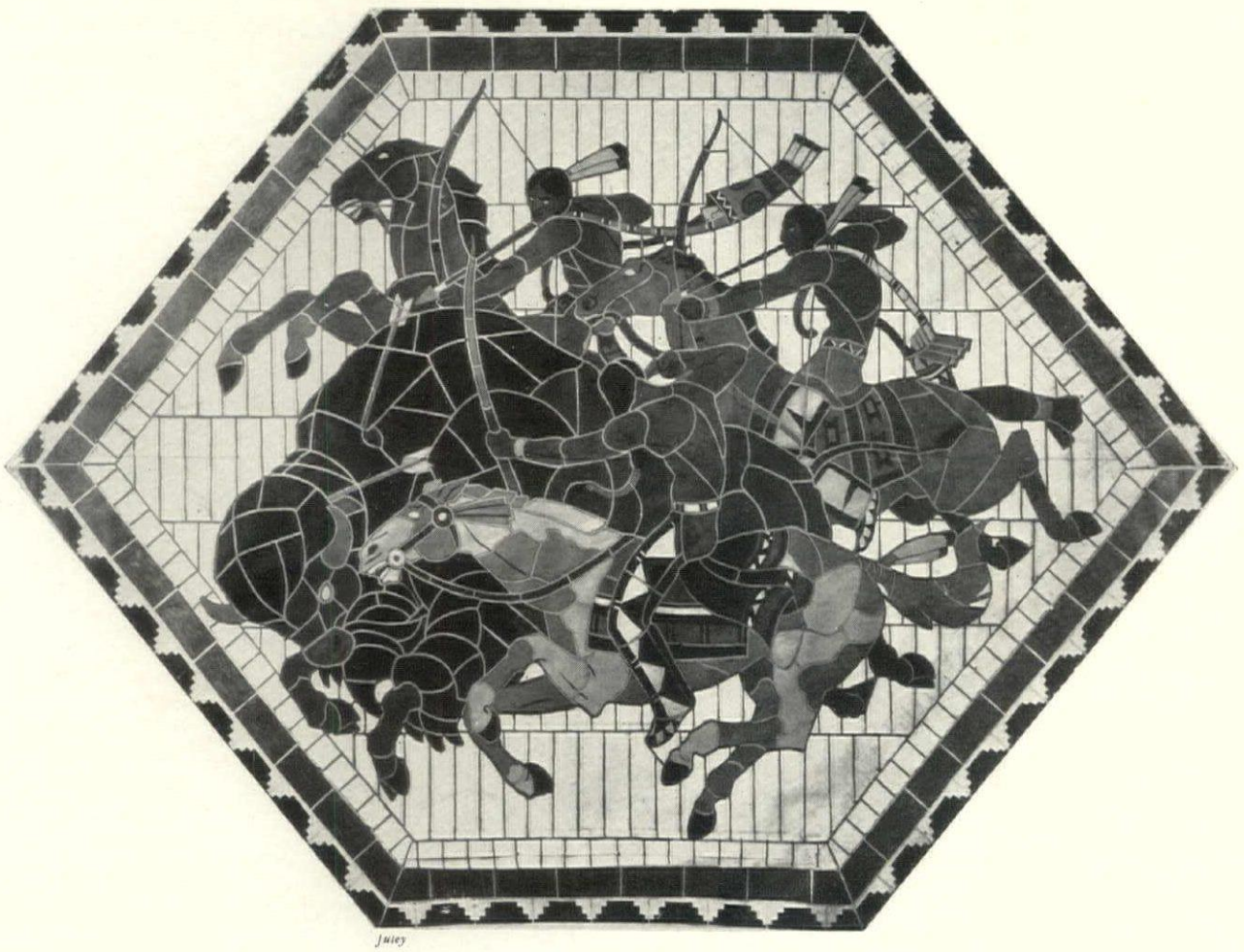


Savastano

A continuation of the decorative frieze in the House Chamber of the Nebraska Capitol, a fortunate treatment since it preserved the acoustic properties of the ceiling, and added sufficient color to the dignified setting

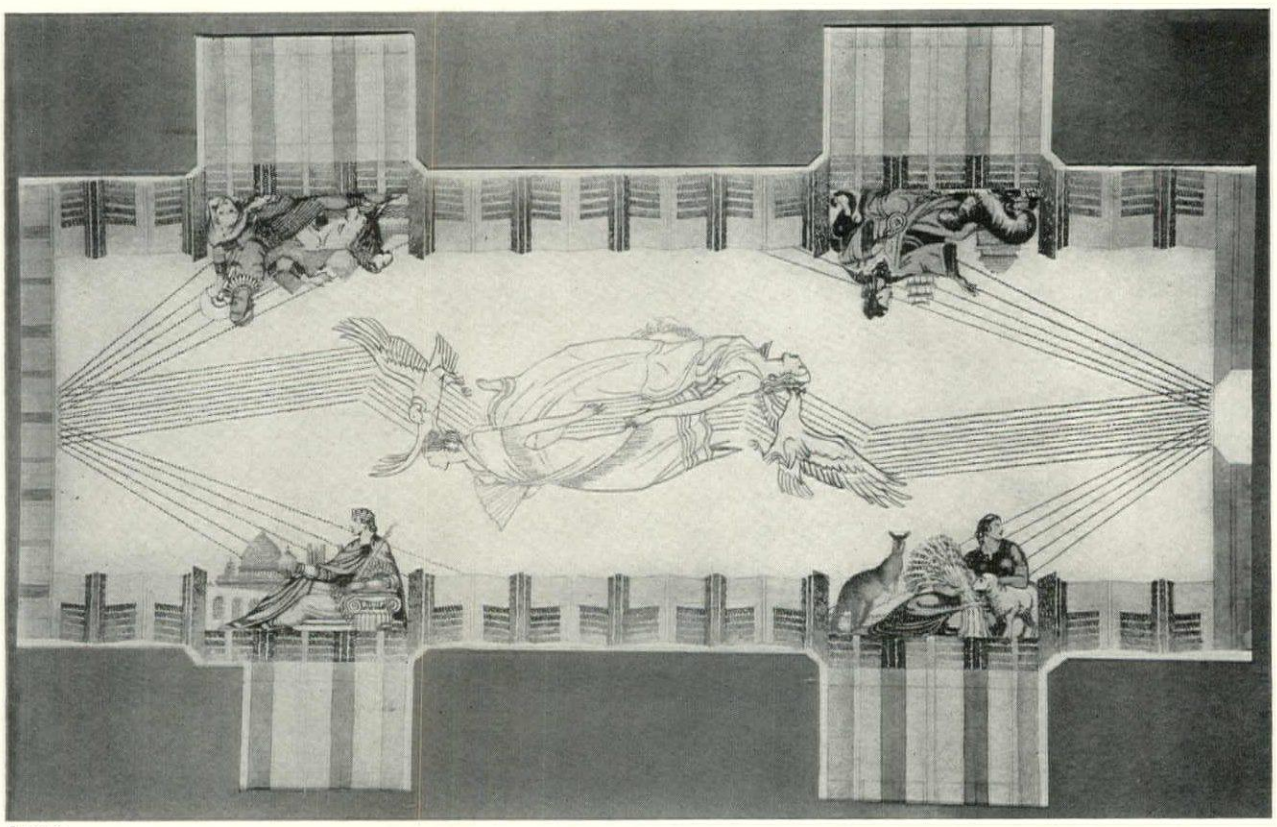
The design was as structural as I could make it to avoid under glaze painting — using the joint line, like the leading in stained glass, and as few colors as possible.

It was after Mr. Goodhue's death that the decorative floor at the Capitol was decided upon and designed, but I feel sure that he would have given it every encouragement. The first idea was to make it as the floor in the Sienna Cathedral, in large slabs of marble with a tight joint. This was found to be prohibitive in cost, so experiments were made in terrazzo. This was felt, however, to be too small in



Juley

Ceramic ceiling panel employing a structural design in keeping with the material used



Savastano

Cartoon for the ceiling of the main foyer and corridor of the Walker-Lispenard Telephone Building, executed in silhouette mosaic, a combination of glass mosaic and colored plaster, a technique particularly adapted to modern design

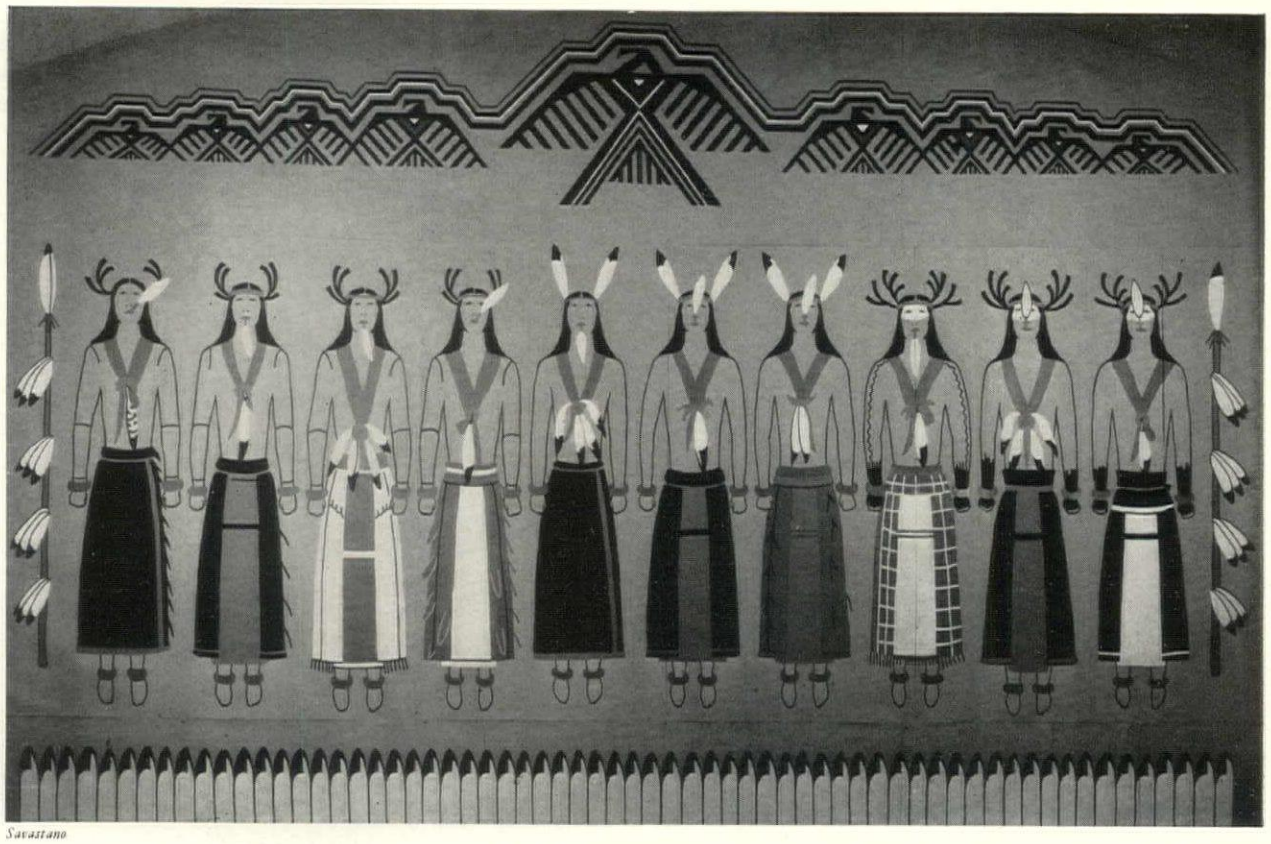
Nyholm & Lincoln

The ceiling of the lobby at No. 1 Wall Street in New York, worked out in silver leaf with color air-brushed over it

scale for such great expanses. The Di Paoli Company finally evolved a combination of marble mosaic for the figure panels and cosmati for the borders, which gives the required vigor.

The decoration of the House Chamber for the Nebraska Capitol presented an interesting problem. It is a combination of walnut and Sanacoustic, the latter painted the same color as the wood. There is a great frieze of the walnut forming the lower part of the ceiling and on this I have put a procession of silhouette figures in gold leaf, ornamental in effect and forming a band nearly 250 ft. in length. It is of historic as well as of æsthetic interest. The room is a better place in which to deliberate because of the influence of such decoration. No ornament on the large acoustic surfaces was attempted.

For acoustic reasons it became necessary to hang tapestries in the Senate Chamber. The character of the room being already set by the Indian ceiling, an Indian character was called for in the tapestry designs. By using a very coarse, eight-point weave and adapting an Indian design, the required effect has been achieved. I mention it because, while I had never designed a tapestry before, and the weavers,



Savastano

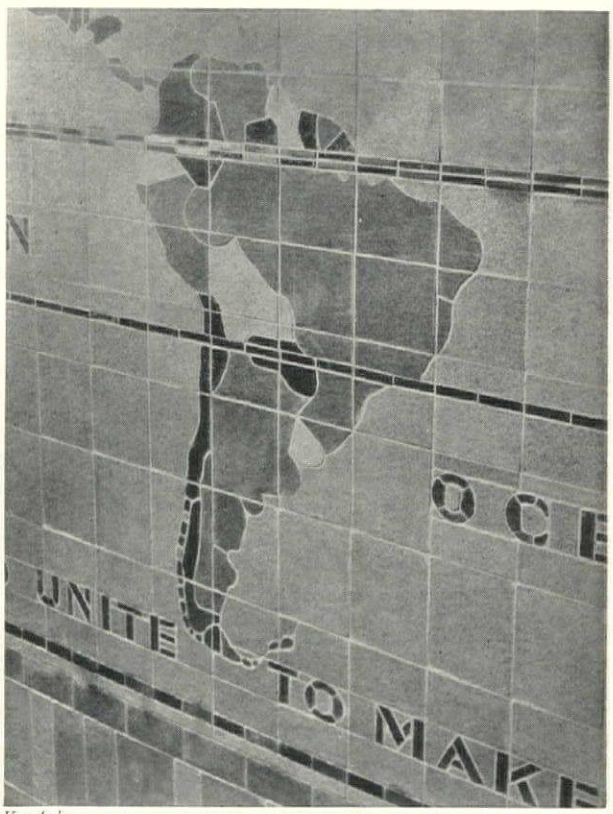
The tapestry designed for the Senate Chamber of the Nebraska State Capitol to meet an acoustic problem. The necessarily strong effect was obtained by using a very coarse weave and adapting an historic Indian design

Renou, Coulaz, Riesen & Co., had never done anything of the character before, we had no trouble whatever after we had clearly established in our minds what effect was to be produced.

The ceiling of the lobby at Number One Wall Street, which Kimon Nicolaides and I designed with Voorhees, Gmelin and Walker, the architects, was extremely interesting — a fresh concept to meet modern decorative needs. The walls were of black marble and the ceiling was the reflecting surface for the light. The design, therefore, could not be heavy either in mass or in color, or the effect would be too dark. Many experiments with silverleaf were made, and the incidental veils of color were blown on with an air brush.

Glass mosaic can hardly be called a new material, so I will only mention that the cartoon for the red room in the same building was somewhat difficult because of the extremely complicated developments of the surfaces.

The Walker-Lispenard Telephone Exchange, also designed by Voorhees, Gmelin and Walker, has in its outer entrance a large map of the world, in building tile, the same material used for the walls



Van Anda

Map of the world executed in building tile, the material used for the walls of the Walker-Lispenard Building

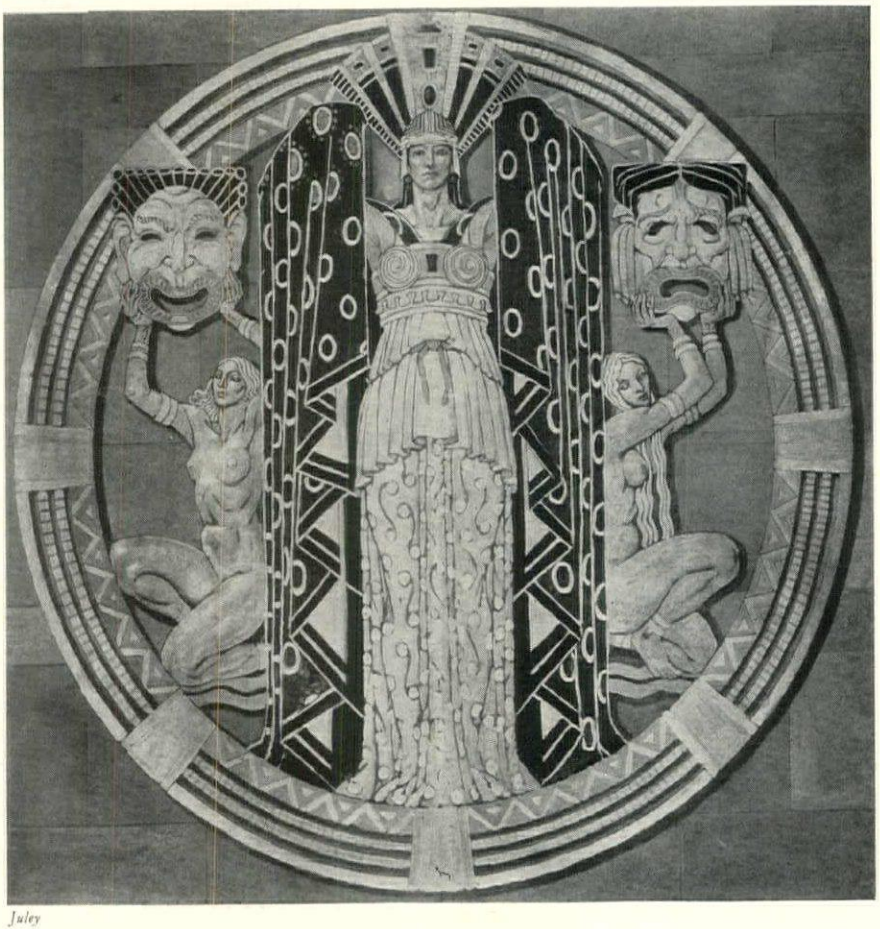
throughout the main corridors. There was an alternative between this material and a painted canvas, and we all felt that the brick was much happier in the place, and finer in texture and scale.

There, again, is an example of an architect having the courage to try something new for the sake of a desired expression of purpose in a simple, decorative idea.

The main foyer and corridor ceiling in the same building is to be in *silhouette mosaic*, a combination of glass mosaic and colored plaster. This technique, which is so adaptable to modern needs in decorative design, has been delightfully handled by the Ravenna Mosaics. It is always a pleasant shock to me to find how far superior the finished craft work is, to the cartoons. This is true in every medium for which I have designed, and makes me realize how much lies in the beauty of the material itself, the value of its texture, the character of its surface and color.

Modern decoration will take these things into account in its design. As long as there are thoughts and feelings or aspirations to be expressed in our buildings, so long must our decoration find forms and techniques to embody them in harmony with the structure. The nature of the material affects the form, for the same idea expressed in metal will differ from that in stone, or mosaic, or fresco, and yet be the same idea.

I have spoken of ceramics, mosaics, new acoustic materials, fabrics, terrazzo, paint and gilt, marble and silverleaf and even brick tile. At present I am working on decorations in metals with enamel, in combinations and at scales never previously attempted, and at the same time painting on canvas a new series of maps. The range is greater than this and is ever expanding — a challenge to our ability. Architects, artists and artisans will work together to make the buildings of our time expressive of ideas, ideals and interests beyond the technical solution to the problem of enclosing space efficiently.

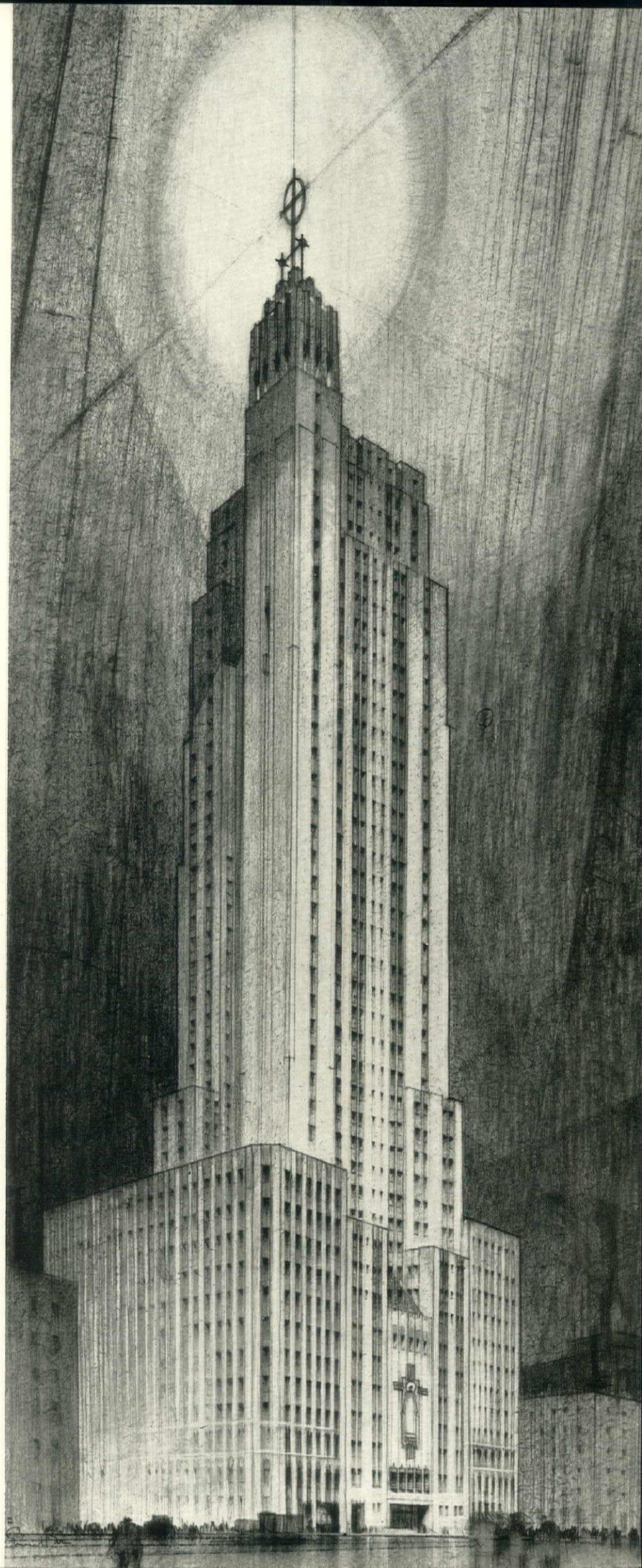


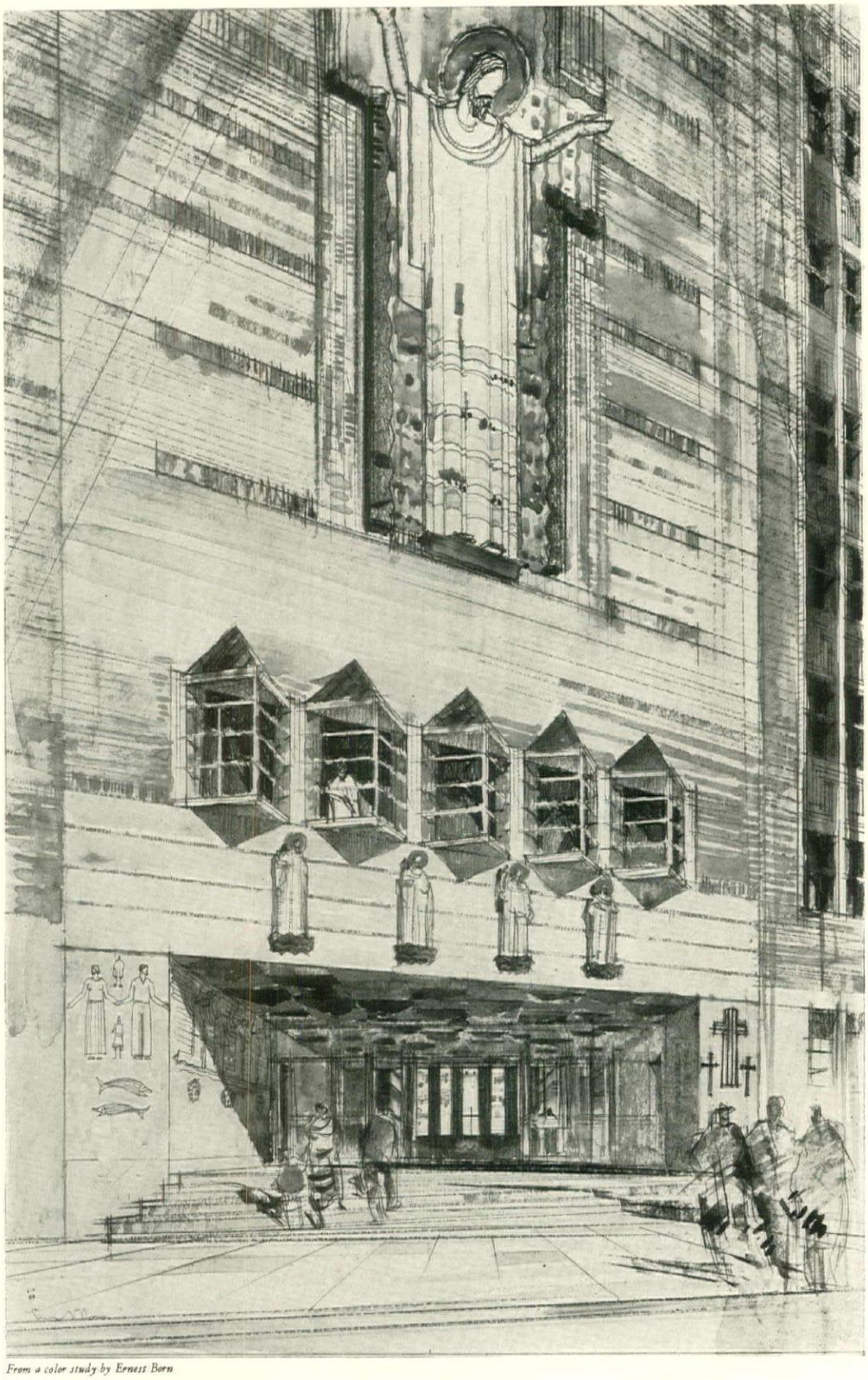
Juley

The third of the three plaques to be executed for the exterior walls of the Rockefeller Center theater. This one represents the drama. Enamel and metal never having been used before in such scale, the result is certain to be most interesting. The panels will be executed by Oscar Bach

FOUR STUDIES BY ERNEST BORN

PRELIMINARY DESIGNS
FOR
BROADWAY TEMPLE
NEW YORK, N. Y.
SHREVE, LAMB & HARMON
ARCHITECTS

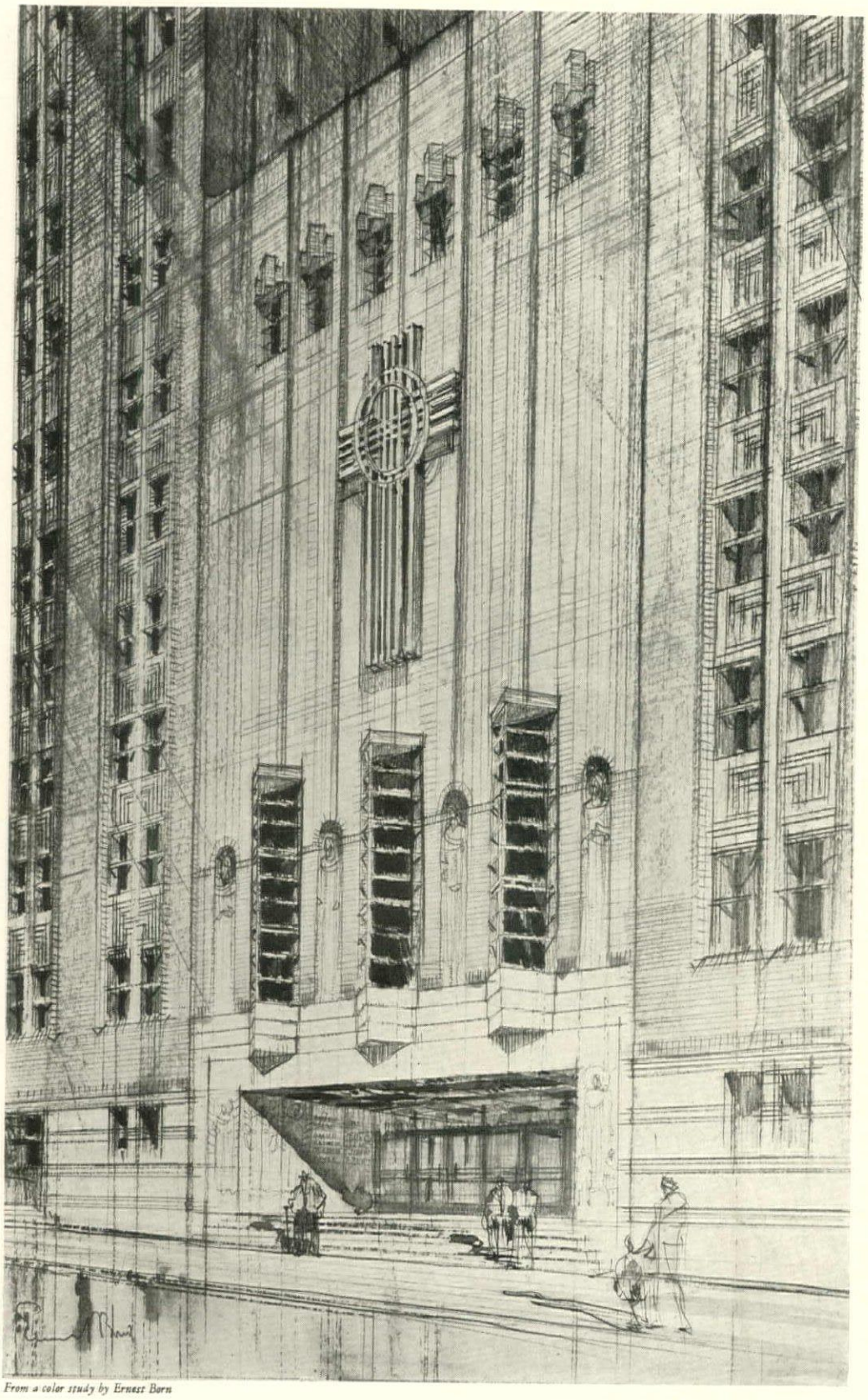




From a color study by Ernest Born

PRELIMINARY STUDY OF BROADWAY TEMPLE, NEW YORK, N. Y.

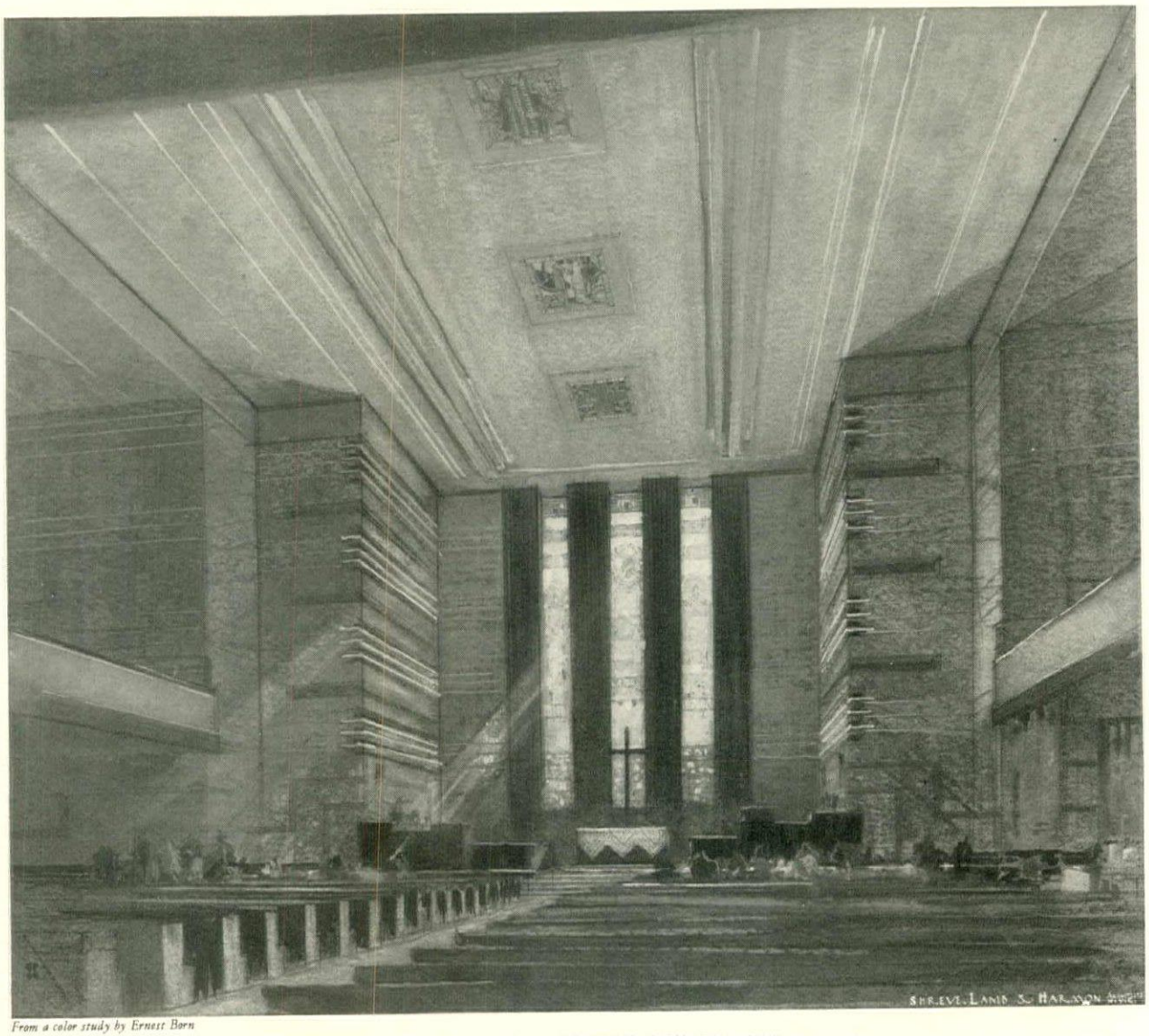
SHREVE, LAMB & HARMON, ARCHITECTS



From a color study by Ernest Born

PRELIMINARY STUDY OF BROADWAY TEMPLE, NEW YORK, N. Y.

SHREVE, LAMB & HARMON, ARCHITECTS



From a color study by Ernest Born

INTERIOR OF THE CHURCH, LOOKING TOWARD THE CHANCEL

PRELIMINARY STUDY OF BROADWAY TEMPLE, NEW YORK, N. Y.

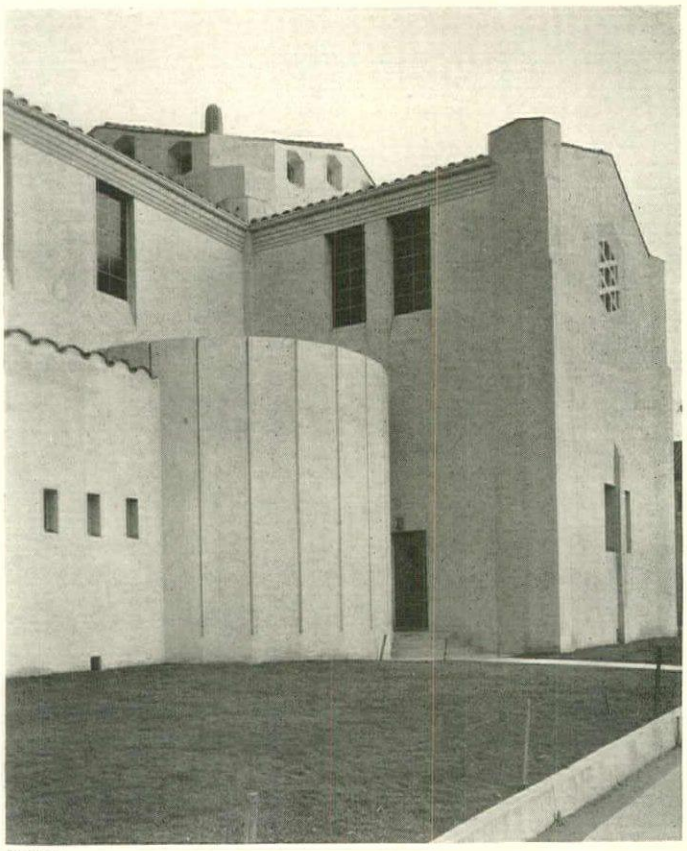
SHREVE, LAMB & HARMON, ARCHITECTS

Maar

CHURCH OF OUR LADY OF LOURDES

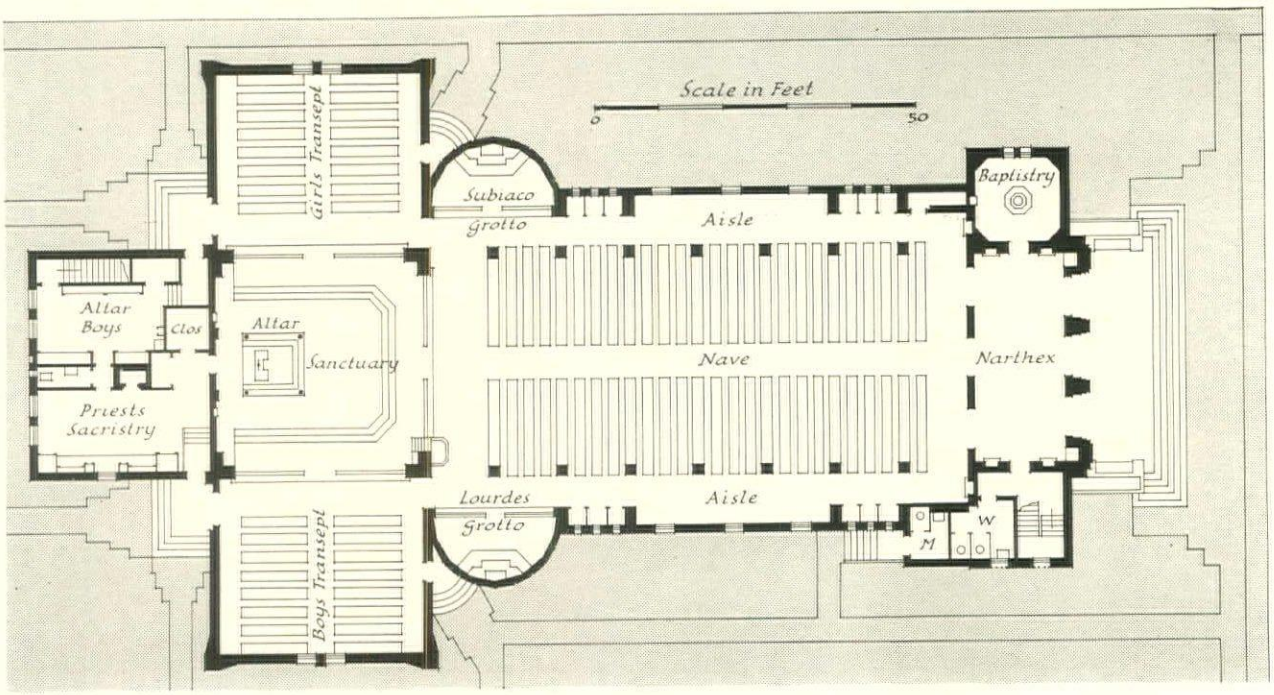
LOS ANGELES, CALIFORNIA

L. G. SCHERER, ARCHITECT



Luckhaus

THE building, erected for the Roman Catholic Church, is of reinforced concrete construction and of earthquakeproof design. Filler walls are of brick, and the floor joists of structural steel. The exterior is finished in coral-gray, integrally colored, textured plaster, trimmed with cast stone of similar tone. The tower, 110 ft. high, is capped in gold mosaic. With a seating capacity of 750, the church cost $58,970, or 14.5 cents per cu. ft. for 392,182 cu. ft.



CHURCH OF OUR LADY OF LOURDES

LOS ANGELES, CALIFORNIA

L. G. SCHERER, ARCHITECT

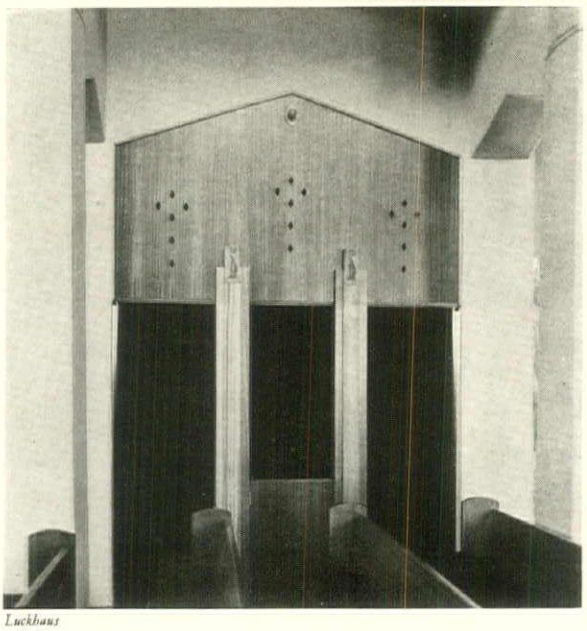
Luckhaus

CHURCH OF OUR LADY OF LOURDES

LOS ANGELES, CALIFORNIA

L. G. SCHERER, ARCHITECT

Mott



Luckhaus

ABOVE the arches the interior is a buff colored acoustic plaster, the beamed ceiling being covered with sand-blasted insulite. The columns and soffits are finished in colored concrete. With the exception of the sanctuary floor, which is of coral-colored terrazzo, the floor is of concrete. The Baldichino is of scagliola to imitate Campan Melange marble. Stations of the Cross were taken from the old church and built into the walls. Lighting fixtures, decoration, and art glass were still incomplete at the time the building was photographed. Above is a view looking toward the sanctuary, and at the left is a detail of the confessional

CHURCH OF OUR LADY OF LOURDES

LOS ANGELES, CALIFORNIA

L. G. SCHERER, ARCHITECT

Rendering by John Wenrich

ROCKEFELLER CENTER, NEW YORK, N. Y.

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

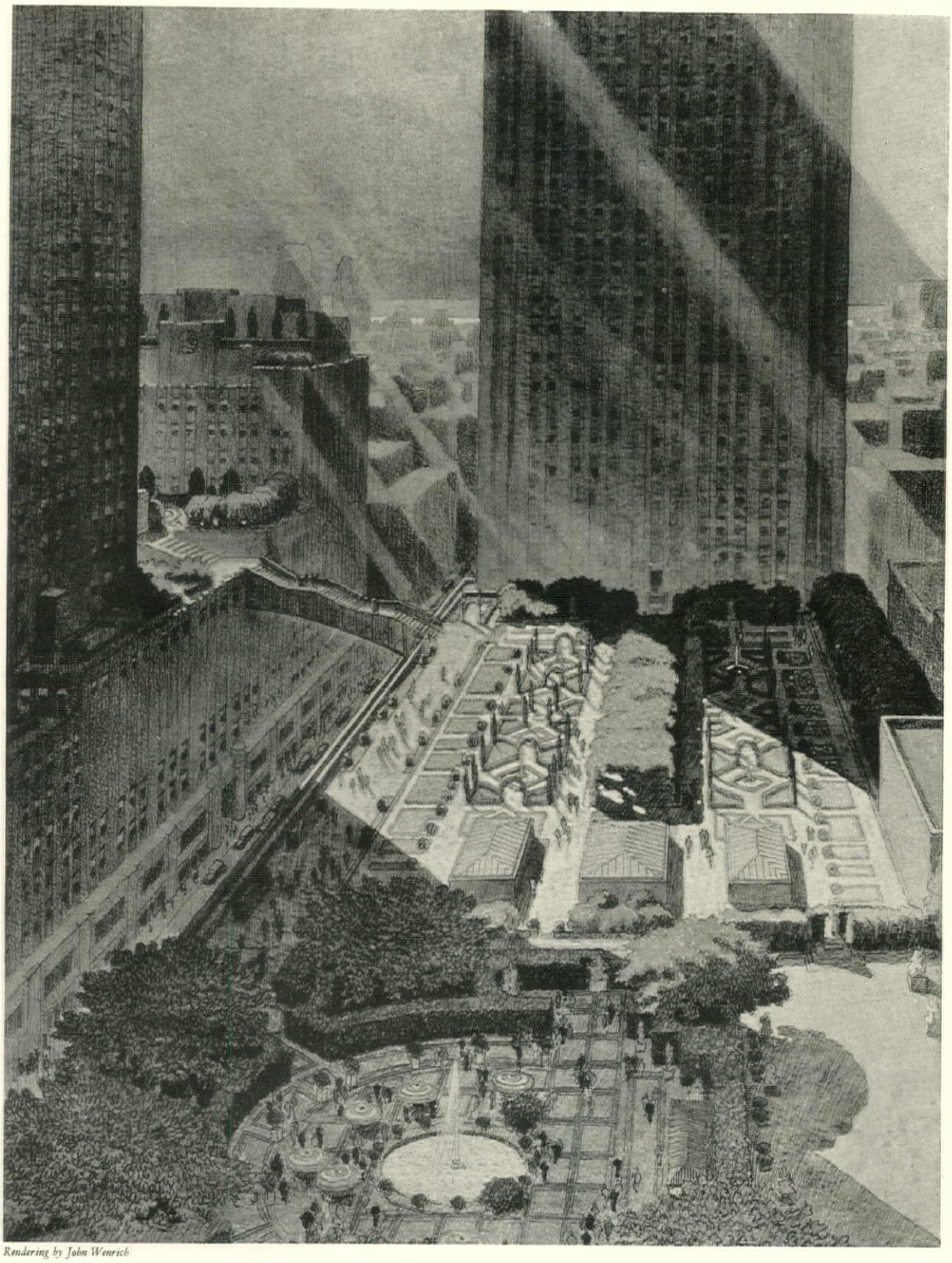
Rendering by John Wenrich

IN THE evolution of the design and plan for Rockefeller Center, important decisions made after the preliminary drawings had been released have altered the character of the project to a considerable degree. Photographs were shown in the January issue of *The Architectural Forum* of the development as it was then planned. The drawings presented now illustrate the final scheme, as the group will look when completed. Probably the most significant changes have taken place on the Fifth Avenue frontage, where in place of the original oval bank building two small foreign buildings will be constructed, and where in place of a proposed department store on the northeast corner of the development, units are to be built for Italian and one other foreign interest. The bridges over the streets, joining the central office building with two theater units, are comparatively new developments, and the character of the Forum, shown above as it will actually appear, has undergone a great many changes. It is now a sunken plaza with entrances leading from it to the shopping level below ground. Since landscaped roofs were first proposed plans for their use have been revised several times. The drawing opposite of the International Music Hall roof is typical of the proposed treatment. A restaurant, an open-air concert hall, and possibly an open-air sculpture museum will be located in the roof gardens. The International Music Hall, which, with the exception of the sound motion picture theater, is nearest completion, is shown for the first time on page 20. This is a view along 51st Street toward Sixth Avenue, showing the private street in the foreground, which is to cut across the development from 48th to 51st Street

ROCKEFELLER CENTER

NEW YORK, N. Y.

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



Rendering by John Wenrich

ROCKEFELLER CENTER

NEW YORK, N. Y.

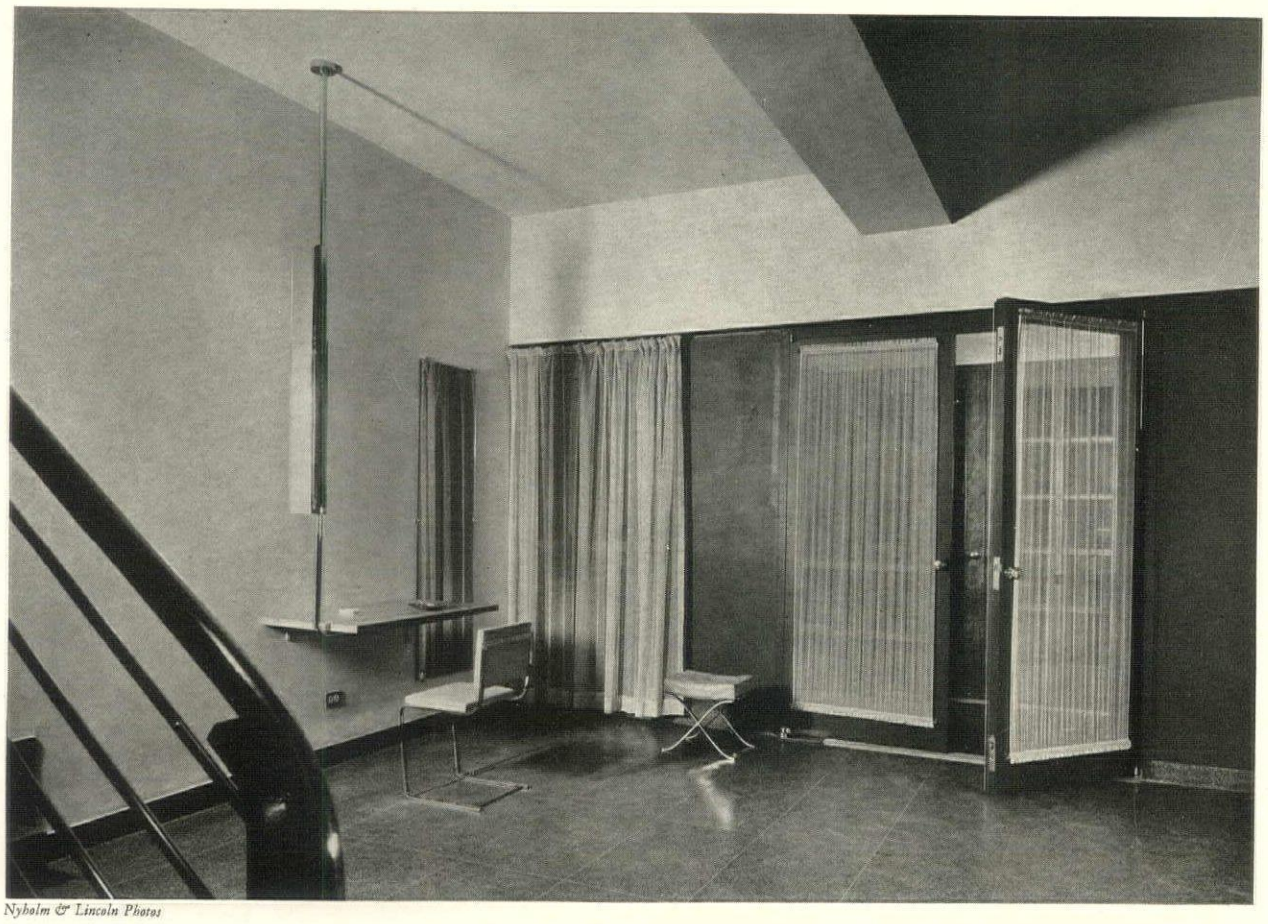
REINHARD & HOFMEISTER, CORBETT, HARRISON & MacMURRAY, HOOD & FOUILHOUX, ARCHITECTS

Rendering by John Wenrich

ROCKEFELLER CENTER

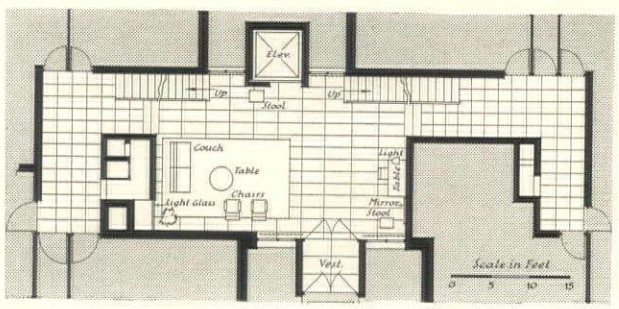
NEW YORK, N. Y.

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



Nyholm & Lincoln Photos

ABSENCE of decorative pattern and emphasis upon color and form mark the treatment of this apartment house lobby. The walls are predominantly yellow, with gray and blue used in mass for relief. The ceiling is white and the floor terrazzo. The furniture is chrome-plated with white leather upholstery. Light is supplied by chrome-plated fixtures and a ground glass wall panel



LOBBY OF CAROL COURT APARTMENT

SUNNYSIDE, LONG ISLAND, N. Y.

CLAUS & DAUB, ARCHITECTS

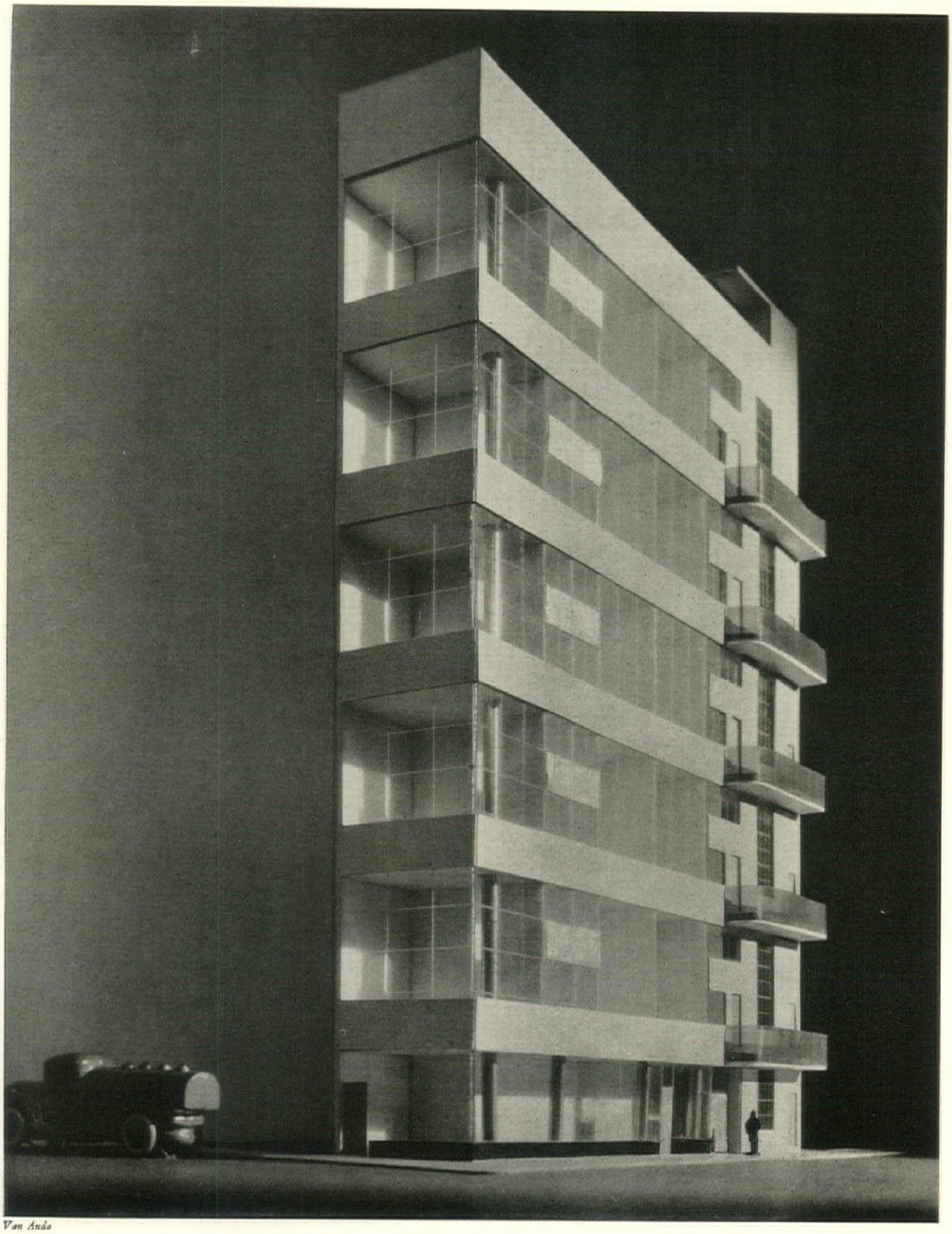
Nyholm & Lincoln

THIS is the living-dining room of a small apartment, redesigned by the architects for the use of one of the members of the firm. Although the structural character of the building prevented complete conformity with the principles of design subscribed to by Claus & Daub, simplicity governed by use was adhered to as far as possible. The wall surfaces are smooth off-white plaster, the ceiling white. The carpet is a dark shade of tan, and the drapes are blue and gray. All furniture, including the glass-topped table, is chrome-plated, the settee having a white leather cover and the chair a deep red cover. The light over the table has a green enamel shade, and the one at the left is chrome-plated. The door at the left is black

APARTMENT OF GEORGE DAUB

NEW YORK, N. Y.

CLAUS & DAUB, ARCHITECTS



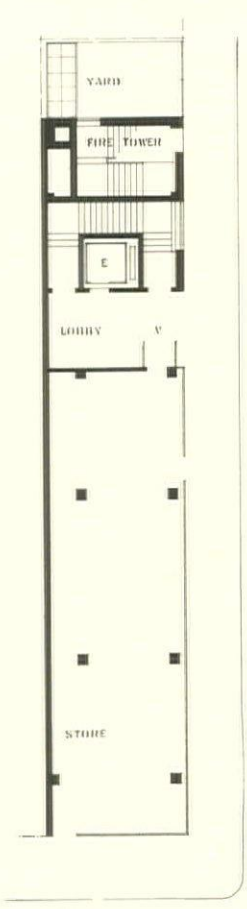
Van Anda

FROM A PHOTOGRAPH OF THE MODEL

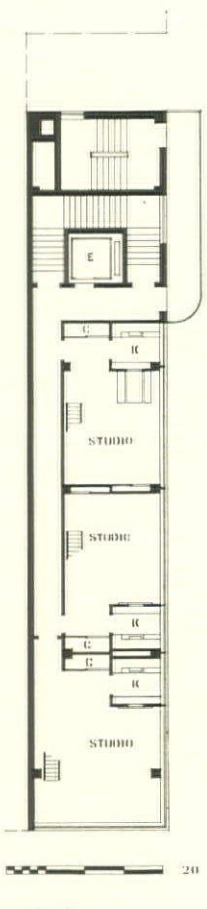
STUDIO APARTMENT BUILDING

PHILADELPHIA, PA.

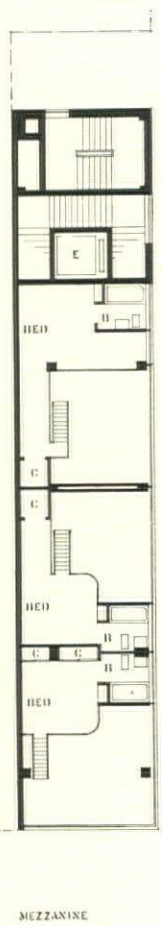
NORMAN N. RICE, ARCHITECT



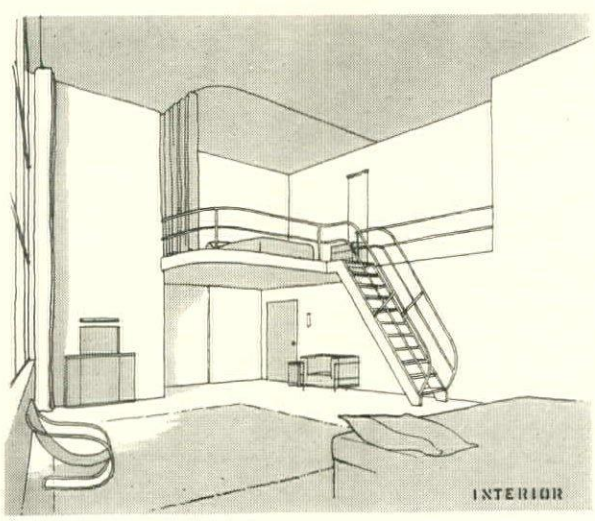
GROUND



TYPICAL



MEZZANINE



THE project shows an interesting solution to the building problem imposed by an 18 x 100 ft. corner lot. The code restricted the coverage to 90 per cent and specified in addition the separate fire tower with an exterior entrance to the public hall on each floor. The fact that the long side of the building faced the north determined the use of the building for studio apartments and the restricted space, further hampered by the necessity of an interior corridor, brought about the expedient of providing a bedroom and bath on the mezzanine floor. The building is designed for a reinforced concrete frame. The spandrels at the floor levels are faced with a light buff enamel brick, the spandrels at the mezzanine floor being of unpolished metal

STUDIO APARTMENT BUILDING

PHILADELPHIA, PA.

NORMAN N. RICE, ARCHITECT

THE EDITOR'S FORUM

THERE WILL BE NO HOUSING—

THERE will be no housing — worthy of the name — until many of the shortcomings of our present system are eliminated. The *laissez faire* concept has brought about monetary rewards (and losses) for speculative competition in building, disregarding entirely the public good. Uncontrolled building irrespective of needs has produced a surplus of some types of building and a dearth of decent dwellings for most of the population. With seemingly no chance for individual profit by a speculator except through ill-planned, firetrap, shoddy rows, building has only been undertaken in fields that promised profit regardless of the welfare of the community. Now that the folly of such procedure is demonstrated there is a return to the sanity of studying needs and a willingness to consider a new order — logical, social, economic — planned for the good of all. Food, clothing and shelter are the essential needs — and housing is the need which the building industry must fill.

One of the primary objectives of the industry and of the architect (the planner and coordinator of that industry) under whatever social order, must necessarily be the production of housing — decent housing for the whole population — produced at low cost in large-scale projects creating planned communities.

Let us sum up therefore those things which we now have that encourage the immediate undertaking of housing, and those things which we lack, that we may work to eliminate our shortcomings.

We have:

A Demand and Market — for the housing it is our object to provide. The need and its statistics do not need reiteration here.

Labor — waiting for the chance to go to work to produce the buildings. Trained, technical and skilled labor is ready to begin.

Materials — on hand or manufacturers eager and able to produce them at low cost.

Locations — either now occupied by unfit or vacant buildings or slums, blighted areas, or unoccupied tracts already supplied with streets and sewers, etc.

Time — for the study and development of housing. We're not too busy now to think or to act to make up those things we now lack.

We lack:

Funds — capital, credit, to finance large-scale housing. This may be made available shortly through Federal aid as the various bills now before Congress are passed.

Financing Methods — which will insure safety and stability and lessen the cost of housing to the ultimate consumer. Practical methods have been advanced recently and deserve thorough trial.

Tax Systems — which will be more nearly equable and which encourage good rather than shoddy construction.

Laws — in every State, enabling and encouraging the formation of housing corporations to undertake the work of housing under adequate technical, social, economic and architectural control to insure the value of the projects. Uniform building codes based on requirements of results to be obtained not prescribing constructive methods. Laws to permit the speedy assembly of lots into adequate sized units for housing.

Sites — assembled into large-scale units guaranteeing continuity and stability of environments, establishing communities.

Organizations — integrated to create housing, i.e., to plan, to finance, to construct and to manage large-scale housing projects.

Techniques — to determine housing needs, qualitatively and quantitatively; to choose most advantageous sites; to determine the type of housing, the building sizes and heights, the plan arrangements best suited to the individual project; to determine scientifically the best materials and methods of construction for economy and efficiency, i.e., techniques of research, of planning and of production.

The Will — of many vitally interested, including architects, to attack boldly the problems implied in this "list of lacks," or to support those who are taking the responsibility of advocating measures that will make housing a reality.

For there will be no housing — worthy of the name — until our present shortcomings are eliminated — eliminated by our own collective efforts.

Kenneth K. Stowell

EDITOR

TOWARD THE RECONSTRUCTION OF NEW YORK'S LOWER EAST SIDE

PART I: AN ANALYSIS OF THE EXISTING CONDITIONS

BY

HARLAND BARTHOLOMEW

CITY PLAN ENGINEER, ST. LOUIS, MO.

FOR the past twenty years the well-known Lower East Side of New York has been declining in population and in property value. For about ten years the decline was very gradual, but since 1920 it has become so great as to approach economic collapse. The loss in population from 1910 to 1930 was 53 per cent and the loss in real property values probably greater than this. It has been suggested that Peter Stuyvesant's farm is merely in process of completing a cycle of development and is now rapidly approaching its original state.

Causes of Decline. The principal causes of the decline and present blighted character of the Lower East Side are:

1. Unlimited spread of the city induced by rapid transit and the automobile.
2. Rapid depreciation and obsolescence of existing buildings, due to poor design, inadequate maintenance, lack of modern conveniences, and inadequate standards of light and air.
3. Cessation of immigration and rapid decentralization of immigrants for whom the Lower East Side served merely as a temporary reservoir.
4. Unfortunate reputation of the district due to former overcrowding of the land and practices of exploitation.
5. Removal of the garment industries to other parts of the city.

Same Conditions Prevalent Elsewhere. All large cities are losing population in their older, centrally located residential areas. The decline of the Lower East Side is merely a somewhat more acute manifestation of what is taking place in other parts of New York, or in the centrally located residence areas of Philadelphia, Chicago and St. Louis, or even of the newer cities, such as Los Angeles. While each blighted district is caused by various combinations of conditions peculiar to the district itself, practically all blighted districts have one basic cause in common, *i.e.*, excessive decentralization of the city as a whole or, more simply stated, lack of a well-balanced, comprehensive and official city plan.

Our urban populations have suddenly achieved such a remarkable degree of mobility through the use of the automobile and of rapid transit during the past twenty years that the economic stability of our cities has been undermined. This shifting about is largely a revolt against the undesirable social conditions created by present building practices. Decentralization does not necessarily produce better conditions but is merely a reaction against present conditions — an expression of inherent dissatisfaction and a hope for an improved condition.

Why do most families endeavor to move to the suburbs? Merely because they think they will have more light and air, more pleasant living conditions, and possibly lower taxes and lower living costs. For a while they may achieve such results. They do not realize that when large numbers of other people have done likewise, all will sooner or later find themselves surrounded by much the same old conditions with probably even higher taxes and living costs; for someone will have to pay the costs of maintaining the older areas, and the municipal structure sooner or later becomes top heavy. Decentralization *per se* is economically unsound and gives no assurance of better social standards, for land subdividers have become no more magnanimous than they were forty or fifty years ago when the older areas were laid out. Most of them merely have a new bag of tricks, although a few enlightened subdividers have come to realize the commercial value of high social and æsthetic standards.

Blighted areas such as the Lower East Side have even greater economic advantages than suburban areas because of their usual centrality of location. There are three great problems to be dealt with in attempting to eliminate the blighted areas, however: (1) *determination of their logical character and usefulness in the comprehensive plan of the city;* (2) *elimination of the obsolescence factor, which can usually be accomplished only by wholesale removal of present structures; and* (3) *determination of new types of dwellings so designed as to be socially desirable, æsthetically attractive, and economically possible.*

Previous Work Done. Several studies and reports of great value, previously prepared, were of much assistance in the present undertaking, notably the Day & Zimmerman Traffic Report (1929), the Board of Transportation's Comprehensive Subway Plan, the Regional Plan of New York and Environs, and

a report of John Taylor Boyd, Jr. and Holden, McLaughlin and Associates.* A most significant and sustained effort for the rehabilitation of the Lower East Side has been performed by the East Side Chamber of Commerce which, over a period of approximately five years, has stimulated an annual expenditure of from one million to one and a half million dollars in the rehabilitation of old buildings.

Organization Interested. The continued decline of the Lower East Side has become a problem of major significance to social and civic organizations as well as to commercial interests. In order to approach the problem in a fundamental manner and to proceed in a thoroughly comprehensive and logical way, the following organizations united to form the Lower East Side Planning Association: Emigrant Industrial Savings Bank, Dry Dock Savings Bank, Citizens Savings Bank, Metropolitan Savings Bank, Bowery Savings Bank, Title Guarantee and Trust Co., New York Title and Mortgage Co., Greater New York Taxpayers' Association, East Side Chamber of Commerce, Henry Street Settlement, Lower East Side Community Council.

Mr. Orrin C. Lester, Vice-President of the Bowery Savings Bank, was elected president of the Lower East Side Planning Association. Under his leadership the work of the association has been aggressively advanced and is becoming widely recognized and understood.

Objects of the Present Study. An agreement was made with the writer's office in October 1931 by the Lower East Side Planning Association shortly after its formation, providing for:

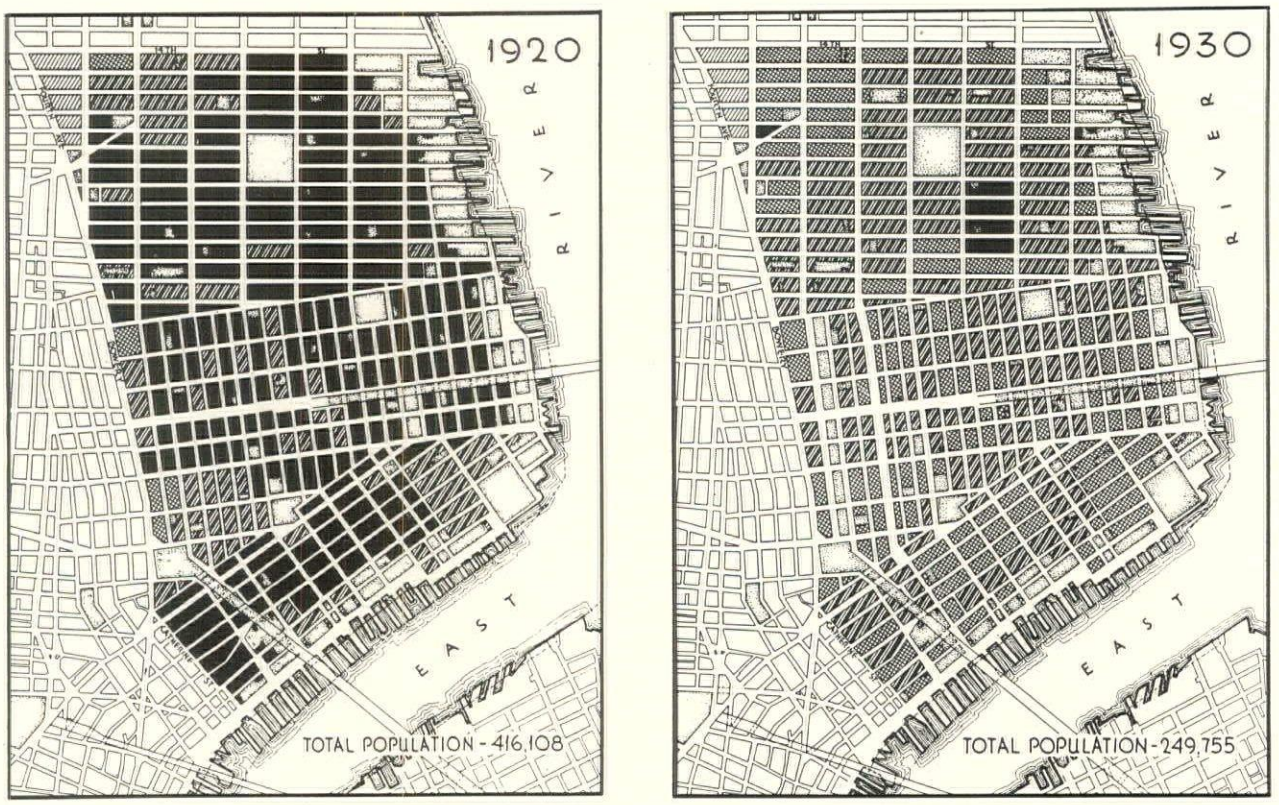
1. Studies of existing uses of property and of traffic conditions, including field surveys and the preparation of various maps portraying the present condition.
2. A comprehensive main and secondary traffic thoroughfare plan.
3. A comprehensive transit plan.
4. Preliminary analysis of the housing problem.

The reconstruction of the Lower East Side must begin with a thorough knowledge of existing conditions, a complete analysis of the factors which have contributed to present conditions, and ascertainment of the precise character and development which would be most appropriate in this area as a fundamental part of the comprehensive city plan. This involves not merely a determination of the uses of property, but thoroughfare and transit plans which are essential for the service of the city as a whole; also such supplemental thoroughfare and transit plans as may be needed for local service within the district. Although there was need for a

* Report and "Key Plan" published 1930 by the East Side Chamber of Commerce, New York.

Fairchild Aerial Surveys

New York's Lower East Side. The Manhattan Bridge is in the foreground and the Williamsburg Bridge at the right. The pronounced bend in the East River makes the Lower East Side comparatively independent of the rest of Manhattan



Figures 1 and 2. These charts forcefully illustrate the tremendous decrease in population that has taken place in the entire East Side area. In 1910 the population of the district was 531,615, and the figure for 1930 represents a decline of 53 per cent from the high point of 1910

study of zoning, of parks and of recreational facilities, it was considered advisable to incorporate these as part of a future undertaking so that they might be integrated with more thorough housing studies than were contemplated in the initial agreement.

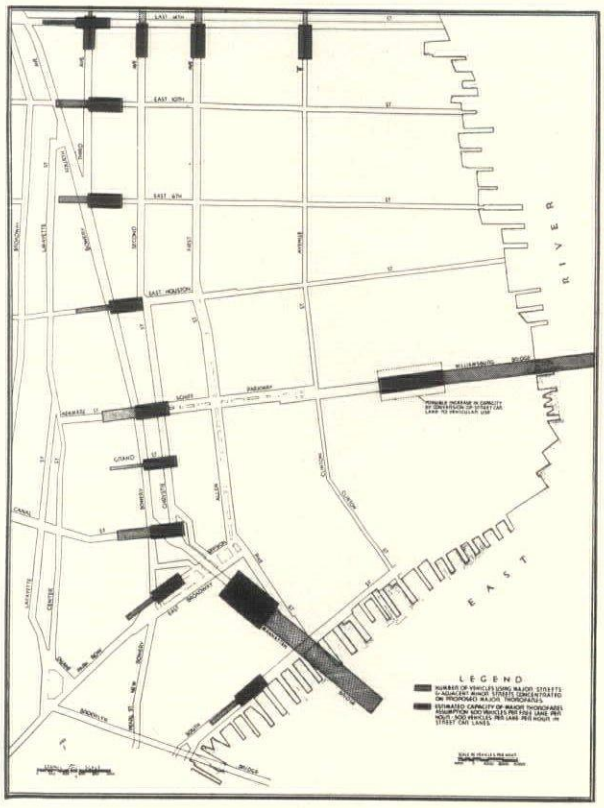
Procedure. Office space was provided in one of the banking structures within the district. The work was carried forward under the personal direction of the writer and his assistant, supplemented by additional temporary services as needed. Special investigations made included:

1. A traffic count upon all streets.
2. A field check of the uses and conditions of each property, recorded in permanent form and supplemented by thorough analysis of the information obtained.
3. A survey of the actual use of existing street space.
4. An analysis of the amount and conditions of the mortgage on each property recorded separately for each of the financial institutions having large investments in this district.
5. A study of the assessed valuations of land and improvements at approximate five-year intervals for the past 25 years.

Important Findings. The Lower East Side of Manhattan has been defined for the purpose of this investigation as all of the area bounded by East 14th Street, Third Avenue, and the Bowery, Bayard and Market Streets, and the East River. The gross area is 897.6 acres which is 6.3 per cent of the total area of the Borough of Manhattan, or 0.45 per cent of the total city area. The area is physically more or less isolated from the rest of Manhattan Island because of a bend which occurs in the East River.

Three of the four East River bridges deposit their traffic within or immediately adjacent to the Lower East Side, causing unusually heavy traffic flow upon main thoroughfares leading directly to the bridgeheads. Streets are of the usual rectangular pattern, generally 50 and 60 ft. wide, although north of Houston Street the avenues are 100 ft. in width in accordance with the prevailing pattern of Manhattan Island. Because of the comparative isolation of the district, very little traffic was found to use the majority of local streets.

The district is very well served with rapid transit facilities, new subways are under construction and several additional subways are proposed in the Board of Transportation's comprehensive subway plan. When all of this construction has been completed, this area will possess one of the greatest concentrations of rapid transit in the city. These facilities are more particularly concentrated in the area bounded by Canal Street, Allen Street, Houston Street and the Bowery. There has been considerable abandonment of street car lines and some



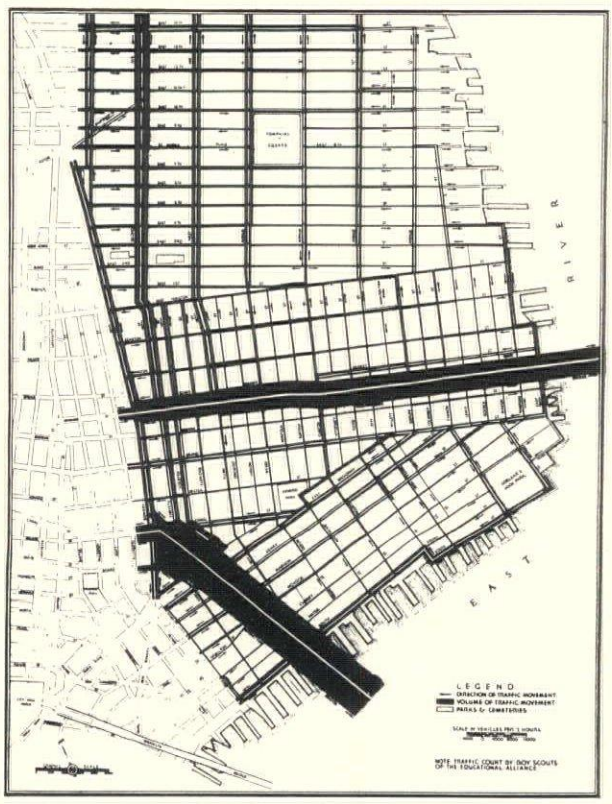


Figure 3, at the left, shows a comparison of present use and future capacity on the major and secondary thoroughfares during the hour of maximum use. Figure 4, at the right, shows the traffic flow within the district during a typical weekday between the hours of 4 to 6 P.M. Little traffic occurs on the majority of local streets

new bus line installation. The areas adjacent to the river are particularly in need of more adequate local transit service.

The area is predominantly residential. There are 9,773 buildings, of which 8,079 are tenements and dwellings, 25 elevator apartments, 34 lodging houses, 755 warehouses and loft buildings, 8 office buildings, 130 factories, 275 stables, 44 theaters, and 429 miscellaneous buildings, such as schools, churches, synagogues, and the like. The majority of tenements have stores upon the ground floor. The average height of all buildings is relatively low, 4.54 stories, the great majority of buildings being five stories high. These are chiefly the old law tenements, built in large numbers during the 80's and 90's. They are a more or less obsolete and unsatisfactory type of housing, covering as high as 90 per cent of the lot, and are often in bad repair. They occupy 367.6 acres or 6.3 per cent of the total block area of 579.4 acres.

There are approximately 12,500 stores within the area, of which a total of about 2,000 are vacant. In the last two years store rentals have dropped from $125 per month to $25 per month in much of the district.

Industry occupies only 16 per cent of the net block area, most of which is concentrated along the northeastern waterfront. It is comparatively low in value, and more or less inactive, as evidenced by the small amount of traffic to and from this waterfront. Large areas along the entire waterfront are zoned as unrestricted, and nearly all of the remaining area is zoned for business.

The population of the district was 531,615 in 1910; 416,108 in 1920; and 249,755 in 1930. The 1930 figure represents a decline of 53 per cent from the 1910 high. Population losses have increased considerably during the past ten years as compared with the previous decade. This loss in population has been more or less uniform throughout the entire area. Whereas there was a density in excess of 750 persons per acre throughout most of the district in 1910, present densities are about evenly divided as between the two classifications of 250 to 500 persons per acre and less than 250 persons per acre, as shown upon the accompanying map.

It is difficult to estimate the actual loss in land values. This loss probably exceeds the total loss in population. This, however, is not entirely borne out by the assessed valuations of land and improvements. The total assessed value of land and improvements in 1910 was $300,307,150 and in 1932, $299,832,920. Assessed values have been reduced to some extent in the residential areas nearer the waterfront, but these reductions have been offset by

Figure 5. Major and secondary traffic thoroughfares including those now existing and those which should be widened to accommodate the normal traffic flow within the district

increases in assessments of commercial property along main traffic thoroughfares and rapid transit lines.

Conclusions and Recommendations. It is most significant that despite considerable subway construction, numerous street widenings, and a large amount of rehabilitation work, the decline of the Lower East Side has not been arrested. The situation has become increasingly difficult. Mortgage loans have been reduced to about the present estimated value of land only and even these investments will sooner or later be in jeopardy. Over 90 per cent of the property is mortgaged, and consequently the land owners have no means with which to undertake extensive reconstruction work. There are very few holdings by large estates. Two or three large reconstruction projects have failed to exert any effect upon the surrounding property. It is consequently more or less obvious that the conditions of the Lower East Side can change only by alteration of the entire environment which involves large-scale reconstruction rather than any amount of rebuilding on small lots.

Broadly speaking, the area is primarily suited to dwelling purposes. It is now predominantly a dwelling area unfortunately encumbered by obsolete types of structures in bad repair, covering too large a proportion of the lots upon which they stand, and too interspersed with commercial and industrial uses.

Since all main traffic movements are confined to the area west of First Avenue-Allen Street-Pike Street, it is recommended that all through traffic be accommodated upon a system of ten main traffic thoroughfares, including First Avenue-Allen Street-Pike Street and west thereof. The large areas east of First Avenue-Allen Street-Pike Street are peculiarly suited to dwelling purposes, although limited provision might be made for local commercial needs. Traffic access to this predominantly dwelling area could be fully accommodated upon a system of some thirteen secondary traffic thoroughfares which would be widened to 100 ft. at such time as reconstruction might take place.

It is estimated that the system of main and secondary traffic thoroughfares recommended could accommodate a total traffic load approximately 60 per cent greater than the total volume of present traffic flow. This is graphically represented upon the accompanying illustration. The traffic counts show more or less conclusively that the present street pattern is quite unnecessary, even though existing building development presumably adjusted itself thereto. While a certain amount of street space may be needed in addition to the main and secondary traffic thoroughfares, the traffic survey demonstrates that at least 50 per cent of existing local streets could be closed to advantage in any large-scale reconstruction program.

Transit. The district is so well served with rapid transit lines that no important recommendations are made in this respect. It is believed that eventually it may be desirable to consider the operation of a rapid transit loop connecting the downtown, midtown, and uptown business centers, which could also be so routed as to use one of the subway routes in the Lower East Side, using existing subways and the proposed Second Avenue line. This would afford direct connection to all of the important business centers for residents of the Lower East Side.

The recommendations for improved local transit service include further abandonment of street car lines and the establishment of a more comprehensive local transit service in the form of bus lines connecting directly with the downtown and midtown business centers. These bus lines would be so arranged as to afford direct access to all parts of the district and would be routed upon the secondary traffic thoroughfares. Improved service would be afforded particularly to those areas near the river front, which are now inadequately served.

Neighborhood Units. Main and secondary traffic thoroughfares would divide the Lower East Side into 38 unit areas, varying in size from 4.4 to 51.6

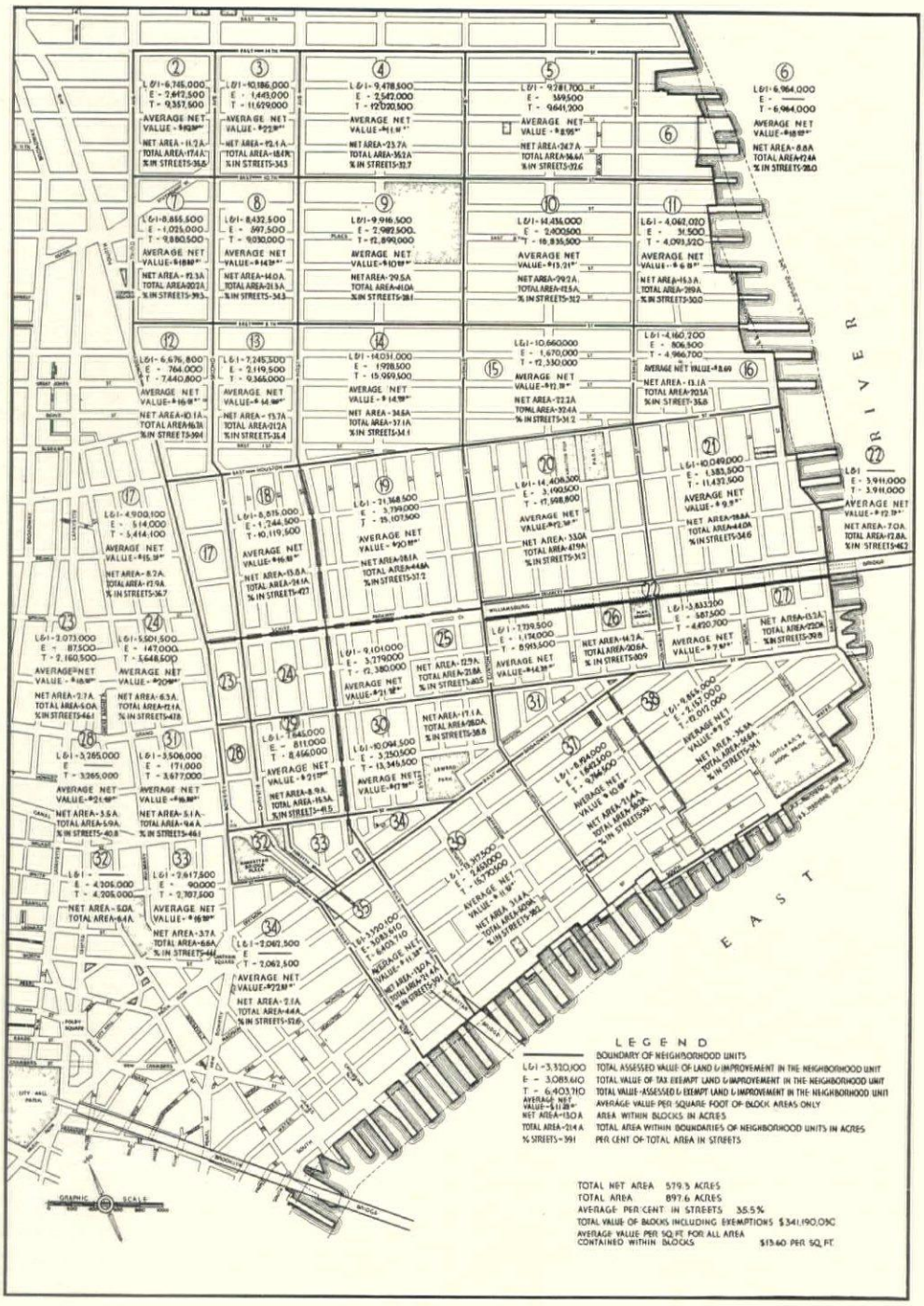


Figure 6. Neighborhood units with the areas assessed and their assessed valuations for 1931. These neighborhood units are logically divided by the main and secondary thoroughfares into 38 areas varying in size from 4.4 to 51.6 acres

acres. The units lying to the west of First Avenue-Allen Street and more particularly between Houston Street and Canal Street are dominantly suited for business development, partly because of the concentration of rapid transit facilities and partly because of higher land values already existing in this area. East of First Avenue-Allen Street neighborhood units as determined by the secondary traffic thoroughfares vary generally from 25 to 40 acres in size. Along the waterfront the total square foot value of land and improvements ranges from about $7 to $10 per sq. ft., and in interior units the total assessed value of land and improvements ranges generally from $12 to $15 per sq. ft., as shown upon the accompanying illustration.

It is believed that these are rather logical sizes for reconstruction purposes in accordance with the principle of more or less self-contained neighborhood units. The size of these neighborhood units is partly the result of circumstances and partly the result of conscious design. Certain of the secondary traffic thoroughfares are logical traffic routes — being

merely the extension of main traffic thoroughfares from areas beyond the district, such as 14th Street, Houston Street, Canal Street and First Avenue. The determination of the locations of other secondary traffic thoroughfares was the result of balanced design in traffic and local transit, particularly since it was found that all present traffic could be accommodated upon the proposed system of main and secondary traffic thoroughfares and still leave room for a 63 per cent increase in traffic, as shown upon the accompanying illustration.

The neighborhood units would be used as a basis for large-scale reconstruction and a preliminary study of one of them was made in consultation with John Taylor Boyd, Jr., architect, in order to determine the practical possibilities of housing construction. The results of this analysis support the contention that it is possible to create in the district a new and superior standard of residence community at moderate rentals. This neighborhood unit would be a self-contained community more or less shut off from the rest of the city, where a considerable population would find harmonious coordination of buildings, local shopping centers, generous open space and park area, school, playground and community facilities. It would also have distinct social advantages. The individual who is lost in the big city could here become a part of a small community with increased incentive for community pride, civic spirit, and loyalty.

Further Steps. Present studies, plans and recommendations were undertaken as the first step in a program of comprehensive reconstruction of the Lower East Side. This first step did not attempt to reach a complete and final solution of an extremely complicated situation. Further disintegration of the Lower East Side cannot be arrested by mere panaceas or palliatives. The roots of the problem are too deeply imbedded in the fundamental economic and social structure of the city to be simply or quickly dealt with. No permanently satisfactory result can be accomplished by a single action, such as a new law, a change of financial policy, a great public improvement, or by ordinary methods of real estate promotion. There must be comprehensive planning for the entire area based on sound economics and high social standards, and there must be concerted effort by each and all of the numerous interests involved — property owners, public officials, financial institutions, building interests, architects and engineers.

Five additional steps are now proposed, several of which can be undertaken simultaneously. It is estimated that within another year it will be possible to initiate construction upon one or more neighborhood units — or demonstrate conclusively that the problem is hopeless. The five additional steps now proposed are:

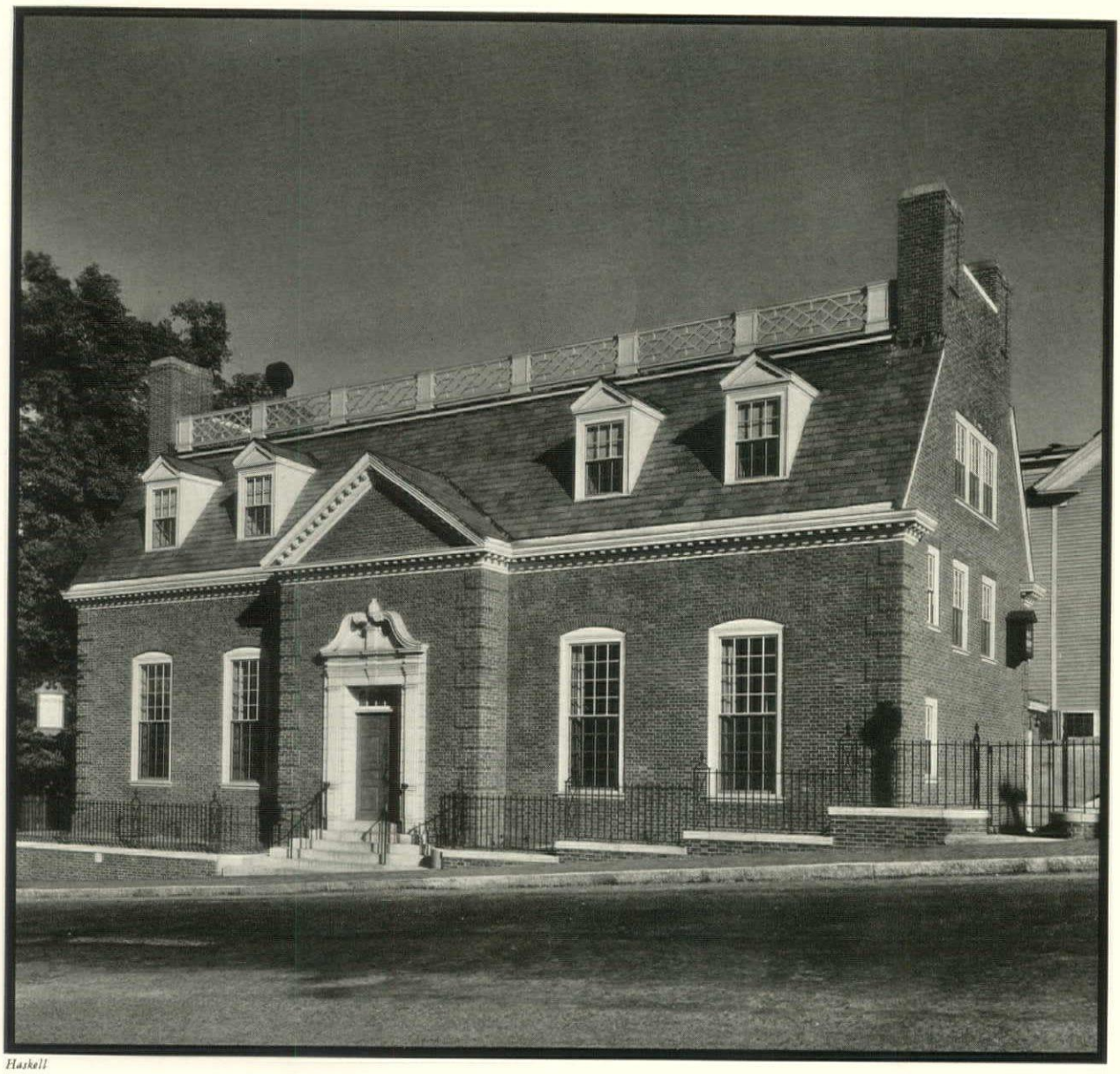
1. Official adoption of the street and transit plans by the municipal government.
2. Market survey (*i.e.*, determination of the types of housing which could most logically be built in the Lower East Side).
3. Research and plan to determine the social standards and economic advantages possible in neighborhood units of varying size and character.
4. The revision of zoning regulations in accordance with neighborhood unit design; a study of recreational needs not supplied by neighborhood unit design; and certain other basic city planning considerations.
5. Formation of housing corporations to build one or more neighborhood units.

Space will not permit of a full discussion of these proposals or the manner in which they should be undertaken. It is obvious that the present plan should be given official recognition and sanction so that those who undertake reconstruction in the Lower East Side may safely base any detailed plan of neighborhood unit construction upon an accepted pattern.

The experiences of the State Housing Board indicate that there is an almost unlimited demand for good low-cost housing facilities. Where so large a construction program as here contemplated is to be undertaken, however, it would seem advisable to make something of a market survey among employes of the larger corporations and business establishments in the downtown and midtown business centers to ascertain as closely as possible the probable demands for space requirements, rental ranges and allied information.

Our studies have revealed that unusual advantages and significant economies are to be accomplished by neighborhood unit construction. This is an unexplored field. It is believed that extensive research would reveal further economies and aid in determining social standards and numerous other factors which would be of fundamental importance in basic design. Something more is needed beyond the mere repetition of existing housing modes in the creation of a new approach to community life such as is afforded by the neighborhood unit.

While equity money for all types of building processes has generally been available in large amounts in normal times, we are now passing through very unusual times, the duration of which is uncertain. It is believed that reconstruction as here contemplated upon the Lower East Side is an extremely sound investment even today, particularly if entered into upon the basis of a limited dividend corporation instead of just another speculation in building with its attendant compartmented procedure and extravagant costs. The economies which are possible and the quality of the community to be created are dependent upon unified control and wise management. Here is an opportunity for financial statesmanship which necessitates bringing those concerned in city government, in financing, and in designing and building into unified and concerted action.



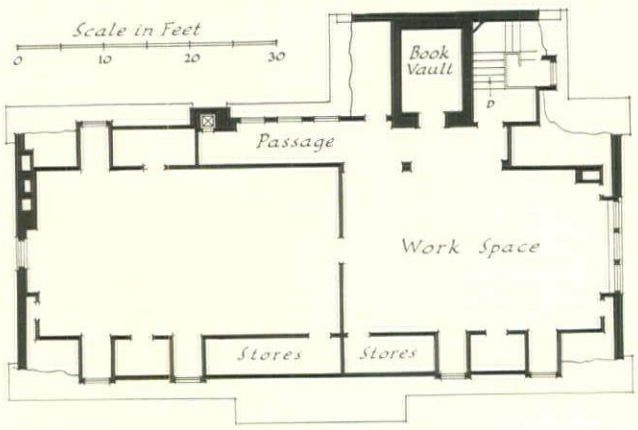
Haskell

THE building is of semi-fireproof construction having exterior walls of face brick in Flemish bond, dampproofed and furred. The first floor construction is reinforced concrete joist and terra cotta block. The second floor is framed with steel girders and wood beams. Local marble is used for trim above the first floor level, and granite below. The pitched roof is of green slate, the flat roof of tar and gravel. Windows, dormers, and roof rail are of white pine, the gutters of cypress. The cost of the building, including fees, was $122,000, or .987 cents per cu. ft. The cost per sq. ft. was $38.65

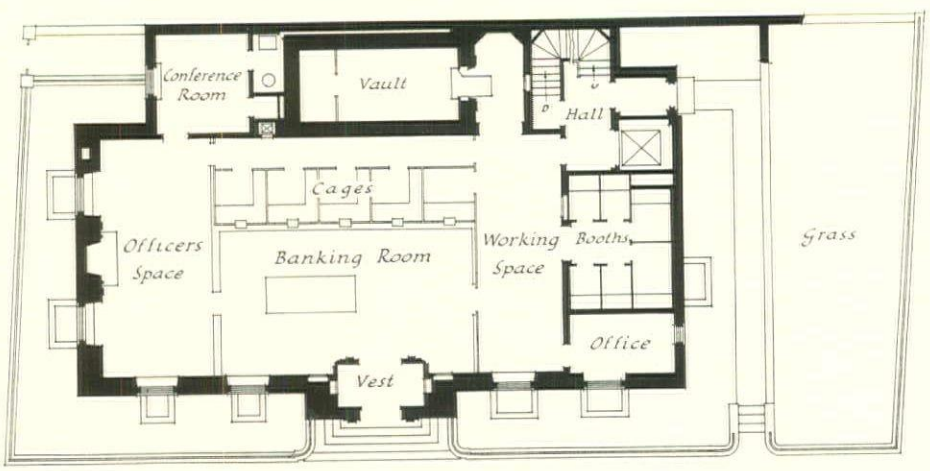
THE BLUE HILL BANK & TRUST CO.

MILTON, MASSACHUSETTS

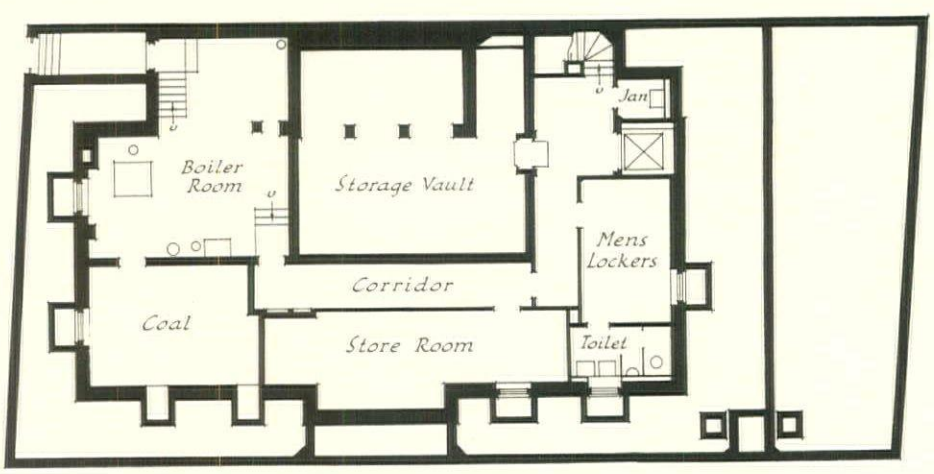
PARKER, THOMAS & RICE, ARCHITECTS



SECOND FLOOR PLAN

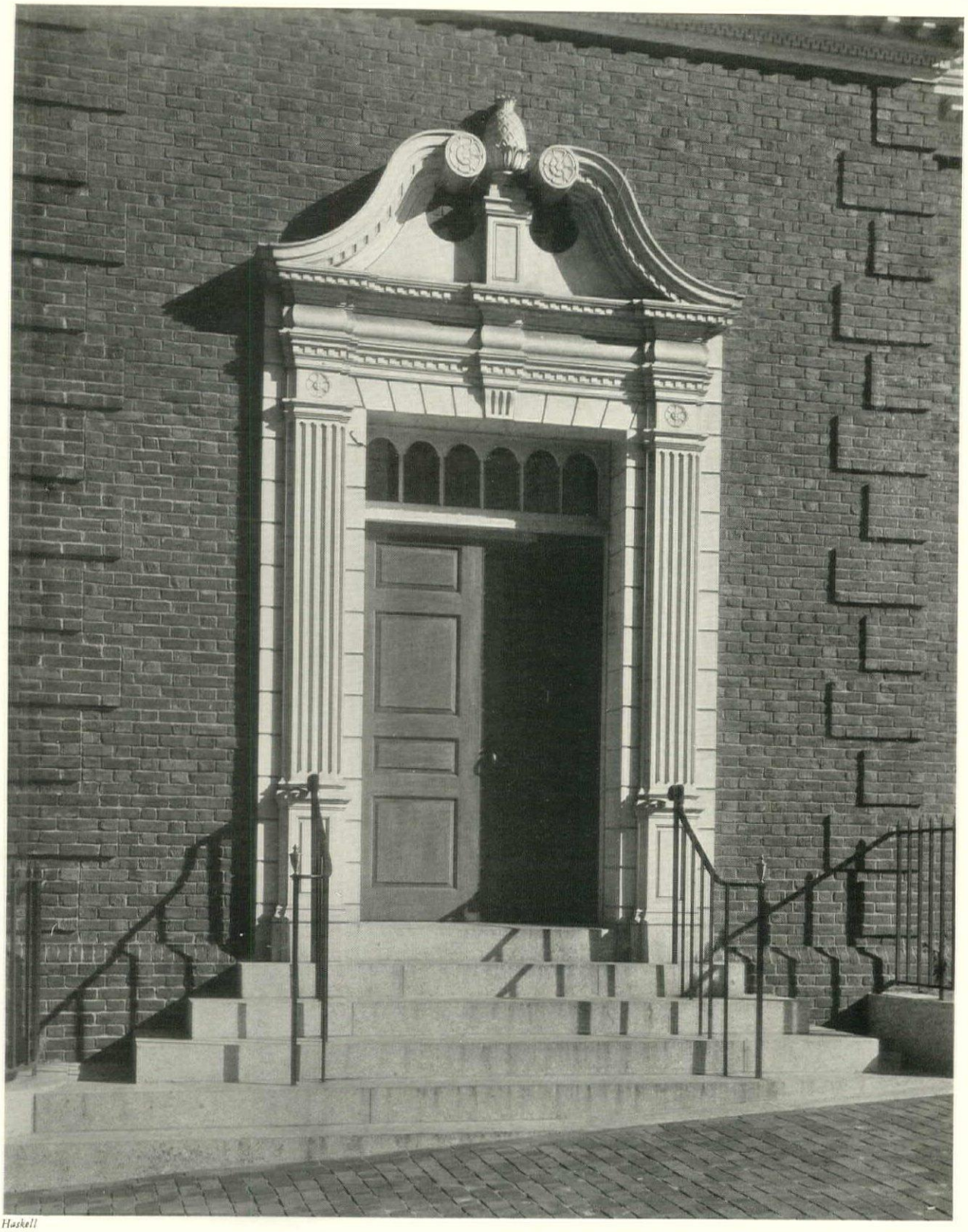


FIRST FLOOR PLAN



BASEMENT FLOOR PLAN

BLUE HILL BANK & TRUST CO.,
MILTON, MASSACHUSETTS
PARKER, THOMAS & RICE, ARCHITECTS



Haskell

BLUE HILL BANK & TRUST CO.,

MILTON, MASSACHUSETTS

PARKER, THOMAS & RICE, ARCHITECTS

Haskell Photos

THE interior of the main banking room, shown above, is pine paneled from base to ceiling line, the same wood being used for ceiling beams, tellers' cages, coupon rooms, etc. Vermont green slate is used for the floor of the banking room and the vestibule. Details of the vestibule, shown at the left, and of the fireplace in the officers' space are shown on page 38. The interior finish of the officers' space is the same as the banking room except that the former has rubber tile floors. All other floors are linoleum, and all trim and hardware is of special wrought iron

BLUE HILL BANK & TRUST CO.,

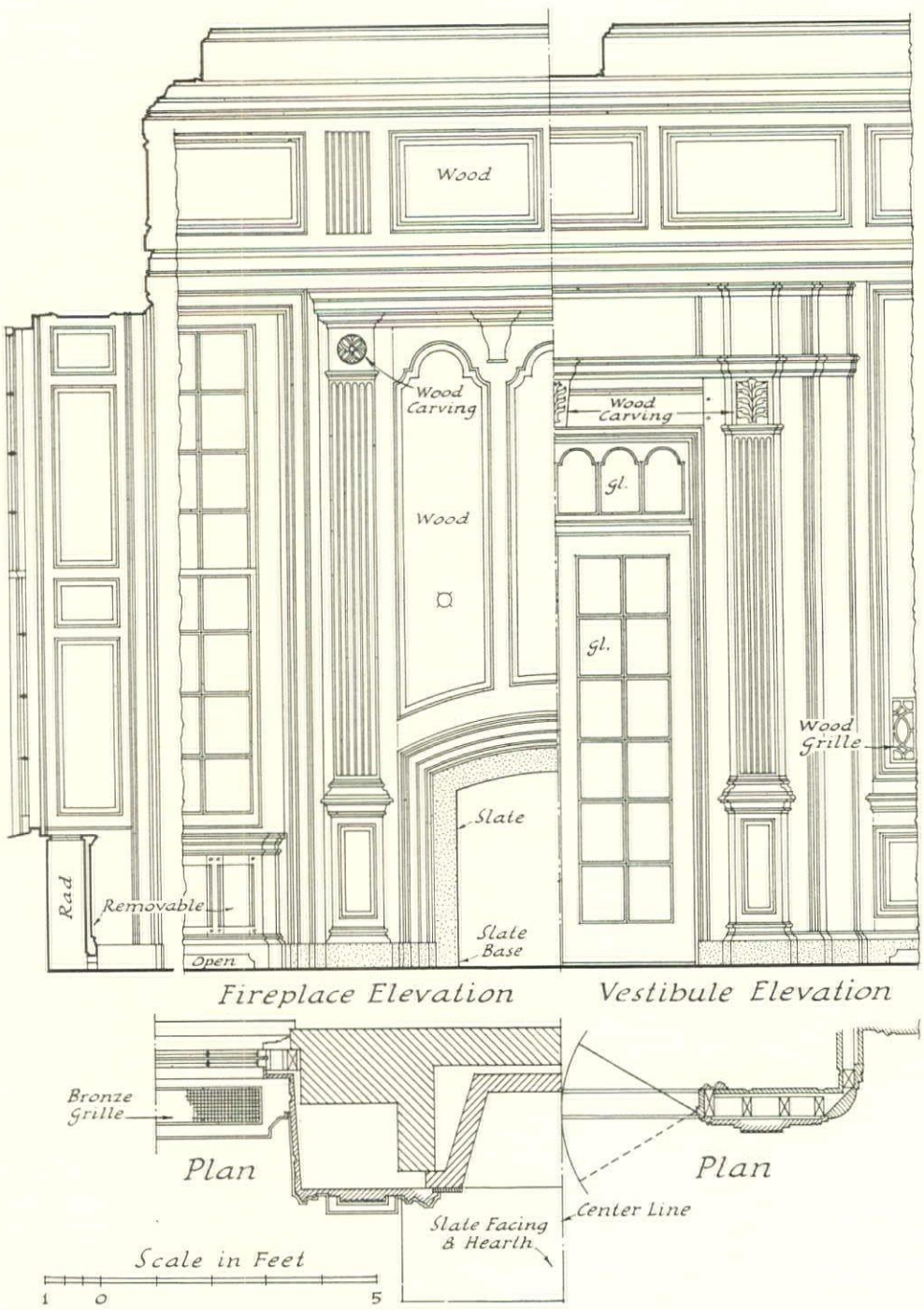
MILTON, MASSACHUSETTS

PARKER, THOMAS & RICE, ARCHITECTS

Haskell

FIREPLACE IN OFFICERS' SPACE

BLUE HILL BANK & TRUST CO.,
MILTON, MASSACHUSETTS
PARKER, THOMAS & RICE, ARCHITECTS



BLUE HILL BANK & TRUST CO.,

MILTON, MASSACHUSETTS

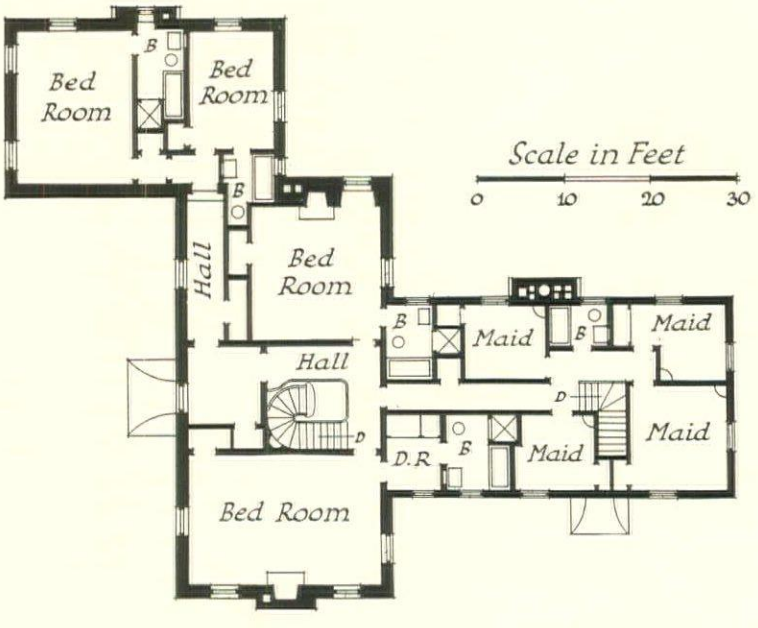
PARKER, THOMAS & RICE, ARCHITECTS

THE FORUM OF SMALLER BUILDINGS

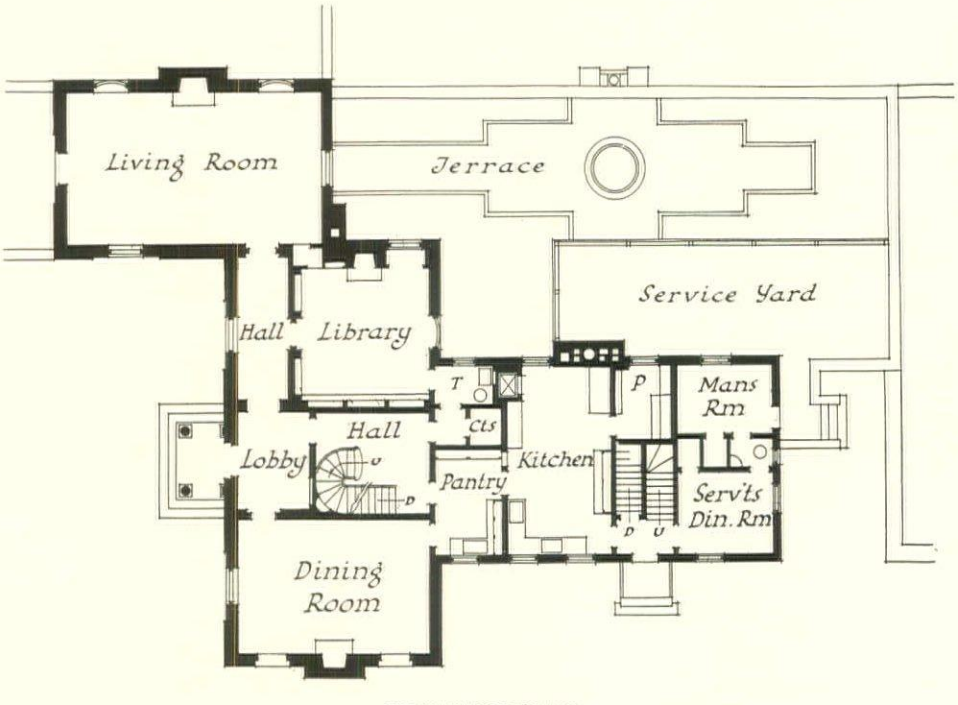
Nyholm & Lincoln

HOUSE OF ROTHWELL SHERIFF
LOCUST VALLEY, L. I., N. Y.
FULLER & DICK, ARCHITECTS

FOUR SMALL RESIDENCES



SECOND FLOOR PLAN

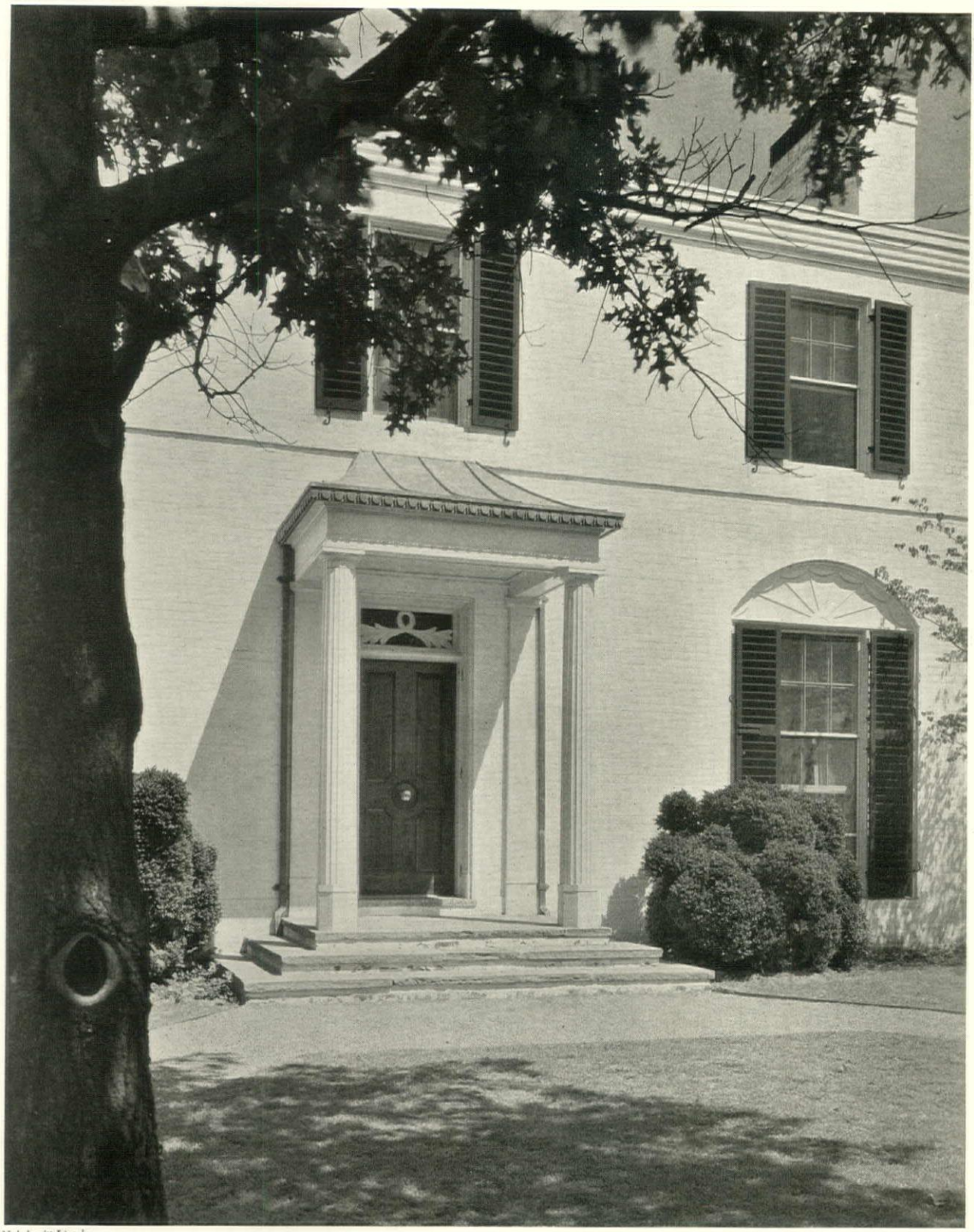


FIRST FLOOR PLAN

HOUSE OF ROTHWELL SHERIFF

LOCUST VALLEY, L. I., N. Y.

FULLER & DICK, ARCHITECTS

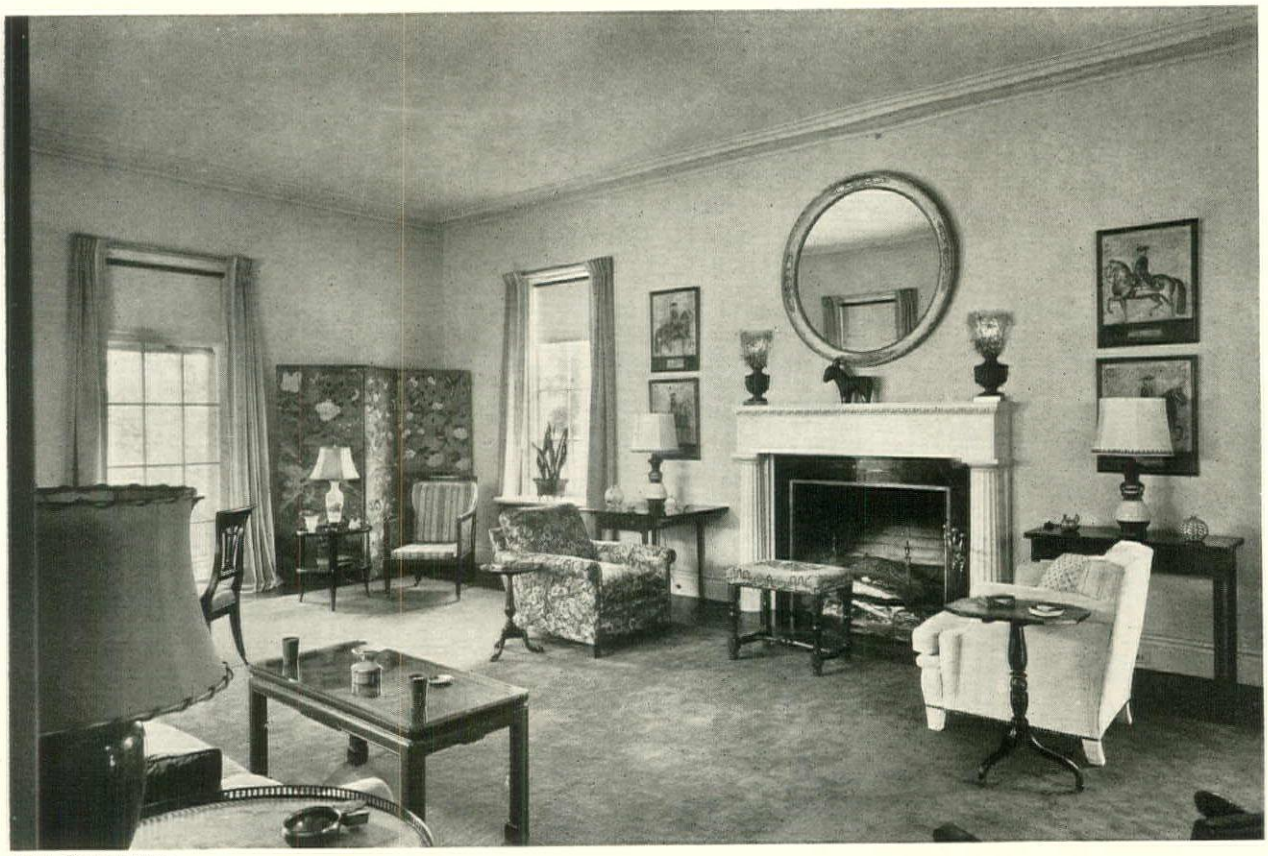


Nyholm & Lincoln

HOUSE OF ROTHWELL SHERIFF

LOCUST VALLEY, L. I., N. Y.

FULLER & DICK, ARCHITECTS



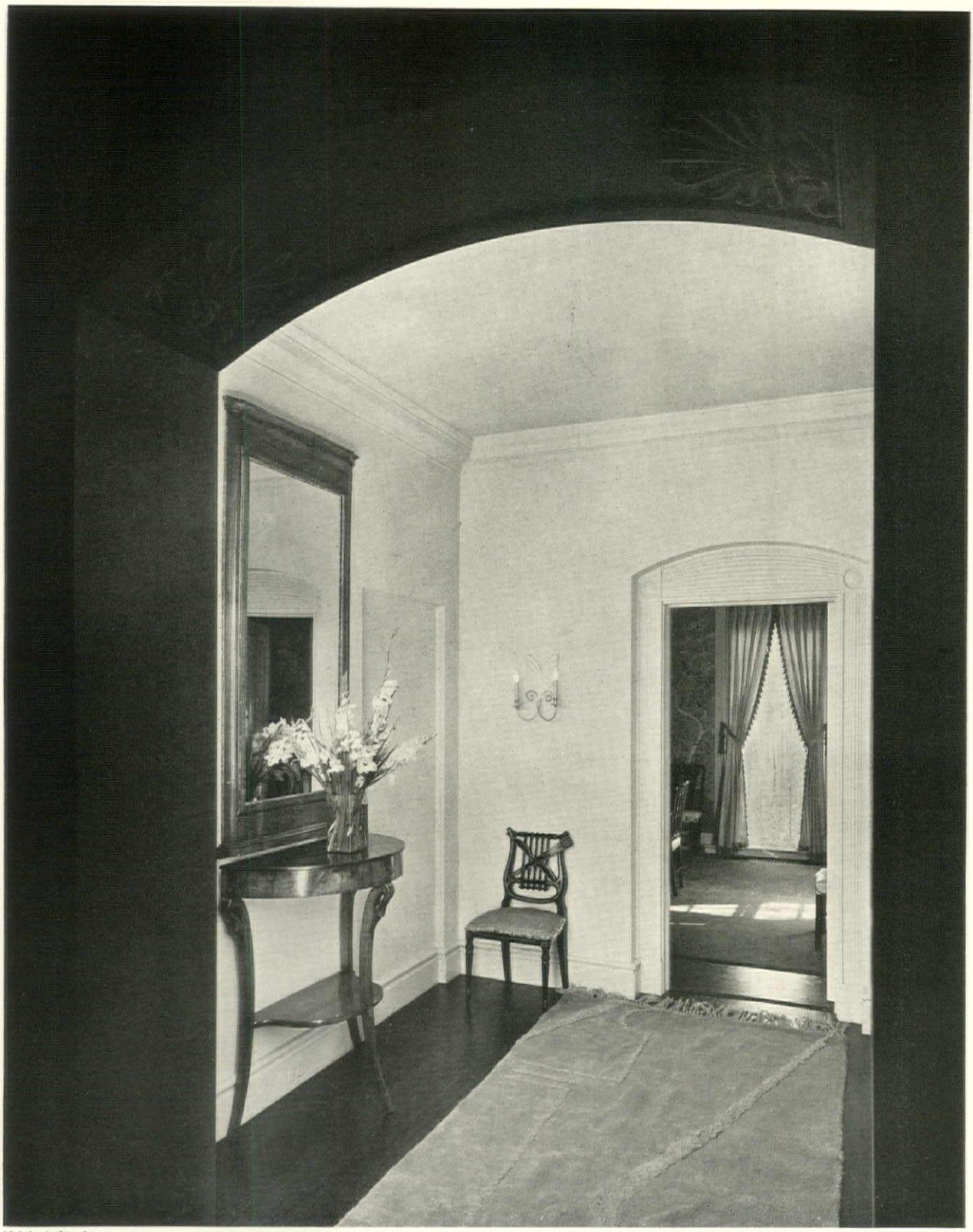
Nyholm & Lincoln Photos

THE main portion of this residence is constructed of cinder block walls with a brick veneer, whitewashed. The service portion has stud walls, stuccoed and painted white. Blue slate is used for the roof, and sheet lead for the main entrance hood. Trim is white painted wood. The living room, above, has painted walls and a floor of herring-bone oak. The library at the left is paneled in butternut and has a walnut floor. Between these two rooms, as the plan shows, there is a radio closet serving both. The hall leading into the dining room, opposite, has painted walls and plank floor

HOUSE OF ROTHWELL SHERIFF

LOCUST VALLEY, L. I., N. Y.

FULLER & DICK, ARCHITECTS



Nyholm & Lincoln

HOUSE OF ROTHWELL SHERIFF

LOCUST VALLEY, L. I., N. Y.

FULLER & DICK, ARCHITECTS

Nyholm & Lincoln Photos

ABOVE is the master's bedroom, which has papered walls and a plank floor. The fireplace facing and hearth are of marble. The dining room at the left is marked by its hand painted scenic wall paper which is in itself the complete wall decoration

HOUSE OF ROTHWELL SHERIFF

LOCUST VALLEY, L. I., N. Y.

FULLER & DICK, ARCHITECTS

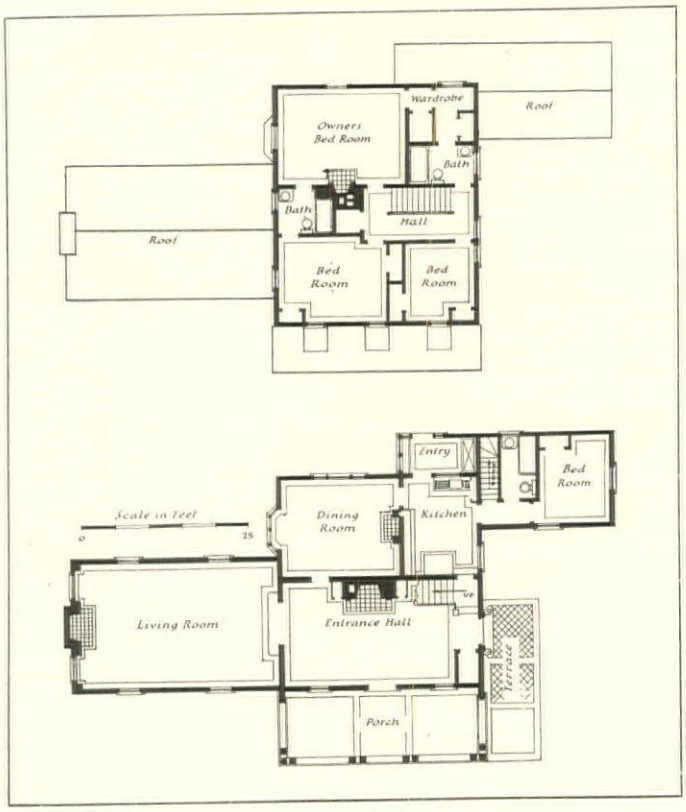
Gillies

HOUSE OF MRS. G. T. McQUADE

FREEPORT, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

Gillies



THIS small frame house, with a cubage of 30,850 cu. ft., employs the familiar 4 in. stud construction. It is built on a concrete foundation and has a waterproofed basement in which there is a large room used as a laundry and game room. White painted shingles are used for the sidings and weather-stained shingles for the roof. The house is oriented to take full advantage of the location and shape of the lot, with a large living room wing, a separate service wing, and the two-story central portion. Requirements of the owner were carried out in such features as the large entrance hall, the enclosed porch, the unusually large living room, and the location of the master's bedroom wardrobe adjacent to the bath. The cubic foot cost of the house was approximately 70 cents

HOUSE OF MRS. G. T. McQUADE

FREEPORT, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

Gillies

HOUSE OF MRS. G. T. McQUADE

FREEPORT, L. I., N. Y.

DWIGHT JAMES BAUM, ARCHITECT

Gottscho

HOUSE OF MRS. G. T. McQUADE

FREEPORT, L. I., N. Y.

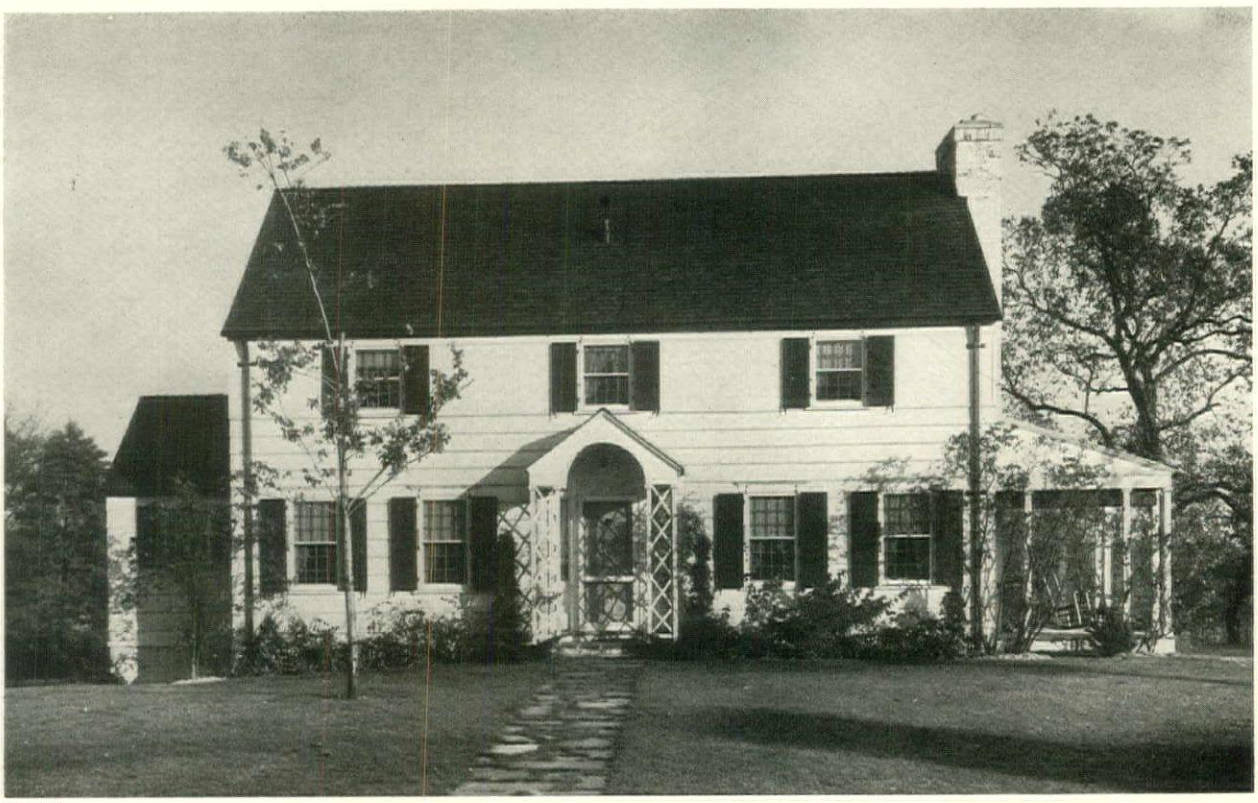
DWIGHT JAMES BAUM, ARCHITECT

Van Anda

HOUSE OF HOMER WICKENDEN

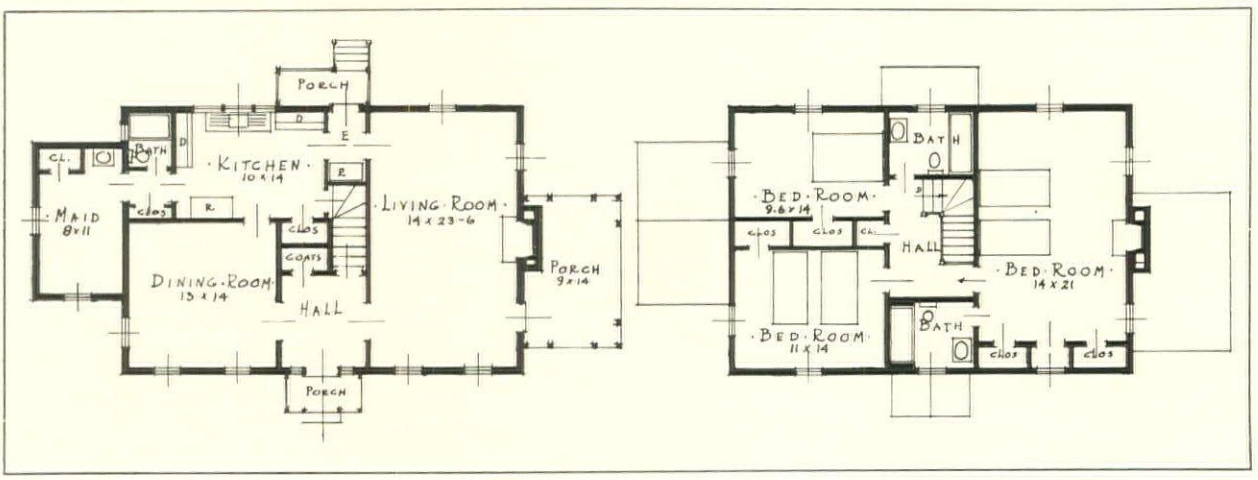
TUCKAHOE, NEW YORK

JAMES J. BEVAN, ARCHITECT



Van Anda

THE house illustrates one of the many adaptations of the center hall type of colonial plan. The entrance faces the west, giving the living room the benefit of a southern exposure which is somewhat lessened, however, by the location of the fireplace. The building was an economical one of frame construction with a stained shingle roof, shingle walls painted white, and light green shutters. The chimney is built of whitewashed brick. The house is heated by a hot water system with an automatic feed boiler, the roof being insulated with balsam wool



HOUSE OF HOMER WICKENDEN

TUCKAHOE, NEW YORK

JAMES J. BEVAN, ARCHITECT

Van Anda

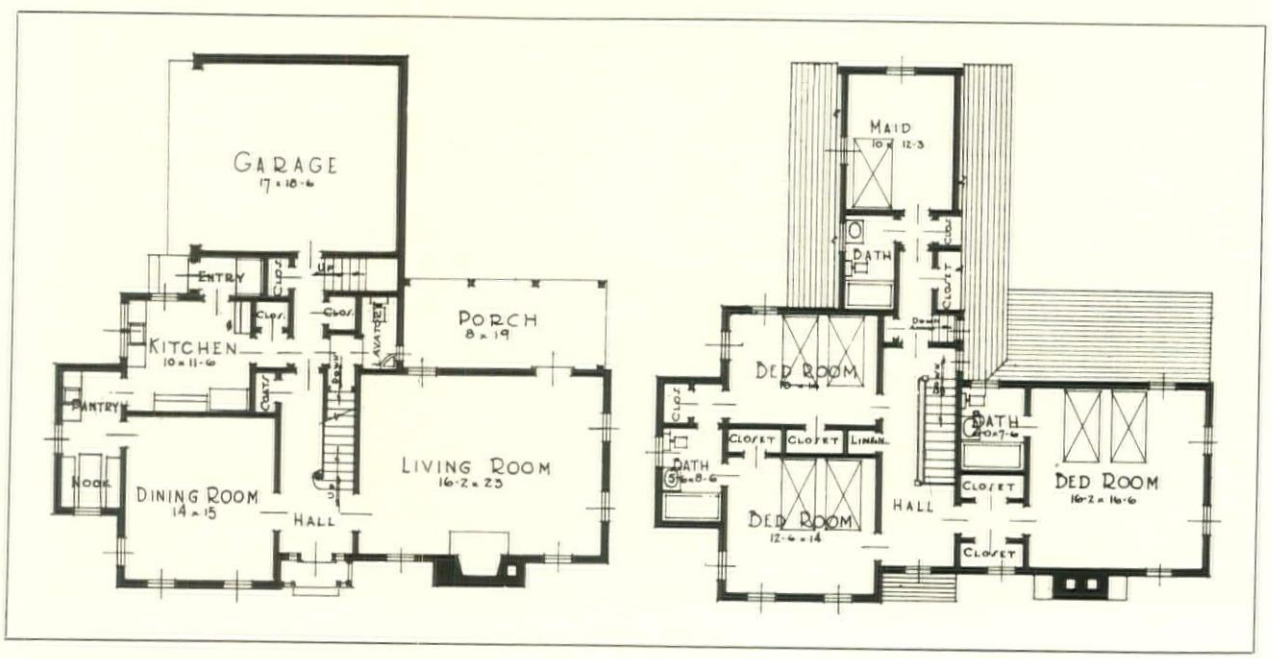
HOUSE OF ELMER W. NYE

BRONXVILLE, NEW YORK

JAMES J. BEVAN, ARCHITECT

Van Anda

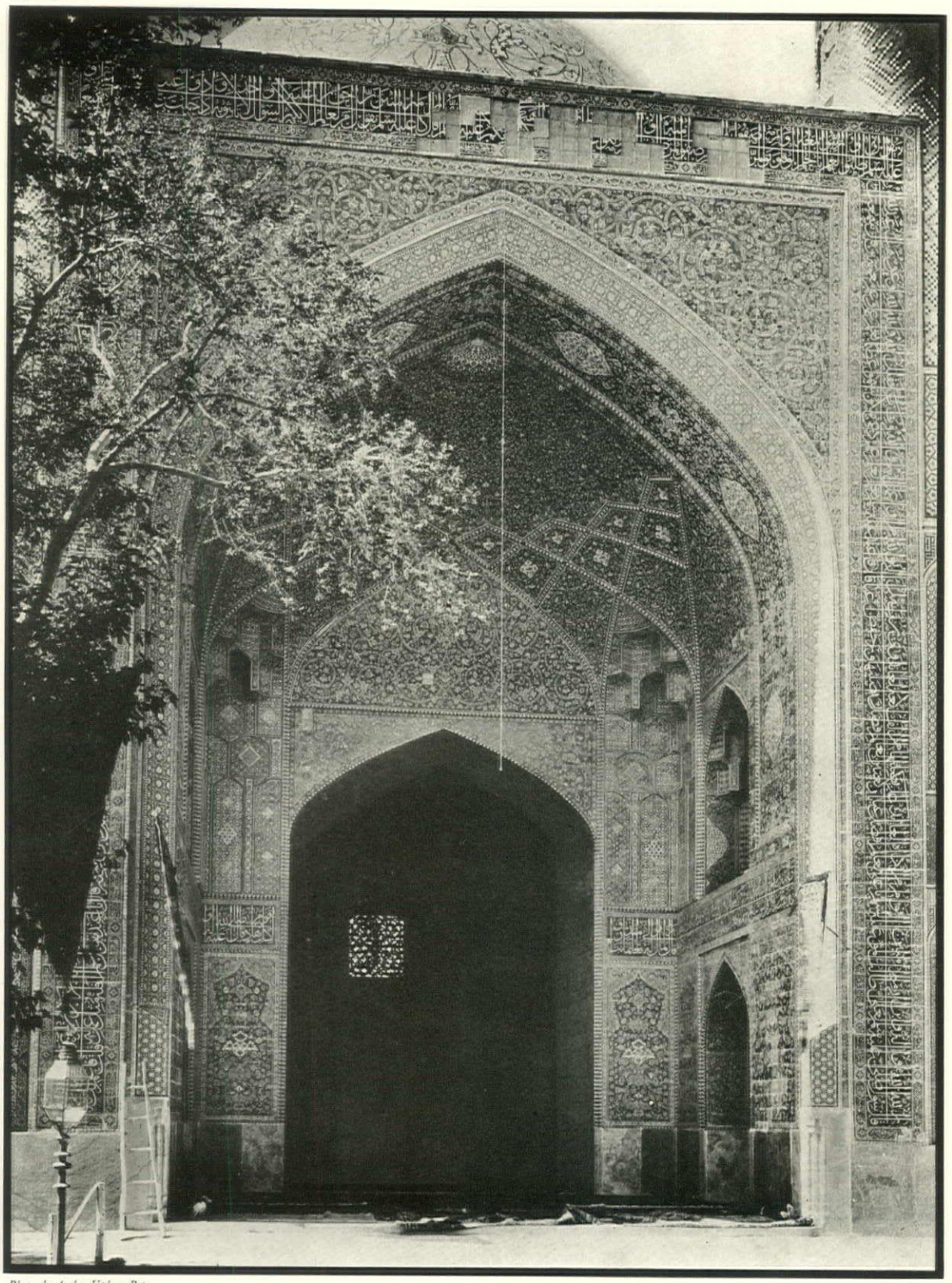
THE house faces west and is set upon a wedge-shaped lot which narrows toward the rear, and at the front overlooks a golf course in a valley below. The house, completed in 1929, is of frame construction with a black slate roof, and white painted shingle walls. The chimney is stuccoed over brick. The shutters on the first floor are painted a light buff; on the second floor they are dark gray. Heating is by a vapor system with an oil burner



HOUSE OF ELMER W. NYE

BRONXVILLE, NEW YORK

JAMES J. BEVAN, ARCHITECT



Photos by Arthur Upham Pope

ENTRANCE ARCHWAY

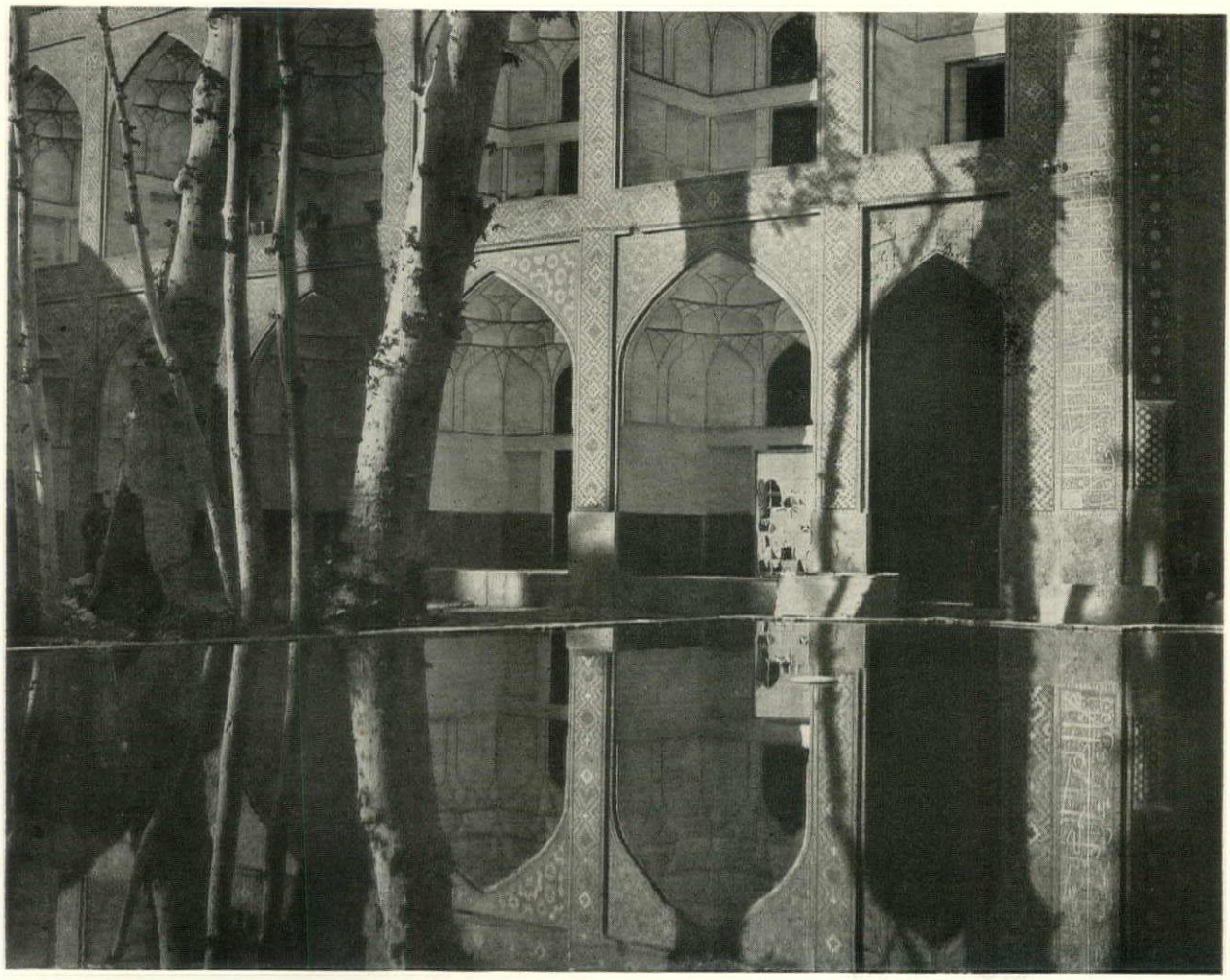
COLLEGE OF MADER-I-SHAH

ISPAHAN, PERSIA

THE COURT

COLLEGE OF MADER-I-SHAH

ISPAHAN, PERSIA



THE COURT

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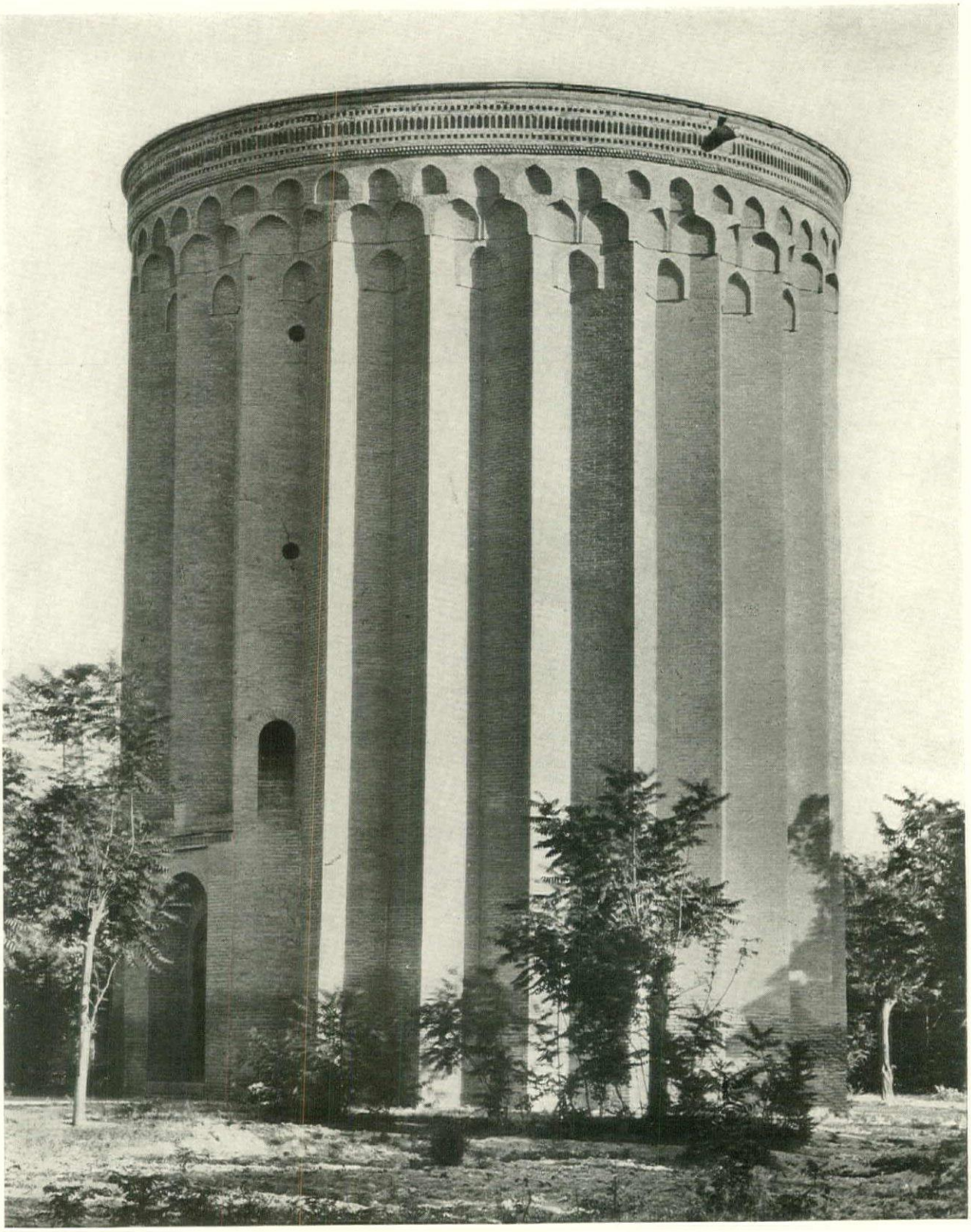


TOMB TOWER OF TOGHRIL

RAY, PERSIA

PERSIAN ISLAMIC BRICKWORK

Almost unknown in the detail of its design and technique, the brickwork of Persia offers a new source of inspiration to the architect of today. The illustrations in this article have been reproduced from a series of photographs through the courtesy of the American Institute for Persian Art and Archæology

BY

MYRON BEMENT SMITH*

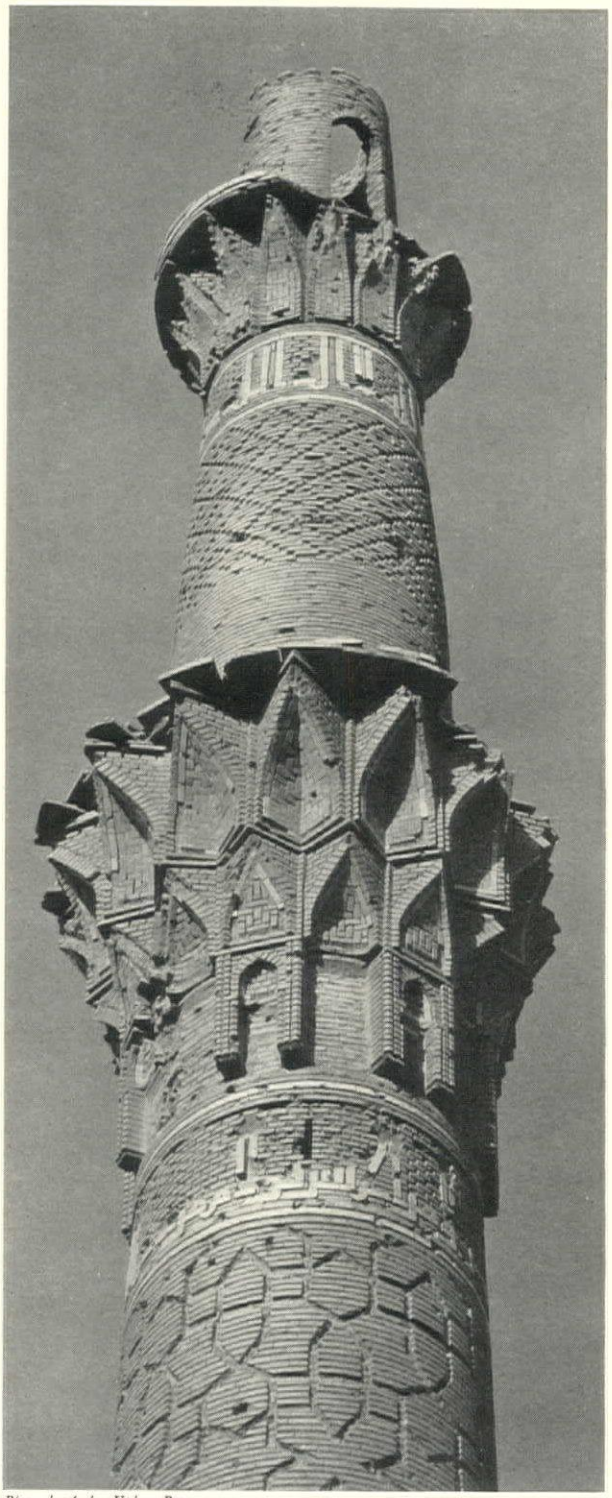
PERSIAN brickwork, technically the most amazing that has ever been produced, deserves, and sometime doubtless will receive, a careful study at full scale in the manner of Nathaniel Lloyd's masterly book on English brickwork. It is surprising that so important an art has been studied so little.

Due to Persia's present geographical isolation, and the long directed attention of historians on Rome for the origins of medieval forms, the architectural contributions of Persia have been recognized by but few scholars other than Strzygowski. The history of Persian architecture has not been written, and in the field of specialized study little has been produced other than the excellent survey of certain monuments made by Professor Sarre and his assistants, the monographs on the Khorasan district by Professor Diez and the studies of Captain Creswell on the Persian origins of the double dome. With scores of monuments yet to be discovered, the field is ripe for some A. Kingsley Porter to do for the Islamic architecture of Persia what that brilliant scholar did for Lombard architecture in Italy.

The tradition of brickmaking in Persia is not new; it is quite possible that brickmaking was invented on the Iranian plateau. Archæologists now know that it was people from highlands in that direction who took the arts with them to Sumer, and that the Sumerians in turn took them on to found the civilization of Egypt. Coming down to historical epochs, the glazed and molded brick reliefs of Susa, notably the frieze of archers, are familiar to all who visit the Susanian gallery of the Louvre. They are part of the tradition of Persian masonry architecture, one of heavy walls of sun-dried or baked brick, incrusted on the exterior and interior surfaces with baked brick, faience or stucco.

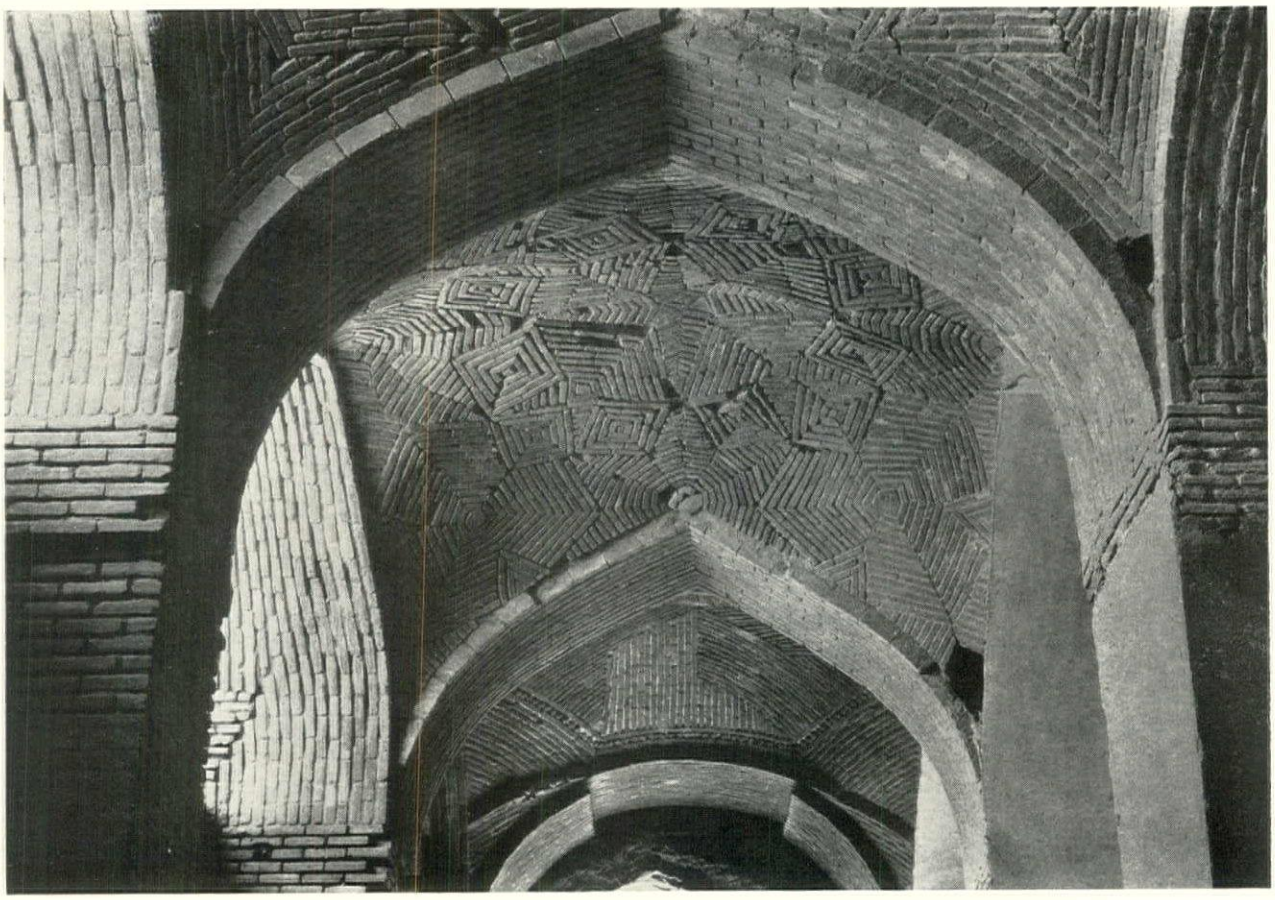
In the Islamic period, this building tradition

*Secretary of the American Institute for Persian Art and Archæology.

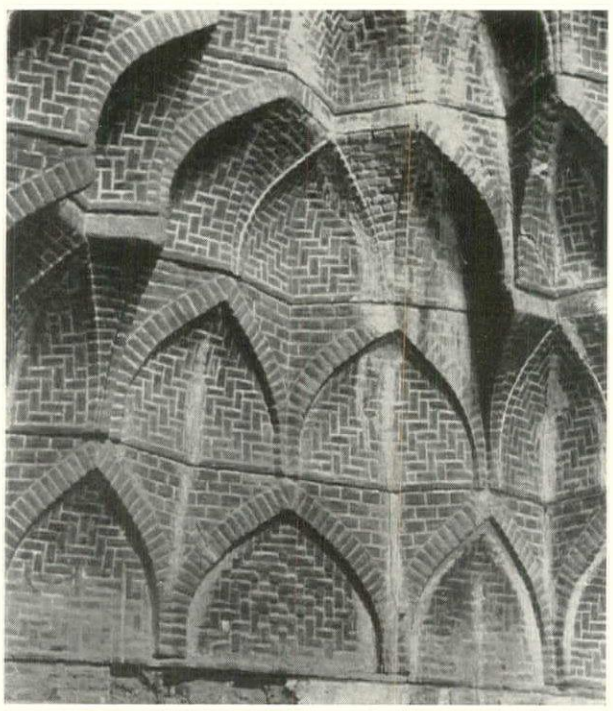


Photos by Arthur Upham Pope

The Sareban Minaret in Isfahan, built in the Fourteenth Century, which illustrates the Persian method of dividing the shaft into zones by varying the pattern of brick

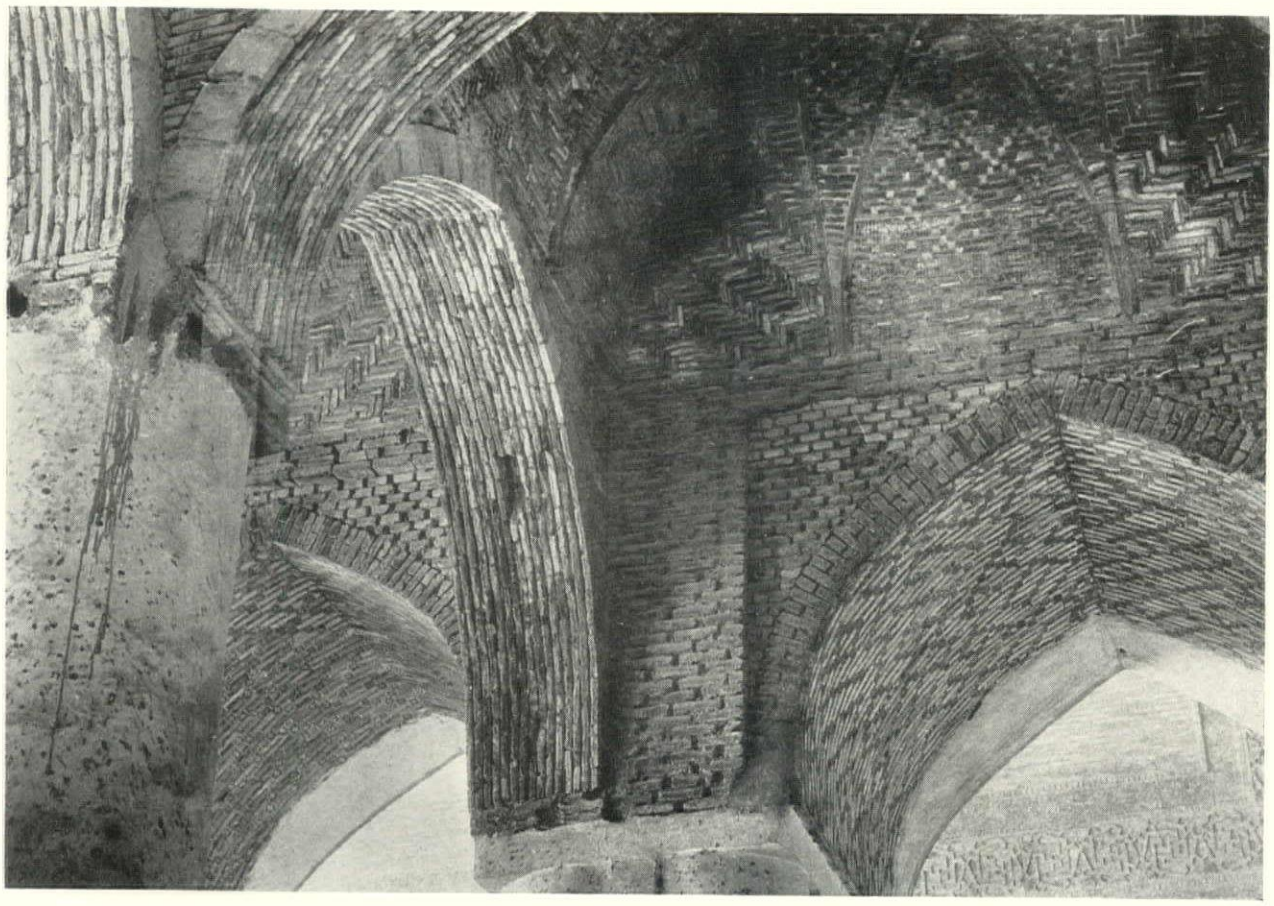


Above is a view of the vaults in the Jami Mosque in Isfahan, which was built probably in the Ninth Century. The Jami Mosque is noted particularly for the variety of geometric patterns used in its vault construction. Below is the Mosoleum of Baba Ghasem in the same city. It was built in 1219 A.D. The detail presented here is a niche showing cusped brickwork laid in an intricate herringbone pattern, an early form of stalactite vaulting



persisted. Under the Seljuks (A.D. 1037–1194), faience incrustation in glazed tile and faience mosaic was developed to a degree of perfection never since equaled. In the later Timurid period (A.D. 1369–1500), bold decorative schemes of plain brown bricks, juxtaposed with colored enamel bricks, were used in conjunction with faience mosaic. To this era belongs the famous Blue Mosque of Tabriz. Under the Safavids (A.D. 1502–1736), it became the custom to sheathe the exterior of the domes with either mosaic faience cut from slabs, or with copper plates heavily surfaced with pure gold. Modeled stucco, and painted stucco in imitation of polychrome faience, were used with the brickwork revivals.

No impression of Persian brickwork would be accurate without mention of the polychromy of tile and mosaic faience in conjunction with which the terra cotta color brick was so often combined. In the Safavid period, a background of deep cobalt blue was almost universal. Against this color was employed an intense turquoise blue, light emerald green, fawn color, pure black, clean white and

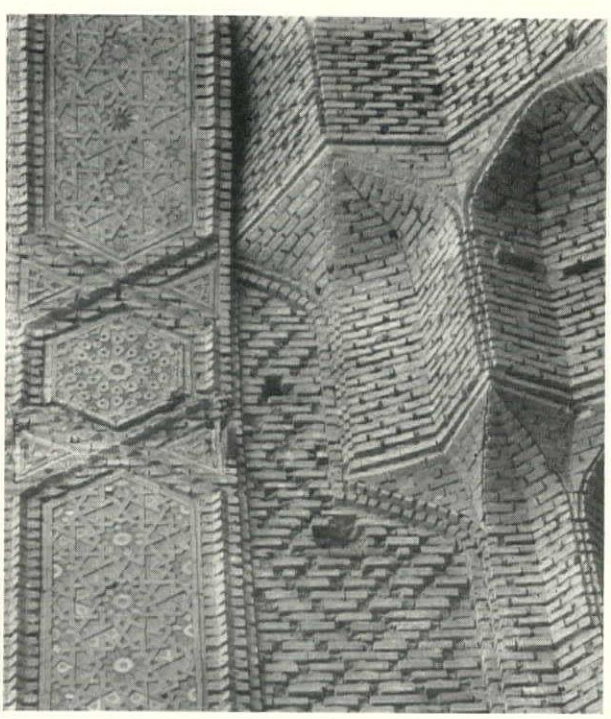


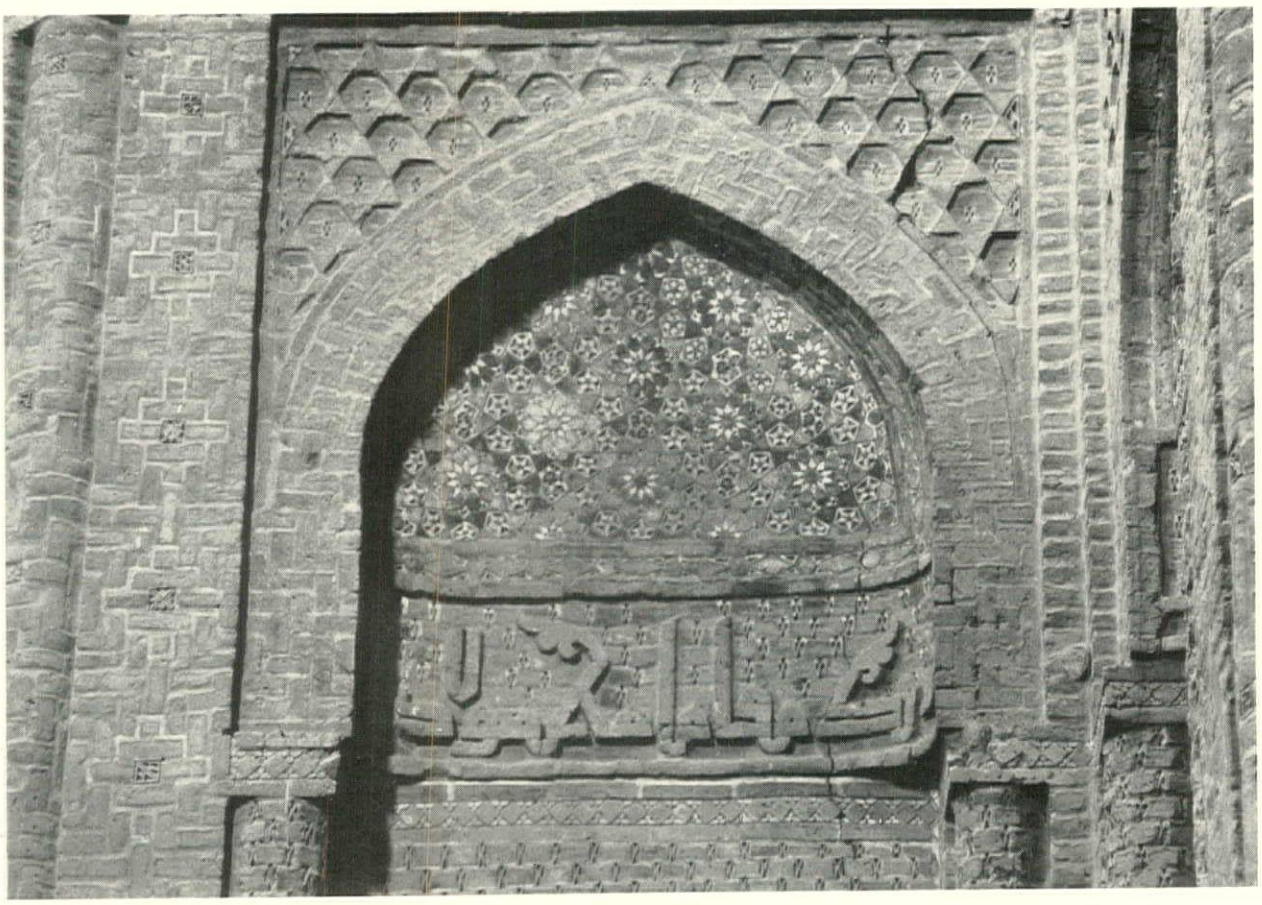
An unusual view of the vaults adjoining the great dome chamber in the Jami Mosque. The Persian feeling for variety in pattern is no better illustrated than in this almost confusing series of courses and inlays. Below is a detail of the portal to the Sanctuary in the Jumeh Mosque in Varamin, which was built in 1322 A.D. The panel at the left, illustrating a typical treatment, is in polychrome faience, chiefly turquoise and dark blue

clear golden yellow. Because of the accidental variations in firing, the individual colors were pale in some areas, deeply intensified in others.

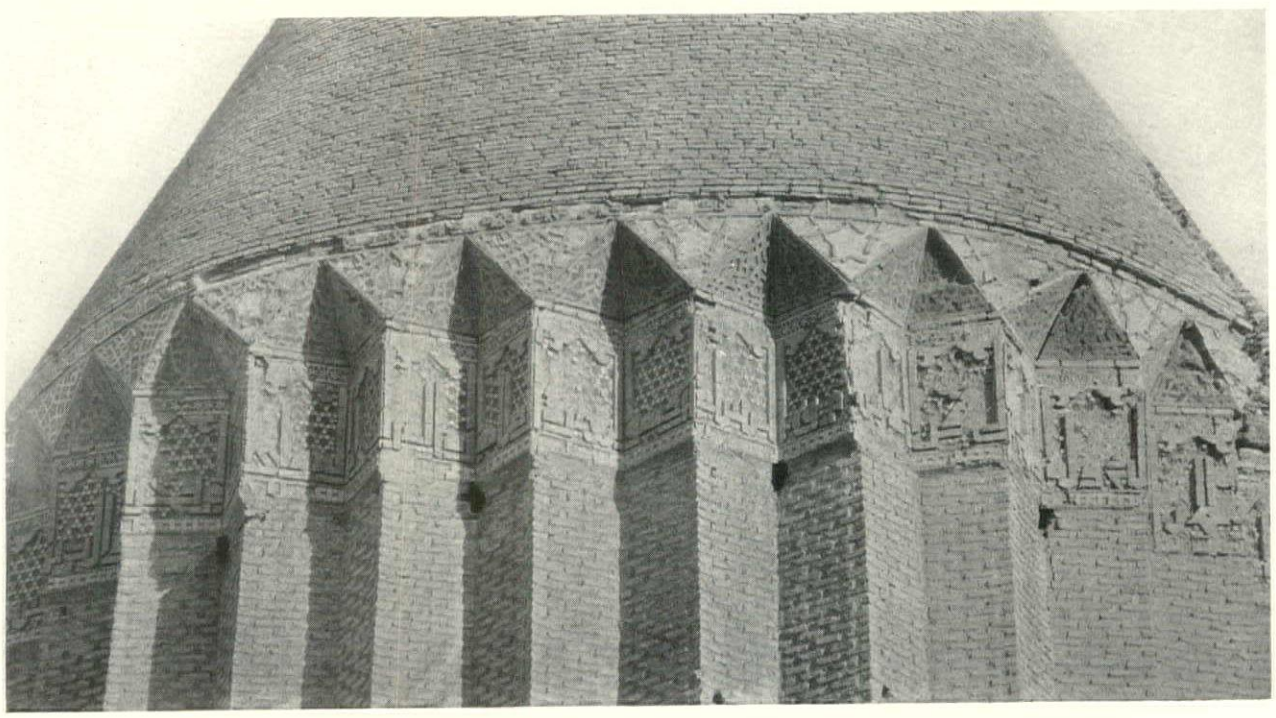
Due to the nature of the Persian method of building, it was natural that the decoration of the surface should become an end in itself. Walls were divided into bold panels, often carried to such an extent that Persian architecture has been referred to as a paneled style. This scheme of decoration contributed to the development of the brickwork, which was used, either by itself or in conjunction with other materials, both to frame the panels and to fill the fields enclosed.

Beginning with the mortar joints, it will be noticed that these were often deeply raked, generally with emphasis on the horizontal. Occasionally a pattern was made by raking certain joints or by treating two bricks as a single unit, the joint between being minimized and flush. The next development was to make bolder patterns of diapers and frets by sinking certain bricks to a plane below that of the wall surface. Both of the above were expedients to break up the flat surface,



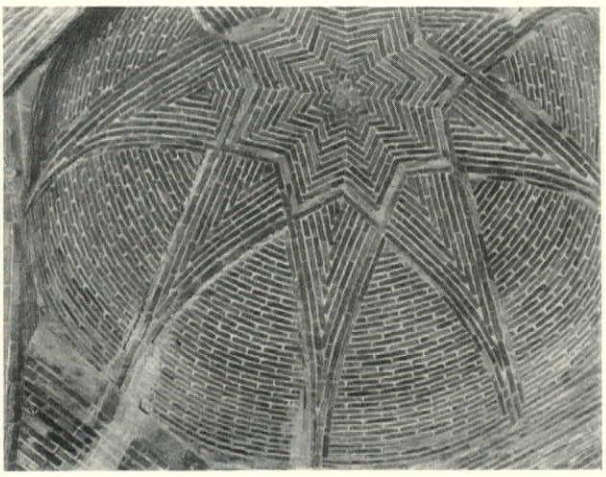


Niche in the dome chamber of Malek Shah in the Jami Mosque, employing both surface and color relief



This tomb tower at Varamin was built in the Twelfth Century. The Kufic frieze and roof cone are in bright blue faience. The faience incrustation in glazed tile, as shown here, reached its highest development in this era

One of the more familiar type of honeycomb patterns found in the vaults of the Jami Mosque in Isfahan



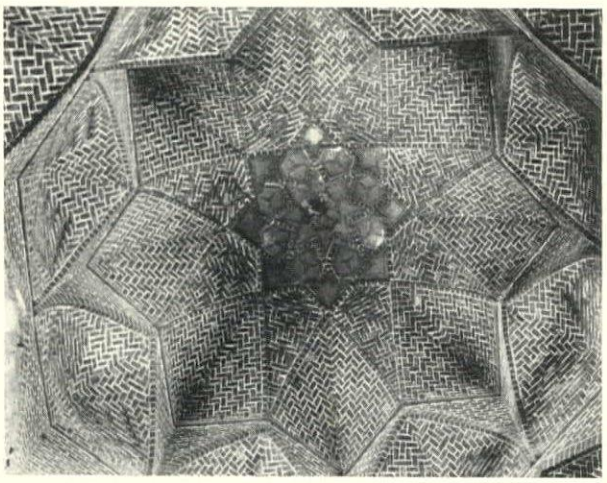
Another vault in the Jami Mosque, with a less intricate herringbone pattern than the other vaults

to "let air into the wall," to make it appear less heavy and solid. Another means to this end was the introduction of terra cotta plugs, generally in the vertical joints. These plugs were impressed with geometric designs, and being of fractional dimensions of the bricks, they not only lightened the effect of the wall, but also gave the bricks scale, and due to their lighter tone, produced a mild play of color. Polychromy by the use of glazed and unglazed bricks was resorted to extensively in the Timurid period, notably at Samarkand.

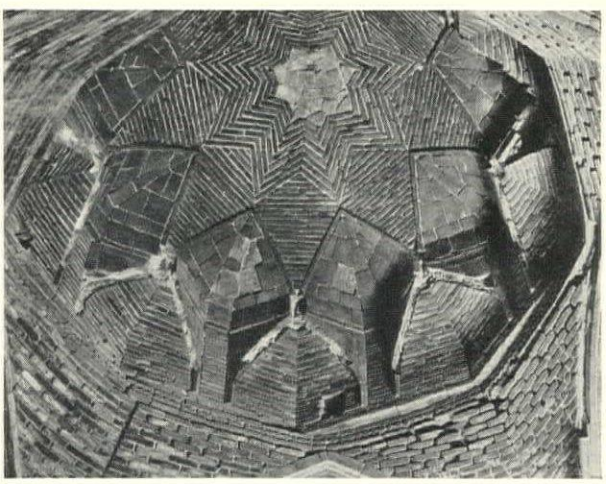
The ornament of the earlier minarets was effected by dividing the shaft into zones by means of elaborate bands of brick pattern, often combined with Kufic inscriptions worked out in the same material. Each of the zones was then treated with a different form of brick mosaic, or diaper, in two planes.

Brick mosaic was often used in complicated vault and dome construction, as in the Jami Mosque, Isfahan. All possible variations of herringbone pattern were employed, the terra cotta plugs were used in various ways, and larger pieces of terra cotta inlay were occasionally inserted. In the more intricate vaults, the field was divided with a honeycomb pattern or broken up with rudimentary stalactite cusps.

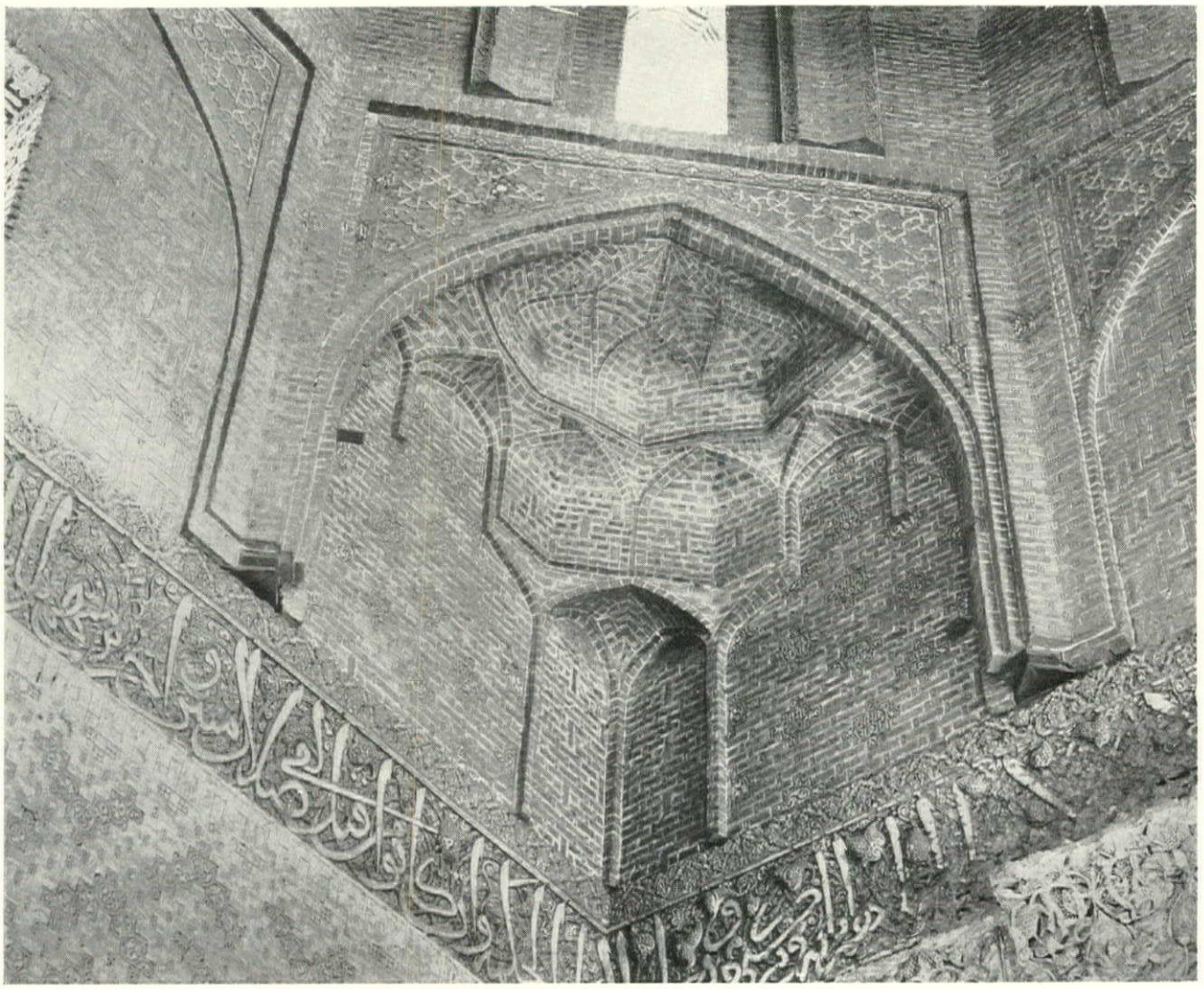
A highly ingenious technique of the Persian bricklayers was that of brick and stucco mosaic. Bricks were laid on edge in geometric patterns, while the space between them was filled with mortar to give a second surface on a sunken plane. This technique was not peculiar to Persia; it was used in practically the same way in Byzantine structures, notably at Mistra. A fine example is the mausoleum of Mumine Chatun at Nachtschewan, northwest Persia. The sunken surface of the plaster was pricked, stamped and modeled, while the bricks themselves were glazed in polychrome.



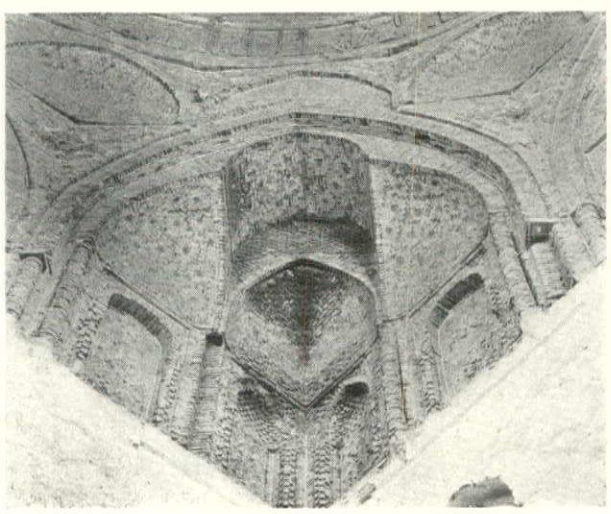
Interior of the dome in the Mosoleum of Baba Ghasem, showing the often used cusping in a herringbone pattern

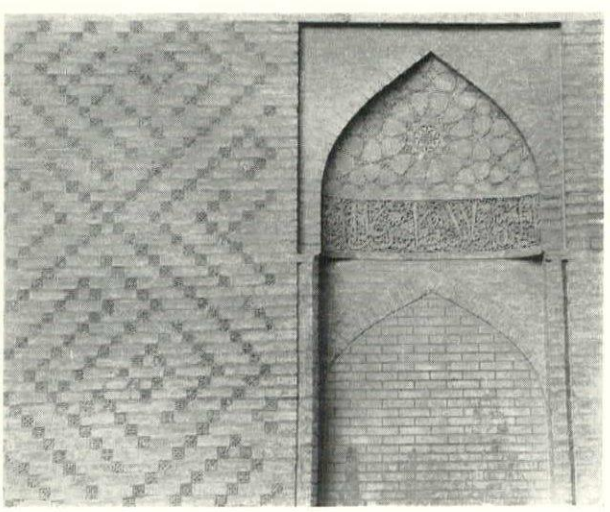


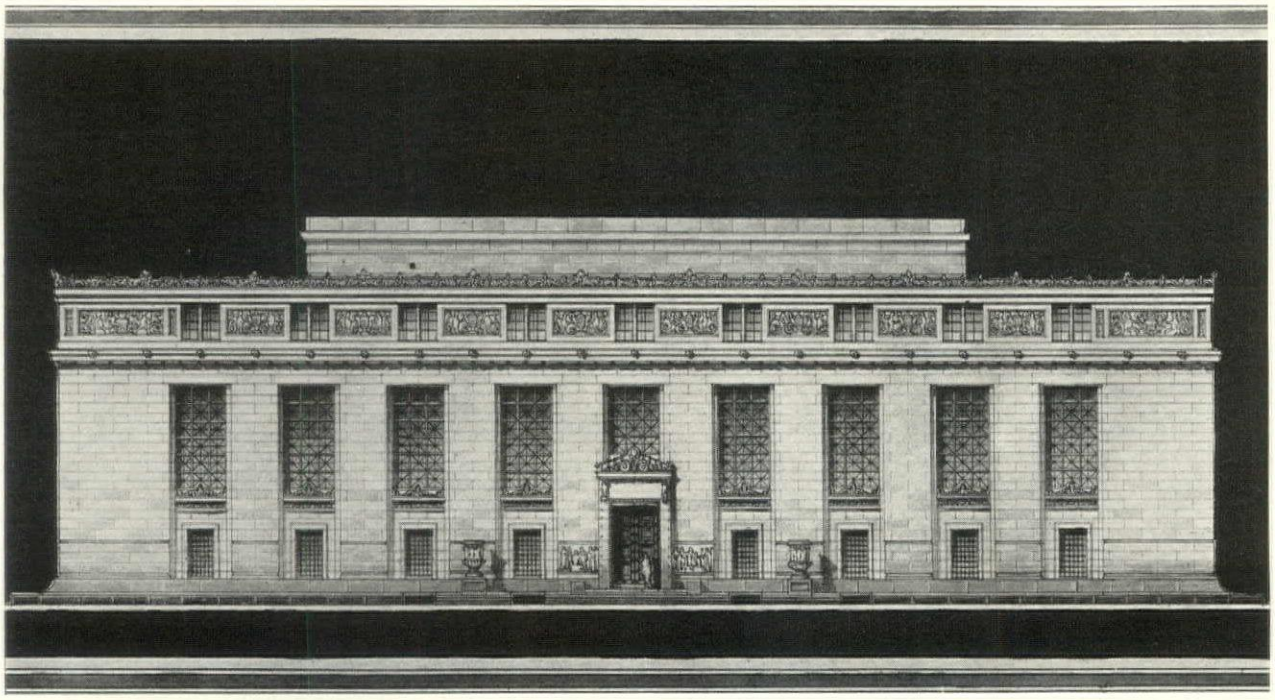
Another illustration of cusping, this one taken from the Jami Mosque. The center inlay has been destroyed



Above is a view of the dome of the Sanctuary in the Jumeh Mosque in Varamin. The construction of the squinch, similar to the one shown below at the left, is typical of Fourteenth Century work. Below the squinch the Kufic characters spell a verse, probably from the Koran. At the bottom right is a detail of the southeast archway in the Jami Mosque, which although more elaborately patterned than the brickwork of today, is simple in comparison to the other examples shown. The squinch at the bottom left is in the great dome chamber of the Jami Mosque, Isfahan





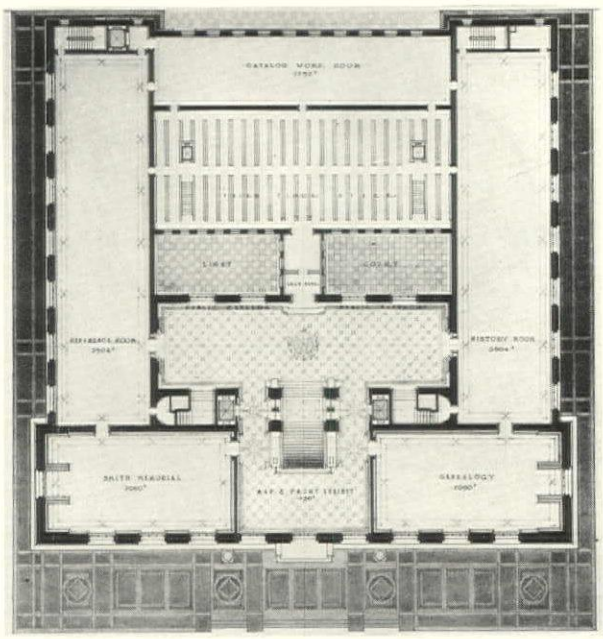


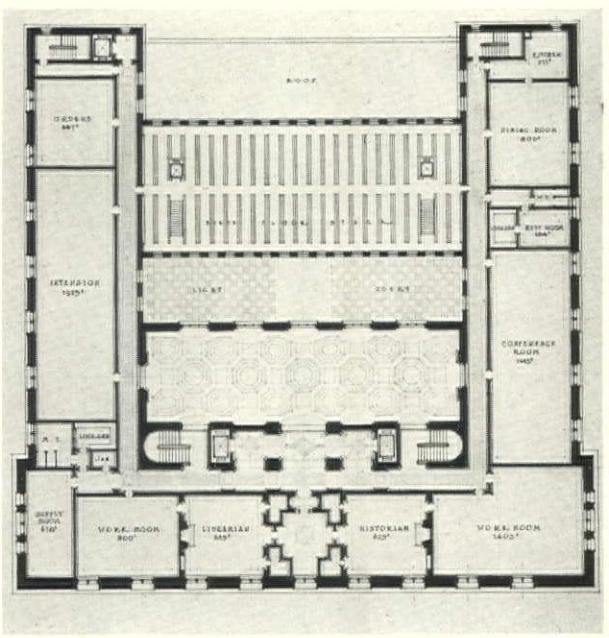
STATE LIBRARY AND HISTORICAL BUILDING

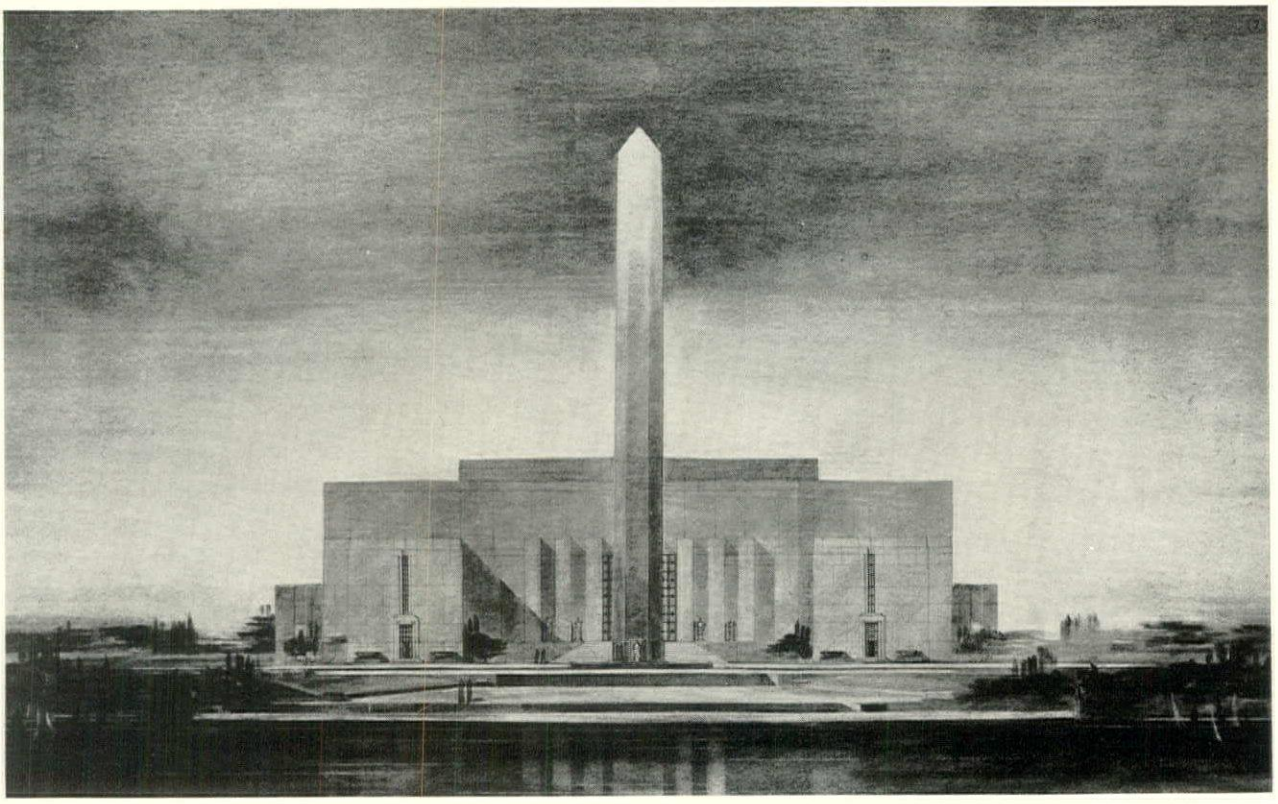
INDIANAPOLIS, INDIANA

WINNING DESIGN BY PIERRE & WRIGHT, ARCHITECTS

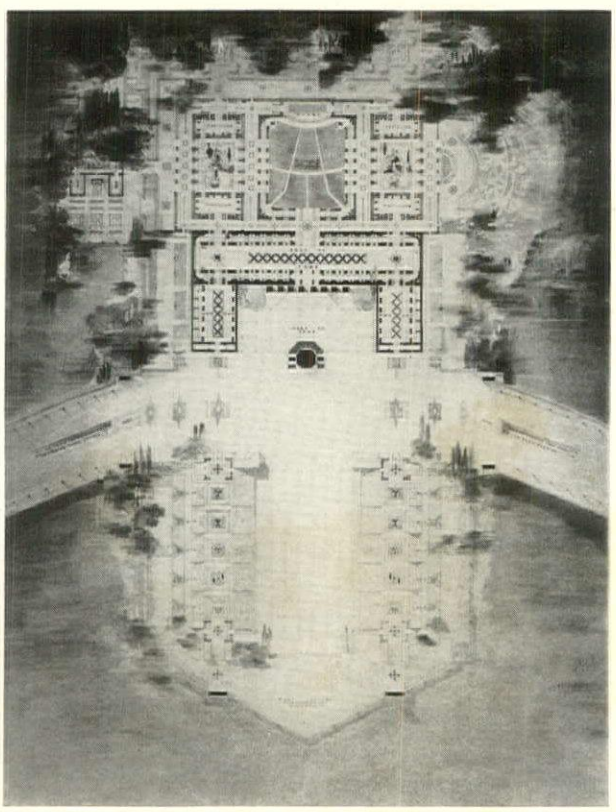
THE illustrations on this page are of the winning design in the recent competition for a State Library and Historical Building for the State of Indiana. Pierre & Wright, whose design is reproduced here, were the winners of the first prize and have been retained as the architects of the building. The program called for a fireproof structure to contain 1,380,000 cu. ft., and to house the State Law Library, the archives of the Historical Commission and the William Henry Smith Memorial Library. The jury consisted of Edgerton Swartout, Raymond Hood and J. C. Ferguson, the librarian of the City of Brooklyn







ROTCH SCHOLARSHIP COMPETITION, 1932



WINNING DESIGN BY CARROLL COLETTI

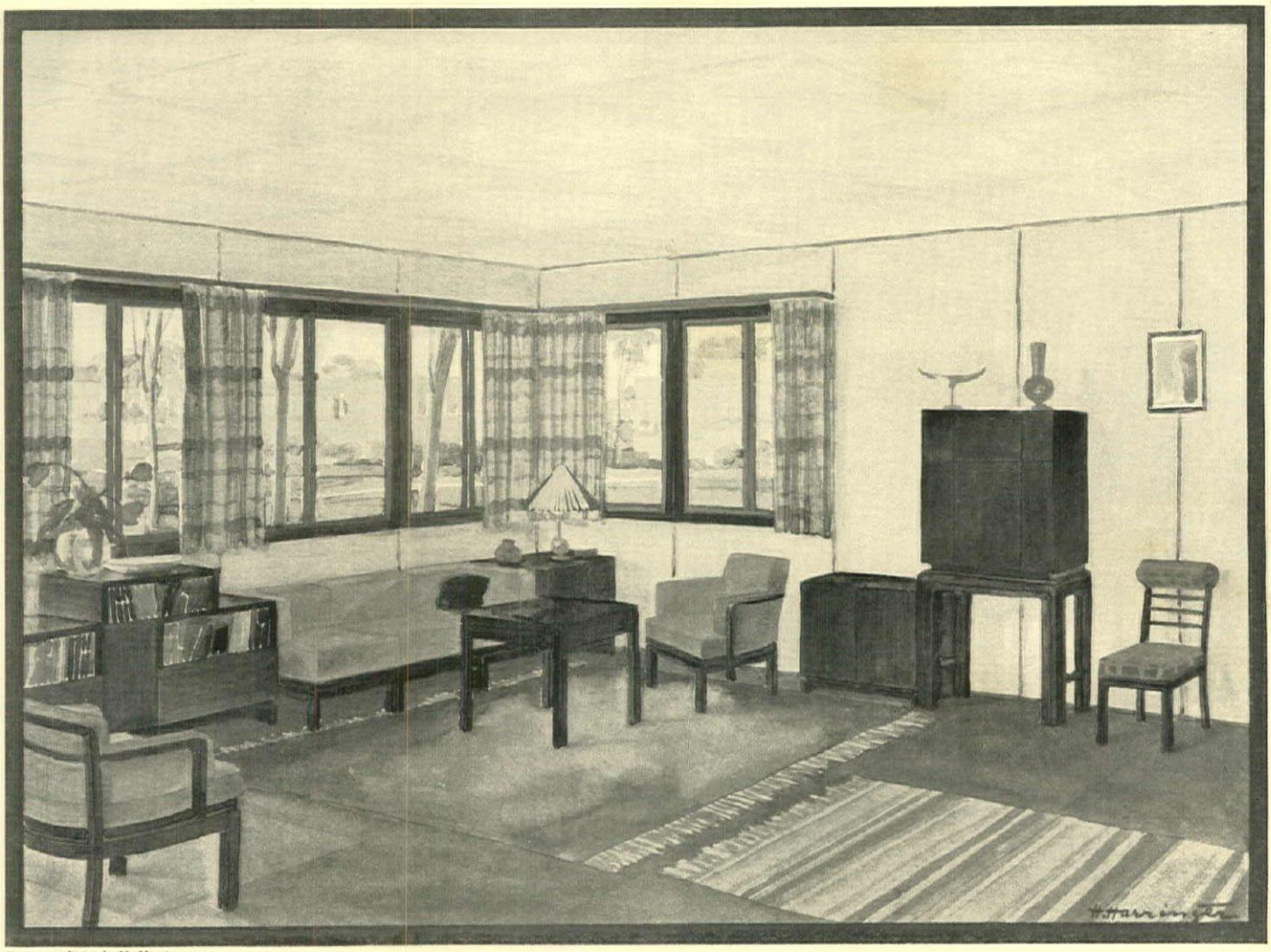
THE annual competition for the Rotch Traveling Scholarship was won by Carroll Coletti of Quincy, Mass. There were nineteen original entrants for the scholarship, and after the preliminary competition seven competed for the final award. The program called for a commemorative monument at the end of a basin and the drawings submitted were judged by a jury consisting of F. Ellis Jackson, William G. Perry and Henry R. Shepley. The program was built around a recent competition for the Massachusetts War Memorial. The first award of $3,000 made to Mr. Coletti carries with it the opportunity of two years' study in Europe. Mr. Coletti has had architectural experience with J. D. Leland & Co. While working in this office he attended the Boston Architectural Club and entered the Yale School of Architecture in 1928. He was the winner of the Intercollegiate Collaborative Problem, 1931, and was graduated from Yale the same year

ENGINEERING & BUSINESS

Van Anda

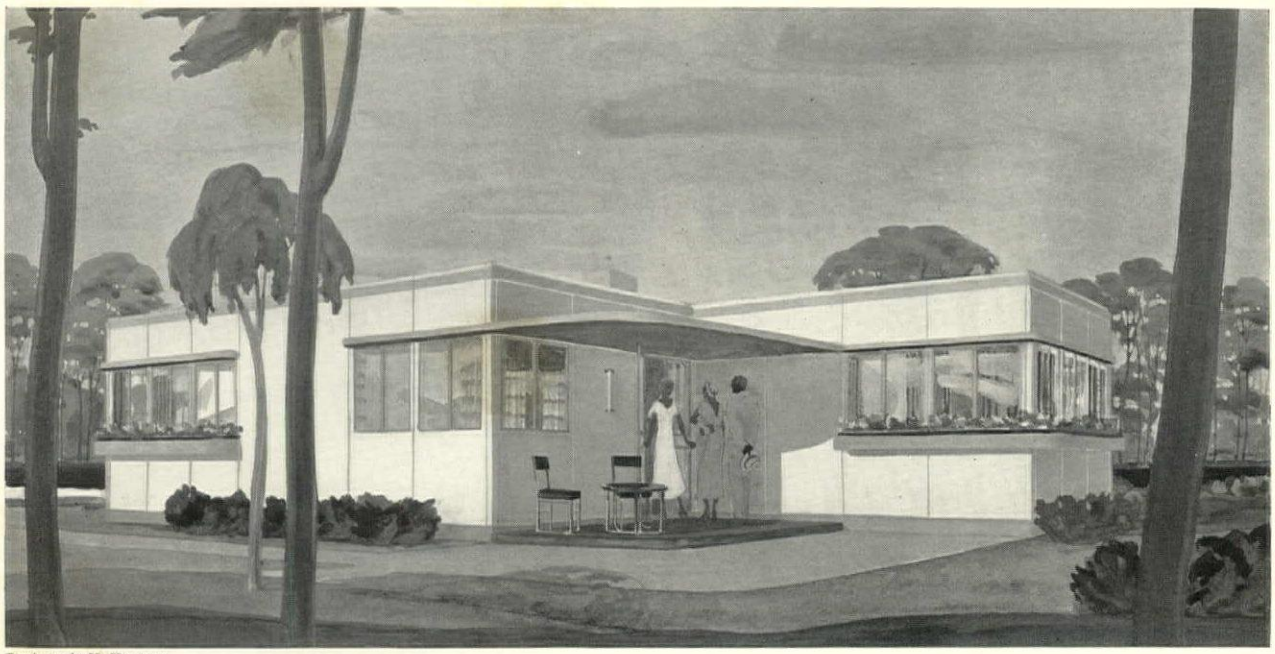
A "Suspension Type" House Designed for Factory Production by S. Clements Horsley, Architect

AN EXCLUSIVE ARTICLE ON THE PRODUCTION PROGRAM OF GENERAL HOUSES, INC. . . . AN INDUSTRIAL APPROACH TO HOUSING, BY IRVING H. BOWMAN . . . WHAT MAKES HOUSING RENTAL? BY EUGENE KLABER . . . ARCHITECTURAL FORUM DATA AND DETAILS OF SMALL HOUSE SPECIAL EQUIPMENT



From a rendering by H. Herrington

THE living room of "K_2 H4 O", a product of General Houses, Inc. This interior is not essentially different in appearance from other small house interiors though frankly acknowledging its panel construction. But the formula implies the application of industrial science to the dwelling as a unit of a coordinated housing scheme in which house, lot and neighborhood are considered as elements of an integrated pattern



Rendering by H. Herringer

A PRODUCT OF GENERAL HOUSES

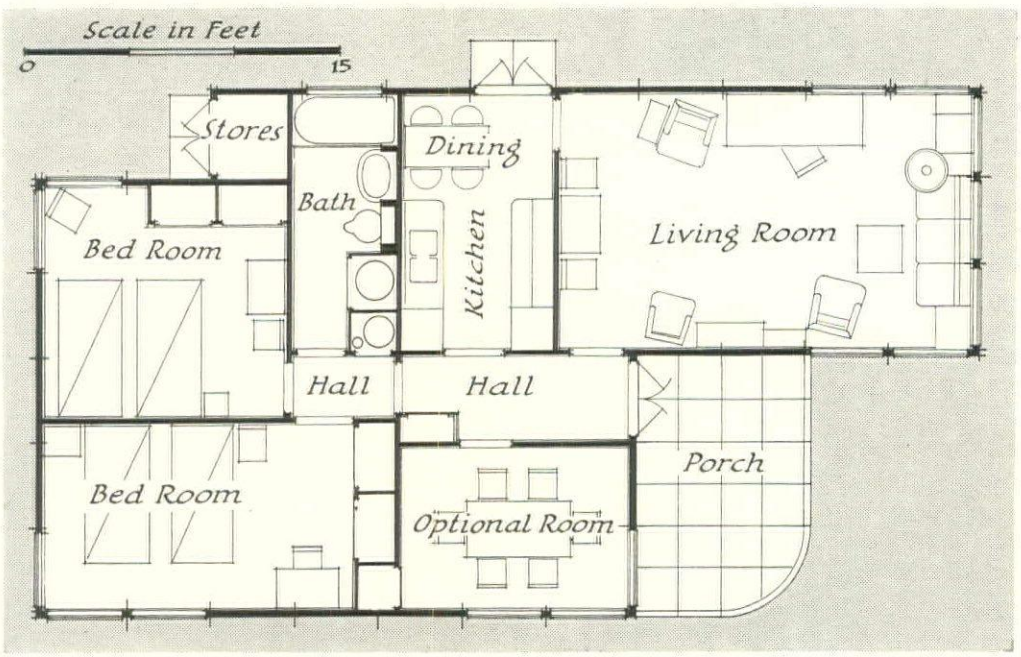
AS CONSTRUCTIVE measures in the solution of the housing problem THE ARCHITECTURAL FORUM has advocated better land control, better planning and construction, cheaper financing, revised laws, large-scale production. Presented here for the first time is a coordinated plan that includes a prefabricated house as a unit of an integrated housing program

UNTIL very recently the architect's concern with the tremendously complicated question of housing has been generally limited to the planning of custom-built houses and the problems of their construction in terms of current practice. With such projects the questions of general economics, land control and social welfare were relatively unimportant. Increasingly, however, attention is being given to the larger problem of housing. Now these questions loom large in the architect's field of interest, for they condition every attempt to solve the problem of providing adequate living space and equipment at a price within the means of the average wage earner or the worker with a small income.

The problem as a whole is in reality an aggregation of many separate problems which affect and are affected by the entire current economic, social and political order. Their complications are not generally realized and their extensive ramifications cannot be explored without analysis and painstaking investigation. Some of this work has already been done; much is still in progress. But a few organizations and individuals have reached conclusions and are now ready to produce their concrete evidence.

Among them is General Houses, Inc., (an organization first described also in the current issue of *Fortune*), which, as a central coordinating and merchandising company, working in close cooperation with a group of outstanding building manufacturers, has for its avowed objective not merely the planning and construction of *houses* but the production of *housing* in the fullest implication of the term. The function of General Houses, Inc. in effect constitutes the integration of many now isolated elements of the building world toward this end. It has written for itself no specific program beyond this. Its initial approach to the entire housing problem is merely a reflection of its proposal to develop adequate, economical conditions for living in terms of immediate and progressive practicality. In this proposition the house itself is regarded as merely one detail of a large and complicated pattern, incomplete without the proper correlation of land control, social sufficiency and individual satisfaction.

The commodity of General Houses, Inc. is this



K_2 H 40 . . . a plan of the house shown at the top of the preceding page. It is one of the small standard models now being developed by General Houses, Inc.

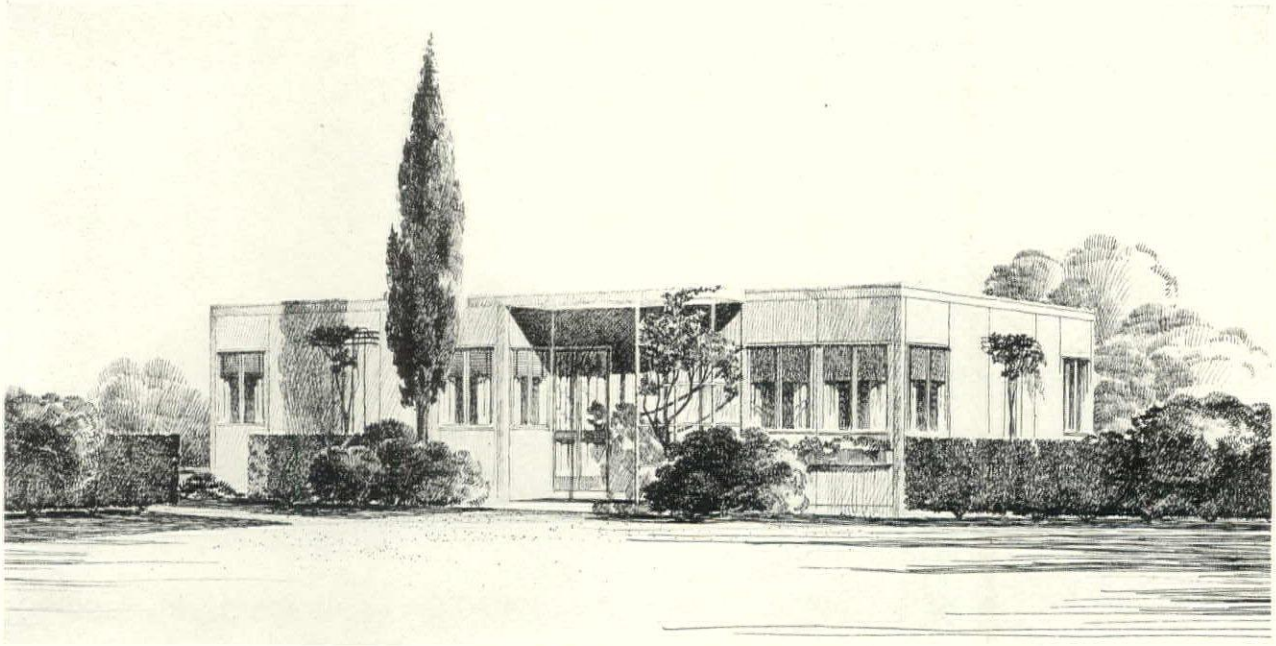
pattern: land in a planned, developed and controlled community; a fireproof, prefabricated dwelling, equipped with every item of modern necessity — even perhaps to the furniture — a wide range of individual choice — and a plan of financing to make it easily available. Behind the commodity itself lies the capacity of the organization to supply, in addition to its executive services, national advertising, architectural and engineering direction, legal counsel, credit facilities and the expert advice required in matters of landscape architecture, group planning, domestic science, interior decoration, etc.

Without minimizing the importance of such problems as land utilization, labor mobility, taxation, installment financing, etc., the attainment of the objective which General Houses, Inc. has set forth will depend largely upon the technological development of the dwelling. The company does not deny the importance of large-scale building operations as applied to the multi-family structure. It is convinced, however, after much study of the problem's various phases that at present the small single family house not only offers the best field for immediate development but also fulfills most completely the needs and desires of the average American family of modest means. But it must not be construed that General Houses, Inc. is committed to any one set of types or will confine itself to any arbitrary series of designs. Its objective is *housing* — a continuing necessity — and if tomorrow develops improvements over today's house, that same tomorrow will find new models ready to be bought at every market agency in the nation-wide network of distribution that General Houses, Inc. contemplates.

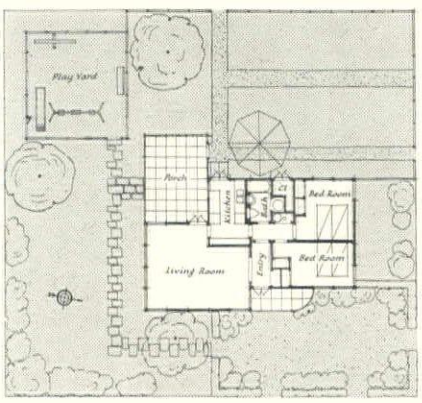
This, however, is the future. Present plans are definite and a series of houses is now being developed based upon the various assemblies of factory-made, standard units, parts and equipment. Mass production has made possible a construction that is economical to produce, simple to build and is adaptable to a variety of uses. Varying site and size conditions may call for different types of dwellings and the structural system combined with the other elements of standardized planning may be used in row or multi-family structures as well as in double and single houses.

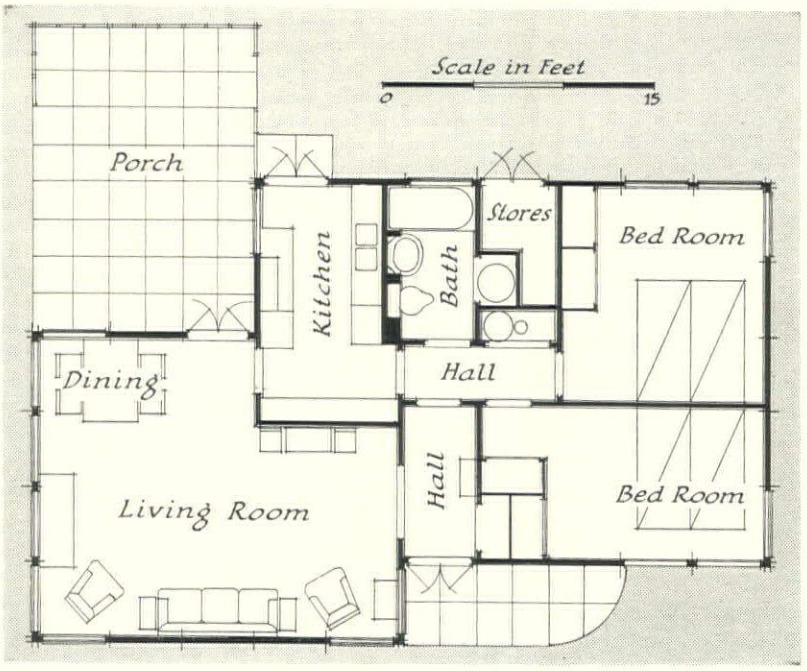
In its July issue *Fortune* publishes a full account of the organization and activities of General Houses, Inc. In this brief article it is possible to describe only the corporation's plans for immediate production — small, low-cost, high-grade, factory-fabricated houses — and to touch upon the proposed method of distribution and finance.

The Problem of Design. Although the prefabricated construction imposes standard structural units, it permits also a wide choice of arrangement with a heretofore unknown efficiency of field erection. General Houses' present list of standard small house models includes eighteen layouts, which with their similar basic equipment vary chiefly in size and room arrangement. The plans are the product of much study and have been based generally upon apartments of demonstrated success. Rooms are grouped about a central hall giving a maximum of privacy within a minimum of space. Bedrooms have been planned as small as is practicable, to make possible a large living room. In most instances the dining room has been eliminated and a portion of the living room set aside to serve its purpose and in the larger plans the kitchen equipment has been ar-



This house, designated as Q_2 H 4, will be fabricated and erected at A Century of Progress Exposition in Chicago in 1933. It will be completely equipped and furnished and will be a model illustration of the General Houses' standard for its program of immediate mass production

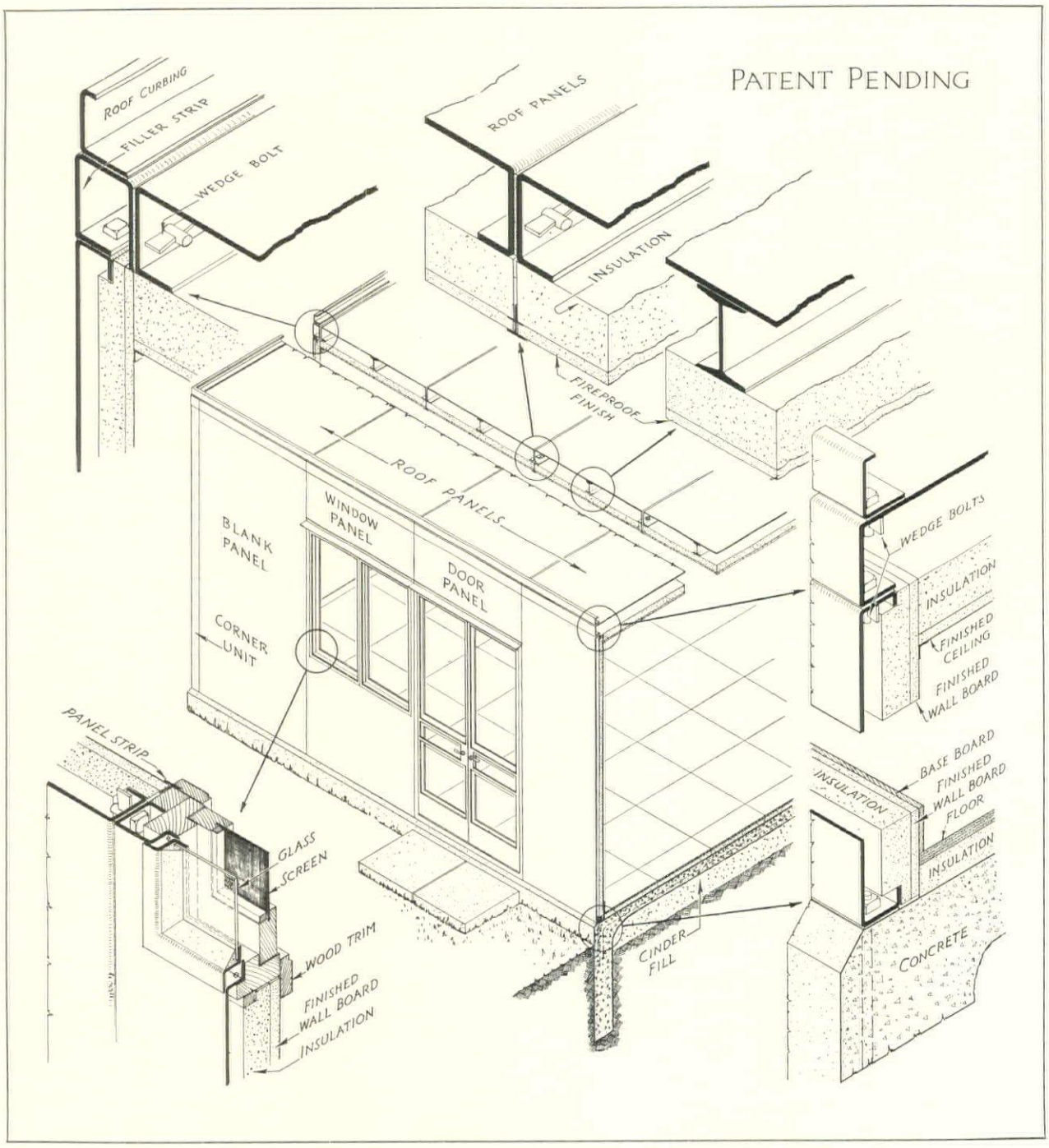




ranged to make possible a dining alcove. The utilities have in each case been grouped together thus saving space, material and also labor during equipment installation.

Normally the houses have no basement, necessitating an outside storage room for trunks, garden implements, etc. Normally also the small houses are only one story high. Neither of these two conditions was arbitrarily set. A basement appeared unnecessary and costly, though when conditions make it desirable it easily may be built of concrete. The grouping of rooms on one floor results in a house of low-lying, small and rambling proportions, a desirable thing as viewed by General Houses, Inc. Aside from these facts a one-story house with no basement produced an economy by eliminating excavation and saving the space which would be necessary for a stair well. Economy also was the primary reason for omitting an attached garage, for the cost of a detached, uninsulated garage is low in comparison and the corporation considers it adequate to the purpose.

Many plans have been developed by Howard T. Fisher, architect and one of the active organizers of



DETAILS OF PREFABRICATED CONSTRUCTION. HOWARD T. FISHER, ARCHITECT

Isometric views of construction details and their assembly as developed by Howard T. Fisher, architect for General Houses, Inc. The units are susceptible to industrial mass production but have been designed so that their field assembly is a simple matter. The exterior panels are pressed from steel sheets. Insulation is in the form of rigid slabs

General Houses, Inc. These plans are conceived in terms of immediate production possibilities and are only a first step toward what their designer sees as the ultimately ideal dwelling. Typical of the average size standard types are the illustrations at the beginning of this article and those on page 67. The latter illustrate a house — designated as Q_2 H 4 — which will be fabricated and erected at A Century of Progress Exposition at Chicago in 1933. Completely equipped and furnished, and set in the center of a landscaped plot, it will illustrate the scope of purpose behind the activities of General Houses, Inc.

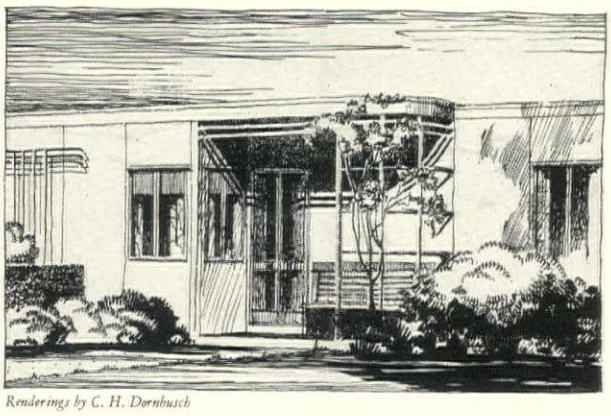
Construction. Every detail of the structural system has been studied to permit economical mass production, to develop simplicity of field assembly and to assure adaptability to a variety of building conditions. Briefly, the construction may be characterized as a panel system in which isolated elements of support are lacking. The forms of the panels developed as a result of reducing construction units to their simplest terms to permit their interchange to suit a variety of designs. The other parts of the construction, including the means of field assembly, were designed not only for the highest efficiency in use but also to avoid special and unusual methods of field erection, making it possible to utilize already available building trades.

The foundations and rough floor do not depart from accepted practice except in the construction methods employed. Both are of concrete and are poured at the same time. The walls are 8 in. thick, and the floor, poured over a 6 in. cinder fill, is a 4 in. slab reinforced with wire mesh carried over the top of the walls. The latter contain anchor bolts at the proper spacing for connection to the wall panels. The pouring of the concrete is expedited by the use of standard self-aligning forms which can be re-used indefinitely. The tops of the forms are leveled to act as a screeding guide for both the concrete and cinder fill and contain jigs for securing the anchor bolts and to assure the proper location of the heating pipes, which are imbedded in, or under the floor slab. These forms save the cost of field layout and eliminate the necessity for batter boards, lines, etc. To insure rapid progress an accelerator is used in the concrete, making it possible to start erection of the wall panels about 24 hours after the mixture has been poured. Integral waterproofing is also used in the slab.

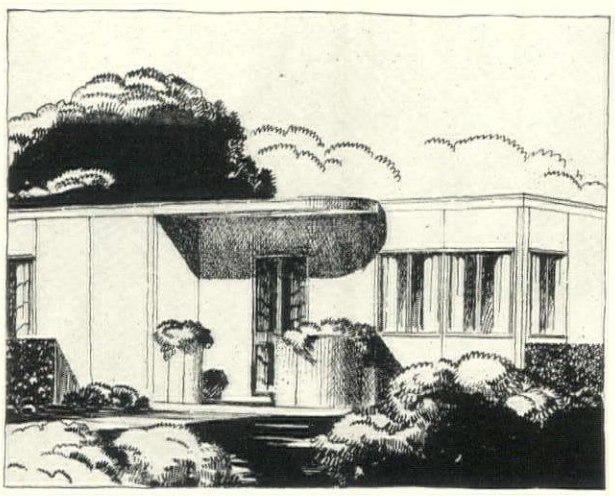
Although this type of foundation and floor requires more field work than a prefabricated construction, it is entirely satisfactory. The alternative is a structural steel floor which would have to be carried on beams resting in turn on isolated piers. Although this system would require no stripping and practically no digging or back filling, it is somewhat more expensive.

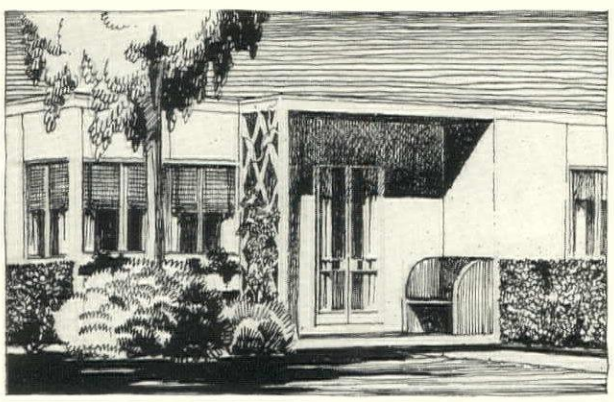
The finished floor is laid after all other parts and equipment of the house have been installed. It consists of 2 ft. squares of laminated wood attached to a 2 in. thick slab of insulation. The flooring is completely prefabricated even to the finish of the wood and is cemented directly to the concrete floor slab with a thin coating of a cold asphalt compound.

After the foundation is in place the unloading and erection of the pressed steel panels is accomplished by a gasoline-operated crane unit, equipped with a caterpillar tread. A crew of only four men will be needed to erect the outside of the building. The time required to set the panels, with the subsequent truing up and tightening, takes less than eight hours.



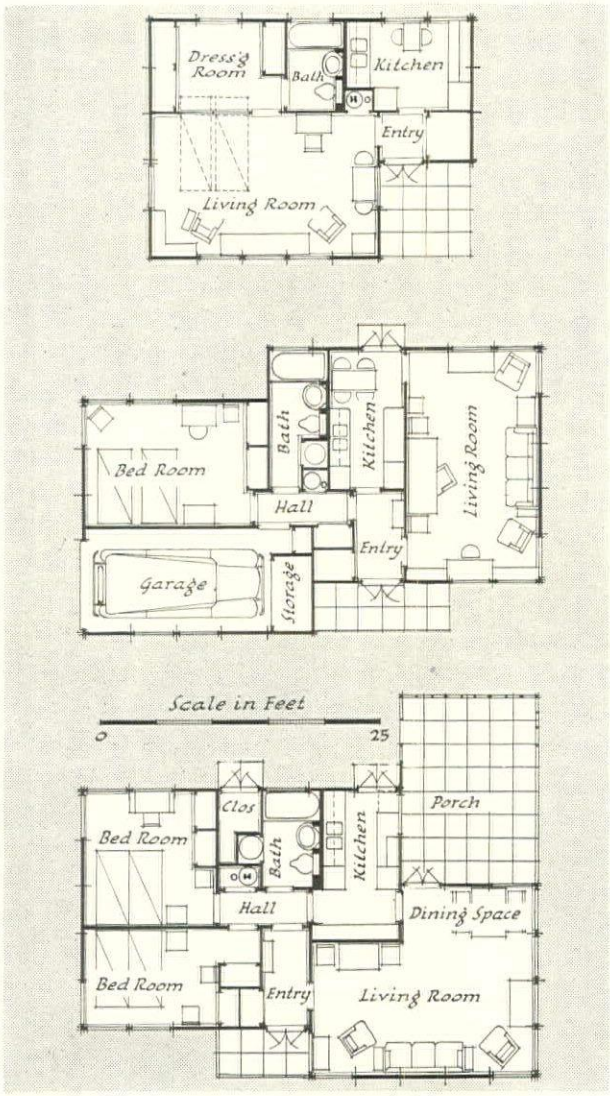
Renderings by C. H. Dornbusch



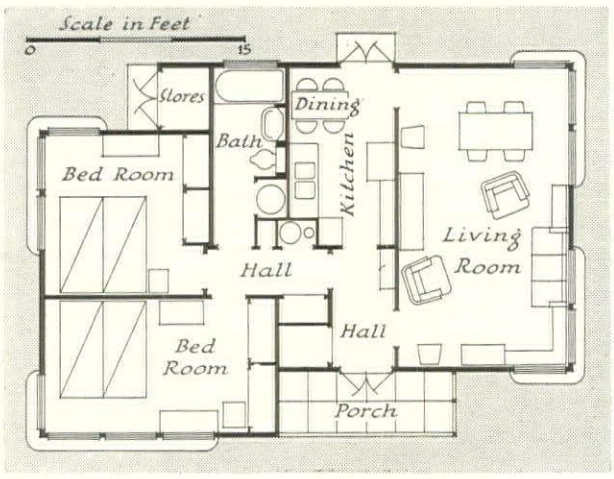


Before the roof is put on all the plumbing fixtures, the heating plant, all millwork, etc., are unloaded from trucks and set inside the house by the crane, in this way doing away with much of the usual hand labor. After the roof units are set (also by the crane) the exterior of the building is completely finished, with the possible exception of glazing and a final coat of paint.

There are four types of exterior structure panels. One of them is a roof panel, furnished in various lengths adapted to standard plans. The others



The three plans above illustrate the adaptability of the panel system of construction to various house sizes and layouts, all of which have been designed to include the best features of successful apartments. Below is one of the standard plans

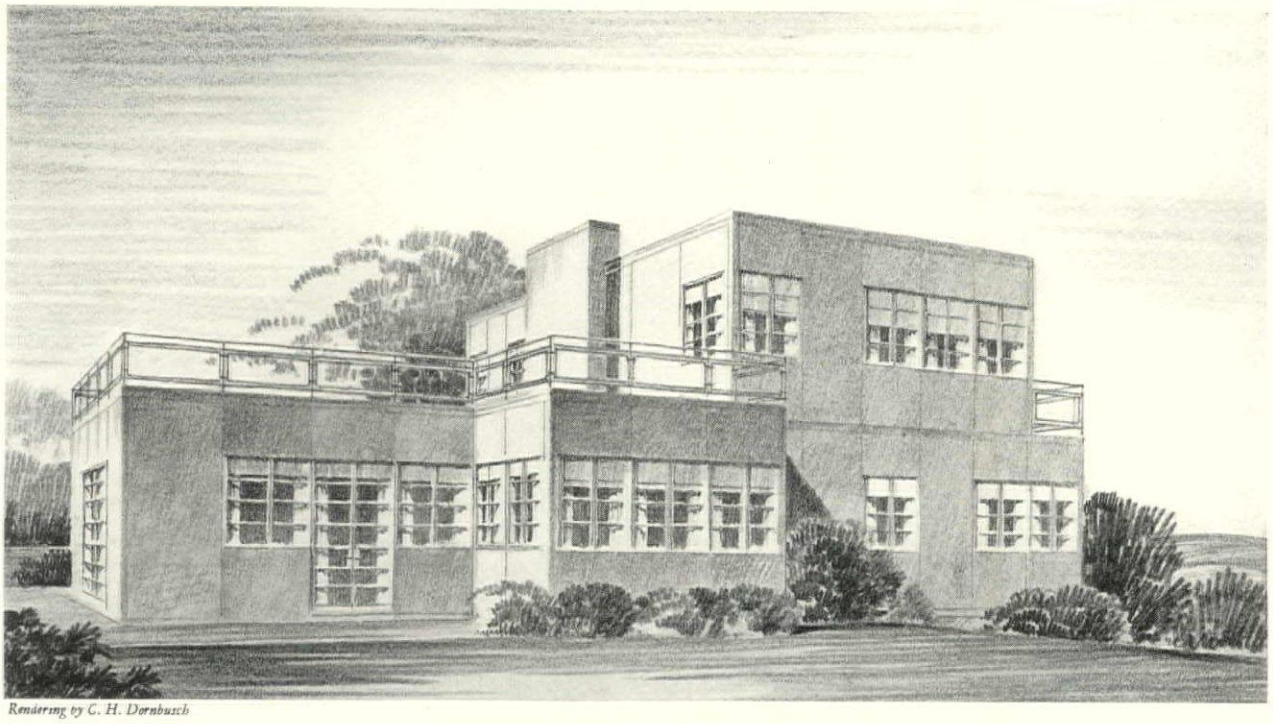


comprise a blank wall panel, a window panel and a door panel. All of the wall panels are completely interchangeable and are pressed from sheet steel from 1/16 in. to ⅛ in. in thickness. They are 4 ft. in width and approximately 9 ft. in height, fabricated in the shapes illustrated in the drawing on page 68. The flanges that form the sides are common to all types and provide the necessary rigidity and vertical supports for the roof. In the case of windows and doors, the flanges serve also as narrow mullions when these panels are used together, for the window and door openings take up almost the full panel width. They are designed to receive double metal casements of a standard type in the case of the windows and a pair of standard French doors in the case of full-height openings.

In combination, these three basic units are sufficient (except for special sections, such as those required for garage doors, etc.) to meet the exterior wall requirements of any house. Their field erection is a simple matter. The flanges are buttered with a waterproof mastic before being set on the foundation and secured by anchor bolts. They are joined together at the panel flanges by a series of wedge bolts which fit into holes punched at the factory. A washer is used between the flanges at each bolt which prevents all the mastic from being squeezed out and assures a permanently waterproof joint. The panels receive two coats of paint at the factory and a finish coat after they are erected at the job. The latter may conform to the owner's desire, but the usual color will be light in tone with a dull, non-glossy finish.

After the exterior panels are erected, the interior window frames are set and secured from the exterior edge of the window opening by screws. The drawing on page 68 will illustrate the method of finishing the interior wall panels at the window jambs. A narrow window trim is secured to the window frame by wood screws similar to those employed in automobile body work. The screen, shown on the inside of the window frame, is removable and during the winter months may be replaced by an operating window, thereby preventing condensation and reducing heat loss through the opening, while still providing the necessary means for ventilation.

The pressed metal panels are fitted with rigid slabs of insulation, the surfaces of which have been treated to provide the finished interior surface of the wall. The insulation is not fitted to the panel in the factory and shipped complete in one unit for two reasons. The first is the difficulty of providing a practical, easily secured link between the panels. With the panel delivered to the building site already fitted with insulation and an interior finish any ordinary method of joining them by bolts would not be possible. Experiment demonstrated the fact that other methods were cumbersome and would off-



Rendering by C. H. Dornbusch

The "Cadillac" or "Lincoln" house may also become an item of General Houses' future production program. The structural system employed in the small models is adaptable to large houses as well as to those developed from the plans opposite

set, by loss of time on the job, the advantages which the fabrication of a complete panel unit might secure. Secondly, the weight of the panel, plus its insulating slab would make it a more unwieldy thing to install with the attendant possibility of damage to the interior finish.

The interior partitions are prefabricated in standard 4 ft. widths of a material similar to the wall insulation. They are entirely prefinished and are set with joint strips similar to those used in the exterior walls. At the walls, floor and ceiling they are secured by a simple system of adjustable channel clips, making their installation a quick and simple matter. The interior doors are set complete with frames at the same time as the partitions are installed, and are secured to the floor and ceiling with simple T-bar stiffeners.

The finish of the ceiling is similar to that of the walls, though in either case the matters of color, applied surface texture, etc., can conform to the varying tastes of the owner. The ceiling is paneled with squares of insulating material with the joints covered by T-bars similar to those in the partitions and exterior walls. The ceiling slabs are kept in place by a strip attached above at the juncture of the structural roof panels and fastened to the supporting T-bar below.

The structural roof is formed of pressed steel panels generally similar in form to the exterior wall panels but stiffened in the center by a small I-beam tack-welded to the panel plate. Their width is the standard 4 ft. but they are fabricated in varying lengths to accommodate the different spans of several standard house plans. The ends of each panel are flanged to form an attachment to the top of the wall units. They are attached to these and to one another by wedge bolts. Watertight gaskets (or a mastic caulking compound) are used between the panels, thus making an impervious exterior surface. The structural roof is not covered by a membrane surface, but is painted with aluminum paint or covered with aluminum foil to reflect the heat of the sun. The edges of the roof are finished with a low curb of pressed steel plate and the surface is drained by an interior downspout.

Although most of the small houses developed by General Houses, Inc. are one story in height, the strength of the wall panels makes it practical to use the structural system for a two-story building. In this case the second floor construction would be similar in all respects to that of the roof. The roof panels have been designed to support a live load of 30 pounds.

Equipment. The small houses developed by General Houses, Inc. are, in effect, built around a core of utilities, which includes the kitchen and bathroom, the heating plant, and the major outlets for electric and gas services. All utility lines are contained within the partition that separates the bathroom and kitchen, thus eliminating long and expensive runs of pipe and affecting a very large

item of expense due to the savings in material, time and labor of installation.

The basic equipment units are standardized throughout, and although their relative location depends somewhat upon the room arrangement of the house, in all cases they occupy a central place in the plan. Contrary to the rule in many small houses every unit has been selected for its special use in a small house. The bathroom in particular is the final result of much study to produce not only the most compact arrangement of fixtures but the highest efficiency of the units themselves. The principle of prefabrication has been applied here as well as to the structural system of the houses. The fixture units will be pre-assembled by General Houses so as to become an integral part of the bathroom wall which, when installed, requires only an attachment to the floor, ceiling and adjacent wall panels. The units thus assembled contain within themselves all necessary traps and fixture connections. Their complete installation requires only the routine connection to the soil stack and service lines. A medicine cabinet is furnished as an integral part of the lavatory unit, and a linen closet is installed over the clothes washer located in the bathroom.

On the opposite side of the bathroom partition is installed the kitchen equipment with units which have been especially designed to provide the maximum of utility and will become standard for small houses of this type. The equipment is arranged to save time and labor in kitchen work. Against the bathroom wall is a double-compartment sink with, in most cases, a built-in range adjacent. A complete kitchen cabinet and an automatic refrigerator are installed on the opposite wall. Included also are china cupboards, built-in vegetable compartments and a broom closet. Near the entrance door a coat closet is provided in all plan types. Wardrobes are used in the bedrooms, first, because they save space, and, second, because they offer a more efficient storage compartment than the more usual closet.

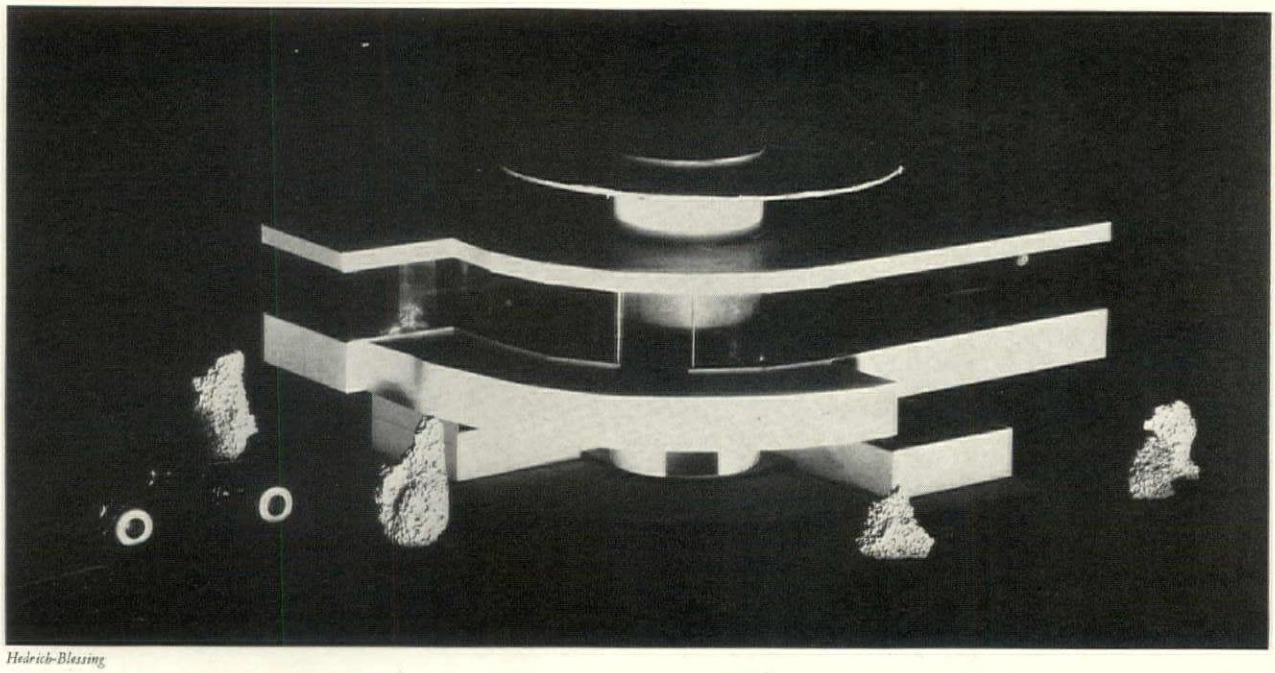
Coal storage has not been provided, as it is anticipated that either gas or oil will be used for fuel. The house is heated by an automatic circulating hot water system. Radiators are supplied by pipes under or in the rough concrete floor. The system is controlled by a thermostat located in the living room and an aquastat at the heater. Hot water, of which there is a constant supply, does not circulate to the radiators until a drop in temperature makes heating necessary. Then the thermostat starts an electric circulator which supplies heat to the radiators throughout the house. When a normal temperature is attained, the thermostat breaks the contact and the circulator stops. In a gas-fired system the boiler capacity is selected to produce comfortable interior temperatures under average weather conditions. In abnormally cold weather a side-arm heater, installed as part of the plant and controlled automatically with it, may be lighted to increase temporarily the heating capacity of the plant. This arrangement insures an unfailing and economical supply of heat, and saves the cost of a larger heater as well as the cost of the additional space necessary for its installation.

Distribution and Financing: Though the products of General Houses, Inc. may become standardized commodities comparable from the manufacturing viewpoint with the automobile, they are sold, of course, for a permanent attachment to land. And though a wide public acceptance of the houses may well attach to them a constant value, shifting land costs due (at least in part) to a lack of planning and control have led General Houses to a land stabilization plan as part of a distribution program in its production of housing.

It proposes through distributors to sell the houses with land in an area developed locally in accordance with a master plan prepared with the cooperation of the company's experts. The tracts would be locally administered by the distributor and controlled — at least during the payment stage — by General Houses itself. The company also sees, in certain cases, the possibility of retaining actual ownership in itself or an affiliated organization, renting its houses under lease rather than selling them. Houses will also be sold without the land to purchasers owning outright a suitable lot. General Houses, however, is well aware of the seriousness of the land situation and from the standpoint of security and for the mutual advantages that land control implies, prefers, in marketing its commodity, to control the land developments.

The sales of the houses will be financed by distributors through an affiliated organization. In the early stages of mass production a standard small house with equipment will sell for approximately $3,500, exclusive of land or furnishings. It is anticipated that this price may be reduced by $1,000 as production increases.

It is proposed to eliminate the distinction between first and second mortgages and to make the sale of a house as simple a matter as the sale of an automobile, considering the influence of the land involved. When a buyer already owns a suitable lot, General Houses will sell the *house* without down payment for approximately $30 per month. Financing costs are estimated at ½ per cent, interest will be 6 per cent and the payments will extend over a fifteen-year period. Where *housing* is sold in one of the company's controlled developments, a down payment will be required. The payment will vary according to location and will be equivalent to the value of the land as determined by a prorated cost of development, financing charges and the profit of the distributor.



Hedrich-Blessing

Incompleted model of a house, designed for complete shop fabrication, to cost approximately $6,000

AN INDUSTRIAL APPROACH TO HOUSING

BY

IRVING H. BOWMAN

OF BOWMAN BROTHERS, ARCHITECTS

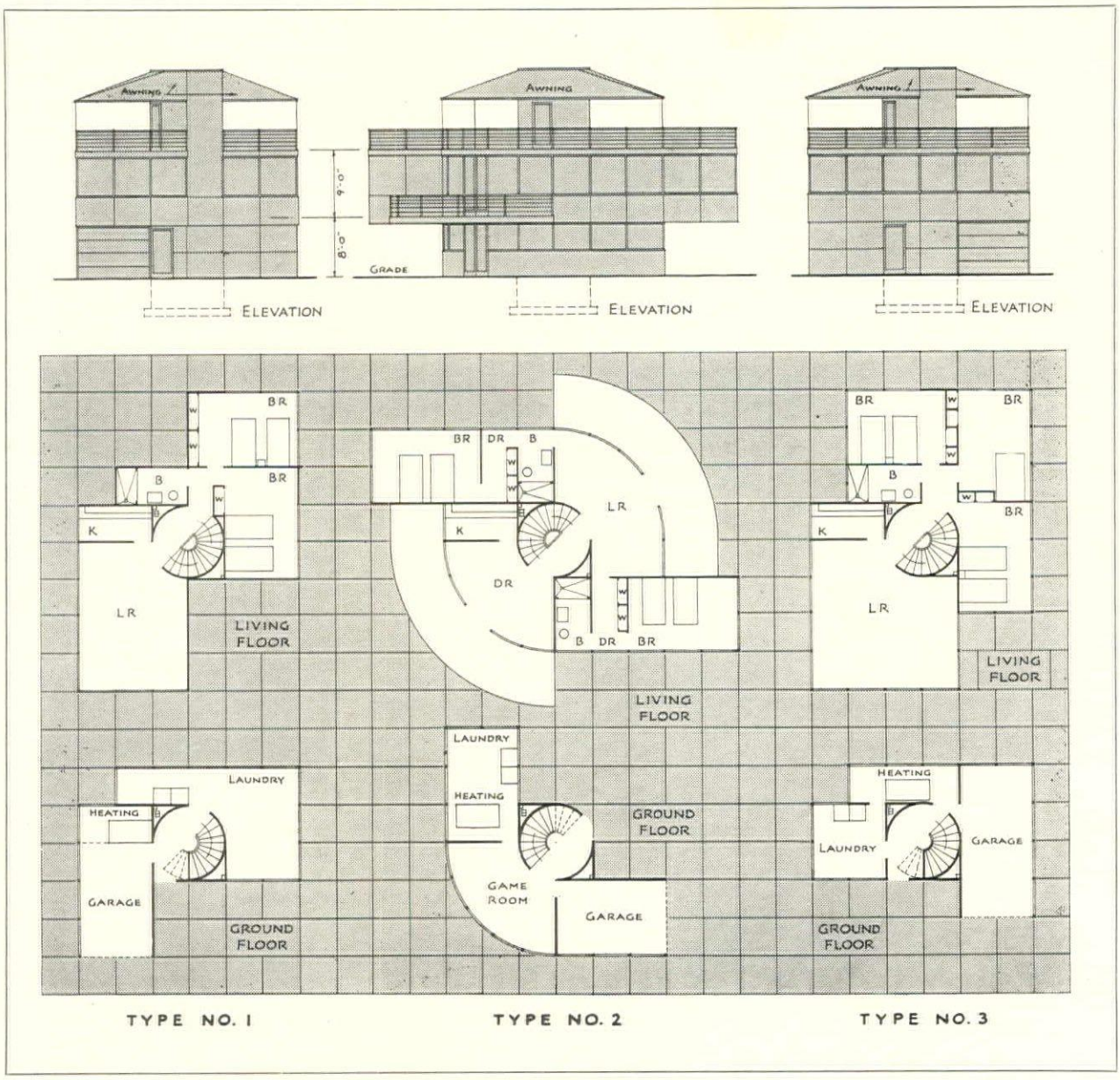
THAT the wide public acceptance of small houses does not constitute a solution to all phases of the housing problem is well recognized by the writer. Equally as well recognized, however, is the general need for small houses which are less expensive, more efficiently equipped and more rationally planned as to space and structure than those at present available to the American family of modest means.

The following paragraphs with their accompanying illustrations describe our efforts to reach a solution not only to the design problems of the house itself but to those of structure, manufacture, erection, finance and sales.

The Problem Analyzed. The difficulty which the ordinary family finds in the present system of house building and ownership is largely an economic one. It is evident that even an excellent solution to the technical problem of the house does not necessarily guarantee to the home buyer a sufficient increase in benefits over the traditional type. The finished house is only one of many items which, combined, form the housing system. The method of its manufacture, field erection, financing and maintenance are of equal importance. Each of these points constitutes a problem in itself which can be solved only by predicating a solution upon the simplest technical organization of the house itself.

It should be noted that the houses presented herewith are not offered as solutions to the problem of the minimum-income shelter. The reason for this is two-fold. The building industry is not sufficiently integrated at the present time to produce a single house within the reach of the average income — which has been variously estimated as between $1,200 and $1,800 per year. Secondly, families with such incomes appear to be more economically housed in multi-family dwellings than in single houses.

Our effort has been to produce a dwelling for the family with standards of individual and community living somewhat above the average; with an income between $2,000 and $3,500 per year; a family which can afford to own a home costing from $4,000 to



Front elevations and floor plans for three different types of houses ranging in cost from $4,000 to $6,000. The elevations at the top correspond with the floor plans directly below, and are not elevations for the same house. Each of the houses is similar in construction, the only changes being those necessary in plan and space provision for the accommodation of the varying needs of the families, with incomes between $2,000 and $3,500, for which they were designed

$6,000, exclusive of the land, and which demands in that home a higher degree of excellence and efficiency than it can obtain in present houses for a similar cost. From a technical standpoint, this combination of requirements presents a problem that is incapable of solution by the present system of small house construction, a fact adequately attested by the failures of many worthy attempts. An entirely new approach was a necessity, and in order to secure economically all the desired advantages, the house has been planned in every detail for industrial mass production.

Shop fabrication of houses is entirely a new field for an industrial plant. In order to avoid an excessive tooling cost to the manufacturer, with a subsequent high cost to the purchaser, it was necessary not only to design every detail for existing materials which were easily obtainable and easily worked. It was also necessary to fabricate them into forms which would serve the purposes of the problem and yet make unnecessary many new industrial tools.

These limitations have had a definite influence upon the selection of materials and upon the type and size of the house units to be fabricated in the shop. Due to the fact that the houses are designed for a national market and may be shipped long dis-

tances, light-weight structures were necessary. The limitations of present trucking facilities determined the maximum size of units, and the method of their field assembly had an important bearing upon their actual design.

Plan and Design. The houses illustrated in detail are only three of several schemes which will be manufactured and sold as standard models. Each has been planned for the general requirements of the "above-the-average" family. Although the houses differ from one another in arrangement, their essential difference is in space accommodations and equipment.

Type 1 was designed for a family of two adults and two children with an income of approximately $2,000. It is assumed that they own an automobile (an assumption common to all types); that, due to a limited income, their home life is not elaborate; and that their requirements will be served by combining the living and dining rooms and by providing only one bathroom.

Type 2 was designed for a family of the same size but with a higher income, accustomed to a more elaborate family life and requiring a separate dining space, a recreation room, and an additional bathroom.

Type 3 was designed for a family of two adults and three or four children, which, although their income is higher than that of the family assumed for the first type, must necessarily live as simply. Although a family with three or four children might well utilize more than one bathroom, it was omitted for the sake of economy in this instance.

The design of all three types was based on the omission of a basement and the location of the laundry, heating equipment and garage on the ground floor. The basement was omitted because it has outlived its usefulness in modern life. It is expensive and serves no purpose that can not be more efficiently included elsewhere. This omission gave added privacy to the living quarters on the second floor and also a freedom from ground dampness. In all the types of houses, bedrooms have been reduced to a minimum size, because they are seldom used for other than sleeping purposes (if an adequate living space is available). For this reason the living rooms were made as large as possible.

The plans show a minimum amount of circulation, due to the central location of the stairs which were made circular for ease in fabrication, to provide passage from the living room to the sleeping quarters and to permit the centralization of utilities on either side. In addition, they are an integral part of the structural system which eliminates large wall columns and gives an unobstructed interior space. This type of stair made the utilization of the roof area a practical feature.

The equipment in each type of house is standard throughout and in most instances is an integral part of the plan. The wardrobes in the bedrooms contain a chest of tray-type drawers, thus obviating the need for a chiffonier in each bedroom. The kitchens are kept at a minimum and the equipment arranged on one wall to save not only space but also effort in the preparation of meals.

Construction. The influences most effective in developing the plan and design were also most influential in determining the structural system and its assembly. The objectives of the structural design were economy, ease of fabrication, transportability, ease of field assembly, lightness, permanence and strength. The houses are designed structurally about the stair tower, which is built in the shop in one piece and forms the main support of the house. From the top of the stair tower, light-weight steel trusses support the mullions in the exterior wall construction, which in turn support the floors. The floor units frame into the stair tower.

The spaces between the webs of the second level floor units are utilized as air conditioning ducts. The heater and the air-cooling mechanisms (the cooling is accomplished by a circulating cold water system) are centrally located on the ground level and are connected directly with two sets of ducts. All vents are in the floor of the second level and in the ceiling of the first. Although the latter have not the efficiency of those on the second level, they assure temperatures satisfactory for garage and laundry spaces.

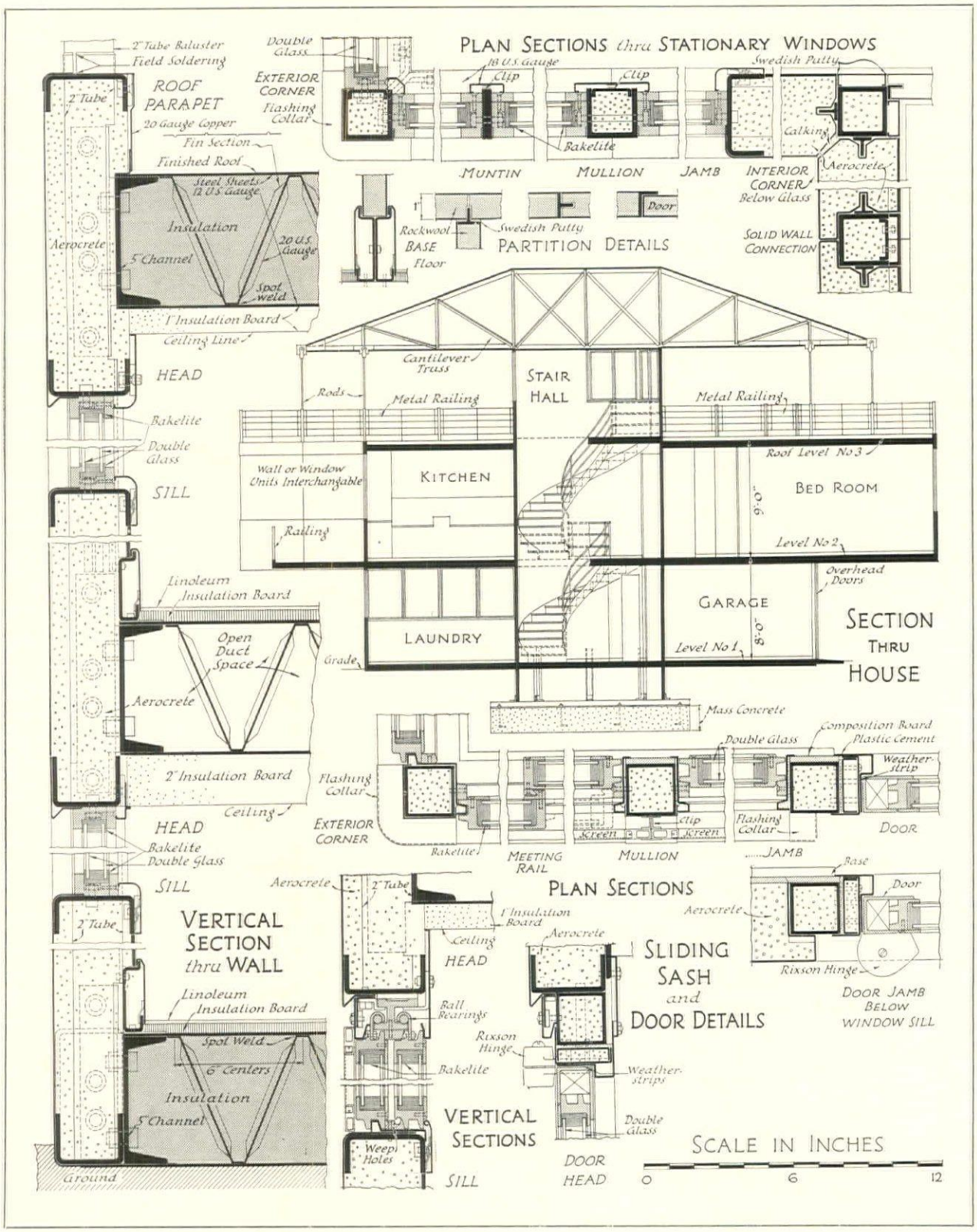
The interior partitions are non-structural and are anchored between floors in a manner that makes them easily removable, if desired. The exterior wall panels have an all-over thickness of only 3¼ in. and are extremely light in weight and easily handled.

The exterior wall units consist of steel stampings 6 ft. long, 4 ft. wide and 3 in. deep, insulated and fireproofed with a 3 in. slab of aerocrete, precast with a wire mesh reinforcement, and cemented to the steel stamping. The aerocrete is precast in a metal mold and then faced on the interior with decorator's muslin. The entire unit is then dipped in paint.

The window units are of two types, fixed and operating. The operating sash of extruded aluminum slide horizontally in a roller-bearing track. Since much of the exterior of the house is of glass, all windows are double glazed with a ⅝ in. dehydrated air space between the glass sheets. The dividing strip between panels is of phenol composition, sealed in place with a transparent, inorganic agent.

All the equipment in the kitchen is contained in one large section, 12 ft. long, 8 ft. 6 in. high. It includes an electric refrigerator, a range, sink, Receivador, and the necessary dish and utensil storage

(*Continued on page 78*)



STANDARD CONSTRUCTION DETAILS FOR PREFABRICATED HOUSES

BOWMAN BROTHERS, ARCHITECTS

Although these details have been selected from the plans of the No. 2 house, they are standard in all types. Applications have been made for patents for all those details which were designed by Bowman Brothers, architects

CONSTRUCTION AND EQUIPMENT DATA

FLOOR UNITS

The floor units are composed of a pressed or rolled sheet metal web system, spot-welded to top and bottom sheet metal plates. Standard units are 12 ft. wide, 28 ft. long, and 6 in. deep. Fireproofing is provided by 1 in. slabs of board-form rock wool, 3 ft. wide and 6 ft. long, with a phenol composition surface, and hung with bolts to the under side of the floor units. Insulation board ½ in. thick is laid on top of the decks as a sub-floor and for sound-deadening. Aerocrete, 22 pounds per cu. ft. density, is used for insulation between the plates of the ground and roof floor units. The second floor units are hollow, the space between them being used as a duct system for heating and air conditioning. Large precut sheets of linoleum form the finish floor.

EXTERIOR WALL UNITS

The wall units consist of 20 gauge steel stampings, 6 ft. long, 4 ft. wide, and 3 in. deep, with steel channel reinforcements at top and bottom. Tubing mullions, 2 in. square, are bolted to the spandrel channels of the floor units at top and bottom. They are located on 5 ft. and 6 ft. centers, with T-shaped tongues tack-welded to the sides of each to receive the grooves in the wall units. Insulation and fireproofing are provided by a 3 in. slab of aerocrete, which is precast with wire mesh reinforcement and cemented to and compressed into the steel stampings. For interior finish the smooth surface of the aerocrete is covered with decorators' muslin and the entire unit dipped in Du-lux paint. The exterior joints between the units are filled with an elaterite caulking compound and depressed so as not to drip when heat expands the units.

WINDOW UNITS

Windows are of two types, fixed and operating. The latter slide horizontally in a track on roller bearings, and are of extruded aluminum, the track of bronze, and the roller bearings of nickel. The fixed sash are of phenol composition. All sash are double-glazed with a ⅝ in. dehydrated, sealed air space between the panes. The sash are designed with interlocking weather breaks.

PARTITIONS

The interior partitions are constructed of a core of insulation board, ⅞ in. thick, and finished with a phenol composition prepared surface that is cemented to the core. Partition units are 3 ft. wide and 8 ft. 3 in. high. The units slip into a groove provided in the rock wool board on the under side of the ceiling units. They are supported by a rolled metal baseboard, which is a continuous wireway of 14 gauge blue annealed steel, grooved to receive a micarta or bakelite removable baseboard which contains the electric base receptacles at 6-ft. intervals. There are no chases in the partition units themselves for wires, since the partitions are movable.

KITCHEN UNITS

The electric refrigerator, range, sink, Receivador are combined into the dish and utensil storage cabinets as an integral part. The cabinet work is built of heavy gauge metal in sections 12 ft. long and 8 ft. 6 in. high. The Receivador is the top of the dumb-waiter which has a package door at the ground level for deliveries. Standard finish for all metal is a Du-lux coating, white in color.

BATHROOM UNITS

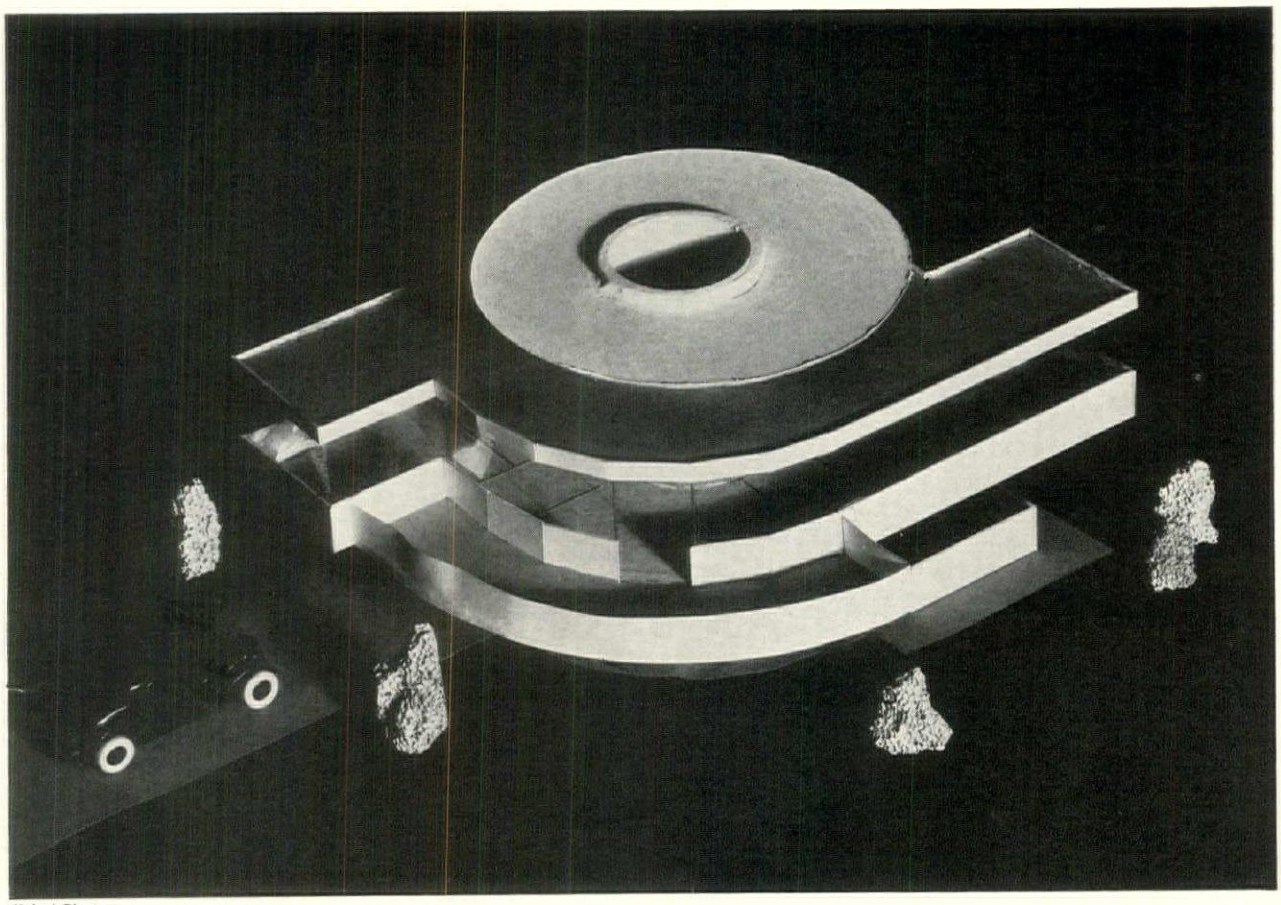
The bathing facilities are a combination tub and shower, constructed of galvannealed sheet steel, dip painted. It is similar to a large shower, 3 ft. x 5 ft., with a curb 17 in. high to permit its use as a tub. Until mass production permits the use of glazed doors, waterproof curtains will be used. The lavatory is of stamped stainless steel, a non-integral spout and compression type valves. The toilet is of a type now standard.

HEATING AND AIR CONDITIONING

Equipment for heating, cooling, ventilating, and humidifying is located in the first floor level, adjacent to the stair tower, and is connected directly with two sets of ducts to vents in the floor of the second level and the ceiling of the first. The 6 in. space between the floor plates is sufficient for accommodation of the ducts. Temperature and humidity control are thermostatic. The air is cooled by passage through a cold water coil rather than a refrigerating unit, and is also passed through an ozonator for purification before being recirculated. Heating equipment may be either gas-fired or oil-fired with no difference in cost.

HOME PURCHASING SCHEDULE

	Type 1	*Type 2*	*Type 3*
Price	$4,000	$6,000	$5,000
Down payment, 20%	800	1,200	1,000
Balance (15 yr. 1st mortgage)	$3,200	$4,800	$4,000
Monthly Charges:			
Principal payment	$17.77	$26.66	$22.22
Interest (5% annually)	13.33	20.00	16.66
Taxes (estimated)	7.00	9.75	8.30
Water, Insurance (estimated)	1.80	2.80	2.25
Total Charges	$39.90	$59.21	$49.43



Hedrich-Blessing

Another view of the model shown on page 73, this one looking down upon the incompleted hood. This house was designed for a family of two adults and two children having an income of approximately $3,500 a year, and with standards of living that demand a separate dining space, a recreation room, and an additional bathroom

cabinets. The unit is built entirely of metal, the Receivador being the top of a dumb-waiter, which has a package door at the ground level for deliveries. The units are not finished with the usual baked enamel but are spray-painted, making refinishing, when necessary, an easy matter.

The bathroom is not installed as a completely fabricated unit, but is assembled on the job from standard units. Since tub bathing is often necessary in times of illness, this facility is combined with the more usually desirable shower bath. The combination tub and shower is stamped from sheet steel, is spray-painted, and is similar to a large shower stall. It measures 3 x 6 ft., and has a 17 in. high curb, permitting its use as a tub. The toilet is of a usual type and the lavatory is of stamped, stainless steel.

Shipment and Field Erection. The units, including cabinets and equipment, are crated at the plant and shipped to the building on truck. They may be erected with a factory trained crew in seven days. The exposed surfaces of all units which have been shop-finished are protected by building paper.

Field assembly is simple. A foundation hole is dug for the stair tower and the bottom leveled off with a mass concrete slab, thus equalizing the soil pressure. The stair tower, anchored to the concrete by a grillage frame, is then erected by derrick, and the light steel trusses hoisted into place and bolted to it. Next, the steel hanger rods are bolted with clevises to the trusses and the mullions for the second level wall construction bolted to them. The roof units are then hoisted into place and bolted to both hanger rods and stair tower. The second level floor units are erected in a similar manner, followed by the assembly of the first level mullions and floor units.

Mechanical equipment is now installed. Beginning at the ground and working up, the wall and window units are slipped into their grooves between mullions and made fast with bolts. It is possible to erect the interior partitions before the exterior wall and it may develop later that it is best. However, they are not too large to be taken through the doors or windows, and this is the intention at present.

The base for the partitions is first secured to the

floor, by driving cold pins into the steel floor plate. The partition slabs are then slipped up into their ceiling grooves and dropped down into the groove in the top of the base.

The Merchandising Organization. Although these houses are not contemplated to serve the lower income group at the present time, it is possible that the economies subsequent to industrial mass production may lower the cost substantially and make them available to a much larger market than is now contemplated. In effect this means the establishment of a new industry and implies a merchandising plan that should be flexible enough to be susceptible to modification in the case of unforeseen commercial conditions. The organization involves the establishment of a parent company which in effect will be a research and directing organization. It will develop and improve house plans and specifications, details of construction and equipment. It will conduct a constant research on new materials and methods of fabrication and erection. It will organize market surveys and control the dissemination of authentic information to the public. In addition it will control all patent rights and establish all contracts with industrial concerns for manufacture of the houses.

It is possible that at some future date the parent company will manufacture the houses as well as control their plan and design. The advantage of the plan outlined, however, utilizes most efficiently already existing machinery and obviates the necessity of a large initial capitalization of the parent company. In addition it assures the lowest price level to the consumer, as it is possible to change manufacturers to assure the most economical manufacture of the units.

The parent company will authorize the establishment of distributors throughout the country who will purchase the houses from the parent company and resell them to the buyers. This organization will contract with the parent company for a definite number of houses per year, delivery to be made when needed. Should the distributor require more than the number originally ordered he establishes a credit with the parent company, as the price of the houses is necessarily controlled by the quantity of their manufacture. If he is unable to sell his quota, he is charged an extra to cover the cost of warehousing, in the case of houses originally ordered, or to adjust the manufacturer's price with the parent company for the added unit cost necessary for a smaller quantity of units.

The distributor will maintain his own erection crew who will be especially trained for the erection of these houses in the manufacturing plant where every tenth house will be assembled and knocked down before it is shipped. The distributor will maintain also a service organization for the replacement of parts and the adjustment of any misunderstandings between himself and the home owner.

The price of the house will be divided between the distributor and financing company, the manufacturer and the parent company. The distributor will receive 17 per cent, the manufacturer 80 per cent and the parent company the remaining 3 per cent. The houses will be sold by the distributor under the following plan:

The prospective buyer must have title to the property on which the house is to be erected. The property should be clear of all incumbrances but, at the option of the financing company and if the mortgage on the property is a small one, the distributor may accept a down payment of 20 per cent on the house purchased, clear up the existing incumbrance on the property and execute a blanket mortgage on the house and lot combined, which will be paid in equal monthly payments over a period of 15 years with interest payable at the same time at the rate of 5 per cent. Mortgage paper of this kind is an attractive investment and should find a ready market at rediscount.

The prospective buyer, however, is not obligated to make use of the financing company which collaborates with the distributor. He may make any other arrangements he sees fit so long as the distributor is paid in full for the house. The distributor deducts his percentage and turns in the money to the parent company who pays the manufacturer.

The houses are sold to the consumer under a guarantee for five years against defective materials and workmanship during which period the buyer may receive repair and replacement services without charge. Any defective parts will be furnished the distributor through the parent company.

EDITOR'S NOTE: Any house as unusual in architectural design and construction as those designed by Bowman Brothers deserves a more extended explanation than can reasonably be included in one article. The industrial approach to the solution of the technological problem of housing is a comparatively new one and implies an extensive research into the physical properties of the materials employed and a close analysis of each item of cost. In a forthcoming issue of THE ARCHITECTURAL FORUM, Irving H. Bowman continues his explanation of these factory-made houses. The article will deal with the factors of prefabrication and the field assembly of parts, with particular emphasis on comparative costs and specifications. It will contain tabulations and cost analyses of operations in the fabrication and erection of the houses, including excavating, the structural floor systems, the wall construction, the window system and the insulation and facing materials.

Browning Photos

NO RENT—NO TAXES—NO WORK

A "HOUSING PROJECT" of improvised shelter built by and for the unemployed on a vacant lot in New York, at 12th Avenue and 40th Street, known to its tenants and the police as "Shanty Town." At the left the "mayor" rings his bell announcing the communal meal. Industrialized housing to produce large-scale, planned communities may contribute to the solution of the problems of both unemployment and housing

WHAT MAKES HOUSING RENTAL?

BY

EUGENE H. KLABER

In designing housing to be rented at a low figure to wage earners some surprising conclusions are drawn from the mathematical analysis of the cost factors and their effect on the rent which must be charged. Mr. Klaber has made a special study of this phase of housing and presents facts that may revise the thinking of many architects who have, perhaps, been putting too much emphasis on just one of the cost factors. He provides an answer to the question of how government assistance can be rendered in housing without altogether upsetting the apple cart of present investments

THE rental that is paid for the use of premises is the result of a number of factors. The cost of land, the cost of the building, including its component factors of material and labor, the financing and carrying charges during the construction, are the elements which determine the total capital cost of a building. Given the capital structure, the rental charged must provide for the following: vacancies, operating expenses, taxes, interest on mortgages, insurance, depreciation, and, where a corporation is involved, federal income tax. What is left over is the return on the equity.

Long experience with a variety of projects has enabled competent bankers, architects and real estate men to estimate with a fair degree of accuracy the effect of these various elements upon the ultimate rental. Their method, however, is entirely empirical, and as no two projects present exactly the same conditions, there is no definite assurance that they will apply in a given case. For instance, if we assume that approximately ten per cent of the capital cost is financing cost and carrying charges during construction, there will always remain the question of the applicability of the assumption to a given project.

It has occurred to the writer that it might be of interest to evolve a more mathematical approach to the question. Experience with a large housing project and a knowledge of the cost, operating expenses and rental charged, has raised the questions: What would have been the rental under other circumstances? With the building cost determined, what would have been the effect of varying the financial structure? On the other hand, if elements of the land and building cost had been reduced, how would the rentals have been affected? How would the rental saved by reduced capital cost compare with what might be saved by reduced rate of interest on money?

These questions are very pertinent at a moment when, in the search for some solution of the housing problem, all sorts of remedies are being suggested. There are many who are searching for a solution through the adoption of new materials and simplified methods. Others feel that the cost of land is the predominant factor. Others, again, are quite sure that a reduction in the wages of labor would go a long way toward solving the problem, and some look to a solution through obtaining cheaper money. Probably all of these elements will have to play a part in the picture, but, relatively, what is their importance in accomplishing our end?

It is possible to investigate these elements mathematically by treating one element as a variable and keeping all other elements constant. Repeating this process for each element in the picture will give results that are significant, and may pretend to be somewhat more authoritative than those obtained by the usual empirical process.

In this investigation the elements of capital structure, interest, rentals and operating cost, taxes, etc., were all known. One problem was to evolve formulæ of conversion of cost elements into rental. Thus, it was necessary to determine how much rental was represented by every dollar of capital cost and how much by each dollar of operating expense, interest, etc. It is not proposed to enter into the somewhat elaborate calculations that were necessary to obtain the results. Suffice it to say that, although there were certain elements in which judgment had to be used to determine minor factors, the method is, by and large, mathematical and the margin of possible error due to problematical factors is small.

The results of this study are shown in Figures 1 and 2. Figure 1 represents an investigation of the method of financing. The project in question is shown as Case No. 2, and inasmuch as no commissions were charged on the mortgage or carrying charges on the land during construction, it has been designated as semi-philanthropic financing. The rental of $17.55 shown is not the actual rental being

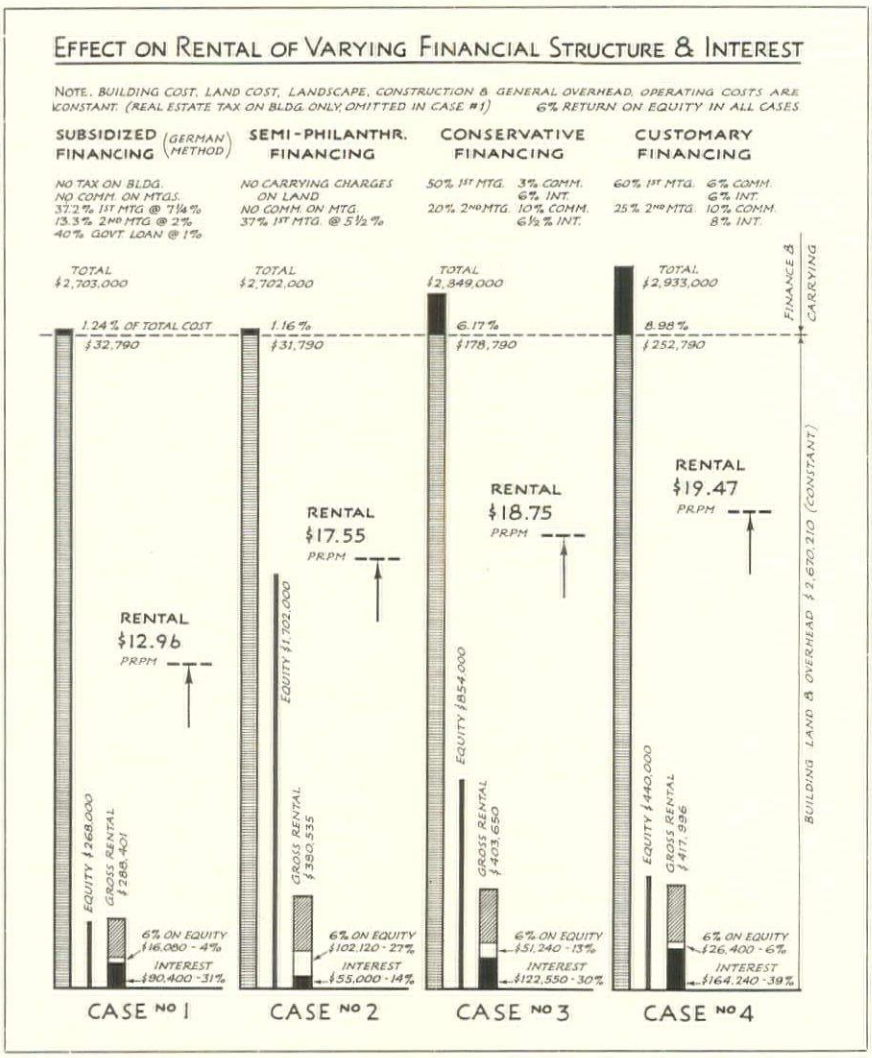


Figure 1. This chart shows the results obtained in an investigation of four methods of financing. It makes evident the importance of both the interest rate and the method of financing. The comparisons established in this study are not necessarily true for every financial set-up and for every building project. The attempt has been made merely to derive a method by which housing projects can be studied with perhaps a closer approximation to the truth than has been possible in the past

charged, but the rental which it would be necessary to charge in order to earn 6 per cent on the equity. In all four cases the assumption has been made that the equity earns 6 per cent.

It will be noted that the cost of the land, building and overhead is constant in all four cases. The varying factors are the rate of interest on the money, commissions charged on the loan and the financing and carrying charges. In the graph, Case No. 3 has been called conservative financing, inasmuch as the first mortgage is only 50 per cent and the equity is 30 per cent. Case No. 4 is a customary method of financing. No examples of so-called "shoestring" finance are shown.

These three cases represent instances sufficiently frequent in America to be called typical. All may be said to be within the range of current possibilities. It will be noted that the spread in rental between the lowest and highest is only $1.88 per room per month. If, however, we step outside of the range of what is currently possible and consider what the effect on rental of a subsidized financing would be, we get a picture analogous to Case No. 1. In this it has been presumed that there is no tax on the building, and no commission on the mortgages. The capital structure is set up on the basis of a housing project in Berlin, in which a 37.2 per cent first mortgage was made by a savings bank. An additional 13.3 per cent constituted the second mortgage, the money being loaned by the city of Berlin at 2 per cent interest and 2 per cent annual amortization. An additional 40 per cent of the total capital was lent by the government at 1 per cent without amortization for five years.

This loan was derived from funds collected by the taxation of rentals. The remaining 9.5 per cent represents the equity. In determining the rental in Berlin, a 5 per cent return is allowed the owner of the equity if it is a public utility corporation. If he is a private individual, he is allowed 7 per cent. For purposes of comparison with the other cases the return on the equity has been figured at 6 per cent. Figure 1 makes evident the importance of the rate of interest and the method of financing, for we note

that in Case No. 1 the rent is $12.96 per room per month, whereas in Case No. 4 (the customary method) it is $19.47 per room per month, or almost exactly 50 per cent more.

There are several reasons for this. In Cases 1 and 4, the equity is comparatively small, but in the former, only 35 per cent of the gross rental has to be devoted to the payment of interest on mortgages and equity, whereas in the latter it amounts to 45 per cent. Comparing Cases 1 and 2, we note that the financing and carrying charges in No. 1 are higher than in No. 2, as well as the interest on mortgages. But this is overbalanced by the very large equity in No. 2, on which 6 per cent has to be earned, the interest demands on the gross rental amounting to 41 per cent as compared with 35 per cent in the subsidized financing.

In Case No. 4 the tenant occupying a four-room apartment would have to pay $934.56 annual rental as compared with $622.08 in Case No. 1. *Note:* This is for exactly similar quarters, produced with the same contract cost, the same building and general overhead; operating costs, taxes and insurance being exactly the same, as well as the allowance for vacancies. It is obvious, however, that with the lower rental, Case No. 1 would have a much smaller percentage of vacancies than Case No. 4. The buildings being identical in both cases, the question at once arises, whether it is equitable to build dwellings similar to those produced by private enterprise which, in this instance, by virtue of government subsidies, can offer rentals one-third less. As long as our economic system remains one which encourages private initiative wherever possible, such an underselling is entirely unfair. We know that proper housing is an essential need of mankind, and that under present conditions it cannot be furnished by private initiative to rent within the spending capacity of a very large share of the population, and that, in some way, government must recognize this fact and lend its assistance.

How, then, is it to be done? The answer is obvious: Government assistance must be devoted to the financing of housing that is unlike that produced by private builders. The latter, in their competitive struggle, are obliged to include in their buildings many elements of luxury and service that could well be dispensed with in our endeavor to produce housing at low rentals. In a word, subsidized housing must be of such simplicity that it furnishes only the elemental needs of shelter and sanitation, at rentals sufficiently low that there is no longer any question of competition. An entirely different demand will be met, just as the market for the lowest priced cars is different from that of the more expensive types.

To accomplish this we must attack all the elements that go to make up the total rental. Land cost must be low, service and luxury cut down to a minimum, labor costs as inexpensive as possible, and interest on money as little as we can make it. The possibilities of such reductions in cost are indicated in Figure 2. This shows varying elements of cost and interest on money as compared with the known project. In each case the point of departure is a rental of $17.55 per room per month, which is the necessary rent to allow 6 per cent on the equity.

Under the head of land cost we show four examples: $1.87 per sq. ft. is the actual cost. If the land were $1 per sq. ft. or 50 cents per sq. ft., the resultant rental would be, respectively, $16.91 per room per month and $16.54 per room per month. If, however, an increased price had been paid, a $4 land value would result in an increase in rental of only $1.55 per room per month.

The second investigation shows the reduction in rental that would occur if the elaborate heating system in the existing project were replaced by a less expensive system in which the tenant furnished his own heat. This would result in a capital saving of $150,000 and a reduction in fuel and maintenance cost of $31,000 per annum. For purposes of comparison there has been added back 60 cents per room per month for the fuel that the tenant would have to buy. This is done because our interest is what the tenant has to pay for his shelter and fuel, whether he pays it all to the landlord or whether part is paid to a public service company. A reduction in the capital cost of 7½ per cent and in the operating cost of 32 per cent reduces the rental per room $1.49 per month.

In the known project there is approximately $180,000 of the capital cost which represents elements of luxury which could well be omitted in a simplified project. Had these been omitted there would be a saving of only 90 cents per room per month, if the same return is to be made on the equity.

The fourth variant shown is the cost of the job labor. It has been assumed that approximately 50 per cent of the building cost, without overhead, is job labor. There are many who maintain that a reduction in the wages of building labor would immediately open up building operations. On the project studied, mechanics in the building trades earned, by and large, $1.62½ an hour. We have considered what would happen, first, had the wages been 20 per cent lower, and secondly, had a flat rate of $1 per hour prevailed, or a reduction of 38 per cent. It is interesting to note that the 38 per cent reduction would have resulted in a rent saving of $1.86.

Our final study illustrates the effect of reduced interest on money. Starting with a return of 6 per cent on the equity and 5½ per cent on the mortgage, each is reduced successively by 1 per cent until in the fourth example the equity has a return of 3 per cent and the mortgage 2½ per cent. The drop in rentals is very marked. Thus, by a reduction of 3

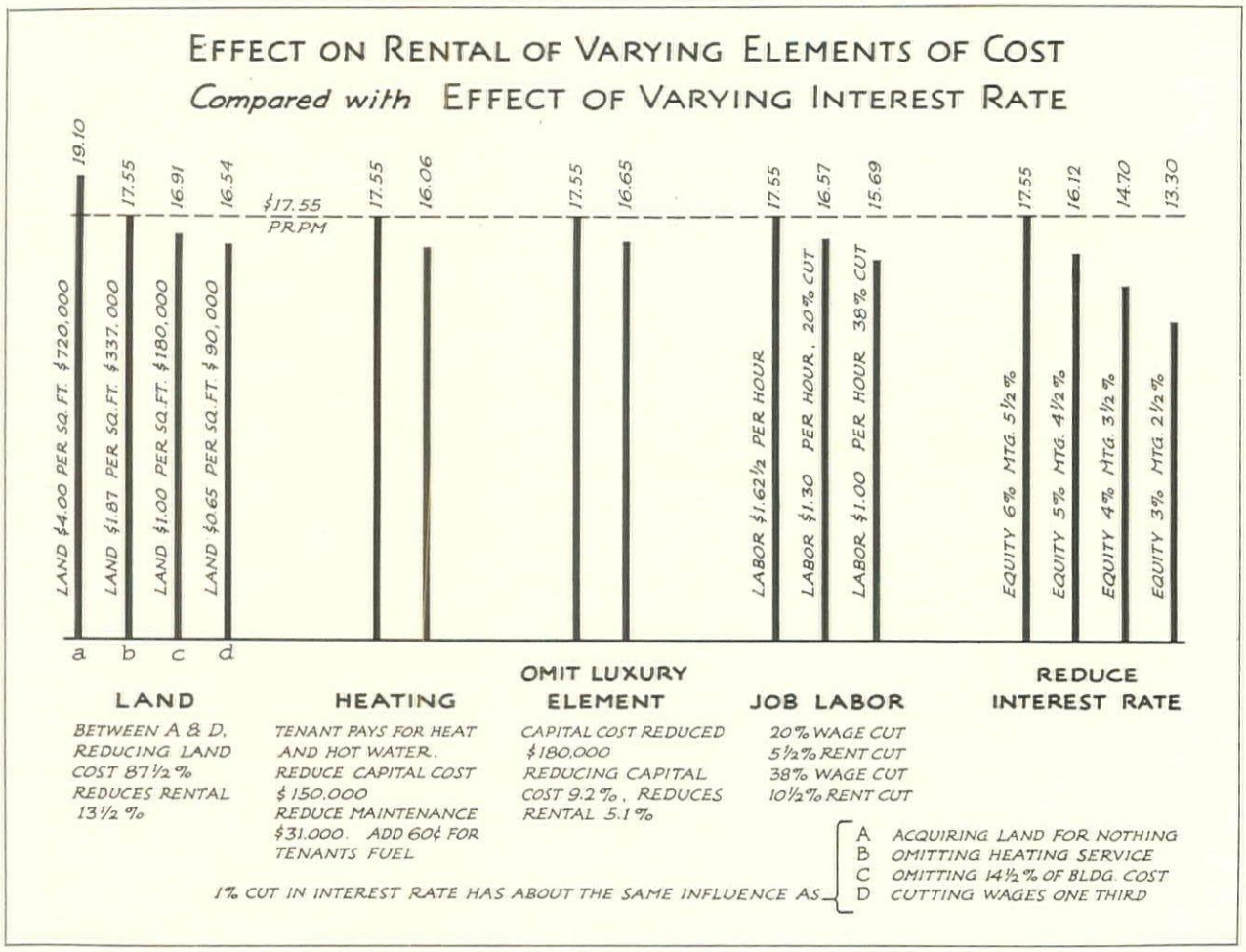


Figure 2*

per cent in the interest rate we obtain a reduction in the rental of 24.2 per cent. Comparing these various results, we find that reducing the rate of interest on equity and mortgage 1 per cent† has about the same influence in reducing the rental as:

(a) Acquiring the land for nothing; (b) omitting the heating service and reducing the cost of the heating system; (c) omitting 14½ per cent of the building cost, or (d) reducing wages of job labor by one-third.

This demonstrates conclusively the enormous importance in future housing, of obtaining money at low rates of interest. It is by no means the whole story but more than any other factor it will help us toward a possible solution.

This study has taken an existing project, and the variants shown involved no changes in the actual layout. One of the elements that has not been shown is the amount of savings that might be effected by more economical planning. This has not been done because it would be almost impossible to make anything like an accurate monetary comparison. Those who have studied this problem know that savings can be made by economy in the layout. This does not mean skimping the size of rooms by square inches, although they must conform to reasonable minima. The study of such economies must rather center around the simplification of the layout and the increase in the number of elements that are repetitive.

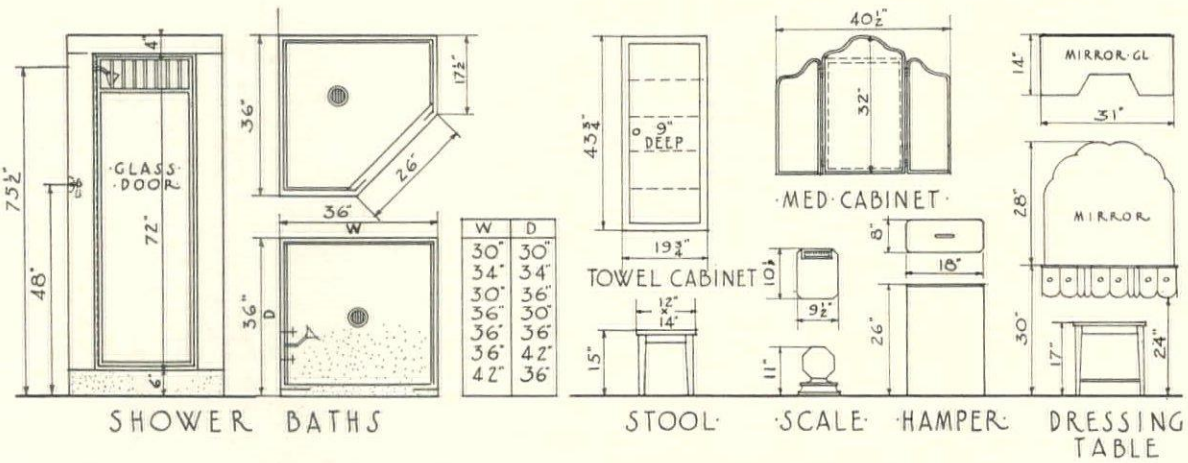
Job experience shows that where, for instance, bathrooms are all exactly the same in fixtures and layout, the workman becomes rapidly trained in the process of installing fixtures, and the curve of labor cost per unit drops quickly as the gangs get into the swing of the work. The same is true of laying brickwork, setting concrete forms and many other divisions of the work. Repetitive units in planning also point to the possibility of developing sectional construction which can be fabricated and sent to the job to be installed in place, with the elimination of much of the usual fitting and cutting.

* The cost of land shown in "d" under "Land" should read 50 cents per sq. ft. instead of 65 cents, as shown.

† Editor's Note: Reducing this rate 1 per cent, from 6 per cent to 5 per cent, for instance, means a reduction of 16⅔ per cent in the annual cost of this item.

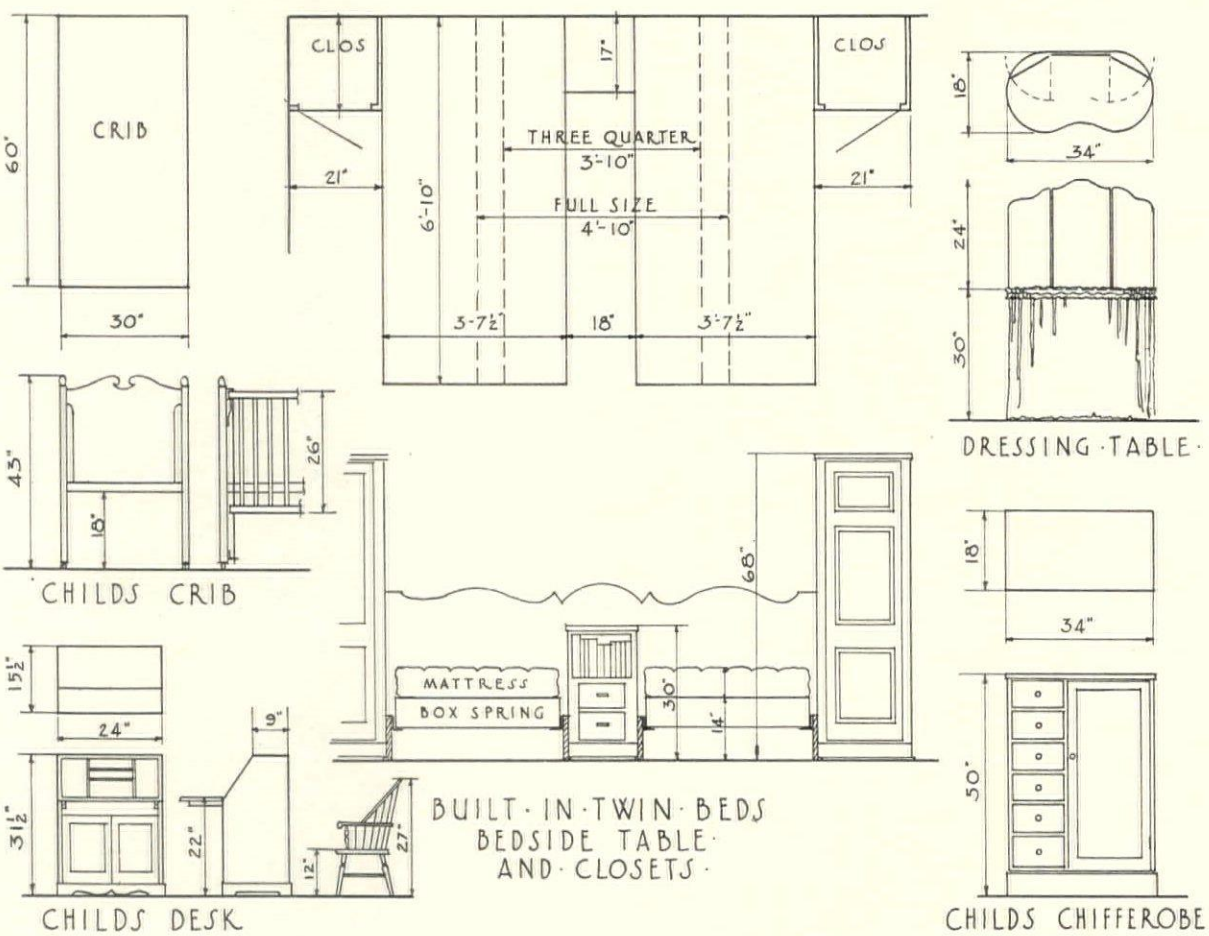
BATH ROOM UNITS

SCALE · FEET
0 1 2 3 4 5 6 7 8 9 10

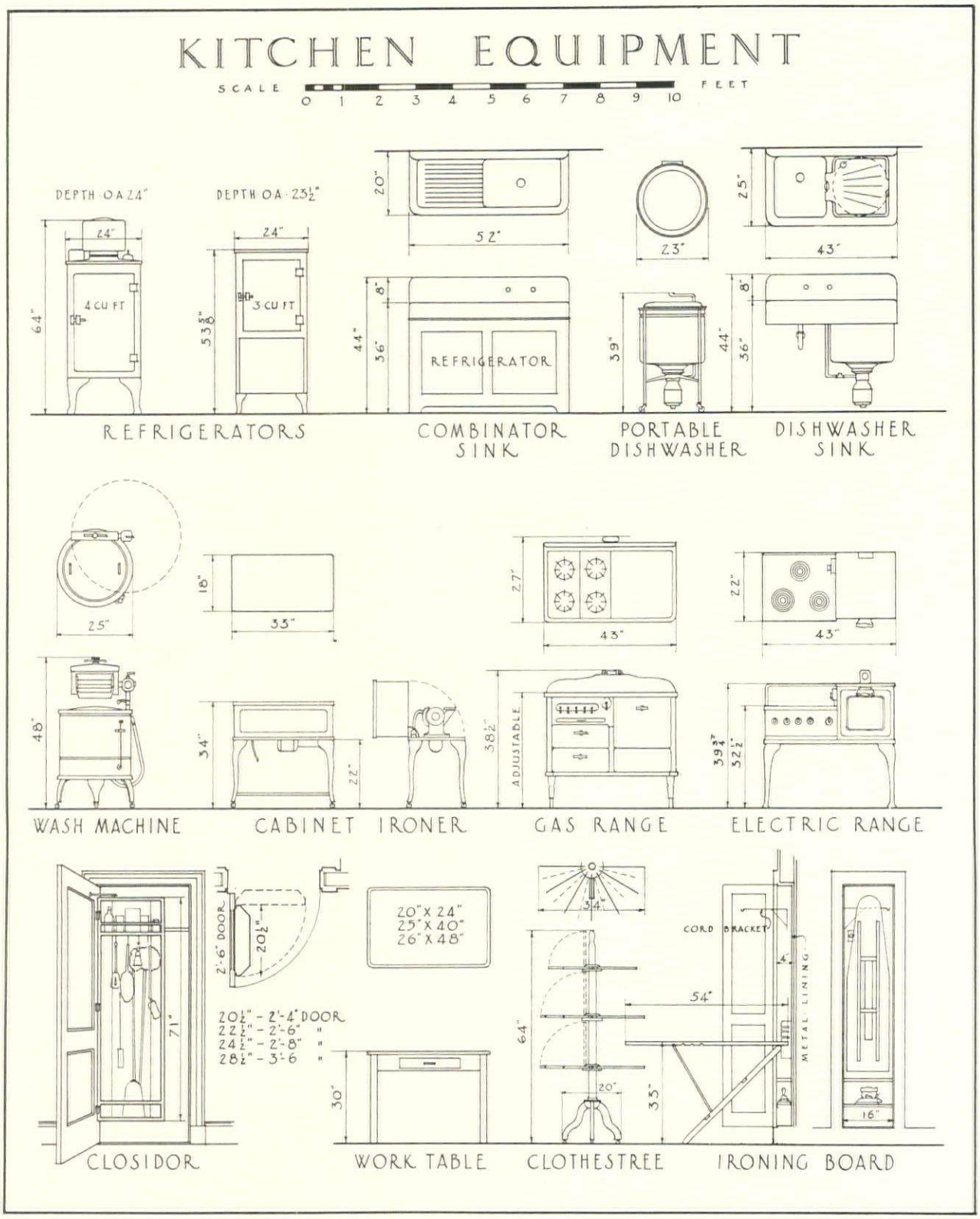


SHOWER BATHS · STOOL · SCALE · HAMPER · DRESSING TABLE

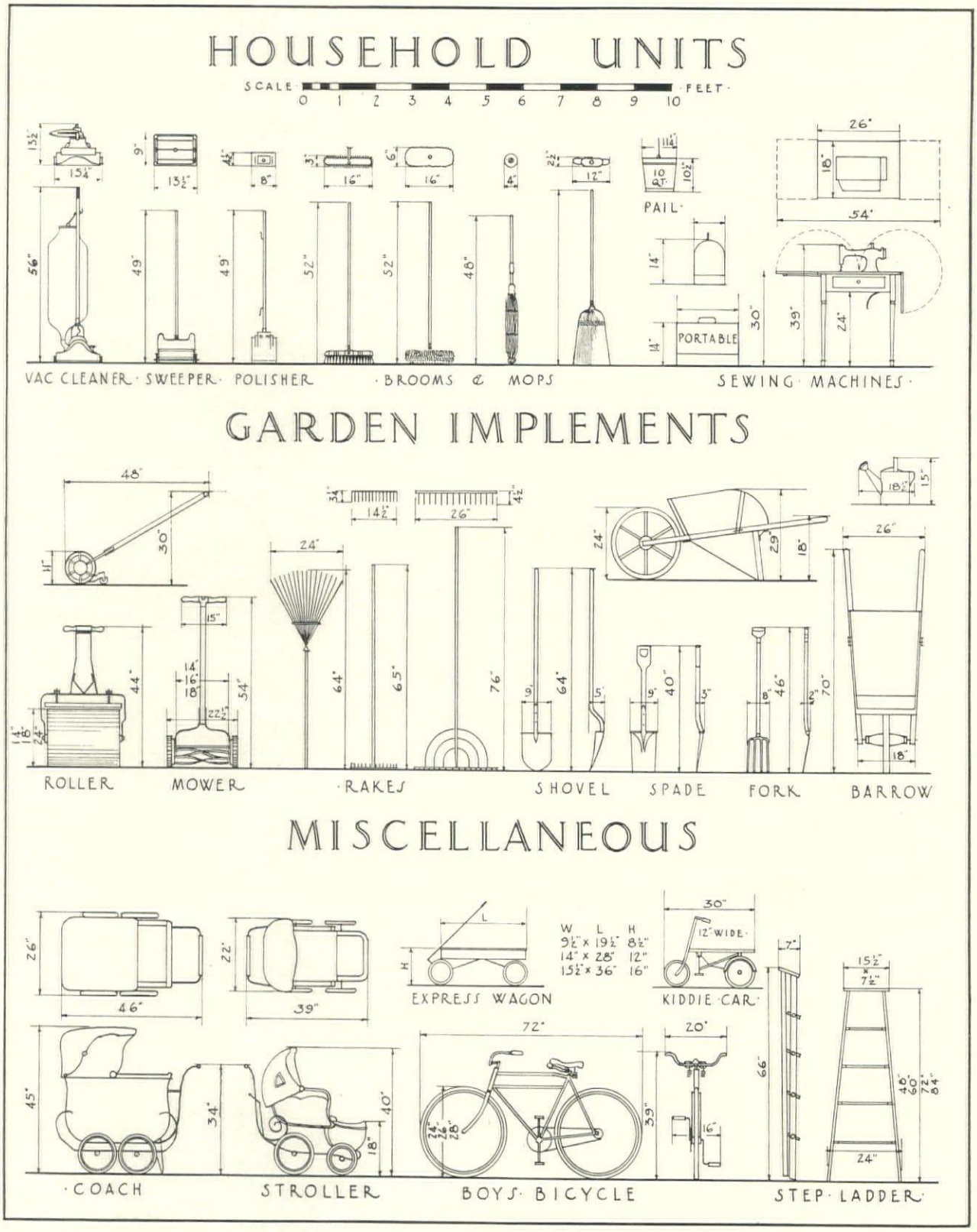
BED ROOM & NURSERY



CHILDS CRIB · BUILT-IN-TWIN-BEDS BEDSIDE TABLE AND CLOSETS · DRESSING TABLE · CHILDS DESK · CHILDS CHIFFEROBE



The equipment units illustrated on these three sheets of data and details are particularly adaptable to the small house or apartment. No effort has been made to show a complete size range of the units illustrated or the more commonly used pieces of standard equipment. The information is useful in providing plan space for these items of equipment



Almost every item illustrated on this page is in general use in small homes and apartments and space for their storage should be included as an important part of the plan. The sizes marked illustrate the average of several types. They are reproduced at a scale of ¼ in. to the foot, making it easy to plan for them on ¼ or ⅛ in. scale working drawings

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.

FACTORY FABRICATED FLOOR UNITS

HIGH strength, increased speed in erection time, and reduction of dead load are three factors incorporated in a new type of steel floor construction. The units, 24 in. wide, and up to 12 ft. 5 in. long, are constructed of two pre-formed steel sheets welded together to form four keystone-shaped cells. In erection, the sections are laid across the structural beams, and are welded, bolted or clipped to the supporting members.

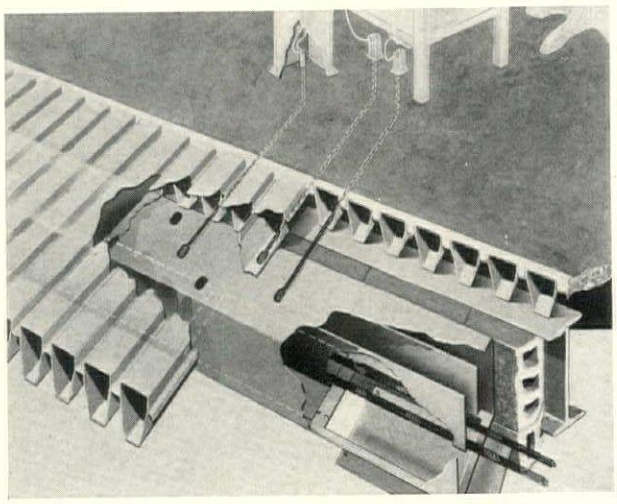
For the two types of flooring shown in diagram, the physical properties are as follows:

I is moment of inertia
S is section modulus
W is weight in pounds per sq. ft.
G is distance from center of gravity to extreme fiber
C is coefficient of strength for simple span
M is maximum moment
R is maximum end reaction for one cell on 2 in. bearing
D is depth of beam

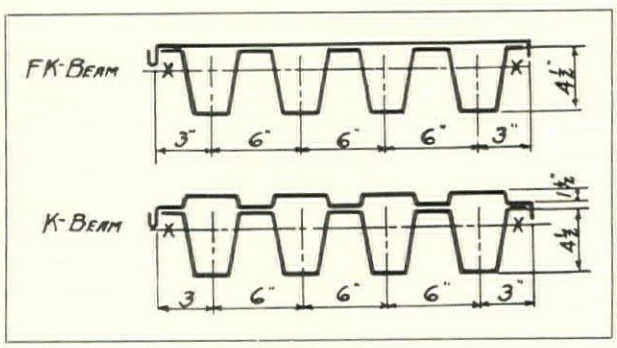
Sheet No. 3	FK16–16	FK14–14	K16–16	K14–14
I Axis X-X	15.25	19.85	25.06	31.32
S "	5.00	6.73	7.37	8.98
W	8.25	10.33	9.39	11.75
G in in.	3.05	2.95	3.40	3.49
C	53330	71790	78610	95790
M in in. lbs.	80000	107680	117920	143690
R in lbs.	4800	6340	4840	6340
D in in.	4.625	4.656	6.125	6.156

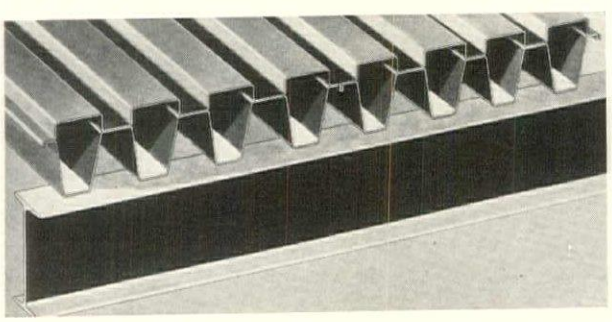
Concrete fill is applied directly to the surface of the floor, and any type of floor covering may, of course, be used as a finish. Ceilings can be suspended from the underside of the flooring as can steam or water pipes. Since the keystone-shaped ducts are

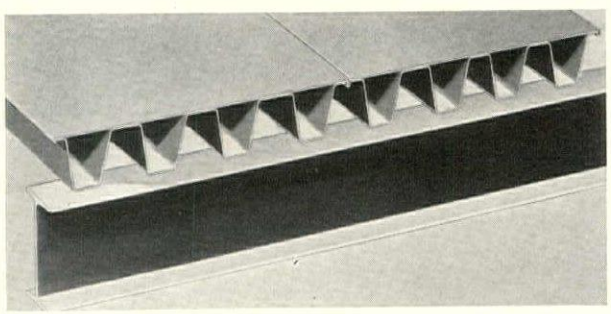
(*Continued on adv. page 14*)



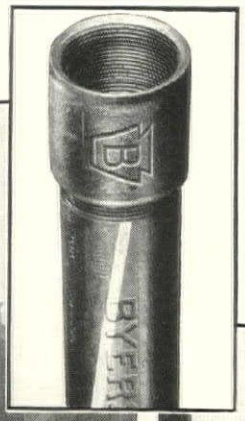
The drawing at the top of the page shows the adaptability of this construction for wiring. Directly below are diagrams of the two types of construction shown in the photographs below, right and left



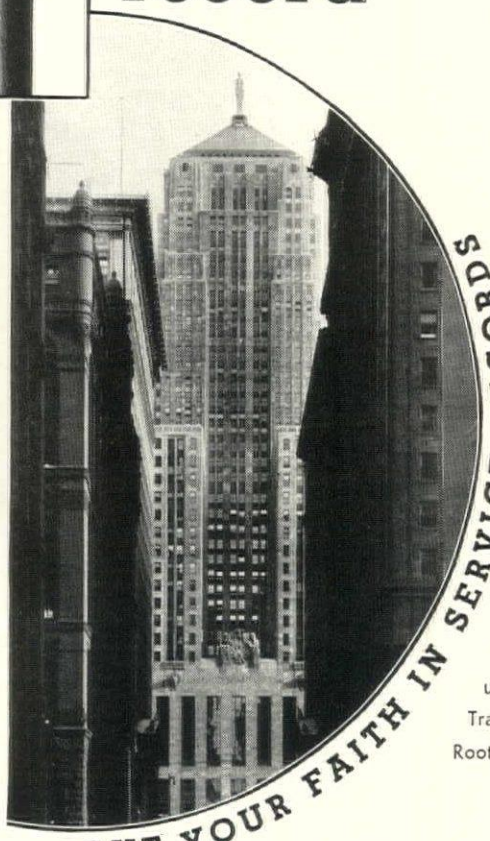




Again BYERS Pipe specified on WROUGHT IRON service record



Old Board of Trade, erected 1882. Equipped throughout with wrought iron.



230 tons of Byers Wrought Iron Pipe used in new Board of Trade Bldg., Holabird & Root, Chicago, Architects.

PUT YOUR FAITH IN SERVICE RECORDS

47-YEAR

service record in old Board of Trade puts BYERS Pipe in new structure

THE OLD HOME of the Chicago Board of Trade offers this amazing example of wrought iron's sure economy and dependability.

When the old building was erected in 1882-83, it was equipped throughout with wrought iron piping. Except for building alterations, no replacement of the original wrought iron pipe was necessary up to the time the building was demolished in 1929. In these later years, when the prospective life of the building was short, a less durable metal was used in making alterations and, in some instances, this failed before the building was razed. *And this is the result of so-called "non-corrosive" lake water.*

So convincing was this service record that in the new Board of Trade Building over 230 tons of Byers Genuine Wrought Iron Pipe was used. No surer guide to proper piping material could have been found!

Let "Pipe Prescription" Aid You

Byers "Pipe Prescription" is an accurate, scientific way of determining the right pipe material for the right job. Let it guide you and your clients in pipe selection. Our engineers are at your call. A. M. Byers Company, Pittsburgh, Pa. Established, 1864.

BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE • CASING • COUPLINGS • NIPPLES • WELDING ELBOWS • SPECIAL BENDING PIPE
BAR IRON • TUBING • PLATES • SHEETS BILLETS

STANDARD of QUALITY for 68 YEARS • • • TODAY BETTER THAN EVER

(*Continued from page 88*)

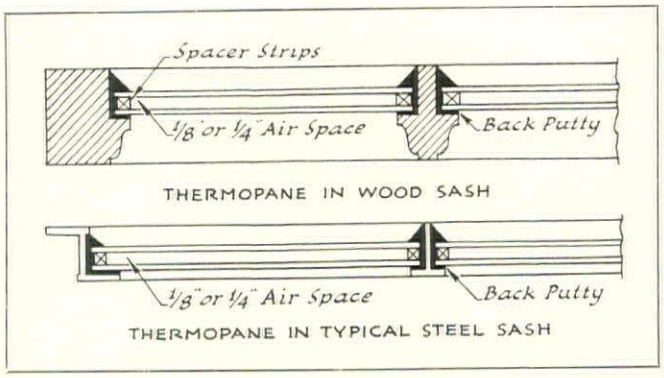
spaced at 6-inch intervals when in place and communicate directly with the corresponding ducts of the adjacent units, the floor may be used, not only as a load-carrying member, but also as a multiple floor duct system for concealment of plumbing, wiring, and other service lines. This type of floor system is particularly advantageous in permitting flexibility in electrical wiring. Changes in outlets may be effected more quickly and with less cost than heretofore.

Actual savings in construction costs will result from the elimination of ducts, reduction of field labor, elimination of temporary planking and masonry forms, and by the saving in time effected by allowing electrical and other trades to follow with their work as soon as the floor is in place.

This floor system was developed by the Mellon Institute of Industrial Research in conjunction with the H. H. Robertson Co. of Pittsburgh. It is known as the Keystone-Robertson Steel Floor, and further data may be obtained from either of the above organizations.

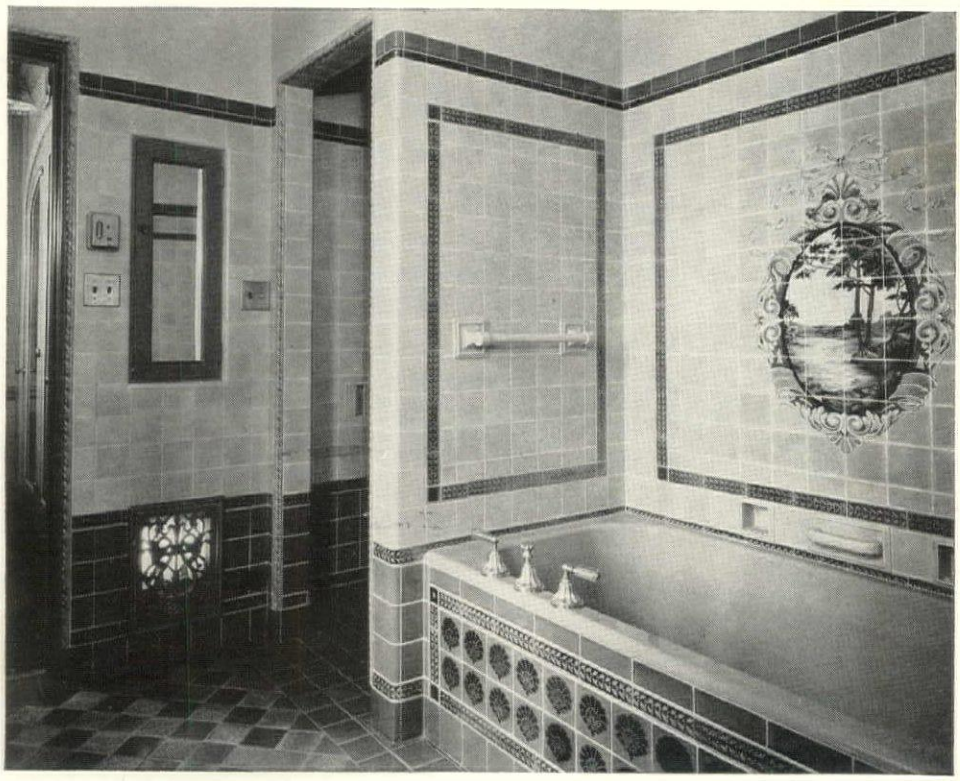
DOUBLE PANE INSULATION GLASS

CONSISTING of two layers of glass with a sealed air space between them, a new window glass has been developed which offers heat insulation, sound insulation, and resistance to frost and moisture. Since the new double-glass window saves from 40 to 63 per cent of the heat lost through windows, its importance in fuel economy and in general air conditioning is obvious. Already available for use in windows, doors, and partitions, it is likely to play an even more significant part in the glass-walled house of the near or distant future.



The dehydrated air between the panes, sealed by special bonding material to make it airtight, watertight, and dustproof, offers the same resistance to sound and heat transmission that dead air space does in any other insulating material. Although the product is furnished standard with 1/8 in. or 1/4 in. air space, it can be furnished with 3/8 in. or 1/2 in. space between. It can

(*Continued on adv. page 16*)



Crane materials make it *economical* to have *good taste*

The sound and original decorative effects to which Crane materials lend themselves more completely than do any others is due to the liaison Crane Co. has always maintained with architects. Otherwise Crane Co. could never have foreshadowed the trend towards harmonious interiors by developing the first ensemble groups or designing other fixtures so architecturally functional as those used in the illustration. For Crane materials make possible bathrooms where the quality of unity is as real and as pleasing as in a well ordered living room.

This is one phase of Crane service to architects. The other, and equally important one, is its constant widening of the architect's influence in bathroom planning by bringing such materials within the range of every builder's budget. Today, for example, such fixtures as these can be purchased and installed for actually less than drab tastelessness cost a few months ago.

CRANE

CRANE CO., GENERAL OFFICES: 836 S. MICHIGAN AVENUE, CHICAGO

NEW YORK: 23 W. 44TH STREET

Branches and Sales Offices in One Hundred and Seventy Cities

PRODUCTS AND PRACTICE

(Continued from adv. page 14)

be supplied in any type of flat glass and in any shape or size up to 48 in. x 48 in. Cut to specified dimensions by the distributors, the product cannot be cut on the job, nor is it at the present time carried in stock sizes.

Manufactured under the trade name "Thermopane," information may be obtained from Charles D. Haven, Milwaukee, Wis., or from J. Flint Foster, distributor, 205 W. Wacker Drive, Chicago.

STAINLESS STEEL SINK

STAINLESS steel, already being widely used in restaurant and kitchen equipment because of its easy maintenance and resistance to fruit juices and other acids is now being employed for kitchen sinks. Made in four standard lengths, 4 ft., 5 ft., 6 ft. and 7 ft., with double or single drainboards, the new units are entirely seamless. The underside is treated with a sound deadening material. Features of the design are: 8 in. basin with removable stopper-strainer, full length ledge and 8 in. splashboard at back, movable mixer-faucet equipped with spray, 54 in. flexible hose for rinsing dishes, and quick compression faucets with swivel-valve seats. A further advantage of this new sink is that the material of which it is made is less bulky than almost all other sinks, and therefore it occupies less work area.

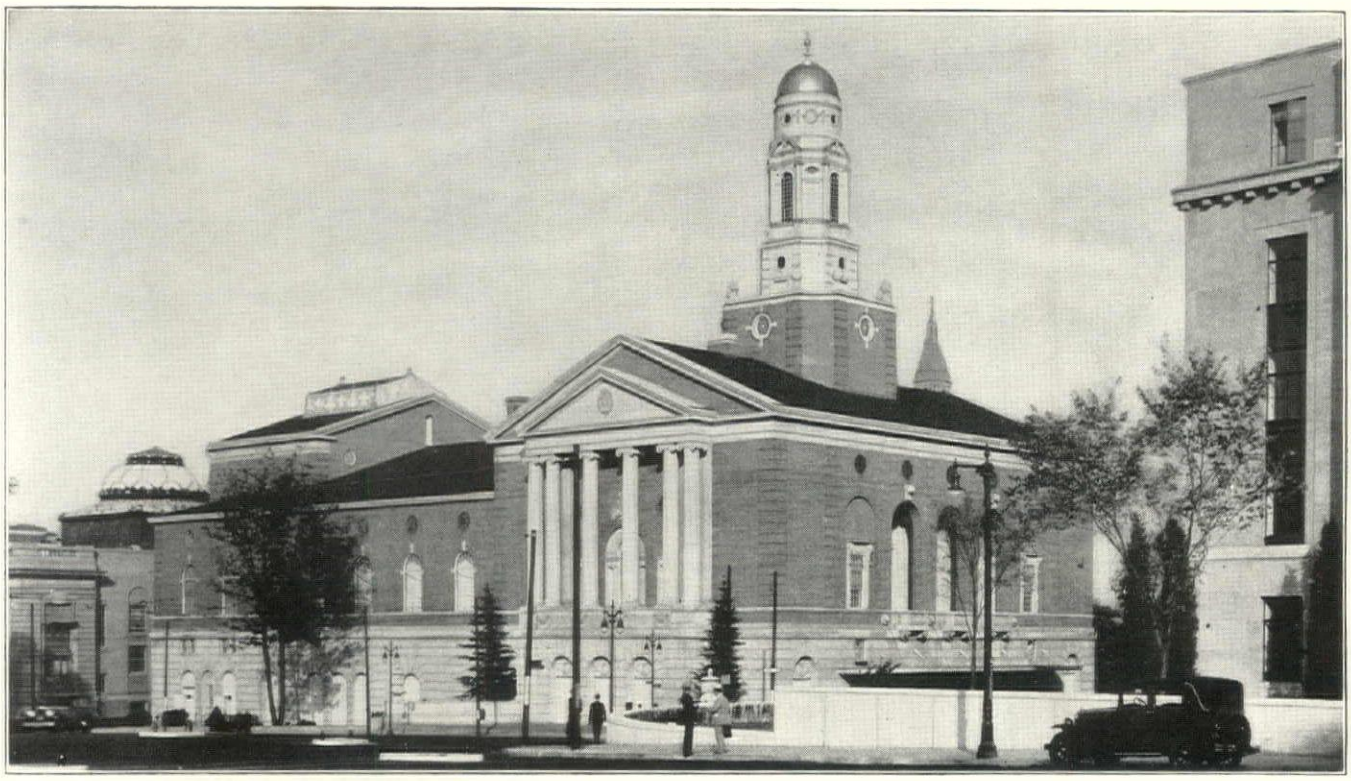
Forty different models are manufactured by the Bossert Company, Utica, N. Y., who have designated their product as the Hydrocrat.

NOISELESS RIVET-BOLT

REDUCTION of noise in steel erection through the elimination of the rivet gun has been accomplished by use of a new rivet-bolt for joining structural steel members. The rivet-bolt has a ribbed shank, slightly larger in diameter than the punched hole, which bites into the metal of the plates, and a self-locking screw thread which produces a positive locking of nut and bolt. Holding quality equal to that of a rivet is obtained by the combination of these features.

In using the rivet-bolt, not more than two men, instead of the usual four in the rivet gang, are required. The bolt is driven into the punched hole with a hand hammer, and the nut is spun around by hand until it seats itself against the structural plate, after which it is

(Continued on adv. page 18)

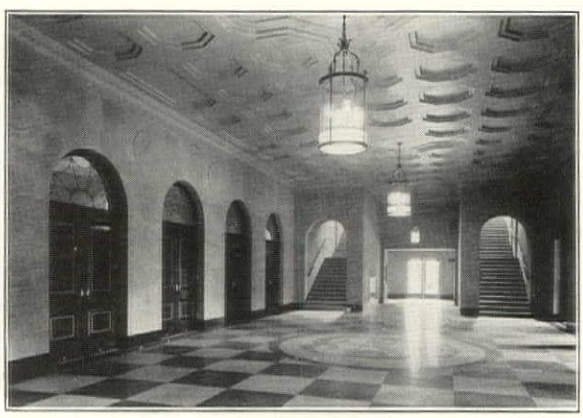


THE HORACE BUSHNELL MEMORIAL

NEW ENGLAND'S LARGEST CONCERT HALL

. . . . . *Automatically Controlled by the Minneapolis-Honeywell Modutrol System*

The Horace Bushnell Memorial, Hartford, Connecticut. Architects: Corbett, Harrison & Mac Murray, New York City. Heating Engineer: Clyde R. Place, New York City General Contractor: R. F. Jones Company, Hartford. Heating Contractor: Wm. B. Carson Company, Hartford.



THE FOYER...HORACE BUSHNELL MEMORIAL

THE HORACE BUSHNELL MEMORIAL, one of the largest structures of its kind, is another building where exacting and varied temperature requirements are met by the Minneapolis-Honeywell Modutrol System. With the accurate Modutrol System, sensitive and positive control of direct radiation and the recirculating air system is maintained. The flexibility and scope of Minneapolis-Honeywell Control Systems make it possible for them to meet any requirement or combination of requirements in the field of engineered automatic control . . . Minneapolis-Honeywell Regulator Company, 2740 Fourth Avenue South, Minneapolis, Minnesota. Factories: Minneapolis and Elkhart and Wabash, Indiana.

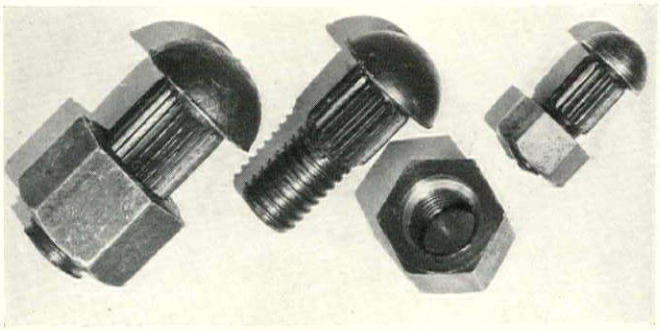
Branch and Distributing Offices: NEW YORK • BOSTON • HARTFORD • NEW HAVEN • PROVIDENCE • PHILADELPHIA • BALTIMORE • WASHINGTON BUFFALO • SYRACUSE • ROCHESTER PITTSBURGH • CLEVELAND • DETROIT • CHICAGO • MILWAUKEE • INDIANAPOLIS • CINCINNATI • ST. LOUIS • KANSAS CITY • DENVER • SALT LAKE CITY • SAN FRANCISCO LOS ANGELES • PORTLAND • SEATTLE. *Canada:* MINNEAPOLIS-HONEYWELL REGULATOR CO., LIMITED, TORONTO AND MONTREAL. *Export:* NEW YORK CITY. *Cable Address:* "LABORAMUS"

MINNEAPOLIS-HONEYWELL

Control Systems

PRODUCTS AND PRACTICE

(*Continued from adv. page 16*)



tightened by a wrench. The self-locking thread holds it secure.

Manufactured by the Dardelet Threadlock Corporation, 120 Broadway, New York, the new rivet-bolt has recently been subjected to structural tests at Columbia University.

ULTRA-VIOLET AND ILLUMINATIVE LIGHTING FIXTURES

COMBINED in one fixture the advantages of ultra-violet and illuminative light are now obtainable for all types of commercial buildings. These dual purpose fixtures operate on two circuits, one for the bulbs used for illumination, and one for the single bulb which radiates ultra-violet. The transformer required for the ultra-violet bulb is concealed in the fixture itself, or it may be installed in the ceiling covered by a plate. Light from the ultra-violet bulb may be either direct or indirect. In the former it is necessary to use the circuit for only short periods of time, whereas in the latter, the bulb may be permitted to burn all day. The accompanying photograph shows the interior construction of the direct-semi-indirect type, with the transformer embodied in a canopy.

Detailed information on these Duo-Purpose lighting fixtures may be obtained from the Miller Company, Meriden, Conn.

OIL BURNING FURNACE

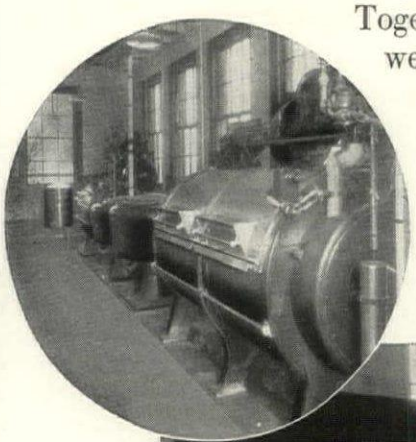
Designed to utilize the heavy and less costly domestic fuel oils, a new type of oil burning furnace has been developed by the General Electric Company, Schenectady, N. Y. This is the first step of the company in its program of manufacturing all the units of air conditioning equipment.

No more floor space available . . .

but THEY DOUBLED ITS SIZE, just the same!

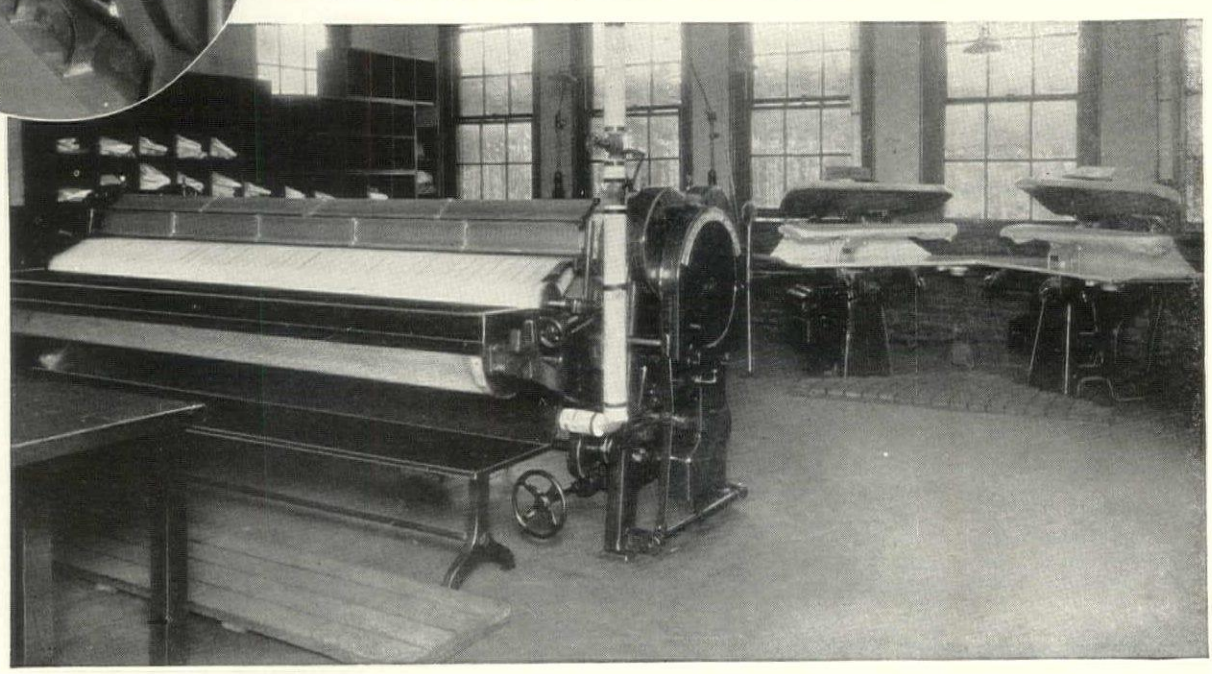
RECENTLY, Lowell General Hospital, Lowell, Mass., increased its capacity from 75 beds up to 150. Which sent exactly twice as much work streaming into its already-crowded laundry department. The hospital's architects, knowing of the changes in laundry volume, sent out a call for the Specialists of The American Laundry Machinery Company. Together they checked, weighed, measured, estimated — then agreed on *a thorough revamping*, with modern, motor-driven "American" equipment.

Now Lowell General Hospital's laundry standards are higher than ever. Laundry operating costs are low. And the remodeled department, *in the same floor space*, handles easily twice as much work! When *your* specifications reach into the laundry field, you can save hours and dollars by conferring with "American" Specialists. Their service will not obligate you in any way.



Two views of Lowell Hospital's laundry department, modernized with the aid of "American" Specialists. Notice the monel metal Cascade Washers, Underdriven Extractors and Flat Work Ironing Unit—also the special-shape, quick-action American Eagles, ideal presses for hospital-laundry work.

APPLETON & STEARNS, ARCHITECTS, BOSTON.



THE AMERICAN LAUNDRY MACHINERY COMPANY

CINCINNATI, OHIO

NOTICES AND EVENTS

WILLIAM SYDNEY WAGNER
1883–1932

WILLIAM SYDNEY WAGNER of New York, member of the firm of Bottomley, Wagner & White, died May 27. Mr. Wagner, whose professional career dated from his winning of the Prix de Paris in 1907, specialized in hotel work, having designed the Statler hotels in Buffalo, Boston, St. Louis, Detroit, and Cleveland. Two of his most prominent buildings in New York were the Hotel Roosevelt and the recently completed River House. Mr. Wagner was a graduate of Cooper Union, Beaux Arts Institute of Design, and L'Ecole des Beaux Arts. He was at one time associated with George B. Post & Sons.

Blank & Stoller

NEW YORK CHAPTER OFFICERS

CHARLES H. HIGGINS has been elected president of the New York Chapter of the American Institute of Architects for 1932–33, succeeding Stephen F. Voorhees. Other officers elected were Dwight James Baum, vice president, Eric Kebbon, secretary, Frederick Mathesius, Jr., treasurer, and Christopher LaFarge, recorder.

MRS. AYMAR EMBURY II
1890–1932

MRS. AYMAR EMBURY II, known in her professional capacity as a landscape gardener as Ruth Dean, died May 26 at her home in New York. Mrs. Embury was probably best known for the landscaping of the Detroit homes of Mrs. Howard Bonbright, Hiram Walker, and Ledyard Mitchell, for which she received the Architectural League of New York's Gold Medal of Honor in Landscape Gardening. Mrs. Embury was a graduate of the University of Chicago.

CONRAD ARTHUR THOMAS
1858–1932

CONRAD ARTHUR THOMAS, mural painter, died June 8 at his home in North Pelham, N. Y. Among Mr. Thomas's best known murals are those in the St. Louis City Hall, the Courthouse at Auburn, Ind., the Hotel Sinton in Cincinnati, the Courthouse at South Bend, Ind., the Seelbach Hotel in Louisville, Ky., and the Cathedral of Saints Peter and Paul in Philadelphia.

EARL HARVEY LYALL
1877–1932

EARL HARVEY LYALL, Federal architect, died June 6 at Selfridge Field, Mich.

J. G. VAN HORNE
1853–1932

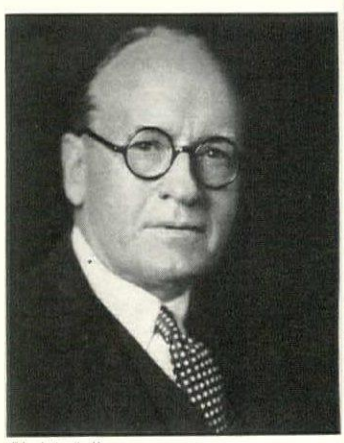
J. G. VAN HORNE, consulting engineer for many suburban developments in the vicinity of New York, died June 6 in that city. Mr. Van Horne was a graduate of New York University, and a member of the American Society of Civil Engineers.

McKIM FELLOWSHIP

FOR his design of a skyscraper to house all the activities of Columbia University, Howard Bahr of Sayville, Long Island, has been awarded the $2,500 Charles Follen McKim Traveling Fellowship. Second prize of $500 was awarded to James Sasso of Brooklyn, N. Y., and third prize of $500 to Joseph De Marco of Farmingdale, Long Island. The jury of award was composed of Dean E. V. Meeks, Arthur Loomis Harmon, Harvey Wiley Corbett, Ely Jacques Kahn, and William Adams Delano.

J. E. R. CARPENTER

ONE of New York's most important skyscraper architects, J. Edwin R. Carpenter, died suddenly in his office June 11. Mr. Carpenter was the architect for the Lincoln Building, and for many large apartment houses in the city. In 1916 he was awarded the Gold Medal of Honor for a 12-story apartment house at 907 Fifth Avenue, and in 1928 he was similarly honored for an apartment house at 819 Park Avenue.



Blank & Stoller

Mr. Carpenter was born in Columbia, Tenn., and was graduated from the Massachusetts Institute of Technology in 1887. He studied at L'Ecole des Beaux Arts, and upon his return, entered practice in Norfolk, Va., before coming to New York.

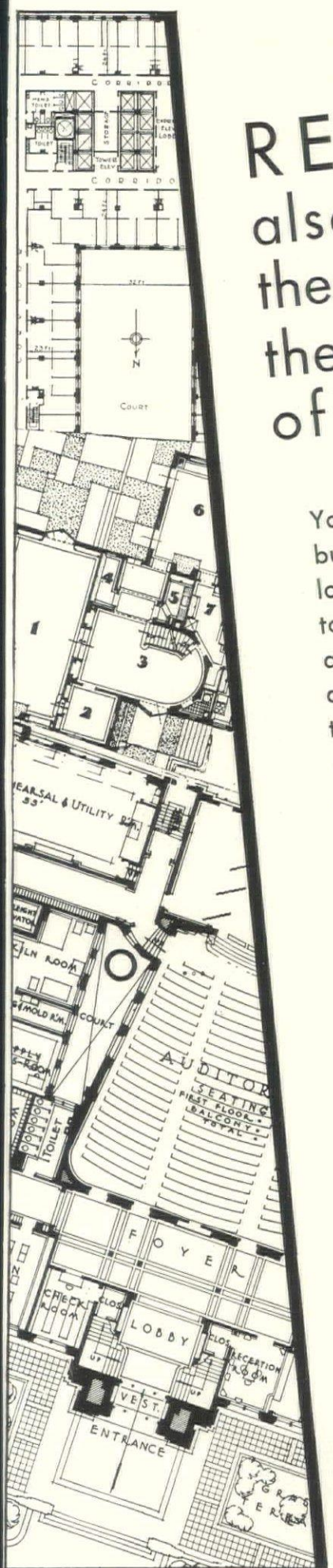
LENIN MONUMENT COMPETITION

AN INTERNATIONAL competition for the design of a monument to Lenin has been announced by the U. S. S. R. Six prizes are to be awarded, ranging from 10,000 rubles to 2,000 rubles. The closing date for entries is September 15, 1932. Information may be obtained from the Amtorg Trading Corporation, New York City.

ILLUMINATION DESIGN COMPETITION

E. A. YOUNG, student of Atelier Adams-Nelson in Chicago, was awarded first prize of $750 in a competition among students for designing illumination for "a great hall at the Electrical Building, Chicago World's Fair." A. E. Alexander of Catholic University won second prize of $250, and H. L. Kamphoefner, Sioux

(Other Notices and Events will be found on adv. page 22)



REPUTATION also depends upon the care exercised in the MAINTENANCE of your building.

You can turn over the keys of a new building but your reputation will be locked up in its future for many years to come. You may have specified standard protective systems but unless they are carefully MAINTAINED—always—their failure in an emergency will have an unfavorable reaction.

Watchmen's systems... manual and automatic fire alarms... burglar alarms... sprinkler systems, when supervised, minute by minute, from an A.D.T. Central Station, receive PERPETUAL CARE—assurance that they are constantly in perfect operating condition. Nothing can happen, day or night, to interfere with the proper functioning of protective devices without A.D.T. taking immediate action!

It will profit you to investigate the Central Station protection facilities of A.D.T. They are available in almost every large city from coast to coast.

A.D.T. SYSTEM

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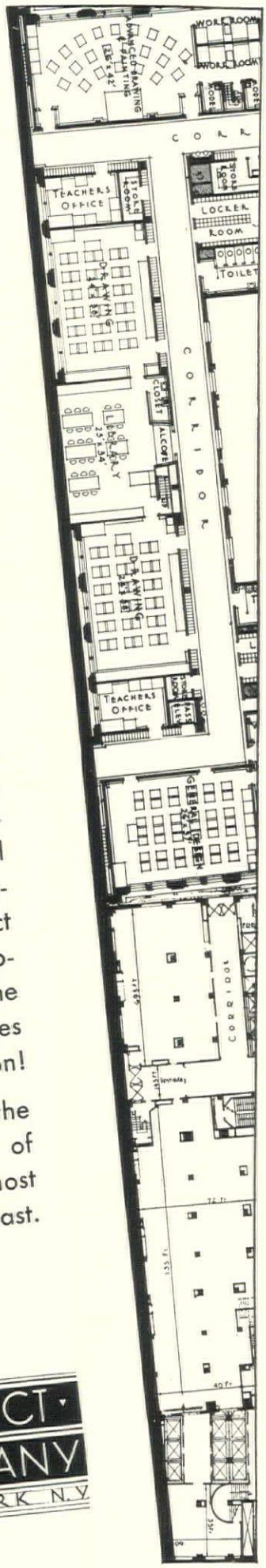


NOTICES AND EVENTS

(*Continued from adv. page 20*)

City, Iowa, won third prize of $150. Fourth and fifth prizes of $50 each were awarded to F. O. Dester, University of Illinois, and H. Tonsager, Armour Institute of Technology, respectively. The competition was conducted by the Beaux Arts Institute of Design, the American Institute of Architects, and the Illuminating Engineering Society. Foster Gunnison was chairman of the committee.

HONORED BY N. Y. U.

I. N. PHELPS STOKES, architect, and Thomas Adams, architect and regional planner, were recipients of honorary degrees at the commencement ceremonies of New York University. The degree of Doctor of Letters was conferred upon Mr. Phelps Stokes, chiefly because of his book, "The Iconography of Manhattan Island," and the degree of Doctor of Science upon Mr. Adams for his contributions as director of the Regional Survey of New York and Its Environs.

BAYONNE BRIDGE WINS PRIZE

BECAUSE "beauty and symmetry had been achieved 'at the price of honesty'" in the George Washington Bridge over the Hudson, the Bayonne Bridge over the Kill van Kull won the prize offered by the American Institute of Steel Construction for the most beautiful bridge costing more than $1,000,000 opened during 1931. The Washington bridge placed second. Othar Hermann Ammann, chief engineer of the Port of New York Authority, designed both bridges.

The prize for bridges costing between $250,000 and $1,000,000 was given to the Waldo-Hancock Suspension Bridge over the Penobscot River at Bucksport, Maine. It was designed by Robinson & Steinman of New York. In the class for bridges costing less than $250,000, the award went to the West Stewartstown Bridge over the Connecticut River at West Stewartstown, N. H. The design for this bridge was created by the New Hampshire State Highway Department.

ERRATUM

IN THE reproduction of the Art Gallery at Mystic, Connecticut, on pp. 563–564 of the June issue, the credit line should have read, Jackson, Robertson & Adams, Architects; George Fraser, Associated. We regret having omitted Mr. Fraser's name.

FRANK PERNA
1884–1932

FRANK PERNA, architect and publisher, of Hoboken, N. J., died suddenly June 14. Mr. Perna received his professional training at the University of Naples, from which he was graduated just prior to his coming to this country 27 years ago. He was the architect for many small buildings in New Jersey, and was president of the Iuventus Publishing Company and of the Circolo Italiano.

LITCHFIELD HEADS ART GROUP

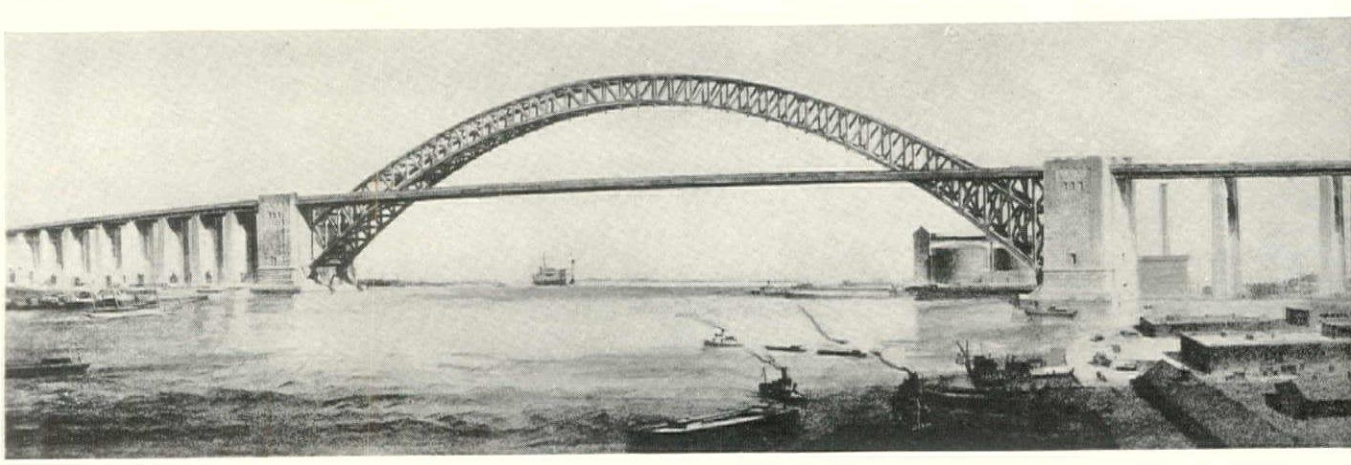
ELECTUS D. LITCHFIELD, prominent New York architect, has been elected president of the Municipal Art Society of that city. The society is, in the words of its new president, "the only official body representing the citizen in furthering the beauty of the city and its artistic possessions."

"HOUSE BEAUTIFUL" COMPETITION

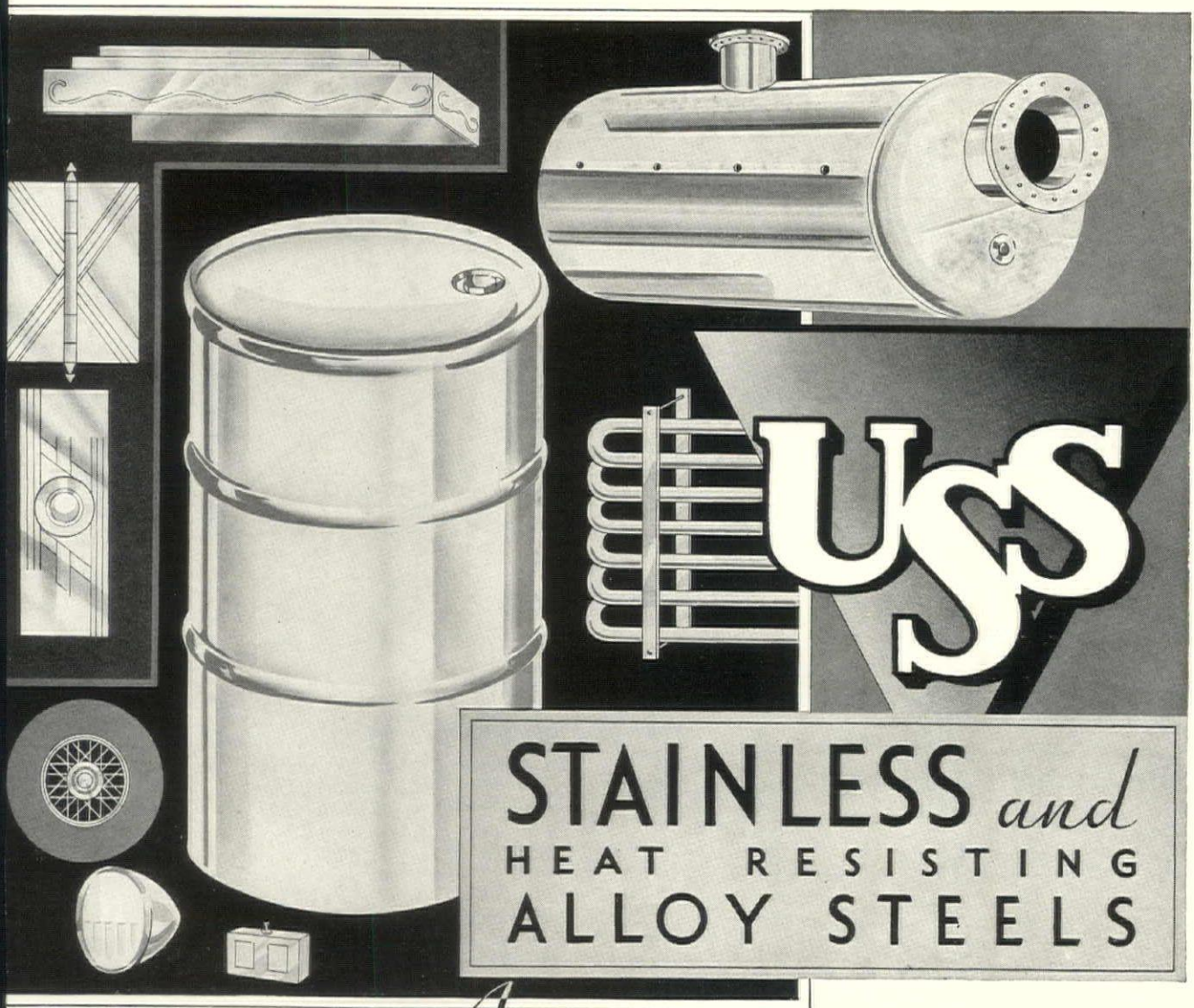
THE annual competition sponsored by House Beautiful magazine for the best six- to twelve-room house closes this year on October 17. In addition to the prizes awarded in that class, there is a special prize of $300 for the best house of from five to seven rooms, costing less than $10,000, built in any section of the country. The regular awards consist of three prizes, $500, $300, and $200 for the best houses built East of the Mississippi, in one class, and West of the Mississippi, in the other. Further information about entries may be obtained from the magazine, 8 Arlington Street, Boston.

DEDICATION OF BRITISH BUILDING IN ROCKEFELLER CENTER

THE cornerstone for the British Empire Building, one of the foreign units planned for Rockefeller Center, is to be laid July 2. Lord Southborough, who is prominent in the directorate of the company backing the British unit, and H. H. Stevens, Canadian Minister of Trade and Commerce, will speak.



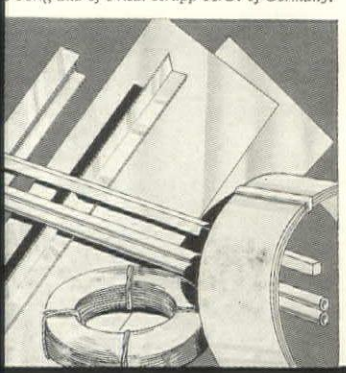
The Bayonne Bridge over the Kill van Kull, Othar Hermann Ammann, chief engineer



Adaptations

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

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



CHARACTER suitable to the intended role, and modifications that are nicely governed with particular results in view—such are the advantages provided in the series of USS STAINLESS and Heat Resisting Steels as a result of long research and unsparing effort.

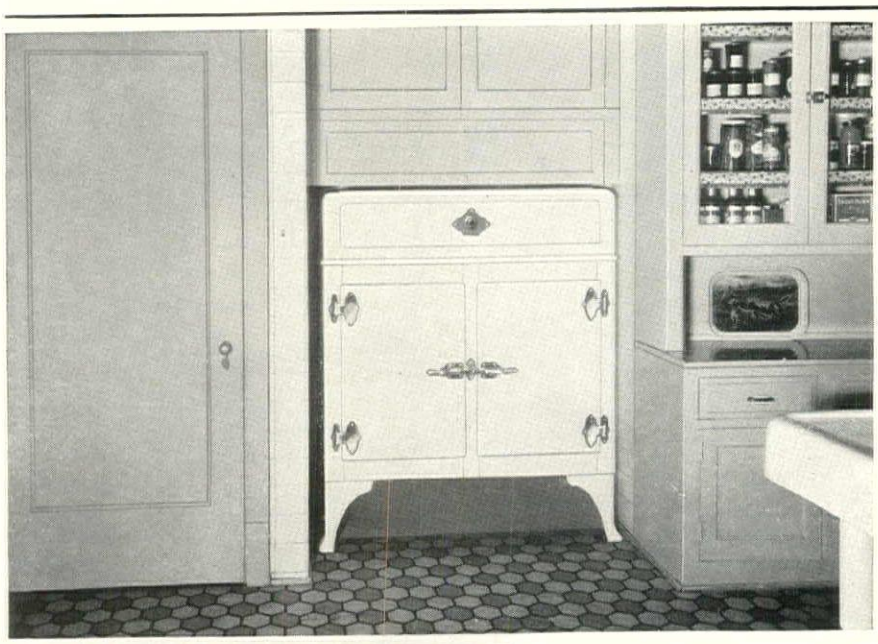
Name your field—industrial, chemical, refining, manufacturing, food handling, architectural, domestic—and your specific use, and the technical staff working with these special alloys will recommend a grade appropriate in cost and adapted to your need. New problems will be considered carefully in order that discriminating advice may be given.

Write for informative booklet. Correspondence is invited by any of the subsidiary companies of the United States Steel Corporation whose names appear below:

AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, - Sheets and Light Plates
AMERICAN STEEL & WIRE COMPANY, Chicago, - Cold Rolled Strip Steel, Wire and Wire Products
CARNEGIE STEEL COMPANY, Pittsburgh, - - Shapes, Plates, Bars and Semi-Finished Products
ILLINOIS STEEL COMPANY, Chicago, - - Bars, Plates, Shapes, Special and Semi-Finished Products
NATIONAL TUBE COMPANY, Pittsburgh, - - - - - - - - Pipe and Tubular Products

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif.
Export Distributors—United States Steel Products Company, Hudson Terminal Building, New York, N. Y.

DUAL-AUTOMATIC



Here is one of the kitchens equipped with a Model DWL-130 Westinghouse Dual-automatic Refrigerator referred to in the letter quoted below.

• • •

"You installed for me twenty-four of your model DWL-130 Westinghouse Refrigerators in my building at 442 Wellington Avenue, during December, 1931, replacing refrigerators which had become quite troublesome.

"Your machines have not only been highly satisfactory from my standpoint but frankly have greatly improved the appearance of the kitchens and have resulted in universal approval from the tenants whose pleasure and satisfaction have of course made me greatly pleased with the installation.

"I can highly recommend to any apartment house owner that he use Westinghouse Refrigerators because of their appearance and performance, and the economy of operation."

—*Fred Becklenberg.*

WITH HERMETICALLY-SEALE MECHANISM AND FORCED DRAFT COOLING COMBINE ONLY IN THE WESTINGHOUS REFRIGERATOR

ASSURES THE DEPENDABILIT DURABILITY AND ECONOM APARTMENT OWNERS HAVE RIGHT TO EXPECT

Apartment owners interested in realizi the most satisfactory return from their inve ment in electric refrigeration will do well investigate the important list of featur combined in the Westinghouse *Dual-au matic* Refrigerator.

One feature alone — the exclusive "Spenc Disc" thermostat control — eliminates o of the greatest causes of adjustment in refrigerator. It keeps the Westinghou Refrigerator automatic through emergenci of all kinds . . . assures trouble-free uninte rupted performance. "Because of the splend service which these refrigerators have giv me, it has not been necessary, up to this tim that I call you in a single instance on a repa or trouble call," writes T. J. Murray who i stalled sixteen refrigerators a year ago.

This fact is significant . . .

Dual-automatic performance is one of t most important reasons for the minimu upkeep expense of the Westinghouse Refri erator. The hermetically-sealed mechanis is another. All mechanism is sealed in a pe manent supply of oil . . . sealed against t ravages of time, corrosion and wear . . . pr tected against tampering. And forced-dra cooling, added to speed the natural cooli action of room air, contributes to the efficien and economy of operation.

Furthermore — new all-steel constructi gives the Westinghouse Refrigerator rugg lifetime durability. And with other importa improvements assures the dependability a durability expected by tenants and hop for by owners. "It is gratifying to have all my tenants express their complete satisfa tion with your refrigerators," writes R. O'Brien.

From the standpoint of tenant satisfacti to that of investment return, the Westin house *Dual-automatic* Refrigerator meets requirements of profitable apartment refri eration. It will pay you to investiga thoroughly before investing another penn

Let us give you complete details a interesting cost figures and data. Fill o and mail the coupon for convenience.

Westinghouse

Dual-automatic Refrigeration

Westinghouse Electric & Mfg. Co.,
Refrigeration Division, Mansfield, Ohio.
Please send complete information about Westinghouse Refrigerators for the modern apartment.

Name .....

Address .....

City ..... State ..... A.F. 7-32

WESTINGHOUSE ELECTRIC & MFG. CO.

Refrigeration Division **Mansfield, Ohio**

SCHOOLS • COLLEGES • UNIVERSITIES • LABORATORIES • COMMERCIAL KITCHENS • PHOTO-ENGRAVING • ELECTRO-PLATING • MEDICAL BUILDINGS • SODA FOUNTAINS • • •

Where DURIRON Drain Pipe should be specified . . .

Corrosive wastes are enemies of a great many well-designed buildings. There is one way to overcome the costly tear-ups and replacement expense they can cause, and that is to use Duriron Acid-proof Drain-pipe.

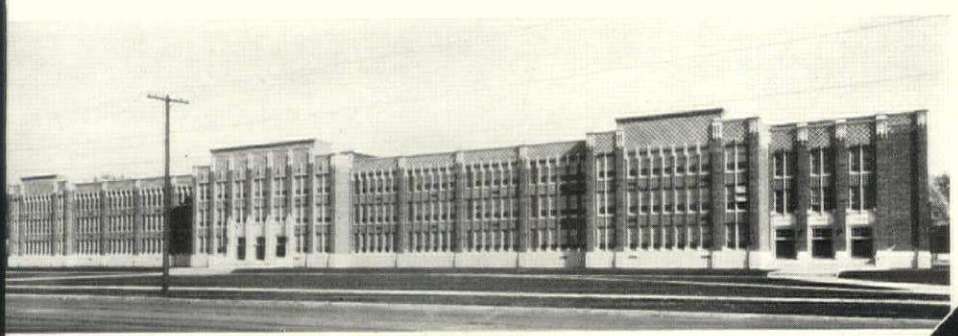
Drainage from laboratories, for instance, is powerless against Duriron, because Duriron is acid-proof all the way through its structure, inside and outside. It does not depend on coating, lining or glaze for corrosion-resistance. Another advantage is its metallic strength.

Every building with a laboratory should be protected by Duriron Acid-proof Drain-pipe . . . schools, colleges, universities . . . hospitals, medical buildings, industrial plants.

Wherever else waste lines must handle corrosives, Duriron has a place . . . photo-engraving and electro-plating plants . . . storage battery rooms . . . soda fountain and commercial kitchen drainage subject to attacks from fruit and food acids and washing compounds.

Duriron Pipe is installed like extra heavy cast iron soil pipe and outlasts the building in which it is placed. See Sweet's Catalogues for further information or write us.

THE DURIRON CO., INC., 446 N. Findlay St., Dayton, Ohio



Front view of million dollar South Side High School, Salt Lake City. Permanently insured against possible damage from laboratory acid wastes by Duriron Acid-proof Pipe, Fittings and Sinks. Architects, Scott & Welch.

DURIRON ACID PROOF DRAIN-PIPE

BOOK FORUM

THREE VOLUMES ON HOUSING

ALTHOUGH the President's Conference on Home Building and Home Ownership fell understandably short of finding all the answers to all the questions of low cost housing, the final results of the many sessions held last fall in Washington are likely to exceed the expectations of most of us. For one thing, the sorry state of the nation's housing has become a significant issue. Not only social workers and architects, but bankers, politicians, and the general public have discovered that good housing for the poor is fully as important a national problem as Prohibition.

Those with a professional or business interest in residence construction were, no doubt, disappointed by the immediate outcome of the Conference. It seemed, at the time, that there had been nothing but talk. An entirely different impression will be obtained, however, from study of three volumes of reports that have recently been issued in permanent bindings. Facts that received no publicity, experiences that were forgotten as soon as they had been related, and concrete proposals that apparently were lost in the mass of less worthy material have been assembled by the Committee to form an extremely valuable manual on housing.

Ten different committee reports are included in these first three volumes. Under the titles, "Planning f[or] Residential Districts," "Home Finance and Taxation[,]" "Slums, Large-Scale Housing and Decentralization[,]" the following subjects are discussed: City Planning a[nd] Zoning, Subdivision Layout, Utilities for Houses, T[he] Relation of Size of Lots to Cost of Utilities and Stre[et] Improvements, Landscape Planning and Plantin[g,] Housing in Unincorporated Areas Adjacent to Citie[s;] in Volume II, Financing Home Ownership, Preside[nt] Hoover's Statement on the Proposed Establishment [of] Home Loan Discount Banks, Taxation and Housing; [in] Volume III, Blighted Areas and Slums, Large-Sca[le] Operations, Business and Housing, Industrial Dece[n]tralization and Housing.

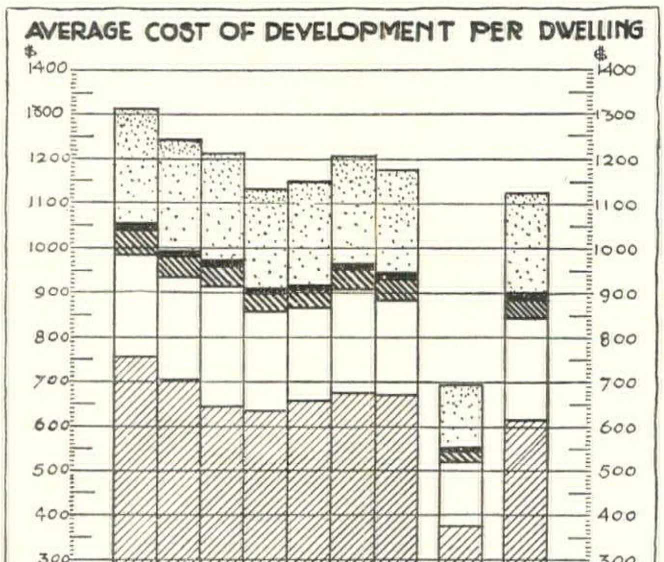
One of the most thorough studies is that on su[b]division layout, which was prepared under the directi[on] of Harland Bartholomew. Costs and methods are ou[t]lined with a clarity seldom found in any other discussi[on] of the subject. Another important chapter in the sam[e] volume is the one dealing with relation of the size of lo[ts] to the cost of utilities. Drawn from the actual experien[ce] of regional planners, realtors, and developers from a[ll] sections, the data to be found here is invaluable.

Equally instructive is the volume on finance a[nd] taxation. Never before has such a thorough study bee[n] made. The opinion and experience of almost ever[y] expert in the country are included in it.

The third volume is chiefly valuable for its chapter o[n] large-scale operations, for which Alfred K. Stern o[f] Chicago and Henry Wright of New York are chief[ly] responsible. Although much of the material had bee[n] published before, it had never been assembled in o[ne] volume.

Those who wish to be brought up to date on this vit[al] question should make arrangements to obtain the[se] first three volumes as well as the several volumes whic[h] are soon to be released.

PLANNING FOR RESIDENTIAL DISTRICTS; HOME F[I]NANCE AND TAXATION; SLUMS, LARGE-SCALE HOU[S]ING AND DECENTRALIZATION, 3 vols. 248 pp., 292 p[p.,] 264 pp., 6 x 9, cloth, illustrated. President's Conference on Ho[me] Building and Home Ownership, Washington, D. C. Price $1. each



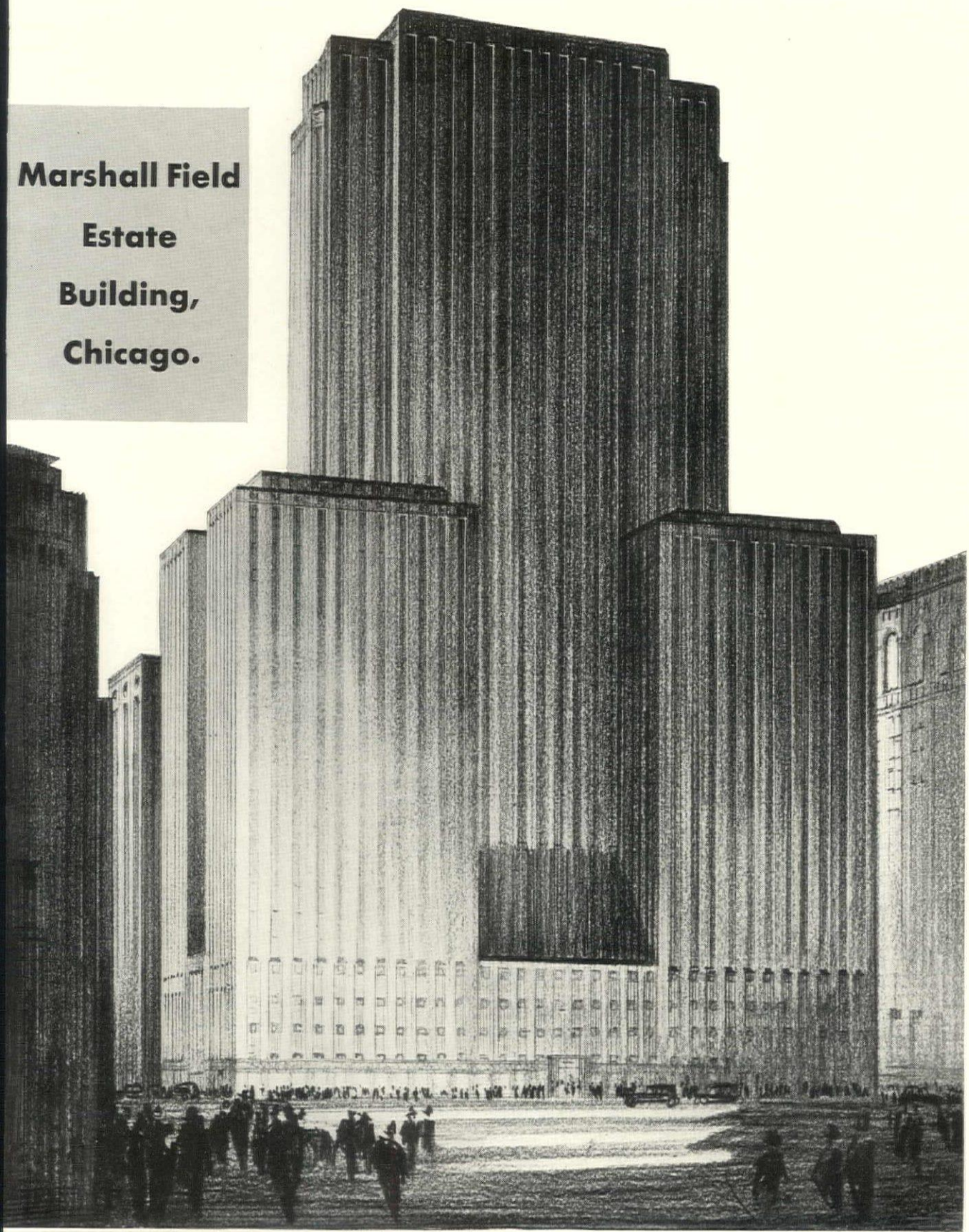
AVERAGE COST PER DWELLING (COMPARE DIAGRAM 20) TABLE VI

DIAGRAM No →	GRIDIRON ft. 12	$	SINGLE B-L ft. 13	$	DOUBLE B-L ft. 14	$	TRIPLE B-L ft. 15	$	C-D-S & LOOPS ft. 16	$
PARK AREA $0.046 p.ft²	620	28,17	1043	47,98	1294	59,52	1482	68,17	1110	51,06
FOOTWALKS $1.44 p.ft	22,3	32,11	9,2	13,25	7,4	10,66	6,0	8,64	12,8	18,43
SEWER		76,32		72,80		60,15		81,09		82,57
SURFACE WATER DRAINS		71,18		65,14		69,07		68,59		74,65
*BOUNDARY ST.	2,1	42,32	7,7	45,89	8,0	47,64	7,5	44,78	7,9	47,08
INTERIOR ST. 50' = $10.66	22,8	238,49	4,5	47,01	4,3	44,91	4,9	52,21	4,3	44,94
40' = 9.26			15,9	147,25	9,5	87,97	5,4	50,00	1,2	11,11
30' = 4.84									12,1	58,56
20' = 2.88										
TURNAROUNDS $.209 p.sq.ft									59,5	12,44
STREET LIGHTING		57,95		55,11		55,19		58,70		52,19
1. COST OF PUBLIC IMPROV.		596,89		495,45		435,10		427,11		453,10
2. COST OF RAW LAND PER DWELLING AT $0.0345 p.sq.ft	6039	207,14	6069	208,17	6037	207,07	6065	208,05	5994	205,59
3. COST OF IMPR. ON THE LOT (T.II)		228,28		228,28		270,35		218,52		206,91
4. CONSTR. + LAND COST PER DWELLING (1+2+3)		982,81		932,10		912,58		853,66		865,57
5. PROF. FEES 10% OF 1.		54,69		49,51		43,50		42,71		45,31
6% OF 3		13,73		13,73		16,22		13,11		12,41
6. COST OF DEVELOPMENT (4+5)		1051,23		995,34		972,30		909,48		923,29
7. CARRYING CHARGES, INTEREST, PROFIT, ETC. 25% OF 6		262,81		248,81		243,08		227,37		230,82
8. GRAND TOTAL COST $		1314,04		1244,15		1215,40		1136,85		1154,11

DIAGRAM No →	MOD. HEXAGON ft. 17	$	CROSS-ACCESS STREET ft. 18	$	MODEL NEIGHB. UNIT ft. 21	$	HEXAG. LAY-[OUT] BY Mr B. PARK[ER]	
PARK AREA $0.046 p.ft²	1110	51,06	1039	47,79	854	39,28	770	35[illegible]
FOOTWALKS $1.44 p.ft	13,2	19,01	10,7	15,41	8,5	12,24		
SEWER		76,35		68,62		32,44		78[illegible]
SURFACE WATER DRAINS		66,72		67,38		37,51		7[illegible]
*BOUNDARY ST.	7,7	45,89	8,1	48,28	5,0	29,84	8,6	5[illegible]
INTERIOR ST. 50' = $10.66	7,5	78,43	3,8	39,75	3,5	36,52		
40' = 9.26	3,9	36,11	9,0	83,34	,4	3,70	9,8	9[illegible]
30' = 4.84	5,0	24,20			3,8	18,39	5,7	27[illegible]
20' = 2.88			11,2	32,26				
TURNAROUNDS $.209 p.sq.ft	57,0	12,96			39,1	8,17	81,9	17[illegible]
STREET LIGHTING		53,88		59,95		35,54		57[illegible]
1. COST OF PUBLIC IMPROV.		467,74		462,38		251,55		426[illegible]
2. COST OF RAW LAND PER DWELLING AT $0.0345 p.sq.ft	6047	207,41	6009	206,11	3832	131,44	5500	188[illegible]
3. COST OF IMPR. ON THE LOT (T.II)		228,78		213,73		136,00		228[illegible]
4. CONSTR. + LAND COST PER DWELLING (1+2+3)		903,93		882,22		518,99		843[illegible]
5. PROF. FEES 10% OF 1.		46,78		46,28		25,16		42[illegible]
6% OF 3		13,73		12,79		8,16		13[illegible]
6. COST OF DEVELOPMENT (4+5)		964,44		941,19		552,31		900[illegible]
7. CARRYING CHARGES, INTEREST, PROFIT, ETC. 25% OF 6		241,11		235,30		138,08		225[illegible]
8. GRAND TOTAL COST $		1205,55		1176,49		690,39		1125[illegible]

A chart and a table taken from the chapter on subdivision layout in Volume I of this noteworthy series

Marshall Field Estate Building, Chicago.



Architects and Engineers: Graham, Anderson, Probst and White; Contractors: George A. Fuller and Company, Inc.

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COMMERCIAL BUILDING PROMOTION

THIS new volume by Charles H. Lench, architect and lecturer, on the subject of commercial building promotion could have been read three or four years ago with immediate profit. With money available and the need urgent, a method of promotion was the only further requirement. Today, however, the ablest of architectural promoters, notwithstanding his familiarity with promotional methods, is having a difficult time of it. Mr. Lench's book, therefore, may well serve as a guide to what we hope will be future operations.

He discusses with considerable clarity the architect's altered position in the building industry, altered, that is, from the conception of his position held by the student fresh from the atelier. He deals with the specific science of building economics, and defines the relation between banker, builder, realtor, attorney, and owner, indicating the architect's connections with each in the promotion of a building.

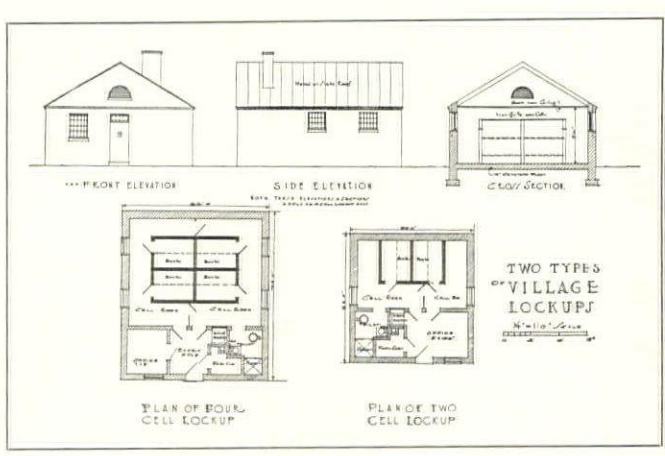
Further than that, Mr. Lench outlines the financial set-ups for various types of operations, apartment houses, hotels, office buildings, loft buildings, garages, warehouses, and suburban housing developments. Although only the fundamentals of promotion are sketched, which would be true of any text on the subject, the book is one that will prove valuable to many in the profession who believe that architectural practice can still run in the groove cut for it years ago.

THE PROMOTION OF COMMERCIAL BUILDINGS, by Charles H. Lench. 234 pp., 6 x 9, unillustrated, cloth. Architectural Economics Press, New York. Price $6.50.

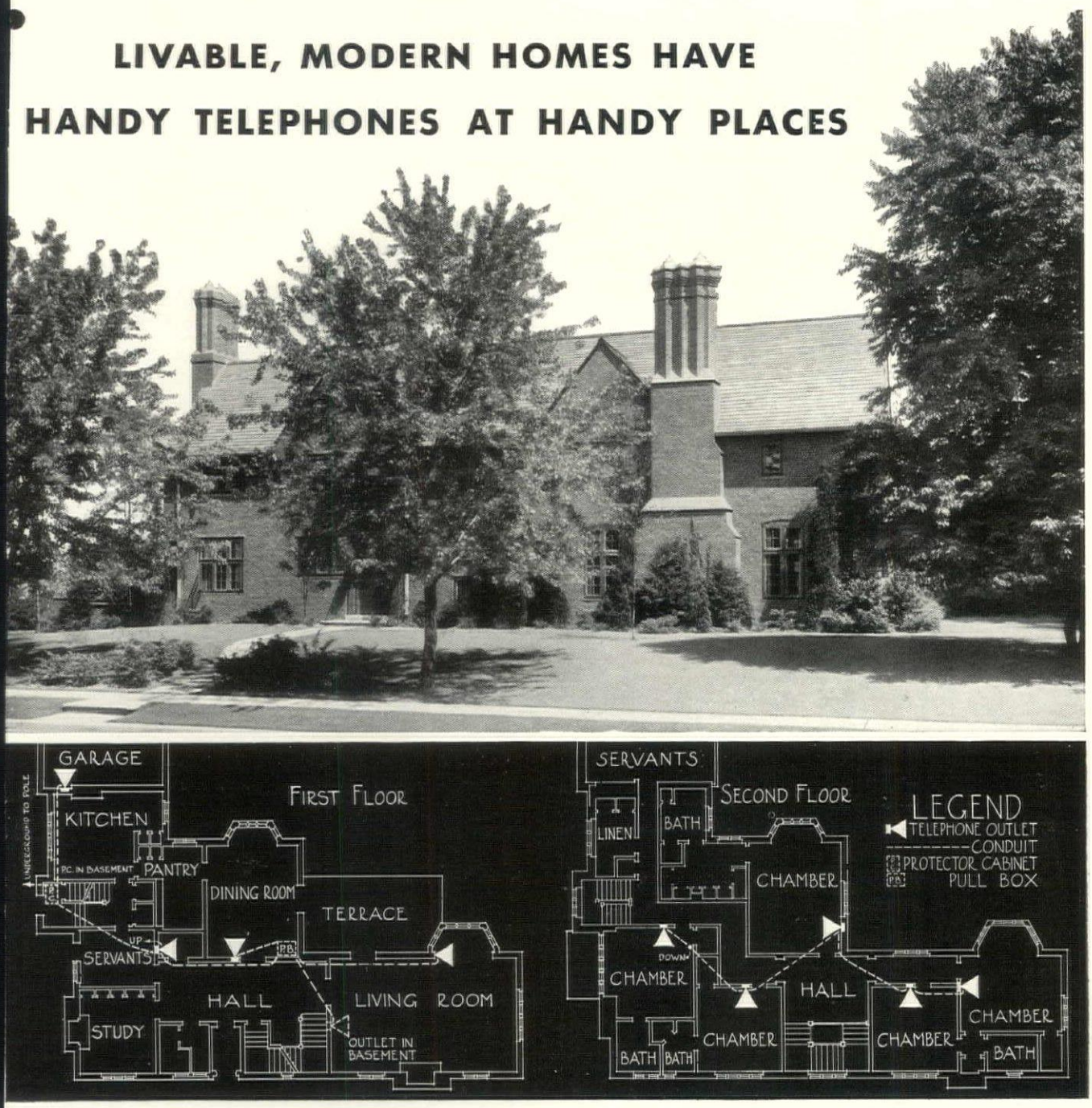
POLICE JAILS AND VILLAGE LOCKUPS

FEW penologists have had so thorough a grasp on the architectural and construction problems of penal institutions as the late Dr. Hastings H. Hart. This small volume on plans for city police jails and village lockups is, like all his other expressed opinions on the subject of penal institutions, a valuable document. In it are included model plans for a large city police station, a medium sized city police station, and a fireproof lockup for a small village. The text is brief and to the point. The plans are large enough in size to permit careful study. Any office contemplating work of this character should obtain a copy of this book.

PLANS FOR CITY POLICE JAILS AND VILLAGE LOCKUPS, by Hastings H. Hart. 27 pp., 9 x 12, cloth, illustrated. Russell Sage Foundation, New York. Price $1.50.



LIVABLE, MODERN HOMES HAVE HANDY TELEPHONES AT HANDY PLACES



In the residence of Mr. T. H. Hinchman, 92 Vendome Road, Village of Grosse Pointe Farms, Detroit, Michigan, telephone convenience is provided for by built-in conduit connecting ten telephone outlets, including one in the basement game room. SMITH, HINCHMAN & GRYLLS, Architects, *Detroit.*

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THREE ROOMS BY McINTIRE

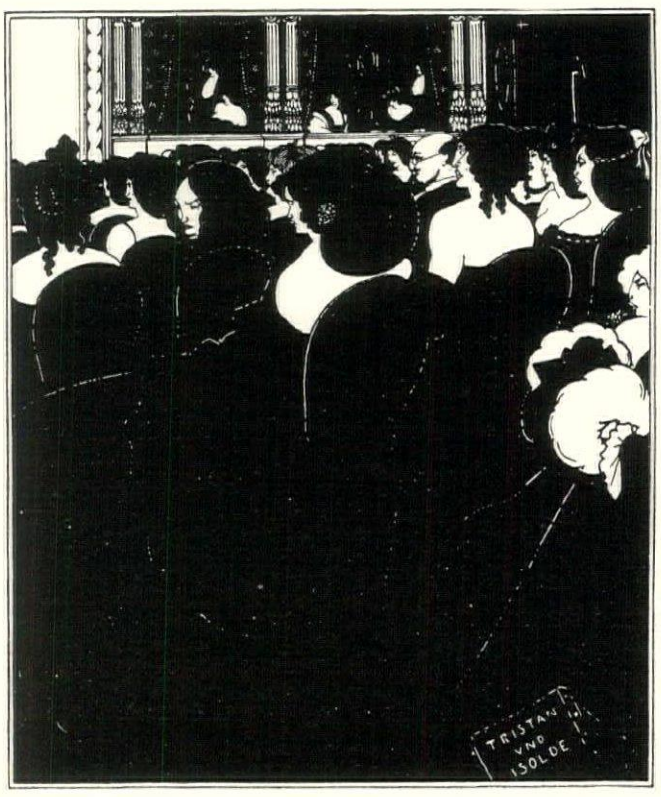
ARCHITECTS who delight in the New England House of the Early Nineteenth Century, and particularly in the work of Samuel McIntire, will find this book by Edwin J. Hipkiss an interesting addition to their libraries. Three rooms from "Oak Hill," built in Peabody, Mass., in 1801, that have been reproduced in the Museum of Fine Arts, Boston, form the subject of the book. It contains about seventy-five full sized plates and measured drawings, and each one is an outstanding representative of the architecture of the period. The parlor, the dining room, and the parlor chamber are the rooms selected. In addition, there are splendid photographs of the furniture used in them.

THREE McINTIRE ROOMS FROM PEABODY, MASSACHUSETTS, by Edwin J. Hipkiss. 93 pp., plates and text, 9½ x 12½, cloth. Museum of Fine Arts, Boston.

WITH PEN AND INK

WHY and when to draw in pen and ink, what to draw with, how to begin, how to go on, and representative work of master pen and ink draughtsmen are the five chapters which make up this admirable text by Jasper Salwey, an able artist and instructor. Since he is writing for the beginner, Mr. Salwey is unusually explicit in his suggestions, illustrating each point with suitable drawings. His discourse is carried along far enough to provide stimulation for further activity. Among the men whose work is reproduced as exemplary are E. H. New, F. L. Griggs, Frank Brangwyn, Arthur Ferrier, and Aubrey Beardsley. There are fifteen altogether.

HOW TO DRAW IN PEN AND INK, by Jasper Salwey. 66 pp., 5¾ x 9¾, cloth, illustrated. Bridgman Publishers, Inc., Pelham, N. Y. Price $2.50.



"The Wagnerites" by Aubrey Beardsley from Salwey's book

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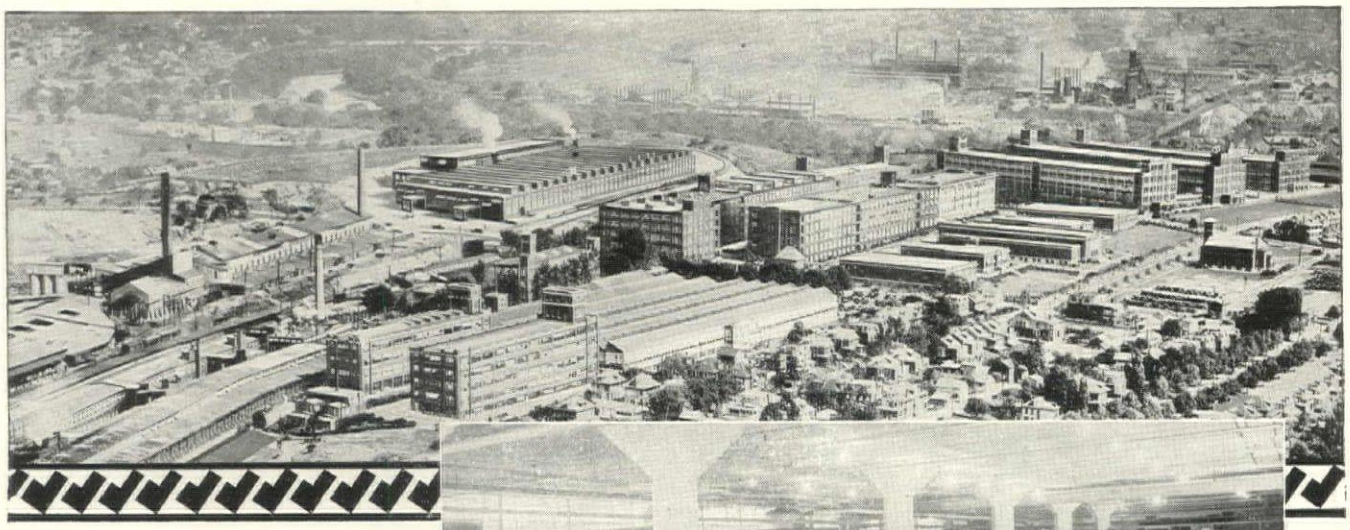

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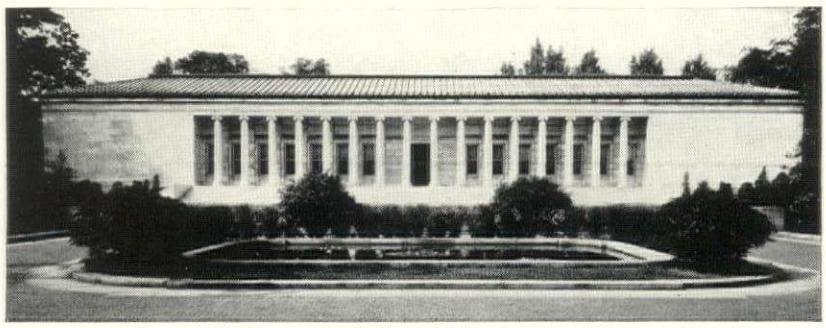
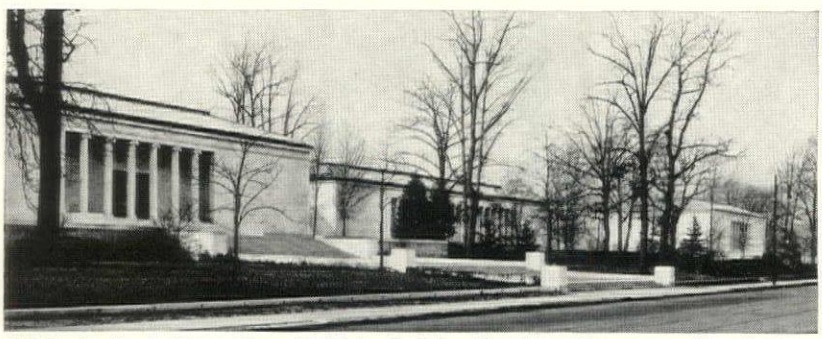


(Above) The Museum in 1909... (Below) As it appears today.



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REVIEWS AND ANNOUNCEMENTS

No. 701
JONES & LAUGHLIN STEEL CORP., Pittsburgh, Pa. "J & L Junior Beam Floors for Residences"

This new booklet describes in detail a residential floor system of steel and concrete that is built around the J & L junior beam, a light-weight rolled copper bearing steel I-section. It may be used as the first floor of any house, or for all the floors of any house having solid masonry walls or steel framing. The stated advantages of the J & L junior beam floor system are that it provides "the same rigid, vibration-free, non-shrinkable support for the interior walls of the house that the foundations provide for the exterior walls. It acts as a complete firestop between the basement and the remainder of the house, and prevents moisture from rising through partition walls to the floors above. It is verminproof and impervious to the attacks of termites." It will eliminate, since it eliminates shrinkage, "plaster cracks in floors and ceilings, twisted door frames, uneven floors, and gaps between basement and flooring."

In the amply illustrated booklet are contained all the important details of the usual methods of installing the system, so that it serves as a practical design and construction guide. Isometric diagrams, steel framing plans, photographs of installations, tables of sizes, weights, properties, and spacings, and all other pertinent information is given clearly and usably.

In a typical installation with hardwood flooring the junior beams rest directly on the foundation. Sleepers (2 x 3 in. wood nailing strips) are secured to the steel by two plate clips at each point where they cross a beam. Between the sleepers two plain steel reinforcing rods, ¼ in. in diameter, are fastened to the beams. The concrete floor slab and the concrete firestop along the foundation wall are then poured, imbedding the top flanges of the beams so that the beams, sleepers, and reinforcing rods are held rigidly in place. The hardwood flooring is then nailed directly to the sleepers.

No. 702
L. J. WING MFG. CO., New York. "Wing Safety Ventilating Fans"

A unique type of protective guard is one of the important features of the Wing ventilating fans described in this new pamphlet. Since it need not be removed to service the fan, it is permanently welded to the frame. The fan itself is of the screw-propeller type, and moves the air at practically the same velocity, both at the tip of the blades and at the center of the fan. The company manufactures a wide range of fans, for alternating and direct current, with diameters of from 9¾ in. to 66 in., high speed fans for industrial use, and pulley-driven fans for uses where motor-driven fans are not feasible. Complete information on sizes, prices, and construction are included in this pamphlet. Other products of the company briefly described are self-closing shutters, exhausters, unit heaters, process heating units, heater sections, and cooling fans.

No. 703
CELOTEX COMPANY, Chicago, Ill. "The Ferox Process"

By use of chemicals in what is known as the Ferox process, the Celotex Company is now manufacturing cane fiber insulating products that are "practically impervious to the natural agents of decay and to the deadly, unseen attack of termites." The Ferox process coats each fiber before it is felted and woven with a chemical complex that is toxic to fungi, termites and other cellulose-destroying organisms. The chemical complex, according to the company, is insoluble in water, non-volatile, odorless, permanent, and in no way alters the physical properties of the finished products.

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No. 704
WORTHINGTON PUMP & MACHINERY CORP., Harrison, N. J. "Model GA Water Meter"

The Worthington Corporation has recently added to its line a new model water meter which is adapted to extremely low flows as well as to intermediate and high flows. Built in sizes from ⅝ to 2 in., with normal flow limits from 1 to 160 gallons per minute, the new meters are of the displacement disc type, all register gears being fitted with rubber-bushed bearings. The register box is fitted with a double lid to facilitate cleaning of the cover glass. The train assembly is composed of four cast bronze gears and four pinions, rigidly fastened to Monel Metal spindles which revolve in replaceable hard rubber bushings. Although standard construction provides for an inclosure for oil, the train easily may be converted to the open type by the substitution of an open train plate. It is said to be sufficiently accurate to record small drips and slow leaks.

No. 705
DURIRON COMPANY, Dayton, Ohio. "Duriron Exhaust Fans"

Bulletin No. 166 of the Duriron Company covers only the engineering and mechanical features of Duriron acid resisting fans for the ventilation of laboratory hoods and other rooms involving fumes. As described in this bulletin, each fan casing is equipped with proper openings for the drainage of condensate. The motors are mounted on rubber cushions, resulting in reduction of vibration to a minimum. Each impeller shaft is provided with a stuffing box to prevent escape of fumes into the motor. The impellers of all fans are mounted on the motor shafts, and are dynamically balanced. The fans themselves are equipped with oversize motors. In all sizes, all movable parts can be withdrawn without disturbing pipe connections.

The data given on each of the many different sizes and types of fans are complete, with dimensions, diagrams, capacities, and all other necessary information.

No. 706
ANTHRACITE INSTITUTE LABORATORY. "Bulletin No. 10"

The laboratory bulletins issued by the Anthracite Institute contain much information that is useful to all architectural offices specifying heating equipment in which Pennsylvania anthracite is to be used. This most recent bulletin pictures, discusses, and approves about forty different pieces of heating equipment, including automatic stokers, thermostatic controls, magazine feed boilers, service water heating systems, vacuum furnace cleaners, blower systems, and space heaters. All the equipment approved has been tested by engineers of the Institute, and their findings are the basis for the discussions of each type of apparatus.

In this bulletin, for instance, seven different automatic stokers are included, the Stowe Type "R," the Electric Furnace-Man, the Auto Coala, the Iron Fireman, the Losch Automatic, the Motorstoker, and the Motorstoker Coal Conveyor. Prices, capacities, and specific recommendations accompany each discussion.

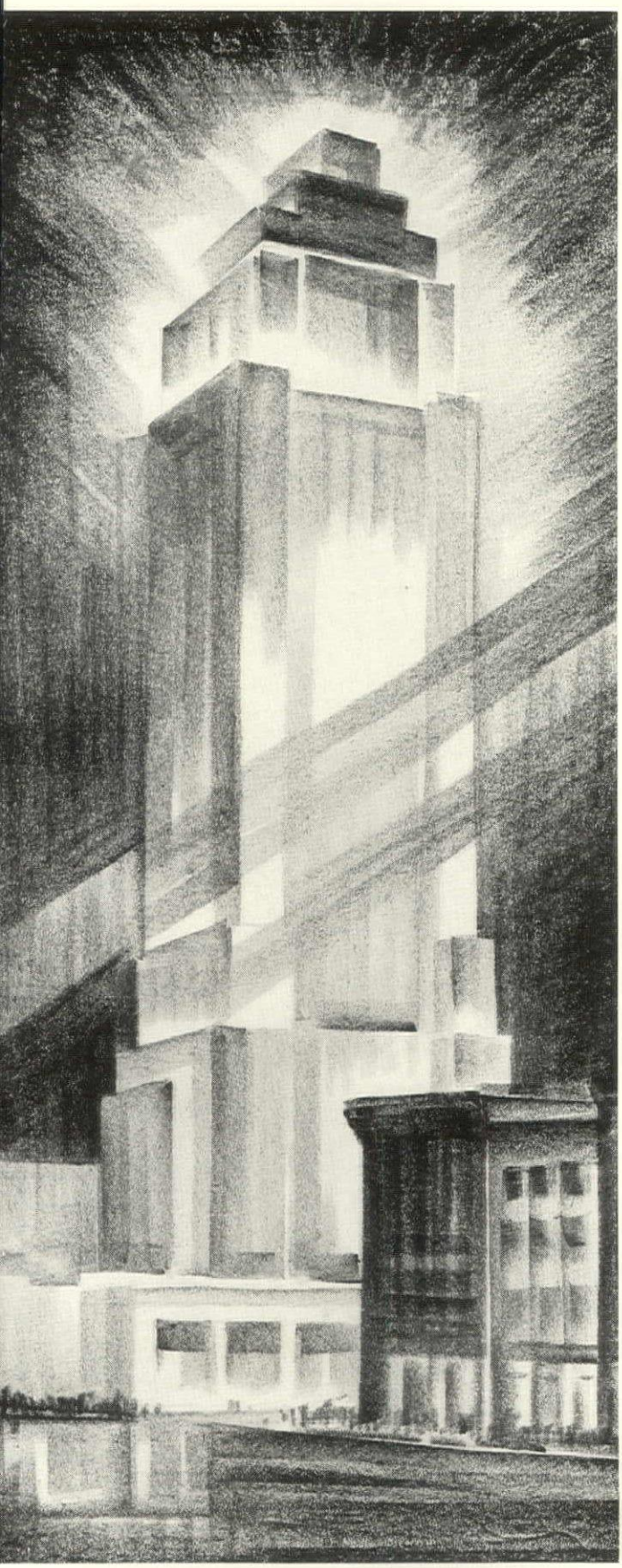
No. 707
EDWIN F. GUTH CO., St. Louis, Mo. "Guthfan Conditionaire"

The Guthfan Conditionaire, introduced in this booklet, is a combination lighting fixture and ozone-laden air circulator. Heretofore, the company had manufactured lighting equipment and the Guthfan, but in this product they have added the Guth Ozonator, which is built into the canopy of the fixture. The ozone drops from the lower part of the canopy when the unit is in operation, and is distributed about the room by the fan. Each of the three elements, the lighting fixture, the fan, or the Ozonator may be bought separately, or in combination to form the Conditionaire.

The catalogue pictures and describes a wide variety of models, some with lights, and some without. Prices are also included. There are diagrams of the assembly of the units, and all necessary engineering information. The company makes a specialty of units for elevator cabs, and there are several models shown for this kind of use.

Levy & Klein, architects, have removed their office from 228 North La Salle Street, Chicago, to 417 Fourth Street, Wilmette, Ill. The new office will specialize in the modernization of homes.

Howard D. Fiedler, architect, formerly with William H. Brainerd Associates, has opened his own office at 89 Franklin Street, Boston, Mass.



LOOK FOR THE GREEN COLOR!
NATIONAL COPPER-STEEL PIPE is marked as follows: BLACK PIPE—Smaller sizes colored green. Larger sizes, two green stripes running lengthwise. GALVANIZED PIPE—All sizes, two green stripes running lengthwise.

Why Copper-Steel Pipe?

The many useful variations produced in steel by different alloying materials and different treatments have become a marvel of the age. Changes of formula so very slight that no appreciable effect would be anticipated by the layman, often bring about incredible differences in character.

A relatively small copper content in steel has been found to heighten its resistance to corrosion, and specifically its resistance to atmospheric corrosion, to a marked degree. This has been proved in use as well as demonstrated by careful experiments, and is no longer in doubt.

Wherever pipe is subjected to alternate wet and dry exposure as in soil, waste, vent lines and rain leaders of large buildings, economy will be served by specifying NATIONAL Copper-Steel Pipe. The extra cost is trifling and the added length of service is appreciable. Write for Bulletin No. 11, describing NATIONAL Copper-Steel Pipe—

The Original Copper-Steel Pipe

NATIONAL TUBE COMPANY, Pittsburgh, Pa.
Subsidiary of United States Steel Corporation

NATIONAL COPPER-STEEL PIPE

REVIEWS OF MANUFACTURERS' PUBLICATIONS

No. 708
BARBER-COLMAN COMPANY, Rockford, Ill. "An Electric System of Temperature Control"

In a booklet that is as interesting as it is instructive, the Barber-Colman Company describes the various types of electric temperature control systems that it manufactures. After explaining the elementary principles of automatic regulation, applications of their products to various heating, ventilating, and air conditioning plants are illustrated. Under separate headings, the workings of thermostats, valves, damper controllers, and motors are shown for direct radiation, unit heater, unit ventilator, direct-indirect radiation, indirect radiation, and warm air furnace installations. The method of presentation is orderly, and sufficient illustrations accompany the text to tell the story clearly.

All operations of the Barber-Colman devices are operated electrically, electric motor-operated valves and damper controls governed by electrically connected thermostats. In explaining the working of the system, the pamphlet states, "The thermostat contains as its temperature-sensitive element a bi-metallic loop with an extension tongue which is free to move between two fixed contact points. When the thermostat calls for heat, the bi-metallic loop causes the tongue to make contact with one point, thus closing a circuit to the motor-operated valve or damper controller. The motor in the damper controller or valve, by means of reduction gears, turns a shaft which operates the valve plunger or moves the damper, thus 'turning on the heat.' When the thermostat calls for 'less heat,' the expansion of the bi-metallic loop moves the tongue against the other contact, thus starting the motor again and closing the valve or moving the damper to deliver less heat."

In addition to photographs of all the units which are employed in the system, there are several pages devoted to installation views and dimensions of units. The book is an extremely useful one to any architectural office.

No. 709
NEWMAN MANUFACTURING CO., Cincinnati, Ohio. "Newmanco Thresholds"

In this recent folder of the Newman Company, kick plates, and push and pull plates as well as thresholds are shown in diagram. There are more than fifty different kinds of thresholds, and the linear foot price and the dimensions are given for each. They are made of extruded bronze. Prices are also given for brass kick plates in widths from 8 to 24 in., and for several different kinds of push and pull plates.

No. 710
FLOCKHART FOUNDRY CO., Newark, N. J. "Standard Construction Castings"

This is the 1932 catalogue of the Flockhart Company covering a wide range of gray cast iron products. These include various types of frames and covers, gratings, valve boxes, curb inlets, catch basin traps, bolted wheel guards, floor drains, clean-out doors, leader shoes, slide valves, lift valves, shear gate valves, and flap valves. Each of these items is covered by a separate data sheet, which contains all the information required, plans, sections, and sizes. There are 32 pages in the booklet, and each page contains useful information.

REQUEST FOR DATA

To obtain any of the publications reviewed on these pages, indicate the number or title and send coupon to THE ARCHITECTURAL FORUM, 220 East 42nd St., New York.

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NAME .....

STREET ADDRESS .....

CITY AND STATE .....

No. 711
GENERAL ELECTRIC CO., Schenectady, N. Y. "Magne Switch"

Printed in a folder that resembles a switch box in shape a color, complete information is given in this new publication on t GE magnetic switch. There are about ten different types of standa general purpose switches shown, and also the necessary accessori The center of this 8-page pamphlet is a reproduction of the swit itself, and arrows point to the significant parts of the device. T points so singled out are the start-stop push button station f convenient local control, the external reset, solid silver umbrell shaped contact tips, hooded barriers for confining the arc, overlo protection, magnet coils, abundance of knock-outs for ease of i stallation, and rounded corners for good design.

No. 712
ROLLER-SMITH COMPANY, New York. "Air Circuit Breaker

A new product, sectional steel, dead-front switchboards a cubicles, is the feature of the new catalogue issued by the Rolle Smith Company, covering air circuit breakers, both open a enclosed, attachments and accessories of all kinds, and relays. T new switchboard and cubicles have been developed in line with t general trend toward control equipment of the dead-front type.

The information on each product in the catalogue is comple with photographs, diagrams, and other practical data.

No. 713
WESTINGHOUSE ELECTRIC & MANUFACTURING C Mansfield, Ohio. "Westinghouse Electric Water Heaters"

Four types of electric water heaters — storage tank, strap-c side-arm circulation, and immersion — are pictured and describ in this new pamphlet of the Westinghouse Company. The stora tank heaters range in capacity from 10 gallons to 80 gallons, and a available in three types: the automatic, adapt-o-matic, and adju o-matic. The primary difference between the first two is that t first has one heating element, and the second two. The adjust matic heater may be controlled at 180°, 155°, and 135° by turni the switch to high, medium, or low. All three may be operated wi or without time-switch control.

Side-arm circulation heaters, as the name suggests, are attach to the side of a storage tank, and the water circulates through t heater and back to the tank. The heating element in the immersi heater is inserted in range boilers or special tanks. This type is us for heating non-corrosive liquids as well as water. The strap-c heaters are designed for installation on existing water tanks. T complete installation consists of two 1000-watt heating elemen with mounting clamps and automatic thermostat, and an asbest cover properly cut to receive the elements that are clamped to t boiler.

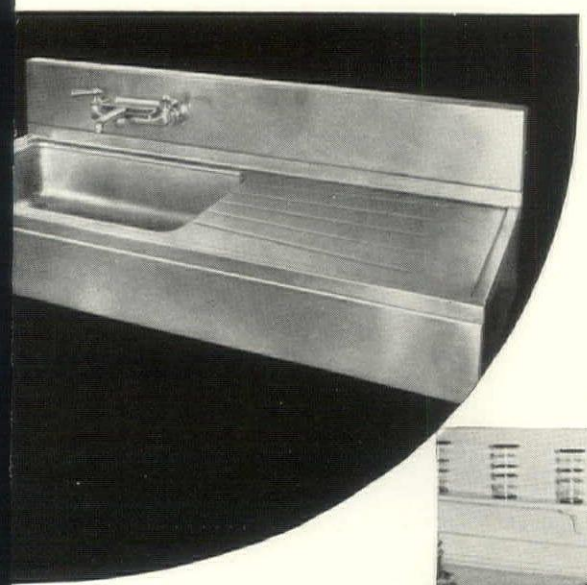
Features of the heaters are the *corox* heating element, the th mostat designed for both adjustable and non-adjustable contr balsam wool insulation, heat trap, cold water baffle, and the corc van casing.

No. 714
KOHLER COMPANY, Kohler, Wis. "Two New Kohler Product

"Avertor" bath bracket and "Protek" are the two new produc described in this small leaflet. The first is a bracket which giv auxiliary support to the tub and ties it to the wall. Protek is a po der paste used with newspapers to protect the tub enamel while building is under construction.

No. 715
CURTIS LIGHTING, INC., Chicago, Ill. "Curtis Floodlighting

In this new 28-page handbook on Curtis floodlighting, a successf attempt is made to explain in detail, by text, photograph a diagram, the various methods of floodlighting various types buildings. It shows the complete light control required of floo lighting projectors, and how each of the four sizes of units (25 500, 750–1000 and 1500 watt) provides proper control with eith white or colored lighting effects. In addition to explaining a demonstrating concentrated, distributed, soft spot, horizontal a vertical beam control, the book is well illustrated with photograp of every type of floodlighting installation. The wattage and type equipment used is explained for each. Methods of planning a reduced to the utmost simplicity, so that even one unfamiliar wi the practices could easily determine the wattage and location units. Line drawings that indicate locations for mounting uni and scale details are other features of the booklet.



GOOD NEWS...

FOR YOU

and your clients

Single drain board Monel Metal "Straitline" kitchen sink. Available with drain board on either right or left side, in both 41- and 50-inch lengths.

Double drain board Monel Metal "Straitline" kitchen sinks are available in both 72- and 60-inch lengths.

"STRAITLINE" Monel Metal sinks

at prices any home can afford...

8

reasons why you should specify Monel Metal "Straitline" Sinks

1. Rich, lustrous beauty...with a satiny, glass-smooth surface.
2. Neutral silver tone that harmonizes with any kitchen color scheme.
3. Rust-proof...highly resistant to corrosion...easy to clean.
4. Solid metal...no coating to chip, crack or wear off...strong as steel.
5. Surfaces give cushioning effect that protects dishes against breakage.
6. 31% more work space than ordinary sinks of same nominal sizes.
7. Standardized sizes and models for every kitchen.
8. Prices within reach of every family purse.

●

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

● Every family wants a Monel Metal Sink...and every family can have one now. The new Monel Metal "Straitline"* Sinks are here!

Fitting companions to the higher-priced "Streamline"* models, the new Monel Metal "Straitline" Sinks are designed, styled and priced to please thousands of women who have always longed for a Monel Metal Sink but never could afford one. They offer, at truly moderate cost, the beauty and durability that have been previously associated with kitchen sinks selling at much higher prices.

In these popularly priced sinks, the new "Straitline" design and Monel Metal have been combined to give trim, modern beauty that is rare in any kitchen equipment . . . permanent beauty that grows with the years . . . and always harmonizes with every kitchen color scheme!

Such sensational sink value has been made possible only by volume production and advanced manufacturing methods. Monel Metal "Straitline" Sinks have been created to meet today's economic conditions. As a result, you can now specify Monel Metal Sinks for every home you plan..."Streamline" models for higher-priced homes and the new, inexpensive "Straitline" Sinks for the more modest ones.

Monel Metal "Straitline" Sinks are now on display at leading plumbing supply houses. See them — and if you have not received your copy of the new illustrated catalog (A.I.A. file No. 29H6) giving sizes, specification data, etc., on Monel Metal kitchen sinks, we will be glad to send it upon request.

*Trade-mark.

A HIGH NICKEL ALLOY

MONEL METAL

NICKEL ALLOYS LOOK BETTER LONGER

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

ALPHABETICAL INDEX

TO ADVERTISING ANNOUNCEMENTS

Iron Engineering is Born

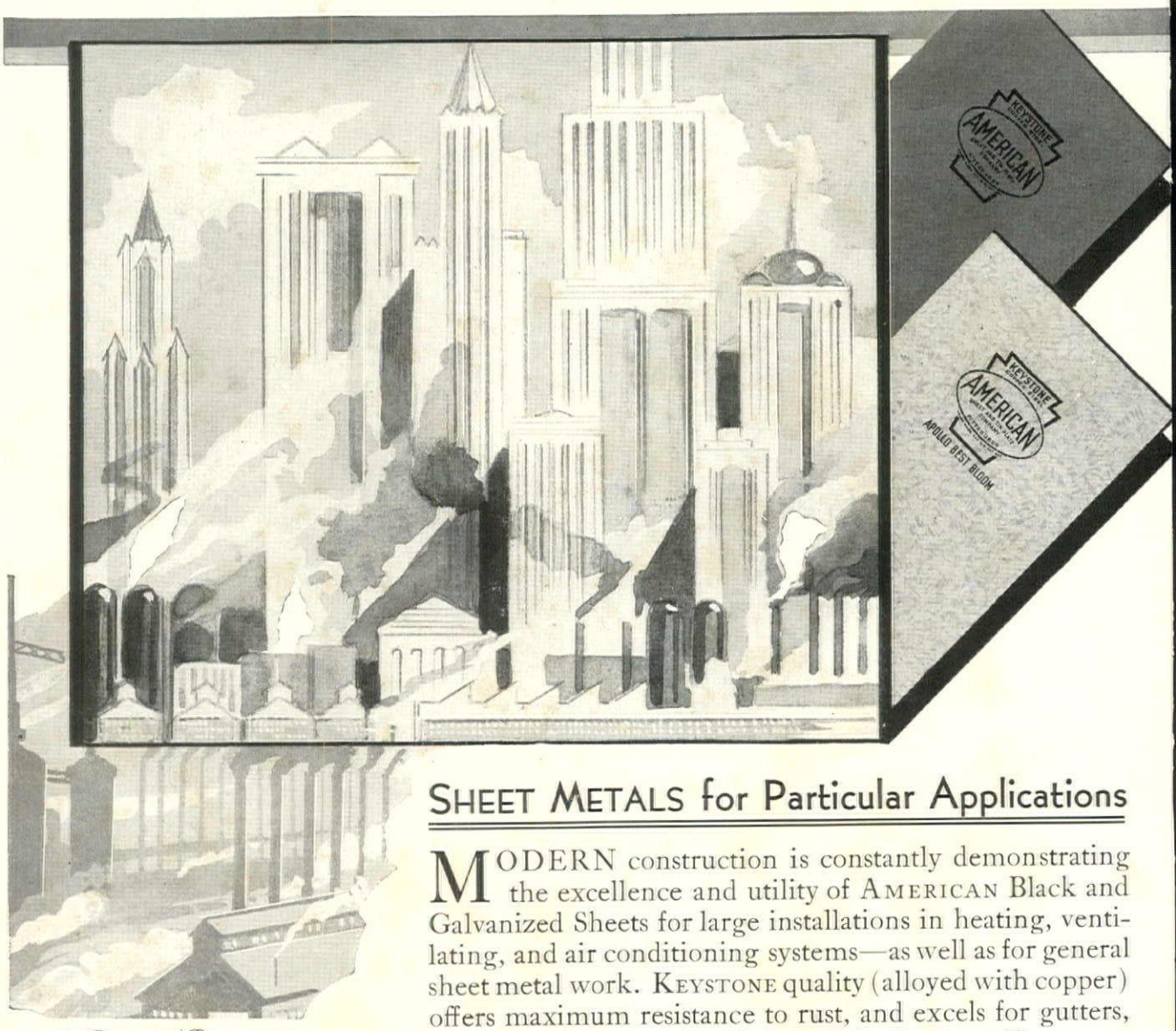
ABOUT the year 1750, in England, there appeared the first example of iron engineering in its modern sense. For at that time, columns of cast iron were first devised.

The name of their originator is no longer known. In all probability, he was an ingenious millwright, for the cast iron columns were first employed in the construction of cotton mills in Lancashire. Their use established a style which was followed with but little alteration for more than a century.

It is likely that as a natural development of the experience gained in this use of cast iron for building columns, the possibilities of its extension into the field of bridge building were seen. In 1776, a cast iron bridge was constructed across the Severn at Coalbrookdale—the first real instance of complex iron engineering in England, and probably in the world.

AMERICAN

Steel Sheets for Building



SHEET METALS for Particular Applications

MODERN construction is constantly demonstrating the excellence and utility of AMERICAN Black and Galvanized Sheets for large installations in heating, ventilating, and air conditioning systems—as well as for general sheet metal work. KEYSTONE quality (alloyed with copper) offers maximum resistance to rust, and excels for gutters, spouting, flashings, metal lath, and similar uses. KEYSTONE Copper Steel Roofing Ternes are produced to give enduring service, protection and satisfaction.

Through every operation and at each stage of manufacture, this Company gives painstaking care to every element and factor entering into the production of steel sheets and terne plates of highest quality. AMERICAN products are sold by leading metal merchants. Write for information and literature.

For Beauty and Permanence, use

USS STAINLESS
and Heat Resisting Steel
Sheets and Light Plates

American Sheet and Tin Plate Company

GENERAL OFFICES; Frick Building, PITTSBURGH, PA.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

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THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R.R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, San Francisco, Calif.
Export Distributors—United States Steel Products Company, New York, N. Y.

To Confirm certain RUMORS

IT IS TRUE that General Electric will present during July a revolutionary new type of oil heating, startlingly different and modern in principle.

The result of five years' engineering research and one year's actual service in many homes, this new type of heating will offer entirely automatic operation . . . quick heat, accurately controlled . . . higher efficiency and lower operating cost . . . quiet operation . . . no soot, fumes, or odor . . . economical hot water supply the year round . . . handsome, compact design . . . and the overall guarantee of one responsible manufacturer — General Electric.

Advance information and data in bulletin form can be obtained by addressing Air Conditioning Dept., General Electric Company, 120 Broadway, New York, N.Y. Ask for Bulletin OF-101.

GENERAL ELECTRIC

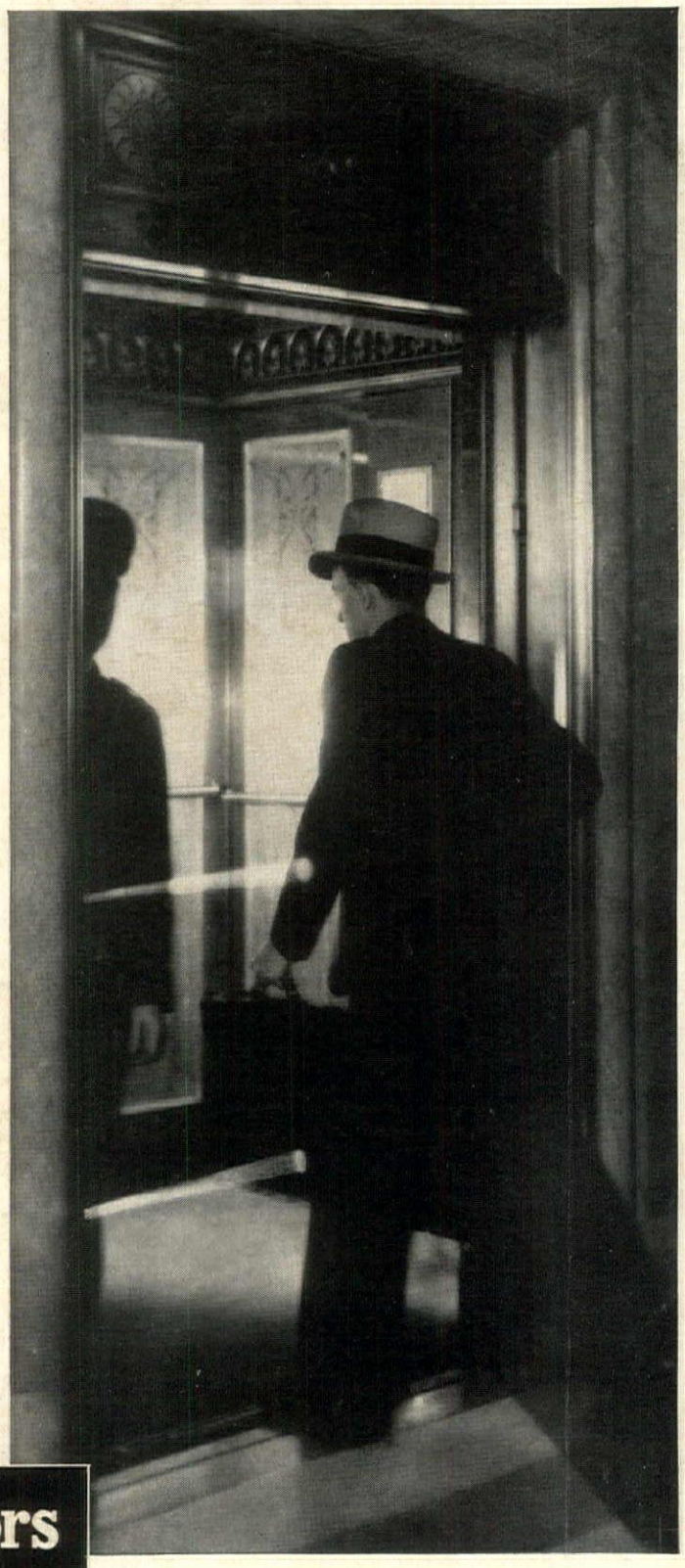
RUMFORD PRESS
CONCORD, N.H.

PROTECTS the careless passenger

FROM FAST-MOVING, POWER-OPERATED ELEVATOR DOORS

THE WESTINGHOUSE SAFE-T-RAY

How? By light beams? Yes—just that. No longer need injuries be caused by doors closing on the hurried or pre-occupied. Any one stepping in or out of an elevator or lingering in the path of fast-closing doors interrupts the light-beams. *Instantly*, the magic of Westinghouse Safe-T-Ray acts—the doors *stop* and re-open automatically. They stay open as long as even a small part of the clothing remains in the paths of the protecting beams which shine steadily.



A wonderful thing to see and consider—developed and applied for Westinghouse elevators by Westinghouse engineers. Speeding up elevator service in tall buildings requires fast-closing doors. The Safe-T-Ray permits this efficiency without accident.

Westinghouse, internationally famous for electrical achievements, is responsible for the present rapid development in the field of vertical transportation. Whatever your elevator problem—rely on Westinghouse.

Fifty-eight Westinghouse elevators in the world's largest office building will be equipped with the Safe-T-Ray. (The Central Tower of Rockefeller Center, "Radio City.")

Westinghouse

Electric Elevators