The AMERICAN ARCHITECT
Founded 1876

VOLUME CXXXV | JUNE 20, 1929 | NUMBER 2571

THE PARABOLIC STYLE

By FRANCIS S. ONDERDONK, T.S.D.*

"WAS gibts Neues?", a favorite question of the Viennese, expresses the craving to view a new revelation every week. Yet all good, essential things are infinitely old and the only change we can expect is a new robe for the old truth.

Good architecture always consisted in the uniting of a truthful expression of constructive principles with simplicity and the domination of the whole design by one main motif. The curved form has always been more pleasing than the angular shape. These facts made the pointed arch supreme in the Gothic period and the same unchangeable laws seem about to crown the parabolic arch as the dominant feature of a new style.

Though ferro-concrete is in most cases the material in which the parabolic halls have been executed, Holland and Germany have examples of parabolas executed in brick and in other instances stone has been used. The term "parabolic style" might therefore express the facts more correctly than "Ferro-Concrete Style" does.

MAIN PAVILION, EXPOSITION AT BRUNN, CZECHOSLOVAKIA
JOSEF KALOUS, ARCHITECT

*Author of "The Ferro-Concrete Style."

The parabolic style can be considered the golden mean between the conservative and the modern extremes in our contemporary architectural world. It is conservative in so far as it obeys the fundamental laws of good architecture mentioned above; it is modern by not copying any definite precedent, and by using the new possibilities offered by modern construction, which includes the spanning of such great widths as the 75 meters of the new market-hall in Leipzig, Germany.

Unquestionably the Exposition Halls of the Czechoslovak Exposition in Brunn represent a remarkable achievement. Whereas the Hall of the Horticultural Society in London and the Breslau Centenary Hall have stepped-back clerestories which are carried by the haunches, the parabolic vaults of these halls are pierced and the glass follows the shape of the vault. This solution recalls the famous hangar at Orly but has much more glass area. It is more satisfactory than the stepped-back clerestories as the vault shape is emphasized. The parabolic crossvault with strong concrete ribs as groins is an innovation which is pleasing.

The vertical walls emphasize—especially on the exterior, by contrasts—the curvature of the parabolic vault, similarly as the vertical feeling of a minaret tends to bring out the beauty of the curved surface of the dome in a Mohammedan mosque.

The Exhibition Halls do not show the artificiality nor the whimsicalness common to so many modern designs in Europe. There is something natural in these parabolic vaults which is convincing. They might be termed neo-gothic in spirit, and yet present a forward step; for were it not that we are accustomed to the point of the Gothic arch it might strike us as something unpleasant, as it breaks the continuity of the arch: the Gothic arch consists of two distinct parts whereas in the parabola one curve, one power-current quivers through the whole, from foundation to foundation. Just as little as one can argue with a water-jet shot forth parabolically by a fountain, can one dispute with these parabolic arches of concrete; they have something elemental, infinite, in them that demands our allegiance. What Le Corbusier and other extremists sense but fail to express—the rhythm of our twentieth cen-

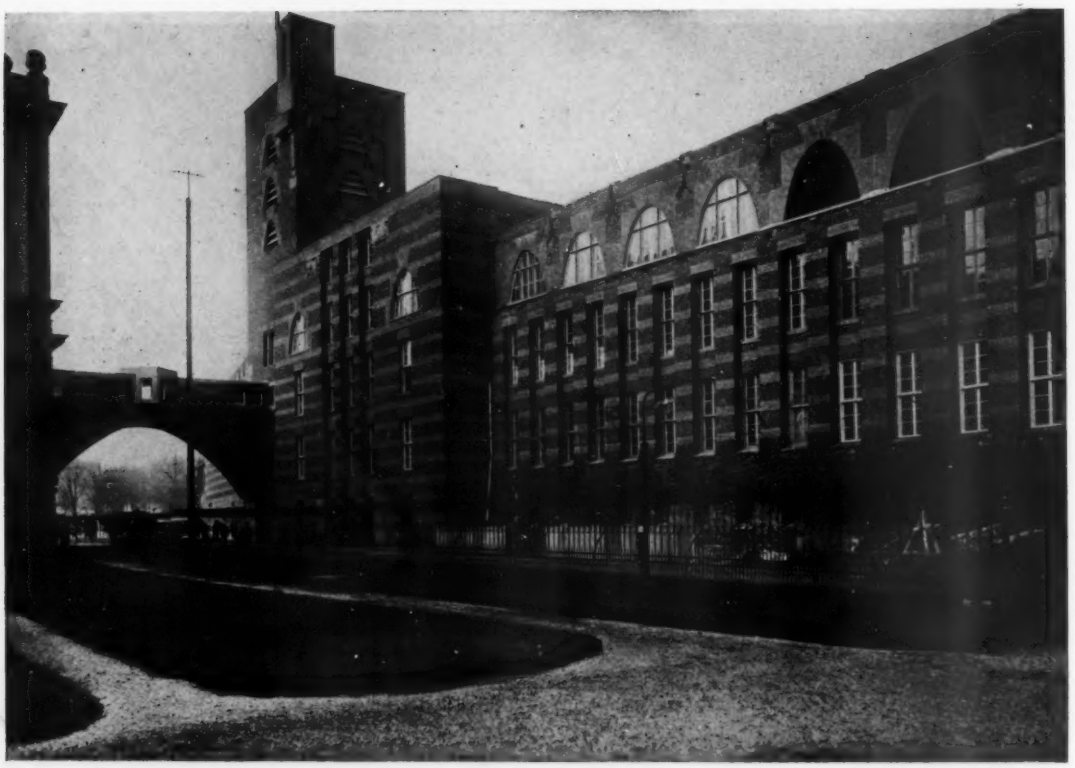
EXPOSITION HALL, BRUNN, CZECHOSLOVAKIA

JOSEF KALOUS, ARCHITECT

INTERIOR OF ONE OF THE MAIN PAVILIONS, BRUNN EXPOSITION, CZECHOSLOVAKIA
JOSEF KALOUS, ARCHITECT

ROTUNDA, MAIN EXPOSITION PAVILIONS, BRUNN, CZECHOSLOVAKIA
JOSEF KALOUS, ARCHITECT

COURT, ADMINISTRATION BUILDING, I. G. FARBENINDUSTRIE, HOECHST A. M., GERMANY
PROF. PETER BEHRENS, ARCHITECT



ADMINISTRATION BUILDING, I. G. FARBENINDUSTRIE, HOECHST A. M., GERMANY
PROF. PETER BEHRENS, ARCHITECT

tury with its transcontinental fliers, its domination of time and space through the airplane and wireless—all that bursts forth in a quivering spray of ferro-concrete spanning space.

The Administration Building of the Farbenindustrie Ltd. in Hoechst on the River Main, Germany, shows that Professor Peter Behrens has felt the spell of the parabola. This is significant as he belongs to the older generation and is considered one of the foremost German architects; the recent public celebration of his birthday demonstrated the high esteem he enjoys. Professor Behrens likes to show the motif which is to dominate a design isolated at a significant point and then to apply it in all its variations. The parabolic arch which bridges the street connecting two units of the Farbenindustrie Works introduces the dominating motif which is repeated in the tower-windows and in the window row of the top floor. This is a novel application of the parabola and shows one possibility of adjusting the vertical window frames to the curved haunches. The desired connection between this arcade and the vertical piers below is missing. The parabolic arch must seem to shoot forth from the ground if its elemental character is to be conveyed. The large area of solid masonry below the tower-windows produces a much better effect than the verticalism of the piers below the parabolic arcade of the main wall. The perfect solution would seem to be the application of the bridge-motif to the facade: an arcade standing on the ground with windows in the arch openings and between vertical posts filling the spandrels.

The swimming pool designed by architect L. Rother shows the use of the parabolic vault for a smaller building. Here, likewise, the dominant impression is one of pleasing variation of light and shade. One only has to compare this, as well as the other buildings already referred to, with some of the ferro-concrete halls using angular frames, or with some modern designs based on Mayan architecture, for example, to recognize the superiority of the parabolic style.

BRIDGE AND ADMINISTRATION BUILDING, I. G. FARBENINDUSTRIE, HOECHST A. M., GERMANY
PROF. PETER BEHRENS, ARCHITECT

SWIMMING POOL IN GERMANY
L. ROTHER, ARCHITECT

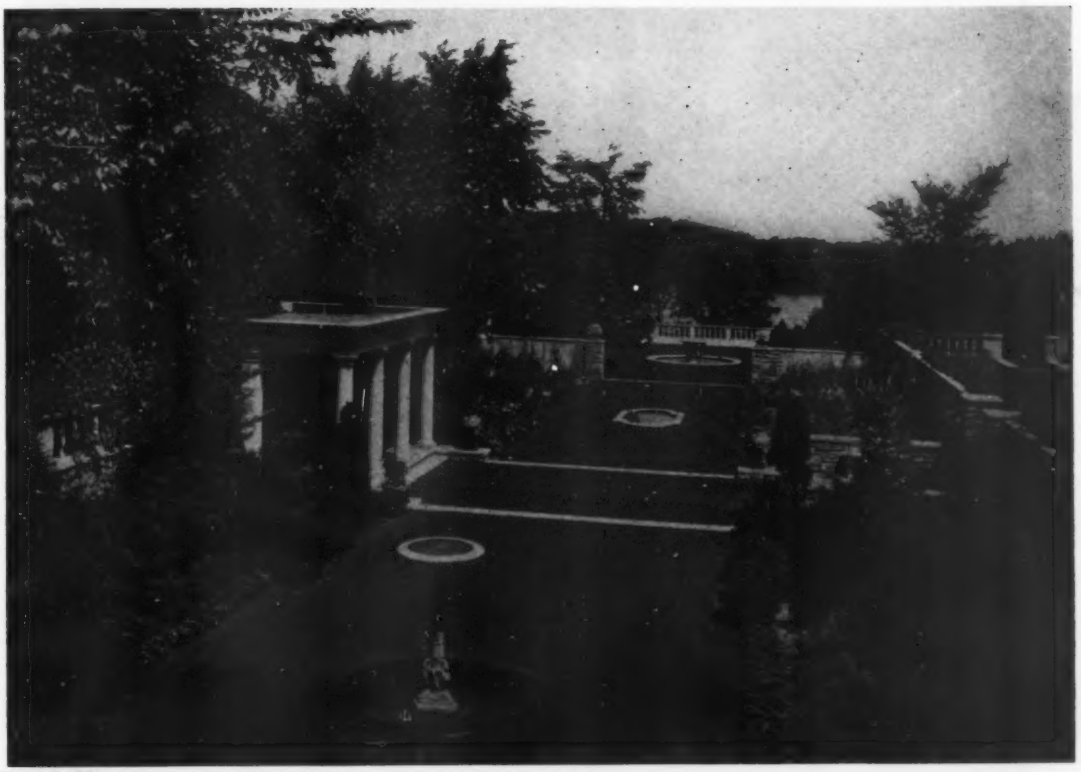
ADMINISTRATION BUILDING, ENTRANCE, I. G. FARBENINDUSTRIE, HOECHST A. M., GERMANY
PROF. PETER BEHRENS, ARCHITECT

ILLUSTRATING
THE HOUSE OF
EDWIN S. GEORGE
BLOOMFIELD HILLS, MICH.

✧

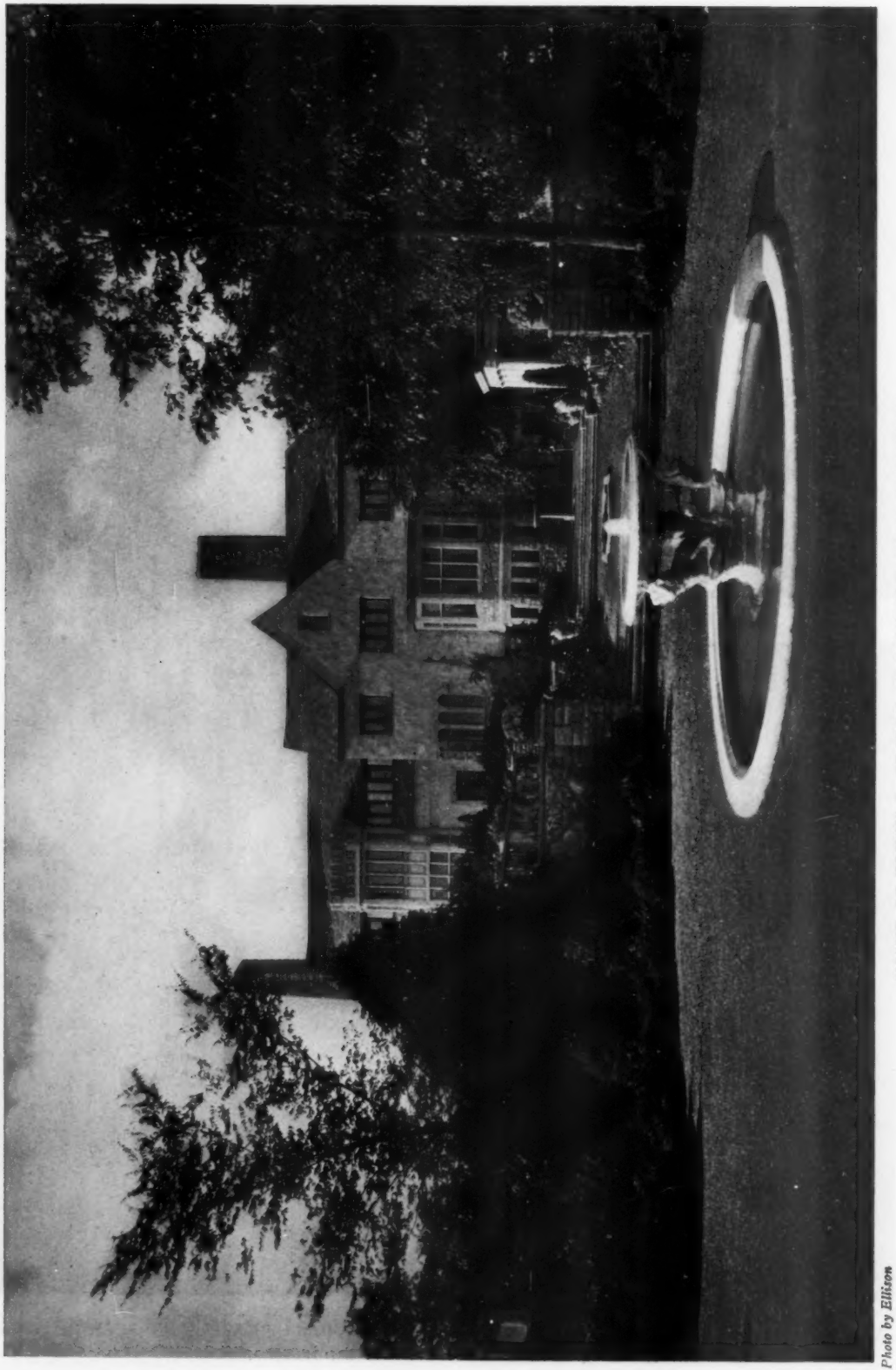
George D. Mason & Company
Architects

✧



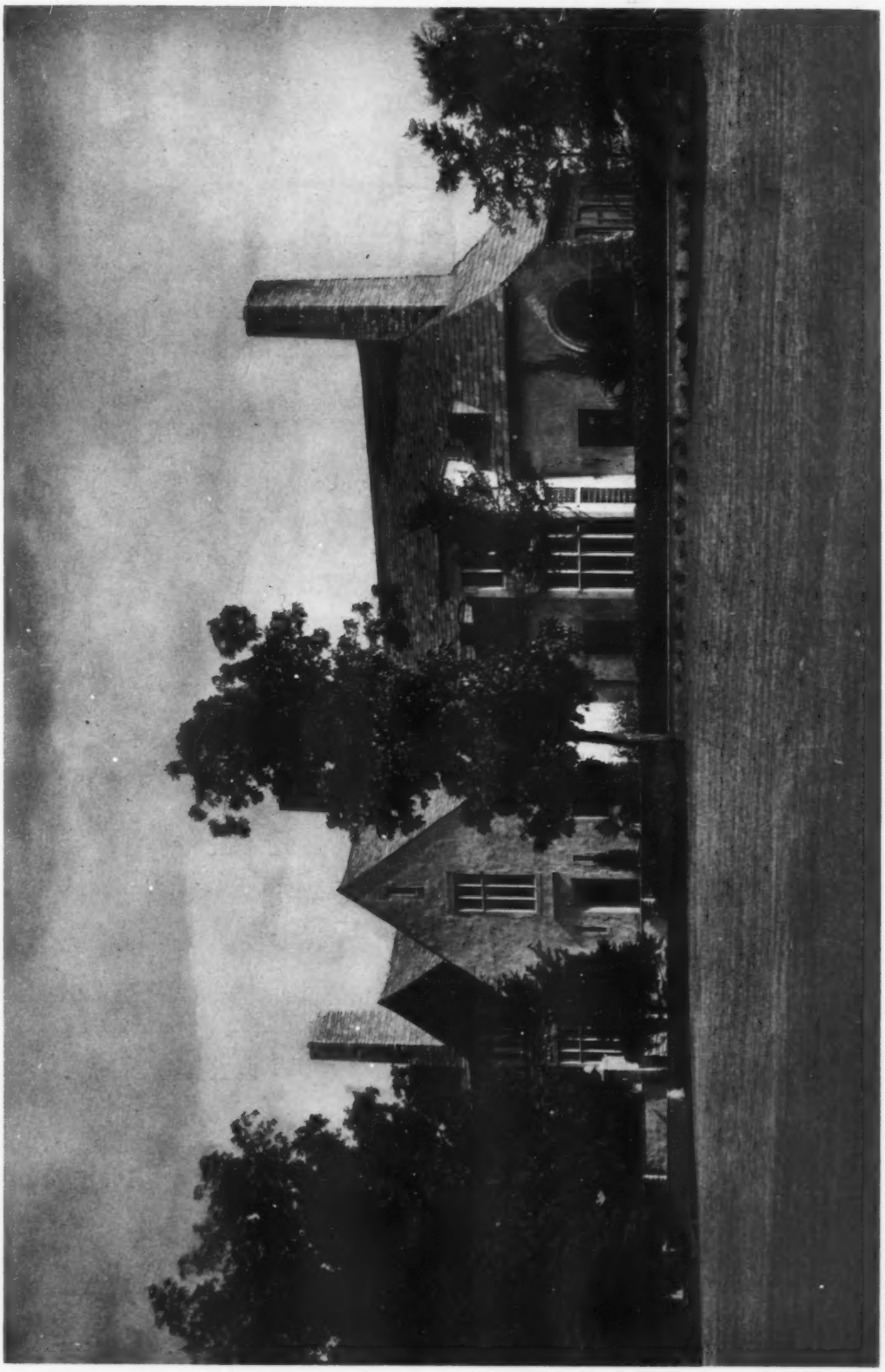
Photos by Ellison

ABOVE, GARDEN ORNAMENT DETAIL. BELOW, GENERAL VIEW OF GARDEN AT REAR OF HOUSE
HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICH.



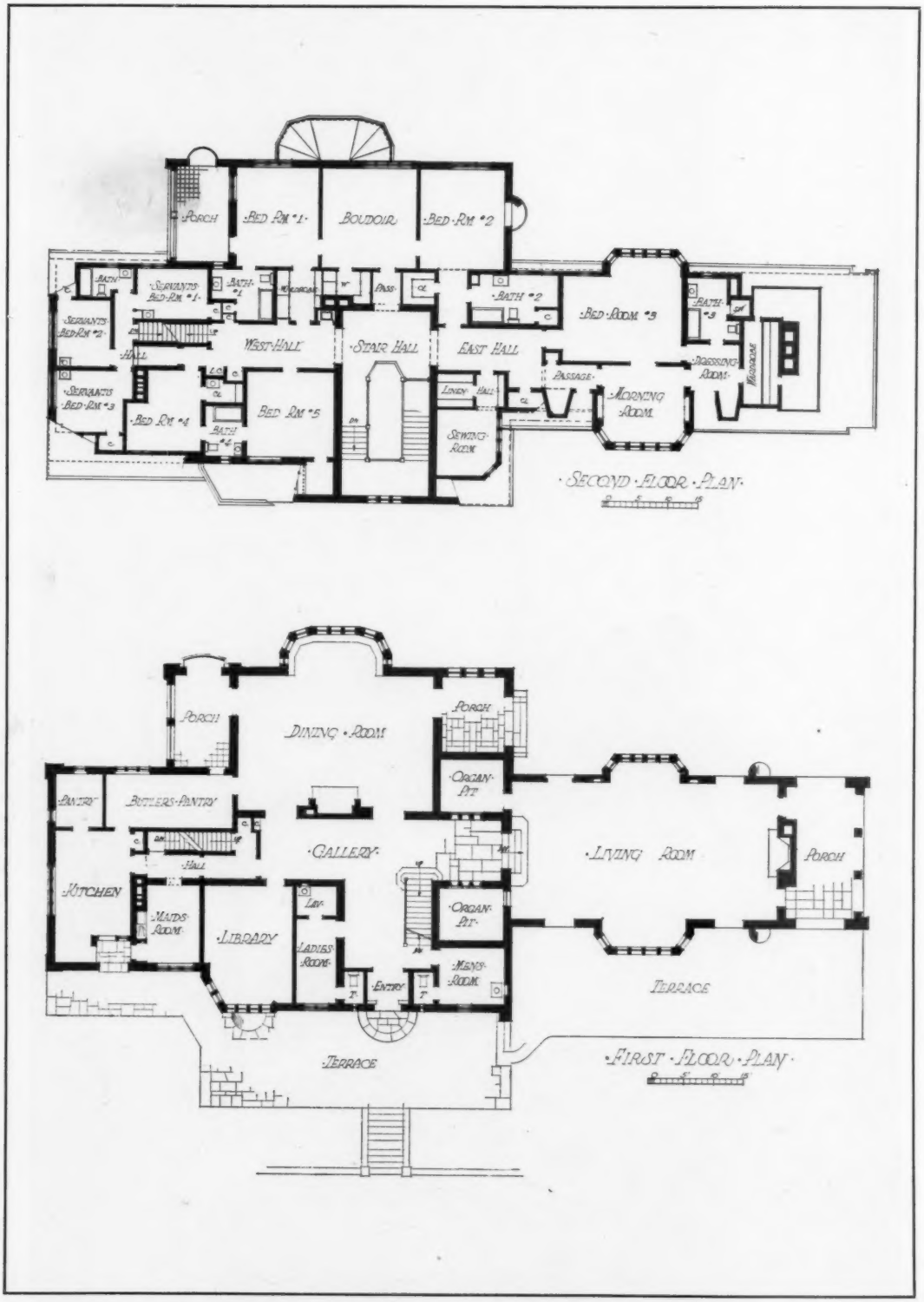
HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICHIGAN
GEORGE D. MASON & COMPANY, ARCHITECTS

Photo by Ellison



HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICHIGAN
GEORGE D. MASON & COMPANY, ARCHITECTS

Photo by Ellison



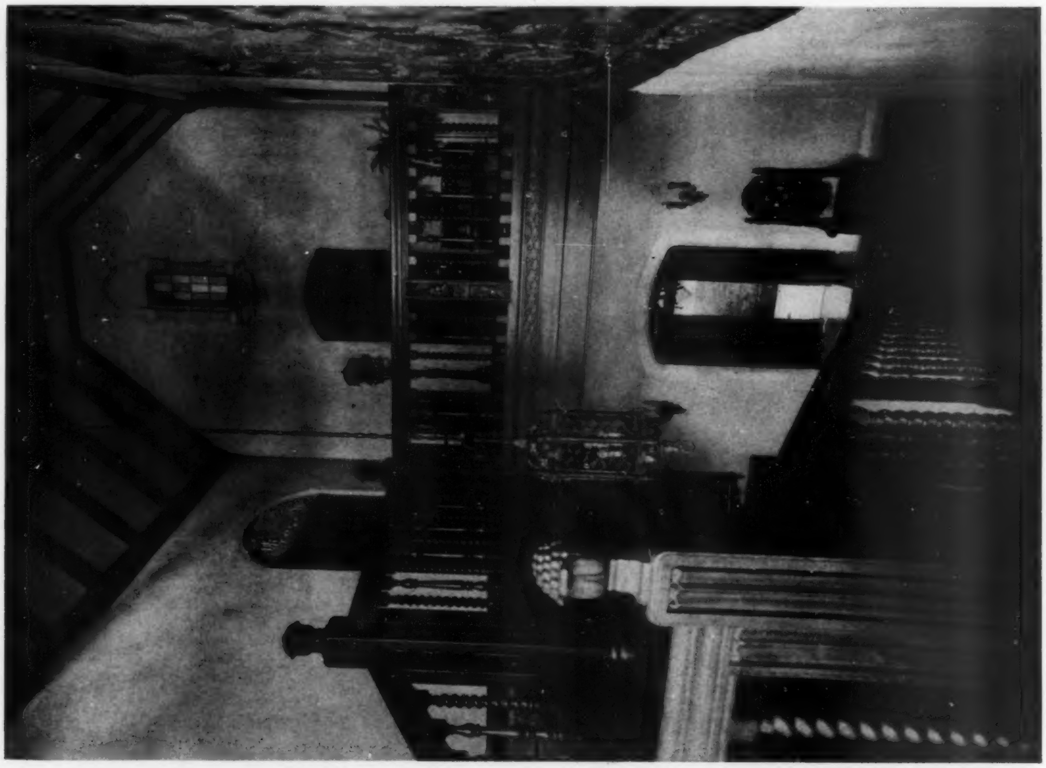
HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICHIGAN

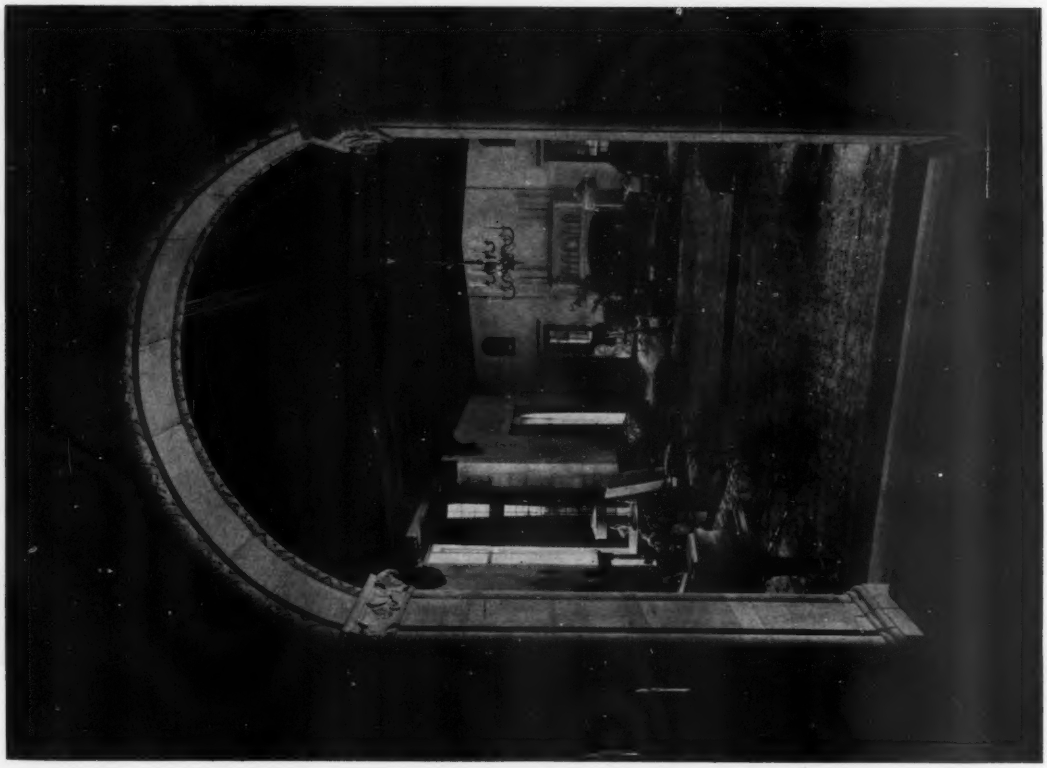
GEORGE D. MASON & COMPANY, ARCHITECTS

Photo by Ellison

HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICHIGAN

GEORGE D. MASON & COMPANY, ARCHITECTS



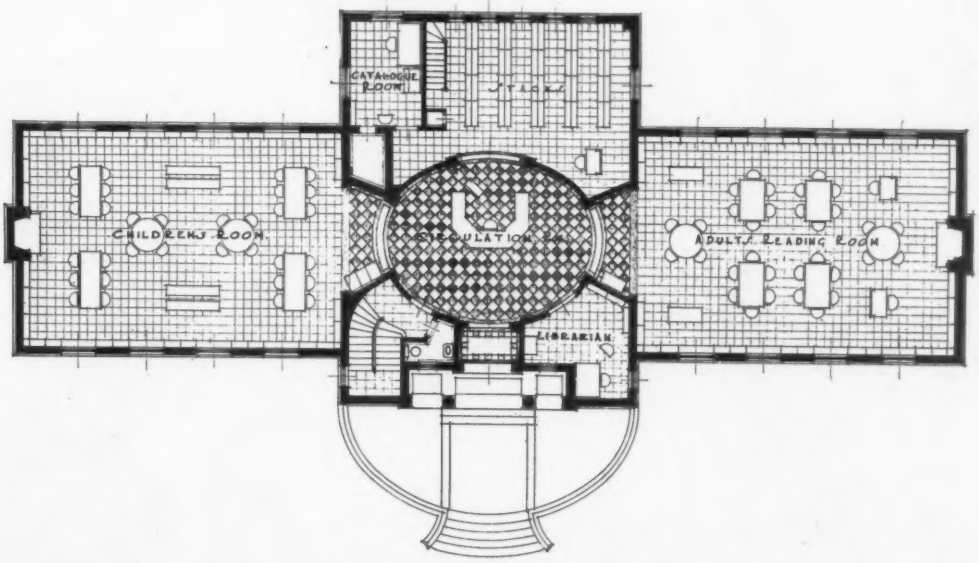


Photos by Ellison

HOUSE OF EDWIN S. GEORGE, BLOOMFIELD HILLS, MICHIGAN
GEORGE D. MASON & COMPANY, ARCHITECTS

A SUBURBAN LIBRARY

Photo by Gillies



HAGAMAN MEMORIAL LIBRARY, EAST HAVEN, CONN.
DAVIS & WALLDORFF, ARCHITECTS

Photo by Gillies

HAGAMAN MEMORIAL LIBRARY, EAST HAVEN, CONN.
DAVIS & WALLDORFF, ARCHITECTS

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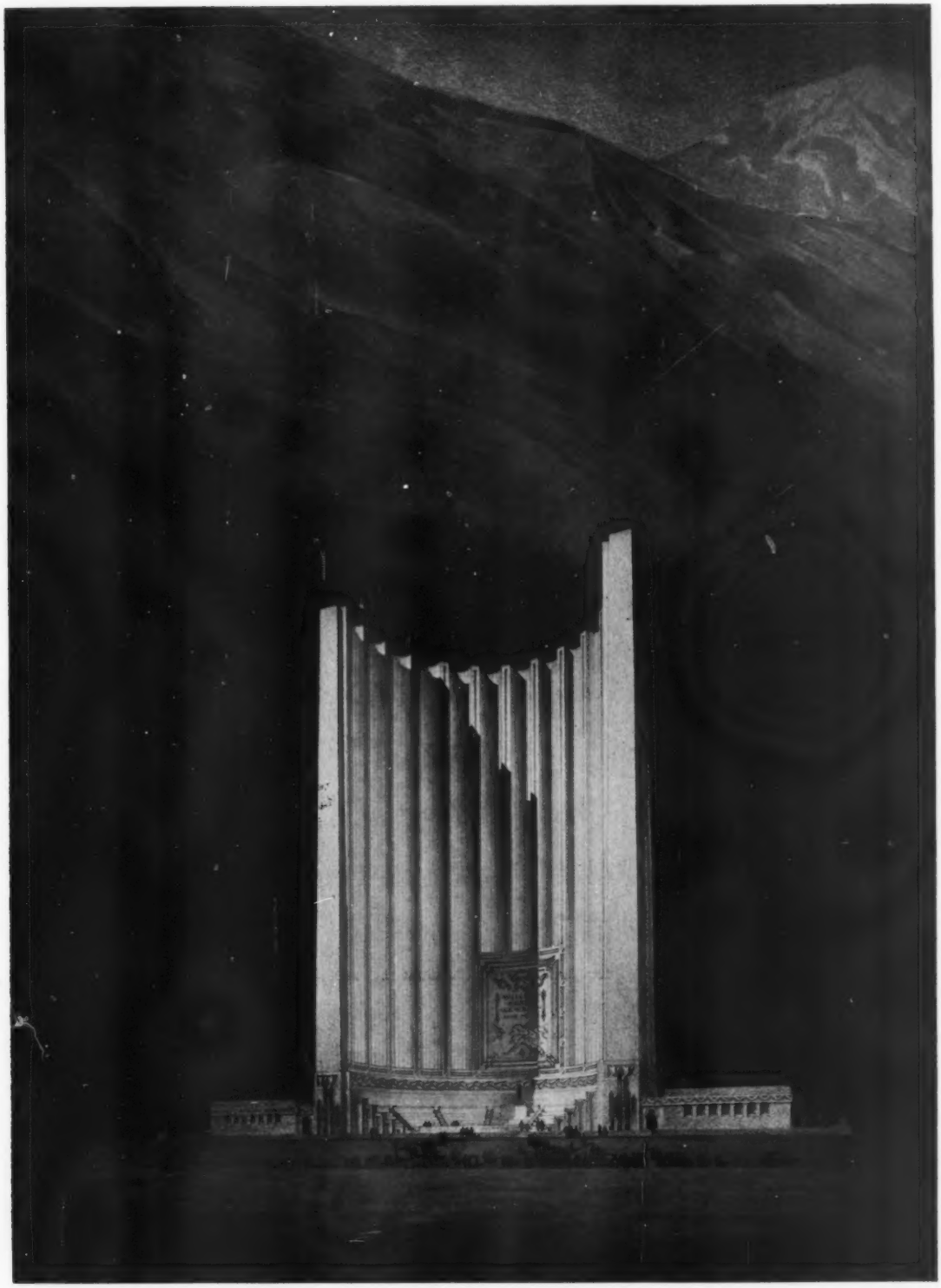
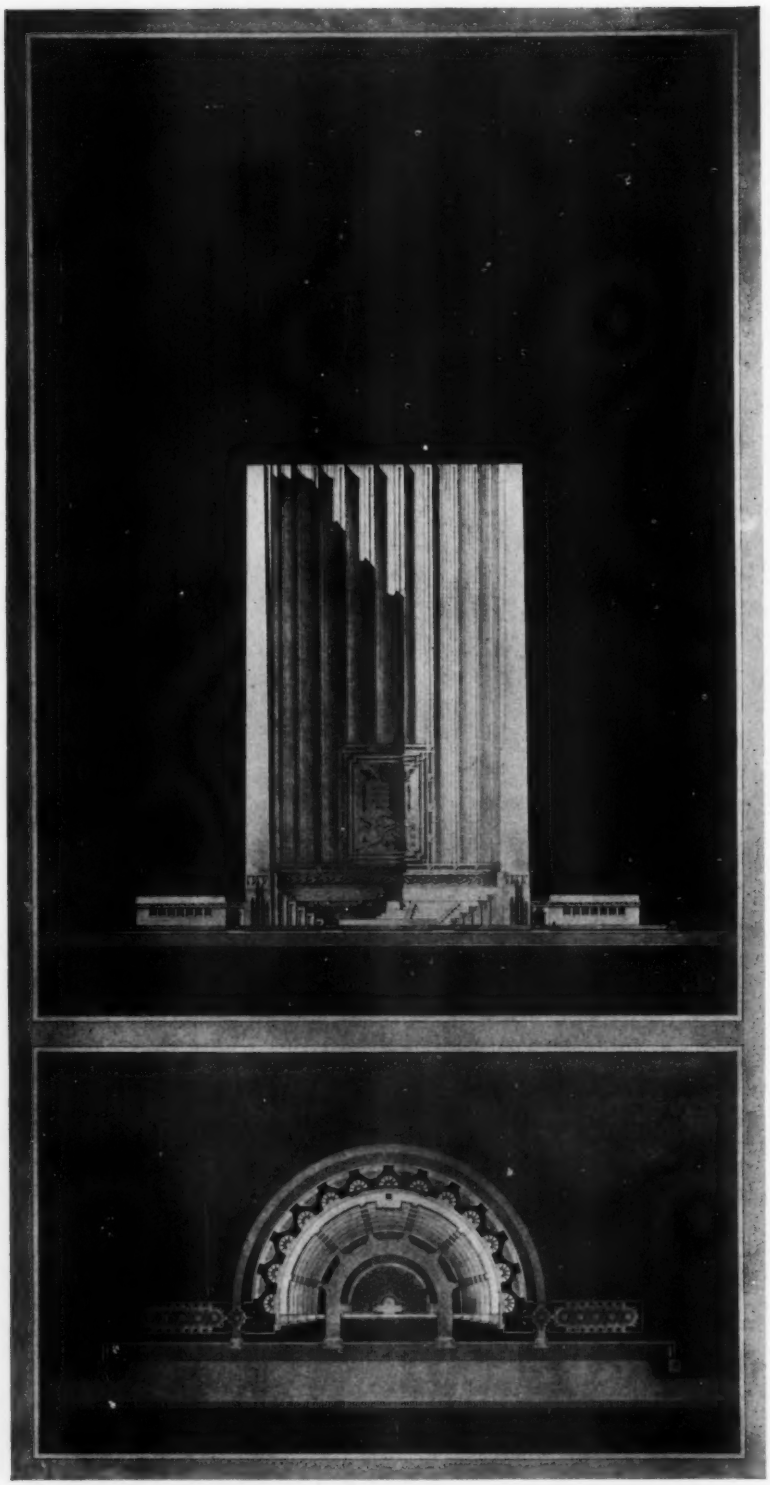
DAVIS & WALLDORFF, ARCHITECTS



WILLIAM HENRY SEWARD MEMORIAL, SEWARD, ALASKA
H. HORNBOSTEL & ERIC FISHER WOOD, ARCHITECTS



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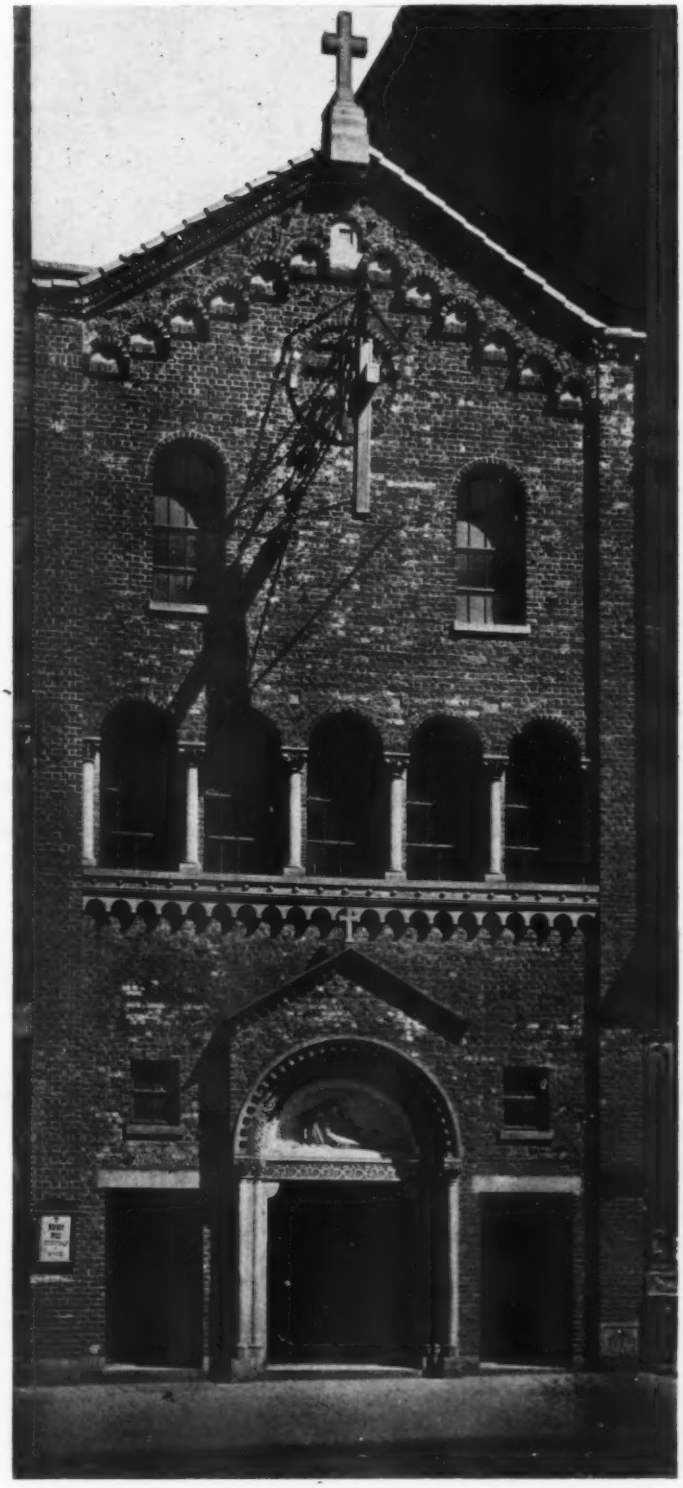
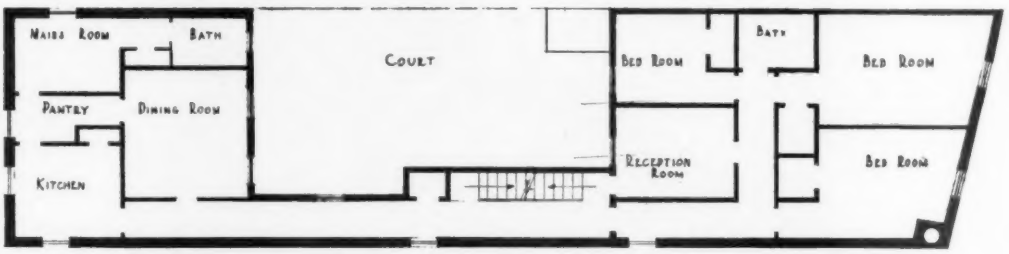
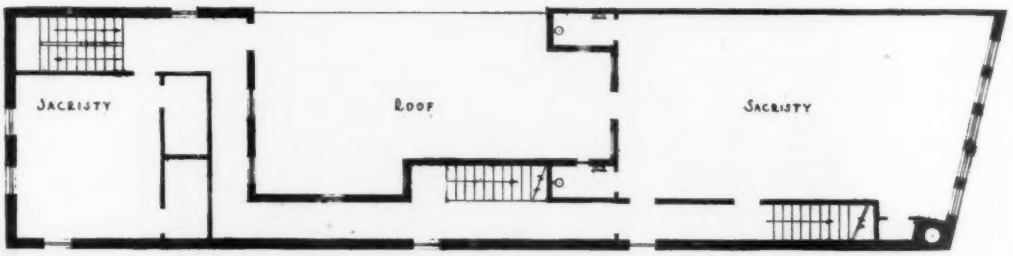


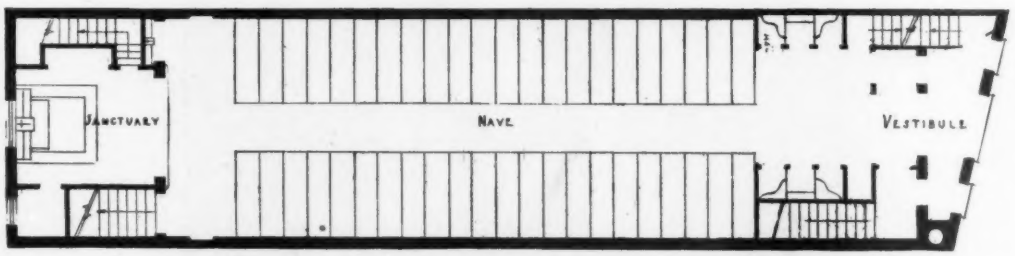
CHURCH OF THE MOST HOLY CRUCIFIX, NEW YORK, N. Y.
ROBERT J. REILEY, ARCHITECT



• THIRD • FLOOR • PLAN •

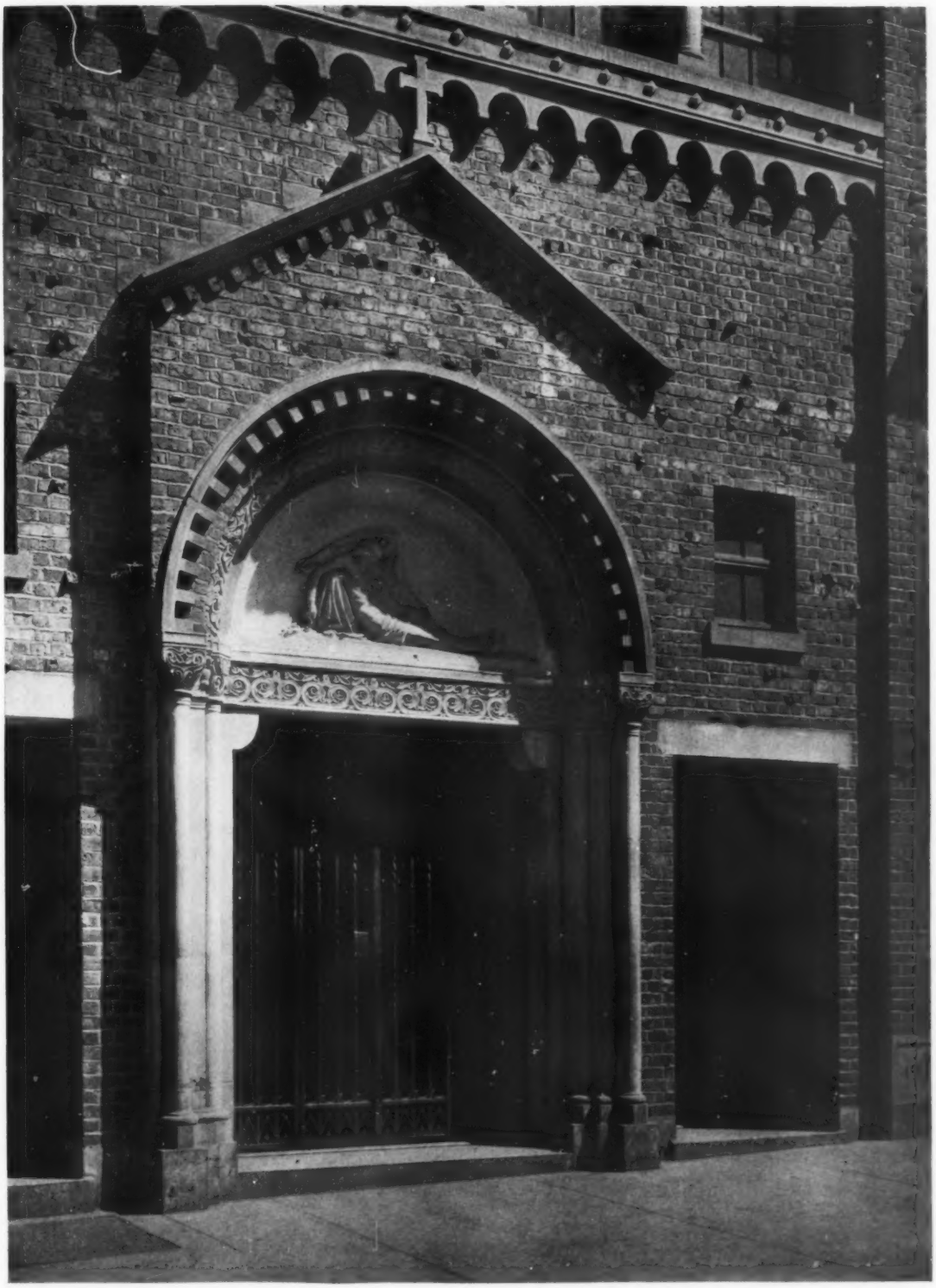


• SECOND • FLOOR • PLAN •



• FIRST • FLOOR • PLAN •

CHURCH OF THE MOST HOLY CRUCIFIX, NEW YORK, N. Y.
ROBERT J. REILEY, ARCHITECT



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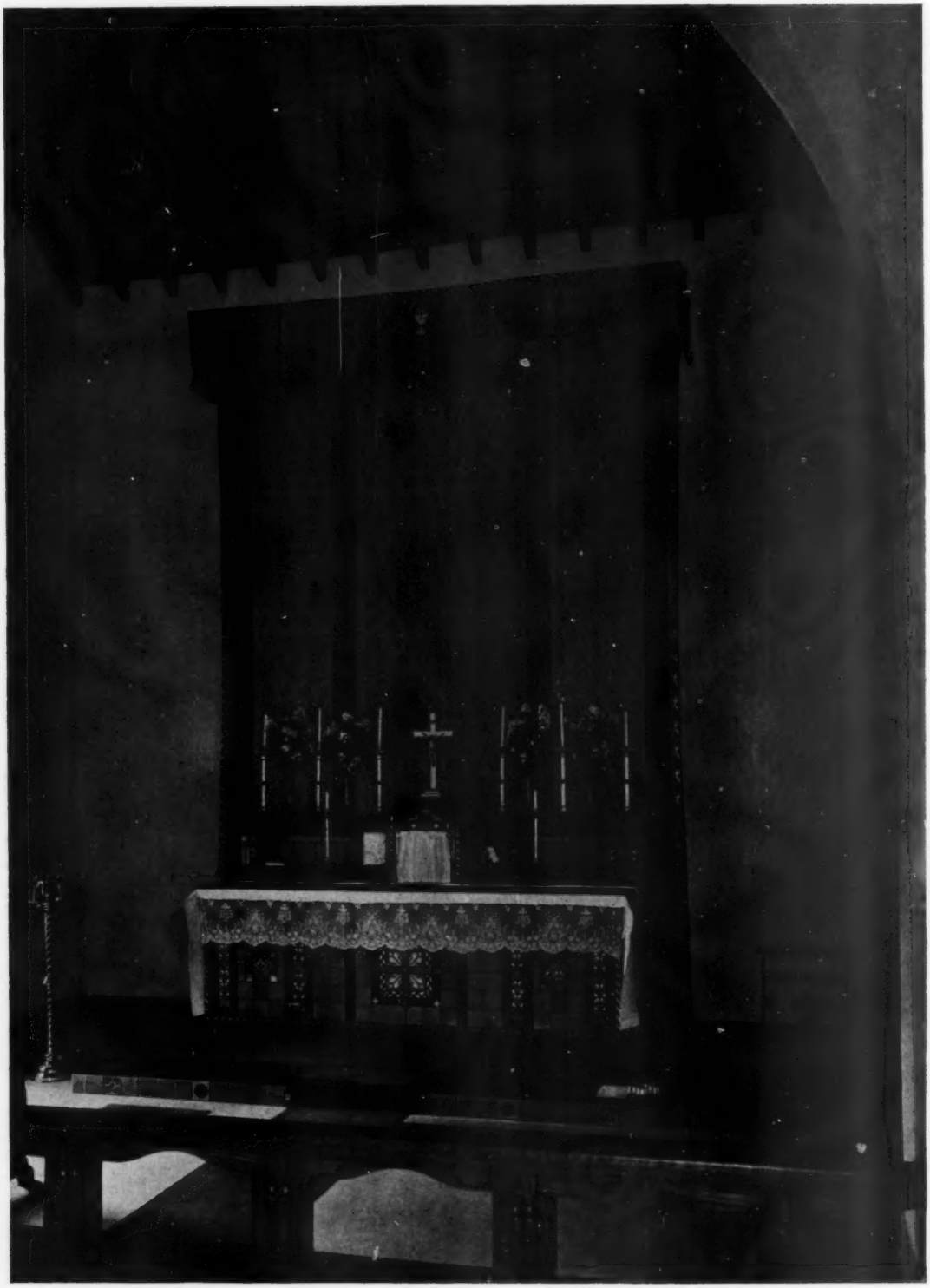


CHURCH OF THE MOST HOLY CRUCIFIX, NEW YORK, N. Y.
ROBERT J. REILEY, ARCHITECT

EDITORIAL COMMENT

WHAT PRICE ARCHITECTURE?

IN a conversation with an architect of our acquaintance the subject of architectural fees was mentioned. This recalled to him a recent occurrence and he told us the story. It appears that an opportunity was presented to design a certain building. Circumstances were such that he preferred not to undertake this commission, and recommended that another architect whom he named should be retained. Disregarding good advice, the owner ultimately selected an architect (?) who undertook the work at a price that was but one-third the amount that experience had shown to be necessary to prepare adequate drawings and specifications and render other essential service. We doubt whether this man rendered his service to the owner at a loss to himself. If proper service was rendered, some one beside the owner made up the loss, although the owner ultimately paid the bill. If proper service was not rendered then the owner got the service he paid for, and if he imagined that he had secured a bargain, he exhibited poor business judgment.

Another instance was cited, in the same conversation, where structural information on a set of plans was conspicuous by its absence. The specifications for the steel work contained a clause to the effect that the steel contractor was to be responsible for the design of the steel frame. A second clause stated that the contractor for the concrete work was to be responsible for the design of the concrete. This is certainly neither architectural nor engineering service. It is evidently a case where the architect gave the client a "special rate." The contractors must have made a "special allowance" in their estimates for engineering service and the owner paid the bill without knowing it.

We have heard it rumored that there are architects who specialize in the design of a particular type of building and furnish plans and specifications for these buildings on a fixed basis of so much per front foot, in spite of the fact that the individual buildings may vary in depth and height. The front foot price is the rate the speculative builder or promoter is willing to pay for "architectural service."

How many architects are there who agree to a reduced fee when they find that it is essential to securing the job? Is this actually necessary? In answer to the first question, we are inclined to believe that the acceptance of a reduced fee is a practice more common in the architectural profession than in any other. In answer to the second, we believe that it is not necessary. It happens most often due to poor or inaccurate salesmanship. If it is necessary in spite of good salesmanship, then there is an existing condition in the ranks of the profession that requires prompt and efficacious measures. These measures are not necessarily, nor can they well be made a matter of mutual or binding agreement within the profession. It is not only a matter of obtaining the price the work is worth but also largely a matter of educating the public, particularly building promoters, realtors and bankers, as to the cost of architectural service, and of architects becoming better informed upon what it costs to render service, and the profit that must be obtained when all factors are considered.

The advocating of a six per cent architectural fee by the American Institute of Architects has in a sense been unfortunate. One reason for this has been the fact that the six per cent portion of the "schedule of proper minimum charges" has been emphasized instead of the words "a proper minimum charge" which precedes it. The result has been that the public considers, if it does so at all, the rate of six per cent as a standard fee, instead of a minimum fee. Certain communities appear to think that the usual fee is five per cent even for house design. Evidently some or all of the architects practicing in these centers make this the basis of their fee. If an architect can render proper service, show a reasonable profit, and offer advice in the interest of his client only at five per cent, there is little reason for charging more. But on house work particularly such conditions rarely exist. The Institute code recognizes this and states in part "on residential work—it is proper to make a higher charge."

Any argument for a sufficient fee to allow for proper service must take into account that all individuals practicing architecture are not endowed with ability, knowledge and experience to the same degree. The fact that a fee which is adequate for a particular job or type of building may be too high or too low for another project, must also be considered. Overhead costs of operating offices vary and must be taken into account.

Is the percentage method of arriving at the

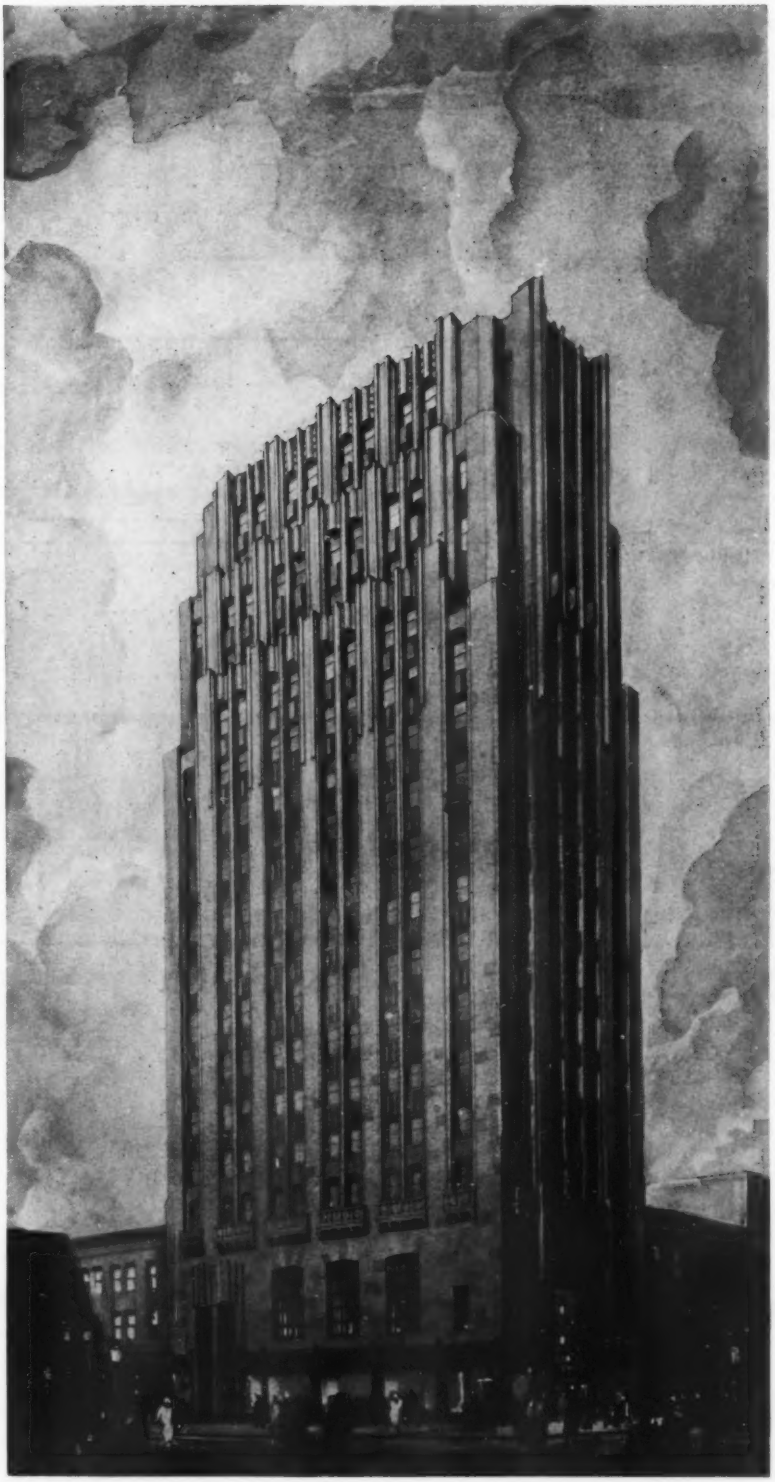
architect's fee the best that can be found? There are those who find the fixed fee more satisfactory. It usually is, especially to the client. A graduated fee starting at a maximum percentage for a structure of minimum cost and decreasing as the cost increases may also be used with fairness to both parties.

The question of fair charge is always present where personal service is involved. The practice of architecture, however, is today faced with another consideration. Building construction has become more complicated, involved and repleted with ramifications as we all know. As a result architects are less able to render personal service in the strict sense of the word. As this condition grows the practice of architecture becomes more and more a business—the sale of a commodity. Unlike other commodities, it is impossible to estimate accurately what this commodity will cost. As a matter of fact on two jobs identical in magnitude and type the costs may be far different because of causes beyond the architects' control. This is usually viewed in the light of the law of averages and it is assumed that the loss on one job is made good by the profit on another job. This can hardly be called sound business.

While the monetary value of architectural service is a question that must be decided by each practitioner, a frank discussion may prove helpful to many and bring to light some means of arriving at a fair charge and eliminate certain practices that place the architectural profession in an unfavorable position. To this end the pages of THE AMERICAN ARCHITECT are open to our readers who have opinions on the subject that will help others. We are not advocating a wholesale increase in architectural fees, nor a fixed price schedule that might be viewed with suspicion by the government. We do argue for a fair fee that permits giving the client the service required at a profit to the architect, and the elimination of the price cutter. The latter rarely makes an honest profit, cannot render reasonable service, and gives to his client a false impression of what an architect is supposed to do.

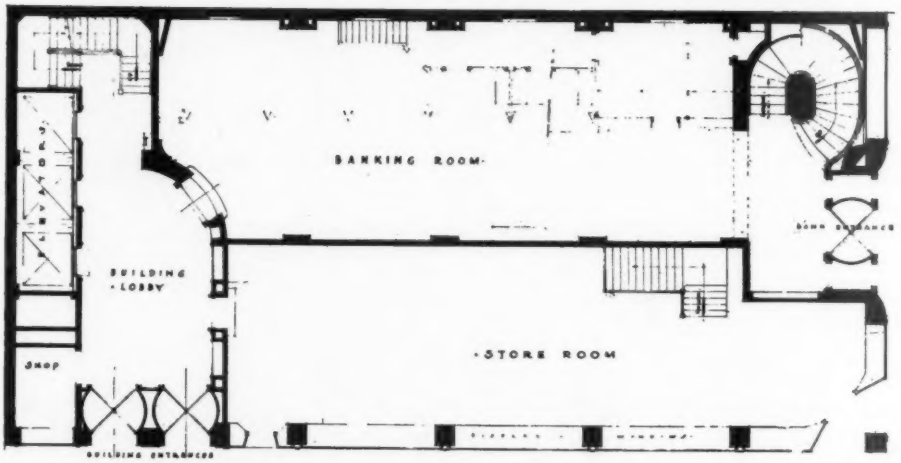
JUDAH BUILDING, CHICAGO, ILL.—HOLABIRD & ROOT, ARCHITECTS

FROM A RENDERING BY GILBERT P. HALL

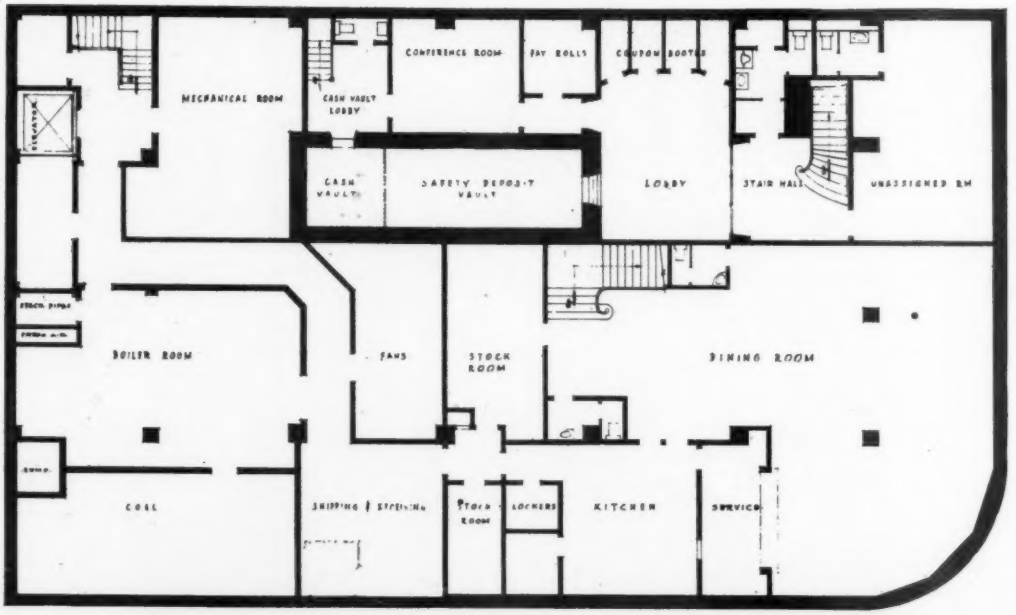


CENTRAL SAVINGS & LOAN COMPANY BUILDING, YOUNGSTOWN, OHIO

MORRIS W. SCHEIBEL, ARCHITECT; R. M. JOHNSON, ASSOCIATE



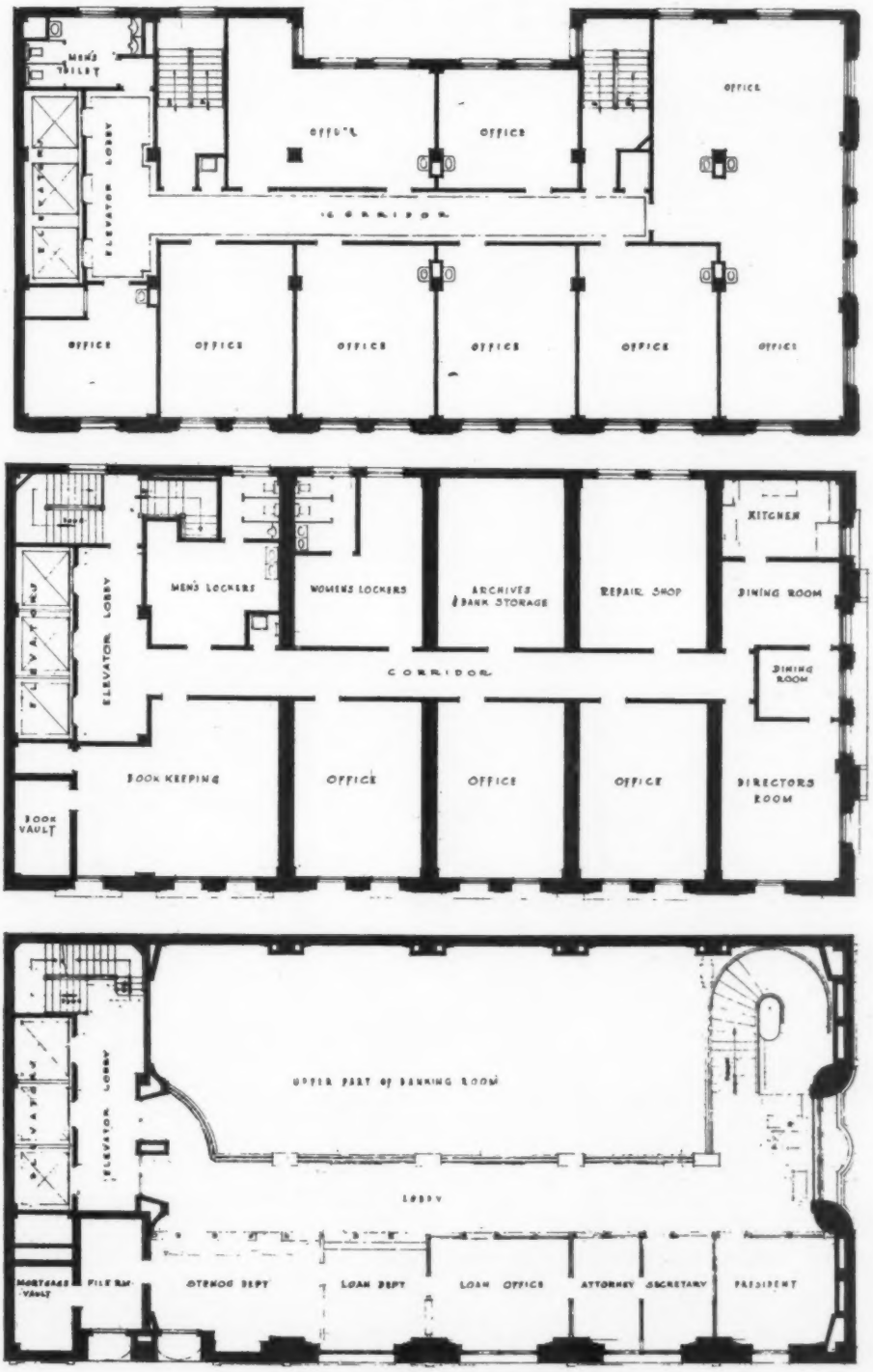
PLAN OF FIRST FLOOR



PLANS OF BASEMENT

CENTRAL SAVINGS & LOAN COMPANY BUILDING, YOUNGSTOWN, OHIO

MORRIS W. SCHEIBEL, ARCHITECT; R. M. JOHNSON, ASSOCIATE



PLANS OF 2ND, 3RD AND TYPICAL FLOORS

CENTRAL SAVINGS & LOAN COMPANY BUILDING, YOUNGSTOWN, OHIO

MORRIS W. SCHEIBEL, ARCHITECT; R. M. JOHNSON, ASSOCIATE

A RE-CONSTRUCTION JOB

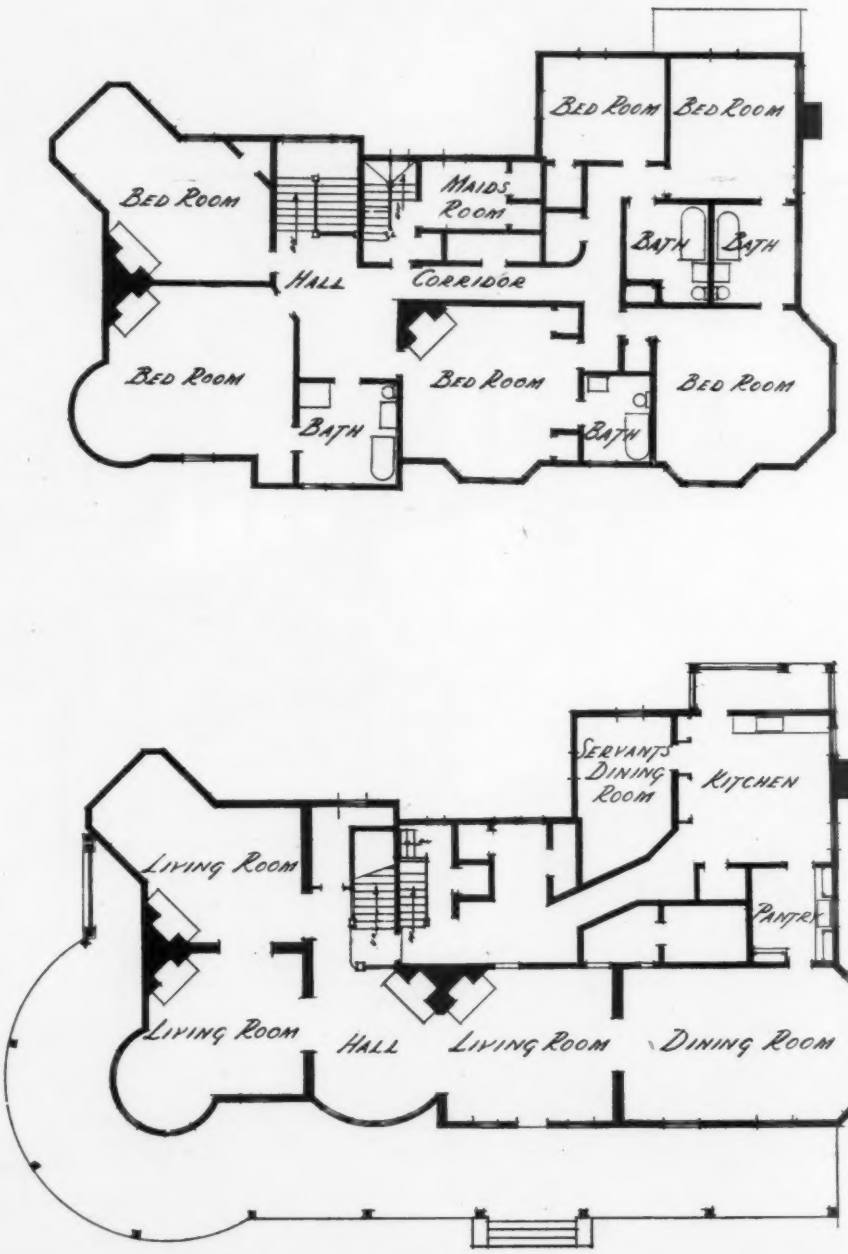
Photos by Fischer

HOUSE OF SIDNEY H. SONN, SUNNY RIDGE, HARRISON, N. Y.

JULIUS GREGORY, ARCHITECT

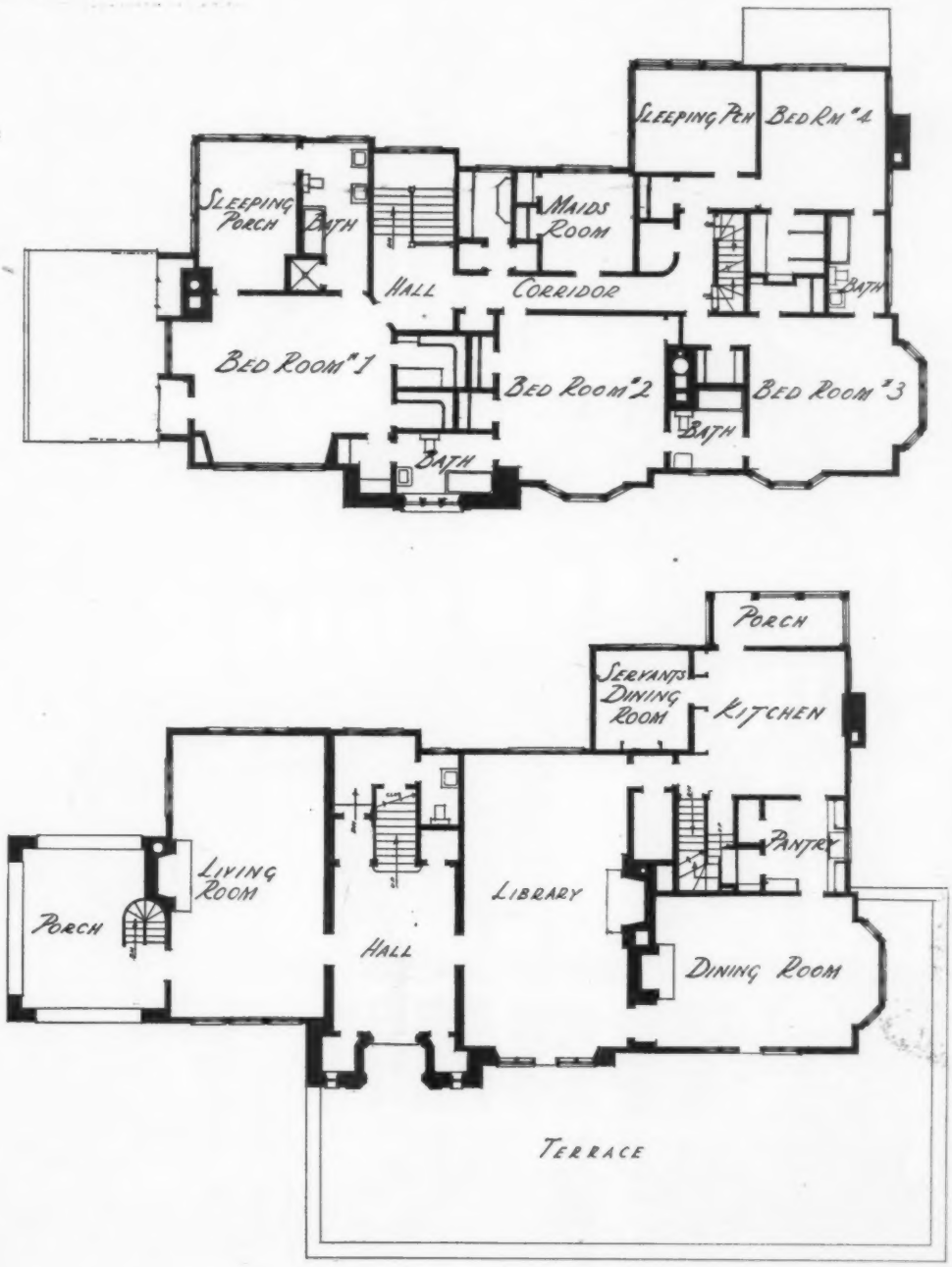
Photo by Fischer

HOUSE OF SIDNEY H. SONN, SUNNY RIDGE, HARRISON, N. Y.
JULIUS GREGORY, ARCHITECT



PLANS OF THE ORIGINAL HOUSE BEFORE ALTERATIONS WERE MADE

HOUSE OF SIDNEY H. SONN, SUNNY RIDGE, HARRISON, N. Y.
JULIUS GREGORY, ARCHITECT



PLANS OF THE HOUSE AS RECONSTRUCTED

HOUSE OF SIDNEY H. SONN, SUNNY RIDGE, HARRISON, N. Y.
JULIUS GREGORY, ARCHITECT

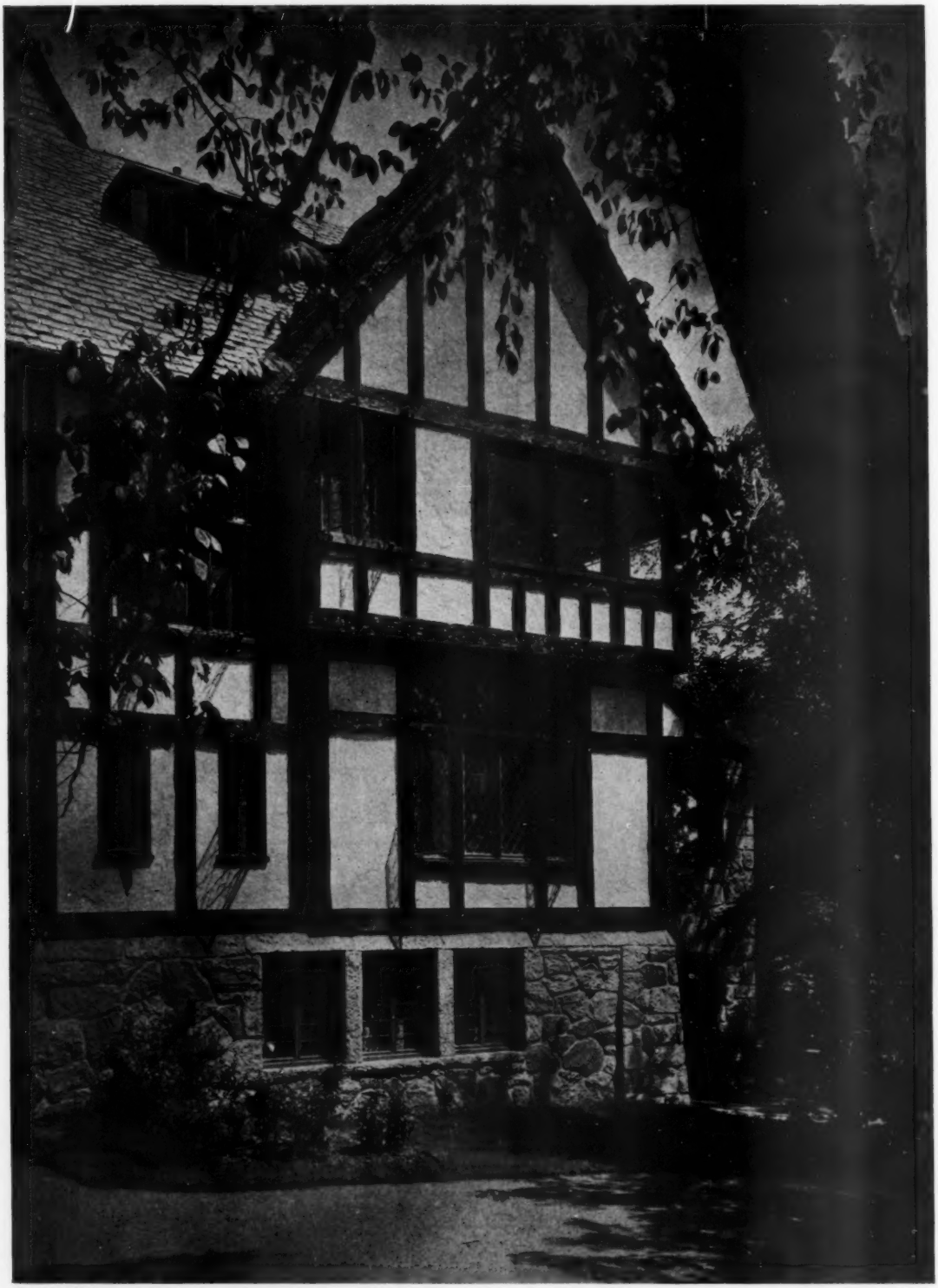
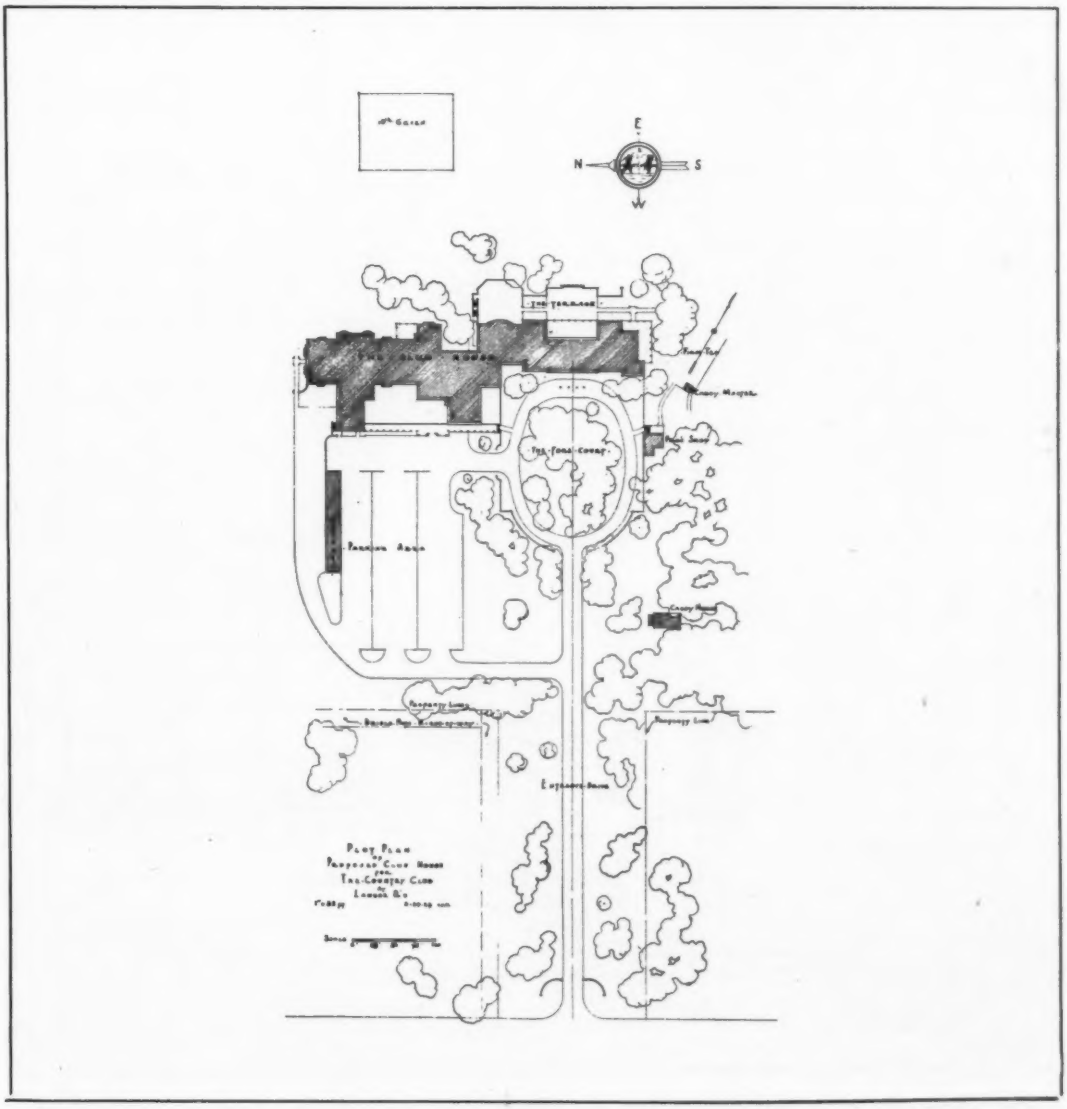
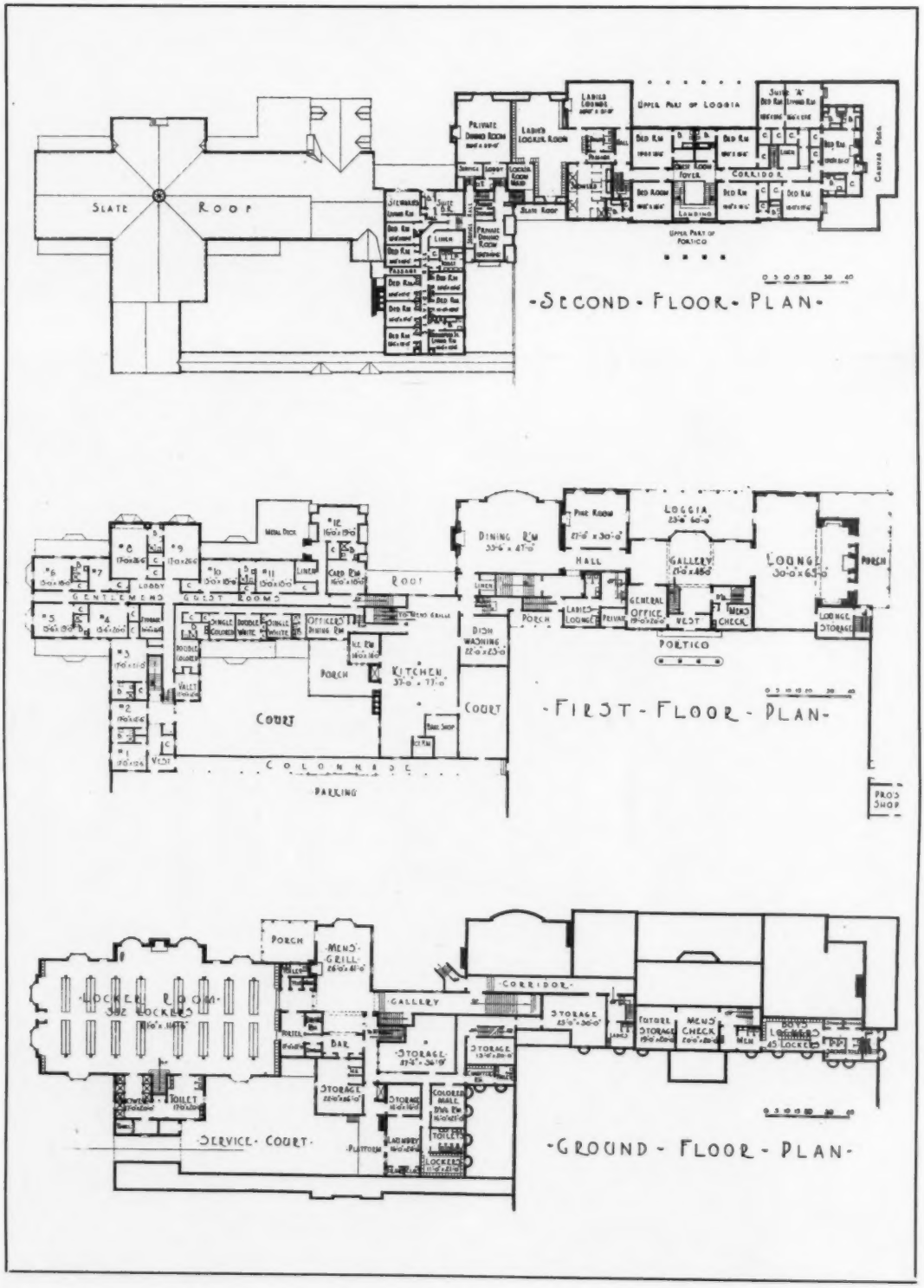


Photo by Fischer

HOUSE OF SIDNEY H. SONN, SUNNY RIDGE, HARRISON, N. Y.
JULIUS GREGORY, ARCHITECT



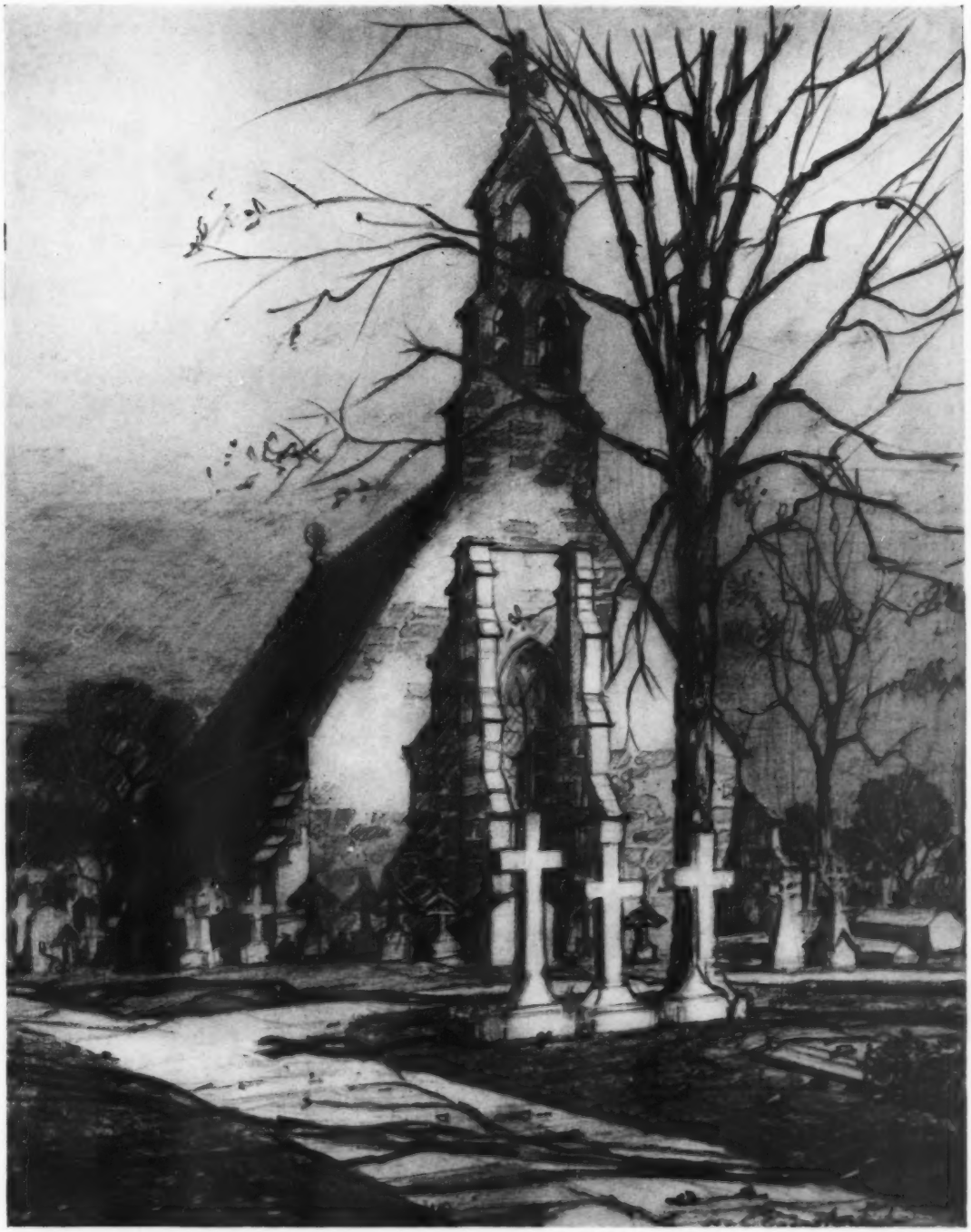
PROPOSED CLUB HOUSE FOR THE COUNTRY CLUB AT LA NDER ROAD, CLEVELAND, OHIO
PHILIP LINDSLEY SMALL & ASSOCIATES, ARCHITECTS



PLANS, PROPOSED CLUB HOUSE FOR THE COUNTRY CLUB AT LANDER ROAD, CLEVELAND, OHIO
PHILIP LINDSLEY SMALL & ASSOCIATES, ARCHITECTS

A GROUP OF SKETCHES

Philadelphia and New York

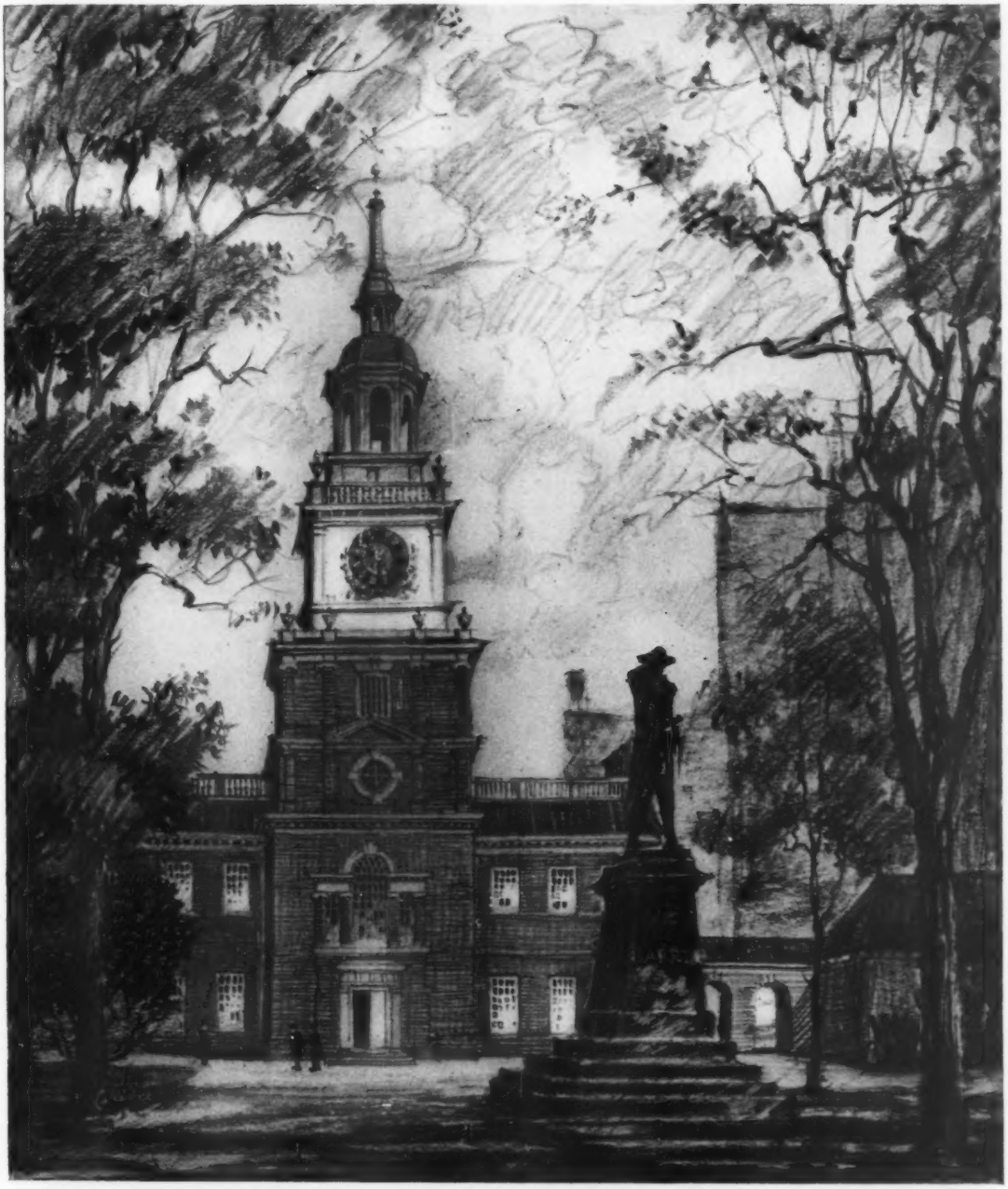


ST. JAMES THE LESS, PHILADELPHIA, PA.

FROM THE ORIGINAL DRAWING BY GEO. C. SPONSLER, JR.

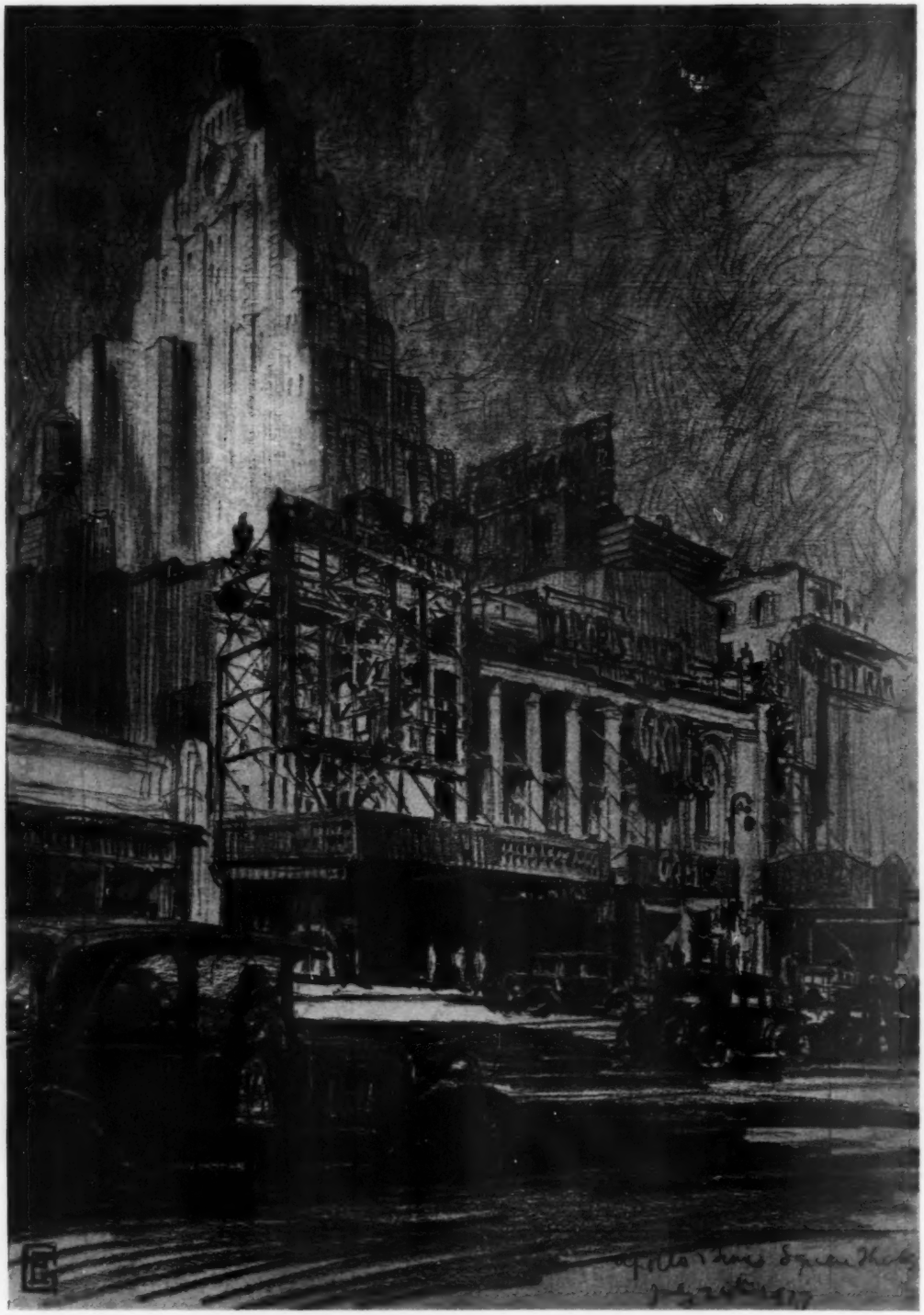
A CHURCH-YARD SCENE

FROM THE ORIGINAL DRAWING BY GEO. C. SPONSLER, JR.



INDEPENDENCE HALL, PHILADELPHIA, PA.

FROM THE ORIGINAL DRAWING BY GEO. C. SPONSLER, JR.



APOLLO AND TIMES SQUARE THEATRES, NEW YORK CITY
SKETCH BY E. P. CHRYSTIE

LOOKING NORTHEAST ON CHERRY STREET, NEW YORK CITY

SKETCH BY E. P. CHRYSTIE

COLOR AND ARCHITECTURE

By JULIAN CLARENCE LEVI

A talk given before the Architectural and Allied Arts Exposition, April 18, 1929

A UNION formed when primitive man constructed his first primitive shelters has, like human unions, been subject to periods of joyous harmony, of coldness, of misunderstanding and of reconciliation. These periods have varied in frequency and in intensity according to racial and climatic conditions but some kind of a relationship, friendly or hostile, has always existed between the two and always must exist. Even in the depths of New York's brown stone front period there was color—monotonous, drab, depressing though it was.

Color in architecture is obtained in two ways. It is due either to the color of the building material or else to the color of pigment applied to the material, paint. A love for color, rich and harmonious, seems to be innate in the human race to such an extent that the natural colors of the materials proved insufficient. The farther one goes into the past, the more intimate a connection one finds between architecture and painting. Buildings were painted inside and outside, surfaces were covered with flat tones, with painted ornaments, with pictorial subjects. Even carved ornament and sculpture were gaily painted.

If we confine our attention to the architecture of European nations, of which American architectural design is an offspring, it would appear that the use of painted color was first abandoned by Rome, under the Emperors, upon the exterior of her monumental buildings. With that exception it persisted until the Renaissance, when the influence of that Roman architecture and, in some countries, the influence of the Reformation caused it to disappear.

You must not think, because of my reference to painted color, that this is to be a talk on paint. In bygone ages man was generally compelled to use the building materials that were native to the locality in which he was building. He had but few artificial methods at his disposal. That he resorted freely to the use of paint was proof of the fact it was the only means he possessed to satisfy his need of color.

Today we have an ever increasing number of both natural and artificial building materials in wide ranges of color, but, alas! our color sense has become numbed and dulled and we do not take advantage of our opportunities.

Architecture is an expression of human life. Nature's setting for life has varied form as well as richness and variety of color. Why shall we persist in creating grey ecclesiastic, white classic, and yellow brick commercial as a man-made setting for human life?

We are availing ourselves to the utmost of the structural possibilities of modern materials and methods of construction. We are piling story upon story until our buildings dwarf the greatest structures of antiquity. In their design we are freeing ourselves of the precedent of Imperial Rome, of the Renaissance, of the 18th century, except as to the use of color. In our architectural design we have the courage to consider mass, line proportion, relation of a part to the whole, relation of void to solid, from the point of view of today, but our consideration of color is timid and halting. That inhibition persists. Yet it is not natural and, measured in terms of architectural history, it was acquired quite recently.

The average architect makes his studies in black and white or in monochrome. The design of his building is conceived in monochrome. It is developed in monochrome. It is only at the final stages of his study that he may consider the use of color in his materials. Color is consequently a secondary consideration. Its use does not influence the character of the design and it is not an integral part of the design. It is like a flower in the architect's coat lapel. It may be worn, or it may not be worn, without in any way affecting the correctness of design of his clothing.

While consideration of the gay posey in the button hole can not seriously be termed a factor in sartorial design, the use of color can be made a vital element in architectural design.

The fact was brought forcibly to my attention by an anecdote told me during the period of my studies at the Ecole des Beaux Arts in Paris. It was about the Paris Opera House. It appears that when that famous building was completed the architect, Charles Garnier, was dissatisfied with the effect of the front of the building as viewed from the square upon which it faced. While the proportions of that front had been most satisfying in his carefully studied drawings, they failed to satisfy when translated into stone. They had lost their Chesterfieldian quality. Careful observation led him to the conclusion that the mass of masonry which crowned this front appeared too heavy for the columns and arches which form a loggia immediately below it. This was an ocular effect, not

a physical fact. The building was safely standing then and is still standing safe and sound today with the same crowning mass of masonry. But the proportions of the front have now achieved the Chesterfieldian effect sought by Garnier in his drawings. He accomplished this result by a very simple device. He inserted a horizontal band of white marble a short distance above the cornice of the loggia. As the general tonality—the monochromality—of the Opera House is grey, this horizontal white band affects the visual aspect of the front to such an extent that the crowning mass appears to stop at the marble band. It no longer appears so heavy. It no longer appears to crush the columns and arches below it.

When we look at a building or any other large object, the brain does not register all details. The eye transmits them, of course, but we are conscious merely of the effect which is their resultant. For example, look at any building and then turn away from it and see whether you can remember the number of windows or stories without having actually counted them. If, when you next go to Paris, you stand on the Place de l'Opera and study the Opera House front, you will then notice that light band, the existence of which I am sure was unknown to those of you who have already seen that beautiful building. It was there, however, and, unseen by you, influenced your mental reaction. It gave you an impression of the relation of masses of masonry, by lightening the appearance of one mass. It consequently became a very important element in the design.

Of course white is strictly speaking not a color, and the introduction of one band of white or of a color does not constitute the use of color in architectural design. But I think it illustrates clearly the fact that architectural proportion is not entirely dependent upon mass and projection.

A column was originally purely structural in its function, so were cornices and overhanging roofs. By their continued use, by the refinement of their proportions and of their details, they have acquired aesthetic value. So have balconies, belt courses and many other elements of architectural design. They allow us to play with vertical lines, horizontal lines, vertical masses, horizontal masses and, by the combination of these lines and masses, create an architectural composition. When the sun shines they cast shadows which give sparkle and life to the building. On a dark day there are no shadows. The building lacks life, it appears flat. It has a different aspect. It is almost a different building. Which aspect does the architect intend to convey? Surely with shades and shadows. The sketches he shows his prospective client have them carefully indicated. And yet, during a large portion of the day, and on many days of the year, no direct sunlight reaches the fronts of buildings designed to be seen in sunlight.

If a band of white on the Paris Opera House can affect its appearance as I have just told you, surely the introduction of color in architectural design can be used, first as an aid in obtaining the desired composition of line and mass, and second in giving that composition warmth and color beauty.

An architectural composition is not unlike that of a painting, to refer to a sister art. Line and mass composition are inherent in both, but the painter rarely stops at a monochrome presentation. Can you imagine painting confined to black and white, grey and white, red and white and so on? The public would soon tire of the coldness and monotony of the painter's art and would cease to buy pictures to hang in home and gallery. But the public cannot cease to build. Practical necessity of modern life demands continued building activity. If the public could say to the architectural profession, we have enough of this cold monotony, the architect would be quick to respond.

All advance in architectural design has been forced upon the profession. It has been the result of new building materials, of new structural methods, of new social, political and religious condition, even of new legal codes. This is not said as a criticism of my own profession. It is a fact. The reason, as I said before, is that architecture is an expression of human life. As conditions of life change, architectural design changes, but more slowly because it is fettered by its own precedent and tradition.

In no country of the world, and at no time in history, has structural precedent and tradition been so completely smashed as in this country of today. We have freed ourselves in that regard. Now is the time to take advantage of the natural building materials of the world which modern transportation makes available, of the artificial materials which modern science makes possible—not only for their structural value but also for their color value.

I am happy to say that a start has been made. I am not here as a prophet nor as pioneer but to do my small bit to aid in spreading an appreciation of the value of color in architectural design, for I am firmly convinced of that value. I feel that by the proper use of color structural design can be enhanced. Color should emphasize the structural lines and masses. The mere use of a colored

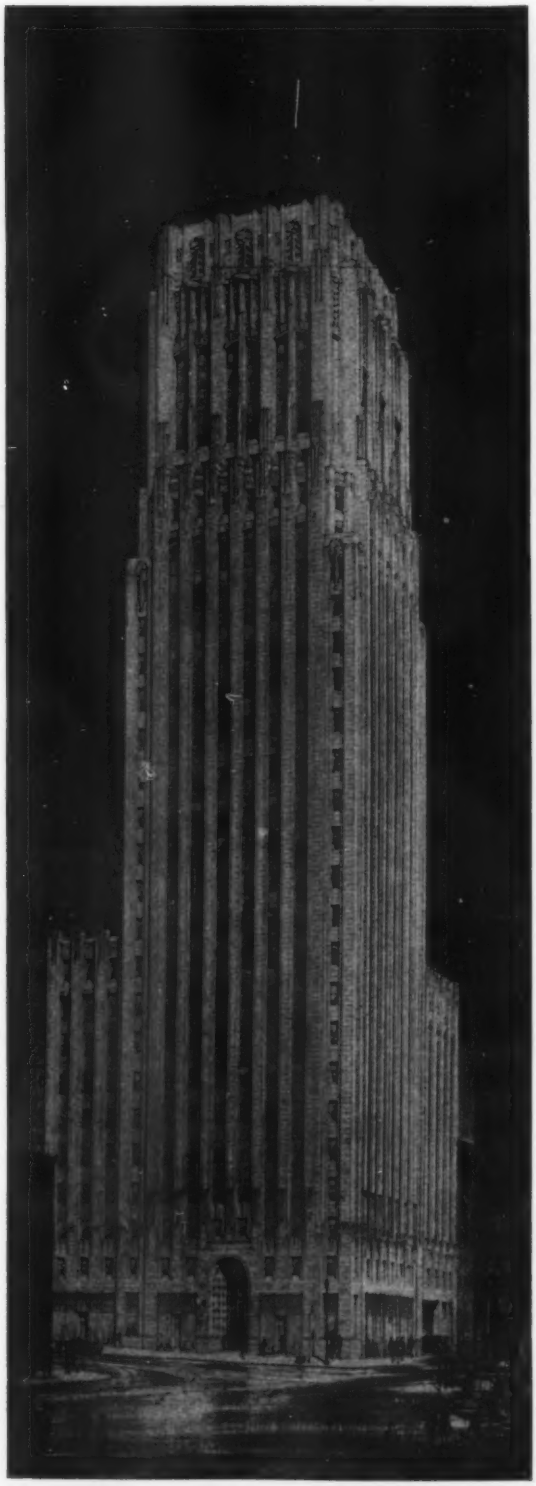
INTERIOR COURT, JEWISH THEOLOGICAL SEMINARY OF AMERICA, NEW YORK
GEHRON & ROSS, ARCHITECTS; DAVID LEVY, ASSOCIATE

material is not sufficient. It may give an individual tonality to the building to distingiush it from its neighbors, but it will not support the design nor add to its interest. Not only does lack of sunlight detract from the effect of our buildings, but soot and grime settle upon them, coating them with a grey skin which deadens the timid colors now in general use. Virile color will shine through shadow and dirt, will add splendor to the sunlight and give life and joy to the aspect of our streets.

I trust that the day is not far distant when we will study our color design at the same time that we study our structural design. The same factors —line, proportion, mass, texture and scale—will demand consideration in one as in the other. They will go hand in hand. Their combination will bring an infinite variety and charm which is now lacking, provided discrimination and good taste are observed.

In nature form is intellectual, color is emotional. Recall how you have been moved by the splendor of autumn foliage, by the glory of a sunset, how you have been depressed by the gloom of a grey day.

We are no longer surrounded by nature, we are plunged into canons of masonry. Walls replace foliage, the sun sets unseen and a grey light is our daily portion. In our modern architecture we have cultivated the intellect. It is high time to add emotional joy to intellectual satisfaction.



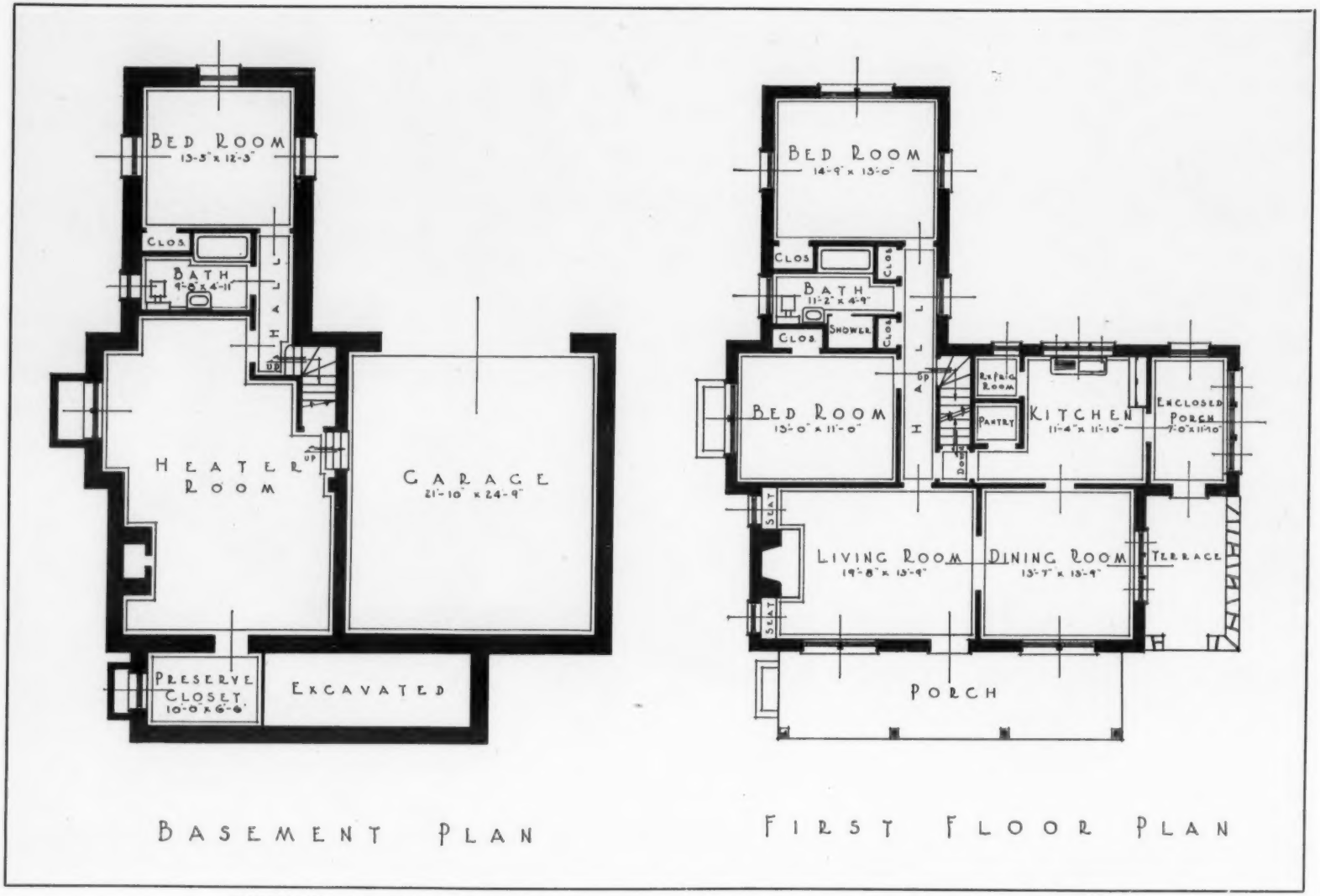
SHELL OIL COMPANY OFFICE BUILDING,
SAN FRANCISCO, CALIF.
GEORGE W. KELHAM, ARCHITECT

Photo by Sanborn Studio

COTTAGE ON ESTATE OF PIERRE S. DU PONT, LONGWOOD, PA.—E. WILLIAM MARTIN, ARCHITECT

Photo by Sanborn Studio

COTTAGE ON ESTATE OF PIERRE S. DU PONT, LONGWOOD, PA.—E. WILLIAM MARTIN, ARCHITECT

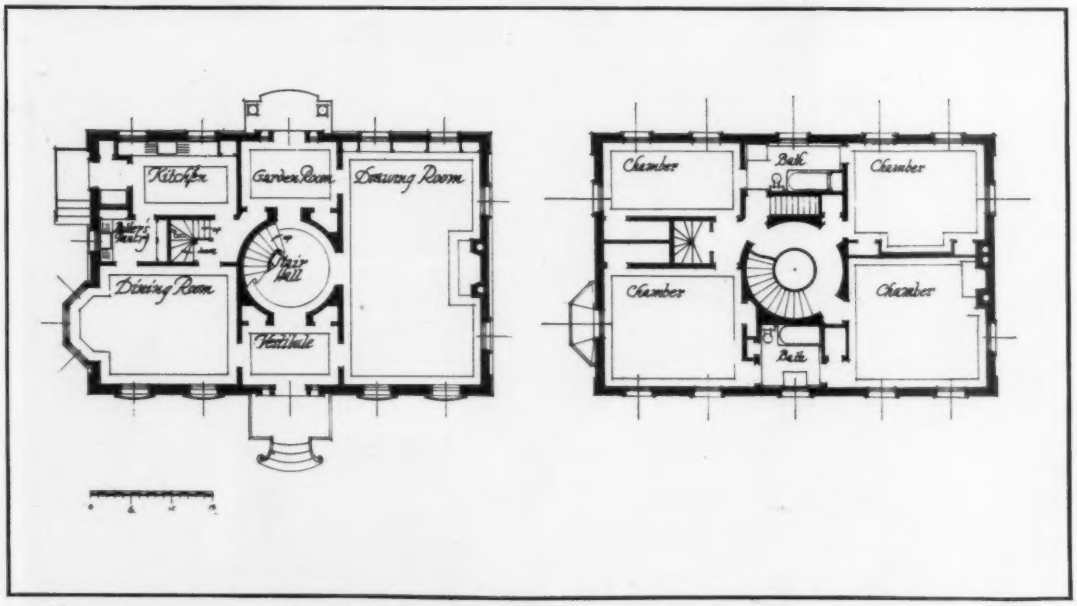


COTTAGES ON ESTATE OF PIERRE S. DU PONT, LONGWOOD, PA.—E. WILLIAM MARTIN, ARCHITECT

Photo by Sanborn Studio

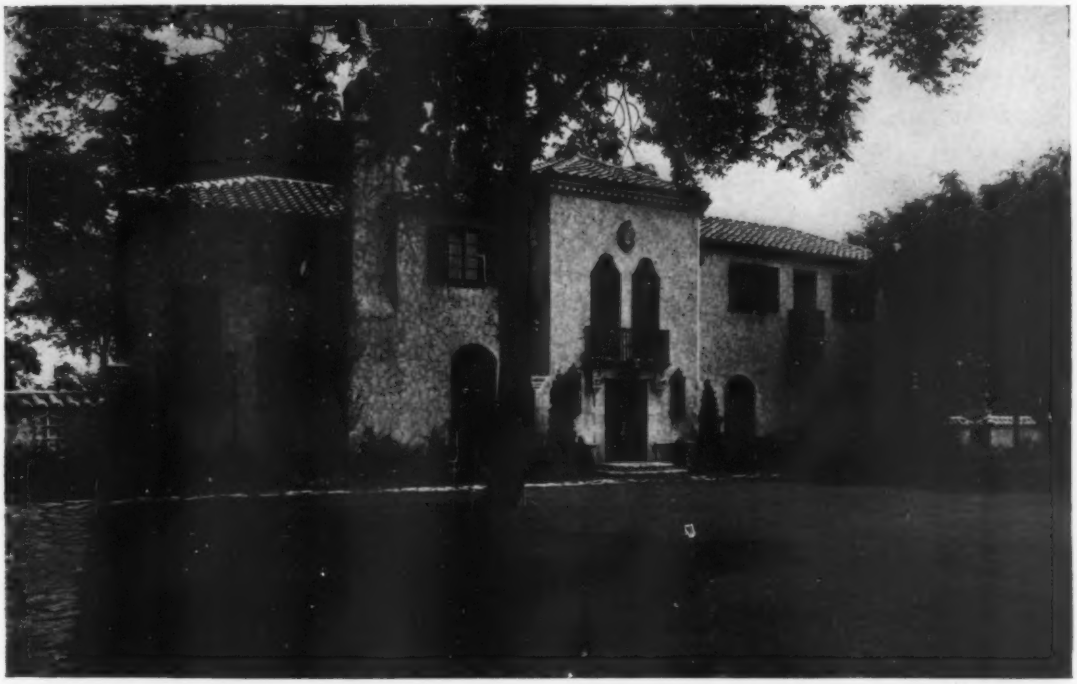
COTTAGE ON ESTATE OF PIERRE S. DU PONT, LONGWOOD, PA.—E. WILLIAM MARTIN, ARCHITECT

Photo by Robbins & Baker



HOUSE OF LEWIS W. THOMSON, SAINT LOUIS, MO.

RALPH COLE HALL & VICTOR PROETZ, ARCHITECTS



HOUSE OF R. LEROY HUSZAGH, WINNETKA, ILLINOIS
HUSZAGH & HILL, ARCHITECTS

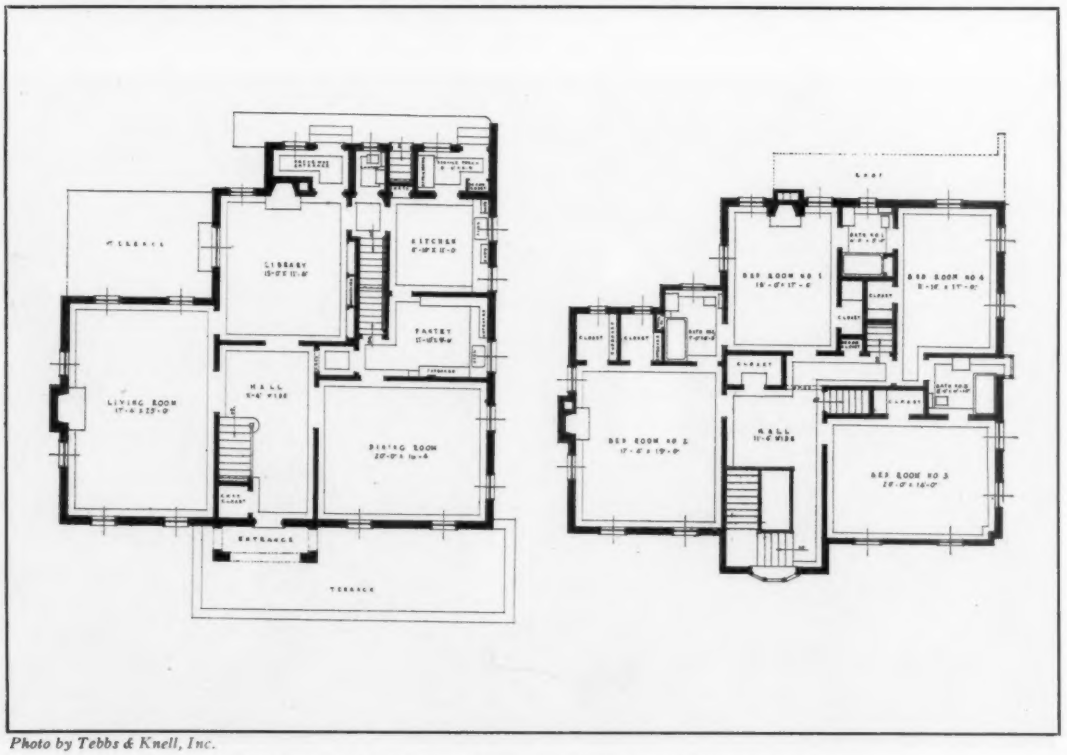


Photo by Tebbs & Knell, Inc.

HOUSE OF MAJOR STUART CRAMER, CHARLOTTE, N. C.

M. E. BOYER, JR., ARCHITECT

SMALL SCULPTURES IN SOAP

THE fifth annual exhibition of small sculpture in white soap, now current at the Anderson Galleries, New York, should be of particular interest to those who possess a peculiar fondness for modeling and yet have not taken up sculpture as a profession. Some of the pieces submitted are admirable. The medium seems to have awakened an ability in creative art which few may have thought they possessed, for there are over 2,700 pieces on exhibition, with practically every state represented among the exhibitors.

For architects who are looking for a "hobby," sculpture in soap offers a particularly interesting field, it would seem. They might even find it desirable and valuable in studying certain details of ornament, for example, by means of a model in soap. We suggest that those who are looking for some recreational fad visit the exhibition and would guarantee that nine out of ten will invest in a cake of "Ivory" on the way home. On page 824 are illustrated certain of the prize winners.

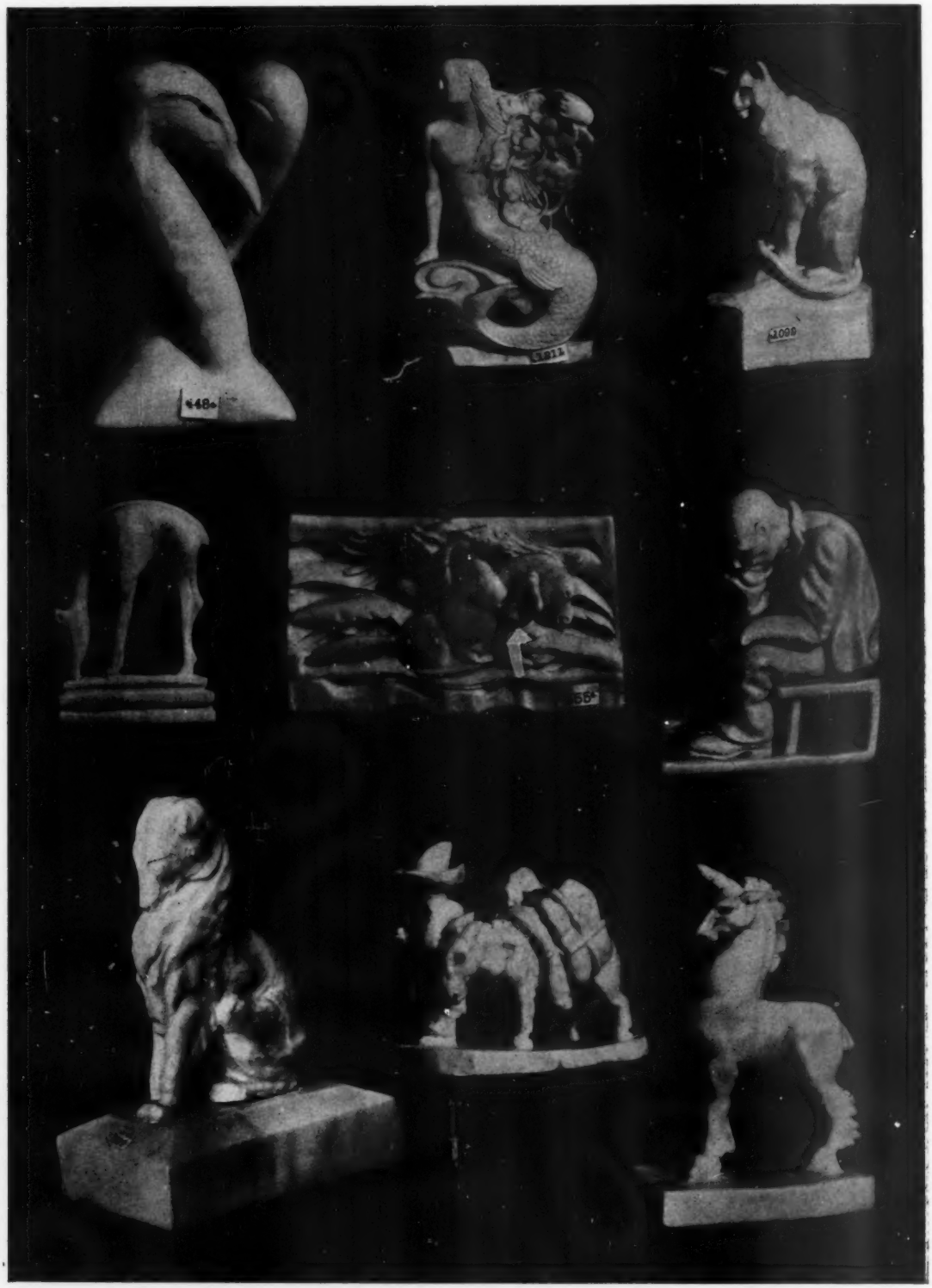
"Mermaid," by Bertha J. Hansen, of Rutherford, N. J., the winner of the first prize in the professional group, is shown in the center of the top row. "Despair," by Jack Carroll, of Jackson, Mich., winner of the first prize in the advanced amateur group, is shown at the right in the center row; and "Unicorn," by Graham Peck, of Derby, Conn., winner of the first prize in the senior group, is shown at the extreme right of the bottom row.

THE PUBLIC AQUARIUM

ANYONE faced with the problem of designing a public or private aquarium will be interested in learning that a booklet on the construction, equipment and management of these institutions has been prepared by Charles H. Townsend, Director of the New York Aquarium. This 90-page booklet is Document No. 1045 of the United States Bureau of Fisheries. Copies may be purchased at twenty-five cents each from the Superintendent of Documents, Government Printing Office, Washington, D. C.

In addition to a description of the New York Aquarium, valuable descriptions are included on the construction of exhibition tanks, distributing tanks, mechanical equipment, filters, ventilating, collecting equipment, care of fishes, construction costs and other subjects. The author is well qualified to write on the subject of aquariums, after a long experience in the management of the New York Aquarium, the assistance he has given on the design of several aquariums already built as well as others projected, and the opportunity afforded him to observe various aquariums while connected with the National Commission of Fisheries.

GIANNINI HALL, COLLEGE OF AGRICULTURE. UNIVERSITY OF CALIFORNIA, BERKELEY, CALIF.
WILLIAM C. HAYS, ARCHITECT



SOME OF THE PRIZE WINNERS, FIFTH ANNUAL EXHIBITION OF SMALL SCULPTURE IN WHITE SOAP-
ANDERSON GALLERIES, NEW YORK, JUNE 4-20, 1929

✧ INTERIOR ARCHITECTURE ✧

CERAMIC TILE FLOORS IN THEATRES

By PAUL H. SOLON*

ONE of the most important of the principles on which architecture is based stipulates that design should reflect the purpose to which a building is to be applied. It is easy, then, to understand why designs of theatres are often unusual, fantastical and even bizarre, for it is in expressing such qualities as these that the purpose of a theatre is interpreted in its architectural and decorative treatments.

The large lobbies, vestibules and promenades of the modern theatres, with expansive walls and high ceilings, lend themselves to decorative schemes that convey the dramatic and theatrical. It logically follows that the floor, too, should be embellished, yet it is often evident that the architect seems to consider the treatment of the floor of secondary importance. He constructs it of some such material as terrazzo or marble, which materials, while having much to recommend them from the durability standpoint, have a limited color range and very little pattern value. Such floors lack the decorative qualities to make them harmonious to and in unity with elaborate wall and ceiling treatments.

By the use of ceramic tile, especially the small unglazed mosaic form, it is possible to design a floor in periodic style thoroughly structural in character, sparkling in brilliant color or low in tone, which will reflect and harmonize with the other elements of the architectural composition. These mosaics are colored by means of a stain which permeates each piece thoroughly and gives them a wearing quality which is a very desirable factor in theatrical requirements.

It has long been the custom to cover the floors of theatres with carpets. This is perhaps due to the fact that a carpeted floor is pleasant and easy to walk upon and at the same time carpet allows an elaboration of design, with colors freely introduced. It is interesting to note that designs made of small ceramic mosaics are based upon the small square motif, as are the designs of woven fabrics.

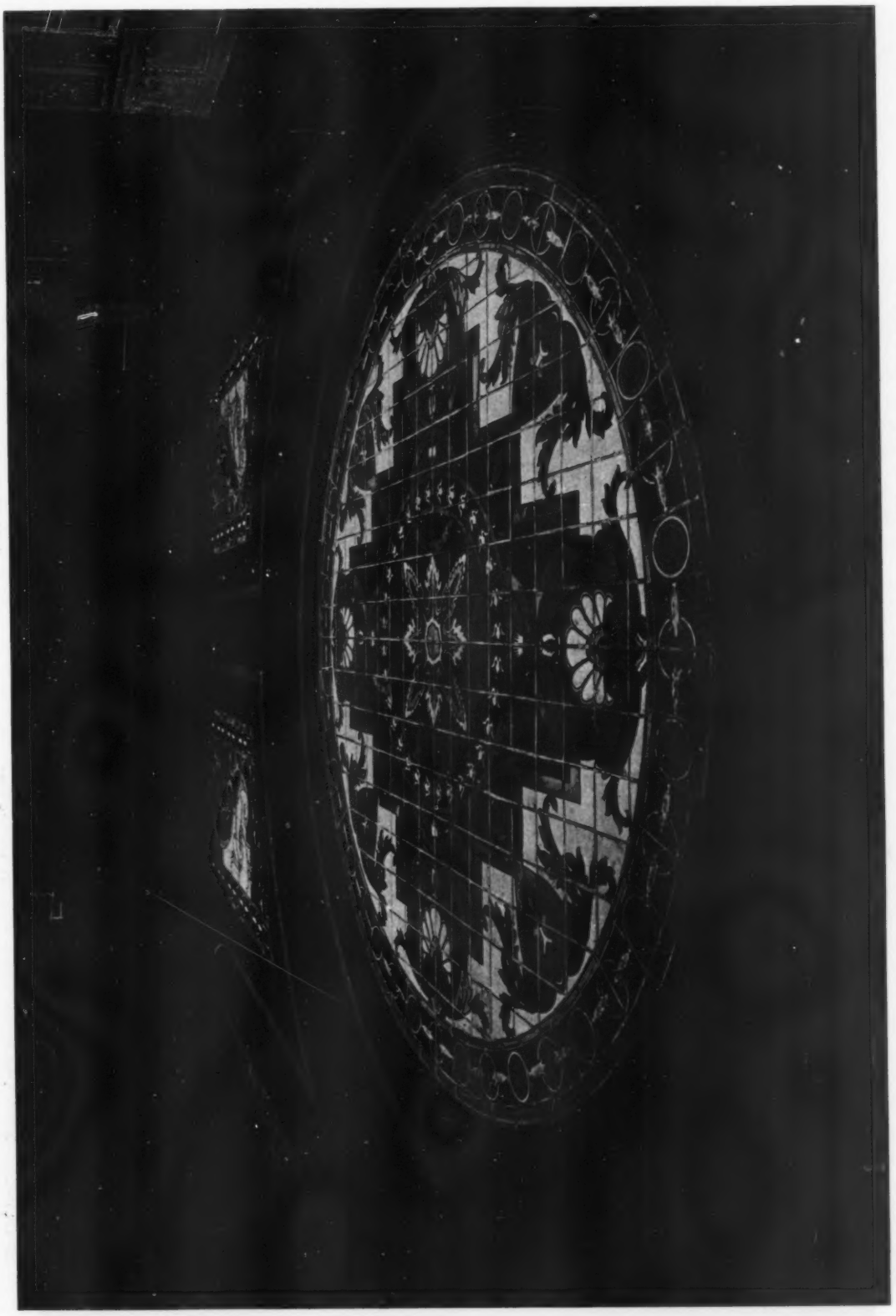
In conjunction with the mosaic forms, colored faience tile may be introduced in band and border effects, with occasional plaques or center pieces. The contrast between the texture of the mosaics and that of the faience tile gives a pleasing effect.

It might also be noted that these ceramic mosaic floors are comparatively inexpensive. Several examples which show the versatility of the product are illustrated herewith.

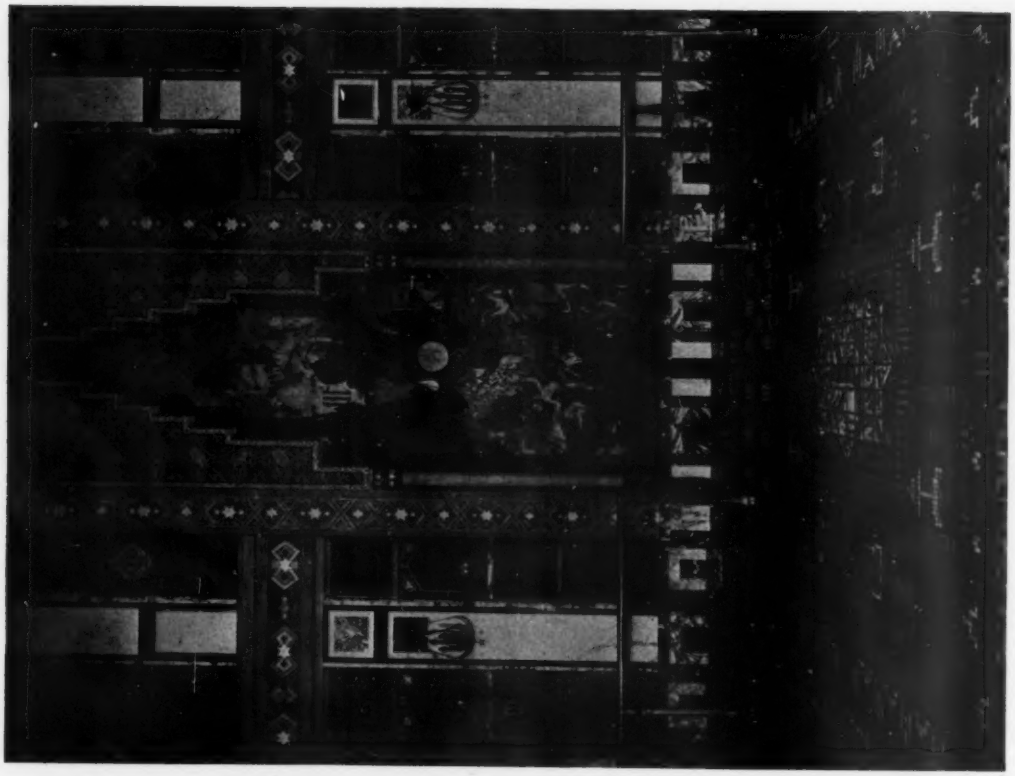
VESTIBULE, RIVIERIA ANNEX THEATRE, DETROIT, MICH.
JOHN EBERSON, ARCHITECT

*The American Encaustic Tiling Co., Ltd.

FOYER, AVALON THEATRE, CHICAGO, ILL.—JOHN EBERSON, ARCHITECT



PROMENADE, PARADISE THEATRE, CHICAGO, ILL.—JOHN EBERSON, ARCHITECT



PROMENADE, AVALON THEATRE, CHICAGO, ILL.
JOHN EBERSON, ARCHITECT

ENTRANCE LOBBY, PARADISE THEATRE, CHICAGO, ILL.
JOHN EBERSON, ARCHITECT

MUSHROOM SKYSCRAPERS

By DAVID CUSHMAN COYLE, C.E.

Primarily the structural frame of a building must have adequate strength to perform its structural function. The science of engineering has progressed so far that today the failure of a structural frame due to incorrect designing is extremely rare. In addition to the requirement of strength the structural frame bears an economic relation to the building as a whole. It must be economical in cost and the cost must be in correct proportion to the total cost of the building. Viewed from the standpoint of profitable building investment, it is not always sufficient that the structural frame have only enough strength to conform to the local building code and be a safe structure. In the case of high buildings the frame must be designed to resist wind pressure with sufficient stiffness to keep the vibration caused by the wind within limits that inspire the occupants with confidence in the strength of the structure.

The accompanying article is based upon recent observations of various tower buildings, by an experienced engineer, to determine to what extent these structures vibrate in the wind. The findings of the author have an important bearing upon the question of the extent to which wind bracing can be economically reduced in buildings of this type.

—THE EDITORS.

IT seems evident that New Yorkers like skyscrapers. Most New Yorkers have had the experience of trotting out to lunch on a Monday, only to find that over the week-end their favorite restaurant has vanished and been replaced by a tower having a stately entrance with bronze doors and perhaps golden ceilings in the modern manner. After lunch, if he has the money, the normal New Yorker will go to the renting office and sign up for a place as near the top as he can get. Two weeks later he will be seen shooting aloft in a curly walnut elevator, with push buttons, to where his freshly bobbed stenographer is sitting at a shiny new desk and gazing out over all the scrubby little twenty-story buildings to the river and the New Jersey smoke. It is all very palatial and not necessarily confined to New York.

To the architect who has carried the new tower under his hatband for the best part of a year, and to the engineer who has had the Socratic privilege of assisting in bringing it to birth, the coming of another skyscraper is of course not so sudden as it seems to the man in the street. But even for them, the time is short, and that is the subject of this paper.

In the old days, when the first towers were set up in New York, each one was the occasion of long fasting and prayer. It was an adventure into the unknown. No one knew exactly what would come of it. Would it blow over? Would people be afraid to live so high above the street? It seemed such a long way to jump in case of fire, too. But the few men who had the money and courage went ahead, and the architects and the engineers furnished the fasting and prayer, and their towers are still standing and still occupied.

But now a high tower is not news, and familiarity has had some of its usual effect. Experience has shown that the substantial construction which seemed necessary when towers were built on faith, can be dispensed with, and no disastrous results will follow. Why go to the expense of costly engineering studies and more costly steel work, when the whole thing can be put up so much more cheaply, and the money saved can be put into bronze and gold and marble where it will do more good?

It is the same evolution which has taken place with the smaller buildings. The first ten story skyscrapers which astonished the world were built with heavy walls and massive steelwork carrying arched floors like a subway. Since then we have learned that light structure will stand up, it will "pass" the building department, it will suit the tenants, so why build as heavily as our timid predecessors?

The logic is good as regards the smaller buildings. Obsolescence is rapid, and buildings are torn down to make room for larger ones, before they are worn out. The more flimsy they are the easier it is to get them out of the way. Moreover, a

fifteen story building in the present type of construction is not only safe, it feels safe; and if it were more substantially built if would feel exactly the same to the occupants as it does now.

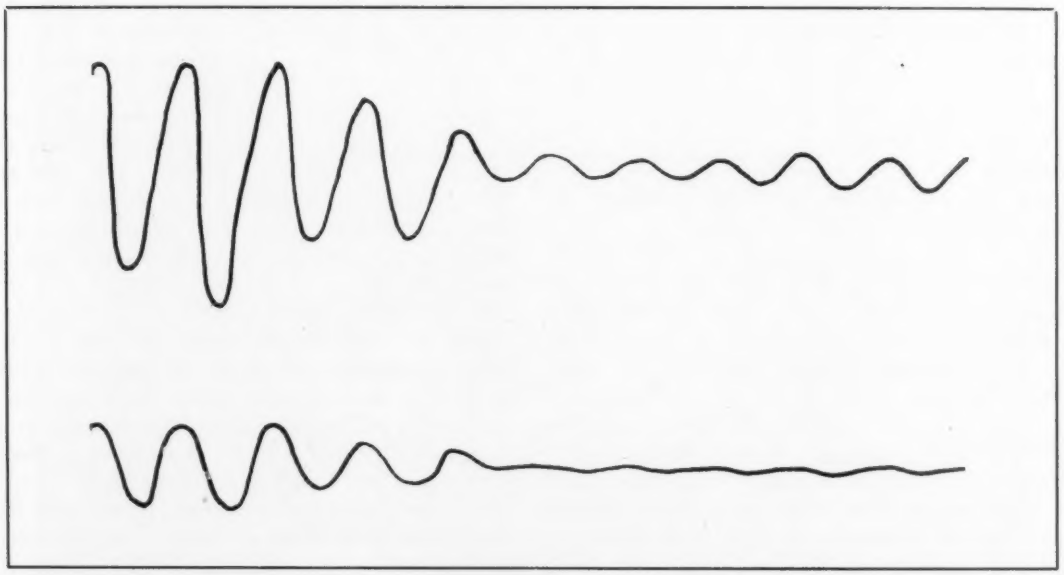
That is where the fallacy lies in the present attitude toward high buildings. However much our present towers may be dwarfed by those of the future, they are already "high" in the sense that they have a motion which is larger than microscopic. Only the narrowest of the fifteen story buildings ever have any such motion, and that only when they are in an exposed location. But all the tall slender towers move in the wind, and that puts them in a class by themselves.

As a rule the bracing of tall buildings has been regarded as a problem in safety. As less and less bracing is used, and they do not blow over, the feeling grows that the heavy construction of the past was unnecessary. Almost anything, it seems, will stand up.

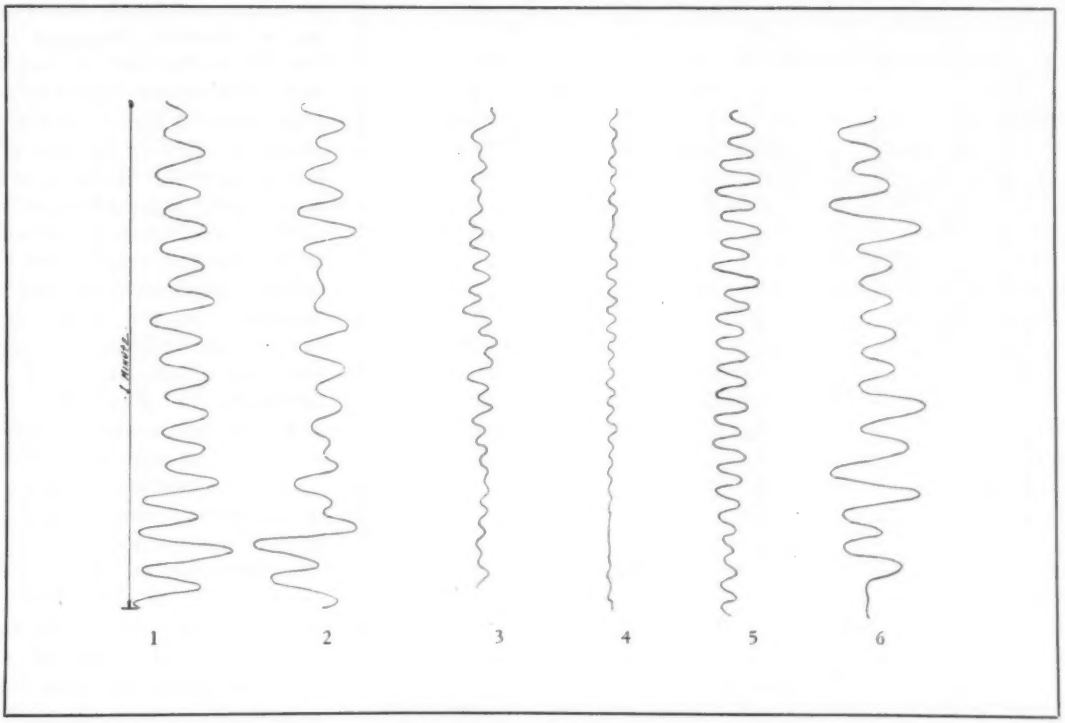
But the older towers, which were designed to be safe according to a theory which was perhaps ultra-conservative, achieved incidentally a result which was of more immediate importance. Their vibration in time of storm is slight, ranging generally within a quarter of an inch total travel. They are not only safe, but they are on the safe side of the motion which most people can feel, which for the owner is the point where the trouble begins. Some of the more recent towers, on the other hand, have two or three times as much swing and are therefore, by that much, closer to the "threshold of sensation" of the average man or woman.

It may as well be taken for granted that all the high towers will produce a sensation in certain people, and that their appeal must be in any case only to the usual individual whose nerves are not abnormally sensitive. It is obvious, however, that the people who can feel a three-quarter inch swing must be about ten times as numerous as those who can feel a quarter inch movement of a building, and therefore ten times as likely to cause trouble to the renting agent. A great deal can be done, of course, to avoid difficulties by having no fixtures that will sway and stimulate unnecessary feelings in the tenants; but if all extraneous factors are eliminated, the fact remains that it is easier to feel a large motion than a small one.

When a building is new and the decorative features are in the prevailing mode, it is fairly easy to attract tenants from old, shabby buildings with pre-war marble work in their entrance corridors. But no one believes that modernist art has reached



CALIBRATION CURVES SHOWING RELATION BETWEEN MAGNIFIED MOTION AS RECORDED BY INSTRUMENT AND ACTUAL MOTION AS MADE ON A VIBRATING TABLE AT PRINCETON UNIVERSITY. THE ABOVE CURVE IS REPRODUCED ACTUAL SIZE AND SHOWS VIBRATIONS RECORDED IN ONE HALF MINUTE. THE CURVE AT THE TOP IS THAT OF THE MACHINE USED IN RECORDING VIBRATIONS IN HIGH BUILDINGS. THIS MACHINE IS SIMILAR TO A SEMESGRAPH USED FOR RECORDING EARTHQUAKE SHOCKS. THE CURVE AT THE BOTTOM IS A CURVE TRACED SIMULTANEOUSLY BY A FIXED POINT AND SHOWS ACTUAL MOTION. THIS COMPARISON WAS MADE TO DETERMINE THE ACCURACY OF THE MACHINE USED FOR RECORDING THE VIBRATION OF TOWER BUILDINGS.



VIBRATION RECORDS

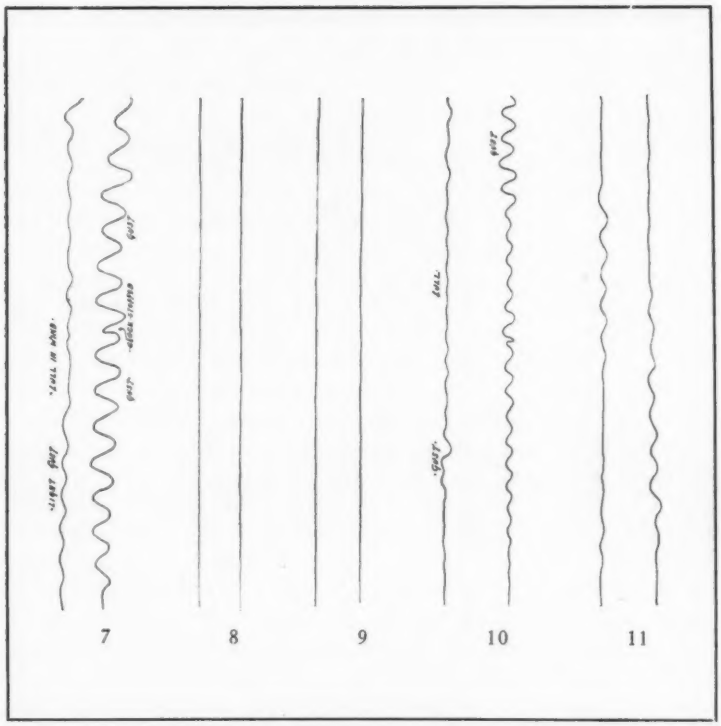
COMPARISON OF LIGHT AND HEAVY CONSTRUCTION.
READINGS WERE TAKEN ON THE SAME DAY, WIND SOUTHWEST, GALE VELOCITY. TIME OF READINGS—ONE MINUTE.
READINGS SHOWN APPROXIMATELY ACTUAL SIZE OF MOTION

1. BUILDING A—(LIGHT CONSTRUCTION) 9:00 A. M. WEAK DIRECTION OF BUILDING.
2. BUILDING B—(LIGHT CONSTRUCTION) 10:00 A. M. WEAK DIRECTION OF BUILDING.
3. BUILDING C—(HEAVY CONSTRUCTION) 10:40 A. M. WEAK DIRECTION OF BUILDING.
4. BUILDING C—11:00 A. M. STRONG DIRECTION.
5. BUILDING D—(HEAVY CONSTRUCTION) VERY NARROW BASE, 2:00 P. M. WEAK DIRECTION OF BUILDING.
6. BUILDING A—2:30 P. M. WEAK DIRECTION. WIND BLOWING HARD.

any final goal, and it is quite possible that these present places may be shabby too in a few years, when styles have changed. Then what? Is it going to be necessary to tear down these fifty-story structures to build something that will pay the ground-rent? How much alteration will their comparatively flimsy construction admit? And if they do not "feel" perfectly safe to their tenants, is the view of the river in itself going to be enough to prevent the tenants from moving to some newer, stiffer tower with an equally good view? These towers are safe, as any engineer knows. Short of a war or a tornado such as we have never seen yet, nothing is going to "happen" to them. But the tenants are not engineers, as a rule, and it is their *feelings* that count.

It is a fallacy which many owners seem to cherish, that the city building department will protect them from the fruits of their own economy. This is not true for ordinary buildings, and less so for high towers than for any others. The law aims at safety, and the city building department is not concerned with anything else. Whether the building feels safe is not the affair of the authorities, and no blame can be attached to them if it does not. Moreover, the time that can be given to checking a set of drawings is limited, and it is therefore impossible for the department's approval to cover such abstruse points as the probable period and amplitude of vibration the building will show when it is completed. The mass of drawings for a large tower which is dumped in front of the examiner with a request for immediate action renders it beyond human power for him to do more than cover the main essentials of the requirements of the law. It is therefore a false security to assume that the building will be satisfactory simply because the law allows it to be built.

Up to the present time, this evolution from substantial to economical construction has taken



VIBRATION STUDY OF BUILDING Y, A RECENTLY COMPLETED TWENTY-FIVE STORY APARTMENT HOUSE IN COMPARISON WITH TWO OTHER BUILDINGS. BUILDING Y IS HEAVILY BRACED AND HAS AN EXPOSED LOCATION. VIBRATION READINGS ABOVE WERE ALL TAKEN ON THE SAME DAY. TWO READINGS, EACH ONE MINUTE, ARE SHOWN IN EACH CASE. WIND: STRONG, SOUTHWEST, IRREGULAR. READINGS ARE SHOWN APPROXIMATELY ACTUAL SIZE.

7. BUILDING X, (LIGHT CONSTRUCTION), 3:00 P. M., 25TH FLOOR.
8. BUILDING Y, NORTH AND SOUTH, 3:40 P. M., 24TH FLOOR.
9. BUILDING Y, EAST AND WEST, 4:00 P. M., 24TH FLOOR.
10. BUILDING Z, (HEAVY CONSTRUCTION, NARROW SHAPE), 4:30 P. M., 28TH FLOOR.
11. BUILDING X, 5:40 P. M., 25TH FLOOR, WIND GRADUALLY DIMINISHING.

place chiefly in the office tower field. If it is now extended to apartment towers, the results may be unpleasant at an earlier date than in the case of office buildings. The relation between type of occupancy and sensitiveness to motion is a very important one. In an office the occupants are awake, clothed, occupied and expecting to be paid for their time. It is daylight, and there are other people about, to give a sense of security. In an apartment one may find himself alone, in bed, and in the dark, with a storm howling outside. Moreover if one is ever subject to disturbances of the organs of equilibrium, such a condition is most apt to occur after an evening. Such being the case it is inevitable that some of the tenants in an apartment tower will feel or imagine strange things, and tell them to their friends. The present apartment towers, like the first office towers, were built substantially, and with due fear of consequences. A typical one of the best type has a vibration frequency of 24 per minute and an amplitude of about one-eighth of an inch in a full gale. Yet many stories are told of its wild behavior on windy nights, and it is popularly supposed to swing several inches when at its best. A typical new office tower of simliar shape and size has a frequency of 16, which indicates a slower comeback from the force of the gusts, and an amplitude of about half an inch. If now the unquestioned safety of the office tower leads to the construction of a flock of apartment houses of the same type of construction, what sort of stories will their tenants bring to the tea-tables of their friends? And what will the owner say to the architect?

Those of us who look forward to a future city made up largely of tall buildings and parks should consider seriously the implications of the present trend in tall building construction. The advantages of living high above the streets, in the clear air and sunshine which will exist as soon as we have controlled our smoke, are so great that the tall building ought to have a noble future ahead of it. But if it gets a bad name for safety, even though that bad name is due to the imaginations of unscientific laymen, the profits of this type may be so reduced that it will become increasingly difficult to finance. It would seem, therefore, the part of wisdom to consider carefully the legitimate limits of immediate economy in construction, lest worse befall, and a small saving turn out to be a great waste.

It is not a subject on which "there ought to be a law." It is a problem in the adjustment of a material creation to the requirements of the human nervous system. It may be that at some future time, when the new psychology grows up, it will be possible to handle such a problem by hard and fast rules. At present, however, if it is to be satisfactorily solved, the solution must come from a happy combination of science and artistic sense.

NEW DEVELOPMENTS IN THE IRON INDUSTRY

UNTIL the time the Bessemer found its way to America, some seventy-five years ago, wrought iron was king of the ferrous world.

It was in 1784 that Henry Cort made the first important step toward scientifically manufacturing wrought iron, but from that time until a matter of a few years ago, no major changes were made in the process for manufacturing this material.

Attempts to produce wrought iron in commercial quantities of increasing size were patterned after the efforts of the hand-puddler by mechanical means.

The product of the hand-puddling furnace, like the products of older processes, was iron of high purity, kneaded and mixed with slag until a rough, corrosion resisting metal called wrought iron was developed.

This corrosion resisting property is a result of the non-corrodible slag finely distributed between the particles of pure iron. It is sometimes supposed that under the hand-puddling method the quality of the iron produced was directly proportional to the skill of the puddler.

The difference between wrought iron and steel is that the former, by virtue of its slag content, is fibrous in structural make up, while the latter is slagless and crystalline. In the beginning of the steel era, soft steel was thought to be practically identical with wrought iron. The great differential in price between steel and wrought iron was a result of the tremendous amount of labor required to produce the latter material. The growth of the country demanded greater and greater quantities of ferrous materials. While wrought iron held its own, steel forged ahead to meet increased demands, due to the labor saving methods inherent in the processes employed. In many instances price became the prime consideration and as a result many applications, primarily in the wrought iron field, fell to the less expensive material.

About ten years ago Dr. James Aston, Consulting Metallurgist for one of the large wrought iron producers, started to develop a new process for manufacturing genuine wrought iron in quantities which might ultimately approximate those of steel.

Dr. James Aston, now the head of the Mining and Metallurgical School of Carnegie Institute of Technology, approached the problem from the scientist's point of view rather than that of the practical shop man, as had been tried countless times in the past, for he realized that the chemical reactions which took place within the furnace were vastly more important in the changing of cast iron into wrought iron than any skill of the puddler. Several years of painstaking laboratory and mill experiments resulted in the development of a new process. The Aston process is considered to be perhaps the greatest development in the ferrous industry since the Bessember converter inasmuch as it now permits genuine wrought iron to be produced in commercial quantities.

Under the old process of manufacturing wrought iron there were three essential steps—the melting of the ore or pig iron; the refining of the iron; and finally impregnating the iron with a slag of the correct chemical proportions. In the new process, the metal is refined in a converter and is then poured into a bath of slag, an operation which is known as "pudding." The melt-

THE "BIG RED BALL" OR SPONGE" RESULTING FROM "PUDDLING" IN THE ASTON PROCESS. THE WEIGHT OF THE BALL SHOWN IS ABOUT 2,000 POUNDS.

ing of the pig iron is done in a cupola having a capacity of about twenty tons an hour.

The metal in the cupola absorbs from the coke a small amount of sulphur, and since this is an undesirable element, the liquid metal is treated by a process to reduce the sulphur while being poured into the ladle. About two tons of metal is tapped at one time. The metal is then poured into a converter for refining. The next process is to pour the liquid iron into a bath of slag.

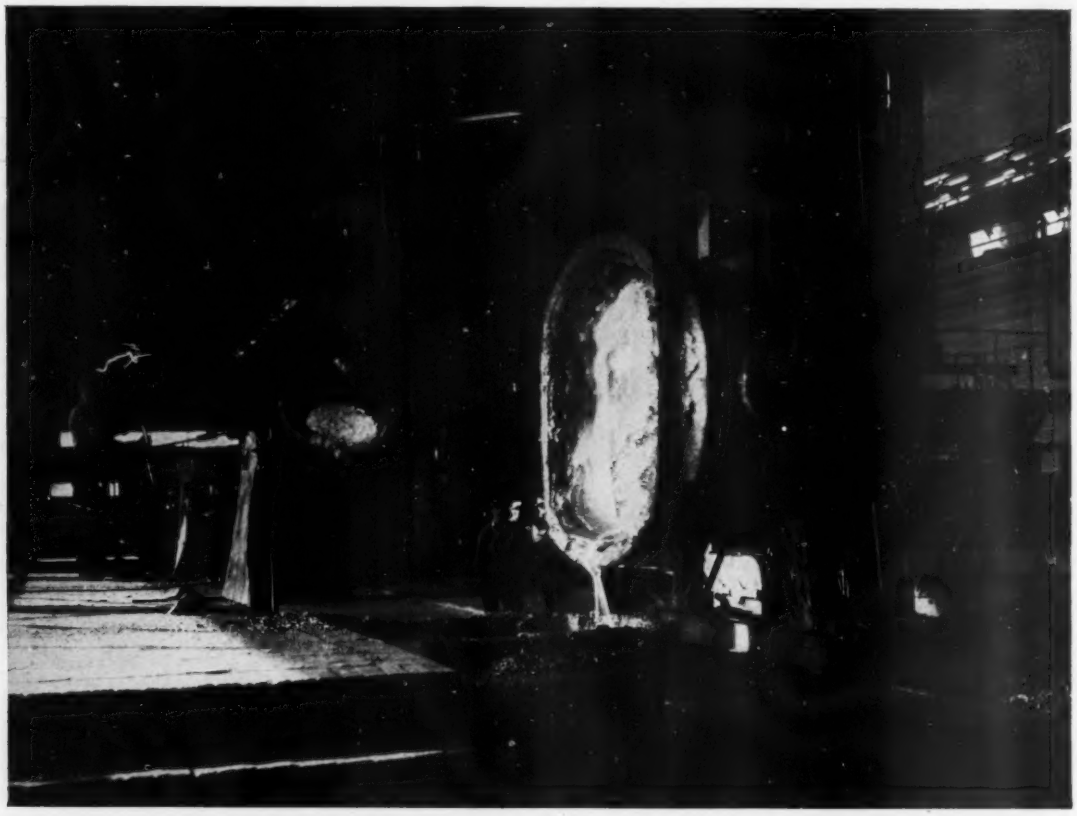
When the stream of iron comes into contact with the slag, the liberated gases cause millions of tiny explosions, which in turn cause the metal to be broken up into tiny pea-sized globules, exactly as in a puddling furnace when the metal is "coming to nature." The identical reactions take place as in hand-puddling, only at a much higher rate of speed and with greater uniformity.

The thimble into which the metal is poured is now raised and tipped until the excess slag is poured off. In the bottom of the thimble there remains a spongy ball of wrought iron weighing approximately 2200 pounds, and having a length of five feet, with a cross section of 12" x 14". The composition of this ball is exactly the same as the ball obtained from a puddling furnace, the latter weighing only about 200 pounds, being limited by the strength of the operator to handle it.

The ingot is passed through the blooming mill until it reaches the shears in the form of a bar approximately 200 feet long by 4" to 8" wide and ¾" thick. It is stated that as much wrought iron can be produced by this new process in twenty minutes as can be turned out by two puddlers working a ten-hour day.

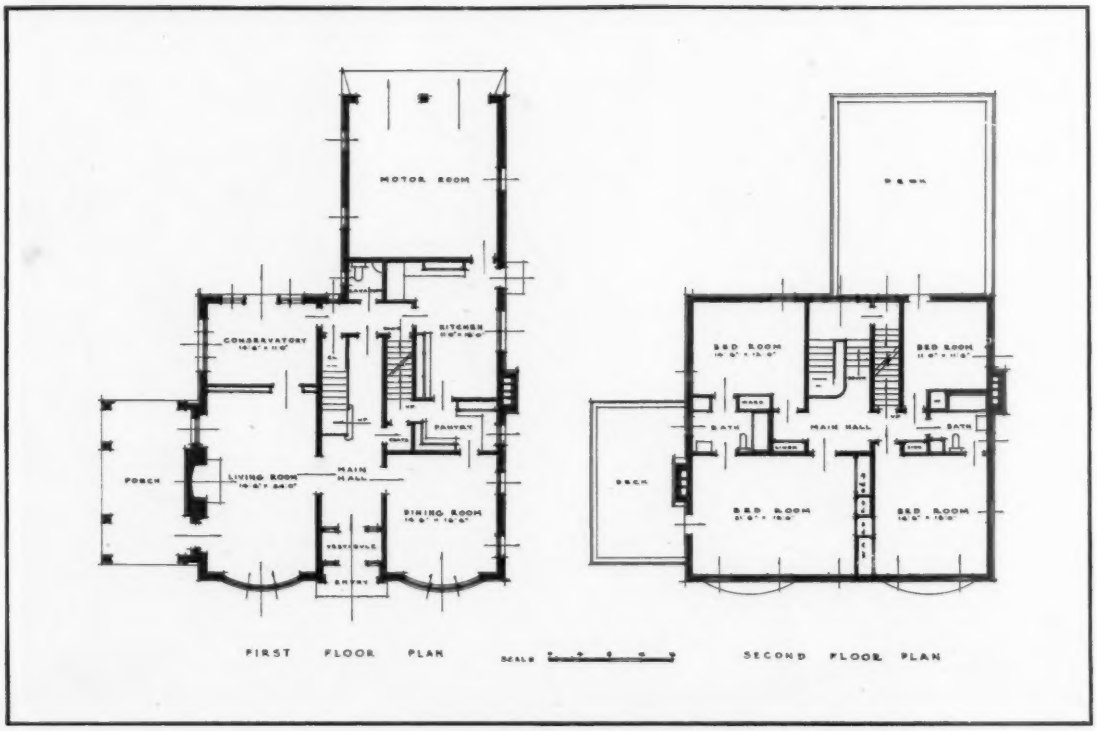
Wrought iron pipe made from this new process is claimed to be superior to that made by the hand-puddling process. It is stated that mill inspection reports reflect a decided falling off in blistering, pasted welds, and a freedom from laminations and an absence of slag pockets, inherent always in hand-puddled material.

It is understood that the price reduction made possible by this process ranges from $2.00 to $18.00 per ton on the different sizes of wrought iron pipe, and that further price reductions will probably be obtained with increased developments in manufacturing facilities.



AFTER THE ROUGH BALL OF WROUGHT IRON IS FORMED IN THE SILICATE SLAG BATH THE SMALL AMOUNT OF LIQUID SLAG IN THE LADLE IS POURED OFF. THE "SPONGE" OR "PUDDLE BALL" IS THEN DUMPED OUT

"PUDDLING" IS THE BASIS OF THE NEW ASTON PROCESS OF MAKING WROUGHT IRON. THE MOLTEN METAL IS FOURED INTO A BATH OF SILICATE SLAG. THE RESULTING "PUDDLE BALL" CONSISTS OF NUMEROUS PEA-SIZED GLOBULES OF PURE IRON, COATED WITH SILICATE SLAG.



HOUSE OF H. F. AFFELDER, CLEVELAND HEIGHTS, OHIO

CHARLES C. COLMAN, ARCHITECT

SPECIFICATIONS

Communications relative to specifications addressed to THE AMERICAN ARCHITECT *will be answered, in the pages of this department, by H. R. Dowswell, of the office of Shreve, Lamb & Harmon, Architects.*

THE Setting of Terra Cotta may form a separate division or may be specified as a part of Masonry. When included in the Masonry division, Part A Specifications should enumerate the items of work and refer by paragraph numbers to the Standard Part B Specifications for Setting of Terra Cotta presented in this issue.

Paragraphs 5, 6, 9, 10 and 14 should be carefully read and requirements specified under Part A.

Paragraph 18 refers to Part B Specifications for Masonry and Concrete materials for requirements in regard to setting materials. If special materials are desired Part A must clearly specify them.

Paragraphs 23 and 24 provide for special cooperation by the Manufacturer. This was referred to in the previous issue in connection with the specification for the Manufacture and Furnishing of Terra Cotta. Attention is again called to the necessity of covering the cost of such coöperation under Part A of the Setting division.

If special protection is required for sills or projecting members, it should be specified under another division and so noted under Part A of this division, and attention called to the requirements of Paragraph 27, or if preferred protection may be included as a part of this division.

A.I.A. DIVISION 9b.

New York Building Congress Standard Specification for SETTING OF TERRA COTTA

PART B.

General Conditions.

1. GENERAL CONDITIONS OF THE CONTRACT of the American Institute of Architects, current edition, shall form a part of this Division, together with the special conditions, to which this Contractor is referred. **General Conditions**

Arbitration Clause.

2. Any dispute or claim arising out of or relating to this Contract, or for the breach thereof, shall be settled by arbitration. Arbitration shall proceed under the requirements specified in the General Conditions, current edition, of the American Institute of Architects; or under the Rules of the Arbitration Court of the New York Building Congress, or of the American Arbitration Association, and judgment upon an award may be entered in the court having jurisdiction. One of these methods of arbitration shall be chosen at the time of the signing of the Contract, or, if not then determined, the choice of these methods shall be at the option of the party asking for arbitration. **Arbitration Clause**

Scope.

3. The following requirements in regard to materials and workmanship specify the required standards for the Setting of all Terra Cotta. Portions within quotation marks are reprinted from the "Standard Specification for the Manufacture, Furnishing and Setting of Terra Cotta" adopted by the National Terra Cotta Society, issue of 1923. **Scope**

4. These requirements, however, form a part of the Contract only insofar as they describe items mentioned in Part A of this specification, or as indicated on the Contract drawings.

General Information.

5. Unless otherwise specified under Part A, the Setting Contractor shall furnish all cartage, scaffolding, hoists and other equipment, necessary to the receipt, storage and erection of all Terra Cotta material furnished under another Division. **General Information**

Handling.

6. "The Setting Contractor shall receive the Terra Cotta on arrival at the freight yards and shall transfer it without damage from the cars to the building. When the Terra Cotta manufacturer delivers on trucks at the building, the Setting Contractor shall **Handling**

New York Building Congress Standard Specifications—

SETTING OF TERRA COTTA—*Continued.*

unload and store the Terra Cotta. The Terra Cotta shall be stored under cover, not in contact with the ground, stacked without inflammable packing on wood laths or strips, so as to protect it from injury."

Cutting and Fitting at the Building.

7. "Notice of errors in the manufacture of the Terra Cotta shall be given to the manufacturer immediately upon discovery. Cutting and fitting due to such errors shall be done by the Terra Cotta manufacturer or shall be paid for by him if he fails to do the necessary cutting or fitting promptly upon receipt of the notice." **Cutting and Fitting at the Building**
8. "Other necessary cutting and fitting of the Terra Cotta that may be required at the building, including all fitting around anchors, steel and iron work and reinforced concrete, shall be done by the Contractor for setting Terra Cotta."

Centers.

9. Unless otherwise specified under Part A to form part of this Division, all centers required for setting Terra Cotta will be furnished, set and removed under another division. This Contractor, however, shall coöperate in setting of centers and, when ready for striking, shall remove all wedges and drop centers so as to relieve them of their load. **Centers**

Anchors, Dowels, Cramps and Metal Supports.

10. When, under Part A, anchors, dowels, cramps and special metal supports are specified to be supplied by this Contractor, they shall be made in accordance with the complete schedule of material required, as prepared by the Terra Cotta manufacturer, and shall be set by this Contractor. He shall also furnish and set ordinary wall anchors. **Anchors, Dowels, Cramps and Metal Supports**
11. All special anchors, hangers, etc. for Terra Cotta, in the main walls of the building, shall be of wrought iron or soft steel and shall be painted, galvanized or udylited, or shall be of special non-corroding metal of ample size to safely secure all Terra Cotta.
12. All ordinary wall anchors shall be of soft steel, galvanized, or of heavy copper wire, or non-corroding metal.
13. All loose pipes, rods, bars, and hangers, used in the construction of exposed features, such as balustrades, balconies, finials, urns, gargoyles and domes, shall be of bronze or of special non-corroding metal and be furnished by this Contractor.
14. The metals and protective coatings for the anchors shall be as described in Part A of this specification.
15. Where anchors or metal supports, in connection with reinforced concrete or concrete masonry, are required to be embedded, they shall be furnished and placed by this Contractor in coöperation with the Contractor for Concrete Work, and at such times as not to delay the work of the Concrete Contractor.

Protection of Supporting Metal Work.

16. "Metal work of every description, supporting Terra Cotta, shall be embedded thoroughly in the masonry backing, and when not so embedded, metal work shall be protected against corrosion by encasing with cement mortar or in cement mortar masonry." **Protection of Supporting Metal Work**
17. "When the back of a Terra Cotta course comes in contact with iron or structural concrete in such manner as to prevent the encasing of supporting iron from the rear, an opening shall be made in the top to admit of the placing of the encasing mortar as required above."

Setting Materials.

18. The setting materials and methods described under Part B of the Specification describing "Masonry and Concrete Materials A.I.A., Division 3," shall apply to this Division and form a part of this specification, insofar as they apply, except where other materials or methods are herein specifically mentioned. **Setting Materials**

Setting Terra Cotta.

19. "All Terra Cotta shall be set by mechanics experienced in handling and setting of the materials." Unless otherwise specified under Part A, Terra Cotta shall be set in Cement Mortar "one volume of Portland Cement to three volumes of sand with not to exceed nine pounds of hydrated lime to each sack of cement." **Setting Terra Cotta**
20. "All Terra Cotta shall be set true to a line and carefully laid in a solid bed of mortar. All rebates in bed and cross joints from front to back and top to bottom, shall be

New York Building Congress Standard Specifications—

SETTING OF TERRA COTTA—*Continued.*

filled solid with mortar, leaving no voids. Each piece of Terra Cotta shall be tamped into place, excess mortar cut off and struck with a jointer or trowel. All sills, wall copings and other capping courses, shall be set in a thick bed of mortar and well pounded down so that the mortar fills all spaces around bottom of webs of Terra Cotta."

21. "All Terra Cotta protecting courses shall be so set that the arris casting a shadow shall be true to line."
22. "The backing shall proceed simultaneously with the setting of Terra Cotta. Each piece of Terra Cotta shall be backed up solid with brick and cement mortar, so as to make a perfect bond and homogeneous mass between wall lines. This backing shall extend beyond the wall line when necessary to structural security. If concrete is used, it shall not be stronger than a 1 to 9 mixture."
23. "When the Terra Cotta work is of such scope or character that the proper handling and setting of the Terra Cotta require special skill and knowledge, the Terra Cotta manufacturer will," if so specified under Part A, "furnish a competent Terra Cotta setter to assist in the sorting, selecting and handling of the Terra Cotta, to co-operate with the Setting Contractor, to assist him when cutting or fitting of the Terra Cotta if necessary, to advise as to interpretation of setting drawings, and to help generally in securing rapid, efficient progress during the setting of the Terra Cotta. For such service the Setting Contractor shall pay such setter full time at his regular wage rate. When the furnishing of such a competent setter involves travelling expenses, the Setting Contractor shall pay the same and also make an allowance for his board."
24. "When the services of such a competent setter are not" specified under Part A, "the Terra Cotta manufacturer may, at his own option and expense, send such a representative to the work, who shall perform the above services, and the Setting Contractor shall coöperate with and aid and facilitate the performance of such services by such representative."

Temporary Covering.

25. "All uncompleted walls including Terra Cotta and backing shall be protected by waterproof covering at night and at any time when liable to injury from storms or freezing," all to be done by this Contractor. **Temporary Covering**

Protection.

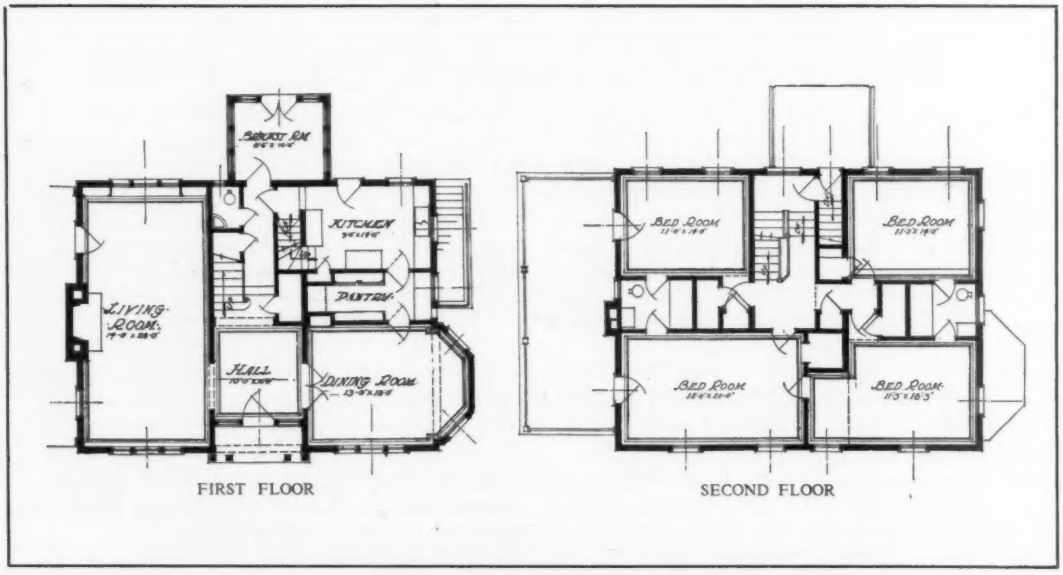
26. Except where specifically noted under Part A to form part of this Division, all protection for sills, and projecting work will be furnished and set under another division. This Contractor, however, shall, as a part of this Contract, notify the General Contractor of the need for protection as the work progresses. **Protection**
27. Where protection is required for projecting pieces, column caps and ornamental work, this Contractor shall provide and build into the mortar bed joints, in suitable locations, one (1″) inch wide strips of sheet zinc projecting at least six (6″) inches, to which the protection may be secured.

Pointing.

28. "All joints in Terra Cotta shall be pointed and struck as the setting progresses except in freezing weather. In freezing weather and when re-pointing is necessary, all joints shall be raked or cut out to a depth of ½″ and the pointing mortar driven into the joint and struck with a jointing tool." Pointing mortar to be as specified for setting mortar. **Pointing**
29. "All top joints in overhanging Terra Cotta, balustrades, parapets and free-standing features shall have joints raked out one-half (½″) inch, and pointed with an approved elastic cement."

Cleaning Down.

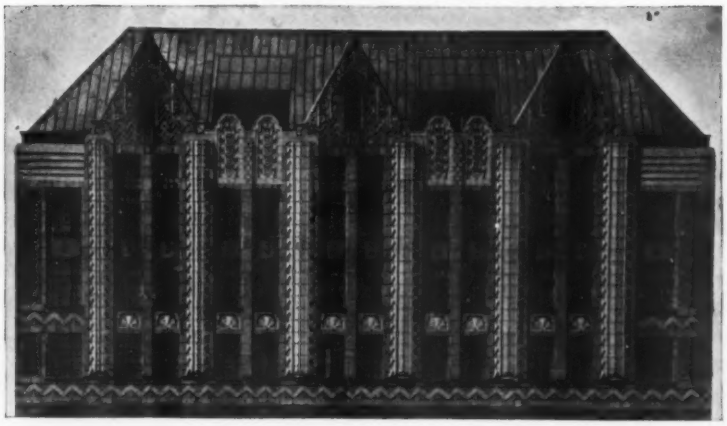
30. "Upon completion of the work, mason's wedges, shoring, supports and centering and all other false work and protection shall be removed and the Terra Cotta cleaned down. If satisfactory results cannot be obtained by the use of abrasive soap or washing powder, a solution, consisting of 1½ pints of Muriatic acid to a gallon of water, may be used. In the use of acid solutions only wooden pails and fibre brushes shall be employed." **Cleaning Down**
31. The Setting Contractor shall exercise the greatest care to avoid injury to the work of other trades. He will be held responsible for all work so injured.



FIRST FLOOR SECOND FLOOR

HOUSE OF E. BURTON CORNING, CHEVY CHASE, MARYLAND

E. BURTON CORNING, ARCHITECT



NORTHWESTERN TERRA COTTA

The superiority of Northwestern terra cotta as a medium to carry out individual expression in form and color is illustrated in these details of building, State and Elm Streets, Chicago. B. Leo Steif & Company, Architects. Full size building was pictured in the January issue. See color detail June issue Pencil Points.

THE NORTHWESTERN TERRA COTTA COMPANY

DENVER. ST. LOUIS. CHICAGO CHICAGO HEIGHTS

BOOK REVIEWS

AMERICAN APARTMENT HOUSES, HOTELS AND APARTMENT HOTELS OF TODAY

DURING the past decade the building of apartment houses, hotels and apartment hotels has largely contributed to the volume of building construction reported in the United States. Interest in multi-family dwellings continues unabated due to the marked tendency of our people to concentrate in city and adjacent suburban areas, and due also to the rapid development of various transportation facilities that is no doubt the reason people travel more than they ever traveled before. To meet the problems of living in congested areas and the furnishing of accommodations to travelers for a night or more the building of apartment houses and hotels will go on until the demand is satisfied. While this question of accommodating a number of families under one roof is not strictly a modern problem, the matter of providing for a very large number of families is decidedly one of the present. Perhaps the rapidity with which it has been necessary to supply the demand accounts in part for the inferiority in architectural design of many apartment houses and hotels. R. W. Sexton, the author of a recent volume entitled "American Apartment Houses, Hotels and Apartment Hotels of Today," places the blame for this situation largely on the owners, real estate operators, building codes and zoning laws and stresses the importance of educating along the right lines those responsible for such projects and the law makers.

In a large measure the design of multi-dwelling houses is in the hands of the architects and, as Raymond Hood says in the foreword to the present volume, "The apartment house is one of the modern problems that challenge the architect of imagination. It is the product of new economic and social conditions, and, if the requirements of the problem are studied and met, if we use the methods and materials of this day and age, the building that we build cannot be other than modern."

The author has written an enlightening resume on the planning and design of apartment houses, hotels and apartment hotels. The volume consists principaly in something over three hundred plates of reproductions of photographs, sketches and plans of buildings coming within the multi-dwelling classification. It is a comparison volume to "American Commercial Buildings of Today," and "American Theatres of Today."

American Apartment Houses, Hotels and Apartment Hotels of Today, by R. W. Sexton. New York: Architectural Book Publishing Company, Inc. 330 *pages, illustrated, size* 9 1-2 x 12 1-2. $18.00.

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THE BRIDGES OF PITTSBURGH

PITTSBURGH, situated at the junction of the Allegheny, Monongahela and Ohio Rivers, and in a district threaded with smaller tributaries to these larger rivers, and numerous ravines, might as a result be well named the city of bridges. The first river bridge of Pittsburgh was constructed over the Monongahela River in 1818. The district today has 43 bridges spanning three wide rivers, and some four hundred and fifty bridges spanning the smaller streams and ravines. Curiously enough and fortunately too, Pittsburgh is situated in a country rich in the materials required for bridge building.

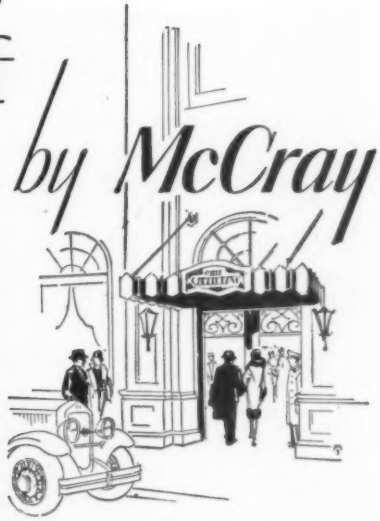
Joseph White, Engineer, Department of Public Works, Allegheny County, Pennsylvania, and M. W. Von Bernewitz, Mining and Metallurgical Engineer, U. S. Bureau of Mines, are the joint authors of a compact and simple record of the bridges of Pittsburgh. If compact, it is at once apparent that completeness has not been sacrificial to make it so, but rather the story has been condensed to a matter of facts, interesting both historically and technically.

The subjects of chapters include "How One May Recognize Various Types of Bridges"; "The Bridge as an Architectural Structure"; "Influence of Automobiles on Modern Bridge Construction"; "Vibrations in Bridges"; "Weight and Cost of Bridges"; "Corrosion of Steel Bridges," and many others that refer particularly to the bridges of Pittsburgh. This volume will be found interesting in reading matter, and illustrations, which include reproductions of photographs, drawings and maps, for all who have to do with the spanning of rivers and valleys.

The Bridges of Pittsburgh, by Joseph White and M. W. Von Bernewitz. Cramer Printing and Publishing Co., Crafton Station, Pittsburgh, Pa. 113 *pages, illustrated, size* 9¼ *x* 12. $5.00.

for
Hotels - Restaurants - Institutions

a New Standard of Refrigerator Service *by McCray*



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CURRENT NOTES

N. F. HOGGSON APPOINTED MEMBER OF COMMITTEE TO SPAIN

NOBLE FOSTER HOGGSON, president of Hoggson Bros., Inc., New York, has been designated a member of the American Industrial Committee to Spain appointed by the Marquis de Foronda, president of the Barcelona International Exhibition and His Excellency, Ambassador Alexandro Padilla, to act in advisory capacity to the exhibition.

Members of the Industrial Committee to Spain include Alfred Sloan, Jr., B. F. Yoakum, General Harbord, L. A. Osborne, Otto Kahn, John F. Tinsley, Conde Nast, P. D. Saylor, Noble Foster Hoggson and Alvan Macauley.

Two hundred American industrialists are represented at the exhibition, according to M. Ventura, official delegate to the United States from Barcelona, having reserved more than 40,000 square feet of space in the arts, chemicals and machinery sections of the industrial zone. Special offices have been opened on the grounds by the American Chamber of Commerce in Barcelona.

The exhibition opened May 19th, under the auspices of the King of Spain, with a banquet given to the King and members of the Consular staff at the City Hall. The exhibition will be open until December.

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1929 EDITION OF A. I. A. FILING SYSTEM ISSUED

THE Standard Construction Classification for filing adopted by the American Institute of Architects, perhaps better known or more properly called a filing system for information on Building Materials and Appliances, has been found a most satisfactory system for the filing of catalogues and manufacturers' literature. The general acceptance and adoption of the system has been indicative of its practical value. Any system of this kind necessarily proceeds through a certain evolution due to improvements that become evident under actual use. The A. I. A. filing system is no exception and, as changes have become desirable to make the system more useful, revised editions of the document have been found necessary.

Revisions in the system are carefully considered to avoid the necessity of making radical changes in files that are already well established. In some cases it has been found desirable to cross-index certain subjects. The only radical revision in the 1929 edition of the filing system is that of the Electrical Section (No. 31). The divisions of this section as revised have been adopted by the Association of Electragists International and endorsed by the National Electrical Manufacturers' Association.

Officers at present filing manufacturers' catalogues by this system, and those contemplating the use of the system, should obtain a copy of the new edition. This can be obtained from the American Institute of Architects, The Octagon, Washington, D. C., by asking for A. I. A. Document 172, 1929 Edition.

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SPECIFICATIONS FOR PLASTERING

THE Standards Council of the American Standards Association, New York, at its last meeting approved the starting of a new project on Standard Specifications for Plastering, to be established under the joint sponsorship of the American Institute of Architects and the American Society for Testing Materials.

The tentative scope of the project includes Specifications for lime, gypsum and cement plastering for interior work—not for exterior work or stucco.

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NEW FILING FOLDER ON GLASS

GLASS, by Mississippi" is the title of a booklet recently issued by the Mississippi Glass Company. The booklet contains 66 pages, is of standard letter size for filing and is indexed with A. I. A. File Number 26a 3-5-6.

In addition to an interesting historical sketch of the glass industry in the United States and valuable data on the daylight illumination of modern industrial buildings; information on glazing; and convenient tables of thicknesses, sizes and weights of Mississippi glass products, there will be found unusually fine illustrations of various types of polished wire glass, polished figured wire glass, polished figured glass and plain figured glass. A brief description of each kind of glass and specifications are included. Information on the light transmission and distribution of various types of window glass will be found especially valuable. The booklet deserves a place in every architect's files. Copies may be obtained from the Mississippi Glass Company, 220 Fifth Ave., New York, or THE AMERICAN ARCHITECT.

PERSONALS

An announcement has been received from William Edgar Baker and Walter Grant Thomas, architects, stating that they are associated under the name of Thomas and Baker, with offices at 105 West 40th Street, New York.

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William Koehl, architect, announces that after April 1st his offices will be located at 1900 Euclid Building, Rooms 108 and 709, Cleveland, Ohio.

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R. Harold Zook, architect, is moving his office from the Adams-Franklin Building, Chicago, to 140 South Dearborn Street, Chicago.

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The Builders Building, Charlotte, N. C., is the new address of Leonard J. Toole, architect, where he would be pleased to receive manufacturers' catalogues and samples.

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Diggs & Marshall, architects, 1513 Latham Square Building, 16th Street and Telegraph Avenue, Oakland, Calif., is the present name and address of the offices formerly located at 5658 College Avenue, of the same town, under the name of John Albert Marshall.

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Herbert A. Brand, architect and engineer, announces the removal of his office from 510 North Dearborn Street to 1941 Daily News Building, 400 West Madison Street, Chicago.

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An announcement has been received from John H. Liebau and John C. Breiby to the effect that they have associated under the name of Liebau and Breiby, Associated Architects, and will be located at 238 Main Street, Hackensack, N. J.

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Ernest P. Goodrich, consulting engineer, of 175 Fifth Avenue, New York, announces his association with William B. Powell, Consulting Traffic Engineer of Buffalo, N. Y., Chairman of the American Engineering Council and of the American Engineering Standards Committees on Signs, Signals and Markings.

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SUMMER COURSE IN ARCHITECTURE

COLUMBIA University in New York City has announced that a six weeks instruction course in Architecture will be given, starting July 8th, 1929. Visits will be made to buildings of various types in and near New York City. Advanced architectural students will be given problems based upon the types of building visited. The summer session will include courses in architectural design, drafting and freehand drawing in various media.

Professor William A. Boring, Director of the School of Architecture, states that these courses will be in charge of Francis Kealley, W. T. Armstrong, Prof. H. V. Walsh, Prof. C. A. Harriman, Prof. G. M. Allen and Joseph Lauber.

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BUREAU OF STANDARDS ANNOUNCES CHANGE IN PRINTING COMMERCIAL STANDARDS MONTHLY

FOR the past four years "The Commercial Standards Monthly" has been the medium through which the Division of Simplified Practice, of the Bureau of Standards, United States Department of Commerce, has kept American industry advised of the progress being made in the elimination of waste through simplification and standardization. This mimeographed bulletin summarizes the projects under consideration by industry in cooperation with the Bureau of Standards, meetings held, and wherever possible the work being done by individual concerns and non-governmental groups in the movement to eliminate waste in industry.

According to an announcement of Ray M. Hudson, Assistant Director of the Bureau of Standards, in charge of the Commercial Standardization Group, the monthly bulletin will hereafter appear as a standard size printed magazine and will be on a subscription basis, starting with the July 15th, 1929 issue. The yearly subscription price will be one dollar ($1.00), payable in advance to the Superintendent of Documents, Government Printing Office, Washington, D. C.

In his announcement of this change Mr. Hudson states that S. F. Tillman, associated with the Division of Simplified Practice for several years, has been appointed as the Editor of The Commercial Standards Monthly.

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PASADENA ARCHITECTURAL CLUB COMPLETES SECOND YEAR

THE Pasadena Architectural Club, of Pasadena, Calif., has completed its second year. It is stated that, under the presidency of Roy S. Parkes in the past year, the club has been successful in promoting two sketch competitions; sketching by individuals; growth in membership; lectures in the arts and allied crafts, as well as social functions. The club announces that it has acquired the Stickney Studios, in Pasadena, as headquarters.

ONYX IN SOUTH DAKOTA

FRANK D. KRIEBS, Secretary of Agriculture, states that one of the most beautiful and highest priced marbles in the world has been discovered recently in the Black Hills of South Dakota, Onyx or Travertine.

Within a few miles of Custer, located near a railroad, an onyx quarry has been opened. Investigations have shown the vein of onyx to be 300 feet wide and 1,500 feet long. This is stated to be the largest deposit in the United States and probably in the entire continent.

California, Arizona, Colorado and some of the southwestern states of the United States have a few small deposits, but the major portion of the onyx used in America is imported from Mexico. Small quantities are furnished this country by Spain, Egypt and Algeria.

With the proper development, this deposit will be able to supply the demands of the entire United States. Onyx is valued up to sixty dollars per cubic foot and is protected by an Act of Congress (1922) with a tariff of 65 cents per cubic foot for undressed onyx and $1.00 dressed.

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SEMI-ANNUAL MEETING, A. S. OF H. & V. E. LAKE-OF-BAYS, ONTARIO

THE semi-annual meeting of the American Society of Heating and Ventilating Engineers will be held at Bigwin Inn, Lake-of-Bays, Ontario, June 26th to 28th, 1929. This is the first meeting of the Society to be held in Canada. The Ontario Chapter of the Society will act as hosts. The program for this meeting contains many addresses and discussions of a technical nature that should be interesting as well as important in the advancement of the science of heating and ventilating.

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THE DETROIT MASONIC TEMPLE

A BOOKLET recently published by the Indiana Limestone Company illustrates the exterior of the Masonic Temple, Detroit, Mich.

The building, designed by George D. Mason & Company, Architects, is built of dark hollow variegated limestone. The design, inspired by the Gothic, presents an interesting combination of plain surfaces and carved ornamental and moulded detail. The site offers a commanding position for the massive structure which dominates its surroundings. This sixteen-page booklet, 8½ x 11 inches in size, also contains a description of the design and the stone used for the exterior. Copies of the booklet can be obtained by addressing the Indiana Limestone Company, Bedford, Indiana.

GARAGE DESIGN DATA

ONE of the major developments in modern building design is that of the garage building —especially that of the multi-floor building. Based upon many years of specialization in the design of garage buildings, the Ramp Buildings Corporation, New York, has prepared a loose-leaf filing folder entitled "Garage Design Data." While these data deal largely in general terms, and specifically with the utilization of the patented d'Humy Motorlamp in garage buildings, the folder contains much information of interest to anyone planning a garage. Among the many subjects covered are those of fundamentals of design, column locations, motor car dimensions, provisions for inter-floor travel, comparative efficiencies, typical layouts, grades, floor loads, mechanical equipment and facilities peculiar to garage buildings. The folder is indexed with the A. I. A. File No. 35-M-3. Correspondence relative to the procuring of this document should be addressed to Ramp Buildings Corp., 21 East 40th Street, New York, or to THE AMERICAN ARCHITECT, Service Department.

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LIGHT-WEIGHT AGGREGATES FOR CONCRETE

METHODS for the production of light-weight aggregates for concrete have been the subject of numerous patents since 1867, the Department of Commerce points out. It is, however, only recently that the industrial importance of such materials has been fully appreciated. Low-grade clays, shales and shale rock, when heated rapidly at about 2,000°F. for a short period of time, expand to 2½ to 3 times their original volume. Material sintered in this fashion when subsequently crushed and used as concrete aggregate yields concrete of the same or somewhat larger compressive strength and of only two-thirds the weight of concrete made with ordinary rock and sand aggregate. The decrease in dead weight resulting from the use of these materials effects a considerable saving in the cost of structural steel for large buildings and other construction work.

In view of the importance of this new industry as evidenced by the number of inquiries concerning the deposits of clays and shale available for the manufacture of light weight concrete aggregate, the Non-Metallic Minerals Experiment Station of the United States Bureau of Mines, in co-operation with the Ceramics Department of Rutgers University of New Brunswick, N. J., is planning to start a survey of such deposits, and a laboratory investigation of the fundamental factors involved in the manufacture of these aggregates.